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PERFORMANCE SPECIFICATION

ACTUATOR, LINEAR, ELECTROMECHANICAL

This specification is approved for use by the Naval Air Systems Command and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for the manufacture and inspection of one type of electromechanical linear actuator. The test limits in this specification define minimum acceptable capabilities.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

MIL-T-7743	Testing, Store Suspension and Release Equipment, General Specification For

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division Lakehurst, Code 4.1.2, Mail Stop 120-3, Route 547, Joint Base MDL, NJ 08733-5100 or emailed to michael.sikora@navy.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

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DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-704	Aircraft Electric Power Characteristics
MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-454	General Guidelines for Electronic Equipment
MIL-HDBK-1250	Corrosion Prevention and Deterioration Control in Electronic Components and Assemblies

(Copies of these documents are available online at http://quicksearch.dla.mil or https://assist.dla.mil.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Design and construction. The design and construction of the actuator shall be in accordance with the requirements specified herein. The actuator shall be capable of meeting all the requirements of this specification after undergoing a room temperature shelf life of 48 months. There shall be no repair of the actuator permitted to meet this requirement.

3.2.1 Materials. The materials shall be entirely suitable for the purpose intended. Materials shall be selected on the basis of strength, workability, and compatibility with other materials in the item so as to minimize galvanic action (see MIL-HDBK-1250). Mounting interfaces shall be constructed of materials that are compatible with the cadmium plated steel pin pivots and stainless steel nuts on the actuating ram.

3.2.2 Finishes. Finishes shall be applied to all materials, whenever applicable, and shall be entirely suitable for the purpose intended, such as corrosion resistance and increased durability.

3.2.3 Surface texture. Surface texture shall not exceed 250 microinches (6.35×10^{-8}

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centimeters) and there shall be no sharp edges or burrs.

3.2.4 Interchangeability. All actuators having the same part number shall be internally and externally identical.

3.2.5 Identification of parts. All parts shall be marked as specified on the applicable drawing or in accordance with MIL-STD-130, if not specified on the drawing.

3.2.6 Nameplates. Identification and wiring schematic plates for actuators shall be in accordance with the applicable drawing for the actuator being procured.

3.2.7 Envelope.

3.2.7.1 Dimensions. The actuator envelope dimensions shall be in accordance with the applicable drawing for the actuator being procured.

3.2.7.2 Electrical interface. The actuator cable interface shall be in accordance with figure 1.

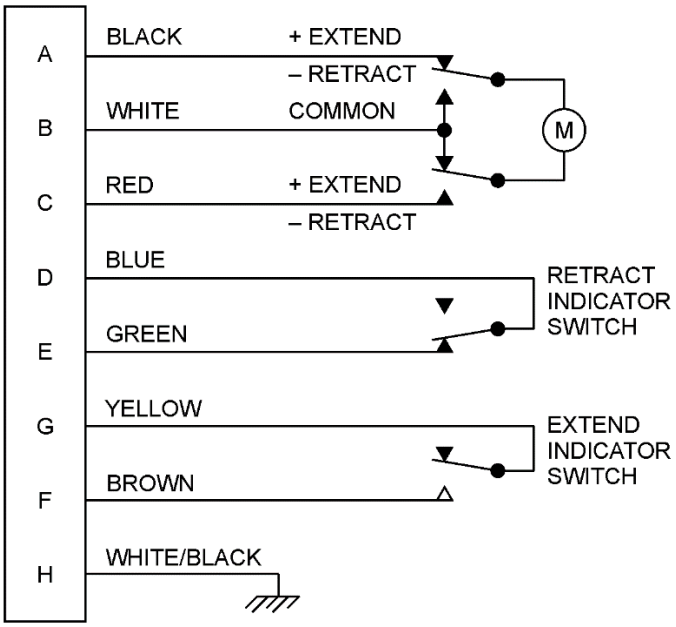

FIGURE 1. Actuator schematic diagram.

3.2.8 Weight. The maximum weight of the actuator shall be 1 pound (0.4536 kilogram).

3.2.9 Lubrication. If lubricants are used, they shall not be of a toxic nature or of such a nature to cause injury to personnel.

