

**MIL-V-7899**  
**30 JUNE 1952**

**MILITARY SPECIFICATION**

**VALVES, FUEL CHECK, LOW PRESSURE**

This specification was approved by the Departments of the Army, the Navy, and the Air Force for use of procurement services of the respective Departments.

**1. SCOPE**

**1.1 Scope.-** This specification covers low pressure fuel check valves suitable for use in aircraft fuel systems. They are intended for use with hydrocarbon fuels only.

**1.2 Classification.-** Check valves shall be of the sizes listed on Standards MS28882, MS28883, MS28884, and MS28885, and of the following types, as specified:

Type A - No permissible internal leakage  
 Type B - Permissible internal leakage

**2. APPLICABLE SPECIFICATIONS, OTHER PUBLICATIONS, AND DRAWINGS**

**2.1.1 Specifications.-**

**Federal**

QQ-P-416	Plating, Cadmium (Electrodeposited)
P-S-661	Solvent; Dry Cleaning

**Military**

MIL-D-5028	Drawings and Data Lists; Preparation of (For Engines, Accessories and Other Auxiliary Equipment)
MIL-E-5557	Enamel; Heat-Resisting, Glyceryl-Phthalate, Black
MIL-F-5161	Fuel; Referee, Aircraft Turbine and Jet Engine
MIL-F-5572	Fuel; Aircraft Reciprocating Engine
MIL-F-5616	Fuel; Aircraft Engine, Grade JP-1
MIL-F-5624	Fuel, Aircraft Turbine and Jet Engine, Grades JP-3 and JP-4
MIL-H-3136	Hydrocarbon Fluid; Standard Test
MIL-P-6064	Packaging of Lightweight Aircraft Accessories
MIL-P-6871	Plating; Chromium
MIL-P-6889	Primer; Zinc-Chromate, For Aircraft Use
MIL-S-7742	Screw Threads, Standard, Aeronautical

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Air Force-Navy Aeronautical

AN-QQ-A-696      Anodic-Films; Corrosion Protective, (for)  
Aluminum Alloys

2.1.2 Other Publications.-

Military Standards (Book)

MIL-STD-129      Marking of Shipments

Air Force-Navy Aeronautical Bulletins

No. 143      Specifications and Standards; Use of  
No. 410      Age Controls - Fuel System Synthetic Rubber Parts

2.1.3 Drawings.-

Military Standards (Sheet)

MS28882	Valve - Fuel Check, Low Pressure, Gasket Seal Straight Thread Connection, Type A
MS28883	Valve - Fuel Check, Low Pressure, Gasket Seal Straight Thread Connection, Type B
MS28884	Valve - Fuel Check, Low Pressure, Flared Tube Connection, Type A
MS28885	Valve - Fuel Check, Low Pressure, Flared Tube Connection, Type B
MS29513	Packing - "O" Ring Hydrocarbon Fuel Resistant

Air Force-Navy Aeronautical Standard Drawings

AND10398      Metals - Definition of Dissimilar

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Materials.- Materials and processes used by the manufacturer of fuel check valves shall be of high quality, suitable for the purpose, and shall conform to applicable Government specifications. Materials conforming to contractor's specifications may be used provided the specifications are released by the Services and contain provision for adequate tests. The use of contractor's specifications will not constitute waiver of Government inspection. All materials used in the valve shall be sufficiently resistant to fuel conforming to Specifications MIL-F-5161, MIL-F-5616, MIL-H-3136, MIL-F-5572, and MIL-F-5624, of aromatic content from 0 to 30 percent, to assure satisfactory operation as herein defined.

3.1.1 Metals.- All metals used in the construction of fuel check valves shall be of a corrosion-resisting type or shall be suitably protected to resist corrosion during the normal service life of the valve. The use of dissimilar metals shall be avoided whenever practicable or used in accordance with Drawing AND10398. The use of magnesium or any alloy thereof is prohibited.

3.1.2 Castings.- Castings shall be of high-grade quality, clean, sound, and free from blow-holes, porosity, cracks, and any other defects.

3.1.3 Selection of Materials.- Specifications and standards for all materials, parts, and Government certification and approval of processes and equipment, which are not specifically designated herein and which are necessary for the execution of this specification, shall be selected in accordance with ANA Bulletin No. 143, except as provided in the following paragraph.

