



CRITICAL ITEMS LIST (CIL)

No. 10-03-04-24R/01

SYSTEM:	Space Shuttle RSRM 10	CRITICALITY CATEGORY:	1R
SUBSYSTEM:	Ignition Subsystem 10-03	PART NAME:	Redesigned Igniter Adapter-to-Igniter Chamber Joint, Special Bolt O-ring and Leak Check Port Plug (2)
ASSEMBLY:	Igniter Assembly 10-03-04	PART NO.:	(See Section 6.0)
FMEA ITEM NO.:	10-03-04-24R Rev N	PHASE(S):	Boost (BT)
CIL REV NO.:	N (DCN-562R1)	QUANTITY:	(See Section 6.0)
DATE:	05 Oct 2001	EFFECTIVITY:	(See Table 101-6)
SUPERSEDES PAGE:	445-1ff.	HAZARD REF.:	BI-02
DATED:	31 Jul 2000	DATE:	
CIL ANALYST:	D. J. McGough		
APPROVED BY:			

RELIABILITY ENGINEERING: K. G. Sanofsky 05 Oct 2001

ENGINEERING: K. J. Speas 05 Oct 2001

- 1.0 FAILURE CONDITION: Failure during operation (D)
- 2.0 FAILURE MODE: 1.0 Leakage of the Special Bolt O-ring and Leak Check Port Plug seals
- 3.0 FAILURE EFFECTS: Failure of the Special Bolt O-ring and Leak Check Port Plug O-ring would result in hot gas flow through the joint to the atmosphere causing burn-through, thrust imbalance and a loss of RSRM, SRB, crew, and vehicle

4.0 FAILURE CAUSES (FC):

FC NO.	DESCRIPTION	FAILURE CAUSE KEY
1.1	Nonconforming finish of sealing surfaces or contamination on sealing surfaces	A
1.2	Nonconforming material properties	B
1.3	Performance degradation due to aging	C
1.4	Damage to O-rings, threads, or sealing surfaces	D
1.5	Nonconforming dimensions	E
1.6	Improper installation of components	F
1.7	Nonconforming surface or subsurface defects in O-rings	G
1.8	Cracks, corrosion, or other material defects	H
1.9	Moisture and/or fungus degradation of elastomer	I

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5.0 REDUNDANCY SCREENS:

- SCREEN A: Fail--The Leak Check Port seal cannot be verified during mission turnaround.
- SCREEN B: Fail--No provision is made for failure detection by the crew.
- SCREEN C: Pass--The Special Bolt O-ring and Leak Check Port Plug seals cannot be lost by a single credible cause.

1. The Special Bolt O-ring and Leak Check Port Plug form part of a redundant seal system with packing with retainer. The Leak Check Port Plug will not be pressurized because it is a standby redundant to the Special Bolt O-ring. If the Special Bolt O-ring fails, the Leak Check Port Plug in addition to packing with retainer will maintain a seal. If both the Special Bolt O-ring and the Leak Check Port Plug fail, a leak path will exist and could result in loss of vehicle and crew.

6.0 ITEM DESCRIPTION:

1. Igniter Adapter-to-Igniter Chamber Joint, Special Bolt O-ring and Leak Check Port Plug (Figures 1, 2, 3, 4, 5, 6). Materials are listed in Table 1.
- 562 2. The Leak Check Port Plug is also known as the RSRM Port Plug (leak check port plug for lock/safety wire).

TABLE 1. MATERIALS

Drawing No.	Name	Material	Specification	Quantity
1U77610	Segment, Rocket Motor, Forward	Composite of Various Components		1/motor
1U77499	Igniter Assembly	Composite of Various Components		1/motor
1U77450	Adapter, Igniter	D6AC Steel	STW4-2706	1/motor
1U77538	Chamber, Igniter	D6AC Steel	STW4-2706	1/motor
1U78650	Forging, Chamber, Igniter	D6AC Steel	STW4-2706	1/motor
1U77356	Bolt, Special	MP159 High-strength Alloy	AMS-5842	4/motor
1U78676	RSRM Port Plug (leak check port plug for lock/safety wire)	Corrosion-Resistive Steel	QQ-S-763, Class 316 or AMS 5648	2/igniter
1U50228	Packing, Preformed	Fluorocarbon Rubber	STW4-3339	5/joint (1/each of 4 special bolts and 1/plug)
MS20995	Wire, Safety or Lock	302 or 304 Stainless Steel	ASTM-A-580	A/R
1U51916	Cartridge Assembly Sealant/Adhesive	Lubricating Oil and Gelling Agent	STW5-2942	A/R
	Lubricant, Air Drying	Molykote 321R Lubricant Spray	STW4-2955	A/R

6.1 CHARACTERISTICS:

1. The Special Bolt is part of the Transducer Assembly (Figures 1, 5, 6, and 7), and is located (Figure 2) on the Igniter Adapter over the inner bolt circle of the inner gasket.
2. The O-ring (Figure 4) is located at the bottom of the Special Bolt Assembly in the Igniter Chamber area. The O-ring contains hot gasses during ignition and boost.
- 562 3. The RSRM Port Plug (leak check port plug for lock/safety wire), Figure 3, is located on the Igniter Adapter flange and between the motor and Igniter seals of the inner gasket, Figure 2. If the O-ring on the Special Bolt fails, the O-ring on the leak check port plug prevents hot gasses from leaking into the atmosphere.



