TWR-17541 Vol. 3 Rev. A

SPACE SHUTTLE

Solid Rocket Motors
Thiokol Corporation

# Flight Set 360L002 (STS-27)
# Insulation Component Final Report
# Volume III
# Final Release

September 1989

**Prepared for:**

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**
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## ABSTRACT

Volume III of this postfire report deals with the insulation component of the RSRM. The report is released twice for each flight set. The interim release is expected on or before 45 days after the last field joint or nozzle to case joint is disassembled at KSC and contains the results of the KSC visual evaluation. The data contained in the Volume III interim release supersedes the insulation data presented in the KSC 10 day report. The final release is expected on or before 45 days after the last factory joint is disassembled at the Clearfield H-7 facility and contains the results of all visual evaluations and a thermal (material decomposition) safety factor analysis. The data contained in the Volume III final release supersedes the interim release and the insulation data presented in the Clearfield 10 day report.

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# ACRONYM LIST

| | | |
|---|---|---|
| ASF | - | Actual Safety Factor |
| CEI | - | Contract End Item |
| CF/EPDM | - | Carbon Fiber Filled EPDM |
| CSF | - | Compliance Safety Factor |
| DR | - | Discrepancy Report |
| EMT | - | Engineering Management Team |
| EPDM | - | Ethylene Propylene Diene Monomer |
| ET | - | External Tank |
| E.T. | - | Exposure Time |
| FRR | - | Flight Readiness Review |
| HPM | - | High Performance Motor |
| I.D. | - | Inside Diameter |
| KSC | - | Kennedy Space Center |
| $M + 3\sigma$ | - | Median Plus Three Times The Standard Deviation |
| MDD | - | Material Decomposition Depth |
| MDR | - | Material Decomposition Rate |
| MDT | - | Minimum Design Thickness |
| NBR | - | Acrylonitrile Butadiene Rubber |
| PEEL | - | Postfire Engineering Evaluation Limits |
| PEEP | - | Postfire Engineering Evaluation Plan |
| PFAR | - | Postfire Anomaly Record |
| PR | - | Problem Report |
| PSI | - | Pounds Per Square Inch |
| RPRB | - | Redesign Program Review Board |
| RSRM | - | Redesign Solid Rocket Motor |
| SRB | - | Solid Rocket Booster |
| SRM | - | Solid Rocket Motor |
| STS | - | Space Transportation System |
| TPS | - | Thermal Protection System |

## 1.0 INTRODUCTION

Space Transportation System (STS)-27 was launched from KSC pad 39B on 2 December 1988. Two of the Redesigned Solid Rocket Motors (RSRM) were part of the launch system and were designated RSRM-2A (360L002A) and RSRM-2B (360L002B). Both motors incorporated the redesigned case field joint and nozzle to case joint as shown on Figure 1. Following booster separation and splashdown, the motors were recovered and returned to Hangar AF for disassembly and inspection.

Following the inspection at Hanger AF, the segments were returned to the Morton Thiokol Refurbishment H-7 facility at Clearfield. There, the insulation thicknesses were measured and the factory joints were disassembled. The documentation of these inspections and the performance evaluation (material decomposition safety factor analysis) have been added to this final release of the report.

In an attempt to standardize and document the evaluation of flight RSRM's, a Postflight Engineering Evaluation Plan (PEEP) has been written (Reference 1). The PEEP outlines the basic evaluations to be performed at KSC Hangar AF. Appropriate procedures contained in this plan were used to evaluate the internal and external insulation. An addendum to the PEEP was written which outlines additional evaluations to be performed on the RSRM-2A and RSRM-2B motors to assess conditions documented on prefire discrepancy reports (Reference 2). The intent of these procedures is to insure that all pertinent evaluation points are examined and documented in a consistent and complete manner.

## 2.0 OBJECTIVE

The objective of this postflight evaluation report is to document the postfire condition of the internal and external insulation and evaluate the thermal (material decomposition) safety factors of the RSRM-2A and RSRM-2B internal insulation. An additional objective of this document is to discuss the Insulation Component Program Team assessment of the observations.

## 3.0 SUMMARY

A summary of the RSRM-2A and RSRM-2B external and internal insulation condition is found below. A detailed description of the results can be found in Sections 6.0 through 9.0.

### 3.1 EXTERNAL INSULATION

#### 3.1.1 Factory Joint Weatherseals

The factory joint weatherseals and exterior motor cases appeared to be in good condition. However, moisture was found under the weatherseal on both forward center segment factory joints and the RSRM-2A aft dome factory joint. The water appeared to have entered the weatherseal at the locations where DFI instrumentation wires or insulation cure thermocouple wires were routed between the weatherseal and the case. The weatherseals were very well bonded in all other areas. The closeout of the wire exit locations is being re-evaluated to eliminate problems on future flights. No significant areas of missing EPDM insulation or edge separations were noted on any factory joint weatherseal.

#### 3.1.2 Stiffener Stubs and Rings

The insulation over the stiffener stubs and rings was in good condition. Normal heat effect and discoloration were evident on all surfaces, with no significant areas of missing material. The EPDM was well bonded to the stiffener stubs and appeared to be well bonded to the stiffener rings. However, after the rings were removed from the case, separations were noted between the insulation and stiffener rings on approximately one third of the eighteen ring segments. The separations were all located on the circumferential ends of the ring segments with no isolated separations. The largest separation measured up to 47.0 inches in length. Pieces of K5NA ablation compound were found under the EPDM as much as 15 inches from the end of the ring segment. This tends to indicate that the separations are at least aggravated, if not caused, by hydrolasing.

## 3.2 NOZZLE TO CASE JOINT

Based on the visual evaluation, both nozzle to case joints performed exceptionally. No gas paths through the polysulfide adhesive or any other anomalous conditions were identified. The polysulfide adhesive had only two measurable voids on the RSRM-2A joint and no voids on the RSRM-2B joint. The largest void was 0.80 inch axially by 0.25 inch circumferentially. Both joints had good cohesive failure of the polysulfide and only very slight porosity in the step region. The average polysulfide vent slot fill was 14% on RSRM-2A and 62% on RSRM-2B.

## 3.3 FIELD JOINTS

The internal insulation in all six of the case field joints performed as designed, and no anomalous conditions were identified. J-leg tip contact was evident over the full circumference at each joint. The forward field joints were heat affected slightly more than seen on the RSRM static test motors. Soot deposits extending down the bondline were noted on the aft RSRM-2A field joint and all RSRM-2B field joints. The most extreme condition was on the RSRM-2B center field joint with soot extending a maximum of 1.0 inch into the bondline (outboard from the remaining material). The initial appearance of these areas could have been construed to be chamber gas leakage into the joint bondline, but the soot was readily removable with solvent. Sooting was noted further into the bondline on the RSRM-1 forward field joints and extended to the radius region. This sooting is believed to have occurred at splashdown during joint flexing in conjunction with the phenomena which generates the radial tears in the NBR inhibitor stubs.

The deepest clevis edge separation had an apparent depth of 1.04 inches on the RSRM-2B aft segment. Clevis edge separations appeared to grow axially in all six segments. The maximum axial growth identified was 0.93 inch, also on the RSRM-2B aft segment. The deepest tang edge separation was 0.35 inch deep on the RSRM-2A aft center segment. The maximum axial growth identified was 0.18 inch on the RSRM-2A forward segment.

## 3.4 IGNITER TO CASE JOINTS

The igniter boss insulation was in excellent condition, with normal erosion and no edge separations evident. Both RSRM-2A and RSRM-2B had minor insulation flashing at the igniter boss.

## 3.5 INTERNAL ACREAGE INSULATION

The acreage insulation, including the internal insulation over each of the factory joints, appeared in good condition during the preliminary evaluation. No evidence of gas paths through the insulation or severe erosion was identified.

### 3.5.1 Aft Segments

No severe conditions were noted in the aft segments. Both NBR inhibitors had areas of uneven, jagged erosion, but the remaining inhibitor heights were within the expected tolerance band and there were no inhibitor tears greater than 3 inches in length. The acreage insulation was in normal condition, with no areas of excessive erosion.

### 3.5.2 Center Segments

A few tears greater than 3 inches radially were noted in the aft center segment inhibitor stubs (three on RSRM-2A and two on RSRM-2B). Some radial tears were also noted in the forward center segment NBR inhibitor stubs (eight on RSRM-2A and five on RSRM-2B). The largest tear measured 14.5 inches radially, but most of the tears ranged from 4.0 to 6.0 inches radially. One of the tears extended radially outward to approximately 9.5 inches inboard from the clevis I.D. The radial extent and frequency of the tears identified in the inhibitor stubs are within the range of tears noted on past flight motors. The edges of the tears appeared rough and could be placed together demonstrating no material loss or erosion. This indicates that the tears occurred after motor burn.

### 3.5.3 Forward Segments

The stress relief flap was present for the full circumference on both forward segments but was severely heat affected. Up to half the flap length was eroded for part of the circumference. The castable inhibitors were completely missing full circumference. No axial tears were identified on the remaining flap unlike RSRM-1 which had numerous flap tears.

## 3.6 FACTORY JOINTS

All the factory joints were in good condition. No abnormal erosion or gas paths were noted. Remaining Teflon tape was visible in all joints as well as normal intermittent NBR flashing on the inner clevis leg. Some of the joints had minor ply separations in the NBR insulation, but they did not affect the performance of the joint.

## 3.7 INSULATION THERMAL PERFORMANCE

No unacceptable conditions were found in the thermal (material decomposition) safety factor evaluation of the nozzle to case joints, field joints, factory joints, and case wall acreage areas. A summary of minimum safety factors can be found in Tables 1 through 3.

A total of three locations in RSRM-2A and and twelve locations in RSRM-2B had apparently violated the compliance thermal safety factor requirements. An analysis of the insulation surface conditions, surrounding prefire and postfire data, and visual inspections indicated that the prefire measurements were inaccurate. Insulation Design has determined that the apparent safety factor violations are due to erroneous data and are not actual violations (see Sections 7.0 and 9.0).

# 4.0 CONCLUSIONS

During the KSC evaluation, Squawk forms were generated to report and track observations which violated the Postfire Engineering Evaluation Limits (Reference 3). The Squawks were reviewed by the SRB/SRM Postflight Assessment Team, and some of the Squawks were elevated to PR's. The PR's and Squawks are contained in Reference 4.

All observations presented in this document were reviewed by the Insulation Component Program Team to determine which observations were potential anomalies. The observations documented on PR's and Squawks were automatically termed potential anomalies. The Insulation Component Program Team then classified each of the potential anomalies as 'critical', 'major', or 'minor' anomaly or 'remains observation' as defined per the Table 4 Redesign Program Review Board (RPRB) criteria.

## 4.1 KSC EVALUATION CLASSIFICATIONS

The Insulation Component Program Team identified two conditions observed at KSC which were considered potential anomalies:

'MINOR ANOMALY'

1. Moisture was found under the factory joint weatherseals on both forward center segment factory joints and the RSRM-2A aft dome factory joint. The water penetrated the weatherseal at the location where instrumentation and thermocouple wires are routed between the weatherseal and the case. The following PR's were written against this condition:
   PR PV6-116194 (Squawk I.D. Number 27-0004) - RSRM-2A forward center segment
   PR PV6-116195 (Squawk I.D. number 27-0003) - RSRM-2B forward center segment
   The condition required corrective action but occurred at splashdown and was not a flight safety issue, so it was not a constraint for the next launch. It involved a hardware reuse issue only; therefore, the moisture under the weatherseal was classified as a 'minor anomaly'. A Postfire Anomaly Record (PFAR) was required for this observation.

'REMAINS OBSERVATION'

2. Insulation to stiffener ring separations. The following Squawk was written against this condition:
   Squawk I.D. number 27-0032 - RSRM-2 insulated stiffener rings
   The evidence suggested that the separations were caused by hydrolasing and did not occur before or during flight; therefore, the insulation to stiffener ring separations were classified as 'remains observation.'

The Insulation Component Program Team presented their assessment of the KSC observations shown in this document to the Engineering Management Team (EMT) on 16 January 1989 and to the RPRB on 25 January 1989. The EMT and the RPRB accepted the insulation team's classifications as presented.

4.2 H-7 EVALUATION CLASSIFICATIONS

The Insulation Component Program Team identified two conditions observed at Clearfield H-7 which were considered potential anomalies:

'MINOR ANOMALY'

1. An insulation to case clevis edge separation on the RSRM-2B aft segment measured 1.042 inches axially deep and 1.022 inches circumferentially wide at 92°. There was no edge separation noted at this location at KSC. Therefore, the edge separation either opened up during transport from KSC to H-7 Clearfield, or the H-7 Clearfield data was incorrect. The insulation was washed out of the segment before Insulation Design received the data, so it was not possible to verify the edge separation. This condition was classified as a minor anomaly even though the accuracy of the measurement was doubtful, because the apparent edge separation was quite large.

'REMAINS OBSERVATION'

2. Three locations within RSRM-2A and twelve locations within RSRM-2B had apparently violated the minimum safety factor requirement. Since Insulation Design believes that these were due to erroneous data, the observation was classified as 'remains observation'.

The Insulation Component Program Team presented their assessment of the Clearfield H-7 observations to the RPRB on 19 July 1989. The RPRB did not accept the team's recommendation. The RPRB directed that the team return with further clarification of both potential anomalies and the corrective action for each.

Item 1 above was present to the RPRB on 4 October 1989 with a set of background data on edge separations. The RPRB accepted the Insulation team's classification.

Item 2 was presented to the RPRB on 6 September 1989 along with a presentation on the insulation measurement processs. The RPRB accepted the Insulation team's classification.

## 5.0 RECOMMENDATIONS

The following recommendations are based on the results of the RSRM-2 postflight inspection:

### 5.1 KSC EVALUATION RECOMMENDATIONS

1. The thermocouple wires should be deleted from the factory joint weatherseal layup to eliminate salt water intrusion paths into the factory joints. The thermocouples are used for insulation cure data only and are no longer considered necessary. DFI wires will not exist under the weatherseal after RSRM-3 except for RSRM-4B aft center and aft segments.

2. Develop a closeout to seal the thermocouple and DFI wires until recommendation 1 can be implemented to prevent salt water intrusion into the factory joints.

3. Perform a tap test on the RSRM-3 stiffener rings prior to hydrolasing to detect any separations.

### 5.2 H-7 EVALUATION RECOMMENDATIONS

1. Prefire insulation thickness measurements of subsequent motors need to be screened and all outlying data remeasured and verified or corrected to ensure that safety factor violations do not occur due to bad prefire data.

2. Eliminate or move performance stations that have provided unreliable prefire insulation thickness data in the past in accordance with Reference 5.

3. Ensure that data is received from Clearfield H-7 and evaluated before the segment insulation is washed out.

## 6.0 RSRM-2A VISUAL EVALUATIONS

The following paragraphs discuss the RSRM-2A evaluations performed at KSC and H-7. During the postflight evaluation, Insulation Design Engineers documented the condition of the external factory joint weatherseals, stiffener rings, stiffener stubs, nozzle to case joint, case field joints, factory joints, segment acreage insulation, NBR

inhibitors, and stress relief flap regions. A copy of this documentation for RSRM-2A can be found in Appendix A. The condition of the insulation components for each segment are discussed in the following subsections.

## 6.1 RSRM-2A EXTERNAL INSULATION

### 6.1.1 RSRM-2A External Factory Joint Weatherseals

The factory joint weatherseal of each joint was visually inspected and the condition is recorded in Tables A-1 through A-7. No significant areas of missing EPDM insulation were noted on any factory joint weatherseal. Small areas of missing EPDM from debris impact were noted on the aft edge of three of the seven factory joints. The deepest area measured 1.0 inch circumferentially, 0.5 inch axially, and 0.20 inch deep on the RSRM-2A forward center segment. Only one small edge separation was noted. It was located on the forward edge of the RSRM-2A aft dome joint from 200°-230° with a maximum depth of 0.05 inch. The weatherseals on all three aft segment factory joints were slightly heat affected from 220°-270°-320° due to the plume radiation from the adjacent solid rocket motor and shuttle main engines. The heaviest heat effect occurred at 270°. This is a normal occurrence that had no effect on the performance of the weatherseals.

Moisture was evident under the weatherseal on two of the factory joints. The forward center segment had water leaking from underneath the weatherseal at the locations where DFI instrumentation wires were routed between the weatherseal and the case. Sections of the weatherseal were removed from the forward center segment and the aft dome joint. A significant amount of water was evident under the forward center segment weatherseal, but only a very small amount of water was evident under the aft dome weatherseal. The water apparently penetrated the weatherseals only at DFI or insulation cure thermocouple wire locations because the weatherseals were very well bonded in all other areas. The closeout of the wire exit locations is being re-evaluated to eliminate problems on future flights.

6.1.2 RSRM-2A Stiffener Stubs and Rings

The condition of the insulation over the stiffener stubs and rings is recorded in Tables A-8 through A-12. The insulation was in good condition with normal heat effect and discoloration on the forward stiffener stub and the three stiffener rings. The heaviest heat effect occurred from 220°-270°-320° due to the plume radiation from the adjacent solid rocket motor and shuttle main engines. This condition was also seen on the aft segment factory joint weatherseals. The K5NA, which was added to the outboard surface of the RSRM-2A forward stiffener stub to meet drawing thickness requirements, was pitted full circumference due to heat effects and debris impact. The heaviest effects were from 220°-270°-320°. The aft face of the RSRM-2A center stiffener ring had a hairline crack in the K5NA from 120°-140°. There was no damage evident on the EPDM or the stiffener ring in this area after the rings were removed from the case.

The EPDM was well bonded to the stiffener stubs and appeared to be well bonded to the stiffener rings. However, after the rings were removed from the case and the ring segments from both motors were evaluated, separations were noted between the insulation and stiffener ring on approximately one third of the eighteen ring segments. The separations were all located on the ends of the ring segments with no isolated separations. The separations ranged in circumferential depth from 0.5 to 47.0 inches (Figure 2). The failure mode was primarily adhesive failure at the Chemlok 205 to steel interface. There was no heat effect or sooting underneath the insulation, but corrosion was evident in some locations. Pieces of K5NA ablation compound were found under the EPDM as much as 15 inches from the end of the ring segment. This tends to indicate that the separations are at least aggravated, if not caused, by hydrolasing.

6.2 RSRM-2A NOZZLE TO CASE JOINT

The nozzle to case joint insulation condition is recorded in Table A-13. The nozzle to case joint performed as expected with no polysulfide blowholes identified across the bondline. Two voids in the polysulfide adhesive were noted aft of the step region. Both voids were directly in

line with a vent slot and were caused by entrapped air in the adhesive during assembly. Neither of the voids extended across the entire bondline or were exposed to hot gas. The largest void was identified at 309.6° and measured 0.80 inch axial by 0.25 inch maximum circumferential. The size and location of the noted voids are contained in Table A-13. Approximately five other very small voids were also noted around the circumference aft of the step.

The failure mode of the polysulfide was approximately 80% cohesive within the polysulfide and 20% adhesive at the NBR to polysulfide interface. A very small amount of porosity was noted within the polysulfide bondline at the step region. The vent slots had a low percentage of polysulfide fill, showing an average fill of 14% with values ranging from 0% to 100% fill.

The bondline around the circumference demonstrated erosion similar to that observed on RSRM static test motors. The polysulfide was decomposed further into the joint (approximately 6.18 inches from the aft face of the nozzle boss) than the flap erosion. For approximately 0.40 inch further aft (5.78 inches from the aft face of the nozzle boss), the polysulfide was partially decomposed and bubbled. Although the material was partially decomposed, no gas flow had occurred in the adhesive bondline decomposed region.

The insulation erosion in the joint region was similar to the condition of previous RSRM motors. The char layer on the CF/EPDM had swollen to the point that the postflight material thickness at the joint appeared to exceed the preflight material thickness by approximately 0.50 to 0.75 inch.

The NBR flap and baffle appeared to be in excellent shape with normal heat effect and erosion. There was an area of slight damage at 252° approximately 9 inches wide circumferentially. The nozzle scraped this area during joint disassembly.

## 6.3 RSRM-2A FIELD JOINTS

### 6.3.1 RSRM-2A Aft Field Joint

The aft field joint insulation condition is recorded in Table A-14. The joint insulation configuration performed as designed. The tang and

clevis joint insulation were in excellent condition. The inboard surfaces of the joint insulation were normally charred with some heat affected areas outboard of the char layer. Measurements of the tang and clevis material char depths and heat affected depths are provided in Table A-14.

The general appearance of the pressure sensitive adhesive was noted. Contact within the joint was based on the matted appearance and flat texture of the adhesive, and non-contact was based on the glossy appearance of the adhesive. The joint appeared to have made contact over the full circumference at the tip of the J-leg. The bondline contact was measured at 0°, 90°, 180°, and 270°. Based on these four measurements, the deflected J-leg appeared to have made contact from the tip of the J-leg to an average of 1.14 inches outboard of the material remaining (Figure 3). The minimum radial contact was 1.00 inch, and the maximum radial contact was 1.35 inches.

No evidence of motor chamber pressure past the J-joint insulation was identified. No heat effect or erosion of the capture feature O-ring, primary O-ring, or secondary O-ring was identified. No evidence of foreign material, cracks, or crazing was identified on the joint insulation surfaces.

Soot deposits extending down the bondline were identified from 65°-80° on the clevis insulation. The maximum depth was 0.30 inch outboard of the remaining material. A similar condition was noted in three of the other five RSRM-2 field joints. The initial appearance could have been construed to be chamber gas leakage into the joint bondline, but the soot was readily removable with solvent. The pressure sensitive adhesive in these regions was still tacky to the touch and showed no signs of heat effect. Similar soot deposits were identified on the RSRM-1 forward field joints, but those soot deposits extended further into the bondline and reached the radius region in some locations. Those sooted regions frequently corresponded to large radial inhibitor stub tears or areas where a portion of the NBR inhibitor stub was torn away. There was no similar correspondence to inhibitor tears or missing

material on the RSRM-2 joints. This sooting is believed to have occurred during motor re-entry or at splashdown when the joint may have flexed slightly and allowed soot into the bondline.

Prior to stacking, the tang and clevis insulation to case bondline of each segment were inspected. Edge separations were identified on the clevis during this preflight inspection, and those which exceeded the specification criteria of 0.05 inch depth were repaired. The tang and clevis insulation edge separations were probed during postflight inspection at Clearfield H-7. The deepest postfire clevis edge separation had a depth of 0.36 inch, which had grown from a repaired prefire separation of 0.10 inch depth. The deepest postfire tang edge separation had a depth of 0.35 inch, which had grown from an area with no prefire separation. These separations are documented in Tables 5 and 6 and detailed results can be found in Reference 6.

6.3.2 RSRM-2A Center Field Joint

The center field joint insulation condition is recorded in Table A-15. The joint insulation configuration performed as designed. The inboard surfaces of the joint insulation were normally charred with some heat affected areas outboard of the char layer. Measurements of the tang and clevis material char depths and heat affected depths are provided in Table A-15.

The general appearance of the pressure sensitive adhesive was noted. Contact and non-contact within the joint was based on the matted appearance and flat texture, or the glossy appearance of the adhesive. The joint appeared to have made contact over the full circumference at the tip of the J-leg. The bondline contact was measured at 0°, 90°, 180°, and 270°. Based on these four measurements, the deflected J-leg appeared to have made contact from the tip of the J-leg to an average of 1.16 inches outboard of the material remaining (Figure 4). The minimum radial contact was 1.10 inches, and the maximum radial contact was 1.50 inches.

No evidence of motor chamber pressure past the J-joint insulation was identified. No heat effect or erosion of the capture feature O-ring, primary O-ring, or secondary O-rings was identified. No evidence of foreign material was identified on the joint insulation surfaces.

Cracks were noted in the clevis insulation in the radius region from 220°-270°-300°. These cracks were documented on prefire discrepancy reports (DR's). They did not grow during motor firing and had no effect on the function of the joint bondline.

Edge separations were identified on the clevis insulation during the preflight inspection, and those which exceeded the specification criteria of 0.05 inch depth were repaired. The tang and clevis insulation edge separations were probed during postflight inspection at Clearfield H-7. The deepest postfire clevis edge separation had a depth of 0.33 inch, which had grown from a repaired prefire separation of 0.08 inch depth. The deepest postfire tang edge separation had a depth of 0.18 inch, which had grown from a repaired prefire separation of 0.12 inch depth. These separations are documented in Tables 5 and 6 and detailed results can be found in Reference 6.

### 6.3.3 RSRM-2A Forward Field Joint

The forward field joint insulation condition is recorded in Table A-16. The joint insulation configuration performed as designed. The inboard surfaces of the joint insulation were normally charred with some heat affected areas outboard of the char layer. The heat effect on the tang was slightly more than has been seen on RSRM static test motors. Measurements of the tang and clevis material char depths and heat affected depths are provided in Table A-16.

The general appearance of the pressure sensitive adhesive was noted. The joint appeared to have made contact over the full circumference at the tip of the J-leg. The contact area appeared matted with a flat texture. The bondline contact was measured at 0°, 90°, 180°, and 270°. Based on these four measurements, the deflected J-leg appeared to have made contact from the tip of the J-leg to an average of 1.18 inches outboard of the material remaining (Figure 5). The minimum radial contact was 1.10 inches, and the maximum radial contact was 1.25 inches.

No evidence of motor chamber pressure past the J-joint insulation was identified. No heat effect or erosion of the capture feature O-ring, primary O-ring, or secondary O-ring was identified. No evidence of cracks or crazing was identified on the joint insulation surfaces.

A white substance was evident intermittently on the tang and clevis insulation ramp surfaces (outboard of the radius region). The substance appeared to be tape residue and may have come from the tape that is placed on the insulation bondline while the metal is being greased prior to segment stacking. The residue did not affect the function of the joint.

Edge separations were identified on the clevis insulation during the preflight inspection, and those which exceeded the specification criteria of 0.05 inch depth were repaired. The tang and clevis insulation edge separations were probed during postflight inspection at Clearfield H-7. The deepest postfire clevis edge separation had a depth of 0.32 inch, which had grown from a repaired prefire separation of 0.20 inch depth. The deepest postfire tang edge separation had a depth of 0.25 inch, which had grown from a repaired prefire separation of 0.18 inch depth. These separations are documented in Tables 5 and 6 and detailed results can be found in Reference 6.

## 6.4 RSRM-2A IGNITER TO CASE JOINT

The condition of the igniter boss insulation was excellent. An evaluation of the insulation to case interface revealed no edge separations. There was insulation flashing at the igniter boss from 210°-270°-0° which measured approximately 0.050 inch axially. The flashing should have been trimmed prior to igniter installation but had no effect on the function of the igniter to case joint. The molded insulation surface was in good condition with normal erosion on the inboard surface. The condition of the igniter internal and external insulation is discussed in a separate document dealing with the igniter component (Reference 7).

## 6.5 RSRM-2A ACREAGE INSULATION

### 6.5.1 RSRM-2A Aft Segment Acreage Insulation

The aft segment internal insulation was in excellent condition and is recorded in Tables A-17 through A-19.

The forward facing NBR inhibitor stub exhibited normal erosion over approximately one-half of the circumference, but there was an area of uneven erosion from approximately 240°-0°-30°. This area had a very short inhibitor stub with intermittent inhibitor pieces extending taller than adjacent areas up to 2.5 inches (Figure 6). There were no inhibitor tears greater than 3 inches in length.

Measurements of the remaining inhibitor stub heights were taken inboard from the I.D. surface of the inner clevis leg every 30° and are contained in Table A-19. The inhibitor height ranged from 4.25 to 8.0 inches. Although the erosion was uneven, the remaining inhibitor stub heights for this segment were within the expected tolerance band for past flight motors based on a statistical analysis of the historical database (Reference 8).

There was no liner remaining in the aft segment. This condition is common for an aft segment.

The erosion in the aft dome was similar to past flight motors. The NBR under the CF/EPDM was not exposed, and the insulation in the aft dome did not appear to be eroded as severely as previous RSRM static motors. This variation between flight and static motors has been common throughout the history of the SRM program.

No evidence of blisters, separations, gouges, cuts, missing material, or excessive erosion was identified in the aft segment.

### 6.5.2 RSRM-2A Aft Center Segment Acreage Insulation

The condition of the aft center segment internal insulation is recorded in Tables A-20 through A-23.

The forward facing NBR inhibitor stub exhibited uniform erosion for the full circumference. Three radial tears greater than 3 inches long were noted. The longest tear measured 4.0 inches. Because the edges of the tears were rough and edge geometry matched when placed together, no material loss or erosion occurred. This indicated that the tears occurred after motor burn. The location and length of the tears are contained in Table A-21.

Measurements from the I.D. surface of the inner clevis leg to the tip of the remaining NBR inhibitor stub were taken every 30° and are contained in Table A-22. The remaining inhibitor stub heights ranged from 12.0 to 15.5 inches for this segment, which is within the expected tolerance band.

Liner coverage in the aft center segment was heavy near the clevis end and generally missing aft of the factory joint. Due to the poor lighting condition and the coating of wet char inside of the motor segments, the exact pattern and termination points of the liner material could not readily be determined at KSC. The diagram of the liner pattern was obtained after the segments arrived at the Clearfield H-7 facility, and is shown in Figure 7.

The condition of the flap region is recorded in Table A-23. The castable inhibitor was completely missing full circumference, which is typical of an aft center segment. The stress relief flap was eroded back to the flap bulb over the full circumference, which is also typical of an aft center segment. The CF/EPDM under the flap was eroded for approximately 95% of the circumference, and remained partially intact from approximately 220°-240°. The exposed NBR under the flap and the portion of the CF/EPDM remaining appeared to be severely heat affected.

No evidence of blisters, separations, gouges, cuts, missing material, or excessive erosion was identified in the aft center segment.

### 6.5.3 RSRM-2A Forward Center Segment Acreage Insulation

The condition of the forward center segment internal insulation is recorded in Tables A-24 through A-27.

The forward facing NBR inhibitor stub exhibited uniform erosion for the full circumference. Eight tears greater than 3 inches long were noted. The longest tear was 14.0 inches and extended radially outward to approximately 9.5 inches inboard of the clevis I.D. surface. The edges of the tears appeared rough, and the edge geometry matched when placed together. They were not charred and demonstrated no material loss or erosion. This indicated that the tears occurred after motor burn. The location and length of the tears are contained in Table A-25. The tears are believed to be a result of re-entry or splashdown loads.

Measurements from the I.D. surface of the inner clevis leg to the tip of the remaining NBR inhibitor stub were taken every 30° and are contained in Table A-26. The remaining inhibitor stub heights for this segment ranged from 22.75 to 28.75 inches. This maximum height was outside the expected tolerance band by 0.49 inch.

Liner coverage for the forward center segment was heavy near the clevis end and completely missing aft of the factory joint except for two thin strips of liner at 120° and 180°. Small patches of thin liner were present intermittently on the insulation over the factory joint. Due to the poor lighting condition and the coating of wet char inside of the motor segments, the exact pattern and termination points of the liner material could not readily be determined at KSC. A diagram of the liner pattern was obtained after the segments arrived at the Clearfield H-7 facility, and is shown in Figure 8.

The condition of the flap region is recorded in Table A-27. The castable inhibitor was completely missing over the full circumference, which is typical of a forward center segment. Two-thirds (approximately 10 inches from the tip of the tang) of the stress relief flap length was missing for the full circumference. Axial measurements from the tip of the tang to the aft edge of the remaining flap were taken every 90° and are shown in Table A-27. There were no flap tears. The CF/EPDM under the flap was present and heat affected for the full circumference.

No evidence of blisters, separations, gouges, cuts, missing material, or excessive erosion was identified in the forward center segment.

### 6.5.4 RSRM-2A Forward Segment Acreage Insulation

The condition of the forward segment internal insulation is recorded in Tables A-28 and A-29.

The eleven point star pattern in the liner was easily distinguishable, and the star and non-star liner termination points were comparable to past flight motors, as shown in Figure 9. The liner remaining under the star tip regions was present from the tip of the tang forward to

145.5 inches. The liner remaining under the non-star tip was present from the tip of the tang forward to 153.5 inches. The liner was light between the tip of the tang and the flap bulb.

The condition of the flap region is recorded in Table A-29. The castable inhibitor was completely missing full circumference. The stress relief flap was intact from approximately 120°-180°-328° with some heat effect from 120°-180°-254°. The flap was eroded and severely heat affected with wavy edges from 328°-0°-120°. The maximum flap erosion occurred from 1°-7° where approximately two thirds of the flap length was missing. No axial tears were present in the remaining flap, unlike RSRM-1 which had numerous axial tears in both forward segment flaps. The NBR was quite heat affected under the flap over the full circumference, but there was no significant erosion. The erosion of the forward segment flap was uncharacteristic of the HPM flight motors. This may, however, be an indication that vacuum putty used in the HPM field joints closed off the stress relief flap gap in the forward segment and precluded any extensive heating in this area.

No evidence of blisters, separations, gouges, cuts, or missing material was identified in the forward segment.

## 6.6 RSRM-2A FACTORY JOINT INSULATION

Following the inspection and measurement of the internal insulation, the factory joint internal insulation was cut, and the joints were disassembled. This allowed the joints to be inspected in detail. Disassembly and inspection of the RSRM-2A factory joints occurred from 25 January through 12 April 1989 at the Clearfield H-7 facility. The condition of the factory joints is recorded in Tables A-30 through A-36.

Postfire evaluation indicates that all the factory joints performed as designed. The internal joint insulation exhibited no gas paths, soot, abnormal erosion, or heat affected material. This indicates that the insulation performed its function as the primary seal. The Teflon tape (used as a stress relief mechanism) was inplace and intact on the inner tang interface for the full circumference on all factory joints with the

exception of a few small areas were the tape was torn as a result of the disassembly process. Normal amounts of insulation flashing were found on most joints on the inner clevis leg tip.

A small piece of chalk and several lockwashers were found on the joint insulation on the forward center segment factory joint. These were not a prefire condition and are believed to have occurred after the insulation was cut during the disassembly process.

Four insulation to case unbonds were present on the aft segment stiffener to stiffener factory joint. Two were located on the tang side insulation approximately 3 inches from the teflon tape. The remaining two unbonds were located on the clevis side insulation 3 inches and 1.5 inches from the clevis tip. Another unbond was found on the ET to stiffener factory joint on the tang side insulation one inch from the Teflon tape. Bare metal, transitioning into Chemlok 233 at the edges, was evident on all of the unbonded regions. The unbonds are believed to have been caused by the disassembly process where the insulation is cut, and a strip of insulation over the joint is removed by hand with spatulas, aided by a come-along.

## 6.7 POSTFIRE EVALUATION OF RSRM-2A PREFIRE DISCREPENCIES

The prefire discrepancy reports for RSRM-2A insulation were evaluated prior to launch to identify significant items. These are identified in Reference 2 and the postfire conditions are discussed below.

DR 161252 documented several insulation to insulation voids within the first 40 inches from the tang end on the RSRM-2A aft center segment. Insulation samples were removed from the postfire segment to evaluate the extent of the voids. The internal acreage inspection at KSC revealed no evidence of the voids and no effect on motor performance.

DR 166815 documented cracks and crazing on the RSRM-2A aft center segment clevis insulation. Insulation samples were removed to evaluate the postfire condition of the cracks. The evaluation indicated that the cracks had not grown from the prefire condition and they had no effect on the function of the bondline or the performance of the motor.

## 7.0 RSRM-2A INSULATION PERFORMANCE EVALUATION

The RSRM-2A segments were insulated to meet the RSRM design drawing requirements (1U75641-01 Aft Dome Insulated, 1U75434-02 Aft Segment Insulated, 1U75428-03 Center Segment Insulated, and 1U75423-03 Forward Segment Insulated). The internal insulation was designed to meet a 2.0 thermal (material decomposition) safety factor in the nozzle to case joint, case field joint, and factory joint areas, and a 1.5 thermal (material decomposition) safety factor for the acreage insulation for all segments. All safety factor analyses discussed in this report will deal with the above mentioned thermal (material decomposition) safety factors.

The insulation was designed using M + 3$\sigma$ material decomposition depths established from the HPM database. References 9 and 10 explain the database analysis and the design methodology, respectively.

The nozzle to case joint, field joints, factory joints, and case wall insulation were evaluated based on the actual safety factor and compliance safety factor as required by the CEI specification. This evaluation was done by the use of prefire and postfire measurements.

Prefire insulation thickness measurements were taken in the aft dome up to the 24.3 inch station by means of a template that was bolted to the nozzle boss. A depth gage was used to measure the distance from the template to the bare metal dome before insulation layup. The measurement was repeated after insulation cure to determine the distance from the template to the insulation surface. The two measurements were then subtracted to determine the prefire insulation thickness. This measurement process was performed a third time after firing and char removal to determine the postfire thickness and material decomposition depth.

Prefire thicknesses at all other locations within the motor were measured using ultrasonic inspection methods.

Postfire insulation thicknesses were determined in the aft segment (forward of the 24.3 inch station), the center segments, and the forward segment by drilling holes in the insulation to the case wall and measuring the insulation thickness with a depth gage.

For the purpose of this report, the nozzle to case joint and the field joints will be dealt with in separate sections. All other areas, including the case acreage, the factory joints, and any other regions requiring a minimum 2.0 safety factor, will be dealt with in the sections devoted to the specific motor segments.

Several axial performance stations previously measured on HPM motors have been moved or eliminated to avoid ply terminations, tapered areas, and other conditions created by the RSRM design. Other locations have been added to provide a more complete database.

Some segment stations had liner material remaining after firing. For analysis purposes, the prefire measurements were used in place of the postfire measurements where liner was remaining, and the MDD was considered to be zero.

Several terms used in this part of the report are defined as follows:

**Actual Safety Factor (ASF):** The thermal (material decomposition) safety factor based on the actual prefire thickness and actual MDD. ASF = prefire thickness / MDD.

**Aft Cylinder:** That region of the aft segment forward of 55.0 inches from the nozzle boss.

**Aft Dome:** That region of the aft segment from the aft face of the nozzle boss to and including 55.0 inches forward of the nozzle boss.

**Compliance Safety Factor (CSF):** The thermal (material decomposition) safety factor based on the MDT and actual MDD. CSF = MDT / MDD.

**Exposure Time (E.T.):** That amount of time that a particular station is subjected to the internal motor environment. The time is measured in seconds and determined by ballistic evaluation (Reference 11).

**HPM Database:** That set of data derived from static and flight HPM motors and defined in Reference 9.

**HPM Database Maximum MDD:** The largest single MDD computed for a given axial station in the HPM database.

**M + 3σ MDD:** The analytically derived MDD values from the HPM database used as the insulation design basis where:

M = the median of the 'within motor' MDD medians

σ = the root sum square of the 'motor to motor' MDD standard deviation ($\sigma_M$) and the median of the 'within motor' standard deviations ($\sigma_{MED}$) Reference 9.

$$\sigma = (\sigma_M^2 + \sigma_{MED}^2)^{1/2}$$

**Material Decomposition Depth (MDD):** The amount of material that is decomposed during firing due to erosion or heat effects measured in inches. MDD = prefire thickness - postfire thickness.

**Material Decomposition Rate (MDR):** The average rate at which material is decomposed as a result of erosion or heat effect. The value is measured in mils (thousandths of an inch) per second and assumes a constant decomposition rate throughout the exposure time. MDR = 1000 X MDD / E.T.

**Minimum Design Thickness (MDT):** The minimum insulation thickness defined on the 1U design drawings. The thicknesses are designed to meet the appropriate safety factor based on an M + 3σ material decomposition and the HPM design thickness (Reference 10).

**Performance Station:** An axial location in the segment found by measuring forward from the tang tip (on the forward and center segments) or from the nozzle boss face (on the aft segment). The stations in the forward dome are located by continuing the measurement along the insulation surface contour from the 321.0 inch station. Figure 10 shows the location of the stations within each segment.

## 7.1 RSRM-2A NOZZLE TO CASE JOINT

The 2.0 safety factor region of the nozzle to case joint area is defined as that area 2 inches to either side of the joint insulation interface, measured along the insulation internal surface contour. Safety factors were evaluated by examining the MDD's at two locations: 1) at the base of the joint stress relief flap gap and 2) on the aft dome insulation at the joint interface.

Visual inspection of the flap gap has revealed that no significant heating occurs in this region. In fact, the Teflon tape which is in the gap is visible after firing. For this reason, no further measurements or inspections in the flap gap were necessary.

The MDD at the nozzle to case joint insulation interface was calculated at 16 planes using the prefire and postfire insulation thickness as measured per Figure 11. The MDT used in the CSF calculations at the nozzle joint was 4.900 inches based on the MDT at the 7.8 and 9.3 inch stations.

The safety factors for the RSRM-2A nozzle to case joint are shown in Table 7. The minimum CSF for the nozzle to case joint was 6.1 at the 46.8° and 180.0° planes. The minimum ASF was 6.8 at the 180.0° plane. The median MDD for the nozzle to case joint was 0.673 inch and ranged from 0.400 to 0.804 inch. The safety factors for the nozzle to case joint exceeded the 2.0 requirement in all areas.

## 7.2 RSRM-2A FIELD JOINTS

The 2.0 safety factor region of the field joint area is defined as that area 2 inches to either side of the joint insulation interface. The joint safety factors were evaluated by examining the MDD's in three areas: 1) in the pressurization gap, 2) at the 3.5 inch station, and 3) at the joint insulation interface.

From a visual inspection of all field joints, it was apparent that no significant material decomposition had occurred in the area of the pressurization gap terminus. For this reason, no further measurements or inspections in the pressurization gaps were necessary.

The safety factor at the 3.5 inch station for each field joint will be dealt with in the discussion of the respective segments.

The safety factors at the joint insulation interface were calculated using the MDD on the clevis joint insulation. The MDD was calculated using the prefire and postfire thicknesses as measured every 10° per Figure 12. The MDT used in the CSF calculations was 2.595 inches. This minimum is derived by subtracting the maximum 1U inner clevis leg metal thickness of 0.430 inch from the minimum 1U drawing insulation overall thickness of 3.025 inches.

The clevis side of the joint interface sits approximately 0.150 inch radially inboard of the J-leg tip when the joint is assembled. As a result, the clevis side is exposed to a more severe environment and experiences more material decomposition than the J-leg tip. This tends

to inflate the MDD value at the joint. A more realistic approach to calculating the joint safety factors would be to use the tang J-leg insulation. It is not possible, however, to obtain corresponding prefire and postfire measurements because the J-leg does not return to the same position after the joint has been assembled and disassembled. For this reason, the clevis side insulation is used to calculate the joint CSF and ASF and is considered to be quite conservative.

### 7.2.1 RSRM-2A Aft Field Joint

The safety factors for the RSRM-2A aft field joint insulation interface are shown in Table 8.

The prefire measurements for this joint appeared to be incorrect. The measurements did not agree with those of previous field joints in the RSRM database. The clevis insulation is a molded surface and the prefire measurements should not vary much between different joints. When the discrepancy was noticed, it was too late to remeasure the insulation. Since the measurements were lower than expected, it appeared that the measurements were taken from the inboard surface of the inner clevis leg instead of the outboard surface of the inner clevis leg. Therefore, the inner clevis leg metal thickness of 0.430 inch was added to the prefire measurements before the safety factors were calculated. Table 8 shows the corrected prefire measurements.

The minimum CSF for the joint interface was 4.2 at the 242° plane. The minimum ASF was 4.7, also at the 242° plane. The median MDD for the aft field joint was 0.572 inch and ranged from 0.520 to 0.619 inch. The safety factors for the aft field joint exceeded the 2.0 requirement in all areas.

### 7.2.2 RSRM-2A Center Field Joint

The safety factors for the RSRM-2A center field joint insulation interface are shown in Table 9. The minimum CSF for the joint interface was 8.5 at the 30° plane. The minimum ASF was 9.1, also at the 30° plane. The median MDD for the center field joint was 0.225 inch and ranged from 0.129 to 0.305 inch. The safety factors for the center field joint exceeded the 2.0 requirement in all areas.

### 7.2.3 RSRM-2A Forward Field Joint

The safety factors for the RSRM-2A forward field joint insulation interface are shown in Table 10. The minimum CSF for the interface was 12.0 at the 70° and 90° planes. The minimum ASF was 12.9, also at the 70° and 90° planes. The median MDD for the forward field joint was 0.160 inch and ranged from 0.099 to 0.217 inch. The safety factors for the forward field joint exceeded the 2.0 safety factor requirement in all areas.

## 7.3 RSRM-2A AFT SEGMENT

For purpose of this analysis, the aft segment is divided into the aft dome region and the aft cylinder region. The aft segment was measured in eight degree planes forward of the 98.0 inch station and at sixteen degree planes at and aft of the 98.0 inch station.

### 7.3.1 RSRM-2A Aft Dome

The safety factor analysis and the supporting measurement data for the RSRM-2A aft dome are shown in Table 11. All safety factors for the aft dome were acceptable with the minimum CSF being 2.23 at the 42.0 inch station in the 270.0° plane and the 45.0 inch station in the 338.4° plane. The minimum ASF was 2.51 at the 42.0 inch station in the 270.0° plane.

Figure 13 shows how the RSRM-2A aft dome MDD's compare with the HPM database median MDD's and the M + 3$\sigma$ design MDD's.

The M + 3$\sigma$ design MDD's were not exceeded at any aft dome stations.

### 7.3.2 RSRM-2A Aft Cylinder

The 68.0, 372.0, 375.0, and 377.5 inch performance stations are new stations beginning with the RSRM motors. The safety factor analysis and the supporting measurement data for the RSRM-2A aft cylinder are shown in Table 12. The performance analysis indicates that there was an apparent safety factor violation at one station in the aft cylinder. The location is shown below:

| STATION | DEGREE | CSF | ASF | REQUIRED SF |
|---|---|---|---|---|
| 105.8 | 0° | 1.32 | 1.86 | 1.5 |

This location was visually inspected to determine if any erosion gouging or pocketing had occurred. Also, the location was inspected for uneven or tapered insulation surfaces which may have affected prefire thickness measurement accuracy. In addition, the postfire insulation thickness measurement at this location was retaken and verified.

The 0° plane had a prefire thickness which was quite high compared to six of the other seven planes at this station. The postfire measurement was comparable to the other planes at this station. This could indicate prefire measurements taken at ply overlaps and postfire measurements taken in different locations or improperly measured or recorded data. This indicates that the prefire measurement was in error, resulting in an unrealistically high MDD, yielding the low safety factor. In reality, this is not a safety factor violation.

Figure 14 shows how the RSRM-2A aft cylinder MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were exceeded at the following aft cylinder stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2A MED MDD | RSRM-2A MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 105.8 | 2 of 8 | 0.388 | 0.568 | 0.405 | 0.817 | 0.559 | 1.32 |
| 214.0 | 1 of 8 | 0.211 | 0.315 | 0.272 | 0.377 | 0.351 | 1.86 |
| 227.3 | 1 of 8 | 0.210 | 0.378 | 0.272 | 0.343 | 0.317 | 1.90 |
| 283.9 | 1 of 8 | 0.126 | 0.193 | 0.167 | 0.294 | 0.251 | 1.53 |

The postfire measurements at all of these locations were retaken and verified. The two planes at the 105.8 inch station had high prefire measurements compared to the surrounding prefire data, and the postfire measurments were comparable to the surrounding data. The 0° plane at the 105.8 inch station resulted in an apparent safety factor violation and was previously discussed. Stations 214.0, 227.3, and 283.9 each had a single plane with a prefire measurement higher than the surrounding prefire data. The postfire measurments were normal. This resulted in

the high MDD's. This could indicate prefire measurements taken at ply overlaps and postfire measurements taken in different locations or improperly measured or recorded data. These stations do not, therefore, generate a concern.

## 7.4 RSRM-2A AFT CENTER SEGMENT

The aft center segment was measured at eight degree planes. The 3.5, 153.5, and 314.0 inch performance stations are new stations beginning with the RSRM motors. The safety factor analysis and the supporting measurement data for the RSRM-2A aft center segment are shown in Table 13. All safety factors for the aft center segment were acceptable. The minimum CSF was 1.60 at the 126.0 inch station in the 180° plane, and the minimum ASF was 2.44 also at the 126.0 inch station in the 180° plane.

The 161.4 inch station is over the factory joint and requires a 2.0 safety factor. The minimum CSF at the 161.4 inch station was 10.73 and the minimum ASF was 25.00. The 3.5 inch station is also located in a region which requires a 2.0 safety factor. The minimum CSF at the 3.5 inch station was 4.30 and the minimum ASF was 5.18.

Figure 15 shows how the RSRM-2A aft center segment MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were exceeded at the following aft center segment stations.

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2A MED MDD | RSRM-2A MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 23.6 | 1 of 8 | 0.293 | 0.395 | 0.315 | 0.483 | 0.460 | 1.93 |
| 126.0 | 2 of 8 | 0.023 | 0.112 | 0.040 | 0.094 | 0.074 | 1.60 |

The postfire measurments at these three locations were retaken and verified. A single plane at the 23.6 inch station had a prefire measurement that was higher than the surrounding prefire data, with the postfire data being comparable to the other planes. Once again, this indicates an incorrect prefire measurement. The 23.6 inch station is located on the ramp from the flap bulb to the acreage insulation and it

has provided unreliable data is past RSRM motors. Following the recommendation of Reference 5, this station will be deleted on future RSRM motors.

The prefire and postfire measurements at the 126.0 inch station were analyzed, and no apparent problems with the data could be seen. Although the noted maximum MDD's at this station exceeded the M + 3σ MDD used to design the insulation, the minimum CSF is above the required 1.5 value. This station will be closely monitored in future motors to determine if the measurements indicate a trend.

The flap region of the aft center segment of RSRM-2A saw more material decomposition than was typically seen on HPM motors. This condition has been noted on all RSRM static test motors but was not commonly seen on HPM flight motors. This condition will be evaluated on future RSRM static test and flight motors.

## 7.5 RSRM-2A FORWARD CENTER SEGMENT

The forward center segment was measured at eight degree planes. The 3.5, 153.5, and 314.0 inch performance stations are new stations beginning with the RSRM motors. The safety factor analysis and the supporting measurement data for the RSRM-2A forward center segment are shown in Table 14. All safety factors for the forward center segment were acceptable. The minimum CSF was 2.10 at the 71.5 inch station in the 46° plane, and the minimum ASF was 3.13 at the 23.6 inch station in the 136° plane.

The 161.4 inch station is over the factory joint and requires a 2.0 safety factor. The postfire and prefire measurements showed no material loss, indicating the safety factor requirement was met. The 3.5 inch station is also located in a region which requires a 2.0 safety factor. The minimum CSF at the 3.5 inch station was 8.41 and the minimum ASF was 10.31. Figure 16 shows how the RSRM-2A forward center segment MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were not exceeded at any forward center segment stations. Generally, there were greater MDD's on this segment in the flap region than on forward center segments in the HPM database.

This is a condition that was seen on all previous RSRM motors but not on HPM flight motors. This condition will be monitored on future RSRM static test and flight motors.

## 7.6 RSRM-2A FORWARD SEGMENT

The forward segment performance data was separated into two groups: the star tip and non-star tip planes. The star tip planes are defined as the 90°, 154°, 222°, 286°, and 352° planes which lie under the thin portion of the propellant grain. These planes have a higher exposure time than the non-star tip planes. The non-star tip planes are defined as the 74°, 140°, 206°, 270°, and 336° planes. These planes lie under the thick parts of the forward segment propellant grain. The 3.5, 13.0, 215.0, 230.0, 312.0, and 330.0 inch performance stations are new stations beginning with the RSRM motors.

### 7.6.1 RSRM-2A Forward Segment Star Tip Planes

The safety factor analysis and the supporting measurement data for the RSRM-2A forward segment star tip planes are shown in Table 15. The performance analysis indicates that there were apparent safety factor violations at two stations in the forward segment under the star tip portion of the propellant grain. A chart listing these locations is shown below:

| STATION | DEGREE | CSF | ASF | REQUIRED SF |
|---|---|---|---|---|
| 305.0 | 154° | 1.36 | 1.89 | 1.5 |
| 383.0 | 90° | 1.43 | 2.08 | 1.5 |

Each of these locations was visually inspected by Insulation Design personnel to determine if any erosion gouging or pocketing had occurred. Also, the locations were inspected for uneven or tapered insulation surfaces which may have affected prefire thickness measurement accuracy. The postfire insulation thickness measurements were also retaken and verified. Both of these stations had a single plane where the prefire measurement was much higher than the surrounding prefire data. The postfire measurments were normal. This resulted in the high MDD's. This

could indicate prefire measurements taken at ply overlaps and postfire measurements taken in different locations or improperly measured or recorded data.

Based on the visual inspection of stations with alleged safety factor violations and based on a careful evaluation of the prefire and postfire thickness measurements, it is believed that there were no safety factor violations in the forward segment star-tip planes.

The 3.5, 162.0, and 321.0 inch stations are located in areas which require a 2.0 safety factor. The minimum CSF's at these stations were 22.08, 2.75, and 3.12, respectively. The minimum ASF's for these stations were 25.09, 4.60, and 3.43, respectively.

Figure 17 shows how the RSRM-2A forward segment star tip MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were exceeded at the following forward segment star tip stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2A MED MDD | RSRM-2A MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 305.0 | 1 of 5 | 0.168 | 0.291 | 0.207 | 0.386 | 0.309 | 1.36 |
| 383.0 | 1 of 5 | 0.151 | 0.250 | 0.172 | 0.357 | 0.295 | 1.43 |
| 394.0 | 1 of 5 | 0.156 | 0.288 | 0.215 | 0.332 | 0.287 | 1.52 |

The data at the 305.0 and the 383.0 inch stations resulted in safety factor violations and were previously discussed.

Analysis of the data at the 394.0 inch station indicates that the prefire data in one plane was high compared to the surrounding prefire data. The postfire data was uniform. This could indicate a ply overlap or incorrectly recorded data, and that prefire data was the cause of the high MDD at this station. The values did not result in safety factor violations and are not a concern.

### 7.6.2 RSRM-2A Forward Segment Non-Star Tip Planes

The safety factor analysis and the supporting measurement data for the RSRM-2A forward segment non-star tip planes are shown in Table 16. All safety factors for the forward segment non-star area were acceptable.

The minimum CSF was 1.64 at the 359.0 inch station in the 206° plane, and the minimum ASF was 2.20, also at the 359.0 inch station in the 206° plane.

The 3.5, 162.0, and 321.0 inch stations are in areas which require a 2.0 safety factor. The minimum CSF's at these stations were 12.77, 4.10, and 5.50, respectively. The minimum ASF's were 15.49, 6.26, and 5.90, respectively.

Figure 18 shows how the RSRM-2A forward segment non-star tip MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were exceeded at the following forward segment non-star tip stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2A MED MDD | RSRM-2A MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 3.5 | 2 of 5 | 0* | 0* | 0.067 | 0.166 | 0.103* | 12.77 |
| 359.0 | 2 of 5 | 0.124 | 0.246 | 0.185 | 0.318 | 0.279 | 1.64 |

* Data taken from the closest adjacent station (11.8 inches)

The MDD at the 3.5 inch station was significantly higher than that experienced in the HPM motors. This condition, however, has been noted on all previous RSRM's and is not unexpected. Even with the increased MDD values, the minimum CSF noted at this station was 12.77 which is well above the 2.0 requirement. This station will continue to be monitored on future motors.

Analysis of the data at the 359.0 inch station indicates that the prefire data in two planes was high compared to the surrounding prefire data. The postfire data did not have similar variations. This could indicate a ply overlap or incorrectly recorded data, and that prefire data was the cause of the high MDD at this station. This station has provided unreliable MDD data in past RSRM experience. Following the recommendations provided in Reference 5, this station will be moved to 362.0 inches in future motors.

## 8.0 RSRM-2B VISUAL EVALUATIONS

The following paragraphs discuss the RSRM-2B evaluations performed at KSC and H-7. A copy of the inspection forms can be found in Appendix B. The condition of the insulation components for each segment are discussed in the following subsections.

### 8.1 RSRM-2B EXTERNAL INSULATION

#### 8.1.1 RSRM-2B External Factory Joint Weatherseals

The condition of the factory joint weatherseals is recorded in Tables B-1 through B-7. No significant areas of missing EPDM insulation were noted on any factory joint weatherseal. Small areas of missing EPDM from debris impact were noted on the aft edge of three of the seven factory joints. The largest area measured 3.50 inches circumferentially, 0.75 inch axially, and 0.10 inch deep on the RSRM-2B forward center segment. No edge separations were noted on any of the RSRM-2B weatherseals. The weatherseals on all three aft segment factory joints were slightly heat affected generally from 220°-270°-320° due to the plume radiation from the adjacent solid rocket motor and shuttle main engines. The heaviest heat effect occurred at 270°. This is a normal occurrence that had no effect on the performance of the weatherseals.

Moisture was evident under the weatherseal on the forward center segment factory joint. Water was leaking from underneath the weatherseal at four locations around the circumference where DFI instrumentation wires were routed between the weatherseal and the case. A section of the weatherseal was removed and a significant amount of water was evident under the weatherseal. The water apparently penetrated the weatherseal only at the wire locations because the weatherseal was very well bonded in all other areas. The closeout of the wire exit locations is being re-evaluated to eliminate problems on future flights.

#### 8.1.2 RSRM-2B Stiffener Stubs and Rings

The condition of the insulation over the stiffener stubs and rings is recorded in Tables B-8 through B-11. The insulation was in good condition with normal heat effect and discoloration on all surfaces. The heaviest heat effect occurred from 220°-270°-320° due to the plume

radiation from the adjacent solid rocket motor and shuttle main engines. The condition was also seen on the aft segment factory joint weather-seals. Two minor areas of missing material were noted on the aft face of the RSRM-2B forward stiffener stub at 220° and 280°. The areas measured approximately 1.0 inch in diameter and were 0.1 inch deep. These two areas appeared to be ply separations and may have been initiated by debris impact.

The EPDM was well bonded to the stiffener stubs and appeared to be well bonded to the stiffener rings. The condition of the rings after removal was previous discussed in Section 6.1.2.

## 8.2 RSRM-2B NOZZLE TO CASE JOINT

The nozzle to case joint insulation condition is recorded in Table B-12. The nozzle to case joint performed as expected with no polysulfide blowholes identified across the bondline. No voids in the polysulfide adhesive were noted, and there was only very slight porosity within the polysulfide at the step region.

The failure mode of the polysulfide was approximately 98% cohesive within the polysulfide and 2% adhesive at the NBR to polysulfide interface. The vent slots showed an average polysulfide fill of 62% with values ranging from 20% to 100% fill.

The bondline around the circumference demonstrated erosion similar to that observed on RSRM static test motors. The polysulfide was decomposed further into the joint (approximately 6.09 inches from the aft face of the nozzle boss) than the flap erosion. For approximately 0.37 inch further aft (5.72 inches from the aft face of the nozzle boss), the polysulfide was partially decomposed and bubbled. Although the material was partially decomposed, no gas flow had occurred in the adhesive bondline decomposed region.

The insulation erosion in the joint region was similar to the condition of previous RSRM motors. The char layer on the CF/EPDM had swollen to the point that the postflight material thickness at the joint appeared to exceed the preflight material thickness by approximately 0.50 to 0.75 inch.

The NBR flap and baffle appeared to be in excellent shape with normal heat effect and erosion. There were two areas approximately 4 inches wide circumferentially where the inboard edge of the flap had been torn, but these areas were caused by joint disassembly. The edge of the flap was brittle due to heat soak during motor descent.

## 8.3 RSRM-2B Field Joints

### 8.3.1 RSRM-2B Aft Field Joint

The aft field joint insulation condition is recorded in Table B-13. The joint insulation configuration performed as designed. The tang and clevis joint insulation were in excellent condition. The inboard surfaces of the joint insulation were charred normally with some heat affected areas outboard of the char layer. Measurements of the tang and clevis material char depths and heat affected depths are provided in Table B-13.

The general appearance of the pressure sensitive adhesive was noted. Contact and non-contact within the joint was based on the matted appearance and flat texture, or the glossy appearance of the adhesive. The joint appeared to have made contact over the full circumference at the tip of the J-leg. The bondline contact was measured at 0°, 90°, 180°, and 270°. Based on these four measurements, the deflected J-leg appeared to have made contact from the tip of the J-leg to an average of 1.35 inches outboard of the material remaining (Figure 19). The minimum radial contact was 0.80 inch, and the maximum radial contact was 1.45 inches.

No evidence of motor chamber pressure past the J-joint insulation was identified. No heat effect or erosion of the capture feature O-ring, primary O-ring, or secondary O-ring was identified. No evidence of foreign material, cracks, or crazings was identified on the joint insulation surfaces.

Soot deposits extending down the bondline were identified intermittently around the circumference with the maximum depth being 0.55 inch outboard of the remaining material at 150°. This was similar to the soot seen on the RSRM-2A aft field joint.

Edge separations were identified on the clevis insulation during the preflight inspection, and those which exceeded the specification criteria of 0.05 inch depth were repaired. The tang and clevis insulation edge separations were probed during postflight inspection at Clearfield H-7. The deepest apparent postfire clevis edge separation had a depth of 1.04 inches at 92°, which had grown from a repaired prefire separation of 0.11 inch depth. The accuracy of this separation is in doubt, since it was so deep and there was no edge separation identified in this location during the KSC inspection. The insulation was washed out of the segment before Insulation Design received the data, so the depth of the separation could not be verified. The deepest postfire tang edge separation had a depth of 0.18 inch, which had grown from an area with no prefire separation. These separations are documented in Tables 5 and 6 and detailed results can be found in Reference 6.

8.3.2 RSRM-2B Center Field Joint

The center field joint insulation condition is recorded in Table B-14. The joint insulation configuration performed as designed. The inboard surfaces of the joint insulation were charred normally with some heat affected areas outboard of the char layer. Measurements of the tang and clevis material char depths and heat affected depths are provided in Table B-14.

The general appearance of the pressure sensitive adhesive was noted. Contact and non-contact within the joint was based on the matted appearance and flat texture, or the glossy appearance of the adhesive. The joint appeared to have made contact over the full circumference at the tip of the J-leg. The bondline contact was measured at 0°, 90°, 180°, and 270°. Based on these four measurements, the deflected J-leg appeared to have made contact from the tip of the J-leg to an average of 1.11 inches outboard of the material remaining (Figure 20). The minimum radial contact was 1.10, and the maximum radial contact was 1.60 inches.

No evidence of motor chamber pressure past the J-joint insulation was identified. No heat effect or erosion of the capture feature O-ring, primary O-ring, or secondary O-rings was identified. No evidence of foreign material, cracks, or crazing was identified on the joint insulation surfaces.

Soot deposits extending down the bondline were identified from 60°-90°-180°. The maximum depth was 1.00 inch outboard of the remaining material from 99° to 103°. The NBR underneath the soot was slightly discolored, but there was no evidence that chamber gas leakage into the joint bondline had occurred. This joint had the most severe sooting in the bondline for RSRM-2 flight set, but it was similar to the soot seen on the RSRM-2A and RSRM-2B aft field joints. It was also less severe than that seen on the RSRM-1 forward field joints which had soot extending into the joint radius region. This sooting is believed to have occurred during motor re-entry or at splashdown when the joint may have flexed slightly and allowed soot into the bondline.

Edge separations were identified on the clevis insulation during the preflight inspection, and those which exceeded the specification criteria of 0.05 inch depth were repaired. The tang and clevis insulation edge separations were probed during postflight inspection at Clearfield H-7. The deepest postfire clevis edge separation had a depth of 0.23 inch, which had grown from a repaired prefire separation of 0.05 inch depth. The deepest postfire tang edge separation had a depth of 0.10 inch, which had grown from an area with no prefire separation. These separations are documented in Tables 5 and 6 and detailed results can be found in Reference 6.

### 8.3.3 RSRM-2B Forward Field Joint

The forward field joint insulation condition is recorded in Table B-15. The joint insulation configuration performed as designed. The inboard surfaces of the joint insulation were charred normally with some heat affected areas outboard of the char layer. Measurements of the tang and clevis material char depths and heat affected depths are provided in Table B-15.

The general appearance of the pressure sensitive adhesive was noted. The joint appeared to have made contact over the full circumference at the tip of the J-leg. The contact area appeared matted with a flat texture. The bondline contact was measured at 0°, 90°, 180°, and 270°. Based on these four measurements, the deflected J-leg appeared to have made contact from the tip of the J-leg to an average of 1.21 inches outboard of the material remaining (Figure 21). The minimum radial contact was 1.15 inches, and the maximum radial contact was 1.30 inches.

No evidence of motor chamber pressure past the J-joint insulation was identified. No heat effect or erosion of the capture feature O-ring, primary O-ring, or secondary O-ring was identified. No evidence of cracks or crazing was identified on the joint insulation surfaces.

A white substance was noted just aft of the capture feature O-ring groove on the tang insulation intermittently around the circumference. The heaviest amount was from 45°-90°-135°. The substance was approximately 0.20 inch wide and did not tend to flake off. It appeared to be the same type of tape residue that was seen on the RSRM-2A forward field joint and had no effect on the function of the joint.

Soot deposits extending down the bondline were identified from 90° to 180° with the maximum depth being 0.50 inch outboard of the remaining material at 112°. This was similar to the soot seen on the other RSRM-2 field joints. There was no indication that chamber gas leakage into the joint bondline had occurred. This sooting is believed to have occurred during motor re-entry or at splashdown when the joint may have flexed slightly and allow soot into the bondline.

Edge separations were identified on the clevis insulation during the preflight inspection, and those which exceeded the specification criteria of 0.05 inch depth were repaired. The tang and clevis insulation edge separations were probed during postflight inspection at Clearfield H-7. The deepest postfire clevis edge separation had a depth of 0.26 inch, which had grown from a repaired prefire separation of 0.08 inch depth. The deepest postfire tang edge separation had a depth of 0.15 inch, which had a prefire depth of 0.18 inch before being repaired. These separations are documented in Tables 5 and 6 and detailed results can be found in Reference 6.

## 8.4 RSRM-2B IGNITER TO CASE JOINT

The condition of the igniter boss insulation was good. An evaluation of the insulation to case interface revealed no edge separations, but there was loose insulation flashing forward of the chamfer from 315°-0°-225° which measured approximately 0.08 inch axially. This flashing should have been trimmed prior to igniter installation but had no effect on the function of the igniter to case joint. The insulation was securely bonded to the case outboard of the chamfer region. The molded insulation surface was in good condition with normal erosion on the inboard surface. The condition of the igniter insulation is discussed in a separate document dealing with the igniter component (Reference 7).

## 8.5 RSRM-2B ACREAGE INSULATION

### 8.5.1 RSRM-2B Aft Segment Acreage Insulation

The aft segment internal insulation was in excellent condition and is recorded in Tables B-16 through B-18.

The forward facing NBR inhibitor stub exhibited normal erosion over approximately two-thirds of the circumference, but there was an area of uneven erosion from approximately 220°-270°-340°. This area had a very short inhibitor stub with intermittent inhibitor pieces extending taller than adjacent areas up to 3.5 inches (Figure 6). This inhibitor erosion was similar to, but slightly more severe than, the erosion on the RSRM-2A aft segment NBR inhibitor. There were no inhibitor tears greater than 3 inches in length.

Measurements of the remaining inhibitor stub heights were taken inboard from the I.D. surface of the inner clevis leg every 30° and are contained in Table B-18. The inhibitor height ranged from 3.5 to 8.75 inches. Although the inhibitor erosion was uneven, the remaining inhibitor stub heights for this segment were within the expected tolerance band for past flight motors based on a statistical analysis of the historical database (Reference 8).

There was no liner remaining in the aft segment. This condition is normal for an aft segment.

The erosion in the aft dome was similar to past flight motors. The NBR under the CF/EPDM was not exposed, and the insulation in the aft dome did not appear to be eroded as severely as previous RSRM static motors.

A small gouge or cut caused by splashdown debris was identified in the insulation surface near 180°. Based on the jagged non-eroded edges of the cut, the damage appeared to have occurred after motor burn. Several insulation ply overlaps were visible on the aft dome factory joint, but this is a normal condition that does not indicate any excessive erosion. No other evidence of blisters, separations, gouges, cuts, missing material, or excessive erosion was identified.

8.5.2 RSRM-2B Aft Center Segment Acreage Insulation

The aft center segment internal insulation condition is recorded in Tables B-19 through B-22.

The forward facing NBR inhibitor stub exhibited uniform erosion for the full circumference. Two radial tears greater than 3 inches long were noted. The longest tear measured 5.0 inches long and extended radially outward to approximately 9 inches inboard of the clevis I.D. surface. Because the edges of the tears were rough and the edge geometry matched when placed together, no material loss or erosion occurred. This indicated that the tears occurred after motor burn. The location and length of the tears are shown in Table B-20.

Measurements from the I.D. surface of the inner clevis leg to the tip of the remaining NBR inhibitor stub were taken every 30° and are contained in Table B-21. The remaining inhibitor stub heights ranged from 11.5 to 15.25 inches for this segment which is within the expected tolerance band.

Liner coverage in the aft center segment was heavy near the clevis end and generally missing aft of the factory joint. Due to the poor lighting condition and the coating of wet char inside the motor segments, the exact pattern and termination points of the liner material could not readily be determined at KSC. The diagram of the liner pattern was obtained after the segments arrived at the Clearfield H-7 facility, and is shown in Figure 22.

The condition of the flap region is recorded in Table B-22. The castable inhibitor was completely missing full circumference which is typical of an aft center segment. The stress relief flap was eroded back to the flap bulb over the full circumference which is also typical of an aft center segment. The CF/EPDM under the flap was missing for the full circumference, and the NBR underneath it was heat affected and slightly eroded. The condition of the flap region is recorded in Table B-22.

Wrinkles due to prefire vacuum bagging were evident on the edges of the internal factory joint insulation. This condition had no adverse effect on motor operation and did not indicate any excessive erosion. Several small scratches due to debris impact at splashdown were evident intermittently throughout the segment. The scratches had no significant depth and were not eroded, indicating they occurred after motor burn. No other evidence of blisters, separations, gouges, cuts, missing material, or excessive erosion was identified.

8.5.3 RSRM-2B Forward Center Segment Acreage Insulation

The condition of forward center segment internal insulation is recorded in Tables B-23 through B-26.

The forward facing NBR inhibitor stub exhibited uniform erosion over the full circumference. Six radial tears greater than 3 inches long were noted. The longest tear was 14.5 inches and extended radially outward to approximately 11.0 inches inboard of the clevis I.D. surface. The edges of the tears appeared rough and matched when placed together. They were not charred and demonstrated no material loss or erosion. This indicated that the tears occurred after motor burn. The location and length of the tears are shown in Table B-24. The radial extent and frequency of the tears identified in the inhibitor stubs on all the RSRM-2 segments were within the range of tears noted on past flight motors.

Measurements from the I.D. surface of the inner clevis leg to the tip of the remaining NBR inhibitor were taken every 30° and are contained in Table B-25. The remaining inhibitor stub heights for this segment ranged from 21.5 to 27.5 inches which is within the expected tolerance band.

Liner coverage for the forward center segment was heavy near the clevis end and generally missing aft of the factory joint. Due to the poor lighting condition and the coating of wet char inside the motor segments, the exact pattern and termination points of the liner material could not readily be determined at KSC. A diagram of the liner pattern was obtained after the segments arrived at the Clearfield H-7 facility, and is shown in Figure 23.

The condition of the flap region is recorded in Table B-26. The castable inhibitor was completely missing over the full circumference which is typical of a forward center segment. Two-thirds (approximately 10 inches from the tip of the tang) of the stress relief flap length was eroded over the full circumference. Axial measurements from the tip of the tang to the aft edge of the remaining flap were taken every 90° and are shown in Table B-26. The CF/EPDM under the flap was present and heat affected with slight erosion for the full circumference.

Small gouges or cuts caused by splashdown debris were identified in the insulation surface near 30°. Based on the jagged non-eroded edges of the cuts, the damage appears to have occurred after motor burn. No other evidence of blisters, separations, missing material, or excessive erosion was identified.

### 8.5.4 RSRM-2B Forward Segment Acreage Insulation

The condition of forward segment internal insulation is recorded in Tables B-27 and B-28.

The eleven point star pattern in the liner was easily distinguishable, and the star and non-star liner termination points were comparable to past flight motors (Figure 24). The liner remaining under the star tip regions was present from the tip of the tang to 142.5 inches forward. The liner remaining under the non-star tip was present from the tip of the tang to 149.0 inches forward. The liner was very light between the tip of the tang and the flap bulb.

The condition of the flap region is recorded in Table B-28. The castable inhibitor was completely missing full circumference. The stress relief flap and the NBR underneath the flap was quite heat affected from 330°-0°-60° and from 100°-180°-220°. Axial measurements from the tip of

the tang to the aft edge of the remaining flap were taken every 90° and are shown in Table B-26. The flap was scalloped and protruded from the case which made it difficult to measure the remaining flap length. Approximately the full flap length was remaining from 204°-0°-110°. From 110°-180°-204°, the flap was eroded, scalloped, and wavy with areas that appeared to be torn but were really just scalloped. No axial tears were present over the length of the remaining flap. The most severe heat effect and erosion were noted from 110° - 136° where approximately one half of the flap length was missing.

No evidence of blisters, separations, gouges, cuts, missing material, or excessive erosion was identified.

## 8.6 RSRM-2B FACTORY JOINT INSULATION

Disassembly and inspection of the RSRM-2 factory joints occurred from 31 January through 23 May 1989 at the Clearfield H-7 facility. The condition of the factory joints is recorded in Tables B-29 through B-35.

Postfire evaluation indicates that all the factory joints performed as designed. The internal joint insulation exhibited no gas paths, soot, abnormal erosion, or heat affected material. This indicates that the insulation performed its function as the primary seal. No foreign material or unbonds were found within the insulation. The Teflon tape (used as a stress relief mechanism) was inplace and intact on the inner tang interface for the full circumference on all factory joint. Normal amounts of insulation flashing was found on most joints on the inner clevis leg tip.

Several insulation to insulation ply separations were present within the aft dome factory joint insulation. They were located intermittently on the tang side insulation. The largest was located 0.4 inch outboard of the remaining insulation and measured 1.25 inches circumferentially and was open 0.2 inch radially. One similar ply separation was found in the tang insulation of the ET to stiffener factory joint. No evidence of contamination, heat effects, or erosion was present adjacent to or within the ply separations. These were not a prefire condition and are partially believed to be a result of the disassembly process.

## 8.7 POSTFIRE EVALUATION OF RSRM-2B PREFIRE DISCREPANCIES

The prefire discrepancy reports for RSRM-2B insulation were evaluated prior to launch to identify significant items. These are identified in Reference 2 and the postfire conditions are discussed below.

DR 161255 documented insulation density variations on the RSRM-2B aft center segment. Insulation samples were removed from the postfire segment to determine what caused the density variations on the X-ray. The internal acreage inspection at KSC revealed no evidence of the density variations and no effect on motor performance.

## 9.0 RSRM-2B INSULATION PERFORMANCE EVALUATION

The RSRM-2B segments were insulated to meet the RSRM design drawing requirements (1U75641-01 Aft Dome Insulated, 1U75434-05 Aft Segment Insulated, 1U75428-03 Center Segment Insulated, and 1U75423-03 Forward Segment Insulated). The performance analysis on the RSRM-2B motor was conducted in the same manner as previously explained for the RSRM-2A motor.

## 9.1 RSRM-2B NOZZLE TO CASE JOINT

The safety factors for the nozzle to case joint are shown in Table 17. The minimum CSF for the nozzle to case joint was 4.0 at the 201.6° plane. The minimum ASF was 4.5, also at the 201.6° plane. The median MDD for the nozzle to case joint was 0.714 inch and ranged from 0 to 1.232 inch. The safety factors for the nozzle to case joint exceeded the 2.0 requirement in all areas.

## 9.2 RSRM-2B FIELD JOINTS

### 9.2.1 RSRM-2B Aft Field Joint

The safety factors for the RSRM-2B aft field joint insulation interface are shown in Table 18. The minimum CSF for the joint interface was 5.0 at the 120° plane. The minimum ASF was 5.4, also at the 120° plane. The median MDD for the aft field joint was 0.445 inch and ranged from 0.338 to 0.518 inch. The safety factors for the aft field joint exceeded the 2.0 requirement in all areas.

### 9.2.2 RSRM-2B Center Field Joint

The safety factors for the RSRM-2B center field joint insulation interface are shown in Table 19.

The prefire measurements for this joint appeared to be incorrect. The measurements did not agree with those of previous field joints in the RSRM database. The clevis insulation is a molded surface and the prefire measurements should not vary much between different joints. When the discrepancy was noticed, it was too late to remeasure the insulation. Since the measurements were lower than expected, it appeared that the measurements were taken from the inboard surface of the inner clevis leg instead of the outboard surface of the inner clevis leg. Therefore, the inner clevis leg metal thickness of 0.430 inch was added to the prefire measurements before safety factors were calculated. Table 19 shows the corrected prefire measurements. This is same problem that was encountered on the RSRM-2A aft field joint (Section 7.2.1).

The minimum CSF for the joint interface was 10.9 at the 100° plane. The minimum ASF was 11.5, also at the 100° plane. The median MDD for the center field joint was 0.151 inch and ranged from 0.080 to 0.239 inch. The safety factors for the center field joint exceeded the 2.0 requirement in all areas.

### 9.2.3 RSRM-2B Forward Field Joint

The safety factors for the RSRM-2B forward field joint insulation interface are shown in Table 20. The minimum CSF for the interface was 12.1 at the 140° plane. The minimum ASF was 12.9 at the 190° plane. The median MDD for the forward field joint was 0.146 inch and ranged from 0 to 0.214 inch. The safety factors for the forward field joint exceeded the 2.0 safety factor requirement in all areas.

## 9.3 RSRM-2B AFT SEGMENT

### 9.3.1 RSRM-2B Aft Dome

The safety factor analysis and the supporting measurement data for the RSRM-2B aft dome are shown in Table 21. The performance analysis indicates that there was an apparent safety factor violation at one station in the aft dome. This location is shown below:

| STATION | DEGREE | CSF | ASF | REQUIRED SF |
|---|---|---|---|---|
| 40.0 | 316.8° | 1.43 | 2.05 | 1.5 |

The postfire insulation thickness measurement was retaken and verified. Analysis of the data indicates that the prefire measurement at the 316.8° plane was quite high compared to the surrounding planes. The postfire thicknesses were consistent. This results in the unrealistically high MDD and the safety factor violation. This indicates a prefire measurement taken at a ply overlap and a postfire measurement taken in a different location, or improperly measured or recorded data. Insulation Design does not consider this to be a true safety factor violation.

Figure 25 shows how the RSRM-2B aft dome MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD was exceeded at the following aft dome station:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2B MED MDD | RSRM-2B MAX MDD | M+3σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 40.0 | 1 of 16 | 0.960 | 1.396 | 0.943 | 1.819 | 1.324 | 1.43 |

This station resulted in a safety factor violation and was previously discussed.

### 9.3.2 RSRM-2B Aft Cylinder

The safety factor analysis and the supporting measurement data for the RSRM-2B aft cylinder are shown in Table 22. The performance analysis indicates that there were apparent safety factor violations at three stations in the aft cylinder. A chart listing the locations is shown below:

| STATION | DEGREE | CSF | ASF | REQUIRED SF |
|---|---|---|---|---|
| 177.7 | 46.8° | 1.79 | 3.03 | 2.0 |
| 322.0 | 316.8° | 1.44 | 2.15 | 1.5 |
| 372.0 | 316.8° | 1.47 | 2.35 | 1.5 |

The postfire insulation thickness measurements at these stations were retaken and verified. Station 177.7 is located over the stiffener to stiffener factory joint and requires a 2.0 safety factor. Analysis of the data indicates that the 177.7 inch station had prefire measurements which were high in two planes compared to the surrounding prefire data. One of the measurements was approximately 0.20 inch higher than the surrounding data and the other one was approximately 0.12 inch higher. The postfire measurements were fairly uniform. This yeilds unrealistically high MDD's at these two planes, with one of them resulting in an apparent safety factor violation. This indicates that the prefire measurements were taken at ply overlaps and the postfire measurements were taken in a different location, or improperly measured or recorded data.

The prefire and postfire measurements at the 322.0 inch station were analyzed. There were no variations between different planes, but all the prefire measurments at station 322.0 were approximately 0.180 inch higher than other motors in the RSRM database (Figure 26). This caused the MDD's to be artificially high. Only one plane had an apparent safety factor violation, but the others were close to 1.5 (ranging from 1.51 to 1.76). Therefore, this is another obvious prefire measurement error in which the prefire measurement appears to be taken on a ply overlap and the postfire measurement was taken off of it.

Analysis of the data at the 372.0 inch station indicates there were two planes with a high prefire measurement and a normal postfire measurement. Only one of the planes had an apparent safety factor violation, but the other plane also had a high MDD and a slighty low safety factor (CSF = 1.63). This again indicates a prefire measurement taken on a ply overlap and postfire measurement taken off of it, or a measurement error.

Insulation Design does not consider these three conditions to be true safety factor violations.

The 56.0, 177.7, and 299.1 inch stations are located in regions which require a 2.0 safety factor. Station 177.7 was previously discussed. The minimum CSF's at the 56.0 and 299.1 inch stations were 3.22 and 2.66, respectively. The minimum ASF's were 4.14 and 4.52, respectively.

Figure 27 shows how the RSRM-2B aft cylinder MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were exceeded at the following aft cylinder stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2B MED MDD | RSRM-2B MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 68.0 | 2 of 16 | 0.516* | 0.745* | 0.628 | 0.983 | 0.889** | 2.24 |
| 177.7 | 2 of 8 | 0.298 | 0.516 | 0.359 | 0.559 | 0.452 | 1.79 |
| 283.9 | 1 of 8 | 0.126 | 0.193 | 0.148 | 0.294 | 0.251 | 1.53 |
| 299.1 | 1 of 8 | 0.150 | 0.272 | 0.191 | 0.254 | 0.253 | 2.66 |
| 322.0 | 8 of 8 | 0.083 | 0.185 | 0.244 | 0.264 | 0.197 | 1.44 |
| 339.0 | 7 of 8 | 0.066 | 0.339 | 0.221 | 0.237 | 0.190 | 1.60 |
| 344.0 | 3 of 8 | 0.061 | 0.223 | 0.135 | 0.248 | 0.187 | 1.53 |
| 372.0 | 2 of 8 | 0.014* | 0.106* | 0.069 | 0.272 | 0.237** | 1.47 |

* Data taken from the closest adjacent station.
** Interpolated from adjacent stations.

The postfire thickness measurements from all of the stations listed above were retaken and verified.

The 177.7, 322.0, and 372.0 inch stations had apparent safety factor violations and were previously discussed. Analysis of the data at the 68.0 inch station indicates two planes had slightly high prefire measurments and slightly low postfire measurements. The prefire data at all of the planes showed significant scatter. The MDD's were somewhat high, but the minimum CSF was 2.24. This station has provided inconsistent MDD's in past RSRM experience. It is located just forward of the aft dome factory joint on the ramp area. Following the recommendations of Reference 5, this station has proven unreliable and will be eliminated on future motors.

Further analysis of the data indicates that the 283.9 and 299.1 inch stations had prefire measurements which were high in a single plane with normal postfire thicknesses. This results in the high MDD's. The single plane at the 299.1 inch station was only slightly higher than the surrounding data, but it was enough to make the MDD higher than the M + 3σ MDD (the MDD was only 0.001 inch high). This could indicate prefire measurements taken at ply overlaps and postfire measurements taken in different locations, or improperly measured or recorded data. These stations do not, therefore, generate a concern.

The prefire and postfire measurements at the 339.0 inch station were analyzed. There were no significant variations between different planes, but all the prefire measurments at station 339.0 were approximately 0.182 inch higher than other motors in the RSRM database (Figure 28). This caused the MDD's to be artificially high. This is another obvious prefire measurement error.

The 344.0 inch station had four of eight planes with high prefire measurments. Three of these planes exceeded the M + 3σ MDD. This station has provided unreliable MDD data in past RSRM experience. Following the recommendations of Reference 5, this station will be moved to 342.0 inches on future motors.

## 9.4 RSRM-2B AFT CENTER SEGMENT

The safety factor analysis and the supporting measurement data for the RSRM-2B aft center segment are shown in Table 23. With the exception of the 161.4 inch station, all safety factors for the aft center segment were acceptable. Other than the 161.4 inch station, the minimum CSF was 1.95 at the 126.0 inch station in the 226° plane, and the minimum ASF was 2.78 at the 71.5 inch station in the 270° plane.

The 161.4 inch station is located over a factory joint and requires a 2.0 safety factor. Four of the eight degree locations at the 161.4 inch station had apparent safety factor violations as shown below:

| STATION | DEGREE | CSF | ASF | REQUIRED SF |
|---|---|---|---|---|
| 161.4 | 46.0° | 1.36 | 3.73 | 2.0 |
| | 226.0° | 1.27 | 3.69 | 2.0 |
| | 270.0° | 1.84 | 4.80 | 2.0 |
| | 316.0° | 1.42 | 3.98 | 2.0 |

Each of these locations were visually inspected by Insulation Design personnel. No abnormal erosion, gouging or pocketing had occurred. The locations were also inspected for uneven or tapered insulation surfaces which may have affected prefire thickness measurement accuracy. The postfire insulation thickness measurements were also retaken and verified.

The postfire measurements at the 161.4 inch station were taken adjacent to an uneven surface. It appears that the prefire measurements were not taken at the same location as the postfire measurements. The 161.4 inch station has provided unreliable data in past RSRM experience. It is located immediately forward of a stack of insulation plies which flow during cure, creating uneven surfaces over the factory joint. Reference 5 recommends that Manufacturing Engineering evaluate the purpose and effectiveness of the additional plies and determine if they can be removed, reduced in number, or moved to eliminate the over thick and uneven surface problem.

The 3.5 inch station is also located in regions which require a 2.0 safety factor. The minimum CSF at this station was 3.93 and the minimum ASF was 4.71.

Figure 29 shows how the RSRM-2B aft center segment MDD's compare with the HPM database median MDD's and the M + 3$\sigma$ design MDD's.

The M + 3$\sigma$ design MDD's were exceeded at the following aft center segment stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2B MED MDD | RSRM-2B MAX MDD | M + 3 $\sigma$ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 48.0 | 3 of 8 | 0.045* | 0.206* | 0.078 | 0.109 | 0.089** | 2.64 |
| 126.0 | 1 of 8 | 0.023 | 0.112 | 0.015 | 0.077 | 0.074 | 1.95 |
| 161.4 | 7 of 8 | 0.025 | 0.107 | 0.121 | 0.186 | 0.082 | 1.27 |

* Data taken from the closest adjacent station.
** Interpolated from adjacent stations.

The postfire measurements were retaken and verified at all of these locations. The prefire and postfire measurements at the 48.0 inch station listed above were analyzed, and no apparent problems with the data could be seen. The station is in a low exposure region which is

very sensitive to measurement error. Although the noted maximum MDD at this station exceeded the M + 3σ MDD used to design the insulation, the minimum CSF was above the required 1.5 value. This station will be closely monitored in future motors to determine if the measurements indicate a trend.

Further analysis of the data indicates that the 126.0 inch station had a prefire measurement which was high in a single plane and had normal postfire thicknesses. This results in the high MDD. This could indicate prefire measurements taken at ply overlaps and postfire measurements taken in different locations, or improperly measured or recorded data. This station does not, therefore, generate a concern.

The 161.4 inch station resulted in apparent safety factor violations and was previously discussed.

## 9.5 RSRM-2B FORWARD CENTER SEGMENT

The safety factor analysis and the supporting measurement data for the RSRM-2B forward center segment are shown in Table 24. All safety factors for the forward center segment were acceptable. The minimum CSF was 3.52 at the 36.2 inch station in the 46° plane, and the minimum ASF was 4.33, also at the 36.2 inch station in the 46° plane.

The 3.5 and 161.4 inch stations are located in regions which require a 2.0 safety factor. The minimum CSF at the 3.5 inch station was 11.98 and the minimum ASF at the 3.5 inch station was 15.06. The data indicates there was no material loss at the 161.4 inch station, so no safety factors could be calculated.

Figure 30 shows how the RSRM-2B forward center segment MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ MDD was not exceeded at any forward center segment station.

## 9.6 RSRM-2B FORWARD SEGMENT

### 9.6.1 RSRM-2B Forward Segment Star Tip Planes

The safety factor analysis and the supporting measurement data for the RSRM-2B forward segment star tip planes are shown in Table 25. The performance analysis indicates that there were apparent safety factor

violations at three stations in the forward segment under the star tip portion of the propellant grain. A chart listing these locations is shown below:

| STATION | DEGREE | CSF | ASF | REQUIRED SF |
|---|---|---|---|---|
| 305.0 | 286° | 1.45 | 2.06 | 1.5 |
| 330.0 | 90° | 1.41 | 2.99 | 1.5 |
| | 286° | 1.22 | 2.41 | 1.5 |
| 347.0 | 286° | 1.26 | 1.83 | 1.5 |

The postfire insulation thickness measurements at these locations were retaken and verified.

The 305.0 inch and 347.0 inch stations each had a prefire measurement which was high at the degree location in question compared to the surrounding prefire data. The postfire data at these locations were consistent with the surrounding data. This could indicate the prefire measurements were taken at ply overlaps and the postfire measurements were taken in different locations, or improperly measured or recorded data. The 347.0 inch station has provided unreliable MDD data in past RSRM experience. Following the recommendations provided in Reference 5, this station will be moved to 350.0 inches in future motors.

The 330.0 inch station had prefire measurements which were slightly higher at the two degree locations in question compared to the surrounding data. This could indicate prefire measurements taken at ply overlaps and postfire measurements taken in different locations, or improperly measured or recorded data. The 330.0 inch station is located on the forward edge of the factory joint insulation and has provided unreliable MDD data in past RSRM experience. Following the recommendations provided in Reference 5, this station will be moved to 339.0 inches in future motors.

Based on a careful evaluation of the prefire and postfire thickness measurements at the stations with alleged safety factor violations, it is believed that there were no safety factor violations in the forward segment star-tip planes.

The 3.5, 162.0, and 321.0 inch stations are located in areas which require a 2.0 safety factor. The minimum CSF's at these stations were 7.49, 3.17 and 2.56, respectively. The minimum ASF's for these stations were 9.20, 5.21, and 3.14, respectively.

