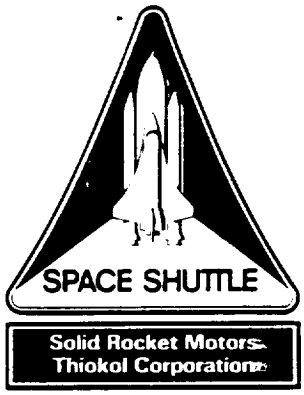

TWR-64563

STS-51, RSRM-033, 360T033 KSC PROCESSING CONFIGURATION AND DATA REPORT

9 December 1993

FINAL

Prepared for:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER
MARSHALL SPACE FLIGHT CENTER, ALABAMA 35812

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Thiokol CORPORATION
SPACE OPERATIONS

PO Box 707, Brigham City, UT 84302-0707 (801) 863-3511

STS-51, RSRM-033
KSC PROCESSING CONFIGURATION AND DATA REPORT

Prepared by:

KSC Operations Office, Launch Support Services
Flow Lead Engineer

Approved by:

Manager, Operations Support

Manager, KSC Operations Office

Manager, Engineering Support

Systems Safety

Quality Engineering

02 Dec 93
Project Engineer

12-13-93
Data Management
ECS NO. SS 4796

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APPENDICES

1.0 INTRODUCTION

KSC Processing Configuration and Data Report is being provided as a historical document and as an enhancement to future RSRM manufacturing and processing operations. The following sections provide information on segment receipt, aft booster build up, motor assembly and closeout for STS-51, RSRM flight set 360T033.

Section 2.0 contains a summary of RSRM-033 processing. Section 3.0 discusses any significant problems or special issues that require special attention.

Sections 4.0 through 6.0 contain narrative descriptions of all key events, including any related processing problems. Appendix A provides Engineering Specifications and Changes. A list and matrix of all Problem Reports (PRs) pertinent to this flight set is provided in Appendix B. The matrix was provided by the Thiokol LSS Quality Engineering office. Copies of the PRs generated during the processing of RSRM-033 will be provided upon request. Appendix C contains the Motor Set Status matrix, which provides milestone dates for the RSRM-033 flow.

Section 7.0 provides recommendations for the improvement of flight hardware processing. Section 8.0 contains data sheets that provide flight hardware parts and consumable information installed during the booster build-up and stacking operations by location, lot/serial number, expiration and cure dates/times, and installation dates.

The postflight recovery and disassembly assessment was performed in accordance with TWR-50050B, KSC Postflight Engineering Evaluation Plan and TWR-60617, Post Flight Hardware Special Issues Report. All the information obtained during recovery and disassembly is documented in TWR-60677, KSC Ten-Day Postflight Hardware Evaluation Report.

2.0 SUMMARY

RSRM-033 flight hardware processing began in the Rotating Process & Surge Facility on February 8, 1993 with the off loading of the RH aft exit cone. The heater functional check out was completed by June 07, 1993. External tank mate was completed June 02 1993. Orbiter mate was completed on June 19, 1993. Roll to pad was accomplished on June 26, 1993. Forward skirt close outs were completed September 02, 1993. Launch took place after four attempts. Fourth and final attempt was successful on September 12, 1993.

3.0 SPECIAL PROBLEMS

The high pressure exit cone joint leak rate was 0.047 sccs. which exceeds the requirement of 0.029 sccs after the initial 30 minute time period and the extended 30 minute time period, ref. PR-AB-BI060L-0001. The trouble shooting and a low pressure deadhead tests were performed with all results nominal. Another high pressure leak test was performed and the leak rate exceeded requirements again at 0.0436 sccs. The port adapter, o-rings and seals were removed and replaced. A third high pressure leak test was performed and failed at 0.0452 sccs. The leak test tubing, port adapter, o-rings and seals were replaced once more, a low pressure dead head test and high pressure volume determination performed nominally. The joint was then pressurized for ultrasonic leak source investigation but no leaks were detected. A fourth high pressure leak test was completed and again exceeded 0.029 sccs at 0.044 sccs.

The leak test equipment was then removed and the aft exit cone assembly was demated from the nozzle. Exit cone mating flanges were photographed and inspected for contamination. Contamination was found across the secondary o-ring at 182 degrees (thought to be a hair), black fiber substances at 37, 48 and 333 degrees in the o-ring grooves and a lint fiber at the 211 degree o-ring groove during the post mate inspections. The contaminants were removed and returned to the plant for analysis.

Thiokol identified the contaminant as a synthetic fiber and believed to be inorganic, not a hair. A replacement o-ring was obtained from logistics and installed. The aft exit cone was then mated and leak checked successfully. The cause of this PR was "environmental damage" damage resulting from exposure to operational or environmental elements. No determination can be made as to how or when the joint was contaminated, but with the current operational controls, the risk of such and occurrence can only be minimized, not eliminated.

After the exit cone was de-mated new inspection steps were performed on the mating surfaces. During the metal parts inspection, raised metal was detected at 46.8 degree bolt hole edge on nozzle flange. This area was reworked on PR AB-BI060L-0002 before continuing mate operations.

Two additional problems were identified which required PR resolutions. The first was fasteners that were miss marked at various locations through out both LH/RH RSRM. MRB approval was granted to accept the improper part marking on the fasteners for use as is, ref PR SB-BI060-0003. Second was pin retainer clip elongation incorrectly checked at 1.0" and S/B at 2.0". MRB approval was granted to use as is, ref PR-SB-BI060-0004.

4.0 SEGMENT/EXIT CONE RECEIPT AND INSPECTION

4.1 Left Hand

4.1.1 Exit Cone

The aft exit cone was received at KSC on 8 Feb 1993 and off-loaded from railcar number UP57961 on 12 Feb 1993. Receiving inspection was completed on 17 Feb 1993.

4.1.2 Aft Segment

The aft segment was received at KSC on 8 Feb 1993 and off-loaded from railcar number UP50024 on 18 Feb 1993. The aft segment was mated to the aft skirt 23 Feb 1993.

4.1.3 Aft Center Segment

The aft center segment was received at KSC on 1 Mar 1993 and off-loaded from railcar number KCS10008 on 19 Mar 1993. Receiving inspection was completed on 23 Mar 1993.

4.1.4 Forward Center Segment

The forward center segment was received at KSC on 1 Mar 1993 and off-loaded from railcar number CSXT600510 on 17 Mar 1993. Receiving inspection was completed on 17 Mar 1993.

4.1.5 Forward Segment

The forward segment was received at KSC on 1 Mar 1993 and off-loaded from railcar number UP50027 on 15 Mar 1993. Receiving inspection was completed on 16 Mar 1993.

4.0 SEGMENT/EXIT CONE RECEIPT AND INSPECTION (continued)

4.2 Right Hand

4.2.1 Exit Cone

The aft exit cone was received at KSC on 1 Mar 1993 and off-loaded from railcar number UP57988 on 8 Feb 1993. Receiving inspection was completed on 9 Feb 1993.

During the receiving inspection there was a scratch identified on the bottom of the o-ring sealing surface at the 291 degree location. The anomaly was removed per SRP B-ST-0001-B, ref. PR SR-EC-60R-018-0001.

4.2.2 Aft Segment

The aft segment was received at KSC on 1 Feb 1993 and off-loaded from railcar number UP50022 on 5 Feb 1993. The aft segment was mated to the aft skirt 9 Feb 1993.

4.2.3 Aft Center

The aft center segment was received at KSC on 9 Mar 1993 and off loaded from railcar number UP50026 on 29 Mar 1993. Receiving inspection was completed on 23 Mar 1993.

During the receiving inspection, there were three PRs generated. The first was a cut identified in the propellant grain aft surface, 210 degree, length .218", width .005", depth .125" ref. PR SR-RAC-60-008-0001. The anomaly was removed per SRP B-ST-0004-0-0. The second PR condition was identified during the ultrasonic inspection. The clevis ultrasonic unbond inspection could not be performed adequately due to extensive rework in the area aft of the pinholes. The rework resulted in a loss of signal throughout the test. A waiver (WK02808R1) to OMRSD B47SGO.051-1 was approved to accept the condition and use as is, ref. PR SR-RAC-60-008-0002. The third PR was contamination in the forward inhibitor at 170 degree location. Contamination was removed using trich and scotch brite, ref: PR SR-RAC-60-008-0003.

4.0 SEGMENT/EXIT CONE RECEIPT AND INSPECTION (continued)

4.2 Right Hand (continued)

4.2.4 Forward Center Segment

The forward center segment was received at KSC on 9 Mar 1993 and off-loaded from railcar number KCS710041 on 26 Mar 1993. Receiving inspection was completed on 30 Mar 1993.

4.2.5 Forward Segment

The forward segment was received at KSC on 9 Mar 1993 and off-loaded from railcar FEC101 on 22 Mar 1993. Receiving inspection was completed on 24 Mar 1993.

5.0 AFT BOOSTER BUILD-UP

5.1 Left Aft Booster

The aft segment was mated to the aft skirt 23 Feb 1993. Processing time was just over three weeks. Booster build was completed 19 Mar 1993.

During the high pressure exit cone leak a PR AB-BI060L-0001 was generated for leak rate exceeding the requirement. The leak rate was 0.047 sccs and should be 0.029 sccs. Contamination was found to be the cause and identified as synthetic fiber and believed to be inorganic, not hair. The joint was mated using a newly obtained o-ring from logistics.

During the remate operations raised metal was noted at the 46.8 degree bolt hole edge of the forward nozzle flange. The nick most likely happened during the demate. The raised metal was removed, ref. PR AB-BI060L-0002.

During the data review of the exit cone leak test it was determined that the 0 degree case RTD was producing incorrect values, therefore resulting in an incorrect leak rate. A recalculation of the high pressure and low pressure leak rates was performed discarding the bad RTD and evaluating the temperatures by averaging the functional RTD values for initial and final temperatures, ref. PR AB-BI060L-0004. These new values satisfy all requirements and specifications, thus no retests were required.

5.0 AFT BOOSTER BUILD-UP (continued)

5.2 Right Aft Booster

The aft segment was mated to the aft skirt 09 Feb 1993. Processing time was just over four weeks. Booster build was completed 09 Mar 1993.

During cable routing of the aft booster build process a PR was generated for not being able to verify cable was water tight at poting compound. After engineering evaluation it was determined that the cable was water tight despite the damage to molding. The cable was MRB approved for "use-as-is" condition, ref PR AB-BI060R-0002.

6.0 SEGMENT ASSEMBLY AND CLOSEOUT

The ASSEMBLY AND CLOSEOUT section is separated into three parts. The mechanical stacking and mating operation (Assembly) and the joint protection system installation (Closeout) and integrated testing and launch.

6.1 Left Hand SRB Assembly

6.1.1 Aft Booster to Aft Center

The aft booster arrived in the VAB on 10 May 1993. The aft segment was placed on the hold down posts on 10 May 1993. The aft center arrived in the VAB on the 11 May 1993 and mated to the aft on the 12 May 1993.

During the mate preps and o-ring installation, contamination was found on the clevis primary o-ring. The o-ring was removed and the groove was cleaned, regreased and a replacement o-ring installed, ref PR-SB-BI060L-0001.

6.1.2 Aft Center to Forward Center

The forward center arrived in the VAB on 13 May 1993. The forward center was mated to the aft center on 14 May 1993.

6.1.3 Forward Center to Forward

The forward arrived in the VAB on 15 May 1993. The forward was mated to the forward center on 16 May 1993.

6.1.4 Forward to Forward Assembly

The forward assembly was mated to the forward on 18 May 1993.

6.1.5 Safe and Arm Device

Safe and Arm device was installed 15 June 1993 and leak checked 17 June 1993.

6.0 SEGMENT ASSEMBLY AND CLOSEOUT (continued)

6.2 Left Hand SRB Closeout

6.2.1 Aft Joint

Leak check was completed on 15 May 1993. Incorrect GSE volumes were used to calculate leak rates. The correct volumes were calculated into the rates and found the leak rates to be acceptable, ref PR SB-BI060L-0002. Heater installation was completed on 19 May 1993. Joint close out was completed on 26 May 1993. Cable installation and heater checkout were completed 28 May 1993.

6.2.2 Center Joint

Leak check was completed on 17 May 1993. Heater installation was completed on 19 May 1993. Joint close out was completed on 22 May 1993. Cable installation and heater checkout were completed 28 May 1993.

6.2.3 Forward Joint

Leak check was completed on 19 May 1993. Low pressure primary/capture leak rate on decay exceeded requirement of between -0.0093 and 0.0082 sccs. Problem was the wrong serial numbered computer Data Acquisition System (DAS), which produced incorrect leak rates. The console was changed out and the problem corrected, ref PR SB-BI060L-0003. Heater installation was completed on 21 May 1993. Joint close out was completed on 25 May 1993. Cable installation and heater checkout were completed 28 May 1993.

6.2.4 Forward Assembly

Field joint protection installation was accomplished without any problems and completed by 24 May 1993.

During the cable routing in the forward skirt, it was noticed that the torque paint was not installed on the igniter heater assembly T-bolt band clamp. The fasteners were loosened, threads cleaned, locking compound applied and torqued to applicable requirements, ref. PR SB-BI060L-0004.

6.2.5 Systems Tunnel

Close out operations were completed without any complications on 21 June 1993.

6.2.6 Engineering Walkdown

Engineering walkdown was completed on 22 June 1993.

6.0 SEGMENT ASSEMBLY AND CLOSEOUT (continued)

6.3 Right Hand SRB Assembly

6.3.1 Aft Booster to Aft Center

The aft booster arrived in the VAB on 16 May 1993. The aft segment was placed on the hold down posts on 17 May 1993. The aft center arrived in the VAB on 18 May 1993 and mated to the aft on 20 May 1993.

6.3.2 Aft Center to Forward Center

The forward center arrived in the VAB on 20 May 1993. The forward center was mated to the aft center on 22 May 1993. Corrosion was identified on the clevis after flight grease was applied, disposition was to remove grease and corrosion and then reapply the flight grease, ref PR SB-BI060R-0002. This was accomplished without any additional problems.

6.3.3 Forward Center to Forward

The forward arrived in the VAB on 24 May 1993. The forward was mated to the forward center on 26 May 1993.

After clevis J-joint abrasion was completed, a small metallic inclusion was seen on the bonding surface. A nylon tool was used to attempt to pry the object out but was not successful. The area was wiped to remove some of the residue from the j-joint abrasion and the object could no longer be found. No measurable depth could be determined after further inspection was performed, ref PR SB-BI060R-0004. Another discrepancy was noted during mate. A nick or abrasion was seen on the secondary o-ring while performing the inspection prior to installation. Another o-ring was obtained and installed into the joint, ref PR SB-BI060R-0005. Discrepant o-ring was returned to plant for evaluation, no defect could be found during analysis.

6.3.4 Forward to Forward Assembly

The forward assembly was mated to the forward on 27 May 1993.

6.3.5 Safe and Arm Device

Safe and Arm device was installed 15 June 1993 and leak checked 17 June 1993.

6.0 SEGMENT ASSEMBLY AND CLOSEOUT (continued)

6.4 Right Hand SRB Closeout

6.4.1 Aft Joint

Leak check was completed on 21 May 1993. Heater installation was completed on 24 May 1993. Joint close out was completed on 01 June 1993. Cable installation was completed 04 June 1993. Heater checkout was completed 07 June 1993.

6.4.2 Center Joint

Leak check was completed on 25 May 1993. Heater installation was completed on 27 May 1993. Joint close out was completed on 28 May 1993. Cable installation was completed 04 June 1993. Heater checkout was completed 07 June 1993.

6.4.3 Forward Joint

Leak check was completed on 27 May 1993. Heater installation was completed on 27 May 1993. Joint close out was completed on 01 June 1993. Cable installation was completed 04 June 1993. Heater checkout was completed 07 June 1993.

6.4.4 Forward Assembly

Field joint protection installation was accomplished without any problems and completed 01 June 1993.

During the cable routing in the forward skirt, it was noticed that the torque paint was not installed on the igniter heater assembly T-bolt band clamp. The fasteners were loosened, threads cleaned, locking compound applied and torqued to applicable requirements, ref. PR SB-BI060R-0006.

6.4.5 Systems Tunnel

Close out operations were completed without any complications 21 June 1993.

6.4.6 Engineering Walkdown

Engineering walkdown was completed 22 June 1993.

6.0 SEGMENT ASSEMBLY AND CLOSEOUT (continued)

6.5 Integrated Testing and Launch

6.5.1 Joint Heater Functional Test

Igniter joint and field joint heaters were successfully tested during the SRB Electrical Check (B5307) on 9 June 1993. The performance of each heater is listed in the following table.

RSRM JOINT HEATER FUNCTIONAL TEST

	Primary			Secondary		
	Max	Max	Max	Max	Max	Max
	Vltg	Crnt	Pwr	Vltg	Crnt	Pwr
Joint	vac	amps	watts	vac	amps	watts
LH						
IGNITER	207.6	2.16	448	206.4	2.14	442
FWD FJ	206.4	15.68	3236	205.2	15.92	3267
CTR FJ	206.4	16.16	3335	205.2	15.84	3250
AFT FJ	206.4	16.32	3368	206.4	16.64	3434
RH						
IGNITER	208.8	2.14	447	207.6	2.14	444
FWD FJ	206.4	16.00	3302	205.2	16.16	3316
CTR FJ	206.4	16.08	3319	206.4	15.60	3220
AFT FJ	208.8	16.32	3408	207.6	15.92	3305

6.5.2 Shuttle Interface Test/Pad Validation Test

During the Shuttle Interface Test (S0008) 21 June 1993 and Pad Validation Test conducted 27 June 1993, all GEI instruments were verified to be operational.