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7.0 FAILURE HISTORY/RELATED EXPERIENCE:

1. Current data on test failures, flight failures, unexplained failures, and other failures during RSRM ground processing activity can be found in the PRACA database.

8.0 OPERATIONAL USE: N/A

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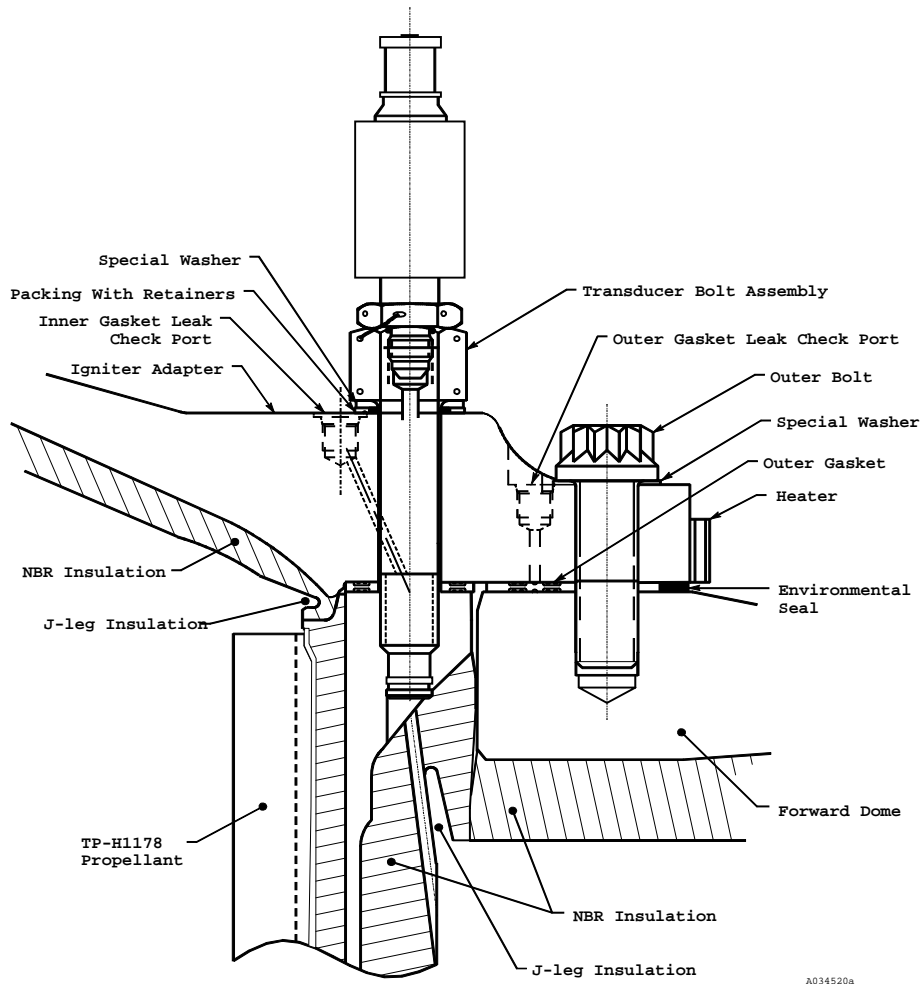


