

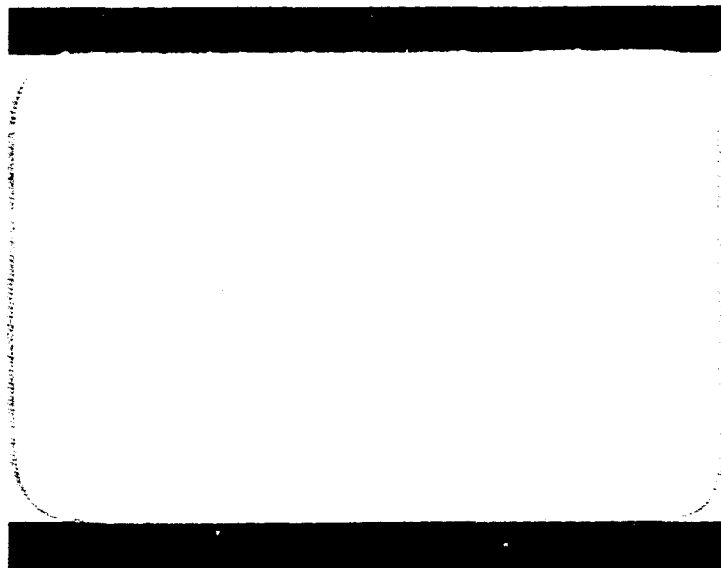
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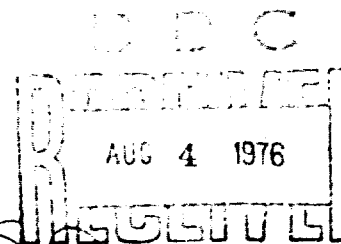
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**GENERAL DYNAMICS**  
*Convair Division*



A2135-1 (REV. 5-65)

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GENERAL DYNAMICS  
Convair Division

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11 Issue Date: 15 August 1966

14 GDC-BRW66-013-Bk-1

6 DIFFICULTIES REVIEW ATLAS BOOSTER  
AIRBORNE AND GROUND SUPPORT SYSTEMS.

|                                 |                                                   |
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BOOK I.

GENERAL INFORMATION.

12 220p.

15 CONTRACT AF04(695)-710

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Approved by

B. B. Shaffer

Chief of Reliability Engineering

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BOOK I - DIFFICULTIES REVIEW - GSE CONTAINS THE FOLLOWING VOLUMES

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| VOLUME III  | ELECTRICAL           |
| VOLUME IV   | FLIGHT CONTROL       |
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| VOLUME XIII | PROPELLANT LOADING   |
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## GENERAL INFORMATION

The Difficulties Review encompasses problems gathered from the factory, the field, (ETR and WTR) and UTP. The factory difficulties are limited to "selloff" and rerun composite testing.

In the UTP area, the difficulties were excerpted from Central Test Control Reports, Problem Reports, Supplementary History Sheets and Problem Review Reports.

Field problems for the Difficulties Review have been limited to captive flights, flight readiness firings, actual countdown dual propellant loading, quad tanking, component reliability testing, and flight acceptance composite tests. Difficulties called out in the search for critical weakness program was not documented.

GSE problems shall be limited to ETR Complex 12, 13, 36A and 36B for the present edition. Hereafter only booster difficulties shall be maintained.

Failure analysis reports cover difficulties from the field and factory and may complement the information above.

The GSE Difficulties Review, Book 1 contains 14 Volumes, one volume for each system, under one cover. Each volume is appropriately indexed.

The Airborne Difficulties Review, Book 2 contains 13 volumes. Each volume is under separate cover except Volumes II, IV and VI. Volumes II, IV, and VI are under one cover because of the limited material contained in each volume. All volumes are appropriately indexed.

A guide to facilitate interpretation of data in the Difficulties Review (GSE and Airborne) is part of each book or volume.

## GENERAL DYNAMICS

Convair Division

Subject: Explanatory Information For Use of Difficulties Review (DR)  
Data Tab Runs

This information has been prepared to facilitate use of the DR. It is not intended to describe how the DR was prepared nor the scope of the existing effort.

The Difficulties Review (DR) is presented on a form compatible with automated data processing and printout.

Appearing at the top of the page (outside of blocked-in areas) is the identification of the system and whether it is Airborne or Ground Support Equipment. Appearing with this identification is the date of the document and the page number.

On the right hand side outside of the blocked area, appears the abstract number. An abstract number is assigned to each item of the Difficulty Review to facilitate traceability to the original input document.

Appearing under the major identification are blocks wherein the information on component or system difficulty is identified and explained. Attached are samples of pages coded for reference to the following definitions and explanations:

### CODE

### EXPLANATION

①

This group of blocks callout system, subsystem, test/report number, failed component name, difficulty (Dif) data source, and GDC part number if applicable. Also called out here is the vehicle number, if applicable, and the date of difficulty.

In the same row, the site location, and in case of a flight, captive flight, or countdown, the time will be entered.

The block containing PRI and OTH refer to whether or not the failure is primary or a secondary failure. A secondary failure is to be interpreted as caused by another discrepancy.

The last block in this row is obvious and requires no further explanation:

②

Refers to a major system of the launch vehicle.

③

Refers to subsystem of a major vehicle system if applicable, (Booster, sustainer, etc).

## GENERAL DYNAMICS

### Convair Division

| <u>CODE</u> | <u>EXPLANATION</u>                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (4)         | Is a report number as opposed to type of report, (UTP, Countdown, Flight, FAR, etc.).                                                                                                                                                                                                                                                                                                                                                        |
| (5)         | Is a type of report, such as a FAR, UTP, FRF, etc.                                                                                                                                                                                                                                                                                                                                                                                           |
| (6)         | Refers to a component part by name.                                                                                                                                                                                                                                                                                                                                                                                                          |
| (7)         | Is a component piece part of the component and referred to by name, (plug, seal, wiring, diode, etc., only where applicable).                                                                                                                                                                                                                                                                                                                |
| (8)         | Is a GDC part number, if applicable.                                                                                                                                                                                                                                                                                                                                                                                                         |
| (9)         | Refers to a site or location at time of discrepancy on the component or vehicle system.                                                                                                                                                                                                                                                                                                                                                      |
| (10)        | Is the vehicle on which discrepancy occurred. Vehicle number listed only if unit was installed on a vehicle at time of discrepancy.                                                                                                                                                                                                                                                                                                          |
| (11)        | Is the vendor part number, if applicable.                                                                                                                                                                                                                                                                                                                                                                                                    |
| (12)        | Is the vendor name, if applicable.                                                                                                                                                                                                                                                                                                                                                                                                           |
| (13)        | Is the failure caused by other component or other system. This item defines the failure as secondary or not secondary.                                                                                                                                                                                                                                                                                                                       |
| (14)        | <p>Refers to the primary failure. If item is labeled <u>no</u>, then item (13) may appear as a <u>yes</u>.</p> <p>Should item (13) appear as a <u>yes</u>, then an abstract will have been written to identify the cause of failure effecting the component referred to in the Difficulty Review, Item 6. It should be noted that a multiple failure may be recorded in these blocks, (yes/yes), or if a failure did not occur, (no/no).</p> |
| (15)        | Defines the failure mode, and if identifiable, the cause is called out. A careful review of the failure mode is made to determine effect on system operation and vehicle effort.                                                                                                                                                                                                                                                             |

## GENERAL DYNAMICS

Convair Division

| <u>CODE</u> | <u>EXPLANATION</u>                                                                                                                                                                                                   |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (16)        | Defines the system effect. This effect is the result of the failure mode assigned to the component.                                                                                                                  |
| (17)        | Defines the vehicle effect. This effect is a result of the failure mode and the result of the system effect.<br><br>It should be noted that corrective action may be taken whether or not the failure was confirmed. |
| (18)        | Lists the corrective action Taken by GDC, the vendor, or both.                                                                                                                                                       |

GENERAL DYNAMICS  
CONVAIR DIVISION

PAGE 0171

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

17 FEB 1968

| SYSTEM<br>SUB-SYSTEM | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTM | VENDOR NAME<br>VENDOR PART NO |
|----------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
|----------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|

CORRECTIVE ACTION-DEPT 141-3 TO PERFORM RETEST ON TWO (2) ADDITIONAL UNITS FROM LOT 13, TO DETERMINE LOT ACCEPTABILITY AND PROVIDE COMPARISON DATE.

HYDRAULIC-A/B BOOSTER 27A3977 HYDRAULIC PUMP UTP-PRT 841229 CONVAIR YES VICKERS NO AA-80894-R-8A 897095

FAILURE MODE-OUT OF SPECIFICATION, 3/4" 408-0430, PEAR TRANSIENT PRESSURES WERE 4100 TO 4800 PSIG, ALLOWABLE IS 4000 PSIG, NO FLOW TO FULL FLOW TIME IS 0.137 SECONDS, ALLOWABLE TIME IS 0.08 SECONDS.

CORRECTIVE ACTION-SUBMIT ECP 7889 TO REVISE TEST REQUIREMENTS TO PRACTICAL LEVELS.

HYDRAULIC-A/B BOOSTER 84V-48-10-249F HYDRAULIC PUMP/SEAL FAR 87-08366-1 841003 T128 FACTORY YES VICKERS NO JA-80894-R-8A 898174

FAILURE MODE-LEAK-EXTERNAL-CONTINUOUS OIL SEEPAGE WAS OBSERVED DURING CHECKOUT, CAUSED BY DEFECTIVE SEAL AT PUMP FLANGE PRESSURE SENSING PORT.

CORRECTIVE ACTION-VENDOR REVIEWED STOCK OF O-RINGS AND INFORMED THEIR PERSONNEL OF CORRECT SEAL INSTALLATION PROCEDURE.

HYDRAULIC-A/B BOOSTER 84V-80-10-239-F BOOSTER HYDRAULIC PUMP/SEAL FAR 87-08366-1 0071-01 MTR YES AA-80894-R-8A 899486

FAILURE MODE-LEAK EXTERNAL. PUMP WAS REPORTED LEAKING AFTER HOT FIRING TEST. CASE WAS OVERPRESSURIZED CAUSING DAMAGE TO CASE COVER SEAL.

CORRECTIVE ACTION-NO CORRECTIVE ACTION RECOMMENDED SINCE DAMAGE OCCURRED DUE TO INADVERTENT OVERPRESSURIZATION OF THE PUMP.

HYDRAULIC-A/B BOOSTER 89A-910-3 HYDRAULIC PUMP UTP-PRT 840814 CONVAIR YES VICKERS NO AA-80894-R-8A

FAILURE MODE-LEAK EXTERNAL, 3/4" 808-0660 FAILED TO MEET CASE DRAIN LEAKAGE REQUIREMENTS OF 0.0 GPM DURING PRT-1AT. THIS UNIT ALSO FAILED TO MEET PEAR TRANSIENT PRESSURE REQUIREMENTS, REFER TO PPN-4893.

SYSTEM EFFECT-NONE.

14

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GENERAL DYNAMICS  
CONVAIR DIVISION

PAGE 0002

15 FEB 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-BOOSTER HYDRAULIC PILL AND BLEED PERFORMED.                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |
| HYDRAULIC-A/B<br>BOOSTER                                                                                                                                                                                                                                                                                                                                       | PTAG887/P8-W0-01-0AC8                       | COMPOSITE-PRD/DPL              | 1310<br>630713      | 308              | NO         | NO                            |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. TEST WAS RUN WITHOUT BOOSTER HYDRAULICS BECAUSE BOOSTER MPU COULD NOT BE OPERATED REMOTELY. THIS WAS NOTED DURING AUTOPILOT FINAL CHECKS.                                                                                                                                                                     |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-BOOSTER MPU HAND VALVE, MICROSWITCHES V3 AND V1 ADJUSTED TO MAKE WIPER CONTACT.                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| HYDRAULIC-A/B<br>BOOSTER                                                                                                                                                                                                                                                                                                                                       | GDC/BKPS-046/D1-401-00-19                   | FLIGHT                         | 390<br>630701       | 8-1<br>-32.3     | YES<br>NO  |                               |
| FAILURE MODE-LEAK. B1 HYDRAULIC ACCUMULATOR PRESSURE EXHIBITED NO PRESSURE DIFFERENCE DURING THE OIL EVACUATION SEQUENCE.                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-POSSIBLE CONTAMINATION. ALTHOUGH THE FAILURE MODE INDICATES THE POSSIBILITY OF AIR IN THE BOOSTER HYDRAULIC SYSTEM, SYSTEM PERFORMANCE WAS SATISFACTORY.                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE. THE POSSIBILITY OF CONTAMINATION WAS NOT CONFIRMED BY ANY OTHER TELEMETRY DATA.                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |
| HYDRAULIC-A/B<br>BOOSTER                                                                                                                                                                                                                                                                                                                                       | GDC/BKPS-039/B2-401-00-177                  | FLIGHT                         | 1770<br>630803      | 8-2<br>2.3       | NO<br>NO   |                               |
| FAILURE MODE-OUT OF TOLERANCE. BOOSTER HYD ACCUM. PRESS MEASUR. H33P AND HYD. PUMP OUTLET PRESS. MEASUR H33P INDICATED AN INITIAL NORMAL PRESS. RISE BUT TO A LOWER (3150 PSIA) THAN NORMAL (3300 PSIA) PEAK AT 2.3 SEC. THE PRESS. THEN DECAYED TO 8720 PSIA DURING NEXT 1.3 SEC. SPECIFIC CAUSE UNKNOWN BUT SYMPTOMATIC OF UNUSUALLY HEAVY DEMAND ON SYSTEM. |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LOW. BOOSTER HYDRAULIC PRESS. LOWER THAN NORMAL FOR A TIME PERIOD OF -2.3 SEC TO 1.3 SEC.                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |
| C. NO ADVERSE EFFECT NOTED ON SYSTEM PERFORMANCE.                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |
| HYDRAULIC-A/B<br>BOOSTER                                                                                                                                                                                                                                                                                                                                       | GDC/CZMH9-D17-0A1047-14-7MO-01-71           | COMPOSITE-PRD/DPL              | 7107<br>630410      | 2-4              | YES<br>NO  |                               |

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H

AIRCONDITIONING SYSTEM

GSE

· DIFFICULTIES REVIEW

DIFFICULTIES REVIEW AIR CONDITIONING SYSTEM GSE

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GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1968

DIFFICULTIES REVIEW-AIR CO DITIONING SYSTEM-CSC

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME            | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>VENDOR, PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------|
| AIR CONDITIONING-CSE<br>POO COOLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CAPRAN 11-041/P3-4MO-02-588<br>CIRCUIT BREAKER, WIRING | COMPOSITE-PRO/DPL              | 2890<br>841108      | 13<br>-860       | YES<br>NO  |                                 |
| <p>FAILURE MODE-ELECTRICAL OPEN. POO AIR CONDITIONING DID NOT OPERATE. INVESTIGATION REVEALED THAT THIS FAILURE WAS CAUSED BY A LOOSE WIRE IN THE CIRCUIT BREAKER.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START.</p> <p>VEHICLE EFFECT-COMPOSITE DELAYED. THERE WAS A 10 MIN HOLD AND A 20 MIN RECYCLE. LOG WAS DETACHED TO PERMIT INVESTIGATION. POO TEMPERATURE INCREASED AND REQUIRED SHUTDOWN OF THE SYSTEMS WITH EQUIPMENT OPERATING IN THE POOS.</p> <p>CORRECTIVE ACTION-CIRCUIT BREAKER WAS REPAIRED.</p> |                                                        |                                |                     |                  |            |                                 |
| AIR CONDITIONING-NS-588<br>POO COOLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | AA22 041/P3-4MO-02-588<br>CIRCUIT BREAKER              | COMPOSITE-J FACT               | 1350<br>840818      | 30A<br>-2180     | YES<br>NO  |                                 |
| <p>FAILURE MODE-ELECTRICAL OPEN. THE AIR CONDITIONING CSE BLU-ER POWER CIRCUIT BREAKER TRIPPED. THE CAUSE WAS UNKNOWN.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. POO AIR CONDITIONING WAS LOST.</p> <p>VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME WAS 31 MINUTES.</p> <p>CORRECTIVE ACTION-THE CIRCUIT BREAKER WAS RESET AND THE TEST CONTINUED.</p>                                                                                                                                                      |                                                        |                                |                     |                  |            |                                 |
| AIR CONDITIONING-CSE<br>THRUST SECTION HEATING                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | AA60-030/P2-401-00-35<br>THRUST SECTION HEATER         | COMPOSITE-J FACT               | 530<br>801028       | 1"<br>-8280      | YES<br>NO  |                                 |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE COUNTDOWN WAS HELD AT 1:38 MINUTES FOR IMPROPER OPERATION OF THE THRUST SECTION HEATER.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.</p> <p>VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME NOT KNOWN.</p> <p>CORRECTIVE ACTION-HEAT FOR THE THRUST SECTION WAS SUPPLIED BY A RECO UNIT.</p>                                                                                                                                                                           |                                                        |                                |                     |                  |            |                                 |

AUTOPILOT SYSTEM

GSE

DIFFICULTIES REVIEW

DIFFICULTIES REVIEW AUTOPILOT GSE

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Amplifier

Sensor

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GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-AUTOPILOT SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>DIF TIME DIF | PRI<br>DIF TIME DIF | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|----------------------|---------------------|-------------------------------|
| AUTOPILOT-SQUARE-68E                                                                                                                                                                                                                                                                               | SLV-98-43-03 F<br>AMPLIFIER, ISOLATION.     | FAR<br>27-00121-1              | 680210 ETR                   | KINETICS<br>MS03-3   |                     | 680213                        |
| FAILURE MODE-ERRATIC OPERATION. INTERMITTENT WAVEFORM WAS REPORTED ON PITCH SIGNAL AMPLIFIER CHANNEL. FAILURE WAS U<br>N CONFIRMED.                                                                                                                                                                |                                             |                                |                              |                      |                     |                               |
| CORRECTIVE ACTION-NONE SINCE THE FAILURE WAS UNCONFIRMED NOR WAS THE REPORTED FAILURE CAUSE FOUND.                                                                                                                                                                                                 |                                             |                                |                              |                      |                     |                               |
| AUTOPILOT-SQUARE-68E                                                                                                                                                                                                                                                                               | SLV-98-43-03SF<br>DELAY, VOLTAGE- SENSING   | FAR<br>27-00241-9              | 53-03 ETR<br>680209          | AUTRONICS<br>1439-8  |                     | 680211                        |
| FAILURE MODE-ERRATIC OPERATION REPORTED BUT FAILURE ANALYSIS COULD NOT CONFIRM THE REPORTED FAILURE.                                                                                                                                                                                               |                                             |                                |                              |                      |                     |                               |
| CORRECTIVE ACTION-NONE SINCE THE REPORTED FAILURE NOR A CAUSE WAS FOUND.                                                                                                                                                                                                                           |                                             |                                |                              |                      |                     |                               |
| AUTOPILOT-SQUARE-68E                                                                                                                                                                                                                                                                               | SLV-98-43-03SF<br>AMPLIFIER                 | FAR<br>27-00121-1              | 680209 ETR                   | KINETICS<br>MS03-3   |                     | 680214                        |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. AMPLIFIER HAD NO OUTPUT. BROKEN FUSE HOLDER HAD SHORT CIRCUITED<br>TO EQUIPMENT CASE.                                                                                                                                                           |                                             |                                |                              |                      |                     |                               |
| CORRECTIVE ACTION-FAR SLV-98-43-3623 AND MEMO FROM SLV LAUNCH CONTROL DATED 680310 STATE THAT AMPLIFIER DASH 1 IS B<br>INTERFERED BY DASH 3 WHICH HAS FUSE HOLDER SECURED WITH BOLT. SUBJECT AMPLIFIER WAS PROBABLY MISHANDLED TO CAUSE DISL<br>COSEMENT OF FUSE HOLDER FROM ITS EXPOSURE BONDING. |                                             |                                |                              |                      |                     |                               |
| AUTOPILOT-SQUARE-68E                                                                                                                                                                                                                                                                               | CT-11-430-023<br>AMPLIFIER, LINE-DRIVING    | FAR<br>59-00864-3              | 680110 ETR                   | KINETICS<br>M-9-9-3  |                     | 680215                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DUE TO BLOWN PRIMARY POWER FUSE.                                                                                                                                                                                                                  |                                             |                                |                              |                      |                     |                               |
| CORRECTIVE ACTION-CAREFUL EXAMINATION OF TEST PROCEDURES TO DETERMINE A POSSIBLE SOURCE OF VOLTAGE MISAPPLICATION O<br>R OTHER EXTERNAL CAUSE OF EXCESSIVE INPUT CURRENT.                                                                                                                          |                                             |                                |                              |                      |                     |                               |

ELECTRICAL SYSTEM

GSE

DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW ELECTRICAL - GSE

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|                     |       |
|---------------------|-------|
| Connector Umbilical | 0033. |
|---------------------|-------|

V. VEHICLE CONTROL DISTR & MONITOR

PAGES

|              |             |
|--------------|-------------|
| Control Unit | 0034.       |
| Relay        | 0034.       |
| Transducer   | 0033, 0035. |

VI. POWER GENERATION D.C.

|                   |             |
|-------------------|-------------|
| Simulator Battery | 0035, 0036. |
|-------------------|-------------|

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                        | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME           | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME QIF | PRI<br>SITE<br>TIME QIF | OTH<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------|------------------------------|-------------------------|-----------------------|
| ELECTRICAL-68E                                                                                                                                                                                                                                                                              | 60C/BRF83-036/A2-801-C0-147                           | COUNTDOWN                      | 147F A2<br>630603            | YES<br>NO               | 099372                |
| FAILURE MODE-FAILED DURING OPERATION. WATER SYSTEM FAILED. INDICATION WAS RECEIVED DURING COUNTDOWN. FLAME DEFLECTOR WATER WAS VISUALLY-CONFIRMED AND MISSILE WAS LAUNCHED.                                                                                                                 |                                                       |                                |                              |                         |                       |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNAL.                                                                                                                                                                                                                                                     |                                                       |                                |                              |                         |                       |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                                                                           |                                                       |                                |                              |                         |                       |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                  |                                                       |                                |                              |                         |                       |
| ELECTRICAL-CYE<br>SUSTAINER                                                                                                                                                                                                                                                                 | A3-4MO-02-301<br>UMBILICAL                            | COMPOSITE-PRD/DPL              | 301D A3<br>630217            | YES<br>NO               | 099374                |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME DUE TO A LOOSE UMBILICAL. THE A/P PROGRAMMER FAILED TO DISARM AT COMMIT STOP.                                                                                                                                                             |                                                       |                                |                              |                         |                       |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                         |                                                       |                                |                              |                         |                       |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                        |                                                       |                                |                              |                         |                       |
| CORRECTIVE ACTION-TIGHTENED LOOSE UMBILICAL.                                                                                                                                                                                                                                                |                                                       |                                |                              |                         |                       |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                        | CAPSAN12-089/P8-L0-01-0AC4<br>UMBILICAL CONNECTOR     | COUNTDOWN                      | 148D 36A<br>641804 -12000    | YES<br>NO               | 099468                |
| FAILURE MODE-ERRATIC OPERATION. ATLAS AUTOPILOT SPIN MOTOR ROTATION OUTPUT DETECTION LIGHT INTERMITTANT THROUGH UMBILICAL P1001.                                                                                                                                                            |                                                       |                                |                              |                         |                       |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                         |                                                       |                                |                              |                         |                       |
| VEHICLE EFFECT-COUNTDOWN DELAYED AT T-200 UNDETERMINED AMOUNT OF TIME.                                                                                                                                                                                                                      |                                                       |                                |                              |                         |                       |
| CORRECTIVE ACTION-P1001 WAS PULLED AND CLEANED WITH ALCOHOL AND REINSTALLED. NO FURTHER INTERMITTANT INDICATIONS WERE OBSERVED.                                                                                                                                                             |                                                       |                                |                              |                         |                       |
| ELECTRICAL-68E                                                                                                                                                                                                                                                                              | 6DA-AP264-032/E1-803-00-110<br>ONE-INCH MOTION SWITCH | COUNTDOWN                      | 110F 378E<br>640807 0        | YES<br>NO               |                       |
| FAILURE MODE-CONTAMINATION. ONE-INCH MOTION SWITCH DID NOT ACTIVATE. CONTAMINATION AND/OR CORROSION CONSIDERED TO BE THE MOST LIKELY CAUSE.                                                                                                                                                 |                                                       |                                |                              |                         |                       |
| SYSTEM EFFECT-OPERATION DOES NOT START. DISCRETE SIGNALS INITIATED BY THE ONE-INCH MOTION SWITCH TO EJECT UMBILICALS AND TO START GUIDANCE COMPUTER RESET TIMER WERE NOT SENT. UMBILICALS EJECTED BY LANTARD. COMPUTER RESET STARTED 0.2 SECONDS LATE BY UMBILICAL EJECTION BACK UP SIGNAL. |                                                       |                                |                              |                         |                       |
| VEHICLE EFFECT-IMPROPER TRAJECTORY. LATE START OF COMPUTER RESET TIMER CONTRIBUTED TO TARGET OVER SHOOT OF 4.8 NM.                                                                                                                                                                          |                                                       |                                |                              |                         |                       |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68C

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                  | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH       | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------------|-------------------------------|--------|
|                                                                                                                                                                                                                                                                                                                                                                                     | CORRECTIVE ACTION-ECP 2489 TO INCLUDE ONE-INCH MOTION SWITCH RELIABILITY IMPROVEMENTS AND PROVIDE MEANS OF FUNCTIONAL CHECK OF SWITCH WITH MISSILE ON STAND. |                                |                     |                  |                  |                               | 689334 |
| ELECTRICAL-68C<br>SUSTAINER                                                                                                                                                                                                                                                                                                                                                         | LV-A9-14-211-F<br>HARNESS-UMBILICAL                                                                                                                          | FAR<br>27-61807-095            | 204-D<br>84D304     | FACTORY          | YES<br>NO        |                               | 689376 |
| FAILURE MODE-OPEN IN CABLE DUE TO IMPROPER WIRING INSTRUCTION ON OPERATIONAL PLANNING CARD RESULTING FROM AN ERROR IN ECM 175225 TO DRAWING 27-61887.                                                                                                                                                                                                                               |                                                                                                                                                              |                                |                     |                  |                  |                               |        |
| CORRECTIVE ACTION-APPLICABLE PLANNING CARD WAS CORRECTED.                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                              |                                |                     |                  |                  |                               |        |
| ELECTRICAL-68C<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                | 6942146<br>PLUG, UMBILICAL CONNECTOR                                                                                                                         | UTP-GUAL/PPT<br>27-04999-17    | 840188              | GD/C             | YES CANNON<br>NO | 017089-1043                   | 689335 |
| FAILURE MODE-FAIL DURING OPERATION. DURING ISPT, THE TEST SPECIMEN DID NOT COMPLETELY EJECT WHEN 22 VEC WAS APPLIED TO THE EJECTION SOLENOID. ELECTRICAL INTERRUPTION WAS ACCOMPLISHED WITHIN THE REQUIRED TIME. PROBLEM DUE TO DRAG ON INSULATOR EXCEEDED THE FORCE OF THE SPRING SYSTEM AVAILABLE TO RETRACT THE MALE PINS FROM THE DEAD FACE FOR COMPLETE MECHANICAL SEPARATION. |                                                                                                                                                              |                                |                     |                  |                  |                               |        |
| CORRECTIVE ACTION-SC SURVEY 33-84 WAS ACCOMPLISHED REPLACING THE CORNER POST SCREWS WITH SMALLER DIAMETER SCREWS. TESTING WAS RESUMED WITH UNDERSIZED CORNER POST SCREWS INSTALLED. (REF FRR 148 B).                                                                                                                                                                                |                                                                                                                                                              |                                |                     |                  |                  |                               |        |
| ELECTRICAL-68C<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                | 6942146<br>PLUG, UMBILICAL CONNECTOR                                                                                                                         | UTP-GUAL/PPT<br>27-04999-17    | 815271              | ACT              | YES CANNON<br>NO | 017089-1043                   | 689335 |
| FAILURE MODE-ELECTRICAL SHORT. OUT OF TOLERANCE DURING ISPT HYPOT TEST, CUT OF TOLERANCE READINGS WERE RECORDED BETWEEN ALL PINS BEING MONITORED AND SHELL AND ALSO BETWEEN CENTER CONDUCTOR OF CONTACT 93 AND SHELL. PART MATED WITH 27-04999-17.                                                                                                                                  |                                                                                                                                                              |                                |                     |                  |                  |                               |        |
| CORRECTIVE ACTION-ARCING ON ALL BUT COAX DISAPPEARED AFTER CONNECTOR DISASSEMBLY AND REASSEMBLY, AND APPEARED TO BE ASSOCIATED WITH A FLOATING POTENTIAL AT HIGH AC VOLTAGE LEVELS. ARCING OF COAX CONTACT CENTER CONDUCTOR TO SHIELD WAS DUE TO POOR WIRE TERMINATION METHOD. VENDOR AND OPI WERE ADVISED OF FAILURE TO PREVENT RECURRENCE OF PROBLEM. (REF FRR 103).              |                                                                                                                                                              |                                |                     |                  |                  |                               |        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE D.F | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO  |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------|--------|
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                            | GD/A63-0889/81-402-00-143<br>UMBILICAL         | COUNTDOWN                      | 1430<br>830729      | B-1              | YES<br>NO  |                                | 000390 |
| FAILURE MODE-FAIL DURING OPERATION. UMBILICAL PI007 FELL OUT AFTER ENGINE START AND BEFORE MAINSTAGE COMPLETE.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. ENGINE CUT-OFF.<br>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.<br>CORRECTIVE ACTION-UNKNOWN.                                                                 |                                                |                                |                     |                  |            |                                |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                            | AX62-0030/FC-4CO-03-113<br>UMBILICAL-CONNECTOR | COMPOSITE-FACTORY              | 1130<br>820710      |                  | YES<br>NO  |                                | 000489 |
| FAILURE MODE-STRUCTURAL - DURING AN UMBILICAL SPRING SURVEY, UMBILICAL J1003 WAS FOUND TO HAVE A CRACKED FACE PLATE.<br>SYSTEM EFFECT-MONE.<br>VEHICLE EFFECT-COMPOSITE RE-SCHEDULED. RERUN OF COMPOSITE WAS REQUIRED BY AIR FORCE.<br>CORRECTIVE ACTION-REPLACED CRACKED FACE PLATE.                                           |                                                |                                |                     |                  |            |                                |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                            | DA343/L2-403-00-97<br>UMBILICAL PLUG           | COUNTDOWN                      | 970<br>810710       | PALCI-2          | YES<br>NO  |                                | 000392 |
| FAILURE MODE-FAIL DURING OPERATION. UMBILICAL PI007 FELL OUT PRIOR TO RECEIPT OF ENGINES COMPLETE SIGNAL. AS A RESULT AN AUTOMATIC CUTOFF SIGNAL WAS GENERATED AND ALL ENGINES WERE CUTOFF.<br>SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS.<br>VEHICLE EFFECT-PREMATURE PROPULSION CUTOFF.<br>CORRECTIVE ACTION-UMBILICAL REPLACED. |                                                |                                |                     |                  |            |                                |        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                              | CT-9B-430-013<br>ACTUATOR EJECTION             | FAR<br>55-08274-5              | 800323              | ETR              | YES<br>NO  | GRAY-MULEGUARD<br>NO 876-440-5 | 000381 |
| FAILURE MODE-OUT OF SPECIFICATION. ACTUATOR RELEASED BY EJECTION FORCES LESS THAN MINIMUM REQUIRED. FAILURE WAS UNCONFIRMED.<br>CORRECTIVE ACTION-RECOMMEND SITE PERSONNEL BE REINSTRUCTED IN THE PROPER USE OF ADEQUATE MEASURING EQUIPMENT                                                                                    |                                                |                                |                     |                  |            |                                |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-69E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                   | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME      | DIF DATA SOURCE<br>PART NUMBER  | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------|---------------------|------------------|---------------------------|-------------------------------|
| ELECTRICAL-69E<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                     | FAR-CT-98-480-012<br>RELAY                       | FAR<br>97-37508-001             | 931813              | 36A/ETR          | YES LEACH<br>NO 9243-33-8 | 000742                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE RELAY SENSES THE PHASE SEQUENCE OF AC GROUND POWER, AND LIGHTS AN INDICATOR IN THE BLOCKHOUSE. THE INDICATOR DID NOT LIGHT. X-RAYS SHOWED AN ARMATURE ARM LOOSE AND FREE TO MOVE AROUND INSIDE THE CASE. THE PART WAS SHORTING TERMINALS INTERNALLY.                                                              |                                                  |                                 |                     |                  |                           |                               |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR IMPROVE THE METHOD OF LOCKING THE ARMATURE ARM TO THE MOTOR SH AFT, AND THAT THE TERMINALS BE INSULATED.                                                                                                                                                                                                          |                                                  |                                 |                     |                  |                           |                               |
| ELECTRICAL-69E<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                     | AA63-0033/P4-7CO-08-3301<br>MAGNETIC AMPLIFIER   | COMPOSITE-J FACT<br>7-60031-645 | 5301<br>931004      | 14               | YES STAVOLT<br>NO         | 000302                        |
| FAILURE MODE-FAIL DURING OPERATION. PS-8 POWER SUPPLY FAILED DURING COMPOSITE JOINT FACT DUE TO DEFECTIVE MAGNETIC AMPLIFIER. REFER TO IR 074507.                                                                                                                                                                                                                      |                                                  |                                 |                     |                  |                           |                               |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. POWER SUPPLY PREMATURELY TERMINATED.                                                                                                                                                                                                                                                                                        |                                                  |                                 |                     |                  |                           |                               |
| VEHICLE EFFECT-NONE. TEST COMPLETED.                                                                                                                                                                                                                                                                                                                                   |                                                  |                                 |                     |                  |                           |                               |
| CORRECTIVE ACTION-AMPLIFIER REPLACED FOLLOWING FACT.                                                                                                                                                                                                                                                                                                                   |                                                  |                                 |                     |                  |                           |                               |
| ELECTRICAL-69E<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                     | FAR-LV-9D-2A-5013-F<br>400-CYCLE MONITOR CIRCUIT | FAR<br>87-16378-1               | 650306              | 13/ETR           | YES<br>NO                 | 000774                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE MONITOR UNIT SENSES THE PHASE VOLTAGES OF THE 400-CYCLE POWER SUPPLY. THE UNIT FAILED TO DETECT LOW VOLTAGE OF PHASE A. INVESTIGATION REVEALED SHORTED TRANSISTORS AND DIODES. PROBABLY CAUSED BY A MOMENTARY POLARITY REVERSAL. THE CAUSE OF THE REVERSAL COULD NOT BE DETERMINED.                               |                                                  |                                 |                     |                  |                           |                               |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. THIS -1 CONFIGURATION HAS BEEN REDESIGNED AND REPLACED BY A PRODUCTION -3 CONFIGURATION.                                                                                                                                                                                                                                  |                                                  |                                 |                     |                  |                           |                               |
| ELECTRICAL-69E<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                     | ETR-039/P8-CO-01-0AC3<br>SAIL SWITCH             | COMPOSITE-J FACT<br>650216      | 1580<br>650216      | 36A/ETR          | YES<br>NO                 |                               |
| FAILURE MODE-FAIL DURING OPERATION. THE SAIL SWITCH THAT INDICATES PROPER OPERATION OF THE POWER SUPPLY COOLING FAN CLOSED SEVERAL TIMES DURING THE TEST. THE CLOSING OF THE SWITCH WAS APPARENTLY CAUSED BY VARYING AIR CURRENTS. WHEN THE SWITCH CLOSSES, THE POWER SUPPLY IS TURNED OFF AND EMERGENCY BATTERIES ARE REQUIRED TO FURNISH THE POWER REQUIRED BY PS-3. |                                                  |                                 |                     |                  |                           |                               |
| SYSTEM EFFECT-ERRATIC OPERATION. THE PS-3 COMPLEX POWER SUPPLY INTERMITTENTLY DROPPED FROM 28 VDC TO 28 DVC THREE TIMES DURING THE TEST.                                                                                                                                                                                                                               |                                                  |                                 |                     |                  |                           |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                        | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|----------------------------------------|
| VEHICLE EFFECT-COMPOSITE DELAYED. A HOLD WAS CALLED TO INVESTIGATE THE VOLTAGE TRANSIENTS.                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-THE BALL SWITCH WAS REMOVED AND THE SYSTEM REVISED TO CONTROL AN INDICATOR LIGHT IN THE BLOCKHOUSE E.                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                                        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                          | AAA-0037/P8-CO-03-0AC3<br>POWER SUPPLY      | COMPOSITE-J FACT               | 1950<br>840622      | 38A/ETR<br>226   | NO<br>NO   |                                        |
| FAILURE MODE-CUT OF TOLERANCE. A MOMENTARY VOLTAGE DROP WAS NOTED DURING THE TEST CAUSED BY HEAVY LOADING WHEN PTRO TECHNIC SIMULATORS WERE FIRED.                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                                        |
| SYSTEM EFFECT-OPERATION TOO LOW. THE LOW OUTPUT OF THE GROUND POWER SUPPLY CAUSED A LOW DC INPUT TO THE AZUSA CANIS TLR (22 VOLTS), AND RESULTED IN A MOMENTARY LOSS OF AZUSA.                                                                                                                                                                              |                                             |                                |                     |                  |            |                                        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                                        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                          | FAR-CT-98-48-004-C<br>RESISTOR              | FAR<br>N/A 27-08416-1          | 840515              | 38A/ETR          | NO<br>YES  | MILWAUKEE REG<br>YES STOR<br>98-188-23 |
| FAILURE MODE-FAIL DURING OPERATION. SIX RESISTORS BURNED AS THE RESULT OF FAILURE OF A TIME DELAY RELAY (REF. FAR-C T-98-48-003C).                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-NONE ACTION WAS TAKEN.                                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                                        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                          | FAR-CT-98-48-003-C<br>TIME DELAY RELAY      | FAR                            | 840515              | 38A/ETR          | YES<br>NO  | CURTIS-WRIGHT<br>ED-70143              |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. AFTER A BRIEF INTERRUPTION OF INPUT POWER, THE MOTOR GENERATOR WOULD NOT START. AN OPEN-CIRCUIT WAS DISCOVERED IN THE RELAY. HOWEVER, THE FAILURE ANALYSIS WAS CANCELLED BY CENTAUR RELIABILITY DIRECTIVE.                                                                                                 |                                             |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-NONE CORRECTIVE ACTION WAS TAKEN AS A RESULT OF THE ANALYSIS CANCELLATION.                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                                        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                          | FAR-LY-98-48-232-F<br>FREQUENCY METER       | FAR<br>95-94300-001            | 840816              | 18/ETR           | YES<br>NO  | VARO<br>6507                           |
| FAILURE MODE-FAIL DURING OPERATION. THE METER IS PART OF THE ELECTRICAL CHECKOUT SFT WHICH MONITORS THE 400-CYCLE POWER FREQUENCY. FAILURE OCCURRED WHEN THE GENERATOR WAS TURNED ON FOR A DAILY CHECK AND THE METER BEGAN TO SHAKE. AFTER DISASSEMBLY, A SHORT WAS DISCOVERED BETWEEN GROUND AND THE RECTIFIER DC OUTPUT CIRCUIT. PROBABLE CAUSE WAS A RES |                                             |                                |                     |                  |            |                                        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME   | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| ENTER LEAD BEARING AGAINST THE CIRCUIT BOARD, GRADUALLY WEARING THROUGH TO MAKE AN ELECTRICAL PATH.                                                                                                                                                                                                                                                                                                           |                                               |                                |                     |                  |            |                               | 000748 |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. IT WAS RECOMMENDED THAT THE VENDOR IMPROVE QUALITY CONTROL TO PREVENT ACCEPTANCE OF BOARDS WITH RESISTOR LEADS EXTENDING BEYOND THE SOLDER POINTS.                                                                                                                                                                                                               |                                               |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                            | FAR-LV-98-43-223<br>CIRCUIT BOARD, TRANSISTOR | FAR<br>27-00241-1              | 631216              | 12/ETR           | YES<br>NO  | YES AUTONICS<br>NO 1436       | 000759 |
| FAILURE MODE-ERRATIC OPERATION. THE RELAY OPERATED INTERMITTENTLY DURING A PROCEDURE PERFORMANCE. THIS IS A VOLTAGE -SENSING RELAY MONITORING THE 115-VOLT SUPPLY TO THE PROGRAMMER, AND CONTAINS TRANSISTOR CIRCUIT BOARDS. FAILURE ANALYSIS TESTS SHOWED BREAKDOWN OF THE 98 TRANSISTOR WHEN INCORRECT VOLTAGE WAS APPLIED TO THE EMITTER-BASE JUNCTION. THIS MALFUNCTION IS DUE TO FAULTY INTERNAL DESIGN. |                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE VENDOR WAS REQUESTED TO MODIFY THE DESIGN. ECP 7760 AND TCP 9327 WERE ISSUED TO COVER REPLACEMENT OF 21 RELAYS. THE FAILURE WAS NOT CONFIRMED.                                                                                                                                                                                                                                          |                                               |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                            | 63-0872/02-401-00-63<br>400 CYCLE GENERATOR   | COUNTDOWN                      | 93D<br>C50903       | 97               | YES<br>NO  |                               | 000963 |
| FAILURE MODE-OUT OF SPECIFICATION. UNABLE TO MAINTAIN RATE LOCK.                                                                                                                                                                                                                                                                                                                                              |                                               |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS, HIGH 400 CYCLE NOISE LEVEL AFFECTED RATE BEACON OUTPUT.                                                                                                                                                                                                                                                                                                                |                                               |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.                                                                                                                                                                                                                                                                                                                                                             |                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-GENERATOR REPLACED.                                                                                                                                                                                                                                                                                                                                                                         |                                               |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                            | 9P-98-48-238F<br>MOTOR GENERATOR RESISTOR     | FAR<br>27-06418-1              | 930725              | 12/ETR           | YES<br>NO  | YES KURZ-ROOT                 | 000991 |
| FAILURE MODE-FAIL DURING OPERATION. MOTOR GENERATOR SHUT DOWN DURING NORMAL OPERATION. CAUSE ATTRIBUTED TO VOLTAGE-ADJUST RESISTORS R-3 BEING OPEN. FAILURE ANALYSIS SHOWED RESISTORS FAILED AS RESULT OF COMBINED EFFECTS OF AGE, VIBRATION AND EXPOSURE TO MOISTURE AND SALT-LADEN AIR.                                                                                                                     |                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-FEASIBILITIES OF ENCLOSING AND AIR CONDITIONING THE GENERATORS, AND REPLACING GENERATORS WITH STATIC POWER SUPPLIES ARE BEING STUDIED.                                                                                                                                                                                                                                                      |                                               |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1963

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME            | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SP-98-48-223-F<br>MOTOR-GENERATOR                      | FAR<br>27-06418-1              | 921219              | 12/ETR           | YES        | KURT-ROOT<br>NO               |
| <p>FAILURE MODE-FAIL DURING OPERATION. BURN OUT OF RECTIFIER CR-13 CAUSED FAILURE OF MOTOR GENERATOR MD-2. ALTHOUGH THE PARTICULAR RECTIFIER WAS NOT RECEIVED FOR ANALYSIS, SEVERAL OTHER FAILED. SELENIUM RECTIFIERS WERE ANALYZED AND THEIR FAILURES ATTRIBUTED TO AGING (REFERENCE FAR MG-98-48-218P). PARTS RECEIVED FOR ANALYSIS WERE EXTREMELY DIRTY.</p> <p>CORRECTIVE ACTION-EFFECTIVE APPROXIMATELY 10 APRIL 63 EACH MOTOR-GENERATOR UPON FAILURE WILL BE CYCLED THROUGH FOLLOWING OVERHAUL PROCEDURE-(A) COMPLETE DISASSEMBLY, (B) 24-HOUR BAKE AT 200 DEG F, (C) BEARING AND BRUSH REPLACEMENT, (D) EPXYOLITE ENCAPSULATION OF ROTOR AND STATOR, (E) MACHINING OF COLLECTOR RINGS AND (F) REASSEMBLY AND TEST. FEASIBILITIES OF PROVIDING GENERATOR WITH ENCLOSED AIR CONDITIONED ENVIRONMENT AND OF REPLACING MD-2 GENERATORS WITH STATIS C POWER SUPPLY IS BEING STUDIED.</p> |                                                        |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AA61-0137/P2-401-00-111                                | COUNTDOWN                      | 1110<br>620789      | 12               | NO         |                               |
| <p>FAILURE MODE-FAIL DURING OPERATION. ETR POWER FAILED CAUSING LOSS OF ALL COMPLEX POWER EXCEPT EMERGENCY POWER. A NEW POWER POLE WAS BEING INSTALLED.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.</p> <p>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.</p> <p>CORRECTIVE ACTION-CAPE POWER SYSTEM WAS REPAIRED.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                        |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AA61-0123/P2-400-03-111<br>GENERATOR MAGNETO CONDENSER | COMPOSITE-J VACT               | 1110<br>610814      | 12/ETR           | YES        |                               |
| <p>FAILURE MODE-FAIL DURING OPERATION. EMERGENCY GENERATOR WOULD NOT START DUE TO A DEFECTIVE MAGNETO CONDENSER.</p> <p>SYSTEM EFFECT-LOSS OF REDUNDANCY. EMERGENCY GENERATOR WOULD NOT START.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                        |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 98-40-007<br>GENERATOR-THERMAL TIME DELAY RELAY        | FAR                            | 430<br>601104       | 12/ETR           | YES        | CURTIS-WRIGHT<br>NO ED-70143  |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE KURT-ROOT MOTOR-GENERATOR (N/G) SET FAILED TO COMPLETE THE STARTING CYCLE. PROBLEM CAUSED BY FAILURE OF TIME-DELAY RELAY WHICH APPLIES FULL VOLTAGE TO M/G AFTER M/G HAS STARTED ON REDUCED VOLTAGE. LAB ANALYSIS REVEALED OPEN RELAY COILS.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                        |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-PROBLEM BROUGHT TO ATTENTION OF KURZ-ROOT MANUFACTURER OF M/G SET. KURZ-ROOT TO TAKE ANY NECESSARY ACTION. GD/C TO MAINTAIN SURVEILLANCE OVER ITEM.                                                                                        |                                             |                                |                     |                  |            |                               | 099649 |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                           | EM1341/P3-402-00-17                         | FRF                            | 170<br>590909       | 13<br>24.2       | YES<br>NO  |                               | 099330 |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. GROUND AC POWER WAS OPERATING BELOW EXPECTED TEST VALUE CAUSING ERRATIC OPERATION OF RATE BEACON AND OTHER VEHICLE SYSTEMS WHEN POWER RETURN TO EXTERNAL WAS ACCOMPLISHED AT COMPLETION OF FLIGHT READINESS FIRING. |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW. GROUND AC POWER SYSTEM WAS OPERATING 1.5 VOLTS BELOW NORMAL.                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                           | EM1332/P4-402-00-50                         | FRF                            | 100<br>590903       | 14<br>-2100      | YES<br>NO  |                               | 099343 |
| FAILURE MODE-OUT OF SPECIFICATION. DURING FLIGHT READINESS FIRING COUNTDOWN THE GROUND 400 CYCLE AC GENERATOR FREQUENCY INCREASED TEMPORARILY TO 405 CPS AND RETURNED TO 401 CPS FOR REASONS NOT DETERMINED.                                                 |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION. THE ELECTRICAL SYSTEM OPERATED OUT OF SPECIFICATION TEMPORARILY DURING COUNTDOWN DUE TO AN UNDETERMINED GROUND AC GENERATOR TEMPORARY MALFUNCTION.                                                                          |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. THE FRF COUNTDOWN WAS DELAYED 15 MINUTES FOR INVESTIGATION OF THE MALFUNCTION. WHEN THE FREQUENCY RETURNED TO NORMAL STEADY OPERATION FOR FIVE MINUTES IT WAS DECIDED TO RESUME THE COUNTDOWN.                             |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE INDICATED.                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                           | AZC-27-051/P3-402-00-05<br>GENERATOR TUBE   | COUNTDOWN                      | 50<br>590802        | 13/ETR           | YES<br>NO  |                               | 099914 |
| FAILURE MODE-ERRATIC OPERATION. THE 400 CPS GENERATOR FREQUENCY FLUCTUATED SLIGHTLY DURING THE LATTER PORTION OF THE COUNTDOWN.                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-REPLACED THE THYRATRON TUBE.                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| ELECTRICAL-GSE<br>POWER GENERATION                                                                                                                                                                                                                                                              | FTA4575/P2-302-00-04                        | COUNTDOWN                      | 4C<br>590123        | 12<br>-1300      | NO<br>NO   |                               | 699379 |
| FAILURE MODE-FAIL DURING OPERATION. CAUSE WAS A FIRE IN THE ETR CRITICAL POWER TRANSFORMER BANK.                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. POWER LOST.                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                            | SLV-9B-40-3340<br>UMBILICAL CABLE           | FAR<br>69-68089-1              | 660101              | ETR              | NO<br>NO   |                               | 699329 |
| FAILURE MODE-ELECTRICAL OPEN. THE UMBILICAL CABLE REPORTEDLY FAILED WHEN NO CONTINUITY WAS FOUND BETWEEN PLUG 202 P IN AND PLUG 600P6 PIN 10.                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NOT A FAILED ITEM. BLUE PRINT INADVERTENTLY MISREAD WHEN MAKING CONTINUITY CHECK. INFORMATION ONLY FAR SLV-9B-40-3823 REQUESTING A RECORD OR DRAWING MAINTENANCE CHANGE BE MADE TO CLARIFY THE DRAWING. ETR NOTIFIED OF ANALYSIS BY TELCON.                                   |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                            | FAR-SLV-9B-53-274-F<br>LOCK ASSEMBLY SHAFT  | FAR<br>N/A 69-68088-1          | 650930              | 12/ETR           | YES<br>NO  | CANNON<br>317-6157-004        | 699765 |
| FAILURE MODE-STRUCTURAL. THE SOLENOID RELEASE SHAFT BROKE WHILE COCKING THE RELEASE MECHANISM OF THE LOCK ASSEMBLY. THE LOCK PROVIDES ATTACHING AND RELEASING FUNCTIONS FOR UMBILICAL CABLES. ANALYSIS REVEALED A WEAKING DOWN OF THREE D RELIEF THROUGH REPEATED LOADINGS.                     |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. SIMILAR FAILURES HAD OCCURRED BEFORE (REF. FAR-CT-98-53-068) AND CORRECTIVE ACTION WAS TAKEN TO REPLACE THE TYPE 303 STAINLESS STEEL WITH TYPE 286-A. HOWEVER, THE REPLACEMENT HAD NOT BEEN ACCOMPLISHED AT SLV SITES AT THE TIME OF THIS FAILURE. |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                            | 82-4M0-01-85<br>UMBILICAL CONNECTOR         | COMPOSITE-FRD/DPL              | 850<br>650922       | 82               | YES<br>NO  |                               |        |
| FAILURE MODE-OUT OF TOLERANCE. DURING POST TEST INVESTIGATION TO DETERMINE THE CAUSE OF AN INTEGRATOR NULLING FAULT AND TWO SMRD FAULTS, A LOOSE P1001 UMBILICAL WAS UNCOVERED.                                                                                                                 |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED. DURING THE LEAK CHECK HOLD, THE SMRD DETECTOR ILLUMINATED TWICE FOR A PERIOD OF 12 AND 14 SECONDS, THEN DISAPPEARED FOR THE DURATION OF THE DPL. A SECOND FAULT OCCURRED DURING THE P                                                         |                                             |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1968

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                          | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                       | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|----------------------------------|-------------------------------|--------|
|                                                                                                                                                                                                                                                                                                                                                                  | ROPELLANT DRAIN SEQUENCE. INTEGRATOR MULLING-VENT RED AND LOX AND FUEL WERE DRAINED ACCORDING TO DPL ABOUT PROCEDURE |                                |                     |                  |                                  |                               | 689287 |
|                                                                                                                                                                                                                                                                                                                                                                  | CORRECTIVE ACTION-THE UMBILICAL WAS READJUSTED AND THE FLIGHT CONTROL SYSTEM WILL BE RE-VALIDATED WITH APCHE DECK 3  |                                |                     |                  |                                  |                               | 689287 |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                             | FI48560/P3-4CO-02-223<br>UMBILICAL                                                                                   | COMPOSITE-J FACT               | 2230<br>890707      | 13/ETR<br>-13    | NO<br>NO                         |                               | 689287 |
| FAILURE MODE-PREATURE OPERATION. LAUNCH CONTROL SIMULATOR SWITCHES 23 AND 22 (2 INCH AND 6 INCH MOTION) WERE PREMA<br>TURELY ACTIVATED THROUGH HUMAN ERROR.                                                                                                                                                                                                      |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| SYSTEM EFFECT-OPERATION STARTS TOO EARLY. PREATURE UMBILICAL EJECTION. ABSENCE OF ENGINE START SEQUENCE AND DELAY<br>OF SOME PROCDURAL PLUS COUNT EVENTS FOLLOWED.                                                                                                                                                                                               |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                                                |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                       |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                             | FAR-CT-38-330-077<br>CABLE ASSEMBLY                                                                                  | FAR                            | 680830              | ETR              | YES LIQUIDOMETER<br>NO 1-401-039 |                               | 689287 |
| FAILURE MODE-ELECTRICAL OPEN. AN OPEN CIRCUIT WAS DISCOVERED AT PIN J, CONNECTOR P101, DURING INITIAL RINGOUT. A WI<br>RE WAS FOUND BROKEN AT PIN J BECAUSE OF IMPROPER SUPPORT AT THE SOLDER JOINT. IMPROPER SUPPORT CAUSES STRAIN ON WIRE<br>8 WHEN THE CABLE IS FLEXED. ALSO, THERE WAS EVIDENCE OF IMPROPER SOLDERING, WIRE TYING, AND INSULATION STRIPPING. |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. IT IS RECOMMENDED THAT THE VENDOR IMPROVE THE CABLE DESIGN AND REVIEW<br>THEIR MANUFACTURING AND INSPECTING TECHNIQUES TO IMPROVE PRODUCT QUALITY. EXPEDITE THE DESIGN AND MANUFACTURE OF COM<br>VAIR- BUILT CABLE, P/N 35-44098, TO REPLACE THE VENDOR'S CABLE.                                                    |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                             | LV-38-43-3313-F<br>UMBILICAL PLUG                                                                                    | FAR<br>7-06234-901             | 680514              | 13/ETR           | YES 60C<br>NO                    |                               | 689287 |
| FAILURE MODE-CONTAMINATION. METAL CHIPS WERE FOUND BETWEEN THE FRONT AND REAR INSULATORS. THE METAL CHIPS BETWEEN T<br>HE FRONT AND REAR INSULATORS ORIGINATED WHEN THE FLANGES WERE DRILLED.                                                                                                                                                                    |                                                                                                                      |                                |                     |                  |                                  |                               |        |
| CORRECTIVE ACTION-THE 60C COMPONENT REMORA DEPARTMENT STATES A MORE COMPLETE INSPECTION WILL BE PERFORMED.                                                                                                                                                                                                                                                       |                                                                                                                      |                                |                     |                  |                                  |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

12 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME        | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTM                    | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------|---------------------|------------------|-------------------------------|-------------------------------|
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FT-18534/P8-4CO-03-804<br>UMBILICALS               | COMPOSITE-B TACY               | 2040<br>850311      | 18/ETR           | NO<br>NO                      |                               |
| <p>FAILURE MODE-PREATURE OPERATION. ALL UMBILICALS, EXCEPT P1801, WERE INADVERTENTLY EJECTED DURING THE MINUS COUNT DUE TO AN INADVERTENT GENERATION OF A 2 INCH MOTION SIGNAL.</p> <p>SYSTEM EFFECT-OPERATION STARTS TOO EARLY. THE UMBILICALS WERE INADVERTENTLY EJECTED PRIOR TO PLANNED SIMULATED 2 INCH MOTION TIME.</p> <p>VEHICLE EFFECT-COMPOSITE DELAYED. THE COMPOSITE COUNTDOWN WAS DELAYED AN UNKNOWN AMOUNT OF TIME.</p> <p>CORRECTIVE ACTION-THE SOURCE OF THIS INADVERTENT SIGNAL WAS DETERMINED AND ACTION WAS TAKEN TO PREVENT RECURRENCE OF THIS CONDITION.</p>                                                                                   |                                                    |                                |                     |                  |                               |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PAR-CT-98-40-037<br>UMBILICAL CONNECTOR            | FAR                            | 1560<br>85022       | 38A/ETR          | YES CANNON<br>NO 317-8137-004 |                               |
| <p>FAILURE MODE-OUT OF SPECIFICATION. THE LOCK ASSEMBLIES WHICH HOLD THE UMBILICAL ELECTRICAL PLUGS TO THE MISSILE AND EJECT THE PLUGS DURING LAUNCHING WERE REJECTED WHILE PERFORMING CONVAIR SURVEY INSTRUCTIONS 8-65 AND 18-65 BECAUSE OF UNDERSIZE MAIN SHAFTS. MAINSHAFTS DID NOT MEET REQUIREMENTS OF SURVEY INSTRUCTION 18-63 REV A.</p> <p>CORRECTIVE ACTION-RECOMMENDED INFORM VENDOR THE MAINSHAFTS DID NOT MEET DIMENSIONAL REQUIREMENTS OF SURVEY INSTRUCTION 18-63 REV A. REQUEST THE VENDOR MEASURE SHAFTS AT THE THREAD RELIEF AND THREAD ROOT TO ASSURE ACCEPTANCE OF ONLY THOSE SHAFTS MEETING REQUIREMENTS OF SURVEY INSTRUCTION 18-63 REV A.</p> |                                                    |                                |                     |                  |                               |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PAR-CT-98-53-072<br>UMBILICAL, SHAFT LOCK ASSEMBLY | FAR                            | 1560<br>85022       | 38A/ETR          | YES CANNON<br>NO 263-8003-002 |                               |
| <p>FAILURE MODE-OUT OF TOLERANCE. THE SHAFT IS PART OF AN UMBILICAL CABLE LOCK ASSEMBLY. EJECTS THE UMBILICAL FROM THE MISSILE. THE SHAFT THREADS WERE OUT OF TOLERANCE WHEN MEASURED PER SURVEY INSTRUCTION 3118-63A (ISSUED AS THE RESULT OF AN EARLIER THREAD FAILURE IN ONE OF THESE PARTS). THREADS WERE EXAMINED BY AN OPTICAL COMPARATOR AND WERE WITHIN TOLERANCE. DYE PENETRANT AND X-RAYS SHOWED NO DISCREPANCIES.</p> <p>CORRECTIVE ACTION-NONE.</p>                                                                                                                                                                                                     |                                                    |                                |                     |                  |                               |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CTR-033/P8-CO-01-04CS<br>JUMPER CABLE              | COMPOSITE-J FACT               | 1560<br>850216      | 38A/CTR          | YES<br>NO -9300               |                               |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. AT T-33 MINUTES A JUMPER WAS DISCOVERED MISSING FROM THE GANTRY TEST BACK.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    |                                |                     |                  |                               |                               |

GENERAL MANICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME         | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------|------------------------------|------------------|------------|-------------------------------|
| <p>VEHICLE EFFECT-COMPOSITE DELAYED. A HOLD OF 9 MINUTES WAS REQUIRED TO INSTALL THE JUMPER.</p> <p>CORRECTIVE ACTION-THE JUMPER WAS INSTALLED.</p>                                                                                                                                                                                                                                                                                                                           |                                                     |                                |                              |                  |            |                               |
| ELECTRICAL-65E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                          | FAR-CT-98-33-068<br>UMBILICAL CONNECTOR             | FAR<br>55-01823-3              | 650120                       | 36A/ETR          | YES<br>NO  | YES CANNON<br>NO 030787-0031  |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE CONNECTOR LOCK SHAFT BROKE IN THREADS. THE CONNECTOR IS IN THE LANDLINE FIRST STAGE UMBILICAL CABLE. IT FAILED TO EJECT EITHER MECHANICALLY OR ELECTRICALLY. THE FAILURE WAS CONFIRMED. EXAMINATION REVEALED THAT THE LOCK SHAFT THREADS HAD BEEN CUT DEEP, REDUCING THE ROOT DIAMETER TO MARGINAL STRENGTH.</p>                                                                                                      |                                                     |                                |                              |                  |            |                               |
| <p>CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR SPECIFY A MINIMUM MINOR DIAMETER ON THE THREADS, INCREASE THE AD SIZE, AND CHANGE THE SHAFT MATERIAL.</p>                                                                                                                                                                                                                                                                                                             |                                                     |                                |                              |                  |            |                               |
| ELECTRICAL-65E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                          | FTAB501/P2-4CO-03-288<br>MISSILE BATTERY TIE WIRING | COMPOSITE-B FACT               | 288D<br>641030               | 12<br>-100       | YES<br>NO  |                               |
| <p>FAILURE MODE-ELECTRICAL OPEN. WHEN THE VEHICLE WAS SWITCHED TO INTERNAL POWER, THE INTERNAL POWER READY LIGHT ON THE TEST CONDUCTIONS FUNCTION SAFE RELEASE PANEL DID NOT ILLUMINATE AS EXPECTED. THIS FUNCTION IS IN THE RELEASE LADDER AND WAS SIMULATED THROUGH THE LAUNCH CONTROL SIMULATOR. IT WAS FOUND THAT THE MAIN MISSILE BATTERY TIE ON THE MISSILE POWER MONITOR PANEL HAD BEEN INADVERTENTLY LEFT DISCONNECTED.</p> <p>SYSTEM EFFECT-NONE.</p>                |                                                     |                                |                              |                  |            |                               |
| <p>VEHICLE EFFECT-COMPOSITE DELAYED. THE COMPOSITE WAS DELAYED TO LOCATE THE TROUBLE AND SIMULATE THE FUNCTION THROUGH THE LAUNCH CONTROL SIMULATOR.</p>                                                                                                                                                                                                                                                                                                                      |                                                     |                                |                              |                  |            |                               |
| <p>CORRECTIVE ACTION-STEPS WERE TAKEN TO PREVENT RECURRENCE OF THIS DIFFICULTY.</p>                                                                                                                                                                                                                                                                                                                                                                                           |                                                     |                                |                              |                  |            |                               |
| ELECTRICAL-65E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                          | 68C2147.1<br>UMBILICAL CONNECTOR                    | UTP-8LT<br>27-04998-13         | 640914                       | FACTORY          | YES<br>NO  | YES CANNON<br>NO 017069-104D  |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DURING A.P.T., THE SPECIMEN FAILED TO ELECTRICALLY EJECT. MALFUNCTION INVESTIGATION REVEALED ONE OF THE SOLENOID LEADS WAS SEVERED AT THE POINT WHERE THE LEAD PASSES THROUGH A SLOT AT THE SOLENOID HOUSING. THE LEADS WERE MANUFACTURED APPROXIMATELY ONE-HALF INCH LONGER THAN SPECIFIED. THIS ALLOWS THE LEAD TO BE PINCHED BETWEEN THE ADAPTER FACE AND SOLENOID HOUSING FACE WHEN TIGHTENING THE LOCK ASSEMBLY.</p> |                                                     |                                |                              |                  |            |                               |
| <p>CORRECTIVE ACTION-CARR P-4347-8C-1 ADVISED GOYA OPTI TO IMPOSE STRICTER SURVEILLANCE ON SOLENOID LEAD LENGTH AND TERMINATION. AS OF 11-11-64 THE VENDOR INITIATED USE OF GAGE TO CHECK WIRE LENGTH, REWORKED ALL ITEMS IN-HOUSE, AND REVISITED CUTTING TECHNIQUES. SURVEY INSTRUCTION 151-84 WAS ISSUED TO ACCOMPLISH A SURVEY OF ALL UMBILICAL PLUGS FOR SEVERED LEADS.</p>                                                                                               |                                                     |                                |                              |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME  | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                     | 69C2147.1<br>UMBILICAL CONNECTOR             | UTP-PRT<br>27-04998-13         | 840902              | FACTORY          | YES        | CANNON<br>NO 017089-1/40      |
| <p>FAILURE MODE-CONTAMINATION. FOLLOWING THE RAIN TEST, HYPOT AND INSULATION RESISTANCE WAS OUT-OF-TOLERANCE. THE SPECIMEN WAS UNMATED AND WATER WAS FOUND AROUND THE CONTACTS. EXAMINATION REVEALED THAT WATER WAS ENTERING THE PLUG THROUGH THE NEOPRENE RESILIENT BOOT COVERING THE AFT PORTION OF THE TANK LOCK ASSEMBLY.</p>                                                                        |                                              |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-50/C RECOMMENDED TO VENDOR THAT BOOT BE CEMENTED AT ATTACHMENT POINTS. VAF 27-04998-B-VCP-022 AND 27-07996-3-VCP-019 TO CEMENT BOOT WAS APPROVED BY DESIGN 10-30-64. TKN SANCAP 10-1, SANVAN 10-090 WAS SENT TO SIT ES 10-19-64 FORWARDING ABOVE INFORMATION. (REF. FRR 393A).</p>                                                                                                  |                                              |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                     | 69C2147.3<br>UMBILICAL CONNECTOR             | UTP-PRT<br>27-07998-5          | 840902              | FACTORY          | YES        | CANNON<br>NO 017089-1044      |
| <p>FAILURE MODE-FAIL DURING OPERATING. FOLLOWING Y-AXIS VIBRATION (RANDOM ONLY, 2 G SQUARE PER CPS) THE SPECIMEN WOULD NOT MECHANICALLY EJECT WHEN A LANYARD FORCE OF 120 LBS. WAS APPLIED. (SPEC. IS 25 TO 100 LBS) SEPARATION WAS ACCOMPLISHED BY ROCKING THE CONNECTOR. EXCESSIVE CONTACT WEAR PRODUCED BY MISALIGNMENT CAUSED INCREASED SEPARATION FORCES BEYOND CAPABILITY OF EJECTION SPRINGS.</p> |                                              |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-SPECIMEN IR/D FOR REPLACEMENT. CARR F-4343-3C-1 ISSUED TO FACTORY TO AMEND AFFECTED MS.9 REQUIREING PIN AND SOCKET ALIGNMENT DURING POTTING.</p>                                                                                                                                                                                                                                    |                                              |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                     | 69C2147.1<br>UMBILICAL CONNECTOR             | UTP-PRT<br>27-04998-13         | 840902              | FACTORY          | YES        | CANNON<br>NO 017089-1040      |
| <p>FAILURE MODE-OUT OF TOLERANCE. FOLLOWING THE RAIN TEST, THE SPECIMEN FAILED HYPOT. THE SPECIMEN WAS UNMATED AND WATER WAS FOUND AROUND THE CONTACTS. EXAMINATION REVEALED EPOXY SHEARED OVER 40 PERCENT OF THE FACE OF THE SEAL THUS ALLOWING WATER TO ENTER THE MATED CONNECTOR.</p>                                                                                                                 |                                              |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-PART IR/D TO REMOVE OLD SEAL AND REPLACE WITH A NEW ONE, THEN REPEAT THE RAIN TEST. O.C. INSPECTION HAS TAKEN STEPS TO ASSURE ALL PARTS RECEIVE ADEQUATE INSPECTION. NOTE - BECAUSE UMBILICAL CONNECTOR TEST SPECIMENS HAVE THEIR OWN SPECIAL CONFIGURATION BY THE INCORPORATION OF SENSE LEADS, THE CONNECTOR DID NOT GO THROUGH FINAL PRODUCTION INSPECTION. (REF. FRR 379).</p>  |                                              |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                     | FTA0481/PB-4CO-01-199<br>UMBILICAL CONNECTOR | COMPOSITE-B FACT               | 1930                | 18/ETR           | YES        | NO                            |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. ALL ENGINE VALVES CLOSED. LIGHTS DID NOT ILLUMINATE ON THE PROPULSION PANEL AFTER THE UMBILICALS WERE REINSTALLED. THIS WAS CAUSED BY A POOR CONNECTION AT THE UMBILICAL.</p>                                                                                                                                                                        |                                              |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
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DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                   | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME         | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>TIME DIF | PRE<br>OTH                    | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------|------------------------------|------------------|-------------------------------|-------------------------------|--------|
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                    |                                                     |                                |                              |                  |                               |                               | 000046 |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                   |                                                     |                                |                              |                  |                               |                               |        |
| CORRECTIVE ACTION-THE UMBILICAL WAS TIGHTENED.                                                                                                                                                                                                                                                                                                                         |                                                     |                                |                              |                  |                               |                               | 000018 |
| ELECTRICAL-63E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                   | FAR-CT-98-400-032<br>UMBILICAL CONNECTOR            | FAR<br>35-85414-1              | 640812                       | 36A/ETR          | YES CANNON ELECTRICAL<br>NO C |                               | 000018 |
| FAILURE MODE-STRUCTURAL. THE UMBILICAL CABLE REPORTEDLY FAILED DURING PRE-INSTALLATION CHECKOUT AS A RESULT OF A BROKEN FRONT INSULATOR ON THE UMBILICAL PLUG. MANUAL EJECTION OF THE TEST WASHER ALLOWED THE FULL SPRING FORCE TO IMPACT THE FRONT INSULATOR CAUSING 2 OF THE 4 CORNER SCREWS TO BREAK.                                                               |                                                     |                                |                              |                  |                               |                               |        |
| CORRECTIVE ACTION-60/C WARNED APPROPRIATE PERSONNEL NOT TO EJECT THE TEST WASHER. FOLLOW VENDOR DMC INSTRUCTIONS. REQUEST VENDOR TO PLACE WARNING ON UMBILICAL PLUG NOT TO EJECT THE TEST WASHER, REDESIGN FRONT AND REAR INSULATOR SO THAT THE FRONT INSULATOR CAN BE REPLACED IF BROKEN, CHANGE FACEPLATE MATERIAL AS PHENOLIC BOARD IS WEAK.                        |                                                     |                                |                              |                  |                               |                               | 000016 |
| ELECTRICAL-63E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                   | FAR-CT-98-400-049<br>UMBILICAL CONNECTOR INSULATION | FAR<br>27-08118-803            | 640803                       | 36A              | YES CANNON ELECTRICAL<br>NO C |                               | 000016 |
| FAILURE MODE-STRUCTURAL. THE UMBILICAL CABLE WAS REJECTED DURING PRE-INSTALLATION INSPECTION BECAUSE THE UMBILICAL PLUG HAD A BROKEN FRONT INSULATOR. FAILURE WAS CONFIRMED. THE 4 CORNER HOLES WERE COUNTERBORED TOO DEEP. MANUAL EJECTION OF THE TEST WASHER ALLOWED THE FULL SPRING FORCE TO IMPACT THE FRONT INSULATOR CAUSING IT TO BREAK AT THE 4 CORNER SCREWS. |                                                     |                                |                              |                  |                               |                               |        |
| CORRECTIVE ACTION-RECOMMENDED. WARN APPROPRIATE PERSONNEL NOT TO EJECT THE TEST WASHER. FOLLOW DMC INSTRUCTIONS. REQUEST VENDOR TO PLACE WARNING ON UMBILICAL PLUG NOT TO EJECT THE TEST WASHER, REDESIGN FRONT AND REAR INSULATOR SO FRONT INSULATOR CAN BE REPLACED IF BROKEN, TAKE ACTION NECESSARY TO PREVENT COUNTERBORING CORNER HOLES TOO DEEPLY.               |                                                     |                                |                              |                  |                               |                               | 000014 |
| ELECTRICAL-63E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                   | FAR-CT-98-400-049<br>UMBILICAL CONNECTOR            | FAR<br>27-08118-803            | 640803                       | 36A/ETR          | YES CANNON ELECTRICAL<br>NO C |                               | 000014 |
| FAILURE MODE-STRUCTURAL. THE UMBILICAL CABLE WAS REJECTED DURING PRE-INSTALLATION INSPECTION BECAUSE THE UMBILICAL PLUG HAD A BROKEN FRONT INSULATOR. BINDING WAS CAUSED BY POTTING COMPOUND FORCING AND HOLDING THE LOCK ASSEMBLY SLEEVE OFF CENTER IN THE UMBILICAL PLUG.                                                                                            |                                                     |                                |                              |                  |                               |                               |        |
| CORRECTIVE ACTION-RECOMMENDED INCORPORATION OF A SEAL ON THE REAR INSULATOR TO THE SHELL TO PREVENT POTTING COMPOUND FROM SETTING BETWEEN FRONT AND REAR INSULATORS.                                                                                                                                                                                                   |                                                     |                                |                              |                  |                               |                               |        |