Figure 31 shows how the RSRM-2B forward segment star tip MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ design MDD's were exceeded at the following forward segment star tip stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2B MED MDD | RSRM-2B MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 3.5 | 3 of 5 | 0* | 0* | 0.182 | 0.283 | 0.103* | 7.49 |
| 305.0 | 1 of 5 | 0.168 | 0.291 | 0.179 | 0.361 | 0.309 | 1.45 |
| 312.0 | 1 of 5 | 0.146* | 0.239* | 0.193 | 0.337 | 0.308** | 1.55 |
| 330.0 | 2 of 5 | 0.147* | 0.277* | 0.302 | 0.450 | 0.333** | 1.22 |
| 347.0 | 1 of 5 | 0.150 | 0.243 | 0.284 | 0.416 | 0.307 | 1.26 |

* Data taken from the closest adjacent station
** Interpolated from adjacent stations

The MDD at the 3.5 inch station was higher than that experienced in the HPM motors. This condition, however, has been noted on all previous RSRM's and is not unexpected. Even with the increased MDD values, the minimum CSF noted at this station was 7.49. This condition will continue to be monitored on future motors.

The data at the 305.0, 330.0, and 347.0 inch stations resulted in safety factor violations and were previously discussed.

Analysis of the data at the 312.0 inch station indicates that the prefire data at the degree location in question was high compared to the surrounding prefire data. The postfire data was consistent with the surrounding data. This could indicate a ply overlap or incorrectly recorded data. The prefire data was the cause of the high MDD at this location. The value did not result in a safety factor violation and is not a concern.

9.6.2 RSRM-2B Forward Segment Non-Star Tip Planes

The safety factor analysis and the supporting measurement data for the RSRM-2B forward segment non-star tip planes are shown in Table 26. All safety factors for the forward segment non-star tip planes were acceptable. The minimum CSF was 1.51 at the 347.0 inch station in the 206° plane, and the minimum ASF was 2.32 at the 394.0 inch station in the 140° plane.

The 3.5, 162.0, and 321.0 inch stations are in areas which require a 2.0 safety factor. The minimum CSF's at these stations were 7.31, 4.34, and 5.19, respectively. The minimum ASF's were 8.83, 7.21, and 6.11, respectively.

Figure 32 shows how the RSRM-2B forward segment non-star tip MDD's compare with the HPM database median MDD's and the M + 3σ design MDD's.

The M + 3σ MDD's were exceeded at the following forward segment non-star tip stations:

(All Dimensions in Inches)

| STATION | PLANES | HPM MED MDD | HPM MAX MDD | RSRM-2B MED MDD | RSRM-2B MAX MDD | M + 3 σ MDD | MIN CSF |
|---|---|---|---|---|---|---|---|
| 3.5 | 4 of 5 | 0* | 0* | 0.174 | 0.290 | 0.103* | 7.31 |
| 347.0 | 1 of 5 | 0.107 | 0.349 | 0.201 | 0.347 | 0.307 | 1.51 |
| 394.0 | 1 of 5 | 0.141 | 0.256 | 0.240 | 0.294 | 0.287 | 1.71 |

* Data taken from the closest adjacent station
** Interpolated from adjacent data.

Four of the locations in the 3.5 inch station exceeded the M + 3σ MDD design criteria. As in the star tip planes, the higher MDD experienced at the 3.5 inch station is consistent with previous RSRM's. The minimum CSF at this station was 7.31, which is well above the 2.0 requirement.

Analysis of the data at the 347.0 inch station indicates that the prefire data at the degree location in question was high compared to the surrounding prefire data. The postfire data did not have similar variations. This could indicate a ply overlap or incorrectly recorded data. The 347.0 inch station has provided unreliable MDD data in past RSRM experience. Following the recommendations provided in Reference 5, this station will be moved to 350.0 inches in future motors.

No problem could be found with the data at the 394.0 inch station. The single degree plane in question did have a slightly higher prefire measurement than the surrounding data, but it was not enough to be significant. Even with the high MDD, the data did not result in a safety factor violation. This station will be monitored on future motors.

REFERENCES

1. TWR-16475 Vol. III, Book 1, Rev. A, 'KSC Postflight Engineering Evaluation Plan', S. Olson and V. Chandler, 23 November 1988.

2. TWR-16475 Vol. III Addendum A, 'RSRM-2 Unique Postfire Evaluation', V. Chandler, 30 November 1988.

3. TWR-18680 Vol. III, Rev. B, 'KSC Postfire Engineering Evaluation Limits, Insulation Component', J. Bailey and V. Chandler, 18 November 1988.

4. TWR-19143, '360L002 (RSRM-2, STS-27R) Squawks and Problem Reports from KSC Postflight Evaluation', S. W. Olson, 18 January 1989.

5. TWR-19167, 'Internal Insulation Inspection', J. Cook, March 1989.

6. TWR-19483-5, 'RSRM-2 Edge Separation Analysis', V. Fitch, (Unreleased).

7. TWR-17541 Vol. VI, 'FEWG Final Report/Igniter Component', P. McCluskey, (Unreleased).

8. Memo L232-FY89-M059, 'Inhibitor Database', B. Cannon, November 1988.

9. TWR-16278 Rev. A, 'HPM Internal Insulation Database for the RSRM Design', J. Passman, 5 August 1988.

10. TWR-18133 Rev. A, 'RSRM Internal Insulation Design Summary', J. Passman and S. Hicken, September 1988.

11. Interoffice Memo, L211-FY89-M062, 'RSRM Insulation Exposure Times', B. Laubacher, 6 January 1989.

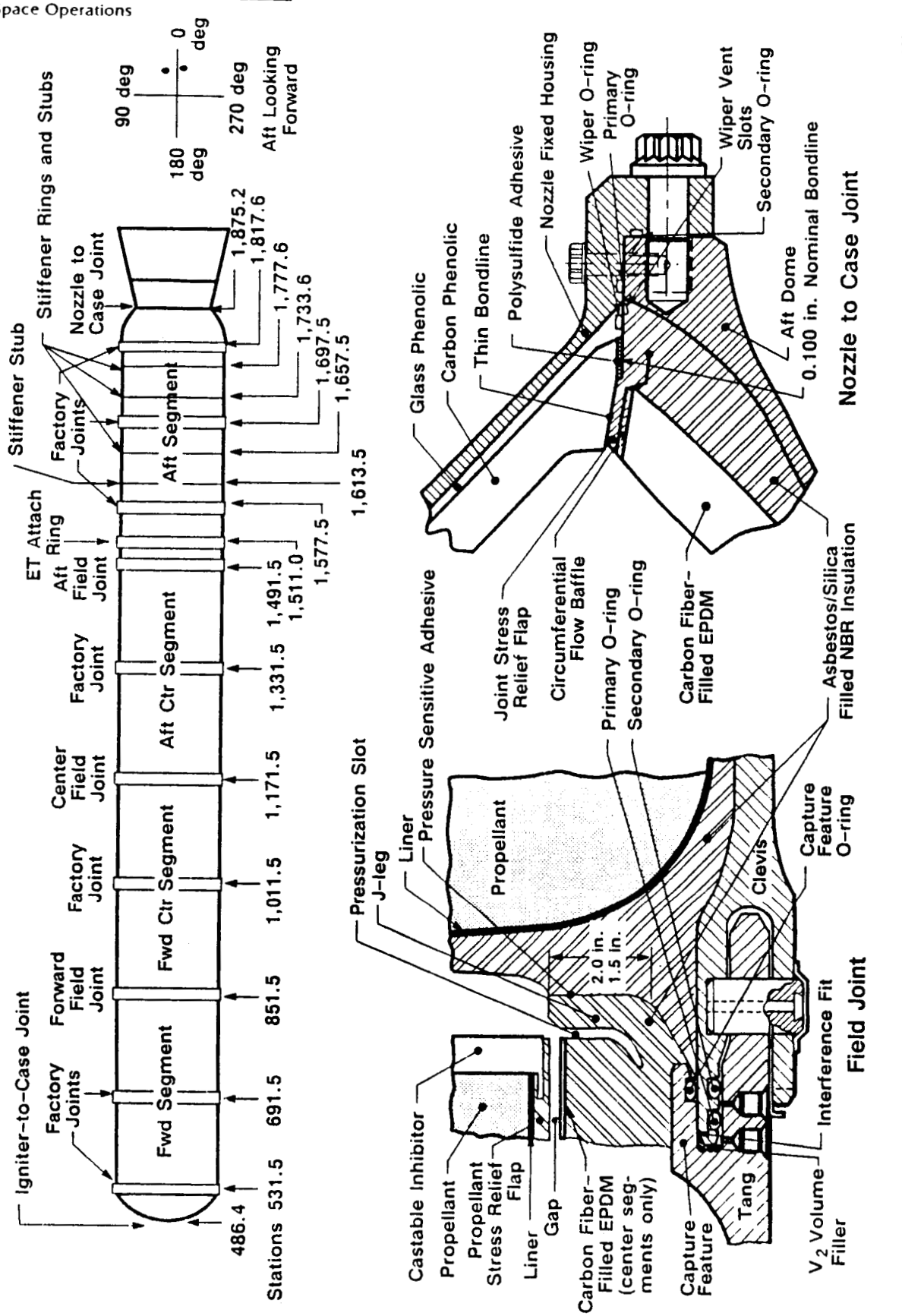



Figure 1 RSRM Motor Configuration

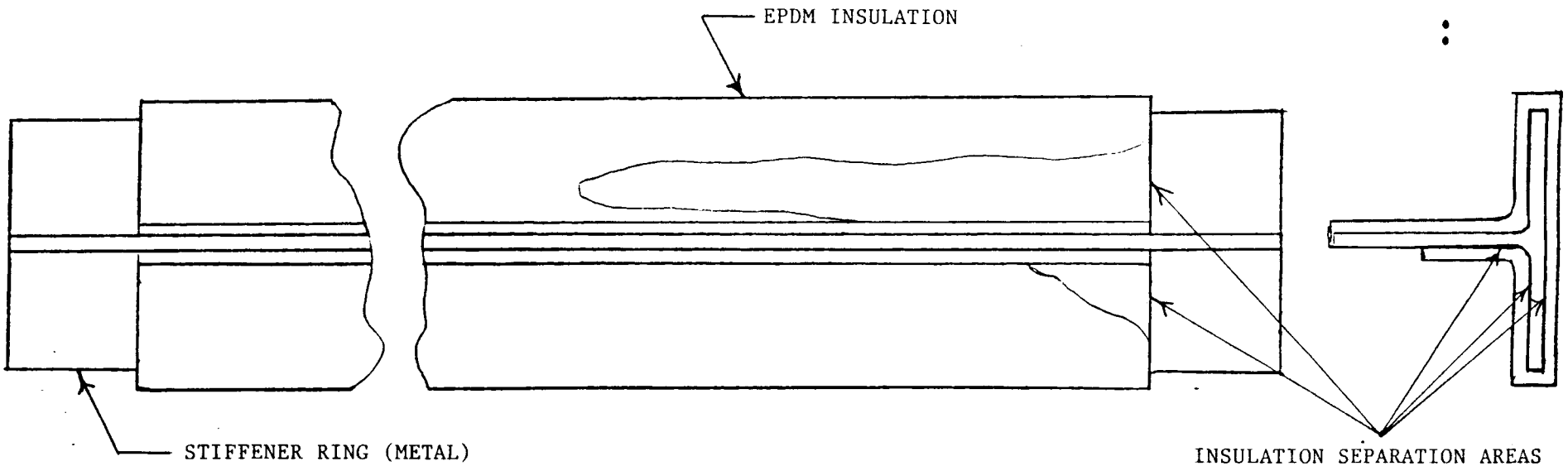
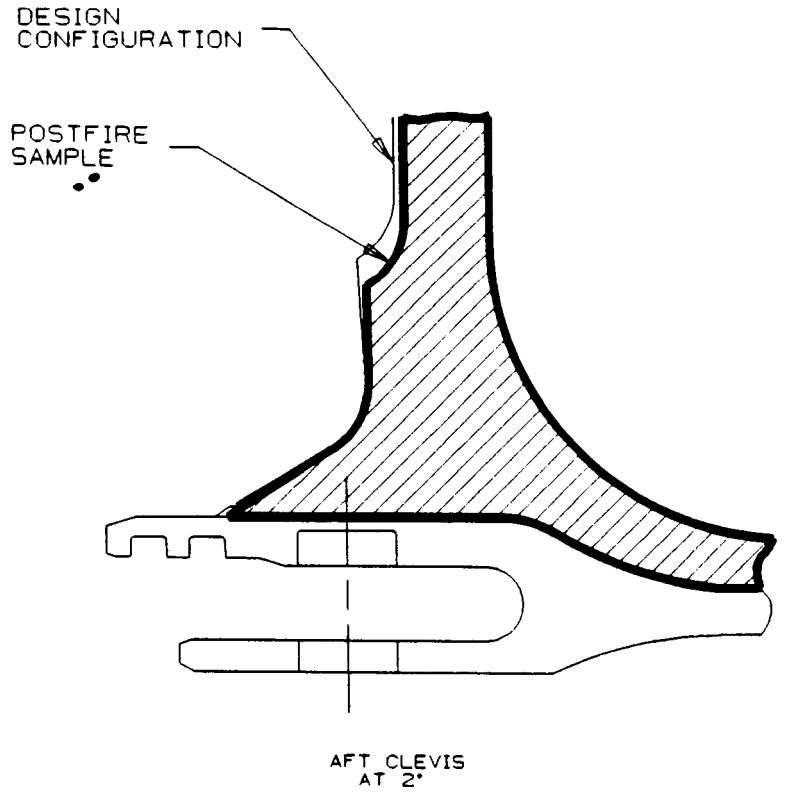
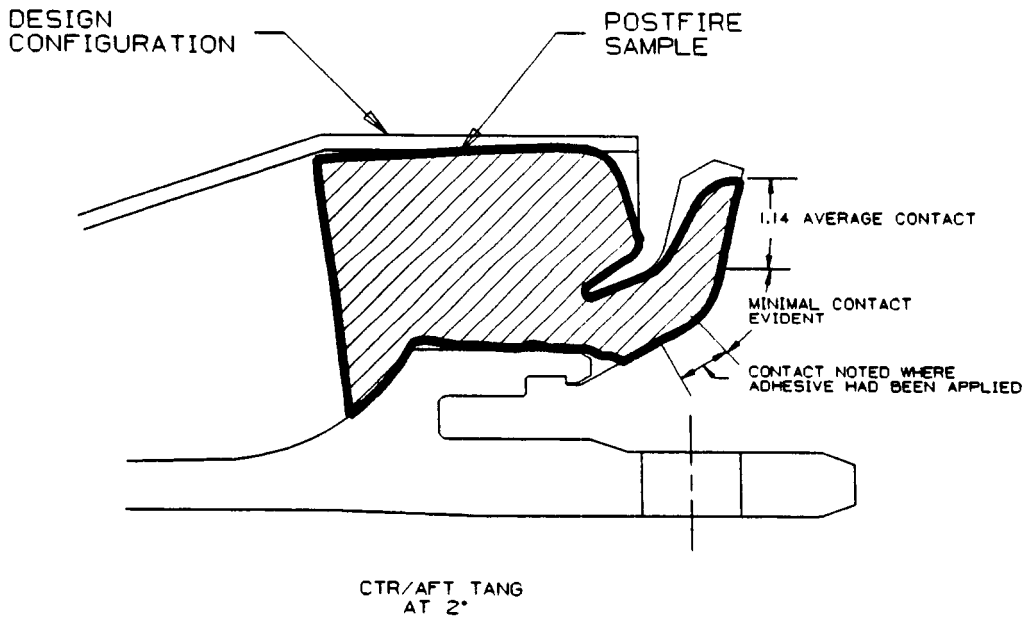


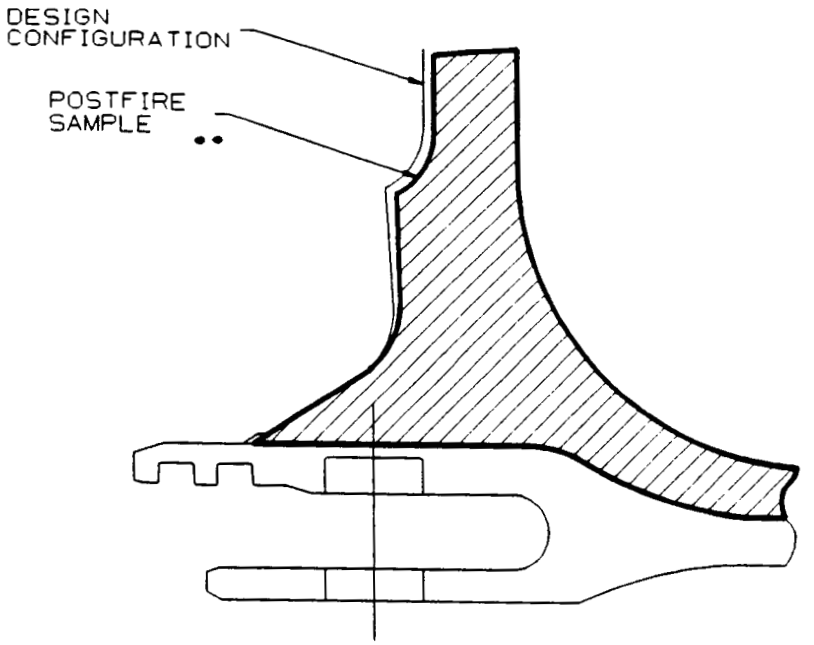

Figure 2 Insulation to Stiffener Ring Separations



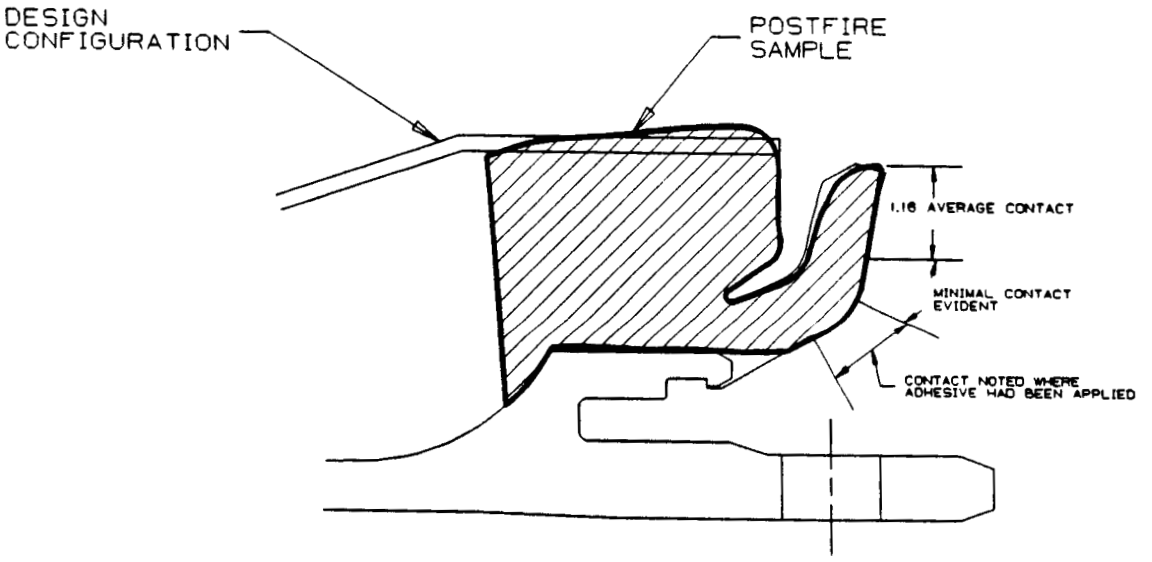




RSRM-2A AFT FIELD JOINT

CLEVIS AND TANG INSULATION
TYPICAL POSTFIRE CONDITION




AFT/CTR CLEVIS
AT 270°



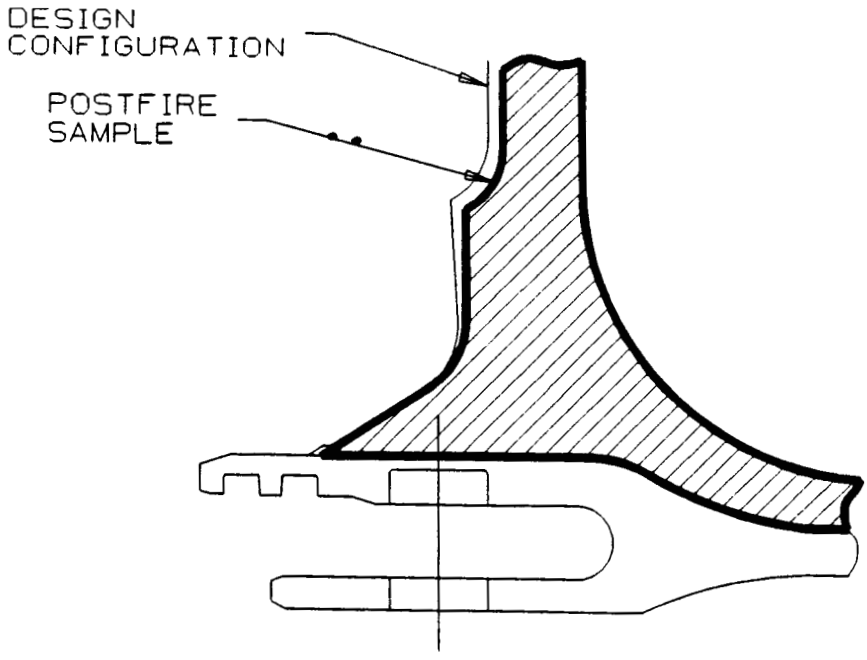

FWD/CTR TANG
AT 270°

RSRM-2A CENTER FIELD JOINT

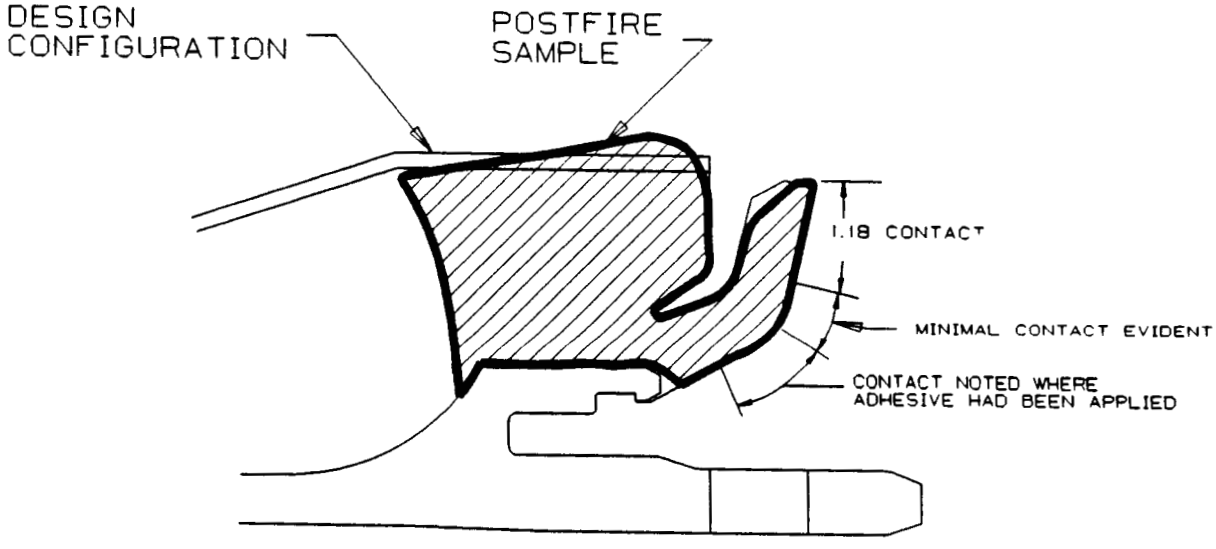
CLEVIS AND TANG INSULATION
TYPICAL POSTFIRE CONDITION



FIGURE 4




FWD/CTR CLEVIS
AT 2°




FWD TANG
AT 2°

RSRM-2A FWD FIELD JOINT

CLEVIS AND TANG INSULATION
TYPICAL POSTFIRE CONDITION



FIGURE 5

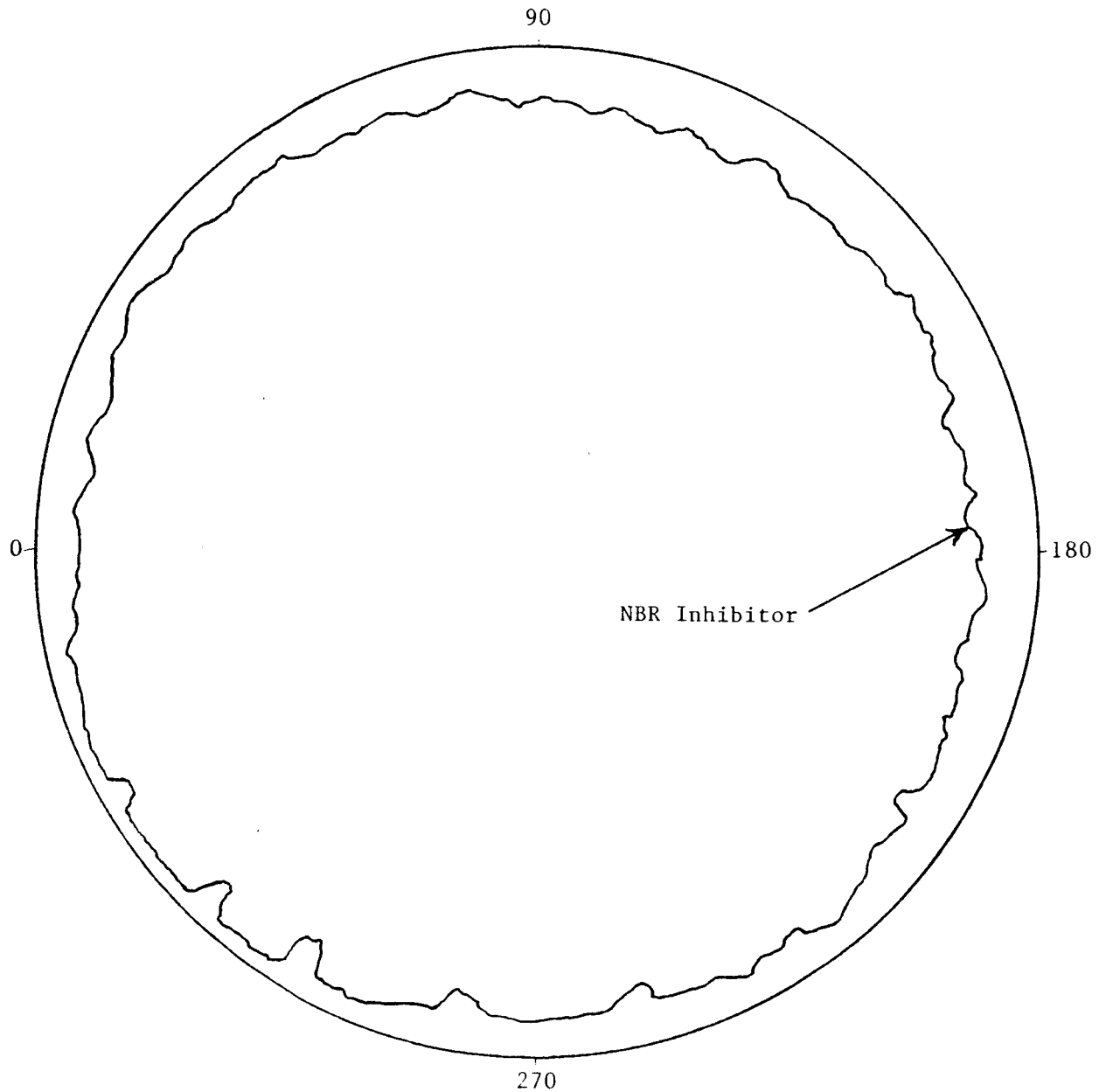



Figure 6 RSRM-2 Aft Segment Inhibitor Erosion

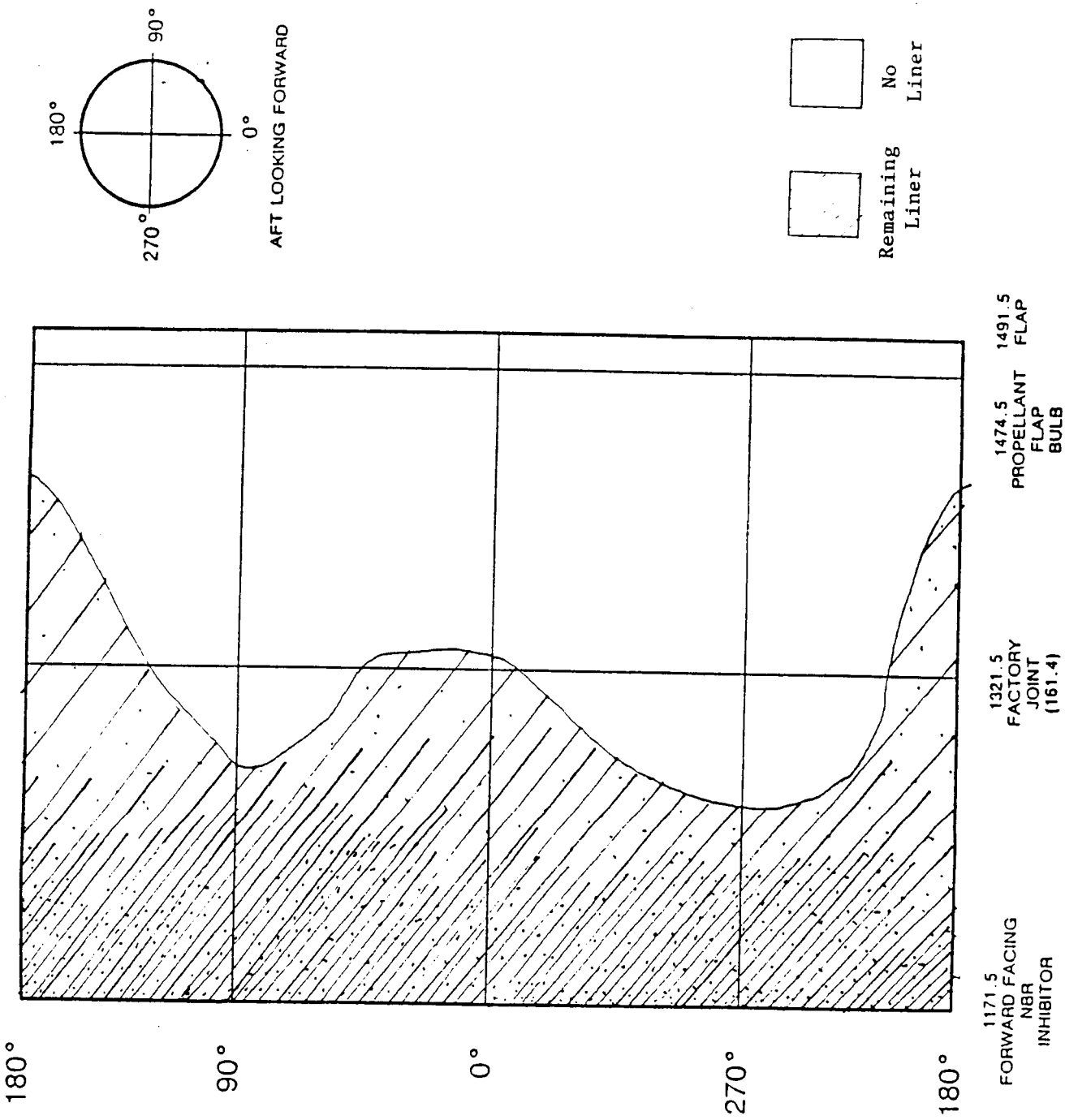



Figure 7 RSRM-2A Aft Center Segment Liner Pattern

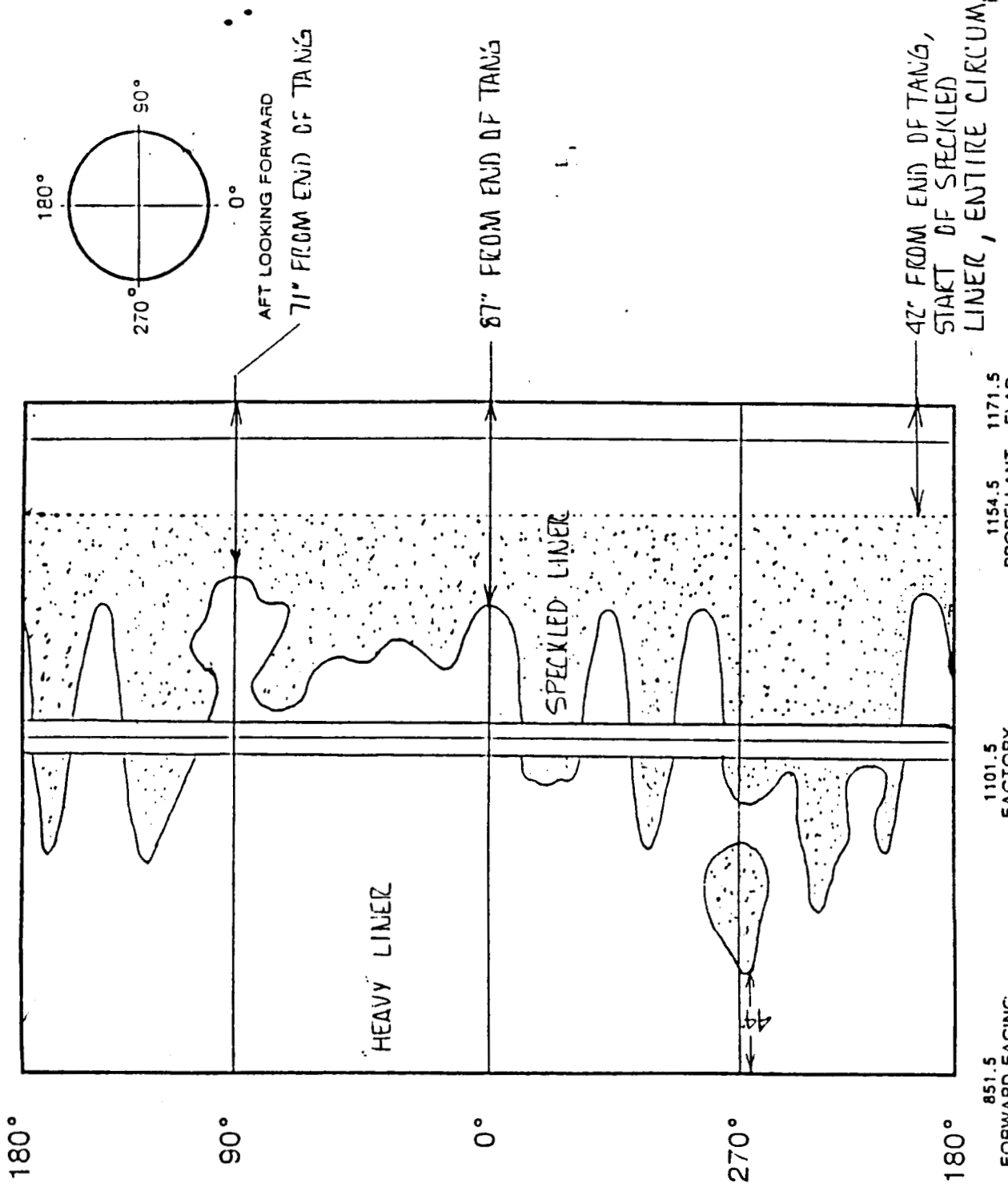



Figure 8 RSRM-2A Forward Center Segment Liner Pattern

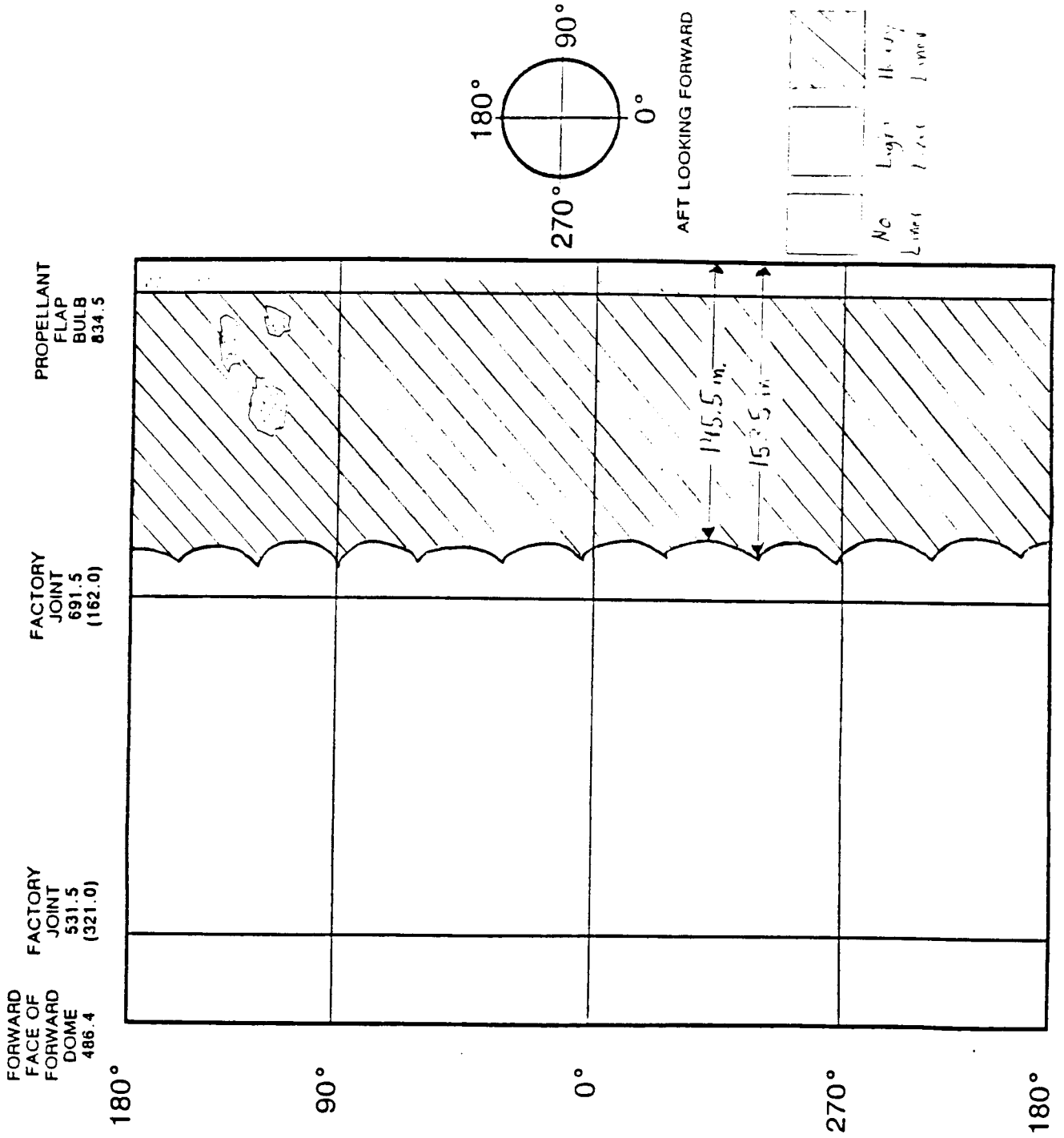
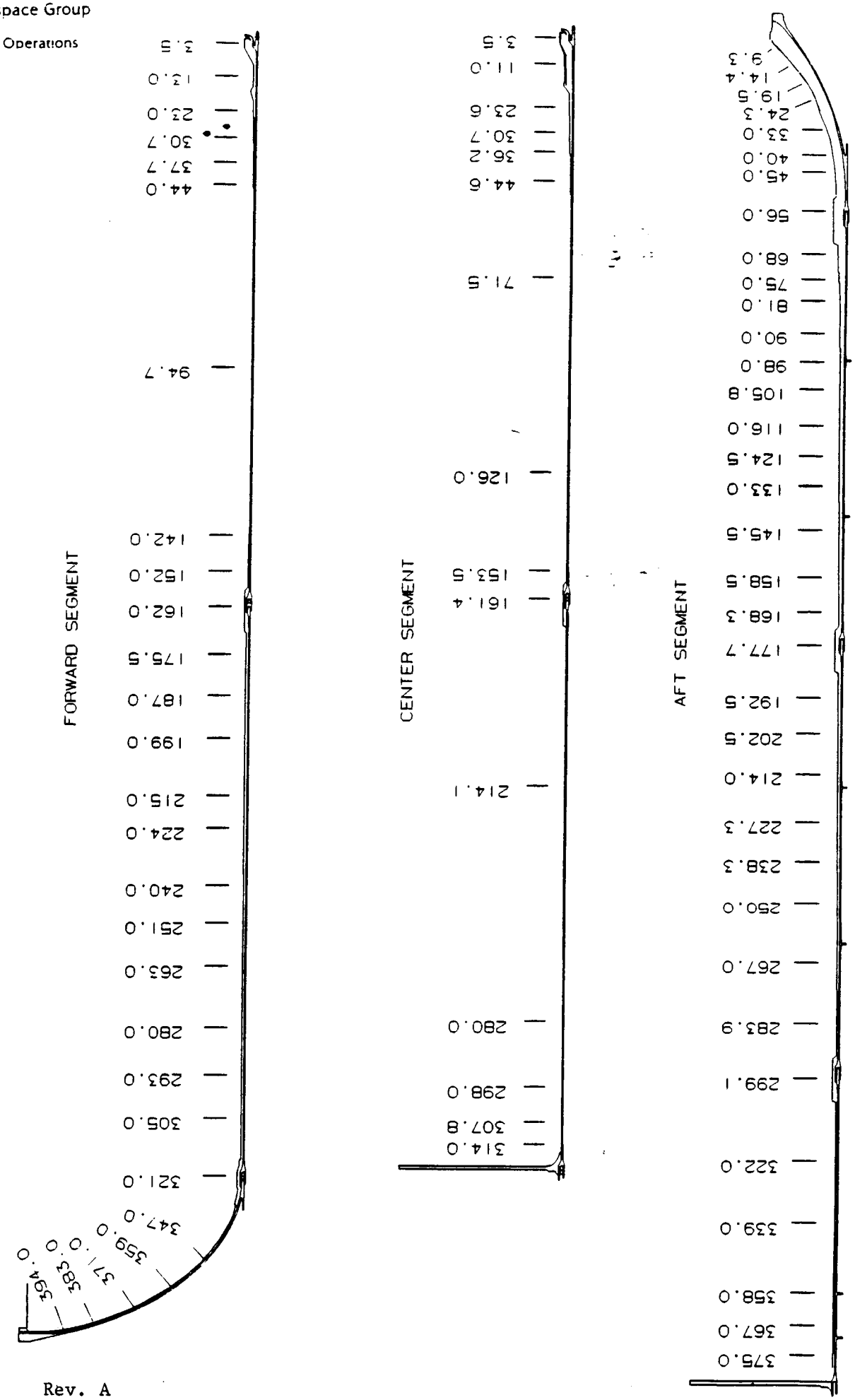



Figure 9
RSRM-2A Forward Segment Liner Pattern




All stations are in inches, measured from the tip of the tang or nozzle boss aft face

Figure 10 RSRM Insulation Performance Stations

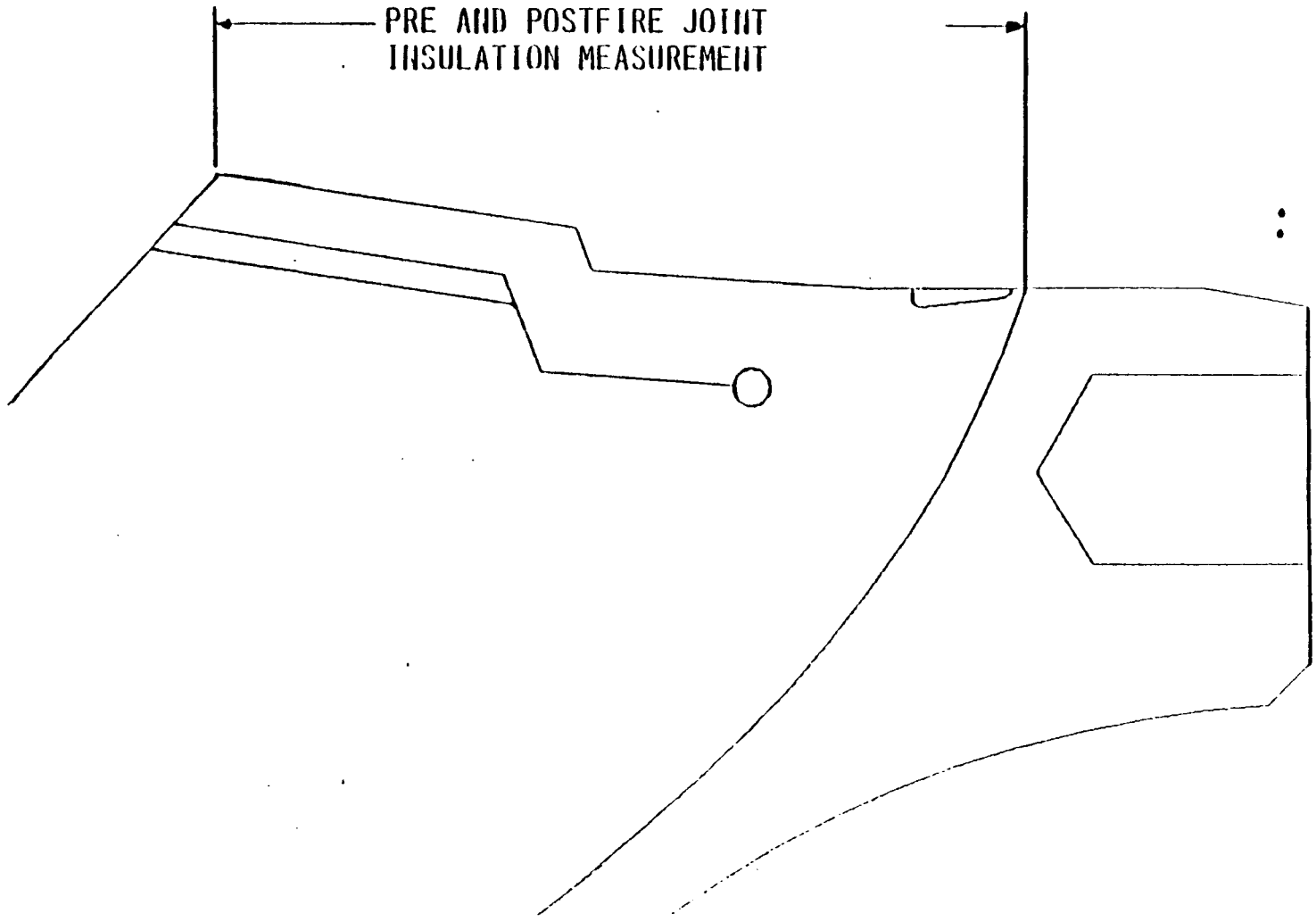



**Figure 11**
**Nozzle to Case Joint Safety Factor Measurement**

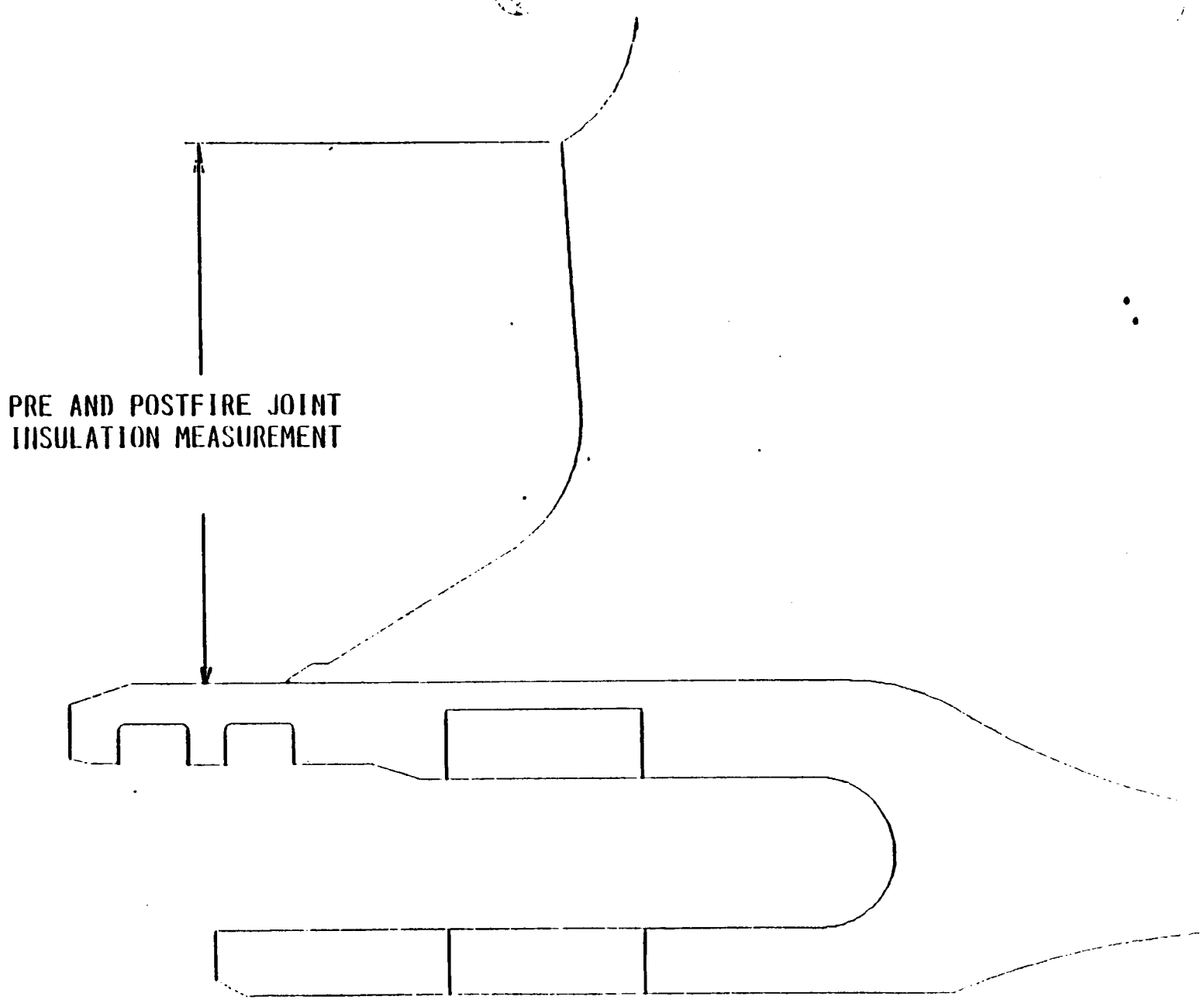



**Figure 12**
**Field Joint (Clevis) Safety Factor Measurement**

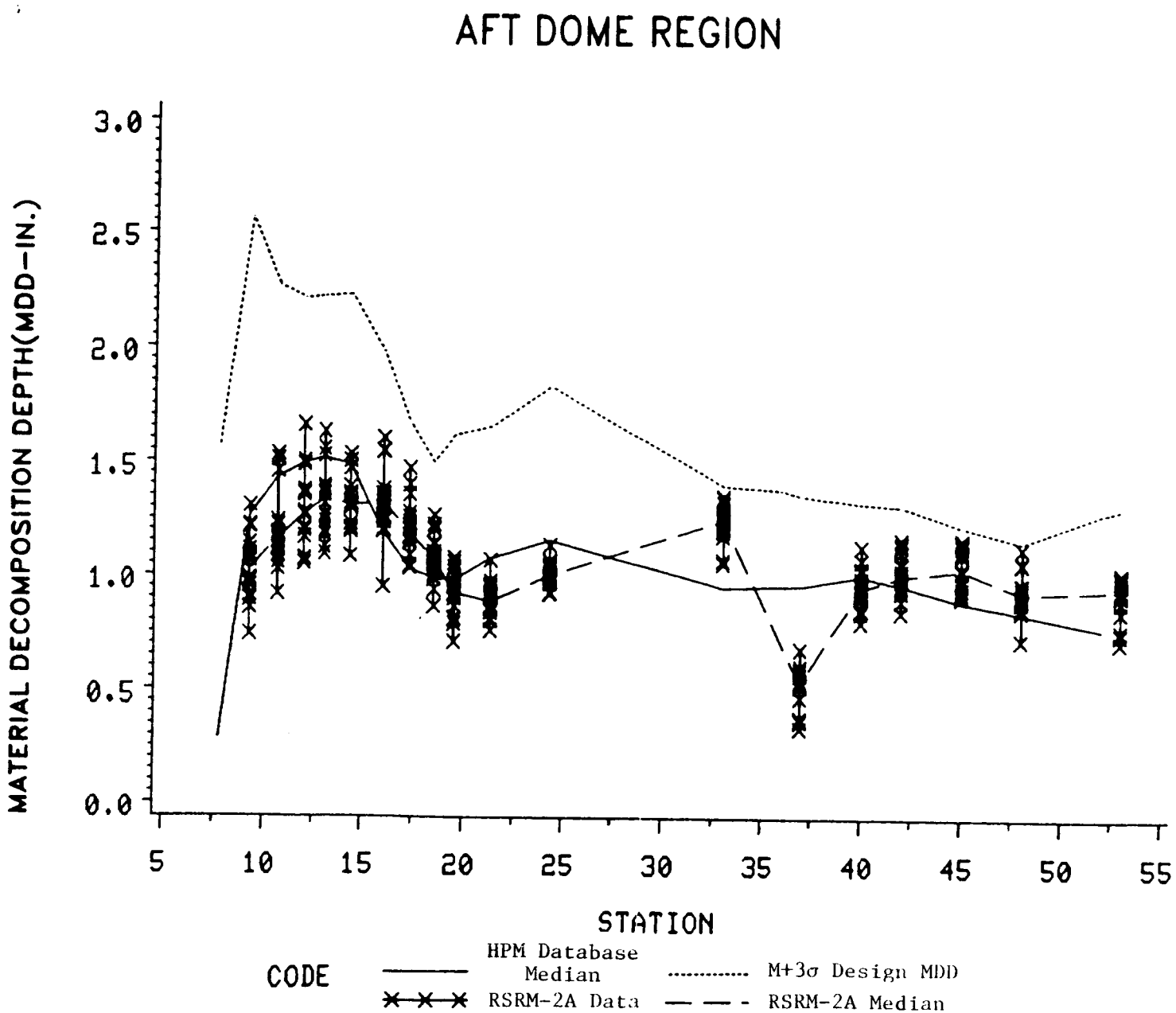



Figure 13 RSRM-2A Aft Dome Insulation Performance

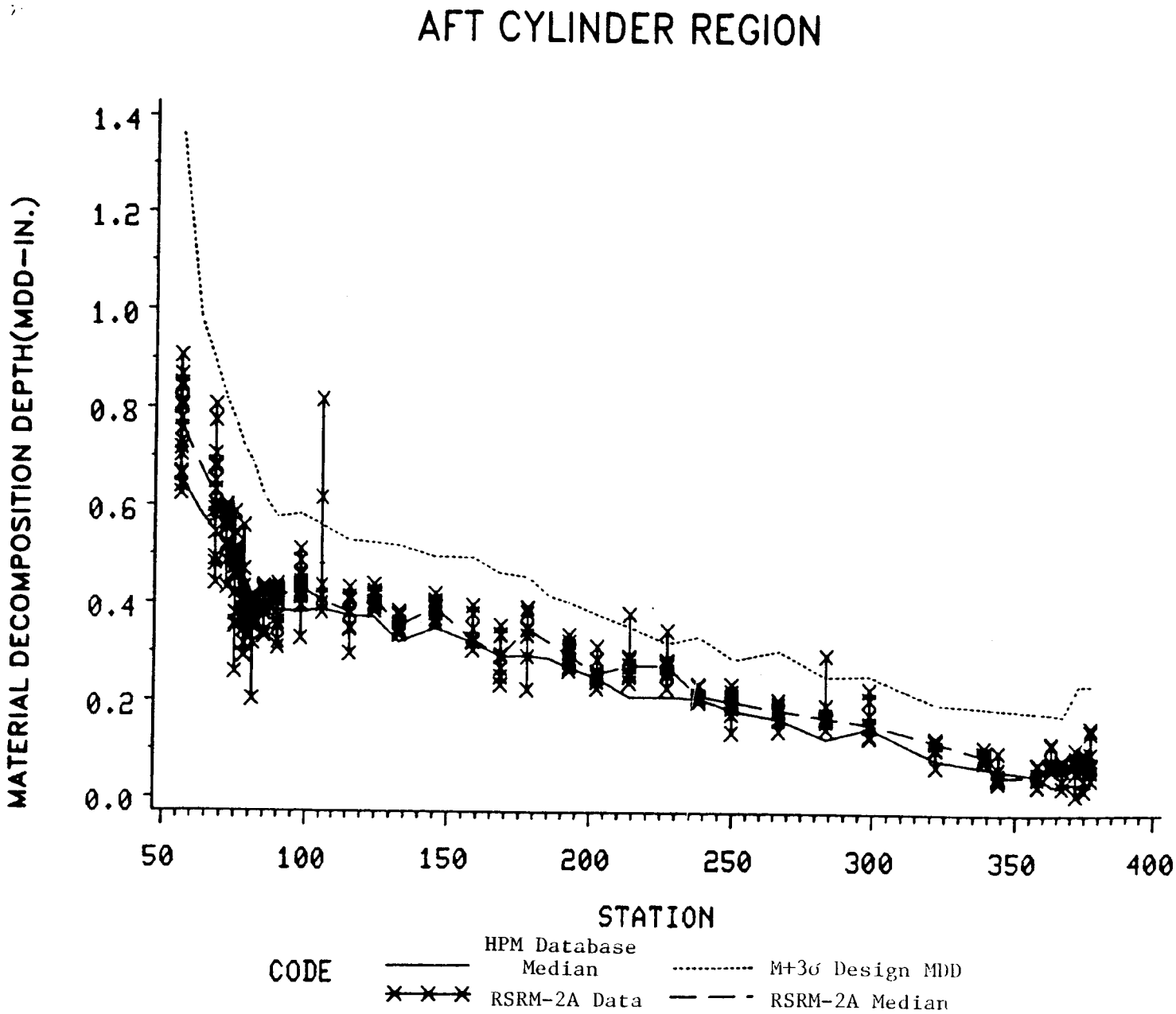



Figure 14 RSRM-2A Aft Cylinder Insulation Performance

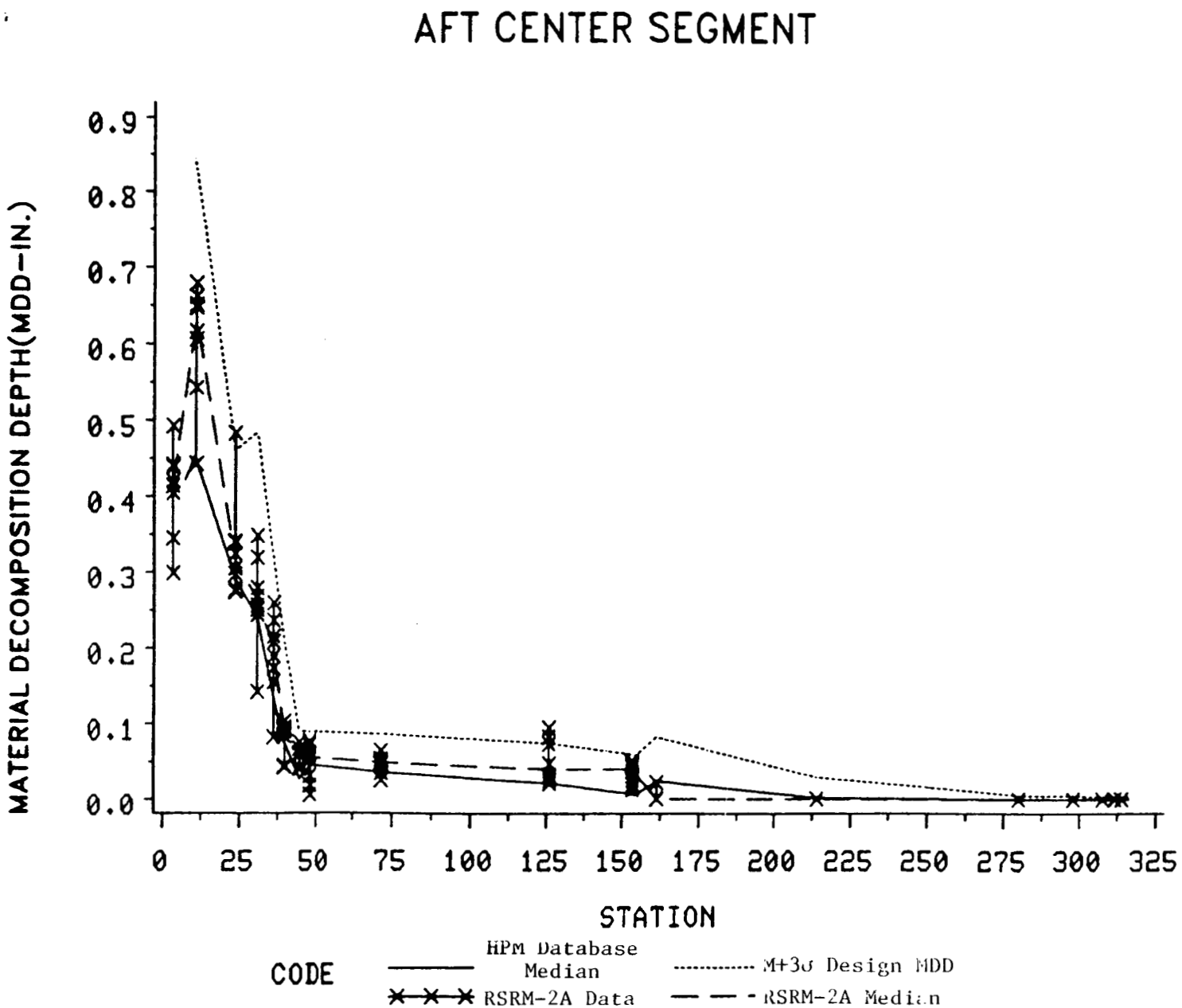



Figure 15 RSRM-2A Aft Center Segment Insulation Performance

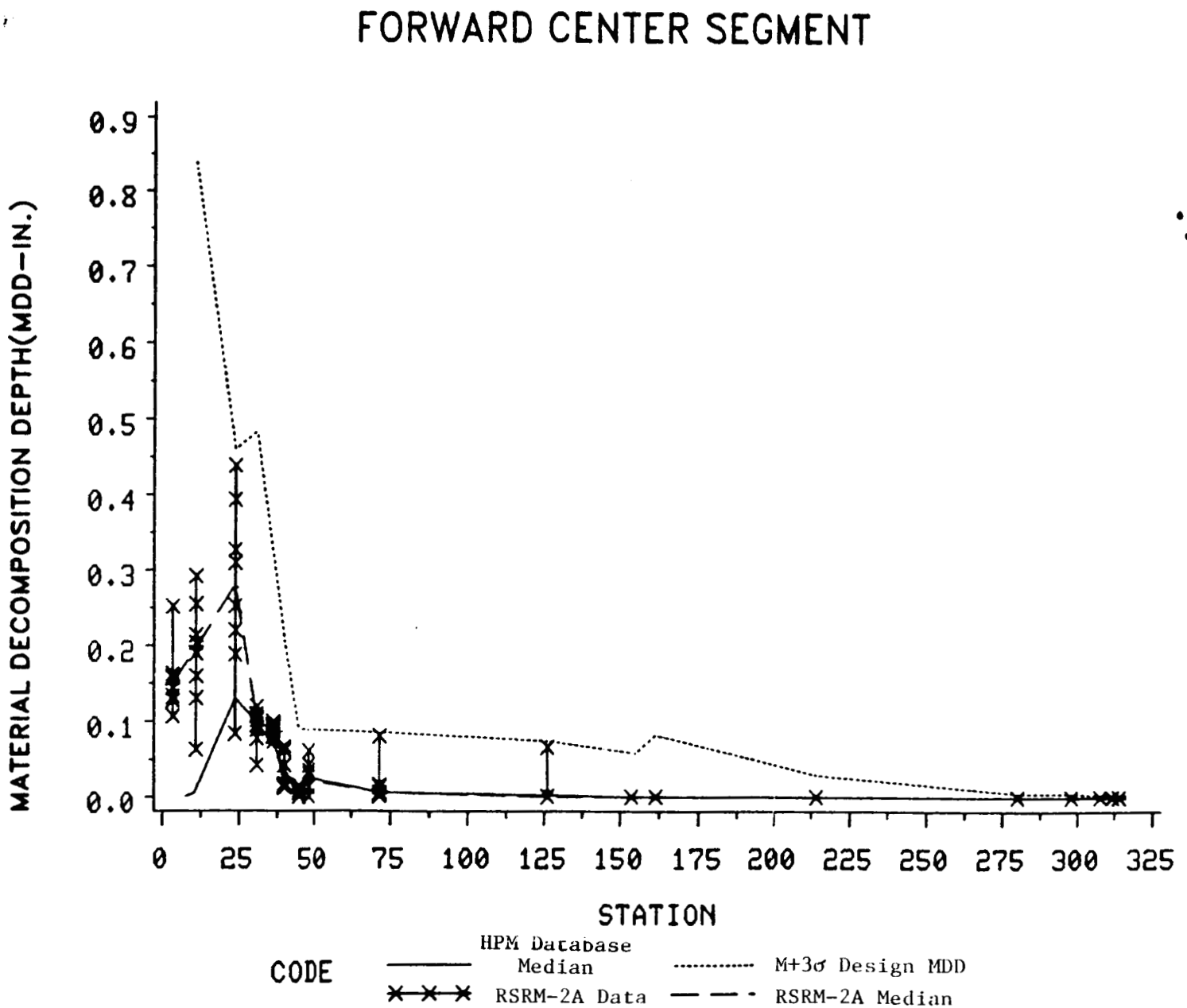



Figure 16 RSRM-2A Forward Center Segment Insulation Performance

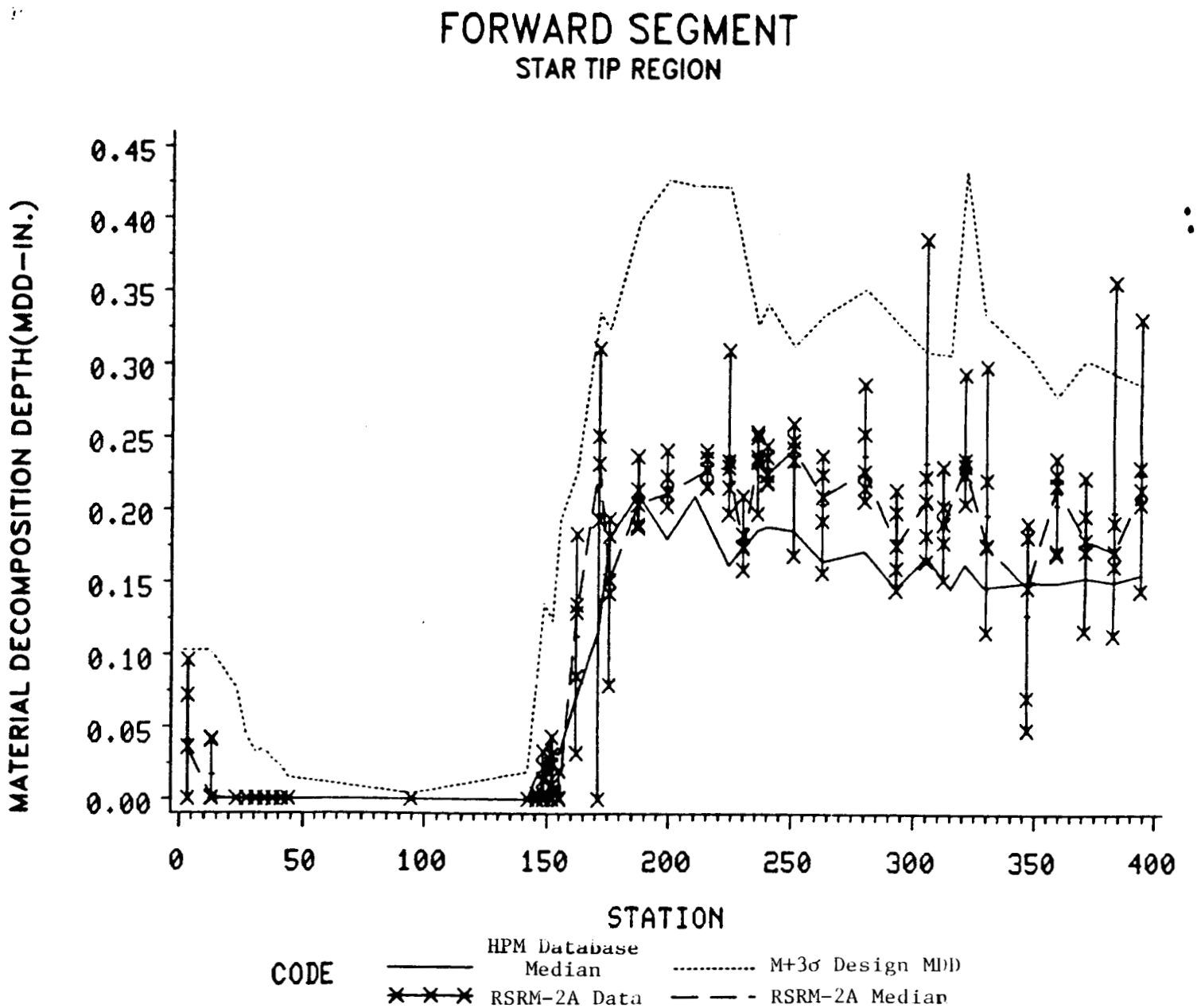



Figure 17 RSRM-2A Forward Segment Star Tip Insulation Performance

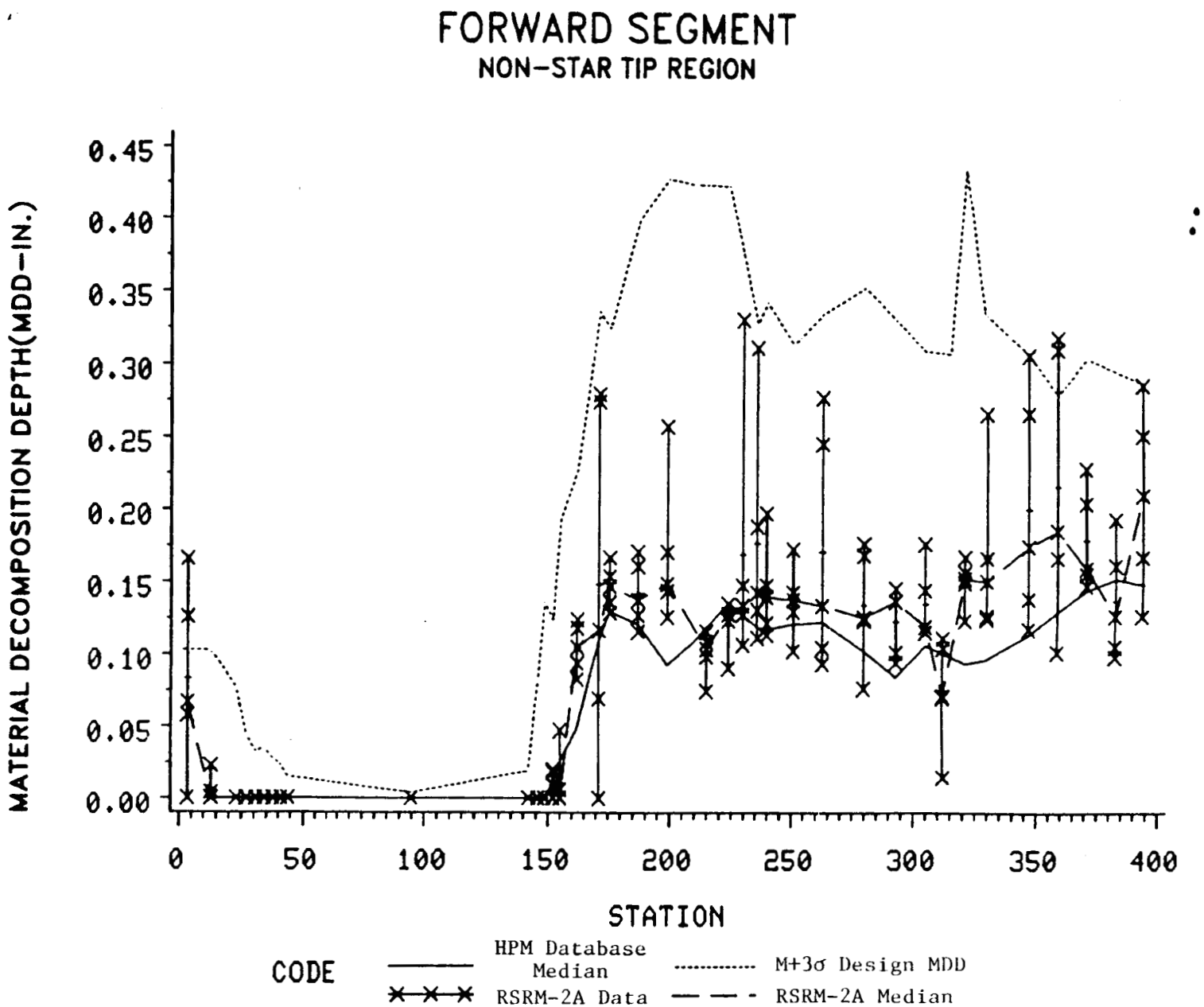
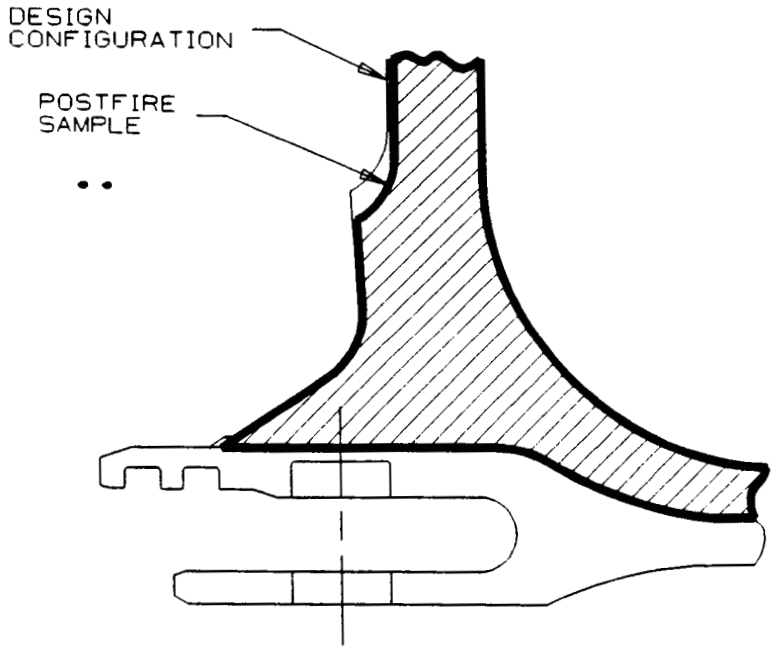
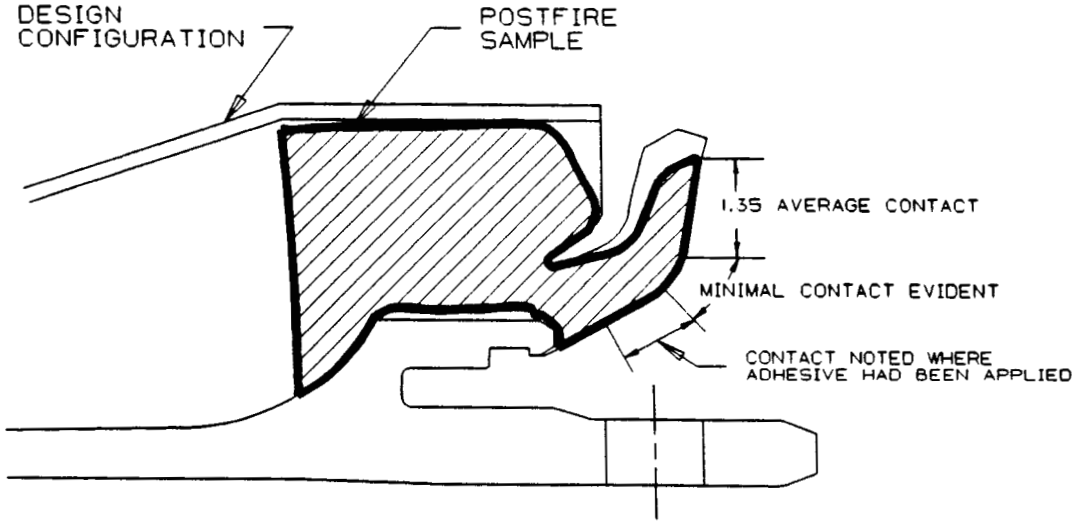