Figure 1. Installed Pressure Transducer and Special Bolt

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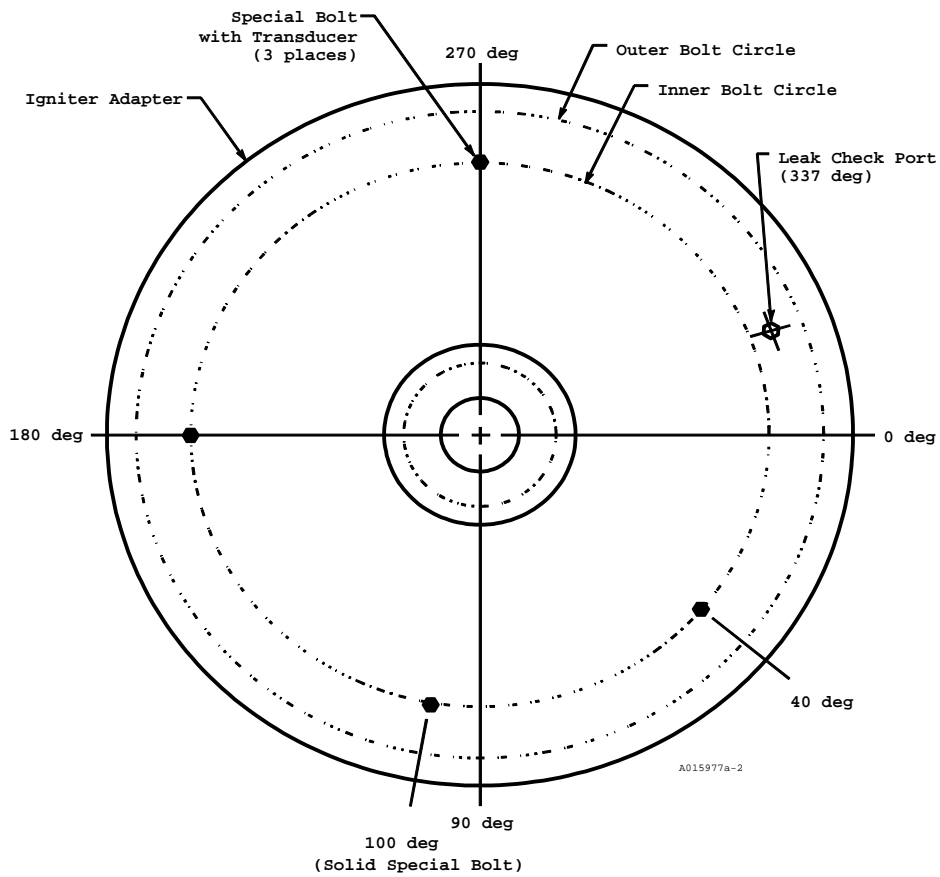


Figure 2. Special Bolt and Leak Check Port Location

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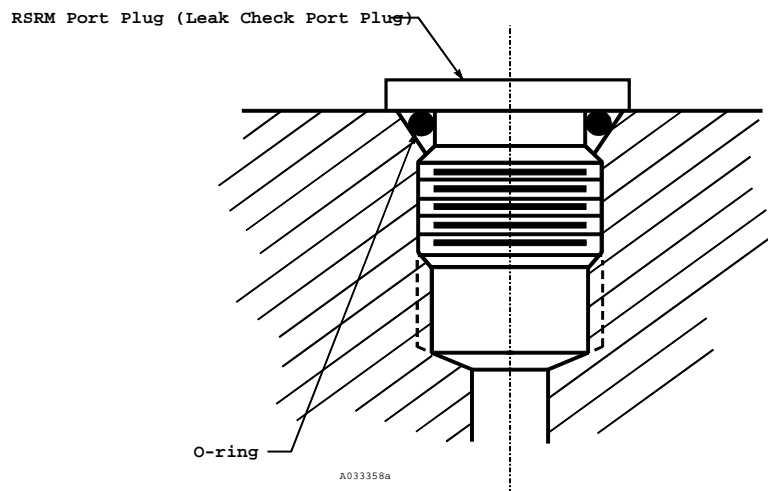
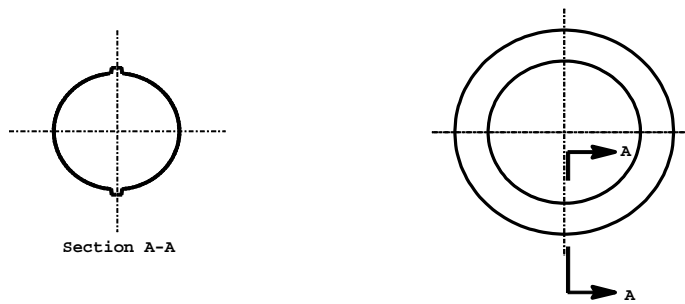


