

CRITICAL ITEMS LIST (CIL)

No. 10-03-02-02R/04

SYSTEM:	Space Shuttle RSRM 10	CRITICALITY CATEGORY:	1
SUBSYSTEM:	Ignition Subsystem 10-03	PART NAME:	Redesigned Barrier-Booster Assembly (1)
ASSEMBLY:	Safety and Arming Device 10-03-02	PART NO.:	(See Table A-3)
FMEA ITEM NO.:	10-03-02-02R Rev M	PHASE(S):	Boost (BT)
CIL REV NO.:	M	QUANTITY:	(See Table A-3)
DATE:	31 Jul 2000	EFFECTIVITY:	(See Table 101-6)
SUPERSEDES PAGE:	415-1ff.	HAZARD REF.:	BI-03
DATED:	30 Jul 1999		
CIL ANALYST:	S. E. Rodgers	DATE:	
APPROVED BY:			
RELIABILITY ENGINEERING: <u> K. G. Sanofsky </u>			<u>31 Jul 2000</u>
ENGINEERING: <u> J. W. Edwards </u>			<u>31 Jul 2000</u>

- 1.0 FAILURE CONDITION: Failure to operate (B)
- 2.0 FAILURE MODE: 1.0 Rotor blocks SRM Ignition Initiator (SII) output
- 3.0 FAILURE EFFECTS: Failure to ignite one RSRM results in thrust imbalance causing loss of the RSRM, SRB, crew, and vehicle

4.0 FAILURE CAUSES (FC):

FC NO.	DESCRIPTION	FAILURE CAUSE KEY
1.1	Nonconforming dimensions/location of holes in barrier	A
1.2	Contamination blocking ports in Barrier-Rotor	B

5.0 REDUNDANCY SCREENS:

SCREEN A: N/A
SCREEN B: N/A
SCREEN C: N/A

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6.0 ITEM DESCRIPTION:

1. The output Barrier-Rotor is an integral part of the Barrier-Booster Assembly (Figures 1, 2, and 3). Materials are listed in Table 1.

TABLE 1. MATERIALS

Drawing No.	Name	Material	Specification	Quantity
1U50688	Rotor, Output Barrier	A286 CRES	AMS-5737	1/Motor
1U77383	Housing, Barrier-Booster	A286 CRES	AMS-5737	1/Motor
1U77385	Barrier-Booster Assembly S&A Device			1/Motor
1U77386	Barrier-Booster Assembly, S&A Device, Loaded			1/Motor

6.1 CHARACTERISTICS:

1. The RSRM Safety and Arming (S&A) device meets established requirements for performance, design, development, test, manufacture, and acceptance for a two-part electromechanical safety and arming device per STW3-9011.
2. The output Barrier-Rotor is an integral part of the Barrier-Booster Assembly. The output Barrier-Rotor is positioned by the Safety and Arming (S&A) device so that:
 - a. When the S&A is on "SAFE", a mechanical barrier between the initiator and the cross-over tube leading to the basket assembly inhibits firing of the RSRM Ignition System.
 - b. When the S&A is on "ARM", a connecting channel between the initiator and cross-over tube leading to the basket assembly allows firing of the RSRM Ignition System.

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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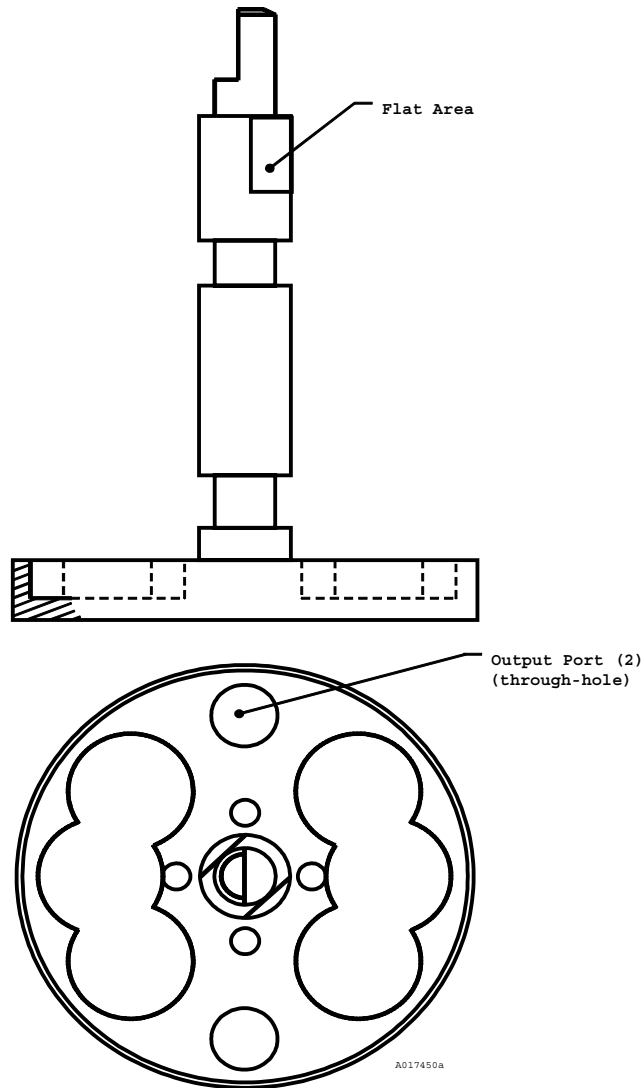


