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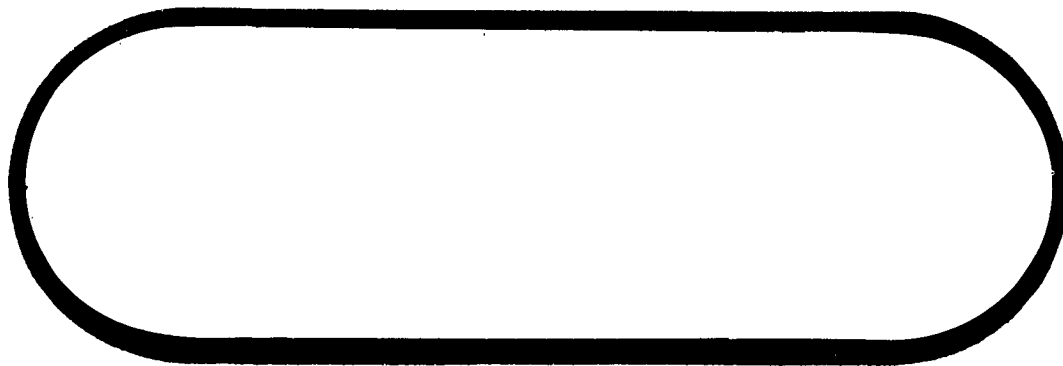


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TITLE QUALIFICATION TEST REPORT FOR MODEL SPECIFICATION S-133-111-1-9 AND QUALIFICATION SUPPLEMENT I, ACTUATING AND LOCKING MECHANISM, LAUNCHER CLOSURE

MODEL NO. WS-133A CONTRACT NO. AF04(647)-289

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QUALIFICATION TEST REPORT  
FOR MODEL SPECIFICATION S-133-111-1-9  
AND QUALIFICATION SUPPLEMENT I THEREOF,  
ACTUATING AND LOCKING MECHANISM, LAUNCHER CLOSURE

1. SCOPE - This qualification report, which is associated with the respective basic specification (S-133-111-1-9, D2-7256) and qualification supplement (D2-7256-1), covers the qualification testing of the Actuating and Locking Mechanism, ATU-26/E. Also covered is the certification of full compliance with the qualification requirements of the foresaid supplement.

2. GENERAL INFORMATION

2.1 References

2.1.1 Basis of Report - The complete basis of this qualification test report is derived from the following non-government documents and drawings.

The Boeing Company

10-20969 Rev. H	30 January 1963	Source Control Drawing, Actuating Assembly - Launcher - Closure
D2-7256	4 May 1962	Model Specification, Actuating and Locking Mechanism, Launcher Closure (S-133-111-1-9)
D2-7256-1	9 August 1962	Supplement I to Model Specification S-133-111-1-9, Qualification Requirements and Test Methods, Actuating and Locking Mechanism, Launcher Closure

(Application for copies should be addressed to The Boeing Company, Aero-Space Division, P.O. Box 3985, Seattle 24, Washington)

2.1.2 Referenced test reports and other documents - The following non-government documents, publications, drawings, and test reports, of the exact issue shown, form a part of this qualification test report to the extent stated herein:

NOTE: All qualification test reports and data by vendors of the Contractor are available to the procuring activity in files maintained by The Boeing Company, Aero-Space Division, Minuteman, P.O. Box 3985, Seattle 24, Washington

### 2.1.2.1 The Boeing Company

#### Documents

D2-5959	5 February 1963	Functional Test Procedures - Launcher - Closure Actuating and Locking Mechanism and its Major Components
D2-9569 Vol. II, Sec. VIII	30 April 1962	Launcher Closure and Actuating Mechanism Function Integration Test - WDO4
D2-9569 Vol. II, Sec. IX	2 November 1962	Interference Test, Launcher Closure Actuating and Locking Mechanism - WDO4.1
D2-9978 Vol. XXVII	18 October 1962	Reduced Data Report - STP III H&D Test WA 01
T2-2076	15 February 1963	Shock Test - Talley Industries Actuator and Gas Generator Assy.