Figure 3. RSRM Port Plug

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A024758a

Figure 4. O-ring

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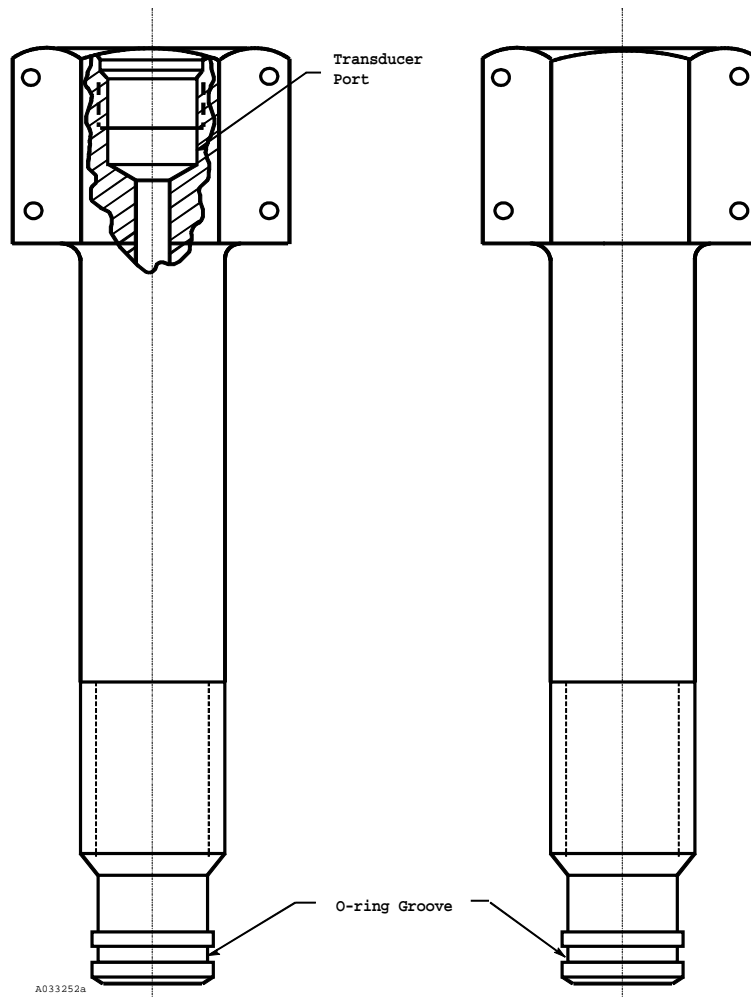


Figure 5. Special Bolt With Transducer Port and Solid Special Bolt



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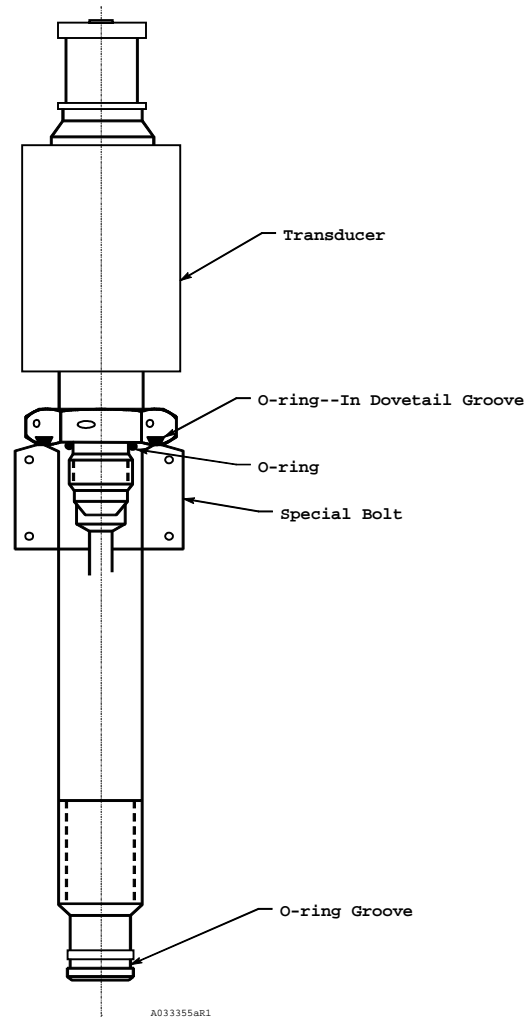


Figure 6. Transducer Bolt Assembly

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9.0 RATIONALE FOR RETENTION:

9.1 DESIGN:

DCN FAILURE CAUSES

- |                 |     |  |
|-----------------|-----|--|
| A,I             | 1.  | Igniter Adapter sealing surface finish requirements are per engineering drawings.<br>a. Refurbishment of the Igniter Adapter is performed per engineering.   |
| A,I             | 2.  | Igniter Chamber surface finish requirements are per engineering drawings.<br>a. Refurbishment of the Igniter Chamber is performed per engineering.   |
| A,I             | 3.  | Special Bolt O-ring groove surface finish requirements are per engineering drawings.   |
| A,G,I           | 4.  | Small O-ring surface quality conforms to engineering which establishes design requirements and fabrication details. The small O-ring is a one-time-use item.   |
| 562 A,I         | 5.  | RSRM Port Plug (leak check port plug for lock/safety wire) surface requirements are per engineering. The RSRM Port Plug is a one-time-use item.  |
| A,I             | 6.  | Surface finish is controlled per engineering drawings and specifications. Surface finish testing was performed on O-ring sealing surfaces for the case and nozzle. Sealing surface finish requirements in the igniter metal components are the same as the case and nozzle metal components. Results show considerable sealing margin in the current design, and more dependence on temperature than surface finish per TWR-17991. |
| A,B,D,E,F,G,H,I | 7.  | Leak check test requirements and procedures are determined per TWR-17922 and TWR-19510.  |
| A,D,F,G,H,I     | 8.  | Cleanliness of sealing surfaces to prevent contamination is controlled per shop planning, engineering, and TWR-16564.  |
| A,D,F,I         | 9.  | All sealing surfaces of Igniter Assembly components must conform to engineering drawings and specifications or they are reworked to conformity per Standard Repair.  |
| A,I             | 10. | Small O-rings are individually packaged in an opaque, waterproof, grease proof, and heat-sealed bag per engineering.   |
| 562 B           | 11. | Required torque for the RSRM Port Plug (leak check port plug for lock/safety wire) is called out per engineering drawings and specifications. This value is based on results from sealability tests documented in TWR-16964.   |
| B               | 12. | Small O-rings are high-temperature, low compression set, fluid-resistant, black fluorocarbon rubber. The small O-ring is a one-time-use item.  |
| B               | 13. | Specific criteria for O-ring material properties were determined in TWR-17367.   |
| B               | 14. | Spray lubricant Molykote 321R material requirements are per engineering.   |
| B               | 15. | Filtered grease material requirements are per engineering.   |
| C               | 16. | Cured fluorocarbon elastomer rubber age-resistant properties are very good with a maximum storage life of up to 20 years when packaged per MIL-HDBK-695.   |