6.5.3 Terminal Countdown Demonstration Test

The Terminal Countdown Demonstration Test (TCDT) was conducted 01 July 1993.

During the TCDT the Operations Pressure Transducer (OPT) B47P2300C1 indicated chamber pressure drop after SRB A and B power-up. The OPT (1U77363-01) was replaced with OPT (1U77363-02). Prime Board MRB approval was granted to use the -02 OPT, ref PR-SB-BI060R-0010.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.3 Terminal Countdown Demonstration Test (continued)

The Operational Pressure Transducer (OPT) 75% Simulation was conducted during the TCDT verifying proper operation of the six (6) transducer. The results are presented in the following table.

MEASUREMENT	75% SIM.	AMBIENT
OPT S/N	ID NUMBER	psia	psia
LH			
266	B47P1300C	759.8	12.6
269	B47P1301C	753.8	4.6
274	B47P1302C	761.8	10.6
RH			
287	B47P2300C	763.8	16.6
292	B47P2301C	761.8	12.6
295	B47P2302C	759.8	8.6

The OMRSD limits are: 75% Sim. 729 to 799 psia.
Ambient -7 to 33 psia.

The joint heaters were operated during TCDT to verify their operation with pad electrical services. All voltage and current readings were similar to those experienced during electrical checkout in the VAB. The amount of time the heater were powered up is listed in the following table.

Heater Location	Primary HR:MIN	Secondary HR:MIN
Igniters	1:00	1:46
Field Joints	1:00	1:45

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.4 Ordinance Installation

Due to countdown scrubs and aborts it became necessary to perform the ordnance installation procedure on four occasions, 11 July, 21 July, 30 July, and 1 September. During the ordnance installation procedure (S5009) the Safe and Arm (S&A) devices were verified as operational by rotating each device from safe to armed and from armed back to safe (10) times.

The results of this verification are listed in the table below and indicate that all rotations were within the 2 second maximum rotation time requirement.

11 July	LH S&A S/N 003		RH S&A S/N 005	
ROTATION	ARM	SAFE	ARM	SAFE
1	0.857	0.937	0.699	0.817
2	0.817	0.737	0.697	0.817
3	0.897	0.897	0.777	0.777
4	0.737	0.737	0.817	0.817
5	0.897	0.776	0.777	0.817
6	0.696	0.896	0.776	0.776
7	0.816	0.896	0.695	0.776
8	0.696	0.897	0.776	0.777
9	0.816	0.777	0.696	0.857
10	0.817	0.777	0.857	0.857

21 July	LH S&A S/N 003		RH S&A S/N 005	
ROTATION	ARM	SAFE	ARM	SAFE
1	0.908	0.789	0.789	0.869
2	0.869	0.789	0.749	0.868
3	0.908	0.749	0.789	0.829
4	0.909	0.869	0.749	0.749
5	0.749	0.869	0.828	0.709
6	0.908	0.869	0.828	0.709
7	0.828	0.868	0.708	0.708
8	0.788	0.788	0.868	0.868
9	0.788	0.748	0.868	0.827
10	0.829	0.909	0.709	0.789

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.4 Ordinance Installation (continued)

The results of this verification are listed in the table below and indicate that all rotations were within the 2 second maximum rotation time requirement.

30 July	LH S&A S/N 003		RH S&A S/N 005	
ROTATION	ARM	SAFE	ARM	SAFE
1	0.826	0.846	0.707	0.829
2	0.747	0.787	0.827	0.867
3	0.907	0.747	0.786	0.827
4	0.746	0.747	0.827	0.827
5	0.746	0.866	0.827	0.747
6	0.746	0.866	0.827	0.747
7	0.746	0.747	0.827	0.826
8	0.827	0.747	0.707	0.826
9	0.707	0.866	0.787	0.746
10	0.866	0.866	0.747	0.747

1 September	LH S&A S/N 003		RH S&A S/N 005	
ROTATION	ARM	SAFE	ARM	SAFE
1	0.907	0.907	0.786	0.787
2	0.867	0.787	0.747	0.867
3	0.746	0.786	0.827	0.887
4	0.827	0.827	0.867	0.707
5	0.868	0.747	0.747	0.787
6	0.746	0.907	0.827	0.787
7	0.787	0.867	0.886	0.747
8	0.827	0.867	0.701	0.827
9	0.707	0.906	0.787	0.787
10	0.787	0.867	0.867	0.747

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch

The countdown to launch on 17 July was scrubbed at T-20 minutes due to a SRB hold down post PIC switch failure. The countdown was restarted at T-11 hours for a 24 July launch. This launch attempt was scrubbed at T-19 seconds due to a failure of the LH SRB APU. The countdown was started a third time at T-72 hours for a 12 August launch. This attempt was aborted at T-3 seconds when a fuel flow sensor on main engine # 2 failed to indicate proper fuel flow. The main engines were replaced and the countdown started a forth time at T-72 hours for a 12 September launch. Discovery was successfully launched 12 September at 7:45 am EDT.

The prediction of the Propellant Mean Bulk Temperature (PMBT) for the 17 July launch prepared at L-9 days was 82 degrees fahrenheit, and at L-2 days and L-24 hours was 82 degrees fahrenheit. The prediction of the Propellant Mean Bulk Temperature (PMBT) for the 24 July launch prepared at L-2 days and L-24 hours was 84 degrees fahrenheit. The prediction of the Propellant Mean Bulk Temperature (PMBT) for the 12 August launch prepared at L-7 days was 84 degrees fahrenheit, and at L-2 days and L-24 hours was 85 degrees fahrenheit. The prediction of the Propellant Mean Bulk Temperature (PMBT) for the 12 September launch prepared at L-9 days was 82 degrees fahrenheit, and at L-2 days and L-24 hours was 81 degrees fahrenheit. The post flight assessment indicates the actual PMBT at the time of launch was 80 degrees fahrenheit.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #1

At approximately L-18.5 hours the igniter heaters were powered up. The field joint heaters were powered up at approximately L-11.5 hours. All heaters operated properly on their primary circuits providing operational temperature ranges of 96-101 degrees fahrenheit at the igniter joint sensors and 91-110 degrees fahrenheit at the field joint sensors. The maximum voltage supplied to the heater was 221.2 V. The ICD requirement is 208 V. nominal with limits of 191 to 225 V. The power statistics for each heater are listed in the following table.

	Primary			Secondary		
	Max	Max	Max	Max	Max	Max
	Vltg	Crnt	Pwr	Vltg	Crnt	Pwr
Joint	vac	amps	watts	vac	amps	watts
LH						
IGNITER	210.0	2.18	458	Secondary circuits		
FWD FJ	207.6	15.60	3239	not used.		
CTR FJ	202.3	15.28	3322			
AFT FJ	208.8	16.32	3408			
RH						
IGNITER	211.0	2.14	451	Secondary circuits		
FWD FJ	207.6	15.68	3302	not used.		
CTR FJ	207.6	15.68	3355			
AFT FJ	210.0	15.16	3355			

The igniter heaters were activated at 197:18:49 GMT (07-16-93, 14:49 EDT), and were deactivated following the countdown scrub at 198:14:18 GMT (07-17-93, 10:18 EDT). The total activation time was 19 hours and 19 minutes, and power was applied to the heating elements an average of 28% of that time after the initial warm up. The field joint heaters were activated at 198:01:54 GMT (07-16-93, 21:54 EDT), and were deactivated after the scrub at 198:14:18 GMT (07-17-93, 10:18 EDT). The total activation time was 12 hours and 24 minutes, and power was applied to the heating elements an average of 17% of the time after the initial warm up.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #1 (continued)

MEASUREMENT	75% SIM.	AMBIENT
OPT S/N	ID NUMBER	psia	psia
LH			
266	B47P1300C	759.8	10.6
269	B47P1301C	753.8	2.6
274	B47P1302C	763.8	12.6
RH			
287	B47P2300C	769.8	16.6
292	B47P2301C	759.8	12.6
295	B47P2302C	759.8	8.6

The OMRSD limits are: 75% Sim. 729 to 799 psia.
Ambient -7 to 33 psia.

The countdown was scrubbed at T-20 minutes. The S&A's were not rotated.

Countdown #2

At approximately L-18 hours the igniter heaters were powered up. The field joint heaters were powered up at approximately L-11.5 hours. All heaters operated properly on their primary circuits providing operational temperature ranges of 97-101 degrees fahrenheit at the igniter joint sensors and 91-107 degrees fahrenheit at the field joint sensors. The maximum voltage supplied to the heater was 211.2 V. The ICD requirement is 208 V. nominal with limits of 191 to 225 V. The power statistics for each heater are listed in the following table.

	Primary			Secondary		
	Max Vltg	Max Crnt	Max Pwr	Max Vltg	Max Crnt	Max Pwr
Joint	vac	amps	watts	vac	amps	watts
LH						
IGNITER	211.2	2.18	460	Secondary circuits not used.		
FWD FJ	208.6	15.68	3239			
CTR FJ	208.8	16.00	3324			
AFT FJ	210.0	16.24	3410			

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #2 (continued)

Joint	Primary Max Vltg vac	Max Crnt amps	Max Pwr watts	Secondary Max Vltg vac	Max Crnt amps	Max Pwr watts
RH IGNITER	211.2	2.18	460	Secondary circuits not used.		
FWD FJ	208.8	16.16	3355			
CTR FJ	208.8	16.00	3302			
AFT FJ	210.0	16.24	3391			

The igniter heaters were activated at 204:19:14 GMT (07-23-93, 15:14 EDT), and were deactivated at the end of the T-9 minute hold which was 205:13:18 GMT (07-24-93, 09:18 EDT). The total activation time was 18 hours and 04 minutes, and power was applied to the heating elements an average of 31% of that time after the initial warm up. The field joint heaters were activated at 205:01:52 GMT (07-23-93, 21:52 EDT), and were deactivated at about T-1 minute which was 205:13:27 GMT (07-24-93, 09:27 EDT). The total activation time was 11 hours and 35 minutes, and power was applied to the heating elements an average of 19% of the time after the initial warm up.

At about T-1.5 hr in the countdown to OPT 75% SIM was conducted. All OPT readings were within required limits as shown below.

MEASUREMENT	75% SIM.	AMBIENT
OPT S/N	ID NUMBER	psia	psia
LH			
266	B47P1300C	759.8	10.6
269	B47P1301C	753.8	4.6
274	B47P1302C	761.8	12.6
RH			
287	B47P2300C	761.8	14.6
292	B47P2301C	761.8	12.6
295	B47P2302C	759.8	8.6

The OMRSD limits are: 75% Sim. 729 to 799 psia.
Ambient -7 to 33 psia.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #2 (continued)

The Safe and Arm devices were successfully rotated to armed at T-5 minutes then rotated back to safe immediately following the countdown scrub.

Left Hand	Arm	0.89	Safe	0.81
Right Hand	Arm	0.93	Safe	0.81

The countdown scrub was scrubbed at T-19 seconds.

Countdown #3

At approximately L-18 hours the igniter heater were powered up. The field joint heater were powered up at approximately L-11.5 hours. All heaters operated properly on their primary circuits, except the left aft heater which experienced at controller problem and was operated on the secondary circuit. The heaters provided operational temperature ranges of 97-101 degrees fahrenheit at the igniter joint sensors and 93-106 degrees fahrenheit at the field joint sensors. The maximum voltage supplied to the heater was 210.0 V. The ICD requirement is 208 V. nominal with limits of 191 to 225 V. The power statistics for each heater are listed in the following table.

	Primary			Secondary		
	Max Vltg	Max Crnt	Max Pwr	Max Vltg	Max Crnt	Max Pwr
Joint	vac	amps	watts	vac	amps	watts
LH						
IGNITER	210.0	2.14	455			
FWD FJ	208.8	16.00	3286			
CTR FJ	208.8	16.32	3371			
AFT FJ				208.8	16.643454	
RH						
IGNITER	210.0	2.16	454	Secondary circuits		
FWD FJ	208.8	15.84	3291	not used.		
CTR FJ	208.8	16.00	3341			
AFT FJ	210.0	16.32	3408			

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #3 (continued)

The igniter heaters were activated at 223:18:58 GMT (08-12-93, 14:58 EDT), and were deactivated at the end of the T-9 minute hold which was 224:13:01 GMT (08-12-93, 09:01 EDT). The total activation time was 18 hours and 03 minutes, and power was applied to the heating elements an average of 33% of that time after the initial warm up. The field joint heaters were activated at 224:01:43 GMT (08-12-93, 21:43 EDT), and were deactivated at about T-1 minute which was 224:13:12 GMT (08-12-93, 09:12 EDT). The total activation time was 11 hours and 29 minutes, and power was applied to the heating elements an average of 18% of the time after the initial warm up.

IPR 51V-109 was written describing the left aft heater activation problem and was assigned to Lockheed MLP/GSE for disposition. The problem was in the MLP control panel interface for the heaters.

At about T-1.5 hr in the countdown to OPT 75% SIM was conducted. All OPT readings were within required limits as shown below.

MEASUREMENT	75% SIM.	AMBIENT
OPT S/N	ID NUMBER	psia	psia
LH			
266	B47P1300C	759.8	12.6
269	B47P1301C	753.8	4.6
274	B47P1302C	761.8	10.6
RH			
287	B47P2300C	763.8	16.6
292	B47P2301C	761.8	12.6
295	B47P2302C	759.8	8.6

The OMRSD limits are: 75% Sim. 729 to 799 psia.
Ambient -7 to 33 psia.

The Safe and Arm devices were successfully rotated to armed at T-5 minutes then rotated back to safe immediately following the main engine shutdown and launch abort.

Left Hand	Arm	0.85	Safe	0.89
Right Hand	Arm	0.93	Safe	0.89

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #3 (continued)

The launch was aborted T-3 seconds.

Following the launch abort, the left aft heater controller was changed out and the heater functionality test was rerun. All heaters performed properly on both primary and secondary circuits.

Lightning struck the water tower or near the water tower on 9 September 1993 which caused damaged to some pad electrical systems. Several systems were retested to ensure the integrity of the circuitry, including the joint heating system, OPT's and GEI instrumentation. Another heater functionality test was conducted verifying that no damage was sustained within the joint heating system. All instrumentation was verified as operational.

Countdown #4

At approximately T-27 hours the option to rotated the S&A's was exercised due to uncertainties expressed since the lightning strike. The S&A's were rotated from safe to armed and armed back to safe on time. The times for S&A rotation to armed are as follows:

Left Hand	Arm	0.79	Safe	0.75
Right Hand	Arm	0.87	Safe	0.83

At approximately L-18 hours the igniter heater were powered up. The field joint heater were powered up at approximately L-11.5 hours. All heaters operated properly on their primary circuits providing operational temperature ranges of 97-101 degrees fahrenheit at the igniter joint sensors and 91-106 degrees fahrenheit at the field joint sensors. The maximum voltage supplied to the heater was 210.0 V. The ICD requirement is 208 V. nominal with limits of 191 to 225 V. The power statistics for each heater are listed in the following table.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #4 (continued)

Joint	Primary Max Vltg vac	Max Crnt amps	Max Pwr watts	Secondary Max Vltg vac	Max Crnt amps	Max Pwr watts
LH						
IGNITER	210.0	2.18	455	Secondary circuits		
FWD FJ	208.8	15.68	3239	not used.		
CTR FJ	208.8	16.16	3335			
AFT FJ	210.0	16.24	3491			
RH						
IGNITER	210.0	2.18	455	Secondary circuits		
FWD FJ	207.6	16.16	3335	not used.		
CTR FJ	207.6	15.76	3255			
AFT FJ	210.0	16.24	3391			

The igniter heaters were activated at 254:17:31 GMT (09-12-93 13:31 EDT), and were deactivated at the end of the T-9 minute hold which was 255:11:36 GMT (09-12-93 07:36 EDT). The total activation time was 18 hours and 1 minutes, and power was applied to the heating elements an average of 35% of that time after the initial warm up. The field joint heaters were activated at 255:00:15 GMT (09-12-93 21:15 EDT), and were deactivated at about T-1 minutes which was 255:11:45 GMT (09-12-93 07:45 EDT). The total activation time was 11 hours and 30 minutes, and power was applied to the heating elements an average of 21% of the time after the initial warm up.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #4 (continued)

At about T-1.5 hr in the countdown to OPT 75% SIM was conducted. All OPT readings were within required limits as shown below.

MEASUREMENT	75% SIM.	AMBIENT
OPT S/N	ID NUMBER	psia	psia
LH			
266	B47P1300C	759.8	10.6
269	B47P1301C	753.8	2.6
274	B47P1302C	761.8	12.6
RH			
287	B47P2300C	763.8	14.6
292	B47P2301C	761.8	12.6
295	B47P2302C	759.8	8.6

The OMRSD limits are: 75% Sim. 729 to 799 psia.
Ambient -7 to 33 psia.

