ATK ALLIANT TECHSYSTEMS
THIOKOL PROPULSION

CRITICAL ITEMS LIST (CIL)

No. 10-03-04-15R/01

SYSTEM:	Space Shuttle RSRM 10	CRITICALITY CATEGORY:	1R
SUBSYSTEM:	Ignition Subsystem 10-03	PART NAME:	Redesigned Igniter Adapter-to-Igniter Chamber Joint, Thermal Barrier, Motor Seal, Leak Check Port Plug (2)
ASSEMBLY:	Igniter Assembly 10-03-04		
FMEA ITEM NO.:	10-03-04-15R Rev M		
CIL REV NO.:	M	PART NO.:	(See Section 6.0)
DATE:	17 Jun 2002	PHASE(S):	Boost (BT)
SUPERSEDES PAGE:	441-1ff.	QUANTITY:	(See Section 6.0)
DATED:	5 Oct 2001	EFFECTIVITY:	(See Table 101-6)
CIL ANALYST:	D. J. McGough	HAZARD REF.:	BI-02
APPROVED BY:		DATE:	

RELIABILITY ENGINEERING: K. G. Sanofsky 17 Jun 2002

ENGINEERING: P. M. McCluskey 17 Jun 2002

1.0 FAILURE CONDITION: Failure during operation (D)

2.0 FAILURE MODE: 1.0 Leakage of the Motor Seal of the Inner Gasket and Leak Check Port Plug

3.0 FAILURE EFFECTS: Failure of the Motor Seal of the Inner Gasket and Leak Check Port Plug would result in hot gas flow through the joint to the atmosphere causing burn through, thrust imbalance and 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 elastomers, 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 elastomers	G
1.8	Cracks, corrosion, or other material defects	H
1.9	Moisture and/or fungus degradation of elastomer	I
1.10	Performance degradation due to temperature effects	J

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 Motor Seal and leak check port plug seal cannot be lost by a single credible cause.

1. The Motor Seal and leak check port plug O-ring, together, form a redundant seal for one potential leak path. The leak check port plug will not be pressurized unless the Motor Seal fails. If both the Motor Seals fail, the leak check port plug in addition to the packing with retainer will maintain a seal. If the Motor Seals and the leak check port plug fail, a leak path will exist that could result in loss of mission and vehicle.

6.0 ITEM DESCRIPTION:

1. Igniter Adapter-to-Igniter Chamber Joint, Motor Seal of Inner Gasket, Leak Check Port Plug (Figures 1, 2, 3, 4). Materials are listed in Table 1.

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, Fwd	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
1U77462	Gasket - Inner	Seal - Fluorocarbon Rubber	MIL-R-83248, Type I, Class 1	1/motor
		Retainer - 4130 Steel	MIL-S-18729	
1U78676	RSRM Port Plug (leak check port plug for lock wire)	Corrosion-Resistive Steel	QQ-S-763, Class 316 or AMS-5648	2/igniter
1U50228	Packing, Preformed	Fluorocarbon Rubber	STW4-3339	1/joint
1U51916	Cartridge Assembly Sealant/ Adhesive	Lubricating Oil and Gelling Agent	STW5-2942	A/R

6.1 CHARACTERISTICS:

1. The Motor Seal (Figures 1 and 4) is an integral part of the Inner Gasket. The Inner Gasket crown and void are shown in Figure 4. The Inner Gasket is located between the Igniter Chamber and Igniter Adapter, and is held in place by 36 bolts. The Motor Seal contains high pressure during the ignition and boost phase that prevents hot gases from escaping into the atmosphere.

2. The RSRM Port Plug (leak check port plug for lock/safety wire), Figure 2, is located on the Igniter Adapter flange and between the motor and igniter seals of the Inner Gasket.

3. The O-ring (Figure 3) is a part of the Leak Check Port Plug and helps to contain hot gasses leaking into the atmosphere if the Motor Seal of the Inner Gasket fails.

