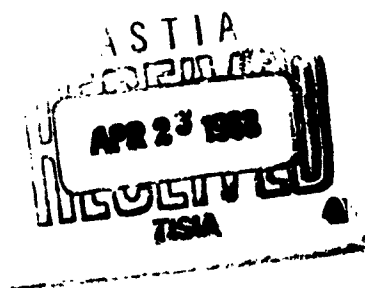
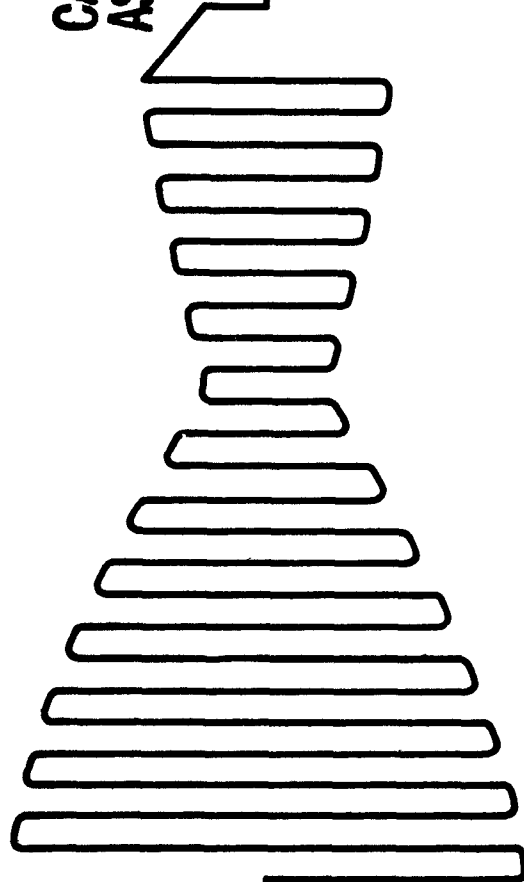


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ROCKETDYNE
A DIVISION OF NORTH AMERICAN AVIATION, INC.
CANOGA PARK, CALIFORNIA

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A T L A S

**COMPONENT RELIABILITY
MONTHLY REPORT
(RS-2)**

For March, 1963

ROCKETDYNE

A DIVISION OF NORTH AMERICAN AVIATION, INC.

6633 CANOGA AVENUE
CANOGA PARK, CALIFORNIA

Contract AF04(694)-328
Part 1, Item 1.C(2) of Exhibit-B
Para. 3.4 of AFBM Exhibit 58-1

PREPARED BY

Reliability Engineering Group

APPROVED BY

J. J. Griffin

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Program Manager
Atlas/Thor/Jupiter

NO. OF PAGES 26

REVISIONS

DATE April 12, 1963

DATE	REV. BY	PAGES AFFECTED	REMARKS

ATLAS MA-3,
COMPONENT RELIABILITY
MONTHLY REPORT
(RS-2)

Explanation and Definition

of

Report Elements

This report complies with contractual requirements and presents component reliability information on the MA-3 propulsion system collected during all stages of manufacturing, assembly, and testing, at Rocketdyne, Convair facilities, and Air Force sites.

All failures occurring on hardware of production engine systems are considered and are reported under eighteen headings corresponding to one primary component for which one or several part numbers are applicable (see list on Page 4). This list reflects the changes of the latest production configuration of the engine and will be revised periodically.

Report Format

The report consists principally of two tables: a summary (Table I) and a failure listing (Table II). The summary presents running time for five primary components, number of exposures for the remaining 13 primary components, number of critical and non-critical failures and number of different units in use during each reporting period. The failure listing (Table II) identifies the failed component and the FCDR or OFR (failure report) number.

Table I - Summary

Table I, Environmental Conditions, categorizes the time during the engine life that the failures have taken place.

- a) Component Testing
- b) Assembly and E&M's
- c) Engine Testing (both R&D and Production)
- d) Field Operation
- e) Field Testing (Captive, FRF and Launch)

"Component Testing" encompasses all exposures of production hardware occurring during testing of thrust chamber assemblies, gas generator assemblies, turbopump assemblies and Vernier Engines. The number of exposures for each component is determined by the actual runs.

