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

H137 Hydramotor® High-Flow, High-Pressure Gas Valve

INSTALLATION AND SERVICE

SDI: H137-1
Effective: 10-96
Supersedes: 7-92

DESCRIPTION

H137 Hydramotor®, high-pressure, high-flow gas valves are normally closed, ON/OFF, current failure type for control and safety shutoff of gas supply to commercial or industrial burners. These valves have soft synthetic seats for tight shutoff.

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

Valves are equipped with: one integral SPDT auxiliary switch, a UL raintight, CSA enclosure 4, NEMA 4 watertight housing, a tamper-proof valve stem enclosure, and a yoke-mounted valve seal over travel interlock switch. One or two optional yoke-mounted SPDT auxiliary switches may be added.

OPERATION

When actuator terminals are powered, the dual relief valves close and the electric motor-driven pump applies hydraulic pressure to a spring-loaded piston. As the stem reaches full travel, a limit switch opens the pump motor circuit to stop pump action. The relief valves remain energized and closed, holding stem in the open position. When the control circuit is broken and actuator is de-energized, the relief valves open and the spring loaded piston forces the stem downward to close the valve (see Figure 3).

WHEN ACTUATOR IS HELD IN ENERGIZED POSITION, THE MOTOR MAY RESTART INTERMITTENTLY TO MAINTAIN PROPER PRESSURE AGAINST THE PISTON.

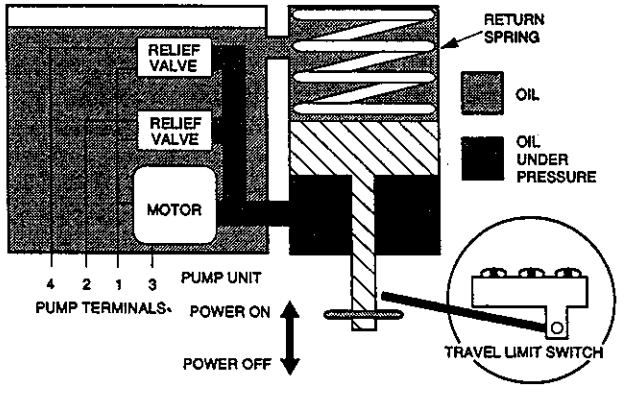

Figure 2. Typical H30 Operation

INSTALLATION

⚠ WARNING ⚠

Turn off electrical power supply and main gas supply before installing valve.

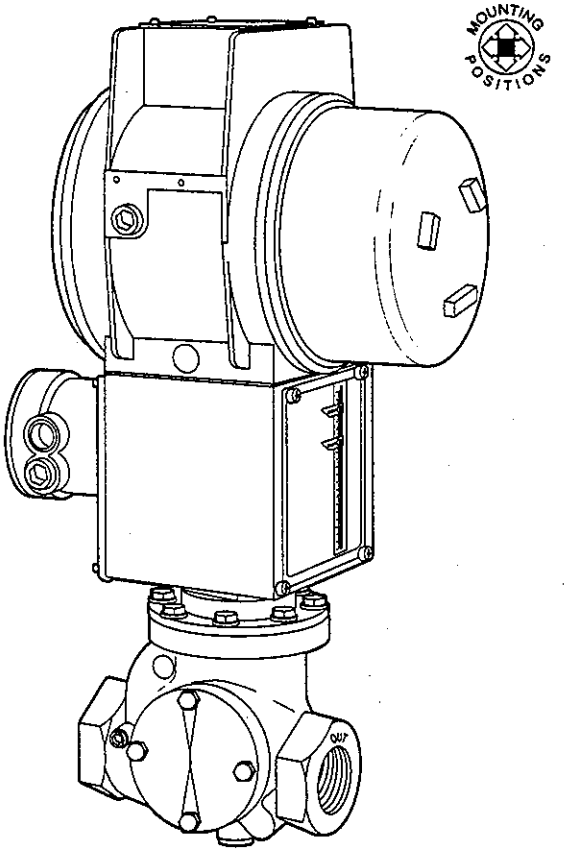

Figure 1. Typical H137 High-Flow Gas Valve

WARNINGS AND PRECAUTIONS

- **This valve should be installed only by a trained and experienced serviceperson.**
- **Install valve where ambient conditions do not exceed valve specifications indicated on nameplate.**
- **Check valve requirements against catalog specifications to make sure proper valve has been selected.**
- **Blow out all pipe lines to remove foreign matter. Strainers in the inlet piping are recommended, as close as practicable to the valve.**

1. Valve is multipoised and may be mounted in any position. Install valve with flow arrow on body in direction of gas flow.