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

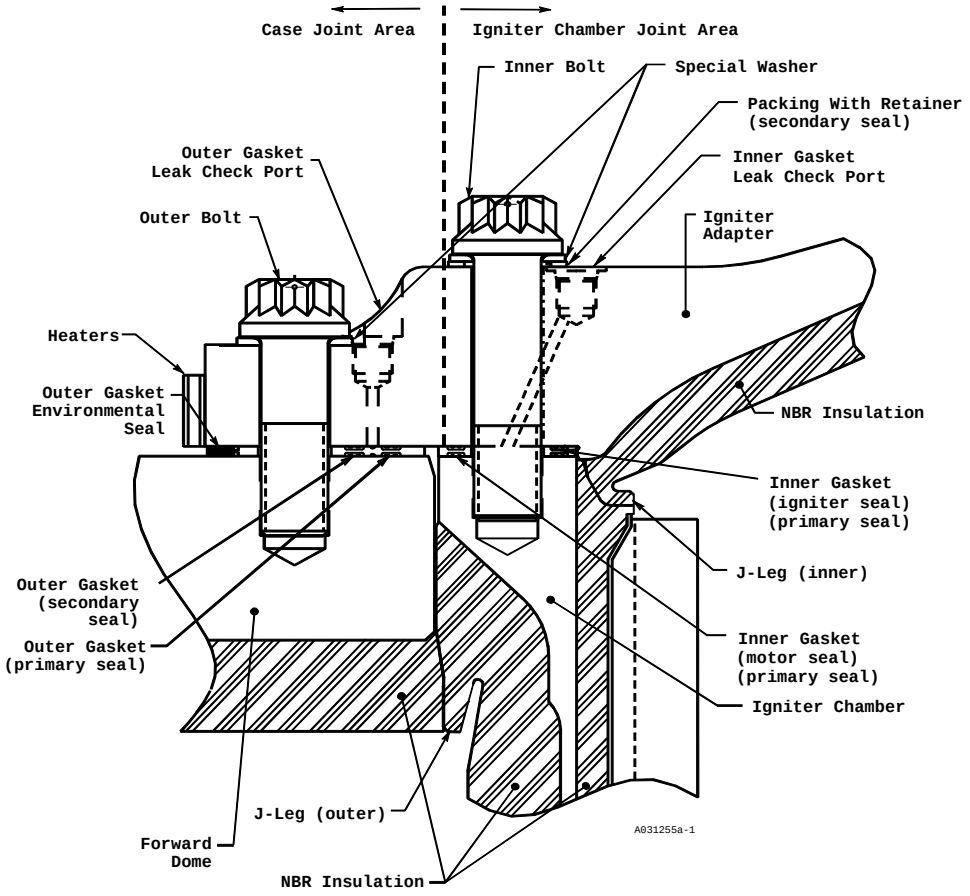

Figure 1. Igniter Adapter-to-Chamber Joint
and Igniter Adapter-to-Case Joint

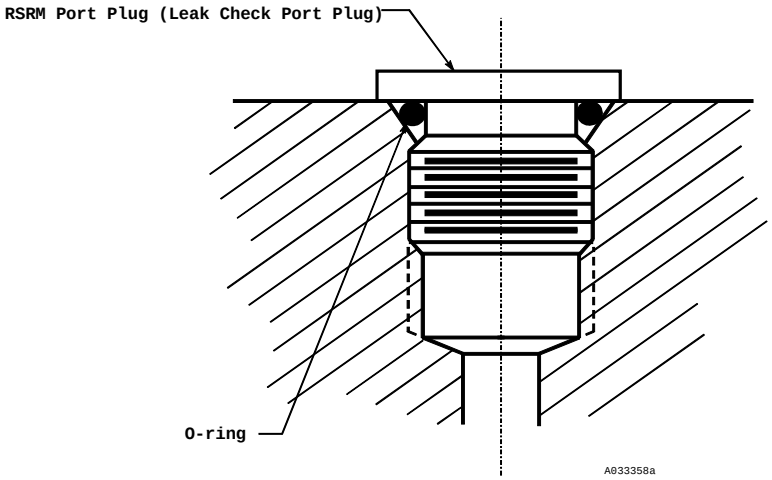

Figure 2. RSRM Port Plug

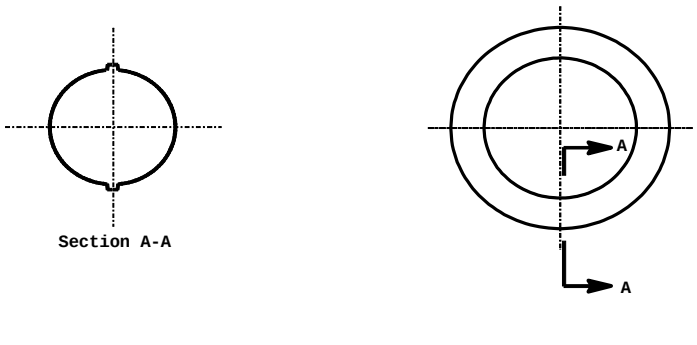

Figure 3. O-ring

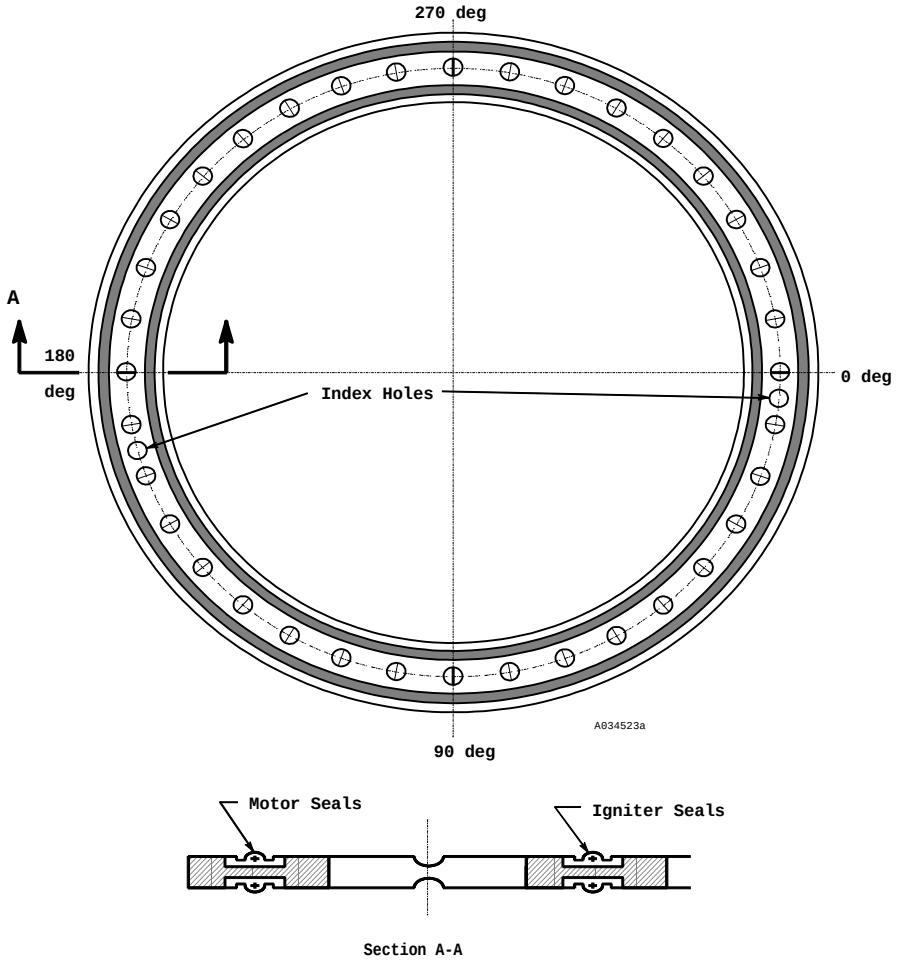

Figure 4. Inner Gasket

9.0 RATIONALE FOR RETENTION:

9.1 DESIGN:

DCN	FAILURE CAUSES		
	A	1.	Igniter Adapter sealing surface finish requirements are per engineering drawings. a. Refurbishment of the Igniter Adapter is performed per engineering.
	A	2.	Igniter Chamber surface finish requirements are per engineering drawings. a. Refurbishment of the Igniter Chamber is performed per engineering.
	A,G	3.	Inner gasket rubber seal surface quality requirements are per engineering.
	A	4.	RSRM Port Plug (leak check port plug for lock/safety wire) requirements are per engineering. The RSRM Port Plug is a one-time-use item.
	A	5.	A small O-ring is used with the RSRM Port Plug (leak check port plug for lock/safety wire). Small O-ring's surface quality is per engineering that establishes design requirements and fabrication details. The small O-ring is a one-time-use item.
	A	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 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.
585	A,D,F	9.	Prior to assembly per shop planning, all heavy-duty calcium grease is removed from the sealing surfaces and bolt holes using a clean, lint-free cloth dampened with approved solvent for sealing surfaces and a soft bristled brush for bolt holes. A piece of mylar film is used to remove excessive grease from the grooves of the igniter gasket.