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| C   | 17. Aging studies of O-rings after 5 years installation life were performed. Test results are applicable to all RSRM fluorocarbon seals. Fluorocarbon maintained its tracking ability and resiliency and was certified to maintain its sealing capability over 5 years per TWR-65546.  |
| C   | 18. Grease is stored at warehouse-ambient condition that is any condition of temperature and relative humidity experienced by the material when stored in an enclosed warehouse, in unopened containers or containers that were resealed after each use. Storage life under these conditions is per engineering.   |
| C   | 19. Aging studies to demonstrate characteristics of grease after 5 years installation life were performed on TEM-9. Results showed that grease provided adequate corrosion protection for D6AC steel, and that all chemical properties of grease remained intact per TWR-61408 and TWR-64397.  |
| C   | 20. Small O-rings are packaged and stored to preclude deterioration from ozone, grease, ultraviolet light, and excessive temperature.  |
| D,F | 21. Thiokol IHM 29 procedures describe the requirements for handling, packaging and transportation systems for the control of internal loads, stresses, or deflections preventing damage to elastomers or sealing surfaces.  |
| D,F | 22. Igniter installation requirements are per engineering as follows:  |
| 562 | <ul style="list-style-type: none"> <li>a. Igniter adapter, igniter chamber, special bolts, O-rings, RSRM Port Plug (leak check port plug for lock/safety wire), and igniter assembly mating surfaces are cleaned.</li> <li>b. Filtered grease is applied to the underside of the special bolt heads, igniter chamber, and igniter adapter sealing surfaces prior to assembly.</li> </ul> |
| D,F | 23. Prior to assembly per shop planning, all grease is removed from sealing surfaces and bolt holes using clean, dampened lint-free cloth for sealing surfaces and a soft bristled brush for bolt holes. A cotton-tipped applicator is used to clean the grooves of the Inner Gasket.  |
| E   | 24. Small O-rings conform to engineering that establishes geometric dimensions and fabrication details. The small O-ring is a one-time-use item.   |
| E   | 25. Special Bolt dimensions are per engineering drawings.  |
| E   | 26. Igniter Chamber dimensions are per engineering drawings. <ul style="list-style-type: none"> <li>a. Refurbishment of the Igniter Chamber is performed per engineering.</li> </ul>   |