GENERAL DYNAMICS  
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DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME         | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO        |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------------|--------|
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                | FAR-CT-98-400-049<br>UMBILICAL CONNECTOR INSULATION | FAR<br>95-08137-801            | 840803              | 38A/ETR          | YES<br>NO  | JEFFERSON ELEC<br>TRIC<br>101836-801 | 888613 |
| FAILURE MODE-STRUCTURAL. THE UMBILICAL CABLE WAS REJECTED DURING PRE-INSTALLATION INSPECTION BECAUSE THE UMBILICAL PLUG HAD A BROKEN FRONT INSULATOR. FAILURE WAS CONFIRMED. THE FOUR CORNER HOLES WERE COUNTERBORED TOO DEEP. MANUAL EJECTION OF THE TEST WASHER ALLOWED THE FULL SPRING FORCE TO IMPACT THE FRONT INSULATOR CAUSING IT TO BREAK AT THE FOUR CORNER SCREENS.                                       |                                                     |                                |                     |                  |            |                                      |        |
| CORRECTIVE ACTION-RECOMMENDED THAT A WARNING TO APPROPRIATE PERSONNEL BE SENT STATING THAT THEY SHOULD NOT EJECT THE TEST WASHER AND FOLLOW VENDORS DMC INSTRUCTIONS. REQUEST VENDOR TO PLACE WARNING ON UMBILICAL PLUG NOT TO EJECT THE TEST WASHER AND TO REDESIGN FRONT AND REAR INSULATOR SO FRONT INSULATOR CAN BE REPLACED IF BROKEN. TAKE ACTION NECESSARY TO PREVENT COUNTERBORING CORNER HOLES TOO DEEPLY. |                                                     |                                |                     |                  |            |                                      |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                | FAR-CT-98-400-049<br>UMBILICAL CONNECTOR INSULATION | FAR<br>95-89414-1              | 840731              | 38A/ETR          | YES<br>NO  | CANNON ELECTRIC                      | 888613 |
| FAILURE MODE-STRUCTURAL. THE UMBILICAL CABLE WAS REJECTED DURING PRE-INSTALLATION INSPECTION BECAUSE THE UMBILICAL PLUG HAD A BROKEN FRONT INSULATOR. FAILURE WAS CONFIRMED. THE 4 CORNER HOLES WERE COUNTERBORED TOO DEEP. MANUAL EJECTION OF THE TEST WASHER ALLOWED THE FULL SPRING FORCE TO IMPACT THE FRONT INSULATOR CAUSING IT TO BREAK AT THE 4 CORNER SCREENS.                                             |                                                     |                                |                     |                  |            |                                      |        |
| CORRECTIVE ACTION-60/C WARNED APPROPRIATE PERSONNEL NOT TO EJECT THE TEST WASHER, FOLLOW VENDOR INSTRUCTIONS. REQUEST VENDOR TO PLACE WARNING ON UMBILICAL PLUG NOT TO EJECT THE TEST WASHER, REDESIGN FRONT AND REAR INSULATOR SO THAT THE FRONT INSULATOR CAN BE REPLACED IF BROKEN. TAKE ACTION NECESSARY TO PREVENT COUNTERBORING CORNER HOLES TOO DEEPLY.                                                      |                                                     |                                |                     |                  |            |                                      |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                | FT8468/P3-4CO-01-216<br>POWER SUPPLY RECTIFIER      | COMPOSITE-B FACT               | 2160                | 13/ETR           | YES<br>NO  |                                      | 888607 |
| FAILURE MODE-OUT OF SPECIFICATION. THE MISSILE 28VDC POWER, AS INDICATED ON THE MISSILE POWER PANEL METER, COULD NOT BE ADJUSTED ABOVE 28.8 VDC. THIS WAS CAUSED BY A DEFECTIVE RECTIFIER STACK IN THE POWER SUPPLY.                                                                                                                                                                                                |                                                     |                                |                     |                  |            |                                      |        |
| SYSTEM EFFECT-OPERATION TOO LOW. THE NOMINAL VOLTAGE SETTING IS 28 PLUS OR MINUS 1 VDC. THE RED LINE LIMIT IS 26.5 VDC.                                                                                                                                                                                                                                                                                             |                                                     |                                |                     |                  |            |                                      |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                |                                                     |                                |                     |                  |            |                                      |        |
| CORRECTIVE ACTION-THE DEFECTIVE RECTIFIER STACK WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                       |                                                     |                                |                     |                  |            |                                      |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                    | VENDOR NAME<br>VENDOR PART NO |
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| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A484-0033/P8-CO-02-04C3<br>RELAY            | COMPOSITE-J FACT               | 139D<br>840815      | 38A/ETR<br>0     | YES<br>NO                     |                               |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. CONTAMINATION OF THE 2-INCH SIMULATOR LUGS DID NOT ALLOW THE 2-INC IN RISE SIGNAL TO BE SENT.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START. THE SIMULATOR FAILED TO SEND THE 2 INCH RISE SIGNAL. UMBILICALS P1002, P1003, P1005, P1007, AND P4001 HAD TO BE EJECTED MANUALLY.</p> <p>VEHICLE EFFECT-COMPOSITE RESCHEDULED. THE SEQUENCE OF EJECTION OF THE UMBILICALS RESULTED IN THE CENTAUR PROGRAMMER BEING COMMANDED TO SAFE BY THE GSE THEREBY INVALIDATING THE TEST AND REQUIRING A RERUN.</p> <p>CORRECTIVE ACTION-THE LUGS WERE REPLACED AND THE TEST WAS RERUN SATISFACTORILY.</p> |                                             |                                |                     |                  |                               |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 6AA2146<br>UMBILICAL RECEPTACLE             | UTP-QUAL/PPT<br>87-04998-17    | 643515              | 6D/C             | YES CANNON<br>NO 017089-1043  |                               |
| <p>FAILURE MODE-STRUCTURAL. DURING THE MALFUNCTION INVESTIGATION, A SMALL AMOUNT OF POTTING WAS FOUND ON THE INSIDE CO RNER OF THE PLUG FACE. THIS LEAKAGE WAS DUE TO INADEQUATE CEMENTING OF THE SEAL RING TO THE INSERT AND A REDUCED SEAL SECTION FROM STRETCHING THE SEAL WHILE ASSEMBLING THE SHELL HALVES.</p> <p>CORRECTIVE ACTION-CARR F-3076-SC-1 ISSUED TO REVISE NS TO PROVIDE FOR TWO STEP POTTING IN BOTH PLUGS AND RECEPTACLE S. CARR F-3076-SC-2 ISSUED TO INCORPORATE A POS: POTTING INSPECTION FOR LEAKAGE IN PLUG AND RECEPTACLE AND TO INSURE THAT SEALANT IS NOT USED.</p>                                                   |                                             |                                |                     |                  |                               |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 89A2146<br>UMBILICAL CONNECTOR              | UTP-QUAL/PPT<br>87-04998-17    | 640501              | FACTORY          | YES CANNON<br>NO 017089-1043  |                               |
| <p>FAILURE MODE-OUT OF TOLERANCE. DURING EXAMINATION OF PRODUCT, THE CABLE ENTRY AND THE O.D. ON THE LOCK ASSEMBLY HOU SING FLANGE WERE OUT OF TOLERANCE.</p> <p>CORRECTIVE ACTION-SPEC CONTROL DRAWING CHANGE WAS MADE TO REFLECT CORRECT CABLE ENTRY DIMENSION. CARR F-3073-8C-2 I SSUED TO IMPROVE VENDOR O.C. ON LOCK ASSEMBLY FLANGE O.D.</p>                                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |                               |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | LV-98-40-3249-F<br>UMBILICAL CONNECTOR      | FAR<br>87-06618-807            | 640408              | 18/ETR           | YES PACIFIC AUTOMA<br>NO TION |                               |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE CABLE FAILED WHEN THE PROGRAMMER SAFE LIGHT DROPPED OUT ON THE BLOCKHOUSE P ANEL DURING THE SIMULATED LAUNCH TEST. THE CABLE FAILURE IS ATTRIBUTED TO CORROSION ON THE WIRE TO PIN SOLDER JOINTS OF PLUGS P-405, P-406, P-407 AND P-408.</p>                                                                                                                                                                                                                                                                                                                                                          |                                             |                                |                     |                  |                               |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | DATE<br>TIME DIF | PRI<br>OTH                   | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------------------------|-------------------------------|
| CORRECTIVE ACTION-EVALUATION OF POTTING COMPOUNDS IS BEING INITIATED. (TCP 8370, ECM 243, MSN 127-8, AND SPECIFICATION 0-73021).                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |                              |                               |
| ELECTRICAL-63E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 69A2146<br>UMBILICAL CONNECTOR              | UTP-QUAL/PPT<br>27-04998-17    | 640327              | FACTORY          | YES CANNON<br>NO 017069-1043 |                               |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE CONTINUOUS CURRENT TEST AT AMBIENT CONDITIONS, THE VOLTAGE DROP ACROSS PIN 1 N TO US8 OUT OF TOLERANCE. INVESTIGATION REVEALED PROBLEM DO TO PIN-SOCKET MISALIGNMENT. PART MATED WITH 27-04998-17                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION- CARR ITEM F-3072-9C-1 WAS ISSUED TO FACTORY TO MINIMIZE PIN-SOCKET MISALIGNMENT BY IMPROVING THE IR POTTING TECHNIQUE. POTTING JIGS ARE NOW EMPLOYED. (REF. FRR 282A).                                                                                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |                              |                               |
| ELECTRICAL-63E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 69A2146<br>UMBILICAL CONNECTOR              | UTP-QUAL/PPT<br>27-04998-17    | 640321              | FACTORY          | YES CANNON<br>NO 017069-1043 |                               |
| FAILURE MODE-FAIL DURING OPERATION. DURING X,Y, AND Z- AXIS VIBRATION (SINE 35 G PEAK), PIN 93 AND 94 WAS INTERMITTENTLY OPEN. ALSO THE SPECIMEN WOULD NOT COMPLETELY EJECT WHEN 22VDC WAS APPLIED TO THE SOLENOID. DURING THE PROOF CYCLE PIN 93 CENTER CONDUCTOR, 93 SHIELD, 94 SHIELD, AND 95 SHIELD VOLTAGE DROP WAS OUT OF TOLERANCE. THIS PART IS MATED WITH 27-04998-17.                                                                                                                                   |                                             |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-AN ADDITIONAL SET OF SPECIMENS WERE SUBJECTED TO MATED VIBRATION AT THE SAME ENERGY LEVEL EXCEPT THE SWEEP RATE WAS CHANGED FROM 4 TO 0.3 MINUTES PER OCTAVE (APPROX. 4 MIN DURATION PER AXIS). DURING Y-AXIS VIBRATION ON THE NEW SPECIMEN AT THE FASTER SWEEP RATE THE SPECIMEN FAILED. PIN 93 SHIELD INTERMITTENTLY OPENED. CAUSE WAS ATTRIBUTED TO PIN/ROCKET WEAR. SPEC 27-04992 REVISED MATED VIBRATION REQUIREMENT FROM SINE TO RANDOM ONLY. NEW PARTS PASSED THE TEST. (REF. FRR 146A). |                                             |                                |                     |                  |                              |                               |
| ELECTRICAL-63E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 69A2146<br>UMBILICAL CONNECTOR              | UTP-QUAL/PPT<br>27-04998-17    | 640320              | FACTORY          | YES CANNON<br>NO 017069-1043 |                               |
| FAILURE MODE-OUT OF TOLERANCE. DURING THE TEMPERATURE SHOCK TEST THE CURRENT THRU THE SOLENOID AT MINUS 30 DEGREES F WAS OUT OF TOLERANCE. ALSO THE VOLTAGE DROP ACROSS PIN 93 WAS OUT OF TOLERANCE. PART IS MATED WITH P/N 27-04998-17                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-REVISION D TO SPEC 27-04998 DELETED THE MAXIMUM CURRENT LIMIT AT MINUS 30 DEGREES F AND REVISED THE CURRENT LIMITS FOR 77 DEGREES F. THE VOLTAGE DROP DISCREPANCY DISAPPEARED WHEN THE CONTACTS WERE CLEANED (REF. FRR 146A).                                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |                              |                               |

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-ELCTICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
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| ELECTRICAL-6SE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 68A2148<br>UMBILICAL CONNECTOR              | UTP-QUAL/PPT<br>27-04898-17    | 940221              | FACTORY          | YES        | CANNON<br>NO 017089-1043      | 000002 |
| FAILURE MODE-OUT OF TOLERANCE. DURING EXAMINATION OF PRODUCT, THE RELEASE SHAFT HOLE AT THE END OF THE LOCK ASSEMBLY WAS DIMENSIONALLY OUT OF TOLERANCE.                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE HARDWARE WAS CONSIDERED ACCEPTABLE. HOWEVER, A CONFORMANCE CHANGE WAS MADE TO THE SPEC CONTROL DRAWING. TESTING WAS CONTINUED. (REF. PRR 186).                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-6SE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | LV-98-40-3231-F<br>CONNECTOR PIN            | FAR<br>27-06143-803            | 940113              | 12/ETR           | YES        | PACIFIC AUTOMATION            | 000003 |
| FAILURE MODE-ELECTRICAL OPEN. THE UMBILICAL CABLE FAILED WHEN P/N 93 OF ELECTRICAL CONNECTOR P-1002 DID NOT MAKE ELECTRICAL CONTACT. THE FAILURE IS ATTRIBUTED TO THE PIN BEING PUSHED TOO FAR INTO THE CONNECTOR ASSEMBLY. COAXIAL SHELLS MADE TO DIFFERENT LENGTHS HAD BEEN PROVIDED BY THE VENDOR AND ASSEMBLED IN THE CONNECTOR. THE CABLE SHOULD HAVE BEEN REMOVED WHEN CIC 22192 AND CIC 01742 WERE RELEASED ON 11 APRIL 1963, REPLACING THE CANNON P/N 317089-0803 CONNECTOR WITH A P/N 27-04898-27 CONNECTOR. |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-ETR AND WTR PERSONNEL WERE REQUESTED TO INSPECT CONNECTORS CLOSELY FOR RECESSED PINS AND COAXIAL SHELLS. THE VENDORS RECORDS INDICATE THAT THE SHORTER SHELL HAD BEEN PURGED FROM THEIR SYSTEM AND FUTURE SHIPMENTS SHOULD CONTAIN ONLY THE LONGER SHELLS.                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-6SE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | AA64-0008/P2-4CO-01-199<br>RELAY WIRE       | COMPOSITE-B FACT               | 1990<br>940103      | 12/ETR           | YES<br>NO  |                               | 000000 |
| FAILURE MODE-PREATURE OPERATION. A BROKEN WIRE AT J409-H CAUSED THE UMBILICALS TO FAIL TO EJECT. THIS WIRE SUPPLIES THE GROUND TO RELAY 4906 IN THE K44 RELAY BOX. 4906 SUPPLIES VOLTAGE TO EJECT THE UMBILICALS.                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE BROKEN WIRE WAS REPAIRED PER 18001984.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-6SE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | LV-98-40-230-F<br>CABLE ASSEMBLY            | FAR<br>27-06630                | 940103              | 12/ETR           | YES        | BENDIX<br>NO                  |        |
| FAILURE MODE-ELECTRICAL OPEN. AN INTERMITTENT OPEN CONNECTION FOUND AT PIN H ON PLUG J-409 OF CABLE CARRYING SIGNALS TO ELECTRICALLY EJECT UMBILICAL CABLES. FAILURE ANALYSIS INDICATED PROBLEM DUE TO BREAKING OF WIRE STRANDS NEAR 30 LDER WICK AT CONNECTOR PIN H. MICROSCOPIC EXAMINATION SHOWED ALL WIRE STRANDS FAILED IN TENSION.                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |



GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>13/ETR | PRI<br>OTH                    | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|----------------|-------------------------------|-------------------------------|
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                       | FAR-CT-98-40-023-P<br>UMBILICAL CONNECTOR   | FAR<br>55-01023-1              | 630806                       | 36A/ETR        | YES CANNON<br>NO 39787-0009   | 680999                        |
| FAILURE MODE-FAIL DURING OPERATION. THE UMBILICAL ADAPTER, WHICH IS THE LANDLINE CONNECTION TO THE FIRST STAGE UMBILICAL CABLE, FAILED BECAUSE THE INSULATION RESISTANCE FROM THE PINS TO THE CASE GROUND WAS BELOW 190C MEGOHMS MINIMUM AS A RESULT OF INCOMPLETE POTTING FORMING MOISTURE LEAK PATHS.                                                                    |                                             |                                |                              |                |                               |                               |
| CORRECTIVE ACTION-60/C RECOMMENDED THAT PERSONNEL CHECK ADAPTERS AT THE SITE FOR CONFORMANCE TO INSULATION RESISTANCE REQUIREMENTS, MARGINAL ADAPTERS BE X-RAYED TO CHECK CONDITION OF POTTING, REJECT ADAPTERS WITH VOIDS IN POTTING OR VACUUM DRY THE ADAPTER BEFORE USING AND CHANGE SPEC TO REQUIRE SLEEVING OF INDIVIDUAL SOLDERED CONNECTIONS AND X-RAY EXAMINATION. |                                             |                                |                              |                |                               |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                       | A-JA-40-3194-F<br>UMBILICAL LOCK ASSEMBLY   | FAR                            | 930703                       | 13/ETR         | YES CANNON<br>NO 317-0416-000 | 680999                        |
| FAILURE MODE-STRUCTURAL. ASSEMBLY FAILED WHEN THEIR LOCKING BALLS AND LOCK SHAFTS WERE SCORED AND NICKED. DAMAGE TO THE LOCKING BALLS AND LOCK SHAFT RESULTED FROM STRESS CONCENTRATION DUE TO THE SMALL BEARING AREA OF THE BALLS ON THE SHAFT.                                                                                                                           |                                             |                                |                              |                |                               |                               |
| CORRECTIVE ACTION-ECP 7142-R1. D SERIES UMBILICAL LOCK CHANGES WERE RELEASED APRIL 13, 1963. THIS ECP CHANGES THE BALL-TYPE LOCK ASSEMBLY TO A TANG LOCK ASSEMBLY.                                                                                                                                                                                                         |                                             |                                |                              |                |                               |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                       | SP-99-14-189-F<br>UMBILICAL CONNECTOR       | FAR<br>7-38391-1               | 263-D<br>930827              | FACTORY        | YES CANNON<br>NO 17089-346    | 680999                        |
| FAILURE MODE-ERRATIC OPERATION DUE TO INTERMITTENT OPEN OF PINS 17 AND 39 RESULTED FROM AN EXCESSIVE AMOUNT OF PERMATEX BEING APPLIED BETWEEN THE FACE PLATES AND SQUEEZING ONTO THE PINS.                                                                                                                                                                                 |                                             |                                |                              |                |                               |                               |
| CORRECTIVE ACTION-VENDOR REQUESTED TO REDUCE AMOUNT OF PERMATEX TO MINIMUM REQUIRED TO SEAL CONNECTOR.                                                                                                                                                                                                                                                                     |                                             |                                |                              |                |                               |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                       | P2-400-03-179                               | COMPOSITE-C FACT               | 1790<br>620828               | 12/ETR         | YES<br>NO                     | 680999                        |
| FAILURE MODE-ERRATIC OPERATION. THE MISSILE DC POWER FLUCTUATED AS MUCH AS 0.3 VDC. CAUSE UNKNOWN.                                                                                                                                                                                                                                                                         |                                             |                                |                              |                |                               |                               |
| SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                              |                |                               |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 90 MINUTES HOLD.                                                                                                                                                                                                                                                                                                                         |                                             |                                |                              |                |                               |                               |
| CORRECTIVE ACTION-UNKNOWN. THE FLUCTUATIONS DECREASED DURING THE HOLD AND THE COUNTDOWN WAS RESUMED.                                                                                                                                                                                                                                                                       |                                             |                                |                              |                |                               |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

12 JUN 1968

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-CSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME   | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| ELECTRICAL-CSE<br>POWER DISTRIBUTION                                                                                                          | P2-4CO-02-179<br>UMBILICAL EJECTION CIRCUITRY | COMPOSITE-J FACT               | 179D<br>820803      | 12/ETR<br>0      | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL P4001 DID NOT EJECT ELECTRICALLY BECAUSE OF IMPROPER WIRING OF EJECTION CIRCUITRY. |                                               |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                           |                                               |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE. THE UMBILICAL WAS MANUALLY PULLED.                                                                                       |                                               |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE UMBILICAL WAS REPLACED.                                                                                                 |                                               |                                |                     |                  |            |                               |
| ELECTRICAL-CSE<br>POWER DISTRIBUTION                                                                                                          | P2-4CO-01-179<br>UMBILICAL EJECTION CIRCUITRY | COMPOSITE-B FACT               | 179D<br>820802      | 12/ETR<br>0      | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL P4001 DID NOT EJECT ELECTRICALLY BECAUSE OF IMPROPER WIRING OF EJECTION CIRCUITRY. |                                               |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                           |                                               |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE. THE UMBILICAL WAS MANUALLY PULLED.                                                                                       |                                               |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE UMBILICAL WAS TO BE REPLACED.                                                                                           |                                               |                                |                     |                  |            |                               |
| ELECTRICAL-CSE<br>POWER DISTRIBUTION                                                                                                          | P2-4CO-01-179<br>UMBILICAL CONNECTOR          | COMPOSITE-B FACT               | 179D<br>820802      | 12/ETR<br>0      | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL P1003 DID NOT EJECT ELECTRICALLY BECAUSE OF MECHANICAL BINDING.                    |                                               |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                           |                                               |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE. THE UMBILICAL WAS MANUALLY PULLED.                                                                                       |                                               |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                    |                                               |                                |                     |                  |            |                               |
| ELECTRICAL-CSE<br>POWER DISTRIBUTION                                                                                                          | P2-4CO-04-143<br>UMBILICAL                    | COMPOSITE-B FACT               | 143D<br>820713      | 12/ETR<br>0      | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL P4001 DID NOT EJECT ELECTRICALLY. THE CAUSE IS UNKNOWN.                            |                                               |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                           |                                               |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                          |                                               |                                |                     |                  |            |                               |

15 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-THE UNBILICAL WAS MANUALLY REMOVED.                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               | 099961 |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                      | PS-4CO-03-145<br>UNBILICAL                  | COMPOSITE-J FACT               | 145D<br>020706      | 12/ETR<br>-      | YES<br>NO  |                               | 099963 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UNBILICAL P4001 DID NOT EJECT ELECTRICALLY. THE CAUSE IS UNKNOWN.                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE UNBILICAL WAS MANUALLY REMOVED.                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               | 099964 |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                      | PS-4CO-02-145<br>UNBILICAL                  | COMPOSITE-B FACT               | 145D<br>020706      | 12/ETR<br>0      | YES<br>NO  |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UNBILICALS P1002, P1003, P1007, P4001 DID NOT EJECT ELECTRICALLY. THE CAUSE IS UNKNOWN.                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE UNBILICALS WERE MANUALLY REMOVED.                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               | 099962 |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                      | SP-9B-40-3056C<br>UNBILICAL CONNECTOR       | FAR<br>7-19713-3               | 145D<br>020626      | 12/ETR           | YES<br>NO  | CANNON<br>P1003               |        |
| FAILURE MODE-OUT OF SPECIFICATION. THE UNBILICAL CABLE REPORTEDLY FAILED TO EJECT MANUALLY AT 20 POUNDS PULL AS REQUIRED. THE FAILURE ANALYSIS WAS CANCELLED BECAUSE IT WAS DISCOVERED THAT IT WAS NOT THE UNBILICAL CABLE THAT HAD FAILED BUT THE MISSILEBORNE RECEPTACLE TO WHICH THIS UNBILICAL MATED. |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                      | SP-9B-40-3057C<br>UNBILICAL CONNECTOR       | FAR<br>7-06231                 | 145D<br>020626      | 12/ETR           | NO<br>NO   | CANNON<br>P1003               |        |
| FAILURE MODE-OUT OF TOLERANCE. THE UNBILICAL CABLE REPORTEDLY FAILED TO EJECT MANUALLY AT 20 POUNDS PULL AS REQUIRED. THE FAILURE ANALYSIS WAS CANCELLED BECAUSE IT WAS DISCOVERED THAT IT WAS NOT THE UNBILICAL THAT HAD FAILED BUT THE MISSILEBORNE RECEPTACLE TO WHICH THIS UNBILICAL MATED.           |                                             |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIF DATA SOURCE<br>PART NUMBER  | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>VENDOR NAME<br>OTH VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------|---------------------|------------------|------------------------------------------|
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                               |                                                |                                 |                     |                  |                                          |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                     | SP-98-40-3028-F<br>UMBILICAL CONNECTOR         | FAR<br>27-08118-3               | 1430<br>620827      | 12/ETR           | YES CANNON<br>NO P1009                   |
| FAILURE MODE-OUT OF TOLERANCE. THE UMBILICAL CABLE PLUG WAS LOOSE AFTER BEING MATED TO THE MISSILE. THE PLUGS LOCKING PROTRUSION WAS TOO SMALL TO ALLOW THE LOCKING BALLS TO ENGAGE IN THE SLOT IN THE RECEPTACLE AND AT THE SAME TIME COMPRESS THE FACEPLATE SPRINGS.                                                                                                   |                                                |                                 |                     |                  |                                          |
| CORRECTIVE ACTION-60/C ETR PERSONNEL WERE ASKED TO CHECK THE ADJUSTMENT OF ALL O SERIES UMBILICALS FAILING IN A SIMILAR MANNER PER PROCEDURE 27-93494-8K1E BEFORE SUBMITTING THEM FOR FAILURE ANALYSIS.                                                                                                                                                                  |                                                |                                 |                     |                  |                                          |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                     | AE62-0837<br>MICRO SWITCH                      | COUNTDOWN                       | 210<br>620821       | B-3              | YES<br>NO                                |
| FAILURE MODE-PREATURE OPERATION. PREATURE UMBILICAL EJECTION RESULTED FROM A FAULTY 2 INCH MOTION MICROSWITCH.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.<br>VEHICLE EFFECT-LAUNCH COUNTDOWN ABORTED.                                                                                                                                                                 |                                                |                                 |                     |                  |                                          |
| CORRECTIVE ACTION-2 INCH MOTION MICROSWITCH REPLACED.                                                                                                                                                                                                                                                                                                                    |                                                |                                 |                     |                  |                                          |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                     | P2-400-01-143<br>UMBILICAL                     | COMPOSITE-B FACT<br>317-0418-00 | 1430<br>620618      | 12/ETR<br>0      | YES<br>NO                                |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICALS P1003, P1007, P4001 DID NOT EJECT ELECTRICALLY. THE CAUSE IS UNKNOWN.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.                                                                                                                                                                                         |                                                |                                 |                     |                  |                                          |
| CORRECTIVE ACTION-THE UMBILICALS WERE MANUALLY REMOVED.                                                                                                                                                                                                                                                                                                                  |                                                |                                 |                     |                  |                                          |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                     | AA62-0037/P2-401-00-133<br>UMBILICAL CONNECTOR | COUNTDOWN                       | 1330<br>620423      | 12/ETR<br>-3600  | YES<br>NO                                |
| FAILURE MODE-PREATURE OPERATION. UMBILICAL P1003 WAS INADVERTENTLY EJECTED. UMBILICAL P1007 WAS FOUND LOOSE.<br>SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. DIFFERENTIAL PRESSURE WARNING LIGHT AND BUZZER CAME ON. THE PCU SET UP 6TA SE 2 EMERGENCY PRESSURES.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. THERE WAS A HOLD OF WHICH 13 MIN COULD BE ATTRIBUTED TO THIS PROBLEM. |                                                |                                 |                     |                  |                                          |

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GENERAL DYNAMICS  
CONVAIR DIVISION  
DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME  | DIF DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTM | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-UMBILICAL PLUG P1003 WAS REINSTALLED.                                                                                                                                                                                                                                                                                                                   |                                              |                                  |                     |                  |            |                               | 000002 |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                      | AG-98-48-0477<br>UMBILICAL CONNECTOR         | FAR<br>87-08117-801              | 1330<br>820423      | 18/ETR           | YES<br>NO  | YES CANNON ELEC.<br>NO P1007  | 000000 |
| FAILURE MODE-STRUCTURAL. POST LAUNCH INSPECTION OF UMBILICAL CONNECTOR REVEALED THAT A NUMBER OF ELECTRICAL CONTACT PINS EXTENDED THROUGH THE FACEPLATE INDICATING A POSSIBLE ABNORMAL EJECTION. BECAUSE OF EXTENSIVE FIRE DAMAGE, ABNORMAL EJECTION WAS NOT CONFIRMED.                                                                                                   |                                              |                                  |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                   |                                              |                                  |                     |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                      | AA82-3087/P8-404-00-104<br>UMBILICAL         | COUNTDOWN                        | 104D<br>820421      | 30A/ETR          | YES<br>NO  |                               | 000001 |
| FAILURE MODE-OUT OF TOLERANCE. AN AUTOMATIC CUTOFF WAS GENERATED AT THE TCC BY THE FUNCTION-SAFE INCOMPLETE CUTOFF TIMER. THE TIMER WAS ACTUATED WHEN THE LOWER PLATE DISCONNECT SIGNAL FAILED TO COMPLETE THE TCC FUNCTION-SAFE LADDER DUE TO THE FIRING VALVE ELECTRICAL PLUG FOR TWO-INCH MOTION AND THE FIRING VALVE PLUG FOR LOWER PLATE DISCONNECT. BEING REVERSED. |                                              |                                  |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. REVERSAL OF THE TWO-INCH MOTION AND LOWER PLATE DISCONNECT FIRING VALVE PLUGS PREVENTED LOWER PLATE EJECTION, CAUSED PREMATURE EJECTION OF THE CENTAUR LOS AND LH2 FILL AND DRAIN VALVES AND UMBILICAL PLUGS P403, J9 AND J11.                                                                                                    |                                              |                                  |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. THE LAUNCH ATTEMPT WAS ABORTED BY AUTOMATIC CUTOFF.                                                                                                                                                                                                                                                                     |                                              |                                  |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE RECEPTACLES AND MATING PLUGS WERE TAPPED WITH PROPER PART NUMBERS, ALL CABLES WERE SHORTENED TO LENGTH PERMITTING CONNECTION TO THEIR MATING RECEPTACLE, ALL CABLES CLAMPED TO THEIR CORRESPONDING SOLENOID VALVE WITHIN 6 INCHES OF MATING PLUG, DESCRIPTIVE NAME OF EACH SOLENOID VALVE PAINTED ABOVE EACH VALVE.                               |                                              |                                  |                     |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                      | AA82-0031/A-98-40-178<br>UMBILICAL CONNECTOR | COMPOSITE-J FACT<br>87-08178-639 | 40E<br>920803       | 13/ETR           | YES<br>NO  |                               | 000003 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL 68004 FAILED TO EJECT ELECTRICALLY. FAILURE CAUSED BY CORROSION IN THE EJECT SOLENOID.                                                                                                                                                                                                                         |                                              |                                  |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE. ELECTRICAL SYSTEM HAD GONE TO INTERNAL POWER.                                                                                                                                                                                                                                                                                                         |                                              |                                  |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                      |                                              |                                  |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UMBILICAL ADAPTOR WRITTEN UP ON IR 633303 AND REPLACED BY NEW UNIT. REPLACEMENT FAILED IN SAME MANNER. IR 617186 WRITTEN. THIRD UNIT SATISFACTORY.                                                                                                                                                                                                      |                                              |                                  |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1968

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|---------------------|------------------|------------|-----------------------------------------------|
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | A-98-40-178F<br>UMBILICAL CONNECTOR            | FAR<br>27-06172-835            | 620205              | 13/ETR           | YES<br>NO  | YES GRAY-HULESUARD<br>000033                  |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. ADAPTER FAILED TO EJECT UPON ELECTRICAL ACTUATION. DISASSEMBLY REVEALED CORROSION ON THE CLUTCH SHAFT AND ON ITS HOUSING WITHIN THE SOLENOID. FAILURE OF THE ADAPTER WAS DUE TO CORROSION CAUSED BY MOISTURE WHICH SEEPED INTO THE SOLENOID.                                                                                                                                                                                                                |                                                |                                |                     |                  |            |                                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | A462-0009/P2-401-00-181<br>UMBILICAL CONNECTOR | COUNTDOWN                      | 1210<br>620126      | 12               | YES<br>NO  | YES<br>NO<br>000377                           |
| FAILURE MODE-ERRATIC OPERATION. THE B1 FUEL VALVE CLOSED PANEL LIGHT GAVE INTERMITTANT INDICATIONS. CAUSED BY AN INTERMITTANT CONNECTION IN UMBILICAL PLUG P1007.                                                                                                                                                                                                                                                                                                                                            |                                                |                                |                     |                  |            |                                               |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNAL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                                               |
| VEHICLE EFFECT-NONE. ACCEPTABLE FOR LAUNCH.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                |                                |                     |                  |            |                                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                |                     |                  |            |                                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | A-98-40-193-F<br>UMBILICAL/CONNECTOR PIN.      | FAR<br>27-06117-801            | 1210<br>620103      | 12/ETR           | YES<br>NO  | YES PACIFIC AUTOMA<br>TION PRODUCTS<br>000103 |
| FAILURE MODE-FAIL DURING OPERATION. THE ENGINE MANIFOLD PRESSURE SWITCH MALFUNCTIONED. THE REPLACEMENT SWITCH MALFUNCTIONED ALSO. FURTHER CHECKS REVEALED THAT PIN 27 OF PLUG P1007 OF THE UMBILICAL CABLE WAS SHORTED TO ELECTRICAL GROUND. THE FAILURE WAS DUE TO THE WIRE SOLDERED AT PIN 27 BEING PINCHED AND DAMAGED IN THE ASSEMBLY OF THE PLUG. SINCE THIS TYPE OF PLUG HAD BEEN REMOVED BY 6D/C PERSONNEL AND BY VENDOR PERSONNEL. IT WAS NOT POSSIBLE TO IDENTIFY THE SOURCE OF THE REMOVED DAMAGE. |                                                |                                |                     |                  |            |                                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | A681-0799<br>UMBILICAL 80007                   | FLIGHT                         | 4F<br>61122         | 11<br>0          | YES<br>NO  | YES<br>NO                                     |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL 80007 FAILED TO EJECT ELECTRICALLY OR BY THE LANYARD.                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                                |                     |                  |            |                                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                |                                |                     |                  |            |                                               |
| VEHICLE EFFECT-NONE. FAILURE OF THE UMBILICAL TO EJECT CAUSED DEFORMATION OF THE ARMA P00 APT BULKHEAD HOWEVER NO FLIGHT SYSTEM PROBLEMS OCCURRED AS A RESULT.                                                                                                                                                                                                                                                                                                                                               |                                                |                                |                     |                  |            |                                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME            | DIF DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                        |                                  |                     |                  |            |                               | 000473 |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AA61-0153/P2-4CO-01-117<br>UMBILICAL CONNECTOR         | COMPOSITE-FRD/DPL                | 117D<br>611006      | 18/ETR           | YES<br>NO  |                               | 000080 |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. UMBILICALS P4001P AND P100YP FAILED TO EJECT ELECTRICALLY.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                   |                                                        |                                  |                     |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AA61-0147/P3-5CO-01-30<br>UMBILICAL CONNECTOR SOLENOID | COMPOSITE-J FACT<br>27-06172-829 | 30E<br>610927       | 13               | YES<br>NO  |                               | 000039 |
| FAILURE MODE-CONTAMINATION. DURING FAC TEST UMBILICAL 60009 FAILED TO EJECT ELECTRICALLY. INVESTIGATION SHOWED CORROSION ON THE SOLENOID RETAINING COLLET.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-IR693446 WAS WRITTEN AND THE UNIT REPLACED.                                                                                                                                                                                                                                                                                   |                                                        |                                  |                     |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AA61-0147/P8-04-286<br>UMBILICAL CONNECTOR PINS        | COMPOSITE-J FACT<br>27-06172-829 | 30E<br>610927       | 13/ETR           | YES<br>NO  |                               | 000022 |
| FAILURE MODE-ELECTRICAL SHORT. TWO PINS IN UMBILICAL ADAPTER 60004 WERE FOUND TO BE SHORTED DURING THE FAC TEST.<br>SYSTEM EFFECT-OPERATION TOO LOW. DC VOLTAGE TO B1 SOLID PROPELLANT GAS GENERATOR HEATER WAS BELOW REQUIREMENTS.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-IR 69349 WRITTEN. UMBILICAL ADAPTER REPLACED.                                                                                                                                                                                                                               |                                                        |                                  |                     |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | AA61-0793/L1-AU1-00-106<br>UMBILICAL P1003             | FLIGHT                           | 106D<br>610909      | 1-1<br>0.265     | YES<br>NO  |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DUE TO FAILURE OF P1003 TO EJECT ELECTRICALLY THE UMBILICAL ALLOWED ELECTRICAL POWER TO SWITCH BACK TO GROUND POWER. NORMALLY P1003 SHOULD EJECT WITH P1005 (PROPELLANT UMBILICAL). WHEN P1003 EJECTED THE LAUNCH CONTROL LOGIC WAS SUCH THAT A COMMIT STOP WAS GENERATED WHICH IN TURN GENERATED AN ELECTRICAL SIGNAL TO THE VEHICLE TO SWITCH BACK TO GROUND POWER. SINCE P1003 WAS STILL ENGAGED THE SIGNAL WAS ACTED UPON BY THE POWER CHANGE-OVER SWITCH.<br>SYSTEM EFFECT-OPERATION STOP PREMATURELY. |                                                        |                                  |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------|---------------------|------------------|------------|-------------------------------|
| VEHICLE EFFECT-PREMATURE PROPULSION SHUTDOWN. THE VEHICLE FELL BACK ON TO THE PAD AND EMPLOYED.<br>CORRECTIVE ACTION-1. COMMIT SEQUENCE LOCK-UP IN LOGIC AFTER RELEASE VEHICLE SIGNAL 2. PREVENT COMMIT STOP GENERATION IN LOGIC UNTIL MISSILE AWAY IS RECEIVED FOR AUTOMATIC STOP) 3. PREVENT MISSILE AWAY UNTIL ALL UNBILICALS HAVE BEEN EJECTED. 4. PROCEDURAL CHANGE TO UNBILICAL INSTALLATION. |                                             |                                  |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                | 98-40-102F<br>UNBILICAL CONNECTOR           | FAR<br>27-08172-833              | 26E<br>610824       | 13/ETR           | YES        | GRAY-HULEGUARD<br>NO          |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE ADAPTER FAILED TO EJECT UPON ELECTRICAL ACTUATION. FAILURE WAS THE RESULT OF THE FINGERS FAILING TO RETRACT FROM THE COLLET. THE FINGERS WOULD NOT RETRACT DUE TO SMALL BURRS ON THE COLLET. THESE BURRS WERE SUFFICIENT TO OVERCOME THE FORCES TENDING TO RETRACT THE FINGERS.                                                                |                                             |                                  |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE. HOWEVER, RELIABILITY RECOMMENDED REDESIGN OF THE SOLENOID EJECTOR MECHANISM.                                                                                                                                                                                                                                                                                                |                                             |                                  |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                | AAG1-0124/98-40-107<br>UNBILICAL CONNECTOR  | COMPOSITE-J FACT<br>27-08172-829 | 26E<br>610821       | 13/ETR           | YES        | NO                            |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. UNBILICAL 800US FAILED TO EJECT ELECTRICALLY.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                     |                                             |                                  |                     |                  |            |                               |
| CORRECTIVE ACTION-IR WRITTEN ON THIS AND SIX ADDITIONAL UNBILICALS AS RESULT OF POST-TEST INVESTIGATION.                                                                                                                                                                                                                                                                                            |                                             |                                  |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                | 98-40-102F<br>UNBILICAL CONNECTOR           | FAR<br>27-08172-833              | 26E<br>610811       | 13/ETR           | YES        | GRAY-HULEGUARD<br>NO          |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THE ADAPTER FAILED TO EJECT UPON ELECTRICAL ACTUATION. THE FAILURE WAS THE RESULT OF THE FINGERS FAILING TO RETRACT FROM THE COLLET. THE FINGERS WOULD NOT RETRACT DUE TO SMALL BURRS ON THE COLLET. THESE BURRS WERE SUFFICIENT TO OVERCOME THE FORCES TENDING TO RETRACT THE FINGERS.                                                          |                                             |                                  |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE. HOWEVER, RELIABILITY RECOMMENDED REDESIGN OF THE SOLENOID EJECTOR MECHANISM.                                                                                                                                                                                                                                                                                                |                                             |                                  |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                | AAG1-0033/P2-401-GU-111<br>UNBILICAL P1001  | COUNTDOWN                        | 1110<br>610789      | 18<br>-9860      | YES        | NO                            |
| FAILURE MODE-SHORT ELECT. #1 POD COLLING DUCT CONDENSATION DRIPPED ON P1001 UNBILICAL PLUG CAUSING THE A/P EMITTER FOLLOWER VOLTAGE TO BE GROUNDED OUT AT THE UNBILICAL.                                                                                                                                                                                                                            |                                             |                                  |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1986

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                 | OIF DATA SOURCE<br>PART NUMBER    | VEHICLE<br>DATE OIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                                                                                                                                                                                                                          | SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. THE VAW GYRO NULL LIGHT CAME ON AND THE GYRO COULD NOT BE NULLED.                                                    |                                   |                     |                  |            |                               | 000371 |
|                                                                                                                                                                                                                          | VEHICLE EFFECT-COUNTDOWN DELAYED. 27 MINUTES OF HOLD TIME WERE REQUIRED TO DRY AND SEAL THE UMBILICAL PLUG.                                                 |                                   |                     |                  |            |                               |        |
|                                                                                                                                                                                                                          | CORRECTIVE ACTION-THE UMBILICAL WAS DRIED WITH GNS. DC-Y COMPOUND WAS APPLIED AROUND THE GARNET. RED TAPE WAS APPLIED OVER THE UMBILICAL AS A WATER SHIELD. |                                   |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                     | 98-40-101<br>UMBILICAL CONNECTOR                                                                                                                            | FAR<br>27-06814-1                 | 010519              | 13/ETR           | YES        | PACIFIC AUTOMA<br>NO TION     | 000708 |
| FAILURE MODE-FAILED DURING OPERATION. CAUSE OF FAILURE WAS A COLD SOLDER JOINT ON PIN Y OF PLUG 600U293.                                                                                                                 |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| CORRECTIVE ACTION-RELIABILITY SUGGESTS THAT QUALITY ASSURANCE TAKE IMMEDIATE STEPS TO IMPROVE THE QUALITY OF THESE ITEMS.                                                                                                |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                     | A461-0062/P3-SCO-01-10<br>UMBILICAL ADAPTER                                                                                                                 | COMPOSITE-B FACT<br>10E<br>010511 | 10E<br>010511       | 13/ETR           | YES<br>NO  |                               | 000986 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UMBILICAL ADAPTERS 600U1, 600U2 AND 600U7 FOUND TO BE DEFECTIVE DURING TEST. 600U2 WAS FOUND TO HAVE COLD SOLDER JOINT AT 600U2 P3-Y WHICH PREVENTED SOLENOID EJECTION. |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                      |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME UNKNOWN.                                                                                                                                                                     |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE UMBILICAL ADAPTERS WERE REPLACED.                                                                                                                                                                  |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                     | 98-40-081<br>UMBILICAL CONNECTOR                                                                                                                            | FAR<br>27-06172-631               | 10E<br>010511       | 13/ETR           | YES        | GREY-HALEGUARD<br>NO          | 000886 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE ADAPTER DID NOT EJECT WHEN THE SOLENOID WAS ENERGIZED. THE FAILURE WAS NOT CONFIRMED. THE ADAPTER EJECTED NORMALLY DURING FAILURE ANALYSIS.                         |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                  |                                                                                                                                                             |                                   |                     |                  |            |                               |        |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                     | 98-40-084<br>UMBILICAL CONNECTOR                                                                                                                            | FAR<br>27-06172                   | 10E<br>010511       | 13/ETR           | YES        | GREY AND NULES<br>NO UARD     |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE ADAPTER FAILED TO EJECT WHEN THE SOLENOID WAS ENERGIZED. FAILURE WAS NOT CONFIRMED. THE ADAPTER OPERATED NORMALLY DURING FAILURE ANALYSIS.                          |                                                                                                                                                             |                                   |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SLT<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|-----------------|------------|-------------------------------|
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                          |                                             |                                |                     |                 |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                             | 98-40-079<br>UMBILICAL CONNECTOR            | FAR<br>27-06172                | 18E<br>610311       | 13/ETR          | YES<br>NO  | YES GREY AND HULES<br>NO WARD |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE ADAPTER DID NOT EJECT WHEN 28VDC WAS APPLIED TO THE SOLENOID. FAILURE WAS NOT CONFIRMED. THE ADAPTER ELECTRICAL EJECTION MECHANISM WORKED NORMALLY DURING FAILURE ANALYSIS. |                                             |                                |                     |                 |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                          |                                             |                                |                     |                 |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                             | 98-40-047<br>UMBILICAL CONNECTOR            | FAR<br>27-06172                | 61020D              | 13/ETR          | YES<br>NO  | YES GREY AND HULES<br>NO AND  |
| FAILURE MODE-STRUCTURAL. THE GEAR TEETH WERE CHISED BECAUSE SPUR GEARS WERE USED WHEN BEVEL GEARS WERE REQUIRED. THE CONNECTOR FAILED TO MATE WITH THE MISSILE RECEPTACLE BECAUSE OF INADEQUATE GEAR DRIVE.                      |                                             |                                |                     |                 |            |                               |
| CORRECTIVE ACTION-THE BACKS OF THE MS CONNECTORS ON THE UMBILICAL CONNECTORS ARE BEING POTTED TO EXCLUDE MOISTURE. THE DRIVE MECHANISM IS BEING REDESIGNED TO PREVENT GEAR TOOTH BREAKAGE AND MECHANICAL BINDING.                |                                             |                                |                     |                 |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                             | DA202/L1-4MO-01-70<br>DC POWER SUPPLY       | COMPOSITE-FRD/DPL              | 70D<br>901209       | 1-1             |            |                               |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. INTERNAL TIMER RAN OUT BEFORE TRANSFER TO INTERNAL POWER DUE TO VOLTAGE BE LOW MINIMUM OF 25.8 VOLTS D.C.                                                                               |                                             |                                |                     |                 |            |                               |
| SYSTEM EFFECT-UNKNOWN.                                                                                                                                                                                                           |                                             |                                |                     |                 |            |                               |
| VEHICLE EFFECT-UNKNOWN.                                                                                                                                                                                                          |                                             |                                |                     |                 |            |                               |
| CORRECTIVE ACTION-TIMER DURATION INCREASED TO 2.0 SECONDS TO SAMPLE VOLTAGE DURING COMMIT SEQUENCE.                                                                                                                              |                                             |                                |                     |                 |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                             | AA80-0180/P2-4CO-01-91<br>ELECTRICAL CABLE  | COMPOSITE-B FACT               | 91D<br>901189       | 18/ETR<br>9     | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. NO UMBILICALS EJECTED ELECTRICALLY AT T-0. THE PROBLEM WAS TRACED TO THE 2 AND 3 INCH RISE CABLE NOT BEING PLUGGED INTO THE JAI BOX.                                            |                                             |                                |                     |                 |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. ELECTRICALLY EJECTED UMBILICALS DID NOT EJECT AT T-0.                                                                                                                                    |                                             |                                |                     |                 |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                             |                                             |                                |                     |                 |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                 | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP JATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>C/N | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-THE WIRING WAS CORRECTED.                                                                                          |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                 | PTA8377/P1-408-08-42                        | COUNTDOWN                      | 420<br>600308       | 11<br>-60        | NO<br>YES  |                               |
| FAILURE MODE-FALL TO OPERATE AT PRESCRIBED TIME. PNEUMATICS COULD NOT GO INTERNAL DUE TO FAILURE OF THE INTERNAL PERMIT CIRCUITRY.   |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. INTERNAL PNEUMATICS COULD NOT BE OBTAINED DUE TO THE FAILURE OF THE INTERNAL PERMIT CIRCUIT. |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED, 4 MINUTES HOLD, 6 MINUTES RECYCLE.                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-JUMPER AROUND PCU PRESSURE SWITCH 89.                                                                              |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                 | PTA8366/P3-4CO-01-49<br>UMBILICAL PLUG      | COMPOSITE-B FACT               | 480<br>600203       | 13/ETR<br>-6     | YES<br>NO  |                               |
| FAILURE MODE-OUT OF TOLERANCE. UMBILICAL P609 WAS LOOSE WHICH CAUSED AN INTERMITTENT AUTOPILOT READY LIGHT ON THE TCC CONSOLE.       |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-ERRATIC OPERATION. THE AUTOPILOT READY LIGHT ON THE TCC CONSOLE WAS INTERMITTENT.                                      |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                              |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                 | AZC-27-053/P3-4CO-03-15<br>CONTROL BOX      | COMPOSITE-B FACT               | 150<br>58112        | ETR              | YES<br>NO  |                               |
| FAILURE MODE-ERRATIC OPERATION. ALL UMBILICALS DID NOT EJECT DUE TO A DEFECTIVE CONTROL BOX.                                         |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                  |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                           |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                 | PTA8131/P3-402-00-17<br>UMBILICAL PLUG      | COUNTDOWN                      | 170<br>580909       | 13/ETR<br>-480   | YES<br>NO  |                               |
| FAILURE MODE-PREATURE OPERATION. A LOOSE UMBILICAL PLUG CAUSED AN OPEN CIRCUIT IN THE BOOSTER NO. 1 IGNITION DETECTION CIRCUIT.      |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                  |                                             |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

19 JUN 1968

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME | SITE<br>DIF TIME | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| VEHICLE EFFECT-COUNTDOWN DELAYED. HXND TIME WAS 18 MINUTES. BOOSTER NO. 1 IGNITION DETECTION LINKS PANEL LIGHTS EXTINGUISHED.                                            |                                             |                                |                          |                  |            |                               | 000002 |
| CORRECTIVE ACTION-THE UNBILICAL WAS TIGHTENED.                                                                                                                           |                                             |                                |                          |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                     | EM1330/P4-401-00-10<br>UNBILICAL CONNECTOR  | PRF                            | 100<br>590901            | 14<br>-9400      | YES<br>NO  | YES ROCKETDYNE                | 000004 |
| FAILURE MODE-PREATURE OPERATION. DURING FLIGHT READINESS FIRING COUNTDOWN THE MERCURY CAPSULE AUXILIARY UNBILICAL DISCONNECTED DUE TO THE WEIGHT OF THE RELEASE LANYARD. |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-NONE. NO EFFECT WAS INDICATED.                                                                                                                             |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAY. THE DISCREPANCY CAUSED A 110 MINUTE DELAY IN COUNTDOWN WHILE THE DIFFICULTY WAS ISOLATED AND CORRECTED.                                  |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-LANYARD SAFETY WIRED TO VEHICLE TO RELIEVE TENSION ON RELEASE MECHANISM.                                                                               |                                             |                                |                          |                  |            |                               |        |
| ELECTRICAL-68E<br>POWER DISTRIBUTION                                                                                                                                     | FTAS013/P2-300-01-08<br>UNBILICAL CONNECTOR | COMPOSITE-B FACT               | 6C<br>890707             | 18/ETR<br>0      | YES<br>NO  |                               | 000076 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. UNBILICALS P403D AND P1007 FAILED TO EJECT ELECTRICALLY BECAUSE OF MECHANICAL BINDING.                                  |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-NONE. UNBILICALS WERE MANUALLY PULLED.                                                                                                                     |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                     |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                               |                                             |                                |                          |                  |            |                               |        |
| ELECTRICAL-68C<br>POWER DISTRIBUTION                                                                                                                                     | ATC-27-031/P3-402-00-03<br>WIRING           | COUNTDOWN                      | 5D<br>590602             | 13/ETR           | YES<br>NO  |                               | 000012 |
| FAILURE MODE-ERRATIC OPERATION. LC-1 VALVE POSITION LIGHTS DID NOT OPERATE PRIOR TO THE START OF TANKING. AFTER TANKING COMMENCED, THE LIGHTS OPERATED PROPERLY.         |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                      |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                     |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-CHECKOUT FOUND THE MICROSWITCHES WERE TIED TO A FLUCTUATING D-C SOURCE. THE CONDITION WAS CORRECTED.                                                   |                                             |                                |                          |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME              | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | DATE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                              | ATC-87-030/P3-48N-03-03<br>UMBILICAL WIRING              | COMPOSITE-B FACT               | 3D<br>590319        | 13/ETR           | YES<br>NO  |                               |
| <p>FAILURE MODE-ELECTRICAL SHORT. DUE TO A GROUND IN THE COMPLEX WIRING, THE A/P CYRO EXCITATION TRANSFORMER WAS BURNED. THIS FAILURE RESULTED FROM THE PRACTICE OF GROUNDING ALL WIRES MARKED SPARE COMING FROM THE UMBILICALS.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COMPOSITE RESCHEDULED. THE TEST WAS UNSUCCESSFUL DUE TO THE BURNED OUT CYRO EXCITATION TRANSFORMER A NO WAS RESCHEDULED.</p> <p>CORRECTIVE ACTION-THE WIRING WAS CORRECTED.</p> |                                                          |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                              | FTA3044/P2-103-00-16<br>MAIN MISSILE BATTERY PANEL METER | COUNTDOWN                      | 16A<br>590329       | 12/ETR<br>80     | YES<br>NO  |                               |
| <p>FAILURE MODE-OUT OF TOLERANCE. THE MAIN MISSILE BATTERY PANEL METER WAS READING LOW DUE TO AN ERRONEOUS CALIBRATION.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. RECYCLE TIME WAS 89 MINUTES. HOLD TIME WAS 2 HOURS AND 15 MINUTES.</p> <p>CORRECTIVE ACTION-THE PANEL METER WAS RECALIBRATED.</p>                                                                                                                                     |                                                          |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                              | FTA2399/P2-102-00-11<br>MISSILE GROUND RECTIFIER         | COUNTDOWN                      | 11A<br>590215       | ZTR<br>-4800     | YES<br>NO  |                               |
| <p>FAILURE MODE-OUT OF TOLERANCE. THE MISSILE GROUND RECTIFIER WAS BELOW BATTERY OUTPUT. RECTIFIER OUTPUT WAS 18 VDC A NO COULD NOT BE VARIED OR CONTROLLED.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. 45 MINUTES WERE REQUIRED FOR REPLACEMENT DURING A HOLD CALLED FOR WEATHER.</p> <p>CORRECTIVE ACTION-A REPLACEMENT RECTIFIER WAS INSTALLED.</p>                                                                                   |                                                          |                                |                     |                  |            |                               |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                                                                              | EC-7-033/P4-102-00-13<br>UMBILICAL CONNECTOR             | FLIGHT                         | 13A<br>590207       | 14<br>0          | YES<br>NO  |                               |
| <p>FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. UMBILICAL P1011 DID NOT EJECT AND WAS PHYSICALLY TORN OFF AND REMAINED WITH THE VEHICLE. AS A RESULT, WHEN P1007 EJECTED NORMALLY, THE VEHICLE TANKS PRESSURIZED SIGNAL TO THE GSE W AS TERMINATED AND RESULTED IN SHUTDOWN OF THE APS.</p> <p>SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS.</p>                                                                                                                 |                                                          |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
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13 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                              | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                                  | VENDOR NAME<br>VE-OR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|---------------------------------------------|------------------------------|
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                          |                                |                     |                  |                                             |                              |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                          |                                |                     |                  |                                             |                              |
| ELECTRICAL-GSE<br>POWER DISTRIBUTION                                                                                                                                                                                                                                                                                                                                                                         | FTAB319/P2-102-00-10                                                                     | PRF                            | 10A<br>371127       | 18/ETR           | YES<br>NO                                   |                              |
| FAILURE MODE-FAIL DURING OPERATION. UNBILICAL PLUG PILOT BECAME DETACHED 8 SECONDS AFTER ENGINE START, RESULTING IN AN ABNORMAL SHUTDOWN, WHICH FURTHER CAUSED THE FUEL DUCT AT INLET TO NO. 2 THRUST CHAMBER PROPELLANT PUMP TO COLLAPSE AND BOTH THRUST CHAMBERS WERE DAMAGED.                                                                                                                             |                                                                                          |                                |                     |                  |                                             |                              |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                          |                                |                     |                  |                                             |                              |
| VEHICLE EFFECT-PREMATURE PROPULSION SHUTDOWN.                                                                                                                                                                                                                                                                                                                                                                |                                                                                          |                                |                     |                  |                                             |                              |
| CORRECTIVE ACTION-REPLACED BOOSTER ENGINES AND DUCTING.                                                                                                                                                                                                                                                                                                                                                      |                                                                                          |                                |                     |                  |                                             |                              |
| ELECTRICAL-GSE<br>INTERSTAGE WIRING AND DIST UNBILICAL CONNECTOR<br>RIBUTION                                                                                                                                                                                                                                                                                                                                 | FAR-CT-98-400-021<br>FAR-CT-98-400-021<br>INTERSTAGE WIRING AND DIST UNBILICAL CONNECTOR | FAR<br>27-06172-053            | 650712              | 368/CTR          | YES GREY AND HULEG<br>NO AND<br>502-700-053 |                              |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE UNBILICAL PLUG DID NOT EJECT ELECTRICALLY DURING CHECKOUT BUT EJECTED MANUALLY. DURING MISSILE MATING THE LANYARD WAS INADVERTENTLY PUSHED INTO THE PLUG CATCHING THE CABLE BETWEEN THE BEVEL GEAR AND THE SOLENOID ACTUATING ARM PREVENTING ELECTRICAL EJECTION. IN ADDITION, HEAVY COUGES WERE FOUND ON THE BODY SHELL CAUSED BY IMPROPER LOCKWIRING. |                                                                                          |                                |                     |                  |                                             |                              |
| CORRECTIVE ACTION-RECOMMEND SITE BE INFORMED OF THE CAUSE OF FAILURE AND REQUEST THEY (A) MAKE SURE THE LANYARD IS FREE DURING MATING (B) PERFORM A ROUGH DIMENSIONAL CHECK OF THE LANYARD DIMENSION BEFORE EJECTION TO ASSURE LANYARD IS FREE OF THE BEVEL GEAR(C) REFRAIN FROM UNAUTHORIZED DISASSEMBLY OR ADJUSTMENTS. FURTHER RECOMMENDATION-VENDOR IMPROVE ASSEMBLY AND INSPECTION PROCEDURES.          |                                                                                          |                                |                     |                  |                                             |                              |
| ELECTRICAL-GSE<br>VEHICLE CONTROL DISTRIBUTOR TRANS-DUCER, WIND<br>ON AND MONITOR                                                                                                                                                                                                                                                                                                                            | CT-98-535-093<br>VEHICLE CONTROL DISTRIBUTOR TRANS-DUCER, WIND<br>ON AND MONITOR         | FAR<br>97-97930-001            | 600324              | 308              | YES BECKMAN-WHITE<br>NO Y                   |                              |
| FAILURE MODE-ELECTRICAL OPEN CIRCUIT OF THE TRANS-DUCER'S SENSOR ELEMENT FROM OVER CURRENT APPLICATION.                                                                                                                                                                                                                                                                                                      |                                                                                          |                                |                     |                  |                                             |                              |
| CORRECTIVE ACTION-RECOMMEND THAT LAUNCH SITE PERSONNEL INVESTIGATE TROUBLE SHOOTING PROCEDURES. THESE TRANS-DUCER'S SHOULD NOT BE CHECKED WITH HIGH CURRENT, PSI, SCALE OF OHMETER.                                                                                                                                                                                                                          |                                                                                          |                                |                     |                  |                                             |                              |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-63E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO               |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------------------|--------|
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR UNIT LOG<br>ON AND MONITOR                                                                                                 | CT-98-530-032                               | FAR<br>27-43021-3              | 860325              | ETR              | YES<br>NO  | YES CALIF INSTRUMENT<br>NO NT<br>27-43021-3 | 860326 |
| FAILURE MODE-ERRATIC OPERATION, DUE TO FOREIGN MATERIAL OBSTRUCTING RELAY CONTACTS OPERATION.                                                                            |                                             |                                |                     |                  |            |                                             |        |
| CORRECTIVE ACTION-RECOMMEND ADVISING THE VENDOR OF THE FINDINGS OF THIS FAILURE AND REQUEST HIS COOPERATION IN THE ELIMINATION OF FOREIGN MATERIAL IN THE CONTACTS AREA. |                                             |                                |                     |                  |            |                                             |        |
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR UNIT POTENTIOMETER<br>ON AND MONITOR                                                                                       | CT-98-530-094                               | FAR<br>66-75179-369            | 860325              | ETR/368          | YES<br>NO  | YES CTS<br>NO R4SDM80100A                   | 860310 |
| FAILURE MODE-ERRATIC OPERATION, OCCURRED AS SYSTEM CALIBRATION BECAME DIFFICULT DUE TO NORMAL WEAR OF THE VARIABLE RESISTOR.                                             |                                             |                                |                     |                  |            |                                             |        |
| CORRECTIVE ACTION-RECOMMEND THE LOG LEVEL CONTROL SYSTEM BE INVESTIGATED TO DETERMINE IF SMOOTHER OPERATING POTENTIALS ARE REQUIRED FOR SYSTEM CALIBRATION.              |                                             |                                |                     |                  |            |                                             |        |
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR TRANSDUCER PRESSURE<br>ON AND MONITOR                                                                                      | CT-98-530-091                               | FAR<br>55-01222-111            | 860119              | ETR              | YES<br>NO  | YES GIANNINI                                | 860324 |
| FAILURE MODE-FAILURE TO OPERATE AT PRESCRIBED TIME DUE TO OPEN CIRCUITED SENSING ELEMENT.                                                                                |                                             |                                |                     |                  |            |                                             |        |
| CORRECTIVE ACTION-RECOMMEND THAT HANDLING PERSONNEL REVIEW OPERATING PROCEDURES TO PRECLUDE THE MISAPPLICATION OF POWER TO THE INCORRECT TERMINALS.                      |                                             |                                |                     |                  |            |                                             |        |
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR RELAY<br>ON AND MONITOR                                                                                                    | CT-98-480-012                               | FAR<br>97-37502-001            | 651213              | ETR              | YES<br>NO  | YES LEACH<br>NO 9843-35-5                   | 860320 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME, CAUSED BY LOOSE PARTS OBSTRUCTING RELAY CONTACTS CLOSURE.                                                               |                                             |                                |                     |                  |            |                                             |        |
| CORRECTIVE ACTION-RECOMMEND THAT THE VENDOR IMPROVE ARMATURE ARM LOCKING METHOD.                                                                                         |                                             |                                |                     |                  |            |                                             |        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-686

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>O/H | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR TRANSducer, PRESSURE<br>ON AND MONITOR                                                                                               | CT-98-330-089                               | FAR<br>68-01023-23             | 651103              | ETR              | YES        | ECCLIFF<br>NO                 |
| FAILURE MODE-OUT OF SPECIFICATION. INSTABILITY WAS DUE TO AGEING ON EXPOSURE TO HIGH TEMPERATURES.                                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-FAR CT-98-24-243-3272 RECOMMENDED A TEST FOR SENSING DEVICE INSTABILITY BE INCLUDED IN THE IAT PR<br>CEDURE.                                                     |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR TRANSducer PRESSURE<br>ON AND MONITOR                                                                                                | CT-98-330-089                               | FAR<br>68-01023-082            | 651014              | ETR              | YES        | EDCLIFF<br>NO 4-531-7236      |
| FAILURE MODE-OUT OF SPECIFICATION INDICATING TWICE THE ACTUAL PRESSURE CAUSED BY AN OPEN COIL WIRE.                                                                                |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-VENDOR REQUESTED TO REVIEW MANUFACTURING PROCEDURES TO PRECLUDE THE INDUCTION OF WIRE STRESS BREA<br>KS.                                                         |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-63E<br>VEHICLE CONTROL DISTRIBUTOR TRANSducer TEMPERATURE<br>ON AND MONITOR                                                                                             | CT-98-33-063                                | FAR<br>7-01684-29W             | 650823              | ETR              | YES        | TEMPER<br>NO 1503-29          |
| FAILURE MODE-OUT OF TOLERANCE, REPORTEDLY HAVING LOW INSULATION RESISTANCE, DUE TO MOISTURE WETTING PATH AT THE SEN<br>SING ELEMENT.                                               |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-CAUTION HANDLING PERSONNEL AGAINST MISHANDLING. PROVIDE THESE UNITS WITH MOISTURE PROTECTIVE DEVI<br>CE.                                                         |                                             |                                |                     |                  |            |                               |
| ELECTRICAL-63E<br>DC POWER GENERATION                                                                                                                                              | 7P68-CO-DB-DACS<br>6TR BATTERY SIMULATOR    | COMPOSITE-J FACT               | 1510<br>650806      | 338/CTR<br>-200  | YES<br>NO  |                               |
| FAILURE MODE-OUT OF TOLERANCE, THE ATLAS WFI FILAMENT 7 VOLT SUPPLY VOLTAGE WENT BELOW REDLINE. THIS VOLTAGE IS OUT<br>AINED FROM THE 6TR. THE CAUSE OF THIS PROBLEM IS NOT KNOWN. |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LOW                                                                                                                                                    |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE DELAYED. RECYCLE TIME WAS 100 SECONDS. HOLD TIME NOT AVAILABLE.                                                                                           |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-TEMPORARY FIX WAS TO SUBSTITUTE A WFI BATTERY FOR THE 6TR BATTERY SIMULATOR.                                                                                     |                                             |                                |                     |                  |            |                               |

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CONVAIR DIVISION

DIFFICULTIES REVIEW-ELECTRICAL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME     | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| ELECTRICAL-68E<br>DC POWER GENERATION                                                                                                                                                                                                                                                                                                                                           | FTA8974/P88-CO-04-04C6<br>6TR BATTERY SIMULATOR | COMPOSITE-J FACT               | 191D<br>830731      | 388/ETR<br>-180  | YES<br>NO  |                               |
| <p>FAILURE MODE-OUT OF TOLERANCE. THE ATLAS RF1 FILAMENT 7 VOLT SUPPLY VOLTAGE WENT BELOW REDLINE. THIS VOLTAGE IS OUT<br/>           AIMED FROM THE 6TR. THE CAUSE OF THIS PROBLEM IS NOT KNOWN.</p> <p>SYSTEM EFFECT-OPERATION TOO LOW.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-TEMPORARY FIX WAS TO SUBSTITUTE A RF1 BATTERY FOR THE 6TR BATTERY SIMULATOR.</p> |                                                 |                                |                     |                  |            |                               |

688878

FLIGHT CONTROL SYSTEM

GSE

DIFFICULTIES REVIEW

## DIFFICULTIES REVIEW FLIGHT CONTROL - GSE

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##### I. TEST & MONITOR

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##### II. ELECTRIC CONTROL

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|-------------------|-------------------|
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GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-686

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                 | DIP DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIP | SIZE<br>TIME DIP | PRI<br>OTH                | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------|---------------------|------------------|---------------------------|-------------------------------|
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                    | 9LV-98-48-033-P<br>AMPLIFIER WIRING                         | FAR<br>27-00121-3                | 851028              | 18/ETR           | YES KINETICS<br>NO N509-7 | 999737                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. AMPLIFIER USED IN AUTOPILOT CHECKOUT EQUIPMENT, REJECTED BECAUSE OF NO OUTPUT. FAILURE ANALYSIS DID NOT CONCLUSIVELY ESTABLISH FAILURE MODE. HOWEVER, THE FAILURE WAS DUPLICATED BY TOUCHING AN UNPROTECTED GROUND SHIELD WIRE, ON A CAPACITOR LEAD, TO TERMINAL BOND CONNECTIONS IN CLOSE PROXIMITY. THE BOND WAS CONSIDERED MOST PROBABLE FAILURE MODE. |                                                             |                                  |                     |                  |                           |                               |
| CORRECTIVE ACTION-60/C REQUESTED THAT VENDOR PROTECT ALL EXPOSED SHIELD WIRES WITH INSULATED SLEEVING. REFERENCE RA 9 LV-98-45-3821.                                                                                                                                                                                                                                                                       |                                                             |                                  |                     |                  |                           |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                    | A48-0055/P4-PCU-06-8301<br>ISOLATION AMPLIFIER              | COMPOSITE-J FACT<br>27-00121-1   | 9301<br>851014      | 14               | YES<br>NO                 | 999803                        |
| FAILURE MODE-ERRATIC OPERATION. GROUND MONITOR NULL CIRCUITRY GAVE ERRATIC INDICATIONS DURING FACT PREPARATIONS. INVESTIGATION SHOWED THAT WITH NULL CIRCUITRY ISOLATION AMPLIFIER SET TO GAIN OF 10, THE AMPLIFIER SATURATED WITH INPUTS GREATER THAN 1.2 VOLTS.                                                                                                                                          |                                                             |                                  |                     |                  |                           |                               |
| SYSTEM EFFECT-IMPROVED ANALOG SIGNALS. AMPLIFIER SATURATION RESULTED IN CLIPPING OF THE OUTPUT AND CAUSED ERRATIC INDICATIONS.                                                                                                                                                                                                                                                                             |                                                             |                                  |                     |                  |                           |                               |
| VEHICLE EFFECT-NONE. AMPLIFIER GAIN REDUCED TO 8 TO CORRECT CLIPPING BEFORE PERFORMING FACT.                                                                                                                                                                                                                                                                                                               |                                                             |                                  |                     |                  |                           |                               |
| CORRECTIVE ACTION-A/P GROUND CONTROL CALIBRATION PROCEDURE 27-93824 BK1, WAS CHANGED TO REFLECT GAIN CHANGE.                                                                                                                                                                                                                                                                                               |                                                             |                                  |                     |                  |                           |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                    | FTAS75/FAR-CT-90-483-082<br>BOLT, SIMULATOR BOX RELAY       | COMPOSITE-J FACT<br>85-84937-002 | 1510<br>850808      | 988/ETR          | YES SC7480<br>NO          | 999860                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DURING THE PLUS COUNT THE QUAD 1 EXPLOSIVE BOLT SIGNAL WAS NOT RECEIVED DUE TO A FAULTY RELAY IN THE BOLT SIMULATOR BOX.                                                                                                                                                                                                                                  |                                                             |                                  |                     |                  |                           |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                  |                     |                  |                           |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                       |                                                             |                                  |                     |                  |                           |                               |
| CORRECTIVE ACTION-THE FAULTY RELAY WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                           |                                                             |                                  |                     |                  |                           |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                    | FTAS74/FAR-CO-04-0402<br>LAUNCH CONTROL SIMULATOR SWITCH 12 | COMPOSITE-J FACT<br>850731       | 1510<br>850731      | 988/ETR          | NO<br>NO                  | 999860                        |
| FAILURE MODE-FAIL TO OPERATE. DURING THE PLUS COUNT IT WAS OBSERVED THAT THE AUTOPILOT PROGRAMMER WAS NOT RUNNING. THE CAUSE OF THE PROBLEM WAS A PROCEDURAL ERROR WHICH PLACED LCB-13 IN THE WRONG POSITION.                                                                                                                                                                                              |                                                             |                                  |                     |                  |                           |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. DURING THE PLUS COUNT, IT WAS OBSERVED THAT THE AUTOPILOT PROGRAMMER WAS NOT                                                                                                                                                                                                                                                                                       |                                                             |                                  |                     |                  |                           |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME             | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>VEHICLE PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------|
| T RUNNING.                                                                                                                                                                                                                                                                                                    |                                                         |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COMPOSITE DELAYED. RECYCLE TIME WAS 8 MINUTES. HOLD TIME WAS APPROXIMATELY ONE HOUR.                                                                                                                                                                                                           |                                                         |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-LBC-13 WAS PLACED IN THE CORRECT POSITION.                                                                                                                                                                                                                                                  |                                                         |                                |                     |                  |            |                                 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                       | FTAP580/P3-4CO-08-283<br>DECADE EVENT TIMER/RELAY       | COMPOSITE-1 FACT               | 8250<br>830707      | 18/4TR<br>D      | YES<br>NO  |                                 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE DECADE EVENT TIMER ON THE PROGRAMMED MONITOR PANEL FAILED TO START AT ZERO TIME ON THE FIRST GCT AND ON 2 PLUS-COUNT PROGRAMMED RUNS. INVESTIGATION REVEALED THAT RELAY R2 WAS AT FAULT.                                                                 |                                                         |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                                                                       |                                                         |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                          |                                                         |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-NONE DURING THE TEST. THE RELAY WAS LATER REPLACED.                                                                                                                                                                                                                                         |                                                         |                                |                     |                  |            |                                 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                       | NJASCF1A/P2-4CO-03-198<br>PIROTECHNIC CHECKOUT BOX FUSE | COMPOSITE-1 FACT               | 1082<br>830208      | 18/4TR           | YES<br>NO  |                                 |
| FAILURE MODE-FAIL DURING OPERATION. THE STRAY CURRENT FUSE IN THE GIB-ARM PREMATURE SEPARATION DESTRUCT CIRCUITRY M AS BLOWN AT SOME TIME DURING THE COUNT. NO CAUSE FOR BLOWN FUSE WAS FOUND DURING TEST RUNS.                                                                                               |                                                         |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                           |                                                         |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN DELAYED. THE COUNTDOWN WAS RECYCLED TWICE FOR A TOTAL OF 33 MINUTES RECYCLE TIME.                                                                                                                                                                                                    |                                                         |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-THE FUSE WAS REPLACED.                                                                                                                                                                                                                                                                      |                                                         |                                |                     |                  |            |                                 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                       | FAN-CT-98-330-047<br>SIMULATOR RELAY                    | FAR                            | 1940<br>841210      | 20A/4TR          | YES<br>NO  |                                 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE SIMULATOR IS USED DURING MISSILE CHECKOUT TO SIMULATE SHOTS LO AS IN AN AUTOPILOT ARMED RUN. A RELAY IN THE SIMULATOR FAILED TO ACTUATE AT THE PROPER TIME. THE ASSEMBLY WAS FUNCTIONALLY TESTED, DISASSEMBLED, AND EXAMINED, BUT NO DEFECTS WERE FOUND. |                                                         |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-THE FAILURE WAS NOT COMPLETED. NO CORRECTIVE ACTION IS REQUIRED.                                                                                                                                                                                                                            |                                                         |                                |                     |                  |            |                                 |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-88E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                 | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE OF TIME | SITE<br>TIME OF DAY | PRI<br>OTHER       | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|-------------------------|---------------------|--------------------|-------------------------------|
| FLIGHT CONTROL-68ND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                              | CAPBANK-088/P6-LO-01-8AC4<br>HARNES         | COUNTDOWN<br>88-64808          | 1460<br>641804          | 384/ETR<br>-18000   | YES<br>NO          |                               |
| FAILURE MODE-FAIL TO CEASE OPERATION. THE FUEL DEPLETION SIGNAL COULD NOT BE DISABLED AT THE A/P PANEL DUE TO SPENT IN 88E HARNES 88-64808.                                                                                                                                                                                                                                          |                                             |                                |                         |                     |                    |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. THE FUEL DEPLETION SIGNAL COULD NOT BE DISABLED.                                                                                                                                                                                                                                                                                             |                                             |                                |                         |                     |                    |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                         |                     |                    |                               |
| CORRECTIVE ACTION-THE SIGNAL WAS REROUTED TO A SPARE CONDUCTOR.                                                                                                                                                                                                                                                                                                                      |                                             |                                |                         |                     |                    |                               |
| FLIGHT CONTROL-68ND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                              | FTAS06/P2-4CO-04-886<br>ISOLATION AMPLIFIER | COMPOSITE-J FACT<br>841116     | 2080<br>841116          | 12/ETR<br>NO        | YES<br>NO          |                               |
| FAILURE MODE-ERRATIC OPERATION. THE PITCH SYRO OUTPUT CONTAINED UNUSUAL OUTPUTS DURING THE FIRST 17 SEC. OF THE 8CT. THE SIGNAL BECAME UNSTABLE AT 8CT ZERO TIME WHEN SYRO MALLING WAS REMOVED. THE SIGNAL FROM THE ISOLATION AMPLIFIER CORRECTED ITSELF APPROXIMATELY 2 SEC. AFTER THE BEGINNING OF THE PITCH PROGRAM. THIS PROBLEM WAS FOUND TO BE DUE TO THE ISOLATION AMPLIFIER. |                                             |                                |                         |                     |                    |                               |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. IMPROPER SIGNALS WERE RECEIVED ON THE BLOCKHOUSE RANDOM RECORDER CHANNEL TH AT WAS MONITORING PITCH SYRO OUTPUT.                                                                                                                                                                                                                              |                                             |                                |                         |                     |                    |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                         |                     |                    |                               |
| CORRECTIVE ACTION-THE ISOLATION AMPLIFIER WAS REPLACED.                                                                                                                                                                                                                                                                                                                              |                                             |                                |                         |                     |                    |                               |
| FLIGHT CONTROL-68ND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                              | FAR-CT-98-450-017<br>AMPLIFIER TRANSISTOR   | FAR<br>98-06284-1              | 041007                  | 384/ETR             | YES KINETICS<br>NO |                               |
| FAIL DURING OPERATION. DURING AN AUTOPILOT SYSTEM CHECKOUT, THE AMPLIFIER WAS INDICING EXCESSIVELY HIGH OUTPUT VOLT AGC. AMPLIFIER OPERATION WAS DEFECTIVE, DUE TO A SHORTED TRANSISTOR. REPLACEMENT OF THE TRANSISTOR PRODUCED NORMAL OPERATION.                                                                                                                                    |                                             |                                |                         |                     |                    |                               |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR (KINETICS) SCREEN 8833 DELCO TRANSISTORS TO ELIMINATE LEAKY U NITS. KINETICS WOULD ADVISE DELCO OF THE TRANSISTOR FAILURE AND REQUEST IMPROVEMENT IN ITS ALLOWING PROCESS.                                                                                                                                                      |                                             |                                |                         |                     |                    |                               |
| FLIGHT CONTROL-68ND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                              | A164-0035/P6-CO-02-8AC3<br>CIRCUIT          | COMPOSITE-J FACT               | 1930<br>840819          | 384/ETR<br>-18      | YES<br>NO          |                               |
| FAILURE MODE-FAIL TO CEASE OPERATION AT PRESCRIBED TIME. THE FIRST HOLDFIRE TEST OF THE SECOND RUN OF THE COMPOSITE WAS UNSATISFACTORY SINCE THE CIRCUIT DID NOT STOP THE SEQUENCER. THE FAILURE OCCURRED BECAUSE THE SYSTEM HAD NOT BE EN RESET AFTER THE FIRST COMPOSITE RUN.                                                                                                      |                                             |                                |                         |                     |                    |                               |

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GENERAL DYNAMICS  
CONVAIR DIVISION