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3.1.3.1 AN or MS Standard Parts.- AN or MS Standard parts shall be used wherever they are suitable for the purpose, and shall be identified on the drawing by their part numbers. Commercial utility parts such as screws, bolts, nuts, cotter pins, etc., may be used, provided they possess suitable properties and are replaceable by the AN or MS Standard parts without alteration, and provided the corresponding AN or MS part numbers are referenced in the parts list and, if practicable, on the contractor's drawings. In the event there is no suitable corresponding AN or MS Standard part in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification.

3.2 Design.- Valves shall be designed to permit flow of fuel in one direction and check flow of fuel in the other direction. The design of the valve shall be such that the movable sealing element shall be closed in all attitudes of the valve in the absence of fluid pressure.

3.3 Construction.- The valve shall be constructed to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service use.

3.3.1 "O" Rings.- All "O" rings shall conform to Standard MS29513.

3.3.2 Lubrication.- The valve shall operate satisfactorily without the use of lubricants.

3.4 Interchangeability.- All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance. Changes in manufacturer's part numbers shall be governed by the drawing number requirements of Specification MIL-D-5028.

3.5 Screw Threads.- All screw threads shall be in accordance with Specification MIL-S-7742.

3.6 Locking of Parts.- All internal and external threaded parts shall be positively locked.

3.7 Clearing.- All parts shall be clean and free from dirt, sand, and metal chips while being assembled and after assembly.

3.8 Finish.-

3.8.1 Anodizing.- All aluminum-alloy parts shall be anodized in accordance with Specification AN-QQ-A-696, or adequately treated in some other acceptable manner for corrosion prevention.

3.8.2 Protective Treatment.- Steel parts, other than corrosion-resisting steel, not in moving contact, shall be cadmium-plated in accordance with Specification QQ-P-416, type II. Sliding or rotating parts may be chromium-plated in accordance with Specification MIL-P-6871, or adequately treated in some other acceptable manner for corrosion prevention, where galling of cadmium plating would cause malfunctioning. Brass, bronze, and copper-alloy parts shall be cadmium-plated, or adequately treated in some other acceptable manner for corrosion prevention. Stainless steel parts shall be passivated.

3.8.3 Paint Finish.- Any parts painted shall be finished with one coat of primer conforming to Specification MIL-P-6889, type I, and one coat of enamel, conforming to Specification MIL-E-5557, type II or IV.

3.9 Synthetic Rubber Parts.-

3.9.1 Marking.- All synthetic rubber parts such as diaphragms, but excepting "O" rings and parts with no suitable surface, shall have painted, stamped with ink, or otherwise noted on the part, the year and month of the curing date of the part.

3.9.2 Curing Date Tag.- A decalcomania or a small metal tag in accordance with the requirements of ANA Bulletin No. 410, giving the year and month of the curing date of the oldest synthetic rubber part in the valve, shall be securely attached to the outside of the valve.

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3.9.3 Serviceability.-- All synthetic rubber parts shall be readily replaceable with a minimum replacement of attaching parts.

3.9.4 Uniformity.-- For valves which include parts fabricated of synthetic material in contact with fuel, manufacturers shall control subsequent batches of the material to provide for uniformity.

3.10 Performance.-- The valves shall satisfy the performance requirements of Section 4, and shall satisfactorily complete the tests.

3.11 Markings.-- All markings shall be permanent to prevent obliteration resulting from service usage.

3.11.1 "Hinge" shall be marked on the outside of the valve adjacent to the pivot location for swing-type valves.

3.11.2 Direction of flow shall be indicated by arrows in two places approximately 180 degrees apart as shown in the drawings.

3.12 Identification of Product.-- The following information shall be etched, engraved, embossed, or stamped in a suitable location on the valve.

VALVE, FUEL CHECK, LOW PRESSURE  
MS Part No.  
Manufacturer's Part No.  
Manufacturer's Name or Trade-Mark

3.12.1 Part Number.-- Each part and assembly shall be marked with a part number which shall be the same as the manufacturer's drawing number, except the following:

- (a) Parts or assemblies which do not have a suitable or sufficient surface for a part number.
- (b) Parts or assemblies which are permanently assembled by welding, brazing, soldering, or riveting. These shall carry their assembly part number.

3.12.1.1 Accessibility.-- The part number shall, when practicable, be located to permit being read after assembly in the complete unit.

3.12.2 Use of AN or MIL Designations.-- AN or MIL designations shall not be applied to a product, except for Qualification test samples, nor referred to in correspondence or sales matter, until notification has been received from the Aeronautical Standards Group that the product has been approved for aeronautical use, by both the Air Force and the Bureau of Aeronautics.

3.13 Workmanship.-- All details of workmanship shall be in accordance with high-grade manufacturing practice covering this class of aircraft accessories.

