ASCO® General Controls
50-60 Hanover Rd, Florham Park, NJ 07932

H118 Hydramotor®
Gas Fuel Valve

INSTALLATION AND SERVICE

SDI: H118-2
Effective: 1-97
Supersedes: 2-96

DESCRIPTION

H118 Hydramotor® Gas Fuel Valves are normally closed, cast iron-bodied, globe-type valves operated by ON/OFF, current failure type actuators for control and safety shutoff of gas supply to commercial or industrial burners. These valves have soft synthetic seats for tight shutoff of all gases.

USE ONLY WITH CLEAN FUEL GASES: NATURAL, MIXED, MANUFACTURED OR LP GASES, INCLUDING HIGH SULFUR, SCRUBBED COKE, AND SCRUBBED AND DRIED SEWER GASES.

OPERATION (figure 2)

When actuator terminals are powered, through limit and/or operating control, a relief valve closes and an electric motor-driven pump applies hydraulic pressure to the spring-loaded piston. When the stem has fully retracted, a limit switch opens the pump motor circuit while the relief valve remains closed, holding the stem in the fully open position. When temperature or pressure reaches a preset limit or the operating control breaks the control circuit, the relief valve opens and the spring-loaded piston returns the stem to its deenergized position (fully closed).

NOTE: When the actuator is holding in its energized position, the motor may restart intermittently to maintain proper pressure against the piston.

⚠ WARNING ⚠

Fire or explosion hazard. Improper installation or service could result in serious personal injury, death, or property damage:

This valve should be installed, serviced, or tested for closure tightness only by experienced service technicians trained in gas safety equipment.

Install valve with arrow pointing in the direction of flow so that flow tends to close valve seat.

Any time valve is disassembled and reassembled, serviced in any form, or installed on pipeline, perform a closure test for leakage before valve is put into operation. See "Closure Tightness Test" instructions, below.

INSTALLATION

Piping the Valve

1. **Turn off main gas supply before installing valve.**
2. Check valve requirements against catalog specifications to assure proper valve has been selected. Seat disc temperature must not exceed 150° F (65° C).
3. Valve is multipoised and may be mounted in any position.
4. Blow out all pipe lines to remove foreign matter. Strainers in the inlet piping are advised, close to the valve.
5. Apply pipe dope sparingly to male threads, leaving two end threads bare.

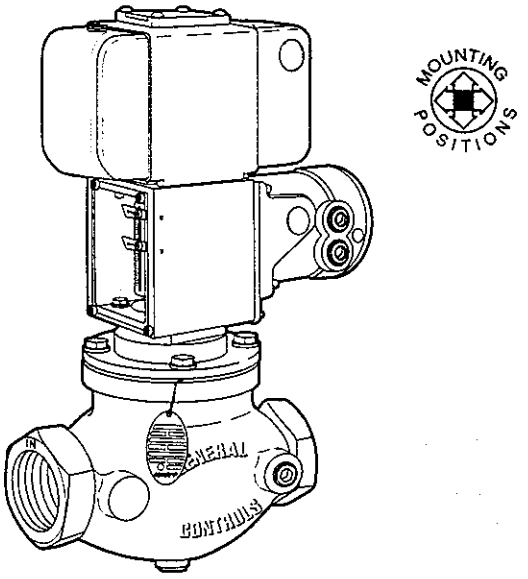

Figure 1. H118 Hydramotor® Gas Fuel Valve

6. On installations using LP gas, use pipe dope resistant to action of LP gas.
7. Install valve in pipeline in accordance with inlet and outlet markings on body. Inlet line pressure is on top of seat in normally closed valves.
8. All piping must comply with applicable local codes and ordinances and with the National Fuel Gas Code (ANSI Z223.1/NFPA No. 54).
9. Connect valve using wrench on body hex at end being joined. Never use actuator as lever.
10. **Before valve is put into final operation a closure tightness test must be made to check leakage.**

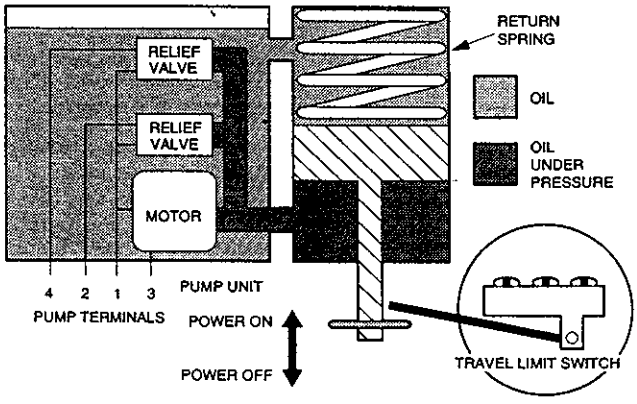

Figure 2. Typical H10/H30 Operation

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Wiring the Actuator

If burner manufacturer has furnished a wiring diagram follow it carefully. Typical wiring connections are shown in figure 3.

