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MOTOR FOR A SPACE SHUTTLE BOOSTER. APPENDIX
B: TYPICAL COMPONENT RECERTIFICATION TEST
PROCEDURES Final Report (Aerojet Solid
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STUDY OF SOLID ROCKET MOTOR
FOR A
SPACE SHUTTLE BOOSTER

FINAL REPORT

APPENDIX B
TYPICAL COMPONENT
RECERTIFICATION TEST PROCEDURES

Report 1917-FR1 CR-123686

15 March 1972



aerojet solid propulsion company

P. O. BOX 13400 SACRAMENTO, CALIFORNIA 95813 • A DIVISION OF AEROJET-GENERAL

Report 1917-FR1

**STUDY OF SOLID ROCKET MOTOR
FOR A
SPACE SHUTTLE BOOSTER**

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**APPENDIX B
TYPICAL COMPONENT
RECERTIFICATION TEST PROCEDURES**

Contract NAS8-28428

**Data Procurement Document 314
Data Requirement MA-02**

15 March 1972

Prepared for:

**George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812**



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A DIVISION OF AEROMET GENERAL 

I. FLEXSEAL ASSEMBLIES

Install flexseal assembly into test fixture and connect load application and pressurization systems. Pressurize cavities in accordance with acceptance test procedure and conduct proof and leak check of assembly. With the assembly in the pressurized condition, conduct a 5-cycle functional test on each assembly observing and recording deflection and force data. Depressurize assembly, install locking fixture and remove flexseal from test fixture. Perform "accept/reject" analysis of test data and complete necessary documentation. Forward test data to Documentation Center and ship flexseal assembly to Manufacturing (accepted parts) or to supplier (rejected parts) for rework, repair, or replacement.

II. TVC ACTUATORS

Install actuator assembly onto hydraulic test bench. Perform visual inspection of all external surfaces for evidence of damage. With actuator disconnected from force measuring system, connect hydraulic supply (GTU) to actuator and apply 3000 psi to both sides of actuator. Hold for 90 sec and record any evidence of piston creep. Attach rod end of actuator to force measuring (calibration) system. Apply 3000 psi first to "extend" side of actuator and then to "retract" side of actuator. Record actuator output forces on Acceptance Test Data Sheet. Visually inspect actuator for evidence of seal leakage. Check and verify all threaded parts for required torque values. Proceed as described in previous task.

III. HYDRAULIC SUPPLY SYSTEM

Install hydraulic supply package onto hydraulic test bench. Perform visual inspection of all external surfaces for evidence of damage. Connect drain line to supply package outlet port and drain all hydraulic fluid from

supply package. Flush, clean and vacuum dry supply system prior to refilling with MIL-0-5606 hydraulic fluid. Attach electrical power cable to 28 VDC supply. Connect pressure and return ports of supply system to flow and pressure measurement system of test bench. Activate 28 VDC supply power switch and circulate oil through measurement system for a period of 2 min. Record oil pressure and flow parameters. Proceed as in flexseal test description.

IV. TVC ELECTRONIC CONTROL UNIT

Perform visual inspection of control unit for evidence of damage. Install package onto TVC test set console and proceed with electrical calibration and recertification to acceptance standards. Proceed as in previous test descriptions.

V. FLIGHT INSTRUMENTATION SYSTEM

Install components on test bench and perform visual inspection for evidence of damage or deterioration. Connect flight instrumentation transducers, signal conditioning equipment and associated cables to the specified positions on the test set, instrumentation. Perform electrical continuity checkout of all circuits and record signal-to-noise ratio data. Connect sensing element of flight transducer to a NBS traceable secondary standard. Perform total system calibration and recertification in accordance with acceptance test procedure. Analyze test data for "accept/reject" criteria. Discard any cable harnesses which do not test to original equipment specifications; repair and retest other components as required for recertification.

VI. ORDNANCE SYSTEM ELECTRONICS

Install ordnance distribution and logic unit on test bench and connect to test set, ordnance. Perform acceptance tests as described for original equipment. Verify proper safe, arm, charge and firing functions of each initiator command module. Proceed as described in previous test descriptions.

VII. HYDROTEST AND RECERTIFICATION OF SRM CASE SEGMENTS

Install each case segment into the hydrotest facility. Attach acoustic emission monitoring transducers at locations described in the 156-in.-dia SRM case segment acceptance test procedure. Connect transducers to acoustic emission console and perform pretest calibrations.

Fill case segment with an approved low viscosity non-flammable hydraulic oil and pressurize to 110 percent of MEOP while recording and monitoring acoustic emission data. Depressurize case segment and drain fluid. Establish and maintain an acceptance certification documentation file on each individual case segment. Prepare acceptance documents on the hydrotested segments and return segments to Manufacturing for insertion into motor manufacturing pipeline. In the event of indication of incipient failure during hydrotest, vent pressure, drain fluid and remove segment to NDT area for examination.