#### 4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 Classification of Tests.-- The inspection and testing of check valves shall be classified as follows:

- (a) Qualification tests: Qualification tests are those tests accomplished on samples submitted for qualification as a satisfactory product.
- (b) Inspection tests: Inspection tests are those tests accomplished on check valves manufactured and submitted for acceptance under contract.

#### 4.2 Qualification Tests.--

4.2.1 Prior Qualification.-- Unless otherwise specified by the procuring agency, valves which have not previously passed a Qualification test, or which have passed the Qualification test and have been modified in any manner, shall satisfactorily pass a Qualification test prior to the acceptance of any valve. The laboratory tests shall be

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conducted by the contractor, and an opportunity shall be given the Inspector or the procuring agency to witness these tests. At the option of the procuring agency, all or any part of the Qualification test may be repeated by the procuring agency for final determination of compliance with the specifications.

4.2.2 Sampling Instructions.— The Qualification test samples shall consist of six valves upon which qualification is desired. Three of the valves shall have been qualification tested by the contractor. The remaining three valves shall be untested units. Samples shall be accompanied by two complete sets of detail and assembly drawings and a complete test report showing results of manufacturer's tests. Samples shall be forwarded to the testing laboratory designated in the authorization for Qualification tests, plainly identified by securely attached durable tags marked with the following information:

Sample for Qualification Test  
VALVE, FUEL CHECK, LOW PRESSURE  
MS Part No.  
Name of Manufacturer  
Submitted by (Name) (Date) for test in accordance with requirements of Specification MIL-V-7899 under authorization (reference authorizing letter).

4.2.2.1 Manufacturer's Drawings.— Manufacturer's drawings submitted with the Qualification test samples shall show a cutaway section showing all parts in their normal assembled position and shall specify part numbers of all parts and subassemblies. The following data shall be furnished on or together with the assembly drawing:

- (a) Mounting Dimensions
- (b) Over-All Dimensions
- (c) Location, Size, and Type of Plumbing Connections
- (d) Materials and Construction, Treatment and Finish
- (e) Pressure and Flow Rating

4.2.2.2 Manufacturer's Test Report.— The test reports submitted with the Qualification test samples shall include the following:

- (a) Report of all tests, graphically presented when possible, together with a detailed statement indicating compliance or extent of noncompliance with all requirements of this and the detail specifications, referring specifically to paragraph numbers. Wherever a requirement is considered to be not applicable, the report should so state this.
- (b) Summary of Endurance test
- (c) Diagrams of all test set-ups
- (d) Outline and description of test and test conditions
- (e) Copies of test log sheets
- (f) Photographs when available

4.2.3 Tests.— The Qualification tests of fuel check valves shall consist of the following tests, in the order listed, and as described under "Test Methods." The Qualification tests may, at the option of the Bureau of Aeronautics or the Wright Air Development Center, be supplemented with tests under actual or simulated service conditions.

#### Tests

- |                                 |             |
|---------------------------------|-------------|
| (a) Examination of Product      | Valve No. 1 |
| (b) Pressure Drop               |             |
| (c) Valve Body Leakage          |             |
| (d) Air Pressure Leakage        |             |
| (e) Fuel Pressure Leakage       |             |
| (f) Valve Opening and Closing   |             |
| (g) Contaminated Fuel Endurance |             |
| (h) Accelerated Corrosion       |             |
| (i) Burst Pressure              |             |
| (j) Disassembly and Inspection  |             |



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- (a) Examination of Product
- (b) Valve Body Leakage
- (c) Air Pressure Leakage
- (d) Fuel Pressure Leakage
- (e) Valve Opening and Closing
- (f) Room Temperature Endurance
- (g) High Temperature Endurance
- (h) Low Temperature Endurance
- (i) Vibration Test
- (j) Disassembly and Inspection

Valve No. 2

- (a) Examination of Product
- (b) Valve Body Leakage
- (c) Air Pressure Leakage
- (d) Fuel Pressure Leakage
- (e) Valve Opening and Closing
- (f) Fuel Resistance and Extreme Temperature
- (g) Disassembly and Inspection

Valve No. 3

**4.3 Inspection Tests.**— The contractor shall furnish all samples and shall be responsible for accomplishing the tests specified herein. When inspection is conducted at the contractor's plant, all inspection and testing shall be under the surveillance of the Government Inspector. Contractors not having laboratory testing facilities satisfactory to the Government shall engage the services of a commercial testing laboratory acceptable to the procuring agency. The contractor shall furnish test reports showing quantitative results for all tests required by this specification, and signed by an authorized representative of the contractor or laboratory, as applicable. Acceptance or approval of material during course of manufacture shall in no case be construed as a guaranty of the acceptance of the finished product.

