
INCH-POUND

A-A-52423(AT)
February 15, 1993
SUPERSEDES
MIL-V-62381A(AT)
18 December 1985

COMMERCIAL ITEM DESCRIPTION

VALVE, SOLENOID OPERATED

The General Services Administration has authorized the use of this commercial item description (CID) as a replacement for MIL-V-62381A(AT) which is canceled.

1.0 Abstract. This CID establishes the requirements for a direct acting, poppet style, two-way shutoff solenoid operated valve for use on a military ground vehicle electronic drive system as an emergency bypass valve.

2.0 Salient characteristics.

2.1 Materials. Materials shall be as specified herein. It shall be free from defects which adversely affect its performance or serviceability. The use of recovered material made in compliance with regulatory requirements is acceptable providing that all requirements of this CID are met (see 5.5).

2.1.1 Material compatibility. Materials for the solenoid valve shall be compatible with the hydraulic fluid, petroleum or synthetic base, used to inhibit corrosion, improve the low-temperature flow, viscosity characteristics and resistance to oxidation of the valve.

2.1.2 Age-sensitive materials. Age control of the valve assembly should be based on the cure date of the oldest elastomeric component. The maximum age of the elastomeric item at time of acceptance by the Government shall not exceed 32 quarters for hoses and 40 quarters for O-rings (see 2.12).

2.1.3 Metals. Metals shall be corrosion resistant or suitably treated to prevent corrosion. The use of dissimilar metals, especially brass, copper, or steel in intimate metal to metal contact, shall be avoided.

Beneficial comments, recommendations, additions, deletions clarifications, etc. and any other data which may improve this document should be sent by letter to: U.S. Army Tank-Automotive Command, ATTN: AMSTA-GDS, Warren, MI 48397-5000.

AMSC N/A

FSC 4810

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2.2 Design and construction. The solenoid valve shall be a direct acting, poppet style shutoff valve, normally closed. The solenoid must be energized for the valve to remain open and allow flow of fluid. The solenoid valve shall conform to Drawing 12265543 and other applicable drawings, specifications and standards (see 5.2).

2.2.1 Operating fluid. The valve shall operate satisfactorily with hydraulic fluid (see 2.1.1).

2.3 Performance.

2.3.1 Proof pressure. With outlet port plugged, a pressure to the inlet port at a rate of 25,000 pounds per square inch (psi) per minute is applied until a pressure of 4,500 psi is obtained. The valve shall withstand this pressure for a period of 2 minutes without permanent deformation, rupture, or measurable external leakage.

2.3.2 Burst pressure. With outlet port plugged, a pressure to the inlet port at a rate of 25,000 psi per minute is applied until a pressure of 7,500 psi is obtained. The valve shall withstand this burst pressure for a period of 2 minutes without rupture of internal or external parts. Solenoid valves subjected to this test shall be indelibly marked as damaged and shall not be delivered as acceptable units.

2.3.3 Pull-in voltage. With the inlet at a maximum operating pressure and with the discharge restricted to maintain rated flow, the valve shall actuate at any voltage applied to the solenoid within a range between 18 and 30 volts direct current (Vdc).

2.3.4 Hold-in voltage. When energized with greater than 24 Vdc at maximum operating pressure and the discharge restricted to maintain flow, the valve shall not release at any voltage to the solenoid greater than 16 Vdc.

2.3.5 Coil current. With solenoid activated, the actuating current shall not exceed 0.51 ampere (A) dc at 30 Vdc and at 77 degrees Fahrenheit (°F).

2.3.6 Insulation resistance. With 500 Vdc applied between the coil terminals connected together and the case, there shall be at least 100 megohms of resistance.

2.3.7 Dielectric withstanding voltage. The solenoid valve shall be capable of initially withstanding 500 volts root mean square (rms), 60 Hertz (Hz) for 1 minute between terminals tied together and the case.

2.3.8 Voltage transient. The valve shall perform as specified when subjected to transient voltages as specified in MIL-STD-1275.

2.3.9 Rated flow. The flow capacity of the valve shall be not less than 0.25 gallon per minute (gpm), inlet to outlet, with a pressure drop across the valve of 75 psi.

2.3.10 Internal leakage. With the solenoid de-energized and the valve closed, a pressure of 3,000 psi shall be applied to the inlet port and held for 2 minutes; the internal leakage at the outlet shall not exceed 0.25 ml after 2 minutes.

2.3.11 External leakage. There shall be no evidence of leakage through external seals. Verification is done by visual examinations.

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2.3.12 Operating time. The units shall open in not more than 1 second by establishing flow at a rate of 0.25 gpm at 3,000 psi after the solenoid shown in the drawing test circuit has been energized.

2.3.13 Closing time. The units shall close in not more than 1 second by terminating flow after the solenoid shown in the drawing test circuit has been de-energized.

2.4 High temperature. The solenoid valve shall operate when subjected to a high ambient temperature of 140°F. The valve unit shall not be damaged nor its performance impaired after storage in a non-operating mode at a high ambient temperature of 158°F.

2.5 Low temperature. The solenoid valve shall operate when subjected to a low ambient temperature of minus 26°F. The valve unit shall not be damaged nor its performance impaired after storage in a non-operating mode at a low ambient temperature of minus 65°F.

2.6 Hydraulic fluid temperature. The solenoid valve shall operate using hydraulic oil in accordance with 2.1.1 at operating oil temperatures of minus 26°F to 170°F with ambient air conditions as specified in 2.4 and 2.5.

2.7 Shock (non-operating). The units shall operate after exposure to a shock impulse of 25 gravity units (g) for 11 milliseconds (ins), half-sine wave form.