Under "Assembly and EM's", the number of OFR's written during engine assembly, first and second EM and final servicing before delivery is indicated. These data appear in the "Total" column under the heading NUMBER OF FAILURES. The total number of exposures for each component will be the number of EM's to which it was exposed and is posted in the "Running Time or Cycles" column.

Under "Engine Testing", running time or exposures is provided for primary components from the actual duration and number of hot fire tests on Rocketdyne stands at Santa Susana and Neosho. Wherever duration is indicated instead of exposure, the figure will be preceded by an "s" denoting running time in seconds.

"Field Operations" show the number of OFR's issued for all operations at customer locations except engine hot fire tests. Exposure or running time are not applicable for the "Field Failure" Classification.

Finally, under "Field Testing" duration in seconds is shown as running time for five primary components and the number of exposures (determined by counting actual runs) is shown for the remaining components. An exposure, for this category includes besides the actual firing to which the component was exposed, at least one E&M which precedes each test. This is consistent with the definition of exposure for engine testing, where some components are exposed to actuations other than those performed during the actual hot fire test. Wherever duration is provided, the figure will be preceded by an "s".

Classification of failures as critical and non-critical follows the definitions set up in AFBM Exhibit 58-10 and associated STL Report TR-59-P002-00821, paragraph 2.21, where a critical failure is so classified when it would normally cause a safety hazard, mission abort or impact outside three CEP. All other failures are found in the column "Non-critical".

The number of units operating during the reporting period is shown for each primary component, by part number and environmental condition group.

Table II - Failure Listing

Table II lists failures by primary and secondary component by name, part number and element, where possible, as well as environmental condition, and failure classification with OFR number.

SUMMARY

During March, 1963, forty-two applicable failures were reported, three of which were critical. Of the forty-two failures, 15 occurred at assembly electromechanical checkout, 11 at engine test, 10 at component test and 6 at field operations. Two of nine turbopump failures resulted in premature cutoff and one gas generator blade valve failure prevented a sustainer engine from going into bootstrap operation.

Turbopump 451190-101 component hot fire test 5359, OFR 00500N, was prematurely cutoff when lube oil indicator spiked below red line minimum of 3.5 gal. per minute, due to suspected lube pump cavitation. Turbopump 451902-51 component hot fire test 133A, OFR 10290R, was prematurely cut off after 248 seconds, due to oil pressure dropping below red line value of 450 psi. Sustainer engine 2222-1 test 512-088A on 3-18-63, OFR 04795R, failed to bootstrap due to water getting into the gas generator blade valve, freezing and restricting valve movement.

Effective with this report, the number of field operations performed on an engine system 89NA5, 105NA5, 101NA3, will no longer be reported, due to a reduction of field site personnel and consequent reduced data input.



W. L. Stewart
Reliability Engineering

WLS:sj

MA-3 Applicable Part Numbers

A list of applicable part numbers used in the preparation of the RS-2 Report is shown below. An asterisk preceding a part number indicates the latest production configuration of that particular component. The list will be revised whenever new information becomes available.

1. Turbopump Assembly

*451190-101
451190-91
451190-81 LR 89NA-5
451190-71
451190-51
451190-41
*453902-51
453902-41 LR 105NA-5
453902-31
453902-21

2. Thrust Chamber Assembly

204710
*204481
201499
200467-11 LR 89NA-5
*200860-121
200860-11 LR 105NA-5
200860
202743

3. Thrust Chamber Injector

204709
*204481
202831-11
202831 LR 89NA-5
*200223 LR 105NA-5

4. Gas Generator Assembly

306275
*307273
306965 LR 89NA-5
*306930-11
306930 LR 105NA-5
307267

5. Vernier Engine Assembly

*350300 LR 101NA-7

6. Solid Propellant Gas Generator

*651198-31
650982-31
650982-21 LR 89NA-5
650801-21

MA-3 Applicable Part Numbers

- | | | |
|---|--|-------------------------|
| 6. Solid Propellant Gas Generator (cont'd) | *651228-31
650988-31
650988-21
650810-21 | LR 105NA-5 |
| 7. Main Fuel Valve or Propellant Utilization Valve | *404924
403700