**4.3.1 Individual Tests.**— Each valve shall be subject to the following tests as described under "Test Methods":

- (a) Examination of Product
- (b) Valve Body Leakage
- (c) Air Pressure Leakage
- (d) Fuel Pressure Leakage

**4.3.2 Sampling Tests.**— One valve shall be selected by the Inspector from each lot of 200 or fraction thereof on the order and subjected to the Burst Pressure test in addition to the Individual tests, as described under "Test Methods."

**4.3.3 Rejection and Retest.**— Any valve failing to meet the requirements of the Individual tests shall be rejected and returned at the contractor's expense. When any representative sample fails to meet the requirements of the Sampling tests, the lot represented shall be rejected and returned at the contractor's expense. Valves which have been rejected may be replaced or repaired to correct the defects and resubmitted for all specified tests. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the original defects shall be furnished the Inspector. Valves rejected after retest shall not be resubmitted without the specific approval of the procuring agency.

#### **4.4 Test Conditions.**—

**4.4.1 Cleaning.**— Prior to testing the valve, all internal parts normally in contact with the fuel shall be thoroughly cleaned to remove all foreign matter.

**4.4.2 Leakage Tests.**— For all leakage tests except Valve Body Leakage, the test set-up shall be similar to figure 1, or shall be such as to give equivalent results.

**4.4.3 Test Fluid.**— Unless otherwise specified, fuel in accordance with Specification MIL-F-5572, grade 100/130 or grade 115/145, or Specification MIL-H-3136, type I, shall be used for all tests. Any fluid complying with Specification P-S-661 (or any other fluid acceptable to the procuring agency) may be used as a substitute for the test fuel for all tests except wherein a specific fluid is specified.

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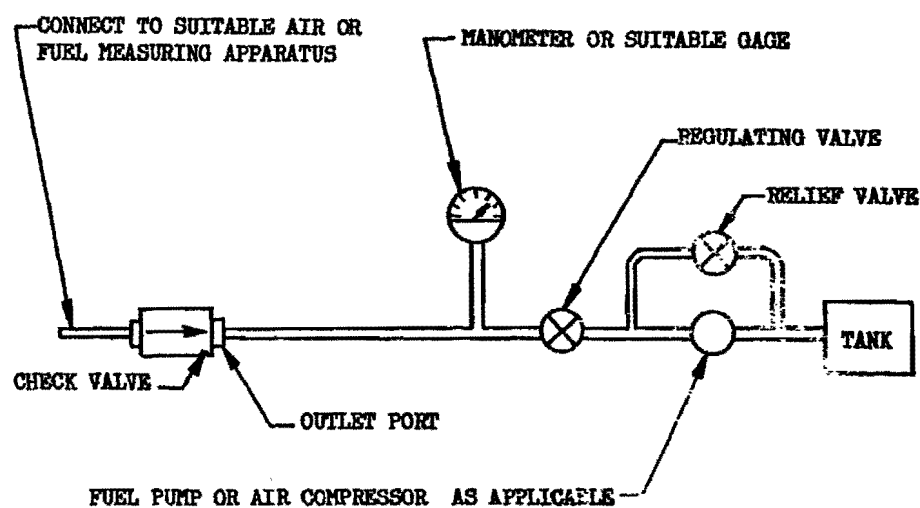


FIGURE 1. Test Set-Up for Fuel (or Air) Pressure Leakage

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4.4.4 Room Temperature and Pressure.- Unless otherwise specified, all tests shall be conducted with the valve and fuel at a room temperature between 60° and 90°F and at atmospheric pressure.

#### 4.5 Test Methods.-

4.5.1 Examination of Product.- Each valve shall be examined to determine conformance with all requirements of this specification for which there are no specific tests.

4.5.2 Pressure Drop.- The pressure drop through the valve shall be determined up to the fuel flow specified in the applicable MS drawing, using a test set-up similar to figure 2. The pressure drop shall be obtained for the two lengths of tubing and fittings between the pressure taps and the check valve connections. The pressure drop for the valve is the difference between the pressure drop for the valve and tubing with fittings and the pressure drop for the tubing with fittings. The pressure drops shall not exceed the values specified on the applicable MS drawing. Pressure drop values must be converted to average MIL-F-5572, grade 115/115, (average viscosity - 0.892 centipoise, average specific gravity - 0.696) by use of the following formula;

$$\Delta P_{\text{corrected}} = \left( \frac{0.892}{\mu} \right)^{.25} \times \left( \frac{0.696}{\rho} \right)^{.75} \times \Delta P_{\text{Observed}}$$

where  $\mu$  = absolute viscosity of test fluid, centipoise

$\rho$  = specific gravity of test fluid

Sufficient data shall be taken to satisfactorily plot a "Pressure Drop against Flow" curve. This curve shall accompany the Qualification test sample when submitted to the procuring agency.

