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GENERAL DYNAMICS

Convair Division

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HYDRAULIC SYSTEM

AIRBORNE

DIFFICULTIES REVIEW

GENERAL DYNAMICS
Convair Division

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BOOK II.

GENERAL INFORMATION.

Volume VII.

Hydraulic System Airborne Difficulties Review.

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B. B. Shaffer Chief of reliability Engineering

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BOOK II - DIFFICULTIES REVIEW - AIRBORNE CONTAINS THE FOLLOWING VOLUMES

VOLUME I	AIRFRAMES
*VOLUME II	ABORT SENSING AND IMPLEMENTATION SYSTEM
VOLUME III	AUTOPILOT
*VOLUME IV	AUXILIARY POWER SOURCE
VOLUME V	ELECTRICAL
*VOLUME VI	GUIDANCE
VOLUME VII	HYDRAULICS
VOLUME VIII	INSTRUMENTATION
VOLUME IX	PNEUMATICS
VOLUME X	PROPELLANT UTILIZATION
VOLUME XI	PROPULSION INTERFACE
VOLUME XII	PROPULSION
VOLUME XIII	RANGE SAFETY COMMAND

*VOLUMES II, IV AND VI UNDER ONE COVER.

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.

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM AIRBORNE

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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).

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CODE	EXPLANATION
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	Refers to the primary failure. If item is labeled no, then item (13) may appear as a yes. Should item (13) appear as a yes, 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).
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.

CODE	EXPLANATION
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. It should be noted that corrective action may be taken whether or not the failure was confirmed.
18	·ts the corrective action. Taken by GDC, the vendor, or both.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

PAGE 0171

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							097076

CORRECTIVE ACTION-DEPT 141-3 TO PERFORM RETEST ON TWO (2) ADDITIONAL UNITS FROM LOT 33, TO DETERMINE LOT ACCEPTABILITY AND PROVIDE COMPARISON DATE.

HYDRAULIC-A/B BOOSTER	27A3977 HYDRAULIC PUMP	UTP-PRT 27-08566-1	041229	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097095

FAILURE MODE-OUT OF SPECIFICATION. S/N 409-0630. PEAK TRANSIENT PRESSURES WERE 4100 TO 4800 PSIG. ALLOWABLE IS 4000 PSIG. NO FLOW TO FULL FLOW TIME IS 0.157 SECONDS. ALLOWABLE TIME IS 0.05 SECONDS.

CORRECTIVE ACTION-SUBMIT ECP 7669 TO REVISE TEST REQUIREMENTS TO PRACTICAL LEVELS.

HYDRAULIC-A/B BOOSTER	SLV-A9-1U-2689 HYDRAULIC PUMP/SEAL	FAR 27-08566-1	7106 041003	FACTORY	YES NO	VICKERS AA-60694-R-2A	098174

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 PROCEDURES.

HYDRAULIC-A/B BOOSTER	SLV-95-10-289-F BOOSTER HYDRAULIC PUMP/SEAL	FAR 27-08566-1	0071-01 040709	WTR	NO YES	VICKERS AA-60694-R-2A	098400

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	69A1910.8 HYDRAULIC PUMP	UTP-PRT 27-08566-1	040814	CONVAIR	YES NO	VICKERS AA-60694-R-2A	

FAILURE MODE-LEAK EXTERNAL. S/N 409-0666 FAILED TO MEET CASE DRAIN LEAKAGE REQUIREMENTS OF 0.0 GPM DURING PRT-1AT. THIS UNIT ALSO FAILED TO MEET PEAK TRANSIENT PRESSURE REQUIREMENTS. REFER TO FPR-4801.

SYSTEM EFFECT-NONE.

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTM	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-BOOSTER HYDRAULIC FILL AND BLEED PERFORMED.							099763
HYDRAULIC-A/B BOOSTER	FTA0887/P8-WO-01-CAC6	COMPOSITE-FRD/DPL	151D 650713	36B	NO NO		097607
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. TEST WAS RUN WITHOUT BOOSTER HYDRAULICS BECAUSE BOOSTER HPU COULD NOT BE OPERATED REMOTELY. THIS WAS NOTED DURING AUTOPILOT FINAL CHECKS. SYSTEM EFFECT-OPERATION DOES NOT START. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-BOOSTER HPU HAND VALVE. MICROSWITCHES V5 AND V1 ADJUSTED TO MAKE WIPER CONTACT.							
HYDRAULIC-A/B BOOSTER	GDC/BKF65-048/01-401-00-59	FLIGHT	59D 650701	B-1 -32.9	YES NO		097144
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 BOOSTER	GDC/BKF65-039/B2-401-00-177	FLIGHT	177D 650603	B-2 2.3	NO NO		097320
FAILURE MODE-OUT OF TOLERANCE. BOOSTER HYD ACCUM. PRESS MEASUR. H33P AND HYD. PUMP OUTLET PRESS. MEASUR H3P 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 2720 PSIA DURING NEXT 1.5 SEC. SPECIFIC CAUSE UNKNOWN BUT SYMPTOMATIC OF UNUSUALLY HEAVY DEMAND ON SYSTEM. (16) SYSTEM EFFECT-OPERATION TOO LOW. BOOSTER HYDRAULIC PRESS. LOWER THAN NORMAL FOR A TIME PERIOD OF -L 3 SEC TO 1.5 SEC. NO ADVERSE EFFECT NOTED ON SYSTEM PERFORMANCE. (17) VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	SD/CZ2M65-015-BA1847-/L4-7NO-01-71 07	COMPOSITE-FRD/DPL	710T 650410	B-4	YES NO		

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	FTA2666/PB-102-00-16 PUMP	FRF	16A 590522	12/ETR	YES NO		090300
FAILURE MODE-ERRATIC OPERATION. BOTH HYDRAULIC ACCUMULATOR PRESSURES SHOWED FLUCTUATIONS OF APPROXIMATELY 1000 PSI PEAK-TO-PEAK. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-REPLACED HYDRAULIC PUMP.							
HYDRAULIC-A/B BOOSTER	69A5074 ACCUMULATOR PRESSURE GAGE, PLUG	UTP-PET 27-06562-3	660711	60/C	YES	AMERICAN STANDARD 6603-719-1	090350
FAILURE MODE-OUT OF SPECIFICATION.BLOWOUT PLUG FAILED TO BLOWOUT AT VALUES 15 PSID AND 30 PSID. RUPTURE OCCURRED AT 59 PSID, DURING BURST PRESSURE TEST. CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETE.							
HYDRAULIC-A/B BOOSTER	27A4508 PUMP BOOSTER HYD.	UTP-PET 27-06566-1	660421	60/C	YES	VICKERS AA-60664-R-2A	090340
FAILURE MODE-ERRATIC OPERATION. WHILE PREPARING FOR THE FINAL PROOF PRESSURE TEST PUMP BECAME NOISY WITH OUTLET PRESSURE FLUCTUATIONS. PUMP DISASSEMBLY REVEALED CONSIDERABLE DAMAGE, PROBLEM FROM FRONT BEARING FAILURE. CORRECTIVE ACTION-PART IS BEING FAILURE ANALYZED. CORRECTIVE ACTION REMAINS OPEN.							
HYDRAULIC-A/B BOOSTER	69A4989.1 ACTUATOR ASSY.	UTP-PET 27-06550-23	660404		YES	HYD. RESEARCH 104700-23	090360
FAILURE MODE-OUT OF TOLERANCE REPORTED ATTRIBUTED TO POSSIBLE TEST ERROR. THE EXTEND AND RETRACT TIME WAS 0.630 SECONDS. REQUIREMENT IS WITHIN 0.498 TO 0.612 SECONDS. THIS PRESENTS NO ADVERSE EFFECT SINCE THE UNIT PASSED THE 10,000 FULL STROKE AND 40,000 HALF STROKE PROOF CYCLE. CORRECTIVE ACTION-NONE SINCE THE REPORTED FAILURE WAS NOT VERIFIED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4989 ACTUATOR ASSY	UTP-PET 27-08530-23	660331	60/C	YES	HYD. RESEARCH 104700-23	000399
FAILURE MODE-STRUCTURAL DUE TO ACTUATOR ROD FRACTURE WHICH OCCURREDDURING VIBRATION TESTING. G FORCES BUILDUPWAS AS GREAT AS 300 GS RMS. THE INPUT FORCES WERE 17 GS RMS. CORRECTIVE ACTION-NONE. TESTING WAS CONTINUED. TEST VIBRATION REQUIREMENTS REVISED, RE.ECP 3697. FAILURE RESOLUTION NOT COMPLETED.							
HYDRAULIC-A/B BOOSTER	27A4508 PUMP BOOSTER HYD., O RING	UTP-PET 27-08360-1	660324	60/C	YES	VICKERS INC. AA-80694R-2A	000300
FAILURE MODE-INTERNAL LEAK DUE TO FAULTY SHAFT SEAL. SEAL WAS FOUND TO HAVE NICKS AND HOLES. CAUSE UNDETERMINED. FA ULT WAS FOUND AFTER COMPLETION OF LOW TEMP. TEST. CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETE.							
HYDRAULIC-A/B BOOSTER BOOSTER	27A4502 VALVE-MANUALLY OPERATED	UTP-PET 27-08360-3	660223	60/C	YES	STERER 12860	000344
FAILURE MODE-OUT OF SPECIFICATION. THE MINIMUM FLOW OF 0.54 GPM WAS NOT ACHIEVED SINCE 0.527 WAS REPORTED. THIS MIN OR DEVIATION WOULD NOT HAVE ANY ADVERSE EFFECT ON MISSILE OPERATION. CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETED.							
HYDRAULIC-A/B BOOSTER	69A5102 ACTUATOR ASSY-BOOSTER	UTP-PET 27-08550-23	660217	60/C	YES	HYD. RESEARCH 104700-23	000301
FAILURE MODE-STRUCTURAL. PISTON ROD WAS FOUND CRACKED FOLLOWING VIBRATION TESTING IN ACCORDANCE WITH TEST PROCEDURE 1-3370.1E PARA. 552. CORRECTIVE ACTION-VIBRATION TEST REQUIREMENTS MODIFIED, RE. ECP 3697.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER BOOSTER	69A5045 SWITCH HYD. PRESSURE	UTP-DPT	660215	60/C	YES	BOURNS 2007171401	000343
FAILURE MODE-STRUCTURAL CAUSED BY A WELD FAILURE IN THE MOUNTING BASE. THIS WAS A SPECIAL DESIGN EVALUATION TEST. T ESTWAS TO SPECIFICATION 27-06343. THREE UNITSFAILED DURING VIBRATION, EACH EXPERIENCED WELD FAILURES IN THEIR MOUNTI NG BASES.							
CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETED.							
HYDRAULIC-A/B BOOSTER	27A4774 ACCUMULATOR PRESSURE GAGE, PLUG	UTP-PET 27-06562-3	660211	60/C	YES	AMERICAN STAND ARD 0903-719-1	000350
FAILURE MODE-OUT OF SPECIFICATION.BLOWOUT PLUG FAILED TO BLOWOUT AT VALUES OF 15 PSID AND 30 PSID. RUPTURE OCCURRED AT 66 PSID, DURING BURST PRESSURE TEST.							
CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETE.							
HYDRAULIC-A/B BOOSTER BOOSTER	69A5019 ACCUMULATOR PRESSURE GAGE	UTP-PET 27-06562-3	660211	60/C	YES	AMERICAN STAND ARD 0903-719-1	000357
FAILURE MODE-OUT OF SPECIFICATION.BLOW OUT PLUG FAILED TO BLOW OUT AT VALUES OF 15 PSID AND 30 PSID. RUPTURE OCCURR ED AT 80 PSID, DURING BURST PRESSURETEST.							
CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETE.							
HYDRAULIC-A/B BOOSTER	69A4990 ACTUATOR ASSY, ORIFICE	UTP-ETT 27-06550-21	660180	60/C	YES	HYD. RESEARCH 104700-21	000381
FAILURE MODE-FAILED DURING OPERATION DURING LIFE TEST OF PROCEDURE 1-3370-1E FILTER ASSY. ORIFICE FRACTURED.							
CORRECTIVE ACTION-SURVEY 9-66 WAS ORIGINATED TO LOCATE AND RETURN TO VENDOR ALL UNITS FOR REWORK, REIDENTIFY AND RE TURN TO60/C.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4909 ACTUATOR ASSEMBLY, ORIFICE	UTP-ETT 27-08550-23	660124	GD/C	YES	HYD. RESEARCH 104700-23	690362
FAILURE MODE-FAILED DURING OPERATION. DURING LIFE TEST OF PROCEDURE 1-3378-1E FILTER ASSY ORIFICE FRACTURED.							
CORRECTIVE ACTION-SURVEY 9-66 WAS ORIGINATED TO LOCATE AND RETURN TO VENDOR ALL UNITS FOR REWORK, REIDENTIFY AND RETURN TO GD/C.							
HYDRAULIC-A/B BOOSTER	CT-9B-D4-264 ACTUATOR ASSEMBLY, CONNECTOR	FAR 27-08550-13	174D 660121	36A	YES NO	HYDRAULIC RESEARCH 104700-13	690460
FAILURE MODE-STRUCTURAL. THE ACTUATOR ASSEMBLY FEEDBACK TRANSDUCER CONNECTOR PLUG WAS FOUND CRACKED LOOSE FROM THE TRANSDUCER BODY AFTER THE ENGINE NACELLE WAS REMOVED FROM CENTAUR BOOSTER 174D.							
CORRECTIVE ACTION-CONFIRMED FAILURE. SOME CORROSION DEPOSITS FOUND. THE SOLDER JOINT FAILED BECAUSE OF EXCESSIVE LOADS APPLIED TO THE CONNECTOR OR ATTACHED ELECTRICAL WIRES. SITE AND FACTORY PERSONNEL TO USE MORE CAUTION WHEN HANDLING UNITS TO PRECLUDE RECCURRENCE OF SUCH PROBLEM.							
HYDRAULIC-A/B BOOSTER	SLV-9B-59-4047 FLUID TANK, O RING	FAR 27-08551-3	5001 660120	CX12		BENDOW 8985	690449
FAILURE MODE-INTERNAL LEAK. DURING PROCEDURE 27-90215 THE TANK LEAK OIL TO THE PNEUMATIC SIDE OF TANK.							
CORRECTIVE ACTION-CONFIRMED FAILURE. LEAK WAS CAUSED BY WRONG SIZE O RING. VENDOR TO TAKE PRECAUTION TO PRECLUDE USE OF WRONG SIZE O RING. CORRECTIVE ACTION DOCUMENTED IN RAR SLV-95-58-5780. FAILURE ANALYSIS ASSIGNED SYSTEM 58 (GROUND PNEUMATICS) TO THIS PROBLEM, SHOULD BE SYSTEM 10, (AIRBORNE HYDRAULICS).							
HYDRAULIC-A/B BOOSTER	GDC/A6U03-001-56/FC-CO-01-0050-001 ACTUATOR ASSY-VERNIER-	COMPOSITE-FACTORY 27-65312-805	3801 660117	FACTORY	YES NO	LIONEL PACIFIC	690513
FAILURE MODE-ERRATIC OPERATION. ERRATIC RESPONSE OF THE VERNIER NO 2 PITCH ENGINE WAS OBSERVED AT SCO VERNIER ACTIVATE. DURING FILTER OVERSHOOT RESPONSE, THE FEEDBACK PEAKED SHARPLY INSTEAD OF THE SMOOTH RESPONSE EXPECTED.							

GENERAL DYNAMICS
CONVAIR DIVISION

19 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4928 ACTUATOR ASSY.-SUSTAINER.	UTP-ETT 27-05314-017	660112	GD/C	YES	LIONEL PACIFIC	090819
FAILURE MODE-FAILED DURING OPERATION. DURING Z AXIS SWEEP VIBRATION THE UNITS NULL POSITION SHIFTED APPROX. 3.0 VOLTS. SHIFT WAS CAUSED BY LACK OF TRANSDUCER COIL BOND TO CASE.							
CORRECTIVE ACTION-INITIATION OF SURVEY 6-66 REQUIRING A CHECK OF BOND ON ALL UNITS.							
HYDRAULIC-A/B BOOSTER	CT-A9-04-260 ACTUATOR ASSEMBLY	FAR 27-08550-13	1040 660111	FACTORY	NO NO	HYDRAULIC RESE ARCH 104700-13	090461
FAILURE MODE-ERRATIC OPERATION. DURING COMBINED FLIGHT ACCEPTANCE TEST, PER PROCEDURE FI-CO-01-0-AC8 INDICATIONS WERE THAT B-2 ENGINE MOVED TO THE NEGATIVE PITCH LIMIT WHEN HYDRAULIC POWER WAS APPLIED. THE ACTUATOR REMAINED IN THIS POSITION THROUGHOUT COMPOSITE FLIGHT.							
CORRECTIVE ACTION-NOT A CONFIRMED FAILURE. FUNCTIONAL ANOMALIES OCCURRED WITH CONTROL SIGNALS FROM THE SERVOAMPLIFIER THAT SUPPLIED SIGNALS. NO SPECIFIC CORRECTIVE ACTION WAS TAKEN. THE REPORTED FAILURE COULD NOT BE TRACED TO THIS COMPONENT.							
HYDRAULIC-A/B BOOSTER	27A4496 TANK-HYDRAULIC	UTP-PET 27-08551-3	851222	GD/C	YES	BENDIX 89858	390346
FAILURE MODE-LEAK DUE TO WORN PARTS FROM LIFE CYCLING.							
CORRECTIVE ACTION-FAILURE RESOLUTION NOT COMPLETED.							
HYDRAULIC-A/B BOOSTER	SLV-A9-04-5039 BOOSTERS ACTUATOR ASSY.	FAR 27-08550-17	71-21 851221	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	090450
FAILURE MODE-ERRATIC OPERATION. SERVOCYLINDER HAD CONSTANT MAGNITUDE 400HERTZ OSCILLATION. UNIT MET ALL EOP RECEIVING INSPECTION VALVES. TESTS ISOLATED THE CONDITION TO A SERVOVALVE-INDUCED INSTABILITY IN RESPONDING TO CONTROL SIGNALS FROM THE MODIFIED AIG-TYPE SERVO- AMPLIFIER.							
CORRECTIVE ACTION-DESIGN WAS REQUESTED TO REVIEW AND REVISE THE SERVO VALVE SPECIFICATION, ESTABLISHING NEW UPPER LIMITS FOR GAIN TO VALVES WILL NOT OSCILLATE WHEN INSTALLED IN AN AUTOPILOT SYSTEM. DESIGN SHOULD ALSO DEVISE ADDITIONAL COMPONENT ACCEPTANCE TESTS TO ASSURE COMPATIBILITY AND STABILITY IN THE SERVOLOOP. GD/C WILL CONTINUE TO MONITOR THIS PROBLEM.							

GENERAL DYNAMICS
CONVAIR DIVISION

13 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	CT-98-04-236 ACTUATOR ASSEMBLY	FAR 27-08550-13	174D 651220	36A	YES NO	HYDRAULIC RESE ARCH 104700-13	890462

FAILURE MODE-OUT OF TOLERANCE. DURING ATLAS/CENTAUR QUAD TANKING (CTP-INT-0006) FEEDBACK INFORMATION INDICATED B-2 ENGINE 0.50 DEGREES FROM NULL. SERIAL NUMBER OF UNIT WAS 103-1702.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. TEMPORARY NULL SHIFT POSSIBLY OCCURRED WHEN A PARTICLE PASSED INTO THE C-1 NOZZLE AND RESTRICTED HYDRAULIC FLOW. VENDOR TO INCORPORATE HIGH FLOW FLUSHING PROCEDURES AT CRITICAL STEPS IN SERVOVALVE ASSEMBLY TO FLUSH AWAY CONTAMINANTS.

HYDRAULIC-A/B BOOSTER	SLV-99-04-5076-P ACTUATOR-BOOSTER PISTON	FAR 27-08550-15	651102	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-15	894074

FAILURE MODE-STRUCTURAL. THIS PISTON ASSEMBLY REPORTEDLY FAILED WHEN DURING PERFORMANCE OF A SPECIAL VIBRATION TEST THE PISTON ASSEMBLY WAS FOUND CRACKED AFTER THE FIRST Y-AXIS VIBRATION TEST. PISTON ASSEMBLY FAILURE WAS CAUSED BY A NOTCH CONDITION CREATED BY PISTON WALL REDUCTION AND TRANSDUCER INSERT POSITION COUPLED WITH-TEST FIXTURE VIBRATIONS IMPOSED ON ACTUATOR ASSEMBLIES ARE MORE SEVERE THAN PREVIOUSLY EXPERIENCED. AND NON-DEFINED OPERATING DYNAMIC CONDITIONS PECULIAR TO -15 UNITS.

CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN. IT IS RECOMMENDED THE PISTON ASSEMBLY BE REDESIGNED TO ELIMINATE THE NOTCH CONDITION. IT IS RECOMMENDED A REVIEW OF THE VIBRATION FIXTURE AND TEST PARAMETERS BE MADE TO DETERMINE THE RELATIONSHIP OF THESE TESTS TO BOOSTER SERVO CYLINDER REQUIREMENTS.

HYDRAULIC-A/B BOOSTER	69A4848 SWITCH, HYD PRESSURE	UTP-PET 87-44900-624	651026	60/C	YES	BOURNS 207171301	890212

FAILURE MODE-OUT OF SPECIFICATION, THE UNITS INSULATION RESISTANCE ACROSS PINS A-B WAS LESS THAN 20 MEGOHMS ALLOWED MEASURING 1.25 15 OHMS, DURING PROOF CYCLE FOLLOWING VIBRATION TESTING CAUSE OF DISCREPANCY IS UNKNOWN FAILURE WAS UNCONFIRMED.

CORRECTIVE ACTION-NONE. TESTING INTENT WAS FOR COMPARATIVE DATA ONLY.

HYDRAULIC-A/B BOOSTER	CT-99-04-238 BOOSTER SERVO CYLINDER, PISTON	FAR 27-08550-15	651022	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-15	

FAILURE MODE-STRUCTURAL. UNIT WAS REJECTED DURING P.E.T. FOR EXTERNAL LEAKAGE AT THE PISTON ROD. FAILURE ATTRIBUTED TO A CRACKED PISTON ROD CAUSED BY A NOTCH CONDITION CREATED BY PISTON WALL REDUCTION AND INSERT POSITION, COUPLED WITH EXCESSIVE VIBRATION CONDITIONS DURING TEST.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-RECOMMENDED REDESIGN OF PISTON ROD TO ELIMINATE NOTCH CONDITION- AND, REVIEW TEST VIBRATION REQUIREMENTS.							000022
HYDRAULIC-A/B BOOSTER	69A4848 SWITCH, HYD. PRESSURE	UTP-PET 87-44900-624	651021	SOC	YES	BOURNS 2007171301	000213
FAILURE MODE-OUT OF SPECIFICATION. THE UNITS INSULATION RESISTANCE ACROSS PINS A-B WAS LESS THAN 20 MEGOHMS ALLOWED MEASURING 5.2 MEGOHMS; DURING PROOF CYCLE OF NON-OPR. TEMP. TEST. CAUSE OF DISCREPANCY UNKNOWN FAILURE WAS UNCONFIRMED.							
CORRECTIVE ACTION-NONE. TESTING INTENT WAS FOR COMPARATIVE DATA ONLY.							
HYDRAULIC-A/B BOOSTER	69A4848 SWITCH HYD. PRESSURE.	UTP-PET 87-44900-624	651021	SO/C	YES	BOURNS 2007171301	000214
FAILURE MODE-OUT OF SPECIFICATION. THE UNITS INSULATION RESISTANCE ACROSS PINS A-B WAS LESS THAN 20 MEGOHMS ALLOWED MEASURING 6 MEGOHMS. DURING NON-OPR. TEMP. TEST, PROOF CYCLE. CAUSE OF DISCREPANCY UNKNOWN. FAILURE WAS UNCONFIRMED.							
CORRECTIVE ACTION-NONE. TESTING INTENT WAS FOR COMPARATIVE DATA ONLY.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR ASSY	UTP-PET 87-08550-18	651020	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-18	000037
FAILURE MODE-LEAK, EXTERNAL.DURING A POST VIBRATION TEST WHEN THE ACTUATOR WAS RETRACTED HYDRAULIC OILSQUIRTED FROM THE PISTON ROD BLEED HOLE. THIS WAS CAUSED BY A CRACKED PISTON ROD. REF. TASK HISTORY LOG NO. 664-0-008 S/N 409-876-1.							
CORRECTIVE ACTION-STOP TEST AND SUBMIT BROKEN PISTON ROD FOR FAILURE ANALYSIS. INSURE THAT FUTURETESTS ARE CONDUCTED UNDER CONTROLLEDASSY. CONDITIONS. AN ECP HAS BEEN SUBMITTED TO CHANGE SINE RANDOM VIBRATION TEST TO PRECLUDE FAILURES OF THIS TYPE.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR ASSY.-BOOSTER	UTP-PET 87-08550-18	651020	SO/C	YES	HYD. RESEARCH 104700-18	
FAILURE MODE-LEAK OIL SQUIRTED FROM PISTON ROD BLEED HOLE. CAUSE DETERMINED TO BE DUE TO IMPROPER ASSEMBLY PERMITTING UNDUE WEAR TO OCCUR.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1988

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
CORRECTIVE ACTION-ASSURE THAT FUTURE TESTS ARE CONDUCTED UNDER CONTROLLED ASSY. CONDITIONS.							890345
HYDRAULIC-A/B BOOSTER	69A4777 BOOSTER SERVO CYLINDER	UTP-PET 27-08550-15	651010	GD/C	YES NO	HYDRAULIC RESE ARCH 104700-15	890955
FAILURE MODE-STRUCTURAL-AFTER VIBRATION ON THE X AXIS THE LOCKING PIN ON THE FIXED END LOCKING NUT WAS FOUND TO BE BROKEN. REF. TASK HISTORY LOG NO.664-0-007 S/N 409-2751. CORRECTIVE ACTION-ALL FUTURE UNITS TO BE TORQUED USING AN ACTUATOR HOLDING TOOL. THIS WILL PROPERLY POSITION THE ACTUATOR SO AS TO PREVENT DAMAGE TO THE KEY WHILE TIGHTENING THE NUT. UNIT REPAIRED AND TEST CONTINUED.							
HYDRAULIC-A/B BOOSTER	69A4777 BOOSTER SERVO CYLINDER	UTP-PET 27-08550-15	651010	GD/C	YES NO	HYDRAULIC RESE ARCH 104700-15	890964
FAILURE MODE-STRUCTURAL-DURING VIBRATION ON THE X AXIS THE LOCKING PIN AND SAFETY WIRE ON THE FIXED END BROKE. THIS WAS CAUSED BY THE JAM NUT LOOSENING UP AND PERMITTED ROTATION OF THE BODY WHICH BROKE THE KEY. REF. TASK HISTORY LOG NO. 664-0-008 S/N 409-2751. CORRECTIVE ACTION-ALL FUTURE UNITS TO BE TORQUED USING AN ACTUATOR HOLDING TOOL. THIS WILL APPLY PROPER HOLDING FORCE AND WILL PREVENT DAMAGE TO THE KEY DURING ASSEMBLY. UNIT REPAIRED AND TEST CONTINUED.							
HYDRAULIC-A/B BOOSTER	SLV-A9-10-285-P PRESSURE GAGE	FAR 27-00562-3	7502 651014	FACTORY	YES NO	AMERICAN STAND ARD 8903-719-1	890871
FAILURE MODE-EXTERNAL LEAK. LEAKAGE WAS DUE TO A HOLE DRILLED IN THE CASE AND THROUGH THE SEALING O-RING. CONCLUDED THAT HOLE WAS DRILLED DURING MANUFACTURING. CORRECTIVE ACTION-FAILURE WAS CONFIRMED. GD/C RECOMMENDED THAT THE VENDOR TAKE QUALITY CONTROL CORRECTIVE ACTION TO PREVENT RECURRENCE OF THIS DRILLING DISCREPANCY. RAR SLV-A9-10-3679 DOCUMENTS CORRECTIVE ACTION REQUIREMENT.							
HYDRAULIC-A/B BOOSTER	22A4555 PUMP-HYD. BOOSTER	UTP-PET 27-08566-1	651012	GD/C	YES	VICKERS AA80694-R-2A	
FAILURE MODE-OUT OF SPECIFICATION. THE PUMP FAILED TO LIMIT THE OUTPUT PRESSURE TO LESS THAN 4,000 PSIG DURING THE TRANSIENT RESPONSE TEST. THE MAX. OUT OF TOL. PRESSURE WAS 4825 PSIG. REGULATION OF TRANSIENT PRESSURE FROM NO FLOW TO FULL FLOW WAS 0.14 SEC. THE ALLOWABLE IS 0.08 SEC.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-DESIGN CRITERIA CHANGED BY SCN. RECOMMEND THAT FUTURE PET TESTING BE GUIDED BY REVISED REQUIREMENTS.							090349
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR-FEEDBACK TRANSDUCER	UTP-PET 27-08550-15	651008	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097067
FAILURE MODE-OPEN ELECTRICAL. THE FEEDBACK TRANSDUCER OPENED IN A MINUS 30 DEGREE FAHRENHEIT TEST. REF. TASK HISTORY LOG NO. 551-2-040 S/N 409-2751.KFM CORRECTIVE ACTION-FAILED TRANSDUCER REPLACED AND TEST CONTINUED.							
CORRECTIVE ACTION-FAILED TRANSDUCER REPLACED AND TEST CONTINUED.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR-ORIFICE	UTP-PET 27-08550-15	651004	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097069
FAILURE MODE-OUT OF TOLERANCE. DURING POST TEMPERATURE SHOCK TEST THE RETRACT PISTON ORIFICE FLOW RATE WAS 2.00 GPM. REQ 1.90 GPM. MAX REF. TASK HISTORY LOG NO. 551-2-042 S/N 409-2751.							
CORRECTIVE ACTION-REVISE SPECIFICATION TO CLARIFY TEST REQUIREMENT. REF. ECP 3442. UNIT IS SATISFACTORY.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR-TRANSDUCER	UTP-PET 27-08550-15	651004	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097068
FAILURE MODE-OUT OF TOLERANCE. THE FEEDBACK TRANSDUCER NULL VOLTAGE WAS 80 MV. REQ. IS 50MV. MAXIMUM. REF. TASK HISTORY LOG NO. 551-2-041 S/N 409-2751.							
CORRECTIVE ACTION-NONE-CONTINUED THE TEST.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR-ORIFICE	UTP-PET 27-08550-15	651004	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	090003
FAILURE MODE-OUT OF TOLERANCE. THE RETRACT PISTON ORIFICE FLOW WAS 2.35 GPM. REQ. 1.90 GPM. MAX. DURING FLUID HIGH TEMPERATURE TEST. REF. TASK HISTORY LOG NO. 551-2-041 S/N 409-2751.							
CORRECTIVE ACTION-NONE-CONTINUED THE TEST.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-15	651005	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097070
FAILURE MODE-OUT OF TOLERANCE. DURING THE FLOW LIMITER TEST AT MINUS 30 DEGREE FAHRENHEIT THE FLOW WAS LESS THAN THE REQUIRED 8.6 GPM. ALSO DURING STATIC FLOW GAIN TEST THE FLOW WAS 3.92 GPM. REQ. 3.94GPM. REF. TASK HISTORY LOG NO. 551-2-040 S/N 409-2751. CORRECTIVE ACTION-NONE CONTINUED THE TEST.							
HYDRAULIC-A/B BOOSTER	69A4794 HYDRAULIC PRESSURE SWITCH	UTP-PET 27-08543-1	650930	GD/C	YES NO	SERVONIC 2092-0801	099019
FAILURE MODE-FAIL DURING OPERATION-DURING VIBRATION TEST THE SWITCH IN THE UNIT FAILED TO RESPOND TO PRESSURE CYCLING AT LEVELS OF 1100 CPS IN BOTH THE Y AND Z AXIS. REF. TASK HISTORY LOG NO. 684-0-005 S/N 509-0035. CORRECTIVE ACTION-STOP AUTHORIZATION NO. 00621 REQUESTED SERVONICS TO STOP PRODUCTION MANUFACTURING, PROCUREMENT OF ADDITIONAL MATERIALS, TESTING AND SHIPMENT OF COMPLETED HARDWARE. CONVAIR IS PROCURING P/N 87-44900-624 PRESSURE SWITCHES TO SUPPORT REPLACEMENT OF EXISTING HARDWARE.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-15	650921	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097072
FAILURE MODE-OUT OF TOLERANCE. DURING BOTH THE INITIAL ACCEPTANCE TEST AND LOW TEMPERATURE TEST THE FLOW LIMITER VALVE OVERSHOOT WAS 24 MILLISECONDS. REQ. IS 15 MILLISECONDS MAX. REF. TASK HISTORY LOG NO. 551-2-039 S/N 409-2751. CORRECTIVE ACTION-NONE-CONTINUED THE TEST.							
HYDRAULIC-A/B BOOSTER	69A4777 ACTUATOR FEEDBACK TRANSDUCER	UTP-PET 27-08550-15	650921	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097071
FAILURE MODE-OPEN ELECTRICAL. DURING THE TRANSDUCER GAIN TESY AFTER THE MINUS 65 DEGREE FAHRENHEIT SOAK AND MINUS 30 DEGREE FAHRENHEIT PROOF CYCLE, IT WAS FOUND THAT PIN A WAS OPEN IN THE FEEDBACK TRANSDUCER COIL. REF. TASK HISTORY LOG NO. 551-2-038 S/N 409-2751. CORRECTIVE ACTION-REPLACE THE FEEDBACK TRANSDUCER AND RERUN TEST. PERFORM FAILURE ANALYSIS ON FAILED UNIT. ALSO 10 SAMPLES FROM STOCK AT HYDRAULIC RESEARCH AND 10 SAMPLES FROM VENDOR (CRESENT ENG.) WERE SUBJECTED TO X-RAY AND COLD SOAK TESTS AS PART OF THE FAILURE ANALYSIS.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-99-04-5077-P BOOSTER ACTUATOR ASSEMBLY,SERVOVALVE	FAR 27-08550-9	191F 650921	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	000149

FAILURE MODE-CONTAMINATION-THE NULL VOLTAGE WAS 0.43 VOLT. MAXIMUM ALLOWED IS 0.35 VOLT. IT IS CONCLUDED THE EXCESSIVE ACTUATOR ASSEMBLY NULL AND IRREGULAR RESPONSE CHARACTERISTICS WERE CAUSED BY A PARTIALLY BLOCKED CONTROL NOZZLE. IT IS ALSO CONCLUDED THIS BLOCKAGE WAS CAUSED BY A THIN-BLACK RUBBER LIKE PARTICLE, WHICH CAME FROM THE C-2 FIRST STAGE PRESSURE DROPPING ORIFICE O-RING.

CORRECTIVE ACTION-THE VENDER WAS REQUESTED TO REVIEW SERVOVALVE ASSEMBLY PROCEDURES, AND TO ASSURE NECESSARY CAUTION BE STRESSED WITH THEIR PERSONNEL TO PREVENT INADVERTANT GENERATION OF RUBBER CONTAMINANTS DURING FIRST STAGE PRESSURE DROPPING ORIFICE INSTALLATION AND ASSEMBLY.

HYDRAULIC-A/B BOOSTER	69A4389 ACTUATOR-FEEDBACK TRANSDUCER	UTP-PET 27-08550-15	650914	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097073

FAILURE MODE-ERRATIC OPERATION-DURING A CYCLING TEST AT MINUS 30 DEGREE FAHRENHEIT TEMPERATURE IN A CLOSED LOOP CONDITION, THE ACTUATOR FULLY EXTENDED. THIS WAS CAUSED BY PIN A OF THE FEED BACK TRANSDUCER COIL BEING OPEN. REF. TASK HISTORY LOG NO. 951-2-036 S/N 201-2618.

CORRECTIVE ACTION-THE FEEDBACK TRANSDUCER WAS REPLACED IN THE UNIT AND THE FAILED UNIT WAS HELD FOR THE VENDOR FOR FAILURE ANALYSIS.

HYDRAULIC-A/B BOOSTER	SLV-99-04-5072-P BOOSTER ACTUATOR ASSEMBLY,SERVOVALVE	FAR 27-08550-17	7201 650918	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-17	000150

FAILURE MODE-OUT OF SPECIFICATION-DURING FINAL CHECKOUT THE SERVOCYLINDER ASSY WAS REPORTED TO BE EXCESSIVELY NOISY AND EXHIBITING EXCESSIVE VIBRATIONS. FAILURE IS CONSIDERED CONFIRMED SINCE THE ASSEMBLY APPEARED TO BE NOISY, AND AS THE OSCILLATIONS WOULD CAUSE EXCESSIVE VIBRATION DURING ANY CHECKOUT WITH IOC-SUPPLIED SIGNALS.

CORRECTIVE ACTION-IT WAS RECOMMENDED THE VENDER REVIEW THE CAUSE FOR ASSEMBLY REJECTION TO CORRECT A LACK OF SERVOVALVE COMPONENT SYMMETRY FROM PRODUCING A MARGINAL CHECKOUT CONDITION.

HYDRAULIC-A/B BOOSTER	SLV-A9-04-5071-F BOOSTER ACTUATOR ASSEMBLY,SERVOVALVE	FAR 27-08550-17	7110 650918	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-17	

FAILURE MODE-CONTAMINATION-FACTORY PERSONNEL REPORTED NULL WAS EXCESSIVE DURING CHECKOUT. THE EXCESSIVE NULL CONDITION REPORTED WAS NOT CONFIRMED THE GRADUALLY WORSENING NULL CONDITION REPORTED COULD HAVE BEEN CAUSED BY A CONTAMINANT PARTICLE MOVING INTO AN ORIFICE, RESTRICTING FLOW, AND CHANGING THE PRESSURE BALANCE WITHIN THE SERVOVALVE.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR IS TAKING CORRECTIVE ACTION TO PREVENT POSSIBLE GENERATION OF CONTAMINANT PARTICLES WITHIN SERVOVALVES DURING ASSEMBLY.							095460
HYDRAULIC-A/B BOOSTER	CT-98-10-089 HYDRAULIC ACCUMULATOR-O-RING	FAR 27-08554-3	1510 650908	ETR	YES NO	PEACOCK 51310-3J	096233
FAILURE MODE-LEAK INTERNAL-LEAKED GASEOUS NITROGEN PAST THE INTERMEDIATE PISTON INTO THE HYDRAULIC SIDE DUE TO CONTAMINANTS AND DAMAGED O-RING.							
CORRECTIVE ACTION-GD/C RECOMMENDED TO PEACOCK TO TAKE QUALITY CONTROL ACTION TO PRECLUDE RECURRENCE OF PROBLEM. OUTSIDE PROCUREMENT INSPECTION INFORMED THAT THIS UNIT DID NOT BEAR SURVEY STAMP 54-65. SITE WAS INFORMED THAT MOISTURE MAY HAVE ENTERED THE ACCUMULATOR DURING LEAKAGE CHECKS.							
HYDRAULIC-A/B BOOSTER	27A4555 HYDRAULIC PUMP	UTP-PET 27-08563-1	650902	CONVAIR	YES NO	VICKERS AA-80694-R-2A	096001
FAILURE MODE-OUT OF SPECIFICATION. S/N 409-0443 SPECIMEN FAILED TO REGULATE PRESSURE WITHIN 0.05 SEC. OUTLET PRESSURE TRANSIENTS EXCEEDED ALLOWABLE 4000 PSIG. TEST CONDITIONS-DURING BOTH IAT AND POST LIFE PROOF CYCLE.							
CORRECTIVE ACTION-FUTURE PET LOT TESTS TO BE CONDUCTED TO REVISED SPECIFICATION REQUIREMENTS AS REVISED BY SCN NO. 14170.							
HYDRAULIC-A/B BOOSTER	27A4555 HYDRAULIC PUMP CASE DRAIN FITTING	UTP-PET 27-08566-1	650824	CONVAIR	YES NO	VICKERS AA-80694-R-2A	097079
FAILURE MODE-LEAK-EXTERNAL. S/N 409-0443 PUMP CASE DRAIN FITTINGS LEAKED DURING PREPARATIONS FOR IAT. CAUSE LOW TORQUED FITTINGS							
CORRECTIVE ACTION-TORQUE FITTINGS TO 100 IN-LB. CHECK TORQUE ON REMAINING PUMPS FROM LOT NO. 13.							
HYDRAULIC-A/B BOOSTER	SLV-A9-04-5064-P BOOSTER ACTUATOR ASSEMBLY,SERVOVALVE	FAR 27-08550-7	7116 650824	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-7	
FAILURE MODE-CONTAMINATION-NULL VOLTAGE REPORTEDLY MEASURED MINUS 280 MILLIVOLTS ACTIVE, AND MINUS 290 MILLIVOLTS INACTIVE. MAXIMUM VALUES ALLOWED ARE ZERO PLUS OR MINUS 250 MILLIVOLTS ACTIVE AND ZERO PLUS OR MINUS 200 MILLIVOLTS INACTIVE. EXCESSIVE ACTUATOR ASSY NULL AND IRREGULAR RESPONSE CHARACTERISTICS WERE CAUSED BY A PARTIALLY RESTRICTED C-2 PRESSURE DROPPING ORIFICE. THE ORIFICE WAS PARTIALLY PLUGGED FROM THE UPSTREAM SIDE BY A METALLIC PARTICLE.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1988

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-GD/C NOTIFIED THE VENDOR OF THIS FAILURE AND ITS CAUSE. VENDOR WAS REQUESTED TO REVIEW SERVOVALVE ASSEMBLY PROCEDURES, AND TOASSURE NECESSARY CAUTION BE STRESSED WITH THEIR PERSONNEL TO PREVENT INADVERTANT GENERATION OF METALLIC CONTAMINANTS DURING FIRST-STAGE FILTER AND ORIFICE INSTALLATION AND ASSEMBLY.							095473
HYDRAULIC-A/B BOOSTER	89A4581 ACTUATOR-FEEDBACK TRANSDUCER	UTP-PET 27-08550-15	850820	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097074
FAILURE MODE-ERRATIC OPERATION-THE SERVO VALVE GENERATED AN OSCILLATING SIGNAL WHICH CAUSED THE ACTUATOR TO OSCILLATE IN CLOSED LOOP CONDITION WITH NO INPUT CURRENT. THIS WAS CAUSED BY AN OPEN CIRCUIT BETWEEN PIN B AND C ON THE FEEDBACK TRANSDUCER REF. TASK HISTORY LOG NO. 551-2-035 S/N 201-2618. CORRECTIVE ACTION-REPLACE FEEDBACK TRANSDUCER AND RERUN PET TEST. RETURN TO VENDOR FOR FAILURE ANALYSIS.							
HYDRAULIC-A/B BOOSTER	GD/CZZH85-026-DA1057-/L4-TNO-02-71 11 B1 ACCUMULATOR	COMPOSITE-FRD/DPL 27-08554-3	7111 850812	2-4	YES NO	PEACOCK 51310-3	099769
FAILURE MODE-INTERNAL LEAK. M33P, B1 ACCUMULATOR, INDICATED A SLOWER THAN NORMAL DECAY AT MPU STOP. THIS SLOW DECAY WAS ATTRIBUTED TO POOR BLEED. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-HYDRAULIC FILL AND BLEED PERFORMED.							
HYDRAULIC-A/B BOOSTER	GD/CZZH85-027-DA1058-/L4-TNO-03-71 11 ACCUMULATOR	COMPOSITE-FRD/DPL 27-08554-3	7111 850812	2-4	YES NO	PEACOCK 51310-3	099766
FAILURE MODE-ERRATIC OPERATION-M33P, B1 HYD. ACCUMULATOR MEASUREMENT, EXHIBITED INTERMITTENT NEGATIVE SPIKING UP TO 20 PERCENT IBM DURING TEST. MEASUREMENT ALSO EXHIBITED A SLOW DECAY AT MPU STOP. IT IS BELIEVED THAT THIS RESULTED FROM AIR IN THE SYSTEM DUE TO A POOR FILL AND BLEED. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-NONE CORRECTIVE ACTION-HYDRAULIC FILL AND BLEED PERFORMED.							
HYDRAULIC-A/B BOOSTER	FAR-SLV-8D-10-2857 BOOSTER HYDRAULIC TANK O RING	FAR 27-08551-3	7112 850809	WTR	YES NO	BENSON 09036	
FAILURE MODE-LEAK-INTERNAL- GAS PRECHARGE WAS LEAKING ACROSS INTERMEDIATE O RING SEAL INTO THE HYDRAULIC SIDE.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							099786

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. DUE TO SOME PAINT PARTICLES FOUND IN THE UNIT FACTORY PERSONNEL WERE INSTRUCTED TO TAKE GREATER CARE WHEN ATTACHING LINES TO THE UNIT.

HYDRAULIC-A/B BOOSTER	CT-98-10-083 HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3K	151D 650807	COMPLEX 368	YES NO	PEACOCK 51310-3J	096210

FAILURE MODE-LEAK INTERNAL-LEAKING GASEOUS NITROGEN FROM PNEUMATIC TO HYDRAULIC SIDE OF THE ACCUMULATOR DUE TO TEFL ON SLIVERS BRIDGING THE INTERMEDIATE PISTON O-RING.

CORRECTIVE ACTION-GD/C REQUESTED PEACOCK TO CHECK DIAMETERS OF TEFLON GUIDE AND BACKUP RINGS PRIOR TO INSTALLATION. INITIATE DESIGN CHANGE TO INCREASE RADIUS ON SHOULDER. INITIATE A CHANGE TO ALTER PLATING THICKNESS IN SNAP RING GROOVE AND AT END OF CYLINDER BORE. USE A METHOD OF OIL DISPLACEMENT COMPATIBLE WITH THAT USED BY PEACOCK.

HYDRAULIC-A/B BOOSTER	CT-98-10-084 HYDRAULICACCUMULATOR,O-RING O RING-HYDRAULIC ACCUMULATOR	FAR 27-08554-3K	151D 650807	COMPLEX 368	YES NO	PEACOCK 51310-3J	096235

FAILURE MODE-LEAK INTERNAL-LEAKING GASEOUS NITROGEN FROM PNEUMATIC TO HYDRAULIC SIDE OF THE ACCUMULATOR DUE TO CONTAMINANTS BRIDGING THE INTERMEDIATE PISTON O-RING.

CORRECTIVE ACTION-GD/C INFORMED FACTORY AND FIELD PERSONNEL TO TAKE MEASURES TO PREVENT SIMILAR ENTRY OF CONTAMINANT PARTICLES.

HYDRAULIC-A/B BOOSTER	CT-98-10-083 HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3K	650807	COMPLEX 368	YES NO	PEACOCK 51310-3K	096234

FAILURE MODE-LEAK INTERNAL-LEAKING GASEOUS NITROGEN FROM PNEUMATIC TO HYDRAULIC SIDE OF THE ACCUMULATOR DUE TO TEFL ON SLIVERS BRIDGING THE INTERMEDIATE PISTON O-RING.

CORRECTIVE ACTION-GD/C REQUESTED PEACOCK TO CHECK DIAMETERS OF TEFLON GUIDE AND BACKUP RINGS PRIOR TO INSTALLATION. INITIATE DESIGN CHANGE TO INCREASE RADIUS ON SHOULDER. INITIATE A CHANGE TO ALTER PLATING THICKNESS IN SNAP RING GROOVE AND AT END OF CYLINDER BORE. USE A METHOD OF OIL DISPLACEMENT COMPATIBLE WITH THAT USED BY PEACOCK.

HYDRAULIC-A/B BOOSTER	GD/CZZH68-022-DA:053-/L4-7NO-01-71 12	COMPOSITE-PRD/DPL	7112 650806	2-4	YES NO		

FAILURE MODE-INTERNAL LEAK. PRESSURE DECREASES OBSERVED ON BOOSTER HYDRAULIC RETURN LANDLINE AND TELEMETRY MEASUREMENTS FOLLOWING COMMIT STOP. MOST LIKELY DUE TO A POOR HYDRAULIC FILL AND BLEED.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-BOOSTER HYDRAULIC FILL AND BLEED PERFORMED.							099763
HYDRAULIC-A/B BOOSTER	CT-98-04-223 ACTUATOR O-RING	FAR 27-00550-13	1910 650602	36	YES NO	HYD RESEARCH 104700-13	093430
FAILURE MODE-LEAK, EXTERNAL. BOOSTER ACTUATOR LEAKED 6 DROPS IN 24 HOURS. FAILURE TRACED TO FAULTY O-RINGS. CORRECTIVE ACTION-VENDOR INITIATED 100 PERCENT INSPECTION OF O-RINGS. THE FAILED O-RINGS WERE INSTALLED BEFORE 100 PER CENT INSPECTION STARTED.							
HYDRAULIC-A/B BOOSTER	SLV-90-284-F HYDRAULIC HOSE ASSEMBLY	FAR 27-00371-61	71-11 650728	WTR	NO NO	AEROQUIP 660121-16-3266	096670
FAILURE MODE-LEAK EXTERNAL. FLUID FOUND AT FITTING WHERE IT ATTACHES TO HOSE. CORRECTIVE ACTION-FAILURE NOT CONFIRMED-NO FURTHER ACTION. OIL WAS FROM EXTERNAL SOURCE.							
HYDRAULIC-A/B BOOSTER	69A4581 ACTUATOR-SERVO VALVE	UTP-PET 27-00550-15	680723	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-15	097075
FAILURE MODE-ERRATIC OPERATION-THE SERVO VALVE GENERATED AN OSCILLATING SIGNAL WHICH CAUSED THE ACTUATOR TO OSCILLATE IN CLOSED LOOP CONDITION WITH NO INPUT CURRENT. REF. TASK HISTORY LOG NO. 551-2-028 S/N 408-2750. CORRECTIVE ACTION-RETURN TO VENDOR FOR FAILURE ANALYSIS. AFTER VENDOR EVALUATION FURTHER ACTION MAY BE IN ORDER.							
HYDRAULIC-A/B BOOSTER	69A4581 ACTUATOR-SERVO VALVE	UTP-PET 27-00550-15	680710	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097056
FAILURE MODE-OUT OF TOLERANCE. DURING LOW TEMPERATURE TEST THE SERVO VALVE NULL CURRENT WAS -0.53 MA. REQ. PLUS/MINUS 0.20 MA. THIS WAS CAUSED BY THE TORQUE MOTOR SHIFTING. REF. TASK HISTORY LOG NO. 551-2-023 S/N 204-3570. CORRECTIVE ACTION-RETURN PART TO VENDOR FOR VERIFICATION. VENDOR TO INITIATE A STUDY TO DETERMINE CAUSE OF THIS TYPE OF FAILURE. DESIGN TO PROVIDE SUPPORT WHEN NECESSARY.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SLV-SD-10-E83-F BOOSTER HYDRAULIC TANK	FAR 27-08551-3	71-12 650707	WTR	YES NO	BENDIX MFG 89856	090679

FAILURE MODE-LEAK INTERNAL-LEAKED GAS FROM PNEUMATIC SIDE TO HYDRAULIC SIDE OF TANK-POSSIBLE CAUSE CONTAMINANTS.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED-SD/C ADVISED PERSONNEL TO CONTROL APPLICATION AND REMOVAL OF TORQUE PAINT O N ALL INSTALLATIONS.

HYDRAULIC-A/B BOOSTER	GDC/BKF65-048/B1-401-00-59 ACCUMULATOR	FLIGHT 27-08554-3	59D 650701	B-1 -32.5	YES NO	PEACOCK 51310-3	097144

FAILURE MODE-LEAK. B1 HYDRAULIC ACCUMULATOR PRESSURE EXHIBITED NO PRESSURE DIFFERENCE DURING THE OIL EVACUATION SEQ UENCE.

SYSTEM EFFECT-POSSIBLE CONTAMINATION. ALTHOUGH THE FAILURE MODE INDICATES THE POSSIBILITY OF AIR IN THE BOOSTER HYD RAULIC 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 BOOSTER	6944389 ACTUATOR-SERVO VALVE	UTP-PET 27-08550-15	650620	CONVAIR	YES NO	HYDRAULIC RESEARCH 104700-15	097037

FAILURE MODE-OUT OF TOLERANCE. DURING THE PROOF CYCLE AT MINUS 30 DEGREE FAHRENHEIT THE SERVO VALVE NULL CURRENT WA S 3.0 MA. REQ. PLUS/MINUS 0.20 MA. REF. TASK HISTORY LOG NO. 551-2-022 S/N 204-3569.

CORRECTIVE ACTION-REWORK AT VENDOR. A TEST OF REMAINING (10-11) CYLINDER ASSEMBLIES EXHIBITED NO SUCH SHIFT AFTER C OLD SOAK.

HYDRAULIC-A/D BOOSTER	A-A9-10-282-F FLEXIBLE HOSE	FAR 27-08600-43	149F 650625	FACTORY	YES NO	RESISTOFLEX R21225-43	090600

FAILURE MODE-EXTERNAL LEAK FROM SWAGED FITTING AT 20 DROPS PER MINUTE.

CORRECTIVE ACTION-CONSIDERED A HUMAN INITIATED FAILURE. PERSONNEL ADVISED ON CORRECT PROCEDURES FOR INSTALLING FLEX IBLE HOSES. EMPHASIS PLACED ON SWAGED FITTING AND NIPPLE FITTING.

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CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SLV-A9-10-279F PRESSURE GAGE	FAR 27-08582-3	71-15 650621	FACTORY	YES NO	AMERICAN STANDARD 6903-719-1	090884
FAILURE MODE-LEAK. EXTERNAL. GAGE LEAKED CAUSING LOSS OF ACCUMULATOR PRECHARGE. CORRECTIVE ACTION-SURVEY WAS INITIATED TO REJECT GAGES NOT HAVING IMPROVEMENTS MADE SINCE 1963.							
HYDRAULIC-A/B BOOSTER	69-4389 ACTUATOR-SERVO VALVE	UTP-PET 27-08550-15	650621	CONVAIR	YES NO	HYDRAULIC RESEARCH 104700-15	097058
FAILURE MODE-OUT OF TOLERANCE. DURING THE SERVO VALVE NULL CURRENT TEST A READING OF PLUS 0.70 MA. WAS FOUND. REQ. PLUS/MINUS 0.20 MA. REF. TASK HISTORY LOG NO. 551-2-017 S/N 410-2755. CORRECTIVE ACTION-SINCE THIS UNIT WAS A PET SAMPLE IT WAS REJECTED AND SENT TO VENDOR FOR DISASSEMBLY AND REWORK.							
HYDRAULIC-A/B BOOSTER	69A4-18 ACTUATOR	UTP-PET 27-08550-17	650618	CONVAIR	YES NO	27-08550-17 104700-17	097061
FAILURE MODE-LEAK-EXTERNAL-DURING LIFE TEST WHILE THE ACTUATOR WAS CYCLING AT THE RATE OF 0.1 CPS VISUAL EXAMINATION SHOWED TWO SCORINGS ON THE ACTUATOR ROD APPROXIMATELY 180 DEGREES APART. ALSO EXTERNAL OIL LEAKAGE WAS 3 DROPS PER 60 CYCLES WHICH IS EXCESSIVE ACCORDING TO SPECIFICATION. REF. TASK HISTORY LOG NO. 551-2-018 S/N 406-2743. CORRECTIVE ACTION-THE SHAFT WAS HONED DOWN TO WITHIN 0.001 INCH ABOVE MINIMUM DIAMETER ALLOWED ON DRAWING AND THE O-RING REPLACED. THE UNIT WAS PUT BACK INTO LIFE TEST AND COMPLETED PET TEST REQUIREMENTS WITHOUT ANY FAILURE. ACCEPT PET LOT 3.							
HYDRAULIC-A/B BOOSTER	69A4418 ACTUATOR	UTP-PET 27-08550-17	650612	CONVAIR	YES NO	HYDRAULIC RESEARCH 104700-17	097062
FAILURE MODE-OUT OF TOLERANCE. DURING THE FLOW LIMITER TEST THE EXTEND AND RETRACT TIME WAS OUT OF TOLERANCE AS FOLLOWS. TEST EXTEND RETRACT REQ. MINUS 30 DEGREE F. 0.295 SEC. 0.291 SEC. 0.252 TO 0.280 PLUS 200 DEGREE F. 0.246SEC. 0.246 SEC. FAILURE CAUSED BY GALLED ACTUATOR PISTON. REF. TASK HISTORY LOG NO. 551-2-011 S/N 406-2743. CORRECTIVE ACTION-REWORK ACTUATOR AND RETEST.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4418 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-17	650610	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	097096

FAILURE MODE-OUT OF TOLERANCE DURING THE FLOW LIMITER VALVE TEST AT MINUS 30 DEGREE FAHRENHEIT, THE EXTEND AND RETR ACT TIME WAS OUT OF TOLERANCE. REF. TASK HISTORY LOG NO. 551-2-010 S/N 406-2745.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B BOOSTER	6944416 HYDRAULIC PRESSURE SWITCH, PLUG	UTP-PET 27-08543-1	650610	GD/C	YES NO	SERVONICS 2092-0801	096013

FAILURE MODE-STRUCTURAL-THE LEE PLUGS WERE FUSED TO CASE. DURING CASE PRESSURIZATION TEST THE FRONT WELD FAILED AT 4100 PSIG. THE PRESSURE REQUIREMENT IS 5000 PSIG. REF. TASK HISTORY LOG NO. 532-1-006 S/N 10005.

CORRECTIVE ACTION-A VCP WAS APPROVED TO ALLOW VENDOR TO INCREASE THE WELD SCHEDULE ON END CAPS AND LEE PLUGS TO CAS E. VENDOR TO REWORK REMAINING UNITS IN PET LOT NO. 1. QUALITY ASSURANCE WILL SELECT ONE UNIT OF REWORKED LOT AND CON DUCT PET.

HYDRAULIC-A/B BOOSTER	69A4416 HYDRAULIC PRESSURE SWITCH	UTP-PET 27-08543-1	650608	GD/C	YES NO	SERVONIC 2092-0801	096036

FAILURE MODE-STRUCTURAL-DURING CASE PRESSURIZATION TEST THE UPPER LEE PLUG FAILED AT 3600 PSIG. THE PRESSURE REQUIR EMENT IS 5000 PSIG. REF. TASK HISTORY LOG NO. 532-1-005 S/N 10005.

CORRECTIVE ACTION-REPLACE LEE PLUGS AND WELD FUSE THEM TO CASE AND CONTINUE TEST.

HYDRAULIC-A/B BOOSTER	NZ-9D-04-5025-F BOOSTER ACTUATOR ASSY	FAR 27-08530-7	2990 650606	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	096142

FAILURE MODE-OUT OF SPECIFICATION-BOOSTER NUMBER TWO ENGINE PITCH ANGLE WAS THEN APPROXIMATELY 30 PERCENT LOW AT TH E START OF PITCH PROGRAM. CONDITION CONTINUED FOR APPROXIMATELY 1.5 SECONDS AND THEN ENGINE PITCH ABRUPTLY WENT TO T HE NORMAL LEVEL. SIMILAR CONDITION REPORTLY OCCURRED APPROXIMATELY 1.5 HOURS BEFORE. THE BOOSTER ACTUATOR ASSY WAS N OT THE CAUSE OF THE SITE FAILURE. THE ASSY MET ALL ACCEPTANCE AND OPERATIONAL REQUIREMENTS.

CORRECTIVE ACTION-NOT CONSIDERED A FAILURE NO CORRECTIVE ACTION TAKEN.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4416 HYDRAULIC PRESSURE SWITCH	UTP-PET 27-08343-1	650604	GD/C	YES NO	SERVONIC 2092-0901	696038
FAILURE MODE-STRUCTURAL-DURING CASE PRESSURIZATION TEST THE LOWER LEE PLUG FAILED AT 3410 PSIG. THE PRESSURE REQUIREMENT IS 5000 PSIG. REF. TASK HISTORY LOG NO. 332-1-004 S/N 10003. CORRECTIVE ACTION-REWORK PART.							
HYDRAULIC-A/B BOOSTER	GDC/BKF65-039/B2-401-00-177	FLIGHT	177D 650603	8-2 2.3	NO NO		697320
FAILURE MODE-OUT OF TOLERANCE. BOOSTER HYD ACCUM. PRESS MEASUR. H33P AND HYD. PUMP OUTLET PRESS. MEASUR H3P INDICATED AN INITIAL NORMAL PRESS. RISE BUT TO A LOWER (3190 PSIA) THAN NORMAL (3500 PSIA) PEAK AT 2.3 SEC. THE PRESS. THEN DECAYED TO 2720 PSIA DURING NEXT 1.5 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 1.5 SEC. NO ADVERSE EFFECT NOTED ON SYSTEM PERFORMANCE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	SLV-99-10-278F HYDRAULIC HOSE ASSEMBLY	FAR 27-08371-61	90-01 650510	FACTORY	YES NO	AEROQUIP 660121-10-0266	696061
FAILURE MODE-LEAK-EXTERNAL-FAILURE OCCURRED DURING CHECKOUT WHEN LEAKAGE APPEARED PAST SOCKET AND FLEX PORTION OF THE HOSE. CORRECTIVE ACTION-GD/C PERSONNEL WERE CAUTIONED TO TAKE GREATER CARE WHEN INSTALLING HOSES AND TO PREVENT TOO SHARP A BEND RADIUS.							
HYDRAULIC-A/B BOOSTER	69A4416 HYDRAULIC PRESSURE SWITCH	UTP-PET 27-08343-1	650508	GD/C	YES NO	SERVONIC 2092-0901	
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME- DURING VIBRATION THE UNIT SWITCH FAILED TO CLOSE DURING ONE PRESSURE CYCLE AT 1100 CPS IN THE Y AXIS. THE REQUIRED PRESSURE CYCLES ARE 1875. REF. TASK HISTORY LOG NO. 332-1-007 S/N 410-0003. CORRECTIVE ACTION-ALL UNITS OF THE PET LOT SUBJECTED TO A MODIFIED VIBRATION TEST. 1000 TO 2000 CPS. UNITS PERFORME							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
D TO THE REQUIREMENTS OF THE SPECIFICATIONS. VENDOR IS TO PROVIDE A PRE-DETERMINED AMOUNT OF OVER TRAVEL FOR ALL ADD ITIONAL UNITS.							096934
HYDRAULIC-A/B BOOSTER	SLV-A9-04-5020-F ACTUATOR BOOSTER, FLOW LIMITER-O-R ING	FAR 27-08550-17	650500	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-17	096164
FAILURE MODE-LEAK EXTERNAL-S/N 206-3681, 206-3643, 206-3627, 206-1987 AND 206-1713 ASSEMBLIES WERE FOUND LEAKING HY DRAULIC OIL PAST THE FLOW-LIMITER PORT STATIC SEAT. THE PRIMARY CAUSE OF THE FAILURES WAS UNDERSIZED O-RING CROSS-SE CTION GIVING MINIMAL EFFECTIVE SQUEEZE. CORRECTIVE ACTION-VENDER CHANGE INCREASES O-RING SQUEEZE AND IS IN CONFORMANCE TO THE RECOMMENDATION OF SPECIFICATI ON MIL-P-5514-D. EOP 305.7M WAS REVISED ON 650710 TO INCORPORATE ADEQUATE STATIC AND DYNAMIC LEAK TEST.							
HYDRAULIC-A/B BOOSTER	69A3166.4 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	650428	CONVAIR	YES NO	SERVONIC 2092-0801	096733
FAILURE MODE-STRUCTURAL-DURING CASE PRESSURIZATION TEST THE UNITS RUPTURED AT 8200 PSIG. THE CASE SHOULD WITHSTAND 5000 PSIG. THE CASE PARTED AT THE FRONT FACE WELD. REF. TASK HISTORY LOG NO. 532-1-003 S/N 411-0005, 411-0010. CORRECTIVE ACTION-VENDOR HAS TAKEN CORRECTIVE ACTION TO PROVIDE THE PROPER WELDS ON PRODUCTION HARDWARE. QUALITY AS SURANCE WILL VERIFY THE INTEGRITY OF THE WELDS THRU THE PET PROGRAM.							
HYDRAULIC-A/B BOOSTER	GD/CZZH03-015-DA1047-/L4-TMO-01-71 07	COMPOSITE-FRD/DPL	7107 650419	2-4	YES NO		096804
FAILURE MODE-INTERNAL LEAK. ABNORMAL BOOSTER HYDRAULIC RETURN PRESSURE OBSERVED ON LANDLINE AND TELEMETRY DATA DURI NG COMMIT SEQUENCE. ABNORMAL DATA ATTRIBUTED TO POOR HYDRAULIC BLEED. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-HYDRAULIC FILL AND BLEED PERFORMED.							
HYDRAULIC-A/B BOOSTER	69A3166.4 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	650414		YES NO	SERVONIC 2092-0801	
FAILURE MODE-ERRATIC OPERATION-DURING VIBRATION THE UNITS CONTACTS OPENED AND CLOSED. REF. TASK HISTORY LOG NO. 532 -1-001 AND 532-1-002.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE-CONTINUED THE TEST.							000032
HYDRAULIC-A/B BOOSTER	LV-93-04-5027-F ACTUATOR ASSEMBLY-BOOSTER	FAR 27-08550-7	650413	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000141
FAILURE MODE-LEAK EXTERNAL-HYDRAULIC OIL WAS OBSERVED LEAKING PAST THE PISTON SHAFT SEALS. THE FAILURE REPORTED WAS NOT CONFIRMED. CORRECTIVE ACTION-THE OFFSITE LEAKAGE TOLERANCE WAS WIDENED FROM 1 TO 2 DROPS PER 24 HOURS, FROM EACH GLAND UNDER S TATIC PRESSURIZATION. FROM 1 DROP PER 25 CYCLE TO 1 DROP PER 10 CYCLES FROM EACH GLAND UNDER DYNAMIC CONDITIONS.							
HYDRAULIC-A/B BOOSTER	60/CZZH65-010DA-1042-L4-TNO-01-740 1	COMPOSITE-FRO/DPL	7401 650322	2-3	YES NO		000007
FAILURE MODE-INTERNAL LEAK. ABNORMAL PRESSURE DECREASES OBSERVED ON BOOSTER HYDRAULIC RETURN LANDLINE AND TELEMETRY MEASUREMENTS AT OIL EVACUATION. ABNORMAL DATA CAUSED BY POOR HYDRAULIC BLEED. SYSTEM EFFECT-ERRATIC OPERATIC. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-BOOSTER HYDRAULIC FILL AN.) BLEED PERFORMED.							
HYDRAULIC-A/B BOOSTER	60C-BKF65-016/B3-411-00-154 ACCUMULATOR	FLIGHT 27-08554-3	1540 650318	5763-3 0.	NO NO	PEACOCK 51310-3	007187
FAILURE MODE-ERRATIC OPERATION. B1 HYDRAULI: ACCUMULATOR PRESSURE INDICATED 200 PSI P-P OSCILLATIONS DUE TO LARGE B OOSTER ENGINE MOVEMENT AT LIFTOFF. SYSTEM EFFECT-NONE. ERRATIC OPERATIONS IN THE FORM OF HYDRAULIC OSCILLATIONS WERE QUICKLY DAMPENED. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	60C-BKF65-016/B3-401-154 BOOSTER ACTUATOR	FLIGHT 27-08550-7	1540 650318	5763-3 0.	YES NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-OUT OF TOLERANCE. A SMALL POSSIBLE MISALIGNMENT OF BOOSTER ENGINES ACTUATORS IN THE YAW PLANE. SYSTEM EFFECT-ERRATIC OPERATION. ROLL TRANSIENT AT LIFTOFF REACHED A PEAK RATE OF 8.0 DEG/SEC. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. AUTOPILOT CORRECTED AND DAMPED OUT THIS OSCILLATION AFTER AUTOPILOT ACTIV ATION AT 0.8 SECONDS.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.							001329
HYDRAULIC-A/B BOOSTER	27A4217 HYDRAULIC PUMP	UTP-PET 27-08566-1	650311	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097078
FAILURE MODE-STRUCTURAL. S/N 409-0425, MINOR CRACK DEVELOPED IN PUMP CASE NEAR MOUNTING FLANGE DURING Z AXIS (1 ST) VIBRATION SWEEP							
CORRECTIVE ACTION-DEPT 141-3 TO REJECT LOT 13 PUMPS. VENDOR TO INVESTIGATE PROBLEM.							
HYDRAULIC-A/B BOOSTER	69A4131.3 ACTUATOR-SERVO VALVE	UTP-PET 27-08550-15	650302	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097166
FAILURE MODE-OUT OF TOLERANCE-DURING 160 DEGREE FAHRENHEIT TEMPERATURE TEST PROOF CYCLE THE SERVO VALVE NULL CURREN T WAS MINUS 0.32 MA. REQUIREMENT PLUS OR MINUS 0.20 MA. A SMALL DENT ON ONE SIDE OF THE VALVE INDICATED POSSIBLE INT ERNAL DAMAGE. REF. TASK HISTORY LOG NUMBER 556-7-049 S/N 201-2619.							
CORRECTIVE ACTION-SINCE THIS UNIT WAS A PET SAMPLE IT WAS REJECTED AND SENT TO VENDOR FOR FAILURE ANALYSIS AND THE PETLOT WAS REJECTED.							
HYDRAULIC-A/B BOOSTER	27A4217 BOOSTER HYDRAULIC,PUMP	UTP-PET 27-08566-1	650302	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097077
FAILURE MODE-OUT OF SPECIFICATION. S/N 409-0445 EXCEEDED ALLOWABLE 4000 PSIG. FULL FLOW TO NO FLOW INTERVAL 0.060 (ALLOWABLE 0.050) SECONDS. S/N 409-0425 PUMP PERFORMED SIMILARILY ON 650303.							
HYDRAULIC-A/B BOOSTER	69A3166.4 HYDRAULIC PRESSURE SWITCH	UTP-DUAL/PPT 27-08543-1	650302	60/C	YES NO	SERVONIC 2092-0801	096931
FAILURE MODE-OUT OF TOLERANCE- THE UNIT EXCEEDED MIL-I-26600 SPECIFICATION REQUIREMENTS AT FIVE TEST FREQUENCIES IN A RADIATED INTERFERENCE TEST. REF. TASK HISTORY NO. 662-6-012 S/N 10073.							
CORRECTIVE ACTION-CONVAIR WILL REQUEST A SPECIFICATION DEVIATION FROM THE CUSTOMER.							

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18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SLV-89-04-5010-F ACTUATOR-BOOSTER ACTUATOR ASSY	FAR 27-08550-9	680226	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	006260

FAILURE MODE-OUT OF SPECIFICATION-PER EOP 308.7 THREE DISCREPANCIES WERE REPORTED-WHEN RUNNING THE PROOF PRESSURE T EST AT 4000 PSIG. THE ACTUATOR EXTENDED HARD OVER AND WOULD NOT RETRACT. ACTUATOR WOULD NOT RESPOND TO INPUT SIGNALS . SOME SAFETY WIRE ON THE SERVOVALVE WAS FOUND CUT. FAILURE CONFIRMED. HOWEVER IT SHOULD BE CONSIDERED AS INCORRECT DISPOSITION OF PREVIOUSLY KNOWN FAILED HARDWARE THAT SHOULD HAVE BEEN SCRAPPED OR REWORKED.

CORRECTIVE ACTION-MATERIAL REVIEW PROCEDURE WILL BE REVISED.

HYDRAULIC-A/B BOOSTER	27A3678 ACCUMULATOR	UTP-PET 27-08554-3	680224	FACTORY	YES NO	PEACOCK 51310-3J	006608

FAILURE MODE-STRUCTURAL-DURING LIFE PRESSURE IMPULSE TEST AT 124,400 CYCLES THE HYDRAULIC END OF THE CASE CRACKED A ND OPENED UP ABOUT 80 PERCENT IN THE AREA OF THE END CAP SNAP RING RETAINER GROOVE. REQ. WAS 140,000 CYCLES. REF. TA SK HISTORY LOG NO. 662-8-011 S/N 406-1169.

CORRECTIVE ACTION-A SURVEY OF ALL ACCUMULATORS IN PET LOT 31 AND 32 IS TO BE MADE AND THE SNAP RING IS TO BE INSPEC TED FOR CONFORMANCE TO BLUEPRINT.

HYDRAULIC-A/B BOOSTER	69A3820 ACTUATOR-SERVO VALVE	UTP-PET 27-08550-17	680223	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	007105

FAILURE MODE-OUT OF TOLERANCE. DURING THE POST HALF STROKE PROOF CYCLE THE SERVO VALVE NULL CURRENT WAS 1.1 MA. REQ UIREMENT CURRENT IS PLUS OR MINUS 0.20 MAXIMUM. THIS SHIFT WAS PROBABLY CAUSED BY A TORQUE MOTOR SHIFT. REF. TASK HI STORY LOG NUMBER 556-7-050 S/N 205-3003.

CORRECTIVE ACTION-TEST TERMINATED. ACCEPTED PET LOT THROUGH MRB ACTION WITH USAF CONCURRENCE (REF. IR W053930).

HYDRAULIC-A/B BOOSTER	1-4161.1 MANUAL FLOW LIMITER	UTP-PET 27-08568-3	680218	CONVAIR	YES NO	STERER ENGR 12690	006697

FAILURE MODE-OUT OF SPECIFICATION. S/N 410-1171 DURING LOW TEMPERATURE TEST RESPONSE, FLOW AND FLOW RATE WERE UNDER SPECIFICATION REQUIREMENTS. LEAKAGE NOTED FROM INLET PORT WITH 4000 PSI ON OUTLET PORT. THE UNIT HAD BEEN SUBJECTED TO EOP TEST AND IAT.

CORRECTIVE ACTION-AS VALVE HAS A NON-CRITICAL FUNCTION DURING FILL AND BLEED ONLY, NO ACTION BY GD/C IS NECESSARY. CONDITIONS DID NOT RECUR DURING FURTHER TESTING. THERE ARE NO INTERNAL LEAKAGE REQUIREMENTS IN THE SPECIFICATION.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4777 HYD BOOSTER ACTUATOR	UTP-PET 27-08550-15	650210	6D/C	YES YES	HYD RESEARCH 104700-15	090235
FAILURE MODE-LOCKING JAM NUT WAS NOT TORQUED TIGHT FOLLOWING INSTALLATION OF TRANSDUCER. THIS CAUSED ASSY TO TURN F REELY AND BREAK LOCKING PIN. THE SAME CONDITION, AS ABOVE, RE-OCCURRED ON THE SAME ASSY AFTER REASSEMBLY. AND CONTIN UATION OF TEST.							
HYDRAULIC-A/B BOOSTER	69A4131.2 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-17	650212	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	097097
FAILURE MODE-OUT OF TOLERANCE. DURING THE FLOW LIMITER VALVE TEST WITH FLUID HIGH TEMPERATURE, EXTEND TIME WAS 0.29 5 SECONDS AND THE RETRACT TIME WAS 0.298 SECONDS. REQ. TIME IS 0.252 TO 0.280 SECONDS. THE FLOW WAS 4.80 GPM. REQ. F LOW IS 3.94 TO 4.82 GPM. REF.TASK HISTORY LOG NO. 556-7-047 S/N 206-1949.							
CORRECTIVE ACTION-NONE. RECOMMENDED PET LOT BE ACCEPTED.							
HYDRAULIC-A/B BOOSTER	69A3820 ACTUATOR FLOW LIMITER VALVE	UTP-PET 27-08550-17	650212	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	097098
FAILURE MODE-OUT OF TOLERANCE. DURING THE FLOW LIMITER VALVE TEST IN TEMPERATURE SHOCK, THE EXTEND TIME WAS 0.250 S ECONDS AND THE RETRACT TIME WAS 0.248 SECONDS. REQ. TIME IS 0.252 TO 0.280 SECONDS. THE FLOW WAS 9.72 GPM. REQ. FLOW IS 8.6 TO 9.6 GPM. REF. TASK HISTORY LOG NO. 556-7-046 S/N 205-3693.							
CORRECTIVE ACTION-NONE. RECOMMENDED PET LOT BE ACCEPTED.							
HYDRAULIC-A/B BOOSTER	69A3820 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-17	650212	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	097099
FAILURE MODE-OUT OF TOLERANCE. DURING THE FLOW LIMITER VALVE TEST AT PLUS 180 DEGREE FAHRENHEIT BOTH THE EXTEND TIM E AND RETRACT TIME WERE 0.247 SECONDS. REQ. TIME IS 0.252 TO 0.280 SECONDS. THE FLOW WAS 9.72 GPM. REQ. FLOW IS 8.6 TO 9.6 GPM. REF. TASK HISTORY LOG NO. 556-7-045 S/N 205-3693.							
CORRECTIVE ACTION-NONE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A4131.2 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-17	650211	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	697040

FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL FLOW LIMITER TEST AT MINUS 30 DEGREE FAHRENHEIT THE EXTEND TIME WAS 0 .2 3 SECONDS AND THE RETRACT TIME WAS 0.293 SECONDS. REQ. TIME IS 0.252 TO 0.280 SECONDS. THE AVERAGE TIME FOR EXTEN D AND RETRACT WAS 0.430 SECONDS. REQ. TIME IS 0.498 TO 0.612 SECONDS. REF. TASK HISTORY LOG NO. 556-7-043 S/N 206-19 49.

CORRECTIVE ACTION-THE SPECIFICATION WAS CHANGED TO REFLECT A MORE REALISTIC PERFORMANCE OIL TEST TEMPERATURE OF PLU S 30 DEGREE FAHRENHEIT.

HYDRAULIC-A/B BOOSTER	69A4131.1 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-15	650211	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	697039

FAILURE MODE-OUT OF TOLERANCE. DURING LOW TEMPERATURE THE ACTUATOR WAS OUT OF TOLERANCE IN EXTEND AND RETRACT TIME AND WAS CAUSED BY THE FLOW LIMITER VALVE AND TIME REQUIRED IN SECONDS IS AS FOLLOWS. EXTEND REQ. RETRACT REQ. TEST 1 0.312 0.280-0.252 0.309 0.280-0.252 TEST 2 - - 0.378 0.416-0.766 REF. TASK HISTORY LOG NO. 556-7-041 S/N E03-3565.

CORRECTIVE ACTION-NONE. TESTING CONTINUED.

HYDRAULIC-A/B BOOSTER	69A3166.4 HYDRAULIC PRESSURE SWITCH	UTP-DUAL/PET 27-08543-1	650211	GD/C	YES NO	SERVONIC 2092-0801	000030

FAILURE MODE-ERRATIC OPERATION-DURING VIBRATION THE UNITS CONTACTS OPENED OR TRIED TO OPEN AT FREQUENCIES FROM 1060 TO 1750 CPS. THIS WAS CAUSED BY THE VIBRATION OF THE CONTACTS IN THE MICROSWITCH OR RESONANCE OF THE BOURDON TUBE. REF. REFER TO TASK HISTORY LOG 662-8-004, 662-8-005. AND 662-8-006-S/N 411-0007. 411-0010.

CORRECTIVE ACTION-RETURN UNITS TO VENDOR FOR REWORK. ALSO SEEK CUSTOMER APPROVAL FOR EXTENDED USE OF INTERIM PART 0 7-44900-624 (MFG. BOURNS).

HYDRAULIC-A/B BOOSTER	69A3020 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08550-17	650210	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	

FAILURE MODE-OUT OF TOLERANCE. DURING THE FLOW LIMITER VALVE TEST AT MINUS 30 DEGREE FAHRENHEIT THE EXTEND TIME WAS 0.281 SECONDS AND THE RETRACT TIME WAS 0.284 SECONDS. REQ. TIME IS 0.252 TO 0.280 SECONDS. THE FLOW WAS 0.50 GPM. R EQ. FLOW IS 0.6 TO 0.6 GPM. REF. TASK HISTORY LOG NO. 556-7-044 S/N E03-3603.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE. CONTINUE THE TEST.							097064
HYDRAULIC-A/B BOOSTER	69A4131.1 ACTUATOR-SERVO VALVE	UTP-PET 27-08550-15	650208	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-15	097197
FAILURE MODE-OUT OF TOLERANCE-AFTER THE FLUID HIGH TEMPERATURE TEST IT WAS FOUND THAT THE SERVO VALVE NULL CURRENT WAS PLUS 0.55 MA. REQUIREMENT PLUS OR MINUS 0.20 MA. THE OUT OF TOLERANCE CAUSED THE UNIT TO FAIL THE FLOW TESTS REP ORTED ON T.M. 556-7-041 REF. TASK HISTORY LOG NUMBER 556-7-042 S/N 203-3568.							
CORRECTIVE ACTION-SINCE THIS UNIT WAS A PET SAMPLE IT WAS REJECTED. RUN ONE UNIT FROM LOT AND RERUN PET TESTS. SECO ND UNIT FAILED AND LOT WAS REJECTED.							
HYDRAULIC-A/B BOOSTER	LV-9B-10-275-F HYDRAULIC FLEXHOSE	FAR 27-08571-65	1960 650129	ETR	YES NO	AEROQUIP 677025-8-0150	096700
FAILURE MODE-LEAK-EXTERNAL. HOSE WAS REJECTED BECAUSE OF REPORTED LEAKAGE.							
CORRECTIVE ACTION-UNKNOWN. FAILURE WAS NOT CONFIRMED. HYDRAULIC FLUID MAY HAVE DRIPPED ON HOSE FROM ANOTHER COMPONE NT.							
HYDRAULIC-A/B BOOSTER	SLV-9D-04-4993-F ACTUATOR-BOOSTER ACTUATOR O-RING	FAR 27-08550-7	7401 650129	MTR	YES NO	HYDRAULIC RESE ARCH 104700-1	096234
FAILURE MODE-LEAK EXTERNAL-LEAKAGE WAS REPORTED TO COME FROM THE SHAFT SEAL END OF THE ACTUATOR. REPORTED FAILURE N OT CONFIRMED.							
CORRECTIVE ACTION-NOT A CONFIRMED FAILURE. NO CORRECTIVE ACTION TAKEN.							
HYDRAULIC-A/B BOOSTER	69A4131-2 ACTUATOR-FLOW LIMITER VALVE	UTP-PET 27-08650-17	650128	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	097047
FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL SATISFACTORY PERFORMANCE TEST THE FEEDBACK TRANSDUCER RATED GAIN WAS 0.503 VOLTS/IN. REQ. IS 0.501 VOLTS/IN MAXIMUM. REF. TASK HISTORY LOG NO. 556-7-032 S/N 206-1949.							
CORRECTIVE ACTION-NONE-ERROR IN DATA CALL-OUT IN E.O.P. 305.7 FOR TRANSDUCERS. READJUST AND CONTINUE TESTING. RECOM MENDED PET LOT BE ACCEPTED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A1920.4 ACTUATOR-SPHERICAL BEARING.	UTP-SLT 27-08550-7	650121	60/C	YES NO	HYDRAULIC RESE ARCH 104700-1	000041

FAILURE MODE-STRUCTURAL-DURING A SLT-VIBRATION TEST THE SPHERICAL BEARING ASSEMBLY SLIPPED OUT OF THE FIXED END BRA CKET. THE FAILURE OCCURRED IN THE X AXIS VIBRATION AT 240 CPS AT ZERO DEGREES FAHRENHEIT. THIS FAILURE WAS CAUSED BY THE GALLED AND LOCKED SPHERICAL BEARING INDUCING A HIGH IMPACT LOADING ON THE ROLLED RETAINING EDGE OF THE BRACKET. STRAIGHTENING OUT WAS DUE TO VIBRATION. REF. TASK HISTORY LOG NO. 662-7-037.

CORRECTIVE ACTION-ALL FUTURE TESTS WILL BE PERFORMED WITH LUBRICATED BEARINGS. THEY WILL BE LUBRICATED IN THE SAME MANNER AS UNITS INSTALLED ON THE VEHICLE.

HYDRAULIC-A/B BOOSTER	69A1920.3 ACTUATOR-SPHERICAL BEARING	UTP-PRT 27-08550-7	650121	60/C	YES NO	HYDRAULIC RESE ARCH 104700-1	000040

FAILURE MODE-STRUCTURAL-DURING A PRT-VIBRATION TEST IN THE Y AXIS THE PISTON SHAFT DEVELOPED A RADIAL CRACK AT ROOM TEMPERATURE AT 110 CPS. THE GALLED AND LOCKED SPHERICAL BEARING INDUCED A HIGH IMPACT LOADING ON THE PISTON SHAFT W HICH CONCENTRATED A HIGH STRESS AT A STRESS RISER ORIGINATING AT THE COPPER BRAZE INTERFACE BETWEEN THE TRANSDUCER P ROBE SUPPORT AND THE I.D. OF THE HOLLOW PISTON ROD CAUSED THE FAILURE. REF. TASK HISTORY LOG NO. 662-7-039 S/N 205-3 668.

CORRECTIVE ACTION-ALL FUTURE TESTS WILL BE PERFORMED WITH LUBRICATED BEARINGS. THEY WILL BE LUBRICATED IN THE SAME MANNER AS UNITS INSTALLED ON THE VEHICLE. THE VENDOR WAS GIVEN ALL INFORMATION FOR HIS EVALUATION OF THE STRESS RISE R POINT.

HYDRAULIC-A/B BOOSTER	LV-A9-04-4968-F BOOSTER ACTUATOR ASSEMBLY,SERVOVAL VE	FAR 27-08550-7	2640 650116	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000250

FAILURE MODE-CONTAMINATION-THE BOOSTER ENGINE 2 PITCH SERVOCYLINDER NULL FEED BACK VOLTAGE REPORTEDLY WAS 0.32 VOLT . MAXIMUM ALLOWED IS 0.25 VOLT. FAILURE WAS CAUSED BY A PARTIALLY RESTRICTED C-1 PRESSURE DROPPING ORIFICE. THE ORIF ICE WAS PARTIALLY PLUGGED FROM THE UPSTREAM SIDE BY A METALLIC PARTICLE.

CORRECTIVE ACTION-HYDRAULIC RESEARCH REVIEWED PROCEDURES AND TECHNIQUES AND NO BETTER ASSEMBLY TECHNIQUE WAS FOUND. ASSEMBLY PERSONNEL AND THEIR SUPERVISORS WERE SHOWN A COPY OF THIS FAR AND REMINDED OF THE NEED FOR CLEANLINESS.

HYDRAULIC-A/B BOOSTER	LV-99-04-5011-F ACTUATOR	FAR 27-08590-17	650115	FACTORY	NO NO	HYDRAULIC RESE ARCH 104700-1?	

FAILURE MODE-OUT OF TOLERANCE-DYNAMIC NULL WAS OUT OF TOLERANCE. SERVOVALVE DID NOT FAIL. REPORTED FAILURE IS THE R ESULT OF A MALFUNCTION WITHIN THE REJECTING TEST SET.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE-SERVOVALVE DID NOT FAIL.							096269
HYDRAULIC-A/B BOOSTER	69A3820.1 ACTUATOR FEED BACK TRANSDUCER	UTP-PET 27-08550-17	650114	CONVAIR	YES NO	HYDRAULIC RESE ARCH 104700-17	097040
FAILURE MODE-OUT OF TOLERANCE. DURING TEMPERATURE TEST AT MINUS 50 DEGREE FAHRENHEIT THE FEEDBACK TRANSDUCER RATED GAIN WAS 6.19 VOLTS/INCH. REQ. RATED GAIN IS 6.08 VOLTS/INCH MAX. REF. TASK HISTORY LOG NO. 556-7-050 S/N 205-3695.							
CORRECTIVE ACTION-CONTINUE THE TEST. UNIT ACCEPTABLE.							
HYDRAULIC-A/B BOOSTER	GDA-APZ65-005/B1-402-00-166 BOOSTER ACTUATORS	FLIGHT 27-08550-7	1660 650112	B-1 0	YES NO	HYDRAULIC RESE ARCH 104700-1	094703
FAILURE MODE-OUT OF TOLERANCE. BOOSTER ENGINE YAW ACTUATOR LENGTHS POSSIBLY WERE OUT-OF-TOLERANCE CREATING A LARGE ROLL TRANSIENT AT LIFTOFF.							
SYSTEM EFFECT-ERRATIC OPERATION. THE VEHICLE ROLL TRANSIENT AT LIFTOFF WAS ONE OF THE LARGEST EXPERIENCED ON SERIES D MISSILES. THE CLOCKWISE TRANSIENT EXCEEDED THE 3 DEGREE DISPLACEMENT GYRO INSTRUMENTATION BANDWIDTH. PEAK RATE ALSO EXCEEDED RATE GYRO BANDWIDTH OF 7.8 DEG/SEC.							
VEHICLE EFFECT-NONE. TRANSIENT PROPERLY DAMPED WHEN THE AUTOPILOT SYSTEM WAS ACTIVATED AT 0.7 SEC.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	27A3977 HYDRAULIC PUMP, BOOSTER	UTP-PET 27-08566-1	650111	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097076
FAILURE MODE-STRUCTURAL. S/N 409-0430, EXCESSIVE LEAKAGE DURING FIRST AXIS VIBRATION SWEEP WAS NOTED AFTER 20 MIN. LEAKAGE DUE TO SMALL CRACK IN CASE.							
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-PET 27-08566-1	641229	CONVAIR	YES NO	VICKERS AA-60694-R-2A	
FAILURE MODE-OUT OF SPECIFICATION. S/N 409-0430. PEAK TRANSIENT PRESSURES WERE 4100 TO 4000 PSIG, ALLOWABLE IS 4000 PSIG. NO FLOW TO FULL FLOW TIME IS 0.187 SECONDS, ALLOWABLE TIME IS 0.08 SECONDS.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PAR/ NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-SUBMIT ECP 7669 TO REVISE TEST REQUIREMENTS TO PRACTICAL LEVELS.							007099
HYDRAULIC-A/B BOOSTER	69A3166.4 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-06543-1	2092-060 1 641229	60/C	YES NO	SERVONIC 2092-0601	006928
FAILURE MODE-STRUCTURAL-DURING Z AXIS VIBRATION SWEEP AT 330 CPS. THE SPOT WELDS WHICH HOLD THE UNIT CASE TO THE MOUNTING BLOCK BROKE ALLOWING THE CASE TO FALL FREE FROM THE MOUNTING BLOCK. REF. REFER TO TASK HISTORY LOG NO. 662-7-029 S/N 10078. CORRECTIVE ACTION-THE VENDOR IS TO IMPROVE THE METHOD OF ATTACHMENT OF MOUNTING BASE TO THE INSTRUMENT BODY, BY USING A INERT GAS WELD STITCHES AT THE ATTACHING POINT.							
HYDRAULIC-A/B BOOSTER	69A3166.4 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-06543-1	641229	60/C	YES NO	SERVONICS 2092-0601	006929
FAILURE MODE-ERRATIC OPERATION-DURING VIBRATION, PARTICULARLY IN THE Y AXIS AFTER THE UNITS HAD CLOSED NORMALLY, THEY OPENED UP AT RESONANT POINTS. THE CAUSE OF THE INDICATED OPEN WAS PROBABLY DUE TO THE MICROSWITCH CONTACT POINTS VIBRATING AT A HIGH FREQUENCY. REF. TASK HISTORY LOG NO. 662-7-036 S/N 10058. 10078. 10188. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	SLV-90-04-4961-F ACTUATOR-BOOSTER,O-RING	FAR 27-06550-7	7187 641229	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	006255
FAILURE MODE-LEAK EXTERNAL-LEAKAGE REPORTEDLY OCCURRED AT THE SHAFT ADJUSTMENT NUT, INDICATING LEAKAGE PAST THE FORWARD INNER PISTON-SHAFT SEAL. FORWARD PISTON SHAFT SEAL LEAKAGE IS ATTRIBUTED TO A SLIGHTLY NICKED FORWARD SEAL O-RING. CORRECTIVE ACTION-60/C INITIATED VENDOR QUALITY CONTROL CORRECTIVE ACTION, REQUESTING THE VENDOR IMPROVE QUALITY CONTROL TO PRECLUDE RECURRENCE OF THE FAILURE REPORTED.							
HYDRAULIC-A/B BOOSTER	69A31664 HYDRAULIC PRESSURE SWITCH/O-RING	UTP-QUAL/PPT 27-06543-1	641218	60/C	YES NO	SERVONIC 2092-0601	
FAILURE MODE-OUT OF TOLERANCE. DURING THE 72 HOUR 275 DEGREE SOIL IMMERSION TEST THE O-RING IN THE ELECTRICAL CONNECTOR BECAME SWOLLEN AND SPLIT IN THREE UNITS. REF. TASK HISTORY LOG NO. 662-7-028 S/N 10058,10078,10188.							

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CORRECTIVE ACTION-THE VENDOR WILL BE REQUIRED TO PROVIDE NEW O-RINGS OF SUITABLE MATERIAL. TO CHANGE THE DRAWINGS, AND TO RETROFIT ALL EXISTING UNITS.							096946
HYDRAULIC-A/B BOOSTER	69A1920.4 ACTUATOR SERVO VALVE	UTP-PRT 27-08550-7	641211	6D/C	YES NO	HYDRAULIC RESE ARCH 104700-1	096939
FAILURE MODE-OUT OF TOLERANCE- DURING INITIAL ACCEPTANCE TEST THE SERO VALVE COIL RESISTANCE FROM PIN A TO C WAS 21 49 OHMS. REQUIRED 2100 MAXIMUM. FROM PIN A TO B AND B TO C WAS 1074 AND 1079 OHMS RESPECTIVELY. REQUIRED 1050 MAXIMU M. REF. TASK HISTORY LOG NO. 556-7-014 S/N 210-3702.							
CORRECTIVE ACTION-THE ABOVE UNIT IS ACCEPTABLE DUE TO A SUBSEQUENT REVISION TO DESIGN SPECIFICATION WHICH INCREASED THE ALLOWABLE RESISTANCE.							
HYDRAULIC-A/B BOOSTER	69A1920.3 ACTUATOR-SERVO VALVE	UTP-PRT 27-08550-7	641204	6D/C	YES NO	HYDRAULIC RESE ARCH 104700-1	096938
FAILURE MODE-OUT OF TOLERANCE-DURING INITIAL ACCEPTANCE TEST THE SERVO COIL RESISTANCE FROM PIN A TO C WAS 2114 OHM S. REQUIRED 2100 MAX. FROM PIN A TO B WAS 1061 OHMS. REQUIRED 1050 MAX. REF. TASK HISTORY LOG NO. 556-7-013 S/N 205-3668.							
CORRECTIVE ACTION-THE ABOVE UNIT IS ACCEPTABLE DUE TO A SUBSEQUENT REVISION TO DESIGN SPECIFICATION WHICH INCREASED THE ALLOWABLE RESISTANCE.							
HYDRAULIC-A/B BOOSTER	E7A3966 YAW LINEAR POSITION TRANSDUCER	UTP-PET 27-04211-1	641202	6D/C	YES NO	CRESCENT HC-67P-4E	096794
FAILURE MODE-SHORT (ELECTRICAL). DURING PET 500 DEGREE F TEMPERATURE TEST, WHEN TEMPERATURE WAS DECREASED, VOLTAGE RETURNED TO NORMAL.							
CORRECTIVE ACTION-SPECIFICATION TO CHANGE 500 DEGREE F TEMPERATURE TEST REQUIREMENT, WHICH CAUSED SHORT CIRCUIT.							
HYDRAULIC-A/B BOOSTER	SLV-90-10-273F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	7106 641127	WTR	YES NO	PEACOCK ENG. 51310-3	
FAILURE MODE-LEAK-INTERNAL ACCUMULATOR WAS FOUND LEAKING GN2 INTO HYDRAULIC SYSTEM BECAUSE OF SUB-STANDARD O-RING I NSTALLATION.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR WAS NOTIFIED REGARDING POOR O-RING INSTALLATION.							090702
HYDRAULIC-A/B BOOSTER	SLV-90-10-273F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	7104 641127	WTR	YES NO	PEACOCK ENG. 51310-3	090703
FAILURE MODE-LEAK-INTERNAL ACCUMULATOR WAS FOUND LEAKING GAS INTO HYDRAULIC SYSTEM BECAUSE OF SUB STANDARD O-RING INSTALLATION.							
CORRECTIVE ACTION-VENDOR WAS NOTIFIED REGARDING POOR O-RING INSTALLATION.							
HYDRAULIC-A/B BOOSTER	SLV-90-10-273F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	7104 641124	WTR	YES NO	PEACOCK ENG. 51310-3	090171
FAILURE MODE-LEAK INTERNAL-ACCUMULATOR WAS FOUND LEAKING GAS INTO HYDRAULIC SYSTEM BECAUSE OF SUB STANDARD O-RING INSTALLATION.							
CORRECTIVE ACTION-VENDOR WAS NOTIFIED REGARDING POOR O-RING INSTALLATION.							
HYDRAULIC-A/B BOOSTER	SLV-A9-10-271F PNEUMATIC PRESSURE GAGE	FAR 27-08562-3	71-13 641123	FACTORY	YES NO	AMERICAN STD P ROD. 0903-719-1	090172
FAILURE MODE-OUT OF TOLERANCE. GAGE READ 300 PSI LOW-CHARACTERISTICS OF BOURDON TUBE WERE LOW. OUT OF CALIBRATION.							
CORRECTIVE ACTION-CONTRACTOR ADVISED PERSONNEL ON CALIBRATION PRACTICES AND REQUIREMENTS.							
HYDRAULIC-A/B BOOSTER	SLV-90-04-4958F BOOSTER ACTUATOR ASSEMBLY,SERVOVALVE	FAR 27-08550-7	7105 641117	2-4	YES NO	HYDRAULIC RESE ARCH 104700-1	090750
FAILURE MODE-OUT OF TOLERANCE. EXCESSIVE OVERSHOOT IN RESPONSE TO NEGATIVE CONTROL SIGNALS. THIS INSTABILITY WAS CAUSED BY THE GEOMETRY OF THE SERVOVALVE TORQUE MOTOR POLE PIECES. LOWER POLE PIECES HAD LARGE GAPS AND UPPER POLE PIECES HAD VERY SMALL AIR GAPS (0.010 INCH). THIS RESULTED FROM USE OF A PERMANENT MAGNET WITH LOW FIELD STRENGTH. THE MAGNET COULD NOT BE CHARGED SUFFICIENTLY TO MEET VENDORS REQUIREMENT.							
CORRECTIVE ACTION-HYDRAULIC RESEARCH ANSWER TO VCAR 7E06-65 AND TO RAR SLV-90-04-0015 SAID EFFECTIVE IMMEDIATELY CLOSER SURVEILLANCE WILL BE PROVIDED DURING MANUFACTURE TO ASSURE PROPER POLE PIECE SPACING. ALSO, ALL MAGNETS ARE INSPECTED FOR A MINIMUM FIELD STRENGTH OF 900 GAUSS AFTER FABRICATION.							

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HYDRAULIC-A/B BOOSTER	A1-4HO-03-210	COMPOSITE-FRD/DPL	2100 641106	A-1	NO NO		007159
FAILURE MODE-LEAK-EXTERNAL. HIGH PRESSURE HYDRAULIC LINE CRACKED AND LEAKING EXTERNAL TO THE 68E BOOSTER HPU. SYSTEM EFFECT-ERRATIC OPERATION. ABNORMAL PRESSURE DATA OBSERVED. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-68E LINE REPLACED.							
HYDRAULIC-A/B BOOSTER	SLV-99-10-270F ABSOLUTE PRESSURE SWITCH	FAR 87-44900-024	71-11 641109	FACTORY	NO NO	BOURNS 2007171301	006173
FAILURE MODE-OUT OF TOLERANCE. SWITCH WAS FOUND SATISFACTORY, AND FAILURE WAS TRACED TO A FAULTY HYDRAULIC TEST KIT. CORRECTIVE ACTION-NOT CONFIRMED. FAULTY TEST EQUIPMENT WAS DISPOSITIONED FOR REPAIR.							
HYDRAULIC-A/B BOOSTER	27A3650 ACTUATOR-CLAMP	UTP-PET 27-08550-9	641031	60/C	YES NO	HYDRAULIC RESE ARCH 104700-9	006023
FAILURE MODE-STRUCTURAL-DURING THE CLAMP TEST AFTER 600 CYCLES THE CLAMP PULLED OUT OF THE ACTUATOR. THE THREADS IN THE ACTUATOR FAILED. REF FRR NR F5153 WT S/N 402-2741. CORRECTIVE ACTION-NONE-PET LOTS ACCEPTED.							
HYDRAULIC-A/B BOOSTER	FTA6500/P3-4C0-04-200 ACCUMULATOR	COMPOSITE-J FACT 27-08554-3	2090 641029	13	YES NO	PEACOCK 51310-3	007002
FAILURE MODE-ERRATIC OPERATION. MEASUREMENT H601P SUSTAINER HYDRAULIC RETURN PRESSURE INDICATED UNUSUALLY LARGE OSC ILLATIONS WHEN DEMAND WAS PLACED ON THE SYSTEM. THIS PROBLEM CAUSED BY THE AIRBORNE ACCUMULATOR BEING FILLED WITH FL UID THUS NOT ACTING AS A SURGE CHAMBER. THE ACCUMULATOR WAS FILLED IN THE HYDRAULIC FILL AND BLEED PROCEDURE WHICH I S NOT NORMALLY RUN UNTIL AFTER THE FAC TEST. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							

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HYDRAULIC-A/B BOOSTER	27A5470 PRESSURE GAGE	UTP-PET 27-08562-3	641026	CONVAIR	YES NO	AMERICAN STANDARD 6903-719-1	000005
FAILURE MODE-OUT-OF-TOLERANCE DURING PET. NUMEROUS FAILURES DURING POST-VIBRATION PROOF CYCLE, IMMERSION TEST, HIGH TEMPERATURE AND HUMIDITY PROOF CYCLE ON S/N 408-1746, 408-1760, 408-1799, 408-1847, 110-1354, 110-1361, AND 408-1840.							
CORRECTIVE ACTION-QUALITY ASSURANCE HAS REQUESTED ALL UNITS IN O&P STORES AND RECEIVING INSPECTION BE REJECTED.							
HYDRAULIC-A/B BOOSTER	LV-90-10-297F BOOSTER ACCUMULATOR	FAR 27-08554-3	3530 641022	WTR	YES NO	PEACOCK 51310-3	000170
FAILURE MODE-LEAK-EXTERNAL, DUE TO CONTAMINATION RESULTING FROM POOR CADMIUM PLATING ON ACCUMULATOR BOSS.							
CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO NOTIFY PERSONNEL TO INSPECT FOR CONTAMINATION AND IMPROVE CADMIUM PLATING METHODS.							
HYDRAULIC-A/B BOOSTER	SLV-99-10-264C PRESSURE GAGE	FAR 27-08562-3	641014	FACTORY	YES NO	ROCHESTER 6903-719-1	000466
FAILURE MODE-INTERNAL LEAK FOUND DURING CHECKOUT.							
CORRECTIVE ACTION-VENDOR CORRECTIVE ACTION WAS INITIATED TO PREVENT LEAKAGE CAUSED BY SUBSTANDARD BRAZEMENTS.							
HYDRAULIC-A/B BOOSTER	GO/A A6U63-001-22/FC-CO-01-0502-00 8 ACTUATOR ASSEMBLY	COMPOSITE-FACTORY 27-08550-7	1740 641008	FACTORY	NO NO	HYDRAULIC RESEARCH 104700-1	000411
FAILURE MODE-ERRATIC OPERATION-BOOSTER NO. 2 YAW/ROLL FEEDBACK TRANSDUCER OUTPUT WAS INTERMITTENT ON DIRECT LINE RECORDING. THE DISCREPANCY WAS ATTRIBUTED TO FAULTY AGE SWITCHING RELAYS.							
SYSTEM EFFECT-ERRATIC OPERATION.							
VEHICLE EFFECT-COMPOSITE DELAYED. POST COMPOSITE TESTING REQUIRED.							
CORRECTIVE ACTION-REPLACED FAULTY AGE SWITCHING RELAY.							

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HYDRAULIC-A/B BOOSTER	LV-99-10-265F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-7	2900 641004	FACTORY	YES NO	PEACOCK 51310-3	091123

FAILURE MODE-LEAK-INTERNAL. PNEUMATIC PRECHARGE PRESSURE DROPPED IN TWO ACCUMULATORS(2 UNITS).

CORRECTIVE ACTION-FAILURE NOT CONFIRMED-GD/C ADVISED PERSONNEL TO RECHECK SYSTEM TO VERIFY LEAKS. VENDOR TO USE BETTER QUALITY O-RINGS.

HYDRAULIC-A/B BOOSTER	SLV-A9-04-4923F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-7	7107 641004	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	091537

FAILURE MODE-OUT OF TOLERANCE. NULL SHIFT ACTIVE AND INACTIVE NULL READINGS WERE 0.208 AND 0.209 M.V.. THE TOLERANCE IS 0.250 AND 0.200 MV FOR ACTIVE AND INACTIVE NULL. FAILURE CAUSED BY A DIFFERENCE IN SERVOVALVE NULL REACTION TO CONTROL SIGNALS FROM THE IOC AND AIG-TYPE SERVOAMPLIFIERS. ANOTHER DISCREPANCY FOUND WAS A CLOSED CRACK IN THE PERMANENT MAGNET.

CORRECTIVE ACTION-ON 640818 GD/A CHANGED I.A.T. DATA SHEET USED BY VENDOR REQUIRING A NULL VALVE USING AN A.I.G. TYPE SERVOAMPLIFIER BE LESS THAN 0.20 M.A. PER VCAR 7137-64 IN ANSWER TO RAR SLV-A9-04-8003 VENDOR REVIEWED PROCEDURES FOR ASSY. AND INSPECTION OF MAGNET ASSEMBLIES. MAGNETS ARE INSPECTED FOR CRACKS, VOIDS AND HOLES AFTER FABRICATION GD/A EOP PROCEDURES WERE UPDATED TO REQUIRE NULL CHECKS WITH BOTH AMPLIFIERS.

HYDRAULIC-A/B BOOSTER	SLV-A9-04-4924F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-7	7107 641004	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	091539

FAILURE MODE-OUT OF TOLERANCE. NULL SHIFT. ACTIVE AND INACTIVE NULL VALUES WERE 0.350 AND 0.355 VOLT RESPECTIVELY. THE TOLERANCE IS 0.250 AND 0.200 VOLT. CAUSED BY MOVEMENT AFTER BUILDUP AND ACCEPTANCE OF THE SERVOVALVE MOTOR RING MAGNET AND UPPER POLE PIECES.

CORRECTIVE ACTION-PER RAR SLV-A9-04-8007 A DETAILED CHECK ASSURED THAT BOOSTER SERVOCYLINDER ASSEMBLIES ARE HANDLED PROPERLY BY STORAGE, PACKAGING AND ASSY. LINE PERSONNEL. PER VCAR 7178-65 AND RAR SLV-A9-04-8008, THE VENDOR WAS INFORMED OF THE CONTAMINANTS FOUND IN TORQUE MOTOR. PER AN A.F.O. DATED 650211 IN ANSWER TO RAR SLV-A9-04-8012. DESIGN PERSONNEL STATED THAT SINCE VENDOR CONTAMINATION HAS BEEN RESOLVED; NO FURTHER ACTION IS WARRANTED.

HYDRAULIC-A/B BOOSTER	SLV-A9-10-269F HYDRAULIC PUMP/SEAL	FAR 27-08586-1	7108 641003	FACTORY	YES NO	VICKERS AA-60694-R-EA	

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

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CORRECTIVE ACTION-VENDOR REVIEWED STOCK OF O-RINGS AND INFORMED THEIR PERSONNEL OF CORRECT SEAL INSTALLATION PROCEDURES.							000174
HYDRAULIC-A/B BOOSTER	LV-A9-04-4906F ACTUATOR ASSEMBLY	FAR 27-08550-7	1960 640928	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	001219
FAILURE MODE-ERRATIC OPERATION. ACTIVE NULL FEEDBACK VOLTAGE FLUCTUATED 20 MV WITH BOOSTER IN NULL POSITION CAUSE NOT DETERMINED. E.O.P. REQUIREMENTS WERE MET. A LARGE INCREASE IN THRESHOLD AND PHASE LAG OCCURRED WITH CONTROL SIGNALS FROM AN A16 OR MODIFIED A16 SERVO AMPLIFIER. MAGNETIC METALLIC PARTICLES WERE FOUND IN THE SERVO VALVE TORQUE MOTOR. VENDOR ACTION FOR INCREASED CLEANLINESS WAS EFFECTIVE AFTER ASSEMBLY OF THIS UNIT.							
CORRECTIVE ACTION-PER RAR LV-A9-04-3969 DATED 641021 DESIGN PERSONNEL WERE REQUESTED TO STUDY THE NULL BEHAVIOR AND IF FOUND TO BE NORMAL, THEN APPROPRIATE INSTRUCTIONS SHOULD BE ISSUED TO CEASE THIS TYPE OF REJECTION. PER RAR LV-A9-08-3970 DATED 641021 60/C NOTIFIED HYDRAULIC RESEARCH OF THE METALLIC CONTAMINANT PARTICLES. MEMO 556-70-350 DATED 641110 REQUESTED THAT DESIGN AND/OR FUNCTIONAL TEST INTEGRATION PERSONNEL BE CONSULTED BEFORE REJECTING SERVO CYLINDER ASSEMBLIES FOR ANOMALIES ALLOWABLE TOLERANCES.							
HYDRAULIC-A/B BOOSTER	SLV-99-04-4913F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-7	5301 640914	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	003624
FAILURE MODE-EXTERNAL LEAKAGE. LEAKAGE OBSERVED AT THE THREADED PISTON SUPPORT WITH HYDRAULIC SYSTEM PRESSURE AT 3000 PSIG. LEAK RATE NOT DETERMINED. CAUSE UNKNOWN. THE TEFLON WIPER WAS DAMAGED AT ASSEMBLY.							
CORRECTIVE ACTION-FAILURE UNCONFIRMED. A MEETING HELD AT 60/A ON 640708 DECIDED THAT A SURVEY WOULD NOT BE REQUESTED. PER DESIGN MEMO 662-10-13 DATED 640728. THE LEAK TOLERANCE FOR SERVO ASSEMBLIES WAS WIDENED FROM ONE DROP PER 25 TO ONE DROP PER 10 CYCLES AT DYNAMIC CONDITIONS, PER 6LAND. MEMO ALSO RECOMMENDS ANY SUSPECT ASSY BE ACTUATED 100 CYCLES AT 1/2 CPS BEFORE REJECTION, USING LEAKAGE DURING LAST 70 CYCLES AS CRITERIA FOR DYNAMIC LEAKAGE REJECTION. THIS IS APPLICABLE TO SITES ONLY. PER RAR SLV-99-04-3976 DATED 641029. 60/C INITIATED DESIGN CORRECTIVE ACTION RECOMMENDING LEAKAGE CRITERIA BE SPECIFIED FOR FACTORY SIMILAR TO MEMO 662-10-13.							
HYDRAULIC-A/B BOOSTER	SLV-99-10-261-C PRESSURE GAGE	FAR 27-08562-3	5B-01 640908	FACTORY	YES NO	ROCHESTER 8903-718-1	000400
FAILURE MODE-LEAK INTERNAL, PRESSURE GAGE WAS FOUND TO BE LEAKING INTERNALLY DURING A CHECKOUT.							
CORRECTIVE ACTION-VENDOR CORRECTIVE ACTION WAS INITIATED TO PREVENT LEAKAGE CAUSED BY SUBSTANDARD BRAZEMENTS.							

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HYDRAULIC-A/B BOOSTER	SLV-99-04-4900-F BOOSTER ACTUATOR ASSEMBLY O-RING	FAR 27-08550-7	71-08 640901	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	091525

FAILURE MODE-EXTERNAL LEAKAGE. HYDRAULIC FLUID LEAK AT LENGTH ADJUSTMENT NUT. OIL HAD LEAKED PAST THE MS28775-219 DYNAMIC O-RING IN THE HOUSING. AS THE O-RING SOFTENED AND SWELLED, ITS LOW PRESSURE SIDE EXTRUDED INTO THE BIAS CUT OF THE TEFLON SPIRAL BACKUP RING AND WAS NICKED. THE NICKS ALLOWED LEAKAGE.

CORRECTIVE ACTION-PER RAR SLV-99-04-8000 DATED 641206; GD/A RECOMMENDED THAT VENDOR ASSURE GLAND DIMENSIONS MEET REQUIREMENTS AND THAT VENDOR RUN VOLUME SWELL TESTS OF SAMPLE O-RINGS IN HYDRAULIC FLUID.

HYDRAULIC-A/B BOOSTER	27A3650 ACTUATOR,SERVOVALVE	UTP-PET 27-08550-9	640825	GD/C	YES NO	HYDRAULIC RESE ARCH 104700-9	097010

FAILURE MODE-OUT OF TOLERANCE. DURING FLUID TEMPERATURE TESTS THE SERVO VALVE COIL RESISTANCE WAS OUT OF TOLERANCE AS FOLLOWS. LOW TEMP. RESISTANCE WAS 2160 OHMS. REQ. 2100 MAX. HIGH TEMP. RESISTANCE WAS 2124 OHMS. REF. FPR NO. F5153WT S/N 402-2741.

CORRECTIVE ACTION-REVISE VENDOR AND CONVAIR IAT VALUES TO BE COMPATIBLE WITH SPECIFICATION VALUES. ALSO PROVIDE NEW VALUES FOR SPECIFIC ENVIRONMENTS IN IAT. NO REJECTION OF LOT. REF. FRR FR654-2-383

HYDRAULIC-A/B BOOSTER	27A3650 BOOSTER SERVO CYLINDER-FLOW LIMITER VALVE	UTP-PET 27-08550-9	640825	GD/C	YES NO	HYDRAULIC RESE ARCH 104700-9	096910

FAILURE MODE-OUT OF TOLERANCE-DURING FLUID TEMPERATURE TESTS THE FLOW LIMITER FLOW RATE WAS 0.16 GPM. REQUIRED IS 0.60 GPM MINIMUM. REF. FOR NO. F5153WT S/N 402-2741.

CORRECTIVE ACTION-REVISE VENDOR AND CONVAIR IAT VALUES COMPATIBLE WITH SPECIFICATION VALUES. ALSO PROVIDE NEW VALVE B FOR SPECIFIC ENVIRONMENTS IN IAT. PET LOT ACCEPTED REF. FRR FR 654-2-383A.

HYDRAULIC-A/B BOOSTER	27A3650 ACTUATOR-FEEDBACK TRANSDUCER	UTP-PET 27-08550-9	640825	GD/C	YES NO	HYDRAULIC RESE ARCH 104700-9	096922

FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE-DURING FLUID TEMPERATURE TEST THE FEEDBACK TRANSDUCER NULL VOLTAGE WAS 54 MV. DURING HIGH FLUID TEMPERATURE TEST THE NULL VOLTAGE WAS 64 MV. REQ. IS 50 MV. MAXIMUM REF. FPR NO. F5153WT S/N 402-2741.

CORRECTIVE ACTION-REVISE VENDOR AND CONVAIR IAT VALUES COMPATIBLE WITH SPECIFICATION VALUES. ALSO PROVIDE NEW VALVE B FOR SPECIFIC ENVIRONMENTS IN IAT. PET LOT ACCEPTED REF FRR FR654-2-383A.

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HYDRAULIC-A/B BOOSTER	SLV-99-10-262F RELIEF VALVE	FAR 27-08570-1	93-01 640817	FACTORY	YES NO	VINSON A-80133-1	000110
FAILURE MODE-LEAK INTERNAL-VALVE ALLOWED PRECHARGE OF HYDRAULIC RESERVOIR TO DECAY.(2 UNITS).							
CORRECTIVE ACTION-NONE-LEAKAGE RATE WAS WITHIN SPECIFICATION REQUIREMENTS.							
HYDRAULIC-A/B BOOSTER	A-99-04-4894-F ACTUATOR O RING	FAR 27-08550-9	119F 640817	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	000050
FAILURE MODE-LEAK, EXTERNAL. BOOSTER 2 YAW SERVOCYLINDER ASSEMBLY HAD HYDRAULIC LEAKAGE FROM THE THREADED PLUG ON B ASE OF ACTUATOR PRESSURE PORT. WHEN ACTUATOR WAS PRESSURIZED TO 100 PSIG, THE LEAKAGE RATE WAS 1 CC/MIN. THE LEAKAGE PATH WAS THROUGH A BREAK IN THE INSIDE DIAMETER OF THE O-RING. FAILURE WAS CAUSED BY AN INTERNAL FLAW IN THE O-RING AGGRAVATED BY A 20 PERCENT O-RING STRETCH IMPOSED BY THE PLUG DIMENSIONS.							
CORRECTIVE ACTION-AS THIS IS FIRST INSTANCE OF A CRACKED O-RING AT THIS PLUG AND SINCE A FLAW EXISTED IN THE O-RING , NO DESIGN CORRECTIVE ACTION WILL BE SOUGHT TO REDUCE THE GLAND DIAMETER. VENDOR QUALITY CONTROL CORRECTIVE ACTION WAS EITHER CONCURRENTLY OR SUBSEQUENT INITIATED TO PREVENT INSTALLATION OF SUB-STANDARD O-RINGS.							
HYDRAULIC-A/B BOOSTER	27A3470 PRESSURE GAGE	UTP-PET 27-08562-3	640814	CONVAIR	YES NO	AMERICAN STAND ARD 6903-719-1	000004
FAILURE MODE-LEAK-DURING PET IMMERSION TEST, TEST SPECIMEN S/N 409-1740, 409-1799, 110-1894 WERE ABOUT ONE-THIRD FU LL OF WATER. SIMILAR FAILURES OCCURRED ON 64/8/25 TO S/N 409-1840, 409-1760, AND 409-1847. REFER TO FRR 377. LEAK DO ES NOT EFFECT FUNCTIONING OF UNIT.							
CORRECTIVE ACTION-QUALITY ASSURANCE HAS REQUESTED ALL UNITS IN OSP STORES AND RECEIVING INSPECTION BE REJECTED.							
HYDRAULIC-A/B BOOSTER	SLV-99-10-262F RELIEF VALVE	FAR 27-08570-1	71-07 640818	FACTORY	YES NO	VINSON A-80133-1	000120
FAILURE MODE - LEAK INTERNAL. VALVE ALLOWED PRECHARGE OF HYDRAULIC TANK TO DECAY.							
CORRECTIVE ACTION-NONE-LEAKAGE RATE WAS WITHIN SPECIFICATION REQUIREMENTS.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	27A3470 PRESSURE GAGE	UTP-PET 27-08562-3	640812	CONVAIR	YES NO	AMERICAN STAND ARD 0903-719-1	396903

FAILURE MODE-OUT OF TOLERANCE. DURING PET POST VIBRATION PROOF CYCLE; THE SCALE ERROR WAS GREATER THAN SPECIFICATIO N ALLOWANCE OF 100 PSIG. AT 2500 PSIG TEST SPECIMEN S/N 408-1740 READ 2650 PSIG.

CORRECTIVE ACTION-QUALITY ASSURANCE HAS REQUESTED ALL UNITS IN OSP STORES AND RECEIVING INSPECTION BE REJECTED.

HYDRAULIC-A/B BOOSTER	GDA-APZ64-052/E1-603-00-110	FLIGHT	110F 640807	5776 -1.5	YES NO		997134

FAILURE MODE-OUT OF TOLERANCE. ABNORMAL BOOSTER HYDRAULIC SYSTEM PRESSURES OCCURRED FROM ENGINE IGNITION TO APPROXI MATELY 12 SECONDS. NORMAL PRESSURE RISE TO 2700 PSI, THEN GRADUAL TO 2800 PSI OVER PERIOD OF 7 SECONDS, THEN INCREAS ED TO NORMAL 3030 PSI DURING NEXT 1.5 SECONDS. DIP IN RETURN PRESSURE FOR 5 SECONDS BEFORE RETURNING TO NORMAL.

SYSTEM EFFECT-NONE. AFTER 12 SECONDS HYDRAULIC PRESSURES INDICATED EXPECTED LEVELS THROUGHOUT THE REMAINDER OF THE FLIGHT. SYSTEM OPERATION WAS SATISFACTORY THROUGHOUT FLIGHT.

VEHICLE EFFECT-NONE. NO DETRIMENTAL VEHICLE EFFECTS RESULTED FROM THE ABNORMAL HYDRAULIC SYSTEM PRESSURES.

CORRECTIVE ACTION-NONE. THE CAUSE OF THE ABNORMAL PRESSURES WAS NOT DETERMINED.