Figure 1. Output Barrier Rotor

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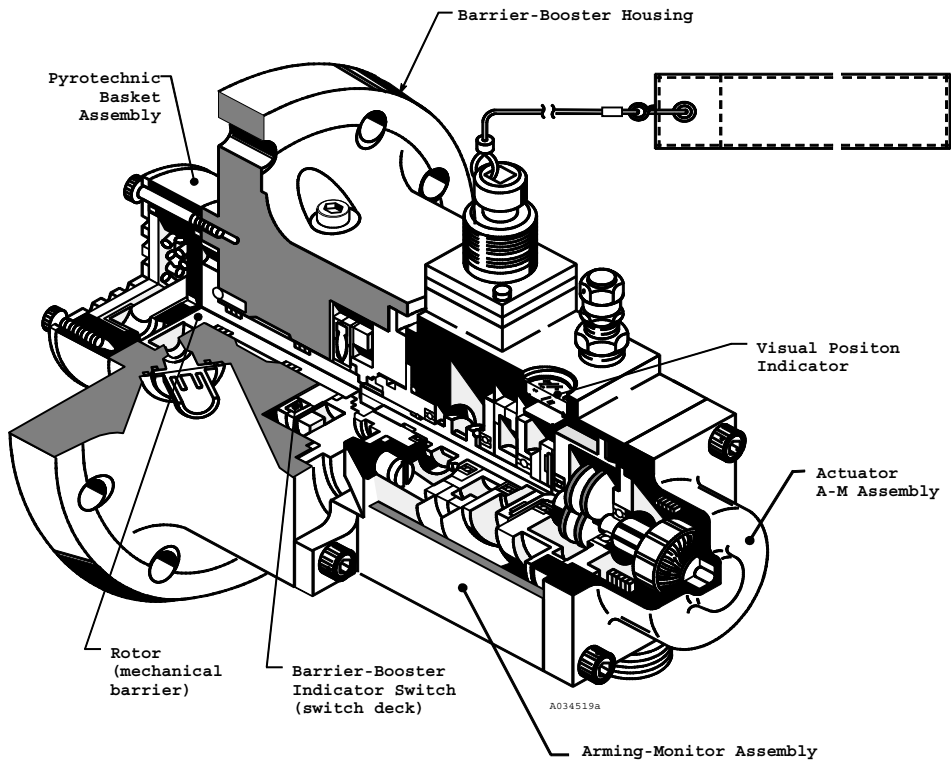