#### 4.5.3 Leakage.-

4.5.3.1 Valve Body Leakage.- With the valve submerged in fuel, or other suitable liquid, and with the outlet port plugged, air pressure from 0 to 120 psi shall be applied to the inlet port for a minimum of 30 seconds. There shall be no external leakage at any required pressure.

4.5.3.2 Air Pressure Leakage.- With the internal parts of the valve wet with fuel but not filled with fuel, air pressures equivalent to 4 inches of fuel, 1 to 6 psi in increments of 1 psi, and also at 10 psi and 30 psi, shall be applied to the outlet port. After 30 seconds, the leakage shall not exceed 10 cc per minute of free air.

4.5.3.3 Fuel Pressure Leakage.- Fuel under pressure from 4 inches of test fluid to 5 psi in 1-psi increments, and from 5 to 60 psi in 10-psi increments shall be applied to the outlet port. The test set-up shall be as shown in figure 1 or such as to give equivalent results. After a 2-minute maximum waiting period, leakage shall not exceed that specified on the applicable MS drawing. For inspection tests only, leakage shall be measured at pressures of 4 inches of fluid, 25 and 60 psi only.

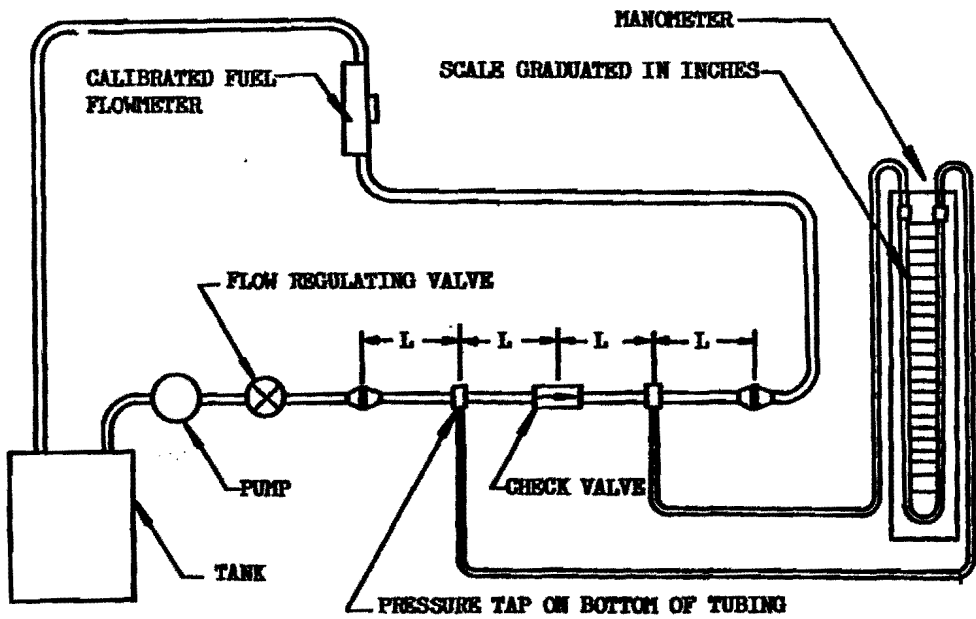
4.5.4 Valve Opening and Closing Test.- The valve shall meet the cracking pressure requirements specified on the applicable MS drawing. On checking for closing, the valve shall close before the outlet pressure rises to equal the inlet pressure.

#### 4.5.5 Endurance.-

4.5.5.1 Room Temperature Endurance.- The valve shall be operated for a total of 8,000 cycles in a test set-up as shown in figure 3 or such as to give equivalent results. During this test, the fuel flow through the open check valve shall be at the rated flow specified on the applicable MS drawing. Fuel pressure of 60 psi shall be imposed on the outlet port when the valve is in the closed position. The valve shall be operated at 10 cycles per minute maximum. At any time during or after the test, the valve shall satisfy the performance requirements under the paragraphs headed as follows:

- (a) Valve Body Leakage
- (b) Air Pressure Leakage
- (c) Fuel Pressure Leakage
- (d) Valve Opening and Closing