HYDRAULIC-A/B BOOSTER	LV-99-04-4827-F BOOSTER ACTUATOR ASSY.	FAR 27-08550-7	640729	FACTORY	YES	HYDRAULIC RESE ARCH 104700-1	095551

FAILURE MODE-FAILED DURING OPERATION-THE ACTUATOR OFFERED INTERMITTENT RESISTANCE TO HAND MOVEMENT OF THE BOOSTER E NGINE DUE TO TIGHT MOUNTING CLEVIS BEARING. EXCESSIVELY HIGH CONTAMINATION LEVEL IN THE 20-50 MICRON AND 100-500 MIC RON SIZE PARTICAL AREAS WAS FOUND BUT NO CONTAMINATION SOURCES LOCATED. HYDRAULIC OIL LEAKAGE WAS EVIDENT PAST THE M ACHINING PORT PLUG AFT OF INLET PRESSURE PORT DUE TO INCORRECT APPLICATION OF PLASTIC THREAD LOCK PERMITTING THE PLU G TO LOOSEN AND BACK OUT.

CORRECTIVE ACTION-GD/C INITIATED VENDOR CORRECTIVE ACTION CONCERNING PORT PLUG LEAKAGE, RECOMMENDING VENDOR IMPROVE ASSEMBLY PROCEDURE TO ASSURE CORRECT INSTALLATION AND LOCKING OF THE PLUG. REF RELIABILITY REPORT LV-99-04-3946 OF AUG 5 1964 NO MEANINGFUL CORRECTIVE ACTION WAS POSSIBLE REGARDING RUB MARKS ON PISTON AND GLAND AS FUNCTION OF PART WAS NOT DETRIMENTALLY AFFECTED VENDOR CONFIRMED CORRECTIVE ACTION RECOMMENDATION SEPT 10, 1964.

HYDRAULIC-A/B BOOSTER	89A1910.5 HYDRAULIC PUMP	UTP-SLT 27-08566-1	640727	CONVAIR	YES NO	VICKERS AA-8094-R-2A	

FAILURE MODE-OUT OF SPECIFICATION. S/N 205-0666. FAILED TO MEET TRANSIENT PRESSURE MAX ALLOWABLE 4000 PSIG LIMIT. T RANSIENTS WERE 4369,4162,4275 AND 4407 PSIG. SPECIMEN EXCEEDED REGULATED FULL FLOW TO NO FLOW LIMIT OF 0.03 SEC. TIM E WAS 0.94 SECONDS.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							897894

CORRECTIVE ACTION-DEPT 694-0 TO SUBMIT ECP 7669 TO REVISE TEST LEVELS.

HYDRAULIC-A/B BOOSTER	27A3470 GAGE-PRESSURE	UTP-PET 27-08562-3	640724	CONVAIR	YES NO	AMERICAN STAND ARD 6903-719-1	896699

FAILURE MODE-OUT OF TOLERANCE AT THE CONCLUSSION OF PET-TEMPERATURE-ALTITUDE-HUMIDITY, GAGE READ 190 PSIG AT ZERO R EFERENCE GAGE PRESSURE. (MAXIMUM SPECIFICATION IS 100 PSIG). SIMILAR FAILURE ON 64/7/20,GAGE READ 2/25 PSIG AT 2000 PSIG REFERENCE. LOT 22. TEST SPECIMENS S/N 405-1799 AND 110-1354. REFER TO FRR 333.

CORRECTIVE ACTION-QUALITY CONTROL TO CONTACT VENDOR AND INFORM HIM OF PROBLEM. THIS IS FIRST PET TEST SINCE 1960, W HEN SIMILAR PROBLEMS EXISTED.

HYDRAULIC-A/B BOOSTER	SLV-99-10-260-F HOSE ASSEMBLY	FAR 27-08571-61	71-07 640721	FACTORY	YES NO	AEROQUIP 660121-16-0266	896470

FAILURE MODE-LEAK EXTERNAL. HOSE ASSEMBLY WAS REJECTED BECAUSE OF REPORTED LEAKAGE.

CORRECTIVE ACTION-UNKNOWN. FAILURE WAS NOT CONFIRMED. HYDRAULIC FLUID MAY HAVE DRIPPED ON HOSE FROM SOME OTHER COMP ONENT.

HYDRAULIC-A/B BOOSTER	LV-JA-04-4823F ACTUATOR,TRANSDUCER-FEEDBACK	FAR	640716	FACTORY	YES NO	CRESCENT ENGR HC-44PH-4E	896877

FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. THE THREADS ON THE PROBE WERE DAMAGED. THE FAILURE WAS ATTRIBUTED T O OVER TORQUING OF THE LOCKNUT DURING INSTALLATION IN THE ACTUATOR.

CORRECTIVE ACTION-HYDRAULIC RESEARCH ESTABLISHED A TORQUE VALUE OF 20 PLUS OR MINUS 2 POUND INCHES FOR THE LOCKNUT WHEN INSTALLING THE TRANSDUCER IN THEIR ACTUATOR.

HYDRAULIC-A/B BOOSTER	SLV-90-10-239-F BOOSTER HYDRAULIC PUMP/SEAL	FAR 27-08366-1	0071-01 640709	WTR	NO YES	VICKERS AA-60694-R-2A	

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

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NO CORRECTIVE ACTION RECOMMENDED SINCE DAMAGE OCCURRED DUE TO INADVERTENT OVERPRESSURIZATION OF T HE PUMP.							098460
HYDRAULIC-A/B BOOSTER	SLV-9D-04-4871-F ACTUATOR ASSEMBLY-BOOSTER-O-RING	FAR 27-08550-7	640709	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	095009
FAILURE MODE-LEAKED INTERNAL-THREE BOOSTER ACTUATOR ASSY REPORTEDLY LEAKED HYDRAULIC OIL AT THE ACTUATOR ROD AT A R ATE OF 2 TO 3 DROPS PER 25 CYCLES AT INLET PRESSURE OF 3000 PSIG. TEST ANALYSIS CONFIRMED ONLY ONE OF THE LEAKAGES, IT LEAKED 13 DROPS PER 24 HRS AT 3000 PSIG. THIS WAS CAUSED BY ASSEMBLY DAMAGE. IT IS THOUGHT MANY INTERNAL SEALS WE RE DAMAGED WHEN UNITS WERE DISASSEMBLED AND REASSEMBLED DURING SURVEY 13-63. CORRECTIVE ACTION-LEAKAGE TOLERANCE FOR THE ASSEMBLIES WAS WIDENED FROM 1 TO 2 DROPS PER 24 HRS, FROM EACH GLAND UN DER STATIC PRESSURIZATION AND FROM 1 DROP PER 25 CYCLES TO 1 DROP PER 10 CYCLES FROM EACH GLAND UNDER DYNAMIC CONDIT IONS. ANY SUSPECT CYLINDER SHOULD BE ACTUATED THROUGH 100 CYCLES AT ONE-HALF CPS BEFORE REJECTION, USING LEAKAGE DUR ING THE LAST 30 CYCLES AS THE CRITERION FOR REJECTION BECAUSE OF DYNAMIC LEAKAGE.							
HYDRAULIC-A/B BOOSTER	27A3531 VALVE-SAFETY RELIEF	UTP-PET 27-08561-1	640707	CONVAIR	YES NO	BENDOW 9050	097174
FAILURE MODE-OUT OF TOLERANCE. DURING PET HIGH TEMPERATURE (PLUS 275 DEG. F), TEST INTERNAL LEAKAGE AT 3000 PSIG WA S 6, 8, AND 7 CC/MIN. (SPECIFICATION IS 3 CC/MIN, MAXIMUM). SIMILAR FAILURE OCCURRED 64/07/29 ON TEST SPECIMEN NUMBE R 404-9468, LOT NUMBER 6 AS ON TEST SPECIMEN NUMBER 406-0477, LOT NUMBER 7, REFER TO FRR 334. CORRECTIVE ACTION-SLV DESIGN TO CHANGE SPECIFICATION TO ALLOW 30 CC/MIN LEAKAGE AT 3150 PSIG.							
HYDRAULIC-A/B BOOSTER	27A3526 MANUAL OPERATED VALVE	UTP-PET 27-08568-3	640706	CONVAIR	YES NO	STERER ENGR 12860	097168
FAILURE MODE-CONTAMINATION. S/N 403-1065 CONTROLLED FLOW WAS 0.515 GPM DURING IAT. SPECIFICATION LIMITS ARE PLUS OR MINUS 0.06. TIME TO STABILIZE WAS 2.0 SECONDS. SPECIFICATION IS 0.1 SECONDS. FPR-5125 CAUSE OF FAILURE NOT ABSOLUTE LY ESTABLISHED-APPEARED TO BE CONTAMINATION. NO OTHER DEFECTS APPARENT UPON DISASSEMBLY. CORRECTIVE ACTION-REF. FR 654-2-340 REQUESTED VENDOR INCREASE INSPECTION SURVEILLANCE. AT PRESENT THERE IS A 100 PC T CONTAMINATION CHECK BY GD/A INSPECTION.							
HYDRAULIC-A/B BOOSTER	LV-9D-10-256-F BOOSTER ACCUMULATOR/O-RING	FAR 27-08554-3	3520 640705	WTR	YES NONE	PEACOCK ENG. 51310-36	
FAILURE MODE-LEAK INTERNAL-CAUSED BY A CUT IN TEFLON BACKUP RING WHICH ALLOWED O-RING SEAL TO EXTRUDE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO INSPECT ACCUMULATORS TO BE CERTAIN THAT SEALS ARE INSTALLED CORRECTLY.							000471
HYDRAULIC-A/B BOOSTER	69A1913.3 VALVE-SAFETY RELIEF	UTP-PRT 27-08561-1	640630	CONVAIR	YES NO	BENDOM 9030	007173
FAILURE MODE-CONTAMINATION. DURING PRT INITIAL ACCEPTANCE TEST, THE LEAKAGE RATE WAS 530 CC/MIN. (SPECIFICATION IS 9 CC/MAXIMUM). TEST SPECIMEN NUMBER 303-0415, REFER TO FRR 334A. CORRECTIVE ACTION - FAILURE ANALYSIS REVEALED THAT CONTAMINENTS WERE FOUND IN VALVE. THE NEXT 25 VALVES RECEIVED WI LL HAVE 100 PCT INSPECTION FOR CONTAMINATION.							
HYDRAULIC-A/B BOOSTER	A-99-04-4836-F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-9	110F 640620	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	001341
FAILURE MODE-FAILED DURING OPERATION. EXCESSIVE VIBRATION AND HUM OCCURRED AT 3000PSI, THEN STOPPED AT 2000PSI. MAX . HUM REPORTED ABOVE 120 DEGREES F. AND WITH SHAFT FULLY EXTENDED. EXTENSIVE TESTING CONFIRMED LOUD HUM. THIS WAS TH E RESPONSE OF THE TORQUE MOTOR ARMATURE TO 400CPS DIG. OF SERVOAMPLIFIER SIGNAL AND IS NOT CONSIDERED HARMFUL TO PRO PER OPERATION OF SERVOCYLINDER. CORRECTIVE ACTION-VENDOR MADE A DESIGN IMPROVEMENT IN AREA OF THE TORQUE MOTOR EFFECTIVE ON SERVOVALVES BUILT AFTER 640101 CHANGING MOTORMOUNTING SCREWS TO A HEX HEAD TYPE TO ALLOW MORE POSITIVE MOUNTING AND TORQUING. RAR A-99-04-3949 ADVISED FACTORY PERSONNEL NOT TO REJECT LOUD SERVOCYLINDERS BEFORE CONSULTING COGNIZANT DESIGN OR FAILURE ANALY SIS PERSONNEL.							
HYDRAULIC-A/B BOOSTER	A-90-04-4834-F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-9	110F 640625	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	001336
FAILURE MODE-FAILED IN OPERATION. EXCESSIVE VIBRATION AND NOISE OCCURRED. THE SERVO CYLINDER MOVED THE ENGINE WITHO UT APPLICATION OF ELECTRICAL SIGNAL. TEST ANALYSIS REVEALED HUM AND NOISE EMANATING FROM THE SERVOCYLINDER WHICH IS THE RESPONSE OF THE TORQUE MOTOR ARMATURE TO THE 400 CPS DITHER IMPARTED BY THE AIG SIGNAL. THIS NOISE WAS LOUDER TH AN NORMAL. HOWEVER, RIGOROUS TESTING BEYOND MISSILE USAGE WAS CONDUCTED TO DETERMINE THE EFFECT OF THIS NOISE. IT WA S CONCLUDED SUCH HUM OR NOISE IS NOT INDICATIVE OF A DEFECTIVE SERVOCYLINDER. CORRECTIVE ACTION-RAR A-99-04-3949 WAS INITIATED TO INFORM FACTORY PERSONNEL THAT SUBJECT SHOULD NOT BE USED AS CAU SE FOR SERVOCYLINDER REJECTION BEFORE CONSULTING COGNIZANT DESIGN OR FAILURE ANALYSIS PERSONNEL.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SLV-A9-04-4837-F ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	FAR 27-08550-7	640623	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	093500

FAILURE MODE-FAILED DURING OPERATION-B1 PITCH SERVOCYLINDER ASSY REJECTED PER PROCEDURE 69-92020-1 DUE TO LOW STATIC GAIN OF THE SERVO LOOP. TEST ANALYSIS INDICATED THE LOW GAIN COULD ONLY BE EXPLAINED BY A HIGH GAIN TRANSDUCER. SINCE THE FEEDBACK SIGNAL IS IN OPPOSITE PHASE FROM THE COMMAND SIGNAL. THE PROBE OF THE FAILED TRANSDUCER RETAINED MORE MAGNETISM THAN OTHER PROBES TESTED. POSSIBLY LOW CHROMIUM IN THE ALLOY MAY ACCOUNT FOR THIS CHARACTERISTIC. THE PERCENTAGE OF CHROMIUM WAS BELOW THE LIMITS SET FOR 410 STEEL.

CORRECTIVE ACTION-RELIABILITY ACTION REPORT SLV-A9-04-3957 WAS SENT TO VENDOR RECOMMENDING DISCUSSIONS WITH THE MANUFACTURER CONCERNING LACK OF PROPER METAL COMPOSITION WITH THEIR SUPPLIERS. THIS IS ONLY FAILURE OF THIS TYPE ON SEVERAL THOUSANDS OF THIS TYPE TRANSDUCER USED.

HYDRAULIC-A/B BOOSTER	69A3166.2 HYDRAULIC PRESSURE SWITCH/HERMETIC SEALED MICROSWITCH	UTP-QUAL/PPT 27-08543-1	640618	GD/C	YES NO	SERVONIC 2092-0801	096027

FAILURE MODE-STRUCTURAL-DURING LIFE TEST ALL THREE UNITS HAD EXTERNAL HYDRAULIC OIL LEAKAGE. THE LEAKAGE WAS CAUSED BY A CRACK IN THE BOURDON TUBE AT THE JOINT WHERE A CAP IS BRAZED ONTO THE TUBE. THIS CRACK EXPOSES 3000 PSIG HYDRAULIC OIL TO THE CASE. REF. FPR NR F-3081-ST S/N 1000, 1001, 1002.

CORRECTIVE ACTION-THE VENDOR WILL REDESIGN THE END OF THE BOURDON TUBE THAT FRACTURED. ALSO THE INSTRUMENT CASE WILL BE REDESIGNED TO WITHSTAND A 5000 PSIG BURST PRESSURE. REVISE SPECIFICATION 27-08543-1 TO REDUCE AMPLITUDE OF THE 3000 PSIG PRESSURE PULSATION. REF. FR 654-2-323 A.

HYDRAULIC-A/B BOOSTER	A-A9-04-4815-F ACTUATOR	FAR 27-08550-9	116F 640611	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	093034

FAILURE MODE-OUT OF TOLERANCE-DURING FINAL CHECKOUT BY MAPCHE PER PROCEDURE 27-96463-1E, PART 7, NO-GO INDICATIONS WERE MONITORED ON INACTIVE NULL, AND STATIC GAIN TESTS. FAILURE WAS DUE TO THE DYNAMIC NULL BEING ADJUSTED OUT OF LIMITS WITH AN AIG TYPE AMPLIFIER.

CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH TO ADJUST THE NULL WITH BOTH THE IOC AND THE AIG SERVO AMPLIFIERS. GD/C RECEIVING INSPECTION TEST PROCEDURES WERE REVISED TO CHECK THE ACTUATORS WITH BOTH THE AIG AND THE IOC SERVO AMPLIFIER.

HYDRAULIC-A/B BOOSTER	LV-9D-04-4814-F ACTUATOR	FAR 27-08550-7	5520 640608	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	

FAILURE MODE-CONTAMINATION. DURINGCHECKOUT IN THE MAINTENANCE BUILDING THE UNIT FAILED THE FREQUENCY RESPONSE TESTS. THERE WAS ALSO VISIBLE LEAKAGE OF HYDRAULIC OIL. FAILURES DUE TO FIBERS ON THE O-RING SEALS AND IN THE OIL.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-THE MISSILE HYDRAULIC SYSTEM WAS FLUSHED UNTIL CLEAN. THE SPECIFICATION LEAKAGE RATE WAS OPENED T O ONE DROP PER 10 CYCLES AND ONE DROP PER 12 HOURS WHILE STATIC. TEFLON WIPERS WERE RECOMMENDED TO REPLACE THE FELT WIPERS.							093023
HYDRAULIC-A/B BOOSTER	09A3168.2 PRESSURE SWITCH, O-RING	UTP-QUAL/PPT 27-08543-1	640603	60/C	YES NO	SERVONIC 2092-0801	090045
FAILURE MODE-OUT OF TOLERANCE- AFTER THE OIL IMMERSION TEST THE O-RING IN THE ELECTRICAL CONNECTOR WAS SWOLLEN AND PARTIALLY OUT OF ITS RETAINING GROOVE. REF. FPR NR F 306087 S/N 1000. CORRECTIVE ACTION-NONE-NOT CONSIDERED A FAILURE BECAUSE THE O-RING IS ONLY A DUST SHIELD AND THE UNIT IS OPERABLE. REF. FR 654-2-203.							
HYDRAULIC-A/B BOOSTER	LV-9D-04-4813-F ACTUATOR-BOOSTER	FAR 27-08550-7	3520 640603	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	093024
FAILURE MODE-CONTAMINATION. DURING CHECKOUT THE B-1 YAW SERVOCYLINDER ASSEMBLY LEAKED HYDRAULIC OIL. LEAKAGE WAS DU E TO FELT FIBERS ON THE O-RING SEALS. CORRECTIVE ACTION-THE HYDRAULIC SYSTEM WAS FLUSHED. THE SPECIFICATION LEAKAGE RATE WAS OPENED TO ONE DROP PER 12 HO URS FROM EACH DYNAMIC SEAL WHILE STATIC OR ONE DROP PER 10 CYCLES IN DYNAMIC APPLICATION.							
HYDRAULIC-A/B BOOSTER	LV-9D-04-4823 ACTUATOR O-RING	FAR 27-08550-7	3520 640603	WTR	YES NO	HYDRAULIC RESE ARCH 104700-7	093211
FAILURE MODE-CONTAMINATION. ACTUATOR LEAKED FROM AFT PRESSURE PORT DURING CHECKOUT OF MISSILE 358 D THE FAILURE WAS CAUSED BY A FOREIGN PARTICLE BRIDGING THE O-RING OF THE FABRICATION PORT PLUG. CORRECTIVE ACTION-NONE. VENDOR HAD CHANGED MANUFACTURING PROCESS ON UNITS OF LATER MANUFACTURE PRECLUDING THIS TYPE OF FAILURE.							
HYDRAULIC-A/B BOOSTER	LV-A9-04-4817-F ACTUATOR/VALVE-SERVO	FAR 27-08550-7	288-B 640602	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-CONTAMINATION. DURING FINAL CHECKOUT OF THE ATLAS MISSILE THE ACTUATOR ASSEMBLY ACTIVE AND INACTIVE NU LL FEEDBACK VOLTAGES WERE ABOVE SPECIFICATION LIMITS. FEEDBACK TRANSDUCER OUTPUT AT NULL MEASURED ~ 100 VOLT INACTIV E AND 0.450 VOLT ACTIVE. FAILURE WAS DUE TO PARTIALLY RESTRICTED C-1 PRESSURE DROPPING ORFICE THAT AS PARTIALLY PLU							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
GGED FROM THE UPSTREAM SIDE BY METALLIC PARTICLES. CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH TO COMPLETELY DISASSEMBLE ALL SERVO VALVES AND EXAMINE THEM FOR CONTAM INANTS. HYDRAULIC RESEARCH MOVED ALL ASSEMBLY AND TEST OPERATIONS TO A SUPER CLEAN ROOM.							094076
HYDRAULIC-A/B BOOSTER	69A3166.2 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08540-1	640601	60/C	YES NO	SERVONIC 2092-0801	096044
FAILURE MODE-OUT OF SPECIFICATION. THE UNIT EXCEEDED MIL-I-26600 SPECIFICATION REQUIREMENTS AT THREE FREQUENCIES IN A RADIATED INTERFERENCE TEST. RLF. TASK HISTORY NO. 12 S/N 1001. CORRECTIVE ACTION-A MEETING WILL BE CALLED WITH APPROPRIATE PEOPLE ATTENDING TO DETERMINE IF A DEVIATION TO MIL-I-2 6600 EXISTS OR IS REQUIRED OR IF A FILTER HAS TO BE ADDED TO THE UNIT OR SYSTEM.							
HYDRAULIC-A/B BOOSTER	LV-99-04-4804-F ACTUATOR/O-RING SEAL	FAR 27-08550-7	289-D 640526	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	095033
FAILURE MODE-LEAK-EXTERNAL.DURING FINAL ASSEMBLY CHECKOUT THE ACTUATOR WAS LEAKING HYDRAULIC FLUID AROUND THE ROD E ND ADJUSTMENT LOCKING NUT. LEAKAGE WAS CAUSED BY INCORRECT ASSEMBLY. LOOSE NOZZLE PRESSURE TEST PORT PLUGS WERE NOT COMPRESSING THE SEALING O-RINGS. PRESSURE AND RETURN PORT SEALING O-RINGS WERE DAMAGED DURING INSTALLATION. POSITION PIN MATERIAL WAS EXTRUDED DURING INSTALLATION. CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH INFORMING THEM OF THE FAILURE AND REQUESTING THEM TO REVIEW THEIR ASSE MBLY TECHNIQUES TO ELIMINATE SIMILAR FAILURES. HYDRAULIC RESEARCH IMPLEMENTED CLOSER INSPECTION SURVEILLANCE OF THES E PARTS.							
HYDRAULIC-A/B BOOSTER	69A1909.3 VALVE, SAFETY RELIEF	UTP-SLT 27-06570-1	640521	CONVAIR	YES NO	VINSON MFG. A-80133-1	097044
FAILURE MODE-OUT OF SPECIFICATION. DURING SLT PROOF CYCLE, RESEAT DIFFERENTIAL PRESSURE WAS 63 PSID (SPEC. IS 65 PS ID MIN.) TEST SPECIMEN 307-0682, REFER TO FRR 2v9. CORRECTIVE ACTION-NONE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A1910.9 HYDRAULIC PUMP	UTP-PRT 27-08566-1	640514	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097004

FAILURE MODE-LEAK EXTERNAL. S/N 203-0668 FAILED TO MEET CASE DRAIN LEAKAGE REQUIREMENTS OF 0.6 GPM DURING PRT-IAT. THIS UNIT ALSO FAILED TO MEET PEAK TRANSIENT PRESSURE REQUIREMENTS. REFER TO FPR-4281.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-REFER TO FR654-2-288. THE TEST SETUP AND SPECIFICATION REVISED BY ECP 7669 TO RELAX LEAKAGE AND P EAK TRANSIENT PRESSURE REQUIREMENTS.

HYDRAULIC-A/B BOOSTER	69A1910.4 HYDRAULIC PUMP	UTP-SLT 27-08566-1	640427	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097006

FAILURE MODE-OUT OF SPECIFICATION. PEAK TRANSIENT PRESSURE WAS 4143 TO 4454 PSIG WHILE GOING FROM FULL FLOW TO NO F LOW, TO FULL FLOW, LIMIT IS 4000 PSIG, TIME WAS 0.056 SEC. LIMIT IS 0.050 SEC. S/N211-5540.

CORRECTIVE ACTION-DEPT 694-0 TO SUBMIT ECP 7669 TO REVISE TEST LEVELS.

HYDRAULIC-A/B BOOSTER	69A1910.3 HYDRAULIC PUMP	UTP-ETT 27-08566-1	640421	CONVAIR	YES NO	VICKERS AA-60694-R-2A	096006

FAILURE MODE-OUT OF SPECIFICATION. S/N 201-0297. PEAK PRESSURE TRANSIENTS EXCEEDED ALLOWABLE MAX 4000PSIG. PEAK PRE SSURES RANGED FROM 4162 TO 4349PSIG.

CORRECTIVE ACTION-DEPT 694-0 TO SUBMIT ECP 7669 TO REVISE TEST LEVELS.

HYDRAULIC-A/B BOOSTER	69A1910.3 HYDRAULIC PUMP	UTP-ETT 27-08566-1	640420	CONVAIR		VICKERS AA-60694-R-2A	096009

FAILURE MODE-OUT OF SPECIFICATION. S/N 212-0377 PEAK TRANSIENT PRESSURES EXCEEDED 4000PSIG LIMIT PRESSURES RANGED F ROM 4156 TO 4492PSIG. UNIT ALSO FAILED FULL FLOW TO NO FLOW LIMIT OF 0.05SEC. TIMES WERE 0.060 AND 0.054SEC.

CORRECTIVE ACTION-DEPT 694-0 TO SUBMIT ECP 7669 TO REVISE TEST LEVELS.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A1910.3 HYDRAULIC PUMP	UTP-ETT 27-08566-1	640417	CONVAIR	YES NO	VICKERS AA-60694-R-2A	696007
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE S/N 208-0340 PEAK TRANSIENT PRESSURES MEASURED WERE 4162 TO 4337 PSI & ALLOWABLE,MAX 4000PSIG.							
CORRECTIVE ACTION-DEPT 694-0 TO SUBMIT ECP7669 TO REVISE TEST LEVELS.							
HYDRAULIC-A/B BOOSTER	69A1910.4 HYDRAULIC PUMP, BOOSTER	UTP-PRT 27-08566-1	640415	CONVAIR	YES NO	VICKERS AA-60694-R-2A	696006
FAILURE MODE-OUT OF SPECIFICATION. S/N 211-3540 FAILED TO MEET TRANSIENT PRESS REQUIREMENTS OF 4000PSIG AND FAILED TO REGULATE IN THE REQUIRED TIME 0.05SEC. FROM FULL FLOW TO NO FLOW DURING IAT. FPR 4275.							
CORRECTIVE ACTION-REFER TO FR 654-2-288, ECP 7669 SUBMITTED REVISING SPECIFICATION AND TEST SET UP TO RELAX SPEC. R EQUIREMENTS.							
HYDRAULIC-A/B BOOSTER	LV-9D-04-4760F ACTUATOR/VALVE-SERVO	FAR 27-08550-7	3500 640415	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	695550
FAILURE MODE-STRUCTURAL. DURING CAPCHE CHECKOUT IN THE MISSILE ASSEMBLY AND MAINTENANCE SHOP A NO-GO INDICATION APP EARED ON CARD 84 FOR THE B-1 PITCH SERVOCYLINDER. THIS WAS DUE TO OUT OF SPECIFICATION LIMITS FEED BACK VOLTAGE AT E NGINE NULL. THE TORQUING MOTOR FLAPPER VALVE WAS NOT CORRECTLY BALANCED. BELIEVED TO HAVE JARRED OUT OF POSITION BY A SHOCK PULSE ON THE END OF THE SERVO CYLINDER PRIOR TO INSTALLATION ON THE MISSILE.							
CORRECTIVE ACTION-GD/C INFORMED ALL APPROPRIATE PERSONNEL OF THE FAILURE AND THE CAUSE AND WERE CAUTIONED TO USE GR EATER CARE TO AVOID UNDUE SHOCK TO SERVOCYLINDERS. 3500 REWORKED FROM 1870.							
HYDRAULIC-A/B BOOSTER	A-9D-10-245-F BOOSTER HYDRAULIC TANK	FAR 27-08551-5	2000 640407	WTR	YES NO	BENSON MFG 8985F	696501
FAILURE MODE-ERRATIC OPERATION DUE TO STICKING PISTON RESULTING FROM A POSSIBLE OVER PRESSURIZATION.							
CORRECTIVE ACTION-GD/C ORIGINATED OPERATION CLASP. SURVEY 47-64 DEMONSTRATED OVER PRESSURIZED TANKS WILL BE FOUND A ND WILL BE REJECTED.							

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HYDRAULIC-A/B BOOSTER	A-A9-10-292-F HYDRAULIC PUMP	FAR 27-08566-1	116F 640404	FACTORY	YES NO	VICKERS AA-60694-R-2A	000477

FAILURE MODE-LEAK EXTERNAL. THE PUMP LEAKED HYDRAULIC FLUID AT THE INLET FLANGE MATING SURFACE.

CORRECTIVE ACTION-FAILURE CONFIRMED VENDOR INITIATED ACTION TO PREVENT IMPROPER MACHINING OF INLET FLANGES AND CHANGED PROCEDURE TO REQUIRE A 24 HOUR STATIC LEAK TEST.

HYDRAULIC-A/B BOOSTER	LV-90-04-4765-F ACTUATOR/SEAL	FAR 27-08550-7	3500 640403	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	000656

FAILURE MODE-LEAK-EXTERNAL. THIS UNIT WAS REMOVED FROM THE MISSILE AT THE ASSEMBLY AND MAINTENANCE SHOP AS A RESULT OF A VISUAL INSPECTION THAT NOTED LEAKAGE OF SEVERAL DROPS IN 24 HOURS. SLIGHT LEAKAGE WAS DUE TO SMALL NICKS IN THE O-RING SEALS.

CORRECTIVE ACTION-SPECIFICATIONS REVISED TO WIDEN LEAKAGE TOLERANCE FROM 1 DROP TO 2 DROPS PER 24 HOURS UNDER STATIC CONDITIONS, AND FROM 1 DROP PER 25 CYCLES TO 1 DROP PER 10 CYCLES FROM EACH GLAND UNDER DYNAMIC CONDITIONS.

HYDRAULIC-A/B BOOSTER	LV-90-04-4738F BOOSTER SERVOCYLINDER	FAR 27-08550-7	3500 640331	WTR	NO YES	HYDRAULIC RESE ARCH 104700-1	001004

FAILURE MODE-ERRATIC OPERATION. UNIT REJECTED WHEN THE B-1 ENGINE WAS VIOLENTLY CYCLED, IN THE PITCH PLANE, AT 10CPS FOR 10 SECONDS.

CORRECTIVE ACTION-FAILURE WAS NOT CONFIRMED. WTR WERE ADVISED OF RESULTS- THEY CONCURRED IN CHECKING THE MISSILE ELECTRICAL SYSTEM TO LOCATE SOURCE OF PROBLEM.

HYDRAULIC-A/B BOOSTER	LV-A9-04-4764-F ACTUATOR/SEAL	FAR 27-08550-7	204-B 640330	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000699

FAILURE MODE-LEAK-EXTERNAL. DURING FINAL MISSILE CHECKOUT THE ACTUATOR WAS REMOVED BECAUSE OIL WAS VISUALLY NOTED LEAKING AT THE SEAL WHILE THE HYDRAULIC SYSTEM WAS AT LOW PRESSURE. LEAK WAS SLIGHTLY ABOVE SPECIFICATION LEAKAGE RATE DUE TO A SMALL PRICK IN THE O-RING SEAL.

CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH INFORMING THEM OF THE FAILURE AND CAUSE. GD/C RECOMMENDED THAT REWORK PROCEDURES AND THE REWORK AREA BE REVIEWED TO ENSURE PROPER USE OF NEW O-RINGS.

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HYDRAULIC-A/B BOOSTER	LV-09-04-4748F ACTUATOR SCREW	FAR 27-08530-7	204D 640330	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	693040

FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR INACTIVE NULL OUT OF TOLERANCE. THE FAILURE WAS ATTRIBUTED TO A NU LL SHIFT CAUSED BY A LOOSE POLE-PIECE HOLDDOWN SCREW.

CORRECTIVE ACTION-THE VENDOR HAD CHANGED FROM A SLOTTED HEAD SCREW TO AN ALLEN SCREW IN AUGUST 1963, SUBSEQUENT TO THE MANUFACTURE OF THIS UNIT.

HYDRAULIC-A/B BOOSTER	69A1910.3 HYDRAULIC PUMP	UTP-ETT 27-08560-1	640325	CONVAIR	YES NO	VICKERS, INC AA-60694-R-RA	697015

FAILURE MODE-OUT OF SPECIFICATION. S/N 208-0340, 212-0377, 201-0297. FAILED TO MEET TRANSIENT PRESSURE LIMIT OF 400 0 PSIG AND TO REGULATE FULL FLOW TO NO FLOW IN 0.05 SECONDS DURING INITIAL PROOF CYCLE FPR-4240.

CORRECTIVE ACTION-REF. FR 654-2-261, ECP 7669 SUBMITTED TO REVISE SPECIFICATION. TEST SET UP TO SIMULATE MISSILE CO NFIGURATION.

HYDRAULIC-A/B BOOSTER	A-A9-08-3190F PNEUMATIC CHECK VALVE	FAR 27-08565-1	10F 640325	FACTORY	YES NO	CIRCLE SEAL 73-319	690650

FAILURE MODE-CONTAMINATION-ALUMINUM PARTICLES HOLDING POPPET OFF VALVE SEAT.

CORRECTIVE ACTION-GO/C TO MONITOR THESE VALVES MORE CLOSELY TO INSURE VALVE INTEGRITY.

HYDRAULIC-A/B BOOSTER	LV-SD-04-4772-F ACTUATOR,O-RING	FAR 27-08550-7	3500 640325	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	691545

FAILURE MODE-LEAK-EXTERNAL. DURING RECEIVING INSPECTION TESTS IN MISSILE ASSEMBLY AND MAINTENANCE BUILDING THE SERV O-CYLINDER WAS FOUND TO BE LEAKING HYDRAULIC OIL FROM BETWEEN THE SERVO-VALVE AND THE ACTUATOR UNDER STATIC CONDITIO NS. LEAKAGE WAS DUE TO THE TWO NOZZLE PRESSURE MONITORING PORT PLUGS FOUND TO BE A HALF A TURN LOOSE.

CORRECTIVE ACTION-HYDRAULIC RESEARCH INSTITUTED MANUFACTURING PROCEDURES AS FOLLOWS. (A) CORRECT BOTTOMING OF TEST PLUG WILL BE CHECKED TO PRECLUDE POSSIBLE INTERFERENCE. (B) SEVEN POWER MAGNIFICATION WILL BE USED TO ASSURE DETECTI ON AND REMOVAL OF EXTRUDED METAL ON THE LOCKING PIN. (C) ASSEMBLY AND TEST PERSONNEL WERE APPRISED OF THE DAMAGED O-RING AND THE NEED FOR CORRECT ASSEMBLY. 3500 REWORED FROM 1070.

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HYDRAULIC-A/B BOOSTER	LV-A9-04-4745F BOOSTER ACTUATOR,O-RING	FAR 27-08530-7	2040 640321	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000703

FAILURE MODE-CONTAMINATED. UNIT REJECTED FOR EVIDENCE OF INTERNAL LEAKAGE. FAILURE WAS ATTRIBUTED TO O-RING DAMAGE AS RESULT OF CONTAMINATION WITH CADMIUM PARTICLES. SOURCE OF CONTAMINANTS IS UNKNOWN. THE O-RING QUALITY WAS FOUND T O BE UNDER SPECIFICATION AS REGARDS ELONGATION AND TENSILE STRENGTH.

CORRECTIVE ACTION-THE PROBLEM OF LOW-QUALITY O RINGS IS BEING REVIEWED BY A GD/C DIAGNOSTIC TEAM. THE CONTAMINATION PROBLEM WAS REFERRED TO THE FACTORY TO ASSURE CLEAN HYDRAULIC SYSTEMS.

HYDRAULIC-A/B BOOSTER	69A3166.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	640317	GD/C	YES NO	SERVONIC 2092-0801	000043

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME- DURING VIBRATION IN THE X-X AXIS THE UNIT FAILED TO MAKE SWITCHING CONTACT. THE FAILURE OCCURRED AT 280CPS. THE CONTACT RESISTANCE WAS GREATER THAN 100 OHMS. ALLOWABLE 4 OHMS MAX. TH IS WAS CAUSED BY THE MICROSWITCH CONTACTS. REF. FPR NR F-3051 S/N 1002.

CORRECTIVE ACTION-VENDOR IS CHECKING OUT A NEW MICROSWITCH. REF. FR 654-2-207 AND FR 654-2-207 C.

HYDRAULIC-A/B BOOSTER	69A3166.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	640317	GD/C	YES NO	SERVONIC 2092-0801	000011

FAILURE MODE-OUT OF TOLERANCE- DURING POST VIBRATION PROOF CYCLE THE CONTACT RESISTANCE BEFORE PRESSURIZATION TO 45 00 PSIG WAS 11.5 OHMS AND AFTER WAS 0.6 OHMS AND VARIED BETWEEN THE ABOVE RESISTANCE VALUES WHILE THE PRESSURE WAS A BOVE CONTACT RANGE. THIS WAS CAUSED BY THE MICROSWITCH CONTACTS. THE MAXIMUM CONTACT RESISTANCE ALLOWED IS 4 OHMS. R EF. FPR NR F-3050 S/N 1001.

CORRECTIVE ACTION-RECOMMEND THE VENDOR INVESTIGATE NEW MICRO SWITCH.

HYDRAULIC-A/B BOOSTER	69A3166.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	640314	GD/C	YES NO	SERVONIC 2092-0801	

FAILURE MODE-OUT OF TOLERANCE- DURING VIBRATION IN ALL THREE AXES OF VIBRATION THE SWITCH OPENING WAS CONSISTANTLY 2600 PLUS/ MINUS 10PSIG. THE REQUIRED IS 2600PSIG. MAX. THE VOLTAGE ACROSS PINS A AND B VARIED AND INDICATED A CHANG E IN RESISTANCE ACROSS THE CONTACTS. IN POST VIBRATION PROOF CYCLE, THE CONTACT RESISTANCE WAS FOUND TO BE 6.5OHMS A T 3000 PSIG, AND 10.50 OHMS AT 4500PSIG. SPECIFICATION REQUIRES 4OHMS MAX. THIS WAS CAUSED BY OIL ON MICROSWITCH CON TACTS. REF. FPR NR F-3050 S/N 1000. S/N 1001.

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CORRECTIVE ACTION-RECOMMEND THE VENDOR INVESTIGATE NEW MICROSWITCH.							000010
HYDRAULIC-A/B BOOSTER	69A3166.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	640313	GD/C	YES NO	SERVONIC 2092-0801	000042
FAILURE MODE-OUT OF TOLERANCE. THE UNIT DID NOT MEET MIL-T-26600 CONDUCTED AND RADIATED INTERFERENCE REQUIREMENTS U SING LINE STABILIZATION NETWORK TECHNIQUE. ALSO THE UNIT SWITCH ACTUATION BECAME INTERMITTENT AND WAS CAUSED BY HIGH CONTACT RESISTANCE WITHIN THE MICROSWITCH REF. FPR NR F-3049 S/N 1002.							
CORRECTIVE ACTION-VENDOR HAS SELECTED A NEW MICROSWITCH THAT IS A SEALED UNIT. THREE UNITS FOR A PPT TEST RERUN ON 4 MAY 1964 ARE AVAILABLE REF. FR 654-2-207 A.							
HYDRAULIC-A/B BOOSTER	LV-9D-10-243-F REDUCER	FAR NONE	351D 640311	WTR	YES NO	DEUTSCH COMPAN Y NS24399	000502
FAILURE MODE-LEAK EXTERNAL-DUE TO DAMAGED FITTING.							
CORRECTIVE ACTION-GD/C FILL AND BLEED AND LEAK CHECKS WILL ISOLATE OTHER POSSIBLE DAMAGED FITTINGS DUE TO ABNORMAL ASSEMBLY. DEUTSCH COMPANY IS NOT AN APPROVED SOURCE FOR TUBING FITTINGS.							
HYDRAULIC-A/B BOOSTER	69A1920 ACTUATOR SERVO VALVE	UTP-PRT 27-08550-7	640310	GD/C	YES NO	HYDRAULIC RESE ARCH 104700-1	000024
FAILURE MODE-OUT OF TOLERANCE-DURING INITIAL ACCEPTANCE TEST THE SERVOVALVE COIL RESISTANCE WAS 2141 OHMS FOR S/N 2 D6-3637 AND 2125 OHMS FOR 205-3592 OHMS FOR S/N 205-3592. SPECIFICATION REQUIRES 2100 MAXIMUM. REF. FPR NR F-4219 ST .							
CORRECTIVE ACTION-CARR F-4219-SC-1 STATES THAT COIL RESISTANCE UP TO 2200 OHMS IS ACCEPTED. IN ECP 7527 ACCEPTABLE CONDITIONS AND RESISTANCES AT TEMPERATURES WILL BE ESTABLISHED.							
HYDRAULIC-A/B BOOSTER	69A3166.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	640310	GD/C	YES NO	SERVONIC 2092-0801	000012
FAILURE MODE-OUT OF TOLERANCE- DURING A RESPONSE TEST THE UNIT WAS SLOW IN RESPONSE.							
CORRECTIVE ACTION-VENDOR HAS SELECTED A NEW MICROSWITCH THAT IS A SEALED UNIT. THREE NEW UNITS, FOR A PPT TEST RERU N ON 4 MAY 1964, ARE AVAILABLE. REF. FR 654-2-207 B.							

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HYDRAULIC-A/B BOOSTER	A-A9-04-4775-F ACTUATOR/O-RING	FAR 27-08550-7	211D 840307	FACTORY	YES NO	HYDRAULIC RESE ARCM 104700-1	093947

FAILURE MODE-LEAK-EXTERNAL. THE BOOSTER 2 YAW SERVOCYLINDER ASSEMBLY WAS OBSERVED LEAKING IN EXCESS OF ONE DROP PER MINUTE DURING SYSTEM CHECKOUT AT 3000 PSIG. LEAKAGE WAS AROUND THE PISTON SHAFT SEALING GLAND NUT. THE ACTUATOR ALS O MADE UNUSUAL NOISES DURING DYNAMIC TESTING. LEAKAGE WAS DUE TO A HARD O-RING SEAL. THE REPORTED NOISE COULD NOT BE REPRODUCED.

CORRECTIVE ACTION-NONE FOR THIS PARTICULAR UNIT. NOT A FAILURE. LEAKAGE WITHIN GD/C SPECIFICATION 27-04202. VENDOR INS ITUTED RIGID STANDARDS FOR ACCEPTING SEALING O-RINGS.

HYDRAULIC-A/B BOOSTER	LV-90-10-241-F HYDRAULIC PUMP	FAR 27-08500-1	2630 840303	COMPLEX 12	NO YES	VICKERS AA-60690-4R-2A	090310

FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. PUMP WOULD NOT MOTOR UNTIL 2200 PSIG HYDRAULIC PRESSURE WAS APPL IED.

CORRECTIVE ACTION-NO FAILURE. SITES ADVISED THAT THE FLOW LIMITER VALVE MAY HAVE CONTRIBUTED TO THE REPORTED FAILUR E INCIDENT.

HYDRAULIC-A/B BOOSTER	69-1913 VALVE-SAFETY RELIEF	UTP-PRT 27-08581-1	840305	CONVAIR	YES NO	BENDOW 9050	097172

FAILURE MODE-OUT OF TOLERANCE. DURING PRT LEAKAGE RATE AT 3150 PSID WAS 22 CC/MIN. (SPECIFICATION MAXIMUM IS 3 CC/M IN). TEST SPECIMEN NUMBER 310-0429, REFER TO FRR 148.

CORRECTIVE ACTION-SLV DESIGN TO CHANGE SPECIFICATION TO ALLOW 30 CC/MIN LEAKAGE AT 3150 PSIG.

HYDRAULIC-A/B BOOSTER	6WA3168.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-09543-1	840304	GD/C	YES NO	SERVONIC 2092-0001	092240

FAILURE MODE-OUT OF TOLERANCE. DURING A RESPONSE TEST BOTH UNITS WERE SLOW IN RESPONSE. REF. FPR NR F-3047.

CORRECTIVE ACTION-SPECIFICATION 27-08543-1 WILL BE REVISED TO INCREASE THE 10 MILLISECONDS TO 50.

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HYDRAULIC-A/B BOOSTER	LV-9D-04-4781F ACTUATOR/O-RING SEAL	FAR 27-08550-7	640303	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	006027

FAILURE MODE-LEAK-EXTERNAL. THE BOOSTER SERVO CYLINDER ASSEMBLY WAS REMOVED FROM THE MISSILE IN THE MAINTENANCE SHO P WHEN IT WAS NOTED DURING A SURVEILLANCE INSPECTION THAT IT WAS LEAKING 5 TO 10 DROPS IN 24 HOURS AT 40 PSIG. THE L EAKAGE WAS DUE TO A SLIGHT DIMENSIONAL DISCREPANCY, AND WORN AND AGED O-RINGS.

CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH INFORMING THEM OF THE DIMENSIONAL DISCREPANCIES ENCOUNTERED AND REQUES TING A QUALITY CONTROL REVIEW.

HYDRAULIC-A/B BOOSTER	LV-9D-04-4787-F ACTUATOR BOOSTER-O-RING	FAR 27-08550-7	350D 640303	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	006140

FAILURE MODE-LEAK EXTERNAL-DURING HYDRAULIC SYSTEM CHECKOUT THE ACTUATOR ASSEMBLY LEAKED HYDRAULIC OIL AROUND THE A CTUATOR SHAFT AT A RATE OF 1 DROP IN 30 MINUTES UNDER STATIC CONDITIONS. MAXIMUM LIMITS IS 1 DROP IN 24 HOURS. CAUSE OF LEAKAGE WAS DUE TO SURFACE DEFECTS IN THE O-RINGS INSTALLED BY THE VENDOR DURING OVERHAUL.

CORRECTIVE ACTION-HYDRAULIC RESEARCH WILL INSPECT O-RINGS ON A 100PCT BASIS. USING A 20 POWER SCOPE FOR VOIDS, ETC. EACH O-RING WILL BE GAGED FOR INSIDE DIAMETER, OUTSIDE DIAMETER, AND CROSS SECTION. 350 D REWORKED FROM 157D.

HYDRAULIC-A/B BOOSTER	69A3166.1 HYDRAULIC PRESSURE SWITCH	UTP-QUAL/PPT 27-08543-1	640302	GD/C	YES NO	SERVONIC 2092-0801	006020

FAILURE MODE-OUT OF TOLERANCE-DIMENSION OF 1.0 PLUS/MINUS 0.03 INCH BETWEEN CENTER POINTS OF THE ELECTRICAL AND PRE SSURE CONNECTIONS WAS 1.25 INCH. REF. FPR NR F-3046 S/N 1000, 1001, 1002.

CORRECTIVE ACTION-THE UNIT COMPLIED WITH THE VENDOR PRINT WHICH WAS APPROVED BY DESIGN. SPECIFICATION WILL BE PROCE SSED AT A LATER DATE TO READ 1.00 PLUS OR MINUS .30 INSTEAD OF 1.0 PLUS OR MINUS 0.03.

HYDRAULIC-A/B BOOSTER	27A3030 GAGE-PRESSURE	UTP-PET 27-08562-3	640225	GD/C	YES NO	AMERICAN STAND ARD 6003-710	006020

FAILURE MODE-LEAK EXTERNAL-DURING PRODUCTION EVALUATION TEST IMPROPER SEALING OF THE GAGE WAS EVIDENCED WHEN AT 90 DEGREES F UNDER A DIFFERENTIAL HEAD OF 14.5 PSIG DURING IMMERSION, THE UNIT WAS ONE-THIRD FULL OF WATER. THIS WAS SP ECIAL PET TEST. REFER TO FAILURE REVIEW REPORT 124. LEAK AS NOTED WILL NOT EFFECT FUNCTION OF UNIT.

CORRECTIVE ACTION-QUALITY CONTROL MEASURES TIGHTENED TO INCLUDE LOT CONTROL. PRODUCTION EVALUATION TESTS INITIATED ON ALL INCOMING UNITS.

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HYDRAULIC-A/B BOOSTER	LV-99-10-240-F BOOSTER HYDRAULIC FLUID TANK	FAR 27-00551-3	1560 640223	FACTORY	YES NO	BENDOW MFG. 0985F	000511
FAILURE MODE-LEAK EXTE L. LEAKAGE WAS OBSERVED FROM THE TANK BODY HYDRAULIC END INTERFACE, POSSIBLY DUE TO A BAD UNION.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C REINSTRUCTED PERSONNEL TO CAREFULLY RESEARCH HYDRAULIC LEAKAGE BEFORE REMOVAL OF HARDWARE.							
HYDRAULIC-A/B BOOSTER	27A-3318 VALVE-SAFETY RELIEF	UTP-PET 27-00561-1	640220	CONVAIR	YES NO	BENDOW 9050	097100
FAILURE MODE-OUT OF TOLERANCE. DURING PET HIGH TEMPERATURE (PLUS 225 DEGREES F) TEST, LEAKAGE RATE WAS 7.0, 9.3, AN D 7.0 CC/MIN. (SPECIFICATION MAXIMUM IS 3 CC/MIN). TEST SPECIMEN NUMBER 312-0040 REFER TO SUPPLEMENT A FRR NUMBER 06 7. LOT NUMBER 5.							
CORRECTIVE ACTION-SPECIFICATION CHANGED TO ALLOW MORE LEAKAGE.							
HYDRAULIC-A/B BOOSTER	LV-A9-10-230-F BOOSTER HYDRAULIC TANK	FAR 27-00551-3	1560 640210	FACTORY	YES NO	BENDOW MFG 0985	000517
FAILURE MODE-LEAK EXTERNAL-LEAKAGE OBSERVED AT PNEUMATIC ENDCAP.							
CORRECTIVE ACTION-VENDOR ASSEMBLY PERSONNEL CAUTIONED TO ASSEMBLE UNITS CORRECTLY WITH INSPECTION TO VERIFY.							
HYDRAULIC-A/B BOOSTER	LV-99-04-4709 ACTUATOR-BOOSTER,SERVOVALVE	FAR 27-00550-7	3500 640210	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	095091
FAILURE MODE-SHORT (ELECTRICAL)-BOOSTER TWO PITCH ACTUATOR HAD HIGH NULL FEEDBACK VOLTAGE. THE MEASURED VOLTAGE WAS 2.1 VOLTS. THEMAXIMUM ALLOWABLE IS 250 MILLIVOLTS. THE FAILUREWAS CAUSED BY A SHORTED TORQUE MOTOR COIL.IT WAS BURN IZED THE SHORT WAS CAUSED BY APPLICATION OF EXCESSIVE VOLTAGE.							
CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	LV-A9-10-236-F BOOSTER HYDRAULIC SAFETY RELIEF VA LVE	FAR 27-08361-1	1960 640216	FACTORY	YES NO	VINSON A-80282	096497
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VALVE WOULD NOT RESEAT WHILE PRESSURE WAS MAINTAINED ABOVE 1550 PS IG.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C RECOMMENDED APPLICABLE CHECKOUT PROCEDURES BE STRINGENTLY FOLLOWED TO PREVENT UNNECESSARY REJECTION OF GOOD HARDWARE.							
HYDRAULIC-A/B BOOSTER	LV-A9-04-4687-F ACTUATOR O-RING	FAR 27-08350-7	1960 640215	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	093999
FAILURE MODE-CONTAMINATION. THE BOOSTER SERVOCYLINDER ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID PAST THE PISTON SH AFT O-RING SEAL AND FROM THE BLEED PORT AT THE PISTON END. LEAKAGE OCCURRED UNDER DYNAMIC CONDITIONS WITH 3000 PSIG. ANALYSIS DETERMINED THAT THERE WAS NO LEAKAGE FROM THE BLEED PORT AND THE LEAKAGE PAST THE ROD-END PISTON-SHAFT DYN AMIC SEAL DID NOT EXCEED SPEC. THE LEAKAGE WAS ATTRIBUTED TO O-RING SURFACE CRACKING, FELT FIBERS, AND CONTAMINATING PARTICLES UPSETTING SEALING SURFACES.							
CORRECTIVE ACTION-VENDOR INVESTIGATED THE PROBLEM, REVIEWED HIS ASSEMBLY AND INSPECTION PROCEDURES, AND INFORMED HI S O-RING SUPPLIERS OF THIS ANALYSIS.							
HYDRAULIC-A/B BOOSTER	LV-A9-04-4686-F ACTUATOR O-RING	FAR 27-08350-7	1960 640215	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	093994
FAILURE MODE-CONTAMINATION. THE BOOSTER SERVOCYLINDER ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID PAST THE PISTON SH AFT SEAL O-RING UNDER DYNAMIC CONDITIONS WITH 3000 PSIG. ANALYSIS CONFIRMED THE LEAKAGE AND ATTRIBUTED IT TO O-RING SURFACE CRACKING, FRAYED FELT FIBERS, AND OTHER CONTAMINATING PARTICLES DISTURBING THE O-RING SEALING SURFACE.							
CORRECTIVE ACTION-VENDOR INVESTIGATED THE PROBLEM, REVIEWED HIS ASSEMBLY AND INSPECTION PROCEDURES, AND INFORMED HI S O-RING SUPPLIERS OF THIS ANALYSIS.							
HYDRAULIC-A/B BOOSTER	LV-A9-04-4685-F ACTUATOR O-RING	FAR 27-08350-7	1960 640215	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-CONTAMINATION. THE BOOSTER SEVEROCYLINDER ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID PAST THE PISTON S HAFT SEAL O-RING UNDER DYNAMIC CONNECTIONS WITH 3000 PSIG. ANALYSIS DETERMINED THAT THE REPORTED LEAKAGE WAS WITHIN SPEC AND WAS CAUSED BY O-RING SURFACE CRACKING, FRAYED FELT FIBERS, AND OTHER CONTAMINATING PARTICLES DISTURBING THE SEALING SURFACES.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR INVESTIGATED THE PROBLEM, REVIEWED HIS ASSEMBLY AND INSPECTION PROCEDURES, AND INFORMED HI S O-RING SUPPLIERS OF THIS ANALYSIS.							093953
HYDRAULIC-A/B BOOSTER	LV-99-04-4667-F ACTUATOR ASSEMBLY-BOOSTER	FAR 27-08550-9	351D 640211	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	090082
FAILURE MODE-OUT OF SPECIFICATION-ACTUATOR ASSEMBLY WAS REMOVED FROM BOOSTER ENGINE 1 WHEN WAS DISCOVERED THE UNIT WAS INCORRECTLY IDENTIFIED ON THE NAMEPLATE AS P/N 27-08550-7. FAILURE WAS CONFIRMED AS THE UNIT WAS ACTUALLY A 27-0 8550-9.							
CORRECTIVE ACTION-INSPECTION SUPERVISION CONCURRED WITH THE FINDINGS OF THIS ANALYSIS. THESE FINDINGS WERE RELATED TO SHOP AND INSPECTION PERSONNEL RESPONSIBLE FOR BOOSTER ACTUATOR ASSEMBLIES INFORMING THEM OF THE CONSEQUENCES OF T HIS IDENTIFICATION ERROR.							
HYDRAULIC-A/B BOOSTER	LV-99-04-4667F ACTUATOR	FAR 27-08550-9	351D 640211	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	093033
FAILURE MODE - OUT OF SPECIFICATION. INCORRECT NAME PLATE IDENTIFICATION OF 27-08550-7 WHEN PART ACTUALLY WAS A 27-08550-9. INCORRECT SERVO CYLINDER WAS INSTALLED ON MISSILE 351D. NAME PLATE HAD BEEN REPLACED AT THE PRODUCT SUPPORT CENTER AND THEN APPROVED BY THEIR INSPECTION.							
CORRECTIVE ACTION - CONFIRMED FAILURE. RAR LV-90-04-3681 RECOMMENDED THAT PRODUCT SUPPORT CENTER PERSONNEL BE REORI ENTATED IN SERVO CYLINDER DASH NUMBER IDENTIFICATION AND THAT QUALITY CONTROL BE IMPROVED SO DISCREPANT PARTS ARE NO T USED. MEMO 143-78-20-64 RECEIVED ON DATE 640328 DOCUMENTS THIS DATA.							
HYDRAULIC-A/B BOOSTER	A-98-10-237-F BOOSTER HYDRAULIC TANK	FAR 27-08581-3	137F 640210	ETR	YES NO	BENDIX MFG. 0903	090490
FAILURE MODE-CONTAMINATION. UNIDENTIFIABLE LIQUID FOUND ON INSIDE AND OUTSIDE OF PART,(4 UNITS).							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ADVIZED COGNIZANT PERSONNEL THAT FLUID WAS MIL-H-6083 USED AS A PROTE CTIVE FLUID.							
HYDRAULIC-A/B BOOSTER	A-98-04-4742F SERVOCYLINDER SPRING	FAR 27-08550-9	9E 640210	11	YES NO	HYDRAULIC RESE ARCH 104700-9	
FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR EXCESSIVE NULL FEEDBACK VOLTAGE. FAILURE ATTRIBUTED TO A NULL SHIF T IN THE SERVOVALVE. CAUSED BY A HYDRAULIC IMBALANCE. THIS RESULTED FROM A BENT FEEDBACK SPRING, CAUSED BY A SEVERE BUMP OR JOLT FROM AN UNKNOWN SOURCE.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							002790
CORRECTIVE ACTION-NONE. CURRENT VALVES ARE CONFIGURED TO PREVENT THE PROBLEM ENCOUNTERED WITH THIS UNIT.							
HYDRAULIC-A/B BOOSTER	LV-9D-04-4707-F ACTUATOR	FAR 27-08550-7	2060 640129	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	005007
FAILURE MODE-LEAK EXTERNAL. BOOSTER TWO PITCH ACTUATOR WAS REJECTED FOR LEAKAGE AROUND PISTON SHAFT GLAND. THE FAIL URE WAS NOT CONFIRMED.							
CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	A-9B-04-4691-F ACTUATOR O-RING	FAR 27-08550-9	9E 640127	ETR	YES NO	HYDRAULIC RESE ARCH 104700-9	003950
FAILURE MODE-EXTERNAL LEAK. THIS BOOSTER SERVOCYLINDER REPORTEDLY LEAKED HYDRAULIC FLUID PAST THE PISTON GLAND WHIL E AT STATIC PRESSURE. ANALYSIS CONFIRMED THE FAILURE AND ATTRIBUTED IT TO A SLIGHTLY HARD AND INELASTIC O-RING.							
CORRECTIVE ACTION-VENDOR WAS INFORMED OF THIS ANALYSIS.							
HYDRAULIC-A/B BOOSTER	27-2975 HYDRAULIC PUMP	UTP-PET 27-08568-1	640117	CONVAIR	YES NO	VICKERS AA-60694-R-2A	007013
FAILURE MODE-CONTAMINATION. PART S/N 301-0364 FAILED TO MEET CASE DRAIN LEAKAGE REQUIREMENTS OF 0.6 GPM. DURING LIF E TEST, FAILURE INVESTGATION REVEALED CONTAMINATION.							
CORRECTIVE ACTION-REF. FR 654-2-142. FAILURE INVESTIGATION SHOWED THAT CONTAMINATED HYDRAULIC OIL CAUSED THE WEAR R ESULTING IN THE LEAKAGE, THE CONTAMINATION WAS CORRECTED BY WEEKLY CLEANLINESS CHECKS.							
HYDRAULIC-A/B BOOSTER	27-3263 ACCUMULATOR-O-RING	UTP-PET 27-08554-3	640116	CONVAIR	YES NO	PEACOCK 81310-36	
FAILURE MODE-LEAK. AT THE COMPLETION OF THE TEMPERATURE CYCLING AND ENDURANCE WITH THE TEMPERATURE AT 180 DEGREE F, THE HYDRAULIC OIL LEAKAGE ACROSS THE PISTON O RING MEASURED BY DRAINING THROUGH THE GAS PORT WAS 232 ML. ALLOWABLE MAX. LEAKAGE IS 12.0 CAUSED BY MFG. PROCESS AND QUALITY CONTROL. REF. FPR NR F-500557 FRR FR 654-2-206 S/N 311-1119							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1988

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-CARR-F-5085-BC-2- TO INITIATE A STOP ORDER AND SURVEY OF ACCUMULATORS CONTAINING AN 6227 O RINGS. AN ECP PRESENTATION TO CUSTOMER WAS TO RECOMMEND MORE REALISTIC LEAKAGE RATES.							097000
HYDRAULIC-A/B BOOSTER	A-A9-04-4644-F SERVOVALVE-BOOSTER ACTUATOR ASSY.	FAR 27-08550-9	78E 040100	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	097199
FAILURE MODE-CONTAMINATION-DURING A RUN OF PROCEDURE 27-98481-9, THE ACTUATOR ASSY. WAS FOUND TO BE OUT OF TOLERANC E. SERVO VALVE NULL CURRENT VALUES DID NOT MEET THE REQUIREMENT OF MAPCHE. THE NULL SHIFT IS ATTRIBUTED TO METALLIC PARTICLES BETWEEN THE ARMATURE AND THE TORQUE MOTOR POLE PIECES. THIS CONDITION WAS CAUSED DURING INITIAL ASSEMBLY A ND CLEANING AT THE VENDOR. CORRECTIVE ACTION-VENDOR CORRECTIVE ACTIONS ARE, A VISIBLE MOISTURE INDICATOR WAS INCORPORATED IN THEIR DRY AIR LIN ES TO SUPPLEMENT THEIR TWICE DAILY MOISTURE DRAINING PROCEDURE. TORQUE MOTOR HOLDDOWN SCREWS WERE REDESIGNED TO ELIM INATE THE NEED FOR LOCKWIRING. LOCKWIRE IS CONSIDERED AN ADDITIONAL SOURCE OF CONTAMINATION.							
HYDRAULIC-A/B BOOSTER	A-A9-04-4644F ACTUATOR-SERVOVALVE	FAR 27-08550-9	78E 040100	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	093030
FAILURE MODE-CONTAMINATION LEAD TO OUT OF TOLERANCE CONDITION. ACTUATOR ASSEMBLY NULL CURRENT EXCEEDED SPECIFICATIO N MAXIMUM. THE NULL SHIFT IS ATTRIBUTED TO METALLIC PARTICLES BETWEEN THE ARMATURE AND THE TORQUE MOTOR POLE PIECES. SOURCE OF PARTICLES WAS VENDOR INITIAL ASSEMBLY AND CLEANING. CORRECTIVE ACTION - FAILURE CONFIRMED. VENDOR REVIEWED TORQUE MOTOR SUBASSEMBLY PROCEDURES AND FOUND THAT MOISTURE IN THE DRYING AIR WAS PRIME SOURCE FOR THE RUST. VENDOR INSTALLED A VISIBLE MOISTURE INDICATOR IN THEIR DRY AIRLINES . TORQUE MOTOR HOLD DOWN SCREWS WERE REDESIGNED TO ELIMINATE NEED FOR LOCK WIRING. LOCK WIRE IS CONSIDERED AN ADDED SOURCE OF CONTAMINATION.							
HYDRAULIC-A/B BOOSTER	A-99-04-4647-F ACTUATOR ASSEMBLY, TORQUE MOTOR	FAR 27-08550-9	78E 040100	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	097197
FAILURE MODE-CONTAMINATION-ACTUATOR ASSY REPORTEDLY DROVE THE BOOSTER NUMBER 2 ENGINE TO EXTREME POSITIVE PITCH WHI LE HYDRAULIC PRESSURE WAS APPLIED TO THE SYSTEM. FAILURE WAS CAUSED BY A LARGE METALLIC CONTAMINANT PARTICLE BLOCKIN G THE TORQUE MOTOR ARMATURE. THE RED CONTAMINANT MATERIAL WAS AN OXIDE THAT PROBABLY FORMED BECAUSE OF MOISTURE DEPO SITS ON THOSE SURFACES. CORRECTIVE ACTION-VENDER PLACED MORE POSITIVE MOISTURE CONTROLS ON THE COMPRESSED AIR SUPPLY USED FOR FINAL TORQUE MOTOR CLEANING. VENDER CHANGED THE TORQUE MOTOR MAGNET AND POLE PIECE FASTENERS FROM SLOTTED-HEAD SCREWS TO EXTERNAL HEX-HEAD SCREWS, EFFECTIVE FOR ALL ORDERS AFTER DECEMBER OF 1983.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-SS-04-4647F BOOSTER ACTUATOR, SERVO VALVE	FAR 27-08550-9	76E 640108	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	693020

FAILURE MODE-CONTAMINATION. SERVO CYLINDER ACTUATOR MOVED HARD TO EXTREME POSITION EACH TIME HYDRAULIC PRESSURE WAS APPLIED, AND DID NOT RESPOND TO COMMAND SIGNALS. A LARGE METALLIC FOREIGN PARTICLE BLOCKED THE TORQUE MOTOR ARMATURE. A RED CONTAMINANT, AN OXIDE, WAS ON BOTH THE ARMATURE AND THE POLE PIECE. THE OXIDE PROBABLY FORMED DUE TO MOISTURE DEPOSITS ON THESE SURFACES. COMPRESSED AIR USED DURING FINAL CLEANING OF THE TORQUE MOTOR AIR GAP MAY HAVE BEEN THE SOURCE OF MOISTURE.

CORRECTIVE ACTION - FAILURE CONFIRMED. HYDRAULIC RESEARCH ADDED VISUAL MOISTURE INDICATORS TO THE COMPRESSED AIR SUPPLY LINES. WHEN MOISTURE IS INDICATED THE SYSTEM IS SHUT DOWN, BLED AND RECHECKED BEFORE FURTHER USE. VENDOR ALSO CHANGED THE TORQUE MOTOR MAGNET AND POLE PIECE FASTENERS FROM SLOTTED HEAD SCREWS TO EXTERNAL HEX HEAD SCREWS, EFFECTIVE ALL ORDERS AFTER DECEMBER 1963.

HYDRAULIC-A/B BOOSTER	69F-3268.1 ACCUMULATOR	UTP-PET 27-08587-3	640103	CONVAIR	YES NO	BENDIX 3057973	697065

FAILURE MODE-OUT OF TOLERANCE. DURING PET 225 DEGREES, TEMPERATURE TEST, THE PISTON FAILED TO BREAKAWAY WITH THE REQUIRED 30 PSIG (MAX.) APPLIED TO THE FLUID PORT. THE PRESSURE REQUIRED FOR BREAKAWAY AND TRAVEL VARIED BETWEEN 35.8 AND 50 PSIG. DISASSEMBLY REVEALED THAT PISTON O-RING WAS PINCHED. TEST SPECIMEN 307-0662. REFER TO FRR 120.

CORRECTIVE ACTION-SPEC. CHANGE TO CALL OUT NEW TYPE O-RING (AN 6227) AS PREFERRED ALTERNATE. LOTS 9 AND 10 REJECTED TO VENDOR FOR INCORPORATION OF NEW O-RINGS.

HYDRAULIC-A/B BOOSTER	69F-3268.1 ACCUMULATOR	UTP-PET 27-08587-3	631230	GD/C	YES NO	BENDIX 3057973	696019

FAILURE MODE-OUT OF TOLERANCE. DURING PET 225 DEGREES F TEMPERATURE TEST, THE PISTON FAILED TO BREAK AWAY WITH THE PRESSURE REQUIRED FOR BREAKAWAY AND TRAVEL VARIED FROM 38 TO 50 PSIG. DISASSEMBLY REVEALED THAT PISTON O-RING WAS PINCHED. TEST SPECIMEN 310-0706, REFER TO FRR 120.

CORRECTIVE ACTION-SPEC. CHANGE TO CALL OUT NEW TYPE O-RING (AN 6227) AS PREFERRED ALTERNATE. LOTS 9 AND 10 REJECTED TO VENDOR FOR INCORPORATION OF NEW O-RINGS.

HYDRAULIC-A/B BOOSTER	69A191E HYDRAULIC FLEX HOSE ASSY.	UTP-SLT 27-08582-5	631227	CONVAIR	YES NO	RESISTOFLEX R21325	

FAILURE MODE-LEAK-EXTERNAL. AFTER COMPLETION OF ALL PRT AND SLT TESTS, THE BURST TEST WAS PERFORMED ON THE UNIT. DURING THIS TEST AT 9000PSIG OIL LEAKED FROM AROUND THE END FITTING SLEEVE AT THE RATE OF 83CC/MIN. REQ. IS ZERO LEAKAGE. REF. FPR NR F-40988T S/N 207-1293.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							007866
CORRECTIVE ACTION-NONE. UNIT TESTED FAR IN EXCESS OF LEVELS EXPERIENCED DURINGFLIGHT. REF. FR 654-2-105.							
HYDRAULIC-A/B BOOSTER	69A1910.2 HYDRAULIC PUMP	UTP-SLT 27-08566-1	631216	CONVAIR	YES NO	VICKERS AA-60694-R-2A	007814
FAILURE MODE-OUT OF SPECIFICATION. PEAK TRANSIENTS WERE 4230 PSIG. MAX ALLOWABLE 4000 PSIG. THERE WAS LEAKAGE OF 1 DROP PER 5 MINUTES AT INLET FITTING WHERE SEPARATION OCCURRED BETWEEN FERROUS FITTING AND ALUMINUM CASTING. NOTED DU RING SLT TEMP-UIN TEST AXIS III 7.1.3 PART S/N 201-0289 FPR4095.							
CORRECTIVE ACTION-ECP 7669 SUBMITTED TO CHANGE SPECIFICATION TRANSIENT REQUIREMENTS. OIL LEAKAGE WAS DUE TO FATIGUE FAILURE. FR 654-2-080, SUPPLEMENTS A AND B.							
HYDRAULIC-A/B BOOSTER	27A2975 HYDRAULIC PUMP	UTP-PET 27-08566-1	631213	CONVAIR	YES NO	VICKERS INC. AA-60694-R-2A	007812
FAILURE MODE-STRUCTURAL-CRACKS IN MOUNTING BASE CAUSED BY FATIGUE STRESS DUE TO EXCESSIVE VIBRATION, RESULTED IN HY DRAULIC LEAKAGE RATE 1 DROP IN 5 MINUTES. PART S/N 301-0397 FPR 5036.							
CORRECTIVE ACTION-STOP TEST. FAILURE DUE TO FATIGUE. REF. FR 654-2-080, SUPPLEMENTS A AND B. LOT 12 ACCEPTED.							
HYDRAULIC-A/B BOOSTER	NE-A9-04-4600-F ACTUATOR - BOOSTER ADJUSTMENT NUT	FAR 27-08550-7	2480 631212	FACTORY	YES NO	HYDRAULIC REDE ARCH 104700-1	000002
FAILURE MODE - LEAK EXTERNAL - HYDRAULIC OIL WAS FOUND DRIPPING FROM THE LENGTH ADJUSTMENT NUT OF THE ACTUATOR. THE REPORTED FAILURE WAS NOT CONFIRMED.							
CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.							
HYDRAULIC-A/B BOOSTER	LV-90-10-220-F ACCUMULATOR SERVICING MANIFOLD	FAR 27-05305-8	3500 631211	WTR	YES NO	GD/C	000824
FAILURE MODE-LEAK EXTERNAL. DUE TO MISALIGNMENT OF THREADS AND THE BLEED PORT HOLE.							
CORRECTIVE ACTION-MANIFOLDS ARE NO LONGER PURCHASED ITEMS. SURVEILLANCE ON MANIFOLD WILL BE INCREASED.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-99-04-4596-F BOOSTER TRANSDUCER	FAR 27-08550-7	248D 631211	FACTORY	NO NO	HYDRAULIC RESE ARCH 104700-1	000066

FAILURE MODE-OUT OF SPECIFICATION-THE BOOSTER 2 PITCH SERVOCYLINDER STATIC GAIN WAS 9 PERCENT BELOW BOOSTER 1 PITCH STATIC GAIN AND 7 PERCENT BELOW NOMINAL. REPORTED FAILURE WAS NOT CONFIRMED.

CORRECTIVE ACTION-SHOP PERSONNEL WERE INFORMED OF THE FINDINGS OF THIS REPORT, EXPLAINING THAT THE REPORTED FAILURE WAS CAUSED BY MISREADING OF OPTICAL DATA IN SIGHTING THE DEFLECTION OF BOOSTER ENGINE 2 OF MISSILE 248D ON DECEMBER 11, 1963.

HYDRAULIC-A/B BOOSTER	69F1910.2 HYDRAULIC PUMP	UTP-SLT 27-08566-1	631206	CONVAIR	YES NO	VICKERS INC. AA-60694-R-2A	097011

FAILURE MODE-STRUCTURAL. DURING ENVIRONMENTAL CONDITIONS-THIRD AXIS OF SLT VIBRATION, PUMP CASE CRACKED AT MOUNTING PLATE STUDS. CAUSED BY EXCESSIVE VIBRATION TIME. PART S/N 201-0289 FPR-4078.

CORRECTIVE ACTION-NO RECOMMENDED ACTION. FR 654-2-080.

HYDRAULIC-A/B BOOSTER	A-9D-10-233-C B-NUT HYDRAULIC FLEXHOSE	FAR 27-08600-47	61E 631204	WTR	YES NO	RESISTOFLEX R21225-47	000522

FAILURE MODE-STRUCTURAL-B-NUT SPLIT LONGITUDINALLY THROUGH ONE FLAT.

CORRECTIVE ACTION-NONE. FAILURE ANALYSIS CANCELED. MISSILE 61E PART OF E-UPDATE PROGRAM-NO CONTRACTUAL COVERAGE.

HYDRAULIC-A/B BOOSTER	LV-9D-10-232-F HYDRAULIC FLEXHOSE, B-NUT	FAR 27-08571-68	227D 631203	WTR	YES NO	AERCQUIP 677028-8-0130	000523

FAILURE MODE-LEAK EXTERNAL. LEAKAGE AT END FITTING REPORTED.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C RECOMMENDED THAT HYDRAULIC FLEXHOSES SUSPECTED OF LEAKAGE BE MONITORED TO VERIFY LEAKAGE PRIOR TO REMOVAL.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	LV-9D-04-4604-F BOOSTER ACTUATOR ASSEMBLY, SERVO V ALVE	FAR 27-06550-7	3500 631129	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	090061
FAILURE MODE-DRIFT-DURING THE THIRD DPL OF MISSILE 350-D THE LANDLINE READINGS OF THE 4-HOURS HOLD AFTER LOADING IN DICATED BOOSTER 1 ENGINE WAS DRIFTING OFF THE NULL POSITION. REPORTED FAILURE WAS NOT CONFIRMED DURING FAILURE ANALY SIS TESTING. CORRECTIVE ACTION-MISSILE 350-D IS BEING RECYCLED AT GD/C. SEVERAL CHECKOUTS OF THE AUTOPILOT SYSTEM WILL BE MADE. MISSILE 350D WAS 157D.							
HYDRAULIC-A/B BOOSTER	69F-1918-1 ACCUMULATOR-O-RING	UTP-SLT 27-06587-3	631127	CONVAIR	YES NO	BENDIX 3057973	097031
FAILURE MODE-OUT OF TOLERANCE. DURING SLT-TEMP-VIBRATION TEST, INTERNAL HYDRAULIC LEAKAGE OF APPROXIMATELY 1/2 CC P ER HOUR WAS NOTED (NO LEAKAGE ALLOWED). TEST SPECIMEN 201-0108, REFER TO FRR 120. FAILURE DUE TO O-RING. CORRECTIVE ACTION-SPEC. CHANGE WAS INITIATED TO CALL OUT NEW TYPE O-RING (AN6227) AS PREFERRED ALTERNATE. LOTS 9 AN D 10 REJECTED TO VENDOR FOR INCORPORATION OF NEW O-RINGS.							
HYDRAULIC-A/B BOOSTER	A-99-04-4509-F ACTUATOR-O-RING	FAR 27-06550-9	5E 631127	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	092071
FAILURE MODE-LEAK (EXTERNAL). THE BOOSTER ACTUATOR ASSEMBLY REPORTEDLY FAILED AT THE GD/C FACTORY DURING TESTING OF VEHICLE 5E. THE FAILURE WAS DUE TO A HYDRAULIC LEAK AT STATIC CONDITIONS. THE FAILURE WAS CONFIRMED AND RESULTED FR OM A CUT AREA IN THE O-RING. CORRECTIVE ACTION-THE VENDOR INSTALLED BETTER QUALITY CONTROL FOR LEAKAGE BY REINSTRUCTING ASSEMBLY PERSONNEL IN TH E CORRECT METHOD OF INSTALLING COMPONENTS CONTAINING O-RINGS.							
HYDRAULIC-A/B BOOSTER	27C-3155 VALVE-SAFETY RELIEF	UTP-PET 27-06561-1	631126	CONVAIR	YES NO	BENDIX-PANTEX 9050	097170
FAILURE MODE-OUT OF TOLERANCE. DURING PET HIGH TEMPERATURE. (PLUS 225 DEGREES F) TEST INTERNAL LEAKAGE WAS 8.4, 7.0 CC/MIN. (SPECIFICATION MAXIMUM 18 CC/MIN.) NO LEAKAGE AT AMBIENT TEMPERATURE. TEST SPECIMEN NUMBER 310-0421, LOT NU MBER 4, REFER TO FRR NUMBER 067. CORRECTIVE ACTION-SPECIFICATION CHANGED TO ALLOW MORE LEAKAGE.							

GENERAL DYNAMICS
CONVAIR DIVISION

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	69A1910.2 HYDRAULIC PUMP	UTP-PRT 27-08566-1	631126	60/C	YES NO	VICKERS AA-60694-R-2A	006000
FAILURE MODE-OUT OF SPECIFICATION. ENVIRONMENTAL CONDITIONS-INITIAL PROOF CYCLE PRESSURE READINGS TO 4560 PSIG WERE RECORDED, ALLOWABLE PRESSURE IS 4000 PSIG. PART S/N 201-0299 FPR-4060. CORRECTIVE ACTION-SPECIFICATION CHANGE TO REVISE TEST SETUP. ECP 7669 SUBMITTED FR 654-2-060, SUPPLEMENT B.							
HYDRAULIC-A/B BOOSTER	A-A9-04-4556-F ACTUATOR/BOOSTER SERVO CYLINDER ASSEMBLY	FAR 27-08550-7	631126	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	002400
FAILURE MODE-OUT OF SPECIFICATION. THE BOOSTER ACTUATOR ASSEMBLY LEAKED HYDRAULIC FLUID. THIS FAILURE WAS CAUSED BY INSTALLATION OF AN UNDERSIZED O-RING WHEN THE SERVOCYLINDER WAS ASSEMBLED. CORRECTIVE ACTION-PERSONNEL RESPONSIBLE AT THE VENDORS FACILITIES WERE MADE AWARE OF THE IMPORTANCE OF CORRECT O-RING INSTALLATION.							
HYDRAULIC-A/B BOOSTER	27C-3151 VALVE-SAFETY RELIEF	UTP-PET 27-08561-1	631121	CONVAIR	YES NO	VINSON MFG. A-80282	097171
FAILURE MODE-OUT OF TOLERANCE. DURING PET-LOW TEMPERATURE (-30 DEGREES F) TEST, THE RATED FLOW DIFFERENTIAL PRESSURE WAS 3835, 3870, AND 3875 PSID (SPECIFICATION IS 3810 PSID MAXIMUM). TEST SPECIMEN NUMBER 205-0305. LOT NUMBER 11. CORRECTIVE ACTION-ALL UNITS OF LOT NUMBER 13 REJECTED BACK TO VENDOR.							
HYDRAULIC-A/B BOOSTER	LV-9D-10-227-F BOOSTER HYDRAULIC ACCUMULATOR	FAR 27-08554-3	227D 631112	WTR	YES NO	PEACOCK 51310-3	000520
FAILURE MODE-LEAK INTERNAL. LEAKED GAS FROM PNEUMATIC SIDE OF INTERMEDIATE PISTON DUE TO INTERNAL BORE PLATING DEFECTS. CORRECTIVE ACTION-WITH SERIAL NUMBER 403-1130, ALL ACCUMULATORS TO BE MADE FROM SOLID STOCK. PLATING SOURCE ADVISED TO COMPLY WITH CLEANING OF BORE AFTER PLATING. INSPECTION METHODS WERE IMPROVED.							

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HYDRAULIC-A/B BOOSTER	69A1910 HYDRAULIC PUMP	UTP-PRT 27-08566-1	631112	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097000
FAILURE MODE-STRUCTURAL-PUMP CASE CRACKED DUE TO ENVIRONMENTAL CONDITIONS-THIRD AXIS VIBRAION SWEEP OF PRT OPERATIN G AT 3000 PSIG, 3750 RPM, 23 GPM OUTPUT. VIB. SWEEP WAS AT 450 CPS. PART S/N 200-0374 FPR-4067.							
CORRECTIVE ACTION-REDUCED PRT VIBRATION TESTING REQUIREMENTS CONSISTANT WITH SPECIFICATION. REF. FR 654-2-050.							
HYDRAULIC-A/B BOOSTER	SLV-99-04-4502-F ACTUATOR O-RING	FAR 27-08550-7	7101 631112	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000034
FAILURE MODE-EXTERNAL LEAK. THE BOOSTER SERVOCYLINDER ASSEMBLY FAILED AT GD/C FACTORY DURING THE TESTING. THE SERVO CYLINDER REPORTEDLY LEAKED HYDRAULIC FLUID WITH LITTLE OR NO PRESSURE APPLIED. FAILURE RESULTED FROM A CUT AREA ON O -RING. THE CUT MOST LIKELY OCCURRED WHEN THE O-RING AND FLOW-LIMITER PLUG ASSEMBLY WERE INSERTED INTO THE FLOW-LIMIT ER SECTION OF THE SERVOCYLINDER.							
CORRECTIVE ACTION-NEW O-RING WAS INSTALLED, AND AFTER 30 HOURS OF STATIC TESTING WITH HYDRAULIC FLUID AT 20 PSIG, N O LEAKAGE OCCURRED. TO PREVENT FUTURE PROBLEMS, HYDRAULIC RESEARCH ASSEMBLY PERSONNEL WERE REINSTRUCTED IN THE CORRE CT METHOD OF INSTALLING COMPONENTS CONTAINING O-RINGS.							
HYDRAULIC-A/B BOOSTER	LV-JA-04-4503-F ACTUATOR ASSEMBLY	FAR 27-08550-7	1720 631111	FACTORY	NO NO	HYDRAULIC RESE ARCH 104700-1	000007
FAILURE MODE-FAIL DURING OPERATION. THE BOOSTER ACTUATOR ASSEMBLY REPORTEDLY FAILED AT THE GD/C PRODUCT SUPPORT CEN TER DURING PRELIMINARY CHECKOUT (PRIOR TO FINAL CHECKOUT OF VEHICLE 1720). THE ACTUATOR ASSY. REPORTEDLY REACTED IN THE OPPOSITE DIRECTION TO THE INPUT SIGNAL. SUBSEQUENT TESTING FAILED TO REVEAL ANY DISCREPANCIES. THE ERROR WAS CAU SED BY THE MISUSE OF THE TEST EQUIPMENT AT THE PRODUCT SUPPORT CENTER.							
CORRECTIVE ACTION-APPROPIATE PERSONNEL AT THE PRODUCT SUPPORT CENTER WERE INFORMED OF THE ERROR. THE ACTUATOR ASSY. WAS RETURNED TO THE PRODUCT SUPPORT CENTER FOR REEVALUATION OF THIS PHASE OF TEST.							
HYDRAULIC-A/B BOOSTER	SLV-99-220-F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	00-0000-1 631100	FACTORY		PEACOCK 51310-3	000007
FAILURE MODE-LEAK INTERNAL. PNEUMATIC PRECHARGE PRESSURE DROP.							
CORRECTIVE ACTION-GD/C REVIEWED O-RING SEAL PROBLEMS. GD/C RECOMMENDED REMOVAL OF ACCUMULATOR FROM HYDRAULIC SYSTEM -DID NOT RECEIVE CUSTOMER APPROVAL.							

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HYDRAULIC-A/B BOOSTER	LV-9D-222-F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	227D 631100	WTR		PEACOCK 51310-3-6	990112
FAILURE MODE-LEAK INTERNAL-LEAKED GAS FROM PNEUMATIC TO HYDRAULIC SIDE OF THE INTERMEDIATE PISTON.							
CORRECTIVE ACTION-ALL VENDOR STOCK REINSPECTED. ASSEMBLY AND INSPECTION PERSONEL ADVISED OF DIMENSIONAL DISCREPANCIES RESULTING FROM INSPECTION ERROR.							
HYDRAULIC-A/B BOOSTER	NZ-99-221-F MANUALLY OPERATED FLOW-CONTROL VALVE	FAR 27-08568-3	240D 631104	FACTORY	YES NO	STERER 12660	990505
FAILURE MODE-LEAK INTERNAL-DUE TO OUT OF ROUNDNESS OF THE VALVE POPPET SEAT AND NONE COMPLIANCE WITH BLUEPRINT.							
CORRECTIVE ACTION-VENDOR VERIFIED THAT PARTS IN STOCK MET BLUEPRINT REQUIREMENTS.							
HYDRAULIC-A/B BOOSTER	A-92-04-4498-F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-9	5E 631101	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-9	992039
FAILURE MODE-OUT OF TOLERANCE. THE BOOSTER SERVOCYLINDER FAILED WHEN THE NULL WAS FOUND TO BE OUT OF TOLERANCE. SUBSEQUENT TESTS RECORDED A STATIC CURRENT OF MINUS 0.03 MILLIAMPERE WITH AN IOC-TYPE AMPLIFIER. SPECIFICATION REQUIRES THE NULL TO BE 0 PLUS OR MINUS 0.2 MILLIAMPERE, HOWEVER, WHEN CHECKED WITH AN AIG-TYPE AMPLIFIER THE STATIC NULL CURRENT WAS OUT OF TOLERANCE AT MINUS 0.245 MILLIAMPERE.							
CORRECTIVE ACTION-SERVO VALUE NULL WILL BE CHECKED WITH AIG-TYPE SERVOAMPLIFIERS TO PREVENT FUTURE DISPARITY OF TEST EQUIPMENT. MODIFICATION ALSO INCLUDED TO ALLOWED RECEIVING-INSPECTION PERSONNEL TO ADJUST SERVO VALUE NULL WITH INPUT SIGNALS FROM AIG-TYPE SERVOAMPLIFIER.							
HYDRAULIC-A/B BOOSTER	LV-A9-10-212-F HYDRAULIC FLEXHOSE	FAR 27-08571-49	216D 631031	FACTORY	YES NO	AEROQUIP 666930-8-0140	990124
FAILURE MODE-LEAK EXTERNAL-OCCURRED AT THE BRAID AND SOCKET JUNCTION OF THE ACTUATOR END FITTING.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. QUESTIONABLE FLEXHOSES TO BE WIPED CLEAN AND WATCHED CLOSELY TO VERIFY THAT LEAKAGE ACTUALLY EXISTS.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-JA-04-4433-F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-08590-7	631027	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000030
FAILURE MODE-OUT OF TOLERANCE. SERVOVALVE WOULD NOT NULL, AND WHEN SET AT THE MIDPOINT, NULL WOULD DRIFT. FAILURE WAS CAUSED BY RESTRICTION OF THE C-8 FIRST STAGE PRESSURE DROPPING ORIFICE, PROBABLY CAUSED BY CONTAMINANTS. CONTAMINANTS IN THIS AREA MUST HAVE BEEN ASSEMBLED INTO THE SERVO VALVE SINCE THEY WERE TOO LARGE TO PASS THROUGH A 50-MICRON FILTER PROTECTING THE ORIFICES.							
CORRECTIVE ACTION-25 SERVOCYLINDERS READY FOR SHIPMENT TO GD/C WERE COMPLETELY DISASSEMBLED AND EXAMINED FOR CONTAMINANTS. SERVOVALVE ASSEMBLY AND TEST OPERATIONS WERE MOVED INTO A SUPER CLEAN ROOM. GD/C CLEAN ROOM PROCEDURES WERE INCORPORATED FOR USE ON THE SERVOVALVE AT VENDORS PLANT.							
HYDRAULIC-A/B BOOSTER	A-A9-10-216-F HYDRAULIC FLEXHOSE	FAR 27-08571-47	233D 631022	FACTORY	YES NO	AEROQUIP 677025-8-0140	000116
FAILURE MODE-LEAK EXTERNAL-LEAKED AT ONE HALF TO ONE INCH FROM END FITTING.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED-NO FURTHER ACTION.							
HYDRAULIC-A/B BOOSTER	A-A9-10-214-F HYDRAULIC FLEXHOSE	FAR 27-08571-40	631022	FACTORY	YES NO	AEROQUIP 666939-8-0140	000121
FAILURE MODE-LEAK EXTERNAL-LEAKED AT ONE HALF INCH FROM END-FITTING.							
CORRECTIVE ACTION-CUTTING BLADES AND COOLING FLUIDS USED IN ASSEMBLY OPERATIONS WERE REDESIGNED IN DECEMBER, 1963.							
HYDRAULIC-A/B BOOSTER	27A-2913 VALVE-SAFETY RELIEF	UTP-PET 27-08591-1	631018	CONVAIR	YES NO	VINSON MFG. A-80282	007033
FAILURE MODE-OUT OF TOLERANCE. DURING PEI LIFE TEST, THE LEAKAGE AT 95 PERCENT REBEAT PRESSURE WAS 12.0,3.0, AND 10.0 CC/MIN. (SPEC. 15 SCC/MIN.).TEST SPECIMEN 302-0325.							
CORRECTIVE ACTION-ALL UNITS OF LOT 18 WERE REJECTED.							

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HYDRAULIC-A/B BOOSTER	27A2975.2 HYDRAULIC PUMP	UTP-PET 27-08869-1	631010	CONVAIR	YES NO	VICKERS AA-80694-R-2A	097080
FAILURE MODE-OUT OF SPECIFICATION. ENVIRONMENTAL CONDITIONS-IAT PEAK TRANSIENT PRESSURES OF 4100 PSIG, 4130 PSIG, 4 800 PSIG AND 4470 PSIG WERE RECORDED DURING IAT. THE MAX ALLOWABLE PRESSURE WAS 4000 PSIG. PART S/N 301-0397 FPR-503 3.							
CORRECTIVE ACTION-REVISE THE SPECIFICATION TO CHANGE THE TEST SETUP. ECP 7869 SUBMITTED, FR 654-2-080, SUPPLEMENT 8 .							
HYDRAULIC-A/B BOOSTER	A-99-04-4493-F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-7	243D 631009	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	095756
FAILURE MODE-LEAK EXTERNAL. BOOSTER ACTUATOR ASSY(S/N 205-1935) LEAKED HYDRAULIC FLUID THROUGH PISTON ROD WHILE PRE SSURE RANGED BETWEEN 2000 AND 3000 PSIG. (OPERATING PRESSURE 3000 PSIG). FAILURE NOT CONFIRMED. STATIC LEAKAGE DID N OT EXCEED ALLOWABLE LEAKAGE SPECIFIED. (MAXIMUM ALLOWED LEAKAGE IS 1 DROP IN 25 FULL-STOKE OPERATING CYCLES).							
CORRECTIVE ACTION-THE VENDOR (HYDRAULIC RESEARCH) WAS REQUESTED TO INSTALL BETTER QUALITY CONTROL IN SELECTING O-RI NGS, AND GDC RECEIVING WAS NOTIFIED THAT ALL O-RINGS RECEIVED MEET THE REQUIREMENTS OF MIL-P-25732.							
HYDRAULIC-A/B BOOSTER	A-99-04-4491-F BOOSTER ACTUATOR ASSEMBLY-O-RING	FAR 27-08550-7	243D 631009	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	092429
FAILURE MODE-LEAK EXTERNAL. BOOSTER SERVOCYLINDER (S/N 205-3558) LEAKED HYDRAULIC FLUID THROUGH THE PISTON ROD WHIL E THE PRESSURE RANGED BETWEEN 2000 AND 3000 PSIG (OPERATING PRESSURE 3000 PSIG). THE FAILURE RESULTED FROM O-RINGS T OO HARD TO GIVE A GOOD DYNAMIC HYDRAULIC SEAL. SPECIFICATIONS REQUIRES A MINIMUM HARDNESS OF SHORE-A85, WITH NO MAXI MUM VALUE STIPULATED. IT WAS FOUND THAT THE SEAL EFFICIENCY WAS POOR AT HARDNESSES ABOVE SHORE A-72. O-RINGS USED AR E PURCHASED WITH A SHORE-A DUROMETER VALUE OF 68 PLUS OR MINUS 3. THE MINIMUM ALLOWABLE PERCENTAGE ELONGATION IS 160 PERCENT PER MIL-P-25732.							
CORRECTIVE ACTION-THE VENDOR (HYDRAULIC RESEARCH) WAS REQUESTED TO INSTALL BETTER QUALITY CONTROL IN SELECTING O-RI NGS, AND GDC RECEIVING WAS NOTIFIED THAT ALL O-RINGS RECEIVED MEET THE REQUIREMENTS OF MIL-P-25732.							
HYDRAULIC-A/B BOOSTER	A-99-04-4491-F BOOSTER ACTUATOR ASSEMBLY-O-RING	FAR 27-08550-7	243D 631009	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-LEAK EXTERNAL. BOOSTER SERVOCYLINDER (S/N 205-3608) LEAKED HYDRAULIC FLUID THROUGH THE PISTON ROD WHIL E PRESSURE RANGED BETWEEN 2000 AND 3000 PSIG(OPERATING PRESSURE 3000 PSIG). THE FAILURE RESULTED FROM O-RINGS TOO HA RD TO GIVE A GOOD DYNAMIC HYDRAULIC SEAL. SPECIFICATION REQUIRES A MINIMUM HARDNESS OF SHORE-A 85, WITH NO MAXIMUM V ALUE STIPULATED. IT WAS FOUND THAT THE SEAL EFFICIENCY WAS POOR AT HARDNESSES ABOVE SHORE A-72. O-RINGS USED ARE PUR							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CHASED WITH A SHORE-A DUROMETER VALUE OF 68 PLUS OR MINUS 3. THE MINIMUM ALLOWABLE PERCENTAGE ELONGATION IS 160 PERC ENT PER MIL-P-25732. CORRECTIVE ACTION-THE VENDOR (HYDRAULIC RESEARCH) WAS REQUESTED TO INSTALL BETTER QUALITY CONTROL IN SELECTING O-RI NGS, AND GDC RECEIVING WAS NOTIFIED THAT ALL O-RINGS RECEIVED MEET THE REQUIREMENTS OF MIL-P-25732.							092420
HYDRAULIC-A/B BOOSTER	A-99-04-4493-F BOOSTER ACTUATOR ASSEMBLY	FAR 27-08550-7	2430 631000	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	092030
FAILURE MODE-LEAK EXTERNAL. BOOSTER ACTUATOR ASSEMBLY (S/N 209-3605) LEAKED HYDRAULIC FLUID THROUGH PISTON ROD WHIL E PRESSURE RANKED BETWEEN 2000 AND 3000 PSIG. (OPERATING PRESSURE 3000 PSIG). FAILURE NOT CONFIRMED. STATIC LEAKAGE DID NOT EXCEED ALLOWABLE LEAKAGE SPECIFIED. (MAXIMUM ALLOWED LEAKAGE IS 1 DROP IN 25 FULL-STROKE OPERATING CYCLES). CORRECTIVE ACTION-THE VENDOR (HYDRAULIC RESEARCH) WAS REQUESTED TO INSTALL BETTER QUALITY CONTROL IN SELECTING O-RI NGS, AND GDC RECEIVING WAS NOTIFIED THAT ALL O-RINGS RECEIVED MEET THE REQUIREMENTS OF MIL-P-25732.							
HYDRAULIC-A/B BOOSTER	69A1910 HYDRAULIC PUMP	UTP-PRT 27-08566-1	631001	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097067
FAILURE MODE-OUT OF SPECIFICATION. ENVIRONMENTAL CONDITIONS-PROOF PRESSURE TEST CASE DRAIN LEAKAGE EXCEEDED MAXIMUM ALLOWABLE (0.8 GPM) DURING PROOF PRESSURE TEST LEAKAGE AT 4000 PSI, 3210 RPM, WAS 0.626 GPM, 4000 PSI, 3750 RPM, W AS 0.637 GPM. PART S/N 208-0374 REFERENCE FPR-4048. CORRECTIVE ACTION-PRT TEST PROCEDURE REVISED TO CORRECT LEAKAGE CALLOUT FOR 3000 PSI OPERATING PRESSURE, PER SPECIF ICATION. FR 834-2-027, SUPPLEMENT A.							
HYDRAULIC-A/B BOOSTER	A-99-04-4428F ACTUATOR-BOOSTER,O-RING	FAR 27-08550-7	106-0 630930	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	096060
FAILURE MODE-LEAKING EXTERNAL-ACTUATOR WAS FOUND LEAKING HYDRAULIC FLUID FROM THE AFT END OF THE PISTON. THE SERVOC YLINDER ASSY FAILED DUE TO STATIC CONDITION HYDRAULIC LEAKAGE. THE STATIC AND THE DYNAMIC LEAKAGE WAS WITHIN SPECIFI CATION. LEAKAGE WAS ATTRIBUTED TO THE USE OF SUBSTANDARD O-RINGS. CORRECTIVE ACTION-100 PERCENT INSPECTION WAS INITIATED FOR O-RINGS USED IN SERVOCYLINDER ASSEMBLIES.							

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HYDRAULIC-A/B BOOSTER	27A2975 HYDRAULIC PUMP	UTP-PET 27-08566-1	630930	6D/C	YES NO	VICKERS AA-60694-R-2A	006605

FAILURE MODE-OUT OF TOLERANCE. ENVIRONMENTAL CONDITIONS-INITIAL PROOF CYCLE CASE DRAIN LEAKAGE SLIGHTLY OUT OF TOLE RANCE. THE LEAKAGE AT 4000 PSI WAS 0.69 GPM (MAX. ALLOWABLE, 0.60 GPM). PART S/N 301-0364 FPR-5026.

CORRECTIVE ACTION-REVISE PET PROCEDURE TO MEASURE LEAKAGE AT OPERATING PRESSURE (3000 PSI) NOT PROOF PRESSURE. REFE R TO FR 654-2-069.

HYDRAULIC-A/B BOOSTER	27A-2913 VALVE-SAFETY RELIEF	UTP-PET 27-08561-1	630927	CONVAIR	YES NO	VINSON MFG. A-80282	007038

FAILURE MODE-LEAK. DURING PET HIGH TEMP (PLUS 275 DEGREES F) TEST, INTERNAL LEAKAGE WAS EVIDENT DURING TWO RUNS. LE AKAGE WAS 4.0 AND 3.6 CC/MIN. (ALLOWABLE 3CC/MIN.). TEST SPECIMEN 302-0325.

CORRECTIVE ACTION-ALL UNITS OF LOT 15 WERE REJECTED.

HYDRAULIC-A/B BOOSTER	SP-9D-04-4413-F PISTON ROD-ACTUATOR-	FAR 27-08550-7	224-D 630924	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	007001

FAILURE MODE-LEAK EXTERNAL-THE SERVOCYLINDER ACTUATOR WAS REPORTEDLY LEAKING AROUND THE PISTON ROD. LEAKAGE WAS CAU SED BY A WORN O-RING DAMAGED BY THE SCORED PISTON ROD. THE PISTON ROD WAS SCORED BY A CHROMEPLATE PARTICLE BROKEN OF F THE ACTUATOR SHAFT THAT DISLODGED ITSELF FROM THE ROUGH PLATING EDGE NEAR THE PISTON.

CORRECTIVE ACTION-THE VENDER WAS INFORMED OF THE CAUSE OF THIS FAILURE, AND THE VENDER INSTALLED BETTER QUALITY CON TROL TO INSURE PISTON RODS ARE PROPERLY INSPECTED AND MACHINED BEFORE THEY ARE USED IN SERVOCYLINDER ACTUATOR ASSEMB LIES.

HYDRAULIC-A/B BOOSTER	A-9D-04-4424-F ACTUATOR-SERVO CYLINDER ASSY.	FAR 27-08550-9	48F 630921	WTR	NO YES	HYDRAULIC RESE ARCH 104700-9	006070

FAILURE MODE-OUT OF SPECIFICATION-AUTO PILOT CHECK PANEL ON SILO LEVEL 3 SHOWED THE FAILURE WAS AN ENGINE DISPLACEM ENT ERROR. TELEMETRY RECORDS REVEALED BOOSTER ENGINE 2 WAS PITCH HARD OVER. FAILURE NOT CONFIRMED. FAILURE WAS FOUND IN SERVO AMPLIFIER-SEE FAR-A-9D-04-4419

CORRECTIVE ACTION-NONE-NO ACTION ON SERVO- CYLINDER ACTUATOR ASSY. SEE FAR A-9D-04-4419 FOR CORRECTIVE ACTION ON SE RVO AMPLIFIER.

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HYDRAULIC-A/B BOOSTER	27A2975.1 HYDRAULIC PUMP	UTP-PET 27-08566-1	630910	CONVAIR	YES NO	VICKERS AA-60694-R-2A	097864
FAILURE MODE-OUT OF SPECIFICATION. INITIAL PROOF CYCLE TEST SPECIMEN FAILED TO REGULATE FROM NO FLOW TO FULL FLOW I N 0.05 SECONDS. TIME REQUIRED WAS 0.07 SECONDS. PART S/N 301-0364. REF. FPR 8038.							
CORRECTIVE ACTION-SPECIFICATION CHANGED TO CLEARLY DEFINE RESPONSE TIME AT FULL FLOW. ECP7660 SUBMITTED TO CUSTOMER . FR 634-2-080. SUPPLEMENT 9.							
HYDRAULIC-A/B BOOSTER	SP-98-10-210-F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	2630 630913	COMPLEX 12		PEACOCK 51310-3	090125
FAILURE MODE-LEAK INTERNAL-LEAKED GAS FROM PNEUMATIC TO HYDRAULIC SIDE OF THE INTERMEDIATE PISTON.							
CORRECTIVE ACTION-GD/C REPLACED MS28775 O-RINGS WITH AN 6227 O-RINGS.							
HYDRAULIC-A/B BOOSTER	69A1907.1 ACCUMULATOR-O-RING	UTP-PRT 27-08554-3	630910	CONVAIR	YES NO	PEACOCK 51310-3	096098
FAILURE MODE-TOLERANCE. DURING POST TEMPERATURE VIBRATION TEST HYDRAULIC OIL LEAKAGE ACROSS THE PISTON O RING WAS M EASURED AS 18 ML/HR. REQUIREMENT IS 0 ML. MAXIMUM. REF. S/N 203-0910.							
CORRECTIVE ACTION-NONE. TEST CONTINUED.							
HYDRAULIC-A/B BOOSTER	A-99-04-4429-F ACTUATOR, O-RING	FAR 27-08550-7	630829	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	096077
FAILURE MODE-LEAK EXTERNAL-DURING FILL-AND-BLEED PROCEDURE THE ACTUATOR WAS FOUND LEAKING HYDRAULIC OIL FROM THE SH AFT SEAL. LEAKAGE WAS CAUSED BY HARD INELASTIC O-RINGS. HOWEVER LEAKAGE RATES WERE WITHIN SPECIFICAIATION.							
CORRECTIVE ACTION-GD/C OBTAINED VENDER CORRECTIVE ACTION, FOR PREVENTING USE OF THE SUBSTANDARD O-RINGS BEFORE THIS REPORTED FAILURE. EFFECTIVE JULY 18, 1962 THE VENDER INSTITUTED RIGID QUALITY CONTROL ACTION TO PROHIBIT THE USE OF SUBSTANDARD O-RINGS. SERVO- CYLINDER ACTUATOR WAS MANUFACTURED IN JUNE 1962. ALSO SERVO CYLINDER ACTUATOR CAN NOT B E CONSIDERED A FAILURE.							

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HYDRAULIC-A/B BOOSTER	69F1911 VALVE, MANUAL OPERATED	UTP-PRT 27-08568-3	630623	CONVAIR	YES NO	STERER ENGR AN D MFG 12060	097085
FAILURE MODE-OUT OF SPECIFICATION. S/N 912 VALVE LEAKED INTERNALLY 150 ML/MIN DURING PRT HIGH TEMP TEST AXIS III. 3 000 PSIG AT OUTLET, 2950 AT INLET. DURING VIB. SWEEP AT 200 DEGREES F AT 100 CPS. CORRECTIVE ACTION-HYDRAULIC FLUID CHECKED 10 DAYS AFTER TEST AND FOUND TO BE CONTAMINATED. A RETEST WITH CLEAN HYDR AULIC FLUID WAS MADE WITH ZERO LEAKAGE MEASURED. REF. FR654-2-014.							
HYDRAULIC-A/B BOOSTER	P3-4CO-04-197 ACTUATOR	COMPOSITE-J FACT	197D 630623	13 140	YES NO		094110
FAILURE MODE-OUT OF SPECIFICATION. BOOSTER ENGINES OVERSHOT [illegible]ROLL AT BECO. ENGINES WERE MOVING NEGATIVE TO NULL. B1 OVERSHOOT, 20 PCT IBW. B2 OVERSHOOT, 4 PCT IBW. 0.50 SECOND REQUIRED FOR ENGINES TO RECOVER TO THE NULL POSITION. SYSTEM EFFECT-ERRATIC OPERATION. BOOSTER ENGINES OVERSHOT NULL IN YAW/ROLL AT BECO. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-INVESTIGATE. REPLACED SERVO VALVE.							
HYDRAULIC-A/B BOOSTER	69F1911 VALVE, MANUAL OPERATED	UTP-PRT 27-08568-3	630614	CONVAIR	YES NO	STERER ENGR AN D MFG 12060	097156
FAILURE MODE-OUT OF TOLERANCE. S/N 912 REGULATED FLOW SLOWLY RESPONSE TIME 0.5 SEC. SPECIFICATION LIMIT 0.1 SEC. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	69A1909-1 VALVE-SAFETY RELIEF	UTP-PRT 27-08570-1	630612	CONVAIR	YES NO	VINSON MFG. A-80133-1	097045
FAILURE MODE-OUT OF SPECIFICATION. DURING PRT VIBRATION TEST, INTERNAL LEAKAGE WAS 6000 CC/MIN. (SPEC. IS 15CC/MIN.). TEST SPECIMEN 205-0619, REFER TO FRR 003. CORRECTIVE ACTION-MINOR FAILURE, WITH NO SIGNIFICANCE ON FLIGHT, NO ACTION REQUIRED.							
HYDRAULIC-A/B BOOSTER	A-99-04-4388-F ACTUATOR-BOOSTER/SERVO VALVE	FAR 27-08550-7	183D 630610	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-OUT OF TOLERANCE. DURING MISSILE CHECKOUT, ACTUATOR WAS OUT OF NULL. FAILURE WAS CONFIRMED MOST PROBAB LY DUE TO SERVOVALVE FLAPPER DISTORTION. CAUSE OF FAILURE NOT DETERMINED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR WAS INFORMED OF FAILURE AND INCREASED QUALITY CONTROL MEASURES TO INSURE THAT SERVOVALVE F LAPPERS OF PROPER STRENGTH ARE USED IN SERVOCYLINDER ASSEMBLIES. VENDOR INITIATED ADDITIONAL TESTS ON SERVOVALVE FLA PPERS.							093990
HYDRAULIC-A/B BOOSTER	A-99-10-208F PNEUMATIC PRESSURE GAGE	FAR 27-08562-3	630607	GD/C LAB	NO NO	ROCHESTER GAGE 6903-719-1	090187
FAILURE MODE-OUT OF TOLERANCE- GAGE REPORTED OUT OF CALIBRATION DUE TO AN OUTMODED STANDARD PLUS OR MINUS PSI ALLOW ABLE ERROR BETWEEN RANGES 0 TO 3000 PSI.							
CORRECTIVE ACTION-NO FAILURE-GD/C REVISED CALIBRATION PROCEDURE TO CONFORM TO REQUIREMENTS OF GD/C SPECIFICATION 27 -08508 REVISION-A-AMENDMENT ONE AND TWO, EFFECTIVE 630928.							
HYDRAULIC-A/B BOOSTER	A-99-10-207F PNEUMATIC PRESSURE GAGE	FAR 27-08562-3	630607	GD/C LAB	YES NO	ROCHESTER GAGE 6903-719-1	090187
FAILURE MODE-OUT OF SPECIFICATION- GAGE REPORTED OUT OF CALIBRATION DUE TO BOURDON TUBE-POINTER CONNECTION EXTENDIN G FAR ENOUGH BEYOND THE BOURDON TUBE SLEEVE TO CAUSE IT TO RUB AGAINST THE COVER GLASS.							
CORRECTIVE ACTION-GD/C TOOK QUALITY CONTROL CORRECTIVE ACTION BY INFORMING ALL PERSONNEL CONCERNED ABOUT THE CORREC T HANDLING OF GAGES-ROUTE REJECTED PARTS THROUGH PROPER CHANNELS.							
HYDRAULIC-A/B BOOSTER	SP-99-10-201-F PRESSURE RELIEF VALVE	FAR 27-08561-1	2050 630731	FACTORY	YES NO	VINSON A80282	090140
FAILURE MODE-FAILS TO OPERATE AT PRESCRIBED TIME- VALVE WOULD NOT FLOW THE REQUIRED FULL FLOW OF 23 GPM UNTIL RELIE F VALVE IN THE GROUND SUPPORT HYDRAULIC PUMPING UNIT BEGAN TO ACTUATE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED-CONVAIR REPLACED VINSON VALVES WITH PANTEX VALVES.							
HYDRAULIC-A/B BOOSTER	SP-99-04-4364-F ACTUATOR	FAR 27-08880-7	2240 630710	FACTORY	NO NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-OUT OF TOLERANCE. ACTUATOR ASSEMBLY HAD OUT OF TOLERANCE NULL DURING CHECKOUT. FAILURE CONFIRMED DUE T O CHARACTERISTICS OF A16 SERVOAMPLIFIER. FAILURE CAUSED BY FACTORY TEST EQUIPMENT INCOMPATIBILITY WITH A16 SERVOAMPL IFIER.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-GD/C DESIGNED NEW FACTORY TEST EQUIPMENT CAPABLE OF ADEQUATELY CHECKING BOTH A16 AND 10C SERVOAMP LIFTERS.							003031
HYDRAULIC-A/B BOOSTER	SP-A9-10-202-F TUBE ASSEMBLY	FAR 27-05007-9	2050 630710	FACTORY	YES NO	CONVAIR	000141
FAILURE MODE-STRUCTURAL FAILURE OF TUBING SLEEVE CAUSING HYDRAULIC FLUID LOSS.							
CORRECTIVE ACTION-FAILURES WILL BE MONITORED AND CORRECTIVE ACTION INITIATED SHOULD OCCURRENCE OF THIS MODE OF FAILURE INCREASE.							
HYDRAULIC-A/B BOOSTER	27C-2780-3 VALVE-SAFETY RELIEF	UTP-PET 27-08561-1	630711	CONVAIR	YES NO	BENDIX 9050	007021
FAILURE MODE-OUT-OF-TOLERANCE DURING PET LIFE TEST. HIGH FREQUENCY NOISE WAS EMITTED DURING PORTIONS OF THE LIFE TEST. DURING THIS TIME, AT RATED FLOW, THE INLET PRESSURE DROPPED TO 3745 PSIG (3760 PSIG MIN SPEC.) AND FLOW RATE INCREASED 0.3 GPM ABOVE THE MAXIMUM OF 23 GPM. TEST SPECIMEN 305-410.							
CORRECTIVE ACTION-ALL UNITS OF LOT 13 WERE REJECTED.							
HYDRAULIC-A/B BOOSTER	SP-99-10-197F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	1990 630710	FACTORY	YES NO	PEACOCK 51310-3	000500
FAILURE MODE-LEAK INTERNAL-LEAKED GAS FROM PNEUMATIC TO HYDRAULIC SIDE OF THE INTERMEDIATE PISTON.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED-CONVAIR INITIATED AN ENGINEERING CHANGE PROPOSAL TO REPLACE THE TWO HIGH PRESSURE CHARGE ACCUMULATORS WITH A SINGLE LOWER PRESSURE CHARGE ACCUMULATOR. BECAUSE NO CUSTOMER REQUEST FOR ECP WAS MADE CONVAIR COULD NOT TAKE REMEDIAL DESIGN ACTION.							
HYDRAULIC-A/B BOOSTER	A-90-10-200-F BOOSTER HYDRAULIC TANK	FAR 27-08551-3	3F 630710	OSTF2	YES NO	BENDIX MFG. 8045	000142
FAILURE MODE-LEAK EXTERNAL-LEAK DUE TO FAILURE OF NICKEL PLATE TO ADHERE TO THE ALUMINUM CYLINDER.							
CORRECTIVE ACTION-BENDIX MFG STATED PARTS WILL BE INSPECTED FOR BLISTERS AFTER PLATING- IMPROVED QUALITY CONTROL OF PLATING PROCESS- PLATING SOURCE CHANGED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A6U63-011-16/FC-CO-01-0071-002 SWITCH-PRESSURE	COMPOSITE-FACTORY 87-44900-624	7102 630707		NO NO		699699

FAILURE MODE-FAILED DURING OPERATION. PRESSURE SWITCH OPERATION FOR BOTH BOOSTER AND SUSTAINER SYSTEMS COULD NOT BE DETERMINED. NO DEFLECTION ON MIDWESTERN RECORDER NO.1 CHANNELS 34 AND 35 WAS EVIDENT. CAUSED BY DEFECTIVE WIRING IN AGE.

SYSTEM EFFECT-OPERATION DOESNT START.

VEHICLE EFFECT-COMPOSITE RE-SCHEDULED. POST-COMPOSITE TESTING REQUIRED.

CORRECTIVE ACTION-REWIRED ENABLE SWITCHES IN TEST EQUIPMENT.

HYDRAULIC-A/B BOOSTER	SP-99-04-4359-F ACTUATOR ASSY.	FAR 87-08550-7	2630 630705	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	695626

FAILURE MODE-ERRATIC OPERATION. BOOSTER 2 PITCH ACTUATOR ASSY OPERATED ERRATICALLY DURING FREQUENCY RESPONSE TEST. FAILURE NOT CONFIRMED IN EXTENSIVE TESTING AND DISASSEMBLY OF ACTUATOR. REJECTION WAS ATTRIBUTED TO AN UNKNOWN TRANS IENT CONDITION.

CORRECTIVE ACTION-INVESTIGATION OF ACTUATOR ERRATIC OPERATION IS CONTINUING. ALL FAILURES WILL BE CAREFULLY INVESTI GATED TO SEE IF CHECKOUT PROCEDURES ARE A CONTRIBUTORY CAUSE OF FAILURE.

HYDRAULIC-A/B BOOSTER	27C2780-3 VALVE-SAFETY RELIEF	UTP-PET 27-08561-1	630622	CONVAIR	YES NO	BENDOM 9050	697022

FAILURE MODE-OUT-OF-TOLERANCE. DURING PET TEST X-AXIS VIBRATION, RESEAT PRESSURE WAS 3225 PSIG WITH 7.1 CC/MIN INTE RNAL LEAKAGE AND LEAKAGE INCREASED TO 44 CC/MIN (SPEC. MAX IS 3 CC/MIN.). TEST SPECIMEN 305-0410.

CORRECTIVE ACTION-ALL UNITS OF LOTS 13 WERE REJECTED.

HYDRAULIC-A/B BOOSTER	27C2780-5 VALVE-SAFETY RELIEF	UTP-PET 27-08561-1	630613	CONVAIR	YES NO	BENDOM 9050	

FAILURE MODE-OUT-OF-TOLERANCE DURING PET TEST. RESEAT PRESSURE LOW (2975 VS SPECIFICATION 3150 PLUS 100 OR -0 PSIG) DURING INITIAL PROOF CYCLE-DURING LOW TEMPERATURE TEST (-30 DEGREES F) RESEAT PRESSURE WAS HIGH (3270 VS SPECIFICAT ION 3150 PLUS 100 PSIG). DURING HIGH TEMPERATURE TEST (PLUS 275 DEGREES F) RESEAT PRESSURE RANGED FROM 2490 TO 3045 PSIG, ALSO EXCESSIVE LEAKAGE WAS NOTED (8CC/MIN.) (SPECIFICATION MAXIMUM IS 0 CC/MIN.) TEST SPECIMEN NUMBER 305-0410 .