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE OF TIME | SITE<br>TIME OF DAY | PRI<br>OIR                      | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|-------------------------|---------------------|---------------------------------|-------------------------------|
| SYSTEM EFFECT-OPERATION TOO LONG. THE SEQUENCE DID NOT STOP AT -10 SECONDS.                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                         |                     |                                 |                               |
| VEHICLE EFFECT-COMPOSITE DELAYED, AT HOLD OF 17 MINUTES AND A 5 MINUTE RECYCLE WAS REQUIRED.                                                                                                                                                                                                                                                                                                                                                             |                                             |                                |                         |                     |                                 |                               |
| CORRECTIVE ACTION-THE CIRCUITRY WAS RESET AND THE TEST BEGUN IMMEDIATELY.                                                                                                                                                                                                                                                                                                                                                                                |                                             |                                |                         |                     |                                 |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR-CT-98-430-018<br>RELAY                  | FAR<br>97-37021-003            | 840803                  | 38A/ETR             | YES UNION SWITCH<br>NO UN324362 | 899704                        |
| FAILURE MODE-FAIL TO OPERATE. CONTACTS WERE DISCOVERED OPEN. THE FAILURE COULD NOT BE CONFIRMED IN FAILURE ANALYSIS<br>ALTHOUGH ALL CONTACTS SHOWED WEAR, AND INTERMITTENT OPENS COULD BE EXPECTED.                                                                                                                                                                                                                                                      |                                             |                                |                         |                     |                                 |                               |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT A SCHEDULE OF PERIODIC REPLACEMENT OF RELAYS BE INITIATED.                                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                         |                     |                                 |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR-CT-98-430-014<br>RELAY                  | FAR<br>97-37021-001            | 840806                  | 38A/ETR             | YES UNION SWITCH<br>NO UN324362 | 899734                        |
| FAILURE MODE-PREATURE OPERATION. THREE RELAYS USED IN THE AUTOPILOT CONSOLE MATRIX DRAWER WERE REJECTED BECAUSE NORMALLY CLOSED CONTACTS INDICATED OPEN CIRCUITS. THE FAILURES WERE CONFIRMED BY TESTS IN FAILURE ANALYSIS. ALL OF THE AFFECTED CONTACTS SHOWED EVIDENCE OF BURNING BUT THE EXACT CAUSE OF BURNING WAS NOT DETERMINED. ONE RELAY SHOWED SOME WHITE FIBER CONTAMINANT ELIMINATED BY THE WHITE NYLON SPIDER USED TO MOVE THE SWINGER ARMS. |                                             |                                |                         |                     |                                 |                               |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT RELAYS BE CLEAN ROOM PROCESSED.                                                                                                                                                                                                                                                                                                                                                                                |                                             |                                |                         |                     |                                 |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR-CT-98-430-014<br>RELAY                  | FAR<br>97-370 1-003            | 840808                  | 38A/ETR             | YES UNION SWITCH<br>NO UN324362 | 899884                        |
| FAILURE MODE-PREATURE OPERATION. FAILURE CONSISTED OF ONE PAIR OF NORMALLY CLOSED CONTACTS APPEARING TO BE OPEN-CIRCUITED. THERE WAS NO EVIDENCE OF CONTAMINATION. REF. IR 899840.                                                                                                                                                                                                                                                                       |                                             |                                |                         |                     |                                 |                               |
| CORRECTIVE ACTION-NO CORRECTIVE ACTION WAS TAKEN. THE FAILURE WAS NOT CONFIRMED.                                                                                                                                                                                                                                                                                                                                                                         |                                             |                                |                         |                     |                                 |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR-CT-98-430-013-C<br>RELAY                | FAR<br>97-37081-008            | 840809                  | 38A/ETR             | YES UNION SWITCH<br>NO UN324362 | 899884                        |
| FAILURE MODE-FAIL DURING OPERATION. THE RELAY IS USED IN THE AUTOPILOT CONSOLE MATRIX DRAWER. TWO PAIRS OF CONTACTS WERE BURNED. THE FAILURE WAS CONFIRMED BY FAILURE ANALYSIS. THERE WAS NO EVIDENCE AS TO THE CAUSE OF THE BURNING.                                                                                                                                                                                                                    |                                             |                                |                         |                     |                                 |                               |

GENERAL DYNAMIC  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-REC

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                         | VER./REPORT NUMBER<br>FIELD COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>O7H | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-NO CORRECTIVE ACTION WAS TAKEN.                                                                                                                                                                                                            |                                            |                                |                     |                  |            |                               | 000740 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                      | FAR-CT-00-43-013-P<br>RELAY                | FAR<br>97-37081-003            | 040407              | 28A/ETR          | YES        | UNION SWITCH<br>NO U1384362   | 000730 |
| FAILURE MODE-PREMAJURE OPERATION. THREE RELAYS USED IN THE AUTOPILOT CONSOLE/MATRIX DRAWER INDICATED OPEN CIRCUITS 7 OR NORMALLY CLOSED CONTACTS. THE FAILURES WERE CONFIRMED BY FAILURE ANALYSIS AND COULD BE ELIMINATED BY MOVING THE CO NTACTS SLIGHTLY.  |                                            |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.                                                                                                                                                                                                                |                                            |                                |                     |                  |            |                               | 000740 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                      | FAR-LV-90-8J-229-F<br>RELAY                | FAR<br>97-37081-003            | 040204              | 18/ETR           | YES        | UNION SWITCH<br>NO U1384362   | 000730 |
| FAILURE MODE-FAIL TO CEASE OPERATION. THIS RELAY IS IN A RELAY DRAWER IN THE AUTOPILOT MONITOR AND CONTROL UNIT. FA ILURE CONSISTED OF ONE NORMALLY CLOSED CONTACT REMAINING OPEN. ANALYSIS REVEALED A BURNED CONTACT POINT. A SYMPTOM OF EXCESSIVE CURRENT. |                                            |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. NO CORRECTIVE ACTION WAS TAKEN. SITE PERSONNEL COULD NOT ESTABLISH ANY EXCESSIVE CURRENT OCCURRENCE.                                                                                                            |                                            |                                |                     |                  |            |                               | 000720 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                      | FAR-CT-00-43-010-C<br>RELAY                | FAR<br>97-37081-003            | 031132              | 30A/ETR          | YES        | UNION SWITCH<br>NO U1384362   | 000720 |
| FAILURE MODE-FAILED TO OPERATE AT PROPER TIME. TWO RELAYS FAILED WHEN NORMALLY CLOSED CONTACTS FAILED TO OPEN WHEN RELAY WAS ENERGIZED.                                                                                                                      |                                            |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.                                                                                                                                                                                                                |                                            |                                |                     |                  |            |                               | 000720 |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                      | FAR-CT-00-43-010-C<br>RELAY                | FAR<br>97-37081-003            | 031020              | 30A/ETR          | YES        | UNION SWITCH<br>NO U1384362   | 000720 |
| FAILURE MODE-FAILED TO OPERATE AT PROPER TIME. TWO RELAYS FAILED WHEN NORMALLY CLOSED CONTACTS FAILED TO OPEN.                                                                                                                                               |                                            |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.                                                                                                                                                                                                                |                                            |                                |                     |                  |            |                               | 000720 |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-385

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIF DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PR1<br>OTH | VENDOR NAME<br>VE-DOE PART NO              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------|---------------------|------------------|------------|--------------------------------------------|
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                             | PS-4CO-03-197/LV-88-43-G18<br>AMPLIFIER RELAYS | COMPOSITE-J FACT<br>87-70381-001 | 1970<br>630880      | 13/ETR           | YES<br>NO  | YES 82866716<br>NO                         |
| FAILURE MODE-FAIL DURING OPERATION. THE TAV 6700 MULLING CIRCUIT DID NOT FUNCTION PROPERLY DURING 6CT. THIS PROBLEM WAS CAUSED BY MALFUNCTIONS IN RELAYS K8 AND K12 AND THE MULLING AMPLIFIER.                                                                                      |                                                |                                  |                     |                  |            |                                            |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                 |                                                |                                  |                     |                  |            |                                            |
| VEHICLE EFFECT-NONE. THE 6CT PORTION OF THE TEST WAS RETURN.                                                                                                                                                                                                                        |                                                |                                  |                     |                  |            |                                            |
| CORRECTIVE ACTION-REPLACED RELAY K8 AND K12 AND THE MULLING AMPLIFIER, LOCATED IN THE TRANSFER ROOM.                                                                                                                                                                                |                                                |                                  |                     |                  |            |                                            |
| FLIGHT CONTROL-WRND<br>TEST AND MONITOR                                                                                                                                                                                                                                             | FAR-CT-98-43-002-P<br>RELAY                    | FAR<br>87-37021-003              | 630401              | 38A/ETR          | YES<br>NO  | YES UNION SWITCH<br>NO UN324382            |
| FAILURE MODE-FAIL TO OPERATE. A FOREIGN PARTICLE (PIECE OF WIRE) NEAR ONE OF THE ARMATURE MAGNET POLES PREVENTED MOVEMENT OF THE ARMATURE WHICH PREVENTED CLOSURE OF CONTACTS.                                                                                                      |                                                |                                  |                     |                  |            |                                            |
| CORRECTIVE ACTION-THE VENDOR WAS NOTIFIED OF THE FAILURE. IT WAS RECOMMENDED THAT THIS PART BE REPLACED BY THE J-35 RELAY WHICH ELIMINATES CONTAMINATION PROBLEMS.                                                                                                                  |                                                |                                  |                     |                  |            |                                            |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                             | FAR-CT-98-93-013F<br>RELAY-HARNES              | FAR<br>97-37008-003              | 680812              | 38A/ETR          | YES<br>NO  | YES UNION SWITCH<br>NO UN32834-002         |
| FAILURE MODE-FAIL DURING OPERATION. CONTACTS 4 AND 8 INDICATED HIGH RESISTANCE DURING MISSILE CHECKOUT. PPAR A-CT-12 41 REPORTED A WIRING INSULATION LEAKAGE IN THE HARNES ASSOCIATED WITH THIS RELAY, WHICH COULD ACCOUNT FOR THE INDICATED CONTACT RESISTANCE.                    |                                                |                                  |                     |                  |            |                                            |
| CORRECTIVE ACTION-NO ACTION WAS TAKEN.                                                                                                                                                                                                                                              |                                                |                                  |                     |                  |            |                                            |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                             | FAR-CT-98-53-003-F<br>RELAY                    | FAR                              | 680303              | 38A/ETR          | YES<br>NO  | YES UNION SWITCH R<br>NO 16MAL<br>UN324362 |
| FAILURE MODE-FAIL DURING OPERATION. NORMALLY CLOSED CONTACTS WERE OPEN CIRCUITED ON SEVEN RELAYS USED IN THE PROGRAM WHEN CONSOLE MATRIX RELAY DRAWS, CAUSED BY THE ROTOR BINDING ON THE COIL PLATE, PREVENTING CONTACTS FROM CLOSING. BE HING WAS THE RESULT OF IMPROPER ASSEMBLY. |                                                |                                  |                     |                  |            |                                            |
| CORRECTIVE ACTION-FAILURE WAS CONFIRMED. THE VENDOR WAS ASKED TO IMPROVE ASSEMBLY AND INSPECTION TECHNIQUES. REFERENCE WAS A-98-04-708 AND ITS REPLY.                                                                                                                               |                                                |                                  |                     |                  |            |                                            |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-661

| SUB-SYSTEM                                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                         | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTM | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                             | FAR-CT-98-48-001-F<br>ISOLATION AMPLIFIER                           | FAR<br>55-66010-3              | 620314              | 30A/ETR          | YES<br>NO  | 999731                        |
| <p>FAILURE MODE-FAIL TO OPERATE. THIS UNIT IS USED TO MONITOR AUTOPILOT SIGNALS AND TO ISOLATE THEM FROM THE GROUND REC ORDER. THERE WAS NO OUTPUT WHEN AN INPUT VOLTAGE WAS APPLIED. LAD TESTS REVEALED THAT THE PLUG TO VDC PIN AND THE SIGNAL OUT PIN WERE BENT SO MUCH THAT THEY DID NOT MAKE CONTACT WITH THE MATING PLUG.</p> |                                                                     |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-DITE PERSONNEL WERE ENLIGHTENED OF THE RESULTS OF THE ANALYSIS. THESE PARTS ARE BEING REPLACED BY P/N 25-08294.</p>                                                                                                                                                                                            |                                                                     |                                |                     |                  |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                             | AASZ-1010/F2-40-01-1L<br>CONAX VALVE BRUIB PURE YELT BOX WE<br>GINS | COMPOSITE-B FACT               | 1210                | 18/ETR           | YES<br>NO  | 999893                        |
| <p>FAILURE MODE-FAIL TO OPERATE. ONLY ONE OF TWO BOOSTER SEPARATION CONAX VALVE BRUIB FUSES BLEW WHEN THE BOOSTER SEPARATION SIGNAL WAS GENERATED BY THE PROGRAMMER. THIS PROBLEM WAS TRACED TO A CIRCUITRY DEFECT IN THE TEST BOX. A BATTERY TEST WAS SUBSEQUENTLY PERFORMED.</p>                                                  |                                                                     |                                |                     |                  |            |                               |
| <p>SYSTEM EFFECT-OPERATION DOES NOT START. ONE CONAX VALVE BRUIB FUSE DID NOT BLOW DURING THE TEST. THIS REQUIRED A RE-SET OF THIS PORTION OF THE TEST TO DEMONSTRATE SATISFACTORY SYSTEM OPERATION.</p>                                                                                                                            |                                                                     |                                |                     |                  |            |                               |
| <p>VEHICLE EFFECT-NONE.</p>                                                                                                                                                                                                                                                                                                         |                                                                     |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-THE CIRCUIT DEFECT WAS CORRECTED.</p>                                                                                                                                                                                                                                                                          |                                                                     |                                |                     |                  |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                             | FAR-CT-98-48-001-F<br>ISOLATION AMPLIFIER                           | FAR<br>55-63030-3              | 011218              | 30A/ETR          | NO<br>YES  | 999610                        |
| <p>FAILURE MODE-DRIFT. DURING A DRIFT TEST, THE AMPLIFIERS DRIFTED OUT OF THE SPECIFIED NULL ZONE. DURING EXTENSIVE LABORATORY DRIFT TESTS, IT WAS CONCLUDED THAT THE UNITS WERE BEING USED WITH INCOMPATIBLE LOADS AT THE AMPLIFIER OUTPUT TERMINALS. IN EFFECT THIS WAS A MISAPPLICATION OF USE OF THE AMPLIFIERS.</p>            |                                                                     |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE PRESENT LINKS BETWEEN AMPLIFIERS AND LOADS BE REPLACED BY LOW CAPACITY ANCE COAX CABLE. IF THIS IS NOT FEASIBLE, AMPLIFIERS SHOULD BE REPLACED BY HIGHER CAPACITY AMPLIFIERS. FAILURE NOT CONFIRMED.</p>                                                                           |                                                                     |                                |                     |                  |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                             | AASZ-0202/F3-301-00-99<br>ISOLATION AMPLIFIER                       | COUNTDOWN                      | 255<br>011130       | 18/ETR           | YES<br>NO  |                               |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE ROLL RATE GYRO ISOLATION AMPLIFIER FAILED DURING THE FIRST LAUNCH ATTEMPT.</p>                                                                                                                                                                                                           |                                                                     |                                |                     |                  |            |                               |
| <p>SYSTEM EFFECT-UNKNOWN.</p>                                                                                                                                                                                                                                                                                                       |                                                                     |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-68

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME         | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| VEHICLE EFFECT-NONE. THE COUNTDOWN WAS ABORTED DUE TO ANOTHER PROBLEM.<br>CORRECTIVE ACTION-AMPLIFIER WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                     |                                |                     |                  |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AAS1-0802/P3-SC0-01-28<br>ISOLATION AMPLIFIER       | COMPOSITE-B FACT<br>91187      | 95C<br>91187        | 13/17R<br>NO     | YES<br>NO  |                               |
| FAILURE MODE-FAIL DURING OPERATION. THE COMPOSITE TEST PITCH ISOLATION AMPLIFIER FAILED DURING THE FAC TEST.<br>SYSTEM EFFECT-UNKNOWN.<br>VEHICLE EFFECT-UNKNOWN.<br>CORRECTIVE ACTION-AMPLIFIER WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                    |                                                     |                                |                     |                  |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AAS1-0802/P3-SC0-01-111<br>SERVO INPUT TEST CIRCUIT | COUNTDOWN                      | 1110<br>91022       | 13/17R<br>-3000  | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE. THERE WAS AN OPEN WIRE IN THE AUTOPILOT SERVO INPUT TEST CIRCUIT BETWEEN THE TERMINAL BOARD AND THE DUBILICAL.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME IS NOT KNOWN.<br>CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                    |                                                     |                                |                     |                  |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AAS1-0109/P3-001-00-02<br>SERVO WIRING              | COUNTDOWN                      | 27<br>91007         | 13/17R<br>NO     | YES<br>NO  |                               |
| FAILURE MODE-ERRATIC OPERATION. WITH WIRE ENGAGED CONNECTED TO THE SERVO TEST POINT, A NOISE PICKUP OF 50 MILLIVOLTS WAS PRESENT. THIS WAS SUFFICIENT TO CAUSE LOSS OF THE SERVO SPINNING INDICATOR.<br>SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. SERVO LIFE WOULD NOT GO OUT. SO BOTH THE SERVO CANISTERS WERE REPLACED. THIS DID NOT HELP, THE SERVO LIFE WAS STILL ON.<br>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. THE COUNT WAS RESCHED AT T-90 MINUTES AND RESCHEDULED.<br>CORRECTIVE ACTION-PROBLEM ELIMINATED BY CUTTING WIRE ENGAGED NEAR 305UPL-C AND TERMINATING IT TO GROUND ON THE SHIELD MALE. |                                                     |                                |                     |                  |            |                               |

15 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-63K

| SYSTEM<br>FWD-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DAT: SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>12/ETR | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|----------------|------------|-------------------------------|
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AASD-01:18/P8-401-00-01<br>WIRING           | COUNTDOWN                      | 910<br>001014                | 12/ETR<br>-420 | NO<br>NO   |                               |
| <p>FAILURE MODE-ERRATIC OPERATION. EXTRANEOUS PROGRAMMER RESET SIGNALS WERE BEING INDUCED IN THE HARDLINES BETWEEN THE BLOCKHOUSE AND THE RAMP. THE VOLTAGE WAS INDUCED BY VOLTAGE SURGES IN ADJACENT WIRING CAUSED BY PULL IN AND DROPOUT OF THE 3000 PSI RELAY IN THE BOOSTER HYDRAULIC SYSTEM.</p> <p>SYSTEM EFFECT-IMPROVED DISCRETE SIGNALS. EXTRANEOUS PROGRAMMER RESET SIGNALS WERE BEING GENERATED.</p> <p>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.</p> <p>CONNECTIVE ACTION-SUPPRESSION DIODES WERE ADDED ACROSS EACH 2000 PSI AND 3000 PSI RELAY IN THE BOOSTER HYDRAULIC SYSTEM.</p>                          |                                             |                                |                              |                |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 08-09-001<br>HARVESTING WIRING              | PAR<br>RT-48873                | PID<br>001210                | 12/ETR<br>-420 | YES<br>NO  |                               |
| <p>FAILURE MODE-ERRATIC OPERATION. THE PROGRAMMER RESET SPURIOUSLY WHILE PERFORMING ENGINE WINDING. INVESTIGATION REVEALED THAT PROGRAMMER WOULD RESET EVERY TIME BOOSTER HYDRAULIC 3000 PSI PRESSURE SWITCH ACTIVATED. SINCE PROGRAMMER WIRING IS LOCATED IN WARDEN'S ROOM ADJACENT WITH HYDRAULIC CONSOLE RELAYS, THE PROGRAMMER WAS BEING RESET BY A TRANSIENT GENERATED WHEN THE HYDRAULIC PRESSURE SWITCH RELAY DE-ENERGIZED.</p> <p>CONNECTIVE ACTION-THE USE OF DIODES ON HYDRAULIC CONSOLE RELAYS ADDRESSED THE TRANSIENT AND ELIMINATED THE PROBLEM. PROBLEM EXISTING AT AIR COMPLEX 13 ONLY. ACTION PER TVA-428073.</p> |                                             |                                |                              |                |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AASD-0120<br>AUDIO WARNING AMPLIFIER        | COUNTDOWN                      | 600<br>000708                | 11<br>-2700    | NO<br>NO   |                               |
| <p>FAILURE MODE-FAILED DURING OPERATION.</p> <p>SYSTEM EFFECT-OPERATION RAMP PREMATURELY.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED TO CHANGE AUDIO WARNING AMPLIFIER (6 MINUTES).</p> <p>CORRECTIVE ACTION-REPLACE AUDIO WARNING AMPLIFIER.</p>                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                |                              |                |            |                               |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FTACTE/PA-000-01-02<br>LIGHT                | COMPOSITE-S FACT               | 220<br>390829                | 12/ETR<br>-420 | YES<br>NO  |                               |
| <p>FAILURE MODE-FAIL TO OPERATE. THE MONITOR LAMP FOR PRESSURISE WARNER TANKS IN THE TEST BOX WAS BURNED-OUT.</p> <p>SYSTEM EFFECT-IMPROVED DISCRETE SIGNAL. FAILURE OF THE LAMP INDICATED ABSENCE OF THE SIGNAL.</p> <p>VEHICLE EFFECT-NONE.</p>                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                              |                |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

# DIFFICULTIES NEWIZW-FLIGHT CONTROL SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>10TH VENDOR PART NO | VENDOR NAME |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|---------------------|------------------|----------------------------|-------------|
| CORRECTIVE ACTION-THE LAMP WAS REPLACED AND THE AUTOPILOT FUNCTION WAS VERIFIED.                                                                                          |                                                |                                |                     |                  |                            |             |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                   | FTAB088/P2-SC0-01-17<br>AUTOPILOT OUTPUT FUSES | COMPOSITE-B FACT               | 17D<br>800827       | 18/ETR           | YES<br>NO                  |             |
| FAILURE MODE-OUT OF TOLERANCE. AUTOPILOT PROGRAMMER OUTPUT FUSE SIZE WAS INCORRECT AND CORRECT OUTPUT COULD NOT BE VERIFIED.                                              |                                                |                                |                     |                  |                            |             |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. AUTOPILOT PROGRAMMER OUTPUT COULD NOT BE VERIFIED DUE TO INCORRECT FUSER IN THE SYSTEM.                                          |                                                |                                |                     |                  |                            |             |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                         |                                                |                                |                     |                  |                            |             |
| CORRECTIVE ACTION-BERGM SPECIAL TESTS. AFTER THE TEST COMPLETION, TO VERIFY PROPER PROGRAMMER OPERATION.                                                                  |                                                |                                |                     |                  |                            |             |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                   | FTAB013/P2-SC0-01-00<br>PANEL LIGHT WIRING     | COMPOSITE-B FACT               | 9C<br>500707        | 18/ETR           | YES<br>NO                  |             |
| FAILURE MODE-FAIL TO OPERATE AT DESCRIBED TIME. THE PRESSURIZED VENTILATOR TANKS PANEL LIGHT DID NOT ILLUMINATE DUE TO AN IMPROPER WIRING CONNECTION.                     |                                                |                                |                     |                  |                            |             |
| SYSTEM EFFECT-MODE. THE FUNCTION WAS PROPERLY RECEIVED AT THE MISSILE.                                                                                                    |                                                |                                |                     |                  |                            |             |
| VEHICLE EFFECT-NONE.                                                                                                                                                      |                                                |                                |                     |                  |                            |             |
| CORRECTIVE ACTION-CORRECTED WIRING CONNECTION.                                                                                                                            |                                                |                                |                     |                  |                            |             |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                   | FTA 48072E-25N-04-8<br>CIRCUIT WIRING          | COMPOSITE-B FACT               | 9C<br>300712        | 18/ETR           | YES<br>NO                  |             |
| FAILURE MODE-PREMIATURE OPERATION. THE SUSTAINER CUTOFF SIGNAL WAS GENERATED AS SOON AS ENABLED BECAUSE OF INCORRECT HARNESS WIRING IN MISSILE AND GROUND TEST CIRCUITRY. |                                                |                                |                     |                  |                            |             |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. SIGNALS WERE INITIATED PREMATURELY AS SOON AS ENABLED                                                                            |                                                |                                |                     |                  |                            |             |
| VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME WAS 43 MINUTES.                                                                                                               |                                                |                                |                     |                  |                            |             |
| CORRECTIVE ACTION-BERGM CAMBLEN REPLACED AND WIRING CONNECTED.                                                                                                            |                                                |                                |                     |                  |                            |             |
| FLIGHT CONTROL-GRND<br>TEST AND MONITOR                                                                                                                                   | FTAB088/P2-SC0-01-10<br>AMPLIFIER              | COMPOSITE-B FACT               | 10A<br>811114       | 18/ETR           | YES<br>NO                  |             |
| FAILURE MODE-FAIL DURING OPERATION. THE BUZZOUT AMPLIFIER FOR THE PITCH CHANNEL, A PART OF THE GROUND TEST EQUIPMENT, FAILED.                                             |                                                |                                |                     |                  |                            |             |

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DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-888

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH                            | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------|---------------------|------------------|---------------------------------------|-------------------------------|--------|
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. FAILURE OF THE BUCCOUT AMPLIFIER PERMITTED THE PITCH PROGRAM TO BE APPLIED WHEN, FOR TEST PURPOSES, IT WAS UNDESIRABLE.<br>VEHICLE EFFECT-COMPOSITE DELAYED.<br>CORRECTIVE ACTION-THE AMPLIFIER WAS REPLACED.                                                                                                                                                                    |                                             |                                  |                     |                  |                                       |                               | 000070 |
| FLIGHT CONTROL-CRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                               | FAP-CT-98-430-023<br>RELAY                  | FAR<br>88-73801-013              | 650007              | 308/ETR          | YES POTTER, BRUMF<br>NO ELD<br>8C7480 |                               | 000748 |
| FAILURE MODE-FAIL TO CEASE OPERATION. THE RELAY WAS REJECTED BECAUSE CONTACTS 1 AND 3 WERE SHORT CIRCUITED. THE CHA<br>SSIS HAD BEEN AFFECTED BY AN AIRBORNE INVERTER OVERLOAD CONDITION ON AUG 9. IFAR-CT-98-141-070 AND FAR-CT-98-430-023<br>AND HAD HAD BEEN SUBJECTED TO EXCESSIVE CURRENT WHICH CAUSED THE CONTACTS TO WELD TOGETHER. THE FAILURE WAS CONFIRM<br>ED. A FRACTURED SOLDER CONNECTION WAS ALSO FOUND. |                                             |                                  |                     |                  |                                       |                               |        |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT ALL OF THE RELAYS INVOLVED IN THE OVERLOAD INCIDENT BE TESTED FOR CONTACT<br>DAMAGE. IT WAS ALSO RECOMMENDED THAT THE VENDOR BE NOTIFIED ABOUT THE SPOKEN SOLDER CONNECTION.                                                                                                                                                                                                  |                                             |                                  |                     |                  |                                       |                               |        |
| FLIGHT CONTROL-CRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                               | FIASCT/FAR-CT-98-430-023<br>RELAY           | COMPOSITE-P PACT<br>30-54037-003 | 1510                | 308/ETR          | YES POTTER, BRUMF<br>NO ELD<br>8C7480 |                               | 000038 |
| FAILURE MODE-ERRATIC OPERATION. THE AUXILIARY PROGRAMMER AND SIGNAL GENERATOR IN THE GSE WERE NOT OPERATING PROPERL<br>Y DUE TO A RELAY, ON RELAYS, MALFUNCTIONING IN THE SYSTEM.<br>SYSTEM EFFECT-ERRATIC OPERATION.<br>VEHICLE EFFECT-NONE.                                                                                                                                                                           |                                             |                                  |                     |                  |                                       |                               |        |
| CORRECTIVE ACTION-REPLACED THE SUSPECT RELAYS IN THE GSE.                                                                                                                                                                                                                                                                                                                                                               |                                             |                                  |                     |                  |                                       |                               |        |
| FLIGHT CONTROL-CRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                               | FAR-CT-98-430-023<br>RELAY                  | FAR<br>88-73801-013              | 650005              | 308/ETR          | YES POTTER, BRUMF<br>NO ELD<br>8C7480 |                               | 000770 |
| FAILURE MODE-PREMIATURE OPERATION. THIS RELAY IS IN A GROUND SUPPORT AUTO-PILOT CHASSIS WHICH TRANSFERS GROUND AC POW<br>ER TO AIRBORNE POWER. IT FAILED WHEN INSTALLED IN THE CHASSIS, BY BEING IN THE ENERGIZED POSITION WHEN DE-ENERGIZED.<br>EXAMINATION REVEALED A BENT WIPER ARM WHICH PREVENTED MOVEMENT OF THE ARMATURE. THE WIPER ARM PROBABLY WAS BENT BEF<br>ORE OR DURING ASSEMBLY OF THE RELAY.            |                                             |                                  |                     |                  |                                       |                               |        |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR BE INFORMED ABOUT THE BENT WIPER ARM.                                                                                                                                                                                                                                                                                                                              |                                             |                                  |                     |                  |                                       |                               |        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME       | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                      | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|---------------------|------------------|---------------------------------|-------------------------------|
| FLIGHT CONTROL-GRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 65C/BRF68-047/L4-T02-00-7109<br>RELAY             | COUNTDOWN                      | 7109<br>680828      | 2-4<br>-80       | YES<br>NO                       | 689478                        |
| <p>FAILURE MODE-OPEN (ELECTRICAL). NO.2 AND NO.3 CONTACTS OF 23A1K34 TIME RELAY FAILED OPEN. LAB ANALYSIS REVEALED CONTACT SURFACES WERE CONTAMINATED WITH THERMOSETTING PLASTIC PARTICLES WHICH CAN PREVENT CONTACTS FROM COMPLETELY CLOSING.</p> <p>SYSTEM EFFECT-IMPROPER DISCRETE SIGNAL. BECAUSE OF CONTACT FAILURES, LAUNCH CONTROL LOGIC FAILED TO LOCK-UP COMMIT SEQUENCE 28 VOC POWER WHEN COMMIT SWITCH DEPRESSED.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. 19-MINUTE HOLD CALLED.</p> <p>CORRECTIVE ACTION-RELAY VENDOR TO INVESTIGATE PROBLEM. CORRECTIVE ACTION TAKEN DURING COUNTDOWN WAS TO JUMPER OUT RELAY.</p> |                                                   |                                |                     |                  |                                 |                               |
| FLIGHT CONTROL-GRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | DA1044<br>RELAY                                   | COUNTDOWN                      | 410<br>680387       | 8-2              | YES<br>NO                       | 689393                        |
| <p>FAILURE MODE-FAIL DURING OPERATION. FAILURE OF NORMALLY CLOSED CONTACTS OF ARKES IN THE MASTER SEQUENCER. CONTACTS REMAINED OPEN WHEN THE RELAY WAS DEENERGIZED.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. CLOSED FC-2 DURING FUEL RAPID LOAD PERMITTING A HYDRAULIC RAM CONDITION TO DAMAGE THE FUEL Y DUCT.</p> <p>VEHICLE EFFECT-COUNTDOWN, ABORTED AND RESCHEDULED.</p> <p>CORRECTIVE ACTION-RELAY REPLACED.</p>                                                                                                                                                                                                  |                                                   |                                |                     |                  |                                 |                               |
| FLIGHT CONTROL-GRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 22H63-003/DA926<br>AUTOPILOT GROUND CHECKOUT UNIT | COUNTDOWN                      | 1190<br>630509      | 1-2              | NO<br>NO                        | 689394                        |
| <p>FAILURE MODE-ERRATIC OPERATION. INTERMITTENT AUTOPILOT GROUND CHECKOUT UNIT MALFUNCTION DURING COUNTDOWN LOOP TEST.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START. START 0-TIMER DISCRETE FAULTED ON LAUNCH ANALYST PANEL.</p> <p>VEHICLE EFFECT-COMPOSITE DELAYED.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p>                                                                                                                                                                                                                                                                                                                     |                                                   |                                |                     |                  |                                 |                               |
| FLIGHT CONTROL-GRND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | H6-98-49-008-F<br>RELAY                           | FAR                            | 680713              | 18/ETR           | YES UNION SWITCH<br>NO UN339230 |                               |
| <p>FAILURE MODE-FAIL DURING OPERATION. RELAY WAS IN FAILED CONDITION WHEN RECEIVED AT COMPLEX 18. CONTINUITY CHECK INDICATED OPEN CIRCUIT CONDITION IN COIL. FAILURE ANALYSIS CONFIRMED OPEN CIRCUIT, HOWEVER, PROBLEM DISAPPEARED WHEN RELAY WAS OPENED. EXACT FAILURE MODE NOT DETERMINED.</p>                                                                                                                                                                                                                                                                                                                                 |                                                   |                                |                     |                  |                                 |                               |

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DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-692

| SYSTEM                                                                                                                                                                                                                               | TEST/REPORT NUMBER                          | DATE DATA SOURCE | VEHICLE       | SITE      | PRI       | VENDOR NAME    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------|---------------|-----------|-----------|----------------|
| SUB-SYSTEM                                                                                                                                                                                                                           | FAILED COMPONENT NAME                       | PART NUMBER      | DATE DIS      | TIME DIS  | OTH       | VENDOR PART NO |
| CORRECTIVE ACTION-LAUNCH COMPUTER DESIGN GROUP APPARENTLY APPROVED INTERIM DESIGN CHANGE OF UNKNOWN NATURE AND STATED THAT PERMANENT CORRECTION WOULD BE UNNECESSARY. REFERENCE DESIGN GROUP MEMO A82-861-3-007, DATED 30 AUGUST 62. |                                             |                  |               |           |           |                |
| FLIGHT CONTROL-SKMD<br>ELECTRICAL CONTROL                                                                                                                                                                                            | A720-0185/5042E-402-00-01<br>WIRING         | COUNTDOWN        | 810<br>80518  | 12<br>-19 | YES<br>NO |                |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. TCC READY LIGHT DID NOT COME ON BECAUSE ACOUSTICA PU SYSTEM WAS NOT ABORD. HUMAN FAILURE.                                                                                           |                                             |                  |               |           |           |                |
| SYSTEM EFFECT-OPERATION DOES NOT START. LADDER IN READY SYSTEM BROKEN.                                                                                                                                                               |                                             |                  |               |           |           |                |
| VEHICLE EFFECT-COUNTDOWN DELAYED 15 MINUTES.                                                                                                                                                                                         |                                             |                  |               |           |           |                |
| CORRECTIVE ACTION-USED AROUND ACOUSTICA READY PORTION OF READY SYSTEM.                                                                                                                                                               |                                             |                  |               |           |           |                |
| FLIGHT CONTROL-SKMD<br>ELECTRICAL CONTROL                                                                                                                                                                                            | F1458R/P5-400-03-23                         | COMPOSITE-0 FACT | 490<br>800809 | 13<br>N   | YES<br>NO |                |
| FAILURE MODE-SEQUENCE OPERATION. THE 2 INCH MOTION SIGNAL WAS REMOVED. PRIOR TO EJECTION OF UNBILICAL PLD01. CAUSING THE AUTOPILOT PROGRAMMER TO START AT PLUS 12 SECONDS.                                                           |                                             |                  |               |           |           |                |
| SYSTEM EFFECT-OPERATION STARTS TOO EARLY. THE AUTOPILOT PROGRAMMER STARTED AT PLUS 12 SECONDS DUE TO EARLY REMOVAL OF THE 2 INCH MOTION SIGNAL.                                                                                      |                                             |                  |               |           |           |                |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                 |                                             |                  |               |           |           |                |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                              |                                             |                  |               |           |           |                |
| FLIGHT CONTROL-SKMD<br>ELECTRICAL CONTROL                                                                                                                                                                                            | A7127-054/A2-402-00-14<br>DIGITAL VOLTMETER | COUNTDOWN        | 120<br>800809 | A2        | YES<br>NO |                |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. THE ROLL VOLTAGE AT THE LAUNCH CONTROL CONSOLE INDICATED ERRONEOUS VALUE DUE TO FAULTY VOLTMETER.                                                                                           |                                             |                  |               |           |           |                |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                  |                                             |                  |               |           |           |                |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                    |                                             |                  |               |           |           |                |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                           |                                             |                  |               |           |           |                |

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DIFFICULTIES REVIEW-FLIGHT CONTROL SYSTEM-68E

| SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME     | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SIZE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| FLIGHT CONTROL-68ND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                        | EN132/PA-402-GU-10<br>RELAY, GYRO TORQUING TEST | PRF                            | 100<br>880803       | 14               | YES<br>NO  | 000943                        |
| <p>FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. DURING PRECOUNT AND COUNTDOWN A RELAY IN THE FLIGHT CONTROL GYRO TORQUING TEST EQUIPMENT FAILED TO ACTIVATE.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START. GYRO TORQUING TESTS WERE NOT COMPLETED DURING COUNTDOWN AND PRECOUNT.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-NONE INDICATED.</p> |                                                 |                                |                     |                  |            |                               |
| FLIGHT CONTROL-68ND<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                        | FTAG08/PS-000-01-1P<br>FUSE                     | COMPOSITE-B FACT               | 170<br>880827       | 13/17R           | YES<br>NO  | 000992                        |
| <p>FAILURE MODE-PREMATINE OPERATION. THE 50 MILLIAMPS BOOSTER STARTING AND NOISE GATE SEPARATION FUSES WERE BLOWN. CAUSE FOR BLOWN FUSES COULD NOT BE DETERMINED.</p> <p>CORRECTIVE ACTION-NONE.</p>                                                                                                                                                             |                                                 |                                |                     |                  |            |                               |

GUIDANCE SYSTEM  
GSE  
DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW GUIDANCE SYSTEM GSE

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#### I. GE MOD IIIG

|          |       |
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| Diode    | 0002. |
| Receiver | 0002. |

#### II. GE MK II

|       |       |
|-------|-------|
| Relay | 0007. |
|-------|-------|

#### III. ARMA GUIDANCE

|                         |       |
|-------------------------|-------|
| Calibrator              | 0009. |
| Harness/Wiring/Circuits | 0009. |
| Oscillator              | 0008. |
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DIFFICULTIES REVIEW-GUIDANCE SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME CIP | SITE<br>TIME CIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|------------------|------------|-------------------------------|
| GUIDANCE-GE MOD 11-GRND                                                                                                                                                                                                                                        | FTA4288/P4-203-00-6                         | COUNTDOWN                      | 98<br>580914                 | 14<br>-420       | YES<br>NO  | 601354U                       |
| FAILURE MODE-OUT OF TOLERANCE. REPORT ENTRIES ARE 2395 96 ESTIMATED 10 MIN TO CHANGE DRIVER. 2398 GUIDANCE SYSTEM INTERMITTENT.                                                                                                                                |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                                                                                                                               |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. TOTAL TIME LOSS 22 MIN HOLD AND 3.5 MIN RECYCLE MAY NOT ALL BE FOR THE SAME PROBLEM.                                                                                                                                         |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                     |                                             |                                |                              |                  |            |                               |
| GUIDANCE-GE MOD 11-GRND<br>COMPUTER                                                                                                                                                                                                                            | EN1338/P4-402-00-10                         | FRF                            | 100<br>590903                | 14<br>-120       | YES<br>NO  | 600347                        |
| FAILURE MODE-ERRATIC OPERATION. THE GUIDANCE SYSTEM GROUND STATION COMPUTER GENERATED A NO-GO INDICATION DURING A HOLD CONDITION INITIATED AT -2 MINUTES. THE COMPUTER RETURNED TO NORMAL OPERATION AFTER RE-POSITIONING THE TRACKING ANTENNAS ON THE VEHICLE. |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-NONE. THE AIRBORNE SYSTEM WAS NOT DIRECTLY AFFECTED BY THE GROUND STATION DISCREPANCY.                                                                                                                                                           |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. THE HOLD FOR LOX FILL AND DRAIN VALVE FAILURE TO CLOSE WAS EXTENDED TO PERMIT CORRECTION OF THE COMPUTER DISCREPANCY. THE COMBINED HOLD LASTED 9 MINUTES.                                                                    |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-NONE INDICATED. DISCREPANCY WAS CORRECTED BY RE-SETTING THE ANTENNA BUT NO FURTHER ACTION WAS INDICATED.                                                                                                                                     |                                             |                                |                              |                  |            |                               |
| GUIDANCE-GE MOD 11-GRND                                                                                                                                                                                                                                        | FTA4579/P1-202-00-11                        | COUNTDOWN                      | 115<br>590204                | 11<br>-420       | YES<br>NO  | 600319                        |
| FAILURE MODE-OUT OF TOLERANCE. G.E. GUIDANCE TRACK NO. 1 EXPERIENCED MULTIPATH PROBLEMS WHICH MADE THE SYSTEM NO-GO.                                                                                                                                           |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. G.E. GUIDANCE TRACK NO. 1 HAD A FLUCTUATING SIGNAL DUE TO MULTIPATH MAKING THE SYSTEM NO-GO.                                                                                                                            |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME 6 MINUTES.                                                                                                                                                                                                         |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-USE SYSTEM NO. 2 AS PRIMARY.                                                                                                                                                                                                                 |                                             |                                |                              |                  |            |                               |
| GUIDANCE-GE MOD 11-GRND                                                                                                                                                                                                                                        | FTA4328/P1-203-00-08                        | COUNTDOWN                      | 98<br>581114                 | 11<br>-1320      | NO         |                               |
| FAILURE MODE-FAIL DURING OPERATION.                                                                                                                                                                                                                            |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. GROUND GUIDANCE TRACK SYSTEM WAS UNABLE TO DORIGHTEN THE ANTENNA.                                                                                                                                                   |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 24 MINUTES HOLD 1 MINUTE RECYCLE.                                                                                                                                                                                            |                                             |                                |                              |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-692

| SYSTEM<br>SUB-SYSTEM | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                            | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                      |                                                                                                                                                                                                                                                                                                                                                                                        |                                |                     |                  |            |                               | 699402 |
|                      | CORRECTIVE ACTION-CHANGED THYRATRON IN AZIMUTH.                                                                                                                                                                                                                                                                                                                                        |                                |                     |                  |            |                               |        |
|                      | GUIDANCE-GE MOD II-GRND FTA4326/P1-202-00-09<br>DIODE                                                                                                                                                                                                                                                                                                                                  | COUNTDOWN                      | 99<br>591114        | 11<br>-1000      | YES<br>NO  |                               | 699401 |
|                      | FAILURE MODE-FAIL DURING OPERATION.<br>SYSTEM EFFECT-ERRATIC OPERATION. GROUND GUIDANCE SYSTEM NO. 1 ANGLE READOUT UNSATISFACTORY. ALSO THERE WERE MULTIPLE DROPOUTS IN AZIMUTH.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTES HOLD 27 MINUTES RECYCLE.<br>CORRECTIVE ACTION--REPLACED DIODE PACKAGE ON THE CONVERTER, TWICE.                                                        |                                |                     |                  |            |                               | 699403 |
|                      | GUIDANCE-GE MOD II-GRND FTA4323/P1-204-00-09<br>RECEIVER                                                                                                                                                                                                                                                                                                                               | COUNTDOWN                      | 99<br>591112        | 11<br>-900       | YES<br>NO  |                               |        |
|                      | FAILURE MODE-FAIL DURING OPERATION. DUE TO BURNED OUT TRACK RECEIVER CRYSTALS.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 18 MINUTES HOLD.<br>CORRECTIVE ACTION--REPLACED CRYSTALS.                                                                                                                                                            |                                |                     |                  |            |                               | 699320 |
|                      | GUIDANCE-GE MOD II-GRND FTA4266/P3-202-00-04                                                                                                                                                                                                                                                                                                                                           | COUNTDOWN                      | 99<br>590919        | 13<br>-0000      | YES<br>NO  |                               |        |
|                      | FAILURE MODE-FAIL DURING OPERATION.<br>SYSTEM EFFECT-OPERATION DOES NOT START.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 5 MINUTE HOLD.<br>CORRECTIVE ACTION--FAULTY COAXIAL CABLE REPLACED AT GUIDANCE GROUND STATION.                                                                                                                                                                     |                                |                     |                  |            |                               | 699320 |
|                      | GUIDANCE-GE MOD II-GRND FTA4266/P3-202-00-04                                                                                                                                                                                                                                                                                                                                           | COUNTDOWN                      | 99<br>590919        | 13<br>-300       | YES<br>NO  |                               |        |
|                      | FAILURE MODE-FAIL DURING OPERATION. GUIDANCE SYSTEM 1 TRACK ENCODER FAULTY FROM A BAD TUBE.<br>SYSTEM EFFECT-ERRATIC OPERATION. INTERMITTENT TRIGGER PULSE IN TRACK SUBSYSTEM CAUSED BY FAULTY ENCODER.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 28 MINUTE HOLD AND 2 MINUTE RECYCLE.<br>CORRECTIVE ACTION--BAD TUBE IN SYSTEM 1 ENCODER DID NOT HAVE OPERATIONAL SPARE. ENCODER REPLACED. |                                |                     |                  |            |                               | 699320 |

GENERAL DYNAMICS  
CONVAIR DIVISION

16 JUN 1968

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-66E

| SYSTEM<br>SUB-SYSTEM                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|------------------|------------|-------------------------------|
| GUIDANCE-6E MOD II-GRND                                                                                                           | FTA4200/PL-203-00-88                        | COUNTDOWN                      | 58 580928                    | 11 -879          | YES<br>NO  | 999363                        |
| FAILURE MODE-FAIL DURING OPERATION-GUIDANCE TAPE RECORDER IN GROUND STATION FAILED.                                               |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                               |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 3 MINUTE HOLD AND ONE MINUTE 21 SECOND RECYCLE.                                                 |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-NONE. EVALUATED SITUATION AND DECIDED TO GO WITHOUT RECORDER.                                                   |                                             |                                |                              |                  |            |                               |
| GUIDANCE-6E MOD II-GRND                                                                                                           | FTA4141/P3-204-00-4                         | COUNTDOWN                      | 48 580802                    | 13 -7280         | YES<br>NO  | 999342                        |
| FAILURE MODE-OUT OF TOLERANCE. 6E GROUND GUIDANCE SYSTEM NO. 2 NO-60.                                                             |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                               |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED 30 MINUTES AT T-110.                                                                             |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-INVESTIGATE-REPORTED 60 AT T-100 MINUTES-NO FURTHER ACTION TAKEN.                                               |                                             |                                |                              |                  |            |                               |
| GUIDANCE-6E MOD II-GRND                                                                                                           | FTA4152/P3-203-00-4                         | COUNTDOWN                      | 48 580801                    | 13 -4908         | YES<br>NO  | 999356                        |
| FAILURE MODE-FAIL DURING OPERATION. 6E GUIDANCE GROUND STATION WAS EXPERIENCING DIFFICULTY IN THEIR HUNGER TWO BEAC ON SYSTEM.    |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-LOSS OF REDUNDANCY. AFTER FURTHER TESTING 6E DECIDED TO GO WITHOUT SYSTEM NO. 2.                                    |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HELD AT T-80 FOR 18 MINUTES FOR FURTHER TESTING.                                                |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                           |                                             |                                |                              |                  |            |                               |
| GUIDANCE-6E MOD II-GRND                                                                                                           | AE60-0539/P2-402-00-32                      | COUNTDOWN                      | 320 600808                   | 12 -80           | YES<br>NO  | 999412                        |
| FAILURE MODE-FAIL DURING OPERATION. 6E GROUND STATION HAD A RECORDING PROBLEM.                                                    |                                             |                                |                              |                  |            |                               |
| SYSTEM EFFECT-NONE. GROUND STATION APPEARED TO BE BECOMING NEGATIVE COMMANDS. HOWEVER, THIS WAS A GROUND RECORDING P ROBLEM ONLY. |                                             |                                |                              |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED TO RESOLVE PROBLEM. NO HOLD CALLED.                                                              |                                             |                                |                              |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                        |                                             |                                |                              |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-88C

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                   | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| GUIDANCE-6E MOO 111B-GRND                                                                                                                                                              | AE60-0040/60AP3-402-00-48                   | COUNTDOWN                      | 490<br>800811       | 13<br>-2100      | YES<br>NO  |                               | 699494 |
| FAILURE MODE-ERRATIC OPERATION. DATA READINGS OF ALL FUNCTIONS IMPROPER IN GROUND GUIDANCE.                                                                                            |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-DELAYED COUNTDOWN 11 MINUTES.                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-MODULE REPLACED IN GROUND GUIDANCE STATION.                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-6E MOO 111B-GRND                                                                                                                                                              | FTA6361/P3-403-00-15                        | COUNTDOWN                      | 150<br>891124       | 13<br>-4500      | YES<br>NO  |                               | 699380 |
| FAILURE MODE-ERRATIC OPERATION. THE OUTPUT POWER OF THE TRACK SYSTEM TRANSMITTER AT THE GUIDANCE GROUND STATION WAS OBSERVED TO BE OCCASIONALLY DROPPING TO A LOWER LEVEL THAN NORMAL. |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW.                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTE HOLD.                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-DEFECTIVE MODULATOR TUBES WERE REPLACED BY A MATCHED SET OF TUBES.                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-6E MOO 111B-GRND                                                                                                                                                              | FTA6190/P1-404-00-16                        | COUNTDOWN                      | 190<br>891006       | 11<br>-300       | YES<br>NO  |                               | 699411 |
| FAILURE MODE-OUT OF TOLERANCE. 6E GROUND STATION EXPERIENCED UNSATISFACTORY RATE RECORDING READOUT.                                                                                    |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS IN GROUND STATION RATE RECORDING READOUT.                                                                                                        |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN RELATED TO RESOLVE PROBLEM. 18 MINUTES HOLD.                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-REPLACE TWO RATE RECORDING EQUIPMENT MODULES.                                                                                                                        |                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-6E MOO 111B-GRND                                                                                                                                                              | FTA6063/P2-303-00-11                        | COUNTDOWN                      | 110<br>890824       | 12<br>-2400      | YES<br>NO  |                               | 699393 |
| ANTENNA AND WAVEGUIDE                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-FAIL DURING OPERATION. THE SOUTH RATE RECEIVER ANTENNA SLAVING SERVO WAS SUSPECTED TO BE DEFECTIVE.                                                                       |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION. GUIDANCE GROUND STATION RATE ANTENNA SLAVING SERVO MOTOR WAS NOT OPERATING PROPERLY.                                                                  |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. A 50 MINUTE HOLD WAS REQUIRED.                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-DURING ATTEMPTS TO RESOLVE THE PROBLEM PROPER OPERATION WAS ATTAINED AND THE CONDITION COULD NOT BE DUPLICATED.                                                      |                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-6E MOO 111B-GRND                                                                                                                                                              | FTA6076/P1-404-00-11                        | COUNTDOWN                      | 110<br>890728       | 11<br>-3500      | YES<br>NO  |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. GUIDANCE GROUND STATION DID NOT SEND VECO DISCRETE.                                                                                   |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNAL. NO GUIDANCE VECO DISCRETE WAS GENERATED.                                                                                                       |                                             |                                |                     |                  |            |                               |        |

19 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-GUIDANCE SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------|
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                         |
| CORRECTIVE ACTION-LOOP TEST RUN.                                                                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                         |
| GUIDANCE-GE MOD 1118-GRND                                                                                                                                                                                                                                                                                                                                      | FTA4249/P8-108-00-10                        | COUNTDOWN                      | 30<br>990414        | 13               | YES<br>NO  | 990447                  |
| FAILURE MODE-FAIL DURING OPERATION.                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                         |
| SYSTEM EFFECT-NONE                                                                                                                                                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                         |
| VEHICLE EFFECT-COUNTDOWN DELAYED START OF COUNTDOWN DELAYED 15 MINUTES.                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                         |
| CORRECTIVE ACTION-UNKNOWN-HELD TO INVESTIGATE A GROUND GUIDANCE STATION CONICAL ANTENNA BURESLIGHTING PROBLEM.                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                         |
| GUIDANCE-GE MOD 1118-GRND                                                                                                                                                                                                                                                                                                                                      | FTA4249/P8-108-00-03                        | COUNTDOWN                      | 30<br>990414        | 13               | NO<br>NO   | 990449                  |
| FAILURE MODE-OUT OF TOLERANCE. NOISY RANGE READOUT FROM TRACKING EQUIPMENT. DETERMINED TO BE A RECORDER PROBLEM.                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                         |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. NOISY RANGE READOUT FROM TRACKING EQUIPMENT.                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                         |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 40 MINUTE HOLD TO INVESTIGATE PROBLEM.                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                         |
| CORRECTIVE ACTION-INVESTIGATED AND DETERMINED TO BE A RECORDER PROBLEM.                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                         |
| GUIDANCE-GE MOD 1118-GRND                                                                                                                                                                                                                                                                                                                                      | IC-7-220/P2-301-00-07                       | FLIGHT                         | 7C<br>990310        | 12<br>40         | YES<br>NO  | 990414                  |
| FAILURE MODE-ERRATIC OPERATION. TANK LOCK WAS INTERMITTENT FOLLOWING SWITCH TO AUTOMATIC TRACK FROM MONOPULSE HOLD AT 48 SECONDS. SWITCH ARRANGEMENT REQUIRES FLIPPING THROUGH CONICAL MODE TO REACH AUTOMATIC MODE, BECAUSE OF LARGE CONICAL ERRORS. SYSTEM WAS FORCED INTO CONICAL TRACK AND AZIMUTH TRACKING WAS ERRATIC.                                   |                                             |                                |                     |                  |            |                         |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. LACK OF GOOD INPUT DATA TO THE COMPUTER RESULTED IN GENERATION OF ONLY ZERO-MAGNITUDE STEERING COMMANDS AND NO DISCRETE COMMANDS.                                                                                                                                                                                       |                                             |                                |                     |                  |            |                         |
| VEHICLE EFFECT-COMMANDS NOT SENT. NO COMMANDS WERE SENT TO THE VEHICLE. ALTHOUGH VEHICLE WAS ACQUIRED AT 140 SECONDS. ATTITUDE AND ANTENNA LOOK ANGLES WERE CHANGING RAPIDLY BECAUSE OF PREMATURE BECO AND ALL SIGNAL WAS LOST AT 134 SECONDS. WERE IT NOT FOR THE PREMATURE BECO, IT IS BELIEVED GUIDANCE OPERATION WOULD HAVE BEEN PROPER AFTER 140 SECONDS. |                                             |                                |                     |                  |            |                         |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                         |
| GUIDANCE-GE MOD 1118-GRND                                                                                                                                                                                                                                                                                                                                      | FTA4316/P2-302-00-03                        | COUNTDOWN                      | 3C<br>991223        | 12<br>-7800      | YES<br>NO  | 990414                  |
| FAILURE MODE-OUT OF TOLERANCE. MOD 111 GUIDANCE GROUND STATION HAD A PROBLEM IN THEIR DESIGNATE BOARD.                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                         |
| SYSTEM EFFECT-OPERATION DOES NOT START. GUIDANCE GROUND STATION NOT READY TO SUPPORT LOOP TEST DUE TO PROBLEM IN IN                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                         |

GENERAL DYNAMICS  
CONVAIR DIVISION

19 JUN 1968

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-08E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME        | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| ELR DESIGNATE BOARD.                                                                                                                                                                                                                                                                                                         |                                                    |                                |                     |                  |            |                               | 000330 |
| VEHICLE EFFECT-COUNTDOWN DELAYED 10 MINUTES AT T-90.                                                                                                                                                                                                                                                                         |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-GUIDANCE GROUND STATION CHANGED AND CHECKED OUT DESIGNATE BOARD.                                                                                                                                                                                                                                           |                                                    |                                |                     |                  |            |                               |        |
| GUIDANCE-GE MOD 111B-GRND                                                                                                                                                                                                                                                                                                    | FTA4310/PS-302-00-3                                | COUNTDOWN                      | 3C<br>581223        | 12               | YES<br>NO  |                               | 000331 |
| FAILURE MODE-OUT OF TOLERANCE. GROUND STATION COMPUTER NOT SENDING CORRECT OUTPUT FOR TEST 4 AND 5 OF LOOP TEST.                                                                                                                                                                                                             |                                                    |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. GROUND STATION COMPUTER NOT SENDING CORRECT OUTPUT.                                                                                                                                                                                                                                 |                                                    |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. DELAY DUE TO THIS PROBLEM ESTIMATED TO BE 48 MINUTES-EXACT TIME UNDETERMINABLE DUE TO OTHER PROBLEMS.                                                                                                                                                                                      |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                   |                                                    |                                |                     |                  |            |                               |        |
| GUIDANCE-GE MOD 111G-GRND                                                                                                                                                                                                                                                                                                    | GDC/BK763-031/PS-402-00-223/1498CO FLIGHT<br>WPLEX |                                | 223D<br>430720      | 13<br>204        | YES<br>NO  |                               | 000323 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. POST-FLIGHT REVIEW OF THE GUIDANCE EQUATION COMPUTATIONS INDICATED THAT THE VECO TIME-TO-GO FUNCTION WAS INFLUENCED BY NOISE ASSOCIATED WITH THE RADAR DATA SUPPLIED TO THE COMPUTER. HOWEVER, THE INSERTION VELOCITIES WERE ADEQUATE TO ACCOMPLISH THE MISSION OBJECTIVES. |                                                    |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                          |                                                    |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-PREATURE VERNIER CUTOFF. EVALUATION OF THE INSERTION CUTOFF VELOCITY ERROR (-4.9 FEET PER SECOND). REVEALED THAT THE VERNIER SOLO DURATION SHOULD HAVE BEEN 19.9 SECONDS AS OPPOSED TO THE ACTUAL DURATION OF 15.1 SECONDS.                                                                                   |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-OPEN. NOISE FREQUENCIES NOT PRESENTLY FILTERED ADEQUATELY MAY HAVE CAUSED THE EARLY CUTOFF. FURTHER STUDIES OF THE RADAR NOISE MODEL ARE CONTINUING TO DETERMINE POSSIBLE IMPROVEMENTS OF THE FILTERING TECHNIQUES PRESENTLY UTILIZED.                                                                     |                                                    |                                |                     |                  |            |                               |        |
| GUIDANCE-GE MOD 111G-GRND                                                                                                                                                                                                                                                                                                    | G0ABKF64-011/72-404-00-263                         | COUNTDOWN                      | 283C<br>640414      | 12<br>-30        | YES<br>NO  |                               | 000325 |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THE TRACK RADAR FAILED TO RESUME AUTOMATIC MONOPULSE LOCK AFTER SWITCHING FROM CONICAL TO MONO PULSE.                                                                                                                                                                     |                                                    |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. TRACK RADAR SYSTEM FAILED TO RESUME AUTOMATIC MONOPULSE LOCK AFTER SWITCHING FROM CONICAL TO MONOPULSE.                                                                                                                                                                              |                                                    |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 11 MINUTE HOLD AND 9 MINUTE RECYCLE. ABOUT CUTOFF RECEIVED.                                                                                                                                                                                                                                |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE. PROBLEM ISOLATED TO A RANDOM OCCURRENCE WHEN SWITCHING FROM CONICAL TO MONOPULSE.                                                                                                                                                                                                                    |                                                    |                                |                     |                  |            |                               |        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-686

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                 | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| GUIDANCE-GE MOD 1110-62ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | AAS4-0008/P2-401-00-199                                     | COUNTDOWN                      | 199D<br>640190      | 12<br>-900       | NO<br>NO   |                               | 000329 |
| FAILURE MODE-FAIL DURING OPERATION. THE 180 VOLT POWER SUPPLY IN THE GUIDANCE GROUND STATION FAILED.<br>SYSTEM EFFECT-OPERATION DOES NOT START.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 40 MINUTE HOLD.<br>CORRECTIVE ACTION-INVESTIGATE, REPAIR AND REVALIDATE GUIDANCE GROUND STATION.                                                                                                                                                                                                                                                                                                                   |                                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-GE MARK 11-62ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | GOC/BKFS6-002/L4-701-00-7114<br>GROUND GUIDANCE RATE SYSTEM | FLIGHT                         | 7114<br>640119      | 2-4<br>200       | YES<br>NO  |                               | 000331 |
| FAILURE MODE-ERRATIC OPERATION. A -300B REDUCTION FROM NOMINAL SIGNAL LEVEL OF THE WEST LATERAL RATE STATION RESULT ED IN RATE DATA DROPOUTS BETWEEN 200 AND 281 SECONDS.<br>SYSTEM EFFECT-ERRATIC OPERATION. DUE TO GROUND SYSTEM MALFUNCTION, DIFFERENTIATED TRACK DATA HAD TO BE USED DURING THE PERIODS OF LATERAL RATE DATA DROPOUTS. IN ADDITION, THE VECO DISCRETE COMMAND WAS GENERATED BY THE COMPUTER LATE-GATE LOGIC RATHER THAN BY THE TIME-TO-GO FUNCTION.<br>VEHICLE EFFECT-NONE. ALL MISSION OBJECTIVES WERE SATISFIED.<br>CORRECTIVE ACTION-GROUND LATERAL RATE PROBLEM RESOLVED BY GC. |                                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-GE MARK 11-62ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | GO/ADKFS6-035L4-702-00-7109<br>RELAY                        | COUNTDOWN                      | 7105<br>641204      | 2-4<br>-120      | YES<br>NO  |                               | 000471 |
| FAILURE MODE-FAIL DURING OPERATION - CONFIDENCE LIGHT ON THE GROUND CONTROL OFFICERS CONSOLE INDICATED THAT THE SIM ULATION EQUIPMENT WAS STILL RADIATING. INDICATION FOUND TO BE ERRONEOUS.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. THE COUNTDOWN WAS RECYCLED TO T-8 MINUTES. HOLD TIME WAS 3 MINUTES BECAUSE OF RE-CYCLE.<br>CORRECTIVE ACTION-REPLACED DEFECTIVE RELAY.                                                                                                                                                                                                         |                                                             |                                |                     |                  |            |                               |        |
| GUIDANCE-GE MARK 11-62ND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | GO/A SRF 84-055 L4-702-00-7105<br>RELAY                     | COUNTDOWN                      | 7105<br>641204      | 2-4<br>-900      | YES<br>NO  |                               | 000472 |
| FAILURE MODE-FAIL DURING OPERATION. TRACK RANGE RATE CIRCUITRY (RELAY 18232K-1) FOUND DEFECTIVE PRIOR TO TERMINAL COUNT LOOP TEST.<br>SYSTEM EFFECT-NONE - PROBLEM FOUND DURING GROUND CHECKS PRIOR TO INTERFACE WITH AIRBORNE SYSTEM.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD CALLED AT T-25 MIN AND LASTED 18 MINUTES.<br>CORRECTIVE ACTION-DIP SOLDER BOARD CONTAINING RELAY WAS REPLACED.                                                                                                                                                                                                         |                                                             |                                |                     |                  |            |                               |        |

10 JUN 1968

GENERAL DYNAMICS  
CONVAIR DIVISION

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP TIME | SITE<br>DIP TIME | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                                              | WSE-3037<br>OSCILLATOR-GRAVITY              | COUNTDOWN                      | 1087<br>641119           | 6                | YES<br>NO  |                               | 000400 |
| FAILURE MODE-FAIL DURING OPERATION.                                                                                                                                                                                                                                            |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. GUIDANCE FAIL INDICATION WAS RECEIVED ON LCC CONSOLE.                                                                                                                                                                               |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED.                                                                                                                                                                                                                                              |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-GRAVITY OSCILLATOR REPLACED IN AGE DRAWER 1A1A5.                                                                                                                                                                                                             |                                             |                                |                          |                  |            |                               |        |
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                                              | 63-0476/C1-803-00-89                        | COUNTDOWN                      | 89E<br>630703            | C                | YES<br>NO  |                               | 000373 |
| FAILURE MODE-FAILED DURING OPERATION. GUIDANCE FAIL INDICATOR WENT RED DUE TO AGE PROBLEMS.                                                                                                                                                                                    |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                                                                                                                                               |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-LAUNCH COUNTDOWN DELAYED.                                                                                                                                                                                                                                       |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-ALTERNATE TARGET WAS INTERMITTENTLY SELECTED.                                                                                                                                                                                                                |                                             |                                |                          |                  |            |                               |        |
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                                              | ADG2-0J18/DA673/01-803-00-66<br>SIGHT TUBE  | COUNTDOWN                      | 64E<br>620823            | F                | YES<br>NO  |                               | 000393 |
| FAILURE MODE-OUT OF TOLERANCE. A GUIDANCE FAULT WAS RECEIVED WHEN THE GUIDANCE SYSTEM FAILED TO ACQUIRE OPTICS. FAIL<br>URE CAUSED BY THE SIGHT TUBE BEING DISENGAGED AND NOT CONNECTED TO THE MISSILE.                                                                        |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. GUIDANCE SYSTEM COULD NOT BE FINE ALIGNED DURING THE COUNTDOWN AS COARSE ALI<br>GNMENT HAD NOT BEEN PERFORMED.                                                                                                                          |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.                                                                                                                                                                                                                              |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                     |                                             |                                |                          |                  |            |                               |        |
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                                              | ADG2-0J18/DA673/01-803-00-66<br>SWITCH      | COUNTDOWN                      | 80C<br>620820            | F                | YES<br>NO  |                               | 000396 |
| FAILURE MODE-FAIL DURING OPERATION. DURING COUNTDOWN A GUIDANCE FAIL INDICATION WAS RECEIVED AT 9 MIN 42 SEC WHEN T<br>HE GUIDANCE SYSTEM FAILED TO BECOME ALIGNED. CAUSED BY AN IMPROPERLY POSITIONED 68E SWITCH WHICH PREVENTED COARSE AL<br>IGNMENT OF THE GUIDANCE SYSTEM. |                                             |                                |                          |                  |            |                               |        |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS.                                                                                                                                                                                                                                         |                                             |                                |                          |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN WAS ABORTED AND RESCHEDULED.                                                                                                                                                                                                                          |                                             |                                |                          |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                     |                                             |                                |                          |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1958

DIFFICULTIES REVIEW-GUIDANCE SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VEHICLE NAME<br>VEHICLE PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------|
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                         | AD61-0287/DA582/01-SMO-04-84<br>CALIBRATOR  | COMPOSITE-FRD/DPL              | 24E<br>610822       | F                | YES<br>NO  | 689428                          |
| FAILURE MODE-FAIL DURING OPERATION. FAILURE IN ACCELEROMETER CALIBRATION DRAWER CAUSED GUIDANCE FAIL INDICATION ON LCC.                                                                                                                                   |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                                 |
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                         | AD61-0277/DA582/01-BUF-04-84<br>W-RING      | COMPOSITE-FRD/DPL              | 24-E<br>610819      | F                | YES<br>NO  | 689427                          |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. GUIDANCE READY INDICATION LOST ON LCC DUE TO BROKEN SOLDERED CONNECTION ON RELAY IN A.I.G. COUNTDOWN GROUP.                                                                                              |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN DELAY.                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-REPAIRED CONNECTION.                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                                 |
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                         | AD61-0287/DA582/01-SBF-03-84                | COMPOSITE-FRD/DPL              | 24E<br>610814       | F                | YES<br>NO  | 689426                          |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. GUIDANCE SYSTEM READY INDICATION ON LCC LOST.                                                                                                                                                            |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                                 |
| GUIDANCE-ARMA-68E                                                                                                                                                                                                                                         | AE60-0720/FC-SCO-02-009                     | COMPOSITE-FACTORY              | 9E<br>601017        |                  | NO<br>NO   | 689425                          |
| FAILURE MODE-ERRATIC OPERATION- RESURGENT GYRO AXIS OUTPUT INDICATED APPROX. 15 PERCENT IBM VARIATIONS. THIS CONDITION RESULTED FROM A BEAT FREQUENCY GENERATED IN THE GROUND LOOP BETWEEN THE EXTERNAL AC POWER SUPPLY AND THE OUTPUT FROM THE INVERTER. |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-ERRATIC OPERATION- HARMONIC BEAT INDUCED BY DIFFERENCES OF INVERTER FREQUENCY AND GROUND POWER FREQUENCY USED TO POWER AGC.                                                                                                                 |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COMPOSITE DELAYED. POST COMPOSITE TESTING REQUIRED TO DETERMINE THE CAUSE OF BEAT.                                                                                                                                                         |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-ENGINEERING CHANGE, CIC 70141, WAS PERFORMED ON THE 68E GROUND LOOP.                                                                                                                                                                    |                                             |                                |                     |                  |            |                                 |

HYDRAULIC SYSTEM  
GSE  
DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW HYDRAULIC SYSTEM CSE

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### I. FIRST STAGE

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME       | DIF DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH                | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------|---------------------|------------------|---------------------------|-------------------------------|--------|
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SLV-88-08-3847<br>TUBING                          | FAR<br>87-87078-7                | 880300              | CH13             | YES 60/C<br>NO MIL-T-8848 |                               | 088884 |
| FAILURE MODE-CONTAMINATION. FOUR SPECIMENS OF TUBING USED IN THE GROUND SUPPORT HYDRAULIC SYSTEM AND OPERATES AT 30<br>OR 318 HYDRAULIC PRESSURE WERE FOUND TO BE CORRODED.                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                   |                                  |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-FAILURE ANALYSIS WAS RESTRICTED TO METALLURGICAL EVALUATION OF TUBE MATERIAL AND CHEMICAL ANALYSIS<br>OF TUBE COMPOSITION. FAILURE WAS DUE TO O <sub>2</sub> RING ATMOSPHERE AND SUSCEPTIBILITY OF TYPE 304 CRES TO STRESS CORROSION<br>IN A MARINE ATMOSPHERE. A CHANGE TO -318 CRES WAS PROPOSED TO 880 AND WAS NOT APPROVED BECAUSE OF THE FOUR-YEAR LIFE<br>EXPECTANCY OF THESE TUBES AND BECAUSE THESE TUBES ARE INSPECTED AFTER EACH LAUNCHING. NO FURTHER ACTION TO BE TAKEN<br>THIS ACTION DOCUMENTED IN MEMO OF 12 JUL 1988 FROM RELIABILITY TECHNICAL REQUIREMENTS GROUP. |                                                   |                                  |                     |                  |                           |                               |        |
| HYD. ULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | PTAS88/P8-MO-01-04C8<br>HAND VALVE, MICROSWITCHES | COMPOSITE-PRO/DPL 181D<br>880718 | 308                 | YES<br>NO        |                           |                               | 088888 |
| FAILURE MODE-ELECTRICAL OPEN. THE HPU COULD NOT BE OPERATED REMOTELY. THE CAUSE OF THIS FAILURE WAS OPEN WIPER CONT<br>ACT ON VALVE V1 AND V5 MICROSWITCHES.                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                   |                                  |                     |                  |                           |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. THE TEST WAS RUN WITHOUT BOOSTER HYDRAULICS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                   |                                  |                     |                  |                           |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                   |                                  |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-ON-V1 AND V5 MICROSWITCHES WERE ADJUSTED TO MAKE PROPER CONTACT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                   |                                  |                     |                  |                           |                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FAR-CT-98-500-013<br>RELAY                        | FAR                              | 841208              | 34A              | YES LEACH<br>NO 837-68    |                               | 088747 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE HPU RELAY WAS REJECTED BECAUSE THE CONTACTS REPORTEDLY STUCK.<br>FAILURE WAS NOT CONFIRMED.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                   |                                  |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                   |                                  |                     |                  |                           |                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FAR-LV-98-30-803-7<br>BLEED VALVE.                | FAR                              | 931226              | 12               | YES SPRAGUE<br>NO 76301   |                               |        |
| FAILURE MODE-LEAK EXTERNAL. VALVE WAS REPORTED TO BE LEAKING 1 DROP PER 10 SECONDS HYDRAULIC FLUID AROUND THE VALVE<br>STEM. LAB TESTING COULD NOT DUPLICATE THIS LEAKAGE RATE HOWEVER, DISASSEMBLY REVEALED EXCESSIVE WEAR AND GALLING ON<br>THE VALVE PLUNGER AND HOUSING. METALLIC PARTICLES AND FIBERS WERE FOUND ADHERED TO THE O-RING.                                                                                                                                                                                                                                                          |                                                   |                                  |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-REVISION OF MAINTENANCE SERVICE CHECKOUT SHEETS A400-8D AND A100-384 TO REQUIRE ANNUAL INSPECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                   |                                  |                     |                  |                           |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-CSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE OF TIME   | SITE<br>DIP                      | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------------|----------------------------------|------------|-------------------------------|
| OF THE BLEED VALVE AND SIGHT TUBE ASSEMBLY PLUNGER AND BORE FOR EXCESSIVE WEAR.                                                                                                                                                                                                                 |                                             |                                |                           |                                  |            |                               |
| HYDRAULIC-CSE<br>FIRST STAGE                                                                                                                                                                                                                                                                    | LV-98-50-206F<br>SAMPLING VALVE             | FAR<br>87-07524-5              | 031101 13                 | YES APCO<br>NO 88-30810-23       |            |                               |
| FAILURE MODE- EXTERNAL LEAK. THE VALVE LEAKED FROM AROUND THE HANDLE SHAFT AT 100 PSIG PRESSURIZATION. FAILURE WAS CAUSED BY AN INSUFFICIENT O-RING SEIZURE DESIGN. THE SURFACE FINISH ON THE VALVE HOUSING BORE RESULTED IN SCORING THE MATING O-RING SEALING SURFACE.                         |                                             |                                |                           |                                  |            |                               |
| CORRECTIVE ACTION-CONVAIR RECOMMENDED THAT VENDOR EXPEDITE CURRENTLY PLANNED CHANGE OF INCREASING O-RING SQUEEZE TO ALLEVIATE LEAKAGE.                                                                                                                                                          |                                             |                                |                           |                                  |            |                               |
| HYDRAULIC-CSE<br>FIRST STAGE                                                                                                                                                                                                                                                                    | 3P-98-50-193F<br>VALVE ACTUATOR BRUSH       | FAR                            | 030521 13                 | YES BARBER COLMAN<br>NO EYLC0828 |            |                               |
| FAILURE MODE-ERRATIC OPERATION. VALVE ACTUATOR ACTED BLUNTY AND ERRATIC. FAILURE WAS DUE TO ONE OF THE MOTOR BRUSHES BEING STUCK IN THE HOUSING AND NOT ALLOWING THE BRUSH SPRING TO KEEP IT AGAINST THE COMMUTATOR. THE BRUSH STUCK IN THE HOUSING DUE TO TWO PROTRUSIONS OF FOREIGN MATERIAL. |                                             |                                |                           |                                  |            |                               |
| CORRECTIVE ACTION-VENDOR HAS ENROLLED PERSONNEL IN THE MASA SOLDERING AND WORKMANSHIP SCHOOL FOR INSTRUCTORS. RANDOM QUALITY CONTROL AUDITS ARE BEING CONDUCTED.                                                                                                                                |                                             |                                |                           |                                  |            |                               |
| HYDRAULIC-CSE<br>FIRST STAGE                                                                                                                                                                                                                                                                    | ADJ83-0033/AS-402-108                       | FLIGHT                         | 1800 AS<br>030280 -104.08 | YES<br>NO                        |            |                               |
| FAILURE MODE-FAILED DURING OPERATION. THE MPU FAILED TO PROPERLY EVACUATE OIL FROM THE BOOSTER AND SUSTAINER HYDRAULIC SYSTEMS DURING THE COMMIT SEQUENCE AS INDICATED BY TEST DATA.                                                                                                            |                                             |                                |                           |                                  |            |                               |
| SYSTEM EFFECT-THE OIL EVACUATION OPERATION WAS NOT PERFORMED.                                                                                                                                                                                                                                   |                                             |                                |                           |                                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                            |                                             |                                |                           |                                  |            |                               |
| CORRECTIVE ACTION-CAUSE OF FAILURE IS UNKNOWN. THE MPU WAS CHECKED OUT AFTER THE FLIGHT AND NO MALFUNCTIONS WERE FOUND.                                                                                                                                                                         |                                             |                                |                           |                                  |            |                               |
| HYDRAULIC-CSE<br>FIRST STAGE                                                                                                                                                                                                                                                                    | FAR98-50-032<br>SERVO ACTUATOR MOTOR        | FAR                            | 010707 18                 | YES BARBER COLMAN<br>NO EYLC0828 |            |                               |
| FAILURE MODE-FAIL DURING OPERATION. THE MOTOR USED TO ACTUATE BYPASS VALVE NO 13 OF THE MPU FAILED DUE TO INTERMITTENT CONTACT OF ONE BRUSH BECAUSE OF ARCING.                                                                                                                                  |                                             |                                |                           |                                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO                 |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-----------------------------------------------|--------|
| CORRECTIVE ACTION-INFORMED VENDOR OF DISCREPANCY FOR CORRECTIVE ACTION PER VENDOR CORRECTIVE ACTION REQUEST NO. 117<br>8-61.                                                                                                      |                                             |                                |                     |                  |            |                                               | 000002 |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                      | 98-50-048<br>PRESSURE SWITCH                | FAR                            | 810881              | 12               | NO<br>NO   | CONSOLIDATED C<br>CONTROL<br>8807-3-3         | 000003 |
| FAILURE MODE-OUT OF TOLERANCE. AFTER THE SWITCH CLOSED ON INCREASING PRESSURE, THE UNIT DID NOT OPEN WHEN PRESSURE WAS DECREASED TO ZERO. FAILURE OF THE SWITCH WAS DUE TO MISADJUSTMENT OF THE MICROSWITCH WITHIN THE UNIT.      |                                             |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION-THE TEST SITE HAS BEEN NOTIFIED OF THE ADJUSTMENT FAILURE.                                                                                                                                                      |                                             |                                |                     |                  |            |                                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                      | FAR-50-037<br>PRESSURE SWITCH               | FAR                            | 810428              | 12               | YES<br>NO  | CONSOLIDATED C<br>NO CONTROLS<br>8807-3-3     | 000004 |
| FAILURE MODE-OUT OF TOLERANCE. SWITCH CONTACTS DID NOT CLOSE WHEN HYDRAULIC RETURN PRESSURE WAS LOWERED TO 30 PSI. LAB TESTING INDICATED THAT THE SWITCH ENCLOSURE WAS NOT MANUFACTURED TO PROPER DIMENSIONAL TOLERANCES.         |                                             |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION- ACTION TO BE TAKEN BY MANUFACTURER. VENDOR TO REMOVE UNITS                                                                                                                                                     |                                             |                                |                     |                  |            |                                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                      | FAR-CT-28-50-011<br>PRESSURE SWITCH         | FAR                            | 810414              | 38A              | YES<br>NO  | DIAPLEX DIV. C<br>NO OK ELECTRONIC<br>76379-1 | 000007 |
| FAILURE MODE-PREMAATURE OPERATION. THE SWITCH LOCATED IN THE MPU AND CONTROLS THE NORMAL 8000 PSI LIGHT ON THE HYDRAULIC CONSOLE, ACTUATED AT 5180 PSI INSTEAD OF 8800 PSI. CAUSE COULD NOT BE DETERMINED. FAILURE WAS CONFIRMED. |                                             |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                      | AASD-0159/P2-421-00-81<br>RELAY, DIODEC     | COUNTDOWN                      | 810<br>601814       | 12<br>-428       | YES<br>NO  |                                               | 000007 |
| FAILURE MODE-OUT OF TOLERANCE. THE ABSENCE OF A SUPPRESSION DIODE ACROSS THE 8000 PSI RELAY IN THE BOOSTER HYDRAULIC SYSTEM PERMITTED VOLTAGE SURGES IN THE LANDLINES WHEN THE RELAY WOULD PICK-UP AND DROP-OUT.                  |                                             |                                |                     |                  |            |                                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. THE VOLTAGE SURGES INDUCED VOLTAGES IN THE AUTOPILOT PROGRAMMER RESET CIRCUITRY, CAUSING THE PROGRAMMER TO RESET.                                                               |                                             |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION-DIODES WERE PLACED ACROSS EACH 8000 PSI AND 8000 PSI RELAY.                                                                                                                                                     |                                             |                                |                     |                  |            |                                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1965