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|-----------|-----|---|
| E         | 27. | Igniter Adapter dimensions are per engineering drawings.<br>a. Refurbishment of the Igniter Adapter is performed per engineering.   |
| G         | 28. | Testing and analysis of elastomers that established criteria for acceptable abrasions, grind marks, scratches, cuts, inhomogeneities, splices, repairs, substandard material, surface voids and inclusions, and internal voids and inclusions are documented in TWR-17991.  |
| 562 B,H   | 29. | RSRM Port Plug (leak check port plug for lock/safety wire) dimensions are per engineering. The RSRM Port Plug is made from stainless steel per Aerospace Material Specifications, or Federal Specifications, and is cold-worked for high strength, high toughness with reduced internal and surface stresses. The RSRM Port Plug proves to be a reliable composition for the intended use and provides a very high degree of corrosion resistance. The passivation process improves corrosion resistance properties. The RSRM Port Plug material is per MSFC specifications that designate high resistance to stress-corrosion cracking. The RSRM Port Plug is a one-time-use only. |
| H         | 30. | The Igniter Chamber and the Igniter Adapter are made of heat treated high-strength D6AC steel.  |
| H         | 31. | Refurbished Igniter Chambers and Igniter Adapters are per engineering requirements.   |
| H         | 32. | Analyses and testing to qualify the Igniter Chamber and Igniter Adapter are reported in TWR-10735, TWR-11559, TWR-61222, TWR-17265, and TWR-16874.  |
| H         | 33. | A lot acceptance test is required for each Igniter lot. A sample Igniter is fired and must meet engineering.  |
| H         | 34. | Igniter Chambers and Igniter Adapters are hydroproof tested and then magnetic-particle inspected before every use.  |
| H         | 35. | The Igniter Chamber and Igniter Adapter are included in TWR-16874. Fracture control analysis of the modified Igniter presented in TWR-16104 and TWR-16874 shows that the Igniter Chamber and Igniter Adapter may be used eight times for the conservative assumptions used. The planned number of uses is four.   |
| H         | 36. | Material Use Agreement SRM-MUA-005 is required per MSFC-SPEC-522 for the Igniter Chamber and Adapter.   |
| H         | 37. | Other materials used in this assembly are listed in Table I of MSFC-SPEC-522 that designates high resistance to stress-corrosion cracking as follows:<br>a. Special Bolts High-strength Alloy, MP159  |
| 562 H     | 38. | Inherent resistance to corrosion and stress-corrosion cracking of metal parts is augmented by the use of filtered grease. Filtered grease is applied to the underside of the bolt heads when the bolts and igniter special washers are pre-assembled, and to RSRM port plugs (leak check port plug for lock/safety wire), bolts, special washers, adapter flange, and igniter chamber interfaces after the bolts are installed and torqued.   |
| A,B,D,E,H | 39. | Igniter special bolts are acceptable for reuse if engineering requirements are met. Special bolts are considered a fracture control item per TWR-16874. The bolts are made from a high strength multiphase alloy with high fracture toughness and   |



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resistance to stress corrosion per TWR-66014. After refurbishment, the special bolts must meet the eddy current inspection criteria.

562 D,E,F

40. Port plug vibration testing, documented in TWR-73485, demonstrated that a very small amount of torque from any combination of O-ring load or thread friction is sufficient to prevent loss of port plugs during flight. In addition, port plugs on the igniter are lock/safety wired in place using the double twist method per engineering.

562 B,E

41. RSRM Port Plug lock/safety wire conforms to engineering requirements.

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9.2 TEST AND INSPECTION:

DCN	FAILURE CAUSES and TESTS (T)		CIL CODE
		1. For New Segment, Rocket Motor, Forward, verify:	
	A,D,F,G,H,I	a. Special bolt O-ring is clean and free of visible contamination prior to installation	AEG411
562	A,D,F,G,H,I	b. Leak check port, RSRM Port Plug (leak check port plug for lock/safety wire), and O-ring are cleaned prior to installation	AEG250
	A,D,F,H,I	c. Leak check ports are free of surface defects prior to plug installation	AEG250A
	A,D,F,H,I	d. Special bolts are clean and free of visible contamination prior to installation	AEG166
	A,D,F,H,I	e. Special bolt hole threads and sealing surface in the igniter chamber are clean and free of contamination and defects prior to special bolt installation	AEG092
	A,D,F,H,I	f. Igniter adapter sealing and mating surfaces are clean and free of contamination and surface defects prior to installation	AEG168
	A,D,F,H,I	g. Filtered grease is applied to the underside of the special bolt head before installation	AEG018
	A,B,D,E, F,G,H,I (T)	h. Installed transducer bolt assemblies have been leak tested at low and high pressures	AEG196,AEG195
562	C	i. RSRM Port Plug (leak check port plug for lock/safety wire) O-ring shelf life, and package container seal prior to installation	AEG119
	C	j. Special bolt O-ring shelf life, and package container seal prior to installation	AEG160
	C	k. Shelf life of filtered grease prior to application	AEG371
	D,F	l. Special bolts are installed, turned in until finger tight	AEG105
	D,F	m. Special bolts are tightened with a snug torque and angle-of-twist in the proper sequence	AEG428
562	D,F	n. Special bolts are lock/safety wired correctly using double twist method	AEG106
	D,F	o. Filtered grease is applied to the special bolt O-ring and O-ring groove	AEG243A,AEG243
	D,F	p. Molykote lubricant spray is applied to the threads of the special bolts and air dried before installation	AEG051A
	D,F	q. Filtered grease is applied to the igniter adapter sealing surfaces and bolt through holes	AEG112
562	D,F,H	r. Filtered grease is applied to the leak check port, RSRM Port Plug (leak check port plug for lock/safety wire), and O-ring	ACP070
562	D,F	s. RSRM Port Plugs (leak check port plug for lock/safety wire) are torqued correctly	AEG272
	H	t. Filtered grease is applied to all exposed bare metal surfaces of the igniter after installation	AEG028
562R1	G	u. RSRM Port Plugs (leak check port plug for lock/safety wire) are lock/safety wired correctly	SER218
		2. For New Igniter Assembly verify:	
	A,D,F,H,I	a. Igniter Chamber sealing and mating surfaces and threaded holes are clean and free of contamination and surface defects prior to installation per the igniter process finalization and installation preparation specifications	AEF224
	A,D,F,H,I	b. Igniter Adapter sealing and mating surfaces and threaded holes are clean and free of contamination and surface defects prior to installation per the igniter process finalization and installation preparation specifications	AEF218

