

# GSM Geared Valve Operation and Maintenance Instructions



These instructions cover panel mounting, maintenance, and operation of 2-valve and 3-valve GSM geared valve assemblies.

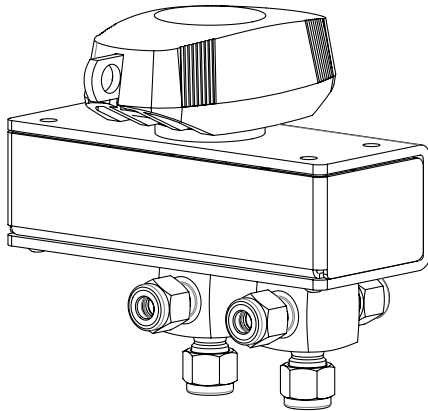


Fig. 1 2-Valve GSM Assembly

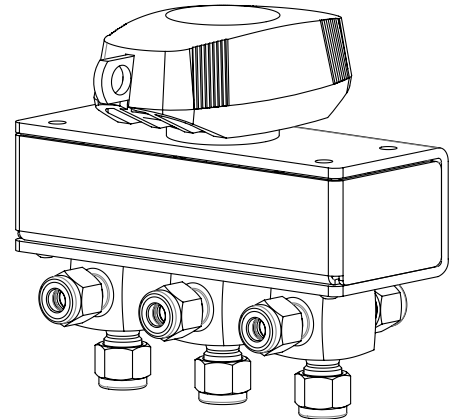


Fig. 2 3-Valve GSM Assembly

## Torque Requirements

| Component        | Size in. | Torque in-lb (N·m)           |
|------------------|----------|------------------------------|
| Handle set screw | 5/32     | 110 to 115<br>(12.4 to 13.0) |
| Gear set screw   | 3/32     | 30 to 35<br>(3.4 to 4.0)     |
| Panel nut        | 1        | wrench-tight                 |
| Shroud screw     | 5/64     | wrench-tight                 |

## Panel Mounting

Note: 3/16 in. (4.5 mm) maximum panel thickness

- Note handle orientation.
- Remove handle and detent plate by loosening handle set screw. Refer to Fig. 9 for 2-valve assemblies and Fig. 12 for 3-valve assemblies.
- Without rotating the gears, mount to rear of panel using (4) 1/4-20 UNC machine screws. (not supplied)
- Replace detent plate.
- Install handle on steam gear in previously noted orientation. Ensure that lock pin and stop lug fit into recesses of detent plate.
- While holding handle and detent plate firmly against the panel, tighten handle set screw.
- Rotate valve handle and ensure operation. See **Operation**.

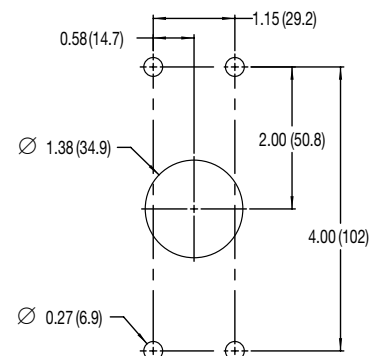


Fig. 3 Panel Cut-out

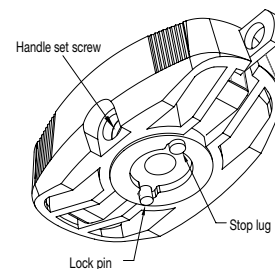


Fig. 4 Latch Lock Handle

## Packing Adjustment

**⚠ CAUTION**  
**Packing adjustments may be required during service life of valves to prevent leakage.**

Removing the valves from the valve bracket is not required. Refer to Fig. 9 for 2-valve assemblies and Fig. 12 for 3-valve assemblies.

1. Remove the gear shroud by loosening and removing the shroud screws.
2. Adjust packing by turning the packing bolt clockwise in 1/16-turn increments until leak-tight performance is achieved.
3. Test the valve for proper function and operation.
4. Replace the gear shroud and secure with the shroud screws.