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME       | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>VENDOR NAME | OTH<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|---------------------|------------------|--------------------|-----------------------|
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FTAG090/PR-3CO-00-11<br>LINE                      | COMPOSITE-B FACT               | 11C<br>990807       | 1E<br>-300       | YES<br>NO          |                       |
| FAILURE MODE-EXTERNAL LEAK. THE BOOSTER HYDRAULIC SYSTEM LINE DEVELOPED A CRACK IN THE TRANSFER ROOM.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. THERE WAS A 44 MIN HOLD.<br>CORRECTIVE ACTION-THE LEAK WAS REPAIRED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                   |                                |                     |                  |                    |                       |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FTAG074/PS-401-00-03<br>PRESSURE SWITCH           | PRF                            | 3D<br>990929        | 1E<br>G          | YES<br>NO          |                       |
| FAILURE MODE-ERRATIC OPERATION. NO RELEASE SIGNAL WAS OBTAINED BECAUSE OF INTERMITTENT OPERATION OF THE BOOSTER HYDRAULIC PRESSURE SWITCH IN THE FUNCTION-SAFE RELEASE LADDER.<br>SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. THE FUNCTION-SAFE RELEASE LADDER WAS NOT COMPLETE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-THE PRESSURE SWITCH WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                   |                                |                     |                  |                    |                       |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FTAG070/PS-401-00-03<br>HYDRAULIC PRESSURE SWITCH | PRF                            | 3D<br>990327        | 1E<br>D          | YES<br>NO          |                       |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. SIMULATED RELEASE WAS NOT ACHIEVED DUE TO LACK OF AN INTERNAL HYDRAULIC SIGNAL TO THE FUNCTION-SAFE RELEASE CIRCUIT. PRIOR TO THE TEST THE GROUND HYDRAULIC SWITCHES WERE SET AT 2800 PSI. POST-TEST INVESTIGATION REVEALED THAT THE SUB. SWITCH PICKED UP AT 2800 PSI AND THE BOOSTER SWITCH PICKED UP AT 2940 PSI. THE FAILURE TO RECEIVE AN INTERNAL HYDRAULICS READY WAS ATTRIBUTED TO ONE OR BOTH SWITCHES.<br>SYSTEM EFFECT-OPERATION DOES NOT START. THE SIMULATED RELEASE WAS NOT ACHIEVED.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-BOTH SWITCHES WERE 18/D AND REPLACED WITH SWITCHES OF THE TYPE USED PREVIOUSLY AT EIR. THE HYDRAULIC SWITCHES USED DURING THIS TEST WERE A NEW TYPE USED FOR FIRST TIME AND WERE LOCATED IN THE SPRAGUE CONTROL UNIT. THE REPLACEMENT SWITCHES ARE OF THE TYPE (300-10280) USED PREVIOUSLY AND ARE LOCATED IN THE HYDRAULIC-PNEUMATIC TRAILER. |                                                   |                                |                     |                  |                    |                       |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FTAG090/PR-3BN-02-03<br>HYDRAULIC PRESSURE SWITCH | COMPOSITE-B FACT               | 3C<br>990818        | 1E<br>NO         | YES<br>NO          |                       |
| FAILURE MODE-OUT OF TOLERANCE. IMPROPER SETTING OF HYDRAULIC PRESSURE SWITCH INHIBITED THE RELEASE SIGNAL.<br>SYSTEM EFFECT-OPERATION STOPPED PREMATURELY. FAILURE TO RECEIVE THE RELEASE SIGNAL CAUSED AUTOMATIC GENERATION OF THE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                   |                                |                     |                  |                    |                       |

18 JUN 1968

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME            | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH                | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------|---------------------|------------------|---------------------------|-------------------------------|--------|
| CUTOFF SIGNAL.                                                                                                                                                                                                                                                                                                                  |                                                        |                                |                     |                  |                           |                               | 000001 |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                            |                                                        |                                |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-THE PRESSURE SWITCH WAS RESET TO THE CORRECT SETTING.                                                                                                                                                                                                                                                         |                                                        |                                |                     |                  |                           |                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                    | FTA4323/PI-204-00-08<br>SENSOR-TEMPERATURE COMPENSATOR | COUNTDOWN                      | 98<br>981113        | 11<br>-900       | YES<br>NO                 |                               | 000422 |
| FAILURE MODE-OUT OF SPECIFICATION. BOOSTER AROUND HYDRAULIC PRESSURE AT 8700 PSI. 8000 PSI REQUIRED.                                                                                                                                                                                                                            |                                                        |                                |                     |                  |                           |                               |        |
| SYSTEM EFFECT-OPERATION TOO HIGH.                                                                                                                                                                                                                                                                                               |                                                        |                                |                     |                  |                           |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 5 MINUTES HOLD.                                                                                                                                                                                                                                                                               |                                                        |                                |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-TEMPERATURE COMPENSATOR RESET.                                                                                                                                                                                                                                                                                |                                                        |                                |                     |                  |                           |                               |        |
| HYDRAULIC-68E<br>FIRST STAGE                                                                                                                                                                                                                                                                                                    | FTA4323/PI-204-00-08<br>SENSOR-TEMPERATURE COMPENSATOR | COUNTDOWN                      | 98<br>981112        | 11<br>-960       | YES<br>NO                 |                               | 000421 |
| FAILURE MODE-OUT OF SPECIFICATION. 900 PSI AT BOOSTER HYDRAULIC TRAILER SUPPLY. 8000 PSI REQUIRED. PROBLEM WAS DUE TO ERRATIC OPERATION OF TEMPERATURE COMPENSATOR IN BOOSTER UNIT.                                                                                                                                             |                                                        |                                |                     |                  |                           |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW.                                                                                                                                                                                                                                                                                                |                                                        |                                |                     |                  |                           |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 5 MINUTES HOLD.                                                                                                                                                                                                                                                                               |                                                        |                                |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-TEMPERATURE COMPENSATOR RESET.                                                                                                                                                                                                                                                                                |                                                        |                                |                     |                  |                           |                               |        |
| HYDRAULIC-68E<br>SECOND STAGE                                                                                                                                                                                                                                                                                                   | FAR-CT-98-30-012<br>PUMP SEAL                          | FAR                            | 020327              | 30A              | YES SPRAGUE<br>NO 76237-1 |                               | 000004 |
| FAILURE MODE-EXTERNAL LEAK. PUMP LEAKAGE WAS DETECTED AT THE SHAFT SEAL. FAILURE WAS CAUSED BY EXCESSIVE OPERATING TEMPERATURE DUE TO POOR SEAL MATERIAL AND INSUFFICIENT SEAL DESIGN.                                                                                                                                          |                                                        |                                |                     |                  |                           |                               |        |
| CORRECTIVE ACTION-ECP 1230 APPROVED TO CHANGE SHAFT SEALS ON BOTH FIRST AND SECOND STAGE HYDRAULIC PUMPS TO A MECHANICAL TYPE SEAL. RELIABILITY CONTROL ENGINEERING INITIATED ACTION TO HAVE VENDOR TAKE ACTION WITH THE MANUFACTURER. SEROTON. TO IMPROVE MC AND PREVENT INADEQUATE HOUSING ASSEMBLIES DUE TO MISSING GASKETS. |                                                        |                                |                     |                  |                           |                               |        |
| HYDRAULIC-68E<br>SECOND STAGE                                                                                                                                                                                                                                                                                                   | ACMA-1106/98-403-00-83<br>SWITCH                       | COUNTDOWN                      | 990<br>011122       | 08               | NO<br>YES                 |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. SUSTAINER HYDRAULIC PRESSURE SWITCH FAILED TO ACTUATE DURING MAINS TAGS.                                                                                                                                                                                                       |                                                        |                                |                     |                  |                           |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-686

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------------------|
| <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. ENGINES CUT-OFF BY FAILURE TIMER.<br/>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.<br/>CORRECTIVE ACTION-UNKNOWN.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                                           |
| HYDRAULIC-63E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FARNE-38-30-128-C<br>SOLENOID VALVE         | FAR                            | 823508              | 1R               | NO         | SPRACUE EMGR.<br>NO 76231                 |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE SOLENOID VALVE WAS BURNED OUT DUE TO APPLICATION OF EXCESSIVE CURRENT.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                                           |
| <p>CORRECTIVE ACTION-FAILURE ANALYSIS WAS NOT PERFORMED.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                                           |
| HYDRAULIC-63C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FAR-CT-98-50-004<br>SOLENOID OPERATED VALVE | FAR                            | 610818              | 38A              | YES        | SPRACUE ENGINE<br>NO ERING CORP.<br>76231 |
| <p>FAILURE MODE-ELECTRICAL SHORT. THE VALVE, IN THE PNEUMATIC PRESSURIZATION LINE TO THE MPU RESERVOIR FAILED WHEN LINE PRESSURE WAS 140 PSI AND SHOULD HAVE CLOSED BY AN INTERLOCKED PRESSURE SWITCH AT 124 PSI. FAILURE WAS CONFIRMED AND WAS DUE TO AN ELECTRICAL SHORT CAUSED BY OVERHEATING. THE OVERHEATING RESULTED FROM BOTH THE ACTUATING COIL AND THE HOLDING COIL BEING ENERGIZED FOR AN ABNORMALLY LONG PERIOD OF TIME. THE FINITE CAUSE OF FAILURE COULD NOT BE DETERMINED.</p>                                                                                                                        |                                             |                                |                     |                  |            |                                           |
| <p>CORRECTIVE ACTION-60/C REQUESTED ALL BASES SEND ADDITIONAL FAILED VALVES FOR ANALYSIS. NO CORRECTIVE ACTION TAKEN SINCE CAUSE OF FAILURE COULD NOT BE DETERMINED.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                                           |
| HYDRAULIC-63E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FARDE-30-014<br>REGULATOR                   | FAR<br>87-08850                | 600324              | 1R               | YES        | MORGREN<br>NO 76227                       |
| <p>FAILURE MODE-STRUCTURAL. THE REGULATOR WHICH SUPPLIES PNEUMATIC HEAD PRESSURE TO THE HYDRAULIC TANK WAS FOUND TO HAVE ITS BRASS DIAPHRAGM RUPTURED AND RIPPED AND THE VALVE SEAT DAMAGED. WITH A NEW DIAPHRAGM INSTALLED CONTINUOUS LEAKAGE WAS NOTED PAST THE VALVE SEAT WHICH COULD HAVE CAUSED THE REGULATOR TO SEE EXCESSIVE PRESSURE ON THE DOWNSTREAM SIDE THUS RUPTURING THE DIAPHRAGM. VALVE SEAT DAMAGE WAS PROBABLY CAUSED BY RESERVOIR PRESSURE BEING TRAPPED BETWEEN THE UNLOADED REGULATOR AND THE DOWNSTREAM VENT VALVE DURING SHUTDOWN WHICH WOULD CAUSE EXCESSIVE LOADING ON THE VALVE SEAT.</p> |                                             |                                |                     |                  |            |                                           |
| <p>CORRECTIVE ACTION-INITIATE NECESSARY PROCEDURE CHANGES TO PREVENT EXCESSIVE GAS PRESSURES FROM BEING TRAPPED OR LEAKING INTO THE DOWNSTREAM SIDE OF THE REGULATOR AT ANY TIME DURING OPERATION OR SHUTDOWN.</p>                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                                           |

INSTRUMENTATION SYSTEM

GSE

DIFFICULTIES REVIEW

## DIFFICULTIES REVIEW INSTRUMENTATION - CSE

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15 JUN 1963

## COMVAIR DIVISION

## DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF    | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------|---------------------|---------------------|------------|------------------------------------|
| INSTRUMENTATION-GSE<br>TELEMETRY CONTROL AND LOG1<br>C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | A063-8084/08-801-80-83<br>LANGLINE TRAILING WIRE UNBILICAL | FLIGHT                         | 83F<br>830381       | WTR<br>MINUS 0.1 NO | YES<br>NO  | YES<br>60C<br>089479               |
| <p>FAILURE MODE-PREATURE OPERATION. THE TRAILING WIRE LANGLINE UNBILICAL WAS PREMATURELY EJECTED 0.3 SECONDS PRIOR TO 1 INCH MOTION. POSSIBLY CAUSED BY EJECT MECHANISM PARTIALLY ACTIVATED PRIOR TO LAUNCH AND VIBRATIONS AT ENGINE IGNITION CAUSING MECHANISM TO RELEASE THE UNBILICAL.</p> <p>SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. DATA FROM 70 PARAMETERS MADE VIA THE TRAILING WIRE UNBILICAL WAS LOST DURING A CRITICAL PERIOD.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p> |                                                            |                                |                     |                     |            |                                    |
| INSTRUMENTATION-GSE<br>TELEMETRY CONTROL AND LOG1 UNBILICAL CONNECTOR<br>C                                                                                                                                                                                                                                                                                                                                                                                                                                | A-88-40-3143-F<br>UNBILICAL CONNECTOR                      | FAR<br>7-19713-801             | 620826              | ETR/18              | YES<br>NO  | PACIFIC AUTOMATA<br>TION<br>089444 |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE WIRE FROM PIN-A OF PLUG P-4001 SHOULD HAVE BEEN SOLDERED TO PIN A-31 OF PLUG P-4003. INSTEAD IT WAS SOLDERED TO PIN A-38. THE WIRING ERROR OCCURRED DURING MANUFACTURE OF THE UNBILICAL ADAPTER.</p> <p>CORRECTIVE ACTION-THE VENDOR INCREASED INSPECTION, INCLUDING 100 PERCENT CONTINUITY CHECKS DURING AND AT THE COMPLETION OF ASSEMBLY.</p>                                                                                                               |                                                            |                                |                     |                     |            |                                    |
| INSTRUMENTATION-GSE<br>TELEMETRY CONTROL AND LOG1 PROPELLANT LOADING INDICATOR<br>C                                                                                                                                                                                                                                                                                                                                                                                                                       | FAR-CT-88-33-001<br>PROPELLANT LOADING INDICATOR           | FAR                            | 610301              | ETR/38A             | YES<br>NO  | TRANS-BONICS<br>114352<br>089519   |
| <p>FAILURE MODE-OUT OF TOLERANCE. THE LEVEL-INDICATING METER SHOWED 100 PERCENT ERROR BETWEEN DIALS 5080 AND 6080 ON THE RATIO TRANSFORMER T-203. AN OPEN IN THE CIRCUIT BETWEEN POSITIONS 5 AND 6 WAS CAUSED BY A COLD SOLDER JOINT. IT WAS ALSO DISCOVERED THAT THE INDICATOR COULD NOT BE ZEROED MECHANICALLY.</p> <p>CORRECTIVE ACTION-THE METER WAS REMOVED BY THE VENDOR.</p>                                                                                                                       |                                                            |                                |                     |                     |            |                                    |
| INSTRUMENTATION-GSE<br>TELEMETRY CONTROL AND LOG1 AM-FM TAPE RECORDER<br>C                                                                                                                                                                                                                                                                                                                                                                                                                                | AE80-0339/P2-402-00-32<br>AM-FM TAPE RECORDER              | COUNTDOWN                      | 320<br>600808       | 12<br>-28           | NO<br>YES  | AMPEX<br>089519                    |
| <p>FAILURE MODE-FAILED DURING OPERATION. FM AND AM LANGLINE RECORDERS STOPPED RUNNING CAUSING LOSS OF LANGLINE AM AND FM DATA. TWO RECORDERS TRIP CIRCUIT BREAKER.</p>                                                                                                                                                                                                                                                                                                                                    |                                                            |                                |                     |                     |            |                                    |

GENERAL DYNAMICS  
CONVAIR DIVISION

19 JUN 1966

DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                         | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRE<br>DIF OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|----------------|-------------------------------|--------|
|                      | SYSTEM EFFECT-OPERATION STOPS PREMATURELY. THE RECORDING OF AN AND FM DATA WAS STOPPED DUE TO FAILURE OF THE AM-FM RECORDER.                                                                                                                                                        |                                |                     |                  |                |                               | 000000 |
|                      | VEHICLE EFFECT-COUNTDOWN DELAYED 10 MINUTES. 8 MINUTE HOLD. 8 MINUTE RECYCLE.                                                                                                                                                                                                       |                                |                     |                  |                |                               |        |
|                      | CORRECTIVE ACTION-OPERATE WITH ONE RECORDER.                                                                                                                                                                                                                                        |                                |                     |                  |                |                               |        |
|                      | INSTRUMENTATION-68E<br>TELEMETRY CONTROL AND LOG1 AUDIO WARNING AMPLIFIER                                                                                                                                                                                                           | COUNTDOWN                      | 000000              | 14<br>-4140      | YES<br>NO      |                               | 000000 |
|                      | FAILURE MODE-FAIL DURING OPERATION.                                                                                                                                                                                                                                                 |                                |                     |                  |                |                               |        |
|                      | SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                 |                                |                     |                  |                |                               |        |
|                      | VEHICLE EFFECT-COUNTDOWN DELAYED 15 MINUTES.                                                                                                                                                                                                                                        |                                |                     |                  |                |                               |        |
|                      | CORRECTIVE ACTION-REPLACED ANA.                                                                                                                                                                                                                                                     |                                |                     |                  |                |                               |        |
|                      | INSTRUMENTATION-68E<br>TELEMETRY CONTROL AND LOG1 CONNECTOR UNBILICAL P4001                                                                                                                                                                                                         | PRF                            | 100<br>590001       | 14<br>-1060      | YES<br>NO      |                               | 000000 |
|                      | FAILURE MODE-CONTAMINATION. DURING HOLD FOR INSTALLING REARLIGHTS AND REPLACING A LEAKING HYDRAULIC LINE ON A MEL IUM COMPRESSOR. WATER WAS FOUND IN UNBILICAL CONNECTOR P4001.                                                                                                     |                                |                     |                  |                |                               |        |
|                      | SYSTEM EFFECT-IMPROPER ANALOG SIGNAL. INSTRUMENTATION LANOLINE SIGNALS FOR 82 TURBINE INLET TEMPERATURE WERE INCORRECT DUE TO WATER IN THE UNBILICAL CONNECTOR. AN EARLIER INCIDENT INVOLVING THE SAME MEASUREMENT WAS ATTRIBUTED TO A FAULTY INSTRUMENTATION AUTOMATIC CALIBRATOR. |                                |                     |                  |                |                               |        |
|                      | VEHICLE EFFECT-COUNTDOWN DELAYED. THE HOLD HAS EXTENDED TO A TOTAL 171 MINUTES WHILE THE WATER WAS REMOVED FROM THE UNBILICAL PLUG.                                                                                                                                                 |                                |                     |                  |                |                               |        |
|                      | CORRECTIVE ACTION-THE PLUG WAS DRIED OUT WITH SN2.                                                                                                                                                                                                                                  |                                |                     |                  |                |                               |        |
|                      | INSTRUMENTATION-68E<br>TELEMETRY CONTROL AND LOG1 LIGHT                                                                                                                                                                                                                             | COUNTDOWN                      | 000000              | 14<br>-80        | YES<br>NO      |                               | 000000 |
|                      | FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. GYRO UNCASE LIGHT ON TELEMETRY PANEL FAILED TO LIGHT. (TELEMETRY 1 INSTRUMENTATION GYRO)                                                                                                                                           |                                |                     |                  |                |                               |        |
|                      | SYSTEM EFFECT-OPERATION DOES NOT START. IT WAS DECIDED TO LAUNCH WITHOUT GYRO3 INSTRUMENTATION.                                                                                                                                                                                     |                                |                     |                  |                |                               |        |
|                      | VEHICLE EFFECT-COUNTDOWN DELAYED. 13 MINUTE HOLD. 6 MINUTE RECYCLE LOSS.                                                                                                                                                                                                            |                                |                     |                  |                |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

# DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-088

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PHI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-STRO UNCASE LIGHT WAS JUMPED.                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TELEMETRY CONTROL AND LOG1 NAME:58                                                                                                                                                                                                                                                                                                                                                                                                                  | FTAS/00/92-15A-00-10                        | COUNTDOWN                      | 15A<br>580603       | 12<br>-0000      | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. GROUND WIRING WAS REVERSED CAUSING ERRONEOUS GROUND LOG START TANK PRESSURE INDICATIONS.                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNAL. WIRING FROM GROUND LOG START TANK PRESSURE TRANSDUCER WAS REVERSED, GIVING ER RONEOUS PRESSURE INDICATION.                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 20 MINUTES HOLD.                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-CORRECTED WIRING ERROR.                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                                                         | 89C4784<br>PRESSURE TRANSDUCER              | UTP-PET<br>00-01003-30         | 051122              | 60/C             | YES<br>NO  | YES BERTONIC<br>NO 2091-1139  |
| FAILURE MODE-OUT OF SPECIFICATION. SIX UNITS WERE REJECTED WHEN THEY HAD OUT OF TOLERANCE SPIKING DURING VIBRATION TESTING. THE SPECIFIED VIBRATION ERROR BAND IS PLUS OR MINUS 2.5 PERCENT.                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE. GOC RECOMMENDED ACCEPTANCE OF THE TRANSDUCERS REPRESENTED BY THESE SPECIMENS VIA TUK TO 830 DATED 24 NOVEMBER 1963.                                                                                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                                                         | 69C4593-1<br>PRESSURE TRANSDUCER            | UTP-PET<br>00-01003-10         | 051101              | 60C              | YES<br>NO  | YES BOURNS<br>NO 2004206303   |
| FAILURE MODE-ERRATIC OPERATION. DURING THE X-AXIS VIBRATION AT 60 PSIA, THE OUTPUT HAD NEGATIVE SPIKES OF 6 PERCENT AT 1000 CPS WITH INCREASING VIBRATION FREQUENCY. SIMILAR SPIKES WERE OBSERVED AT 1000 AND 1600 CPS WITH DECREASING VIBRATION FREQUENCY. SPIKES OF PLUS OR MINUS 2.5 PERCENT ARE ALLOWED. THE TRANSDUCER WAS RETESTED AT BOURNS, AND THE FAILURE COULD NOT BE CONFIRMED. THE SPIKING MAY HAVE BEEN CAUSED BY EXCESSIVE PLAY IN THE TRANSDUCER BEARINGS. |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-SPECIFICATION RT-01443-7 WAS CLARIFIED PER CIC 33977. CONDUCT VIBRATION TEST USING CAPACITOR PER CIC 33977.                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                                                         | FAR-CT-98-350-086<br>PRESSURE TRANSDUCER    | FAR<br>00-01029-023            | 051014              | ETR/36A          | YES<br>NO  | YES EDCLIFF<br>NO 4-551--7236 |
| FAILURE MODE-ELECTRICAL OPEN. HEATER DUCT PRESSURE INSTRUMENTATION WAS INDICATING TWICE THE ACTUAL SYSTEM PRESSURE ANALYSIS CONFIRMED THE FAILURE AND ISOLATED THE TROUBLE TO AN OPEN COIL IN THE PRESSURE HEAD. CIRCUITS, TERMINALS AND CONNECTIONS WERE SATISFACTORY. THE BREAK IN THE COIL WIRE MAY HAVE BEEN THE RESULT OF HIGH STRESS WHEN THE COIL WAS IN                                                                                                            |                                             |                                |                     |                  |            |                               |

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CONVAIR DIVISION

## DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | 791<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| 48C. MEASUREMENT AM1793P.                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-68/C RECOMMENDED THAT THE VENDOR REVIEW MANUFACTURING PROCEDURES TO PRECLUDE HIGH WIRE STRESS.                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                         | FAR-CT-02-83-025<br>TEMPERATURE TRANSDUCER  | FAR<br>7-01664-28W             | 080923              | ETR/38A          | YES        | TEMTECH<br>NO 1903-89         |
| FAILURE MODE-CONTAMINATION. DURING AN ELECTRICAL CHECK, A LOW INSULATION RESISTANCE WAS FOUND. TESTS IN FAILURE ANALYSIS PRODUCED LOW RESISTANCE ONLY WHEN THE PART WAS SUBJECTED TO A HIGH MOISTURE CONTENT ENVIRONMENT. AN OILY FILM FOUND ON THE CONNECTOR BASE ACTED LIKE A WETTING AGENT WHICH COULD DEVELOP MOISTURE PATHS IN A HUMID ENVIRONMENT. NO WEVER, THERE WAS NO EVIDENCE OF MOISTURE IN THE CONNECTOR.                     |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT OTHER TEMP PROBE CONNECTORS BE INSPECTED FOR WETTING AGENT FILM, AND THAT THE CONNECTORS BE PROTECTED FROM MOISTURE IF EXPOSED TO A HIGH HUMIDITY ENVIRONMENT.                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                         | FAR-CT-98-530-030<br>PRESSURE TRANSDUCER    | FAR<br>89-01023-27             | 080781              | ETR/38A          | YES        | EDCLIFF<br>NO 4-331-1.8076    |
| FAILURE MODE-ELECTRICAL SHORT. DURING INITIAL ELECTRICAL CHECKOUT, A SHORT WAS DISCOVERED BETWEEN THE CIRCUIT GROUND PIN C AND CASE GROUND PIN D. THIS TRANSDUCER REQUIRES PRO COOLING DUCTPRESSURE. WHEN THE UNIT WAS DISASSEMBLED IT WAS DISCOVERED THAT THE CIRCUIT GROUND TERMINAL PROTRUDED ABOVE THE POTTING COMPOUND AND HAD BROKEN THROUGH THE PAINT ON THE COVER, MAKING ELECTRICAL CONTACT TO CASE GROUND. MEASUREMENT AN 1761P. |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR INSTALL INSULATING SHEETS BENEATH THE COVERS OF THESE TRANSDUCERS. FAILURE WAS CONFIRMED.                                                                                                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                         | ELV-90-53-234-C<br>TRANSDUCER               | FAR<br>7-01728-2               | 040710              | WTR              | NO         | CEC<br>NO                     |
| FAILURE MODE-ELECTRICAL OPEN. THE UNIT FAILED WHEN IT WAS FOUND TO BE ELECTRICALLY OPEN. THE ANALYSIS WAS CANCELLED BY TUX VANSAN 7-28-870, STATING THAT INCORRECT VOLTAGES WERE APPLIED TO THE TRANSDUCER.                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |

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DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                  | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | YES<br>OTM | VEHICLE NAME<br>VEHICLE PART NO            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------------------|
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                    | PAR-LV-98-56-146-F<br>PRESSURE TRANSDUCER   | PAR<br>87-02848-1              | 840906              | ETR/13           | YES<br>NO  | COLVIN<br>MO 481-D-8-758                   |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. THIS IS A LANDLINES TRANSDUCER MEASURING LOW STORAGE TANK LIQUID LEVEL. IT REPORTEDLY FAILED DUE TO LEAKAGE. HOWEVER, PERSONNEL STATED IT HAD BEEN OVERPRESSURIZED WHEN A VALVE TO THE LOW PRESSURE PORT WAS CLOSED. NO LEAKAGE WAS FOUND, BUT X-RAYS SHOWED THE WIPER ARM IN THE WRONG POSITION FOR A NO-LOAD CONDITION, USUALLY THE RESULT OF OVERLOADING. |                                             |                                |                     |                  |            |                                            |
| CORRECTIVE ACTION-THE LEAKAGE FAILURE WAS NOT CONFIRMED. OVERPRESSURIZATION WAS CONFIRMED. TO PREVENT RECURRENCE, VALVES TO THE HIGH AND LOW PRESSURE SIDES ARE NOW SAFETY WIRED OPEN AND TAPPED TO WARN PERSONNEL TO KEEP THE VALVES OPEN.                                                                                                                                                           |                                             |                                |                     |                  |            |                                            |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                    | A-98-14-203-F<br>TRANSDUCER-PRESSURE        | PAR<br>87-01981-1              | 631802              | FACTORY          | YES<br>NO  | DATA SENSORS<br>PB590A25                   |
| FAILURE MODE-LEAK OF REFERENCE PRESSURE FROM TRANSDUCER RESULTED IN ERRATIC AND REDUCED OUTPUT. LEAK DUE TO MISALIGNED SCREW HOLES RESULTING IN LEAKAGE UNDER THE GASKET.                                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                                            |
| CORRECTIVE ACTION-VENDOR ADVISED OF FAILURE AND REQUESTED TO CHECK DIMENSIONS USED FOR SCREW HOLE MOUNTINGS. ALSO REQUESTED TO IMPROVE QUALITY CONTROL.                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                                            |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                    | LY-80-58-217-F<br>PRESSURE TRANSDUCER       | PAR<br>87-93890-130            | 8370                | S-3              | NO<br>NO   | CONSOLIDATED ELECTRODYNAMICS<br>4-328-0214 |
| FAILURE MODE-ELECTRICAL OPEN. THE UNIT EXHIBITED A HIGH OUTPUT OF 3 VOLTS DC, WHEREAS 1.3 VOLTS DC IS CALLED FOR. THE FAILURE RESULTED FROM AN OVERVOLTAGE BEING APPLIED TO THE TRANSDUCER, BURNING OPEN THE TOP WIRE OF THE BRIDGE CIRCUIT.                                                                                                                                                          |                                             |                                |                     |                  |            |                                            |
| CORRECTIVE ACTION-SITE PERSONNEL WERE INFORMED OF THE FAILURE.                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                                            |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                    | PAR-CT-98-40-0370<br>TRANSDUCER             | PAR<br>86-76000-835            | 1880                | ETR/13A          | YES<br>NO  | HUMPHREY<br>RPO1-0109-1                    |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. THE POSITION TRANSDUCER WHICH INDICATED THE POSITION OF THE RETRACTABLE LAUNCHER REPORTEDLY FAILED AS A RESULT OF NON-LINEAR OUTPUT, HOWEVER CORROSION WAS PRESENT ON THE INSIDE SURFACES OF THE END PLUGS BUT WAS NOT THE CAUSE OF THE REPORTED FAILURE.                                                                                                    |                                             |                                |                     |                  |            |                                            |
| CORRECTIVE ACTION-RECOMMEND REPLACING TRANSDUCER WITH A TRANSDUCER HAVING SEALS AT EACH END OF THE CASE.                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                                            |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME  | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------|---------------------|------------------|------------|----------------------------------------------------------|
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                           | FAR-CT-88-03-031<br>PRESSURE TRANSDUCER TUBE | FAR<br>87-01191-1              | 1100<br>630807      | ETR/36A          | NO<br>NO   | CEC<br>4-386-0214                                        |
| <p>FAILURE MODE-EXTERNAL LEAK. AT 1000 PSIG THE UNIT LEAKED HELIUM AT THE TUBING CONNECTION TO THE TRANSDUCER BODY. D1 ASSEMBLY REVEALED THAT THE METAL SEAL BETWEEN THE BODY AND THE TUBING ADAPTER HAD BEEN FLATTENED OUT, PROBABLY BY OVERTIGHTENING.</p>                                                                                                                                                                 |                                              |                                |                     |                  |            |                                                          |
| <p>CORRECTIVE ACTION-TWO SANCAP 7-552 DATED 630730 REQUESTED THAT THE AFFECTED SITE PERSONNEL BE INFORMED OF THE CONSEQUENCES OF IMPROPER TIGHTENING.</p>                                                                                                                                                                                                                                                                    |                                              |                                |                     |                  |            |                                                          |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                           | SP-90-53-115-F<br>TRANSDUCER                 | FAR<br>87-93900-130            | 681820              | 2-3              | NO<br>NO   | CONSOLIDATED E<br>LECTRODYNAMICS<br>4-528-0214-600<br>06 |
| <p>FAILURE MODE-ELECTRICAL OPEN. TWO UNITS WERE REJECTED FOR HAVING HIGH RESISTANCE BETWEEN PINS B AND C, AND PINS B AND D, RESPECTIVELY. THE FAILURES RESULTED FROM AN OVERVOLTAGE BEING APPLIED TO THE TRANSDUCERS, BURNING OPEN THE RESISTANCE ELEMENTS (STRAIN GAUGES). THE SERIOUS VOLTAGE CONDITION MAY HAVE OCCURRED DURING INITIAL LANDLINE INSTRUMENTATION CHECKOUT.</p>                                            |                                              |                                |                     |                  |            |                                                          |
| <p>CORRECTIVE ACTION-THE SITE TECHNICIANS HAVE BEEN INFORMED OF THE FAILURE.</p>                                                                                                                                                                                                                                                                                                                                             |                                              |                                |                     |                  |            |                                                          |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                           | FAR-CT-88-34-012<br>TRANSDUCER-LANDLINE      | FAR<br>87-93900-088            | 810519              | ETR/36A          | YES<br>NO  | SERVOINCS, INC                                           |
| <p>FAILURE MODE-STRUCTURAL. THE TRANSDUCER USED TO MONITOR HELIUM PRESSURE FROM THE BOTTLES INDICATED 1500 PSI WHEN ACTUAL PRESSURE WAS 3000 PSI. THE BOURBON TUBE FAILED WHEN THE TRANSDUCER WAS AT 5000 PSIG. AS THE PRESSURE BUILT UP BETWEEN THE TRANSDUCER AND THE CASE, IT STARTED TO EQUALIZE AND THE RESISTANCE STARTED DROPPING, THUS GIVING A FALSE READING. THE LEAK WAS IN THE UPPER BRAZED END OF THE TUBE.</p> |                                              |                                |                     |                  |            |                                                          |
| <p>CORRECTIVE ACTION-RECOMMEND VENDOR BE NOTIFIED OF THEIR POOR WORKMANSHIP ON THE BOURBON TUBE BRAZING.</p>                                                                                                                                                                                                                                                                                                                 |                                              |                                |                     |                  |            |                                                          |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                           | AZN-27-338/PC-4CO-03A-16<br>TRANSDUCER       | COMPOSITE-FACTORY              | 160<br>980923       | FACTORY          | NO<br>NO   | ACOUSTICA                                                |
| <p>FAILURE MODE-OUT OF TOLERANCE. TRANSDUCER ANGULAR DISPLACEMENT DIAL READINGS WERE OUT OF TOLERANCE DUE TO A LOOSE WIRE IN THE ACOUSTICA TEST EQUIPMENT (ASEI).</p>                                                                                                                                                                                                                                                        |                                              |                                |                     |                  |            |                                                          |
| <p>SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. VALVE ANGLE READINGS WERE OF UNEXPECTED VALUES DUE TO FAULTY GAGE.</p>                                                                                                                                                                                                                                                                                                             |                                              |                                |                     |                  |            |                                                          |
| <p>VEHICLE EFFECT-COMPOSITE DELAYED. POST COMPOSITE TESTING REQUIRED.</p>                                                                                                                                                                                                                                                                                                                                                    |                                              |                                |                     |                  |            |                                                          |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME      | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PR1<br>OTM | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-LOOSE WIRE IN ACOUSTICA AGE RESOLDERED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                |                     |                  |            |                               | 000001 |
| INSTRUMENTATION-68E<br>TRANSDUCERS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PTA2888/PE-1HN-01-10<br>TRANSDUCER-LANDLINE      | COMPOSITE-PRD/DPL              | 10A<br>871119       | ETR/12<br>-27    | YES<br>NO  |                               | 000010 |
| FAILURE MODE-OUT OF TOLERANCE. THE WRONG TRANSDUCER HAD BEEN INSTALLED TO MEASURE THE DELTA TEMPERATURE ACROSS THE<br>LOS FLOWMETER.<br>SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. THE DELTA TEMPERATURE ACROSS THE LOS FLOWMETER WAS INDICATED AS BEING EXCESS<br>IVE.<br>VEHICLE EFFECT-COMPOSITE DELAYED. THERE WERE TWO HOLDS AND TWO RECYCLES. THE HOLDS WERE CALLED FOR PRESSURIZATION A<br>ND THIS PROBLEM OCCURRED DURING THE HOLDS. THE TOTAL HOLD AND RECYCLE TIME WAS APPROXIMATELY 25 MINUTES.<br>CORRECTIVE ACTION-THE TRANSDUCER WAS REPLACED WITH THE CORRECT ITEM. |                                                  |                                |                     |                  |            |                               | 000020 |
| INSTRUMENTATION-68E<br>TELEMETRY POWER CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | FAR-CT-98-530-075<br>HARNES, DISTRIBUTION        | FAR<br>85-17320-043            | 050312              | ETR/36A          | YES<br>NO  |                               | 000020 |
| FAILURE MODE-ELECTRICAL SHORT. A CONTINUITY CHECK DURING VALIDATION CTP-LL-1000 REVEALED A SHORT BETWEEN PINS AT MA<br>PNES CONNECTOR J7. THE SHORT WAS CAUSED BY A HOT SOLDERED SHIELD MELTING THE INSULATION AND CONTACTING THE CONDUCTO<br>RS.<br>CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. MANUFACTURING PERSONNEL WERE CAUTIONED AGAINST PRESSING HOT SOLDERED W<br>ORK AGAINST INSULATION. INSPECTION PERSONNEL SHOULD EXAMINE SOLDERED CONNECTORS BEFORE POTTING.                                                                                                    |                                                  |                                |                     |                  |            |                               | 000020 |
| INSTRUMENTATION-68E<br>TELEMETRY POWER CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | AX63-0003-1300/FC-CO-02-0004-022<br>SWITCH-RELAY | COMPOSITE-FACTORY              | 1300<br>030121      | FACTORY          | NO<br>NO   |                               | 000020 |
| FAILURE MODE-FAIL DURING OPERATION. TELEMETRY RECORDINGS INDICATED LOSS OF POWER DURING TELEMETRY SYSTEM POWER CHAN<br>GEOVER. THE POWER DROPOUT WAS CAUSED BY ACTIVATION OF THE A62 20-SECOND TIME-DELAY RELAY.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. TELEMETRY POWER DROPPED OUT DURING TELEMETRY SYSTEM POWER CHANGEOVER.<br>VEHICLE EFFECT-COMPOSITE RE-SCHEDULED. POST-COMPOSITE TESTING REQUIRED.<br>CORRECTIVE ACTION-INVESTIGATION REVEALED THAT THE SWITCHING SHOULD BE PERFORMED RAPIDLY TO DISABLE THE TIME-DELAY.                                          |                                                  |                                |                     |                  |            |                               | 000020 |

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DIFFICULTIES REVIEW-INSTRUMENTATION SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | 817C<br>TIME DIP | PR1<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| INSTRUMENTATION-68E<br>TELEMETRY POWER CONTROL                                                                                                                                                                                                                            | FTA-4411/P4-803-00-12<br>AMPLIFIER          | COUNTDOWN                      | 128<br>881120       | ETR<br>-2520     | YES<br>NO  | 652461                        |
| FAILURE MODE-ERRATIC OPERATION. NOISY V2 YAW FEEDBACK SIGNAL ON BLOCKHOUSE BARBORN RECORDER DUE TO INOPERATIVE RECO<br>DER PRE-AMPLIFIER.                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. NOISY V2 YAW FEEDBACK SIGNAL.                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 27 MINUTES HOLD.                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-REPLACED PRE-AMPLIFIER.                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| INSTRUMENTATION-68E<br>TELEMETRY POWER CONTROL                                                                                                                                                                                                                            | FTART10/P4-103-00-18<br>WIRING              | PRF                            | 15A<br>980322       | ETR<br>-24       | YES<br>NO  | 698469                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. FAILURE OF INSTRUMENTATION (COMBUSTION CHAMBER TEMPERATURE AND 115<br>VAC OUTPUT) INDICATED THAT SYSTEM HAD FAILED TO START AT PRESCRIBED TIME. THE PRF WAS TERMINATED AT 2.00 SEC AFTER<br>BOOSTER IGNITER LINKS BREAK. |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-PREATURE PROPULSION CUTOFF. TEST WAS TERMINATED 2.00 SEC AFTER BOOSTER IGNITER LINKS BREAK BY THE T<br>EST CONDUCTOR WHEN THE MALFUNCTION WAS CALLED BY THE APS PANEL OBSERVER.                                                                            |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |

LAUNCHER SYSTEM  
GSE  
DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW LAUNCHER GSE

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#### I. MECHANICAL

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| Filter Assy.                 | 0001.                         |
| Mscap                        | 0002                          |
| Pin                          | 0001, 0006.                   |
| Release Cylinder             | 0001.                         |
| Seals (O-Rings gaskets etc.) | 0001, 0002, 0003, 0004, 0005. |
| Shock Absorber               | 0002.                         |
| Slave Cylinder               | 0006.                         |
| Sleeve Assy.                 | 0004, 0005.                   |
| Swivel Joint                 | 0006.                         |

#### II. PNEUMATIC PRESSURIZATION

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| Boss                    | 0002.       |
| Harness/Wiring/Circuits | 0017, 0019. |
| Motor                   | 0021.       |
| Orifice                 | 0020.       |
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## II. PNEUMATIC PRESSURIZATION (Continued)

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| Regulator                    | 0011.                               |
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| Regulator Pressure           | 0008.                               |
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| Seals (O-Rings Gaskets etc.) | 0007, 0012, 0017, 0020, 0022.       |
| Sleeve Assy.                 | 0013, 0014.                         |
| Solenoid                     | 0017.                               |
| Spring                       | 0018.                               |
| Temperature Compensator      | 0015.                               |
| Tube Mech                    | 0016.                               |
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| Valves                       | 0009, 0015.                         |

## III. ELECTRICAL CONTROL

|                         |       |
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| Harness/Wiring/Circuits | 0023. |
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| Switch Motion           | 0002. |
| Switch Press.           | 0024. |
| Valve Fill & Drain      | 0002. |
| Valve Solenoid          | 0023. |

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DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO               |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|------------------|------------|---------------------------------------------|--------|
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                      | SLV-98-40-3338<br>FILTER ASSEMBLY           | FAR<br>7-00307                 | 880128                       |                  | YES<br>NO  | PERMANENT FILT<br>NO ER COMP.<br>10025-3900 | 099338 |
| FAILURE MODE-STRUCTURAL. DURING INSPECTION TO SUPPORT CORRECTIVE ACTION FOR FAR SLV-98-40-3328 ELEMENT APPEARED TO BE MISSING SOME SINTERED BRONZE MATERIAL. THIS LOSS OF SINTERED MATERIAL DUE TO HIGH VELOCITY WAS CARRYING LOOSE PARTICLES OUT THE OUTLET PORT.                                                                                              |                                             |                                |                              |                  |            |                                             |        |
| CORRECTIVE ACTION-HISTORICAL DATA REVEALED THIS WAS THE ONLY REPORTED FAILURE OF THIS FILTER IN THE MODE DESCRIBED. CONVAIR DID NOT DEEM IT NECESSARY TO TAKE CORRECTIVE ACTION OTHER THAN MONITORING OF UNIT AND SYSTEM. MEMO DATED 18 MAY 1966 DOCUMENTS ABOVE ACTION.                                                                                        |                                             |                                |                              |                  |            |                                             |        |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                      | SLV-98-40-3333<br>HOLDOWN AND RELEASE PIN   | FAR<br>27-49106-8              | 880112                       | CH13             | YES<br>NO  | 60/C                                        | 099333 |
| FAILURE MODE-CONTAMINATION. PIN WAS REJECTED WHEN DURING SURVEILLANCE INSPECTION, SEVERAL AREAS OF CORROSION AND PITTING THROUGH THE PROTECTIVE CHROME PLATING WERE FOUND ON BOTH HOLD PINS.                                                                                                                                                                    |                                             |                                |                              |                  |            |                                             |        |
| CORRECTIVE ACTION-CONFIRMED FAILURES. FAILURE WAS CAUSED BY PLATING WEAR AND MINIMUM MAINTENANCE. LAUNCHER PINS TO BE COATED WITH MIL-C-2578A, 20 TO 30 THOUSANDTHS. NO ENGLISH DIMS DRAWING CHANGES TO BE MADE. XMO 981-7-4 DATED 23 JANUARY 1966 DOCUMENTS CORRECTIVE ACTION.                                                                                 |                                             |                                |                              |                  |            |                                             |        |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                      | SLV-90-40-3332<br>RELEASE CYLINDER          | FAR<br>27-82225-803            | 851111                       | 1-2              | YES<br>NO  | LOUD MACHINE W<br>ORRS                      | 099334 |
| FAILURE MODE-FAIL DURING OPERATION. WHILE EXERCISING THE HOLDOWN AND RELEASE SYSTEM, THE RELEASE CYLINDER WOULD NOT RETRACT THE LAST 4 INCHES.                                                                                                                                                                                                                  |                                             |                                |                              |                  |            |                                             |        |
| CORRECTIVE ACTION-CONFIRMED FAILURE. SEGMENTS DID NOT COMPLETELY RESEAT IN THE GROOVE AS PISTON RETRACTED DUE TO LACK OF LUBRICATION. UNIT HAD BEEN SHOWN FOR AN EXTENDED PERIOD WHICH REQUIRED IN ADEQUATE LUBRICATION. NO CORRECTIVE ACTION EXCEPT IMPROVING RELEASE PERFORMED TO LUBRICATE UNIT AS REQUIRED. THIS INFORMED BY TELCOM DATED 28 FEBRUARY 1968. |                                             |                                |                              |                  |            |                                             |        |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                      | SLV-98-40-3330<br>SWIVEL JOINT, SEAL        | FAR<br>7-02237                 | 851023                       | CH-14            | YES<br>NO  | BARCO<br>10-50284                           |        |
| FAILURE MODE-EXTERNAL LEAKAGE. JOINT REPORTEDLY FAILED WHEN A STEADY STREAM OF LIQUID OXYGEN WAS OBSERVED COMING FROM THE SWIVEL JOINT DURING LOG TANKING.                                                                                                                                                                                                      |                                             |                                |                              |                  |            |                                             |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRJ<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               | 659933 |
| CORRECTIVE ACTION-CONFIRMED FAILURE. FAILURE WAS ATTRIBUTED TO LEAKAGE PAST THE GOUNDED PRIMARY SEAL. FAILURE OF THE SEAL WAS CAUSED BY ABRASIVE CONTAMINANTS. CONVAIR INCLUDED THE SWIVEL JOINT IN MAINTENANCE LIST AMM 65-002, SPECIFYING UNIT OPERATIONAL AND CYCLIC LIFE PERIODS PER COMPONENT SPECIFICATION. ETR TO COVER SWIVEL JOINT WHEN PERSONNEL 8 AMOBLAST LAUNCHER. MEMO OF 10 MARCH 1966 DOCUMENTS CORRECTIVE ACTION.                                                                                             |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FAR-CT-98-400-064<br>SHOCK ABSORBER         | FAR<br>7-08291-1               | 650928              | 36A/ETR          | YES        | BENDIX<br>NO 1010323          | 659933 |
| FAILURE MODE-STRUCTURAL. THE RECEIVER IN THE LAUNCHER A-FRAME USED AS A SHOCK ABSORBER DURING LAUNCH WAS REJECTED DURING SURVEILLANCE INSPECTION BECAUSE OF A CRACKED ENDCAP. THE ANGOIZED SURFACE OF THE ENDCAP WAS CHIPPED BY THE STAINLESS STEEL REDUCER EXPOSING THE ALUMINUM ALLOY TO THE ELEMENTS. 2024-T4 ALUMINUM ALLOY OF THE ENDCAP DOES NOT HAVE GOOD CORROSION-RESISTANT PROPERTIES. GALVANIC CORROSION ACTION OCCURRED BETWEEN THE REDUCER AND THE ENDCAP.                                                        |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-60/C RECOMMENDED THE FOLLOWING IN ORDER FROM THE LEAST TO MOST EFFECTIVE METHOD OF PREVENTING ALUMINUM CORROSION. (A) KEEP ENDCAPS WELL PAINTED. (B) CADMIUM PLATE THE REDUCER AND BARREL. (C) ARTIFICIALLY AGE THE ENDCAPS TO THE T-6 CONDITION. (D) CHANGE ENDCAPS AND BARREL TO ANY 300-SERIES STAINLESS STEEL EXCEPT TYPE 303.                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MSCAPE 515D/P48-LO-01-DACE                  | COUNTDOWN                      | 191C<br>650810      | 360<br>-3400     | NO<br>NO   |                               | 659933 |
| FAILURE MODE-OUT OF TOLERANCE. TOWER REMOVAL TASK BEHIND SCHEDULE.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LONG.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED 15 MINUTES FOR COMPLETION OF TOWER REMOVAL AND SECURING THE TOWER. TOWER REMOVAL WAS POSSIBLY DELAYED TO REPLACE A BOOM MICROSWITCH.                                                                                                                                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FAR-CT-98-40-063<br>COMPENSATOR, O-RING     | FAR<br>2T-88041-1              | 650728              | 36A/ETR          | YES        | FLUIDGENICS<br>NO             | 659933 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE TEMPERATURE COMPENSATOR ASSEMBLY WAS REJECTED BECAUSE THE FIRST O-RING FAILED TO MOVE AT 200 PSI WHEN 600 PSI WAS APPLIED TO THE GAS CHAMBER. THE PISTON MOVED AS REQUIRED AT 300 PSI. A LARGE DING ON THE O-RING GLAND CAUSED INTERFERENCE BETWEEN THE PISTON AND BORE. USING HIGH PRESSURE AND CYCLING THE PISTON AND SHAFT MOVED DOWN THE DING AND SCRATCHED THE GLANDS. CORROSION ALSO APPEARED ON THE ASSEMBLY BODY AND NO ENDCAPS WHERE NICKEL PLATING WAS CHIPPED. |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-RECOMMENDED, SINCE THE ASSEMBLY HAD BEEN REMOVED BY 60/C, APPROPRIATE PERSONNEL SHOULD BE SHOWN THIS REPORT TO PROVIDE THEM WITH THE RESULTS OF INSTALLING DAMAGED PISTONS. ALL COMPONENTS SHOULD BE THOROUGHLY INSPECTED, PROTECTIVE COATING SHOULD BE APPLIED WHERE NICKEL PLATING IS CHIPPED.                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                               |        |

18 JUN 1966

CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME        | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | FRI<br>OTH | VENDOR MAKE<br>VENDOR PART NO |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FAR-CT-98-40-062<br>COMPENSATOR, SEALS             | FAR<br>7-08279-1               | 65002               | 308/ETR          | YES        | LIONEL-PACIFIC<br>NO 2252-103 | 699569 |
| FAILURE MODE-LEAKAGE. THE TEMPERATURE COMPENSATOR, A COMPONENT OF THE STABILIZING LAUNCHER RELEASE SYSTEM AUXILIARY SUPPORT REPORTEDLY FAILED BECAUSE OF EXTERNAL LEAKAGE. EXTERNAL LEAKAGE OCCURRED AS A RESULT OF CUTTING THE ENDCAP TEFLON BACKUP RING DURING INSTALLATION AND CHROMIUM PLATING ON THE SHAFT CENTER SECTION BEING TOO THICK CAUSING CRACKING DURING USE ALLOWING LEAKAGE PAST THE O-RINGS.                                                                    |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-EARLY-98-40-3809 WAS ISSUED TO VENDOR REQUESTING NECESSARY ACTION BE TAKEN TO ASSURE SHAFT CHROMIUM PLATING THICKNESS MEETS THE 0.0002 TO 0.0003 INCH REQUIREMENT AND INVESTIGATION OF USING A STRESS-FREE CHROMIUM PLATING PROCESS TO PREVENT RESIDUAL STRESS CRACKING. INFORM VENDOR OF THIS FAILURE TO SUPPORT CORRECTIVE ACTION OF RA 8-LV-38-40-3809. GD/C REMOVED DEPT BE INFORMED TO TAKE CARE DURING ASSEMBLY TO PREVENT O-RING OR BACKUP RING DAMAGE. |                                                    |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                       | LV-98-40-3323-F<br>TEMPERATURE COMPENSATOR         | FAR<br>7-08279-1               | 650514              | 13/ETR           | YES        | LIONEL-PACIFIC<br>NO 2252-103 | 699794 |
| FAILURE MODE-ERRATIC OPERATION. THE PISTON POSITION CHANGED WHILE PERFORMING TEST PROCEDURE 27-90230, BOOK 2. WHEN THE UNIT WAS RECEIVED FOR FAILURE ANALYSIS, THE GAGE WAS BROKEN AND THE ENDCAP SCREWS WERE NOT SAFETY WIRED. IT COULD NOT BE DETERMINED WHEN THE SAFETY WIRE WAS REMOVED, OR HOW THE GAGE WAS BROKEN. THE FAILURE COULD NOT BE CONFIRMED DURING FUNCTIONAL TESTING.                                                                                           |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                       | LV-98-40-3323-F<br>TEMPERATURE COMPENSATOR, O-RING | FAR<br>7-08279-1               | 650503              | 12/ETR           | YES        | LIONEL-PACIFIC<br>NO 2252-103 | 699798 |
| FAILURE MODE-EXTERNAL LEAK. LEAKAGE OCCURRED AT THE CYLINDER CENTER JOINT. THE FAILURE IS ATTRIBUTED TO THE SHAFT CHROMIUM PLATING BEING CRAZED AND ALLOWING LEAKAGE PAST THE O-RINGS. THE CHROMIUM PLATE CRAZING IS ATTRIBUTED TO THE CHROMIUM PLATING BEING TOO THICK.                                                                                                                                                                                                         |                                                    |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE VENDOR HAS PROVIDED A THIN STRESS-FREE CHROME PLATE SURFACE ON ALL RECENT ORDERS. THE VENDOR STATES THAT GRINDING AFTER CHROME PLATING WILL NO LONGER BE PERMITTED.                                                                                                                                                                                                                                                                                        |                                                    |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                       | LV-98-40-3304-Y<br>ACTUATING CYLINDER              | FAR<br>7-08268                 | 650200              | 12/ETR           | YES        | J.C. PEACOCK<br>NO 05088EC    |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE UNIT FAILED TO OPERATE WHEN 1000 PSI PNEUMATIC PRESSURE WAS APPLIED. THE CYLINDER FAILED TO OPERATE BECAUSE THE PISTON ROD STUCK IN THE SLAND NUT DUE TO DRIED GREASE, RUST PARTICLES AND ALUMINUM RUST ON THE INTERIOR OF THE SLAND NUT. INCORRECT GREASE WAS USED IN THE CYLINDER AT THE TIME OF REPAIR.                                                                                                                  |                                                    |                                |                     |                  |            |                               |        |

18 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME       | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO                                  |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|---------------------|------------------|------------|----------------------------------------------------------------|--------|
| LOADING IN 1961, AND THE GREASE WAS HYDROSCOPIC.                                                                                                                                                                                                                                                                                                                                                |                                                   |                                |                     |                  |            |                                                                | 689794 |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                      | LV-98-40-3308-F<br>TEMPERATURE COMPENSATOR O-RING | FAR<br>7-00879-1               | 680103              | 12/ETR           | YES<br>NO  | YES LIONEL-PACIFIC<br>NO 2238-103                              | 689793 |
| FAILURE MODE-EXTERNAL LEAK. THE UNIT LEAKED EXTERNALLY AT THE CENTER BODY JOINT. LEAKAGE WAS CAUSED BY THE LOW PERCENT SQUEEZE ON ALL SIX O-RINGS. THIS WAS CAUSED BY COMPRESSIVE SET OR THE LACK OF SUFFICIENT MATERIAL ON THE OUTSIDE DIAMETER OF THE O-RINGS.                                                                                                                                |                                                   |                                |                     |                  |            |                                                                |        |
| CORRECTIVE ACTION-LIONEL-PACIFIC REINSPECTED ALL O-RINGS IN STOCK. THEY WERE FOUND TO BE WITHIN SPECIFICATION. ON ALL FUTURE ASSEMBLIES THE LIONEL-PACIFIC SHOP TRAVELLER FOR ASSEMBLY WILL CALL OUT THAT THE OUTER DIAMETER OF THE O-RINGS ARE TO BE CHECKED AFTER THEY ARE INSTALLED ON THE PISTON.                                                                                           |                                                   |                                |                     |                  |            |                                                                |        |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                      | LV-98-40-3868-F<br>TEMPERATURE COMPENSATOR O-RING | FAR<br>7-00879-1               | 640910              | 12/ETR           | YES<br>NO  | YES LIONEL-PACIFIC<br>OR INTERSTATE<br>ENGINEERING<br>2238-103 | 689790 |
| FAILURE MODE-EXTERNAL LEAK. THE TEMPERATURE COMPENSATOR LEAKED EXTERNALLY. THE LOW SQUEEZE AND/OR THE BLEMISH ON THE HYDRAULIC O-RING CAUSED THE O-RING SEAL LEAKAGE. THE O-RING HAD BEEN DAMAGED MECHANICALLY WHEN THE ROD WAS INSERTED THROUGH THE PACKING SLAND DURING ASSEMBLY.                                                                                                             |                                                   |                                |                     |                  |            |                                                                |        |
| CORRECTIVE ACTION-THE PRODUCT SUPPORT CENTER IMPLEMENTED MICROSCOPIC INSPECTION OF O-RINGS BEFORE INSTALLATION IN COMPONENTS.                                                                                                                                                                                                                                                                   |                                                   |                                |                     |                  |            |                                                                |        |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                      | LV-98-40-3847-F<br>TUBE ASSEMBLY-SLEEVE           | FAR<br>27-00838-39             | 640800              | 13/ETR           | YES<br>NO  | YES ALLEN AIRCRAFT                                             | 689792 |
| FAILURE MODE-STRUCTURAL. THE STABILIZATION SYSTEM TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL REMAINING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS AFFECTING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT. |                                                   |                                |                     |                  |            |                                                                |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN SELECTED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOC RS WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                            |                                                   |                                |                     |                  |            |                                                                |        |

18 JUN 1968

CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                        | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------------|
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE                            | FAR<br>27-09258-23             | 640800              | 13/ETR           | YES<br>NO  | YES ALLEN AIRCRAFT<br>NO<br>099791  |
| FAILURE MODE-STRUCTURAL. THE RETRACTION SYSTEM TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT. |                                                                    |                                |                     |                  |            |                                     |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOCK IS BEING NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                     |                                                                    |                                |                     |                  |            |                                     |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                | LV-98-40-3238-F<br>SLAVE CYLINDER O-RING                           | FAR<br>7-00864-1               | 640728              | 12/ETR           | YES<br>NO  | YES PEACOCK<br>NO D50864<br>099807  |
| FAILURE MODE-LEAK. THE CYLINDER LEAKED FROM THE HYDRAULIC TO THE PNEUMATIC PORTION IN THE CYLINDER. THIS INTERNAL LEAKAGE WAS PAST THE HYDRAULIC O-RING, AND WAS CAUSED BY AN ACCUMULATION OF WOOL FIBERS.                                                                                                                                                                                |                                                                    |                                |                     |                  |            |                                     |
| CORRECTIVE ACTION-THE VENDOR STATES THAT THE O-RING STOCK HAS BEEN PURGED, AND EFFECTIVE 3 NOVEMBER 1964 AN ASSEMBLY AND INSPECTION BUT OFF SHEET WAS INITIATED TO PRECLUDE POSSIBLE RECURRENCE.                                                                                                                                                                                          |                                                                    |                                |                     |                  |            |                                     |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                | SP-98-40-3183C<br>AIR CYLINDER                                     | FAR<br>27-09100-3              | 630701              | 13               | YES<br>NO  | YES MILLER<br>NO J86<br>099871      |
| FAILURE MODE-FAILED DURING OPERATION. CYLINDER APPEARED TO BE BINDING DURING OPERATION. THE PROBLEM REPORT WAS DESIGNATED AS INFORMATION. THE AIR CYLINDER WAS NOT RECEIVED FOR FAILURE ANALYSIS.                                                                                                                                                                                         |                                                                    |                                |                     |                  |            |                                     |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                   |                                                                    |                                |                     |                  |            |                                     |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                | SP-98-40-3184F<br>LAUNCHER MASTER CYLINDER, GLAND NUT 7-09283<br>T | FAR<br>GLAND NUT 7-09283       | 630628              | 13/ETR           | YES<br>NO  | YES PEACOCK<br>NO D50893F<br>092808 |
| FAILURE MODE-STRUCTURAL. THE PISTON WAS FOUND TO BE BINDING IN THE EXTENDED POSITION. THE CYLINDER FAILED DUE TO IMPROPER ADJUSTMENT OF THE GLAND NUT DURING REBUILDING. THE DAMAGED BACKUP RING SHOULD CAUSE THE O-RING TO FAIL AFTER REPETITIVE PRESSURIZATIONS DURING USE.                                                                                                             |                                                                    |                                |                     |                  |            |                                     |
| CORRECTIVE ACTION-TO MAINTAIN CONTROL OVER THE LOCKWIRE AND ADJUSTMENT OF THE GLAND NUT, CONVAIR IS REVISING THE PERFORMANCE CHECK SHEET TO HAVE THE CYLINDER LOCKWIRED PER PEACOCK DRAWING D508836, BEFORE FUNCTIONAL TESTING.                                                                                                                                                           |                                                                    |                                |                     |                  |            |                                     |

GENERAL DYNAMICS  
CONVAIR DIVISION

10 JUN 1966

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-08E

| SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER               | DIP DATA SOURCE   | VEHICLE DATE | SITE TIME | PRJ OTH                  | VENDOR NAME PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------|--------------|-----------|--------------------------|---------------------|
| LAUNCHER-08E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WZ-00-40-3106F<br>SLAVE CYLINDER | FAR<br>7-08264-1  | 080100       | 18/ETR    | YES PEACOCK<br>NO D90896 | 080878              |
| FAILURE MODE-EXTERNAL LEAK. THE 4800 PSI SLAVE CYLINDER LEAKED HYDRAULIC FLUID PAST THE SHAFT SEAL. THE REPORTED FAILURE COULD NOT BE DUPLICATED OR CONFIRMED BY FAILURE ANALYSIS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                   |              |           |                          |                     |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |                   |              |           |                          |                     |
| LAUNCHER-08E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AG-00-40-179F<br>SHIVEL JOINT    | FAR<br>27-08752-7 | 080202       | 18/ETR    | YES BARCO<br>NO          | 080872              |
| FAILURE MODE-EXTERNAL LEAKAGE. THE SHIVEL JOINT FAILED DUE TO LEAKAGE WHEN IT WAS INSTALLED AS A REPLACEMENT FOR A DAMAGED PART. DISASSEMBLY OF THE UNIT REVEALED A PIECE OF LOCK-WIRE LOOSED BETWEEN THE REL-F SEAL AND THE SHIVEL BALL.                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                   |              |           |                          |                     |
| CORRECTIVE ACTION-EFFECTIVE 7 SEPTEMBER 1962, BARCO CHANGED THEIR ASSEMBLY PROCEDURES SO THAT THE BALL END ASSEMBLY WOULD BE PROTECTED FROM WIRE CONTAMINATION.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                  |                   |              |           |                          |                     |
| LAUNCHER-08E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AG-00-40-092<br>SLAVE CYLINDER   | FAR<br>7-08264-1R | 010723       | 18/ETR    | YES PEACOCK<br>NO        | 080833              |
| FAILURE MODE-LEAK. THE LAUNCHER RESPONSE WAS REPORTED TO BE SLOW OR SPONGY DURING THE LAUNCHER COLD RELEASE TEST. T ROULESHOOTING INDICATED THAT THE CYLINDER WAS LEAKING INTERNALLY. THE FAILURE WAS NOT CONFIRMED. EXAMINATION OF THE METERING ORIFICE REVEALED SEVERAL DENTS IN THE UPSTREAM ORIFICE PLATE AND THE ORIFICE WAS NICKED. IT WAS CONCLUDED THAT THE SLOW OR SPONGY OPERATION OF THE CYLINDER WAS CAUSED BY A FOREIGN PARTICLE INTERMITTENTLY BLOCKING THE METERING ORIFICE. THIS FOREIGN PARTICLE, PROBABLY A SMALL METAL CHIP, MAY HAVE BEEN INADVERTENTLY LOST DURING EXCHANGE OF CYLINDERS FOR FIELD TROUBLE SHOOTING OR DURING SHIPMENT. |                                  |                   |              |           |                          |                     |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |                   |              |           |                          |                     |
| LAUNCHER-08E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AZC-27-052/PA-405-00-07<br>PIN   | FLIGHT            | 300510       | 14        | YES<br>NO                |                     |
| FAILURE MODE-FAIL DURING OPERATION. A MALFUNCTION IN THE 82 LAUNCHER RELEASE MECHANISM DURING THE RELEASE SEQUENCE DAMAGED THE PNEUMATIC PRESSURIZATION DUCT (AIRBORNE) AND BOOSTER THRUST SECTION.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |                   |              |           |                          |                     |
| SYSTEM EFFECT-OPERATION STARTS TOO LATE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                  |                   |              |           |                          |                     |
| VEHICLE EFFECT-LOSS OF VEHICLE INTEGRITY. VEHICLE SELF DESTRUCTED AT 84.9 SECONDS WHEN THE INTERMEDIATE BULKHEAD EC WAS DUE TO RUPTURE OF THE PRESSURIZATION DUCT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                   |              |           |                          |                     |

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## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME          | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTM | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-HOLDOWN PIN RETRACTING LINKAGE ADJUSTMENT PROCEDURE TO BE SUPPLEMENTED. INSPECTION PROCEDURE TO BE REVISED TO INCLUDE THE CHECKING OF ALL JOINTS FOR PROPER ADJUSTMENT AND LUBRICATION; AND TO CHECK FOR PROPER CLEARANCE FOR ALL MOVING PARTS. BELL CRANK RETAINING BOLTS OF HIGHER HEAT-TREAT STEEL TO BE INSTALLED ON ALL LAUNCHERS. |                                                      |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                | 2C-7-205/P3-208-00-08<br>RELEASE ARM ACTUATING STRUT | FLIGHT                         | 98<br>980910        | 13<br>0.         | YES<br>NO  |                               |
| FAILURE MODE-FAIL DURING OPERATION. THE LAUNCHER RELEASE ARM ACTUATING STRUT AND LAUNCHER HEAD FAILED TO ACTUATE PROPERLY RESULTING IN DRAGGING ALONG THE FAIRING AS THE VEHICLE ROSE. THE 51 ENGINE SIDE OF THE BOOSTER SECTION WAS DAMAGED BUT THIS DID NOT RESULT IN ANY EFFECT TO THE LATER LOSS OF THE VEHICLE.                                      |                                                      |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STARTS TOO LATE.                                                                                                                                                                                                                                                                                                                  |                                                      |                                |                     |                  |            |                               |
| VEHICLE EFFECT-LOSS OF VEHICLE INTEGRITY. THE 51 ENGINE SIDE OF THE BOOSTER SECTION WAS DESTROYED- HOWEVER, THIS DID NOT RESULT IN THE LATER LOSS OF THE VEHICLE.                                                                                                                                                                                         |                                                      |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-CHANGED LAUNCHER MAINTENANCE AND CHECKOUT PROCEDURES.                                                                                                                                                                                                                                                                                   |                                                      |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>MECHANICAL                                                                                                                                                                                                                                                                                                                                | FTA4086/P1-206-00-3                                  | COUNTDOWN                      | 35<br>360715        | 11<br>-2700      | YES<br>NO  |                               |
| FAILURE MODE-LEAK-EXTERNAL. WATER MONITOR NOZZLE LEAKING.                                                                                                                                                                                                                                                                                                 |                                                      |                                |                     |                  |            |                               |
| SYSTEM EFFECT-ERRATIC OPERATION-WATER MONITOR NOZZLE LEAKED, CLEARED UP, AND LEAKED AGAIN.                                                                                                                                                                                                                                                                |                                                      |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 10 MINUTE HOLD SHARED WITH OTHER SYSTEMS. 9 MINUTE HOLD LATER IN COUNT.                                                                                                                                                                                                                                                 |                                                      |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-RECYCLED MONITOR NOZZLE AND LEAKAGE CLEARED UP. LEAKAGE OCCURRED LATER AND DECISION WAS MADE TO LAUNCH WITHOUT NOZZLE.                                                                                                                                                                                                                  |                                                      |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                  | CT-98-40-064<br>A-FRAME RETRACT CYLINDER, SEAL       | FAR<br>7-08247                 | 640309              | 36A              |            | CLENCO AERO<br>2808-1         |
| FAILURE MODE-INTERNAL LEAKAGE. DURING MECHANICAL CHECKOUT PROCEDURE CIP-MECH-00028, STEP 8.2.3 WITH 2000 PSI APPLIED 640 LEAKED BY OR THROUGH THE PISTON AT 3 STANDARD INCHES PER MINUTE.                                                                                                                                                                 |                                                      |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-CONFIRMED FAILURE. LEAKAGE WAS ATTRIBUTED TO FELT FIBERS BRIDGING THE PISTON O-RING. CHANGE CHECKOUT PROCEDURE TO ALLOW SAME LEAKAGE RATE THAT APPLIED WHEN CYLINDER IS PURCHASED. REPAIR DEPOT TO ASSURE CORRECT LOG SIGNATURE IS BEING USED IN CYLINDERS, AND TO EXERCISE CARE TO PREVENT DAMAGE TO BACKUP RINGS.                     |                                                      |                                |                     |                  |            |                               |
|                                                                                                                                                                                                                                                                                                                                                           |                                                      |                                |                     |                  |            | PAGE 0007                     |

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CONVAIR DIVISION

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-69C

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PSI<br>OTM                         | VENDOR NAME<br>VENDOR PART NO    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------------------------------|----------------------------------|
| LAUNCHER-69C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                         | CT-98-40-287<br>RELEASE CYLINDER            | FAR<br>7-09380-9               | 660809              | 36A              | YES<br>NO                          | 699316                           |
| FAILURE MODE-STRUCTURAL. DURING SPECIAL TEST PROCEDURE, TPS 36A-3600 LOCKING SEGMENT SCREWS WERE DAMAGED DUE TO FORCIBLE EXTENSION OF THE RELEASE CYLINDER                                                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |                                    |                                  |
| CORRECTIVE ACTION-CONFIRMED FAILURE. GO/C PERSONNEL WILL COMPLETELY DEPRESSURIZE RELEASE CYLINDER DURING MANUAL EXTENSION, AND VENTED TO ATMOSPHERE DURING THIS EXERCISE.                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |                                    |                                  |
| LAUNCHER-69C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                         | CT-98-395-133<br>PNEUMATIC RELIEF VALVE     | FAR                            | 660203              | 36B              | ANDERSON, GREE<br>M4000<br>43844-2 | 699317                           |
| FAILURE MODE-EXTERNAL LEAKAGE. UNIT LEAKED AT 4000 PSI DURING SYSTEM TESTING PER PROCEDURE CTP-MECH-1004.                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |                                    |                                  |
| CORRECTIVE ACTION-CONFIRMED FAILURE. CONTAMINATION ON THE ORING CAUSED THE FAILURE. THE CRUMBLY PLASTIC-LIKE MATERIAL EVIDENTLY CAME FROM THE TEST SETUP. METALLIC PARTICLES MOST LIKELY CAME FROM THE ETR EQUIPMENT. BETTER QUALITY CONTROL PROCEDURES TO BE INSTITUTED.                                                                                                                                                                                                        |                                             |                                |                     |                  |                                    |                                  |
| LAUNCHER-69C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                         | CT-98-400-066<br>PRESSURE REGULATOR         | FAR<br>87-09755-3              | 651026              | 36A              | YES<br>NO                          | 699316                           |
| FAILURE MODE-INTERNAL LEAK. THE REGULATOR DID NOT FUNCTION AS A CHECK VALVE AND ALLOWED SYSTEM PRESSURE TO BLEED DOWN.                                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |                                    |                                  |
| CORRECTIVE ACTION-CONFIRMED FAILURE. LEAKAGE PAST THE CHECK VALVE SECTION WAS ATTRIBUTED TO THE NYLON SEAT BEING IMPROPERLY INSTALLED DURING REGULATOR ASSEMBLY. LEAKAGE PAST THE SEAT IS NOW BEING TESTED. VENDOR IS TO TAKE ACTION TO INSURE CORRECT INSTALLATION OF VALVE SEAT.                                                                                                                                                                                               |                                             |                                |                     |                  |                                    |                                  |
| LAUNCHER-69C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                         | SLV-98-40-3324<br>PRESSURE REGULATOR        | FAR<br>7-08387-603             | 651006              | CK14             | YES<br>NO                          | WESTON HYDRAUL<br>1CS<br>19400-3 |
| FAILURE MODE-OUT OF TOLERANCE. THE REGULATOR, A COMPONENT OF THE HOLDDOWN, RELEASE AND SLAVING SUB SYSTEM, WAS REJECTED WHEN THE OUTLET PRESSURE GREPT TOO HIGH AND COULD NOT BE ADJUSTED.                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |                                    |                                  |
| CORRECTIVE ACTION-CONFIRMED FAILURE. FAILURE WAS ATTRIBUTED TO LEAKAGE PAST THE MAIN POPPET. THIS OCCURRED AFTER NYLON SEAT WAS DAMAGED BY CONTAMINANT PARTICLES. CONVAIR SC CORRECTIVE ACTION TAKEN TO INSPECT UPSTREAM FILTER, REINSPECT ASSEMBLIES, REINSPECT W8-48049Y BALLS IN STOCK, INSPECT LAPPING OF VALVE SEAT BACK UP RINGS ELIMINATED ON -3 AS SCHEDULED. PROCUREMENT PR, 8-0022-KP DATED 8 FEB 1968 DOCUMENTS CORRECTIVE ACTION EFFECTIVE ON ALL SERIAL NUMBERS HIS |                                             |                                |                     |                  |                                    |                                  |