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-ALL UNITS OF LOT NUMBER 13 WERE REJECTED.							697065
HYDRAULIC-A/B BOOSTER	60/A63-0398/LB-401-00-139 RISE-OFF DISCONNECT	FLIGHT 27-08558-3	1390 630612	1-2 68	NO NO	PEACOCK 51300-3	691467
FAILURE MODE-STRUCTURAL. BOOSTER SYSTEM HIGH-PRESSURE RISE-OFF DISCONNECT RUPTURED AT 88.4 SECONDS DUE TO EXCESSIVE EXPOSURE TO RADIATION HEATING. EXCESSIVE EXPOSURE RESULTED FROM FAILURE OF RADIATION SHIELDS WHICH FELL OFF AT LIFT OFF. SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. BOOSTER SYSTEM HYDRAULIC FLUID SUPPLY WAS DEPLETED AS RESULT OF RUPTURED DISCONNECT. CONSEQUENTLY, HYDRAULIC CONTROL PRESSURE TO BOOSTER ENGINES WAS LOST. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. LOSS OF HYDRAULIC CONTROL PRESSURE RESULTED IN LOSS OF VEHICLE STABILITY AND SUBSEQUENT VEHICLE DESTRUCTION. CORRECTIVE ACTION-RISE-OFF DISCONNECT WAS REDESIGNED AND CHECK VALVES WERE INSTALLED IN THE BOOSTER AND SUSTAINER HIGH-PRESSURE DISCONNECT LINES. CIC 07414.							
HYDRAULIC-A/B BOOSTER	A-99-10-195-F HYDRAULIC PUMP, GASKET	FAR 27-08566-1	630611	FACTORY	YES NO	VICKERS AA-60694-R-2A	690156
FAILURE MODE-LEAK EXTERNAL-HYDRAULIC FLUID LEAK PAST THE END PLATE SEAL. CORRECTIVE ACTION-VICKERS QUALITY CONTROL INSPECTION PROCEDURES REVISED TO PRECLUDE DEFICIENCIES ENCOUNTERED.							
HYDRAULIC-A/B BOOSTER	SP-90-10-185F TUBE CLAMP	FAR MS-21919 MS	630606		YES NO		690340
FAILURE MODE-STRUCTURAL-VISUAL INSPECTION REVEALED THAT THE CLAMP WAS BROKEN. THIS CLAMP SUPPORTED 27-05007-05 TUBE ASSEMBLY. CORRECTIVE ACTION-NONE-THIS FAILURE IS CLASSIFIED AS A RANDOM TYPE.							
HYDRAULIC-A/B BOOSTER	CT-90-10-020-F PRESSURE GAGE	FAR 27-08562-3	1160 630526	COMPLEX 36	YES NO	ROCHESTER 6003-719-1	
FAILURE MODE-CONTAMINATION-CONTAMINATED BY HEAVY WHITE POWDER ON THE EXTERNAL AND INTERNAL SURFACES OF THE GAGE. CONTAMINANTS ATTRIBUTED SALT AIR CONDENSATION ENTERING THROUGH RELIEF PLUG HOLE. CORRECTIVE ACTION-GD/C RECOMMENDED THAT THE COVER DOOR OF THE GAGE INSTALLATION BE KEPT CLOSED WHEN VEHICLE IS IN V							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
ERTICAL POSITION SO THAT THERE IS NO EXPOSURE OF THE GAGE TO DIRECT SUN RAYS. INSPECT GAGE MORE FREQUENTLY TO ASSURE RELIEF PLUG IS IN PLACE.							000240
HYDRAULIC-A/B BOOSTER	SP-A9-04-/292-F ACTUATOR-SERVOVALVE	FAR 27-08850-13	1260 630519	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-13	000065
FAILURE MODE-CONTAMINATION. FAILURE REPORTED DURING A BELL RUN WHEN A NULL READING OF 1.4 VOLTS WAS OBTAINED. PARAGRAPH 5.4 OF PROCEDURE 53-95023 ALLOWS A NULL READING OF 0.25 VOLTS MAXIMUM. FAILURE WAS CAUSED BY CONTAMINANT INTERFERRING WITH THE FLOW OF HYDRAULIC FLUID TO THE NOZZLE OF THE SERVOVALVE.							
CORRECTIVE ACTION-THE VENDER INTENSIFIED INSPECTION SURVEILLANCE OF THE SERVOVALVE. THE FAILED UNIT WAS ASSEMBLED JANUARY 1962 BEFORE THE CORRECTIVE ACTION TOOK PLACE.							
HYDRAULIC-A/B BOOSTER	A-9D-10-193-F HYDRAULIC PUMP, O-RING	FAR 27-08566-1	3F 630517	WTR	YES NO	VICKERS AA60694-R-2A	000130
FAILURE MODE-LEAK EXTERNAL-HYDRAULIC FLUID LEAK AT OUTLET FLANGE.							
CORRECTIVE ACTION-FAILURE CONFIRMED-VICKERS QUALITY CONTROL ADDED 100 PERCENT CONFORMANCE TO OUTLET FLANGE AND COMPENSATOR. DRAWING DETAILS SHOULD BE MAINTAINED PER THEIR INSPECTION PROCEDURE.							
HYDRAULIC-A/B BOOSTER	A-A9-10-192F MANIFOLD PLUG, MECHANICAL	FAR 27-05300-7	1129 630515	FACTORY	YES NO	CONVAIR	000333
FAILURE MODE-LEAK-EXTERNAL-EXTERNAL OIL LEAKAGE CAUSED BY MISALIGNMENT OF SCREW THREADS IN PORT.							
CORRECTIVE ACTION-FAILURE CONFIRMED-CONVAIR QUALITY CONTROL ADVISED TO USE MORE STRINGENT INSPECTION METHODS.							
HYDRAULIC-A/B BOOSTER	SP-A9-10-1077 PNEUMATIC RELIEF VALVE	FAR 27-08570-1	1260 630506	FACTORY	YES NO	VINSON A-60133-1	000360
FAILURE MODE-INTERNAL LEAK. GASEOUS PRECHARGE PRESSURE DROPPED IN A 24 HR PERIOD GREATER THAN THE FACTORY ALLOWABLE OF 3 PSIG.							
CORRECTIVE ACTION-NO FAILURE. FACTORY INSPECTION PERSONNEL WERE INSTRUCTED THAT 7 PSIG PER DAY WAS ACCEPTABLE. IF THE LEAKAGE WAS ESTABLISHED AS BEING SOLELY FROM INTERNAL LEAKAGE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SP-9D-10-183F HYDRAULIC ACCUMULATOR;O-RING	FAR 27-08554-3	149D 630503	VAFB	YES NO	PEACOCK 51310-5	000348
FAILURE MODE-LEAK-INTERNAL-GAS PRECHARGE LEAKAGE ACROSS THE INTERMEDIATE PISTON O-RING SEAL INTO THE HYDRAULIC SIDE WAS CAUSED BY THE PERMEABLE NATURE OF THE O RING TO HIGH PRESSURE NITROGEN GAS.							
CORRECTIVE ACTION-BETTER QUALITY CONTROLLED O-RINGS DID NOT SOLVE THE FAILURE PROBLEM CONVAIR SUBMITTED AN ECP FOR MODIFYING THE BOOSTER HYDRAULIC SYSTEM.							
HYDRAULIC-A/B BOOSTER	A-9D-04-4300-C ACTUATOR	FAR 27-08550-9	62E 630503	WTR-	YES NO	HYDRAULIC RESE ARCH 104700-9	007765
FAILURE MODE-LEAK-EXTERNAL. BOOSTER PITCH SERVO ASSEMBLY WAS LEAKING AT 2 DROPS PER HOUR. FAILURE OBSERVED DURING V ISUAL INSPECTION.							
CORRECTIVE ACTION-NONE. CAUSE NOT DETERMINED.							
HYDRAULIC-A/B BOOSTER	SP-99-10-170F HYDRAULIC ACCUMULATOR	FAR 27-08554-3	201D 630403	FACTORY	YES NO	PEACOCK 51310-5	000346
FAILURE MODE-LEAK-EXTERNAL-HYDRAULIC OIL LEAKED FROM THE ACCUMULATOR BLEED PORT.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. CONVAIR INITIATED DESIGN CORRECTIVE ACTION BY REQUESTING THE HYDRAULIC BLE ED PORTS AND PNEUMATIC BLEED PORTS OF THE UNIT BE IDENTIFIED ON THE VEHICLE.							
HYDRAULIC-A/B BOOSTER	A-9D-10-199F HYDRAULIC TUBE ASSEMBLY-B-NUT	FAR 27-05107-099	24E 630401	VAFB	YES NO	CONVAIR	000347
FAILURE MODE-LEAK-EXTERNAL-HYDRAULIC OIL LEAKAGE FROM THE TUBE AT THE CONNECTION WITH A TEE.							
CORRECTIVE ACTION-UNKNOWN. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	A-99-04-4185-F ACTUATOR	FAR 27-08550-7	183D 630313	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	
FAILURE MODE-OUT OF SPECIFICATION. THE BOOSTER SERVOCYLINDER ASSEMBLY DEVELOPED A LEAK AT THE GLAND NUT DURING MISS ILE CHECKOUT. ANALYSIS FOUND THAT THE GLAND NUT O-RING GROOVE WAS MACHINED TOO DEEPLY.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							094147
CORRECTIVE ACTION-VENDOR INITIATED CLOSER QUALITY CONTROL TO ASSURE THAT MACHINED PARTS ARE TO BLUEPRINT SPECIFICAT ION.							
HYDRAULIC-A/B BOOSTER	SP-99-10-167F HYDRAULIC ACCUMULATOR,O-RING.	FAR 27-06554-3	1300 630308	FACTORY	YES NO	PEACOCK 51510-3	096301
FAILURE MODE-LEAK INTERNAL. GAS PRECHARGE LEAKAGE ACROSS THE PISTON O-RING SEAL INTO THE HYDRAULIC SIDE WAS CAUSED BY THE PERMEABLE NATURE OF THE O-RINGSPECIFIED FOR THIS UNIT.							
CORRECTIVE ACTION-SINCE THE DEVELOPMENT OF A NEW O-RING FOR THIS APPLICATION IS NOT PRACTICAL BECAUSE OF TIME CONSI DERATIONS, CONVAIR IS TAKING ACTION TO ELIMINATE THE SUBTAINER ACCUMULATOR AND TO REPLACE THE BOOSTER ACCUMULATOR WI TH ONE USING LESS PRESSURE DIFFERENTIAL.							
HYDRAULIC-A/B BOOSTER	NZ-99-04-4207F ACTUATOR SCREW	FAR 27-06550-7	2000 630305	FACTORY	YES NO	HYD. RESEARCH 104700-1	097463
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. OUT OF NULL (NULL SHIFTED OUT OF TOLERANCE). FAILURE WAS DUE TO ONE OF THE HOLDDOWN SCREWS USED TO FASTEN THE FLAPPER-FEEDBACK-SPRING ASSEMBLY BEING LOOSE. THIS ALLOWED THE FLAPPER FE EDBACK SPRING ASSEMBLY TO MOVE OUT OF NORMAL POSITION.							
CORRECTIVE ACTION-VCAR ISSUED TO HYDRAULIC RESEARCH RECOMMENDING THE VENDOR ADD TORQUE VALVES FOR THE HOLDDOWN SCRE WS TO HIS MANUFACTURING PROCEDURES.							
HYDRAULIC-A/B BOOSTER	CT-99-10-014F HYDRAULIC TUBE ASSEMBLY, B-NUT	FAR 27-05007-33	1100 630304	COMPLEX 36	YES NO	GD/C	096842
FAILURE MODE-STRUCTURAL-B-NUT ON TUBING ASSEMBLY FOUND CRACKED. CRACK CAUSED BY STRESS-CORROSION.							
CORRECTIVE ACTION-GD/C AND AIR FORCE RELEASED MILITARY SPECIFICATION MIL-F-8809, AMENDMENT 7 ON 630118 THEREBY ELIM INATING THE USE OF ALUMINUM ALLOYS PRONE TO STRESS-CORROSION CRACKING.							
HYDRAULIC-A/B BOOSTER	A-99-10-166F ACCUMULATOR	FAR 27-06554-3	710 630227	FACTORY	YES NO	PEACOCK 51510-3	
FAILURE MODE-LEAK EXTERNAL. GAS PRECHARGE LEAKAGE WAS CAUSED BY A CRACK IN THE SEAM BETWEEN THE CYLINDER BARREL AND THE SPHERICAL END CAP.							

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							096368
CORRECTIVE ACTION-THE VENDOR TO BE INFORMED OF THE CAUSE OF FAILURE AND BE REQUESTED TO INSTALL AN IMPROVED QUALITY CONTROL SYSTEM.							
HYDRAULIC-A/B BOOSTER	CT-9B-10-015-F TUBING FLEXIBLE	FAR 27-08571-43	116D 630222	COMPLEX 36A	YES NO	AEROQUIP 677025-0-0161	096241
FAILURE MODE-LEAK EXTERNAL-REPORTED LEAK PAST SOCKET SLEEVE AND THE HOSE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED-GD/C ADVISED COGNIZANT PERSONNEL TO WIPE HOSES CLEAN AND TO VERIFY LEAKAGE PRIOR TO REJECTION.							
HYDRAULIC-A/B BOOSTER	A-9D-10-175C HYDRAULIC VALVE-MANUALLY OPERATED	FAR 27-08568-3	61E 630218	WTR	YES NO	STERER ENGR AN D MFG 12860	096442
FAILURE MODE-LEAK-EXTERNAL-VALVE REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING E-SERIES UPDATING.							
CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED. GD/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APP LICABLE OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B BOOSTER	FARNZ-99-04-4108-F ACTUATOR SEAL	FAR 27-08550-7	200D 630207	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	097003
FAILURE MODE-LEAK-EXTERNAL. BOOSTER SERVO CYLINDER WAS REJECTED AT FACTORY FOR STEADY STREAM OF LEAKAGE. LEAK RATE WAS 3 DROPS PER HOUR DUE TO AN O-RING WHICH HAD HARDENED WITH AGE.							
CORRECTIVE ACTION-VCAR 3112-63 NOTIFIED VENDOR TO ASSURE AGAINST USE OF SUBSTANDARD O-RINGS. ANA BULLETIN 436 [illegible] AD HERED TO IN PREPARATION OF RUBBER-ASSEMBLY-DATE DECALS FOR MISSILE HARDWARE.							
HYDRAULIC-A/B BOOSTER	BP-A9-C4-4167-F ACTUATOR SEALS	FAR 27-08550-13	126D 630203	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-13	096099
FAILURE MODE-LEAK-EXTERNAL. THE SERVOCYLINDER LEAKED HYDRAULIC FLUID PAST THE PISTON ROD SEAL. THIS WAS CAUSED BY A WRONG-SIZE O-RING AND AN OUT OF TOLERANCE PISTON ROD.							
CORRECTIVE ACTION-NONE.							

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HYDRAULIC-A/B BOOSTER	SP-99-10-164F RISEOFF DISCONNECT COUPLING.	FAR 27-08587-3	2010 630201	FACTORY	YES NO	PEACOCK 51295-3	000304

FAILURE MODE-OUT OF TOLERANCE. THIS UNIT HAD BEEN INSTALLED IN A MANNER SO THAT WHEN ENGAGED WITH THE GROUND COUPLING THE MINIMUM REQUIRED MATING DEPTH WAS EXCEEDED, THIS CAUSED A RESTRICTION IN THE HYDRAULIC LINE AND CAUSED A PRESSURE BUILD UP.

CORRECTIVE ACTION-CONVAIR CORRECTED THE TOOL SKETCH OF THE RISEOFF DISCONNECT PANEL FOR VEHICLE QUADRANTS 1 AND 2. THIS FAILURE CAUSED THE FAILURES ON UNITS REPORTED ON FARS. SP-99-161F, SP-99-10-162F, SP-99-10-163F.

HYDRAULIC-A/B BOOSTER	AOJ63-0017/82-401-00-39 ACTUATOR,ASSEMBLY	FLIGHT 27-08550-7	390 630125	0	YES NO	HYDRAULIC RESE ARCH 104700-1	097150

FAILURE MODE-OUT OF SPECIFICATION. THE BOOSTER ENGINE ACTUATORS WERE MISALIGNED.

SYSTEM EFFECT-NONE. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. THE BOOSTER DEFLECTIONS CAUSED UNUSUAL PITCH AND YAW TRANSIENTS- AND AN UNUSUAL COUNTERCLOCKWISE ROLL AT 0.5 SECONDS, UPON ACTUATION OF THE AUTOPILOT. THE AUTOPILOT CORRECTED AND NO FURTHER VEHICLE EFFECT WAS OBSERVED.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. THE BOOSTER DEFLECTIONS CAUSED UNUSUAL PITCH AND YAW TRANSIENTS- AND AN UNUSUAL COUNTERCLOCKWISE ROLL AT 0.5 SECONDS, UPON ACTUATION OF THE AUTOPILOT. THE AUTOPILOT CORRECTED AND NO FURTHER VEHICLE EFFECT WAS OBSERVED.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B BOOSTER	SP-99-04-4124-F ACTUATOR/MOTOR	FAR 27-08550-7	1990 630110	FACTORY		HYDRAULIC RESE ARCH 104700-1	097857

FAILURE MODE-ERRATIC OPERATION. THE BOOSTER SERVOCYLINDER ASSEMBLY OSCILLATED WITH NO SIGNAL TO THE SERVOVALVE AND WITH 1000 TO 3000 PSIG HYDRAULIC PRESSURE ON THE UNIT. MALFUNCTION WAS DUE TO A LOOSE TORQUE MOTOR COIL.

CORRECTIVE ACTION-VENDOR UPDATED ALL SERVOCYLINDER ASSEMBLIES TO A CONFIGURATION WHEREIN THE TORQUE MOTOR COILS ARE SUPPORTED BY A RUBBER ENCLOSURE TO PREVENT SHIFTING.

HYDRAULIC-A/B BOOSTER	A-99-04-4073F ACTUATOR ASSEMBLY	FAR 27-08550-9	135F 630110	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	

FAILURE MODE-ERRATIC OPERATION. ACTUATOR DROVE BOOSTER ENGINE 2 TOO HARD OVER POSITIVE PITCH WHEN HYDRAULIC PRESSURE WAS INCREASED TO 3000 PSIG. FAILURE WAS CAUSED BY METAL CONTAMINANTS LODGING BETWEEN ARMATURE AND POLE PIECE ALLOWING SERVO TO GO HARD OVER. MATERIAL CAME FROM SLOTTED HEAD OF SCREWS HOLDING POLE PIECES.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR CHANGED SCREWS FROM SLOTTED HEAD TO INTERNAL HEX HEAD SCREWS.							057039
HYDRAULIC-A/B BOOSTER	A-9F-10-156C HYDRAULIC PUMP	FAR 27-08566-1	64D 630107	WARREN	YES NO	VICKERS AA-60694-R-2A	000214
FAILURE MODE-STRUCTURAL-INSPECTION DISCOVERED AN EIGHT INCH CRACK IN THE PUMP CASE.							
CORRECTIVE ACTION-NONE-THERE WAS NO CONTRACTURAL COVERAGE TO PERFORM A FAILURE ANALYSIS.							
HYDRAULIC-A/B BOOSTER	AD462-0010/01-502-00-64 HYDRAULIC PUMP	FLIGHT 27-08566-1	64E 621214	08TF1 -43	YES NO	VICKERS AA-60694-R-2A	007262
FAILURE MODE-ERRATIC OPERATION. VARIATIONS IN HYDRAULIC PRESSURE WERE INDICATED FOR APPROXIMATELY 6 SECONDS FOLLOWING LIFTOFF. THESE COULD HAVE BEEN CAUSED BY A STICKING COMPENSATOR IN THE PUMP CONTROL MECHANISM.							
SYSTEM EFFECT-ERRATIC OPERATION. FLUCTUATIONS EXISTED IN THE BOOSTER LOW PRESSURE SYSTEM, WITH A MAXIMUM VARIATION OF 350PSIG.							
VEHICLE EFFECT-NONE.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	AGL62-0047/L2-401-00-131 RISE-OFF DISCONNECT	FLIGHT 27-08558-3	131D 621217	1-2 61	NO NO	PEACUCK 51300-3	001010
FAILURE MODE-STRUCTURAL. BOOSTER SYSTEM HIGH-PRESSURE RISE-OFF DISCONNECT RUPTURED AT APPROXIMATELY 64 SECONDS DUE TO EXCESSIVE EXPOSURE TO RADIATION HEATING. EXCESSIVE EXPOSURE RESULTED FROM FAILURE OF RADIATION SHIELDS WHICH FELL OFF AT LIFTOFF.							
SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. BOOSTER SYSTEM HYDRAULIC FLUID SUPPLY WAS DEPLETED AS RESULT OF RUPTURED DISCONNECT. CONSEQUENTLY, HYDRAULIC CONTROL PRESSURE TO BOOSTER ENGINES WAS LOST.							
VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. LOSS OF HYDRAULIC CONTROL PRESSURE RESULTED IN LOSS OF VEHICLE STABILITY AND SUBSEQUENT VEHICLE DESTRUCTION.							
CORRECTIVE ACTION-RISE-OFF DISCONNECT WAS REDESIGNED AND CHECK VALVES WERE INSTALLED IN THE BOOSTER AND SUSTAINER HIGH-PRESSURE DISCONNECT LINES. CIC 07614.							
HYDRAULIC-A/B BOOSTER	A-90-10-157F HYDRAULIC FLEX HOSE	FAR 27-08600-47	63F 621204	WTR	YES NO	RESISTOFLEX R21225-47	
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE AT THE SLEEVE JOINT.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-UNKNOWN. FAILURE NOT CONFIRMED.							000390
HYDRAULIC-A/B BOOSTER	A-9R-04-4009F ACTUATOR PLUG	FAR 27-06550-9	20F 021180	WAFB	YES NO	HYDRAULIC RESE ARCH 104700-9	007121
FAILURE MODE-LEAK EXTERNAL. ACTUATOR LEAKED AROUND METAL PLUG. LEAK WAS TRACED TO PIECE OF METAL, UNDER O-RING. CORRECTIVE ACTION-HYDRAULIC RESEARCH INSTITUTED TIGHTER QUALITY CONTROL OF THE METAL PLUG AND CONTAMINATION CONTROL .							
HYDRAULIC-A/B BOOSTER	SP-99-04-3565F ACTUATOR/O-RING	FAR 27-06550-7	1900 021112	FACTORY	YES NO	HYDRAULIC RE E ARCH 104700-1	005546
FAILURE MODE-LEAK-EXTERNAL-AN OIL LEAK OF UNDETERMINED MAGNITUDE WAS FOUND AT THE FLOW LIMITER PLUG IN THE AFT END OF THE SERVOCYLINDER. FAILURE ANALYSIS CONCLUDED THAT THE LEAKAGE WAS CAUSED BY A COMBINATION OF IMPROPER O-RING INSTALLATION AND USE OF AN O-RING IN WHICH THE MATERIAL WAS HARD AND OF LOW STRENGTH. CORRECTIVE ACTION GD/C OBTAINED VENDOR CORRECTIVE ACTION. EFFECTIVE ON DATE 620718. 100 PERCENT VISUAL AND DIMENSIONAL CHECKS. AT 20X MAGNIFICATION, WERE INITIATED FOR O-RINGS USED IN SERVOCYLINDER ASSEMBLIES. EFFECTIVE SEPTEMBER 1 , 1962, ADDITIONAL SUBASSEMBLY INSPECTIONS WERE INSTITUTED DURING THE ASSEMBLY OPERATION.							
HYDRAULIC-A/B BOOSTER	SP-AB-04-3811-F	FAR 27-41300-891	021500	FACTORY	YES NO	GD/C	007280
FAILURE MODE-FAIL DURING OPERATION. DURING FACTORY A/P SYSTEMS TEST, B1 ENGINE ZEROED IN A RAMP MOVEMENT AT STAGING . POSSIBLE CAUSE OF FAILURE IS AIR IN HYD. SYSTEM OR CONTAMINATION IN HYD SYSTEM. SERVO AMP CHECKED OK DURING EXTENSIVE TESTING. CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	A-9P-04-3592F ACTUATOR/O-RING	FAR 27-06550-9	01F 021180	PLATTSBU RG	YES NO	HYDRAULIC RESE ARCH 104700-9	
FAILURE MODE-LEAK-EXTERNAL-DURING PERFORMANCE OF A CHECKOUT PROCEDURE, THE BOOSTER ACTUATOR ASSY DEVELOPED LEAKAGE AT THE SHAFT SEAL. THE REPORTED FAILURE WAS CONFIRMED. THE LEAKAGE EXCEEDED MAXIMUM ALLOWABLES AND WAS CAUSED BE THE EXCESSIVELY WORN O RING. THE O RING MATERIAL WAS TOO HARD, A CONDITION WHICH DOES NOT RESPOND WELL TO DEFORMATION A ND WEARS MORE RAPIDLY.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-THE RELIABILITY FAILURE ANALYSIS GROUP INFORMED THE VENDOR (RAR A-9P-04-3609) OF THE CAUSE OF FAILURE AND REQUESTED A MORE RIGID INSPECTION OF O RINGS. THE RECOMMENDED ACTION OF MAINTAINING CLOSER QUALITY CONTROL OF O RING SELECTION IS IN EFFECT (APRIL 23, 1963).							095543
HYDRAULIC-A/B BOOSTER	A-9R-04-3539F ACTUATOR	FAR 27-08150-9	88F 621022	WALKER	YES NO	HYDRAULIC RESE ARCH 104700-9	096990
FAILURE MODE-OUT OF SPECIFICATION.-DURING CHECKOUT, THE ACTUATOR FAILED TO OPERATE CORRECTLY. THE FAILURE WAS NOT CONFIRMED. THE SERVO-CYLINDER ASSEMBLY MET ALL REQUIRED PERFORMANCE CRITERIA. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	A-9R-10-159F BOOSTER HYDRAULIC TANK	FAR 27-08551-3	88F 621019	WALKER	YES NO	BENDOW 6985E	098446
FAILURE MODE-LEAK-INTERNAL-GAS PRECHARGE BUBBLES WERE NOTICED IN THE FLOWMETER SIGHTGLASS OF THE HYDRAULIC PUMPING UNIT. POSSIBILITY EXISTS WHERE BY GAS BUBBLES IN SIGHTGLASS ORIGINATED IN OTHER COMPONENT AND MIGRATED TO HPU. CORRECTIVE ACTION-NO FAILURE-GD/C ADVISED FIELD SERVICE PERSONNEL TO EXAMINE SYSTEM ACCUMULATOR FOR INTERNAL GAS LEAK.							
HYDRAULIC-A/B BOOSTER	AX62-0071/FC-CO-01-0008-002 ACTUATOR	COMPOSITE-FACTORY 27-08550-7	2500 621016		YES YES	HYDRAULIC RESE ARCH 104700-1	098147
FAILURE MODE-FAIL DURING OPERATION. BOOSTER NO. 1 YAW/ROLL FEED BACK INDICATED AN EXTENDED NULLING PERIOD AT STAGING DUE TO A FAULTY HYDRAULIC ACTUATOR ASSEMBLY. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COMPOSITE RESCHEDULED. SYSTEM AND COMPOSITE RE-TESTING REQUIRED. CORRECTIVE ACTION-REPLACE HYDRAULIC ACTUATOR AND AUTOPILOT SERVO CANISTER.							
HYDRAULIC-A/B BOOSTER	UP-99-04-3504-F ACTUATOR ASSEMBLY	FAR 27-08550-7	2500 621016	FACTORY	YES NO	HYD. RESEARCH 104700-1	
FAILURE MODE - ERRATIC OPERATION. CHANGE IN RATE OF ENGINE MOVEMENT WHEN RETURNING TO NULL POSITION DURING COMPOSITE CHECKOUT. FAILURE NOT CONFIRMED. MOST LIKELY CAUSES OF FAILURE WERE: CONTAMINATION, ENTRAPPED AIR IN SYSTEM, ERRATIC SERVOVALVE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							097269
CORRECTIVE ACTION ALL SERVOVALVE TORQUE MOTORS WILL BE INSPECTED FOR CONTAMINATION IN THE AREA OF THE TORQUE MOTOR COVER STARTING 9/1/66. WCAR 1965-62. R-R A-09-04-752.							
HYDRAULIC-A/B BOOSTER	A-99-04-3579F ACTUATOR	FAR 27-08550-7	1470 621010	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	095540
FAILURE MODE-LEAK-EXTERNAL-THE BOOSTER SERVO CYLINDER DEVELOPED A LEAK FROM THE BLEEDPORT AT THE ROD END OF THE ACTUATOR DURING A HYDRAULIC SYSTEM FILL AND BLEED PROCEDURE. THE LEAKAGE RATE WAS ONE DROP PER MINUTE. THE REPORTED FAILURE WAS NOT CONFIRMED DURING FAILURE ANALYSIS. THE SLIGHT LEAKAGE PRODUCED IN THE HYDRAULICS LABORATORY WAS LESS THAN THE ALLOWABLE.							
CORRECTIVE ACTION-NO CORRECTIVE ACTION.-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	A-99-04-4003F ACTUATOR O-RING	FAR 27-08550-9	621000	PAFB	YES NO	HYDRAULIC RESE ARCH 104700-9	097119
FAILURE MODE-LEAK EXTERNAL. O-RING SEAL WAS DAMAGED BY EXCESSIVE METALLIC PARTICLE CONTAMINATION IN HYDRAULIC FLUID. FAILURE WAS ATTRIBUTED TO DAMAGED THREADS RESULTING FROM IMPROPER ASSEMBLY IN THE FIELD. NO NOTICEABLE LEAKAGE WAS DETECTED DURING FAILURE ANALYSIS.							
CORRECTIVE ACTION-PRECAUTIONARY NOTE WAS ADDED TO OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B BOOSTER	A-99-04-4004F ACTUATOR MOTOR	FAR 27-08550-7	1330 621000	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	097125
FAILURE MODE-STRUCTURAL. LOW FREQUENCY OSCILLATION DURING FINAL CHECK OUT OF MISSILE. FLAPPER WAS POORLY BRAZED TO ARMATURE OF TORQUE MOTOR.							
CORRECTIVE ACTION-VENDOR INSTITUTED IMPROVED TEMPERATURE CONTROL OF BRAZING PROCESS.							
HYDRAULIC-A/B BOOSTER	A-99-04-3C30F ACTUATOR	FAR 27-08550-9	997 620007	WALKER	YES NO	HYDRAULIC RESE ARCH 104700-9	
FAILURE MODE-LEAK EXTERNAL-COMPONENT WAS REJECTED FOR LEAKAGE AT PISTON ROD END.							
CORRECTIVE ACTION-NO FAILURE-LEAKAGE NOT DUPLICATED IN EXTENSIVE FUNCTIONAL TESTING. O-RING MATERIAL ACCEPTABLE, AN							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
D DIMENSIONAL CHECKS OF O-RING VERIFIED ACCEPTABILITY.							007035
HYDRAULIC-A/B BOOSTER	SP-99-04-4084-F ACTUATOR	FAR 27-08550-7	15:D 620911	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	006917
FAILURE MODE-ERRATIC OPERATION-ACTUATOR SHOWED INTERMITTENT GAIN DURING FREQUENCY RESPONSE TEST-FAILURE NOT CONFIRMED DURING EXTENSIVE LABORATORY TESTING. CAUSE OF FAILURE NOT DETERMINED.							
CORRECTIVE ACTION-NONE-CAUSE OF FAILURE NOT DETERMINED BY FAILURE ANALYSIS.							
HYDRAULIC-A/B BOOSTER	HG-98-10-136F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	11:D 620907	ETR	YES NO	PEACOCK 51310-3	006565
FAILURE MODE-CONTAMINATION. GAS PRECHARGE DROPPED OVER A PERIOD OF SEVERAL DAYS. THIS WAS CAUSED BY PARTICLES BRIDGING THE INTERMEDIATE O-RING SEAL.							
CORRECTIVE ACTION-CONVAIR INFORMED RESPONSIBLE PERSONNEL AT ANR THAT NECESSARY CHECKS BE MADE TO ASSURE THAT THE HYDRAULIC SYSTEM ON 1130 IS NOT HARBORING ANY CONTAMINATION AS FOUND IN THIS FAILED UNIT.							
HYDRAULIC-A/B BOOSTER	A-99-04-4075F ACTUATOR	FAR 27-08550-9	93F 620907	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-9	007020
FAILURE MODE-OUT OF TOLERANCE-THE SERVO VALVE NULL VOLTAGE TOO HIGH DURING NAPCHE CHECKOUT.							
CORRECTIVE ACTION-A STUDY IS BEING MADE IF A POSSIBLE NULL SHIFT IS CAUSED BY DIFFERENCES IN SERVO VALVE RECEPTION OF SIGNALS FROM INDIVIDUAL SERVOAMPLIFIERS. (IDC OR A16) 60/C LATER MODIFIED SERVOAMPLIFIERS.							
HYDRAULIC-A/B BOOSTER	A-99-04-4029F ACTUATOR/O-RING	FAR 27-08550-9	95F 620907	WALKER	YES NO	HYDRAULIC RESE ARCH 104700-9	007034
FAILURE MODE-LEAK EXTERNAL-COMPONENT WAS REJECTED FOR EXCESSIVE LEAKAGE AROUND PISTON ROD. FAILURE WAS ATTRIBUTED TO USE OF SUBSTANDARD O-RING.							
CORRECTIVE ACTION-HYDRAULIC RESEARCH INSTITUTED 100 PERCENT INSPECTION OF O-RINGS EFFECTIVE JULY 15, 1962 THIS ACTUATOR ASSEMBLED PRIOR TO CORRECTIVE ACTION DATE.							

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HYDRAULIC-A/B BOOSTER	A-BN-10-148F BOOSTER HYDRAULIC ACCUMULATOR	FAR 27-00334-3	32-B 620808	ALTUS	YES NO	PEACOCK 51310-36	000195

FAILURE MODE-LEAK-INTERNAL. HYDRAULIC OIL WAS FOUND ON THE PNEUMATIC SIDE POSSIBLY DUE TO LOSS OF PRECHARGE PRESSURE AND CREATING A HIGH DIFFERENTIAL PRESSURE ACROSS THE INTERMEDIATE PISTON FROM THE HYDRAULIC SIDE TO THE PNEUMATIC SIDE.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. THE ACCUMULATOR WAS NOT TESTED BECAUSE OF FIELD DISASSEMBLY. BY TWX 80F608 FIELD PERSONNEL WERE INFORMED NOT TO DISASSEMBLE ITEMS BEING RETURNED FOR FAILURE ANALYSIS.

HYDRAULIC-A/B BOOSTER	A-BB-04-3580F ACTUATOR	FAR 27-00330-7	143D 620831	FACTORY	YES NO	HYDRAULIC RESE ARCH 104700-1	000541

FAILURE MODE-OUT OF TOLERANCE. DURING AUTOPILOT SYSTEM CHECKOUT THE BOOSTER SERVO CYLINDER ASSEMBLIES (S/N 907-0831, 935-0365, AND 110-1873) VIBRATED EXCESSIVELY. REPORTED FAILURES WERE CONFIRMED AND WERE DUE TO THE EXISTENCE OF AN UNSTABLE CAPACITANCE-INDUCTANCE TANK-CIRCUIT BETWEEN THE SERVOAMPLIFIER OUTPUT AND THE SERVO VALVE TORQUE MOTOR COIL.

CORRECTIVE ACTION-GD/C REVIEWED THE VENDOR TEST EQUIPMENT AND PROCEDURES IN NOVEMBER 1968 SO THAT SERVO CYLINDER ASSEMBLIES WHICH EXHIBIT OSCILLATION CHARACTERISTICS WILL BE CAUGHT BEFORE SHIPMENT TO GD/C. GD/C PLACED ALL SERVO CYLINDER ASSEMBLIES UNDER SURVEILLANCE TO EVALUATE THE EXTENT OF THIS PROBLEM AND TO DETERMINE IF ADDITIONAL ACTION IS NECESSARY.

HYDRAULIC-A/B BOOSTER	A-BB-10-126F HYDRAULIC FLEX HOSE	FAR 27-00800-47	77F 620884	WALKER	YES NO	RESTS TO FLEX R21223-47	000560

FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKED AT THE SLEEVE JOINTS. LEAKAGE WAS DETERMINED TO BE FROM SOME OTHER COMPONENT ALTHOUGH NOT IDENTIFIED.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ADVISED PERSONNEL THAT IN PROBLEMS OF THIS TYPE THE HOSE BE WIPED CLEAN AND BE WATCHED CLOSELY TO ASSURE THAT THE HOSE IS ACTUALLY LEAKING BEFORE REJECTING IT.

HYDRAULIC-A/B BOOSTER	A-BR-04-3555F ACTUATOR/VALVE-SERVO	FAR 27-00330-8	620884	WALKER	YES NO	HYDRAULIC RESE ARCH 104700-8	

FAILURE MODE-OUT OF TOLERANCE-IT WAS REPORTED THAT THE ENGINE OPERATED BY THIS SERVOCYLINDER FAILED TO RETURN TO THE NULL POSITION DURING HAPCHE OPERATION. THE FAILURE WAS CONFIRMED. THE CAUSE OF THE OUT OF TOLERANCE WAS NOT ESTABLISHED BY THE FAILURE ANALYSIS. THE FEEDBACK TRANDUCER WAS OUT-OF-TOLERANCE BUT COULD NOT HAVE CAUSED THE ORIGINAL FAILURE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-THE FAILURE ANALYSIS GROUP INITIATED CORRECTIVE ACTION BY REQUESTING THAT VENDOR B.C. BE IMPROVED TO PREVENT THE USE OF FEEDBACK TRANSDUCERS WITH BELOW TOLERANCE INPUT IMPEDANCE. REF. RAR A-9R-04-3819. THE VENDOR HAS TIGHTENED RECEIVING INSPECTION ON THE FEEDBACK TRANSDUCER AND HAS REVIEWED FAILURE OF THE SERVO VALVE.							097187
HYDRAULIC-A/B BOOSTER	A-9N-10-146F HYDRAULIC ACCUMULATOR	FAR 27-08554-3	43-F 620F22	ALTUS	YES NO	PEACOCK 51310-3	096196
FAILURE MODE-LEAK-INTERNAL. PRECHARGE GAS LEAKAGE ACROSS THE PISTON INTO THE HYDRAULIC SYSTEM. THE LEAKAGE WAS DISCOVERED DURING THE FILL-AND-BLEED OPERATION.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. ACCUMULATOR REPLACED WITH SIMILAR UNIT. NO FURTHER ACTION TAKEN.							
HYDRAULIC-A/B BOOSTER	A-9R-10-148-F HYDRAULIC TANK	FAR 27-06551-3	74F 620818	WALKER	YES NO	BENDIX MFG. 8985	096202
FAILURE MODE-LEAK-INTERNAL. GAS PRECHARGE BUBBLES WERE NOTICED IN THE HYDRAULIC SIGHTGLASS OF THE HYDRAULIC PUMPING UNIT.							
CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. FIELD PERSONNEL WERE REQUESTED TO CHECK OTHER COMPONENTS OF THE SYSTEM IN THE EVENT OF SIMILAR APPARENT FAILURES AND TO EXAMINE THE SYSTEM FOR ENTRAPPED GAS THAT WAS NOT PURGED DURING FILL AND BLEED.							
HYDRAULIC-A/B BOOSTER	A-9D-04-4001-F ACTUATOR O-RING	FAR 27-08550-9	64E 620817	WTR	YES NO	HYDRAULIC RESEARCH 104700-9	097120
FAILURE MODE-LEAK EXTERNAL. PISTON O-RING WAS WORN FLAT ON INNER SURFACE.							
CORRECTIVE ACTION-HYDRAULIC RESEARCH INSTITUTED 100PER CENT VISUAL INSPECTION OF O-RINGS.							
HYDRAULIC-A/B BOOSTER	A-99-04-3444-F ACTUATOR O-RING	FAR 27-08550-7	250D 620817	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	
FAILURE MODE-EXTERNAL LEAK. A FLUID LEAK WAS OBSERVED FROM THE BOOSTER 1 YAW SERVOCYLINDER ASSEMBLY DURING ROUTINE TEST DUE TO WORN AND COMPRESSED GLAND NUT O-RING. THE O-RING WAS SUBSTANDARD ACCORDING TO SHORE-A AND ELONGATION TESTS.							

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CORRECTIVE ACTION-VENDOR INITIATED 100 PERCENT INSPECTION OF SERVOCYLINDER O-RINGS.							695004
HYDRAULIC-A/B BOOSTER	A-90-10-147-C HYDRAULIC FLEX LINE	FAR 27-06502-5	139-D 620015	WTR	YES NO	RESISTOFLEX R21325	696447
FAILURE MODE-LEAK-EXTERNAL. UNIT LEAKED HYDRAULIC FLUID. ORIGIN OF LEAK NOT DETERMINED. CORRECTIVE ACTION-NONE. FAILURE ANALYSIS OF THIS UNIT WAS CANCELLED. HOSE WAS SCRAPPED AT SITE.							
HYDRAULIC-A/B BOOSTER	A-90-10-143F HYDRAULIC FLEX HOSE	FAR 27-06571-45	139D 620015	576-A1	YES NO	AEROQUIP 666039-8-0161	696801
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE AT A FITTING DURING PERFORMANCE OF A CHECKOUT PROCEDURE WAS CAUSED BY THE LACK OF TORQUE BETWEEN THE SOCKET AND THE FERRULE. CORRECTIVE ACTION-FIELD RELIABILITY PERSONNEL WERE REQUESTED TO TAKE NECESSARY ACTION TO DISSEMINATE PROPER TORQUING INFORMATION TO THE MECHANICS AT VANDENBURG AIR FORCE BASE.							
HYDRAULIC-A/B BOOSTER	A-BR-04-3597F ACTUATOR/O-RING	FAR 27-06550-9	79F 620012	WALKER	YES NO	HYDRAULIC RESEARCH 104700-9	695545
FAILURE MODE-LEAK-EXTERNAL-DURING MISSILE CHECKOUTS. LEAKAGE DEVELOPED FROM THE ACTUATOR PISTON SHAFT. THE HYDRAULIC PRESSURE WAS 3000 PSIG. THE FAILURE WAS CONFIRMED AND WAS DUE TO THE O RING SEAL WHICH WAS SLIGHTLY WORN AND THE MATERIAL WAS VERY HARD. THE MATERIAL WOULD NOT MEET THE REQUIREMENTS OF MIL-P-25732. CORRECTIVE ACTION-EFFECTIVE 620715, ALL O-RINGS ARE GIVEN A PHYSICAL AND VISUAL INSPECTION FOR DEFECTS AT 20 POWER MAGNIFICATION BEFORE BEING ACCEPTED FOR USE IN SERVOCYLINDER ASSEMBLIES.							
HYDRAULIC-A/B BOOSTER	A-90-04-3393-F ACTUATOR-SERVO CYLINDER ASSEMBLY	FAR 27-06550-9	8EF 620008	FACTORY	YES NO	HYD. RESEARCH 104700-9 104700-9	697203
FAILURE MODE-CONTAMINATION. THE BOOSTER 1 ACTUATOR NO. 2 WOULD NOT NULL THE TORQUE MOTOR CAP WAS REMOVED AND TWO MAGNETIC PARTICLES WERE FOUND BETWEEN THE MAGNET POLE PIECE AND SERVOVALVE FLAPPER. THESE PARTICLES WERE REMOVED AND THE TORQUE MOTOR REASSEMBLED. AFTER REASSEMBLY THE UNIT PERFORMED WITHIN SPECIFICATION. CORRECTIVE ACTION-ALL SERVOVALVES WILL BE INSPECTED FOR CONTAMINANTS IN THE AREA OF THE TORQUE MOTOR JUST BEFORE ASSEMBLY OF THE COVER. REF RAR A-90-04-732.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SP-99-04-4089F ACTUATOR ASSEMBLY	FAR 27-08550-7	140D 620808	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	897164
FAILURE MODE-OUT OF TOLERANCE. FEED BACK VOLTAGE AT NULL WAS HIGH. THE REPORTED FAILURE WAS NOT CONFIRMED. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	A-98-04-3417-F SERVOCYLINDER O-RING	FAR 27-08550-7	179D 620808	ETR	YES NO	HYDRAULIC RESEARCH 104700-1	899833
FAILURE MODE-LEAK EXTERNAL. SERVOCYLINDER FAILED DURING PERFORMANCE TEST WHEN A LEAK DEVELOPED AROUND THE SHAFT SEAL. THE LEAK WAS DUE TO SUB-STANDARD O-RINGS. CORRECTIVE ACTION-GD/C OBTAINED CORRECTIVE ACTION THROUGH VENDOR WHO INITIATED 100 PERCENT INSPECTION OF SERVOCYLINDER O-RINGS.							
HYDRAULIC-A/B BOOSTER	A-99-04-3424-F ACTUATOR	FAR 27-0855-9	91F 620731	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-9	894121
FAILURE MODE-OUT OF TOLERANCE. NULL VOLTAGE REPORTED OUT OF TOLERANCE. CORRECTIVE ACTION-NONE. CAUSE OF FAILURE NOT DETERMINED.							
HYDRAULIC-A/B BOOSTER	A-99-04-3403F ACTUATOR-O-RING	FAR 27-08550-7	620730	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	897708
FAILURE MODE-LEAK EXTERNAL. SERVOVALVE WAS FOUND LEAKING FROM THE COVER PLATE AT THE FORWARD END DURING A HYDRAULIC SYSTEM LEAK CHECK. MATERIAL ANALYSIS OF THE O-RINGS REMOVED FROM THE SERVOCYLINDER AND SERVOVALVE REVEALED 5 OF 8 O-RINGS WERE SUBSTANDARD. CORRECTIVE ACTION-VENDOR INITIATED 100 PER CENT INSPECTION OF O-RINGS UTILIZED FOR SERVOCYLINDER ASSEMBLIES. THIS ACTION WAS EFFECTIVE JULY 15 1966.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-09-04-3403-F ACTUATOR O-RING	FAR 27-08550-7	65D 620730	FACTORY	YES NO	HYDRAULIC RISE ARCH 104700-1	004160

FAILURE MODE-LEAK, EXTERNAL. EXTERNAL HYDRAULIC LEAKAGE FROM COVER PLATE AT FORWARD END DUE TO USE OF SUB-STANDARD O-RING.

CORRECTIVE ACTION-GD/C OBTAINED CORRECTIVE ACTION BY VENDOR WHO INITIATED 100 PER CENT INSPECTION OF O-RINGS.

HYDRAULIC-A/B BOOSTER	A-9L-10-133-7 HYDRAULIC FLEX HOSE	FAR 27-08600-43	49F 620728	LINCOLN	YES NO	RESISTOFLEX R21225-45	000551

FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKED NEAR FERRULE. POSSIBLY DUE TO A BAD CONNECTION.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ADVISED COGNIZANT PERSONNEL TO MONITOR THESE HOSES DURING SYSTEM CHECKOUT.

HYDRAULIC-A/B BOOSTER	A-9N-10-119F HYDRAULIC TANK ASSEMBLY	FAR 27-08551-3	36F 620728	SCHILLIN G	YES NO	BENDIX 0005	000140

FAILURE MODE-STRUCTURAL-AT TIME OF TANK RUPTURE THE PNEUMATIC SIDE OF THE TANK WAS NOT CHARGED AND THE ACCUMULATOR HAD REACHED 1800 PSIG. TANK FAILED DUE TO OVERPRESSURIZATION.

CORRECTIVE ACTION-FAILURE TO BE ASCERTAINED BY SAFB INVESTIGATION TEAM.

HYDRAULIC-A/B BOOSTER	A-88-10-117F HYDRAULIC TUBE ASSEMBLY, B-NUT	FAR 27-09127-785	79F 620729	STC.	YES NO	CONVAIR	000115

FAILURE MODE-EXTERNAL LEAK-OIL LEAKAGE AT JUNCTION OF THE TUBE ASSEMBLY AND MANIFOLD FITTING. B NUT ON TUBING WAS CROSS THREADED ON THE MANIFOLD FITTING CREATING LEAK.

CORRECTIVE ACTION-SITE WAS NOTIFIED OF FAILURE AND INFORMED ABOUT INSTALLATION REQUIREMENTS CONTAINED IN MPS 24.19A

GENERAL DYNAMICS
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19 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-88-10-117F HYDRAULIC MANIFOLD, B-NUT	FAR 27-05318-11	78F 620725	STC.	YES NO	CONVAIR	099141
FAILURE MODE-EXTERNAL LEAK-OIL LEAKAGE AT JUNCTION OF THE TUBE ASSEMBLY AND MANIFOLD FITTING. B NUT ON TUBING WAS CROSS THREADED ON THE MANIFOLD FITTING CREATING THE LEAK.							
CORRECTIVE ACTION-SITE WAS NOTIFIED OF THIS FAILURE AND INFORMED ABOUT INSTALLATION REQUIREMENTS CONTAINED IN MPS 2 4.19A.							
HYDRAULIC-A/B BOOSTER	A-99-04-3407F ACTUATOR O-RING	FAR 27-08550-7	215D 620725	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	097255
FAILURE MODE-LEAK EXTERNAL. THE SERVO CYLINDER WAS FOUND TO BE LEAKING HYDRAULIC FLUID FROM THE TWO PLUG SCREWS AFT OF THE SERVO VALVE DURING MISSILE CHECKOUT. THE FAILURE WAS CAUSED BY AN IMPROPERLY MOLDED O-RING AND IMPROPER INSERTION OF THE PLUG DURING VENDOR ASSEMBLY.							
CORRECTIVE ACTION-THE VENDOR NOTIFIED HIS PERSONNEL OF THE CAUSE OF FAILURE AND INCREASED INSPECTION SURVEILLANCE OF ASSEMBLY OF THE SEAL PLUGS.							
HYDRAULIC-A/B BOOSTER	A-99-04-3407-F BOOSTER ACTUATOR ASSEMBLY, O-RING	FAR 27-08550-7	215D 620725	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-1	094123
FAILURE MODE-LEAK, EXTERNAL. LEAKAGE OCCURRED DUE TO SPLIT O-RING AND DISTORTED TEFLON WASHER RESULTING FROM AN IMPROPERLY MOLDED O-RING AND IMPROPER INSERTION OF THE PLUG DURING VENDOR ASSEMBLY.							
CORRECTIVE ACTION - VENDOR INITIATED ADDITIONAL INSPECTION SURVEILLANCE DURING ASSEMBLY.							
HYDRAULIC-A/B BOOSTER	MG-99-10-118F HYDRAULIC PUMP	FAR 27-08568-1	113D 620723	FACTORY 71	YES NO	VICKERS AA-60694-R-2A	099125
FAILURE MODE-CONTAMINATION-DURING PRESSURE TESTS, BRONZE CONTAMINENTS WERE FOUND IN THE HYDRAULIC FLUID DRAINED FROM THE PUMP. CONCLUDED THAT CONTAMINATION MUST HAVE OCCURRED BEFORE MOUNTING ON 113D.							
CORRECTIVE ACTION-B.C. WAS REQUESTED TO REVIEW THE RECEIVING INSPECTION TECHNIQUES AND RECORD KEEPING FILES.							

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CONVAIR DIVISION

13 JUN 1976

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-90-10-116F HYDRAULIC FLUID TANK,SEAL	FAR 27-08581-3	620717	WTR	YES NO	BENDIX 6965	099128
FAILURE MODE-INTERNAL LEAK-PRE-CHARGE GAS LEAKAGE ACROSS THE PISTON TO THE OIL SIDE.							
CORRECTIVE ACTION-UNKNOWN. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	A-90-10-154F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08534-3	620717	DYESS	YES NO	PEACOCK 51310-3	090216
FAILURE MODE-LEAK-INTERNAL-GAS PRECHARGE LEAKED PAST THE PISTON O RING SEAL INTO THE HYDRAULIC SIDE.							
CORRECTIVE ACTION-UNKNOWN. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	A-99-04-3394F ACTUATOR - SERVO CYLINDER	FAR 27-08550-9	620711	FACTORY	YES NO	HYD. RESEARCH	097205
FAILURE MODE OUT OF TOLERANCE. SERVO CYLINDER 3867. WAS IR/D FOR OUT-OF-TOLERANCE DURING CHECKOUT. FAILURE ANALYSIS FOUND FAILURE WAS CAUSED BY IMPROPER FINAL ADJUSTMENT AT VENDOR, THIS UNIT HAD NOT BEEN TESTED BY RECEIVING INSP.							
CORRECTIVE ACTION-GD/C REINSTATED 100 PER CENT ACCEPTANCE TESTING. REF RAR A-99-04-734 RECEIVED 19 OCTOBER 1968.							
HYDRAULIC-A/B BOOSTER	A-90-10-114F MANIFOLD	COMPOSITE-J FACT 27-05300-7	620703	WTR	YES NO	CONVAIR	099102
FAILURE MODE-STRUCTURAL. OIL LEAKS FROM A BLEED SCREEN FITTING. CAUSED BY EXCESSIVE TORQUE WHILE CLOSING BLEED VALVE.							
SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.							
VEHICLE EFFECT-LOSS OF VEHICLE STABILITY.							
CORRECTIVE ACTION-ALL SITES WERE CAUTIONED ABOUT TIGHTENING PROCEDURE.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	SP-80-04-3335F ACTUATOR SERVO VALVE	FAR 27-06150-7	1180 680703	1-8	YES NO	HYD. RESEARCH 104700-1	806909

FAILURE MODE-SHORT, ELECTRICAL-THE BOOSTER SERVOCYLINDER FAILED TO OPERATE DURING A RUN OF PROCEDURE 27-90605-8. FAILURE ANALYSIS FOUND THAT A SHORT EXISTED BETWEEN PINS B AND C OF THE TORQUE MOTOR COIL. FAILURE WAS ATTRIBUTED TO OVERLAPPING OF THE LEAD WIRES DURING MANUFACTURE OF THE TORQUE MOTOR COIL.

CORRECTIVE ACTION-VENDOR ADVISED OF FAILURE AND ITS CAUSE AND INSTRUCTED TO IMPROVE WORKMANSHIP. REF RAR SP-80-04-3 603.

HYDRAULIC-A/B BOOSTER	A-89-04-3422-F BOOSTER ACTUATOR ASSEMBLY	FAR 27-06550-8	80F 680703	FACTORY	YES NO	HYDRAULIC RESEARCH 104700-9	804153

FAILURE MODE-OUT OF TOLERANCE. OUT OF TOLERANCE DUE TO MARGINAL ADJUSTMENT OF THE SERVOCYLINDER DURING CHECKOUT BY THE VENDOR.

CORRECTIVE ACTION-60/C REINSTATE [illegible] PER CENT ACCEPTA[illegible] TESTS.

HYDRAULIC-A/B BOOSTER	A-84-10-1125F HYDRAULIC TANK, O-RING	FAR 27-06551-3	820620	SYCE	YES NO	BEHBOW 8965	800120

FAILURE MODE-INTERNAL LEAK-GAS LEAKAGE ACROSS THE PISTON WAS SUSPECTED. SLIGHT LEAKAGE ACROSS THE PISTON WAS FOUND. DISASSEMBLY REVEALED METALLIC CONTAMINANTS ON THE PISTON O RING.

CORRECTIVE ACTION-VENDOR WAS NOTIFIED OF CONTAMINATION AND THEY REPLIED THAT THEIR RECORDS SHOWED THIS TANK MET CONVAIR CLEANLINESS TESTS.

HYDRAULIC-A/B BOOSTER	A-8L-10-115F HYDRAULIC VALVE,MANUALLY OPERATED	FAR 27-06560-3	820627	LAFB	YES NO	STERER 12060	800184

FAILURE MODE-FAIL DURING OPERATION-VALVE OPERATED INTERMITTANTLY DURING SYSTEM CHECK OUT. VALVE FAILED TO ALLOW FLOW AT ANY PRESSURE FROM 0 TO 3000 PSIG. DISASSEMBLY REVEALED THAT THE SLEEVE HAD BEEN INSTALLED BACKWARDS AND ON THE WRONG END OF THE SPRING, COMPLETELY CLOSING THE OUTLET ORIFICE.

CORRECTIVE ACTION-PERSONNEL AT LINCOLN AFB WERE NOTIFIED ABOUT THIS FIELD ASSEMBLY DESCREPANCY.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-86-10-123F RELIEF VALVE	FAR 27-00561-1	73F 020626	SYCAMORE	YES NO	VINSON A00282	000550

FAILURE MODE-OUT OF TOLERANCE. VALVE FAILED TO RESEAT AT SPECIFIED PRESSURE. THE FLOW WAS RESTRICTED TO 18 GPM. THE SPECIFICATION CALLS FOR 23 GPM FULL FLOW.

CORRECTIVE ACTION - NO FAILURE. VINSON WITHDREW ALL VALVES FROM STOCK AND REINSPECTED THEM 100 PERCENT. ALL VALVES TO BE CYCLED 100 TIMES IN FUNCTIONAL TESTING. DISASSEMBLED AND 100 PERCENT INSPECTED BY GD/C REPRESENTATIVE.

HYDRAULIC-A/B BOOSTER	A-84-04-3273F ACTUATOR/VALVE, SERVO	FAR 27-00550-9	020626	LINCOLN	YES	HYDRAULIC RESEARCH 104700-9	007135

FAILURE MODE-CONTAMINATION. ACTUATOR FAILED TO RESPOND TO SIGNALS PROPERLY. FAILURE WAS CAUSED BY METALLIC CONTAMINANTS IN THE FIRST STAGE DROPPING ORIFICE.

CORRECTIVE ACTION-HYDRAULIC RESEARCH CLEANING FACILITIES WERE IMPROVED TO PREVENT RECURRANCE OF THIS FAILURE MODE.

HYDRAULIC-A/B BOOSTER	A-90-10-115F HYDRAULIC ACCUMULATOR	FAR 27-00554-3	020625	DAFB	YES NO	PEACOCK 51310-3	000101

FAILURE MODE-INTERNAL LEAK. GAS PRECHARGE LEAKAGE ACROSS THE PISTON INTO THE HYDRAULIC SIDE.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED.

HYDRAULIC-A/B BOOSTER	BP-98-04-3500-F ACTUATOR O-RING	FAR 27-00550-7	1450 020621	SE	YES NO	HYD RESEARCH 104700-1	002750

FAILURE MODE-LEAK, EXTERNAL. THE SERVOCYLINDER LEAKED AT A RATE OF 1 DROP IN 20 CYCLES. SPEC CALLS FOR MAXIMUM LEAKAGE RATE OF 1 DROP IN 25 FULL-STROKE CYCLES. DISASSEMBLY OF THE ACTUATOR SHOWED A WORN O-RING.

CORRECTIVE ACTION-VENDOR, EFFECTIVE 15 JULY 1962, WILL INSPECT ALL O-RINGS USING 20 POWER MAGNIFICATION.

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CONVAIR DIVISION

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-9L-04-3332F ACTUATOR SEAL	FAR 27-08550-9	34F 620613	LINCOLN	YES NO	HYDRAULIC RESE ARCH 104700-1	097100

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC FLUID LEAKED AROUND THE ACTUATOR SHAFT. FUNCTIONAL TESTING DURING FAILURE ANALYSIS FAILED TO CONFIRM THE REPORTED LEAKAGE. THE ACTUATOR O-RING SEAL WAS FOUND TO HAVE SURFACE BLEMISHES THAT COULD HAVE CAUSED THE SERVOCYLINDER TO LEAK AS WAS REPORTED.

CORRECTIVE ACTION-THE VENDOR, BEGINNING JULY 15, 1962, BEGAN 100 PER CENT INSPECTION OF O-RINGS, FOR USE IN HYDRAULIC ACTUATORS, UNDER 20 POWER SCOPE FOR VOIDS, IMPERFECT MOLDING, ETC.

HYDRAULIC-A/B BOOSTER	A-9L-04-3420-F ACTUATOR O-RING	FAR 27-08550-9	620606	LINCOLN	YES NO	HYDRAULIC RESE ARCH 104700-9	095702

FAILURE MODE-OUT OF TOLERANCE. A LEAK WAS OBSERVED AT THE ACTUATOR SHAFT SEAL. THE FAILURE WAS CAUSED BY A WORN AND HARDENED O-RING.

CORRECTIVE ACTION - VENDOR INITIATED INSPECTION PROCEDURES TO INCLUDE MICROSCOPIC EXAMINATION OF ALL O-RINGS INSTALLED IN SERVOCYLINDERS. GD/C ANALYZED O-RINGS FOR COMPLIANCE WITH APPLICABLE SPECIFICATIONS.

HYDRAULIC-A/B BOOSTER	A-90-04-3340F ACTUATOR ASSEMBLY	FAR 27-08550-9	72F 620604	DYESS	YES NO	HYDRAULIC RESE ARCH 104700-9	097100

FAILURE MODE-LEAK-EXTERNAL. THE HYDRAULIC BOOSTER SERVOCYLINDER WAS LEAKING AROUND THE ACTUATOR SHAFT. FAILURE ANALYSIS TESTING DID NOT CONFIRM THE FAILURE. REPLACEMENT OF THE SERVO CYLINDER IN THE FIELD CORRECTED THE REPORTED LEAKAGE.

CORRECTIVE ACTION-NO CORRECTIVE ACTION-THE FAILURE WAS NOT CONFIRMED.

HYDRAULIC-A/B BOOSTER	A-90-10-111F HYDRAULIC PUMP	COMPOSITE-J FACT 27-08800-1	620601	WTR	YES NO	VICKERS AA-00894-R-2A	099102

FAILURE MODE-EXTERNAL LEAK-LEAKS FROM MOUNTING PLATE.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED.

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15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTK	VENDOR NAME / VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-96-04-3479-F ACTUATOR O-RING	FAR 27-08550-9	72F 020001	34FB	YES NO	HYD RESEARCH 104700-9	004100

FAILURE MODE-EXTERNAL LEAK. THE BOOSTER SERVOCYLINDER WAS IR/D FOR LEAKAGE. THE ACTUATOR WAS FOUND TO BE LEAKING AT A RATE OF 3 DROPS EVERY THREE HOURS UNDER 500 LBS. PRESSURE. LEAKAGE WAS CAUSED BY FAULTY O-RINGS, RESULTING FROM A TOO COURSE BRUSH BEING USED DURING THE MANUFACTURE OF THE O-RING.

CORRECTIVE ACTION-STARTING 15 JULY 1962 THE MANUFACTURER STARTED 100 PER CENT VISUAL INSPECTION UNDER A 20 POWER SC OPE FOR VOIDS, IMPERFECT MOLDING, ETC.

HYDRAULIC-A/B BOOSTER	A-96-04-3349F ACTUATOR SERVO VALVE	FAR 27-08550-9	90F 020500	ALTUS	YES NO	HYDRAULIC RESE ARCH 104700-9	000002

FAILURE MODE-OUT OF SPECIFICATION. THE BOOSTER SERVOCYLINDER ASSEMBLIES WERE IR/D WHEN THEY FAILED TO MALL PROPERLY . TESTS CONFIRMED THE FAILURE. THE MALL SHIFTS WERE CAUSED BY A SHIFT OF THE TORQUE MOTOR POLE PIECES.

CORRECTIVE ACTION-THE VENDOR WAS REQUESTED TO IMPROVE THE PRESENT METHOD OF SECURING THE TORQUE MOTOR POLE PIECES. REF FAR A-96-04-725. STARTING WITH SERVOVALVE S/N 100-1204 ALL TORQUE MOTOR COILS ARE SUPPORTED IN RUBBER. THE RUBBE R ALSO HELPS HOLD THE TORQUE MOTOR PIECES SECURELY IN PLACE.

HYDRAULIC-A/B BOOSTER	3P-90-10-137F PUMP, O-RING	FAR 27-08500-1	1300 020500	WTR	YES NO	VICKERS AA-60684-12-2A	000007

FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKED 2 DROPS IN 30 MINUTES AT A 110 PSIG CASE PRESSURE. THE LEAK WAS CA USED BY A DEFECTIVE O-RING.

CORRECTIVE ACTION-SPECIFICATION 27-08503 WAS REVISED ON 8/20/62 TO SPECIFY MAXIMUM ALLOWABLE LEAKAGE, AND TO OUTLIN E TEST PROCEDURES FOR ACCEPTANCE TESTING BOOSTER HYDRAULIC PUMPS. RECEIVING INSPECTION PROCEDURE 27-QC-10013 WAS ALS O REVISED FOR SPECIFYING ACCEPTABLE LEAKAGE PARAMETERS.

HYDRAULIC-A/B BOOSTER	A-96-10-128-F HYDRAULIC FLEX HOSE	FAR 27-00600-47	71F 020502	DYESS	YES NO	RESISTOFLEX R21P25-47	000550

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKED AT THE SLEEVE JOINTS. LEAKAGE WAS DETERMINED TO BE FROM SOME OTHER COMPONENT ALTHOUGH NOT IDENTIFIED.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ADVISED PERSONNEL THAT IN PROBLEMS OF THIS TYPE THE HOSE BE WIPED CLE AN AND BE WATCHED CLOSELY TO ASSURE THAT THE HOSE IS ACTUALLY LEAKING BEFORE REJECTING IT.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI CTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-BL-10-141F O-RING-BOOSTER HYDRAULIC PUMP	FAR 27-08566-1	59F 680522	LINCOLN	NO	VICKERS AA-60694-R-RA	090818

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE DURING A PRESSURE CHECK WAS CAUSED BY A SLIGHTLY ROUGH TEFLON GAS RET THAT HAD NOT COMPRESSED SUFFICIENTLY TO MAKE A GOOD SEAL.

CORRECTIVE ACTION-SPECIFICATION 27-08503 WAS REVISED JUNE 28, 1962 TO OUTLINE TEST PROCEDURES FOR ACCEPTANCE OF PUMPS REGARDING LEAKAGE. QUALITY CONTROL DOCUMENT, 27-QC-10013 WAS REVISED ACCORDINGLY.

HYDRAULIC-A/B BOOSTER	69A3166.2 HYDRAULIC PRESSURE SWITCH/HERMETIC SEALED MICROSWITCH	UTP-QUAL/PPT 27-08543-1	680522	CONVAIR	YES NO	SERVONIC 8098-0601	090928

FAILURE MODE-OUT OF TOLERANCE-DIMENSION OF 1.0 PLUS/MINUS 0.03 INCH BETWEEN CENTER POINTS OF THE ELECTRICAL AND PRESSURE CONNECTIONS WAS 1.25 INCH. REF. TASK HISTORY NO. 10 S/N 1000, 1001,1002.

CORRECTIVE ACTION-THE UNIT COMPLIED WITH THE VENDOR PRINT WHICH WAS APPROVED BY DESIGN. SPECIFICATION WILL BE PROCESSED AT A LATER DATE TO READ 1.00 PLUS OR MINUS .50 INSTEAD OF 1.0 PLUS OR MINUS 0.03.

HYDRAULIC-A/B BOOSTER	A-90-10-144F BOOSTER HYDRAULIC ACCUMULATOR	FAR 27-08554-3	64F 680517	DYESS	YES NO	PEACOCK 51510-3	090190

FAILURE MODE-CONTAMINATION. GAS PRECHARGE LEAKED ACROSS PISTON INTO THE HYDRAULIC OIL SIDE POSSIBLY DUE TO METALLIC SLIVERS BRIDGING O-RING. PARTICLE FOUND ON DISASSEMBLY.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. INSPECTION PERSONNEL WERE ALERTED TO THE CRITICAL NEED FOR ASSURING CONTAMINANTS DO NOT ENTER THE VEHICLE HYDRAULIC SYSTEM DURING VEHICLE ASSEMBLY.

HYDRAULIC-A/B BOOSTER	A-84-10-107F TUBE ASSEMBLY	FAR 27-05107-493	680510	SYC.	YES NO	SO/C	090106

FAILURE MODE-STRUCTURAL-CRACK WAS NOTED IN ONE OF THE 8 NUT FITTINGS ON THE TUBE. NO LEAKAGE WAS OBSERVED. FAILURE DUE TO STRESS CORROSION CRACK.

CORRECTIVE ACTION-THIS STRESS CORROSION PROBLEM INITIATED A PROGRAM TO STUDY THE USE OF STAINLESS STEEL INSTEAD OF ALUMINUM. THIS WAS DONE ON WAP 2451 AND ECP 1855.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OIN	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-9N-3342F ACTUATOR-O-RING	FAR 27-08550-9	01F 020500	ALTUS	YES NO	HYD. RESEARCH 104700-9	000094

FAILURE MODE-LEAK. THE BOOSTER SERVOCYLINDER ASSEMPLIES WERE REJECTED FOR LEAKAGE. THE LEAKAGE WAS CONFIRMED AND TRACED TO FAULTY O-RINGS.

CORRECTIVE ACTION-VENDOR INFORMED OF RESULTS OF FAILURE ANALYSIS AND REQUESTED VENDOR QC BE IMPROVED TO PREVENT USE OF INFERIOR O-RINGS. REF RAR A-9N-04-TEB.

HYDRAULIC-A/B BOOSTER	A-90-04-3277F ACTUATOR ASSEMBLY	FAR 27-08550-9	020500	WTR	YES NO	HYDRAULIC RESEARCH 104700-9	000001

FAILURE MODE-CONTAMINATION-ACTUATOR WAS REJECTED BECAUSE TORQUE PAINT FRAGMENTS WERE FOUND DURING REPLACEMENT OF FITTINGS DURING SHOTGUN PROGRAM. TORQUE PAINT PARTICLES WERE FOUND INSIDE THE ACTUATOR BUT NOT DOWN STREAM OF THE INLET FILTER.

CORRECTIVE ACTION-RELIABILITY FIELD PERSONNEL CAUTIONED MECHANICS TO REMOVE TORQUE PAINT PRIOR TO DISASSEMBLING FITTINGS.

HYDRAULIC-A/B BOOSTER	A-9N-10-138C HYDRAULIC ACCUMULATOR	FAR 27-08554-8	000500	ALTUS	YES NO	PEACOCK 81810-40	000001

FAILURE MODE-LEAK INTERNAL. HYDRAULIC OIL FOUND ON THE PNEUMATIC SIDE OF THE INTERMEDIATE PISTON. THE UNIT WAS CHECKED IN THE FIELD AND FOUND TO BE ACCEPTABLE AND WAS RETURNED TO SERVICE.

CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED. GD/C ADVISED FIELD PERSONNEL TO VERIFY LEAKAGE PRIOR TO REMOVAL OF FUTURE COMPONENTS.

HYDRAULIC-A/B BOOSTER	A-6N-10-134F HYDRAULIC ACCUMULATOR	FAR 27-38554-8	000000	ALTUS	YES NO	PEACOCK 81810-36	000002

FAILURE MODE-LEAKAGE INTERNAL-HYDRAULIC OIL FOUND ON PNEUMATIC SIDE OF PISTON DUE TO PARTICLES ON SEALING O-RING.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ALERTED INSPECTION PERSONNEL TO THE NEED FOR ASSURING CONTAMINANTS DO NOT ENTER THE HYDRAULIC SYSTEM DURING VEHICLE ASSEMBLY.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-88-10-106F HYDRAULIC ACCUMULATOR O-RING	FAR 27-08554-3	0487		YES NO	PEACOCK MACH. CO. 51310-3	099107
FAILURE MODE-INTERNAL LEAK. LEAKAGE OF GAS PRECHARGE ACROSS THE PISTON INTO THE HYDRAULIC SYSTEM. FAILURE CAUSED BY CRACKS IN THE O RING.							
CORRECTIVE ACTION-VENDOR WAS ISSUED E.O. 2567 TO PROCURE SUPERIOR QUALITY O RINGS.							
HYDRAULIC-A/B BOOSTER	CT-98-10-011-F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	820425	1	YES NO	PEACOCK 51310-3	090243
FAILURE MODE-LEAK INTERNAL-PNEUMATIC LEAKAGE TO HYDRAULIC SIDE OF THE ACCUMULATOR. CAUSE WAS O-RING PERMEABILITY.							
CORRECTIVE ACTION-GD/C SUBMITTED CHANGE REQUEST 3103 FOR AIRFORCE APPROVAL WHEREIN THE SUSTAINER ACCUMULATORS WOULD BE DELETED AND THE BOOSTER ACCUMULATOR REPLACED WITH A NEW UNIT. CHANGE WAS DISAPPROVED.							
HYDRAULIC-A/B BOOSTER	A-90-04-3353F ACTUATOR-O-RING	FAR 27-08550-9	84E 820419	WTR	YES NO	HYD. RESEARCH 104700-9	096091
FAILURE MODE-CONTAMINATION. THE BOOSTER SERVOCYLINDER WAS IR/D FOR LEAKAGE AROUND GLAND NUT AT PISTON END OF THE ACTUATOR. FAILURE ANALYSIS FOUND A CONTAMINANT PARTICLE OF COTTON BRIDGING THE GLAND NUT O-RING.							
CORRECTIVE ACTION-VENDOR REQUESTED TO IMPROVE CLEANING PROCESSES. REF RAR-A-90-04-726.							
HYDRAULIC-A/B BOOSTER	AD62-0043/DA697/D1-GND-11-12	COMPOSITE-FRD/DPL	12F 820418	0700	NO NO		096092
FAILURE MODE-OUT OF TOLERANCE BOOSTER HYDRAULIC PRESSURE WAS OUT OF TOLERANCE PRECLUDING COMPLETION OF MISSILE READY FOR COMMIT SUMMARY.							
SYSTEM EFFECT-OPERATION TOO LOW BOOSTER HYDRAULIC PRESSURE WAS APPROXIMATELY 1800 PSI.							
VEHICLE EFFECT-COUNTDOWN DELAYED							
CORRECTIVE ACTION-HPU BOOSTER HYDRAULIC SYSTEM PRESSURE CONTROL WAS ADJUSTED TO THE PROPER PRESSURE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	A-88-04-3174F ACTUATOR	FAR 27-08550-9	58F 620402	SYCAMORE	YES NO	HYDRAULIC RESE ARCH 104700-9	097100

FAILURE MODE-LEAK EXTERNAL-LEAKAGE WAS REPORTED TO BE FROM THE FLOW LIMITER PLUG. IT IS QUITE POSSIBLE THAT THE SER VO CYLINDER DID ACTUALLY LEAK VERY SLIGHTLY CAUSING A SURFACE WETTING AND EVENTUALLY THE FORMATION OF A DROP. LEAKAG E OF THIS NATURE IS DISCUSSED IN REPORT HYD-150-62 WHICH STATES THAT SUCH LEAKAGE IS NOT A CAUSE FOR REJECTION AND R EMOVAL OF A HYDRAULIC COMPONENT.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C INFORMED PERSONNEL AT SYCAMORE OF THE RESULTS OF THIS ANALYSIS AND HA S SENT THEM A COPY OF REPORT HYD-150-62 WHICH DESCRIBES ALLOWABLE HYDRAULIC SYSTEM LEAKAGE RATES. GD/C FURTHER ADVIS ED PERSONNEL NOT TO REMOVE UNITS UNTIL LEAKAGE IS OUT OF SPECIFICATION.

HYDRAULIC-A/B BOOSTER	A-88-04-3214F ACTUATOR	FAR 27-08550-9	54F 620330	DAFB	YES NO	HYDRAULIC RESE ARCH 104700-9	098078

FAILURE MODE-LEAK, FAILURE OCCURRED DURING PERFORMANCE OF FILL AND BLEED PROCEDURE 27-08402, WITH 500 PSIG APPLIED TO THE SYSTEM.

CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.

HYDRAULIC-A/B BOOSTER	CT-98-10-009-F BOOSTER HYDRAULIC PUMP	FAR 27-08588-1	620320	ETR	YES NO	VICKERS AA-50694-R-2A	098244

FAILURE MODE-STRUCTURAL-INSPECTION OF PUMP REVEALED PUMP CASE CRACK EXTENDING FROM THE BACK COVER PLATE FLANGE TO T HE CONTROL PISTON FLANGE. CAUSE OF FAILURE WAS DUE TO BOOSTER RETURN SYSTEM OVER PRESSURIZATION.

CORRECTIVE ACTION-GD/C CHANGED HYDRAULIC READINESS OPERATION TO DELETE THE CLOSURE OF RETURN SHUT OFF VALVES V2 AND V4 DURING A SEQUENCE OF HYDRAULIC PRESSURE UNIT OPERATION. E AND F SERIES HYDRAULIC PUMPING UNITS DO NOT HAVE V2 AN D V3 VALVES-PROBLEM REDUCED TO D-SERIES.

HYDRAULIC-A/B BOOSTER	AC-62-0027/611-12-01 BOOSTER ACCUMULATOR	CAPTIVE 27-08554-3	1F 620323	SL	YES NO	PEACOCK 51310-3	

FAILURE MODE-LEAK INTERNAL. BOTH BOOSTER ACCUMULATORS WERE DISCOVERED TO BE LEAKING GAS FROM THE GAS TO THE FLUID S IDE OF THE ACCUMULATOR PISTONS.

SYSTEM EFFECT-DEPLETION OF GAS SUPPLY IN ACCUMULATORS.

VEHICLE EFFECT-NONE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-BOTH BOOSTER ACCUMULATORS WERE REPLACED.							097335
HYDRAULIC-A/B BOOSTER	A-8R-04-3216-C ACTUATOR	FAR 27-08550-9	620316	WAFB	YES NO	HYDRAULIC RESE ARCH 104700-9	098075
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. WHILE RUNNING NAPCHE DECK 401, AUTOPILOT/HYDRAULICS NO-606 WERE RECEIVED ON CARDS 434 AND 436. THE PITCH ACTUATOR WOULD NOT NULL. CORRECTIVE ACTION-NONE, DUE TO ERROR IN SHIPPING INSTRUCTIONS, PART WAS NOT RECEIVED FOR FAILURE ANALYSIS.							
HYDRAULIC-A/B BOOSTER	A-90-10-103F HYDRAULIC TANK	FAR 27-08551-3	620309	WTR	YES NO	BENDOW MFG. CO . 0003	099130
FAILURE MODE-INTERNAL LEAK-PROBABLE PRE-CHARGE GAS LEAK ACROSS THE PISTON INTO THE HYDRAULIC SYSTEM. CORRECTIVE ACTION-UNKNOWN. FAILUREWOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	CT-98-10-008F HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	620305	ETR	YES NO	PEACOCK 51310-3	098363
FAILURE MODE-LEAK INTERNAL. LEAKING GAS TO HYDRAULIC SIDE OF THE ACCUMULATOR. CORRECTIVE ACTION-PEACOCK E.O. 2507 WAS ISSUED TO PROCURE SUPERIOR QUALITY O-RINGS EFFECTIVE ON 11/10/61.							
HYDRAULIC-A/B BOOSTER	CT-98-10-008F BOOSTER HYDRAULIC ACCUMULATOR	FAR 27-08554-3	620305	ETR	YES NO	PEACOCK 51310-3	098364
FAILURE MODE-LEAK INTERNAL-REPORTED LEAKING GAS TO HYDRAULIC SIDE OF THE ACCUMULATOR. CORRECTIVE ACTION-FAILURE NOT CONFIRMED. PEACOCK E.O. 2507 WAS ISSUED TO PROCURE SUPERIOR QUALITY O-RINGS EFFECTIVE ON 611110.							
HYDRAULIC-A/B BOOSTER	A-8N-04-3151F ACTUATOR/AMPLIFIER	FAR 27-08550-9	25F 620301	SCHILLIN G	NO NO	HYDRAULIC RESE ARCH 104700-9	
FAILURE MODE-FAIL DURING OPERATION-BOOSTER SERVO CYLINDERS VIBRATED EXCESSIVELY DURING PERFORMANCE OF HYDRAULIC FILL AND BLEED PROCEDURE 27-98402 WITH INPUTS FROM BOTH THE P/N 27-45200-1 AND THE P/N 27-41000-051 AMPLIFIER. FAILURE							

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WAS CONFIRMED WITH THE P/N 27-45200-1 UNMODIFIED AMPLIFIER BUT NOT WITH THE P/N 27-41000-031 AMPLIFIER. P/N 27-41000 -031 WAS MODIFIED SPECIFICALLY TO ELIMINATE THE FAILURE MODE NOTED. THE ACTUATOR WAS WITHIN SPECIFICATION. CORRECTIVE ACTION-GD/C HAS INFORMED PERSONNEL AT SCHILLING AFB OF THE RESULTS OF THE ANALYSIS AND RECOMMENDED THAT ADDITIONAL AUTOPILOT TROUBLE SHOOTING BE PERFORMED TO ISOLATE THE COMPONENT CAUSING THE EXCESSIVE VIBRATIONS WHEN US ED WITH THE P/N 27-41000-031 MODIFIED AMPLIFIER.							097187
HYDRAULIC-A/B BOOSTER	A-90-04-3215F ACTUATOR	FAR 27-08550-7	620212	WTR	YES NO	HYDRAULIC REDE ARCH 104700-1	000074
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME REPORTED. F FAILED WHILE PERFORMING TEST PROCEDURE 27-90506-6 USING APCHE DECK 6. AT CARD 29, THE BOOSTER NO. 2 HYDRAULIC-YAW SERVOCYLINDER WOULD NOT NULL WHEN COMMAND SIGNAL WAS PROGR AMMED. CORRECTIVE ACTION-NONE, FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	6R-9F-04-3105F ACTUATOR	FAR 27-08550-7	620200	WAFB	YES NO	HYDRAULIC REDE ARCH 104700-1	000068
FAILURE MODE-CONTAMINATION. DURING APCHE DECK 56 PERFORMANCE, FREQUENCY RESPONSE TEST SHOWED THE TWO BOOSTER SERVO CYLINDERS OUT OF NULL. ANALYSIS REVEALED THAT THE SERVO CYLINDERS FAILED DUE TO EXCESSIVE CONTAMINATION BELIEVED TO HAVE COME FROM THE HYDRAULIC PUMPING UNIT AND/OR THE MISSILE HYDRAULIC SYSTEM. CORRECTIVE ACTION-AN OIL SAMPLE OF THE HYDRAULIC SYSTEM BELIEVED TO BE CONTAMINATED WAS TESTED AND THE CONTAMINATIO N LEVEL WAS FOUND TO BE SLIGHTLY OUT OF SPECIFICATION IN ONE CATEGORY. THE TEST RESULTS WERE SENT TO COGNIZANT AIR F ORCE PERSONNEL AT WARREN AFB.							
HYDRAULIC-A/B BOOSTER	A-90-04-3125-F ACTUATOR O-RING	FAR 27-09550-9	51F 620200	BAFB	YES NO	HYDRAULIC REDE ARCH 104700-9	097[illegible]05
FAILURE MODE-LEAK-EXTERNAL. DURING VISUAL INSPECTION OF A/B AND HYDRAULIC HAPCHE CHECK, HYDRAULIC FLUID WAS LEAKING FROM THE BOOSTER ACTUATOR. ANALYSIS SHOWED THAT AN O-RING WAS DETERIORATED AND OF INFERIOR MATERIAL. CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO SUPPLY PROPER O-RINGS.							

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HYDRAULIC-A/B BOOSTER	3P-90-04-4114-F ACTUATOR/WIRING	FAR 27-08550-7	1280 620203	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	697044

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME-SERVOVALVE TORQUE MOTOR COIL SPLICE WAS IMPROPERLY JOINED RESULTING IN OPEN CIRCUIT BETWEEN PINS B AND C.

CORRECTIVE ACTION-VENDOR TO INSPECT THE SPLICE JOINT AND VACUUM-IMPREGNATE THE COIL WITH EPOXY.

HYDRAULIC-A/B BOOSTER	A-90-04-3102-C ACTUATOR	FAR 27-08550-9	620200	5760	YES YES	HYDRAULIC RESE ARCH 104700-9	696084

FAILURE MODE-OPEN, ELECTRICAL-DURING OPERATIONAL TESTS PER PROCEDURE 27-98451-1 THE BOOSTER SERVO CYLINDER FAILED TO PRODUCE AN OUTPUT SIGNAL FROM THE FEEDBACK TRANSDUCER. ADDITIONAL TESTS PIN-POINTED THE TROUBLE TO AN OPEN CIRCUIT IN THE FEEDBACK TRANSDUCER ON THE B-1 YAW SERVO CYLINDER. FAILURE WAS DETERMINED TO BE DUE TO MOISTURE IN UMBILICAL S-NOT IN THE REJECTED PART.

CORRECTIVE ACTION-CORRECTIVE ACTION HAS BEEN INITIATED BY FAR A-90-14-010P; FAR A-90-14-102P; RARA-90-14-652.

HYDRAULIC-A/B BOOSTER	A-90-04-3066-F ACTUATOR,O-RING	FAR 27-08550-9	620122	WTR	YES NO	HYD-RESEARCH 104700-9	697048

FAILURE MODE-LEAK-EXTERNAL-SURFACE WETTING TYPE LEAKAGE OCCURRED AT THE INTERFACE OF SERVOVALVE ACTUATOR BODY-ACTUAL LEAKAGE RATE NOT CONFIRMED-VERY SLIGHT SURFACE WETTING CAUSED BY OIL SEEPING FROM CAPILLARY AREA AT INTERFACE.

CORRECTIVE ACTION-NO FAILURE REPORT ISSUED ON ALLOWABLE SEEPAGE RATES FROM HYDRAULIC COMPONENTS AND DISTRIBUTED TO ALL BASES-DIFFERENCES BETWEEN LEAKAGE AND SEEPAGE CLARIFIED.

HYDRAULIC-A/B BOOSTER	A-90-04-3080-F ACTUATOR ASSEMBLY	FAR 27-08550-7	1090 620114	ETR	YES NO	HYDRAULIC RESE ARCH 104700-1	697111

FAILURE MODE-ERRATIC OPERATION-DURING PRELAUNCH CHECKOUT THE UNIT OSCILLATED AT 5CPS ON 2200 PSIG SYSTEM PRESSURE-ACTUATOR JUMPED AN AMOUNT EQUIVALENT TO AN ENGINE DEFLECTION OF SIX MINUTES WHEN PRESSURE WAS INCREASED TO 3000 PSIG AND THEN DECREASED TO 2200 PSIG-FAILURE NOT CONFIRMED DURING TEST-UNIT DID NOT MEET PRESENT SYSTEM DAMPING REQUIREMENTS.

CORRECTIVE ACTION-ASSEMBLIES MEETING NEW SYSTEM DAMPING REQUIREMENTS PHASED INTO PROGRAM.

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HYDRAULIC-A/B BOOSTER	A6-98-04-3088-F ACTUATOR/SEAL	FAR 27-08550-7	121D 680108	ETR	YES NO	HYDRAULIC RESE ARCH 104700-1	697115

FAILURE MODE-LEAK-EXTERNAL-HYDRAULIC OIL LEAKED FROM PISTON SHAFT SEAL AT LOWER END OF ACTUATOR DURING SYSTEM CHECK . TEFLON BACKUP RING FOUND INCORRECTLY INSTALLED-O-RING WAS SADLY WORN.

CORRECTIVE ACTION-VENDOR INFORMED AND STATED THAT ALL POSSIBLE CONTROL IS BEING EXERCISED TO PREVENT A RECURRENCE O F A HUMAN ERROR FAILURE OF THIS TYPE.

HYDRAULIC-A/B BOOSTER	A-B8-10-094F HYDRAULIC ACCUMULATOR	FAR 27-08554-3	611220	SVC.	YES NO	PEACOCK ENGR. CO. 51310-3	699130

FAILURE MODE-INTERNAL LEAK. PRECHARGE GAS LEAKAGE ACROSS PISTON INTO THE HYDRAULIC SYSTEM.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. A TEST PROGRAM COVERED BY TCP 518 IS PRESENTLY BEING CONDUCTED TO REMEDY T HIS TYPE OF FAILURE.

HYDRAULIC-A/B BOOSTER	AE61-1282P1-001-00-06	FLIGHT	0F 611220	11 120	NO YES		697430

FAILURE MODE-LEAK EXTERNAL. DATA INDICATED A HYDRAULIC FLUID LEAK IN THE RETURN PRESSURE SYSTEM STARTED 0.5 SECONDS AFTER STAGING.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. HYDRAULIC SYSTEM PRESSURE LOST.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B BOOSTER	CT-98-10-003-F BOOSTER HYDRAULIC FLUID TANK	FAR 27-08551-8	104D 611210	ETR	YES NO	DENBOW MFG. 8863E	698603

FAILURE MODE-LEAK INTERNAL-LEAKING GASEOUS NITROGEN INTO THE HYDRAULIC SIDE OF THE UNIT WITH A PRESSURE DIFFERENTIA . OF 80 PSIG ON THE GAS SIDE. POSSIBLE CAUSE OF REPORTED LEAKAGE IS TORQUE PAINT ON FEMALE PORT THREADS AND ALSO MIS RATING TO THE PISTON O-RING.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED- RELIABILITY CONTROL ENGINEERING HAS NOTIFIED COGNIZANT PERSONNEL OF THE AB OVE CIRCUMSTANCES IN ORDER TO PREVENT RECURRENCE OF THE SITUATION.

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HYDRAULIC-A/B BOOSTER	A-B8-10-093F HYDRAULIC ACCUMULATOR	FAR 27-08554-3	611211	SYC.	YES NO	PEACOCK MACH. CO. 51310-3	099151

FAILURE MODE-LEAK-INTERNAL LEAKAGE ACROSS THE PISTON INTO THE HYDRAULIC SYSTEM.

CORRECTIVE ACTION-TEST PROGRAM COVERED BY TCP 518 AND WAP 4032 IS PRESENTLY BEING CONDUCTED TO SOLVE THIS TYPE OF F AILURE.

HYDRAULIC-A/B BOOSTER	A-9L-04-3079-F ACTUATOR/SEAL	FAR 27-08550-9	611206	LINCOLN	YES NO	HYDRAULIC RESE ARCH 104700-9	097112

FAILURE MODE-LEAK-EXTERNAL-HYDRAULIC FLUID WAS DETECTED DRIPPING AT A STEADY RATE FROM THE CYLINDER. FAILURE NOT CO NFIRMED DURING TESTING.

CORRECTIVE ACTION-SINCE THE FAILURE WAS NOT CONFIRMED, NO CORRECTIVE ACTION WAS INITIATED.

HYDRAULIC-A/B BOOSTER	98-10-092F HYDRAULIC FLEX HOSE	FAR 27-08600-47	611110	ETR	YES NO	RESISTOFLEX R21225-47	099152

FAILURE MODE-EXTERNAL LEAK-OIL LEAKAGE AT THE ACTUATOR END OF THE BRAID SLEEVE JOINT.

CORRECTIVE ACTION-UNKNOWN. FAILURE NOT CONFIRMED.

HYDRAULIC-A B BOOSTER	SA-9D-10-091F BOOSTER ACCUMULATOR O-RING	FAR 27-08554-3	1060 611031	ETR	YES NO	PEACOCK ENG. 51310-3	099146

FAILURE MODE-LEAK-INTERNAL LEAKAGE OF PRECHARGE GAS ACROSS THE PISTON TO THE OIL SIDE. FAILURE WAS DUE TO A POOR QU ALITY O RING.

CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO IMPROVE HIS Q.C. ON O RINGS.

HYDRAULIC-A/B BOOSTER	A-9K-04-3087-F ACTUATOR VALVE-SERVO	FAR 27-08550-9	610917	FAIRCHIL D	YES NO	HYD-RESEARCH 104700-9 104700-9	

FAILURE MODE-FAIL DURING OPERATION-SERVOVALVE MALFUNCTIONED DURING APCHE CHECK-FAILURE DUE TO ELECTRICALLY SHORTED SERVOVALVE TORQUE MOTOR COIL-SHORT CAUSED BY OVERLOAD AND SOURCE OF OVERLOAD NOT DETERMINED-FAILURE CONSIDERED AS HU MAN INITIATED.

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							897847
CORRECTIVE ACTION-INVESTIGATION OF CAUSE OF OVERLOAD ON SERVOVALVE COIL TO BE CONTINUED. GD/C ADVISED SITE PERSONNEL TO TAKE PRECAUTIONS AGAINST HUMAN INITIATED FAILURES.							
HYDRAULIC-A/B BOOSTER	9K-10-085 ACCUMULATOR PRESSURE GAGE	FAR 27-08582-3	14E 610827	FAFB	YES NO	ROCHESTER MFG. CO. 6803-719-1	899119
FAILURE MODE-EXTERNAL LEAK-LEAKAGE CAUSED BY A CRACK WHICH EXTENDED FROM ONE OF THE EXTERNAL WRENCH FLATS THROUGH THE FITTING INTO THE INTERNAL THREADED AREA. OVERTORQUING PROVIDED A CONDITION FOR STRESS CORROSION CRICKING.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	AA61-0103/PG-4CNO-02-104/C2 B NUT	COMPOSITE-FRD/DPL	104D 610604	56	YES NO		900875
FAILURE MODE-LEAK-EXTERNAL. THERE WAS A HYDRAULIC LEAK AT A B NUT.							
SYSTEM EFFECT-NONE.							
VEHICLE EFFECT-NONE.							
CORRECTIVE ACTION-TIGHTEN B NUT.							
HYDRAULIC-A/B BOOSTER	9H-10-079 HYDRAULIC PUMP, O RING	FAR 27-08306-.	46E 610720	FORBES	YES NO	VICKERS AA-60694-R-2A	899112
FAILURE MODE-LEAK-EXTERNAL-LEAKAGE FROM AROUND THE INLET PORT FLANGE. LEAKAGE CAUSED BY O RING DAMAGE INCURRED DURING ASSEMBLY.							
CORRECTIVE ACTION-VENDOR NOTIFIED THAT HE PREVENT O RING DAMAGE DURING ASSEMBLY.							
HYDRAULIC-A/B BOOSTER	90-04-10027 ACTUATOR ASSEMBLY, BOOSTER	FAR 27-08350-8	24E 610727	WTR	YES NO	HYDRAULIC RESEARCH 104700-9	899036
FAILURE MODE-LEAK INTERNAL. LEAKAGE OF HYDRAULIC FLUID FROM THE ITEM.							
CORRECTIVE ACTION-CONTINUED SURVEILLANCE OF ITEM ALTHOUGH NO MALFUNCTION COULD BE FOUND. ITEM ACCEPTABLE FOR SERVICE.							

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HYDRAULIC-A/B BOOSTER	9R-10-041 BOOSTER HYDRAULIC ACCUMULATOR O-RING	FAR 27-08554-3	20E 610721	FAIRCHILD	YES NO	PEACOCK ENG. 51310-3	099117

FAILURE MODE-INTERNAL LEAK-PRE-CHARGE GAS LEAKAGE ACROSS THE PISTON TO THE OIL SIDE. LEAKAGE CAUSED BY AN IMPROPERLY MANUFACTURED O RING.

CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO IMPROVE THEIR Q.C.

HYDRAULIC-A/B BOOSTER	9R-04-267 ACTUATOR ASSEMBLY	FAR 27-08550-9	21E 610720	ETR	NO NO	HYDRAULIC RESEARCH 104700-9	097367

FAILURE MODE-ERRATIC OPERATION-THE ACTUATOR REPORTEDLY INDUCED EXCESSIVE ENGINE VIBRATION DURING ACTUATOR PERFORMANCE TESTS. SYSTEM PRESSURE DURING THE REPORTED MALFUNCTION WAS 2750 AND 3000 PSIG. FAILURE ANALYSIS DID NOT CONFIRM THE FAILURE. TESTS INDICATE THE ACTUATOR ASSEMBLY, S/N 010-1005, IS NOT A FAILED UNIT, AND THAT IT CAN BE OPERATED WITH ANY OF THE PRESENTLY USED SERVO AMPLIFIERS.

CORRECTIVE ACTION-NONE-GD/C FIELD PERSONNEL HAVE BEEN INFORMED THAT THIS UNIT WAS NOT THE CAUSE OF THE REPORTED MALFUNCTION.

HYDRAULIC-A/B BOOSTER	AE61-0581/FC-4CO-01-093 ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	COMPOSITE-FACTORY 27-08550-7	93D 610714		YES NO	HYDRAULIC RESEARCH 104700-1	099282

FAILURE MODE-FAIL DURING OPERATION-BOOSTER NO. 1 YAW FEEDBACK TRANSDUCER INDICATED UNEXPECTED OSCILLATIONS DURING THE COMPOSITE TEST.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-COMPOSITE RESCHEDULED. COMPOSITE RETEST REQUIRED.

CORRECTIVE ACTION-A COMPLETE FILL AND BLEED OPERATION WAS PERFORMED ON THE HYDRAULIC SYSTEM.

HYDRAULIC-A/B BOOSTER	9F-04-252 ACTUATOR ASSEMBLY	FAR 27-08550-9	46E 610706	MAFB	YES NO	HYDRAULIC RESEARCH 104700-9	097365

FAILURE MODE-FAILED DURING OPERATION-THE ACTUATOR REPORTEDLY CAUSED THE BOOSTER ENGINE TO VIBRATE DURING A HYDRAULIC FILL AND BLEED OPERATION. FAILURE ANALYSIS DID NOT CONFIRM THE FAILURE.

CORRECTIVE ACTION-THIS ASSEMBLY, S/N 104-1150 WILL BE PROCESSED BY GD/C IN ACCORDANCE WITH CURRENTLY ESTABLISHED PROCEDURES TO IDENTIFY ALL HYDRAULIC RESEARCH ACTUATORS AS STABLE, OR OSCILLATION PRONE. GD/C WILL ACCOMPLISH MINOR LEAKAGE ADJUSTMENT BEFORE RETURNING THE UNIT TO SERVICE.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	85-04-248 ACTUATOR SERVO VALVE	FAR 27-08550-9	30E 810617	FAFB	YES NO	HYDRAULIC RESE ARCH 104700-9	007360

FAILURE MODE-EXTERNAL LEAK. FLUID APPEARED TO LEAK THROUGH THE SERVO VALVE CASE. FAILURE ANALYSIS ATTRIBUTES OIL SE EPAGE PAST THE SERVO VALVE COVER PLATE TO A DEFECTIVE O-RING SEAL IN THE END CAP FOR THE FILTER PLUG CHAMBER DUE TO THE PRESENCE OF A RELATIVELY DEEP FISSURE IN THE MOLDING BEAN. CROSS SECTIONAL SHAPE OF THE SEAL WAS DEFORMED AND IR REGULAR. MOLDING FLASHES WERE EXCESSIVE.

VEHICLE EFFECT-DELAY.

CORRECTIVE ACTION-GD/C OUTSIDE PRODUCTION INSPECTION(OPI) HAS BEEN MADE COGNIZANT OF THE ANALYSIS OF THE FAILED ITE M. GD/C OPI INSPECTORS WILL EXERCISE VIGILANCE DURING SERVO VALVE ASSEMBLY TO PREVENT THE RECURRENCE OF THE SUBJECT FAILURE.

HYDRAULIC-A/B BOOSTER	86-10-078 HYDRAULIC ACCUMULATOR,SEAL	FAR 27-08554-3	07D 810613	ETR	YES NO	PEACOCK ENG. 51310-3	000160

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF PRECHARGE GAS ACROSS PISTON INTO THE SYSTEM HYDRAULIC OIL.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. ACTION INITIATED TO MAKE AN ENGINEERING EVALUATION TO ALLOW FOR THE TECHNI CAL DIRECTION TO ELIMINATE GAS LEAKAGE PAST THE PISTON.

HYDRAULIC-A/B BOOSTER	86-10-078 HYDRAULIC ACCUMULATOR	FAR 27-08554-3	9E 810613	ETR	YES NO	PEACOCK ENG 51310-3	000160

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF PRECHARGE GAS ACROSS PISTON INTO THE SYSTEM HYDRAULIC OIL.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. ACTION INITIATED TO MAKE AN ENGINEERING EVALUATION TO ALLOW FOR THE TECHNI CAL DIRECTION TO ELIMINATE GAS LEAKAGE PAST THE PISTON.

HYDRAULIC-A/B BOOSTER	86-10-078 HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08554-3	13E 810613	ETR	YES NO	PEACOCK ENG. 51310-3	000167

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF PRECHARGE GAS ACROSS PISTON INTO THE SYSTEM HYDRAULIC OIL.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. ACTION INITIATED TO MAKE AN ENGINE ING EVALUATION TO ALLOW FOR THE TECHNI CAL DIRECTION TO ELIMINATE GAS LEAKAGE PAST THE PISTON.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OIM	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	AC-62-0008/61-603-AE-01 ACCUMULATOR	CAPTIVE	1F 010618	B-1/61C 1.70	NO NO		096208

FAILURE MODE-PREMATURE OPERATION. OBSERVER CUTOFF WHEN CHART OBSERVER MISS READ M1033P (B1 HYDRAULIC ACCUMULATOR) A ND M1140P (SUSTAINER- VERNIER HYDRAULIC PRESSURE).

SYSTEM EFFECT-OPERATION STOPS PREMATURELY.

VEHICLE EFFECT-PREMATURE PROPULSION CUTOFF.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B BOOSTER	90-10-067 HYDRAULIC ACCUMULATOR,O-RING	FAR 27-00554-3	010600	WTR	YES NO	PEACOCK ENG. 51310-3	099176

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF GAS PAST THE PISTON INTO THE SYSTEM HYDRAULIC OIL. MAY BE CAUSED BY NORMAL O R NEAR NORMAL CONTAMINATION ABOUT THE PISTON O RING

CORRECTIVE ACTION-RECOMMENDED THAT THE ACCUMULATOR BE REMOVED FROM THE SYSTEM.

HYDRAULIC-A/B BOOSTER	98-10-074 BOOSTER HYDRAULIC TANK	FAR 27-00551-3	1000 010504	ETR	YES NO	BENDIX 0005	099154

FAILURE MODE-OUT OF TOLERANCE-END CAPS WERE LOOSE ON BARREL. LOCKWIRES FOR CAPS WERE .007 INCHES UNDERSIZE.

CORRECTIVE ACTION-UNIT WAS MISSED ON G.C. SURVEY REQUEST NO. 18, WHICH REQUIRED ALL UNITS WITH UNDERSIZED WIRES TO BE REWORKED.

HYDRAULIC-A/B BOOSTER	64-04-221 ACTUATOR-BOOSTER ENGINE	FAR 27-00550-7	1010 010510	B5	YES NO	HYDRAULIC RESE ARCH 104700-1	097060

FAILURE MODE-ERRATIC OPERATION. THE BOOSTER ENGINE ACTUATORS CHATTERED AND VIBRATED DURING PREPARATION FOR HYDRAULI C FILL AND BLEED TEST. CONCURRENTLY, SEVERAL ACTUATOR ASSEMBLIES WERE REJECTED FOR SIMILAR PERFORMANCE DURING INDIVI DUAL ACCEPTANCE TESTS IN RECEIVING INSPECTION AT PLANT 71.

CORRECTIVE ACTION-GENERAL DYNAMICS/CONVAIR HAS MODIFIED ALL SERVO AMPLIFIERS, EXCEPT THOSE USED WITH (ROUNDCAN) AUT OPILOTS FOR ALL D, E, AND F SERIES MISSILES, EXCEPT THOSE HAVING INITIAL OPERATIONAL CAPABILITY (D-10C). GD WILL IDE NTIFY BY MARKING ALL HYDRAULIC RESEARCH ACTUATORS WHICH DO NOT HAVE OSCILLATION CHARACTERISTICS AND RESERVE FOR USE ON D-10C MISSILES. UNMARKED ACTUATORS WILL BE USED ON OTHER D, E, AND F MISSILES.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	66-10-076 HYDRAULIC PUMP	FAR 27-08866-1	33D 610812	WTR	YES NO	VICKERS AA-60694-R-EA	000175

FAILURE MODE-STRUCTURAL-PUMP HOUSING WAS CRACKED WHILE MISSILE WAS DEMATED. FAILURE OF UNIT WAS PROBABLY CAUSED BY OVER PRESSURIZATION.

CORRECTIVE ACTION-RECOMMENDATION WAS MADE TO AIR FORCE PERSONNEL AT VAFB TO CAREFULLY FOLLOW THE MISSILE STORAGE PROCEDURES SET FORTH IN T.O. SM65-2J-8-2.

HYDRAULIC-A/B BOOSTER	66-10-071 BOOSTER HYDRAULIC TANK	FAR 27-08.51-3	12E 610906	ETR	YES NO	BENDOW 8985	000133

FAILURE MODE-OUT OF TOLERANCE-UNIT WAS REJECTED BECAUSE THE CAP ON THE HYDRAULIC END WAS ABOUT 4 DEGREES OUT OF ALIGNMENT WITH THE CYLINDER. THE COCKED END CAP WAS DUE TO .062 DIAMETER LOCKING WIRE USED INSTEAD OF REQUIRED .091 DIAMETER WIRE.

CORRECTIVE ACTION-THE APPROPRIATE PERSONNEL AT ALL FIELD AND FACTORY LOCATIONS WERE NOTIFIED TO RETURN ALL DEFECTIVE RESERVOIRS FOR REWORK.

HYDRAULIC-A/B BOOSTER	66-10-070 HYDRAULIC ACCUMULATOR,O-RING	FAR 27-08534-3	9E 610905	SYC	YES NO	PEACOCK ENG. 81310-3	000170

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF GAS ACROSS THE PISTON TO THE OIL SIDE.

CORRECTIVE ACTION-UNKNOWN. FAILURENOT CONFIRMED.

HYDRAULIC-A/B BOOSTER	66-04-238 ACTUATOR-BOOSTER TANK.	FAR 27-08550-9	41E 610427	FAFB	NO YES	HYDRAULIC RESE ARCH FAR8104700-0 R-04	007362

FAILURE MODE-FAILED DURING OPERATION-DURING THE FILL AND BLEED VALIDATION VIBRATION OCCURRED AND BOOSTER ENGINE NO 5 COULD NOT BE HALLED. BOTH THE ACTUATOR AND ITS ASSOCIATED SERVO AMPLIFIER WERE FAILURE ANALYZED. FAILURE OF THE ACTUATOR WAS NOT CONFIRMED.

CORRECTIVE ACTION-NONE.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	6R-04-221 ACTUATOR ASSEMBLY,BOOSTER	FAR 27-08550-9	18E 610414	18	NO NO	HYDRAULIC RESE ARCH 104700-9	097553
FAILURE MODE-ERRATIC OPERATION-THE BOOSTER ENGINE ACTUATORS CHATTERED AND VIBRATED DURING PREPARATION FOR ENGINE AL IGNMENT OPERATION.							
CORRECTIVE ACTION-GENERAL DYNAMICS CONVAIR WILL IDENTIFY ALL HYDRAULIC RESEARCH ACTUATORS FOR SPECIFIC USE. SEE REP ORT 6R-04-221.							
HYDRAULIC-A/B BOOSTER	96-04-212 ACTUATOR VALVE-SERVO	FAR 27-08550-5	65D 610321	OFFUTT	YES NO	MOOG N7773	090067
FAILURE MODE-CONTAMINATION-CONTAMINATION OF FILTER SCREENS UPSTREAM OF DROPPING ORIFICES AND IN PORT NO. 1 ORIFICE.							
CORRECTIVE ACTION-RECALLED ALL MOOG 27-08550-5 ACTUATORS FOR CLEANING AND RETROFIT WITH NEW FILTER AND ORIFICE UNIT S.							
HYDRAULIC-A/B BOOSTER	98-10-063 HYDRAULIC ACCUMULATOR LINE-PRECHAR GE	FAR 27-05007-303	610314	ETR	YES NO	CONVAIR	090170
FAILURE MODE-LEAK-EXTERNAL-ACCUMULATOR PRESSURE COULD NOT BE MAINTAINED DUE TO SMALL PIT HOLES IN THE FIRST SIX INC HES OF THE ALUMINUM TUBING LEADING FROM THE CHARGE PANEL. THE PIT HOLES WERE CAUSED BY A CORROSION ATTACK.							
CORRECTIVE ACTION-MEASURES WERE TAKEN TO INSURE THAT THE DEOXIDIZER SOLUTION USED IN THE PROCESSING OF ALUMINUM TUB ING BE MORE CLOSELY CONTROLLED TO PREVENT CORROSION PITTING.							
HYDRAULIC-A/B BOOSTER	6R-04-188 ACTUATOR	FAR 27-08550-5	82D 610313	WTR	YES NO	MOOG N7773	097202
FAILURE MODE-CONTAMINATION. DURING A FILL AND BLEED TEST THE ACTUATOR REMAINED FULLY EXTENDED WHEN A NULL SIGNAL WA S APPLIED. PRESSURE WAS AT 3000 PSI. FAILURE WAS DUE TO EXCESS CONTAMINATION IN THE DROPPING ORFICE. CONTAMINATION W AS MACHINE BURRS.							
CORRECTIVE ACTION-ALL MOOG 27-08550-5 ACTUATORS RECALLED AND RETROFITTED WITH NEW FILTER PLUG ASSEMBLIES. MOOG MODI FIED THE FABRICATION PROCESS TO ELIMINATE THE REOCCURRENCE OF MACHINE BURR FORMATIONS IN THE DROPPING ORFICE. MOOG R ETROFITTED ACTUATORS WILL BE RE-IDENTIFIED 27-08550-15.							

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HYDRAULIC-A/B BOOSTER	90-04-211 ACTUATOR ASSEMBLY,FEEDBACK TRANSDUCER	FAR 27-08550-3	1E 610310	WTR	YES NO	HYDRAULIC RESE ARCH 104700-3	000000
FAILURE MODE-FAIL DURING OPERATION-APPLICATION OF 3000 PSIG HYDRAULIC PRESSURE RESULTED IN PITCH BOOSTER ACTUATOR EXTENDING TO FULL HARD-OVER DEFLECTION. FEED BACK TRANSDUCER WAS OPEN A TO B AND A TO C, B TO C SHORTED. BURNED INSULATION AND FITTING, MELTED AND BROKEN COIL WINDING. CAUSE UNKNOWN.							
CORRECTIVE ACTION-NONE AS CAUSE COULD NOT BE DETERMINED. FAILURE HISTORY OF THIS ITEM DOES NOT INDICATE A TRANSDUCER DEFICIENCY. PROBABLE SECONDARY FAILURE, CAUSE UNKNOWN.							
HYDRAULIC-A/B BOOSTER	68-04-138 ACTUATOR	FAR 27-08550-7	000 610300	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	007324
FAILURE MODE-OUT OF TOLERANCE-DURING BOOSTER ENGINE GIMBALING THE ACTUATORS WERE EXHIBITING A HIGH AUDIBLE NOISE. ACTUATOR HAD A HIGH GAIN DUE TO IMPROPERLY ADJUSTED MAGNETS IN THE SERVO VALVE MOTOR.							
CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH TO PROVIDE INCREASED SURVEILLANCE OF ALL TEST DATA. GD/C WILL CHANGE INITIAL CHECKOUT PROCEDURE TO ISOLATE HIGH GAIN ADJUSTMENTS AT THE ACTUATOR ASSEMBLY AREA.							
HYDRAULIC-A/B BOOSTER	98-04-192 ACTUATOR	FAR 27-08550-3	610223	1-4	YES NO	HYDRAULIC RESE ARCH 104700-3	007192
FAILURE MODE-ERRATIC OPERATION-DURING AUTOPILOT CALIBRATION THE ACTUATOR WAS OBSERVED VIBRATING AND HUNTING. FAILURE COULD NOT BE CONFIRMED IN SAN DIEGO. CAUSE BELIEVED TO BE OTHER THAN THE ACTUATOR.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	98-10-066 BOOSTER HYDRAULIC RESERVOIR	FAR 27-08551-3	000 610210	ETR	YES NO	BENDIX 0005	000120
FAILURE MODE-INTERNAL LEAK-LEAKAGE OF PRE-CHARGE GAS ACROSS THE PISTON TO THE OIL SIDE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. CONVAIR IS CONSIDERING A BETTER METHOD OF CHECKOUT ON THE HYDRAULIC ACCUMULATOR TO DETECT GAS LEAKAGE PAST THE PISTON AFTER ASSEMBLY.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	9D-04-193 ACTUATOR	FAR 27-08550-8	610216	WTR	YES NO	HOOG M7773	897201
FAILURE MODE-OUT OF TOLERANCE-DURING CHECKOUT THE ACTUATOR EXHIBITED ERRATIC BEHAVIOR. FAILURE WAS DUE TO THE PRESENCE OF AN EXTRA CENTERING PIN IN THE PORT NO. 1 SPOOL SPRING AND A MISALIGNED CENTERING PIN BETWEEN THE SPOOL AND PORT NO. 2 SPOOL SPRING.							
CORRECTIVE ACTION-GD/C INSPECTION ALERTED TO THE FAILURE. VCAR TO HOOG TO TAKE ACTION TO PREVENT RE-OCCURRENCE OF SIMILIAR FAILURES.							
HYDRAULIC-A/B BOOSTER	A-9M-10-089F HYDRAULIC PUMP	FAR 27-08566-1	610207	FORBES	YES NO	VICKERS AA-60694-R-2A	899153
FAILURE MODE-EXTERNAL LEAK-LEAKAGE (OIL) AT THE CONTROL PISTON COVER PLATE. FAILURE WAS DUE TO OMISSION OF AN O RING & SPACER P/N 170364 UNDER THE CONTROL PISTON COVER PLATE DURING FIELD ASSEMBLY.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	98-04-147 ACTUATOR ORIFICE	FAR 27-08550-7	79D 602507	ETR	YES NO	HYDRAULIC RESE ARCH 104700-1	897155
FAILURE MODE-CONTAMINATION. DURING AN AUTOPILOT FREQUENCY RESPONSE TEST THE ACTUATOR RESPONDED ERRATICALLY WHEN A 5 0 CPS INPUT WAS APPLIED. FAILURE WAS DUE TO A SERVO VALVE ORIFICE BEING PARTIALLY BLOCKED BY CONTAMINATION OF METAL PARTICLES.							
CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH REQUESTING THEM TO IMPROVE THE CLEANLINESS OF THEIR COMPONENTS.							
HYDRAULIC-A/B BOOSTER	98-04-147 ACTUATOR ORIFICE	FAR 27-08550-3	602507	1-4	YES NO	HYDRAULIC RESE ARCH 104700-3	897154
FAILURE MODE-CONTAMINATION. DURING SYSTEM CHECKOUT THE ACTUATOR EXHIBITED ERRATIC OPERATIONAL RESPONSE. FAILURE WAS CAUSED BY A PARTIALLY BLOCKED SERVO VALVE ORIFICE IN THE FILTER STIFFENER. THE CONTAMINATION WAS THE SAME AS THE MATERIAL USED IN THE ACTUATORS.							
CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH TO TAKE ACTION TO IMPROVE CLEANLINESS.							

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SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	98-04-100 ACTUATOR ASSEMBLY	FAR 27-08550-3	320 602406	ETR	YES NO	MOOG M7773	007751
FAILURE MODE-STRUCTURAL. ACTUATOR REJECTED BECAUSE VISUAL EXAMINATION INDICATED SELF ALIGNING BEARINGS AT EACH END OF THE ACTUATOR WERE SEIZED. THE BACK END BEARING RACE WAS GOUGED AND THE MOUNTING FLANGE WAS BATTERED. ACTUATOR MET ALL OPERATING REQUIREMENTS. CORRECTIVE ACTION-COMPONENT PROBABLY DAMAGED DURING INSTALLATION. COGNIZANT PERSONNEL INFORMED OF THE DISCREPANCY.							
HYDRAULIC-A/B BOOSTER	8804075 ACTUATOR	FAR 27-08550-3	22 602104	FACTORY	NO NO	HYDRAULIC RESE ARCH 104700-3	007808
FAILURE MODE-OUT OF TOLERANCE-FEED BACK NULL OUT OF TOLERANCE. COULD NOT BE CONFIRMED. CORRECTIVE ACTION-NONE-CAUSE OF REPORTED FAILURE COULD NOT BE DETERMINED.							
HYDRAULIC-A/B BOOSTER	90-10-061 HYDRAULIC ACCUMULATOR	FAR 27-08554-3	990 601228	WTR	YES NO	PEACOCK ENG. 51310-3	009101
FAILURE MODE-INTERNAL LEAK. GAS PRECHARGE LEAKING ACROSS THE PISTON. CORRECTIVE ACTION-FAILURE NOT CONFIRMED. PROBABLE CAUSE OF FAILURE WAS O RING. O RING BECOMES POROUS WHEN SUBJECTED TO HIGH TEMPERATURE QUALIFICATION TEST. SEE CLASS REPORT							
HYDRAULIC-A/B BOOSTER	98-04-152 ACTUATOR O-RING	FAR 27-08550-3	900 601222		YES NO	MOOG M7773	007130
FAILURE MODE-LEAK, EXTERNAL. UNIT REMOVED DUE TO A LEAK AT THE MID CYLINDER CASTING JOINT. FAILURE WAS DUE TO A FIN E CIRCUMFERENTIAL CUT THAT PERMITTED LEAKAGE UNDER 3000 PSI HYDRAULIC SYSTEM PRESSURE. CORRECTIVE ACTION-GD/C INITIATED A REVISED ACCEPTANCE PROCEDURE INCORPORATING DYNAMIC TESTING OF THE INTEGRATED ASS EMBLY CONSISTING OF ACTUATOR, SERVO VALVE AND FEEDBACK TRANSDUCER.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	6R-04-142 ACTUATOR, BOOSTER	FAR 27-08550-7	990 601218	WTR	YES NO	HYDRAULIC RESE ARCH 104700-1	007829
FAILURE MODE-CONTAMINATION. DURING APCHE DECK 58 CHECKOUT A NO-GO INDICATION WAS RECEIVED DURING FREQUENCY RESPONSE TESTS AT 10 CPS. FAILURE WAS DUE TO PLUG MATERIAL CONTAMINATION IN THE ORFICE AND DRILL BURRS IN THE HOLE OF THE FI LTER SLEEVE. CORRECTIVE ACTION-(1) VCAR TO HYDRAULIC RESEARCH TO ESTABLISH PROCEDURES TO ELIMINATE SIMILIAR CONTAMINATION (2) GO /C REVISED INSPECTION PROCEDURE TO DETECT SIMILIAR SHIFTS IN DYNAMIC NULLS IN FUTURE ACTUATORS.							
HYDRAULIC-A/B BOOSTER	98-04-160 VALVE SERVO	FAR 27-08550-5	960 601212	OFFUTT	YES NO	MOOG M-7773	007140
FAILURE MODE-OUT OF TOLERANCE. DURING SYSTEM TESTS THE UNIT WAS REMOVED BECAUSE THE FREQUENCY RESPONSE WAS BELOW TH E SPECIFICATION LIMITS. BELIEVED DUE TO AN IMPROPER INSTALLATION THAT WAS INADVERTENTLY CORRECTED DURING INSTALLATIO N OF NEW PART. CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-10-060 ACTUATOR	FAR 27-08550-7	800 601210	ETR	YES NO	HYDRAULIC RESE ARCH 104700-1	009160
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION. CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							
HYDRAULIC-A/B BOOSTER	98-10-060 BOOSTER PRESSURE RISE OFF DISCONNE CT	FAR 27-08550-5	800 601210	ETR	YES NO	PEACOCK 51300-3	005137
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION. CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	98-10-060 BOOSTER RESERVOIR	FAR 27-08551-3	800 601210	ETR	YES NO	BENDOW 8005	000130

FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION.

CORRECTIVE ACTION-MORE RIGID MEASURE TO PREVENT CONTAMINATION HAVE BEEN TAKEN.

HYDRAULIC-A/B BOOSTER	AC-60-0050/31-511-A7-08 B1 HYD. RESERVOIR FLEX HOSE	CAPTIVE 27-08800-B1	SE 601128	B1	YES NO	000001

FAILURE MODE-LEAK-EXTERNAL- MINOR LEAK WAS DISCOVERED DURING POST TEST SECURING.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

HYDRAULIC-A/B BOOSTER	ETR-031/14-531-E3-SE	CAPTIVE	601128	1-4 0.7	YES NO	002203

FAILURE MODE-CONTAMINATION. THE BOOSTER HYDRAULIC SYSTEM HAD AN EXCESSIVE AMOUNT OF ENTRAPPED GAS.

SYSTEM EFFECT-ERRATIC OPERATION. B1 HYDRAULIC ACCUMULATOR PRESSURE WAS ERRATIC.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-HYDRAULIC SYSTEM WAS BLED.

HYDRAULIC-A/B BOOSTER	99-10-037 RELIEF VALVE	FAR 27-08561-1	870 601110		YES NO	VINSON A-80282	000155

FAILURE MODE-INTERNAL LEAK. LEAKAGE PERMITTED LOW PRESSURE SYSTEM TO OVERPRESSURIZE CAUSING FAILURE OF BOOSTER HYDRAULIC FLUID TANK.

CORRECTIVE ACTION-VENDER WAS INSTRUCTED TO IMPROVE HIS QUALITY CONTROL.