## Operation

1. Depress the trigger all the way into the handle.
2. Begin turning the handle and release the trigger.
3. Continue turning the handle until it clicks into place.  
**Note:** The handle stops at the 0°, 90°, and 180° positions.
4. Valve can be locked out by placing a padlock or locking device through the lock hole.

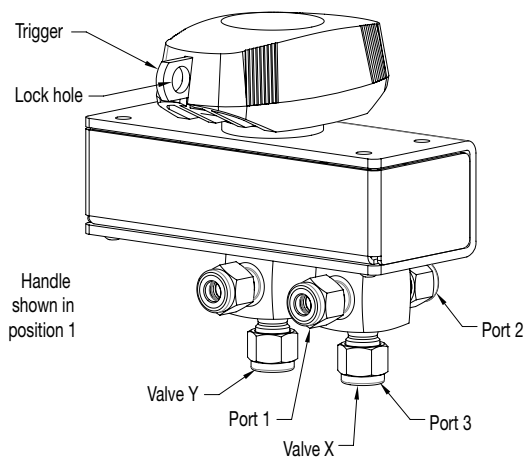


Fig. 5 2-Valve GSM Assembly

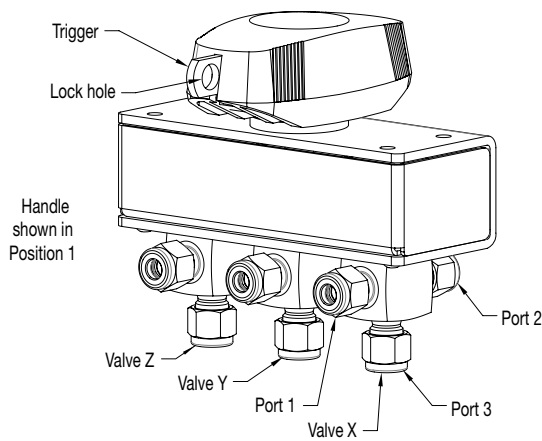


Fig. 6 3-Valve GSM Assembly

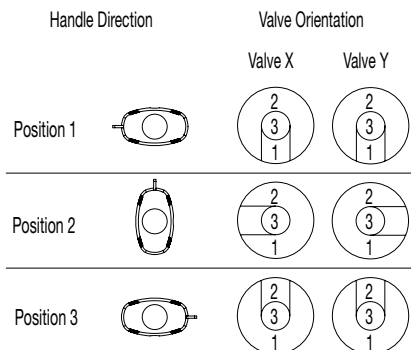


Fig. 7 2-Valve GSM Assembly Schematic

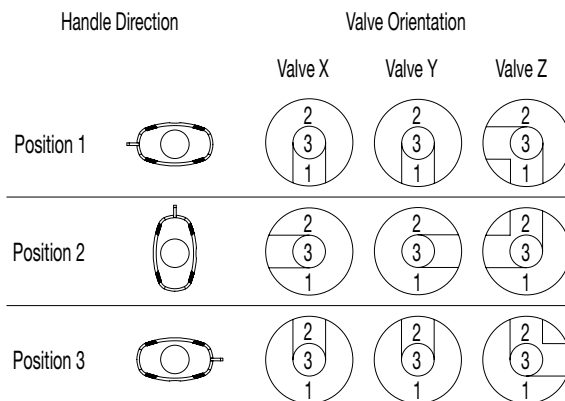


Fig. 8 3-Valve GSM Assembly Schematic

## General Maintenance

- Remove the gear shroud and clear any dirt or debris from the gear box. Use a wire brush or other tool to remove build-up in gear teeth.
- Rotate the handle to verify smooth operation.
- Check the gear set screws and handle set screw to verify they are torqued according to **Torque Requirements**.