	A,D,F	10.	All sealing surfaces of the Igniter Assembly components must conform to engineering drawings and specification.
	A,I	11.	Small O-rings are individually packaged in an opaque, waterproof, grease-proof, and heat-sealed bag per engineering.
	B,J	12.	The igniter inner gasket seal is fabricated from fluorocarbon rubber.
	B	13.	The RSRM Port Plug (leak check port plug for lock/safety wire) is made from stainless steel per Aerospace Material Specifications, or Federal Specifications. The RSRM Port Plug is a one-time-use item.
	B	14.	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	15.	Small O-rings are high temperature, low compression set, fluid resistant, black fluorocarbon rubber.
B	16.	Grease material requirements are per engineering.
B	17.	Criteria for nonmetallic properties were determined by TWR-17367.
B,C	18.	Tests for sealing the igniter gaskets with joint deflection were performed as outlined and reported in TWR-61388 and TWR-61400. The tests show that the sealing function is maintained for worst-case compression-set under maximum extremes of temperature and maximum deflections.
C	19.	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.
C	20.	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	21.	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 which were resealed after each use. Storage life under these conditions is per engineering.
C	22.	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 the grease remained intact per TWR-61408 and TWR-64397.
C	23.	Small O-rings are packaged and stored to preclude deterioration from ozone, grease, ultraviolet light, and excessive temperature.