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NOTE: IF VALVE IS BEING USED ON LP GAS APPLICATION, USE PIPE DOPE RESISTANT TO ACTION OF LP GAS.

2. Apply pipe dope sparingly to male threads only, leaving two end threads bare.
3. All piping must comply with applicable local codes and ordinances and with the National Fuel Gas Code (ANSI Z223.1/NFPA No. 54).
4. Connect valve, using wrench on body flats at end being joined. Never use actuator as lever.
5. Check power source, valve operation and all limit switches in electrical circuit.

Before valve is put into final operation a closure tightness test must be made to check leakage. See CLOSURE TEST.

WIRING

CAUTION

- **All wiring must be NEC Class 1. All wiring must conform to applicable electrical codes and ordinances.**
- **Installations in Canada require rigid metal conduit to ground the electrical enclosure of this valve.**
- **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.**
- **Maximum connected load of yoke-mounted switches must not exceed 2000 VA.**
- **Do not connect additional wiring to travel limit switch (see Figure 2).**
- **Remove all loose metallic particles from joints and interior of electrical enclosure before tightening cover.**

Remove electrical cover (Figure 1). If equipment manufacturer has furnished wiring instructions, follow them. Typical wiring connections are shown in Figures 3 and 4.

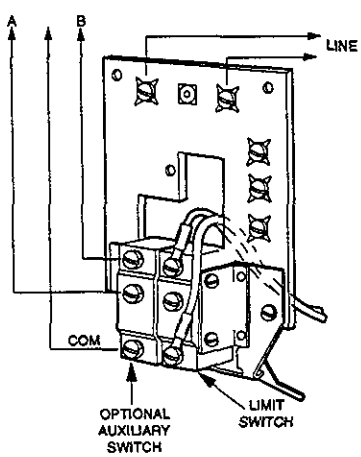


Figure 3. 2-wire circuit with auxiliary switch

INITIAL OPERATION

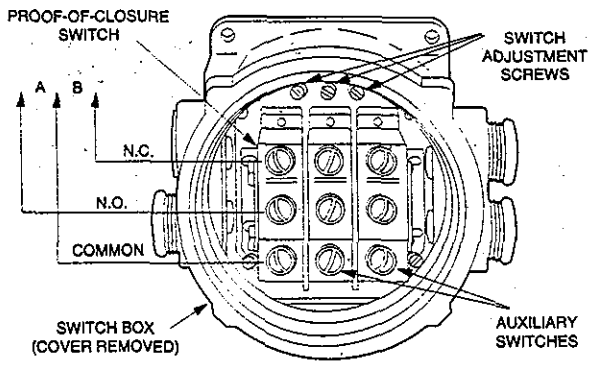
After complete valve installation, and with main gas cock shut off, run unit through four or five complete cycles. Entrained air in actuator causes unit to operate sluggishly for the first few cycles. Opening time may be delayed for several minutes at subzero temperatures, until pump motor has warmed the hydraulic oil.

AUXILIARY SWITCH ADJUSTMENT

The integral SPDT auxiliary switch is nonadjustable and actuates at end of actuator energized stroke. See Figure 2 for switch location and function.

YOKE-MOUNTED AUXILIARY SWITCH UNIT

Each auxiliary switch in the yoke-mounted switch box may be adjusted separately to actuate at any point of actuator stem travel. Turn individual switch adjustment screw *counterclockwise* (CCW) to actuate switch closer to de-energized position. Turn screw only 1/8-turn at a time and check operation. Do not set switch for operation within 1/8" of either end of stroke. See Figure 4.



A - N.C. When Actuator De-energized
B - N.O. When Actuator De-energized

Figure 4. Yoke-Mounted Auxiliary Switch Adjustment

VALVE SEAL OVERTRAVEL INTERLOCK SWITCH

A yoke-mounted valve seal overtravel interlock switch permits automatic control and supervision of the valve's closed position and can be wired into the start-up or preignition interlock circuit. Switch must be used in combination with V764 Series gas valves with valve seal overtravel (see Figure 6). The switch is precisely set at the factory and is not field adjustable.

MAINTENANCE AND SERVICE

⚠ WARNING ⚠

Whenever valve is disassembled and reassembled, serviced in any form, or installed on pipeline, perform closure test to check leakage before valve is put into final operation. Gas leakage is dangerous. Gas leakage may accumulate and result in an explosion. See Closure Test instructions herein.

WARNINGS AND PRECAUTIONS

- **Disassembly, reassembly, repair or test of this valve must be performed by a trained and experienced service person.**
- **A nicked, scored or otherwise damaged valve stem can ruin stem seal and cause leakage.**
- **Use care when slipping packing ring over threaded portion of stem.**

The Hydramotor® actuator operating mechanism is immersed in oil and sealed, eliminating usual maintenance and service. However, all system and burner controls should be checked

on a routine basis, monthly or more often, by a trained and experienced serviceperson.