The S&A rotation times at T-5 minutes were:

Left Hand S&A 0.97 Right Hand S&A 0.85

The Nozzle/Case Joint temperature ranged from 78 to 83 degrees fahrenheit during the LCC time period. The Flex Bearing Mean Bulk Temperature (FBMBT) at the time of launch was 81 degrees fahrenheit. The Aft Skirt GN2 purge was initiated at 254:22:30 GMT (09-11-93 18:30 EDT) at high temperature, low flow for 31 minutes to verify proper purge operation. The purge was again initiated at 255:11:20 GMT (09-12-93), successfully T-15 minutes, using high flow rate and high temperature to perform the aft skirt hydrazine cleansing purge. Total aft skirt purge activation time was approximately 56 minutes.

The case acreage temperatures for the LCC instruments located at 270 degrees ranged from 74 to 80 degrees fahrenheit.

6.0 MOTOR ASSEMBLY AND CLOSEOUT (continued)

6.5 Vehicle Integration Operations (continued)

6.5.5 Countdown To Launch (continued)

Countdown #4 (continued)

The ambient temperature was 71 to 75 degrees fahrenheit during the Terminal countdown and was 73 degrees fahrenheit at launch.

There were no Launch Commit Criteria (LCC) violations from RSRM hardware during the countdown activities.

STS-51 was successfully launched on Sunday, 12 September 1993, at 255:11:45:00.007 GMT which was 0745 hours EDT.

7.0 RECOMMENDATIONS

No recommendations are made at this time.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA

RSRM: 033 BIO: 60 STS: 58

8.1 Date Segments Received at KSC

		AFT	AFT CENTER	FWD CENTER	FORWARD
LH:	DATE	08FEB93	01MAR93	11MAR93	01MAR93
	P/N:	1U76757-10	1U76792-05	1U76791-05	1U76790-13
	S/N:	0000001	0000008	0000008	0000008
R/R CAR #		UP50024	KCS710008	CSXT600510	UP50027
RH:	DATE	01MAR93	09MAR93	09MAR93	09MAR93
	P/N:	1U76958-11	1U76792-06	1U76791-06	1U76790-14
	S/N:	0000001	0000008	0000008	0000014
R/R CAR #		UP50022	UP50026	KCS710041	FEC101

8.2 Segment Offload Dates

LH:	18FEB93	19MAR93	17MAR93	15MAR93
RH:	08MAR93	14APR93	26MAR93	22MAR93

8.3 Date Exit Cone Received at KSC

	DATE	PART NO.	SERIAL NO.	R/R CAR #
LH:	08FEB93	1U76970-01	0000017	UP57961
RH:	01MAR93	1U76970-02	0000018	UP57988

8.4 Offload Date of Exit Cone

LH: 12FEB93 RH: 08MAR93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.5 Mate Aft Segment to Aft Skirt (LH/RH)

LH AFT

	PART NO.	SERIAL NO.	DATE
	1U76957-01	0000001	23FEB93

ITEM	PART NO.	LOT NO.	QTY
PINS	1U51055-02	ECL-0006 ECL-0003	176 1

LOCATION	DATE	TIME	DEGREE
FIRST PIN:	23FEB93	03:30	290
LAST PIN:	23FEB93	03:45	110

AFT SEGMENT/SKIRT CLOSEOUT:

ITEM	PART NO.	SERIAL/LOT NUMBER
FIELD JOINT KIT (STRAP)	1U75345-07	0000181
INSULATOR	1U50746-03	0141
ADHESIVE	STW5-3837	0023

RH AFT

	PART NO.	SERIAL NO.	DATE
	1U76958-11	0000001	09MAR93

ITEM	PART NO.	LOT NO.	QTY
PINS	1U51055-02	ECL-0001 ECL-0003/0006	84 79/14

LOCATION	DATE	TIME	DEGREE
FIRST PIN:	09MAR93	23:00	36
LAST PIN:	09MAR93	23:21	196

AFT SEGMENT/SKIRT CLOSEOUT:

ITEM	PART NO.	SERIAL/LOT NUMBER
FIELD JOINT KIT (STRAP)	1U75345-07	0000165
INSULATOR	1U50746-03	ECL-0140
ADHESIVE	STW5-3837	ECL-0024

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.6 LH Stiffener Ring Installation

LOCATION	PART NO.	SERIAL/LOT NUMBER	DATE
FWD RING, INSUL	1U52501-01	0000314	24FEB93
FWD RING	1U52502-04	0000257	24FEB93
FWD RING, INSUL	1U52501-04	0000213	24FEB93
FWD RING	1U52502-07	0000244	24FEB93
FWD RING, INSUL	1U52501-05	0000213	24FEB93
FWD RING	1U52502-08	0000243	24FEB93
BOLT	1U52510-01	ECL-0016	24FEB93
MID RING, INSUL	1U52501-01	0000313	24FEB93
MID RING	1U52502-04	0000258	24FEB93
MID RING, INSUL	1U52501-04	0000212	24FEB93
MID RING	1U52502-07	0000245	24FEB93
MID RING, INSUL	1U52501-05	0000212	24FEB93
MID RING	1U52502-08	0000244	24FEB93
BOLT	1U52510-01	ECL-0016/0021 164/13 ea	24FEB93
AFT RING, INSUL	1U52501-01	0000316	24FEB93
AFT RING	1U52502-04	0000259	24FEB93
AFT RING, INSUL	1U52501-04	0000215	24FEB93
AFT RING	1U52502-07	0000246	24FEB93
AFT RING, INSUL	1U52501-05	0000215	24FEB93
AFT RING	1U52502-08	0000245	24FEB93
BOLT	1U52510-01	ECL-0016	24FEB93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.7 RH Stiffener Ring Installation

LOCATION	PART NO.	SERIAL/LOT NUMBER	DATE
FWD RING, INSUL	1U52501-01	0000317	15MAR93
FWD RING	1U52502-04	0000243	15MAR93
FWD RING, INSUL	1U52501-04	0000216	15MAR93
FWD RING	1U52502-07	0000230	15MAR93
FWD RING, INSUL	1U52501-05	0000217	15MAR93
FWD RING	1U52502-08	0000232	15MAR93
BOLT	1U52510-01	ECL-0010/0016	15MAR93
MID RING, INSUL	1U52501-01	0000315	15MAR93
MID RING	1U52502-04	0000253	15MAR93
MID RING, INSUL	1U52501-04	0000214	15MAR93
MID RING	1U52502-07	0000241	15MAR93
MID RING, INSUL	1U52501-05	0000214	15MAR93
MID RING	1U52502-08	0000234	15MAR93
BOLT	1U52510-01	ECL-0016	15MAR93
AFT RING, INSUL	1U52501-01	0000318	15MAR93
AFT RING	1U52502-04	0000246	15MAR93
AFT RING, INSUL	1U52501-04	0000217	15MAR93
AFT RING	1U52502-07	0000233	15MAR93
AFT RING, INSUL	1U52501-05	0000216	15MAR93
AFT RING	1U52502-08	0000250	15MAR93
BOLT	1U52510-01	ECL-0016	15MAR93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.8 LH Splice Plate Installation

FORWARD STIFFENER RING

ITEM	LOCATION	PART NO.	SERIAL/LOT NO.
PLATE	210	1U52508-01	0000580
BOLT, SHOULDER	210	1U52734-02	ECL-0023
PLATE	330	1U52508-01	0000581
BOLT, SHOULDER	330	1U52734-02	ECL-0023
SPLICE PLATE	210	1U52506-02	0000589
BOLT, SHOULDER	210	1U52734-03	ECL-0012
SPLICE PLATE	330	1U52506-02	0000585
BOLT, SHOULDER	330	1U52734-03	ECL-0012
SPLICE PLATE	90	1U52506-03	0000198
BOLT, SHOULDER	90	1U52734-04	ECL-0005
ADAPT PLATE, UPPER	90	1U77164-01	0000214
ADAPT PLATE, LOWER	90	1U77164-01	0000215
BOLT, SHOULDER	90	1U52734-01	ECL-0014

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.8 LH Splice Plate Installation (continued)

CENTER STIFFENER RING

ITEM	LOCATION	PART NO.	SERIAL/LOT NO.
PLATE	210	1U52508-01	0000582
BOLT, SHOULDER	210	1U52734-02	ECL-0023
PLATE	330	1U52508-01	0000584
BOLT, SHOULDER	330	1U52734-02	ECL-0023
SPLICE PLATE	210	1U52506-02	0000586
BOLT, SHOULDER	210	1U52734-03	ECL-0012
SPLICE PLATE	330	1U52506-02	0000582
BOLT, SHOULDER	330	1U52734-03	ECL-0012
SPLICE PLATE	90	1U52506-03	0000199
BOLT, SHOULDER	90	1U52734-04	ECL-0005
ADAPT PLATE, UPPER	90	1U77164-01	0000213
ADAPT PLATE, LOWER	90	1U77164-01	0000212
BOLT, SHOULDER	90	1U52734-01	ECL-0004

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.8 LH Splice Plate Installation (continued)

AFT STIFFENER RING

ITEM	LOCATION	PART NO.	SERIAL/LOT NO.
PLATE	210	1U52508-01	0000579
BOLT, SHOULDER	210	1U52734-02	ECL-0023
PLATE	330	1U52508-01	0000583
BOLT, SHOULDER	330	1U52734-02	ECL-0023
SPLICE PLATE	210	1U52506-02	0000583
BOLT, SHOULDER	210	1U52734-03	ECL-0012
SPLICE PLATE	330	1U52506-02	0000581
BOLT, SHOULDER	330	1U52734-03	ECL-0012
SPLICE PLATE	90	1U52506-03	0000197
BOLT, SHOULDER	90	1U52734-04	ECL-0005
ADAPT PLATE, UPPER	90	1U77164-01	0000216
ADAPT PLATE, LOWER	90	1U77164-01	0000217
BOLT, SHOULDER	90	1U52734-01	ECL-0014

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.9 RH Splice Plate Installation

FORWARD STIFFENER RING

ITEM	LOCATION	PART NO.	SERIAL/LOT NO.
PLATE	210	1U52508-01	0000609
BOLT, SHOULDER	210	1U52734-02	ECL-0023
PLATE	330	1U52508-01	0000608
BOLT, SHOULDER	330	1U52734-02	ECL-0023
SPLICE PLATE	210	1U52506-02	0000584
BOLT, SHOULDER	210	1U52734-03	ECL-0005
SPLICE PLATE	330	1U52506-02	0000592
BOLT, SHOULDER	330	1U52734-03	ECL-0005
SPLICE PLATE	90	1U52506-03	0000211
BOLT, SHOULDER	90	1U52734-04	ECL-0001
ADAPT PLATE, UPPER	90	1U77164-01	0000219
ADAPT PLATE, LOWER	90	1U77164-01	0000211
BOLT, SHOULDER	90	1U52734-01	ECL-0014

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.9 RH Splice Plate Installation (continued)

CENTER STIFFENER RING

ITEM	LOCATION	PART NO.	SERIAL/LOT NO.
PLATE	210	1U52508-01	0000607
BOLT, SHOULDER	210	1U52734-02	ECL-0023
PLATE	330	1U52508-01	0000586
BOLT, SHOULDER	330	1U52734-02	ECL-0023
SPLICE PLATE	210	1U52506-02	0000590
BOLT, SHOULDER	210	1U52734-03	ECL-0005
SPLICE PLATE	330	1U52506-02	0000587
BOLT, SHOULDER	330	1U52734-03	ECL-0005
SPLICE PLATE	90	1U52506-03	0000212
BOLT, SHOULDER	90	1U52734-04	ECL-0001
ADAPT PLATE, UPPER	90	1U77164-01	0000221
ADAPT PLATE, LOWER	90	1U77164-01	0000210
BOLT, SHOULDER	90	1U52734-01	ECL-0014

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.9 RH Splice Plate Installation (continued)

AFT STIFFENER RING

ITEM	LOCATION	PART NO.	SERIAL/LOT NO.
PLATE	210	1U52508-01	0000585
BOLT, SHOULDER	210	1U52734-02	ECL-0023
PLATE	330	1U52508-01	0000610
BOLT, SHOULDER	330	1U52734-02	ECL-0023
SPLICE PLATE	210	1U52506-02	0000588
BOLT, SHOULDER	210	1U52734-03	ECL-0005
SPLICE PLATE	330	1U52506-02	0000591
BOLT, SHOULDER	330	1U52734-03	ECL-0005
SPLICE PLATE	90	1U52506-03	0000200
BOLT, SHOULDER	90	1U52734-04	ECL-0001
ADAPT PLATE, UPPER	90	1U77164-01	0000218
ADAPT PLATE, LOWER	90	1U77164-01	0000220
BOLT, SHOULDER	90	1U52734-01	ECL-0004

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.10 Exit Cone Installation (LH/RH)

LH: First mate

ITEM	PART NO.	SERIAL/LOT NO.	DATE	EXP DATE
EXIT CONE	1U76970-01	0000017	25/FEB93	N/A
GREASE	1U51916-09	ECL-0072	24FEB93	20AUG94
O-RING, PRI	1U75801-03	0000374	*25FEB93	02AUG93
O-RING, SEC	1U75801-04	0000374	*25FEB93	26MAR93
Backfill RTV	STW5-2813	ECL- N/A	N/A	N/A
BOLT	1U75756-10	ECL-0019	25FEB93	N/A

REMARKS: During the high pressure leak check there was a failure rate of 0.0427 sccs. Maximum allowable is 0.029 sccs. Demate was required.

RH:

ITEM	PART NO.	SERIAL/LOT NO.	DATE	EXP DATE
EXIT CONE	1U76970-02	0000018	23MAR93	N/A
GREASE	1U51916-09	ECL-0075	23MAR93	10MAR95
O-RING, PRI	1U75801-03	0000375	*23MAR93	04AUG93
O-RING, SEC	1U75801-04	0000374	*23MAR93	05SEP93
STW5-2813	MIL-S-8802	ECL-0171	24MAR93	15AUG93
BOLT	1U75756-10	ECL-0020	23MAR93	N/A

*REMARKS: The o-ring expiration dates represent that of a lubricated o-ring and not the o-ring itself.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.10 Exit Cone Installation (LH/RH) (continued)

LH: Second mate

ITEM	PART NO.	SERIAL/LOT NO.	DATE	EXP DATE
EXIT CONE	1U76970-01	0000017	25/FEB93	N/A
GREASE	1U51916-09	ECL-0072	24FEB93	20AUG94
O-RING, PRI	1U75801-03	0000373	*03MAR93	16MAR93
O-RING, SEC	1U75801-04	0000371	*03MAR93	02AUG93
Backfill RTV	STW5-2813	ECL-0166	04MAR93	04MAR93
BOLT	1U75756-10	ECL-0019	25FEB93	N/A

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.11 Exit Cone Leak Check (LH/RH)

LH DATE: 04 MAR 93

PRIMARY TO		ALLOWED	ACTUAL RATE
SECONDARY	83 PSIG DECAY LEAK RATE	.029	0.001922 SCCS
CAVITY	30 PSIG DECAY LEAK RATE	.0082	0.00053 SCCS

P/S PRINTOUT PLACED IN DATA BOOK BY: B. Hillard

270 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U50159-02	ECL-0019
O-RING	1U50228-25	ECL-0068
GREASE	1U51916-09	ECL-0072

270 DEGREE PLUG INSTALLATION VERIFIED BY: Bob Hillard

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RH DATE: 24 MAR 93

PRIMARY TO		ALLOWED	ACTUAL RATE
SECONDARY	83 PSIG DECAY LEAK RATE	.029	0.002025 SCCS
CAVITY	30 PSIG DECAY LEAK RATE	.0082	0.000381 SCCS

P/S PRINTOUT PLACED IN DATA BOOK BY: T. White

270 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U50159-02	ECL-0019
O-RING	1U50228-25	ECL-0068
GREASE	1U51916-09	ECL-0075

270 DEGREE PLUG INSTALLATION VERIFIED BY: T. White

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.12 LH Field Joint Mate

LH AFT FIELD JOINT MATE

AFT BOOSTER CLEVIS DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10 MAR 95	12 MAY 93,04:30
O-RING, PRI	1U75801-01	**0001248	*08 JAN 93	12 MAT 93,09:46
O-RING, SEC	1U75801-01	0001239	*14 JUL 93	12 MAY 93,17:00
J-SEAL ADH.	STW5-3479	ECL-0040	02 SEP 93	12 MAY 93,11:25

**REMARKS: PR-SB-BI060L-0001 Contamination found on primary o-ring at approx. 120 degrees and replaced. (J-seal adhesive STW5-3479. Contaminated o-ring serial number 0001224)

AFT CENTER TANG DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10 MAR 95	12 MAY 93,05:30
V-2 FILLER	STW3-3353	ECL-0019	N/A	12 MAY 93,07:20
O-RING, CAP	1U75801-02	0000522	*03 AUG 93	12 MAY 93,08:00
J-SEAL ADH.	STW5-3479	ECL-0040	02 SEP 93	12 MAY 93,09:15

* REMARKS: The o-ring expiration dates represent that of a lubricated o-ring and not the o-ring itself.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.12 LH Field Joint Mate (continued)

LH AFT FIELD JOINT MATE (continued)

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-12	ECL-0016	36
		ECL-0001	59
		ECL-0008	8
		ECL-0007	2
		ECL-0004	55
		ECL-0002	17

	DATE	TIME	DEGREE LOCATION
FIRST PIN:	12 MAY 93	22:46	184
LAST PIN:	12 MAY 93	23:00	298

ITEM	PART NO.	LOT NUMBER	QTY
PIN RETAINER	1U51899-12	ECL-0030	177

DASH NO. OF WEDGE USED (IF ANY): N/A

DEGREE LOCATIONS USED AT: N/A

ITEM	PART NO.	SERIAL NO.	SERIAL NO.	SERIAL NO.
RETAINER BAND	1U82840-02	0002024	0002015	0002027
	1U82840-03	N/A	N/A	N/A
BAND JOINT LOCATIONS (DEG):		30-150	150-270	270-30

NOTE: Retainer Bands (1U82840-02 and 1U82840-03) are interchangeable. Only one retainer band is required at each designated location.