CAUTION

- **All wiring must be NEC Class 1. All wiring must conform to applicable electrical codes and ordinances. Installations in Canada require the use of rigid metal conduit to ground the electrical enclosure of this valve.**
- **Turn off electric power supply before wiring actuator to prevent electrical shock or damage to equipment.**
- **Maximum connected load to motor and auxiliary switch must not exceed 2000 VA.**
- **Limit controls must be capable of handling electrical load shown on actuator/valve nameplate (volts, frequency, VA). Use #16 wire or larger, suitable for 167° F (75° C). Wire limit controls in hot side of circuit (See figure 3).**
- **Do not connect additional wiring to travel limit switch (See figure 3).**
- **All loose metallic particles must be removed from joints and interior of the electrical enclosure prior to tightening cover.**

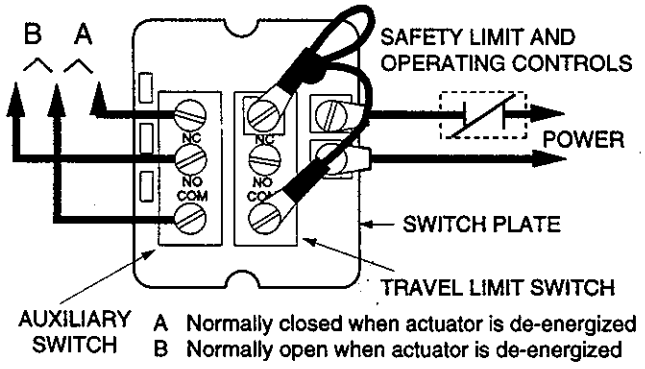


Figure 3. Typical Wiring

Check Out and Operation

After complete valve installation and with main gas cock shut off, run unit through four or five operations. Entrained air in actuator makes unit operate sluggishly for the first few cycles.

Opening time may be delayed for several minutes at sub-zero temperatures until pump motor has warmed the hydraulic oil.

Regular (monthly or more often) tests of all controls in safety and operating circuits should be performed.

SWITCHES

Auxiliary Switch Adjustment (figure 4)

The integral SPDT auxiliary switch is nonadjustable and actuates at end of actuator energized stroke. See figures for switch location and function. Each switch in the yoke-mounted auxiliary switch unit may be adjusted separately to actuate at any point of actuator stem travel.

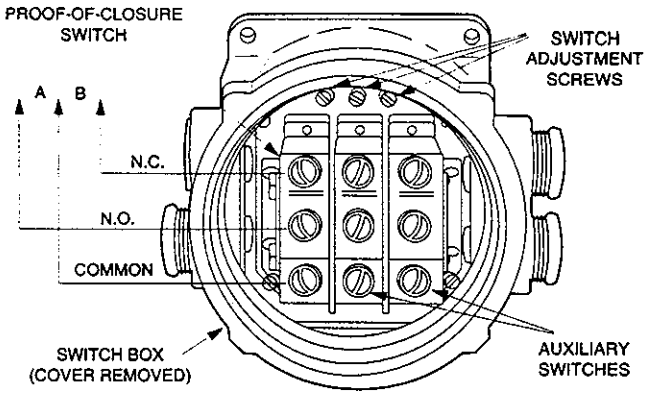


Figure 4. Yoke-Mounted Auxiliary Switch Adjustment

Turn individual switch adjustment screw counterclockwise to actuate switch closer to deenergized position. Turn screw only 1/8-turn at a time and check operation. Do not attempt to set switch for operation within 1/8" of either end of stroke.

Valve Seal Overtravel Interlock Switch

H118 Hydramotor® valve models with F26V16 option have a factory-set valve seal overtravel interlock switch in the yoke-mounted housing which permits supervision of the valve's closed position and can be wired into the start-up or preignition interlock circuit. If the Hydramotor® is equipped with more than one switch, the FM proof of closure switch is the one on the far left hand side when facing the open side of switch box. The other switches are field adjustable. NOTE: Valve body must be equipped with valve seal overtravel. Do not utilize valve body without this provision.

OVERHAUL

Stem Nut Adjustment

If upper valve stem nut is removed during repair, it must be adjusted according to the following procedure.

CAUTION

A nicked, scored or otherwise damaged valve stem can ruin stem O-ring and cause external leakage. Misalignment of valve guide or damage to seat ring can cause internal leakage. Follow directions carefully.

