

# Butterfly Valve Gear Operator Replacement

SERIES 765, 705, 766, AND 707C

## WARNING

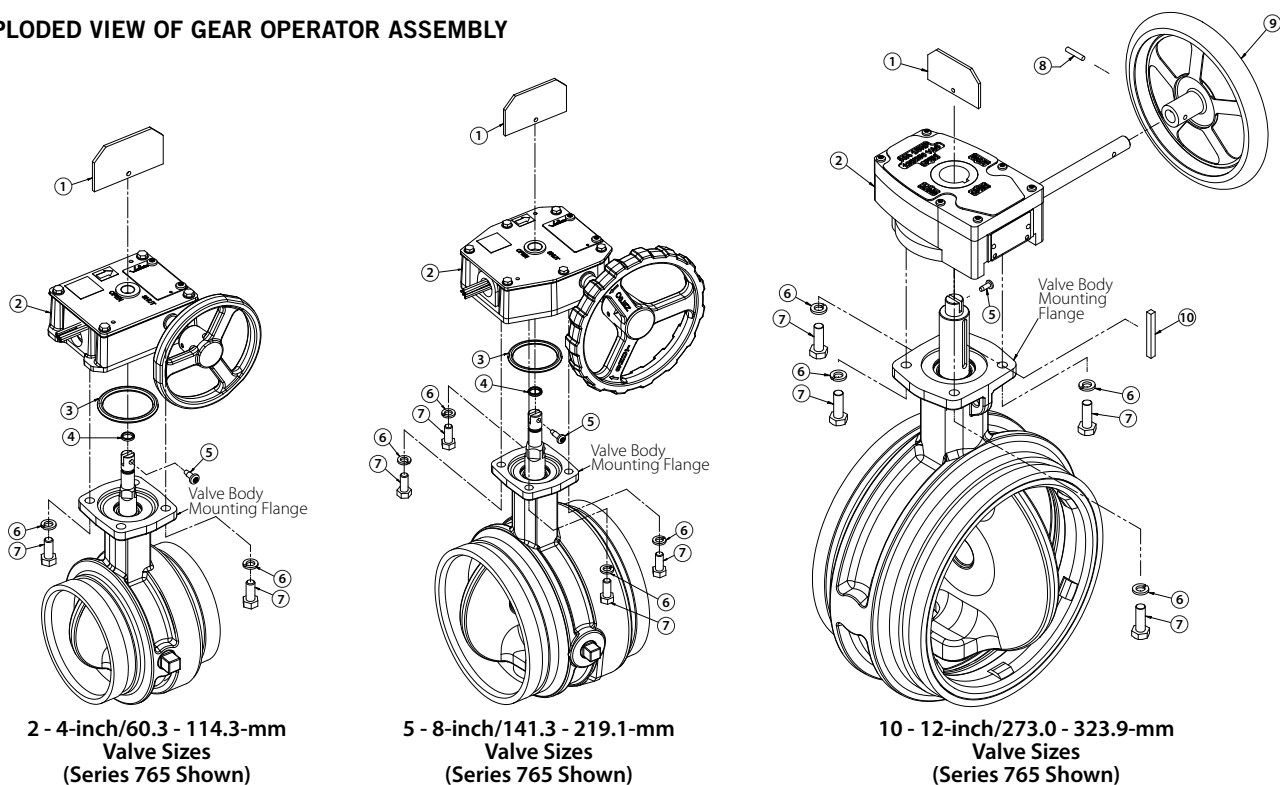


- Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in serious personal injury and/or property damage.

The following instructions cover the procedures required for removing and replacing a gear operator on Series 765, 705, 766, and 707C Butterfly Valves. In addition, this sheet covers the procedures for adjusting the gear operator's travel limit stops for 10 - 12-inch/273.0 - 323.9-mm sizes. Always read all instructions and labels, supplied with the product, for proper installation, operation, and maintenance instructions.