8.12 LH Field Joint Mate (continued)

LH CENTER FIELD JOINT MATE

AFT CENTER CLEVIS DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0072	20 AUG 93	14 MAY 93,04:00
O-RING, PRI	1U75801-01	0001231	*04 JUN 93	14 MAY 93,12:20
O-RING, SEC	1U75801-01	0001234	*07 JUN 93	14 MAY 93,12:10
J-SEAL ADH.	STW5-3479	ECL-0040	02 SEP 93	14 MAY 93,14:00

FORWARD CENTER TANG DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0072	20 MAY 93	14 MAY 93,09:18
V-2 FILLER	STW3-3353	ECL-0020	N/A	14 MAY 93,09:40
O-RING, CAP	1U75801-02	0000526	*18 SEP 93	14 MAY 93,09:55
J-SEAL ADH.	STW5-3479	ECL-0040	02 SEP 93	14 MAY 93,11:40

*REMARKS: The o-ring expiration dates represent that of a lubricated o-ring and not the o-ring itself.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.12 LH Field Joint Mate (continued)

LH CENTER FIELD JOINT MATE (continued)

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-12	ECL-0001	61
		ECL-0002	23
		ECL-0003	2
		ECL-0004	17
		ECL-0005	25
		ECL-0007	32
		ECL-0009	11
		ECL-0011	6

	DATE	TIME	DEGREE LOCATION
FIRST PIN:	14 MAY 93	18:47	270
LAST PIN:	14 MAY 93	19:02	28

ITEM	PART NO.	LOT NUMBER	QTY
PIN RETAINER	1U51899-12	ECL-0034	177

DASH NO. OF WEDGE USED (IF ANY): N/A

DEGREE LOCATIONS USED AT: N/A

ITEM	PART NO.	SERIAL NO.	SERIAL NO.	SERIAL NO.
RETAINER BAND	1U82840-02	0002034	0002026	0002017
	1U82840-03	N/A	N/A	N/A
BAND JOINT LOCATIONS (DEG):		30-150	150-270	270-30

NOTE: Retainer Bands (1U82840-02 and 1U82840-03) are interchangeable. Only one retainer band is required at each designated location.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.12 LH Field Joint Mate (continued)

LH FORWARD FIELD JOINT MATE

FORWARD CENTER CLEVIS DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10 MAR 95	16 MAY 93,02:40
O-RING, PRI	1U75801-01	0001236	*07 JUN 93	16 MAY 93,06:42
O-RING, SEC	1U75801-01	0001235	*07 JUN 93	16 MAY 93,06:30
J-SEAL ADH.	STW5-3479	ECL-0040	02 SEP 93	16 MAY 93,08:40

FORWARD TANG DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10 MAR 95	16 MAY 93,04:20
V-2 FILLER	STW3-3353	ECL-0020	N/A	16 MAY 93,04:40
O-RING, CAP	1U75801-02	0000527	*18 SEP 93	16 MAT 93,04:55
J-SEAL ADH.	STW5-3479	ECL-0040	02 SEP 93	16 MAY 93,06:10

*REMARKS: The o-ring expiration dates represent that of the lubricated o-ring (grease) and not the o-ring itself.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.12 LH Field Joint Mate (continued)

LH FORWARD FIELD JOINT MATE (continued)

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-12	ECL-0003	3
		ECL-0026	174

	DATE	TIME	DEGREE LOCATION
FIRST PIN:	16 MAY 93	16:00	104
LAST PIN:	16 MAY 93	16:13	350

ITEM	PART NO.	LOT NUMBER	QTY
PIN RETAINER	1U51899-12	ECL-0034	102
		ECL-0025	75

DASH NO. OF WEDGE USED (IF ANY): N/A

DEGREE LOCATIONS USED AT: N/A

ITEM	PART NO.	SERIAL NO.	SERIAL NO.	SERIAL NO.
RETAINER BAND	1U82840-02	0002035	0002020	0002033
	1U82840-03	N/A	N/A	N/A
BAND JOINT LOCATIONS (DEG):		30-150	150-270	270-30

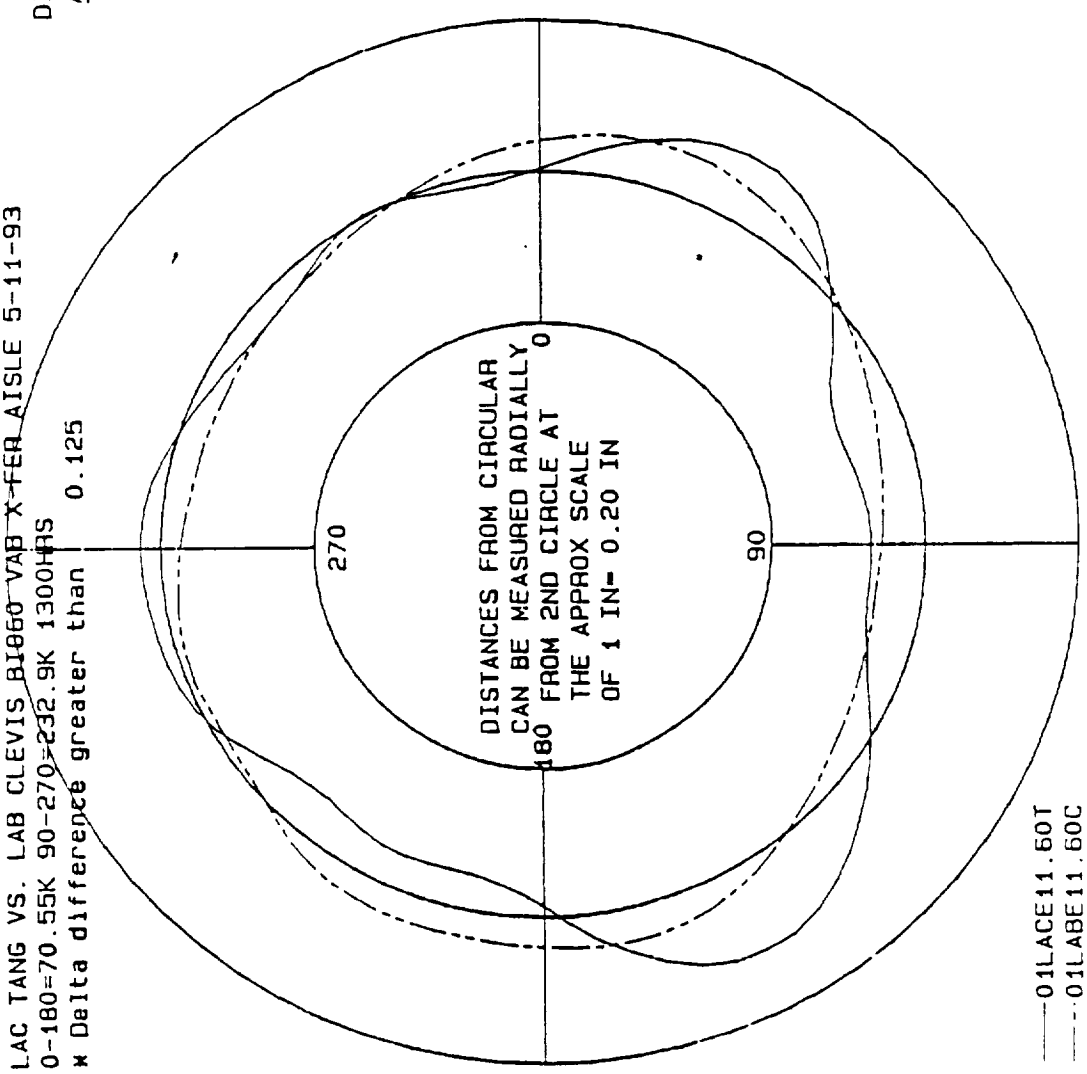
NOTE: Retainer Bands (1U82840-02 and 1U82840-03) are interchangeable. Only one retainer band is required at each designated location.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.13 LH CIRC Sine Bar Data

ANGLE	DIFF	ANGLE	DIFF
0	-0.037	320	0.003
10	-0.015	330	0.013
20	0.016	340	0.007
30	0.039	350	0.036
40	0.031		
50	-0.010		
60	-0.049		
70	-0.051		
80	-0.029		
90	-0.014		
100	-0.011		
110	0.003		
120	0.034		
130	0.069		
140	0.094		
150	0.094		
160	0.060		
170	0.004		
180	-0.054		
190	-0.083		
200	-0.082		
210	-0.081		
220	-0.077		
230	-0.040		
240	0.005		
250	0.025		
260	0.035		
270	0.053		
280	0.052		
290	0.032		
300	0.013		
310	-0.001		



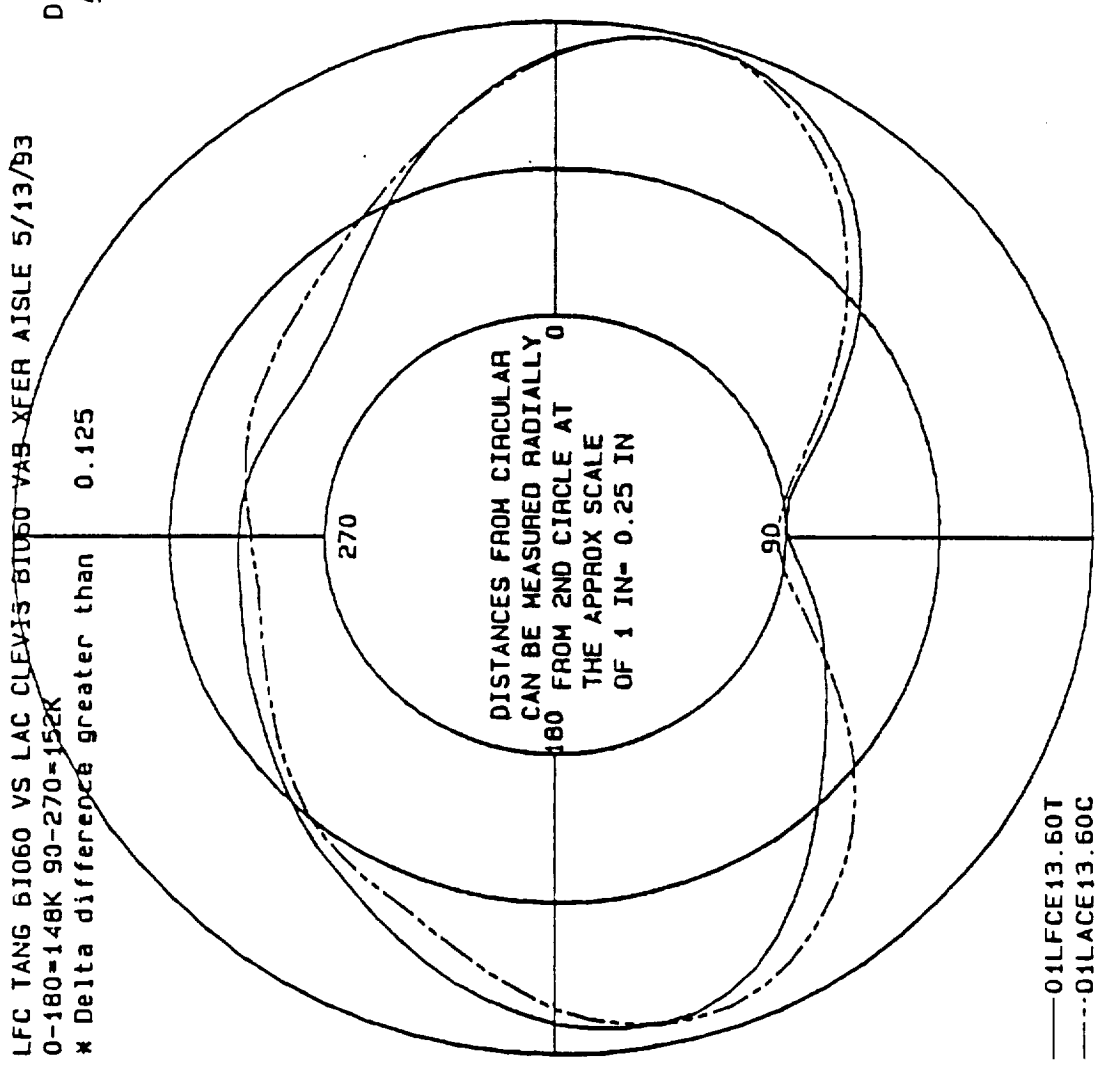
8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.13 LH Sine Bar Data (continued)

DIFF IN DELTAS FROM CIRC

ANGLE	DIFF	ANGLE	DIFF
0	0.003	320	-0.057
10	0.000	330	-0.034
20	0.006	340	-0.010
30	0.019	350	0.004
40	0.028		
50	0.031		
60	0.027		
70	0.015		
80	0.009		
90	0.020		
100	0.033		
110	0.021		
120	-0.022		
130	-0.065		
140	-0.075		
150	-0.051		
160	-0.020		
170	0.003		
180	0.025		
190	0.047		
200	0.047		
210	0.026		
220	0.015		
230	0.017		
240	0.024		
250	0.030		
260	0.029		
270	0.019		
280	-0.003		
290	-0.033		
300	-0.058		
310	-0.068		



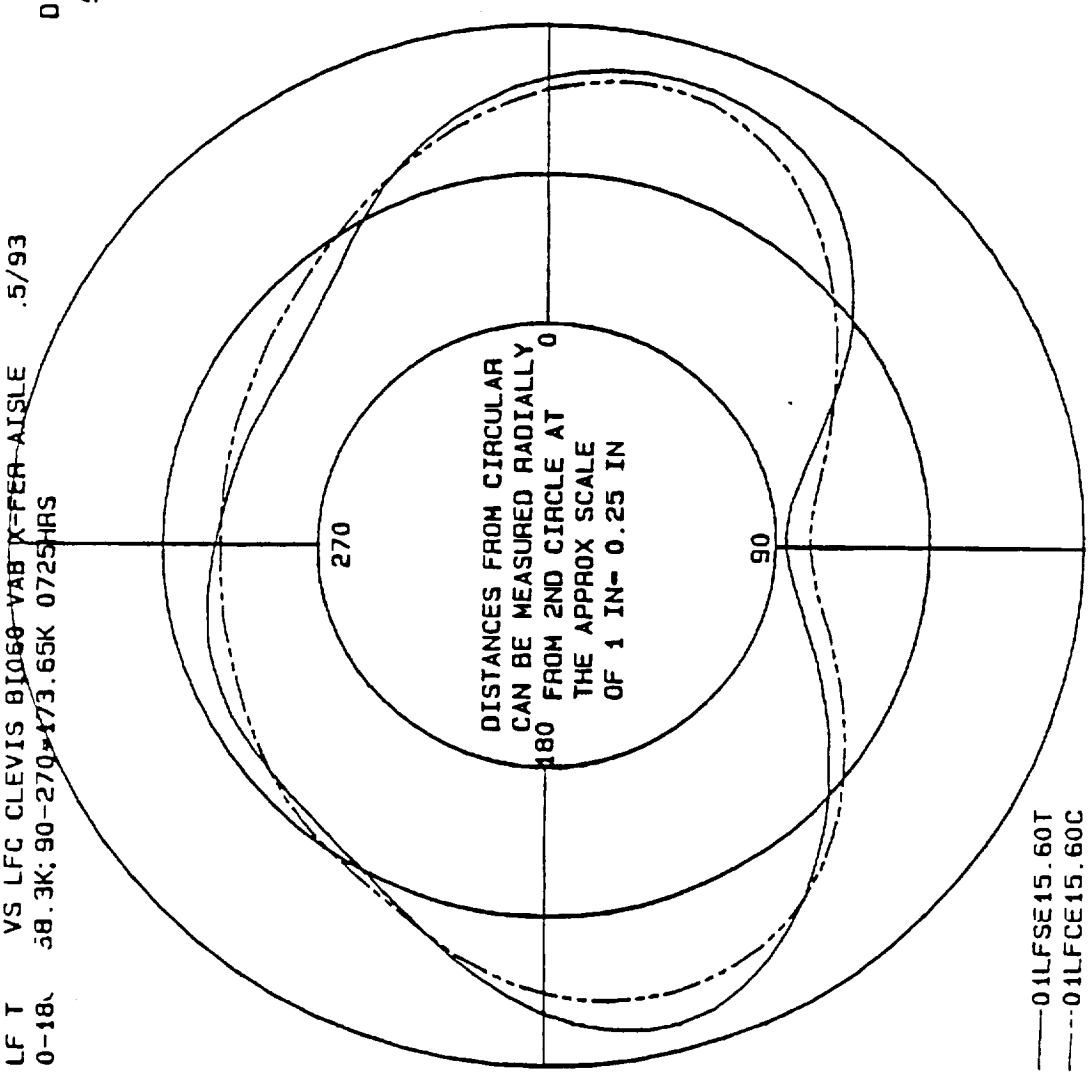
8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.13 LH Sine Bar Data (continued)

DIFF IN DELTAS FROM CIRC

ANGLE	DIFF	ANGLE	DIFF
0	0.019	320	-0.042
10	0.017	330	-0.022
20	0.023	340	0.003
30	0.040	350	0.017
40	0.052		
50	0.041		
60	0.009		
70	-0.023		
80	-0.037		
90	-0.038		
100	-0.038		
110	-0.038		
120	-0.033		
130	-0.027		
140	-0.013		
150	0.019		
160	0.050		
170	0.053		
180	0.033		
190	0.011		
200	-0.005		
210	-0.015		
220	-0.016		
230	0.001		
240	0.023		
250	0.031		
260	0.021		
270	0.005		
280	-0.009		
290	-0.024		
300	-0.039		
310	-0.048		



8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.14 RH Field Joint Mate

RH AFT FIELD JOINT MATE

AFT BOOSTER CLEVIS DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10MAR95	19MAY93,12:30
O-RING, PRI	1U75801-01	0001240	*08JUN93	19MAY93,17:40
O-RING, SEC	1U75801-01	0001238	*08JUN93	19MAY93,17:20
J-SEAL ADH.	STW5-3479	ECL-0040	02SEP93	19MAY93,18:30

AFT CENTER TANG DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10MAR95	19MAY93,14:10
V-2 FILLER	STW3-3353	ECL-0020	N/A	19MAY93,15:00
O-RING, CAP	1U75801-02	0000530	*18SEP93	19MAY93,16:30
J-SEAL ADH.	STW5-3479	ECL-0040	02SEP93	19MAY93,17:00

*REMARKS: The o-ring expiration dates represent that of a lubricated o-ring and not the o-ring itself.