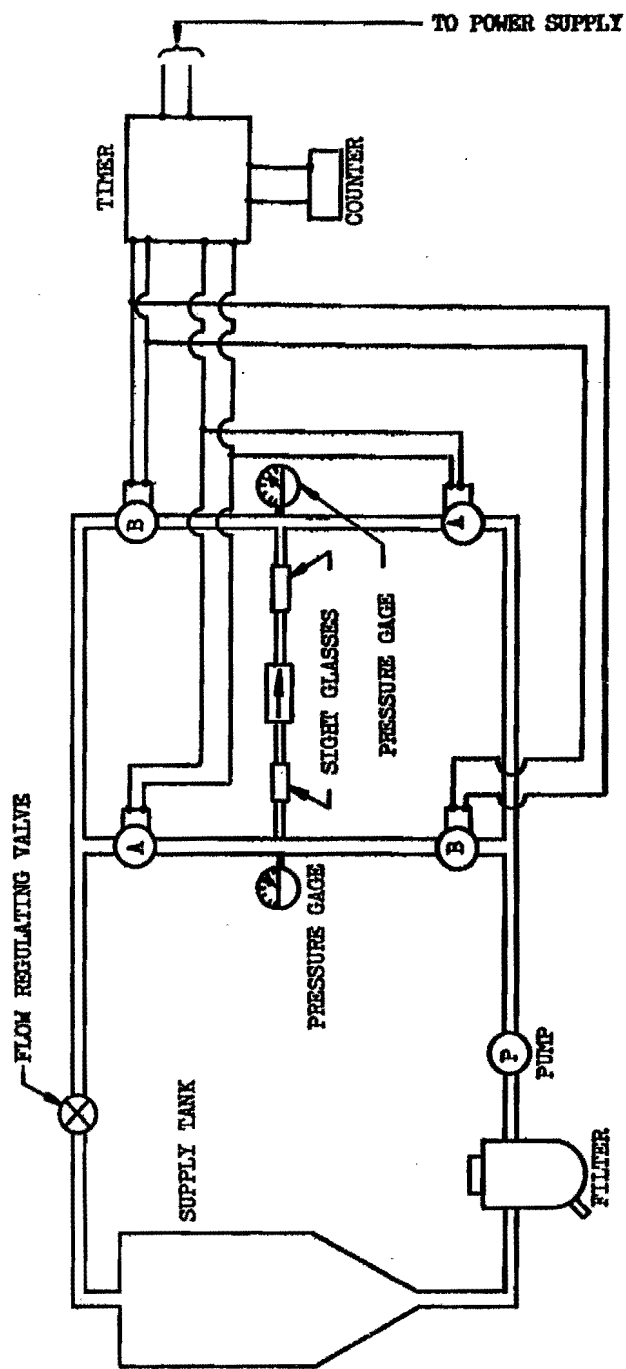




L = 10 DIAMETERS OF TUBING

FIGURE 2. Test Set-Up for Pressure Drop

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NOTE: A, A, B, B, ARE QUICK ACTING SOLENOID SHUT-OFF VALVES ELECTRICALLY OPERATED THROUGH THE TIMER SO THAT WHEN A, A ARE CLOSED, B, B ARE OPEN, AND FLUID FLOWS THROUGH THE OPEN CHECK VALVE. TO COMPLETE ONE CYCLE, A, A ARE OPENED AND B, B ARE CLOSED, AND THE RESULTANT REVERSAL CLOSES THE CHECK VALVE.

FIGURE 3. Endurance Test Set-Up

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4.5.5.2 High Temperature Endurance.— The valve shall be tested as specified and shall satisfy the requirements under the paragraph headed Room Temperature Endurance, except for the following:

- (a) Temperature of the fuel and valve shall be 125° to 135°F.
- (b) The valve shall be operated for a total of 1,000 cycles.
- (c) Flow need not be rated flow.

4.5.5.3 Low Temperature Endurance.— The valve shall be tested as specified and shall satisfy the requirements under the paragraph headed Room Temperature Endurance, except for the following:

- (a) The valve and fuel shall be held at a temperature of -65° to -70°F.
- (b) The valve shall be operated for a total of 1,000 cycles.
- (c) Flow need not be rated flow.

4.5.6 Vibration Test.— The valve shall be adequately mounted on the vibration device with fluid pressure applied to the outlet port and with the inlet port open, and subjected to six vibration scanning cycle tests listed in table I. The test shall be conducted at room temperature. Fluid leakage shall not exceed 1 cc per minute. There shall be no evidence of damage to the valve, loosening of parts, or leakage as a result of the test.