## Valve Replacement

### 2-Valve Assembly

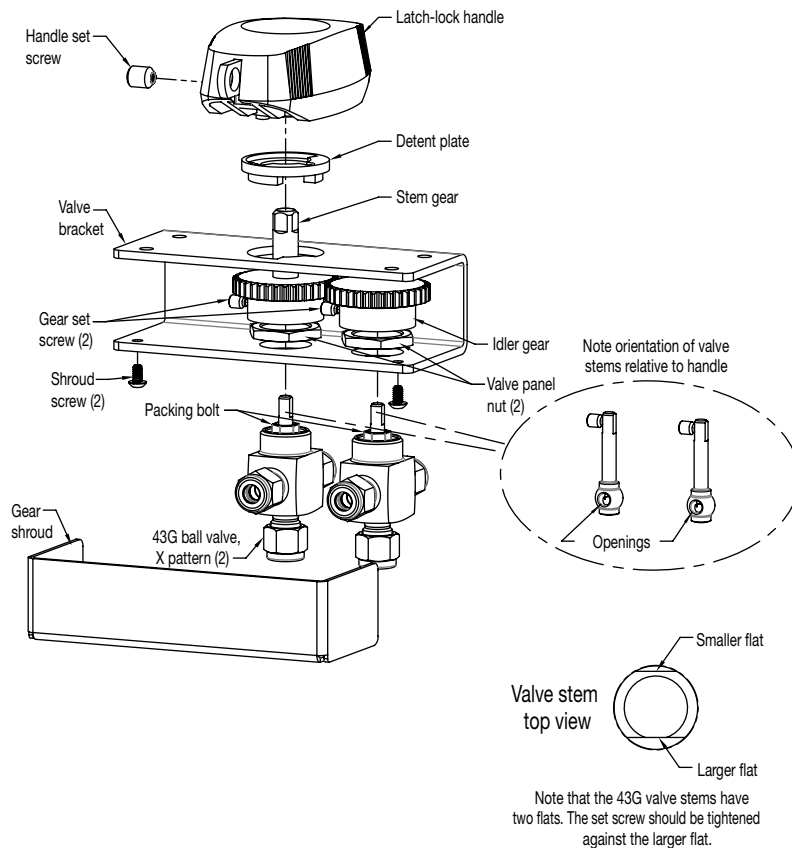


Fig. 9 2-Valve GSM Assembly Exploded View

### Replacing Valve X

1. Remove the gear shroud by loosening and removing the shroud screws.
2. Turn the handle to position 2. (Refer to Fig. 7, 2-valve assembly schematic.) Note orientation of gears as they will need to be reassembled in the same orientation.
3. Loosen the gear set screw and panel nut of valve X. Remove the valve from the bracket.
4. Orient the stem of the new valve so that the large flat faces port 1.
5. Install the valve into bracket, inserting the valve stem into the idler gear while loosely threading the panel nut onto valve. Valve stem should bottom out into the gear.
6. Verify orientation of the gears as previously noted in step 2. Tighten the gear set screw.
7. Verify the valve body is parallel to edge of the bracket and tighten the panel nut.
8. Rotate the handle and ensure operation according to **Operation**.
9. Replace the gear shroud and secure with the shroud screws.