*250736
251254 | 2R 89NA-5
2R 105NA-5 |
| 8. Main Lox Valve or Head Suppression Valve | *403825
402565

250311 *251071
250737 | 2R 89NA-5
2R 105NA-5 |
| 9. Gas Generator Blade Valve | 308828
*306289 | LR 105NA-5 |
| 10. Gas Generator Control Valve | *307475
307960
305278
307052
305324 | 2R 89NA-5 |
| 11. Lox Regulator | *306818
306424
306413
306842
302722 | 2R 89NA-5 |
| 12. Hydraulic Control Package
(2 way Hyd. Cont. Valve.)
(Directional Control Valve) | NA5-28089
*NA5-28039
NA5-28037
*NA5-28052 | 2R 89NA-5
2R 105NA-5 |
| 13. Head Suppression Controller
(Mixture Ratio Controller) | *250958
250948 | 2R 105NA-5 |
| 14. Propellant Utilization Controller
(Serve Valves) | *NA5-270672 | 2R 105NA-5 |
| 15. Pneumatic Control Assembly | *554127
554162
554160
553077
551722 | LR 105NA-5 |

16. Turbine Exhaust Duct (without Heat Exchanger)*304681
(with Heat Exchanger)*304682 LR 89NA-5
17. Electrical System *500601 LR 89NA-5
- (Rocket Engine Relay Box) *500120
(" " " ") *500535-31 LR 105NA-5
500535-21
18. Other Engine Components

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				Running Time or Cycles	No. of Units Oper- ating	LAST 6 MONTHS			No. of Units Oper- ating
			NUMBER OF FAILURES			Running Time or Cycles			NUMBER OF FAILURES			
			Criti- cal	Non- Criti- cal	Total				Criti- cal	Non- Criti- cal	Total	
Turbopump	451190	Comp. Test	-	-	-	-	-	S150	-	-	-	1
	451190-41	Field Oper.	-	-	-	-	-	N.A.	-	1	1	N.A.
	451190-51	Comp. Test	-	-	-	-	-	N.A.	-	-	2	N.A.
		Assy-EM	-	-	-	-	-	-	-	-	-	-
		Eng. Test	-	-	-	-	-	-	-	-	-	-
		Field Oper	-	-	-	-	-	-	-	-	-	-
		Field Test	-	-	-	-	-	-	-	-	-	-
	451190-61	Assy-EM	-	-	-	-	-	1	-	-	-	1
		Eng. Test	-	-	-	-	-	-	-	-	-	4
		Field Oper	-	-	-	-	-	-	-	-	-	-
		Field Test	-	-	-	-	-	-	-	-	-	-
	451190-71	Comp. Test	S150	-	-	-	-	S602	-	-	-	4
		Assy-EM	-	-	-	-	-	10	-	-	-	9
		Eng. Test	-	-	-	-	-	S610	-	1	1	5
		Field Oper	-	-	-	-	-	-	-	-	-	4
	451190-91	Eng. Test	-	-	-	-	-	S1181	-	1	1	4
		Field Oper	-	-	-	-	-	-	-	-	-	7
		Field Test	S313	-	-	-	-	S762	-	-	-	11
	451190-101	Comp. Test	S312	7	5	6	1	S2839	11	8	9	25
		Assy-EM	S1117	-	-	-	-	41	-	2	2	47
		Eng. Test	-	-	-	-	-	S7919	-	1	1	36
		Field Oper.	-	-	-	-	-	-	-	-	-	37
		Field Test	S633	-	-	-	-	S904	-	-	-	12
	456788	Comp. Test	S700	-	-	-	-	S1177	-	-	-	6
		Assy-EM	-	-	-	-	-	-	-	-	-	-
		Eng. Test	-	-	-	-	-	-	-	-	-	-
		Field Oper	-	-	-	-	-	-	-	-	-	-