8.14 RH Field Joint Mate (continued)

RH AFT FIELD JOINT MATE (continued)

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-12	ECL-0019	56
		ECL-0015	1
		ECL-0010	38
		ECL-0006	3
		ECL-0009	20
		ECL-0007	53
		ECL-0002	2

	DATE	TIME	DEGREE LOCATION
FIRST PIN:	20 MAY 93	23:50	180
LAST PIN:	20 MAY 93	23:59	290

ITEM	PART NO.	LOT NUMBER	QTY
PIN RETAINER	1U51899-13	ECL-0019	177

DASH NO. OF WEDGE USED (IF ANY): N/A

DEGREE LOCATIONS USED AT: N/A

ITEM	PART NO.	SERIAL NO.	SERIAL NO.	SERIAL NO.
RETAINER BAND	1U82840-02	0002022	0002038	0002029
	1U82840-03	N/A	N/A	N/A
BAND JOINT LOCATIONS (DEG):		30-150	150-270	270-30

NOTE: Retainer Bands (1U82840-02 and 1U82840-03) are interchangeable. Only one retainer band is required at each designated location.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.14 RH Field Joint Mate (continued)

RH CENTER FIELD JOINT MATE

AFT CENTER CLEVIS DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10MAR95	21MAY93,21:30
O-RING, PRI	1U75801-01	0001249	*14JUL93	21MAY93,22:35
O-RING, SEC	1U75801-01	0001237	*08JUN93	21MAY93,22:15
J-SEAL ADH.	STW5-3479	ECL-0040	02SEP93	22MAY93,23:45

FORWARD CENTER TANG DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10MAR95	21MAY93,13:30
V-2 FILLER	STW3-3353	ECL-0018	N/A	21MAY93,14:25
O-RING, CAP	1U75801-02	0000529	*18SEP93	21MAY93,14:35
J-SEAL ADH.	STW5-3479	ECL-0040	02SEP93	21MAY93,15:15

*REMARKS: The o-ring expiration dates represent that of the lubricated o-ring (grease) and not the o-ring itself.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.14 RH Field Joint Mate (continued)

RH CENTER FIELD JOINT MATE (continued)

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-12	ECL-0029	177

	DATE	TIME	DEGREE LOCATION
FIRST PIN:	22 MAY 93	04:45	270
LAST PIN:	22 MAY 93	04:50	342

ITEM	PART NO.	LOT NUMBER	QTY
PIN RETAINER	1U51899-13	ECL-0019	177

DASH NO. OF WEDGE USED (IF ANY): N/A

DEGREE LOCATIONS USED AT: N/A

ITEM	PART NO.	SERIAL NO.	SERIAL NO.	SERIAL NO.
RETAINER BAND	1U82840-02	0000343	0000344	0000361
	1U82840-03	N/A	N/A	N/A
BAND JOINT LOCATIONS (DEG):		30-150	150-270	270-30

NOTE: Retainer Bands (1U82840-02 and 1U82840-03) are interchangeable. Only one retainer band is required at each designated location.

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.14 RH Field Joint Mate (continued)

RH FORWARD FIELD JOINT MATE

FORWARD CENTER CLEVIS DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10MAR95	25MAY93,03:15
O-RING, PRI	1U75801-01	0001246	*13JUL93	25MAY93,10:15
O-RING, SEC	1U75801-01	0001247	*13JUL93	25MAY93,10:00
J-SEAL ADH.	STW5-3479	ECL-0040	02SEP93	25MAY93,11:10

FORWARD TANG DATA

ITEM	PART NO.	SERIAL/LOT NO.	EXP DATE	DATE/TIME
GREASE	1U51916-09	ECL-0075	10MAR95	25MAY93,04:30
V-2 FILLER	STW3-3353	ECL-0020	N/A	25MAY93,05:10
O-RING, CAP	1U75801-02	0000525	*08SEP93	25MAY93,05:25
J-SEAL ADH.	STW5-3479	ECL-0040	02SEP93	25MAY93,06:52

*REMARKS: The o-ring expiration dates represent that of a lubricated o-ring and not the o-ring itself.

8.14 RH Field Joint Mate (continued)

RH FORWARD FIELD JOINT MATE (continued)

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-12	ECL-0029	177

	DATE	TIME	DEGREE LOCATION
FIRST PIN:	25 MAY 93	16:02	82
LAST PIN:	25 MAY 93	16:11	166

ITEM	PART NO.	LOT NUMBER	QTY
PIN RETAINER	1U51899-12	ECL-0034 ECL-0011 ECL-0030	121 50 6

DASH NO. OF WEDGE USED (IF ANY): N/A

DEGREE LOCATIONS USED AT: N/A

ITEM	PART NO.	SERIAL NO.	SERIAL NO.	SERIAL NO.
RETAINER BAND	1U82840-02 1U82840-03	0002032 N/A	0002023 N/A	0002018 N/A
BAND JOINT LOCATIONS (DEG):		30-150	150-270	270-30

NOTE: Retainer Bands (1U82840-02 and 1U82840-03) are interchangeable. Only one retainer band is required at each designated location.

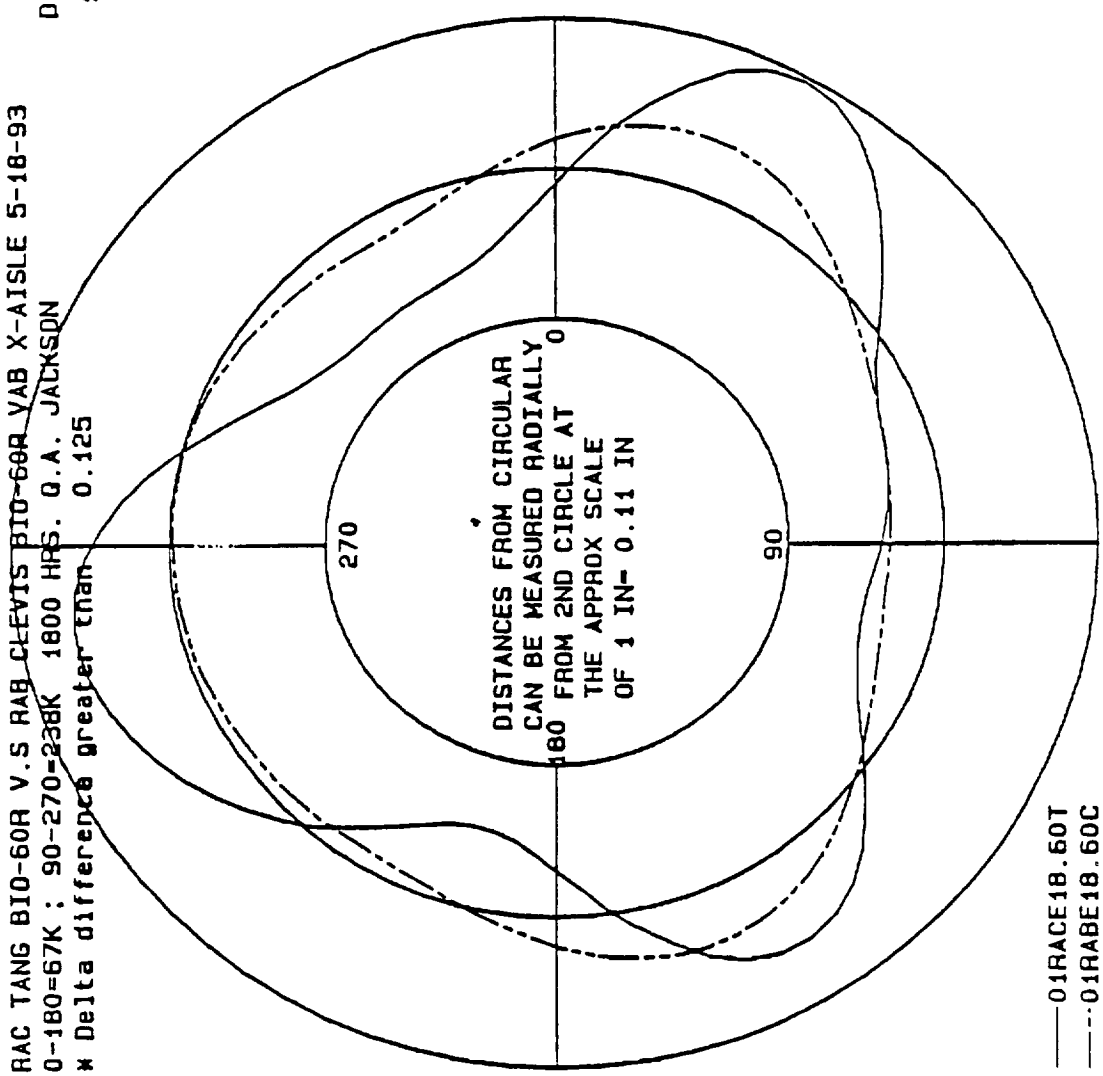
8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.15 RH Sine Bar Data

DIFF IN DELTAS FROM CIRC

ANGLE	DIFF	ANGLE	DIFF
0	-0.035	320	-0.057
10	0.006	330	-0.052
20	0.052	340	-0.052
30	0.073	350	-0.053
40	0.060		
50	0.030		
60	0.006		
70	-0.001		
80	0.000		
90	-0.005		
100	-0.012		
110	-0.015		
120	-0.008		
130	0.012		
140	0.033		
150	0.033		
160	0.006		
170	-0.030		
180	-0.057		
190	-0.064		
200	-0.050		
210	-0.022		
220	0.007		
230	0.034		
240	0.060		
250	0.074		
260	0.075		
270	0.058		
280	0.020		
290	-0.021		
300	-0.047		
310	-0.058		



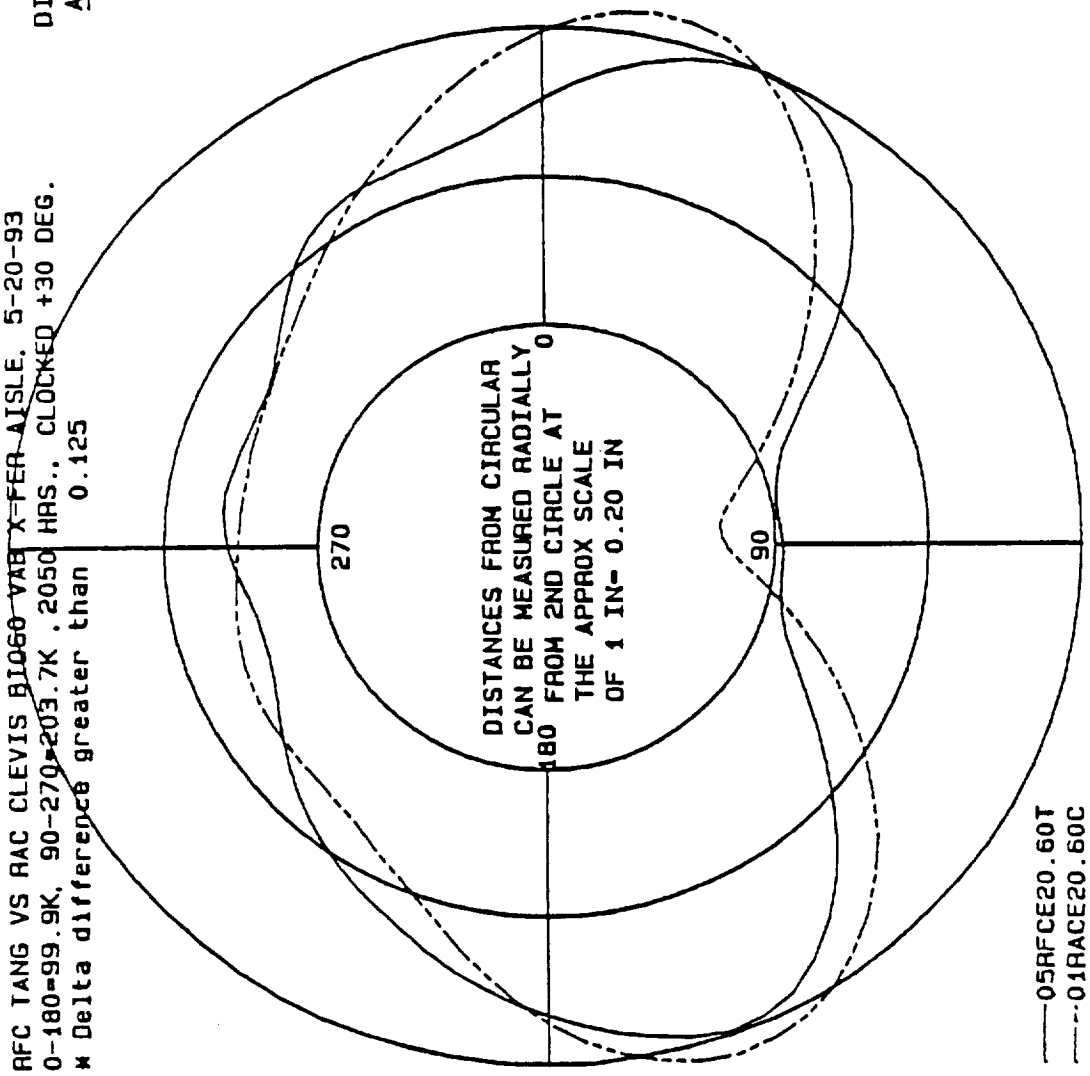
8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.15 RH Sine Bar Data (continued)

DIFF IN DELTAS FROM CIRC

ANGLE	DIFF	ANGLE	DIFF
0	-0.091	320	0.030
10	-0.075	330	0.016
20	-0.031	340	-0.032
30	0.034	350	-0.077
40	0.075		
50	0.065		
60	0.039		
70	0.042		
80	0.072		
90	0.078		
100	0.030		
110	-0.033		
120	-0.071		
130	-0.079		
140	-0.063		
150	-0.039		
160	-0.031		
170	-0.032		
180	-0.010		
190	0.026		
200	0.049		
210	0.057		
220	0.046		
230	0.012		
240	-0.022		
250	-0.035		
260	-0.015		
270	0.016		
280	0.022		
290	0.011		
300	0.001		
310	0.013		