HYDRAULIC-A/B BOOSTER	AE60-0749/L1-408-00-87 TRANSDUCER	FLIGHT	870 601011	PALS-1 107	NO YES	

FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE-B1 HYD ACCUMULATOR PRESSURE DECREASED FROM 3060 PSIG TO 810 PSIG BETWEEN 107 AND 192 SECS (JETTISON). NOT REFLECTED IN ANY SYSTEM LOSS OF HYDRAULIC CONTROL. ERRONEOUS SENSING OF BOOSTE

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R HYDRAULIC PRESSURE DUE TO A FROZEN SENSING LINE. SYSTEM EFFECT-OPERATION TOO LOW-DATA INDICATED LOW SYSTEM PRESSURE. NO OTHER EFFECTS OBSERVED. CORRECTIVE ACTION-EXTENSIVE LABORATORY TESTING IN AN ATTEMP TO SIMULATE FLIGHT CONDITIONS TO DETERMINE THE CAUSE OF PRESSURE DECREASE. THE PROBABLE CAUSES ARE AS LISTED IN THE FAILURE MODE.							000017
HYDRAULIC-A/B BOOSTER	98-04-157 ACTUATOR SLEEVE	FAR 27-06550-7	79D 600915	ETR	YES NO	HYDRAULIC RESE ARCH 104700-1	007143
FAILURE MODE-STRUCTURAL. DURING SYSTEM TESTING THE UNIT OPERATED ERRATICALLY AND WAS REMOVED. FAILURE WAS DUE TO A CRACK IN THE BRAZE BETWEEN THE FLEXURE SLEEVE AND THE FLEXURE SLEEVE HOUSING. THIS RESULTED IN A MECHANICAL MIS-ALIGNMENT OF THE FLEXURE SLEEVE AND HOUSING. CORRECTIVE ACTION-VCAR TO HYDRAULIC RESEARCH TO INTENSIFY EFFORT TO ENSURE THAT NO ADDITIONAL FAILURES OF THIS TYPE OCCUR.							
HYDRAULIC-A/B BOOSTER	AA60-0099P4-401-0079 ACTUATOR ASSEMBLY, SERVO VALVE	COUNTDOWN	79D 600915	14 -1.	YES NO		003070
FAILURE MODE-OUT OF TOLERANCE. DURING THE ATTEMPTED LAUNCH COUNTDOWN, THE B2 ENGINE DID NOT MAINTAIN A PROPER NULL POSITION IN PITCH DUE TO ORGANIC CONTAMINATION IN THE SERVO VALVE. THIS IMPROPER NULL WAS EXPERIENCED AFTER ENGINES SHUTDOWN. SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. BOOSTER ENGINE FAILED TO MAINTAIN PROPER NULL. VEHICLE EFFECT-NONE. COUNTDOWN WAS ABORTED FOR OTHER REASONS. CORRECTIVE ACTION-THE B2 ACTUATOR WAS REPLACED.							
HYDRAULIC-A/B BOOSTER	98-04-156 ACTUATOR ASSEMBLY	FAR 27-06550-5	79D 600825	ETR	YES NO	MOOG M7775	007142
FAILURE MODE-STRUCTURAL. DURING SYSTEM TEST3 THE UNITS FREQUENCY RESPONSE WAS BELOW THE SPECIFICATION LIMITS. FAILURE WAS DUE TO A SLIGHTLY WORN SPOOL BELIEVED CAUSED BY SOME SORT OF CONTAMINANT. HOWEVER NO CONTAMINANT WAS PRESENT WHEN THE UNIT WAS DISASSEMBLED. CORRECTIVE ACTION-GD/C INTENSIFIED CONTAMINATION PREVENTIVE MEASURES.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	98-04-118 ACTUATOR ASSEMBLY, BOOSTER SERVO V ALVE	FAR 27-06550-3	3E 600817	ETR	NO NO	HYD-RESEARCH 104700-3	697146
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE-HIGH NULL VOLTAGE AND INSTABILITY. FAILURE ANALYSIS DID NOT CONFIRM FAILURE. PROBABLY CAUSED BY CONTAMINATION. CORRECTIVE ACTION-NONE							
HYDRAULIC-A/B BOOSTER	90-04-108 ACTUATOR ASSEMBLY	FAR 27-06550-5	57-D 600813	WTR	NO NO	MOOG M7773	697343
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE-HIGH NULL CHARACTERISTICS NOT CONFIRMED BY TESTING. CORRECTIVE ACTION-NONE-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	90-04-108 ACTUATOR ASSEMBLY	FAR 27-06550-5	57-D 600813	WTR	YES NO	MOOG M7773	697344
FAILURE MODE-LEAK-EXTERNAL. FAILURE NOT CONFIRMED DURING FAILURE ANALYSIS. MAY HAVE BEEN CAUSED BY O-RING CONTAMINATION. CORRECTIVE ACTION-NONE-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-04-118 ACTUATOR ASSY	FAR 27-06550-5	600811	ERB	NO NO	HYD-RESEARCH 104700-3	697147
FAILURE MODE-OUT OF TOLERANCE. NULL VOLTAGE WAS HIGH. FAILURE NOT CONFIRMED BY FAILURE ANALYSIS. PROBABLY CAUSED BY CONTAMINATION. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	88-10-054 BOOSTER HYDRAULIC PUMP,SEAL	FAR 27-06566-1	2E 800729	SYCAMORE	YES NO	VICKERS AA-60694-R-2A	
FAILURE MODE-LEAK-EXTERNAL-A STEADY DRIP OIL LEAK OCCURRED AT THE MATING FLANGE OF PUMP BODY AND THE COMPENSATOR. LEAK WAS CAUSED BY A DEFORMED TEFLON WASHER AT THE MATING SURFACE OF THE COMPENSATOR AND THE PUMP.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR WAS INSTRUCTED TO IMPROVE THE QUALITY CONTROL ON THE SUBJECT TYPE OF WASHER.							099174
HYDRAULIC-A/B BOOSTER	98-10-033 BOOSTER HYDRAULIC PUMP,SEAL	FAR 27-08566-1	54D 600713	ETR	YES NO	VICKERS AA-60694-A-2A	099157
FAILURE MODE-LEAK-EXTERNAL-SLIGHT SEEPAGE LEAK AT THE ADAPTER PADS ON BOTH THE INLET AND OUTLET ELBOWS.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-04-159 ACTUATOR	FAR 27-08550-5	66D 600712	ETR	YES NO	MOOG M7773	097141
FAILURE MODE-ERRATIC OPERATION. DURING SYSTEM TESTING THE BOOSTER 2 ENGINE EXHIBITED ERRATIC OPERATION BY CAUSING THE ENGINE TO KICK AND VIBRATE IN RESPONSE TO INPUT SIGNALS. FAILURE COULD NOT BE CONFIRMED BUT BELIEVED TO BE DUE TO A POOR ELECTRICAL CONNECTION.							
CORRECTIVE ACTION-NONE. CAUSE OF FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-04-148 ACTUATOR SEAL	FAR 27-08550-8	50D 600622	ETR	YES NO	MOOG M7773	097153
FAILURE MODE-LEAK, EXTERNAL. ACTUATOR REMOVED BECAUSE IT WAS REPORTED TO BE LEAKING AT THE SHAFT SEAL.							
CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	DA209/83-4MO-04-53	COMPOSITE-FRD/DPL	53D 600615	B-3	YES NO		097026
FAILURE MODE-CONTAMINATION. ENGINE NULLS COULD NOT BE OBTAINED. THIS WAS CAUSED BY A POOR FILL AND BLEED OF THE HYDRAULIC SYSTEM.							
SYSTEM EFFECT-ERRATIC OPERATION.							
VEHICLE EFFECT-COUNTDOWN DELAYED.							
CORRECTIVE ACTION-FILL AND BLEED PERFORMED ON THE HYDRAULIC SYSTEMS.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	88-04-110 SERVO ACTUATOR ASSEMBLY	FAR 27-08550-5	2E 600604	8YC	YES NO	HYD-RESEARCH 1047/10-6	887340
FAILURE MODE-LEAK-EXTERNAL. FAILURE NOT CONFIRMED BY TESTING. MAY HAVE BEEN CAUSED BY O-RING CONTAMINATION.							
CORRECTIVE ACTION-NONE-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-04-101 ACTUATOR ASSEMBLY,SEAL	FAR 27-08550-5	56D 600531	ETR	YES NO	MOOG M7773	887881
FAILURE MODE-LEAK-EXTERNAL. REMOVED FROM MISSILE FOR EXCESSIVE LEAKAGE AT THE SHAFT SEAL.FAILURE COULD NOT BE CONFIRMED.							
CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.							
HYDRAULIC-A/B BOOSTER	98-10-030 HYDRAULIC TANK,SEAL	FAR 27-08551-5	600519		YES NO	PANTEX 8865	889373
FAILURE MODE-INTERNAL LEAK. INTERNAL GAS LEAKAGE PAST THE PISTON TO THE HYDRAULIC SIDE.							
CORRECTIVE ACTION-NONE - FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-04-114 VALVE-BOOSTER ACTUATOR ASSEMBLY,SERVO	FAR 27-08550-5	56D 600512	ETR	YES NO	MOOG M7773	887347
FAILURE MODE-ERRATIC OPERATION DUE TO CONTAMINATION RESULTING FROM IMPROPER CLEANING BY VENDOR.							
CORRECTIVE ACTION-VENDOR INFORMED OF CONTAMINATION PROBLEM AND PROPER CLEANING METHOD.							
HYDRAULIC-A/B BOOSTER	98-04-101 ACTUATOR ASSEMBLY,SEAL	FAR 27-08550-5	56D 600509	ETR	YES NO	MOOG M7773	
FAILURE MODE-LEAK-EXTERNAL. REMOVED FROM MISSILE FOR EXCESSIVE LEAKAGE AT THE SHAFT SEAL. FAILURE COULD NOT BE CONFIRMED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.							097000
HYDRAULIC-A/B BOOSTER	98-04-114 VALVE-BOOSTER ACTUATOR SERVO	FAR 27-06550-5	650 600500	FACTORY	YES NO	MOOG M7773	097340
FAILURE MODE-ERRATIC OPERATION DUE TO CONTAMINATION RESULTING FROM IMPROPER CLEANING BY VENDOR. CORRECTIVE ACTION-VENDOR INFORMED OF CONTAMINATION PROBLEM AND PROPER CLEANING METHOD.							
HYDRAULIC-A/B BOOSTER	98-04-114 VALVE-BOOSTER ACTUATOR SERVO	FAR 27-06550-5	650 600500	FACTORY	YES NO	MOOG M7773	097346
FAILURE MODE-ERRATIC OPERATION DUE TO CONTAMINATION RESULTING FROM IMPROPER CLEANING BY VENDOR. CORRECTIVE ACTION-VENDOR INFORMED OF CONTAMINATION PROBLEM AND PROPER CLEANING METHOD.							
HYDRAULIC-A/B BOOSTER	98-04-114 VALVE-BOOSTER ACTUATOR SERVO	FAR 27-06550-5	650 600500	FACTORY	YES NO	MOOG M7773	097345
FAILURE MODE-ERRATIC OPERATION DUE TO CONTAMINATION RESULTING FROM IMPROPER CLEANING BY VENDOR. CORRECTIVE ACTION-VENDOR INFORMED OF CONTAMINATION PROBLEM AND PROPER CLEANING METHOD.							
HYDRAULIC-A/B BOOSTER	90-04-081 ACTUATOR	FAR 27-06550-5	470 600405	WTR	YES NO	MOOG M7773	097736
FAILURE MODE-OUT OF TOLERANCE-FAILED TO HOLD WITH IN SPECIFICATION LIMITS DURING SYSTEM TESTING. FAILURE COULD NOT BE CONFIRMED. CORRECTIVE ACTION-NONE-NO CAUSE COULD BE FOUND.							
HYDRAULIC-A/B BOOSTER	98-10-049 PRESSURE GAGE	FAR 27-06562-3	400 600404	ETR	YES NO	ROCHESTER	
FAILURE MODE-CONTAMINATION. THE UNIT FAILED TO INDICATE AT VARIOUS PRESSURE LEVELS. THE BOURDON TUBE IN THE UNIT WA S FILLED WITH RUST PREVENTING THE UNIT TO INDICATE A CHANGE IN PRESSURE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-ACTION HAS TAKENPLACE TO CHANGE THE BOURDON TUBE MATERIAL TO INCONEL.							098574
HYDRAULIC-A/B BOOSTER	98-04-064 ACTUATOR ASSEMBLY	FAR 27-08550-5	350 600404	WAFB	YES NO	NOOS N7775	097670
FAILURE MODE-LEAK-EXTERNAL-SHAFT SEAL LEAKED WHILE HYDRAULIC SYSTEM WAS PRESSURIZED AT 2900 PSIG WITH ENGINE CYCLIN G.							
CORRECTIVE ACTION-FAILURE UNCONFIRMED, NO CORRECTIVE ACTION TAKEN.							
HYDRAULIC-A/B BOOSTER	96-10-047 HYDRAULIC FLEX HOSE	FAR 27-08571-63	600310	ETR	YES NO	AEROQUIP 675035-1	099579
FAILURE MODE-LEAK-EXTERNAL - EXTERNAL LEAKAGE OF HOSE AT A POINT WHERE THE BRAIDED HOSE COVER ENTERS THE SOCKET.							
CORRECTIVE ACTION-NONE - FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-10-048 HYDRAULIC FLEX HOSE	FAR 27-08571-61	420 600319	ETR	YES NO	AEROQUIP 860121-10-0266	099575
FAILURE MODE-LEAK-EXTERNAL - EXTERNAL LEAKAGE LOCATED AT THE JUNCTION OF THE BRAID AND SOCKET. FAILED BECAUSE OF A BONDED SLEEVE AND LOOSELY TORQUED END FITTING.							
CORRECTIVE ACTION-VENDOR NOTIFIED AND INSTRUCTED TO INSURE PROPER TORQUE VALUES DURING HOSE FABRICATION.							
HYDRAULIC-A/B BOOSTER	98-04-050 ACTUATOR/O-RING SEALS	FAR 27-08550-5	420 600301	ETR	YES NO	NOOS N7773	097180
FAILURE MODE-LEAK-EXTERNAL-ACTUATOR ASSEMBLY LEAKED AT MATING FLANGE DURING SYSTEM TESTING AT 3000 PSIG. ROD END OF DYNAMIC O-RING SEAL WAS NICKED ON THE INNER RADIUS.							
CORRECTIVE ACTION-VCAR ISSUED TO VENDOR TO IMPROVE QUALITY CONTROL DURING ASSEMBLY.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	98-04-051 ACTUATOR-SERVO VALVE	FAR 27-08550-8	290 600300	ETR	YES NO	MOOG M7773	097130

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME-ACTUATOR WAS BIASED HARD OVER WHEN IT SHOULD HAVE BEEN NULLED. ACTUATOR WOULD NOT RESPOND TO A/P SIGNALS. SERVO VALVE SPOOL CENTERING PIN AT ONE END WAS OUT OF CORRECT POSITION DUE TO IMPROPER ASSEMBLY.

CORRECTIVE ACTION-VCAR ISSUED TO VENDOR TO INSTENSIFY INSPECTION SURVEILLANCE.

HYDRAULIC-A/B BOOSTER	AE60-0198/FC-4CO-02-390 ACTUATOR ASSEMBLY	COMPOSITE-FACTORY 27-08550-5	390 600222	FACTORY	YES NO	MOOG M7773	097330

FAILURE MODE-OUT OF TOLERANCE. BOOSTER NO. 2 YAW ACTUATOR ASSEMBLY WAS REJECTED FOR FAILURE TO MA.. THE ENGINE UNTIL HYDRAULIC PRESSURE INDICATED 2900. THIS ACTUATOR ASSEMBLY WAS REPLACED WITH S/N 905-0000.

SYSTEM EFFECT-OPERATION STARTS TOO LATE. ACTUATOR FAILED TO MALL ENGINE UNTIL PRESSURE WAS 2900 PSI.

VEHICLE EFFECT-COMPOSITE DELAYED. ADDITIONAL SYSTEMS TEST REQUIRED TO PROVE SATISFACTORY OPERATION.

CORRECTIVE ACTION-ACTUATOR REPLACED.

HYDRAULIC-A/B BOOSTER	98-04-088 ACTUATOR-82 YAW	FAR 27-08550-8	290 600129	ETR	YES NO	MOOG M7773	097774

FAILURE MODE-OUT OF SPECIFICATION-FREQUENCY RESPONSE WAS 3 TO 7 DB BELOW 1 DB SPECIFICATION LIMITS. BENCH TEST COULD NOT BE VERIFIED. CADMIUM FLAKE CONTAMINATION WAS FOUND.

CORRECTIVE ACTION-VCAR TO MOOG TO REMOVE CADMIUM PLATING FROM INSIDE OF ACTUATORS WHERE CONTACT WITH HYDRAULIC OIL IS MADE. ALL STOCK SURVEYED AND RETURNED TO VENDOR.

HYDRAULIC-A/B BOOSTER	98-0:-044 ACTUATOR FEEDBACK TRANSDUCER CONNECTOR	FAR T-84501-502	000100	ETR	YES NO		000007

FAILURE MODE-SHORT (ELECTRICAL). ACTUATOR FEEDBACK TRANSDUCER WAS SHORTED AND WOULD NOT INDICATE POSITION.

CORRECTIVE ACTION-FEEDB.CK TRANSDUCER CONNECTOR REPLACED WITH IMPROVED TYPE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	80-10-048 HYDRAULIC TANK,O-RING	FAR 27-08551-5	591200	MTR	YES NO	PANTEX 8985	890741

FAILURE MODE-LEAK-EXTERNAL-EXCESSIVE EXTERNAL OIL LEAKAGE AT THE COUPLING COLLAR (NUT) ON THE PORTED HYDRAULIC END DUE TO A DAMAGED O RING.

CORRECTIVE ACTION-INITIATED ACTION FOR BETTER SEAL INSTALLATION. ALSO THE VENDOR WAS NOTIFIED AND INSTRUCTED TO IMPROVE HIS QUALITY.

HYDRAULIC-A/B BOOSTER	90-04-033 ACTUATOR ASSEMBLY	FAR 27-08550-5	200 591200	ETR	YES NO	M006 M7773	890865

FAILURE MODE-FAIL DURING OPERATION-DURING AUTOPILOT SYSTEM RESPONSE TESTS THE ACTUATOR DROVE THE B-1 ENGINE HARD OVER IN YAW WHEN IT NORMALLY SHOULD HAVE REMAINED IN THE NULL POSITION.

CORRECTIVE ACTION-VCAR ISSUED TO THE VENDOR TO INSTITUTE CONTAMINATION CONTROL DURING SERVO VALVE ASSEMBLY.

HYDRAULIC-A/B BOOSTER	AZC-27-055/PS-403-00-15 ACTUATOR ASSEMBLY	FLIGHT 27-08550-5	150 591184	15 0.	YES NO	M006 M7773	893929

FAILURE MODE-OUT OF TOLERANCE. BOOSTER ENGINES OFFSET IN YAW BY APPROXIMATELY 1.0 DEGREES. OFFSET MOST PROBABLY THE RESULT OF MISADJUSTED ACTUATOR LENGTHS DUE TO A BIAS DURING ALIGNMENT.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B BOOSTER	86-04-028 ACTUATOR, O-RING	FAR 27-08550-5	360 591183	FACTORY	YES NO	M006 M7773	890589

FAILURE MODE-LEAK EXTERNAL. YAW ACTUATOR ON B-1 ENGINE LEAKED AT THE SHAFT SEAL DURING STANDBY AT A PRESSURE OF 100 PSIG.

VEHICLE EFFECT-POSSIBLE COUNTDOWN OR COMPOSITE DELAY OR RESCHEDULE. LOSS OF VEHICLE STABILITY MAY OCCUR DURING FLIGHT.

CORRECTIVE ACTION-METAL PARTICLES WERE BETWEEN SHAFT AND O-RING SEALS. VCAR ISSUED TO VENDOR.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI GTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	90-10-035 HYDRAULIC ACCUMULATOR,O-RING	FAR 27-06554-3	80 591100	576-AR	YES NO	PEACOCK ENG. 51310-3	899733

FAILURE MODE-CONTAMINATION. LEAKAGE OF THE GAS PRECHARGE ACROSS THE PISTON TO THE HYDRAULIC SIDE OF THE UNIT. THE U NIT FAILED AS SPECIFIED BECAUSE OF EXCESSIVE PARTICLE CONTAMINATION ON THE O AND BACKUP RINGS.

CORRECTIVE ACTION-IT IS RECOMMENDED THAT A PROGRAM BE ESTABLISHED TO ARRIVE AT A COMPATIBLE SYSTEM LEVEL CONTAMINAT ION CONTROL.

HYDRAULIC-A/B BOOSTER	88-10-041 HYDRAULIC TANK, O-RING	FAR 27-06551-3	180 591016	ETR	YES NO	FANTEX 0065	899571

FAILURE MODE-STRUCTURAL - THE FLUID END OF THE HYDRAULIC TANK RUPTURED.

CORRECTIVE ACTION-THE TANK FAILED BECAUSE OF OVER - PRESSURIZATION OF THE HYDRAULIC SYSTEM. CONVAIR HAS INITIATED A CTION TO PROVIDE A STANDARDIZED PROCEDURE FOR ADJUSTMENT OF THE RISE-OFF DISCONNECT PANEL AND A PROPER OPERATING PRO CEDURE TO ADVERT SIMILAR FAILURES.

HYDRAULIC-A/B BOOSTER	90-10-038 HYDRAULIC FLEX HOSE	FAR 27-06571-53	120 591005	WTR	YES NO	AEROQUIP 666939-12-0080	899737

FAILURE MODE-STRUCTURAL-A SEVERE TWIST CAUSED A PERMANENT DEFORMATION OF THE HOSE.

CORRECTIVE ACTION-PROPER ACTION WAS INITIATED TO REQUIRE BETTER INSTALLATION AND INSPECTION OF SUBJECT HOSE ASSEMBL Y TO MINIMIZE SIMULAR FAILURES.

HYDRAULIC A/B BOOSTER	90-10-037 HYDRAULIC ACCUMULATOR	FAR 27-06554-3	270 590980	WTR	YES NO	PEACOCK ENG. 51310-3	899736

FAILURE MODE-INTERNAL LEAK. INTERNAL GAS PRE-CHARGE LEAKAGE ACROSS THE PISTON TO THE HYDRAULIC SIDE OF THE UNIT. TH E CAUSE OF THE LEAKAGE WAS DUE TO POROSITY OF THE PISTON.

CORRECTIVE ACTION-ALL ACCUMULATORS THAT WERE IN STOCK OR AT THE VENDORS WILL BE CHECKED AND REPLACED IF POROUS. GD/ C HAS INITIATED ACTION TO INSURE CONFORMANCE OF FUTURE ACCUMULATORS

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	98-10-036 HYDRAULIC FLEX HOSE	FAR 27-08571-59	590922	ETR	YES NO	AEROQUIP 675012 L-0171	899735
FAILURE MODE-LEAK-EXTERNAL-EXTERNAL LEAKAGE BETWEEN THE B NUT AND THE NIPPLE.							
CORRECTIVE ACTION-NONE-LEAKAGE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-10-036 HYDRAULIC FLEX HOSE	FAR 27-08571-51	590922	ETR	YES NO	AEROQUIP 675011 L-0080	899734
FAILURE MODE-LEAK-EXTERNAL-EXTERNAL LEAKAGE BETWEEN BRAID AND SLEEVE.							
CORRECTIVE ACTION-NONE-LEAKAGE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	90-10-033 HYDRAULIC PUMP	FAR 27-08588-1	120 590828	WTR	YES NO	VICKERS	899572
FAILURE MODE-EXTERNAL LEAK. A HYDRAULIC LEAK IN THE BOOSTER PUMP CASING WAS DISCOVERED WHEN THE ACCUMULATOR WAS CHARGED TO 2050 PSIG.							
CORRECTIVE ACTION-THE HYDRAULIC SYSTEM WAS OVER - PRESSURIZED DURING CHARGING OF THE ACCUMULATOR. CONVAIR HAS INITIATED ACTION TO CHANGE APPROPIATE SECTIONS OF THE FILL AND BLEED AND VALIDATION PROCEDURES FOR THE A/B HYDRAULIC SYSTEM TO PREVENT SIMILAR FAILURES.							
HYDRAULIC-A/B BOOSTER	AZM-27-332/FC-4CO-01-33 ACTUATOR	COMPOSITE-FACTORY 27-08550-5	330 590828		YES NO	MOOG M7773	897108
FAILURE MODE-ERRATIC OPERATION-VARIATIONS IN BOOSTER NO. 1 YAW FEEDBACK VOLTAGES WERE OBSERVED. THIS CONDITION DID NOT OCCUR ON POST COMPOSITE TESTING AND WAS ATTRIBUTED TO AIR IN THE HYDRAULIC SYSTEM.							
SYSTEM EFFECT-ERRATIC OPERATION.							
VEHICLE EFFECT-COMPOSITE DELAYED. AIR IN HYDRAULIC SYSTEM CAUSED UNEXPECTED VARIATIONS IN ENGINE POSITION. POST COMPOSITE TESTS REQUIRED TO SHOW PROPER SYSTEM OPERATION.							
CORRECTIVE ACTION-NOT KNOWN.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B BOOSTER	66-10-031 HYDRAULIC FLEX HOSE	FAR 27-08571-43	990728	SVC.	YES NO	AEROQUIP 677025-8-016	099743
FAILURE MODE-EXTERNAL LEAK. LEAKING AT EITHER ONE OR BOTH END FITTINGS.							
CORRECTIVE ACTION-ALL DEFECTIVE HOSES RETURNED TO THE VENDOR FOR REPLACEMENT. THE VENDOR IS ASSEMBLING NEW HOSES TO A REVISED MANUFACTURING PROCEDURE.							
HYDRAULIC-A/B BOOSTER	66-10-031 HYDRAULIC FLEX HOSE	FAR 27-08571-47	990728	SVC.	YES NO	AEROQUIP 677025-8-0140	099731
FAILURE MODE-EXTERNAL LEAK. LEAKING AT EITHER ONE OR BOTH END FITTINGS.							
CORRECTIVE ACTION-ALL DEFECTIVE HOSES RETURNED TO THE VENDOR FOR REPLACEMENT. THE VENDOR IS ASSEMBLING NEW HOSES TO A REVISED MANUFACTURING PROCEDURE.							
HYDRAULIC-A/B BOOSTER	66-10-031 HYDRAULIC FLEX HOSE	FAR 27-08571-51	990728	SVC.	YES NO	AEROQUIP 675011 L-0080	099713
FAILURE MODE-EXTERNAL LEAK. LEAKING AT EITHER ONE OR BOTH END FITTINGS.							
CORRECTIVE ACTION-ALL DEFECTIVE HOSES RETURNED TO THE VENDOR FOR REPLACEMENT. THE VENDOR IS ASSEMBLING NEW HOSES TO A REVISED MANUFACTURING PROCEDURE.							
HYDRAULIC-A/B BOOSTER	66-10-028 BOOSTER HYDRAULIC ACCUMULATOR;O-RING	FAR 27-08554-3	20 990722		YES NO	PEACOCK ENG. CO. S1310-3	099710
FAILURE MODE-STRUCTURAL-INTERNAL GAS LEAKAGE PAST THE PISTON TO THE HYDRAULIC SIDE OF THIS ACCUMULATOR DURING FIRST SYSTEM OPERATION. EXTRUSION OF THE PISTON O RING THROUGH A WEAK BACKUP RING WAS THE CAUSE OF THE FAILURE. FAILURE OF THE BACKUP RING OCCURRED DURING ASSEMBLY OR DISASSEMBLY BY THE VENDOR.							
CORRECTIVE ACTION-THIS UNIT IS TO BE PRESSURE CYCLED AFTER A PROOF PRESSURE TEST AS PART OF THE ACCEPTANCE TEST PROCEDURE.							

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HYDRAULIC-A/B BOOSTER	FTA5028/P2-304-00-8 RISE OFF DISCONNECT	COUNTDOWN 27-08550-3	8C 590715	18 0	YES NO	PEACOCK 52300-3	000320

FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. RISE OFF DISCONNECT SEPARATION WAS GREATER THAN ALLOWABLE. THIS RESULTED IN SEPARATION OF THE GROUND/AIRBORNE DISCONNECT AFTER IGNITION. THIS ISOLATED THE AIRBORNE PRESSURE FROM THE GROUND SYSTEM WHICH CONTAINS THE HYDRAULIC INTERNAL PRESSURE SWITCH. CONSEQUENTLY THE SWITCH DID NOT PICK UP AND COMPLETE THE RELEASE CIRCUITRY. RESULT WAS A CUTOFF AFTER RELEASE TIMER RAN OUT. SAME PROBLEM OCCURRED ON SUSTAINER HYDRAULIC SYSTEM.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. COMPLETE CUTOFF RECEIVED AFTER IGNITION DUE TO RUN OUT OF RELEASE TIMER.

CORRECTIVE ACTION-RE-ADJUST DISCONNECT SEPARATION DISTANCE UNTIL WITHIN SPECIFICATION.

HYDRAULIC-A/B BOOSTER	FTA5013/P2-5C0-01-08 ACTUATOR, O-RING	COMPOSITE-B FACT 27-08550-5	8C 590707	12	YES NO	MODG N7773	000000

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC FLUID LEAKAGE THROUGH CRACKED O-RING ON THE B2 PITCH ACTUATOR BLEED PORT.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-HYDRAULIC PRESSURES LOWERED DURING TEST TO REDUCE LEAKAGE. THE O-RING WAS REPLACED AFTER THE TEST.

HYDRAULIC-A/B BOOSTER	B6-04-011 ACTUATOR ASSEMBLY,ORIFICE	FAR 27-08550-5	8D 590609	SYCAMORE	YES NO	MODG N7773	000330

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. BOOSTER PITCH ACTUATOR WOULD NOT OPERATE DURING ENGINE GIMBAL TEST DUE TO CONTAMINANTS IN THE SERVO VALVE ORIFICE.

CORRECTIVE ACTION-VENDOR INFORMED OF LINT AND DUST BEING BUILT INTO SERVO VALVES. VENDORS INSPECTION AND CLEANING TECHNIQUES IMPROVED.

HYDRAULIC-A/B BOOSTER	DA40/A1-4NO-01-04 FLEX HOSE	COMPOSITE-FRD/DPL	4D 590608	A-1	YES NO	

FAILURE MODE-LEAK-EXTERNAL. POST TEST INSPECTION REVEALED A LEAKY FLEX HOSE TO THE B1 YAW ACTUATOR.

SYSTEM EFFECT-NONE

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VEHICLE EFFECT-NONE CORRECTIVE ACTION-FLEX HOSE REPLACED AND FILL AND BLEED PERFORMED.							898760
HYDRAULIC-A/B BOOSTER	FTA4629/P1-401-00-07 SWITCH-INTERNAL HYDRAULICS	COUNTDOWN	7D 590508	14	YES NO		898863
FAILURE MODE-ERRATIC OPERATION. DURING ENGINE FIRING, VIBRATIONS WERE CAUSING THE BOOSTER HYDRAULICS INTERNAL SWITCH TO DROPOUT INTERMITTENTLY GIVING THIS SIGNAL TO THE TCC PANEL AND THE EA RECORDER. SYSTEM EFFECT-ERRATIC OPERATION. ERRATIC INVALID SIGNALS SENT TO TCC PANEL AND RECORDERS. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-MODIFY MOUNTING BRACKET.							
HYDRAULIC-A/B BOOSTER	88-10-026 BOOSTER HYDRAULIC ACCUMULATOR;O-RING	FAR 27-08554-3	2D 590428		YES NO	PEACOCK ENG. CO. 51310-3	899567
FAILURE MODE-INTERNAL LEAK - INTERNAL GAS LEAKAGE PAST THE PISTON TO THE HYDRAULIC SIDE OF ACCUMULATOR. CORRECTIVE ACTION-NONE - FAILURE WAS NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	88-10-023 BOOSTER HYDRAULIC TANK,SEAL	FAR 27-08551-3	590428	SYC.	YES NO	PANTEX MFG CORP 8985	899566
FAILURE MODE-INTERNAL LEAK - INTERNAL GAS LEAKAGE PAST THE TANK PISTON TO THE HYDRAULIC SIDE OF THE TANK. CORRECTIVE ACTION-NONE - FAILURE WAS NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	98-10-038 HYDRAULIC FLEX HOSE	FAR 27-08571-59	590222	ETR	YES NO	AEROQUIP 675012 L-0171	899322
FAILURE MODE-EXTERNAL LEAKAGE BETWEEN THE B NUT AND THE NIPPLE. CORRECTIVE ACTION-NONE-LEAKAGE NOT CONFIRMED.							

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HYDRAULIC-A/B BOOSTER	58-10-015 HYDRAULIC RELIEF VALVE	FAR 7-08211-8	3C 590214		YES NO	BENDIX-VICKERS	000700
FAILURE MODE-OUT OF TOLERANCE. BOOSTER HYDRAULIC SYSTEM PRESSURE WAS BELOW MINIMUM REQUIREMENTS CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B BOOSTER	ZC-7-2097 HYDRAULIC PUMP,COMPENSATOR	FLIGHT 27-08588-1	11B 590204	11 -3.	NO YES	VICKERS INC. AA-60694-R-2A	007531
FAILURE MODE-ERRATIC OPERATION-AN OSCILLATION OF APPROX 17 SEC DURATION IN BOOSTER HYDRAULIC PUMP COMPENSATOR DUE T O PROBABLE STICKING. A SAW TOOTH PRESS PATTERN CHARACTERIZED BY THE CRACKING AND RESEATING OF THE VALVE OF A PEAK TO PEAK MAGNITUDE OF 2900 TO 3500 PSIG. BY 17.5 SEC THE COMPENSATOR EVIDENTLY WORKED LOOSE AND A STEADY STATE PRESS OF 3300 PSIG MAINTAINED. SYSTEM EFFECT-ERRATIC OPERATION. SYSTEM DISPLAYED OSCILLATION IN HIGH PRESSURE UNTIL 17.5 SECONDS. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-A SERIES OF TESTS TO DUPLICATE AND ISOLATE SOURCE OF TROUBLE AND ELIMINATE SAME WERE CONDUCTED.							
HYDRAULIC-A/B BOOSTER	58-10-017 HYDRAULIC CONTROL DIAPHRAGM	FAR 7-63855	38 590121		YES NO	PACIFIC AUTOMO TIVE PROD	000730
FAILURE MODE-FAILURE TO OPERATE A PRESCRIBED TIME-DURING CONDUCTANCE OF A FLIGHT TEST PROCEDURE TEST ON MISSILE 38 AN INTERNAL HYDRAULIC PRESSURE SIGNAL WAS NOT RECEIVED, WHICH CAUSED A CUTOFF SIGNAL TO BE INITIATED. CORRECTIVE ACTION-NONE-AN INVESTIGATION REVEALED THAT THE SWITCHES DID NOT CAUSE THE ABOVE FAILURE. SEE FAR-60-003 FOR ADDITIONAL CORRECTIVE ACTION.							
HYDRAULIC-A/B BOOSTER	ZC-7-[illegible]/PE-302-00-08 HYDRAULIC PUMP	FLIGHT 27-08588-1	3C 581223	12 0	YES NO	VICKERS AA-60694-R-2A	
FAILURE MODE-ERRATIC OPERATION. ALTERNATE CRACKING AND RESEATING OF THE AIRBORNE RELIEF VALVE CAUSED PEAK TO PEAK O SCILLATIONS OF 2500 TO 3500 PSIA UNTIL 28 SECONDS OF FLIGHT. PROBABLE CAUSE WAS STICKING OF THE HYDRAULIC PUMP COMPE NSATOR. SYSTEM EFFECT-ERRATIC OPERATION. OSCILLATION OF THE HYDRAULIC PRESSURE BETWEEN 2500 AND 3500 PSIA. NORMAL OPERATING PRESSURE OF 3070 PSIA WAS ATTAINED AT 28 SECONDS WHEN PUMP COMPENSATOR STOPPED STICKING. VEHICLE EFFECT-NONE.							

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CORRECTIVE ACTION-NONE.							697332
HYDRAULIC-A/B BOOSTER	FTA 4422/P2-301-00-3 RELIEF VALVE BOOSTER HYDRAULIC HIG H PRESSURE	FRF	3C 561217	12 1	YES NO		691139
FAILURE MODE-OUT OF TOLERANCE. VALVE WAS RELIEVING AT 2550 PSI AND RESEATING AT 2100. NOMINAL VALUES 3050 AND 3150. SYSTEM EFFECT-OPERATION TOO LOW. BOOSTER HYDRAULIC PRESSURE ROSE TO 2600 PSI AT MAINSTAGE START, THEN OPERATED AT V ARYING LOW PRESSURE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-REPLACED RELIEF VALVE.							
HYDRAULIC-A/B BOOSTER	FTA4323/P1-203-00-9	FRF	9B 561027	11	YES NO		691774
FAILURE MODE-OUT OF TOLERANCE. BOOSTER HYDRAULIC PRESSURE WAS APPROXIMATELY 3460 PSIG COMPARED TO 3000 PSIG NOMINAL . SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B BOOSTER	FTA4311/P1-201-00-9 BOOSTER HYDRAULIC PRESSURE SWITCH	FRF	9B 561014	11 0	YES NO		691755
FAILURE MODE-ERRATIC OPERATION. THE BOOSTER INTERNAL HYDRAULIC PRESSURE SWITCH ACTUATED AND DEACTUATED SEVERAL TIME S WHEN IT SHOULD HAVE REMAINED IN THE ACTUATED POSITION. SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. SYSTEM OPERATION WAS NOT PROPERLY SUMMARIZED IN LAUNCH CONTROL LOGIC. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-SWITCH REPLACED.							
HYDRAULIC-A/B BOOSTER	FTA4E52/P4-201-00-08 PUMP	FRF 87-06566-1	9B 560906	14/ETR	YES NO	VICKERS AA-60684-R-2A	
FAILURE MODE-FAIL DURING OPERATION. BOOSTER HYDRAULIC PRESSURE WAS ERRATIC, FLUCTUATING FROM 2100 TO 3100 PSI DUE T O AN APPARENT FAILURE OF THE BOOSTER HYDRAULIC PUMP.							

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SYSTEM EFFECT-ERRATIC OPERATION. BOOSTER HYDRAULIC PRESSURE FLUCTUATED FROM 2100 TO 3100 PSI. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-BOOSTER HYDRAULIC PUMP WAS REPLACED.							693276
HYDRAULIC-A/B BOOSTER	EM-1028/ TEST 14-302 HYDRAULIC PUMP	CAPTIVE 27-085661	560813	1-4	YES NO	VICKERS AA-60694-R-2A	693008
FAILURE MODE-FAILED DURING OPERATION. BOOSTER AIRBORNE HYDRAULIC PUMP APPARENTLY FAILED TO BUILD UP PRESSURE AT ENGINE START AND SYSTEM REMAINED ON GROUND PRESSURE THROUGHOUT RUN. SYSTEM EFFECT-OPERATION DOES NOT START. AIRBORNE PRESSURE TRANSFER NOT ACHIEVED. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B BOOSTER	EM1028/TEST 14-307 HYDRAULIC PUMP	CAPTIVE 27-09566-1	560813	1-4 0.	NO NO	VICKERS AA-60694-R-2A	693010
FAILURE MODE-FAILED DURING OPERATION. NO INDICATIONS OF TRANSITION TO AIRBORNE SYSTEM FOR FIRST 60 SECONDS OF OPERATION. FROM 60 TO 66 SECONDS THE PRESSURE ERRATICALLY ROSE TO 2800 PSIG FOR 2 SECONDS. FROM 68 TO 129 SECONDS THE TRACE WAS DISTORTED BY A 1.13 CPS OSCILLATION WITH AN AVERAGE P/P VALUE OF 560 PSIG. PROBABLE CAUSE- A FAULTY MS FITTING IN SLEEVE OF INSTRUMENTATION CROSS IN 3/4 INCH HIGH PRESSURE DISCHARGE LINE. SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. IT APPEARS AIRBORNE PUMP PRESSURE INCREASED OVER GROUND LEVEL AFTER 60 SECONDS. BY THIS TIME, HOWEVER, THE LEAK AT THE INSTRUMENTATION BOTTOMED OUT THE ACCUMULATOR AND DRAINED THE RESERVOIR, PERMITTING PRESS. HELIUM TO ENTER THE SYSTEM AND CAVITATE THE PUMP. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-PUMP IN QUESTION WAS REPLACED AFTER THE RUN AND DEFECTIVE UNIT RETURNED TO SAN DIEGO FOR INSPECTION.							
HYDRAULIC-A/B BOOSTER	FTA41CO/P1-E04-00-3 ACTUATOR FEEDBACK TRANSDUCER	FRF 87-08550	38 560708	11/ETR -26	YES NO		693339
FAILURE MODE-FAIL DURING OPERATION. LOSS OF AUTOPILOT B1 FEEDBACK VOLTAGE. SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. VEHICLE EFFECT-COUNTDOWN DELAYED. 21 MIN HOLD AND 20 MIN RECYCLE LOSS. CORRECTIVE ACTION-FEEDBACK CIRCUIT REPAIRED.							

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HYDRAULIC-A/B BOOSTER	EM800/1A-105-A4-14 PUMP	CAPTIVE	14A 560130	1A 14	YES NO		096639

FAILURE MODE-CONTAMINATION. THREE UNACCOUNTABLE PRESSURE DROPS OCCURRED IN THE BOOSTER HYDRAULIC SYSTEM AT 14, 19, AND 23 SECONDS. IT IS BELIEVED THAT THEY COULD BE CAUSED BY AIR IN THE SYSTEM OR DIRT IN THE AIRBORNE PUMP COMPENSATOR.

SYSTEM EFFECT-ERRATIC OPERATION. THE OPERATION OF THE AIRBORNE SYSTEM WAS SOMEWHAT ERRATIC ABOUT A MEAN PRESSURE OF 2900 PSIG.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B BOOSTER	2C-7-091-10A/P2-107-00-10	FLIGHT	10A 580110	12 10	NO NO		096690

FAILURE MODE-OUT OF EXPECTED TEST VALUE.AIRBORNE HYDRAULIC SYSTEM PRESSURE OSCILLATED ATA FREQUENCY OF 4.5 CPS AND AN AVERAGE PEAK TO PEAK AMPLITUDE OF 200 PSI. CAUSE UNKNOWN AND NO APPARENT CORRELATION WITH AUTOPILOT DATA.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B BOOSTER	EM-696/1A, 113-D8-02 HYDRAULIC PUMP	CAPTIVE 27-08566-1	2A 571000	1A 0	YES NO	VICKERS AA-60694	096310

FAILURE MODE-OUT OF TOLERANCE. HYDRAULIC FLUID TEMPERATURE WAS LOWER THAN THE NORMAL OPERATING RANGE OF 80 TO 150 DEG. F. THE TEMPERATURE WAS 55 DEG. F. AT TEST START INCREASING TO 110 DEG. F. BY SHUTDOWN.

SYSTEM EFFECT-LOW TEMPERATURE ENVIRONMENT.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B BOOSTER	EM-668/107-SP1-05 HYDRAULIC PUMP	CAPTIVE 27-08566-1	5A 570927	ERB/1-1 2.	YES NO	VICKERS AA-60694-R-2A

FAILURE MODE-OUT OF TOLERANCE. B1 ACCUMULATOR PRESSURE CURVE FOLLOWED THE NORMAL PATTERN UNTIL 2.0 SECONDS WHEN IT ROSE ABRUPTLY FROM A NOMINAL 3093 PSIG. PRESSURE REMAINED BETWEEN 3300 AND 3400 PSIG UNTIL SHUTDOWN, EXCEPT FOR OCCASIONAL UNACCOUNTABLE TRANSIENT PEAKS AS HIGH AS 4000 PSIG. IMMEDIATE CAUSE OF HIGH PRESSURE AND TRANSIENT PEAKS WAS NOT ESTABLISHED. IT IS BELIEVED TO RESULT FROM FAULTY OPERATION OF AIRBORNE HYDRAULIC PUMP OR PUMP COMPENSATOR.

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SYSTEM EFFECT-OPERATION TOO HIGH. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							000271
HYDRAULIC-A/B BOOSTER	EM-5571/1A,106-04-02 HYDRAULIC PUMP	CAPTIVE 27-08566-1	2A 570726	1A	YES NO	VICKERS AA-60694-R-2A	007281
FAILURE MODE-FAIL DURING OPERATION. HYDRAULIC PUMP CAVITATED DURING 8 SECOND RUN DUE TO INSUFFICIENT BLEED PRIOR TO TEST. SYSTEM EFFECT-OPERATION DOES NOT START. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-BLEED PROPERLY.							
HYDRAULIC-A/B BOOSTER	EM-5571-A,105-04-02 PUMP	CAPTIVE 27-08566-1	2A 570723	1A	NO NO	VICKERS AA-60694-R-2A	000061
FAILURE MODE-FAILED TO CEASE OPERATION AT PRESCRIBED TIME. AT 0.5 SECONDS AFTER THE PREMATURE CUTOFF THE HYDRAULIC PRESSURE ROSE RAPIDLY AND VARIED FROM 2200 TO 3100 PSIG FOR ABOUT 5 SECONDS. ALTHOUGH THE B1 TURBINE DID OVERSPEED, I TS SPEED 0.5 SECONDS AFTER SHUTDOWN WAS ABOUT 1/2 NORMAL MAINSTAGE SPEED. THE LAG IN HYDRAULIC PRESSURE DECAY IS UNA CCOUNTED FOR. SYSTEM EFFECT-OPERATION TOO LONG. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B BOOSTER	EM-5467/1A-104-03-02A B1 PUMP COMPENSATOR	CAPTIVE 27-08566-1	2A 570703	1A 0.5	YES NO	VICKERS AA-60694-F 2A	000314
FAILURE MODE-FAIL DURING OPERATION. B1 AIRBORNE HYDRAULIC PRESSURE WAS ABNORMALLY HIGH, BETWEEN 3200 AND 3400 PSIG, FOR THE FIRST 12 SECONDS OF RUN AND RETURNED TO NORMAL 3000 PSIG THEREAFTER. SYSTEM EFFECT-OPERATION TOO HIGH. B1 HYDRAULIC PRESSURE 3200 TO 3400 PSIG DURING FIRST 12 SECONDS OF RUN RETURNED T O NORMAL 3000 PSIG THEREAFTER. HYDRAULIC PUMP DISCHARGE TEMP ROSE FROM 60 DEG F AT BOOTSTRAP TO 96 DEG F AT 12.5 SEC , THEN BECAME ERRATIC, GOING OFF SCALE AT 20.8 SEC. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE, SUBSEQUENT TEST VALUES WERE BETWEEN 3000 AND 3200 PSIG.							

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HYDRAULIC-A/B BOOSTER	EM-433/108CD-4 HYDRAULIC PUMP,COMPENSATOR	CAPTIVE 27-08566-1	3A 570527	S-1 31	NO NO	VICKERS AA-60694-R-2A	696000

FAILURE MODE-FAIL DURING OPERATION. THE PUMP COMPENSATOR FAILED.

SYSTEM EFFECT-ERRATIC OPERATION. THE PRESSURE AT THE OIL SIDE OF THE B1 HYDRAULIC ACCUMULATOR VARIED BETWEEN 2020 A ND 4020 PSIG. SIMILAR VARIATIONS OCCURRED IN THE PUMP DISCHARGE PRESSURE. THESE VARIATIONS DID NOT CORRESPOND TO INP UT SIGNALS FROM THE SERVO SYSTEM.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B BOOSTER	EM-466/S-1,107-3 HYDRAULIC PUMP	CAPTIVE 27-08566-1	3A 570525	S-1 4	YES NO	VICKERS AA-60694-R-2A	697333

FAILURE MODE-ERRATIC OPERATION. ABNORMAL 0.5 CPS PRESSURE OSCILLATIONS OF VARYING MAGNITUDE WERE NOTED ON THE B1 HY DRAULIC ACCUMULATOR OIL PRESSURE FROM 4 TO 20 SECONDS AND 46 TO 53 SECONDS.

SYSTEM EFFECT-OPERATION STOPS PREMATURELY. HYDRAULIC POWER TO GIMBAL THE THRUST CHAMBER WAS LOST RESULTING IN GROUN D SUPPLY PRESSURE TAKING OVER.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B BOOSTER	EM-466/S-1,107-3 TRANSDUCER	CAPTIVE	3A 570525	S-1 53	YES NO		697334

FAILURE MODE-LEAK EXTERNAL. A LEAK WAS PRODUCED BY THE HYDRAULIC PUMP DISCHARGE PRESSURE TRANSDUCER COMING LOOSE.

SYSTEM EFFECT-OPERATION TOO LOW. LOSS OF PRESSURE AT 53 SECONDS PREVENTED THE AIRBORNE HYDRAULIC SYSTEM TO SUPPLY H YDRAULIC POWER TO THE THRUST CHAMBERS. GROUND SUPPLY PRESSURE AT THIS TIME TOOK OVER.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B BOOSTER	EM-466S-1,107-3 PUMP	CAPTIVE 27-08566-1	3A 570525	S-1 119	NO NO	VICKERS AA-60694-R-2A	

FAILURE MODE-FAILED DURING OPERATION. THE AIRBORNE HYDRAULIC PRESSURE BEING SUPPLIED BY THE GROUND FELL TO ZERO PSI G UPON INITIATION OF GIMBAL STEP FUNCTION IN PITCH AND YAW. THE PRESSURE THEN ROSE BACK TO 180 PSIG WHERE IT REMAINE D FOR THE DURATION OF THE TEST.

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SYSTEM EFFECT-OPERATION TOO LOW. VEHICLE EFFECT-NONE-THE LOSS OF HYDRAULIC PRESSURE ALLOWED THE THRUST CHAMBERS TO SWING FREELY. CORRECTIVE ACTION-UNKNOWN.							697550
HYDRAULIC-A/B BOOSTER	EM-384/104-1 HYDRAULIC PUMP,COMPENSATOR	CAPTIVE 27-08566-1	5A 570321	8-1 5	YES NO	VICKERS AA-60694-R-2A	696614
FAILURE MODE-FAIL DURING OPERATION DUE TO AIR IN LINE OR FAULTY PUMP COMPENSATOR. DISCHARGE PRESSURE DROPPED BELOW 2000 PSI BETWEEN 5 AND 12.5 SEC, PRESSURE FELL AS LOW AS 670 PSI. SYSTEM EFFECT-ERRATIC OPERATION.RES VEHICLE EFFECT-NONE. GROUND HYDRAULICS POWERED THE MISSILE BETWEEN 5 AND 12.5 SEC. VEHICLE EFFECT-NONE. GROUND HYDRAULICS POWERED THE MISSILE BETWEEN 5 AND 12.5 SEC. CORRECTIVE ACTION-HYDRAULIC PUMP WAS REPLACED.							
HYDRAULIC-A/B BOOSTER	EM-347/103-1 HYDRAULICPUMP	CAPTIVE 27-0856601	5A 570210	8-1 1	NO NO	VICKERS AA-60694-R-2A	696595
FAILURE MODE-OUT OF TOLERANCE. AN EXCESSIVE PEAK WAS NOTED IN THE HYDRAULIC PUMP DISCHARGE PRESSURE. THE PRESSURE REACHED 4000 PSIG AT 1 SEC. SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B BOOSTER	28-7-087 PART 2 TEST 113-2 SERVO VALVE	CAPTIVE	570215	1-4	YES NO		696669
FAILURE MODE-FAIL DURING OPERATION. THE B2 SERVO VALVE WAS JAMMED BY A METALLIC CHIP. SYSTEM EFFECT-ERRATIC OPERATION-IMPROPER OPERATION OF THE B2 PITCH SERVO VALVE CAUSED THE B2 THRUST CHAMBER TO HANG UP IN THE FULL OUTBOARD PITCH POSITION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-REPLACE B2 SERVO VALVE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A4878 FLEX HOSE, HYDRAULIC	UTP-PET 27-08571-9	660513	GD/C	YES	AEROQUIP 677159-6-0203	690299
FAILURE MODE-STRUCTURAL DUE TO HOSE INNER LINER COMING LOOSE FROM END FITTINGS DURING LIFE TEST OF PROCEDURE 1-3060 .1.							
CORRECTIVE ACTION-REJECTED UNIT FROM TESTING. FAILURE RESOLUTION NOT COMPLETED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-9B-04-264 SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-010	2090 660502	36A	YES NO	LIONEL PACIFIC	690459
FAILURE MODE-ERRATIC OPERATION. ASSEMBLY DISPLAYED IRREGULAR POSITION-FEEDBACK TRANSDUCER OUTPUT IN RESPONSE TO A 1 0 CPS SINEWAVE CONTROL SIGNAL.							
CORRECTIVE ACTION-FIELD TEST PROCEDURES WERE REVISED TO REQUIRE NO FREQUENCY RESPONSE TESTS AT FREQUENCIES ABOVE 6 CPS, NO OUTPUT TRACE IRREGULARITIES AT 10 CPS WILL OCCUR.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-10-288 TANK	FAR 27-08552-3	660412		NO NO	BENDIX 89036	690503
FAILURE MODE-STRUCTURAL. TANK WAS REMOVED FROM SLV-3 FUNCTIONAL MOCKUP (EID 69-0099) AFTER IT HAD UNDERGONE A SPECI AL HYDRAULIC SYSTEMS TEST TO DETERMINE THE EFFECTS OF 800 PSIG PRESSURE SPIKES ON THE SYSTEM.							
CORRECTIVE ACTION-NOT A FAILED ITEM. UNIT WAS PURPOSELY OVERPRESSURIZED. GD/C PERSONNEL WILL USE DATA FROM THIS REP ORT TO ASSIST IN A SPECIAL ENGINEERING INVESTIGATION OF THE EFFECTS OF SYSTEM OVERPRESSURIZATION ON VEHICLE HARDWARE .							
HYDRAULIC-A/B SUSTAINER/VERNIER	27AU494 FLOW LIMITER-VERNIER	UTP-PET 27-04206-3	660326		YES	STERER ENG. 13000-1	690307
FAILURE MODE-FAIL DURING OPERATION WITH A RADIAL CRACK ONE QUARTER INCH FROM THE INLET END EXTENDING HALF WAY AROUN D THE HOUSING. THIS OCCURRED AFTER 5 HRS OF LIFE TESTING.							
CORRECTIVE ACTION-NONE SINCE ONLY ONE OF TWO TESTED SHOWED THIS FAILURE AND ECP 8448 ACTION REMOVES THIS PART.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A4494 FLOW LIMITER-VERNIER	UTP-PET 27-04208-3	660322	GD/C	YES	STEREO ENG. 13000-1	890353

FAILURE MODE-OUT OF SPECIFICATION FLOW RATE WAS MEASURED AT 120 PERCENT OF STEADY STATE FLOW COMPARED TO 100 PERCENT PLUS OR MINUS 8 PERCENT.

CORRECTIVE ACTION-NONE. ECP 3442 DELETES THIS PART FROM SERVICE.

HYDRAULIC-A/B SUSTAINER/VERNIER	874-3-66-36	FLIGHT	3030 660304	ABRESA-1 JETT	YES NO		890399

FAILURE MODE-SUSTAINER HYDRAULIC RETURN PRESSURE WAS LOST AT JETTISON. EXACT HARDWARE AND MODE OF FAILURE IS UNKNOWN.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY LOSS OF HYDRAULIC FLUID AND PUMP HEAD RESULTED IN COMPLETE LOSS OF HYDRAULIC PRESSURE.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY.

CORRECTIVE ACTION-A LARGE NUMBER OF CORRECTIVE ACTIONS HAVE BEEN TAKEN OR ARE PROPOSED. SEE FLIGHT REPORT 60C-BAF68-018 FOR A COMPLETE DESCRIPTION OF THESE.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-10-287 PUMP, SHAFT	FAR 27-08590-3	660223		NO YES	VICKERS INC. AA60410-L-2	890431

FAILURE MODE-STRUCTURAL. COUPLING SHAFT BROKE IN HALF AT RELIEF NOTCH DURING PET TEST.

CORRECTIVE ACTION-FAILURE CONFIRMED. MATERIAL OF THE SHAFT MET REQUIREMENTS OF VICKERS SPECIFICATION. THERE WAS A MISALIGNMENT IN THE TEST EQUIPMENT. COUPLING SHAFT WAS REPLACED AND PUMP RERUN THROUGH COMPLETE PET LIFE TEST. NO VENDOR ACTION RECOMMENDED.

HYDRAULIC-A/B SUSTAINER/VERNIER	77-A4874 PUMP SUSTAINER HYD.	UTP-PET 27-08590-3	660223	GD/C	YES NO	VICKERS AA-60410-L-2	890196

FAILURE MODE - FAILURE DURING OPERATION. DURING LIFE TEST THE PUMP SPLINE SHEARED. THE PUMP WAS EXPERIENCING ALTERNATE 1 MIN. EACH OF 100 PERCENT AND 1 MIN 50 PER CENT FLOW. INLET PRESS. AT 100 PERCENT FLOW WAS 22 PSIA AT 2830 RPM. 12.5 HRS OF TEST IS REQUIRED. 10 HR. 20 MIN. HAD ELAPSED AT FAILURE. FAULTY TEST SETUP WAS THE CAUSE.

CORRECTIVE ACTION - CHANGE TEST SETUP DRIVER FLANGE TO CONFORM WITH 20001 STANDARD AND THE PROPER INSTALLATION OF THE LOCATING RING ADAPTER.

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A4874 PUMP HYD., SUSTAINER	UTP-PET 27-06590-3	660212	60/C	YES	VICKERS AA-60410-L-2	890342
FAILURE MODE-EXTERNAL LEAK. LEAK WAS AT BI-METAL INLET PORT. DURING THIRD AXIS OF VIBRATION, CAUSE UNKNOWN. LEAKAGE RATE OF 1.5 CC/HR VS NONE ALLOWED; INSUFFICIENT TODEPLETE FLUID SUPPLY DURING FLIGHT.							
CORRECTIVE ACTION-RECOMMEND THE REDESIGN OF THE PUMPS INLET PORT TO ONE PIECE TYPE CONSTRUCTION. DURING LV/SLV DESIGN REVIEW 1966.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4874 PUMP HYD. SUSTAINER	UTP-PET 27-06590-3	660208	60/C	YES	VICKERS AA-60410-L-2	890341
FAILURE MODE-OUT OF SPECIFICATION. THE TRANSIENT RESPONSE TIME IN CHANGING FROM FULL FLOW TO 10 PERCENT FLOW WAS 0.210 SECONDS. MAXIMUM ALLOWABLE TIME IS 0.20 SECONDS DURING IAT.							
CORRECTIVE ACTION-CHANGE ACCUMULATOR PRECHARGE PRESSURE. EVALUATE NEW TEST DATA AND PROPOSE APPROPRIATE SPECIFICATION REVISION SO THAT PUMP RESPONSE TIME WILL BE ACCEPTABLE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A4927 ACTUATOR ASSY-VERNIER	UTP-ETT 69-05311-1	660125	60/C	YES	LIONEL PACIFIC	890339
FAILURE MODE-OUT OF TOLERANCE THE UNIT DEMONSTRATED A NULL VOLTAGE OF 78 MV AT THE 0.100 INCH DISPLACEMENT POSITION AND 76 MV AT NULL. 30 MV OR LESS IS ALLOWED.							
CORRECTIVE ACTION-TESTING WAS CONTINUED. FAILURE RESOLUTION NOT COMPLETE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27C4991.1 TRANSDUCER-LINEAR POSITION	UTP-PET 27-04205-1	660121	60/C	YES	CRESCENT MC-65P-4E	890354
FAILURE MODE-OUT OF SPECIFICATION DIMENSIONALLY							
CORRECTIVE ACTION-SPEC CONTROL DWG UPDATED BY CHANGE D550069-551-4 TO INCLUDE ANGLE TOLERANCE OF 45 PLUS OR MINUS 5 DEGREES INSTEAD OF 45 DEG PLUS OR MINUS ONE HALF DEGREE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A4482 VALVE, RELIEF	UTP-PET 27-06570-1	660110	GD/C	YES	VINSON A-00133-1	690303
FAILURE MODE-OUT OF SPECIFICATION DUE TO IMPROPER PRESSURE SETTING BY VENDOR. DISCREPANCY WAS DISCOVERED DURING THE PROOF CYCLE AFTER TEMP. TEST. THE DIFFERENTIAL PRESSURE OF 108 PSID AND FLOWRATE OF 27 SCFM. ALLOWABLE MAX. IS 100 PSID FLOW RATE.							
CORRECTIVE ACTION-VENDOR REQUESTED THE RETURN OF ALL UNITS FOR RECALIBRATION SETTING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27C4534.1 TRANSDUCER-LINEAR POSITION	UTP-PET 27-04204-1	660115	GD/C	YES	CRESCENT MC-106-4E	690304
FAILURE MODE-OUT OF SPECIFICATION DIMENSIONALLY. DURING EOP DIM. M MEASURED 0.681 IN. TOL. IS 0.79 TO 0.85 IN. DIM. R MEASURED 0.273 IN. TOL. IS 0.278 TO 0.283 IN. DIM. AB MEASURED 0.203 IN. TOL. IS 0.204 TO 0.209 IN.							
CORRECTIVE ACTION-RECOMMEND A QUALITY CONTROL INSPECTION OF THE VENDORS MANUFACTURING METHODS AND CORRECT THE PROBLEM. GD/C ENG. CHANGED DIM. M TO 0.82 M WITHIN TOL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A4928 ACTUATOR ASSY-SUSTAINER	UTP-ETT 27-05314-017	660111	GD/C	YES	GD/C	690210
FAILURE MODE-LEAK, EXTERNAL. THE ACTUATOR ROD SEAL LEAKED THREE DROPS AFTER THE THIRD Y AXIS VIBRATION SWEEP. NO LEAKAGE IS ALLOWED. REPORTED FAILURE WAS NOT CONFIRMED.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4706 HYDRAULIC FILTER	UTP-PET 27-06564-8	681214	CONVAIR	YES NO	MICROPOROUS F-4158	690617
FAILURE MODE-CONTAMINATION-THE UNIT FAILED TO MEET THE CLEANLINESS REQUIREMENT. REF. TASK HISTORY LOG NUMBER 664-0-017. ERROR FOUND IN CLEANLINESS TEST PROCEDURE. ADDITIONAL UNITS FROM SAME LOTS BEING TESTED TO NEW PROCEDURE WITH NO FAILURES TO DATE.							
CORRECTIVE ACTION-NONE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A4501 FILTER	UTP-PET 27-08564-803	681214	CONVAIR	YES NO	MICROPOROUS F-4170	890010
FAILURE MODE-CONTAMINATION. THE UNITS FAILED TO MEET THE CLEANLINESS REQUIREMENT. REF. TASK HISTORY LOG NUMBER 664-0-016. ERROR FOUND IN CLEANLINESS TEST PROCEDURE. ADDITIONAL UNITS FROM SAME LOTS BEING TESTED TO NEW PROCEDURE WITH NO FAILURES TO DATE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4501 FILTER-HYDRAULIC	UTP-PET 27-08564-803	681214	GD/C	YES	MICROPOROUS FILTER F-4170	890224
FAILURE MODE-OUT OF SPECIFICATION TWO TEST SPECIMENS FAILED TO MEET THE CLEANLINESS REQUIREMENTS. INVESTIGATION FOUND THAT OIL SAMPELS TESTED WERE NOT TAKEN PROPERLY. CORRECTIVE ACTION-USE TEST PROCEDURES PER 0-75080 ON FUTURE TESTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4706 FILTER-HYDRAULIC	UTP-PET 27-08564-5	681214	GD/C		MICROPOROUS FILTER F-4150	890223
FAILURE MODE-OUT OF SPECIFICATION. THE UNIT FAILED TO MEET THE CLEANLINESS REQUIREMENTS. INVESTIGATION FOUND THAT OIL SAMPLES TESTED WERE NOT TAKEN PROPERLY. CORRECTIVE ACTION-USE TEST PROCEDURES PER 0-75080.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27C4536.1 TRANSDUCER-LINEAR POSITION	UTP-PET 27-04211-1	681207	GD/C	YES NO	CRESCENT HC-67P-4E	890302
FAILURE MODE-STRUCTURAL. DURING FSPT X-RAY REVEALED A CRACK IN THE UNITS POTTING. THE FLOW IS ABOUT MIDPOINT BETWEEN THE CENTER TAP AND THE WINDING END. CORRECTIVE ACTION-RECOMMEND X-RAY SURVEILLANCE OF ALL PET UNITS TO ASCERTAINPOTTING INTEGRITY PRIOR TO FINAL ASSEMBLY.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A4773 VALVE-RELIEF	UTP-PET 27-08569-1	651124	60/C	YES	BENDOW 92120	890352

FAILURE MODE-OUT OF SPECIFICATION. 3025 PSID RESEATING PRESSURE WAS REPORTED. 3150 PSID IS LOWEST ALLOWED. THIS REPORTED FAILURE WAS NOT CONFIRMED.

CORRECTIVE ACTION-NO ACTION TAKEN SINCE REPORTED FAILURE WAS NOT REPEATED.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A4773 VALVE-RELIEF	UTP-PET 27-08569-1	651119	60/C	YES	BENDOW 92120	890351

FAILURE MODE-LEAK. VALVE LEAKAGE DURING X AXIS VIB VARIED FROM 36 CC TO 392 CC PER MIN. FOLLOWING THAT AXIS VIB LEAKAGE WAS WITHIN 5 CC/MIN ALLOWED. DURING Y AXIS VIB LEAKAGE VARIED FROM 36 CC TO 106 CC/MIN. FOLLOWING VIB LEAKAGE WAS 240 CC/MIN.

CORRECTIVE ACTION-REVISE TEST SET-UP RE RUN TEST USING NEW TEST SPECIMEN.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A4773 VALVE, RELIEF	UTP-PET 27-08569-1	651105	CONVAIR	YES NO	BENDOW 92120	897178

FAILURE MODE-CONTAMINATIONS. S/N 509-0836. DURING THE TEMPERATURE TEST THE PARAMETERS FOR RESEAT PRESSURE WERE NOT MET. LEAKAGE AT 3150 PSIG WAS 1104 CC/MIN-ALLOWABLE, 30 CC/MIN. PROBABLE CAUSE-CONTAMINATION OF HYDRAULIC FLUID BY LONG LENGTH OF HEATING COILS BETWEEN SYSTEM FILTER AND TEST SPECIMEN.

CORRECTIVE ACTION-MOVE TEST SETUP FILTER CLOSE TO SPECIMEN AND RERUN THAT PORTION OF TEST.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A4773 VALVE-RELIEF	UTP-PET 27-08569-1	651105	60/C	YES	BENDOW 92120	890350

FAILURE MODE-INTERNAL LEAK. DURINGTEMP TEST WHILE PRESSURIZED AT 3150 PSIG THE LEAKAGE MEASURED 11 84 CC/MIN, MAX. TOL IS LESS THAN 30 CC/MIN. CONTAMINATION WAS THE CAUSE.

CORRECTIVE ACTION-REVISE TEST SET-UP AND CONTINUE TESTING.

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HYDRAULIC-A/B SUSTAINER/VERNIER	27C-4333.1 TRANSDUCER-LINEAR POSITION	UTP-PET 27-04208-1	651026	GD/C	YES NO	CRESCENT HC-65P-4E	690300

FAILURE MODE-OUT OF SPECIFICATION,DIMENSIONALLY. A ROUND CORNER ON THE PROBESHAFT CREATED A MINOR OUT OF TOL. WHICH WOULD NOT ADVERSFLY AFFECT THE SYSTEM FUNCTION. THE REPORTED CONDITION IS ACCEPTABLE TO ENGINEERING.

CORRECTIVE ACTION-VENDOR WASREQUESTED TO CONFORM TO DIMENSIONAL REQUIREMENTSAS PER SCD 27-04205 BY VCAR 7967-65 DAT ED 651112.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5084-P FEEDBACK TRANSDUCER	FAR 27-04211-1	651015	FACTORY	YES NO	CRESCENT ENG. HC-67P-4E	690376

FAILURE MODE-OUT OF SPECIFICATION. NULL VOLTAGE OF SUBJECT TRANSDUCER WAS 0.085 VOLT. MAXIMUM ALLOWABLE PER SPEC 27 -04217 IS 0.050 VOLT. PROBLEM CAUSED BY ABNORMALLY HIGH SUSCEPTIBILITY OF TRANSDUCER PROBE TO BECOME MAGNETIZED. MAG NETIC PROPERTIES OF PROBE CHANGED AS RESULT OF USING INCOMPLETELY STABILIZED PROBE MATERIAL.

CORRECTIVE ACTION-CRESCENT ENGINEERING REQUESTED TO REVISE HEAT TREATING PROCEDURE OF CARPENDER HIGH-PERMEABILITY 4 9 MATERIAL TRANSDUCER PROBES TO ASSURE MATERIAL IS IN MAGNETICALLY STABLE CONDITION.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-98-04-5078-F ACTUATOR ASSEMBLY	FAR 27-05314-817	651011	ETR	YES NO	LIONEL PACIFIC	690991

FAILURE MODE-CONTAMINATION. HYDRAULIC SYSTEM RETURN PORT PLUG WAS REMOVED AND WAS FOUND TO BE CONTAMINATED WITH WHA T APPEARED TO BE SHREDDED O-RING MATERIAL. THE SOURCE OF THE O-RING PARTICLES ON THE PORT PLUG WAS NOT FROM WITHIN T HE ACTUATOR ASSY. MOST LIKELY SOURCE WOULD BE THE O-RING SEAL USED WHEN THE AN-FITTING WAS THREADED INTO THE ACTUATO R BODY FOR HYDRAULIC LINE CONNECTION. SINCE THESE COMPONENTS WERE NOT WITH THE ASSY, NO EVALUATION COULD BE MADE.

CORRECTIVE ACTION-NONE. SOURCE OF CONTAMINATION WAS NOT FOUND.

HYDRAULIC-A/B SUSTAINER/VERNIER	GDC/BKF65-062/83-401-00-34 CHECK VALVE	FLIGHT 27-06360-5	34D 651005	B-3/WTR 318	YES NO	KOHLER KOHLER CO. K-1427-6 K 1247-6	

FAILURE MODE-LEAK. CHECK VALVE LEAKED IN REVERSE DIRECTION ALLOWING VERNIER HYDRAULIC PRESSURE TO BLEED INTO SUSTAI NER HYDRAULIC SYSTEM AFTER SUSTAINER CUTOFF.

SYSTEM EFFECT-OPERATION TOO SHORT. VSA ACTION OF VERNIER HYDRAULIC SYSTEM WAS SHORTENED WITH VSA BOTTOMING OUT 0.5 SECONDS AFTER VECO. EXPECTED VSA ACTION SHOULD BE OF LONGER DURATION.

VEHICLE EFFECT-NONE.

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CORRECTIVE ACTION-NONE. NO IMMEDIATE CORRECTIVE ACTION PLANNED. LONG-RANGE CORRECTIVE ACTION INCLUDES INCREASING CA PACITY OF VSA SYSTEM.							087128
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-5089-P ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85314-821	151-F 850909	FACTORY	YES NO	LIONEL PACIFIC	085470
FAILURE MODE-CONTAMINATION-INACTIVE NULL REPORTEDLY MEASURED PLUS 0.46 VOLT, EXCEEDING PLUS 0.40 VOLT, THE MAXIMUM LIMIT. THE EXCESSIVE NULL CONDITION WAS CAUSED BY CONTAMINANTS INCREASING FRICTION OF THE POWER-STAGE FLOW CONTROL S POOL. CONTAMINANTS FOUND WERE METALLIC AND MAGNETIC. THEY WERE PROBABLY MACHINING OR GRINDING RESIDUE.							
CORRECTIVE ACTION-CADILLAC GAGE WAS REQUESTED TO IMPROVE CLEANING AND ASSEMBLY PROCEDURES AND TECHNIQUES TO ASSURE SERVOVALVES ARE ASSEMBLED FREE OF CONTAMINANTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5087-P SERVOVALVE	FAR 27-04208-1	850907	FACTORY	YES NO	CADILLAC GAGE FC26-398A	085471
FAILURE MODE-STRUCTURAL. TWO SERVOVALVES WERE REJECTED FOR LOW STANDBY PRESSURE. S/N 109-0609 AND 209-0838. DAMAGE TO THE SPOOL OF SERVOVALVE S/N 109-0609 WAS CAUSED BY BROACHING OPERATION BURRS BEING FREED DURING VIBRATION DURING PET TEST. DAMAGE TO THE SPOOL OF SERVOVALVE S/N209-0838 WAS CAUSED BY A CONTAMINANT OF UNKNOWN SOURCE HOWEVER, THE L OW HARDNESS OF THE SPOOL LAND SURFACE MAGNIFIED THE DAMAGE CAUSED BY THE CONTAMINANT.							
CORRECTIVE ACTION-GD/C INITIATED THE FOLLOWING VENDOR CORRECTIVE ACTION. INSPECTION PROCEDURES BE PROPERLY IMPLEMEN TED, PARTICULARLY NOTING THE SLEEVE PORT RADII. GRINDING AND HONING OPERATIONS SHOULD BE CAREFULLY CONTROLLED TO AVO ID LOCALIZED GRINDING HEAT FROM SOFTENING SPOOL LANDS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4727 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	850830	FACTORY	YES NO	CADILLAC GAGE FC-27-398A	086784
FAILURE MODE-OUT OF TOLERANCE DURING PET POST VIBRATION PROOF CYCLE. THE CYLINDER PORT STANDBY PRESSURE WAS 800 PSI G (SPEC. IS 1000 PSIG MINIMUM). SIMILAR FAILURE OCCURRED ON 850818 DURING PET PLUS 30 DEGREES FLUID TEMPERATURE TEST . ACTUATOR STANDBY PRESSURE WAS 825 PSIG.							
CORRECTIVE ACTION-PERFORM METALLURGICAL TESTS. PRELIMINARY INVESTIGATION REVEALS CHIPPING OF SPOOL EDGES. CORRECTIV E ACTION OPEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-90-04-9060-F ACTUATOR VERNIER	FAR 60-85311-1	850820	WTR	NO NO	LIONEL PACIFIC	
FAILURE MODE-SHORT ELECTRICAL-FIELD PERSONNEL REPORTED THE V2 ENGINE WENT HARD OVER IN YAW WITH AC-POWER AND HYDRAU LIC PRESSURE APPLIED. A CONTINUITY CHECK OF THE HARNESS FROM PLUG P-1 AT THE SERVOAMPLIFIER REVEALED THE WIRE LEADIN							

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6 TO THE SERVOVALVE CENTER TAP WAS GROUNDED. NO ACTUATOR ASSEMBLY OPERATING DEFICIENCY WAS FOUND. THE ELECTRICAL SHO RT REPORT WAS NOT CONFIRMED. CORRECTIVE ACTION-FAILURE ANALYSIS WAS PERFORMED ON THE HARNESS CONNECTING TO THIS ACTUATOR ASSEMBLY. THAT FAILURE ANALYSIS IS DISCUSSED IN FAR SLV-9D-14-240.							095474
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-9D-04-5060 SERVO ACTUATOR	FAR 60-85311-1	7110 850825	WTR	YES NO	LIONEL PACIFIC	639755
FAILURE MODE-ERRATIC OPERATION- UNIT REJECTED FOR GOING HARD OVER IN YAW. FAILURE COULD NOT BE CONFIRMED. ALSO SEE FAR SLV-9D-14-240. CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5057-F VERNIER SERVO VALVE	FAR 27-04209-1	850823	FACTORY	YES NO	CADILLAC GAGE FC26-397A	095475
FAILURE MODE-OUT OF SPECIFICATION-DURING PERFORMANCE OF PET TEST TP-1-3978-1, PARAGRAPH 4.7.6, THE VALVE NULL CURRE NT SHIFTED TO PLUS 0.27 MA AFTER 900,000 CYCLES, AND AT 1350000 CYCLES THE NULL CURRENT SHIFTED TO PLUS 0.31 MILLIAN PERE. MAXIMUM ALLOWABLE NULL CURRENT IS PLUS OR MINUS 0.20 MILLIAMPERE. THE CAUSE FOR THE SERVOVALVE NULL SHIFT COUL D NOT BE DEFINITELY ESTABLISHED. CORRECTIVE ACTION-GD/C OBTAINED DESIGN CORRECTIVE ACTION IN ECP 3442.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 VERNIER SERVO VALVE	UTP-PET 27-04209-1	850821	GD/C	YES NO	CADILLAC GAGE CO FC26-397A	096797
FAILURE MODE-OUT OF TOLERANCE-DURING POST 900,000 CYCLE LIFE PROOF CYCLE. THE NULL CURRENT WAS MEASURED AS PLUSO 0. 27 MA. THE MAXIMUM PERMITTED IS 0.20MA. AFTER 1,350,000 CYCLES RECORDED ON 2ND SHIFT ON 850821 WAS PLUS 0.31MA. CAUS ED BY IMPROPER TEMPERATURE AGING OR ARM LEVER WEAR. THESE ARE POSSIBLE MAJOR CONTRIBUTORS. CORRECTIVE ACTION-FAILURE ANALYSIS NEEDED TO DETERMINE CONDITION OF ARM AND LEVER ASSEMBLY. REF-CTCTM NUMBER 551-2-033.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	60/CZZHGS-026-0A1057-/L4-TNO-02-71 11	COMPOSITE-FRD/DPL	7111 650812	2-4	YES NO		090913

FAILURE MODE-ERRATIC OPERATION-ABNORMAL SUSTAINER RETURN PRESSURE OBSERVED ON LANDLINE DATA. MOST LIKELY DUE TO A P OOR HYDRAULIC BLEED.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-HYDRAULIC FILL AND BLEED PERFORMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	60C/ZZA65-027-0A1036-/L4-TNO-03-71 11	COMPOSITE-FRD/DPL	7111 650812	2-4	YES NO		09\'60

FAILURE MODE-INTERNAL LEAK. ABNORMAL PRESSURE TRENDS OBSERVED ON SUSTAINER HYDRAULIC RETURN LANDLINE AND TELEMETRY MEASUREMENTS. PROBLEM ATTRIBUTED TO POOR HYDRAULIC BLEED.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-HYDRAULIC FILL AND BLEED PERFORMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A4456 FLOW LIMITER VALVE	UTP-PET 27-04208-1	650603	60/C	YES NO	STERER 13000	094428

FAILURE MODE-OUT OF TOLERANCE. DURING PET LOW FLUID TEMP TEST. THE TRANSIENT RESPONSE TEST TIME WAS 2.233 SECONDS (SPEC. IS 2.0 TO 2.190 SECONDS). TEST SPECIMEN 303-1047. REFER TO FAILURE LOG 551-2-029.

CORRECTIVE ACTION-RETEST USING DIFFERENT UNIT.

HYDRAULIC-A/B SUSTAINER/VERNIER	09A4671 VERNIER SERVOVALVE	UTP-PET 27-04208-1	650801	60/C	YES NO	CADILLAC GAGE FC-27-397A	090080

FAILURE MODE-OUT OF TOLERANCE-DURING POST FLUID TEMP. SHOCK PROOF CYCLE, PARA-3.4.3. THE STANDBY PRESSURE WAS 760 P SIG. THE ALLOWABLE VALUE IS MINIMUM OF 1500 PLUS OR MINUS 500 PSIG. FAILURE CAUSED BY IMPROPER SPOOL LAPPING.

CORRECTIVE ACTION-NONE-TEST FOR ENGINEERING DATA ONLY. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. HYDRAULIC RES EARCH. PART 256190 WERE NEVER FLIGHT ARTICLES. 60/C PART NUMBER USED AS REFERENCE ONLY. REF. CTCH NO. 551-2-032.

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A4071 VERNIER SERVO VALVE	UTP-PET 27-04209-1	650801	GD/C	YES NO	HYDRAULIC RESEARCH 256190	096760

FAILURE MODE-OUT OF TOLERANCE-DURING THE HIGH FLUID TEMPERATURE TEST THE TOTAL LEAKAGE RATE WAS 0.100 GPM. THE MAXIMUM ALLOWED VALUE IS 0.10 GPM CAUSED BY IMPROPER SPOOL LAPPING.

CORRECTIVE ACTION-CONTINUE EVALUATION TESTING. NO FURTHER ACTION. TEST FOR ENGINEERING DATA ONLY. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. HYDRAULIC RESEARCH, PART 256190, WAS NEVER FLIGHT ARTICLES, GD/C PART NUMBER USED AS REFERENCE ONLY. REF-CTCTH NUMBER 551-2-031.

HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-225 VERNIER ACTUATOR ASSEMBLY	FAR 27-05312-608	151D 650801	36B	YES NO	LIONEL PACIFIC	094023

FAILURE MODE-CONTAMINATION. UNIT REJECTED FOR EXTERNAL LEAKAGE. FAILURE WAS NOT CONFIRMED, ALTHOUGH FELT FIBERS WERE FOUND IN THE AREA OF THE O-RINGS.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. NO CORRECTIVE ACTION TAKEN.

HYDRAULIC-A/B SUSTAINER/VERNIER	CT-9D-10-088 HYDRAULIC ACUMULATOR, O-RING	FAR 27-08553-3	151D 650719	ETR	YES NO	PEACOCK 51303-3	096236

FAILURE MODE-LEAK INTERNAL-LEAKED GASEOUS NITROGEN PAST THE INTERMEDIATE PISTON INTO THE HYDRAULIC SIDE. LEAKAGE DUE TO CONTAMINATION AND DAMAGED O-RING. O-RING DAMAGED AT ASSEMBLY OF UNIT.

CORRECTIVE ACTION-GD/C RECOMMENDED TO PEACOCK TO TAKE QUALITY CONTROL ACTION TO PRECLUDE RECURRENCE OF PROBLEM. OUTSIDE PROCUREMENT INSPECTION INFORMED THAT THIS UNIT DID NOT BEAR SURVEY STAMP 54-85.

HYDRAULIC-A/D SUSTAINER/VERNIER	69A4408 SUSTAINER SERVOVALVE	UTP-ET 27-04208-1	630714	FACTORY	YES NO	HYDRAULIC RESEARCH 261370	096667

FAILURE MODE-FAIL DURING OPERATION. DURING ENGINEERING EVALUATION TEST, Z-AXIS VIBRATION SERVOVALVE FAILED TO OPERATE AT 1475 CPS. AT 1480 CPS. OPERATION WAS RESUMED. SIMILAR FAILURE OCCURRED ON 630717 DURING PLUS 278 DEGREES F FLUID TEMPERATURE TEST.

CORRECTIVE ACTION-FAILURE PROBABLY CAUSED BY SHIFT OF TORQUE MOTOR ASSEMBLY. VENDOR TO PREFORM FAILURE ANALYSIS. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. HYDRAULIC RESEARCH, PART 261370, NEVER WAS FLIGHT ARTICLE. GD/C PART NUMBER 27-04208-1 USED AS REFERENCE ONLY.

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A4629 VERNIER SERVOVALVE	UTP-PET 27-04209-1	850713	GD/C	YES NO	MOOG, INC. 010-45078	096702

FAILURE MODE-OUT OF TOLERANCE-DURING INITIAL ACCEPTANCE TEST, THE STANDBY PRESSURE WAS 2030 PSIG. MINIMUM OF 2000 PSIG IS ALLOWED, CAUSED PROBABILITY BY EXCESSIVE OVERLAP OF SPOOL SLEEVE DURING MACHINING.

CORRECTIVE ACTION-NONE. CONTINUE TESTING TEST IS ENGINEERING PET QUALIFICATION TEST OF MOOG SERVOVALVE. PET ON VENDOR MODEL PART. QUALIFICATION TEST TO ESTABLISH 27-04209-5 UNIT. GD/C PART NUMBER 27-04209-1 USED AS REFERENCE ONLY. REF-ECP 3412 ALSO REF-CTCTH NUMBER 551-2-024.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A4629 VERNIER SERVOVALVE	UTP-PET 27-04209-1	850713	GD/C	YES NO	MOOG, 010-45078	096705

FAILURE MODE-OUT OF TOLERANCE-DURING THE ACCEPTANCE TEST, THE LOAD FLOW RATES WERE PLUS 1.025 AND -1.05 GPM . THE MINIMUM ALLOWED VALUES ARE PLUS 1.35 [illegible] .080 GPM RESPECTIVELY. CAUSED BY VALVE SPOOL STOPS BEING TOO LARGE . THE REQUIRED MAXIMUM FLOW COULD NOT BE OBTAINED DUE TO OVERSIZED SPOOL STOPS.

CORRECTIVE ACTION-NONE. THE MATTER OF NEW SPOOL STOPS FOR THE VENDOR VALVES WILL BE DISCUSSED WITH VENDOR BY DESIGN PENDING A PRODUCTION ORDER. PET ON VENDOR MODEL PART. QUALIFICATION TEST TO ESTABLISH 27-04209-5 UNIT. GD/C PART NUMBER 27-04209-1 USED AS REFERENCE ONLY. REF. ECP 3442 ALSO. REF-CTCTH NUMBER 551-2-030.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A4629 VERNIER SERVOVALVE	UTP-PET 27-04209-1	850713	GD/C	YES NO.	MOOG INC. 010-45078	096791

FAILURE MODE-OUT OF TOLERANCE-DURING INITIAL ACCEPTANCE TEST, THE LOAD FLOW RATE WAS PLUS 1.03 GPM. THE MINIMUM ALLOWED VALUE IS PLUS 1.08 GPM. CAUSED BY VALVE SPOOL STOPS THAT ARE TOO LARGE AND THEREFORE REQUIRED MINIMUM FLOW COULD NOT BE OBTAINED.

CORRECTIVE ACTION-NONE. CONTINUE TESTING. THE MATTER OF NEW SPOOL STOPS FOR THE VERNIER VALVES WILL BE DISCUSSED WITH VENDOR BY DESIGN PENDING A PRODUCTION ORDER. PET ON VENDOR MODEL PART. QUALIFICATION TEST TO ESTABLISH 27-04209-5 UNIT. GD/C PART NUMBER 27-04209-1 USED AS REFERENCE ONLY. ECP 3442 ALSO. REF-CTCTH NUMBER 551-2-025.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5033-F FEEDBACK TRANSDUCER	PAR 27-04211-1	850713	FACTORY	YES NO	CRESCENT ENGR HC-67P-4E	

FAILURE MODE-OUT OF TOLERANCE-EACH TRANSDUCER FAILED TO MEET THE LINEARITY REQUIREMENTS OF GD/C SPECIFICATION 27-04217. TRANSDUCER S/N 603-1160 WAS FOUND TO BE 4.08 PERCENT OUT OF LINEARITY. S/N 904-1945 WAS 1.33 PERCENT OUT OF LINEARITY. FAILURE WAS NOT CONFIRMED DURING FAILURE ANALYSIS.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-CALIBRATION PERSONNEL WERE CAUTIONED TO ADHERE TO THEIR PROCEDURES.							09947B
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 VERNIER SERVOVALVE	UTP-PET 27-04208-1	650624	60/C	YES NO	CADILLAC GAGE CO FC26-397A	096700
FAILURE MODE-OUT OF TOLERANCE-DURING POST 1,000,000 CYCLE LIFE PROOF CYCLE, THE NULL CURRENT WAS MEASURED AS PLUS 0 .26 MA. THE MAXIMUM PERMITTED IS 0.20 MA. CAUSED BY TEMPERATURE SENSITIVITY OF VALVE. CORRECTIVE ACTION-ECP 3411 PROPOSES REDUCTION IN LIFE CYCLES TO 700,000. PRE-ECP ACTIVITY IN PROCESS FOR POSSIBLE A LTERNATE/REPLACEMENT VENDOR. PET LOT 2-65 IS ACCEPTABLE. REF-CTCTN NUMBER 551-2-019.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 SUSTAINER SERVO VALVE	UTP-ET 27-04208-1	650623	60/C	YES NO	HYDRAULIC RESE ARCH 261370	096708
FAILURE MODE-DURING ENGR. LIFE TEST. DURING FIRST PROOF CYCLE AFTER 450,000 CYCLES SERVO COULD NOT BE CONTROLLED, D UE TO A BROKEN ARMATURE (FEED BACK SPRING). SIMILAR FAILURE OCCURRED ON 650624 ON TEST SPECIMEN NUMBER 001 AND 003. CORRECTIVE ACTION-RETURN SERVO VALVE TO VENDORFOR SPOOL STOP INCORPORATION. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. HYDRAULIC RESEARCH, PART 261370, WAS NEVER FLIGHT ARTICLE. 60/C PART NUMBER USED AS REFERENCE ONLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 SUSTAINER SERVO VALVE	UTP-ET 27-04208-1	650619	60/C	YES NO	HYDRAULIC RESE ARCH 261370	096708
FAILURE MODE-OUT OF TOLERANCE. DURING ENGR. IAT, POST VIBRATION, LOW TEMPERATURE, HIGH TEMPERATURE, AND POST TEMPER ATURE SHOCK TEST, FLOW RATE VARIED FROM PLUS AND MINUS 2.37 TO 2.48 GPM, (SPEC IS PLUS OR MINUS 2.38 GPM MAX.). ADDI TIONAL FAILURES OCCURRED ON 650620 ON SAME TEST SPECIMEN S/N 001. CORRECTIVE ACTION-NONE. OUT OF TOLERANCEIS NOT CONSIDERED PROBLEM. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. H YDRAULIC RESEARCH, PART 261370, WAS NEVER FLIGHT ARTICLE. 60/C PART NUMBER USED AS REFERENCE ONLY.							
HYDRAULIC A/B SUSTAINER/VERNIER	A-99-04-5049-F VERNIER ACTUATOR, O-RING	FAR 27-08573-3	650617	FACTORY	YES NO	LIONEL PACIFIC 2792-2	
FAILURE MODE-CONTAMINATION-DURING STATIC LEAK TESTING, PER EOP 305.10, THE VERNIER ACTUATOR REPORTEDLY LEAKED HYDRA ULIC OIL AT THE PISTON SEALS ON EACH SIDE OF THE RACK AND AT BOTH SHUBBER PORTS. LEAKAGE IS ATTRIBUTED TO FIBERS FRO M THE FELT LUBRICATOR BRIDGING THE SEALING SURFACE OF THE C-1 AND C-2 END PISTON O-RING.							

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CORRECTIVE ACTION-ECP 3442 REPLACES FELT LUBRICATOR WITH TEFLON LUBRICATOR. REMOVE ALL NS-28775 O-RINGS AND REPLACE WITH TOP VISUAL QUALITY-TYPE O-RINGS. REVISE LEAKAGE CRITERIA.							005476
HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-9D-10-281P HOSE ASSEMBLY	FAR 27-08571-8	3020 650610	WTR	YES NO	AEROQUIP 677341-6-0213	000602
FAILURE MODE-LEAK-EXTERNAL-FAILURE OCCURRED DURING CHECKOUT WHEN LEAKAGE APPEARED PAST SOCKET AND FLEX PORTION OF THE HOSE.							
CORRECTIVE ACTION-GD/C PERSONNEL WERE CAUTIONED TO TAKE GREATER CARE WHEN INSTALLING HOSES AND TO PREVENT TOO SHARP A BEND RADIUS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403.3 VERNIER SERVO VALVE	UTP-PET 27-04208-1	650608	GD/C	YES NO	CADILLAC GAGE CO. FC26-397A	000623
FAILURE MODE-OUT OF TOLERANCE-DURING INITIAL ACCEPTANCE TEST, THE STANDBY PRESSURE WAS RECORDED TO BE 2130 PSIG. MAXIMUM ALLOWED VALUE IS 2000 PSIG. CAUSED BY UNSATISFACTORY QUALITY CONTROL AT VENDORS FACILITY.							
CORRECTIVE ACTION-REJECTED TEST SPECIMEN TO VENDOR REPLACEMENT SPECIMEN FOR THIS LOT 2-69 PLACED INTO TEST. PRE-ECP ACTIVITY IN PROCESS FOR POSSIBLE ALTERNATE/REPLACEMENT VENDOR. REF-CTCTM NO. 551-2-008.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 SUSTAINER SERVOVALVE	UTP-PET 27-04208-1	660528	GD/C	YES NO	CADILLIAC GAGE FC-26-398A	000668
FAILURE MODE-OUT OF TOLERANCE. DURING PET POST 450,000 LIFE CYCLES TEST, FLOW RATE OF PORT 1 WITH A 1865 PSIG LOAD WAS 2.42 GPM (SPEC. IS 2.36 GPM MAX.). SIMILAR FAILURE ON 65/05/27 AFTER 1,350,000 LIFE CYCLES. TEST SPECIMEN 308-0065. REFER TO FAILURE LOG 551-2-007 AND -008.							
CORRECTIVE ACTION-NO CORRECTIVE ACTION REQUIRED. ACCEPT LOT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	GD/CZZH65-018-0A1049-/L4-7HO-01-71 08 SUSTAINER HYDRAULIC ACCUMULATOR	COMPOSITE-FRD/DPL 27-08553-8	7108 650520	2-4	YES NO	PEACOCK 51305-3	
FAILURE MODE-INTERNAL LEAK. THE NORMAL PRESSURE TRANSIENT FOLLOWING COMMIT STOP WAS NOT APPARENT ON THE SUSTAINER HYDRAULIC RETURN MEASUREMENTS. THIS IS INDICATIVE OF AIR IN THE SYSTEM. PRIOR TO THE DPL A DECREASE IN PNEUMATIC PRESSURE WAS OBSERVED ON THE SUSTAINER ACCUMULATOR. GAS LEAKING PAST THE ACCUMULATOR PISTON WOULD EXPLAIN THE LACK OF THE NORMAL TRANSIENT AT COMMIT STOP.							
SYSTEM EXPECT-ERRATIC OPERATION.							

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VEHICLE EFFECT-NONE. CORRECTIVE ACTION-SUSTAINER HYDRAULIC ACCUMULATOR REPLACED AND FILL AND BLEED PERFORMED.							000778
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-9D-10-280F ACCUMULATOR, O-RING	FAR 27-08553-3	7108 650520	WTR	YES NO	PEACOCK 51305-3	000003
FAILURE MODE-LEAK-INTERNAL. PNEUMATIC PRESSURE DECAYED AND GAS WAS FOUND IN THE HYDRAULIC SYSTEM DUE TO IMPROPERLY INSTALLED O-RING. CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO PROVIDE PROPER PLATING AND O-RING INSTALLATION. GD/C PERSONNEL WERE CAUTIONED TO INSTALL CRUSH SEALS PROPERLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403.2 SUSTAINER SERVOVALVE	UTP-PET 27-04208-1	650515	GD/C	YES NO	CADILLAC GAGE FC28-398A	000003
FAILURE MODE-OUT OF TOLERANCE. DURING PET FLUID LOW TEMP. TEST, NULL OFFSET CURRENT WAS -0.23 M.A. (SPEC. IS PLUS OR MINUS 0.20 M.A. MAX.). TEST SPECIMEN 402-0982, REFER TO FAILURE LOG 551-2-004, UNIT DOES NOT REPRESENT ACTUAL LOT. CORRECTIVE ACTION-SUBMIT ECP TO INVESTIGATE ALTERNATE VALVE SOURCE. ALSO, ALL FUTURE TEST SPECIMENS WILL RECEIVE SPECIAL IAT PRIOR TO TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 SUSTAINER SERVOVALVE	UTP-ET 27-04208-1	650515	GD/C	YES NO	HYDRAULIC RESEARCH 261370	000000
FAILURE MODE-FAIL DURING OPERATION DURING ENGINEERING OPERATING VIBRATION TEST. AT 950 CPS, VALVE CEASED TO OPERATE. TEST SPECIMEN 001; REFER TO FAILURE LOG 551-2-003. CORRECTIVE ACTION-RETURN VALVE TO VENDORFOR REWORK. UPON RETURN TO GD/C; RETEST VALVES. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. HYDRAULIC RESEARCH, PART 261370, NEVER WASFLIGHT ARTICLE. GD/C PART NUMBER USED AS REFERENCE ONLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4403 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	650515	GD/C	YES NO	HYDRAULIC RESEARCH 261370	
FAILURE MODE-OUT OF TOLERANCE DURING ENGINEERING PLUS 30 DEGREES F FLUID TEMPERATURE TEST. STANDBY PRESSURE WAS 900 PSIG (SPEC. IS 1000 PSIG MIN.) DURING PET PLUS 165 DEGREES F FLUID TEMPERATURE TEST FLOW OUT OF PORT 1 WAS 1.60 GPM (SPEC. IS 1.94 GPM MIN.) ALSO HYSTERSIS WAS 2.2 M.A. (SPEC. IS 0.20 M.A. MAXIMUM).							

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							000787
CORRECTIVE ACTION-RETURN VALVE TO VENDORFOR REWORK. UPON RETURN TO GD/C, RETEST VALVES. NOTE-HYDRAULIC RESEARCH NEVER QUALIFIED UNITS. HYDRAULIC RESEARCH, PART 201370, WAS NEVERFLIGHT ARTICLE. GD/C PART NUMBER USED AS REFERENCE ONLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5036-F VERNIER ACTUATOR ASSEMBLY, SEALS	FAR 27-05312-005	650512	FACTORY	YES NO	LIONEL PACIFIC	000143
FAILURE MODE-CONTAMINATION. VERNIER ACTUATOR ASSY REPORTEDLY LEAKED EXCESSIVELY FROM THE TRANSDUCER END OF THE CUTAWAY AREA IN THE CYLINDER BODY EXPOSING THE PISTON GEAR RACK. LEAKAGE WAS CAUSED BY A CHUNK OF FELT FROM THE LUBRICATOR BRIDGING THE PISTON O-RING SEALING SURFACE. THE CHUNK OF FELT WAS APPARENTLY SHEARED FROM THE LUBRICATOR DURING ACTUATOR BUILD-UP AND BECAME DEPOSITED ON THE PISTON SEAL DURING SUBSEQUENT SERVOCYLINDER ASSEMBLY OPERATION.							
CORRECTIVE ACTION-SHOP AND INSPECTION PERSONNEL WERE INFORMED OF THIS FAILURE AND ITS CAUSE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-10-277-F HYDRAULIC HOSE ASSEMBLY	FAR 27-08571-5	71-11 650511	FACTORY	YES NO	AEROQUIP 677341-6-0213	000099
FAILURE MODE-LEAK-EXTERNAL. HOSE DEVELOPED LEAKAGE PAST SOCKET AND FLEX PORTION OF HOSE.							
CORRECTIVE ACTION-GD/C PERSONNEL WERE CAUTIONED TO USE CARE WHEN INSTALLING FLEX HOSES TO PREVENT TWISTING OF FLEX PORTION RELATIVE TO THE SOCKET.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-5033 ACTUATOR-VERNIER	FAR 27-05312-005	1640 650510	FACTORY	YES NO	LIONEL PACIFIC	000130
FAILURE MODE-LEAK EXTERNAL-ASSEMBLY WAS FOUND LEAKING HYDRAULIC OIL PAST THE SHAFT SEAL ON THE TRANSDUCER END OF THIS ASSEMBLY. FAILURE WAS NOT CONFIRMED.							
CORRECTIVE ACTION-GD/C INITIATED QUALITY CONTROL CORRECTIVE ACTION TO MINIMIZE REJECTION OF FUNCTIONAL VERNIER ACTUATOR ASSEMBLIES. RECOMMENDING, THE CYCLING OF SIMILAR ACTUATORS BEFORE STATIC OR DYNAMIC LEAK TESTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-10-276F SUSTAINER PUMP	FAR 27-08590-5	2640 650505	ETR	YES NO	VICKERS AA-80410-L-8	
FAILURE MODE-LEAK EXTERNAL. PUMP WAS REJECTED FOR OIL SEEPAGE AT INLET AND OUTLET FLANGES.							

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CORRECTIVE ACTION-FAILURE NOT CONFIRMED. NO FURTHER ACTION.							090700
HYDRAULIC-A/B SUSTAINER/VERNIER	AA65-0018/PE-401-00-264 SUSTAINER PUMP, FLANGE	COUNTDOWN 27-08590-5	2640 850504	12 -13000	YES NO	VICKERS AA-60410-L-2	092200
FAILURE MODE-LEAK, EXTERNAL. HYDRAULIC PUMP LEAKAGE AT INLET AND OUTLET FLANGES AND AT A MANUFACTURING ACCESS FLANGE WERE DISCOVERED DURING COUNTDOWN. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COUNTDOWN DELAYED APPROXIMATELY 100 MINUTES. CORRECTIVE ACTION-PUMP REPLACED DURING COUNTDOWN HOLD. (REFERENCE WO 65217). PUMP WAS REPLACED AGAIN AFTER COUNTDOWN ABORT PER TWX TO INSTALL A SUFFIX (A) PUMP.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5021-F ACTUATOR-VERNIER	FAR 27-05318-005	5302 850500	FACTORY	YES NO	LIONEL PACIFIC	095100
FAILURE MODE-LEAK EXTERNAL-OIL LEAKED AT 3 DROPS PER CYCLE FROM THE NULL ADJUSTMENT SCREW DURING PERFORMANCE OF EOP 405.13. THE CAUSE OF FAILURE REMAINS UNKNOWN AS ONLY A PARTIAL ANALYSIS WAS DIRECTED. CORRECTIVE ACTION-NO CORRECTIVE ACTION INITIATED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4269 SUSTAINER SERVOVALVE	UTP-PET 27-04208-1	850412	60/C	YES NO	CADILLAC GAGE FC26-398A	096001
FAILURE MODE-OUT-OF-TOLERANCE DURING PET POST 1,350,000 LIFE CYCLE PROOF CYCLE TEST. THE NULL OFFSET CURRENT WAS 0.26 M.A. (SPEC. IS 0.20 M.A. MAX). TEST SPECIMEN 406-0980, LOT 1-65, REFER TO FAILURE LOG 551-2-001. CORRECTIVE ACTION-ECP 3411 HAS BEEN SUBMITTED TO REDUCE LIFE CYCLES TO 700,000 CYCLES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4330 VERNIER SERVO VALVE	UTP-PET 27-04209-1	850412	60/C	YES NO	CADILLAC GAGE CO FC26-397A	
FAILURE MODE-OUT OF TOLERANCE. DURING POST 900,000 CYCLE LIFE PROOF CYCLE, THE NULL CURRENT WAS MEASURED AS PLUS 0.25 MA. THE MAXIMUM PERMITTED IS 0.20 MA. CAUSE OF DISCREPANCY IS MAXIMUM CAPABILITY OF DESIGN COUPLED WITH CRAFTMANSHIP TYPE MANUFACTURING. CORRECTIVE ACTION-NONE-IMPROVED IAT TESTING AND REPLACEMENT STUDY PROGRAM ALREADY EXISTS. ECP 3411 PROPOSES REDUCTI							

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ON IN LIFE CYCLES TO 700,000. REF-CTCTH NO. 551-2-002.							006020
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-5024-F VERNIER ACTUATOR ASSEMBLY,SEAL	FAR 27-65312-005	2250 650324	FACTORY	YES NO	LIONEL PACIFIC	006137
FAILURE MODE-CONTAMINATION-HYDRAULIC OIL WAS FOUND LEAKING PAST THE ACTUATOR SHAFT SEAL. LEAKAGE WAS DUE TO FELT LUBRICATOR FIBERS BLOCKING THE SEALING O-RING. CORRECTIVE ACTION-THE ALLOWABLE LEAK RATE WAS INCREASED. CYCLING OF ASSEMBLIES BEFORE THEIR REJECTION IS NOW REQUIRED AT ETR AND WTR. EOP 305.10 WAS REVISED FOR A 500 CYCLE DYNAMIC TEST FOR LEAKAGE IN RECEIVING INSPECTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-5015-F VERNIER SERVO VALVE,MOTOR	FAR 27-04209-1	650318	FACTORY	YES NO	CADILLAC GAGE FC26-397A	006163
FAILURE MODE-STRUCTURAL. DURING RETEST OF THE SERVOVALVE, PER SURVEY 97-64, LEAKAGE REPORTEDLY OCCURRED FROM THE SERVOVALVE BODY-TO-CAP INTERFACE LEAKAGE REPORTED WAS NOT CONFIRMED DURING LABORATORY TESTS. HOWEVER THE CRACK THROUGH THE TORQUE MOTOR CAP SIDE WALL COULD EASILY ALLOW LEAKAGE DEPENDING ON WHERE THE O-RING SEATED. THE CRACK IN THE TORQUE MOTOR CAP WAS TRANSGRANULAR INDICATING A MECHANICAL CAUSE. CORRECTIVE ACTION-PLANNING CARDS FOR SERVOVALVE OVERHAUL WERE REVISED, EFFECTIVE ON DATE 650527, REQUIRING TORQUE MOTOR CAPS BE CHECKED FOR CRACKS USING A MINIMUM OF 10-POWER MAGNIFICATION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-5026-F VERNIER ACTUATOR, O-RING	FAR 27-65312-005	184-B 650318	FACTORY	YES NO	LIONEL PACIFIC	006140
FAILURE MODE-LEAK EXTERNAL-DURING ROUTINE SURVEILLANCE, THE ASSEMBLY WAS REPORTED TO HAVE A RUNNING LEAK UNDER STATIC PRESSURE. THE EVIDENCE FOUND SHOWED LEAKAGE WAS CAUSED BY GROSS DEFECTS-SPLIT O-RINGS, AND NO SQUEEZE. ANALYSIS WAS STOPPED BEFORE ITS COMPLETION. CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-5014-F VERNIER ACTUATOR ASSEMBLY	FAR 27-65312-005	2040 650300	12	YES NO	LIONEL PACIFIC	006168
FAILURE MODE-LEAK EXTERNAL-DURING PRE-FLIGHT CHECK-OUT ABOARD MISSILE 204-B, OIL WAS FOUND LEAKING PAST PISTON SHAFT SEAL. CORRECTIVE ACTION-MODE-FAILURE WAS NOT CONFIRMED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-90-04-5002-P VERNIER ACTUATOR ASSEMBLY, SERVOVA LVE	FAR 69-05311-1	7104 650300	2-5 PALC	YES NO	GO/C	696264
FAILURE MODE-OUT OF TOLERANCE-NULL VOLTAGE REPORTEDLY WAS OUT OF TOLERANCE. THE NULL SHIFT REPORTED WAS CAUSED BY F LUCTUATION OF A DOWNWARD LOAD ON THE TARGET SCREW END OF THE ARMATURE RESULTING FROM CONTACT WITH THE TORQUE MOTOR C OIL LEADWIRES.							
CORRECTIVE ACTION-VENDER WAS REQUESTED TO ASSURE ASSY AND QUALITY CONTROL PROCEDURES AND TECHNIQUES ARE ADEQUATE TO ASSURE TORQUE MOTOR LEADWIRES DO NOT CONTACT THE ARMATURE, TARGET SCREW SEALS ARE NOT DAMAGED AND FEEDBACK LEVER HA RD CHROME PLATING THICKNESS IS SUFFICIENT. CONVAIR PERSONNEL WERE REQUESTED TO ASSURE TORQUE MOTOR LEADWIRES DO NOT BECOME SLACK ENOUGH TO INTERFERE WITH THE ARMATURE DURING PERFORMANCE OF SURVEY 97-64.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A-4277 VERNIER SERVO VALVE	UTP-PET 27-04209-1	650229	GO/C	YES NO	CADILLAC GAGE CO FC26-397A	696021
FAILURE MODE-OUT OF TOLERANCE-DURING POST 900,000 CYCLE LIFE PROOF CYCLE, THE NULL CURRENT WAS MEASURED AS PLUS 0.2 5 MA. THE MAXIMUM PERMITTED IS 0.20 MA.CAUSE TO BE DETERMINED BY FAILURE ANALYSIS AT VENDORS FACILITY.							
CORRECTIVE ACTION-RETURN UNIT TO VENDOR FOR ANALYSIS. REF-CTCTH NO. 556-7-048.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3770 STAGING ASSEMBLY, POPPET SEAL	UTP-PET 27-08556-3	650212	CONVAIR	YES NO	PEACOCK 51290-3	696670
FAILURE MODE-LEAK INTERNAL. DURING POST TEMPERATURE PROOF CYCLE LEAKAGE WAS NOTED THROUGH THE -3 COUPLING. THERE WA S SUFFICIENT LEAKAGE OF HYDRAULIC FLUID SO THAT A HAND PUMP COULD NOTMAINTAIN A PRESSURE. REQUIREMENT IS 15 DROPS PE RHOUR MAXIMUM. REF. TASK HISTORY LOG NUMBER682-8-003 S/N 109-0752.							
CORRECTIVE ACTION-TEST TERMINATED-VENDOR NOTIFIED TO IMPROVE HIS QUALITY VIA A VCAR.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3745 SUSTAINER ACTUATOR; SCREWS	UTP-PET 27-08503-5	650211	GO/C	YES NO	LIONEL PACIFIC 2723-1	697198
FAILURE MODE-STRUCTURAL. FAILURE DURING PET X-AXIS VIBRATION. THE ACTUATOR BODY ROTATED ABOUT THE FIXED END DURING VIBRATION DUE TO INADEQUATE LOCKNUT TIGHTENING PROCEDURES AND PROBABLE INADEQUATE LOCTITE APPLIED. TEST SPECIMEN S/N 406-1092. REFER TO FAILURE LOG 682-3-007.							
CORRECTIVE ACTION-CLASS II CHANGE WILL BE INSTITUTED TO ADD NOTE TO DRAWING TO ADD LOCTITE AND TORQUE REQUIREMENTS. IN ADDITION A SHORT DET TEST WILL BE PROPOSED TO ESTABLISH OPTIMUM METHOD AND TYPE OF LOCTITE TO BE USED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSY.-SPHERICAL BRG.	UTP-SLT 27-85314-017	650210	60/C	YES NO	LIONEL PACIFIC	006030

FAILURE MODE-STRUCTURAL-DURING THE EXTENDED DYNAMIC CYCLING TEST THE OUTER RACE SURROUNDING THE FIXED END BEARING H AD MOVED OUT APPROXIMATELY 0.10 INCHES AT THE COMPLETION OF THE 15,000 CYCLES. REF. TASK HISTORY LOG NO. 662-6-006 S /N 306-0071.

CORRECTIVE ACTION-PRESS RACE BACK TO ORIGINAL POSITION AND CONTINUE TEST. TO PREVENT THE ACTUATOR BODY FROM ROTATIN G, A NOTE WILL BE ADDED TO THE INSTALLATION AND ASSEMBLY DRAWINGS TO ADD REQUIRED TORQUE AND LOCTITE TO THE GLAND LO CKNUT, ROD END LOCKNUT, AND TRANSDUCER LOCK SET SCREW. CHANGE TO BE EFFECTIVE 650630. THIS ACTION IS FOR T.M.662-7-0 41,-042,-044,-045,-049,-050,-052 AND 662-8-001,-006.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A4197 SUSTAINER SERVO VALVE	UTP-PET 27-04209-1	650210	60/C	YES NO	CADILLAC GAGE FC26-388A	006060

FAILURE MODE-OUT-OF-TOLERANCE DURING PET INITIAL ACCEPTANCE TEST, THE PHASE LAG WAS EXCESSIVE AND SENSITIVE TO THE INPUT CURRENT. PHASE LAG WAS 18.5 DEGREES AT 6 CPS (SPEC. IS 12 DEGREES). SPECIMEN S/N 406-0978 CONTINUED OUT OF PHA SE LAG TOLERANCE UP TO 30 CPS. REFER TO FAILURE LOG 556-7-040.

CORRECTIVE ACTION-I.R. TEST SPECIMEN AND RETURN TO VENDOR FOR REWORK.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLY-8D-04-5005-F O-RING-VERNIER ACTUATOR ASSY.	FAR 27-85312-605	7401 650208	MTR	YES NO	LIONEL PACIFIC	006065

FAILURE MODE-LEAK EXTERNAL-THE SERVOCYLINDER ASSY LEAKED HYDRAULIC OIL PAST THE ACTUATOR PISTON SEALS. LEAKAGE WAS CAUSED BY A SUBSTANDARD, WORN, AND DAMAGED PISTON O-RING SEAL. FELT LUBRICATOR SHREDDING ALSO CONTRIBUED TO THIS FAI LURE.

CORRECTIVE ACTION-60/C OBTAINED VENDER CORRECTIVE ACTION. VENDER STATED AN ILLUMINATED MAGNIFYING GLASS HAS BEEN IN STALLED IN THEIR CLEAN ROOM. O-RINGS ARE INSPECTED JUST BEFORE INSTALLATION.

HYDRAULIC-A/B SUSTAINER/VERNIER	LY-8B-04-5008-F VERNIER ACTUATOR ASSEMBLY, O-RING	FAR 27-85312-605	190 650208		YES NO	LIONEL PACIFIC

FAILURE MODE-CONTAMINATION-VERNIER SERVOCYLINDER ASSY LEAKED HYDRAULIC OIL AT AN ACTUATOR PISTON SEAL DURING PERFOR MANCE OF A HYDRAULIC SYSTEM FILL AND BLEED. LEAKAGE WAS CAUSED BY FIBERS FROM THE FELT LUBRICATOR BRIDGING THE SEALI NG SURFACE OF THE C-1 END PISTON O-RING.

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CORRECTIVE ACTION-ECP 3442-REPLACE FELT LUBRICATOR WITH TEFLON LUBRICATOR. REMOVE ALL MS-28778 O-RINGS AND REPLACE WITH TOP VISUAL QUALITY TYPE O-RINGS. REVISED LEAKAGE CRITERIA.							896266
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.3 SUSTAINER ACTUATOR ASSY, TUBE	UTP-SLT 27-85314-817	850205	60/C	YES NO	60/C	896042
FAILURE MODE-STRUCTURAL-DURING SLT ROOM TEMPERATURE VIBRATION IN THE Y-AXIS, THE HIGH PRESSURE-11 TUBE ASSEMBLY RUPTURED AT THE SINE FREQUENCY OF 15 CPS. REF. TASK HISTORY LOG NO. 662-8-002 S/N 304-0828. CORRECTIVE ACTION-REPLACE THE TUBE ASSEMBLY AND CONTINUE TEST. TO PREVENT THE ACTUATOR BODY FROM ROTATING A NOTE WILL BE ADDED TO THE INSTALLATION AND ASSEMBLY DRAWINGS TO ADD REQUIRED TORQUE AND LOCTITE ON THE GLAND LOCKNUT, ROD END LOCKNUT AND TRANSDUCER LOCK SET SCREW. THIS ACTION IS FOR T.H. 662-7-046,-047 AND 662-8-002.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY	UTP-SLT 27-85314-817	850204	60/C	YES NO	LIONEL PACIFIC	896038
FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF SLT VIBRATION IN THE X-AXIS IT WAS FOUND THAT THE ACTUATOR BODY ROTATED 15 TO 20 DEGREES WITH RESPECT TO THE ACTUATOR ROD ENDS. REQ. NO ROTATION. REF. TASK HISTORY LOG NO. 662-8-001 S/N 308-0871. CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE LOCKNUT AND ROD END GLAND ADJUSTMENT NUT TO 100 FT-LBS. CONTINUE THE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY, TUBE	UTP-SLT 27-85314-817	850203	60/C	YES NO	LIONEL PACIFIC	896037
FAILURE MODE-STRUCTURAL-DURING THE SLT VIBRATION TEST IN THE Y AXIS THE HIGH PRESSURE-13 TUBE ASSEMBLY RUPTURED. REF. TASK HISTORY LOG.NO. 662-7-052 S/N 308-0871. CORRECTIVE ACTION-REPLACE THE TUBE ASSEMBLY AND CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4277 VERNIER SERVO VALVE	UTP-PET 27-04208-1	[illegible]0203	60/C	YES NO	CADILLAC GAGE CO. FC26-397A	
FAILURE MODE-OUT OF TOLERANCE-DURING LOW TEMPERATURE TEST THE STANDBY PRESSURE WAS [illegible] TO 850 PSIG. THE MINIMUM ALLOWED VALUE IS 1000 PSIG. CAUSED BY UNREALISTIC LOW TEMPERATURE REQUIREMENT FOR PARTS PERFORMANCE. CORRECTIVE ACTION-SPECIFICATION TO BE REVISED FOR FOLLOW ON CONTRACT TO A MORE REALISTIC VALUE OF PLUS 30 DEGREES F							

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. ALSO CURRENT CONTRACT SPECIFICATIONS MAY BE CHANGED IF APPLICABLE. REF-CTCTH NUMBER 558-7-037.							000795
HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-9D-04-4977-F VERNIER YAW ACTUATOR, SERVO VALVE	FAR 27-85311-805	211D 850205	WTR		YES LIONEL PACIFIC NO	000258
FAILURE MODE-ERRATIC OPERATION THE V2 ENGINE REPORTEDLY WENT TO YAW BIAS AT THE PROPER TIME BUT FAILED TO RESPOND TO GUIDANCE STEERING AND FAILED TO RETURN TO NULL WHEN THE PROGRAMMER RESET. ALTHOUGH THE V1 ENGINE RESPONDED NORMALLY. REPORTED FAILURE WAS NOT CONFIRMED. EXCESSIVE PARTICLE CONTAMINATION FOUND IN FLUID SPECIMENS TAKEN FROM ACTUATOR AND SERVOVALVE MAY HAVE CONTRIBUTED TO THE FAILURE. CORRECTIVE ACTION-NOT A CONFIRMED FAILURE-THE INFORMATION CONTAINED IN THIS ANALYSIS WAS RELAYED TO APPROPRIATE PERSONNEL AT THE WTR AS IT WAS OBTAINED TO PROVIDE URGENTLY NEEDED DATA FOR PROBLEM RESOLUTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY	UTP-SLT 27-85314-817	850202	60/C		YES LIONEL PACIFIC NO	000630
FAILURE MODE-STRUCTURAL-DURING THE SLT VIBRATION TEST IN THE Y-AXIS THE HIGH PRESSURE-SS TUBE ASSEMBLY RUPTURED. REF. TASK HISTORY LOG NO.662-7-050 S/N 308-0871. CORRECTIVE ACTION-REPLACE THE TUBE ASSEMBLY AND CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY	UTP-PRT 27-85314-817	850202	60/C		YES LIONEL PACIFIC NO	000700
FAILURE MODE-OUT OF TOLERANCE. DURING PROOF CYCLE AFTER PRT TEMPERATURE VIBRATION, THE PHASE LAG OF THE UNIT EXCEEDED THE ALLOWABLE. REF. TASK HISTORY LOG NUMBER 558-7-038 S/N 308-0871. CORRECTIVE ACTION-CONTINUE TEST. THE CAUSE OF THE ACTUATOR ASSEMBLY FAILURE IS DUE TO THE FACT IT CANNOT WITHSTAND SINE/RANDOM VIBRATION. THE UNIT REQUIRED REDESIGN TO WITHSTAND THE SINE/RANDOM VIBRATION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1951.3 VERNIER ACTUATOR ASSY.-BRACKET	UTP-SLT 60-85311-1	850201	60/C		YES LIONEL PACIFIC NO	000010
FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF THE Z AXIS OF SLT VIBRATION IT WAS NOTICED THAT THE NUT PLATE ON THE INSIDE OF THE SHIELD MOUNTING BRACKET HAD BROKEN. REF. TASK HISTORY LOG NO. 662-7-051 S/N 310-0009. CORRECTIVE ACTION-NONE-CONTINUE TESTING.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1951.3 VERNIER ACTUATOR ASSEMBLY, SERVO V ALVE	UTP-BLT 69-85311-1	650201	60/C	YES NO	LIONEL PACIFIC	696015
FAILURE MODE-FAILS TO OPERATE AT PRESCRIBED TIME- DURING BLT HIGH TEMPERATURE (240 DEGREES F VIBRATION TEST, THE UN IT FAILED TO OPERATE. THIS FAILURE WAS CAUSED BY THE SERVO VALVE NULL CURRENT SHIFTED TO A MAGNITUDE SUCH THAT THE A MPLIFIER COULD NOT COMPENSATE. REF. TASK HISTORY LOG NO. 886-7-036 S/N 310-0009.							
CORRECTIVE ACTION-TERMINATE TEST. UNIT TESTED ABOVE DESIGN REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.3 SUSTAINER ACTUATOR ASSEMBLY	UTP-PRT 27-85314-817	650130	60/C	YES NO	LIONEL PACIFIC	696041
FAILURE MODE-STRUCTURAL-DURING PRT ROOM TEMPERATURE VIBRATION IN THE Y-AXIS THE ACTUATOR BEGAN ROTATING ABOUT THE R OD ENDS AT THE SINE VIBRATION FREQUENCY OF 250 CPS. ALSO THE TRANSDUCER LOCK SET SCREW BACKED OFF 1 3-4 TURNS. REF. TASK HISTORY LOG NO. 662-7-046 S/N 304-0828.							
CORRECTIVE ACTION-REALIGN ACTUATOR BODY RETORQUE AND SAFETY WIRE THE GLAND END LOCKNUT AND ROD END LOCKNUT TO 100 A ND 50 FT-LBS RESPECTIVELY. TIGHTEN SETSCREW AND CONTINUE TESTING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY, SET S CREW	UTP-PRT 27-85314-817	650130	60/C	YES NO	LIONEL PACIFIC	696029
FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION TEST IN THE Y-AXIS THE FEEDBACK TRANSDUCER LOCK SET SCREW BACKED O UT 1 3/4 TURNS. THIS WAS DISCOVERED AT THE COMPLETION OF THE Y-AXIS VIBRATION SWEEP. REF.TASK HISTORY LOG NO. 662-7-049 S/N 308-0871.							
CORRECTIVE ACTION-REPOSITION THE TRANSDUCER AND TIGHTEN THE SET SCREW. CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SUSTAINER ACTUATOR ASSEMBLY	UTP-PRT 27-85314-817	650130	60/C	YES NO	LIONEL PACIFIC	696020
FAILURE MODE-STRUCTURAL-DURING PRT HIGH TEMPERATURE VIBRATION IN THE X-AXIS THE ACTUATOR BODY ROTATED ABOUT THE ROD ENDS THREE TIMES DURING THE SWEEP. AFTER EACH ROTATION THE BODY WAS REALIGNED AND TEST CONTINUED. REF. TASK HISTORY LOG NO. 662-7-047 S/N 304-0828.							
CORRECTIVE ACTION-EACH REALIGNING OF THE ACTUATOR BODY HAD THE GLAND END LOCKNUT AND THE ROD END LOCKNUT RETORQUED TO 100 AND 50 FT-LBS RESPECTIVELY, BOTH NUTS SAFETY WIRED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1831.3 VERNIER ACTUATOR ASSEMBLY, SERVO V ALVE	UTP-PRT 69-65311-1	850130	60/C	YES NO	LIONEL PACIFIC	896014

FAILURE MODE-OUT OF TOLERANCE- DURING POST PRT TEST PROOF CYCLE THE UNIT SERVO VALVE FAILED. REF. TASK HISTORY LOG NO. 556-7-034 S/N 310-0009.

CORRECTIVE ACTION-CONTINUE TEST. THE UNIT NOT PURCHASED TO MEET SINE/RANDOM VIBRATION. REDESIGN REQUIRED TO MEET TH TS ENVIRONMENT

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-10-274F PUMP SEAL	FAR 27-08590-3	1660 850129	ETR	YES NO	VICKERS AA-60410-L-2	896701

FAILURE MODE-LEAK-EXTERNAL SEEPAGE BETWEEN THE OUTLET FLANGE AND HOUSING CAUSED BY A POOR INSTALLATION OF THE OUTLE T FLANGE PRESSURE- SENSING PORT SEAL.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. BORE DEPTH ON OUTLET FLANGE FLAGGED TO INSURE COMPLIANCE WITH BLUEPRINT. V ENDOR TO INSURE PROPER THICKNESS OF TEFLON RINGS.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.3 SUSTAINER ACTUATOR ASSEMBLY	UTP-PRT 27-65314-017	850129	60/C	YES NO	60/C	896040

FAILURE MODE-STRUCTURAL-DURING PRT LOW TEMPERATURE VIBRATION IN THE Z-AXIS THE ACTUATOR BODY ROTATED ABOUT THE ROD ENDS 5 TO 10 DEGREES. ROTATION WAS DUE TO A LOOSE LOCKNUT ON THE FIXED ROD END. ALSO TRANSDUCER LOCK SETSCREW LOOSEN ED. REF. TASK HISTORY LOG NO. 662-7-045 S/N 308-0071.

CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE ROD END LOCKNUT TO 50FT-LBS AND SAFETY WIRE. TIGHTEN SETSCREW. CONTINUE TEST.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY, SET S CREW	UTP-PRT 27-65314-017	850129	60/C	YES NO	60/C	[illegible]

FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION TEST IN THE Z-AXIS THE FEEDBACK TRANSDUCER LOCK SETSCREW BACKED OU T 1 1/2 TURNS. REF. TASK HISTORY LOG NO. 662-7-045 S/N 308-0071.

CORRECTIVE ACTION-REPOSITION THE TRANSDUCER AND TIGHTEN THE SET SCREW. CONTINUE TEST.

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A2011.2 STAGING DISCONNECT	UTP-SLT 27-08355-1	650128	CONVAIR	YES NO	PEACOCK 81205-1	007003
FAILURE MODE-STRUCTURAL-DURING DEMATED SLT VIBRATION SWEEP THE SEAL TAB ON THE SAFETY WIRE BROKE OFF. REF. TASK HISTORY LOG NO. 662-7-043 S/N 110-1132.							
CORRECTIVE ACTION-NONE. UNIT TESTED ABOVE SPECIFICATION REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY, TUBE	UTP-PRT 27-05314-017	650128	GD/C	YES NO	LIONEL PACIFIC	006034
FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION TEST IN THE Z-AXIS THE HIGH PRESSURE-11 TUBE ASSEMBLY RUPTURED. REF. TASK HISTORY LOG NO. 662-7-044 S/N 308-0071.							
CORRECTIVE ACTION-REPLACE THE TUBE ASSEMBLY AND CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.4 SUSTAINER ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	UTP-PRT 27-05314-017	650128	GD/C	YES NO	LIONEL PACIFIC	006035
FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION TEST IN THE Z-AXIS THE FEEDBACK TRANSDUCER WAS LOOSE. REF. TASK HISTORY LOG NO. 662-7-044 S/N 308-0071.							
CORRECTIVE ACTION-SCREW IN FEEDBACK TRANSDUCER UNTIL IT BOTTOMS, THEN BACK IT OUT UNTIL FIRST LOCK NOTCH CAN BE PICKED UP BY THE SET SCREW LOCK. CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950-4 SUSTAINER ACTUATOR ASSEMBLY	UTP-PRT 27-05314-017	650127	GD/C	YES NO	LIONEL PACIFIC	006033
FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION SWEEP IN THE X AXIS THE BODY OF THE ACTUATOR BODY ROTATED WITH RESPECT TO THE ACTUATOR ROD ENDS. REQUIRED-NO ROTATION REF. TASK HISTORY LOG NO. 662-7-042 S/N 308-0071.							
CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE LOCKNUT-END GLAND ADJUSTMENT NUT TO 100FT-LBS. CONTINUE THE TEST.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.3 SUSTAINER ACTUATOR ASSEMBLY	UTP-PRT 27-05314-017	650126	60/C	YES NO	LIONEL PACIFIC	000038

FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION SWEEP IN THE Y AXIS THE BODY OF THE ACTUATOR ROTATED WITH RESPECT TO THE ACTUATOR ROD ENDS. REQ. NO ROTATION. REF. TASK HISTORY LOG NO. 662-7-041 S/N 308-0071.

CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE LOCKNUT ROD-END GLAND ADJUSTMENT NUT TO 100FT-LBS. CONTINUE THE TEST.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1931.3 VERNIER ACTUATOR ASSEMBLY, FEEDBAC K TRANSDUCER	UTP-PRT 60-05311-1	650126	60/C	YES NO	LIONEL PACIFIC	000015

FAILURE MODE-OUT OF TOLERANCE- DURING POST PRT VIBRATION PROOF CYCLE THE FEEDBACK TRANSDUCERS NULL VOLTAGE WAS FOUND TO BE 0.086 VOLTS. REQ. IS 0.050 V MAX. REF. TASK HISTORY LOG NO. 556-7-038 S/N 310-0009.

CORRECTIVE ACTION-ADJUST THE TRANSDUCER TO MINIMUM NULL VOLTAGE WITH THE ACTUATOR POSITIONED AT MECHANICAL NULL POSITION AND CONTINUE TEST.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-69-04-5009F VERNIER ACTUATOR, O-RING	FAR 27-06573-3	650126	FACTORY	YES NO	LIONEL-PACIFIC 2792-2	000287

FAILURE MODE-LEAK EXTERNAL-VERNIER ACTUATOR REPORTEDLY LEAKED HYDRAULIC OIL AT BOTH ENDS DURING PERFORMANCE OF ACCEPTANCE TEST PER EOP 305.10 PARAGRAPH 5.8.1. LEAKAGE WAS CAUSED BY WORN PISTON SEAL O-RINGS. O-RING DAMAGE RESULTED WHEN O-RINGS WERE RUBBED ACROSS WEAR MARKS IN THE CYLINDER BORE DURING ACTUATOR OPERATION.

CORRECTIVE ACTION-LIONEL-PACIFIC ADDED A NOTE TO THE SHOP TRAVELLER TO ASSURE INSPECTIONS ARE MADE CHECKING ACTUATOR PISTON AND CYLINDER BORE STRAIGHTNESS.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-69-04-5032-F VERNIER SERVO VALVE	FAR 27-04208-1	650126	FACTORY	YES NO	CADILLAC GAGE FC26-387A	000139

FAILURE MODE-OUT OF SPECIFICATION-FACTORY PERSONNEL REPORTED THE SERVOVALVE HAD EXCESSIVE PHASE LAG DURING PERFORMANCE OF EOP 305.10. CAUSE FOR THE ANOMALY WAS ISOLATED TO THE SERVOVALVE CRADLE ASSEMBLY AND IS ATTRIBUTED TO CONTROL NOZZLE TIP DAMAGE-FLATTENING DUE TO TARGET SCREW IMPACT. CONTROL NOZZLE AND TARGET SCREW CONTACT OCCURS WHEN A CYCLING SIGNAL IS APPLIED TO THE SERVOVALVE IN THE ABSENCE OF HYDRAULIC PRESSURE. IT IS NOT POSSIBLE TO AFFIX RESPONSIBILITY FOR THIS TYPE OF FAILURE.

CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-88-04-200 ACTUATOR ASSEMBLY	FAR 27-35314-019	1880 850121	30A	YES NO	LIONEL-PACIFIC	091180

FAILURE MODE-LEAK-EXTERNAL. DURING SURVEILLANCE INSPECTION,HYDRAULIC FLUID WAS FOUND IN THE END HOUSING AROUND THE ACTUATOR SHAFT INDICATING LEAKAGE. THE FAILURE WAS CONFIRMED AND WAS DUE TO LEAKAGE AROUND THE CLEVIS END GLAND STATIC SEAL BECAUSE OF SCRATCHES IN THE SEALING SURFACE OF THE MATING AREA OF THE ACTUATOR BODY. THE SCRATCHES WERE CAUSED BY INSERTION OR REMOVAL OF THE ACTUATOR CLEVIS END GLAND. THE TEFLON BACK-UP RING WAS SHEARED DURING INSERTION OF THE END GLAND, BUT THIS PROBABLY DID NOT AFFECT THE LEAKAGE CONDITIONS. RESPONSIBILITY FOR THE SCRATCHES COULD NOT BE DETERMINED.

CORRECTIVE ACTION-NO CORRECTIVE ACTION. CONVAIR OVERHAUL PERSONNEL AND THE VENDOR WERE INFORMED OR THIS FAILURE AND ITS CAUSE.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1951.3 VERNIER ACTUATOR ASSEMBLY, PROBE B RACKET	UTP-PRT 69-85311-1	850119	60/C	YES NO	LIONEL PACIFIC	096012

FAILURE MODE-STRUCTURAL-DURING POST PRT VIBRATION TEST PROOF CYCLE THE FEEDBACK TRANSDUCER NULL TEST COULD NOT BE PERFORMED BECAUSE THE TRANSDUCER PROBE HOLDING BRACKET BECAME LOOSE FROM THE ACTUATOR PISTON ROD. REF. TASK HISTORY LOG NO. 662-7-035 S/N 310-0009.

CORRECTIVE ACTION-NONE-THE PROBE BRACKET HOLDING SCREWS WERE RETORQUED AND SAFETY WIRED AND THE PROBE POSITION READJUSTED TO MINIMUM NULL VOLTAGE AND THEN CONTINUE TESTING. TORQUE REQUIREMENTS TO BE ADDED FOR SCREWS ON 69-85311. THE ADDITION WILL BE MADE AS A CLASS II CONFORMANCE CHANGE.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1951.4 VERNIER ACTUATOR ASSEMBLY, SERVO VALVE	UTP-PRT 69-85311-1	850119	60/C	YES NO	LIONEL PACIFIC	096011

FAILURE MODE-STRUCTURAL-DURING PRT VIBRATION SWEEP IN THE Y-AXIS AT A SINE FREQUENCY OF 900 CPS THE ACTUATOR WENT HARD OVER. THIS WAS CAUSED BY A CRACKED SERVO VALVE COIL WHICH CREATED AN OPEN. REF. TASK HISTORY LOG NO.336-T-031 S/N 404-0962.

CORRECTIVE ACTION-TEST TERMINATED. TEST CONDUCTED WITH SINE/RANDOM VIBRATION. THE UNIT WAS NOT PURCHASED TO MEET THIS ENVIRONMENT. REDESIGN REQUIRED TO MEET TCP-0190 SINE/RANDOM REQUIREMENTS.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1951.5 VERNIER ACTUATOR ASSEMBLY, BRACKET	UTP-PRT 69-85311-1	850119	60/C	YES NO	LIONEL PACIFIC	

FAILURE MODE-STRUCTURAL-DURING THE PRT VIBRATION ALONG AXIS I (Y-AXIS) A FLANGE AND A NUT PLATE BROKE OFF A SHIELD BRACKET REF. TASK HISTORY LOG NO. 662-7-032 S/N 310-0009.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							896810
CORRECTIVE ACTION-NONE-CONTINUE TESTING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	GDA-APZ65-005/B1-402-00-166 SUSTAINER PUMP, COMPENSATOR	FLIGHT 27-08590-5	1060 650112	B1/WTR 0.	YES NO	VICKERS	897321
FAILURE MODE-ERRATIC OPERATION. MINOR HUNTING CHARACTERISTICS EXHIBITED BY SUSTAINER HYDRAULIC PUMP COMPENSATOR. SYSTEM EFFECT-ERRATIC OPERATION. HYDRAULIC PRESSURE OSCILLATIONS WERE LARGER THAN NORMAL AT ENGINE START (200 PSI P-P). BOOSTER JETTISON (330 PSI P-P), AND DURING SUSTAINER PHASE (SMALL INTERMITTENT OSCILLATIONS). VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4134 VERNIER SERVO VALVE	UTP-PET 27-04209-1	650108	60/C	YES NO	CADILLAC GAGE CO. FC26-397A	896796
FAILURE MODE-OUT OF TOLERANCE-DURING ISPT THE PHASE LAG WAS AS FOLLOWS AT 6 CPS, 10.0 DEGREES, AT 10 CPS, 16.0 DEGREES AND AT 15 CPS, 23.5 DEGREES WHEREAS ALLOWABLE VALUES ARE 9 DEGREES, 15 DEGREES, AND 22.5 DEGREES RESPECTIVELY. CAUSED BY DEGRADATION OF QUALITY CONTROL AT VENDORS PLANT. CORRECTIVE ACTION-LOT NUMBER 448 REJECTED AND RETURNED TO VENDOR. REF-CTCTN NUMBER 556-7-028.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4146 VERNIER SERVO VALVE	UTP-PET 27-04209-1	650108	60/C	YES NO	CADILLAC GAGE CO. FC26-397A	896822
FAILURE MODE-OUT OF TOLERANCE-DURING PROOF CYCLE AFTER 200,000 LIFE TEST, THE NULL OFFSET CURRENT WAS MEASURED AS PLUS 0.27 MA. ALLOWABLE VALUE IS PLUS OR -0.2 MA. CAUSED BY POOR QUALITY CONTROL AT VENDORS PLANT. CORRECTIVE ACTION-REJECTED LOT 8 TO VENDOR. REF-CTCTN NO. 556-7-027.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4145 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	650104	60/C	YES NO	CADILLAC GAGE FC26-396A	
FAILURE MODE-OUT OF TOLERANCE DURING PET TEST. THE STANDBY PRESSURE WAS 2240 PSIG (SPEC IS 1500 PLUS OR MINUS 500 PSIG) DURING FLUID HIGH TEMPERATURE TEST. TEST SPECIMEN 209-0848; REFER TO FAILURE LOG NUMBER 556-7-026. ALSO NULL CURRENT WAS 1.25 MA (SPEC. IS .2 MA) DURING LIFE TEST, 556-7-026.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-RETURN LOT TO PRODUCT SUPPORT.							096703
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4139.2 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641230	GD/C	YES NO	CADILLAC GAGE CO. FC26-3974	096694
FAILURE MODE-OUT OF TOLERANCE-DURING FLUID LOW TEMP. TEST, THRESHOLD CURRENT WAS PLUS 0.12 AND MINUS 0.19 MA. ALLOWABLE VALUE IS PLUS OR MINUS 0.05 MA. HYSTERESIS WAS 0.8 MA WHERE ALLOWABLE VALUE IS 0.2 MA. ALSO FLOW RATE WAS 0.98 GPM WHICH IS LOWER THAN ALLOWABLE VALUE OF 1.2 PLUS OR MINUS 0.12 GPM. CAUSED BY DEGRADATION OF QUALITY CONTROL AT PRODUCT SUPPORT FACILITY.							
CORRECTIVE ACTION-RETURN LOT PS-1 AFTER REJECTION TO PRODUCT SUPPORT. DISASSEMBLY REVEALED RUST PARTICLES AND FIBER THROUGHOUT THE VALVE. THE FEEDBACK SPRING AND EXTERNAL ADJUST SCREW EXHIBITED ADVANCE STAGES OF RUST. REF. CTCTH NO. 556-7-024.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4139.1 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641230	GD/C	YES NO	CADILLAC GAGE CO. FC26-397A	096709
FAILURE MODE-OUT OF TOLERANCE-DURING LOW TEMPERATURE (MINUS 30 DEGREES F) TEST, THE THRESHOLD CURRENT WAS PLUS 0.26 AND MINUS 0.30 MA. THE ALLOWABLE VALUE IS PLUS 0.05 OR MINUS 0.05 MA. FAILURE CAUSED BY UNREALISTIC PERFORMANCE TEST REQUIREMENT FOR LOW TEMPERATURE VALUE.							
CORRECTIVE ACTION-LOT NUMBER A WAS REJECTED TO MRB FOR ACTION TO ACCEPT LOT ON BASIS OF SPECIFICATION CHANGE TO PLUS 30 DEGREES F. REF-CTCTH NUMBER 556-7-025.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3770 DISCONNECT-STAGING, POPPET SEAL	UTP-PET 27-06556-3	641229	CONVAIR	YES NO	PEACOCK 51290-3	097098
FAILURE MODE-STRUCTURAL. DURING PRE TEST DISASSEMBLY IT WAS REVEALED THAT THE POPPET NEOPRENE SEAL WAS DAMAGED IN THREE AREAS. REF. TASK HISTORY LOG NO. 662-7-028 S/N 109-0752.							
CORRECTIVE ACTION-VENDOR NOTIFIED TO IMPROVE QUALITY CONTROL, UNIT PUT INTO PET TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4118 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641229	GD/C	YES NO	CADILLAC GAGE CO. FC26-397A	
FAILURE MODE-OUT OF TOLERANCE-DURING PROOF CYCLE AFTER 480,000 CYCLES LIFE TEST, THE RECORDED HYSTERESIS WAS 0.39 MA. ALLOWABLE HYSTERESIS WAS 0.2 MA. PROOF CYCLES PERFORMED AFTER 900,000, 1,350,000, AND 1,800,000 CYCLES DID NOT INDICATE EXCESSIVE HYSTERESIS. FAILURE CAUSED BY DEGRADATION OF QUALITY CONTROL AT THE VENDORS PLANT.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-LOT 44A AND TEST SPECIMEN WERE REJECTED AND RETURNED TO VENDOR. REF-CTCTH NO. 550-7-023.							004053
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4116 VERNIER SERVOVALVE	UTP-PET 27-04209-1	641229	GD/C	YES NO	CADILLAC GAGE NO. FC29-397A	006052
FAILURE MODE-OUT OF TOLERANCE-DURING PROOF CYCLE AFTER 900,000 CYCLES LIFE TEST, STAND BY PRESSURE WAS 2100 PSIG WH ENEAS 1500 PLUS OR MINUS 500 PSIG IS ALLOWED. AT CONCLUSION OF 1,350,000, AND 1,800,000 CYCLES THE STANDBY PRESSURES WERE 2130 AND 2100 PSIG RESPECTIVELY, FAILURE CAUSED BY DEGRADATION OF QUALITY CONTROL AT THE VENDORS PLANT.							
CORRECTIVE ACTION-LOT 44A AND TEST SPECIMEN WERE REJECTED AND RETURNED TO VENDOR. REF. CTCTH NO. 550-7-022.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1952.4 VERNIER ACTUATOR ASSEMBLY, SERVO V ALVE	UTP-PRT 27-05312-005	641221	FACTORY	YES NO	LIONEL PACIFIC	006008
FAILURE MODE-STRUCTURAL-DURING PRT VIBRATION SWEEP IN X-AXIS AT A SINE FREQUENCY OF 500 CPS, THE ACTUATOR WENT HARD OVER. THIS WAS CAUSED BY A CRACKED SERVOVALVE COIL WHICH CREATED AN OPEN. REF. TASK HISTORY LOG NO. 550-7-020 S/N 4 03-0374.							
CORRECTIVE ACTION-TEST TERMINATED. TEST WAS CONDUCTED WITH SINE/RANDOM VIBRATION. THE UNIT WAS NOT PURCHASED TO MEE T THIS ENVIRONMENT. REDESIGN REQUIRED TO MEET TCP-0199 SINE/RANDOM REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1952.4 VERNIER ACTUATOR ASSEMBLY, FEEDBAC K TRANSDUCER	UTP-PRT 27-05312-005	641221	CONVAIR	YES NO	LIONEL PACIFIC	006008
FAILURE MODE-STRUCTURAL-DURING PRT VIBRATION SWEEP IN X-AXIS AT A SINE FREQUENCY OF 500 CPS, THE ACTUATOR WENT HARD OVER DECAUSE OF SERVOVALVE FAILURE. FURTHER INVESTIGATION REVEALED THAT THE FEEDBACK TRANSDUCER SUSTAINED STRUCTURA L DAMAGE. THE MOUNTING-CLIP ON THE PROBE END OF THE XCDR WAS BROKEN OFF. ALSO THE BODY CASE WAS CRACKED AT THE JUNCT ION WITH THE MAIN MOUNTING FLANGE. REF. TASK HISTORY LOG NO. 550-7-020 S/N 403-0374.							
CORRECTIVE ACTION-TEST TERMINATED. TEST WAS CONDUCTED WITH SINE/RANDOM VIBRATION. THE UNIT WAS NOT PURCHASED TO MEE T THIS ENVIRONMENT. REDESIGN REQUIRED TO MEET TCP-0199 SINE/RANDOM REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-10-272F HOSE ASSEMBLY, 8-NUT	FAR 27-08871-8	7110 641219	FACTORY	YES NO	AEROQUIP 077341-8-0215	
FAILURE MODE-LEAK EXTERNAL. HYDRAULIC FLUID LEAKED FROM BOTH ENDS OF HOSE ASSEMBLY UNDER PRESSURE. FAILURE WAS DUE TO IMPROPER TORQUING PROCEDURE ON INSTALLATION.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-GD/C PERSONNEL WERE CAUTIONED TO APPLY PROPER INSTALLATION PROCEDURES.							000482
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4035 SUSTAINER SERVO VALVE	UTP-PET 27-04209-1	641219	GD/C	YES NO	CADILLAC FC26-398A	000050
FAILURE MODE-OUT-OF-TOLERANCE DURING PET TEST. EXCESSIVE FLOW FROM PORTS 1 AND 2 FROM 2.39 TO 2.47 GPM (SPEC. IS 2.36 GPM MAX.). TEST SPECIMEN 406-0871, LOT 238. REFER TO FAILURE LOG 556-7-019. SIMILIAR FAILURE DURING PET LIFE TEST ON 641223 (TEST REPORT 27A3991).							
CORRECTIVE ACTION-LOT 238 REJECTED AND RETURNED TO VENDOR.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1952.3 VERNIER ACTUATOR ASSEMBLY, FEEDBAC K TRANSDUCER	UTP-PRT 27-05312-405	641217	GD/C	YES NO	LIONEL PACIFIC	000004
FAILURE MODE-STRUCTURAL-DURING PRT VIBRATION SWEEP IN X-AXIS AT A SINE FREQUENCY OF 14 CPS THE ACTUATOR WENT HARD O VER BECAUSE OF SERVO VALVE FAILURE. FURTHER INVESTIGATION REVEALED THAT THE FEEDBACK TRANSDUCER SUSTAINED STRUCTURAL DAMAGE. THE MOUNTING CLIP ON THE PROBE END OF THE TRANSDUCER WAS BROKEN OFF. REF. TASK HISTORY LOG NO. 556-7-018 S/ N 401-0558.							
CORRECTIVE ACTION-TEST TERMINATED. TEST WAS CONDUCTED WITH SINE/RANDOM VIBRATION. THE UNIT WAS NOT PURCHASED TO MEE T THIS ENVIRONMENT. REDESIGN REQUIRED TO MEET TCP-8190 SINE/RANDOM REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1952.3 VERNIER ACTUATOR ASSEMBLY, SERVO V ALVE	UTP-PRT 27-05312-805	641217	GD/C	YES NO	LIONEL PACIFIC	000003
FAILURE MODE- STRUCTURAL- DURING PRT VIBRATION SWEEP IN X-AXIS AT A SINE FREQUENCY OF 14 CPS THE ACTUATOR WENT HARD OVER. THIS WAS CAUSED BY A CRACKED SERVO VALVE COIL WHICH CREATED AN OPEN BETWEEN PIN A AND B. REF. TASK HISTORY LO G NO. 556-7-018 S/N 401-0558.							
CORRECTIVE ACTION-TEST TERMINATED. TEST WAS CONDUCTED WITH SINE/RANDOM VIBRATION. THE UNIT WAS NOT PURCHASED TO MEE T THIS ENVIRONMENT. REDESIGN REQUIRED TO MEET TCP-8190 SINE/RANDOM REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4116 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641218	GD/C	YES NO	CADILLAC GAGE CO. FC-26-397A	
FAILURE MODE-OUT OF TOLERANCE-DURING HIGH TEMP. TEST AT PLUS 165 DEGREES F, THE NULL CURRENT WAS MEASURED AS MINUS 0.26 MA. MAXIMUM PERMITTED CLOSED LOOP WAS MINUS 0.31 MA. MAXIMUM PERMITTED IS 0.20 MA. AND AT 115 DEGREES F A NULL OF MINUS 0.24 MA WAS OBTAINED. FAILURE CAUSED BY QUALITY CONTROL DEGRADATION AT VENDORS PLANT.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							696051
CORRECTIVE ACTION-LOT 45C AND TEST SPECIMEN REJECTED AND RETURNED TO VENDOR. REF. CTCTH NO. 556-7-017.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-9D-04-4963-F VERNIER ACTUATOR ASSEMBLY, O-RING	FAR 27-05318-605	7106 641208	WTR	YES NO	LIONEL PACIFIC	696001
FAILURE MODE-LEAK EXTERNAL-DURING PERFORMANCE OF PROCEDURE 27-98122 THE ACTUATER WAS FOUND LEAKING HYDRAULIC OIL FR ON THE SHAFT SEALS. EXCESSIVE LEAKAGE IS ATTRIBUTED TO A DEFECTIVE DYNAMIC SEALING O-RING. SHREDDING OF THE FELT LUB RICATOR WAS A STRONG CONTRIBUTOR TO THIS FAILURE. SEAL WEAR DECREASED EFFECTIVE SQUEEZE.							
CORRECTIVE ACTION-ASSEMBLY PERSONNEL WERE INFORMED OF LEAKAGE CAUSE AND ALERTED TO THE CORRECT ASSEMBLY TECHNIQUES. PERSONNEL INVOLVED ON MISSILE INSTALLATION WERE INSTRUCTED AS TO CORRECT HOOK-UP AND INSTALLATION OF THIS UNIT. AN APPROVED WAP AUTHORIZES ESTABLISHMENT OF EXTENDED LEAKAGE TEST CRITERIA AS PART OF THE PROGRAM FOR HYDRAULIC ACTUATO R TESTING CHANGES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4960-F SUSTAINER ACTUATOR ASSEMBLY, ADJUS TMENT SPRING	FAR 27-05314-019	2040 641205	FACTORY	YES NO	LIONEL PACIFIC	696000
FAILURE MODE-OUT OF SPECIFICATION-DURING FINAL CHECKOUT ABOARD MISSILE 204-D, NULL VOLTAGE WAS REPORTED TO BE 0.540 VOLT. MAXIMUM ALLOWED IS 0.350 VOLT. NULL SHIFT WAS CAUSED BY SLIGHT MOVEMENT OF THE NULL ADJUSTMENT SPRING TO A ST ATE OF LOWER SPRING TENSION DURING SERVOCYLINDER ASSEMBLY OPERATION (AFTER FINAL NULL ADJUSTMENT).							
CORRECTIVE ACTION-DESIGN PERSONNEL REVIEWED THIS FAILURE AND ITS CAUSE. THE MAGNITUDE OF A NULL SHIFT CAUSED BY FEE DBACK SPRING MOVEMENT IS CONSIDERED BY DESIGN PERSONNEL TO BE OF MINOR MAGNITUDE AND WOULD NOT JEOPARDIZE MISSILE PE RFORMANCE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4970-F SUSTAINER ACTUATOR, O-RING	FAR 27-05314-017	7139 641204	FACTORY	YES NO	LIONEL PACIFIC	696251
FAILURE MODE-EXTERNAL LEAKAGE-HYDRAULIC LEAKAGE WAS OBSERVED AT THE END GLAND NUT ON THE SUSTAINER PITCH SERVO CYLI NDER ASSY. LEAKAGE WAS DUE TO CONTAMINATION INTRODUCED DURING INSTALLATION OF THE O-RING, AND TO THE USE OF O-RING W ITH SURFACE FLAWS.							
CORRECTIVE ACTION-60/C OBTAINED VENDOR CORRECTIVE ACTION BEFORE THIS FAILURE OCCURRED AND UNIT WAS MANUFACTURED BEF ORE CORRECTIVE ACTION WAS TAKEN. LIONEL PACIFIC NOW INSPECTS ALL SEALING O-RINGS FOR DIMENSIONAL REQUIREMENTS, BLIST ERS, VOIDS, LAPS, AND POROSITY.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	27-3879 PITCH/ROLL LINEAR POSITION TRANSDUCER	UTP-PET 27-04204-1	641202	60/C	YES NO	CRESCENT HC-106-4E	896024
FAILURE MODE-SHORT (ELECTRICAL). DURING PET 500 DEGREES F TEMPERATURE TEST, SPECIMEN SHORTED INTERNALLY, HOWEVER FAILURE DISAPPEARED WHEN TEMP. WAS REDUCED. WHEN SPECIMEN WAS REMOVED, BLACK, STICKY SUBSTANCE WAS FOUND PROTRUDING FROM SEALS ON EACH END. REFER TO FAILURE LOG 556-7-011.							
CORRECTIVE ACTION-SPECIMEN WAS TESTED TO EXCESSIVE TEMP., SPECIFICATION REQUIREMENT SHOULD BE CHANGED. ACTION TO BE TAKEN BY 650315							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A/076 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641130	60/C	YES NO	CADILLAC GAGE CO. FC26-397A	896050
FAILURE MODE-OUT OF TOLERANCE-DURING LOW FLUID TEMP. TEST. THE NULL CURRENT WAS MEASURED AS -0.30MA. MAXIMUM VALUE PERMITTED IS 0.20 MA. AN AMBIENT CHECK INDICATED A NULL OF -0.055 MA.-CAUSED BY QUALITY CONTROL DEGRADATION AT THE VENDORS PLANT.							
CORRECTIVE ACTION-SPECIMEN FAILED WAS LAST OF LOT 44C AND LOT TO BE REJECTED AND SUBMITTED TO MRB FOR ACTION FOR ACCEPTANCE. SPEC. TEMP. REQUIREMENTS WILL BE CHANGED. FROM -50 DEGREES F TO PLUS 30 DEGREES F. REF. CTCTM NO. 556-7-010.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4035 SUSTAINER SERVO VALVE	UTP-PET 27-04209-1	641125	60/C	YES NO	CADILLAC FC26-396A	896059
FAILURE MODE-OUT-OF-TOLERANCE DURING PET LIFE TEST. NULL CURRENT WAS PLUS 0.44 MILLIAMPS STATIC AND 0.46 MILLIAMPS DYNAMIC. (SPEC. IS 0.20 MILLIAMPS MAX.). TEST SPECIMEN 406-0903, LOT 23C. REFER TO FAILURE LOG 556-7-009.							
CORRECTIVE ACTION-LOT 23C REJECTED AND RETURNED TO VENDOR.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4023 HYDRAULIC FLEX HOSE ASSY.	UTP-PET 27-06571-5	641123	CONVAIR	YES NO	AEROQUIP 677341-6-0213	897026
FAILURE MODE-LEAK-EXTERNAL. DURING LIFE TEST IMPULSE TEST WITH THE OIL TEMPERATURE AT 275 DEGREES F, AFTER 9907 CYCLES AT A RATE OF 35CPM, THE UNIT DEVELOPED 3 LEAKS. REQ. NO LEAKS. THE LEAK WAS CAUSED BY A CRACK IN THE TUBE AT THE BACK OF THE NIPPLE SHANK.							
CORRECTIVE ACTION-RETURN UNIT AND ALL UNITS ASSOCIATED WITH THE LOT BACK TO THE VENDOR. REF. TASK HISTORY LOG NO 66 2-7-009. AEROQUIP FAILURE ANALYSIS NO. 443. S/N 410-1808.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4036 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641121	60/C	YES NO	CADILLAC GAGE CO FC26-397A	096602
FAILURE MODE-OUT OF TOLERANCE-DURING POST 1,8000,000 CYCLE LIFE PROOF CYCLE, THE NULL CURRENT WAS MEASURED AS PLUS 0.30 MA THE MAXIMUM PERMITTED IS PLUS 0.20 MA. CAUSED BY QUALITY CONTROL DEGRADATION AT THE VENDORS PLANT.							
CORRECTIVE ACTION-IMPROVED QUALITY CONTROL PROCEDURES HAVE BEEN IMPOSED AT VENDORS PLANT BY ACTIONS TAKEN BY 60/C & A. REF. CTCTH NUMBER 556-7-008.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4036 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641121	60/C	YES NO	CADILLAC GAGE CO FC26-397A	096601
FAILURE MODE-OUT OF TOLERANCE-DURING POST 1,350,000 CYCLE LIFE PROOF CYCLE, THE NULL CURRENT WAS MEASURED AS PLUS 0 .34 MA. THE MAXIMUM PERMITTED IS PLUS 0.20 MA. CAUSED BY QUALITY CONTROL DEGRADATION AT THE VENDORS PLANT.							
CORRECTIVE ACTION-IMPROVED QUALITY CONTROL PROCEDURES HAVE BEEN IMPOSED AT VENDORS PLANT BY ACTIONS TAKEN BY 60/C & A. REF. CTCTH NUMBER 556-7-007							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4036 VERNIER SERVOVALVE	UTP-PET 27-04209-1	641119	60/C	YES NO	CADILLAC GAGE CO FC26-397A	096600
FAILURE MODE-OUT OF TOLERANCE-DURING POST 900,000 CYCLE LIFE PROOF CYCLE, THE NULL CURRENT WAS MEASURED AS 0.34MA. THE MAXIMUM PERMITTED IS PLUS 0.20 MA CAUSED BY QUALITY CONTROL DEGRADATION AT THE VENDORS PLANT.							
CORRECTIVE ACTION-IMPROVED QUALITY CONTROL PROCEDURES HAVE BEEN IMPOSED AT VENDORS PLANT BY ACTIONS TAKEN BY 60/C & A. REF- CTCTH NUMBER 556-7-005.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4036 VERNIER SERVOVALVE	UTP-PET 27-04209-1	641110	60/C	YES NO	CADILLAC GAGE CO FC26-397A	096799
FAILURE MODE-OUT OF TOLERANCE-DURING POST 490,000 CYCLE LIFE-PROOF CYCLE THE NULL CURRENT WAS MEASURED AS PLUS 0.30 MA. THE MAXIMUM PERMITTED IS PLUS 0.20 MA CAUSED BY QUALITY CONTROL DEGRADATION AT THE VENDORS PLANT.							
CORRECTIVE ACTION-IMPROVED QUALITY CONTROL PROCEDURES HAVE BEEN IMPOSED AT VENDORS PLANT BY ACTIONS TAKEN BY 60/C & A. REF- CTCTH NUMBER 556-7-004.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3693 FLOW LIMITER VALVE	UTP-PET 27-04206-1	641100	GD/C	YES NO	STERER 13000	000026
FAILURE MODE-OUT-OF-TOLERANCE DURING PET LOW TEMPERATURE TEST. STEADY STATE FLOW RATES VARIED FROM .775 TO .860 GPM FOR TEST SPECIMEN 410-1777, LOT 24, AND FROM .905 TO .938 GPM FOR TEST SPECIMEN 410-1819 LOT 25. SPEC. REQUIREMENT IS 1.050 GPM (MIN.). REFER TO FAILURE LOG 586-602.							
CORRECTIVE ACTION-ECP 7636 SUBMITTED TO RELAX SPECIFICATION LIMITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4949F SUSTAINER ACTUATOR, O-RING	FAR 27-85314-817	5301 641106	FACTORY	YES NO	LIONEL PACIFIC	005740
FAILURE MODE-CONTAMINATION. HYDRAULIC LEAKAGE FROM THE NULL ADJUSTMENT SCREW HOLE IN THE SERVO VALVE. LEAK WAS CAUSED BY A CHIPPED O-RING ON THE BEVEL PIN. DAMAGE TO O-RING WAS PROBABLY DONE DURING ASSEMBLY.							
CORRECTIVE ACTION-VENDOR REPLY TO VCAR 7158-65 RECEIVED ON DATE 650224 (REFERENCE RAR SLV-A9-04-6004) STATED THAT PRODUCTION AND INSPECTION SUPERVISORS WERE REQUESTED TO INFORM THEIR PERSONNEL OF THE DISCREPANCY AND ITS CONSEQUENCES. PROCEDURES WERE CHANGED TO ASSURE PROPER INSTALLATION OF O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4951F VERNIER ACTUATOR ASSEMBLY, O-RINGS	FAR 27-85312-605	-7107 641106		YES NO	LIONEL PACIFIC	005747
FAILURE MODE-EXTERNAL LEAKAGE. LEAKED HYDRAULIC OIL FROM BOTH SHAFT SEALS WHEN HYDRAULIC PRESSURE WAS DROPPED. AN ACTUATOR BODY WITH A SCORED BORE WAS USED TO REASSEMBLE THE SERVO CYLINDER AND THE IRREGULAR BORE SURFACE DAMAGED THE O-RING SEALS.							
CORRECTIVE ACTION-PER REPLY TO RAR SLV-A9-04-6005, THE BENCH CHECK PERSONNEL AT PRODUCT SUPPORT CENTER TO BE MORE ANALYTICAL OF PROBLEM AREAS DURING TEARDOWN OF ITEMS FOR REPAIR AND OVERHAUL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A4019 VERNIER SERVO VALVE	UTP-PET 27-04209-1	641103	GD/C	YES NO	CADILLAC GAGE CO. FC26-397A	000040
FAILURE MODE-OUT OF TOLERANCE-DURING FLUID HIGH TEMPERATURE TEST THE NULL CURRENT WAS MEASURED AS 0.60 MA AND SPECIFIED AS 0.20MA ABLO CYLINDER PORT 2 FLOW WAS 1.48 GPM. AND SPECIFIED AS 1.32 GPM MAX. CAUSED BY INADEQUATE QUALITY CONTROL ON THE PART OF THE VENDOR.							
CORRECTIVE ACTION-IMPROVED QUALITY CONTROL PROCEDURES HAVE BEEN IMPOSED AT VENDORS PLANT. BY ACTIONS TAKEN BY GD/CONVAIR. LOT 47 ACCEPTED. REF. CTCTN NO. 586-7-001.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4938F VERNIER ACTUATOR ASSEMBLY, O-RINGS	FAR 27-65312-608	7107 641103	FACTORY	YES NO	LIONEL PACIFIC	695753

FAILURE MODE-EXTERNAL LEAKAGE. ACTUATOR LEAKAGE AFTER REPLACEMENT PER SURVEY 97-64. CAUSE WAS THE INSTALLATION OF U NDERSIZED O-RINGS.

CORRECTIVE ACTION-WAP M060234, APPROVED ON DATE 650110 AUTHORIZED ESTABLISHMENT OF EXTENDED LEAKAGE TEST AS PART OF THE PROGRAM, FOR HYDRAULIC ACTUATOR TESTING CHANGES PER MEMO 662-7, PNEU/HYDR-493 DATED 641217. PRODUCTION AND INSP ECTION ASSEMBLY PERSONNEL WERE INFORMED OF THIS FAILRE AND REQUESTED TO ASSURE THAT ALL COMPONENTS USED, COMPLY WITH APPLICABLE MANUFACTURING SPECIFICATIONS. REF-RAR SLV-A9-04-3969.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A3770 DISCONNECT-STAGING, POPPET	UTP-PET 27-38558-3	641102	CONVAIR	YES NO	PEACOCK 51290-3	697091

FAILURE MODE-OUT OF TOLERANCE. DURING A PRE TEST DISASSEMBLY IT WAS REVEALED THAT THE SURFACE FINISH ON THE POPPET SEAT WAS REPRESENTATIVE OF A 125 FINISH. REQ. IS 63 FINISH REF. TASK HISTORY LOG NO. 662-7-003 S/N 404-0908.

CORRECTIVE ACTION-UNIT REJECTED AND RETURNED TO VENDOR.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A3785 FLOW LIMITER VALVE	UTP-PET 27-04206-1	641102	60/C	YES NO	STERER 13000	696687

FAILURE MODE-OUT-OF-TOLERANCE DURING PET FLUID HIGH TEMP TEST. STEADY STATE FLOW RATE VARIED FROM 1.215 TO 1.24 GPM (SPEC. MAX. IS 1.20). DYNAMIC FLOW WAS 1.28 GPM. TEST SPECIMEN 407-1734, LOT 23. REFER TO FAILURE LOG 556-7-003. SI MILIAR FAILURE OCCURRED 641120.

CORRECTIVE ACTION-ECP 7868 SUBMITTED TO RELAX SPECIFICATION LIMITS.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-9D-04-4946F VERNIER ACTUATOR	FAR 68-65311-1	7105 641030	PALC 8-4	YES NO	LIONEL PACIFIC	695749

FAILURE MODE-EXTERNAL LEAKAGE. LEAKED 30 DROPS/MINUTE DURING PROCEDURE 29-02708. CAUSE WAS A COMBINATION OF MINIMAL SQUEEZE OF 10 PER CENT AND O-RING WEAR COMBINED WITH FELT BLOCKAGE.

CORRECTIVE ACTION-PER MEMO 662-8-65/107 IN REPLY TO RAR SLV-9: -04-6001, THE DESIGN GROUP RECOMMENDED TO THE CUSTOME R A REDESIGN OF ACTUATOR SEAL GLANDS. GLAND DIMENSIONS WERE REVIWED. O-RING SIZE WAS CONSIDERED CORRECT FOR THE GLAN D. THE VENDOR HAD PURGED HIS STOCK OF DIMENSIONALLY DEFICIENT PARTS AFTER ASSEMBLY OF THIS ACTUATOR AND BEFORE THIS FAILURE OCCURRED.

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CONVAIR DIVISION

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-4944F SERVO VALVE	FAR 27-04208-1	-7107 641020	FACTORY	YES NO	CADILLAC GAGE FCZG-397A	095751

FAILURE MODE-LEAK EXTERNAL. MARGINAL EXCESSIVE INTERNAL LEAKAGE DURING REACCEPTANCE TESTING AFTER PERFORMING SURVEY 87-64 (CHECKING FOR PROPER TARGET SCREW SOLDER STAKING). LEAKAGE AT 3000 PSIG MEASURED 0.108 GPM. MAXIMUM ALLOWED I S 0.10 GPM. CAUSE NOT DETERMINED.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED PER RAR SLV-99-04-3098, DATED 641204 GD/C NOTIFIED CADILLAC GAGE OF THIS FA ILURE ANALYSIS OF A SERVO VALVE WITH MARGINALLY HIGH TOTAL LEAKAGE.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4937F SUSTAINER ACTUATOR, TRANSDUCER	FAR 27-85314-817	641020	FACTORY	YES NO	LIONEL PACIFIC	095752

FAILURE MODE-OUT OF TOLERANCE. A STATIC GAIN OF 14 PERCENT ABOVE NORMAL (PLUS OR MINUS 5 PERCENT IS ALLOWED). CAUSE WAS INSERTION OF WRONG TRANSDUCER PROBE INTO THE TRANSDUCER DURING PERFORMANCE OF SURVEY 65-62. (THIS SURVEY REPLAC ED COLLINS WITH CRESCENT TRANSDUCERS).

CORRECTIVE ACTION-PER RAR SLV-A9-04-3980, DATED NOVEMBER 20, 1964 ASSEMBLY PERSONNEL WERE INFORMED OF THIS ANALYSIS AND OF THE NEED FOR PROPER MATING OF TRANSDUCER COMPONENTS.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-4926F VERNIER ACTUATOR ASSEMBLY	FAR 27-85310-805	7110 641023	FACTORY	YES NO	LIONEL PACIFIC	091840

FAILURE MODE-EXTERNAL LEAKAGE. HYDRAULIC FLUID SEEN EXTERNALLY ON PISTON SHAFT DURING AN E.O.P. PROCEDURE. CAUSE WA S A CUT O-RING WHICH WAS DAMAGED BY CYLINDER BORE ROUGHNESS. LARGEST BORE DEFECT WAS A RAISED AREA IN THE NICKELPLAT E. CAUSE OF PLATING AND PARENT METAL DEFECTS NOT KNOWN. A METAL CONTAMINANT WAS FOUND IN A GEAR RACK. CAUSE WAS AN O VERSIGHT.

CORRECTIVE ACTION-PER RAR SLV-99-04-3982 SPECIAL GD/C ASSY. PERSONNEL WILL DO ALL GEAR. BACKLASH CHECKING TO PRECLU DE GEAR RACK CONTAMINATION. PER RAR SLV-99-04-3983 LIONEL PACIFIC NOTIFIED THEIR PLATING VENDOR OF THE PLATING DEFEC T IN THE BORE AND EMPHASIZED QUALITY WORKMANSHIP. AFTER A REVIEW, LIONEL PACIFIC FOUND PRESENT MANUFACTURING AND ASS EMBLY PROCEDURES ADEQUATE TO PREVENT ACCEPTANCE OF DEFECTIVE PARTS AS FOUND IN THIS ACTUATOR. THIS WAS VENDOR REPLY TO VCAR 7207-65.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A3078 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	641020	GD/C	YES NO	CADILLAC GAGE FCZG-398A	

FAILURE MODE-OUT OF-TOLERANCE. DURING PET. AT -32 F RATED FLOW WAS 1.62 GPM. AT -27 F RATED FLOW WAS 1.76 GPM. AT - 36 F RATED FLOW WAS 1.57 GPM. MINIMUM ALLOWABLE IS 1.34 GPM. TEST SPECIMEN S/N 410-1009, LOT 25.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. UNIT WAS TAKEN TO CADILLAC GAGE FOR FAILURE VERIFICATION. FAILURE COULD NO T BE DUPLICATED. ALL UNITS OF LOT 25 IN STOCK HAVE BEEN REJECTED.							006072
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4922F FEEDBACK TRANSDUCER	FAR 27-04211-1	120F 841017	FACTORY	YES YES	CRESENT ENGINE ERING MC-67P-4E	000030
FAILURE MODE-SHORT - THE TRANSDUCER WOULD NOT NULL. CAUSED BY AN INTERMITTANT SHORTING OF A PORTION OF THE COIL. CORRECTIVE ACTION-VENDOR WAS INFORMED OF FAILURE AND ANALYSIS IN RAR-A-99-04-3980.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-J4-4919F CONNECTOR, PIN-WIRE HARNESS	FAR 92-40041-004	7108 841017	FACTORY	YES YES	BENDIX 6P3106E-10SL-3 S	003333
FAILURE MODE-STRUCTURAL. PLUG PINS WERE FOUND SHORTED. WIRES WERE SHORTED. CAUSE WAS EXCESSIVE TORQUE APPLIED TO TH E PLUG BACKSHELL. TORQUE CRACKED THE POTTING AND SLIPPED WIRE INSULATION BACK ENOUGH FOR WIRES TO TWIST TOGETHER AND SHORT. CORRECTIVE ACTION-FAILURE CONFIRMED. RAR SLV-A9-04- 3980 REQUESTED MANUFACTURING PERSONNEL BE CAUTIONED NOT TO TIGH TEN PLUGS AT THE BACKSHELL. THIS RAR AND FAR SLV-A9-04-4919 WERE CIRCULATED TO ALL AFFECTED SHOP PERSONNEL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3876 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	841016	GD/C	YES NO	CADILLAC GAGE FC26-396A	007103
FAILURE MODE-OUT OF TOLERANCE. DURING PET, 165 DEG. F. PROOF CYCLE THE NULL CURRENT WAS MINUS 0.35 MILLIAMPS (MAXIM UM ALLOWABLE PLUS OR MINUS 0.20 MILLIAMPS. TEST SPECIMEN S/N 410-1000, LOT 24. CORRECTIVE ACTION-ALL UNITS OF LOT 24 WERE REJECTED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-04-4920 SUSTAINER ACTUATOR ASSEMBLY	FAR 27-85314-817	3930 841012	ETR	YES NO	LIONEL PACIFIC	000054
FAILURE MODE-EXTERNAL LEAKAGE HYDRAULIC FLUID LEAKED AT SERVOVALVE AND ACTUATOR INTERFACE. FAILURE IS ATTRIBUTED TO SCRATCHES ON THE SERVOVALVE MOUNTING PAD OF THE ACTUATOR WHERE AN O-RING MUST SEAL. CORRECTIVE ACTION-MEMO CARR 146-8-85;-84 DATED 841202 INFORMED MANUFACTURING OF THIS ANALYSIS TO ASSURE THAT CORREC T HANDLING AND ASSEMBLY TECHNIQUES ARE USED.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-166 ACTUATOR	FAR 27-85314-819	1460 641007	FACTORY	YES NO	LIONEL PACIFIC	001190

FAILURE MODE-STRUCTURAL. DURING DISASSEMBLY OF THE SERVOCYLINDER FOR FAILURE ANALYSIS, ALUMINUM SHAVING CONTAMINATION WAS FOUND INSIDE OF THE MECHANISM. ANALYSIS REVEALED THAT THE CONTAMINATION WAS DUE TO UNDERSIZED ROOT DIAMETER OF THE FEMALE THREADS IN THE ACTUATOR BODY CAUSED BY A WORN CUTTING TOOL USED BY THE VENDOR

CORRECTIVE ACTION-IT WAS RECOMMENDED THAT THE VENDOR IMPROVE INSPECTION OF THREAD DIMENSIONS AND THREAD-CUTTING MACHINE TOOLS.

HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-166 ACTUATOR,ASSEMBLY	FAR 27-85314-819	1460 641007	36A	YES NO	LIONEL PACIFIC	001186

FAILURE MODE-STRUCTURAL. DURING ADJUSTMENT OR THE ACTUATOR PER EOP 315.5 PARAGRAPHS 3.0.3 THROUGH 3.0.4 THE GLAND ADJUSTMENT JAMNUT WAS FOUND OVERTORQUED, REQUIRING 300 POUND-FEET OF TORQUE TO LOOSEN. IN ADDITION, ONE OF THE TWO SET-SCREWS IN THE END GLAND POSITIONING THE TRANSDUCER EXTENDED THREE THREADS ABOVE THE GLAND SURFACE. THE OVERTORQUED CONDITION OF THE GLAND ADJUSTMENT JAMNUT COULD NOT BE CONFIRMED AS THE NUT WAS LOOSENED AT ETR. THE SET-SCREW PROJECTING ABOVE THE END GLAND WAS CONFIRMED AND WAS CAUSED BY HUMAN ERROR BY REVERSING THE POSITION OF THE LONG AND THE SHORT SET-SCREWS.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-10-266F TUBE ASSEMBLY, B-NUT	FAR 69-85038-7	2000 641006	ETR	YES NO	GD/C	000175

FAILURE MODE-LEAK-EXTERNAL-COUPLING NUT WAS FOUND WITH BACK WALL DEFORMED DUE TO OVER TORQUING.

CORRECTIVE ACTION-GD/C PERSONNEL WERE CAUTIONED TO USE PROPER TORQUING PROCEDURES

HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-169 ACTUATOR ASSEMBLY	FAR 27-85314-819	1460 641006	36A	YES NO	LIONEL PACIFIC	

FAILURE MODE-STRUCTURAL. INSPECTORS REPORT 150702 STATED THAT THE SERVOCYLINDER ASSEMBLY SHOWED EVIDENCE OF BEING DROPPED DURING SHIPPING OR HANDLING. A PRESSURE TUBE WAS FOUND BENT AND NICKED, AND SHOWED SURFACE ABRASION. FUNCTIONAL CHECKS SHOWED THAT THE ASSEMBLY PERFORMED WITHIN SPECIFICATION. THE DAMAGE MAY HAVE OCCURRED AFTER THE SERVOCYLINDER WAS REMOVED FROM THE VEHICLE, OR OTHER POST-REJECTION HANDLING.

CORRECTIVE ACTION-IT WAS RECOMMENDED THAT ALL PERSONNEL HANDLING, INSTALLING OR WORKING AROUND INSTALLED SUSTAINER

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

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SERVOCYLINDER ASSEMBLIES BE NOTIFIED OF THE MISHANDLING DAMAGE SUSTAINED BY THIS UNIT.							001200
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-189 ACTUATOR, SUSTAINER	FAR 27-05314-010	1460 641008	36A	NO NO	LIONEL PACIFIC	030025

FAILURE MODE-OUT OF TOLERANCE. DURING BOOSTER CHECKOUT, THE ACTUATOR ASSEMBLY EXHIBITED A DISCREPANT RESPONSE AT 0.3 CPS. FAILURE ANALYSIS CONFIRMED THE REPORTED CONDITION OF FEEDBACK SIGNAL SINE-WAVE PEAK FLATTENING. FEEDBACK TRANSDUCER SINE-WAVE TRACES CLEARED UP WITH CONTROL SIGNALS FROM AN IOC-TYPE SERVOAMPLIFIER INSTEAD OF THE A16 SERVOAMPLIFIER USED ON BOOSTER 1060. SERVOVALVE THRESHOLD LIMITS ARE SET FOR OPERATION WITH IOC TYPE SERVOAMPLIFIERS. THRESHOLD VALUES INCREASE FOR OPERATION WITH CONTROL SIGNALS FOR AN A16-TYPE SERVOAMPLIFIER, BUT NO LIMITS ARE SET. THERE WAS NO SERVOCYLINDER ASSEMBLY FAILURE.

CORRECTIVE ACTION-NO FAILURE. DESIGN PERSONNEL ARE EVALUATING THE BASIS OF THIS REJECTION WHERE NO ACTUAL COMPONENT FAILURE OCCURRED, AND REQUEST THAT THEY EVALUATE THE DIFFERENCES IN ACTUATOR ASSEMBLY PERFORMANCE WITH CONTROL SIGNALS FROM A16 AGAINST IOC TYPE SERVOAMPLIFIERS. HAVE DESIGN PERSONNEL EXAMINE POSSIBILITIES FOR REDESIGNING OR MODIFYING A16-TYPE SERVOAMPLIFIERS TO REDUCE THEIR EFFECT OF INCREASING SERVOVALVE THRESHOLD AND REDUCING SERVOVALVE FREQUENCY RESPONSE.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A3297.1 VERNIER HYDRAULIC ACTUATOR, O-RING	UTP-PET 27-08574-3	641005	CONVAIR	YES NO	LIONEL PACIFIC 2776-100	007030

FAILURE MODE-OUT OF SPECIFICATION. INVESTIGATION OF FAILURE DUE TO LEAKAGE REVEALED THAT THE O-RING FROM THE LEAKING SIDE WAS WORN MORE THAN THE OTHER ONE. A DIMENSIONAL CHECK OF ACTUATOR PISTON AND BORE REVEALED THAT BOTH O-RING GROOVE O.D. DIMENSION WERE OUT OF TOLERANCE. READING ON UNIT 0.632 INCH, REQ. 0.635 PLUS OR MINUS 0.001 INCH. REF. FPR NR F5172 SWT S/N 406-1747.

CORRECTIVE ACTION-REJECT ALL UNITS ASSOCIATED WITH PET LOT 1 AND SEND BACK TO VENDOR FOR REWORK. REF. FRR FR 654-2-434.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4673-F SERVO VALVE	FAR 27-04209-1	641005	FACTORY	YES NO	CADILLAC GAGE FC26-397A	003560

FAILURE MODE-FAILED DURING OPERATION. THE VERNIER SERVO-VALVE FAILED TO ACTUATE THE SERVOCYLINDER PER REQUIREMENTS. [illegible] NULL OFFSET WAS-0.22 MA VS MAX. ALLOWABLE OF 0.2 MA. THE PHASE LAG WAS 90 DEGREES AT 30CPS AND INDICATE INSUFFICIENT FLOW THRU NO. 2 PORT. CORRECT PHASE LAG PER SPEC. 27-04212 IS 30 DEGREES AT 30 CPS. EXAMINATION AND REPLACEMENT OF ALL APPROPIATE SUB-COMPONENTS OF SERVOVALVE FAILED TO ISOLATE THE SOURCE OF FAILURE.

CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN BECAUSE FAILURE WAS NOT RESOLVED.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT N	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-49001 FEEDBACK TRANSDUCER	FAR 27-G4211-1	119F 640924	FACTORY	YES NO	CRESCENT ENGIN EERING HC-67P-4E	099999
FAILURE MODE-OUT OF TOLERANCE. HIGH NULL VALUE OF 60 MV. MAXIMUM ALLOWABLE IS 50 M.V. ANALYSIS WAS NOT COMPLETED. F AILURE CAUSE IS NOT KNOWN.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED- NO CORRECTIVE ACTION TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3785 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04206-1	640923	GD/C	YES NO	STERER 13000	096600
FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TEST- THE FLOW RATES AT 2000AND 2700 PSIG BACK PRESSURE WERE 2.13 GPM AND 2.20 GPM, RESPECTIVELY- (SPEC. REQUIREMENT 2.0 GPM). TEST ON S/N 407-1734, LOT 28. SIMILAR FAILURE OCCURRED ON S 41018 AND P-1030.							
CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX COMPONENT SPECIFICATION LIMITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-10-263-F FILTER, O-RING	FAR 27-08564-5	2900 640922	FACTORY	YES NO	PUROLATOR 64967	096465
FAILURE MODE-LEAKAGE EXTERNAL-FINAL CHECKOUT REPORTED LEAKAGE OF FILTER UNDER STATIC HYDRAULIC PRESSURE. O-RING WAS FOUND TO BE DAMAGED. NO PREVIOUS FAILURES IN PRIOR 6 MONTHS.							
CORRECTIVE ACTION-VENDOR CAUTIONED INSPECTION AND ASSEMBLY PERSONNEL TO TAKE MORE CARE WHEN INSTALLING O-RINGS TO P REVENT DAMAGE FROM SHARP EDGES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4899-F TORQUE MOTOR	FAR 69-85311-1	6905 640922	FACTORY	YES NO	LIONEL PACIFIC	093060
FAILURE MODE-OUT OF TOLERANCE. THE OUTBOARD VERNIER SERVOCYLINDER FAILED DUE TO A NULL SHIFT. FEEDBACK VOLTAGES WER E TOO HIGH WITH A VALUE OF 375 MV RECORDED VS A MAX ALLOWABLE OF 250 MV DURING INACTIVE TESTING. FOR ACTIVE TESTING THE NULL WAS 400 MV VS MAX ALLOWABLE OF 300 MV. EXTENSIVE TEST ANALYSIS ATTRIBUTED THE FAILURE TO BENT TORQUE MOTOR FLAPPER AND DEFORMED CONDITION OF THE SPRING GROOVES. THE FLAPPER WAS BENT BEFORE AND DURING ASSEMBLY AS TESTS PROVE D. THE CONDITION OF THE FLAPPER, SPRING GROOVES IN THE FLAPPER, THE DRILLED HOLES IN THE HINGE AND SCRATCHES ON THE ZERO ADJUST WEDGE ARE INDICATIVE OF POOR QUALITY CONTROL DURING MANUFACTURE.							
CORRECTIVE ACTION-VENDOR WAS ADVISED OF PROBLEM AND TO IMPROVE THEIR QUALITY CONTROL IN THIS AREA. IN JAN 1985 THE VENDOR ADVISED THEY HAD INITIATED 100 PERCENT INSPECTION OF ALL PARTS INCLUDED IN THIS FAILURE.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	69A3297.1 VERNIER HYDRAULIC ACTUATOR	UTP-PET 27-08574-3	640921	CONVAIR	YES NO	LIONEL PACIFIC 2770-100	007055
FAILURE MODE-LEAK-EXTERNAL. DURING LOW TEMPERATURE TEST AT MINUS 30 DEG F, THE LEAKAGE FROM THE RIGHT SIDE OF THE U NIT WAS FOUND TO BE 6 ML. FOR 25 FULL STROKE CYCLES. REQ. IS ONE DROP PER 25 FULL STROKE CYCLES. REF. FPR NR "S1723W T S/N 406-1747. CORRECTIVE ACTION-UNKNOWN. VENDOR TO PARTICIPATE IN FAILURE INVESTIGATION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3693 VERNIER SERVO VALVE	UTP-PET 27-04209-1	640904	60/C	YES NO	CADILLAC GAGE FC26-397A	007101
FAILURE MODE-OUT OF TOLERANCE. DURING PET TEST THE NULL CURRENT WAS .23 MILLIAMPS (SPECIFICATION IS .20 MILLIAMPS). TEST SPECIMEN WAS 407-2020, REFER TO FRR 367. SIMILAR FAILURE OCCURRED 640910. CORRECTIVE ACTION-NO ACTION REQUIRED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4902F VERNIER ACTUATOR, O-RING	F/ 27-05312-603	7104 640602	FACTORY	YES NO	LIONEL PACIFIC	005592
FAILURE MODE-OUT OF TOLERANCE. VERNIER 2 PITCH NULL FEED BACK VOLTAGE SHIFTED 160 TO 170 MILLIVOLTS. MAXIMUM SHIFT ALLOWED IS 150 MILLIVOLTS. CAUSED BY DAMAGED O-RINGS ON THE FEED BACK END OF THE POWER STAGE SLEEVE. SOME OTHER UNKN OWN DEFECT MAY HAVE CONTRIBUTED TO THE NULL SHIFT. CORRECTIVE ACTION-CADILLAC GAGE ANSWER TO RAR SLV-A9-04-3966 STATED THAT ASSEMBLY INSTRUCTIONS AND INSPECTION METHO DS HAVE BEEN REVIEWED AND REVISED TO PREVENT DAMAGING O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A352. VERNIER SERVO VALVE	UTP-PET 27-04209-1	640924	60/C	YES NO	CADILLAC GAGE FC26-397A	007170
FAILURE MODE-OUT OF TOLERANCE. DURING PET TEST NULL CURRENTS WERE OUT OF TOLERANCE (.35 MA VS .20 SPECIFICATION). S IMILAR FAILURES OCCURRED ON 64/0/25, 64/09/1[illegible], 64/09/19, AND 64/09/22. TEST SPECIMENS WERE S/N 405-1917 AND S/N 404-1969, LOTS 44 AND 45 RESPECTIVELY. REFER TO FRR 5146. CORRECTIVE ACTION-SURVEY INSTRUCTIONS 120-64 ISSUED TO REJECT ALL UNITS FROM LOT 44 AND LOT 45.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-10-266F TUBE ASSEMBLY, B-NUT	FAR 27-85007-285	193D 640819	ETR	YES NO	GD/C	000467

FAILURE MODE-STRUCTURAL FAILURE. COUPLING NUT RUPTURED AROUND SHOULDER DUE TO OVERTORQUING OF NUT.

CORRECTIVE ACTION-GD/C PERSONNEL WERE CAUTIONED TO USE PROPER TORQUE PROCEDURES AND OBSERVE TORQUE LIMITS.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-04-4864-F VERNIER ACTUATOR ASSEMBLY, O-RING	FAR 27-85311-809	195D 640818	ETR	YES NO	LIONEL PACIFIC	000784

FAILURE MODE-FAILED DURING OPERATION. VERNIER 2 YAW ACTUATOR ASSEMBLY NULL FEEDBACK VOLTAGE INDICATED PLUS 750 MV W HEREAS PLUS OR MINUS 350 MV INACTIVE AND PLUS OR MINUS 400 MV ACTIVE IS MAXIMUM ALLOWABLE. NULL SHIFT WAS CAUSED BY LEAKAGE PAST A DEFECTIVE O-RING OF AN OLD-CONFIGURATION CONTROL-NOZZLE SEAL. LAB TESTS SHOWED THE BUNA-N O-RING MAY HAVE BEEN EXPOSED TO TRICHLOROETHYLENE WHICH INCREASES HARDNESS AND COULD CONTRIBUTE TO SURFACE FLAKING FOUND.

CORRECTIVE ACTION-REPLACE OLD-CONFIGURATION CONTROL NOZZEL SEALS WITH NEW-CONFIGURATION SEALS DURING SERVO VALVE OV ERHAUL AT DEPOT. ALSO ACTION WAS INITIATED TO ASSURE NO BUNA-N O-RINGS ARE NOT EXPOSED TO TRICHLOROETHYLENE DURING S ERVOVALVE OVERHAUL AT THE DEPOT.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A3626 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04206-1	640818	GD/C	YES NO	CONAIR 13003	000606

FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TESTING, THE STEADY STATE FLOW WAS ABNORMALLY LOW. REFER TO F 5147, TE ST SPECIMEN S/N 201-1055. READINGS WERE .090 TO .188 GPM VS. SPECIFICATION OF 1.05 GPM MINIMUM.

CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX SPECIFICATION LIMITS. ALSO, ACTION INITIATED BY GD/C TO DROP CONVAIR AS A SOURCE OF 27-04206-1. REFER TO FRR378.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-6869-F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-85314-821	119F 640813	FACTORY	YES NO	LIONEL PACIFIC	000008

FAILURE MODE-OUT OF TOLERANCE. THE ACTUATOR ASSY REPORTEDLY HAD EXCESSIVE YAW CROSS COUPLING. EXTENSIVE ANALYSIS AN D FUNCTIONAL TESTING COULD NOT CONFIRM THE FAILURE. IT WAS THEREFORE CONCLUDED THAT EXCESSIVE CROSS COUPLING EXPERIE NCED MUST HAVE RESULTED FROM A UNIQUE TOLERANCE BUILDUP OR FROM A LOOSE CONNECTOR THAT WAS TIGHTENED WHEN THE SERVOC YLINDER WAS REPLACED.

CORRECTIVE ACTION-RECOMMENDED SERVOCYLINDER ASSEMBLIES NOT BE REJECTED AND REMOVED FROM MISSILE FLIGHT-CONTROL SYST EM FOR INCREASED CROSS-COUPLING, WITHOUT CONSULTATION WITH APPROPRIATE FAILURE ANALYSIS AND DESIGN PERSONNEL.

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HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-99-04-4880-1 SERVO VALVE	FAR 27-04209-1	640813	FACTORY	YES NO	CADILLAC GAGE FC26-397A	093537

FAILURE MODE-OUT OF TOLERANCE. THE VERNIER SERVO VALVE CAUSED LOW AMPLITUDE RATIO CONDITION BEING 4.5 CM AT 20CPS V S MIN. ALLOWABLE LIMIT OF 4.0 CM AT 20 CPS. PHASE LAG WAS 1.3 CM AT 3 CPS VS MAX ALLOWABLE OF 0.0 CM. IT WAS ALSO 4. 0 CM AT 20CPS VS MAX. ALLOWABLE OF 3.0 CM.RPM CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN. NO TEST ANALYSIS AVAILAB LE FOR RESOLUTION OF PROBLEM.

CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN. NO TEST ANALYSIS AVAILABLE FOR RESOLUTION OF PROBLEM.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-4874-F SERVO VALVE	FAR 27-04209-1	640913	FACTORY	YES NO	CADILLAC GAGE FC26-398A	093569

FAILURE MODE-OUT OF TOLERANCE. THE SUSTAINER SERVOVALVE COULD NOT BE ADJUSTED TO MEET EOP 305.0 NULL CURRENT REQUIR EMENTS WITH INPUT C TROL SIGNALS FROM IOC AND AIG SERVOAMPLIFIERS AT THE SAME NULL SETTING. THIS CONDITION SHOULD N OT BE CONSIDERED A FAILURE OF THE SERVOVALVES AS THE NULL DISPARITY IS CAUSED BY A DIFFERENCE IN SERVOVALVE NULL REA CTION TO CONTROL SIGNALS FROM IOC AND AIG-TYPE SERVOAMPLIFIERS DUE TO DIFFERENCES IN THE ELECTRICAL CHARACTERISTICS OF THE SIGNALS.

CORRECTIVE ACTION-REV.H. TO EOP 305.0 REMOVED THE IOC NULL REQUIREMENT. THIS WILL NOT ADVERSELY AFFECT ACTUATOR ASS EMBLY PERFORMANCE SINCE MOST MISSILES HAVE AIG TYPE SERVOAMPLIFIERS.

HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-99-04-4882F SERVO VALVE	FAR 27-04209-1	640813	FACTORY	YES NO	CADILLAC GAGE FC26-397A	093520

FAILURE MODE-OUT OF TOLERANCE. THE VERNIER SERVO VALVE CAUSED LOW AMPLITUDE RATIO CONDITION BEING 4.5 CM AT 20 CPS VS MIN. ALLOWABLE OF 4.0 CM AT 20 CPS. PHASE LAG WAS 1.5 CM AT 3 CPS VS MAX. ALLOWABLE OF 0.0 CM. IT WAS ALSO 3.2 CM AT 10 CPS VS MAX. ALLOWABLE OF 2.2 CM. IT WAS ALSO 4.0 CM AT 20 CPS VS. MAX. ALLOWABLE OF 3.0 CM. TEST ANALYSIS VAL UES MET EOP REQUIREMENTS EXCEPT FOR FREQUENCY RESPONSE WHICH WAS CAUSED BY ARMATURE IN THE SERVO VALVE TORQUE MOTOR. THIS CAUSED INCREASED FRICTION DECREASING TORQUE MOTOR PERFORMANCE.

CORRECTIVE ACTION-THE VENDOR WAS ADVISED TO IMPROVE DIMENSIONAL INSPECTION AND FLOOR INSPECTION DURING ASSY OF TORQ UE MOTOR ASSYS. 100 PERCENT INSPECTION WAS INITIATED BY THE VENDOR.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A3694 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04206-1	640810	GD/C	YES NO	STERER 18000	

FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TEST, PROOF CYCLE AT -30 DEG SPECIMEN FLOW RATE (1.015 VS. SPECIFICATI ON OF 1.05 GPM MIN.) AND RESPONSE TIME (2.34 VS. SPECIFICATION OF 2.10 SECONDS MAXIMUM).

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							005608
CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX COMPONENT SPECIFICATION LIMITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-04-4891-F ACTUATOR ASSEMBLY, O-RING	FAR 27-05311-909	195D 640807	FACTORY	YES NO	LIONEL PACIFIC	001012
FAILURE MODE-LEAK, EXTERNAL. THE VERNIERSERVO-CYLINDER REPORTEDLY FAILED DUE TO HYDRAULIC FLUID SEEPING PAST SHAFT SEAL OF VERNIER 2 YAW ACTUATOR AT ARATE OF 5 DROPS PER HOUR AT 40 PSIG HYDRAULIC PRESSURE. METALLIC PARTICLES WERE ALSO OBSERVED IN THE LEAKAGE FUEL. EXTENSIVE TEST ANALYSIS FAILED TO CONFIRM THIS REPORT FAILURE AND COULD NOT BE DUPLICATED. THIS REPORTED LEAKAGE MAY HAVE OCCURRED IF FELT FIBERS FROM THE DAMAGED FELT WIPER WERE CAUGHT BETWEEN THE O-RING AND THE BORE PROVIDING A LEAKAGE PATH. NO METAL PARTICLES LARGER THAN 10 MICRONS WERE FOUND. THE 10 MICRON PARTICLES ARE WITHIN SPECIFICATION.							
CORRECTIVE ACTION-NONE. SUCH LEAKAGE IN FAILURES ENCOUNTERED TO DATE ARE NOT SUFFICIENT TO COMPROMISE MISSIONSUCCESS. USE OF TEFLON RINGS IN PLACE OF FELT LUBRICATORS HAS BEENPROPOSED AS A CLASS 1 IMPROVEMENT CHANGE TO THE AIRFORCE. AIRFORCE HAS DISAPPROVED THE PROPOSAL AT THIS TIME.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3543 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	640806	GD/C	YES NO	CADILLAC GAGE FC26-398A	007184
FAILURE MODE-OUT OF TOLERANCE. DURING PET FLUID-LOW-TEMPERATURE TEST, THE SPECIMEN FAILED TO PASS SUFFICIENT FLOW AT 8 MILLIAMPS DIFFERENTIAL CURRENTS. THE FLOWS WERE PLUS 1.35 AND MINUS 1.67 GPM. (REQUIREMENT 2.15 PLUS OR MINUS .2 16 GPM.) TEST SPECIMEN S/N 403-0966 (LOT 23) REFER TO FRR 372. SIMILAR FAILURES OCCURRED ON 640825, 640904, AND 6409 14 THROUGH 640917.							
CORRECTIVE ACTION-SURVEY INSTRUCTIONS 150-64 ISSUED TO REJECT ALL UNITS OF LOT NUMBER 23.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3524 VERNIER SERVO VALVE	UTP-PET 27-04208-1	640805	GD/C	YES NO	CADILLAC GAGE FC26-398A	007180
FAILURE MODE-OUT OF TOLERANCE. DURING PET LOW FLUID TEMPERATURE TEST THE SPECIMEN FAILED TO PASS SUFFICIENT FLOW AT 8 MILLIAMPS DIFFERENTIAL CURRENT. THE FLOWS WERE PLUS 1.05 AND 1.30 GPM. TEST SPECIMEN S/N WAS 403-1017, LOT 44, REFER TO FRR 375.							
CORRECTIVE ACTION-SURVEY INSTRUCTIONS 129-64 ISSUED TO REJECT ALL UNITS FROM LOT 44 AND LOT 45.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	27-3407 VERNIER HYDRAULIC CYLINDER ASSEMBL Y, BEARING	UTP-PET 27-08573-3	640803	CONVAIR	YES NO	LIONEL PACIFIC 2792-2	007052

FAILURE MODE-OUT OF TOLERANCE. DURING POST LIFE TEST THE PRESSURE REQUIRED TO MOVE THE ACTUATOR PISTON AGAINST A 10 0 PSIG BIAS PRESSURE RANGED BETWEEN 60 AND 64 PSIG. REQ. IS 50 PSIG MAX. THIS FAILURE WAS CAUSED BY A GALLED BACK BE ARING. REF. FPR NR F-51395WT S/N 401-1043.

CORRECTIVE ACTION-NONE-THE INERTIA LOAD USED FOR THE ABOVE TEST IS GREATER THAN ACTUAL LOAD ON VEHICLE. PET LOT 16 ACCEPTABLE REF. FAR FR054-2-360.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A3654 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04208-1	640803	60/C	YES NO	STERER 13000	008604

FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TEST-PROOF CYCLE AT LOW TEMPERATURE- THE RESPONSE TIME WAS 2.336 SECON DS (SPECIFICATION REQUIREMENT IS 2.0 TO 2.190 SECONDS). TEST WAS ON S/N 406-1608 REPRESENTING LOT 22. REFER TO FAILU RE REVIEW REPORT 357 AND 369.

CORRECTIVE ACTION-ECP 7638 SUBMITTED TO RELAX COMPONENT SPECIFICATION LIMITS.

HYDRAULIC-A/B SUSTAINER/VERNIER	60A/AP264-050/A64-365-F-3498	FLIGHT	2400 640729	A3 262.00	YES NO		007148

FAILURE MODE-ERRATIC OPERATION. SUSTAINER HYDRAULIC PRESSURE OSCILLATIONS (MAX. PEAK-TO-PEAK AMPL. WAS 140 PSI) WER E OBSERVED PRIOR TO SUSTAINER CUTOFF. THERE WERE NO SIGNIFICANT ENGINE MOVEMENTS TO EXPLAIN THIS ANOMALY.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE. SUBSEQUENT INVESTIGATIONS OF THIS ANOMALY HAVE INDICATED NOTHING OF A CRITICAL OR MARGINAL NATURE CONTRIBUTED TO THE OBSERVED OSCILLATIONS.

HYDRAULIC-A/B SUSTAINER/VERNIER	60A/BKF64-032/P2-402-00-250 ACTUATOR	FLIGHT 27-08576-3	2500 640728	12 266	YES NO	LIONEL PACIFIC 2770-100	

FAILURE MODE-ERRATIC OPERATION-RIGID BODY OSCILLATIONS EXCITED BY A YAW STEERING COMMAND FOLLOWING SECO DECAYED TO HALF AMPLITUDE IN 1.5 CYCLES, BUT DID NOT DECAY FURTHER IN THE REMAINING THREE HALF CYCLES PRIOR TO VECO.

SYSTEM EFFECT-ERRATIC OPERATION-THE FLIGHT CONTROL SYSTEM DID NOT COMPLETELY DAMP THE RIGID BODY OSCILLATIONS BECAU SE OF A LIMIT CYCLE RESULTING FROM A DEAD ZONE IN THE VERNIER ACTUATOR ASSEMBLIES AND/OR OTHER SYSTEM NON-LINEARITIE S.

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SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME / VENDOR PART NO	
VEHICLE EFFECT-NONE. CORRECTIVE ACTION-THE VERNIER ENGINE BIAS DURING SUSTAINER AND VERNIER PHASES WAS REDUCED FROM 50 TO 45 DEGREES TO IMPROVE CONTROL.							094771
HYDRAULIC-A/B SUSTAINER/VERNIER	27A5627 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04208-1	640724	60/C	YES NO	STERER 13000	095603
FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TEST, THE STEADY STATE FLOW WAS OUT OF TOLERANCE FROM 1.205 TO 1.235 G PM(SPECIFICATION REQUIREMENT 1.20). SIMILAR FAILURE OCCURRED 640805, REFER TO FRR 357,359, AND 369. TEST SPECIMEN S/N 008-0129. CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX COMPONENT SPECIFICATION LIMITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-10-257-C PRESSURE GAGE	FAR 27-06582-3	640721	FACTORY	YES NO	ROCHESTER GAGE 6903-817-1	096472
FAILURE MODE-LEAK-PRESSURE GAGE WAS FOUND TO BE LEAKING INTERNALLY DURING PRESSURE CHECK. CORRECTIVE ACTION-VENDOR CORRECTIVE ACTION WAS ACCOMPLISHED TO PREVENT LEAKAGE CAUSED BY SUBSTANDARD BRAZEMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4656-F SERVOVALVE	FAR 27-04208-1	640720	FACTORY	YES NO	CADILLAC GAGE FC26-598A	095011
FAILURE MODE-OUT OF TOLERANCE-SUSTAINER SERVOVALVE REPORTEDLY CAUSED EXCESSIVE NULL CURRENT CONDITION OF.065MA VS MAX ALLOWABLE OF 0.50MA DURING TEST OF ASSEMBLED SEROCYLINDER. EOP 305.9 WAS USED WITH CONTROL SIGNALS FROM AN IOC TYPE SERO AMPLIFIER. CAUSE WAS AN ELECTROMAGNETIC COUPLING INCOMPATIBILITY BETWEEN USE OF TWO DIFFERENT SERVO AMPLIFIERS RESULTING IN NON ADJUSTIBILITY OF NULL WITH INPUT SIGNALS FROM BOTH SERVO AMPLIFIERS AT THE SAME SETTING. CORRECTIVE ACTION-DELETE THE NULL ADJUSTMENT TEST WITH INPUT FROM THE IOC TYPE SERVO AMPLIFIER FROM EOP 305.9 PER TCA 12 AND REV H TO EOP 305.9.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-80-04-4659-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85312-805	3550 640720	FACTORY	YES NO	LIONEL PACIFIC	
FAILURE MODE-CONTAMINATION. DURING CHECKOUT PER PROCEDURE 27-88122 THE VERNIER ACTUATOR ASSEMBLY LEAKED HYDRAULIC OIL PAST ACTUATOR SHAFT SEALS. ANALYSIS CONFIRMED THE LEAK. THE RATE WAS 2.5 CC FOR 80 HOURS AT 40 PSIG AND 14.1 CC FOR 24 HOURS AT 100 PSIG. THE INDICATED CAUSE WAS FELT LUBRICATOR SHREADING AND O-RING DAMAGE IN RH PISTON SEAL. ALSO O-RING MOLDING DEFECTS WERE VISIBLE UNDER MICROSCOPIC EXAMINATION.							

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SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
CORRECTIVE ACTION-MEMO 662-10-13 OF JULY 28, 1964 ESTABLISHED NEW DESIGN CRITERIA APPROXIMATELY DOUBLING LEAK RATE TOLERANCE.							095250
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4834-F SERVO VALVE-SUSTAINER	FAR 27-04208-1	640717	FACTORY	YES NO	CADILLAC GAGE FC28-398A	096246
FAILURE MODE-OUT OF TOLERANCE-SUSTAINER SERVOVALVE CAUSED EXCESSIVE NULL CURRENT OF .16MA VS MAX ALLOWABLE OF .050 MA. EOP 305.9 WAS USED. TEST ANALYSIS DEMONSTRATED THAT SERVOCYLINDER NULL COULD BE ADJUSTED WITHIN EOP REQUIREMENTS WITH INPUT SIGNALS FROM EITHER THE A16 OR 10C-TYPE AMPLIFIER. NULL COULD BE ADJUSTED WITH INPUT SIGNALS FROM BOTH SERVO- AMPLIFIERS AT THE SAME SETTING. FAILURE CAUSE WAS AN ERROR IN DISPOSITION OF NON-CONFORMING SUPPLIES. CORRECTIVE ACTION-SUPERVISION AND PERSONNEL WERE ADMONISHED TO CAREFULLY FOLLOW GD/C RCS 140-70-1, SUPPLEMENT 3, WHICH WOULD HAVE ELIMINATED ANOTHER ANALYSIS OF THIS UNIT BEFORE IT HAD BEEN REPAIRED, INSPECTED AND RETURNED TO SERVICE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4833-F SERVO VALVE-SUSTAINER	FAR 27-04208-1	640708	FACTORY	YES NO	CADILLAC GAGE FC28-398A	096247
FAILURE MODE-OUT OF TOLERANCE-SUSTAINER SERVOVALVE REPORTEDLY CAUSED EXCESSIVE NULL CURRENT CONDITION OF .085MA VS MAX. ALLOWABLE OF .050 MA DURING TEST OF ASSEMBLED SERVO CYLINDER. EOP 305.9 WAS USED WITH CONTROL SIGNALS FROM AN 10C TYPE SERVO AMPLIFIER. CAUSE, WAS AN ELECTROMAGNETIC COUPLING INCOMPATIBILITY BETWEEN USE OF TWO DIFFERENT SERVOAMPLIFIERS. RESULTING IN NON ADJUSTABILITY OF NULL WITH INPUT SIGNALS FROM BOTH SERVOAMPLIFIERS AT THE SAME SETTING. CORRECTIVE ACTION-DELETE THE NULL ADJUSTMENT TEST WITH INPUT FROM THE 10C-TYPE SERVO AMPLIFIER FROM E.O.P. 305.9. PER TCA 12 AND REV. H TO EOP 305.9.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-04-4841-F VERNIER ACTUATOR ASSEMBLY	FAR 27-05311-000	640708	ETR	YES NO	LIONEL PACIFIC	096249
FAILURE MODE-FAILED DURING OPERATION-VERNIER ACTUATOR ASSY. REPORTEDLY FAILED DURING PERFORMANCE OF FREQUENCY RESPONSE PORTION OF PROCEDURE 27-93558, BOOK 3-D. EXTENSIVE FUNCTIONAL TESTING FAILED TO CONFIRM REPORTED FAILURE AS THE SEROCYLINDER ASSY MET ITS FUNCTIONAL REQUIREMENTS WELL WITHIN APPLICABLE SPECS. CAUSE OF REJECTION APPARENTLY IS INVOLVED IN THE SPECIFIC TOLERANCES AND TOLERANCE BUILDUP ASSOCIATED WITH THE TEST APPARATUS USED. CORRECTIVE ACTION-FIELD PERSONNEL ADVISED I. PROBLEMS OF THIS NATURE TO SHIP THE REJECTED SANBORN TAPE READOUT WITH CALIBRATION PHASE AND THE HARDWARE FOR VERIFICATION.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SLV/A-99-04-4648-F SERVO VALVE-SUSTAINER	FAR 27-04208-1	640680	FACTORY	YES NO	CADILLAC GAGE FC26-398A	896240

FAILURE MODE-FAILED DURING OPERATION-SUSTAINER SERVOVALVES REPORTEDLY FAILED DURING ABBY OF SUSTAINER SERVOCYLINDER . INCOMPATIBILITY OF NULL VALUES BETWEEN #16 AND IOC AMPLIFIERS CAUSED REJECTION OF THE SUSTAINER SERVO CYLINDER ASS YS. THE NULL VALUES WITH VARIOUS TYPES OF AMPLIFIERS ARE TOO WIDE TO BE WITHIN THE TOLERANCE BAND OF EOP 305.9.

CORRECTIVE ACTION- RAR SLV/A-99-04-3927 REQUESTED EOP 305.9 BE REVISED TO ADJUST THE NULL VALUE AT 10CPS, 1 MA INPU T, CLOSED LOOP, USING AN UNMODIFIED A16 AMPLIFIER, DROPPING THE NULL REQUIREMENT WITH THE IOC AMPLIFIER BUT STILL RE QUIRING THE THRESHOLD BE WITHIN PLUS OR MINUS 0.20 MA, USING AN IOC AMPLIFIER.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-04-4855-F VERNIER ACTUATOR ASSEMBLY	FAR 27-83311-009	250D 640629	ETR	YES NO	LIONEL PACIFIC	896245

FAILURE MODE-LEAK EXTERNAL-VERNIER SERVOCYLINDER REPORTEDLY FAILED DUE TO OIL SEEPING PAST THE SHAFT SEAL FOLLOWING OPERATION OF SUST. HYD. SYSTEM AT 2000 PSIG, PER 27-94634 GUIDANCE COMMAND TEST. ALTHOUGH TEST ANALYSIS CONFIRMED T HE SLIGHT LEAKAGE, IT IS CONSIDERED MARGINAL BECAUSE HAND GIMBALLING WAS REQUIRED TO PRODUCE ANY LEAKAGE AFTER 88 HO URS OF STATIC TESTING. NO DEFICIENCY WAS OBSERVED THAT COULD POSSIBLY CAUSE FAILURE OF THE ASSEMBLY TO OPERATE PROPE RLY.

CORRECTIVE ACTION-DESIGN MEMO 662-10-13 DATE-640728 ESTABLISHED NEW SERVOCYLINDER LEAKAGE CRITERIA OF A) 1 DROP PER 10 CYCLES PER SEAL MAX. DURING DYNAMIC OPERATION B) 1 DROP IN 12 HRS PER SEAL MAX. FOR STATIC TESTS.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.5 PUMP, FITTING	UTP-PRT 27-08590-3	640623	CONVAIR	YES NO	VICKERS AA-60410-L-2	897028

FAILURE MODE-LEAK-EXTERNAL-DURING POST PRT TEMPERATURE-VIBRATION PROOF CYCLE, THE TEST UNIT INLET PORT FITTING LEAK ED AT THE INTERFACE OF THE FERROUS AND NON-FERROUS PARTS. THE LEAKAGE RATE WAS 1/2 CC/MIN. ALSO LEAKAGE FROM ONE OF THE BOLTS IN THE HOUSING WAS ONE DROP PER MINUTE. REQ. IS NO LEAKAGE. REF. FPR NR F-43118T REV A. S/N 303-0363.

CORRECTIVE ACTION-REPAIR THE UNIT BY REPLACING THE INLET OR FITTING FROM AN EXPENDED ETT TEST UNIT AND CONTINUE TES T. NO ACTION EXCEPT A MEETING WAS HELD WITH THE VENDOR SPECIFYING PROPER TORQUING OF THE CASE COVER NUTS. REF. FRR F R854-2-330 REV A.

HYDRAULIC-A/B SUSTAINER/VERNIER	2743550 SUSTAINER SERVO VALVE	UTP-PET 27-04208-1	640617	GD/C	YES NO	CADILLAC GAGE FC26-398A	

FAILURE MODE-OUT OF TOLERANCE. DURING PET FLUID-LOW-TEMPERATURE TEST (-30 DEGREES F) THE FLOW FROM PORT 2 WAS 1.88 GPM (REQUIREMENT 2.13 PLUS OR MINUS .216 GPM). TEST SPECIMEN S/N 312-0940 (LOT 82), REFER TO FRR 313.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NOT CONSIDERED A FAILURE-WITHIN ALLOWABLE LIMITS. THE OUT-OF-TOLERANCE FLOW RATE WAS DUE TO AN IN TOLERANCE NULL SHIFT WHICH WAS CAUSED BY TEMPERATURE CHANGE. SINCE TEMPERATURE IS LOWER THAN ACTUAL OPERATING CONDIT IONS, LOT IS ACCEPTED.							097102
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-04-4849-F VERNIER ACTUATOR ASSEMBLY	FAR 27-85311-005	2160 640616	ETR	YES NO	LIONEL PACIFIC	091971
FAILURE MODE-LEAK EXTERNAL. THE VERNIER ACTUATOR ASSEMBLY REPORTEDLY FAILED DUE TO HYDRAULIC FLUID SEEPING PAST SHA FT SEALS IN EXCESS OF ONE DROP IN 24 HOURS. ANALYSIS COULD NOT FULLY BE ASSIGNED SINCE SCARRING OF THE O-RING GROOVE DID NOT PROHIBIT CORRECT SEALING AFTER THE O-RINGS WERE REINSTALLED. ALTHOUGH FELT LUBRICATOR CONTAMINATION WAS NOT EVIDENT UPON DISASSEMBLY, IT IS POSSIBLE FIBER BLOCKAGE INCREASED THE LEAK RATE.							
CORRECTIVE ACTION-NO CORRE TIVE ACTION IS GIVEN AS RESPONSIBILITY FOR CAUSING THE SCRATCH ON THE O-RING GROOVE SEAL ING CANNOT BE AFFIXED. DESI N MEMO 662-10-13 DATED 640728 ESTABLISHES NEW CRITERION FOR CLASSIFICATION OF REJECTABLE LEAKAGE. IT IS A LEAK RATE IN EXCESS OF 2 DROPS IN 24 HOURS AT STATIC PRESSURE AND NO MORE THAN ONE DROP PER 10 CYC LES AT EACH DYNAMIC SEAL UNDER DYNAMIC CONDITIONS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3501 FEEDBACK TRANSDUCER	UTP-PET 27-04211-1	640615	60/C	YES NO	CRESCENT HC-07P-4E	097103
FAILURE MODE-OPEN (ELEC). DURING PET IMMERSION TEST, INSULATION RESISTANCE READING WAS 33 KILOHMS (SPECIFICATION RE QUIREMENT IS GREATER THAN 100 MEGOHMS). TEST SPECIMEN S/N 403-1196, LOT 30, REFER TO FRR 320.							
CORRECTIVE ACTION-INADEQUATE SEAL BETWEEN CONNECTOR AND TRANSDUCER BODY. LOT REJECTED. VENDOR TO MAKE FIX.							
HYDRAULIC-A/B SUSTAINER/VERNIER	09C1952.2 VERNIER ACTUATOR ASSEMBLY, PROBE B RACKET	UTP-ETT 27-85312-005	640611	60/C	YES NO	LIONEL PACIFIC	096609
FAILURE MODE-STRUCTURAL-DURING ETT POST VIBRATION PROOF CYCLE THE FEEDBACK TRANSDUCER PROBES MOUNTING BRACKET WAS L OOSE AND WAS CAUSED BY THE TWO MOUNTING SCREWS WHICH HAD BACKED OFF 1-10 TURN DESPITE THE UNBROKEN LOCKWIRE. REF. TA BK HISTORY LOG NO. 654-2-5.7 S/N 204-0333.							
CORRECTIVE ACTION-RETIGHTEN AND RE-LOCKWIRE THE TWO BRACKET SCREWS AND CONTINUE THE TEST.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	69C1952.2 VERNIER ACTUATOR ASSY.-SERVO VALVE	UTP-ETT 27-05312-005	640611	SD/C	YES NO	LIONEL PACIFIC	006007
FAILURE MODE-OUT OF TOLERANCE- DURING ETT POST VIBRATION PROOF CYCLE THE SERVO VALVE NULL CURRENT WAS PLUS 0.44 MA. REQ. IS 0.20 MA. MAX. REF. TASK HISTORY LOG NO. 654-2-917 S/N 204-0335.							
CORRECTIVE ACTION-NONE. TEST CONTINUED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69C1951.2 VERNIER ACTUATOR ASSEMBLY, SERVO VALVE	UTP-ETT 69-05311-1	640610	SD/C	YES NO	LIONEL PACIFIC	006008
FAILURE MODE-OUT OF TOLERANCE- DURING THE ETT POST VIBRATION PROOF CYCLE THE SERVO VALVE NULL CURRENT WAS-0.24 MA. REQ. IS 0.20 MA. MAX. REF. FPR NR F-4301 ST S/N 402-0022.							
CORRECTIVE ACTION-NONE. TEST CONTINUED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4701-F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05311-009	1510 640610	FACTORY	YES NO	LIONEL PACIFIC	005755
FAILURE MODE-OUT OF TOLERANCE-DURING FINAL CHECKOUT THE ACTUATOR EXHIBITED AN OSCILLATING CONDITION WITH PRESSURE APPLIED THAT COULD NOT BE ELIMINATED. FAILURE WAS DUE TO IMPROPER ASSEMBLY. A SUSTAINER SERVO VALVE WAS INSTALLED IN PLACE OF A VERNIER ONE. IN ADDITION, THE SERVO VALVE NOZZLE TARGET SCREW WAS NOT PROPERLY STAKED.							
CORRECTIVE ACTION-SD/C ASSEMBLY AND INSPECTION PERSONNEL WERE INFORMED OF THE FAILURE. THE ASSEMBLY TRAVELLER WAS AMENDED TO REQUIRE SUBASSEMBLY PART NUMBERS AND SERIAL NUMBERS BE HAND INSERTED BY INSPECTION PERSONNEL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69C1952.2 VERNIER ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	UTP-ETT 27-05312-005	640605	SD/C	YES NO	LIONEL PACIFIC	006006
FAILURE MODE-STRUCTURAL-DURING THE ETT HIGH TEMPERATURE FLIGHT VIBRATION TEST IN THE Z-AXIS THE FEEDBACK TRANSDUCER SUSTAINED STRUCTURAL DAMAGE. THE MOUNTING CLIP ON THE PROBE END OF THE TRANSDUCER BROKE OFF THE UNIT. REF. TASK HISTORY LOG NO. 654-2-301A S/N 403-0577.							
CORRECTIVE ACTION-NONE. TEST CONTINUED.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-10-256-F TUBE ASSEMBLY	FAR 69-85007-25	640604	FACTORY	YES NO	60/C	000475

FAILURE MODE-STRUCTURAL-CRACKS IN TUBE FLARES WERE FOUND UNDER MAGNIFICATION.

CORRECTIVE ACTION-NEW FLARING TECHNIQUES HAVE BEEN DEVELOPED TO PREVENT CRACKS.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4803-F ACTUATOR ASSEMBLY, O-RING SEAL	FAR 27-85314-019	174-D 640601	FACTORY	YES NO	LIONEL PACIFIC	000010

FAILURE MODE-EXTERNAL LEAK. DURING HYDRAULIC SYSTEM STATIC PRESSURE TESTS AT 3000 PSIG. THE LEAKAGE OIL FROM THE GL AND LOCKNUT ON THE PISTON END OF THE ACTUATOR. IT ALSO CONTINUED TO LEAK AT ZERO PSIG. THE LEAKAGE WAS CAUSED BY MET ALLIC PARTICLES OBSTRUCTING CORRECT SEATING OF THE GLAND STATIC-SEALING O-RING. THE METAL PARTICLES AND ANODIZE PART ICLES WERE GENERATED BY CUTTING OF THE ACTUATOR HOUSING THREADS DURING INSERTION AND TORQUING OF THE GLAND RETAININ RING. THE DAMAGE TO THE THREADS INDICATE A SLIGHT MISALIGNMENT DURING RETAINER INSERTION.

CORRECTIVE ACTION-VCAR TO LIONEL PACIFIC INFORMING THEM OF THE FAILURE AND CAUSE AND REQUESTING THEM TO REVIEW THEI R ASSEMBLY TECHNIQUES TO PRECLUDE DAMAGE TO THE HOUSING THREADS AND SUBSEQUENT CONTAMINATION.

HYDRAULIC-A/B SUSTAINER/VERNIER	69C1962.2 VERNIER ACTUATOR ASSEMBLY, FEEDBAC K TRANSDUCER	UTP-ETT 27-85312-05	640527	FACTORY	YES NO	LIONEL PACIFIC	000005

FAILURE MODE-STRUCTURAL-DURING THE ETT LOW TEMPERTURE FLIGHT VIBRATION TEST IN THE X-AXIS. THE FEEDBACK TRANSDUCER SUSTAINED STRUCTURAL DAMAGE. THE MOUNTING CLIP ON THE PROBE END OF THE TRANSDUCER BROKE OFF BOTH UNITS. REF. TASK HI STORY LOG NO. 654-2-301A S/N 204-0333 408-0978.

CORRECTIVE ACTION-NONE. TEST CONTINUED.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-251-C PRESSURE GAGE	FAR 27-08582-3	2090 640522	FACTORY	YES NO	ROCHESTER 8803-716-1	000470

FAILURE MODE-INTERNAL LEAK. PRESSURE GAGES WERE FOUND TO BE LEAKING INTERNALLY DURING MISSILE CHECKOUT. TOTAL OF TH REE GAGES REJECTED ON SAME MISSILE FOR SAME CAUSE.

CORRECTIVE ACTION-ROCHESTER GAGE TO USE GENERAL ELECTRIC HALOGEN LEAK DETECTOR FOR WELD INSPECTION. MINIATURIZED WE LD TIPS TO BE USED WITH HYDROGEN AS WELDING GAS. CHANGE FLUX MATERIAL AND USE CONTROLLED ATMOSPHERE DURING TUBE HEAT TREATING.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-10-285-F SUSTAINER HYDRAULIC TANK	FAR 27-08588-8	2160 640921	ETR	NO YES	BENDOW PANTEX 88036	088474
FAILURE MODE-STRUCTURAL-RESERVOIR WAS OVER PRESSURIZED AND DAMAGED BY UNKNOWN CAUSES. CORRECTIVE ACTION-SURVEY 47-64 WAS INITIATED TO LOCATE OVERPRESSURIZED RESERVOIRS. CORRECTIVE ACTION IS PART OF PROJECT CLASP.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-4798-F ACTUATOR, SERVO VALVE	FAR 27-05314-017	640520	FACTORY	YES NO	CADILLAC GAGE	091227
FAILURE MODE- OUT OF TOLERANCE. DURING ETT TESTING THE NULL VOLTAGE SHIFTED FROM AN ACCEPTABLE VALUE OF PLUS OR MINUS 0.2 MA TO -0.5 MA. FAILURE WAS DUE TO INPROPER STAKING OF THE TARGET SCREW TO THE FLAPPER. CORRECTIVE ACTION-GD/C SURVEYED ALL SERVO VALVES AND INSPECTED THEM FOR PROPER STAKING OF THE SERVO VALVE TARGET SCREWS. CADILLAC INITIATED 100 PERCENT INSPECTION OF TARGET SCREW STAKING BY BOTH VENDOR INSPECTORS AND GD/C OPI INSPECTORS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4793F ORIFICE-FLOW LIMITER/O-RING SEALS	FAR 27-04206-1	640519	FACTORY	YES NO	STERER 13000	095469
FAILURE MODE-STRUCTURAL. DURING RECEIVING INSPECTION THE VALVE, WITH NO PRESSURE APPLIED, LEAKED HYDRAULIC OIL THROUGH THE VALVE BODY. CAUSE OF LEAKAGE WAS AN INTERGRANULAR STRESS CORROSION ATTACK ON THE VALVE BODY. A SHREDDED STATIC O-RING WAS ALSO UNCOVERED DURING DISASSEMBLY. THIS FLOW LIMITER HAD BEEN REWORKED BY THE VENDOR TO REPLACE THE RUBBER PRODUCTS. CORRECTIVE ACTION-GD/C SURVEYED ALL THE IMPROPERLY REWORKED FLOW LIMITERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	89A1904.4 HYDRAULIC PUMP	UTP-PRT 27-08590-3	640510	CONVAIR	YES NO	VICKERS AA-90410-L-2	097027
FAILURE MODE-OUT OF TOLERANCE. DURING POST PRT VIBRATION PROOF CYCLE TRANSIENT RESPONSE TEST, THE UNIT FAILED TO REGULATE THE FLUID DELIVERY FROM FULL FLOW TO ZERO FLOW IN THE REQUIRED TIME OF 0.05 SEC. THE ACTUAL TIMES VARIED BETWEEN 0.075 TO 0.065 SEC. REF. S/N 303-0581. CORRECTIVE ACTION-TEST CONTINUED. PUMP CANNOT PASS THE TESTS USING THE PRESENT SPECIFICATION PUMP RESPONSE REQUIREMENTS. REF. FPR FR 654-2-429 SCN NO.14170 CHANGES THE PUMP REQUIREMENTS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1804.4 PUMP	UTP-PRT 27-08580-3	640914	CONVAIR	YES NO	VICKERS AA-60410-L-2	087025
FAILURE MODE-OUT OF TOLERANCE. DURING THE IAT TRANSIENT RESPONSE TEST THE UNIT FAILED TO REGULATE THE FLUID DELIVER Y FROM FULL FLOW TO ZERO FLOW IN THE REQUIRED TIME OF 0.05 SEC. THE ACTUAL TIMES VARIED BETWEEN 0.080 TO 0.085 SEC. REF. S/N 303-0331.							
CORRECTIVE ACTION-TEST CONTINUED. PUMP CANNOT PASS THE TESTS USING THE PRESENT PUMP SPECIFICATION TRANSIENT RESPONS E REQUIREMENTS. REF. FPR FR 654-2-429 SCN NO. 14170 CHANGES THE PUMP REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-10-248-C PRESSURE GAGE	FAR 27-08562-3	1510 640508	FACTORY		ROCHESTER GAGE 6903-719-1	086460
FAILURE MODE-LEAK INTERNAL, DUE TO DEFECTIVE BRAZING OF THE BOURDON TUBE TO THE DIAL INDICATOR JOINT.							
CORRECTIVE ACTION-ROCHESTER GAGE TO USE GENERAL ELECTRIC HALOGEN LEAK DETECTOR FOR WELD INSPECTION. MINIATURIZED WE LD TIPS TO BE BE USED WITH HYDROGEN AS WELDING GAS. CHANGE FLUX MATERIAL AND USE CONTROLLED ATMOSPHERE DURING TUBE H EAT TREATING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6901917.3 HYDRAULIC FLEX HOSE ASSY.	UTP-PRT 27-08571-5	640508	OTHER	YES NO	AEROQUIP 677341-6-0213	087017
FAILURE MODE-STRUCTURAL. DURING THE OVER TORQUE TEST THE UNIT FAILED WHEN THE FLANGE EXPANDED BENEATH THE B NUT AND PREVENTED THE NUT FROM ROTATING AFTER 8 OVERTORQUE APPLICATIONS. REQ. IS 15 MIN OVERTORQUE APPLICATIONS. REF. FPR M R F-4273 ST S/N305-1790.							
CORRECTIVE ACTION-TEST TERMINATED. HOSE REPLACED AND TEST RERUN. OVERTORQUE IS NOT NORMAL FOR HOSE INSTALLATION ON VEHICLE. REF. FRR FR 654-2-217.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-254-F HYDRAULIC FLEX HOSE ASSEMBLY	FAR 27-08571-55	2660 640508	FACTORY	YES NONE	AEROQUIP 677160-6-0226	086476
FAILURE MODE-CONTAMINATION. FLEXHOSE FAILED DURING LEAK CHECK NEAR THE OFFSET END FITTING DUE TO CONTAMINATION.							
CORRECTIVE ACTION-FAILURE WAS CONFIRMED DUE TO CONTAMINATION OF SEAL AREA. VENDOR WAS NOTIFIED TO CORRECT ASSEMBLY PROCEDURES TO PREVENT CONTAMINATION.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.3 PUMP, FLANGE	UTP-PRT 27-08590-3	640505	CONVAIR	YES NO	VICKERS AA-60410-L-R	097084

FAILURE MODE-STRUCTURAL-DURING SECOND AXIS PRT VIBRATION SWEEP AT A FREQUENCY OF 17 CPS ALL FOUR MOUNTING EARS ON T HE UNIT FRACTURED AND THE MAIN BODY FELL TO THE BOTTOM OF THE TEMPERATURE CHAMBER. REF FPR NR 42805T S/N 110-0223.

CORRECTIVE ACTION-TEST TERMINATED SINCE THE FAILED PUMP WAS SUBJECTED TO THREE SHOCK LOADS DUE TO THE DUMPING OF TH E VIBRATION SYSTEM. THE TEST IS TO BE RERUN WITH A NEW PUMP REF. FRR FR 651-2-284.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.2 SUSTAINER ACTUATOR ASSEMBLY, SERVO VALVE	UTP-ETT 27-05314-017	640505	60/C	YES NO	LIONEL PACIFIC	096040

FAILURE MODE-OUT OF TOLERANCE- DURING POST VIBRATION PROOF CYCLE THE SERVO VALVE NULL CURRENT WAS-0.50 MA. REQ. IS 0.20 MA. MAX. THE FAILURE WAS CAUSED BY A MOVEMENT OF THE TARGET SCREW IN VALVE. REF. FPR NR F-4283 ST S/N 305-0640.

CORRECTIVE ACTION-TEST CONTINUED. THE IMPROPER SOLDERING OF THE TARGET SCREW IS A VENDOR QUALITY CONTROL PROBLEM. A SOLDER CHECK PROCEDURE IS BEING WORKED OUT. REF. FRR FR 654-2-017.

HYDRAULIC-A/B SUSTAINER/VERNIER	H-99-04-4794-F SERVO VALVE, O-RING SEAL	FAR 27-04208-1	640504	FACTORY	YES NO	CADILLAC FC-27-388A	095746

FAILURE MODE-LEAK EXTERNAL. DURING ASSEMBLY FUNCTIONAL CHECKING THE SERVOVALVE REPORTEDLY LEAKED HYDRAULIC OIL AT T HE RATE OF 40 DROPS PER MINUTE FROM THE NULL ADJUSTMENT SCREW HOLE. LEAKAGE WAS DUE TO DAMAGED O-RING SEALS THAT WER E CUT ON THREADS OF THE NULL ADJUSTMENT SCREW. THREADS WERE CUT TOO DEEP THAN NORMAL. THE VENDORS DRAWING CALLOUT ON LY LISTED A MINIMUM DEPTH.

CORRECTIVE ACTION-VCAR ISSUED TO CADILLAC TO ADD A DIMENSION FOR MAXIMUM NULL ADJUSTMENT SCREW HELI-COIL THREAD DEP TH ON CADILLAC DRAWING 18202. THE NEW REQUIREMENTS ARE 0.320 INCH MINIMUM AND 0.390 INCH MAXIMUM. CADILLAC GAGE ALSO CHECKED ALL SERVO VALVE HOUSINGS IN STOCK AND IN PROGRESS TO ASSURE COMPLIANCE WITH THESE NEW REQUIREMENTS.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-90-04-4788-F ACTUATOR ASSEMBLY, O-RING SEALS	FAR 27-05312-005	3500 640501	WTR	YES NO	LIONEL PACIFIC	

FAILURE MODE-OUT OF SPECIFICATION. DURING ENGINE GIMBALLING TESTS, THE UNIT LEAKED IN EXCESS OF THE SPECIFICATION L IMITS OF 1 DROP PER 25 CYCLES. FAILURE BELIEVED DUE TO THE FLAKING OF THE CHROME PLATING CONTAMINATING THE O-RING SU RFACES.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VCAR TO LIONEL PACIFIC REQUESTING THEM TO CORRECT THE CHROME PLATING. PROCEDURE TO ELIMINATE THE FLAKING PROBLEM.							000147
HYDRAULIC-A/B SUSTAINER/VERNIER	2743478 SERVO VALVE, FEEDBACK TRANSDUCER	UTP-PET 27-04204-1	840430	GD/C	YES NO	CRESCENT MC-108-4E	000300
FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. IMMERSION TEST, INSULATION RESISTANCE WAS OUT OF SPECIFICATION (READIN G 20 KILOHMS VS. SPECIFICATION OF GREATER THAN 100 MEGOHMS). REFER TO FRR 138. TEST SPECIMENS S/N 401-1418 (LOT 23) AND S/N 403-1438(LOT 28).							
CORRECTIVE ACTION-LOTS 23 AND 28 WERE REJECTED TO VENDOR. VENDOR REQUIRED TO PERFORM IMMERSION TEST ON ALL UNITS BE FORE BEING SENT TO GD/C. VCAR PROCESSED, VENDOR TO CHANGE TO AN EPOXY SEAL BETWEEN CONNECTOR FLANGE AND MOUNTING FLA NGE. NO APPARENT IMPROVEMENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4810-F ACTUATOR-VERNIER	FAR 27-08573-3	840430	FACTORY	YES NO	LIONEL PACIFIC 2792-2	003025
FAILURE MODE-EXTERNAL LEAK. DURING PROOF TESTING AT 4000 PSIG IN RECEIVING INSPECTION, THE ACTUATOR LEAKED HYDRAULI C OIL AT THE RATE OF 3 DROPS PER MINUTE. FAILURE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS. THE FELT LUBRICATOR WASHERS COULD HAVE INTERFERED WITH SEALING AND CAUSED THE LEAKAGE.							
CORRECTIVE ACTION-A DESIGN CHANGE WAS RECOMMENDED TO ADD A TEFLON WIPER. ACTION PER ECP 3448 HAS RECEIVED CUSTOMER APPROVAL. TEFLON WIPERS WILL REPLACE FELT WIPERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6991917.3 HYDRAULIC FLEX HOSE ASSY	UTP-PRT 27-08571-5	840429	OTHER	YES NO	AEROQUIP 677341-6-0213	007010
FAILURE MODE-STRUCTURAL-DURING THE OVER TORQUE TEST THE UNIT FAILED WHEN THE FLANGE EXPANDED BENEATH THE B NUT AND PREVENTED THE NUT FROM ROTATING AFTER 2 OVER TORQUE APPLICATIONS. REQ. IS 15 MIN. OVERTORQUE APPLICATIONS. REF. FPR NR F-4252 ST S/N 202-1696.							
CORRECTIVE ACTION-TEST TERMINATED HOSE REPLACED AND TEST RERUN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4789-F ACTUATOR/VALVE-SERVO	FAR 27-65314-010	1740 840429	FACTORY	YES NO	LIONEL PACIFIC	
FAILURE MODE-OUT OF TOLERANCE-DURING RECEIVING INSPECTION TESTING THE SERVO CYLINDER ASSEMBLY DID NOT MEET THE SPEC IFICATION FREQUENCY RESPONSE LIMITS. IT WAS ALSO REPORTED THAT THE SERVO CYLINDER BOTTOMED OUT IN THE EXTENDED POSIT							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
NOT TO DRAWING DIMENSIONS.							000145
CORRECTIVE ACTION-CADILLAC GAGE INITIATED INSPECTION OF THE TORQUE MOTOR AREA JUST BEFORE FINAL ASSEMBLY OF THE CAP TO PRECLUDE ANY CONTAMINATION BEING PRESENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SR-27-2027 SUSTAINER HYDRAULIC TANK, O-RING	UTP-PET 27-30552-3	640428	CONVAIR	YES NO	BENSON 09035	005610
FAILURE MODE-INTERNAL LEAKAGE. DURING TEMPERATURE AND LIFE CYCLING TESTS THE GAS PRECHARGE LEAKAGE ACROSS THE PISTON O-RING WAS 22 ML./HR. REQ. IS 2ML./HR. MAX. AND WAS CAUSED BY SMALL CUTS AND PINHOLES IN THE MS28775 O-RING. THE TANK WAS HEAVILY CONTAMINATED. REF. FRR FR654- 2-203 S/N 309-0372.							
CORRECTIVE ACTION-NONE-HYDRAULIC TEST SYSTEM CLEANED UP.							
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-167 SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-010	1350 640427	CX36A	YES NO	LIONEL PACIFIC	001300
FAILURE MODE-EXTERNAL LEAK. DURING A SURVEILLANCE INSPECTION THE ACTUATOR ASSEMBLY WAS OBSERVED TO BE LEAKING HYDRAULIC FLUID IN EXCESS OF 1 DROP IN 24 HOURS. THE PRESSURE WAS STANDBY RESERVOIR PRESSURE OF 100 PSIG. THE REPORTED FAILURE WAS NOT REPEATED DURING EXTENSIVE FAILURE ANALYSIS TESTING. THE REPORTED FAILURE MAY HAVE BEEN CAUSED BY CONTAMINANTS ON THE O-RING AS A HIGH LEVEL OF CONTAMINATION WAS FOUND DURING THE FAILURE ANALYSIS.							
CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-10-250-F MANUALLY-OPERATED TWO WAY HYDRAULIC FLOW-CONTROL VALVE	FAR 27-08960-3	3550 640422	FACTORY	NO NO	STERER 12060	000510
FAILURE MODE-ERRATIC OPERATION. DUE TO INCORRECT OPERATION OF THE VALVE. THE VALVE WAS NOT CORRECTLY MANUALLY POSITIONED.							
CORRECTIVE ACTION-NO FAILURE. VALVE WAS NOT CORRECTLY OPERATED. FACTORY EQUIPMENT OPERATING PROCEDURES WERE REVISED TO REQUIRE A FULL 90 DEGREE ACTUATION OF MANUALLY OPERATED CAM.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4770-F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05314-021	49F 640422	FACTORY	YES NO	LIONEL PACIFIC	
FAILURE MODE-STRUCTURAL. DURING A RECEIVING INSPECTION FUNCTIONAL TEST THE PISTON OF THE SERVO CYLINDER WENT HARD OVER WHEN PRESSURE WAS APPLIED AND THE SERVO CYLINDER FAILED TO RESPOND TO ANY INPUT SIGNAL. CAUSE WAS DUE TO THE SP							

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ACER IN THE SERVO VALVE SPOOL BEING RECESSED. THIS BLOCKED THE CONTROL PORTS MAKING THE PRESSURE ON THE DAMPING END OF THE SPOOL LOW. THE CAUSE OF THE VALVE SPOOL BEING RECESSED WAS DUE TO INADVERTENT OVERPRESSURIZATION OF THE RETURN SYSTEM DURING THE INITIAL PHASES OF THE FUNCTIONAL TEST.							005540
CORRECTIVE ACTION-GD/C RECEIVING INSPECTION AND QUALITY CONTROL APPRISED OF THE FAILURE AND CAUSE. QUALITY CONTROL WAS REQUESTED TO REVIEW THE TEST EQUIPMENT AND PROCEDURE TO ENSURE SIMILIAR FAILURES DO NOT RECUR.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3387 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04206-1	640421	GD/C		YES STERER NO 13000	005601
FAILURE MODE-STRUCTURAL. LEAKAGE NOTED COMING FROM SPECIMEN WALLS DURING 200 HOUR P.E.T. LIFE TEST. SMALL CRACKS WERE NOTED IN SPECIMEN. LOT 19 REJECTED. REFER TO F 5107 AND FRR 270. TEST SPECIMEN S/N 401-1650.							
CORRECTIVE ACTION-ADDITIONAL SAMPLES TAKEN FROM LOT AND SUBJECTED TO LIFE CYCLING TEST ALL FAILED. THE PRESENT TEST SETUP AND PROCEDURES ARE BEING REVISED DUE TO IMPROPER CYCLING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3387 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04206-1	640421	GD/C		YES STERER NO 13000	005609
FAILURE MODE-STRUCTURAL. CAUSED LEAK COMING FROM SPECIMEN WALLS DURING 200 HR. P.E.T. LIFE TEST. SMALL CRACKS WERE NOTED IN SPECIMEN. LOT 18 REJECTED. REFER TO F5090 AND FRR270. TEST SPECIMEN S/N 304-1632.							
CORRECTIVE ACTION-ADDITIONAL SAMPLES WERE TAKEN FROM LOT AND SUBJECTED TO LIFE CYCLING TEST. ALL FAILED. THE PRESENT TEST SETUP AND PROCEDURE ARE BEING REVISED DUE TO IMPROPER CYCLING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	JV-99-10-233F HYDRAULIC HOSE	FAR 27-08582-3	3530 640420	FACTORY		YES RESISTOFLEX NO R21328-3	006478
FAILURE MODE-LEAK EXTERNAL-STEADY DRIP OF HYDRAULIC FLUID DURING PRESSURE CHECK.							
CORRECTIVE ACTION-VENDOR WAS INFORMED TO INSPECT FLEX HOSE TEFLON LINERS FOR IMPERFECTIONS WHICH RESULTED IN LEAKAGE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.8 PUMP	UTP-PET 27-08590-3	640418	CONVAIR		YES VICKERS NO AA-80410-L-2	
FAILURE MODE-OUT OF TOLERANCE. DURING PERFORMANCE TESTS THE UNIT FAILED TO REGULATE THE FLUID DELIVERY FROM FULL FLOW TO ZERO FLOW IN THE REQUIRED TIME OF 0.08 SEC. THE ACTUAL TIMES VARIED BETWEEN 0.070 TO 0.080 SEC. REF FPR NR 427							

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4ST S/N 110-0223.							697023
CORRECTIVE ACTION-TEST CONTINUED. PUMP CAN NOT PASS THE TESTS USING THE PRESENT PUMP SPECIFICATION TRANSIENT RESPONSE REQUIREMENTS. REF. FPR FR 654-2-284 FR 654-2-428 SCN NO. 14170 CHANGES THE PUMP REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.2 SUSTAINER ACTUATOR ASSEMBLY, ORIFICE PLUG	UTP-ETT 27-85314-017	640418	GD/C	YES NO	LIONEL PACIFIC	696047
FAILURE MODE-INTERNAL LEAKAGE-WHILE PREPARING TO RUN THE SINE/RANDOM VIBRATION ON THE UNIT IN THE Z-AXIS UNIT FAILED TO RESPOND TO AN ELECTRICAL INPUT SIGNAL. THIS WAS CAUSED BY THE BY PASS ORIFICE PLUG IN THE PISTON COMPLETELY BACKING OUT. IT WAS NOTED THAT THE VENDOR NYLON LOCK WAS MISSING FROM THE PLUG. REF. FPR NR F-4238 ST S/N 305-0846.							
CORRECTIVE ACTION-THE UNIT WAS REPAIRED BY REINSERTING THE ORIFICE PLUG IN THE PISTON AND STAKING IT IN. TEST CONTINUED. THE VENDOR WILL TORQUE THE PLUG TO A MINIMUM OF 4 IN/LB RUNNING TORQUE AND A BOTTOMING TORQUE OF 100 IN/LB. TORQUE VERIFICATION SHALL BE STAMPED BY THE VENDOR INSPECTION ON THE VENDOR IAT DATA REPORT AND ACKNOWLEDGED BY GD/C OPI. REF. FRR FR 654-2-247 A.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-08-31817 CHECK VALVE, O-RING	FAR 27-08565-1C	751 640418	FACTORY	YES NO	CIRCLE SEAL PS-319	696057
FAILURE MODE-EXTERNAL LEAKAGE. A LEAK OF 150 C.C. PER MINUTE WAS CAUSED BY A MISSING GASKET. DURING O-RING REPLACEMENT THE GASKET WAS ERRONIOUSLY OMITTED AT REASSEMBLY.							
CORRECTIVE ACTION-CONFIRMED. SHOP PERSONNEL WERE REQUESTED TO DISASSEMBLE CHECK VALVES ONLY IN THE CLEAN ROOM AND WERE INSTRUCTED THE IMPORTANCE OF FOLLOWING SPECIFIC INSTRUCTIONS. REFERENCE C.A. MEMO OF JUNE 9,1966.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.2 SUSTAINER ACTUATOR ASSY	UTP-ETT 27-85314-017	640414	GD/C	YES NO	LIONEL PACIFIC	696048
FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF SINE/RANDOM VIBRATION IN Y-AXIS, THE ACTUATOR BODY WAS FOUND TO HAVE ROTATED ABOUT THE ROD ENDS. THIS WAS CAUSED BY A LOOSE GLAND LOCKNUT. REF. S/N 305-0846.							
CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE GLAND END LOCKNUT TO 100 FT-LBS. CONTINUE TEST.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.2 SUSTAINER ACTUATOR ASSY.	UTP-ETT 27-85314-817	640414	60/C	YES NO	LIONEL PACIFIC	096645
FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF SINE/RANDOM VIBRATION IN Y-AXIS THE ACTUATOR BODY WAS FOUND TO HAVE ROTATED ABOUT THE ROD ENDS. THIS WAS CAUSED BY A LOOSE GLAND LOCK NUT. REF. S/N 305-0851.							
CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE GLAND END LOCKNUT TO 100 FT-LBS. CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.2 SUSTAINER ACTUATOR ASSY.	UTP-ETT 27-85314-817	640414	60/C	YES NO	LIONEL PACIFIC	096644
FAILURE MODE-STRUCTURAL-DURING EQUALIZING FOR PRT RANDOM VIBRATION IN X-AXIS, THE ACTUATOR BODY ROTATED ABOUT THE ROD ENDS. THIS WAS CAUSED BY A LOOSE GLAND LOCKNUT. REF. S/N 305-0849.							
CORRECTIVE ACTION-REALIGN THE ACTUATOR BODY WITH THE ACTUATOR ROD ENDS AND RETORQUE THE GLAND END LOCKNUT TO 100 FT-LBS. CONTINUE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6991905.1 HYDRAULIC FLEX HOSE ASSY.	UTP-PRT 27-08571-43	640413	OTHER	YES NO	AERQUIP 677L25-8-016.	097034
FAILURE MODE-STRUCTURAL-AT THE CONCLUSION OF THE OPERATING PRESSURE CYCLES IT WAS NOTED THAT BOTH ENDS OF THE HOSE WERE DISTORTED. THE HOSE WAS SWOLLEN APPROXIMATELY 3/4 INCH FROM EITHER END. REF. FPR NR F-4235 AT S/N 109-1247.							
CORRECTIVE ACTION-NONE-THE UNIT WITHSTOOD A PROOF PRESSURE OF 6000 PSIG WITH 275 DEGREE F. OIL WITHOUT LEAKING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-90-10-248-F CHECK VALVE	FAR 27-08363-8	3810 640400	COMPLEXE	YES NO	KOHLER R1247-6	098479
FAILURE MODE-LEAK INTERNAL, POSSIBLE CAUSED BY HARD CONTAMINANTS THAT HELD THE VALVE POPPET OPEN AND NICKED THE SEAT.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. CONTAMINANT PARTICLES WERE WITHIN SPECIFICATION LIMITS. NO FURTHER ACTION.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-04-4768F ACTUATOR ASSEMBLY, O-RING SEALS	FAR 27-8551 -808	350D 640407	WTR	YES NO	LIONEL PACIFIC	095540

FAILURE MODE-CONTAMINATION-DURING SURVEILLANCE INSPECTION OF THE MISSILE, LEAKAGE IN EXCESS OF ONE DROP IN 24 HOURS UNDER STATIC CONDITIONS WAS NOTED. FAILURE WAS DUE TO SMALL PARTICLES OF CONTAMINATES ON THE O-RING CAUSING OUT OF SPECIFICATION LEAKAGE THAT WAS INSIGNIFICANT.