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				Running Time or Cycles	No. of Units Oper- ating	LAST 6 MONTHS			No. of Units Oper- ating
			NUMBER OF FAILURES			Running Time or Cycles			NUMBER OF FAILURES			
			Criti- cal	Non- Criti- cal	Total				Criti- cal	Non- Criti- cal	Total	
Turbopump (cont)	456600	Comp. Test	-	-	-	-	S150	-	-	-	-	1
	456797	Comp. Test	-	-	-	-	S300	-	-	-	-	2
		Field Oper	-	-	-	-	-	-	-	-	-	-
		Field Test	-	-	-	-	-	-	-	-	-	-
	453902-21	Eng. Test	-	-	-	-	N.A.	-	-	-	1	N.A.
		Field Oper	-	-	-	-	-	-	-	-	1	N.A.
		Field Test	-	-	-	-	S290	-	-	-	-	1
	453902-31	Comp. Test	-	-	-	-	S290	-	-	-	-	1
		Eng. Test	-	-	-	-	S377	-	-	-	-	2
		Field Oper	-	-	-	-	S99	-	-	-	-	1
453902-41	Field Test	-	-	-	-	-	-	-	-	-	-	
	Comp. Test	S321	-	-	-	-	S2635	-	-	-	1	
	Eng. Test	-	-	-	-	-	-	-	-	-	-	
453902-51	Field Oper	-	-	-	-	-	-	-	-	-	-	
	Field Test	-	-	-	-	-	S578	-	-	-	-	
	Comp. Test	S1887	1	1	2	6	S7543	4	8	12	25	
	Assy-EM	3	-	-	-	2	27	-	3	3	21	
	Eng. Test	S169	-	1	1	2	S6935	-	7	7	24	
Thrust Chamber	Field Oper	-	-	-	-	2	-	-	-	-	22	
	Field Test	S981	-	-	-	4	S997	-	1	1	8	
	Assy-EM	-	-	-	-	-	-	-	-	-	-	
	Eng. Test	-	-	-	-	-	11	-	-	-	12	
	Field Oper	-	-	-	-	-	S610	-	-	-	5	
204710 with 204708	Field Test	-	-	-	-	-	-	-	-	1	8	
	Assy-EM	2	-	-	-	1	41	-	-	-	31	
	Eng. Test	S164	-	-	-	1	S6457	-	-	-	32	
	Field Oper	-	-	-	-	-	-	-	-	-	27	
	Field Test	-	-	-	-	-	S255	-	-	-	2	

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS								
			Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating	Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating					
				Criti- cal	Non- Criti- cal			Total	Criti- cal		Non- Criti- cal	Total			
Thrust Chamber (cont)	201499	Assy-EM	7	●	-	-	5	-	-	-	49	-	-	1	
		Eng. Test Field Oper. Field Test	S1161 - S946	- - -	1 - -	1 - -	5 ● 10	- - -	- - -	- - -	5 2 -	40 43 24	5 2 -	- - -	
	200860	Assy-EM	-	-	-	-	-	-	-	-	1	-	-	1	
		Eng. Test Field Oper	- - -	- - -	- - -	- - -	- - -	- - -	1 - -	187 -	1	2 4	1 1	- -	
	200860-111	Eng. Test Field Oper	- -	- -	- -	- -	- -	- -	- -	- -	- -	1 1	- -	- -	
		Assy-EM	-	-	-	-	-	-	-	-	-	6	-	-	
	200860-121	Eng. Test Field Oper. Field Test	- - S981	- - -	- - -	- - -	- - 2	- - 4	- - -	- - -	- - -	9 3147 -	- - -	- - -	9 19 11
		Assy-EM	4	-	-	-	3	-	-	-	-	19	-	-	16
	202743	Eng. Test Field Oper.	S377 -	- -	1 2	2 -	3 3	- -	- -	- -	- -	S3534 -	- -	5 12	15
		Field Oper.	-	-	-	-	-	-	-	-	-	-	-	-	1
Thrust Chamber Injector	202831-11 204481	Assy-EM	5	-	-	-	4	-	-	-	63	-	-	50	
		Eng. Test Field Oper. Field Test	S997 - S946	- - -	- - -	- - -	4 4 1	- - -	- - -	- - -	S12775 - -	- - -	- - -	42 50 24	
200223 with 200224	200223 with 200224	Assy-EM	3	-	-	-	2	-	-	-	26	-	-	20	
		Eng. Test Field Oper Field Test	S169 - S981	- - -	- - -	- - -	2 2 2	- - -	- - -	- - -	S5550 - -	- - -	- - -	23 15 11	

