

# Installation & Maintenance Instructions

## Valve Position Monitor

### With Integrated Valve

**SERIES**  
**HS2**  
**HS3**  
**HS4**  
 (Section 1 of 2)

**Notice:** These instructions are divided into two sections. Be sure to read, understand and follow all instructions on I&M No. V9538R2 – Section 1 and 2.

Each valve position monitor is provided with a separate *Mounting Plate Kit* containing mounting instructions and all necessary parts to mount the valve position monitor to a specific actuator. See separate *Installation Instructions For Mounting Plate Kits* on I&M No. V7490.

### DESCRIPTION

Series HS2, HS3 and HS4 are visual and electrical valve position monitors for use with linear actuators. Visual indication of the actuator's *OPEN/CLOSED* position is accomplished by a yellow disc which displays the word *OPEN* on the side and top of the valve position monitor. When *CLOSED*, the disc retracts into the enclosure. Electrical indication is provided by one or two switches having a wide range of ratings and constructions to meet customer requirements.

The integrated solenoid valve has an internal pilot which operates in conjunction with the linear indicator. It offers a 3/2 NC operation.

Separate *Mounting Plates Kits* are provided with each valve position monitor for direct mounting to a specific actuator.

Series HS2 Valve Position Monitor is provided for indoor applications with an enclosure designed to meet Type 4 and 4X – Watertight, Nonincendive Class I, Division 2, Groups A, B, C & D, Class II, Class III Division 2, Groups F & G.

Series HS3 Valve Position Monitor is provided for indoor/outdoor applications with an enclosure designed to meet IP66 – Watertight, Nonincendive Class I, Division 2, Groups A, B, C & D.

Series HS4 Valve Position Monitor is provided with an enclosure designed to meet Type 4 and 4X – Watertight.

### INSTALLATION

Check cover nameplate for correct catalog number and electrical rating of switches. Never exceed electrical rating of switches. Check valve nameplate for valve information including pressure, voltage, frequency and service. Installation and maintenance to be performed by qualified personnel.

#### Temperature Limitations

Ambient temperature range: –20°F to 170°F (–29°C to 77°C)

#### Media

Air or neutral (inert) gas

#### Positioning

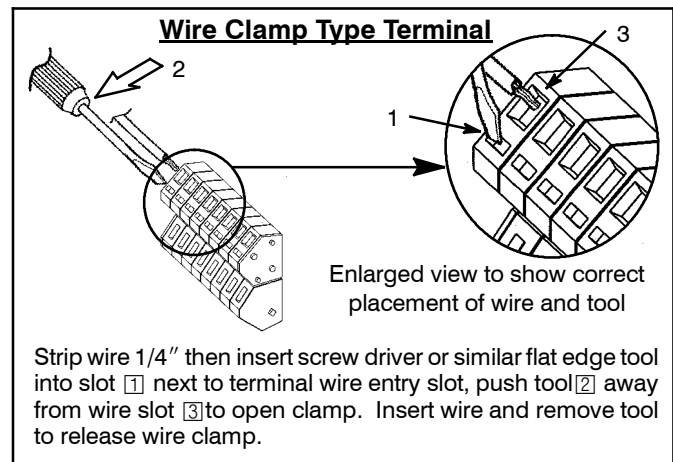
Position monitor may be mounted in any position.

#### Mounting

A separate mounting plate kit with installation instructions is supplied with each monitor. After the mounting plate kit is installed on the actuator, see steps 1 through 6 starting on page 3 of 6 for *Mounting Valve Position Monitor To Actuator Mounting Plate*.

### Wiring

Wiring must comply with local codes and National Electric Code. The position monitor enclosure is provided with 1/2 NPT or 1/2 NPSM conduit connections. Internal and external grounding locations are provided. To make electrical connections to terminal block, remove cover. *Follow wiring diagrams inside housing cover or diagrams provided.* For electrical connections use solid or stranded copper wire from 28 AWG to 14 AWG. Strip wire 1/4" then depress wire clamp in terminal with screwdriver or similar flat edge tool, and insert wire in terminal block slot and release wire clamp. Before operation, replace housing cover.



The position monitor is provided with independent switches. Each switch is adjusted independently to provide electrical indication of the actuators open or closed position.