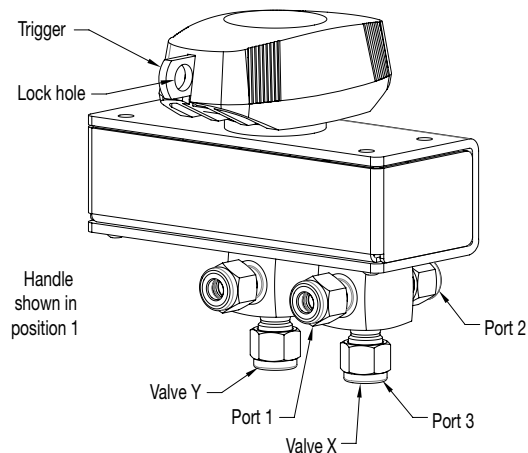


Fig. 10 2-Valve GSM Assembly

## Valve Replacement

### 2-Valve Assembly continued

#### Replacing Valve Y

1. Remove the gear shroud by loosening and removing the shroud screws.
2. Turn the handle to position 1. (Refer to Fig. 7, 2-valve assembly schematic.) Note orientation of the gears and handle as they will need to be reassembled in the same orientation.
3. Remove the handle and detent plate by loosening the handle set screw.
4. Loosen the gear set screw and panel nut of valve Y. Remove the valve from the bracket.
5. Orient the stem of the new valve so that large flat is half-way between ports 1 and 2 (facing away from valve X).
6. Install the valve into bracket, inserting the valve stem into the stem gear while loosely threading the panel nut onto valve. Valve stem should bottom out into the gear.
7. Verify orientation of the gears as previously noted in step 2. Tighten the gear set screw.
8. Verify the valve body is parallel to edge of the bracket and tighten the panel nut.
9. Replace the detent plate.
10. Install the handle on stem gear in previously noted orientation (step 2). Ensure that the lock pin and stop lug fit into recesses of detent plate.
11. While holding the handle and detent plate tight to panel, tighten the handle set screw.
12. Rotate the valve handle and ensure operation according to **Operation**.
13. Replace the gear shroud and secure with the shroud screws.

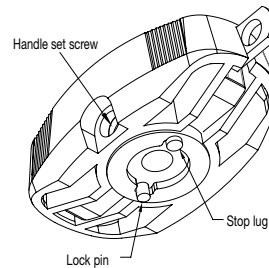


Fig. 11 Latch Lock Handle

# Valve Replacement

## 3-Valve Assembly

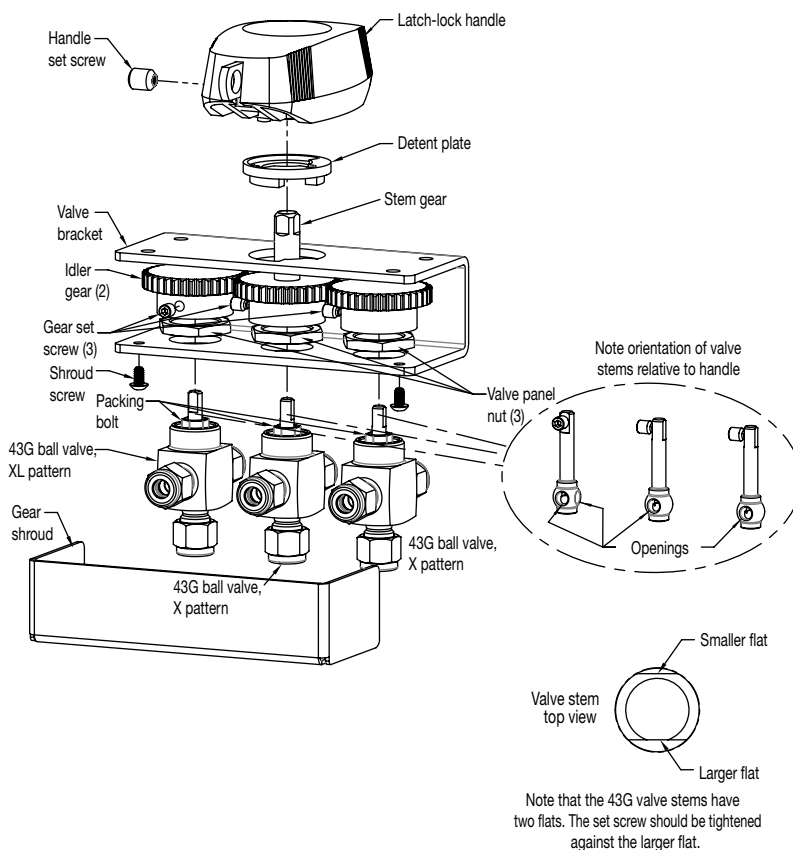


Fig. 12 3-Valve GSM Assembly Exploded View

### Replacing Valve X

1. Remove the gear shroud by loosening and removing the shroud screws.
2. Turn the handle to position 2. (Refer to Fig. 8, 3-valve assembly schematic.) Note orientation of gears as they will need to be reassembled in the same orientation.
3. Loosen the gear set screw and panel nut of valve X. Remove the valve from the bracket.
4. Orient stem of the new valve so that the large flat faces port 1.
5. Install the valve into the bracket, inserting the valve stem into the idler gear while loosely threading the panel nut onto the valve. Valve stem should bottom out into the gear.
6. Verify orientation of the gears as previously noted in step 2. Tighten the gear set screw.
7. Verify the valve body is parallel to edge of the bracket and tighten the panel nut.
8. Rotate the handle and ensure operation according to **Operation**.
9. Replace the gear shroud and secure with the shroud screws.