CORRECTIVE ACTION-VCAR ISSUED TO LIONEL PACIFIC TO ENSURE THAT O-RING INSTALLATIONS MEET GD/C, MS-28775, AND MIL-P-25732A REQUIREMENTS. 350D WAS 157D.

HYDRAULIC-A/B SUSTAINER/VERNIER	2ZH64-014/DA1008/L3-4MO-01-351 CHECK VALVE	COMPOSITE-FRD/DPL 27-08560-9	351D 640404	8-3	YES NO	KOHLER K-1247-6	097100

FAILURE MODE-LEAK, INTERNAL. THE CHECK VALVE WHICH ISOLATES THE VERNIER SOLO ACCUMULATOR FROM THE HPU WAS LEAKING, ALLOWING HYDRAULIC FLUID TO ENTER THE VERNIER SOLO ACCUMULATOR.

SYSTEM EFFECT-ERRATIC OPERATION-ABNORMAL PRESSURE DECAY WAS NOTED AFTER HPU SHUTDOWN.

VEHICLE EFFECT-COUNTDOWN DELAYED.

CORRECTIVE ACTION-THE CHECK VALVE WAS REPLACED AND A HYDRAULIC FILL AND BLEED PERFORMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4785F SUSTAINER ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85314-819	156D 640404	FACTORY	YES NO	LIONEL PACIFIC	095759

FAILURE MODE-OUT OF TOLERANCE-DURING FINAL ACCEPTANCE CHECKOUT THE ACTUATOR ASSEMBLY ACTIVE AND INACTIVE NULL FEEDBACK VOLTAGES WERE PLUS 0.405 VOLT AND PLUS 0.375 VOLT. MAXIMUM SPECIFICATION LIMITS ARE 0.400 VOLT AND 0.350 VOLT. FAILURE WAS DUE TO THE INCOMPATIBILITY OF THE IOC TEST EQUIPMENT SERVO AMPLIFIERS TO ADJUST THE A16 SERVO ASSEMBLIES.

CORRECTIVE ACTION-GD/C REDESIGNED THE TEST EQUIPMENT TO INCLUDE A16 TYPE SERVO AMPLIFIERS USED ON MOST ATLAS MISSILES AND SPACE BOOSTERS.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4736F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-85314-817	7101 640404	FACTORY	NO NO	LIONEL PACIFIC	

FAILURE MODE-OUT OF TOLERANCE. UNIT REJECTED FOR EXCESSIVE INACTIVE NULL FEEDBACK VOLTAGE. FAILURE ATTRIBUTED TO THE TEST CONSOLES INABILITY TO CONDUCT TESTS USING EITHER AN A16 OR AN IOC TYPE SERVOAMPLIFIER. THE UNIT FAILED USING AN A16 AMPLIFIER, BUT PASSED USING AN IOC TYPE AMPLIFIER.

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CORRECTIVE ACTION-REDESIGN OF THE TEST CONSOLE TO ACCOMMODATE EITHER TYPE AMPLIFIER WAS INITIATED.							891375
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3432 FEEDBACK TRANSDUCER, CONNECTOR	UTP-PET 27-04211-1	640402	GD/C	NO NO	CRESCENT HC-87P-4E	897170
FAILURE MODE-DURING PET TEST-PROOF CYCLES B AT 500 DEGREES F TRANSDUCER OUTPUT JUMPED TO 4.5 VOLTS RMS. SIMILAR FAILURE OCCURRED 64/4/14. TEST SPECIMEN S/N401-1760, LOT 28, REFER TO FRR 320.							
CORRECTIVE ACTION-USE OF INADEQUATE TEST CONNECTOR WAS REASON FOR FAILURE AT 500 DEGREES F. TEST PROCEDURE CORRECTED TO CALLOUT CORRECT CONNECTOR.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4790-C ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05311-809	195D 640402	FACTORY	YES NO	LIONEL PACIFIC	890148
FAILURE MODE-OUT OF TOLERANCE-DURING A FLIGHT CONTROL SYSTEMS CHECKOUT THE VERNIER YAW SERVOCYLINDER ASSEMBLY NULL FEEDBACK VOLTAGE EXCEEDED THE SPECIFICATION LIMITS. VOLTAGE WAS 0.340 VOLT AS COMPARED TO THE MAXIMUM ALLOWABLE OF 0.250 VOLTS. FAILURE DUE TO A LOOSE SERVOVALVE NOZZLE TARGET SCREW THAT WAS NOT STAKED WITH A BRAZE.							
CORRECTIVE ACTION-CADILLAC GAGE IMPROVED ASSEMBLY AND INSPECTION PROCEDURES TO ASSURE TARGET SCREWS ARE PROPERLY AND SECURELY BRAZED. GD/C SURVEYED ALL CADILLAC GAGE SERVO VALVES AND INSPECTED THEM FOR PROPERLY SECURED CONTROL NOZZEL TARGET SCREWS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-244-F SUSTAINER HYDRAULIC TANK	FAR 27-08552-5	181D 640331	FACTORY	YES NO	BENBOW MFG 68036	890506
FAILURE MODE-LEAK EXTERNAL. LEAK REPORTED WHEN TANK WAS PRESSURIZED TO 80 PSIG. CAUSE AND SOURCE OF LEAKAGE NOT DETERMINED.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. NO FURTHER ACTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6901917.1 HYDRAULIC FLEX HOSE ASSY.	UTP-PRT 27-08571-5	640331	OTHER	YES NO	AEROQUIP 677341-6-0213	897035
FAILURE MODE-STRUCTURAL-DURING THE OVERTORQUE TEST, THE UNIT FAILED WHEN THE FLANGE EXPANDED BENEATH THE B NUT AND PREVENTED THE NUT FROM ROTATING AFTER A OVERTORQUE APPLICATION. REQ. IS 18 MIN. REF. FPR NR P-4210 BY S/N R08-1770.							
CORRECTIVE ACTION-TEST TERMINATED. HOSE REPLACED AND TEST RERUN.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-168 ACTUATOR ASSEMBLY O-RING	FAR 27-85314-819	135D 840327	36A	YES NO	LIONELPACIFIC	092719
FAILURE MODE-EXTERNAL LEAK. THE FORWARD SEAL OF THE ACTUATOR WAS FOUND TO BE LEAKING 20 DROPS PER HOUR AT 100 PSIG. THE FAILURE WAS CONFIRMED AND WAS CAUSED BY A DEFECTIVE FORWARD-END STATIC O-RING. THE O-RING WAS FOUND TO BE BELOW SPECIFICATION REQUIREMENTS OF MIL-P-25732A AND IT SHOWED SURFACE ABRASION CAUSED BEFORE OR DURING INSTALLATION.							
CORRECTIVE ACTION-CORRECTIVE ACTION HAS BEEN TAKEN PRIOR TO THIS FAILURE WHICH WILL ELIMINATE THIS PROBLEM FOR FUTURE ACTUATORS. REF. RAR A-A9-04-3804 AND RAR A-90-04-3838. NO FURTHER ACTION IS REQUIRED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4758-F ACTUATOR	FAR 27-85312-805	114-F 840324	FACTORY	YES NO	LIONEL PACIFIC	090831
FAILURE MODE-LEAK-EXTERNAL. THE VERNIER SERVOCYLINDER WAS REJECTED DURING FINAL CHECKOUT DUE TO LEAKAGE WHILE OPERATING AT 3000PSIG WHILE ACTUATING THE VERNIER ENGINE. FAILURE COULD NOT BE CONFIRMED DURING FAILURE ANALYSIS.							
CORRECTIVE ACTION-NONE-FAILURE CAUSE COULD NOT BE CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-10-242-F FLARED TUBE, CROSS	FAR 27-85337-9	114F 840318	FACTORY	YES NO	GD/C	090509
FAILURE MODE-LEAK EXTERNAL-LEAK CAUSED BY MACROSCOPIC VOIDS IN THE PARENT MATERIAL.							
CORRECTIVE ACTION-GD/C SPECIFIED 321 STAINLESS STEEL AND PRECLUDED FURTHER USE OF 303 STAINLESS STEEL FOR FABRICATION OF FUTURE PARTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	89A1904.2 PUMP	UTP-ETT 27-08390-3	840318	CONVAIR	YES NO	VICKERS AA-60410-L-2	097007
FAILURE MODE-OUT OF TOLERANCE. DURING PERFORMANCE TESTS THE UNIT FAILED TO REGULATE FLUID DELIVERY FROM FULL FLOW TO ZERO FLOW IN THE REQUIRED TIME OF 0.03 SEC. THE ACTUAL TIMES VARIED BETWEEN 0.080 TO 0.088 SEC. REF. FPR NR P-4216 3T REV A S/N 308-0368.							
CORRECTIVE ACTION-TEST CONTINUED- PUMP CANNOT PASS THE TESTS USING THE PRESENT PUMP SPECIFICATION TRANSIENT RESPONSE REQUIREMENTS. REF. FPR FR 654-2-224, FR 654-2-420. ECN NO.14170 CHANGES THE PUMP REQUIREMENTS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-89-04-4733F VERNIER ACTUATOR ASSEMBLY, O-RING	FAR 27-08574-80?	77E 640312	FACTORY	YES NO	LIONEL-PACIFIC	691574
FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR EXTERNAL LEAKAGE. FAILURE ATTRIBUTED TO A DAMAGED TEFLON BACKUP RING.							
CORRECTIVE ACTION-VENDOR NOTIFIED WHICH RESULTED IN ALERTING HIS PRODUCTION AND INSPECTION PERSONNEL TO TAKE GREATE R CARE DURING ASSEMBLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-246-F FILTER	FAR 27-08564-803	640311	GD/C REC . INSP	YES NO	PUROLATOR 64988-1	698481
FAILURE MODE-CONTAMINATION-DUE TO FOREIGN MATERIAL FOUND BONDED ON FILTER ELEMENT. FOREIGN MATERIAL WAS ALUMINUM, A ND LOCATED ON UPSTREAM SIDE OF FILTER ELEMENT.							
CORRECTIVE ACTION-GD/C SUSPENDED PURCHASES OF FILTERS FROM THIS SOURCE. NEW SOURCE IS MICROPOROUS FILTER COMPANY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.2 PUMP	UTP-ETT 27-08590-3	640309	CONVAIR	YES NO	VICKERS AA-60410-L-2	697008
FAILURE MODE-OUT OF TOLERANCE. DURING PERFORMANCE TESTS THE UNIT FAILED TO REGULATE FLUID FLOW DELIVERY FROM FULL F LOW TO ZERO FLOW IN THE REQUIRED TIME O 0.05 SEC. THE ACTUAL TIMES VARIED BETWEEN 0.075 TO 0.066 SEC. REF. FPR NR F-4216ST REV A S/N 303-0333.							
CORRECTIVE ACTION-TEST CONTINUED- PUMP CANNOT PASS THE TESTS USING THE PRESENT PUMP SPECIFICATION TRANSIENT RESPONS E REQUIREMENTS. REF FRR FR 654-2-224, FR 654-2-429. SCN NO.14170 CHANGES THE PUMP REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.2 PUMP	UTP-ETT 27-08590-3	640221	CONVAIR	YES NO	VICKERS AA-60410-L-2	697009
FAILURE MODE-OUT OF TOLERANCE. DURING PERFORMANCE TESTS THE UNIT FAILED TO REGULATE FLUID DELIVERY FROM FULL FLOW T O ZERO FLOW IN THE REQUIRED TIME OF 0.05 SEC. THE ACTUAL TIMES VARIED BETWEEN 0.088 TO 0.070 SEC. REF. FPR NR F-4216 ST REVISION A S/N 303-0350.							
CORRECTIVE ACTION-TEST CONTINUED. PUMP CAN NOT PASS THE TESTS USING THE PRESENT PUMP SPECIFICATION TRANSIENT RESPON SE REQUIREMENTS. REF. FPR FR 654-2-224, FR 654-2-429. SCN NO. 14170 CHANGES THE PUMP REQUIREMENTS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4694-F ACTUATOR ASSEMBLY, SCREW	FAR 27-05318-003	3500 640219	FACTORY	YES NO	LIONEL PACIFIC	894028

FAILURE MODE-STRUCTURAL. THE VERNIER 2 PITCH SERVOCYLINDER WAS FOUND TO BE OUT OF TOLERANCE WITH AN INACTIVE NULL OF 0.280 VOLT. THE MAXIMUM ALLOWABLE IS 0.250 VOLT. ANALYSIS ATTRIBUTED THE FAILURE TO AN INADEQUATE SOLDER JOINT WHICH ALLOWED THE TARGET SCREW TO ROTATE AFTER FINAL ADJUSTMENT.

CORRECTIVE ACTION-CADILLAC GAGE REVISED THEIR VALVE DRAWINGS TO SPECIFY KESTER 44 60-40 SOLDER JOINT CAPABLE OF WITHSTANDING 5 IN-OZ TORQUE APPLIED TO THE SCREW IN EACH DIRECTION. ASTRONAUTICS INITIATED SURVEY 97-64 TO CHECK THE TARGET SCREW SOLDER BOND ON ALL CADILLAC GAGE SERVOVALVES.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4785F SERVO VALVE	FAR 27-04209-1	640218	FACTORY	YES NO	CADILLAC GAGE FC-27-397A	893027

FAILURE MODE-OUT OF TOLERANCE. THE SERVO VALVE WAS REJECTED FOR LOW OUTPUT AT 20 CYCLES. THE FAILURE WAS DUE TO INSUFFICIENT POWER SPOOL DAMPING CAUSED BY A GOUGED O-RING.

CORRECTIVE ACTION-VENDORS IN-PROCESS INSPECTION WAS UP-GRADED.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4688-F ACTUATOR ASSEMBLY, O-RING	FAR 27-08573-3C	640218	FACTORY	YES NO	CLEMCO 2732-2	892647

FAILURE MODE-LEAK-EXTERNAL. THE VERNIER ACTUATOR ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID FROM THE PISTON SHAFT O-RING SEAL IN THE STATIC CONDITION.

CORRECTIVE ACTION-PERSONNEL WERE INSTRUCTED TO CAREFULLY FOLLOW ASTRONAUTICS RCS 140-70-1 SUPPL 3 TO PRECLUDE RECURRENCE OF THIS PROBLEM.

HYDRAULIC-A/B SUSTAINER/VERNIER	Z7-3298 VALVE, SAFETY RELIEF	UTP-PET Z7-08569-1	640217	CONVAIR	YES NO	DENSON 9212D	897036

FAILURE MODE-OUT OF TOLERANCE. PART S/N 305-0718 FAILED TO MEET 30 PSIG PRESSURE DIFFERENTIAL (FULL FLOW VS CRACKING PRESSURE) IN ONE OF THREE POST LIFE TEST PROOF CYCLES. REF. FPR 5060, S/N 318-0766, FPR-5062, S/N401-0760, FPR-5063.

CORRECTIVE ACTION-REF. FR 656-2-140. ECP 7663 SUBMITTED TO REVISE SPECIFICATION 27-08501 TO DELETE THE REQUIRED 30 PSID DIFFERENTIAL PRESSURE TEST BETWEEN CRACKING AND FULL FLOW.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-BB-J4-47(4F ACTUATOR-O-RING	FAR 27-05311-809	2300 640218	ETR	YES NO	LIONEL PACIFIC	085701

FAILURE MODE-LEAK EXTERNAL-THE VERNIER ACTUATOR WAS REJECTED WHEN POOLS OF OIL WERE FOUND IN THE FAIRING SURROUNDIN G IT. SLIGHT LEAKAGE WAS OBSERVED DURING FAILURE ANALYSIS. THE LEAKAGE WAS ATTRIBUTED TO THE USE OF A SUBSTANDARD O-RING WITH SURFACE DEFECTS.

CORRECTIVE ACTION-NONE. PROCESS CONTROLS INSTITUTED AT LIONEL PACIFIC AFTER THIS UNIT WAS MANUFACTURED ARE CONSIDER ED ADEQUATE.

HYDRAULIC-A/B SUSTAINER/VERNIER	3RE7-2969 SUSTAINER H'D. TANK-O RING	UTP-PET 27-08552-5	640212	CONVAIR	YES NO	BENDOW 89836	085615

FAILURE MODE-LEAK INTERNAL. DURING TEMPERATURE AND LIFE CYCLING TEST, THE GAS PRECHARGE LEAKAG ACROSS THE PISTON O-RING WAS EXCESSIVE. AT MINUS 15 DEGREES F, 2.5 ML. IN 7 MIN.,IS ALLOWABLE. AT 8 DEGREE F. 5.0 ML. IN 45 MINUTES. 2 M L./HOUR, AT AMBIENT AND 3.0 ML. IN 5 MIN. REF. FPR NR F-5073 SWT S/N 308-0372.

CORRECTIVE ACTION-THE OIL WAS CONT'NINATED FROM THE TEST SET UP. THE UNIT WAS REFURBISHED AND PLACED BACK INTO TEST

HYD'AU IC-A/B SUS A.NER/VERNIER	27A3339 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04208-1	640212	GC/C	YES NO	STERER 13000	085600

FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TEST, FLOW RATES VARIED FROM .475 TO 1.04 GPM (SPECIFICATION REQUIREME NT 1.05 GPM MINIMUM), WERE OUT OF TOLERANCE DURING FLUID LOW TEMPERATURE TEST(-30 DGF). REFER TO FRR 035. STEADY STA TE FLOW WAS ALSO EXCESSIVE ON 640218. TEST SPECIMEN S/N 304-1652.

CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX SPECIFICATION LIMITS.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-JA-10-239-F MANIFOLD ASSEMBLY	FAR 27-05328-1	640211	FACTORY	YES NO	GD/C	085510

FAILURE MODE-STRUCTURAL. DUE TO SUBSTANDARD WELD JOINTS. (22 UNITS).

CORRECTIVE ACTION-RAD'OGRAPHIC INSPECTION WAS INCORPORATED PLUS A CHECK OF MATERIAL HANDLING AND PACKAGING. ITEM IS NO LONGER USED.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-04-4681-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85311-809	2960 640210	WTR	YES NO	LIONEL PACIFIC	693950
FAILURE MODE-LEAK EXTERNAL. THE VERNIER SERVOCYLINDER ASSEMBLY SHOWED EVIDENCE OF A HYDRAULIC LEAK DURING SURVEILLANCE INSPECTION IN MAB-5. ANALYSIS COULD NOT CONFIRM THE REPORTED FAILURE ALTHOUGH O-RING ELONGATION TEST VALUES AND DIMENSIONAL MEASUREMENTS WERE SUFFICIENTLY BELOW REQUIREMENTS TO INDICATE THE O-RINGS WERE SUBSTANDARD WHEN INSTALLED.							
CORRECTIVE ACTION-LIONEL-PACIFIC ASSURED THAT THE QUALITY OF O-RINGS WILL BE KEPT WITHIN THE REQUIRED STANDARDS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27-3298 VALVE, SAFETY RELIEF	UTP-PET 27-08569-1	640206	CONVAIR	YES NO	BENDOW 9212D	697041
FAILURE MODE-INTERNAL LEAK. PART S/N 305-0716 FAILED DUE TO INTERNAL LEAKAGE RATE IN HIGH TEMPERATURE TEST PROOF CYCLE, FPR 5066. TEMPERATURE 275 DEGREES F LEAKAGE RATE 4.2 CC/MIN.							
CORRECTIVE ACTION-REF. FR054-"-148. CONTINUE TEST. ECP 7603 SUBMITTED TO REVISE SPECIFICATION 27-08501 TO INCREASE ALLOWABLE LEAKAGE RATE TO 30 CC/MIN AT 3150 PSIG AND 20 CC/MIN AT 3000 PSIG.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4680-F ACTUATOR BLEED VALVE	FAR 27-08563-8	2960 640206	FACTORY	YES NO	LIONEL PACIFIC 2725-1	693948
FAILURE MODE-LEAK-EXTERNAL. THE SUSTAINER ACTUATOR ASSEMBLY FAILED DURING MANUFACTURING TESTING DUE TO LEAKAGE OF HYDRAULIC FLUID FROM THE BLEED PORT. THIS WAS CAUSED BY A POOR FINISH OF THE BLEEDER VALVE SEALING SURFACE.							
CORRECTIVE ACTION-LIONEL-PACIFIC RECEIVING INSPECTION PROCEDURES AND ACCEPTANCE TEST PROCEDURES WERE REVIEWED. ALL AN 6204 BLEEDER VALVES NOW RECEIVE 100 PER-CENT INSPECTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27-3298 VALVE, SAFETY RELIEF	UTP-PET 27-08569-1	640205	CONVAIR	YES NO	BENDOW 9212D	697040
FAILURE MODE-OUT OF SPECIFICATION. PART S/N 305-0716, FAILED TO MEET 80 PSIG PRESSURE DIFFERENCE (FULL FLOW VS. CRACKING PRESSURE) DURING THE INTERMEDIATE TEMPERATURE TEST PROOF CYCLES. REF. FPR 5066.							
CORRECTIVE ACTION-REF. FR 054-2-148. ECP 7603 SUBMITTED REVISING SPECIFICATION 27-08501 TO DELETE THE CRACKING PRESSURE REQUIREMENTS INCLUDING THE 80 PSIG DIFFERENTIAL BETWEEN FULL FLOW AND CRACKING PRESSURE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4702-F ACTUATOR ASSEMBLY	FAR 27-85311-811	SE 640205	ETR	YES NO	LIONEL PACIFIC	891200
FAILURE MODE-LEAK-EXTERNAL. THIS VERNIER 2 PITCH SERVOCYLINDER ASSEMBLY WAS REPORTEDLY LEAKING HYDRAULIC FLUID PAST THE ACTUATOR SHAFT SEAL. ANALYSIS FOUND NO DISCREPANCIES. THERE WAS NO LEAKAGE UNDER STATIC CONDITIONS. LEAKAGE UNDER DYNAMIC CONDITIONS WAS WITHIN SPECIFICATION LIMITS.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1950.3 SUSTAINER ACTUATOR ASSEMBLY, SERVO VALVE	UTP-PRT 27-85314-817	640204	60/C	YES NO	LIONEL PACIFIC	890643
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE- DURING PROOF CYCLE AFTER PRT TEMPERATURE VIBRATION THE SERVO VALVE NULL CURRENT WAS -0.09 MA. REQ. IS 0.20 MA. MAX.							
CORRECTIVE ACTION-TEST CONTINUED. THE UNIT WAS TESTED WITH SINE/RANDOM VIBRATION TO WHICH THE UNIT CAN NOT STAND UP TO. THE UNIT REQUIRES REDESIGN TO WITHSTAND THE S/R VIBRATION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3100 VERNIER SERVO VALVE	UTP-PET 27-04209-1	640203	60/C	YES NO	CADILLAC GAGE FC20-397A	897170
FAILURE MODE-OUT OF TOLERANCE. DURING PET TEST. POST LIFE TEST, SERVO VALVE NULL CURRENT WAS PLUS 0.33 MILLIAMPS (SPECIFICATION VALUE IS 0.2 MILLIAMPS. TEST SPECIMEN S/N 309-1761, LOT 41- REFER TO FRR 157.							
CORRECTIVE ACTION-DISASSEMBLY OF VALVE REVEALED THAT THE BALL ON THE FEEDBACK LEVER HAD WORN SUFFICIENTLY TO CAUSE A SHIFT IN NULL POSITION, THEREBY INCREASING CURRENT REQUIREMENTS. HOWEVER, DUE TO LARGE NUMBER OF LIFE CYCLES ON UNITS (1.8X10 6), THE LOT WAS ACCEPTED. VENDOR TO IMPROVE QUALITY CONTROL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-68-04-4701-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85314-823	SE 640203	ETR	YES NO	LIONEL PACIFIC	891850
FAILURE MODE-EXTERNAL LEAK. THE SUSTAINER SERVOCYLINDER LEAKED HYDRAULIC FLUID DYNAMICALLY AND STATICALLY AT 3000 PSIG. THE FAILURE WAS ATTRIBUTED TO AN O-RING HAVING MOLDING DEFECTS AND CONTAMINATION ABRASION.							
CORRECTIVE ACTION-ALL O-RINGS USED IN ACTUATORS ARE INSPECTED UNDER MAGNIFICATION FOR EVIDENCE OF VOIDS, MOLD LAPS, AND OTHER MOLDED DEFECTS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69H2071.1 DISCONNECT-STABING, FITTING	UTP-SLT 27-08556-3	640202	OTHER	YES NO	PEACOCK 81290-3	097090

FAILURE MODE-STRUCTURAL-DURING THE LAST MINUTE OF A SLT VIBRATION SWEEP THE UNIT CRACKED AT THE BASE OF THE AN FITTING CAUSING A FINE SPRAY OF OIL. REF. S/N 112-0808. DETERMINED TO BE CONTAMINATION OF 1. SHARP CORNER ON COMPONENT NOT PER DRAWING AND 2. CONDITION AGGRAVATED BY TEST HOSE INSTALLATION.

HYDRAULIC-A/B SUSTAINER/VERNIER	69C1952.1 VERNIER ACTUATOR ASSEMBLY, TRANSDUCER BRACKET	UTP-SLT 27-05312-808	640201	GD/C	YES NO	LIONEL PACIFIC	096094

FAILURE MODE-STRUCTURAL-PRIOR TO START OF SLT VIBRATION, IT WAS NOTED THAT THE MOUNTING CLIP ON THE PROBE END OF THE FEEDBACK TRANSDUCER WAS BROKEN OFF. THE BRACKET WAS BROKEN DUE TO HIGH STRESS CONCENTRATIONS. REF. FPR NR F-4133 ST S/N 204-0360.

CORRECTIVE ACTION-NONE. CONTINUE TEST. REF. FRR FR 654-2-151.

HYDRAULIC-A/B SUSTAINER/VERNIER	27-3298 VALVE, SAFETY RELIEF	UTP-PET 27-08569-1	640131	CONVAIR	YES NO	BENDOW 9212D	097055

FAILURE MODE-OUT OF TOLERANCE. PART S/N 305-0718 FAILED INITIAL ACCEPTANCE TEST PROOF CYCLE SPECIMEN DID NOT RESEAT UNTIL 2200 PSI. MINIMUM ALLOWABLE RESEAT PRESSURE IS 3150 PSI REF FPR-5066. PLASTIC END CAP PARTICLES FOUND IN VALVE.

CORRECTIVE ACTION-REF. FR 654-2-148, THREE ADDITIONAL PROOF CYCLES PERFORMED SATISFACTORILY AND THE TESTING CONTINUED. THE SPECIMEN WAS DISASSEMBLED AND CONTAMINATION BY PLASTIC END CAP PARTICLES WAS DETERMINED TO BE THE PROBABLE CAUSE OF THE MALFUNCTION. VENDOR TO USE METAL END CAPS IN PLACE OF PLASTIC CAPS NOW IN USE.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4711F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-825	BE 640130	WTR	YES NO	LIONEL PACIFIC	095050

FAILURE MODE-ERRATIC OPERATION-THE ACTUATOR WAS REJECTED BECAUSE OF 000 HARMONIC DISTORTION OF THE SUSTAINER YAW FEEDBACK SIGNAL.

CORRECTIVE ACTION-NONE-THE FAILURE WAS NOT CONFIRMED.

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HYDRAULIC-A/B SUSTAINER/VERNIER	LV-69-04-4705-C ACTUATOR ASSEMBLY	FAR 27-05311-609	2040 640120	FACTORY	YES NO	LIONEL PACIFIC	001263
FAILURE MODE-LEAK-EXTERNAL. THIS VERNIER SERVOCYLINDER WAS REJECTED WHEN IT DEVELOPED LEAKAGE OF HYDRAULIC FLUID AR OUND THE PISTON AT A STEADY DRIP WITH PRESSURE APPLIED. THE ASSEMBLY WAS LOST WHILE IN TRANSIT FOR FAILURE ANALYSIS.							
CORRECTIVE ACTION-NONE. FAILURE ANALYSIS WAS NOT PERFORMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	W-122E-0001-5-010 VALVE,SAFETY RELIEF	UTP-PRT 27-06569-1	640127	OTHER	YES NO	BENBOW 82120	007054
FAILURE MODE-OUT OF SPECIFICATION. PART S/N 310-0757. THE ALLOWABLE FLOW OR LEAKAGE RATE AT RESEAT PRESSURE IS 6 CC /MIN. MEASURED LEAKAGE WAS 25.6 CC/MIN. DIFFERENTIAL OR RESEAT PRESSURE WAS 3150 PSID. FAILURE NOTED AT CONCLUSION O F PRT. REF. FPR-4130.							
CORRECTIVE ACTION-REF. FR 654-2-140; ECP 7863 SUBMITTED REVISING SPECIFIED ALLOWABLE RESEAT PRESSURE FLOW RATE FROM 6 CC/MIN TO 30 CC/MIN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4689-F ACTUATOR O-RING	FAR 27-05312-605	5E 640127	ETR	YES NO	LIONEL PACIFIC	003056
FAILURE MODE-OUT OF TOLERANCE. THIS VERNIER SERVOCYLINDER ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID PAST THE SHAFT SEAL AT STATIC PRESSURE. ANALYSIS CONFIRMED THE FAILURE AND ATTRIBUTED IT TO POOR QUALITY O-RINGS. STILLMAN RUBBER MANUFACTURED THE O-RINGS IN 1963. DEFECTS APPEARED TO BE DUE TO MOLD LAGS, LOOSE FLASHING, DIRTY MOLDS, OR OTHER MOL D DEFECTS.							
CORRECTIVE ACTION-ASTRONAUTICS PRODUCT SUPPORT CENTER REVIEWED THEIR STOCK TO ENSURE THAT ALL O-RINGS REQUIRING BLU E-DOT IDENTIFICATION WERE SO IDENTIFIED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	8001903.1 HYDRAULIC FLEX HOSE ASSY.	UTP-PRT 27-06571-43	640124	OTHER	YES NO	AEROQUIP 677023-6-0161	007037
FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL ACCEPTANCE TEST THE LENGTH OF HOSE MEASURED 15.934 INCH. REQ. IS 16.1 2 PLUS OR MINUS 0.125 INCHES. REF. FPR NR F-4237 P S/N 305-4486.							
CORRECTIVE ACTION-UNIT REPLACED WITH ONE OF CORRECT LENGTH. TESTING CONTINUED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	27A2888 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04208-1	640124	60/C	YES NO	STERER 13000	093607
FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. TESY, FLOW RATE (.98 GPM VS. SPEC. OF 1.05 MIN.) WAS OUT OF TOLERANCE DURING FLUID LOW TEMPERATURE TEST. REFER TO FRR 038. TEST SPECIMEN S/N 206-1557.							
CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX SPECIFICATION LIMITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4690-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85312-005	SE 640122	ETR	YES NO	LIONEL PACIFIC	093997
FAILURE MODE-EXTERNAL LEAK. THIS VERNIER SERVOCYLINDER REPORTEDLY LEAKED HYDRAULIC FLUID PAST THE SHAFT SEAL AT STA TIC PRESSURE. ANALYSIS DID NOT CONFIRM THE REPORTED FAILURE. HOWEVER, THERE WAS SOME CONTAMINATION IN THE ACTUATOR W HICH MAY HAVE CONTRIBUTED TO LEAKAGE AT THE SITE.							
CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4633-F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-85314-017	3500 640120	FACTORY	YES NO	LIONEL PACIFIC	097200
FAILURE MODE-LEAK EXTERNAL-SUSTAINER SERVO CYLINDER ASSEMBLY WAS REPORTEDLY LEAKING HYDRAULIC FLUID, AT THE END OPP OSITE THE PISTON, WITH 3000 PSIG APPLIED. REPORTED FAILURE WAS NOT CONFIRMED AFTER FOUR DAYS OF HYDRAULIC PRESSURE T ESTING.							
CORRECTIVE ACTION-FACTORY PERSONNEL WERE NOTIFIED THAT THE FAILURE WAS NOT CONFIRMED, AND VISIBLE LEAKAGE COULD HAV E COME FROM ANOTHER COMPONENT. FURTHER INVESTIGATION REVEALED NO LEAKAGE HAS BEEN VISIBLE ON THE REPLACEMENT PART. N O FURTHER CORRECTIVE ACTION IS CONSIDERED NECESSARY. 3500 WAS 157D.							
HYDRAULIC-A/B SUSTAINER/VERNIER	M-1222-8001-5-010 VALVE, SAFETY RELIEF	UTP-PRT 27-06560-1	640120	OTHER	YES NO	BENSON 9212D	097042
FAILURE MODE-INTERNAL LEAK. PART S/N810-0787, INTERNAL LEAKAGE AT 3000 PSID WAS 3.5 CC/MIN. ALLOWABLE LEAKAGE, 2CC/ MIN. FAILURE OCCURRED DURING INITIAL ACCEPTANCE TEST PROOF CYCLE. FPR 4129.							
CORRECTIVE ACTION-REF. FR 684-E-148; ECP 7665 SUBMITTED CHANGING SPECIFICATION LEAKAGE RATE FROM 2 TO 20 CC/MIN.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4641F VERNIER ACTUATOR, PORT PLUG	FAR 27-05311-009	3500 640110	FACTORY	YES NO	LIONEL PACIFIC	005034

FAILURE MODE-EXTERNAL LEAKAGE. LEAKED HYDRAULIC OIL PAST THE LEVER PIN PLUG. CAUSE. INCORRECT REWORK OF THE LEVER P IN PORT BY THE VENDOR. THREADS HAD BEEN DAMAGED AND DEPTH ALTERED BY REWORK. O-RING SEALING WAS NOT COMPLETE.

CORRECTIVE ACTION-CONFIRMED. VENDOR REPLY TO RAR LV-99-04-3889, RECEIVED MARCH 26, 1964 STATES THAT NEW PROCEDURES WERE IMPOSED TO PREVENT RECURRENCE OF THE FAILURE MODE. NOTE-3500 REWORKED FROM 157D.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4703-F ACTUATOR ASSEMBLY, O-RING	FAR 27-05311-007	112F 640117	FACTORY	YES NO	LIONEL PACIFIC	001261

FAILURE MODE-LEAK-EXTERNAL. THIS VERNIER SERVOCYLINDER ASSEMBLY LEAKED HYDRAULIC FLUID FROM THE NULL ADJUSTMENT SCR EW WITH 3000 PSIG APPLIED. FAILURE WAS ATTRIBUTED TO A DAMAGED O-RING. ASSEMBLY OF THE NULL ADJUSTMENT WEDGE IS SUCH THAT O-RING DAMAGE CAN EASILY OCCUR.

CORRECTIVE ACTION-ASTRONAUTICS PRODUCT SUPPORT CENTER ASSEMBLY PERSONNEL WERE WARNED OF THE POSSIBILITY OF DAMAGING THE O-RING AND WERE INSTRUCTED TO TAKE EXTRA CARE WHILE ASSEMBLING THE ADJUSTMENT WEDGE.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-235-C RELIEF VALVE	FAR 27-06370-1	2960 640110	FACTORY	NO NO	VINSON A-60133-1	000610

FAILURE MODE-OUT OF SPECIFICATION. RUBBER CURE DATE EXPIRED, VALVE REMOVED FROM MISSILE.

CORRECTIVE ACTION-NO FAILURE. ANALYSIS CANCELLED.

HYDRAULIC-A/B SUSTAINER/VERNIER	27A2804 SUSTAINER ACTUATOR ASSEMBLY, ORIFICE	UTP-PET 27-06563-3	640110	60/C	YES NO	LIONEL PACIFIC LIONEL-PACIFIC 2425-103	007177

FAILURE MODE-STRUCTURAL. DURING INITIAL PROOF CYCLE DURING PET TEST. THE PISTON WAS LOCKED IN THE MID-POSITION WITH THE RETURN PORT VENTED TO THE ATMOSPHERE. THE FLOW RATE WAS 1.48 GPM (SPECIFICATION 1.15 GPM) IN THE EXTEND DIRECTI ON. THIS WOULD NOT EFFECT FLIGHT RESPONSE.

CORRECTIVE ACTION-THE VENDOR IS TAKING ACTION TO CORRECT THE SOURCE OF LEAKAGE. SYSTEMS TESTING WOULD DETECT ANY SR OGS ERRORS.

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4630-F SUSTAINER ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-65314-823	640118	FACTORY	YES NO	LIONEL PACIFIC	095936
FAILURE MODE-CONTAMINATION. DURING INSPECTION CHECKOUT PER EOP 305.9 THE NULL CURRENT WAS A POSITIVE 0.16 MILLIAMPERE. NULL CURRENT ALLOWED IS PLUS OR MINUS 0.05 MA. FAILURE IS ATTRIBUTED TO THE COMBINED CONTAMINATION OF THE FIRST-STAGE DROPPING ORIFICE AND THE NOZZLE SCREEN.							
CORRECTIVE ACTION-CADILLAC GAGE INITIATED CORRECTIVE ACTION AFTER JULY 1963 FOR ALL SERVOVALVES CLEANED AND REWORKED BECAUSE OF CRYSTALLINE PARTICULATE CONTAMINATION, INCLUDING A NEW CLEANING PROCEDURE AND TIGHTER CONTROLS TO ASSURE COMPLIANCE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3032 FEEDBACK TRANSDUCER	UTP-PET 27-04211-1	640114	GD/C	YES NO	CRESCENT HC-67P-4E	097194
FAILURE MODE-OPEN (ELECT). DURING PET TEST, SPECIMEN FAILED TO MEET INSULATION RESISTANCE REQUIREMENTS OF 100 MEGOHMS. TEST SPECIMEN S/N 306-1088 READ ONLY 5 MEGOHMS FOLLOWING IMMERSION TEST. SIMILAR FAILURE OCCURED 1/17/64 ON TEST SPECIMEN, S/N 310-1123 LOT 28, REFER TO FRR 135.							
CORRECTIVE ACTION-FAILURE ANALYSIS REVEALED LEAKING AROUND PLUG AND VOIDS IN POTTING COMPOUND. VENDOR FIX IF AN EPOXY SEAL IS REQUIRED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3159 SERVO VALVE, FEEDBACK TRANSDUCER	UTP-PET 27-04204-1	640114	GD/C	YES NO	CRESCENT HC-108-4E	095597
FAILURE MODE-OUT OF TOLERANCE. DURING P.E.T. IMMERSION TEST INSULATION RESISTANCE WAS OUT OF TOLERANCE (READING 20 MEGOHMS). REFER TO FRR 136. TEST SPECIMEN S/N 309-1394 (LOT 24).							
CORRECTIVE ACTION-FAILURE ANALYSIS REVEALED LEAKING AROUND PLUG AND VOIDS IN POTTING COMPOUND. LOT 24 WAS REJECTED. VENDOR TO CHANGE TO AN EPOXY SEAL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4646-F SUSTAINER ACTUATOR ASSEMBLY, O-RING	FAR 27-65314-619	2960 640112	FACTORY	YES NO	LIONEL PACIFIC	
FAILURE MODE-LEAK EXTERNAL-SUSTAINER SERVO CYLINDER ASSY REPORTEDLY FAILED WHEN HYDRAULIC OIL WAS FOUND TO BE LEAKING FROM THE AFT HOUSING GLAND NUT OF THE SERVO CYLINDER. FAILURE WAS CAUSED BY THE USE OF SUBSTANDARD O-RINGS. THE O-RINGS WERE IMPROPERLY MOLDED. SUBSTANDARD O-RINGS WERE INSTALLED DURING REWORK OF THE SERVO CYLINDER ASSY.							
CORRECTIVE ACTION-GD/C QUALITY CONTROL TOOK CORRECTIVE ACTION. EFFECTIVE FEBRUARY 18, 1964, ALL O-RINGS USED IN ACT							

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UATORS WILL BE INSPECTED, UNDER MAGNIFICATION, FOR EVIDENCE OF VOIDS, MOLD LAPS, AND OTHER MOLDED DEFECTS.							007190
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4848F SUSTAINER ACTUATOR ASSEMBLY, O-RIN GS	FAR 27-85314-819	2960 640112	FACTORY	YES NO	LIONEL PACIFIC	003029
FAILURE MODE-EXTERNAL LEAKAGE. LEAKED HYDRAULIC OIL PAST SERVO CYLINDER GLAND NUT AT STATIC PRESSURE. CAUSE OF FAIL URE WAS USE OF SUBSTANDARD O-RING MOLDS HAD ALLOWED DEFECTS ON SIDES OF O-RINGS. CORRECTIVE ACTION-CONFIRMED. IN A REPLY TO RAR-A-9D-04-3838, EFFECTIVE ON DATE 640212, ALL O-RINGS USED IN ACTUATOR S WILL BE INSPECTED UNDER MAGNIFICATION FOR EVIDENCE OF VOIDS, MOLD LAPS AND OTHER DEFECTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-04-4860-F VERNIER ACTUATOR ASSEMBLY, O-RINGS	FAR 27-85312-805	1990 640104		YES NO	LIONEL PACIFIC	007190
FAILURE MODE-LEAK EXTERNAL-ASSEMBLY WAS FOUND TO BE SEEPING OIL FROM THE TRANSDUCER SIDE OF THE ACTUATOR DRIVE RACK WHEN THE UNIT WAS GIMBALED BY HAND. LEAKAGE WAS ATTRIBUTED TO SUBSTANDARD O-RINGS. CORRECTIVE ACTION-D/C OBTAINED VENDER CORRECTIVE ACTION BEFORE THIS FAILURE. EFFECTIVE MARCH 20, 1963 LIONEL PACIF IC INSPECTS ALL O-RINGS USED IN VERNIER ACTUATORS. FAILED ACTUATOR WAS MANUFACTURED BEFORE THE IMPROVED INSPECTION O F THE INTERNAL O-RINGS AND WOULD NOT REFLECT THE IMPROVEMENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-98-04-4860F VERNIER ACTUATOR ASSEMBLY, O-RINGS	FAR 27-85312-805	1960 640104	COMPLEX 12	YES NO	LIONEL PACIFIC	003031
FAILURE MODE-EXTERNAL LEAKAGE. HYDRAULIC OIL SEEPAGE FROM THE TRANSDUCER SIDE OF THE ACTUATOR DRIVE RACK WHEN THE U NIT WAS GIMBALED BY HAND. CAUSE WAS SUBSTANDARD O-RINGS IN THE ACTUATOR. SIX O-RINGS DID NOT MEET ELONGATION REQUIRE MENTS AND FOUR OF THESE WERE TOO HARD AND UNRESPONSIVE. CORRECTIVE ACTION-FAILURE CONFIRMED. THE ACTUATOR VENDOR, LIONEL PACIFIC, INSPECTS ALL O-RINGS USED IN THE ACTUATOR , EFFECTIVE ON DATE 630320. SINCE THE UNIT WAS MADE PRIOR TO THIS DATE IT DID NOT REFLECT THIS IMPROVEMENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-04-4586-F VERNIER ACTUATOR ASSEMBLY, PISTON	FAR 27-85312-805	2050 640103	WTR	YES NO	LIONEL PACIFIC	
FAILURE MODE-LEAK EXTERNAL. VERNIER ACTUATOR WAS FOUND LEAKING PAST BOTH ACTUATOR SHAFT SEAL WHEN THE UNIT WAS HAND GIMBALLED. THE FAILURE WAS CAUSED BY GALLING OF THE PISTON LANDS, AND SHREDDING THE SEALING O-RINGS. GALLING OF THE PISTON LANDS WAS DUE TO THE LACK OF CHROME PLATING REQUIRED FOR SPECIFIC PISTON A EAS. FAILURE WOULD NOT HAVE OCCUR RED IF THE INTENT OF LCP1947 HAD BEEN CARRIED TO COMPLETION.							

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CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
CORRECTIVE ACTION-REPAIR FACILITY INSPECTION PERSONNEL WERE INSTRUCTED TO CLOSELY INSPECT ALL ACTUATOR PISTONS FOR THE REQUIRED CHROMEPLATE.							000000
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-04-4592-F VERNIER ACTUATOR ASSEMBLY	FAR 27-85312-805	2850 631219	WTR	YES NO	LIONEL PACIFIC	000007
FAILURE MODE-LEAK EXTERNAL. IT WAS REPORTED A SMALL PUDDLE OF OIL WAS OBSERVED ON THE FLOOR UNDER THE VERNIER ENGINE. OIL WAS APPARENTLY COMING FROM THE ACTUATOR SHAFT. REPORTED FAILURE WAS UNCONFIRMED BY FAILURE ANALYSIS TESTING. MARKING ON ONE O-RING HAD THE APPEARANCE OF PAINT AND MAY HAVE BEEN A PAINT PARTICLE LODGED ON THE O-RING DURING TESTING AT WTR CAUSING LEAKAGE.							
CORRECTIVE ACTION-WTR PEOPLE WERE INFORMED OF THE RESULTS OF THIS ANALYSIS. THEY VERIFIED CLEANLINESS WOULD BE MAINTAINED IN THE MISSILE HYDRAULIC SYSTEM. VENDER, LIONEL PACIFIC, TOOK STEPS TO ELIMINATE POSSIBLE CONTAMINATION SOURCES AT THEIR FACILITIES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-04-4598-F VERNIER ACTUATOR ASSEMBLY, WIPER	FAR 27-85312-805	1990 631216		YES NO	LIONEL PACIFIC	000003
FAILURE MODE-CONTAMINATION-ACTUATOR OF VERNIER SERVOCYLINDER REPORTLY DEVELOPED A LEAK OF HYDRAULIC FLUID AT THE PISTON SHAFT SEAL. FAILURE IS ATTRIBUTED TO FELT CONTAMINATION OF THE O-RING RESULTING IN A LOW-PRESSURE LEAKAGE PATH.							
CORRECTIVE ACTION-DESIGN GROUP RECOMMEND AN IMPROVEMENT, REPLACING THE FELT WITH TEFLON RINGS. NO OTHER ACTION TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-A9-10-229-F HYDRAULIC FLEXHOSE, B-NUT	FAR 27-08571-47	24800 D 631211	FACTORY	YES	AEROQUIP 677025-8-0140	000515
FAILURE MODE-LEAK EXTERNAL. LEAKING AT B-NUT END FITTING.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ADVISED PERSONNEL TO WIPE HOSES CLEAN AND TO WATCH MORE CLOSELY TO VERIFY LEAKAGE DOES EXIST PRIOR TO REJECTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-10-230-F HYDRAULIC TUBE ASSEMBLY, B-NUT	FAR 27-85007-189	1990 631210	ETR	NO NO	GD/C	
FAILURE MODE-STRUCTURAL. DURING VISUAL INSPECTION OF COUPLING NUT, NUT ON ONE END OF TUBE APPEARED TO BE CRACKED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NO FAILURE. SITE PERSONNEL INFORMED OF RESULTS OF ANALYSIS AND RECOMMEND CLOSER EXAMINATION OF NU T BEFORE REJECTION.							090814
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-90-10-218-F TUBE ASSEMBLY, B-NUT	FAR 27-05314-13	3500 631210	WTR	YES NO	GD/C	090115
FAILURE MODE-OUT OF TOLERANCE. DIMENSIONAL DISCREPANCY AND SURFACE CONDITION MAKE IT A SUBSTANDARD ITEM. CORRECTIVE ACTION-NO FAILURE-GD/C OBTAINED QUALITY CONTROL-ALL NUTS DIMENSIONALLY CHECKED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A3055 FLEX HOSE ASSY.	UTP-PET 27-08361-5	631210	CONVAIR	YES NO	TITEFLEX 98932-5	097050
FAILURE MODE-LEAK-EXTERNAL-DURING POST VIBRATION PROOF PRESSURE TEST THE UNIT LEAKED 18CC/MIN. OF WATER AT 6000 PSI G. REQ. NO LEAKAGE. REF. FPR MR F-5040 SWT S/N 307-0460. CORRECTIVE ACTION-NONE-UNIT DEMONSTRATED A MARGIN OF SAFETY PRIOR TO FAILURE. ACCEPT LOT 1. REF. FRR FR 654-2-093.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A3196 VERNIER FLOW LIMITER VALVE	UTP-PET 27-04206-1	631210	GD/C	YES NO	CONAIR 1470-7	095602
FAILURE MODE-OUT OF TOLERANCE. STATIC FLOW(1.21 VS. SPECIFICATION OF 1.20 GPM MAXIMUM) AND DYNAMIC FLOW(1.21 VS. SP ECIFICATION OF 1.20 GPM MAXIMUM) WERE OUT OF TOLERANCE. SIMILAR FAILURES OCCURRED 631210. REFER TO FRR 384. TEST SPE CIMEN S/N 310-1038. CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX SPECIFICATION LIMITS. ALSO, ACTION INITIATED TO DROP CONAIR AS A SOUR CE OF 27-04206-1. REFER TO FRR 378.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4378-F FEEDBACK TRANSDUCER/V2 ACTUATOR AS BY	FAR 27-05318-005	60F 631209	FACTORY	YES NO	LIONEL PACIFIC	
FAILURE MODE-OUT OF SPECIFICATION. THE V2 ACTUATOR ASSEMBLY FAILED WHEN THE DIFFERENTIAL FEEDBACK VOLTAGE WITH THE ENGINE ACTUATED TO EXTREME YAW POSITIONS MEASURED 0.74 VOLT AS OPPOSED TO A MAX. ALLOWABLE 0.6 VOLT. THE FAILURE WAS DUE TO A NULL VOLTAGE SHIFT WHICH RESULTED FROM A PHYSICAL JAR TO THE FEEDBACK TRANSDUCER PROBE BRACKET. EXISTING D IMENSIONS OF THE BRACKET MOUNTING HOLES AND SECURING SCREWS ALLOW FOR CONSIDERABLE SLOP WHICH COULD PERMIT EXCESSIVE NULL SHIFT.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-COGNIZANT PERSONNEL WERE ADVISED OF THE NEED FOR CAREFUL ADHERENCE TO APPLICABLE HANDLING PROCEDURES. THERE WAS INSUFFIENT EVIDENCE TO WARRANT A CLASS 2 CHANGE TO REDUCE THE BRACKET HOLE DIAMETER.							093670
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-224-F TUBE ASSEMBLY, B-NUT	FAR 27-05397-7	3500 651206	WTR	YES NO	GD/C	000111
FAILURE MODE-OUT OF SESCIFICATION OR TOLERANCE-DUE TO HIGH TORQUE REQUIRED TO SEAL AGAINST TUBE FLARE. CORRECTIVE ACTION-GD/C SURVEY 116-43 WAS INITIATED TO EXAMINE ALL ONE-QUARTER INCH MAGENTA-COLORED B-NUTS. A STUDY PROGRAM OF THE PROBLEM WAS STARTED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SR-27-2027 SUSTAINER HYDRAULIC TANK, O-RING	UTP-PET 27-06552-5	651206	CONVAIR	YES NO	BENDOW 89636	095612
FAILURE MODE-LEAK. INTERNAL DURING TEMPERATURE AND LIFE CYCLING TESTS THE GAS PRECHARGE LEAKAGE ACROSS THE PISTON O-RING EXCEEDED 2ML./HR. ALLOWED. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9D-04-4625-C SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-019	651204	WTR	YES NO	LIONEL PACIFIC	090987
FAILURE MODE-CONTAMINATION. SUSTAINER SERVO CYLINDER REPORTEDLY FAILED WHEN DURING AN INSPECTION CORROSION WAS FOUND ON THE EXTERNAL SURFACES OF THE SERVOCYLINDER. THIS FAILURE ANALYSIS WAS CANCELED AS THE SERVOCYLINDER ASSY COULD NOT BE FOUND FOR ANALYSIS. CORRECTIVE ACTION-NO ACTION TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4068-F FEEDBACK TRANSDUCER	FAR 27-04208-1	651203		YES NO	CRESCENT PC-03P-4E	097163
FAILURE MODE-OUT OF TOLERANCE. NULL VOLTAGE WAS REPORTED TO BE HIGH. THE TRANSDUCER WAS RECEIVED FOR FAILURE ANALYSIS WITH THE TUNING SLUG MISSING AND A BROKEN SHEILDED CONNECTING CABLE SO THE FAILURE WAS NOT CONFIRMED. CORRECTIVE ACTION-FAILURE NOT CONFIRMED. UNIT RECEIVED IN A DAMAGED CONDITION.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-BD-04-4551-F ACTUATOR ASSEMBLY	FAR 27-83811-809	227D 631208	2-3	YES NO	LIONEL PACIFIC	002401

FAILURE MODE-LEAK-EXTERNAL. THE V2 SERVOCYLINDER ASSEMBLY LEAKED OIL AROUND THE SHAFT DURING AUTOPILOT CHECKOUT. THE CAUSE OF THE REPORTED FAILURE WAS NOT DEFINITELY DETERMINED. THERE WAS NO EVIDENCE OF DAMAGED, CONTAMINATED OR UNDERSIZED SEALING SURFACES. ANY LEAKAGE PROBABLY RESULTED FROM SPONGE-LIKE ACCUMULATION OF HYDRAULIC FLUID IN THE FELT LUBRICATORS.

CORRECTIVE ACTION-ALTHOUGH THE LEAKAGES REFLECTED THROUGHOUT THE HISTORY OF THIS FAILURE MODE ARE SO SMALL AS TO BE INCONSEQUENTIAL, IT WAS RECOMMENDED, SUBJECT TO AIR FORCE APPROVAL, THAT TEFLON RINGS BE SUBSTITUTED FOR THE FELT LUBRICATORS. REF. ECP 3462.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4815F TRANSDUCER, FUNCTIONAL	FAR 27-04204-1	631127	FACTORY	YES NO	CRESCENT MC106-4E	095561

FAILURE MODE-STRUCTURAL. TRANSDUCER HAD HIGH NULL VOLTAGE DUE TO A BENT PROBE. THE REASON FOR THE BENT PROBE WAS NOT LEARNED.

CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-223-F PRESSURE GAGE	FAR 27-08568-3	1460 631126	FACTORY	YES NO	ROCHESTER GAGE 6903-71[illegible]-1	096109

FAILURE MODE-LEAK INTERNAL-LEAK AT THE BOURDON TUBE BRAZE JOINT.

CORRECTIVE ACTION-LEAKING GAGES WOULD BE DETECTED DURING EQUIPMENT OPERATION. CAN BE CAUGHT AT SITE DURING PRECHARGE.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-4618-F ACTUATOR, VERNIER	FAR 27-08573-3	631126	FACTORY	YES NO	LIONEL-PACIFIC 2792-2	096050

FAILURE MODE-LEAK EXTERNAL-ACTUATORS S/N 211-0780 AND 106-0177 REPORTEDLY LEAKED HYDRAULIC OIL FROM THE SHUBBER PORT AT THE CYLINDER HOUSING. THE REPORTED FAILURES WERE NOT CONFIRMED. THE O-RINGS IN THE ACTUATORS WERE OF INFERIOR MATERIAL BUT WERE NOT CUT OR GOUGED TO ALLOW LEAKAGE AT THE VERY HIGH RATES REPORTED.

CORRECTIVE ACTION-THE VENDER WAS NOTIFIED OF THE INFERIOR QUALITY OF THE O-RINGS IN THE ACTUATORS. THE VENDER WAS ALSO REQUESTED TO INFORM O-RING SUPPLIERS OF THIS FAILURE ANALYSIS.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-219-F SUSTAINER HYDRAULIC PUMP	FAR 27-08590-3	351D 631125	FACTORY	YES NO	VICKERS AA-60410-L-2	000136
FAILURE MODE-CONTAMINATION-NOT IDENTIFIABLE.							
CORRECTIVE ACTION-VIBRATION AND FLUSHING CHECKOUT PROCEDURES ADDED-QUALITY CONTROL SURVEILLANCE INCREASED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4977-F ACTUATOR ASSY, SERVOVALVE	FAR 27-08314-021	631125	FACTORY	NO NO	LIONEL PACIFIC	002555
FAILURE MODE-OUT OF SPECIFICATION. THE SUSTAINER SERVOCYLINDER ASSEMBLY FAILED WHEN THE RECORDER SERVOVALVE THRESHOLD CURRENT WAS PLUS OR MINUS 0.205 MILLIAMPERE. ALLOWABLE THRESHOLD CURRENT WAS PLUS OR MINUS 0.200 MILLIAMPERE. THIS REPORTED FAILURE WAS NOT CONFIRMED. THE THRESHOLD CURRENT RECORDED DURING FAILURE ANALYSIS WAS PLUS OR MINUS 0.19 MILLIAMPERE. EVIDENCE INDICATES THE AMMETER USED BY RECEIVING INSPECTION WAS NOT ADEQUATE TO ACCURATELY RECORD THE SECOND SIGNIFICANT NUMBER.							
CORRECTIVE ACTION-THE TEST CONSOLE WAS REWORKED IN APRIL 1964. THE REWORK INCLUDED INSTALLATION OF A MORE RELIABLE AMMETER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-10-223-F SUSTAINER HYDRAULIC PUMP, O-RING	FAR 27-08590-3	137F 631122	COMPLEX1 1	YES NO	VICKERS AA-60410-L-2	000110
FAILURE MODE-LEAK EXTERNAL-OCCURED BETWEEN COVERPLATE AND PUMP BODY.							
CORRECTIVE ACTION-IMPROVED SEAL DESIGN BY VICKERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-225-F PRESSURE GAGE	FAR 27-08582-3	76E 631122	FACTORY	YES NO	ROCHESTER GAGE 6803-719-1	000108
FAILURE MODE-LEAK INTERNAL-LEAK AT THE BOURDON TUBE BRAZE JOINT.							
CORRECTIVE ACTION-LEAKING GAGES WOULD BE DETECTED DURING EQUIPMENT OPERATION. CAN BE CAUGHT AT SITE DURING PRECHARGE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.1 FITTING, PUMP	UTP-SLT 27-08590-3	631122	CONVAIR	YES NO	VICKERS AA-60410-L-2	097010

FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF THE THIRD AXIS SLT VIBRATION TEST IT WAS DISCOVERED THAT THE INLET PRESSURE FITTING WAS CRACKED AND LEAKING OIL. THE UNIT WAS AT 160 DEGREE F. FOR 30 MINUTES AND THE FINAL 5 MINUTES AT 275 DEGREE S F DURING THE VIBRATION SWEEP. REF. FPR NR F-4072 ST S/N 303-0344.

CORRECTIVE ACTION-NONE-REF. FRR FR 654-2062.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4176-F SUSTAINER ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05314-017	1660 631122	FACTORY	NO NO	LIONEL PACIFIC	095757

FAILURE MODE-LEAK-EXTERNAL-THE SUSTAINER ACTUATOR ASSEMBLY REPORTEDLY LEAKED OIL THROUGH THE SERVOVALVE. THIS REPORTED FAILURE WAS NOT CONFIRMED. TESTING INDICATED NO LEAKAGE, AND DISASSEMBLY REVEALED NO DISCREPANCIES OR CONTAMINATION. EVIDENCE INDICATES THIS PART WAS MISTAKENLY SUBMITTED FOR ANALYSIS CONCERNING SUSPECTED LEAKAGE ON 21 AUGUST 1963 FOR WHICH IT HAD ALREADY BEEN TESTED. THE REJECTION TAG OF 15 NOVEMBER WAS TO REPLACE 2 BOLTS. AN INSPECTORS REPORT REGARDING THE 21 AUGUST SUSPECTED LEAKAGE WAS STAPLED TO THE BOLT REQUEST TAG.

CORRECTIVE ACTION-NO CORRECTIVE ACTION TAKEN.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-90-04-4571-F ACTUATOR ASSY, TRANSDUCER	FAR 27-05314-010	2270 631121	PALC 2-3	NO NO	LIONEL PACIFIC	092400

FAILURE MODE-ERRATIC OPERATION. THE SUSTAINER ACTUATOR ASSEMBLY WAS REJECTED WHEN THE POSITION FEEDBACK TRANSDUCER OUTPUT WAS IRREGULAR AT 10 CPS. THIS IRREGULAR OUTPUT SIGNAL WAS CAUSED BY VERY SMALL MOVEMENTS BETWEEN THE ENGINE-ACTUATOR ATTACH POINT AND THE VEHICLE-ACTUATOR ATTACH POINT, DUE TO DEFLECTION DURING ACTUATOR OPERATION WHICH WERE AMPLIFIED BY A SERVOVALVE MORE RESPONSIVE THAN NORMAL TO SMALL AMPLITUDE HIGH FREQUENCY SIGNALS. THIS IS NOT CONSIDERED A FAILURE OF THE SERVOCYLINDER ASSEMBLY.

CORRECTIVE ACTION-SITE PERSONNEL WERE ADVISED THAT DISTORTIONS IN POSITION OUTPUT SIGNAL ON THE 10 OR 12 CPS TEST ARE NOT TO BE USED AS A CRITERIA FOR COMPONENT REJECTION.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-223-F PRESSURE GAGE	FAR 27-08562-3	631120	FACTORY	YES NO	ROCHESTER GAGE 8903-719-1	

FAILURE MODE-LEAK INTERNAL-LEAK AT THE SOURDON TUBE BRAZE JOINT.

CORRECTIVE ACTION-LEAKING GAGES WOULD BE DETECTED DURING EQUIPMENT OPERATION. CAN BE CAUGHT AT SITE DURING PRECHARG

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
E.							090110
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-225-F PRESSURE GAGE	FAR 27-08582-3	631120	FACTORY	YES NO	ROCHESTER GAGE 8903-719-1	090107

FAILURE MODE-LEAK INTERNAL-LEAK AT THE BOURDON TUBE BRAZE JOINT.

CORRECTIVE ACTION-LEAKING GAGES WOULD BE DETECTED DURING EQUIPMENT OPERATION. CAN BE DETECTED AT SITE DURING PRECHA RGE.

HYDRAULIC-A/B SUSTAINER/VERNIER	27C3154 VALVE, SAFETY RELIEF	UTP-PET 27-08369-1	631120	CONVAIR	YES NO	BENDOW 92120	097043

FAILURE MODE-OUT OF SPECIFICATION. S/N 310-0747, DIFFERENCE BETWEEN FULL FLOW DIFFERENTIAL PRESSURE WAS 30 PSID. MI N. ALLOWABLE 50 PSID. DURING IAT FPR-5021 FAILURE DUE TO DIFFERENCES IN TEST TECHNIQUES.

CORRECTIVE ACTION-REF. FR 654-2-070. ALL GD/C TEST LABS WERE DIRECTED TO OBSERVE UNIFORM TESTING TECHNIQUES. UNIT W AS RETESTED 15 TIMES USING THE PROPER TECHNIQUES WITHOUT ANY DISCREPANCIES.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4552-F VERNIER ACTUATOR, O-RINGS	FAR 27-08573-3	631119	FACTORY	YES NO	LIONEL-PACIFIC 2792-2	092485

FAILURE MODE-CONTAMINATION. THE VERNIER ACTUATOR LEAKED HYDRAULIC OIL BECAUSE OF SHREDDING OF THE FELT LUBRICATOR W HICH CONTAMINATED THE SEALING O-RING.

CORRECTIVE ACTION-ALTHOUGH THE LEAKAGE RATE FOR THIS FAILURE MODE IS VERY LOW AND DOES NOT CONSTITUTE AN OIL DEPLET ION OR FIRE HAZARD PROBLEM, IT WAS RECOMMENDED, SUBJECT TO AIR FORCE APPROVAL, THAT TEFLON RINGS BE SUBSTITUTED FOR THE FELT LUBRICATORS. REF-ECP 3442.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4552-F ACTUATOR, VERNIER	FAR 27-08573-3	631119	FACTORY	NO NO	LIONEL-PACIFIC 2792-2	

FAILURE MODE-LEAK-EXTERNAL. THE VERNIER ACTUATOR (S/N 211-0778) LEAKED HYDRAULIC OIL DURING PROOF PRESSURE TESTING. THERE WAS NO LEAKAGE DURING EXTENSIVE TESTING FOLLOWING THIS REPORTED FAILURE. THERE WAS NO EVIDENCE OF CONTAMINATI ON, SEALING O-RING DEFECT OR INTERNAL CYLINDER BORE DEFECTS. THEREFORE, THE CAUSE OF THE LEAKAGE WAS ASSIGNED TO OTH ER HARDWARE ATTACHED TO THE ACTUATOR AT THE TIME OF INITIAL TESTING. THIS HARDWARE WAS REMOVED BEFORE FAILURE ANALYS IS.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE. SINCE THE ACTUATOR CANNOT BE CONSIDERED A FAILED ITEM AND ASSOCIATED HARDWARE WAS REMOVED B EFORE THE CAUSE OF THE LEAKAGE COULD BE DETERMINED.							092464
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-89-04-4552-F ACTUATOR, VERNIER	FAR 27-08573-3	631110	FACTORY	NO NO	LIONEL-PACIFIC 2792-2	092463
FAILURE MODE-LEAK-EXTERNAL. THE VERNIER ACTUATOR (S/N 204-0871) LEAKED HYDRAULIC OIL DURING PROOF PRESSURE TESTING. THERE WAS NO LEAKAGE DURING EXTENSIVE TESTING FOLLOWING THIS REPORTED FAILURE. THERE WAS NO EVIDENCE OF CONTAMINATI ON, SEALING O-RING DEFECT, OR INTERNAL CYLINDER BORE DEFECTS. THEREFORE, THE CAUSE OF THE LEAKAGE WAS ASSIGNED TO OT HER HARDWARE ATTACHED TO THE ACTUATOR AT THE TIME OF INITIAL TESTING. THIS HARDWARE WAS REMOVED BEFORE FAILURE ANALY SIS. CORRECTIVE ACTION-NONE SINCE THE ACTUATOR CANNOT BE CONSIDERED A FAILED ITEM AND ASSOCIATED HARDWARE WAS REMOVED BE FORE THE CAUSE OF THE LEAKAGE COULD BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-04-4552-F ACTUATOR, VERNIER	FAR 27-08573-3	631110	FACTORY	NO NO	LIONEL-PACIFIC 2792-2	092462
FAILURE MODE-LEAK-EXTERNAL. THE VERNIER ACTUATOR (S/N 211-0786) LEAKED HYDRAULIC OIL DURING PROOF PRESSURE TESTING. THERE WAS NO LEAKAGE DURING EXTENSIVE TESTING FOLLOWING THIS REPORTED FAILURE. THERE WAS NO EVIDENCE OF CONTAMINATI ON, SEALING O-RING DEFECT OR INTERNAL CYLINDER BORE DEFECTS. THEREFORE, THE CAUSE OF THE LEAKAGE WAS ASSIGNED TO OTH ER HARDWARE ATTACHED TO THE ACTUATOR AT THE TIME OF INITIAL TESTING. THIS HARDWARE WAS REMOVED BEFORE FAILURE ANALYS IS. CORRECTIVE ACTION-NONE SINCE THE ACTUATOR CANNOT BE CONSIDERED A FAILED ITEM AND ASSOCIATED HARDWARE WAS REMOVED BE FORE THE CAUSE OF THE LEAKAGE COULD BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	59A1904.1 PUMP, FITTING	UTP-PRT 27-08590-3	631115	CONVAIR	YES NO	VICKERS AA-60410-L-2	087010
FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF PRT VIBRATION TEST IT WAS DISCOVERED THAT SEPARATION OCCURRED AT THE C AST FITTING ON THE PUMP INLET PAD. REF. FPR UR F-4071 BY S/N 303-0344. CORRECTIVE ACTION-REPLACED THE FAILED INLET PAD WITH A GOOD ONE FROM ANOTHER UNIT AND CONTINUED TESTING. RETAINED T HE FAILED PART FOR FAILURE ANALYSIS. REF. FRR FR864-2-062 STATES THAT DESIGN HAS SUBMITTED TO THE PROCEDURE GROUP TE ST PROCEDURE CHANGES TO BE INCORPORATED, CUTTING DOWN VIBRATION TIME ON EACH AXIS AND TO USE ONE RPM SPEED DURING TE ST.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4558-F ACTUATOR ASSEMBLY, SERVOVALVE	FAR 27-65311-807	38F 631113	FACTORY		LIONEL PACIFIC	092400

FAILURE MODE-OUT OF TOLERANCE. THE V1 ACTUATOR ASSEMBLY FAILED DURING CHECKOUT WHEN THE INACTIVE NULL READING WAS -0.275 VOLT WHILE PLUS OR MINUS 0.25 VOLT IS THE MAXIMUM ALLOWABLE TOLERANCE RANGE. THE FAILURE RESULTED FROM AN INCORRECT SERVOVALVE NULL ADJUSTMENT CAUSED BY THE UNIT BEING ADJUSTED WITH AN IOC-TYPE SERVOAMPLIFIER AND THEN TESTED WITH AN AIG-TYPE SERVOAMPLIFIER.

CORRECTIVE ACTION-EQUIPMENT USED FOR ACCEPTANCE TESTING AND SERVOVALVE NULL ADJUSTMENT WAS MODIFIED BY INSTALLING AN AIG-TYPE SERVOAMPLIFIER TO ALIGN TEST EQUIPMENT MORE CLOSELY WITH MISSILE HARDWARE. SERVOVALVE NULL ON ALL VEHICLES WILL BE ADJUSTED USING AN AIG-TYPE SERVOAMPLIFIER BECAUSE 90 PERCENT OF THE VEHICLES HAVE AUTOPILOTS WITH AIG-TYPE SERVOAMPLIFIERS.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A1904.1 PUMP, FLANGE	UTP-PRT 27-06590-8	631114	CONVAIR	YES NO	VICKERS AA-60410-L-2	097020

FAILURE MODE-STRUCTURAL-AT THE COMPLETION OF AXISII PRT VIBRATION SWEEP, A CRACK WAS DISCOVERED IN THE OUTLET PRESSURE PORT PAD AT ONE OF THE SECURING BOLTS. REF. FDR NR F-4071 ST S/N 303-0344.

CORRECTIVE ACTION-REPLACE THE CRACKED OUTLET PRESSURE PORT PAD WITH A GOOD ONE FROM ANOTHER UNIT AND CONTINUE TESTING. HOLD THE FAILED PART FOR FAILURE ANALYSIS.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-04-4557-F ACTUATOR ASSY VERNIER	FAR 27-65312-805	250D 631113	FACTORY	YES NO	LIONEL PACIFIC	092407

FAILURE MODE-EXTERNAL LEAK. ACTUATOR ASSEMBLY LEAKED OIL AROUND THE SHAFT DURING CHECKOUT IN THE FINAL ASSEMBLY AREA. THE CAUSE OF THE REPORTED FAILURE COULD NOT DEFINITELY BE DETERMINED. THERE WAS SLIGHT FELT FIBER CONTAMINATION OF ONE OF THE SEALING O-RINGS, HOWEVER, ANY LEAKAGE MOST PROBABLY RESULTED FROM SPONGELIKE ACCUMULATION OF HYDRAULIC FLUID IN THE FELT LUBRICATORS.

CORRECTIVE ACTION-ALTHOUGH THE LEAKAGE RATE FOR THIS FAILURE MODE IS VERY LOW AND DOES NOT CONSTITUTE AN OIL DEPLETION OR FIRE HAZARD PROBLEM, IT WAS RECOMMENDED, SUBJECT TO AIR FORCE APPROVAL, THAT TEFLON RINGS BE SUBSTITUTED FOR THE FELT LUBRICATORS.

HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-A9-04-4572-F VERNIER ACTUATOR SERVOVALVE	FAR 60-65311-1	36D 631113	FACTORY	YES NO	LIONEL PACIFIC	

FAILURE MODE-DRIFT. THE V2 YAW ACTUATOR ASSEMBLY FAILED WHEN THE FEEDBACK TRANSDUCER NULL VOLTAGES DRIFTED FROM 50 TO 230 MV AFTER 8 HOURS CONTINUOUS OPERATION. THIS WAS ATTRIBUTED TO SERVOVALVE ARMATURE ASSEMBLY CONTOUR DISCREPANCIES.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							002431
CORRECTIVE ACTION-THE VENDOR ESTABLISHED BETTER ASSEMBLY INSPECTION PROCEDURES. EACH VALVE NOW RECEIVES A THERMAL C YCLE FOR STRESS RELIEF TO DETECT ANY UNSTABLE CONDITION IN THE TORQUE MOTOR ASSEMBLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-90-04-4532-F ACTUATOR ASSY, O-RING	FAR 27-05318-005	2270 631111	WTR	YES NO	LIONEL PACIFIC	001550
FAILURE MODE-EXTERNAL LEAK. THE V1 SERVOCYLINDER ASSEMBLY FAILED DURING CHECKOUT WHEN IT WAS FOUND TO BE LEAKING EX CESSIVELY. THE FAILURE WAS ATTRIBUTED TO FELT-FIBER CONTAMINATION OF THE O-RING SEALS RESULTING FROM SHREDDING OF TH E FELT LUBRICATOR RINGS. CORRECTIVE ACTION-ALTHOUGH LEAKAGE RESULTING FROM THIS FAILURE MODE IS SMALL AND DOES NOT CONSTITUTE A DEPLETION OR FIRE HAZARD PROBLEM, IT HAS BEEN RECOMMENDED SUBJECT TO AIR FORCE APPROVAL, THAT TEFLON RINGS BE SUBSTITUTED FOR TH E FELT LUBRICATOR RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-04-4549-F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05314-017	631109	FACTORY	YES NO	LIONEL PACIFIC	002460
FAILURE MODE-OUT OF SPECIFICATION. THE SUSTAINER SERVOCYLINDER ASSEMBLY FAILED ON THE SLV MOCKUP WHEN THE SUSTAINER YAW IN ACTIVE NULL READ 30 MV OVER THE MAXIMUM ALLOWABLE 350 MV. ALL ITEMS CHECKED OUT WITHIN REQUIREMENTS WHEN THE SERVOCYLINDER WAS FUNCTIONALLY TESTED, AND THE CAUSE OF THE REPORTED FAILURE COULD NOT DEFINITELY BE DETERMINED. HO WEVER, PIECES OF ORANGE PAINT FOUND IN THE SERVOVALVE MAY HAVE CAUSED THE REPORTED NULL SHIFT. CORRECTIVE ACTION-FAILURE NOT CONFIRMED. THE HYDRAULIC SYSTEM OF SLV MOCKUP WAS EXAMINED FOR CONTAMINATION. NONE WA S FOUND AND THE SYSTEM MET ALL SPECIFICATION REQUIREMENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	60A83-1083/A1-601-00-E38	FLIGHT	2320 631104	A-1 250	YES NO		007138
FAILURE MODE-ERRATIC OPERATION OSCILLATIONS WERE NOTED ON THE SUSTAINER HYDRAULIC SYSTEM PRESSURE MEASUREMENTS FROM 250 SECONDS TO 275 SECONDS. MAXIMUM PEAK-TO-PEAK VALVE WAS 148PSI. SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	60A63-1093/A1-401-00-232	FLIGHT	2320 621104	A-1 307	YES NO		007132

FAILURE MODE-ERRATIC OPERATION. AT 307 SECONDS SUSTAINER HYDRAULIC PUMP INLET PRESSURE BEGAN TO INCREASE FROM 76 PS IG. AT 345.5 SECONDS THE PRESSURE WAS AT 111 PSIG. AT THIS TIME THE PRESSURE DECREASED TO 23 PSIG WITHIN 0.5 SECONDS . DISTURBANCES WERE NOTED IN AXIAL ACCELERATION AND ROLL RATE AT THIS TIME.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE. REASONS FOR THE DISTURBANCES WERE NOT DETERMINED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4536-F VERNIER ACTUATOR ASSY, O-RING	FAR 27-05312-005	SE 631030	FACTORY	YES NO	LIONEL PACIFIC	002636

FAILURE MODE-EXTERNAL LEAK. THE VE YAW SERVOCYLINDER ASSEMBLY FAILED DURING CHECKOUT IN THE FACTORY WHEN IT LEAKED HYDRAULIC FLUID DURING MANUAL ACTUATION OF THE ENGINE. THE LEAKAGE WAS CAUSED BY SHREDDING FELT LUBRICATORS WHICH CU T AND CONTAMINATED THE O-RING SEALS.

CORRECTIVE ACTION-THE FRAYED FELT LUBRICATOR RINGS AND DISCREPANT O-RINGS WERE REPLACED. INSPECTION PERSONNEL WERE INSTRUCTED TO EXAMINE ALL O-RINGS UNDER MAGNIFICATION FOR SURFACE DEFECTS BEFORE INSTALLATION. ALTHOUGH THE LEAKAGE RATE FOR THIS FAILURE MODE IS SMALL AND DOES NOT CONSTITUTE A FIRE HAZARD OR DEPLETION PROBLEM, IT WAS RECOMMENDED T HAT TEFLON RINGS BE SUBSTITUTED FOR THE FELT LUBRICATORS.

HYDRAULIC-A/B SUSTAINER/VERNIER	D409367 ACCUMULATOR, O-RING	UTP-PET 27-08553-3	631029	CONVAIR	YES NO	PEACOCK 51305-3	005611

FAILURE MODE-LEAK EXTERNAL. DURING THE MINUS 30 DEGREE F. TEST, HYDRAULIC OIL LEAKAGE ACROSS THE PISTON O-RING INTO THE PNEUMATIC SIDE WAS 172 ML. AFTER 50 CYCLES OF OPERATION. REQ. IS 60 ML. MAX. THIS LEAKAGE WAS CAUSED BY CRACKS ON THE O-RING SEAL. REF. FR654-2-037 S/N 207-0394.

CORRECTIVE ACTION-NONE-SCHEDULED TESTING IS TO CONTINUE.

HYDRAULIC-A/B SUSTAINER/VERNIER	60A63-1002/P1-602-00-136	FLIGHT	1307 631020	11 131	YES NO	

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC PRESSURES BEGAN DECAYING SHORTLY AFTER THE BEGINING OF BOOSTER JETTISON.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. PRESSURE IN THE SUSTAINER SYSTEM WAS LOST BY 140 SECONDS AND IN THE VERNI ER SYSTEM BY 167 SECONDS.

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VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. VEHICLE STABILITY WAS LOST BY 140 SECONDS. THE SUSTAINER AND VERNIER ENGINES SHUT DOWN AT 261 SECONDS. CORRECTIVE ACTION-NONE.							000513
HYDRAULIC-A/B SUSTAINER/VERNIER	60A63-0690/B3-403-00-142 SUSTAINER ACTUATOR ASSY	FLIGHT 27-65314	142D 631028	B-3 136.5	YES NO	LIONEL PACIFIC	000419
FAILURE MODE-OUT OF EXPECTED TEST VALUE. THE SUSTAINER ENGINE EVIDENCED A YAW OFFSET AT NULL POSITION. THE ENGINE APPEARED TO BE MISALIGNED IN YAW. SYSTEM EFFECT-NONE. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. THE ENGINE IMPARTED A YAW ACCELERATION WHEN NULLED BY THE FLIGHT CONTROL SYSTEM AFTER BECO. THE FLIGHT CONTROL SYSTEM SUBSEQUENTLY STABILIZED THE VEHICLE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-04-4537-F VERNIER ACTUATOR, O-RING	FAR 27-0J312-005	109F 631027	WTR MAB2		LIONEL PACIFIC	062660
FAILURE MODE-EXTERNAL LEAK. THE VERNIER SERVOCYLINDER ASSEMBLY FAILED DURING MISSILE CHECKOUT IN MAB 2 WHEN IT LEAKED HYDRAULIC FLUID. THE FAILURE WAS ATTRIBUTED TO CONTAMINATION OF THE O-RING SEALS BY SHREDDING FELT LUBRICATORS. CORRECTIVE ACTION-THIS ACTUATOR WAS MADE IN 1962. IN MARCH 1963 THE VENDOR REVISED THE ASSEMBLY METHOD TO REDUCE FRAYING OF THE FELT DURING ASSEMBLY. IT WAS RECOMMENDED, SUBJECT TO AIR FORCE APPROVAL, THAT THE FELT LUBRICATORS BE REPLACED WITH TEFLON RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-04-4538-F VERNIER ACTUATOR ASSY, O-RING	FAR 27-05312-005	109F 631027	WTR WTRMAB2	YES NO	LIONEL PACIFIC	001380
FAILURE MODE-EXTERNAL LEAK. THE VERNIER ACTUATOR ASSEMBLY FAILED DURING PERFORMANCE OF FILL-AND-BLEED PROCEDURES ON MISSILE 109F IN MAB 2 WHEN IT LEAKED HYDRAULIC FLUID. THE CAUSE OF THE LEAKAGE WAS DAMAGED O-RINGS AGGRAVATED BY FELT CONTAMINATION. CONTRIBUTING TO THE SHREDDING OF THE FELT LUBRICATORS, WAS THAT THEY WERE NOT CUT ON AN ANGLE AS REQUIRED. CORRECTIVE ACTION-A MICROSCOPIC EXAMINATION OF O-RINGS IN STOCK SHOWED A LARGE PERCENTAGE TO BE DEFECTIVE DUE TO MOLD PROBLEMS. INSPECTION PERSONNEL WERE INSTRUCTED TO MICROSCOPICALLY INSPECT ALL O-RINGS FOR DEFECTS. ASSEMBLY AND INSPECTION PERSONNEL WERE INSTRUCTED IN THE CORRECT METHOD OF FORMING CUTTING, AND INSTALLING FELT LUBRICATOR RINGS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-10-226-F HOSE ASSEMBLY	FAR 27-08581-5	651022	FACTORY	YES NO	TITEFLEX 96932-5	000525
FAILURE MODE-STRUCTURAL-BECAME CONTORTED DURING FLEXING CYCLES DURING PRT DUE TO WIRE BRAID FAILING IN FATIGUE.							
CORRECTIVE ACTION-SURVEY 102-63 WAS ISSUED TO REJECT ALL UNITS FROM LOTS 6, 7, 8 AND 9. NEW HOSE DESIGNED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-A9-10-213-F HOSE ASSEMBLY	FAR 27-08581-5	2250 651021	FACTORY	YES NO	TITEFLEX 96932-5	000122
FAILURE MODE-LEAK EXTERNAL-GASEOUS NITROGEN LEAKAGE AT END FITTING FERRULE DUE TO INADEQUATE SILVER BRAZING.							
CORRECTIVE ACTION-BRAZE PENETRATION CONTROLLED BY A MODIFIED BRAID RING DRILLED THROUGH THE OUTSIDE DIAMETER AT 60 DEGREE INCREMENTS. DRAWING CALLS OUT THAT BOTH BRAID AND SILVER BRAZE MUST BE VISIBLE THROUGH FIVE OF THE SIX HOLES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	27A2898 VERNIER FLOW LIMITER VALVE	UTP-PRT 27-04206-1	651021	GO/C	YES NO	STERER 13000	000074
FAILURE MODE-OUT OF-TOLERANCE. DURING PRT TESTS THE STEADY STATE FLOW AND THE OVERSHOOT RESPONSE TIME WERE OUT-OF-TOLERANCE. OVERSHOOT TIME VARIED FROM 60 TO 120 MILLISECONDS (SPEC ALLOWABLE IS 15 MILLISECONDS). REFER TO FRR 039. TEST SPECIMEN S/V Z06-1537.							
CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX SPECIFICATION LIMITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-A9-04-4435-F SUSTAINER ACTUATOR ASSY, SERVOVALVE	FAR 27-05314-819	1990 651018	FACTORY	YES NO	LIONEL PACIFIC	000070
FAILURE MODE-LEAK. THE SERVO VALVE ON THE ACTUATOR DEMONSTRATED AN INTERMITTENT NULL DROP-OUT ASSOCIATED WITH CHANGES IN HYDRAULIC SUPPLY PRESSURE. FAILURE WAS CAUSED BY O-RING LEAKAGE.							
CORRECTIVE ACTION-GO/C SECURED A VENDOR DESIGN CHANGE INCORPORATED INTO NEW AND REPAIRED SERVOVALVES AFTER APRIL 1962. THE SERVOVALVE SEAL CHANGE REPLACES THE LARGE CROSS-SECTION O-RING AND WASHER UNDER THE CONTROL-PRESSURE NOZZLE WITH A SMALL CROSS-SECTION O-RING AND A BRASS SPACER IN PLACE OF THE ALUMINUM WASHER.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4402-F SUSTAINER ACTUATOR ASSY, O-RING	FAR 27-85314-819	2450 631011	FACTORY	YES NO	LIONEL PACIFIC	002433

FAILURE MODE-LEAK-EXTERNAL. A HYDRAULIC LEAK WAS REPORTED IN THE SUSTAINER ACTUATOR BETWEEN THE SERVOVALVE AND THE ACTUATOR. FURTHER INVESTIGATION REVEALED THAT THREE O-RINGS WERE DAMAGED. POSSIBILITY OF INCORRECT O-RINGS SIZES INSTALLED.

CORRECTIVE ACTION-PRODUCTION AND INSPECTION DEPARTMENTS WERE INSTRUCTED TO CHECK ALL O-RINGS FOR DAMAGE BEFORE INSTALLATION AND ALSO TO VERIFY THAT THE CORRECT SIZES ARE USED.

HYDRAULIC-A/B SUSTAINER/VERNIER	6901905.1 HYDRAULIC FLEX HOSE ASSY.	UTP-PRT 27-08571-43	631000	OTHER	YES NO	AEROQUIP 677025-8-0161	007038

FAILURE MODE-OUT OF TOLERANCE. DURING INITIAL ACCEPTANCE TEST THE UNIT WHEN PRESSURIZED TO 3000 PSIG. EXCEEDED 6 PERCENT OF ITS UNPRESSURIZED VOLUME, 6 PERCENT FOR THIS UNIT IS 2.46 CC.

CORRECTIVE ACTION-NONE-TEST TERMINATED.

HYDRAULIC-A/B SUSTAINER/VERNIER	LV-9B-04-4560-F VERNIER ACTUATOR ASSEMBLY	FAR 27-85311-805	2630 630930	ETR	NO NO	LIONEL PACIFIC	002491

FAILURE MODE-ERRATIC OPERATION. THE VERNIER ACTUATOR ASSEMBLY REPORTEDLY FAILED DURING PERFORMANCE OF A FACT AT ETR WHEN THE VERNIER ENGINE FAILED TO RESPOND TO CONTROL SIGNALS FOR 30 TO 40 SECONDS, AFTER WHICH PROPER OPERATION WAS RESUMED. THE CAUSE OF THIS FAILURE WAS NOT DETERMINED AS ANALYSIS OF THE SERVOCYLINDER REVEALED NO DISCREPANCIES.

CORRECTIVE ACTION-NONE. SINCE THE FAILURE OF THIS ACTUATOR ASSEMBLY WAS NOT CONFIRMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	FTA8254/P2-4CO-02-263 ACTUATOR ASSEMBLY	COMPOSITE-J FACT 27-85311-805	2630 630927	12 277.8	YES YES	LIONEL PACIFIC	007060

FAILURE MODE-FAIL DURING OPERATION. DATA INDICATED LOSS OF V1 ENGINE POSITION CONTROL FROM 277.8 TO 487.7 SECONDS. DATA WAS NORMAL BEFORE AND AFTER THIS TIME.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-COMMANDS NOT RECEIVED OR SENT FROM 277.8 TO 487.7 SECONDS.

CORRECTIVE ACTION-REPLACED A/P SERVO CANISTER AND ENGINE ACTUATOR.

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HYDRAULIC-A/B SUSTAINER/VERNIER	60/A63-0968/C1-301-00-71 TUBING	FLIGHT	71E 630925	C1 127.5	YES NO		007880

FAILURE MODE-STRUCTURAL. SUSTAINER/VERNIER HYDRAULIC RETURN PRESSURE DROPPED TO 0 PSI DURING THE STAGING BLACKOUT A S A RESULT OF A COMPLETE RETURN LINE SEVERANCE.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. LOSS OF HYDRAULIC FLUID CAUSED SUSTAINER/VERNIER PUMP DISCHARGE PRESSURE TO START DECAYING 5.1 SECONDS AFTER STAGING AND FLIGHT CONTROL WAS LOSS AT 140 SECONDS.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4444-F VERNIER ACTUATOR ASSEMBLY, FEEDBAC K TRANSDUCER	FAR 27-85312-005	48E 630921	FACTORY	YES NO	LIONEL PACIFIC	006072

FAILURE MODE-OUT OF SPECIFICATION-REPORTEDLY, DURING MAPCHE LOOK-SEE RUN, VERNIER 2 YAW OPTICAL READINGS FOR ENGINE DISPLACEMENT WERE OUT OF SPECIFIED LIMITS. REPORTED FAILURE NOT CONFIRMED, HOWEVER FEEDBACK TRANSDUCER ADJUSTMENT D ISCREPANCY CAUSED THE EXCESSIVE ENGINE DISPLACEMENT VALUES REPORTED. INCORRECT FEEDBACK TRANSDUCER ADJUSTMENT PROCED URES CAUSED PROBLEM.

CORRECTIVE ACTION-REVIEW SHOWED THE ACTUATOR ASSY FEEDBACK TRANSDUCER NULL AND PHASING TESTING WAS INADVERTENTLY OM ITTED ON THIS ACTUATOR ASSEMBLY. TO PREVENT RECURRENCE OF THIS OMISSION, TRANSDUCER NULL AND PHASING TESTS HAVE BEEN INCORPORATED IN ALL ACTUATOR ASSEMBLY PERFORMANCE CHECK SHEETS.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A2019A VERNIER FLOW LIMITER VALVE	UTP-PRT 27-04206-1	630920	60/C	YES NO	CONAIR 1470-7	005599

FAILURE MODE-OUT OF TOLERANCE. DURING FREQUENCY RESPONSE TEST, STATIC FLOW (1.02 VS. SPECIFICATION OF 1.10 GPM MINI MUM) AND OVERSHOOT TIME (.042 SECONDS VS. SPECIFICATION OF .015 SECONDS) WERE OUT OF TOLERANCE. SIMILAR FAILURES ON D ATE 630924. REFER TO FRR 006. TEST SPECIMEN S/N 206-1537.

CORRECTIVE ACTION-ECP 7698 SUBMITTED TO RELAX SPECIFICATION LIMITS. ALSO, ACTION INITIATED TO DROP CONAIR AS A SOUR CE OF 27-04206-1. REFER TO FRR 378.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4462-F SERVOVALVE-VERNIER	FAR 27-85312-005	233D 630917	FACTORY	YES NO	LIONEL PACIFIC	

FAILURE MODE-OUT OF TOLERANCE-SERVOVALVE ON ACTUATOR WAS OUT OF NULL TOLERANCE. THIS FAILURE SHOULD NOT BE CONSIDER ED AS FAILURE OF THE ACTUATOR ASSEMBLY BUT RATHER AS INCORRECT ACTUATOR ASSEMBLY NULL ADJUSTMENT CAUSED BY A DIFFERE NCE BETWEEN COMPONENT TEST EQUIPMENT SERVO-AMPLIFIER AND THE SERVOAMPLIFIER ON MISSILE 233-D.

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CORRECTIVE ACTION-IN APRIL 1964 GD/C BEGAN MODIFICATION OF ACTUATOR ASSEMBLY TEST EQUIPMENT USED FOR ACCEPTANCE TESTING AND SERVOVALVE NULL ADJUSTMENT. SERVOVALVE NULL WILL BE ADJUSTED WITH CONTROL SIGNALS FROM AIC RATHER THAN AN IOC-TYPE OF SERVOAMPLIFIER.							000000
HYDRAULIC-A/B SUSTAINER/VERNIER	69F1977.1 HYDRAULIC FILTER	UTP-SLT 27-08564-603	630916	CONVAIR	YES NO	PUROLATOR 64988-1	007000
FAILURE MODE-OUT OF SPECIFICATION. DURING FINAL PROOF CYCLE AFTER THE 4000 PSIG DELTA PRESSURE TEST, THE BUBBLE POINT TEST SHOWED THAT THE PORE SIZE OF THE FILTER ELEMENT TO BE 26.2 MICRONS. REQ. SIZE IS 25 MICRONS MAX. REF. FPR NR F-4033 ST S/N 012-0157. CORRECTIVE ACTION-HYDRAULICS DESIGN IS TO AMEND THE SPECIFICATION 27-08512 TO ALLOW INCREASE IN MICRON SIZE AFTER ELEMENT PROOF PRESSURE TEST UP TO 40 MICRONS. REF. FRR FR654-2-028.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-95-04-4448-F ACTUATOR-SUSTAINER	FAR 27-0858 -3	630916	FACTORY	YES NO	LIONEL-PACIFIC 2723-1	000071
FAILURE MODE-OUT OF SPECIFICATION-DURING RECEIVING INSPECTION THE FLOW RATE WAS REPORTEDLY 1.08 GPM WHEREAS ONLY 1.00 GPM IS THE MAXIMUM PERMITTED. IT WAS NOT POSSIBLE TO DUPLICATE THE REPORTED FAILURE AS THE COMPLETE ACTUATOR ASSEMBLY WAS NOT SENT FOR FAILURE ANALYSIS. CORRECTIVE ACTION-THE RECOMMENDED CORRECTIVE ACTION OF THE ENTIRE ASSEMBLY WHENEVER THERE IS A FAILURE DURING PERFORMANCE OF EOP 303.9, 303.7, 303.8 OR 303.10, WAS EFFECTED NOVEMBER 13, 1963. RECEIVING PERSONNEL STATED IT WOULD BE ACCOMPLISHED FOR ALL ASSEMBLIES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-02-016P VERNIER ACTUATOR FAIRING	FAR 27-85322	1260 63091.	36A	YES NO		000200
FAILURE MODE-STRUCTURAL. THE FORWARD EDGE OF THE FAIRING WAS CRACKED TWO INCHES AND HAD A CHIP MISSING. FAILURE IS ATTRIBUTED TO RESIN DEPLETION AT INITIAL FABRICATION, UNDER CURING AND AGEING. THE CRACK HAD BEEN PATCHED-WITHOUT AUTHORIZATION. RESIN CONTENT WAS APPROXIMATELY HALF THAT REQUIRED BY DRAWING, 37 PERCENT. THIS REDUCED FLEXURE STRENGTH TO 6143 PSI. REQUIREMENT IS FOR 10,000 PSI. SEVERLY CONTOURED AREAS AFFECT RESIN CONTENT. CORRECTIVE ACTION-IT WAS RECOMMENDED TO REPLACE ALL FAIRINGS HAVING UNAUTHORIZED PATCHING. DESIGN PERSONNEL ESTABLISHED A MANUFACTURING SPECIFICATION FOR REPAIR OF ASBESTOS RESIN STRUCTURE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4441-F SUSTAINER SERVO VALVE	FAR 27-04209-1	630911	FACTORY	YES NO	CADILLAC GAGE FC-26-398A	006073

FAILURE MODE-OUT OF SPECIFICATION-UNIT SIGNAL RESPONSE TIME WAS SLOW. FAILURE IS CONSIDERED UNCONFIRMED. CONFIRMATION AND DETERMINATION OF CAUSE FOR FAILURE CAN NOT BE MADE FOR RESPONSE TIME REQUIREMENTS WITHOUT THE MATING ACTUATOR.

CORRECTIVE ACTION-ADEQUATE STEPS WERE TAKEN BY THE REPAIR ACTIVITY TO ASSURE CORRECT INTERNAL VALVE ADJUSTMENTS WILL BE MADE DURING THE REPAIR AND TESTING OF SERVO VALVES.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4442-F VERNIER SERVO VALVE	FAR 27-04209-1	630911	FACTORY	YES NO	CADILLAC GAGE FC26-397A	006074

FAILURE MODE-FAILED DURING OPERATION-DURING A RUN OF PERFORMANCE CHECK THE SERVOVALVE WAS INOPERATIVE. FAILURE WAS CAUSED BY INCORRECT ORIFICE DIAMETERS IN THE SUPPLY ORIFICE ASSEMBLY. THE ARMATURE TARGET SETSCREW WAS NOT PROPERLY SOLDERED AFTER ADJUSTMENT. DAMAGE TO THE SUPPLY ORIFICE ASSEMBLY O-RING WAS CAUSED BY ASSEMBLY TECHNIQUES. ZERO ADJUSTMENT ROD IMMOBILITY WAS CAUSED BY DAMAGE TO THE GUIDE ORIFICE DURING REPAIR.

CORRECTIVE ACTION-ALL SUPPLY ORIFICE ASSY HOLE DIAMETERS WILL BE MEASURED AND RECORDED DURING SERVOVALVE REASSEMBLY TO ASSURE CORRECT COMPONENTS ARE INSTALLED. THE VISUAL AIDS USED IN ASSEMBLY ARE BEING REVISED TO DOCUMENT THE HOLE MEASUREMENT REQUIREMENT.

HYDRAULIC-A/B SUSTAINER/VERNIER	69A2010A VERNIER FLOW LIMITER VALVE	UTP-PRT 27-04206-1	630907	GD/C	YES NO	STERER 13000	006075

FAILURE MODE-OUT OF-TOLERANCE. DURING PRT TESTS THE STEADY STATE FLOW AND THE OVERSHOOT RESPONSE TIME WERE OUT-OF-TOLERANCE. OVERSHOOT TIME VARIED FROM 60 TO 126 MILLISECONDS (SPEC ALLOWABLE IS 15 MILLISECONDS). OTHER SIMILAR FAILURES 630913, AND 630420. REFER TO FRR 006.

CORRECTIVE ACTION-ECP 7000 SUBMITTED TO RELAX SPECIFICATION LIMITS.

HYDRAULIC-A/B SUSTAINER/VERNIER	60A63-0072/BE-403-00-03 LINE	FLIGHT	630 630906	B-2 110	YES NO	

FAILURE MODE-FAIL DURING OPERATION-VERNIER HYD LINE LOCATED DOWNSTREAM OF DISTRIBUTION MANIFOLD IN VERNIER ENGINE FAIRING FAILED DUE TO INDUCED AERODYNAMIC HEATING AT 110 SEC.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY.

VEHICLE EFFECT-PREMATURE PROPULSION SHUTDOWN- SUSTAINER AND VERNIER ENGINES SHUTDOWN PREMATURELY.

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CORRECTIVE ACTION-LATER SERIES ENGINES (BLOCK I) CHANGED LINE FROM ALUMINUM TO STEEL.							000106
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-04-4430-F VERNIER ACTUATOR ASSEMBLY, WIPER	FAR 27-03312-008	630905	FACTORY	YES NO	LIONEL PACIFIC LIONEL PACIFIC	000070
FAILURE MODE-LEAK-AFTER INITIAL VERNIER INSTALLATION THE ACTUATOR LEAKED HYDRAULIC FLUID UNDER RESIDUAL SYSTEM PRESSURE. FAILURE IS ATTRIBUTED TO SHREDDING OF THE FELT WIPER BLOCKING PROPER SEALING OF THE O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-209-F SUSTAINER HYDRAULIC PUMP, O-RING	FAR 27-08590-3	3F 630827	WTR	YES NO	VICKERS AA-60410-L-2	000120
FAILURE MODE-LEAK EXTERNAL-HYDRAULIC FLUID LEAK AT REAR COVERPLATE.							
CORRECTIVE ACTION-60/C ADVISED PERSONNEL ON PROPER TORQUING OF REAR COVER PLATE NUTS-ADVISED WTR AND FACTORY ON USE OF ARTICLES PRIOR TO EXPIRATION OF O RING CURE DATE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69F3268.1 ACCUMULATOR	UTP-PET 27-08587-3	630822	CONVAIR	YES NO	BENDIX 3057973	000040
FAILURE MODE-OUT OF TOLERANCE. DURING PET PISTON BREAKAWAY TEST, PRESSURE REQUIRED WAS 31 PSIG (SPEC. IS 30 PSIG MAX.). TEST SPECIMEN 203-0560.							
CORRECTIVE ACTION-SPECIFICATION TO BE CHANGED TO ALLOW INCREASED BREAKAWAY PRESSURE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-208-F STAGING DISCONNECT ASSEMBLY	FAR 27-08555-3	1600-0 630820	FACTORY	NO NO	PEACOCK 51283-3	000130
FAILURE MODE-ERRATIC OPERATION-COUPLING SUSPECTED OF FAILING TO PERMIT BACKFLOW DURING FILL AND BLEED OPERATION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1908.1 ACCUMULATOR-PISTON	UTP-PRT 27-08555-3	630819	CONVAIR	YES NO	PEACOCK 51303-3	
FAILURE MODE-OUT OF TOLERANCE. TEST THE GAS PRECHARGE LEAKAGE ACROSS THE PISTON WAS 20 ML/HR. REQ. IS 2 ML/HR. MAX. AND WAS CAUSED BY A POROUS PISTON. REF. S/N 11R-0508.							

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CORRECTIVE ACTION-NONE. TEST TERMINATED.							006004
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-204F ACCUMULATOR	FAR 27-08553-3	630616	FACTORY	YES NO	PEACOCK 51305-3	000140
FAILURE MODE-LEAK INTERNAL-LEAKED GAS FROM PNEUMATIC TO THE HYDRAULIC SIDE OF THE INTERMEDIATE PISTON. CORRECTIVE ACTION - PEACOCK PISTON DRAWING REVISED TO REQUIRE DYE-PENETRANT INSPECTION OF PISTON HEAD, RADIOGRAPHIC INSPECTION OF PISTON DOME AREA, GLASS-PEENING OF INTERNAL AND EXTERNAL PISTON DOME SURFACES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-10-203-F HYDRAULIC RELIEF VALVE	FAR 27-08569-1	1660 630607	FACTORY	YES NO	BENDIX NF6 9212	000143
FAILURE MODE-LEAK INTERNAL DUE TO MISADJUSTMENT OF VALVE POPPET RESULTING IN HIGHER THAN ALLOWABLE INTERNAL LEAKAGE AT INLET PRESSURE OF 3150 PSIG. CORRECTIVE ACTION-GD/C CONTACTED QUALITY CONTROL PERSONNEL TO REINSTRUCT THEM TO ASSURE TOLERANCE REQUIREMENTS ARE MET BEFORE ACCEPTANCE OF UNITS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69F3268.1 ACCUMULATOR	UTP-PET 27-08587-3	630607	CONVAIR	YES NO	BENDIX 305-7973	007029
FAILURE MODE-OUT-OF-TOLERANCE DURING PET LEAK TEST. LEAKAGE WAS 45 PSIG (SPEC. MAX. IS 10 PSIG.). TEST SPECIMEN 203-0360. CORRECTIVE ACTION-SPECIFICATION TO BE CHANGED TO ALLOW MORE LEAKAGE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-99-04-4308-F ACTUATOR ASSEMBLY, SEAL	FAR 27-05312-808	2330 630607	FACTORY	YES NO	LIONEL-PACIFIC	
FAILURE MODE-CONTAMINATION. EXTERNAL LEAK; CAUSED VERNIER ACTUATOR LEAKED ON BOTH SIDES OF SHAFT. FAILURE WAS CONFIRMED DUE TO LUBRICATOR FELT SHREDDING PROHIBITING DYNAMIC O-RING SEALING. CORRECTIVE ACTION-GD/C STUDIED THE POSSIBILITY OF REPLACING THE FELT MATERIAL WITH A TEFLON SCRAPER RING BUT CONSIDERED THE COST OF REDESIGN AND TEST TOO HIGH AT THIS TIME. GD/C INITIATED CLOSER LIAISON WITH VENDOR QUALITY CONTROL.							

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							693990
HYDRAULIC-A/B SUSTAINER/VERNIER	88A1906.1 ACCUMULATOR, O-RING	UTP-PRT 27-08353-3	630808	CONVAIR	YES NO	PEACOCK 91309-3	698614
FAILURE MODE-LEAK INTERNAL-DURING THE STATIC TEST THE GAS PRECHARGE LEAKAGE ACROSS THE PISTON O-RING WAS 240 ML/HR. REQ. IS 2 ML/HR MAX. AND WAS CAUSED BY AN O-RING WITH NUMEROUS SURFACE IRREGULARITIES. REF. FR654-2-001 S/N 112-030 5. CORRECTIVE ACTION-THE O-RING WAS REPLACED AND THE UNIT RETURNED TO TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-89-04-4371-F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-65314-825	109F 630801	FACTORY	NO NO	LIONEL PACIFIC	693993
FAILURE MODE-OUT OF TOLERANCE. ACTUATOR ASSEMBLY HAD OUT OF TOLERANCE PITCH NULL DURING CHECKOUT. FAILURE CONFIRMED DUE TO CHARACTERISTICS OF A16 SERVOAMPLIFIER. FAILURE CAUSED BY FACTORY TEST EQUIPMENT INCOMPATIBILITY WITH A16 SER VOAMPLIFIER. CORRECTIVE ACTION-GD/C DESIGNED NEW FACTORY TEST EQUIPMENT CAPABLE OF ADEQUATELY CHECKING BOTH A16 AND 10C SERVOAMP LIFIERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-10-235-F O-NUT FLEXIBLE HOSE	FAR 27-08600-37	138F 630731	ETR	YES NO	RESISTOFLEX R21225-37	696139
FAILURE MODE-STRUCTURAL-FITTING AT ONE END OF THE HOSE WAS FOUND FROZEN AND COULD NOT BE TURNED BECAUSE TUBING SLEE VE WAS OF 400-SERIES STAINLESS STEEL. CORRECTIVE ACTION-GD/C ADVISED AIR FORCE THE FLEXIBLE HOSE IS NOT SUFFICIENT FOR ITS APPLICATION. A MATERIAL CHANGE IN TUBE SLEEVE DOES NOT WARRANT DESIGN ACTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-89-04-4387-F ACTUATOR ASSY-SUSTAINER	FAR 27-65314-817	163D 630731	FACTORY	NO NO	LIONEL PACIFIC	693997
FAILURE MODE-OUT OF TOLERANCE. DURING APCHE CHECKOUT, ACTUATOR HAD OUT OF TOLERANCE NULL. FAILURE NOT CONFIRMED IN ACTUATOR. APCHE TEST EQUIPMENT DETERMINED TO HAVE LOW INPUT VOLTAGE SIGNAL. PROBLEM IN GSE. CORRECTIVE ACTION-APCHE FACTORY TEST EQUIPMENT WAS REPAIRED AND REVALIDATED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-04-4381-F ACTUATOR ASSY-VERNIER O-RING	FAR 27-05312-005	4SF 630726	WTR	YES NO	LIONEL-PACIFIC	003904
FAILURE MODE-EXTERNAL LEAK. DURING MISSILE CHECKOUT, ACTUATOR DEVELOPED LEAKAGE OF HYDRAULIC FLUID PAST PISTON SEAL . FAILURE WAS CONFIRMED. PROBABLY DUE TO CONTAMINATION ACROSS O-RING. CAUSE OF FAILURE NOT ISOLATED BY FAILURE ANALY SIS.							
CORRECTIVE ACTION-GD/C INVESTIGATION OF ACTUATOR LEAKAGE IS CONTINUING. ECP 3442 CHANGES O-RING TO TOP VISUAL QUALI TY TYPE AND FELT WIPERS WILL BE REPLACED BY TEFLON WIPERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-04-4391-F ACTUATOR	FAR 27-06563-5	3F 630726	WTR	NO NO	CLEMCO 2725-1	003999
FAILURE MODE-LEAK-EXTERNAL. ACTUATOR FOUND LEAKING UNDER STANDBY HYDRAULIC PRESSURE. FAILURE WAS NOT CONFIRMED AS T HE AMOUNT OF SEEPAGE COULD NOT BE CONSIDERED OUT OF SPECIFICATION. STRIPPED CLAMP BOLTHOLE THREADS WERE FOUND BUT DI D NOT EFFECT LEAKAGE OR OPERATIONAL PERFORMANCE.							
CORRECTIVE ACTION-GD/C INSTRUCTED SITE PERSONNEL OF THE MINIMAL SEEPAGE LEAK FOUND DURING TEST AND ALSO DESCRIBED T HE STRIPPAGE OF THREADS AND THE NEED FOR PROPER INSTALLATION IF PISTON CLAMPS ARE USED AT THE SITE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-10-190-F HOSE ASSEMBLY	FAR 27-06581-5	630725	WTR	YES NO	TITFLEX 98932-5	006335
FAILURE MODE-LEAK EXTERNAL-GASEOUS NITROGEN LEAKAGE.							
CORRECTIVE ACTION-RESULTS OF TESTING LOST. SITES INFORMED TO HAVE PART WATCHED MORE CLOSELY AND TO PROMPTLY DISPOSI TION FUTURE FAILURES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SLV-99-10-215-F HOSE ASSEMBLY	FAR 27-06581-5	630723	GD/CPRT	YES NO	TITEFLEX 98932-5	000117
FAILURE MODE-LEAK EXTERNAL-GASEOUS NITROGEN- HOSE RUPTURED DURING FLEX TESTING AT 1030 FLEXING CYCLES WITH 3100-PSI G APPLIED TO HOSE. FAILURE ATTRIBUTED TO THE WIRE BRAID FAILING IN BENDING AND TENSION- RESULTED IN BELLOWS RUPTURE.							
CORRECTIVE ACTION-SURVEY 102-63 WAS ISSUED TO REJECT ALL UNITS FROM LOTS 8-7-8 AND 9. NEW HOSE DESIGNED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	69A1953-3 FLEX HOSE ASSY.	UTP-PRT 27-08581-5	630722	CONVAIR	YES NO	TITEFLEX 98932-5	897108
FAILURE MODE-LEAK-EXTERNAL-DURING THE FLEXIBILITY TEST AFTER 1030 C CLES THE UNIT LEAKED GNZ. THE LEAKAGE CAME THRO UGH THE FLEX BRAID AND WAS CAUSED BY THE RUPTURE OF THE BRAID AND FLEX TUBE AT THE JUNCTION OF THE BRAID AND END FIT TING. UNIT WAS AT 3100 PSIG. AND 101 DEGREE F. REF. RELIABILITY TEST FAILURE NOTICE BLV7 S/N 110-0350. CORRECTIVE ACTION-NONE-PROPULSION DESIGN STATED THAT THIS FAILURE WOULD HAVE NO EFFECT ON FLIGHT. REF. FRR FR654-2-002 AND SUPPLEMENT A AND B.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1953.3 FLEX HOSE ASSY.	UTP-PRT 27-08581-5	630722	CONVAIR	YES NO	TITE FLEX 98932-5	897088
FAILURE MODE-LEAK-EXTERNAL-THE UNIT WAS PRESSURIZED WITH GNZ TO 6000 PSIG. IT LEAKED AT THE RATE OF 400 CC/MIN. AT THE CONNECTION OF THE FLEX SECTION TO THE END FITTING. THE UNIT WAS SUBJECTED TO THE FLEXIBILITY TEST AND DURING THE FLEXURE CYCLES THE LEAKAGE STEADIL. INCREASE UNTIL THE HOSE RUPTURED AT 1070 FLEXURE CYCLES WITH THE UNIT PRESSURIZ ED TO 3100 PSIG AND AT A TEMPERATURE OF 70 DEGREE F. REF. RELIABILITY FAILURE NOTICE BLV8 S/N 110-0359. CORRECTIVE ACTION-NONE-TEST TERMINATED. PROPULSION DESIGN STATED THAT THIS FAILURE WOULD HAVE NO EFFECT ON FLIGHT. REF. FRR FR654-2-002 AND SUPPLEMENT A AND B.							
HYDRAULIC-A/B SUSTAINER/VERNIER	69A1953.3 FLEX HOSE ASSY.	UTP-PRT 27-08581-5	630722	CONVAIR	YES NO	TITEFLEX 98932-5	897051
FAILURE MODE-LEAK-EXTERNAL-DURING POST PRT VIBRATION PROOF CYCLE THE UNIT LEAKED GNZ AT THE RATE OF 8 CC/MINUTE AT 3000 PSIG AT THE MATING OF THE FLEX SECTION AND ONE OF THE END FITTINGS. REF. RELIABILITY TEST FAILURE NOTICE BLV5 S/N 110-0359. CORRECTIVE ACTION-NONE. TESTING CONTINUED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-09-10-189-F PRESSURE GAGE	FAR 27-08562-3	72E 630718	FACTORY	YES NO	ROCHESTER GAGE 8803-718-1	898144
FAILURE MODE-LEAK EXTERNAL-LEAKING FLUID FROM GAGE ATTACHMENT TO THE ACCUMULATOR LINE FITTING. DUE TO A DEFECTIVE B RAZE. CORRECTIVE ACTION-FIELD PERSONNEL NOTIFIED OF POSSIBLE ACCUMULATOR PROBLEMS BY TWX AND BY TELECON.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-198-F PRESSURE GAGE	FAR 27-08562-3	199D 630709	FACTORY	YES NO	ROCHESTER GAGE 6903-719-1	690145

FAILURE MODE-LEAK INTERNAL-LEAKING BETWEEN GAGE HOUSING AND THE TUBE CONNECTION THROUGH THE RELIEF PORT IN THE GAGE HOUSING.

CORRECTIVE ACTION-ROCHESTER GAGE TO USE GENERAL ELECTRIC HALOGEN LEAK DETECTOR FOR WELD INSPECTION. MINIATURIZED WELD TIPS TO BE USED WITH HYDROGEN AS WELDING GAS. CHANGE FLUX MATERIAL AND PROCURE TUBING OF 0.005 INCH OUTSIDE DIAMETER TOLERANCE.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4362-F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-85314-023	136F 630707	ETR	YES NO	LIONEL PACIFIC	693995

FAILURE MODE-LEAK-EXTERNAL. ACTUATOR HAD LEAKAGE OF HYDRAULIC FLUID FROM ADJUSTABLE END. FAILURE WAS NOT CONFIRMED IN EXTENSIVE TESTING. CAUSE OF FAILURE UNKNOWN.

CORRECTIVE ACTION-GD/C INFORMED SITE PERSONNEL OF RESULTS OF ANALYSIS. NO FURTHER CORRECTIVE ACTION WAS TAKEN SINCE REPORTED FAILURE WAS NOT CONFIRMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4332-F ACTUATOR ASSEMBLY, SEAL	FAR 27-85312-005	109F 630701	FACTORY	YES NO	CLEMCO	693826

FAILURE MODE-LEAK-EXTERNAL. VERNIER SERVOCYLINDER LEAKED HYDRAULIC FLUID IN EXCESS OF SEVERAL DROPS PER MINUTE. FAILURE CONFIRMED DUE TO OMISSION OF O-RING IN PRESSURE PORT UNION. FAILURE CAUSED BY IMPROPER ASSEMBLY.

CORRECTIVE ACTION-GD/C REVIEWED ALL PART PLANNING AND O-RING CALLOUT WAS FOUND ADEQUATE. ALL RESPONSIBLE PERSONNEL WERE NOTIFIED OF THIS HUMAN ERROR FAILURE. ASSEMBLY AND INSPECTION PROCEDURES WERE TIGHTENED.

HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-4356-F ACTUATOR ASSEMBLY, SEAL	FAR 27-85312-005	79D 630620	WTR	YES NO	LIONEL-PACIFIC	693630

FAILURE MODE-LEAK-EXTERNAL. VERNIER ACTUATOR ASSY LEAKED HYDRAULIC OIL PAST PISTON SHAFT SEAL WITH NO SYSTEM PRESSURE APPLIED. OUT OF SPECIFICATION LEAKAGE NOT CONFIRMED. O-RING ON TRANSDUCER END OF ACTUATOR HAD A FINE CUT ON PERIPHERY AND WAS PROBABLE CAUSE OF LEAKAGE REPORTED FROM FIELD.

CORRECTIVE ACTION-VENDOR REINSTRUCTED ASSEMBLY AND INSPECTION PERSONNEL IN PROPER METHODS OF INSTALLING O-RINGS, BACK-UP RINGS AND FELT LUBRICATORS IN VERNIER ACTUATOR ASSEMBLIES. VENDOR ALSO IMPLEMENTED 100-PERCENT INSPECTION OF O

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HYDRAULIC-A/B SUSTAINER/VERNIER	EM-1860/82-401-00-138	FLIGHT	1560 630827	5768-2 118.7	YES NO		097100
FAILURE MODE-FAILED DURING OPERATION. SUSTAINER VERNIER HYDRAULIC PRESSURE LOST AT 118.7 SECONDS. SYSTEM EFFECT-OPERATION STOPPED PREMATURELY. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. STRONG DIVERGENT SLOSH OSCILLATIONS IN PITCH AND ERRATIC ENGINE MOVEMENTS . ENGINES SHUT DOWN ABOUT 119 SECONDS. SHOCKS NOTED ON GYROS AT 118.4 SECONDS. VEHICLE SELF-DESTRUCTION ABOUT 120 SE CONDS. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-196-F ACCUMULATOR	FAR 27-08553-3	630626	FACTORY	YES NO	PEACOCK 51303-3	090113
FAILURE MODE-LEAK INTERNAL-LEAKED GAS FROM PNEUMATIC TO THE HYDRAULIC SIDE OF THE INTERMEDIATE PISTON CORRECTIVE ACTION-PEACOCK PISTON DRAWING REVISED TO REQUIRE DYE-PENETRANT INSPECTION OF PISTON HEAD. RADIOGRAPHIC I NSPECTION OF PISTON DOME AREA GLASS-PEENING OF INTERNAL AND EXTERNAL PISTON DOME SURFACES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-90-04-4370-F ACTUATOR ASSEMBLY, SEAL	FAR 27-05311-803	750 630626	WTR	YES NO	CLEMCO	093033
FAILURE MODE-EXTERNAL LEAK. VERNIER B ACTUATOR WAS FOUND LEAKING EXCESSIVELY DURING PERFORMANCE PROCEDURE. FAILURE WAS CONFIRMED DUE TO FELT WIPER SHEDDING AND PROHIBITING PROPER O-RING SEALING. FAILURE MOST PROBABLY CAUSED BY IMPR OPER ASSEMBLY OF FELT WIPERS. CORRECTIVE ACTION-OVERHAUL CENTER PROVIDED VISUAL AID FOR OVERHAUL PERSONNEL TO CLARIFY FELT WIPER FABRICATION AND ASSEMBLY. GD/C STUDIED THE POSSIBILITY OF REPLACING THE FELT WITH A TEFLON SCRAPER RING BUT CONSIDERED THE COST OF R EDESIGN AND TEST TOO HIGH AT THIS TIME. GD/C INITIATED CLOSER LIAISON WITH VENDOR QUALITY CONTROL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-10-189C SUSTAINER HYDRAULIC PUMP	FAR 27-08590-3	626 630628	VAFB	YES NO	VICKERS AA-60410-L-2	090337
FAILURE MODE-ERRATIC OPERATION-DURING FILL AND BLEED OPERATION THE PUMP EMITTED A CLICKING SOUND DUE TO PRESSURE AN D PUMP ROTATION. CORRECTIVE ACTION-NONE-FAILURE ANALYSIS ON THE UNIT WAS CANCELLED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-4333-F ACTUATOR ASSEMBLY	FAR 27-05511-605	201D 630620	WTR	YES NO	LIONEL-PACIFIC	095589
FAILURE MODE-OUT OF TOLERANCE. MISSILE CHECKOUT ACTUATOR FAILED TO RESPOND TO INPUT SIGNALS FROM MAPCHE DECK 107, C ARDS 204 AND 210. FAILURE CONFIRMED DUE TO INCORRECT SNUBBER PISTON ACTION. CAUSE OF FAILURE WAS SNUBBER PISTONS INS TALLED BACKWARDS ALLOWING UNRESTRICTED FLOW OF HYDRAULIC FLUID PAST THE SNUBBER PISTONS. CORRECTIVE ACTION-GD/C REVISED TEST PROCEDURE TO INSURE SNUBBER SECTION HYDRAULIC PLUGS ARE REMOVED DURING TESTING , AND PROVIDED ADDITIONAL TRAINING FOR ASSEMBLY PERSONNEL IN CORRECT METHODS OF INSTALLING SNUBBER PISTONS.						
HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4333-F SERVO VALVE	FAR 27-04208-1	630620	FACTORY	YES NO	CADILLAC GAGE FC-27-398A	095629
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. SERVO-VALVE FAILED TO MEET SPECIFICATION SIGNAL RESPONSE RATE REQU IREMENTS. FAILURE WAS CONFIRMED DUE TO EXTRANEOUS METAL CHIP BLOCKING PROPER OPERATION OF FLAPPER MECHANISM. FAILURE CAUSED BY CONTAMINATION INTRODUCED DURING OVERHAUL. CORRECTIVE ACTION-GD/C REVIEWED OVERHAUL BC PROCEDURES AND INITIATED IMPROVED CLEANING AND CLEANLINESS INSPECTION T ECHNIQUES. ULTRASONIC CLEANING TECHNIQUES AND DETAILED INSTRUCTIONS WERE INCORPORATED FOR REWORK CYCLES.						
HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4365-F SERVO VALVE	FAR 27-04209-1	630619	FACTORY	YES NO	CADILLAC GAGE FC-26-397A	095632
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. SERVOVALVE WOULD NOT NULL AFTER OVERHAUL. FAILURE WAS CONFIRMED DUE TO IMPROPER ASSEMBLY. CORRECTIVE ACTION-GD/C REINSTRUCTED PERSONNEL IN THE CORRECT OVERHAUL AND HANDLING PROCEDURES FOR SERVOVALVES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-9B-04-086 VERNIER ACTUATOR ASSEMBLY, SERVO V ALVE	FAR 27-05311-5	110-D 630617	38-A	YES NO	LIONEL PACIFIC GD/C	
FAILURE MODE-OUT OF SPECIFICATION. THE FEEDBACK VOLTAGE WAS EXCESSIVE AT NULL DURING STATIC CHECKOUTS. THE MEASURED FEEDBACK POTENTIAL WAS 450 MILLIVOLTS, WHEREAS THE MAXIMUM ALLOWED IS 350 MILLIVOLTS. FAILURE WAS CONFIRMED. THE EX ACT CAUSE FOR THE NULL SHIFT WAS NOT FOUND. THE NULL SHIFT WAS PROBABLY CAUSED BY A CHANGE IN PRESSURE-CONTROL NOZZL E GEOMETRY, REDUCING PRESSURE DROP THROUGH THE NOZZLE. THE CONTROL NOZZLE GEOMETRY CHANGE WOULD BE CAUSED BY NUMEROU S IMPACTS WITH THE CONTROL NOZZLE TARGET SCREW DURING VALVE OPERATION WITH LOW HYDRAULIC FLOW, AND WOULD BE IN THE F ORM OF A DAMAGED NOZZLE TIP OR VERTICAL MOVEMENT OF THE NOZZLE ITSELF.							