Switch Rating	Wiring Diagram
(T)* Reed Switch, Tungsten (SPDT) 3 Amps at 120 VAC (100 VA max) 2 Amps at 24 VDC (100 W MAX) 3 Watt (min)	See Figures 1 through 3
(R)* Reed Switch, Rhodium (SPDT) 1 Amps at 24 V AC/DC (max) 10 mA at 3 VDC (min)	
(A)* Snap Switch, Silver Contacts (SPDT) 15 Amps at 125/250 VAC (max) 125 mA at 125/250 VAC (min) (HS4 ONLY)	

\* Corresponds to character # 8 of catalog.

**⚠ WARNING:** To prevent the possibility of death, serious injury or property damage, turn off electrical power and depressurize actuator before installation, inspection or service.

**⚠ CAUTION:** Failure to stay within electrical range may result in damage to or premature failure of electrical switches.

Integrated Solenoid Valve		
Code	Electrical Rating	Wiring Diagram
(A)	1.0 W at 120 VAC	See Figures 1 through 3
(F)	1.0 W at 12 VDC	
(D)	0.5 W at 24 VDC	

**WIRING DIAGRAMS**

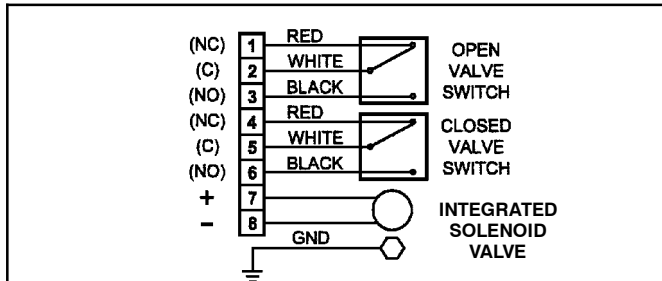


Figure 1. Wiring Diagram for SPDT-Mechanical and Reed Switch

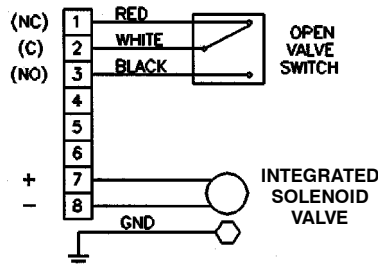


Figure 2. Wiring Diagram for Open SPDT-Mechanical and Reed Switch

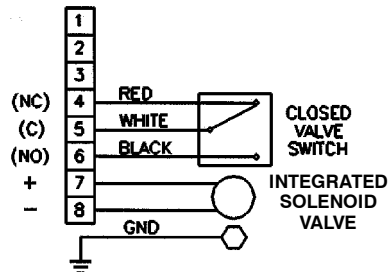


Figure 3. Wiring Diagram for Closed SPDT-Mechanical and Reed Switch

Note: Terminals 7 & 8, in Figures 1, 2 & 3 are for solenoid connection.

**Mounting Valve Position Monitor to Actuator Mounting Plate**

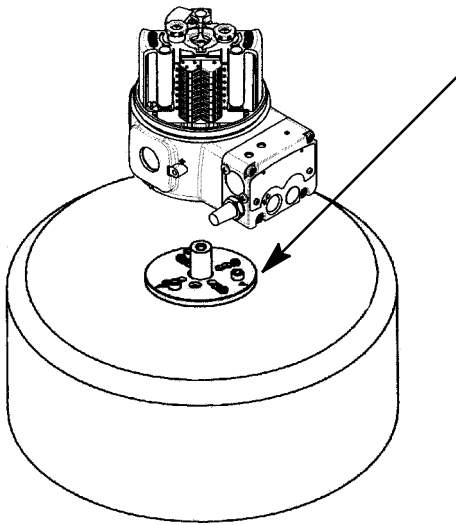
1. Mount valve position monitor in an orderly fashion paying careful attention to exploded views for proper orientation and location of parts. Refer to Steps 1 through 6 starting on page 3 of 6.
2. Install mounting plate kit on actuator following separate installation instructions.
3. Check base of valve position monitor to verify mounting screw gasket (3) and center gasket (1) are properly aligned. Center gasket supplied in mounting plate kit.
4. Locate three mounting screws and center shaft screw on valve position monitor. Refer to Steps 2 and 5.
5. Check the bottom of the valve position monitor to see that the center shaft screw is visible and extends beyond the base. If the screw is not visible and extended, loosen center knob screw on CLOSE adjustment knob and rotate knob until center shaft screw is extended.