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS			
			Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating	Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating
				Criti- cal	Non- Criti- cal			Criti- cal	Non- Criti- cal	
Thrust Chamber Injector (cont)	204709 with 204708	Assy-EM	2	•	-	1	41	-	-	31
		Eng. Test	S164	-	-	1	S6447	-	-	32
		Field Oper.	-	-	-	-	-	-	-	27
		Field Test	-	-	-	-	S255	-	-	2
Gas Generator	306965	Comp. Test	-	-	-	-	S590	-	-	1
		Assy-EM	-	•	-	-	-	-	-	-
		Eng. Test	-	-	-	-	-	-	-	-
		Field Oper.	-	-	-	•	-	-	-	-
	307273	Comp. Test	-	-	-	-	-	-	-	-
		Assy-EM	-	-	•	-	3	-	-	3
		Eng. Test	-	-	-	-	-	-	-	-
		Field Oper.	-	-	-	-	-	-	-	38
	306930-11	Field Test	S946	-	-	10	S1669	-	-	24
		Comp. Test	-	-	-	-	S3911	-	-	5
		Assy-EM	-	-	•	-	5	-	-	3
		Eng. Test	S9	-	•	•	S1057	-	-	11
	302675	Field Oper.	-	-	-	2	-	-	-	21
		Field Test	S981	-	-	4	S1389	-	-	11
		Comp. Test	S1936	-	-	10	S5640	-	-	31
		Assy-EM	7	-	2	5	58	-	-	47
	307267	Eng. Test	S1073	-	-	3	S5750	-	-	33
		Field Oper.	-	-	-	1	-	-	-	14
		Comp. Test	S1236	-	1	5	S11,303	-	-	33
		Assy-EM	3	-	-	2	20	-	-	16
		Eng. Test	S159	-	1	2	S5369	-	-	17
		Field Oper.	-	-	-	-	-	-	-	2

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS				
			Running Time or Cycles	NUMBER OF FAILURES			Running Time or Cycles	NUMBER OF FAILURES			
				Criti- cal	Non- Criti- cal	Total		Criti- cal	Non- Criti- cal	Total	
Vernier Engine	350300	Assy-EM	10	-	5	5	65	-	11	11	44
		Eng. Test	S959	-	-	-	S8892	-	2	2	50
		Field Oper	-	-	-	-	-	-	13	13	35
		Field Test	S2056	-	-	-	S3680	-	3	3	18
Solid Propellant Gas Generator	650988-21, -31 651198-11, -31	Field Oper.	-	-	-	-	-	-	1	1	N. A.
		Eng. Test	86	-	-	-	242	-	9	9	226
		Field Oper.	-	-	-	-	N.A.	-	2	2	N. A.
		Eng. Test	24	-	-	-	73	-	1	1	68
Main Fuel or Prop. Util. Valve	651039	Eng. Test	-	-	-	-	2	-	-	-	1
		Field Oper.	-	-	-	-	-	-	-	-	2
		Field Test	-	-	-	-	4	-	-	-	4
		Assy-EM	-	-	-	-	4	-	-	-	6
(P. U. Valve)	403700	Eng. Test	-	-	-	-	36	-	-	-	1
		Field Oper.	-	-	-	-	-	-	-	-	3
		Field Test	-	-	-	-	-	-	-	-	-
		Assy-EM	7	-	-	-	40	-	-	-	21
(P. U. Valve)	404924	Eng. Test	41	-	-	-	112	-	-	-	5
		Field Oper	-	-	-	-	-	-	-	-	43
		Field Test	10	-	-	-	24	-	-	-	24
		Comp. Test	1	-	-	-	1	-	-	-	1
(P. U. Valve)	250736	Assy-EM	-	-	-	-	7	-	-	-	7
		Eng. Test	-	-	-	-	18	-	-	-	4
		Field Oper.	-	-	-	-	-	-	-	-	51
		Field Test	4	-	-	-	12	-	-	-	12