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CORRECTIVE ACTION-THE VENDOR CHANGE REPLACED THE LARGE CROSS-SECTION O-RING AND WASHER UNDER THE PRESSURE-CONTROL N OZZLE WITH A BRASS SPACER, BETWEEN THE BASE OF THE NOZZLE AND THE CRADLE, AND A VERY SMALL CROSS-SECTION O-RING. THE SPACER PREVENTS POSSIBLE CONTROL NOZZLE MOVEMENT ALONG ITS CENTERLINE, AND RESULTING IN NULL SHIFT.							094072
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-9B-04-091 SUSTAINER ACTUATOR ASSEMBLY	FAR 27-83314-819	116-D 630617	36-A	YES NO	LIONEL PACIFIC	094073
FAILURE MODE-OUT OF SPECIFICATION. DURING A PERFORMANCE CENTAUR TEST PROCEDURE AP0003A A TRANIENT SIGNAL WAS OBSERV ED AT 0.3 CPS. THE ERRATIC RESPONSE WAS NOT TRANSIENT, AS INITIALLY REPORTED, BUT WAS PRESENT AT ALL NORMAL OPERATIN G FREQUENCIES. THE CAUSE OF THE ERRATIC RESPONSE IS ATTRIBUTED TO DAMAGE TO THE PISTON BCARRING THE ACTUATOR BORE DU RING INITIAL ASSEMBLY AND DURING SUBSEQUENT ACTUATION. THIS CONDITION CAUSED A RESPONSE LAG AT EACH END OF THE STROK E. CORRECTIVE ACTION-IT IS RECOMMENDED DESIGN ENGINEERS REVIEW THE TEST PARAMETERS TO REQUIRE A RERUN OF THE PROCEDURE WHEN AN ERRATIC RESPONSE IS ENCOUNTERED AT LOW FREQUENCY. IT IS ALSO RECOMMENDED THAT DESIGN ENGINEERS CONSIDER THE POSSIBILITY OF INCORPORATING AN OSCILLOSCOPE IN CHECKOUT EQUIPMENT FOR VISUAL READOUT OF RESPONSE AT HIGHER FREQUEN CIES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4325-F ACTUATOR ASSEMBLY	FAR 27-83314-823	136F 630615	FACTORY	YES NO	LIONEL-PACIFIC	095358
FAILURE MODE-OUT OF TOLERANCE. DURING FINAL MISSILE CHECKOUT ACTUATOR TURNED FREELY 120 DEGREES ON PISTON SHAFT. FA ILURE CONFIRMED DUE TO ASSEMBLY RETAINER BEING ONE-QUARTER TURN FROM MAKING THE NECESSARY METAL-TO-METAL FIT. MOST P ROBABLE CAUSE OF LOOSENESS WAS ESTABLISHED TO BE ASSEMBLY RETAINER SHIFT DURING 4000 PSIG PROOF TEST. CORRECTIVE ACTION-VENDOR CONTACTED AND REVISED 4000 PSIG PROOF-PRESSURE TEST PROCEDURE TO PROVIDE FOR RETORQUING AN D LOCKWIRING THE ASSEMBLY RETAINERS AFTER THE PROOF TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-4333-F ACTUATOR ASSEMBLY, SEAL	FAR 27-83312-805	201D 630614	WTR	YES NO	LIONEL-PACIFIC	095557
FAILURE MODE-EXTERNAL LEAKAGE. ACTUATOR DEVELOPED LEAKAGE OF HYDRAULIC FLUID PAST PISTON SEAL DURING MISSILE CHECKO UT. FAILURE WAS CONFIRMED DUE TO FELT CONTAMINATION ON THE O-RINGS. FAILURE CAUSED BY IMPROPER INSTALLATION OF O-RIN G AND FELT WIPER. CORRECTIVE ACTION-VENDOR RE-INSTRUCTED ALL ASSEMBLY AND INSPECTION PERSONNEL IN PROPER METHODS OF INSTALLING FELT W IPERS AND O-RINGS. VENDOR INITIATED NEW WRITTEN INSPECTION PROCEDURES REQUIRING CLOSE INSPECTION OF EACH INDIVIDUAL FELT WIPER.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-4334-F ACTUATOR ASSY	FAR 27-85311-805	2010 650614	WTR	NO NO	LIONEL-PACIFIC	095550

FAILURE MODE-LEAK-EXTERNAL. ACTUATOR DEVELOPED LEAKAGE OF HYDRAULIC FLUID PAST PISTON SEAL DURING MISSILE CHECKOUT. FAILURE NOT CONFIRMED SINCE LEAKAGE DID NOT EXCEED SPECIFICATION LIMITS OF 1 DROP DURING 25 FULL-STROKE OPERATING C YCLES.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C INFORMED SITE PERSONNEL OF RESULTS OF FAILURE ANALYSIS AND OF SPECIFI ED LIMITS. GD/C INVESTIGATION OF ACTUATOR LEAKAGE PROBLEMS IS CONTINUING. ECP 3442 CHANGES O-RINGS TO TOP VISUAL QUA LITY TYPE AND REPLACES FELT WIPERS WITH TEFLON WIPERS.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-09-04-4329-F ACTUATOR ASSEMBLY, SEAL	FAR 27-85312-805	45F 650613	FACTORY	YES NO	LIONEL-PACIFIC	095556

FAILURE MODE-EXTERNAL LEAK. DURING FINAL MISSILE CHECKOUT HYDRAULIC FLUID LEAKED AT GEAR RACK OPENING OF HOUSING. F AILURE WAS CONFIRMED DUE TO FELT STRANDS ON BOTH TOP AND BOTTOM SURFACES OF O-RING. FAILURE CAUSED BY IMPROPER INSTA LLATION OF O-RING AND FELT WIPER.

CORRECTIVE ACTION-VENDOR RE-INSTRUCTED ALL ASSEMBLY AND INSPECTION PERSONNEL IN PROPER METHODS OF INSTALLING FELT W IPERS AND O-RINGS. VENDOR INITIATED NEW WRITTEN INSPECTION PROCEDURES REQUIRING CLOSE INSPECTION OF EACH INDIVIDUAL FELT WIPER.

HYDRAULIC-A/B SUSTAINER/VERNIER	GD/A33-0392/GD/AL2-401-00-130 DISCONNECT-RISE OFF	FLIGHT 27-08557-3	1390 650612	1-2 00.33	NO YES	000424

FAILURE MODE-STRUCTURAL. FAILURE OF THE RISE OFF DISCONNECT WAS ATTRIBUTED TO HIGH THERMAL ENVIRONMENT CREATED BY T HE LOSS OF THE RADIATION SHIELD DURING THE LIFTOFF SEQUENCE.

SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY. FAILURE OF THE RISEOFF DISCONNECT CAUSED DEPLETION OF BOOSTER SYSTEM HY DRAULIC FLUID, WITH A CONSEQUENT LOSS OF VEHICLE STABILITY.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY WITH A SUBSEQUENT LOSS OF THE VEHICLE BY SELF DESTRUCTION AT 93.413 SECOND S.

CORRECTIVE ACTION-CHECK VALVES AND HYDRAULIC RELEASE LADDER PRESSURE SWITCHES WERE INSTALLED IN THE BOOSTER AND SUS TAINER HIGH PRESSURE LINES UPSTREAM OF THE RISE OFF DISCONNECTS. IN ADDITION, THE RISE OFF DISCONNECT PANEL WAS MODI FIED.

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-10-194-F TUBE ASSEMBLY, B-NUT	FAR 27-85007-3	630531	FACTORY	YES NO	CONVAIR	000157
FAILURE MODE-LEAK EXTERNAL-GASEOUS LEAK AROUND B-NUT AT ONE END OF TUBE. CORRECTIVE ACTION-FAILURE CONFIRMED-ASSEMBLERS AT CONVAIR WERE REINSTRUCTED CORRECT TORQUING OF 6091-T6 ALUMINUM-ALLOY B-NUTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-10-188F SUSTAINER HYDRAULIC PUMP, SCREWS	FAR 27-08590-3	109F 630527	FACTORY	YES NO	VICKERS AA-60410-L-2	000330
FAILURE MODE-STRUCTURAL-ONE OF THE STUDS THAT RETAIN THE PUMP COVER BROKE DURING REMOVAL OF THE NUT TO INSTALL A TRANSDUCER. THE STUD WAS FRACTURED DUE TO OVERTORQUING. CORRECTIVE ACTION-SUPERVISION WAS REQUESTED TO REINSTRUCT EMPLOYEES IN THE CORRECT TORQUING OF NUTS ON HYDRAULIC PUMPS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-10-184F SUSTAINER HYDRAULIC PUMP, O-RING	FAR 27-08590-3	65E 630520	VAFB	YES NO	VICKERS AA-60410-L-2	000341
FAILURE MODE-LEAK-EXTERNAL-HYDRAULIC OIL LEAKAGE FROM THE COMPENSATOR FLANGE AND THE PUMP CASE WAS CAUSED BY SLIGHTLY ROUGH TEFLON GASKETS THAT HAD NOT COMPRESSED SUFFICIENTLY AT LOW PRESSURE TO MAKE A GOOD SEAL. CORRECTIVE ACTION-RECEIVING INSPECTION PROCEDURE 27-QC-10033 WAS REVISED, REQUIRING NEW PUMPS TO BE PRESSURIZED TO 60 PSIG WITH INLET AND OUTLET PLUGGED FOR 24 HOURS WITH NO LEAKAGE ALLOWED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6-3213A ACCUMULATOR-O RING	UTP-PET 27-08533-3	630506	OTHER	YES NO	PEACOCK 51303-3	000007
FAILURE MODE-LEAK-INTERNAL-UPON CONCLUSION OF THE TEMPERATURE TEST AND WHEN THE UNIT WAS EXAMINED FOR LEAKAGE, IT WAS FOUND THAT 10.0 ML OF HYDRAULIC FLUID HAD LEAKED ACROSS THE PISTON O-RING INTO THE PNEUMATIC SIDE. REF. S/N 207-0 384. CORRECTIVE ACTION-CONTINUE TEST. NO CORRECTIVE ACTION TAKEN.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-90-04-4291-F VERNIER ACTUATOR ASSEMBLY, SEALS	FAR 27-05312-805	210-D 630503	FACTORY	YES NO	LIONEL PACIFIC	000047

FAILURE MODE-EXTERNAL LEAK. HYDRAULIC OIL REPORTEDLY LEAKED PAST THE SEALS ON THE ACTUATING CYLINDER DURING HYDRAULIC OPERATIONAL TESTS. LEAKAGE WAS CAUSED BY WIPER MATERIAL ON THE SURFACE OF THE SEALING O-RING DUE TO IMPROPER PREPARATION AND ASSEMBLY OF THE FELT WIPER.

CORRECTIVE ACTION-REINSTRUCTED ASSEMBLY AND INSPECTION PERSONEL IN PROPER METHODS FOR INSTALLING O-RING, BACKUP RINGS, AND FELT WIPERS. NEW INSTRUCTION REQUIRING CLOSE INSPECTION OF EACH FELT WIPER WERE ISSUED TO INSPECTION AND ASSEMBLY PERSONNEL. ALL O-RINGS ARE BEING INSPECTED FOR DIMENSIONAL REQUIREMENTS, BLISTERS, VOIDS, LAPS AND POROSITY.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-10-166F SUSTAINER HYDRAULIC PUMP	FAR 27-06590-3	24E 630430	OSTF-1	YES NO	VICKERS AA-60410-L-2	000339

FAILURE MODE-STRUCTURAL-EXTERNAL HYDRAULIC OIL LEAKAGE AT THE INLET FITTING ON THE UNIT WAS CAUSED BY A CRACK IN THE ALUMINUM CASE CASTING AROUND THE STEEL INSERT.

CORRECTIVE ACTION-THE VENDOR WAS INFORMED OF THIS FAILURE AND HE IS INSTALLING CLOSER QUALITY CONTROL INSPECTION OF INLET FITTING CASTINGS. ALSO THEY ADDED A 1000 PSIG PRESSURE TEST OF THIS FLANGE EFFECTIVE JUNE 21, 1963.

HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-181F PRESSURE GAGE	FAR 27-06582-3	212D 630422	FACTORY	YES NO	ROCHESTER 6903-719-1	000344

FAILURE MODE-LEAK-EXTERNAL-ACCUMULATOR GAS PRECHARGE LEAKAGE WAS FOUND AT THE GAGE FITTING BASE. THIS WAS CAUSED BY A DEFECTIVE BRAZE JOINT AT THE BOURDON TUBE.

CORRECTIVE ACTION-VENDOR ANSWER TO VCAR 3537-63 STATED THAT HE WILL INSTITUTE BETTER QUALITY CONTROL MEASURES, USE NEW WELDING EQUIPMENT AND TECHNIQUES AND CONTROL THE MATERIAL SIZE AND CLEANLINESS MORE RIGIDLY.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-10-180F HYDRAULIC CHECK VALVE, FITTING	FAR 27-06560	109F 630417	FACTORY	YES NO	KOHLER K1247-6	000345

FAILURE MODE-LEAK-EXTERNAL-THE HYDRAULIC OIL LEAKAGE AT THE END FITTING WAS CAUSED BY A SCORED SURFACE ON THE OUTLET FITTING. THE DEEP SCRATCH WAS CAUSED BY MISHANDLING DURING ASSEMBLY.

CORRECTIVE ACTION-PRODUCTION HYDRAULIC SYSTEM ASSEMBLIERS WERE INFORMED OF THE FAILURE AND INSTRUCTION ON PROPER ASSEMBLY METHODS WAS GIVEN. THE ABOVE INFORMATION WAS ALSO TRANSMITTED TO THE SUPPORT PUBLICATIONS DEPARTMENT.

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-10-191-F SUSTAINER HYDRAULIC PUMP	FAR 27-08880-3	135F 630410		YES NO	VICKERS AA-60410-L-2	000334
FAILURE MODE-LEAK EXTERNAL-HYDRAULIC FLUID LEAK AT OUTLET FLANGE. CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-10-177C HYDRAULIC TUBE ASSEMBLY	FAR 27-05107-797	61E 630412	WTR	YES NO	CONVAIR	000222
FAILURE MODE-LEAK-EXTERNAL-TUBE ASSEMBLY WAS REPORTED TO BE LEAKING WITH SYSTEM PRESSURE AT 3000 PSIG. FAILURE WAS NOTICED DURING E-SERIES UPDATING. CORRECTIVE ACTION-UNKNOWN. FAILURE ANALYSIS IS NOT CONDUCTED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-04-429[illegible]-F FEEDBACK TRANSDUCER-ACTUATOR-	FAR 27-05314-823	135-F 630411	11	YES NO	LICAEL PACIFIC	000003
FAILURE MODE-OPEN, ELECTRICAL. WHEN SUSTAINER HYDRAULIC SYSTEM WAS ENERGIZED, THE SUSTAINER ENGINE WENT TO A PLUS T AW POSITION AND COULD NOT BE CONTROLLED. REPORTEDLY, A CONTINUITY CHECK REVEALED THE FEEDBACK TRANSDUCER TO BE OPEN CIRCUITED ON THE POSITIVE SIDE. LEAD WIRE HAD BEEN FRACTURED WHEN ADJUSTMENT WAS MADE WITHOUT REMOVING THE LEAD WIRE RETAINING PLATE. CORRECTIVE ACTION-PERSONNEL AT ETR WERE INFORMED OF THE CAUSE OF FAILURE. CAUSE WAS NEGLECTING TO LOOSEN THE RETAIN ER PLATE WHILE ADJUSTING THE ACTUATOR LENGTH.							
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-02-006F F[illegible]AIRING-VERNIER ACTUATOR	FAR 27-05322-13	116D 630410	36A	YES NO		000312
FAILURE MODE-STRUCTURAL. VERNIER-1 ACTUATOR FAIRING WAS FOUND CRACKED IN THREE PLACES DUE TO MISHANDLING. SCRATCHES AND HEAVY DINGS EXISTED ON ALL PROTRUDING SURFACES. CRACK DIRECTION WAS OPPOSITE THE DIRECTION WHICH WOULD INDICATE MISMATCH OF MATING FAIRING HALF. DESIGN AND MATERIAL SELECTION APPEARED TO BE ADEQUATE. MATERIAL WAS RAYBESTOS-MANH ATTAN PYROLEX RESIN IMPREGNATED FELT. CORRECTIVE ACTION-CONFIRMED. NO CORRECTIVE ACTION IS APPLICABLE. THE ALTERNATE MATERIAL-PHENOLIC PRE- IMPREGNATED C HOPPED GLASS FIBER-APPROVED JAN 29, 1968 DRAWING 27-05322 REVISION G IS CONSIDERED SUPERIOR AND IS NOW BEING USED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4286-F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05314-023	135-F 630410	11	YES NO	LIONEL PACIFIC	007840

FAILURE MODE-OUT OF SPECIFICATION. FAILURE REPORTED WHEN AN ABNORMALITY WAS NOTED IN THE SUSTAINER YAW FREQUENCY RESPONCE RECORDING. IT WAS REPORTED ERRATIC MOVEMENT COULD BE DETECTED WHEN THE ENGINES WERE GIMBALED. FAILURE WAS NOT CONFIRMED.

CORRECTIVE ACTION-PERSONNEL AT ETR WERE NOTIFIED OF THE RESULTS OF THIS TEST AND ARE KEEPING THIS PROBLEM UNDER SURVEILLANCE. MISSILE 135-D WAS FLOWN SO IT IS NOT POSSIBLE TO INVESTIGATE OTHER POSSIBLE CAUSE FOR THIS REPORTED CONDITION.

HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-99-10-182F HYDRAULIC HOSE ASSEMBLY	FAR 27-08571-0	1930 630405	FACTORY	YES NO	AEROQUIP 677159-6-0203	006343

FAILURE MODE-STRUCTURAL-WHEN THE HYDRAULIC SYSTEM WAS PRESSURIZED THE METAL BRAID PULLED AWAY FROM THE FITTING. THE STRUCTURAL FAILURE WAS DUE TO A CORROSIVE ATTACK BY CHLORIDE ON THE STAINLESS STEEL BRAID.

CORRECTIVE ACTION-THE ASSEMBLY LUBRICANT USED ON THIS UNIT WAS PROMAX, A CHLORINATED OIL. THIS LUBRICANT HAS SINCE BEEN CHANGED TO ELECTROFILM 4396 TO PREVENT CORROSION.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4237-C VERNIER ACTUATOR	FAR 27-08574-001	630402	FACTORY	YES NO	LIONEL-PACIFIC 2778-102	006051

FAILURE MODE-CONTAMINATION. VERNIER HYDRAULIC ACTUATOR WAS REJECTED WHEN A PRE-INSTALLATION INSPECTION REVEALED FELT-LIKE CONTAMINATION MATERIAL IN ONE OF THE HYDRAULIC PORTS. REPORTEDLY CONTAMINATED ASSEMBLY WAS RETURNED TO VENDOR BEFORE FAILURE ANALYSIS WAS STARTED. FAILURE ANALYSIS IS NO LONGER POSSIBLE AND THEREFORE IS CANCELLED.

CORRECTIVE ACTION-NONE. FAILURE ANALYSIS WAS CANCELLED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4286-F VERNIER SERVO VALVE	FAR 27-04209-1	630401	FACTORY	YES NO	CADILLAC GAGE FC26-397A	

FAILURE MODE-OUT OF SPECIFICATION-THE SERVOVALVE REPORTEDLY COULD NOT BE ADJUSTED TO NULL PROPERLY WHEN TESTED AS PART OF A VERNIER SERVOCYLINDER ASSEMBLY. FAILURE WAS NOT CONFIRMED. HOWEVER DISASSEMBLY REVEALED A CONTAMINANT PARTICLE TANGLED IN THE COIL OF THE FEEDBACK SPRING. CONTAMINANT PARTICLE ON THE FEEDBACK SPRING IS NOT DETRIMENTAL TO SERVOVALVE OPERATION.

CORRECTIVE ACTION-CORRECTIVE ACTION WAS INITIATED BY NOTIFYING THE VENDER OF THE RESULTS OF THIS ANALYSIS AND REQUE

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STED NECESSARY CORRECTIVE ACTION BE TAKEN TO PREVENT A RECURRENCE OF SERVOVALVE CONTAMINATION.							094050
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4280-F VERNIER ACTUATOR ASSEMBLY, SEAL	FAR 27-85311-011	135-F 630325	11	YES NO	LIONEL PACIFIC	09.048
FAILURE MODE-VERNIER SERVO CYLINDER ASSY REPORTEDLY DEVELOPED LEAKAGE OF HYDRAULIC FLUID PAST THE PISTON SEAL DURIN G A CHECKOUT PROCEDURE. LEAKAGE RATE WAS 1 DROP EVERY 35 TO 40 MINUTES. FAILURE WAS CONFIRMED. FAILURE WAS ATTRIBUTE D TO FELT CONTAMINATION. CORRECTIVE ACTION-RE-INSTRUCTION OF ALL ASSEMBLY AND INSPECTION PERSONNEL IN THE PROPER METHODS FOR INSTALLING FELT WIPERS AND O-RINGS. NEW WRITTEN INSPECTION INSTRUCTIONS WERE ISSUED TO ASSEMBLY AND INSPECTION PERSONNEL, REQUIRING CLOSE INSPECTION OF EACH INDIVIDUAL FELT WIPER IN THE VERNIER ACTUATOR CYLINDER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4278-F VERNIER ACTUATOR ASSEMBLY, SEAL	FAR 27-85311-011	135-F 630321	ETR	YES NO	LIONEL PACIFIC	096949
FAILURE MODE-LEAK SERVO CYLINDER ASSY REPORTEDLY DEVELOPED LEAKAGE OF HYDRAULIC FLUID PAST THE PISTON SEAL AFTER IN STALLATION AS REPLACEMENT ON THE MISSILE. LEAKAGE WAS 8 DROPS PER HOUR. SAME REPORTED FAILURE ON S/N 203-0690 UNIT O N 4 APRIL 1963. FAILURES NOT CONFIRMED. CORRECTIVE ACTION-NONE-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4240-F VERNIER ACTUATOR ASSEMBLY, SHAFT S EAL	FAR 27-85312-005	103D 630316	FACTORY	YES NO	LIONEL PACIFIC	096052
FAILURE MODE-LEAK EXTERNAL. ACTUATOR DEVELOPED A HYDRAULIC LEAK IN THE SHAFT SEAL AREA AFTER SHUTDOWN OF SYSTEM. RE RUNNING THE SYSTEM FAILED TO REPRODUCE ANY NOTICEABLE LEAKAGE. FAILURE WAS NOT CONFIRMED BY FAILURE ANALYSIS. CORRECTIVE ACTION-RE-INSTRUCTION OF ALL ASSEMBLY AND INSPECTION PERSONNEL IN THE PROPER METHODS FOR INSTALLING FELT WIPERS AND O-RINGS. NEW WRITTEN INSPECTION INSTRUCTIONS WERE ISSUED TO ASSEMBLY AND INSPECTION PERSONNEL, REQUIRING CLOSE INSPECTION OF EACH INDIVIDUAL FELT WIPER IN THE VERNIER ACTUATOR CYLINDER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A0J03-0049/A1-401-00-103	FLIGHT	103D 630316	A-1 149	NO NO		
FAILURE MODE-FAIL DURING OPERATION-SUSTAINER/VERNIER HYD. PRESS BEGAN A DECAY FROM 3095 PSIG AT 149 SEC TO ZERO PSI G BY 153 SECS. CAUSE WAS PROBABLY RESULT OF MISSILE PITCH INSTABILITY AT 103 SECS AND THE ABNORMAL VIGRATION AND SHO CK ENVIRONENT WHICH CAUSED SYSTEM LINE FAILURE. SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY-AT 149 SEC VERNIER SOLO. SUSTAINER AND NAA ACCUMULATORS BEGAN DISCHARGE IN							

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TO HYD SYSTEM. SUST. ENG MOVED TO THE STOPS AT 155 SEC. MAA ACCUMULATOR BOTTOMED OUT AT 180 SEC. VERNIER SOLO ACCUMULATOR BOTTOMED OUT AT 184 SEC. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY-RESULTING IN SHUTDOWN OF SUSTAINER AND VERNIER ENGINES. MISSILE SELF DESTRUCTED AFTER 248 SEC AND TANK SECTION IMPACTED APPROX. 300 N. MILES DOWN RANGE. CORRECTIVE ACTION-NONE, SECONDARY FAILURE.							091151
HYDRAULIC-A/B SUSTAINER/VERNIER	A0J63-0049/A1-401-00-193	FLIGHT	193D 630316	A1 180 SEC.	NO NO		091333
FAILURE MODE-FAILED DURING OPERATION. LOSS OF HYDRAULIC PRESS AFFECTED HB VALVE AND DECREASED SUSTAINER PERFORMANCE. LOSS OF LOX TO PUMP INLET ATTRIBUTED TO CHANGES IN MISSILE ACCELERATION. MISSILE STARTED TUMBLING AT 155 SEC. BETWEEN 160 AND 170 SECS. VERNIER THRUST INDICATED A DECREASING TREND. SYSTEM EFFECT-OPERATION STOPS PREMATURELY. VEHICLE EFFECT-PREMATURE PROPULSION SHUTDOWN. AT 201 SEC. THE SUSTAINER ENGINE FLAMED OUT. VERNIER 1 AND 2 CEASED OPERATION AT 192 AND 206 SECONDS RESPECTIVELY. MISSILE DESTRUCTED AFTER 248 SEC. AND TANK SECTION IMPACTED APPROXIMATELY 300 NAUTICAL MILES DOWNRANGE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	WSE-75/D1-801-00-63 ACCUMULATOR	FLIGHT 27-08567-3	63F 630315	D1 311.17	YES BENDIX NO 3037973		097118
FAILURE MODE-LEAK-EXTERNAL. VERNIER-SOLO ACCUMULATOR BOTTOMED OUT AFTER 12.8 SECONDS OF OPERATION. MINIMUM SYSTEM PRESSURIZATION TIME IS 15.0 SECONDS. SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY. LOSS OF HYDRAULIC FLUID RESULTED IN LOSS OF FLIGHT CONTROL TO THE VERNIER ENGINES 1 SECOND AFTER THE ACCUMULATOR BOTTOMED OUT. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4239-F VERNIER ACTUATOR ASSEMBLY, SHAFT SEAL	FAR 27-05511-805	183D 630313	FACTORY	YES LIONEL PACIFIC NO		096953
FAILURE MODE-LEAK EXTERNAL. ACTUATOR DEVELOPED A HYDRAULIC LEAK IN THE SHAFT SEAL AREA AFTER SHUTDOWN OF SYSTEM. RE RUNNING THE SYSTEM FAILED TO REPRODUCE ANY NOTICEABLE LEAKAGE. FAILURE WAS NOT CONFIRMED BY FAILURE ANALYSIS. CORRECTIVE ACTION-AS NO FAILURE OCCURED AND AS THE REPORTED FAILURE WAS OF THE SORT TENDING TO REDUCE RELIABILITY, IT WAS ADVANTEGEOUS TO REMOVE THE UNIT. REMOVAL, HOWEVER, MUST BE MADE WITH ENGINEERING AND PRODUCTION JUDGEMENT. THIS WAS STRESSED, DURING DISCUSSION WITH FACTORY PERSONNEL, AS THE APPROPRIATE CORRECTIVE ACTION OF THIS FAILURE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-39-04-4489-F SUSTAINER ACTUATOR ASSEMBLY, BEARING	FAR 27-65314-023	75F 650305	SYCAMORE	YES NO	LIONEL PACIFIC	002430

FAILURE MODE-CONTAMINATION. THE ACTUATOR PISTON ALIGNING BEARING WAS CORRODED. CHEMICAL TESTS REVEALED THE PRESENCE OF CHLORIDES INDICATING CORROSION RESULTED FROM A CHLORIDE ATTACK. THE ACTUATOR ASSEMBLY WAS ON VEHICLE 75F THAT UNDERWENT NUMEROUS STATIC TESTS. THE CORROSION WAS PROBABLY DUE TO UNUSUAL ENVIRONMENTAL CONDITIONS CAUSED BY VAPORIZED FLAME-COOLANT AND FLAME-BUCKET BLOWBACK.

CORRECTIVE ACTION-NO ACTION REQUIRED SINCE CORROSION RESULTED FROM UNUSUAL CONDITIONS.

HYDRAULIC-A/B SUSTAINER/VERNIER	AOJ63-0032/P1-601-00-134 PUMP, COMPENSATOR	FLIGHT 27-06590-3	134F 650301	11 0	YES NO	VICKERS INC. AA-60410-L-2	100464

FAILURE MODE-ERRATIC OPERATION. SUSTAINER HYDRAULIC PUMP DISCHARGE PRESSURE FLUCTUATIONS EXISTED THROUGHOUT PUMP OPERATION. THE MAXIMUM PEAK-TO-PEAK FLUCTUATIONS REACHED 120 PSI. SLIGHT IRREGULARITIES OF THE PUMP COMPENSATOR SPOOL, OR FLUID CONTAMINANTS, ARE THE MOST PROBABLE CAUSES.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE-VICKERS INC. DETERMINED THAT THE CONDITION NOTED WILL HAVE NO DETRIMENTAL EFFECT ON PUMP OPERATION.

HYDRAULIC-A/B SUSTAINER/VERNIER	AOJ63-0031/A1-402-00-176	FLIGHT	108D 650228	A-3 318	NO NO		002038

FAILURE MODE - STRUCTURAL. DUE TO THE FAILURE OF THE GROUND EQUIPMENT TO SATISFACTORILY ACCOMPLISH OIL EVACUATION AT MINUS 136.65 SECONDS AN EXCESS OF HYDRAULIC OIL REMAINED IN THE SYSTEM. AFTER SECO THE VERNIER SOLO AND SUSTAINER ACCUMULATORS DISCHARGED ADDITIONAL OIL (UNDER PRESSURE UP TO 1000 PSI) INTO THE SYSTEM RESULTING IN RUPTURE OF THE TANK.

SYSTEM EFFECT-OPERATION DOES NOT START. THE OIL EVACUATION OPERATION WAS NOT PERFORMED.

VEHICLE EFFECT-NONE. SATISFACTORY HYDRAULIC PRESSURE WAS SUPPLIED DURING POWERED FLIGHT. SIX SECONDS AFTER VCO, A RAPID INCREASE IN THE NORMAL PRESSURE DECAY RATE INDICATED THE SUSTAINER HYDRAULIC SYSTEM RESERVOIR HAD RUPTURED.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-04-4218-F VERNIER ACTUATOR ASSEMBLY, PISTON	FAR 27-65318-+38	650219	WTR	YES NO	LIONEL PACIFIC	

FAILURE MODE-LEAK INTERNAL. HYDRAULIC FLUID REPORTEDLY LEAKED AROUND THE ACTUATOR PISTON AT 3000 PSI STATIC AND DYNAMIC PRESSURE DURING SYSTEM CHECKOUT. FAILURE WAS NOT CONFIRMED. DUE TO FIELD ATTEMPTS TO CORRECT THE REPORTED LEAKA

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GE, AFFIXING RESPONSIBILITY FOR THE INTERNAL CONDITION OF THE UNIT WAS NOT POSSIBLE.							896054
CORRECTIVE ACTION-TWX SENT TO RELIABILITY PERSONNEL AT WTR INFORMING THEM OF THE FIELD DISASSEMBLY. SINCE IT WAS NOT POSSIBLE TO ASSIGN RESPONSIBILITY FOR THE INTERNAL CONDITION OF THE UNIT DUE TO FIELD DISASSEMBLY, NO FURTHER ACTION IS MEANINGFUL.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-044218F ACTUATOR ASSEMBLY	FAR 27-85312-805	630219	WTR	YES NO	LIONEL PACIFIC	896071
FAILURE MODE-LEAK EXTERNAL-ACTUATOR LEAKED AROUND PISTON AT 3000 PSIG. FAILURE WAS NOT CONFIRMED. HOWEVER, EVIDENCE OF REWORK DONE IN THE FIELD WAS FOUND.							
CORRECTIVE ACTION-UNKNOWN-FAILURE WAS NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-174C HYDRAULIC TUBE ASSEMBLY	FAR 27-85107-116	61E 630210	WTR	YES NO	CONVAIR	896444
FAILURE MODE-LEAK-EXTERNAL-TUBE ASSEMBLY REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING E-SERIES UPDATING.							
CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED 60/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-173C HYDRAULIC TUBE ASSEMBLY	FAR 27-85107-8	61E 630210	WTR	YES NO	CONVAIR	896443
FAILURE MODE-LEAK-EXTERNAL-TUBE ASSEMBLY REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING E-SERIES UPDATING.							
CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED. 60/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-171C HYDRAULIC TUBE ASSEMBLY	FAR 27-85107-665	61E 630210	WTR	YES NO	CONVAIR	
FAILURE MODE-LEAK-EXTERNAL-TUBE ASSEMBLY REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING E-SERIES UPDATING.							

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CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED- GD/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERAT NAL TECHNICAL ORDERS.							000441
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-176C HYDRAULIC TUBE ASSEMBLY	FAR 27-05107-94	61E 630210	WTR	YES NO	CONVAIR	000440
FAILURE MODE-LEAK-EXTERNAL-TUBE ASSEMBLY REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING SYSTEM CHECKOUT . CHECKOUT WAS CONDUCTED DURING E-SERIES UPDATING PROGRAM.							
CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED. GD/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-172C HYDRAULIC MANIFOLD	FAR 27-06189-5	61E 630210	WTR	YES NO	CONVAIR	000445
FAILURE MODE-LEAK-EXTERNAL-MANIFOLD REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING E-SERIES UPDATING.							
CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED. GD/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-179C HYDRAULIC TUBE ASSEMBLY	FAR 27-05107-751	61E 630210	WTR	YES NO	CONVAIR	000197
FAILURE MODE-LEAK-EXTERNAL. REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING SYSTEM CHECKOUT. CHECKOUT WAS CONDUCTED DURING E-SERIES UPDATING.							
CORRECTIVE ACTION-UNKNOWN FAILURE ANALYSIS NOT CONDUCTED. GD/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-178C HYDRAULIC TUBE ASSEMBLY	FAR 27-05107-142	61E 630210	WTR	YES NO	CONVAIR	
FAILURE MODE-LEAK-EXTERNAL. REPORTEDLY LEAKED WITH SYSTEM PRESSURE AT 3000 PSIG DURING SYSTEM CHECKOUT. CHECKOUT WAS CONDUCTED DURING E-S SERIES UPDATING.							

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CORRECTIVE ACTION-FAILURE ANALYSIS NOT CONDUCTED. GD/C ADVISED COGNIZANT PERSONNEL TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							000190
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-04-4118-F ACTUATOR ASSEMBLY, SEAL	FAR 27-06573-3	197D 630214	FACTORY	YES NO	LIONEL-PACIFIC 2792-2	097040
FAILURE MODE-LEAK-EXTERNAL-THE PISTON O-RINGS HAD BEEN REMOVED DURING FAILURE ANALYSIS AS REPORTED ON FAR SP-99-04-4115F. CONSEQUENTLY, THE UNIT WOULD NOT HOLD ANY HYDRAULIC PRESSURE. CONSIDERED A HUMAN INITIATED FAILURE.							
CORRECTIVE ACTION-REWORK AND DISASSEMBLY OF VERNIER SERVOCYLINDERS WAS CHANGED TO THE PRODUCT SUPPORT CENTER INSTEAD OF THE VERNIER SERVOCYLINDER ASSEMBLY AREA TO PRECLUDE HUMAN INITIATED FAILURES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4172-F VERNIER FLOW LIMITER VALVE	FAR 27-04206-1	72E 630213	FACTORY	YES NO	STERER 13000	000000
FAILURE MODE-ERRATIC OPERATION. THE VERNIER FLOW LIMITER CAUSED THE VERNIER 2 YAW SERVOCYLINDER TO EXHIBIT A JERKY RESPONSE DURING AUTOPILOT COMPOSITE TEST. THE FLOW LIMITER FAILURE WAS CAUSED BY A STAINLESS STEEL METAL CHIP BLOCKING THE INTERNAL MOVING COMPONENTS. SOURCE OF CHIP COULD NOT BE DETERMINED.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4176-F ACTUATOR ASSEMBLY, SEALS	FAR 27-05312-005	72E 630211	FACTORY	YES NO	LIONEL-PACIFIC	000000
FAILURE MODE-EXTERNAL LEAK. THE VERNIER SERVOCYLINDER ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID AT A RATE OF THREE DROPS PER CYCLE AT 40 PSIG. ANALYSIS FOUND LEAKAGE CAUSED BY A HARD O-RING AND FELT CONTAMINATION.							
CORRECTIVE ACTION-INSTRUCTION GIVEN TO ALL ASSEMBLY AND INSPECTION PERSONNEL IN PROPER METHODS FOR INSTALLING AND INSPECTING FELT WIPERS AND O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP99-08-3105-F CHECK VALVE	FAR 27-06568-1C	126D 630210	FACTORY	YES NO	CIRCLE SEAL P3-319	000520
FAILURE MODE-LEAK INTERNAL-DURING FACTORY CHECK OF HYDRAULIC SYSTEM.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. VALVE WAS REJECTED IN ERROR.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-A9-04-4175-F ACTUATOR ASSEMBLY, SEAL	FAR 27-05312-003	72E 630207	FACTORY	YES NO	LIONEL-PACIFIC	096097
FAILURE ANALYSIS-EXTERNAL LEAK. THE VERNIER SERVOCYLINDER ASSEMBLY REPORTEDLY LEAKED HYDRAULIC FLUID AT THE RATE OF SEVERAL DROPS PER MINUTE AT 40 PSIG. ANALYSIS CONFIRMED A LEAK BUT IT WAS WITHIN SPEC. LEAKAGE WAS CAUSED BY A DAMAGED O-RING AND FELT CONTAMINATION. CORRECTIVE ACTION-VENDOR TOOK ACTION TO IMPROVE CLEANLINESS AND INSPECTION OF ASSEMBLIES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	FAR A-99-04-4110-F FILTER	FAR 27-08564-003	630204	FACTORY	YES NO	PUROLATOR 64988-1	097097
FAILURE MODE-OUT OF SPEC. HYDRAULIC FILTER WAS REJECTED FOR HAVING A MAX PORE DIAMETER OF 28 MICRONS. 25 MICRON IS SPEC LIMIT. THE REPORTED FAILURE WAS CONFIRMED DURING LAB TESTING. CORRECTIVE ACTION-PROCUREMENT OF FILTERS FROM THIS VENDOR WAS SUSPENDED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-162F SUSTAINER HYDRAULIC PUMP	FAR 27-06590-3	201D 630201	FACTORY	NO NO	VICKERS AA-60410-L-2	096300
FAILURE MODE-STRUCTURAL. A HYDRAULIC PRESSURE BUILDUP OCCURRED IN THE RETURN SYSTEM CAUSED THE RUPTURE OF THE UNIT. CORRECTIVE ACTION-NONE. THIS IS A SECONDARY FAILURE. AN INVESTIGATION IS BEING CONDUCTED ON OTHER COMPONENTS IN THE SYSTEM TO DETERMINE THE CAUSE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-161F SUSTAINER HYDRAULIC FLUID TANK	FAR 27-06552-3	201D 630131	FACTORY	NO NO	BENDIX 6983	096307
FAILURE MODE-STRUCTURAL. DURING PERFORMANCE OF A LEAK TEST OF THE MISSILE HYDRAULIC SYSTEM THE TANK RUPTURED DUE TO A PRESSURE SPIKE. CORRECTIVE ACTION-CONVAIR REMOVED ALL SYSTEM COMPONENTS THAT COULD BE DAMAGED OR THAT COULD CAUSE A PRESSURE SPIKE IN THE HYDRAULIC SYSTEM.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-163F HYDRAULIC STAGING DISCONNECT ASSEMBLY	FAR 27-08558-1, -3	201D 630130	FACTORY	NO NO	PEACOCK 51205-1, -3	096303
FAILURE MODE-STRUCTURAL. SUSPECTED OF HAVING STRUCTURAL DAMAGE DUE TO SYSTEM PRESSURE BUILDUP. THE UNIT WAS NOT DAMAGED.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-10-168-F PRESSURE GAGE	FAR 27-08562-3	134F 630130	ETR	YES NO	ROCHESTER GAGE 6903-719-1	096336
FAILURE MODE-LEAK EXTERNAL-DUE TO DEFECTIVE BRAZING OF THE BOURDON TUBE TO THE DIAL INDICATOR JOINT.							
CORRECTIVE ACTION-ROCHESTER GAGE TO USE GENERAL ELECTRIC HALOGEN LEAK DETECTOR FOR WELD INSPECTION. MINIATURIZED WELD TIPS TO BE USED WITH HYDROGEN AS WELDING GAS. CHANGE FLUX MATERIAL AND USE CONTROLLED ATMOSPHERE DURING TUBE HEAT-TREATING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-4131-F SERVO VALVE, SPRING	FAR 27-04209-1	201D 630128	FACTORY	YES NO	CADILLAC GAGE FC26-397A	096093
FAILURE MODE-ERRATIC OPERATION. THE VERNIER SERVOVALVE NULL CURRENT SHIFTED EACH TIME HYDRAULIC PRESSURE WAS DROPPED AND BROUGHT UP AGAIN. HOWEVER, THE NULL DID NOT SHIFT OUT OF SPECIFICATION LIMITS. THE SEVOCYLINDER NULL KEPT SHIFTING DUE TO A 0.002 INCH PLAY IN THE SPOOL-AND-SLEEVE SECTION OF THE SERVOVALVE.							
CORRECTIVE ACTION-VENDOR ESTABLISHED CLOSER QUALITY CONTROL ON THE SPOOL-AND-SLEEVE SECTION EFFECTIVE APRIL 2, 1968.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-10-160C PRESSURE GAGE	FAR 27-08562-3	630110	ETR	YES NO	ROCHESTER 6903-719-1	096300
FAILURE MODE-LEAK-EXTERNAL. ACCUMULATOR GAS PRECHARGE LEAKING THROUGH THE VENT PORT DUE TO A POOR BRAZE JOINT ON THE BOURDON TUBE.							
CORRECTIVE ACTION-VENDOR INSTRUCTED TO IMPROVE HIS QUALITY CONTROL ON THE BOURDON TUBE BRAZE JOINT.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-10-156F TUBING ASSEMBLY, B-NUT	FAR 27-85007-251	1900 630117	FACTORY	YES NO	60/C	000815

FAILURE MODE-STRUCTURAL-DURING AN INSPECTION THE B-NUT WAS FOUND TO BE SPLIT.

CORRECTIVE ACTION-CONVAIR REMOVED FROM STOCK ALUMINUM ALLOY B-NUTS OTHER THAN THOSE OF 6061-T6 ALUMINUM ALLOY ALL O LD STOCK HAS BEEN PURGED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-08-3091F CHECK VALVE	FAR 27-08565-1	1390 630115	FACTORY	YES NO	CIRCLE SEAL P3-319	001003

FAILURE MODE-INTERNAL LEAKAGE. LEAKAGE REPORTED OF 20 PSI PER DAY. CAUSE NOT KNOWN. ANALYSIS DID NOT REVEAL ANY LEA KAGE.

CORRECTIVE ACTION-NOT CONFIRMED. PER RAR A-99-08-3621 DATED 630203 A REQUEST WAS MADE FOR ANOTHER LEAK CHECK OF THE HYDRAULIC RESERVOIR PRECHARGE SYSTEM ON 1390. CHECK WAS WAS MADE-NO LEAKS FOUND.

HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-99-10-165F PRESSURE GAGE	FAR 27-08562-3	630113	VAFB	YES NO	ROCHESTER 6903-719-1	000303

FAILURE MODE-LEAK-EXTERNAL. ACCUMULATOR GAS PRECHARGE DECAY DUE TO A POOR BRAZE JOINT ON THE BOURDON TUBE. A SECOND FAILURE WAS REPORTED FROM THE FACTORY. A THIRD FAILURE IS REPORTED ON FAR A-99-10-166F AT ETR.

CORRECTIVE ACTION-VENDOR INSTRUCTED TO REVIEW HIS BRAZING TECHNIQUES. CONVAIR ACCEPTANCE TESTS SHOULD REINSTATE 100 PCT INSPECTION REQUIREMENT AND SHOULD INCLUDE PRESSURE LEAK CHECK.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4154-F ACTUATOR ASSEMBLY	FAR 27-85314-017	630110	FACTORY	YES NO	LIONEL PACIFIC	007000

FAILURE MODE-OUT OF SPECIFICATION. THE SUSTAINER SERVOCYLINDER ASSEMBLY REPORTEDLY EMITTED A HIGH-PITCHED SQUEAL DU RING PERFORMANCE OF EOP 303.9. OSCILLOSCOPE PRESENTATION OF ACTUATOR RESPONSE SHOWED AN OUT-OF-SPECIFICATION FIGURE. ANALYSIS COULD NOT CONFIRM A FAILURE OF THE SERVOCYLINDER ASSEMBLY. THE REPORTED FAILURE IS ATTRIBUTED TO A TRANSIE NT AND UNDEFINED CAUSE.

CORRECTIVE ACTION-NONE.

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4095-F ACTUATOR ASSEMBLY, PISTON	FAR 27-85314-819	630110	FACTORY	YES NO	LIONEL PACIFIC	696015
FAILURE MODE-OUT OF TOLERANCE. BYPASS PISTON FLOW AT 3000 PSIG MEASURED 1.17 TO 1.04 GPM WHEN 0.85 PLUS MINUS 0.15 GPM IS ALLOWED. FAILURE CONFIRMED. DUE TO INCORRECT PISTON HAVING BEEN ASSEMBLED INTO ACTUATOR DURING OVERHAUL.							
CORRECTIVE ACTION-GD/C NOTIFIED OVERHAUL PERSONNEL OF FAILURE AND INITIATED CLOSER INSPECTION OF PARTS AND CLOSER S UPERVISION OF PERSONNEL IN ORDER TO ELIMINATE THIS TYPE OF HUMAN ERROR FAILURE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	LV-99-10-234-F RELIEF VALVE	FAR 27-08570-1	3510 630107	FACTORY	YES NO	VINSON A-80133-1	696521
FAILURE MODE-LEAK EXTERNAL-LOSS OF HYDRAULIC TANK PRECHARGE PRESSURE.							
CORRECTIVE ACTION-NO FAILURE-LEAKAGE WAS WITHIN SPECIFICATIONS. GD/C TO INITIATE FUNCTIONAL TEST OF VALVES SUSPECT OF MALFUNCTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-04-4094-F ACTUATOR ASSEMBLY	FAR 27-85314-817	1390 630104	FACTORY	YES NO	LIONEL PACIFIC	696010
FAILURE MODE-ERRATIC OPERATION. SUSTAINER ACTUATOR OPERATED ERRATICALLY DURING FINAL CHECKOUT BY EXHIBITING AN ENGI NE DEAD SPOT OF PLUS OR MINUS 1 INCH UNDER EXTERNAL LOAD. FAILURE NOT CONFIRMED AND CAUSE NOT DETERMINED IN EXTENSIV E LABORATORY TESTS.							
CORRECTIVE ACTION-GD/C INITIATED SUPPLEMENTAL AUTOPILOT SYSTEM CHECKS TO INSURE SYSTEM INTEGRITY. CHECKS INCLUDED E NGINE EXTERNAL LOAD TESTS AND SPECIAL SERVOAMPLIFIER OUTPUT TESTS. FACTORY TEST EQUIPMENT WAS RE-VALIDATED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	FARSP-90-04-4109-F ACTUATOR ASSEMBLY, SEAL	FAR 27-85312-005	1490 661226	WTR	YES NO	INTERSTATE	697606
FAILURE MODE-LEAK-EXTERNAL-VERNIER SERVOCYLINDER REJECTED FOR LEAKAGE RATE OF ONE DROP PER MIN AT 3000 PSIG. FAILUR E WAS VERIFIED AND CAUSED BY A DEFECTIVE O-RING AND CONTAMINATED O-RING GROOVE.							
CORRECTIVE ACTION-VENDOR INITIATED IMPROVED CLEANLINESS EFFECTIVE S/N 504-XXXX AND ON. ASSEMBLY AND INSPECTION PERS ONNEL REINSTRUCTED ON HANDLING O-RINGS, BACK-UP RINGS, AND FELT WIPERS. NEW INSPECTION METHODS FOR O-RINGS.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4085-F ACTUATOR ASSEMBLY, SEAL	FAR 27-08573-3	180D 621217	FACTORY	YES NO	LIONAL-PACIFIC 2782-2	097072

FAILURE MODE-CONTAMINATION. THE SERVO CYLINDER LEAKED HYDRAULIC FLUID. FELT WIPER FOUND DAMAGED AND LODGED ON O-RIN G.

CORRECTIVE ACTION-VENDOR INSTRUCTED PERSONEL IN PROPER ASSEMBLY OF ACTUATOR.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4056F ACTUATOR ASSEMBLY, SEAL	FAR 27-05312-005	70E 621217	FACTORY	YES NO	LIONEL-PACIFIC	097161

FAILURE MODE-LEAK-EXTERNAL. THE SERVOCYLINDER LEAKED HYDRAULIC OIL AT THE PISTON ROD SEAL. THIS WAS A RUNNING-TYPE LEAK WITH PRESSURE AT 3000PSIG. THE REPORTED FAILURE WAS NOT CONFIRMED BY FUNCTIONAL TESTING. THERE WAS CONSIDERABLE CONTAMINATION IN THE ACTUATOR WHICH MAY HAVE CAUSED THE RUNNING LEAK.

CORRECTIVE ACTION-A CHANGE IN THE PROCEDURE FOR WELDING AND PLATING OF THE ACTUATOR BODY WAS MADE TO ASSURE BETTER CLEANLINESS IN THIS AREA. GD/C HAS CHANGED THE SERVOCYLINDER BUILD-UP AREA TO A CONTAMINATION CONTROLLED AREA.

HYDRAULIC-A/B SUSTAINER/VERNIER	AOL62-0047/GD/AL2-401-00-131 DISCONNECT-RISEOFF	FLIGHT 27-08537-3	131D 621217	1-2	YES NO		08E423

FAILURE MODE-STRUCTURAL. FAILURE OF THE RISE OFF DISCONNECT WAS ATTRIBUTED TO HIGH THERMAL ENVIRONMENT CREATED BY T HE LOSS OF THE RADIATION SHIELD DURING THE LIFTOFF SEQUENCE.

SYSTEM EFFECT-LOSS OF STRUCTURAL INTEGRITY. FAILURE OF THE RISE OFF DISCONNECT CAUSED DE*LETION OF BOOSTER SYSTEM H YDRAULIC FLUID WITH A SUBSEQUENT LOSS OF VEHICLE STABILITY.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. AS A RESULT OF THE LOSS OF VEHICLE STABILITY (INDICATED ON AGENA VEHICLE TELEMETRY) THE VEHICLE WAS SELF DESTROYED AT 80.52 SECONDS.

CORRECTIVE ACTION-CHECK VALVES AND HYDRAULIC RELEASE LADDER PRESSURE SWITCHES WERE INSTALLED IN THE BOOSTER AND SUS TAINER HIGH PRESSURE LINES UPSTREAM OF THE RISE OFF DISCONNECTS. IN ADDITION, THE RISE OFF DISCONNECT PANEL WAS REDE SIGNED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4028F ACTUATOR ASSEMBLY, FEEDBACK TRANSD UCER	FAR 27-05312-005	70E 621215	FACTORY	YES NO	LIONEL PACIFIC	

FAILURE MODE-OPEN ELECTRICAL-CENTER TAP OF FEEDBACK TRANSDUCER WAS FOUND OPEN DURING FINAL CHECKOUT OF VEHICLE 70E. FAILURE WAS CAUSED BY FAULTY SOLDERING OF ELECTRICAL CONNECTOR.

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CORRECTIVE ACTION-CRESCENT ENGINEERING INSTITUTED NEW SOLDERING METHODS AND CHANGED PERSONNEL TO ASSURE GOOD SOLDER CONNECTIONS.							097033
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-04-4115-F ACTUATOR ASSEMBLY- O-RING	FAR 27-85312-005	1990 621215	FACTORY	YES NO	LIONEL PACIFIC	097045
FAILURE MODE-LEAK-EXTERNAL. ACTUATOR REPORTEDLY DEVELOPED LEAKAGE OF HYDRAULIC OIL PAST A PISTON O-RING DURING FACTORY FINAL CHECKOUT. ANALYSIS COULD NOT CONFIRM EXCESSIVE OIL LEAKAGE. CORRECTIVE ACTION-NO FAILURE. NO CORRECTIVE ACTION WAS CONSIDERED NECESSARY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-10-152F ACCUMULATOR, O-RING	FAR 27-08553-3	2150 621210	ETR	YES NO	PEACOCK 51305-3	096219
FAILURE MODE-LEAK-INTERNAL-GAS PRECHARGE WAS LEAKING PAST THE PISTON SEAL INTO THE HYDRAULIC SIDE DURING FILL AND BLEED. THE LEAKAGE WAS CAUSED BY THE PERMEABLE NATURE OF THE O-RING TO HIGH PRESSURE NITROGEN GAS. CORRECTIVE ACTION-FAILURE ANALYSIS GROUP INITIATED DESIGN CORRECTIVE ACTION RECOMMENDING THE USE OF A HARDER O-RING MATERIAL. THIS IS DOCUMENTED IN RAR A-98-10-3603 ADDITIONAL INFORMATION ON THIS FAILURE CAN BE FOUND IN RAR A-98-10-149F.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4026-F ACTUATOR ASSEMBLY	FAR 27-85312-005	69E 621207	FACTORY	YES NO	LIONEL PACIFIC	097032
FAILURE MODE-CONTAMINATION. COMPONENT LEAKED HYDRAULIC FLUID WITH NO PRESSURE APPLIED WHILE MOUNTED ON VEHICLE 69E. FAILURE WAS ATTRIBUTED TO CONTAMINATION IN HYDRAULIC FLUID CORRECTIVE ACTION-VENDOR INSTITUTED TIGHTER QUALITY CONTROLS EFFECTIVE 3/20/63.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4050F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85311-007	69E 621205	FACTORY	YES NO	LIONEL PACIFIC	097043
FAILURE MODE-OUT OF TOLERANCE. ACTUATOR WAS REJECTED WHEN SERVO VALVE NULL SHIFTED DURING CHECKOUT OF MISSILE 69 E. THE FAILURE WAS ATTRIBUTED TO A LOOSE TORQUE MOTOR IN THE SERVO VALVE. CORRECTIVE ACTION-EFFECTIVE APRIL 9, 1963 CADILLAC GAGE INSTITUTED TIGHTER QUALITY CONTROL OF TORQUE MOTOR INSTALLATION.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-99-10-155F HYDRAULIC DISCONNECT HALF, O-RING	FAR 27-08555-3	102D 621204	FACTORY	YES NO	PEACOCK 81285-3	000200
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE IN THE COUPLED POSITION. CORRECTIVE ACTION-FAILURE NOT CONFIRMED DUE TO THE FACT THE MATING PROBE P/N 27-08555-1 WAS NOT RETURNED. GD/C ADVISED PERSONNEL TO SEND IN BOTH HALVES OF COUPLINGS ON FUTURE DISCREPANCIES. GD/C SET MAXIMUM LIMITS ON USE OF BUNA-N O-RING HARDNESS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	NZ-9D-06-201F TUBE ASSEMBLY	FAR 27-05007-207	101D 621126	WTR	YES NO	GD/C	000077
FAILURE MODE-STRUCTURAL-TUBE ASSEMBLY FLARED END CRACKED. CORRECTIVE ACTION-GD/C INITIATED STRICT CONTROL OF THE FLARING PROCESSES. ALSO IMPROVE FLARING TECHNIQUES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4082-F ACTUATOR ASSEMBLY, SEAL	FAR 27-05312-005	1500 621123	FACTORY	YES NO	LIONEL-PACIFIC	000014
FAILURE MODE-LEAK-EXTERNAL-DURING FACTORY CHECKOUT HYDRAULIC FLUID LEAKED FROM PISTON SEAL. FAILURE CONFIRMED DUE TO DAMAGED O-RING CORRECTIVE ACTION-VENDOR WAS INFORMED AND STATED THAT CLOSER INSPECTION OF INSTALLATION OF O-RINGS DURING ASSEMBLY OPERATION WAS BEGUN. O-RINGS ARE INSPECTED FOR DIMENSIONAL REQUIREMENTS PER APPLICABLE SPECIFICATIONS (ALSO FOR LAPS, BLISTERS, VOIDS AND POROSITY).							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4041F ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-005	1500 621116	FACTORY	YES NO	LIONEL PACIFIC	007041
FAILURE MODE-OUT OF TOLERANCE. ACTUATOR WAS REJECTED WHEN IT LOST NULL DURING CHECKOUT OF MISSILE 1500. FAILURE WAS ATTRIBUTED TO A LEAKY NOZZLE O-RING SEAL IN THE SERVO VALVE. CORRECTIVE ACTION-THIS VALVE WAS ASSEMBLED IN AUGUST 1961. A NEW NOZZLE O-RING RETAINER WAS ADDED TO THE SERVO VALVE. CHANGE WAS EFFECTIVE 3/19/63.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-04-4028F ACTUATOR ASSEMBLY; SERVO VALVE	FAR 27-05311-008	250D 621118	FACTORY	YES NO	LIONEL PACIFIC	007031
FAILURE MODE-DRIFT-SERVO VALVE NULL CURRENT CHANGED WITH EACH APPLICATION OF HYDRAULIC PRESSURE. THE FAILURE WAS ATTRIBUTED TO A LOOSENESS IN THE SPOOL AND SLEEVE SECTION OF THE VALVE. CORRECTIVE ACTION-LIONEL PACIFIC INSTITUTED TIGHTER QUALITY CONTROL EFFECTIVE APRIL 2, 1963.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-3582F SERVO VALVE	FAR 27-04208-1	621115	FACTORY	NO NO	CADILLAC GAGE CO FC-27-397A	005542
FAILURE MODE-OUT OF TOLERANCE. THE SERVO VALVE FAILED DURING PERFORMANCE OF EQUIPMENT OPERATING PROCEDURE (EOP)309.9. THE SERVO VALVE FAILED TO MEET THE REQUIREMENTS OF PARAGRAPH 9.30.1 OF EOP 309.9 WHICH IS A MEASURE OF FREQUENCY RESPONSE OF SERVO VALVE AND ACTUATOR. THE FAILURE WAS NOT CONFIRMED. THE SERVO VALVE MET ALL ESTABLISHED TEST REQUIREMENTS. CORRECTIVE ACTION-NO CORRECTIVE ACTION. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-99-04-4018F ACTUATOR ASSEMBLY	FAR 27-05314-017	197D 621109	FACTORY	YES NO	LIONEL-PACIFIC	007022
FAILURE MODE-LEAK EXTERNAL-DUE TO PARTICULATE CONTAMINATION IN HYDRAULIC FLUID. CORRECTIVE ACTION-LIONEL-PACIFIC INSTITUTED TIGHTER QUALITY CONTROL TO INSURE CLEANLINESS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-10-151F HYDRAULIC PUMP	FAR 27-08590-1	147D 621102	FACTORY	YES NO	VICKERS AA-60401-L-2	006220
FAILURE MODE-CONTAMINATION. METALLIC PARTICLES WERE FOUND IN THE PUMP CASE PRIOR TO A COMPONENT PRESSURE CHECK. CORRECTIVE ACTION-QUALITY CONTROL WAS REQUESTED TO CONTACT THE VENDOR AND REQUEST HIM TO IMPROVE HIS CLEANING AND ASSEMBLY TECHNIQUES. CORRECTIVE ACTION IS DOCUMENTED IN RAR A-99-10-3601.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	FAR A-98-04-4103-C SUSTAINER ACTUATOR ASSEMBLY	FAR 27-85314-023	10F 621023	FACTORY	YES NO	INTERSTATE	007849
FAILURE MODE-OUT OF TOLERANCE. 2 SERVOCYLINDER ASSY. REJECTED AT FACTORY FOR HIGH NULL READINGS OF 404MV AND 420MV RESPECTIVELY. SPEC TOLERANCE IS PLUS 400 AND-100MV. THE REPORTED FAILURES WERE NOT CONFIRMED BY LABTESTING. IT IS PO SSIBLE A TOLERANCE BUILDUP OF NULL SHIFT BETWEEN THE DIFFERENT TYPES OF SERVOAMPS, THE SERVOAMP OUTPUT BALANCE, AND POSSIBLE TEST EQUIPMENT BIAS CONTRIBUTED TO THE REPORTED FAILURE. CORRECTIVE ACTION-MODIFICATION OF TEST EQUIPMENT PER TCP 8127 TERMINATED WHEN COVERAGE FOR SUCH ACTION EXPIRED FOR E AND F SERIES R AND D PROGRAMS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-3371F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85314-023	16F 621023	COMPLEX 12	YES NO	LIONEL PACIFIC	005539
FAILURE MODE-ERRATIC OPERATION. THE ACTUATOR ASSY HELD THE SUSTAINER ENGINE IN THE HARD OVER PLUS YAW POSITION WHEN HYDRAULIC PRESSURE WAS APPLIED WITHOUT SUCH A COMMAND SIGNAL PROGRAMMED. THE FAILURE WAS CONFIRMED. THE CAUSE WAS C ONTAMINATION OF THE DROPPING ORIFICES OF THE SERVO VALVE. THE ACTUATOR BORE WAS SCORED DUE TO MISALIGNMENT OF THE PI STON CAUSED BY POOR MACHINING (OUT OF - TOLERANCE) OF ACTUATOR BODY. CORRECTIVE ACTION-RAR-98-04-3631 WAS WRITTEN REQUESTING THAT THE VENDOR BE INFORMED OF THE FAILURE ANALYSIS AND BE REQUESTED TO IMPROVE CLEANLINESS PROCEDURES DURING ASSEMBLY. LIONEL-PACIFIC INSPECTED ALL ACTUATOR BODIES IN PRODUCT ION AND ADDED CAUTION NOTES TO THE MANUFACTURING OUTLINE AND THE INSPECTION SEQUENCE FOR THIS PART.							
HYDRAULIC-A/B SUSTAINER/VERNIER	T-A62-571-G-2399/P1-601-00-14 SUSTAINER HYDRAULIC PUMP, B-NUT	COUNTDOWN 27-08590-3	14F 621019	11 -2700.	YES NO	VICKERS AA-80410-L-2	006234
FAILURE MODE-LEAK EXTERNAL. THE LAUNCH COUNTDOWN WAS STOPPED FOR A 25 MINUTE HOLD TO REPAIR A HYDRAULIC LEAK AT THE HIGH PRESSURE FLANGE OF THE SUSTAINER HYDRAULIC PUMP. LEAK WAS DUE TO LOOSE B-NUTS. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COUNTDOWN DELAYED. COUNTDOWN WAS STOPPED AT T-45 MIN TO REPAIR HYDRAULIC LEAK ON SUSTAINER PUMP. COU NTDOWN RESUMED AFTER LEAK WAS REPAIRED. CORRECTIVE ACTION-THE B-NUTS ON THE SU TAINER HYDRAULIC PUMP WERE RETORQUED AND DISPOSITIONED ACCEPTABLE FOR FLIGHT .							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-4034F ACTUATOR ASSEMBLY, SEAL	FAR 27-85312-003	14F 621003	ETR	YES NO	LIONEL PACIFIC	
FAILURE MODE-LEAK-EXTERNAL. THE SERVOCYLINDER LEAKED HYDRAULIC OIL.							

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							097075
CORRECTIVE ACTION-NONE. FAILURE UNCONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-3524-C SERVO VALVE	FAR 27-04206-1	621005	SAN DIEG O	YES NO	CADILLAC GAGE CO. FC-27-396A	096968
FAILURE MODE-OUT OF TOLERANCE-THE SLIDING VALVE WAS STICKING AT BOTH ENDS OF ITS TRAVEL. THE SERVO VALVE WAS SCRAPPED PRIOR TO FAILURE ANALYSIS, THEREFORE FAILURE ANALYSIS WAS CANCELLED.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-4[illegible]77 ACTUATOR ASSEMBLY, O-RING	FAR 27-05314-019	1280 621001	WTR	YES NO	LIONAL PACIFIC	097102
FAILURE MODE-LEAK EXTERNAL. THE SERVO CYLINDER LEAKED HYDRAULIC OIL. CONFIRMED AT 3 DROPS PER HOUR. THE O-RING MATERIAL IS TOO HARD TO GIVE A GOOD HYDRAULIC SEAL.							
CORRECTIVE ACTION-VENDOR WILL MAKE CLOSER INSPECTION OF O-RINGS DURING ASSEMBLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9R-04-4053F ACTUATOR ASSEMBLY, SEAL	FAR 27-05311-007	102F 620920	WAFB	YES NO	LIONEL-PACIFIC	097074
FAILURE MODE-LEAK EXTERNAL. THE SERVO CYLINDER LEAKED HYDRAULIC OIL. O-RING FOUND TO BE OF SUB QUALITY.							
CORRECTIVE ACTION-RAR A-99-04-3660 AND VCAR 3430-63 WAS WRITTEN. VENDOR WILL MAKE CLOSER INSPECTION OF O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-04-4014F ACTUATOR ASSEMBLY	FAR 27-05314-017	64E 620925	OSTF 1	YES NO	LIONEL PACIFIC	097124
FAILURE MODE-LEAK EXTERNAL. THE COMPONENT WAS REJECTED FOR LEAKAGE AT OSTF 1. FAILURE ANALYSIS SHOWED DAMAGE TO O-RINGS, PISTON, AND ACTUATOR BODY. THE FAILURE WAS ATTRIBUTED TO SHIFTING OF THE PISTON RETAINERS.							
CORRECTIVE ACTION-O-RING GLAND AND PISTON RETAINERS WERE RETORQUED, ALIGNED AND LOCK WIRED IN POSITION AFTER PROOF TEST.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A0J82-0047 TRANSDUCER	FLIGHT	8F 620918	11 288	NO NO		897140

FAILURE MODE-OUT OF TOLERANCE. H105P AT SUSTAINER HYDRAULIC PUMP INLET RECORDED TWO PRESSURE SPIKES, EACH 0.055 SEC IN DURATION TO 540 PSIG, AND TO 220 PSIG. IT IS BELIEVED THAT SIMULTANEOUS CLOSING OF H8, PU AND 66 VALVES AT SCO I S CAUSE OF HIGH PRESS FROM SUS ENGINE HYD. CONTROL MANIFOLD ENTERING RETURN LINE TO HYD. PUMP.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-JA-04-3522-F ACTUATOR	FAR 27-08563-5	620911	FACTORY	NO NO	INTERSTATE 2725-1	897210

FAILURE MODE-OUT OF TOLERANCE. FOLLOWING REPAIR OF UNIT AT PRODUCT SUPPORT CENTER (PLT. 2) PISTON STROKE WAS OUT OF TOLERANCE IN RETRACT AND EXTENDED POSITIONS. UNCONFIRMED. FAILURE ATTRIBUTED TO IMPROPER MEASUREMENT TECHNIQUE EMPL OYED BY SUPPORT CENTER INSPECTION GROUP.

CORRECTIVE ACTION-NONE. DEPOT ADVISED OF CORRECT MEASUREMENT METHODS.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-60-04-4012F ACTUATOR ASSEMBLY, PISTON	FAR 27-85314-021	65E 620911	WTR	YES NO	LIONEL PACIFIC	897237

FAILURE MODE-LEAK EXTERNAL. THE COMPONENT WAS REJECTED FOR LEAKAGE AT FORTY PSIG. FAILURE ANALYSIS OF THE COMPONENT REVEALED DAMAGE TO O-RINGS, PISTON ROD, AND FEED BACK TRANSDUCER. THE FAILURE WAS ATTRIBUTED TO MISALIGNMENT OF THE PISTON RETAINERS.

CORRECTIVE ACTION-O-RING GLAND AND PISTON RETAINERS ARE NOW RETORQUED, ALIGNED AND LOCKWIRED IN POSITION AFTER PROO F TESTING.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-4047F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85314-017	93-F 620907	FACTORY	YES NO	LIONEL PACIFIC	897042

FAILURE MODE-OUT OF TOLERANCE. ACTUATOR WAS REJECTED WHEN NULL WAS OUT OFSPECIFICATION DURING NAPCHE CHECKOUT OF 93 F MISSILE. THE FAILURE WAS ATTRIBUTED TO LOOSENESS IN NULL ADJUSTMENT LINKAGE IN THE SERVO VALVE.

CORRECTIVE ACTION-CADILLAC GAGE IMPROVED TORQUE-MOTOR ASSEMBLY PROCEDURES.

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HYDRAULIC-A/B SUSTAINER/VERNIER	P1-6CO-01-08 FEEDBACK TRANSDUCER, CIRCUITRY	COMPOSITE-B FACT	8F 620907	11 -3000	YES NO	CRESENT	693217
FAILURE MODE-ELECTRICAL OPEN. SPLICES BROKEN DURING CAP TEST IN V1 FEEDBACK TRANSDUCER CIRCUITRY. SYSTEM EFFECT-ERRATIC OPERATION. VERNIER ENGINE WENT TO NEGATIVE PITCH STOP AT PROGRAMMER RESET DURING THE CAP TEST . VEHICLE EFFECT-COMPOSITE DELAYED. HOLD TIME INDETERMINATE. CORRECTIVE ACTION-REPAIRED BROKEN SPLICES AND RECHECKED CIRCUITRY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	M6-9B-04-3413-F VERNIER ACTUATOR ASSEMBLY	FAR 27-85312-003	620831	ETR	YES NO	LIONEL PACIFIC	693764
FAILURE MODE-LEAK, EXTERNAL. WORN PISTON O-RING LEAKED. IT IS ESTIMATED THAT THE CYLINDER HAD BEEN CYCLED 500,000 T IMES DURING 90.1 HOURS OF OPERATION. DESIGN LIFE IS 50,000 CYCLES. CORRECTIVE ACTION-NONE. CYLINDER HAD EXCESSIVE USE. ETR PERSONNEL WERE ADVISED OF THE ANALYSIS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-B8-10-153F ACCUMULATOR, O-RING	FAR 27-08553-3	620829	SYCAMORE	YES NO	PEACOCK 51305-3	690217
FAILURE MODE-LEAK-INTERNAL-GAS PRECHARGE WAS LEAKING PAST THE PISTON O-RING SEAL INTO THE HYDRAULIC SIDE. CORRECTIVE ACTION-UNKNOWN. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9P-04-3489-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85314-017	84F 620829	PLATTSBU R6	YES NO	LIONEL PACIFIC	692613
FAILURE MODE-LEAK. THE SERVOCYLINDER WAS FOUND LEAKING BETWEEN SERVOVALVE AND THE ACTUATOR CYLINDER. FAILURE ANALYS IS FOUND THAT ONE FLOW PORT SEALING O-RING WAS MISSING. CORRECTIVE ACTION-PRODUCTION AND INSPECTION PERSONNEL CAUTIONED TO USE CARE WHEN MATTING SERVOVALVE TO THE ACTUATOR .							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9L-10-140F HYDRAULIC PUMP, O-RING	FAR 27-08890-3	47F 620820	LINCOLN	YES NO	VICKERS AA-80410-L-2	690213
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE AT THE INLET AND OUTLET FLANGES WAS CAUSED BY POOR QUALITY O-RING S. CORRECTIVE ACTION-CONVAIR REQUESTED THE VENDOR TO USE O-RINGS THAT MEET MIL-R-25732. THE VENDOR IS ALSO SUBJECTING THESE UNITS TO A 24 HOUR STATIC TEST PRIOR TO PRODUCTION RELEASE. VENDOR COMPLIED WITH GD/C REQUEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-3401C ACTUATOR ASSEMBLY	FAR 27-05314-017	620814	ETR	NO NO	LIONEL PACIFIC	697720
FAILURE MODE-ERRATIC OPERATION. REPORTED TO BE OPERATING ERRATICALLY. NO FAILURE ANALYSIS PERFORMED. CORRECTIVE ACTION-NO ANALYSIS WAS PERFORMED. THE PART WAS REJECTED IN ERROR AND THEREFORE THE ANALYSIS WAS CANCELED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-3401-C ACTUATOR ASSEMBLY	FAR 27-05314-017	620814	ETR	YES NO	LIONEL PACIFIC	695763
FAILURE MODE-ERRATIC OPERATION. SERVOCYLINDER ACTUATOR WAS REPORTED OPERATING ERRATICALLY. CORRECTIVE ACTION-NONE. PART WAS NOT ANALYZED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9L-10-150F HYDRAULIC TANK	FAR 27-08552-5	620813	LINCOLN	YES NO	BENDIX MFG 8603F	690221
FAILURE MODE-STRUCTURAL. THE HYDRAULIC END OF THE TANK BLEW OFF. FAILURE WAS CAUSED BY OVERPRESSURIZATION OF THE LOW PRESSURE (60-120PSIG) SIDE OF THE SUSTAINER HYDRAULIC SYSTEM. CORRECTIVE ACTION-PERSONNEL AT LINCOLN AIR FORCE BASE WERE NOTIFIED OF THE CAUSE OF FAILURE. ALSO WERE ADVISED THAT OTHER COMPONENTS IN THE HYDRAULIC RETURN SYSTEM WERE EXPOSED TO THE SEVERE OVERPRESSURIZATION ALSO NOTIFIED SUPPORT PUBLICATIONS TO INSURE COMPATIBILITY WITH APPLICABLE OPERATIONAL TECHNICAL ORDERS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9R-04-3593F ACTUATOR	FAR 27-08573-3	90F 620603	WALKER	YES NO	CLEMCOAERO PRC DUCTS 2792-2	005544
FAILURE MODE-LEAK-EXTERNAL-THE VERNIER HYDRAULIC ACTUATOR LEAKED AT AN UNDETERMINED RATE DURING MISSILE CHECKOUT OPERATIONS. THE REPORTED FAILURE WAS NOT CONFIRMED, HOWEVER, THE SERVOVALVE AND THE FEEDBACK TRANSDUCER HAD BEEN REMOVE PRIOR TO SUBMITTAL FOR FAILURE ANALYSIS.							
CORRECTIVE ACTION-NO CORRECTIVE ACTION. GD/C INFORMED FIELD PERSONNEL AT WALKER AFB OF THE CONDITION IN WHICH THE VERNIER HYDRAULIC ACTUATOR WAS RECEIVED FOR FAILURE ANALYSIS. FIELD PERSONNEL WERE REQUESTED NOT TO DISASSEMBLE VERNIER SERVOCYLINDER ASSEMBLIES BEFORE SUBMISSION FOR FAILURE ANALYSIS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9H-10-126F HYDRAULIC PUMP	FAR 27-08590-3	17F 620602	SCHILLIN G	YES NO	VICKERS AA-60410-L-2	006220
FAILURE MODE-LEAK-EXTERNAL. PUMP WAS FOUND LEAKING HYDRAULIC FLUID EXTERNALLY AT SEVERAL LOCATIONS.							
CORRECTIVE ACTION-NONE. LEAKAGE NOT CONFIRMED							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-3543F ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-003	91F 620602	FACTORY	YES NO	LIONEL-PACIFIC	006003
FAILURE MODE-LEAK(EXTERNAL)-THE VERNIER SERVOCYLINDER ASSEMBLY LEAKED DURING MISSILE CHECKOUT. THE LEAKAGE REPORTEDLY OCCURRED AT 50 PSIG WITH THE SERVOCYLINDER AT AN EXTREME OF ITS TRAVEL. ANALYSIS CONFIRMED THE FAILURE. THE LEAKAGE RATE WAS 20 DROPS PER MINUTE AT 50 PSIG. THE LEAKAGE WAS DUE TO WORN AND ABRADED O RING CAUSED BY A ROUGH FINISH OF ACTUATOR CYLINDER BORE (RMS 40 IN PLACES).							
CORRECTIVE ACTION-THE VENDOR WAS NOTIFIED OF THE FAILURE AND ITS CAUSE. THE VENDOR INTENSIFIED HIS INSPECTION OF THE CYLINDER BORE AFTER PREPARATION FOR PLATING, AFTER PLATING AND POLISHING, AND DURING ASSEMBLY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-86-10-131-F HYDRAULIC FILTER, FLANGE	FAR 27-08364-001	75F 620721	SYCAMORE 02	YES NO	PUROLATOR 64900	006554
FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKAGE AT THE BODY JOINT WAS CAUSED BY A MARRED JOINT SURFACE DUE TO MISHANDLING OF UNIT.							
CORRECTIVE ACTION-AN AVO SENT TO QUALITY CONTROL ADVISING LEAK WAS CAUSED BY MISHANDLING AT ASSEMBLY. GD/C INCREASED SURVEILLANCE ON COMPONENT AND CARE WAS TAKEN TO PRECLUDE MISHANDLING OF UNITS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-121F HYDRAULIC TUBE ASSEMBLY, FITTING	FAR 27-85107-142	57F 620731	WTR	YES NO	CONVAIR	096838
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE FROM THE TUBING FLARE. TOOLING MARKS WERE ON THE FLARES WERE RESPONSIBLE FOR THE LEAKAGE. CORRECTIVE ACTION-QUALITY CONTROL INITIATED A MORE RIGID INSPECTION OF THE FINISHED FLARE BEFORE RELEASING TO PRODUCTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9R-04-3523C ACTUATOR ASSEMBLY	FAR 27-85312-805	113F 620731	MAFB	YES NO	LIONEL PACIFIC	096887
FAILURE MODE-LEAK-EXTERNAL-THE VERNIER SERVO CYLINDER LEAKED HYDRAULIC OIL. THE FAILURE ANALYSIS WAS CANCELLED BECAUSE THE ACTUATOR WAS NOT SENT IN FOR ANALYSIS. THE PART WAS REPAIRED AT WALKER AFB. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9H-10-127F PUMP, O-RING	FAR 27-50330-3	620730	SCHILLIN G	YES NO	VICKERS AA-60410-L-2	096229
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE AT SEVERAL LOCATIONS WAS CAUSED BY SLIGHTLY ROUGH TEFLON GASKETS. CORRECTIVE ACTION-RECEIVING INSPECTION PROCEDURE 27-QC-10033 WAS REVISED EFFECTIVE FEB. 2 1988 REQUIRING UNITS TO BE PRESSURIZED TO 80 PSIG WITH INLET AND OUTLET PORTS PLUGGED FOR 24 HOURS. NO LEAKAGE PERMITTED FOR ACCEPTANCE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9B-04-4040F ACTUATOR ASSEMBLY, O-RING	FAR 27-85312-805	7F 620719	ETR	YES NO	LIONEL-PACIFIC	087640
FAILURE MODE-LEAK EXTERNAL. ACTUATOR WAS REJECTED FOR LEAKAGE. TESTING AT SAN DIEGO DID NOT VERIFY LEAKAGE HOWEVER O-RING WAS FOUND TO BE OF INFERIOR QUALITY. FAILURE WAS ATTRIBUTED TO O-RING. CORRECTIVE ACTION-LIONEL PACIFIC TIGHTENED INSPECTION OF O-RINGS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	AE62-0038/B1-401-00-18 HYDRAULIC PUMP	FLIGHT 27-08590-3	13D 620718	B1 3	YES NO	VICKERS AA-60416-L-2	096062
FAILURE MODE-ERRATIC OPERATION. UNUSUAL PRESSURE FLUCTUATIONS NOTED IN SUSTAINER/VERNIER SYSTEM DURING FIRST 50 SECONDS OF FLIGHT. POSSIBLY CAUSED BY ERRATIC OPERATION OF THE PUMP COMPENSATOR DUE TO CONTAMINATION. SYSTEM EFFECT-ERRATIC OPERATION. MAXIMUM PRESSURE OF 3240 PSIG DURING OSCILLATORY PERIOD WAS NOT DETRIMENTAL TO SYSTEM OPERATION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9B-04-3472F VERNIER ACTUATOR ASSEMBLY	FAR 27-05312-605	7F 620719	ETR	YES NO	LIONEL PACIFIC	094187
FAILURE MODE-EXTERNAL LEAK. ACTUATOR IR/D FOR LEAKAGE. CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9M-04-3393-F ACTUATOR ASSEMBLY, O-RING	FAR 27-05314-017	36F 620717	SCHILLIN 6	YES NO	LIONEL PACIFIC	097704
FAILURE MODE-LEAK-EXTERNAL. SUSTAINER SERVOCYLINDER ASSEMBLY IR/D FOR LEAKED HYDRAULIC FLUID AROUND BASE OF SERVOVALVE ASSEMBLY. LEAK COULD NOT BE CONFIRMED, HOWEVER ON DISASSEMBLY OF SERVO VALVE A MISSING O-RING WAS NOTED. CORRECTIVE ACTION-COGNIZANT ASSEMBLY PERSONNEL WERE INFORMED OF DEFFICIENCY. ALSO A 24-HOUR STATIC LEAK TEST INITIATED ON ALL UNITS ASSEMBLED AT GD/C. REF RAR A-6P-04-3612 WRITTEN 7 NOV 1962. ALSO REF ECN 44110 REQUIRING REPLACEMENT OF O-RINGS BY GD/C CONTROLLED PART.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9M-10-124F HYDRAULIC PUMP, O-RING	FAR 27-08590-1	6E0715	SCHILLIN 6	YES NO	VICKERS AA-60401-L-2	098227
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKED PAST THE DRIVE SHAFT SEALS. CORRECTIVE ACTION-FAILURE CONFIRMED. EFFECTIVE FEB. 2 1962. RECEIVING INSPECTION PROCEDURE 27-QC-10033 WAS REVISED, REQUIRING THAT SUSTAINER PUMPS BE PRESSURIZED TO 80 PSIG WITH INLET AND OUTLET PORTS BLOCKED FOR 24 HOURS WITH NO LEAKAGE PERMITTED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-04-3421-F VERNIER ACTUATOR ASSEMBLY	FAR 27-85311-808	620710	WTR	YES NO	LIONEL PACIFIC	004154
FAILURE MODE-LEAK, EXTERNAL. EXTERNAL LEAKAGE AROUND SHAFT WAS REPORTED.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. FIELD PERSONNEL WERE ADVISED OF TEST RESULTS AND WERE INFORMED OF THE LEAK AGE CRITERIA FOR REJECTION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-3341-F ACTUATOR ASSEMBLY	FAR 27-85314-817	101F 620709	FACTORY	YES NO	LIONEL PACIFIC	007106
FAILURE MODE-OUT OF SPECIFICATION. THE PITCH ACTUATOR INDICATED OUT OF NULL. RECOMMENDATION-ENGINEERING ADJUST SERV O VALVE. ACTUATOR WAS IR/D. FAILURE ANALYSIS FOUND NOTHING WRONG WITH VALVE EXCEPT THAT IT NEEDED ADJUSTMENT.							
CORRECTIVE ACTION-NONE-ASSEMBLY COULD HAVE BEEN ADJUSTED REF. RELIABILITY MEMORANDUM REL 62-61-003 OF 13 OCTOBER 19 62.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-90-04-3485-C VERNIER ACTUATOR ASSEMBLY	FAR 27-85311-8	120D 620709	WTR	YES NO	LIONEL PACIFIC	004433
FAILURE MODE-ERRATIC OPERATION. VERNIER SERVO CYLINDER ASSEMBLY BECAME ERRATIC. THIS ASSEMBLY WAS REPAIRED AND RETU RNED TO SITE. UNIT WAS INADVERTENTLY ASSIGNED TO THE GUIDANCE CONTROL LABORATORY, AS PER TWX VANSAN 10-295-10-16-62.							
CORRECTIVE ACTION-THIS FAILURE ANALYSIS WAS CANCELLED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9L-10-129F BOOSTER STAGING DISCONNECT	FAR 27-08556-8	40F 620703	LINCOLN	YES NO	PEACOCK 51290-3	006839
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKED DURING HIGH PRESSURE TEST. LEAKAGE ATTRIBUTED TO MATING HALF PART 27-08556-3.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED NO CORRECTIVE ACTION DEEMED NECESSARY BECAUSE MATING HALF OF THIS COUPLING WAS CAUSE OF LEAKAGE. CORRECTIVE ACTION ON PART 27-08556-8 WAS TO ELIMINATE SHARP EDGE ON PROBE, AND IS NOTED IN FAR ABN-10-129F.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9M-10-125F STAGING DISCONNECT, O-RING	FAR 27-08556-3	40F 620703	LINCOLN	YES NO	PEACOCK 51290-3	096230
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE IN THE MATED CONDITION WAS CAUSED BY A TORN SUSTAINER O-RING SEAL BECAUSE OF A SHARP EDGE ON THE BOOSTER PROBE. CORRECTIVE ACTION-THE SHARP EDGE WAS REMOVED FROM THE PROBE BY THE VENDOR VIA VCR 3747.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-139F PUMP, O-RING	FAR 27-08590-3	620703	WTR	YES NO	VICKERS AA-60410-L-2	096223
FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC OIL LEAKAGE WAS CAUSED BY SCRATCHES IN THE HOUSING AROUND THE BEARING RETAINE R O-RING. THE CASE DRAIN PLUG O-RING WAS CUT AND OTHER O-RINGS WERE PERMANENTLY FLATTENED. CORRECTIVE ACTION-DUE TO THE O-RING LEAKAGE, THE VENDOR CHANGED O-RINGS FROM P/N 174579 (DUROMETER OF 90) TO P/N 151 127 (DUROMETER OF 70). VENDOR WILL INCORPORATE A 24 HOUR PRESSURIZATION TEST ON ALL PUMPS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-3246F ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85314-010	1190 620703	WTR	YES NO	LIONEL PACIFIC	096095
FAILURE MODE-OUT OF TOLERANCE-FAILED TO NULL PROPERLY DURING CHECKOUT OF MISSILE 1190. FAILURE WAS ATTRIBUTED TO IN PROPER NULL ADJUSTMENT OF SERVO VALVE DURING ASSEMBLY AND FACTORY CHECKOUT. CORRECTIVE ACTION-RECEIVING INSPECTION TEST PROCEDURE REVISED TO ASSURE PROPER NULL ADJUSTMENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9M-04-3173F ACTUATOR, SERVOVALVE	FAR 27-85311-007-01	29F 620703	SCHILLIN G	YES NO	INTERSTATE	096094
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME-DURING MISSILE CHECKOUT THE ACTUATOR FAILED TO RESPOND PROPERLY TO AUTOPILOT INPUT SIGNALS. THE FAILURE RESULTED FROM A NULL SHIFT WITHIN THE SERVO VALVE. THE NOZZLE ADJUSTMENT SCREW HAD MOVED. THE CONTROL NOZZLE WAS DAMAGED. CORRECTIVE ACTION-GD/C HAS INFORMED THE VENDOR OF THE FINDINGS OF THIS ANALYSIS AND IS REQUESTING THAT APPROPRIATE ACTION BE TAKEN. THE VENDOR HAS CONDUCTED INSTRUCTIONAL TRAINING COURSES AND HAS INCREASED ASSEMBLY LINE INSPECTION.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9B-04-3399-F ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-005	145D 620620	ETR	YES NO	LIONEL PACIFIC	007191

FAILURE MODE-LEAK-EXTERNAL. THE VERNIER SERVOCYLINDER WAS FOUND TO BE LEAKING BETWEEN THE SERVOVALVE AND THE ACTUAT OR BODY. REMOVAL OF THE SERVOVALVE REVEALED NO DEFECTS HOWEVER THE O-RINGS APPEARED TO LACK PROPER RESILIENCY.

CORRECTIVE ACTION-ALL O-RINGS RECEIVED WITH THE SERVOVALVE WILL BE REPLACED WITH GD/C CONTROLLED ONES AT TIME OF AS SEMBLY TO ACTUATOR CYCLINDER.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-B4-1U-122F SUSTAINER RELIEF VALVE	FAR 27-08569-1	75F 620626	SYCAMORE	YES NO	PANTEX/BENDOM 9212D	008557

FAILURE MODE-OUT OF TOLERANCE. VALVE FAILED TO REseAT AT SPECIFIED PRESSURE. THE FLOW WAS RESTRICTED TO 8.5 GPM INS TEAD OF 10 GPM AT FULL FLOW.

CORRECTIVE ACTION-VENDOR ADVISED OF OUT OF TOLERANCE ADJUSTMENT AND WILL TAKE ACTION TO PROPERLY ADJUST VALVES.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-04-3242F ACTUATOR ASSEMBLY, O-RING	FAR 27-05311-007	64E 620619	OBTF1	YES NO	LIONEL PACIFIC	006096

FAILURE MODE-LEAK EXTERNAL ACTUATOR WAS FOUND TO LEAK AT 40 PSIG DURING ROUTINE INSPECTION OF MISSILE 64E. LEAK STO PPED WHEN PRESSURE WAS RAISED TO 3000 PSIG. LEAK RATE WAS NOT DOCUMENTED. LEAK WAS NOT VERIFIED IN FAILURE ANALYSIS. HOWEVER, ACTUATOR WAS CONTAMINATED WITH METAL CHIPS WHICH COULD CAUSE A LEAK AT O-RING.

CORRECTIVE ACTION-LIONEL-PACIFIC INCORPORATED AN ADDITIONAL CLEANING STEP IN MANUFACTURING PROCESS OF ACTUATOR.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-9B-04-5549F ACTUATOR, ASSEMBLY	FAR 27-05314-017	31F 620617	DYESS AF B	YES YES	LIONEL PACIFIC	007190

FAILURE MODE-ERRATIC OPERATION. DURING THE RUNNING OF PROCEDURE 27-41074, THERE WAS A SLOW RESPONSE TO NULL POSITIO N AS INDICATED BY THE AUTOPILOT ENGINE POSITION. WHEN HYDRAULIC PRESSURE WAS BROUGHT UP, AN INDICATION OF SUSTAINER NOT-AT-NULL WAS RECEIVED. FAILURE ANALYSIS FUNCTIONAL TESTING DID NOT CONFIRM THE REPORTED FAILURE. IT IS BELIEVED T HAT THE FAILURE WAS DUE TO AIR IN THE HYDRAULIC SYSTEM. WHEN THE SERVOCYLINDER WAS REPLACED, THE FILL AND DRAIN PROC EDURE ELIMINATED THE DIFFICULTY.

CORRECTIVE ACTION-NONE.

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9N-10-125F HYDRAULIC STAGING DISCONNECT, O-RI NG	FAR 27-06556-5	27F 620616	ALTUS	YES NO	PEACOCK 51290-5	000502
FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKAGE IN THE MATED CONDITION CAUSED BY A DAMAGED O-RING DUE TO A SHARP EDGE ON THE BOOSTER PROBE. CORRECTIVE ACTION-THE SHARP EDGE WAS REMOVED FROM THE PROBE BY THE VENDOR VIA VCR 3747.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9N-10-125F STAGING DISCONNECT, O-RING	FAR 27-06556-3	27F 620616	ALTUS	YES NO	PEACOCK 51290-3	000553
FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKAGE IN THE MATED CONDITION WAS CAUSED BY A TORN SUSTAINER O-RING SEAL BECAUSE OF A SHARP EDGE ON THE BOOSTER PROBE. CORRECTIVE ACTION-THE SHARP EDGE WAS REMOVED FROM THE PROBE BY THE VENDOR VIA VCR 3747.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-120F PUMP, FLANGE	FAR 27-06590-3	67E 620614	WTR	YES NO	VICKERS AA-60410-L-2	000231
FAILURE MODE-LEAK-EXTERNAL. LEAKAGE APPEARED AT THE COMPENSATOR FLANGE, DUE TO IMPERFECTIONS ON THE SEALING SURFACE . CORRECTIVE ACTION-PRESSURIZATION OF PUMP DID NOT PRODUCE LEAKAGE. GO/C REVISED PROCEDURE 27 0C10033 TO INCLUDE A 24 -HOUR LEAK TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9N-10-145F SUSTAINER HYDRAULIC PUMP	FAR 27-06590-3	36F 620602	SCHILLIN G	YES NO	VICKERS AA-60410-L-2	000211
FAILURE MODE-STRUCTURAL. TWO CRACKS WERE DISCOVERED IN THE PUMP CASE AFTER PERFORMANCE OF PROCEDURE 27-06541. PUMP CASE HAD A 6 INCH CRACK RUNNING FROM THE SMALL COVER PLATE AT ONE END TO THE MOUNTING FLANGE AT THE OTHER END. THE F AILURE WAS CAUSED BY OVERSTRESS DUE TO OVERPRESSURIZATION OF THE SYSTEM. CORRECTIVE ACTION-PERSONNEL AT SHILLING WERE NOTIFIED BY TWX SOF138 THE FAILURE WAS CAUSED BY OVER PRESSURIZATION O F THE SUSTAINER HYDRAULIC RETURN LINE. THIS INFORMATION RELAYED TO SUPPORT PUBLICATIONS DEPARTMENT TO INSURE COMPATI BILITY WITH APPLICABLE OPERATION TECHNICAL ORDERS.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-10-130F HYDRAULIC RELIEF VALVE	FAR 27-08369-1	75F 820601	SYCAMORE	NO NO	VINSON A-61071	899330
FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKED AT THE MATING SURFACES OF THE TWO HALVES OF THE VALVE BODY. FLUID WAS FROM OTHER SOURCE. CORRECTIVE ACTION-NO FAILURE. GO/C ADVISED PERSONNEL TO INVESTIGATE OTHER SOURCES OF POSSIBLE LEAKS AND TO VERIFY L EAKS BEFORE REMOVAL OF COMPONENTS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-10-110F STAGING DISCONNECT	FAR 27-06555-3	820521	ETR	YES NO	PEACOCK ENG. 51203-3	899139
FAILURE MODE-EXTERNAL LEAK-HYDRAULIC OIL LEAKS. CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9M-04-3436-F ACTUATOR ASSEMBLY, O-RING	FAR 27-03314-017	820518	SCHILLIN G	YES NO	CLENCO	894094
FAILURE MODE-OUT OF TOLERANCE. A LEAK WAS OBSERVED AROUND THE ACTUATOR SHAFT. THE FAILURE WAS CAUSED BY INSTALLATIO N OF THE WRONG SIZE O-RING DURING MANUFACTURE. CORRECTIVE ACTION-CLENCO AERO PRODUCTS WAS NOTIFIED, AND INITIATED STRICTER INSPECTION METHODS TO INSURE INSTALLATI ON OF PROPER O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9M-04-3406F ACTUATOR ASSEMBLY, O-RING	FAR 27-03314-017	820517	SAFB	YES NO	LIONEL PACIFIC	897246
FAILURE MODE-LEAK EXTERNAL. THE SUSTAINER SERVOCYLINDER ASSEMBLY WAS REJECTED WHEN IT LEAKED AT THE SHAFT SEAL DURI NG A HYDRAULIC SYSTEM CHECK. ANALYSIS DETERMINED ACTUATOR LEAKAGE OF 3 DROPS IN 52 HOURS. FAILURE ATTRIBUTED TO GALL INS OF CYLINDER AS A RESULT OF PISTON BINDING. CORRECTIVE ACTION-EFFECTIVE SEPTEMBER 1 1982, THE GLAND-NUT ASSEMBLY RINGS ARE RETORQUED AND LOCKWIRED AFTER THE 40 00 PSIG PROOF TEST TO ASSURE PROPER PISTON ALIGNMENT. THIS PROCEDURE CHANGE WILL ASSURE AGAINST ECCENTRICITY BUILDUP S CAUSING THE ACTUATOR PISTON TO RUB THE ACTUATOR CYLINDER BORE.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9N-04-3406-F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-017	660817	SCHILLIN G	YES NO	LIONEL PACIFIC	099848
FAILURE MODE-LEAK EXTERNAL. DURING HYDRAULIC SYSTEM CHECK, LEAKAGE WAS OBSERVED. FAILURE WAS NOT CONFIRMED. A SLIGH T LEAKAGE WAS NOTED FROM THE GLAND-NUT, HOWEVER THE LEAKAGE RATE WAS INSIGNIFICANT. DISASSEMBLY OF CYLINDER REVEALED BORE DAMAGE DUE TO MECHANICAL BINDING OF PISTON AND CYLINDER WALL.							
CORRECTIVE ACTION-VENDOR INITIATED ACTION TO RETORQUE THE GLAND-NUT ASSEMBLY AFTER A 4000 PSI. PROOF PRESSURE TEST TO ASSURE PROPER PISTON ALIGNMENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-3225F ACTUATOR ASSEMBLY, O-RING	FAR 27-05314-017	TJE 660516	FACTORY	YES NO	LIONEL PACIFIC	097037
FAILURE MODE-LEAK-EXTERNAL-ACTUATOR LEAKED AT SEAL. O-RING WAS OF INCORRECT SIZE.							
CORRECTIVE ACTION-VENDOR INSPECTION PROCEDURES IMPROVED TO ASSURE INSTALLATION OF PROPER SIZE O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	58-98-10-109F CHECK VALVE, O-RING	FAR 27-08565-1	660914	ETE	YES NO	CIRCLE SEAL PS-319	099109
FAILURE MODE-INTERNAL LEAK. HYDRAULIC LEAK ACROSS THE TANK PISTON AND THEN REVERSED FLOW PAST THE CHECK VALVE TO CO LLECT IN THE DOWNSTREAM PNEUMATIC LINE.							
CORRECTIVE ACTION-CAUSE OF FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	58-98-10-108F HYDRAULIC TANK, SEAL	FAR 27-08552-5	660914	ETR	YES NO	BENDOW MFG CO. 8963	099130
FAILURE MODE-INTERNAL LEAK-OIL LEAKAGE ACROSS THE TANK PISTON AND THEN REVERSE FLOWED PAST AN ADDITIONALY FAULTY PN EUMATIC SIDE CHECK VALVE TO DEPOSITE HYDRAULIC OIL IN DOWNSTREAM PNEUMATIC LINES.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-9N-04-3310F ACTUATOR ASSEMBLY, O-RING	FAR 27-85318-803	61F 620308	AAFB	YES NO	LIONEL PACIFIC	007310
FAILURE MODE-LEAK-EXTERNAL. ACTUATOR LEAKED EXCESSIVELY FROM THE CUTAWAY SECTION OF THE ACTUATOR CYLINDER HOUSING U NDER 1000 PSIG STATIC CONDITIONS. CAUSED BY O-RING DAMAGE RESULTING FROM EXCESSIVE AND ECCENTRIC PISTON LAND LOADING S WHICH IN TURN RESULTED FROM BENDING OF THE ALUMINUM ACTUATOR CYLINDER BODY DURING OPERATION. CORRECTIVE ACTION-SALES ORDER 901-1-63 EFFECTIVE 620630 GIVES COVERAGE TO REPLACE ALUMINUM BODY ACTUATORS WITH STEE L BODY ACTUATORS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-3225-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85314-817	63F 620301	FACTORY	YES NO	LIONEL PACIFIC	007030
FAILURE MODE-LEAK-EXTERNAL-ACTUATOR LEAKED AT SEAL. O-RING WAS NOT OF PROPER SIZE. CORRECTIVE ACTION-VENDOR INSPECTION PROCEDURES IMPROVED TO ASSURE INSTALLATION OF PROPER SIZE O-RINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AE62-047782-401-00-140 SERVO VALVE	FLIGHT 27-04209-1	1400 620427	B-2 E02	YES YES	CADILLAC GAGE CADILLAC FC-27-397A	007165
FAILURE MODE-OUT OF TOLERANCE. POSSIBLE LARGER THAN USUAL SERVO VALVE DEAD ZONE RESPONSIBLE FOR DIVERGING ROLL OSCI LLATIONS DURING VERNIER SOLO. SYSTEM EFFECT-ERRATIC OPERATION. DIVERGING MISSILE ROLL RATE DURING VERNIER SOLO POSSIBLY CAUSED BY COMBINATION OF LARGER THAN NORMAL DEAD ZONE, HIGH HYDRAULIC PRESSURE (WITHIN TOLERANCE) AND HIGH VERNIER ENGINE GIMBAL FRICTION. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9N-04-3302F ACTUATOR ASSEMBLY	FAR 27-85311-803	24F 620425	SAFB	YES NO	INTERSTATE	007346
FAILURE MODE-OUT OF TOLERANCE. SERVOCYLINDER DID NOT RESPOND TO A NULLING SIGNAL. NULL-CURRENT FOUND EXCESSIVE DUE TO IMPROPER ADJUSTMENT TECHNIQUE DURING FACTORY ASSEMBLY AND CHECKOUT. CORRECTIVE ACTION-VERNIER SERVOCYLINDER RECEIVING INSPECTION ACCEPTANCE TEST PROCEDURE EOP 305.0 REVISED 620717 (RE VISION E) TO INCLUDE STEP BY STEP NULL ADJUSTMENT PROCEDURES.							

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CONVAIR DIVISION

18 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9B-10-103F DISCONNECT, STAGING	FAR 27-08556-3	620423	ETR	YES NO	PEACOCK ENG. C O. 51290-3	899100

FAILURE MODE-EXTERNAL LEAK-OIL LEAKAGE DUE TO O-RING BEING DAMAGED BY SHARP EDGE IN MATING HALF.

CORRECTIVE ACTION-G.C. NOTIFIED TO IMPROVE THE METHOD OF TESTING THE DISCONNETS. VENDOR NOTIFIED TO REMOVE SHARP ED GES ON MATING HALF.

HYDRAULIC-A/B SUSTAINER/VERNIER	SP-9D-04-3287F ACTUATOR, O-RING	FAR 27-08373-1	620420	WTR	YES NO	INTERSTATE ENG R. 2792-1	896083

FAILURE MODE-LEAK EXTERNAL-ACTUATOR WAS REJECTED FROM POINT ARGUELLO LAUNCH COMPLEX 1 FOR LEAKAGE AT 3000 PSIG. LEA KAGE WAS DUE TO BADLY WORN O-RINGS AND TEFLON BACKUPS. FAILURE WAS CAUSED BY OUT OF ROUND PISTON LANDS ALLOWING TEFL ON BACKUP AND O-RING TO EXTRUDE INTO AREA BETWEEN PISTON AND CYLINDER BORE.

CORRECTIVE ACTION-INTERSTATE WAS BOUGHT OUT BY LIONEL PACIFIC WHOSE ACTUATORS HAVE NOT BEEN FOUND TO HAVE THIS PROB LEM. INTERSTATE ACTUATORS WILL BE REPLACED AT TIME OF FAILURE OR WHEN SERVICE LIFE EXPIRES.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-135C SUSTAINER HYDRAULIC PUMP	FAR 27-08590-3	13F 620411	WTR	YES NO	VICKERS AA-60410-L-2	896366

FAILURE MODE-LEAK EXTERNAL. HYDRAULIC OIL LEAKED FROM THE BOTTOM PLATE AT THE RADIATION SHIELD.

CORRECTIVE ACTION-UNIT WAS LOST. GD/C ADVISED COGNIZANT PERSONNEL TO VERIFY LEAKAGE PRIOR TO REMOVAL OF FUTURE COMP ONENTS

HYDRAULIC-A/B SUSTAINER/VERNIER	AE62-0318/B3-401-00-129 ACTUATOR ASSEMBLY	FLIGHT 27-85314-019	1290 620411	B3 0	YES NO	LI[illegible] PACIFIC	891534

FAILURE MODE-OUT OF TOLERANCE. THE SUSTAINER YAW ACTUATOR LENGTH APPEARED TO BE ADJUSTED TO THE WRONG LENGTH, BASED ON ANALYSIS OF SYSTEM PERFORMANCE DURING FLIGHT.

SYSTEM EFFECT-IMPROPER ANALOG SIGNALS.

VEHICLE EFFECT-NONE. THE SUSTAINER ENGINE EXHIBITED A YAW OFFSET FROM NULL POSITION. A SMALL COUNTERCLOCKWISE ROLL TRANSIENT WAS PRESENT AT LIFTOFF INSTEAD OF THE NORMAL CLOCKWISE TRANSIENT. AT BOOSTER CUTOFF THE MISSILE EXPERIENCE D A NOSE-LEFT ACCELERATION DUE TO THE SUSTAINER YAW. FLIGHT SUCCESSFUL.

CORRECTIVE ACTION-NONE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-99-04-3179F ACTUATOR ASSEMBLY, O-RING	FAR 27-83311-807	131D 620408	CONVAIR	YES NO	CLEMCO AERO PRODUCTS.	000003

FAILURE MODE-EXTERNAL LEAK. EXCESSIVE LEAKAGE PAST ONE OF THE PISTON SEALS. THE FAILURE WAS CONFIRMED. THE LEAK WAS APPROXIMATELY ONE DROP PER SIX CYCLES. THE MAXIMUM ALLOWABLE IS ONE DROP FOR EVERY TWENTY FIVE (25) CYCLES. THE LEAK WAS DUE TO O-RING FAILURE CAUSED BY POOR QUALITY BUNA -N MATERIAL WHICH RESULTED IN ACCELERATED O-RING BREAKDOWN.

CORRECTIVE ACTION-GD/C HAS INFORMED THE VENDOR OF THE RESULTS OF THIS ANALYSIS AND HAS REQUESTED THAT HE CORRECT AND IMPROVE HIS QUALITY CONTROL PROCEDURES TO ASSURE THAT O-RINGS USED IN HYDRAULIC ACTUATORS MEET THE REQUIREMENTS OF MIL-P-25732A. (REF RAR A 99-04-710). TESTS OF VENDOR O-RING STOCK IN SEPTEMBER 1962 REVEAL THAT O-RINGS DO MEET PROCUREMENT SPECIFICATIONS.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-10-104F HYDRAULIC RELIEF VALVE O-RING	FAR 27-08569-2	33F 620329	SYC.	YES NO	VINSON A-61071	000114

FAILURE MODE-EXTERNAL LEAK-OIL SEEPAGE AT THE INTERFACE OF THE TWO HALVES OF THE VALVE BODY. FAILURE WAS CAUSED BY POOR QUALITY O RING.

CORRECTIVE ACTION-VENDOR WAS INFORMED OF APPROPRIATE Q.C. ON THE O RINGS PURCHASED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-10-102F HYDRAULIC PUMP, O-RING	FAR 27-08590-3	620301	SYC.	YES NO	VICKERS AA-60410-L-2	000190

FAILURE MODE-EXTERNAL LEAK-OIL SEEPAGE AT THE COMPENSATOR FLANGE, AND THE PUMP OUTLET FLANGE. FAILURE WAS CAUSED BY THE POOR O-RINGS AND SCRATCHES ON THE FITTING BEVEL.

CORRECTIVE ACTION-VENDOR WAS INFORMED TO IMPROVE HIS Q.C. IN MANUFACTURE, ALSO A NEW TOOL WAS MADE TO ELIMINATE HIS INSTALLED INSERTS.

HYDRAULIC-A/B SUSTAINER/VERNIER	AE62-0078/01-904-00-66 ACCUMULATOR CHARGE LINE	FLIGHT	66E 620220	OGTF-1 131	NO NO	GD/CONVAIR

FAILURE MODE-STRUCTURAL. AN ABNORMAL PRESSURE TRANSIENT TO 3500 PSIG ON SUSTAINER/VERNIER HYDRAULIC SYSTEM. THIS CHARACTERISTIC IS INDICATIVE OF THE LOSS OF AN ACCUMULATOR CHARGE LINE. CHARGE LINE FAILURE IS ATTRIBUTED TO A THRUST SECTION FIRE.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE.							007005
HYDRAULIC-A/B SUSTAINER/VERNIER	A-BH-04-3145F ACTUATOR ASSEMBLY, O-RING	FAR 27-85312-005	26F 620220	SCHILLIN G	YES NO	CLENCO AERO PR ODUCTS	006070
FAILURE MODE-LEAK-EXTERNAL THE ACTUATOR WAS OBSERVED TO HAVE EXCESSIVE LEAKAGE FROM CUT ASAY AREA OF THE ACUTATOR D URING PERFORMANCE OF HYDRAULIC SYSTEM FILL AND BLEED PROCEDURE 27-00402. DISASSEMBLY REVEALED DAMAGE. O-RINGS OF SUB -SPECIFICATION QUALITY THAT COULD HAVE PERMITTED THE EXCESSIVE LEAKAGE REPORTED.							
CORRECTIVE ACTION-GD/C RELIABILTY CONTROL ENGINEERING HAS INFORMED THE VENDOR OF THE O RING PROBLEM AND IS REQUESTI NG THAT HE INSTITUTE QUALITY CONTROL PROCEDURES TO ASSURE THAT O RINGS USED IN SUBJECT ACTUATORS MEETS THE REQUIREME NTS OF MIL-P-25732. REF RARS WGR-SF-04-694 AND MG-BB-04-604. VENDOR COMPLIED WITH CORRECTIVE ACTION REQUEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	BP-BD-04-3099-F ACTUATOR ASSEMBLY, HARNESS	FAR 27-85314-019	620227	WTR	NO NO	INTERSTATE	007113
FAILURE MODE-ERRATIC OPERATION-DURING LOOP TEST UNIT REPORTEDLY GAVE THE SUSTAINER ENGINE INTERMITTENT KICKS. TEST RESULTS SHOWED ACTUATOR TO BE SATISFACTORY. INVESTIGATION FOUND INTERMITTENT OPEN CIRCUIT IN ELECTRICAL SYSTEM HARNE SS.							
CORRECTIVE ACTION-NONE REQUIRED ON ACTUATOR- REPLACEMENT OF HARNESS ELIMINATED INTERMITTENT SUSTAINER ENGINE KICKIN G PROBLEM.							
HYDRAULIC-A/B SUSTAINER/VERNIER	ABD-04-3172F ACTUATOR ASSEMBLY, O-RING	FAR 27-85312-005	620210	WTR	YES NO	LIONEL PACIFIC	007320
FAILURE MODE-LEAK-EXTERNAL-DURING HYDRAULIC FILL AND BLEED TESTS, A CONSPICUOUS AMOUNT OF LEAKAGE WAS OBSERVED. THE LEAK DRIPPED CONTINUOUSLY UNDER 40 PSIG. THE FAILURE WAS CONFIRMED. THE LEAKAGE WAS CAUSE BY EITHER(1) A PIECE OF F ELT SEPARATING FROM THE WIPER AND BECOMING LODGED ACROSS ONE OF THE PISTON O-RINGS, OR (2) THE O-RING ITSELF DETERIO RATING. THE O-RING MATERIAL WAS SUB-STANDARD.							
CORRECTIVE ACTION-RAR A-BD-04-708 REQUESTING THAT THE VENDOR BE INFORMED OF THE SUBQUALITY O-RING AND THE FAULTY FE LT WIPER INSTALLATION AND THAT HE IMPROVE HIS QUALITY CONTROL IN THE PROBLEM AREAS. THE VENDOR HAS STATED THAT FELT WIPERS WILL BEINSPECTED MORE THOROUGHLY ON PARTS TO BE MADE. THE O-RING DETERIORATION WAS WITHIN ALLOWABLE TOLERANCE CONSIDERING OIL AND AIR AGING.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-31835 ACTUATOR ASSEMBLY, O-RING	FAR 27-85311-307	820810	ETR	YES NO	LIONEL PACIFIC	000000

FAILURE MODE-LEAK-EXTERNAL. OUT NG FACT. PROCEDURE 27-00000-04- IC, A FINE STREAM OF HYDRAULIC FLUID WAS DETECTED L EAKING FROM A RACK GLAND OF THE VERNIER 2 PITCH SERVOCYLINDER. LEAKAGE OCCURRED IN BOTH STATIC AND DYNAMIC STATES. T HE FAILURE COULD NOT BE CONFIRMED. THE CONDITION OF THE O-RINGS INDICATED THAT BELOW SPECIFICATION MATERIAL MAY HAVE CAUSED THE REPORTED FAILURE.

CORRECTIVE ACTION-RAR A-80-04-710 HAS BEEN WRITTEN REQUESTING THAT ACTION BE TAKEN TO ENSURE THAT THE O-RINGS USED BY THE VENDOR MEET THE REQUIREMENTS OF MIL-P-83732A. THE VENDOR WAS INFORMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-80-10-1017 HYDRAULIC PUMP, O-RING	FAR 27-00300-3	820815	WTR	YES NO	VICKERS AA-00410-L-2	000100

FAILURE MODE-EXTERNAL LEAK-OIL SEEPAGE AT THE PUMP FLANGES. FAILURE WAS CAUSED BY POOR QUALITY O RINGS.

CORRECTIVE ACTION-VENDOR WAS INSTRUCTED TO INVESTIGATE AND CORRECT THE POOR O RINGS. THE NEW IAT TEST PROCEDURE ALL OWS A SMALL AMOUNT OF SEEPAGE FROM THE STATIC SEALS AS WELL AS THE SHAFT SEAL.

HYDRAULIC-A/B SUSTAINER/VERNIER	MG-79-04-31179 ACTUATOR ASSEMBLY	FAR 27-85311-5	820820	FACTORY	YES NO	INTERSTATE	007730

FAILURE MODE-STRUCTURAL. SERVO VALVE WAS REJECTED BECAUSE OF DRIF ING-ANALYSIS SHOWED THAT CYLINDER BODY MANUFACTUR ED BY INTERSTATE ENG. DID NOT HAVE AN ADEQUATE CUTOUT FOR A TRANSDUCER PROBE SUPPORT.

CORRECTIVE ACTION-A SURVEY WAS MADE TO MAKE CERTAIN THAT ALL CYLINDERS HAVE PROPER CUTOUT.

HYDRAULIC-A/B SUSTAINER/VERNIER	MGR-80-04-31037 ACTUATOR ASSEMBLY, O-RING	FAR 27-85311-8	730 820801	WNFB	YES NO	INTERSTATE ENG .	000303

FAILURE MODE-LEAK EXTERNAL-LEAKAGE PAST O-RING SEALS.

CORRECTIVE ACTION-GD/C WORKING WITH VENDOR TO IMPROVE RELIABILITY OF O-RING MATERIAL.

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM / SUB-SYSTEM	TEST/REPORT NUMBER / FAILED COMPONENT NAME	DIF DATA SOURCE / PART NUMBER	VEHICLE / DATE DIF	SITE / TIME DIF	PRI / OTH	VENDOR NAME / VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-66-10-088F HYDRAULIC ACCUMULATOR, O-RING	FAR 27-08551-3	620126		YES NO	PEACOCK 51369-3	699191
FAILURE MODE-INTERNAL LEAK. PRECHARGE OF GAS LEAKAGE ACROSS THE PISTON INTO THE HYDRAULIC SYSTEM. FAILURE DUE TO A DEFECTIVE O RING. CORRECTIVE ACTION-VENDOR WAS NOTIFIED ABOUT POOR O RINGS, REPLY WAS THAT ALL O RINGS USED WERE CERTIFIED TO MEET TH E REQUIRED MIL SPECS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AF62-0075/63-401-00-136	FLIGHT	1320 620123	83 0	YES NO		697587
FAILURE MODE-ERRATIC OPERATION. SUSTAINER/VERNIER HYDRAULIC PRESSURE WAS UNSTABLE FOR THE FIRST 35 SECONDS OF FLIGH T AFTER NORMAL START TRANSIENT. PRESSURE DISPLAYED SINE- LIKE OSCILLATION (210 PSIG P-P MAX AMPLITUDE). SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-66-10-097F HYDRAULIC PUMP, SEAL	FAR 27-08590-1	620117	SVC.	YES NO	VICKERS AA-60401-L-2	699147
FAILURE MODE-EXTERNAL LEAK-OIL SEEPAGE AT THE DRIVE- SHAFT SEAL. IT WAS CONCLUDED THAT THE PUMP CASE WAS OVERPRESSU RIZED DUE TO CUT AND DAMAGED PART OF SEAL. CORRECTIVE ACTION-IT WAS REQUESTED THAT MORE STRICT TESTING PROCEDURES BY EMPLOYED TO ELIMINATE LEAKING PUMPS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9H-04-3105F ACTUATOR ASSEMBLY	FAR 17-03312-003	18F 620109	SAFB	YES NO	CLEMCO AERO PR OD.	696575
FAILURE MODE-LEAK EXTERNAL-EXCESSIVE WEAR OF PISTON GLANDS, O-RINGS, AND CYLINDER BORES. CORRECTIVE ACTION-GC HAS INCORPORATED CHROME PLATING OF PISTONS AND CYLINDER BORES. THESE PARTS ARE DESIGNATED 27 -03312-003.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	H6-88-04-3101F ACTUATOR ASSEMBLY, O-RING	FAR 27-85311-8	1090 820108	ETR	YES NO	INTERSTATE ENG .	886600

FAILURE MODE-LEAK EXTERNAL-LEAKING AT POSITION END OF PISTON O-RING HAD TRAVERSE CUTS.

CORRECTIVE ACTION-GD/C WORKING WITH VENDOR TO IMPROVE RELIABILITY.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-04-3109F SUSTAINER ACTUATOR ASSEMBLY, BEARI NG	FAR 27-85314-017	40E 820108	1B	NO NO	LIONEL PACIFIC	886578

FAILURE MODE-FAILED DURING OPERATION-HIGH PITCHED SQUEAL DURING FREQUENCY RESPONSE. SUSPECTED TO BE BINDING OF SELF ALIGNING BEARING.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. PERSONNEL AT SITE INFORMED TO CHECK THAT SELF ALIGNING BEARINGS ARE TIGHT TO ASSURE AGAINST BEARING SLOP.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-04-3085-F ACTUATOR ASSEMBLY, O-RING	FAR 27-85314-018	1330 820108	FACTORY	YES NO	INTERSTATE	887040

FAILURE MODE-LEAK-EXTERNAL-DURING CHECKOUT OF MISSILE HYDRAULIC OIL LEAKED FROM THE STATIC O-RING AT THE STATIONARY END OF ACTUATOR-LEAKAGE RATE OF ONE DROP/30 MINUTES WAS DUE TO POROUS O-RING SEAL (BUNA-N MATERIAL BELOW MINIMUM MI L-SPEC REQUIREMENTS).