1. In order to obtain proper seating pressure and correct valve lift, distance from actuator shaft to stem nut must be in accordance with value in table 1. Dimension "A" is measured with valve stem in DOWN position (closed) and actuator shaft in UP (energized position) (see figure 5).
2. Adjust upper stem nut (see table 1) and lock with two set screws. Rotate stem to align prongs with grooves.

Table 1. Stem Nut Adjustment (inches)

Port Size	Dim "A"	Port Size	Dim "A"
1	1/2	2 1/2	7/8
1 1/4	9/16	3	1
1 1/2	5/8	4	1 1/8
2	3/4	6	1 5/8

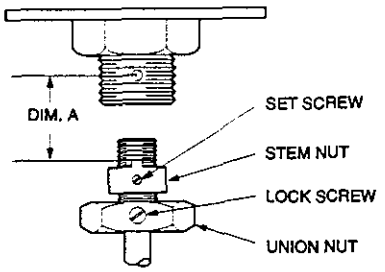


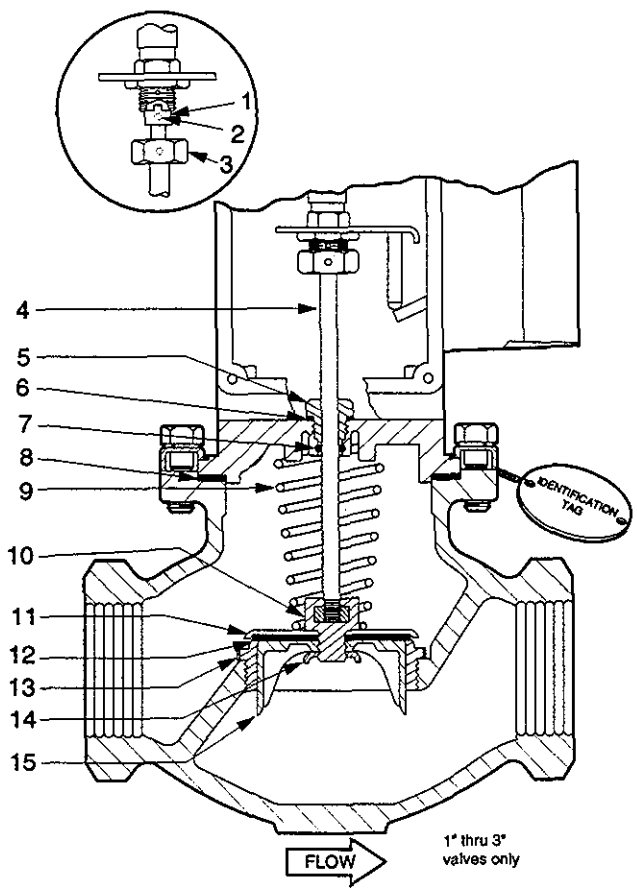
Figure 5. Stem Nut Adjustment

Actuator Removal/Replacement (figure 6)

1. Loosen lock screw in side of union nut (4). Remove union nut.
2. Energize actuator to relieve pressure on valve stem.

⚠ WARNING ⚠

Actuator is heavily spring loaded. If H118 actuator cannot be operated, take care in removing it from the valve.



1. STEM NUT
2. SET SCREW
3. UNION NUT
4. STEM ASSEMBLY
5. PACKING BUSHING
6. STEM O-RING
7. STEM PACKING
8. BONNET GASKET
9. VALVE SPRING
10. RETAINING SCREW
11. DISC RETAINER
12. SEAT DISC
13. SEAT RING
14. STEM LOCKNUT
15. VALVE GUIDE

Figure 6. H118 Hydramotor® Cross Section

3. Remove four hex head cap screws holding actuator to valve bonnet (figure 6).
4. Lift actuator off valve bonnet.
5. Energize new actuator and set on valve bonnet.
6. Replace and tighten four hex head cap screws.
7. If upper valve stem nut (2) has been removed see **Stem Nut Adjustment.**

VALVE OVERHAUL

Before performing the following procedures:

1. **Turn off gas supply** at upstream manual gas cock.
2. Remove actuator from valve body.

Replacement of Stem Packing Ring (figure 6)

1. Loosen union nut lockscrew and remove union nut (3).
2. Loosen set screws and remove stem nut (1).
3. Remove packing bushing (5). Stem packing ring (6) is now accessible.

NOTE: Use care to not damage packing ring (6) when slipping over threaded portion of stem.

4. Inspect valve stem (4) for nicks or scoring. Replace valve stem if necessary.
5. Replace packing ring (7) and bushing (5). Turn bushing down snug.