2.6 Vibration (non-operating). The valve shall meet the performance requirements and show no evidence of failure or damage after performance of a vibration test in accordance with 2.8.1 and 2.8.2.

2.8.1 Low frequency. The valve shall be subjected to a simple harmonic motion having an amplitude of 0.03 inch (0.06 inch maximum total excursion) with the frequency being varied uniformly between the approximate limits of 10 to 55 Hertz (Hz). The entire frequency range, 10 to 55 Hz and back to 10 Hz, shall be traversed in approximately one minute. This motion shall be applied for 2 hours in each of three mutually perpendicular axes.

2.8.2 High frequency. The valve shall be subjected to a simple harmonic motion having an amplitude varied to maintain a constant peak acceleration of 10g's (peak), the frequency being varied logarithmically between the approximate limits of 55 and 2,000 Hz. The entire frequency range of 55 to 2,000 Hz (no return sweep) shall be traversed in 35 +/- 5 minutes, except that in the vicinity of what appears to be resonance and in order to facilitate the establishment of a resonant frequency, the above rate may be decreased. Valves shall be vibrated for 5 minutes at each of two resonant frequencies observed. This procedure shall be performed in each of three mutually perpendicular axes. Interruptions are permitted provided the requirements for rate of change and test duration are met.

2.9 Salt-fog (non-operating). A valve conditioned for 2 hours at 95°F, exposed for 48 hours to salt-fog at fallout rate between 0.5 and 3 millimeters per 80 square centimeters per hour, then stored in a standard atmosphere for 48 hours for drying, shall operate without evidencing any malfunction or failure.

2.10 Fungus. The solenoid valve shall be constructed of only materials that are fungus non-nutrient, where possible. Fungus growth shall not degrade performance.

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2.11 Cleanliness. The valve shall be precision cleaned (see 5.3). Upon completion of testing a sufficient quantity of fluid shall be retained in the valve to assure proper preservation during extended storage and shipment. Ports shall be covered with suitable plugs.

2.12 Identification and marking. Identification and marking shall be permanent and legible and, unless otherwise specified in Drawing 12265543, shall include the manufacturer's identification code (CAGE), the contract number, the engineering drawing part number, and the national stock number (NSN) (see 5.2) .

2.12.1 Cure date. The cure date shall be physically and legibly marked on the exterior of the valve assembly.

2.13 Workmanship. Workmanship shall be in accordance with the manufacture of a high quality solenoid valves. This shall be evidenced by the absence of defects detrimental to its life. serviceability. or appearance.

3.0 Quality assurance provisions.

3.1 Responsibility for inspection. The contractor is responsible for the performance of all inspections (examinations and tests).

3.2 Contractor certification. The contractor shall certify and maintain substantiating evidence that the product offered meets the salient characteristics of this commercial item description and that the product conforms to the producer's own drawings, specifications. standards, and quality assurance practices. Items with known defects shall not be submitted for Government acceptance. The Government reserves the right to require proof of such conformance prior to the first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

4.0 Preservation, packaging, packing, labeling, and marking. Preservation, packaging, packing, labeling, and marking for the desired level shall be as specified in the contract (see 5.2).

5.0 Notes.

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

5.1 Addresses for obtaining copies of referenced documents.

5.1.1 Government specifications and standards. MIL-STD-1275 "Characteristics of 28 Volt DC Electrical Systems in Military Vehicles" is available from the Navy Publications and Printing Service Office, Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

5.1.2 Other Government documents, drawings, and publications. Drawings 12265543 "Valve, Solenoid Operated" is available from the Contracting Officer, Us. Army Tank-Automotive Command, Warren, MI 48397-5000.

5.2 Ordering data. Acquisition documents must specify. the following:

- a. Title, number, and date of this CID.
- b. Issue of the DODISS to be cited in the solicitation and if required, the specific issue of individual documents referenced (see 5.1.1 and 5.1.2).
- c. Title, number and revision letter of the applicable engineering drawing and part number (see 2.2 and 2.12).
- d. Selection of applicable level and packaging requirements (see 4.0)

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5.3 Precision cleaning. This method is used to achieve a level of product cleanliness greater than the level normally detected by visual means. Articles should be visibly clean prior to precision cleaning. Precision cleaning is performed in a controlled environment, and is intended to remove particles, films, biological forms, fibers and other forms of contaminants that are usually not visible, but which could degrade the product or process. The level of precision cleanliness should be verified and evidence of inspection and acceptance provided. Precision cleaned articles should be packaged immediately after verification of cleanliness, or suitably protected prior to leaving the controlled environment.

5.3.1 Precision cleaning solutions, fluids. Precision cleaning solutions or material should not react with, combine with, etch, or otherwise cause immediate or latent degradation of the item being cleaned. Precision cleaning fluids should be filtered, and controlled. Their cleanliness level should be verified as being sufficient to achieve the specified product cleanliness.

5.4 Cross-reference data. Solenoid valves conforming to this CID are interchangeable/substitutable with solenoid valves conforming to MIL-V-62381A(AT), dated 18 December 1985.

5.5 Regulatory requirements. The offeror/contractor is encouraged to use recovered materials in accordance with Public Law 94-580 to the maximum extent practicable.

5.6 Metric product. The solenoid operated valves made to metric dimensions will be considered on the following basis:

a. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within specified tolerances using conversion tables contained in the latest revision of ASTM E380, and all other requirements of this CID are met.

b. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch/pound units, a request should be made to the contracting officer to determine if the product is acceptable.

c. The contracting officer has the option of accepting or rejecting the product.

Custodian:
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