D,F	24.	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 the elastomers or sealing surfaces.
D,F	25.	Igniter installation requirements are per engineering. Igniter adapter, igniter chamber, inner gasket, RSRM Port Plug (leak check port plug for lock/safety wire), and igniter assembly mating surfaces are cleaned.
E	26.	Igniter inner gasket dimensions are per engineering.
E	27.	Small O-rings are per engineering that establishes geometric dimensions and fabrication details. The small O-ring is a one-time-use item.
E	28.	Igniter Chamber dimensions are per engineering drawings.
		a. Refurbishment of the Igniter Chamber is performed per engineering.
E	29.	Igniter Adapter dimensions are per engineering drawings.
		a. Refurbishment of the Igniter Adapter is performed per engineering.
E	30.	RSRM Port Plug (leak check port plug for lock/safety wire) dimensions are per engineering. The RSRM Port Plug is a one-time-use item.

E 31. A special tool (inspection aid) was developed to visually inspect the seal foot print around the entire circumference of each new inner gasket.

G 32. Small O-ring's surface quality is per engineering that establishes design requirements and fabrication details.

G 33. 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.

H 34. 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 which designate high resistance to stress-corrosion cracking. The RSRM Port Plug is a one-time-use only.

H 35. The Igniter Chamber and the Igniter Adapter are made of high-strength D6AC steel and heat treated.

H 36. Refurbished Igniter Chambers and Igniter Adapters are per engineering.

