

INSTALLATION AND SERVICE

SDI: AH2B/AH13B
 Effective: 12-96
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DESCRIPTION

AH2B and AH13B Hydramotors[®] are self-contained linear, push-type actuators which extend when powered and retract by spring force upon power interruption.

The AH actuator is typically used for control of gas-fired heating equipment, commonly to open and close a valve or both a valve and damper. AH2B actuators position V710 series valve assemblies. AH13B actuators power short-stroke HO series gas valves. Stroke length is the only difference between the AH2B and AH13B Hydramotors[®].

The AH2/13 Hydramotor[®] features increased force output, improved piston/cylinder sealing, faster opening time, and a standardized 3/8" damper shaft accommodating left or right mounted damper arms. The duplex pump/motor mechanism is completely immersed in oil, greatly reducing the need for maintenance or service. The AH Hydramotor[®] may be equipped with optional damper arm and shaft, raintight enclosure, auxiliary switch and/or proof-of-closure switch.

OPERATION

Application of electrical power simultaneously drives an electric pump and closes a normally-open dump valve, exerting up to 200 pounds of hydraulic pressure against a spring-loaded piston. This extends the actuator shaft and attached valve poppet, to open the valve and/or damper.

Upon reaching the fully extended position, a safety travel limit switch interrupts power to the electric motor while maintaining power to the dump valve, thus stabilizing hydraulic pressure to hold shaft position. Position indicators on both sides of the actuator show the actual position of the valve stem.

Upon power interruption, an internal spring opens the dump valve, which controls the release of hydraulic pressure for fast or slow operation, allowing the return spring to retract the shaft and close the valve fully. Closing time is one second or less.

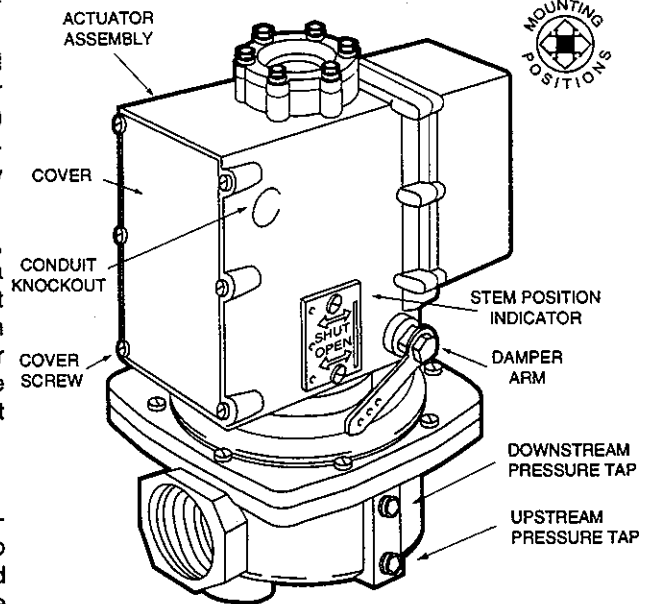


Figure 1. AH2B Actuator (shown mounted on V710 gas valve)

SPECIFICATIONS

Force Output: 200 lb.

Stroke: AH2B: 1 1/4" AH13B: 5/8"

Current (ampere)	Voltage	Inrush	Running	Holding
	24	28.0	8.0	0.73
	120	5.6	1.6	0.14
	240	2.8	0.8	0.05

Opening Time*: Fast: AH2B: 7 to 12 seconds
 AH13B: 3 to 6
 Slow: AH2B: 14 to 24
 AH13B: 7 to 12

* not field adjustable

Maximum Closing Time: One second

Ambient Temperature: -40° to 150° F [-40° to 66° C]

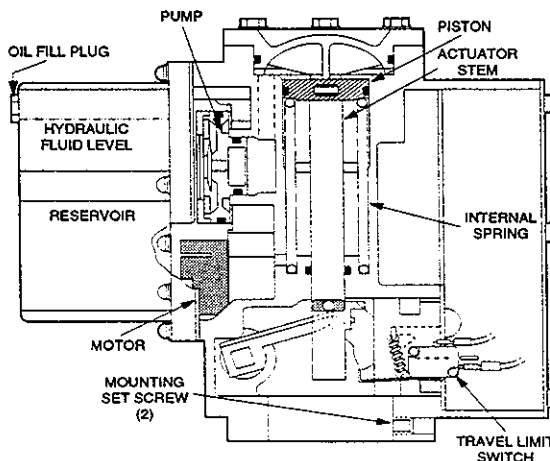


Figure 2. Cutaway Schematic (Deenergized Position)

SAFETY WARNINGS AND PRECAUTIONS

- Actuator and valve should only be installed or serviced by a trained, experienced service technician.
- Check nameplate and verify actuator selected is appropriate for application.
- Test all functions and check out the complete system after installing the actuator.
- Verify conformance to valve manufacturer's instructions and all applicable codes and ordinances.