Figure 18 RSRM-2A Forward Segment Non-Star Tip Insulation Performance




AFT CLEVIS
AT 270°



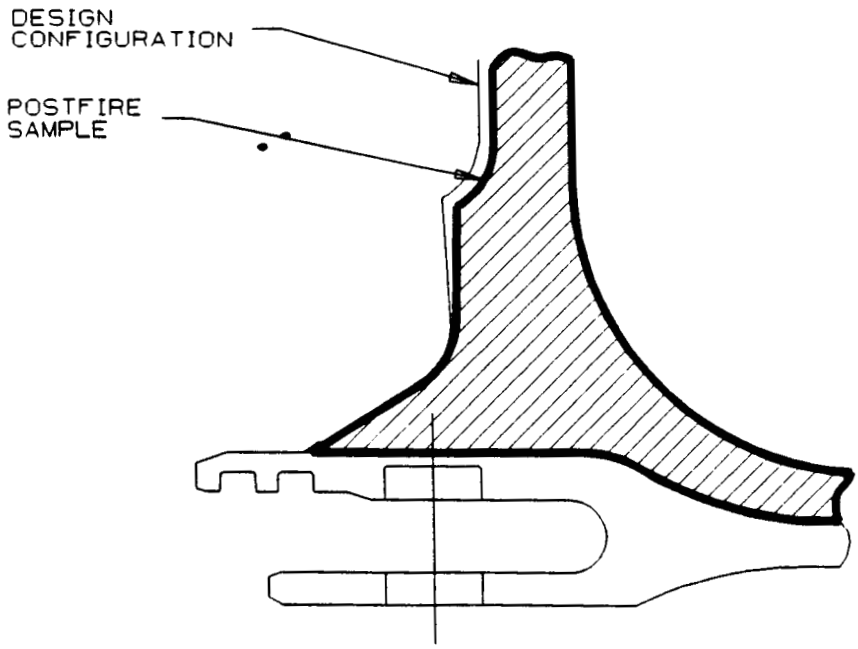

AFT/CTR TANG
AT 270°

RSRM-2B AFT FIELD JOINT

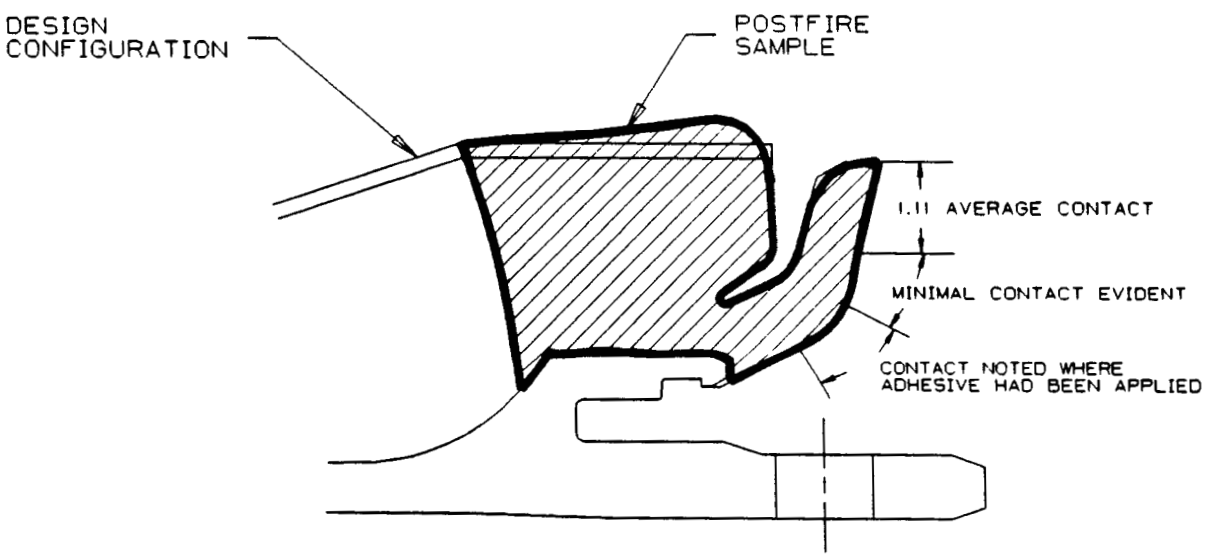
CLEVIS AND TANG INSULATION
TYPICAL POSTFIRE CONDITION



FIGURE 19




CTR/AFT CLEVIS
AT 90°



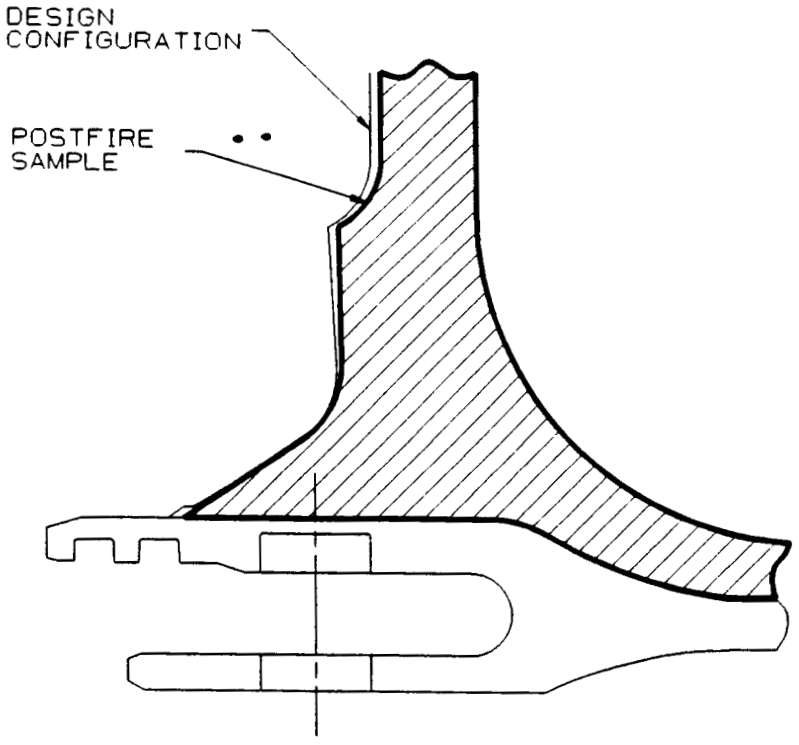

CTR/FWD TANG
AT 92°

RSRM-2B CTR FIELD JOINT

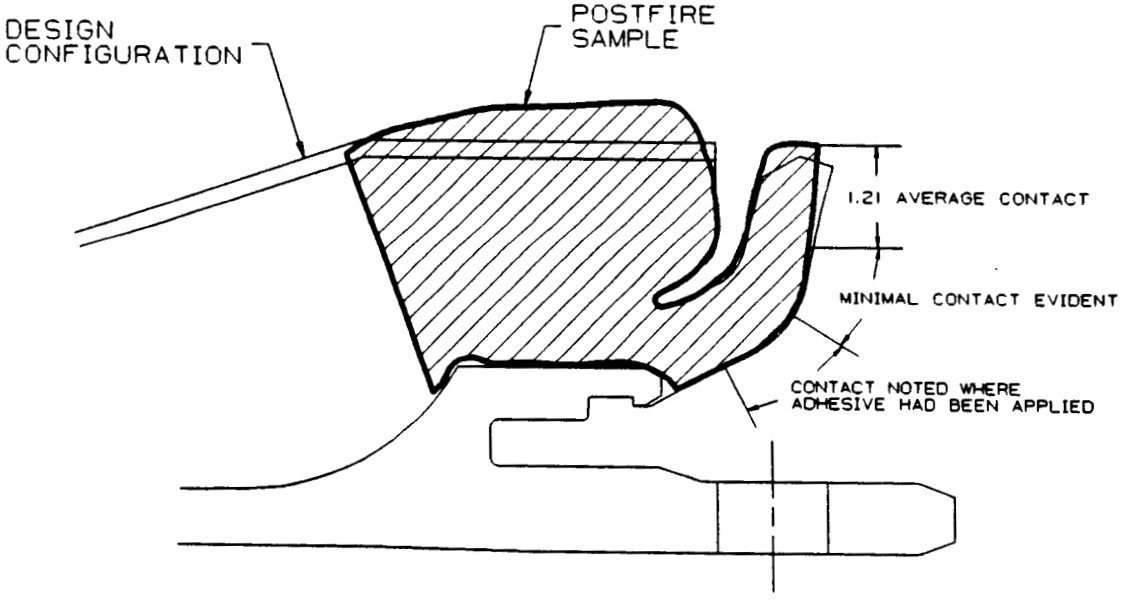
CLEVIS AND TANG INSULATION
TYPICAL POSTFIRE CONDITION



FIGURE 20




CTR/FWD CLEVIS
AT 0°




FWD TANG
AT 2°

RSRM-2B FORWARD FIELD JOINT

CLEVIS AND TANG INSULATION
TYPICAL POSTFIRE CONDITION

FIGURE 21

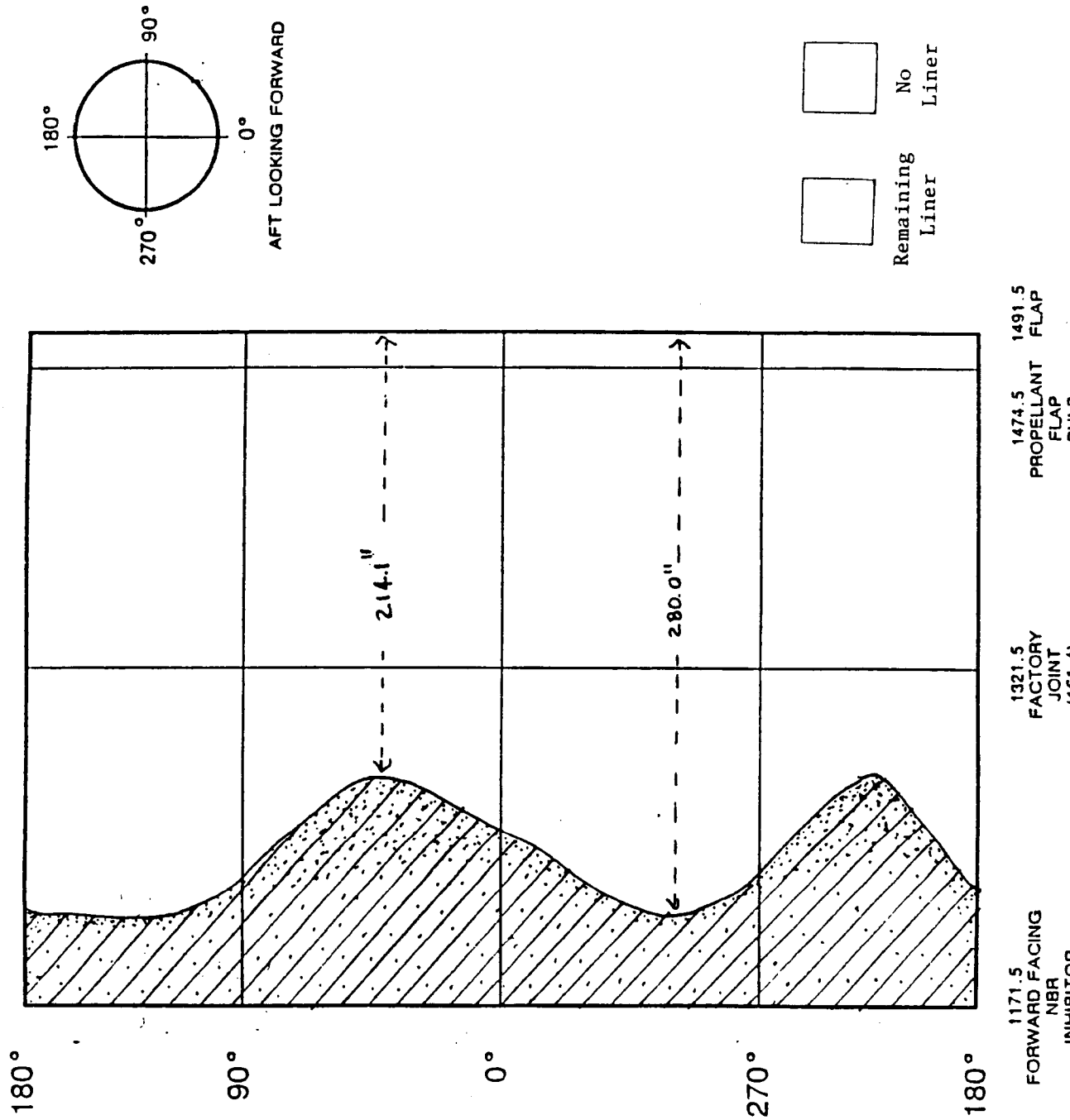



Figure 22 RSRM-2B Aft Center Segment Liner Pattern

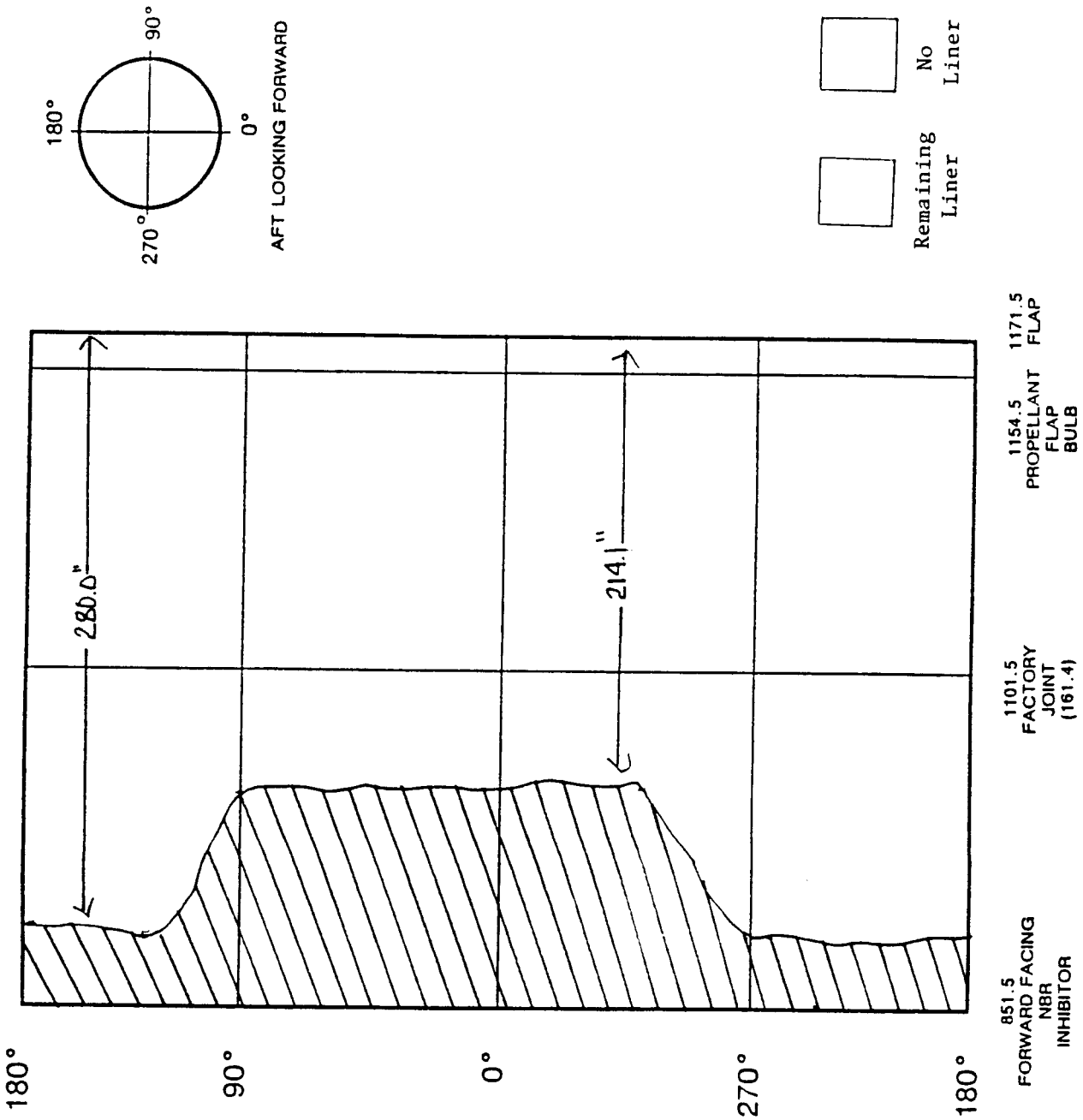



Figure 23 RSRM-2B Forward Center Segment Liner Pattern

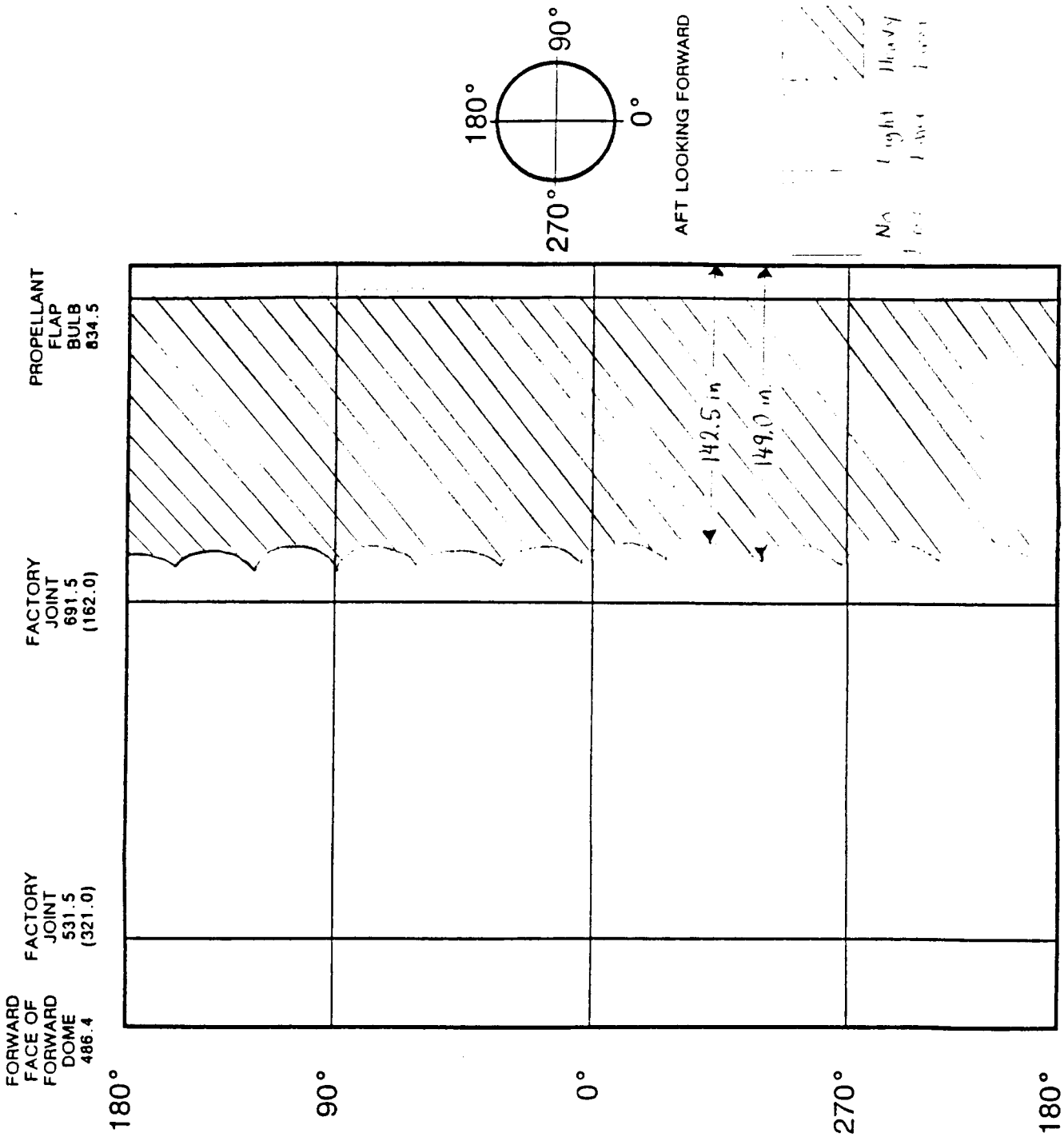



Figure 24
RSRM-2B Forward Segment Liner Pattern

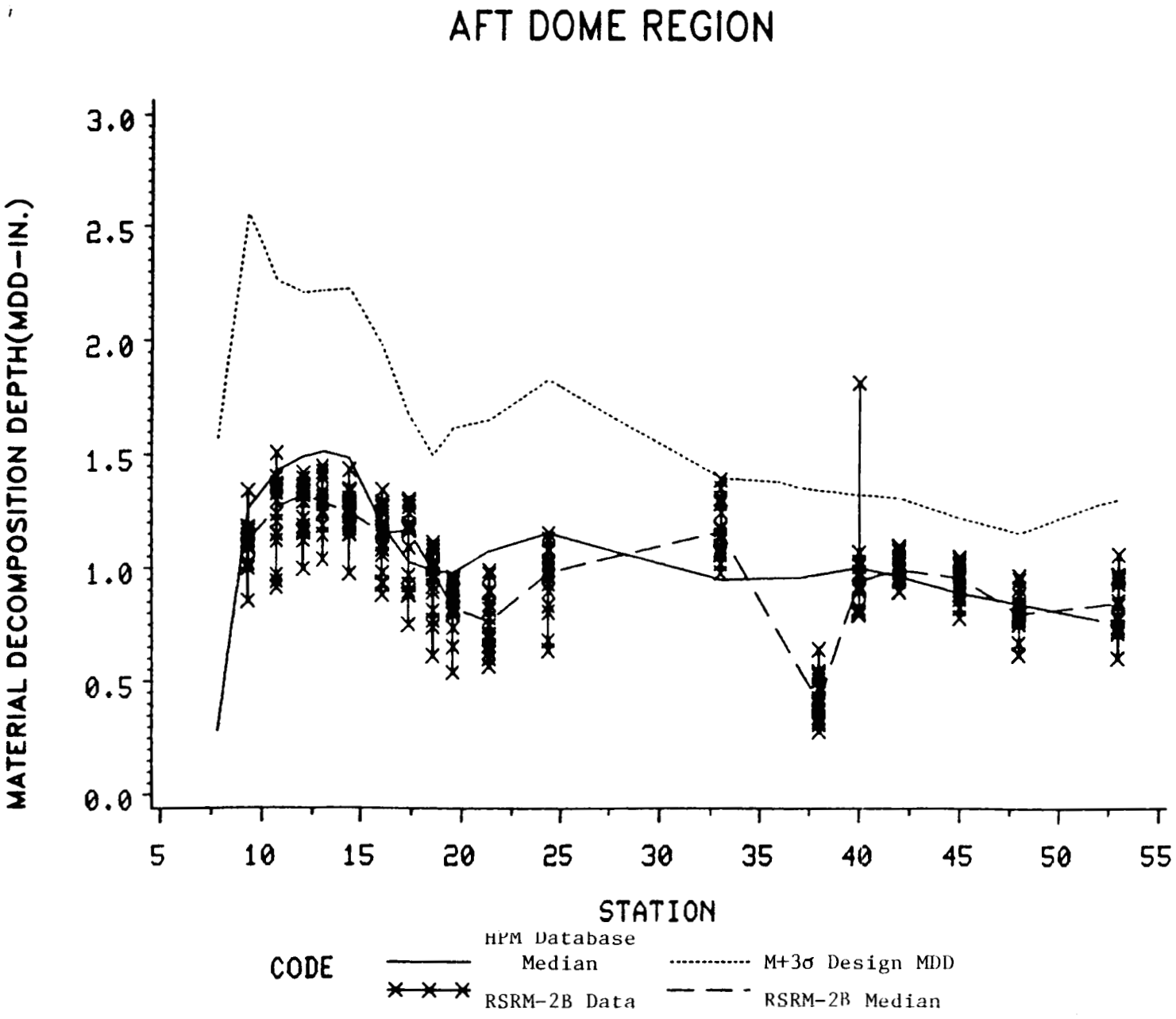
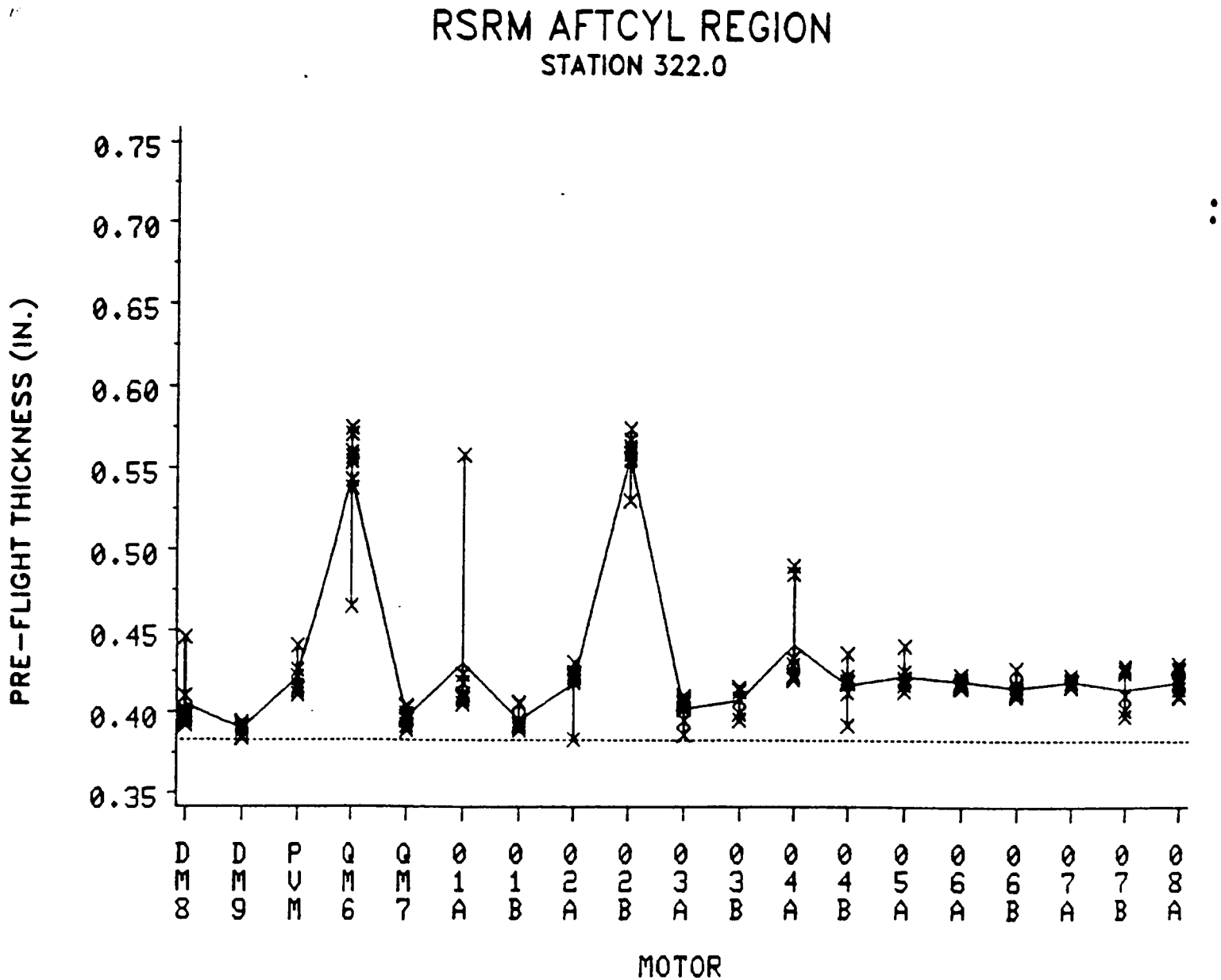



Figure 25 RSRM-2B Aft Dome Insulation Performance




..... Minimum 1U Thickness ———— Prefire Median

Figure 26 RSRM-2B Aft Cylinder Prefire Outliers at Station 322.0

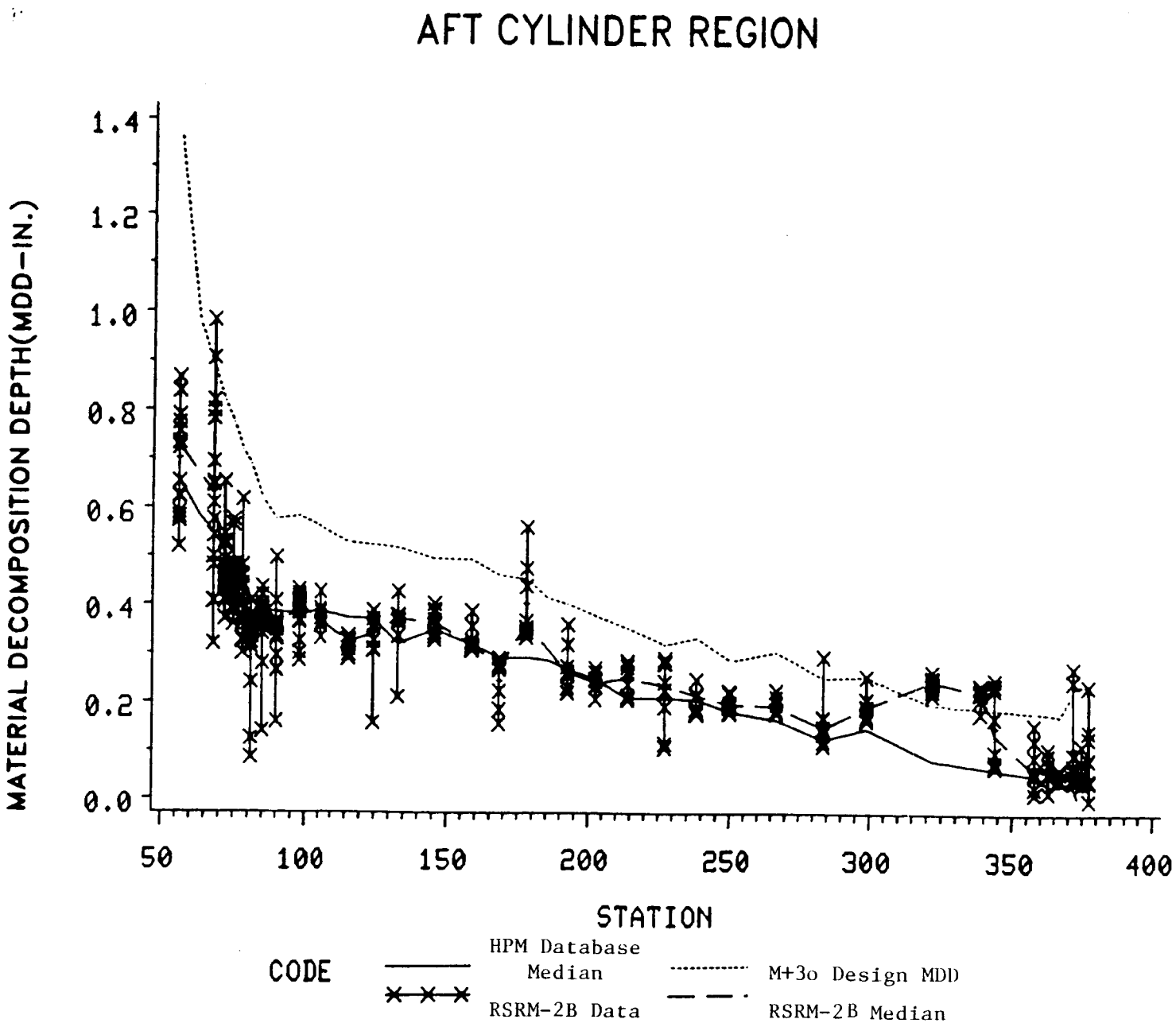
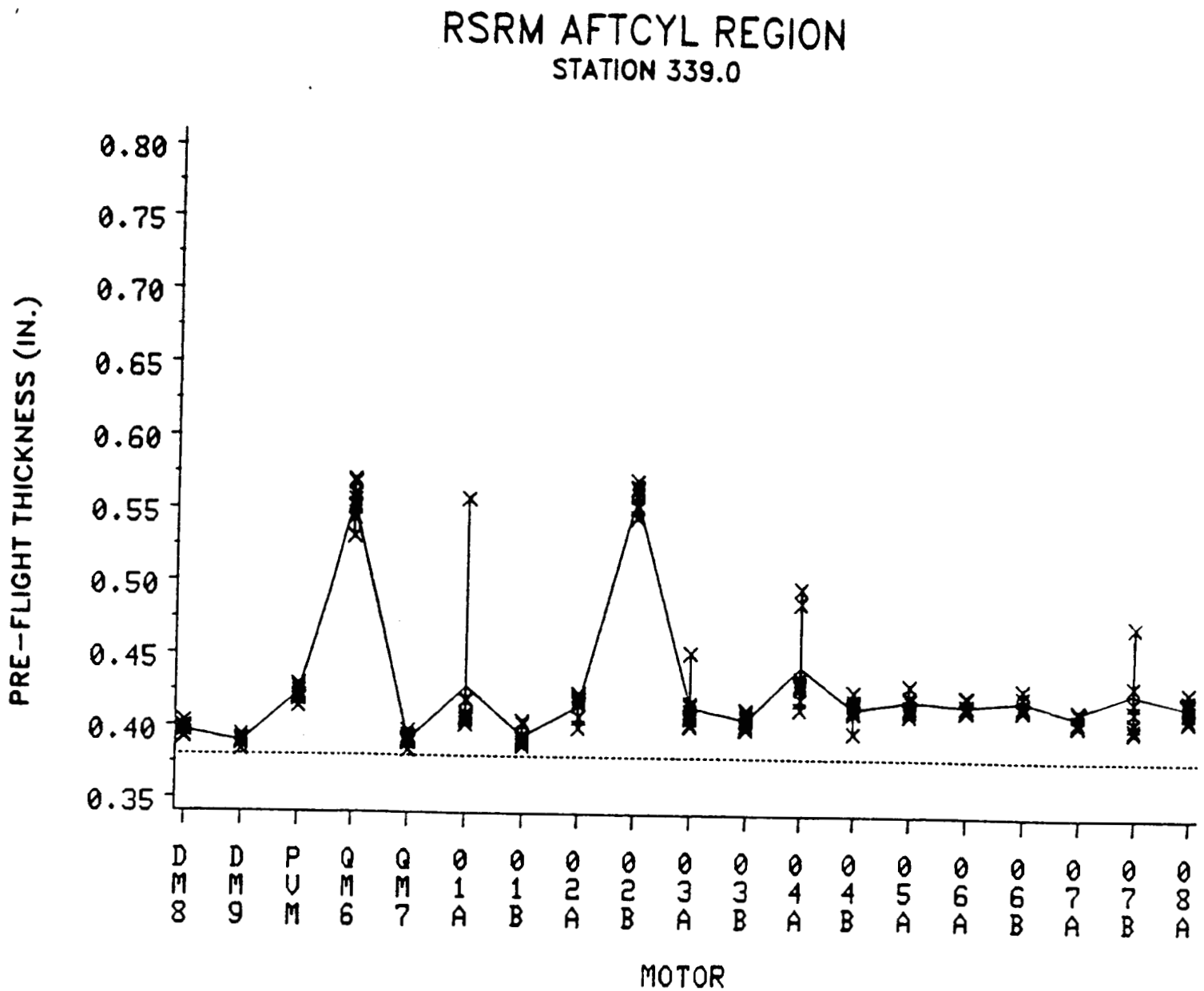



Figure 27 RSRM-2B Aft Cylinder Insulation Performance




..... Minimum 1U Thickness

———— Prefire Median

FIgure 28 RSRM-2B Aft Cylinder Prefire Outliers at Station 339.0

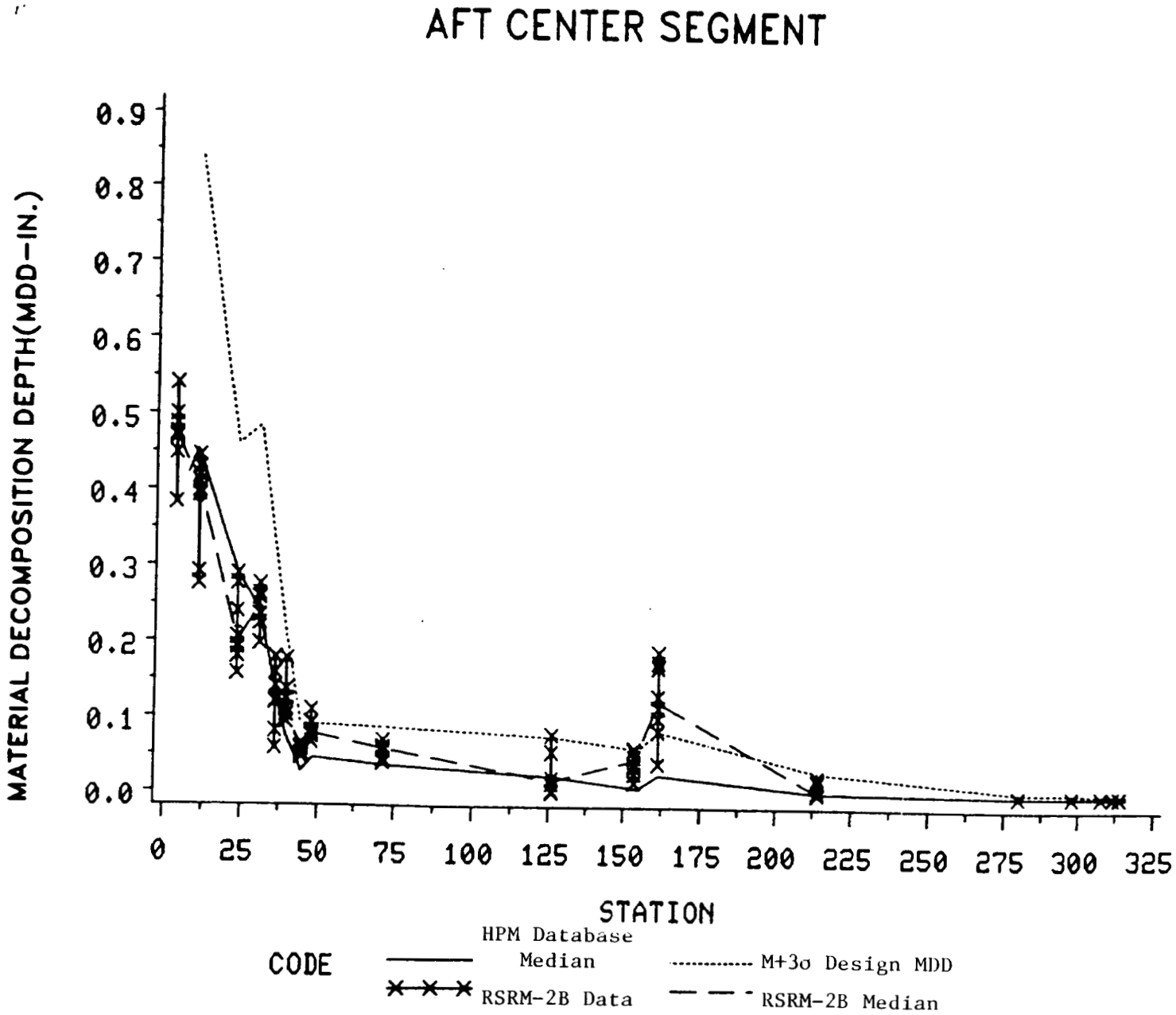



Figure 29 RSRM-2B Aft Center Segment Insulation Performance

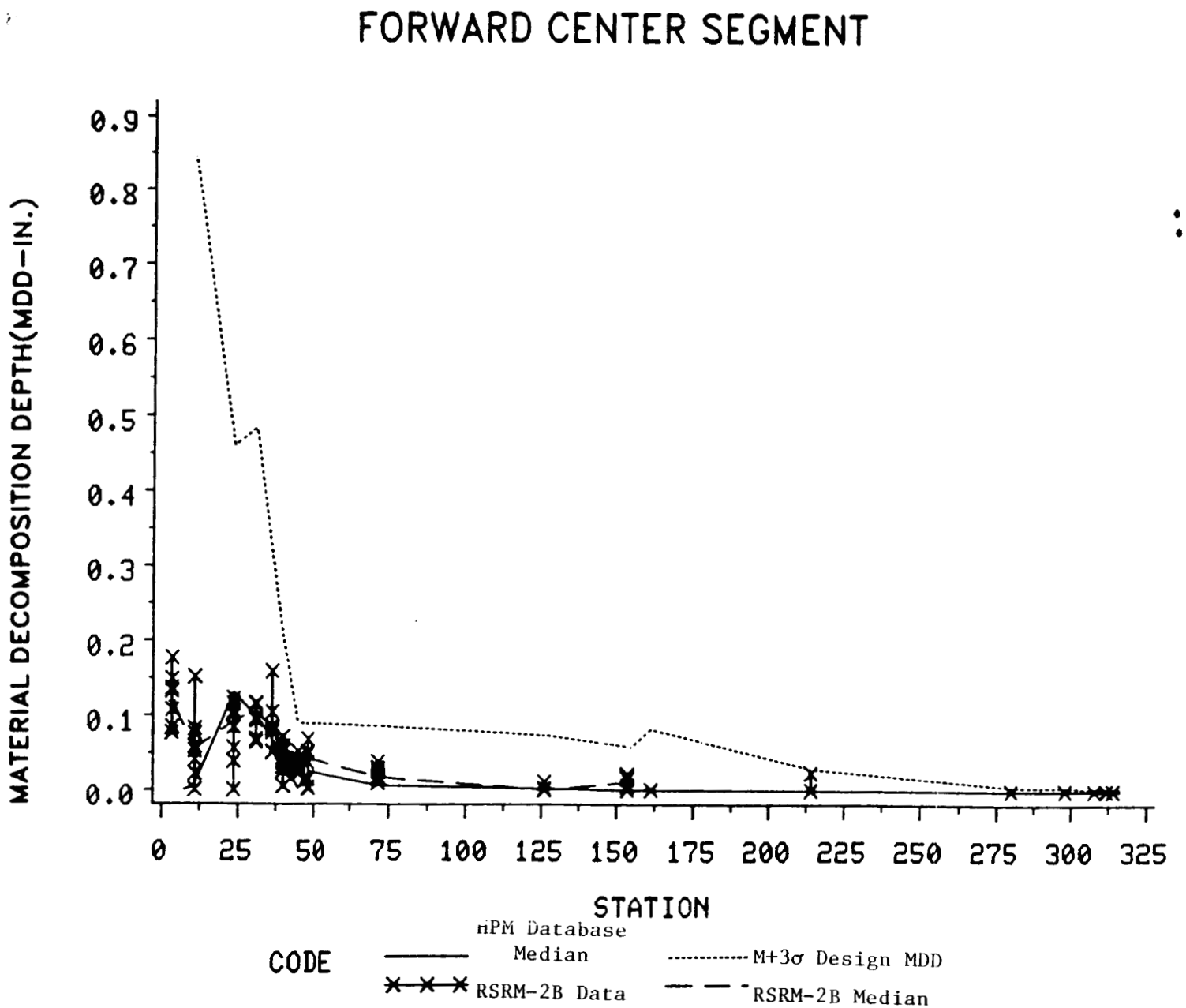



Figure 30 RSRM-2B Forward Center Segment Insulation Performance

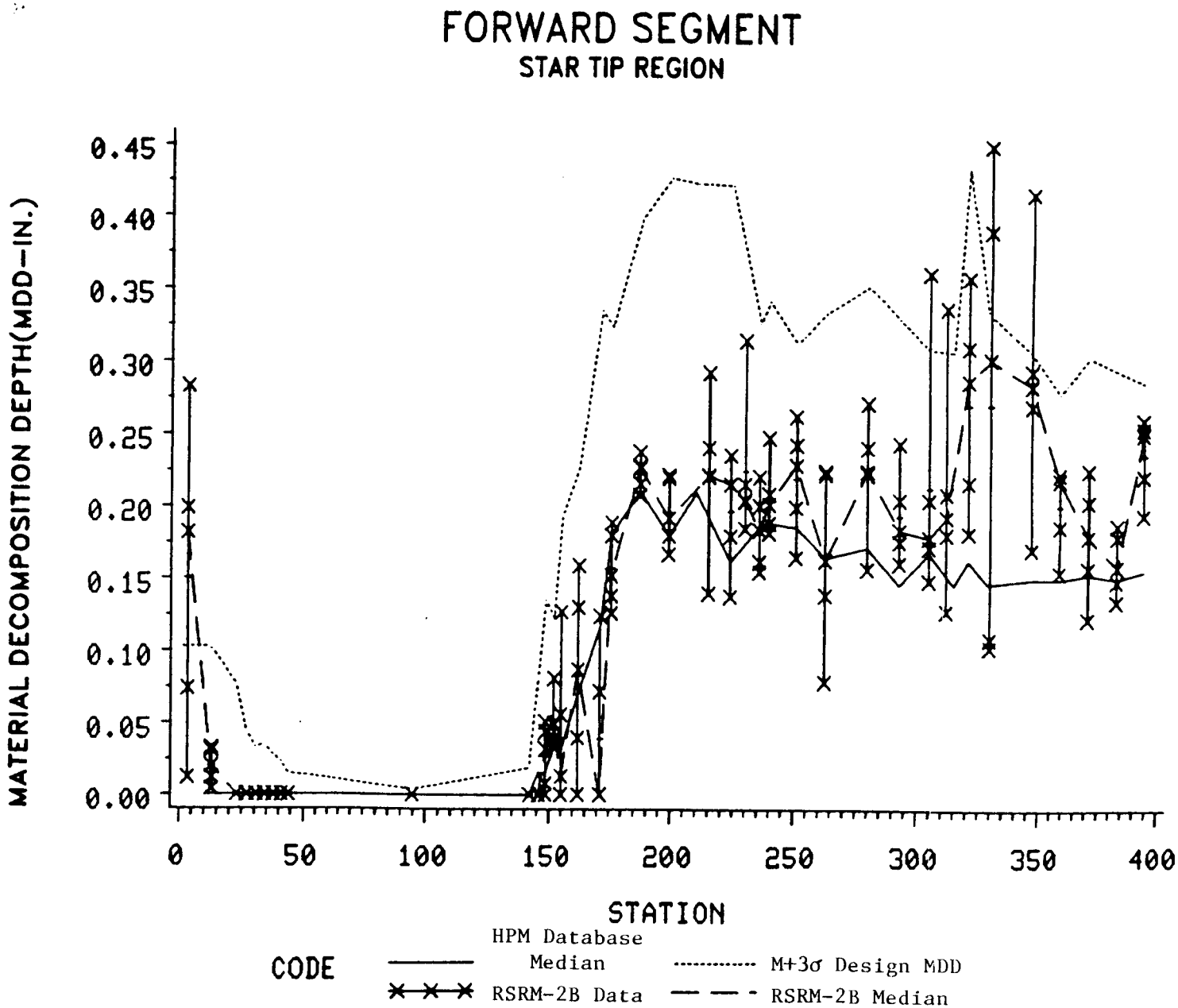



Figure 31 RSRM-2B Forward Segment Star Tip Insulation Performance

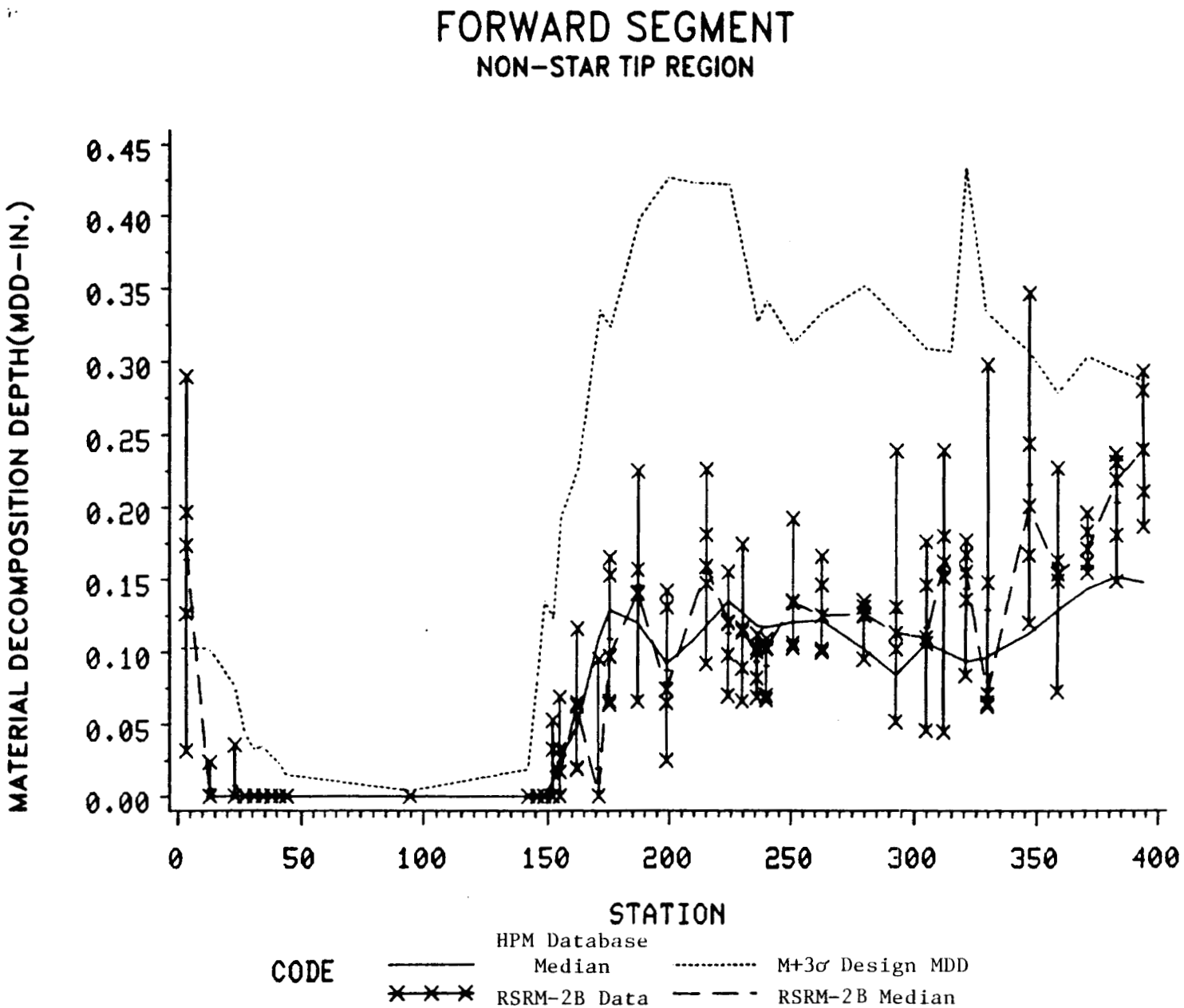



Figure 32 RSRM-2B Forward Segment Non-Star Tip Insulation Performance

Table 1
Summary of Nozzle to Case Joint and Field Joint Safety Factors

| JOINT | MINIMUM COMPLIANCE SAFETY FACTOR (CSF) | DEGREE LOCATION | MINIMUM ACTUAL SAFETY FACTOR (ASF) | DEGREE LOCATION |
|---|---|---|---|---|
| NOZZLE TO CASE A | 6.1 | 46.8° & 180° | 6.8 | 180.0° |
| NOZZLE TO CASE B | 4.0 | 201.6° | 4.5 | 201.6° |
| AFT A | 4.2 | 242° | 4.7 | 242° |
| AFT B | 5.0 | 120° | 5.4 | 120° |
| CENTER A | 8.5 | 30° | 9.1 | 30° |
| CENTER B | 10.9 | 100° | 11.5 | 100° |
| FORWARD A | 12.0 | 70° & 90° | 12.9 | 70° & 90° |
| FORWARD B | 12.1 | 140° | 12.9 | 190° |

NOTE: ALL SAFETY FACTORS MUST MEET A 2.0 MINIMUM.

CSF = MDT/MDD
ASF = Actual Prefire Thickness/MDD

Where: MDT = Minimum Design Thickness
MDD = Material Decomposition Depth

Table 2
Summary of Factory Joint Safety Factors

| SEGMENT | STATION | MINIMUM COMPLIANCE SAFETY FACTOR (CSF) | DEGREE LOCATION | MINIMUM ACTUAL SAFETY FACTOR (ASF) | DEGREE LOCATION |
|---|---|---|---|---|---|
| AFT A | 56.0" | 3.08 | 338.4° | 3.74 | 338.4° |
| AFT B | 56.0" | 3.22 | 316.8° | 4.14 | 316.8° |
| AFT A | 177.7" | 2.57 | 136.8° | 3.87 | 270.0° |
| AFT B | 177.7" | 1.79* | 46.8° | 3.03 | 46.8° |
| AFT A | 299.1" | 3.00 | 46.8° | 4.82 | 46.8° |
| AFT B | 299.1" | 2.66 | 136.8° | 4.52 | 136.8° |
| AFT CTR A | 161.4" | 10.73 | 180.0° | 25.00 | 180.0° |
| AFT CTR B | 161.4" | 1.27** | 226.0° | 3.69 | 226.0° |
| FWD CTR A | 161.4" | 99.00*** | *** | 99.00*** | *** |
| FWD CTR B | 161.4" | 99.00*** | *** | 99.00*** | *** |
| FORWARD A | 162.0" | 2.75 | 90.0° | 4.60 | 90.0° |
| FORWARD B | 162.0" | 3.17 | 352.0° | 5.21 | 352.0° |
| FORWARD A | 321.0" | 3.12 | 90.0° | 3.43 | 90.0° |
| FORWARD B | 321.0" | 2.56 | 90.0° | 3.14 | 90.0° |

NOTE: ALL FACTORY JOINT SAFETY FACTORS MUST MEET A 2.0 MINIMUM
* SEE SECTION 9.3.2
** SEE SECTION 9.4
*** NO MATERIAL LOSS

CSF = MDT/MDD
ASF = Actual Prefire Thickness/MDD

Where: MDT = Minimum Design Thickness
MDD = Material Decomposition Depth

Table 3
• • Summary of Case Insulation Safety Factors

| SEGMENT | MINIMUM COMPLIANCE SAFETY FACTOR (CSF) | STATION | MINIMUM ACTUAL SAFETY FACTOR (ASF) | STATION |
|---|---|---|---|---|
| AFT DOME A | 2.23 | 42.0" & 45.0" | 2.51 | 42.0" |
| AFT DOME B | 1.43* | 40.0" | 2.05 | 40.0" |
| AFT A | 1.32** | 105.8" | 1.86 | 105.8" |
| AFT B | 1.44*** | 322.0" | 2.15 | 322.0" |
| AFT CTR A | 1.60 | 126.0" | 2.44 | 126.0" |
| AFT CTR B | 1.95**** | 126.0" | 2.78 | 71.5" |
| FWD CTR A | 2.10 | 71.5" | 3.13 | 23.6" |
| FWD CTR B | 3.52 | 36.2" | 4.33 | 36.2" |
| FORWARD A | 1.36***** | 305.0" | 1.89 | 305.0" |
| FORWARD B | 1.22****** | 330.0" | 1.83 | 347.0" |

NOTE: ALL ACREAGE AREA SAFETY FACTORS MUST MEET A MINIMUM OF 1.5.
* SEE SECTION 9.3.1
** SEE SECTION 7.3.2
*** SEE SECTION 9.3.2
**** EXCLUDING THE FACTORY JOINT - SEE SECTION 9.4
***** SEE SECTION 7.6.1
****** SEE SECTION 9.6.1

CSF = MDT/MDD
ASF = Actual Prefire Thickness/MDD

Where: MDT = Minimum Design Thickness
MDD = Material Decomposition Depth

| Remains Observation | Anomaly | | |
|---|---|---|---|
| | Minor | Major | Critical |
| • Requires no specific action | • Requires corrective action, but has no impact on:<br>—Motor Performance<br>—Program Schedule<br>• Does not reduce usability of part for its intended function<br>• Could cause damage preventing reuse of hardware in combination with other anomaly<br>• Significant departure from the historical data base | • Could cause failure in combination with other anomaly<br>• Could cause damage preventing reuse of hardware<br>• Program acceptance of cause, corrective action, and risk assessment required before subsequent static test/flight | • Violates CEI spec requirements<br>• Could cause failure and possible loss of mission/life<br>• Mandatory resolution before subsequent static test/flight |

Note: This criteria is to be applied to the specific observed potential anomaly as it relates to the observed article and as it relates to subsequent articles

Table 4 Criteria for Classifying Potential Anomalies

Table 5
RSRM-2 Final Clevis Edge Separation Conditions

PREFIRE KSC WORST CONDITIONS (AFTER HARD PROBE*)

| SEGMENT | PREFIRE MAX DEPTH | POSTFIRE DEPTH | DEGREE LOCATION | PRIMARY BOND GROWTH | REPAIRED** BOND GROWTH | AREA TOTAL |
|---|---|---|---|---|---|---|
| A AFT | 0.28 IN | 0.00 IN | 258° | 0.00 IN | 0.00 IN | 5.1 $IN^2$ |
| A A/C | 0.40 | 0.00 | 180 | 0.00 | 0.00 | 20 |
| A F/C | 0.90 | 0.15 | 245 | 0.00 | 0.15 | 60 |
| B AFT*** | 0.25 | 0.25 | 302-305 | 0.00 | 0.18 | 2.2 |
| B A/C | 0.27 | 0.00 | 256 | 0.00 | 0.00 | 47 |
| B F/C | 0.25 | 0.20,0.24 | 335,344 | 0.00,0.00 | 0.20,0.24 | 6.6 |

POSTFIRE CLEARFIELD H-7 CONDITIONS****

| SEGMENT | PREFIRE DEPTH | POSTFIRE MAX DEPTH | DEGREE LOCATION | PRIMARY BOND GROWTH | REPAIR GROWTH | HARD PROBED POSTFIRE | AREA TOTAL |
|---|---|---|---|---|---|---|---|
| A AFT | 0.10 IN | 0.36 IN | 252-254° | 0.25 IN | 0.10 IN | NO | 24 $IN^2$ |
| A A/C | 0.08 | 0.33 | 258 | 0.25 | 0.25 | NO | 7.8 |
| A F/C | 0.20 | 0.32 | 20 | 0.12 | 0.20 | YES | 13 |
| B AFT | 0.11 | 1.04 | 92 | 0.93 | 0.11 | NO | 3.8 |
| B A/C | 0.05 | 0.23 | 17 | 0.18 | 0.01 | NO | 1.4 |
| B F/C | 0.08 | 0.26 | 88 | 0.19 | 0.00 | YES | 6.0 |

* MTI PREFIRE HARD PROBE, INSPECTION PERFORMED AT FINAL ASSEMBLY
** REPAIRED BOND GROWTH DETERMINED WITH MTI INSPECTION AT FINAL
*** PROCESSED WITH EXTENDED GRIT BLAST AND CHEMLOK DIMENSIONS
**** POSTFIRE HARD PROBE INSPECTION PERFORMED FOR ENGINEERING DATA ONLY

Table 6
RSRM-2 Final Tang Edge Separation Conditions

PREFIRE KSC WORST CONDITIONS

| SEGMENT | PREFIRE MAX DEPTH | POSTFIRE DEPTH | DEGREE LOCATION | PRIMARY BOND GROWTH | REPAIRED** BOND GROWTH | AREA TOTAL |
|---|---|---|---|---|---|---|
| A A/C* | 0.15 IN | 0.15 IN | 272-275° | 0.00 IN | N/A | 3.4 $IN^2$ |
| A F/C | 0.14 | 0.00,0.00 | 100,194 | 0.00,0.00 | 0.00,0.00 | 12 |
| A FWD* | 0.18 | 0.25 | 00 | 0.07 | 0.18 | 38 |
| B A/C | - | - | - | - | - | - |
| B F/C | 0.22 | 0.07 | 198 | 0.00 | N/A | - |
| B FWD* | 0.20 | 0.00 | 294 | 0.00 | 0.00 | 79 |

POSTFIRE CLEARFIELD H-7 WORST CONDITIONS

| SEGMENT | PREFIRE DEPTH | POSTFRE MAX DEPTH | DEGREE LOCATION | PRIMARY BOND GROWTH | REPAIR GROWTH | AREA TOTAL |
|---|---|---|---|---|---|---|
| A A/C | 0.00 IN | 0.35 IN | 326° | 0.35 IN | 0.00 IN | 5.4 $IN^2$ |
| A F/C | 0.12 | 0.18 | 180-218 | 0.06 | 0.12 | 35 |
| A FWD | 0.18 | 0.25 | 00 | 0.07 | 0.18 | 3.0 |
| B A/C | - | 0.18 | 270,350<br>251,247 | - | - | 8.0 |
| B F/C | 0.00 | 0.10 | 158 | - | - | 0.79 |
| B FWD | 0.18 | 0.15 | 90-94 | 0.00 | 0.03 | 2.7 |

* PREFIRE CONDITION AT KSC FOLLOWING 360° FLASHING REMOVAL AND HARD PROBE
** REPARIED BOND GROWTH DETERMINED FROM SEPARATION DEPTH AT KSC

Table 7 RSRM-2A Nozzle to Case Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 0.0 | 5.532 | 4.841 | 0.691 | 7.1 | 8.0 |
| 21.6 | 5.493 | 4.813 | 0.680 | 7.2 | 8.1 |
| 46.8 | 5.500 | 4.699 | 0.801 | 6.1 | 6.9 |
| 68.4 | 5.481 | 4.836 | 0.645 | 7.6 | 8.5 |
| 90.0 | 5.491 | 4.794 | 0.697 | 7.0 | 7.9 |
| 111.6 | 5.476 | 4.802 | 0.674 | 7.3 | 8.1 |
| 136.8 | 5.524 | 4.979 | 0.545 | 9.0 | 10.1 |
| 158.4 | 5.489 | 4.904 | 0.585 | 8.4 | 9.4 |
| 180.0 | 5.449 | 4.645 | 0.804 | 6.1 | 6.8 |
| 201.6 | 5.478 | 4.682 | 0.796 | 6.2 | 6.9 |
| 226.8 | 5.493 | 4.821 | 0.672 | 7.3 | 8.2 |
| 248.4 | 5.460 | 5.060 | 0.400 | 12.2 | 13.6 |
| 270.0 | 5.463 | 4.812 | 0.651 | 7.5 | 8.4 |
| 291.6 | 5.443 | 4.780 | 0.663 | 7.4 | 8.2 |
| 316.8 | 5.465 | 4.785 | 0.680 | 7.2 | 8.0 |
| 338.4 | 5.457 | 4.954 | 0.503 | 9.7 | 10.8 |
| | MEDIAN 5.480 | MEDIAN 4.813 | MEDIAN 0.673 | MINIMUM 6.1 | MINIMUM 6.8 |

Table 8 RSRM-2A Aft Field Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 2.0 | 2.890 | 2.342 | 0.548 | 4.7 | 5.3 |
| 10.0 | 2.887 | 2.327 | 0.560 | 4.6 | 5.2 |
| 20.0 | 2.891 | 2.293 | 0.598 | 4.3 | 4.8 |
| 30.0 | 2.889 | 2.330 | 0.559 | 4.6 | 5.2 |
| 40.0 | 2.891 | 2.317 | 0.574 | 4.5 | 5.0 |
| 50.0 | 2.888 | 2.291 | 0.597 | 4.3 | 4.8 |
| 60.0 | 2.889 | 2.320 | 0.569 | 4.6 | 5.1 |
| 70.0 | 2.893 | 2.355 | 0.538 | 4.8 | 5.4 |
| 80.0 | 2.893 | 2.323 | 0.570 | 4.6 | 5.1 |
| 90.0 | 2.894 | 2.344 | 0.550 | 4.7 | 5.3 |
| 100.0 | 2.898 | 2.314 | 0.584 | 4.4 | 5.0 |
| 110.0 | 2.890 | 2.288 | 0.602 | 4.3 | 4.8 |
| 120.0 | 2.882 | 2.291 | 0.591 | 4.4 | 4.9 |
| 130.0 | 2.889 | 2.334 | 0.555 | 4.7 | 5.2 |
| 140.0 | 2.894 | 2.304 | 0.590 | 4.4 | 4.9 |
| 150.0 | 2.892 | 2.312 | 0.580 | 4.5 | 5.0 |
| 160.0 | 2.894 | 2.290 | 0.604 | 4.3 | 4.8 |
| 170.0 | 2.894 | 2.303 | 0.591 | 4.4 | 4.9 |
| 180.0 | 2.892 | 2.372 | 0.520 | 5.0 | 5.6 |
| 190.0 | 2.889 | 2.321 | 0.568 | 4.6 | 5.1 |
| 200.0 | 2.870 | 2.309 | 0.561 | 4.6 | 5.1 |
| 210.0 | 2.863 | 2.286 | 0.577 | 4.5 | 5.0 |
| 220.0 | 2.865 | 2.290 | 0.575 | 4.5 | 5.0 |
| 230.0 | 2.880 | 2.296 | 0.584 | 4.4 | 4.9 |
| 242.0 | 2.880 | 2.261 | 0.619 | 4.2 | 4.7 |
| 250.0 | 2.873 | 2.273 | 0.600 | 4.3 | 4.8 |
| 260.0 | 2.877 | 2.344 | 0.533 | 4.9 | 5.4 |
| 270.0 | 2.860 | 2.283 | 0.577 | 4.5 | 5.0 |
| 280.0 | 2.871 | 2.323 | 0.548 | 4.7 | 5.2 |
| 290.0 | 2.870 | 2.296 | 0.574 | 4.5 | 5.0 |
| 300.0 | 2.869 | 2.334 | 0.535 | 4.9 | 5.4 |
| 310.0 | 2.869 | 2.325 | 0.544 | 4.8 | 5.3 |
| 320.0 | 2.871 | 2.268 | 0.603 | 4.3 | 4.8 |
| 330.0 | 2.869 | 2.308 | 0.561 | 4.6 | 5.1 |
| 340.0 | 2.870 | 2.315 | 0.555 | 4.7 | 5.2 |
| 350.0 | 2.868 | 2.315 | 0.553 | 4.7 | 5.2 |
| | MEDIAN | MEDIAN | MEDIAN | MINIMUM | MINIMUM |
| | 2.888 | 2.313 | 0.572 | 4.2 | 4.7 |

Table 9 RSRM-2A Center Field Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 2.0 | 2.756 | 2.574 | 0.182 | 14.3 | 15.1 |
| 10.0 | 2.764 | 2.532 | 0.232 | 11.2 | 11.9 |
| 20.0 | 2.766 | 2.522 | 0.244 | 10.6 | 11.3 |
| 30.0 | 2.776 | 2.471 | 0.305 | 8.5 | 9.1 |
| 40.0 | 2.772 | 2.511 | 0.261 | 9.9 | 10.6 |
| 50.0 | 2.783 | 2.566 | 0.217 | 12.0 | 12.8 |
| 60.0 | 2.770 | 2.543 | 0.227 | 11.4 | 12.2 |
| 70.0 | 2.757 | 2.540 | 0.217 | 12.0 | 12.7 |
| 80.0 | 2.772 | 2.531 | 0.241 | 10.8 | 11.5 |
| 90.0 | 2.778 | 2.587 | 0.191 | 13.6 | 14.5 |
| 100.0 | 2.790 | 2.612 | 0.178 | 14.6 | 15.7 |
| 110.0 | 2.770 | 2.570 | 0.200 | 13.0 | 13.8 |
| 120.0 | 2.771 | 2.642 | 0.129 | 20.1 | 21.5 |
| 130.0 | 2.766 | 2.538 | 0.228 | 11.4 | 12.1 |
| 140.0 | 2.774 | 2.522 | 0.252 | 10.3 | 11.0 |
| 150.0 | 2.784 | 2.538 | 0.246 | 10.5 | 11.3 |
| 160.0 | 2.787 | 2.538 | 0.249 | 10.4 | 11.2 |
| 170.0 | 2.786 | 2.559 | 0.227 | 11.4 | 12.3 |
| 180.0 | 2.765 | 2.540 | 0.225 | 11.5 | 12.3 |
| 190.0 | 2.740 | 2.533 | 0.207 | 12.5 | 13.2 |
| 200.0 | 2.735 | 2.548 | 0.187 | 13.9 | 14.6 |
| 210.0 | 2.742 | 2.518 | 0.224 | 11.6 | 12.2 |
| 220.0 | 2.747 | 2.508 | 0.239 | 10.9 | 11.5 |
| 230.0 | 2.745 | 2.525 | 0.220 | 11.8 | 12.5 |
| 242.0 | 2.748 | 2.594 | 0.154 | 16.9 | 17.8 |
| 250.0 | 2.742 | 2.540 | 0.202 | 12.8 | 13.6 |
| 260.0 | 2.745 | 2.545 | 0.200 | 13.0 | 13.7 |
| 270.0 | 2.770 | 2.560 | 0.210 | 12.4 | 13.2 |
| 280.0 | 2.756 | 2.532 | 0.224 | 11.6 | 12.3 |
| 290.0 | 2.765 | 2.549 | 0.216 | 12.0 | 12.8 |
| 300.0 | 2.753 | 2.536 | 0.217 | 12.0 | 12.7 |
| 310.0 | 2.752 | 2.511 | 0.241 | 10.8 | 11.4 |
| 320.0 | 2.744 | 2.503 | 0.241 | 10.8 | 11.4 |
| 330.0 | 2.750 | 2.500 | 0.250 | 10.4 | 11.0 |
| 340.0 | 2.754 | 2.500 | 0.254 | 10.2 | 10.8 |
| 350.0 | 2.748 | 2.495 | 0.253 | 10.3 | 10.9 |
| | MEDIAN 2.764 | MEDIAN 2.538 | MEDIAN 0.225 | MINIMUM 8.5 | MINIMUM 9.1 |

Table 10 RSRM-2A Forward Field Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 2.0 | 2.783 | 2.612 | 0.171 | 15.2 | 16.3 |
| 10.0 | 2.774 | 2.630 | 0.144 | 18.0 | 19.3 |
| 20.0 | 2.781 | 2.648 | 0.133 | 19.5 | 20.9 |
| 30.0 | 2.784 | 2.571 | 0.213 | 12.2 | 13.1 |
| 40.0 | 2.776 | 2.577 | 0.199 | 13.0 | 13.9 |
| 50.0 | 2.778 | 2.645 | 0.133 | 19.5 | 20.9 |
| 60.0 | 2.785 | 2.593 | 0.192 | 13.5 | 14.5 |
| 70.0 | 2.795 | 2.578 | 0.217 | 12.0 | 12.9 |
| 80.0 | 2.780 | 2.589 | 0.191 | 13.6 | 14.6 |
| 90.0 | 2.784 | 2.568 | 0.216 | 12.0 | 12.9 |
| 100.0 | 2.768 | 2.602 | 0.166 | 15.6 | 16.7 |
| 110.0 | 2.804 | 2.628 | 0.176 | 14.7 | 15.9 |
| 120.0 | 2.765 | 2.636 | 0.129 | 20.1 | 21.4 |
| 130.0 | 2.756 | 2.626 | 0.130 | 20.0 | 21.2 |
| 140.0 | 2.780 | 2.596 | 0.184 | 14.1 | 15.1 |
| 150.0 | 2.758 | 2.659 | 0.099 | 26.2 | 27.9 |
| 160.0 | 2.773 | 2.626 | 0.147 | 17.7 | 18.9 |
| 170.0 | 2.775 | 2.652 | 0.123 | 21.1 | 22.6 |
| 180.0 | 2.755 | 2.612 | 0.143 | 18.1 | 19.3 |
| 190.0 | 2.753 | 2.590 | 0.163 | 15.9 | 16.9 |
| 200.0 | 2.762 | 2.612 | 0.150 | 17.3 | 18.4 |
| 210.0 | 2.750 | 2.611 | 0.139 | 18.7 | 19.8 |
| 220.0 | 2.745 | 2.584 | 0.161 | 16.1 | 17.0 |
| 230.0 | 2.751 | 2.631 | 0.120 | 21.6 | 22.9 |
| 242.0 | 2.755 | 2.595 | 0.160 | 16.2 | 17.2 |
| 250.0 | 2.750 | 2.620 | 0.130 | 20.0 | 21.2 |
| 260.0 | 2.760 | 2.591 | 0.169 | 15.4 | 16.3 |
| 270.0 | 2.755 | 2.614 | 0.141 | 18.4 | 19.5 |
| 280.0 | 2.753 | 2.640 | 0.113 | 23.0 | 24.4 |
| 290.0 | 2.754 | 2.600 | 0.154 | 16.9 | 17.9 |
| 300.0 | 2.741 | 2.632 | 0.109 | 23.8 | 25.1 |
| 310.0 | 2.769 | 2.581 | 0.188 | 13.8 | 14.7 |
| 320.0 | 2.761 | 2.582 | 0.179 | 14.5 | 15.4 |
| 330.0 | 2.742 | 2.563 | 0.179 | 14.5 | 15.3 |
| 340.0 | 2.746 | 2.579 | 0.167 | 15.5 | 16.4 |
| 350.0 | 2.756 | 2.571 | 0.185 | 14.0 | 14.9 |
| | MEDIAN 2.761 | MEDIAN 2.606 | MEDIAN 0.160 | MINIMUM 12.0 | MINIMUM 12.9 |

RSRM-2A Aft Dome
COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 4.41 | 4.31 | 5.38 | 5.06 | 4.98 | 4.02 | 4.04 | 4.55 | 5.03 | 5.49 | 5.72 | 4.50 | 6.61 | 4.60 | 3.75 | 5.15 | 3.75 | 316.8 | 1.5 |
| 10.7 | 3.86 | 3.97 | 5.13 | 4.18 | 4.01 | 4.24 | 3.07 | 3.23 | 4.00 | 4.32 | 4.09 | 4.58 | 4.45 | 3.80 | 3.12 | 4.33 | 3.07 | 136.8 | 1.5 |
| 12.0 | 3.53 | 3.76 | 3.86 | 3.57 | 4.29 | 3.33 | 2.71 | 3.00 | 3.30 | 3.73 | 3.28 | 3.55 | 4.22 | 3.54 | 3.03 | 4.20 | 2.71 | 136.8 | 1.5 |
| 13.1 | 3.13 | 3.27 | 3.48 | 3.40 | 3.93 | 3.12 | 2.64 | 2.77 | 3.16 | 3.42 | 3.10 | 3.60 | 3.66 | 3.18 | 2.82 | 3.83 | 2.64 | 136.8 | 1.5 |
| 14.4 | 3.05 | 3.15 | 3.44 | 3.40 | 3.16 | 3.13 | 2.79 | 2.73 | 3.11 | 3.14 | 2.95 | 3.35 | 3.44 | 3.01 | 2.68 | 3.79 | 2.68 | 316.8 | 1.5 |
| 16.0 | 2.80 | 3.03 | 3.06 | 2.92 | 2.86 | 2.79 | 2.36 | 2.45 | 2.74 | 2.83 | 2.87 | 3.00 | 3.98 | 3.14 | 2.44 | 3.16 | 2.36 | 136.8 | 1.5 |
| 17.3 | 2.93 | 3.41 | 3.12 | 3.03 | 2.79 | 2.84 | 2.42 | 2.54 | 2.89 | 3.05 | 3.10 | 3.45 | 3.04 | 2.96 | 2.63 | 3.28 | 2.42 | 136.8 | 1.5 |
| 18.5 | 3.13 | 3.17 | 3.20 | 3.28 | 2.95 | 2.96 | 2.66 | 2.80 | 3.05 | 3.59 | 3.42 | 3.90 | 3.10 | 3.26 | 2.75 | 3.34 | 2.66 | 136.8 | 1.5 |
| 19.5 | 3.30 | 3.90 | 3.44 | 3.51 | 3.33 | 3.41 | 2.93 | 3.18 | 2.99 | 3.65 | 3.88 | 4.45 | 3.26 | 3.44 | 3.05 | 4.00 | 2.93 | 136.8 | 1.5 |
| 21.3 | 3.12 | 3.67 | 3.17 | 3.45 | 3.64 | 3.51 | 3.25 | 3.21 | 3.41 | 3.41 | 3.89 | 2.76 | 3.02 | 3.17 | 3.08 | 3.67 | 2.76 | 248.4 | 1.5 |
| 24.3 | 2.95 | 2.94 | 2.79 | 2.85 | 2.59 | 2.87 | 3.02 | 2.98 | 2.92 | 2.96 | 3.04 | 3.20 | 3.01 | 2.82 | 2.77 | 3.18 | 2.59 | 90.0 | 1.5 |
| 33.0 | 2.42 | 2.58 | 2.54 | 2.56 | 2.52 | 2.49 | 2.64 | 2.99 | 2.72 | 3.03 | 2.62 | 2.37 | 2.51 | 2.38 | 2.67 | 2.61 | 2.37 | 248.4 | 1.5 |
| 37.0 | 4.99 | 4.57 | 6.84 | 7.10 | 4.78 | 4.91 | 4.56 | 7.07 | 5.53 | 7.76 | 4.97 | 4.42 | 4.30 | 3.82 | 4.87 | 4.91 | 3.82 | 291.6 | 1.5 |
| 40.0 | 2.54 | 2.81 | 2.51 | 2.77 | 2.53 | 2.85 | 3.08 | 3.25 | 3.04 | 3.02 | 2.79 | 2.70 | 2.62 | 2.30 | 2.43 | 2.73 | 2.30 | 291.6 | 1.5 |
| 42.0 | 2.45 | 2.69 | 2.62 | 2.46 | 2.27 | 2.74 | 2.78 | 3.08 | 2.90 | 2.64 | 2.63 | 2.53 | 2.23 | 2.34 | 2.57 | 2.29 | 2.23 | 270.0 | 1.5 |
| 45.0 | 2.29 | 2.79 | 2.73 | 2.74 | 2.33 | 2.63 | 2.51 | 2.82 | 2.85 | 2.67 | 2.28 | 2.25 | 2.36 | 2.37 | 2.53 | 2.23 | 2.23 | 338.4 | 1.5 |
| 48.0 | 2.69 | 2.73 | 3.04 | 2.45 | 2.44 | 2.88 | 2.82 | 3.58 | 2.89 | 3.00 | 2.91 | 2.69 | 2.86 | 2.68 | 2.30 | 2.77 | 2.30 | 316.8 | 1.5 |
| 53.0 | 3.36 | 3.61 | 3.55 | 3.58 | 3.34 | 3.96 | 4.70 | 4.48 | 3.76 | 4.39 | 3.64 | 3.37 | 3.45 | 3.31 | 3.39 | 3.32 | 3.31 | 291.6 | 1.5 |

SEGMENT MINIMUM = 2.23 AT THE 45.0 INCH STATION.

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 4.63 | 4.49 | 5.58 | 5.34 | 5.17 | 4.18 | 4.20 | 4.70 | 5.27 | 5.77 | 5.89 | 4.72 | 6.91 | 4.76 | 3.94 | 5.33 | 3.94 | 316.8 |
| 10.7 | 3.97 | 4.08 | 5.15 | 4.32 | 4.08 | 4.29 | 3.13 | 3.28 | 4.05 | 4.45 | 4.15 | 4.71 | 4.57 | 3.82 | 3.21 | 4.41 | 3.13 | 136.8 |
| 12.0 | 3.66 | 3.89 | 3.90 | 3.71 | 4.43 | 3.42 | 2.79 | 3.09 | 3.39 | 3.85 | 3.36 | 3.75 | 4.35 | 3.60 | 3.15 | 4.35 | 2.79 | 136.8 |
| 13.1 | 3.30 | 3.43 | 3.59 | 3.58 | 4.16 | 3.25 | 2.75 | 2.90 | 3.18 | 3.60 | 3.24 | 3.79 | 3.82 | 3.32 | 3.00 | 4.03 | 2.75 | 136.8 |
| 14.4 | 3.24 | 3.38 | 3.60 | 3.68 | 3.44 | 3.31 | 2.91 | 2.91 | 3.34 | 3.36 | 3.20 | 3.60 | 3.68 | 3.18 | 2.89 | 4.06 | 2.89 | 316.8 |
| 16.0 | 3.16 | 3.49 | 3.42 | 3.33 | 3.28 | 3.15 | 2.70 | 2.77 | 3.15 | 3.20 | 3.25 | 3.38 | 4.43 | 3.36 | 2.81 | 3.63 | 2.70 | 136.8 |
| 17.3 | 3.43 | 4.20 | 3.61 | 3.56 | 3.31 | 3.32 | 2.83 | 2.94 | 3.41 | 3.57 | 3.62 | 4.04 | 3.49 | 3.43 | 3.09 | 3.86 | 2.83 | 136.8 |
| 18.5 | 3.72 | 3.95 | 3.81 | 3.97 | 3.55 | 3.55 | 3.21 | 3.33 | 3.68 | 4.29 | 4.09 | 4.66 | 3.70 | 3.88 | 3.35 | 4.01 | 3.21 | 136.8 |
| 19.5 | 4.00 | 4.79 | 4.17 | 4.29 | 4.10 | 4.44 | 3.58 | 3.84 | 3.69 | 4.43 | 4.75 | 5.50 | 3.92 | 4.19 | 3.72 | 4.93 | 3.58 | 136.8 |
| 21.3 | 3.83 | 4.51 | 3.93 | 4.24 | 4.47 | 4.30 | 3.95 | 3.91 | 4.24 | 4.18 | 4.77 | 3.44 | 3.70 | 3.92 | 3.81 | 4.55 | 3.44 | 248.4 |
| 24.3 | 3.45 | 3.43 | 3.31 | 3.30 | 3.01 | 3.35 | 3.44 | 3.43 | 3.47 | 3.49 | 3.55 | 3.77 | 3.48 | 3.32 | 3.27 | 3.74 | 3.01 | 90.0 |
| 33.0 | 2.74 | 2.87 | 2.80 | 2.86 | 2.76 | 2.73 | 2.93 | 3.35 | 3.02 | 3.33 | 2.88 | 2.64 | 2.74 | 2.66 | 2.98 | 2.84 | 2.64 | 248.4 |
| 37.0 | 5.65 | 5.12 | 7.54 | 7.86 | 5.53 | 5.48 | 5.24 | 8.11 | 6.14 | 8.49 | 5.64 | 5.00 | 4.80 | 4.43 | 5.67 | 5.68 | 4.43 | 291.6 |
| 40.0 | 2.74 | 3.05 | 2.78 | 2.98 | 2.84 | 3.08 | 3.25 | 3.46 | 3.33 | 3.29 | 3.01 | 2.89 | 2.79 | 2.60 | 2.71 | 3.07 | 2.60 | 291.6 |
| 42.0 | 2.68 | 2.88 | 2.82 | 2.68 | 2.59 | 2.96 | 3.00 | 3.31 | 3.08 | 2.97 | 2.83 | 2.76 | 2.51 | 2.56 | 2.79 | 2.60 | 2.51 | 270.0 |
| 45.0 | 2.56 | 2.99 | 2.88 | 2.86 | 2.61 | 2.86 | 2.78 | 3.11 | 3.12 | 2.98 | 2.59 | 2.54 | 2.60 | 2.60 | 2.79 | 2.55 | 2.54 | 248.4 |
| 48.0 | 3.33 | 3.40 | 3.71 | 2.99 | 3.01 | 3.56 | 3.35 | 4.32 | 3.48 | 3.74 | 3.50 | 3.35 | 3.38 | 3.20 | 3.02 | 3.46 | 2.99 | 68.4 |
| 53.0 | 3.80 | 4.04 | 4.00 | 4.06 | 3.79 | 4.51 | 5.30 | 5.06 | 4.27 | 4.97 | 4.17 | 3.82 | 3.89 | 3.70 | 3.85 | 3.71 | 3.70 | 291.6 |

SEGMENT MINIMUM = 2.51 AT THE 42.0 INCH STATION.

Table 11 RSRM-2A Aft Dome Insulation Performance

RSRM-2A Aft Dome

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MAX. | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 1.110 | 1.138 | 0.910 | 0.969 | 0.984 | 1.220 | 1.212 | 1.077 | 0.975 | 0.892 | 0.856 | 1.088 | 0.741 | 1.065 | 1.305 | 0.952 | 1.305 | 1.031 | 1.025 | 0.149 |
| 10.7 | 1.219 | 1.184 | 0.917 | 1.125 | 1.173 | 1.109 | 1.530 | 1.457 | 1.175 | 1.088 | 1.149 | 1.026 | 1.055 | 1.238 | 1.507 | 1.085 | 1.530 | 1.190 | 1.161 | 0.172 |
| 12.0 | 1.275 | 1.196 | 1.167 | 1.262 | 1.050 | 1.353 | 1.659 | 1.500 | 1.364 | 1.206 | 1.372 | 1.269 | 1.066 | 1.270 | 1.485 | 1.072 | 1.659 | 1.285 | 1.270 | 0.168 |
| 13.1 | 1.374 | 1.315 | 1.235 | 1.265 | 1.093 | 1.380 | 1.630 | 1.554 | 1.360 | 1.256 | 1.389 | 1.195 | 1.174 | 1.352 | 1.525 | 1.122 | 1.630 | 1.326 | 1.334 | 0.152 |
| 14.4 | 1.346 | 1.303 | 1.192 | 1.205 | 1.297 | 1.311 | 1.470 | 1.502 | 1.319 | 1.305 | 1.388 | 1.225 | 1.192 | 1.360 | 1.532 | 1.083 | 1.532 | 1.314 | 1.308 | 0.121 |
| 16.0 | 1.351 | 1.248 | 1.236 | 1.296 | 1.320 | 1.357 | 1.604 | 1.544 | 1.378 | 1.337 | 1.317 | 1.261 | 0.950 | 1.204 | 1.547 | 1.195 | 1.604 | 1.322 | 1.319 | 0.157 |
| 17.3 | 1.213 | 1.045 | 1.142 | 1.175 | 1.275 | 1.254 | 1.471 | 1.399 | 1.232 | 1.167 | 1.150 | 1.033 | 1.172 | 1.201 | 1.356 | 1.087 | 1.471 | 1.211 | 1.188 | 0.121 |
| 18.5 | 1.074 | 1.060 | 1.051 | 1.025 | 1.140 | 1.134 | 1.264 | 1.201 | 1.100 | 0.936 | 0.983 | 0.862 | 1.083 | 1.030 | 1.222 | 1.007 | 1.264 | 1.073 | 1.067 | 0.105 |
| 19.5 | 0.954 | 0.807 | 0.916 | 0.898 | 0.945 | 0.923 | 1.075 | 0.991 | 1.055 | 0.863 | 0.811 | 0.708 | 0.967 | 0.916 | 1.034 | 0.787 | 1.075 | 0.916 | 0.919 | 0.102 |
| 21.3 | 0.943 | 0.802 | 0.926 | 0.852 | 0.808 | 0.838 | 0.906 | 0.917 | 0.863 | 0.863 | 0.756 | 1.066 | 0.972 | 0.927 | 0.955 | 0.801 | 1.066 | 0.887 | 0.885 | 0.079 |
| 24.3 | 0.998 | 1.000 | 1.054 | 1.031 | 1.133 | 1.025 | 0.972 | 0.985 | 1.008 | 0.994 | 0.966 | 0.918 | 0.977 | 1.042 | 1.062 | 0.925 | 1.133 | 1.006 | 0.999 | 0.053 |
| 33.0 | 1.322 | 1.241 | 1.260 | 1.250 | 1.269 | 1.287 | 1.210 | 1.070 | 1.178 | 1.056 | 1.220 | 1.353 | 1.273 | 1.343 | 1.200 | 1.227 | 1.353 | 1.235 | 1.246 | 0.083 |
| 37.0 | 0.521 | 0.569 | 0.380 | 0.366 | 0.544 | 0.529 | 0.570 | 0.368 | 0.470 | 0.335 | 0.523 | 0.588 | 0.604 | 0.681 | 0.534 | 0.529 | 0.681 | 0.507 | 0.529 | 0.098 |
| 40.0 | 1.025 | 0.926 | 1.037 | 0.939 | 1.027 | 0.911 | 0.844 | 0.800 | 0.854 | 0.860 | 0.931 | 0.963 | 0.991 | 1.132 | 1.072 | 0.953 | 1.132 | 0.954 | 0.946 | 0.090 |
| 42.0 | 1.063 | 0.966 | 0.992 | 1.055 | 1.146 | 0.950 | 0.936 | 0.845 | 0.897 | 0.985 | 0.987 | 1.026 | 1.164 | 1.111 | 1.012 | 1.135 | 1.164 | 1.017 | 1.002 | 0.091 |
| 45.0 | 1.136 | 0.932 | 0.951 | 0.950 | 1.116 | 0.990 | 1.037 | 0.922 | 0.912 | 0.975 | 1.140 | 1.153 | 1.103 | 1.099 | 1.027 | 1.165 | 1.165 | 1.038 | 1.032 | 0.092 |
| 48.0 | 0.965 | 0.951 | 0.855 | 1.061 | 1.065 | 0.902 | 0.922 | 0.726 | 0.901 | 0.868 | 0.894 | 0.967 | 0.910 | 0.971 | 1.129 | 0.938 | 1.129 | 0.939 | 0.930 | 0.094 |
| 53.0 | 1.003 | 0.934 | 0.950 | 0.942 | 1.008 | 0.852 | 0.717 | 0.753 | 0.897 | 0.768 | 0.926 | 1.000 | 0.976 | 1.019 | 0.993 | 1.014 | 1.019 | 0.922 | 0.946 | 0.099 |

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 9.2 | 9.4 | 7.5 | 8.0 | 8.1 | 10.1 | 10.0 | 8.9 | 8.0 | 7.4 | 7.1 | 9.0 | 6.1 | 8.8 | 10.8 | 7.8 | 8.5 | 121.3 |
| 10.7 | 10.2 | 9.9 | 7.7 | 9.4 | 9.8 | 9.3 | 12.8 | 12.2 | 9.9 | 9.1 | 9.6 | 8.6 | 8.9 | 10.4 | 12.7 | 9.1 | 10.0 | 119.1 |
| 12.0 | 11.0 | 10.3 | 10.0 | 10.9 | 9.0 | 11.6 | 14.3 | 12.9 | 11.7 | 10.4 | 11.8 | 10.9 | 9.2 | 10.9 | 12.8 | 9.2 | 11.1 | 116.2 |
| 13.1 | 12.1 | 11.6 | 10.9 | 11.2 | 9.6 | 12.2 | 14.4 | 13.7 | 12.0 | 11.1 | 12.2 | 10.5 | 10.4 | 11.9 | 13.4 | 9.9 | 11.7 | 113.4 |
| 14.4 | 12.1 | 11.7 | 10.7 | 10.8 | 11.6 | 11.7 | 13.2 | 13.5 | 11.8 | 11.7 | 12.4 | 11.0 | 10.7 | 12.2 | 13.7 | 9.7 | 11.8 | 111.6 |
| 16.0 | 12.6 | 11.6 | 11.5 | 12.1 | 12.3 | 12.6 | 14.9 | 14.4 | 12.8 | 12.4 | 12.3 | 11.7 | 8.8 | 11.2 | 14.4 | 11.1 | 12.3 | 107.4 |
| 17.3 | 11.6 | 10.0 | 10.9 | 11.2 | 12.2 | 12.0 | 14.0 | 13.4 | 11.8 | 11.1 | 11.0 | 9.9 | 11.2 | 11.5 | 13.0 | 10.4 | 11.6 | 104.7 |
| 18.5 | 10.5 | 10.3 | 10.3 | 10.0 | 11.1 | 11.1 | 12.3 | 11.7 | 10.7 | 9.1 | 9.6 | 8.4 | 10.6 | 10.0 | 11.9 | 9.8 | 10.5 | 102.5 |
| 19.5 | 9.5 | 8.0 | 9.1 | 8.9 | 9.4 | 9.2 | 10.7 | 9.9 | 10.5 | 8.6 | 8.1 | 7.0 | 9.6 | 9.1 | 10.3 | 7.8 | 9.1 | 100.5 |
| 21.3 | 9.7 | 8.3 | 9.5 | 8.8 | 8.3 | 8.6 | 9.3 | 9.4 | 8.9 | 8.9 | 7.8 | 11.0 | 10.0 | 9.5 | 9.8 | 8.2 | 9.1 | 97.1 |
| 24.3 | 10.7 | 10.7 | 11.3 | 11.1 | 12.2 | 11.0 | 10.4 | 10.6 | 10.8 | 10.7 | 10.4 | 9.8 | 10.5 | 11.2 | 11.4 | 9.9 | 10.8 | 93.2 |
| 33.0 | 15.9 | 14.9 | 15.2 | 15.0 | 15.3 | 15.5 | 14.6 | 12.9 | 14.2 | 12.7 | 14.7 | 16.3 | 15.3 | 16.2 | 14.4 | 14.8 | 14.9 | 83.1 |
| 37.0 | 6.6 | 7.2 | 4.8 | 4.7 | 6.9 | 6.7 | 7.2 | 4.7 | 6.0 | 4.3 | 6.6 | 7.5 | 7.7 | 8.7 | 6.8 | 6.7 | 6.4 | 78.7 |
| 40.0 | 13.3 | 12.0 | 13.5 | 12.2 | 13.4 | 11.8 | 11.0 | 10.4 | 11.1 | 11.2 | 12.1 | 12.5 | 12.9 | 14.7 | 13.9 | 12.4 | 12.4 | 76.9 |
| 42.0 | 14.0 | 12.7 | 13.1 | 13.9 | 15.1 | 12.5 | 12.3 | 11.1 | 11.8 | 13.0 | 13.0 | 13.5 | 15.3 | 14.6 | 13.3 | 15.0 | 13.4 | 75.9 |
| 45.0 | 15.2 | 12.5 | 12.8 | 12.8 | 15.0 | 13.3 | 13.9 | 12.4 | 12.2 | 13.1 | 15.3 | 15.5 | 14.8 | 14.8 | 13.8 | 15.6 | 13.9 | 74.5 |
| 48.0 | 13.6 | 13.4 | 12.1 | 15.0 | 15.0 | 12.7 | 13.0 | 10.3 | 12.7 | 12.3 | 12.6 | 13.7 | 12.9 | 13.7 | 15.9 | 13.2 | 13.3 | 70.8 |
| 53.0 | 13.5 | 12.6 | 12.8 | 12.7 | 13.6 | 11.5 | 9.7 | 10.1 | 12.1 | 10.3 | 12.5 | 13.5 | 13.1 | 13.7 | 13.4 | 13.6 | 12.4 | 74.3 |

Table 11 (Cont'd) RSRM-2A Aft Dome Insulation Performance

RSRM-2A Aft Dome

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MIN. | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 5.141 | 5.106 | 5.077 | 5.174 | 5.084 | 5.096 | 5.086 | 5.065 | 5.134 | 5.143 | 5.040 | 5.137 | 5.122 | 5.067 | 5.141 | 5.073 | 5.040 | 5.101 | 0.037 | 4.900 |
| 10.7 | 4.840 | 4.826 | 4.718 | 4.857 | 4.785 | 4.763 | 4.791 | 4.784 | 4.761 | 4.844 | 4.763 | 4.832 | 4.821 | 4.730 | 4.841 | 4.780 | 4.718 | 4.788 | 0.043 | 4.700 |
| 12.0 | 4.666 | 4.649 | 4.555 | 4.679 | 4.655 | 4.631 | 4.629 | 4.640 | 4.622 | 4.646 | 4.613 | 4.760 | 4.642 | 4.575 | 4.684 | 4.666 | 4.555 | 4.644 | 0.046 | 4.500 |
| 13.1 | 4.529 | 4.513 | 4.431 | 4.535 | 4.547 | 4.479 | 4.486 | 4.514 | 4.327 | 4.520 | 4.501 | 4.525 | 4.484 | 4.488 | 4.572 | 4.521 | 4.327 | 4.514 | 0.056 | 4.300 |
| 14.4 | 4.356 | 4.410 | 4.295 | 4.432 | 4.463 | 4.334 | 4.280 | 4.373 | 4.411 | 4.390 | 4.443 | 4.414 | 4.386 | 4.323 | 4.422 | 4.392 | 4.280 | 4.391 | 0.053 | 4.100 |
| 16.0 | 4.273 | 4.356 | 4.222 | 4.310 | 4.331 | 4.281 | 4.331 | 4.284 | 4.335 | 4.273 | 4.283 | 4.264 | 4.209 | 4.043 | 4.340 | 4.333 | 4.043 | 4.284 | 0.076 | 3.780 |
| 17.3 | 4.162 | 4.387 | 4.122 | 4.186 | 4.216 | 4.158 | 4.169 | 4.115 | 4.201 | 4.168 | 4.163 | 4.169 | 4.093 | 4.114 | 4.187 | 4.197 | 4.093 | 4.169 | 0.066 | 3.560 |
| 18.5 | 3.992 | 4.191 | 4.004 | 4.073 | 4.043 | 4.023 | 4.056 | 3.998 | 4.050 | 4.017 | 4.024 | 4.019 | 4.002 | 3.997 | 4.093 | 4.043 | 3.992 | 4.023 | 0.050 | 3.360 |
| 19.5 | 3.818 | 3.863 | 3.822 | 3.849 | 3.875 | 4.095 | 3.853 | 3.810 | 3.894 | 3.827 | 3.852 | 3.891 | 3.787 | 3.835 | 3.851 | 3.876 | 3.787 | 3.852 | 0.069 | 3.150 |
| 21.3 | 3.610 | 3.618 | 3.636 | 3.616 | 3.610 | 3.607 | 3.582 | 3.585 | 3.662 | 3.605 | 3.609 | 3.666 | 3.596 | 3.630 | 3.637 | 3.641 | 3.582 | 3.613 | 0.024 | 2.940 |
| 24.3 | 3.448 | 3.433 | 3.488 | 3.401 | 3.414 | 3.431 | 3.348 | 3.378 | 3.495 | 3.470 | 3.430 | 3.462 | 3.399 | 3.462 | 3.474 | 3.462 | 3.348 | 3.441 | 0.041 | 2.940 |
| 33.0 | 3.618 | 3.560 | 3.528 | 3.581 | 3.501 | 3.512 | 3.546 | 3.580 | 3.560 | 3.512 | 3.508 | 3.570 | 3.489 | 3.575 | 3.581 | 3.485 | 3.485 | 3.553 | 0.040 | 3.200 |
| 37.0 | 2.945 | 2.916 | 2.866 | 2.875 | 3.010 | 2.901 | 2.984 | 2.985 | 2.886 | 2.845 | 2.952 | 2.942 | 2.902 | 3.020 | 3.026 | 3.005 | 2.845 | 2.944 | 0.059 | 2.600 |
| 40.0 | 2.811 | 2.824 | 2.883 | 2.796 | 2.920 | 2.806 | 2.745 | 2.765 | 2.840 | 2.830 | 2.798 | 2.785 | 2.764 | 2.945 | 2.906 | 2.921 | 2.745 | 2.818 | 0.063 | 2.600 |
| 42.0 | 2.850 | 2.779 | 2.795 | 2.832 | 2.970 | 2.809 | 2.810 | 2.798 | 2.765 | 2.928 | 2.789 | 2.835 | 2.925 | 2.845 | 2.823 | 2.956 | 2.765 | 2.828 | 0.065 | 2.600 |
| 45.0 | 2.907 | 2.789 | 2.743 | 2.718 | 2.918 | 2.830 | 2.886 | 2.863 | 2.848 | 2.901 | 2.954 | 2.926 | 2.865 | 2.861 | 2.862 | 2.967 | 2.718 | 2.864 | 0.069 | 2.600 |
| 48.0 | 3.212 | 3.235 | 3.175 | 3.174 | 3.206 | 3.210 | 3.086 | 3.137 | 3.132 | 3.250 | 3.125 | 3.243 | 3.078 | 3.111 | 3.407 | 3.243 | 3.078 | 3.191 | 0.082 | 2.600 |
| 53.0 | 3.811 | 3.771 | 3.796 | 3.827 | 3.824 | 3.840 | 3.798 | 3.810 | 3.826 | 3.820 | 3.863 | 3.816 | 3.801 | 3.774 | 3.828 | 3.761 | 3.761 | 3.814 | 0.027 | 3.370 |

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 4.031 | 3.968 | 4.167 | 4.205 | 4.100 | 3.876 | 3.874 | 3.988 | 4.159 | 4.251 | 4.184 | 4.049 | 4.381 | 4.002 | 3.836 | 4.121 | 3.836 | 4.075 | 0.150 |
| 10.7 | 3.621 | 3.642 | 3.801 | 3.732 | 3.612 | 3.654 | 3.261 | 3.327 | 3.586 | 3.756 | 3.614 | 3.806 | 3.766 | 3.492 | 3.334 | 3.695 | 3.261 | 3.632 | 0.171 |
| 12.0 | 3.391 | 3.453 | 3.388 | 3.417 | 3.605 | 3.278 | 2.970 | 3.140 | 3.258 | 3.440 | 3.241 | 3.491 | 3.576 | 3.305 | 3.199 | 3.594 | 2.970 | 3.390 | 0.175 |
| 13.1 | 3.155 | 3.198 | 3.196 | 3.270 | 3.454 | 3.099 | 2.856 | 2.960 | 2.967 | 3.264 | 3.112 | 3.330 | 3.310 | 3.136 | 3.047 | 3.399 | 2.856 | 3.176 | 0.165 |
| 14.4 | 3.010 | 3.107 | 3.103 | 3.227 | 3.166 | 3.023 | 2.810 | 2.871 | 3.092 | 3.085 | 3.055 | 3.189 | 3.194 | 2.963 | 2.890 | 3.309 | 2.810 | 3.089 | 0.137 |
| 16.0 | 2.922 | 3.108 | 2.986 | 3.014 | 3.011 | 2.924 | 2.727 | 2.740 | 2.957 | 2.936 | 2.966 | 3.003 | 3.259 | 2.839 | 2.793 | 3.138 | 2.727 | 2.962 | 0.141 |
| 17.3 | 2.949 | 3.342 | 2.980 | 3.011 | 2.941 | 2.904 | 2.698 | 2.716 | 2.969 | 3.001 | 3.013 | 3.136 | 2.921 | 2.913 | 2.831 | 3.110 | 2.698 | 2.959 | 0.155 |
| 18.5 | 2.918 | 3.131 | 2.953 | 3.048 | 2.903 | 2.889 | 2.792 | 2.797 | 2.950 | 3.081 | 3.041 | 3.157 | 2.919 | 2.967 | 2.871 | 3.036 | 2.792 | 2.952 | 0.109 |
| 19.5 | 2.864 | 3.056 | 2.906 | 2.951 | 2.930 | 3.172 | 2.778 | 2.819 | 2.839 | 2.964 | 3.041 | 3.183 | 2.820 | 2.919 | 2.817 | 3.089 | 2.778 | 2.924 | 0.128 |
| 21.3 | 2.667 | 2.816 | 2.710 | 2.764 | 2.802 | 2.769 | 2.676 | 2.668 | 2.799 | 2.742 | 2.853 | 2.600 | 2.624 | 2.703 | 2.682 | 2.840 | 2.600 | 2.726 | 0.077 |
| 24.3 | 2.450 | 2.433 | 2.434 | 2.370 | 2.281 | 2.406 | 2.376 | 2.393 | 2.487 | 2.476 | 2.464 | 2.544 | 2.422 | 2.420 | 2.412 | 2.537 | 2.281 | 2.428 | 0.065 |
| 33.0 | 2.296 | 2.319 | 2.268 | 2.331 | 2.232 | 2.225 | 2.336 | 2.510 | 2.382 | 2.456 | 2.288 | 2.217 | 2.216 | 2.232 | 2.381 | 2.258 | 2.216 | 2.292 | 0.087 |
| 37.0 | 2.424 | 2.347 | 2.486 | 2.509 | 2.466 | 2.372 | 2.414 | 2.617 | 2.416 | 2.510 | 2.429 | 2.354 | 2.298 | 2.339 | 2.492 | 2.476 | 2.298 | 2.427 | 0.082 |
| 40.0 | 1.786 | 1.898 | 1.846 | 1.857 | 1.893 | 1.895 | 1.901 | 1.965 | 1.986 | 1.970 | 1.867 | 1.822 | 1.773 | 1.813 | 1.834 | 1.968 | 1.773 | 1.880 | 0.067 |
| 42.0 | 1.787 | 1.813 | 1.803 | 1.777 | 1.824 | 1.859 | 1.874 | 1.953 | 1.868 | 1.943 | 1.802 | 1.809 | 1.761 | 1.734 | 1.811 | 1.821 | 1.734 | 1.812 | 0.060 |
| 45.0 | 1.771 | 1.857 | 1.792 | 1.768 | 1.802 | 1.840 | 1.849 | 1.941 | 1.936 | 1.926 | 1.814 | 1.773 | 1.762 | 1.762 | 1.835 | 1.802 | 1.762 | 1.808 | 0.062 |
| 48.0 | 2.247 | 2.284 | 2.320 | 2.113 | 2.141 | 2.308 | 2.164 | 2.411 | 2.231 | 2.382 | 2.231 | 2.276 | 2.168 | 2.140 | 2.278 | 2.305 | 2.113 | 2.262 | 0.087 |
| 53.0 | 2.808 | 2.837 | 2.846 | 2.885 | 2.816 | 2.988 | 3.081 | 3.057 | 2.929 | 3.052 | 2.937 | 2.816 | 2.825 | 2.755 | 2.835 | 2.747 | 2.747 | 2.842 | 0.107 |

Table 11 (Cont'd) RSRM-2A Aft Dome Insulation Performance

RSRM-2A Aft Cylinder

COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 3.32 | 3.48 | 4.21 | 3.59 | 3.44 | 3.89 | 4.46 | 4.18 | 3.96 | 4.36 | 3.69 | 3.47 | 3.83 | 3.22 | 3.29 | 3.08 | 3.08 | 338.4 | 2.0 |
| 68.0 | 3.25 | 3.67 | 2.73 | 3.12 | 3.66 | 3.73 | 4.04 | 4.48 | 3.49 | 3.81 | 4.58 | 3.39 | 2.84 | 3.22 | 3.23 | 4.99 | 2.73 | 46.8 | 1.5 |
| 72.0 | 3.34 | 4.63 | 3.51 | 3.45 | 3.41 | 3.62 | 3.90 | 3.43 | 3.33 | 3.51 | 4.12 | 3.59 | 3.33 | 3.57 | 3.38 | 3.83 | 3.33 | 180.0 | 1.5 |
| 75.0 | 3.80 | 6.95 | 3.31 | 3.92 | 3.90 | 3.58 | 5.11 | 4.28 | 3.53 | 3.94 | 4.76 | 3.65 | 3.07 | 3.62 | 3.52 | 5.03 | 3.07 | 270.0 | 1.5 |
| 78.0 | 3.95 | 5.46 | 2.87 | 4.16 | 4.04 | 4.64 | 3.93 | 4.62 | 3.41 | 4.42 | 5.06 | 3.96 | 3.70 | 3.95 | 4.00 | 5.50 | 2.87 | 46.8 | 1.5 |
| 81.0 | 3.38 | 6.90 | 3.66 | 3.78 | 3.99 | 3.86 | 4.40 | 3.46 | 3.62 | 3.95 | 3.85 | 3.49 | 3.65 | 3.60 | 3.37 | 3.58 | 3.37 | 316.8 | 1.5 |
| 85.0 | 2.99 | 3.80 | 3.36 | 3.36 | 3.31 | 3.45 | 3.82 | 3.32 | 3.07 | 3.19 | 3.02 | 3.04 | 3.02 | 3.10 | 3.19 | 3.90 | 2.99 | 0.0 | 1.5 |
| 90.0 | 2.98 | 3.60 | 3.06 | 2.99 | 3.05 | 3.00 | 2.96 | 3.03 | 4.09 | 3.15 | 3.42 | 2.88 | 3.52 | 3.10 | 3.11 | 3.94 | 2.88 | 248.4 | 1.5 |
| 98.0 | 2.34 | 2.73 | 2.75 | 2.66 | 2.23 | 2.71 | 2.88 | 2.69 | 2.59 | 3.46 | 2.57 | 2.49 | 2.47 | 2.62 | 2.49 | 2.86 | 2.23 | 90.0 | 1.5 |
| 105.8 | 1.32< | | 2.84 | | 2.73 | | 1.75 | | 2.62 | | 2.83 | | 2.49 | | 2.72 | | 1.32 | 0.0 | 1.5 |
| 116.0 | 2.44 | | 3.04 | | 2.55 | | 3.56 | | 2.76 | | 2.77 | | 2.60 | | 3.01 | | 2.44 | 0.0 | 1.5 |
| 124.5 | 2.49 | | 2.36 | | 2.64 | | 2.44 | | 2.70 | | 2.60 | | 2.48 | | 2.57 | | 2.36 | 46.8 | 1.5 |
| 133.0 | 2.88 | | 2.83 | | 2.93 | | 2.74 | | 2.57 | | 2.87 | | 2.61 | | 2.63 | | 2.57 | 180.0 | 1.5 |
| 145.5 | 2.46 | | 2.31 | | 2.23 | | 2.41 | | 2.61 | | 2.54 | | 2.35 | | 2.38 | | 2.23 | 90.0 | 1.5 |
| 158.5 | 2.76 | | 2.55 | | 2.75 | | 2.72 | | 2.24 | | 2.72 | | 2.91 | | 2.34 | | 2.24 | 180.0 | 1.5 |
| 168.3 | 3.21 | | 3.68 | | 3.43 | | 2.56 | | 2.54 | | 2.41 | | 2.94 | | 2.91 | | 2.41 | 226.8 | 1.5 |
| 177.7 | 4.52 | | 3.01 | | 3.46 | | 2.57 | | 2.88 | | 2.65 | | 2.58 | | 2.91 | | 2.57 | 136.8 | 2.0 |
| 192.5 | 2.44 | | 2.60 | | 2.80 | | 2.99 | | 2.75 | | 2.52 | | 2.90 | | 2.34 | | 2.34 | 316.8 | 1.5 |
| 202.5 | 2.57 | | 2.58 | | 3.24 | | 2.94 | | 3.05 | | 2.93 | | 2.82 | | 2.35 | | 2.35 | 316.8 | 1.5 |
| 214.0 | 2.41 | | 2.46 | | 2.57 | | 2.80 | | 1.86 | | 2.95 | | 2.73 | | 2.57 | | 1.86 | 180.0 | 1.5 |
| 227.3 | 2.38 | | 2.50 | | 2.88 | | 2.41 | | 1.90 | | 2.30 | | 2.56 | | 2.34 | | 1.90 | 180.0 | 1.5 |
| 238.3 | 2.72 | | 2.74 | | 3.18 | | 3.00 | | 2.99 | | 3.17 | | 3.07 | | 2.70 | | 2.70 | 316.8 | 1.5 |
| 250.0 | 2.62 | | 2.36 | | 2.82 | | 2.74 | | 2.94 | | 4.04 | | 3.16 | | 2.51 | | 2.36 | 46.8 | 1.5 |
| 267.0 | 2.79 | | 2.48 | | 2.60 | | 3.05 | | 2.73 | | 2.76 | | 3.57 | | 2.72 | | 2.48 | 46.8 | 1.5 |
| 283.9 | 2.69 | | 2.34 | | 1.53 | | 2.60 | | 2.80 | | 2.69 | | 3.10 | | 2.80 | | 1.53 | 90.0 | 1.5 |
| 299.1 | 5.12 | | 3.00 | | 4.33 | | 5.28 | | 3.89 | | 4.42 | | 4.45 | | 3.30 | | 3.00 | 46.8 | 2.0 |
| 322.0 | 3.62 | | 3.06 | | 3.52 | | 3.02 | | 3.17 | | 2.99 | | 3.17 | | 5.51 | | 2.99 | 226.8 | 1.5 |
| 339.0 | 3.88 | | 3.92 | | 4.04 | | 4.32 | | 4.69 | | 3.45 | | 4.27 | | 4.27 | | 3.45 | 226.8 | 1.5 |
| 344.0 | 3.76 | | 8.09 | | 5.85 | | 7.60 | | 10.00 | | 8.44 | | 7.76 | | 7.17 | | 3.76 | 0.0 | 1.5 |
| 358.0 | 11.52 | | 5.21 | | 11.87 | | 7.92 | | 4.94 | | 6.79 | | 12.26 | | 5.14 | | 4.94 | 180.0 | 1.5 |
| 363.0 | 3.28 | | 4.94 | | 4.58 | | 5.94 | | 5.00 | | 3.17 | | 5.76 | | 5.21 | | 3.17 | 226.8 | 1.5 |
| 367.0 | 4.52 | | 13.57 | | 5.00 | | 9.05 | | 4.94 | | 4.94 | | 5.67 | | 4.47 | | 4.47 | 316.8 | 1.5 |
| 372.0 | 5.19 | | 4.40 | | 6.67 | | 5.06 | | 5.19 | | 5.00 | | 33.33 | | 3.77 | | 3.77 | 316.8 | 1.5 |
| 375.0 | 6.40 | | 5.71 | | 6.32 | | 5.45 | | 6.96 | | 10.67 | | 21.82 | | 4.85 | | 4.85 | 316.8 | 1.5 |
| 377.5 | 3.73 | | 11.78 | | 6.79 | | 3.53 | | 5.41 | | 6.97 | | 8.55 | | 7.26 | | 3.53 | 136.8 | 1.5 |

SEGMENT MINIMUM = 1.32 AT THE 105.8 INCH STATION.