15 JUN 1969

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-08E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP TIME | SITE<br>DIP | PRI<br>OTH                    | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|--------------------------|-------------|-------------------------------|-------------------------------|
| 699330                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                                |                          |             |                               |                               |
| LAUNCHER-08E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                           | CT-98-500-131<br>RELIEF VALVE                  | FAR                            | 651001                   | 368/ETR     | YES ANDERSON GREEN<br>NO WOOD | 43B44-2                       |
| 699330                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                                |                          |             |                               |                               |
| FAILURE MODE-INTERNAL LEAK. VALVE WAS NOTED TO BE LEAKING INTERNALLY WHERE THE NOZZLE CONTACTS THE VALVE BODY. TESTING REVEALED THE LEAK OCCURRED BETWEEN THE NOZZLE FLANGE AND GUIDE AND AROUND THE POPPET SEAT. ALSO, THE GUIDE AND NOZZLE FLANGE WERE DISTORTED.                                                                                                                                |                                                |                                |                          |             |                               |                               |
| CORRECTIVE ACTION-VALVE SHOULD BE ASSEMBLED CAREFULLY IF REMOVED AND OVERTORQUING OF THE VALVE BONNET SHOULD BE AVOIDED.                                                                                                                                                                                                                                                                           |                                                |                                |                          |             |                               |                               |
| LAUNCHER-08E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                           | CT-98-500-131<br>RELIEF VALVE                  | FAR<br>55-08159-1              | 651001                   | 368         | YES ANDERSON-GREEN<br>NO WOOD | 43B44-2                       |
| 699330                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                                |                          |             |                               |                               |
| FAILURE MODE-LEAK. RELIEF VALVE LEAKED INTERNALLY AT THE NOZZLE-TO-VALVE BODY CONTACT POINT. ANALYSIS CONFIRMED FAILURE AND DISCLOSED LEAKAGE AT OTHER INTERNAL POINTS DUE TO DISTORTED AND GROOVED COMPONENTS. IT IS PROBABLE THAT THIS DAMAGE RESULTED FROM OVERTORQUING THE VALVE BONNET AND FROM IMPROPER INSTALLATION OF THE NOZZLE DURING RE-ASSEMBLY AFTER THE VALVE HAD BEEN DISASSEMBLED. |                                                |                                |                          |             |                               |                               |
| CORRECTIVE ACTION-RECOMMENDED THAT REMOVAL PERSONNEL BE CAUTIONED TO ASSEMBLE VALVE WITH CARE AND NOT TO OVERTORQUE THE VALVE BONNET.                                                                                                                                                                                                                                                              |                                                |                                |                          |             |                               |                               |
| LAUNCHER-08E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                           | SLV-90-40-335T<br>HOLDOWN AND RELEASE VALVE    | FAR<br>87-08754-803            | 650823                   | 2-4         | YES BENSON<br>NO              | 8464-9                        |
| 699320                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                                |                          |             |                               |                               |
| FAILURE MODE-OUT OF TOLERANCE. DURING A SERIES OF BLOWDOWNS, THE VALVE WAS FOUND TO BE LAGGING AT THE RISEOFF POINT.                                                                                                                                                                                                                                                                               |                                                |                                |                          |             |                               |                               |
| CORRECTIVE ACTION-CONFIRMED FAILURE. THE REPORTED FAILURE APPARENTLY RESULTED FROM INCREASED FRICTION DUE TO GALLING BETWEEN THE SHUT OFF BUTTON AND THE MAIN POPPET. VENDOR FINAL ASSEMBLY AND INSPECTION PERSONNEL CAUTIONED TO FOLLOW ASSEMBLY AND INSPECTION PROCEDURES IN DETAIL. REPLY TO CORRECTIVE ACTION REPORT 7811-65 DOCUMENTED VENDOR ACTION.                                         |                                                |                                |                          |             |                               |                               |
| LAUNCHER-08E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                           | 607C-84285-053REV8/POR-LO-OR-DACB<br>COUNTDOWN | 1910                           | 368/ETR                  | YES         |                               |                               |
| 699320                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                                |                          |             |                               |                               |
| FAILURE MODE-STRUCTURAL. THE QUAD 111 8000 PSI LINE WAS RUPTURED, POSSIBLY BY THRUST SLAST AFTER LIFTOFF.                                                                                                                                                                                                                                                                                          |                                                |                                |                          |             |                               |                               |
| SYSTEM EFFECT-ERRATIC OPERATION. THE LAUNCHER A FRAMED RETURNED TO THE UPRIGHT POSITION AT PLUS 10 SECONDS.                                                                                                                                                                                                                                                                                        |                                                |                                |                          |             |                               |                               |

18 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-635

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                    | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|-------------------------------|-------------------------------|--------|
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |                               |                               | 699823 |
| CORRECTIVE ACTION-RUPTURED LINE WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                                |                     |                  |                               |                               |        |
| LAUNCHER-635                                                                                                                                                                                                                                                                                                                                                                                                                                              | FAR-CT-98-40-003                            | FAR                            | 630802              | 308/ETR          | YES WESTERN HYDRAU<br>NO LICB |                               | 699823 |
| PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                  | GAS REGULATOR, POPPET                       | 7-00387-603                    |                     |                  | 13400-3                       |                               |        |
| FAILURE MODE-STRUCTURAL. THE PNEUMATIC HOLDOWN AND RELEASE GNS PRESSURE REGULATOR CONTINUOUSLY VENTED WHEN 2000 PSI & INLET PRESSURE WAS APPLIED. VENTING WAS CAUSED BY TILTING OF THE MAIN POPPET ASSEMBLY RESULTING IN LEAKAGE AND DAMAGE TO THE PLASTIC POPPET. TILTING OF THE POPPET ASSEMBLY RESULTED FROM THE USE OF AN UNGROUND, UNSQUARED, OFF CENTER RED SPRING. THE DESIGN DOES NOT PROVIDE FOR SPRING CENTERING AT THE LARGER SPRING DIAMETER. |                                             |                                |                     |                  |                               |                               |        |
| CORRECTIVE ACTION-60/C RECOMMENDED THAT THE VENDOR BE INFORMED OF THE CAUSE OF FAILURE AND REQUEST VENDOR (A) GRIND ENDS OF SPRING SQUARE (B) PROVIDE MEANS FOR CENTERING THE LARGE DIAMETER OF THE SPRING AGAINST THE MAIN SEAT.                                                                                                                                                                                                                         |                                             |                                |                     |                  |                               |                               |        |
| LAUNCHER-635                                                                                                                                                                                                                                                                                                                                                                                                                                              | LV-98-40-3318-F                             | FAR                            | 650424              | 12/ETR           | YES SOUTHWESTERN<br>NO        |                               | 699758 |
| PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                  | SOLENOID VALVE                              | 99-35002-001                   |                     |                  |                               |                               |        |
| FAILURE MODE-EXTERNAL LEAKAGE. THE VALVE REPORTEDLY FAILED WHEN LEAKAGE OF APPROXIMATELY 100 SCIMS WAS OBSERVED. DIS ASSEMBLY DISCLOSED A CORROSION BUILDUP IN A CRITICAL AREA OF THE SOLENOID ARMATURE. THIS BUILDUP WOULD EFFECTIVELY SHORTEN THE POPPET STROKE AND CAUSE THE REPORTED FAILURE.                                                                                                                                                         |                                             |                                |                     |                  |                               |                               |        |
| CORRECTIVE ACTION-DESIGN PERSONNEL ARE PRESENTLY TAKING ACTION TO REPLACE THIS VALVE WITH A DIFFERENT PART NUMBER VALVE. RELOCATION AND SHIELDING OF THIS VALVE WAS APPROVED AND OPERATIONALLY TESTED. ACCORDING TO DESIGN PERSONNEL, THE VALVE IS NOT NOW EXPOSED TO THE MISSILE EXHAUST OR FIREX STREAM.                                                                                                                                                |                                             |                                |                     |                  |                               |                               |        |
| LAUNCHER-635                                                                                                                                                                                                                                                                                                                                                                                                                                              | LV-98-40-3312-F                             | FAR                            | 650316              | 12/ETR           | YES MAROTTA<br>NO 600774      |                               | 699753 |
| PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                  | LAUNCH RELEASE SOLENOID VALVE O-RING        | 99-35002-001                   |                     |                  |                               |                               |        |
| FAILURE MODE-EXTERNAL LEAK. THE VALVE LEAKED BETWEEN THE VALVE BODY AND THE SOLENOID ASSEMBLY. LEAKAGE WAS CAUSED BY A SHEARED O-RING ALLOWING INLET PRESSURE TO ESCAPE THROUGH THE VALVE BODY VENT HOLE. IT COULD NOT BE DETERMINED HOW OR WHEN THE O-RING WAS SHEARED.                                                                                                                                                                                  |                                             |                                |                     |                  |                               |                               |        |
| CORRECTIVE ACTION-CONVAIR REPAIR FACILITY PERSONNEL WERE ADVISED OF THE FAILURE AND THE SHEARED O-RING. NO OTHER CORRECTIVE ACTION TAKEN.                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |                               |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-602

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                   | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>DIF | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                      | CT-98-88-110<br>LAUNCH BOOSTER UNIT-GAUGE                     | FAR                            | 650801              | 38A/ETR          | YES        | HASKEL<br>NO 9555             |
| <p>FAILURE MODE-STRUCTURAL. WHEN 7000 PSI 682 WAS APPLIED TO THE SYSTEM, THE BOURDON TUBE IN THE PRESSURE GAUGE RUPTURED TO 10,000 PSI RANGE. ANALYSIS INDICATED THE TUBE WAS WEAKENED DUE TO STRESS CORROSION CRACKING MOST PROBABLY CAUSED BY RETAINED TRICH. WITH WHICH THE SYSTEM IS FLUSHED AFTER EVERY CALIBRATION.</p> |                                                               |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-6D/C TO INVESTIGATE TO DETERMINE RELIABILITY OF OTHER GAUGES IN SERVICE THAT ARE CLEANED WITH TRI CN AFTER CALIBRATION.</p>                                                                                                                                                                              |                                                               |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                      | CO/A-BN264-045/P6-LG-03-GAC4<br>REGULATOR                     | COUNTDOWN                      | 1460<br>841711      | 38A<br>-8400     | YES<br>NO  |                               |
| <p>FAILURE MODE-DRIFT. LAUNCHER BOOSTER UNIT REGULATOR DRIFTING.</p>                                                                                                                                                                                                                                                          |                                                               |                                |                     |                  |            |                               |
| <p>SYSTEM EFFECT-OPERATION TOO HIGH. CREEPING REGULATOR CAUSED AN INCREASING PRESSURE TO THE LAUNCHER STABILIZATION SYSTEM.</p>                                                                                                                                                                                               |                                                               |                                |                     |                  |            |                               |
| <p>VEHICLE EFFECT-COUNTDOWN DELAYED. EXACT DELAY CAN NOT BE DETERMINED DUE TO OTHER COUNTDOWN PROBLEMS. ESTIMATE COUNT DOWN DELAY DUE TO LBU REGULATOR WAS ONE HOUR.</p>                                                                                                                                                      |                                                               |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-REPLACED REGULATOR.</p>                                                                                                                                                                                                                                                                                  |                                                               |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                      | CO/ABN264-045/P6-LG-03-GAC4<br>LBU PNEUMATIC REGULATOR        | COUNTDOWN                      | 1460<br>831211      | 38A/ETR<br>-8400 | YES<br>NO  |                               |
| <p>FAILURE MODE-INTERNAL LEAK. LEAKAGE OF THE LBU REGULATOR CAUSED INCREASING PRESSURIZATION OF THE LAUNCHER STABILIZATION SYSTEM.</p>                                                                                                                                                                                        |                                                               |                                |                     |                  |            |                               |
| <p>SYSTEM EFFECT-OPERATION TOO HIGH.</p>                                                                                                                                                                                                                                                                                      |                                                               |                                |                     |                  |            |                               |
| <p>VEHICLE EFFECT-COUNTDOWN DELAYED.</p>                                                                                                                                                                                                                                                                                      |                                                               |                                |                     |                  |            |                               |
| <p>CORRECTIVE ACTION-THE REGULATOR WAS REPLACED.</p>                                                                                                                                                                                                                                                                          |                                                               |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                      | AB9-93D-8018/P6-LG-03-GAC4<br>LAUNCHER BOOSTER UNIT REGULATOR | COUNTDOWN                      | 1460<br>1041211     | 38A<br>-8400     | YES<br>NO  |                               |
| <p>FAILURE MODE-DRIFT. LBU REGULATOR DRIFTING RESULTING IN INCREASED PRESSURE TO THE LAUNCHER STABILIZATION.</p>                                                                                                                                                                                                              |                                                               |                                |                     |                  |            |                               |
| <p>SYSTEM EFFECT-OPERATION TOO HIGH. MISSILE STABILIZATION PRESSURE WAS INCREASING.</p>                                                                                                                                                                                                                                       |                                                               |                                |                     |                  |            |                               |
| <p>VEHICLE EFFECT-NONE.</p>                                                                                                                                                                                                                                                                                                   |                                                               |                                |                     |                  |            |                               |

18 JUN 1966

## CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                    | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO      |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|------------------------------------|--------|
| CORRECTIVE ACTION-REGULATOR WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                |                                |                     |                  |            |                                    | 099467 |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | BK784-039/P2-401-00-109<br>LSU PISTON RETAINER RING                            | COUNTDOWN                      | 1950<br>640903      | 12/ETR<br>-12000 | YES<br>NO  |                                    | 099565 |
| FAILURE MODE-STRUCTURAL. THE PISTON RETAINER RING OF THE LSU COMPRESSOR FAILED; DAMAGING THE PISTON AND DISINTEGRATING THE CARBON BEARING. AS A RESULT THE LSU COMPRESSOR WAS INOPERATIVE.<br><br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.<br><br>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.<br><br>CORRECTIVE ACTION-8000-P91 GNE SUPPLY WAS PLUMBED FROM COMPLEX 11.                                                                                                                                           |                                                                                |                                |                     |                  |            |                                    | 099776 |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR-LV-98-58-4019<br>LAUNCHER BOOSTER UNIT COMPRESSOR R N/A 7-88552-809<br>ING | FAR                            | 640903              | 12/ETR           | YES<br>NO  | HASKELL<br>NO 13527                |        |
| FAILURE MODE-FAIL DURING OPERATION. THE LAUNCHER BOOSTER UNIT COMPRESSOR ASSEMBLY PISTON-RETAINING RING FAILED COMPLETELY DISINTEGRATING THE PISTON. THE RETAINING RING BROKE INTO SEVERAL PIECES AS A RESULT OF AN OVERLOAD CONDITION. IT WAS CONCLUDED THE RING IS NOT CAPABLE OF SUSTAINING THE CYCLIC COMPRESSIVE LOADS EXERTED IN THE COMPRESSOR.<br><br>CORRECTIVE ACTION-TCP 8384 APPROVED BY SALES ORDER 311-1-521 TO REMOVE LSU FROM CX 12. A PARALLEL HI PRESSURE GAS LINE HAS ALREADY BEEN INSTALLED AT CX 12. |                                                                                |                                |                     |                  |            |                                    | 099468 |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | A864-0059/P2-401-00-195<br>LAUNCHER BOOSTER UNIT                               | COUNTDOWN                      | 1950<br>640903      | 12<br>-12000     | YES<br>NO  |                                    |        |
| FAILURE MODE-FAILED DURING OPERATION. LSU INOPERATIVE BECAUSE OF FAILURE OF FIRST STAGE COMPRESSOR.<br><br>SYSTEM EFFECT-OPERATION STOPPED PREMATURELY. LSU DID NOT SUPPLY HIGH PRESSURE NITROGEN TO THE LAUNCHER HOLD DOWN CYLINDERS.<br><br>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED HOLD FOR 90 MINUTES PRIOR TO ABORT.<br><br>CORRECTIVE ACTION-NO REPLACEMENT UNIT WAS AVAILABLE. TEMPORARY PLUMBING INSTALLED FROM C111 UNIT TO SUPPORT FLIGHT COUNTDOWN.                                                   |                                                                                |                                |                     |                  |            |                                    |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | LV-9D-40-1271-F<br>LAUNCH RELEASE SOLENOID VALVE                               | FAR                            | 640919              | 12/ETR           | YES<br>NO  | MAROTTA SOUTH<br>EASTERN<br>800774 |        |
| FAILURE MODE-FAIL TO CEASE OPERATION AT PRESCRIBED TIME. THE VALVE CONTINUOUSLY VENTED IN THE CHARGE POSITION DURING LAUNCHER COLO RELEASE TEST. FAILURE OF THE SOLENOID VALVE WAS ATTRIBUTED TO A CONTAMINANT IN THE TEFLON SEAT SURFACE.                                                                                                                                                                                                                                                                                |                                                                                |                                |                     |                  |            |                                    |        |

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## CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME      | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO      |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------|---------------------|------------------|------------|------------------------------------|--------|
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                |                     |                  |            |                                    | 099797 |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                     | LV-98-40-3270-F<br>LAUNCH RELEASE SOLENOID VALVE | FAR<br>98-35002-001            | 040917              | 12/ETR           | YES<br>NO  | MAROTTA SOUTH<br>EASTERN<br>800774 | 099806 |
| FAILURE MODE-OUT OF TOLERANCE. THE VALVE OPERATED SLUGGISHLY DURING A LAUNCHER COLD RELEASE TEST. THE SLUGGISH OPERATION OF THE SOLENOIDS IS ATTRIBUTED TO MALADJUSTMENT OF THE VALVE DURING REMORK. LEAKAGE OF CYLINDER 2, SEAT D WAS ATTRIBUTED TO CORROSION ON THE ARMATURE. CORROSION WAS CAUSED BY EXPOSURE TO A HIGHLY-CORROSIVE ENVIRONMENT. SOLENOID ENERGIZING TIME OUT OF SPEC. INDICATING 120 MS. |                                                  |                                |                     |                  |            |                                    |        |
| CORRECTIVE ACTION-GOC PRODUCT SUPPORT CENTER CHECK SHEET 231 HAD BEEN REVISED TO REQUIRE A 100 MILLISECONDS RESPONSE TIME FOR REBUILT VALVES.                                                                                                                                                                                                                                                                |                                                  |                                |                     |                  |            |                                    |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                     | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE          | FAR<br>27-00258-41             | 640800              | 13/ETR           | YES<br>NO  | ALLEN AIRCRAFT                     | 099800 |
| FAILURE MODE-STRUCTURAL. THE AUXILIARY SUPPORT RETRACTION SYSTEM TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT.  |                                                  |                                |                     |                  |            |                                    |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOKES WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                                           |                                                  |                                |                     |                  |            |                                    |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                     | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE          | FAR<br>27-00259-21             | 640800              | 13/ETR           | YES<br>NO  | ALLEN AIRCRAFT                     | 099798 |
| FAILURE MODE-STRUCTURAL. THE PURGE ASSEMBLY TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT.                       |                                                  |                                |                     |                  |            |                                    |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOKES WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                                           |                                                  |                                |                     |                  |            |                                    |        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68C

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | DATE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| LAUNCHER-68C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                  | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE     | FAR<br>27-09259-41             | 840800              | 13/ETR           | YES<br>NO  | YES ALLEN AIRCRAFT<br>NO      | 009796 |
| FAILURE MODE-STRUCTURAL. THE STABILIZATION SYSTEM TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT.              |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOKS WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-68C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                  | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE     | FAR<br>27-09259-17             | 840800              | 12/ETR           | YES<br>NO  | YES ALLEN AIRCRAFT<br>NO      | 009795 |
| FAILURE MODE-STRUCTURAL. THE PURGE SYSTEM TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL, RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT.                     |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOKS WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-68C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                  | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE     | FAR<br>27-01593-001            | 840800              | 13/ETR           | YES<br>NO  | YES ALLEN AIRCRAFT<br>NO      | 009797 |
| FAILURE MODE-STRUCTURAL. THE STRETCH SLING TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT.                     |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOKS WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-68C<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                  | FAR-CT-98-400-046<br>SOLENOID VALVE         | FAR<br>28-33002-001            | 840801              | 36A/ETR          | YES<br>NO  | SOUTHWESTERN<br>NO 800774     |        |
| FAILURE MODE-LEAK. THE PNEUMATIC HOLODOWN AND RELEASE 3 POSITION SOLENOID VALVE DEVELOPED A LEAK AS A RESULT OF CORROSION AROUND THE SOLENOID, ARMAITURE, ARMAITURE RETURN SPRING, INSIDE THE SOLENOID CAP, ELECTRICAL CONNECTIONS AND SEALS, PREVENTING PROPER SEATING OF THE PORPIT SEAL. CORROSION WAS CAUSED BY INABILITY OF THE VALVE DESIGN TO PREVENT MOISTURE FROM ENTERING THE SOLENOID HOUSING. |                                             |                                |                     |                  |            |                               |        |

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**DIFFICULTIES REVIEW-LAUNCHER SYSTEM-COE**

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## CONTAIN DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-63E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME              | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO        |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------------|--------|
| LAUNCHER-63E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-58-003<br>GAS REGULATOR                        | FAR<br>N/A 7-08988-009         | 630716              | 36A              | YES<br>NO  | YES VICTOR EQUIPME<br>NO NT<br>60710 | 699723 |
| FAILURE MODE-OUT OF SPECIFICATION. THE PRESSURE REGULATOR FAILED TO MAINTAIN 9500 PLUS OR MINUS 50 PSIG WITH A 7000 PSIG INLET PRESSURE. FAILURE WAS CONFIRMED. FAILURE WAS CAUSED BY LEADED BRASS PARTICLES FOUND ON THE SEATS. THE SE AT RETAINERS AND REGULATOR BODY ARE OF LEADED BRASS THEREFORE IT WAS CONCLUDED THE PARTICLES CAME FROM WITHIN THE REGULATOR AND NOT FROM WITHIN THE SYSTEM. |                                                          |                                |                     |                  |            |                                      |        |
| CORRECTIVE ACTION-RECOMMENDED VENDOR BE NOTIFIED OF THE RESULTS OF THE ANALYSIS AND TAKE SC CORRECTIVE ACTION TO PREVENT RECURRENT.                                                                                                                                                                                                                                                                 |                                                          |                                |                     |                  |            |                                      |        |
| LAUNCHER-63E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-58-074<br>TUBE                                 | FAR<br>27-08252-13             | 630702              | 36A/ETR          | YES<br>NO  |                                      | 699743 |
| FAILURE MODE-STRUCTURAL. THE TUBE ASSEMBLY, A COMPONENT OF THE LAUNCHER FUEL TANK PRESSURE SENSING INSTALLATION FAILED BECAUSE OF A CRACKED ASSEMBLY SLEEVE. FAILURE WAS CONFIRMED. CRACK WAS CAUSED BY CHEMICAL CORROSION FROM WATER A NO CHLORIDES.                                                                                                                                               |                                                          |                                |                     |                  |            |                                      |        |
| CORRECTIVE ACTION-RECOMMENDED STAINLESS STEEL TUBING AND FITTINGS CORROSION FAILURES AT 38-A BE REVIEWED WITH RESPECT TO (1) REPLACEMENT OF TYPE 304 STAINLESS WITH MONEL OR OTHER CORROSION-RESISTANT MATERIALS. (2) COATING OF PRESENTLY-INSTALLED TUBING (3) ESTABLISHMENT OF A STRICT MAINTENANCE PROGRAM TO PREVENT FAILURES DURING CRITICAL PERIODS.                                          |                                                          |                                |                     |                  |            |                                      |        |
| LAUNCHER-63E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-58-072<br>GAS REGULATOR, LAUNCHER BOOSTER UNIT | FAR                            | 1260<br>630612      | 36A/ETR          | YES<br>NO  | YES VICTOR EQUIPME<br>NO NT<br>L8208 | 699680 |
| FAILURE MODE-ERRATIC OPERATION. THE PNEUMATIC PRESSURE REGULATOR IN THE LAUNCHER BOOSTER UNIT BECAME ERRATIC AND THE SET PRESSURE OF 2000 PSIG DETERIORATED TO 1600 PSIG. FAILURE RESULTED FROM SMALL PARTICLES OF LENT IN THE VALVE.                                                                                                                                                               |                                                          |                                |                     |                  |            |                                      |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                |                     |                  |            |                                      |        |
| LAUNCHER-63E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-40-021<br>SOLENOID VALVE SCREW                 | FAR<br>99-35002-001            | 630331              | 36A/ETR          | YES<br>NO  | YES SOUTHWESTERN<br>NO 80077A        |        |
| FAILURE MODE-EXTERNAL LEAKAGE. THE PNEUMATIC HD AND R VALVE WITH SOLENOID NUMBER 2 ACTUATED HAD A CONSTANT LEAK FROM THE VENT PORT. ONE OF THE TWO SCREWS HOLDING THE SOLENOID TO THE VALVE BODY WAS SHEARED SO THE SOLENOID COULD NOT MAINTAIN PROPER RELATIONSHIP TO THE POPPET, HAMPERING THE POPPET TRAVEL SUFFICIENTLY TO PREVENT IT FROM SEALING OFF THE VENT PORT.                           |                                                          |                                |                     |                  |            |                                      |        |

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GENERAL INVESTIGATIVE  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68C

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                   | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                   | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-THE NAMEPLATE WITH THE PART NUMBER, SERIAL NUMBER, ETC WAS MISSING AND THE SUPPORTING PAPERWORK GAVE NO DATA ON THE VALVE. 60/°C COULD TAKE NO CORRECTIVE ACTION SINCE THERE WAS NO WAY OF DETERMINING WHEN, WHERE OR BY WHOM THE SCREW WAS SHEARED.                                                                                                 |                                                               |                                |                     |                  |            |                               | 099666 |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                               | RA-98-40-297-P<br>HOLDOWN AND RELEASE CYLINDER SEAL 7-99399-3 | FAR                            | 620612              | 12/ETR           | YES        | GDC<br>NO                     | 099712 |
| FAILURE MODE-EXTERNAL LEAK. THE CYLINDER WAS LEAKING DURING A CHECKOUT OF THE HOLDOWN AND RELEASE SYSTEM. THE LEAK WAS ATTRIBUTED TO AN IMPROPERLY INSTALLED TEFLON BACKUP RING. DURING ASSEMBLY OF THE HOLDOWN-AND-RELEASE CYLINDER R. THE TEFLON BACKUP SEAL WAS NOT FULLY BOTTOMED OUT IN ITS RETAINING GROOVE BEFORE THE PISTON WAS INSERTED IN THE CYLINDER HEAD. |                                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-RELIABILITY CONTROL ENGINEERING INITIATED QUALITY-CONTROL CORRECTIVE ACTION BY REQUESTING THAT ASSEMBLY TECHNIQUES FOR THE ASSEMBLY BE REVIEWED TO PRECLUDE RECURRENCE OF THIS PROBLEM. PAR A-98-40-708.                                                                                                                                             |                                                               |                                |                     |                  |            |                               |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                               | A-98-40-222F<br>LAUNCH RELEASE SOLENOID                       | FAR<br>99-35002-001            | 620412              | 12/ETR           | YES        | MAROTTA<br>NO 800774          | 099707 |
| FAILURE MODE-OUT OF TOLERANCE. THE DOUBLE SOLENOID VALVE FAILED WHEN ONE SOLENOID RELEASE PRESSURE 0.10 TO 0.25 SEC ONDS SLOWER THAN THE SECOND SOLENOID. THE VALVE FAILURE IS ATTRIBUTED TO POOR ADJUSTMENT WHICH CAUSED IMPROPER RESPONSE TIMES.                                                                                                                     |                                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                |                                                               |                                |                     |                  |            |                               |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                               | AC-98-40-175F<br>SOLENOID VALVE, WIRING                       | FAR<br>99-35002-001            | 620319              | 12/ETR           | YES        | SOUTHWESTERN<br>NO 800774     | 099713 |
| FAILURE MODE-ERRATIC OPERATION. THE SOLENOID VALVE FUNCTIONED IN REVERSE OF THE RELEASE AND CHARGE SIGNALS. REMOVAL OF THE AMPHENOL CONNECTOR REVEALED THAT THE SOLENOID WIRES HAD BEEN CONNECTED TO THE WRONG PINS AND THAT THE INSULATION WAS STRIPPED FROM THE COMMON WIRE LEADING TO SOLENOID NUMBER 1, SHORTING IT TO THE HOUSING.                                |                                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-EFFECTIVE 15 MARCH 1962, THE TEST REQUIREMENTS AND THE PERFORMANCE CHECKSHEET WERE REVISED TO INCLUDE CONTINUITY, RESISTANCE, AND PRESSURE CHECKS.                                                                                                                                                                                                   |                                                               |                                |                     |                  |            |                               |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                               | FAR-CT-98-40-002F<br>SOLENOID OPERATED VALVE                  | FAR                            | 620131              | 30A/ETR          | YES        | SOUTHWESTERN<br>NO 800774     |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. PNEUMATIC NO AND R VALVE WOULD NOT GO INTO CHARGE POSITION BECAUSE THE COIL WAS ELECTRICALLY OPEN. THE FORMVAR INSULATION COATING THE COIL WAS FLAKED AND UNEVEN WHICH RESULTED IN A BU                                                                                                                               |                                                               |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| RNT AREA APPROXIMATELY 1/2 INCH LONG OVER 3 TURNS AND THREE WRAPPINGS OF WIRE.                                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               | 099639 |
| CORRECTIVE ACTION-PERFORMANCE CHECKSHEET USED TO CHECK THE VALVE WAS REVISED TO INCLUDE-CONTINUITY AND RESISTANCE CHECK OF THE RECEPTACLE PINS, INSTALLING PRESSURE GAUGES ON PORTS TO INSURE PRESSURES ARE TRANSMITTED THRU PROPER PORTS WHEN EITHER OR BOTH SOLENOIDS ARE ENERGIZED OR DE-ENERGIZED. INSPECTION IS TO CHECK AND BUYOFF OF THE PROPER POSITIONING OF THE RECEPTACLE ON THE VALVE AND A PROPER SPRING ADJUSTMENT.  |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                           | AS-98-40-107F<br>SOLENOID VALVE             | FAR<br>99-33008-001            | 620115              | ETR              | YES<br>NO  | SOUTHWESTERN<br>NO 800774     | 099706 |
| FAILURE MODE-OUT OF TOLERANCE. THE SOLENOID VALVE WAS REJECTED WHEN THE LAUNCHER RELEASE SYSTEM APPEARED TO BE OPERATING SLUGGISHLY. THE TIME FROM SOLENOID RELEASE SIGNAL TO THE BEGINNING OF PRESSURE DECAY WAS 0.85 SECONDS. ANALYSIS SHOWED THAT THE VALVE FAILED DUE TO AN IMPROPER ADJUSTMENT OF THE RETURN SPRING FORCE.                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-EFFECTIVE 15 MARCH 1962. THE TEST REQUIREMENTS AND THE PERFORMANCE CHECK SHEET WAS REVISED TO INCLUDE CONTINUITY, RESISTANCE, PRESSURE, AND SPRING ADJUSTMENT CHECKS.                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                           | AS-98-40-172F<br>SOLENOID VALVE             | FAR<br>99-33008-001            | 620103              | 18/ETR           | YES<br>NO  | SOUTHWESTERN<br>NO            | 099696 |
| FAILURE MODE-EXTERNAL LEAKAGE. THE VALVE HAD A LEAK THROUGH THE VENT WHEN THE SOLENOID WAS IN THE ENERGIZED POSITION. FAILURE IS ATTRIBUTED TO CORROSION (ELECTROLYTIC ACTION BETWEEN DISSIMILAR METALS, THE STEEL SPRING AND ALUMINUM PARTS) WHICH RESTRICTED ACTUATION AND SEATING OF THE POPPET.                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                           | FAR-CT-98-40-003F<br>SOLENOID VALVE SPRING  | FAR                            | 620101              | 36A/ETR          | YES<br>NO  | SOUTHWESTERN<br>NO 800774     | 099660 |
| FAILURE MODE-FAIL DURING OPERATION. PNEUMATIC HO AND R VALVE VENTED IN THE CHARGE POSITION BECAUSE THE ADJUSTABLE RETURN SPRING FORCE WAS TOO HIGH TO PERMIT SOLENOID ACTUATION. THE RETURN SPRING FORCE DETERMINES THE SOLENOID ENERGIZATION AND DE-ENERGIZATION REACTION TIME AND THE POPPET SEATING PRESSURE. RETURN SPRING FORCE WAS TOO HIGH BECAUSE OF IMPROPER ADJUSTMENT.                                                  |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-PERFORMANCE CHECK SHEET USED TO CHECK THE VALVE WAS REVISED TO INCLUDE-CONTINUITY AND RESISTANCE CHECK OF THE RECEPTACLE PINS, INSTALLING PRESSURE GAUGES ON PORTS TO INSURE PRESSURES ARE TRANSMITTED THRU PROPER PORTS, WHEN EITHER OR BOTH SOLENOIDS ARE ENERGIZED OR DE-ENERGIZED, AND INSPECTION CHECK AND BUYOFF OF THE PROPER POSITIONING OF THE RECEPTACLE ON THE VALVE, AND A PROPER SPRING ADJUSTMENT. |                                             |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME             | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FAR-C1-98-80-007<br>RELIEF VALVE, LAUNCHER BOOSTER UNIT | FAR                            | 610807              | 26A/ETR          | YES        | MASKEL<br>NO 13412            |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE RELIEF VALVE, LOCATED IN THE LAUNCHER BOOSTER UNIT, FAILED TO RELIEVE AT 7700 PSIG. CONTAMINATION FOUND IN THE VALVE WAS NOT SUFFICIENT TO CAUSE THE FAILURE BUT POSSIBLY OTHER CONTAMINATION WAS DISLOOGEED AND LOST DURING SHIPMENT AS THE VALVE WAS RECEIVED AT GD/CIN AN UNPROTECTED CONDITION.</p> <p>CORRECTIVE ACTION-RECOMMEND SITE BE NOTIFIED OF FAILURE AND THE APPLICABLE PRESSURE GAGE IN THE LAUNCHER BOOSTER UNIT BE CHECKED FOR ERRATIC OPERATION. ALSO RECOMMEND SITE EMER. BE NOTIFIED OF POSSIBLE CONTAMINATION IN THE LBU. REQUEST SITE PERSONNEL PROTECT FUTURE PARTS FROM CONTAMINATION WHEN FORWARDING TO GD/C FOR FAILURE ANALYSIS.</p> |                                                         |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | AA61-0137/P2-403-00-111<br>LAUNCHER BOOSTER UNIT        | COUNTDOWN                      | 1110<br>610801      | 12<br>-0800      | NO<br>NO   |                               |
| <p>FAILURE MODE-ERRATIC OPERATION. LBU OUTPUT PRESSURE WAS CYCLING DUE TO AN UNKNOWN CAUSE.</p> <p>SYSTEM EFFECT-ERRATIC OPERATION. LBU OUTPUT PRESSURE WAS CYCLING.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-A SOLENOID VALVE WAS REPLACED BUT THE PROBLEM STILL REMAINED.</p>                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                         |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | AA61-0137/P2-403-00-111<br>LAUNCHER BOOSTER UNIT        | COUNTDOWN                      | 1110<br>610731      | 12/ETR<br>-0800  | YES<br>NO  |                               |
| <p>FAILURE MODE-ERRATIC OPERATION. THE LBU OUTPUT PRESSURE WAS CYCLING. A SOLENOID VALVE WAS SUSPECT, BUT REPLACEMENT DID NOT CORRECT THE PROBLEM.</p> <p>SYSTEM EFFECT-ERRATIC OPERATION.</p> <p>VEHICLE EFFECT-NONE. A DECISION WAS MADE TO GO AS IS.</p> <p>CORRECTIVE ACTION-A SOLENOID VALVE WAS REPLACED BUT DID NOT CORRECT THE PROBLEM.</p>                                                                                                                                                                                                                                                                                                                                                                     |                                                         |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | AA60-C134/P2-402-00-03<br>WIRING HARNESS                | COUNTDOWN                      | 83D<br>601113       | 12<br>-680       | YES<br>NO  |                               |
| <p>FAILURE MODE-OPEN (ELECT). WIRING BETWEEN SENSOR VALVE MICROSWITCHES AND THEIR CONNECTOR PLUGS WAS NOT COMPLETELY INSTALLED.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                         |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-MICROSWITCHES JUMPED IN ORDER TO COMPLETE LADDER IN TCC PRESTART PANEL.                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                   | A2C-27-081/P2-408-00-08<br>COMPRESSOR SEAL  | COUNTDOWN                      | 5D<br>590602        | 12/ETR<br>NO     | YES<br>NO  | 099438<br>099438              |
| FAILURE MODE-STRUCTURAL. THE HASSEL COMPRESSOR BLEW A HYDRAULIC SEAL DURING THE LAUNCH OPERATION.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN DELAYED.<br>CORRECTIVE ACTION-THE SEAL WAS REPLACED AND THE UNIT WAS USED FOR THE OPERATION.          |                                             |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                   | FTA4891/P2-301-00-7<br>CHECK VALVE          | COUNTDOWN                      | 7C<br>590350        | 12<br>-7080      | YES<br>NO  | 099438                        |
| FAILURE MODE-LEAK (EXTERNAL). LBU CHECK VALVE HAD A SMALL LEAK RESULTING IN A LOW LBU PRESSURE.<br>SYSTEM EFFECT-OPERATION TOO LOW. LBU PRESSURE WAS LOW DUE TO A LEAKING CHECK VALVE.<br>VEHICLE EFFECT-NONE, NO HOLD.<br>CORRECTIVE ACTION-REPAIR VALVE. |                                             |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                   | FTA4422/P2-301-00-3<br>ORIFICE              | PRF                            | 3C<br>581217        | 12/ETR<br>-1820  | YES<br>NO  | 099438                        |
| FAILURE MODE-OUT OF TOLERANCE. B1 CYLINDER WAS 450 PSI HIGH AND B2 CYLINDER PRESSURE WAS 450 PSI LOW. THE CAUSE WAS UNKNOWN.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-NONE. A DECISION WAS MADE TO GO AS IS.                    |                                             |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                   | FTA4422/P2-301-00-3<br>ORIFICE              | PRF                            | 3C<br>581217        | 12/ETR<br>0      | YES<br>NO  | 099438                        |
| FAILURE MODE-FAIL DURING OPERATION. THERE WAS A LARGE MAXIMUM DIFFERENTIAL PRESSURE AFTER DECAY TO 2350 PSIG. THIS WAS BELIEVED TO BE THE RESULT OF A DAMAGED B2 CYLINDER ORIFICE.<br>SYSTEM EFFECT-ERRATIC OPERATION.<br>VEHICLE EFFECT-NONE.             |                                             |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-4E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME   | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-THE ORIFICE WAS CHANGED.                                                                                                                |                                               |                                |                     |                  |            |                               | 099991 |
| LAUNCHER-GSE<br>PNEUMATIC PRESSURIZATION                                                                                                                  | FTA4266/P3-202-00-0<br>LSU MOTOR              | COMPOSITE-FRD/DPL              | 60<br>500910        | 13/ETR<br>-300   | YES<br>NO  |                               | 099990 |
| FAILURE MODE-FAIL DURING OPERATION. THE MOTOR TO THE LSU COMPRESSOR STOPPED CAUSING INSUFFICIENT HOLD DOWN PRESSURE                                       |                                               |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW. HOLD DOWN AND RELEASE PRESSURE WAS TO LOW.                                                                               |                                               |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME IS NOT KNOWN.                                                                                                 |                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE LSU COMPRESSOR MOTOR WAS RESTARTED.                                                                                                 |                                               |                                |                     |                  |            |                               |        |
| LAUNCHER-GSE<br>PNEUMATIC PRESSURIZATION                                                                                                                  | FTA4266/P3-202-00-0<br>LAUNCHER BOOSTER UNIT  | COUNTDOWN                      | 60<br>500910        | 13<br>-480       | YES<br>NO  |                               | 099327 |
| FAILURE MODE-FAIL DURING OPERATION. LAUNCHER BOOSTER UNIT MOTOR STOPPED OPERATING.                                                                        |                                               |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LAUNCHER BOOSTER UNIT STOPPED OPERATING CAUSING LOSS OF SUFFICIENT PRESSURE IN THE MISSILE HOLDDOWN CYLINDERS. |                                               |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 21 MINUTES HOLD TIME.                                                                                                   |                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-RESTARTED LSU MOTOR AND OPERATION WAS SATISFACTORY. NO FURTHER ACTION TAKEN.                                                            |                                               |                                |                     |                  |            |                               |        |
| LAUNCHER-GSE<br>PNEUMATIC PRESSURIZATION                                                                                                                  | FTA4255/P4-203-00-0<br>REGULATOR LSU 2000 PSI | COUNTDOWN                      | 60<br>500914        | 14<br>-1800      | YES<br>NO  |                               | 099341 |
| FAILURE MODE-ERRATIC OPERATION.                                                                                                                           |                                               |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                          |                                               |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 10 MINUTE HOLD.                                                                                                         |                                               |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-REGULATOR ADJUSTED.                                                                                                                     |                                               |                                |                     |                  |            |                               |        |
| LAUNCHER-GSE<br>PNEUMATIC PRESSURIZATION                                                                                                                  | FTA4000/P1-200-00-0                           | COUNTDOWN                      | 30<br>500718        | 11<br>-5100      | NO<br>NO   |                               |        |
| FAILURE MODE-OUT OF TOLERANCE. STAND TASKS AND PRESSURIZING OF HIGH PRESSURE AIR FLASK WERE NOT COMPLETED BY PRESSURIZED TIME.                            |                                               |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                       |                                               |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTE HOLD                                                                                                          |                                               |                                |                     |                  |            |                               |        |

15 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-HOLD TO COMPLETE TASKS.                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               | 999433 |
| LAUNCHER-65E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                | FTA300/P2-104-00-18<br>TRANSDUCER BOSS      | COUNTDOWN                      | 16A<br>980603       | 12/ETR<br>-540   | YES<br>NO  |                               | 999959 |
| FAILURE MODE-EXTERNAL LEAK. THE WEST HOLDOWN CYLINDER WAS LOSING PRESSURE THROUGH A LEAK AT THE PRESSURE TRANSDUCER R. THIS LEAK CAUSED PRESSURE TO DROP BELOW AN ACCEPTABLE LEVEL.                                                                     |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. HOLDOWN PRESSURE DECAYED BELOW ACCEPTABLE LIMITS.                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. RECYCLE TIME WAS 111 MINUTES. HOLD TIME WAS 8 HOURS AND 1 MINUTE.                                                                                                                                                     |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>PNEUMATIC PRESSURIZATION                                                                                                                                                                                                                | FTA2579/P2-101-00-11<br>COMPRESSOR O-RING   | FRF                            | 11A<br>580208       | 12/ETR<br>-9900  | YES<br>NO  |                               | 999957 |
| FAILURE MODE-EXTERNAL LEAK. DURING THE PRECOUNT THERE WAS AN O RING FAILURE ON ONE PISTON, THE 9245 PISTON ASSEMBLY . OF THE COMPRESSOR.                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW. A SERIOUS BLOW-BY RESULTED FROM THE O RING FAILURE.                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE PISTON ASSEMBLY WAS REPAIRED.                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>ELECTRICAL CONTROL                                                                                                                                                                                                                      | 574-3-86-24<br>SWITCH-MOTION                | FLIGHT                         | 5001<br>660408      | ETR12<br>D       | YES<br>NO  |                               | 999509 |
| FAILURE MODE-THE TWO-INCH MOTION SIGNAL WAS NOT GENERATED.                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE-HOWEVER THE TWO AND EIGHT INCH UMBILICALS WERE EJECTED BY LANYARD BACKUP.                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-OPEN-INVESTIGATION IN PROCESS TO DETERMINE CAUSE OF FAILURE AND ACTION TO BE TAKEN.                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| LAUNCHER-65E<br>ELECTRICAL CONTROL                                                                                                                                                                                                                      | SLV-98-40-5336<br>FUEL FILL AND DRAIN VALVE | FAR<br>27-02101-23             | 660118              | CH14             | NO<br>YES  | AIRSEARCH<br>181034           |        |
| FAILURE MODE-ELECTRICAL SHORT. ELECTRICAL ARCING OCCURRED FROM THE FUEL FILL AND DRAIN VALVE ELECTRICAL CONNECTOR T O THE CABLE ASSEMBLY ELECTRICAL CONNECTOR AND IS ATTRIBUTED TO ELECTRICAL POWER BEING APPLIED TO THE HARNESS BEFORE HARNESS HOOKUP. |                                             |                                |                     |                  |            |                               |        |

18 JUN 1968

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                      | DIF DATA SOURCE<br>PART NUMBER   | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |           |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------|------------------|------------|-------------------------------|-----------|
|                                    | CORRECTIVE ACTION-CONVAIR TOOK CORRECTIVE ACTION BY SENDING A TUX TO ETR ON 18 MARCH 1968 REQUESTING ALL ETR PERSONNEL BE CAUTIONED TO ASSURE NO ELECTRICAL POWER IS ON THE HARNESS WHEN IT IS BEING MATED TO THE FUEL FILL AND DRAIN VALVE.                                                                     |                                  |                     |                  |            |                               | 009932    |
| LAUNCHER-63E<br>ELECTRICAL CONTROL | AG-9B-40-107F<br>SOLENOID VALVE, WIRING                                                                                                                                                                                                                                                                          | FAR<br>99-38002-001              | 620309              | 12/ETR           | YES<br>NO  | SOUTHWESTERN<br>NO 900774     | 009709    |
|                                    | FAILURE MODE-ERRATIC OPERATION. TWO SOLENOID VALVES OPERATED IN REVERSE OF THE ACTUATING SIGNAL. REMOVAL OF THE AMP HENOL PLUG REVEALED THAT THE LEAD WIRES FROM THE SOLENOIDS WERE WIRED TO THE WRONG PINS AND ALSO HAD BEEN SPLICED BEFORE BEING CONNECTED TO THE PLUG.                                        |                                  |                     |                  |            |                               |           |
|                                    | CORRECTIVE ACTION-EFFECTIVE 15 MARCH 1968, THE TEST REQUIREMENTS AND THE PERFORMANCE CHECK SHEET WAS REVISED TO INCLUDE CONTINUITY, RESISTANCE, AND PRESSURE CHECKS. PLANNING CHANGES WERE MADE TO THE FOLLOWING EFFECT. 1. DISASSEMBLY PERSONNEL SHALL NOT CUT RECEPTACLE LEADS. 2. NO SPLICES WILL BE ALLOWED. |                                  |                     |                  |            |                               | 009661    |
| LAUNCHER-63E<br>ELECTRICAL CONTROL | FAR-CT-9B-40-004F<br>RELAY                                                                                                                                                                                                                                                                                       | FAR                              | 620306              | 30A/ETR          | YES<br>NO  | CLARK<br>NO 7313              |           |
|                                    | FAILURE MODE-OUT OF TOLERANCE. THIS PNEUMATIC SOLENOID OPERATED TIME-DELAY RELAY USED TO ACTUATE THE HYDRAULIC SYSTEM ON THE BOOM. UNABLE TO DELAY CONTACT ACTUATION MORE THAN 6 SECONDS. RELAY FOUND TO BE OUT OF ITS PLUS OR MINUS 10 PCT TOLERANCE AND HAD POOR REPEATABILITY WHEN SUBJECTED TO TESTING.      |                                  |                     |                  |            |                               |           |
|                                    | CORRECTIVE ACTION-RELAY WILL BE KEPT UNDER SURVEILLANCE FOR POSSIBLE FUTURE FAILURES. THIS IS THE FIRST FAILURE OF THIS RELAY. FAILURE NOT CONFIRMED.                                                                                                                                                            |                                  |                     |                  |            |                               | 009840    |
| LAUNCHER-63E<br>ELECTRICAL CONTROL | AA61-0123/P2-4CO-03-111<br>SOLENOID OPERATED VALVE                                                                                                                                                                                                                                                               | COMPOSITE-J FACT<br>27-03106-001 | 111D<br>610614      | 12/ETR           | YES<br>NO  |                               |           |
|                                    | FAILURE MODE-FAIL DURING OPERATION. THERE WAS NO SHUTTLE VALVE CONTROL DURING THE FACT. A DEFECTIVE SOLENOID WAS FOUND IN THE LAUNCHER PURGE BOX.                                                                                                                                                                |                                  |                     |                  |            |                               |           |
|                                    | SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                                                                                                                                                                                 |                                  |                     |                  |            |                               |           |
|                                    | VEHICLE EFFECT-UNKNOWN.                                                                                                                                                                                                                                                                                          |                                  |                     |                  |            |                               |           |
|                                    | CORRECTIVE ACTION-SOLENOID WAS REPLACED.                                                                                                                                                                                                                                                                         |                                  |                     |                  |            |                               |           |
|                                    |                                                                                                                                                                                                                                                                                                                  |                                  |                     |                  |            |                               | PAGE 0023 |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-LAUNCHER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                    | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| LAUNCHER-68E<br>ELECTRICAL CONTROL                                                                                                                              | A461-0002/P3-801-00-10<br>MICROSWITCH                          | COUNTDOWN                      | 10E<br>610919       | 13/ETR           | YES<br>NO  | 000000                        |
| FAILURE MODE-OUT OF TOLERANCE. HOLDDOWN SYSTEM MICROSWITCH IN LOWER LAUNCHER PEDESTAL IN SUAD 3 OUT OF ADJUSTMENT.                                              |                                                                |                                |                     |                  |            |                               |
| SYSTEM EFFECT-ERRATIC OPERATION.                                                                                                                                |                                                                |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD CALLED TO ADJUST MICROSWITCH AND REMOVE SUAD AND CABLE FROM SCIENTIFIC PASS<br>EMER POD. TOTAL HOLD TIME WAS 50 MINUTES. |                                                                |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE MICROSWITCH WAS ADJUSTED.                                                                                                                 |                                                                |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>ELECTRICAL CONTROL                                                                                                                              | A461-0002/P3-801-00-10<br>MICROSWITCH                          | COUNTDOWN                      | 10E<br>610919       | 13               | YES<br>NO  | 000000                        |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. LAUNCHER HOLDDOWN SYSTEM MICROSWITCH ON LOWER LAUNCHER PEDESTAL IN SUAD 3 O<br>UT OF ADJUSTMENT.                       |                                                                |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. LAUNCHER RELEASE SYSTEM WOULD NOT OPERATE.                                                                              |                                                                |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. COUNTDOWN DELAYED TO ADJUST MICROSWITCH.                                                                                      |                                                                |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-ADJUST MICROSWITCH.                                                                                                                           |                                                                |                                |                     |                  |            |                               |
| LAUNCHER-68E<br>ELECTRICAL CONTROL                                                                                                                              | FT4615/P2-301-00-09<br>PRESSURE SWITCH, LBU 7000 LB BOTTL<br>E | COUNTDOWN                      | 9C<br>80024         | 12/ETR<br>-3600  | YES<br>NO  | 000000                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE PRESSURE SWITCH IN THE LBU 7000 POUND BOTTLE WOULD NOT CYCLE.                                              |                                                                |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO HIGH.                                                                                                                               |                                                                |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                            |                                                                |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-IT WAS DECIDED TO SECURE THE PRESSURE AT THE PRESENT PRESSURE LEVEL IF THE SWITCH COULD NOT BE FI<br>XED. FINAL FIX UNKNOWN.                  |                                                                |                                |                     |                  |            |                               |

**LAUNCH CONTROL SYSTEM**

**GSE**

**DIFFICULTIES REVIEW**

# DIFFICULTIES REVIEW LAUNCH CONTROL GSE

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GENERAL DYNAMICS  
CONVAIR DIVISION

16 JUN 1966

DIFFICULTIES REVIEW-LAUNCH CONTROL-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME         | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------|---------------------|------------------|------------|----------------------------------|
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                | FAR-CT-98-460-036<br>TIMER, RECTIFIER               | FAR<br>88-73900-381            | 880819              | 38A/ETR          | YES<br>NO  | YES 6-V CONTROLS<br>NO 900848-20 |
| FAILURE MODE-ELECTRICAL SHORT. THIS IS AN ELECTRONIC TIMER USED IN THE ENGINE CUTOFF CIRCUIT OF THE TEST CONDUCTORS CONSOLE. THE FAILURE WAS CONFIRMED. A SILICON CONTROLLED RECTIFIER WAS FOUND TO BE SHORTED.                              |                                                     |                                |                     |                  |            |                                  |
| CORRECTIVE ACTION-THE RECOMMENDATION WAS MADE TO THE VENDOR TO WEED OUT MARGINAL RECTIFIERS.                                                                                                                                                 |                                                     |                                |                     |                  |            |                                  |
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                | A468-0012/P4-T8N-01-0301<br>SWITCH                  | COMPOSITE-FRD/DFL              | 5501<br>850181      | 14               | YES<br>NO  |                                  |
| FAILURE MODE-ERRATIC OPERATION-SWITCH 28 (LOX LOAD PROPERLY IN THE NORMAL POSITION. THE TANKING OPERATION WAS COMPLETED WITH THE SWITCH IN THE TEST POSITION. POST-TEST INVESTIGATION REVEALED A WIRING DISCREPANCY IN THE SWITCH CIRCUITRY. |                                                     |                                |                     |                  |            |                                  |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                          |                                                     |                                |                     |                  |            |                                  |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                         |                                                     |                                |                     |                  |            |                                  |
| CORRECTIVE ACTION-THE WIRING WAS CORRECTED AND PROPER SWITCH OPERATION WAS VERIFIED.                                                                                                                                                         |                                                     |                                |                     |                  |            |                                  |
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                | A468-0043/P6-CO-01-04C4<br>RANGE READY SIGNAL LIGHT | COMPOSITE-J FACT               | 1460<br>841124      | 38A/ETR<br>-25   | NO<br>NO   |                                  |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DUE TO A PROCEDURAL ERROR. THE PAD SAFETY OFFICER WAS NOT ON STATION TO PROVIDE A RANGE READY SIGNAL (LIGHT).                                                                               |                                                     |                                |                     |                  |            |                                  |
| SYSTEM EFFECT-OPERATION DOES NOT START. THE HOLD FIRE TEST COULD NOT BE PERFORMED DUE TO LACK OF A RANGE READY SIGNAL.                                                                                                                       |                                                     |                                |                     |                  |            |                                  |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                            |                                                     |                                |                     |                  |            |                                  |
| CORRECTIVE ACTION-THE SIGNAL WAS SIMULATED BY THE LAUNCH CONTROL SYSTEM SWITCH.                                                                                                                                                              |                                                     |                                |                     |                  |            |                                  |
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                | FAR-LV-28-53-223-F<br>TIME DELAY RELAY              | FAR<br>88-73900-315            | 831809              | 12               | YES<br>NO  | WHEATON<br>E-618-A               |
| FAILURE MODE-FAIL DURING OPERATION. THIS IS RELAY K43 IN THE TEST CONDUCTORS CONSOLE. THE RELAY COULD NOT BE ADJUSTED TO ITS LOWER LIMIT BECAUSE OF SEIZED CONTACTS.                                                                         |                                                     |                                |                     |                  |            |                                  |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR CONSIDER CHANGING SURGE-CURRENT CONDITIONS TO BE COMPATIBLE WITH CONTACTS. IT WAS ALSO RECOMMENDED THAT 60/C REPLACE RELAYS OPERATING UNDER SIMILAR SURGE CONDITIONS. THE FAILURE WAS   |                                                     |                                |                     |                  |            |                                  |

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DIFFICULTIES REVIEW-LAUNCH CONTROL-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME  | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>VEHICLE PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------|
| 8 CONFIRMED.                                                                                                                                                                                                                                                                                                                                             |                                              |                                |                     |                  |            |                                 |
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                                                                                                                            | AASG-0089P4-401-0079<br>LAUNCH CONTROL RELAY | COUNTDOWN                      | 79D<br>800915       | 14<br>-1.        | YES<br>NO  | 000760<br>000360                |
| FAILURE MODE-ERRATIC OPERATION. DURING AN ATTEMPTED LAUNCH AND AFTER ENGINES TRANSITION TO MAINSTAGE, THE LAUNCH CONTROL RELAY WHICH PROVIDES A SIGNAL OF INTERNAL PNEUMATICS READY, DEACTIVATED AND OPENED PREVENTING RELEASE OF THE VEHICLE. RELAY DEACTIVATED DUE TO AN INDUCTIVE VOLTAGE ON THE GROUND WIRE WHICH IS A FLOATING GROUND AT THIS TIME. |                                              |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-ERRATIC OPERATION. RELAY WAS ACTIVATING AND DEACTIVATING INTERMITTENTLY AND CAUSING THE SAME ACTION OF THE PRE-RELEASE CUTOFF DISARM RELAY. RELEASE OF THE VEHICLE WAS PREVENTED SINCE THIS RELAY KEPT STARTING THE PRE-RELEASE TIMER. RELEASE TAKES PLACE AT TIMER EXPIRATION.                                                            |                                              |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-PREATURE PROPULSION SHUTDOWN. ALL ENGINES WERE SHUT DOWN BY THE ENGINE CUTOFF TIMER SINCE RELEASE HAD NOT TAKEN PLACE.                                                                                                                                                                                                                    |                                              |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-CIRCUIT WAS JUMPERED SO THE GROUND TO THESE RELAYS IS NOT REMOVED.                                                                                                                                                                                                                                                                     |                                              |                                |                     |                  |            |                                 |
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                                                                                                                            | FTA4581/PS-38H-06-3<br>RELAY                 | COMPOSITE-J FACT               | 3C<br>501212        | 12<br>-71        | YES<br>NO  | 000953                          |
| FAILURE MODE-PREATURE OPERATION. THE MISSILE PREP COMPLETE LIGHT ON THE TEST CONDUCTORS CONSOLE CAME ON PRIOR TO 175 SCHEDULED TIME. THIS OCCURRED BECAUSE RELAY K19 IN THE CONSOLE WAS LOCKED IN.                                                                                                                                                       |                                              |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS.                                                                                                                                                                                                                                                                                                                 |                                              |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COMPOSITE DELAYED. 6 MINUTES HOLD AND 4 MINUTES RECYCLE.                                                                                                                                                                                                                                                                                  |                                              |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-THE RELAY WAS UNLOCKED BY PROGRAMMING A CUTOFF SIGNAL.                                                                                                                                                                                                                                                                                 |                                              |                                |                     |                  |            |                                 |
| LAUNCH CONTROL-68E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                                                                                                                            | FTA 4591/PS-38H-09-3<br>WIRING               | COMPOSITE-J FACT               | 3C<br>501212        | 12<br>-38        | YES<br>NO  | 000956                          |
| FAILURE MODE-OUT OF SPECIFICATION. A JUMPER HAD BEEN PLACED IN SUCH A MANNER THAT THE VERNIER PROPELLANT VALVES OPENED WHEN THE TEST-OFF-ARM SWITCH ON THE TEST CONDUCTORS CONSOLE WAS PLACED IN EITHER THE TEST OR ARM POSITION.                                                                                                                        |                                              |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. THE VERNIER PROPELLANT VALVES WERE BEING COMMANDED OPEN BY THE TEST-OFF-ARM SIGNAL ON THE TEST CONDUCTORS CONSOLE.                                                                                                                                                                                              |                                              |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 27 MINUTES HOLD AND 9.5 MINUTES RECYCLE.                                                                                                                                                                                                                                                                               |                                              |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-THE JUMPER WAS REMOVED.                                                                                                                                                                                                                                                                                                                |                                              |                                |                     |                  |            |                                 |

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DIFFICULTIES REVIEW-LAUNCH CONTROL-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME GIP | SITE<br>TIME GIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|------------------------------|------------------|------------|-------------------------------|
| LAUNCH CONTROL-65E<br>TEST CONDUCTORS CONSOLE                                                                                                                                                                                                                                                                      | FTA4501/P8-38N-08-3<br>WIRING               | COMPOSITE-J FACT               | SC<br>001818                 | 12               | YES<br>NO  |                               |
| <p>FAILURE MODE-ELECTRICAL OPEN. THE TEST CONDUCTORS CONSOLE WAS NOT COMPLETELY WIRED. AS A RESULT, THE RANGE-READY NO LD-FIRE TEST COULD NOT BE COMPLETED.</p> <p>SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED</p> <p>CORRECTIVE ACTION-THE CONSOLE WIRING WAS COMPLETED.</p> |                                             |                                |                              |                  |            |                               |

000018

PNEUMATIC SYSTEM  
GSE  
DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW GSE

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## VI. VEHICLE PRESSURIZATION

|                             |                               |
|-----------------------------|-------------------------------|
| Circuit                     | 0017.                         |
| Clamp                       | 0027.                         |
| Compressor                  | 0025.                         |
| Controller                  | 0022, 0023, 0030, 0032.       |
| Fitting                     | 0018.                         |
| Meter                       | 0021.                         |
| Micro Switch                | 0024.                         |
| Pressurization Unit         | 0028.                         |
| Regulator                   | 0019.                         |
| Regulator Fluid/Gas         | 0020, 0029, 0031.             |
| Relay                       | 0020, 0021, 0026, 0027.       |
| Riseoff Disconnect Assembly | 0029.                         |
| Seals ("O" Rings)           | 0023, 0025, 0026, 0030.       |
| Sense Line                  | 0023.                         |
| Sleeve Tube Assembly        | 0018, 0019.                   |
| Switch                      | 0018.                         |
| Switch Pressure             | 0017, 0019, 0020, 0026.       |
| Valve Manual                | 0030.                         |
| Valve Relief                | 0021, 0022, 0028, 0029, 0031. |
| Valve Solenoid              | 0023, 0024, 0028.             |
| Valve Shutoff               | 0019.                         |
| Valve Vent                  | 0032.                         |
| Valves                      | 0022, 0025, 0026, 0027, 0031. |

## V. GROUND PRESSURIZATION

|                       |                   |
|-----------------------|-------------------|
| Compressor            | 0013, 0015.       |
| Control Unit          | 0014.             |
| Control Unit Pressure | 0006, 0009.       |
| Filter                | 0010, 0011.       |
| Heat Exchanger        | 0015.             |
| Regulator             | 0008, 0014, 0015. |
| Regulator Fluid/Gas   | 0009, 0012.       |

V. GROUND PRESSURIZATION (Continued)

|                  |                              |
|------------------|------------------------------|
| Seals            | 0007, 0013.                  |
| Surge Damper     | 0016.                        |
| Switch           | 0007.                        |
| Switch Pressure  | 0004, 0005, 0012.            |
| Valves           | 0008, 0010, 0012, 0013, 0016 |
| Valve Disconnect | 0013                         |
| Valve Relief     | 0006, 0007, 0009, 0017.      |
| Valve Solenoid   | 0006, 0011.                  |
| Wiring           | 0011.                        |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-38E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PNEUMATIC-63E<br>LINE SUPPLY                                                                                                                                                                              | 6DC/8KPG-010<br>SWITCH                      | COUNTDOWN                      | 3010<br>690223      | A-3              | YES<br>NO  |                               | 699409 |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THE OPEN MICROSWITCH ON VALVE LN-83 (LNB FINE LOAD VALVE) FAILED TO INDICATE THE VALVE WAS OPEN AND RESULTED IN A LNB3 NOT OPEN INDICATION ON THE LAP. |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY.                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-MICROSWITCH WAS ADJUSTED.                                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E<br>SUSTAINER                                                                                                                                                                                | DA817/A1-4XO-04-159                         | COMPOSITE-FRD/DPL              | 159D<br>621023      | A-1              | YES<br>NO  |                               | 699366 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. MICRO SWITCH FAILED TO INDICATE THAT H8 (BOOSTER IF/ME LOADING VALVE) WAS CLOSED.                                                                        |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-FAIL TO OPERATE AT PRESCRIBED TIME. MICRO SWITCH FAILURE DID NOT ALLOW BOOSTER HELIUM BOTTLES TO VENT AT PROPER TIME DURING FUEL DRAIN. OPERATION STARTS TOO LATE.                          |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-SWITCH ADJUSTED AND CHECKED OUT PRIOR TO LAUNCH.                                                                                                                                        |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E                                                                                                                                                                                             | AE62-0729/83-404-00-06<br>CONTROLLER        | COUNTDOWN                      | 8D<br>620603        | B-3              | YES<br>NO  |                               | 699333 |
| FAILURE MODE-OUT OF SPECIFICATION. HELIUM LINE PRESSURE SUPPLIED FROM THE GROUND WAS TOO HIGH.                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO HIGH.                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-CONTROLLER REPLACED.                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E                                                                                                                                                                                             | AE62-0318/83-401-00-122<br>UNKNOWN          | COUNTDOWN                      | 122D<br>620411      | B-3              | YES<br>NO  |                               | 699416 |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THERE WAS A .80 SECOND DELAY AFTER COMMIT START BEFORE P.C.U. STEPPED TO PHASE III PRESS.                                                              |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |

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GENERAL  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME           | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                   | VENDOR MARK<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------|---------------------|------------------|------------------------------|-------------------------------|
| PNEUMATIC-65E                                                                                                                                                                                                                                                                                                                                   | A401-0152/P2-404-00-117<br>VALVE-SOLENOID OPERATED    | COUNTDOWN                      | 1170<br>611118      | 18<br>-1800      | YES<br>NO                    | 699286                        |
| FAILURE MODE-FAIL DURING OPERATION-LN2 SHROUD COOLING SYSTEM VALVE 7 FROZEN.                                                                                                                                                                                                                                                                    |                                                       |                                |                     |                  |                              |                               |
| SYSTEM EFFECT-ERRATIC OPERATION-VALVE WOULD NOT OPERATE. FAILURE TO LOAD LN2 ON MISSILES.                                                                                                                                                                                                                                                       |                                                       |                                |                     |                  |                              |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED-4 MINUTES.                                                                                                                                                                                                                                                                                                     |                                                       |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-VALVE FREED BY CYCLING.                                                                                                                                                                                                                                                                                                       |                                                       |                                |                     |                  |                              |                               |
| PNEUMATIC-65E<br>SUSTAINER                                                                                                                                                                                                                                                                                                                      | 90-08-135<br>HELIUM PRESSURIZATION PANEL ASSY         | FAR<br>27-80064-19             | 32D<br>591200       | WTR              | YES<br>NO                    | 699284                        |
| FAILURE MODE-CONTAMINATION. PANEL FAILED DURING TEST PROCEDURE VTP-F-009 WHEN IT DID NOT CHECK COMPLETELY FOR 2 CYCLES DURING BLOWDOWN AS AMBIENT BOTTLE VALVE FAILED TO CHECK. FAILURE RESULTED FROM CONTAMINATION WAS LOGGED UNDER POCKET SEAT.                                                                                               |                                                       |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-TEST PROCEDURE VTP-F-009 REPLACED BY PROCEDURE 27-47309-1 ON 13 NOVEMBER 1959 ON COMPLEX 65-2. AT COMPLEX 65-1 PROCEDURE REPLACED WITH T. 0.21-8M850-11-2-15. THESE PROCEDURES CONTAIN PURGE INSTRUCTIONS FOR A/B HELIUM SYSTEM TO REDUCE CONTAMINATION LEVEL. MISSILE 33D AND ON DO NOT HAVE SOLENOID OPERATED CHECK VALVES. |                                                       |                                |                     |                  |                              |                               |
| PNEUMATIC-65E<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                                     | 92-08-126<br>MOTOR OPERATED HELIUM VALVE              | FAR<br>27-08116-9              | 391000              | WTR              | YES ROBERTSHAM FUL<br>NO TON | 699400                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. TWO VALVES FAILED TO OPEN ON COMMAND. FAILURE RESULTED FROM TWO TEFLON WASHERS EXTRUDING INTO MICROSWITCH CAM SLOT AND ARMATURE BRUSHES DUE TO VALVE OVERTRAVEL (CAUSE NOT DETERMINED)                                                                                                         |                                                       |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-MODIFICATION OF VALVES EFFECTIVE AUGUST 1959 CONSISTED OF CHANGING ADJUSTING SET SCREW TO A LOCKWITE NYLON PLUG TO BE IMBEDDED IN THE ADJUSTING THREADS TO MAKE A POSITIVE LOCK.                                                                                                                                              |                                                       |                                |                     |                  |                              |                               |
| PNEUMATIC-65E<br>BOOSTER                                                                                                                                                                                                                                                                                                                        | EM1330/P4-401-00-10<br>TUBING HYDRAULIC PRESSURE GAGE | FRF                            | 100<br>590901       | 14<br>-1800      | YES<br>NO                    |                               |
| FAILURE MODE-EXTERNAL LEAK. A PRESSURE GAGE LINE ON A HELIUM COMPRESSOR WAS FOUND TO BE LEAKING DURING A HOLD FOR 1 INSTALLING SEARCH LIGHTS.                                                                                                                                                                                                   |                                                       |                                |                     |                  |                              |                               |
| SYSTEM EFFECT-CONTAMINATION. HYDRAULIC FLUID LEAKAGE WAS CAUSING POSSIBLE FIRE HAZARD IN THE HELIUM COMPRESSOR AREA                                                                                                                                                                                                                             |                                                       |                                |                     |                  |                              |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. COUNTDOWN WAS FURTHER DELAYED WHILE THE LEAKAGE WAS BEING CORRECTED.                                                                                                                                                                                                                                          |                                                       |                                |                     |                  |                              |                               |

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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE OF | SITE<br>TIME OF | PRI<br>OTH                   | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------|--------------------|-----------------|------------------------------|-------------------------------|--------|
| CORRECTIVE ACTION-LEAKING LINE WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |                                |                    |                 |                              |                               | 692351 |
| PNEUMATIC-68E<br>BOOSTER                                                                                                                                                                                                                                                                                                                                                                                                                           | EN1330/P4-401-00-10<br>PRESSURIZATION COMPRESSOR           | FRF                            | 100<br>590901      | 14<br>-2100     | YES<br>NO                    |                               | 692353 |
| FAILURE MODE-ERRATIC OPERATION. ONE OF THE GROUND HELIUM PRESSURIZATION COMPRESSORS WAS FOUND TO BE OPERATING IMPROPERLY DURING FLIGHT READINESS FIRING TEST COUNTDOWN.<br><br>SYSTEM EFFECT-OPERATION TOO LOW. THE AIRBORNE HELIUM BOTTLES COULD NOT BE PRESSURIZED TO THE CORRECT LEVEL BY THE 6 GROUND COMPRESSORS.<br><br>VEHICLE EFFECT-COUNTDOWN DELAYED. THE COUNTDOWN WAS DELAYED 110 MINUTES WHILE THE DEFECTIVE COMPRESSOR WAS REPLACED. |                                                            |                                |                    |                 |                              |                               |        |
| CORRECTIVE ACTION-COMPRESSOR REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                             |                                                            |                                |                    |                 |                              |                               |        |
| PNEUMATIC-68E<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                        | 9A-08117<br>GROUND BREAKAWAY DISCONNECT VALVES 7-08225-801 | FAR                            | 590800             | EDWARDS         | YES ROBERTSHAW FUL<br>NO TON |                               | 692439 |
| FAILURE MODE-LEAK EXTERNAL AT MATING SEAL DURING NORMAL OPERATION. LEAKAGE RESULTED FROM WRONG ASSEMBLY AT MATING SEAL AND WASHER.                                                                                                                                                                                                                                                                                                                 |                                                            |                                |                    |                 |                              |                               |        |
| CORRECTIVE ACTION-INCREASED QUALITY CONTROL INSPECTION AT 60/C AND VENDOR.                                                                                                                                                                                                                                                                                                                                                                         |                                                            |                                |                    |                 |                              |                               |        |
| PNEUMATIC-68E<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                        | 9A-08-117<br>GROUND BREAKAWAY DISCONNECT VALVES 7-08225-5  | FAR                            | 590600             | EDWARDS         | YES ROBERTSHAW FUL<br>NO TON |                               | 692441 |
| FAILURE MODE-LEAK-EXTERNAL AT MATING SEAL DURING NORMAL OPERATION. LEAKAGE RESULTED FROM WRONG ASSEMBLY OF MATING SEAL AND WASHER.                                                                                                                                                                                                                                                                                                                 |                                                            |                                |                    |                 |                              |                               |        |
| CORRECTIVE ACTION-INCREASED QUALITY CONTROL INSPECTION AT 60/C AND VENDOR.                                                                                                                                                                                                                                                                                                                                                                         |                                                            |                                |                    |                 |                              |                               |        |
| PNEUMATIC-68E                                                                                                                                                                                                                                                                                                                                                                                                                                      | FTA2382/P4-102-00-12                                       | COUNTDOWN                      | 12A<br>571217      | 14<br>-4500     | YES<br>NO                    |                               | 692451 |
| FAILURE MODE-LEAK-EXTERNAL-LEAK AT THE COMPRESSOR WHICH PRESSURIZES THE GROUND HELIUM STORAGE TANK<br><br>SYSTEM EFFECT-OPERATION DOES NOT START. GROUND LOADING SYSTEM WAS UNABLE TO LOAD HELIUM ON THE VEHICLE.<br><br>VEHICLE EFFECT-COUNTDOWN DELAYED. 33 MIN HOLD.<br><br>CORRECTIVE ACTION-REPAIR LEAK AT COMPRESSOR.                                                                                                                        |                                                            |                                |                    |                 |                              |                               |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                | VEHICLE NAME<br>VEHICLE PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|---------------------------|---------------------------------|
| PNEUMATIC-68E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SLV-98-08-3247<br>TUBING                    | FAR<br>27-81583-23             | 660300              | CX13             | YES 6D/C<br>NO MIL-Y-8845 | 699327                          |
| <p>FAILURE MODE-CONTAMINATION. THREE SPECIMENS OF TUBING USED IN THE STRETCH SLING SYSTEM WERE FOUND TO BE CORRODED. SYSTEM OPERATES AT 180 PSIG PNEUMATIC PRESSURE.</p> <p>CORRECTIVE ACTION-FAILURE ANALYSIS WAS RESTRICTED TO METALLURGICAL EVALUATION OF TUBE MATERIAL AND CHEMICAL ANALYSIS OF TUBE COMPOSITION. FAILURE WAS DUE TO MARINE ATMOSPHERE AND SUSCEPTIBILITY OF TYPE 304 CRES TO STRESS CORROSION IN A MARINE ATMOSPHERE. A CHANGE TO TYPE -316 CRES WAS PROPOSED TO 880 AND WAS NOT APPROVED BECAUSE OF THE FOUR-YEAR LIFE EXPECTANCY OF THESE TUBES AND BECAUSE THESE TUBES ARE INSPECTED AFTER EACH LAUNCHING. NO FURTHER ACTION TO BE TAKEN. THIS ACTION DOCUMENTED IN MEMO OF 12 MAY 1966 FROM RELIABILITY TECHNICAL REQUIREMENTS GROUP.</p> |                                             |                                |                     |                  |                           |                                 |
| PNEUMATIC-68E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CT-98-560-123<br>SOLENOID VALVE/O-RING      | FAR<br>55-02981-1              | 650819              | 368              | YES MAROTTA<br>NO 806134  | 699301                          |
| <p>FAILURE MODE-EXTERNAL LEAK. SOLENOID VALVE LEAKED GASEOUS NITROGEN FROM BODY VENT HOLE. LEAKAGE CAUSED BY POPPET ASSEMBLY O-RING HAVING UNFILLED SECTION ON INNER CIRCUMFERENCE. DAMAGE TO O-RING APPARENTLY RESULTED FROM EXTRUSION BETWEEN THE BORE AND A TOO-SHORT TEFLON BACKUP RING WHEN PRESSURE APPLIED TO VALVE. O-RING AND BACKUP RING WERE INSTALLED BY VENDOR.</p> <p>CORRECTIVE ACTION-REQUESTED THAT VENDOR EXAMINE O-RINGS AND REJECT THOSE WITH VOIDS, AND THAT BACKUP RINGS BE VISUALLY EXAMINED AFTER INSTALLATION TO CHECK FOR CORRECT LENGTH.</p>                                                                                                                                                                                            |                                             |                                |                     |                  |                           |                                 |
| PNEUMATIC-68E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | A1-4MO-01-21<br>PRESSURE SWITCH             | COMPOSITE-FRD/DPL              | 2100                | A-1              | NO<br>NO                  | 699400                          |
| <p>FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. PCU PRESSURE SWITCH/FUEL TANK PRESSURE GREATER THAN 17 PSI) FAILED TO OPERATE.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. LOX CHILDDOWN COULD NOT BE INITIATED.</p> <p>CORRECTIVE ACTION-POST TEST INVESTIGATION REVEALED THAT SWITCH WAS PNEUMATICALLY DISCONNECTED. THE SWITCH WAS CONNECTED PROPERLY. KCA</p>                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |                           |                                 |
| PNEUMATIC-68E<br>GROUND PRESSURIZATION<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A3-4MO-01-300                               | 300-D<br>641021                | A3                  | NO<br>NO         |                           |                                 |
| <p>FAILURE MODE-FAIL DURING OPERATION. 68E PRESSURE SWITCH 17 FAILED DURING THE HELIUM LOADING SEQUENCE.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |                           |                                 |