H 37. Analyses and testing to qualify the Igniter Chamber and Igniter Adapter are reported in TWR-10735, TWR-11559, TWR-61222, and TWR-16104.

H 38. A lot acceptance test is required for each igniter lot. A sample igniter is fired and must meet requirements per engineering.

H 39. Igniter Chambers and Igniter Adapters are hydroproof tested and then magnetic-particle inspected before every use.

H 40. The Igniter Chamber and Igniter Adapter are included in TWR-16872. Fracture control analysis of the modified igniter presented in TWR-16104 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 41. A Material Use Agreement is provided per MSFC requirements for D6AC steel.

H 42. 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 bolt heads when the bolts and igniter special washers are pre-assembled, and to bolts, special washers, adapter flange, and igniter chamber interfaces after the bolts are installed and torqued.

J 43. Igniter gasket fluorocarbon elastomer resiliency and dynamic tests were performed per TWR-61388 and TWR-61400. The tests show that sealing function is maintained for worst-case compression set under maximum extremes of temperature and maximum deflections.

J 44. Inner Gasket fluorocarbon elastomer material high temperature response for compression-set and volume swell (in fluids) is covered in TWR-17367.

J 45. SRM Launch Constraints per TWR-15832 currently limit igniter joint temperature to no lower than specified per TWR-61388 and TWR-61400.

D,E,F	46.	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.
B,E	47.	RSRM Port Plug lock/safety wire conforms to engineering requirements.

9.2 TEST AND INSPECTION

DCN	FAILURE CAUSES and TESTS (T)			CIL CODE
		1.	For New Segment, Rocket Motor, Forward, verify:	
	D,F	a.	Special bolts are tightened with a snug torque and angle-of-twist in the proper sequence	AEG428
	D,F,H	b.	Leak check port, RSRM Port Plug (leak check port plug for lock/safety wire), and O-ring are cleaned prior to installation	AEG250
	D,F,H	c.	Leak check ports are free of surface defects prior to plug installation	AEG250A
	D,F,H	d.	Filtered grease is applied to the leak check port, RSRM Port Plug (leak check port plug for lock/safety wire), and O-ring	ACP070
	D,F	e.	RSRM Port Plugs (leak check port plug for lock/safety wire) are torqued correctly	AEG272
	C	f.	RSRM Port Plug (leak check port plug for lock/safety wire) O-ring shelf life, and package container seal prior to installation.	AEG119
	H	g.	Filtered grease is applied to all exposed bare metal surfaces of the igniter after installation	AEG028
	G	h.	RSRM Port Plugs (leak check port plug for lock/safety wire) are lock/safety wired correctly	SER218
		2.	For New Igniter Assembly verify:	
	A,B,D,E, F,G,H,I (T)	a.	Inner Gasket and inner bolt redundant seals are leak tested with an acceptable leak rate per the leak check specification	AEF108,AEF120
	A,D,F,H,I	b.	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	c.	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
	A,D,F,H	d.	Filtered grease is applied to the Chamber sealing surface per the installation preparation specification	CCC016
	A,D,F,H	e.	Filtered grease is applied to the adapter sealing surfaces and bolt through holes per the installation preparation specification	CCC017
	A,B,D,E, F,G,H,I (T)	f.	Packing with retainer seals are bubble tested after bolt loading per the leak test specification	AEF120A
	C	g.	Inner Gasket shelf life has not expired and package container seal was not violated prior to installation	ACS064
	C	h.	Shelf life of filtered grease has not expired prior to application	ACP075
	D,F	i.	Inner bolts are clean and free of visible contamination prior to installation per the installation specification	AEF048
	D,F	j.	Inner Gasket is free of contamination, corrosion and excess grease prior to installation per the installation preparation specification	AEF071
	D,F	k.	Inner Gasket is installed correctly (oriented and indexed properly) per the installation preparation specification	CCC090
		3.	For New Igniter Chamber, verify:	
	A,E	a.	Flatness and parallelism of sealing surface	AEC087,AEC092