CORRECTIVE ACTION-VENDOR CHANGED-INTERSTATE ACTUATORS TO BE REPLACED AT TIME OF FAILURE OR WHEN SERVICE LIFE EXPIRE S AND DEFECTIVE SEALS WILL BE REPLACED DURING SUBSEQUENT OVERHAUL.

HYDRAULIC-A/B SUSTAINER/VERNIER	CT-83-04-013F VERNIER ACTUATOR ASSEMBLY	FAR 27-85312-005	1040 820108	50A	NO NO	CLEVCO	882961

FAILURE MODE-ERRATIC OPERATION. UNIT REJECTED WHEN IT RESPONDED ERRATICALLY TO LIGHT TAPPING ON THE FEEDBACK TRANSD UCER. FAILURE NOT CONFIRMED BUT ATTRIBUTED TO AN AMPLIFIER FAILURE REPORTED IN FAR CT-88-04-000.

CORRECTIVE ACTION-NONE. FAILURE NOT CONFIRMED.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-10-100F HYDRAULIC ACCUMULATOR	FAR 27-08583-3	820103	VAFB	YES NO	PEACOCK ENGR. CO. 51303-3	899193
FAILURE MODE-INTERNAL LEAK. LEAKAGE OF PRECHARGE GAS ACROSS THE PISTON INTO THE HYDRAULIC SYSTEM. FAILURE WAS CAUSED BY THE O RING.							
CORRECTIVE ACTION-VENDOR WAS ISSUED E.O. NO. 2587 TO PROCURE SUPERIOR QUALITY O RING PACKINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-8B-10-095F HYDRAULIC PUMP, O-RING	FAR 27-08590-3	811229		YES NO	VICKERS AA-80410-L-2	899149
FAILURE MODE-EXTERNAL LEAK-OIL SEEPAGE AT THE PUMP FLANGES.							
CORRECTIVE ACTION-VENDOR NOTIFIED TO INVESTIGATE THE POOR O RING QUALITY USED FOR SEALING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AE61-0055/FC-4LO-01-100 MANIFOLD, O-RING	COMPOSITE-FACTORY	1000 811225	GD/C	YES NO	GD/C	856432
FAILURE MODE-LEAK-HYDRAULIC LEAK DEVELOPED IN THE O RING AT THE SUSTAINER ENGINE CONTROL MANIFOLD.							
SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY-O RING LEAKED.							
VEHICLE EFFECT-COUNTDOWN OR COMPOSITE DELAYED OR RESCHEDULED. RETEST OF HYDRAULIC SYSTEM REQUIRED.							
CORRECTIVE ACTION-O RING WAS REPLACED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-04-3107F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-017	811219	WTR	YES NO	LIONEL PACIFIC	896577
FAILURE MODE-CONTAMINATION-ENGINE FAILED TO MEET NULL LIMITS. FLOW RESTRICTED THROUGH RETURN CHECK VALVE.							
CORRECTIVE ACTION-VENDOR HAS SINCE BUILT NEW DECONTAMINATION AREA USING LATEST EQUIPMENT. FACILITIES HAVE BEEN CERTIFIED PER CLEANING SPEC.D-79014.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9D-04-3108F SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-017	811218	WTR	YES NO	LIONEL PACIFIC	
FAILURE MODE-OUT OF TOLERANCE. VALVE NULL CURRENT SHIFTED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-VENDOR HAS SINCE BUILT NEW DECONTAMINATION AREA USING LATEST EQUIPMENT. FACILITIES HAVE BEEN CERT IFIED PER CLEANING SPEC.0-75014.							000376
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9R-10-099F HYDRAULIC ACCUMULATOR, O-RING	FAR 27-08555-3F	611251	FAFB		PEACOCK ENGR. CO. 51305-5	000192
FAILURE MODE-INTERNAL LEAK. LEAKAGE OF THE PRECHARGE GAS ACROSS THE PISTON. FAILURE WAS CAUSED BY THE O RING.							
CORRECTIVE ACTION-VENDOR WAS ISSUED AN E.O. NO. 2587 TO PROCURE SUPERIOR QUALITY O RING PACKINGS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	CT-98-04-008F ACTUATOR ASSEMBLY	FAR 27-05312-005	611130	AMR	YES NO	CLEMCO	002939
FAILURE MODE-LEAK-EXTERNAL. UNIT REJECTED FOR AN EXTERNAL LEAK AT THE PISTON SHAFT SEAL.							
CORRECTIVE ACTION-NONE. FAILURE WAS NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-04-303RF ACTUATOR	FAR 27-05312-005	1F 611127	SYCAMORE	YES NO	LIONEL PACIFIC	007262
FAILURE MODE-LEAK-EXTERNAL. DURING SYSTEMS CHECK OUT, EXCESSIVE HYDRAULIC FLUID LEAKAGE PAST THE PISTON SEALS WAS O BSERVED. OUTBOARD PISTON LANDS WORN ON RACK SIDE, CHAFED O-RINGS AND SLIGHT NICK ADJACENT TO LAND WEAR CAUSED BY IMP ROPER INSTALLATION. REPORTED LEAKAGE WAS NOT CONFIRMED.							
CORRECTIVE ACTION-INVESTIGATION REVEALED DISCREPANT UNITS HAD BEEN INSTALLED IN THE FIELD. A TWX TO THE FIELD REQUE STED ALL SUBJECT UNITS DESTINED FOR REJECTION BE INSPECTED FOR GEAR BACKLASH REQUIREMENTS AND NEW UNITS BE INSTALLED IN STRICT COMPLIANCE WITH BACKLASH TOLERANCES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AE61-1106/82-403-00-83 DISCONNECT, DTAGING	COUNTDOWN 27-08550-1	530 611122	82	YES NO	104700-0 91890-1	007354
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DISCONNECT POPPET INCORRECTLY INSTALLED PREVENTED ACTUATION OF SUB T. HYDRAULIC PRESSURE SWITCH DURING MAINSTAGE.							
SYSTEM EFFECT-OPERATING STOPS PREMATURELY. ENGINES CUT-OFF BY FAILURE TIMER.							
VEHICLE EFFECT-COUNTDOWN ABORTED AND RE-SCHEDULED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-68-10-0068F HYDRAULIC PUMP, O-RING	FAR 87-08590-3	611031		YES NO	VICKERS AA-60410-L-2	001140
FAILURE MODE-EXTERNAL LEAK-OIL SEEPAGE FROM THE PUMP FLANGES. FAILURE DUE TO POOR QUALITY O RINGS.							
CORRECTIVE ACTION-VENDOR INSTRUCTED TO IMPROVE Q.C.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AA61-0152/PE-402-00-117 ACTUATOR ASSEMBLY, VERNIER	COUNTDOWN	1170 611022	12 -3660	YES NO	LIONEL PACIFIC	007322
FAILURE MODE-LEAK EXTERNAL-HYDRAULIC LEAKAGE PAST THE TEFLON SEALS.							
SYSTEM EFFECT-NONE.							
VEHICLE EFFECT-COUNTDOWN ABORTED.							
CORRECTIVE ACTION-ENGINE REPLACED-VERNIER 1 WAS ALSO CHANGED FOR CONFIDENCE REASONS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-68-04-3075F ACTUATOR ASSEMBLY, SEAL	FAR 87-85312-003	611017	SYCAMORE	YES NO	CLEVCO	007114
FAILURE MODE-LEAK-EXTERNAL. UNIT LEAKED A STEADY STREAM AT THE SHAFT SEAL WHEN THE VERNIER ENGINE WAS GIMBALED. FAILURE CONFIRMED, AND WAS DUE TO EXCESSIVE SCORING ON PISTON LANDS O-RINGS, AND PISTON SHAFT.							
CORRECTIVE ACTION-INSTRUCTIONS ISSUED TO INSURE THAT ALL NEW UNITS TO BE INSTALLED SHALL COMPLY WITH BACKLASH TOLERANCES AND REQUESTING THAT UNITS DESTINED FOR REJECTION BE INSPECTED FOR COMPLIANCE TO GEAR BACKLASH REQUIREMENTS PRIOR TO REMOVAL FROM THE INSTALLATION AND RECORDED ON THE REJECTION FORM.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-68-04-3031F ACTUATOR ASSEMBLY	FAR 87-85312-003	1170 611009	ETR	YES NO	LIONEL PACIFIC	007203
FAILURE MODE-LEAK-EXTERNAL-DURING A ROUTINE MAINTENANCE CHECK HYDRAULIC FLUID WAS OBSERVED LEAKING FROM THE CYLINDER HOUSING PAST THE PISTON SEALS. OUTBOARD PISTON LANDS WORN ON RACKSIDE, CHAFED O-RINGS AND SLIGHT NICK ADJACENT TO LAND WEAR CAUSED BY IMPROPER INSTALLATION. REPORTED LEAKAGE WAS NOT CONFIRMED.							
CORRECTIVE ACTION-INVESTIGATION REVEALED CONFIRMED FAILURES HAD BEEN INSTALLED IN THE FIELD. A TWX TO THE FIELD REQUESTED ALL SUBJECT UNITS DESTINED FOR REJECTION BE INSPECTED FOR GEAR BACKLASH REQUIREMENTS AND NEW UNITS BE INSTALLED IN STRICT COMPLIANCE WITH BACKLASH TOLERANCES.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-3030F ACTUATOR ASSEMBLY	FAR 27-05312-005	4F 011000	ETR	YES NO	LIONEL PACIFIC	007264
FAILURE MODE-LEAK-EXTERNAL. DURING MAPCHE PU CHECKS A STEADY STREAM OF HYDRAULIC FLUID WAS NOTED TO BE LEAKING FROM THE CYLINDER HOUSING PAST THE PISTON SEALS. OUTBOARD PISTON LANDS SEVERELY WORN ON RACK SIDE, SCRATCHES ON CYLINDER BORE, CHAFED O-RINGS ADJACENT WORN PISTON LANDS CAUSED BY IMPROPER INSTALLATION.							
CORRECTIVE ACTION-INVESTIGATION REVEALED DISCREPANT UNITS HAD BEEN INSTALLED IN THE FIELD. A TWX TO THE FIELD REQUESTED ALL SUBJECT UNITS DESTINED FOR REJECTION BE INSPECTED FOR GEAR BACKLASH REQUIREMENTS AND NEW UNITS BE INSTALLED IN STRICT COMPLIANCE WITH BACKLASH TOLERANCES.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9H-04-287 ACTUATOR ASSEMBLY	FAR 27-05312-005	50E 011000	FORBES	YES NO	BOHANAN MFG. C O.	007341
FAILURE MODE-STRUCTURAL. THE SUBJECT SERVO ACTUATOR LEAKED HYDRAULIC FLUID FROM CYLINDER ASSEMBLY P/N 27-08573-1. ANALYSIS REVEALED A CRACK APPROXIMATELY ONE INCH LONG IN THE FORGED ALUMINUM CYLINDER HOUSING. IT FOLLOWED THE FORGING PARTING LINE. HYDRAULIC FLUID WAS FORCED THROUGH THE CRACK DURING PRESSURIZATION.							
CORRECTIVE ACTION-GD/C HAS TERMINATED PROCUREMENT OF THE FORGED ALUMINUM ALLOY CYLINDER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9H-04-286 ACTUATOR ASSEMBLY	FAR 27-05312-005	50E 011000	FORBES	YES NO	BOHANAN MFG. C O.	007342
FAILURE MODE-LEAK-EXTERNAL-THE SUBJECT SERVO ACTUATOR LEAKED HYDRAULIC FLUID FROM CYLINDER ASSEMBLY P/N 27-08573-1. ANALYSIS REVEALED A CRACK APPROXIMATELY ONE INCH LONG IN THE FORGED ALUMINUM CYLINDER HOUSING. IT FOLLOWED THE FORGING PARTING LINE. HYDRAULIC FLUID WAS FORCED THROUGH THE CRACK DURING PRESSURIZATION.							
CORRECTIVE ACTION-GD/C HAS TERMINATED PROCUREMENT OF THE FORGED ALUMINUM ALLOY CYLINDER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9K-10-067 HYDRAULIC PUMP	FAR 27-06590-3	14G 015001	FAIRCHIL B	YES NO	VICKERS AA-60410-L-7	000113
FAILURE MODE-EXTERNAL LEAK-LEAKAGE AT MATING FLANGES BETWEEN THE PUMP HOUSING AND THE CONTROL VALVE.							
CORRECTIVE ACTION-LEAKAGE NOT CONFIRMED.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1980

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9H-04-3036-F SERVO VALVE, TORQUE MOTOR	FAR 27-04209-1	46E 610918	FORBES	YES NO	CADILLAC GAGE FC-27-397A	097090

FAILURE MODE-ERRATIC OPERATION. CAUSE OF FAILURE ATTRIBUTED TO METALLIC CONTAMINATION FOUND LODGED IN THE TORQUE MOTOR OF THE SERVOVALVE.

CORRECTIVE ACTION-VENDOR PROCEDURES CHANGED TO INSURE GREATER CLEANLINESS DURING THE MANUFACTURING PROCESS BY PROVIDING ADDITIONAL CLEANING AND INSPECTION STEPS. GD/C PERSONNEL REVIEWED VENDORS QC PROCEDURES.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-084 FITTING, SEAL	FAR 27-08572-1	610218	ETR	YES NO	SNAP-TITE INC.	099163

FAILURE MODE-EXTERNAL LEAK-LEAKAGE FROM SEAL AND INTERNAL SURFACE OF COUPLING WAS CORRODED.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. VENDOR WAS NOTIFIED ABOUT PROBLEM OF CORROSION OF COUPLING AND TO IMPROVE THEIR QUALITY CONTROL.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-3036F ACTUATOR ASSEMBLY, O-RING	FAR 27-05314-017	30E 610915	ETR	YES NO	INTERSTATE	097052

FAILURE MODE-LEAK-EXTERNAL- HYDRAULIC OIL WAS LEAKING FROM THE RETAINER RING AT THE LOWER END OF ACTUATOR. FAILURE WAS NOT CONFIRMED DURING FAILURE ANALYSIS.

CORRECTIVE ACTION-INITIATED CLOSE SURVEILLANCE OF ACTUATOR-FIELD PERSONNEL REQUESTED TO CHECK SUBJECT COMPONENTS TO VERIFY FAILURES PRIOR TO REMOVAL.

HYDRAULIC-A/B SUSTAINER/VERNIER	9H-04-2/8 ACTUATOR ASSEMBLY	FAR 27-05318-003	29E 610912	FORBES	YES NO	BOHANAN MFG. C O.	097330

FAILURE MODE-EXTERNAL LEAK. THE VERNIER ENGINE SERVO ACTUATOR WAS DETECTED LEAKING HYDRAULIC FLUID. ANALYSIS CONFIRMED THE LEAK. HYDRAULIC OIL SEEPAGE THROUGH THE MANIFOLD WALL IS DUE TO EITHER A DISCREPANT PLUG OR THE IMPROPER INSTALLATION OF THE PLUG. EXISTENCE OF A SMALL FRACTURE IN THE FORGING ADJACENT TO THE PLUG IS POSSIBLE.

CORRECTIVE ACTION-GD/C HAS TERMINATED PROCUREMENT OF THE FORGED ALUMINUM ALLOY CYLINDER MADE BY BOHANAN MFG. CO.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-9F-04-3057-F SERVO VALVE	FAR 27-04208-1	43E 610910	WARREN	YES NO	CADILLAC GAGE 7C-27-398A	697851

FAILURE MODE-ERRATIC OPERATION. SERVOVALVE MALFUNCTION DURING MISSILE CHECKOUT-FAILURE CONFIRMED AT SO-NO EXACT CAUSE OF FAILURE WAS DETERMINED - MOST PROBABLE CAUSE OF FAILURE IS METAL PARTICLE CONTAMINATION.

CORRECTIVE ACTION-VENDOR PROCEDURES CHANGED TO INSURE GREATER CLEANLINESS DURING THE MANUFACTURING PROCESS BY PROVIDING ADDITIONAL CLEANING AND INSPECTION STEPS-GD/C PERSONNEL REVIEWED VENDORS QC PROCEDURES.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-C4-293F ACTUATOR ASSEMBLY	FAR 27-05312-805	28E 610906	13	YES NO	INTERSTATE	697340

FAILURE MODE-LEAK-EXTERNAL-DURING AN INTEGRATED TEST OF THE AUTOPILOT AND GUIDANCE SYSTEMS, LEAKAGE OF HYDRAULIC FLUID WAS OBSERVED BETWEEN THE CYLINDER ASSEMBLY HOUSING AND THE PISTON. ANALYSIS FAILED TO CONFIRM THE FAILURE. DURING FAILURE ANALYSIS TESTS THE OBSERVED LEAKAGE RATES WERE WELL BELOW THE ALLOWABLE OF ONE DROP PER 25 FULL CYCLES. THE REPORTED (APPARENT) LEAKAGE COULD HAVE RESULTED FROM ACCUMULATION OF ALLOWABLE LEAKAGE OVER A PERIOD OF ACTUATOR INACTIVITY.

CORRECTIVE ACTION-GD/C FIELD PERSONNEL AND BASE MANAGERS HAVE BEEN MADE COGNIZANT OF THE RESULTS OF THIS ANALYSIS. THIS SHOULD REDUCE THE INCIDENCE OF UNCONFIRMED FAILURES.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-9F-04-3034F ACTUATOR ASSEMBLY	FAR 27-05312-803	44E 610818	WAFB	YES NO	LIONEL PACIFIC	697261

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC FLUID WAS OBSERVED LEAKING FROM THE CYLINDER HOUSING PAST THE PISTON SEALS. OUTBOARD PISTON LANDS WERE DEEPLY SCORED AND O-RING SEALS BADLY CHAFED. FAILURE WAS CAUSED BY IMPROPER INSTALLATION.

CORRECTIVE ACTION-INVESTIGATION REVEALED DISCREPANT UNITS HAD BEEN INSTALLED IN THE FIELD. A TWX TO THE FIELD REQUESTED ALL SUBJECT UNITS DESTINED FOR REJECTION BE INSPECTED FOR GEAR BACKLASH REQUIREMENTS AND NEW UNITS BE INSTALLED IN STRICT COMPLIANCE WITH BACKLASH TOLERANCES

HYDRAULIC-A/B SUSTAINER/VERNIER	A-9F-04-3016 ACTUATOR ASSEMBLY	FAR 27-05314-817	35E 610829	WAFB	YES NO	LIONEL PACIFIC	

FAILURE MODE-OUT OF TOLERANCE. ACTUATOR MOVED IN EXCESS OF THE AMOUNT CORRESPONDING TO THE MAGNITUDE OF THE INPUT SIGNAL RESULTING FROM A NULL SHIFT ATTRIBUTED TO SLIGHT INTERNAL CONTAMINATION.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-MANUFACTURE DATE OF THIS SERVO VALVE WAS 1960. VENDOR PROCEDURES HAVE SINCE BEEN CHANGED TO ASSUR E GREATER CLEANLINESS.							097158
HYDRAULIC-A/B SUSTAINER/VERNIER	SERVO ACTUATOR ASSEMBLY, B-NUT.	FAR 27-05314-017	52E 610825	WAFB	YES NO	INTERSTATE	096965
FAILURE MODE-EXTERNAL LEAK. LEAKAGE OF HYDRAULIC FLUID FROM ITEM. CAUSE OF FAILURE, LOOSE B NUTS AT EACH END OF FIL TER AND MISSING O RINGS AT BULKHEAD UNIONS.							
CORRECTIVE ACTION-HUMAN ERROR TO BE ELIMINATED BY REVIEW OF EXISTING PLANNING AND INSPECTION CONTROLS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	A-98-04-3058-F SERVO VALVE	FAR 27-04209-1	26E 610823	ETR	NO YES	CADILLAC FC-27-397A	097020
FAILURE MODE-FAIL DURING OPERATION-SERVOVALVE REPORTEDLY MALFUNCTIONED DURING CHECKOUT OF MISSILE- EXTENSIVE TESTIN G CONFIRMED THAT SUBJECT VALVE FUNCTIONED PROPERLY AND THAT THE VERNIER YAW SERVOAMPLIFIER MALFUNCTIONED. SEE FAR A9 B-04-257F FOR ANALYSIS OF SERVOAMPLIFIER MALFUNCTION.							
CORRECTIVE ACTION-NONE REQUIRED (NO FAILURE).							
HYDRAULIC-A/B SUSTAINER/VERNIER	MD-90-10-083 HYDRAULIC FILTER-SUSTAINER	FAR 27-08564-003	610803		YES NO	PUROLATOR 64988-1	09910/
FAILURE MODE-EXCESSIVE EXTERNAL LEAKAGE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9K-04-263 ACTUATOR ASSEMBLY, SEAL	FAR 27-05312-003	15E 610802	FAFB	YES NO	INTERSTATE ENG INEERING	097366
FAILURE MODE-EXTERNAL LEAK-THE UNIT LEAKED HYDRAULIC FLUID BETWEEN THE RACK AND HOUSING OF CYLINDER ASSEMBLY, P/N 2 7-08573-1. THE LEAK WAS A FEW DROPS PER MINUTE IN THE STATIC CONDITION AND A STEADY STREAM DURING CYCLING AT 3000 PS I. FAILURE ANALYSIS DID NOT CONFIRM THE LEAKAGE ALTHOUGH A SMALL PIECE OF ALUMINUM WAS FOUND BENEATH THE FELT WIPER WHICH MAY HAVE TEMPORARILY CAUSED THE LEAK REPORTED IN THE FIELD.							
CORRECTIVE ACTION-THE PROBLEM OF EXCESSIVE FLUID LEAKAGE BETWEEN THE RACK SHAFT AND HOUSING OF VERNIER ENGINE ACTUA TOR CYLINDERS IS CURRENTLY UNDER GD/C SURVEILLANCE.							

GENERAL DYNAMICS
CONVAIR DIVISION

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	84-10-082 SUSTAINER TANK	FAR 27-08532-5	33E 810601	FORBES	YES NO	BENDIX 8983	059210

FAILURE MODE-STRUCTURAL-HYDRAULIC END CAP SEPARATED FROM THE MAIN CYLINDER, AND THE MOUNTING BRACKET ON THE PNEUMATIC END WAS FRACTURED. RESERVOIR FAILED BECAUSE HYDRAULIC SYSTEM WAS OVERPRESSURIZED. CAUSE OF OVERPRESSURIZATION IS UNDETERMINED.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-262 ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-803	111D 810722	ETR	YES NO	INTERSTATE ENGINEERING	057565

FAILURE MODE-EXTERNAL LEAK. THE UNIT, S/N 102-0262, WAS REPORTED LEAKING HYDRAULIC FLUID BETWEEN THE RACK AND HOUSING OF THE CYLINDER ASSEMBLY, P/N 27-08575-1. FAILURE ANALYSIS INDICATED THAT LEAKAGE IS DUE TO A WORN CONDITION OF THE PISTON O-RING SEAL. THE SPECIFIED MINIMUM LIFE OF THE ITEM ACTUATOR IS 80000 CYCLES. CONSERVATIVE ESTIMATES ARE THAT THE ITEM UNIT HAS ACHIEVED A CYCLING LIFE OF 100M-150M CYCLES.

CORRECTIVE ACTION-NONE-LEAKAGE PAST PISTON SEALS ON ENGINE ACTUATORS IS CURRENTLEY UNDER GD/C SURVEILLANCE.

HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-0036F ACTUATOR ASSEMBLY, VERNIER	FAR 27-05311-803	2F 810721	COMPLEX1 3	YES NO	INTERSTATE	000099

FAILURE MODE-EXTERNAL LEAK. LEAKAGE OF HYDRAULIC FLUID FROM THE ITEM

CORRECTIVE ACTION-CONTINUED SURVEILLANCE OF ITEM ALTHOUGH NO FAILURE COULD BE FOUND. ITEM ACCEPTABLE FOR SERVICE.

HYDRAULIC-A/B SUSTAINER/VERNIER	A-63-04-3013F ACTUATOR ASSEMBLY, VERNIER	FAR 27-05311-803	2F 810721	CH13 CORESET B	YES NO	INTERSTATE	000090

FAILURE MODE-LEAK EXTERNAL. LEAKAGE OF HYDRAULIC FLUID FROM THE ITEM.

CORRECTIVE ACTION-CONTINUED SURVEILLANCE OF ITEM ALTHOUGH NO FAILURE COULD BE FOUND. ITEM ACCEPTABLE FOR SERVICE. ACTION WAS TAKEN TO ENFORCE ADHERENCE TO EXISTING PROVISIONING PROCEDURES FOR REMOVAL, REPLACEMENT AND HANDLING OF SERVO ACTUATORS.

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	A-88-04-3016F VERNIER ACTUATOR ASSEMBLY	FAR 27-85312-203	21E 610719	COMP-11	YES NO	INTERSTATE ENG R. CO.	000952

FAILURE MODE-EXTERNAL LEAK. LEAKAGE OF HYDRAULIC FLUID BETWEEN PISTON AND CYLINDER IN THE CYLINDER ASSEMBLY 27-0857 3-1. CAUSES, LOCKWIRING MISSING FROM ENDS OF PLUGS OF THE CYLINDER HOUSING, TIE DOWN BOLTS LOOSE, O-RING MISSING FOR PRESSURE PORT, FEEDBACK TRANSDUCER MISSING.

CORRECTIVE ACTION-ACTION WAS TAKEN TO ENFORCE ADHERENCE TO EXISTING PROVISIONING PROCEDURES FOR REMOVAL, REPLACEMEN T AND HANDLING OF SERVO ACTUATORS.

HYDRAULIC-A/B SUSTAINER/VERNIER	9R-04-3007P ACTUATOR ASSEMBLY, SUSTAINER	FAR 27-85314-013	14E 610718	967-MAB	YES NO	LIONEL PACIFIC	000959

FAILURE MODE-CONTAMINATION, HYDRAULIC FLUID CONTAINED EXCESSIVE PARTICLES OF CONTAMINATE SIZE.

CORRECTIVE ACTION-INSTRUCTIONS ISSUED ADVISING THAT ACTUATORS BE HANDLED IN THE FIELD AS COMPLETE ASSEMBLIES DISASS EMBLY OF ACTUATORS SHOULD ONLY BE DONE UNDER CONTROLLED LABORATORY CONDITIONS. ALL HYDRAULIC SUPPLIES TO BE CAREFULL Y HANDLED TO PREVENT CONTAMINATION.

HYDRAULIC-A/B SUSTAINER/VERNIER	A9-04-242 ACTUATOR ASSEMBLY, VERNIER	FAR 27-85312-003	123D 610631-0 10722	B2	YES NO	INTERSTATE ENG INEERING AND C LENCO	007350

FAILURE MODE-LEAK EXTERNAL. SEVEN OF THE ITEM ACTUATORS WERE REMOVED FROM MISSILES DUE TO EXCESSIVE LEAKAGE. FAILUR E ANALYSIS REVEALED THAT RE-ENTRY OF A PORTION OF THE OUTBOARD LAND OR THE PISTON DURING FULL STROKE CYCLING AND SHU DDING IN THE PRESENCE OF HYDRAULIC PRESSURE INDUCED DEFLECTION. RESULTS IN IMPINGEMENT BETWEEN THE LANDS AND THE SHA RP EDGES OF THE CYLINDER BORE. THIS CAUSED SCORING AND GALLING. SMALL PARTICLES THUS PRODUCED CAUSED SEVERE ABRASION TO PISTON SEALS RESULTING IN LEAKS.

CORRECTIVE ACTION-THE DESIGN WAS CHANGED TO REQUIRE CHROME PLATED PISTONS. THE VENDOR WILL ELIMINATE THE SHARP EDGE OF THE CYLINDER BORE. GD/C WILL CONTINUE TO KEEP EXCESSIVE LEAK PROBLEM UNDER SURVEILLANCE. A SEARCH FOR CRITICAL W EAKNESS PROGRAM(SFCW) IS CURRENTLY BEING CONDUCTED ON SEVERAL UNITS OF THE MODIFIED ITEM.

HYDRAULIC-A/B SUSTAINER/VERNIER	9R-04-238 ACTUATOR ASSEMBLY, SERVO VALVE.	FAR 27-85311-003	14E 610630	FAPB	YES NO	INTERSTATE	

FAILURE MODE-FAILED DURING OPERATION-WHEN ENERGIZED, THE ACTUATOR PISTON MOVED TO THE STOPS ON THE SHORT STROKE SID E AND BECAME FIXED. CYCLING COULD NOT BE ACCOMPLISHED. FAILURE ANALYSIS CONCLUDED THAT THE FAILURE WAS DUE TO THE SH ORTING OF ONE OF THE TORQUE MOTOR LEADS TO THE BACKPACE OF THE RECEPTACLE PLATE.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1968

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-GO/C HAS MADE THE SERVO VALVE VENDOR (INTERSTATE) COGNIZANT OF THE ELECTRICAL DISCREPANCY. THE VENDOR HAS BEEN ADVISED TO CORRECT THE ASSOCIATED INSPECTION VOID.							007304
HYDRAULIC-A/B SUSTAINER/VERNIER	84-04-288 ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05311-003	14E 010680	FAFB	YES NO	INTERSTATE	007329
FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME-THE SERVO ACTUATOR, S/N 000-0104, FAILED TO ACTUATE IN THE PITCH PLANE DURING PERFORMANCE OF HARCHE AUTOPILOT TEST PROCEDURES. ANALYSIS CONFIRMED THE FAILURE AND ATTRIBUTES THE FAILURE TO THE INABILITY OF THE NOZZLE ADJUSTMENT SCREW TO CAP OFF THE NOZZLE WHEN THE PROPER SIGNAL IS FED TO THE TORQUE MOTOR DUE TO A DISCREPANT NOZZLE.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	84-10-078 HYDRAULIC PUMP	FAR 27-00500-1	010614		YES NO	VICKERS AA-60401-L-2	000166
FAILURE MODE-LEAK-EXTERNAL-SEEPING TYPE LEAK FROM THE INTERFACE OF THE PUMP BODY AND THE DISCHARGE PLATE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	84-10-075 ACCUMULATOR, SEAL	FAR 27-00553-2F	19E 010680		YES NO	PEACOCK ENG. 51303-3	000171
FAILURE MODE-INTERNAL LEAK. WHEN PNEUMATIC PRESSURE WAS RELEASED FROM THE ACCUMULATOR, HYDRAULIC FLUID WAS OBSERVED LEAKING FROM THE PNEUMATIC CHARGING PORT. IT WAS FOUND THAT OIL WAS A PRESERVATIVE AND HAD BEEN THERE SINCE MANUFACTURE. ACCUMULATOR HAD PREVIOUSLY BEEN FAILURE ANALYZED FOR SIMILAR FAILURES.							
CORRECTIVE ACTION-WAP 4032 TO INVESTIGATE AND ESTABLISH CORRECTIVE ACTION WAS INITIATED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	84-10-073 TUBE	FAR 27-73107-100	010303	FAFB	YES NO	CONVAIR	000178
FAILURE MODE-STRUCTURAL-TUBE BROKE DURING SEPARATION LATCH OPERATIONS AT FORDES AFB. PNEUMATIC PRESSURE IN THE TUBE WAS 1000 PSIG AT TIME OF FAILURE. FAILURE CAUSED BY UNAUTHORIZED BEND AT SLEEVE.							
CORRECTIVE ACTION-NONE-SOURCE OF BEND IS INDETERMINATE							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1'80

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	9R-04-229 ACTUATOR ASSEMBLY, SERVOVALVE TORQUE MOTOR	FAR 27-85311-001	610510	FAFB	YES NO	INTERSTATE	097360
FAILURE MODE-STRUCTURAL-TORQUE MOTOR CAP FRACTURED DURING POST MODIFICATION PROOF PRESSURE CHECK DUE TO OVER STRESSING. THE FAILURE OCCURRED BECAUSE OF IMPROPER CONFIGURATION DURING THE PROOF TEST.							
CORRECTIVE ACTION-A NOTE HAS BEEN ADDED TO THE MODIFICATION PLANNING TO PREVENT ANY CONFUSION AS TO WHICH CONFIGURATION IS REQUIRED FOR THE PROOF PRESSURE TEST.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6R-04-213 ACTUATOR ASSEMBLY	FAR 27-85312-003	101D 610501	WTR	YES NO	BOMANAN MFG. CO.	097350
FAILURE MODE-STRUCTURAL WEAKNESS-THE ACTUATOR CYLINDER OF THE ASSEMBLY HAD EXHIBITED A STRUCTURAL WEAKNESS CHARACTERISTIC DURING PRODUCT EVALUATION AND FIELD TESTS.							
CORRECTIVE ACTION-HYDRAULIC DESIGN ORDERED THE CESSATION OF PROCUREMENT AND SCRAPPING OF ALL EXISTING BOMANAN ACTUATORS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9D-04-206 ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	FAR 27-85311-9	610500	WTR	YES NO	LIONEL PACIFIC	000973
FAILURE MODE-ERRATIC OPERATION. DURING FLIGHT CONTROL CHECKOUT, ERRATIC OPERATION OF THE VERNIER ACTUATOR ASSY WAS NOTED ACCOMPANIED BY UNSATISFACTORY NULL PERFORMANCE. SOLDER BALL IN THE FEEDBACK TRANSDUCER ELECTRICAL RECEPTACLE INTERMITTENTLY SHORTED PINS.							
CORRECTIVE ACTION-ALERTED OFFSITE AND MANUFACTURING INSPECTORS TO THE CONTAMINATED CONDITION OF THIS RECEPTACLE. INSPECTION HAS BEEN INSTRUCTED TO EXERCISE VIGILANCE TO PREVENT RECURRENCE OF THIS PROBLEM.							
HYDRAULIC-A/B SUSTAINER/VERNIER	6R-04-200 ACTUATOR ASSEMBLY	FAR 27-85314-011	95D 610420	WTR	YES NO	INTERSTATE	000979
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. DURING APCHE CHECK NO-GO INDICATIONS WERE RECEIVED ON CARD 110, DEC& 87-800. IT WAS SUSPECTED THAT AIR CONTAMINATION IN THE HYDRAULIC SYSTEM COULD POSSIBLY BE THE CAUSE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GD/C ADVISED GOLDEN RAN QUALITY CONTROL GROUP THAT AIR CONTAMINATION IN THE HYDRAULIC SYSTEM WAS A POSSIBLE FACTOR IN THIS MALFUNCTION.							

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CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIP DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	AE61-0018/FC-4CO-08-080 ACCUMULATOR	COMPOSITE-FACTORY 27-08553-3	880 610418	68/C	YES NO	PEACOCK 51303-3	000065

FAILURE MODE - OUT OF SPECIFICATION. THE SUSTAINER HYDRAULIC ACCUMULATOR INDICATED EXCESSIVE LOSS OF PRESSURE AT TIMES COINCIDENT WITH SEVERE ENGINE MOVEMENT. THE ACCUMULATORS WERE CHARGED TO 1000 PIA. LARGE HYDRAULIC SURGES CANNOT BE HANDLED WITHOUT A CHARACTERISTIC DROP IN ACCUMULATOR PRESSURE BECAUSE ACCUMULATORS NOT CHARGED TO 3000 PIA AS FOR FLIGHT.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-NONE. DURING FLIGHT, ACCUMULATORS ARE CHARGED TO 3000 PIA. THE HYDRAULIC SURGES WILL NOT AFFECT THE SYSTEM CAUSING LOSS OF PRESSURE.

HYDRAULIC-A/B SUSTAINER/VERNIER	9K-04-220 ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-05311-001	2UE 610407	FAFB	YES NO	INTERSTATE	007330

FAILURE MODE-SHORT (ELECT)-ANGULAR DISPLACEMENT OF THE VERNIER ENGINE DURING APPLICATION OF HYDRAULIC PRESSURE, IN THE PRESENCE OF A NULL REQUEST IS ATTRIBUTABLE TO THE GROUNDING OF LEAD A THROUGH EITHER THE VALVE CASE OR THE MOTOR MOUNTS. THE INCREASE IN CURRENT FLOW THROUGH THE SHORTED COIL UPSET THE BALANCE BETWEEN THE TWO TORQUE MOTOR COILS, INDUCING THE ACTUATOR TO ROTATE THE VERNIER ENGINE.

CORRECTIVE ACTION-THE VENDOR INTERSTATE HAS REWORKED AFFECTED UNITS BY INCREASING THE CLEARANCE INSIDE THE VALVE CASE, SHORTENING THE LENGTH OF THE TORQUE MOTOR LEADS, AND INCREASING THE LENGTH OF STRIPPER TUBE BINDING FOR THE LEADS BETWEEN THE MOTOR AND THE RECEPTACLE.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-060 SUSTAINER HYDRAULIC TANK, SEAL	FAR 27-08552-3	4E 610317	ETR	YES NO	BENDIX MFG 8963	000132

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF GAS ACROSS THE PISTON TO THE OIL SIDE.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. NO CORRECTIVE ACTION TAKEN.

HYDRAULIC-A/B SUSTAINER/VERNIER	68-10-060 ACCUMULATOR, O-RING	FAR 27-08553-3	980 610318	WPB	YES NO	PEACOCK ENG. 51303-3

FAILURE MODE-INTERNAL LEAK. LEAKAGE OF GAS ACROSS THE PISTON TO THE OIL SIDE. ALSO A SMALL AMOUNT OF HYDRAULIC OIL WAS FOUND IN THE GAS SIDE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION - UNKNOWN. FAILURE NOT CONFIRMED.							000177
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-058 SUSTAINER HYDRAULIC PUMP	FAR 27-08590-1	010818	ETR	YES NO	VICKERS AA-60401-L-2	000144
FAILURE MODE-LEAK-EXTERNAL-LEAKAGE OF SEVERAL DROPS PER MINUTE AROUND ONE OF THE FOUR MOUNTING STUDS ON THE INLET A DAPTER PLATE. POSSIBLE FOREIGN PARTICLE UNDER FLANGE SEAT OF PUMP.							
CORRECTIVE ACTION-VENDOR WAS NOTIFIED OF THIS ANALYSIS.							
HYDRAULIC-A/B SUSTAINER/VERNIER	88-10-059 ACCUMULATOR, O-RING	FAR 27-08553-3	010817		YES NO	PEACOCK ENGR. CO. 51305-3	000154
FAILURE MODE-LEAK-INTERNAL PRE-CHARGE GAS LEAKING PAST THE PISTON AT A HIGH RATE.							
CORRECTIVE ACTION-VENDOR WAS NOTIFIED TO IMPROVE HIS QUALITY CONTROL. PROBABLE CAUSE OF FAILURE WAS FAILURE OF O RI NG WHEN SUBJECTED TO HIGH TEMPERATURE DURING QUALIFICATION. SEE CLASP REPORT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	68-10-065 HYDRAULIC STAGING DISCONNECT	FAR 27-08536-3	010800	WTR	YES NO	PEACOCK 51290-6	000178
FAILURE MODE-LEAK-EXTERNAL-LEAKAGE WHILE SYSTEM WAS PRESSURIZED TO 100 PSI.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. GOLDEN RAM G.C. GROUP WAS ALERTED TO THE PROBLEM AND ADVISED THAT FIELD PE RSONNEL MUST BE INSTRUCTED TO ALIGN THE DISCONNECT PROBES BEFORE MATING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AC-61-0065/62-SOE-A2-06 ACCUMULATOR	CAPTIVE 27-08553-3	6E 010807	6E	YES NO	PEACOCK 51305-3	000017
FAILURE MODE-LEAK-EXTERNAL-POST RUN INSPECTION REVEALED A SMALL EXTERNAL HYDRAULIC FLUID LEAK.							
SYSTEM EFFECT-NONE.							
VEHICLE EFFECT-NONE.							
CORRECTIVE ACTION-THE SUSTAINER HYDRAULIC ACCUMULATOR WAS REPLACED FOLLOWING RUN 006.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	AC-81-0065/SE-SGE-A2-06	CAPTIVE 27-065533-5	06 810807	02 120.57	YES NO	PEACOCK 51305-5	000151

FAILURE MODE-OUT OF SPECIFICATION. THE LEVELING OFF OF PRESSURE DECAY WAS NOTED AT SUSTAINER CUTOFF PLUS 0.45 SECON DS AND SUSTAINER HYDRAULIC ACCUMULATOR PISTON BOTTOMING WAS NOT EVIDENT.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-UNKNOWN.

HYDRAULIC-A/B SUSTAINER/VERNIER	68-10-064 HYDRAULIC RELIEF VALVE, POPPET	FAR 27-06560-1	810808		YES NO	VINSON A-61071	000160

FAILURE MODE-FAIL DURING OPERATION-HYDRAULIC UNIT FLOW METER MEASUREMENTS WERE THE BASIS FOR FAILURE. RESEAT PRESS URE WAS BELOW ALLOWED MINIMUM.

CORRECTIVE ACTION-FAILURE WAS NOT CONFIRMED. VENDOR HAS BEEN INFORMED OF THIS RESEAT DISCREPANCY AND REQUESTED TO M AINTAIN INSPECTION VIGILANCE DURING THE POPPET ADJUSTMENT OPERATION, PRIOR TO IAT.

HYDRAULIC-A/B SUSTAINER/VERNIER	96-04-164 ACTUATOR, SEAL	FAR 27-06573-1	810808	0AFB	YES NO	INTERSTATE 2702-1	007063

FAILURE MODE-LEAK-EXTERNAL. UNIT WAS REMOVED FROM THE MISSILE BECAUSE THE SHAFT SEAL LEAKED WHEN NOT UNDER PRESSURE . OIL BELIEVED TO HAVE COLLECTED FROM A SOURCE OTHER THAN THE ACTUATOR.

CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.

HYDRAULIC-A/B SUSTAINER/VERNIER	AA81-0011/P8-SGE-00-06 SEAL	COUNTDOWN	06 860123	15 -0000	YES NO	INTERSTATE	003074

FAILURE MODE-LEAK-EXTERNAL. HYDRAULIC LEAK AT V8 ENGINE GIMBAL SHAFT. LEAK PROBABLY DUE TO SEAL PROBLEM.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-COUNTDOWN ABORTED AND RE-SCHEDULED. COUNTDOWN ABORTED TO REPLACE V8 ENGINE.

CORRECTIVE ACTION-REPLACE V8 ENGINE.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	96-04-184 ACTUATOR, SEAL	FAR 27-06573-1	61[illegible]10	OAFB	YES NO	INTERSTATE 2792-1	696677
FAILURE MODE-LEAK-EXTERNAL-UNIT WAS REMOVED FROM THE MISSILE BECAUSE THE SHAFT SEAL LEAKED WHEN NOT UNDER PRESSURE. LEAK COULD NOT BE CONFIRMED. OIL BELIEVED TO HAVE COLLECTED FROM A SOURCE OTHER THAN THE ACTUATOR. CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	96-04-184 ACTUATOR ASSEMBLY, SEAL	FAR 27-05311-5	610108	OAFB	YES NO	INTERSTATE	696678
FAILURE MODE-LEAK-EXTERNAL. UNIT WAS REMOVED FROM THE MISSILE BECAUSE THE SHAFT SEAL LEAKED WHEN NOT UNDER PRESSURE . LEAK COULD NOT BE CONFIRMED. OIL BELIEVED TO HAVE COLLECTED FROM A SOURCE OTHER THAN THE ACTUATOR. CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	96-04-184 ACTUATOR ASSEMBLY, SEAL	FAR 27-05314-013	610108	OAFB	YES NO	INTERSTATE	696680
FAILURE MODE-LEAK-EXTERNAL. UNIT WAS REMOVED FROM THE MISSILE BECAUSE THE SHAFT SEAL LEAKED WHEN NOT UNDER PRESSURE . LEAK COULD NOT BE CONFIRMED. OIL BELIEVED TO HAVE COLLECTED FROM A SOURCE OTHER THAN THE ACTUATOR. CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	96-04-184 ACTUATOR ASSEMBLY, SEAL	FAR 27-55312-003	610108	OAFB	YES NO	INTERSTATE	696679
FAILURE MODE-LEAK-EXTERNAL. UNIT WAS REMOVED FROM THE MISSILE BECAUSE THE SHAFT SEAL LEAKED WHEN NOT UNDER PRESSURE . LEAK COULD NOT BE CONFIRMED. OIL BELIEVED TO HAVE COLLECTED FROM A SOURCE OTHER THAN THE ACTUATOR. CORRECTIVE ACTION-NONE. CAUSE COULD NOT BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	96-04-144 TRANSDUCER, FEEDBACK	FAR 27-04204-1	4E 60-14-11	ETR	NO NO	COLLINS	
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME-DURING CHECKOUT THE V-2 ENGINE TRANSDUCER PRODUCED NO OUTPUT WHEN T HE ENGINE WAS GIMBALED. FAILURE COULD NOT BE CONFIRMED AT S.D. CAUSE BELIEVED TO BE EXTERNAL TO THE TRANSDUCER.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-NONE-CAUSE WAS NOT CONFIRMED.							097361
HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-153 SERVO VALVE	FAR 27-04209-1	910 001214		YES NO	CADILLAC FC-27-397A	097130
FAILURE MODE-OUT OF TOLERANCE. VE ENGINE FAILED TO NULL WHEN ZERO SIGNAL WAS APPLIED. FAILURE WAS DUE TO AN INCORRECT ADJUSTMENT PRIOR TO INSTALLATION. CORRECTIVE ACTION-GD/C INITIATED A REVISED ACCEPTANCE PROCEDURE INCORPORATING DYNAMIC TESTING OF THE INTEGRATED ASSEMBLY CONSISTING OF ACTUATOR, SERVO VALVE AND FEEDBACK TRANSDUCER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-060 SUSTAINER STAGING DISCONNECT	FAR 27-08555-3	800 001210	ETR	YES NO	PEACOCK 51203-3	099150
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION. CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-060 SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-013	800 001210	ETR	YES NO	INTERSTATE	099150
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION. CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-060 SUSTAINER RETURN RISE OFF DISCONNECT	FAR 27-08557-3	800 001210	ETR	YES NO	PEACOCK 51203-3	099151
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION. CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	9B-10-060 SUSTAINER TANK	FAR 27-08552-5	800 601210	ETR	YES NO	BENDIX 8903	000138

FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION.

CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.

HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0750/P3-502-00-04 DISCONNECT, RISEOFF	FLIGHT 27-08558-3	4E 601129	1B 4019	YES NO	PEACOCK 51300-3	007061

FAILURE MODE-STRUCTURAL. THE HIGH PRESSURE HYDRAULIC RISE-OFF DISCONNECT RUPTURED DUE TO EXCESSIVE HEAT INPUT FROM THE ENGINE EXHAUST.

SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY RESULTING IN LOSS OF CONTROL OF SUSTAINER AND VERNIER ACTUATORS.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY AFTER BCO DUE TO LACK OF CONTROL OVER SUSTAINER AND VERNIER ENGINES.

CORRECTIVE ACTION-INSTALLED CHECK VALVES FORWARD OF RISEOFF AND STAGING DISCONNECTS. INSTALLED COVER PLATES TO PROTECT RISEOFF DISCONNECT PANELS DURING FLIGHT. REROUTED SYSTEM TUBING TO ENSURE SUFFICIENT CLEARANCES. INSTALLED ADDITIONAL TUBING CLAMPS CHANGED CERTAIN ALUMINUM TUBING TO CRES STEEL. MODIFIED SUSTAINER HYDRAULIC PUMP SHAFT. INSTALLED RISEOFF DISCONNECT HEAT SHIELDS. STRENGTHENED SUSTAINER ENGINE CONTROL MANIFOLD AND HYDRAULIC SYSTEM RELIEF VALVE MOUNTING BRACKETRY.

HYDRAULIC-A/B SUSTAINER/VERNIER	AC-60-0050/B1-511-A7-05 SUST. YAW ACTUATOR FLEX HOSE	CAPTIVE 27-06300-38	5E 601125	81	YES NO	RESISTOFLEX R-21225-39	000000

FAILURE MODE-EXTERNAL LEAK

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-FLEX HOSE WAS REPLACED.

HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0750/P3-5C0-01-04 FEEDBACK TRANSDUCER	COMPOSITE-J FACT 27-04204-1	4E 601117	1B	YES NO	CRESCENT MC-100-4E	

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME, NO OUTPUT FROM VERNIER YAW ROLL HYDRAULIC ACTUATOR FEEDBACK WHEN ENGINE POSITION WAS VARIED.

SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. FLIGHT CONTROL SYSTEM LOST FEEDBACK INFORMATION AS TO VERNIER ENGINE POSITION FOR ATTITUDE CONTROL.

VEHICLE EFFECT-COMPOSITE DEGRADED.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE IF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-UNIT REMOVED AND RETURNED FOR INSPECTION. REPLACED BY ANOTHER UNIT. 1R008466.							095750
HYDRAULIC-A/B SUSTAINER/VERNIER	AC-60-0047/81-310-A6-05 SUSTAINER PITCH ACTUATOR, FLEX HOS E	CAPTIVE 27-06871-8	SE 601117	81	YES NO	AEROQUIP 877341-8-0213	000900
FAILURE MODE-LEAK-EXTERNAL. FLEX HOSE FOR PRESSURE SIDE OF THE SUSTAINER PITCH ACTUATOR LEAKED. THE LEAK WAS DISCOV ERED DURING POST TEST INSPECTION. SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-FLEX HOSE WAS REPLACED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-151 VERNIER ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-003	7E 601118	WTR	YES NO	INTERSTATE	097137
FAILURE MODE-ERRATIC OPERATION. THE VERNIER ACTUATOR MOVED HARD OVER TO THE YAW POSITION ON A NULL SIGNAL. FAILURE WAS DUE TO A CUT O-RING ALLOWING SUFFICIENT LEAKAGE TO CAUSE THE ACTUATOR TO OPERATE IMPROPERLY. CORRECTIVE ACTION-GD/C INITIATED REVISED ACCEPTANCE PROCEDURES INCORPORATING DYNAMIC TESTING OF THE INTEGRATED ASSE MBLY, CONSISTING OF ACTUATOR, SERVO VALVE, AND FEEDBACK TRANSDUCER.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0542/P3-503-00-03 DISCONNECT RISEOFF	FLIGHT 27-06558-3	3E 601110	13 41.8	YES NO	PEACOCK 91300-3	097003
FAILURE MODE-STRUCTURAL. THE HIGH PRESSURE HYDRAULIC RISEOFF DISCONNECT RUPTURED DUE TO EXCESSIVE HEAT INPUT FROM T HE ENGINE EXHAUST. SYSTEM EFFECT-DEPLETION OF LIQUID SUPPLY RESULTING IN LOSS OF CONTROL OF SUSTAINER AND VERNIER ACTUATORS. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY AFTER BECO DUE TO LACK OF CONTROL OVER SUSTAINER AND VERNIER ENGINES. CORRECTIVE ACTION-INSTALLED CHECK VALVES FORWARD OF RISEOFF AND STAGING DISCONNECTS. INSTALLED COVER PLATES TO PROT ECT RISEOFF DISCONNECT PANELS DURING FLIGHT. REROUTED SYSTEM TUBING TO ENSURE SUFFICIENT CLEARANCES. INSTALLED ADDIT IONAL TUBING CLAMPS. CHANGED CERTAIN ALUMINUM TUBING TO CRES STEEL. MODIFIED SUSTAINER HYDRAULIC PUMP SHAFT. INSTALL ED RISEOFF DISCONNECT HEAT SHIELDS. STRENGTHENED SUSTAINER ENGINE CONTROL MANIFOLD AND HYDRAULIC SYSTEM RELIEF VALVE MOUNTING BRACKETRY.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	AC-60-0046/81-509-A5-35 PUMP DISCHARGE LINE, B-NUT	CAPTIVE	5E 601100	81	YES NO	60/C	099969

FAILURE MODE-LEAK-EXTERNAL- LOOSE B NUT IN SUSTAINER HYDRAULIC DISCHARGE LINE DISCOVERED DURING POST TEST SECURING.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-RETORQUED B NUT.

HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-151 SUSTAINER ACTUATOR ASSEMBLY	FAR 27-05314-013	7E 601100	WTR	YES NO	INTERSTATE	097136

FAILURE MODE-OUT OF TOLERANCE. DURING A NAPCHE FILL AND BLEED TEST A HIGH NULL FEEDBACK VOLTAGE FROM THE ENGINE WAS RECEIVED. FAILURE WAS DUE TO IMPROPER ADJUSTMENTS PRIOR TO INSTALLATION.

CORRECTIVE ACTION-60/C INITIATED REVISED ACCEPTANCE PROCEDURES INCORPORATING DYNAMIC TESTING OF THE INTEGRATED ASSEMBLY CONSISTING OF ACTUATOR, SERVO VALVE, AND FEEDBACK TRANSDUCER.

HYDRAULIC-A/B SUSTAINER/VERNIER	58-10-056 PRESSURE GAGE	FAR 27-08562-3	60D 601027	ETR	YES NO	ROCHESTER MFG. CO.	069145

FAILURE MODE-LEAK-INTERNAL. GAS LEAKAGE CAUSED BY A POROUS BRAZED AREA JOINING THE BOURDON COIL TO THE STAINLESS STEEL BUSHING.

CORRECTIVE ACTION-VENDOR WAS INSTRUCTED TO IMPROVE THE QUALITY OF THE BRAZE JOINT.

HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0761/FC-4CO-01-092	COMPOSITE-FACTORY 27-0531	9E0 600014	FACTORY	YES NO	INTERSTATE	099199

FAILURE MODE-OUT OF TOLERANCE UNEXPECTED NEGATIVE 0.8 VOLT VERNIER NO. 2 ENGINE MOVEMENT IN PITCH/ROLL AXIS OCCURRED AT 34.1 SECONDS, FOR A DURATION OF 0.04 SECOND. THIS MOVEMENT WAS ATTRIBUTED TO AIR BUBBLES IN THE OIL OF THE HYDRAULIC SYSTEM.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-COMPOSITE DELAYED. POST-COMPOSITE TESTING REQUIRED.

CORRECTIVE ACTION-FILL AND BLEED OPERATION WAS PERFORMED.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0781/FC-4CO-01-092 ACTUATOR ASSEMBLY, SERVO VALVE	COMPOSITE-FACTORY 27-85311-5	920 600914		YES NO	INTERSTATE	000195

FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE-VERNIER NO. 1 YAW AXIS GIMBAL NG DURING VERNIER SOLO STAGE WAS LIMITED IN MAGNITUDE BY APPROXIMATELY 11 PERCENT OF AN EXPECTED VALUE OF 2.8 VOLTS DURING YAW GYRO EXERCISE. SERVO VALVE NULL WAS MISADJUSTED.

SYSTEM EFFECT-OPERATION TOO LOW.

VEHICLE EFFECT-COMPOSITE RESCHEDULED. SYSTEMS LEVEL AND COMPOSITE TESTING REQUIRED.

CORRECTIVE ACTION-SERVO VALVE WAS REWOUNDED. TEST FOR SERVO VALVE NULLS WAS INCLUDED IN THE SYSTEM LEVEL TEST PROCEDURE TO PREVENT RECCURRENCE.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-150 ACTUATOR LINE	FAR 27-85314-011	800 600831	ETR	YES NO	INTERSTATE	007152

FAILURE MODE-OUT OF SPECIFICATION. DURING SYSTEM CHECKOUT THE UNIT EXTENDED TO FULL POSITION AND REMAINED THERE. FAILURE DUE TO REVERSED CONNECTION OF HYDRAULIC LINES. AFTER PROPERLY CONNECTING HYDRAULIC LINES UNIT WOULD NOT RESPOND TO AUTOPILOT SIGNALS. FAILURE DUE TO SERVO VALVE SPOOL BEING FORCED ONE SIXTEENTH OF AN INCH INTO THE END OF THE SPOOL SLEEVE RECESS. THIS WAS CAUSED BY THE REVERSED 3000 PSIG. PRESSURE ON THE END OF THE SPOOL THAT IS NORMALLY SUBJECTED TO 60 PSIG.

CORRECTIVE ACTION-COGNIZANT FIELD PERSONNEL WERE INFORMED OF THE FAILURE AND CAUTIONED TO ADHERE TO CORRECT PROCEDURES WHEN INSTALLING THE SUBJECT ASSEMBLY.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-127 ACTUATOR ASSEMBLY	FAR 27-85314-013	700 600804	ETR	YES NO	INTERSTATE	007383

FAILURE MODE-ERRATIC OPERATION-DURING SYSTEM CHECKOUT THE ACTUATOR EXHIBITED NON-LINEAR AND ERRATIC RESPONSE WITH STEP FUNCTION INPUT SIGNALS APPLIED. CAUSE NOT DETERMINED, BUT BELIEVED TO BE CONTAMINATION.

CORRECTIVE ACTION-VCAR ISSUED TO INTERSTATE TO IMPROVE CLEANLINESS PROCEDURES.

HYDRAULIC-A/B SUSTAINER/VERNIER	68-10-346 HYDRAULIC FILTER, FITTING	FAR 27-08984-001	890 600711	ETR	YES NO	PUROLATOR PROD INC 646[illegible]	

FAILURE MODE-STRUCTURAL - CRACKING IN THE WELD AREA AND LEAKING EXTERNALLY AT JUNCTION OF BODY AND WELD ON COLLAR.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-TO RETROFIT ALL D AND E AND MODEL SS MISSILES WITH SIMILAR FILTERS WITH HOUSINGS MADE OF WELDABLE 6061 ALUMINUM.							899376
HYDRAULIC-A/B SUSTAINER/VERNIER	9D-04-050 ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	FAR 27-85314-803	35D 600701	WTR	YES NO	INTERSTATE	897750
FAILURE MODE-OUT OF TOLERANCE. DURING APCHE SYSTEM CHECKOUT, THE ACTUATOR FEEDBACK TRANSDUCER NULL VOLTAGE FAILED TO MEET SPECIFICATION LIMITS. FEEDBACK TRANSDUCER PROBE WAS IMPROPERLY POSITIONED. TRANSDUCER PROBE LOCK WIRE WAS MISSING AND NUT WAS LOOSE. CORRECTIVE ACTION-INSTALLATION AND MAINTENANCE INSPECTION PERSONNEL ALERTED TO POTENTIAL PROBLEM AREA AND REQUESTED TO INCREASE SURVEILLANCE OF THIS AREA.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9S-04-103 SERVO VALVE	FAR 27-04209-1	54D 600608	ETR	YES NO	CADILLAC	897879
FAILURE MODE-LEAK, EXTERNAL. ACTUATOR REMOVED FROM MISSILE. REPORTED TO BE LEAKING AT THE MATING FLANGE. LEAKAGE COULD NOT BE CONFIRMED. CORRECTIVE ACTION-NONE. FAILURE COULD NOT BE VERIFIED NOR COULD CAUSE BE DETERMINED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9B-10-030 HYDRAULIC TANK, SEAL	FAR 27-06556-5	600519		YES NO	BENDIX MFG. CO . 0903	899127
FAILURE MODE-INTERNAL LEAK-GAS LEAKAGE PAST THE PISTON TO THE HYDRAULIC SIDE. CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0467/FC-4CO-02-27	COMPOSITE-FACTORY 27-85311	27D 600513		YES NO		896356
FAILURE MODE-CONTAMINATION. VERNIER NO. 2 YAW INDICATED ERRATIC MOVEMENT PRIOR TO ACTIVATION. DIFFICULTY CAUSED BY AIR IN THE HYDRAULIC SYSTEM. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-COMPOSITE RESCHEDULED. POST COMPOSITE TESTING REQUIRED. CORRECTIVE ACTION-FILL AND BLEED OPERATION PERFORMED ON THE HYDRAULIC SYSTEM.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	88-04-110 ACTUATOR ASSEMBLY	FAR 27-85312-608	84-D 600518	ETR	YES NO	CLEMCO OR INTE RSTATE	097350
FAILURE MODE-LEAK EXTERNAL.							
CORRECTIVE ACTION-NONE-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-145 ACTUATOR ASSEMBLY, VALVE-SERVO	FAR 27-85311-5	560 600505	ETR	YES NO	INTERSTATE	097327
FAILURE MODE-OUT OF TOLERANCE-DURING SYSTEM CHECKOUT THE ACTUATOR OSCILLATED IN THE NULL POSITION WHILE STATIC GAIN MEASUREMENTS WERE BEING TAKEN.							
CORRECTIVE ACTION-VCAR TO CADILLAC INFORMING THEM OF THE PROBLEMS ENCOUNTERED AS A RESULT OF CONTAMINATION AND REQU ESTING THEM TO IMPROVE THE QUALITY OF THE COMPONENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-148 ACTUATOR ASSEMBLY, SERVO VALVE	FAR 27-85314-811	470 600404	WTR	YES NO	INTERSTATE	097356
FAILURE MODE-OUT OF TOLERANCE-DURING SYSTEM CHECKOUT BOTH SUSTAINER ACTUATORS FAILED TO NULL WITHIN THE REQUIRED LI MITS AND EXHIBITED ERRATIC OPERATION. FAILURE WAS DUE TO A SERVO VALVE SPOOL ADJUSTMENT PROBLEM AND POSSIBLE CONTAMI NATION.							
CORRECTIVE ACTION-VCAR TO INTERSTATE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	R004059 ACTUATOR ASSEMBLY	FAR 27-85311-5	61D 600409	FACTORY	YES NO	LIONEL PACIFIC	097794
FAILURE MODE-CONTAMINATION. ACTUATOR FREQUENCY RESPONSE BELOW SPECIFICATION LIMITS DUE TO CONTAMINATION BY METAL PA RTICLES.							
CORRECTIVE ACTION-CLEANING PROCEDURES DURING ASSEMBLY INTENSIFIED.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-059 SERVO VALVE	FAR 27-04209-1	440 600488	ETR	YES NO	INTERSTATE	007769

FAILURE MODE-OUT OF SPECIFICATION-ACTUATORS FREQUENCY RESPONSE BELOW SPECIFICATION LIMITS DUE TO CONTAMINATION BY M ETAL PARTICLES.

CORRECTIVE ACTION-CLEANING PROCEDURES DURING ASSEMBLY INTENSIFIED.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-074 ACTUATOR ASSEMBLY	FAR 27-05311-5	560 600324	ETR	YES NO	LIONEL PACIFIC	007804

FAILURE MODE-OUT OF SPECIFICATION-ACTUATOR RESTRICTED THE V-1 ENGINE MOVEMENT TO 21 DEGREES SPECIFICATION REQUIRES 24 DEGREES. NOT AN ACTUATOR FAILURE BUT AN INSTALLATION FAILURE.

CORRECTIVE ACTION-ENGINE ANGULAR MOVEMENT CHECK ADDED TO FINAL ASSEMBLY INSPECTION PROCEDURE.

HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-038 ACTUATOR ASSEMBLY, O-RING SEAL	FAR 27-06563-9	470 600512	WTR	YES NO	INTERSTATE 2725-1	006960

FAILURE MODE-LEAK-EXTERNAL-DURING A HYDRAULICS SYSTEM CHECKOUT THE HYDRAULIC ACTUATOR WAS REPORTED TO BE LEAKING OI L. AFTER THE ACTUATOR WAS REMOVED THE FAILURE COULD NOT BE CONFIRMED.

CORRECTIVE ACTION-NONE-FAILURE UNCONFIRMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	AZC-27-116/P1-405-00-42 ACCUMULATOR CHARGE LINE	FLIGHT	420 600308	11 97.2	NO YES	GO/C	007116

FAILURE MODE-STRUCTURAL. THE PNEUMATIC CHARGING LINE TO THE VERNIER SOLO ACCUMULATOR FAILED AT 97.2 SECONDS DUE TO A HIGH TEMPERATURE CONDITION IN THE AREA.

SYSTEM EFFECT-OPERATION TOO LOW. DUE TO THE CHARGE LINE FAILURE, A HYDRAULIC PRESSURE DECAY BEGAN AT 250.0 SECONDS AND DROPPED FROM 3115 PSIG TO 280 PSIG IN 3.5 SECONDS.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. VERNIER ENGINES CONTROL WAS LOST WITH RESULTANT LOSS OF MISSILE ATTITUDE CONTROL.

CORRECTIVE ACTION-USE OF STEEL AND/OR WRAPPED LINES USED FOR THE PNEUMATIC CHARGING LINE FOR SUBSEQUENT FLIGHTS.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-052 ACTUATOR ASSEMBLY	FAR 27-63314-013	430 600300	ETR	YES NO	INTERSTATE	097131
FAILURE MODE-OUT OF TOLERANCE-DURING FREQUENCY RESPONSE TESTS THE ACTUATORS EXHIBITED LOW GAIN.							
CORRECTIVE ACTION-VCAR SENT TO VENDOR TO INTENSIFY INSPECTION PROCEDURE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-045 RELIEF VALVE-HYDRAULIC	FAR 27-00500-1	430 600211	ETR	YES NO	PANTEX	099742
FAILURE MODE-FAILURE DURING OPERATION-SUBJECT VALVE WAS RELIEVING LOW AND CHATTERING.							
CORRECTIVE ACTION-NONE-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AE60-0040/P3-402-00-40 TANK PRESSURE LINE	FLIGHT	400 600211	13 130.20	NO NO	GD/C	097610
FAILURE MODE-LEAK-EXTERNAL. THE SUSTAINER HYDRAULIC TANK PRESSURIZATION LINE WAS DAMAGED AT BOOSTER JETTISON.							
SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. THE SUSTAINER HYDRAULIC FLUID TANK PNEUMATIC PRESSURE DECREASED TO 27.6 PSIG FROM 77.6 PSIG AT 130.23 SECONDS.							
VEHICLE EFFECT-NONE.							
CORRECTIVE ACTION-CLARIFY METHOD OF ATTACHMENT OF LINES TO FUEL TANK IN AREA OF POSSIBLE BOOSTER JETTISON INTERFERENCE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-046 ACTUATOR ASSEMBLY, SEALS	FAR 27-65314-011	400 600300	ETR	YES NO	INTERSTATE	097120
FAILURE MODE-LEAK EXTERNAL. ACTUATOR WAS LEAKING AT MATING FLANGE BETWEEN SERVO AND SERVO CYLINDER ASSEMBLY WITH A SYSTEM PRESSURE OF 3000 PSIG. O-RING SEALS WERE DAMAGED.							
CORRECTIVE ACTION-VCAR ISSUED TO VENDOR TO IMPROVE QUALITY CONTROL.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI SYM	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-044 SUSTAINER HYDRAULIC RESERVOIR	FAR 27-06552-5	220 800120	ETR	YES NO	PANTEX 8953	000578
FAILURE MODE-INTERNAL LEAK - INTERNAL GAS LEAK PAST THE PISTON TO THE HYDRAULIC SIDE. PROBABLE CAUSE OF FAILURE WAS CONTAMINATION.							
CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	9A-04-037 ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-003	800100	ERB	YES NO	INTERSTATE ENG R.	000001
FAILURE MODE-EXTERNAL LEAK. UNIT LEAKED AT PISTON ROD RACK SEAL DURING SYSTEM HYDRAULIC BLEED AND CHECKOUT AT 500 P SIG. A PIECE OF PLASTIC TAPE WAS FOUND ON THE SHAFT O-RING SEAL.							
CORRECTIVE ACTION-VCAR ISSUED TO VENDOR TO INTENSIFY INSPECTION SURVEILLANCE OF THIS COMPONENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-036 ACTUATOR ASSEMBLY, O-RING	FAR 27-05312-003	200 800100	ETR	YES NO	INTERSTATE	000002
FAILURE MODE-LEAK EXTERNAL-THE V-1 ENGINE PITCH ACTUATOR LEAKED AROUND THE ROD AND SEAL DURING A RESPONSE TEST. THE ACTUATOR SHAFT O-RING SEAL WAS SCRATCHED.							
CORRECTIVE ACTION-VCAR ISSUED TO VENDOR TO INTENSIFY INSPECTION SURVEILLANCE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-043 HYDRAULIC TANK, SEAL	FAR 27-06552-5	200 901215	ETR	YES NO	PANTEX 8963	000577
FAILURE MODE-INTERNAL LEAK - THE FLUID SIDE SIGHT GLASS WAS FULL OF HYDRAULIC OIL. THE O RING SEAL WAS DAMAGED ON T HE INDICATOR SHAFT.							
CORRECTIVE ACTION-INITIATED ACTION FOR BETTER SEAL INSTALLATION. ALSO THE VENDOR WAS NOTIFIED TO IMPROVE HIS QUALIT Y.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	AZM-27-368/FC-4CO-03-40	COMPOSITE-FACTORY	400 591082	FACTORY	YES NO		007184

FAILURE MODE-ERRATIC OPERATION-VARIATIONS WITH AMPLITUDE OF UP TO 0.8 VOLTS OBSERVED ON VERNIER NO. 1 PITCH/ROLL AX IS COULD NOT BE DUPLICATED DURING POST-COMPOSITE TESTING. THIS CONDITION MAY HAVE BEEN CAUSED BY AIR TRAPPED IN THE HYDRAULIC SYSTEM.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-COMPOSITE DELAYED. VERNIER ENGINE NO. 1 HAD UNEXPECTED VARIATIONS IN PITCH AND ROLL.

CORRECTIVE ACTION-UNKNOWN. POST-COMPOSITE TESTS WERE MADE TO FIND THE SOURCE OF THE PROBLEM. COULD NOT REPEAT THE I RREGULARITY.

HYDRAULIC-A/B SUSTAINER/VERNIER	66-10-040 HYDRAULIC TANK	FAR 27-08512-5	240 591016	SVC	YES NO	PANTEX 0003	000740

FAILURE MODE-LEAK. INTERNAL GAS PRE-CHARGE LEAKAGE TO THE HYDRAULIC SIDE ACROSS THE PISTON.

CORRECTIVE ACTION-NONE-LEAKAGE NOT CONFIRMED.

HYDRAULIC-A/B SUSTAINER/VERNIER	AZM-27-366/FC-4CO-03-30 ACTUATOR ASSEMBLY	COMPOSITE-FACTORY 27-03311-5	360 591007	FACTORY	YES NO	LIONEL PACIFIC	007906

FAILURE MODE-ERRATIC OPERATION. ERRATIC MOVEMENTS OF VERNIER NO 2 YAW JUST PRIOR TO VERNIER SOLO PHASE WERE CAUSED BY AIR IN THE HYDRAULIC SYSTEM

SYSTEM EFFECT-ERRATIC OPERATION. AIR IN THE HYDRAULIC SYSTEM CAUSED ERRATIC MOVEMENT OF THE ENGINE ACTUATOR.

VEHICLE EFFECT-COMPOSITE RE-SCHEDULED.

CORRECTIVE ACTION-FILL AND BLEED OPERATION ON HYDRAULIC SYSTEM WAS PERFORMED. A PARTIAL COMPOSITE RETEST WAS PERFOR MED.

HYDRAULIC-A/B SUSTAINER/VERNIER	AZM-27-365/FC-4CO-02-30	COMPOSITE-FACTORY	350 591007		YES NO		

FAILURE MODE-ERRATIC OPERATION. SPURIOUS ENGINE MOVEMENTS AND GLITCHES WERE OBSERVED ON TEST DATA. CAUSED BY AIR IN THE HYD SYSTEM AND A POSSIBLE LOOSE SUSTAINER ENGINE SINDAL BLOCK.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-COMPOSITE RESCHEDULED.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
CORRECTIVE ACTION-UNKNOWN. PERFORMED A FILL AND BLEED AND RETIGHTENED THE TERMINAL BLOCK.							097749
HYDRAULIC-A/B SUSTAINER/VERNIER	AZC-27-034/PS-403-00-14	FLIGHT	140 900011	18 -01.8	YES NO		090926
FAILURE MODE-OUT OF EXPECTED TEST VALUE. SUSTAINER/VERNIER HYDRAULIC RETURN PRESSURE GREATER THAN 28 PERCENT ABOVE NORMAL. SYSTEM EFFECT-OPERATION TOO HIGH. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AZN-27-332/FC-4CO-01-330 FEEDBACK TRANSDUCER	COMPOSITE-FACTORY 27-05312	330 900026		YES NO	INTERSTATE	097103
FAILURE MODE-ERRATIC OPERATION-VARIATIONS IN VERNIER NO. 1 PITCH, AND ROLL TRANSDUCER FEEDBACK VOLTAGES WERE OBSERVED. THIS CONDITION DID NOT OCCUR ON POST-COMPOSITE TESTING AND WAS ATTRIBUTED TO AIR IN THE HYDRAULIC SYSTEM. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-COMPOSITE DELAYED. AIR IN HYDRAULIC SYSTEM CAUSED UNEXPECTED VARIATIONS IN THE ENGINE POSITIONS. POST COMPOSITE TESTS REQUIRED TO SHOW PROPER SYSTEM OPERATION. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	68-06-034 PUMP, SUSTAINER HYDRAULIC	FAR 27-00590-1	900730	STC	YES NO	VICKERS AA-80401-L-2	090712
FAILURE MODE-STRUCTURAL-PUMP HOUSING CONTAINED A 8 INCH CRACK FROM THE HEAD COVER DOWN THE PUMP BODY. CRACK WAS CAUSED BY OVERPRESSURIZING THE LOW PRESSURE SIDE OF THE SYSTEM. FAILURE OCCURRED DURING SETUP AND CHECKOUT OF THE VEHICLE HYDRAULIC SYSTEM, PRECEDED BY TWO STATIC FIRINGS. CORRECTIVE ACTION-OIL EVALUATION PROCEDURE WAS MODIFIED TO PRECLUDE OVERPRESSURIZATION. ALL SITES NOTIFIED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	68-10-031 HYDRAULIC FLEX HOSE	FAR 27-00571-29	900720		YES NO	AEROQUIP 675011L-0235	
FAILURE MODE-EXTERNAL LEAK. LEAKING AT EITHER ONE OR BOTH END FITTINGS.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
A NEW MANUFACTURING PROCEDURE.							090711
HYDRAULIC-A/B SUSTAINER/VERNIER	FTA3026/PE-304-00-8 RISEOFF DISCONNECT	COUNTDOWN	8C 500719	18 0	YES NO	PEACOCK	090587

FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. RISE OFF DISCONNECT SEPARATION WAS GREATER THAN ALLOWABLE. THIS RES ULTED IN SEPARATION OF THE GROUND AND AIRBORNE DISCONNECT AFTER IGNITION. THIS ISOLATED THE AIRBORNE PRESSURE FROM T HE GROUND SYSTEM WHICH CONTAINS THE HYDRAULIC INTERNAL PRESSURE SWITCH. CONSEQUENTLY THE SWITCH DID NOT PICKUP AND C OMPLETE THE RELEASE CIRCUITRY. RESULT WAS A CUTOFF AFTER THE RELEASE TIMER RAN OUT. SAME PROBLEM OCCURRED ON BOOSTER HYDRAULIC SYSTEM.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED COMPLETE CUTOFF RECEIVED AFTER IGNITION DUE TO RUN OUT OF RELEASE TIMER.

CORRECTIVE ACTION-ADJUST DISCONNECT SEPARATION.

HYDRAULIC-A/B SUSTAINER/VERNIER	AZM-27-288/FC-4CO-01-25 ACTUATOR ASSEMBLY, FEEDBACK TRANSD UCER	COMPOSITE-FACTORY 27-05314	25D 500718	FACTORY	YES NO	LIONEL PACIFIC	090357

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VERNIER NO. 1 YAW FEEDBACK DATA INDICATED THAT THE ENGINE REMAINED AT ZERO POSITION THROUGH OUT THE TEST. A FAULTY PLUG WAS FOUND IN THE OUTPUT CIRCUITRY OF THE SUSTAINER YAW FEEDBAC K TRANSDUCER.

SYSTEM EFFECT-IMPROPER ANALOG SIGNAL.

VEHICLE EFFECT-COMPOSITE RESCHEDULED. COMPOSITE RE-TEST REQUIRED.

CORRECTIVE ACTION-NOT KNOWN.

HYDRAULIC-A/B SUSTAINER/VERNIER	98-04-017 ACTUATOR, SEALS	FAR 27-06274-1	11D 500700	ETR	YES NO	INTERSTATE ENG R. 2778-1	091540

FAILURE MODE-LEAK EXTERNAL. VERNIER ENGINE ACTUATOR LEAKED HYDRAULIC OIL PROFUSELY WHEN HYDRAULIC SYSTEM WAS PRESSU RIZED, DUE TO WORN O-RING SEALS.

CORRECTIVE ACTION-MANUFACTURING AND INSTALLATION PROCEDURES REVISED TO ASSURE GEAR MESH OF THE VERNIER ACTUATORS AN D RACK ASSEMBLY. TO THE VERNIER ENGINE DRIVE GEAR ASSEMBLY WHICH WILL ENSURE PROPER GEAR-RACK MESH.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-013 ACTUATOR ASSEMBLY, WIRING	FAR 27-05314-003-005	60 590620	AS	YES NO	INTERSTATE ENG R.	000557
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. ENGINE COULD NOT BE NULLED DUE TO REVERSED WIRING IN A FEEDBACK TRANSDUCER.							
CORRECTIVE ACTION-MISSILE CHECK OUT PROCEDURES CORRECTED TO RECORD ALL ACTUATOR FEEDBACK PHASING CIRCUIT SIGNALS ON PERFORMANCE CHECK SHEET.							
HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-015 ACTUATOR ASSEMBLY, TRANSDUCER WIRING	FAR 27-05314-005	60 590619	WTR	YES NO	INTERSTATE ENG R.	000559
FAILURE MODE-OUT OF TOLERANCE. FEEDBACK TRANSDUCER HAD REVERSED WIRING.							
CORRECTIVE ACTION-PERFORMANCE CHECK SHEET INITIATED TO PERMANENTLY RECORD THE RESULTS OF THE PHASE TESTS MADE ON ACTUATORS IN THE FACTORY AFTER MANUFACTURING.							
HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-014 ACTUATOR ASSEMBLY	FAR 27-05314-005	40 590619	ETR	YES NO	INTERSTATE	000625
FAILURE MODE-OUT OF TOLERANCE. SUSTAINER ACTUATOR RESPONSE WAS OUT OF SPECIFICATION DURING TEST. A VERNIER ENGINE FLOW VALVE WAS INADVERTENTLY INSTALLED ON THE ACTUATOR IN PLACE OF A SUSTAINER FLOW VALVE.							
CORRECTIVE ACTION-INSPECTION PROCEDURE TO INCLUDE A CHECK FOR PROPER SERVO VALVE OPERATION.							
HYDRAULIC-A/B SUSTAINER/VERNIER	90-04-009 ACTUATOR ASSEMBLY, FEEDBACK TRANSDUCER	FAR 7-04501-039	70 590[illegible]10	ETR	YES NO	GD/C	000555
FAILURE MODE-ERRATIC OPERATION. THE SETSCREW THAT SECURES THE TRANSDUCER WINDING ASSEMBLY TO THE ACTUATOR HOUSING WAS FOUND TO BE LOOSE, PERMITTING MOVEMENT OF THE FEEDBACK TRANSDUCER.							
CORRECTIVE ACTION-PRODUCTION PROCEDURES CHANGED TO INCLUDE TORQUING THE TRANSDUCER WINDING ASSEMBLY SETSCREW TO 15 INCH POUNDS AND APPLYING GLYPTOL SEIZING COMPOUND TO THE SETSCREW AFTER TORQUING.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	80-10-021 HYDRAULIC FLEX HOSE, SEAL	FAR 27-08571-29	590406		YES NO	AEROQUIP 675011L-0235	000570
FAILURE MODE-EXTERNAL LEAK - LEAKS AT THE SWAGED FITTINGS, CRACKS IN THE FITTINGS AND LEAKS IN THE TEFLON LINER. CORRECTIVE ACTION-A SURVEY MADE ON ALL VENDORS HOSES AT OFFSITE BASES AS WELL AS IN STORES AND MANUFACTURING FOR THE ABOVE DISCREPENCIES. ALL DEFECTIVE HOSES FOUND ARE TO BE RETURNED TO THE VENDORS FOR REPLACEMENT.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AZM-27-225/FC-4CO-01-12 FLOW LIMITER	COMPOSITE-FACTORY 27-04207-1	120 590405		YES NO	CONAIR 3140	000449
FAILURE MODE-FAIL DURING OPERATION. THE SUSTAINER ENGINE INDICATED OVERSHOOT WHEN ACTIVATED IN YAW. THE SUSTAINER YAW FLOW LIMITER WAS REPLACED. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COMPOSITE RESCHEDULED. RERUN OF COMPOSITE REQUIRED. CORRECTIVE ACTION-FLOW LIMITER REPLACED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	AZM-27-209/FC-4CO-01-11 ACTUATOR ASSEMBLY	COMPOSITE-FACTORY 27-05314	110 590304	FACTORY	YES NO	INTERSTATE	000194
FAILURE MODE-OUT OF TOLERANCE. THE SUSTAINER ENGINE INDICATED OVERSHOOT WHEN ACTIVATED IN YAW. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COMPOSITE RESCHEDULED. A RERUN OF COMPOSITE WAS REQUIRED TO SHOW SATISFACTORY OPERATION. CORRECTIVE ACTION-ACTUATOR IN/D AND REPLACED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	MST814-401-01-80/14-401-01-80 ACTUATOR SHAFT, O-RING	CAPTIVE	590180	1-4	YES NO	CLEMCO	000058
FAILURE MODE-LEAK EXTERNAL. PRIOR TO TEST THERE WAS A SMALL AMOUNT OF SEEPAGE AT THE VERNIER ACTUATOR SHAFT O-RING. SYSTEM EFFECT-NONE. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-REPAIR PRIOR TO NEXT TEST.							

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HYDRAULIC-A/B SUSTAINER/VERNIER	FTA4413/P1-201-00-10 RISEOFF DISCONNECT	FRF	108 501200	11/ETR -6900	YES NO	PEACOCK	093615
FAILURE MODE-LEAK-EXTERNAL AT QUAD 2 DISCONNECT PANEL. SYSTEM EFFECT-NONE. VEHICLE EFFECT-COUNTDOWN DELAYED. 15 MIN HOLD. CORRECTIVE ACTION-FITTING TIGHTENED.							
HYDRAULIC-A/B SUSTAINER/VERNIER	98-10-016 UNION	FAR MS21902-8D	501204		YES NO	PARKER MS21902	099736
FAILURE MODE-STRUCTRUAL-FAILURE OCCURRED WHEN THE SYSTEM PRESSURE WAS RAISED TO 3500 PSI. THE BREAK WAS UNUSUAL SIN CE THE FRACTURE FOLLOWED THE CREST OF ONE OF THE THREADS. CORRECTIVE ACTION-THE TEST SITES AND FACTORY WERE INFORMED THAT CONFORMANCE TO PROCEDURES DETAILING ASSEMBLY OF FLU ID PRESSURE FITTING IS MANDATORY.							
HYDRAULIC-A/B SUSTAINER/VERNIER	ZM-7-657/FC-3CO-01-07 ACTUATOR	COMPOSITE-FACTORY 27-05314	7 501203	FACTORY	YES NO	CLINCO	097409
FAILURE MODE-ERRATIC OPERATION-SUSTAINER PITCH ACTUATOR FEEDBACK OUTPUT DATA INDICATED EXTREME IRREGULARITIES. CAUS E UNKNOWN. SYSTEM EFFECT-ERRATIC OPERATION. VEHICLE EFFECT-COMPOSITE RESCHEDULED-SATISFACTORY COMPOSITE RETEST WAS PERFORMED. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B SUSTAINER/VERNIER	FTA4311/P1-201-00-9 HYDRAULIC PRESSURE SWITCH	FRF SWITCH50	98 501014	11	YES NO	SPRAGUE 79379-2	091747
FAILURE MODE-OUT OF TOLERANCE. THE SUSTAINER INTERNAL HYDRAULIC PRESSURE SWITCH ACTUATED SEVERAL TIMES DURING ENGIN E RUN, EVEN THOUGH THE SUSTAINER HYDRAULIC SYSTEM WAS NOT FUNCTIONING DUE TO THE SSG NOT OPERATING. THE SWITCH WAS S ET TO ACTUATE AT 2400 PSIG AND THE GROUND PRESSURE CAUSED IT TO ACTUATE. SYSTEM EFFECT-IMPROPER DISCRETE SIGNALS. THE SUSTAINER INVALID INDICATIONS OF SYSTEM OPERATION WAS INDICATED. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-RESET PRESSURE SWITCH TO SETS PLUS OR MINUS 25 PSIG.							

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B SUSTAINER/VERNIER	ZH-7-638/FC-2CO-01A-13 ACTUATOR ASSEMBLY, SEAL	COMPOSITE FACTORY	138 660918		YES NO	CLENCO	007420

FAILURE MODE-LEAK EXTERNAL. VERNIER NO. 2 ACTUATOR WAS OBSERVED LEAKING AT A SEAL BEFORE AND AFTER THE TEST.

SYSTEM EFFECT-NONE-LEAK WAS NOT LARGE ENOUGH TO CAUSE ANY HARMFUL EFFECT.

VEHICLE EFFECT-COMPOSITE RESCHEDULED.

CORRECTIVE ACTION-THE ACTUATOR WAS REPLACED. SYSTEM AND COMPOSITE RETESTING WAS CONDUCTED.

HYDRAULIC-A/B SUSTAINER/VERNIER	ZB-7-079/SE-214-C4-01 HYDRAULIC PRESSURE SWITCH	CAPTIVE SWITCH 50	18 660731	02 0.05	YES NO	SPRAGUE 79379-2	007560

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. A MALFUNCTION OF THE SUSTAINER HYDRAULIC PRESSURE SWITCH RESULTED IN PREPARATION INCOMPLETE CUTOFF.

SYSTEM EFFECT-IMPROPER DISCRETE SIGNAL.

VEHICLE EFFECT-PREMATURE PROPULSION CUTOFF.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B SUSTAINER/VERNIER	9B-10-062 HYDRAULIC MANIFOLD ASSEMBLY	FAR 27-85328-1	610121	ETR	YES NO	CONVAIR	000150

FAILURE MODE-STRUCTURAL-TWO FLARE SEATS WERE CONCAVE AND THE -7 TUBE FLARE WAS CRACKED AND BROKEN. FAILURE OCCURED BECAUSE FITTINGS WERE OVER-TORQUED.

CORRECTIVE ACTION-PRODUCTION PERSONNEL HAVE BEEN INFORMED TO ADHERE STRICTLY TO APPLICABLE INSTALLATION PROCEDURES.

HYDRAULIC-A/B VERNIER SOLO-VSMPS	LV-9D-04-4860-F O-RING AND FELT LUBRICATORS/INBD VERNIER ACTUATOR ASSY	FAR 27-85312-005	3530 640717	FACTORY	YES NO	LIONEL PACIFIC	000760

FAILURE MODE-CONTAMINATION. THE ACTUATOR ASSEMBLY LEAKED HYDRAULIC OIL BETWEEN ACTUATOR PISTON ROD AND HOUSING AT A RATE OF 3 DROPS IN 50 MINUTES (NO PRESSURE GIVEN). ANALYSIS CONFIRMED A LEAKAGE RATE IN EXCESS OF SPECIFIED LIMITS OF 1 DROP IN 24 HOURS AT STATIC PRESSURE AND 1 DROP IN 25 FULL STROKE CYCLES FOR DYNAMIC OPERATION. THE INDICATED CAUSE WAS O-RING-MOLDING DEFECTS AND POSSIBLE FELT LUBRICATOR CONTAMINATION ON THE PISTON SEALING O-RING.

CORRECTIVE ACTION-DESIGN MEMO 062-10-13 DATED 640728 INCREASED THE PERMISSIBLE LEAK RATES AND DEFINED TESTS FOR DETERMINATION OF LEAK RATES.

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SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B VERNIER SOLO-VSHPS	90-10-080 HYDRAULIC TEE FITTING 3/8 TO 1/2 I NCH	FAR 27-85406-7	111D 610916	ETR	YES NO	CONVAIR	099162

FAILURE MODE-STRUCTURAL-1/2 INCH CENTER LEG BROKE AWAY FROM THE BODY OF TEE. FITTING FAILED BECAUSE IT WAS MADE FRO M A BRITTLE MATERIAL AND USED IN A MARGINAL DESIGN.

CORRECTIVE ACTION-A W.A.R. WAS INITIATED TO CREATE AN PART MADE OF 2024-T4 ALUMINUM INSTEAD OF THE 7075T6.

HYDRAULIC-A/B VERNIER SOLO-V2HPS	90-10-077 TEE-FLARED TUBE 3/8 TO 1/2 INCH.	FAR 27-85406-7	610600	ETR	YES NO	CONVAIR	099170

FAILURE MODE-STRUCTURAL-THREADED MALE SIDE PORT OF THE TEE SHEARED OFF OF THE BODY.

CORRECTIVE ACTION-NONE. FITTING SUBJECTED TO OVERSTRESS.

HYDRAULIC-A/B VERNIER SOLO-VSHPS	98-10-030 VERNIER ENGINE SUPPLY FILTER	FAR 27-08584-5	60D 601210	ETR	YES NO	PUROLATOR 64987	099143

FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION.

CORRECTIVE ACTION-NONE-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.

HYDRAULIC-A/B VERNIER SOLO-VSHPS	AE60-0107/FC-4CO-01-58 GIMBAL SEAL	COMPOSITE-FACTORY	58D 600E19		YES NO		098453

FAILURE MODE-EXTERNAL LEAK-A HYDRAULIC LEAK WAS FOUND IN THE VERNIER ENGINE NO. 1 ENGINE GIMBAL SEAL. THE ENGINE WA S REPLACED. ERRATIC MOVEMENT INDICATED ON COMPOSITE TEST WAS BELIEVED TO BE CAUSED BY AIR IN THE HYDRAULIC SYSTEM.

SYSTEM EFFECT-ERRATIC OPERATION.

VEHICLE EFFECT-COMPOSITE RESCHEDULED. RERUN OF COMPOSITE MADE.

CORRECTIVE ACTION-REPLACED VERNIER ENGINE.

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HYDRAULIC-A/B VERNIER SOLO-VSHPS	A2C-27-062/P1-401-00-26	FLIGHT	260 591029	11 201	NO NO		006070
FAILURE MODE-OUT OF TOLERANCE. HIGH VERNIER SOLO HYDRAULIC PRESSURE. THIS CONDITION IS THOUGHT TO BE CAUSED BY A PR OPULSION SYSTEM FAILURE THAT RESULTED IN FROZEN HYDRAULIC LINES NEAR THE V2 ENGINE. THE HIGH PRESSURE COULD RESULT F ROM DECREASED VERNIER ENGINE DEMANDS AND LEAKAGE RATES BEING CONSIDERABLY REDUCED FROM NORMAL. SYSTEM EFFECT-OPERATION TOO HIGH. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	66-10-039 EXPLOSIVE AIR RELEASE VALVE ASSEMB LY, PIN	FAR 27-06560-3	501006		YES NO	CONAX CORPORAT ION 3011A	000739
FAILURE MODE-OPEN (ELECTRIC)- THE VALVE FAILED TO FIRE WHEN REQUIRED BECAUSE A LEAD TO PIN B ON CONNECTOR WAS BROKE N. DURING MANUFACTURING A POOR STRIPPING OPERATION BY THE VENDOR RESULTED IN THE PARTIAL SEVERING OF THE ELECTRICAL LEAD. CORRECTIVE ACTION-THE VENDOR WAS NOTIFIED AND THIS LOT OF VALVES WERE REJECTED.							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	62-406-C6-E4 VERNIER SOLO ACTUATION VALVE 60U1B	CAPTIVE	260 501006	5-2 261.14	NO YES		006601
FAILURE MODE-FAILED TO OPERATE AT PRESCRIBED TIME. THE VERNIER SOLO ACTUATION VALVE 60U1B DID NOT FIRE AT SUSTAINER CUTOFF THUS PREVENTING THE PNEUMATIC FLASK FROM DISCHARGING. SYSTEM EFFECT-OPERATION DOES NOT START. THE LACK OF PNEUMATIC PRESSURE PREVENTED THE VSHPS FROM PREFORMING SATISFAC TORILY, NECESSITATING THAT THE VERNIER GIMBALLING PROGRAM BE ATTAINED WITH GROUND HYDRAULIC PRESSURE. VEHICLE EFFECT-NONE							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	A7C-27-070/P3-404-00-17	FLIGHT	170 560916	13 276.0	YES YES		
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. THE VSHPS DID NOT ACTIVATE AT SUSTAINER CUTOFF DUE TO EITHER A FAI LURE OF THE EXPLOSIVE VALVE TO OPERATE OR A LACK OF COMPRESSED AIR IN THE AIR FLASK. SYSTEM EFFECT-OPERATION DOES NOT START. HYDRAULIC PRESSURE WAS NOT SUPPLIED DURING THE VERNIER SOLO PHASE OF FLIGHT . VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. NO VERNIER CONTROL DURING VERNIER SOLO PHASE OF FLIGHT.							

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CORRECTIVE ACTION-INSTRUMENTATION WAS ADDED ON 18D TO MEASURE AIR FLASK PRESSURE.							090033
HYDRAULIC-A/B VERNIER SOLO-VSHPS	AZM-27-330/FC-4CO-02-31 ACTUATOR ASSEMBLY	COMPOSITE-FACTORY 27-05312	31D 590824	133	YES NO	LIONEL PACIFIC	097009
FAILURE MODE-ERRATIC OPERATION. A 1.5 VOLT OVERSHOOT WAS NOTED IN VERNIER NO 1 PITCH/ROLL FEEDBACK WHEN THE ROLL DISPLACEMENT GYRO OUTPUT WAS GROUNDED. THIS WAS CAUSED BY AIR IN THE HYDRAULIC SYSTEM. SYSTEM EFFECT-ERRATIC OPERATION. POOR FILL AND BLEED CAUSED ERRATIC OPERATION OF VERNIER NO. 1 PITCH/ROLL ACTUATOR. VEHICLE EFFECT-COMPOSITE RESCHEDULED. CORRECTIVE ACTION-FILL AND BLEED ON HYDRAULIC SYSTEM WAS PERFORMED. PARTIAL COMPOSITE RETEST WAS PERFORMED.							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	AZC-27-053/P1-404-00-11 VERNIER SYSTEM HYDRAULIC SUPPLY LINE	FLIGHT	11D 590723	11 280	NO YES	CD/C	097146
FAILURE MODE-FAIL DURING OPERATION. VERNIER HYDRAULIC PRESSURE SUPPLY LINE FROM SOLO SUPPLY UNIT FROZE AS RESULT OF LOX LEAK IN ENGINE COMPARTMENT. ENGINE COMPARTMENT TEMPERATURE INSTRUMENTATION REFLECTED A COLD ENVIRONMENT. SYSTEM EFFECT-OPERATION STOPS PREMATURELY. NO HYDRAULIC CONTROL PRESSURE PROVIDED TO VERNIER ENGINES AFTER FIRST 3 SECONDS OF VERNIER SOLO PHASE. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. LACK OF VERNIER CONTROL RESULTED IN LOSS OF VEHICLE STABILITY DURING VERNIER SOLO PHASE AND A ROLL MOTION WAS IMPARTED TO VEHICLE. AS RESULT, RE-ENTRY VEHICLE WAS BUMPED AT SEPARATION. RE-ENTRY VEHICLE IMPACT WAS SATISFACTORY, HOWEVER, DATA CAPSULE WAS NOT EJECTED. CORRECTIVE ACTION-UNKNOWN.							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	31-407-A3-00 AIR FLASK	CAPTIVE 27-08575-1	9D 590713	81	YES NO	WALTER KIDDE 691614-02	099000
FAILURE MODE-FAILURE DURING OPERATION- AIR FLASK WAS NOT CHARGED DUE TO HUMAN ERROR. SYSTEM EFFECT-OPERATION STOPS PREMATURELY- VERNIER HYDRAULICS DECAYED TO GROUND LEVEL OF 1040 PSIG 3.8 SEC AFTER SECO. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-INSTRUCT PERSONNEL.							

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HYDRAULIC-A/B VERNIER SOLO-VSHPS	86-10-032 PNEUMATIC PRESSURE REGULATOR, SEAL	FAR 7-08324-1	90 860707		YES NO	WESTON LIMITED 11340	000732
FAILURE MODE-FAILURE DURING OPERATION-DURING OPERATION CHECKOUT OF THE VERNIER HYDRAULIC SUPPLY SYSTEM THE UNIT REMAINED IN THE FULL OPEN POSITION. CORRECTIVE ACTION-IT WAS RECOMMENDED TO REDESIGN THE VALVE MANIFOLD SEAL TO INCLUDE A METAL ANNULUS BETWEEN THE O RING AND THE GAS FLOW PASSAGE.							
HYDRAULIC-A/B VERNIER 3 LO-VSHPS	86-10-027 HYDRAULIC ACCUMULATOR, O-RING	FAR 87-08587-1	360808		YES NO	PARKER AIRCRAFT CO. 1336-542097	000588
FAILURE MODE-INTERNAL LEAK - GAS PRE-CHARGE LEAKED TO THE HYDRAULIC SIDE DUE TO A CUT IN THE O RING SEAL BETWEEN THE HYDRAULIC END CAP AND THE CYLINDER SLEEVE. CORRECTIVE ACTION-THE VENDOR WAS CONTACTED AND HE WILL TAKE ACTION TO IMPROVE ASSEMBLY PROCEDURES, REMOVE THE SHARP EDGE FROM THE CYLINDER SLEEVE, PERFORM LEAK CHECKS USING GAS INSTEAD OF HYDRAULIC OIL. ALL UNITS IN STOCK AT CONVAIR WERE REINSPECTED FOR CUT O-RINGS.							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	32-410-85-05 CONAX VALVE, TIMER	CAPTIVE	20 860828	82 252.17	NO NO	CONAX CORPORATION 3011A	002233
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VSHPS FIRED 15.8 SECONDS AFTER BECO INSTEAD OF AT BECO. THIS WAS CAUSED BY A GROUND TIMER WHICH MALFUNCTIONED. SYSTEM EFFECT-OPERATION TOO LOW. HYDRAULIC PRESSURE DECAYED TO GROUND PRESSURE (2100 PSIG) DURING INTERVAL BEFORE VSHPS FIRING. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-REPLACED TIMER, GSE EQUIPMENT.							
HYDRAULIC-A/B VERNIER SOLO-VSHPS	86-10-024 HYDRAULIC ACCUMULATOR, O-RING	FAR 87-08587-1	860427		YES NO	PARKER AIRCRAFT CO 1336-542097	000589
FAILURE MODE-INTERNAL LEAK - GAS PRE-CHARGE LEAKED TO THE HYDRAULIC SIDE DUE TO A CUT IN THE O RING SEAL BETWEEN THE HYDRAULIC END CAP AND THE CYLINDER SLEEVE. CORRECTIVE ACTION-THE VENDOR WAS CONTACTED AND HE WILL TAKE ACTION TO IMPROVE ASSEMBLY PROCEDURES AND TIGHTEN TEST REQUIREMENTS.							

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HYDRAULIC-A/B VERNIER SOLO-VSHPS	88-10-019 PUMP ASSEMBLY	FAR 97-00300-001	590409	STR	YES NO	VICKERS PF76-3907-30-3 352	099744

FAILURE MODE-EXTERNAL LEAK. THE FLUID LEAKAGE WAS 40 DROPS PER MINUTE.

CORRECTIVE ACTION-THE FAILURE WAS NOT CONFIRMED. IT WAS RECOMMENDED TO RETURN THE UNIT TO THE VENDOR FOR THE PURPOSE OF OVERHAUL AND RESTORING TO OPERATING CONDITION.

HYDRAULIC-A/B VERNIER SOLO-VSHPS	ZC-7-206/P4-201-00-08 VERNIER HYDRAULIC ACCUMULATOR	FLIGHT 27-00587-1	08 560914	14 240	YES NO	PARKER AIRCRAFT CO 1356-542097	097110

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VERNIER HYDRAULIC SYSTEM FAILED TO PROVIDE PRESSURE TO ACTUATORS POSSIBLY BECAUSE THE GN2 FLASK HAD BEEN INADEQUATELY CHARGED OR HAD LEAKED.

SYSTEM EFFECT-OPERATION DOES NOT START. PRESSURE FOR CONTROL OF VERNIER ENGINES WAS NOT AVAILABLE.

VEHICLE EFFECT-NONE. ALTHOUGH NO ADVERSE EFFECTS RESULTED, VERNIER ENGINE CONTROL DURING VERNIER SOLO WAS LOST.

CORRECTIVE ACTION-UNKNOWN. SYSTEM LATER REDESIGNED.

HYDRAULIC-A/B VERNIER SOLO-VSHPS	ZC-7-204/P1-203-00-05 HYDRAULIC PUMP, BOTTLE STORAGE	FLIGHT 97-00300-001	30 560828	11 253.1	YES NO	VICKERS PF76-3907-30-3 352	097352

FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VERNIER HYDRAULIC PUMP FAILED TO SUPPLY HYDRAULIC PRESSURE TO VERNIER ACTUATORS DURING VERNIER SOLO. SUSPECTED PROBLEM WAS LOW CHARGE OR LEAKAGE IN PUMP MOTOR GAS SUPPLY PRIOR TO SECO. PUMP DISCHARGE PRESSURE WAS ONLY 30 PERCENT OF NOMINAL AT SECO AND DECAYED TO ZERO IN FEW TENTHS SECOND ON ACTIVATION.

SYSTEM EFFECT-OPERATION DOES NOT START. VERNIER ENGINE ACTUATORS DID NOT HAVE NECESSARY HYDRAULIC PRESSURE FOR OPERATION.

VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. CLOSED LOOP GUIDANCE CONTROL OF VERNIER ENGINES LOST WHEN VERNIER ACTUATOR HYDRAULIC PRESSURE FAILED. SOME VEHICLE INSTABILITY RESULTED DUE TO LOSS OF VERNIER CONTROL BUT NOT ENOUGH TO SERIOUSLY AFFECT IMPACT ACCURACY.

CORRECTIVE ACTION-NONE.

HYDRAULIC-A/B VERNIER SOLO-VSHPS	EM1029/TEST 14-307 ACTUATOR ASSEMBLY, WIRING	CAPTIVE 27-00311	560813	1-4 70 SECS	NO NO	CLEMCO/OR INTE ROTATE	

FAILURE MODE-FAILED DURING OPERATION. V2 ENGINE DRIFTED TO VERTICAL STOP IN YAW AND BURNED THRU VERNIER FLAME DEFLECTOR AS A RESULT OF BROKEN WIRE AT V2 YAW SERVO VALVE CONNECTOR. AT 94 SECONDS REFLECTED HEAT CAUSED SHORT IN V2 YAW FEEDBACK TRANSDUCER EXCITATION WIRING.

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SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. RECENTLY INSTALLED FUSE IN FEEDBACK CIRCUIT BLEW AT 95 SECONDS AND ALL ENGINES RETURNED TO NORMAL POSITIONS EXCEPT V2 YAW. AT 136 SECONDS V1 YAW SHIFTED 16 DEGREES AS A RESULT OF DAMAGE DUE TO REFLECTED HEAT. AT 141 SECONDS TEST WAS TERMINATED PREMATURELY AFTER V2 ENGINE DRIFTED TO VERTICAL STOP IN YAW AND BURNED THRU FLAME DEFLECTOR. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-INCLUDED INSTALLATION OF MECHANICAL LOCKS IN PLACE OF THE VERNIER ACTUATORS AND REMOVAL OF VERNIER FLAME DEFLECTORS.							093177
HYDRAULIC-A/B VERNIER SOLO-VSMPS	FTA4101/P1-200-00-3	COUNTDOWN	38 560710	11 -4200	YES NO		097643
FAILURE MODE-LEAK-EXTERNAL. LEAKAGE IN VERNIER HIGH PRESSURE AIR FLASK PRESSURIZATION SYSTEM. SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. VERNIER AIR FLASK COULD NOT BE PRESSURIZED TO PROPER PRESSURE DUE TO LEAKAGE. VEHICLE EFFECT-COUNTDOWN DELAYED. 15 MINUTE HOLD. CORRECTIVE ACTION-REPAIRED LEAK.							
HYDRAULIC-A/B VERNIER SOLO-VSMPS	FTA4102/P1-207-00-3 VALVE-CONAX.	COUNTDOWN 27-06560-3	38 560710	11 -6	NO NO	CONAX CORPORATION 3011A	097646
FAILURE MODE-PREMATURE OPERATION. AT T-6 SECONDS WHEN A REDLINE CUTOFF WAS INITIATED, THE VERNIER HIGH PRESSURE AIR FLASK EXPLOSIVE VALVE FIRED. SYSTEM EFFECT-DEPLETION OF GAS SUPPLY. VEHICLE EFFECT-COUNTDOWN ABORTED AND RESCHEDULED. CORRECTIVE ACTION-REPLACED AIR FLASK AND VALVE.							
HYDRAULIC-A/B VERNIER SOLO-VSMPS	EM1028/TEST 14-305 FEEDBACK TRANSDUCER, EXCITATION WIRING	CAPTIVE	560000	1-4 -1.6	YES NO		
FAILURE MODE-ELECTRICAL SHORT. AT -1.91 SECONDS ALL ENGINE NULL POSITIONS SHIFTED OUT OF TOLERANCE. THIS WAS ATTRIBUTED TO A REDUCTION IN FEEDBACK EXCITATION VOLTAGE AS A RESULT OF A SHORT TO GROUND SOMEWHERE IN FEEDBACK TRANSDUCER EXCITATION WIRING EXTERNAL TO THE SERVO AMPLIFIER CANISTER. SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. WITH THE LARGE DEFLECTION OF VERNIER ENGINES, REFLECTED HEAT AND FLAME CAUSED EXTENSIVE DAMAGE TO VERNIER WIRING AND TO FLAME DEFLECTORS. AT 19 SECONDS V1 YAW ACTUATOR WIRING BURNED THROUGH ACCOUNTING FOR FURTHER MOVEMENT OF V1 YAW ACTUATOR. AT 81 SECONDS AND REMAINDER OF RUN, ALL ENGINE FEEDBACKS INDICATED LARGE SHIFTS AS A RESULT OF INTERMITTENT SHORTING IN WIRING. PRIMARY WINDING OF EXCITATION TRANSFORMER T804 WAS OPEN.							

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VEHICLE EFFECT-NONE. CORRECTIVE ACTION-INCLUDED THE ADDITION OF FUSES IN EACH FEEDBACK EXCITATION CIRCUIT.							003170
HYDRAULIC-A/B VERNIER SOLO-VSHPS	2C-7-098/P2-103-00-11 VERNIER ENGINE FEEDBACK TRANSDUCER	FLIGHT	11A 300220	12 51.9	YES NO	CRESENT	000205
FAILURE MODE-ELECTRICAL SHORT. IT IS CONCLUDED THAT ONE OF THE VERNIER ENGINE FEEDBACK TRANSDUCERS SHORTED DUE TO E XCESSIVE HEAT CAUSING A DECREASE IN AUTOPILOT FEEDBACK EXCITATION. THIS RESULTED IN A GAIN CHANGE WHICH CAUSED AUTOP ILOT INSTABILITY. SYSTEM EFFECT-IMPROPER ANALOG SIGNALS. AT 51.9 SECONDS THE V2 ENGINE MOVED TO THE HARD-OVER POSITION. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. V2 SHUTDOWN PREMATURELY 6.5 SECONDS AFTER ENGINES WERE GIMBALLING BETWEEN THE STOPS. V1 AND BOOSTER ENGINES SHUTDOWN 2 SECONDS PREMATURELY AT 113.5 SECONDS. CORRECTIVE ACTION-COMPLETE SEAL AT FORWARD PORTION OF THE FAIRING, STEEL PLATE OVER OUTBOARD AND UPPER AFT PORTION OF THE FAIRING, ALUMINUM SHIELD TO COVER END OF THE VERNIER FAIRING, FEEDBACK TRANSDUCER SOLDERED PLUG REPLACED WITH PERMANENT SPLICE, TRANSDUCER WIRING SLEEVED IN FIBERGLASS AND ROUTED THROUGH CONDUIT, ALL VERNIER ENGINE AREA WIRIN G WRAPPED IN ALUMINUM FOIL, AND NICHROME WIRE WILL REPLACE WIRING IN THE TWO EXCITATION LEADS TO THE TWO VERNIER ENG INE FEEDBACK TRANSDUCERS. (REPORT 2C-7-098)							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	SLV-AB-04-5099 ACTUATOR ASSEMBLY, SEAL	FAR 27-05312-005	000188	FACTORY	YES NO	LIONEL PACIFIC	000493
FAILURE MODE-OUT OF TOLERANCE. VERNIER SERVOVALVE ASSEMBLY WAS REJECTED FOR EXCESSIVE PITCH OVERSHOOT. THE FAILURE WAS NOT DUPLICATED. HOWEVER ON DISASSEMBLY A GOUGED POWER-STAGE SPOOL-DAMPING ORIFICE O-RING WAS FOUND WHICH COULD P ERMIT LEAKAGE AND REDUCE DAMPING. CORRECTIVE ACTION-CADILLAC GAGE WAS NOTIFIED OF THIS. VENDOR RE-INSTRUCTED ALL PRODUCTION AND INSPECTION PERSONNEL ON CORRECT PROCEDURES FOR REINSTALLATION OF THE -010 O-RING IF THE SPOOL AND SLEEVE ASSEMBLY ARE DISASSEMBLED AND RE -ASSEMBLED.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	69A4929 ACTUATOR ASSY, VERNIER	UTP-ETT 27-05312-005	000108	GD/C	YES NO	GD/C	000817
FAILURE MODE-STRUCTURAL. ERRATIC OPERATION OCCURRED DUE TO IMPROPER LOCK WIRE INSTALLATION. MOUNTING SCREWS BECAME LOOSE CAUSING THE DISCREPANCY. CORRECTIVE ACTION-LOCK WASHERS WILL BE ADDED TO MOUNTING SCREWS TO PREVENT BACK OUT, PER ECP 3442.							

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DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	LV-99-10-247-F VERNIER SOLO ACCUMULATOR	FAR 27-08587-3	640306	FACTORY	YES NO	BENDIX 3037973	000114
FAILURE MODE-LEAK INTERNAL-HYDRAULIC FLUID LEAK AT PNEUMATIC END OF ACCUMULATOR. (PNEUMAYIC END OF ACCUMULATOR WAS OPEN). CORRECTIVE ACTION-FAILURE NOT CONFIRMED- VENDOR AND FACTORY NOTIFIED OF FAILURE ANALYSIS-NO FURTHER ACTION.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	60A63-0074/B1-401-00-64 ACCUMULATOR CHARGE LINE	FLIGHT	840 630011	B-1 96.6	NO YES	60/C	000663
FAILURE MODE-LEAK EXTERNAL IN VERNIER SOLO ACCUMULATOR CHARGE CHARGE LINE PROBABLY DUE TO HIGH ENGINE COMPARTMENT T EMPERATURE. LATTER NOT MONITORED BUT FITS PATTERN OF SUCH FAILURES, CHARGE LINE LEAK AND LOSS OF ACCUMULATOR CHARGE INDICATED BY SUSTAINER/VERNIER HYDRAULIC PRESSURE TRANSIENT. SYSTEM EFFECT-DEPLETION OF GAS SUPPLY TO VERNIER SOLO ACCUMULATOR. SUBSEQUENT FAILURE OF VERNIER HYDRAULIC SYSTEM F OLLOWING SECO (274.2 SECS). VEHICLE EFFECT-LOSS OF VEHICLE STABILITY CAUSED BY VERNIER HYDRAULIC SYSTEM FAILURE TO SUPPLY HYDRAULIC CONTROL TO VERNIER ENGINES DURING VERNIER SOLO PHASE. R/V PREARM SIGNAL NOT SENT BY GUIDANCE BECAUSE OF VEHICLE INSTABILITY AND RESULTING LOSS OF GUIDANCE SYSTEM LOCK. R/V DID NOT SEPARATE DUE TO LACK OF PREARM SIGNAL. CORRECTIVE ACTION-NONE TO D SERIES OPERATIONAL VEHICLES. CHARGE LINE CHANGED FROM ALUMINUM TO STAINLESS STEEL ON SP ACE PROGRAM VEHICLES AND VEHICLES IN OTHER PROGRAMS AS A RESULT OF PRIOR FAILURES OF THIS TYPE.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	60/A63-0107/01-501-00-65 ACCUMULATOR VERNIER-SOLO	FLIGHT 27-08582	65E 630484	F-1	YES NO	BENDIX 3037973	000218
FAILURE MODE-FAIL TO OPERATE AT PRESCRIBED TIME. VERNIER-SOLO ACCUMULATOR (VSA) DID NOT PROVIDE CONTROL PRESSURE TO VERNIER ENGINES DURING VERNIER-SOLO PHASE. PROBABLE CAUSE WAS LOSS OF VSA PRECHARGE BETWEEN LAST SYSTEM CHECK AND E NGINE START. DATA DOES NOT SUBSTANTIATE SUPPOSITION OF A REVERSAL OF VSA CHARGE PRESSURE (1000 PSIG) AND SUSTAINER A CCUMULATOR CHARGE PRESSURE (2600 PSIG) AS POSSIBLE CAUSE OF PROBLEM. SYSTEM EFFECT-OPERATION DOES NOT START. AS RESULT OF LOSING CHARGE PRESSURE, VSA DID NOT SUPPLY CONTROL PRESSURE TO VERNIER ENGINES. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. LACK OF CONTROL PRESSURE DURING VERNIER-SOLO PHASE DID NOT PERMIT CORRECT ION OF ERRORS RESULTING FROM PITCH AND YAW ACCELERATIONS AT SECO. ERRORS DID NOT AFFECT MISSION. CORRECTIVE ACTION-AREA OF FAILURE RESULTING IN LOSS OF VSA PRECHARGE WAS NOT ISOLATED. HOWEVER, LEAKAGE HISTORY OF GAUGE USED IN CHARGE SYSTEM LED TO REQUEST FOR VENDOR TO REVIEW WELDING TECHNIQUES AND FOR SOC QC TO PERFORM 100-PER CENT CHECKOUT OF GAUGES.							

GENERAL DYNAMICS
CONVAIR DIVISION

18 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	AC-63-0007/62-610-B13-75 VERNIER SOLO ACCUMULATOR GAS CHARG E LINE	CAPTIVE 27-68107-401	75F 630418	82	YES NO	GD/C	090010

FAILURE MODE-STRUCTURAL. POST TEST INSPECTION REVEALED A SMALL CRACK IN THE CHARGE LINE.

SYSTEM EFFECT-NONE.

VEHICLE EFFECT-NONE.

CORRECTIVE ACTION-THE LINE WAS REPLACED.

HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	AE62-0730/62-404-00-67 TUBING-CHARGE LINE	FLIGHT	87D 620609	B-2 106	NO NO	GD/C	097117

FAILURE MODE-STRUCTURAL. AT 106 SECONDS A SLIGHT HYDRAULIC PRESSURE DECREASE WAS FOLLOWED BY A SUDDEN INCREASE TO 3 ,430 PSIA, AND THEN A RETURN TO STABILITY AT 3,150 PSIA. THIS PRESSURE TRANSIENT IS BELIEVED TO INDICATE A RUPTURE O F THE VSA CHARGE LINE CAUSED BY EXCESSIVE TEMPERATURES IN THE ENGINE COMPARTMENT. THIS CONCLUSION IS BASED ON SIMILA R DATA OBTAINED ON FLIGHT 42D.

SYSTEM EFFECT-OPERATION STOPS PREMATURELY. HYDRAULIC PRESSURE WAS NOT SUPPLIED DURING VERNIER SOLO.

VEHICLE EFFECT-IMPROPER TRAJECTORY. FINAL YAW CORRECTIONS DURING VERNIER SOLO WERE NOT EFFECTED.

CORRECTIVE ACTION-IN THE FUTURE, SERIES B MISSILES USED AS SPACE BOOSTERS WILL HAVE INSULATED ACCUMULATOR CHARGE LI NES. SERIES E AND F MISSILES WILL INCORPORATE STAINLESS STEEL LINES.

HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	A-9N-10-132F VERNIER SYSTEM HYDRAULIC ACCUMULAT OR	FAR 27-00587-3	41F 620620	ALTUS	YES NO	PEACOCK 10224-3	000549

FAILURE MODE-LEAK INTERNAL. GAS PRECHARG PRESSURE DROPPED 100 PSI IN A 12 HOUR PERIOD. SOURCE AND CAUSE OF LEAKAGE WAS NOT APPARENT.

CORRECTIVE ACTION-FAILURE NOT CONFIRMED. IT WAS CONCLUDED THAT IT WAS POSSIBLE THAT A SMALL LEAK IN THE ASSOCIATED LINE TO THE UNIT WAS THE CAUSE OF FAILURE AND THAT THIS WAS ELIMINATED WHEN THE REPLACEMENT UNIT WAS INSTALLED. NO F URTHER ACTION TAKEN.

HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	9K-10-090-F VERNIER SOLO ACCUMULATOR	FAR 27-00587-3	20E 611102	TORRES	YES NO	BENDIX 3037073	

FAILURE MODE-EXTERNAL LEAK-GAS LEAKAGE AT THE PNEUMATIC END OF THE CYLINDER HOUSING.

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1986

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO	
							000118
CORRECTIVE ACTION-FAILURE NOT CONFIRMED. VENDOR WAS NOTIFIED AND REQUESTED TO IMPROVE HIS Q.C.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	98-10-080 VERNIER SOLO ACCUMULATOR	FAR 27-00587-5	060798	ETR-13	YES NO	BENDIX 3657973	000103
FAILURE MODE-INTERNAL LEAK. GAS PRECHARGE LEAKAGE.							
CORRECTIVE ACTION-FAILURE NOT CONFIRMED.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	98-10-060 YAW ACTUATOR ASSEMBLY	FAR 27-03312-003	000 001210	ETR	YES NO	INTERSTATE	000142
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION.							
CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	AZC-27-116/P1-405-00-42 PNEUMATIC CHARGE LINE TO HYDRAULIC ACCUMULATOR	FLIGHT	400 000300	11 00	NO NO	00/C	000081
FAILURE MODE-STRUCTURAL. A HIGH TEMPERATURE ENVIRONMENT IN THE THRUST SECTION RESULTED IN LOSS OF THE PNEUMATIC CHA RGE LINE TO THE VERNIER HYDRAULIC ACCUMULATOR, AND SUBSEQUENT BLEED DOWN OF THE ACCUMULATOR. SYSTEM EFFECT-OPERATION TOO LOW. HYDRAULIC PRESSURE WAS NOT AVAILABLE FOR VERNIER CONTROL. VEHICLE EFFECT-LOSS OF VEHICLE STABILITY. VERNIER ENGINE CONTROL WAS LOST. DURING VERNIER SOLO PHASE. CORRECTIVE ACTION-NONE.							
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	FTA6240/P2-3CO-02-00	COMPOSITE-S FACT	00 900010	12	YES NO		
FAILURE MODE-OUT OF SPECIFICATION OR TOLERANCE. WHEN GROUND SUSTAINER/VERNIER HYDRAULIC PUMP WAS STOPPED AT SUSTAIN EN CUTOFF, PRESSURE IN THE TWO VERNIER SOLO ACCUMULATORS DROPPED FROM 2730 PSIA TO 1286 PSIA. SYSTEM EFFECT-OPERATION TOO LOW. IT WAS BELIEVED THAT THE PRESSURE DROP WAS TOO SHARP TO FURNISH SUFFICIENT PRESSUR							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1966

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PC. OYH	VENDOR NAME VENDOR PART NO	
E FOR THE VERNIER SOLO PERIOD. VEHICLE EFFECT-NONE. CORRECTIVE ACTION-UNKNOWN.							007337
HYDRAULIC-A/B VERNIER SOLO-SINGLE OR DUA L ACCUMULATOR	98-10-060 PITCH ACTUATOR ASSEMBLY	FAR 87-05311-8	000 00010	ETR	YES NO	INTERSTATE	000194
FAILURE MODE-CONTAMINATION-SUSPECTED OF CONTAINING EXCESSIVE CONTAMINATION. CORRECTIVE ACTION-MORE RIGID MEASURES TO PREVENT CONTAMINATION HAVE BEEN TAKEN.							

GENERAL DYNAMICS
CONVAIR DIVISION

15 JUN 1969

DIFFICULTIES REVIEW-HYDRAULIC SYSTEM-AIRBORNE

SYSTEM SUB-SYSTEM	TEST/REPORT NUMBER FAILED COMPONENT NAME	DIF DATA SOURCE PART NUMBER	VEHICLE DATE DIF	SITE TIME DIF	PRI OTH	VENDOR NAME VENDOR PART NO