#### Drawings

29-18553	29 August 1962	Cable Assy - Launcher Closure and Locking Mechanism
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(Copies of the above documents may be obtained as noted in 2.1.1)

### 2.1.2.2 Talley Industries

#### Reports

TPR 5084	2 February 1962	Preproduction Test Report for Actuating Assy - Ballistic - Launcher - Closure
TPR 5002 Rev. F	28 September 1962	Acceptance Test Procedure for Actuator, Launcher Closure

### 2.1.2.2 Talley Industries (Continued)

#### Reports (Continued)

TPR 5001 Rev. D	27 December 1961	Preproduction Test Procedure for Actuator and Gas Generator Assy
TPR 5146	11 January 1963	Qualification Test Report for Cartridge

#### Drawings

5290	6 December 1961	Cartridge Assembly
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(Application for copies should be addressed to Talley Industries, Mesa, Arizona.)

### 2.1.2.3 Tucson Engineering Laboratory

#### Documents

2126.0220/20	1 February 1962	Phase I Report, Pre-production Tests of Actuator Assembly and Gas Generator Assembly
2126.0220/20	17 July 1962	Supplement to Pre-production Tests of Actuator Assembly

(Application for copies should be addressed to Tucson Engineering Laboratory, Aeronautical Systems Division, Hughes Aircraft Company, Tucson, Arizona.)

2.2 Qualification Requirements - The qualification requirements for the Actuating and Locking Mechanism, Launcher Closure are stated in Section 3, "Qualification Requirements", of the qualification supplement (D2-7256-1) which includes coverage of the configuration, performance, environments, and other features of the articles subject to qualification testing.



## 2.2 (continued)

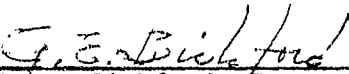
Correlation is provided between the above noted qualification requirements and the qualification test reporting contained in Section 4 herein, by means of a cross reference (Table I). A certification of full compliance with the requirements of Section 3 of the qualification supplement is provided on page 5.

2.3 Nature of Qualification Test Report - This qualification report is in summary form for each requirement and test, under the consideration that savings in the processing of reports and data are involved. Summarization is presented in Table I, "Summarization and Cross Reference Chart". All items listed in Table I have fully complied with the requirements of Supplement I to the basic specification.

Additional information or data is included in the case of any test which is considered marginal relative to fulfilling the respective requirements. References to subsidiary detailed reports and data are included.

3.0 CERTIFICATION OF QUALIFICATION

I hereby certify that the Actuating and Locking Mechanism,  
Launcher Closure, Boeing Part No. 25-23712-27, Figure A 1280  
has been tested as reported herein, and in my opinion has  
evidenced full compliance with the qualification requirements  
of Section 3 of Supplement I, dated 9 August 1962 of Model Specification  
8-133-111-1-9, dated 4 May 1962.

  
G. E. Bickford, Group Supervisor,  
Umbilical Retract System Design Group  
Minuteman, Aero-Space Division  
The Boeing Company  
Seattle, Washington

#### 4. QUALIFICATION TEST REPORT

4.1 Examination of Product - The Actuating and Locking Mechanism, Launcher Closure was examined for conformance to the drawing requirements applicable to the part number specified in 3.3 of the basic specification, the requirement being based on 3.2 of the qualification supplement. The equipment was found to be in compliance with the requirements.

4.2 Performance Tests - The performance tests and procedures are summarized in Table I as noted in 2.3 herein. The referenced test reports\* for the actuator assembly are primarily those of the vendor-manufacturer, Talley Industries. Also referenced are subsidiary reports\*\* by Tucson Engineering Laboratory under subcontract with the vendor-manufacturer. The referenced qualification data for the complete actuating and locking mechanism, and major components other than the actuator assembly, are those of the contractor, The Boeing Company.