### EXPLODED VIEW OF GEAR OPERATOR ASSEMBLY



2 - 4-inch/60.3 - 114.3-mm  
Valve Sizes  
(Series 765 Shown)

5 - 8-inch/141.3 - 219.1-mm  
Valve Sizes  
(Series 765 Shown)

10 - 12-inch/273.0 - 323.9-mm  
Valve Sizes  
(Series 765 Shown)

Item	Description	Qty. for 2-4-inch/60.3-114.3-mm Valves	Qty. for 5-8-inch/141.3-219.1-mm Valves	Qty. for 10-12-inch/273.0-323.9-mm Valves
1	Actuator Flag	1	1	1
2	Gear Operator	1	1	1
3	O-Ring §	1	1	0
4	O-Ring ‡	1	1	0
5	Self-Tapping Torx Screw	1	1	1

Item	Description	Qty. for 2-4-inch/60.3-114.3-mm Valves	Qty. for 5-8-inch/141.3-219.1-mm Valves	Qty. for 10-12-inch/273.0-323.9-mm Valves
6	Lock Washer	2	4	4
7	Hex-Head Screw	2	4	4
8	Coiled Pin	*	*	1
9	Handwheel	*	*	1
10	Key #	*	*	1

\* Handwheels for 2 - 8-inch/60.3 - 219.1-mm valve sizes come pre-assembled to the gear operator. For 10 - 12-inch/273.0 - 323.9-mm valve sizes, the gear operator is shipped without the handwheel installed. Follow the instructions on the following page to install the handwheel to the gear operator.

§ O-ring replacement sizes (SAE AS-568) are as follows: 6-mm ID x 1.5 mm for 2 - 3-inch/60.3 - 88.9-mm valve sizes, 011 for the 4-inch/114.3-mm valve size, and 013 for 5 - 8-inch/141.3 - 219.1-mm valve sizes.

‡ O-ring replacement size (SAE AS-568) for all valve sizes is 327.

# Key is 360 Brass, ¼-inch square x 2 ¼ inches long

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### GEAR OPERATOR REPLACEMENT

In the event that a gear operator fails, complete replacement would be required. Refer to the drawings on the previous page for the parts breakdown.

The gear operator replacement procedure can be performed without removing the valve from the piping system. **FLOW MUST BE SHUT OFF OR DIVERTED** to prevent flow from passing through the valve during removal of the gear operator.

#### **CAUTION**

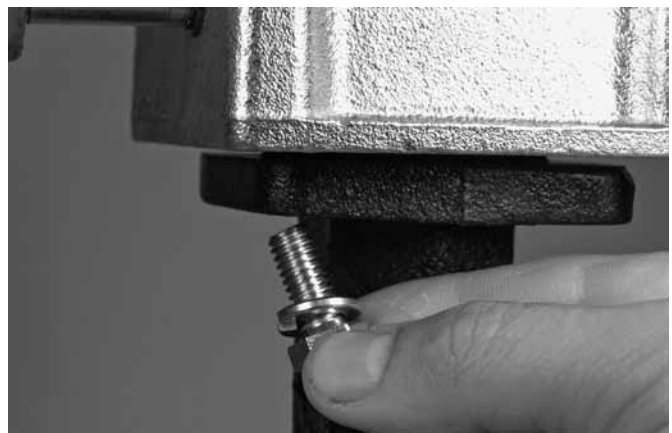
- Use **ONLY** Victaulic replacement parts.
- Before removing the gear operator, note the current orientation of the gear operator on the valve body mounting flange. The new gear operator must be installed on the valve body mounting flange in the same orientation.

Failure to follow these instructions may cause in improper valve operation, resulting in property damage.