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|-------|----|---|--------|
| D,F,H | c. | Filtered grease is applied to the Chamber sealing surface per the installation preparation specification                          | CCC016 |
| D,F,H | d. | Filtered grease is applied to the Adapter sealing surfaces and bolt through holes per the installation preparations specification | CCC017 |

3. For New Igniter Chamber, verify:

- |           |    |   |                |
|-----------|----|---|----------------|
| A,E,I     | a. | Flatness and parallelism of sealing surface         | AEC087,AEC092  |
| A,H,I (T) | b. | Magnetic-particle inspection                        | AEC139,AEC156  |
| A,H,I (T) | c. | Proof test  | AEC206,AEC207  |
| A,I       | d. | Surface finish for top sealing surface (Datum-A-)   | AEC230         |
| A,E,H,I   | e. | Vendor records are complete and acceptable          | AEC280         |
| D,E,F     | f. | Threaded holes for inner bolts                      | AEC261         |
| D,E,F     | g. | Threaded holes for Special Bolts                    | AEC262         |
| E         | h. | 8.550 dimension of view "B"                         | AEC001         |
| E         | i. | 11.100 dimension of view "B"                        | AEC001A        |
| E         | j. | 9.250 dimension of view "B"                         | AEC001B        |
| E         | k. | Circular run out in view "B"                        | AEC001C        |
| E         | l. | 1.20 dimension of view "B"                          | AEC001D        |
| E         | m. | .510 dimension of view "B"                          | AEC001E        |
| E         | n. | Bolt hole through diameter                          | AEC004         |
| E         | o. | Tap drill depth of threaded holes                   | AEC049,AEC049A |
| E         | p. | Outside diameter of sealing surface                 | AEC191         |
| E         | q. | True position threaded holes                        | AEC264         |
| E         | r. | Wall thickness--membrane area stamp VIP item number | AEC288         |
| E         | s. | Inside diameter in flange area                      | RAA117         |
| H (T)     | t. | Heat treatment                                      | AEC110,AEC115  |
| H (T)     | u. | Mechanical properties                               | AEC245,RAA048  |
| H (T)     | v. | Ultrasonic testing                                  | AEC265,AEC274  |

4. For Refurbished Igniter Chamber, verify:

- |           |    |  |        |
|-----------|----|--|--------|
| A,H,I (T) | a. | Hydroproof successful  | AEC117 |
| A,H,I (T) | b. | Magnetic-particle after hydroproof test and all indications are recorded | AEC143 |
| A,D,F,I   | c. | No unacceptable scratches, gouges, or pitting in sealing surfaces        | AEC173 |
| A,I       | d. | Surface finish for top sealing surface                                   | AEC291 |
| D,E,F     | e. | Threaded holes conform to gauging requirements                           | AEC035 |
| D,F       | f. | Threaded holes are free from contamination, damage, and surface defects  | AEC098 |
| E         | g. | Flatness and parallelism of mating surfaces                              | AEC086 |
| E         | h. | Wall thickness membrane area after hydroproof test                       | AEC287 |

5. For New Igniter Adapter, verify:

- |             |    |  |                |
|-------------|----|--|----------------|
| A,H,I (T)   | a. | Proof test   | AAS198A        |
| A,D,E,F,I   | b. | Inner Leak Check Port per MS16142 except as shown on drawing             | AAS229         |
| A,H,I (T)   | c. | Magnetic-particle inspection after proof test is complete and acceptable | AAS313A        |
| A,D,E,F,H,I | d. | Vendor records are complete and acceptable                               | AAS550         |
| D,E,F       | e. | Inner leak check port spot face depth                                    | AAS075         |
| D,E,F       | f. | Inner leak check port spot face diameter                                 | AAS376         |
| E           | g. | Flange thickness at inner bolt circle                                    | AAS006,RAA105  |
| E           | h. | Diameter of inner bolt through holes                                     | AAS076,AAS077  |
| H (T)       | i. | Chemical analysis  | AAS029,AAS323  |
| H (T)       | j. | Mechanical properties  | AAS404,RAA044  |
| H (T)       | k. | Metallurgical characteristics  | AAS404C,RAA045 |
| H (T)       | l. | Heat treatment   | AAS175,AAS177  |
| H           | m. | Material is D6AC steel   | AAS029A        |
| H           | n. | No obvious shipping or handling damage                                   | AAS343         |