INSTALLATION

Follow the valve and/or damper manufacturer's instructions when installing the Hydramotor®.

1. Position the actuator to operate the valve (and damper if appropriate), and secure with the two mounting set screws (Figure 2). AH2B and AH13B actuators can be installed to operate in any position.
2. For damper applications, connect the damper arm and linkage so the damper will return to the desired position on power failure. The maximum damper arm travel is 2 inches. Applied load should not exceed 10 pounds.

WIRING



WARNING



Electrical shock hazard. To avoid serious personal injury, death, or property damage due to electrical shock, turn off power supply and disconnect power wiring prior to servicing actuator.

CAUTION

- Wiring must conform to all applicable local and national electrical codes and ordinances.
- Limit controls must conform to actuator rating (voltage, amperage, hertz). Wire limit controls in the hot side of power supply.

1. Remove six screws and electrical cover.
2. Route wiring through one of the conduit knockout openings. Install appropriate electrical fittings.
3. Connect the power wiring to terminals 1 and 2, and splice the ground wire to the green wire beside the terminal strip (Figure 3).
4. Connect auxiliary or proof of closure switch wiring to the common and normally open or normally closed switch terminals.
5. Reinstall electrical cover and gasket (raintight models).
6. Operate system through five cycles to purge hydraulic circuits of air and to verify proper operation.

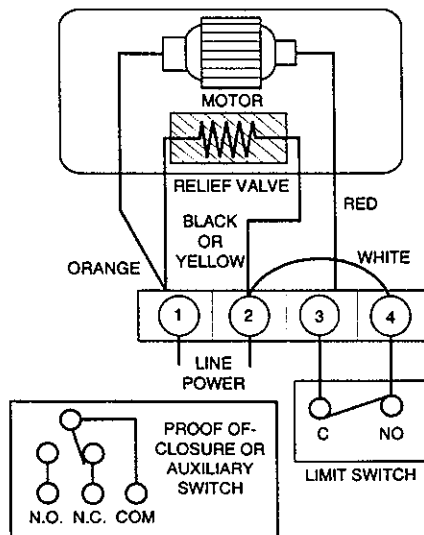


Figure 3. Typical AH2B/AH13B Actuator Wiring

SWITCH ADJUSTMENT

The optional proof of closure switch is set at the factory to provide a positive indication of valve closure. **This switch is not adjustable.** Auxiliary switches may be located on either side and may be field adjusted as follows:

1. Remove the window (Figure 4).

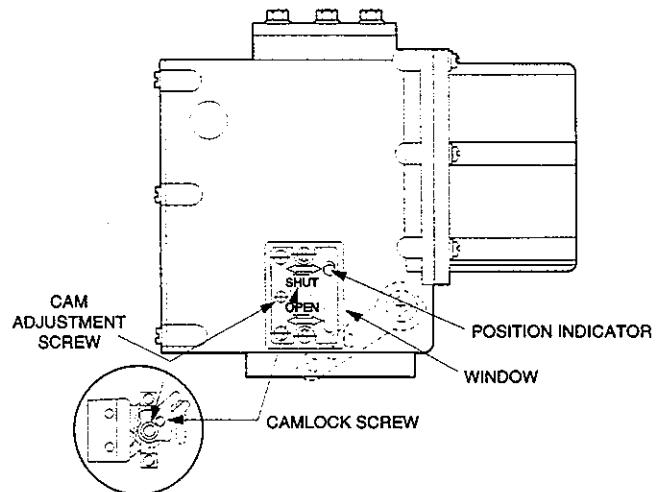


Figure 4. Auxiliary Switch Adjustment

2. Loosen the camlock screw no more than 1/2-turn.
3. Reset the cam adjustment screw to the desired switching point.
4. Tighten the camlock screw. Cycle the actuator to verify the switch setting, and readjust as required.
5. Reinstall the window.

SERVICE



WARNING



Shock, fire, or explosion hazard. Servicing powered actuators could cause personal injury or property damage. Turn off electrical power before servicing actuator.