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS			
			Running Time or Cycles	NUMBER OF FAILURES			Running Time or Cycles	NUMBER OF FAILURES		
				Criti- cal	Non- Criti- cal	Total		Criti- cal	Non- Criti- cal	Total
(P. U. Valve) 251254		Comp. Test	3	-	-	-	3	-	-	-
		Assy-EM	3	-	-	-	25	-	2	2
		Eng. Test	2	-	-	-	34	-	1	1
		Field Oper.	-	-	-	-	-	-	1	1
Main LOX or Head 403825 Suppression Valve		Assy-EM	7	-	-	-	62	-	-	-
		Eng. Test	8	-	-	-	357	-	4	4
		Field Oper.	-	-	-	-	-	-	1	1
		Field Test	10	-	-	-	24	-	-	-
251071		Assy-EM	3	-	-	-	17	-	-	-
		Eng. Test	2	-	-	-	46	-	-	-
		Field Oper.	-	-	-	-	-	-	1	1
		Field Test	4	-	-	-	11	-	-	-
250711		Comp. Test	1	-	-	-	1	-	-	-
		Assy-EM	3	-	-	-	27	-	1	1
		Eng. Test	26	-	-	-	48	-	1	1
		Field Oper.	-	-	-	-	-	-	-	-
306289		Field Test	4	-	-	-	11	-	-	-
		Eng. Test	-	-	-	-	6	-	-	-
		Comp. Test	12	-	-	-	47	-	-	-
		Assy-EM	7	-	-	-	60	-	-	-
306828		Eng. Test	84	-	-	-	331	-	-	-
		Field Oper.	-	-	-	-	-	-	-	-
		Field Test	10	-	-	-	24	-	-	-
		Eng. Test	-	-	-	-	2	-	-	-
307175		Field Oper.	2	-	-	-	9	-	-	-
		Field Test	-	-	-	-	-	-	-	-
		Eng. Test	-	-	-	-	-	-	-	-
		Field Oper.	-	-	-	-	-	-	-	-
306812		Field Test	-	-	-	-	-	-	-	-
		Eng. Test	-	-	-	-	-	-	-	-
		Field Oper.	-	-	-	-	-	-	-	-
		Field Test	-	-	-	-	-	-	-	-

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS			
			Running Time or Cycles	NUMBER OF FAILURES			Running Time or Cycles	NUMBER OF FAILURES		
				Criti- cal	Non- Criti- cal	Total		Criti- cal	Non- Criti- cal	Total
IOX Regulator (cont)	306848	Assy-EM	3	-	-	-	37	-	8	8
		Eng. Test	26	-	-	-	106	-	1	1
		Field Oper	-	-	-	-	-	-	1	1
		Field Test	11	-	-	-	1	-	-	-
Hydraulic Control Package	306445	Field Oper.	-	-	-	-	-	-	-	-
		Assy-EM	4	-	-	-	37	-	-	-
		Eng. Test	14	-	-	-	212	-	2	2
		Field Oper.	-	-	-	-	-	-	-	-
NA5-28037	NA5-28037	Field Test	10	-	-	-	24	-	-	-
		Eng. Test	-	-	-	-	38	-	-	-
		Field Oper	-	-	-	-	1	-	-	-
		Field Test	-	-	-	-	-	-	-	-
NA5-28052	NA5-28052	Assy-EM	3	-	-	-	28	-	-	-
		Eng. Test	26	-	-	-	67	-	1	1
		Field Oper.	-	-	-	-	-	-	-	-
		Field Test	4	-	-	-	10	-	-	-
NA5-28089	NA5-28089	Assy-EM	3	-	-	-	21	-	-	-
		Eng. Test	82	-	-	-	157	-	1	1
		Field Oper	-	-	-	-	-	-	-	-
		Field Test	-	-	-	-	-	-	-	-
Head Suppression Controller	250950	Assy-EM	3	-	-	-	27	-	-	-
		Eng. Test	26	-	2	2	114	-	5	5
		Field Oper	-	-	-	-	-	-	-	-
		Field Test	4	-	-	-	11	-	-	-
Prop. Utilizat- ion Controller	NA5-27063T1	Assy-EM	3	-	-	-	17	-	1	1
		Eng. Test	26	-	-	-	114	-	2	2
		Field Oper.	-	-	-	-	-	-	-	-
		Field Test	4	-	-	-	11	-	-	-