TABLE I  
Vibration Test

Scanning Cycle Test	1	2	3	4	5	6
Axis of Vibration	x	y	z	x	y	z
Fluid Pressure	60 psi	60 psi	60 psi	1/2 psi	1/2 psi	1/2 psi
Scanning Cycle Time	15 min	15 min	15 min	15 min	15 min	15 min
Number of Scanning Cycles per Test	2	2	2	2	2	2
Procedure	The Vibration test shall be conducted on the valve along three mutually perpendicular axes herein referred to as the x, y, and z axes; the x axis being defined as lying along center line of the valve. The frequency shall be uniformly increased with respect to time through a frequency range from 10 to 500 cycles/sec with an applied double amplitude of 0.036 inch up to 75 cycles/sec, and from there an applied vibration acceleration not less than $\pm 10g$ . The frequency shall be similarly decreased such that the complete cycle is accomplished in the specified cycle time.					

4.5.7 Fuel Resistance and Extreme Temperature Test.— The Fuel Resistance and Extreme Temperature tests shall be conducted in accordance with table II.

TABLE II  
Fuel Resistance and Extreme Temperature Test Schedule

Test	Fuel Resistance					Extreme Temperature	
Period	Initial Drying	Phase I Soak	Phase I Dry	Phase II Soak	Phase II Dry	Low Temperature	High Temperature
Component Configuration	Drained, Ports Open	Ports Open	Drained, Ports Open	Ports Open	Drained, Ports Open	Figure 1	Figure 1
Test Fluid	None	MIL-H-3136, type III	None	MIL-H-3136, type I	None	MIL-H-3136, type I	MIL-H-3136, type III
Period Duration	168 Hours (7 Days)	168 Hours (7 Days)	4 Hours	504 Hours (21 Days)	4 Hours	72 Hours (3 Days)	72 Hours (3 Days)
Temperature	158° ±2°F	Room	158° ±2°F	Room	158° ±2°F	-67 ±2°F	130 ±5°F
Operation and Tests During Period	None	Actuate Valve At Least Twice per Day	None	Actuate Valve At Least Twice per Day	None	None	None
Operation and Tests Immediately after Period	(1) Conduct Fuel Pressure Leakage Test Using MIL-H-3136, type I Fluid.	Conduct Fuel Pressure Leakage Test Using MIL-H-3136, Type III Fluid.	(1) Conduct Fuel Pressure Leakage Test Using MIL-H-3136, type I Fluid.	Conduct Fuel Pressure Leakage Test Using MIL-H-3136 Type I Fluid.	(1) Conduct Fuel Pressure Leakage Test Using MIL-H-3136, type I Fluid.	With Ambient Temperature and Test Fluid at not higher than -65°F:	With Ambient Temperature and Test Fluid at 130° ±5°F:
	(2) Conduct Valve Opening and Closing Test.		(2) Conduct Valve Opening and Closing Test.		(2) Conduct Valve Opening and Closing Test.	(1) Conduct Fuel Pressure Leakage Test Using MIL-H-3136, Type I Fluid.	(1) Conduct Fuel Pressure Leakage Test Using MIL-H-3136, Type III Fluid.
						(2) Conduct Valve Opening and Closing Test.	(2) Conduct Valve Opening and Closing Test.

NOTES: (a) During periods of soaking in the test fluid, the valve shall be maintained in such a manner as to insure complete contact of all nonmetallic parts with the fluid as would be expected under service conditions.  
(b) Each period shall follow immediately after the preceding one in the order noted.  
(c) During all Fuel Pressure Leakage Tests, there shall be no evidence of valve body leakage.

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**4.5.8 Contaminated Fuel Endurance.**-- A quantity of fuel, containing a quantity and type of contaminant for every 20 gallons conforming to table III shall be pumped through the valve at the rated flow shown on the applicable MS drawing in a recirculating system similar to that shown in figure 3. The valve shall be operated at a speed of 10 cycles per minute maximum for 2,000 cycles. The fuel shall be properly agitated to keep the contaminant uniformly distributed in the circulating fuel. A minimum quantity of 20 gallons of fuel shall be used for this test. After this test, the valve shall be tested as follows:

- (a) Valve Body Leakage
- (b) Air Pressure Leakage
- (c) Fuel Pressure Leakage
- (d) Valve Opening and Closing