Service should include periodic inspection and cleaning. Use a cleaning fluid compatible with actuator components to remove dirt and oil. Organize a maintenance schedule based on the environment and frequency of use. Include a leak check on every inspection. Check for loose electrical and mechanical connections, and replace damaged lead wires. Watch for excessive oil leaks on the actuator shaft and around the seals.

Field service of AH2B/AH13B Actuators is limited to the following:

1. Limit switch replacement kit S109450A (AH2B) or S109450B (AH13B).
2. Addition of left-hand auxiliary switch kit S107721A.
3. Addition of right-hand auxiliary switch kit S107721B.
4. Replacement of proof-of-closure switch kit S108621A.
5. Addition of raintight kit S109557A.
6. Addition of damper shaft kit S109556A.

7. Addition of damper arm kit S109555A (with spring and spring plug) or S109555B (without spring and spring plug).
8. Oil kit S156202A.

To order, specify the kit or part number, as well as the actuator model and serial numbers.

LIMIT SWITCH REPLACEMENT

1. **Turn off power supply.** Remove the six cover screws and the cover plate (Figure 1).
2. Disconnect actuator and switch wiring. Remove two mounting screws and the limit switch (Figure 2).
3. Install the new switch. Wire and adjust the switch to actuate at end of stroke by bending switch lever.
4. Turn on power. Reinstall the cover plate and screws.

AUXILIARY SWITCH INSTALLATION

NOTE: The right-hand auxiliary switch, kit S107721B, cannot be used with AH2B variations equipped with proof-of-closure switch.

1. **Turn off power.** Remove six cover screws and the cover plate (Figure 1). Remove window (Figure 4).
2. Disconnect switch wiring. Remove two mounting screws and old switch, and install new switch.
3. Wire and adjust switch as instructed under "Switch Adjustment." Turn power on, reinstall cover plate window and screws.

RAINTIGHT KIT INSTALLATION (Figure 5)

1. **Turn off power supply.** Remove six cover screws and the cover plate (15). Install cover plate gasket (16), cover plate, and screws.
2. Remove windows (18). Install window gaskets (17), windows (18), and screws.
3. Loosen the two mounting set screws (Figure 2) and lift the actuator from the valve.

STEPS 4 THROUGH 8 APPLY ONLY TO ACTUATORS EQUIPPED WITH THE OPTIONAL DAMPER SHAFT.

4. Remove the retaining ring (9), optional spring plug (13), return spring (12), and damper arm (11). Slide the damper shaft (2) out of the actuator.
5. Assemble the retaining ring (1) on the end of the damper shaft (2). Install O-ring (6) on bushing (7) and slide the bushing onto the end of the shaft so the bushing shoulder faces the retaining ring (1). Slide gasket (8) onto the shaft and against the bushing.
6. Slide the damper assembly into the actuator body.
7. Install O-ring (5) on bushing (3). Slide gasket (4) and bushing (3) onto the shaft and against the actuator housing.
8. Install the optional damper arm (11), return spring (12), and spring plug (13). Secure the assembly with retaining ring (9).
9. Install the gasket (14) to the bottom of the actuator, attach the valve, and tighten the mounting set screws.

NOTE: Installer must provide raintight conduit fittings to complete the raintight modification.

10. Restore electrical power and cycle the actuator to verify proper operation.

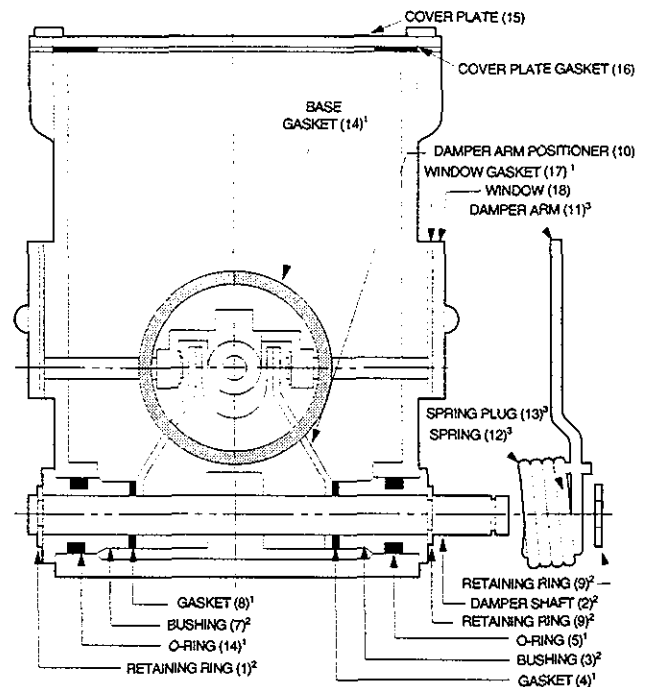


Figure 5. Raintight, Damper Shaft, and Damper Arm Kits

DAMPER SHAFT INSTALLATION (Figure 5)

The damper shaft can be installed with the damper arm on either side of the actuator.