**IMPORTANT:** Before monitor installation on mounting plate, determine best location for main electrical connection of monitor. Three delta marks  $\nabla$  ( $120^\circ$  apart) on mounting plate indicate where monitor can be mounted with main electrical connection directly above.

6. Install valve position monitor on mounting plate and align center shaft screw with actuator shaft. Torque center shaft screw to 10 in-lbs maximum [1,1 Nm maximum].
7. Rotate valve position monitor on mounting plate to the best location for electrical connection.
8. Using a suitable screwdriver, thread all mounting screws a few turns into mounting plate. When it is determined that all screws are properly engaged, torque mounting screws (3) evenly in a crisscross manner to 10 in-lbs maximum [1,1 Nm maximum].
9. Make electrical connections and switch adjustments to valve position monitor. Replace enclosure cover before operation.

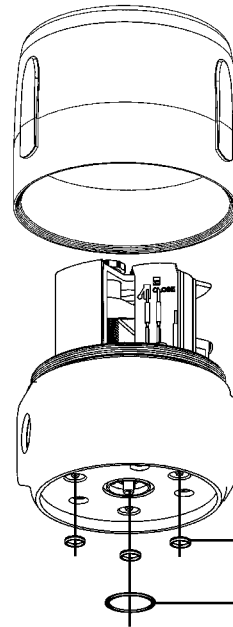
## STEP 1

Install mounting plate kit on actuator, see separate instructions.



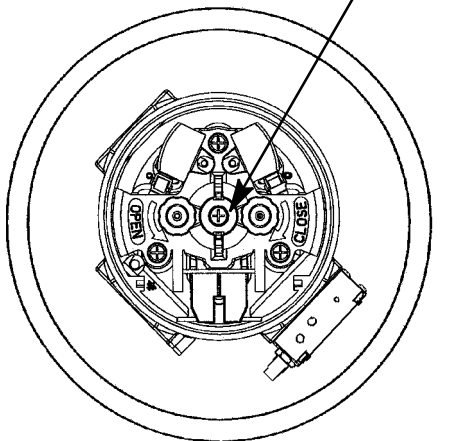
## STEP 2

1. Check base of monitor for mounting screw gaskets (3).
2. Install center gasket in recess around shaft hole. Center gasket supplied in mounting plate kit.



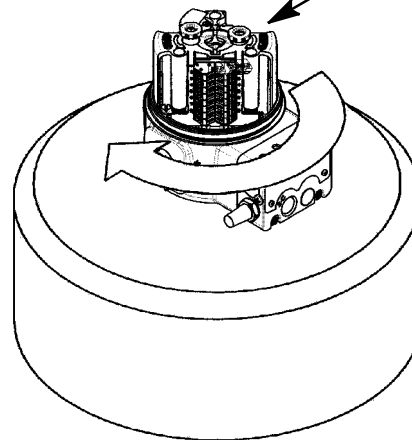
## STEP 3

Align center shaft screw with actuator shaft, then torque to 10 in-lbs maximum [1,1 Nm maximum].



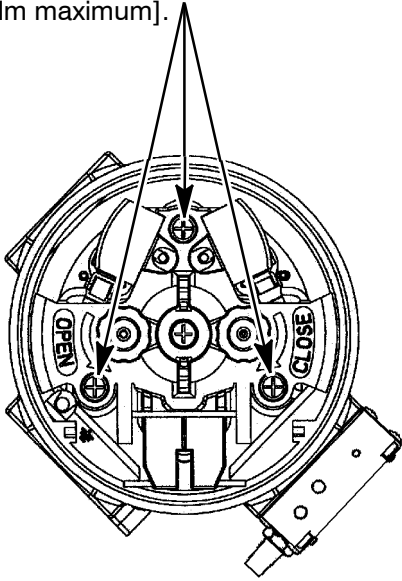
## STEP 4

Lift and rotate enclosure for desirable position.