1. De-energize the electrical system and disconnect the wiring before attempting to replace the gear operator.

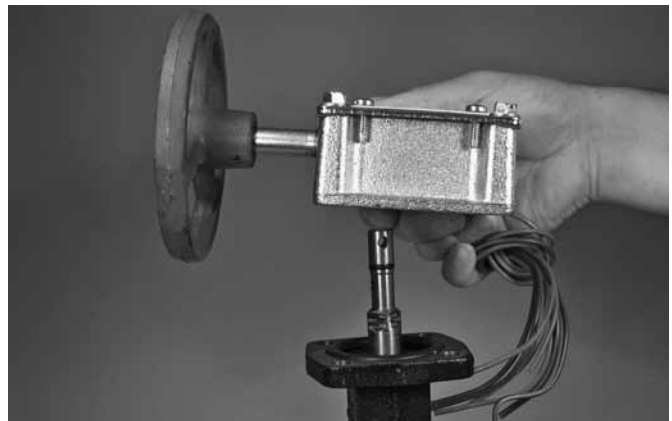


2. Remove the self-tapping torx screw (Item 5) from the actuator flag (Item 1). Remove the actuator flag (Item 1).



3. Remove the hex-head screws (Item 7) and lock washers (Item 6) from the underside of the gear operator (Item 2), where the gear operator mounts to the valve body mounting flange.

**NOTE:** For 2 - 4-inch/60.3 - 114.3-mm sizes, only two hex-head screws mount the gear operator to the valve body mounting flange.

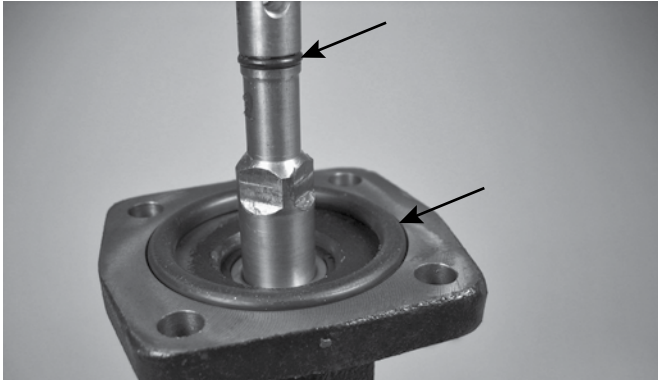


4. Lift the gear operator (Item 2) straight up off the valve body mounting flange. Use caution when removing the gear operator in order to prevent damage to the stem.

**NOTE:** For 10 - 12-inch/273.0 - 323.9-mm valve sizes, be careful not to lose the key (Item 10) installed in the stem. This key is required for proper installation of the gear operator in later steps. Inspect the key for signs of damage. If necessary, replace the key with a new, Victaulic-supplied key of the same type and size (360 Brass, ¼-inch square x 2 ¼ inches long).

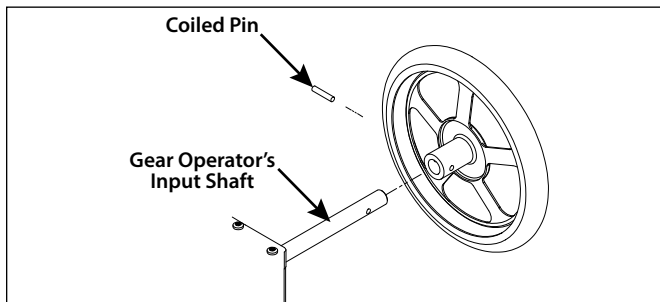
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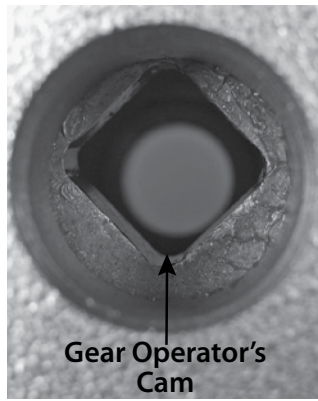
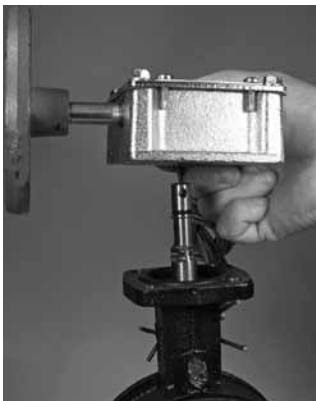


5. Inspect the o-ring between the gearbox and valve body mounting flange (Item 3) and the o-ring around the valve stem (Item 4) for signs of damage. Replace the o-rings, if necessary.