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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME | SITE<br>DIF TIME | PRI<br>OTH                 | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|--------------------------|------------------|----------------------------|-------------------------------|
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. HELIUM LOADING STOPPED PREMATURELY.                                                                                                                                                               |                                             |                                |                          |                  |                            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                            |                                             |                                |                          |                  |                            |                               |
| CORRECTIVE ACTION-GSE SWITCH P/S 17 (LN2 STORAGE TANK) REPLACED.                                                                                                                                                                             |                                             |                                |                          |                  |                            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                       | A1-4MO-01-233<br>PRESSURE SWITCH            | COMPOSITE-FRD/DPL              | 233D<br>031112           | A-1              | NO<br>NO                   |                               |
| FAILURE MODE-OUT OF TOLERANCE. GSE LOX TANK PRESSURE SWITCH WAS INDICATING TOO HIGH TO ALLOW FUEL DRAIN TO BE COMPLETED.                                                                                                                     |                                             |                                |                          |                  |                            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                          |                                             |                                |                          |                  |                            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. FUEL DRAIN SEQUENCE STOPPED PREMATURELY.                                                                                                                                                                   |                                             |                                |                          |                  |                            |                               |
| CORRECTIVE ACTION-GSE SWITCH RECALIBRATED.                                                                                                                                                                                                   |                                             |                                |                          |                  |                            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                       | 9P-9B-58-3556<br>PRESSURE SWITCH            | FAR                            | 031017                   | 13               | YES MELETRON<br>NO 920-20L |                               |
| FAILURE MODE-FAILED DURING OPERATION. SWITCH FAILED WHEN IT WOULD NOT RESET BELOW 4D P816. FAILURE WAS NOT CONFIRMED. PCU PRESSURE SWITCH SETTINGS LISTED IN 27-02310 DID NOT AGREE WITH PRESSURE SWITCH SETTINGS IN 27-93417, BOOK 3.       |                                             |                                |                          |                  |                            |                               |
| CORRECTIVE ACTION-DRAWING CHANGE A TO 27-92310 CALIBRATION DATA FOR PCU WAS RELEASED SEPTEMBER 23, 1963 CHANGING THE PCU PRESSURE SWITCH SETTINGS TO AGREE WITH THE CORRECT SETTING IN GROUND PNEUMATIC CHECKOUT PROCEDURE 27-93417, BOOK 3. |                                             |                                |                          |                  |                            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                       | A1-4MO-03-232<br>PRESSURE SWITCH            | COMPOSITE-FRD/DPL              | 232D<br>031011           | A-1              | NO<br>NO                   |                               |
| FAILURE MODE-OUT OF TOLERANCE. COMMIT STOP OCCURRED DUE TO A FALSE LOX TANK PRESSURE HIGH. INDICATION FROM A GSE SWITCH.                                                                                                                     |                                             |                                |                          |                  |                            |                               |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. THE PCU WENT INTO EMERGENCY.                                                                                                                                                                        |                                             |                                |                          |                  |                            |                               |
| VEHICLE EFFECT-COMPOSITE ABORTED.                                                                                                                                                                                                            |                                             |                                |                          |                  |                            |                               |
| CORRECTIVE ACTION-GSE SWITCH RECALIBRATED.                                                                                                                                                                                                   |                                             |                                |                          |                  |                            |                               |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PR<br>OTH | VENDOR NAME<br>VENDOR PART NO                    |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|-----------|--------------------------------------------------|--------|
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                | B2-4MO-63<br>PRESSURE CONTROL UNIT          | COMPOSITE-FRD/DPL              | 63D<br>630923       | 92               | YES<br>NO |                                                  | 699491 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. PCU FAILED TO STEP LOX TANK TO FLIGHT PRESSURE DURING THE COMMIT SEQUENCE.                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |           |                                                  |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. COMMIT SEQUENCE TERMINATED.                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |           |                                                  |        |
| VEHICLE EFFECT-DPL COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |           |                                                  |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |           |                                                  |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                | FAR-CT-9B-56-C14<br>SOLENOID VALVE          | FAR                            | 126D<br>630715      | 36A              | YES<br>NO | ATKOMATIC<br>NO 11-147,8097005                   | 699679 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. ATTRIBUTED TO LACK OF COMPATIBILITY BETWEEN VALVE DESIGN AND THE IN-SERVICE MEDIUM, HELIUM, MAKING THE PISTON BLEED-RATE AND PROPER VALVE OPERATION UNPREDICTABLE.                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |           |                                                  |        |
| CORRECTIVE ACTION-RECOMMENDED REPLACEMENT OF THE VALVE WITH A MORE SUITABLE UNIT.                                                                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |           |                                                  |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                | FAR-CT-9B-56-087<br>SOLENOID VALVE          | FAR                            | 126D<br>630703      | 36A              | YES<br>NO | ATKOMATIC<br>NO 11-14585K60920<br>02             | 699677 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE SOLENOID VALVE FAILED TO PERMIT LOX TANK ULLAGE PRESSURE TO RISE FROM 15 TO 30 PSIG IN THE REQUIRED 5.5 SECONDS. FAILURE CONFIRMED AND ATTRIBUTED TO LACK OF COMPATIBILITY BETWEEN VALVE DESIGN AND THE IN-SERVICE MEDIUM, HELIUM, MAKING THE PISTON BLEED-RATE AND PROPER VALVE OPERATION UNPREDICTABLE.                                                                                                        |                                             |                                |                     |                  |           |                                                  |        |
| CORRECTIVE ACTION-RECOMMENDED REPLACEMENT OF THE VALVE WITH A MORE SUITABLE UNIT.                                                                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |           |                                                  |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                | FAR-CT-9B-56-084<br>RELIEF VALVE, POPPET    | FAR                            | 630604              | 36A              | YES<br>NO | CIRCLE SEAL<br>NO 5159T1-16TB-17<br>00PH/812A013 |        |
| FAILURE MODE-FAIL TO CEASE OPERATION AT PRESCRIBED TIME. THE PNEUMATIC RELIEF VALVE VENTS HELIUM WHEN THE SUPPLY PRESSURE TO THE PCU RISES ABOVE 1700 PSIG. VALVE FAILED TO RESEAT AFTER CRACKING. FAILURE WAS CONFIRMED. THE POPPET AND GUIDE AREA WERE CALLED BECAUSE CLEARANCE BETWEEN THE POPPET AND THE HOUSING WAS TOO SMALL RESULTING IN STAINLESS STEEL MOVING AGAINST STAINLESS STEEL OR FOREIGN MATERIAL JAMMED BRIEFLY BETWEEN THE POPPET AND ITS HOUSING. |                                             |                                |                     |                  |           |                                                  |        |
| CORRECTIVE ACTION-RECOMMENDED VENDOR BE INFORMED OF THE ELLIPTICAL SHAPE OF THE POPPET AND THE RESULTING FAILURE AND REQUEST VENDOR INSURE MACHINING AND TOOLING ACCURACY IS MAINTAINED. APPROPRIATE FIELD PERSONNEL SHOULD MAKE SURE C                                                                                                                                                                                                                               |                                             |                                |                     |                  |           |                                                  |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                 | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO                    |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------------------------|--------|
| CONTAMINANTS FROM CALLED AREA DO NOT CONTAMINATE THE SYSTEM.                                                                                                                                                                                                                                                                                                      |                                                             |                                |                     |                  |            |                                                  | 099663 |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-58-081<br>RELIEF VALVE, SEAL                      | FAR                            | 630531              | 36A              | YES<br>NO  | CIRCLE SEAL<br>NO 315971-167B-17<br>DOPH/812A013 | 099662 |
| FAILURE MODE-FAIL DURING OPERATION. THE PNEUMATIC RELIEF VALVE VENTS HELIUM WHEN THE SUPPLY PRESSURE TO THE PCU RISES ABOVE 1700 PSIG. VALVE FAILED TO RESEAT AFTER CRACKING. FAILURE CONFIRMED, CAUSED BY SLIGHT AMOUNT OF COLD FLOW PLUS CONTAMINATION ON THE SEAL. THE SEAL MATERIAL WAS MARGINAL IN RELATION TO NOMINAL STANDARDS SET FOR THIS TYPE MATERIAL. |                                                             |                                |                     |                  |            |                                                  |        |
| CORRECTIVE ACTION-RECOMMENDED VENDOR BE NOTIFIED OF THE CONDITION OF THE SEAL MATERIAL AND REQUESTED SEAL STOCK BE EXAMINED TO PRECLUDE USE OF MARGINAL OR BELOW STANDARD STOCK. APPROPRIATE FIELD PERSONNEL BE INFORMED OF THE CONTAMINATION AND REQUESTED CHECK OF SYSTEM FILTERS AND TAKE NECESSARY ACTION TO INSURE SYSTEM CLEANLINESS.                       |                                                             |                                |                     |                  |            |                                                  |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-58-036<br>RELIEF VALVE POPPET                     | FAR                            | 116D<br>630529      | 36A              | YES<br>NO  | CIRCLE SEAL<br>NO P33-344/812A01<br>3            | 099676 |
| FAILURE MODE-OUT OF TOLERANCE. THE PNEUMATIC RELIEF VALVE VENTS SUPPLY PRESSURE TO THE PCU. IT FAILED BECAUSE IT COULD NOT BE ADJUSTED TO THE CORRECT CRACKING PRESSURE. FAILURE WAS CONFIRMED. THE POPPET WAS SHEARED AND THE POPPET GUARD DE SCORED. CAUSE OF FAILURE COULD NOT BE DETERMINED.                                                                  |                                                             |                                |                     |                  |            |                                                  |        |
| CORRECTIVE ACTION-RECOMMENDED THAT THE VENDOR BE INFORMED OF THE FAILURE AND REQUEST VENDOR INVESTIGATE ASSEMBLY AND INSPECTION PROCEDURES TO LOCATE ANY AREA WHICH MIGHT CAUSE THIS TYPE FAILURE.                                                                                                                                                                |                                                             |                                |                     |                  |            |                                                  |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                            | AD63-0066/DA922/L2-4MO-03-119<br>SWITCH                     | COMPOSITE-FRD/DPL              | 119D<br>630423      | 1-2              | YES<br>NO  |                                                  | 099307 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. PCU MICROSWITCH ACTIVATION FAILURE PREVENTED SENDING THE CLOSING COMMAND TO AIRBORNE CHANGEOVER VALVE AT COMMIT STOP.                                                                                                                                                                                            |                                                             |                                |                     |                  |            |                                                  |        |
| SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. AIRBORNE HELIUM SUPPLY VENTED THROUGH THE LOX AIRBORNE REGULATOR AND BOIL-OFF VALVE.                                                                                                                                                                                                                                       |                                                             |                                |                     |                  |            |                                                  |        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                                                 |                                                             |                                |                     |                  |            |                                                  |        |
| CORRECTIVE ACTION-PCU MICROSWITCH READJUSTED AND AIRBORNE LOX REGULATOR WAS REPLACED.                                                                                                                                                                                                                                                                             |                                                             |                                |                     |                  |            |                                                  |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                            | AD63-0066/DA922/L2-4MO-02-119<br>INFLIGHT HELIUM VENT VALVE | COMPOSITE-FRD/DPL              | 119D<br>630423      | 1-2              | YES<br>NO  |                                                  |        |
| FAILURE MODE-FAIL DURING OPERATION. INFLIGHT HELIUM VENT VALVE IN GROUND SYSTEM OPENED MOMENTARILY AFTER COMMIT STOP.                                                                                                                                                                                                                                             |                                                             |                                |                     |                  |            |                                                  |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-63E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                  | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|-----------------------------|-------------------------------|
| <p>SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. INFLIGHT HELIUM BOTTLES ON MISSILE DECAYED 400 PSIG.</p> <p>VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p>                                                                                                                                                                                                                    |                                             |                                |                     |                  |                             |                               |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                           | LMSC-8040277/P2-4BN-01-215<br>REGULATOR     | COMPOSITE-FRO/DPL              | 215D<br>820927      | 12               | YES<br>NO                   | 699960                        |
| <p>FAILURE MODE-FAIL DURING OPERATION. THE POWER REACTOR REGULATOR WHICH REGULATES PRESSURE TO THE LO2 STORAGE TANK WAS ALLOWING A CONTINUOUS DECAY IN STORAGE TANK PRESSURE DURING THE TANKING TEST.</p> <p>SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. LO2 STORAGE TANK PRESSURE WAS DECAYING CONTINUOUSLY DURING THE TANKING.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-THE REGULATOR WAS REPLACED.</p> |                                             |                                |                     |                  |                             |                               |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                           | FAR-A-98-58-3357<br>VALVE                   | FAR                            | 820810              | 12               | YES A.W. CASH<br>NO 8138001 | 699761                        |
| <p>FAILURE MODE-ERRATIC OPERATION. THE DIAPHRAGM VALVE FAILED TO PROPERLY PORT THE INSTRUMENT AIR FROM THE SEQUENCE 1-2 CONTROLLER. VALVE SEAT AND SYSTEM CONTAMINATION IN THE FORM OF TRANSIENT PARTICLES COULD HAVE CAUSED THE FAILURE.</p> <p>CORRECTIVE ACTION-COGNIZANT SITE PERSONNEL INFORMED OF THE UNCONFIRMED FAILURE AND OF POSSIBLE SYSTEM CONTAMINATION. FAILURE NOT CONFIRMED.</p>                 |                                             |                                |                     |                  |                             |                               |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                           | AA82-0087/P6-402-00-104<br>VALVE            | COUNTDOWN<br>7-89310-3         | 1040<br>820411      | 36A              | YES<br>NO                   | 699811                        |
| <p>FAILURE MODE-FAIL DURING OPERATION. VALVE 4 IN THE PCUA HEAT EXCHANGER FAILED WITH 4400 PSIG APPLIED TO THE VALVE 1 INLET.</p> <p>SYSTEM EFFECT-OPERATION TOO LOW. THE TEST WAS CONTINUED WHEN IT WAS FOUND THAT THE VALVE WOULD CONTROL PROPERLY WITH AN INLET PRESSURE OF 3800 PSIG.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p>                                                      |                                             |                                |                     |                  |                             |                               |

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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | FRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | AD62-0042/DA696/D2-6MO-01-13                | COMPOSITE-FRD/DPL              | 13F<br>620407       | 6                | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE OPEN POSITION MICRO-SWITCH ON THE LM2 RAPID LOAD VALVE FAILED TO INDICATE THAT THE VALVE WAS OPEN.                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE SWITCH WAS MANUALLY ACTIVATED.                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | AD62-0042/DA696/D2-6MO-01-13                | COMPOSITE-FRD/DPL              | 13F<br>620407       | 6                | NO<br>YES  |                               |
| FAILURE MODE-LEAK EXTERNAL-GSE RELIEF VALVE 12 IN THE BOTTLE PRESSURIZATION SYSTEM WAS LEAKING AND RESULTED IN LOW CONTROLS BOTTLE PRESSURE.                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-DEPLETION OF GAS SUPPLY IN SUSTAINER CONTROL HELIUM BOTTLE.                                                                                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | FAR-AC-9B-58-240<br>GAS REGULATOR           | FAR                            | 620402              | 12               | YES<br>NO  | YES<br>NO<br>NT<br>LR208      |
| FAILURE MODE-OUT OF TOLERANCE. THE REGULATOR, A COMPONENT OF THE LAUNCHER BOOSTER UNIT, FAILED WHEN IT WAS FOUND TO BE LEAKING CONTINUOUSLY FROM THE VENT PORT. FAILURE WAS CONFIRMED AND RESULTED FROM WEAR CAUSED BY IMPROPER ALIGNMENT OF PARTS WITHIN THE REGULATOR. IMPROPER ALIGNMENT DAMAGED THE CONTROL AND VENT VALVES PERMITTING CONTINUOUS VENTING AND INABILITY TO REGULATE PROPERLY. |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-INCREASE SURVEILLANCE TO DETECT EARLY SIGNS OF FAILURE TO EFFECT RAPID REPLACEMENT AND MAINTAIN MAXIMUM OPERATING EFFICIENCY.                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                            | DA67502-6MO-16-03<br>PRESSURE CONTROL UNIT  | COMPOSITE-FRD/DPL              | 3F<br>620320        | 6                | NO<br>NO   |                               |
| FAILURE MODE-OUT OF SPECIFICATION. STOPPED COMMIT SEQUENCE DUE TO PCU STEPPING TO EMERGENCY.                                                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. FLIGHT PRESS IN THE LOS TANK WAS NOT MAINTAINED, NOR WAS THE PCU ABLE TO STAY IN AUTOMATIC FOR COMMIT.                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                 | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
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| CORRECTIVE ACTION-PS 384 SET TO 29.92 PSIG (PCU LOS PRESS DUCT).                                                                                                                                                                                                                                                                                                         |                                                             |                                |                     |                  |            |                               | 099467 |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                   | AG-98-58-178F<br>REGULATOR FILTER                           | FAR                            | 620119              | 12               | YES<br>NO  | VICTOR<br>LR20A               | 099736 |
| FAILURE MODE-OUT OF SPECIFICATION. REGULATOR WOULD NOT MAINTAIN REQUIRED OUTLET PRESSURE. PROBLEM RESULTED FROM PRESSURE SURGE IN REGULATOR SUPPLY LINE WHEN HAND VALVE OPENED TO PRESSURIZE SYSTEM. PRESSURE SURGE CAUSED INLET FILTER TO BLOW OUT AND CONTAMINATE REGULATOR HOUSING WALLS. THE CHECK VALVE POPPET COCKED DURING VALVE OPERATION SCORING HOUSING WALLS. |                                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-SUBJECT REGULATOR NO LONGER BEING MANUFACTURED. NEW REGULATOR HAS REDESIGNED INLET FILTER AND INTERNAL BODY ASSEMBLY. RECOMMENDED THAT RESTRICTOR BE PLACED IN SUPPLY LINE TO DAMPEN SURGES WHEN PRESSURIZING SYSTEM.                                                                                                                                  |                                                             |                                |                     |                  |            |                               | 099098 |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                   | AA62-0026/P2-48N-01-121<br>2.5 PSIG REGULATOR               | COMPOSITE-FRD/DPL              | 1210<br>620109      | 12               | YES<br>NO  |                               |        |
| FAILURE MODE-ERRATIC OPERATION. REGULATOR FAILED TO MAINTAIN FUEL STORAGE TANK PRESSURE AT A SAFE OPERATING LEVEL.                                                                                                                                                                                                                                                       |                                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION. FUEL STORAGE TANK PRESSURE WOULD NOT STABILIZE.                                                                                                                                                                                                                                                                                         |                                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                     |                                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE REGULATOR WAS REPLACED BY THE RANGE CONTRACTOR.                                                                                                                                                                                                                                                                                                    |                                                             |                                |                     |                  |            |                               | 099740 |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                   | AG98-58-183-F<br>REGULATOR FILTER                           | FAR                            | 611222              | 12               | YES<br>NO  | VICTOR<br>LR20A               |        |
| FAILURE MODE-OUT OF TOLERANCE. REGULATOR COULDNOT BE ADJUSTED TO MAINTAIN CONSTANT OUTLET PRESSURE. PROBLEM CAUSED BY CONTAMINATION OF FILTER WHICH LED TO RUPTURE OF FILTER AND CONTAMINATION OF VALVE POPPET SEAT. THIS REGULATOR CONTROLS SUPPLY PRESSURE TO THE HASWELL LAUNCH BOOSTER UNIT.                                                                         |                                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-SITE NOTIFIED BY TWX OF FINDINGS OF ANALYSIS AND RECOMMENDATION MADE THAT SYSTEM BE CHECKED FOR CLEANLINESS AND CLEANED IF NECESSARY. FILTERS DOWNSTREAM OF FAILED REGULATOR WERE REPLACED.                                                                                                                                                            |                                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                   | AA61-0111/P6-4CWO-03-104/C2<br>PRESSURE CONTROL UNIT, VALVE | COMPOSITE-FRD/DPL              | 1040<br>610910      | 36A<br>-18       | NO<br>NO   |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE PNEUMATIC SYSTEM FAILED TO SWITCH FROM PHASE III PRESSURE TO PHASE I PRESSURE IN THE FUEL TANK IN THE ABORT SEQUENCE.                                                                                                                                                                                               |                                                             |                                |                     |                  |            |                               |        |

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GENERAL DYNAMICS  
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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GNE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                             | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|----------------------------------------|-------------------------------|
| SYSTEM EFFECT-OPERATION DOES NOT START. PNEUMATIC SYSTEM PRESSURE FOR FUEL TANK IS OUT OF SEQUENCE THIS PROBLEM WAS CAUSED BY IMPROPER OPERATION OF VALVE 20 IN THE PCU.                                                                  |                                             |                                |                     |                  |                                        |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                      |                                             |                                |                     |                  |                                        |                               |
| CORRECTIVE ACTION-CHANGE VALVE 20 RESPONSE TIME.                                                                                                                                                                                          |                                             |                                |                     |                  |                                        |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                    | 98-56-015<br>FILTER ELEMENT                 | FAR                            | 010403              | 13               | YES PERMANENT FIX<br>YES ER<br>8369-10 | 609731                        |
| FAILURE MODE-STRUCTURAL. FILTER ELEMENT RUPTURED. FILTER DAMAGE WAS A SECONDARY FAILURE CAUSED BY THE ABNORMAL OPERATION OF THE SHUT OFF REGULATOR VALVE, 27-02277-1.                                                                     |                                             |                                |                     |                  |                                        |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                |                                             |                                |                     |                  |                                        |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                    | AA61-007/P2-401-00-80<br>COMPRESSOR WIRING  | COUNTDOWN<br>7-09144-001       | 900                 | 12               | YES HASKELL<br>NO                      | 609889                        |
| FAILURE MODE-ELECTRICAL OPEN. DURING THE COUNTDOWN, THE HASKELL COMPRESSOR FAILED TO CYCLE IN THE REMOTE POSITION. THE TROUBLE WAS TRACED TO A BROKEN WIRE IN THE COMPRESSOR CONTROL BOX.                                                 |                                             |                                |                     |                  |                                        |                               |
| SYSTEM EFFECT-LOSS OF REDUNDANCY. AN ALTERNATE COMPRESSOR WAS USED UNTIL THE FAILED UNIT WAS REPLACED DURING A HOLD.                                                                                                                      |                                             |                                |                     |                  |                                        |                               |
| VEHICLE EFFECT-NONE. THE COMPRESSOR WAS REPLACED DURING A HOLD FOR A/C ANTENNA FAIRING. ROSLEM.                                                                                                                                           |                                             |                                |                     |                  |                                        |                               |
| CORRECTIVE ACTION-CONTROL BOX WIRING REPAIRED.                                                                                                                                                                                            |                                             |                                |                     |                  |                                        |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                    | 37-58-008<br>SOLENOID VALVE                 | FAR                            | 600910              | 13               | YES ATOMATIC<br>NO 808200R             | 609609                        |
| FAILURE MODE-OUT OF TOLERANCE. THE VALVE FAILED TO CLOSE DURING OPERATION. THE DESIGN OF THE PISTON RING WHICH CONTROLS PILOT PRESSURE LEAKAGE IS MARGINAL, WHICH RESULTED IN RING INSTABILITY AND UNCONTROLLED PILOT PRESSURE FLOW RATE. |                                             |                                |                     |                  |                                        |                               |
| CORRECTIVE ACTION-CONVAIR HAS TAKEN ACTION TO REPLACE ALL ATOMATIC VALVES WITH ROBE OTHER VALVE WHICH WILL BE SELECTED AFTER COMPLETION OF QUALIFICATION TESTS.                                                                           |                                             |                                |                     |                  |                                        |                               |

GENERAL DYNAMICS  
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DIFFICULTIES REVIEW-PNEUMATIC: SYSTEM-GSE

| SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TEST/REPORT NUMBER                 | DIFF DATA SOURCE | VEHICLE | DATE | TIME | SIZE       | PRI | VENDOR NAME    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------|---------|------|------|------------|-----|----------------|
| SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | FAILED COMPONENT NAME              | PART NUMBER      | DATE    | TIME | DIS  | OTH        |     | VENDOR PART NO |
| PNEUMATIC-GSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ETR-008/14-S01-C1-3E               | CAPT VC          | 600803  | 1-4  | YES  | NO         |     |                |
| GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PRESSURE SWITCH                    |                  |         |      |      |            |     |                |
| <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. P380, WHICH TERMINATES CHARGING OF THE SUSTAINER CONTROLS HELIUM BOTTLE, FAILED DURING COUNTDOWN. WATER WAS DISCOVERED IN THE PRESSURE SWITCH CONNECTOR.</p> <p>SYSTEM EFFECT-NONE. BOTTLE CHARGING WAS TERMINATED MANUALLY.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-CONNECTOR WAS DRIED AND HOTTED.</p>                                                                                                                                                                                                                                                                                |                                    |                  |         |      |      |            |     |                |
| PNEUMATIC-GSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 95-58-046                          | FAR              | 800107  | 13   | YES  | VICTOR     |     |                |
| GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PNEUMATIC REGULATOR                |                  |         |      | NO   | 13163      |     |                |
| <p>FAILURE MODE-ERRATIC OPERATION. THE REGULATOR WAS REGULATING ERRATICALLY AND THE TEFLON BACK-UP WASHER HAD COLD FLOW DISTORTION AT THE SEAL ON THE POPPET CHAMBER BACK-PLUG. THE BACK-PLUG WASHER WAS EXTRUDING BECAUSE OF EXCESSIVE DESIGN CLEARANCE BETWEEN THE BODY AND THE BACK-PLUG.</p> <p>CORRECTIVE ACTION-ACTION HAS BEEN TAKEN WITH THE VENDOR OF THE PUNCHER BOOSTER UNIT TO CHANGE THE BACK PLUG AND BACK UP WASHERS ON ALL SIMILAR REGULATORS NOW IN USE TO REDUCE THE CLEARANCE AT THE WASHER.</p>                                                                                                                                      |                                    |                  |         |      |      |            |     |                |
| PNEUMATIC-GSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 90-50-019                          | FAR              | 391000  | 13   | YES  | ROBERTSHAW | FUL |                |
| GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FUEL TANK PRESSURIZATION REGULATOR |                  |         |      | NO   | TOM        |     |                |
| <p>FAILURE MODE-EXTERNAL LEAKAGE. REGULATOR MAINTAINED A HIGHER OUTLET PRESSURE WHILE THE INLET PRESSURE WAS DROPPING TO THE MINIMUM ALLOWABLE FUEL TANK PRESSURE. THIS PREVENTED THE CONTROLLER VALVE FROM SENSING LOW TANK PRESSURE AND APPLYING EMERGENCY PRESSURIZATION TO THE MISSILE TANK. THE REGULATOR WAS FOUND TO LEAK THROUGH THE ATMOSPHERE VENT ABOVE THE OUTLET PRESSURE FLASHING DIAPHRAGM. REASON FOR THE LEAKAGE WAS FOUND TO BE A POOR SEALING SURFACE ON THE STEEL NEEDLE VALVE.</p> <p>CORRECTIVE ACTION-CONVAIR IS REPLACING THE PRESSURE CONTROLLER VALVE WITH A CONTROLLER WHICH CAN ACCEPT THE FULL RANGE OF TANK PRESSURES.</p> |                                    |                  |         |      |      |            |     |                |
| PNEUMATIC-GSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 98-08-123                          | FAR              | 120     | WTR  | YES  | 50/C       |     |                |
| GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | HELIUM SHUT OFF VALVE              | 27-0816-0        | 391000  |      | NO   |            |     |                |
| <p>FAILURE MODE-SOLENOID VALVE CONTAMINATION IN THE POPPET WITH METAL PARTICLES, HELIUM SEEPAGE IN MANIFOLD AND MOISTURE THROUGHOUT UNIT.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                    |                  |         |      |      |            |     |                |

GENERAL DYNAMICS  
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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-59E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME             | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-INSTRUCTIONS ISSUED TO BLOWDOWN THE HELIUM SYSTEM TO REMOVE DIRT PARTICLES AND MOISTURE. INSPECT THE GROUND HELIUM FILTER FOR METAL PARTICLES AND CLEAN AS REQUIRED.                                                         |                                                         |                                |                     |                  |            |                               | 899391 |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                         | 98-08-123<br>HELIUM SHUT OFF VALVE                      | FAR<br>27-08118-9              | 60<br>591000        | WTR              | YES<br>NO  | 60/C                          | 899399 |
| FAILURE MODE-CONTAMINATION, SOLENOID VALVE CONTAMINATION IN THE POPPET WITH METAL PARTICLES- KEL-F GREASE IN MANIFOLD AND MOISTURE THROUGHOUT UNIT.                                                                                            |                                                         |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-INSTRUCTIONS ISSUED TO BLOWDOWN THE HELIUM SYS. TO REMOVE DIRT PARTICLES AND MOISTURE-INSPECT THE GROUND HELIUM FILTER FOR METAL PARTICLES AND TO CLEAN AS REQUIRED.                                                         |                                                         |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                         | FTA 5073/PS-401-00-14<br>PRESSURE CONTROL UNIT, SEAL    | FRI                            | 140<br>390724       | 13<br>-4800      | NO<br>NO   |                               | 899402 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. LHZ LOAD COULD NOT START DUE TO A BLOWING LEAK IN THE LHZ HEAT EXCHANGER UNIT OF THE PCU. THE LEAK WAS LOCATED AT THE SEAL BETWEEN A RELIEF VALVE AND THE BULKHEAD FITTING ON THE INLET SIDE. |                                                         |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. LHZ LOAD COULD NOT BEGIN.                                                                                                                                                                              |                                                         |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 45 MINUTE HOLD                                                                                                                                                                                               |                                                         |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE BULKHEAD FITTING WAS REMOVED AND REPLACED WITH A COMPLETE UNIT WITH SEAL.                                                                                                                                                |                                                         |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                         | 98-08-120<br>DISCONNECT VALVE/POPPET                    | FAR<br>7-08224-7               | 60<br>390700        | ETR              | YES<br>NO  | ROBERTSHAW FUL<br>TON         | 899400 |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. FAILED TO VENT DISPLACED GAS AS A RESULT OF A RESTRICTION CREATED BY POPPET MISALIGNMENT DUE TO IMPROPER HANDLING.                                                                          |                                                         |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-INITIATED BETTER INSPECTION PROCEDURE TO INSURE PROPER HANDLING AND INSTALLATION.                                                                                                                                            |                                                         |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                         | FTA4894/PS-404-00-03<br>CONTROLS BOTTLE, GSE COMPRESSOR | COUNTDOWN                      | 30<br>390805        | 13<br>-9900      | NO<br>YES  |                               |        |
| FAILURE MODE-OUT OF TOLERANCE, WAS TAKEN AS A GROUND TRAILER PROBLEM. THE HASKELL COMPRESSORS APPEAR WEAK.                                                                                                                                     |                                                         |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW. DURING PRECOUNT BUST CONTROLS BOTTLE HAS REPORTED NOT HOLDING PRESSURE PROPERLY. LOWEST PRESSURE NOTED IS 2500. REDLINE 3050.                                                                                 |                                                         |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 20 MINUTES OF HOLD WERE REQUIRED AT T-6 TO REACH REDLINE.                                                                                                                                                    |                                                         |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME      | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH      | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------|---------------------|------------------|-----------------|-------------------------------|--------|
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                          |                                                  |                                |                     |                  |                 |                               | 000477 |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                              | 0430/A1-403-00-04<br>PRESSURIZATION CONTROL UNIT | FRF                            | 4D<br>990602        | A-1              | YES<br>NO       |                               | 000103 |
| FAILURE MODE-FAILED DURING OPERATION-AT TRANSFER TO INTERNAL PRESSURIZATION, THE PCU WENT INTO EMERGENCY BECAUSE THE PCU PRESSURE SWITCH SETTING HAD DROPPED FROM 92.6 PSIG TO 81.1 PSIG.<br><br>SYSTEM EFFECT-OPERATION DOES NOT START.<br><br>VEHICLE EFFECT-COMMIT SEQUENCE STOPPED PRIOR TO ENGINE IGNITION. COUNTDOWN ABORTED.<br><br>CORRECTIVE ACTION-RESET PRESSURE SWITCH.                 |                                                  |                                |                     |                  |                 |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                              | NOTS TEST REPORT 14-404-81-90<br>REGULATOR       | CAPTIVE                        | 990304              | 1-4              | YES<br>YES      |                               | 000802 |
| FAILURE MODE-OUT OF TOLERANCE. THE FUEL TANK PRESSURE WAS 70 PSIG AT TEST START, DECREASING TO 0 PSIG BY 11.3 SECS. THE PRESSURE WAS MAINTAINED AT 36.6 PSIG DURING SUSTAINER OPERATION. THE OVERPRESSURE WAS CAUSED BY LEAKAGE IN THE GSE PRESSURE PROGRAMMER FUEL TANK PRESSURE REGULATOR.<br><br>SYSTEM EFFECT-OPERATION TOO HIGH.<br><br>VEHICLE EFFECT-NONE.<br><br>CORRECTIVE ACTION-UNKNOWN. |                                                  |                                |                     |                  |                 |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                              | NOTS TEST REPORT 14-404-81-90<br>REGULATOR       | CAPTIVE                        | 990302              | 1-4              | NO<br>YES       |                               | 000801 |
| FAILURE MODE-OUT OF TOLERANCE. A LEAK IN THE GSE TANK PRESSURE PROGRAMMER REGULATOR CAUSED THE LOX TANK PRESSURE TO INCREASE AS HIGH AS 40 PSIG.<br><br>SYSTEM EFFECT-OPERATION TOO HIGH.<br><br>VEHICLE EFFECT-NONE.<br><br>CORRECTIVE ACTION-UNKNOWN.                                                                                                                                             |                                                  |                                |                     |                  |                 |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                              | FAR-BK-43-00<br>REGULATOR                        | FAR<br>T-08331                 | 990210              | NYC              | YES GROVE<br>NO |                               |        |
| FAILURE MODE-LEAK INTERMITTENT. EXCESSIVE LEAKAGE WAS NOTED IN THE MISSILE PURGE SYSTEM REGULATOR. THIS PART SUPPLIER 1 000 PSI G2 TO THE PURGE BOX. PROBABLE CAUSE WAS A FOUR SEATING OF THE POPPET ON THE VALVE SEAT DUE TO POPPET TO SEA MISALIGNMENT.                                                                                                                                           |                                                  |                                |                     |                  |                 |                               |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-CORRECTIVE ACTION WAS NOT DEEMED NECESSARY AT THE TIME. THIS WAS THE FIRST FAILURE OF THIS COMPONENT.                                                                  |                                                                |                                |                     |                  |            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                   | FTA 4410/P4-201-00-12<br>HELIUM STORAGE BOTTLE, GSE COMPRESSOR | FRF                            | 129<br>501121       | 14/ETR<br>-2700  | YES<br>YES | 609483                        |
| FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. HELIUM BOTTLE PRESSURIZATION COULD NOT BE CONTINUED AT A NORMAL RATE DUE TO A MALFUNCTION OF THE EAST COMPRESSOR.                        |                                                                |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LOW. HELIUM BOTTLE PRESSURIZATION WAS ACCOMPLISHED SLOWLY USING THE WEST COMPRESSOR ONLY.                                                                    |                                                                |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 20 MINUTE HOLD.                                                                                                                                        |                                                                |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-HOLD AND ACCOMPLISH PRESSURIZATION WITH WEST COMPRESSOR ONLY.                                                                                                          |                                                                |                                |                     |                  |            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                   | FTA4141/P3-201-00-4<br>REGULATOR-PCU                           | COUNTDOWN                      | 49<br>500802        | 13<br>-2100      | YES<br>NO  | 609359                        |
| FAILURE MODE-FAILURE DURING OPERATION. THE FUEL TANK SECOND STAGE PRESSURIZATION REGULATOR IN THE PRESSURIZATION CONTROL UNIT FAILED TO RESEAT WHEN GOING TO SEQUENCE 11 PRESSURIZATION. |                                                                |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                      |                                                                |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED 30 MINUTES AT T-33.                                                                                                                                     |                                                                |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-MORE LOADING PRESSURE WAS APPLIED TO THE VALVE, THE STEM WAS MANUALLY MANIPULATED, AND IT RESEATED PROPERLY.                                                           |                                                                |                                |                     |                  |            |                               |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                   | FTA4088/P3-201-00-4<br>HEAT EXCHANGER                          |                                | 40<br>500716        | 13<br>-2400      | NO<br>NO   | 609484                        |
| FAILURE MODE-OUT OF TOLERANCE. HELIUM BOTTLES WERE NOT CAPABLE OF BEING PRESSURIZED TO 2000 PSI DUE TO A GROUND HEAT EXCHANGER VENT VALVE NOT RESEATING.                                 |                                                                |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LOW. HELIUM BOTTLES COULD NOT BE PRESSURIZED TO PROPER LEVEL.                                                                                                |                                                                |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 28 MINUTE HOLD.                                                                                                                                        |                                                                |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                               |                                                                |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                      | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------|------------------------------|------------------|------------|-------------------------------|--------|
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                          | ZB-7-079/92-210-84-01<br>HELIUM STORAGE BOTTLE, GSE VALVE        | CAPTIVE                        | 18<br>390601                 | 82<br>3.39       | YES<br>YES |                               | 699493 |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. A GROUND VALVE MALFUNCTION PREVENTED CHARGING OF THE AIRBORNE TANK PRESSURIZATION BOTTLES TO PROPER PRESSURE.                                                                          |                                                                  |                                |                              |                  |            |                               |        |
| SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. TANK PRESSURES DECAYED RAPIDLY FOLLOWING ENGINE START.                                                                                                                                   |                                                                  |                                |                              |                  |            |                               |        |
| VEHICLE EFFECT-PREATURE PROPULSION CUTOFF. OBSERVER CUTOFF WHEN LOX TANK PRESSURE DROPPED BELOW REDLINE LIMIT.                                                                                                                  |                                                                  |                                |                              |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                      |                                                                  |                                |                              |                  |            |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                          | 2C-7-094/P2-103-00-11                                            | FLIGHT                         | 11A<br>590220                | 12               | NO<br>YES  |                               | 699490 |
| FAILURE MODE-OUT OF SPECIFICATION. GROUND PRESSURIZATION TO THE MAIN TANKS WAS SLIGHTLY HIGH (FUEL TANK 61 PSIG, LOX TANK 27 PSIG). SPECIFICATION LIMITS WERE 20 TO 25 PSIG IN THE LOX TANK AND 55 TO 60 PSIG IN THE FUEL TANK. |                                                                  |                                |                              |                  |            |                               |        |
| SYSTEM EFFECT-NONE. WHEN TANK PRESSURIZATION REVERTED TO INTERNAL, THE TANK PRESSURES RETURN TO THEIR NORMAL OPERATING LEVELS.                                                                                                  |                                                                  |                                |                              |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                            |                                                                  |                                |                              |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                         |                                                                  |                                |                              |                  |            |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                          | FTA2579/P2-101-00-11<br>SURGE DAMPER, FACILITY HE PRESSURIZATION | FRF                            | 11A<br>590209                | 12               | YES<br>NO  |                               | 699827 |
| FAILURE MODE-ERRATIC OPERATION. THE NO. 9200 COMPRESSOR OPERATED NORMALLY EXCEPT FOR ERRATIC OPERATION OF THE SURGE DAMPER.                                                                                                     |                                                                  |                                |                              |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                             |                                                                  |                                |                              |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                            |                                                                  |                                |                              |                  |            |                               |        |
| CORRECTIVE ACTION-THE DAMPER WAS REPLACED.                                                                                                                                                                                      |                                                                  |                                |                              |                  |            |                               |        |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                          | FTA2549/P2-102-00-13                                             |                                | 13A<br>590207                | 12<br>-4200      | YES<br>NO  |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. HELIUM COULD NOT BE STORED BECAUSE OF GROUND SYSTEM DIFFICULTIES. THE GROUND SYSTEM WOULD NOT GO INTO STORAGE MODE.                                                            |                                                                  |                                |                              |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. HELIUM STORAGE PRESSURIZATION WILL NOT GO INTO STORAGE.                                                                                                                                 |                                                                  |                                |                              |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 45 MIN. HOLD.                                                                                                                                                                                 |                                                                  |                                |                              |                  |            |                               |        |

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| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME      | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO      |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------|---------------------|------------------|------------|------------------------------------|--------|
| CORRECTIVE ACTION-SOLENOID RELAY CIRCUIT JUMPED TO GROUND TO COMPLETE CIRCUIT.                                                                                                                                                                                                    |                                                  |                                |                     |                  |            |                                    | 699499 |
| PNEUMATIC-GSE<br>GROUND PRESSURIZATION                                                                                                                                                                                                                                            | 98-58-024<br>RELIEF VALVE PCU                    | FAR                            | 13                  |                  | YES<br>NO  | ROBERTSHAW PUL<br>TON<br>301-70028 | 699603 |
| FAILURE MODE-FAILED DURING OPERATION. THE VALVE OPENED AND REMAINED OPEN WHEN IT WAS SUPPOSED TO STAY CLOSED. THE VALVE FAILED BECAUSE OF OVERPRESSURIZATION. THE METHOD OF OVERPRESSURIZATION HAS NOT BEEN DETERMINED.                                                           |                                                  |                                |                     |                  |            |                                    |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                           |                                                  |                                |                     |                  |            |                                    |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                           | CT-98-58-123<br>PRESSURE SWITCH                  | FAR                            | 630802              | 368              | YES<br>NO  | MELETRON<br>NO 920-108-418         | 699667 |
| FAILURE MODE-FAIL DURING OPERATION. ATLAS PCU PRESSURE SWITCH NO 93, WHICH TRANSFERS ELECTRICAL POWER TO ACTUATE THE LO2 BOILOFF VALVE, WAS FOUND ACTUATED WITH 0 PSIG APPLIED.                                                                                                   |                                                  |                                |                     |                  |            |                                    |        |
| CORRECTIVE ACTION-FUNCTIONAL TESTING COULD NOT CONFIRM FAILURE. SWITCH OPERATION WAS SATISFACTORY. RECOMMEND EXAMINATION OF PCU FOR POSSIBLE MALFUNCTION OF ANOTHER COMPONENT AND REVIEW PROCEDURE TO ASSURE NO PRESSURE IS BEING APPLIED TO THE SWITCH WHEN CHECKING CONTINUITY. |                                                  |                                |                     |                  |            |                                    |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                           | CT-98-58-122<br>PRESSURE SWITCH                  | FAR                            | 630719              | 368              | YES<br>NO  | MELETRON<br>NO 9209-2DL-213        | 699750 |
| FAILURE MODE-FAIL DURING OPERATION. PRESSURE SWITCH NO. 92 IN THE ATLAS PCU FAILED TO BREAK CONTACT WHEN PRESSURE WAS DECREASED ON TWO OUT OF 8 SWITCH ACTUATIONS. THIS CONDITION GIVES AN ATLAS FUEL PRESSURE TOO HIGH INDICATION, AND PLACES THE PCU IN THE EMERGENCY MODE.     |                                                  |                                |                     |                  |            |                                    |        |
| CORRECTIVE ACTION-NONE. FAILURE COULD NOT BE CONFIRMED. IT WAS CONCLUDED THAT THE ITEM WAS NOT RECEIVED IN THE FAILO CONDITION. REQUEST SITE TO INSURE FAILED ITEMS ARE NOT TAMPED WITH BEFORE BEING SENT IN FOR FAILURE ANALYSIS.                                                |                                                  |                                |                     |                  |            |                                    |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                           | FTA0567/P8-NO-01-DAC6<br>STEP III PERMIT CIRCUIT | COMPOSITE-FRD/DPL              | 1510                | 360              | YES<br>NO  |                                    |        |
| FAILURE MODE-ELECTRICAL OPEN. UPON INITIATING SEQUENCE III PRESSURE, THE LOX TOPPING LOW PROBE WAS UNCOVERED. DUE TO A WIRING ERROR. THIS UNCOVERING OPENED THE SEQUENCE III PERMIT CIRCUIT. THUS FLIGHT PRESSURE COULD NOT BE OBTAINED                                           |                                                  |                                |                     |                  |            |                                    |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. FLIGHT PRESSURE COULD NOT BE OBTAINED DUE A PREMATURE DROPOUT OF THE SEQUENCE III PERMIT CIRCUIT.                                                                                                                                      |                                                  |                                |                     |                  |            |                                    |        |

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| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                             | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                                                                                                                                                                                                                                                                                                                                                                                            | VEHICLE EFFECT-COUNTDOWN DELAYED. THERE WERE 190 SECONDS OF RECYCLE AND 6 MINUTES OF HOLD.<br>CORRECTIVE ACTION-THE SEQUENCE III PERMIT SIGNAL WAS JUMPERED IN THE CIRCUIT. AFTER THE TEST THE CIRCUITRY WAS CORRECTED. |                                |                     |                  |            |                               | 000087 |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                    | LV-9B-40-3326-F<br>HOSE ASSEMBLY FITTING                                                                                                                                                                                | FAR<br>27-06705-23             | 050427              | 13               | YES        | DUNBAR KAPPLE<br>NO 216-2045  | 000700 |
| FAILURE MODE-CONTAMINATION. THE HOSE ASSEMBLY WAS REJECTED WHEN THE FITTING FLARE WAS FOUND CORRODED AND CRACKED. THE FAILURE IS ATTRIBUTED TO THE FLARE BEING IMPROPERLY HEAT TREATED. IMPROPER HEAT TREATMENT ALLOWS CHROMIUM-CARBIDE PRECIPITATION AT THE GRAIN BOUNDARIES, MAKING THE STEEL SUSCEPTIBLE TO INTERGRANULAR CORROSION.                                                    |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                    | FAR-CT-9B-46-029<br>TOGGLE SWITCH                                                                                                                                                                                       | FAR                            | 050122              | 36A              | YES        | MICROSWITCH<br>NO 511781-7    | 000720 |
| FAILURE MODE-ELECTRICAL SHORT. THIS SWITCH IS ON THE PNEUMATIC PANEL. IT CONNECTS POWER TO THE FUEL TANK PRESSURE CIRCUITS. DURING A VALIDATION TEST THE SWITCH TOGGLE SHORTED TO ONE OF THE TERMINALS. EXAMINATION REVEALED THAT A TRAVEL LIMITING PART HAD BEEN LEFT OUT DURING ASSEMBLY OF THE SWITCH.                                                                                  |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-IT WAS RECOMMENDED THAT A SURVEY BE CONDUCTED ON ALL SWITCHES OF THIS TYPE. THE VENDOR WAS NOTIFIED OF THE DISCREPANCY.                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                    | LV-9D-40-3247-F<br>TUBE ASSEMBLY-SLEEVE                                                                                                                                                                                 | FAR<br>27-01993-33             | 040800              | 13               | YES        | ALLEN AIRCRAFT<br>NO          | 000799 |
| FAILURE MODE-STRUCTURAL. THE PCU HEAT EXCHANGER TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT. |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOCKS WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                         |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |
|                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                         |                                |                     |                  |            |                               |        |

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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------------|
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | LV-98-40-3247-F<br>TUBE ASSEMBLY-SLEEVE     | FAR<br>27-61907-03             | 840800              | 12               | YES<br>NO  | YES ALLEN AIRCRAFT<br>NO<br>000001   |
| FAILURE MODE-STRUCTURAL. THE PCU INSTALLATION TUBE ASSEMBLY SLEEVE WAS CRACKED. THE CRACKED SLEEVE WAS CAUSED BY A COMBINATION OF (1) SENSITIZED METAL RENDERING IT SUSCEPTIBLE TO CORROSION ATTACK. (2) SULFUR/SELENIUM INCLUSIONS GIVING THE PART LOW TRANSVERSE STRENGTH. (3) CORROSIVE ATMOSPHERE AT ETR. (4) POSSIBLE EXPANSION AND CONTRACTION CAUSED BY MISSILE EXHAUST GAS HEAT.                                                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                                      |
| CORRECTIVE ACTION-TYPE-303 STAINLESS STEEL HAS BEEN DELETED AS ACCEPTABLE MATERIAL FOR TUBE ASSEMBLY FITTINGS. STOKES WERE NOT PURGED, BUT WERE TO BE DEPLETED THROUGH NORMAL USE.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                                      |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | FAR-LV-98-38-4008<br>PRESSURE SWITCH        | FAR<br>N/A 27-08432            | 840716              | 13               | YES<br>NO  | YES MELETRON<br>NO 8006079<br>000778 |
| FAILURE MODE-ERRATIC OPERATION. THE PRESSURE SWITCH USED IN THE PCU WHICH SIGNALS THE LOX BOILOFF VALVE TO OPEN, PERFORMED ERRATICALLY. FAILURE WAS CAUSED BY CONTAMINATION ON THEMICROSWITCH CONTACTS.                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                                      |
| CORRECTIVE ACTION-FAILURE WAS CONFIRMED. VENDOR WAS ADVISED OF THE FAILURE AND REQUESTED TO IMPROVE THE OC. TO PREVENT CONTAMINATION.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                                      |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CT-98-58-093<br>REGULATOR                   | FAR                            | 1260<br>840527      | 36A              | YES<br>NO  | YES APCO<br>NO 119500<br>000736      |
| FAILURE MODE-OUT OF SPECIFICATION. THIS REGULATOR WAS REJECTED DURING CHECKOUT DUE TO THE HANDWHEEL BEING HARD TO ROTATE. THIS FAILURE WAS ATTRIBUTED TO CORROSION OF THE IDLER GEAR IN THE HOUSING MECHANISM WHICH PREVENTED ROTATION OF THE SUN GEAR AND ADJUSTMENT OF THE RELIEF SPRING. ALSO, DIMENSIONAL ERRORS WERE NOTED BETWEEN THE IDLER PIN AND THE INNER DIAMETER OF THE IDLER GEAR. CORROSION PROBABLY DUE TO APPLICATION OF KEL-F LUBRICANT.                                                                                                                                                                            |                                             |                                |                     |                  |            |                                      |
| CORRECTIVE ACTION-INITIATE REGULATOR REWORK INCLUDING DISASSEMBLY TO CHECK FOR CORROSION AND UPDATE TO LATEST VENDOR DRAWING.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                                      |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CT-98-58-090-9<br>SHUTOFF VALVE             | FAR<br>25-00181                | 1260<br>840319      | 36A              | YES<br>NO  | YES ROBERTSHAW<br>NO 232-20144       |
| FAILURE MODE-FAIL DURING OPERATION. VALVE WOULD NOT FULLY SEAT DURING THE PNEUMATIC TEST PROCEDURE. DISASSEMBLY REVEALED THE TEFLON SEAT EXHIBITED SEVERE COLD FLOW, RAGGED EDGES, AND HAD METAL PARTICLES EMBEDDED IN IT. THIS COLD FLOW OF THE TEFLON SEAT ALLOWED METAL TO METAL CONTACT AND CAUSED INTERMITTENT LEAKAGE. ALSO, THE VALVE STEM AND GUIDES WERE FOUND TO BE GALLED WHICH IS THE SOURCE OF THE METAL PARTICLES FOUND IN THE TEFLON SEAT. PROTRUSIONS NOTED IN THE CHROMIUM PLATING OF THE VALVE STEM GUIDES COULD HAVE CAUSED TILTING OF THE MATING PARTS, RESULTING IN BINDING AND MISALIGNMENT OF THE VALVE STEM. |                                             |                                |                     |                  |            |                                      |

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| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH                     | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|--------------------------------|-------------------------------|
| CORRECTIVE ACTION-FAILURE ATTRIBUTED TO NORMAL WEAR. HOWEVER, ALL VALVES OF THIS TYPE ARE TO BE CHECKED FOR RECENT REWORK AND BE REPLACED IF NO REWORK RECORD EXISTS.                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |                                |                               |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                  | LV-9B-46-4202<br>PRESSURE REGULATOR         | FAR                            | 640224              | 13               | YES VACCO<br>NO HL7P-4105      | 000933                        |
| FAILURE MODE-INTERNAL LEAK. REGULATOR WAS LEAKING INTERNALLY AND EXTERNALLY. THE REGULATOR HAD BEEN REMOVED AFTER BEING REJECTED OCTOBER 7, 1963. FAILURE WAS ATTRIBUTED TO A DAMAGED RELIEF VALVE SEAT AND MAIN SEAT. DAMAGE TO THE RELIEF VALVE SEAT RESULTED FROM THE DESIGN OF THE RELIEF VALVE AND POSSIBLY THE BRASS MATERIAL USED IN THE SENSING PLASTON CONTRIBUTED SLIGHTLY.                                                                    |                                             |                                |                     |                  |                                |                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |                                |                               |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR-LV-9B-58-3383<br>PRESSURE SWITCH        | FAR                            | 230D<br>640211      | 12               | YES MELETRON<br>NO 920-15L-137 | 000766                        |
| FAILURE MODE-OUT OF TOLERANCE. THE PRESSURE SWITCH ACTUATED AT 3.5 PSIG, SETTING THE PCU INTO EMERGENCY PHASE, SWITCH SHOULD HAVE ACTUATED ONLY IF LOX TANK PRESSURE FELL BELOW 3.3 PLUS MINUS 0.1 PSIG. THE SWITCH WOULD NOT MEET THE PLUS MINUS 0.1 PSI TOLERANCE.                                                                                                                                                                                     |                                             |                                |                     |                  |                                |                               |
| CORRECTIVE ACTION-GD/C REQUESTED DESIGN REVIEW TO CONSIDER (A) REPLACING SWITCH (B) OPENING ACTUATION TOLERANCES (C) A NEW PCU WITH DIFFERENT SWITCHES AND SETTINGS OR (D) INCREASING REGULATOR SETTING. NO CORRECTIVE ACTION TAKEN BECAUSE (A) THIS IS THE ONLY REPORTED FAILURE IN THE PAST 6 MOS. (B) UNABLE TO OBTAIN REPLACEMENT SWITCH AND (C) SWITCH FAILURE WOULD NOT RESULT IN LOSS OF MISSILE UNLESS IT WAS SIMULTANEOUS WITH ANOTHER FAILURE. |                                             |                                |                     |                  |                                |                               |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                  | AAG4-0006/P2-4MO-01-199<br>RELAY            | COMPOSITE-FRD/DPL              | 199D<br>640128      | 12               | YES<br>NO                      | 000938                        |
| FAILURE MODE-ERRATIC OPERATION. THE PRESSURIZATION SYSTEM WOULD NOT REMAIN IN THE INTERNAL MODE. THE PROBLEM WAS CHECKED OUT AFTER THE PCU WAS ISOLATED FROM THE VEHICLE BUT IT COULD NOT BE DUPLICATED.                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |                                |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |                                |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |                                |                               |
| CORRECTIVE ACTION-RELAYS K108, K229, K235, AND K222 WERE REPLACED.                                                                                                                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |                                |                               |

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| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO                 |        |
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| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                       | FAR-LV-9B-53-226-F<br>RELAY                                    | FAR<br>86-73900-032            | 640128              | 12               | YES<br>NO  | FILTOR8<br>LL26J18                            | 699758 |
| FAILURE MODE-ERRATIC OPERATION. THIS IS RELAY K-229 OF THE AUXILIARY PNEUMATICS PANEL. IT PROVIDES COMMANDS TO SHUT CH BETWEEN INTERNAL AND EXTERNAL HELIUM SUPPLY. FAILURE OF THE RELAY CAUSED A DROPOUT OF THE INDICATOR LIGHT. EXAMINATION REVEALED A LOOSE TERMINAL AND A PAIR OF VIBRATION-SENSITIVE CONTACTS WHICH MAY HAVE BEEN CAUSED BY IMPROPER HANDLING.                                                           |                                                                |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION-THE FAILURE WAS NOT CONFIRMED, ALTHOUGH THE DEFICIENCIES FOUND COULD HAVE CAUSED THE FAILURE. THE VENDOR WAS TOLD ABOUT THE FAILURE AND REPLIED THAT THE TERMINAL DESIGN, AND QUALITY CONTROL, HAD BEEN IMPROVED SINCE THE FAILED PART HAD BEEN MADE.                                                                                                                                                       |                                                                |                                |                     |                  |            |                                               |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                       | FAR-CT-9B-58-089<br>RELIEF VALVE                               | FRF                            | 640124              | 36A              | YES<br>NO  | CIRCLE SEAL<br>5159T1-16TB-17<br>00PH/812AD13 | 699716 |
| FAILURE MODE-STRUCTURAL. THE PNEUMATIC RELIEF VALVE, LEAKED AFTER RESEATING AND ALSO PRODUCED AN AUDIBLE CHATTERING SOUND. FAILURE WAS CONFIRMED. CALLING OCCURRED ON POPPET AND POPPET GUIDE BECAUSE OF BEING IN CONTACT WITH BEARING MATERIAL. CAUSE OF DISCREPANCY DUE TO BOTH BEING MADE OF THE SAME SOFT MATERIAL. THE SPRING RETAINER ALSO WAS DAMAGED FROM THE WEARING ACTION OF THE HARD SPRING ON THE SOFT RETAINER. |                                                                |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION-RECOMMENDED EITHER POPPET OR POPPET GUIDE BE CHROME PLATED. THE SPRING RETAINER SHOULD ALSO BE CHROME PLATED. CIC 31146 REMOVED VALVES FROM PCU AT 36A AMR.                                                                                                                                                                                                                                                 |                                                                |                                |                     |                  |            |                                               |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                       | FAR-CT-9B-53-053P<br>METER                                     | FAR<br>55-06134-1              | 640123              | 36A              | YES<br>NO  | HICKOK<br>48-250R                             | 699601 |
| FAILURE MODE-OUT OF TOLERANCE. DURING A ROUTINE CALIBRATION, THE METER SHOWED A FOUR PERCENT ERROR OVER THE UPPER HALF OF ITS 0-TO-40 PSI RANGE. ANALYSIS CONFIRMED THE FAILURE. THE METER HAD SENSITIVITY LOSSES AND EXCESSIVE POSITION ERROR, WHICH COULD BE CAUSED BY EXPOSURE TO MAGNETIC FIELDS AND BY OVERLOADING.                                                                                                      |                                                                |                                |                     |                  |            |                                               |        |
| CORRECTIVE ACTION-RECOMMENDED THAT THE CONTROL PANEL BE CHECKED FOR MAGNETIC FIELDS AND, IF FOUND, PROTECTION SHOULD BE FURNISHED FOR THE METER. IT WAS ALSO RECOMMENDED THAT THE METER BE PROTECTED FROM HIGH OVERLOAD CONDITIONS.                                                                                                                                                                                           |                                                                |                                |                     |                  |            |                                               |        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                       | AA64-005/P2-48N-02-199<br>RELIEF VALVE, PCU FUEL TANK PRESSURE | COMPOSITE-FRD/DPL              | 199D<br>340109      | 12               | YES<br>NO  |                                               |        |
| FAILURE MODE-OUT OF TOLERANCE. INVESTIGATION SHOWED A LOW RELIEF SETTING ON A PCU FUEL TANK PRESSURE RELIEF VALVE. THIS CAUSED AN UNEXPECTED DROP IN THE MISSILE FUEL TANK PRESSURE AT THE START OF LOG TANKING.                                                                                                                                                                                                              |                                                                |                                |                     |                  |            |                                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                |                                |                     |                  |            |                                               |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO       |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------------|--------|
| VEHICLE EFFECT-COMPOSITE DELAYED. DELAY TIME UNKNOWN.<br>CORRECTIVE ACTION-RELIEF VALVE WAS ADJUSTED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                                     | 699946 |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FAR-CT-98-38-087<br>VALVE                   | FAR                            | 631122              | 36A              | YES<br>NO  | ROBERTSHAW<br>NO 232-20144          | 699715 |
| FAILURE MODE-STRUCTURAL. THE SHUTOFF VALVE, WOULD NOT FULLY SEAT. FAILURE WAS THE RESULT OF COLD FLOW OF THE TEFLON SEAT MATERIAL ALLOWING THE MICROSWITCH GUIDE SPACER TO REST AGAINST THE BOTTOM OF THE SLOT IN THE ATTACHED MICROSWITCH PLATE. THE VALVE STEM WAS CALLED FROM NORMAL WEAR.<br>CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                                     | 699765 |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FAR-SP-98-38-3561<br>CONTROLLER             | FAR                            | 630909              | 12               | YES<br>NO  | MINNEAPOLIS-HO<br>MEYELL<br>800H013 | 699770 |
| FAILURE MODE-CONTAMINATION. THE PNEUMATIC PRESSURE CONTROLLER, A COMPONENT OF THE PCU, HAD AN ERRATIC CONTROLLED OUTPUT PRESSURE AND WOULD HANG UP AND NOT RESPOND TO THE INPUT (SENSING) PRESSURE. FRICTION AND SLACK IN THE LINKAGE, AND SHAVINGS AND BURRS IN THE FILTER AND RESTRICTION HOLE HELD THE FILTER PLUG OFF ITS SEAT RESULTING IN NO RESTRICTION OR FILTERING ACTION.<br>CORRECTIVE ACTION-CONTROLLERS TO BE REPLACED PER ECP 7295.                                                                                                                                                                                            |                                             |                                |                     |                  |            |                                     | 699770 |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FAR-SP-98-38-3558<br>RELIEF VALVE           | FAR                            | 630906              | 12               | YES<br>NO  | CIRCLE SEAL<br>812A013              | 699770 |
| FAILURE MODE-OUT OF TOLERANCE. THE RELIEF VALVE WAS A CRACKING PRESSURE OF 1725 PLUS OR MINUS 85 PSIG AND MINIMUM RESEAT PRESSURE OF 1550 PSIG. THE VALVE CRACKED AT 1590 PSI AND RESEATED AT 1900 PSI. EXAMINATION REVEALED SMALL BLACK RUBBER PARTICLES THROUGHOUT THE VALVE, A FINE HAIRLIKE SCRATCH ON THE SEAL AND A LARGE AMOUNT OF DIRT ON THE THREADED PORTIONS OF THE VALVE. FAILURE WAS ATTRIBUTED TO SYSTEM CONTAMINATION.<br>CORRECTIVE ACTION-FAILURE WAS CONFIRMED. TXN 044-045 800 SENT TO THE FIELD REQUESTING A SYSTEM CONTAMINATION CHECK. BECAUSE OF DIFFICULTY OF MAKING A SYSTEM CHECK, NO CORRECTIVE ACTION WAS TAKEN. |                                             |                                |                     |                  |            |                                     | 699770 |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FAR-SP-98-38-3561<br>CONTROLLER             | FAR                            | 630830              | 12               | YES<br>NO  | MINNEAPOLIS-HO<br>MEYELL<br>800H013 | 699770 |
| FAILURE MODE-ERRATIC OPERATION. THE PNEUMATIC PRESSURE CONTROLLER, A COMPONENT OF THE PCU, HAD AN ERRATIC CONTROLLED OUTPUT PRESSURE. FRICTION AND SLACK IN THE LINKAGE OVERCOMING THE AVAILABLE AIR PRESSURE CAUSED THE ERRATIC CONDITION.                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                                     | 699770 |

GENERAL DYNAMICS  
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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM                                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|----------------------------------------|
| ION AT THE LOWER SENSING PRESSURE.                                                                                                                                                                                                                                                    |                                                                |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-CONTROLLERS TO BE REPLACED PER ECPT889.                                                                                                                                                                                                                             |                                                                |                                |                     |                  |            |                                        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                               | DPL-01<br>VALVE, SEAL                                          | COMPOSITE-FRD/DPL              | 63C<br>630415       | F                | YES<br>NO  |                                        |
| FAILURE MODE-OUT OF TOLERANCE. REQUIRED 19.5 SECONDS TO RAISE LOX TANK ULLAGE PRESSURE FROM 10.0 TO 20.0 PSIG DUE TO A FAULTY VALVE NO. 62 IN THE PCU.                                                                                                                                |                                                                |                                |                     |                  |            |                                        |
| SYSTEM EFFECT-OPERATION TOO LONG.                                                                                                                                                                                                                                                     |                                                                |                                |                     |                  |            |                                        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                     |                                                                |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-VALVE REPLACED.                                                                                                                                                                                                                                                     |                                                                |                                |                     |                  |            |                                        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                               | FAR-CT-98-43-006<br>SOLENOID VALVE                             | FAR<br>7-02239                 | 630307              | 36A              | YES<br>NO  | STERER<br>NO 10420                     |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE 2 POSITION PNEUMATIC GNR VALVE WAS REJECTED WHEN IT REPORTEDLY FAILED TO GO TO THE ENERGIZED OR OPEN POSITION. FAILURE WAS NOT CONFIRMED. FAILURE POSSIBLY COULD HAVE BEEN CAUSED BY CONTAMINATION DISLODGED DURING SHIPMENT.    |                                                                |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                               |                                                                |                                |                     |                  |            |                                        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                               | FAR-98-58-3445<br>CONTROLLER                                   | FAR<br>7-08432                 | 621204              | 12               | YES<br>NO  | MINNEAPOLIS NO<br>NO MEYWELL<br>Y708P1 |
| FAILURE MODE-OUT OF TOLERANCE. THE PNEUMATIC PRESSURE CONTROLLER, A COMPONENT OF THE PCU, FAILED WHEN ITS OUTPUT PRESSURE DRIFTED OVER 1.0 PSI. THE FAILURE WAS THE RESULT OF WORN LINKAGE CONNECTIONS FROM NORMAL IN-SERVICE WEAR DURING SEVERAL YEARS.                              |                                                                |                                |                     |                  |            |                                        |
| CORRECTIVE ACTION-FAILURE WAS CONFIRMED. NO CORRECTIVE ACTION TAKEN.                                                                                                                                                                                                                  |                                                                |                                |                     |                  |            |                                        |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                               | T-162-571-3-2399/PI-RHM-01-14<br>FUEL TANK PRESSURE SENSE LINE | COMPOSITE-FRD/DPL              | 14F<br>62100P       | 11               | YES<br>NO  |                                        |
| FAILURE MODE-OUT OF SPECIFICATION. DURING LOX LOADING THE FUEL PRESSURE INDICATION ON THE PNEUMATICS CONSOLE DROPPED FROM 62.3 PSIG TO 58.3 PSIG OVER A 15 MIN PERIOD. THE PROBLEM WAS ISOLATED TO AN AIRBORNE FUEL SENSING LINE WHICH WAS NOT INSTALLED TO BLUEPRINT SPECIFICATIONS. |                                                                |                                |                     |                  |            |                                        |

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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                      | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| SYSTEM EFFECT-OPERATION TOO LOW. FUEL TANK PRESSURE DROPPED BELOW SPECIFICATIONS FOR PHASE 2 PRESSURE. WHEN LOX WAS DETANKED, FUEL PRESSURE ROSE TO NORMAL LEVEL. THE PROBLEM WAS REPEATABLE WHEN LOX WAS RETANKED. FURTHER TESTING SHOWED PCU WAS OPERATING PROPERLY. PROBLEM WAS DUE TO A FAULTY AIR/EXRNE SENSE LINE. |                                                                  |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED SEVERAL ATTEMPTS WERE MADE TO LOAD LOX, BUT ALL WERE UNSUCCESSFUL AND COMPOSITE WAS ABORTED DUE TO LOW PHASE 2 FUEL PRESSURES. MINIMUM ACCEPTABLE PRESSURE LEVEL IS 80.7 PSIG.                                                                                          |                                                                  |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-FUEL SENSING LINE WAS REMOVED AND REWORKED TO BLUEPRINT SPECIFICATION. SENSE LINE WAS EXTENDING TOO FAR INTO THE FUEL TANK. A RUN OF THE DPL WAS SUCCESSFUL.                                                                                                                                           |                                                                  |                                |                     |                  |            |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                  | AA82-0081/P2-401-00-179<br>MICROSWITCH                           | COUNTDOWN<br>ANS134-1          | 179D<br>620825      | 12               | YES<br>NO  |                               |
| FAILURE MODE-ELECTRICAL SHORT. WATER HAD COLLECTED IN THE MICROSWITCH HOUSING BELOW VALVE 20 AND HAD SHORTED OUT THE 28 VDC WIRE TO THE COMMON CONTACT OF THE MICROSWITCH.                                                                                                                                               |                                                                  |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. THE FAILURE OCCURRED AFTER REACHING STAGE 11 PRESSURE DURING FUEL TANKING ON N X-1 DAY AND AS A RESULT IT WAS IMPOSSIBLE TO RESTEP TO STAGE 1 PRESSURE.                                                                                                                          |                                                                  |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                     |                                                                  |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE MICROSWITCH AND ASSOCIATED RF FILTER WERE REPLACED WHILE THE PCU WAS IN EMERGENCY CONFIGURATION.                                                                                                                                                                                                   |                                                                  |                                |                     |                  |            |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                  | AA82-0080/P2-40N-04-179<br>R/F FILTER ON SOLENOID OPERATED VALVE | COMPOSITE-FRD/DPL<br>8138001   | 179D<br>620825      | 12               | YES<br>NO  |                               |
| FAILURE MODE-FAIL DURING OPERATION. VALVE 20 IN THE PCU FAILED AFTER REACHING STAGE TWO PRESSURES. THE VALVE COULD NOT RESTEP TO STAGE ONE PRESSURE. THE FAILURE WAS TRACED TO WATER IN THE SWITCH HOUSING THAT SHORTED OUT 28 VDC TO THE R/F FILTER.                                                                    |                                                                  |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. THE SYSTEM COULD NOT RESTEP TO PHASE ONE PRESSURES.                                                                                                                                                                                                                           |                                                                  |                                |                     |                  |            |                               |
| VEHICLE EFFECT-TANKING DELAYED. TANK PRESSURES WERE MAINTAINED WITH THE PCU IN THE EMERGENCY CONFIGURATION WHILE VALVE 20 SWITCH AND FILTER WERE REPLACED.                                                                                                                                                               |                                                                  |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-MICROSWITCH AND R/F FILTER FOR PCU VALVE 20 WERE REPLACED.                                                                                                                                                                                                                                             |                                                                  |                                |                     |                  |            |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                  | AA80-0080/<br>SOLENOID OPERATED VALVE                            | COMPOSITE-FRD/DPL<br>7-08432   | 179<br>620810       | 12               | YES<br>NO  | 8138001                       |
| FAILURE MODE-FAIL DURING OPERATION. VALVE 20 IN THE PCU FAILED AFTER REACHING STAGE TWO PRESSURES. THE VALVE COULD NOT RESTEP TO STAGE ONE PRESSURE. THE FAILURE WAS TRACED TO WATER IN THE SWITCH HOUSING THAT SHORTED OUT 28 VDC TO THE R/F FILTER.                                                                    |                                                                  |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. PHASE TWO PRESSURE COULD NOT BE ACHIEVED.                                                                                                                                                                                                                                     |                                                                  |                                |                     |                  |            |                               |

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## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-65E

| SYSTEM<br>SUB-SYSTEM                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DIF DATA SOURCE<br>PART NUMBER    | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO            |        |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------|------------------|------------|------------------------------------------|--------|
|                                         | VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                   |                     |                  |            |                                          | 000010 |
|                                         | CORRECTIVE ACTION-FAULTY VALVE, 22A IN PCU, REMOVED AND REPLACED WITH NEW UNIT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                     |                  |            |                                          |        |
| PNEUMATIC-65E<br>MISSILE PRESSURIZATION | A482-0081/A-98-58-3357<br>VALVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | COMPOSITE-FRD 'DPL<br>7-08432     | 179D<br>820810      | 12               | YES<br>NO  | YES 8138001                              | 000013 |
|                                         | FAILURE MODE-FAIL DURING OPERATION, DURING PROPELLANT TANKING, VALVE 22A IN THE PCU FAILED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |                     |                  |            |                                          |        |
|                                         | SYSTEM EFFECT-OPERATION DOES NOT START, PHASE 3 TANK PRESSURES COULD NOT BE PROPERLY MAINTAINED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |                     |                  |            |                                          |        |
|                                         | VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |                     |                  |            |                                          |        |
|                                         | CORRECTIVE ACTION-THE VALVE WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                   |                     |                  |            |                                          |        |
| PNEUMATIC-65E<br>MISSILE PRESSURIZATION | FAR-CT-98-58-034<br>RELIEF VALVE SEAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | FAR                               | 820424              | 30A              | YES<br>NO  | YES ROBERTSHAW-FUL<br>TON<br>301-20100-8 | 000075 |
|                                         | FAILURE MODE-OUT OF SPECIFICATION, THE MOTOR ACTUATED GATE VALVE VENTS THE MISSILE FUEL TANK PRESSURE AND IS CLOSED FOR PRESSURIZATION, THE VALVE SHUTOFF FAILED TO OBTAIN A CLOSE INDICATION WHEN SIGNAL WAS SENT, FAILURE WAS CONFIRMED, THE ELECTRICAL COMPONENTS WERE BURNED OUT BECAUSE OF OVERHEATING DUE TO BINDING OF THE GATE SLIDE AND SEALS, THE BINDING WAS THE RESULT OF FIELD PERSONNEL REPLACING THE ORIGINAL O-RING WITH A SILICONE TYPE O-RING NOT COMPATIBLE TO FUEL LINES, SEALS SWELLED FORCING THE SEALS INTO THE TRAVEL PATH OF THE SLIDE. |                                   |                     |                  |            |                                          |        |
|                                         | CORRECTIVE ACTION-VENDOR PRINT MODIFICATION WAS MADE CHANGING SILICONE TYPE O-RING TO VITRON O-RING, 60/C CHANGED A PPLICABLE OPERATIONAL TECHNICAL ORDERS.                                                                                                                                                                                                                                                                                                                                                                                                      |                                   |                     |                  |            |                                          |        |
| PNEUMATIC-65E<br>MISSILE PRESSURIZATION | CAPSARK-376/P2-4MO-01-133<br>HELIUM COMPRESSOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | COMPOSITE-FRD/DPL<br>07-09305-001 | 133D<br>820420      | 12               | YES<br>NO  |                                          | 000023 |
|                                         | FAILURE MODE-ERRATIC OPERATION, HAZARD COMPRESSORS OF HELIUM PRESSURIZATION SYSTEM NOT FUNCTIONING PROPERLY, THE CAUSE OF THIS FAILURE WAS NOT KNOWN.                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |                     |                  |            |                                          |        |
|                                         | SYSTEM EFFECT-OPERATION TOO LOW, PRESSURE TO A/B HELIUM BOTTLES COULD NOT BE MAINTAINED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                   |                     |                  |            |                                          |        |
|                                         | VEHICLE EFFECT-NONE, FRD COUNTDOWN WAS CONTINUED USING HELIUM TRAILER PRESSURE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                     |                  |            |                                          |        |
|                                         | CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |                     |                  |            |                                          |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | UIF DATA SOURCE<br>PART NUMBER    | VEHICLE<br>DATE DIF | DATE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------|---------------------|------------------|------------|-------------------------------|
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A482-0038/P2-4MO-01-133<br>PRESSURE SWITCH  | COMPOSITE-FRD/DPL<br>97-06432-801 | 133D<br>620480      | 12               | YES<br>NO  |                               |
| FAILURE MODE-OUT OF EXPECTED TEST VALVE. SETTING OF PRESSURE SWITCH 83 INCREASED TO APPROXIMATELY 8 PSIG. ABOVE THE NOMINAL CLOSING PRESSURE OF 7.7 PSIG.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                                   |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO HIGH. PRESSURE FROM PCU WAS TOO HIGH AND HELIUM WAS VENTED THROUGH THE BOILOFF VALVE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                   |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                   |                     |                  |            |                               |
| CORRECTIVE ACTION-IR WRITTEN ON PRESSURE SWITCH.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                   |                     |                  |            |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A-98-40-807F<br>RISE-OFF DISCONNECT SEAL    | PAR<br>27-80N94-9                 | 620387              | 12               | YES<br>NO  |                               |
| FAILURE MODE-EXTERNAL LEAK. THE DISCONNECT HAD A LEAK AT THE INTERFACE WITH THE LAUNCHER. THE FAILURE WAS CAUSED BY A BAD SEAL, P/N 94-18005-003, AT THE MATING JOINT BETWEEN THE GROUND HALF OF THE RISE-OFF DISCONNECT AND THE GROUND HELIUM LINE. THE SEAL WAS DIMENSIONALLY INCORRECT, HAVING A LIP OF EXCESS MATERIAL THAT HAD NOT BEEN TRIMMED OFF DURING ITS MANUFACTURE. THE EXCESSIVE MAJOR DIAMETER OF THE SEAL MADE THE SEAL TOO LARGE TO FIT INTO THE GROOVE IN THE DISCONNECT BODY. AS A RESULT, THE UNTRIMMED LIP ON THE SEAL CAUGHT BETWEEN THE MATING PARTS PROVIDING A FLOW PATH FOR THE HELIUM TO ESCAPE. |                                             |                                   |                     |                  |            |                               |
| CORRECTIVE ACTION-ALL P/N 94-18005-003 METALLIC SEALS WILL BE CHECKED BY GD/C RECEIVING INSPECTION, BEGINNING 21 JULY 1962.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                   |                     |                  |            |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D4881/D1-6MO-01-18<br>VALVE                 | COMPOSITE-FRD/DPL                 | 12F<br>620316       | 0                | YES<br>NO  |                               |
| FAILURE MODE-OUT OF EXPECTED TEST VALVE. FUEL TANK FAILED TO PRESSURIZE TO PHASE II- CAUSED BY FAILURE OF PCU VALVE 102.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                   |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. PCU FAILED TO PRESSURIZE FUEL TANK TO PHASE II PRESSURE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                   |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                   |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                   |                     |                  |            |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A081-0322/D4833/02-6MO-13-03<br>RELAY       | COMPOSITE-FRD/DPL                 | 3F<br>611219        | 6                | YES<br>NO  |                               |
| FAILURE MODE-FAIL DURING OPERATION. FAILURE OF PCU PRIMARY SUPPLY PRESSURE DUE TO RELAY FAILURE CAUSING PCU VALVE 102 TO 60 CLOSED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                             |                                   |                     |                  |            |                               |