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS			
			Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating	Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating
				Criti- cal	Non- Criti- cal			Criti- cal	Total	
Pneumatic Control Assembly	551162	Eng. Test	-	-	-	-	6	-	-	1
		Assy-EM	4	-	-	3	31	-	1	25
		Eng. Test	2	-	-	1	214	-	-	24
		Field Oper	-	-	-	1	-	-	-	27
		Field Test	5	-	-	5	12	-	-	13
(with heat exchanger)	304682	Assy-EM	3	-	-	2	29	-	1	70
		Eng. Test	39	-	-	2	72	-	-	15
		Field Oper	-	-	-	-	-	-	-	28
		Field Test	6	-	-	6	13	-	-	13
		Assy-EM	6	-	-	5	37	-	6	13
Electrical System	500120	Field Oper	5	-	-	N.A.	12	-	-	24
		Field Test	5	-	-	5	-	-	-	12
		Assy-EM	7	-	-	5	51	-	1	52
		Field Oper	-	-	-	N.A.	26	-	-	39
		Field Test	10	-	-	10	-	-	-	25
Other Engine Components	500535-31, -41	Field Oper	-	-	-	N.A.	-	-	1	24
		Field Test	5	-	-	5	13	-	-	9
		Assy-EM	7	-	-	5	51	-	-	52
		Eng. Test	127	-	-	5	382	-	-	47
		Field Oper	-	-	-	N.A.	-	-	-	49
100656	1R89MA-5	Field Test	10	-	-	10	26	-	-	25
		Assy-EM	-	-	-	-	-	-	36	36
		Eng. Test	-	-	-	-	-	-	2	2
100656	100656	Field Oper	-	-	-	-	-	-	4	4

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS			
			Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating	Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating
				Criti- cal	Non- Criti- cal			Criti- cal	Total	
Other Engine Components (cont)	304601	Assy-EM Eng. Test Field Oper.		-	1	1		-	23	23
				-	-	-		-	2	2
				-	-	-		-	3	3
	401501	Assy-EM		-	-	-		-	10	10
	552051	Assy-EM Comp. Test Eng. Test Field Oper.		-	1	1		-	1	1
				-	1	1		-	1	1
				-	-	-		-	1	1
	305845	Field Oper.		-	1	1		-	1	1
	651133	Eng. Test		-	-	-		-	1	1
	<u>1R105NA-5</u>	Assy-EM Eng. Test Field Oper. Field Test	6 36 5	-	-	-	27 114 13	-	-	13 35 14 12
	400120	Assy-EM Eng. Test Field Oper. Field Test		-	1	1		-	11	11
				-	-	-		-	1	1
	601130	Assy-EM Field Oper.		-	-	-		-	4	4
	650566	Field Oper.		-	-	-		-	1	1
	551120	Field Oper.		-	1	1		-	1	1
				-	-	-		-	22	22

TABLE I

Primary Component	Part Number	ENVIRON- MENTAL CONDITIONS	CURRENT MONTH				LAST 6 MONTHS			
			Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating	Running Time or Cycles	NUMBER OF FAILURES		No. of Units Oper- ating
				Criti- cal	Non- Criti- cal			Criti- cal	Total	
Other Engine Components (cont.)	600275	Eng. Test Field Oper.		-	1	1		-	1	1
	5502010	Field Oper.		-	1	1		-	1	1