**NOTE:** The 10 - 12-inch/273.0 - 323.9-mm valve sizes do not contain the o-rings shown above.

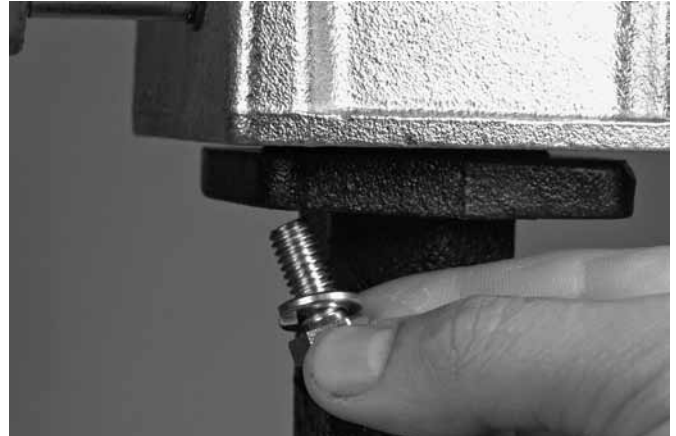


6. **FOR 10 - 12-INCH/273.0 - 323.9-MM VALVE SIZES:** The gear operator is shipped without the handwheel (Item 9) installed. Install the handwheel onto the gear operator's input shaft. Align the hole in the handwheel's hub with the input shaft's hole. Drive the coiled pin (Item 8) through the handwheel and input shaft.



7. Install the replacement gear operator in the exact orientation as the one removed from the valve body mounting flange. Turn the handwheel to align the new gear operator's cam to the valve stem. Install the gear operator so that the rectangular valve stem engages the gear operator's cam. **NOTE:** The gear operator engages with the valve stem only one way and should not be forced. Once engaged, turn the handwheel until the gear operator's mounting holes align with the holes in the valve body mounting flange.

**NOTE:** The 10 - 12-inch/273.0 - 323.9-mm valve sizes do not contain a cam.



8. Use the hex-head screws (Item 7) and lock washers (Item 6), removed in Step 3, to secure the new gear operator to the valve body mounting flange. Tighten the hex-head screws until the lock washers are fully compressed.



9. Re-install the actuator flag onto the valve stem with the self-tapping torx screw removed in Step 2.
10. Operate the valve with the handwheel to ensure that the valve opens and closes fully and that the actuator stem and disc are in the same orientation.
11. Wire the gear operator. Refer to the "Switch and Wiring" section.
12. **FOR 10 - 12-INCH/273.0 - 323.9-MM VALVE SIZES:** Follow the steps on the following pages to adjust the gear operator's closed and open travel limit stops.

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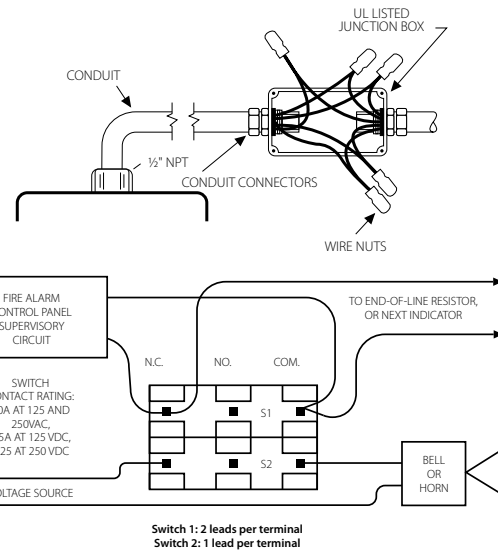
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## SWITCH AND WIRING