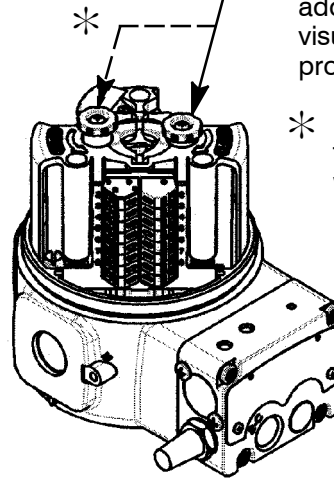
## STEP 5

Thread all mounting screws a few turns into mounting plate. Then torque mounting screws in a crisscross manner to 10 in-lbs maximum [1,1 Nm maximum].



## STEP 6

Unlock CLOSE adjustment knob by loosening center screw. Turn knob in direction of arrow until switch is actuated. Once switch is activated, turn knob an additional 3 full turns to ensure visual indicator operates properly. Lock center screw.



\* Perform the same procedure for OPEN adjustment knob with actuator in the open position.

### NOTE:

For constructions without an open switch, the OPEN adjustment knob should be turned in the direction of the arrow (CCW) until cam is at the fully extended position with the actuator in the open position. Lock center screw.

Replace cover before operation.

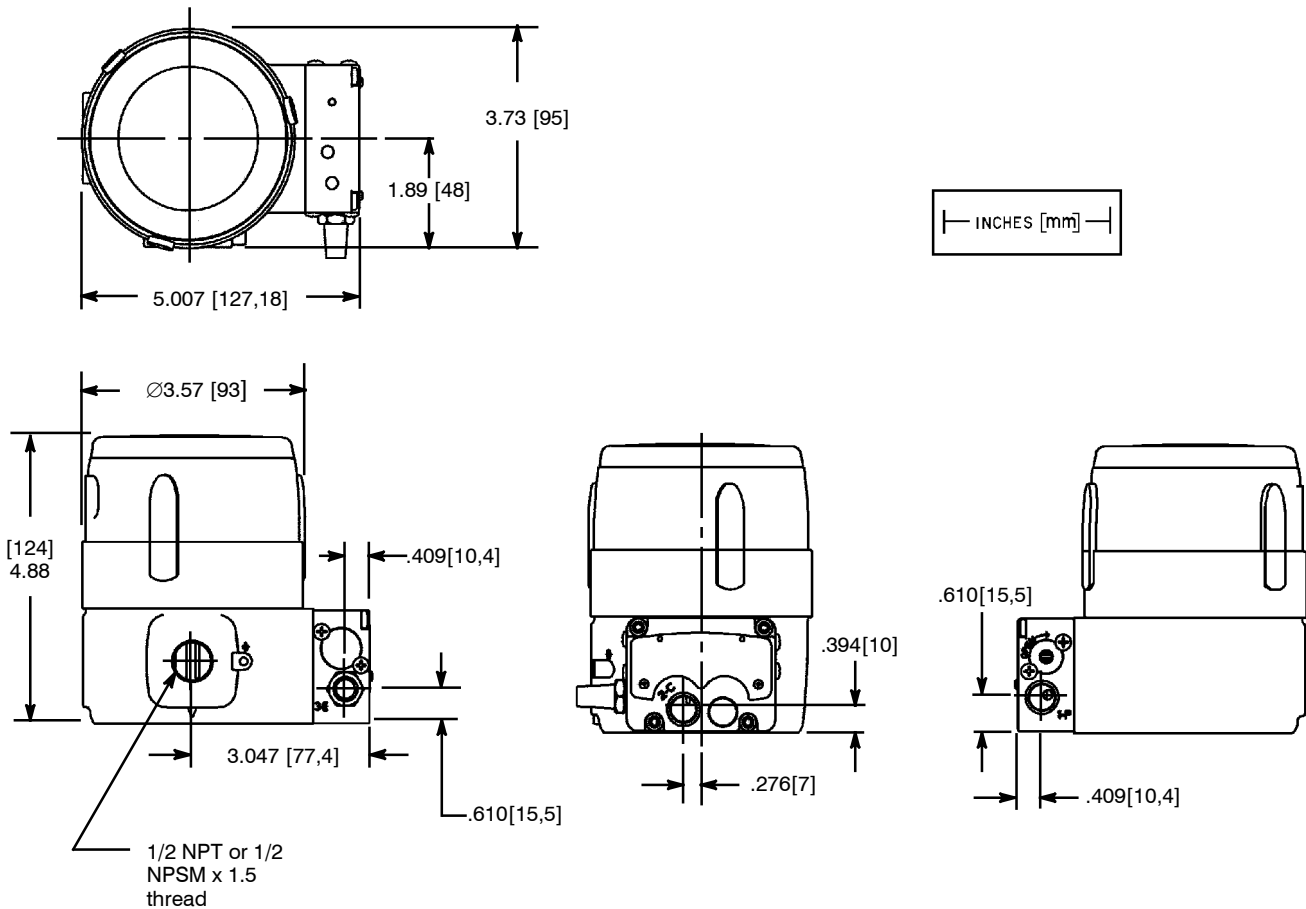


Figure 1. Integrated Valve Dimensions

# Installation & Maintenance Instructions

## Valve Position Monitor With Integrated Valve

**SERIES**  
**HS2**  
**HS3**  
**HS4**  
 (Section 2 of 2)

**Notice:** These instructions are divided into two sections. Be sure to read, understand and follow all instructions on I&M No. V9538R2 – Sections 1 and 2.

### INTEGRATED SOLENOID VALVE

These valves are 3 – way 2 position single solenoid valves designed for valve actuation use.