OVERHAUL INSTRUCTIONS

Stem Nut Adjustment

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

1. For correct seating pressure and valve lift, distance from top of stem nut to bottom of actuator shaft must be as shown (Dim. "A") in Figure 5. Dimension "A" is measured with valve stem in DOWN (closed) position and actuator shaft in UP (energized) position.
2. Adjust upper stem nut and lock with set screws. Rotate stem to align prongs with grooves.

Table 1. Stem Nut Adjustment

Valve Size (inches)	Lift Dimension "A" (inches)
2, 2 1/2, 3	1
4, 6	1 1/8

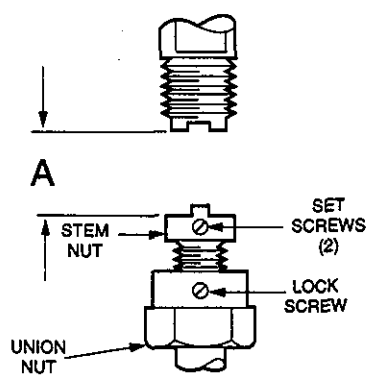


Figure 5. Stem Nut Adjustment

Actuator Removal/Replacement

1. Loosen union nut lockscrew and disengage union nut (see Figure 5).
2. Energize actuator to relieve pressure on valve stem.

⚠ WARNING ⚠

Use Extreme Care. Valve is heavily spring loaded to close on power interruption. If motor is inoperative or power is not available, use a restraining device and take care when removing actuator from valve body. Improper disassembly may cause serious personal injury.

3. Remove four hex cap screws holding actuator to valve bonnet (1) (see Figure 6).
4. Lift actuator off valve bonnet.
5. Energize new actuator and set on valve bonnet.
6. Replace and tighten hex cap screws.
7. Reconnect union nut and tighten lock screw.

If upper valve stem nut has been removed see "Stem Nut Adjustment" above.

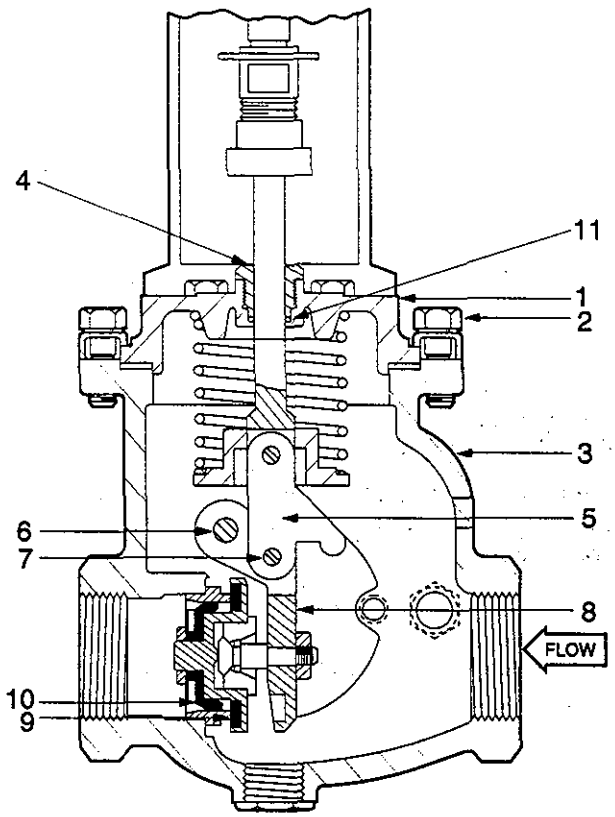


Figure 6. Cross-section of Typical H137 Valve With Valve Overtravel Seal

Stem Packing Ring Replacement

1. **Turn off gas supply** at upstream manual gas cock.
2. Loosen union nut lockscrew and disengage union nut (see Figure 5).
3. Loosen set screws and remove stem nut.
4. Remove packing bushing (4, Figure 6). Stem packing ring (11) is now accessible.
5. Inspect valve stem for nicks or scoring. Replace valve stem if necessary.
6. Replace packing ring (11). Turn bushing (4) down snug.
7. Assemble in reverse order of disassembly.

Lower Valve Repair or Valve Seat Cleaning

1. **Turn off gas supply** at upstream manual gas cock.
2. Remove plug (5) or side access plate to remove lever shaft (6) (see Figure 6).
3. Energize actuator, lift valve linkage (5) so lever shaft (6) may be removed. Push shaft (6) through valve, or pull lever shaft out of valve with 10-32 screw threaded into end of shaft. Remove lever (8) and seat disc assembly (9) and (10).
4. Assemble in reverse order of disassembly.