A,H	(T)	b.	Magnetic-particle inspection	AEC139,AEC156
A,H	(T)	c.	Proof test	AEC206,AEC207
A		d.	Surface finish for top sealing surface (Datum-A-)	AEC230
A,E,H		e.	Supplier 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.	D6AC steel	AEC041
H	(T)	u.	Ultrasonic testing	AEC265,AEC274

4. For Refurbished Igniter Chamber, verify:

A,H	(T)	a.	Hydroproof successful	AEC117
A,H	(T)	b.	Magnetic-particle after hydroproof test and all indications are recorded	AEC143
A,D,F		c.	No unacceptable scratches, gouges, or pitting in sealing surfaces	AEC173
A		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 surface	AEC086
E		h.	Wall thickness membrane area after hydroproof test	AEC287

5. For New Igniter Adapter, verify:

A,H	(T)	a.	Proof test	AAS198A
A,D,E,F		b.	Inner Leak Check Port	AAS229
A,H	(T)	c.	Magnetic-particle inspection after proof test is complete and acceptable	AAS313A
A,D,E,F		d.	Surface finish of bottom surface (Datum -C-)	AAS458,AAS466
A,E,H		e.	Supplier records are complete and acceptable	AAS550
A		f.	Surface finish on Inner Bolt circle for packing with retainer	RAA108
E		g.	Flange thickness at inner bolt circle	AAS006,RAA105
E		h.	Inner leak check port spot face depth	AAS075
E		i.	Diameter of inner bolt through holes	AAS076,AAS077
E		j.	Outside diameter	AAS366
E		k.	Inner Leak Check Port spot face diameter	AAS376
E		l.	True position of inner bolt through holes	RAA096,RAA101
E		m.	Flatness and parallelism of bottom surface (Datum -C-)	RAA109,AAS138
E		n.	Outside diameter of alignment lip	RAA115
E		o.	Height of alignment lip	RAA116
H	(T)	p.	Chemical analysis	AAS029,AAS323
H	(T)	q.	Mechanical properties	AAS404,RAA044
H	(T)	r.	Metallurgical characteristics	AAS404C,RAA045
H	(T)	s.	Heat treatment	AAS175,AAS177
H		t.	Material is D6AC steel	AAS029A
H		u.	No obvious shipping or handling damage	AAS343
H	(T)	v.	Ultrasonic testing complete and acceptable	AAS541,RAA001

6. For Refurbished Igniter Adapter, verify:

A,H	(T)	a.	Hydroproof successful	AAN008
A,D,F,H		b.	Sealing and mating surfaces for surface defects and surface finish	AAS107
A,D,F		c.	Sealing surfaces of leak check ports for surface defects and surface finish	AAS230
A,H	(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.	Flatness and parallelism of sealing and mating surfaces	AAS136
E		h.	Flange thickness	AAS061A

7. For New Igniter Inner Gasket, verify:

A,E,G,H		a.	Primary and secondary seals for unbonds	CCC050,CCC064
A,E,G,H		b.	Primary and secondary seals for flash	CCC051,CCC065
A,E,G,H		c.	Primary and secondary seals for unacceptable flat spots on the crown	ACS096,CCC069
A,E,G,H		d.	Primary and secondary seals for abrasions	CCC054,CCC071
A,E,G,H		e.	Primary and secondary seals for flow marks	CCC057,CCC072
A,E,G,H		f.	Primary and secondary seals had the foot-print inspection performed	CCC058,CCC073
A,E,G,H		g.	Primary and secondary seals had the compression inspection performed	CCC059,CCC074
A,E,G,H		h.	Primary and secondary seals had the finger inspection performed	CCC060,CCC075
A,E,G,H		i.	Primary and secondary seals for inclusions, cuts, voids, foreign material or other irregularities	ACS139,ACS002
A,E,G,H		j.	Primary and secondary seals for undispersed materials	CCC056,CCC116
A,H	(T)	k.	Magnetic-particle testing	ACS118,ACS110
A,B,C,E,G,H		l.	Supplier records are complete and acceptable	ACS034
B,C,J		m.	Seal material is fluorocarbon rubber	ACS127
C		n.	Time between cure date and supplier shipping date	ACS178
C		o.	Each gasket is packaged and sealed in an individual bag	ACS106
E		p.	Primary and secondary seals for crown height	ACS054
E		q.	Total variation in retainer thickness	ACS206
E		r.	Groove depth	ACS102
E		s.	Groove full radius	ACS103
E		t.	Diameter of index pin through hole	ACS079B
E		u.	Diameter of bolt through holes	ACS079
E		v.	True position of bolt through holes	ACS079A
E		w.	Outside diameter of gasket	ACS078
E		x.	Metal retainer thickness	ACS109
H		y.	Voids, circumferential scratches and radial scratches in metal retainer do not exceed acceptable conditions	CCC096,ACS074
H		z.	Absence of corrosion on the metal retainer	CCC099,CCC049
H		aa.	No shipping/handling damage	RAA120