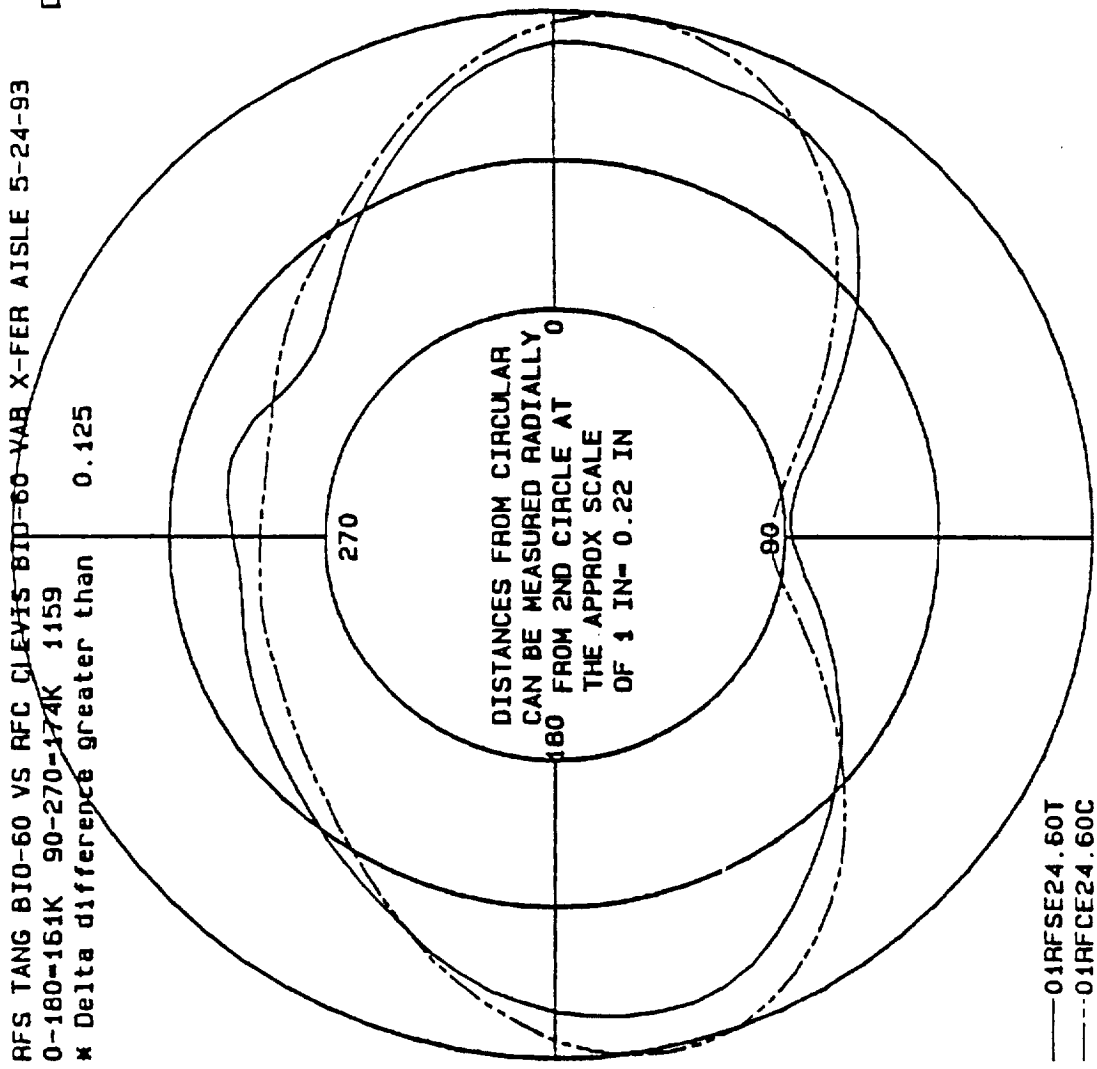
8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.15 RH Sine Bar Data (continued)

DIFF IN DELTAS FROM CIRC

ANGLE	DIFF	ANGLE	DIFF
0	-0.030	320	-0.048
10	-0.050	330	-0.028
20	-0.044	340	-0.023
30	-0.002	350	-0.019
40	0.038		
50	0.044		
60	0.036		
70	0.027		
80	0.022		
90	0.031		
100	0.042		
110	0.041		
120	0.024		
130	-0.011		
140	-0.046		
150	-0.060		
160	-0.061		
170	-0.058		
180	-0.041		
190	-0.017		
200	0.000		
210	0.018		
220	0.031		
230	0.036		
240	0.038		
250	0.032		
260	0.026		
270	0.038		
280	0.053		
290	0.033		
300	-0.021		
310	-0.056		



8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.16 LH Joint Leak Checks & 45 Deg Plug

LH AFT FIELD JOINT

DATE: 13 MAY 93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0210 SCCS
	30 PSIG DECAY LEAK RATE	.0082	0.0004 SCCS

DATE: 13 MAY 93

			ALLOWED	ACTUAL RATE
PRIMARY TO BARRIER CAVITY	100 PSIG	DECAY LEAK RATE	.037	0.0225 SCCS
		PRESS RISE RATE	.037	0.0005 SCCS
	30 PSIG	DECAY LEAK RATE	.0082	-0.0005 SCCS
		PRESS RISE RATE	.0082	0.0004 SCCS

45 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U100269-03	ECL-0024
O-RING	1U50228-15	ECL-0121
GREASE	1U51916-09	ECL-0072

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.16 LH Joint Leak Checks & 45 Deg Plug (continued)

LH CENTER FIELD JOINT

DATE: 16 MAY 93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0146 SCCS
	30 PSIG DECAY LEAK RATE	.0082	0.0004 SCCS

DATE: 17 MAY 93			ALLOWED	ACTUAL RATE
PRIMARY TO BARRIER CAVITY	100 PSIG	DECAY LEAK RATE	.037	0.0112 SCCS
		PRESS RISE RATE	.037	0.0002 SCCS
	30 PSIG	DECAY LEAK RATE	.0082	0.0010 SCCS
		PRESS RISE RATE	.0082	0.0002 SCCS

45 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U100269-03	ECL-0024
O-RING	1U50228-15	ECL-0121
GREASE	1U51916-09	ECL-0072

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.16 LH Joint Leak Checks & 45 Deg Plug (continued)

LH FORWARD FIELD JOINT

DATE: 19 MAY 93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0305 SCCS
	30 PSIG DECAY LEAK RATE	.0082	0.0001 SCCS

DATE: 20 MAY 93			ALLOWED	ACTUAL RATE
PRIMARY TO BARRIER CAVITY	100 PSIG	DECAY LEAK RATE	.037	0.0101 SCCS
		PRESS RISE RATE	.037	0.0003 SCCS
	30 PSIG	DECAY LEAK RATE	.0082	0.0005 SCCS
		PRESS RISE RATE	.0082	0.0002 SCCS

45 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U100269-03	ECL-0024
O-RING	1U50228-15	ECL-0015
GREASE	1U51916-09	ECL-0072

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.17 RH Joint Leak Checks & 45 Deg Plug

RH AFT FIELD JOINT

DATE: 20 MAY 93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0149 SCCS
	30 PSIG DECAY LEAK RATE	.0082	-0.0005 SCCS

DATE: 20 MAY 93			ALLOWED	ACTUAL RATE
PRIMARY TO BARRIER CAVITY	100 PSIG	DECAY LEAK RATE	.037	0.0200 SCCS
		PRESS RISE RATE	.037	0.0003 SCCS
	30 PSIG	DECAY LEAK RATE	.0082	0.0003 SCCS
		PRESS RISE RATE	.0082	0.0002 SCCS

45 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U100269-03	ECL-0024
O-RING	1U50228-15	ECL-0121
GREASE	1U51916-09	ECL-0072

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.17 RH Joint Leak Checks & 45 Deg Plug (continued)

RH CENTER FIELD JOINT

DATE: 24 MAY 93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0105 SCCS
	30 PSIG DECAY LEAK RATE	.0082	-0.0002 SCCS

DATE: 24 MAY 93

			ALLOWED	ACTUAL RATE
PRIMARY TO BARRIER CAVITY	100 PSIG	DECAY LEAK RATE	.037	0.0178 SCCS
		PRESS RISE RATE	.037	0.0005 SCCS
	30 PSIG	DECAY LEAK RATE	.0082	0.0005 SCCS
		PRESS RISE RATE	.0082	0.0004 SCCS

45 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U100269-03	ECL-0024
O-RING	1U50228-15	ECL-0121
GREASE	1U51916-09	ECL-0075

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.17 RH Joint Leak Checks & 45 Deg Plug (continued)

RH FORWARD FIELD JOINT

DATE: 26 MAY 93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0225 SCCS
	30 PSIG DECAY LEAK RATE	.0082	0.00002 SCCS

DATE: 26 MAY 93			ALLOWED	ACTUAL RATE
PRIMARY TO BARRIER CAVITY	100 PSIG	DECAY LEAK RATE	.037	0.0068 SCCS
		PRESS RISE RATE	.037	0.0003 SCCS
	30 PSIG	DECAY LEAK RATE	.0082	0.0011 SCCS
		PRESS RISE RATE	.0082	0.0001 SCCS

45 DEGREE LEAK CHECK PORT

ITEM	PART NO.	LOT NO.
PLUG	1U100269-03	ECL-0024
O-RING	1U50228-15	ECL-0121
GREASE	1U51916-09	ECL-0072

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.18 LH 135 Vent Plug & Leak Check

LH AFT FIELD JOINT 135 DEGREE VENT PORT PLUG LEAK CHECK

ITEM	PART NO.	SERIAL/LOT NO.
GREASE	1U51916-09	ECL-0072
PLUG, BOTTOM	1U76425-01	ECL-0014
PLUG, TOP	1U76425-03	ECL-0028
PLUG, CLOSURE	1U50159-02	ECL-0019
O-RING, PRIMARY	1U50228-44	ECL-0015
O-RING, SECONDARY	1U50228-15	ECL-0121
O-RING, CLOSURE	1U50228-25	ECL-0068

LEAK TEST DATA

1. START TIME (TO THE SECOND): 22:36:00

2. INITIAL ISOLATION PRESSURE: 1003.000 PSIG
+ 14.696
1017.696 = P1

3. INITIAL ISOLATION TEMPERATURE: 77.4 DEGREES F
+ 459.7
537.1 = T1

4. STOP TIME (TO THE SECOND): 22:51:00 (MINUTES * 60)
(PLUS SECONDS)
ELAPSED TIME IN SECONDS: 900 = T

5. FINAL ISOLATION PRESSURE: 1000.000 PSIG
+ 14.696
1014.696 = P2

6. FINAL ISOLATION TEMPERATURE: 77.8 DEGREES F
+ 459.7
533.7 = T2

V = 1.4 CALCULATE THE LEAK RATE PER THE FOLLOWING:

$$\text{LEAK RATE} = \frac{579.478\ (1.4)}{T}\ (P1/T1 - P2/T2)$$

LEAK RATE = 0.0063 SCCS V = 1.4

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.18 LH 135 Vent Plug & Leak Check (continued)

LH CENTER FIELD JOINT 135 DEGREE VENT PORT PLUG LEAK CHECK

ITEM	PART NO.	SERIAL/LOT NO.
GREASE	1U51916-09	ECL-0072
PLUG, BOTTOM	1U76425-01	ECL-0014
PLUG, TOP	1U76425-03	ECL-0028
PLUG, CLOSURE	1U50159-02	ECL-0019
O-RING, PRIMARY	1U50228-44	ECL-0015
O-RING, SECONDARY	1U50228-15	ECL-0121
O-RING, CLOSURE	1U50228-25	ECL-0068

LEAK TEST DATA

1. START TIME (TO THE SECOND): 18:30:00

2. INITIAL ISOLATION PRESSURE: 994.000 PSIG
+ 14.696
1008.696 = P1

3. INITIAL ISOLATION TEMPERATURE: 78.2 DEGREES F
+ 459.7
537.9 = T1

4. STOP TIME (TO THE SECOND): 18:45:00 (MINUTES * 60)
(PLUS SECONDS)
ELAPSED TIME IN SECONDS: 900 = T

5. FINAL ISOLATION PRESSURE: 990.000 PSIG
+ 14.696
1004.696 = P2

6. FINAL ISOLATION TEMPERATURE: 78.1 DEGREES F
+ 459.7
537.8 = T2

V = 1.4 CALCULATE THE LEAK RATE PER THE FOLLOWING:

$$\text{LEAK RATE} = \frac{579.478\ (1.4)}{T}\ (P1/T1 - P2/T2)$$

LEAK RATE = 0.0064 SCCS V = 1.4

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.18 LH 135 Vent Plug & Leak Check (continued)

LH FORWARD FIELD JOINT 135 DEGREE VENT PORT PLUG LEAK CHECK

ITEM	PART NO.	SERIAL/LOT NO.
GREASE	1U51916-09	ECL-0072
PLUG, BOTTOM	1U76425-01	ECL-0014
PLUG, TOP	1U76425-03	ECL-0021
PLUG, CLOSURE	1U50159-02	ECL-0019
O-RING, PRIMARY	1U50228-44	ECL-0015
O-RING, SECONDARY	1U50228-15	ECL-0121
O-RING, CLOSURE	1U50228-25	ECL-0068

LEAK TEST DATA

1. START TIME (TO THE SECOND): 04:55:00

2. INITIAL ISOLATION PRESSURE: 997.000 PSIG
+ 14.696
1011.696 = P1

3. INITIAL ISOLATION TEMPERATURE: 78.2 DEGREES F
+ 459.7
537.9 = T1

4. STOP TIME (TO THE SECOND): 05:10:00 (MINUTES * 60)
(PLUS SECONDS)
ELAPSED TIME IN SECONDS: 900 = T

5. FINAL ISOLATION PRESSURE: 991.000 PSIG
+ 14.696
1005.696 = P2

6. FINAL ISOLATION TEMPERATURE: 78.0 DEGREES F
+ 459.7
537.7 = T2

V = 1.4 CALCULATE THE LEAK RATE PER THE FOLLOWING:

$$\text{LEAK RATE} = \frac{579.478\ (1.4)}{T}\ (P1/T1 - P2/T2)$$

LEAK RATE = 0.0094 SCCS V = 1.4

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.19 RH 135 Vent Plug & Leak Check

RH AFT FIELD JOINT 135 DEGREE VENT PORT PLUG LEAK CHECK

ITEM	PART NO.	SERIAL/LOT NO.
GREASE	1U51916-09	ECL-0072
PLUG, BOTTOM	1U76425-01	ECL-0016
PLUG, TOP	1U76425-03	ECL-0021
PLUG, CLOSURE	1U50159-02	ECL-0019
O-RING, PRIMARY	1U50228-44	ECL-0015
O-RING, SECONDARY	1U50228-15	ECL-0121
O-RING, CLOSURE	1U50228-25	ECL-0069

LEAK TEST DATA

1. START TIME (TO THE SECOND): 03:50:00

2. INITIAL ISOLATION PRESSURE: 994.000 PSIG
+ 14.696
1008.696 = P1

3. INITIAL ISOLATION TEMPERATURE: 73.5 DEGREES F
+ 459.7
533.2 = T1

4. STOP TIME (TO THE SECOND): 04:05:00 (MINUTES * 60)
(PLUS SECONDS)
ELAPSED TIME IN SECONDS: 900 = T

5. FINAL ISOLATION PRESSURE: 989.000 PSIG
+ 14.696
1003.696 = P2

6. FINAL ISOLATION TEMPERATURE: 74.0 DEGREES F
+ 459.7
533.7 = T2

V = 1.4 CALCULATE THE LEAK RATE PER THE FOLLOWING:

$$\text{LEAK RATE} = \frac{579.478\ (1.4)}{T}\ (P1/T1 - P2/T2)$$

LEAK RATE = 0.0101 SCCS V = 1.4

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.19 RH 135 Vent Plug & Leak Check (continued) .