- The supervisory switch contains two, single pole, double throw, pre-wired switches.
- Switches are rated:
  - 10 amps @ 125 or 250 VAC/60 Hz
  - 0.50 amps @ 125 VDC
  - 0.25 amps @ 250 VDC
- For Series 765 and Series 705, switches supervise the valve in the "OPEN" position. For Series 766 and Series 707C, switches supervise the valve in the "CLOSED" position.**
- One switch has two #18 insulated wires per terminal, which permit complete supervision of leads (refer to diagrams and notes below). The second switch has one #18 insulated wire per terminal. This double circuit provides flexibility to operate two electrical devices at separate locations, such as an indicating light and an audible alarm, in the area that the valve is installed.
- A #14 insulated ground lead (green) is provided.
  - Switch #1 = S1 For connection to the supervisory circuit of a UL Listed alarm control panel
  - Switch #2 = S2 Auxiliary switch that may be connected to auxiliary devices, per the authority having jurisdiction

**S1** { Normally Closed: (2) Blue  
Common: (2) Yellow

**S2** { Normally Closed: Blue with Orange Stripe  
Normally Open: Brown with Orange Stripe  
Common: Yellow with Orange Stripe



**NOTE:** The above diagram shows a connection between the common terminal (yellow – S1 and yellow-with-orange stripe – S2) and the normally closed terminal (blue – S1 and blue-with-orange strip – S2). In this example, the indicator light and alarm will stay on until the valve is fully OPEN (for Series 765 and Series 766) or fully CLOSED (for Series 766 and Series 707C). When the valve is fully OPEN (for Series 765 and Series 766) or fully CLOSED (for Series 766 and Series 707C), the indicator light and alarm will go out. Cap off any unused wires (e.g. brown with orange stripe).

Only S1 (two leads per terminal) may be connected to the fire alarm control panel. The connection of the alarm switch wiring shall be in accordance with NFPA 72 and the auxiliary switch per NFPA 70 (NEC).

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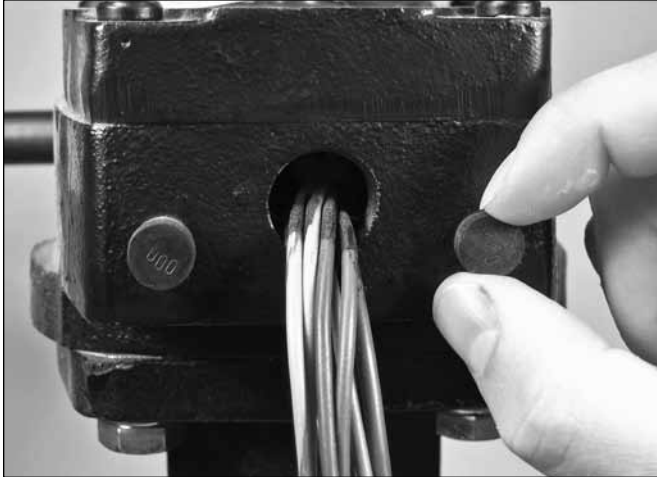
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### ADJUSTING THE TRAVEL LIMIT STOPS

Adjustment of the travel limit stops can be performed while the system is operational. **NOTE:** Cycling of the valve to test travel limit stop adjustments may affect downstream equipment.