Document D2-5959 and respective reports of tests performed and Drawing 29-18553 (against which quality control inspection was performed) are referenced (2.1.2.1 herein) to establish proof of compliance of the major components of the actuating and locking mechanism, except the actuator assembly, with the qualification requirements of Supplement I to the basic specification. The procedures listed in the aforementioned data are similar to the extent that compliance with the functional test requirements is considered as proof of compliance with the qualification test requirements, and additional testing is not necessary. All components listed in Table I, referenced to D2-5959 and Drawing 29-18553 have successfully completed functional testing as required.

\* Including Talley Industries report TPR 5001, Rev. D.

\*\* Tucson Engineering Laboratory reports 2126.0220/20 dated 1 February 1962, and 2126.0220/20 dated 17 July 1962.

TABLE I  
(SUMMARIZATION AND CROSS REFERENCE)

Correlation of this Qualification Report D2-7256-2  
with the Requirements of Qualification Supplement I  
(D2-7256-1) to Model Specification S-133-111-1-9  
(D2-7256)

NOTE: The Qualification Supplement specifies that the design and test requirements be in accordance with 3.3 and 3.4 of the basic specification. Test methods are specified to be in accordance with 4.3 and 4.4 through 4.4.6 of the basic specification, except 4.4.3.1.5.2.4. In addition, the qualification supplement specifies test requirements and test methods for tactical opening, operation after simulated nuclear overburst and humidity tests of the Gas Generator Assembly.

Requirements and test methods are referenced in the following tabulation.

T A B L E I

S-133-111-1-9		S-133-111-1-9		S-133-111-1-9	
Basic Spec.		Basic Spec.		Basic Spec.	
Qualification Test		Qualification		Qualification	
Requirement Suppl.		D2-7256		D2-7256	
Requirement	Test	Test Title	Document	Accomplished	Test
				Paragraph	Comments
3.3	3.4.1.1	Lock Retract	D2-5959	6.3 Sec.	2
3.3	3.4.1.2	Lock Reseat	D2-5959	6.3 Sec.	2
3.3	3.4.2.1	Recker Arm Retr.	D2-5959	6.4 Sec.	2
3.3	3.4.2.2	Piston Ext.	D2-5959	6.4 Sec.	2
3.3	3.4.3	Cable Assy.	29-18533	See Dwg.	3
3.3	3.4.4.1	Burst Press.	TPR 5084	5.3	6
3.3	3.4.4.2	Piston Pos. Press.	TPR 5084	5.2	6
		Piston Pos. Proof	TPR 5002	3.2.4	3
		Power Req'd	TPR 5084	5.1	2
		Friction	TPR 5002	3.3.4	3
		Ult. Lead	TPR 5084	5.3	6
		Stroking	TPR 5002	3.3.4	3
		Circuit Resist.	TPR 5084	4.1.2	2
		Dielectric Str.	TPR 5084	4.1.3	2
		Insul. Resist.	TPR 5084	4.1.4	2
		No Fire	TPR 5084	4.1.5	2
		Elect. Disch.	TPR 5084	4.1.6	2
		Voltage & Curr. Sens.	TPR 5084	4.1.7	2
		All-Fire	TPR 5084	4.1.8	2
		Altitude	TPR 5146	3.6	4
		Stabilized Cond.	TPR 5146	3.4.5.	4
		Gradient	TPR 5146	3.5	4
		Performance	TPR 5146	3.3.	4
		Performance Limits	TPR 5146	3.3.	4
		Power	TPR 5146	3.3.	4
		Maintenance	TPR 5002	3.2.4	3
		Temperature	TPR 5146	3.7.	4
		Altitude	TPR 5146	3.4.3	4
		Vibration	TPR 5084	4.2.3. & 5.5	5
		Sand and Dust	TPR 5146	3.4.2	4
			TPR 5084	5.4.2	5

TABLE I (continued)