Figure 2. S&A Device

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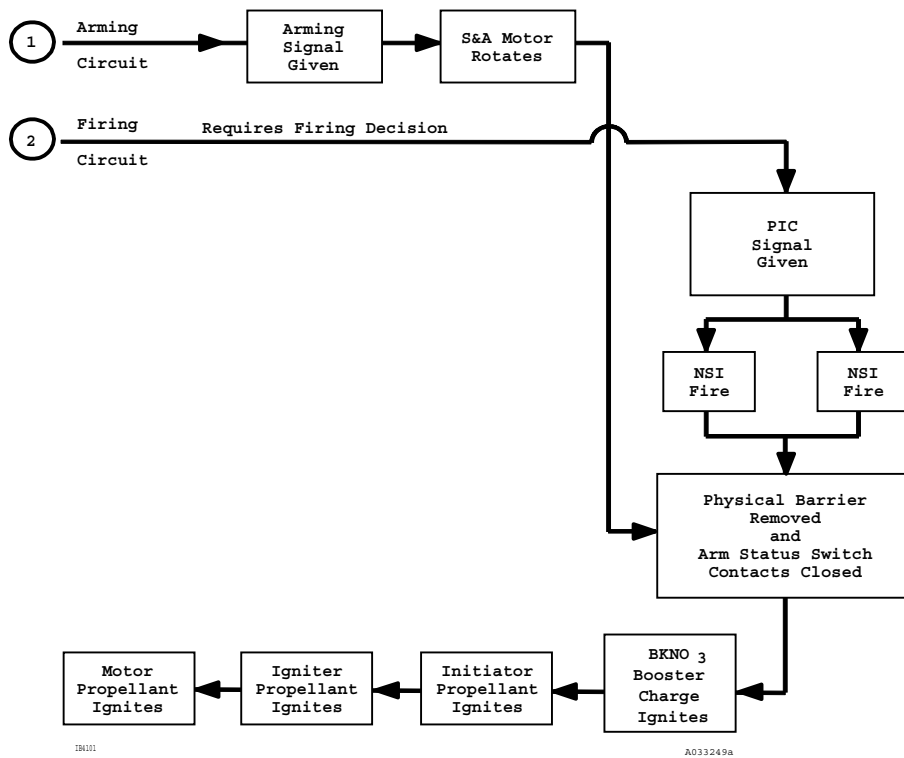


Figure 3. RSRM Ignition Subsystem Operational Sequence

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9.0 RATIONALE FOR RETENTION:

9.1 DESIGN:

DCN FAILURE CAUSES

1. New Barrier- Booster assembly is as follows:
 - B a. The Barrier-Booster Rotor is cleaned per engineering drawings.
 - B b. Threaded protectors are installed in the SII holes, two places.
 - B c. A shipping cover is installed over the rotor per engineering drawings.
 - B d. Procedures and requirements for cleanliness and contamination control are established per engineering drawings.
2. Refurbishment of the Barrier-Booster Assembly is as follows:
 - A,B a. Refurbishment of the Barrier-Booster Assembly, of which the rotor is a component, is per engineering and acceptance criteria.
 - B b. Procedures and requirements for cleanliness and contamination control are established per engineering drawings.
3. Reusable components of the Barrier-Booster Assembly including the rotor are reassembled to the assembly from which they came at refurbishment per engineering drawings.

A
4. Rotor dimensions are controlled per engineering drawings.

A

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9.2 TEST AND INSPECTION:

<u>DCN</u>	<u>FAILURE CAUSES and TESTS (T)</u>	<u>CIL CODES</u>
	1. For New Barrier-Booster Assembly, Loaded, verify:	
B	a. Prior to mating, area of Barrier-Booster Assembly that mates with Pyrotechnic Basket is cleaned	ADA017
B	b. Environmental seals in place and undamaged	ADA035
B	c. Initiators are free of damage and contamination prior to installation	ADA048
	2. For New Barrier-Booster Assembly, verify:	
A,B	a. Through holes in rotor fully aligned with initiator ports in Barrier-Booster assembly in full "ARM" position	ACZ170
B	b. Barrier-Booster Assembly for absence of foreign material in through holes in the full "ARM" position	DAA017
	3. For Refurbished Barrier-Booster Assembly, verify:	
B	a. Barrier-Booster housing cleaned of carbon deposits	ACY009
B	b. Barrier-Booster housing cleaned of lubricant	ACY010
A,B	c. Barrier-Booster housing cleaned of other contaminants	ACY011
B	d. Through holes in rotor fully aligned with initiator ports in Booster-Booster assembly in full "ARM" position	ACZ171
B	e. Barrier-Booster Assembly for absence of foreign material in through holes in the full "ARM" position	DAA017A
	4. For New Barrier-Booster Rotor, verify:	
A	a. Diameter of two through holes	ABG016
A	b. True position of two through holes in rotor	ABG003,DAA043
	5. For Refurbished Barrier-Booster Rotor, verify:	
A,B	a. Rotor inspected and refurbished	ABG048
B	b. Rotor was cleaned	ABG049