RH CENTER FIELD JOINT 135 DEGREE VENT PORT PLUG LEAK CHECK

ITEM	PART NO.	SERIAL/LOT NO.
GREASE	1U51916-09	ECL-0075
PLUG, BOTTOM	1U76425-01	ECL-0014
PLUG, TOP	1U76425-03	ECL-0021
PLUG, CLOSURE	1U50159-02	ECL-0019
O-RING, PRIMARY	1U50228-44	ECL-0020
O-RING, SECONDARY	1U50228-15	ECL-0121
O-RING, CLOSURE	1U50228-25	ECL-0069

LEAK TEST DATA

1. START TIME (TO THE SECOND): 08:15:00

2. INITIAL ISOLATION PRESSURE: 993.000 PSIG
+ 14.696
1007.696 = P1

3. INITIAL ISOLATION TEMPERATURE: 74.8 DEGREES F
+ 459.7
534.5 = T1

4. STOP TIME (TO THE SECOND): 08:30:00 (MINUTES * 60)
(PLUS SECONDS)
ELAPSED TIME IN SECONDS: 900 = T

5. FINAL ISOLATION PRESSURE: 989.000 PSIG
+ 14.696
1003.696 = P2

6. FINAL ISOLATION TEMPERATURE: 74.9 DEGREES F
+ 459.7
534.6 = T2

V = 1.4 CALCULATE THE LEAK RATE PER THE FOLLOWING:

$$\text{LEAK RATE} = \frac{579.478\ (1.4)}{T}\ (P1/T1 - P2/T2)$$

LEAK RATE = 0.007 SCCS V = 1.4

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.19 RH 135 Vent Plug & Leak Check (continued)

RH FORWARD FIELD JOINT 135 DEGREE VENT PORT PLUG LEAK CHECK

ITEM	PART NO.	SERIAL/LOT NO.
GREASE	1U51916-09	ECL-0072
PLUG, BOTTOM	1U76425-01	ECL-0014
PLUG, TOP	1U76425-03	ECL-0021
PLUG, CLOSURE	1U50159-02	ECL-0019
O-RING, PRIMARY	1U50228-44	ECL-0015
O-RING, SECONDARY	1U50228-15	ECL-0121
O-RING, CLOSURE	1U50228-25	ECL-0069

LEAK TEST DATA

1. START TIME (TO THE SECOND): 02:33:30

2. INITIAL ISOLATION PRESSURE: 995.0 PSIG
+ 14.696
1009.696 = P1

3. INITIAL ISOLATION TEMPERATURE: 76.0 DEGREES F
+ 459.7
535.7 = T1

4. STOP TIME (TO THE SECOND): 02:48:30 (MINUTES * 60)
(PLUS SECONDS)
ELAPSED TIME IN SECONDS: 900 = T

5. FINAL ISOLATION PRESSURE: 992.0 PSIG
+ 14.696
1006.696 = P2

6. FINAL ISOLATION TEMPERATURE: 76.0 DEGREES F
+ 459.7
535.7 = T2

V = 1.4 CALCULATE THE LEAK RATE PER THE FOLLOWING:

$$\text{LEAK RATE} = \frac{579.478\ (1.4)}{T}\ (P1/T1 - P2/T2)$$

LEAK RATE = 0.0050 SCCS V = 1.4

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.20 LH Field Joint Closeout

AFT FIELD JOINT CLOSEOUT

ITEM	PART NO.	SERIAL/LOT NO.	DATE
JOINT HEATER	1U77252-01	0000139	19 MAY 93
SENSOR ASSY	1U77076-01	0000099	19 MAY 93
SENSOR ASSY	1U77076-02	0000089	19 MAY 93
THERMAL BAR.	1U77157-01	ECL-0148	19 MAY 93
HEATER STRAP	1U77114-01	0000194	19 MAY 93
LINK	1U77119-01	0000179	19 MAY 93
CLIP	1U77120-01	0000190	19 MAY 93
AFT CORK STRIP	1U77160-01	ECL-0122	19 MAY 93
FWD CORK STRIP	1U77160-02	ECL-0133	19 MAY 93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.20 LH Field Joint Closeout (continued)

CENTER FIELD JOINT CLOSEOUT

ITEM	PART NO.	SERIAL/LOT NO.	DATE
JOINT HEATER	1U77252-01	0000140	19 MAY 93
SENSOR ASSY	1U77076-01	0000094	19 MAY 93
SENSOR ASSY	1U77076-02	0000094	19 MAY 93
THERMAL BAR.	1U77157-01	ECL-0145	19 MAY 93
HEATER STRAP	1U77114-01	0000188	19 MAY 93
LINK	1U77119-01	0000201	19 MAY 93
CLIP	1U77120-01	0000180	19 MAY 93
AFT CORK STRIP	1U77160-01	ECL-0126	20 MAY 93
FWD CORK STRIP	1U77160-02	ECL-0115	20 MAY 93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.20 LH Field Joint Closeout (continued)

FORWARD FIELD JOINT CLOSEOUT

ITEM	PART NO.	SERIAL/LOT NO.	DATE
JOINT HEATER	1U77252-01	0000124	21 MAY 93
SENSOR ASSY	1U77076-01	0000095	21 MAY 93
SENSOR ASSY	1U77076-02	0000084	21 MAY 93
THERMAL BAR.	1U77157-01	ECL-0147	21 MAY 93
HEATER STRAP	1U77114-01	0000189	21 MAY 93
LINK	1U77119-01	0000171	21 MAY 93
CLIP	1U77120-01	0000192	21 MAY 93
AFT CORK STRIP	1U77160-01	ECL-0131	22 MAY 93
FWD CORK STRIP	1U77160-02	ECL-0126	22 MAY 93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.21 RH Field Joint Closeout

AFT FIELD JOINT CLOSEOUT

ITEM	PART NO.	SERIAL/LOT NO.	DATE
JOINT HEATER	1U77252-01	0000126	22 MAY 93
SENSOR ASSY	1U77076-01	0000103	22 MAY 93
SENSOR ASSY	1U77076-02	0000092	22 MAY 93
THERMAL BAR.	1U77157-01	ECL-0143	22 MAY 93
HEATER STRAP	1U77114-01	0000187	22 MAY 93
LINK	1U77119-01	0000170	22 MAY 93
CLIP	1U77120-01	0000191	22 MAY 93
AFT CORK STRIP	1U77160-01	ECL-0129	27 MAY 93
FWD CORK STRIP	1U77160-02	ECL-0114	27 MAY 93

8.21 RH Field Joint Closeout (continued)

CENTER FIELD JOINT CLOSEOUT

ITEM	PART NO.	SERIAL/LOT NO.	DATE
JOINT HEATER	1U77252-01	0000123	26 MAY 93
SENSOR ASSY	1U77076-01	0000098	26 MAY 93
SENSOR ASSY	1U77076-02	0000090	26 MAY 93
THERMAL BAR.	1U77157-01	ECL-0146	27 MAY 93
HEATER STRAP	1U77114-01	0000181	27 MAY 93
LINK	1U77119-01	0000177	27 MAY 93
CLIP	1U77120-01	0000193	27 MAY 93
AFT CORK STRIP	1U77160-01	ECL-0128	27 MAY 93
FWD CORK STRIP	1U77160-02	ECL-0123	27 MAY 93

8.21 RH Field Joint Closeout (continued)

FORWARD FIELD JOINT CLOSEOUT

ITEM	PART NO.	SERIAL/LOT NO.	DATE
JOINT HEATER	1U77252-01	0000146	27 MAY 93
SENSOR ASSY	1U77076-01	0000100	27 MAY 93
SENSOR ASSY	1U77076-02	0000091	27 MAY 93
THERMAL BAR.	1U77157-01	ECL-0144	27 MAY 93
HEATER STRAP	1U77114-01	0000193	27 MAY 93
LINK	1U77119-01	0000169	27 MAY 93
CLIP	1U77120-01	0000148	27 MAY 93
AFT CORK STRIP	1U77160-01	ECL-0130	28 MAY 93
FWD CORK STRIP	1U77160-02	ECL-0125	28 MAY 93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.22 Forward Assembly Installation (LH/RH)

LH DATE: 18 MAY 93

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-03	ECL-0009	195
PINS (ALT.)	1U51055-09	N/A	N/A
STRAPPING KIT	1U75345-07	0000157	1

RH DATE: 26 MAY 93

ITEM	PART NO.	LOT NUMBER	QTY
PINS	1U51055-03	ECL-0003	122
	1U51055-03	ECL-0005	73
PINS (ALT.)	1U51055-09	N/A	N/A
STRAPPING KIT	1U75345-07	0000158	1

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.23 LH Safe and Arm Installation

ITEM	PART NO.	SERIAL/LOT NO.	DATE
SAFE & ARM	1U52295-08	0000004	15JUN93
GASKET	1U77464-01	0000029	15JUN93
BOLTS	1U51569-02	ECL-0011	15JUN93
WASHER, PLI	1UMS21206-C6	ECL-0018	15JUN93

LEAK CHECK DATA

DATE: 17JUN93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.001532 SCCS
	30 PSIG DECAY LEAK RATE	.0082	-0.000043 SCCS

PRINTOUT PLACED IN DATA BOOK BY: R. C. Hillard

LEAK CHECK PORT PLUG DATA

ITEM	PART NO.	SERIAL/LOT NO.	DATE
O-RING	1U50228-25	ECL-0069	17JUN93
PLUG	1U50159-02	ECL- N/A	17JUN93

PLUG INSTALLATION VERIFIED BY: R. C. Hillard

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.24 RH Safe and Arm Installation

ITEM	PART NO.	SERIAL/LOT NO.	DATE
SAFE & ARM	1U52295-08	0000006	15JUN93
GASKET	1U77464-01	0000032	15JUN93
BOLTS	1U51569-02	ECL-0011	15JUN93
WASHER, PLI	MS21206-C6	ECL-0018	15JUN93

LEAK CHECK DATA

DATE: 17JUN93

		ALLOWED	ACTUAL RATE
PRIMARY TO SECONDARY CAVITY	1000 PSIG DECAY LEAK RATE	.10	0.0004 SCCS
	30 PSIG DECAY LEAK RATE	.0082	0.00005 SCCS

PRINTOUT PLACED IN DATA BOOK BY: R. Haskell

LEAK CHECK PORT PLUG DATA

ITEM	PART NO.	SERIAL/LOT NO.	DATE
O-RING	1U50228-25	ECL-0069	17JUN93
PLUG	1U50159-02	ECL- N/A	17JUN93

PLUG INSTALLATION VERIFIED BY: R. Haskell

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.25 LH Verification of Leak Check/Vent Port Plug Installation

ITEM	PHOTO REVIEWED BY FLOW LEAD (INITIALS)	DATE
SAFE & ARM 306 DEG. LK CK PORT PLUG	R. C. Hillard	13JUL93
FORWARD JOINT 135 DEG. VENT PORT PLUG	R. C. Hillard	13JUL93
FORWARD JOINT 45 DEG. LK CHECK PORT PLUG	R. C. Hillard	13JUL93
CENTER JOINT 135 DEG. VENT PORT PLUG	R. C. Hillard	13JUL93
CENTER JOINT 45 DEG. LK CHECK PORT PLUG	R. C. Hillard	13JUL93
AFT JOINT 135 DEG. VENT PORT PLUG	R. C. Hillard	13JUL93
AFT JOINT 45 DEG. LK CHECK PORT PLUG	R. C. Hillard	13JUL93
AFT EXIT CONE 270 DEG. LEAK CHECK PORT PLUG	R. C. Hillard	13JUL93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.26 RH Verification of Leak Check/Vent Port Plug Installation

ITEM	PHOTO REVIEWED BY FLOW LEAD (INITIALS)	DATE
SAFE & ARM 306 DEG. LK CK PORT PLUG	R. C. Hillard	13JUL93
FORWARD JOINT 135 DEG. VENT PORT PLUG	R. C. Hillard	13JUL93
FORWARD JOINT 45 DEG. LK CHECK PORT PLUG	R. C. Hillard	13JUL93
CENTER JOINT 135 DEG. VENT PORT PLUG	R. C. Hillard	13JUL93
CENTER JOINT 45 DEG. LK CHECK PORT PLUG	R. C. Hillard	13JUL93
AFT JOINT 135 DEG. VENT PORT PLUG	R. C. Hillard	13JUL93
AFT JOINT 45 DEG. LK CHECK PORT PLUG	R. C. Hillard	13JUL93
AFT EXIT CONE 270 DEG. LEAK CHECK PORT PLUG	R. C. Hillard	13JUL93

8.0 LSS ENGINEERING AS-BUILT CONFIGURATION DATA (cont.)

RSRM: 033 BIO: 60 STS: 58

8.27 Roll to Pad Date: 26 June 1993

8.28 Launch Date: 12 September 1993

8.29 Segment Return to Utah:

	AFT SEG	AFT CTR SEG	FWD CTR SEG	FWD SEG
LH: DATE	4 Oct 1993	4 Oct 1993	4 Oct 1993	4 Oct 1993
R/R CAR #	CSXT 600513	CSXT 600514	CSXT 600510	UP 50027
RH: DATE	4 Oct 1993	4 Oct 1993	4 Oct 1993	4 Oct 1993
R/R CAR #	UP 50029	MP 865025	CSXT 600512	FEC 101

8.30 Exit Cone Return to Utah:

LH: DATE 21 Sept 1993 RH: DATE 21 Sept 1993

Truck No. Yowell 5926 Truck No. Yowell 5926

8.31 Nozzle Return to Utah

LH: DATE 22 Sept 1993 RH: DATE 22 Sept 1993

Truck No. Yowell 5946 Truck No. Yowell 5926

APPENDIX A

Engineering Specifications and Changes

AFT BOOSTER ASSEMBLY DRAWING: 1U76950-03 REVISION: A ECO: 2,3,5,6

RSRM STACKING DRAWING: 1U77426-02 REVISION: A ECO: 6,7

STACKING SPECIFICATION: STW9-3835 REVISION: N SCN: 19

FECs APPLICABLE TO THIS FLOW: RSRM-095

TCTIs APPLICABLE TO THIS FLOW: N/A

BLDG 45s APPLICABLE TO THIS FLOW: N/A

APPENDIX A

Engineering Specifications and Changes (continued)

The following list provides the OMI title, OMI number, and OMI Revision as it applied to RSRM-033 (STS-51):

OMI Title	OMI No.	OMI Rev.
Stacking and Alignment Operations	B5303	V
SRB System Mate and Closeout	B5304	N
Aft Booster Assembly Electrical Buildup	B5305	R
SRB Ordnance Connection and Pad Closeout	B5306	K
SRB Cable Installation and Checkout and Prepower Electrical Checks	B5307	Q
SRB RPSF Operations	B5308	P
Aft Booster Assembly (RPSF)	B5309	Q
SRB Standard Technical Practices	B5311	H

APPENDIX B

Problem Reports (PRs)

The following pages represent Problem Reports (PRs) that were initiated during the operational flow of RSRM-033, STS-51.

PROBLEM REPORT COUNT

RSRM-033
STS-51

	TOTAL PR'S	SRM ONLY	SRM OPEN	WASATCH RESP.	PRs SENT TO WAS.	TAIR LOG STATUS
LEFT						
SR-LF-60-008 (R&I FORWARD)	0	0	0	0	0	CLOSED
SR-LFC-60-008 (R&I CTR. FORWARD)	0	0	0	0	0	CLOSED
SR-LAC-60-008 (R&I CTR. AFT)	0	0	0	0	0	CLOSED
SR-LA-60-001 (R&I AFT)	0	0	0	0	0	CLOSED
SR-EC-60L-017 (R&I EXIT CONE)	0	0	0	0	0	CLOSED
AB-BI060L (AFT BUILDUP)	4	3	0	0	3	CLOSED
SB-BI060L (ASSEMBLY)	7	4	0	1	4	
RIGHT						
SR-RF-60-008 (R&I FORWARD)	0	0	0	0	0	CLOSED
SR-RFC-60-008 (R&I CTR. FORWARD)	0	0	0	0	0	CLOSED
SR-RAC-60-008 (R&I CTR. AFT)	3	3	0	2	3	CLOSED
SR-RA-60-001 (R&I AFT)	0	0	0	0	0	CLOSED
SR-EC-60R-018 (R&I EXIT CONE)	1	1	0	1	1	CLOSED
AB-BI060R (AFT BUILDUP)	7	1	0	1	1	CLOSED
SB-BI060R (ASSEMBLY)	13	5	0	3	4	
GENERAL						
AB-BI060 (AFT BUILDUP)	0	0	0	0	0	CLOSED
SB-BI060 (ASSEMBLY)	3	2	0	2	2	
TOTAL	38	19	0	10	18	

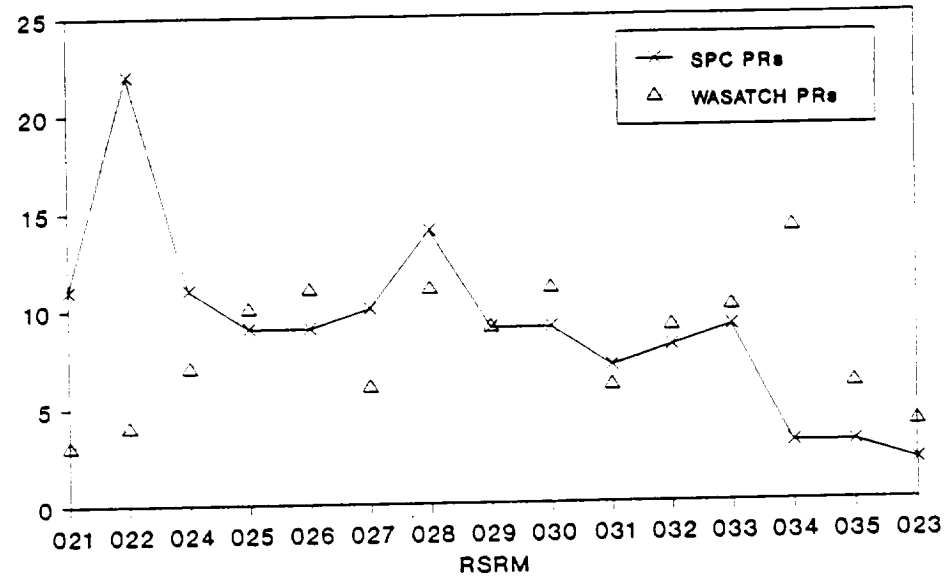
NOTE: TOTAL PR'S OPEN (INCLUDING THIOKOL & USBI)= 1

08/19/93 TAIR COUNT AT 0430 HOURS.