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H	(T)	o.	Ultrasonic testing complete and acceptable	AAS541,RAA001
6. For Refurbished Igniter Adapter, verify:				
A,H,I	(T)	a.	Hydroproof successful	AAN008
A,D,F,H,I		b.	Sealing and mating surfaces for surface defects and surface finish	AAS107
A,D,E,F,I		c.	Sealing surfaces of leak check ports for surface defects and surface finish	AAS230
A,H,I	(T)	d.	Magnetic-particle after hydroproof test	AAS301
D,F,H		e.	Threaded holes for surface contamination, damage, surface irregularities, raised metal and scratches after hydroproof testing	AAS123
D,E,F		f.	Threaded holes conform to gauging requirements after hydroproof testing	AAS491
E		g.	Flange thickness	AAS061A
E		h.	Flatness and parallelism of sealing and mating surfaces	AAS136
E		i.	Diameter of inner bolt through holes	AAS505
7. For New Bolt, Special verify:				
A,H,I		a.	No surface discontinuities detected by dye penetrant inspection	ACC107
A,H,I		b.	Certificate of Conformance is complete and acceptable	ACC009
A,I		c.	Surface finish of O-ring groove	AAU001
D,F,H	(T)	d.	Eddy-current inspection is acceptable	CCC055
E		e.	Bolt length	ACC004
E,H		f.	External threads conform to applicable engineering	ACC130
E		g.	Inside diameter of O-ring groove	ACC059
E		h.	Outside diameter of O-ring groove	ACC060
E		i.	Width of O-ring groove	ACC089
H		j.	Material-tensile ultimate strength, tensile yield strength, and alloy	RAA086
H	(T)	k.	Ultrasonic inspection is acceptable	RAA087
H		l.	No shipping or handling damage	ACC076
562		8. For New RSRM Port Plug (leak check port plug for lock/safety wire) verify:		
A,I		a.	O-ring groove surface finish	AAB043
A,I		b.	O-ring groove sealing surface blemishes	LAA264
A,H,I		c.	No shipping or handling damage to packaging	AAB090
B	(T)	d.	Tensile strength	AAB081
B	(T)	e.	Yield strength	AAB091
B,H	(T)	f.	Plug material	AAB053
E		g.	O-ring groove width dimension	AAB047
E		h.	O-ring groove diameter dimension	AAB036
E		i.	Plug length	AAB018
E		j.	Correct thread form	AAB082
E		k.	Thread surface blemishes	LAA268
9. For New Small O-ring verify:				
A,D,E,F,G,I		a.	Surface quality	AAQ234,AAQ233
B		b.	Material is fluorocarbon rubber	AAQ157,AAQ117
B	(T)	c.	Shore A hardness	LAA001,LAA006,LAA011,LAA016
B	(T)	d.	Tensile strength	LAA002,LAA007,LAA012,LAA017
B	(T)	e.	Ultimate elongation	LAA003,LAA008,LAA013,LAA018
B	(T)	f.	Compression-set	LAA004,LAA009,LAA014,LAA019
B	(T)	g.	Tear strength	LAA005,LAA010,LAA015,LAA020
C		h.	Time from cure date to shipment	AAQ251
C		i.	Individually packaged and sealed in opaque bags; material conforming is per engineering	AAQ211



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E	j.	Inside diameter "A"	AAQ002,AAQ003
E	k.	Cross-sectional dimension "W"	AAQ004,AAQ062
E	l.	Flash dimensions	AAQ111,AAQ112

| 562 10. For New Lock/Safety Wire, verify:

B	a.	Certificate of Conformance complete and acceptable	AJV000
E	b.	Diameter	AJV005

11. For New Grease verify:

B	(T)	a.	Penetration	LAA037
B	(T)	b.	Dropping point	ANO042
B	(T)	c.	Zinc concentration	LAA038

12. For New Filtered Grease verify:

B	(T)	a.	Contamination	ANO064
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13. For New Lubricant Molykote 321R verify:

B	(T)	a.	Nonvolatile content	AMB007
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14. For Refurbished Special Bolt verify:

A,B,D,E,H	a.	Surface finish of O-ring groove	LHA901
A,B,D,E,H	b.	Surface finish of shank and bolt head bottom surface	LHA902
A,B,D,E,H	c.	External threads	LHA903
A,B,D,E,H	d.	Port threads	LHA904
A,B,D,E,H	e.	Surface finish of sealing surfaces in port area	LHA905
A,B,D,E,H	f.	Eddy current inspection is acceptable	LHA906

15. For New Igniter Chamber Forging, verify:

A,B,E	(T)	a.	Chemical analysis	AEC018,RAA047
A,B,C,E		b.	D6AC steel	AEC041
A,B,E	(T)	c.	Mechanical properties	AEC245A,RAA048A

16. KSC verifies:

562	F	a.	Lock/safety wire on the igniter adapter inner and outer bolt circles, the OPTs, and the RSRM Port Plugs (leak check port plug for lock/safety wire) to be unbroken prior to forward skirt closeout per OMRSD File V, Vol. I, B47IG0.040	OMD045
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