A " < " INDICATES THE PRECEDING SAFETY FACTOR HAS VIOLATED THE MINIMUM SAFETY FACTOR REQUIREMENT.

Table 12 RSRM-2A Aft Cylinder Insulation Performance

RSRM-2A Aft Cylinder

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 4.08 | 4.22 | 5.11 | 4.39 | 4.20 | 4.75 | 5.41 | 5.10 | 4.73 | 5.31 | 4.49 | 4.23 | 4.65 | 3.97 | 4.09 | 3.74 | 3.74 | 338.4 |
| 68.0 | 3.90 | 4.35 | 3.56 | 3.87 | 4.45 | 4.76 | 5.09 | 5.52 | 4.25 | 4.58 | 5.61 | 4.13 | 3.68 | 4.02 | 4.03 | 5.83 | 3.56 | 46.8 |
| 72.0 | 3.75 | 4.99 | 4.00 | 3.98 | 3.90 | 4.18 | 4.55 | 3.95 | 3.80 | 4.07 | 4.83 | 4.03 | 3.74 | 4.08 | 3.88 | 4.27 | 3.74 | 270.0 |
| 75.0 | 4.06 | 7.22 | 3.81 | 4.15 | 4.31 | 4.03 | 5.60 | 4.57 | 3.91 | 4.28 | 5.21 | 4.01 | 3.38 | 4.03 | 3.95 | 5.32 | 3.38 | 270.0 |
| 78.0 | 4.05 | 5.51 | 3.29 | 4.20 | 4.22 | 4.90 | 4.47 | 4.72 | 3.70 | 4.58 | 5.33 | 4.13 | 3.84 | 4.13 | 4.19 | 5.56 | 3.29 | 46.8 |
| 81.0 | 3.62 | 7.34 | 3.97 | 4.04 | 4.30 | 4.15 | 4.77 | 3.75 | 3.86 | 4.21 | 4.15 | 3.79 | 3.95 | 3.90 | 3.80 | 4.08 | 3.62 | 0.0 |
| 85.0 | 3.57 | 4.39 | 3.96 | 3.99 | 4.04 | 4.18 | 4.70 | 4.04 | 3.83 | 3.82 | 3.67 | 3.69 | 3.59 | 3.73 | 3.79 | 4.61 | 3.57 | 0.0 |
| 90.0 | 3.36 | 4.04 | 3.52 | 3.49 | 3.60 | 3.50 | 3.44 | 3.46 | 4.65 | 3.52 | 3.77 | 3.30 | 4.06 | 3.51 | 3.45 | 4.39 | 3.30 | 248.4 |
| 98.0 | 3.13 | 3.55 | 3.61 | 3.40 | 3.03 | 3.56 | 3.76 | 3.45 | 3.38 | 4.41 | 3.40 | 3.34 | 3.26 | 3.35 | 3.31 | 3.79 | 3.03 | 90.0 |
| 105.8 | 1.86 | | 3.05 | | 2.89 | | 2.41 | | 2.77 | | 2.96 | | 2.61 | | 2.90 | | 1.86 | 0.0 |
| 116.0 | 2.67 | | 3.26 | | 2.74 | | 3.86 | | 2.95 | | 2.92 | | 2.71 | | 3.19 | | 2.67 | 0.0 |
| 124.5 | 2.63 | | 2.50 | | 2.76 | | 2.66 | | 2.87 | | 2.76 | | 2.59 | | 2.71 | | 2.50 | 46.8 |
| 133.0 | 3.29 | | 3.24 | | 3.49 | | 3.22 | | 3.05 | | 3.27 | | 3.04 | | 3.02 | | 3.02 | 316.8 |
| 145.5 | 2.50 | | 2.32 | | 2.38 | | 2.41 | | 2.61 | | 2.54 | | 2.35 | | 2.43 | | 2.32 | 46.8 |
| 158.5 | 2.77 | | 2.61 | | 2.85 | | 2.78 | | 2.49 | | 2.79 | | 3.06 | | 2.53 | | 2.49 | 180.0 |
| 168.3 | 3.92 | | 4.39 | | 4.24 | | 3.35 | | 3.10 | | 2.89 | | 3.51 | | 3.48 | | 2.89 | 226.8 |
| 177.7 | 6.92 | | 4.49 | | 5.14 | | 4.14 | | 4.27 | | 3.98 | | 3.87 | | 4.30 | | 3.87 | 270.0 |
| 192.5 | 2.88 | | 3.07 | | 3.32 | | 3.43 | | 3.19 | | 2.88 | | 3.31 | | 2.84 | | 2.84 | 316.8 |
| 202.5 | 2.61 | | 2.62 | | 3.29 | | 2.95 | | 3.07 | | 2.94 | | 2.82 | | 2.44 | | 2.44 | 316.8 |
| 214.0 | 2.48 | | 2.54 | | 2.70 | | 2.86 | | 2.27 | | 3.00 | | 2.82 | | 2.65 | | 2.27 | 180.0 |
| 227.3 | 2.67 | | 2.85 | | 3.27 | | 2.88 | | 2.45 | | 2.77 | | 3.03 | | 2.66 | | 2.45 | 180.0 |
| 238.3 | 2.75 | | 2.77 | | 3.24 | | 3.04 | | 3.00 | | 3.54 | | 3.09 | | 2.78 | | 2.75 | 0.0 |
| 250.0 | 2.64 | | 2.47 | | 2.96 | | 2.78 | | 2.98 | | 4.38 | | 3.22 | | 2.61 | | 2.47 | 46.8 |
| 267.0 | 2.87 | | 2.59 | | 2.87 | | 3.15 | | 2.87 | | 2.94 | | 3.83 | | 2.83 | | 2.59 | 46.8 |
| 283.9 | 2.93 | | 2.65 | | 2.18 | | 2.90 | | 3.09 | | 2.95 | | 3.36 | | 3.17 | | 2.18 | 90.0 |
| 299.1 | 7.80 | | 4.82 | | 6.90 | | 7.87 | | 5.94 | | 6.76 | | 6.91 | | 5.24 | | 4.82 | 46.8 |
| 322.0 | 4.02 | | 3.41 | | 3.93 | | 3.41 | | 3.48 | | 3.31 | | 3.49 | | 5.55 | | 3.31 | 226.8 |
| 339.0 | 4.26 | | 4.30 | | 4.48 | | 4.81 | | 4.94 | | 3.81 | | 4.57 | | 4.67 | | 3.81 | 226.8 |
| 344.0 | 4.30 | | 9.09 | | 6.62 | | 8.72 | | 11.18 | | 9.42 | | 8.78 | | 8.11 | | 4.30 | 0.0 |
| 358.0 | 13.00 | | 5.90 | | 13.25 | | 8.73 | | 5.58 | | 7.66 | | 13.90 | | 5.89 | | 5.58 | 180.0 |
| 363.0 | 3.96 | | 5.65 | | 5.29 | | 6.80 | | 5.64 | | 4.27 | | 6.83 | | 6.04 | | 3.96 | 0.0 |
| 367.0 | 5.62 | | 16.07 | | 6.24 | | 10.90 | | 6.23 | | 6.18 | | 6.97 | | 5.53 | | 5.53 | 316.8 |
| 372.0 | 5.84 | | 5.01 | | 7.60 | | 5.68 | | 5.65 | | 5.70 | | 37.17 | | 4.25 | | 4.25 | 316.8 |
| 375.0 | 7.07 | | 6.49 | | 7.17 | | 6.05 | | 7.58 | | 12.64 | | 24.68 | | 5.56 | | 5.56 | 316.8 |
| 377.5 | 4.86 | | 14.87 | | 8.62 | | 4.51 | | 6.53 | | 8.26 | | 10.60 | | 9.11 | | 4.51 | 136.8 |

SEGMENT MINIMUM = 1.86 AT THE 105.8 INCH STATION.

Table 12 (Cont'd) RSRM-2A Aft Cylinder Insulation Performance

RSRM-2A Aft Cylinder

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MAX. | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 0.841 | 0.801 | 0.663 | 0.777 | 0.810 | 0.717 | 0.625 | 0.667 | 0.704 | 0.640 | 0.757 | 0.805 | 0.729 | 0.866 | 0.848 | 0.906 | 0.906 | 0.760 | 0.767 | 0.086 |
| 68.0 | 0.677 | 0.600 | 0.806 | 0.705 | 0.601 | 0.590 | 0.544 | 0.491 | 0.631 | 0.578 | 0.480 | 0.649 | 0.774 | 0.683 | 0.681 | 0.441 | 0.806 | 0.621 | 0.616 | 0.102 |
| 72.0 | 0.599 | 0.432 | 0.570 | 0.580 | 0.587 | 0.553 | 0.513 | 0.583 | 0.601 | 0.570 | 0.486 | 0.557 | 0.601 | 0.560 | 0.591 | 0.522 | 0.601 | 0.557 | 0.570 | 0.047 |
| 75.0 | 0.474 | 0.259 | 0.543 | 0.459 | 0.461 | 0.503 | 0.352 | 0.421 | 0.510 | 0.457 | 0.378 | 0.493 | 0.586 | 0.497 | 0.511 | 0.358 | 0.586 | 0.454 | 0.468 | 0.083 |
| 78.0 | 0.405 | 0.293 | 0.558 | 0.385 | 0.396 | 0.345 | 0.407 | 0.346 | 0.469 | 0.362 | 0.316 | 0.404 | 0.432 | 0.405 | 0.400 | 0.291 | 0.558 | 0.388 | 0.398 | 0.067 |
| 81.0 | 0.414 | 0.203 | 0.382 | 0.370 | 0.351 | 0.363 | 0.318 | 0.405 | 0.387 | 0.354 | 0.364 | 0.401 | 0.384 | 0.389 | 0.416 | 0.391 | 0.416 | 0.368 | 0.383 | 0.051 |
| 85.0 | 0.435 | 0.342 | 0.387 | 0.387 | 0.393 | 0.377 | 0.340 | 0.392 | 0.424 | 0.408 | 0.431 | 0.427 | 0.431 | 0.420 | 0.408 | 0.333 | 0.435 | 0.396 | 0.400 | 0.034 |
| 90.0 | 0.425 | 0.351 | 0.413 | 0.423 | 0.415 | 0.422 | 0.428 | 0.417 | 0.309 | 0.402 | 0.370 | 0.439 | 0.359 | 0.408 | 0.407 | 0.321 | 0.439 | 0.394 | 0.410 | 0.040 |
| 98.0 | 0.486 | 0.416 | 0.412 | 0.426 | 0.510 | 0.419 | 0.394 | 0.422 | 0.438 | 0.328 | 0.442 | 0.455 | 0.460 | 0.434 | 0.455 | 0.397 | 0.510 | 0.431 | 0.430 | 0.041 |
| 105.8 | 0.817< | | 0.380 | | 0.396 | | 0.616< | | 0.412 | | 0.381 | | 0.434 | | 0.397 | | 0.817 | 0.479 | 0.405 | 0.157 |
| 116.0 | 0.430 | | 0.345 | | 0.411 | | 0.295 | | 0.380 | | 0.379 | | 0.404 | | 0.349 | | 0.430 | 0.374 | 0.380 | 0.043 |
| 124.5 | 0.413 | | 0.436 | | 0.390 | | 0.422 | | 0.382 | | 0.396 | | 0.416 | | 0.400 | | 0.436 | 0.407 | 0.407 | 0.018 |
| 133.0 | 0.340 | | 0.346 | | 0.334 | | 0.358 | | 0.381 | | 0.341 | | 0.376 | | 0.372 | | 0.381 | 0.356 | 0.352 | 0.018 |
| 145.5 | 0.378 | | 0.403 | | 0.417 | | 0.386 | | 0.357 | | 0.366 | | 0.396 | | 0.391 | | 0.417 | 0.387 | 0.389 | 0.020 |
| 158.5 | 0.319 | | 0.345 | | 0.320 | | 0.323 | | 0.393 | | 0.323 | | 0.302 | | 0.376 | | 0.393 | 0.338 | 0.323 | 0.032 |
| 168.3 | 0.265 | | 0.231 | | 0.248 | | 0.332 | | 0.334 | | 0.352 | | 0.289 | | 0.292 | | 0.352 | 0.293 | 0.291 | 0.044 |
| 177.7 | 0.221 | | 0.332 | | 0.289 | | 0.389 | | 0.347 | | 0.378 | | 0.387 | | 0.344 | | 0.389 | 0.336 | 0.346 | 0.057 |
| 192.5 | 0.320 | | 0.300 | | 0.279 | | 0.261 | | 0.284 | | 0.310 | | 0.269 | | 0.333 | | 0.333 | 0.294 | 0.292 | 0.025 |
| 202.5 | 0.284 | | 0.283 | | 0.225 | | 0.248 | | 0.239 | | 0.249 | | 0.259 | | 0.310 | | 0.310 | 0.262 | 0.254 | 0.028 |
| 214.0 | 0.290 | | 0.285 | | 0.272 | | 0.250 | | 0.377< | | 0.237 | | 0.256 | | 0.272 | | 0.377 | 0.280 | 0.272 | 0.043 |
| 227.3 | 0.273 | | 0.260 | | 0.226 | | 0.270 | | 0.343< | | 0.282 | | 0.254 | | 0.278 | | 0.343 | 0.273 | 0.272 | 0.033 |
| 238.3 | 0.232 | | 0.230 | | 0.198 | | 0.210 | | 0.211 | | 0.199 | | 0.205 | | 0.233 | | 0.233 | 0.215 | 0.211 | 0.015 |
| 250.0 | 0.210 | | 0.233 | | 0.195 | | 0.201 | | 0.187 | | 0.136 | | 0.174 | | 0.219 | | 0.233 | 0.194 | 0.198 | 0.030 |
| 267.0 | 0.179 | | 0.202 | | 0.192 | | 0.164 | | 0.183 | | 0.181 | | 0.140 | | 0.184 | | 0.202 | 0.178 | 0.182 | 0.019 |
| 283.9 | 0.167 | | 0.192 | | 0.294< | | 0.173 | | 0.161 | | 0.167 | | 0.145 | | 0.161 | | 0.294 | 0.183 | 0.167 | 0.047 |
| 299.1 | 0.132 | | 0.225 | | 0.156 | | 0.128 | | 0.174 | | 0.153 | | 0.152 | | 0.205 | | 0.225 | 0.166 | 0.155 | 0.034 |
| 322.0 | 0.105 | | 0.124 | | 0.108 | | 0.126 | | 0.120 | | 0.127 | | 0.120 | | 0.069 | | 0.127 | 0.112 | 0.120 | 0.019 |
| 339.0 | 0.098 | | 0.097 | | 0.094 | | 0.088 | | 0.081 | | 0.110 | | 0.089 | | 0.089 | | 0.110 | 0.093 | 0.091 | 0.009 |
| 344.0 | 0.101 | | 0.047 | | 0.065 | | 0.050 | | 0.038 | | 0.045 | | 0.049 | | 0.053 | | 0.101 | 0.056 | 0.049 | 0.020 |
| 358.0 | 0.033 | | 0.073 | | 0.032 | | 0.048 | | 0.077 | | 0.056 | | 0.031 | | 0.074 | | 0.077 | 0.053 | 0.052 | 0.020 |
| 363.0 | 0.116 | | 0.077 | | 0.083 | | 0.064 | | 0.076 | | 0.120 | | 0.066 | | 0.073 | | 0.120 | 0.084 | 0.076 | 0.022 |
| 367.0 | 0.084 | | 0.028 | | 0.076 | | 0.042 | | 0.077 | | 0.077 | | 0.067 | | 0.085 | | 0.085 | 0.067 | 0.076 | 0.021 |
| 372.0 | 0.077 | | 0.091 | | 0.060 | | 0.079 | | 0.077 | | 0.080 | | 0.012 | | 0.106 | | 0.106 | 0.073 | 0.078 | 0.028 |
| 375.0 | 0.075 | | 0.084 | | 0.076 | | 0.088 | | 0.069 | | 0.045 | | 0.022 | | 0.099 | | 0.099 | 0.070 | 0.076 | 0.025 |
| 377.5 | 0.142 | | 0.045 | | 0.078 | | 0.150 | | 0.098 | | 0.076 | | 0.062 | | 0.073 | | 0.150 | 0.091 | 0.077 | 0.037 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

Table 12 (Cont'd) RSRM-2A Aft Cylinder Insulation Performance

RSRM-2A Aft Cylinder

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 11.4 | 10.8 | 9.0 | 10.5 | 11.0 | 9.7 | 8.5 | 9.0 | 9.5 | 8.7 | 10.2 | 10.9 | 9.9 | 11.7 | 11.5 | 12.3 | 10.3 | 73.9 |
| 68.0 | 10.8 | 9.6 | 12.9 | 11.3 | 9.6 | 9.4 | 8.7 | 7.8 | 10.1 | 9.2 | 7.7 | 10.4 | 12.4 | 10.9 | 10.9 | 7.0 | 9.9 | 62.6 |
| 72.0 | 10.7 | 7.7 | 10.2 | 10.3 | 10.5 | 9.9 | 9.1 | 10.4 | 10.7 | 10.2 | 8.7 | 9.9 | 10.7 | 10.0 | 10.5 | 9.3 | 9.9 | 56.1 |
| 75.0 | 9.4 | 5.1 | 10.8 | 9.1 | 9.2 | 10.0 | 7.0 | 8.4 | 10.1 | 9.1 | 7.5 | 9.8 | 11.7 | 9.9 | 10.2 | 7.1 | 9.0 | 50.3 |
| 78.0 | 8.8 | 6.3 | 12.1 | 8.3 | 8.6 | 7.5 | 8.8 | 7.5 | 10.2 | 7.8 | 6.8 | 8.7 | 9.4 | 8.8 | 8.7 | 6.3 | 8.4 | 46.2 |
| 81.0 | 9.1 | 4.5 | 8.4 | 8.1 | 7.7 | 8.0 | 7.0 | 8.9 | 8.5 | 7.8 | 8.0 | 8.8 | 8.5 | 8.6 | 9.2 | 8.6 | 8.1 | 45.4 |
| 85.0 | 9.7 | 7.6 | 8.6 | 8.6 | 8.8 | 8.4 | 7.6 | 8.8 | 9.5 | 9.1 | 9.6 | 9.5 | 9.6 | 9.4 | 9.1 | 7.4 | 8.8 | 44.8 |
| 90.0 | 9.6 | 7.9 | 9.3 | 9.6 | 9.4 | 9.5 | 9.7 | 9.4 | 7.0 | 9.1 | 8.4 | 9.9 | 8.1 | 9.2 | 9.2 | 7.3 | 8.9 | 44.2 |
| 98.0 | 11.3 | 9.6 | 9.5 | 9.9 | 11.8 | 9.7 | 9.1 | 9.8 | 10.1 | 7.6 | 10.2 | 10.5 | 10.6 | 10.0 | 10.5 | 9.2 | 10.0 | 43.2 |
| 105.8 | 19.3 | | 9.0 | | 9.3 | | 14.5 | | 9.7 | | 9.0 | | 10.2 | | 9.4 | | 11.3 | 42.4 |
| 116.0 | 10.3 | | 8.3 | | 9.9 | | 7.1 | | 9.1 | | 9.1 | | 9.7 | | 8.4 | | 9.0 | 41.6 |
| 124.5 | 10.2 | | 10.7 | | 9.6 | | 10.4 | | 9.4 | | 9.8 | | 10.2 | | 9.9 | | 10.0 | 40.6 |
| 133.0 | 8.6 | | 8.8 | | 8.5 | | 9.1 | | 9.7 | | 8.7 | | 9.5 | | 9.4 | | 9.0 | 39.4 |
| 145.5 | 10.1 | | 10.7 | | 11.1 | | 10.3 | | 9.5 | | 9.8 | | 10.6 | | 10.4 | | 10.3 | 37.5 |
| 158.5 | 8.9 | | 9.6 | | 8.9 | | 9.0 | | 10.9 | | 9.0 | | 8.4 | | 10.5 | | 9.4 | 35.9 |
| 168.3 | 7.7 | | 6.7 | | 7.2 | | 9.6 | | 9.7 | | 10.2 | | 8.4 | | 8.5 | | 8.5 | 34.5 |
| 177.7 | 6.5 | | 9.7 | | 8.5 | | 11.4 | | 10.2 | | 11.1 | | 11.3 | | 10.1 | | 9.8 | 34.1 |
| 192.5 | 10.4 | | 9.7 | | 9.0 | | 8.4 | | 9.2 | | 10.0 | | 8.7 | | 10.8 | | 9.5 | 30.9 |
| 202.5 | 9.6 | | 9.6 | | 7.6 | | 8.4 | | 8.1 | | 8.4 | | 8.8 | | 10.5 | | 8.9 | 29.5 |
| 214.0 | 10.4 | | 10.3 | | 9.8 | | 9.0 | | 13.6 | | 8.5 | | 9.2 | | 9.8 | | 10.1 | 27.8 |
| 227.3 | 10.6 | | 10.1 | | 8.8 | | 10.5 | | 13.3 | | 10.9 | | 9.8 | | 10.8 | | 10.6 | 25.8 |
| 238.3 | 9.6 | | 9.5 | | 8.2 | | 8.7 | | 8.7 | | 8.2 | | 8.5 | | 9.6 | | 8.9 | 24.2 |
| 250.0 | 9.5 | | 10.5 | | 8.8 | | 9.1 | | 8.4 | | 6.1 | | 7.8 | | 9.9 | | 8.8 | 22.2 |
| 267.0 | 9.1 | | 10.3 | | 9.8 | | 8.4 | | 9.3 | | 9.2 | | 7.1 | | 9.4 | | 9.1 | 19.6 |
| 283.9 | 9.9 | | 11.4 | | 17.5 | | 10.3 | | 9.6 | | 9.9 | | 8.6 | | 9.6 | | 10.9 | 16.8 |
| 299.1 | 7.6 | | 12.9 | | 9.0 | | 7.4 | | 10.0 | | 8.8 | | 8.7 | | 11.8 | | 9.5 | 17.4 |
| 322.0 | 8.3 | | 9.8 | | 8.5 | | 9.9 | | 9.4 | | 10.0 | | 9.4 | | 5.4 | | 8.8 | 12.7 |
| 339.0 | 8.1 | | 8.0 | | 7.8 | | 7.3 | | 6.7 | | 9.1 | | 7.4 | | 7.4 | | 7.7 | 12.1 |
| 344.0 | 8.3 | | 3.9 | | 5.4 | | 4.1 | | 3.1 | | 3.7 | | 4.0 | | 4.4 | | 4.6 | 12.1 |
| 358.0 | 2.9 | | 6.5 | | 2.8 | | 4.2 | | 6.8 | | 5.0 | | 2.7 | | 6.5 | | 4.7 | 11.3 |
| 363.0 | 10.3 | | 6.8 | | 7.3 | | 5.7 | | 6.7 | | 10.6 | | 5.8 | | 6.5 | | 7.5 | 11.3 |
| 367.0 | 7.7 | | 2.6 | | 7.0 | | 3.9 | | 7.1 | | 7.1 | | 6.1 | | 7.8 | | 6.1 | 10.9 |
| 372.0 | 4.9 | | 5.8 | | 3.8 | | 5.0 | | 4.9 | | 5.1 | | 0.8 | | 6.8 | | 4.6 | 15.7 |
| 375.0 | 3.9 | | 4.4 | | 4.0 | | 4.6 | | 3.6 | | 2.4 | | 1.2 | | 5.2 | | 3.7 | 19.0 |
| 377.5 | 7.0 | | 2.2 | | 3.9 | | 7.4 | | 4.9 | | 3.8 | | 3.1 | | 3.6 | | 4.5 | 20.2 |

Table 12 (Cont'd) RSRM-2A Aft Cylinder Insulation Performance

RSRM-2A Aft Cylinder

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MIN. | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 3.429 | 3.381 | 3.390 | 3.410 | 3.406 | 3.409 | 3.380 | 3.403 | 3.330 | 3.397 | 3.400 | 3.402 | 3.392 | 3.438 | 3.466 | 3.390 | 3.330 | 3.401 | 0.029 | 2.790 |
| 68.0 | 2.639 | 2.608 | 2.867 | 2.730 | 2.675 | 2.810 | 2.769 | 2.708 | 2.683 | 2.645 | 2.694 | 2.678 | 2.848 | 2.749 | 2.744 | 2.569 | 2.569 | 2.701 | 0.083 | 2.200 |
| 72.0 | 2.247 | 2.156 | 2.278 | 2.306 | 2.288 | 2.309 | 2.332 | 2.303 | 2.282 | 2.320 | 2.346 | 2.244 | 2.245 | 2.285 | 2.291 | 2.231 | 2.156 | 2.287 | 0.046 | 2.000 |
| 75.0 | 1.924 | 1.870 | 2.068 | 1.907 | 1.987 | 2.028 | 1.971 | 1.925 | 1.992 | 1.957 | 1.969 | 1.977 | 1.980 | 2.003 | 2.020 | 1.906 | 1.870 | 1.974 | 0.051 | 1.800 |
| 78.0 | 1.640 | 1.615 | 1.835 | 1.616 | 1.670 | 1.689 | 1.821 | 1.633 | 1.733 | 1.657 | 1.684 | 1.668 | 1.657 | 1.671 | 1.677 | 1.618 | 1.615 | 1.669 | 0.065 | 1.600 |
| 81.0 | 1.499 | 1.491 | 1.517 | 1.493 | 1.508 | 1.507 | 1.517 | 1.519 | 1.495 | 1.492 | 1.510 | 1.518 | 1.516 | 1.518 | 1.580 | 1.596 | 1.491 | 1.513 | 0.030 | 1.400 |
| 85.0 | 1.551 | 1.502 | 1.532 | 1.546 | 1.588 | 1.574 | 1.598 | 1.584 | 1.622 | 1.557 | 1.581 | 1.574 | 1.547 | 1.567 | 1.547 | 1.536 | 1.502 | 1.562 | 0.029 | 1.300 |
| 90.0 | 1.430 | 1.418 | 1.455 | 1.475 | 1.492 | 1.479 | 1.474 | 1.444 | 1.437 | 1.415 | 1.395 | 1.450 | 1.459 | 1.433 | 1.406 | 1.410 | 1.395 | 1.441 | 0.029 | 1.265 |
| 98.0 | 1.523 | 1.476 | 1.488 | 1.449 | 1.546 | 1.490 | 1.480 | 1.457 | 1.479 | 1.448 | 1.502 | 1.520 | 1.498 | 1.453 | 1.505 | 1.506 | 1.448 | 1.489 | 0.028 | 1.135 |
| 105.8 | 1.518 | | 1.158 | | 1.143 | | 1.482 | | 1.141 | | 1.128 | | 1.132 | | 1.151 | | 1.128 | 1.147 | 0.166 | 1.080 |
| 116.0 | 1.149 | | 1.126 | | 1.128 | | 1.139 | | 1.120 | | 1.108 | | 1.095 | | 1.114 | | 1.095 | 1.123 | 0.017 | 1.050 |
| 124.5 | 1.088 | | 1.092 | | 1.076 | | 1.122 | | 1.095 | | 1.093 | | 1.076 | | 1.083 | | 1.076 | 1.090 | 0.015 | 1.030 |
| 133.0 | 1.120 | | 1.120 | | 1.166 | | 1.154 | | 1.162 | | 1.116 | | 1.143 | | 1.125 | | 1.116 | 1.134 | 0.020 | 0.980 |
| 145.5 | 0.944 | | 0.935 | | 0.994 | | 0.931 | | 0.931 | | 0.931 | | 0.931 | | 0.950 | | 0.931 | 0.933 | 0.022 | 0.930 |
| 158.5 | 0.885 | | 0.900 | | 0.911 | | 0.898 | | 0.979 | | 0.900 | | 0.924 | | 0.951 | | 0.885 | 0.905 | 0.032 | 0.880 |
| 168.3 | 1.040 | | 1.013 | | 1.052 | | 1.113 | | 1.034 | | 1.019 | | 1.013 | | 1.015 | | 1.013 | 1.027 | 0.034 | 0.850 |
| 177.7 | 1.529 | | 1.491 | | 1.485 | | 1.610 | | 1.483 | | 1.504 | | 1.498 | | 1.480 | | 1.480 | 1.495 | 0.043 | 1.000 |
| 192.5 | 0.921 | | 0.922 | | 0.925 | | 0.895 | | 0.906 | | 0.894 | | 0.891 | | 0.945 | | 0.891 | 0.914 | 0.019 | 0.780 |
| 202.5 | 0.740 | | 0.742 | | 0.741 | | 0.732 | | 0.734 | | 0.732 | | 0.731 | | 0.757 | | 0.731 | 0.737 | 0.009 | 0.730 |
| 214.0 | 0.718 | | 0.725 | | 0.735 | | 0.715 | | 0.854 | | 0.712 | | 0.721 | | 0.720 | | 0.712 | 0.721 | 0.048 | 0.700 |
| 227.3 | 0.730 | | 0.742 | | 0.738 | | 0.777 | | 0.839 | | 0.782 | | 0.769 | | 0.740 | | 0.730 | 0.756 | 0.036 | 0.650 |
| 238.3 | 0.638 | | 0.638 | | 0.641 | | 0.638 | | 0.632 | | 0.704 | | 0.633 | | 0.647 | | 0.632 | 0.638 | 0.024 | 0.630 |
| 250.0 | 0.555 | | 0.575 | | 0.578 | | 0.558 | | 0.558 | | 0.595 | | 0.561 | | 0.571 | | 0.555 | 0.566 | 0.014 | 0.550 |
| 267.0 | 0.514 | | 0.523 | | 0.551 | | 0.517 | | 0.526 | | 0.532 | | 0.536 | | 0.520 | | 0.514 | 0.525 | 0.012 | 0.500 |
| 283.9 | 0.489 | | 0.508 | | 0.642 | | 0.501 | | 0.497 | | 0.492 | | 0.487 | | 0.510 | | 0.487 | 0.499 | 0.052 | 0.450 |
| 299.1 | 1.030 | | 1.084 | | 1.077 | | 1.007 | | 1.033 | | 1.034 | | 1.051 | | 1.075 | | 1.007 | 1.043 | 0.028 | 0.676 |
| 322.0 | 0.422 | | 0.423 | | 0.424 | | 0.430 | | 0.418 | | 0.421 | | 0.419 | | 0.383 | | 0.383 | 0.421 | 0.014 | 0.380 |
| 339.0 | 0.417 | | 0.417 | | 0.421 | | 0.423 | | 0.400 | | 0.419 | | 0.407 | | 0.416 | | 0.400 | 0.417 | 0.008 | 0.380 |
| 344.0 | 0.434 | | 0.427 | | 0.430 | | 0.436 | | 0.425 | | 0.424 | | 0.430 | | 0.430 | | 0.424 | 0.430 | 0.004 | 0.380 |
| 358.0 | 0.429 | | 0.431 | | 0.424 | | 0.419 | | 0.430 | | 0.429 | | 0.431 | | 0.436 | | 0.419 | 0.430 | 0.005 | 0.380 |
| 363.0 | 0.459 | | 0.435 | | 0.439 | | 0.435 | | 0.429 | | 0.512 | | 0.451 | | 0.441 | | 0.429 | 0.440 | 0.027 | 0.380 |
| 367.0 | 0.472 | | 0.450 | | 0.474 | | 0.458 | | 0.480 | | 0.476 | | 0.467 | | 0.470 | | 0.450 | 0.471 | 0.010 | 0.380 |
| 372.0 | 0.450 | | 0.456 | | 0.456 | | 0.449 | | 0.435 | | 0.456 | | 0.446 | | 0.450 | | 0.435 | 0.450 | 0.007 | 0.400 |
| 375.0 | 0.530 | | 0.545 | | 0.545 | | 0.532 | | 0.523 | | 0.569 | | 0.543 | | 0.550 | | 0.523 | 0.544 | 0.014 | 0.480 |
| 377.5 | 0.690 | | 0.669 | | 0.672 | | 0.677 | | 0.640 | | 0.628 | | 0.657 | | 0.665 | | 0.628 | 0.667 | 0.020 | 0.530 |

Table 12 (Cont'd) RSRM-2A Aft Cylinder Insulation Performance

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 2.588 | 2.580 | 2.727 | 2.633 | 2.596 | 2.692 | 2.755 | 2.736 | 2.626 | 2.757 | 2.643 | 2.597 | 2.663 | 2.572 | 2.618 | 2.484 | 2.484 | 2.629 | 0.076 |
| 68.0 | 1.962 | 2.008 | 2.061 | 2.025 | 2.074 | 2.220 | 2.225 | 2.217 | 2.052 | 2.067 | 2.214 | 2.029 | 2.074 | 2.066 | 2.063 | 2.128 | 1.962 | 2.066 | 0.083 |
| 72.0 | 1.648 | 1.724 | 1.708 | 1.726 | 1.701 | 1.756 | 1.819 | 1.720 | 1.681 | 1.750 | 1.860 | 1.687 | 1.644 | 1.725 | 1.700 | 1.709 | 1.644 | 1.715 | 0.055 |
| 75.0 | 1.450 | 1.611 | 1.525 | 1.448 | 1.526 | 1.525 | 1.619 | 1.504 | 1.482 | 1.500 | 1.591 | 1.484 | 1.394 | 1.506 | 1.509 | 1.548 | 1.394 | 1.508 | 0.059 |
| 78.0 | 1.235 | 1.322 | 1.277 | 1.231 | 1.274 | 1.344 | 1.414 | 1.287 | 1.264 | 1.295 | 1.368 | 1.264 | 1.225 | 1.266 | 1.277 | 1.327 | 1.225 | 1.277 | 0.052 |
| 81.0 | 1.085 | 1.288 | 1.135 | 1.123 | 1.157 | 1.144 | 1.199 | 1.114 | 1.108 | 1.138 | 1.146 | 1.117 | 1.132 | 1.129 | 1.164 | 1.205 | 1.085 | 1.137 | 0.048 |
| 85.0 | 1.116 | 1.160 | 1.145 | 1.159 | 1.195 | 1.197 | 1.258 | 1.192 | 1.198 | 1.149 | 1.150 | 1.147 | 1.116 | 1.147 | 1.139 | 1.203 | 1.116 | 1.155 | 0.037 |
| 90.0 | 1.005 | 1.067 | 1.042 | 1.052 | 1.077 | 1.057 | 1.046 | 1.027 | 1.128 | 1.013 | 1.025 | 1.011 | 1.100 | 1.025 | 0.999 | 1.089 | 0.999 | 1.044 | 0.037 |
| 98.0 | 1.037 | 1.060 | 1.076 | 1.023 | 1.036 | 1.071 | 1.086 | 1.035 | 1.041 | 1.120 | 1.060 | 1.065 | 1.038 | 1.019 | 1.050 | 1.109 | 1.019 | 1.055 | 0.029 |
| 105.8 | 0.701 | | 0.778 | | 0.747 | | 0.866 | | 0.729 | | 0.747 | | 0.698 | | 0.754 | | 0.698 | 0.747 | 0.053 |
| 116.0 | 0.719 | | 0.781 | | 0.717 | | 0.844 | | 0.740 | | 0.729 | | 0.691 | | 0.765 | | 0.691 | 0.734 | 0.048 |
| 124.5 | 0.675 | | 0.656 | | 0.686 | | 0.700 | | 0.713 | | 0.697 | | 0.660 | | 0.683 | | 0.656 | 0.685 | 0.020 |
| 133.0 | 0.780 | | 0.774 | | 0.832 | | 0.796 | | 0.781 | | 0.775 | | 0.767 | | 0.753 | | 0.753 | 0.777 | 0.024 |
| 145.5 | 0.566 | | 0.532 | | 0.577 | | 0.545 | | 0.574 | | 0.565 | | 0.535 | | 0.559 | | 0.532 | 0.562 | 0.017 |
| 158.5 | 0.566 | | 0.555 | | 0.591 | | 0.575 | | 0.586 | | 0.577 | | 0.622 | | 0.575 | | 0.555 | 0.576 | 0.020 |
| 168.3 | 0.775 | | 0.782 | | 0.804 | | 0.781 | | 0.700 | | 0.667 | | 0.724 | | 0.723 | | 0.667 | 0.749 | 0.048 |
| 177.7 | 1.308 | | 1.159 | | 1.196 | | 1.221 | | 1.136 | | 1.126 | | 1.111 | | 1.136 | | 1.111 | 1.148 | 0.066 |
| 192.5 | 0.601 | | 0.622 | | 0.646 | | 0.634 | | 0.622 | | 0.584 | | 0.622 | | 0.612 | | 0.584 | 0.622 | 0.019 |
| 202.5 | 0.456 | | 0.459 | | 0.516 | | 0.484 | | 0.495 | | 0.483 | | 0.472 | | 0.447 | | 0.447 | 0.478 | 0.023 |
| 214.0 | 0.428 | | 0.440 | | 0.463 | | 0.465 | | 0.477 | | 0.475 | | 0.465 | | 0.448 | | 0.428 | 0.464 | 0.017 |
| 227.3 | 0.457 | | 0.482 | | 0.512 | | 0.507 | | 0.496 | | 0.500 | | 0.515 | | 0.462 | | 0.457 | 0.498 | 0.022 |
| 238.3 | 0.406 | | 0.408 | | 0.443 | | 0.428 | | 0.421 | | 0.505 | | 0.428 | | 0.414 | | 0.406 | 0.425 | 0.032 |
| 250.0 | 0.345 | | 0.342 | | 0.383 | | 0.357 | | 0.371 | | 0.459 | | 0.387 | | 0.352 | | 0.342 | 0.364 | 0.038 |
| 267.0 | 0.335 | | 0.321 | | 0.359 | | 0.353 | | 0.343 | | 0.351 | | 0.396 | | 0.336 | | 0.321 | 0.347 | 0.022 |
| 283.9 | 0.322 | | 0.316 | | 0.348 | | 0.328 | | 0.336 | | 0.325 | | 0.342 | | 0.349 | | 0.316 | 0.332 | 0.012 |
| 299.1 | 0.898 | | 0.859 | | 0.921 | | 0.879 | | 0.859 | | 0.881 | | 0.899 | | 0.870 | | 0.859 | 0.880 | 0.022 |
| 322.0 | 0.317 | | 0.299 | | 0.316 | | 0.304 | | 0.298 | | 0.294 | | 0.299 | | 0.314 | | 0.294 | 0.301 | 0.009 |
| 339.0 | 0.319 | | 0.320 | | 0.327 | | 0.335 | | 0.319 | | 0.309 | | 0.318 | | 0.327 | | 0.309 | 0.319 | 0.008 |
| 344.0 | 0.333 | | 0.380 | | 0.365 | | 0.386 | | 0.387 | | 0.379 | | 0.381 | | 0.377 | | 0.333 | 0.380 | 0.018 |
| 358.0 | 0.396 | | 0.358 | | 0.392 | | 0.371 | | 0.353 | | 0.373 | | 0.400 | | 0.362 | | 0.353 | 0.372 | 0.018 |
| 363.0 | 0.343 | | 0.358 | | 0.356 | | 0.371 | | 0.353 | | 0.392 | | 0.385 | | 0.368 | | 0.343 | 0.363 | 0.017 |
| 367.0 | 0.388 | | 0.422 | | 0.398 | | 0.416 | | 0.403 | | 0.399 | | 0.400 | | 0.385 | | 0.385 | 0.400 | 0.013 |
| 372.0 | 0.373 | | 0.365 | | 0.396 | | 0.370 | | 0.358 | | 0.376 | | 0.434 | | 0.344 | | 0.344 | 0.372 | 0.027 |
| 375.0 | 0.455 | | 0.461 | | 0.469 | | 0.444 | | 0.454 | | 0.524 | | 0.521 | | 0.451 | | 0.444 | 0.458 | 0.032 |
| 377.5 | 0.548 | | 0.624 | | 0.594 | | 0.527 | | 0.542 | | 0.552 | | 0.595 | | 0.592 | | 0.527 | 0.572 | 0.034 |

Table 12 (Cont'd) RSRM-2A Aft Cylinder Insulation Performance

RSRM-2A Aft Center Segment

COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 5.12 | 4.80 | 6.14 | 5.05 | 5.23 | 7.09 | 4.30 | 4.83 | 4.30 | 270.0 | 2.0 |
| 11.0 | 2.80 | 2.92 | 3.08 | 2.87 | 4.29 | 3.50 | 2.94 | 3.14 | 2.80 | 0.0 | 1.5 |
| 23.6 | 3.36 | 3.05 | 2.74 | 2.87 | 1.93 | 2.73 | 3.39 | 3.13 | 1.93 | 180.0 | 1.5 |
| 30.7 | 2.93 | 5.28 | 3.07 | 2.16 | 2.35 | 2.99 | 2.69 | 2.80 | 2.16 | 136.0 | 1.5 |
| 36.2 | 3.24 | 6.83 | 2.60 | 2.16 | 2.96 | 3.61 | 2.37 | 2.69 | 2.16 | 136.0 | 1.5 |
| 39.7 | 4.67 | 5.18 | 4.17 | 4.17 | 10.24 | 4.53 | 9.77 | 4.78 | 4.17 | 90.0 | 1.5 |
| 44.6 | 5.37 | 6.10 | 5.90 | 5.90 | 6.00 | 9.00 | 8.57 | 4.80 | 4.80 | 316.0 | 1.5 |
| 48.0 | 4.97 | 4.00 | 57.60 | 5.54 | 16.00 | 9.29 | 4.72 | 3.79 | 3.79 | 316.0 | 1.5 |
| 71.5 | 4.86 | 3.40 | 3.62 | 3.40 | 3.21 | 6.80 | 3.70 | 2.66 | 2.66 | 316.0 | 1.5 |
| 126.0 | 6.00 | 3.19 | 5.00 | 2.05 | 1.60 | 7.14 | 4.69 | 1.83 | 1.60 | 180.0 | 1.5 |
| 153.5 | 6.84 | 2.89 | 3.10 | 3.51 | 2.71 | 5.20 | 2.60 | 10.00 | 2.60 | 270.0 | 1.5 |
| 161.4 | + | + | + | + | 10.73 | + | + | + | 10.73 | 180.0 | 2.0 |
| 214.1 | + | + | + | + | + | + | + | + | | | 1.5 |
| 280.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 298.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 307.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 311.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 314.0 | + | + | + | + | + | + | + | + | | | 1.5 |

SEGMENT MINIMUM = 1.60 AT THE 126.0 INCH STATION.

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 5.96 | 5.64 | 6.98 | 6.38 | 6.37 | 8.62 | 5.18 | 5.79 | 5.18 | 270.0 |
| 11.0 | 3.32 | 3.51 | 3.66 | 3.56 | 4.70 | 4.24 | 3.37 | 3.72 | 3.32 | 0.0 |
| 23.6 | 3.98 | 3.81 | 3.42 | 3.62 | 2.76 | 3.66 | 4.05 | 3.85 | 2.76 | 180.0 |
| 30.7 | 3.53 | 6.27 | 3.75 | 2.88 | 2.82 | 3.71 | 3.15 | 3.53 | 2.82 | 180.0 |
| 36.2 | 4.13 | 8.90 | 3.45 | 3.12 | 3.93 | 4.46 | 3.43 | 3.64 | 3.12 | 136.0 |
| 39.7 | 5.00 | 5.35 | 4.40 | 4.38 | 10.86 | 4.89 | 10.25 | 5.02 | 4.38 | 136.0 |
| 44.6 | 5.58 | 6.19 | 6.07 | 6.07 | 6.13 | 9.30 | 8.76 | 4.99 | 4.99 | 316.0 |
| 48.0 | 6.28 | 5.00 | 61.00 | 7.00 | 19.11 | 11.87 | 5.92 | 4.79 | 4.79 | 316.0 |
| 71.5 | 5.29 | 3.96 | 4.11 | 3.98 | 3.68 | 7.72 | 4.33 | 3.19 | 3.19 | 316.0 |
| 126.0 | 6.96 | 4.00 | 6.93 | 3.23 | 2.44 | 11.57 | 7.37 | 2.78 | 2.44 | 180.0 |
| 153.5 | 8.21 | 3.62 | 3.90 | 4.57 | 3.56 | 6.52 | 3.26 | 12.69 | 3.26 | 270.0 |
| 161.4 | + | + | + | + | 25.00 | + | + | + | 25.00 | 180.0 |
| 214.1 | + | + | + | + | + | + | + | + | | |
| 280.0 | + | + | + | + | + | + | + | + | | |
| 298.0 | + | + | + | + | + | + | + | + | | |
| 307.8 | + | + | + | + | + | + | + | + | | |
| 311.8 | + | + | + | + | + | + | + | + | | |
| 314.0 | + | + | + | + | + | + | + | + | | |

SEGMENT MINIMUM = 2.44 AT THE 126.0 INCH STATION.
A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 13 RSRM-2A Aft Center Segment Insulation Performance

RSRM-2A Aft Center Segment

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.414 | 0.442 | 0.345 | 0.420 | 0.405 | 0.299 | 0.493 | 0.439 | 0.493 | 0.407 | 0.417 | 0.060 |
| 11.0 | 0.679 | 0.651 | 0.616 | 0.662 | 0.443 | 0.543 | 0.647 | 0.606 | 0.679 | 0.606 | 0.632 | 0.078 |
| 23.6 | 0.277 | 0.305 | 0.339 | 0.324 | 0.483 < | 0.341 | 0.274 | 0.297 | 0.483 | 0.330 | 0.315 | 0.067 |
| 30.7 | 0.256 | 0.142 | 0.244 | 0.348 | 0.319 | 0.251 | 0.279 | 0.268 | 0.348 | 0.263 | 0.262 | 0.061 |
| 36.2 | 0.173 | 0.082 | 0.215 | 0.259 | 0.189 | 0.155 | 0.236 | 0.208 | 0.259 | 0.190 | 0.199 | 0.055 |
| 39.7 | 0.092 | 0.083 | 0.103 | 0.103 | 0.042 | 0.095 | 0.044 | 0.090 | 0.103 | 0.082 | 0.091 | 0.025 |
| 44.6 | 0.067 | 0.059 | 0.061 | 0.061 | 0.060 | 0.040 | 0.042 | 0.075 | 0.075 | 0.058 | 0.060 | 0.012 |
| 48.0 | 0.058 | 0.072 | 0.005 | 0.052 | 0.018 | 0.031 | 0.061 | 0.076 | 0.076 | 0.047 | 0.055 | 0.026 |
| 71.5 | 0.035 | 0.050 | 0.047 | 0.050 | 0.053 | 0.025 | 0.046 | 0.064 | 0.064 | 0.046 | 0.049 | 0.012 |
| 126.0 | 0.025 | 0.047 | 0.030 | 0.073 | 0.094 < | 0.021 | 0.032 | 0.082 < | 0.094 | 0.051 | 0.040 | 0.029 |
| 153.5 | 0.019 | 0.045 | 0.042 | 0.037 | 0.048 | 0.025 | 0.050 | 0.013 | 0.050 | 0.035 | 0.040 | 0.014 |
| 161.4 | 0 | 0 | 0 | 0 | 0.022 | 0 | 0 | 0 | 0.022 | 0.003 | 0.000 | 0.008 |
| 214.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 3.7 | 4.0 | 3.1 | 3.8 | 3.6 | 2.7 | 4.4 | 3.9 | 3.6 | 111.6 |
| 11.0 | 7.0 | 6.7 | 6.4 | 6.8 | 4.6 | 5.6 | 6.7 | 6.3 | 6.3 | 96.8 |
| 23.6 | 4.2 | 4.7 | 5.2 | 5.0 | 7.4 | 5.2 | 4.2 | 4.5 | 5.0 | 65.4 |
| 30.7 | 5.4 | 3.0 | 5.2 | 7.4 | 6.8 | 5.3 | 5.9 | 5.7 | 5.6 | 47.2 |
| 36.2 | 5.4 | 2.5 | 6.7 | 8.0 | 5.9 | 4.8 | 7.3 | 6.4 | 5.9 | 32.3 |
| 39.7 | 4.2 | 3.8 | 4.7 | 4.7 | 1.9 | 4.3 | 2.0 | 4.1 | 3.7 | 22.0 |
| 44.6 | 5.6 | 5.0 | 5.1 | 5.1 | 5.0 | 3.4 | 3.5 | 6.3 | 4.9 | 11.9 |
| 48.0 | 5.2 | 6.4 | 0.4 | 4.6 | 1.6 | 2.8 | 5.4 | 6.8 | 4.2 | 11.2 |
| 71.5 | 3.5 | 5.0 | 4.7 | 5.0 | 5.2 | 2.5 | 4.6 | 6.3 | 4.6 | 10.1 |
| 126.0 | 2.9 | 5.4 | 3.4 | 8.4 | 10.8 | 2.4 | 3.7 | 9.4 | 5.8 | 8.7 |
| 153.5 | 2.5 | 5.8 | 5.5 | 4.8 | 6.2 | 3.2 | 6.5 | 1.7 | 4.5 | 7.7 |
| 161.4 | 0 | 0 | 0 | 0 | 2.2 | 0 | 0 | 0 | 0.3 | 9.9 |
| 214.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 5.9 |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 3.4 |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2.8 |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2.0 |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2.0 |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0.6 |

Table 13 (Cont'd) RSRM-2A Aft Center Segment Insulation Performance

RSRM-2A Aft Center Segment

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.468 | 2.491 | 2.408 | 2.678 | 2.578 | 2.578 | 2.555 | 2.540 | 2.408 | 2.548 | 0.082 | 2.120 |
| 11.0 | 2.256 | 2.287 | 2.255 | 2.354 | 2.083 | 2.302 | 2.181 | 2.255 | 2.083 | 2.256 | 0.082 | 1.900 |
| 23.6 | 1.103 | 1.161 | 1.158 | 1.174 | 1.333 | 1.248 | 1.109 | 1.142 | 1.103 | 1.160 | 0.077 | 0.930 |
| 30.7 | 0.903 | 0.890 | 0.915 | 1.002 | 0.898 | 0.932 | 0.880 | 0.945 | 0.880 | 0.909 | 0.039 | 0.750 |
| 36.2 | 0.714 | 0.730 | 0.742 | 0.809 | 0.742 | 0.692 | 0.809 | 0.757 | 0.692 | 0.742 | 0.042 | 0.560 |
| 39.7 | 0.460 | 0.444 | 0.453 | 0.451 | 0.456 | 0.465 | 0.451 | 0.452 | 0.444 | 0.453 | 0.006 | 0.430 |
| 44.6 | 0.374 | 0.365 | 0.370 | 0.370 | 0.368 | 0.372 | 0.368 | 0.374 | 0.365 | 0.370 | 0.003 | 0.360 |
| 48.0 | 0.364 | 0.360 | 0.305 | 0.364 | 0.344 | 0.368 | 0.361 | 0.364 | 0.305 | 0.363 | 0.021 | 0.288 |
| 71.5 | 0.185 | 0.198 | 0.193 | 0.199 | 0.195 | 0.193 | 0.199 | 0.204 | 0.185 | 0.197 | 0.006 | 0.170 |
| 126.0 | 0.174 | 0.188 | 0.208 | 0.236 | 0.229 | 0.243 | 0.236 | 0.228 | 0.174 | 0.229 | 0.025 | 0.150 |
| 153.5 | 0.156 | 0.163 | 0.164 | 0.169 | 0.171 | 0.163 | 0.163 | 0.165 | 0.156 | 0.164 | 0.004 | 0.130 |
| 161.4 | 0.520 | 0.511 | 0.517 | 0.524 | 0.550 | 0.517 | 0.526 | 0.528 | 0.511 | 0.522 | 0.012 | 0.236 |
| 214.1 | 0.253 | 0.284 | 0.282 | 0.287 | 0.294 | 0.281 | 0.251 | 0.273 | 0.251 | 0.282 | 0.016 | 0.130 |
| 280.0 | 0.120 | 0.119 | 0.118 | 0.117 | 0.127 | 0.120 | 0.120 | 0.126 | 0.117 | 0.120 | 0.004 | 0.090 |
| 298.0 | 0.222 | 0.212 | 0.225 | 0.228 | 0.222 | 0.221 | 0.224 | 0.220 | 0.212 | 0.222 | 0.005 | 0.090 |
| 307.8 | 0.119 | 0.115 | 0.117 | 0.125 | 0.123 | 0.122 | 0.119 | 0.119 | 0.115 | 0.119 | 0.003 | 0.090 |
| 311.8 | 0.116 | 0.116 | 0.122 | 0.124 | 0.124 | 0.117 | 0.120 | 0.119 | 0.116 | 0.120 | 0.003 | 0.090 |
| 314.0 | 0.113 | 0.124 | 0.118 | 0.119 | 0.123 | 0.116 | 0.119 | 0.126 | 0.113 | 0.119 | 0.004 | 0.090 |

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.054 | 2.049 | 2.063 | 2.258 | 2.173 | 2.279 | 2.062 | 2.101 | 2.049 | 2.082 | 0.095 |
| 11.0 | 1.577 | 1.636 | 1.639 | 1.692 | 1.640 | 1.759 | 1.534 | 1.649 | 1.534 | 1.640 | 0.068 |
| 23.6 | 0.826 | 0.856 | 0.819 | 0.850 | 0.850 | 0.907 | 0.835 | 0.845 | 0.819 | 0.848 | 0.027 |
| 30.7 | 0.647 | 0.748 | 0.671 | 0.654 | 0.579 | 0.681 | 0.601 | 0.677 | 0.579 | 0.663 | 0.052 |
| 36.2 | 0.541 | 0.648 | 0.527 | 0.550 | 0.553 | 0.537 | 0.573 | 0.549 | 0.527 | 0.550 | 0.038 |
| 39.7 | 0.368 | 0.361 | 0.350 | 0.348 | 0.414 | 0.370 | 0.407 | 0.362 | 0.348 | 0.365 | 0.025 |
| 44.6 | 0.307 | 0.306 | 0.309 | 0.309 | 0.308 | 0.332 | 0.326 | 0.299 | 0.299 | 0.308 | 0.011 |
| 48.0 | 0.306 | 0.288 | 0.300 | 0.312 | 0.326 | 0.337 | 0.300 | 0.288 | 0.288 | 0.303 | 0.017 |
| 71.5 | 0.150 | 0.148 | 0.146 | 0.149 | 0.142 | 0.168 | 0.153 | 0.140 | 0.140 | 0.149 | 0.009 |
| 126.0 | 0.149 | 0.141 | 0.178 | 0.163 | 0.135 | 0.222 | 0.204 | 0.146 | 0.135 | 0.156 | 0.032 |
| 153.5 | 0.137 | 0.118 | 0.122 | 0.132 | 0.123 | 0.138 | 0.113 | 0.152 | 0.113 | 0.127 | 0.013 |
| 161.4 | 0.528 | 0.540 | 0.531 | 0.545 | 0.528 | 0.521 | 0.552 | 0.545 | 0.521 | 0.536 | 0.011 |
| 214.1 | L | L | L | L | L | L | L | L | 0.251 | 0.282 | 0.016 |
| 280.0 | L | L | L | L | L | L | L | L | 0.117 | 0.120 | 0.004 |
| 298.0 | L | L | L | L | L | L | L | L | 0.212 | 0.222 | 0.005 |
| 307.8 | L | L | L | L | L | L | L | L | 0.115 | 0.119 | 0.003 |
| 311.8 | L | L | L | L | L | L | L | L | 0.116 | 0.120 | 0.003 |
| 314.0 | L | L | L | L | L | L | L | L | 0.113 | 0.119 | 0.004 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUES WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 13 (Cont'd) RSRM-2A Aft Center Segment Insulation Performance

RSRM-2A Forward Center Segment

COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 16.56 | 15.94 | 19.81 | 13.50 | 14.72 | 8.41 | 13.33 | 13.01 | 8.41 | 226.0 | 2.0 |
| 11.0 | 9.31 | 7.45 | 14.50 | 10.00 | 8.88 | 6.51 | 11.88 | 30.16 | 6.51 | 226.0 | 1.5 |
| 23.6 | 4.21 | 11.07 | 3.00 | 2.12 | 4.92 | 3.68 | 2.84 | 2.36 | 2.12 | 136.0 | 1.5 |
| 30.7 | 8.33 | 6.94 | 9.62 | 7.81 | 6.82 | 6.25 | 17.86 | 7.28 | 6.25 | 226.0 | 1.5 |
| 36.2 | 6.09 | 6.83 | 6.36 | 5.89 | 5.83 | 7.00 | 7.67 | 5.60 | 5.60 | 316.0 | 1.5 |
| 39.7 | 10.24 | 25.29 | 6.42 | 28.67 | 6.94 | 35.83 | 28.67 | 28.67 | 6.42 | 90.0 | 1.5 |
| 44.6 | + | 27.69 | 72.00 | 45.00 | 24.00 | + | + | + | 24.00 | 180.0 | 1.5 |
| 48.0 | + | 22.15 | 9.60 | 22.15 | 4.72 | 6.86 | + | 8.47 | 4.72 | 180.0 | 1.5 |
| 71.5 | 28.33 | 2.10 | + | 10.63 | 42.50 | 13.08 | 28.33 | 42.50 | 2.10 | 46.0 | 1.5 |
| 126.0 | + | 2.27 | + | + | + | + | + | + | 2.27 | 46.0 | 1.5 |
| 153.5 | + | + | + | + | + | + | + | + | | | 1.5 |
| 161.4 | + | + | + | + | + | + | + | + | | | 2.0 |
| 214.1 | + | + | + | + | + | + | + | + | | | 1.5 |
| 280.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 298.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 307.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 311.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 314.0 | + | + | + | + | + | + | + | + | | | 1.5 |

SEGMENT MINIMUM = 2.10 AT THE 71.5 INCH STATION.

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 19.27 | 18.71 | 23.36 | 15.75 | 17.40 | 10.31 | 15.88 | 15.28 | 10.31 | 226.0 |
| 11.0 | 11.70 | 9.02 | 17.31 | 11.82 | 11.00 | 8.17 | 14.72 | 35.13 | 8.17 | 226.0 |
| 23.6 | 5.61 | 13.24 | 4.20 | 3.13 | 6.18 | 4.68 | 4.04 | 3.45 | 3.13 | 136.0 |
| 30.7 | 9.59 | 7.72 | 10.86 | 8.72 | 8.04 | 7.28 | 20.26 | 8.29 | 7.28 | 226.0 |
| 36.2 | 7.60 | 8.29 | 7.86 | 7.17 | 7.35 | 8.74 | 9.64 | 7.05 | 7.05 | 316.0 |
| 39.7 | 11.43 | 26.41 | 7.18 | 29.40 | 8.00 | 37.25 | 31.47 | 29.67 | 7.18 | 90.0 |
| 44.6 | + | 28.92 | 73.00 | 46.25 | 25.47 | + | + | + | 25.47 | 180.0 |
| 48.0 | + | 25.62 | 12.23 | 26.85 | 6.11 | 8.93 | + | 9.47 | 6.11 | 180.0 |
| 71.5 | 31.83 | 3.32 | + | 11.81 | 45.75 | 13.92 | 31.00 | 46.50 | 3.32 | 46.0 |
| 126.0 | + | 3.88 | + | + | + | + | + | + | 3.88 | 46.0 |
| 153.5 | + | + | + | + | + | + | + | + | | |
| 161.4 | + | + | + | + | + | + | + | + | | |
| 214.1 | + | + | + | + | + | + | + | + | | |
| 280.0 | + | + | + | + | + | + | + | + | | |
| 298.0 | + | + | + | + | + | + | + | + | | |
| 307.8 | + | + | + | + | + | + | + | + | | |
| 311.8 | + | + | + | + | + | + | + | + | | |
| 314.0 | + | + | + | + | + | + | + | + | | |

SEGMENT MINIMUM = 3.13 AT THE 23.6 INCH STATION.
A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 14 RSRM-2A Forward Center Segment Insulation Performance

RSRM-2A Forward Center Segment

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.128 | 0.133 | 0.107 | 0.157 | 0.144 | 0.252 | 0.159 | 0.163 | 0.252 | 0.155 | 0.150 | 0.043 |
| 11.0 | 0.204 | 0.255 | 0.131 | 0.190 | 0.214 | 0.292 | 0.160 | 0.063 | 0.292 | 0.189 | 0.197 | 0.072 |
| 23.6 | 0.221 | 0.084 | 0.310 | 0.439 | 0.189 | 0.253 | 0.327 | 0.394 | 0.439 | 0.277 | 0.282 | 0.115 |
| 30.7 | 0.090 | 0.108 | 0.078 | 0.096 | 0.110 | 0.120 | 0.042 | 0.103 | 0.120 | 0.093 | 0.100 | 0.024 |
| 36.2 | 0.092 | 0.082 | 0.088 | 0.095 | 0.096 | 0.080 | 0.073 | 0.100 | 0.100 | 0.088 | 0.090 | 0.009 |
| 39.7 | 0.042 | 0.017 | 0.067 | 0.015 | 0.062 | 0.012 | 0.015 | 0.015 | 0.067 | 0.031 | 0.016 | 0.023 |
| 44.6 | 0 | 0.013 | 0.005 | 0.008 | 0.015 | 0 | 0 | 0 | 0.015 | 0.005 | 0.002 | 0.006 |
| 48.0 | 0 | 0.013 | 0.030 | 0.013 | 0.061 | 0.042 | 0 | 0.034 | 0.061 | 0.024 | 0.022 | 0.021 |
| 71.5 | 0.006 | 0.081 | 0.001 | 0.016 | 0.004 | 0.013 | 0.006 | 0.004 | 0.081 | 0.016 | 0.006 | 0.027 |
| 126.0 | 0 | 0.066 | 0 | 0 | 0 | 0 | 0 | 0 | 0.066 | 0.008 | 0.000 | 0.023 |
| 153.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 161.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 214.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 1.1 | 1.2 | 1.0 | 1.4 | 1.3 | 2.3 | 1.4 | 1.5 | 1.4 | 111.8 |
| 11.0 | 2.1 | 2.6 | 1.3 | 2.0 | 2.2 | 3.0 | 1.6 | 0.6 | 1.9 | 97.2 |
| 23.6 | 3.3 | 1.3 | 4.7 | 6.7 | 2.9 | 3.8 | 5.0 | 6.0 | 4.2 | 66.0 |
| 30.7 | 1.9 | 2.3 | 1.6 | 2.0 | 2.3 | 2.5 | 0.9 | 2.2 | 2.0 | 47.6 |
| 36.2 | 2.8 | 2.5 | 2.7 | 2.9 | 2.9 | 2.4 | 2.2 | 3.0 | 2.7 | 32.9 |
| 39.7 | 1.9 | 0.8 | 3.0 | 0.7 | 2.7 | 0.5 | 0.7 | 0.7 | 1.4 | 22.6 |
| 44.6 | 0 | 1.0 | 0.4 | 0.6 | 1.2 | 0 | 0 | 0 | 0.4 | 12.7 |
| 48.0 | 0 | 1.1 | 2.5 | 1.1 | 5.1 | 3.5 | 0 | 2.8 | 2.0 | 12.0 |
| 71.5 | 0.6 | 7.4 | 0.1 | 1.5 | 0.4 | 1.2 | 0.6 | 0.4 | 1.5 | 10.9 |
| 126.0 | 0 | 6.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9 | 9.5 |
| 153.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 8.7 |
| 161.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 10.7 |
| 214.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 7.1 |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 4.2 |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 4.0 |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 3.4 |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 3.4 |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0.6 |

Table 14 (Cont'd) RSRM-2A Forward Center Segment Insulation Performance

RSRM-2A Forward Center Segment

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.466 | 2.488 | 2.499 | 2.472 | 2.505 | 2.598 | 2.525 | 2.490 | 2.466 | 2.495 | 0.042 | 2.120 |
| 11.0 | 2.387 | 2.301 | 2.267 | 2.246 | 2.353 | 2.386 | 2.355 | 2.213 | 2.213 | 2.327 | 0.066 | 1.900 |
| 23.6 | 1.240 | 1.112 | 1.301 | 1.372 | 1.168 | 1.184 | 1.321 | 1.360 | 1.112 | 1.271 | 0.096 | 0.930 |
| 30.7 | 0.863 | 0.834 | 0.847 | 0.837 | 0.884 | 0.874 | 0.851 | 0.854 | 0.834 | 0.853 | 0.017 | 0.750 |
| 36.2 | 0.699 | 0.680 | 0.692 | 0.681 | 0.706 | 0.699 | 0.704 | 0.705 | 0.680 | 0.699 | 0.010 | 0.560 |
| 39.7 | 0.480 | 0.449 | 0.481 | 0.441 | 0.496 | 0.447 | 0.472 | 0.445 | 0.441 | 0.461 | 0.021 | 0.430 |
| 44.6 | 0.368 | 0.376 | 0.365 | 0.370 | 0.382 | 0.372 | 0.375 | 0.369 | 0.365 | 0.371 | 0.005 | 0.360 |
| 48.0 | 0.293 | 0.333 | 0.367 | 0.349 | 0.373 | 0.375 | 0.368 | 0.322 | 0.293 | 0.358 | 0.029 | 0.288 |
| 71.5 | 0.191 | 0.269 | 0.187 | 0.189 | 0.183 | 0.181 | 0.186 | 0.186 | 0.181 | 0.187 | 0.029 | 0.170 |
| 126.0 | 0.169 | 0.256 | 0.174 | 0.183 | 0.163 | 0.174 | 0.171 | 0.153 | 0.153 | 0.172 | 0.032 | 0.150 |
| 153.5 | 0.159 | 0.256 | 0.224 | 0.167 | 0.185 | 0.170 | 0.166 | 0.217 | 0.159 | 0.178 | 0.035 | 0.130 |
| 161.4 | 0.529 | 0.531 | 0.570 | 0.523 | 0.550 | 0.542 | 0.634 | 0.521 | 0.521 | 0.537 | 0.038 | 0.236 |
| 214.1 | 0.244 | 0.181 | 0.137 | 0.133 | 0.138 | 0.131 | 0.136 | 0.138 | 0.131 | 0.138 | 0.039 | 0.130 |
| 280.0 | 0.105 | 0.095 | 0.094 | 0.097 | 0.094 | 0.094 | 0.092 | 0.117 | 0.092 | 0.094 | 0.008 | 0.090 |
| 298.0 | 0.096 | 0.093 | 0.098 | 0.096 | 0.095 | 0.095 | 0.100 | 0.118 | 0.093 | 0.096 | 0.008 | 0.090 |
| 307.8 | 0.094 | 0.094 | 0.097 | 0.096 | 0.100 | 0.093 | 0.092 | 0.115 | 0.092 | 0.095 | 0.007 | 0.090 |
| 311.8 | 0.095 | 0.094 | 0.093 | 0.092 | 0.101 | 0.094 | 0.093 | 0.120 | 0.092 | 0.094 | 0.009 | 0.090 |
| 314.0 | 0.094 | 0.093 | 0.093 | 0.091 | 0.104 | 0.095 | 0.097 | 0.117 | 0.091 | 0.094 | 0.009 | 0.090 |

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.338 | 2.355 | 2.392 | 2.315 | 2.361 | 2.346 | 2.366 | 2.327 | 2.315 | 2.351 | 0.024 |
| 11.0 | 2.183 | 2.046 | 2.136 | 2.056 | 2.139 | 2.094 | 2.195 | 2.150 | 2.046 | 2.138 | 0.055 |
| 23.6 | 1.019 | 1.028 | 0.991 | 0.933 | 0.979 | 0.931 | 0.994 | 0.966 | 0.931 | 0.985 | 0.036 |
| 30.7 | 0.773 | 0.726 | 0.769 | 0.741 | 0.774 | 0.754 | 0.809 | 0.751 | 0.726 | 0.762 | 0.025 |
| 36.2 | 0.607 | 0.598 | 0.604 | 0.586 | 0.610 | 0.619 | 0.631 | 0.605 | 0.586 | 0.606 | 0.013 |
| 39.7 | 0.438 | 0.432 | 0.414 | 0.426 | 0.434 | 0.435 | 0.457 | 0.430 | 0.414 | 0.433 | 0.012 |
| 44.6 | 0.382 | 0.363 | 0.360 | 0.362 | 0.367 | 0.380 | 0.382 | 0.372 | 0.360 | 0.370 | 0.009 |
| 48.0 | 0.340 | 0.320 | 0.337 | 0.336 | 0.312 | 0.333 | 0.402 | 0.288 | 0.288 | 0.335 | 0.033 |
| 71.5 | 0.185 | 0.188 | 0.186 | 0.173 | 0.179 | 0.168 | 0.180 | 0.182 | 0.168 | 0.181 | 0.007 |
| 126.0 | L | 0.190 | L | 0.214 | 0.232 | 0.239 | 0.198 | 0.194 | 0.169 | 0.196 | 0.025 |
| 153.5 | L | L | L | 0.174 | L | L | L | L | 0.159 | 0.179 | 0.035 |
| 161.4 | 0.598 | 0.564 | 0.592 | 0.562 | 0.636 | 0.613 | 0.680 | 0.648 | 0.562 | 0.605 | 0.041 |
| 214.1 | L | L | L | L | L | 0.220 | 0.175 | L | 0.133 | 0.156 | 0.042 |
| 280.0 | L | L | L | L | L | L | L | L | 0.092 | 0.094 | 0.008 |
| 298.0 | L | L | L | L | L | L | L | L | 0.093 | 0.096 | 0.008 |
| 307.8 | L | L | L | L | L | L | L | L | 0.092 | 0.095 | 0.007 |
| 311.8 | L | L | L | L | L | L | L | L | 0.092 | 0.094 | 0.009 |
| 314.0 | L | L | L | L | L | L | L | L | 0.091 | 0.094 | 0.009 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUES WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 14 (Cont'd) RSRM-2A Forward Center Segment Insulation Performance

RSRM-2A Forward Segment Star Tip

| STATION (IN) | COMPLIANCE SAFETY FACTOR (CSF) DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR | STATION (IN) | ACTUAL SAFETY FACTOR (ASF) DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 29.44 | 22.08 | + | + | 58.89 | 22.08 | 154.0 | 2.0 | 3.5 | 33.40 | 25.09 | + | + | 72.78 | 25.09 | 154.0 |
| 13.0 | 15.85 | + | + | 15.48 | + | 15.48 | 286.0 | 1.5 | 13.0 | 19.73 | + | + | 17.88 | + | 17.88 | 286.0 |
| 23.0 | + | + | + | + | + | | | 1.5 | 23.0 | + | + | + | + | + | | |
| 27.0 | + | + | + | + | + | | | 1.5 | 27.0 | + | + | + | + | + | | |
| 30.7 | + | + | + | + | + | | | 1.5 | 30.7 | + | + | + | + | + | | |
| 34.2 | + | + | + | + | + | | | 1.5 | 34.2 | + | + | + | + | + | | |
| 37.7 | + | + | + | + | + | | | 1.5 | 37.7 | + | + | + | + | + | | |
| 41.2 | + | + | + | + | + | | | 1.5 | 41.2 | + | + | + | + | + | | |
| 44.0 | + | + | + | + | + | | | 1.5 | 44.0 | + | + | + | + | + | | |
| 94.7 | + | + | + | + | + | | | 1.5 | 94.7 | + | + | + | + | + | | |
| 142.0 | + | + | + | + | + | | | 1.5 | 142.0 | + | + | + | + | + | | |
| 145.7 | 58.50 | + | + | + | + | 58.50 | 90.0 | 1.5 | 145.7 | 63.25 | + | + | + | + | 63.25 | 90.0 |
| 148.5 | 8.36 | 12.55 | 92.00 | + | 19.71 | 8.36 | 90.0 | 1.5 | 148.5 | 9.24 | 13.64 | + | + | 21.14 | 9.24 | 90.0 |
| 152.0 | 7.37 | 10.23 | 31.70 | 13.21 | + | 7.37 | 90.0 | 1.5 | 152.0 | 8.05 | 11.48 | 33.40 | 14.29 | + | 8.05 | 90.0 |
| 155.0 | 18.00 | + | + | + | + | 18.00 | 90.0 | 1.5 | 155.0 | 26.00 | + | + | + | + | 26.00 | 90.0 |
| 162.0 | 2.75 | 3.91 | 15.75 | 5.93 | 3.76 | 2.75 | 90.0 | 2.0 | 162.0 | 4.60 | 5.95 | 22.87 | 8.66 | 5.98 | 4.60 | 90.0 |
| 171.0 | 2.83 | 2.18 | 1.76 | + | 2.35 | 1.76 | 222.0 | 1.5 | 171.0 | 5.89 | 4.35 | 3.72 | + | 4.35 | 3.72 | 222.0 |
| 175.5 | 3.11 | 7.65 | 4.25 | 4.00 | 3.32 | 3.11 | 90.0 | 1.5 | 175.5 | 4.01 | 9.29 | 5.36 | 4.85 | 4.05 | 4.01 | 90.0 |
| 187.0 | 2.70 | 3.14 | 3.40 | 3.37 | 2.99 | 2.70 | 90.0 | 1.5 | 187.0 | 2.84 | 3.24 | 3.57 | 3.42 | 3.16 | 2.84 | 90.0 |
| 199.0 | 2.88 | 3.03 | 3.17 | 3.17 | 2.67 | 2.67 | 352.0 | 1.5 | 199.0 | 3.09 | 3.23 | 3.34 | 3.33 | 2.88 | 2.88 | 352.0 |
| 215.0 | 2.65 | 2.96 | 2.94 | 2.80 | 2.71 | 2.65 | 90.0 | 1.5 | 215.0 | 2.81 | 3.18 | 3.20 | 3.13 | 2.96 | 2.81 | 90.0 |
| 224.0 | 2.96 | 2.06 | 2.78 | 2.73 | 3.23 | 2.06 | 154.0 | 1.5 | 224.0 | 3.25 | 2.55 | 3.15 | 3.04 | 3.61 | 2.55 | 154.0 |
| 230.0 | 3.37 | 2.79 | 3.35 | 3.69 | 3.20 | 2.79 | 154.0 | 1.5 | 230.0 | 3.52 | 3.29 | 3.51 | 3.79 | 3.39 | 3.29 | 154.0 |
| 236.0 | 2.30 | 2.44 | 2.92 | 2.47 | 2.28 | 2.28 | 352.0 | 1.5 | 236.0 | 2.53 | 2.73 | 3.12 | 2.57 | 2.48 | 2.48 | 352.0 |
| 240.0 | 2.42 | 2.61 | 2.62 | 2.34 | 2.55 | 2.34 | 286.0 | 1.5 | 240.0 | 2.61 | 2.78 | 2.83 | 2.44 | 2.78 | 2.44 | 286.0 |
| 251.0 | 2.18 | 3.36 | 2.42 | 2.29 | 2.34 | 2.18 | 90.0 | 1.5 | 251.0 | 3.03 | 4.48 | 3.07 | 3.04 | 2.98 | 2.98 | 352.0 |
| 263.0 | 2.94 | 2.52 | 2.70 | 2.39 | 3.62 | 2.39 | 286.0 | 1.5 | 263.0 | 3.16 | 2.64 | 2.82 | 2.53 | 3.79 | 2.53 | 286.0 |
| 280.0 | 2.25 | 2.63 | 2.50 | 1.98 | 2.74 | 1.98 | 286.0 | 1.5 | 280.0 | 2.95 | 3.34 | 3.15 | 2.64 | 3.60 | 2.64 | 286.0 |
| 293.0 | 2.74 | 3.10 | 2.55 | 3.41 | 3.77 | 2.55 | 222.0 | 1.5 | 293.0 | 2.84 | 3.19 | 2.64 | 3.62 | 3.83 | 2.64 | 222.0 |
| 305.0 | 2.54 | 1.36< | 3.18 | 2.87 | 2.35 | 1.36 | 154.0 | 1.5 | 305.0 | 2.68 | 1.89 | 3.24 | 2.94 | 2.52 | 1.89 | 154.0 |
| 312.0 | 2.94 | 2.27 | 2.74 | 3.44 | 2.58 | 2.27 | 154.0 | 1.5 | 312.0 | 3.44 | 2.63 | 3.06 | 3.57 | 3.00 | 2.63 | 154.0 |
| 321.0 | 3.12 | 4.08 | 3.91 | 4.48 | 3.97 | 3.12 | 90.0 | 2.0 | 321.0 | 3.43 | 4.22 | 4.17 | 4.80 | 4.38 | 3.43 | 90.0 |
| 330.0 | 2.49 | 1.84 | 3.15 | 3.13 | 4.75 | 1.84 | 154.0 | 1.5 | 330.0 | 4.63 | 3.25 | 5.57 | 5.10 | 6.98 | 3.25 | 154.0 |
| 347.0 | 2.87 | 10.67 | 3.56 | 7.37 | 2.74 | 2.74 | 352.0 | 1.5 | 347.0 | 3.40 | 12.20 | 3.88 | 7.87 | 2.86 | 2.86 | 352.0 |
| 359.0 | 2.20 | 3.02 | 3.06 | 2.39 | 2.31 | 2.20 | 90.0 | 1.5 | 359.0 | 2.50 | 3.37 | 3.28 | 2.82 | 2.48 | 2.48 | 352.0 |
| 371.0 | 3.02 | 4.44 | 2.89 | 2.33 | 2.64 | 2.33 | 286.0 | 1.5 | 371.0 | 3.16 | 4.67 | 3.18 | 2.74 | 2.87 | 2.74 | 286.0 |
| 383.0 | 1.43< | 4.48 | 2.66 | 2.97 | 3.15 | 1.43 | 90.0 | 1.5 | 383.0 | 2.08 | 4.65 | 2.85 | 3.10 | 3.54 | 2.08 | 90.0 |
| 394.0 | 2.19 | 1.52 | 2.45 | 2.34 | 3.47 | 1.52 | 154.0 | 1.5 | 394.0 | 2.83 | 2.14 | 2.87 | 3.03 | 3.91 | 2.14 | 154.0 |

SEGMENT MINIMUM = 1.36 AT THE 305.0 INCH STATION

SEGMENT MINIMUM = 1.89 AT THE 305.0 INCH STATION.

A " < " INDICATES THE PRECEDING SAFETY FACTOR HAS VIOLATED THE MINIMUM SAFETY FACTOR REQUIREMENT.