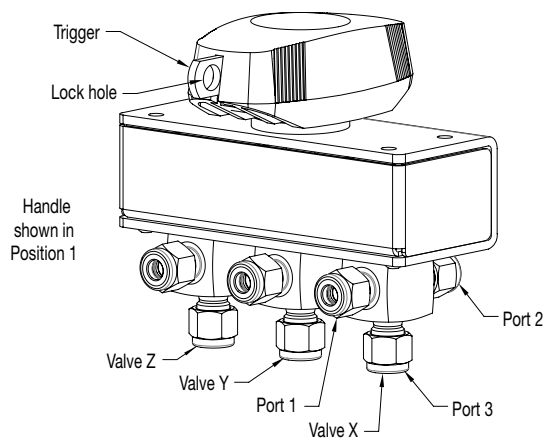


Fig. 13 3-Valve GSM Assembly

## Valve Replacement

### 3-Valve Assembly continued

#### Replacing Valve Y:

1. Remove the gear shroud by loosening and removing the shroud screws.
2. Turn the handle to position 1. (Refer to Fig. 8, 3-valve assembly schematic.) Note orientation of the gears and handle as they will need to be reassembled in the same orientation.
3. Remove the handle and detent plate by loosening the handle set screw.
4. Loosen the gear set screw and panel nut of valve Z. Remove the valve from the bracket.
5. Loosen the gear set screw and panel nut of valve Y. Remove the valve from the bracket.
6. Orient the stem of new valve Y so that the large flat is half way between ports 1 and 2 (facing valve Z).
7. Install valve Y into the bracket, inserting the valve stem into the stem gear while loosely threading the panel nut onto the valve. The valve stem should bottom out into the gear.
8. Verify orientation of the gears as previously noted in step 2. Tighten the gear set screw.
9. Verify the valve Y body is parallel to edge of the bracket and tighten the panel nut.
10. Install valve Z into the bracket, inserting the valve stem into the idler gear while loosely threading the panel nut onto the valve. Valve stem should bottom out into the gear.
11. Verify orientation of the gears as previously noted in step 2. Tighten the gear set screw.
12. Verify the valve Z body is parallel to edge of the bracket and tighten the panel nut.
13. Replace the detent plate.
14. Install the handle on the stem gear in previously noted orientation (step 2). Ensure that the lock pin and stop lug fit into recesses of the detent plate.
15. While holding the handle and detent plate tight to panel, tighten the handle set screw.
16. Rotate the valve handle and ensure operation according to **Operation**.
17. Replace the gear shroud and secure with the shroud screws.

#### Replacing Valve Z:

1. Remove the gear shroud by loosening and removing the shroud screws.
2. Turn the handle to position 1. (Refer to Fig. 8, 3-valve assembly schematic.) Note orientation of the gears as they will need to be reassembled in the same orientation.
3. Loosen the gear set screw and panel nut of valve Z. Remove the valve from the bracket.
4. Orient stem of the new valve so that the large flat faces port 1.
5. Install the valve into the bracket, inserting the valve stem into the idler gear while loosely threading the panel nut onto the valve. Valve stem should bottom out into the gear.
6. Verify orientation of the gears as previously noted in step 2. Tighten the gear set screw.
7. Verify the valve body is parallel to edge of the bracket and tighten the panel nut.
8. Rotate the valve handle and ensure operation according to **Operation**.
9. Replace the gear shroud and secure with the shroud screws.

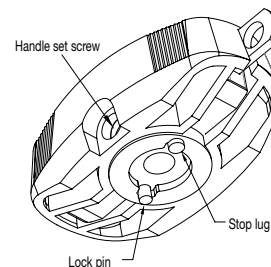


Fig. 14 Latch Lock Handle