Replacement of Stem

1. Follow steps 1 through 4 under **Replacement of Stem Packing Ring** in order to loosen stem packing ring.
2. Remove bonnet bolts. Carefully raise stem, bonnet, seat and guide together so seat disc does not slide off.
3. Slide valve stem guide and seat disc assembly off stem. Pull stem carefully down through packing. Be sure stem O-ring packing is loose to prevent damage by threaded portion of stem.
4. Carefully insert new stem and nut assembly through packing in bonnet. Replace packing nut and run down snug. Align seat disc on lower stem nut. Replace bonnet gasket. Carefully lower parts into valve body. Make certain valve guide slips straight into seat ring without damage to seat ring.

Replacement of Seat Disc, Guide or Ring

1. Remove bonnet bolts.
2. Lift actuator, bonnet and connected parts straight up, being careful not to drop valve guide assembly from stem.
3. Unscrew valve guide and replace valve guide to guide retaining screw.
4. Reassemble and stake lock nut to guide retaining screw.
5. Check seat ring for nicks, change if necessary.
6. Replace bonnet gasket. Replace valve guide and seat disc assembly on stem, and carefully lower into valve body. Make certain valve guide slips straight into seat and does not nick edge.

FILLING POWER UNIT WITH OIL

Units are filled with MIL-H-5606 or equivalent oil, available from ASCO General Controls. Do not mix with other oils. Filter oil if secured from source other that ASCO GC. Take care that dirt, dust or lint does not enter pump unit or cylinder.

1. **Deenergize actuator** and place in upright position.
2. Unscrew filler plug at end opposite valve body.
3. Fill power unit of Hydramotor® valve utilizing H10 Actuator with oil not to exceed one pint. Fill power unit of Hydramotor® valve utilizing H30 actuator with oil not to exceed three pints. Energize actuator ON and OFF for 15 to 20 minutes to release air from cylinder and bring oil temperature to 68° F or above. Add enough oil to fill container to base of filler tube.
4. Replace plug and tighten.

REPLACEMENT PARTS

Replacement Parts and/or Repair Kits are available for this product. When ordering repair parts give complete catalog number and serial number of product. See your local Factory Authorized Distributor for availability. A parts list may be obtained by writing ASCO General Controls.

CLOSURE TIGHTNESS TEST

The following instructions are for closure tightness test of gas safety shutoff valves on initial burner start-up.

1. **Turn off electrical power** to deenergize control system and safety shutoff valve.
2. **Turn off gas supply at upstream manual gas cock** (see figure 7).
3. Make sure manual test petcock is closed.
4. Remove plug from leak test tap and connect test equipment to leak test tap as shown in figure 7.
5. Close downstream manual gas cock.
6. Open upstream manual gas cock.
7. Program safety shutoff valve (SSOV), through the safety system to full open position, then immediately deenergize it to seat valve operationally.

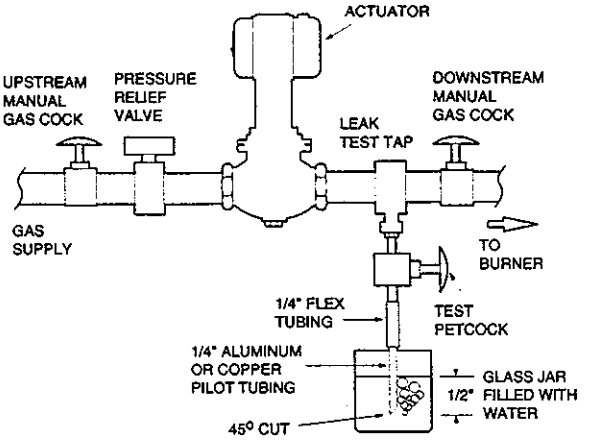


Figure 7. Test Setup for Checking Through-the-Valve Leakage

8. Immerse 1/4" tube vertically into jar of water about 1/2", as shown in figure 7.
9. Slowly open test petcock.
10. As the rate of bubbles coming through the water stabilize, count number of bubbles appearing during a 10-second period. Each bubble that appears during 10-second period represents a flow rate of approximately 0.001 CFH. To meet all requirements leakage should not be more than 23 bubbles during a 10-second period (0.023 CFH = 650 cc/hr. approx.). If leakage exceeds 23 bubbles valve bonnet and interior assembly must be replaced.
11. Close upstream manual gas cock.
12. Close test petcock, remove test equipment and replace lead test tap plug.
13. Turn on gas supply at upstream manual gas cock and energize safety shutoff valve (SSOV).
14. Test for leaks at test tap with soap solution.
15. Deenergize safety shutoff valve (SSOV).
16. Open downstream manual gas cock.
17. Restore system to normal operation.