A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 15 RSRM-2A Forward Segment Star Tip Insulation Performance

RSRM-2A Forward Segment Star Tip

| STATION (IN) | MATERIAL DECOMPOSITION DEPTH (MDD) INCHES DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION | STATION (IN) | MATERIAL DECOMPOSITION RATE (MDR) MILS / SECOND DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.072 | 0.096 | 0 | 0 | 0.036 | 0.096 | 0.041 | 0.036 | 0.043 | 3.5 | 2.1 | 2.8 | 0 | 0 | 1.1 | 1.2 | 34.1 |
| 13.0 | 0.041 | 0.001 | 0 | 0.042 | 0 | 0.042 | 0.017 | 0.001 | 0.023 | 13.0 | 1.9 | 0 | 0 | 1.9 | 0 | 0.8 | 22.0 |
| 23.0 | 0 | 0 | 0 | 0 | 0 | | | | | 23.0 | 0 | 0 | 0 | 0 | 0 | | 7.9 |
| 27.0 | 0 | 0 | 0 | 0 | 0 | | | | | 27.0 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 30.7 | 0 | 0 | 0 | 0 | 0 | | | | | 30.7 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 34.2 | 0 | 0 | 0 | 0 | 0 | | | | | 34.2 | 0 | 0 | 0 | 0 | 0 | | 4.2 |
| 37.7 | 0 | 0 | 0 | 0 | 0 | | | | | 37.7 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 41.2 | 0 | 0 | 0 | 0 | 0 | | | | | 41.2 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 44.0 | 0 | 0 | 0 | 0 | 0 | | | | | 44.0 | 0 | 0 | 0 | 0 | 0 | | 3.0 |
| 94.7 | 0 | 0 | 0 | 0 | 0 | | | | | 94.7 | 0 | 0 | 0 | 0 | 0 | | 0.8 |
| 142.0 | 0 | 0 | 0 | 0 | 0 | | | | | 142.0 | 0 | 0 | 0 | 0 | 0 | | 1.0 |
| 145.7 | 0.004 | 0 | 0 | 0 | 0 | 0.004 | 0.001 | 0.000 | 0.002 | 145.7 | 0.3 | 0 | 0 | 0 | 0 | 0.1 | 13.7 |
| 148.5 | 0.033 | 0.022 | 0.003 | 0 | 0.014 | 0.033 | 0.014 | 0.014 | 0.014 | 148.5 | 1.5 | 1.0 | 0.1 | 0 | 0.6 | 0.6 | 22.2 |
| 152.0 | 0.043 | 0.031 | 0.010 | 0.024 | 0 | 0.043 | 0.022 | 0.024 | 0.017 | 152.0 | 1.3 | 1.0 | 0.3 | 0.7 | 0 | 0.7 | 32.3 |
| 155.0 | 0.020 | 0 | 0 | 0 | 0.001 | 0.020 | 0.004 | 0.000 | 0.009 | 155.0 | 0.5 | 0 | 0 | 0 | 0 | 0.1 | 40.2 |
| 162.0 | 0.183 | 0.129 | 0.032 | 0.085 | 0.134 | 0.183 | 0.113 | 0.129 | 0.057 | 162.0 | 3.2 | 2.2 | 0.6 | 1.5 | 2.3 | 2.0 | 57.5 |
| 171.0 | 0.193 | 0.251 | 0.311 | 0 | 0.232 | 0.311 | 0.197 | 0.232 | 0.118 | 171.0 | 2.4 | 3.2 | 3.9 | 0 | 2.9 | 2.5 | 79.1 |
| 175.5 | 0.194 | 0.079 | 0.142 | 0.151 | 0.182 | 0.194 | 0.150 | 0.151 | 0.045 | 175.5 | 2.2 | 0.9 | 1.6 | 1.7 | 2.1 | 1.7 | 88.4 |
| 187.0 | 0.237 | 0.204 | 0.188 | 0.190 | 0.214 | 0.237 | 0.207 | 0.204 | 0.020 | 187.0 | 2.3 | 2.0 | 1.9 | 1.9 | 2.1 | 2.0 | 101.1 |
| 199.0 | 0.223 | 0.212 | 0.203 | 0.203 | 0.241 | 0.241 | 0.216 | 0.212 | 0.016 | 199.0 | 2.2 | 2.1 | 2.0 | 2.0 | 2.4 | 2.1 | 101.1 |
| 215.0 | 0.241 | 0.216 | 0.217 | 0.228 | 0.236 | 0.241 | 0.228 | 0.228 | 0.011 | 215.0 | 2.4 | 2.1 | 2.1 | 2.3 | 2.3 | 2.3 | 101.1 |
| 224.0 | 0.216 | 0.310 | 0.230 | 0.234 | 0.198 | 0.310 | 0.238 | 0.230 | 0.043 | 224.0 | 2.1 | 3.1 | 2.3 | 2.3 | 2.0 | 2.4 | 101.1 |
| 230.0 | 0.174 | 0.210 | 0.175 | 0.159 | 0.183 | 0.210 | 0.180 | 0.175 | 0.019 | 230.0 | 1.7 | 2.1 | 1.7 | 1.6 | 1.8 | 1.8 | 101.1 |
| 236.0 | 0.251 | 0.237 | 0.198 | 0.234 | 0.254 | 0.254 | 0.235 | 0.237 | 0.022 | 236.0 | 2.5 | 2.3 | 2.0 | 2.3 | 2.5 | 2.3 | 101.1 |
| 240.0 | 0.237 | 0.220 | 0.219 | 0.245 | 0.225 | 0.245 | 0.229 | 0.225 | 0.011 | 240.0 | 2.3 | 2.2 | 2.2 | 2.4 | 2.2 | 2.3 | 101.1 |
| 251.0 | 0.260 | 0.169 | 0.235 | 0.248 | 0.243 | 0.260 | 0.231 | 0.243 | 0.036 | 251.0 | 2.6 | 1.7 | 2.3 | 2.5 | 2.4 | 2.3 | 101.1 |
| 263.0 | 0.193 | 0.225 | 0.210 | 0.238 | 0.157 | 0.238 | 0.205 | 0.210 | 0.031 | 263.0 | 1.9 | 2.2 | 2.1 | 2.4 | 1.6 | 2.0 | 101.1 |
| 280.0 | 0.253 | 0.216 | 0.227 | 0.287 | 0.207 | 0.287 | 0.238 | 0.227 | 0.032 | 280.0 | 2.5 | 2.1 | 2.2 | 2.8 | 2.0 | 2.4 | 101.1 |
| 293.0 | 0.199 | 0.176 | 0.214 | 0.160 | 0.145 | 0.214 | 0.179 | 0.176 | 0.028 | 293.0 | 2.0 | 1.7 | 2.1 | 1.6 | 1.4 | 1.8 | 101.1 |
| 305.0 | 0.207 | 0.386< | 0.165 | 0.183 | 0.223 | 0.386 | 0.233 | 0.207 | 0.088 | 305.0 | 2.0 | 3.8 | 1.6 | 1.8 | 2.2 | 2.3 | 101.1 |
| 312.0 | 0.178 | 0.230 | 0.191 | 0.152 | 0.203 | 0.230 | 0.191 | 0.191 | 0.029 | 312.0 | 1.8 | 2.3 | 1.9 | 1.5 | 2.0 | 1.9 | 101.1 |
| 321.0 | 0.294 | 0.225 | 0.235 | 0.205 | 0.231 | 0.294 | 0.238 | 0.231 | 0.033 | 321.0 | 2.8 | 2.2 | 2.3 | 2.0 | 2.2 | 2.3 | 103.3 |
| 330.0 | 0.221 | 0.299 | 0.175 | 0.176 | 0.116 | 0.299 | 0.197 | 0.176 | 0.068 | 330.0 | 2.2 | 3.0 | 1.7 | 1.7 | 1.2 | 2.0 | 100.7 |
| 347.0 | 0.182 | 0.049 | 0.147 | 0.071 | 0.191 | 0.191 | 0.128 | 0.147 | 0.065 | 347.0 | 1.8 | 0.5 | 1.5 | 0.7 | 1.9 | 1.3 | 99.1 |
| 359.0 | 0.236 | 0.172 | 0.170 | 0.218 | 0.225 | 0.236 | 0.204 | 0.218 | 0.031 | 359.0 | 2.4 | 1.7 | 1.7 | 2.2 | 2.3 | 2.1 | 98.7 |
| 371.0 | 0.172 | 0.117 | 0.180 | 0.223 | 0.197 | 0.223 | 0.178 | 0.180 | 0.039 | 371.0 | 1.8 | 1.2 | 1.9 | 2.4 | 2.1 | 1.9 | 94.0 |
| 383.0 | 0.357< | 0.114 | 0.192 | 0.172 | 0.162 | 0.357 | 0.199 | 0.172 | 0.093 | 383.0 | 3.7 | 1.2 | 2.0 | 1.8 | 1.7 | 2.1 | 95.3 |
| 394.0 | 0.230 | 0.332< | 0.205 | 0.215 | 0.145 | 0.332 | 0.225 | 0.215 | 0.068 | 394.0 | 2.4 | 3.4 | 2.1 | 2.2 | 1.5 | 2.3 | 96.9 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

Table 15 (Cont'd) RSRM-2A Forward Segment Star Tip Insulation Performance

RSRM-2A Forward Segment Star Tip

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.405 | 2.409 | 2.411 | 2.415 | 2.620 | 2.405 | 2.411 | 0.094 | 2.120 |
| 13.0 | 0.809 | 0.707 | 0.699 | 0.751 | 0.674 | 0.674 | 0.707 | 0.053 | 0.650 |
| 23.0 | 0.694 | 0.682 | 0.651 | 0.663 | 0.651 | 0.651 | 0.663 | 0.019 | 0.500 |
| 27.0 | 0.552 | 0.512 | 0.661 | 0.570 | 0.504 | 0.504 | 0.552 | 0.063 | 0.450 |
| 30.7 | 0.458 | 0.459 | 0.436 | 0.459 | 0.453 | 0.436 | 0.458 | 0.010 | 0.400 |
| 34.2 | 0.535 | 0.589 | 0.571 | 0.425 | 0.554 | 0.425 | 0.554 | 0.065 | 0.380 |
| 37.7 | 0.385 | 0.385 | 0.382 | 0.385 | 0.379 | 0.379 | 0.385 | 0.003 | 0.330 |
| 41.2 | 0.284 | 0.306 | 0.287 | 0.282 | 0.288 | 0.282 | 0.287 | 0.010 | 0.280 |
| 44.0 | 0.286 | 0.296 | 0.285 | 0.288 | 0.261 | 0.261 | 0.286 | 0.013 | 0.250 |
| 94.7 | 0.128 | 0.090 | 0.095 | 0.094 | 0.125 | 0.090 | 0.095 | 0.018 | 0.090 |
| 142.0 | 0.161 | 0.158 | 0.155 | 0.162 | 0.162 | 0.155 | 0.161 | 0.003 | 0.113 |
| 145.7 | 0.253 | 0.259 | 0.253 | 0.253 | 0.252 | 0.252 | 0.253 | 0.003 | 0.234 |
| 148.5 | 0.305 | 0.300 | 0.306 | 0.286 | 0.296 | 0.286 | 0.300 | 0.008 | 0.276 |
| 152.0 | 0.346 | 0.356 | 0.334 | 0.343 | 0.345 | 0.334 | 0.345 | 0.008 | 0.317 |
| 155.0 | 0.520 | 0.522 | 0.546 | 0.465 | 0.545 | 0.465 | 0.522 | 0.033 | 0.360 |
| 162.0 | 0.842 | 0.767 | 0.732 | 0.736 | 0.801 | 0.732 | 0.767 | 0.046 | 0.504 |
| 171.0 | 1.137 | 1.093 | 1.156 | 0.948 | 1.010 | 0.948 | 1.093 | 0.088 | 0.546 |
| 175.5 | 0.777 | 0.734 | 0.761 | 0.733 | 0.738 | 0.733 | 0.738 | 0.020 | 0.604 |
| 187.0 | 0.673 | 0.661 | 0.672 | 0.650 | 0.677 | 0.650 | 0.672 | 0.011 | 0.640 |
| 199.0 | 0.690 | 0.684 | 0.679 | 0.676 | 0.694 | 0.676 | 0.684 | 0.007 | 0.643 |
| 215.0 | 0.678 | 0.686 | 0.695 | 0.713 | 0.699 | 0.678 | 0.695 | 0.013 | 0.639 |
| 224.0 | 0.701 | 0.790 | 0.724 | 0.711 | 0.714 | 0.701 | 0.714 | 0.036 | 0.639 |
| 230.0 | 0.612 | 0.691 | 0.615 | 0.602 | 0.621 | 0.602 | 0.615 | 0.036 | 0.586 |
| 236.0 | 0.636 | 0.647 | 0.617 | 0.602 | 0.629 | 0.602 | 0.629 | 0.017 | 0.578 |
| 240.0 | 0.619 | 0.611 | 0.620 | 0.598 | 0.625 | 0.598 | 0.619 | 0.011 | 0.574 |
| 251.0 | 0.789 | 0.757 | 0.721 | 0.754 | 0.725 | 0.721 | 0.754 | 0.028 | 0.568 |
| 263.0 | 0.609 | 0.593 | 0.593 | 0.603 | 0.595 | 0.593 | 0.595 | 0.007 | 0.568 |
| 280.0 | 0.746 | 0.721 | 0.716 | 0.759 | 0.745 | 0.716 | 0.745 | 0.018 | 0.568 |
| 293.0 | 0.565 | 0.561 | 0.564 | 0.579 | 0.556 | 0.556 | 0.564 | 0.009 | 0.546 |
| 305.0 | 0.555 | 0.730 | 0.534 | 0.538 | 0.563 | 0.534 | 0.555 | 0.082 | 0.525 |
| 312.0 | 0.613 | 0.606 | 0.584 | 0.542 | 0.609 | 0.542 | 0.606 | 0.030 | 0.523 |
| 321.0 | 1.008 | 0.949 | 0.979 | 0.985 | 1.011 | 0.949 | 0.985 | 0.025 | 0.918 |
| 330.0 | 1.024 | 0.971 | 0.975 | 0.897 | 0.810 | 0.810 | 0.971 | 0.083 | 0.551 |
| 347.0 | 0.618 | 0.598 | 0.570 | 0.559 | 0.547 | 0.547 | 0.570 | 0.029 | 0.523 |
| 359.0 | 0.591 | 0.580 | 0.557 | 0.615 | 0.558 | 0.557 | 0.580 | 0.024 | 0.520 |
| 371.0 | 0.544 | 0.546 | 0.572 | 0.611 | 0.565 | 0.544 | 0.565 | 0.027 | 0.520 |
| 383.0 | 0.744 | 0.530 | 0.548 | 0.534 | 0.574 | 0.530 | 0.548 | 0.090 | 0.511 |
| 394.0 | 0.650 | 0.711 | 0.589 | 0.652 | 0.567 | 0.567 | 0.650 | 0.057 | 0.503 |

Table 15 (Cont'd) RSRM-2A Forward Segment Star Tip Insulation Performance

RSRM-2A Forward Segment Star Tip

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.333 | 2.313 | 2.450 | 2.435 | 2.584 | 2.313 | 2.435 | 0.108 |
| 13.0 | 0.768 | 0.706 | 0.715 | 0.709 | 0.700 | 0.700 | 0.709 | 0.028 |
| 23.0 | L | L | L | L | L | 0.651 | 0.663 | 0.019 |
| 27.0 | L | L | L | L | L | 0.504 | 0.552 | 0.063 |
| 30.7 | L | L | L | L | L | 0.436 | 0.458 | 0.010 |
| 34.2 | L | L | L | L | L | 0.425 | 0.554 | 0.065 |
| 37.7 | L | L | L | L | L | 0.379 | 0.385 | 0.003 |
| 41.2 | L | L | L | L | L | 0.282 | 0.287 | 0.010 |
| 44.0 | L | L | L | L | L | 0.261 | 0.286 | 0.013 |
| 94.7 | L | L | L | L | L | 0.090 | 0.095 | 0.018 |
| 142.0 | L | L | L | L | L | 0.155 | 0.161 | 0.003 |
| 145.7 | 0.249 | 0.262 | 0.266 | 0.254 | 0.262 | 0.249 | 0.262 | 0.007 |
| 148.5 | 0.272 | 0.278 | 0.303 | 0.295 | 0.282 | 0.272 | 0.282 | 0.013 |
| 152.0 | 0.303 | 0.325 | 0.324 | 0.319 | 0.395 | 0.303 | 0.324 | 0.036 |
| 155.0 | 0.500 | 0.529 | 0.570 | 0.519 | 0.544 | 0.500 | 0.529 | 0.026 |
| 162.0 | 0.659 | 0.638 | 0.700 | 0.651 | 0.667 | 0.638 | 0.659 | 0.023 |
| 171.0 | 0.944 | 0.842 | 0.845 | 0.950 | 0.778 | 0.778 | 0.845 | 0.074 |
| 175.5 | 0.583 | 0.655 | 0.619 | 0.582 | 0.556 | 0.556 | 0.583 | 0.039 |
| 187.0 | 0.436 | 0.457 | 0.484 | 0.460 | 0.463 | 0.436 | 0.460 | 0.017 |
| 199.0 | 0.467 | 0.472 | 0.476 | 0.473 | 0.453 | 0.453 | 0.472 | 0.009 |
| 215.0 | 0.437 | 0.470 | 0.478 | 0.485 | 0.463 | 0.437 | 0.470 | 0.019 |
| 224.0 | 0.485 | 0.480 | 0.494 | 0.477 | 0.516 | 0.477 | 0.485 | 0.016 |
| 230.0 | 0.438 | 0.481 | 0.440 | 0.443 | 0.438 | 0.438 | 0.440 | 0.019 |
| 236.0 | 0.385 | 0.410 | 0.419 | 0.368 | 0.375 | 0.368 | 0.385 | 0.022 |
| 240.0 | 0.382 | 0.391 | 0.401 | 0.353 | 0.400 | 0.353 | 0.391 | 0.020 |
| 251.0 | 0.529 | 0.588 | 0.486 | 0.506 | 0.482 | 0.482 | 0.506 | 0.043 |
| 263.0 | 0.416 | 0.368 | 0.383 | 0.365 | 0.438 | 0.365 | 0.383 | 0.032 |
| 280.0 | 0.493 | 0.505 | 0.489 | 0.472 | 0.538 | 0.472 | 0.493 | 0.025 |
| 293.0 | 0.366 | 0.385 | 0.350 | 0.419 | 0.411 | 0.350 | 0.385 | 0.029 |
| 305.0 | 0.348 | 0.344 | 0.369 | 0.355 | 0.340 | 0.340 | 0.348 | 0.011 |
| 312.0 | 0.435 | 0.376 | 0.393 | 0.390 | 0.406 | 0.376 | 0.393 | 0.022 |
| 321.0 | 0.714 | 0.724 | 0.744 | 0.780 | 0.780 | 0.714 | 0.744 | 0.031 |
| 330.0 | 0.803 | 0.672 | 0.800 | 0.721 | 0.694 | 0.672 | 0.721 | 0.061 |
| 347.0 | 0.436 | 0.549 | 0.423 | 0.488 | 0.356 | 0.356 | 0.436 | 0.072 |
| 359.0 | 0.355 | 0.408 | 0.387 | 0.397 | 0.333 | 0.333 | 0.387 | 0.031 |
| 371.0 | 0.372 | 0.429 | 0.392 | 0.388 | 0.368 | 0.368 | 0.388 | 0.024 |
| 383.0 | 0.387 | 0.416 | 0.356 | 0.362 | 0.412 | 0.356 | 0.387 | 0.028 |
| 394.0 | 0.420 | 0.379 | 0.384 | 0.437 | 0.422 | 0.379 | 0.420 | 0.025 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUE WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 15 (Cont'd) RSRM-2A Forward Segment Star Tip Insulation Performance

RSRM-2A Forward Segment Non-Star Tip

| STATION (IN) | COMPLIANCE SAFETY FACTOR (CSF) DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|
| 3.5 | 36.55 | + | 31.64 | 16.83 | 12.77 | 12.77 | 336.0 | 2.0 |
| 13.0 | + | + | + | 28.26 | + | 28.26 | 270.0 | 1.5 |
| 23.0 | + | + | + | + | + | | | 1.5 |
| 27.0 | + | + | + | + | + | | | 1.5 |
| 30.7 | + | + | + | + | + | | | 1.5 |
| 34.2 | + | + | + | + | + | | | 1.5 |
| 37.7 | + | + | + | + | + | | | 1.5 |
| 41.2 | + | + | + | + | + | | | 1.5 |
| 44.0 | + | + | + | + | + | | | 1.5 |
| 94.7 | + | + | + | + | + | | | 1.5 |
| 142.0 | + | + | + | + | + | | | 1.5 |
| 145.7 | + | + | + | + | + | | | 1.5 |
| 148.5 | + | + | + | + | + | | | 1.5 |
| 152.0 | 35.22 | 17.61 | + | 15.85 | + | 15.85 | 270.0 | 1.5 |
| 155.0 | 7.66 | + | 60.00 | + | + | 7.66 | 74.0 | 1.5 |
| 162.0 | 4.85 | 4.31 | 5.42 | 6.15 | 4.10 | 4.10 | 336.0 | 2.0 |
| 171.0 | 1.96 | 4.71 | 1.99 | + | 7.91 | 1.96 | 74.0 | 1.5 |
| 175.5 | 4.47 | 4.14 | 4.72 | 3.64 | 3.95 | 3.64 | 270.0 | 1.5 |
| 187.0 | 4.00 | 5.57 | 5.08 | 4.67 | 3.76 | 3.76 | 336.0 | 1.5 |
| 199.0 | 2.50 | 4.34 | 4.50 | 5.14 | 3.78 | 2.50 | 74.0 | 1.5 |
| 215.0 | 5.56 | 6.52 | 8.64 | 5.92 | 6.20 | 5.56 | 74.0 | 1.5 |
| 224.0 | 5.03 | 5.20 | 7.10 | 5.03 | 4.77 | 4.77 | 336.0 | 1.5 |
| 230.0 | 3.99 | 4.61 | 4.41 | 5.53 | 1.78 | 1.78 | 336.0 | 1.5 |
| 236.0 | 3.07 | 1.86 | 5.21 | 4.45 | 4.07 | 1.86 | 140.0 | 1.5 |
| 240.0 | 4.13 | 3.90 | 5.08 | 4.74 | 2.91 | 2.91 | 336.0 | 1.5 |
| 251.0 | 3.30 | 4.40 | 5.57 | 4.00 | 4.15 | 3.30 | 74.0 | 1.5 |
| 263.0 | 4.27 | 2.32 | 6.11 | 5.46 | 2.05 | 2.05 | 336.0 | 1.5 |
| 280.0 | 7.47 | 3.38 | 4.62 | 3.23 | 4.54 | 3.23 | 270.0 | 1.5 |
| 293.0 | 4.01 | 4.01 | 5.41 | 5.81 | 3.77 | 3.77 | 336.0 | 1.5 |
| 305.0 | 4.41 | 2.98 | 4.57 | 4.41 | 3.65 | 2.98 | 140.0 | 1.5 |
| 312.0 | 7.37 | 4.71 | 7.47 | 34.87 | 5.03 | 4.71 | 140.0 | 1.5 |
| 321.0 | 6.16 | 5.50 | 6.04 | 7.46 | 5.88 | 5.50 | 140.0 | 2.0 |
| 330.0 | 3.67 | 4.44 | 3.32 | 4.37 | 2.07 | 2.07 | 336.0 | 1.5 |
| 347.0 | 1.71 | 1.97 | 4.47 | 3.01 | 3.79 | 1.71 | 74.0 | 1.5 |
| 359.0 | 2.81 | 5.15 | 1.64 | 3.13 | 1.68 | 1.64 | 206.0 | 1.5 |
| 371.0 | 3.35 | 2.55 | 3.54 | 3.27 | 2.28 | 2.28 | 336.0 | 1.5 |
| 383.0 | 2.65 | 4.06 | 4.87 | 3.17 | 5.21 | 2.65 | 74.0 | 1.5 |
| 394.0 | 1.76 | 2.00 | 3.01 | 2.40 | 3.99 | 1.76 | 74.0 | 1.5 |

SEGMENT MINIMUM = 1.64 AT THE 359.0 INCH STATION

A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

| STATION (IN) | ACTUAL SAFETY FACTOR (ASF) DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|
| 3.5 | 41.83 | + | 37.58 | 19.14 | 15.49 | 15.49 | 336.0 |
| 13.0 | + | + | + | 31.74 | + | 31.74 | 270.0 |
| 23.0 | + | + | + | + | + | | |
| 27.0 | + | + | + | + | + | | |
| 30.7 | + | + | + | + | + | | |
| 34.2 | + | + | + | + | + | | |
| 37.7 | + | + | + | + | + | | |
| 41.2 | + | + | + | + | + | | |
| 44.0 | + | + | + | + | + | | |
| 94.7 | + | + | + | + | + | | |
| 142.0 | + | + | + | + | + | | |
| 145.7 | + | + | + | + | + | | |
| 148.5 | + | + | + | + | + | | |
| 152.0 | 38.22 | 19.89 | + | 17.35 | + | 17.35 | 270.0 |
| 155.0 | 11.83 | + | 88.00 | + | + | 11.83 | 74.0 |
| 162.0 | 7.38 | 6.67 | 8.12 | 8.95 | 6.26 | 6.26 | 336.0 |
| 171.0 | 4.19 | 9.71 | 4.18 | + | 14.26 | 4.18 | 206.0 |
| 175.5 | 5.50 | 5.19 | 5.90 | 4.63 | 4.88 | 4.63 | 270.0 |
| 187.0 | 4.13 | 5.83 | 5.21 | 4.96 | 4.15 | 4.13 | 74.0 |
| 199.0 | 3.20 | 4.66 | 4.72 | 5.42 | 4.29 | 3.20 | 74.0 |
| 215.0 | 5.82 | 6.73 | 9.31 | 6.41 | 6.74 | 5.82 | 74.0 |
| 224.0 | 5.67 | 5.64 | 7.61 | 5.58 | 5.34 | 5.34 | 336.0 |
| 230.0 | 4.30 | 4.87 | 4.62 | 5.74 | 2.48 | 2.48 | 336.0 |
| 236.0 | 3.43 | 2.51 | 5.49 | 4.63 | 4.65 | 2.51 | 140.0 |
| 240.0 | 4.42 | 4.19 | 5.44 | 5.03 | 3.43 | 3.43 | 336.0 |
| 251.0 | 4.55 | 6.63 | 7.07 | 5.28 | 5.21 | 4.55 | 74.0 |
| 263.0 | 4.41 | 3.07 | 6.16 | 5.71 | 2.76 | 2.76 | 336.0 |
| 280.0 | 9.95 | 4.41 | 5.85 | 4.25 | 5.90 | 4.25 | 270.0 |
| 293.0 | 4.22 | 4.14 | 5.50 | 5.98 | 4.01 | 4.01 | 336.0 |
| 305.0 | 4.64 | 3.52 | 4.73 | 4.50 | 3.87 | 3.52 | 140.0 |
| 312.0 | 8.54 | 6.05 | 8.53 | 36.93 | 5.87 | 5.87 | 336.0 |
| 321.0 | 6.57 | 5.90 | 6.64 | 7.87 | 6.54 | 5.90 | 140.0 |
| 330.0 | 6.55 | 7.23 | 5.73 | 7.70 | 3.38 | 3.38 | 336.0 |
| 347.0 | 2.51 | 2.71 | 4.65 | 3.40 | 4.10 | 2.51 | 74.0 |
| 359.0 | 3.10 | 5.39 | 2.20 | 3.51 | 2.33 | 2.20 | 206.0 |
| 371.0 | 3.75 | 2.92 | 3.84 | 3.52 | 2.58 | 2.58 | 336.0 |
| 383.0 | 2.94 | 4.26 | 5.07 | 3.37 | 5.76 | 2.94 | 74.0 |
| 394.0 | 2.33 | 2.40 | 3.25 | 2.84 | 4.72 | 2.33 | 74.0 |

SEGMENT MINIMUM = 2.20 AT THE 359.0 INCH STATION.

Table 16 RSRM-2A Forward Segment Non-Star Tip Insulation Performance

RSRM-2A Forward Segment Non-Star Tip

| STATION (IN) | MATERIAL DECOMPOSITION DEPTH (MDD) INCHES DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION | STATION (IN) | MATERIAL DECOMPOSITION RATE (MDR) MILS / SECOND DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.058 | 0 | 0.067 | 0.126< | 0.166< | 0.166 | 0.083 | 0.067 | 0.064 | 3.5 | 1.7 | 0 | 2.0 | 3.7 | 4.9 | 2.4 | 34.1 |
| 13.0 | 0 | 0.004 | 0 | 0.023 | 0 | 0.023 | 0.005 | 0.000 | 0.010 | 13.0 | 0 | 0.2 | 0 | 1.0 | 0 | 0.2 | 22.0 |
| 23.0 | 0 | 0 | 0 | 0 | 0 | | | | | 23.0 | 0 | 0 | 0 | 0 | 0 | | 7.9 |
| 27.0 | 0 | 0 | 0 | 0 | 0 | | | | | 27.0 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 30.7 | 0 | 0 | 0 | 0 | 0 | | | | | 30.7 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 34.2 | 0 | 0 | 0 | 0 | 0 | | | | | 34.2 | 0 | 0 | 0 | 0 | 0 | | 4.2 |
| 37.7 | 0 | 0 | 0 | 0 | 0 | | | | | 37.7 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 41.2 | 0 | 0 | 0 | 0 | 0 | | | | | 41.2 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 44.0 | 0 | 0 | 0 | 0 | 0 | | | | | 44.0 | 0 | 0 | 0 | 0 | 0 | | 3.0 |
| 94.7 | 0 | 0 | 0 | 0 | 0 | | | | | 94.7 | 0 | 0 | 0 | 0 | 0 | | 0.8 |
| 142.0 | 0 | 0 | 0 | 0 | 0 | | | | | 142.0 | 0 | 0 | 0 | 0 | 0 | | 1.0 |
| 145.7 | 0 | 0 | 0 | 0 | 0 | | | | | 145.7 | 0 | 0 | 0 | 0 | 0 | | 2.0 |
| 148.5 | 0 | 0 | 0 | 0 | 0 | | | | | 148.5 | 0 | 0 | 0 | 0 | 0 | | 10.7 |
| 152.0 | 0.009 | 0.018 | 0 | 0.020 | 0 | 0.020 | 0.009 | 0.009 | 0.010 | 152.0 | 0.4 | 0.9 | 0 | 1.0 | 0 | 0.5 | 20.6 |
| 155.0 | 0.047 | 0 | 0.006 | 0 | 0 | 0.047 | 0.011 | 0.000 | 0.021 | 155.0 | 1.7 | 0 | 0.2 | 0 | 0 | 0.4 | 28.1 |
| 162.0 | 0.104 | 0.117 | 0.093 | 0.082 | 0.123 | 0.123 | 0.104 | 0.104 | 0.017 | 162.0 | 2.4 | 2.7 | 2.1 | 1.9 | 2.8 | 2.4 | 44.0 |
| 171.0 | 0.279 | 0.116 | 0.274 | 0 | 0.069 | 0.279 | 0.148 | 0.116 | 0.125 | 171.0 | 4.6 | 1.9 | 4.5 | 0 | 1.1 | 2.4 | 61.0 |
| 175.5 | 0.135 | 0.146 | 0.128 | 0.166 | 0.153 | 0.166 | 0.146 | 0.146 | 0.015 | 175.5 | 2.0 | 2.2 | 1.9 | 2.4 | 2.3 | 2.1 | 67.8 |
| 187.0 | 0.160 | 0.115 | 0.126 | 0.137 | 0.170 | 0.170 | 0.142 | 0.137 | 0.023 | 187.0 | 2.4 | 1.7 | 1.9 | 2.1 | 2.6 | 2.1 | 66.0 |
| 199.0 | 0.257 | 0.148 | 0.143 | 0.125 | 0.170 | 0.257 | 0.169 | 0.148 | 0.052 | 199.0 | 3.9 | 2.2 | 2.2 | 1.9 | 2.6 | 2.6 | 66.0 |
| 215.0 | 0.115 | 0.098 | 0.074 | 0.108 | 0.103 | 0.115 | 0.100 | 0.103 | 0.016 | 215.0 | 1.7 | 1.5 | 1.1 | 1.6 | 1.6 | 1.5 | 66.0 |
| 224.0 | 0.127 | 0.123 | 0.090 | 0.127 | 0.134 | 0.134 | 0.120 | 0.127 | 0.017 | 224.0 | 1.9 | 1.9 | 1.4 | 1.9 | 2.0 | 1.8 | 66.0 |
| 230.0 | 0.147 | 0.127 | 0.133 | 0.106 | 0.330 | 0.330 | 0.169 | 0.133 | 0.091 | 230.0 | 2.2 | 1.9 | 2.0 | 1.6 | 5.0 | 2.6 | 66.0 |
| 236.0 | 0.188 | 0.311 | 0.111 | 0.130 | 0.142 | 0.311 | 0.176 | 0.142 | 0.080 | 236.0 | 2.8 | 4.7 | 1.7 | 2.0 | 2.2 | 2.7 | 66.0 |
| 240.0 | 0.139 | 0.147 | 0.113 | 0.121 | 0.197 | 0.197 | 0.143 | 0.139 | 0.033 | 240.0 | 2.1 | 2.2 | 1.7 | 1.8 | 3.0 | 2.2 | 66.0 |
| 251.0 | 0.172 | 0.129 | 0.102 | 0.142 | 0.137 | 0.172 | 0.136 | 0.137 | 0.025 | 251.0 | 2.6 | 2.0 | 1.5 | 2.2 | 2.1 | 2.1 | 66.0 |
| 263.0 | 0.133 | 0.245 | 0.093 | 0.104 | 0.277 | 0.277 | 0.170 | 0.133 | 0.085 | 263.0 | 2.0 | 3.7 | 1.4 | 1.6 | 4.2 | 2.6 | 66.0 |
| 280.0 | 0.076 | 0.168 | 0.123 | 0.176 | 0.125 | 0.176 | 0.134 | 0.125 | 0.040 | 280.0 | 1.2 | 2.5 | 1.9 | 2.7 | 1.9 | 2.0 | 66.0 |
| 293.0 | 0.136 | 0.136 | 0.101 | 0.094 | 0.145 | 0.145 | 0.122 | 0.136 | 0.023 | 293.0 | 2.1 | 2.1 | 1.5 | 1.4 | 2.2 | 1.9 | 66.0 |
| 305.0 | 0.119 | 0.176 | 0.115 | 0.119 | 0.144 | 0.176 | 0.135 | 0.119 | 0.026 | 305.0 | 1.8 | 2.7 | 1.7 | 1.8 | 2.2 | 2.0 | 66.0 |
| 312.0 | 0.071 | 0.111 | 0.070 | 0.015 | 0.104 | 0.111 | 0.074 | 0.071 | 0.038 | 312.0 | 1.1 | 1.7 | 1.1 | 0.2 | 1.6 | 1.1 | 66.0 |
| 321.0 | 0.149 | 0.167 | 0.152 | 0.123 | 0.156 | 0.167 | 0.149 | 0.152 | 0.016 | 321.0 | 2.0 | 2.3 | 2.1 | 1.7 | 2.1 | 2.0 | 73.3 |
| 330.0 | 0.150 | 0.124 | 0.166 | 0.126 | 0.266 | 0.266 | 0.166 | 0.150 | 0.058 | 330.0 | 2.1 | 1.7 | 2.3 | 1.7 | 3.7 | 2.3 | 72.3 |
| 347.0 | 0.306 | 0.266 | 0.117 | 0.174 | 0.138 | 0.306 | 0.200 | 0.174 | 0.082 | 347.0 | 4.3 | 3.7 | 1.6 | 2.4 | 1.9 | 2.8 | 71.8 |
| 359.0 | 0.185 | 0.101 | 0.318< | 0.166 | 0.310< | 0.318 | 0.216 | 0.185 | 0.095 | 359.0 | 2.6 | 1.4 | 4.4 | 2.3 | 4.3 | 3.0 | 71.6 |
| 371.0 | 0.155 | 0.204 | 0.147 | 0.159 | 0.228 | 0.228 | 0.179 | 0.159 | 0.035 | 371.0 | 2.2 | 2.9 | 2.1 | 2.3 | 3.3 | 2.6 | 69.4 |
| 383.0 | 0.193 | 0.126 | 0.105 | 0.161 | 0.098 | 0.193 | 0.137 | 0.126 | 0.040 | 383.0 | 2.7 | 1.8 | 1.5 | 2.3 | 1.4 | 1.9 | 70.2 |
| 394.0 | 0.286 | 0.251 | 0.167 | 0.210 | 0.126 | 0.286 | 0.208 | 0.210 | 0.064 | 394.0 | 4.0 | 3.5 | 2.4 | 3.0 | 1.8 | 2.9 | 70.8 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

Table 16 (Cont'd) RSRM-2A Forward Segment Non-Star Tip Insulation Performance

RSRM-2A Forward Segment Non-Star Tip

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.426 | 2.410 | 2.518 | 2.412 | 2.572 | 2.410 | 2.426 | 0.073 | 2.120 |
| 13.0 | 0.714 | 0.713 | 0.698 | 0.730 | 0.697 | 0.697 | 0.713 | 0.014 | 0.650 |
| 23.0 | 0.687 | 0.675 | 0.694 | 0.705 | 0.683 | 0.675 | 0.687 | 0.011 | 0.500 |
| 27.0 | 0.556 | 0.621 | 0.517 | 0.517 | 0.516 | 0.516 | 0.517 | 0.046 | 0.450 |
| 30.7 | 0.458 | 0.469 | 0.458 | 0.430 | 0.453 | 0.430 | 0.458 | 0.014 | 0.400 |
| 34.2 | 0.554 | 0.530 | 0.535 | 0.428 | 0.511 | 0.428 | 0.530 | 0.049 | 0.380 |
| 37.7 | 0.392 | 0.385 | 0.383 | 0.383 | 0.382 | 0.382 | 0.383 | 0.004 | 0.330 |
| 41.2 | 0.280 | 0.282 | 0.294 | 0.280 | 0.281 | 0.280 | 0.281 | 0.006 | 0.280 |
| 44.0 | 0.290 | 0.290 | 0.296 | 0.264 | 0.263 | 0.263 | 0.290 | 0.016 | 0.250 |
| 94.7 | 0.095 | 0.093 | 0.126 | 0.092 | 0.093 | 0.092 | 0.093 | 0.015 | 0.090 |
| 142.0 | 0.165 | 0.153 | 0.153 | 0.162 | 0.166 | 0.153 | 0.162 | 0.006 | 0.113 |
| 145.7 | 0.244 | 0.255 | 0.255 | 0.246 | 0.246 | 0.244 | 0.246 | 0.005 | 0.234 |
| 148.5 | 0.283 | 0.304 | 0.302 | 0.289 | 0.295 | 0.283 | 0.295 | 0.009 | 0.276 |
| 152.0 | 0.344 | 0.358 | 0.404 | 0.347 | 0.345 | 0.344 | 0.347 | 0.025 | 0.317 |
| 155.0 | 0.556 | 0.514 | 0.528 | 0.527 | 0.538 | 0.514 | 0.528 | 0.016 | 0.360 |
| 162.0 | 0.767 | 0.780 | 0.755 | 0.734 | 0.770 | 0.734 | 0.767 | 0.018 | 0.504 |
| 171.0 | 1.170 | 1.126 | 1.144 | 0.993 | 0.984 | 0.984 | 1.126 | 0.088 | 0.546 |
| 175.5 | 0.743 | 0.758 | 0.755 | 0.768 | 0.747 | 0.743 | 0.755 | 0.010 | 0.604 |
| 187.0 | 0.660 | 0.671 | 0.657 | 0.679 | 0.705 | 0.657 | 0.671 | 0.019 | 0.640 |
| 199.0 | 0.822 | 0.689 | 0.675 | 0.678 | 0.729 | 0.675 | 0.689 | 0.062 | 0.643 |
| 215.0 | 0.669 | 0.660 | 0.689 | 0.692 | 0.694 | 0.660 | 0.689 | 0.015 | 0.639 |
| 224.0 | 0.720 | 0.694 | 0.685 | 0.709 | 0.715 | 0.685 | 0.709 | 0.015 | 0.639 |
| 230.0 | 0.632 | 0.619 | 0.615 | 0.608 | 0.820 | 0.608 | 0.619 | 0.091 | 0.586 |
| 236.0 | 0.645 | 0.780 | 0.609 | 0.602 | 0.660 | 0.602 | 0.645 | 0.072 | 0.578 |
| 240.0 | 0.615 | 0.616 | 0.615 | 0.609 | 0.675 | 0.609 | 0.615 | 0.028 | 0.574 |
| 251.0 | 0.783 | 0.855 | 0.721 | 0.750 | 0.714 | 0.714 | 0.750 | 0.057 | 0.568 |
| 263.0 | 0.587 | 0.751 | 0.573 | 0.594 | 0.764 | 0.573 | 0.594 | 0.095 | 0.568 |
| 280.0 | 0.756 | 0.741 | 0.720 | 0.748 | 0.737 | 0.720 | 0.741 | 0.014 | 0.568 |
| 293.0 | 0.574 | 0.563 | 0.556 | 0.562 | 0.581 | 0.556 | 0.563 | 0.010 | 0.546 |
| 305.0 | 0.552 | 0.619 | 0.544 | 0.535 | 0.557 | 0.535 | 0.552 | 0.033 | 0.525 |
| 312.0 | 0.606 | 0.672 | 0.597 | 0.554 | 0.610 | 0.554 | 0.606 | 0.042 | 0.523 |
| 321.0 | 0.979 | 0.985 | 1.010 | 0.968 | 1.020 | 0.968 | 0.985 | 0.022 | 0.918 |
| 330.0 | 0.982 | 0.897 | 0.952 | 0.970 | 0.898 | 0.897 | 0.952 | 0.040 | 0.551 |
| 347.0 | 0.769 | 0.720 | 0.544 | 0.591 | 0.566 | 0.544 | 0.591 | 0.100 | 0.523 |
| 359.0 | 0.573 | 0.544 | 0.701 | 0.582 | 0.721 | 0.544 | 0.582 | 0.081 | 0.520 |
| 371.0 | 0.582 | 0.596 | 0.564 | 0.560 | 0.588 | 0.560 | 0.582 | 0.015 | 0.520 |
| 383.0 | 0.568 | 0.537 | 0.532 | 0.542 | 0.564 | 0.532 | 0.542 | 0.016 | 0.511 |
| 394.0 | 0.667 | 0.602 | 0.542 | 0.597 | 0.595 | 0.542 | 0.597 | 0.044 | 0.503 |

Table 16 (Cont'd) RSRM-2A Forward Segment Non-Star Tip Insulation Performance

RSRM-2A Forward Segment Non-Star Tip

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.368 | 2.448 | 2.451 | 2.286 | 2.406 | 2.286 | 2.406 | 0.068 |
| 13.0 | 0.720 | 0.709 | 0.700 | 0.707 | 0.709 | 0.700 | 0.709 | 0.007 |
| 23.0 | L | L | L | L | L | 0.675 | 0.687 | 0.011 |
| 27.0 | L | L | L | L | L | 0.516 | 0.517 | 0.046 |
| 30.7 | L | L | L | L | L | 0.430 | 0.458 | 0.014 |
| 34.2 | L | L | L | L | L | 0.428 | 0.530 | 0.049 |
| 37.7 | L | L | L | L | L | 0.382 | 0.383 | 0.004 |
| 41.2 | L | L | L | L | L | 0.280 | 0.281 | 0.006 |
| 44.0 | L | L | L | L | L | 0.263 | 0.290 | 0.016 |
| 94.7 | L | L | L | L | L | 0.092 | 0.093 | 0.015 |
| 142.0 | L | L | L | L | L | 0.153 | 0.162 | 0.006 |
| 145.7 | L | L | L | L | L | 0.244 | 0.246 | 0.005 |
| 148.5 | L | L | L | L | L | 0.283 | 0.295 | 0.009 |
| 152.0 | 0.335 | 0.340 | L | 0.327 | 0.352 | 0.327 | 0.340 | 0.031 |
| 155.0 | 0.509 | 0.539 | 0.522 | 0.537 | 0.609 | 0.509 | 0.537 | 0.039 |
| 162.0 | 0.663 | 0.663 | 0.662 | 0.652 | 0.647 | 0.647 | 0.662 | 0.007 |
| 171.0 | 0.891 | 1.010 | 0.870 | 1.026 | 0.915 | 0.870 | 0.915 | 0.071 |
| 175.5 | 0.608 | 0.612 | 0.627 | 0.602 | 0.594 | 0.594 | 0.608 | 0.012 |
| 187.0 | 0.500 | 0.556 | 0.531 | 0.542 | 0.535 | 0.500 | 0.535 | 0.021 |
| 199.0 | 0.565 | 0.541 | 0.532 | 0.553 | 0.559 | 0.532 | 0.553 | 0.013 |
| 215.0 | 0.554 | 0.562 | 0.615 | 0.584 | 0.591 | 0.554 | 0.584 | 0.024 |
| 224.0 | 0.593 | 0.571 | 0.595 | 0.582 | 0.581 | 0.571 | 0.582 | 0.010 |
| 230.0 | 0.485 | 0.492 | 0.482 | 0.502 | 0.490 | 0.482 | 0.490 | 0.008 |
| 236.0 | 0.457 | 0.469 | 0.498 | 0.472 | 0.518 | 0.457 | 0.472 | 0.025 |
| 240.0 | 0.476 | 0.469 | 0.502 | 0.488 | 0.478 | 0.469 | 0.478 | 0.013 |
| 251.0 | 0.611 | 0.726 | 0.619 | 0.608 | 0.577 | 0.577 | 0.611 | 0.057 |
| 263.0 | 0.454 | 0.506 | 0.480 | 0.490 | 0.487 | 0.454 | 0.487 | 0.019 |
| 280.0 | 0.680 | 0.573 | 0.597 | 0.572 | 0.612 | 0.572 | 0.597 | 0.044 |
| 293.0 | 0.438 | 0.427 | 0.455 | 0.468 | 0.436 | 0.427 | 0.438 | 0.016 |
| 305.0 | 0.433 | 0.443 | 0.429 | 0.416 | 0.413 | 0.413 | 0.429 | 0.012 |
| 312.0 | 0.535 | 0.561 | 0.527 | 0.539 | 0.506 | 0.506 | 0.535 | 0.020 |
| 321.0 | 0.830 | 0.818 | 0.858 | 0.845 | 0.864 | 0.818 | 0.845 | 0.019 |
| 330.0 | 0.832 | 0.773 | 0.786 | 0.844 | 0.632 | 0.632 | 0.786 | 0.085 |
| 347.0 | 0.463 | 0.454 | 0.427 | 0.417 | 0.428 | 0.417 | 0.428 | 0.020 |
| 359.0 | 0.388 | 0.443 | 0.383 | 0.416 | 0.411 | 0.383 | 0.411 | 0.024 |
| 371.0 | 0.427 | 0.392 | 0.417 | 0.401 | 0.360 | 0.360 | 0.401 | 0.026 |
| 383.0 | 0.375 | 0.411 | 0.427 | 0.381 | 0.466 | 0.375 | 0.411 | 0.037 |
| 394.0 | 0.381 | 0.351 | 0.375 | 0.387 | 0.469 | 0.351 | 0.381 | 0.045 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUE WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 16 (Cont'd) RSRM-2A Forward Segment Non-Star Tip Insulation Performance

Table 17 RSRM-2B Nozzle to Case Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 0.0 | 5.519 | 4.569 | 0.950 | 5.2 | 5.8 |
| 21.6 | 5.529 | 5.040 | 0.489 | 10.0 | 11.3 |
| 46.8 | 5.521 | 4.835 | 0.686 | 7.1 | 8.0 |
| 68.4 | 5.500 | 5.035 | 0.465 | 10.5 | 11.8 |
| 90.0 | 5.523 | 5.070 | 0.453 | 10.8 | 12.2 |
| 111.6 | 5.488 | 5.505 | 0.000 | + | + |
| 136.8 | 5.517 | 4.415 | 1.102 | 4.4 | 5.0 |
| 158.4 | 5.465 | 4.724 | 0.741 | 6.6 | 7.4 |
| 180.0 | 5.530 | 4.900 | 0.630 | 7.8 | 8.8 |
| 201.6 | 5.514 | 4.282 | 1.232 | 4.0 | 4.5 |
| 226.8 | 5.528 | 4.570 | 0.958 | 5.1 | 5.8 |
| 248.4 | 5.506 | 4.960 | 0.546 | 9.0 | 10.1 |
| 270.0 | 5.528 | 4.915 | 0.613 | 8.0 | 9.0 |
| 291.6 | 5.525 | 4.580 | 0.945 | 5.2 | 5.8 |
| 316.8 | 5.522 | 4.595 | 0.927 | 5.3 | 6.0 |
| 338.4 | 5.504 | 4.722 | 0.782 | 6.3 | 7.0 |
| | MEDIAN 5.520 | MEDIAN 4.780 | MEDIAN 0.714 | MINIMUM 4.0 | MINIMUM 4.5 |

A " + " INDICATES THAT NEGLIGIBLE MATERIAL DECOMPOSITION HAS OCCURRED.

Table 18 - RSRM-2B Aft Field Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 2.0 | 2.768 | 2.315 | 0.453 | 5.7 | 6.1 |
| 10.0 | 2.775 | 2.292 | 0.483 | 5.4 | 5.7 |
| 20.0 | 2.791 | 2.312 | 0.479 | 5.4 | 5.8 |
| 30.0 | 2.794 | 2.356 | 0.438 | 5.9 | 6.4 |
| 40.0 | 2.795 | 2.326 | 0.469 | 5.5 | 6.0 |
| 50.0 | 2.787 | 2.342 | 0.445 | 5.8 | 6.3 |
| 60.0 | 2.782 | 2.355 | 0.427 | 6.1 | 6.5 |
| 70.0 | 2.777 | 2.356 | 0.421 | 6.2 | 6.6 |
| 80.0 | 2.777 | 2.337 | 0.440 | 5.9 | 6.3 |
| 90.0 | 2.760 | 2.335 | 0.425 | 6.1 | 6.5 |
| 100.0 | 2.773 | 2.343 | 0.430 | 6.0 | 6.4 |
| 110.0 | 2.790 | 2.332 | 0.458 | 5.7 | 6.1 |
| 120.0 | 2.774 | 2.256 | 0.518 | 5.0 | 5.4 |
| 130.0 | 2.781 | 2.334 | 0.447 | 5.8 | 6.2 |
| 140.0 | 2.786 | 2.358 | 0.428 | 6.1 | 6.5 |
| 150.0 | 2.795 | 2.408 | 0.387 | 6.7 | 7.2 |
| 160.0 | 2.796 | 2.393 | 0.403 | 6.4 | 6.9 |
| 170.0 | 2.775 | 2.366 | 0.409 | 6.3 | 6.8 |
| 180.0 | 2.760 | 2.422 | 0.338 | 7.7 | 8.2 |
| 190.0 | 2.771 | 2.396 | 0.375 | 6.9 | 7.4 |
| 200.0 | 2.774 | 2.366 | 0.408 | 6.4 | 6.8 |
| 210.0 | 2.774 | 2.368 | 0.406 | 6.4 | 6.8 |
| 220.0 | 2.775 | 2.350 | 0.425 | 6.1 | 6.5 |
| 230.0 | 2.775 | 2.303 | 0.472 | 5.5 | 5.9 |
| 242.0 | 2.777 | 2.321 | 0.456 | 5.7 | 6.1 |
| 250.0 | 2.775 | 2.359 | 0.416 | 6.2 | 6.7 |
| 260.0 | 2.769 | 2.305 | 0.464 | 5.6 | 6.0 |
| 270.0 | 2.761 | 2.313 | 0.448 | 5.8 | 6.2 |
| 280.0 | 2.748 | 2.310 | 0.438 | 5.9 | 6.3 |
| 290.0 | 2.758 | 2.288 | 0.470 | 5.5 | 5.9 |
| 300.0 | 2.762 | 2.302 | 0.460 | 5.6 | 6.0 |
| 310.0 | 2.768 | 2.314 | 0.454 | 5.7 | 6.1 |
| 320.0 | 2.760 | 2.315 | 0.445 | 5.8 | 6.2 |
| 330.0 | 2.770 | 2.308 | 0.462 | 5.6 | 6.0 |
| 340.0 | 2.770 | 2.325 | 0.445 | 5.8 | 6.2 |
| 350.0 | 2.785 | 2.295 | 0.490 | 5.3 | 5.7 |
| | MEDIAN | MEDIAN | MEDIAN | MINIMUM | MINIMUM |
| | 2.775 | 2.333 | 0.445 | 5.0 | 5.4 |

Table 19 · RSRM-2B Center Field Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 2.0 | 2.711 | 2.503 | 0.208 | 12.5 | 13.0 |
| 10.0 | 2.732 | 2.521 | 0.211 | 12.3 | 12.9 |
| 20.0 | 2.736 | 2.597 | 0.139 | 18.7 | 19.7 |
| 30.0 | 2.728 | 2.593 | 0.135 | 19.2 | 20.2 |
| 40.0 | 2.731 | 2.557 | 0.174 | 14.9 | 15.7 |
| 50.0 | 2.720 | 2.553 | 0.167 | 15.5 | 16.3 |
| 60.0 | 2.724 | 2.549 | 0.175 | 14.8 | 15.6 |
| 70.0 | 2.742 | 2.563 | 0.179 | 14.5 | 15.3 |
| 80.0 | 2.739 | 2.586 | 0.153 | 17.0 | 17.9 |
| 90.0 | 2.745 | 2.548 | 0.197 | 13.2 | 13.9 |
| 100.0 | 2.749 | 2.510 | 0.239 | 10.9 | 11.5 |
| 110.0 | 2.750 | 2.532 | 0.218 | 11.9 | 12.6 |
| 120.0 | 2.737 | 2.520 | 0.217 | 12.0 | 12.6 |
| 130.0 | 2.738 | 2.536 | 0.202 | 12.8 | 13.6 |
| 140.0 | 2.716 | 2.543 | 0.173 | 15.0 | 15.7 |
| 150.0 | 2.700 | 2.528 | 0.172 | 15.1 | 15.7 |
| 160.0 | 2.724 | 2.505 | 0.219 | 11.8 | 12.4 |
| 170.0 | 2.681 | 2.542 | 0.139 | 18.7 | 19.3 |
| 180.0 | 2.682 | 2.589 | 0.093 | 27.9 | 28.8 |
| 190.0 | 2.669 | 2.580 | 0.089 | 29.2 | 30.0 |
| 200.0 | 2.652 | 2.548 | 0.104 | 25.0 | 25.5 |
| 210.0 | 2.661 | 2.570 | 0.091 | 28.5 | 29.2 |
| 220.0 | 2.768 | 2.572 | 0.196 | 13.2 | 14.1 |
| 230.0 | 2.644 | 2.564 | 0.080 | 32.4 | 33.1 |
| 242.0 | 2.634 | 2.526 | 0.108 | 24.0 | 24.4 |
| 250.0 | 2.659 | 2.550 | 0.109 | 23.8 | 24.4 |
| 260.0 | 2.668 | 2.561 | 0.107 | 24.3 | 24.9 |
| 270.0 | 2.672 | 2.555 | 0.117 | 22.2 | 22.8 |
| 280.0 | 2.643 | 2.552 | 0.091 | 28.5 | 29.0 |
| 290.0 | 2.659 | 2.509 | 0.150 | 17.3 | 17.7 |
| 300.0 | 2.664 | 2.540 | 0.124 | 20.9 | 21.5 |
| 310.0 | 2.662 | 2.563 | 0.099 | 26.2 | 26.9 |
| 320.0 | 2.658 | 2.553 | 0.105 | 24.7 | 25.3 |
| 330.0 | 2.674 | 2.541 | 0.133 | 19.5 | 20.1 |
| 340.0 | 2.675 | 2.517 | 0.158 | 16.4 | 16.9 |
| 350.0 | 2.716 | 2.535 | 0.181 | 14.3 | 15.0 |
| | MEDIAN 2.706 | MEDIAN 2.549 | MEDIAN 0.151 | MINIMUM 10.9 | MINIMUM 11.5 |

Table 20 - RSRM-2B Forward Field Joint Performance

A SAFETY FACTOR OF 2.0 IS REQUIRED

| DEGREE LOCATION | PREFIRE (INCHES) | POSTFIRE (INCHES) | MDD | CSF | ASF |
|---|---|---|---|---|---|
| 2.0 | 2.773 | 2.818 | 0.000 | + | + |
| 10.0 | 2.782 | 2.668 | 0.114 | 22.8 | 24.4 |
| 20.0 | 2.771 | 2.769 | 0.002 | + | + |
| 30.0 | 2.770 | 2.590 | 0.180 | 14.4 | 15.4 |
| 40.0 | 2.772 | 2.621 | 0.151 | 17.2 | 18.4 |
| 50.0 | 2.765 | 2.584 | 0.181 | 14.3 | 15.3 |
| 60.0 | 2.767 | 2.592 | 0.175 | 14.8 | 15.8 |
| 70.0 | 2.722 | 2.611 | 0.111 | 23.4 | 24.5 |
| 80.0 | 2.736 | 2.595 | 0.141 | 18.4 | 19.4 |
| 90.0 | 2.706 | 2.658 | 0.048 | 54.1 | 56.4 |
| 100.0 | 2.710 | 2.618 | 0.092 | 28.2 | 29.5 |
| 110.0 | 2.743 | 2.601 | 0.142 | 18.3 | 19.3 |
| 120.0 | 2.756 | 2.603 | 0.153 | 17.0 | 18.0 |
| 130.0 | 2.740 | 2.574 | 0.166 | 15.6 | 16.5 |
| 140.0 | 2.775 | 2.561 | 0.214 | 12.1 | 13.0 |
| 150.0 | 2.768 | 2.590 | 0.178 | 14.6 | 15.6 |
| 160.0 | 2.759 | 2.598 | 0.161 | 16.1 | 17.1 |
| 170.0 | 2.779 | 2.592 | 0.187 | 13.9 | 14.9 |
| 180.0 | 2.761 | 2.648 | 0.113 | 23.0 | 24.4 |
| 190.0 | 2.732 | 2.520 | 0.212 | 12.2 | 12.9 |
| 200.0 | 2.740 | 2.579 | 0.161 | 16.1 | 17.0 |
| 210.0 | 2.735 | 2.597 | 0.138 | 18.8 | 19.8 |
| 220.0 | 2.750 | 2.571 | 0.179 | 14.5 | 15.4 |
| 230.0 | 2.715 | 2.594 | 0.121 | 21.4 | 22.4 |
| 242.0 | 2.748 | 2.580 | 0.168 | 15.4 | 16.4 |
| 250.0 | 2.743 | 2.565 | 0.178 | 14.6 | 15.4 |
| 260.0 | 2.738 | 2.604 | 0.134 | 19.4 | 20.4 |
| 270.0 | 2.744 | 2.639 | 0.105 | 24.7 | 26.1 |
| 280.0 | 2.721 | 2.620 | 0.101 | 25.7 | 26.9 |
| 290.0 | 2.726 | 2.625 | 0.101 | 25.7 | 27.0 |
| 300.0 | 2.722 | 2.594 | 0.128 | 20.3 | 21.3 |
| 310.0 | 2.730 | 2.574 | 0.156 | 16.6 | 17.5 |
| 320.0 | 2.733 | 2.605 | 0.128 | 20.3 | 21.4 |
| 330.0 | 2.728 | 2.613 | 0.115 | 22.6 | 23.7 |
| 340.0 | 2.745 | 2.583 | 0.162 | 16.0 | 16.9 |
| 350.0 | 2.732 | 2.580 | 0.152 | 17.1 | 18.0 |
| | MEDIAN 2.743 | MEDIAN 2.596 | MEDIAN 0.146 | MINIMUM 12.1 | MINIMUM 12.9 |

A " + " INDICATES THAT NEGLIGIBLE MATERIAL DECOMPOSITION HAS OCCURRED.

RSRM-2B Aft Dome
COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 4.34 | 4.28 | 4.37 | 4.44 | 4.37 | 4.14 | 4.36 | 4.90 | 4.80 | 5.72 | 4.21 | 3.65 | 4.49 | 4.16 | 4.48 | 4.35 | 3.65 | 248.4 | 1.5 |
| 10.7 | 3.52 | 3.42 | 4.19 | 3.90 | 3.62 | 3.35 | 4.08 | 4.84 | 5.13 | 4.99 | 3.79 | 3.12 | 3.46 | 3.53 | 4.09 | 3.43 | 3.12 | 248.4 | 1.5 |
| 12.0 | 3.38 | 3.36 | 3.79 | 3.47 | 3.36 | 3.23 | 3.86 | 3.69 | 3.90 | 4.51 | 3.17 | 3.32 | 3.29 | 3.40 | 4.01 | 3.40 | 3.17 | 226.8 | 1.5 |
| 13.0 | 3.43 | 3.28 | 3.76 | 3.02 | 3.23 | 3.35 | 3.47 | 3.32 | 3.45 | 4.14 | 3.07 | 3.35 | 2.98 | 3.23 | 3.63 | 2.97 | 2.97 | 338.4 | 1.5 |
| 14.4 | 3.57 | 3.34 | 3.45 | 3.04 | 3.18 | 3.57 | 3.26 | 3.31 | 3.41 | 4.21 | 3.14 | 2.86 | 3.06 | 3.24 | 3.50 | 3.07 | 2.86 | 248.4 | 1.5 |
| 16.0 | 4.29 | 3.42 | 4.08 | 2.81 | 2.93 | 3.57 | 3.30 | 3.16 | 4.04 | 3.87 | 3.04 | 3.49 | 2.99 | 3.22 | 3.26 | 2.97 | 2.81 | 68.4 | 1.5 |
| 17.3 | 4.75 | 4.05 | 3.69 | 2.73 | 2.87 | 3.97 | 2.76 | 3.06 | 3.05 | 3.84 | 3.02 | 4.03 | 2.80 | 3.27 | 3.04 | 2.99 | 2.73 | 68.4 | 1.5 |
| 18.5 | 5.48 | 3.76 | 3.66 | 3.02 | 3.13 | 3.13 | 3.07 | 3.33 | 3.52 | 4.37 | 4.14 | 4.54 | 3.34 | 3.37 | 3.29 | 3.46 | 3.02 | 68.4 | 1.5 |
| 19.5 | 5.84 | 3.94 | 3.81 | 3.45 | 3.32 | 3.28 | 3.50 | 3.84 | 4.28 | 3.65 | 3.38 | 4.83 | 3.96 | 3.87 | 3.71 | 3.87 | 3.28 | 111.6 | 1.5 |
| 21.3 | 4.47 | 3.77 | 3.50 | 3.03 | 3.27 | 3.30 | 2.98 | 3.60 | 3.77 | 4.89 | 3.94 | 4.67 | 4.16 | 5.19 | 4.19 | 4.30 | 2.98 | 136.8 | 1.5 |
| 24.3 | 3.27 | 2.95 | 2.98 | 2.55 | 2.71 | 2.74 | 2.89 | 3.06 | 2.86 | 4.62 | 3.16 | 4.32 | 3.04 | 2.61 | 3.53 | 3.66 | 2.55 | 68.4 | 1.5 |
| 33.0 | 2.57 | 2.30 | 2.79 | 2.30 | 2.36 | 3.13 | 3.02 | 2.44 | 2.92 | 3.27 | 2.98 | 2.73 | 2.49 | 2.71 | 3.01 | 2.82 | 2.30 | 68.4 | 1.5 |
| 38.0 | 4.78 | 5.14 | 4.90 | 5.53 | 6.53 | 6.90 | 7.01 | 6.12 | 8.31 | 6.16 | 9.22 | 9.15 | 7.49 | 4.05 | 7.95 | 4.93 | 4.05 | 291.6 | 1.5 |
| 40.0 | 2.69 | 2.85 | 2.43 | 2.53 | 2.65 | 2.88 | 2.89 | 2.43 | 2.57 | 2.64 | 2.88 | 3.16 | 3.22 | 2.82 | 1.43< | 3.27 | 1.43 | 316.8 | 1.5 |
| 42.0 | 2.56 | 2.64 | 2.48 | 2.42 | 2.63 | 2.37 | 2.42 | 2.75 | 2.64 | 2.39 | 2.42 | 2.89 | 2.69 | 2.61 | 2.90 | 2.72 | 2.37 | 111.6 | 1.5 |
| 45.0 | 2.86 | 2.55 | 2.57 | 2.69 | 3.32 | 2.74 | 2.69 | 3.14 | 2.66 | 2.48 | 2.51 | 3.00 | 2.82 | 2.87 | 2.94 | 2.57 | 2.48 | 201.6 | 1.5 |
| 48.0 | 4.21 | 2.95 | 3.45 | 3.36 | 4.19 | 3.33 | 3.27 | 3.32 | 2.69 | 3.24 | 2.74 | 3.87 | 3.09 | 3.16 | 2.85 | 2.75 | 2.69 | 180.0 | 1.5 |
| 53.0 | 4.63 | 4.02 | 4.71 | 3.61 | 3.51 | 3.18 | 3.50 | 4.29 | 5.58 | 4.36 | 3.46 | 3.48 | 3.94 | 4.52 | 4.55 | 3.54 | 3.18 | 111.6 | 1.5 |

SEGMENT MINIMUM = 1.43 AT THE 40.0 INCH STATION.

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 4.63 | 4.61 | 4.72 | 4.81 | 4.71 | 4.44 | 4.69 | 5.29 | 5.25 | 6.20 | 4.56 | 3.93 | 4.87 | 4.52 | 4.83 | 4.78 | 3.93 | 248.4 |
| 10.7 | 3.72 | 3.64 | 4.45 | 4.17 | 3.86 | 3.58 | 4.37 | 5.11 | 5.52 | 5.34 | 4.04 | 3.34 | 3.72 | 3.77 | 4.40 | 3.67 | 3.34 | 248.4 |
| 12.0 | 3.59 | 3.57 | 4.01 | 3.69 | 3.58 | 3.44 | 4.11 | 3.88 | 4.27 | 4.82 | 3.37 | 3.56 | 3.52 | 3.64 | 4.30 | 3.62 | 3.37 | 226.8 |
| 13.0 | 3.67 | 3.50 | 3.98 | 3.22 | 3.44 | 3.56 | 3.69 | 3.50 | 3.74 | 4.45 | 3.26 | 3.61 | 3.17 | 3.44 | 3.89 | 3.16 | 3.16 | 338.4 |
| 14.4 | 3.84 | 3.50 | 3.61 | 3.18 | 3.33 | 3.73 | 3.41 | 3.44 | 3.66 | 4.45 | 3.28 | 3.04 | 3.22 | 3.38 | 3.77 | 3.22 | 3.04 | 248.4 |
| 16.0 | 4.61 | 3.68 | 4.36 | 3.02 | 3.15 | 3.81 | 3.52 | 3.33 | 4.42 | 4.18 | 3.22 | 3.78 | 3.21 | 3.45 | 3.51 | 3.18 | 3.02 | 68.4 |
| 17.3 | 5.24 | 4.49 | 4.02 | 2.99 | 3.15 | 4.35 | 3.01 | 3.31 | 3.43 | 4.25 | 3.30 | 4.48 | 3.10 | 3.60 | 3.34 | 3.28 | 2.99 | 68.4 |
| 18.5 | 6.14 | 4.23 | 4.08 | 3.36 | 3.49 | 3.51 | 3.43 | 3.66 | 4.02 | 4.93 | 4.62 | 5.13 | 3.75 | 3.78 | 3.67 | 3.85 | 3.36 | 68.4 |
| 19.5 | 6.67 | 4.57 | 4.35 | 3.91 | 3.79 | 3.78 | 4.01 | 4.29 | 4.95 | 4.23 | 3.88 | 5.54 | 4.55 | 4.40 | 4.21 | 4.44 | 3.78 | 111.6 |
| 21.3 | 5.18 | 4.45 | 4.06 | 3.52 | 3.80 | 3.91 | 3.52 | 4.15 | 4.47 | 5.82 | 4.62 | 5.48 | 4.94 | 6.05 | 4.87 | 5.04 | 3.52 | 136.8 |
| 24.3 | 3.75 | 3.44 | 3.38 | 2.94 | 3.11 | 3.18 | 3.37 | 3.51 | 3.36 | 5.46 | 3.65 | 4.96 | 3.52 | 3.01 | 4.09 | 4.16 | 2.94 | 68.4 |
| 33.0 | 2.90 | 2.60 | 3.14 | 2.58 | 2.66 | 3.51 | 3.28 | 2.75 | 3.16 | 3.53 | 3.19 | 3.03 | 2.79 | 2.99 | 3.23 | 2.97 | 2.58 | 68.4 |
| 38.0 | 5.40 | 5.75 | 5.29 | 6.09 | 7.12 | 7.51 | 7.77 | 6.91 | 9.21 | 6.67 | 9.97 | 9.86 | 8.15 | 4.37 | 8.35 | 5.54 | 4.37 | 291.6 |
| 40.0 | 3.02 | 3.12 | 2.61 | 2.72 | 2.81 | 3.09 | 3.10 | 2.78 | 2.76 | 2.80 | 3.08 | 3.37 | 3.45 | 3.06 | 2.05 | 3.51 | 2.05 | 316.8 |
| 42.0 | 2.84 | 2.89 | 2.73 | 2.68 | 2.85 | 2.60 | 2.70 | 3.10 | 2.89 | 2.58 | 2.63 | 3.14 | 2.95 | 2.87 | 3.11 | 2.96 | 2.58 | 201.6 |
| 45.0 | 3.10 | 2.87 | 2.90 | 2.98 | 3.56 | 2.95 | 2.98 | 3.42 | 2.97 | 2.66 | 2.71 | 3.26 | 3.10 | 3.14 | 3.17 | 2.85 | 2.66 | 201.6 |
| 48.0 | 4.88 | 3.44 | 4.19 | 4.09 | 4.90 | 3.94 | 3.94 | 4.04 | 3.50 | 3.80 | 3.34 | 4.55 | 3.78 | 3.77 | 3.44 | 3.14 | 3.14 | 338.4 |
| 53.0 | 5.11 | 4.49 | 5.16 | 4.17 | 4.05 | 3.69 | 4.08 | 4.71 | 6.39 | 4.99 | 3.90 | 3.87 | 4.45 | 4.96 | 4.95 | 4.02 | 3.69 | 111.6 |

SEGMENT MINIMUM = 2.05 AT THE 40.0 INCH STATION.
A " < " INDICATES THE PRECEDING SAFETY FACTOR HAS VIOLATED THE MINIMUM SAFETY FACTOR REQUIREMENT.

Table 21 RSRM-2B Aft Dome Insulation Performance

RSRM-2B Aft Dome
MATERIAL DECOMPOSITION DEPTH (MDD)
INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MAX. | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 1.128 | 1.145 | 1.121 | 1.103 | 1.121 | 1.185 | 1.123 | 1.001 | 1.021 | 0.856 | 1.165 | 1.344 | 1.092 | 1.179 | 1.094 | 1.127 | 1.344 | 1.113 | 1.122 | 0.102 |
| 10.7 | 1.335 | 1.374 | 1.122 | 1.206 | 1.300 | 1.402 | 1.153 | 0.971 | 0.916 | 0.942 | 1.239 | 1.508 | 1.360 | 1.333 | 1.149 | 1.371 | 1.508 | 1.230 | 1.270 | 0.176 |
| 12.0 | 1.333 | 1.338 | 1.186 | 1.296 | 1.338 | 1.394 | 1.166 | 1.219 | 1.155 | 0.997 | 1.418 | 1.355 | 1.366 | 1.323 | 1.123 | 1.323 | 1.418 | 1.271 | 1.323 | 0.116 |
| 13.0 | 1.252 | 1.310 | 1.145 | 1.423 | 1.332 | 1.284 | 1.238 | 1.294 | 1.248 | 1.038 | 1.402 | 1.285 | 1.445 | 1.332 | 1.186 | 1.447 | 1.447 | 1.291 | 1.289 | 0.111 |
| 14.4 | 1.150 | 1.227 | 1.188 | 1.348 | 1.290 | 1.148 | 1.257 | 1.238 | 1.201 | 0.975 | 1.305 | 1.434 | 1.341 | 1.265 | 1.173 | 1.336 | 1.434 | 1.242 | 1.248 | 0.107 |
| 16.0 | 0.882 | 1.105 | 0.927 | 1.344 | 1.289 | 1.058 | 1.146 | 1.195 | 0.935 | 0.978 | 1.244 | 1.082 | 1.266 | 1.174 | 1.158 | 1.271 | 1.344 | 1.128 | 1.152 | 0.142 |
| 17.3 | 0.750 | 0.879 | 0.966 | 1.305 | 1.242 | 0.896 | 1.291 | 1.163 | 1.167 | 0.926 | 1.179 | 0.883 | 1.270 | 1.090 | 1.172 | 1.191 | 1.305 | 1.086 | 1.165 | 0.175 |
| 18.5 | 0.613 | 0.894 | 0.918 | 1.111 | 1.075 | 1.073 | 1.093 | 1.010 | 0.955 | 0.769 | 0.812 | 0.740 | 1.006 | 0.996 | 1.022 | 0.970 | 1.111 | 0.941 | 0.983 | 0.142 |
| 19.5 | 0.539 | 0.799 | 0.826 | 0.914 | 0.949 | 0.959 | 0.901 | 0.821 | 0.736 | 0.863 | 0.932 | 0.652 | 0.795 | 0.815 | 0.850 | 0.814 | 0.959 | 0.823 | 0.823 | 0.110 |
| 21.3 | 0.657 | 0.779 | 0.839 | 0.969 | 0.899 | 0.891 | 0.987 | 0.816 | 0.779 | 0.601 | 0.746 | 0.629 | 0.706 | 0.566 | 0.702 | 0.684 | 0.987 | 0.766 | 0.762 | 0.128 |
| 24.3 | 0.898 | 0.996 | 0.988 | 1.152 | 1.083 | 1.073 | 1.016 | 0.960 | 1.029 | 0.636 | 0.930 | 0.680 | 0.967 | 1.126 | 0.834 | 0.804 | 1.152 | 0.948 | 0.978 | 0.148 |
| 33.0 | 1.247 | 1.392 | 1.147 | 1.393 | 1.355 | 1.021 | 1.061 | 1.309 | 1.095 | 0.979 | 1.074 | 1.172 | 1.287 | 1.179 | 1.062 | 1.136 | 1.393 | 1.182 | 1.160 | 0.134 |
| 38.0 | 0.544 | 0.506 | 0.531 | 0.470 | 0.398 | 0.377 | 0.371 | 0.425 | 0.313 | 0.422 | 0.282 | 0.284 | 0.347 | 0.642 | 0.327 | 0.527 | 0.642 | 0.423 | 0.410 | 0.105 |
| 40.0 | 0.965 | 0.913 | 1.068 | 1.026 | 0.981 | 0.903 | 0.900 | 1.070 | 1.010 | 0.983 | 0.903 | 0.824 | 0.807 | 0.922 | 1.819 | <0.795 | 1.819 | 0.993 | 0.943 | 0.236 |
| 42.0 | 1.017 | 0.984 | 1.049 | 1.076 | 0.988 | 1.097 | 1.074 | 0.945 | 0.985 | 1.090 | 1.073 | 0.900 | 0.966 | 0.998 | 0.896 | 0.955 | 1.097 | 1.006 | 0.993 | 0.065 |
| 45.0 | 0.909 | 1.019 | 1.010 | 0.967 | 0.782 | 0.949 | 0.967 | 0.827 | 0.978 | 1.049 | 1.036 | 0.867 | 0.923 | 0.906 | 0.885 | 1.012 | 1.049 | 0.943 | 0.958 | 0.077 |
| 48.0 | 0.618 | 0.882 | 0.754 | 0.774 | 0.620 | 0.780 | 0.795 | 0.783 | 0.967 | 0.802 | 0.948 | 0.671 | 0.842 | 0.824 | 0.913 | 0.947 | 0.967 | 0.808 | 0.799 | 0.109 |
| 53.0 | 0.728 | 0.838 | 0.715 | 0.934 | 0.961 | 1.061 | 0.963 | 0.785 | 0.604 | 0.773 | 0.973 | 0.968 | 0.856 | 0.746 | 0.740 | 0.951 | 1.061 | 0.850 | 0.847 | 0.127 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

MATERIAL DECOMPOSITION RATE (MDR)
MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 9.2 | 9.3 | 9.1 | 9.0 | 9.1 | 9.7 | 9.2 | 8.2 | 8.3 | 7.0 | 9.5 | 11.0 | 8.9 | 9.6 | 8.9 | 9.2 | 9.1 | 122.7 |
| 10.7 | 11.1 | 11.4 | 9.3 | 10.0 | 10.8 | 11.6 | 9.6 | 8.1 | 7.6 | 7.8 | 10.3 | 12.5 | 11.3 | 11.1 | 9.5 | 11.4 | 10.2 | 120.5 |
| 12.0 | 11.3 | 11.4 | 10.1 | 11.0 | 11.4 | 11.9 | 9.9 | 10.4 | 9.8 | 8.5 | 12.1 | 11.5 | 11.6 | 11.3 | 9.6 | 11.3 | 10.8 | 117.5 |
| 13.0 | 10.9 | 11.4 | 10.0 | 12.4 | 11.6 | 11.2 | 10.8 | 11.3 | 10.9 | 9.0 | 12.2 | 11.2 | 12.6 | 11.6 | 10.3 | 12.6 | 11.3 | 114.7 |
| 14.4 | 10.2 | 10.9 | 10.5 | 11.9 | 11.4 | 10.2 | 11.1 | 11.0 | 10.6 | 8.6 | 11.6 | 12.7 | 11.9 | 11.2 | 10.4 | 11.8 | 11.0 | 112.9 |
| 16.0 | 8.1 | 10.2 | 8.5 | 12.4 | 11.9 | 9.7 | 10.5 | 11.0 | 8.6 | 9.0 | 11.4 | 10.0 | 11.6 | 10.8 | 10.7 | 11.7 | 10.4 | 108.7 |
| 17.3 | 7.1 | 8.3 | 9.1 | 12.3 | 11.7 | 8.5 | 12.2 | 11.0 | 11.0 | 8.7 | 11.1 | 8.3 | 12.0 | 10.3 | 11.1 | 11.2 | 10.3 | 105.9 |
| 18.5 | 5.9 | 8.6 | 8.9 | 10.7 | 10.4 | 10.3 | 10.5 | 9.7 | 9.2 | 7.4 | 7.8 | 7.1 | 9.7 | 9.6 | 9.9 | 9.4 | 9.1 | 103.7 |
| 19.5 | 5.3 | 7.9 | 8.1 | 9.0 | 9.3 | 9.4 | 8.9 | 8.1 | 7.2 | 8.5 | 9.2 | 6.4 | 7.8 | 8.0 | 8.4 | 8.0 | 8.1 | 101.6 |
| 21.3 | 6.7 | 7.9 | 8.5 | 9.9 | 9.2 | 9.1 | 10.1 | 8.3 | 7.9 | 6.1 | 7.6 | 6.4 | 7.2 | 5.8 | 7.1 | 7.0 | 7.8 | 98.2 |
| 24.3 | 9.5 | 10.6 | 10.5 | 12.2 | 11.5 | 11.4 | 10.8 | 10.2 | 10.9 | 6.8 | 9.9 | 7.2 | 10.3 | 12.0 | 8.9 | 8.5 | 10.1 | 94.2 |
| 33.0 | 14.8 | 16.6 | 13.7 | 16.6 | 16.1 | 12.2 | 12.6 | 15.6 | 13.0 | 11.7 | 12.8 | 14.0 | 15.3 | 14.0 | 12.6 | 13.5 | 14.1 | 84.0 |
| 38.0 | 6.8 | 6.4 | 6.7 | 5.9 | 5.0 | 4.7 | 4.7 | 5.3 | 3.9 | 5.3 | 3.5 | 3.6 | 4.4 | 8.1 | 4.1 | 6.6 | 5.3 | 79.6 |
| 40.0 | 12.4 | 11.7 | 13.7 | 13.2 | 12.6 | 11.6 | 11.6 | 13.8 | 13.0 | 12.6 | 11.6 | 10.6 | 10.4 | 11.9 | 23.4 | 10.2 | 12.8 | 77.8 |
| 42.0 | 13.2 | 12.8 | 13.7 | 14.0 | 12.9 | 14.3 | 14.0 | 12.3 | 12.8 | 14.2 | 14.0 | 11.7 | 12.6 | 13.0 | 11.7 | 12.4 | 13.1 | 76.8 |
| 45.0 | 12.1 | 13.5 | 13.4 | 12.8 | 10.4 | 12.6 | 12.8 | 11.0 | 13.0 | 13.9 | 13.7 | 11.5 | 12.2 | 12.0 | 11.7 | 13.4 | 12.5 | 75.4 |
| 48.0 | 8.6 | 12.3 | 10.5 | 10.8 | 8.7 | 10.9 | 11.1 | 10.9 | 13.5 | 11.2 | 13.2 | 9.4 | 11.8 | 11.5 | 12.8 | 13.2 | 11.3 | 71.6 |
| 53.0 | 9.7 | 11.1 | 9.5 | 12.4 | 12.8 | 14.1 | 12.8 | 10.4 | 8.0 | 10.3 | 12.9 | 12.9 | 11.4 | 9.9 | 9.8 | 12.6 | 11.3 | 75.2 |

Table 21 (Cont'd) RSRM-2B Aft Dome Insulation Performance

RSRM-2B Aft Dome

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MIN. | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 5.223 | 5.284 | 5.289 | 5.304 | 5.276 | 5.260 | 5.269 | 5.294 | 5.358 | 5.310 | 5.314 | 5.285 | 5.316 | 5.325 | 5.279 | 5.387 | 5.223 | 5.292 | 0.038 | 4.900 |
| 10.7 | 4.969 | 4.998 | 4.989 | 5.025 | 5.016 | 5.020 | 5.036 | 4.958 | 5.053 | 5.029 | 5.008 | 5.040 | 5.063 | 5.019 | 5.052 | 5.035 | 4.958 | 5.023 | 0.029 | 4.700 |
| 12.0 | 4.789 | 4.777 | 4.751 | 4.781 | 4.796 | 4.794 | 4.791 | 4.733 | 4.927 | 4.802 | 4.782 | 4.830 | 4.815 | 4.814 | 4.827 | 4.792 | 4.733 | 4.793 | 0.042 | 4.500 |
| 13.0 | 4.592 | 4.587 | 4.555 | 4.582 | 4.584 | 4.569 | 4.572 | 4.526 | 4.670 | 4.618 | 4.576 | 4.638 | 4.587 | 4.579 | 4.618 | 4.571 | 4.526 | 4.583 | 0.034 | 4.300 |
| 14.4 | 4.416 | 4.293 | 4.285 | 4.286 | 4.296 | 4.287 | 4.292 | 4.262 | 4.390 | 4.341 | 4.279 | 4.366 | 4.321 | 4.282 | 4.418 | 4.296 | 4.262 | 4.295 | 0.051 | 4.100 |
| 16.0 | 4.063 | 4.069 | 4.044 | 4.056 | 4.057 | 4.033 | 4.039 | 3.980 | 4.137 | 4.087 | 4.011 | 4.093 | 4.064 | 4.049 | 4.060 | 4.042 | 3.980 | 4.057 | 0.035 | 3.780 |
| 17.3 | 3.933 | 3.946 | 3.888 | 3.902 | 3.914 | 3.895 | 3.888 | 3.847 | 4.003 | 3.935 | 3.890 | 3.957 | 3.941 | 3.920 | 3.915 | 3.905 | 3.847 | 3.914 | 0.036 | 3.560 |
| 18.5 | 3.766 | 3.782 | 3.745 | 3.734 | 3.756 | 3.765 | 3.746 | 3.694 | 3.838 | 3.791 | 3.751 | 3.798 | 3.773 | 3.760 | 3.755 | 3.736 | 3.694 | 3.758 | 0.032 | 3.360 |
| 19.5 | 3.594 | 3.650 | 3.596 | 3.570 | 3.599 | 3.629 | 3.611 | 3.523 | 3.646 | 3.649 | 3.613 | 3.614 | 3.616 | 3.585 | 3.580 | 3.611 | 3.523 | 3.611 | 0.032 | 3.150 |
| 21.3 | 3.401 | 3.470 | 3.406 | 3.414 | 3.416 | 3.487 | 3.476 | 3.384 | 3.479 | 3.496 | 3.447 | 3.446 | 3.485 | 3.427 | 3.417 | 3.445 | 3.384 | 3.446 | 0.035 | 2.940 |
| 24.3 | 3.368 | 3.424 | 3.340 | 3.389 | 3.368 | 3.413 | 3.427 | 3.370 | 3.461 | 3.472 | 3.390 | 3.375 | 3.402 | 3.392 | 3.410 | 3.343 | 3.340 | 3.391 | 0.037 | 2.940 |
| 33.0 | 3.621 | 3.625 | 3.598 | 3.590 | 3.611 | 3.587 | 3.477 | 3.594 | 3.457 | 3.453 | 3.422 | 3.553 | 3.587 | 3.526 | 3.425 | 3.370 | 3.370 | 3.570 | 0.084 | 3.200 |
| 38.0 | 2.935 | 2.912 | 2.809 | 2.861 | 2.834 | 2.832 | 2.882 | 2.935 | 2.883 | 2.816 | 2.811 | 2.801 | 2.829 | 2.804 | 2.729 | 2.920 | 2.729 | 2.833 | 0.058 | 2.600 |
| 40.0 | 2.910 | 2.845 | 2.792 | 2.786 | 2.760 | 2.791 | 2.794 | 2.971 | 2.792 | 2.757 | 2.780 | 2.781 | 2.783 | 2.818 | 3.725 | 2.790 | 2.757 | 2.792 | 0.236 | 2.600 |
| 42.0 | 2.888 | 2.842 | 2.860 | 2.886 | 2.819 | 2.857 | 2.900 | 2.930 | 2.850 | 2.811 | 2.825 | 2.829 | 2.845 | 2.866 | 2.787 | 2.830 | 2.787 | 2.848 | 0.037 | 2.600 |
| 45.0 | 2.817 | 2.924 | 2.931 | 2.878 | 2.786 | 2.797 | 2.878 | 2.831 | 2.908 | 2.789 | 2.810 | 2.824 | 2.862 | 2.843 | 2.805 | 2.882 | 2.786 | 2.837 | 0.048 | 2.600 |
| 48.0 | 3.018 | 3.035 | 3.162 | 3.166 | 3.036 | 3.074 | 3.130 | 3.167 | 3.380 | 3.045 | 3.166 | 3.053 | 3.184 | 3.110 | 3.145 | 2.975 | 2.975 | 3.120 | 0.096 | 2.600 |
| 53.0 | 3.723 | 3.765 | 3.687 | 3.891 | 3.889 | 3.920 | 3.925 | 3.700 | 3.861 | 3.858 | 3.799 | 3.748 | 3.810 | 3.699 | 3.666 | 3.821 | 3.666 | 3.805 | 0.087 | 3.370 |

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.3 | 4.095 | 4.139 | 4.168 | 4.201 | 4.155 | 4.075 | 4.146 | 4.293 | 4.337 | 4.454 | 4.149 | 3.941 | 4.224 | 4.146 | 4.185 | 4.260 | 3.941 | 4.162 | 0.116 |
| 10.7 | 3.634 | 3.624 | 3.867 | 3.819 | 3.716 | 3.618 | 3.883 | 3.987 | 4.137 | 4.087 | 3.769 | 3.532 | 3.703 | 3.686 | 3.903 | 3.664 | 3.532 | 3.743 | 0.176 |
| 12.0 | 3.456 | 3.439 | 3.565 | 3.485 | 3.458 | 3.400 | 3.625 | 3.514 | 3.772 | 3.805 | 3.364 | 3.475 | 3.449 | 3.491 | 3.704 | 3.469 | 3.364 | 3.480 | 0.130 |
| 13.0 | 3.340 | 3.277 | 3.410 | 3.159 | 3.252 | 3.285 | 3.334 | 3.232 | 3.422 | 3.580 | 3.174 | 3.353 | 3.142 | 3.247 | 3.432 | 3.124 | 3.124 | 3.281 | 0.124 |
| 14.4 | 3.266 | 3.066 | 3.097 | 2.938 | 3.006 | 3.139 | 3.035 | 3.024 | 3.189 | 3.366 | 2.974 | 2.932 | 2.980 | 3.017 | 3.245 | 2.960 | 2.932 | 3.030 | 0.130 |
| 16.0 | 3.181 | 2.964 | 3.117 | 2.712 | 2.768 | 2.975 | 2.893 | 2.785 | 3.202 | 3.109 | 2.767 | 3.011 | 2.798 | 2.875 | 2.902 | 2.771 | 2.712 | 2.898 | 0.160 |
| 17.3 | 3.183 | 3.067 | 2.922 | 2.597 | 2.672 | 2.999 | 2.597 | 2.684 | 2.836 | 3.009 | 2.711 | 3.074 | 2.671 | 2.830 | 2.743 | 2.714 | 2.597 | 2.786 | 0.187 |
| 18.5 | 3.153 | 2.888 | 2.827 | 2.623 | 2.681 | 2.692 | 2.653 | 2.684 | 2.883 | 3.022 | 2.939 | 3.058 | 2.767 | 2.764 | 2.733 | 2.766 | 2.623 | 2.766 | 0.157 |
| 19.5 | 3.055 | 2.851 | 2.770 | 2.656 | 2.650 | 2.670 | 2.710 | 2.702 | 2.910 | 2.786 | 2.681 | 2.962 | 2.821 | 2.770 | 2.730 | 2.797 | 2.650 | 2.770 | 0.116 |
| 21.3 | 2.744 | 2.691 | 2.567 | 2.445 | 2.517 | 2.596 | 2.489 | 2.568 | 2.700 | 2.895 | 2.701 | 2.817 | 2.779 | 2.861 | 2.715 | 2.761 | 2.445 | 2.701 | 0.134 |
| 24.3 | 2.470 | 2.428 | 2.352 | 2.237 | 2.285 | 2.340 | 2.411 | 2.410 | 2.432 | 2.836 | 2.460 | 2.695 | 2.435 | 2.266 | 2.576 | 2.539 | 2.237 | 2.430 | 0.156 |
| 33.0 | 2.374 | 2.233 | 2.451 | 2.197 | 2.256 | 2.566 | 2.416 | 2.285 | 2.362 | 2.474 | 2.348 | 2.381 | 2.300 | 2.347 | 2.363 | 2.234 | 2.197 | 2.355 | 0.098 |
| 38.0 | 2.391 | 2.406 | 2.278 | 2.391 | 2.436 | 2.455 | 2.511 | 2.510 | 2.570 | 2.394 | 2.529 | 2.517 | 2.482 | 2.162 | 2.402 | 2.393 | 2.162 | 2.421 | 0.102 |
| 40.0 | 1.945 | 1.932 | 1.724 | 1.760 | 1.779 | 1.888 | 1.894 | 1.901 | 1.782 | 1.774 | 1.877 | 1.957 | 1.976 | 1.896 | 1.906 | 1.995 | 1.724 | 1.895 | 0.084 |
| 42.0 | 1.871 | 1.858 | 1.811 | 1.810 | 1.831 | 1.760 | 1.826 | 1.985 | 1.865 | 1.721 | 1.752 | 1.929 | 1.879 | 1.868 | 1.891 | 1.875 | 1.721 | 1.862 | 0.067 |
| 45.0 | 1.908 | 1.905 | 1.921 | 1.911 | 2.004 | 1.848 | 1.911 | 2.004 | 1.930 | 1.740 | 1.774 | 1.957 | 1.939 | 1.937 | 1.920 | 1.870 | 1.740 | 1.916 | 0.070 |
| 48.0 | 2.400 | 2.153 | 2.408 | 2.392 | 2.416 | 2.294 | 2.335 | 2.384 | 2.413 | 2.243 | 2.218 | 2.382 | 2.342 | 2.286 | 2.232 | 2.028 | 2.028 | 2.339 | 0.110 |
| 53.0 | 2.995 | 2.927 | 2.972 | 2.957 | 2.928 | 2.859 | 2.962 | 2.915 | 3.257 | 3.085 | 2.826 | 2.780 | 2.954 | 2.953 | 2.926 | 2.870 | 2.780 | 2.941 | 0.109 |

Table 21 (Cont'd) RSRM-2B Aft Dome Insulation Performance

RSRM-2B Aft Cylinder

COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 5.37 | 4.73 | 4.80 | 3.80 | 3.33 | 3.33 | 4.87 | 4.46 | 3.86 | 3.81 | 3.60 | 4.27 | 4.49 | 3.69 | 3.22 | 3.54 | 3.22 | 316.8 | 2.0 |
| 68.0 | 4.57 | 4.06 | 2.75 | 2.24 | 4.41 | 5.42 | 3.17 | 2.81 | 2.43 | 3.61 | 5.39 | 3.41 | 2.69 | 3.83 | 3.38 | 6.88 | 2.24 | 68.4 | 1.5 |
| 72.0 | 4.58 | 4.91 | 4.63 | 3.06 | 3.67 | 4.57 | 5.39 | 3.77 | 3.83 | 4.38 | 4.49 | 4.17 | 4.44 | 4.85 | 4.48 | 4.07 | 3.06 | 68.4 | 1.5 |
| 75.0 | 3.74 | 4.34 | 4.03 | 3.13 | 4.08 | 3.84 | 4.55 | 3.19 | 3.95 | 5.00 | 3.77 | 4.26 | 4.62 | 4.04 | 4.66 | 4.07 | 3.13 | 68.4 | 1.5 |
| 78.0 | 2.59 | 4.27 | 4.00 | 3.33 | 3.67 | 4.88 | 4.32 | 3.48 | 3.62 | 4.92 | 4.85 | 4.41 | 3.88 | 4.28 | 3.51 | 5.32 | 2.59 | 0.0 | 1.5 |
| 81.0 | 3.70 | 4.19 | 4.18 | 4.33 | 3.99 | 5.81 | 3.88 | 3.70 | 3.43 | 16.47 | 3.80 | 4.47 | 4.09 | 3.76 | 3.91 | 11.20 | 3.43 | 180.0 | 1.5 |
| 85.0 | 2.98 | 3.55 | 3.62 | 3.34 | 3.40 | 3.82 | 3.54 | 3.10 | 3.68 | 4.64 | 3.51 | 3.53 | 3.48 | 3.25 | 3.33 | 9.29 | 2.98 | 0.0 | 1.5 |
| 90.0 | 2.55 | 3.46 | 3.76 | 3.51 | 3.62 | 4.74 | 4.77 | 3.80 | 3.11 | 4.29 | 3.50 | 3.54 | 3.58 | 3.54 | 3.83 | 7.91 | 2.55 | 0.0 | 1.5 |
| 98.0 | 2.96 | 2.80 | 2.63 | 2.70 | 3.11 | 3.77 | 3.48 | 3.08 | 2.87 | 2.93 | 2.83 | 2.78 | 2.74 | 2.74 | 3.97 | 2.87 | 2.63 | 46.8 | 1.5 |
| 105.8 | 3.03 | | 2.90 | | 3.00 | | 2.98 | | 3.25 | | 2.77 | | 2.82 | | 2.54 | | 2.54 | 316.8 | 1.5 |
| 116.0 | 3.21 | | 3.25 | | 3.13 | | 3.54 | | 3.24 | | 3.63 | | 3.41 | | 3.23 | | 3.13 | 90.0 | 1.5 |
| 124.5 | 2.78 | | 2.87 | | 3.38 | | 2.66 | | 3.17 | | 3.34 | | 2.93 | | 6.56 | | 2.66 | 136.8 | 1.5 |
| 133.0 | 2.60 | | 2.70 | | 2.61 | | 2.30 | | 2.93 | | 2.67 | | 2.59 | | 4.67 | | 2.30 | 136.8 | 1.5 |
| 145.5 | 2.72 | | 2.54 | | 2.78 | | 2.84 | | 2.62 | | 2.43 | | 2.32 | | 2.40 | | 2.32 | 270.0 | 1.5 |
| 158.5 | 2.72 | | 2.81 | | 2.89 | | 2.86 | | 2.79 | | 2.71 | | 2.29 | | 2.49 | | 2.29 | 270.0 | 1.5 |
| 168.3 | 3.10 | | 3.85 | | 2.94 | | 4.64 | | 3.13 | | 5.52 | | 3.06 | | 3.20 | | 2.94 | 90.0 | 1.5 |
| 177.7 | 3.01 | | 1.79< | | 2.92 | | 2.11 | | 2.74 | | 2.85 | | 2.84 | | 2.29 | | 1.79 | 46.8 | 2.0 |
| 192.5 | 2.99 | | 2.87 | | 3.58 | | 3.41 | | 2.46 | | 3.00 | | 2.18 | | 3.08 | | 2.18 | 270.0 | 1.5 |
| 202.5 | 2.99 | | 3.56 | | 3.16 | | 3.15 | | 2.96 | | 3.13 | | 2.83 | | 2.72 | | 2.72 | 316.8 | 1.5 |
| 214.0 | 2.50 | | 2.97 | | 3.43 | | 3.33 | | 3.30 | | 2.69 | | 2.57 | | 2.47 | | 2.47 | 316.8 | 1.5 |
| 227.3 | 2.31 | | 2.90 | | 3.42 | | 2.26 | | 6.13 | | 5.65 | | 2.33 | | 2.70 | | 2.26 | 136.8 | 1.5 |
| 238.3 | 2.93 | | 3.37 | | 3.50 | | 3.58 | | 2.94 | | 2.96 | | 2.56 | | 2.93 | | 2.56 | 270.0 | 1.5 |
| 250.0 | 2.81 | | 2.79 | | 2.82 | | 3.09 | | 2.88 | | 3.04 | | 2.48 | | 2.53 | | 2.48 | 270.0 | 1.5 |
| 267.0 | 2.73 | | 2.54 | | 2.81 | | 2.78 | | 2.54 | | 2.38 | | 2.70 | | 2.23 | | 2.23 | 316.8 | 1.5 |
| 283.9 | 3.28 | | 3.06 | | 3.72 | | 4.02 | | 1.53 | | 2.68 | | 2.65 | | 3.02 | | 1.53 | 180.0 | 1.5 |
| 299.1 | 3.52 | | 3.27 | | 3.89 | | 2.66 | | 4.12 | | 3.56 | | 4.00 | | 3.28 | | 2.66 | 136.8 | 2.0 |
| 322.0 | 1.76 | | 1.51 | | 1.67 | | 1.62 | | 1.53 | | 1.58 | | 1.51 | | 1.44< | | 1.44 | 316.8 | 1.5 |
| 339.0 | 1.73 | | 1.82 | | 2.12 | | 1.72 | | 1.69 | | 1.72 | | 1.60 | | 1.63 | | 1.60 | 270.0 | 1.5 |
| 344.0 | 5.51 | | 3.80 | | 5.21 | | 4.75 | | 1.60 | | 2.22 | | 1.66 | | 1.53 | | 1.53 | 316.8 | 1.5 |
| 358.0 | 3.04 | | 6.33 | | 6.55 | | 2.44 | | 27.14 | | 14.07 | | 4.18 | | 7.31 | | 2.44 | 136.8 | 1.5 |
| 363.0 | 7.04 | | 4.04 | | 22.35 | | 7.04 | | 6.79 | | 3.55 | | 5.00 | | 6.44 | | 3.55 | 226.8 | 1.5 |
| 367.0 | 6.44 | | 5.85 | | 9.05 | | 8.09 | | 9.05 | | 8.64 | | 6.13 | | 5.85 | | 5.85 | 46.8 | 1.5 |
| 372.0 | 1.63 | | 6.25 | | 10.26 | | 7.84 | | 5.48 | | 9.09 | | 4.17 | | 1.47< | | 1.47 | 316.8 | 1.5 |
| 375.0 | 8.42 | | 8.89 | | 13.33 | | 9.60 | | 9.60 | | 5.93 | | 4.21 | | 9.60 | | 4.21 | 270.0 | 1.5 |
| 377.5 | 3.68 | | 12.93 | | 4.08 | | 12.33 | | + | | 2.25 | | 6.16 | | 13.59 | | 2.25 | 226.8 | 1.5 |

SEGMENT MINIMUM = 1.44 AT THE 322.0 INCH STATION.