3.2.10 Manual operation. The actuator shall incorporate provisions for a manual operation. The ratio of turns of the manual input shaft to the actuating ram stroke shall be a maximum of 20 turns of manual input shaft rotation for linear movement of output shaft from fully extended to fully

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retracted position. The torque required to manually operate the actuator shall be a maximum of 10 inch pounds (1.1 N·m).

3.2.11 Input power requirements. The rated voltage of the actuator shall be 28 volts direct current (Vdc). The actuator shall operate from a 28 Vdc power source with the characteristics and limits defined in MIL-STD-704, except that the actuator shall operate over a range of 18 to 30 volts with a normal operating load applied.

3.2.12 Electromagnetic interference control. The electrical portion of the system shall be designed for electromagnetic-interference-free operation in accordance with 4.5.6.

3.2.13 Operating stroke. The operating stroke shall be as specified in the applicable drawing for the actuator being procured.

3.2.14 Manual torque. The torque required to manually operate the actuator (no external load applied) when the actuating ram is positioned approximately mid-stroke shall be:

a. 10 inch pounds (1.13 N·m) maximum (breakaway)
b. 6 inch pounds (0.677 (N·m) maximum (run).

3.2.15 Operating loads. The normal operating load shall be 90 ±10 pounds (40.82 ±4.54 kilograms) in a direction opposing the travel of the actuator shaft in both the extend and retract modes. The maximum operating load shall be 180 pounds (81.65 kilograms) applied in the same manner as a normal load.

3.2.16 Reversibility. The actuator shall not mechanically reverse as a result of an externally applied load of 200 pounds (90.72 kilograms) with the actuator electrically unpowered.

3.2.17 Static load. The maximum static load shall be 200 pounds (90.72 kilograms) tension or compression.

3.2.18 Overriding loads. The overriding load for the actuator (90 ±10 pounds, 40.82 ±4.54 kilograms) shall not cause sufficient overspeeding of the actuator during operation to cause failure or damage in the actuating system. Overriding loads shall not increase the stopping distance beyond that allowed in the applicable drawing for the actuator being procured.

3.2.19 End play. At any point in the electrical cycle, the actuating ram end play shall not exceed 0.010 inch (0.0254 centimeter) TIR (total indicator reading), when measured under a 10-pound (4.54-kilogram) reversing load.

3.2.20 Duty cycle. The duty cycle of the actuator shall be 30 seconds on and 5 minutes off.

3.2.21 Operating life. The operating life of the actuator shall be 5000 cycles at normal operating load, rated voltage and room temperature. The duty cycle (see 3.2.20) shall be applicable during the 5000 cycles.

3.2.22 Bend test. The actuator cable shall maintain electrical and mechanical integrity after

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being subjected to the bend test of 4.5.12.

3.2.23 Pull test. The actuator shall remain functional while sustaining a tensile load in accordance with 4.5.13.

3.2.24 Performance.

3.2.24.1 Current. The normal operating current shall not exceed 1.0 ampere. Starting and stall current shall not exceed 2.1 amperes at 28 Vdc and room temperature.

3.2.24.2 Electrical limit. The actuator shall contain internal limit devices set to limit the stroke as shown on the applicable drawings for the actuator being procured.

3.2.24.3 Mechanical stops. The actuator shall contain internal, non-jamming, mechanical stops. Mechanical stops shall limit the stroke as shown in the applicable drawings for the actuator being procured.

3.2.24.4 Direction of operation. The actuator shall be electrically reversible when energized in accordance with the basic wiring schematic of the applicable drawing.

3.2.24.5 Instantaneous reversal (plugging). With no external load applied, the actuator shall be capable of repeated electrical polarity reversals (rated voltage), instantaneously reversing the direction of the actuating ram, without damage to the actuator.

3.2.24.6 Anti-rotation device. The actuator shall contain an anti-rotation device to prevent rotation of the actuating ram.

3.2.24.7 Position indicator. The actuator shall incorporate two devices for position indication in accordance with the applicable drawings for the actuator being procured.