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CONVAIR DIVISION

## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-G3E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                 | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-OPERATION TOO LOW. FUEL TANK PRESSURE COULD NOT BE RAISED TO PHASE II PRESSURE DURING ABORT SEQUENCE.                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               | 000486 |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-G3E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                              | AE61-1107/83-402-00-02<br>RELAY             | COUNTDOWN                      | 02D<br>011206       | 03               | YES<br>NO  |                               | 000417 |
| FAILURE MODE-FAIL DURING OPERATION. FAILURE OF RELAY CONTACT IN PCU SEQUENCER.                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. FLIGHT PRESSURIZATION DID NOT OCCUR.                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RE-SCHEDULED.                                                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-RELAY CONTACTS CLEANED.                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-G3E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                              | RA-98-58-150-F<br>CLAMP                     | FAR                            | 011013              | 12               | YES<br>NO  | YES HARMON<br>NO 92-73002-001 | 000730 |
| FAILURE MODE-STRUCTURAL. CLAMP USED ON INLET FLANGE CONNECTION TO VALVE 72B IN RELIEF VALVE UNIT. FAILED WHEN HEAD OF T-BOLT BROKE OFF. T-BOLT FAILED AS RESULT OF COLD LAPS AND/OR INCLUSIONS IN FOLT MATERIAL WHICH INDUCED HIGH STRESS CONCENTRATION FACTORS. SURFACE CRACKS THEN DEVELOPED WHICH PROPAGATED UNTIL T-BOLT FAILED. |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-GD/C INITIATED CORRECTIVE ACTION TO REDESIGN CLAMP.                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-G3E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                              | AAB1-0111/P6-4CNO-03-1047C2<br>PCU VALVE 20 | COMPOSITE-FRD/DPL              | 104D<br>010810      | 36A<br>-10       | YES<br>NO  |                               | 000930 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE PNEUMATICS SYSTEM FAILED TO TRANSFER FROM INTERNAL TO EXTERNAL SEQUENCE III. THIS PROBLEM WAS CAUSED BY IMPROPER OPERATION OF VALVE 20 IN THE PCU.                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE 20 RESPONSE TIME WAS CHANGED.                                                                                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-G3E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                              | AE62-0421/P6-40N-02-104                     | COMPOSITE-FRD/DPL              | 104D<br>010317      | 36A              | YES<br>NO  |                               |        |
| FAILURE MODE-OUT OF SPECIFICATION. DUE TO AN EXCESSIVE DROP IN GNS PRESSURE, LOS TANKING WAS NOT ATTEMPTED.                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-28E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME  | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------------|
| SYSTEM EFFECT-OPERATION TOO LOW. SUFFICIENT TANK PRESSURIZATION WAS NOT AVAILABLE.                                                                                                                                                                                                                                                                                                                        |                                              |                                |                     |                  |            |                                       |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RE-SCHEDULED.                                                                                                                                                                                                                                                                                                                                                        |                                              |                                |                     |                  |            |                                       |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                |                                              |                                |                     |                  |            |                                       |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                   | FAR-9F-58-086<br>SOLENOID VALVE              | FAR                            | 610300              | 13               | YES        | ATKOMATIC<br>NO 8002002               |
| FAILURE MODE-FAIL DURING OPERATION. THIS VALVE PROVIDES 1800 PSIG HELIUM PRESSURE TO THE VEHICLE LO2 AND FUEL PRESSURIZATION MANIFOLDS. THE VALVE EITHER FAILED TO FULLY OPEN OR WHEN OPEN, FAILED TO FULLY CLOSE. EXAMINATION REVEALED THAT THE STAINLESS STEEL PISTON RING ON THE MAIN VALVE PISTON WAS CRITICAL IN DESIGN AND THIS CAUSED RING INSTABILITY AND UNCONTROLLED PILOT PRESSURE FLOW RATES. |                                              |                                |                     |                  |            |                                       |
| CORRECTIVE ACTION-REPLACE ALL ATKOMATIC VALVES WITH SOME OTHER VALVE TO BE SELECTED AFTER COMPLETION OF QUALIFICATION TESTING.                                                                                                                                                                                                                                                                            |                                              |                                |                     |                  |            |                                       |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                   | AAG-0130/P2-4BN-03-53<br>PRESSURIZATION UNIT | COMPOSITE-FRD/DPL<br>7-09210   | 550<br>800321       | 12               | NO         | NO                                    |
| FAILURE MODE-CONTAMINATION. THE GROUND AND AIRBORNE FUEL PRESSURIZATION SYSTEMS WERE BOTH CONTAMINATED WHEN AN OVER FILL CONDITION OCCURRED DURING TANKING TEST.                                                                                                                                                                                                                                          |                                              |                                |                     |                  |            |                                       |
| SYSTEM EFFECT-CONTAMINATION.                                                                                                                                                                                                                                                                                                                                                                              |                                              |                                |                     |                  |            |                                       |
| VEHICLE EFFECT-COMPOSITE RESCHEDULED.                                                                                                                                                                                                                                                                                                                                                                     |                                              |                                |                     |                  |            |                                       |
| CORRECTIVE ACTION-SYSTEMS CLEANED AND PURGED.                                                                                                                                                                                                                                                                                                                                                             |                                              |                                |                     |                  |            |                                       |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                   | 9B-38-031<br>RELIEF VALVE PCU                | FAR                            | 800800              | 13               | YES        | ROBERTSHAW FUL<br>NO TON<br>832-20131 |
| FAILURE MODE-CONTAMINATION. THE VALVE FAILED DUE TO LEAKAGE THROUGH ITS REL-F SEAT AT 2800 PSI DURING THE HELIUM CHARGE PORTION OF THE COUNTDOWN. A PARTICLE OF HARD MATERIAL WAS LOOSED BETWEEN THE TAPERED VALVE POPPET AND THE REL-F SEAT. THE VALVE, UPON CLOSING, CAUSED THE INITIAL DEFORMATION AND CHIPPING OF THE SEAT. THE VALVE SUBSEQUENTLY FAILED FROM LEAKAGE.                               |                                              |                                |                     |                  |            |                                       |
| CORRECTIVE ACTION-CONVAIR WAS INITIATED ACTION TO INCORPORATE FILTERS IN THE GSE HELIUM SYSTEM.                                                                                                                                                                                                                                                                                                           |                                              |                                |                     |                  |            |                                       |

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                   | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|---------------------|------------------|------------------------------|-------------------------------|
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FTAB231/P3-401-00-22<br>RELIEF VALVE           | COUNTDOWN                      | 220<br>591009       | 13<br>-2220      | YES<br>NO                    | 000994                        |
| FAILURE MODE-STRUCTURAL. THE MAIN SEAT OF PCU VALVE NO. 11 RUPTURED. THIS IS THE 3000 PSIG HELIUM SYSTEM RELIEF VALVE IN THE GROUND HEAT EXCHANGER.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |                              |                               |
| SYSTEM EFFECT-DEPLETION OF GAS SUPPLY.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                |                                |                     |                  |                              |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 115 MINUTES HOLD AND 45 MINUTES RECYCLE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-THE VALVE WAS REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                |                                |                     |                  |                              |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1FTAB231/P3-401-00-22<br>RELIEF VALVE          | COUNTDOWN                      | 220<br>591009       | 13<br>-2220      | YES<br>NO                    | 000994                        |
| FAILURE MODE-LEAK EXTERNAL. PCU VALVE 11 (3000 PSIG HELIUM RELIEF VALVE) LEAKED DUE TO THE MAIN SEAT RUPTURING.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                |                                |                     |                  |                              |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |                              |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED TO REPLACE VALVE 11. 115 MINUTES HOLD, 45 MINUTES RECYCLE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-VALVE 11 REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                |                                |                     |                  |                              |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR98-58-019<br>REGULATOR                      | FAR                            | 591007              | 13               | YES ROBERTSHAW FUL<br>NO TON | 000996                        |
| FAILURE MODE-ERRATIC OPERATION. REGULATOR IN THE PCU WHICH PREVENTS APPLICATION OF PRESSURE ABOVE 9 PSI TO BOURDON TUBE IN EMERGENCY PRESSURE CONTROLLER VALVE HAD A HIGH OUTLET PRESSURE WHILE INLET PRESSURE DROPPED TO MINIMUM ALLOWABLE FUEL TANK PRESSURE. THIS PREVENTED CONTROLLER VALVE FROM SENSING LOW TANK PRESSURE AND APPLYING EMERGENCY PRESSURIZATION. BENCH TESTING INDICATED REGULATOR HAD SLOW RESPONSE TO DECREASING INLET PRESSURE AND THE UNIT LEAKED THROUGH THE ATMOSPHERE VENT ABOVE THE OUTLET PRESSURE SENSING DIAPHRAGM. CONCLUDED THAT REGULATOR RESPONSE TO DECREASING INLET PRESSURE WAS DIRECTLY PROPORTIONAL TO THE EXTERNAL LEAKAGE PAST THE OUTLET PRESSURE/ATMOSPHERE DIAPHRAGM, MAKING OPERATION INHERENTLY ERRATIC. |                                                |                                |                     |                  |                              |                               |
| CORRECTIVE ACTION-REPLACE PRESSURE CONTROLLER VALVE USED WITH A CONTROLLER WHICH CAN ACCEPT THE FULL RANGE OF TANK PRESSURES, WHICH WOULD ELIMINATE THE NEED FOR THE SUBJECT REGULATOR IN THE PCU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |                                |                     |                  |                              |                               |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 9A-08-114<br>DISCONNECT-RISE-OFF ASSY., HELIUM | FAR<br>7-06224-903             | 591000              | EDWARDS          | YES ROBERTSHAW FUL<br>NO TON | 000996                        |
| FAILURE MODE-LEAKAGE AT A RATE OF 600 CC/MIN. AT 90 PSIG (ALLOWABLE 400 CC/MIN. AT 90 PSIG). THIS LEAKAGE WAS CAUSED BY THE OXYLUSE DRYING, RESULTING IN IMPROPER SEAL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                |                                |                     |                  |                              |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                      | QIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                                                                                                                                    | CORRECTIVE ACTION-PART ELIMINATED AT END OF C SERIES MISSILES, REPLACED BY PART 27-08126. OXYLUKE 703 ELIMINATED FOR USE ON RISEOFF DISCONNECTS. |                                |                     |                  |            |                               | 688433 |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                            | FTAB142/PS-404-00-17<br>PCU VALVE NO. 11 CONTROLLER                                                                                              | COUNTDOWN                      | 17D<br>890910       | 13<br>-2100      | YES<br>NO  |                               | 688850 |
| FAILURE MODE-DRIFT. THE PCU VALVE 11 CONTROLLER SETTING DRIFTED, CAUSING BELOW REDLINE AIRBORNE BOTTLE SUPPLY PRESSURE.            |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW.                                                                                                   |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME 9 MINUTES.                                                                             |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE PCU VALVE NO. 11 CONTROLLER WAS RESET TO GIVE SATISFACTORY PRESSURES.                                        |                                                                                                                                                  |                                |                     |                  |            |                               | 689436 |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                            | 98-08-121<br>VALVE-MANUAL SHUT-OFF HELIUM/O-RING T-08233-11                                                                                      | FAR                            | 890900              | M878             | YES<br>NO  | ROBERTSHAW FUL<br>TON         |        |
| FAILURE MODE-LEAKED INTERNALLY ALONG BUTTERFLY SHAFT DUE TO DAMAGED O-RING.                                                        |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-A CHAMFER ON VALVE BODY AND BUTTERFLY WILL BE INCORPORATED TO ALLOW INSTALLATION OF SHAFT O-RING WITHOUT DAMAGE. |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                            | 98-08-121<br>MANUAL SHUTOFF HELIUM VALVE/O RING 27-08108-3                                                                                       | FAR                            | 2D<br>590800        | SYCAMORE         | YES<br>NO  | ROBERTSHAW FUL<br>TON         | 689437 |
| FAILURE MODE-LEAKED INTERNALLY WHEN CLOSED AND IN LOCKED POSITION DUE TO 1/4 INCH O-RING DAMAGE WHICH RESULTED FROM ASSEMBLY.      |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-A CHAMFER ON VALVE BODY AND BUTTERFLY TO BE INCORPORATED TO ALLOW INSTALLATION OF SHAFT O-RING WITHOUT DAMAGE.   |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| PNEUMATIC-68E<br>MISSILE PRESSURIZATION                                                                                            | 98-08-121<br>MANUAL SHUT-OFF HELIUM VALVE/O-RING 27-08108-3                                                                                      | FAR                            | 590800              | ETR              | YES<br>NO  | ROBERTSHAW FUL<br>TON         |        |
| FAILURE MODE-LEAKED INTERNALLY WHEN CLOSED AND IN LOCKED POSITION DUE TO 1/4 INCH O-RING DAMAGE WHICH RESULTED FROM ASSEMBLY.      |                                                                                                                                                  |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-A CHAMFER ON VALVE BODY AND BUTTERFLY TO BE INCORPORATED TO ALLOW INSTALLATION OF SHAFT O-RING WITHOUT DAMAGE.   |                                                                                                                                                  |                                |                     |                  |            |                               |        |

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GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-63E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| THOUT DAMAGE.                                                                                                                                                                      |                                                |                                |                     |                  |            |                               | 099436 |
| PNEUMATIC-63E<br>MISSILE PRESSURIZATION                                                                                                                                            | FAR98-38-004<br>DISCONNECT COUPLING VALVE      | FAR<br>87-08128-2              | 3D<br>890418        | 13               | YES<br>NO  | ROBERTSHAW-VUL<br>TON         | 099557 |
| FAILURE MODE-EXTERNAL LEAK. THE GROUND PORTION OF DISCONNECT COUPLING VALVE WAS LEAKING AT THE SEAL DUE TO SHRINKAGE OF THE TEFLON LIP SEAL.                                       |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VENDOR REQUESTED TO RETROFIT ALL UNITS WITH SEALS OF BETTER QUALITY MATERIAL.                                                                                    |                                                |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E<br>MISSILE PRESSURIZATION                                                                                                                                            | FAR-98-38-002<br>RELIEF VALVE                  | FAR<br>232-20151               | 590402              |                  | YES<br>NO  | ANNIN                         | 099588 |
| FAILURE MODE-EXTERNAL LEAK. VALVE WAS LEAKING THROUGH THE SEAT DURING AMR TEST. FAILURE DUE TO AN EXCESSIVE APPLICATION OF MOLYKOTE TO THE SEAT OF THE VALVE AND SURROUNDING AREA. |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE WAS CLEANED AND TESTED SATISFACTORILY.                                                                                                                     |                                                |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E<br>MISSILE PRESSURIZATION                                                                                                                                            | FTM4579/P1-202-00-11<br>RELIEF VALVE           | COUNTDOWN                      | 118<br>590204       | 11<br>-210       | YES<br>NO  |                               | 098344 |
| FAILURE MODE-FAIL DURING OPERATION. RELIEF VALVE 11 IN THE HELIUM 3000 PSI SYSTEM WAS VENTING, THUS PREVENTING COMPLETION AT HELIUM STORAGE.                                       |                                                |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW. HELIUM STORAGE COULD NOT BE COMPLETED DUE TO VENTING OF 3000 PSI SYSTEM RELIEF VALVE 11.                                                          |                                                |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD 6 MINUTES, RECYCLE 3 1/2 MINUTES.                                                                                                           |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-CYCLE DUMP LINES TO RESEAT VALVES.                                                                                                                               |                                                |                                |                     |                  |            |                               |        |
| PNEUMATIC-63E<br>MISSILE PRESSURIZATION                                                                                                                                            | FTA4141/P3-204-00-4<br>PCU FUEL TANK REGULATOR | COUNTDOWN                      | 48<br>590902        | 13<br>-2100      | YES<br>NO  |                               | 099906 |
| FAILURE MODE-INTERNAL LEAK. THE PCU FUEL TANK REGULATOR WOULD NOT SEAT CAUSING DIFFICULTY IN MAINTAINING PROPER TANK PRESSURIZATION.                                               |                                                |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                |                                                |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME WAS 30 MINUTES.                                                                                                                        |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                         |                                                |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                                                        | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|-------------------------------------------------------------------|-------------------------------|
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                      | FTA4088/PS-201-00-4<br>VENT VALVE           | FRF                            | 48<br>580716        | 13<br>-2400      | YES<br>NO                                                         | 899903                        |
| FAILURE MODE-OUT OF TOLERANCE. THE GROUND HEAT EXCHANGER VENT VALVE RELIEVED BELOW 2800 PSI WHICH PREVENTED FULL PR<br>ESSURIZATION OF HELIUM BOTTLES.                                                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |                                                                   |                               |
| SYSTEM EFFECT-OPERATION TOO LOW.                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                                |                     |                  |                                                                   |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME WAS 27 MINUTES.                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |                                                                   |                               |
| CORRECTIVE ACTION-NOT DOCUMENTED. THE TEST WAS CONTINUED WITH OUT OF TOLERANCE VALVE.                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |                                                                   |                               |
| PNEUMATIC-GSE<br>MISSILE PRESSURIZATION                                                                                                                                                                                                                                                                                                                                                                                                                      | FAR-SP-98-58-3444<br>CONTROLLER             | FAR<br>T-08432-801             | 62124               | 12               | YES MINNEAPOLIS MO<br>NO MEYWELL<br>880H013                       | 899763                        |
| FAILURE MODE-OUT OF TOLERANCE. THE PNEUMATIC PRESSURE CONTROLLER, A COMPONENT OF THE PCU, FAILED WHEN IT WOULD NOT<br>REPEAT WITHIN LIMITS. IMPROPER POSITIONING OF THE MANUAL RESET ADJUSTMENT AND A LOOSE FEEDBACK BELLON'S CANISTER WERE<br>THE CAUSES OF FAILURE.                                                                                                                                                                                        |                                             |                                |                     |                  |                                                                   |                               |
| CORRECTIVE ACTION-FAILURE WAS CONFIRMED. RELIABILITY FAILURE ANALYSIS GROUP INFORMED PNEUMATICS DESIGN OF FINDINGS<br>AND RECOMMENDED THE POSSIBILITY OF LOCKWIRING THE MANUAL RESET ADJUSTMENT SETSCREW AND THE FEEDBACK BELLON'S CANISTER<br>ATTACHING SCREWS. GD/C CONSIDERED THE FAILURE RATE INSUFFICIENT TO WARRANT DESIGN ACTION.                                                                                                                     |                                             |                                |                     |                  |                                                                   |                               |
| PNEUMATIC-GSE<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                  | SP-98-58-3547<br>PRESSURE CONTROLLER        | FAR<br>N/A T-08432-801         | 63028               | 13               | YES MINNEAPOLIS MO<br>NO MEYWELL<br>Y708P1-PS-77-1<br>11-IV-NH-VI | 899700                        |
| FAILURE MODE-OUT OF SPECIFICATION. THE THIRD OUTPUT PRESSURE CALIBRATION POINT WAS BETWEEN 10 AND 15 PSI HIGH AT IT<br>S DESIGNATED SENSING PRESSURE. FAILURE WAS DUE TO THE CONTROLLER BEING OUT OF ADJUSTMENT. THIS WAS CAUSED BY ETR PER<br>SONNEL NOT ISOLATING THE CONTROLLER WHILE CHECKING RELIEF VALVES. THIS RESULTED IN OVER PRESSURIZATION OF THE BOURDO<br>N TUBE WITHIN THE CONTROLLER AND CHANGED THE OPERATING RANGE OF THE UNIT AS ADJUSTED. |                                             |                                |                     |                  |                                                                   |                               |
| CORRECTIVE ACTION-NONE. ETR PERSONNEL ARE AWARE OF THE PROBLEM.                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |                                                                   |                               |
| PNEUMATIC-GSE<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                  | SP-98-58-3546<br>PRESSURE CONTROLLER        | FAR                            | 63027               | 13               | YES MINNEAPOLIS MO<br>NO MEYWELL<br>388933                        | 899700                        |
| FAILURE MODE-OUT OF SPECIFICATION. CONTROLLED AIR PRESSURE WAS NOT WITHIN SPECIFICATION LIMITS. FAILURE WAS DUE TO<br>THE CONTROLLER BEING OUT OF ADJUSTMENT. THIS WAS CAUSED BY ETR PERSONNEL NOT ISOLATING THE CONTROLLER WHILE CHECKING<br>RELIEF VALVES. THIS RESULTED IN OVERPRESSURIZATION OF THE BOURDON TUBE WITHIN THE CONTROLLER AND CHANGED THE OPERAT<br>ING RANGE OF THE UNIT AS ADJUSTED.                                                      |                                             |                                |                     |                  |                                                                   |                               |

GENERAL DYNAMICS  
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DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | OIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE. ETR PERSONNEL ARE AWARE OF THE PROBLEM.                                                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               | 099699 |
| PNEUMATIC-GSE<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                              | SP-98-56-3555C<br>PRESSURE SWITCH           | FAR                            | 630523              | 13               | YES<br>NO  | MELETRON<br>NO 9800-20L88-168 | 099769 |
| FAILURE MODE-OUT OF SPECIFICATION. SWITCH DRIFTED OUT OF CALIBRATION. FAILURE ANALYSIS WAS CANCELLED.                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                              | SP-98-56-3555C<br>PRESSURE SWITCH           | FAR                            | 630523              | 13               | YES<br>NO  | MELETRON<br>NO 9800-20L-161   | 099767 |
| FAILURE MODE-OUT OF SPECIFICATION. SWITCH DRIFTED OUT OF CALIBRATION. FAILURE ANALYSIS WAS CANCELLED.                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                              | AD61-0349-DA650/L2-4MD-01-114               | COMPOSITE-FRD/DPL              | 114-D<br>611216     | 1-2              | NO<br>NO   |                               | 099493 |
| FAILURE MODE-OUT OF EXPECTED TEST VALUE. LOX TANK PRESSURE DROPPED TO 4.0 PSIG AT TERMINATION OF LOX RAPID LOAD. FAILURE CAUSED BY DEPLETION OF GROUND LOX SUPPLY ALLOWING TRANSFER NITROGEN TO ENTER LOX DUCTING AND LOX TANK. MINIMUM AMOUNT OF LOX INTENTIONALLY USED FOR THIS TEST TO CHECK EFFECT OF LOX CONTAMINATION BY NITROGEN. |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW. LOW LOX TANK PRESSURE CAUSED PCU TO GO TO EMERGENCY.                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PNEUMATIC-GSE<br>LN2 SUPPLY                                                                                                                                                                                                                                                                                                              | AA61-0152/P2-404-00-117<br>PCU VALVE NO. 7  | COUNTDOWN                      | 117D<br>611116      | 1Z<br>-1960      | YES<br>NO  |                               | 099854 |
| FAILURE MODE-CONTAMINATION. LN2 STORAGE VALVE NO. 7 FROZE DURING LN2 STORAGE. THE VALVE WAS FREED UPON CYCLING.                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LN2 STORAGE WAS TEMPORARILY DISCONTINUED.                                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME WAS 4 MINUTES.                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE NO. 7 WAS CYCLED UNTIL IT OPERATED FREELY.                                                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |

15 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                  | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME           | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PNEUMATIC-68E<br>LN2 SUPPLY                                                                                                                                                           | FTA6342/P3-402-00-44<br>HEAT EXCHANGER                | COUNTDOWN                      | 440<br>600126       | 13<br>-3940      | YES<br>NO  |                               | 899989 |
| FAILURE MODE-EXTERNAL LEAK. AN LN2 LEAK AT THE HEAT EXCHANGER WAS REPORTED. INVESTIGATION REVEALED THAT IT WAS NOT SERIOUS.                                                           |                                                       |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                   |                                                       |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                  |                                                       |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE. A DECISION WAS MADE TO GO AS IS.                                                                                                                              |                                                       |                                |                     |                  |            |                               |        |
| PNEUMATIC-68E<br>LN2 SUPPLY                                                                                                                                                           | FTA 8084/P2-302-00-11<br>REGULATOR                    | COUNTDOWN                      | 11C<br>590921       | 12<br>-1920      | YES<br>NO  |                               | 899303 |
| FAILURE MODE-FAIL DURING OPERATION. LN2 COULD NOT BE LOADED DUE TO A FAULTY REGULATOR ON THE LN2 TRAILER.                                                                             |                                                       |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                               |                                                       |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 32 MINUTE HOLD AND COUNTDOWN RECYCLE OF 3 MINUTES.                                                                                                  |                                                       |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-ATTEMPTS WERE MADE TO ATTAIN PROPER REGULATOR OPERATION. THESE WERE UNSUCCESSFUL. THE LN2 TRAILER WAS THEN REPLACED.                                                |                                                       |                                |                     |                  |            |                               |        |
| PNEUMATIC-68E<br>LN2 SUPPLY                                                                                                                                                           | FTA4579/P3-202-00-11<br>LN2 STORAGE TRAILER REGULATOR | COUNTDOWN                      | 11B<br>590204       | 11<br>-2700      | YES<br>NO  |                               | 899346 |
| FAILURE MODE-FAIL DURING OPERATION. LN2 LOADING COULD NOT BE CONTINUED DUE TO FAILURE OF THE LN2 TRAILER REGULATOR WHICH OVER PRESSURIZED THE TRAILER CAUSING RELIEF VALVE ACTUATION. |                                                       |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LN2 STORAGE COULD NOT BE CONTINUED DUE TO FAILURE OF THE LN2 TRAILER REGULATOR.                                                            |                                                       |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 5 MINUTES HOLD.                                                                                                                                     |                                                       |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-CHANGED LN2 TRAILERS.                                                                                                                                               |                                                       |                                |                     |                  |            |                               |        |
| PNEUMATIC-68E<br>LN2 SUPPLY                                                                                                                                                           | FTA4008/P3-201-00-4<br>VALVE-LN2 HEAT EXCHANGER       | FRF                            | 4B<br>590716        | 13<br>-4200      | YES<br>NO  |                               |        |
| FAILURE MODE-CONTAMINATION. LN2 HEAT EXCHANGER VALVE WAS FROZEN.                                                                                                                      |                                                       |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                               |                                                       |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME 30 MINUTES.                                                                                                                               |                                                       |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

19 JUN 1966

DIFFICULTIES REVIEW-PNEUMATIC SYSTEM-CSE

| SYSTEM<br>SUB-SYSTEM                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-THE VALVE WAS THAWED.                                                                 |                                             |                                |                     |                  |            |                               |
| PNEUMATIC-CSE<br>LNE SUPPLY                                                                             | PTA008/PS-201-00-4<br>VALVE-LNE SYSTEM      | FRP                            | 48<br>800716        | 13<br>-4200      | YES<br>NO  |                               |
| FAILURE MODE-OUT OF TOLERANCE. LNE COULD NOT BE LOADED DUE TO A FROZEN GROUND HEAT EXCHANGER LNE VALVE. |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. LNE VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTE HOLD.           |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTE HOLD.                                                       |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THAWED VALVE OUT SO IT WAS OPERATIVE.                                                 |                                             |                                |                     |                  |            |                               |

600013

999346

PROPULSION INTERFACE

GSE

DIFFICULTIES REVIEW

DIFFICULTIES REVIEW - GSE

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GENERAL MANICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION SYSTEM-68C

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                              | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPULSION-MAZ-68E                                                                                                                                                  | AE60-0538/P1-402-00-60<br>AMPLIFIER                                      | COUNTDOWN                      | 600<br>600702       | 11/ETR<br>-4800  | YES<br>NO  |                               | 688480 |
| FAILURE MODE-OUT OF SPECIFICATION. B2 RCC ACCELEROMETER AMPLIFIER WAS NOISY.                                                                                        |                                                                          |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-ERRATIC OPERATION. LOSS OF CAPABILITY TO MEASURE B2 ROUGH COMBUSTION.                                                                                 |                                                                          |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                |                                                                          |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-AMPLIFIER WAS REPLACED.                                                                                                                           |                                                                          |                                |                     |                  |            |                               |        |
| PROPULSION-MAZ-68E<br>GENERAL                                                                                                                                       | FTA4797/P3-402-00-03<br>LITHIUM CHLORIDE UNIT FILTER                     | COUNTDOWN                      | 30<br>590414        | 13               | YES<br>NO  |                               | 688488 |
| FAILURE MODE-FAIL DURING OPERATION. LITHIUM CHLORIDE FILTER WAS PLUGGED.                                                                                            |                                                                          |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LOW.                                                                                                                                    |                                                                          |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. START OF COUNTDOWN DELAYED ONE HOUR.                                                                                              |                                                                          |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-LITHIUM CHLORIDE UNIT FILTER WAS REPLACED.                                                                                                        |                                                                          |                                |                     |                  |            |                               |        |
| PROPULSION-MA3-68E                                                                                                                                                  | DA639/F1-SMO-16-24<br>CIRCUIT FOR SP66 INITIATOR SIMULAT<br>OR.          | COMPOSITE-FRD/DPL              | 24E<br>611201       | F                | YES<br>NO  |                               | 688484 |
| FAILURE MODE-OUT OF TOLERANCE. GAS GENERATOR INITIATOR SIMULATOR DID NOT ALLOW FIRING OF INITIATORS AS THE SIMULATOR WAS NOT COMPATIBLE WITH LAUNCH CONTROL SYSTEM. |                                                                          |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. SP66 INITIATORS DID NOT FIRE.                                                                                               |                                                                          |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                   |                                                                          |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                          |                                                                          |                                |                     |                  |            |                               |        |
| PROPULSION-MA3-68E                                                                                                                                                  | AD61-0292DA598/F1-SMO-23-24<br>CIRCUIT FOR SP66 INITIATOR SIMULAT<br>OR. | COMPOSITE-FRD/DPL              | 24E<br>610921       | F                | YES<br>NO  |                               | 688483 |
| FAILURE MODE-OUT OF TOLERANCE. GAS GENERATOR INITIATOR SIMULATOR DID NOT ALLOW FIRING OF INITIATORS AS SIMULATOR WAS NOT COMPATIBLE WITH LAUNCH CONTROL SYSTEM.     |                                                                          |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. SP66 INITIATORS DID NOT FIRE.                                                                                               |                                                                          |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                   |                                                                          |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                          |                                                                          |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONV/ 11V:810N

15 JUN 1966

DIFFICULTIES REVIEW-PROPULSION SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                           | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME | SITE<br>DIF TIME | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------|------------------|------------|-------------------------------|
| PROPULSION-MAS-GSE   | SLV-9D-40-3337<br>LIQUID OXYGEN FILL AND DRAIN VALVE 27-02102-31                                                                                                                                                                                                                                                      | FAR                            | 690115                   |                  | YES        | ATRATOS                       |
|                      | FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. DURING DPL PROCEDURE 27-94445-3, THE VALVE FAILED TO OPEN AND CL<br>OSE IN THE COMMIT SEQUENCE.                                                                                                                                                                    |                                |                          |                  | NO         |                               |
|                      | CORRECTIVE ACTION-CONFIRMED FAILURE. WATER HAD ENTERED VALVE, FROZE AND PREVENTED OPERATION. NO MEANINGFUL ACTION C<br>AN BE TAKEN OTHER THAN INFORMING SITE PERSONNEL OF DETAILS OF THIS ANALYSIS. THIS WAS DONE 3 MARCH 1966.                                                                                       |                                |                          |                  |            |                               |
| PROPULSION-MAS-GSE   | SLV-9D-40-3329<br>FUEL FILL AND DRAIN VALVE                                                                                                                                                                                                                                                                           | FAR                            | 691008                   | 2-4              | YES        | AIRESEARCH                    |
|                      | FAILURE MODE-ERRATIC OPERATION. VALVE SERIAL NUMBER 405-1470 WAS FOUND TO OPERATE IN REVERSE DIRECTION DUE TO IMPRO<br>PER INSTALLATION OF THE LINKAGE.                                                                                                                                                               | 27-02101-23                    |                          |                  | NO         | 121034                        |
|                      | CORRECTIVE ACTION-NEW EOP 313.26 WAS RELEASED 15 FEBRUARY 1966 TO PROVIDE REQUIREMENTS FOR TESTING AND ADJUSTMENT O<br>F THE FILL AND DRAIN VALVE. NO FURTHER ACTION TAKEN.                                                                                                                                           |                                |                          |                  |            |                               |
| PROPULSION-MAS-GSE   | SLV-9D-40-3329<br>FUEL FILL AND DRAIN VALVE                                                                                                                                                                                                                                                                           | FAR                            | 691008                   | 2-4              | YES        | AIRESEARCH                    |
|                      | FAILURE MODE-OUT OF TOLERANCE. VALVE, SERIAL NUMBER, 208-1980 OPERATED TOO RAPIDLY AND THE OPEN MICRO SWITCH FAILED<br>TO FUNCTION. THE SCREW SECURING THE LEVER ARM WAS FOUND LOOSE. NO SHIMS WERE FOUND.                                                                                                            | 27-02101-23                    |                          |                  | NO         | 121034                        |
|                      | CORRECTIVE ACTION-NEW EOP 315.26 WAS RELEASED 15 FEBRUARY 1966 TO PROVIDE REQUIREMENTS FOR TESTING AND ADJUSTMENT OF<br>THE FILL AND DRAIN VALVE. NO FURTHER ACTION TAKEN.                                                                                                                                            |                                |                          |                  |            |                               |
| PROPULSION-MAS-GSE   | SLV-9D-40-3329<br>FUEL FILL AND DRAIN VALVE, SCREW                                                                                                                                                                                                                                                                    | FAR                            | 691008                   | 2-4              | YES        | AIRESEARCH                    |
|                      | FAILURE MODE-OUT OF TOLERANCE. VALVE SERIAL NUMBER, 410-3650, OPERATED IN REVERSE AND THE OPEN MICROSWITCH WAS HALP<br>UNCTIONING. THE SECURING SCREW WAS FOUND LOOSELY TORQUED. NO SHIMS WERE FOUND BETWEEN THE SUPPORTING SHAFT AND SPLIN<br>ED BUTTERFLY SHAFT. BINDING BETWEEN LINKAGE AND ITS HOUSING WAS FOUND. | 27-02101-23                    |                          |                  | NO         | 121034                        |
|                      | CORRECTIVE ACTION-NEW EOP 315.28 WAS RELEASED 15 FEBRUARY 1966 TO PROVIDE REQUIREMENTS FOR TESTING AND ADJUSTMENT O<br>F THE FILL AND DRAIN VALVE. NO FURTHER ACTION TAKEN.                                                                                                                                           |                                |                          |                  |            |                               |

PROPULSION INTERFACE

GSE

DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW PROPULSION INTERFACE GSE

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GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-63E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPUL INTERFACE-63E<br>ENGINE PURGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | FAR-CT-98-40-039<br>SOLENOID VALVE          | FAR<br>27-02106-1              | 650224              | 39A/ETR          | YES        | MAROTTA<br>NO 803394          |
| <p>FAILURE MODE-LEAK-EXTERNAL. THE 2 POSITION PNEUMATIC PURGEVALVE USED TO PURGE THE LOX DOME OF THE BOOSTER AND SUSTA<br/>INNER ENGINES LEAKED OUT THE VENT PORT IN THE NORMALLY CLOSED POSITION. LEAK WAS CAUSED BY CONTAMINATION AT THE POPPE<br/>Y SEATING PREVENTING PROPER SEATING OF THE VALVE. SOURCE OF THE CONTAMINATION IS UNKNOWN.</p> <p>CORRECTIVE ACTION-SITE PERSONNEL INFORMED TO CLEAN THE SYSTEM. RECOMMENDED, REPLACE AND REMARK ALL SOLENOID VALVES<br/>HAVING RUBBER CURE AND ASSEMBLY DATES EXCEEDING 1 YEAR. PROVIDE ASSURANCE ALL VALVES CLEANED PER CORRECT CONVAIR SPE<br/>C. VALVES TO BE REMARKED BY VENDOR UNTIL CONVAIR HAS NECESSARY KNOWLEDGE AND TECHNIQUES TO CORRECTLY REMARK VALVES.<br/>UP TO DATE REMARK RECORDS WILL BE MAINTAINED.</p> |                                             |                                |                     |                  |            |                               |
| PROPUL INTERFACE-63E<br>ENGINE PURGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LV-98-40-3259-F<br>SOLENOID VALVE           | FAR<br>27-02106-1              | 640805              | 13/ETR           | YES        | MAROTTA<br>NO 803394          |
| <p>FAILURE MODE-LEAK. CONTAMINATION ENTERED THE VALVE THROUGH THE BODY PISTON VENT HOLES AND THE CYLINDER VENT PORT. Y<br/>HIS CONDITION ALLOWED LEAKAGE PAST THE POPPET SEAT.</p> <p>CORRECTIVE ACTION-ECP 3472, APPROVED BY THE CUSTOMER, 3 SEPTEMBER 1963, REMOVES AND REPLACES TWO PURGE CONTROL BOX<br/>HALF-COVER ASSEMBLIES AND GASKETS WITH NEW ONES, AND ADDS A PROTECTIVE HEAT RESISTANT COATING, COMPLYING WITH GDC SP<br/>ECIFICATION 0-00012, TO THE CONTROL BOX TO ELIMINATE PAINT BLISTERING AND PEELING INSIDE THE BOX.</p>                                                                                                                                                                                                                                     |                                             |                                |                     |                  |            |                               |
| PROPUL INTERFACE-63E<br>ENGINE PURGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | LV-98-40-3259-F<br>SOLENOID VALVE           | FAR<br>27-02106-1              | 640619              | 12/ETR           | YES        | SOUTHWESTERN<br>NO 803394     |
| <p>FAILURE MODE-CONTAMINATION. THE VALVE WOULD NOT ACTUATE COMPLETELY OR SEAT PROPERLY DURING A SYSTEM LEAK CHECK. THE<br/>FAILURE IS ATTRIBUTED TO INTERNAL CONTAMINATION PREVENTING FULL POPPET TRAVEL.</p> <p>CORRECTIVE ACTION-ECP 3472, APPROVED BY THE CUSTOMER, REMOVES AND REPLACES TWO PURGE CONTROL BOX HALF-COVER ASSEMBL<br/>IES AND GASKETS, AND ADDS A PROTECTIVE HEAT RESISTANT COATING, COMPLYING WITH GDC SPECIFICATION 0-00012.</p>                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| PROPUL INTERFACE-63E<br>ENGINE PURGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A-99-40-3032-F<br>SOLENOID VALVE            | FAR<br>27-02106-1              | 620905              | 12/ETR           | YES        | MAROTTA<br>NO 803394          |
| <p>FAILURE MODE-LEAK-EXTERNAL. THE SOLENOID VALVE VENTED CONTINUOUSLY FROM THE EXHAUST PORT. INTERNAL LEAKAGE WAS THE<br/>RESULT OF CONTAMINATION INTERFERENCE WITH POPPET SEATING.</p> <p>CORRECTIVE ACTION-CIC 07060, EFFECTIVE 8 NOVEMBER 1962, PROVIDED INSTALLATION OF CHECK VALVES IN THE PURGE BOX MANI</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME              | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTR | VENDOR NAME<br>VENDOR PART NO   |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------|--------|
| FOLD.                                                                                                                                                                                                                                                                               |                                                          |                                |                     |                  |            |                                 | 699719 |
| PROPUL INTERFACE-GSE<br>ENGINE PURGE                                                                                                                                                                                                                                                | 9B-40-017<br>SOLENOID OPERATED PURGE VALVE/O-RING<br>NG  | FAR<br>7-02300-1               | 990800              | 12/ETR           | YES        | SOUTHWESTERN V<br>NO ALVE CORP. | 699799 |
| FAILURE MODE-INTERNAL LEAK. THE VALVE LEAKED THROUGH THE VENT PORT. LEAKAGE OCCURRED PAST A SLIGHTLY MICKED APARENT<br>LY UNDERSIZED O-RING.                                                                                                                                        |                                                          |                                |                     |                  |            |                                 |        |
| CORRECTIVE ACTION-NONE. C SERIES WILL BE REPLACED BY D SERIES TYPE VALVE.                                                                                                                                                                                                           |                                                          |                                |                     |                  |            |                                 |        |
| PROPUL INTERFACE-GSE<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                          | FTAB575/P68-CO-03-0AC3<br>B66 IGNITER 1 AND 2 CONNECTORS | COMPOSITE-J FACT               | 1510                | 368/ETR          | YES        |                                 | 699824 |
| FAILURE MODE-OUT OF TOLERANCE. PLUGS P203 AND P204 (B66 IGNITER NO. 1 AND NO. 2) IN THE GTR WERE REVERSED WHICH PRE<br>VENTED COMPLETION OF THE ENGINE START SEQUENCE.                                                                                                              |                                                          |                                |                     |                  |            |                                 |        |
| SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. REVERSING OF GTR PLUG P203 AND P204 CAUSED AN IGNITION STAGE LIMITER CUTOFF<br>F.                                                                                                                                                          |                                                          |                                |                     |                  |            |                                 |        |
| VEHICLE EFFECT-COMPOSITE DELAYED. RECYCLE TIME WAS 5 MINUTES. HOLD TIME IS NOT AVAILABLE.                                                                                                                                                                                           |                                                          |                                |                     |                  |            |                                 |        |
| CORRECTIVE ACTION-INSTALLED PLUGS P203 AND P204 IN THE PROPER RECEPTACLES.                                                                                                                                                                                                          |                                                          |                                |                     |                  |            |                                 |        |
| PROPUL INTERFACE-GSE<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                          | AAGS-0046/P6-4CO-03-F1<br>PROPULSION CHECKOUT WIRING     | COMPOSITE-J FACT               | 104D                | 36A/ETR          | YES        |                                 | 699844 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE SUSTAINER PROPELLANT VALVES DID NOT GO INTO CONTROL. CONTROL S<br>IGNAL WAS INADVERTENTLY WIRED TO GROUND WIRING WHICH WAS EJECTED AT T ZERO.                                                                                  |                                                          |                                |                     |                  |            |                                 |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                 |                                                          |                                |                     |                  |            |                                 |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                |                                                          |                                |                     |                  |            |                                 |        |
| CORRECTIVE ACTION-VALVE CONTROL CIRCUITRY WAS PROPERLY WIRED.                                                                                                                                                                                                                       |                                                          |                                |                     |                  |            |                                 |        |
| PROPUL INTERFACE-GSE<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                          | AAGS-0045/P6-4CO-04-F1<br>PROPULSION CHECKOUT WIRING     | COMPOSITE-J FACT               | 104D                | 36A/ETR          | YES        |                                 |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE SUSTAINER FLIGHT LOCK-IN RELAY DID NOT PICK-UP WHICH RESULTED<br>IN CUTOFF. THE RELAY FAILED TO PICK-UP BECAUSE REVERSAL OF CABLE CONNECTIONS TO 866 NO 1 AND 2 RECEPTACLES PREVENTED<br>PROPER GENERATION OF CIRCUITRY LOGIC. |                                                          |                                |                     |                  |            |                                 |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY.                                                                                                                                                                                                                                          |                                                          |                                |                     |                  |            |                                 |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

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DIFFICULTIES REVIEW-PROPULSION INTERFACE SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME              | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME | SITE<br>DIF TIME | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------|--------------------------|------------------|------------|-------------------------------|--------|
| VEHICLE EFFECT-COMPOSITE DELAYED. THE COMPOSITE WAS DELAYED AND RECYCLED 25 MINUTES.<br>CORRECTIVE ACTION-SIMULATOR CABLES WERE INSTALLED CORRECTLY.                                                                                                                                                                                                                                                    |                                                          |                                |                          |                  |            |                               | 000000 |
| PROPUL INTERFACE-68E<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                              | AAS0002/P8-4CBH-07-104/C1<br>PROPULSION CHECK OUT WIRING | COMPOSITE-FRD/DPL              | 1040<br>611222           | 36A/ETR          | YES<br>NO  |                               | 000001 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE ENGINE TANKS DID NOT VENT WHEN THE SIGNAL WAS TRANSMITTED. FAILURE TO VENT WAS CAUSED BY A REDUNDANT JUMPER WIRE IN THE PRESSURIZATION CIRCUITRY.<br>SYSTEM EFFECT-OPERATION DOES NOT START.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION THE TANKS WERE VENTED BY MOMENTARILY REMOVING MISSILE D.C. POWER. THE JUMPER WAS REMOVED AFTER THE TEST. |                                                          |                                |                          |                  |            |                               | 000005 |
| PROPUL INTERFACE-68E<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                              | AAS1-0080/P8-4MO-01-111<br>PURGE RESET CIRCUIT           | COMPOSITE-FRD/DPL              | 1110<br>610710           | 12/ETR           | YES<br>NO  |                               | 000007 |
| FAILURE MODE-OUT OF TOLERANCE. A WIRING ERROR IN THE PURGE RESET CIRCUIT CAUSED THE FUEL PRE-VALVE AND FILL AND DRA IN VALVE LIGHTS ON THE PURGE PANEL TO BE INOPERATIVE.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-THE PURGE RESET CIRCUIT WIRING WAS CORRECTED.                                                                                                             |                                                          |                                |                          |                  |            |                               | 000007 |
| PROPUL INTERFACE-61E<br>ELECTRICAL CONTROL                                                                                                                                                                                                                                                                                                                                                              | AAS0-0159/P8-402-00-91                                   | COUNTDOWN                      | 910<br>601215            | 12/ETR<br>-80    | YES<br>NO  |                               | 000007 |
| FAILURE MODE-ERRATIC OPERATION. AN RCC DISCRETE WAS GENERATED BY THE BOOSTER SYSTEM PRIOR TO ENGINE START.<br>SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 10 MINUTES HOLD AND 2 MINUTES RECYCLE.<br>CORRECTIVE ACTION-THE RCC BACKUP CIRCUITRY WAS DEACTIVATED.                                                                                                       |                                                          |                                |                          |                  |            |                               | 000007 |

PROPELLANT LOADING SYSTEM

GSE

DIFFICULTIES REVIEW

# DIFFICULTIES REVIEW PROPELLANT UTIL/LOADING SYSTEM GSE

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## III. PROPELLANT LOADING

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                  | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP  | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------|----------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FTA4572/P2-303-00-04                                                         | COUNTDOWN                      | 4C 18<br>990187 -480 | YES<br>NO        |            | 699361                        |
| <p>FAILURE MODE-OUT OF TOLERANCE. TANKING WAS SLOW, CAUSE UNKNOWN.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. TOTAL DELAY 20 MINUTES.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p>                                                                                                                                                                                                                                                                                         |                                                                              |                                |                      |                  |            |                               |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FAR-CT-98-540-021<br>LIQUID HYDROGEN FLOW CONTROL VALVE 59-02109-1<br>SWITCH | FAR                            | 950719               | ETR              | YES<br>NO  | 55-02109-1<br>699360          |
| <p>LOX FEED</p> <p>FAILURE MODE-CONTAMINATION. THE SWITCH FAILED TO FUNCTION WHEN THE VALVE CLOSED. EXAMINATION REVEALED CORROSION AND PITTING OF SWITCH CONTACT SURFACES. CORROSION WAS DUE TO MOISTURE ENTERING THE ATMOSPHERE VENT OF THE VALVE OVER AN EXTENDED PERIOD OF INACTIVITY.</p> <p>CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. IT WAS RECOMMENDED THAT THE FLOW CONTROL VALVE BE PROTECTED FROM MOISTURE DURING PERIODS OF INACTIVITY.</p>                                    |                                                                              |                                |                      |                  |            |                               |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MSCAPE137D/P3-48N-03-225                                                     | COMPOSITE-FRD/DPL              | 221D<br>650630       | ETR<br>-126      | YES<br>NO  | 699334                        |
| <p>LOX FEED</p> <p>FAILURE MODE-OUT OF TOLERANCE. MEASUREMENT P1021T (LOX AT BREAKAWAY VALVE) WAS AT -279.8 DEG. F, ABOVE THE RED LINE LIMIT OF -283 DEG. F. SIMILAR EFFECTS OCCURRED DURING P3-48N-01-225.</p> <p>SYSTEM EFFECT-HIGH TEMPERATURE ENVIRONMENT.</p> <p>VEHICLE EFFECT-COMPOSITE RESCHEDULED.</p> <p>CORRECTIVE ACTION-ON NEXT TANKING TEST, SUBCOOLED LOX WAS USED TO TOP FROM THE 95 PCT LEVEL BEGINNING APPROX T-9 MINUTES. INSULATION WAS ALSO ADDED TO THE LOX LINES.</p> |                                                                              |                                |                      |                  |            |                               |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | AA89-0012/P4-TN0-01-3301<br>PROBE-LOX OVERFILL                               | COMPOSITE-FRD/DPL              | 3301<br>650802       | 14               | YES<br>NO  |                               |
| <p>LOX FEED</p> <p>FAILURE MODE-FALL DURING OPERATION. DURING RE EVALUATION OF THE AUTO TOPPING SYSTEM PROPER OPERATION WAS NOTED THROUGH SIX CYCLES. ON THE SEVENTH, THE OVERFILL PROBE PICKED UP CUTTING OFF THE AUTO SYSTEM WHICH REMAINED DISABLED. TO PPING WAS MAINTAINED MANUALLY.</p>                                                                                                                                                                                                |                                                                              |                                |                      |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-GSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. THE AUTOMATIC TOPPING SYSTEM CUTOFF AND TOPPING WAS MAINTAINED MANUALLY.                                                                                                           |                                             |                                |                     |                  |            |                               | 899307 |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E                                                                                                                                                                                                    | AA65-0012/P4-78N-01-9301                    | COMPOSITE-FRD/DPL              | 9301                | 14               | YES        |                               | 899308 |
| LOX FEED                                                                                                                                                                                                                      | TRANSDUCER LANDLINE                         | 27-01908-18                    | 650121              |                  | NO         |                               |        |
| FAILURE MODE-EXTERNAL LEAK. DURING TOPPING A LOX LEAK WAS NOTED IN THE LOX AREA. AFTER DETANKING, IT WAS DISCOVERED THE LEAK WAS ORIGINATING FROM A FRACTURED TRANSDUCER.                                                     |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE TRANSDUCER WAS IRD AND REPLACED. (IR 872388).                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E                                                                                                                                                                                                    | AA65-0012/P4-78N-01-9301                    | COMPOSITE-FRD/DPL              | 9301                | 14               | NO         |                               | 899309 |
| LOX FEED                                                                                                                                                                                                                      |                                             | 650121                         |                     |                  | NO         |                               |        |
| FAILURE MODE-OUT OF SPECIFICATION. THE LOX TOPPING SYSTEM WOULD NOT MAINTAIN LOX TEMPERATURE BELOW THE MAXIMUM REDLINE LIMIT. THE LNZ SUBCOOLER AND THE AUTOMATIC LOX TOPPING SYSTEM WERE OPERATING NORMALLY AND AS DESIGNED. |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE. LOX TEMPERATURE COULD NOT BE MAINTAINED BELOW THE MAXIMUM REDLINE LIMIT. THIS CONDITION DID NOT PRECLUDE SATISFACTION OF DUAL TANKING TEST OBJECTIVES.                                                    |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E                                                                                                                                                                                                    | AA65-0012/P4-78N-01-9301                    | COMPOSITE-FRD/DPL              | 9301                | 14               | YES        | PACIFIC                       | 899303 |
| LOX FEED                                                                                                                                                                                                                      | BYPASS VALVE                                | 27-02833-11                    | 650121              |                  | NO         |                               |        |
| FAILURE MODE-EXTERNAL LEAK. THE LOX SUBCOOLER BYPASS VALVE LEAKED DURING LOX TANKING.                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE WAS IRD REMOVED, REBUILT, AND REINSTALLED. (IR 978331).                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | OIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SIZE<br>TIME DIF | FRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | AAGA-0088/P3-401-00-888<br>FILTER           | COUNTDOWN                      | 889D<br>841108      | ETR<br>-180      | YES<br>NO  |                               |
| <p>FAILURE MODE-CONTAMINATION. FAILURE TO GET 100 PCT LOX LOAD AT PRESCRIBED TIME WAS ATTRIBUTED TO FILTER ICING.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. THIS PROBLEM CONTRIBUTED TO AN 11 MIN HOLD AND 8 MIN RECYCLE. A FURTHER 1 MIN HOLD WAS INCURRED IN THE SECOND (SUCCESSFUL) EFFORT TO LOAD LOX.</p> <p>CORRECTIVE ACTION-LOX WAS DUMPED TO APPROX 97 PCT, THEN TOPPED AT A LOW RATE.</p>                                                                                                                          |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | AAGA-0038/P3-MO-03-04CS<br>PUMP LC          | COMPOSITE-FRD/DPL              | 135D<br>840816      | ETR<br>-780      | YES<br>NO  |                               |
| <p>FAILURE MODE-EXTERNAL LEAK. A LEAK CAUSED THE VARI-DRIVE BELT OF PUMP LC TO FREEZE TO THE PULLEYS. WHEN THE MOTOR WAS STARTED THE BELT BROKE.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START. THE PUMP WOULD NOT OPERATE. ATLAS LOX TOPPING COULD NOT BE ACCOMPLISHED. THE TEMPERATURE AT THE LOX BREAKAWAY VALVE WAS NOT WITHIN REDLINE.</p> <p>VEHICLE EFFECT-NONE. HOWEVER, EARLIER IN THE COUNTDOWN (4080 SECONDS) THERE WAS A HOLD OF 34 MINUTES WHILE A SUSPECTED LEAK IN THE LOX TRANSFER UNIT WAS INVESTIGATED.</p> <p>CORRECTIVE ACTION-THE BELT WAS REPLACED.</p> |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | AAGA-0038/FAR-CT-P3-580-026<br>PUMP, SEAL   | COMPOSITE-FRD/DPL              | 135D<br>840608      | ETR<br>-1080     | YES<br>NO  |                               |
| <p>FAILURE MODE-INTERNAL LEAK. INSPECTION INDICATED THE POSSIBILITY THAT A CARBON SEAL, BETWEEN THE LOX PUMP AND BEARING HOUSING, HAD FAILED AND PERMITTED MIXING OF LOX WITH THE LUBRICANT.</p> <p>SYSTEM EFFECT-EXPLOSION. AT PUMP START, THE MIXTURE EXPLODED AND DESTROYED PUMP LB.</p> <p>VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.</p> <p>CORRECTIVE ACTION-THE LOX TRANSFER UNIT WAS REPLACED.</p>                                                                                                                                                             |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | LY-98-J8-148F<br>STD AND NUTS               | FAR<br>85-65938                | 840882              | ETR              | YES<br>NO  |                               |
| <p>FAILURE MODE-OUT OF SPECIFICATION. AN ATTEMPT TO BACK OFF THE NUTS TO EQUALIZE THE GRIP OF THE STUDS RESULTED IN 64</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1986

DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-CSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| LLING AND SEIZURE. FAILURE OF THE STUD AND NUT ASSEMBLIES WAS CAUSED BY THE COMBINATION OF AN OUT OF SPECIFICATION C<br>ONDITION OF THE STUD AND THE NUT.                                                                                                                        |                                             |                                |                     |                  |            |                               | 000701 |
| CORRECTIVE ACTION-SURVEY 7A-64 WAS ISSUED JUNE 9 1984 TO F AND CO-IR ALL STUDS OF PIN 87-42908-018 THROUGH -021. 59<br>9 STUDS WERE WRITTEN UP.                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E                                                                                                                                                                                                                                                       | LY-89-58-149F<br>STUD AND D NUTS            | PAR<br>87-42908-017            | 8408E2              | ETR              | YES<br>NO  |                               | 000702 |
| LOX FEED                                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-OUT OF SPECIFICATION. AN ATTEMPT TO BACK OFF THE NUTS TO EQUALIZE THE GRIP OF THE STUDS RESULTED IN SA<br>LLING AND SEIZURE. FAILURE OF THE STUD AND NUT ASSEMBLIES WAS CAUSED BY THE COMBINATION OF AN OUT OF SPECIFICATION C<br>ONDITION OF THE STUD AND THE NUT. |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-SURVEY 7A-64 WAS ISSUED JUNE 9, 1984 TO F AND CO-IR ALL STUDS OF PIN 87-42908-018 THROUGH-021. 59<br>9 STUDS WERE WRITTEN UP.                                                                                                                                  |                                             |                                |                     |                  |            |                               | 000800 |
| PROPELLANT LOADING-GDC-68E                                                                                                                                                                                                                                                       | A/63-U050/P8-NO-02-0ACE<br>VALVES           | COMPOSITE-FRD/DPL              | 1260<br>63114       | ETR<br>600       | YES<br>NO  |                               |        |
| LOX FEED                                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. VALVE LR-2 AND LR-4 IN THE LOX TRANSFER UNIT LEAKED DURING LOX TANKING.                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-LOW TEMPERATURE ENVIRONMENT. THE LOX LEAKS CAUSED THE FOLLOWING PROBLEMS. LOSS OF CONTROL PRESSURE AN<br>D OPERATIONAL POWER TO THE LOX TRANSFER UNIT, PUMP LC WAS FROZEN AND INOPERATIVE, AND PUMP LB OUTLET VALVE WAS FROZE<br>N OPEN.                           |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME WAS 18 MINUTES.                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-REPLACED VALVE LR-2 AND LR-4 AFTER THE TEST.                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E                                                                                                                                                                                                                                                       | A83-0039/P3-4WQ-01-18F<br>FILTER, GASKET    | COMPOSITE-FRD/DPL              | 1970<br>63101       | ETR              | YES<br>NO  |                               | 000844 |
| LOX FEED                                                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. THE GASKET IN THE LV-1 FILTER FAILED CAUSING EXCESSIVE LEAKAGE.                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. A 30-MINUTE HOLD WAS CALLED.                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE FILTER CAP GASKET WAS REPLACED.                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |

GENERAL DYNAMICS  
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-688

| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | VEHICLE<br>DATE OF<br>PART NUMBER | VEHICLE<br>DATE OF<br>TIME OF<br>DISPATCH | PRI<br>OTHER<br>VENDOR PART NO | 688410 |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------|--------------------------------|--------|
| PROPELLANT LOADING-60C-688 | 63-0880/03-402-00-142<br>LOX STORAGE TANK PRESSURIZATION VA<br>LVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | COUNTDOWN                         | 1420<br>030800                            | YES<br>NO                      | 688410 |
| LOX FEED                   | <p>FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. LOX STORAGE TANK FAILED TO PRESSURIZE. FAILURE CAUSED BY PRESSURIZATION VALVE FAILING TO OPEN.</p> <p>SYSTEM EFFECT-OPERATION DOES NOT START. LOX LOAD DID NOT START.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED.</p> <p>CORRECTIVE ACTION-VALVE OPENED MANUALLY.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                           |                                | 688410 |
| PROPELLANT LOADING-60C-688 | 60/A63-0880/81-402-00-142                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | COUNTDOWN                         | 143-0<br>030731                           | YES<br>NO                      | 688410 |
| LOX FEED                   | <p>FAILURE MODE-FAIL DURING OPERATION. LOX RAPID LOAD FAULT REQUIRED THAT LOX BE LOADED BY THE FINE LOAD VALVE.</p> <p>SYSTEM EFFECT-OPERATION TOO LONG. EXCESSIVE TIME REQUIRED TO LOAD LOX.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAY.</p> <p>CORRECTIVE ACTION-UNKNOWN.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |                                           |                                | 688410 |
| PROPELLANT LOADING-60C-688 | 60/CT-98-40-0280<br>FILL AND DRAIN VALVE SCREW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | FAR<br>88-08180-1                 | 630708                                    | YES HYDROMATICS<br>NO AIRSIS   | 688410 |
| LOX FEED                   | <p>FAILURE MODE-INTERNAL LEAK. MOTOR-OPERATED LOX FLOW CONTROL VALVE LEAKED 1.35 SCFM WITH 10 PSIG PURGE PRESSURE IN THE CLOSED POSITION. TESTING REVEALED VALVE WOULD NOT OPEN COMPLETELY NOR WOULD IT CLOSE COMPLETELY. FAILURE WAS ATTRIBUTED TO THE INADEQUATE HOLDING ABILITY OF THE SET SCREW HOLDING THE CAN GOVERNING THE CLOSED POSITION OF THE VALVE. THIS SET SCREW SLIPPED FROM THE ORIGINAL ACTUATOR ROD SETTING GIVING CAN AN INCORRECT POSITION WHICH TRANSMITTED TO THE MICROSWITCH. THE MICROSWITCH DEENERGIZED THE CIRCUIT AND STOPPED THE MOTOR. IN ADDITION, CONTAMINANTS ABOVE ALLOWABLE LIMITS WERE FOUND AND ALSO VALVE WAS NOT WIRED PROPERLY PER DWS 18181-8.</p> <p>CORRECTIVE ACTION-RECOMMENDED PERFORM DESIGN REVIEW BY (A) SELECTING BIGGER SETSCREW, MAKE ALLOWANCE FOR LARGER ALL EN WRENCH. PRESENT TOOL TOO SMALL TO ALLOW ENOUGH TORQUE. (B) USE 2 SET SCREWS FOR EACH CAN. ALSO RECOMMENDED TO REQUEST VENDOR TO EXPLAIN WHY VALVE WAS WIRED INCORRECTLY AND SUBMIT COMPLETE AND DETAILED DWS.</p> |                                   |                                           |                                | 688410 |

GENERAL DYNAMICS  
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-SSC

| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE OF TIME | SITE<br>DIP OTH | PRJ<br>VENDOR NAME<br>VENDOR PART NO |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------|-----------------|--------------------------------------|
| PROPELLANT LOADING-60C-68E | FAR-CT-88-40-013P<br>FILL AND DRAIN VALVE SEAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | FAR<br>27-02102-31             | 090181                  | ETR             | YES STRATOS<br>NO 50-186-01          |
| LOX FEED                   | <p>FAILURE MODE-STRUCTURAL. THE LOX FILL AND DRAIN VALVE LEAKAGE RATE WAS APPROX 800 SCIN WITH 80 PSIG GNR PRESSURE APPLIED TO THE DOWNSTREAM SIDE OF THE BUTTERFLY. ALLOWABLE LEAKAGE IS 3 SCIN. THE REL-7 LIPSEAL ON THE VALVE BUTTERFLY PLATE WAS CRACKED. UNDER TEST THE SEAL WAS FOUND TO BE OVERLY BRITTLE AND FAILED TO MEET ANY OF THE GIVEN REQUIREMENTS.</p> <p>CORRECTIVE ACTION-REL FAILURE ANALYSIS GROUP RECOMMENDED VENDOR BE INFORMED OF THE MATERIAL ANALYSIS OF THE REL-7 LIPSEAL AND DIRECTED TO IMPROVE QC INSPECTION TO INSURE A HIGH LEVEL OF QUALITY BE MAINTAINED.</p>                                                                                                                                             |                                |                         |                 |                                      |
| PROPELLANT LOADING-60C-68E | FAR-CT-99-40-010P<br>FILL AND DRAIN VALVE SEAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | FAR<br>57-83209-5              | 021220                  | FACTORY         | YES<br>NO                            |
| LOX FEED                   | <p>FAILURE MODE-CONTAMINATION. METAL PARTICLE CONTAMINATION DAMAGED THE REL-F LIPSEALS ON THE ACTUATOR PISTON AND THE TRANSDUCER PORTION OF THE VALVE CAUSING THE VALVE TO LEAK DURING ACCEPTANCE TESTING. THE CONTAMINATION WAS A RESULT OF INADEQUATE LOX CLEANING PROCESSES.</p> <p>CORRECTIVE ACTION-RELIABILITY FAILURE ANALYSIS GROUP INITIATED QC CORRECTIVE ACTION BY INFORMING SD/C FACTORY PERSONNEL OF THE (A) METAL PARTICLE CONTAMINATION, (B) INADEQUATE CLEANING PROCESSES AND (C) THE REQUIREMENT FOR REJECTION OF CONTAMINATED VALVE ASSEMBLY BEFORE ASSEMBLY. (REF. REL ACTION RPT CT-99-40-3628). ALSO REQUESTED RESUME OF REDESIGN AND EVALUATION PROGRAM STATUS OF THE VALVE (REF. REL ACTION RPT CT-99-40-3629).</p> |                                |                         |                 |                                      |
| PROPELLANT LOADING-60C-68E | A462-0084/CE-424-01-213<br>LOX STORAGE TANK PRESSURE REGULATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | COMPOSITE-FRD/DPL              | 213D                    | ETR             | YES POWER REACTOR<br>NO              |
| LOX FEED                   | <p>FAILURE MODE-OUT OF TOLERANCE. THE LOX STORAGE TANK PRESSURE DECAVED CONTINUOUSLY DURING THE TEST. THIS PROBLEM WAS TRACED TO THE TANK REGULATOR.</p> <p>SYSTEM EFFECT-OPERATION TOO LOW.</p> <p>VEHICLE EFFECT-NONE.</p> <p>CORRECTIVE ACTION-REPLACED THE REGULATOR.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                |                         |                 |                                      |

GENERAL DYNAMICS  
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME              | QIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------|
| PROPELLANT LOADING-GDC-68E<br>LOX FEED                                                                                                                                                                                        | AL62-0782/PR-48N-02-178<br>LOX TOPPING LINE RUPTURE DISC | COMPOSITE-FRD/DPL              | 1790<br>820809      | ETR              | YES<br>NO  | 869992                         |
| FAILURE MODE-STRUCTURAL. THE RUPTURE DISC IN THE 2 INCH LOX TOPPING LINE WAS RUPTURED BY WATER HAMMER. THIS SAME FAILURE OCCURRED ON FIRST TANKING TEST 7 AUGUST 1966.                                                        |                                                          |                                |                     |                  |            |                                |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LOX LOADING WAS TERMINATED BY THIS FAILURE.                                                                                                                                        |                                                          |                                |                     |                  |            |                                |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.                                                                                                                                                                             |                                                          |                                |                     |                  |            |                                |
| CORRECTIVE ACTION-SUCCESSFUL FIX MADE BY ADDING 30 FEET OF LINE BETWEEN DISC AND TOPPING LINE. RUPTURE DISC REPLACED.                                                                                                         |                                                          |                                |                     |                  |            |                                |
| PROPELLANT LOADING-GDC-68E<br>LOX FEED                                                                                                                                                                                        | AL62-0081/12-48N-02-178<br>RUPTURE DISC                  | COMPOSITE-FRD/DPL              | 1790<br>820809      | ETR              | YES<br>NO  | 869993                         |
| FAILURE MODE-STRUCTURAL. DURING LOX TANKING THE RUPTURE DISC IN THE 2-INCH TOPPING LINE WAS RUPTURED ON TWO OCCASIONS. THE CAUSE WAS DETERMINED TO BE WATER HAMMER.                                                           |                                                          |                                |                     |                  |            |                                |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.                                                                                                                                                                                     |                                                          |                                |                     |                  |            |                                |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                          |                                                          |                                |                     |                  |            |                                |
| CORRECTIVE ACTION-RELOCATED RUPTURE DISC BY ADDING 30 FEET OF PIPE BETWEEN THE DISC AND THE TOPPING LINE.                                                                                                                     |                                                          |                                |                     |                  |            |                                |
| PROPELLANT LOADING-GDC-68E<br>LOX FEED                                                                                                                                                                                        | FAR-A-93-50-116<br>CHECK VALVE                           | FAR<br>27-02910-1              | 820809              | ETR              | YES<br>NO  | 869777                         |
| FAILURE MODE-STRUCTURAL. THE CHECK VALVE USED IN THE LOX TOPPING LINE, TO PREVENT LOSS OF LOX AFTER TOPPING, FAILED TO OPEN. CALLING OF THE POPPET AND POPPET SLEEVE FROM NORMAL USAGE WEAR PREVENTED THE VALVE FROM OPENING. |                                                          |                                |                     |                  |            |                                |
| CORRECTIVE ACTION-CIC 82329 REPLACED VALVE WITH VALVE P/N 89-33108-004.                                                                                                                                                       |                                                          |                                |                     |                  |            |                                |
| PROPELLANT LOADING-GDC-68E<br>LOX FEED                                                                                                                                                                                        | AL62-0782/PR-48N-01-179<br>LOX TOPPING LINE RUPTURE DISC | COMPOSITE-FRD/DPL              | 1790<br>820807      | ETR              | YES<br>NO  | 869994                         |
| FAILURE MODE-STRUCTURAL. THE RUPTURE DISC IN THE 2 INCH LOX TOPPING LINE WAS RUPTURED BY WATER HAMMER.                                                                                                                        |                                                          |                                |                     |                  |            |                                |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LOX LOADING WAS TERMINATED BY FAILURE OF THE RUPTURE DISC.                                                                                                                         |                                                          |                                |                     |                  |            |                                |

GENERAL DYNAMICS  
CONVAIR DIVISION

19 JUN 1966

DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                      | TEST/REPAIR NUMBER<br>FAILED COMPONENT NAME                  | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.                                                                         |                                                              |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-FAILED DISC WAS REPLACED.                                                                               |                                                              |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                | AL82-0723, PG-49N-01-125<br>PUMP, LC                         | COMPOSITE-PRD/DPL              | 1430<br>880820      | ETR              | YES<br>NO  |                               |
| LOX FEED                                                                                                                  |                                                              |                                |                     |                  |            |                               |
| FAILURE MODE-FAILED DURING OPERATION. PUMP LC IN THE LOX TRANSFER UNIT FAILED DURING THE TANKING TEST.                    |                                                              |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOP PREMATURELY. LOX LOADING WAS TERMINATED.                                                     |                                                              |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RE-SCHEDULED.                                                                        |                                                              |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                |                                                              |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                | AL82-0421/PG-403-00-F1<br>RUPTURE DISCS                      | COUNTDOWN                      | 1040<br>880420      | ETR<br>-1800     | YES<br>NO  |                               |
| LOX FEED                                                                                                                  |                                                              |                                |                     |                  |            |                               |
| FAILURE MODE-STRUCTURAL. RUPTURE DISCS IN THE 8-INCH AND 6-INCH LOX TRANSFER LINES WERE BLOWN.                            |                                                              |                                |                     |                  |            |                               |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.                                                                                 |                                                              |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.                                                                         |                                                              |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-REPLACED RUPTURE DISCS WITH RELIEF VALVES.                                                              |                                                              |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                | CAPSAW 4-375, PG-403-01-133<br>LOX TOPPING LINE RUPTURE DISC | COMPOSITE-PRD/DPL              | 1330<br>880420      | ETR<br>-1800     | YES<br>NO  |                               |
| LOX FEED                                                                                                                  |                                                              |                                |                     |                  |            |                               |
| FAILURE MODE-STRUCTURAL. THE RUPTURE DISC IN THE TWO INCH LOX TOPPING LINE RUPTURED.                                      |                                                              |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOP PREMATURELY. USE OF LOX TOPPING SYSTEM TERMINATED FOR THIS TEST.                             |                                                              |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE. FLIGHT LEVEL FOR REMAINDER OF THE TEST WAS MAINTAINED BY USE OF AMBIENT LOX THROUGH THE 6 INCH LINE. |                                                              |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-DISC REPLACED AFTER TEST.                                                                               |                                                              |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                | AL82-0421/PG-403-00-F1<br>RUPTURE DISC                       | COUNTDOWN                      | 1040<br>880420      | ETR              | YES<br>NO  |                               |
| LOX FEED                                                                                                                  |                                                              |                                |                     |                  |            |                               |
| FAILURE MODE-STRUCTURAL. THE RUPTURE DISCS IN THE 8-INCH AND 6-INCH LOX TRANSFER LINES WERE BLOWN OUT AND THERE WAS       |                                                              |                                |                     |                  |            |                               |

GENERAL DYNAMICS  
CONVAY DIVISION

# DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-08E

| SYSTEM<br>SUB-SYSTEM                                                                                                | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>VEHICLE PART NO |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|---------------------------------|
| A LOW LOX LEVEL IN THE LOX STORAGE TANK.                                                                            |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. LOX TANKING HAD TO BE STOPPED DUE TO THE BLOWN RUPTURE DISCS.             |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. TEST WAS TERMINATED AT 1-30 MINUTES.                              |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-RUPTURE DISCS WERE REPLACED WITH RELIEF VALVES.                                                   |                                             |                                |                     |                  |            |                                 |
| PROPELLANT LOADING-6DC-68E AEGE-0421/P6-403-08-F1 COUNTDOWN 1043 30A YES                                            |                                             |                                |                     |                  |            |                                 |
| LOX FEED 620420 -1800 NO                                                                                            |                                             |                                |                     |                  |            |                                 |
| FAILURE MODE-STRUCTURAL. PROPELLANT LOADING HINDERED BY BLOWN RUPTURE DISCS IN 2 INCH AND 6 INCH LOX TRANSFER LINES |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-OPERATION TOO LOW.                                                                                    |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.                                                                   |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-ALL RUPTURE DISCS REPLACED BY RELIEF VALVES.                                                      |                                             |                                |                     |                  |            |                                 |
| PROPELLANT LOADING-6DC-68E AAGE-0087/P6-402-00-104 COUNTDOWN 1043 ETR YES                                           |                                             |                                |                     |                  |            |                                 |
| LOX FEED CHECK VALVE, SEAL 620411 NO                                                                                |                                             |                                |                     |                  |            |                                 |
| FAILURE MODE-EXTERNAL LEAK. DURING THE LAUNCH ATTEMPT IT WAS NOTED THAT THE CHECK VALVE DOWNSTREAM OF THE 6 INCH LI |                                             |                                |                     |                  |            |                                 |
| NE FILTER HAD A LEAKY SEAL.                                                                                         |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-NONE.                                                                                                 |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-NONE.                                                                                                |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-UNKNOWN.                                                                                          |                                             |                                |                     |                  |            |                                 |
| PROPELLANT LOADING-6DC-68E AEGE-0318/33-401-00-128 COUNTDOWN 1290 0-3 YES                                           |                                             |                                |                     |                  |            |                                 |
| LOX FEED VALVE 620411 NO                                                                                            |                                             |                                |                     |                  |            |                                 |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME, VALVE 0-31(LOX STORAGE TANK AUTOMATIC VENT) FROZEN.                |                                             |                                |                     |                  |            |                                 |
| SYSTEM EFFECT-OPERATION DOES NOT START. STORAGE TANK COULD NOT BE VENTED TO ALLOW MISSILE LOX TANK DRAIN TO START D |                                             |                                |                     |                  |            |                                 |
| URING COUNTDOWN HOLD.                                                                                               |                                             |                                |                     |                  |            |                                 |
| VEHICLE EFFECT-COUNTDOWN DELAY.                                                                                     |                                             |                                |                     |                  |            |                                 |
| CORRECTIVE ACTION-MANUAL VALVE 0-30 OPENED TO ALLOW COMPLETION OF LOX DRAIN SEQUENCE.                               |                                             |                                |                     |                  |            |                                 |

15 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                               | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME     | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-6DC-68E<br>LOX SYSTEM DUCTING<br>LOX FEED                                                                                                                                                                                                                                                                                                                                       | AAB2-0026/P2-48N-01-133<br>LOX SYSTEM DUCTING   | COMPOSITE-FRD/DPL              | 133D<br>620410      | ETR              | YES<br>NO  |                               |
| FAILURE MODE-EXTERNAL LEAKS. SEVERAL LEAKS WERE DISCOVERED IN THE LOX LOADING SYSTEM DURING THE TANKING TEST.<br>SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-LOX LEAKS REPAIRED AND CHECKED.                                                                                                                                                            |                                                 |                                |                     |                  |            |                               |
| PROPELLANT LOADING-6DC-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                             | AAB2-0026/P2-48N-01-121<br>LOX LINE CHECK VALVE | COMPOSITE-FRD/DPL              | 121D<br>620109      | ETR              | YES<br>NO  |                               |
| FAILURE MODE-EXTERNAL LEAK. DURING THE LOX TANKING TEST, A LEAK WAS DISCOVERED AT THE LOX MAIN LINE CHECK VALVE. IN VESTIGATION REVEALED THAT THE FLANGE BOLTS WERE LOOSE.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-THE BOLTS WERE TIGHTENED.                                                                                                                           |                                                 |                                |                     |                  |            |                               |
| PROPELLANT LOADING-6DC-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                             | AAB3-0031/P3-58N-01-40<br>LOX SLUGTANK VENT     | COMPOSITE-FRD/DPL              | 40E<br>620104       | ETR              | YES<br>NO  |                               |
| FAILURE MODE-CONTAMINATION. ICING OF DIFFUSER RESTRICTED VENTING OF THE LOX SLUG TANK.<br>SYSTEM EFFECT-HIGH TEMPERATURE ENVIRONMENT. THE LOX SLUG WAS DELIVERED EXCEEDING THE REDLINE TEMPERATURE FOR PROPELLANT REQUIREMENTS.<br>VEHICLE EFFECT-NONE. NORMAL SLUG SEQUENCE PURGING OF DIFFUSER REMOVED ICE SLURRY. SECOND SLUG DELIVERED AT SATISFACTORY TEMPERATURE.<br>CORRECTIVE ACTION-NONE. |                                                 |                                |                     |                  |            |                               |
| PROPELLANT LOADING-6DC-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                             | A-9B-40-159F<br>DISCONNECT COUPLING, SEAL       | FAR<br>87-28077-3              | 611228              | ETR              | YES<br>NO  | YES<br>PEACOCK                |
| FAILURE MODE-EXTERNAL LEAK. COUPLING ALLOWED LEAKAGE PAST THE LIP SEAL. FAILURE WAS ATTRIBUTED TO THREE FACTORS. (1) AN ECCENTRICALLY LOCATED BUSH THAT WAS BENT WHEN THE MALE PROBE WAS ENGAGED IN THE DISCONNECT, DUE TO IMPROPER SHIM INSTALLATION. (2) SCORE MARKS ON THE SEALING SURFACE OF THE LIP SEAL PROBABLY CAUSED BY IMPROPER ASSEMBLY. (3) FAULTY TEMPERATURE.                        |                                                 |                                |                     |                  |            |                               |