S-133-III-1-9 Basic Spec. Qualification Test Requirement D2-7256-1	S-133-III-1-9 Basic Spec. Qualification D2-7256 Requirement	Test	Test Title	Test Accomplished		Comments
				Document	Paragraph	
3.4	3.5.1.6	4.4.3.1.4	Shock	TPR-5084	5.6	6
3.4	3.5.1.7	4.4.3.1.5.4	Life	T2-2076		4
3.4	3.5.2.1	4.4.3.2	Temperature	TPR-5146	3.7	4
3.4	3.5.2.2	4.4.3.2	Altitude	TPR 5146	3.6	4
4.1			Humidity	TPR 5146	3.6	4
4.2			Tactical Opening	TPR 5146	3.4.4	4
4.3			Op. Aft. Sim. Nucl. Blast	TPR 5084	4.2.5	5
				D2-9978		6
				Vol. XXVII		
				D2-9569, Vol. II		
				Sect. VIII & IX		

1 A cross reference of Boeing Part Numbers and Talley Industry Part Numbers is shown on Table 2.

2 Tests were conducted on a 10-20969-6 Cartridge that is similar to the 10-20969-15 Cartridge delivered as part of 25-23712-27. (See Table 2)

3 These are acceptance tests performed on each individual delivered item.

4 These tests were performed on a 5290-3 Cartridge that is similar to a 10-20969-15 Cartridge. (See Table 2)

5 These tests were performed on a 10-20969-3 Gas Generator

6 These tests were performed on a 10-20969-3 Gas Generator and 10-20969-4 Actuator

TABLE I (continued)

S-133-111-1-9 Basic Spec. Qualification Test Requirement	S-133-111-1-9 Basic Spec. Qualification D2-7256	Test Title	Test		Comments	
			Requirement	Test		
3.4	3.5.1.6	4.4.3.1.4	Shock	TPR-5084 T2-2076	5.6	6
3.4	3.5.1.7	4.4.3.1.5.4	Life	TPR-5146	3.7	4
3.4	3.5.2.1	4.4.3.2	Temperature	TPR 5146	3.6	4
3.4	3.5.2.2	4.4.3.2	Altitude	TPR 5146	3.6	4
4.1			Humidity	TPR 5146	3.4.4	4
4.2			Tactical Opening	TPR 5084	4.2.5	5
4.3			Op. Aft. Sim. Nucl. Blast	D2-9978 Vel. XXVII D2-9569, Vol. II Sect. VIII & IX		6

1 A cross reference of Boeing Part Numbers and Talley Industry Part Numbers is shown on Table 2.

2 Tests were conducted on a 10-20969-6 Cartridge that is similar to the 10-20969-15 Cartridge delivered as part of 25-23712-27. (See Table 2)

3 These are acceptance tests performed on each individual delivered item.

4 These tests were performed on a 5290-3 Cartridge that is similar to a 10-20969-15 Cartridge. (See Table 2)

5 These tests were performed on a 10-20969-3 Gas Generator

6 These tests were performed on a 10-20969-3 Gas Generator and 10-20969-4 Actuator

T A B L E 2

Boeing Part No.	Talley Industries Part No.	Nomenclature	Configuration
10-20969-6	5290	Cartridge	The 5290 Cartridge did not satisfactorily complete the accelerated aging part of the qualification test. The 5290-3 Cartridge using a new propellant was retested and satisfactorily passed all qualification tests. During the qualification test, the housing threads were staked to prevent motion of the Housing relative to the Propellant Case. Also, during the test, a new 90047-1 Shorting Cap was installed on the Firing Head Assy replacing the old Shorting Cap. At the completion of the qualification test, the 5290 Cartridge drawing was changed to show a new 5290-9 Cartridge, which reflects the above changes made on the 5290-3 Cartridge during the qualification test.
None	5290-3	Cartridge	
10-20969-15	5290-9	Cartridge	
10-20969-3	2100-14	Gas Generator	The 10-20969-3 Gas Generator used a 5290 Cartridge. The 10-20969-14 Gas Generator used a 5290-9 Cartridge. The 10-20969-3 and 10-20969-14 are otherwise identical.
10-20969-14	2100-27	Gas Generator	
10-20969-4	4300-11	Actuator	
10-20969-7	2100-16	Mounting Kit	



5. NOTES

5.1 Relative to any reference in the test reports listed in Table I to "preproduction tests", such reference is construed as "qualification tests".