3.2.24.8 Operating time. Under normal operating load, rated voltage and room temperature (25 ±10 ºC) the actuating ram shall operate at a rate of 1 inch (2.54 centimeters) per 2.2 to 4.5 seconds.

3.2.25 Operating environment. The actuator performance shall comply with the requirements of the applicable conditions specified in MIL-STD-810 and MIL-T-7743 and other conditions specified herein (see tables I and II).

3.2.26 Workmanship. The workmanship displayed in fabrication and assembly of the actuator shall be such as to assure, within design limitations, ability of the actuator to meet performance requirements under all applicable environmental conditions specified herein. Unauthorized repair, welding, heavy burrs, or parts assembled by introduction of high stresses not prescribed in design, are typical signs of inferior workmanship and shall be cause for rejection. The standards of workmanship exhibited in the approved first article sample, subject to any qualification stated in the Government's notice of approval, shall be determinative of the requirements of the contract relative to workmanship. MIL-HDBK-454 provides workmanship guidance.

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4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2).
b. Conformance inspection (see 4.3).

4.2 First article inspection. First article inspection of the actuators shall consist of all tests and examinations listed in table I (see 6.2.1).

4.2.1 First article sample. The first article actuator samples shall consist of the first nine actuators manufactured on contract. The actuators shall be permanently labelled A, B, and C for ease of identification. Failure of the actuators to pass any of the first article inspections shall be cause for rejection (see 6.2.j).

4.3 Conformance inspection. Conformance inspection shall consist of the following inspections:

a. Individual inspections (see 4.3.1).
b. Sampling inspections (see 4.3.2).

4.3.1 Individual inspections. Individual inspections are those inspections conducted on each actuator in accordance with the inspections listed in table II, Group I. Failure to pass any of these inspections shall be cause for rejection of the actuator.

4.3.2 Sampling inspections. A random sampling of actuators shall be selected by the procuring activity from each production lot in accordance with table III and shall be subjected to the inspections listed in table II, Groups 1 and 2. Group 1 inspections shall be conducted prior to Group 2 inspections. Failure of any sample to pass any of these inspections shall be cause for rejection of the entire lot.

4.4 Inspection conditions. Unless otherwise specified, all inspections shall be performed under the following conditions:

a. Room temperature. Room ambient of 25 ±10 ºC (77 ±18 ºF) indicated.

b. Test temperature. All parts of the test item shall be stabilized at the specified temperature ±2.8 ºC (±5 ºF) indicated prior to conducting any tests. Unless otherwise specified, temperature stabilization will have been attained when the indicated temperature of the surface of the largest mass of the test item does not change more than ±2.8 ºC (±5 ºF) per hour.

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TABLE I. First article inspections: schedule and sequence. 1/

TESTS	TEST PARA.	SAMPLE		
		A	B	C
Actuator inspection	4.5.1	1	1	1
Manual torque	4.5.3	2	2	2
End play	4.5.4	3	3	3
Functional test	4.5.5	4	4	4
Electromagnetic compatibility	4.5.6	5	5	X
Maximum operating load	4.5.7	6	6	5
Overriding loads	4.5.8	7	7	6
Combined altitude and low temperature	4.5.9.1	8	8	7
High temperature	4.5.9.2	9	9	8
Temperature shock	4.5.9.3	10	10	9
Salt fog	4.5.9.4	11	11	10
Humidity	4.5.9.5	12	12	11
Dust	4.5.9.6	13	13	12
Fungus	4.5.9.7	14	X	X
Shock	4.5.9.8	X	14	13
Explosive atmosphere	4.5.9.9	15	X	X
Acceleration	4.5.9.10	X	15	14
Vibration	4.5.9.11	16	16	X
Endurance	4.5.9.12	X	17	15
Static load	4.5.10	17	X	16
Mechanical stops	4.5.11	18	X	X
End play	4.5.4	19	18	17
Bend test	4.5.12	20	19	18
Pull test	4.5.13	21	20	19

1/ Inspection sequence is denoted by the numbers in the sample columns. An X denotes inspection not required.