1. **Turn off power supply.** Loosen the two mounting set screws (Figure 2) and lift the actuator from the valve.
2. Install the retaining ring (1) and bushing (7) on the damper shaft (2).
3. Install the damper arm positioner (10), then slide the damper shaft (2) through the actuator and positioner.
4. Install bushing (3) and secure with retaining ring (9).
5. Reconnect the wiring, restore power, and cycle the actuator to verify proper operation.

DAMPER ARM INSTALLATION (Figure 5)

S109555A (with return spring and plug)
S109555B (without return spring and plug)

1. **Turn off power supply.** Remove retaining ring (9).
2. Install damper arm (11).
3. Install return spring (12) and spring plug (13) if required (S109555A only).
4. Secure the assembly with the retaining ring removed in step 1, above.
5. Reconnect the wiring and cycle the actuator to verify proper operation.

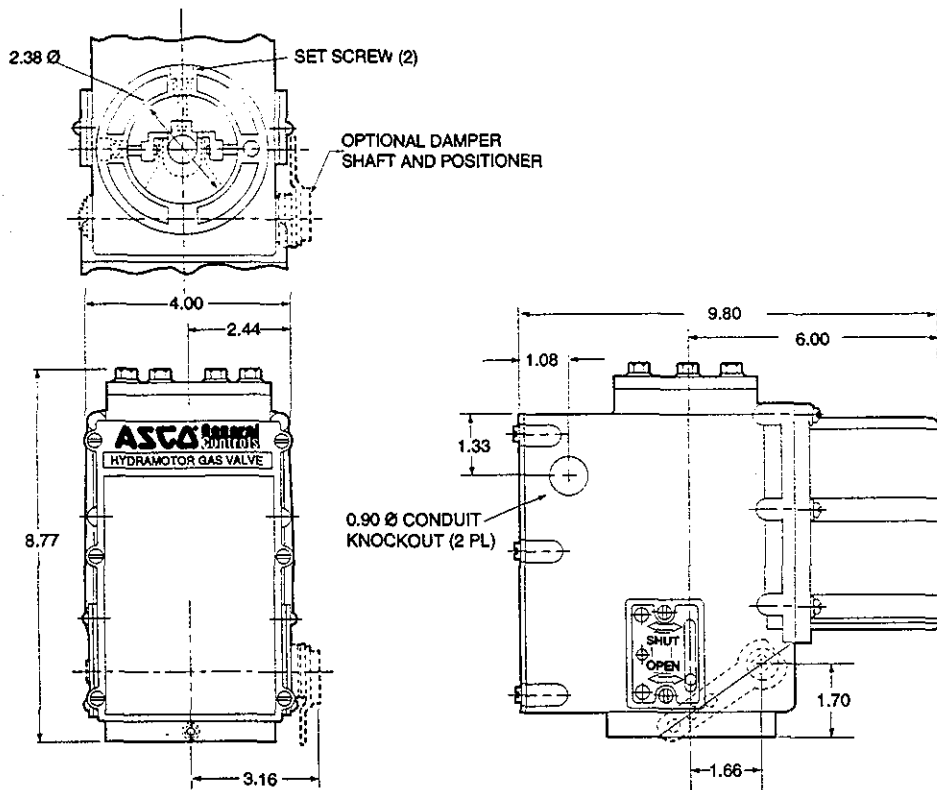


Figure 6. Dimensions (Inches)

REPLACEMENT OIL

Standard units are filled with MIL-H-5606 oil (kit no. S156202A), available from ASCO General Controls.

FILLING WITH OIL

- 1A. With actuator mounted upright (Figure 2), remove oil fill plug and fill to bottom of fill port. Replace the fill plug.
- 1B. With actuator on its side, and oil fill plug uppermost, remove the oil fill plug. The oil level should be 5/8-inch from the top of the pump cover. Replace the fill plug.
2. Power the actuator on and off five times, through its full stroke, to purge air from the system. Remove the oil fill plug.
3. Check the oil level and add oil if necessary. Replace the oil fill plug, and return the unit to its normal orientation.
4. Cycle the actuator to verify proper operation.