15 JUN 1966

GENERAL DYNAMICS  
CONVAIR DIVISION

## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH                    | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|-------------------------------|-------------------------------|--------|
| LTV REL-F LIP SEAL MATERIAL DUE TO IMPROPER SINTERING THAT CREATED VOIDS IN THE FINISHED PRODUCT.                                                                                                                                                                             |                                             |                                |                     |                  |                               |                               | 899637 |
| CORRECTIVE ACTION-A PLANNING CARD CHANGE WAS MADE TO INCLUDE THE FOLLOWING. INSPECTION TO ENSURE THAT LIP SEAL 27-2 9096-Y AND SHIM 27-29094-9 ARE PROPERLY INSTALLED AND CENTERED PER BLUEPRINT, AND THAT NO LUBRICANT IS USED WITHIN THE LOX CLEAN AREAS OF THE DISCONNECT. |                                             |                                |                     |                  |                               |                               |        |
| PROPELLANT LOADING-EDC-68E A481-0132/P2-402-00-317<br>SOLENOID VALVE                                                                                                                                                                                                          |                                             | COUNTDOWN<br>27-27099-001      | 117D<br>611022      | ETR<br>-9000     | YES<br>NO                     |                               | 899821 |
| LOX FEED                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |                               |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DURING LOX TANKING PREPARATIONS, LC-2 SOLENOID VALVE FAILED TO OPERATE.                                                                                                                                                      |                                             |                                |                     |                  |                               |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |                               |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                          |                                             |                                |                     |                  |                               |                               |        |
| CORRECTIVE ACTION-LC-2 SOLENOID VALVE WAS CHANGED DURING A HOLD FOR ANOTHER SYSTEM.                                                                                                                                                                                           |                                             |                                |                     |                  |                               |                               |        |
| PROPELLANT LOADING-EDC-68E A-98-36-Q31F<br>LIQUID OXYGEN TANK INLET VALVE                                                                                                                                                                                                     |                                             | FAR                            | 610908              | ETR              | YES HYDROSTATICS<br>NO 132K52 |                               | 899752 |
| LOX FEED                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |                               |                               |        |
| FAILURE MODE-CONTAMINATION. THE VALVE POSITION INDICATING SWITCH FAILED TO PROVIDE THE PROPER SIGNAL WHEN THE VALVE WAS OPENED. FAILURE WAS CAUSED BY CALLING OF THE MICROSWITCH ACTUATOR SHAFT TO THE SUPPORTING BRACKET.                                                    |                                             |                                |                     |                  |                               |                               |        |
| CORRECTIVE ACTION-NONE. THIS UNIT IS SCHEDULED FOR PHASE OUT.                                                                                                                                                                                                                 |                                             |                                |                     |                  |                               |                               |        |
| PROPELLANT LOADING-EDC-68E A481-0137/P2-403-00-311<br>LA BY-PASS VALVE                                                                                                                                                                                                        |                                             | COUNTDOWN                      | 111D<br>610901      | ETR<br>-900      | YES<br>NO                     |                               | 899819 |
| LOX FEED                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |                               |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. BYPASS VALVE WAS INOPERATIVE PRIOR TO LOX TANKING.                                                                                                                                                                           |                                             |                                |                     |                  |                               |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. LOX TANKING COULD NOT BE STARTED DUE TO FAILURE OF THE LA BY PASS VALVE.                                                                                                                                                              |                                             |                                |                     |                  |                               |                               |        |
| VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED.                                                                                                                                                                                                                             |                                             |                                |                     |                  |                               |                               |        |
| CORRECTIVE ACTION-THE LA BY-PASS VALVE WAS REPLACED AFTER THE TEST WAS TERMINATED.                                                                                                                                                                                            |                                             |                                |                     |                  |                               |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME    | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                    | AA01-0237/P8-403-00-111<br>LA-1 SOLENOID VALVE | COUNTDOWN                      | 1110<br>610801      | ETR<br>-1840     | YES<br>NO  |                               | 699880 |
| LOX FEED                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                               |        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. LOX TRANSFER UNIT VALVE LA-1 WOULD NOT FUNCTION DURING LOX TANKING PREPARATIONS.                                                                                                                                             |                                                |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LOX TANKING PREPARATIONS COULD NOT BE COMPLETED DUE TO THE FAILURE OF VALVE LA-1.                                                                                                                                                  |                                                |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                          |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE LA-1 WAS RELAXED.                                                                                                                                                                                                                                     |                                                |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                    | FAR-98-56-028<br>SOLENOID OPERATED VALVE SEAL  | FAR                            | 610801              | ETR              | YES<br>NO  | YES AIRMATIC<br>NO S-3-250    | 699771 |
| LOX FEED                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                               |        |
| FAILURE MODE-STRUCTURAL. THE PNEUMATIC PRESSURE VALVE IS USED TO OPEN AND CLOSE THE LOX BY-PASS VALVE. THE PRESSURE VALVE FAILED TO CLOSE THE BY-PASS VALVE. THE SEALS WERE BADLY AGED. FAILURE WAS DUE TO USE OF THE VALVE PAST THE OPERATING LIFE OF ITS RUBBER COMPONENTS. |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-RECOMMENDED 60/C TO OVERHAUL ANY SUBJECT VALVE USED PAST THE OPERATING LIFE OF ITS RUBBER COMPONENTS.                                                                                                                                                       |                                                |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                    | AES-0421/P8-4CBN-04-104-S<br>VALVE             | COMPOSITE-FRD/DPL              | 1040<br>610706      | ETR              | YES<br>NO  |                               | 699667 |
| LOX FEED                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                               |        |
| FAILURE MODE-FAIL DURING OPERATION. AN INOPERATIVE VALVE IN THE ATLAS LOX TRANSFER SYSTEM PRECLUDED ATLAS LOX TANKING.                                                                                                                                                        |                                                |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                                                                                       |                                                |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.                                                                                                                                                                                                                             |                                                |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                    |                                                |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                    | AE98-0421/P8-4CBN-02-104-S<br>DUCTING          | COMPOSITE-FRD/DPL              | 1040<br>610703      | ETR              | YES<br>NO  |                               |        |
| LOX FEED                                                                                                                                                                                                                                                                      |                                                |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. TRIPLE TANKING COULD NOT BE COMPLETED, AS LEAKS IN THE LOX TRANSFER SYSTEM PREVENTED LOX LOADING.                                                                                                                                                 |                                                |                                |                     |                  |            |                               |        |

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| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                    | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                            | SYSTEM EFFECT-OPERATION DOES NOT START. LOX TANKING WAS NOT ACCOMPLISHED.<br>VEHICLE EFFECT-COMPOSITE ABORTED AND RE-SCHEDULED.<br>CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                  |                                |                     |                  |            |                               | 099943 |
| PROPELLANT LOADING-60C-68E | FAR-CT-98-48-001<br>SWITCH                                                                                                                                                                                                                                                                                                                                                                     | FAR<br>58-68118-9              | 610323              | 36A              | YES<br>NO  | MASTER SPECIAL<br>TV          | 099727 |
| LOX FEED                   | FAILURE MODE-CONTAMINATION. THE SWITCH IS LOCATED ON THE LOX PANEL IN THE BLOCKHOUSE. THE SWITCH LIGHTS INDICATED 1<br>INTERMITTENT OPERATION, WHICH WAS CONFIRMED IN THE LABORATORY. DIRT AND SOLDER FLUX WERE FOUND IN THE SWITCH ACTIVATIO<br>N MECHANISM, WHICH INTERFERED WITH ELECTRICAL CONTACT. THE SWITCH IS NOT SEALED.                                                              |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-ALL SWITCHES OF THIS TYPE HAVE BEEN REWORKED TO DESIGN CHANGES WHICH ELIMINATED THE POSSIBILITY O<br>F CONTAMINATION.                                                                                                                                                                                                                                                        |                                |                     |                  |            |                               | 099943 |
| PROPELLANT LOADING-60C-68E | AE60-0957/73-802-00-13<br>LOX TRANSFER PUMP SEAL                                                                                                                                                                                                                                                                                                                                               | COUNTDOWN<br>7-89207-001       | 13E<br>610313       | ETR<br>-30D      | YES<br>NO  |                               |        |
| LOX FEED                   | FAILURE MODE-EXTERNAL LEAK. DURING LOX LOADING, THE TANKING WAS INTERRUPTED AT THE 95 PERCENT LEVEL WHEN THE BELT D<br>RIVE TO PUMP LC DROKE. THE TROUBLE WAS TRACED TO A LEAKING SEAL ON THE PUMP WHICH CAUSED DETERIORATION OF THE DRIVE<br>BELT IN LOX ENVIRONMENT. THIS BELT WAS A REPLACEMENT FOR ONE BROKEN 2 MARCH DURING LOX TANK TEST.                                                |                                |                     |                  |            |                               |        |
|                            | SYSTEM EFFECT-OPERATION STOPS PREMATURELY. PUMPING CAPABILITY OF LOX TRANSFER SYSTEM HALTED BY PUMP FAILURE.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. 12 MINUTE HOLD CALLED BECAUSE OF LC PUMP FAILURE. LOX LOADING WAS COMPLETED BY PR<br>ESSURIZING THE STORAGE TANK TO 40 PSIG.                                                                                                                 |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-LEAKING PUMP SEAL WAS CORRECTED. THIS SAME PROBLEM OCCURRED DURING THE LOX TANKING TEST ON 2 MARC<br>H 1966. THE BELT WAS REPLACED BUT THE LEAKING SEAL WAS NOT DISCOVERED.                                                                                                                                                                                                  |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E | 9A-56-012<br>GHE SLUG CHILL FILTER                                                                                                                                                                                                                                                                                                                                                             | FAR<br>87-02897-1              | 610301              | ETR              | YES<br>NO  | PERMANENT FILT<br>ER          |        |
| LOX FEED                   | FAILURE MODE-STRUCTURAL. FILTER FAILED AS IF SUBJECTED TO A REVERSE FLOW CONDITION OF EXPLOSIVE FORCE WHICH DESTROY<br>ED THE STRUCTURAL INTEGRITY OF THE FINE SCREEN ELEMENT BY PERFORATING IT WITH HOLES. PRIOR TO THE FILTER FAILURE, TH<br>E SLUG CHILL GHE REGULATOR SHUT OFF VALVE, HAD EXPERIENCED AN EXTREMELY ABRUPT AND ABNORMAL SHUT OFF CAUSING REVERSE<br>SHOCKING OF THE SYSTEM. |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                          | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                       |                                                                      |                                |                     |                  |            |                               | 999805 |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                    | AE60-0918/PS-381-00-09<br>SOLENOID VALVE                             | COUNTDOWN<br>27-02106-001      | SE<br>010224        | ETR              | YES<br>NO  |                               | 999847 |
| LOX FEED                                                                                                                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. A MINOR LEAK WAS FOUND IN THE LOX GROUND FILL AND DRAIN VALVE OPEN SOLENOID.                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                           |                                                                      |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                          |                                                                      |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-SOLENOID WAS REPLACED.                                                                                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                    | FTAT105/PS-38N-02-09<br>LOX HEAT EXCHANGER DRAIN VALVE SEA           | COMPOSITE-FRD/DPL              | SE<br>001218        | ETR              | YES<br>NO  | YES HYDROSTATIC               | 999856 |
| LOX FEED                                                                                                                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| FAILURE MODE-OUT OF TOLERANCE. A LOX LEAK WAS DISCOVERED AT THE LOX SLUG UNIT HEAT EXCHANGER MANUAL DRAIN VALVE. THE LEAK WAS DUE TO A BLOWN INLET FLANGE SEAL. IT WAS DETERMINED THAT ONE OF SIX ALLEN SCREWS USED TO RETAIN THE INLET FLANGE WAS INSUFFICIENTLY TORQUED, PERMITTING THE SEAL TO EXPAND AND ULTIMATELY FAIL. |                                                                      |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                           |                                                                      |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE. THE COMPOSITE WAS ABORTED DUE TO ANOTHER PROBLEM.                                                                                                                                                                                                                                                        |                                                                      |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE LOX SLUG UNIT HEAT EXCHANGER MANUAL DRAIN VALVE WAS REPLACED.                                                                                                                                                                                                                                           |                                                                      |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                    | FTAT105/PS-38N-02-09<br>SLUG UNIT REGULATOR INLET FLANGE &<br>EAL    | COMPOSITE-FRD/DPL              | SE<br>001218        | ETR              | YES<br>NO  |                               | 999834 |
| LOX FEED                                                                                                                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. DURING ATTEMPTED LOX TANKING TEST, EXCESSIVE LEAKAGE WAS NOTED AT THE RACO SEAL ON THE SLUG UNIT REGULATOR INLET FLANGE.                                                                                                                                                                          |                                                                      |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                           |                                                                      |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE. THE COMPOSITE WAS ABORTED DUE TO ANOTHER PROBLEM.                                                                                                                                                                                                                                                        |                                                                      |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE SEAL WAS REPLACED.                                                                                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                    | FTAT105/PS-38N-02-09<br>SLUG UNIT LOX TANK DRAIN VALVE BOS<br>& SEAL | COMPOSITE-FRD/DPL              | SE<br>001218        | ETR              | YES<br>NO  |                               |        |
| LOX FEED                                                                                                                                                                                                                                                                                                                      |                                                                      |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. DURING ATTEMPTED LOX TANKING TEST, EXCESSIVE LEAKAGE WAS NOTED AT THE SLUG UNIT LOX TANK                                                                                                                                                                                                          |                                                                      |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                           | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| E MANUAL DRAIN VALVE BOSS SEAL.                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               | 000033 |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE. THE COMPOSITE WAS ABORTED DUE TO ANOTHER PROBLEM.                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-SEAL WAS REPLACED.                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E FTAT103/P3-58N-02-08                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               | 000033 |
| LOX TOPPING RISEOFF DISCONNECT PLA                                                                                                                                                                                                             |                                             |                                |                     |                  |            |                               |        |
| LOX FEED                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. DURING ATTEMPTED LOX TANKING TEST, EXCESSIVE LEAKAGE WAS NOTED AT THE FLEX JOINT TO THE LOX TOPPING RISEOFF DISCONNECT FITTING. THE HARMON FLANGE ON THE FLEXJOINT WAS LATER FOUND TO BE INCORRECTLY MANUFACTURED. |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED. LOX TANKING TEST WAS DELAYED ONE DAY.                                                                                                                                                        |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE FLEXJOINT WAS REPLACED.                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E AA60-0156/P2-4MC-01-91                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               | 000076 |
| VALVE                                                                                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| LOX FEED                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-CONTAMINATION. LOX WAS NOT REACHING THE VEHICLE THROUGH THE SIX INCH LINE DUE TO A FROZEN VALVE.                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START. TANKING WAS NOT ACCOMPLISHED.                                                                                                                                                                          |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME WAS 25 MINUTES.                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-THE VALVE WAS LOOSENED WITH WATER AFTER REMOVAL OF SOME OF THE INSULATION.                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E AA60-0150/P2-48M-01-91                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               | 000031 |
| FILTER                                                                                                                                                                                                                                         |                                             |                                |                     |                  |            |                               |        |
| LOX FEED                                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. LOX MAIN LINE FILTER AT THE TEST STAND DEVELOPED A LEAK.                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-REPLACED ONE GASKET AND MILLED FLANGE MATING PLATES TO PROVIDE PARALLEL FACES.                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68X

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME             | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VEHICLE NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------|
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                   | AE60-0750/P3-101-00-04<br>LOX TOPPING LINE SWIVEL JOINT | COUNTDOWN                      | 4E<br>601126        | ETR              | YES<br>NO  | 699631                         |
| FAILURE MODE-EXTERNAL LEAK. A LEAK WAS DISCOVERED IN THE 3-INCH LOX TOPPING LINE SWIVEL JOINT.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. COUNTDOWN ABORTED AT T-7 MINUTES DUE TO THE UNAVAILABILITY OF A REPLACEMENT PART.<br>CORRECTIVE ACTION-UNKNOWN.                               |                                                         |                                |                     |                  |            |                                |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                   | AE60-0750/P3-101-00-04<br>LOX TOPPING LINE SWIVEL JOINT | COUNTDOWN                      | 4E<br>601126        | 12<br>-420       | YES<br>NO  | 699396                         |
| FAILURE MODE-EXTERNAL LEAK. LEAK IN SWIVEL JOINT OF 3 INCH LOX TOPPING LINE OF PROPELLANT LOADING SYSTEM.<br>SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.<br>VEHICLE EFFECT-COUNTDOWN ABORTED. REPLACEMENT PART NOT AVAILABLE. ABORT CALLED AT T-7 MINUTES.<br>CORRECTIVE ACTION-PART OBTAINED AND LOADING SYSTEM REPAIRED. |                                                         |                                |                     |                  |            |                                |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                   | AA60-134/P2-402-00-03<br>PUMP LC                        | COUNTDOWN                      | 93D<br>601115       | ETR<br>-420      | YES<br>NO  | 699971                         |
| FAILURE MODE-OUT OF TOLERANCE. PROPER LOR LEVEL COULD NOT BE MAINTAINED WITH PUMP LC BECAUSE OF LOW OUTPUT.<br>SYSTEM EFFECT-OPERATION TOO LOW. MISSILE WAS LAUNCHED WITH 600 LB LOR SHORTAGE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-NONE. A DECISION WAS MADE TO GO AS IS.                                       |                                                         |                                |                     |                  |            |                                |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                   | AA60-0134/P2-402-00-03<br>RUPTURE DISC                  | COUNTDOWN                      | 93D<br>601114       | 12<br>-420       | YES<br>NO  |                                |
| FAILURE MODE-STRUCTURAL. FOR UNKNOWN REASONS, RUPTURE DISCS WERE BLOWN IN GROUND 2 IN AND 6 IN LOR LINES.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. IT WAS NECESSARY TO DETANK AND RETANK LOR. THERE WAS A TOTAL OF 151 MIN HOLD AND 63 MIN RECYCLE, BUT NOT ALL OF THE TIME LOSS IS ATTRIBUTED TO THIS PROBLEM.              |                                                         |                                |                     |                  |            |                                |

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| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                            | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENMOOR PART NO |        |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|--------------------------------|--------|
|                            | CORRECTIVE ACTION-RUPTURE DISCS WERE REPLACED.                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |                     |                  |            |                                | 000070 |
| PROPELLANT LOADING-60C-68E | AASD-0134/P2-402-00-03                                                                                                                                                                                                                                                                                                                                                                                                                                                 | COUNTDOWN                      | 03D                 | ETR              | YES        |                                | 000018 |
| LOX FEED                   | LO2 TRANSFER UNIT INLET VALVE                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                | 001114              | -060             | NO         |                                |        |
|                            | FAILURE MODE-CONTAMINATION. THE LO2 TRANSFER UNIT INLET VALVE WAS FROZEN CLOSED.<br>SYSTEM EFFECT-OPERATION DOES NOT START. LO2 COULD NOT BE TANKED.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. THERE WAS A 15 MIN EXTENSION OF A HOLD WHICH WAS STARTED FOR ANOTHER REASON.<br>CORRECTIVE ACTION-MORE REPORTED. VALVE WAS REPORTED OPEN AFTER 6 MINUTES.                                                                                                                    |                                |                     |                  |            |                                | 000072 |
| PROPELLANT LOADING-60C-68E | AASD-0130/P2-401-00-55                                                                                                                                                                                                                                                                                                                                                                                                                                                 | COUNTDOWN                      | 01D                 | ETR              | YES        |                                | 000018 |
| LOX FEED                   | RUPTURE DISK                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                | 001022              | -1000            | NO         |                                |        |
|                            | FAILURE MODE-STRUCTURAL. DURING LO2 TANKING THE 2 INCH RUPTURE DISC BLEW.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LO2 TANKING WAS STOPPED AND THE COUNTDOWN HELD.<br>VEHICLE EFFECT-COMPOSITE DELAYED. THIRTEEN MINUTES OF HOLD TIME WAS REQUIRED TO REPLACE THE RUPTURE DISC.<br>CORRECTIVE ACTION-THE RUPTURE DISC WAS REPLACED.                                                                                                                               |                                |                     |                  |            |                                | 000018 |
| PROPELLANT LOADING-60C-68E | AASD-0077/DA258                                                                                                                                                                                                                                                                                                                                                                                                                                                        | COUNTDOWN                      | 01D                 | 8-3              | YES        |                                | 000018 |
| LOX FEED                   | LO2 OVERFILL PROBE                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                | 001012              |                  | YES        |                                |        |
|                            | FAILURE MODE-PREMATURE OPERATION. AT APPROXIMATELY THE SAME TIME LO2 90 PCT. FULL INDICATION WAS RECEIVED, THE LO2 OVERFILL LIGHT BEGAN FLICKERING ON THE LAP AND FINALLY LOCKED UP.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LO2 FINE LOAD AND TOPPING VALVES WERE PREMATURELY CLOSED.<br>VEHICLE EFFECT-COUNTDOWN DELAYED.<br>CORRECTIVE ACTION-LO2 WAS DRAINED AND THE PREMATURE INDICATION JUMPED OUT. LO2 LOAD WAS REINITIATED AND COMPLETED SATISFACTORILY. |                                |                     |                  |            |                                | 000018 |
| PROPELLANT LOADING-60C-68E | AASD-0103/P2-301-00-04                                                                                                                                                                                                                                                                                                                                                                                                                                                 | FRP                            | 31C                 | ETR              | YES        |                                | 000018 |
| LOX FEED                   | SLUG CHILL LINE DUCTING                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                | 000928              |                  | NO         |                                |        |
|                            | FAILURE MODE-LEAK-EXTERNAL. THE 88 SLUG CHILL LINE WAS LEAKING.                                                                                                                                                                                                                                                                                                                                                                                                        |                                |                     |                  |            |                                | 000018 |

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## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-02E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | FRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-NONE.                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               | 099801 |
| VEHICLE EFFECT-PREATURE PROPULSION SHUTDOWN. THE LOX LEAKAGE ON THE 92 LUBE OIL PUMP SHAFT CAUSING THE SHAFT TO SH<br>EAR OFF. LACK OF 92 LUBE OIL PRESSURE RESULTED IN PREMATURE TERMINATION OF THE PRF. |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-8LUG CHILL LINE LEAK WAS FIXED AND THE 92 ENGINE REPLACED.                                                                                                                              |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E FTAS581/P3-42H-02-49<br>OUTLET VALVE                                                                                                                                           |                                             | COMPOSITE-PRD/DPL              | 490<br>000282       | ETR              | YES<br>NO  |                               | 099800 |
| LOX FEED                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-FAIL DURING OPERATION. LOX TANKING TEST WAS CANCELLED DURING PRECOUNT DUE TO DIFFICULTY WITH THE LOX 9<br>TORQUE TANK OUTLET VALVE.                                                          |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COMPOSITE RE-SCHEDULED.                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-68E FTAS542/P3-402-00-44                                                                                                                                                           |                                             | COUNTDOWN                      | 440<br>000126       | ETR<br>-2100     | YES<br>NO  |                               | 099800 |
| LOX FEED                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-EXTERNAL LEAK. A SMALL MAGNITUDE 60X LEAK WAS REPORTED IN THE TRANSFER UNIT.                                                                                                                 |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE. THE PROBLEM WAS CONSIDERED MINOR AND IT WAS DECIDED TO GO AS IS.                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-60E FTAS542/P3-402-00-44                                                                                                                                                           |                                             | COUNTDOWN                      | 440<br>000126       | ETR<br>-2100     | YES<br>NO  |                               | 099802 |
| LOX FEED                                                                                                                                                                                                  |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-LEAK-EXTERNAL. 60X LEAK IN TRANSFER UNIT.                                                                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-NONE. CONTINUE COUNTDOWN.                                                                                                                                                               |                                             |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME               | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF TIME DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------|------------------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-3DC-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FTAG831/P3-48N-01-22<br>RUPTURE DISC                      | COMPOSITE-FRD/DPL              | 920<br>590920                | ETR              | YES<br>NO  | 999997                        |
| <p>FAILURE MODE-STRUCTURAL. TEST WAS UNSATISFACTORY DUE TO A RUPTURED DISC IN THE FILL LINE.</p> <p>SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.</p> <p>VEHICLE EFFECT-COMPOSITE RE-SCHEDULED.</p> <p>CORRECTIVE ACTION-RUPTURED DISC WAS REPLACED.</p>                                                                                                                                                                                                                                      |                                                           |                                |                              |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FTAG178/P2-301-00-09<br>OUTLET VALVE                      | COUNTDOWN                      | 9C<br>590924                 | ETR<br>-1650     | YES<br>NO  | 999920                        |
| <p>FAILURE MODE-CONTAMINATION. THE LA1 OUTLET VALVE COULD NOT BE CLOSED BECAUSE ICE HAD FORMED AROUND THE VALVE STEM.</p> <p>SYSTEM EFFECT-OPERATION TOO LOW. THE OPEN VALVE CAUSED A PARTIAL FLOW OF LOX BACK INTO THE STORAGE TANK.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. THERE WAS A 10 MIN. HOLD AND 3 MIN. OF RECYCLE.</p> <p>CORRECTIVE ACTION-THE ICE WAS REMOVED BY LOX HANDLING PERSONNEL.</p>                                                                                |                                                           |                                |                              |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FTAG049/P2-301-00-11<br>LOX SUBCOOLED TOPPING LINE FILTER | FRF                            | 11C<br>590934                | ETR<br>-420      | YES<br>NO  | 999918                        |
| <p>FAILURE MODE-CONTAMINATION. THE FLIGHT LEVEL 99.8 TO 99.9 PCT. COULD NOT BE ACHIEVED WITH SUBCOOLED TOPPING BECAUSE OF AN ICE CLOGGED FILTER.</p> <p>SYSTEM EFFECT-OPERATION TOO LOW. THE SUBCOOLED TOPPING LINE COULD NOT BE USED, BUT THE LARGE LINE WAS AVAILABLE.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. THERE WAS A 20 MIN HOLD.</p> <p>CORRECTIVE ACTION-LOX WAS TANKED ABOVE THE DESIRED LEVEL, THEN DRAINED TO MEET PUMP INLET TEMPERATURE REQUIREMENTS AT ENGINE START.</p> |                                                           |                                |                              |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>LOX FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FTAG422/P2-301-00-3<br>PUMP                               | FRF                            | 3C<br>561217                 | 18<br>-940       | YES<br>NO  | 999918                        |
| <p>FAILURE MODE-FAIL DURING OPERATION. DURING LOX TANKING OPERATIONS, PUMP LC FAILED.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LOX TOPPING COULD NOT BE ACCOMPLISHED.</p>                                                                                                                                                                                                                                                                                                        |                                                           |                                |                              |                  |            |                               |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-03E

| SYSTEM<br>SUB-SYSTEM                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| VEHICLE EFFECT-NONE.                                                                                                    |                                             |                                |                     |                  |            |                               | 099679 |
| CORRECTIVE ACTION-THE PUMP WAS REPAIRED.                                                                                |                                             |                                |                     |                  |            |                               | 099680 |
| PROPELLANT LOADING-60C-63E                                                                                              | FTA4482/PE-301-00-3                         | PRF                            | 3C<br>581217        | ZTR<br>-2300     | YES<br>NO  |                               |        |
| LOX FEED                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-OUT OF TOLERANCE. DURING PRE-TANKING OPERATIONS, VALVE LC-1 DID NOT CHECK OUT SATISFACTORILY.              |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-LOSS OF REDUNDANCY.                                                                                       |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-NONE.                                                                                                    |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VALVE LC-2 WAS USED.                                                                                  |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-63E                                                                                              | FTA4101/PI-208-00-3                         | COUNTDOWN                      | 5B<br>580718        | 11<br>-420       | YES<br>NO  |                               | 499443 |
| LOX FEED                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-OUT OF TOLERANCE. LOX TANKING WAS NOT COMPLETED BY THE PRESCRIBED TIME.                                    |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LONG. INSUFFICIENT LOX ABOARD THEREFORE ADDITIONAL TIME WAS REQUIRED TO COMPLETE TANKING.   |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. TWO MINUTE HOLD REQUIRED TO COMPLETE LOX TANKING.                                     |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN. HOLD REQUIRED TO COMPLETE TANKING                                                            |                                             |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-60C-63E                                                                                              | FTA4102/PI-207-0013                         | COUNTDOWN                      | 3B<br>580718        | 11<br>-420       | YES<br>NO  |                               | 099434 |
| LOX FEED                                                                                                                |                                             |                                |                     |                  |            |                               |        |
| FAILURE MODE-OUT OF TOLERANCE. LOX TANKING WAS NOT COMPLETED BY PRESCRIBED TIME.                                        |                                             |                                |                     |                  |            |                               |        |
| SYSTEM EFFECT-OPERATION TOO LONG. INSUFFICIENT LOX ABOARD SO THAT ADDITIONAL TIME WAS REQUIRED TO COMPLETE LOX TANKING. |                                             |                                |                     |                  |            |                               |        |
| VEHICLE EFFECT-COUNTDOWN DELAYED. ONE MINUTE HOLD.                                                                      |                                             |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-UNKNOWN. HOLD REQUIRED TO COMPLETE TANKING.                                                           |                                             |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                                 | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENUE NAME<br>VENDOR PART NO |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|------------------------------|
| PROPELLANT LOADING-GDC-68E | FTA4088/P3-201-00-4<br>LOX TRANSFER PUMP                                                                                                                                                                                                                                                                                                                                                                                                                                    | FRF                            | 4B<br>580716        | 13<br>-2400      | YES<br>NO  |                              |
| LOX FEED                   | <p>FAILURE MODE-FAIL DURING OPERATION. COMPLETE LOX LOADING COULD NOT BE ACHIEVED BECAUSE OF FAILURE OF LOX TRANSFER PUMP LC.</p> <p>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. PUMP LC FAILED WITH THE LOX LEVEL 2000 POUNDS BELOW DESIRED LEVEL.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. HOLD TIME WAS 2 MINUTES.</p> <p>CORRECTIVE ACTION-NONE. THE TEST WAS PERFORMED WITH LOX LEVEL 2,000 POUNDS LOX.</p>                                                             |                                |                     |                  |            |                              |
| PROPELLANT LOADING-GDC-68E | FTA4088/P3-208-00-3                                                                                                                                                                                                                                                                                                                                                                                                                                                         | COUNTDOWN                      | 3B<br>580715        | 11<br>-420       | YES<br>NO  |                              |
| LOX FEED                   | <p>FAILURE MODE-OUT OF TOLERANCE. LOX TOPPING WAS NOT COMPLETED BY THE PRESCRIBED TIME.</p> <p>SYSTEM EFFECT-OPERATION TOO LONG. INSUFFICIENT LOX ABOARD SO THAT ADDITIONAL TIME WAS REQUIRED TO COMPLETE LOX TANKING.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. 2 MINUTE HOLD.</p> <p>CORRECTIVE ACTION-UNKNOWN. HOLD REQUIRED TO COMPLETE LOX TOPPING.</p>                                                                                                                 |                                |                     |                  |            |                              |
| PROPELLANT LOADING-GDC-68E | FTA2319/P2-102-00-10<br>LOX DUMP LINE BELLOW                                                                                                                                                                                                                                                                                                                                                                                                                                | FRF                            | 10A<br>571127       | ETR<br>-2640     | YES<br>NO  |                              |
| LOX FEED                   | <p>FAILURE MODE-STRUCTURAL. LOX DUMPLINE BELLOW RUPTURED WHICH CAUSED LOX TO DUMP IN THE COMPLEX AREA.</p> <p>SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. RECYCLE TIME WAS 31 MINUTES, HOLD TIME WAS 1 HOUR AND 49 MINUTES.</p> <p>CORRECTIVE ACTION-THE BELLOW ASSEMBLY WAS REPLACED.</p>                                                                                                                                           |                                |                     |                  |            |                              |
| PROPELLANT LOADING-GDC-68E | FAP-CT-38-340-024<br>SOLENOID VALVE, POPPET                                                                                                                                                                                                                                                                                                                                                                                                                                 | FAR                            | 651122              | ETR              | YES<br>NO  | MAROTTA<br>006134            |
| FUEL FEED                  | <p>FAILURE MODE-STRUCTURAL. THE SOLENOID VALVE LEAKED FROM THE PRESSURE PORT TO THE VENT PORT WHEN THE SOLENOID WAS ENERGIZED. THE FAILURE WAS CONFIRMED DURING FAILURE ANALYSIS AND WAS ATTRIBUTED TO DEFORMATION OF THE POPPET SEAT. THE VALVE BECAME HOT WHEN ENERGIZED FOR LONG PERIODS OF TIME, AND THE POPPET SEAT BECAME DEFORMED FROM THE POPPET FORCE. AFTER REPEATED CYCLES THE ARMATURE TRAVEL IS NOT ENOUGH TO PRODUCE A GOOD SEAL BETWEEN POPPET AND SEAT.</p> |                                |                     |                  |            |                              |

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| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                   | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
|                            | CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VALVE BE REDESIGNED TO PROVIDE A CONSTANT FORCE OF THE POPPET AGAINST THE SEAT. IT WAS ALSO RECOMMENDED THAT PERISCOIC CHECKS BE MADE FOR PROPER ADJUSTMENT OF ARMATURE TRAVEL. |                                |                     |                  |            |                               | 699732 |
| PROPELLANT LOADING-GDC-68E | 60C/ZZHG8-031-DA 1082                                                                                                                                                                                                         | COMPOSITE-FRD/DPL              | 7113                | 2-4              | YES        |                               | 699310 |
| FUEL FEED                  | FUEL FILL AND DRAIN VALVE FLANGE                                                                                                                                                                                              | 27-08101                       | 691102              |                  | NO         |                               |        |
|                            | FAILURE MODE-EXTERNAL LEAK. A FUEL LEAK WAS NOTED DURING DPL LEAK CHECK AT THE GROUND FUEL FILL AND DRAIN VALVE FLANGE.                                                                                                       |                                |                     |                  |            |                               |        |
|                            | SYSTEM EFFECT-NONE.                                                                                                                                                                                                           |                                |                     |                  |            |                               |        |
|                            | VEHICLE EFFECT-NONE.                                                                                                                                                                                                          |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-THE FLANGE BOLTS WERE TIGHTENED FOLLOWING THE TEST.                                                                                                                                                         |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E | 60M-SOF27/83-481-00-34                                                                                                                                                                                                        | COUNTDOWN                      | 34D                 | 8-3              | YES        |                               | 699370 |
| FUEL FEED                  | LIQUID SENSOR                                                                                                                                                                                                                 |                                | 691003              |                  | NO         |                               |        |
|                            | FAILURE MODE-ERRATIC OPERATION OF FUEL IN UPPERLINE SENSOR.                                                                                                                                                                   |                                |                     |                  |            |                               |        |
|                            | SYSTEM EFFECT-OPERATION STOPS PREMATURELY. RAPID LOAD WAS RESTARTED AT LINE FILL TIMER RUNOUT.                                                                                                                                |                                |                     |                  |            |                               |        |
|                            | VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                             |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-NONE.                                                                                                                                                                                                       |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E | 783-4MO-03-34                                                                                                                                                                                                                 | COMPOSITE-FRD/DPL              | 34D                 | 8-3              | YES        |                               | 699373 |
| FUEL FEED                  | LIQUID SENSOR                                                                                                                                                                                                                 |                                | 690930              |                  | NO         |                               |        |
|                            | FAILURE MODE-ERRATIC OPERATION. FUEL IN UPPER LINE SENSOR WAS ERRATIC.                                                                                                                                                        |                                |                     |                  |            |                               |        |
|                            | SYSTEM EFFECT-OPERATION STOPS PREMATURELY FUEL RAPID LOAD WAS RESTARTED AT LINE FILL TIMER RUNOUT.                                                                                                                            |                                |                     |                  |            |                               |        |
|                            | VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                             |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME             | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|---------|
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | B3-4MO-01-34<br>LIQUID SENSOR                           | COMPOSITE-FRD/DPL              | 34D                 | B-3              | YES        |                               | 6893369 |
| FUEL FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         |                                |                     |                  | NO         |                               |         |
| FAILURE MODE-ERRATIC OPERATION. FUEL IN UPPERLINE SENSOR WAS ERRATIC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                         |                                |                     |                  |            |                               |         |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY FUEL RAPID LOAD WAS RESTARTED AT LINE FILL TIMER RUNOUT.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |                                |                     |                  |            |                               |         |
| VEHICLE EFFECT-DPL COUNTDOWN DELAYED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                         |                                |                     |                  |            |                               |         |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |                                |                     |                  |            |                               |         |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | CT-08-560-125<br>SOLENOID VALVE, O-RING                 | FAR<br>85-02961-1              | 650819              | ETR              | YES        | MAROTTA<br>NO 806134          | 6893368 |
| FUEL FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         |                                |                     |                  |            |                               |         |
| FAILURE MODE-INTERNAL LEAK. SOLENOID VALVE F-25-2, WHICH ACTUATES THE RP-1 FUEL TRANSFER VALVE, WAS LEAKING G2 FRO<br>N THE BODY VENT HOLE. LEAKAGE DUE TO POPPET ASSEMBLY O-RING HAVING AN UNFILLED SECTION ON THE INNER CIRCUMFERENCE.                                                                                                                                                                                                                                                                                                                      |                                                         |                                |                     |                  |            |                               |         |
| CORRECTIVE ACTION-VENDOR REQUESTED TO VISUALLY EXAMINE O-RINGS PRIOR TO INSTALLATION AND REJECT THOSE WITH VOIDS AN<br>D EXAMINE TEFLON BACKUP RINGS FOR PROPER LENGTH.                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |                                |                     |                  |            |                               |         |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FAR-CT-08-540-010<br>FUEL METER ROTOR                   | FAR                            | 650501              | ETR              | YES        | NEPTUNE<br>NO 83968           | 6893367 |
| FUEL FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         |                                |                     |                  |            |                               |         |
| FAILURE MODE-STRUCTURAL. THE ROTOR SHAFT ARM BROKE DURING FUEL TOTALIZER CALIBRATION CTP-PLS-1001A EXAMINATION SHOW<br>ED THAT THE BREAK WAS AN OVERSTRESS TYPE OF FAILURE. DURING A PRECEDING VALIDATION TEST, THE METER WAS SUBJECTED TO<br>A SUDDEN GASEOUS NITROGEN FLOW AT 150 PSIG, CAUSING THE METER TO OVERSPEED AND OVERHEAT. ALTHOUGH PARTS OF THE METER<br>HAD TO BE REPLACED, THE ROTOR WAS NOT REPLACED BECAUSE THERE WAS NO APPARENT DAMAGE AT THAT TIME. THE ROTOR BROKE Y<br>HE NEXT TIME IT WAS USED, WHICH WAS THE ABOVE CALIBRATION CHECK. |                                                         |                                |                     |                  |            |                               |         |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. IT WAS RECOMMENDED THAT PERSONNEL BE CAUTIONED TO THROTTLE GAS FLOW PE<br>R PUBLISHED PROCEDURES.                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                |                     |                  |            |                               |         |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ETR-033/P8-WO-01-04CS<br>FUEL TRANSFER SYSTEM FLEX LINE | COMPOSITE-FRD/DPL              | 1560                | ETR              | YES        |                               | 6893366 |
| FUEL FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         | 8T-02117-001                   | 850211              |                  | NO         |                               |         |
| FAILURE MODE-LEAK-EXTERNAL. DURING TANKING, A LEAK WAS FOUND IN A FUEL TRANSFER SYSTEM FLEX LINE.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                         |                                |                     |                  |            |                               |         |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER  | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------|---------------------|------------------|------------|-------------------------------|---------|
| SYSTEM EFFECT-NONE.                                                                                                                                                                                              |                                             |                                 |                     |                  |            |                               | 0000009 |
| VEHICLE EFFECT-COMPOSITE DELAYED. A HOLD WAS CALLED WHILE THE FLEX LINE WAS REPLACED.                                                                                                                            |                                             |                                 |                     |                  |            |                               |         |
| CORRECTIVE ACTION-THE FLEX LINE WAS REPLACED.                                                                                                                                                                    |                                             |                                 |                     |                  |            |                               |         |
| PROPELLANT LOADING-6DC-68E NZASOF18/P2-48N-01-196<br>FUEL TOTALIZER                                                                                                                                              |                                             | COMPOSITE-FRD/DPL<br>07-29188-3 | 1800<br>080127      | 12               | YES<br>NO  |                               | 0000004 |
| FUEL FEED                                                                                                                                                                                                        |                                             |                                 |                     |                  |            |                               |         |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE FUEL TOTALIZER WAS INOPERATIVE AND FUEL WAS TANKED USING ONLY THE PLCU PROBES.                                                                              |                                             |                                 |                     |                  |            |                               |         |
| SYSTEM EFFECT-LOSS OF BACKUP.                                                                                                                                                                                    |                                             |                                 |                     |                  |            |                               |         |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                             |                                             |                                 |                     |                  |            |                               |         |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                       |                                             |                                 |                     |                  |            |                               |         |
| PROPELLANT LOADING-6DC-68E AASS-0012/P4-78N-01-5301<br>COUNTER                                                                                                                                                   |                                             | COMPOSITE-FRD/DPL<br>27-02137-1 | 5301<br>080121      | 14               | YES<br>NO  |                               | 0000004 |
| FUEL FEED                                                                                                                                                                                                        |                                             |                                 |                     |                  |            |                               |         |
| FAILURE MODE-FAIL DURING OPERATION. THE FUEL TOTALIZER COUNTER FAILED DURING TOPPING AND WAS IRO.                                                                                                                |                                             |                                 |                     |                  |            |                               |         |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                              |                                             |                                 |                     |                  |            |                               |         |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                             |                                             |                                 |                     |                  |            |                               |         |
| CORRECTIVE ACTION-COUNTER REPLACED AFTER THE TEST. (IR 972358).                                                                                                                                                  |                                             |                                 |                     |                  |            |                               |         |
| PROPELLANT LOADING-6DC-68E LV-98-J0-3284-F<br>SOLENOID VALVE                                                                                                                                                     |                                             | FAR<br>27-02108-1               | 680115              | CTR              | YES<br>NO  | SOUTHWESTERN<br>603394        | 0000004 |
| FUEL FEED                                                                                                                                                                                                        |                                             |                                 |                     |                  |            |                               |         |
| FAILURE MODE-INTERNAL LEAK. THE VALVE LEAKED TO VENT WHILE CLOSED. THE LEAKAGE WAS ATTRIBUTED TO IMPROPER SETTING OF THE NORMALLY CLOSED POPPET SEAT ADJUSTMENT.                                                 |                                             |                                 |                     |                  |            |                               |         |
| CORRECTIVE ACTION-60/C SHOP AND INSPECTION PERSONNEL WERE INFORMED THAT CARE SHOULD BE TAKEN TO ASSURE CORRECT ADJUSTMENT AND PREVENT ACCEPTANCE OF marginally adjusted valves as OUTLINED IN PAR LV-98-40-3780. |                                             |                                 |                     |                  |            |                               |         |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                   | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPELLANT LOADING-GDC-68E | FAR-LV-98-40-3876<br>SOLENOID OPERATED VALVE, O-RING                                                                                                                                                                                                                                                                                                                                                                                                          | FAR<br>27-02106-1              | 641016              | ETR              | YES<br>NO  | MAROTTA<br>803394             | 699772 |
| FUEL FEED                  | FAILURE MODE-STRUCTURAL. THE SOLENOID VALVE IS IN THE LAUNCHER PURGE BOX AND SUPPLIES PNEUMATIC PRESSURE TO OPERATE THE FUEL PREVALVE. THE VALVE REPORTEDLY FAILED BECAUSE OF LEAKAGE THRU THE VENT PORT. THE NORMALLY-CLOSED POPPET SE AT O-RING WAS UNDERSIZE CAUSING IT TO DISTORT. THIS COMBINED WITH AGING PLUS THE LUBRICANT DRYING CAUSED THE FAILURE                                                                                                  |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E | FAR-LV-98-40-3873<br>SOLENOID OPERATED VALVE                                                                                                                                                                                                                                                                                                                                                                                                                  | FAR<br>27-02106-1              | 641007              | ETR              | YES<br>NO  | MAROTTA<br>803394             | 699773 |
| FUEL FEED                  | FAILURE MODE-OUT OF SPECIFICATION. THE SOLENOID VALVE IS IN THE LAUNCHER PURGE BOX AND SUPPLIES PNEUMATIC PRESSURE TO OPERATE THE FUEL PREVALVE. THE VALVE FAILED DURING CHECKOUT WHEN IT DID NOT OPEN. IMPROPER ADJUSTMENT OF THE ARMA TURE STEM DURING REMARK CAUSED THE VALVE NOT TO FUNCTION.                                                                                                                                                             |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. A TWX WAS SENT TO SITE INFORMING THEM OF THE FAILURE. FACTORY PERSONNE L WERE INFORMED OF THE FAILURE AND REQUESTED NECESSARY ACTION BE TAKEN TO ASSURE CORRECT ADJUSTMENT OF THE STEM.                                                                                                                                                                                                                          |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-GDC-68E | FAR-CT-98-400-034<br>FILL AND DRAIN VALVE CLAMP                                                                                                                                                                                                                                                                                                                                                                                                               | FAR<br>27-29006                | 1350<br>640630      | ETR              | YES<br>NO  | AIR RESEARCH                  | 699809 |
| FUEL FEED                  | FAILURE MODE-STRUCTURAL. THE FUEL FLEX DUCT FROM THE MISSILE RISEOFF DISCONNECT TO THE FILL VALVE ON THE LAUNCH STA NO SEPARATED FROM THE FILL VALVE AND WAS BLOWN DOWN THE FLAME BUCKET. FAILURE WAS CONFIRMED. HIGH TEMPERATURE ENGINE EXHAUST GASES CAUSED EXPANSION OF THE CLAMP RING AND MELTED THE SNAPPING AND LOCKWIRE LEAVING THE CLAMP HANDLE UNRE STRAINED. THE CLAMP WAS THEN EASILY OPENED BY HIGH VELOCITY EXHAUST GASES AND INDUCED VIBRATION. |                                |                     |                  |            |                               |        |
|                            | CORRECTIVE ACTION-RECOMMENDED PIN AND SNAPPING BE REPLACED BY A HIGH TEMPERATURE BOLT AND SELFLOCKING NUT, STRENGTH ENING OF THE CLAMP SUPPORTING BRACKET AND REPLACE SAFETY WIRE WITH A CLAMP CAPABLE OF WITHSTANDING THE ENVIRONMENTAL CONDITIONS. ALTERNATE SHOULD BE TO REDESIGN VALVE AND DUCT TO INCORPORATE A BOLTED FLANGE AT THE INTERFACE OR A SOLT ED CLAMP RING.                                                                                  |                                |                     |                  |            |                               |        |

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| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| PROPELLANT LOADING-6DC-68E | FAR-LV-98-24-4872-F<br>COUNTER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FAR<br>91-64900-003            | 840311              | ETR              | YES        | AUTRON<br>NO 9280-024-A8      | 699780 |
| FUEL FEED                  | <p>FAILURE MODE-STRUCTURAL. THE COUNTER WHICH INDICATES THE AMOUNT OF FUEL IN THE MISSILE TANK WAS REPORTED TO BE COUNTING INACCURATELY AND WITH ERRATIC MOTION. AFTER DISASSEMBLY IT WAS DISCOVERED THAT A SPRING ARMATURE WHEEL ASSEMBLY HAD BROKEN DUE TO FATIGUE.</p> <p>CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. THE VENDOR WAS CONTACTED AND IT WAS LEARNED THAT THIS ASSEMBLY HAS BEEN REDESIGNED TO ELIMINATE THE FATIGUE SUSCEPTIBILITY, AND HAS BEEN INCORPORATED INTO ALL COUNTER MODELS.</p>                                                                                                                                                                                                                                                                                                                                                                                     |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E | LV-98-40-3234-F<br>FILL AND DRAIN VALVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FAR<br>27-02101-23             | 840327              | ETR              | YES        | AIRESEARCH<br>NO 121054       | 699674 |
| FUEL FEED                  | <p>FAILURE MODE-ERRATIC OPERATION. THE GROUND FUEL FILL-AND-DRAIN VALVE OPERATION WAS ERRATIC DURING CHECKOUT. THE FAILURE WAS CONFIRMED. THE ERRATIC OPERATIONS WERE CAUSED BY ANY COMBINATION OF THE FOLLOWING DISCREPANCIES. 1. THE VALVE BUTTERFLY WAS ASSEMBLED INCORRECTLY AND WAS FOUND TO BE OFF-CENTER. 2. THE LIMIT INDICATING SWITCH WAS SUSCEPTABLE TO CHANGING ACTUATING POSITION SUFFICIENTLY TO SHIFT THE BUTTERFLY INDICATION POSITION. 3. SOME BINDING MAY HAVE OCCURRED WHEN THE VALVE ACTUATING LEVER RUBBED AGAINST THE ACTUATOR HOUSING.</p> <p>CORRECTIVE ACTION-THE GO/C SUPPORT CENTER MECHANICAL ASSEMBLY PERSONNEL HAVE BEEN INSTRUCTED TO INCLUDE IN ASSEMBLY THE VENDOR P/N 38157N101-031 WASHERS AS INDICATED IN THE NEWLY FURNISHED VENDOR P/N 121055-P DRAWING. CARE WILL BE TAKEN TO PREVENT THE IMPROPER BEARING PLACEMENT AND IMPROPER BUTTERFLY POSITION.</p> |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E | FAR-CT-98-40-023<br>FILL AND DRAIN VALVE, SWITCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | FAR<br>27-02101-23             | 1260<br>830623      | ETR              | YES        | AIR RESEARCH<br>NO 121054     | 699600 |
| FUEL FEED                  | <p>FAILURE MODE-OUT OF TOLERANCE. THE GROUND FUEL FILL AND DRAIN VALVE WAS REJECTED BECAUSE OF SLUGGISH OPENING OPERATION. THE MICROSWITCH WAS OUT OF ADJUSTMENT CAUSING THE VALVE-CLOSED MICROSWITCH TO DEACTIVATE EARLY DURING THE VALVE OPENING HALF-CYCLE. WHEN VIEWING THE VALVE POSITION LIGHTS, OPERATION WOULD APPEAR SLUGGISH.</p> <p>CORRECTIVE ACTION-RECOMMENDED THAT THE APPROPRIATE REBUILD AND SITE PERSONNEL BE INFORMED OF THE FINDINGS AND THAT THE SWITCH ADJUSTMENT PROCEDURE BE REVIEWED AND ALTERED AS NECESSARY TO PRECLUDE INTERMITTENT OPERATION OF THE SWITCHES.</p>                                                                                                                                                                                                                                                                                                   |                                |                     |                  |            |                               |        |

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## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM       | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                    | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-6DC-68E | AAS0-0147/P2-48H-01-20<br>FUEL TOTALIZER                                                                                                                                                                                                                                                                                                       | COMPOSITE-FRD/DPL              | 30E<br>610921       | ETR              | YES<br>NO  | 699934                        |
| FUEL FEED                  | FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. DURING FUEL TANKING THE FUEL TOTALIZER FAILED TO OPERATE.<br>SYSTEM EFFECT-LOSS OF REDUNDANCY. AMOUNT OF FUEL TRANSFERRED TO MISSILE NOT INDICATED BY TOTALIZER.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-TOTALIZER SUBSEQUENTLY ADJUSTED PER PREP SHEET TPO 13-1489.                   |                                |                     |                  |            |                               |
| PROPELLANT LOADING-6DC-68E | DAS39/B3-48H-01-99<br>GROUND FUEL FILL AND DRAIN VALVE                                                                                                                                                                                                                                                                                         | COMPOSITE-FRD/DPL              | 99D<br>601210       | B3               | YES<br>NO  | 699936                        |
| FUEL FEED                  | FAILURE MODE-LEAK EXTERNAL. FUEL LEAK IN THE GROUND FILL AND DRAIN VALVE.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN DELAYED.<br>CORRECTIVE ACTION-VALVE WAS TIGHTENED.                                                                                                                                                                |                                |                     |                  |            |                               |
| PROPELLANT LOADING-6DC-68E | AAS0-0134/P2-48H-01-93<br>PUMP CONTROL                                                                                                                                                                                                                                                                                                         | COMPOSITE-FRD/DPL              | 93D<br>601107       | ETR              | YES<br>NO  | 699949                        |
| FUEL FEED                  | FAILURE MODE-ERRATIC OPERATION. IMPROPER OPERATION OF FUEL LOADING SYSTEM RESULTED IN FUEL CONTAMINATION OF FUEL TANK PNEUMATIC REGULATOR.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-COUNTDOWN ABORTED AND RE-SCHEDULED.<br>CORRECTIVE ACTION-UNKNOWN FOR THE PROPELLANT LOADING SYSTEM. THE PNEUMATIC REGULATOR WAS REPLACED WITH A LIKE ITEM. |                                |                     |                  |            |                               |
| PROPELLANT LOADING-6DC-68E | AAS0-0130/P2-48H-03-55<br>PUMP CONTROL                                                                                                                                                                                                                                                                                                         | COMPOSITE-FRD/DPL              | 55D<br>600321       | ETR              | YES<br>NO  | 699952                        |
| FUEL FEED                  | FAILURE MODE-FAILED TO CEASE OPERATION AT PRESCRIBED TIME. FUEL TANK OVERFILLED 130 GALS PAST OVERFILL PROGE DURING TANKING TEST. AVAILABLE DETAILS INDICATE PUMP CONTROL PROBLEM.<br>SYSTEM EFFECT-OPERATION TOO LONG. FUEL TANKING SYSTEM OPERATED TOO LONG RESULTING IN OVERFILL OF FUEL TANK DURING T                                      |                                |                     |                  |            |                               |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68C

| SYSTEM<br>SUB-SYSTEM | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
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| EST.                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                     |                  |            |                               | 689866 |
|                      | VEHICLE EFFECT-COMPOSITE RESCHEDULED. FUEL PRESSURIZATION SYSTEMS WERE CONTAMINATED.<br>CORRECTIVE ACTION-FUEL TANKING SYSTEM CONTROL INVESTIGATED. RESULTS NOT INDICATED. CONTAMINATED PRESSURIZATION SYSTEMS CLEANED AND PURGED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |                     |                  |            |                               |        |
|                      | PROPELLANT LOADING-COC-68C AZC-27-121/P2-48N-01-31<br>FUEL FILL AND DRAIN VALVE GASKET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | COMPOSITE-FRD/DPL              | 51D                 | ETR              | YES        | NO                            | 689896 |
|                      | FUEL FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |                     |                  |            |                               |        |
|                      | FAILURE MODE-EXTERNAL LEAK. DURING FUEL TANKING, A LEAK WAS FOUND AT THE LOWER FLANGE OF THE FUEL FILL AND DRAIN VALVE. INVESTIGATION REVEALED A MISSING GASKET.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.<br>CORRECTIVE ACTION-THE GASKET WAS INSTALLED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |                     |                  |            |                               |        |
|                      | PROPELLANT LOADING-COC-68C 9B-40-029<br>FILL AND DRAIN VALVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FAR                            | 600100              | ETR              | YES        | AIRSEARCH<br>NO               | 689843 |
|                      | FUEL FEED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |                     |                  |            |                               |        |
|                      | FAILURE MODE-STRUCTURAL. SIX UNITS WERE FOUND TO BE CRACKED AT THE POINT WHERE THE BUTTERFLY SHAFT ENTERS THE CASTING ON THE SIDE OF THE VALVE OPPOSITE THE PNEUMATIC ACTUATOR. AT MISSILE RISE-OFF, EXHAUST HEATING OF THE VALVE CAUSED THE ALUMINUM CASTING TO EXPAND, ELIMINATING THE BUTTERFLY TO BORE NEGATIVE CLEARANCE. COOLING OF THE ALUMINUM CASTING CAUSED IT TO SHRINK BACK ONTO THE OVERSIZED STEEL BUTTERFLY. THE RESULTING STRESSES CAUSED THE BRITTLE CASTING TO CRACK.<br>CORRECTIVE ACTION-THE VENDOR HAS REDESIGNED THE VALVE BUTTERFLY SEAL TO ELIMINATE NEGATIVE METAL TO METAL CLEARANCE. VALVES INCORPORATING THIS CHANGE ARE ALREADY IN SERVICE. THE VENDOR IS NOW PROPERLY SKINNING THE PNEUMATIC ACTUATOR TO PREVENT BUTTERFLY OVER TRAVEL. |                                |                     |                  |            |                               |        |
|                      | PROPELLANT LOADING-COC-68C 9B-40-02-85<br>LOX LOADING PROBES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | COMPOSITE-FRD/DPL              | 85D                 | DS               | YES        | NO                            |        |
|                      | PLCU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                |                     |                  |            |                               |        |
|                      | FAILURE MODE-PREATURE OPERATION. SIXTEEN MINUTES PRIOR TO LOX CHILLODOWN ALL LOX LOADING PROBES ACTIVATED AND DE-ACTIVATED IN SEQUENCE. THE CAUSE OF THIS PROBLEM IS UNKNOWN.<br>SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                     |                  |            |                               |        |

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## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PHI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| CORRECTIVE ACTION-UNKNOWN, THE PROBLEM IS UNDER INVESTIGATION.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |
| 099289                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 82-4MO-02-89                                | COMPOSITE-FRD/DPL              | 850                 | 82               | YES        |                               |
| PLCU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 90 PERCENT FUEL LOADING PROBE               |                                | 851210              |                  | NO         |                               |
| FAILURE MODE-ERRATIC OPERATION. APPROXIMATELY 25 SECONDS AFTER FUEL LOAD START THE 90 PERCENT FUEL PROBE ACTIVATED INTERMITTENTLY. THE PROBE EXTINGUISHED 3 MINUTES LATER. FUEL WAS DRAINED AND ATTEMPTED A SECOND AND THIRD TIME WITH SIMILAR RESULTS. TROUBLE SHOOTING WAS INITIATED AND THE PROBES WERE FOUND TO BE OPERATING SATISFACTORILY. FUEL LOAD WAS STARTED THE FOURTH TIME AND PROCEEDED NORMALLY TO 90 PERCENT. FINE LOAD TOOK 1 MIN 56 SEC. THIS IS 25 SEC LONGER THAN NORMAL AND MIGHT INDICATE A PREMATURE 90 PERCENT ACTIVATION. |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE DELAYED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN, THE PROBLEM IS UNDER INVESTIGATION.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                                |                     |                  |            |                               |
| 099367                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 83-4MO-02-34                                | COMPOSITE-FRD/DPL              | 34D                 | 8-3              | YES        |                               |
| PLCU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | LIQUID SENSOR                               |                                | 850927              |                  | NO         |                               |
| FAILURE MODE-ERRATIC OPERATION OF FUEL IN UPPER LINE SENSOR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY (FUEL RAPID LOAD) RAPID LOAD WAS RESTARTED AT LINE FILL TIMER RUNOUT.                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| 099286                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 82-4MO-01-89                                | COMPOSITE-FRD/DPL              | 850                 | 82               |            |                               |
| PLCU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | LOX DRAIN LINE VALVE                        |                                | 850922              |                  |            |                               |
| FAILURE MODE-FAIL TO CEASE OPERATION AT PRESCRIBED TIME. DURING LOX LOADING, WHEN THE OVERFILL PROBE ACTIVATED, L22 (LOX LINE DRAIN VALVE) LOCKED OPEN INSTEAD OF OPENING, THEN CLOSING AFTER THE PRESSURE IN THE DRAIN LINE DECREASED BELOW 20 PSI. THIS PROBLEM HAS OCCURRED IN THE PAST AND IS UNDER INVESTIGATION.                                                                                                                                                                                                                            |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LONG.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                                |                     |                  |            |                               |

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## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME        | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-40C-68E<br>PLCU                                                                                                                                                                                                                                                              | FAR-CT-98-340-089<br>SOLENOID VALVE                | FAR<br>SS-08961-1              | 650701              | ETR              | YES<br>NO  | MAROTTA<br>NO 806134          |
| FAILURE MODE-STRUCTURAL. WHEN THE SOLENOID WAS ENERGIZED, THE VALVE LEAKED INTERNALLY FROM THE PRESSURE PORT TO THE VENT PORT. LEAKAGE WAS CAUSED BY DEFORMATION OF THE POPPET SEAT.                                                                                                            |                                                    |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. IT WAS RECOMMENDED THAT THE VENDOR ESTABLISH A SOLENOID ARMATURE GAP A NO RETAINING NUT TORQUE THAT WILL PREVENT LEAKAGE, AND INVESTIGATE THE POSSIBILITY OF USING A POPPET SEAT MATERIAL THAT WILL NOT DEFORM ENOUGH TO ALLOW LEAKAGE.            |                                                    |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>PLCU                                                                                                                                                                                                                                                              | FAR-CT-98-340-019<br>PROPELLANT FLOW CONTROL VALVE | FAR<br>SS-08109-1              | 650509              | ETR              | YES<br>NO  | HYDRONATICS<br>NO 141K1       |
| FAILURE MODE-CONTAMINATION. THE VALVE ACTUATOR FAILED TO OPERATE DUE TO EXCESSIVE CORROSION IN ALL PNEUMATIC PARTS OF THE POSITIONER AND THE CUSHION REGULATOR. CORROSION WAS DUE TO MOISTURE ENTERING VENT HOLES OVER LONG PERIODS OF INACTIVITY.                                              |                                                    |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE FAILURE WAS CONFIRMED. IT WAS RECOMMENDED THAT ALL VALVES OF THIS PART NUMBER BE REPLACED IF THEY HAVE BEEN INACTIVE, AND THAT RAIN SHIELDS BE PROVIDED OR A MEANS DEVISED TO PURGE THE VALVE CONTINUOUSLY. SERVICE LIFE AND FREQUENCY OF INSPECTIONS SHOULD BE REVIEWED. |                                                    |                                |                     |                  |            |                               |
| PROPELLANT LOADING-60C-68E<br>PLCU                                                                                                                                                                                                                                                              | AA63-0039/P3-48N-01-197<br>PLCU FUEL PROBE, SEAL   | COMPOSITE-FRD/DPL              | 197D<br>630807      | ETR              | YES<br>NO  |                               |
| FAILURE MODE-EXTERNAL LEAK. DURING THE FUEL TANKING TEST, A SMALL AMOUNT OF SEEPAGE WAS NOTED AT THE PLCU FUEL PROBE.                                                                                                                                                                           |                                                    |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                                                                             |                                                    |                                |                     |                  |            |                               |
| VEHICLE EFFECT-NONE.                                                                                                                                                                                                                                                                            |                                                    |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-THE SEAL WAS REPLACED.                                                                                                                                                                                                                                                        |                                                    |                                |                     |                  |            |                               |
| PROPELLANT LOADING-40C-68E<br>PLCU                                                                                                                                                                                                                                                              | AA61-0152/PE-402-00-117<br>SOLENOID                | COUNTDOWN                      | 117D<br>611022      | 12<br>-3600      | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME SOLENOID OF VALVE LCB IN LOZ LOADING SYSTEM INOPERATIVE.                                                                                                                                                                                        |                                                    |                                |                     |                  |            |                               |

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## DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                                                                                                                     | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME                         | DIP DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIP | SITE<br>TIME DIP | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|--------|
| SYSTEM EFFECT-NONE.<br>VEHICLE EFFECT-W/NE.<br>CORRECTIVE ACTION-REPLACED.                                                                                                                                                                                                                                                                                               |                                                                     |                                |                     |                  |            |                               | 699367 |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                               | A-98-40-141F<br>LIQUID OXYGEN DISCONNECT VALVE, SE 27-29077-3<br>AL | FAR                            | 611018              | ETR              | YES        | PEACOCK<br>NO                 | 699823 |
| FAILURE MODE-OUT OF TOLERANCE. THE DISCONNECT WAS LEAKING PAST THE KEL-F LIP SEAL (P/N 27-29098-7). THE NOTED DISTORTION, AND SEAL FAILURE IS ATTRIBUTED TO POOR OR NO ANNEALING. A LUBRICANT WAS ALSO FOUND ON THE BACK OF THE KEL-F LIP SEAL.                                                                                                                          |                                                                     |                                |                     |                  |            |                               |        |
| CORRECTIVE ACTION-VCAR 1386-62 FROM PEACOCK ENGINEERING STATES, SUBJECT SEALS WERE MANUFACTURED BEFORE NOV. 28, 1980 BY RACO ENGINEERING. THIS VENDOR IS NO LONGER FURNISHING THIS PART. PRESENT VENDOR IS THE FLUOROCARBON CO. CONVAIR DRAWING 27-29098, CHANGE A, CHANGES THE SEAL MATERIAL REQUIREMENT FROM AMS 3650 TO CONVAIR SPEC /-75064.                         |                                                                     |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                               | AE61-0797/P3-501-00-26<br>50 SECOND TIMER PROBE                     | COUNTDOWN                      | 26E<br>610908       | ETR<br>-60       | YES<br>NO  |                               | 699842 |
| SYSTEM EFFECT-OPERATION STOPS PREMATURELY. LOX SLUG TRANSFER SEQUENCE STOPPED BEFORE COMPLETION.<br>VEHICLE EFFECT-COUNTDOWN DELAYED. A 5 MINUTE HOLD WAS CALLED TO PREPARE FOR SECOND SLUG ATTEMPT.<br>CORRECTIVE ACTION-NONE.                                                                                                                                          |                                                                     |                                |                     |                  |            |                               |        |
| PROPELLANT LOADING-6DC-68E                                                                                                                                                                                                                                                                                                                                               | AC-60-0028/92-501-A1-02<br>LOX TANK HIGH TOPPING RELAY IN PLC<br>U  | CAPTIVE                        | 2E<br>800719        | 82               | YES<br>NO  |                               | 699317 |
| FAILURE MODE-FAIL TO OPERATE PRESCRIBED TIME. THE RELAY DID NOT PICK UP UNTIL 17 SECONDS AFTER THE PROBE HAD BEEN COVERED.<br>SYSTEM EFFECT-OPERATION STOPS PREMATURELY. INITIAL LOX SLUG TRANSFER OPERATION WAS PREMATURELY TERMINATED. ANOTHER SLUG TRANSFER WAS ACCOMPLISHED WITH NO DIFFICULTIES.<br>VEHICLE EFFECT-COUNTDOWN DELAYED.<br>CORRECTIVE ACTION-UNKNOWN. |                                                                     |                                |                     |                  |            |                               |        |

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DIFFICULTIES REVIEW-PROPELLANT UTIL/LOADING SYSTEM-CSE

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                             | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| PROPELLANT LOADING-GDC-6SE<br>PLCU                                                                                                                                                                                                               | AZC-27-083/PS-ADN-03-28<br>PROBES           | COMPOSITE-FRD/DPL              | 280<br>591025       | ETR              | YES<br>NO  |                               |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE TL WAS UNSATISFACTORY, THE PLCU AND PU PROBES DID NOT FUNCTION.                                                                                                                             |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                                                              |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COMPOSITE RE-SCHEDULED.                                                                                                                                                                                                           |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-GDC-6SE<br>PLCU                                                                                                                                                                                                               | FTA4575/P2-302-00-04<br>METER               | COUNTDOWN                      | 4C<br>590123        | ETR<br>-35       | YES<br>NO  |                               |
| FAILURE MODE-OUT OF TOLERANCE. LOW METER READING, UPON GOING TO STAGE 3. ANALYSIS INDICATED THAT THERE WAS A PROPER LOZ LOAD. TWO ADDITIONAL RUNS GAVE SIMILAR RESULTS. THE CAUSE OF THIS PROBLEM IS UNKNOWN.                                    |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LOW. LOZ WAS DETANKED BECAUSE THE METER INDICATED AN INSUFFICIENT LOZ LOAD.                                                                                                                                          |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 97 MIN OF HOLD RESULTED AND THIS PROBLEM WAS A CONTRIBUTING CAUSE FOR THE COUNTDOWN ABORT.                                                                                                                     |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-GDC-6SE<br>PLCU                                                                                                                                                                                                               | FTA4575/P2-302-00-04<br>METER               | COUNTDOWN                      | 4C<br>590123        | 12<br>-35        | YES<br>NO  |                               |
| FAILURE MODE-FAIL DURING OPERATION. PLCU METER READING DROPPED FROM 100.2 PCT (AT STAGE 2) TO 98 PCT UPON GOING TO STAGE 3. TWO ADDITIONAL RUNS OBTAINED SIMILAR RESULTS. PLCU METER INDICATION WAS CONSIDERED ERRONEOUS.                        |                                             |                                |                     |                  |            |                               |
| SYSTEM EFFECT-OPERATION TOO LOW. ANALYSIS INDICATED PROPER LOZ LOAD. LOZ WAS DETANKED BECAUSE OF LOW METER INDICATION.                                                                                                                           |                                             |                                |                     |                  |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED.                                                                                                                                                                                                                |                                             |                                |                     |                  |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                                                                       |                                             |                                |                     |                  |            |                               |
| PROPELLANT LOADING-GDC-6SE<br>PLCU                                                                                                                                                                                                               | AZC-27-083/PS-ADN-03-28<br>PROBES           | COUNTDOWN                      | 39E<br>611103       | 13<br>-90.       | YES<br>NO  |                               |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. NO LOZ BLUG WAS DELIVERED TO THE LOZ TANK DURING AN ATTEMPTED LAUNCH. SECONDARY FAILURE. LOW LEVEL FLOAT SWITCH IN LOZ BLUG TANK WAS STUCK IN THE LOW POSITION AND PREVENTED START OF LAUNCH. |                                             |                                |                     |                  |            |                               |

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| SYSTEM<br>SUB-SYSTEM | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PHI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
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F SLUG DELIVERY.

SYSTEM EFFECT-OPERATION DOES NOT START. THE LOX SLUG DELIVERY WAS NOT INITIATED AND LOX IN THE VEHICLE WAS TOO LOW FOR FLIGHT.

CORRECTIVE ACTION-LAUNCH RESCHEDULED AND PERFORMED ON FOLLOWING DAY. LOX SLUG TANK SWITCH WAS JUMPERED PER EO 23970 6 TO GIVE A CONTINUOUS WET SIGNAL.

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PROPELLANT LOADING-ACOUS-6 A63-0004/P1-68N-02-134  
SEAL-LOX TOPPING LINE

COMPOSITE-FRD/DPL 124F 11 YES  
NO  
27-20090-7

SC  
LOX FEED

FAILURE MODE-LEAK EXTERNAL-DURING THE SECOND DPL ON THIS VEHICLE, A LARGE LOX LEAK WAS NOTED AT THE AIRBORNE SIDE OF THE LOX TOPPING RISE-OFF DISCONNECT. LEAK WAS DUE TO A MISSING SEAL.

SYSTEM EFFECT-NONE. LOSS OF LOX THROUGH THE LEAKAGE POINT. LEAK WAS DISCOVERED WHEN LOX TOPPING WAS TEMPORARILY HALTED BY ACTIVATION OF SLUG TANK LOW LEVEL CUTOFF FLOAT. THIS INADVERTANT CUTOFF MAY HAVE BEEN DUE TO THE LOX LEAK. THE LEAK COULD HAVE CAUSED VORTERING IN THE SLUG TANK WITH RESULTING CUTOFF.

VEHICLE EFFECT-COMPOSITE ABORTED AND RESCHEDULED.

CORRECTIVE ACTION-MISSING SEAL WAS REPLACED. THE RESCHEDULED COMPOSITE WAS PERFORMED SUCCESSFULLY WITH NO LEAKS REAPPEARING.

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DIFFICULTIES REVIEW-SERVICE TOWER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                    | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF     | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|----------------------|------------|-------------------------------|
| SERVICE TOWER-68E                                                                                                                                                                                       | AAG1-0137/P2-402-00-121                     | COUNTDOWN                      | 1110<br>610823      | 12<br>-3000          | YES<br>NO  | 6893281                       |
| FAILURE MODE-FAIL DURING OPERATION.                                                                                                                                                                     |                                             |                                |                     |                      |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START.                                                                                                                                                                 |                                             |                                |                     |                      |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED TO COMPLETE SERVICE TOWER REMOVAL PREPARATIONS.                                                                                                                        |                                             |                                |                     |                      |            |                               |
| CORRECTIVE ACTION-NONE.                                                                                                                                                                                 |                                             |                                |                     |                      |            |                               |
| SERVICE TOWER-68E                                                                                                                                                                                       | AES0-0536/P4-402-00-65                      | COUNTDOWN                      | 620<br>600822       | 14<br>-6840          | YES<br>NO  | 689464                        |
| FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME.                                                                                                                                                        |                                             |                                |                     |                      |            |                               |
| SYSTEM EFFECT-OPERATION DOES NOT START. TOWER DID NOT MOVE BECAUSE OF LACK OF AIR PRESSURE.                                                                                                             |                                             |                                |                     |                      |            |                               |
| VEHICLE EFFECT-NONE. NO HOLD CALLED.                                                                                                                                                                    |                                             |                                |                     |                      |            |                               |
| CORRECTIVE ACTION-UNKNOWN.                                                                                                                                                                              |                                             |                                |                     |                      |            |                               |
| SERVICE TOWER-68E                                                                                                                                                                                       | PTA5028/P2-304-00-08                        | COUNTDOWN                      | 6C<br>590715        | 12<br>MINUS 54<br>00 | NO<br>NO   | 689460                        |
| FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THE TOWER CREW WAS LATE IN MOVING THE TOWER TO THE MAINTENANCE AREA.                                                                                 |                                             |                                |                     |                      |            |                               |
| SYSTEM EFFECT-OPERATION STARTS TOO LATE. TOWER REMOVAL WAS NOT ACCOMPLISHED ON TIME.                                                                                                                    |                                             |                                |                     |                      |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 4 MINUTES HOLD.                                                                                                                                                       |                                             |                                |                     |                      |            |                               |
| CORRECTIVE ACTION-CONTINUE TASK.                                                                                                                                                                        |                                             |                                |                     |                      |            |                               |
| SERVICE TOWER-68E                                                                                                                                                                                       | PTA4757/P3-402-00-03                        | COUNTDOWN                      | 30<br>590414        | 13<br>-4200          | NO<br>NO   | 689432                        |
| FAILURE MODE-OUT OF TOLERANCE. TOWER REMOVAL AND SECURING COULD NOT BE ACCOMPLISHED WITHIN PRESCRIBED TIME DUE TO ADDITIONAL TASKS WHICH WERE PERFORMED AND BAD COMMUNICATIONS WITH THE TRANSFER TABLE. |                                             |                                |                     |                      |            |                               |
| SYSTEM EFFECT-NONE.                                                                                                                                                                                     |                                             |                                |                     |                      |            |                               |
| VEHICLE EFFECT-COUNTDOWN DELAYED. 30 MINUTE HOLD TO COMPLETE TOWER REMOVAL AND OTHER TASKS HELD UP BY FAILURE TO GET TOWER REMOVED.                                                                     |                                             |                                |                     |                      |            |                               |
| CORRECTIVE ACTION-HOLD TO COMPLETE TASK.                                                                                                                                                                |                                             |                                |                     |                      |            |                               |

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DIFFICULTIES REVIEW-SERVICE TOWER SYSTEM-68E

| SYSTEM<br>SUB-SYSTEM                                                                                                                                                                                                                                                            | TEST/REPORT NUMBER<br>FAILED COMPONENT NAME | DIF DATA SOURCE<br>PART NUMBER | VEHICLE<br>DATE DIF | SITE<br>TIME DIF | PRI<br>OTH | VENDOR NAME<br>VENDOR PART NO |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------|---------------------|------------------|------------|-------------------------------|
| SERVICE TOWER-68E                                                                                                                                                                                                                                                               | PTA101/PI-202-00-3                          | COUNTDOWN                      | 38<br>590739        | 51<br>-9100      | NO<br>NO   |                               |
| <p>FAILURE MODE-OUT OF TOLERANCE. STAND OPERATIONS WERE NOT COMPLETED BY PRESCRIBED TIME DUE TO RANGE SAFETY COMMAND T<br/>EST DELAYS.</p> <p>SYSTEM EFFECT-NONE.</p> <p>VEHICLE EFFECT-COUNTDOWN DELAYED. 15 MINUTE HOLD.</p> <p>CORRECTIVE ACTION-HOLD TO COMPLETE TASKS.</p> |                                             |                                |                     |                  |            |                               |

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