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TABLE II. Conformance inspections: schedule and sequence. 1/

TESTS	TEST PARAGRAPH	SAMPLE		
		A	B	C
GROUP 1				
Actuator inspection	4.5.1	2/		
Manual torque	4.5.3	2/		
Functional test	4.5.5	2/		
GROUP 2				
End Play	4.5.4	1	1	1
Maximum operating load	4.5.7	2	2	2
Overriding loads	4.5.8	3	3	3
Combined altitude and low temperature	4.5.9.1	4	4	4
High temperature	4.5.9.2	5	5	5
Temperature shock	4.5.9.3	6	6	6
Salt fog	4.5.9.4	7	7	7
Humidity	4.5.9.5	8	8	8
Shock	4.5.9.8	X	9	9
Acceleration	4.5.9.10	X	10	10
Vibration	4.5.9.11	9	11	X
Endurance	4.5.9.12	X	12	11
Static load	4.5.10	10	X	12
Mechanical stops	4.5.11	11	X	X
End play	4.5.4	12	13	13
Bend test	4.5.12	13	14	14
Pull test	4.5.13	14	15	15

1/ Inspection sequence is denoted by the numbers in the sample columns. An X denotes inspection not required.
2/ Inspect all actuators to the requirements of the test paragraph.

TABLE III. Sampling test items.

PRODUCTION LOT SIZE	NUMBER OF SAMPLES
500 or less	3
501 to 1000	6 1/
1001 or more	2/

1/ Actuators shall be inspected as two groups of three units each, in accordance with table II.
2/ Number of samples shall be in multiples of 3. The procuring activity shall specify the number of samples and the sequence of inspections each unit shall be subjected to for lots in excess of 1000 units (see 6.2.i).

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4.5 Test methods.

4.5.1 Individual actuator visual inspection. Each actuator shall be inspected to ensure that it has been properly assembled and that the workmanship is as specified in 3.2.26.

4.5.2 First article and conformance inspections.

4.5.3 Manual torque. Disconnect the actuator from all external electrical circuits. The torque measurements to manually operate the actuator (no external load applied), when the actuating ram is positioned approximately mid-stroke, shall conform to 3.2.14.

4.5.4 End play. At any point in the electrical cycle, the actuator end play shall conform to 3.2.19.

4.5.5 Functional test. The actuator shall be subjected to the following operational checks.

4.5.5.1 Direction of operation. Operate the actuator in the retract direction with 18 Vdc applied. The output shaft shall move in the retract direction. Subsequently, operate the actuator in the extend direction with 18 Vdc applied. The output shaft shall move in the extend direction.

NOTE

The actuating ram shall move in the extend direction with 18 Vdc applied if the positive (+) potential is applied to pin A (Black) and the negative (-) potential applied to pin C (Red). During any operational check, a negative (-) potential must be applied to pin B (White) to allow dynamic braking at the electrical limits. Pin designations and wire colors are identified on figure 1.

4.5.5.2 Electrical stroke and position indicator. The actuator shall be subjected to the following checks:

a. The actuator shall be operated in a no-load condition to ascertain compliance with the mechanical and electrical extend and retract limits on the applicable drawing.

b. The actuator shall be operated to ensure that both extend and retract indicator devices are actuated prior to, but within 0.120 inch (0.305 centimeter) maximum travel of their respective limit devices.

4.5.5.3 Mechanical stop. The actuating ram shall be operated with 30 Vdc into the retract mechanical stop by bypassing the electrical limit device. The actuator shall then be operated with 18 Vdc in the extend direction. The actuator shall pull off the retract mechanical stop. The actuating ram shall be operated with 30 Vdc into the extend mechanical stop by bypassing the electrical limit device. The actuator shall then be operated with 18 Vdc in the retract direction. The actuator shall pull off the extend mechanical stop.

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4.5.5.4 Normal load. The actuator shall be operated for a full stroke with 28 Vdc in the retract direction against a load of 90 ±10 pounds (40.82 ±4.54 kilograms). The time to complete the stroke shall be based on a rate of 1 inch (2.54 centimeters) per 2.2 to 4.5 seconds. The running current during operation shall not exceed 1.0 ampere. Starting and stall current shall not exceed 2.1 amperes at 28 Vdc and room temperature. The actuator shall be operated for a full stroke with 28 Vdc in the extend direction against a load of 90 ±10 pounds (40.82 ±4.54 kilograms). The time to complete the stroke shall be based on a rate of 1 inch (2.54 centimeters) per 2.2 to 4.5 seconds. The running current during operation shall not exceed 1.0 ampere.