8. For Refurbished Igniter Inner Gasket, verify:

A,E,G,H		a.	Primary and secondary seals for unbonds	CCC050A,CCC064A
A,E,G,H		b.	Primary and secondary seals for flash	CCC051A,CCC065A
A,E,G,H		c.	Primary and secondary seals for unacceptable flat spots on the crown	ACS096A,CCC069A
A,E,G,H		d.	Primary and secondary seals for abrasions	CCC054A,CCC071A
A,E,G,H		e.	Primary and secondary seals for flow marks	CCC057A,CCC072A

A,E,G,H		f.	Primary and secondary seals had the foot-print inspection performed	CCC058A,CCC073A
A,E,G,H		g.	Primary and secondary seals had the compression inspection performed	CCC059A,CCC074A
A,E,G,H		h.	Primary and secondary seals had the finger inspection performed	CCC060A,CCC075A
A,E,G,H		i.	Primary and secondary seals for inclusions, cuts, voids, foreign material or other irregularities	ACS139A,ACS002A
A,E,G,H		j.	Primary and secondary seals for undispersed materials	CCC056A,CCC116A
A,B,C,E,G,H		k.	Supplier records are complete and acceptable	ACS034A
B,C,J		l.	Seal material is fluorocarbon rubber	ACS127A
C		m.	Time between cure date and supplier shipping date	ACS178A
C		n.	Each gasket is packaged and sealed in an individual bag	ACS106A
E		o.	Primary and secondary seals for crown height	ACS054A
H		p.	Voids, circumferential scratches and radial scratches in metal retainer do not exceed acceptable conditions	CCC096A,ACS074A
H		q.	Absence of corrosion on the metal retainer	CCC099A,CCC049A
H		r.	No shipping/handling damage	RAA120A

9. For New RSRM Port Plug (leak check port plug for lock/safety wire) verify:

A		a.	O-ring groove surface finish	AAB043
A,H		b.	No shipping or handling damage to packaging	AAB090
A		c.	O-ring groove sealing surface blemishes	LAA264
B	(T)	d.	Tensile strength	AAB081
B	(T)	e.	Yield strength	AAB091
B,H	(T)	f.	Plug material	AAB053
B		g.	Thread surface blemishes	LAA268
E		h.	O-ring groove width dimension	AAB047
E		i.	O-ring groove diameter dimension	AAB036
E		j.	Plug length	AAB018
E		k.	Correct thread form	AAB082

10. For New Small O-ring verify:

A,D,F,G		a.	Surface quality	AAQ234,AAQ233
B,J		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 is per engineering requirements	AAQ211
E		j.	Inside diameter "A"	AAQ002,AAQ003
E		k.	Cross-sectional dimension "W"	AAQ004,AAQ062
E		l.	Flash dimensions	AAQ111,AAQ112

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:

A,B	(T)	a.	Contamination	ANO064

13. For New Lock/Safety Wire verify:

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

14. KSC verifies:

J	a.	Igniter heaters are activated and that temperature is in compliance with NASA Launch Commit Criteria (NSTS-16007) per OMRSD File II, Vol. I, S00FA0.620	OMD012
F	b.	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