A " < " INDICATES THE PRECEDING SAFETY FACTOR HAS VIOLATED THE MINIMUM SAFETY FACTOR REQUIREMENT.

A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 22 RSRM-2B Aft Cylinder Insulation Performance

RSRM-2B Aft Cylinder

ACTUAL SAFETY FACTOR (ASF)

DEGREE LOCATION

| STATION (IN) | 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 6.58 | 5.64 | 5.69 | 4.73 | 4.17 | 4.17 | 5.79 | 5.28 | 4.82 | 4.89 | 4.41 | 5.06 | 5.29 | 4.50 | 4.14 | 4.46 | 4.14 | 316.8 |
| 68.0 | 5.80 | 5.01 | 3.51 | 3.06 | 5.34 | 6.05 | 4.21 | 3.64 | 3.27 | 4.42 | 6.07 | 4.23 | 3.55 | 4.65 | 4.18 | 7.59 | 3.06 | 68.4 |
| 72.0 | 5.07 | 5.29 | 4.99 | 3.50 | 4.06 | 5.16 | 5.86 | 4.25 | 4.26 | 4.96 | 4.91 | 4.61 | 4.84 | 5.26 | 4.84 | 4.66 | 3.50 | 68.4 |
| 75.0 | 4.17 | 4.73 | 4.38 | 3.54 | 4.42 | 4.46 | 4.90 | 3.62 | 4.28 | 5.51 | 4.14 | 4.69 | 4.96 | 4.40 | 5.06 | 4.73 | 3.54 | 68.4 |
| 78.0 | 3.06 | 4.44 | 4.16 | 3.57 | 3.90 | 5.23 | 4.50 | 3.73 | 3.88 | 5.18 | 5.04 | 4.64 | 4.10 | 4.41 | 3.81 | 5.92 | 3.06 | 0.0 |
| 81.0 | 4.03 | 4.45 | 4.43 | 4.60 | 4.37 | 6.17 | 4.21 | 3.98 | 3.79 | 17.53 | 4.14 | 4.77 | 4.36 | 4.00 | 4.23 | 11.90 | 3.79 | 180.0 |
| 85.0 | 3.67 | 4.27 | 4.31 | 4.04 | 4.18 | 4.81 | 4.34 | 3.81 | 4.40 | 5.73 | 4.28 | 4.27 | 4.22 | 3.91 | 4.04 | 10.76 | 3.67 | 0.0 |
| 90.0 | 3.09 | 3.76 | 4.16 | 3.87 | 4.12 | 5.20 | 5.28 | 4.26 | 3.52 | 4.84 | 3.99 | 3.91 | 3.93 | 3.91 | 4.34 | 8.81 | 3.09 | 0.0 |
| 98.0 | 3.72 | 3.52 | 3.37 | 3.34 | 3.82 | 4.51 | 4.20 | 3.69 | 3.48 | 3.49 | 3.39 | 3.35 | 3.37 | 3.37 | 4.80 | 3.66 | 3.34 | 68.4 |
| 105.8 | 3.14 | | 2.95 | | 3.05 | | 3.02 | | 3.44 | | 2.83 | | 2.91 | | 2.60 | | 2.60 | 316.8 |
| 116.0 | 3.32 | | 3.27 | | 3.20 | | 3.56 | | 3.43 | | 3.66 | | 3.48 | | 3.24 | | 3.20 | 90.0 |
| 124.5 | 2.84 | | 2.94 | | 3.41 | | 2.71 | | 3.22 | | 3.36 | | 3.01 | | 6.75 | | 2.71 | 136.8 |
| 133.0 | 2.96 | | 3.16 | | 3.10 | | 2.83 | | 3.33 | | 3.10 | | 3.09 | | 5.41 | | 2.83 | 136.8 |
| 145.5 | 2.76 | | 2.61 | | 2.84 | | 2.84 | | 2.66 | | 2.51 | | 2.45 | | 2.46 | | 2.45 | 270.0 |
| 158.5 | 2.87 | | 2.95 | | 3.01 | | 2.89 | | 2.88 | | 2.85 | | 2.50 | | 2.57 | | 2.50 | 270.0 |
| 168.3 | 4.18 | | 4.75 | | 3.80 | | 5.87 | | 3.95 | | 6.81 | | 3.87 | | 4.20 | | 3.80 | 90.0 |
| 177.7 | 4.48 | | 3.03 | | 4.36 | | 3.41 | | 4.12 | | 4.24 | | 4.21 | | 3.56 | | 3.03 | 46.8 |
| 192.5 | 3.36 | | 3.58 | | 4.11 | | 3.90 | | 3.05 | | 3.50 | | 2.70 | | 3.37 | | 2.70 | 270.0 |
| 202.5 | 3.07 | | 3.67 | | 3.22 | | 3.17 | | 3.03 | | 3.22 | | 2.92 | | 2.77 | | 2.77 | 316.8 |
| 214.0 | 2.61 | | 3.05 | | 3.50 | | 3.39 | | 3.45 | | 2.81 | | 2.69 | | 2.54 | | 2.54 | 316.8 |
| 227.3 | 2.77 | | 3.58 | | 4.11 | | 2.89 | | 7.39 | | 6.79 | | 2.83 | | 3.12 | | 2.77 | 0.0 |
| 238.3 | 3.01 | | 3.48 | | 3.53 | | 3.64 | | 3.04 | | 3.08 | | 2.67 | | 3.00 | | 2.67 | 270.0 |
| 250.0 | 2.88 | | 2.85 | | 2.90 | | 3.20 | | 3.02 | | 3.16 | | 2.61 | | 2.64 | | 2.61 | 270.0 |
| 267.0 | 3.17 | | 2.87 | | 3.31 | | 3.16 | | 2.97 | | 2.74 | | 2.96 | | 2.47 | | 2.47 | 316.8 |
| 283.9 | 3.79 | | 3.48 | | 4.19 | | 4.46 | | 2.22 | | 3.09 | | 3.14 | | 3.45 | | 2.22 | 180.0 |
| 299.1 | 5.63 | | 5.16 | | 6.28 | | 4.52 | | 6.45 | | 5.85 | | 6.27 | | 5.31 | | 4.52 | 136.8 |
| 322.0 | 2.45 | | 2.22 | | 2.44 | | 2.40 | | 2.31 | | 2.33 | | 2.22 | | 2.15 | | 2.15 | 316.8 |
| 339.0 | 2.51 | | 2.68 | | 3.04 | | 2.56 | | 2.53 | | 2.55 | | 2.39 | | 2.37 | | 2.37 | 316.8 |
| 344.0 | 6.06 | | 4.45 | | 5.97 | | 5.31 | | 2.46 | | 3.08 | | 2.49 | | 2.23 | | 2.23 | 316.8 |
| 358.0 | 5.06 | | 8.93 | | 8.59 | | 3.90 | | 40.71 | | 20.19 | | 6.29 | | 10.50 | | 3.90 | 136.8 |
| 363.0 | 9.43 | | 5.48 | | 29.82 | | 9.72 | | 9.48 | | 5.08 | | 7.00 | | 8.78 | | 5.08 | 226.8 |
| 367.0 | 7.37 | | 6.85 | | 10.98 | | 9.40 | | 10.14 | | 9.91 | | 7.18 | | 6.62 | | 6.62 | 316.8 |
| 372.0 | 2.49 | | 6.67 | | 11.05 | | 8.45 | | 6.30 | | 9.55 | | 4.79 | | 2.35 | | 2.35 | 316.8 |
| 375.0 | 9.16 | | 9.76 | | 14.53 | | 10.42 | | 10.58 | | 6.78 | | 4.96 | | 10.56 | | 4.96 | 270.0 |
| 377.5 | 5.52 | | 17.02 | | 6.92 | | 19.40 | | + | | 3.76 | | 8.60 | | 20.26 | | 3.76 | 226.8 |

SEGMENT MINIMUM = 2.15 AT THE 322.0 INCH STATION.

A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 22 (Cont'd) RSRM-2B Aft Cylinder Insulation Performance

RSRM-2B Aft Cylinder

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MAX. | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 0.520 | 0.590 | 0.581 | 0.734 | 0.838 | 0.839 | 0.573 | 0.625 | 0.723 | 0.733 | 0.774 | 0.653 | 0.622 | 0.756 | 0.866 | 0.789 | 0.866 | 0.701 | 0.728 | 0.108 |
| 68.0 | 0.481 | 0.542 | 0.799 | 0.983< | 0.499 | 0.406 | 0.694 | 0.782 | 0.906< | 0.609 | 0.408 | 0.646 | 0.819 | 0.575 | 0.651 | 0.320 | 0.983 | 0.632 | 0.628 | 0.190 |
| 72.0 | 0.437 | 0.407 | 0.432 | 0.653 | 0.545 | 0.438 | 0.371 | 0.530 | 0.522 | 0.457 | 0.445 | 0.480 | 0.450 | 0.412 | 0.446 | 0.492 | 0.653 | 0.470 | 0.448 | 0.068 |
| 75.0 | 0.481 | 0.415 | 0.447 | 0.575 | 0.441 | 0.469 | 0.396 | 0.564 | 0.456 | 0.360 | 0.477 | 0.423 | 0.390 | 0.445 | 0.386 | 0.442 | 0.575 | 0.448 | 0.444 | 0.059 |
| 78.0 | 0.618 | 0.375 | 0.400 | 0.481 | 0.436 | 0.328 | 0.370 | 0.460 | 0.442 | 0.325 | 0.330 | 0.363 | 0.412 | 0.374 | 0.456 | 0.301 | 0.618 | 0.404 | 0.388 | 0.079 |
| 81.0 | 0.378 | 0.334 | 0.335 | 0.323 | 0.351 | 0.241 | 0.361 | 0.378 | 0.408 | 0.085 | 0.368 | 0.313 | 0.342 | 0.372 | 0.358 | 0.125 | 0.408 | 0.317 | 0.347 | 0.091 |
| 85.0 | 0.436 | 0.366 | 0.359 | 0.389 | 0.382 | 0.340 | 0.367 | 0.419 | 0.353 | 0.280 | 0.370 | 0.368 | 0.374 | 0.400 | 0.390 | 0.140 | 0.436 | 0.358 | 0.369 | 0.068 |
| 90.0 | 0.497 | 0.366 | 0.336 | 0.360 | 0.349 | 0.267 | 0.265 | 0.333 | 0.407 | 0.295 | 0.361 | 0.357 | 0.353 | 0.357 | 0.330 | 0.160 | 0.497 | 0.337 | 0.351 | 0.072 |
| 98.0 | 0.384 | 0.405 | 0.431 | 0.420 | 0.365 | 0.301 | 0.326 | 0.368 | 0.396 | 0.387 | 0.401 | 0.408 | 0.414 | 0.414 | 0.286 | 0.396 | 0.431 | 0.381 | 0.396 | 0.043 |
| 105.8 | 0.357 | | 0.373 | | 0.360 | | 0.362 | | 0.332 | | 0.390 | | 0.383 | | 0.426 | | 0.426 | 0.373 | 0.368 | 0.028 |
| 116.0 | 0.327 | | 0.323 | | 0.336 | | 0.297 | | 0.324 | | 0.289 | | 0.308 | | 0.325 | | 0.336 | 0.316 | 0.324 | 0.016 |
| 124.5 | 0.370 | | 0.359 | | 0.305 | | 0.387 | | 0.325 | | 0.308 | | 0.352 | | 0.157 | | 0.387 | 0.320 | 0.338 | 0.072 |
| 133.0 | 0.377 | | 0.363 | | 0.375 | | 0.426 | | 0.335 | | 0.367 | | 0.378 | | 0.210 | | 0.426 | 0.354 | 0.371 | 0.063 |
| 145.5 | 0.342 | | 0.366 | | 0.335 | | 0.327 | | 0.355 | | 0.383 | | 0.401 | | 0.388 | | 0.401 | 0.362 | 0.361 | 0.027 |
| 158.5 | 0.323 | | 0.313 | | 0.305 | | 0.308 | | 0.315 | | 0.325 | | 0.385 | | 0.354 | | 0.385 | 0.329 | 0.319 | 0.027 |
| 168.3 | 0.274 | | 0.221 | | 0.289 | | 0.183 | | 0.272 | | 0.154 | | 0.278 | | 0.266 | | 0.289 | 0.242 | 0.269 | 0.050 |
| 177.7 | 0.332 | | 0.559< | | 0.343 | | 0.474< | | 0.365 | | 0.351 | | 0.352 | | 0.437 | | 0.559 | 0.402 | 0.359 | 0.081 |
| 192.5 | 0.261 | | 0.272 | | 0.218 | | 0.229 | | 0.317 | | 0.260 | | 0.358 | | 0.253 | | 0.358 | 0.271 | 0.261 | 0.046 |
| 202.5 | 0.244 | | 0.205 | | 0.231 | | 0.232 | | 0.247 | | 0.233 | | 0.258 | | 0.268 | | 0.268 | 0.240 | 0.238 | 0.019 |
| 214.0 | 0.280 | | 0.236 | | 0.204 | | 0.210 | | 0.212 | | 0.260 | | 0.272 | | 0.283 | | 0.283 | 0.245 | 0.248 | 0.033 |
| 227.3 | 0.281 | | 0.224 | | 0.190 | | 0.288 | | 0.106 | | 0.115 | | 0.279 | | 0.241 | | 0.288 | 0.216 | 0.233 | 0.073 |
| 238.3 | 0.215 | | 0.187 | | 0.180 | | 0.176 | | 0.214 | | 0.213 | | 0.246 | | 0.215 | | 0.246 | 0.206 | 0.214 | 0.023 |
| 250.0 | 0.196 | | 0.197 | | 0.195 | | 0.178 | | 0.191 | | 0.181 | | 0.222 | | 0.217 | | 0.222 | 0.197 | 0.196 | 0.016 |
| 267.0 | 0.183 | | 0.197 | | 0.178 | | 0.180 | | 0.197 | | 0.210 | | 0.185 | | 0.224 | | 0.224 | 0.194 | 0.191 | 0.016 |
| 283.9 | 0.137 | | 0.147 | | 0.121 | | 0.112 | | 0.294< | | 0.168 | | 0.170 | | 0.149 | | 0.294 | 0.162 | 0.148 | 0.057 |
| 299.1 | 0.192 | | 0.207 | | 0.174 | | 0.254< | | 0.164 | | 0.190 | | 0.169 | | 0.206 | | 0.254 | 0.195 | 0.191 | 0.029 |
| 322.0 | 0.216< | | 0.251< | | 0.227< | | 0.235< | | 0.248< | | 0.241< | | 0.252< | | 0.264< | | 0.264 | 0.242 | 0.244 | 0.015 |
| 339.0 | 0.220< | | 0.209< | | 0.179 | | 0.221< | | 0.225< | | 0.221< | | 0.237< | | 0.233< | | 0.237 | 0.218 | 0.221 | 0.018 |
| 344.0 | 0.069 | | 0.100 | | 0.073 | | 0.080 | | 0.237< | | 0.171 | | 0.229< | | 0.248< | | 0.248 | 0.151 | 0.135 | 0.079 |
| 358.0 | 0.125 | | 0.060 | | 0.058 | | 0.156 | | 0.014 | | 0.027 | | 0.091 | | 0.052 | | 0.156 | 0.073 | 0.059 | 0.048 |
| 363.0 | 0.054 | | 0.094 | | 0.017 | | 0.054 | | 0.056 | | 0.107 | | 0.076 | | 0.059 | | 0.107 | 0.065 | 0.058 | 0.028 |
| 367.0 | 0.059 | | 0.065 | | 0.042 | | 0.047 | | 0.042 | | 0.044 | | 0.062 | | 0.065 | | 0.065 | 0.053 | 0.053 | 0.010 |
| 372.0 | 0.246< | | 0.064 | | 0.039 | | 0.051 | | 0.073 | | 0.044 | | 0.096 | | 0.272< | | 0.272 | 0.111 | 0.069 | 0.094 |
| 375.0 | 0.057 | | 0.054 | | 0.036 | | 0.050 | | 0.050 | | 0.081 | | 0.114 | | 0.050 | | 0.114 | 0.062 | 0.052 | 0.025 |
| 377.5 | 0.144 | | 0.041 | | 0.130 | | 0.043 | | 0 | | 0.236 | | 0.086 | | 0.039 | | 0.236 | 0.090 | 0.065 | 0.077 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

Table 22 (Cont'd) RSRM-2B Aft Cylinder Insulation Performance

RSRM-2B Aft Cylinder

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 7.0 | 7.9 | 7.8 | 9.8 | 11.2 | 11.2 | 7.7 | 8.4 | 9.7 | 9.8 | 10.3 | 8.7 | 8.3 | 10.1 | 11.6 | 10.5 | 9.4 | 74.8 |
| 68.0 | 7.6 | 8.5 | 12.6 | 15.5 | 7.9 | 6.4 | 10.9 | 12.3 | 14.3 | 9.6 | 6.4 | 10.2 | 12.9 | 9.1 | 10.3 | 5.0 | 10.0 | 63.4 |
| 72.0 | 7.7 | 7.2 | 7.6 | 11.5 | 9.6 | 7.7 | 6.5 | 9.3 | 9.2 | 8.1 | 7.8 | 8.5 | 7.9 | 7.3 | 7.9 | 8.7 | 8.3 | 56.7 |
| 75.0 | 9.4 | 8.2 | 8.8 | 11.3 | 8.7 | 9.2 | 7.8 | 11.1 | 9.0 | 7.1 | 9.4 | 8.3 | 7.7 | 8.7 | 7.6 | 8.7 | 8.8 | 50.9 |
| 78.0 | 13.2 | 8.0 | 8.6 | 10.3 | 9.3 | 7.0 | 7.9 | 9.9 | 9.5 | 7.0 | 7.1 | 7.8 | 8.8 | 8.0 | 9.8 | 6.4 | 8.7 | 46.7 |
| 81.0 | 8.2 | 7.3 | 7.3 | 7.0 | 7.6 | 5.3 | 7.9 | 8.2 | 8.9 | 1.9 | 8.0 | 6.8 | 7.5 | 8.1 | 7.8 | 2.7 | 6.9 | 45.9 |
| 85.0 | 9.6 | 8.1 | 7.9 | 8.6 | 8.4 | 7.5 | 8.1 | 9.2 | 7.8 | 6.2 | 8.2 | 8.1 | 8.3 | 8.8 | 8.6 | 3.1 | 7.9 | 45.3 |
| 90.0 | 11.1 | 8.2 | 7.5 | 8.1 | 7.8 | 6.0 | 5.9 | 7.4 | 9.1 | 6.6 | 8.1 | 8.0 | 7.9 | 8.0 | 7.4 | 3.6 | 7.5 | 44.7 |
| 98.0 | 8.8 | 9.3 | 9.9 | 9.6 | 8.4 | 6.9 | 7.5 | 8.4 | 9.1 | 8.9 | 9.2 | 9.3 | 9.5 | 9.5 | 6.5 | 9.1 | 8.7 | 43.7 |
| 105.8 | 8.3 | | 8.7 | | 8.4 | | 8.4 | | 7.7 | | 9.1 | | 8.9 | | 9.9 | | 8.7 | 42.9 |
| 116.0 | 7.8 | | 7.7 | | 8.0 | | 7.1 | | 7.7 | | 6.9 | | 7.3 | | 7.7 | | 7.5 | 42.1 |
| 124.5 | 9.0 | | 8.7 | | 7.4 | | 9.4 | | 7.9 | | 7.5 | | 8.6 | | 3.8 | | 7.8 | 41.1 |
| 133.0 | 9.4 | | 9.1 | | 9.4 | | 10.7 | | 8.4 | | 9.2 | | 9.5 | | 5.3 | | 8.9 | 39.9 |
| 145.5 | 9.0 | | 9.7 | | 8.8 | | 8.6 | | 9.4 | | 10.1 | | 10.6 | | 10.2 | | 9.6 | 37.9 |
| 158.5 | 8.9 | | 8.6 | | 8.4 | | 8.5 | | 8.7 | | 9.0 | | 10.6 | | 9.8 | | 9.0 | 36.3 |
| 168.3 | 7.9 | | 6.3 | | 8.3 | | 5.2 | | 7.8 | | 4.4 | | 8.0 | | 7.6 | | 6.9 | 34.9 |
| 177.7 | 9.6 | | 16.2 | | 9.9 | | 13.7 | | 10.6 | | 10.2 | | 10.2 | | 12.7 | | 11.6 | 34.5 |
| 192.5 | 8.3 | | 8.7 | | 7.0 | | 7.3 | | 10.1 | | 8.3 | | 11.4 | | 8.1 | | 8.7 | 31.3 |
| 202.5 | 8.2 | | 6.9 | | 7.7 | | 7.8 | | 8.3 | | 7.8 | | 8.6 | | 9.0 | | 8.0 | 29.9 |
| 214.0 | 10.0 | | 8.4 | | 7.3 | | 7.5 | | 7.5 | | 9.3 | | 9.7 | | 10.1 | | 8.7 | 28.1 |
| 227.3 | 10.8 | | 8.6 | | 7.3 | | 11.0 | | 4.1 | | 4.4 | | 10.7 | | 9.2 | | 8.3 | 26.1 |
| 238.3 | 8.8 | | 7.6 | | 7.3 | | 7.2 | | 8.7 | | 8.7 | | 10.0 | | 8.8 | | 8.4 | 24.5 |
| 250.0 | 8.7 | | 8.8 | | 8.7 | | 7.9 | | 8.5 | | 8.0 | | 9.9 | | 9.6 | | 8.8 | 22.5 |
| 267.0 | 9.2 | | 9.9 | | 9.0 | | 9.1 | | 9.9 | | 10.6 | | 9.3 | | 11.3 | | 9.8 | 19.8 |
| 283.9 | 8.1 | | 8.6 | | 7.1 | | 6.6 | | 17.3 | | 9.9 | | 10.0 | | 8.8 | | 9.5 | 17.0 |
| 299.1 | 10.9 | | 11.8 | | 9.9 | | 14.4 | | 9.3 | | 10.8 | | 9.6 | | 11.7 | | 11.1 | 17.6 |
| 322.0 | 16.9 | | 19.6 | | 17.7 | | 18.4 | | 19.4 | | 18.8 | | 19.7 | | 20.6 | | 18.9 | 12.8 |
| 339.0 | 18.0 | | 17.1 | | 14.7 | | 18.1 | | 18.4 | | 18.1 | | 19.4 | | 19.1 | | 17.9 | 12.2 |
| 344.0 | 5.7 | | 8.2 | | 6.0 | | 6.6 | | 19.4 | | 14.0 | | 18.8 | | 20.3 | | 12.4 | 12.2 |
| 358.0 | 11.0 | | 5.3 | | 5.1 | | 13.7 | | 1.2 | | 2.4 | | 8.0 | | 4.6 | | 6.4 | 11.4 |
| 363.0 | 4.7 | | 8.2 | | 1.5 | | 4.7 | | 4.9 | | 9.4 | | 6.7 | | 5.2 | | 5.7 | 11.4 |
| 367.0 | 5.4 | | 5.9 | | 3.8 | | 4.3 | | 3.8 | | 4.0 | | 5.6 | | 5.9 | | 4.8 | 11.0 |
| 372.0 | 15.6 | | 4.1 | | 2.5 | | 3.2 | | 4.6 | | 2.8 | | 6.1 | | 17.2 | | 7.0 | 15.8 |
| 375.0 | 3.0 | | 2.8 | | 1.9 | | 2.6 | | 2.6 | | 4.2 | | 5.9 | | 2.6 | | 3.2 | 19.2 |
| 377.5 | 7.1 | | 2.0 | | 6.4 | | 2.1 | | 0 | | 11.6 | | 4.2 | | 1.9 | | 4.4 | 20.4 |

Table 22 (Cont'd) RSRM-2B Aft Cylinder Insulation Performance

RSRM-2B Aft Cylinder

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MIN. | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 3.419 | 3.330 | 3.307 | 3.470 | 3.492 | 3.497 | 3.320 | 3.302 | 3.483 | 3.585 | 3.417 | 3.303 | 3.288 | 3.404 | 3.583 | 3.520 | 3.288 | 3.418 | 0.102 | 2.790 |
| 68.0 | 2.791 | 2.717 | 2.802 | 3.004 | 2.666 | 2.457 | 2.920 | 2.850 | 2.961 | 2.694 | 2.476 | 2.730 | 2.909 | 2.672 | 2.724 | 2.428 | 2.428 | 2.727 | 0.175 | 2.200 |
| 72.0 | 2.214 | 2.151 | 2.156 | 2.286 | 2.212 | 2.261 | 2.174 | 2.250 | 2.225 | 2.266 | 2.183 | 2.212 | 2.180 | 2.168 | 2.160 | 2.295 | 2.151 | 2.212 | 0.048 | 2.000 |
| 75.0 | 2.006 | 1.965 | 1.958 | 2.036 | 1.950 | 2.090 | 1.942 | 2.039 | 1.953 | 1.982 | 1.973 | 1.984 | 1.935 | 1.958 | 1.954 | 2.092 | 1.935 | 1.969 | 0.050 | 1.800 |
| 78.0 | 1.894 | 1.666 | 1.664 | 1.718 | 1.702 | 1.715 | 1.664 | 1.715 | 1.715 | 1.682 | 1.664 | 1.684 | 1.688 | 1.649 | 1.736 | 1.783 | 1.649 | 1.695 | 0.060 | 1.600 |
| 81.0 | 1.525 | 1.487 | 1.484 | 1.487 | 1.533 | 1.488 | 1.520 | 1.504 | 1.545 | 1.490 | 1.524 | 1.492 | 1.492 | 1.487 | 1.513 | 1.487 | 1.484 | 1.492 | 0.020 | 1.400 |
| 85.0 | 1.599 | 1.564 | 1.549 | 1.572 | 1.597 | 1.637 | 1.594 | 1.595 | 1.553 | 1.605 | 1.585 | 1.570 | 1.579 | 1.566 | 1.577 | 1.507 | 1.507 | 1.578 | 0.029 | 1.300 |
| 90.0 | 1.534 | 1.377 | 1.398 | 1.395 | 1.437 | 1.389 | 1.400 | 1.418 | 1.433 | 1.428 | 1.442 | 1.396 | 1.387 | 1.397 | 1.432 | 1.409 | 1.377 | 1.405 | 0.037 | 1.265 |
| 98.0 | 1.430 | 1.426 | 1.452 | 1.404 | 1.394 | 1.359 | 1.369 | 1.357 | 1.380 | 1.349 | 1.359 | 1.367 | 1.395 | 1.395 | 1.374 | 1.450 | 1.349 | 1.387 | 0.033 | 1.135 |
| 105.8 | 1.120 | | 1.100 | | 1.097 | | 1.094 | | 1.142 | | 1.102 | | 1.114 | | 1.107 | | 1.094 | 1.105 | 0.016 | 1.080 |
| 116.0 | 1.085 | | 1.055 | | 1.074 | | 1.056 | | 1.110 | | 1.058 | | 1.073 | | 1.052 | | 1.052 | 1.066 | 0.020 | 1.050 |
| 124.5 | 1.050 | | 1.057 | | 1.040 | | 1.048 | | 1.046 | | 1.034 | | 1.058 | | 1.059 | | 1.034 | 1.049 | 0.009 | 1.030 |
| 133.0 | 1.117 | | 1.147 | | 1.162 | | 1.204 | | 1.116 | | 1.137 | | 1.168 | | 1.137 | | 1.116 | 1.142 | 0.029 | 0.980 |
| 145.5 | 0.945 | | 0.954 | | 0.950 | | 0.930 | | 0.946 | | 0.961 | | 0.983 | | 0.953 | | 0.930 | 0.951 | 0.015 | 0.930 |
| 158.5 | 0.926 | | 0.922 | | 0.918 | | 0.889 | | 0.907 | | 0.925 | | 0.964 | | 0.910 | | 0.889 | 0.920 | 0.021 | 0.880 |
| 168.3 | 1.146 | | 1.049 | | 1.099 | | 1.074 | | 1.075 | | 1.048 | | 1.075 | | 1.117 | | 1.048 | 1.075 | 0.034 | 0.850 |
| 177.7 | 1.489 | | 1.696 | | 1.494 | | 1.614 | | 1.503 | | 1.487 | | 1.482 | | 1.557 | | 1.482 | 1.498 | 0.078 | 1.000 |
| 192.5 | 0.876 | | 0.975 | | 0.897 | | 0.893 | | 0.968 | | 0.909 | | 0.965 | | 0.853 | | 0.853 | 0.903 | 0.046 | 0.780 |
| 202.5 | 0.750 | | 0.752 | | 0.743 | | 0.735 | | 0.748 | | 0.750 | | 0.753 | | 0.742 | | 0.735 | 0.749 | 0.006 | 0.730 |
| 214.0 | 0.730 | | 0.720 | | 0.713 | | 0.712 | | 0.732 | | 0.730 | | 0.732 | | 0.719 | | 0.712 | 0.725 | 0.008 | 0.700 |
| 227.3 | 0.777 | | 0.802 | | 0.780 | | 0.831 | | 0.783 | | 0.781 | | 0.790 | | 0.752 | | 0.752 | 0.782 | 0.023 | 0.650 |
| 238.3 | 0.648 | | 0.650 | | 0.635 | | 0.640 | | 0.651 | | 0.656 | | 0.657 | | 0.644 | | 0.635 | 0.649 | 0.008 | 0.630 |
| 250.0 | 0.564 | | 0.561 | | 0.565 | | 0.570 | | 0.576 | | 0.572 | | 0.579 | | 0.572 | | 0.561 | 0.571 | 0.006 | 0.550 |
| 267.0 | 0.580 | | 0.565 | | 0.589 | | 0.568 | | 0.586 | | 0.576 | | 0.548 | | 0.554 | | 0.548 | 0.572 | 0.015 | 0.500 |
| 283.9 | 0.519 | | 0.511 | | 0.507 | | 0.500 | | 0.652 | | 0.519 | | 0.534 | | 0.514 | | 0.500 | 0.516 | 0.050 | 0.450 |
| 299.1 | 1.081 | | 1.069 | | 1.093 | | 1.149 | | 1.057 | | 1.112 | | 1.059 | | 1.094 | | 1.057 | 1.087 | 0.031 | 0.676 |
| 322.0 | 0.530 | | 0.556 | | 0.555 | | 0.563 | | 0.574 | | 0.561 | | 0.559 | | 0.567 | | 0.530 | 0.560 | 0.013 | 0.380 |
| 339.0 | 0.553 | | 0.560 | | 0.545 | | 0.565 | | 0.570 | | 0.564 | | 0.566 | | 0.552 | | 0.545 | 0.562 | 0.009 | 0.380 |
| 344.0 | 0.418 | | 0.445 | | 0.436 | | 0.425 | | 0.584 | | 0.526 | | 0.571 | | 0.553 | | 0.418 | 0.486 | 0.071 | 0.380 |
| 358.0 | 0.633 | | 0.536 | | 0.498 | | 0.608 | | 0.570 | | 0.545 | | 0.572 | | 0.546 | | 0.498 | 0.558 | 0.042 | 0.380 |
| 363.0 | 0.509 | | 0.515 | | 0.507 | | 0.525 | | 0.531 | | 0.544 | | 0.532 | | 0.518 | | 0.507 | 0.521 | 0.013 | 0.380 |
| 367.0 | 0.435 | | 0.445 | | 0.461 | | 0.442 | | 0.426 | | 0.436 | | 0.445 | | 0.430 | | 0.426 | 0.439 | 0.011 | 0.380 |
| 372.0 | 0.613 | | 0.427 | | 0.431 | | 0.431 | | 0.460 | | 0.420 | | 0.460 | | 0.640 | | 0.420 | 0.446 | 0.089 | 0.400 |
| 375.0 | 0.522 | | 0.527 | | 0.523 | | 0.521 | | 0.529 | | 0.549 | | 0.565 | | 0.528 | | 0.521 | 0.528 | 0.016 | 0.480 |
| 377.5 | 0.795 | | 0.698 | | 0.899 | | 0.834 | | 0.733 | | 0.888 | | 0.740 | | 0.790 | | 0.698 | 0.793 | 0.073 | 0.530 |

Table 22 (Cont'd) RSRM-2B Aft Cylinder Insulation Performance

RSRM-2B Aft Cylinder

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 21.6 | 46.8 | 68.4 | 90.0 | 111.6 | 136.8 | 158.4 | 180.0 | 201.6 | 226.8 | 248.4 | 270.0 | 291.6 | 316.8 | 338.4 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.0 | 2.899 | 2.740 | 2.726 | 2.736 | 2.654 | 2.658 | 2.747 | 2.677 | 2.760 | 2.852 | 2.643 | 2.650 | 2.666 | 2.648 | 2.717 | 2.731 | 2.643 | 2.722 | 0.074 |
| 68.0 | 2.310 | 2.175 | 2.003 | 2.021 | 2.167 | 2.051 | 2.226 | 2.068 | 2.055 | 2.085 | 2.068 | 2.084 | 2.090 | 2.097 | 2.073 | 2.108 | 2.003 | 2.085 | 0.079 |
| 72.0 | 1.777 | 1.744 | 1.724 | 1.633 | 1.667 | 1.823 | 1.803 | 1.720 | 1.703 | 1.809 | 1.738 | 1.732 | 1.730 | 1.756 | 1.714 | 1.803 | 1.633 | 1.735 | 0.052 |
| 75.0 | 1.525 | 1.550 | 1.511 | 1.461 | 1.509 | 1.621 | 1.546 | 1.475 | 1.497 | 1.622 | 1.496 | 1.561 | 1.545 | 1.513 | 1.568 | 1.650 | 1.461 | 1.535 | 0.054 |
| 78.0 | 1.276 | 1.291 | 1.264 | 1.237 | 1.266 | 1.387 | 1.294 | 1.255 | 1.273 | 1.357 | 1.334 | 1.321 | 1.276 | 1.275 | 1.280 | 1.482 | 1.237 | 1.278 | 0.061 |
| 81.0 | 1.147 | 1.153 | 1.149 | 1.164 | 1.182 | 1.247 | 1.159 | 1.126 | 1.137 | 1.405 | 1.156 | 1.179 | 1.150 | 1.115 | 1.155 | 1.362 | 1.115 | 1.156 | 0.083 |
| 85.0 | 1.163 | 1.198 | 1.190 | 1.183 | 1.215 | 1.297 | 1.227 | 1.176 | 1.200 | 1.325 | 1.215 | 1.202 | 1.205 | 1.166 | 1.187 | 1.367 | 1.163 | 1.201 | 0.059 |
| 90.0 | 1.037 | 1.011 | 1.062 | 1.035 | 1.088 | 1.122 | 1.135 | 1.085 | 1.026 | 1.133 | 1.081 | 1.039 | 1.034 | 1.040 | 1.102 | 1.249 | 1.011 | 1.072 | 0.060 |
| 98.0 | 1.046 | 1.021 | 1.021 | 0.984 | 1.029 | 1.058 | 1.043 | 0.989 | 0.984 | 0.962 | 0.958 | 0.959 | 0.981 | 0.981 | 1.088 | 1.054 | 0.958 | 1.005 | 0.040 |
| 105.8 | 0.763 | | 0.727 | | 0.737 | | 0.732 | | 0.810 | | 0.712 | | 0.731 | | 0.681 | | 0.681 | 0.732 | 0.038 |
| 116.0 | 0.758 | | 0.732 | | 0.738 | | 0.759 | | 0.786 | | 0.769 | | 0.765 | | 0.727 | | 0.727 | 0.759 | 0.020 |
| 124.5 | 0.680 | | 0.698 | | 0.735 | | 0.661 | | 0.721 | | 0.726 | | 0.706 | | 0.902 | | 0.661 | 0.714 | 0.074 |
| 133.0 | 0.740 | | 0.784 | | 0.787 | | 0.778 | | 0.781 | | 0.770 | | 0.790 | | 0.927 | | 0.740 | 0.783 | 0.056 |
| 145.5 | 0.603 | | 0.588 | | 0.615 | | 0.603 | | 0.591 | | 0.578 | | 0.582 | | 0.565 | | 0.565 | 0.590 | 0.016 |
| 158.5 | 0.603 | | 0.609 | | 0.613 | | 0.581 | | 0.592 | | 0.600 | | 0.579 | | 0.556 | | 0.556 | 0.596 | 0.019 |
| 168.3 | 0.872 | | 0.828 | | 0.810 | | 0.891 | | 0.803 | | 0.894 | | 0.797 | | 0.851 | | 0.797 | 0.840 | 0.039 |
| 177.7 | 1.157 | | 1.137 | | 1.151 | | 1.140 | | 1.138 | | 1.136 | | 1.130 | | 1.120 | | 1.120 | 1.138 | 0.011 |
| 192.5 | 0.615 | | 0.703 | | 0.679 | | 0.664 | | 0.651 | | 0.649 | | 0.607 | | 0.600 | | 0.600 | 0.650 | 0.036 |
| 202.5 | 0.506 | | 0.547 | | 0.512 | | 0.503 | | 0.501 | | 0.517 | | 0.495 | | 0.474 | | 0.474 | 0.505 | 0.021 |
| 214.0 | 0.450 | | 0.484 | | 0.509 | | 0.502 | | 0.520 | | 0.470 | | 0.460 | | 0.436 | | 0.436 | 0.477 | 0.030 |
| 227.3 | 0.496 | | 0.578 | | 0.590 | | 0.543 | | 0.677 | | 0.666 | | 0.511 | | 0.511 | | 0.496 | 0.561 | 0.070 |
| 238.3 | 0.433 | | 0.463 | | 0.455 | | 0.464 | | 0.437 | | 0.443 | | 0.411 | | 0.429 | | 0.411 | 0.440 | 0.018 |
| 250.0 | 0.368 | | 0.364 | | 0.370 | | 0.392 | | 0.385 | | 0.391 | | 0.357 | | 0.355 | | 0.355 | 0.369 | 0.015 |
| 267.0 | 0.397 | | 0.368 | | 0.411 | | 0.388 | | 0.389 | | 0.366 | | 0.363 | | 0.330 | | 0.330 | 0.378 | 0.025 |
| 283.9 | 0.382 | | 0.364 | | 0.386 | | 0.388 | | 0.358 | | 0.351 | | 0.364 | | 0.365 | | 0.351 | 0.365 | 0.014 |
| 299.1 | 0.889 | | 0.862 | | 0.919 | | 0.895 | | 0.893 | | 0.922 | | 0.890 | | 0.888 | | 0.862 | 0.891 | 0.019 |
| 322.0 | 0.314 | | 0.305 | | 0.328 | | 0.328 | | 0.326 | | 0.320 | | 0.307 | | 0.303 | | 0.303 | 0.317 | 0.011 |
| 339.0 | 0.333 | | 0.351 | | 0.366 | | 0.344 | | 0.345 | | 0.343 | | 0.329 | | 0.319 | | 0.319 | 0.344 | 0.014 |
| 344.0 | 0.349 | | 0.345 | | 0.363 | | 0.345 | | 0.347 | | 0.355 | | 0.342 | | 0.305 | | 0.305 | 0.346 | 0.017 |
| 358.0 | 0.508 | | 0.476 | | 0.440 | | 0.452 | | 0.556 | | 0.518 | | 0.481 | | 0.494 | | 0.440 | 0.488 | 0.037 |
| 363.0 | 0.455 | | 0.421 | | 0.490 | | 0.471 | | 0.475 | | 0.437 | | 0.456 | | 0.459 | | 0.421 | 0.458 | 0.022 |
| 367.0 | 0.376 | | 0.380 | | 0.419 | | 0.395 | | 0.384 | | 0.392 | | 0.383 | | 0.365 | | 0.365 | 0.384 | 0.016 |
| 372.0 | 0.367 | | 0.363 | | 0.392 | | 0.380 | | 0.387 | | 0.376 | | 0.364 | | 0.368 | | 0.363 | 0.372 | 0.011 |
| 375.0 | 0.465 | | 0.473 | | 0.487 | | 0.471 | | 0.479 | | 0.468 | | 0.451 | | 0.478 | | 0.451 | 0.472 | 0.011 |
| 377.5 | 0.651 | | 0.657 | | 0.769 | | 0.791 | | 0.755 | | 0.652 | | 0.654 | | 0.751 | | 0.651 | 0.704 | 0.062 |

Table 22 (Cont'd) RSRM-2B Aft Cylinder Insulation Performance

RSRM-2B Aft Center Segment

COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 4.73 | 4.47 | 5.54 | 4.36 | 4.52 | 4.25 | 3.93 | 4.50 | 3.93 | 270.0 | 2.0 |
| 11.0 | 4.55 | 4.77 | 6.53 | 6.88 | 4.65 | 4.27 | 4.42 | 4.83 | 4.27 | 226.0 | 1.5 |
| 23.6 | 5.92 | 4.79 | 5.17 | 4.54 | 3.89 | 3.37 | 3.22 | 4.87 | 3.22 | 270.0 | 1.5 |
| 30.7 | 3.81 | 3.21 | 3.35 | 2.92 | 2.86 | 3.35 | 2.73 | 2.73 | 2.73 | 270.0 | 1.5 |
| 36.2 | 6.91 | 4.71 | 9.66 | 3.13 | 4.00 | 3.15 | 3.54 | 4.63 | 3.13 | 136.0 | 1.5 |
| 39.7 | 3.50 | 3.94 | 4.62 | 4.22 | 3.94 | 3.94 | 3.16 | 2.43 | 2.43 | 316.0 | 1.5 |
| 44.6 | 6.32 | 6.43 | 7.20 | 7.83 | 6.10 | 5.54 | 6.43 | 5.54 | 5.54 | 226.0 | 1.5 |
| 48.0 | 3.84 | 3.89 | 2.64 | 4.36 | 3.16 | 3.65 | 3.74 | 3.13 | 2.64 | 90.0 | 1.5 |
| 71.5 | 3.86 | 2.88 | 3.04 | 2.83 | 3.04 | 4.36 | 2.46 | 2.83 | 2.46 | 270.0 | 1.5 |
| 126.0 | 7.89 | + | 75.00 | 2.78 | 7.89 | 1.95 | + | 12.50 | 1.95 | 226.0 | 1.5 |
| 153.5 | 3.33 | 2.20 | 9.29 | 2.24 | 5.00 | 2.71 | 2.28 | 3.71 | 2.20 | 46.0 | 1.5 |
| 161.4 | 2.09 | 1.36 < | 2.38 | 2.88 | 6.05 | 1.27 < | 1.84 < | 1.42 < | 1.27 | 226.0 | 2.0 |
| 214.1 | 32.50 | + | 5.65 | 8.12 | + | + | + | 7.22 | 5.65 | 90.0 | 1.5 |
| 280.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 298.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 307.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 311.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 314.0 | + | + | + | + | + | + | + | + | | | 1.5 |

SEGMENT MINIMUM = 1.27 AT THE 161.4 INCH STATION.

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 5.59 | 5.45 | 6.38 | 5.21 | 5.37 | 5.16 | 4.71 | 5.37 | 4.71 | 270.0 |
| 11.0 | 5.07 | 5.23 | 7.21 | 7.51 | 4.95 | 4.72 | 4.84 | 5.19 | 4.72 | 226.0 |
| 23.6 | 6.35 | 5.23 | 5.86 | 4.92 | 4.41 | 3.82 | 3.66 | 5.42 | 3.66 | 270.0 |
| 30.7 | 4.34 | 3.70 | 3.86 | 3.35 | 3.25 | 3.81 | 3.12 | 3.09 | 3.09 | 316.0 |
| 36.2 | 8.11 | 5.49 | 10.53 | 3.65 | 4.65 | 3.73 | 4.14 | 5.07 | 3.65 | 136.0 |
| 39.7 | 4.07 | 4.52 | 5.33 | 4.82 | 4.53 | 4.59 | 3.66 | 2.82 | 2.82 | 316.0 |
| 44.6 | 6.60 | 6.91 | 7.80 | 8.15 | 6.47 | 5.98 | 6.73 | 5.92 | 5.92 | 316.0 |
| 48.0 | 5.47 | 5.46 | 3.77 | 6.05 | 4.52 | 5.01 | 5.17 | 4.34 | 3.77 | 90.0 |
| 71.5 | 4.32 | 3.20 | 3.37 | 3.17 | 3.48 | 4.82 | 2.78 | 3.23 | 2.78 | 270.0 |
| 126.0 | 8.53 | + | 85.50 | 3.04 | 9.16 | 3.23 | + | 13.58 | 3.04 | 136.0 |
| 153.5 | 4.59 | 3.02 | 12.29 | 2.97 | 6.62 | 3.31 | 2.93 | 4.57 | 2.93 | 270.0 |
| 161.4 | 5.71 | 3.73 | 6.11 | 7.12 | 13.36 | 3.69 | 4.80 | 3.98 | 3.69 | 226.0 |
| 214.1 | 37.75 | + | 6.48 | 9.75 | + | + | + | 8.61 | 6.48 | 90.0 |
| 280.0 | + | + | + | + | + | + | + | + | | |
| 298.0 | + | + | + | + | + | + | + | + | | |
| 307.8 | + | + | + | + | + | + | + | + | | |
| 311.8 | + | + | + | + | + | + | + | + | | |
| 314.0 | + | + | + | + | + | + | + | + | | |

SEGMENT MINIMUM = 2.78 AT THE 71.5 INCH STATION.
A " < " INDICATES THE PRECEDING SAFETY FACTOR HAS VIOLATED THE MINIMUM SAFETY FACTOR REQUIREMENT.
A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 23 RSRM-2B Aft Center Segment Insulation Performance

RSRM-2B Aft Center Segment

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.448 | 0.474 | 0.383 | 0.486 | 0.469 | 0.499 | 0.540 | 0.471 | 0.540 | 0.471 | 0.472 | 0.045 |
| 11.0 | 0.418 | 0.398 | 0.291 | 0.276 | 0.409 | 0.445 | 0.430 | 0.393 | 0.445 | 0.382 | 0.404 | 0.063 |
| 23.6 | 0.157 | 0.194 | 0.180 | 0.205 | 0.239 | 0.276 | 0.289 | 0.191 | 0.289 | 0.216 | 0.200 | 0.047 |
| 30.7 | 0.197 | 0.234 | 0.224 | 0.257 | 0.262 | 0.224 | 0.275 | 0.275 | 0.275 | 0.244 | 0.245 | 0.028 |
| 36.2 | 0.081 | 0.119 | 0.058 | 0.179 | 0.140 | 0.178 | 0.158 | 0.121 | 0.179 | 0.129 | 0.131 | 0.044 |
| 39.7 | 0.123 | 0.109 | 0.093 | 0.102 | 0.109 | 0.109 | 0.136 | 0.177 | 0.177 | 0.120 | 0.109 | 0.027 |
| 44.6 | 0.057 | 0.056 | 0.050 | 0.046 | 0.059 | 0.065 | 0.056 | 0.065 | 0.065 | 0.057 | 0.057 | 0.007 |
| 48.0 | 0.075 | 0.074 | 0.109< | 0.066 | 0.091< | 0.079 | 0.077 | 0.092< | 0.109 | 0.083 | 0.078 | 0.014 |
| 71.5 | 0.044 | 0.059 | 0.056 | 0.060 | 0.056 | 0.039 | 0.069 | 0.060 | 0.069 | 0.055 | 0.058 | 0.010 |
| 126.0 | 0.019 | 0 | 0.002 | 0.054 | 0.019 | 0.077< | 0 | 0.012 | 0.077 | 0.023 | 0.015 | 0.028 |
| 153.5 | 0.039 | 0.059 | 0.014 | 0.058 | 0.026 | 0.048 | 0.057 | 0.035 | 0.059 | 0.042 | 0.044 | 0.016 |
| 161.4 | 0.113< | 0.173< | 0.099< | 0.082< | 0.039 | 0.186< | 0.128< | 0.166< | 0.186 | 0.123 | 0.121 | 0.050 |
| 214.1 | 0.004 | 0 | 0.023 | 0.016 | 0 | 0 | 0 | 0.018 | 0.023 | 0.008 | 0.002 | 0.010 |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 4.0 | 4.2 | 3.4 | 4.3 | 4.2 | 4.4 | 4.8 | 4.2 | 4.2 | 112.9 |
| 11.0 | 4.3 | 4.1 | 3.0 | 2.8 | 4.2 | 4.5 | 4.4 | 4.0 | 3.9 | 97.9 |
| 23.6 | 2.4 | 2.9 | 2.7 | 3.1 | 3.6 | 4.2 | 4.4 | 2.9 | 3.3 | 66.2 |
| 30.7 | 4.1 | 4.9 | 4.7 | 5.4 | 5.5 | 4.7 | 5.8 | 5.8 | 5.1 | 47.7 |
| 36.2 | 2.5 | 3.6 | 1.8 | 5.5 | 4.3 | 5.4 | 4.8 | 3.7 | 4.0 | 32.7 |
| 39.7 | 5.5 | 4.9 | 4.2 | 4.6 | 4.9 | 4.9 | 6.1 | 7.9 | 5.4 | 22.3 |
| 44.6 | 4.8 | 4.7 | 4.2 | 3.8 | 4.9 | 5.4 | 4.7 | 5.4 | 4.7 | 12.0 |
| 48.0 | 6.6 | 6.5 | 9.6 | 5.8 | 8.1 | 7.0 | 6.8 | 8.1 | 7.3 | 11.3 |
| 71.5 | 4.3 | 5.8 | 5.5 | 5.9 | 5.5 | 3.8 | 6.8 | 5.9 | 5.4 | 10.2 |
| 126.0 | 2.2 | 0 | 0.2 | 6.1 | 2.2 | 8.8 | 0 | 1.4 | 2.6 | 8.8 |
| 153.5 | 5.0 | 7.6 | 1.8 | 7.4 | 3.3 | 6.2 | 7.3 | 4.5 | 5.4 | 7.8 |
| 161.4 | 11.3 | 17.3 | 9.9 | 8.2 | 3.9 | 18.6 | 12.8 | 16.6 | 12.3 | 10.0 |
| 214.1 | 0.7 | 0 | 3.8 | 2.7 | 0 | 0 | 0 | 3.0 | 1.3 | 6.0 |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 3.4 |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2.8 |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2.0 |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 2.0 |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0.6 |

Table 23 (Cont'd) RSRM-2B Aft Center Segment Insulation Performance

RSRM-2B Aft Center Segment

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.505 | 2.585 | 2.442 | 2.530 | 2.517 | 2.575 | 2.545 | 2.530 | 2.442 | 2.530 | 0.044 | 2.120 |
| 11.0 | 2.120 | 2.080 | 2.097 | 2.073 | 2.025 | 2.102 | 2.080 | 2.038 | 2.025 | 2.080 | 0.032 | 1.900 |
| 23.6 | 0.997 | 1.014 | 1.054 | 1.009 | 1.054 | 1.054 | 1.058 | 1.035 | 0.997 | 1.044 | 0.024 | 0.930 |
| 30.7 | 0.854 | 0.866 | 0.865 | 0.860 | 0.851 | 0.853 | 0.857 | 0.851 | 0.851 | 0.855 | 0.006 | 0.750 |
| 36.2 | 0.657 | 0.653 | 0.611 | 0.654 | 0.651 | 0.664 | 0.654 | 0.614 | 0.611 | 0.654 | 0.020 | 0.560 |
| 39.7 | 0.501 | 0.493 | 0.496 | 0.492 | 0.494 | 0.500 | 0.498 | 0.499 | 0.492 | 0.497 | 0.003 | 0.430 |
| 44.6 | 0.376 | 0.387 | 0.390 | 0.375 | 0.382 | 0.389 | 0.377 | 0.385 | 0.375 | 0.384 | 0.006 | 0.360 |
| 48.0 | 0.410 | 0.404 | 0.411 | 0.399 | 0.411 | 0.396 | 0.398 | 0.399 | 0.396 | 0.402 | 0.006 | 0.288 |
| 71.5 | 0.190 | 0.189 | 0.189 | 0.190 | 0.195 | 0.188 | 0.192 | 0.194 | 0.188 | 0.190 | 0.003 | 0.170 |
| 126.0 | 0.162 | 0.160 | 0.171 | 0.164 | 0.174 | 0.249 | 0.178 | 0.163 | 0.160 | 0.168 | 0.030 | 0.150 |
| 153.5 | 0.179 | 0.178 | 0.172 | 0.172 | 0.172 | 0.159 | 0.167 | 0.160 | 0.159 | 0.172 | 0.007 | 0.130 |
| 161.4 | 0.645 | 0.645 | 0.605 | 0.584 | 0.521 | 0.686 | 0.614 | 0.660 | 0.521 | 0.630 | 0.051 | 0.236 |
| 214.1 | 0.151 | 0.146 | 0.149 | 0.156 | 0.150 | 0.143 | 0.148 | 0.155 | 0.143 | 0.150 | 0.004 | 0.130 |
| 280.0 | 0.123 | 0.121 | 0.126 | 0.128 | 0.126 | 0.108 | 0.120 | 0.125 | 0.108 | 0.124 | 0.006 | 0.090 |
| 298.0 | 0.125 | 0.122 | 0.126 | 0.129 | 0.127 | 0.174 | 0.129 | 0.148 | 0.122 | 0.128 | 0.018 | 0.090 |
| 307.8 | 0.126 | 0.126 | 0.127 | 0.125 | 0.126 | 0.106 | 0.121 | 0.124 | 0.106 | 0.126 | 0.007 | 0.090 |
| 311.8 | 0.127 | 0.127 | 0.126 | 0.126 | 0.127 | 0.106 | 0.121 | 0.126 | 0.106 | 0.126 | 0.007 | 0.090 |
| 314.0 | 0.126 | 0.123 | 0.126 | 0.129 | 0.125 | 0.109 | 0.120 | 0.127 | 0.109 | 0.126 | 0.006 | 0.090 |

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.057 | 2.111 | 2.059 | 2.044 | 2.048 | 2.076 | 2.005 | 2.059 | 2.005 | 2.058 | 0.030 |
| 11.0 | 1.702 | 1.682 | 1.806 | 1.797 | 1.616 | 1.657 | 1.650 | 1.645 | 1.616 | 1.669 | 0.071 |
| 23.6 | 0.840 | 0.820 | 0.874 | 0.804 | 0.815 | 0.778 | 0.769 | 0.844 | 0.769 | 0.817 | 0.035 |
| 30.7 | 0.657 | 0.632 | 0.641 | 0.603 | 0.589 | 0.629 | 0.582 | 0.576 | 0.576 | 0.616 | 0.030 |
| 36.2 | 0.576 | 0.534 | 0.553 | 0.475 | 0.511 | 0.486 | 0.496 | 0.493 | 0.475 | 0.503 | 0.036 |
| 39.7 | 0.378 | 0.384 | 0.403 | 0.390 | 0.385 | 0.391 | 0.362 | 0.322 | 0.322 | 0.384 | 0.025 |
| 44.6 | 0.319 | 0.331 | 0.340 | 0.329 | 0.323 | 0.324 | 0.321 | 0.320 | 0.319 | 0.324 | 0.007 |
| 48.0 | 0.335 | 0.330 | 0.302 | 0.333 | 0.320 | 0.317 | 0.321 | 0.307 | 0.302 | 0.321 | 0.012 |
| 71.5 | 0.146 | 0.130 | 0.133 | 0.130 | 0.139 | 0.149 | 0.123 | 0.134 | 0.123 | 0.134 | 0.009 |
| 126.0 | 0.143 | 0.171 | 0.169 | 0.110 | 0.155 | 0.172 | 0.189 | 0.151 | 0.110 | 0.162 | 0.024 |
| 153.5 | 0.140 | 0.119 | 0.158 | 0.114 | 0.146 | 0.111 | 0.110 | 0.125 | 0.110 | 0.122 | 0.018 |
| 161.4 | 0.532 | 0.472 | 0.506 | 0.502 | 0.482 | 0.500 | 0.486 | 0.494 | 0.472 | 0.497 | 0.018 |
| 214.1 | 0.147 | L | 0.126 | 0.140 | 0.209 | L | 0.168 | 0.137 | 0.126 | 0.145 | 0.026 |
| 280.0 | L | L | L | L | L | L | L | L | 0.108 | 0.124 | 0.006 |
| 298.0 | L | L | L | L | L | L | L | L | 0.122 | 0.128 | 0.018 |
| 307.8 | L | L | L | L | L | L | L | L | 0.106 | 0.126 | 0.007 |
| 311.8 | L | L | L | L | L | L | L | L | 0.106 | 0.126 | 0.007 |
| 314.0 | L | L | L | L | L | L | L | L | 0.109 | 0.126 | 0.006 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUES WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 23 (Cont'd) RSRM-2B Aft Center Segment Insulation Performance

RSRM-2B Forward Center Segment

COMPLIANCE SAFETY FACTOR (CSF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 27.53 | 24.94 | 19.63 | 15.47 | 15.94 | 25.24 | 14.23 | 11.98 | 11.98 | 316.0 | 2.0 |
| 11.0 | 25.00 | 46.34 | 12.50 | + | 35.85 | 32.20 | 22.89 | 86.36 | 12.50 | 90.0 | 1.5 |
| 23.6 | 9.21 | 16.32 | 8.02 | 7.56 | 10.94 | 8.77 | + | 23.85 | 7.56 | 136.0 | 1.5 |
| 30.7 | 6.52 | 7.65 | 6.47 | 6.41 | 10.87 | 6.47 | 11.54 | 7.98 | 6.41 | 136.0 | 1.5 |
| 36.2 | 7.18 | 3.52 | 6.83 | 5.33 | 6.67 | 10.77 | 6.59 | 10.98 | 3.52 | 46.0 | 1.5 |
| 39.7 | 13.44 | 16.54 | 7.29 | 86.00 | 10.75 | 8.11 | 5.97 | 11.62 | 5.97 | 270.0 | 1.5 |
| 44.6 | 14.40 | 10.91 | 8.57 | 12.00 | 6.92 | 16.36 | 15.00 | 9.73 | 6.92 | 180.0 | 1.5 |
| 48.0 | 5.88 | 19.20 | 5.54 | 7.78 | 4.24 | + | 72.00 | 5.65 | 4.24 | 180.0 | 1.5 |
| 71.5 | 9.44 | 10.63 | 6.80 | 10.00 | 10.00 | 5.67 | 4.47 | 17.00 | 4.47 | 270.0 | 1.5 |
| 126.0 | 13.64 | + | + | 75.00 | + | + | + | + | 13.64 | 0.0 | 1.5 |
| 153.5 | 26.00 | 8.67 | + | 6.19 | 21.67 | 6.84 | 7.65 | + | 6.19 | 136.0 | 1.5 |
| 161.4 | + | + | + | + | + | + | + | + | | | 2.0 |
| 214.1 | + | + | + | + | 5.42 | + | + | + | 5.42 | 180.0 | 1.5 |
| 280.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 298.0 | + | + | + | + | + | + | + | + | | | 1.5 |
| 307.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 311.8 | + | + | + | + | + | + | + | + | | | 1.5 |
| 314.0 | + | + | + | + | + | + | + | + | | | 1.5 |

SEGMENT MINIMUM = 3.52 AT THE 36.2 INCH STATION.

ACTUAL SAFETY FACTOR (ASF)

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 32.57 | 30.19 | 22.91 | 19.02 | 19.39 | 30.39 | 16.99 | 15.06 | 15.06 | 316.0 |
| 11.0 | 27.18 | 50.27 | 13.69 | + | 40.15 | 35.54 | 24.76 | 93.45 | 13.69 | 90.0 |
| 23.6 | 10.15 | 17.84 | 9.09 | 8.42 | 12.29 | 9.75 | + | 26.00 | 8.42 | 136.0 |
| 30.7 | 7.57 | 8.89 | 7.93 | 7.53 | 12.22 | 7.61 | 13.72 | 9.30 | 7.53 | 136.0 |
| 36.2 | 8.74 | 4.33 | 8.60 | 6.65 | 8.31 | 13.25 | 8.13 | 13.51 | 4.33 | 46.0 |
| 39.7 | 14.19 | 17.73 | 7.97 | 94.20 | 11.57 | 8.89 | 6.49 | 12.54 | 6.49 | 270.0 |
| 44.6 | 15.36 | 11.61 | 9.26 | 12.80 | 7.79 | 17.55 | 16.13 | 10.30 | 7.79 | 180.0 |
| 48.0 | 7.96 | 26.67 | 7.73 | 10.92 | 5.76 | + | + | 7.78 | 5.76 | 180.0 |
| 71.5 | 10.89 | 12.19 | 7.80 | 11.41 | 11.35 | 6.70 | 5.21 | 19.20 | 5.21 | 270.0 |
| 126.0 | 14.36 | + | + | 79.00 | + | + | + | + | 14.36 | 0.0 |
| 153.5 | 32.20 | 10.60 | + | 7.71 | 26.50 | 8.68 | 9.47 | + | 7.71 | 136.0 |
| 161.4 | + | + | + | + | + | + | + | + | | |
| 214.1 | + | + | + | + | 6.21 | + | + | + | 6.21 | 180.0 |
| 280.0 | + | + | + | + | + | + | + | + | | |
| 298.0 | + | + | + | + | + | + | + | + | | |
| 307.8 | + | + | + | + | + | + | + | + | | |
| 311.8 | + | + | + | + | + | + | + | + | | |
| 314.0 | + | + | + | + | + | + | + | + | | |

SEGMENT MINIMUM = 4.33 AT THE 36.2 INCH STATION.
A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 24 RSRM-2B Forward Center Segment Insulation Performance

RSRM-2B Forward Center Segment

MATERIAL DECOMPOSITION DEPTH (MDD)

INCHES

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.077 | 0.085 | 0.108 | 0.137 | 0.133 | 0.084 | 0.149 | 0.177 | 0.177 | 0.119 | 0.121 | 0.036 |
| 11.0 | 0.076 | 0.041 | 0.152 | 0 | 0.053 | 0.059 | 0.083 | 0.022 | 0.152 | 0.061 | 0.056 | 0.046 |
| 23.6 | 0.101 | 0.057 | 0.116 | 0.123 | 0.085 | 0.106 | 0 | 0.039 | 0.123 | 0.078 | 0.093 | 0.043 |
| 30.7 | 0.115 | 0.098 | 0.116 | 0.117 | 0.069 | 0.116 | 0.065 | 0.094 | 0.117 | 0.099 | 0.106 | 0.022 |
| 36.2 | 0.078 | 0.159 | 0.082 | 0.105 | 0.084 | 0.052 | 0.085 | 0.051 | 0.159 | 0.087 | 0.083 | 0.034 |
| 39.7 | 0.032 | 0.026 | 0.059 | 0.005 | 0.040 | 0.053 | 0.072 | 0.037 | 0.072 | 0.040 | 0.038 | 0.021 |
| 44.6 | 0.025 | 0.033 | 0.042 | 0.030 | 0.052 | 0.022 | 0.024 | 0.037 | 0.052 | 0.033 | 0.032 | 0.010 |
| 48.0 | 0.049 | 0.015 | 0.052 | 0.037 | 0.068 | 0.002 | 0.004 | 0.051 | 0.068 | 0.035 | 0.043 | 0.025 |
| 71.5 | 0.018 | 0.016 | 0.025 | 0.017 | 0.017 | 0.030 | 0.038 | 0.010 | 0.038 | 0.021 | 0.018 | 0.009 |
| 126.0 | 0.011 | 0.001 | 0 | 0.002 | 0 | 0 | 0 | 0 | 0.011 | 0.002 | 0.000 | 0.004 |
| 153.5 | 0.005 | 0.015 | 0 | 0.021 | 0.006 | 0.019 | 0.017 | 0 | 0.021 | 0.010 | 0.010 | 0.009 |
| 161.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 214.1 | 0 | 0 | 0 | 0 | 0.024 | 0 | 0 | 0 | 0.024 | 0.003 | 0.000 | 0.008 |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

MATERIAL DECOMPOSITION RATE (MDR)

MILS / SECOND

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.7 | 0.8 | 1.0 | 1.2 | 1.2 | 0.7 | 1.3 | 1.6 | 1.0 | 113.1 |
| 11.0 | 0.8 | 0.4 | 1.5 | 0 | 0.5 | 0.6 | 0.8 | 0.2 | 0.6 | 98.3 |
| 23.6 | 1.5 | 0.9 | 1.7 | 1.8 | 1.3 | 1.6 | 0 | 0.6 | 1.2 | 66.8 |
| 30.7 | 2.4 | 2.0 | 2.4 | 2.4 | 1.4 | 2.4 | 1.4 | 2.0 | 2.1 | 48.1 |
| 36.2 | 2.3 | 4.8 | 2.5 | 3.2 | 2.5 | 1.6 | 2.6 | 1.5 | 2.6 | 33.3 |
| 39.7 | 1.4 | 1.1 | 2.6 | 0.2 | 1.7 | 2.3 | 3.1 | 1.6 | 1.8 | 22.9 |
| 44.6 | 2.0 | 2.6 | 3.3 | 2.3 | 4.1 | 1.7 | 1.9 | 2.9 | 2.6 | 12.8 |
| 48.0 | 4.0 | 1.2 | 4.3 | 3.1 | 5.6 | 0.2 | 0.3 | 4.2 | 2.9 | 12.1 |
| 71.5 | 1.6 | 1.5 | 2.3 | 1.5 | 1.5 | 2.7 | 3.5 | 0.9 | 1.9 | 11.0 |
| 126.0 | 1.1 | 0.1 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0.2 | 9.6 |
| 153.5 | 0.6 | 1.7 | 0 | 2.4 | 0.7 | 2.2 | 1.9 | 0 | 1.2 | 8.8 |
| 161.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 10.8 |
| 214.1 | 0 | 0 | 0 | 0 | 3.3 | 0 | 0 | 0 | 0.4 | 7.2 |
| 280.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 4.2 |
| 298.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 4.0 |
| 307.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 3.4 |
| 311.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 3.4 |
| 314.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0.6 |

Table 24 (Cont'd) RSRM-2B Forward Center Segment Insulation Performance

RSRM-2B Forward Center Segment

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.508 | 2.566 | 2.474 | 2.606 | 2.579 | 2.553 | 2.531 | 2.666 | 2.474 | 2.559 | 0.059 | 2.120 |
| 11.0 | 2.066 | 2.061 | 2.081 | 2.057 | 2.128 | 2.097 | 2.055 | 2.056 | 2.055 | 2.064 | 0.026 | 1.900 |
| 23.6 | 1.025 | 1.017 | 1.054 | 1.036 | 1.045 | 1.034 | 1.064 | 1.014 | 1.014 | 1.035 | 0.018 | 0.930 |
| 30.7 | 0.871 | 0.871 | 0.920 | 0.881 | 0.843 | 0.883 | 0.892 | 0.874 | 0.843 | 0.877 | 0.022 | 0.750 |
| 36.2 | 0.682 | 0.689 | 0.705 | 0.698 | 0.698 | 0.689 | 0.691 | 0.689 | 0.682 | 0.690 | 0.007 | 0.560 |
| 39.7 | 0.454 | 0.461 | 0.470 | 0.471 | 0.463 | 0.471 | 0.467 | 0.464 | 0.454 | 0.465 | 0.006 | 0.430 |
| 44.6 | 0.384 | 0.383 | 0.389 | 0.384 | 0.405 | 0.386 | 0.387 | 0.381 | 0.381 | 0.385 | 0.008 | 0.360 |
| 48.0 | 0.390 | 0.400 | 0.402 | 0.404 | 0.392 | 0.390 | 0.403 | 0.397 | 0.390 | 0.399 | 0.006 | 0.288 |
| 71.5 | 0.196 | 0.195 | 0.195 | 0.194 | 0.193 | 0.201 | 0.198 | 0.192 | 0.192 | 0.195 | 0.003 | 0.170 |
| 126.0 | 0.158 | 0.160 | 0.158 | 0.158 | 0.160 | 0.166 | 0.164 | 0.162 | 0.158 | 0.160 | 0.003 | 0.150 |
| 153.5 | 0.161 | 0.159 | 0.151 | 0.162 | 0.159 | 0.165 | 0.161 | 0.159 | 0.151 | 0.160 | 0.004 | 0.130 |
| 161.4 | 0.525 | 0.523 | 0.527 | 0.527 | 0.507 | 0.520 | 0.382 | 0.399 | 0.382 | 0.521 | 0.061 | 0.236 |
| 214.1 | 0.143 | 0.147 | 0.141 | 0.140 | 0.149 | 0.149 | 0.145 | 0.144 | 0.140 | 0.145 | 0.003 | 0.130 |
| 280.0 | 0.114 | 0.109 | 0.114 | 0.117 | 0.121 | 0.123 | 0.121 | 0.105 | 0.105 | 0.116 | 0.006 | 0.090 |
| 298.0 | 0.116 | 0.118 | 0.116 | 0.110 | 0.121 | 0.118 | 0.122 | 0.116 | 0.110 | 0.117 | 0.004 | 0.090 |
| 307.8 | 0.117 | 0.115 | 0.113 | 0.115 | 0.119 | 0.117 | 0.117 | 0.112 | 0.112 | 0.116 | 0.002 | 0.090 |
| 311.8 | 0.117 | 0.117 | 0.115 | 0.114 | 0.110 | 0.120 | 0.116 | 0.112 | 0.110 | 0.116 | 0.003 | 0.090 |
| 314.0 | 0.118 | 0.117 | 0.114 | 0.115 | 0.111 | 0.109 | 0.118 | 0.118 | 0.109 | 0.116 | 0.003 | 0.090 |

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 0.0 | 46.0 | 90.0 | 136.0 | 180.0 | 226.0 | 270.0 | 316.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.431 | 2.481 | 2.366 | 2.469 | 2.446 | 2.469 | 2.382 | 2.489 | 2.366 | 2.458 | 0.046 |
| 11.0 | 1.990 | 2.020 | 1.929 | 2.084 | 2.075 | 2.038 | 1.972 | 2.034 | 1.929 | 2.027 | 0.052 |
| 23.6 | 0.924 | 0.960 | 0.938 | 0.913 | 0.960 | 0.928 | 1.116 | 0.975 | 0.913 | 0.949 | 0.065 |
| 30.7 | 0.756 | 0.773 | 0.804 | 0.764 | 0.774 | 0.767 | 0.827 | 0.780 | 0.756 | 0.774 | 0.024 |
| 36.2 | 0.604 | 0.530 | 0.623 | 0.593 | 0.614 | 0.637 | 0.606 | 0.638 | 0.530 | 0.610 | 0.034 |
| 39.7 | 0.422 | 0.435 | 0.411 | 0.466 | 0.423 | 0.418 | 0.395 | 0.427 | 0.395 | 0.423 | 0.021 |
| 44.6 | 0.359 | 0.350 | 0.347 | 0.354 | 0.353 | 0.364 | 0.363 | 0.344 | 0.344 | 0.354 | 0.007 |
| 48.0 | 0.341 | 0.385 | 0.350 | 0.367 | 0.324 | 0.388 | 0.399 | 0.346 | 0.324 | 0.359 | 0.026 |
| 71.5 | 0.178 | 0.179 | 0.170 | 0.177 | 0.176 | 0.171 | 0.160 | 0.182 | 0.160 | 0.177 | 0.007 |
| 126.0 | 0.147 | 0.159 | 0.186 | 0.156 | 0.227 | 0.253 | 0.226 | 0.201 | 0.147 | 0.194 | 0.039 |
| 153.5 | 0.156 | 0.144 | 0.159 | 0.141 | 0.153 | 0.146 | 0.144 | 0.160 | 0.141 | 0.149 | 0.008 |
| 161.4 | 0.554 | 0.545 | 0.540 | 0.535 | 0.547 | 0.537 | 0.570 | 0.540 | 0.535 | 0.543 | 0.011 |
| 214.1 | L | L | L | 0.167 | 0.125 | 0.157 | 0.229 | L | 0.125 | 0.146 | 0.032 |
| 280.0 | L | L | L | L | L | L | L | L | 0.105 | 0.116 | 0.006 |
| 298.0 | L | L | L | L | L | L | L | L | 0.110 | 0.117 | 0.004 |
| 307.8 | L | L | L | L | L | L | L | L | 0.112 | 0.116 | 0.002 |
| 311.8 | L | L | L | L | L | L | L | L | 0.110 | 0.116 | 0.003 |
| 314.0 | L | L | L | L | L | L | L | L | 0.109 | 0.116 | 0.003 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUES WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 24 (Cont'd) RSRM-2B Forward Center Segment Insulation Performance

| STATION (IN) | COMPLIANCE SAFETY FACTOR (CSF) DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR |
|---|---|---|---|---|---|---|---|---|
| 3.5 | 10.65 | 11.65 | 28.65 | + | 7.49 | 7.49 | 352.0 | 2.0 |
| 13.0 | 19.70 | 20.97 | 54.17 | + | 32.50 | 19.70 | 90.0 | 1.5 |
| 23.0 | + | + | + | + | + | | | 1.5 |
| 27.0 | + | + | + | + | + | | | 1.5 |
| 30.7 | + | + | + | + | + | | | 1.5 |
| 34.2 | + | + | + | + | + | | | 1.5 |
| 37.7 | + | + | + | + | + | | | 1.5 |
| 41.2 | + | + | + | + | + | | | 1.5 |
| 44.0 | + | + | + | + | + | | | 1.5 |
| 94.7 | + | + | + | + | + | | | 1.5 |
| 142.0 | + | + | + | + | + | | | 1.5 |
| 145.7 | + | + | + | + | + | | | 1.5 |
| 148.5 | 5.41 | + | 6.27 | 8.62 | 34.50 | 5.41 | 90.0 | 1.5 |
| 152.0 | 6.34 | 9.06 | 6.47 | 3.91 | 8.13 | 3.91 | 286.0 | 1.5 |
| 155.0 | + | 2.83 | 27.69 | 6.43 | + | 2.83 | 154.0 | 1.5 |
| 162.0 | 5.79 | 12.60 | + | 3.88 | 3.17 | 3.17 | 352.0 | 2.0 |
| 171.0 | 4.40 | + | + | + | 7.58 | 4.40 | 90.0 | 1.5 |
| 175.5 | 4.38 | 4.79 | 3.20 | 3.97 | 3.36 | 3.20 | 222.0 | 1.5 |
| 187.0 | 2.81 | 2.82 | 2.69 | 3.08 | 2.96 | 2.69 | 222.0 | 1.5 |
| 199.0 | 3.57 | 3.85 | 2.92 | 3.35 | 2.90 | 2.90 | 352.0 | 1.5 |
| 215.0 | 2.89 | 4.56 | 2.65 | 2.18 | 2.88 | 2.18 | 286.0 | 1.5 |
| 224.0 | 4.63 | 2.96 | 2.96 | 2.71 | 3.55 | 2.71 | 286.0 | 1.5 |
| 230.0 | 3.17 | 2.87 | 2.71 | 2.86 | 1.86 | 1.86 | 352.0 | 1.5 |
| 236.0 | 2.88 | 3.73 | 3.14 | 3.57 | 2.62 | 2.62 | 352.0 | 1.5 |
| 240.0 | 3.04 | 3.15 | 2.84 | 2.75 | 2.31 | 2.31 | 352.0 | 1.5 |
| 251.0 | 2.84 | 3.44 | 2.34 | 2.48 | 2.16 | 2.16 | 352.0 | 1.5 |
| 263.0 | 4.09 | 7.19 | 2.52 | 2.55 | 3.48 | 2.52 | 222.0 | 1.5 |
| 280.0 | 2.52 | 3.62 | 2.09 | 2.36 | 2.55 | 2.09 | 222.0 | 1.5 |
| 293.0 | 3.10 | 3.39 | 2.24 | 2.97 | 2.66 | 2.24 | 222.0 | 1.5 |
| 305.0 | 2.93 | 3.52 | 3.05 | 1.45< | 2.56 | 1.45 | 286.0 | 1.5 |
| 312.0 | 1.55 | 2.89 | 2.71 | 4.09 | 2.50 | 1.55 | 90.0 | 1.5 |
| 321.0 | 2.56 | 5.04 | 2.96 | 4.23 | 3.20 | 2.56 | 90.0 | 2.0 |
| 330.0 | 1.41< | 5.35 | 1.82 | 1.22< | 5.06 | 1.22 | 286.0 | 1.5 |
| 347.0 | 1.78 | 1.84 | 1.94 | 1.26< | 3.06 | 1.26 | 286.0 | 1.5 |
| 359.0 | 2.37 | 2.33 | 2.33 | 2.78 | 3.35 | 2.33 | 154.0 | 1.5 |
| 371.0 | 2.30 | 2.89 | 2.55 | 3.29 | 4.23 | 2.30 | 90.0 | 1.5 |
| 383.0 | 3.79 | 3.21 | 3.43 | 2.84 | 2.72 | 2.72 | 352.0 | 1.5 |
| 394.0 | 2.00 | 1.97 | 1.93 | 2.27 | 2.58 | 1.93 | 222.0 | 1.5 |

SEGMENT MINIMUM = 1.22 AT THE 330.0 INCH STATION

| STATION (IN) | ACTUAL SAFETY FACTOR (ASF) DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|
| 3.5 | 12.96 | 14.29 | 33.81 | + | 9.20 | 9.20 | 352.0 |
| 13.0 | 24.33 | 24.06 | 66.67 | + | 37.65 | 24.06 | 154.0 |
| 23.0 | + | + | + | + | + | | |
| 27.0 | + | + | + | + | + | | |
| 30.7 | + | + | + | + | + | | |
| 34.2 | + | + | + | + | + | | |
| 37.7 | + | + | + | + | + | | |
| 41.2 | + | + | + | + | + | | |
| 44.0 | + | + | + | + | + | | |
| 94.7 | + | + | + | + | + | | |
| 142.0 | + | + | + | + | + | | |
| 145.7 | + | + | + | + | + | | |
| 148.5 | 6.47 | + | 7.77 | 10.47 | 41.37 | 6.47 | 90.0 |
| 152.0 | 7.66 | 9.89 | 8.10 | 4.84 | 10.08 | 4.84 | 286.0 |
| 155.0 | + | 3.91 | 36.38 | 9.48 | + | 3.91 | 154.0 |
| 162.0 | 8.60 | 19.75 | + | 5.93 | 5.21 | 5.21 | 352.0 |
| 171.0 | 8.39 | + | + | + | 11.61 | 8.39 | 90.0 |
| 175.5 | 5.42 | 5.86 | 4.24 | 4.84 | 4.22 | 4.22 | 352.0 |
| 187.0 | 2.87 | 2.89 | 2.80 | 3.18 | 3.04 | 2.80 | 222.0 |
| 199.0 | 3.93 | 4.13 | 3.16 | 3.66 | 3.14 | 3.14 | 352.0 |
| 215.0 | 3.49 | 4.79 | 2.98 | 2.58 | 3.02 | 2.58 | 286.0 |
| 224.0 | 5.01 | 3.25 | 3.28 | 2.98 | 3.82 | 2.98 | 286.0 |
| 230.0 | 3.45 | 3.00 | 2.88 | 3.07 | 2.34 | 2.34 | 352.0 |
| 236.0 | 3.20 | 3.94 | 3.20 | 3.87 | 3.10 | 3.10 | 352.0 |
| 240.0 | 3.33 | 3.36 | 2.97 | 2.99 | 2.72 | 2.72 | 352.0 |
| 251.0 | 3.28 | 4.55 | 3.12 | 3.26 | 2.95 | 2.95 | 352.0 |
| 263.0 | 4.24 | 7.47 | 2.64 | 2.68 | 3.61 | 2.64 | 222.0 |
| 280.0 | 3.32 | 4.68 | 2.69 | 2.89 | 3.22 | 2.69 | 222.0 |
| 293.0 | 3.20 | 3.55 | 2.39 | 3.18 | 2.80 | 2.39 | 222.0 |
| 305.0 | 3.07 | 3.91 | 3.43 | 2.06 | 2.85 | 2.06 | 286.0 |
| 312.0 | 2.29 | 3.31 | 3.36 | 4.26 | 2.93 | 2.29 | 90.0 |
| 321.0 | 3.14 | 5.69 | 3.59 | 4.65 | 4.00 | 3.14 | 90.0 |
| 330.0 | 2.99 | 8.82 | 3.42 | 2.41 | 7.68 | 2.41 | 286.0 |
| 347.0 | 2.10 | 2.43 | 2.38 | 1.83 | 3.16 | 1.83 | 286.0 |
| 359.0 | 2.84 | 2.62 | 2.87 | 3.20 | 3.79 | 2.62 | 154.0 |
| 371.0 | 2.49 | 3.06 | 2.81 | 3.60 | 4.59 | 2.49 | 90.0 |
| 383.0 | 3.97 | 3.50 | 3.76 | 3.14 | 2.91 | 2.91 | 352.0 |
| 394.0 | 2.53 | 2.29 | 2.69 | 2.73 | 2.83 | 2.29 | 154.0 |

SEGMENT MINIMUM = 1.83 AT THE 347.0 INCH STATION.

A " < " INDICATES THE PRECEDING SAFETY FACTOR HAS VIOLATED THE MINIMUM SAFETY FACTOR REQUIREMENT.