4.5.5.5 Manual shaft torque. With no load applied, the actuating ram shall be positioned at approximately mid-stroke. The breakaway and running torques shall then be measured. The torque shall meet the requirements of 3.2.14 without any slipping or binding.

4.5.6 Electromagnetic compatibility. Actuators qualified after the date of the current revision to this specification shall be tested in accordance with MIL-STD-461, Methods CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102 (10 kHz – 18 GHz), RS101, and RS103 (2 MHz – 18 GHz). Actuators qualified prior to the date of the current revision of this specification shall be tested in accordance with their earlier electromagnetic interference (EMI) requirements and associated limits in accordance with 4.2.4.2 of MIL-STD-461.

a. The power line configuration during conducted emission testing shall include a 7 microhenry choke in series with each power lead.

b. The actuator shall be loaded with a 0.030 ampere suppressed inductive load across pins E and D in series with a 28 Vdc power source. Pins G and F shall be loaded by a 0.010 ampere resistive load in series with a 28 Vdc power source. Pin designations and wire colors are identified on figure 1.

NOTE

In cases where an electrical connector is not required by the applicable drawing, the suppressed inductive load shall be across the blue and green lines, and the yellow and brown lines shall be loaded by the resistive load.

c. The actuator shall not be mechanically loaded during this test.

d. Additionally, the actuator shall meet the following requirements:

1. The actuator shall operate without degradation when subjected to a near-linear-steady-state magnetic field of one oersted.

2. Static magnetic fields. The actuator shall not generate a static magnetic field intensity (H), due to dc, exceeding 1.2×10^{-1} oersteds, at a point 12.0 inches (30.48 centimeters) from the center of the actuator magnetic sources. A static magnetic field is defined as a field that does not change in magnitude or direction.

3. Dynamic magnetic fields. The actuator shall not generate a dynamic magnetic

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field intensity (H) over the frequency range from dc to 30 Hertz (Hz) exceeding 7.2 x 10^{-3} oersteds. A dynamic field is defined as a field that can change. The measurement distance shall be 12.0 inches (30.48 centimeters) from the center of the actuator magnetic sources.

4.5.7 Maximum operating load. The actuator shall be operated utilizing the input power and maximum operating loads (see 3.2.11 and 3.2.15) respectively. The actuator shall operate satisfactorily under these conditions.

4.5.8 Overriding loads. The actuator shall be operated utilizing the input power and overriding load conditions (see 3.2.11 and 3.2.18), respectively. The load shall be applied in the same direction as the actuating ram direction and shall not cause sufficient over-speeding of the actuator during operation to cause failure or damage to the actuator. Overriding loads shall not increase the stopping distance beyond that allowed in 3.2.18.

4.5.9 Environmental tests. The actuators shall be subjected to the following environmental tests. Where required, the actuator shall be subjected to an operational check as follows:

The actuator shall be operated for seven cycles in the following sequence. A normal full-stroke cycle shall consist of starting at a point on the stroke and going to the electrical limits on both ends of the stroke before returning to that point. Each cycle shall be conducted using rated voltage (see 3.2.11), except as noted in e. below and normal operating loads (see 3.2.15) except as noted in b. below. Measured values shall verify compliance with 3.2.24, except for e. below.

a. Two normal full-stroke cycles shall be performed.

b. One cycle shall be an instantaneous reversal of the actuating ram direction (no external applied load) when at the midpoint of the stroke.

c. One cycle shall be performed with the limit devices bypassed. The actuating ram shall be driven into the mechanical stops corresponding to each direction of the ram. The limit devices shall be bypassed by opening the common ground wire. The actuator will be electrically isolated from grounding through the case. The stall current shall not exceed 2.1 amperes at 28 Vdc at room temperature.

d. One normal full-stroke cycle shall be performed.

e. Two cycles shall be performed utilizing the full electrical stroke of the actuator, and the input power shall be 18 Vdc for one cycle and 30 Vdc for the remaining cycle.