### INSTALLATION

Check nameplate for pressure, voltage, frequency and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

#### Piping / Tubing

Connect piping or tubing to valve according to marking on valve body. Refer to Flow Diagrams and Figure 6 for valve operation. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. Wrenches applied to valve body or piping must be located as close as possible to connection point.

**CAUTION:** Do not exceed 200 in-lbf torque at valve ports.

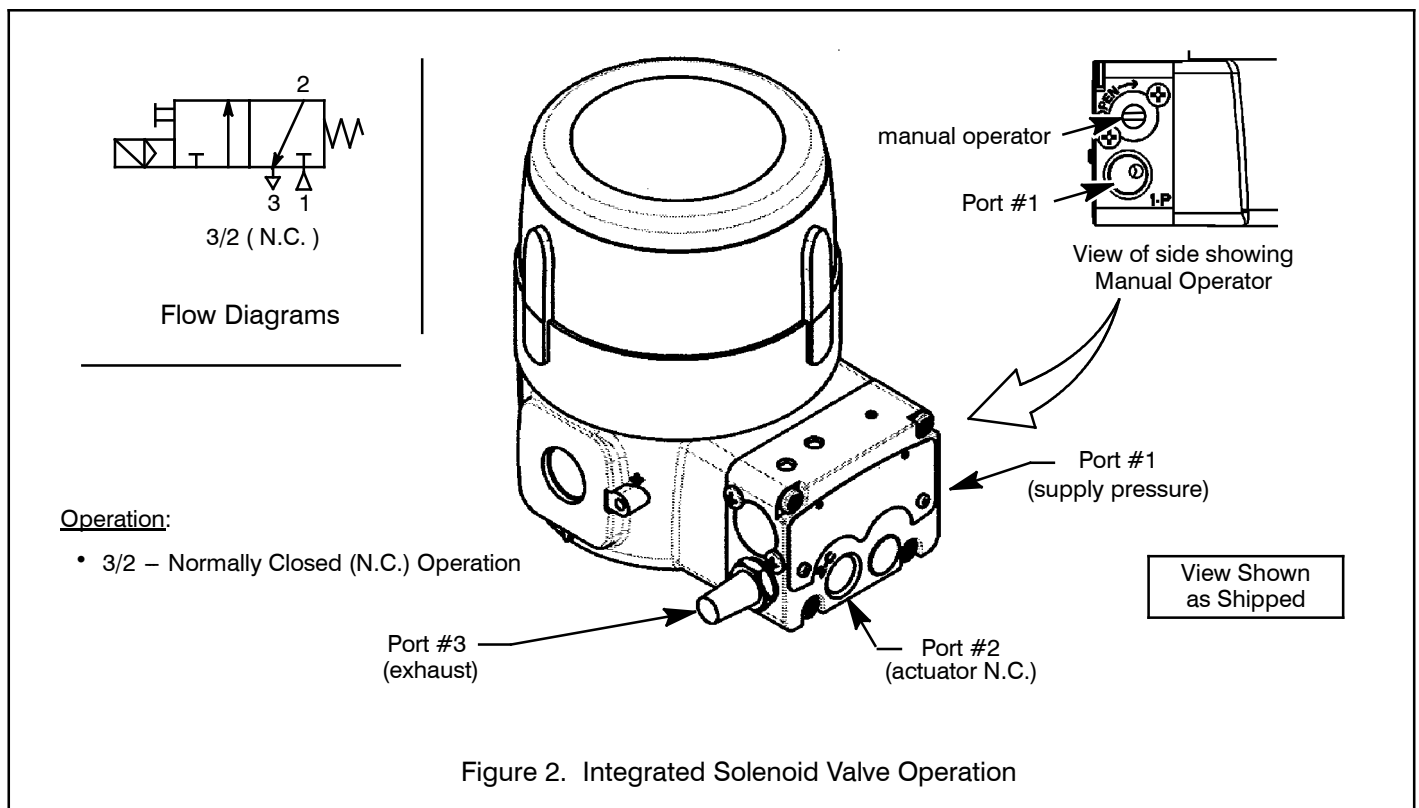
**CAUTION:** These solenoid valves are intended for use on clean dry air, filtered to 40 micrometres or better. The dew point of the media should be at least 10° C (18° F) below the minimum temperature to which any portion of the clean air/inert gas system could be exposed to prevent freezing. If lubricated air is used, the lubricants must be compatible with Nitrile elastomers. Diester oils may cause operational problems. Instrument air in compliance with ANSI/ISA Standard 7.0.01 – 1996 exceeds the above requirements and is, therefore, an acceptable media for these valves.