A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

Table 25 RSRM-2B Forward Segment Star Tip Insulation Performance

RSRM-2B Forward Segment Star Tip

| STATION (IN) | MATERIAL DECOMPOSITION DEPTH (MDD) INCHES DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION | STATION (IN) | MATERIAL DECOMPOSITION RATE (MDR) MILS / SECOND DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.199< | 0.182< | 0.074 | 0.012 | 0.283< | 0.283 | 0.150 | 0.182 | 0.107 | 3.5 | 5.8 | 5.3 | 2.1 | 0.3 | 8.2 | 4.3 | 34.5 |
| 13.0 | 0.033 | 0.031 | 0.012 | 0.004 | 0.020 | 0.033 | 0.020 | 0.020 | 0.012 | 13.0 | 1.5 | 1.4 | 0.5 | 0.2 | 0.9 | 0.9 | 22.3 |
| 23.0 | 0 | 0 | 0 | 0 | 0 | | | | | 23.0 | 0 | 0 | 0 | 0 | 0 | | 8.0 |
| 27.0 | 0 | 0 | 0 | 0 | 0 | | | | | 27.0 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 30.7 | 0 | 0 | 0 | 0 | 0 | | | | | 30.7 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 34.2 | 0 | 0 | 0 | 0 | 0 | | | | | 34.2 | 0 | 0 | 0 | 0 | 0 | | 4.2 |
| 37.7 | 0 | 0 | 0 | 0 | 0 | | | | | 37.7 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 41.2 | 0 | 0 | 0 | 0 | 0 | | | | | 41.2 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 44.0 | 0 | 0 | 0 | 0 | 0 | | | | | 44.0 | 0 | 0 | 0 | 0 | 0 | | 3.0 |
| 94.7 | 0 | 0 | 0 | 0 | 0 | | | | | 94.7 | 0 | 0 | 0 | 0 | 0 | | 0.8 |
| 142.0 | 0 | 0 | 0 | 0 | 0 | | | | | 142.0 | 0 | 0 | 0 | 0 | 0 | | 1.0 |
| 145.7 | 0 | 0 | 0 | 0 | 0 | | | | | 145.7 | 0 | 0 | 0 | 0 | 0 | | 13.8 |
| 148.5 | 0.051 | 0 | 0.044 | 0.032 | 0.008 | 0.051 | 0.027 | 0.032 | 0.022 | 148.5 | 2.3 | 0 | 2.0 | 1.4 | 0.4 | 1.2 | 22.5 |
| 152.0 | 0.050 | 0.035 | 0.049 | 0.081 | 0.039 | 0.081 | 0.051 | 0.049 | 0.018 | 152.0 | 1.5 | 1.1 | 1.5 | 2.5 | 1.2 | 1.6 | 32.7 |
| 155.0 | 0 | 0.127 | 0.013 | 0.056 | 0 | 0.127 | 0.039 | 0.013 | 0.054 | 155.0 | 0 | 3.1 | 0.3 | 1.4 | 0 | 1.0 | 40.7 |
| 162.0 | 0.087 | 0.040 | 0 | 0.130 | 0.159 | 0.159 | 0.083 | 0.087 | 0.065 | 162.0 | 1.5 | 0.7 | 0 | 2.2 | 2.7 | 1.4 | 58.1 |
| 171.0 | 0.124 | 0 | 0 | 0 | 0.072 | 0.124 | 0.039 | 0.000 | 0.057 | 171.0 | 1.5 | 0 | 0 | 0 | 0.9 | 0.5 | 80.0 |
| 175.5 | 0.138 | 0.126 | 0.189 | 0.152 | 0.180 | 0.189 | 0.157 | 0.152 | 0.027 | 175.5 | 1.5 | 1.4 | 2.1 | 1.7 | 2.0 | 1.8 | 89.4 |
| 187.0 | 0.228 | 0.227 | 0.238 | 0.208 | 0.216 | 0.238 | 0.223 | 0.227 | 0.012 | 187.0 | 2.2 | 2.2 | 2.3 | 2.0 | 2.1 | 2.2 | 102.2 |
| 199.0 | 0.180 | 0.167 | 0.220 | 0.192 | 0.222 | 0.222 | 0.196 | 0.192 | 0.024 | 199.0 | 1.8 | 1.6 | 2.2 | 1.9 | 2.2 | 1.9 | 102.2 |
| 215.0 | 0.221 | 0.140 | 0.241 | 0.293 | 0.222 | 0.293 | 0.223 | 0.222 | 0.055 | 215.0 | 2.2 | 1.4 | 2.4 | 2.9 | 2.2 | 2.2 | 102.2 |
| 224.0 | 0.138 | 0.216 | 0.216 | 0.236 | 0.180 | 0.236 | 0.197 | 0.216 | 0.039 | 224.0 | 1.4 | 2.1 | 2.1 | 2.3 | 1.8 | 1.9 | 102.2 |
| 230.0 | 0.185 | 0.204 | 0.216 | 0.205 | 0.315 | 0.315 | 0.225 | 0.205 | 0.052 | 230.0 | 1.8 | 2.0 | 2.1 | 2.0 | 3.1 | 2.2 | 102.2 |
| 236.0 | 0.201 | 0.155 | 0.184 | 0.162 | 0.221 | 0.221 | 0.185 | 0.184 | 0.027 | 236.0 | 2.0 | 1.5 | 1.8 | 1.6 | 2.2 | 1.8 | 102.2 |
| 240.0 | 0.189 | 0.182 | 0.202 | 0.209 | 0.248 | 0.248 | 0.206 | 0.202 | 0.026 | 240.0 | 1.8 | 1.8 | 2.0 | 2.0 | 2.4 | 2.0 | 102.2 |
| 251.0 | 0.200 | 0.165 | 0.243 | 0.229 | 0.263 | 0.263 | 0.220 | 0.229 | 0.038 | 251.0 | 2.0 | 1.6 | 2.4 | 2.2 | 2.6 | 2.2 | 102.2 |
| 263.0 | 0.139 | 0.079 | 0.225 | 0.223 | 0.163 | 0.225 | 0.166 | 0.163 | 0.061 | 263.0 | 1.4 | 0.8 | 2.2 | 2.2 | 1.6 | 1.6 | 102.2 |
| 280.0 | 0.225 | 0.157 | 0.272 | 0.241 | 0.223 | 0.272 | 0.224 | 0.225 | 0.042 | 280.0 | 2.2 | 1.5 | 2.7 | 2.4 | 2.2 | 2.2 | 102.2 |
| 293.0 | 0.176 | 0.161 | 0.244 | 0.184 | 0.205 | 0.244 | 0.194 | 0.184 | 0.032 | 293.0 | 1.7 | 1.6 | 2.4 | 1.8 | 2.0 | 1.9 | 102.2 |
| 305.0 | 0.179 | 0.149 | 0.172 | 0.361< | 0.205 | 0.361 | 0.213 | 0.179 | 0.085 | 305.0 | 1.8 | 1.5 | 1.7 | 3.5 | 2.0 | 2.1 | 102.2 |
| 312.0 | 0.337< | 0.181 | 0.193 | 0.128 | 0.209 | 0.337 | 0.210 | 0.193 | 0.077 | 312.0 | 3.3 | 1.8 | 1.9 | 1.3 | 2.0 | 2.1 | 102.2 |
| 321.0 | 0.358 | 0.182 | 0.310 | 0.217 | 0.287 | 0.358 | 0.271 | 0.287 | 0.071 | 321.0 | 3.4 | 1.7 | 3.0 | 2.1 | 2.7 | 2.6 | 104.5 |
| 330.0 | 0.390< | 0.103 | 0.302 | 0.450< | 0.109 | 0.450 | 0.271 | 0.302 | 0.159 | 330.0 | 3.8 | 1.0 | 3.0 | 4.4 | 1.1 | 2.7 | 101.8 |
| 347.0 | 0.294 | 0.284 | 0.270 | 0.416< | 0.171 | 0.416 | 0.287 | 0.284 | 0.087 | 347.0 | 2.9 | 2.8 | 2.7 | 4.2 | 1.7 | 2.9 | 100.2 |
| 359.0 | 0.219 | 0.223 | 0.223 | 0.187 | 0.155 | 0.223 | 0.201 | 0.219 | 0.030 | 359.0 | 2.2 | 2.2 | 2.2 | 1.9 | 1.6 | 2.0 | 99.8 |
| 371.0 | 0.226 | 0.180 | 0.204 | 0.158 | 0.123 | 0.226 | 0.178 | 0.180 | 0.040 | 371.0 | 2.4 | 1.9 | 2.1 | 1.7 | 1.3 | 1.9 | 95.0 |
| 383.0 | 0.135 | 0.159 | 0.149 | 0.180 | 0.188 | 0.188 | 0.162 | 0.159 | 0.022 | 383.0 | 1.4 | 1.6 | 1.5 | 1.9 | 2.0 | 1.7 | 96.4 |
| 394.0 | 0.251 | 0.255 | 0.261 | 0.222 | 0.195 | 0.261 | 0.237 | 0.251 | 0.028 | 394.0 | 2.6 | 2.6 | 2.7 | 2.3 | 2.0 | 2.4 | 98.0 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

Table 25 (Cont'd) RSRM-2B Forward Segment Star Tip Insulation Performance

RSRM-2B Forward Segment Star Tip

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.579 | 2.600 | 2.502 | 2.474 | 2.603 | 2.474 | 2.579 | 0.060 | 2.120 |
| 13.0 | 0.803 | 0.746 | 0.800 | 0.733 | 0.753 | 0.733 | 0.753 | 0.032 | 0.650 |
| 23.0 | 0.664 | 0.695 | 0.691 | 0.765 | 0.731 | 0.664 | 0.695 | 0.039 | 0.500 |
| 27.0 | 0.475 | 0.474 | 0.484 | 0.496 | 0.476 | 0.474 | 0.476 | 0.009 | 0.450 |
| 30.7 | 0.480 | 0.483 | 0.485 | 0.496 | 0.480 | 0.480 | 0.483 | 0.007 | 0.400 |
| 34.2 | 0.416 | 0.411 | 0.409 | 0.428 | 0.410 | 0.409 | 0.411 | 0.008 | 0.380 |
| 37.7 | 0.418 | 0.415 | 0.410 | 0.426 | 0.408 | 0.408 | 0.415 | 0.007 | 0.330 |
| 41.2 | 0.315 | 0.314 | 0.304 | 0.300 | 0.307 | 0.300 | 0.307 | 0.006 | 0.280 |
| 44.0 | 0.323 | 0.266 | 0.310 | 0.330 | 0.309 | 0.266 | 0.310 | 0.025 | 0.250 |
| 94.7 | 0.121 | 0.130 | 0.121 | 0.121 | 0.120 | 0.120 | 0.121 | 0.004 | 0.090 |
| 142.0 | 0.165 | 0.165 | 0.168 | 0.167 | 0.160 | 0.160 | 0.165 | 0.003 | 0.113 |
| 145.7 | 0.299 | 0.240 | 0.292 | 0.292 | 0.295 | 0.240 | 0.292 | 0.025 | 0.234 |
| 148.5 | 0.330 | 0.293 | 0.342 | 0.335 | 0.331 | 0.293 | 0.331 | 0.019 | 0.276 |
| 152.0 | 0.383 | 0.346 | 0.397 | 0.392 | 0.393 | 0.346 | 0.392 | 0.021 | 0.317 |
| 155.0 | 0.478 | 0.496 | 0.473 | 0.531 | 0.541 | 0.473 | 0.496 | 0.031 | 0.360 |
| 162.0 | 0.748 | 0.790 | 0.752 | 0.771 | 0.828 | 0.748 | 0.771 | 0.033 | 0.504 |
| 171.0 | 1.040 | 0.844 | 0.822 | 0.948 | 0.836 | 0.822 | 0.844 | 0.094 | 0.546 |
| 175.5 | 0.748 | 0.738 | 0.801 | 0.735 | 0.760 | 0.735 | 0.748 | 0.027 | 0.604 |
| 187.0 | 0.654 | 0.655 | 0.667 | 0.661 | 0.657 | 0.654 | 0.657 | 0.005 | 0.640 |
| 199.0 | 0.707 | 0.689 | 0.696 | 0.703 | 0.697 | 0.689 | 0.697 | 0.007 | 0.643 |
| 215.0 | 0.772 | 0.671 | 0.719 | 0.756 | 0.670 | 0.670 | 0.719 | 0.047 | 0.639 |
| 224.0 | 0.691 | 0.701 | 0.709 | 0.703 | 0.688 | 0.688 | 0.701 | 0.009 | 0.639 |
| 230.0 | 0.639 | 0.613 | 0.621 | 0.630 | 0.738 | 0.613 | 0.630 | 0.051 | 0.586 |
| 236.0 | 0.644 | 0.610 | 0.589 | 0.627 | 0.685 | 0.589 | 0.627 | 0.036 | 0.578 |
| 240.0 | 0.630 | 0.611 | 0.600 | 0.624 | 0.674 | 0.600 | 0.624 | 0.028 | 0.574 |
| 251.0 | 0.656 | 0.751 | 0.757 | 0.746 | 0.776 | 0.656 | 0.751 | 0.047 | 0.568 |
| 263.0 | 0.589 | 0.590 | 0.594 | 0.597 | 0.589 | 0.589 | 0.590 | 0.004 | 0.568 |
| 280.0 | 0.748 | 0.735 | 0.733 | 0.696 | 0.718 | 0.696 | 0.733 | 0.020 | 0.568 |
| 293.0 | 0.563 | 0.571 | 0.583 | 0.585 | 0.573 | 0.563 | 0.573 | 0.009 | 0.546 |
| 305.0 | 0.549 | 0.583 | 0.590 | 0.744 | 0.585 | 0.549 | 0.585 | 0.077 | 0.525 |
| 312.0 | 0.773 | 0.600 | 0.648 | 0.545 | 0.613 | 0.545 | 0.613 | 0.085 | 0.523 |
| 321.0 | 1.124 | 1.035 | 1.114 | 1.008 | 1.147 | 1.008 | 1.114 | 0.060 | 0.918 |
| 330.0 | 1.165 | 0.908 | 1.032 | 1.086 | 0.837 | 0.837 | 1.032 | 0.133 | 0.551 |
| 347.0 | 0.616 | 0.691 | 0.643 | 0.762 | 0.541 | 0.541 | 0.643 | 0.083 | 0.523 |
| 359.0 | 0.623 | 0.585 | 0.639 | 0.598 | 0.588 | 0.585 | 0.598 | 0.023 | 0.520 |
| 371.0 | 0.562 | 0.550 | 0.573 | 0.569 | 0.564 | 0.550 | 0.564 | 0.009 | 0.520 |
| 383.0 | 0.536 | 0.556 | 0.560 | 0.566 | 0.548 | 0.536 | 0.556 | 0.012 | 0.511 |
| 394.0 | 0.636 | 0.584 | 0.701 | 0.606 | 0.552 | 0.552 | 0.606 | 0.057 | 0.503 |

Table 25 (Cont'd) RSRM-2B Forward Segment Star Tip Insulation Performance

RSRM-2B Forward Segment Star Tip

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 90.0 | 154.0 | 222.0 | 286.0 | 352.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.380 | 2.418 | 2.428 | 2.462 | 2.320 | 2.320 | 2.418 | 0.054 |
| 13.0 | 0.770 | 0.715 | 0.788 | 0.729 | 0.733 | 0.715 | 0.733 | 0.031 |
| 23.0 | L | L | L | L | L | 0.664 | 0.695 | 0.039 |
| 27.0 | L | L | L | L | L | 0.474 | 0.476 | 0.009 |
| 30.7 | L | L | L | L | L | 0.480 | 0.483 | 0.007 |
| 34.2 | L | L | L | L | L | 0.409 | 0.411 | 0.008 |
| 37.7 | L | L | L | L | L | 0.408 | 0.415 | 0.007 |
| 41.2 | L | L | L | L | L | 0.300 | 0.307 | 0.006 |
| 44.0 | L | L | L | L | L | 0.266 | 0.310 | 0.025 |
| 94.7 | L | L | L | L | L | 0.120 | 0.121 | 0.004 |
| 142.0 | L | L | L | L | L | 0.160 | 0.165 | 0.003 |
| 145.7 | L | L | L | L | 0.333 | 0.240 | 0.292 | 0.033 |
| 148.5 | 0.279 | 0.339 | 0.298 | 0.303 | 0.323 | 0.279 | 0.303 | 0.023 |
| 152.0 | 0.333 | 0.311 | 0.348 | 0.311 | 0.354 | 0.311 | 0.333 | 0.020 |
| 155.0 | 0.532 | 0.369 | 0.460 | 0.475 | 0.571 | 0.369 | 0.475 | 0.077 |
| 162.0 | 0.661 | 0.750 | 0.768 | 0.641 | 0.669 | 0.641 | 0.669 | 0.057 |
| 171.0 | 0.916 | 1.073 | 0.956 | 0.970 | 0.764 | 0.764 | 0.956 | 0.112 |
| 175.5 | 0.610 | 0.612 | 0.612 | 0.583 | 0.580 | 0.580 | 0.610 | 0.016 |
| 187.0 | 0.426 | 0.428 | 0.429 | 0.453 | 0.441 | 0.426 | 0.429 | 0.011 |
| 199.0 | 0.527 | 0.522 | 0.476 | 0.511 | 0.475 | 0.475 | 0.511 | 0.025 |
| 215.0 | 0.551 | 0.531 | 0.478 | 0.463 | 0.448 | 0.448 | 0.478 | 0.045 |
| 224.0 | 0.553 | 0.485 | 0.493 | 0.467 | 0.508 | 0.467 | 0.493 | 0.033 |
| 230.0 | 0.454 | 0.409 | 0.405 | 0.425 | 0.423 | 0.405 | 0.423 | 0.019 |
| 236.0 | 0.443 | 0.455 | 0.405 | 0.465 | 0.464 | 0.405 | 0.455 | 0.025 |
| 240.0 | 0.441 | 0.429 | 0.398 | 0.415 | 0.426 | 0.398 | 0.426 | 0.016 |
| 251.0 | 0.456 | 0.586 | 0.514 | 0.517 | 0.513 | 0.456 | 0.514 | 0.046 |
| 263.0 | 0.450 | 0.511 | 0.369 | 0.374 | 0.426 | 0.369 | 0.426 | 0.059 |
| 280.0 | 0.523 | 0.578 | 0.461 | 0.455 | 0.495 | 0.455 | 0.495 | 0.050 |
| 293.0 | 0.387 | 0.410 | 0.339 | 0.401 | 0.368 | 0.339 | 0.387 | 0.028 |
| 305.0 | 0.370 | 0.434 | 0.418 | 0.383 | 0.380 | 0.370 | 0.383 | 0.027 |
| 312.0 | 0.436 | 0.419 | 0.455 | 0.417 | 0.404 | 0.404 | 0.419 | 0.020 |
| 321.0 | 0.766 | 0.853 | 0.804 | 0.791 | 0.860 | 0.766 | 0.804 | 0.041 |
| 330.0 | 0.775 | 0.805 | 0.730 | 0.636 | 0.728 | 0.636 | 0.730 | 0.064 |
| 347.0 | 0.322 | 0.407 | 0.373 | 0.346 | 0.370 | 0.322 | 0.370 | 0.032 |
| 359.0 | 0.404 | 0.362 | 0.416 | 0.411 | 0.433 | 0.362 | 0.411 | 0.026 |
| 371.0 | 0.336 | 0.370 | 0.369 | 0.411 | 0.441 | 0.336 | 0.370 | 0.041 |
| 383.0 | 0.401 | 0.397 | 0.411 | 0.386 | 0.360 | 0.360 | 0.397 | 0.020 |
| 394.0 | 0.385 | 0.329 | 0.440 | 0.384 | 0.357 | 0.329 | 0.384 | 0.041 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUE WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 25 (Cont'd) RSRM-2B Forward Segment Star Tip Insulation Performance

RSRM-2B Forward Segment Non-Star Tip

| STATION (IN) | COMPLIANCE SAFETY FACTOR (CSF) DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | PLANE | REQUIRED SAFETY FACTOR | STATION (IN) | ACTUAL SAFETY FACTOR (ASF) DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | PLANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 7.31 | 16.69 | 66.25 | 12.18 | 10.76 | 7.31 | 74.0 | 2.0 | 3.5 | 8.83 | 20.24 | 77.56 | 14.85 | 12.96 | 8.83 | 74.0 |
| 13.0 | + | + | + | + | 27.08 | 27.08 | 336.0 | 1.5 | 13.0 | + | + | + | + | 31.92 | 31.92 | 336.0 |
| 23.0 | + | + | + | 13.89 | + | 13.89 | 270.0 | 1.5 | 23.0 | + | + | + | 19.50 | + | 19.50 | 270.0 |
| 27.0 | + | + | + | + | + | | | 1.5 | 27.0 | + | + | + | + | + | | |
| 30.7 | + | + | + | + | + | | | 1.5 | 30.7 | + | + | + | + | + | | |
| 34.2 | + | + | + | + | + | | | 1.5 | 34.2 | + | + | + | + | + | | |
| 37.7 | + | + | + | + | + | | | 1.5 | 37.7 | + | + | + | + | + | | |
| 41.2 | + | + | + | + | + | | | 1.5 | 41.2 | + | + | + | + | + | | |
| 44.0 | + | + | + | + | + | | | 1.5 | 44.0 | + | + | + | + | + | | |
| 94.7 | + | + | + | + | + | | | 1.5 | 94.7 | + | + | + | + | + | | |
| 142.0 | + | + | + | + | + | | | 1.5 | 142.0 | + | + | + | + | + | | |
| 145.7 | + | + | + | + | + | | | 1.5 | 145.7 | + | + | + | + | + | | |
| 148.5 | + | + | + | + | + | | | 1.5 | 148.5 | + | + | + | + | + | | |
| 152.0 | + | + | + | 9.61 | 5.98 | 5.98 | 336.0 | 1.5 | 152.0 | + | + | + | 11.79 | 7.28 | 7.28 | 336.0 |
| 155.0 | + | 5.22 | 21.18 | + | 10.91 | 5.22 | 140.0 | 1.5 | 155.0 | + | 7.26 | 27.41 | + | 16.15 | 7.26 | 140.0 |
| 162.0 | 8.00 | 26.53 | 25.20 | 7.75 | 4.34 | 4.34 | 336.0 | 2.0 | 162.0 | 12.65 | 39.32 | 39.10 | 11.89 | 7.21 | 7.21 | 336.0 |
| 171.0 | 5.75 | + | + | + | + | 5.75 | 74.0 | 1.5 | 171.0 | 10.29 | + | + | + | + | 10.29 | 74.0 |
| 175.5 | 6.23 | 9.44 | 9.15 | 3.66 | 3.95 | 3.66 | 270.0 | 1.5 | 175.5 | 7.64 | 11.25 | 11.12 | 4.58 | 5.33 | 4.58 | 270.0 |
| 187.0 | 4.54 | 9.70 | 4.57 | 2.84 | 4.08 | 2.84 | 270.0 | 1.5 | 187.0 | 4.83 | 9.73 | 4.77 | 3.39 | 4.17 | 3.39 | 270.0 |
| 199.0 | 4.91 | 25.72 | 9.89 | 8.69 | 4.53 | 4.53 | 336.0 | 1.5 | 199.0 | 5.53 | 27.12 | 10.78 | 9.12 | 5.30 | 5.30 | 336.0 |
| 215.0 | 6.95 | 4.35 | 4.02 | 3.53 | 2.83 | 2.83 | 336.0 | 1.5 | 215.0 | 7.93 | 4.97 | 4.52 | 3.85 | 3.42 | 3.42 | 336.0 |
| 224.0 | 5.28 | 6.52 | 4.12 | 5.33 | 9.13 | 4.12 | 206.0 | 1.5 | 224.0 | 5.88 | 7.16 | 4.70 | 5.80 | 9.29 | 4.70 | 206.0 |
| 230.0 | 5.14 | 6.58 | 8.88 | 5.05 | 3.37 | 3.37 | 336.0 | 1.5 | 230.0 | 5.65 | 7.06 | 9.38 | 5.18 | 3.94 | 3.94 | 336.0 |
| 236.0 | 5.61 | 7.05 | 8.38 | 5.16 | 5.78 | 5.16 | 270.0 | 1.5 | 236.0 | 6.02 | 7.33 | 9.03 | 5.42 | 6.25 | 5.42 | 270.0 |
| 240.0 | 5.27 | 8.20 | 8.57 | 5.63 | 5.57 | 5.27 | 74.0 | 1.5 | 240.0 | 5.70 | 8.61 | 9.22 | 6.13 | 5.97 | 5.70 | 74.0 |
| 251.0 | 2.96 | 4.21 | 5.36 | 4.24 | 5.51 | 2.96 | 74.0 | 1.5 | 251.0 | 3.78 | 5.19 | 7.21 | 5.77 | 7.09 | 3.78 | 74.0 |
| 263.0 | 5.57 | 4.54 | 3.89 | 3.42 | 5.68 | 3.42 | 270.0 | 1.5 | 263.0 | 5.78 | 4.88 | 4.21 | 3.77 | 5.81 | 3.77 | 270.0 |
| 280.0 | 5.98 | 4.51 | 4.21 | 4.34 | 4.54 | 4.21 | 206.0 | 1.5 | 280.0 | 7.77 | 5.96 | 5.66 | 5.15 | 5.56 | 5.15 | 270.0 |
| 293.0 | 10.50 | 5.35 | 4.17 | 4.83 | 2.28 | 2.28 | 336.0 | 1.5 | 293.0 | 10.65 | 5.52 | 4.52 | 5.23 | 2.85 | 2.85 | 336.0 |
| 305.0 | 2.98 | 11.41 | 3.60 | 4.77 | 4.95 | 2.98 | 74.0 | 1.5 | 305.0 | 3.45 | 13.07 | 4.14 | 5.20 | 5.82 | 3.45 | 74.0 |
| 312.0 | 2.91 | 11.62 | 3.23 | 3.46 | 2.19 | 2.19 | 336.0 | 1.5 | 312.0 | 3.62 | 13.62 | 3.88 | 4.13 | 3.10 | 3.10 | 336.0 |
| 321.0 | 6.75 | 5.19 | 10.93 | 5.92 | 5.50 | 5.19 | 140.0 | 2.0 | 321.0 | 7.54 | 6.44 | 11.83 | 7.01 | 6.11 | 6.11 | 336.0 |
| 330.0 | 7.76 | 8.75 | 8.48 | 1.85 | 3.72 | 1.85 | 270.0 | 1.5 | 330.0 | 12.69 | 13.62 | 14.82 | 3.64 | 5.66 | 3.64 | 270.0 |
| 347.0 | 2.14 | 2.60 | 1.51 | 4.36 | 3.13 | 1.51 | 206.0 | 1.5 | 347.0 | 2.76 | 2.97 | 2.33 | 4.47 | 3.53 | 2.33 | 206.0 |
| 359.0 | 3.49 | 3.38 | 3.19 | 7.12 | 2.29 | 2.29 | 336.0 | 1.5 | 359.0 | 4.27 | 3.86 | 3.61 | 8.30 | 2.88 | 2.88 | 336.0 |
| 371.0 | 3.35 | 3.04 | 2.84 | 2.65 | 3.21 | 2.65 | 270.0 | 1.5 | 371.0 | 3.61 | 3.25 | 3.31 | 3.12 | 3.88 | 3.12 | 270.0 |
| 383.0 | 2.33 | 2.82 | 2.16 | 2.21 | 3.43 | 2.16 | 206.0 | 1.5 | 383.0 | 2.59 | 3.06 | 2.67 | 2.87 | 3.67 | 2.59 | 74.0 |
| 394.0 | 2.38 | 1.71 | 2.10 | 2.69 | 1.79 | 1.71 | 140.0 | 1.5 | 394.0 | 2.64 | 2.32 | 2.57 | 3.17 | 2.33 | 2.32 | 140.0 |

SEGMENT MINIMUM = 1.51 AT THE 347.0 INCH STATION

A " + " MEANS NEGLIGIBLE MDD HAS OCCURRED.

SEGMENT MINIMUM = 2.32 AT THE 394.0 INCH STATION.

Table 26 RSRM-2B Forward Segment Non-Star Tip Insulation Performacne

RSRM-2B Forward Segment Non-Star Tip

| STATION (IN) | MATERIAL DECOMPOSITION DEPTH (MDD) INCHES DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MAXIMUM | AVE. | MEDIAN | STANDARD DEVIATION | STATION (IN) | MATERIAL DECOMPOSITION RATE (MDR) MILS / SECOND DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | AVERAGE | EXPOSURE TIME |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 0.290< | 0.127< | 0.032 | 0.174< | 0.197< | 0.290 | 0.164 | 0.174 | 0.095 | 3.5 | 8.4 | 3.7 | 0.9 | 5.0 | 5.7 | 4.8 | 34.5 |
| 13.0 | 0 | 0 | 0 | 0 | 0.024 | 0.024 | 0.005 | 0.000 | 0.011 | 13.0 | 0 | 0 | 0 | 0 | 1.1 | 0.2 | 22.3 |
| 23.0 | 0 | 0 | 0 | 0.036 | 0 | 0.036 | 0.007 | 0.000 | 0.016 | 23.0 | 0 | 0 | 0 | 4.5 | 0 | 0.9 | 8.0 |
| 27.0 | 0 | 0 | 0 | 0 | 0 | | | | | 27.0 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 30.7 | 0 | 0 | 0 | 0 | 0 | | | | | 30.7 | 0 | 0 | 0 | 0 | 0 | | 4.8 |
| 34.2 | 0 | 0 | 0 | 0 | 0 | | | | | 34.2 | 0 | 0 | 0 | 0 | 0 | | 4.2 |
| 37.7 | 0 | 0 | 0 | 0 | 0 | | | | | 37.7 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 41.2 | 0 | 0 | 0 | 0 | 0 | | | | | 41.2 | 0 | 0 | 0 | 0 | 0 | | 3.6 |
| 44.0 | 0 | 0 | 0 | 0 | 0 | | | | | 44.0 | 0 | 0 | 0 | 0 | 0 | | 3.0 |
| 94.7 | 0 | 0 | 0 | 0 | 0 | | | | | 94.7 | 0 | 0 | 0 | 0 | 0 | | 0.8 |
| 142.0 | 0 | 0 | 0 | 0 | 0 | | | | | 142.0 | 0 | 0 | 0 | 0 | 0 | | 1.0 |
| 145.7 | 0 | 0 | 0 | 0 | 0 | | | | | 145.7 | 0 | 0 | 0 | 0 | 0 | | 2.0 |
| 148.5 | 0 | 0 | 0 | 0 | 0 | | | | | 148.5 | 0 | 0 | 0 | 0 | 0 | | 10.8 |
| 152.0 | 0 | 0 | 0 | 0.033 | 0.053 | 0.053 | 0.017 | 0.000 | 0.025 | 152.0 | 0 | 0 | 0 | 1.6 | 2.5 | 0.8 | 20.9 |
| 155.0 | 0 | 0.069 | 0.017 | 0 | 0.033 | 0.069 | 0.024 | 0.017 | 0.029 | 155.0 | 0 | 2.4 | 0.6 | 0 | 1.2 | 0.8 | 28.5 |
| 162.0 | 0.063 | 0.019 | 0.020 | 0.065 | 0.116 | 0.116 | 0.057 | 0.063 | 0.040 | 162.0 | 1.4 | 0.4 | 0.4 | 1.5 | 2.6 | 1.3 | 44.5 |
| 171.0 | 0.095 | 0 | 0 | 0 | 0 | 0.095 | 0.019 | 0.000 | 0.042 | 171.0 | 1.5 | 0 | 0 | 0 | 0 | 0.3 | 61.8 |
| 175.5 | 0.097 | 0.064 | 0.066 | 0.165 | 0.153 | 0.165 | 0.109 | 0.097 | 0.048 | 175.5 | 1.4 | 0.9 | 1.0 | 2.4 | 2.2 | 1.6 | 68.6 |
| 187.0 | 0.141 | 0.066 | 0.140 | 0.225 | 0.157 | 0.225 | 0.146 | 0.141 | 0.057 | 187.0 | 2.1 | 1.0 | 2.1 | 3.4 | 2.4 | 2.2 | 66.8 |
| 199.0 | 0.131 | 0.025 | 0.065 | 0.074 | 0.142 | 0.142 | 0.087 | 0.074 | 0.049 | 199.0 | 2.0 | 0.4 | 1.0 | 1.1 | 2.1 | 1.3 | 66.8 |
| 215.0 | 0.092 | 0.147 | 0.159 | 0.181 | 0.226 | 0.226 | 0.161 | 0.159 | 0.049 | 215.0 | 1.4 | 2.2 | 2.4 | 2.7 | 3.4 | 2.4 | 66.8 |
| 224.0 | 0.121 | 0.098 | 0.155 | 0.120 | 0.070 | 0.155 | 0.113 | 0.120 | 0.031 | 224.0 | 1.8 | 1.5 | 2.3 | 1.8 | 1.0 | 1.7 | 66.8 |
| 230.0 | 0.114 | 0.089 | 0.066 | 0.116 | 0.174 | 0.174 | 0.112 | 0.114 | 0.040 | 230.0 | 1.7 | 1.3 | 1.0 | 1.7 | 2.6 | 1.7 | 66.8 |
| 236.0 | 0.103 | 0.082 | 0.069 | 0.112 | 0.100 | 0.112 | 0.093 | 0.100 | 0.017 | 236.0 | 1.5 | 1.2 | 1.0 | 1.7 | 1.5 | 1.4 | 66.8 |
| 240.0 | 0.109 | 0.070 | 0.067 | 0.102 | 0.103 | 0.109 | 0.090 | 0.102 | 0.020 | 240.0 | 1.6 | 1.0 | 1.0 | 1.5 | 1.5 | 1.4 | 66.8 |
| 251.0 | 0.192 | 0.135 | 0.106 | 0.134 | 0.103 | 0.192 | 0.134 | 0.134 | 0.036 | 251.0 | 2.9 | 2.0 | 1.6 | 2.0 | 1.5 | 2.0 | 66.8 |
| 263.0 | 0.102 | 0.125 | 0.146 | 0.166 | 0.100 | 0.166 | 0.128 | 0.125 | 0.028 | 263.0 | 1.5 | 1.9 | 2.2 | 2.5 | 1.5 | 1.9 | 66.8 |
| 280.0 | 0.095 | 0.126 | 0.135 | 0.131 | 0.125 | 0.135 | 0.122 | 0.126 | 0.016 | 280.0 | 1.4 | 1.9 | 2.0 | 2.0 | 1.9 | 1.8 | 66.8 |
| 293.0 | 0.052 | 0.102 | 0.131 | 0.113 | 0.239 | 0.239 | 0.127 | 0.113 | 0.069 | 293.0 | 0.8 | 1.5 | 2.0 | 1.7 | 3.6 | 1.9 | 66.8 |
| 305.0 | 0.176 | 0.046 | 0.146 | 0.110 | 0.106 | 0.176 | 0.117 | 0.110 | 0.049 | 305.0 | 2.6 | 0.7 | 2.2 | 1.6 | 1.6 | 1.7 | 66.8 |
| 312.0 | 0.180 | 0.045 | 0.162 | 0.151 | 0.239 | 0.239 | 0.155 | 0.162 | 0.070 | 312.0 | 2.7 | 0.7 | 2.4 | 2.3 | 3.6 | 2.3 | 66.8 |
| 321.0 | 0.136 | 0.177 | 0.084 | 0.155 | 0.167 | 0.177 | 0.144 | 0.155 | 0.037 | 321.0 | 1.8 | 2.4 | 1.1 | 2.1 | 2.3 | 1.9 | 74.2 |
| 330.0 | 0.071 | 0.063 | 0.065 | 0.298 | 0.148 | 0.298 | 0.129 | 0.071 | 0.101 | 330.0 | 1.0 | 0.9 | 0.9 | 4.1 | 2.0 | 1.8 | 73.2 |
| 347.0 | 0.244 | 0.201 | 0.347< | 0.120 | 0.167 | 0.347 | 0.216 | 0.201 | 0.086 | 347.0 | 3.4 | 2.8 | 4.8 | 1.7 | 2.3 | 3.0 | 72.6 |
| 359.0 | 0.149 | 0.154 | 0.163 | 0.073 | 0.227 | 0.227 | 0.153 | 0.154 | 0.055 | 359.0 | 2.1 | 2.1 | 2.3 | 1.0 | 3.1 | 2.1 | 72.4 |
| 371.0 | 0.155 | 0.171 | 0.183 | 0.196 | 0.162 | 0.196 | 0.173 | 0.171 | 0.016 | 371.0 | 2.2 | 2.4 | 2.6 | 2.8 | 2.3 | 2.5 | 70.2 |
| 383.0 | 0.219 | 0.181 | 0.237 | 0.231 | 0.149 | 0.237 | 0.203 | 0.219 | 0.037 | 383.0 | 3.1 | 2.5 | 3.3 | 3.3 | 2.1 | 2.9 | 71.0 |
| 394.0 | 0.211 | 0.294< | 0.240 | 0.187 | 0.281 | 0.294 | 0.243 | 0.240 | 0.045 | 394.0 | 2.9 | 4.1 | 3.4 | 2.6 | 3.9 | 3.4 | 71.6 |

A " < " INDICATES THE PRECEDING MDD HAS EXCEEDED THE M + 3 SIGMA DESIGN CRITERIA.

Table 26 (Cont'd) RSRM-2B Forward Segment Non-Star Tip Insulation Performance

RSRM-2B Forward Segment Non-Star Tip

PREFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | MEDIAN | STANDARD DEVIATION | MDT |
|---|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.562 | 2.570 | 2.482 | 2.584 | 2.554 | 2.482 | 2.562 | 0.040 | 2.120 |
| 13.0 | 0.780 | 0.753 | 0.790 | 0.725 | 0.766 | 0.725 | 0.766 | 0.025 | 0.650 |
| 23.0 | 0.683 | 0.686 | 0.712 | 0.702 | 0.653 | 0.653 | 0.686 | 0.022 | 0.500 |
| 27.0 | 0.490 | 0.486 | 0.488 | 0.484 | 0.484 | 0.484 | 0.486 | 0.003 | 0.450 |
| 30.7 | 0.498 | 0.488 | 0.506 | 0.481 | 0.490 | 0.481 | 0.490 | 0.010 | 0.400 |
| 34.2 | 0.419 | 0.408 | 0.426 | 0.413 | 0.409 | 0.408 | 0.413 | 0.008 | 0.380 |
| 37.7 | 0.417 | 0.411 | 0.421 | 0.417 | 0.411 | 0.411 | 0.417 | 0.004 | 0.330 |
| 41.2 | 0.308 | 0.297 | 0.354 | 0.333 | 0.310 | 0.297 | 0.310 | 0.023 | 0.280 |
| 44.0 | 0.326 | 0.310 | 0.283 | 0.321 | 0.310 | 0.283 | 0.310 | 0.017 | 0.250 |
| 94.7 | 0.119 | 0.119 | 0.120 | 0.121 | 0.121 | 0.119 | 0.120 | 0.001 | 0.090 |
| 142.0 | 0.163 | 0.161 | 0.166 | 0.167 | 0.161 | 0.161 | 0.163 | 0.003 | 0.113 |
| 145.7 | 0.297 | 0.265 | 0.297 | 0.302 | 0.287 | 0.265 | 0.297 | 0.015 | 0.234 |
| 148.5 | 0.335 | 0.317 | 0.329 | 0.350 | 0.341 | 0.317 | 0.335 | 0.012 | 0.276 |
| 152.0 | 0.385 | 0.339 | 0.394 | 0.389 | 0.386 | 0.339 | 0.386 | 0.022 | 0.317 |
| 155.0 | 0.534 | 0.501 | 0.466 | 0.494 | 0.533 | 0.466 | 0.501 | 0.029 | 0.360 |
| 162.0 | 0.797 | 0.747 | 0.782 | 0.773 | 0.836 | 0.747 | 0.782 | 0.033 | 0.504 |
| 171.0 | 0.978 | 0.899 | 0.777 | 0.769 | 0.853 | 0.769 | 0.853 | 0.087 | 0.546 |
| 175.5 | 0.741 | 0.720 | 0.734 | 0.755 | 0.815 | 0.720 | 0.741 | 0.037 | 0.604 |
| 187.0 | 0.681 | 0.642 | 0.668 | 0.763 | 0.654 | 0.642 | 0.668 | 0.048 | 0.640 |
| 199.0 | 0.724 | 0.678 | 0.701 | 0.675 | 0.753 | 0.675 | 0.701 | 0.033 | 0.643 |
| 215.0 | 0.730 | 0.731 | 0.718 | 0.697 | 0.773 | 0.697 | 0.730 | 0.028 | 0.639 |
| 224.0 | 0.712 | 0.702 | 0.728 | 0.696 | 0.650 | 0.650 | 0.702 | 0.029 | 0.639 |
| 230.0 | 0.644 | 0.628 | 0.619 | 0.601 | 0.685 | 0.601 | 0.628 | 0.032 | 0.586 |
| 236.0 | 0.620 | 0.601 | 0.623 | 0.607 | 0.625 | 0.601 | 0.620 | 0.011 | 0.578 |
| 240.0 | 0.621 | 0.603 | 0.618 | 0.625 | 0.615 | 0.603 | 0.618 | 0.008 | 0.574 |
| 251.0 | 0.726 | 0.701 | 0.764 | 0.773 | 0.730 | 0.701 | 0.730 | 0.029 | 0.568 |
| 263.0 | 0.590 | 0.610 | 0.615 | 0.625 | 0.581 | 0.581 | 0.610 | 0.018 | 0.568 |
| 280.0 | 0.738 | 0.751 | 0.764 | 0.674 | 0.695 | 0.674 | 0.738 | 0.038 | 0.568 |
| 293.0 | 0.554 | 0.563 | 0.592 | 0.591 | 0.680 | 0.554 | 0.591 | 0.050 | 0.546 |
| 305.0 | 0.607 | 0.601 | 0.604 | 0.572 | 0.617 | 0.572 | 0.604 | 0.017 | 0.525 |
| 312.0 | 0.651 | 0.613 | 0.629 | 0.624 | 0.741 | 0.613 | 0.629 | 0.052 | 0.523 |
| 321.0 | 1.025 | 1.140 | 0.994 | 1.086 | 1.020 | 0.994 | 1.025 | 0.059 | 0.918 |
| 330.0 | 0.901 | 0.858 | 0.963 | 1.086 | 0.837 | 0.837 | 0.901 | 0.100 | 0.551 |
| 347.0 | 0.674 | 0.597 | 0.809 | 0.537 | 0.590 | 0.537 | 0.597 | 0.106 | 0.523 |
| 359.0 | 0.636 | 0.595 | 0.589 | 0.606 | 0.653 | 0.589 | 0.606 | 0.028 | 0.520 |
| 371.0 | 0.559 | 0.556 | 0.606 | 0.611 | 0.628 | 0.556 | 0.606 | 0.033 | 0.520 |
| 383.0 | 0.567 | 0.554 | 0.633 | 0.663 | 0.547 | 0.547 | 0.567 | 0.052 | 0.511 |
| 394.0 | 0.557 | 0.681 | 0.616 | 0.593 | 0.655 | 0.557 | 0.616 | 0.049 | 0.503 |

Table 26 (Cont'd) RSRM-2B Forward Segment Non-Star Tip Insulation Performance

RSRM-2B Forward Segment Non-Star Tip

POSTFIRE MEASUREMENTS

| STATION (IN) | DEGREE LOCATION 74.0 | 140.0 | 206.0 | 270.0 | 336.0 | MINIMUM | MEDIAN | STANDARD DEVIATION |
|---|---|---|---|---|---|---|---|---|
| 3.5 | 2.272 | 2.443 | 2.450 | 2.410 | 2.357 | 2.272 | 2.410 | 0.074 |
| 13.0 | 0.812 | 0.854 | 0.834 | 0.749 | 0.742 | 0.742 | 0.812 | 0.050 |
| 23.0 | L | L | L | 0.666 | L | 0.653 | 0.683 | 0.022 |
| 27.0 | L | L | L | L | L | 0.484 | 0.486 | 0.003 |
| 30.7 | L | L | L | L | L | 0.481 | 0.490 | 0.010 |
| 34.2 | L | L | L | L | L | 0.408 | 0.413 | 0.008 |
| 37.7 | L | L | L | L | L | 0.411 | 0.417 | 0.004 |
| 41.2 | L | L | L | L | L | 0.297 | 0.310 | 0.023 |
| 44.0 | L | L | L | L | L | 0.283 | 0.310 | 0.017 |
| 94.7 | L | L | L | L | L | 0.119 | 0.120 | 0.001 |
| 142.0 | L | L | L | L | L | 0.161 | 0.163 | 0.003 |
| 145.7 | L | L | L | L | L | 0.265 | 0.297 | 0.015 |
| 148.5 | L | L | L | L | L | 0.317 | 0.335 | 0.012 |
| 152.0 | L | L | L | 0.356 | 0.333 | 0.333 | 0.356 | 0.027 |
| 155.0 | 0.567 | 0.432 | 0.449 | 0.509 | 0.500 | 0.432 | 0.500 | 0.053 |
| 162.0 | 0.734 | 0.728 | 0.762 | 0.708 | 0.720 | 0.708 | 0.728 | 0.020 |
| 171.0 | 0.883 | 1.004 | 1.063 | 0.909 | 0.955 | 0.883 | 0.955 | 0.073 |
| 175.5 | 0.644 | 0.656 | 0.668 | 0.590 | 0.662 | 0.590 | 0.656 | 0.031 |
| 187.0 | 0.540 | 0.576 | 0.528 | 0.538 | 0.497 | 0.497 | 0.538 | 0.028 |
| 199.0 | 0.593 | 0.653 | 0.636 | 0.601 | 0.611 | 0.593 | 0.611 | 0.025 |
| 215.0 | 0.638 | 0.584 | 0.559 | 0.516 | 0.547 | 0.516 | 0.559 | 0.046 |
| 224.0 | 0.591 | 0.604 | 0.573 | 0.576 | 0.580 | 0.573 | 0.580 | 0.013 |
| 230.0 | 0.530 | 0.539 | 0.553 | 0.485 | 0.511 | 0.485 | 0.530 | 0.026 |
| 236.0 | 0.517 | 0.519 | 0.554 | 0.495 | 0.525 | 0.495 | 0.519 | 0.021 |
| 240.0 | 0.512 | 0.533 | 0.551 | 0.523 | 0.512 | 0.512 | 0.523 | 0.016 |
| 251.0 | 0.534 | 0.566 | 0.658 | 0.639 | 0.627 | 0.534 | 0.627 | 0.052 |
| 263.0 | 0.488 | 0.485 | 0.469 | 0.459 | 0.481 | 0.459 | 0.481 | 0.012 |
| 280.0 | 0.643 | 0.625 | 0.629 | 0.543 | 0.570 | 0.543 | 0.625 | 0.043 |
| 293.0 | 0.502 | 0.461 | 0.461 | 0.478 | 0.441 | 0.441 | 0.461 | 0.023 |
| 305.0 | 0.431 | 0.555 | 0.458 | 0.462 | 0.511 | 0.431 | 0.462 | 0.049 |
| 312.0 | 0.471 | 0.568 | 0.467 | 0.473 | 0.502 | 0.467 | 0.473 | 0.042 |
| 321.0 | 0.889 | 0.963 | 0.910 | 0.931 | 0.853 | 0.853 | 0.910 | 0.042 |
| 330.0 | 0.830 | 0.795 | 0.898 | 0.788 | 0.689 | 0.689 | 0.795 | 0.076 |
| 347.0 | 0.430 | 0.396 | 0.462 | 0.417 | 0.423 | 0.396 | 0.423 | 0.024 |
| 359.0 | 0.487 | 0.441 | 0.426 | 0.533 | 0.426 | 0.426 | 0.441 | 0.047 |
| 371.0 | 0.404 | 0.385 | 0.423 | 0.415 | 0.466 | 0.385 | 0.415 | 0.030 |
| 383.0 | 0.348 | 0.373 | 0.396 | 0.432 | 0.398 | 0.348 | 0.396 | 0.031 |
| 394.0 | 0.346 | 0.387 | 0.376 | 0.406 | 0.374 | 0.346 | 0.376 | 0.022 |

AN " L " INDICATES THAT LINER MATERIAL WAS REMAINING AT THAT LOCATION.
THE MEDIAN AND MINIMUM VALUE WERE CALCULATED USING THE PREFIRE THICKNESSES
AT THE LOCATIONS WHERE LINER MATERIAL WAS REMAINING.

Table 26 (Cont'd) RSRM-2B Forward Segment Non-Star Tip Insulation Performance

# APPENDIX A

# RSRM-2A INSULATION EVALUATIONS

Table A-1
RSRM-2A Aft Dome Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 10:00 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [X] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1, 3 |
| B. Charred Material? | X | yes | | no | 1 |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | | yes | X | no | |
| E. Edge Separation? | X | yes | | no | 2 |
| F. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Forward facing surface slightly heat affected (light brown color) 220° - 270° - 320°. Outboard surface (dark brown) and aft facing surface (gray) slight charring, immeasurable ablation 195° - 270° - 0°. Heaviest at 270°.

2. Edge unbond .050 in. depth max. 200° - 230° noted on the forward edge of weatherseal.

3. Slight heat effect (light brown) on forward face of weatherseal on protuberance from hatband joint at 30°.

4. A small section (~ 2 in.) of weatherseal was removed at 270° (down position) on 12 December 1988. A very small amount of water came out. The area was greased, and no more weatherseal was removed. There were no DFI wires at 270°, but there were wires covered with cork at the systems tunnel (90°) where water could have penetrated the weatherseal.

Table A-2
RSRM-2A Aft Segment Stiffener to Stiffener Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 9:55 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [X] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Charred Material? | X | yes | | no | 1 |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | | yes | X | no | |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

otes/Comments:

1. EPDM heat effected on outboard surface from 250° - 270° - 300°. Two small blisters (brown colored, light heat effect) (0.25 in. diam.) on aft edge of weatherseal at 270°. Heavy heat effect (slight charring, immeasurable ablation) from 195° - 270° - 0° on aft edge (gray color). Heaviest heat effect at 270°.

Table A-3
RSRM-2A Aft Segment ET Attach to Stiffener Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 9:45 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [X] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Charred Material? | X | yes | | no | 1 |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | | yes | X | no | |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Charring, heat effected aft face of weatherseal 210° - 330° (gray color).

Table A-4
RSRM-2A Aft Center Segment Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 9:40 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [X] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | | yes | X | no | |
| B. Charred Material? | | yes | X | no | |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | X | yes | | no | 1 |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Missing material caused by debris on aft edge of joint 1.5 in. circ. X 0.4 in. axial X 0.080 in. deep at 190°.

2. Glob of material (appears to be paint) on aft edge of weatherseal at 140°, 0.45 in. circ. X 0.25 in. axially X 0.10 in. height. No adverse effect.

Table A-5
RSRM-2A Forward Center Segment Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 9:40 a.m. |
|---|---|---|
| Inspector(s): Scott Manz, Hal Huppi | | |

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [X] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | | yes | X | no | |
| B. Charred Material? | | yes | X | no | |
| C. Moisture Under Seal? | X | yes | | no | 1 |
| D. Missing Material? | X | yes | | no | 2 |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Water was dripping out of weatherseal at instrumentation wires at 10° and 190°. No missing material. A rust color was evident. A squawk was written on this on 5 December 1988.

2. Two debris marks on aft face of weatherseal at 115°, 3 in. circ. X 0.5 in. axial X 0.10 in. deep. at 120° approx. 1 in. diameter X 0.20 in. deep.

3. Water was leaking out of the DFI wires at 270° after the segment had been sitting with 270° down for a few days after hydrolasing. A section of weatherseal approx. 10 in. wide circ. was removed (also DFI wire location) on 12 December 1988. When the segment was rotated to locate 0° down, a significant amount of water came out. The exposed metal near 0° was then covered, and no more weatherseal was removed.

Table A-5
RSRM-2A Forward Segment Cylinder to Cylinder Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 9:30 a.m. |
|---|---|---|
| Inspector(s): Scott Manz | | |

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [X] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | | yes | X | no | |
| B. Charred Material? | | yes | X | no | |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | X | yes | | no | 1 |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

Notes/Comments:

1. Debris mark at 120° 1.0 in circ. X 0.5 in. axial X 0.2 in. deep on aft face of weatherseal.

Table A-7
RSRM-2A Forward Dome Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 9:10 a.m. |
|---|---|---|
| Inspector(s): Scott Manz | | |

Factory Joint:

- [X] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | ____ | yes | X | no | ____ |
| B. Charred Material? | ____ | yes | X | no | ____ |
| C. Moisture Under Seal? | ____ | yes | X | no | ____ |
| D. Missing Material? | ____ | yes | X | no | ____ |
| E. Edge Separation? | ____ | yes | X | no | ____ |
| F. Impact Damage? | ____ | yes | X | no | ____ |

otes/Comments:

Table A-8
RSRM-2A Aft Stiffener Ring TPS Evaluation Before Ring Removal

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 11:40 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

- [ ] Forward Stiffener Stub (1613.62)
- [ ] Center Stiffener Ring (1733.43)
- [ ] Forward Stiffener Ring (1657.65)
- [X] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | X | yes | | no | 2 |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

Notes/Comments:

1. Heat effect, charred material with immeasurable ablation (brown color) on the outboard surface, forward edge and aft edge from 220° - 270° - 320°. Slight heat effect on forward edge (gray brown color) from 60° - 180° - 220°.

2. Area of missing material due to heat effect and ablation on forward edge of ring at 270°, 1.0 in. circ. X 0.3 in. axial X 0.020 in. depth. There were also some areas that appeared to be cut by the hydrolasing on the aft edge.

Table A-9
RSRM-2A Center Stiffener Ring TPS Evaluation Before Ring Removal

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 11:35 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

- [ ] Forward Stiffener Stub (1613.62)
- [X] Center Stiffener Ring (1733.43)
- [ ] Forward Stiffener Ring (1657.65)
- [ ] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | | yes | X | no | |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damange? | X | yes | | no | 2 |

tes/Comments:

1. Heat effect, charred material with immeasurable ablation (brown color) on the outboard surface, forward edge and aft edge (which is not covered by foam) from 220° - 270° - 320°. Light heat effect on forward edge (gray brown color) from 60° - 180° - 220°.

2. Hairline crack in K5NA under instafoam from 120° - 140° on aft face of stub.

Table A-10
RSRM-2A Forward Stiffener Ring TPS Evaluation Before Ring Removal

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 11:30 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

- [ ] Forward Stiffener Stub (1613.62)
- [ ] Center Stiffener Ring (1733.43)
- [X] Forward Stiffener Ring (1657.65)
- [ ] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | | yes | X | no | |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Heat effect, charred material with immeasurable ablation (brown color) on the outboard surface, forward edge and aft edge (which is not covered by foam) from 220° - 270° - 320°. Light heat effect on forward edge (gray brown color) from 60° - 180° - 220°.

Table A-11
RSRM-2A Forward Stiffener Stub TPS Evaluation

| Motor No.: RSRM-2A | Date: 5 December 1988 | Time: 11:25 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

[X] Forward Stiffener Stub (1613.62)

[ ] Center Stiffener Ring (1733.43)

[ ] Forward Stiffener Ring (1657.65)

[ ] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | X | yes | | no | 2 |
| E. Insulation to Case Separation? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

Notes/Comments:

1. The K5NA which was added to the outboard surface of the stub was heat effected (brown color) and missing intermittently on the aft edge of the stub outboard surface generally full circumference. The heaviest heat effect occurred from 220° - 270° - 320°. Heat effect also on aft face and forward edge from 220° - 270° - 320°.

2. Four areas appeared to not have had any K5NA applied prefire 95° - 100°, 110° - 115°, 135° - 140°, and 170° - 180°.

Table A-12
Stiffener Ring Segment TPS Evaluation After Ring Removal

| Motor No.: RSRM-2A & RSRM-2B | Date: 10 December 1988 | Time: 1:00 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Stiffener Ring/Stub:

[ ] Forward Stiffener Stub (1613.62)
[X] Center Stiffener Ring (1733.43)
[X] Forward Stiffener Ring (1657.65)
[X] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | X | yes | | no | 2 |
| E. Insulation to Case Separations? | X | yes | | no | 3 |
| F. Tears? | | yes | X | no | |
| G. Impact Damange? | X | yes | | no | 3 |

otes/Comments:

e stiffener rings were inspected again after they were removed from the case.

1. Discoloration and heat effects from 220° - 320° as noted during open assessment.

2. Several areas of missing material and gouges due to hydrolasing operation.

3. Insulation to case separations were noted on some of the ends of the stiffener ring segments, where the splice plates are located. The separations were mainly located on the inboard face near the corner both aft and forward of the stub, but they were also located on the aft and forward faces and the outboard face of the ring. 35 of the 108 ring end locations (forward inboard corner, aft inboard corner, outboard face) of the 18 ring sections had separations ranging in depth from 0.5 to 47 inches. None of these separations were isolated; they all extended from an end. There was no heat effect or sooting underneath the insulation, but corrosion was evident. The separations may have been initiated, caused, or worsened by the hydrolasing operations or at splashdown.

4. A sample of the stiffener ring insulation was removed from the left hand center ring at 210° on the forward face of the ring.

Table A-13
RSRM-2A Nozzle to Case Joint Insulation Evaluation

| Motor No.: RSRM-2A | Date: 13 December 1988 | Time: 9:30 a.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Voids? | X | yes | | no | 1 |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Adhesive Porosity? | X | yes | | no | 2 |
| 6. Aft Dome Edge Separations? | | yes | X | no | |
| 7. Baffle Torn? | | yes | X | no | 5 |
| 8. Polysulfide in Vent Slots? | X | yes | | no | 3 |
| 9. Polysulfide Failure Mode | 20 % Adhesive at NBR Interface | | | 80 % Cohesive | |
| | 0 % Adhesive at Phenolic Interface | | | | |

otes/Comments:

1. Two voids aft of step. One at 309.6°, 0.80 in. axial X 0.25 in. circ. max., 4.78 in. from nozzle boss to forward edge of void. Another void at 252.0°, 0.65 in. axial X 0.28 in. wide, 3.65 in. from nozzle boss to forward edge of void, almost extends to wiper O-ring, 1.30 from step region, 0.10 from wiper. Both voids in line with wiper vent slots. No voids forward of step. About five other very small voids are evident aft of step.

2. Very slight porosity in step region.

3. Slightly less than normal polysulfide in vent slots.

4.

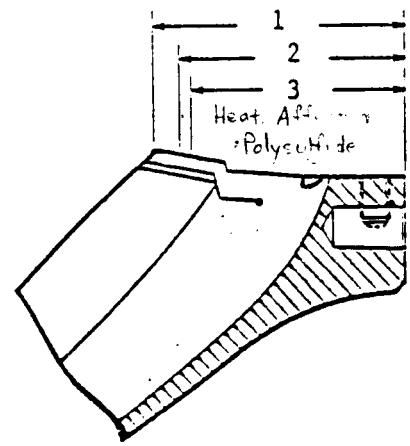
| KSC Bondline Measurements (From Nozzle Boss Aft Face) | 0° | 90° | 180° | 270° |
|---|---|---|---|---|
| (1) Material Remaining (Not including char)* | 7.00 in. | 7.25 in. | 7.00 in. | 7.38 in. |
| (2) Inboard Polysulfide | 6.12 in. | 6.25 in. | 6.12 in. | 6.25 in. |
| (3) Outboard Heat Affected Polysulfide | 5.62 in. | 5.75 in. | 5.75 in. | 6.00 in. |

* Aprroximately 0.50 - 0.75 in. of char on forward end of bondline full circumference.

Table A-13 Cont'd
RSRM-2A Nozzle to Case Joint Evaluation

Clearfield Final Bondline Measurements

| Degree Location | (1) Material Remaining | (2) Inboard Polysulfide | (3) Outboard Polysulfide |
|---|---|---|---|
| 0 | 7.001 | 6.136 | 5.511 |
| 21.6 | 6.973 | 6.178 | 5.681 |
| 46.8 | 6.859 | 6.081 | 5.609 |
| 68.4 | 6.996 | 6.287 | 5.829 |
| 90.0 | 6.954 | 6.184 | 5.739 |
| 111.6 | 6.962 | 6.177 | 5.769 |
| 136.8 | 7.139 | 6.198 | 6.117 |
| 158.4 | 7.064 | 6.245 | 5.607 |
| 180.0 | 6.805 | 6.095 | 5.693 |
| 201.6 | 6.842 | 6.168 | 5.690 |
| 226.8 | 6.981 | 6.218 | 5.735 |
| 248.4 | 7.220 | 6.269 | 5.810 |
| 270.0 | 6.972 | 6.228 | 5.640 |
| 291.6 | 6.940 | 6.070 | 5.577 |
| 316.8 | 6.945 | 6.134 | 5.739 |
| 338.4 | 7.114 | 6.063 | 5.652 |




5. Slight flap/baffle damage at 252° from disassembly, approx. 8-10 in. wide circumferentially. This also caused a rub mark on the nozzle in this degree location.

Table A-14
RSRM-2A Aft Field Joint Insulation Evaluation

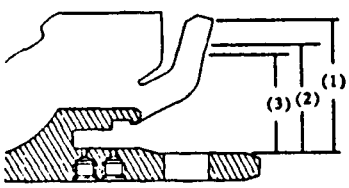
| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 5:30 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken

Field Joint: [ ] Forward [ ] Center [X] Aft

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Areas of Non-Contact? | | yes | X | no | |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | X | yes | | no | 1 |
| 4. Tang Heat Affected Material? | X | yes | | no | 2 |
| 5. Foreign Material? | | yes | X | no | |
| 6. Clevis Edge Separations? | X | yes | | no | 3 |

Tang End Measurements




| | Degree Location | Depth (1) | Depth (2) | Depth (3) | Bondline Contact ** |
|---|---|---|---|---|---|
| | 0° | No char | 2.90 | 2.50 | 1.00 |
| | 90° | 3.15 | 2.90 | 2.60 | 1.35 |
| | 180° | 3.15 | 2.90 | 2.55 | 1.10 |
| | 270° | 3.00 | 2.85 | 2.50 | 1.10 |
| Max | | | | | |
| Min | | | | | |

Note:
The following measurements are taken from the inner diameter of the tang leg (TANG):
Depth (1) - to the tip of the remaining material
Depth (2) - to the outboard edge of the char layer
Depth (3) - to the outboard edge of the heat affected material*,
(i.e. a measurement of the virgin material remaining).
* Location based on the tan discoloration of the adhesive.
** Measurement taken from the outboard edge of the char layer to the outboard extent of contact.

Notes/Comments:

1. Light soot in bondline from 65° - 80° on clevis insulation max. 0.30 in. from material remaining. Much less soot than seen in RSRM-2B joints and none on tang.

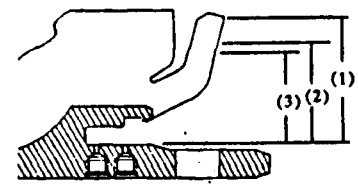
2. See tang heat effect measurements above. Normal erosion and heat effect.

3. Only edge separations > .10 depth were documented.

Table A-14 (Cont'd)
RSRM-2A Aft Field Joint Insulation Evaluation

Clearfield Final
Tang End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.700 | 2.438 | 180 | | 2.720 | 2.422 |
| 10 | | 2.695 | 2.371 | 190 | | 2.693 | 2.379 |
| 20 | | 2.665 | 2.408 | 200 | | 2.695 | 2.400 |
| 30 | | 2.645 | 2.448 | 210 | | 2.700 | 2.390 |
| 40 | | 2.655 | 2.432 | 220 | | 2.667 | 2.374 |
| 50 | | 2.703 | 2.400 | 230 | | 2.700 | 2.400 |
| 60 | | 2.715 | 2.400 | 242 | | 2.650 | 2.211 |
| 70 | | 2.722 | 2.264 | 250 | | 2.666 | 2.280 |
| 80 | | 2.738 | 2.400 | 260 | | 2.695 | 2.378 |
| 90 | | 2.742 | 2.425 | 270 | | 2.648 | 2.400 |
| 100 | | 2.734 | 2.449 | 280 | | 2.718 | 2.445 |
| 110 | | 2.677 | 2.388 | 290 | | 2.744 | 2.520 |
| 120 | | 2.644 | 2.359 | 300 | | 2.665 | 2.367 |
| 130 | | 2.722 | 2.359 | 310 | | 2.695 | 2.400 |
| 140 | | 2.716 | 2.381 | 320 | | 2.700 | 2.468 |
| 150 | | 2.691 | 2.279 | 330 | | 2.722 | 2.424 |
| 160 | | 2.680 | 2.306 | 340 | | 2.764 | 2.413 |
| 170 | | 2.704 | 2.330 | 350 | | 2.716 | 2.405 |



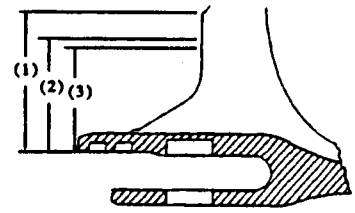

* No char remained after rinse.

Clevis end measurements were not taken at KSC. The measurement method is inaccurate and the clevis side insulation performance mirrored the performance of the tang side. Clevis measurements were taken at Clearfield H-7 and are shown below.

Measurements:
(1)* Remaining char was rinsed out. Measurement was not taken.
(2) To the outboard edge of the char layer.
(3) To the outboard edge of the heat affected material (i.e. measurement of the virgin material remaining.

Clearfield Final
Clevis End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 5 | | 2.772 | 2.646 | 180 | | 2.802 | 2.681 |
| 10 | | 2.757 | 2.606 | 190 | | 2.751 | 2.541 |
| 20 | | 2.723 | 2.594 | 200 | | 2.739 | 2.524 |
| 30 | | 2.760 | 2.581 | 210 | | 2.716 | 2.517 |
| 40 | | 2.747 | 2.621 | 220 | | 2.720 | 2.514 |
| 50 | | 2.721 | 2.597 | 230 | | 2.726 | 2.650 |
| 60 | | 2.750 | 2.576 | 242 | | 2.691 | 2.445 |
| 70 | | 2.785 | 2.604 | 250 | | 2.703 | 2.452 |
| 80 | | 2.753 | 2.605 | 260 | | 2.774 | 2.516 |
| 90 | | 2.774 | 2.610 | 270 | | 2.713 | 2.524 |
| 100 | | 2.744 | 2.602 | 280 | | 2.753 | 2.464 |
| 110 | | 2.718 | 2.560 | 290 | | 2.726 | 2.445 |
| 120 | | 2.721 | 2.561 | 300 | | 2.764 | 2.491 |
| 130 | | 2.764 | 2.629 | 310 | | 2.755 | 2.503 |
| 140 | | 2.734 | 2.541 | 320 | | 2.698 | 2.435 |
| 150 | | 2.742 | 2.545 | 330 | | 2.738 | 2.542 |
| 160 | | 2.720 | 2.612 | 340 | | 2.745 | 2.447 |
| 170 | | 2.733 | 2.556 | 350 | | 2.745 | 2.470 |




* No char remained after rinse.

Table A-14 (Cont'd)
RSRM-2A Aft Field Joint Insulation Evaluation

| | | |
|---|---|---|
| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 4:25 p.m. |
| Inspector(s): Scott Manz, Steve Hicken | Corresponding Comment Number 3 | |
| Field Joint Clevis: [ ] Forward | [ ] Center | [X] Aft |
| Joint: [ ] Igniter to Case | [ ] Nozzle to Case | |

| Edge Separation | Center Degree Location | | Circumferential Width (in.) | Maximum Depth (in.) | Axial Growth From Prefire Unrepaired Condition |
|---|---|---|---|---|---|
| 1 | 8° | | 3.15 | 0.25 | 0.10 |
| 2 | 41° | | 1.60 | 0.25 | 0.13 |
| 3 | 43° | | 0.60 | 0.25 | 0.11 |
| 4 | 54° | | 0.40 | 0.25 | 0.15 |
| 5 | 88° | | 0.45 | 0.12 | 0.02 |
| 6 | 129° | | 0.80 | 0.20 | 0.02 |
| 7 | 136° | | 4.30 | 0.20 | 0 |
| 8 | 149° | | 3.10 | 0.21 | 0.10 |
| 9 | 226° | | 0.50 | 0.15 | 0 |
| 10 | 275° | | 0.50 | 0.20 | 0.03 |
| 11 | 327° | | 0.80 | 0.25 | 0.03 |

Comments/Notes:

4. Appears to have been repaired prefire.

Table A-15
RSRM-2A Center Field Joint Insulation Evaluation

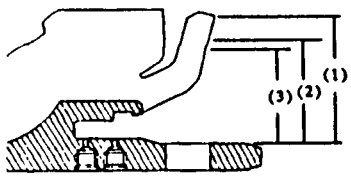
| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 6:30 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Field Joint: [ ] Forward [X] Center [ ] Aft

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Areas of Non-Contact? | | yes | X | no | |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | | yes | X | no | |
| 4. Tang Heat Affected Material? | X | yes | | no | 1 |
| 5. Foreign Material? | | yes | X | no | |
| 6. Clevis Edge Separations? | X | yes | | no | 2 |

Tang End Measurements




| | Degree Location | Depth (1) | Depth (2) | Depth (3) | Bondline Contact ** |
|---|---|---|---|---|---|
| | 0° | 3.20 | 3.10 | 2.85 | 1.10 |
| | 90° | No char | 3.15 | 2.75 | 1.15 |
| | 180° | 3.30 | 3.15 | 2.80 | 1.30 |
| | 270° | 3.30 | 3.10 | 2.85 | 1.10 |
| Max | 118° | | | | 1.50 |
| Min | | | | | |

Note:
The following measurements are taken from the inner diameter of the tang leg (TANG):
Depth (1) - to the tip of the remaining material
Depth (2) - to the outboard edge of the char layer
Depth (3) - to the outboard edge of the heat affected material*,
(i.e. a measurement of the virgin material remaining).
* Location based on the tan discoloration of the adhesive.
** Measurement taken from the outboard edge of the char layer to the outboard extent of contact.

Notes/Comments:

1. Normal tang heat effect and erosion as shown in the measurements above.

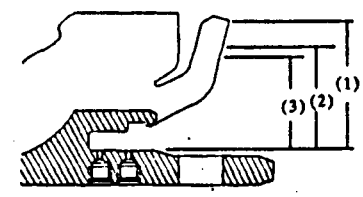
2. Only edge separations > 0.10 depth were documented (See attached sheet).

3. Ozone cracks in clevis insulation were noted mainly in the radius region from 220° - 270° - 300°. These cracks were documented on prefire DR's, and postfire results indicate they did not open up, and they did not affect joint perfromance.

Table A-15 (Cont'd)
RSRM-2A Center Field Joint Insulation Evaluation

Clearfield Final
Tang End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.906 | 2.858 | 180 | | 2.863 | 2.503 |
| 10 | | 2.870 | 2.735 | 190 | | 2.868 | 2.558 |
| 20 | | 2.910 | 2.885 | 200 | | 2.895 | 2.647 |
| 30 | | 2.932 | 2.862 | 210 | | 2.909 | 2.848 |
| 40 | | 2.922 | 2.808 | 220 | | 2.868 | 2.736 |
| 50 | | 2.902 | 2.836 | 230 | | 2.835 | 2.729 |
| 60 | | 2.950 | 2.836 | 242 | | 2.935 | 2.878 |
| 70 | | 2.958 | 2.740 | 250 | | 2.931 | 2.858 |
| 80 | | 2.928 | 2.624 | 260 | | 2.958 | 2.811 |
| 90 | | 2.916 | 2.310 | 270 | | 2.943 | 2.818 |
| 100 | | 2.849 | 2.759 | 280 | | 2.914 | 2.792 |
| 110 | | 2.814 | 2.603 | 290 | | 2.935 | 2.398 |
| 120 | | 2.882 | 2.724 | 300 | | 2.946 | 2.750 |
| 130 | | 2.879 | 2.671 | 310 | | 2.890 | 2.710 |
| 140 | | 2.898 | 2.589 | 320 | | 2.923 | 2.905 |
| 150 | | 2.852 | 2.606 | 330 | | 2.912 | 2.718 |
| 160 | | 2.840 | 2.577 | 340 | | 2.892 | 2.633 |
| 170 | | 2.844 | 2.794 | 350 | | 2.891 | 2.732 |



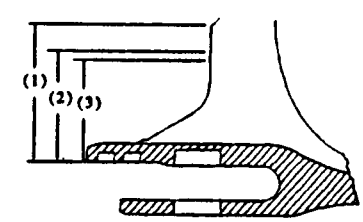

* No char remained after rinse.

Clevis end measurements were not taken at KSC. The measurement method is inaccurate and the clevis side insulation performance mirrored the performance of the tang side. Clevis measurements were taken at Clearfield H-7 and are shown below.

Measurements:
(1)* Remaining char was rinsed out. Measurement was not taken.
(2) To the outboard edge of the char layer.
(3) To the outboard edge of the heat affected material (i.e. measurement of the virgin material remaining.

Clearfield Final
Clevis End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 3.004 | 2.896 | 180 | | 2.970 | 2.825 |
| 10 | | 2.962 | 2.853 | 190 | | 2.963 | 2.838 |
| 20 | | 2.952 | 2.856 | 200 | | 2.978 | 2.826 |
| 30 | | 2.901 | 2.778 | 210 | | 2.948 | 2.820 |
| 40 | | 2.941 | 2.715 | 220 | | 2.938 | 2.792 |
| 50 | | 2.996 | 2.715 | 230 | | 2.955 | 2.846 |
| 60 | | 2.973 | 2.832 | 242 | | 3.024 | 2.902 |
| 70 | | 2.970 | 2.828 | 250 | | 2.970 | 2.866 |
| 80 | | 2.961 | 2.735 | 260 | | 2.975 | 2.902 |
| 90 | | 3.017 | 2.672 | 270 | | 2.990 | 2.895 |
| 100 | | 3.042 | 2.708 | 280 | | 2.962 | 2.840 |
| 110 | | 3.000 | 2.665 | 290 | | 2.979 | 2.859 |
| 120 | | 3.072 | 2.730 | 300 | | 2.966 | 2.851 |
| 130 | | 2.968 | 2.834 | 310 | | 2.941 | 2.818 |
| 140 | | 2.952 | 2.810 | 320 | | 2.933 | 2.847 |
| 150 | | 2.968 | 2.862 | 330 | | 2.930 | 2.834 |
| 160 | | 2.968 | 2.880 | 340 | | 2.930 | 2.862 |
| 170 | | 2.989 | 2.881 | 350 | | 2.925 | 2.840 |




* No char remained after rinse

Table A-15 (Cont'd)
RSRM-2A Center Field Joint Insulation Evaluation

| | | |
|---|---|---|
| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 6:30 p.m. |
| Inspector(s): Scott Manz, Steve Hicken | Corresponding Comment Number 2 | |
| Field Joint Clevis: [ ] Forward | [X] Center | [X] Aft |
| Joint: [ ] Igniter to Case | [ ] Nozzle to Case | |

| Edge Separation | Center Degree Location | | Circumferential Width (in.) | Maximum Depth (in.) | Axial Growth From Prefire Unrepaired Condition |
|---|---|---|---|---|---|
| 1 | 80° | | 1.00 | 0.22 | 0.14 |
| 2 | 88° | | 1.00 | 0.26 | 0.26 |
| 3 | 100° | | 3.00 | 0.20 | 0.10 |
| 4 | 116° | | 2.00 | 0.26 | 0.26 |
| 5 | 144° | | 1.25 | 0.21 | 0.21 |
| 6 | 148° | | 2.00 | 0.26 | 0.26 |
| 7 | 161° | | 0.50 | 0.21 | 0.21 |
| 8 | 178° | | 0.70 | 0.24 | 0.24 |
| 9 | 222° | | 0.40 | 0.13 | 0.13 |
| 10 | 240° | | 0.30 | 0.14 | 0.14 |
| 11 | 246° | | 0.50 | 0.14 | 0.05 |
| 12 | 277° | | 1.00 | 0.22 | 0.11 |
| 13 | 279° | | 1.60 | 0.20 | 0.10 |
| 14 | 280° | | 0.60 | 0.23 | 0.13 |
| 15 | 358° | | 1.20 | 0.20 | 0.15 |

Table A-16
RSRM-2A Forward Field Joint Insulation Evaluation

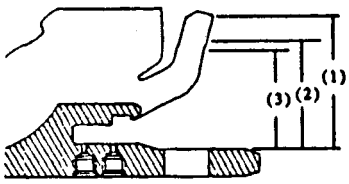
| Motor No.: RSRM-2A | Date: 12 December 1988 | Time: 10:00 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken

Field Joint: [X] Forward [ ] Center [ ] Aft

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Areas of Non-Contact? | | yes | X | no | |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | | yes | X | no | |
| 4. Tang Heat Affected Material? | X | yes | | no | 1 |
| 5. Foreign Material? | X | yes | | no | 2 |
| 6. Clevis Edge Separations? | X | yes | | no | 3 |

Tang End Measurements




| | Degree Location | Depth (1) | Depth (2) | Depth (3) | Bondline Contact ** |
|---|---|---|---|---|---|
| | 0° | No Char | 3.15 | 2.80 | 1.15 |
| | 90° | 3.30 | 3.15 | 2.85 | 1.25 |
| | 180° | 3.25 | 3.15 | 2.95 | 1.20 |
| | 270° | No Char | 3.15 | 2.75 | 1.10 |
| Max | | | | | |
| Min | | | | | |

Note:
The following measurements are taken from the inner diameter of the tang leg (TANG):
Depth (1) - to the tip of the remaining material
Depth (2) - to the outboard edge of the char layer
Depth (3) - to the outboard edge of the heat affected material*,
(i.e. a measurement of the virgin material remaining).
* Location based on the tan discoloration of the adhesive.
** Measurement taken from the outboard edge of the char layer to the outboard extent of contact.

Notes/Comments:

1. Slightly more heat effect on tang than seen on static test forward joints.

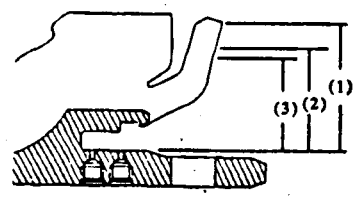
2. White substance that appears to be tape residue is evident intermittently on tang and clevis insulation ramp areas. More residue than on RSRM-2B forward joint.

3. Only edge separations > 0.10 in. depth were documented.

Table A-16 (Cont'd)
RSRM-2A Forward Field Joint Insulation Evaluation

Clearfield Final
Tang End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.914 | 2.443 | 180 | | 2.984 | 2.668 |
| 10 | | 2.954 | 2.622 | 190 | | 2.989 | 2.595 |
| 20 | | 2.989 | 2.605 | 200 | | 2.996 | 2.615 |
| 30 | | 2.992 | 2.603 | 210 | | 2.981 | 2.414 |
| 40 | | 2.975 | 2.649 | 220 | | 2.961 | 2.579 |
| 50 | | 3.011 | 2.718 | 230 | | 2.977 | 2.666 |
| 60 | | 3.017 | 2.672 | 242 | | 2.964 | 2.702 |
| 70 | | 3.013 | 2.693 | 250 | | 2.978 | 2.713 |
| 80 | | 2.989 | 2.709 | 260 | | 2.969 | 2.706 |
| 90 | | 2.988 | 2.338 | 270 | | 2.959 | 2.768 |
| 100 | | 2.940 | 2.645 | 280 | | 2.989 | 2.722 |
| 110 | | 2.995 | 2.403 | 290 | | 2.993 | 2.718 |
| 120 | | 2.952 | 2.595 | 300 | | 3.002 | 2.651 |
| 130 | | 2.943 | 2.691 | 310 | | 2.973 | 2.704 |
| 140 | | 2.971 | 2.680 | 320 | | 2.972 | 2.675 |
| 150 | | 2.969 | 2.661 | 330 | | 2.990 | 2.658 |
| 160 | | 2.982 | 2.685 | 340 | | 2.932 | 2.565 |
| 170 | | 2.981 | 2.692 | 350 | | 2.929 | 2.485 |



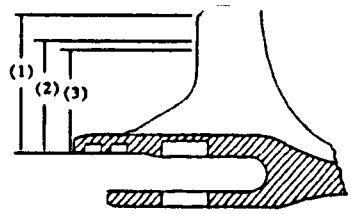

* No char remained after rinse.

Clevis end measurements were not taken at KSC. The measurement method is inaccurate and the clevis side insulation performance mirrored the performance of the tang side. Clevis measurements were taken at Clearfield H-7 and are shown below.

Measurements:
(1)* Remaining char was rinsed out. Measurement was not taken.
(2) To the outboard edge of the char layer.
(3) To the outboard edge of the heat affected material (i.e. measurement of the virgin material remaining.

Clearfield Final
Clevis End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 3.042 | 2.935 | 180 | | 3.042 | 2.908 |
| 10 | | 3.060 | 2.979 | 190 | | 3.020 | 2.968 |
| 20 | | 3.078 | 2.959 | 200 | | 3.042 | 2.951 |
| 30 | | 3.001 | 2.915 | 210 | | 3.041 | 2.968 |
| 40 | | 3.007 | 2.912 | 220 | | 3.014 | 2.956 |
| 50 | | 3.075 | 2.938 | 230 | | 3.061 | 2.098 |
| 60 | | 3.023 | 2.954 | 242 | | 3.025 | 2.980 |
| 70 | | 3.008 | 2.942 | 250 | | 3.050 | 2.927 |
| 80 | | 3.019 | 2.949 | 260 | | 3.021 | 2.971 |
| 90 | | 2.998 | 2.888 | 270 | | 3.044 | 2.908 |
| 100 | | 3.032 | 2.851 | 280 | | 3.070 | 3.055 |
| 110 | | 3.058 | 2.820 | 290 | | 3.030 | 2.951 |
| 120 | | 3.066 | 2.901 | 300 | | 3.062 | 3.032 |
| 130 | | 3.056 | 2.896 | 310 | | 3.011 | 2.924 |
| 140 | | 3.026 | 2.972 | 320 | | 3.012 | 2.958 |
| 150 | | 3.089 | 3.072 | 330 | | 2.993 | 2.911 |
| 160 | | 3.056 | 2.927 | 340 | | 3.009 | 2.985 |
| 170 | | 3.082 | 2.992 | 350 | | 3.001 | 2.900 |




* No char remained after rinse

Table A-16 (Cont'd)
RSRM-2A Forward Field Joint Insulation Evaluation

| | | |
|---|---|---|
| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 10:15 a.m. |
| Inspector(s): Scott Manz, Steve Hicken | Corresponding Comment Number 3 | |
| Field Joint Clevis: [X] Forward | [ ] Center | [ ] Aft |
| Joint: [ ] Igniter to Case | [ ] Nozzle to Case | |

| Edge Separation | Center Degree Location | | Circumferential Width (in.) | Maximum Depth (in.) | Axial Growth From Prefire Unrepaired Condition |
|---|---|---|---|---|---|
| 1 | 195° | | 0.60 | 0.21 | 0.13 |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |

Table A-17
RSRM-2A Aft Segment Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 12 December 1988 | Time: 3:00 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| **Insulated Cylinder Region** | | | | | |
| A. Blisters Visible? | ____ | yes | X | no | ____ |
| B. Discolorations or Repairs Visible? | ____ | yes | X | no | ____ |
| C. Separations or Delaminations? | ____ | yes | X | no | ____ |
| D. Excessive Erosion at Factory Joints? | ____ | yes | X | no | ____ |
| E. Tears, Gouges, Cuts? | ____ | yes | X | no | ____ |
| F. Liner present? | ____ | yes | X | no | ____ |
| **Aft Dome Region** | | | | | |
| A. Abnormal CF/EPDM Erosion? | ____ | yes | X | no | ____ |
| B. NBR Under CF/EPDM Exposed? | ____ | yes | X | no | 1 |

otes/Comments:

1. A slight ridge of exposed NBR at a ply overlap was evident at 130° at the forward end of the aft dome, but this was NBR that was layed up on top of the CF/EPDM when the barrel and dome were assembled; it was not NBR under the CF/EPDM.

Table A-18
RSRM-2A Aft Segment NBR Inhibitor Tear Evaluation

| | | |
|---|---|---|
| **Motor No.:** RSRM-2A | **Date:** 11 December 1988 | **Time:** 5:00 p.m. |
| **Side:** [X] **Left (A)** | [ ] **Right (B)** | |
| **Inspector(s):** Scott Manz, Steve Hicken | | |
| **Segment:** [ ] **Forward Center (852)** | [ ] **Aft Center (1172)** | [X] **Aft (1492)** / **Component: Insulation** |

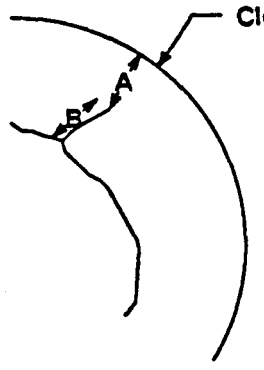
**NBR Inhibitor Description** — **Comment Number**

**A. Number of radial tears greater than 3 in. long (TEARS)?** 0

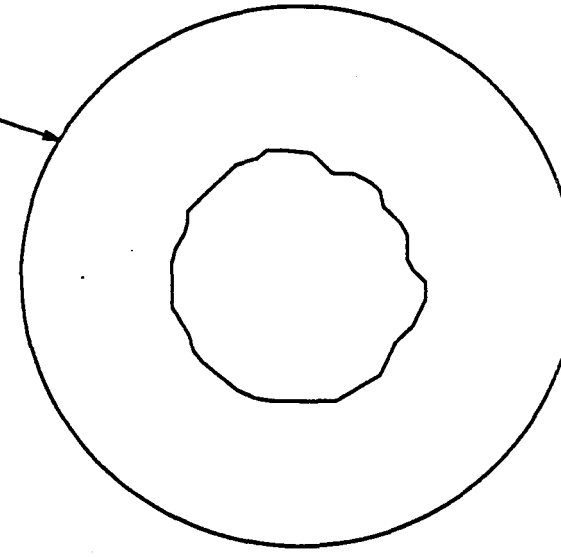
**B. Tears exhibiting charring or erosion (INSER)?** ____ **yes** X **no** ____

**C. Circumferential tears (TEARS)?** ____ **yes** X **no** ____

**Measurement Definitions**




**Sketch Tears Here**



**Inhibitor Tears > 3 in. Long**

**Measurements "A & B" taken as shown above.**

| Degree Location | Meas. "A" | Meas. "B" | Comments (Charring, etc.) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Notes / Comments**

**Comment sheet(s) attached?** ____ **yes** X **no**

Table A-19
RSRM-2A Aft Segment NBR Inhibitor Height Evaluation

| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 4:25 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken

Segment: [ ] Forward Center [ ] Aft Center [X] Aft

NBR Inhibitor Description

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Delaminations or Separations? | ____ | yes | X | no | ____ |
| B. Unusual Erosion (Other than Tears)? | ____ | yes | X | no | ____ |

NBR Inhibitor Measurements

Radial measurements from the I.D. of the inner clevis leg.

| Degree Location | Radial Distance | Degree Location | Radial Distance |
|---|---|---|---|
| 0° | 5.0 in. | 180° | 6.75 in. |
| 30° | 4.75 in. | 210° | 5.5 in. |
| 60° | 6.0 in. | 240° | 4.25 in. |
| 90° | 7.5 in. | 270° | 3.5 in. |
| 120° | 7.0 in. | 300° | 6.5 in. |
| 150° | 4.25 in. | 330° | 4.5 in. |

Max. inhibitor height = 8.0 in. at 40°
Min. inhibitor height = 4.25 in. at 150°

tes/Comments:

Table A-20
RSRM-2A Aft Center Segment Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 12 December 1988 | Time: 2:30 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| Insulated Cylinder Region | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | |
| E. Tears, Gouges, Cuts? | | yes | X | no | |
| F. Liner present? | X | yes | | no | |

otes/Comments:

Table A-21
RSRM-2A Aft Center Segment NBR Inhibitor Tear Evaluation

| | | |
|---|---|---|
| **Motor No.:** RSRM-2A | **Date:** 11 December 1988 | **Time:** 6:45 p.m. |
| **Side:** | [X] **Left (A)** | [ ] **Right (B)** |
| **Inspector(s):** Scott Manz, Steve Hicken, Cary Ralston | | |
| **Segment:** [ ] **Forward Center (852)** | [X] **Aft Center (1172)** | [ ] **Aft (1492)** / **Component: Insulation** |

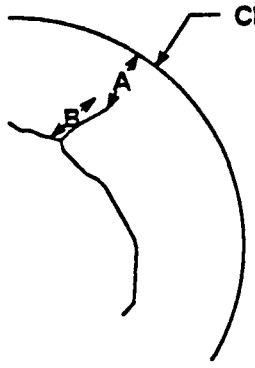
**NBR Inhibitor Description** — **Comment Number**

**A. Number of radial tears greater than 3 in. long (TEARS)?** 3

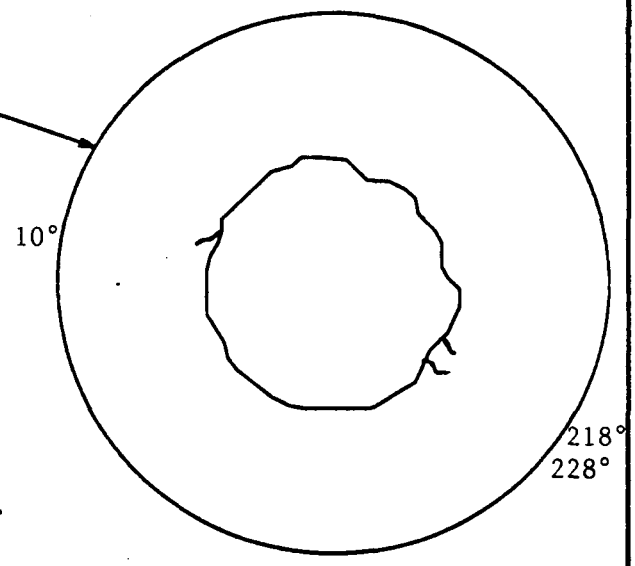
**B. Tears exhibiting charring or erosion (INSER)?** ____ **yes** X **no** ____

**C. Circumferential tears (TEARS)?** ____ **yes** X **no** ____

**Measurement Definitions**




**Sketch Tears Here**




**Inhibitor Tears > 3 in. Long**

**Measurements "A & B" taken as shown above.**

| Degree Location | Meas. "A" | Meas. "B" | Comments (Charring, etc.) |
|---|---|---|---|
| 218° | 11.75 in. | 3.5 in. | |
| 228° | 11.0 in. | 4.0 in. | |
| 10° | 9.5 in. | 3.5 in. | |
| | | | |
| | | | |
| | | | |
| | | | |

**Notes / Comments**

**Comment sheet(s) attached?** ____ **yes** X **no**

Table A-22
RSRM-2A Aft Center Segment NBR Inhibitor Height Evaluation

| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 6:30 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Segment: [ ] Forward Center [X] Aft Center [ ] Aft

NBR Inhibitor Description

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Delaminations or Separations? | ____ | yes | X | no | ____ |
| B. Unusual Erosion (Other than Tears)? | ____ | yes | X | no | ____ |

NBR Inhibitor Measurements

Radial measurements from the I.D. of the inner clevis leg.

| Degree Location | Radial Distance | Degree Location | Radial Distance |
|---|---|---|---|
| 0° | 12.5 in. | 180° | 14.5 in. |
| 30° | 12.0 in. | 210° | 14.75 in. |
| 60° | 13.0 in. | 240° | 14.5 in. |
| 90° | 15.0 in. | 270° | 12.5 in. |
| 120° | 15.5 in. | 300° | 13.0 in. |
| 150° | 14.5 in. | 330° | 13.0 in. |

Max. inhibitor height = 15.5 in. at 120°
Min. inhibitor height = 12.0 in. at 30°

otes/Comments:

Table A-23
RSRM-2A Aft Center Segment Stress Relief Flap Evaluation

| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 5:30 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken

Segment: [ ] Forward [ ] Forward Center [X] Aft Center

Flap Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Gouges, Cuts, Tears? | | yes | X | no | |
| B. Pocketing? | | yes | X | no | |
| C. Missing Material? | X | yes | | no | 1 |
| D. Heat Affected CF/EPDM or NBR? | X | yes | | no | 2 |
| E. Eroded CF/EPDM or NBR? | X | yes | | no | 2 |
| F. Bulb Separations, Voids, Delaminations? | | yes | X | no | |

Flap Measurements
Measurements from the tip of the tang to the aft edge of the flap.

| Degree Location | Axial Distance |
|---|---|
| 0° | 15 in. |
| 90° | 15 in. |
| 180° | 15 in. |
| 270° | 15 in. |

Tear Measurements
Measurement "A" taken from the J-leg tip to the aft edge of the flap.
Measurement "B" taken from the aft edge of the flap to the forward edge of the tear.

| Degree Location | Measurement "A" | Measurement "B" | Comments (Charring, etc.) |
|---|---|---|---|
| No Flap | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

otes/Comments

1. Flap is eroded to bulb (completely missing) full circumference.

2. CF/EPDM is eroded away most of the circumference. There is some CF/EPDM from approx. 220° - 240°, but it is severely heat affected. The NBR exposed under the flap is heat affected and slightly eroded.