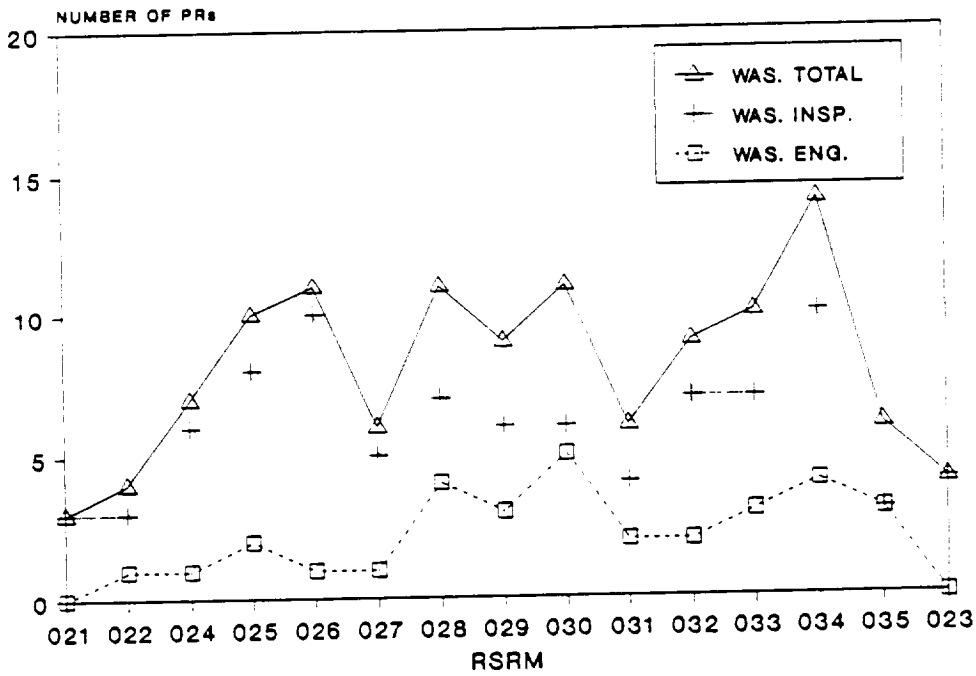
PR CLOSURE COUNT IS SUBJECT TO ENGINEERING EVALUATION AND IS BASED ON THE PREMISE THAT WORK IS 'COMPLETE'.

Thiokol LSS Quality Engineering

WASATCH/SPC
PR TRENDS



WASATCH PRs



Thiokol LSS Quality Engineering

As of 08-12-93

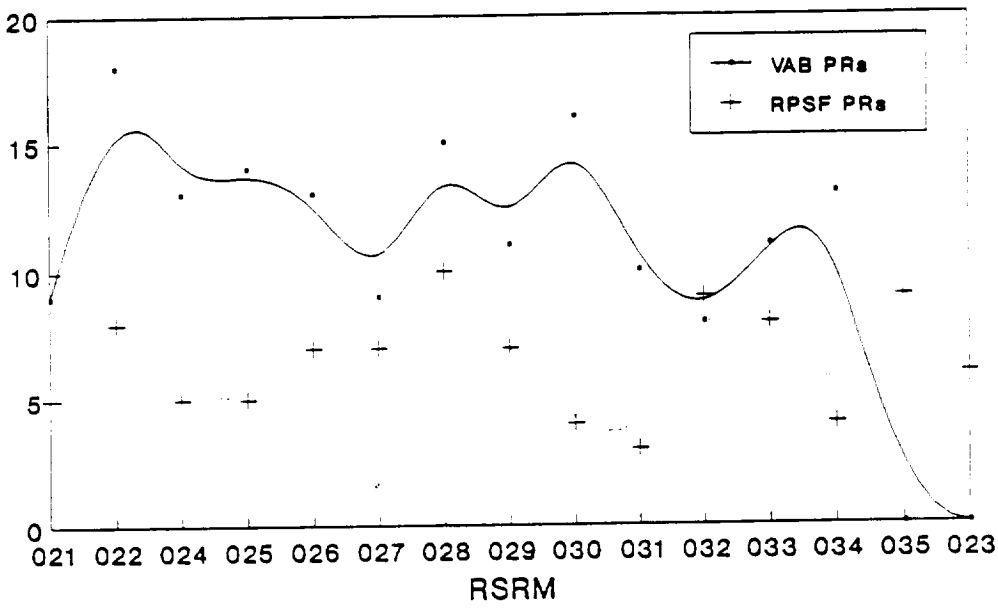
OPEN CAARS

FLIGHT	CAAR NUMBER	CAR NUMBER	DATE ISSUED	DAYS OPEN	RESP. ORGAN.
RSRM-023	PV6249287CT1		07/29/93	21	WASATCH

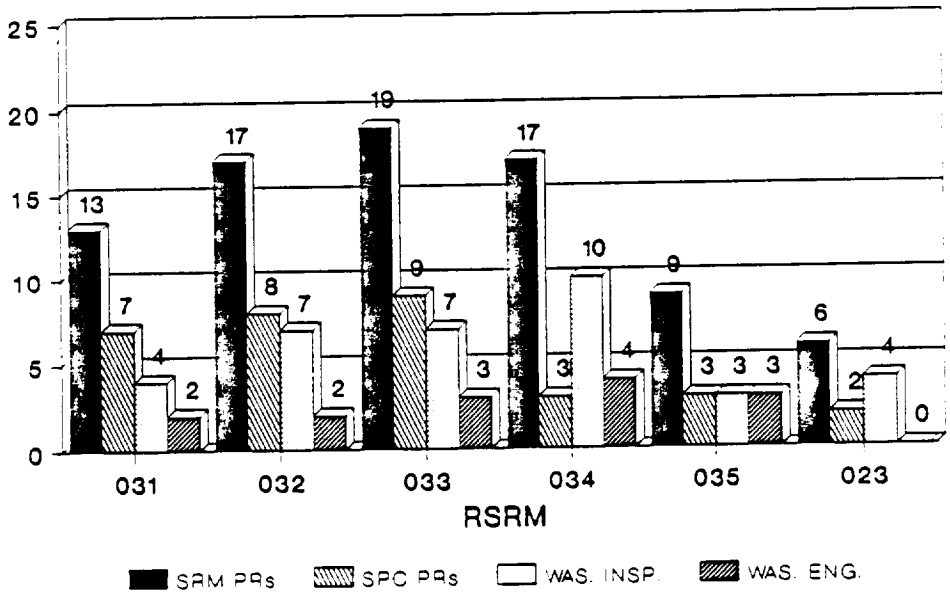
CAAR DATA

ACTIVITY	TOTAL CAAR'S	OPEN CAAR'S
RSRM-029	0	0
RSRM-030	1	0
RSRM-031	1	0
RSRM-032	1	0
RSRM-033	2	0
RSRM-034	0	0
RSRM-035	2	0
MISCELLANEOUS	11	0

VAB & RPSF
PR TREND



RESPONSIBILITY BREAKDOWN



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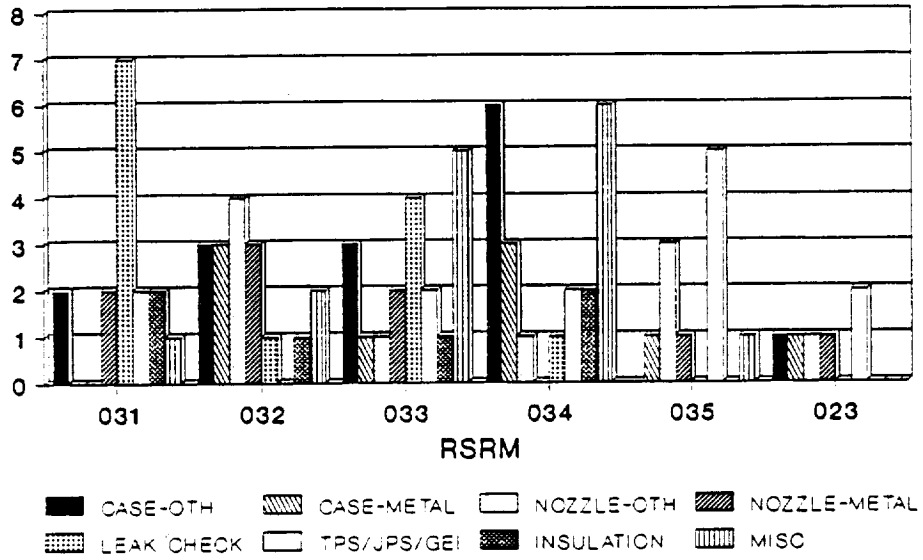
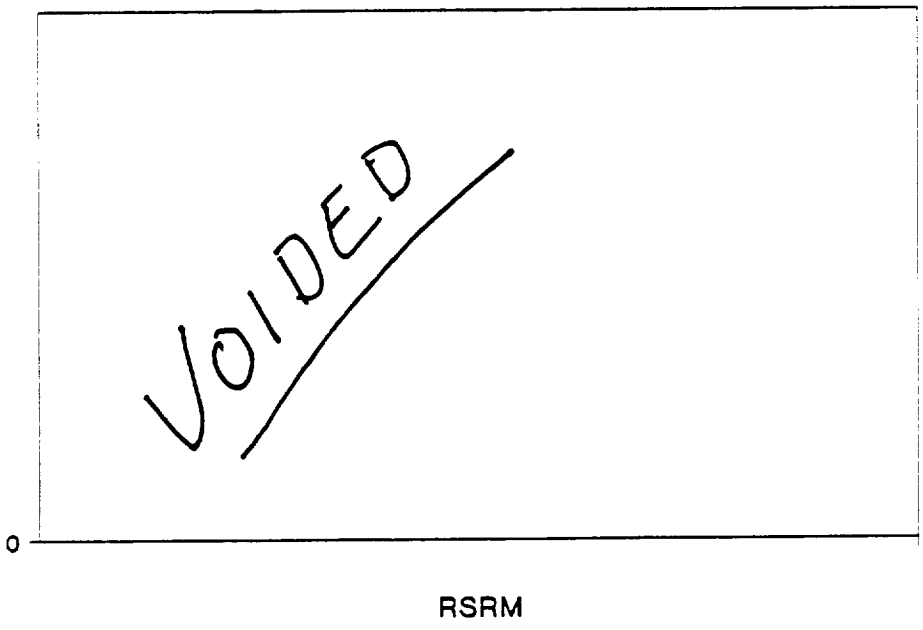
As of 08-12-93

DISCREPANCY BREAKDOWN



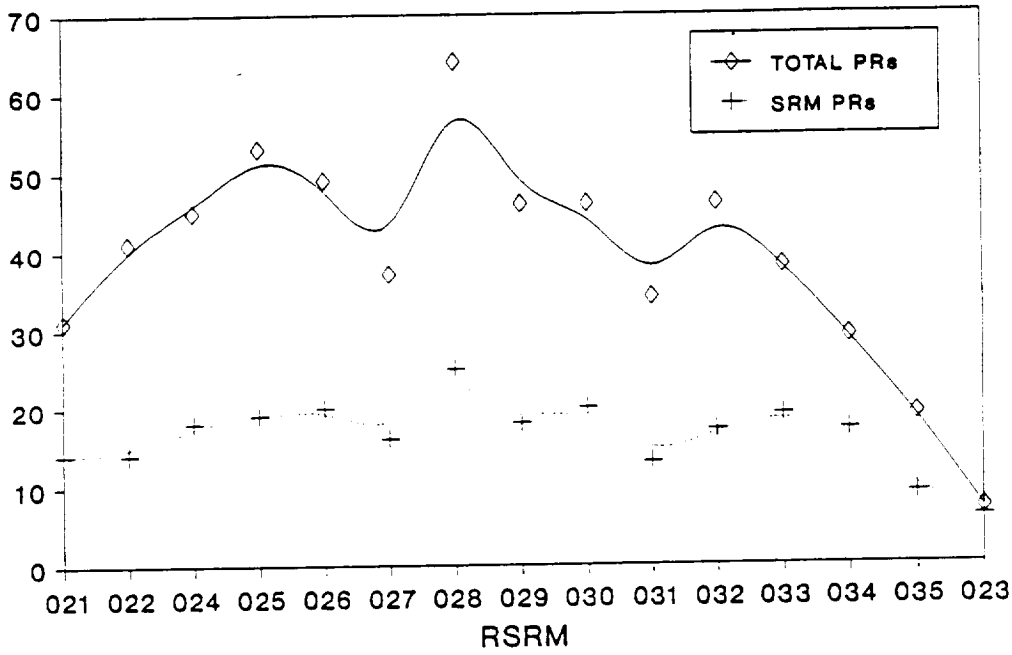
PR SMRB ASSESSMENT



Thiokol LSS Quality Engineering

As of 08-12-93

PR TREND



ASSEMBLY DATA

FLIGHT	TOTAL PR'S	SRM PR'S	CLOSED PR'S
RSRM-021	31	14	14
RSRM-022	41	14	14
RSRM-024	45	18	18
RSRM-025	53	19	19
RSRM-026	49	20	20
RSRM-027	37	16	16
RSRM-028	64	25	25
RSRM-029	46	18	18
RSRM-030*	46	20	20
RSRM-031*	34	13	13
RSRM-032*	46	17	17
RSRM-033*	38	19	19
RSRM-034*	29	17	17
RSRM-035*	19	9	9
RSRM-023*	7	6	2

Thiokol LSS Quality Engineering

As of 08-12-93

APPENDIX C

The Motor Set Status can be found on the following page.

MOTOR SET STATUS

STS-51 BI060 360T033

AS OF 13 SEPTEMBER 1993

A (LH) / B (RH)		ON DOCK KSC	OFF LOAD	RECEIVING INSPECTION	LOCATION		JOINT MATE	LEAK CHECK	HEATER INSTALL	JOINT CLOSEOUT	CABLE INSTALL	HEATER CHECKOUT
S&A 0000004 / 0000006	A	16 MAR 93		14 APR 93	PAD	A	15 JUN 93	17 JUN 93				
				CHECKOUT			INSTALLATION					
	B	16 MAR 93		14 APR 93	PAD	B	15 JUN 93	17 JUN 93				
54 / 41R1 / 41R5 / 14R7 / 26R1 / 36 — FWD SEG	A	1 MAR 93	15 MAR 93	16 MAR 93	PAD							
	B	9 MAR 93	22 MAR 93	24 MAR 93	PAD	A	16 MAY 93	19 MAY 93	21 MAY 93	25 MAY 93	28 MAY 93	28 MAY 93
						B	25 MAY 93	27 MAY 93	27 MAY 93	1 JUN 93	4 JUN 93	7 JUN 93
95R2 / 11R7 / 80 / 81 — FWD CTR SEG	A	1 MAR 93	17 MAR 93	17 MAR 93	PAD	A	14 MAY 93	17 MAY 93	19 MAY 93	22 MAY 93	28 MAY 93	28 MAY 93
	B	9 MAR 93	26 MAR 93	30 MAR 93	PAD	B	22 MAY 93	25 MAY 93	26 MAY 93	28 MAY 93	4 JUN 93	7 JUN 93
9R5 / 104RR / 79 / 62R1 — AFT CTR SEG	A	1 MAR 93	19 MAR 93	23 MAR 93	PAD	A	12 MAY 93	15 MAY 93	19 MAY 93	26 MAY 93	28 MAY 93	28 MAY 93
	B	9 MAR 93	29 MAR 93	23 MAR 93	PAD	B	20 MAY 93	21 MAY 93	22 MAY 93	28 MAY 93	4 JUN 93	7 JUN 93
40R2 / 49 / 863 / 41R2 / 31 / 80R1 / 20R3 / 18R4 — AFT SEG	A	8 FEB 93	18 FEB 93	19 MAR 93	PAD							
	B	1 MAR 93	5 MAR 93	8 APR 93	PAD							
AEC 47R3 / 43R3	A	8 FEB 93	12 FEB 93	17 FEB 93	PAD	A	25 FEB 93** 3 MAR 93***	25 FEB 93 † 4 MAR 93 ††				
							AEC MATE					
	B	1 MAR 93*	8 FEB 93	9 MAR 93	PAD	B	23 MAR 93	24 MAR 93				
AFT SKT	A	23 FEB 93				A	10 MAY 93					
		SKIRT MATE					AFT BOOSTER ON MLP					
	B	9 MAR 93				B	17 MAY 93					

Legend

- ON DOCK KSC -- RAILCARS PHYSICALLY ON KSC
- OFFLOAD -- SEGMENT LIFTED FROM THE RAILCAR
- REC / INSP -- COMPLETE WHEN WEATHER COVER INST
- FIELD JOINT/AFT SKIRT MATE -- LAST PIN INSTALLED
- AFT BOOSTER ON MLP -- BEAM DISCONNECT
- AEC MATED -- LAST BOLT TORQUED
- LEAK CHECK -- VENT AND LK CK PLUGS INSTALLED
- HEATER INSTALL -- HEATER INSTALLED ON SEGMENT
- CABLE INSTALL -- ALL HEATER CABLES CONNECTED
- JOINT CLOSEOUT -- ALL JPS PAINT TOP COAT INSTALLATION COMPLETE
- HEATER CHECKOUT, FIELD JOINT AND IGNITER -- B5307 TASK 5 COMPLETED
- FORWARD ASSEMBLY MATE -- LAST PIN INSTALLED
- ET / SRB MATE -- BEAM DISCONNECTED FROM ET
- ORBITER MATE -- BEAM DISCONNECTED FROM ORBITER
- ROLL TO PAD -- FIRST MOTION IN THE VAB
- FWD SKT CLOSEOUT -- FORWARD SKIRT DOOR INST

FORWARD ASSEMBLY MATE LH 18 MAY 93 RH 1 JUN 93

ET/SRB MATE 2 JUN 93 ORBITER MATE 19 JUN 93

ROLL TO PAD 26 JUN 93 FWD SKT CLOSEOUT L/H 2 SEPT 93 R/H 2 SEPT 93

Launch 12 SEPT 93

Thiokol CORPORATION

* = S/N 0000018 from RSRM-34 (FEC-095)
** = 1st Joint Mate
*** = 2nd Joint Mate

† = Failed 1st Leak Check
†† = Passed 2nd Leak Check

KSC Operations Office

FSS FLOW ENGINEER - Bob Hillard
(407) 867-2704

C-2

TWR-64563

C2