### OPERATION

**Normally Closed:** Applies pressure when solenoid is energized; exhausts pressure when solenoid is de-energized. When solenoid is energized, flow is from Port #1 to Port #2 and Port #3 is closed. When solenoid is de-energized, flow is from Port #2 to Port #3 and Port #1 is closed.

#### Manual Operator

Manual operator allows manual operation during interruption of electrical power or when otherwise desired. A screw type of manual operator is supplied. To operate valve, rotate manual operator stem at side of valve body clockwise with a screwdriver until the valve shifts. Do not overtighten. Valve will now be in the same position as when the solenoid is energized. Rotate manual operator stem fully counterclockwise before operating valve electrically.



## MAINTENANCE

**▲ WARNING:** To prevent the possibility of death, serious injury or property damage, turn off electrical power and depressurize actuator before installation, inspection or service.

**▲ WARNING:** To prevent the possibility of death, serious injury or property damage, connect supply pressure line to port #1 only. Do not exceed maximum rated pressure.

### Causes of Improper Operation

- **Faulty Control Circuit:** Check the electrical power supply to switches. Check for loose or blown fuses, grounded or open-circuit wires, loose wire connections at terminal.
- **Incorrect Electrical Indication:** Check switch adjustment (setting) steps of valve position monitor.

### Preventive Maintenance

- Periodic inspection of the valve position monitor, external surfaces only, should be carried out. Position monitors should be kept clean and free from paint and foreign matter.

### Switch Replacement (Refer to Figure 6)

1. Remove switches in an orderly fashion paying careful attention to wire location, numbering, color codes and wiring diagrams provided.
2. From switch side of terminal block, remove switch wires from terminal block. Refer to *Wiring* section and *Wiring Diagrams* provided in Section 1.
3. Loosen and remove screw on top of each switch assembly.
4. Slide switch assemblies from valve position monitor.
5. Install new switch assemblies, be sure switch marked OPEN is installed on OPEN side of valve monitor and switch marked CLOSE is installed on CLOSE side.
6. Install switch assembly mounting screw and torque to 2 in-lbs [0,2 Nm].
7. Thread lead wires from both switches through wing on CLOSE side of monitor to terminal block.
8. Strip wire 1/4" then depress wire clamp in terminal with screwdriver or similar flat edge tool, and insert wire in terminal block slot and release wire clamp. Before operation, replace housing cover. Refer to *Wiring* section and *Wiring Diagrams* provided.
9. After new switch assemblies are installed, cycle monitor and check for proper switch operation. If necessary, readjust switches.

### Cause of Improper Visual Indication

- **Incorrect setting of adjustment knob:** Check switch adjustment setting of valve position monitor making sure 3 additional full turns are applied to ensure full visual indication. (Refer to **STEP 6 on Page 4 in Section 1**)

## FOR INFORMATION OR VALVE POSITION MONITOR OR SWITCH KITS

Consult Factory or Authorized Factory  
Representative or Distributor