Table A-24
RSRM-2A Forward Center Segment Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 12 December 1988 | Time: 2:45 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| Insulated Cylinder Region | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | |
| E. Tears, Gouges, Cuts? | | yes | X | no | |
| F. Liner present? | X | yes | | no | |

otes/Comments:

Table A-25
RSRM-2A Forward Center Segment NBR Inhibitor Tear Evaluation

| | | |
|---|---|---|
| **Motor No.:** RSRM-2A | **Date:** 12 December 1988 | **Time:** 10:15 a.m. |
| **Side:** | ☒ **Left (A)** | ☐ **Right (B)** |
| **Inspector(s):** Scott Manz, Steve Hicken | | |
| **Segment:** ☒ **Forward Center (852)** | ☐ **Aft Center (1172)** | ☐ **Aft (1492)** / **Component: Insulation** |

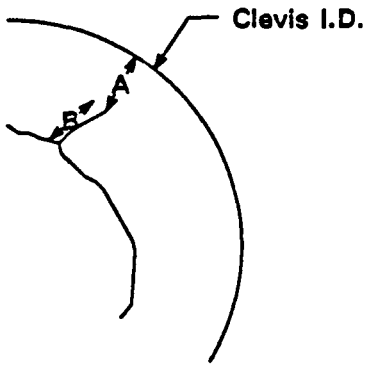
**NBR Inhibitor Description** — **Comment Number**

**A. Number of radial tears greater than 3 in. long (TEARS)?** 8

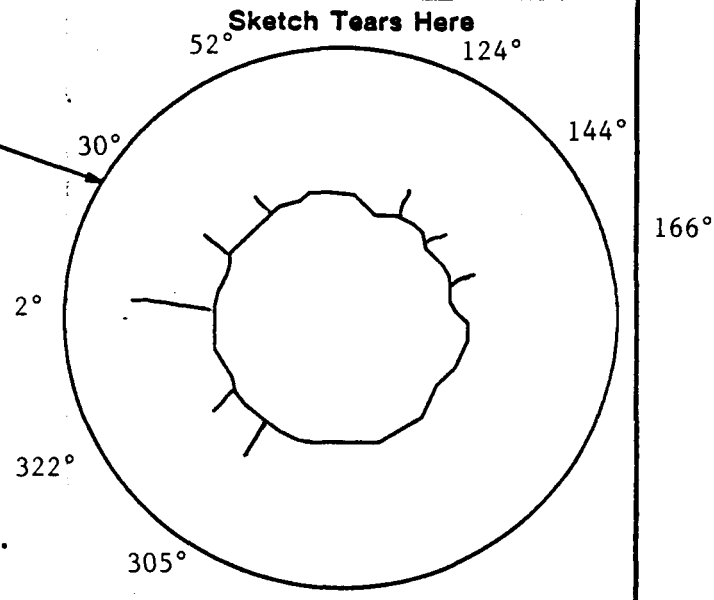
**B. Tears exhibiting charring or erosion (INSER)?** ____ **yes** X **no** ____

**C. Circumferential tears (TEARS)?** ____ **yes** X **no** ____

**Measurement Definitions**




**Sketch Tears Here**




**Inhibitor Tears > 3 in. Long**

**Measurements "A & B" taken as shown above.**

| Degree Location | Meas. "A" | Meas. "B" | Comments (Charring, etc.) |
|---|---|---|---|
| 305° | 15.0 in. | 8.0 in. | |
| 322° | 18.0 in. | 6.0 in. | |
| 2° | 9.5 in. | 14.0 in. | |
| 166° | 18.25 in. | 5.0 in. | |
| 144° | 19.5 in. | 3.5 in. | |
| 124° | 19.5 in. | 4.0 in. | |
| 52° | 20.5 in. | 5.0 in. | |
| 30° | 18.0 in. | 6.25 in. | |

Notes / Comments

**Comment sheet(s) attached?** ____ **yes** X **no**

Table A-26
RSRM-2A Forward Center Segment NBR Inhibitor Height Evaluation

| Motor No.: RSRM-2A | Date: 12 December 1988 | Time: 10:15 a.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |
| Segment: [X] Forward Center | [ ] Aft Center | [ ] Aft |

NBR Inhibitor Description

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Delaminations or Separations? | ____ | yes | X | no | ____ |
| B. Unusual Erosion (Other than Tears)? | ____ | yes | X | no | ____ |

NBR Inhibitor Measurements

Radial measurements from the I.D. of the inner clevis leg.

| Degree Location | Radial Distance | Degree Location | Radial Distance |
|---|---|---|---|
| 0° | 26.5 in. | 180° | 23.25 in. |
| 30° | 24.0 in. | 210° | 22.75 in. |
| 60° | 27.0 in. | 240° | 24.25 in. |
| 90° | 28.0 in. | 270° | 23.5 in. |
| 120° | 24.25 in. | 300° | 25.0 in. |
| 150° | 25.5 in. | 330° | 25.0 in. |

Max. inhibitor height = 28.75 in. at 88°
Min. inhibitor height = 22.75 in. at 210°

otes/Comments:

Table A-27
RSRM-2A Forward Center Segment Stress Relief Flap Evaluation

| Motor No.: RSRM-2A | Date: 11 December 1988 | Time: 6:40 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken, Cary Ralston | | |
| Segment: [ ] Forward [X] Forward Center [ ] Aft Center | | Component: Insulation |

Flap Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Gouges, Cuts, Tears? | | yes | X | no | |
| B. Pocketing? | | yes | X | no | |
| C. Missing Material? | X | yes | | no | 1 |
| D. Heat Affected CF/EPDM or NBR? | X | yes | | no | 2 |
| E. Eroded CF/EPDM or NBR? | X | yes | | no | 2 |
| F. Bulb Separations, Voids, Delaminations? | | yes | X | no | |

Flap Measurements
Measurements from the tip of the tang to the aft edge of the flap.

| Degree Location | Axial Distance |
|---|---|
| 0° | 9.5 in. |
| 90° | 11.0 in. |
| 180° | 10.0 in. |
| 270° | 9.5 in. |

Min. Flap = 12.5 in. missing at 130°
Max. Flap = 6.5 in. missing at 198°

Tear Measurements
Measurement "A" taken from the J-leg tip to the aft edge of the flap.
Measurement "B" taken from the aft edge of the flap to the forward edge of the tear.

| Degree Location | Measurement "A" | Measurement "B" | Comments (Charring, etc.) |
|---|---|---|---|
| No Tears | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

tes/Comments:

1. Approximately 2/3 of the flap length is eroded away, as shown in the measurements above.

2. CF/EPDM extends to the pressurization gap full circumference, heat affected, and charred and slightly eroded.

Table A-28
RSRM-2A Forward Segment Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 13 December 1988 | Time: 10:30 a.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| **Insulated Cylinder Region** | | | | | |
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | |
| E. Tears, Gouges, Cuts? | | yes | X | no | |
| F. Liner present? | X | yes | | no | 1 |
| **Forward Dome Region** | | | | | |
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separtions or Delaminations? | | yes | X | no | |
| D. Tears, Gouges, Cuts? | | yes | X | no | 2 |

otes/Comments:

1. Liner extends to flap bulb, charred liner aft of flap bulb but the region where the flap is most heat affected (45°) liner extends to end of flap. Flap is scalloped and heat affected quite severely from 315° - 0° - 260°, most severe erosion and heat affect 330° - 0° - 120°.

2. No significant debris damage in forward dome to correspond with debris damage or igniter at 90°.

3. No castable inhibitor was remaining.

Table A-29
RSRM-2A Forward Segment Stress Relief Flap Evaluation

| Motor No.: RSRM-2A | Date: 12 December 1988 | Time: 10:00 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken

Segment: [X] Forward [ ] Forward Center [ ] Aft Center

Flap Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Gouges, Cuts, Tears? | | yes | X | no | |
| B. Pocketing? | | yes | X | no | |
| C. Missing Material? | X | yes | | no | 1 |
| D. Heat Affected CF/EPDM or NBR? | X | yes | | no | 1 |
| E. Eroded CF/EPDM or NBR? | X | yes | | no | 1 |
| F. Bulb Separations, Voids, Delaminations? | | yes | X | no | |

Flap Measurements
Measurements from the tip of the tang to the aft edge of the flap.

| Degree Location | Axial Distance | |
|---|---|---|
| 0° | 8.25 in. | Min. Flap 1° - 7°, 11.0 in. missing |
| 90° | 7.5 in. | |
| 180° | 2.5 in. | Full flap remaining, sticking up slightly |
| 270° | 2.5 in. | Full flap length remaining, sticking up slightly |

Tear Measurements
Measurement "A" taken from the J-leg tip to the aft edge of the flap.
Measurement "B" taken from the aft edge of the flap to the forward edge of the tear.

| Degree Location | Measurement "A" | Measurement "B" | Comments (Charring, etc.) |
|---|---|---|---|
| No Tears | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

tes/Comments:

1. Flap is severely heat affected, scalloped, and more eroded 328° - 0° - 120°. Eroded in wavy pattern in this region: ⋀⋀⋀⋀⋀ NBR under flap is also very heat affected full circumference. Flap slightly scalloped from 120° - 180° - 254°. Max. flap erosion 1° - 7°. Patches of char under the flap have fallen off from 0° - 90° - 100°, exposing lighter colored NBR. This is a normal Evaluation that has been seen in static test motors.

Table A-30
RSRM-2A Aft Dome Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 25 January 1989 | Time: 2200 |
|---|---|---|
| Inspector(s): Scott Manz, Mike Walsh | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | ____ | yes | X | no | ____ |
| 2. Soot? | ____ | yes | X | no | ____ |
| 3. Heat Affected Material? | | | | | |
| A. Tang | ____ | yes | X | no | ____ |
| B. Clevis | ____ | yes | X | no | ____ |
| 4. Foreign Material? | ____ | yes | X | no | ____ |
| 5. Ply Separations? | ____ | yes | X | no | ____ |
| 6. Unbonds? | ____ | yes | X | no | ____ |
| 7. Teflon Tape Condition (Tang) | X | yes | ____ | no | 1 |

tes/Comments:

1. Teflon tape in place and in good condition on tang full circumference.

2. Intermittent insulation flashing and Chemlok 233 on tip of inner clevis leg.

3. Heavy corrosion under hatband from 180° - 0° - 90°. Mild corrosion 90° - 130°.

Table A-31
RSRM-2A Aft Segment Stiffener to Stiffener Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 26 January 1989 | Time: 0500 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | | yes | X | no | |
| 6. Unbonds? | X | yes | | no | 1 |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | |

otes/Comments:

1. Possible unbonds - bare metal with Chemlok 233 on edges - may be from disassembly

   88° - tang 3 in. circ., 2 in. axial from teflon tape; clevis 1 in. circ, 1.5 in. axial from tip
   214° - tang 3 in. circ., 3 in. axial from teflon tape; clevis 2 in. circ., 3 in. axial from clevis tip

2. Intermittent insulation flashing on inner clevis leg. No Chemlok, very clean.

3. No problems on external insulation. Very little corrosion under hatband.

Table A-32
RSRM-2A Aft Segment ET Attach to Stiffener Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 26 January 1989 | Time: 1030 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | ___ | yes | X | no | ___ |
| 2. Soot? | ___ | yes | X | no | ___ |
| 3. Heat Affected Material? | | | | | |
| A. Tang | ___ | yes | X | no | ___ |
| B. Clevis | ___ | yes | X | no | ___ |
| 4. Foreign Material? | ___ | yes | X | no | ___ |
| 5. Ply Separations? | ___ | yes | X | no | ___ |
| 6. Unbonds? | ___ | yes | X | no | 1 |
| 7. Teflon Tape Condition (Tang) | X | yes | ___ | no | ___ |

otes/Comments:

1. Possible unbond on tang - bare metal with Chemlok 233 - probably from disassembly 158° - 3 in. circ., 1 in. axial, 1 in. forward of Teflon tape

2. Heavy flashing on tip of inner clevis leg 102° - 168°, intermittent flashing 264° - 278° and 316° - 333°. No Chemlok on tip, very clean.

3. No problems on external insulation. Only a few small spots (0.25 in. diam.) of rust under hatband intermittently.

Table A-33
RSRM-2A Aft Center Segment Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 14 March 1989 | Time: 1500 |
|---|---|---|
| Inspector(s): Alex Saunders | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | ___ | yes | X | no | ___ |
| 2. Soot? | ___ | yes | X | no | ___ |
| 3. Heat Affected Material? | | | | | |
| A. Tang | ___ | yes | X | no | ___ |
| B. Clevis | ___ | yes | X | no | ___ |
| 4. Foreign Material? | ___ | yes | X | no | ___ |
| 5. Ply Separations? | ___ | yes | X | no | ___ |
| 6. Unbonds? | ___ | yes | X | no | ___ |
| 7. Teflon Tape Condition (Tang) | X | yes | ___ | no | 1 |

tes/Comments:

1. Tape torn at: 4°, 7°, 10°, 12°, 19°, 23°, 62°, 90°, 139°, 168°, 172°, 227°, 240°, 256°, 308°, 331°, 352°.

Table A-34
RSRM-2A Forward Center Segment Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 12 April 1989 | Time: 2200 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | X | yes | | no | 1 |
| 5. Ply Separations? | | yes | X | no | |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | 2 |

›tes/Comments:

1. Piece of chalk on tang at 82°. Lockwashers on tang at 72° and 148°. Occurred after joint insulation was cut - not a prefire condition.

2. Teflon tape frayed from disassembly, but still in place.

3. Intermittent insulation flashing on inner clevis leg.

Table A-35
RSRM-2A Forward Segment Cylinder to Cylinder Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 4 April 1989 | Time: 0700 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | | yes | X | no | |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | |

tes/Comments:

Table A-36
RSRM-2A Forward Dome Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2A | Date: 4 April 1989 | Time: 0200 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | ____ | yes | X | no | ____ |
| 2. Soot? | ____ | yes | X | no | ____ |
| 3. Heat Affected Material? | | | | | |
| A. Tang | ____ | yes | X | no | ____ |
| B. Clevis | ____ | yes | X | no | ____ |
| 4. Foreign Material? | ____ | yes | X | no | ____ |
| 5. Ply Separations? | ____ | yes | X | no | ____ |
| 6. Unbonds? | ____ | yes | X | no | ____ |
| 7. Teflon Tape Condition (Tang) | X | yes | ____ | no | ____ |

otes/Comments:

| NEG NUMBER | PHOTO CODE | SEGMENT | JOINT | SEGMENT END | DEG LOC | COMMENT |
|---|---|---|---|---|---|---|
| FXD HOUSING | | | | | | |
| 107494-01 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 212 | NOZZLE TO CASE JOINT @ 212 DEG FIXED HOUSING CUT IN WIPER O-RING |
| 107494-02 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 212 | NOZZLE TO CASE JOINT @ 212 DEG CUT IN WIPER O-RING (CLOSE-UP) |
| 107501-01 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 0 | NOZZLE OVERALL EXTERIOR 0 DEG |
| 107501-02 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 90 | NOZZLE OVERALL EXTERIOR 90 DEG |
| 107501-03 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 180 | NOZZLE OVERALL EXTERIOR 180 DEG |
| 107501-05 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 270 | NOZZLE OVERALL EXTERIOR 270 DEG |
| AFT SEG | | | | | | |
| 107496-08 | 33 | AFT SEG | NOZZLE/CASE JNT | | 240-0 | NOZZLE BOSS |
| 107496-07 | 32 | AFT SEG | NOZZLE/CASE JNT | | 120-240 | NOZZLE BOSS |
| 107496-06 | 31 | AFT SEG | NOZZLE/CASE JNT | | 0-120 | NOZZLE BOSS |
| 107482-01 | 26 | AFT SEG | UNKNOWN | | 360 | AFT DOME REGION |
| 107482-09 | 25 | AFT SEG | AFT FIELD JNT | CLEVIS | 240-0 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107482-08 | 24 | AFT SEG | AFT FIELD JNT | CLEVIS | 120-240 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107482-07 | 23 | AFT SEG | AFT FIELD JNT | CLEVIS | 0-120 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107482-06 | 22 | AFT SEG | AFT FIELD JNT | CLEVIS | 360 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 107496-05 | 00 | AFT SEG | NOZZLE/CASE JNT | | 360 | NOZZLE BOSS OVERALL |
| 108483-01 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 108483-02 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 120-0 | TANG AND CLEVIS INSULATION |
| 108483-03 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 0-240 | TANG AND CLEVIS INSULATION |
| 108484-01 | 00 | AFT SEG | STIFF/STIFF FACT JNT | BOTH | 0-240 | TANG AND CLEVIS INSULATION |
| 108484-02 | 00 | AFT SEG | STIFF/STIFF FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 108484-03 | 00 | AFT SEG | STIFF/STIFF FACT JNT | BOTH | 120-0 | TANG AND CLEVIS INSULATION |
| 108485-01 | 00 | AFT SEG | ET ATTACH/STIFF FACT JNT | BOTH | 0-120 | TANG AND CLEVIS INSULATION |
| 108485-02 | 00 | AFT SEG | ET ATTACH/STIFF FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 108485-03 | 00 | AFT SEG | ET ATTACH/STIFF FACT JNT | BOTH | 240-0 | TANG AND CLEVIS INSULATION |
| 107472-06 | 00 | AFT SEG | UNKNOWN | | | STIFFENER RING INSULATION SEPARATIONS AFTER HYDROLASING |
| 107472-07 | 00 | AFT SEG | UNKNOWN | | | STIFFENER RING INSULATION SEPARATIONS AFTER HYDROLASING |
| 107472-08 | 00 | AFT SEG | UNKNOWN | | | STIFFENER RING INSULATION SEPARATIONS AFTER HYDROLASING |
| 107472-09 | 00 | AFT SEG | UNKNOWN | | | STIFFENER RING K5NA UNDER INSULATION AFTER HYDROLASING |
| AFT CTR SEG | | | | | | |

| NEG NUMBER | PHOTO CODE | SEGMENT | JOINT | SEGMENT END | DEG LOC | COMMENT |
|---|---|---|---|---|---|---|
| 107482-05 | 21 | AFT CTR SEG | AFT FIELD JNT | TANG | 240-0 | FLAP, CYLINDER REGION, AND TANG |
| 107482-04 | 20 | AFT CTR SEG | AFT FIELD JNT | TANG | 120-240 | FLAP, CYLINDER REGION, AND TANG |
| 107482-03 | 19 | AFT CTR SEG | AFT FIELD JNT | TANG | 0-120 | FLAP, CYLINDER REGION, AND TANG |
| 107482-02 | 18 | AFT CTR SEG | AFT FIELD JNT | TANG | 360 | FLAP, CYLINDER REGION, AND TANG |
| 107483-08 | 17 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 240-0 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 107483-07 | 16 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 120-240 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 107483-06 | 15 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 0-120 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 107483-05 | 14 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 360 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 109544-01 | 00 | AFT CTR SEG | AFT CTR FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 109544-07 | 00 | AFT CTR SEG | AFT CTR FACT JNT | BOTH | 0-120 | TANG AND CLEVIS INSULATION |
| 109544-08 | 00 | AFT CTR SEG | AFT CTR FACT JNT | BOTH | 240-0 | TANG AND CLEVIS INSULATION |
| 109544-02 | 00 | AFT CTR SEG | AFT CTR FACT JNT | CLEVIS | 0 | TYPICAL CLEVIS AT 0 DEG |
| 109544-03 | 00 | AFT CTR SEG | AFT CTR FACT JNT | CLEVIS | 355 | RUST ON LAND BETWEEN JOINT AT 355 DEG |
| 109544-04 | 00 | AFT CTR SEG | AFT CTR FACT JNT | CLEVIS | 0 | RUST ON OUTER CLEVIS LEG |
| 109544-06 | 00 | AFT CTR SEG | AFT CTR FACT JNT | CLEVIS | 208 | RUST IN BOTTOM OF CLEVIS AT 208 DEG |
| 109544-05 | 00 | AFT CTR SEG | AFT CTR FACT JNT | TANG | 354-6 | RUST ON TANG 354-0 DEG |
| 107499-01 | 00 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 250 | CRACKS IN CLEVIS INSULATION RADIUS AREA 250 DEG. |
| 107499-02 | 00 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 250 | CRACKS IN CLEVIS INSULATION RADIUS AREA 250 DEG. |
| FWD CTR SEG | | | | | | |
| 107483-04 | 13 | FWD CTR SEG | CTR FIELD JNT | TANG | 240-0 | FLAP, CYLINDER REGION, AND TANG |
| 107483-03 | 12 | FWD CTR SEG | CTR FIELD JNT | TANG | 120-240 | FLAP, CYLINDER REGION, AND TANG |
| 107483-02 | 11 | FWD CTR SEG | CTR FIELD JNT | TANG | 0-120 | FLAP, CYLINDER REGION, AND TANG |
| 107483-01 | 10 | FWD CTR SEG | CTR FIELD JNT | TANG | 360 | FLAP, CYLINDER REGION, AND TANG |
| 107481-05 | 09 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 240-0 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107481-04 | 08 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 120-240 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107481-03 | 07 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 0-120 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107481-02 | 06 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 360 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 110118-01 | 00 | FWD CTR SEG | FWD CTR FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 110118-02 | 00 | FWD CTR SEG | FWD CTR FACT JNT | BOTH | 0-120 | TANG AND CLEVIS INSULATION |
| 110118-03 | 00 | FWD CTR SEG | FWD CTR FACT JNT | BOTH | 240-0 | TANG AND CLEVIS INSULATION |
| 107459-04 | 00 | FWD CTR SEG | FWD CTR FACT JNT | N/A | 10 | WATER SEEPAGE UNDER WEATHERSEAL AT 10 DEGREES |

Table A-37 (Cont'd)
RSRM-2A Insulation Postfire Photography List

| NEG NUMBER | PHOTO CODE | SEGMENT | JOINT | SEGMENT END | DEG LOC | COMMENT |
|---|---|---|---|---|---|---|
| FWD SEG | | | | | | |
| 107481-09 | 05 | FWD SEG | FWD FIELD JNT | TANG | 240-0 | FLAP, CYLINDER REGION, AND TANG |
| 107481-08 | 04 | FWD SEG | FWD FIELD JNT | TANG | 120-240 | FLAP, CYLINDER REGION, AND TANG |
| 107481-07 | 03 | FWD SEG | FWD FIELD JNT | TANG | 0-120 | FLAP, CYLINDER REGION, AND TANG |
| 107481-06 | 02 | FWD SEG | FWD FIELD JNT | TANG | 360 | INTERNAL INSULATION AND TANG |
| 107481-01 | 01 | FWD SEG | UNKNOWN | FWD DOME | 360 | FORWARD DOME AND CYLINDER REGION |
| 109991-08 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 0-120 | TANG AND CLEVIS INSULATION |
| 109991-09 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 240-0 | TANG AND CLEVIS INSULATION |
| 109991-10 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 109991-05 | 00 | FWD SEG | FWD DOME FACT JNT | BOTH | 0-120 | TANG AND CLEVIS INSULATION |
| 109991-06 | 00 | FWD SEG | FWD DOME FACT JNT | BOTH | 120-240 | TANG AND CLEVIS INSULATION |
| 109991-07 | 00 | FWD SEG | FWD DOME FACT JNT | BOTH | 240-0 | TANG AND CLEVIS INSULATION |
| 107474-01 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 0-360 | IGNITER FORWARD DOME BOSS |
| 107474-02 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 270 | IGNITER FORWARD DOME BLOW HOLE AT 270 DEG |
| 107475-02 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 290-300 | FORWARD DOME IGNITER BOSS METAL DAMAGE 290 DEG - 300 DEG |

***END OF REPORT***

# APPENDIX B

# RSRM-2B INSULATION EVALUATIONS

Table B-1
RSRM-2B Aft Dome Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 12:45 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [X] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Charred Material? | X | yes | | no | 1 |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | | yes | X | no | |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Heat effect, charring, immeasurable ablation (gray color) on aft face of weatherseal 210° - 270° - 340°. Slight heat effect (brown color) on outboard surface and forward face 235° - 270° - 315°. Heaviest heat effect at 270°.

Table B-2
RSRM-2B Aft Segment Stiffener to Stiffener Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 12:00 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [X] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Charred Material? | X | yes | | no | 1 |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | | yes | X | no | |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Heat effect (gray color) on aft face of weatherseal 210° - 270° - 330°, charring, immeasurable ablation. Slight heat effect (brown color) on top surface and forward face from 240° - 270° - 300°. Heaviest heat effect at 270°

Table B-3
RSRM-2B Aft Segment ET Attach to Stiffener Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 10:50 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [X] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Charred Material? | X | yes | | no | 1 |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | | yes | X | no | |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Slight charring on aft face of weatherseal 220° - 270° - 320°, heaviest at 270° (gray color).

Table B-4
RSRM-2B Aft Center Segment Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 10:45 a.m. |
|---|---|---|
| Inspector(s): Scott Manz, Hal Huppi | | |

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [X] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | | yes | X | no | |
| B. Charred Material? | | yes | X | no | |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | X | yes | | no | 1 |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | 1 |

›tes/Comments:

1. Several small debris marks on aft edge of weatherseal at 230° and 130° - 180° - 220°.
2. 135° - 160° several paint drops on weatherseal. No adverse effect.

Table B-5
RSRM-2B Forward Center Segment Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 12:55 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [X] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | | yes | X | no | |
| B. Charred Material? | | yes | X | no | |
| C. Moisture Under Seal? | X | yes | | no | 2 |
| D. Missing Material? | X | yes | | no | 1 |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Missing material from debris at 255° 1 in. circ. X 0.4 in. axial X 0.080 max. depth aft edge of weatherseal. Several small debris marks on aft edge of weatherseal from 90° - 180° - 240°. At 180° missing material 3.5 in. circ. X 0.75 in. max. axial X 0.10 in. max. depth.

2. Instrumentation wires coming out of weatherseal at this location, wires are unbonded from the case and moisture is dripping out. Paint missing from case 1.45 in. axial X 0.80 in. circ. Moisture also began dripping out of the instrumentation location at 0° after the motor was rotated. The instrumentation at 0° is still securely bonded and there is no missing material. After the motors were hydrolased and rotated, moisture was noted dripping out of the instrumentation wires at 280° and also a thermocouple wire wrinkle at 270°, on the aft edge of the weatherseal, on 9 December 1988 with 270° in the down position.

3. A section of weatherseal 24 in. wide circ. was removed from 270° - 280° on 12 December 1988. The segment was rotated to move 270° horizontal to assist removal. A lot of water came out when the weatherseal was first cut, and more water was noted as more weatherseal was cut. The water appeared to run along the wire routing. The bond between the weatherseal and the case and pin retainer band was very good. Corrosion was noted underneath the pin retainer band.

Table B-6
RSRM-2B Forward Segment Cylinder to Cylinder Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 10:30 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [ ] Forward Segment Dome/Cylinder
- [X] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | | yes | X | no | |
| B. Charred Material? | | yes | X | no | |
| C. Moisture Under Seal? | | yes | X | no | |
| D. Missing Material? | X | yes | | no | 1 |
| E. Edge Separation? | | yes | X | no | |
| F. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Slight missing material caused by debris at 226° aft edge of weatherseal 0.45 in. circ. X 0.20 in. axial X 0.050 in. deep. Four small areas of missing material (0.25 in. diam. max., 0.050 in. depth max.) in same location. Small cut in aft edge of weatherseal at 205° 0.35 in. axial X 0.15 in. depth. Three other debris marks near 205°.

Table B-7
RSRM-2B Forward Dome Factory Joint Weatherseal Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 12:55 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Factory Joint:

- [X] Forward Segment Dome/Cylinder
- [ ] Forward Segment Cylinder/Cylinder
- [ ] Forward Center Segment Cylinder/Cylinder
- [ ] Aft/Ctr Segment Cylinder/Cylinder
- [ ] Aft Segment ET Attach/Stiffener
- [ ] Aft Segment Stiffener/Stiffener
- [ ] Aft Segment Stiffener/Dome

| Weatherseal Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | ____ | yes | X | no | ____ |
| B. Charred Material? | ____ | yes | X | no | ____ |
| C. Moisture Under Seal? | ____ | yes | X | no | ____ |
| D. Missing Material? | ____ | yes | X | no | ____ |
| E. Edge Separation? | ____ | yes | X | no | ____ |
| F. Impact Damage? | ____ | yes | X | no | ____ |

tes/Comments:

Table B-8
RSRM-2B Aft Stiffener Ring TPS Evaluation Before Ring Removal

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 1:15 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

- [ ] Forward Stiffener Stub (1613.62)
- [ ] Center Stiffener Ring (1733.43)
- [ ] Forward Stiffener Ring (1657.65)
- [X] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | X | yes | | no | 2 |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Heat effect, charred material with immeasurable ablation (brown color) on the outboard surface, aft edge and the forward edge from 220° - 270° - 320°. Slight heat effect (light brow color) on the forward edge from 180° - 220° and 320° - 0°.

2. Areas of material that appeared to be cut by the hydrolasing on the aft edge.

Table B-9
RSRM-2B Center Stiffener Ring TPS Evaluation Before Ring Removal

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 1:00 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

- [ ] Forward Stiffener Stub (1613.62)
- [X] Center Stiffener Ring (1733.43)
- [ ] Forward Stiffener Ring (1657.65)
- [ ] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | | yes | X | no | |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Heat effect, charred material with immeasurable ablation (brown color) on the outboard surface, aft edge (not covered by foam), and forward edge from 220° - 270° - 320°. Slight heat effect (light brown) on the forward edge from 180° - 220° and 320° - 0°.

Table B-10
RSRM-2B Forward Stiffener Ring TPS Evaluation Before Ring Removal

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 12:45 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

- [ ] Forward Stiffener Stub (1613.62)
- [ ] Center Stiffener Ring (1733.43)
- [X] Forward Stiffener Ring (1657.65)
- [ ] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | | yes | X | no | |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

tes/Comments:

1. Heat effect, charred material with immeasurable ablation (brown color) on the outboard surface and aft edge (not covered by foam) from 220° - 270° - 320°. Slight heat effect on forward edge (light brown) from 180° - 270° - 0°.

Table B-11
RSRM-2B Forward Stiffener Stub TPS Evaluation

| Motor No.: RSRM-2B | Date: 5 December 1988 | Time: 12:30 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Hal Huppi

Stiffener Ring/Stub:

[X] Forward Stiffener Stub (1613.62)
[ ] Center Stiffener Ring (1733.43)
[ ] Forward Stiffener Ring (1657.65)
[ ] Aft Stiffener Ring (1777.46)

| Stiffener Ring/Stub TPS Condition | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Discolored? | X | yes | | no | 1 |
| B. Blistered Paint? | | yes | X | no | |
| C. Heat Affected/Charred Material? | X | yes | | no | 1 |
| D. Missing Material/Gouges? | X | yes | | no | 2 |
| E. Insulation to Case Separations? | | yes | X | no | |
| F. Tears? | | yes | X | no | |
| G. Impact Damage? | | yes | X | no | |

otes/Comments:

1. Slight heat effect (light brown color) on the forward corner edge of the stub from 120° - 160°. Heat effect (brown color) on the aft face and outboard face of the stub from 220° - 270° - 320°. The aft face was also charred with immeasurable ablation from 220° - 270° - 320°.

2. Two areas of missing material on the aft face of the stub at 220° and 280°, approximately 1 in. diameter and 0.1 in. deep, appeared to ply separation. These areas may have been caused by debris impact.

3. There was a piece of charred material on the forward face of the stub at 260°, approximately 0.3 in. diameter.

Table B-12
RSRM-2B Nozzle to Case Joint Insulation Evaluation

| Motor No.: RSRM-2B | Date: 12 December 1988 | Time: 6:55 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken, Cary Ralston | | |

| | | | | | | Comment Numbers |
|---|---|---|---|---|---|---|
| 1. Voids? | | ____ | yes | X | no | ____ |
| 2. Gas Paths? | | ____ | yes | X | no | ____ |
| 3. Soot? | | ____ | yes | X | no | ____ |
| 4. Foreign Material? | | ____ | yes | X | no | ____ |
| 5. Adhesive Porosity? | | X | yes | ____ | no | 1 |
| 6. Aft Dome Edge Separations? | | ____ | yes | X | no | ____ |
| 7. Baffle Torn? | | ____ | yes | X | no | 4 |
| 8. Polysulfide in Vent Slots? | | X | yes | ____ | no | 2 |
| 9. Polysulfide Failure Mode | 2 | % Adhesive at NBR Interface | | 98 | % Cohesive | |
| | 0 | % Adhesive at Phenolic Interface | | | | |

Notes/Comments:

1. Porosity at step region - very small bubbles

2. Some polysulfide in all vents. See next page. 11 of 50 slots had over 100% fill. Average fill = 62%. Polysulfide to forward edge of wiper O-ring full circumference.

3.

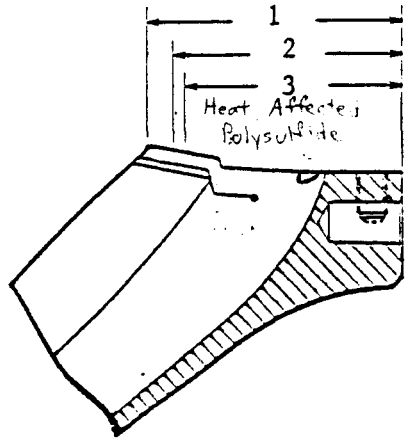
| KSC Bondline Measurements (From Aft Nozzle Boss) | 0° | 90° | 180° | 270° |
|---|---|---|---|---|
| Material Remaining* | 7.1 in. | 7.0 in. | 7.0 in. | 7.25 in. |
| Inboard Polysulfide | 6.0 in. | 6.12 in. | 6.0 in. | 6.25 in. |
| Outboard Heat Affected Polysulfide | 5.75 in. | 5.75 in. | 5.62 in. | 5.75 in. |

* Material remaining did not include char. There was a char layer of approximately 0.50 in. to 0.75 in. full circumference.

Table B-12 (Cont'd)
RSRM-2B Nozzle to Case Joint Insulation Evaluation

Clearfield Final Bondline Measurements

| Degree Location | (1) Material Remaining | (2) Inboard Polysulfide | (3) Outboard Polysulfide |
|---|---|---|---|
| 0 | 6.098 | * | 6.098 |
| 21.6 | 5.122 | * | 5.122 |
| 46.8 | 5.175 | * | 5.175 |
| 68.4 | 5.000 | * | 5.000 |
| 90.0 | 5.800 | * | 5.800 |
| 111.6 | 7.665 | * | 5.070 |
| 136.8 | 6.575 | * | 4.965 |
| 158.4 | 6.884 | * | 5.021 |
| 180.0 | 7.060 | * | 5.136 |
| 201.6 | 6.442 | * | 5.040 |
| 226.8 | 6.730 | * | 5.045 |
| 248.4 | 7.120 | * | 5.080 |
| 270.0 | 7.075 | * | 5.140 |
| 291.6 | 6.740 | * | 5.085 |
| 316.8 | 6.755 | * | 4.998 |
| 338.4 | 6.882 | * | 5.065 |




* Data not available

4. The forward edge of the flap was torn slightly at 225° and 315° from disassembly, approx. 4 in. wide circumferentially. No other tears.

Table B-13
RSRM-2B Aft Field Joint Insulation Evaluation

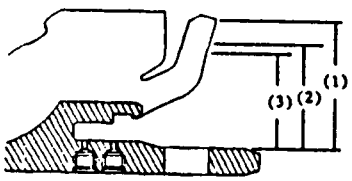
| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 11:45 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Field Joint: [ ] Forward [ ] Center [X] Aft

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Areas of Non-Contact? | | yes | X | no | |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | X | yes | | no | 1 |
| 4. Tang Heat Affected Material? | X | yes | | no | |
| 5. Foreign Material? | | yes | X | no | |
| 6. Clevis Edge Separations? | X | yes | | no | 2 |

Tang End Measurements




| | Degree Location | Depth (1) | Depth (2) | Depth (3) | Bondline Contact ** |
|---|---|---|---|---|---|
| | 0° | 3.20 | 2.80 | 2.65 | 1.25 |
| | 90° | No Char | 2.90 | 2.60 | 1.40 |
| | 180° | No Char | 3.00 | 2.70 | 1.45 |
| | 270° | 2.90 | 2.80 | 2.55 | 1.30 |
| Max | | | | | |
| Min | 96° | | | | .80 |

Note:
The following measurements are taken from the inner diameter of the tang leg (TANG):
Depth (1) - to the tip of the remaining material
Depth (2) - to the outboard edge of the char layer
Depth (3) - to the outboard edge of the heat affected material*,
(i.e. a measurement of the virgin material remaining).
* Location based on the tan discoloration of the adhesive.
** Measurement taken from the outboard edge of the char layer to the outboard extent of contact.

Notes/Comments:

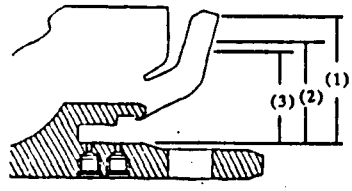
1. Soot extends into bondline intermittently around circumference, max. 0.55 in. outboard of remaining material at 150°. Not as heavy as RSRM-2B center field joint.

2. Only edge separations > 0.10 in. depth were documented.

Table B-13 (Cont'd)
RSRM-2B Aft Field Joint Insulation Evaluation

Clearfield Final
Tang End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.693 | 2.600 | 180 | | 2.785 | 2.524 |
| 10 | | 2.696 | 2.594 | 190 | | 2.715 | 2.602 |
| 20 | | 2.687 | 2.575 | 200 | | 2.703 | 2.545 |
| 30 | | 2.729 | 2.579 | 210 | | 2.723 | 2.592 |
| 40 | | 2.707 | 2.521 | 220 | | 2.728 | 2.599 |
| 50 | | 2.712 | 2.686 | 230 | | 2.701 | 2.554 |
| 60 | | 2.758 | 2.724 | 242 | | 2.695 | 2.516 |
| 70 | | 2.710 | 2.515 | 250 | | 2.700 | 2.531 |
| 80 | | 2.706 | 2.575 | 260 | | 2.696 | 2.567 |
| 90 | | 2.701 | 2.580 | 270 | | 2.698 | 2.548 |
| 100 | | 2.724 | 2.648 | 280 | | 2.690 | 2.500 |
| 110 | | 2.720 | 2.637 | 290 | | 2.656 | 2.493 |
| 120 | | 2.685 | 2.648 | 300 | | 2.687 | 2.563 |
| 130 | | 2.715 | 2.596 | 310 | | 2.703 | 2.598 |
| 140 | | 2.695 | 2.584 | 320 | | 2.704 | 2.574 |
| 150 | | 2.702 | 2.546 | 330 | | 2.682 | 2.629 |
| 160 | | 2.741 | 2.512 | 340 | | 2.696 | 2.609 |
| 170 | | 2.757 | 2.598 | 350 | | 2.701 | 2.656 |



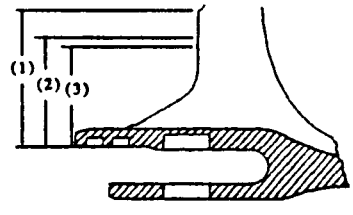

* No char remained after rinse.

Clevis end measurements were not taken at KSC. The measurement method is inaccurate and the clevis side insulation performance mirrored the performance of the tang side. Clevis measurements were taken at Clearfield H-7 and are shown below.

Measurements:
(1)* Remaining char was rinsed out. Measurement was not taken.
(2) To the outboard edge of the char layer.
(3) To the outboard edge of the heat affected material (i.e. measurement of the virgin material remaining.

Clearfield Final
Clevis End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.745 | 2.355 | 180 | | 2.852 | 2.574 |
| 10 | | 2.722 | 2.380 | 190 | | 2.826 | 2.598 |
| 20 | | 2.742 | 2.370 | 200 | | 2.796 | 2.535 |
| 30 | | 2.786 | 2.416 | 210 | | 2.798 | 2.537 |
| 40 | | 2.756 | 2.515 | 220 | | 2.780 | 2.450 |
| 50 | | 2.772 | 2.536 | 230 | | 2.733 | 2.412 |
| 60 | | 2.785 | 2.468 | 242 | | 2.751 | 2.558 |
| 70 | | 2.786 | 2.460 | 250 | | 2.789 | 2.505 |
| 80 | | 2.767 | 2.485 | 260 | | 2.735 | 2.428 |
| 90 | | 2.765 | 2.474 | 270 | | 2.743 | 2.375 |
| 100 | | 2.773 | 2.468 | 280 | | 2.740 | 2.438 |
| 110 | | 2.762 | 2.533 | 290 | | 2.718 | 2.421 |
| 120 | | 2.686 | 2.350 | 300 | | 2.732 | 2.394 |
| 130 | | 2.764 | 2.470 | 310 | | 2.744 | 2.411 |
| 140 | | 2.788 | 2.522 | 320 | | 2.745 | 2.443 |
| 150 | | 2.838 | 2.521 | 330 | | 2.738 | 2.447 |
| 160 | | 2.823 | 2.545 | 340 | | 2.755 | 2.403 |
| 170 | | 2.796 | 2.492 | 350 | | 2.725 | 2.459 |




* No char remained after rinse

Table B-13 (Cont'd)
RSRM-2B Aft Field Joint Insulation Evaluation

| | | |
|---|---|---|
| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 11:30 a.m. |
| Inspector(s): Scott Manz, Steve Hicken | Corresponding Comment Number a | |
| Field Joint Clevis: [ ] Forward | [ ] Center | [X] Aft |
| Joint: [ ] Igniter to Case | [ ] Nozzle to Case | |

| Edge Separation | Center Degree Location | | Circumferential Width (in.) | Maximum Depth (in.) | Axial Growth From Prefire Unrepaired Condition |
|---|---|---|---|---|---|
| 1 | 88° | | 0.90 | 0.12 | 0.09 |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |

Table B-14
RSRM-2B Center Field Joint Insulation Evaluation

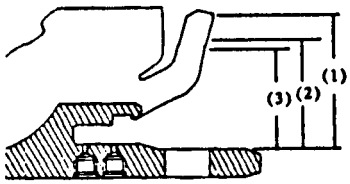
| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 12:40 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Field Joint: [ ] Forward [X] Center [ ] Aft

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Areas of Non-Contact? | | yes | X | no | |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | X | yes | | no | 1 |
| 4. Tang Heat Affected Material? | X | yes | | no | 2 |
| 5. Foreign Material? | | yes | X | no | |
| 6. Clevis Edge Separations? | X | yes | | no | 3 |

Tang End Measurements




| | Degree Location | Depth (1) | Depth (2) | Depth (3) | Bondline Contact ** |
|---|---|---|---|---|---|
| | 0° | 3.15 | 3.05 | 2.60 | 1.15 |
| | 90° | 3.15 | 3.10 | 2.70 | 1.10 |
| | 180° | No Char | 3.15 | 2.80 | 1.10 |
| | 270° | 3.35 | 3.15 | 2.90 | 1.10 |
| Max | 353° | | | | 1.60 |
| Min | 180° | | | | 1.10 |

Note:
The following measurements are taken from the inner diameter of the tang leg (TANG):
Depth (1) - to the tip of the remaining material
Depth (2) - to the outboard edge of the char layer
Depth (3) - to the outboard edge of the heat affected material*,
(i.e. a measurement of the virgin material remaining).
* Location based on the tan discoloration of the adhesive.
** Measurement taken from the outboard edge of the char layer to the outboard extent of contact.

Notes/Comments:

1. Soot extends into bondline from 60° - 90° - 180°, with max. 1.0 in. from material remaining at 99° - 103°. The soot can be wiped off, very slight discoloration on NBR.

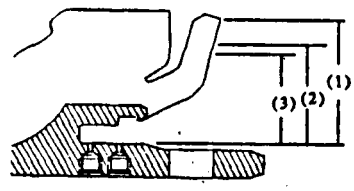
2. See tang heat effect measurements above. Normal erosion and heat effect.

3. Only edge separations > 0.10 depth were documented.

Table B-14 (Cont'd)
RSRM-2B Center Field Joint Insulation Evaluation

Clearfield Final
Tang End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.943 | 2.761 | 180 | | 2.946 | 2.790 |
| 10 | | 2.940 | 2.547 | 190 | | 2.953 | 2.821 |
| 20 | | 2.923 | 2.653 | 200 | | 2.955 | 2.739 |
| 30 | | 2.935 | 2.572 | 210 | | 2.960 | 2.670 |
| 40 | | 2.922 | 2.556 | 220 | | 2.975 | 2.790 |
| 50 | | 2.944 | 2.635 | 230 | | 2.962 | 2.779 |
| 60 | | 2.922 | 2.585 | 242 | | 3.018 | 2.773 |
| 70 | | 2.922 | 2.672 | 250 | | 2.960 | 2.673 |
| 80 | | 2.972 | 2.645 | 260 | | 2.949 | 2.638 |
| 90 | | 2.985 | 2.616 | 270 | | 2.927 | 2.562 |
| 100 | | 2.985 | 2.768 | 280 | | 2.918 | 2.666 |
| 110 | | 2.977 | 2.783 | 290 | | 2.913 | 2.688 |
| 120 | | 2.966 | 2.782 | 300 | | 2.928 | 2.632 |
| 130 | | 2.925 | 2.684 | 310 | | 2.930 | 2.680 |
| 140 | | 2.934 | 2.749 | 320 | | 2.934 | 2.675 |
| 150 | | 2.937 | 2.714 | 330 | | 2.925 | 2.628 |
| 160 | | 2.951 | 2.623 | 340 | | 2.912 | 2.642 |
| 170 | | 2.964 | 2.623 | 350 | | 2.926 | 2.652 |



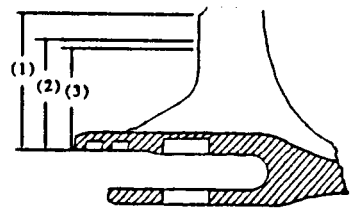

* No char remained after rinse.

Clevis end measurements were not taken at KSC. The measurement method is inaccurate and the clevis side insulation performance mirrored the performance of the tang side. Clevis measurements were taken at Clearfield H-7 and are shown below.

Measurements:
(1)* Remaining char was rinsed out. Measurement was not taken.
(2) To the outboard edge of the char layer.
(3) To the outboard edge of the heat affected material (i.e. measurement of the virgin material remaining.

Clearfield Final
Clevis End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.933 | 2.870 | 180 | | 3.019 | 2.938 |
| 10 | | 2.951 | 2.855 | 190 | | 3.010 | 2.933 |
| 20 | | 3.027 | 2.866 | 200 | | 2.978 | 2.916 |
| 30 | | 3.023 | 2.965 | 210 | | 3.000 | 2.921 |
| 40 | | 2.987 | 2.910 | 220 | | 3.002 | 2.940 |
| 50 | | 2.983 | 2.890 | 230 | | 2.994 | 2.944 |
| 60 | | 2.979 | 2.880 | 242 | | 2.956 | 2.916 |
| 70 | | 2.993 | 2.896 | 250 | | 2.980 | 2.855 |
| 80 | | 3.016 | 2.922 | 260 | | 2.991 | 2.902 |
| 90 | | 2.978 | 2.917 | 270 | | 2.985 | 2.860 |
| 100 | | 2.940 | 2.881 | 280 | | 2.982 | 2.868 |
| 110 | | 2.962 | 2.919 | 290 | | 2.939 | 2.860 |
| 120 | | 2.950 | 2.896 | 300 | | 2.970 | 2.905 |
| 130 | | 2.966 | 2.851 | 310 | | 2.993 | 2.910 |
| 140 | | 2.973 | 2.871 | 320 | | 2.983 | 2.922 |
| 150 | | 2.958 | 2.925 | 330 | | 2.971 | 2.891 |
| 160 | | 2.935 | 2.874 | 340 | | 2.947 | 2.855 |
| 170 | | 2.972 | 2.933 | 350 | | 2.965 | 2.887 |




* No char remained after rinse

Table B-14 (Cont'd)
RSRM-2B Center Field Joint Insulation Evaluation

| | | |
|---|---|---|
| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 11:30 a.m. |
| Inspector(s): Scott Manz, Steve Hicken | Corresponding Comment Number 3 | |
| Field Joint Clevis: ☐ Forward | ☒ Center | ☐ Aft |
| Joint: ☐ Igniter to Case | ☐ Nozzle to Case | |

| Edge Separation | Center Degree Location | | Circumferential Width (in.) | Maximum Depth (in.) | Axial Growth From Prefire Unrepaired Condition |
|---|---|---|---|---|---|
| 1 | 7° | | 0.70 | 0.23 | 0.13 |
| 2 | 14° | | 0.30 | 0.14 | 0.09 |
| 3 | 69° | | 0.80 | 0.12 | 0 |
| 4 | 78° | | 0.30 | 0.14 | 0.04 |
| 5 | 232° | | 0.50 | 0.18 | 0.03 |
| 6 | 258° | | 0.60 | 0.14 | 0 |
| 7 | 262° | | 0.70 | 0.24 | 0.04 |
| 8 | 264° | | 0.80 | 0.20 | 0 |
| 9 | 270° | | 0.50 | 0.21 | 0.01 |
| 10 | | | | | |
| 11 | | | | | |

Table B-15
RSRM-2B Forward Field Joint Insulation Evaluation

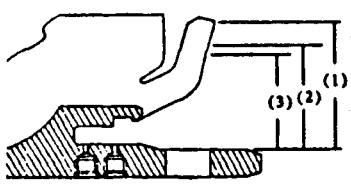
| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 3:40 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Field Joint: [X] Forward [ ] Center [ ] Aft

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Areas of Non-Contact? | | yes | X | no | |
| 2. Gas Paths? | | yes | X | no | |
| 3. Soot? | X | yes | | no | 1 |
| 4. Tang Heat Affected Material? | X | yes | | no | |
| 5. Foreign Material? | | yes | X | no | |
| 6. Clevis Edge Separations? | X | yes | | no | 2 |

Tang End Measurements




| | Degree Location | Depth (1) | Depth (2) | Depth (3) | Bondline Contact ** |
|---|---|---|---|---|---|
| | 0° | 3.45 | 3.15 | 3.00 | 1.15 |
| | 90° | No Char | 3.20 | 2.80 | 1.25 |
| | 180° | No Char | 3.20 | 2.70 | 1.15 |
| | 270° | 3.30 | 3.15 | 2.80 | 1.30 |
| Max | | | | | |
| Min | | | | | |

Note:
The following measurements are taken from the inner diameter of the tang leg (TANG):
Depth (1) - to the tip of the remaining material
Depth (2) - to the outboard edge of the char layer
Depth (3) - to the outboard edge of the heat affected material*,
(i.e. a measurement of the virgin material remaining).
* Location based on the tan discoloration of the adhesive.
** Measurement taken from the outboard edge of the char layer to the outboard extent of contact.

Notes/Comments:

1. Soot extends into bondline from approximately 90° - 180°, with max. 0.50 in. outboard of remaining material at 112°. Not as heavy as RSRM-2B center field joint.

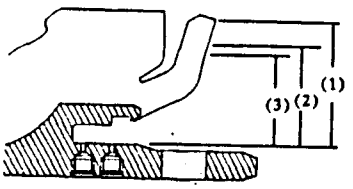
2. Only edge separations > 0.10 depth were documented (See next page).

3. White substance noted just aft of capture feature O-ring groove on tang insulation intermittently around circumference, most severe 45° - 90° - 135°. Substance is approximately 0.20 in. wide and does not flake off. Appears to be tape residue.

Table B-15 (Cont'd)
RSRM-2B Forward Field Joint Insulation Evaluation

Clearfield Final
Tang End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 2.946 | 2.833 | 180 | | 2.866 | 2.620 |
| 10 | | 2.920 | 2.814 | 190 | | 2.841 | 2.512 |
| 20 | | 2.983 | 2.841 | 200 | | 2.932 | 2.830 |
| 30 | | 2.972 | 2.852 | 210 | | 2.960 | 2.642 |
| 40 | | 2.961 | 2.822 | 220 | | 2.938 | 2.634 |
| 50 | | 2.967 | 2.812 | 230 | | 2.982 | 2.741 |
| 60 | | 2.963 | 2.722 | 242 | | 2.921 | 2.632 |
| 70 | | 2.968 | 2.760 | 250 | | 2.911 | 2.692 |
| 80 | | 3.000 | 2.789 | 260 | | 2.963 | 2.782 |
| 90 | | 3.021 | 2.808 | 270 | | 3.003 | 2.785 |
| 100 | | 2.944 | 2.741 | 280 | | 3.006 | 2.844 |
| 110 | | 2.961 | 2.636 | 290 | | 2.981 | 2.762 |
| 120 | | 2.946 | 2.724 | 300 | | 2.958 | 2.731 |
| 130 | | 2.971 | 2.791 | 310 | | 2.949 | 2.610 |
| 140 | | 2.963 | 2.712 | 320 | | 2.985 | 2.784 |
| 150 | | 2.938 | 2.768 | 330 | | 2.998 | 2.756 |
| 160 | | 2.921 | 2.664 | 340 | | 2.955 | 2.632 |
| 170 | | 2.994 | 2.781 | 350 | | 2.958 | 2.671 |



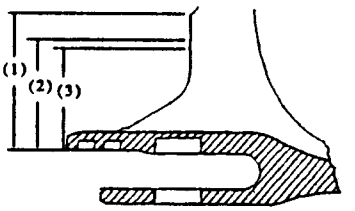

* No char remained after rinse

Clevis end measurements were not taken at KSC. The measurement method is inaccurate and the clevis side insulation performance mirrored the performance of the tang side. Clevis measurements were taken at Clearfield H-7 and are shown below.

Measurements:
(1)* Remaining char was rinsed out. Measurement was not taken.
(2) To the outboard edge of the char layer.
(3) To the outboard edge of the heat affected material (i.e. measurement of the virgin material remaining.

Clearfield Final
Clevis End Measurement

| Degree Location | Measurements: (1)* | (2) | (3) | Degree Location | Measurements: (1)* | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2 | | 3.248 | 2.955 | 180 | | 3.078 | 2.955 |
| 10 | | 3.098 | 2.992 | 190 | | 2.950 | 2.891 |
| 20 | | 3.199 | 2.900 | 200 | | 3.009 | 2.931 |
| 30 | | 3.020 | 2.961 | 210 | | 3.027 | 2.959 |
| 40 | | 3.051 | 2.953 | 220 | | 3.001 | 2.930 |
| 50 | | 3.014 | 2.935 | 230 | | 3.024 | 2.948 |
| 60 | | 3.022 | 2.911 | 242 | | 3.010 | 2.919 |
| 70 | | 3.041 | 2.886 | 250 | | 2.995 | 2.894 |
| 80 | | 3.025 | 2.930 | 260 | | 3.034 | 2.942 |
| 90 | | 3.088 | 2.981 | 270 | | 3.069 | 2.978 |
| 100 | | 3.048 | 2.985 | 280 | | 3.050 | 2.961 |
| 110 | | 3.031 | 2.975 | 290 | | 3.055 | 2.985 |
| 120 | | 3.035 | 2.962 | 300 | | 3.024 | 2.941 |
| 130 | | 3.004 | 2.929 | 310 | | 3.004 | 2.936 |
| 140 | | 2.991 | 2.908 | 320 | | 3.035 | 2.928 |
| 150 | | 3.020 | 2.945 | 330 | | 3.043 | 2.944 |
| 160 | | 3.028 | 2.922 | 340 | | 3.013 | 2.930 |
| 170 | | 3.022 | 2.909 | 350 | | 3.010 | 2.952 |




* No char remained after rinse

Table B-15 (Cont'd)
RSRM-2B Forward Field Joint Insulation Evaluation

| | | |
|---|---|---|
| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 11:30 a.m. |
| Inspector(s): Scott Manz, Steve Hicken | Corresponding Comment Number a | |
| Field Joint Clevis: [X] Forward | [ ] Center | [ ] Aft |
| Joint: [ ] Igniter to Case | [ ] Nozzle to Case | |

| Edge Separation | Center Degree Location | | Circumferential Width (in.) | Maximum Depth (in.) | Axial Growth From Prefire Unrepaired Condition |
|---|---|---|---|---|---|
| 1 | 88° | | 0.50 | 0.20 | 0.12 |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |

Table B-16
RSRM-2B Aft Segment Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 12 December 1988 | Time: 10:00 a.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| **Insulated Cylinder Region** | | | | | |
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | 2 |
| E. Tears, Gouges, Cuts? | X | yes | | no | 1 |
| F. Liner present? | | yes | X | no | |
| **Aft Dome Region** | | | | | |
| A. Abnormal CF/EPDM Erosion? | | yes | X | no | |
| B. NBR Under CF/EPDM Exposed? | | yes | X | no | |

Notes/Comments:

1. Cut near 180°, from debris at impact.

2. Several ply overlaps visible on aft dome factory joint - no adverse effect.

Table B-17
RSRM-2B Aft Segment NBR Inhibitor Tear Evaluation

| | | |
|---|---|---|
| **Motor No.:** RSRM-2A | **Date:** 11 December 1988 | **Time:** 11:30 a.m. |
| **Side:** ☐ Left (A) ☒ Right (B) | | |
| **Inspector(s):** Scott Manz, Steve Hicken, Cary Ralston | | |
| **Segment:** ☐ Forward Center (852) ☐ Aft Center (1172) ☒ Aft (1492) | | **Component: Insulation** |

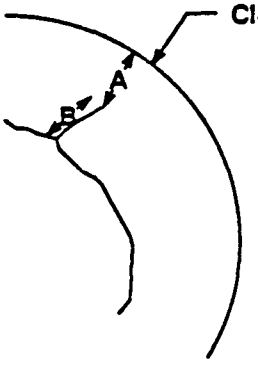
**NBR Inhibitor Description** — Comment Number

A. Number of radial tears greater than 3 in. long (TEARS)? 0

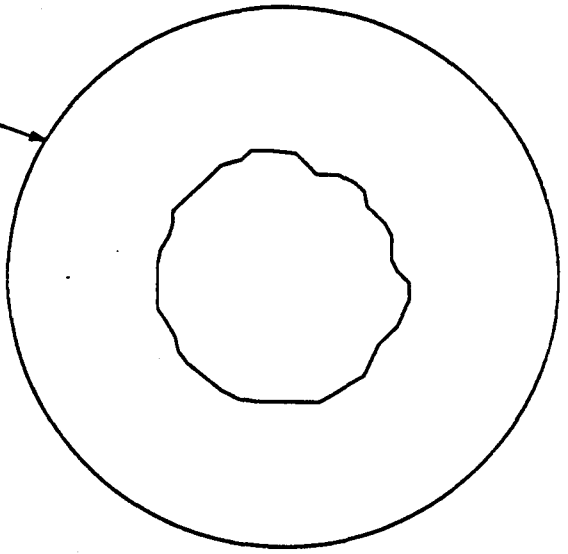
B. Tears exhibiting charring or erosion (INSER)? ____ yes X no ____

C. Circumferential tears (TEARS)? ____ yes X no ____

**Measurement Definitions**




**Sketch Tears Here**



**Inhibitor Tears > 3 in. Long**

**Measurements "A & B" taken as shown above.**

| Degree Location | Meas. "A" | Meas. "B" | Comments (Charring, etc.) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Notes / Comments**

**Comment sheet(s) attached?** ____ yes X no

Table B-18
RSRM-2B Aft Segment NBR Inhibitor Height Evaluation

| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 11:30 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Segment: [ ] Forward Center [ ] Aft Center [X] Aft

NBR Inhibitor Description

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Delaminations or Separations? | | yes | X | no | |
| B. Unusual Erosion (Other than Tears)? | X | yes | | no | 1 |

NBR Inhibitor Measurements

Radial measurements from the I.D. of the inner clevis leg.

| Degree Location | Radial Distance | Degree Location | Radial Distance |
|---|---|---|---|
| 0° | 6.0 in. | 180° | 8.0 in. |
| 30° | 3.5 in. | 210° | 6.75 in. |
| 60° | 7.5 in. | 240° | 5.5 in. |
| 90° | 7.5 in. | 270° | 5.0 in. |
| 120° | 7.5 in. | 300° | 8.0 in. |
| 150° | 8.0 in. | 330° | 4.5 in. |

Max. inhibitor height = 8.75 in. at 244°
Min. inhibitor height = 3.5 in. at 30°

Notes/Comments:

1. Uneven inhibitor erosion with extending areas, as sketched in Figure 6.

Table B-19
RSRM-2B Aft Center Segment Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 12 December 1988 | Time: 1:45 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

Insulated Cylinder Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | 1 |
| E. Tears, Gouges, Cuts? | | yes | X | no | 2 |
| F. Liner present? | X | yes | | no | |

Notes/Comments:

1. Vacuum bag wrinkles are evident on edges of factory joint. No excessive erosion or adverse effect.

2. Scratches from debris at impact are visible, no measurable depth.

Table B-20
RSRM-2B Aft Center Segment NBR Inhibitor Tear Evaluation

| | | |
|---|---|---|
| **Motor No.:** RSRM-2B | **Date:** 11 December 1988 | **Time:** 12:45 p.m. |
| **Side:** ☐ Left (A) | ☒ Right (B) | |
| **Inspector(s):** Scott Manz, Steve Hicken | | |
| **Segment:** ☐ Forward Center (852) | ☒ Aft Center (1172) | ☐ Aft (1492) / **Component: Insulation** |

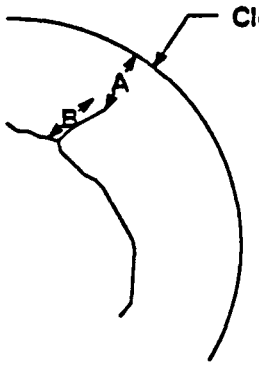
**NBR Inhibitor Description** — Comment Number

A. Number of radial tears greater than 3 in. long (TEARS)? 2

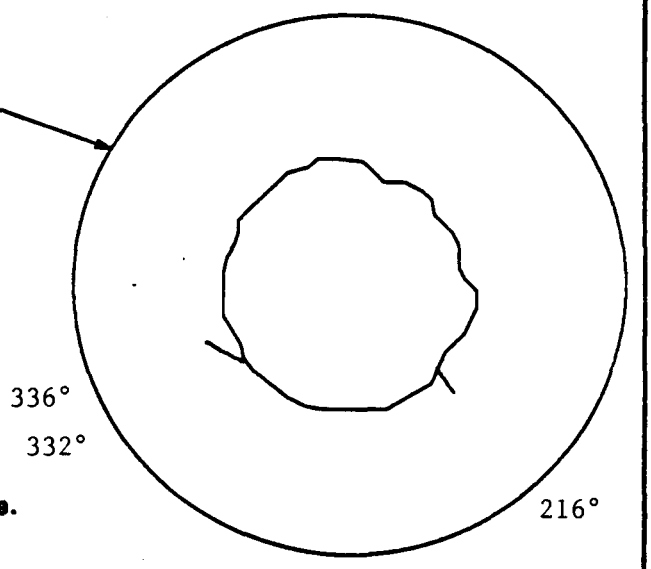
B. Tears exhibiting charring or erosion (INSER)? ____ yes X no ____

C. Circumferential tears (TEARS)? ____ yes X no ____

**Measurement Definitions**




**Sketch Tears Here**




**Inhibitor Tears > 3 in. Long**

**Measurements "A & B" taken as shown above.**

| Degree Location | Meas. "A" | Meas. "B" | Comments (Charring, etc.) |
|---|---|---|---|
| 216° | 9.0 in. | 4.5 in. | |
| 336°-332° | 9.0 in. | 5.0 in. | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Notes / Comments**

Comment sheet(s) attached? ____ yes X no

Table B-21
RSRM-2B Aft Center Segment NBR Inhibitor Height Evaluation

| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 12:50 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken, Cary Ralston | | |
| Segment: [ ] Forward Center | [X] Aft Center | [ ] Aft |

NBR Inhibitor Description

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Delaminations or Separations? | ____ | yes | X | no | ____ |
| B. Unusual Erosion (Other than Tears)? | ____ | yes | X | no | ____ |

NBR Inhibitor Measurements

Radial measurements from the I.D. of the inner clevis leg.

| Degree Location | Radial Distance | Degree Location | Radial Distance |
|---|---|---|---|
| 0° | 12.5 in. | 180° | 13.5 in. |
| 30° | 13.5 in. | 210° | 14.5 in. |
| 60° | 13.0 in. | 240° | 14.5 in. |
| 90° | 15.0 in. | 270° | 12.5 in. |
| 120° | 15.25 in. | 300° | 11.5 in. |
| 150° | 14.25 in. | 330° | 12.0 in. |

Max. inhibitor height = 15.25 in. at 120°
Min. inhibitor height = 11.5 in. at 300°

Notes/Comments:

Table B-22
RSRM-2B Aft Center Segment Stress Relief Flap Evaluation

| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 11:50 a.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Segment: [ ] Forward [ ] Forward Center [X] Aft Center

Flap Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Gouges, Cuts, Tears? | | yes | X | no | |
| B. Pocketing? | | yes | X | no | |
| C. Missing Material? | X | yes | | no | 1 |
| D. Heat Affected CF/EPDM or NBR? | X | yes | | no | 2 |
| E. Eroded CF/EPDM or NBR? | X | yes | | no | 2 |
| F. Bulb Separations, Voids, Delaminations? | | yes | X | no | |

Flap Measurements
Measurements from the tip of the tang to the aft edge of the flap.

| Degree Location | Axial Distance |
|---|---|
| 0° | 14.5 in. |
| 90° | 14.5 in. |
| 180° | 14.5 in. |
| 270° | 14.5 in. |

Tear Measurements
Measurement "A" taken from the J-leg tip to the aft edge of the flap.
Measurement "B" taken from the aft edge of the flap to the forward edge of the tear.

| Degree Location | Measurement "A" | Measurement "B" | Comments (Charring, etc.) |
|---|---|---|---|
| No Tears | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Notes/Comments

1. Flap is missing full circumference.

2. CF/EPDM is eroded away full circumference. The NBR underneath it is heat affected and slightly eroded.

Table B-23
RSRM-2B Forward Center Segment Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 12 December 1988 | Time: 2:00 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

Insulated Cylinder Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | 1 |
| E. Tears, Gouges, Cuts? | X | yes | | no | 2 |
| F. Liner present? | X | yes | | no | 3 |

Notes/Comments:

1. No vacuum bag wrinkles evident.
2. Debris damage near 30°, minor cuts that happened at splashdown.
3. Spotty liner pattern. Fairly consistent liner forward of factory joint.

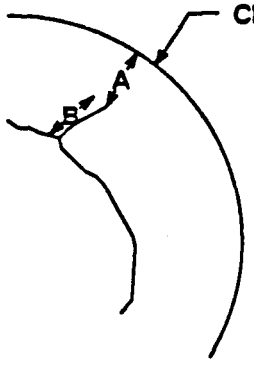
Table B-24
RSRM-2B Forwad Center Segment NBR Inhibitor Tear Evaluation

| | | |
|---|---|---|
| **Motor No.:** RSRM-2B | **Date:** 11 December 1988 | **Time:** 3:45 p.m. |
| **Side:** ☐ Left (A) | ☒ Right (B) | |
| **Inspector(s):** Scott Manz, Steve Hicken | | |
| **Segment:** ☒ Forward Center (852) ☐ Aft Center (1172) ☐ Aft (1492) | | **Component: Insulation** |

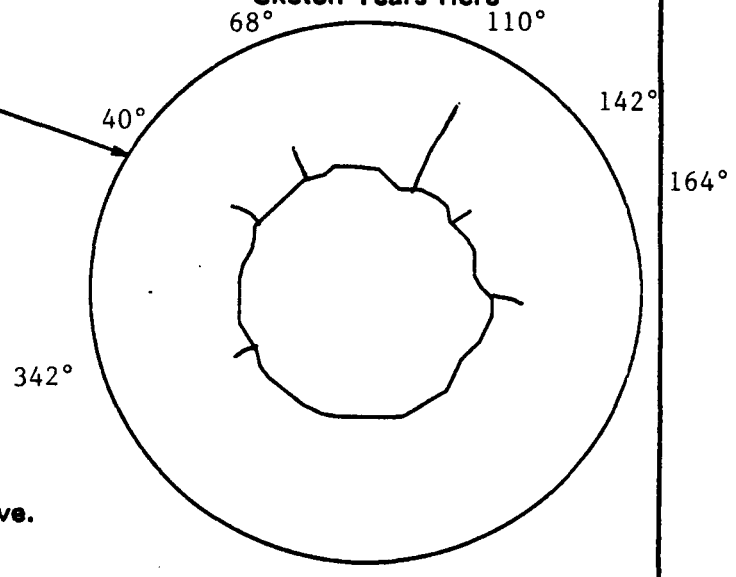
**NBR Inhibitor Description**

| | | | | Comment Number |
|---|---|---|---|---|
| A. Number of radial tears greater than 3 in. long (TEARS)? | 6 | | | |
| B. Tears exhibiting charring or erosion (INSER)? | ____ | yes | X | no |
| C. Circumferential tears (TEARS)? | ____ | yes | X | no |

**Measurement Definitions**




**Sketch Tears Here**




**Inhibitor Tears > 3 in. Long**

**Measurements "A & B" taken as shown above.**

| Degree Location | Meas. "A" | Meas. "B" | Comments (Charring, etc.) |
|---|---|---|---|
| 164° | 19.5 in. | 5.5 in. | |
| 142° | 18.0 in. | 4.0 in. | |
| 110° | 11.0 in. | 14.5 in. | |
| 68° | 18.5 in. | 5.5 in. | |
| 40° | 17.0 in. | 5.5 in. | |
| 342° | 18.5 in. | 4.5 in. | |
| | | | |

**Notes / Comments**

**Comment sheet(s) attached?** ____ yes X no

Table B-25
RSRM-2B Forward Center Segment NBR Inhibitor Height Evaluation

| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 3:40 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken, Cary Ralston

Segment: [X] Forward Center [ ] Aft Center [ ] Aft

NBR Inhibitor Description

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Delaminations or Separations? | ____ | yes | X | no | ____ |
| B. Unusual Erosion (Other than Tears)? | ____ | yes | X | no | ____ |

NBR Inhibitor Measurements

Radial measurements from the I.D. of the inner clevis leg.

| Degree Location | Radial Distance | Degree Location | Radial Distance |
|---|---|---|---|
| 0° | 25.5 in. | 180° | 25.0 in. |
| 30° | 24.5 in. | 210° | 25.25 in. |
| 60° | 27.75 in. | 240° | 21.5 in. |
| 90° | 25.5 in. | 270° | 24.5 in. |
| 120° | 24.5 in. | 300° | 23.0 in. |
| 150° | 27.0 in. | 330° | 25.0 in. |

Max. inhibitor height = 27.5 in. at 6°
Min. inhibitor height = 21.5 in. at 240°

Notes/Comments:

Table B-26
RSRM-2B Forward Center Segment Stress Relief Flap Evaluation

| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 1:00 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken, Cary Ralston | | |
| Segment: [ ] Forward [X] Forward Center [ ] Aft Center | | Component: Insulation |

Flap Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Gouges, Cuts, Tears? | | yes | X | no | |
| B. Pocketing? | | yes | X | no | |
| C. Missing Material? | X | yes | | no | 1 |
| D. Heat Affected CF/EPDM or NBR? | X | yes | | no | 2 |
| E. Eroded CF/EPDM or NBR? | X | yes | | no | 2 |
| F. Bulb Separations, Voids, Delaminations? | | yes | X | no | |

Flap Measurements
Measurements from the tip of the tang to the aft edge of the flap.

| Degree Location | Axial Distance |
|---|---|
| 0° | 11.25 in. |
| 90° | 10.25 in. |
| 180° | 9.25 in. |
| 270° | 9.0 in. |

Min. Flap = 13 in. missing at 12°
Max. Flap = 6.5 in. missing at 310°

Tear Measurements
Measurement "A" taken from the J-leg tip to the aft edge of the flap.
Measurement "B" taken from the aft edge of the flap to the forward edge of the tear.

| Degree Location | Measurement "A" | Measurement "B" | Comments (Charring, etc.) |
|---|---|---|---|
| No Tears | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Notes/Comments:

1. Flap eroded as shown in measurements above.

2. CF/EPDM extends to the pressurization gap full circumference, heat affected and slightly eroded.

Table B-27
RSRM-2B Forward Segment Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 12 December 1988 | Time: 2:15 p.m. |
|---|---|---|
| Inspector(s): Scott Manz, Steve Hicken | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| **Insulated Cylinder Region** | | | | | |
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separations or Delaminations? | | yes | X | no | |
| D. Excessive Erosion at Factory Joints? | | yes | X | no | |
| E. Tears, Gouges, Cuts? | | yes | X | no | |
| F. Liner present? | X | yes | | no | |
| **Forward Dome Region** | | | | | |
| A. Blisters Visible? | | yes | X | no | |
| B. Discolorations or Repairs Visible? | | yes | X | no | |
| C. Separtions or Delaminations? | | yes | X | no | |
| D. Tears, Gouges, Cuts? | | yes | X | no | |

Notes/Comments:

1. No castable inhibitor was remaining.

Table B-28
RSRM-2B Forward Segment Stress Relief Flap Evaluation

| Motor No.: RSRM-2B | Date: 11 December 1988 | Time: 4:00 p.m. |
|---|---|---|

Inspector(s): Scott Manz, Steve Hicken

Segment: [X] Forward [ ] Forward Center [ ] Aft Center

Flap Region

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| A. Gouges, Cuts, Tears? | | yes | X | no | |
| B. Pocketing? | | yes | X | no | |
| C. Missing Material? | X | yes | | no | 2 |
| D. Heat Affected CF/EPDM or NBR? | X | yes | | no | 1 |
| E. Eroded CF/EPDM or NBR? | X | yes | | no | 2 |
| F. Bulb Separations, Voids, Delaminations? | | yes | X | no | |

Flap Measurements
Measurements from the tip of the tang to the aft edge of the flap.

| Degree Location | Axial Distance | |
|---|---|---|
| 0° | ~ 3.75 in. | Approx. 0.75 in. flap eroded, cannot be measured normally |
| 90° | 3.0 in. | Flap full length, sticking out from case |
| 180° | ~ 3.75 in. | Approx. 0.75 in. flap eroded away, sticking up |
| 270° | 3.0 in. | Full flap length |

Tear Measurements
Measurement "A" taken from the J-leg tip to the aft edge of the flap.
Measurement "B" taken from the aft edge of the flap to the forward edge of the tear.

| Degree Location | Measurement "A" | Measurement "B" | Comments (Charring, etc.) |
|---|---|---|---|
| 118° | Not possible | 12.0 in. | Flap scalloped, deepest measurement |
| 110°-180°-204° | Heat affected and scalloped with more erosion, wavy flap | | |
| 110° - 136° | Severe heat effect and scalloping, not really torn but very wavy. | | |
| | | | |
| | | | |
| | | | |
| | | | |

Notes/Comments:

1. Flap is very heat affected and quite wavy from 330° - 0° - 60° and 100° - 180° - 220°. Flap is severely heat affected, can not be pressed down to measure the flap from the tang end. NBR under flap also heat affected. Most severe 110° - 180° - 204°.

2. Flap is eroded somewhat from 110° - 180° - 204°. Most severe erosion 110° - 136°, approx. ½ flap length is eroded.

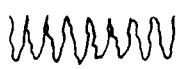
Sketch:  Flap 110° - 180° - 204°

Table B-29
RSRM-2B Aft Dome Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 31 January 1989 | Time: 0900 |
|---|---|---|
| Inspector(s): Jim Passman | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | X | yes | | no | 1 |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | 2 |

Notes/Comments:

1. Several insulation to insulation ply separations were present on the tang side insulation. They were intermittent full circumference; the maximum condition was at 188° 0.40 in. outboard of remaining insulation, 1.25 in. circ, 0.20 in. open radially.

2. Teflon tape was in place and intact.

3. Flashing was present intermittently full circumference on the inner clevis leg tip.

Table B-30
RSRM-2B Aft Segment Stiffener to Stiffener Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 31 January 1989 | Time: 1245 |
|---|---|---|
| Inspector(s): Jim Passman | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | | yes | X | no | |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | 1 |

Notes/Comments:

1. Teflon tape was in place and intact.

2. Minimal amount of flashing.

Table B-31
RSRM-2B Aft Segment ET Attach to Stiffener Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 31 January 1989 | Time: 1445 |
|---|---|---|
| Inspector(s): Jim Passman | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | X | yes | | no | 1 |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | |

Notes/Comments:

1. One insulation to insulation ply separation was present at 130°; 1 in. outboard from remaining insulation material on the tang side, 1.25 in. circ., 0.10 in. open radial.

2. Teflon tape in place and intact.

3. Moisture within joint on primary O-ring. Appears to be inhibited water from disassembly process.

Table B-32
RSRM-2B Aft Center Segment Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 6 April 1989 | Time: 2220 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | | yes | X | no | |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | |

Notes/Comments:

1. No insulation flashing on inner clevis leg tip. Intermittent spots of Chemlok 233.

Table B-33
RSRM-2B Forward Center Segment Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 25 April 1989 | Time: 2015 |
|---|---|---|
| Inspector(s): Scott Manz | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | ___ | yes | X | no | ___ |
| 2. Soot? | ___ | yes | X | no | ___ |
| 3. Heat Affected Material? | | | | | |
| A. Tang | ___ | yes | X | no | ___ |
| B. Clevis | ___ | yes | X | no | ___ |
| 4. Foreign Material? | ___ | yes | X | no | ___ |
| 5. Ply Separations? | ___ | yes | X | no | ___ |
| 6. Unbonds? | ___ | yes | X | no | ___ |
| 7. Teflon Tape Condition (Tang) | X | yes | ___ | no | ___ |

Notes/Comments:

1. Normal insulation flashing on inner clevis leg tip.

2. Heavy rust under hatband - worst at 180° and 270°.

Table B-34
RSRM-2B Forward Segment Cylinder to Cylinder Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 23 May 1989 | Time: 1300 |
|---|---|---|
| Inspector(s): Kevin Albrechtsen | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | ___ | yes | X | no | ___ |
| 2. Soot? | ___ | yes | X | no | ___ |
| 3. Heat Affected Material? | | | | | |
| A. Tang | ___ | yes | X | no | ___ |
| B. Clevis | ___ | yes | X | no | ___ |
| 4. Foreign Material? | ___ | yes | X | no | ___ |
| 5. Ply Separations? | ___ | yes | X | no | ___ |
| 6. Unbonds? | ___ | yes | X | no | ___ |
| 7. Teflon Tape Condition (Tang) | X | yes | ___ | no | 1 |

Notes/Comments:

1. Teflon tape was visible for the full circumference on the tang. It was in one piece and not damage. There was a slight amount of NBR flashing in this region and on top of the inner clevis leg.

Table B-35
RSRM-2B Forward Dome Factory Joint Internal Insulation Evaluation

| Motor No.: RSRM-2B | Date: 23 May 1989 | Time: 0730 |
|---|---|---|
| Inspector(s): Kevin Albrechtsen | | |

| | | | | | Comment Numbers |
|---|---|---|---|---|---|
| 1. Gas paths? | | yes | X | no | |
| 2. Soot? | | yes | X | no | |
| 3. Heat Affected Material? | | | | | |
| A. Tang | | yes | X | no | |
| B. Clevis | | yes | X | no | |
| 4. Foreign Material? | | yes | X | no | |
| 5. Ply Separations? | | yes | X | no | |
| 6. Unbonds? | | yes | X | no | |
| 7. Teflon Tape Condition (Tang) | X | yes | | no | 1 |

Notes/Comments:

1. Teflon tape was visible intermittently full circumference on the tang end. It was in one piece and not damaged during disassembly. There was intermittent flashing up to the primary O-ring.

| NEG NUMBER | PHOTO CODE | SEGMENT | JOINT | SEGMENT END | DEG LOC | COMMENT |
|---|---|---|---|---|---|---|
| FXD HOUSING | | | | | | |
| 107489-10 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | | NOZZLE TO CASE JOINT TYPICAL CONDITION |
| 107492-01 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 0 | NOZZLE OVERALL EXTERIOR 0 DEG |
| 107492-02 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 90 | NOZZLE OVERALL EXTERIOR 90 DEG |
| 107492-03 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 180 | NOZZLE OVERALL EXTERIOR 180 DEG |
| 107492-04 | 00 | FXD HOUSING | NOZZLE/CASE JNT | | 270 | NOZZLE OVERALL EXTERIOR 270 DEG |
| AFT SEG | | | | | | |
| 107496-04 | 33 | AFT SEG | NOZZLE/CASE JNT | | 240-0 | NOZZLE BOSS |
| 107496-03 | 32 | AFT SEG | NOZZLE/CASE JNT | | 120-240 | NOZZLE BOSS |
| 107496-02 | 31 | AFT SEG | NOZZLE/CASE JNT | | 0-120 | NOZZLE BOSS |
| 107480-02 | 26 | AFT SEG | UNKNOWN | AFT DOME | 360 | AFT DOME REGION |
| 107486-04 | 25 | AFT SEG | AFT FIELD JNT | CLEVIS | 240-0 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107486-03 | 24 | AFT SEG | AFT FIELD JNT | CLEVIS | 120-240 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107486-02 | 23 | AFT SEG | AFT FIELD JNT | CLEVIS | 0-120 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107486-01 | 22 | AFT SEG | AFT FIELD JNT | CLEVIS | 360 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| 107496-01 | 00 | AFT SEG | NOZZLE/CASE JNT | | 360 | NOZZLE BOSS OVERALL |
| 107489-11 | 00 | AFT SEG | NOZZLE/CASE JNT | AFT DOME | | NOZZLE TO CASE JOINT TYPICAL JOINT CONDITION |
| 108718-01 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 240-120 | TANG AND CLEVIS INSUALTION |
| 108718-02 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 120-0 | TANG AND CLEVIS INSUALTION |
| 108718-03 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 120-0 | TANG AND CLEVIS INSUALTION |
| 108718-04 | 00 | AFT SEG | AFT DOME FACT JNT | BOTH | 0-240 | TANG AND CLEVIS INSUALTION |
| 108720-01 | 00 | AFT SEG | STIFF/STIFF FACT JNT | BOTH | 240-120 | TANG AND CLEVIS INSUALTION |
| 108720-02 | 00 | AFT SEG | STIFF/STIFF FACT JNT | BOTH | 240-0 | TANG AND CLEVIS INSUALTION |
| 108720-03 | 00 | AFT SEG | STIFF/STIFF FACT JNT | BOTH | 0-120 | TANG AND CLEVIS INSUALTION |
| 108719-01 | 00 | AFT SEG | ET ATTACH/STIFF FACT JNT | BOTH | 240-120 | TANG AND CLEVIS INSUALTION |
| 108719-02 | 00 | AFT SEG | ET ATTACH/STIFF FACT JNT | BOTH | 0-240 | TANG AND CLEVIS INSUALTION |
| 108719-03 | 00 | AFT SEG | ET ATTACH/STIFF FACT JNT | BOTH | 120-0 | TANG AND CLEVIS INSUALTION |
| 109964-05 | 00 | AFT SEG | AFT CTR FACT JNT | BOTH | 240 | TANG AND CLEVIS INSUALTION |
| 109964-06 | 00 | AFT SEG | AFT CTR FACT JNT | BOTH | 0 | TANG AND CLEVIS INSUALTION |
| 109964-07 | 00 | AFT SEG | AFT CTR FACT JNT | BOTH | 120 | TANG AND CLEVIS INSUALTION |
| AFT CTR SEG | | | | | | |
| 107485-12 | 21 | AFT CTR SEG | AFT FIELD JNT | TANG | 240-0 | FLAP, CYLINDER REGION, AND TANG |
| 107485-11 | 20 | AFT CTR SEG | AFT FIELD JNT | TANG | 120-240 | FLAP, CYLINDER REGION, AND TANG |

| NEG NUMBER | PHOTO CODE | SEGMENT | JOINT | SEGMENT END | DEG LOC | COMMENT |
|---|---|---|---|---|---|---|
| 107485-10 | 19 | AFT CTR SEG | AFT FIELD JNT | TANG | 0-120 | FLAP, CYLINDER REGION, AND TANG |
| 107485-09 | 18 | AFT CTR SEG | AFT FIELD JNT | TANG | 360 | FLAP, CYLINDER REGION, AND TANG |
| 107485-08 | 17 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 240-0 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107485-07 | 16 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 120-240 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107485-06 | 15 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 0-120 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107485-05 | 14 | AFT CTR SEG | CTR FIELD JNT | CLEVIS | 360 | INTERNAL INSULATION, NBR INHIBITOR, AND CLEVIS |
| FWD CTR SEG | | | | | | |
| 107485-04 | 13 | FWD CTR SEG | CTR FIELD JNT | TANG | 240-0 | FLAP, CYLINDER REGION, AND TANG |
| 107485-03 | 12 | FWD CTR SEG | CTR FIELD JNT | TANG | 120-240 | FLAP, CYLINDER REGION, AND TANG |
| 107485-02 | 11 | FWD CTR SEG | CTR FIELD JNT | TANG | 0-120 | FLAP, CYLINDER REGION, AND TANG |
| 107485-01 | 10 | FWD CTR SEG | CTR FIELD JNT | TANG | 360 | FLAP, CYLINDER REGION, AND TANG |
| 107484-05 | 09 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 240-0 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107484-04 | 08 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 120-240 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107484-03 | 07 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 0-120 | CLEVIS, NBR INHIBITOR, AND CYLINDER REGION |
| 107484-02 | 06 | FWD CTR SEG | FWD FIELD JNT | CLEVIS | 360 | INTERNAL INSULATION, NBR INHIBTOR, AND CLEVIS |
| 107479-08 | 00 | FWD CTR SEG | CTR FIELD JNT | TANG | 99-103 | CENTER FIELD JOINT J-LEG SOOT 99-103 DEG (BEFORE CLEANING) |
| 107479-09 | 00 | FWD CTR SEG | CTR FIELD JNT | TANG | 99-103 | CENTER FIELD JOINT J-LEG SOOT 99-103 DEG (AFTER CLEANING) |
| 110391-03 | 00 | FWD CTR SEG | FWD CTR FACT JNT | BOTH | 0-120 | |
| 110391-04 | 00 | FWD CTR SEG | FWD CTR FACT JNT | BOTH | 240-0 | |
| 110391-05 | 00 | FWD CTR SEG | FWD CTR FACT JNT | BOTH | 120-240 | |
| 107488-04 | 00 | FWD CTR SEG | FWD CTR FACT JNT | N/A | 280 | WEATHERSEAL REMOVAL 280 DEG |
| 107488-05 | 00 | FWD CTR SEG | FWD CTR FACT JNT | N/A | 280 | WEATHERSEAL REMOVAL 280 DEG |
| 107488-06 | 00 | FWD CTR SEG | FWD CTR FACT JNT | N/A | 280 | WEATHERSEAL REMOVAL 280 DEG |
| 107488-07 | 00 | FWD CTR SEG | FWD CTR FACT JNT | N/A | 280 | WEATHERSEAL REMOVAL 280 DEG |
| 107488-08 | 00 | FWD CTR SEG | FWD CTR FACT JNT | N/A | 280 | WEATHERSEAL REMOVAL 280 DEG |
| FWD SEG | | | | | | |
| 107484-09 | 05 | FWD SEG | FWD FIELD JNT | TANG | 240-0 | FLAP, CYLINDER REGION, AND TANG |
| 107484-08 | 04 | FWD SEG | FWD FIELD JNT | TANG | 120-240 | FLAP, CYLINDER REGION, AND TANG |
| 107484-07 | 03 | FWD SEG | FWD FIELD JNT | TANG | 0-120 | FLAP, CYLINDER REGION, AND TANG |
| 107484-06 | 02 | FWD SEG | FWD FIELD JNT | TANG | 360 | INTERNAL INSULATION AND TANG |
| 107484-01 | 01 | FWD SEG | UNKNOWN | FWD DOME | 360 | FORWARD DOME AND CYLINDER REGION |

| NEG NUMBER | PHOTO CODE | SEGMENT | JOINT | SEGMENT END | DEG LOC | COMMENT |
|---|---|---|---|---|---|---|
| 110908-01 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 0-120 | |
| 110908-02 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 120-240 | |
| 110908-03 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 240-0 | |
| 110908-04 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | BOTH | 240-0 | |
| 110908-05 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | CLEVIS | | TYPICAL CLEVIS |
| 110908-06 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | CLEVIS | | RUST IN CLEVIS ROOT |
| 110908-07 | 00 | FWD SEG | FWD CYL/CYL FACT JNT | TANG | | TYPICAL TANG |
| 110929-01 | 00 | FWD SEG | FWD DOME FACT JNT | BOTH | 120-240 | |
| 110929-02 | 00 | FWD SEG | FWD DOME FACT JNT | BOTH | 240-0 | |
| 110929-03 | 00 | FWD SEG | FWD DOME FACT JNT | BOTH | 0-120 | |
| 107477-01 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 0-360 | FORWARD DOME BOSS IGNITER OVERALL |
| 107477-02 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 0-360 | FORWARD DOME BOSS IGNITER OVERALL |
| 107477-03 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 0-360 | FORWARD DOME BOSS IGNITER OVERALL |
| 107477-04 | 00 | FWD SEG | IGNITER/CASE JNT | FWD DOME | 250 | FORWARD DOME BOSS IGNITER BLOW HOLE 250 DEG (CLOSE-UP) |

***END OF REPORT***