TABLE III

Contaminant Description	Particle Size	Quantity
Sharp Silica Sand	Smaller than 30 mesh Larger than 50 mesh	0.2 grams
Sharp Silica Sand	Smaller than 50 mesh Larger than 100 mesh	0.2 grams
Prepared Dust		0.6 grams
AC Spark Plug Co. Part No. 1543637 or equal	0-5 Microns 12 $\pm$ 2 percent 5-10 Microns 12 $\pm$ 3 percent 10-20 Microns 14 $\pm$ 3 percent 20-40 Microns 23 $\pm$ 3 percent 40-80 Microns 30 $\pm$ 3 percent 80-200 Microns 9 $\pm$ 3 percent	

**4.5.9 Accelerated Corrosion.**-- The valve, with open ports, shall be immersed in a solution consisting of 2-1/2 percent by weight of sodium chloride in distilled water. After immersion, the solution shall be drained and the valve shall be heated in an oven to a temperature of 125° to 135°F for a period of not less than 1 hour. The immersion and heating cycle shall be repeated 50 times. The valve shall not be operated at any time during the immersion cycles. Immediately after completing the immersion cycles, the valve shall be washed out with warm water to remove all salt accumulations, after which the valve shall be dried, wetted with fuel, and operated three complete cycles. Corrosion of any part of the valve to a degree which might affect performance shall be cause for rejection.

**4.5.10 Burst Pressure.**-- With the valve in the closed position, it shall be subjected to a fuel pressure of 180  $\pm$  2 psi on the outlet port and the inlet port open to atmosphere, for a minimum period of 1 minute. There shall be no evidence of distortion or other damage to the valve. When the pressure is lowered to 60 psi, there shall be no evidence of external leakage from any portion of the valve. This test shall be repeated with the pressure applied to the inlet port with the outlet port plugged.

**4.5.11 Disassembly and Inspection.**-- The unit shall be disassembled and inspected. If corrosion deterioration or wear exists to a degree which affects performance the unit shall be rejected.

## 5. PREPARATION FOR DELIVERY

**5.1 Application.**-- The requirements specified herein apply only to direct purchases by or direct shipments to the Government.

**5.2 Preservation, Packaging and Packing.**-- The valves shall be preserved, packaged and packed in accordance with Specification MIL-P-6064, Group VI.

**5.3 Marking and Labeling.**-- Marking shall be in accordance with the applicable requirements of MIL-STD-129.



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5.3.1 The following note shall be applied on unit and intermediate packages and exterior shipping containers:

"IF IN STORAGE AFTER (DATE)(INSERT DATE 18 MONTHS AFTER CURING DATE OF OLDEST SYNTHETIC RUBBER PART USED IN VALVE), THE VALVE SHALL BE TESTED AND INSPECTED BEFORE USE."

## 6. NOTES

6.1 Intended Use.- The fuel check valves covered by this specification are intended for use in aircraft fuel systems.

### 6.2 Definitions.-

6.2.1 Cycle.- A cycle is an operation of the valve from full-closed to full-open and returned to full-closed, or starting at full-open to full-closed and returned to full-open.

6.2.2 Cracking Pressure.- Cracking pressure is the pressure at which 1/2 percent of rated flow is obtained.

6.3 Ordering Data.- Requisitions, contracts, and orders should specify quantity, NS part number of valve required, and whether overseas packing is desired.

6.4 Provisions for Qualification Tests.- The right is reserved to reject any bids on fuel check valves which have not been subjected to the required tests and found satisfactory. The attention of manufacturers is called to this provision, and they are urged to request authorization for tests of fuel check valves which they propose to offer to the Air Force or Navy under this specification. It is suggested that the manufacturer submit drawings to the Government testing agency for comment and recommended changes which may seem desirable prior to his conducting of Qualification tests. Requests for authorization of tests should be addressed to the Bureau of Aeronautics, Navy Department, Washington 25, D. C., or to the Commanding General, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, the qualifying agencies. Drawings and test reports as required under paragraph 4.2.1 shall be submitted with this request for authorization.

6.4.1 It is to be understood that upon receipt of the Letter of Authorization samples shall be furnished at no cost to the Government, and that the manufacturer shall pay the transportation charges to and from the designated point where tests are to be made. In the case of failure of the sample or samples submitted, consideration will be given to the request of the manufacturer for additional tests only after it has been clearly shown that changes have been made in the product which the Government considers sufficient to warrant additional tests.

6.4.2 It is to be understood that valves supplied under contract shall be identical in every respect to the sample tested and found satisfactory and to the detail drawings thereof, except for changes previously approved by the Bureau of Aeronautics or the Air Force. Any unapproved changes from the qualification sample or from the drawings shall constitute cause for rejection.

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodians:  
Navy - Bureau of Aeronautics  
Air Force