4.5.9.1 Altitude and low temperature. The actuator shall be subjected to a low temperature altitude test. The temperature shall be -54 ºC (-65 ºF) and the altitude shall be 50,000 feet (15.240 meters). The actuator shall be maintained under these conditions for one hour. The operational checks of 4.5.9 shall be performed while the altitude and temperature conditions are maintained. The actuator shall then be returned to room temperature and the operational checks repeated.

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4.5.9.2 High temperature. The actuator shall be subjected to a temperature of 71 ºC (160 ºF) for a period of 4 hours. The operational check of 4.5.9 shall be performed while the temperature condition is maintained. The actuator shall then be returned to room temperature and the operational checks repeated.

4.5.9.3 Temperature shock. The actuator shall be subjected to the temperature shock test in accordance with MIL-T-7743, except the beginning test temperature shall be 71 ºC (160 ºF). At the completion of testing, the actuator shall be tested in accordance with 4.5.9.

4.5.9.4 Salt fog. The actuator shall be subjected to the salt fog test in accordance with MIL-T-7743. The exposure period shall be 50 hours. The operational checks of 4.5.9 shall be performed within 1 hour after completion of the test.

4.5.9.5 Humidity. The actuator shall be subjected to the humidity test in accordance with MIL-T-7743. At the completion of testing, the actuator shall be tested in accordance with 4.5.9.

4.5.9.6 Dust. The actuator shall be subjected to the dust test in accordance with MIL-T-7743. At the completion of testing, the actuator shall be tested in accordance with 4.5.9.

4.5.9.7 Fungus. The actuator shall be subjected to the fungus test in accordance with MIL-T-7743. At the completion of testing, the actuator shall be tested in accordance with 4.5.9.

4.5.9.8 Shock. The actuator shall be subjected to the no-load shock test in accordance with MIL-T-7743. The actuator shall be mounted on rigid plate utilizing its mounting points only, and the actuating ram shall be extended to the mid-stroke position. At the completion of testing, the actuator shall be tested in accordance with 4.5.9.

4.5.9.9 Explosive atmosphere (vapor-safe). The actuator shall be subjected to the explosive atmosphere test in accordance with MIL-STD-810, Method 511, Procedure I. While under explosive conditions, the actuator will only be mechanically loaded in one direction of the stroke. At the completion of testing, the actuator shall be tested in accordance with 4.5.9.

4.5.9.10 Acceleration. The actuator shall be subjected to the acceleration test in accordance with MIL-STD-810, Method 513, Procedure II. Accelerations equivalent to 10g's shall be applied in such directions as are likely to cause malfunctions, such as lifted brushes or switch contacts. Each acceleration vector shall be maintained for the period required to perform the operational check of 4.5.9.

4.5.9.11 Vibration. The actuator shall be subjected to the vibration test in accordance with MIL-T-7743. The actuator shall be attached to the vibration table by means of a rigid fixture on which it is attached by its normal mount fittings. During the resonant and destructive vibration tests, the actuator shall be operated, with no external applied mechanical loading, for two normal full-stroke operating cycles (as defined in 4.5.9) at each resonant frequency in each axis. At the completion of each axis of testing, the actuator shall be tested in accordance with 4.5.9.

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4.5.9.12 Endurance. The actuator shall be subjected to 5,000 normal full-stroke cycles (as defined in 4.5.9) at room temperature. The operational check of 4.5.9 shall be performed after every 500 cycles.

4.5.10 Static load. As specified in 3.2.17, the actuator shall withstand a static load of 200 pounds (90.72 kilograms) when applied as a tension and compression load. The actuator shall be irreversible with these applied loads, and no permanent deformation shall occur. The loads shall be applied at any position of the actuating ram, other than at the mechanical stops.

4.5.11 Mechanical stops. The actuator shall be subjected to 100 jams into each mechanical stop with the limit devices bypassed to determine compliance with 3.2.24.3. Each jam will consist of:

a. With no load applied and an input voltage of 30 Vdc, the actuator shall be jammed into one of the mechanical stops.

b. With maximum operating load (see 3.2.15) applied and an applied voltage of 18 Vdc, the actuator shall pull off the stop.