### ADJUSTING THE GEAR OPERATOR'S CLOSED TRAVEL LIMIT STOPS (10 - 12-INCH/273.0 - 323.9-MM SIZES)

1. Turn the handwheel counterclockwise to ensure the valve disc is not in the fully closed position.



2. Remove the dust cap from the right side of the gear operator.



3. Using a  $\frac{5}{32}$  allen wrench, loosen the internal set screw counterclockwise to increase the distance for disc travel.
- 3a. Using a  $\frac{5}{32}$  allen wrench, tighten the internal set screw clockwise to decrease the distance for disc travel.
- 3b. Turn the handwheel in the clockwise direction to place the valve disc in the closed (shut) position to confirm that the valve is providing shutoff service. Repeat steps 3 and 3a, as necessary.

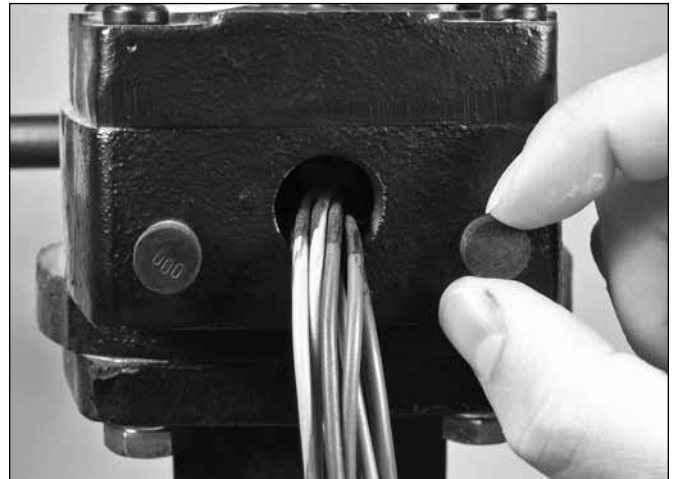


4. With the valve disc in the closed (shut) position, tighten the internal set screw (clockwise) with a  $\frac{5}{32}$  allen wrench.

#### NOTICE

- System pressure upstream of the valve may increase while the valve disc is in the fully closed position.
- Flow downstream of the valve will be interrupted with the disc in the fully closed position.

5. Verify proper operation of the gear operator by turning the handwheel.



6. Replace the dust cap.
7. Follow the "Adjusting the Gear Operator's Open Travel Limit Stops" section on the following page.

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### ADJUSTING THE GEAR OPERATOR'S OPEN TRAVEL LIMIT STOPS (10 - 12-INCH/273.0 - 323.9-MM SIZES)

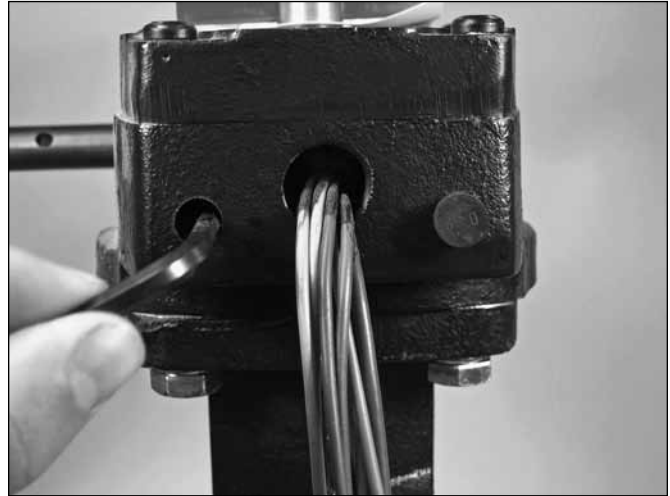
1. Turn the handwheel clockwise to place the valve disc in the slightly open position.



2. Remove the dust cap from the left side of the gear operator.



3. Using a  $\frac{1}{32}$  allen wrench, loosen the internal set screw counterclockwise.
- 3a. Turn the handwheel to place the valve disc in the desired open position.



4. With the valve disc in the desired open position, tighten the internal set screw (clockwise) with a  $\frac{1}{32}$  allen wrench.
5. Verify proper operation of the gear operator by turning the handwheel.



6. Replace the dust cap.



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For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

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