Table II Failure Listing
Primary Component: TURBOPUMP ASSEMBLY

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class Critical Non-Crit.	FCDR Number
451190-101	Lube Pump MA5-26584	-	Comp. Test	I	00500N
"	"	"	"	X	01203N
"	"	"	"	X	01205N
"	"	"	"	X	01207N
"	LOX Valve	O-ring	"	X	01202N
"	Turbine	Seal	"	X	01204N
453902-51	T/P	"	Comp. Test	X	10290R
"	"	"	"	X	10294R
"	Fuel Coolant MA5-26202 Relief Valve	"	Eng. Test	X	04789R

Table II Failure Listing
Primary Component: THRUST CHAMBER ASSEMBLY

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class Critical Non-Crit.	PCDR Number
201499	Check Valve 407780	-	Eng. Test	X	04794R
202743	Body	Weld	Assy-EM	X	10362R
"	"	Tube	Eng. Test	X	04775R
"	"	"	"	X	12352R

Table II. Failure Listing
Primary Component: THRUST CHAMBER INJECTOR

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class Critical Non-Crit.	FCDR Number
200223	Gasket 7-2357-1PMA	--	Assy-EM	X	10339R

Table II Failure Listing
Primary Component: GAS GENERATOR ASSEMBLY

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class Critical Non-Crit.	FCDR Number
302675	Injector	MS-29513-135	O-ring	Assy-EM	01291N
"	"	"	"	"	01292N
307267	Combustor	306931-16	Comp Test	"	10292R
"	"	"	Eng. Test	"	01792R

Table II Failure Listing
Primary Component: VERNIER ENGINE ASSEMBLY

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class Critical Non-Crit.	FCDR Number
350300	Propellant Valve NA5-26312	-	Assy-EM	X	01181N
350300	Housing 350206-1	-	"	X	01179N
350300	Valve Assy. 305520	Body	"	X	01286N
350300	"	"	"	X	01287N
350300	"	"	"	X	01288N

Table II. Failure Listing
Primary Component: MAIN LOX VALVE AND HEAD SUPPRESSION VALVE

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class Critical Non-Crit.	FCDR Number
403825	M. L. Valve	---	Eng. Test	X	04788R
"	"	---	"	X	04779R
251071	H. S. Valve	Heater	Field Oper.	X	00566F

Table II Failure Listing
Primary Component: GAS GENERATOR BLADE VALVE

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class. Critical Non-Crit.	OFR Number
306289	G.O. Blade Valve	Contaminated	Eng. Test	I	04795R

Table II Failure Listing
Primary Component: HEAD SUPPRESSION CONTROLLER

Primary Component P/N	Failed Component and	P/N	Failed Element	Environmental Conditions	Failure Class. Critical Non-Crit.	OFR Number
250950	H. S. Cont.	--	--	Eng. Test	X	12330R
"	"	--	--	"	X	12353R

Table II Failure Listing
Primary Component: ELECTRICAL SYSTEM

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class. Critical Non-Crit.	OFR Number
500120	Elect. Cable & Harness	Insulation	Assy-EM	X	10334R
"	"	"	"	X	10342R
"	"	"	"	X	10343R

Table II Failure Listing
Primary Component: OTHER ENGINE COMPONENTS

Primary Component P/N	Failed Component and P/N	Failed Element	Environmental Conditions	Failure Class. Critical Non-Crit.	OFFR Number
304601	Gaskets 9627-948444-43	--	Assy-EM	X	01394N
305845	Fuel Tank VD261-0002-0015	Gasket	Field Oper.	X	00565F
400120	Hypergol Assy. 400964	Threads	Field Oper.	X	05323F
"	Seal RD261-3005-0026	--	Assy-EM	X	10344R
551120	Tube Assy. 301759	B-nut	Field Oper.	X	00912F
552051	Bleed Valve 555022	Spring	Component	X	00708N
"	Lube Manifold 552095	Bellows	Assy-EM	X	01387N
600275	Hyd. Cont. Assy 601030	Seal	Eng. Test	X	12329R
"	Flex Assy NA5-26356-5	Weld	Field Oper.	X	00432F
5502010	Tube Assy. 304366	B-nut	"	X	00904F