NOTE

The test method for this test shall not provide any rotational restraint to the actuator to ensure that the requirements of the anti-rotation device (see 3.2.24.6) are satisfied.

4.5.12 Bend test. The actuator cable shall be subjected to a bend test. The actuator shall be suspended in a temperature conditioning chamber at least 6 inches (15.24 centimeters) above a mandrel which is 1.9 inches (4.8 centimeters) in diameter. The cable shall be allowed to hang down tangent to the mandrel. A 5 ±1 pound (2.27 ± .45 kilogram) load shall be secured to the end of the cable. The temperature of the chamber shall be lowered to -54 ºC (-65 ºF) and maintained for 4 hours. At the end of this period and while the actuator and mandrel are still at temperature, the cable shall be wrapped once around the mandrel and subjected to the 5-pound (2.27-kilogram) load. The actuator and mandrel shall then be returned to room temperature. The actuator shall be removed from the mandrel, visually inspected and subjected to an operational check in accordance with the requirements of 4.5.9 and 4.5.13.

4.5.13 Pull test. The actuator cable shall be subjected to a pull test. A 15- to 20-pound (6.8 to 9.07 kilogram) inline tensile load shall be applied to the cable connector. While under this load, the actuator shall be subjected to one normal full-stroke cycle. The load shall be removed, and the operational check of 4.5.9 shall be performed.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or

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within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The actuator covered by this specification is used as a safe-lock mechanism on armament type equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Total quantity desired.

c. If first article is required (see 6.2.1).

d. Applicable detail drawing specification.

e. Selection of applicable levels of packaging required (see 5.1).

f. Samples subjected to sampling inspection are not considered or accepted as part of the contract.

g. Sampling inspection selection (see 4.3.2).

h. A statement that requires the contractor to notify the procuring activity of any changes in design and construction after the actuator has passed first article inspection. In all cases, configuration control of the actuator is governed by the requirements of SAE EIA-649 and as directed by the procuring activity.

i. Number of samples and inspection sequence for production lots in excess of 1,000 units (see table III).

j. A requirement that prior to submission, the contractor must inspect the first article samples to the degree necessary to assure that they conform to the requirements of the contract and submit an inspection report with the samples, including statements of findings and certificates of conformance of materials and tests of 4.5.1, 4.5.3, 4.5.4, 4.5.5, and 4.5.7 as listed in table I.

k. Name and location of Government representative responsible for random selection of inspection samples (see 4.3.2).

l. Items of data required (see 6.3).

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m. Name and location of Government approved test laboratory.

6.2.1 First article. When a first article is required for inspection and approval (see 3.1, 4.2 and 6.2), the contract must specify the following provision for first article inspection. When a contractor is in continuous production of actuators from contract to contract, consideration should be given to waive the first article inspections. If inspection is required, indicate:

a. If first article inspections are conducted at the contractor's plant or a Government approved laboratory, an inspection report must be forwarded for verification to the procuring activity.

b. That the approval of first article samples or the waiving of the first article inspection does not relieve the contractor of his obligation to fulfill all other requirements of the specification and contract.

6.3 Associated Data Item Descriptions (DIDs). This specification has been assigned an Acquisition Management Systems Control (AMSC) number authorizing it as the source document for the following DID. When necessary to obtain the data, the applicable DID must be listed on the Contract Data Requirements List (DD Form 1423).

DATA REQUIREMENT	APPLICABLE DID	DID TITLE
First Article Inspection and Conformance Reports	DI-NDTI-80809	Test/Inspection Report

The above DID was current as of the date of this specification. The ASSIST database should be researched at http://quicksearch.dla.mil to ensure that only current and approved DIDs are cited on DD Form 1423.

6.4 Subject term (key word) listing.

28 Vdc
Anti-rotation
Electronic Equipment

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

CONCLUDING MATERIAL

Custodian:
Navy - AS

Preparing activity:
Navy - AS
Project 1095-2015-002

NOTE: The activity listed above was interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.