Upper Valve Repair/Replacement

1. Follow steps 1, 2 and 3, "Lower Valve Repair," then remove actuator as described in "Actuator Removal/ Replacement."

2. Loosen packing bushing (4), (See Figure 6). Loosen set screws in stem nut and remove stem nut.
3. Remove hex cap screws (2), (See Figure 6) connecting bonnet (1) to valve body (3) and lift connected parts out of valve body. Replace or clean necessary parts.
4. Assemble in reverse order of disassembly. See "Stem Nut Adjustment" above.

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. Parts list may be obtained by writing to ASCO General Controls, attention Technical Services Department.

FILLING POWER UNIT WITH OIL

NOTE: UNITS ARE FILLED WITH MIL-H-5606 OIL AVAILABLE FROM ASCO GENERAL CONTROLS.

CAUTION

Do not mix MIL-H-5606 with other oils. Oil must be filtered if secured from source other that ASCO General Controls. Take care that dirt, dust or lint does not enter pump unit or cylinder.

Four pints of oil are included with each replacement power unit assembly. Unit must be vertical to assure proper oil level.

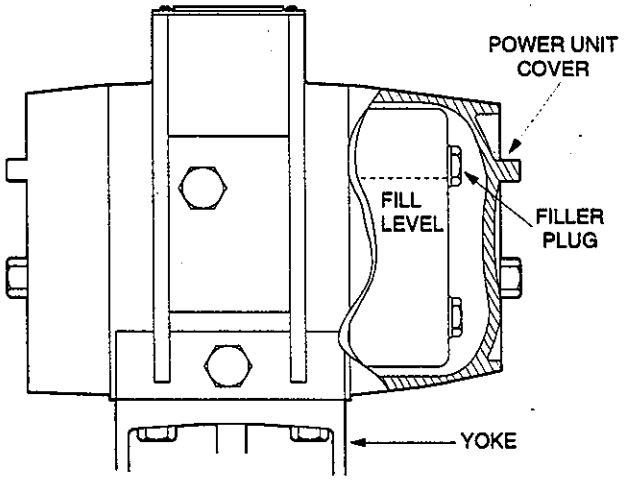


Figure 7. H30 Actuator

1. De-energize units before refilling unit with oil.
2. Remove power unit cover.
3. Unscrew filler plug near top of mounted unit (Figure 7).
4. Fill power unit with oil (not to exceed three pints). Cycle actuator for 15 to 20 minutes to release air from cylinder and raise oil temperature to 68° F. or above. Add enough additional oil to fill container to base of filler tube.
5. Replace plug and tighten. Replace power unit cover.

CLOSURE TEST

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

1. **Turn off power** to de-energize control system and safety shutoff valve (SSOV).
2. **Turn off gas supply** at upstream manual gas cock (see Figure 8).
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 8.

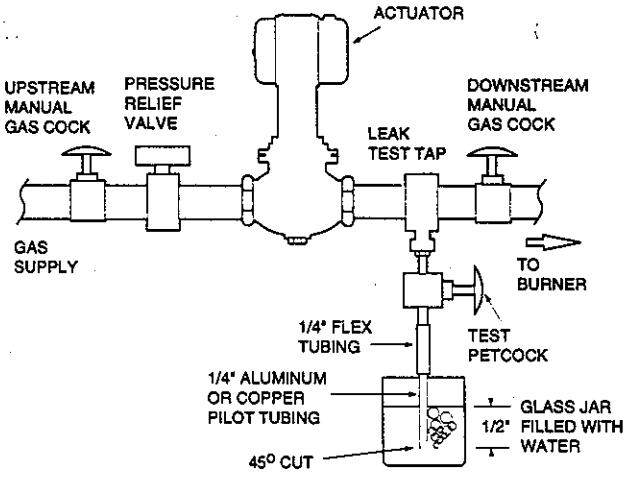


Figure 8. Test setup for checking through-the-valve leakage

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 de-energize it to seat valve operationally.
8. Immerse 1/4" tube vertically into jar of water about 1/2" as shown in illustration.
9. Slowly open test petcock.
10. As the rate of bubbles coming through the water stabilizes, 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 = 650cc/hr approx.). If leakage exceeds 23 bubbles, valve interior assembly must be replaced.
11. Close upstream manual gas cock.
12. Close test petcock, remove test equipment and replace leak test cap 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. De-energize safety shutoff valve (SSOV).
16. Open downstream manual gas cock.
17. Restore system to normal operation.