

ACTUATION REPLACEMENT FOR MODEL D PIG VALVE

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1.0 PURPOSE

To outline the steps required to replace the actuation for Argus' Model D Pig Valve. This document applies to the replacement of manual actuation and automatic actuation.

2.0 SCOPE

This document outlines the steps and precautions required to ensure safe and proper actuation replacement for Argus' Model D Pig Valve.

⚠ Warning:

These steps provide a general outline of the procedure and are not intended as a comprehensive guide. Obey all local and site-specific safety regulations regarding work on pressure vessels and use of lifting equipment. Failure to consider all site-specific hazards may lead to injury or death.

Read all instructions prior to changing flow direction to ensure familiarity with the process. Contact an Argus service representative immediately to address any questions or concerns.

Note:

- If flow direction change occurs at the same time, please see more details in GB-PV-005 for Argus Model D Pig Valve or GB-PV-014 for Argus Model D Pig Valve supplied with upstream and downstream equalization ports.
- If Model D Multi-Pig Launcher barrel replacement occurs at the same time, more details are available in GB-ML-002 for barrel replacement.

3.0 REFERENCE DOCUMENTS

Document No.	Document Name
GB-PV-005	Pig Valve Model D - Pig Stopper & Flow Direction - Field Modification
GB-PV-014	Flow Direction Change For Model D Pig Valve C/W Upstream and Downstream Equalization
GB-ML-002	Barrel Replacement For Model D Multi-Pig Launcher
MN-PV-004	Pig Valve - 6" - 12" Model D - Installation, Operation And Maintenance Manual
MN-PV-005	Pig Valve - 14" And Larger Model D - Installation, Operation And Maintenance Manual

4.0 ACTUATION REPLACEMENT PROCEDURE

4.1 Isolate the Pig Valve from service flow.

⚠ Caution: Removal of the actuation is safer if done on an isolated valve.

4.2 Vent pressure from the valve body cavity using the vent/drain valve. Confirm pressure has been relieved using the pressure alert valve.

Note: See Argus' Model D Pig Valve Installation, Operation and Maintenance Manual MN-PV-004 & MN-PV-005 for more details.

4.3 Ensure the Pig Valve is in the fully OPEN position to remove the actuation if the Pig Valve is installed in pipeline.

Note: If the Pig Valve is off pipeline, this procedure can be applied when the Pig Valve is fully either OPEN or CLOSED for actuation replacement.

⚠ Caution: For the 12" and above Pig Valves manufactured and assembled before March 2017, this procedure only can be applied when the Pig Valves are in the fully **CLOSED** position.

If the Pig Valve cannot be fully OPEN or CLOSED, contact an Argus service representative immediately.

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4.4 Remove original actuation.

If the actuation is automatic, disconnect the power before removing the automatic actuation.

Note: Actuation varies with manual actuation and automatic actuation as shown in Figures 1 & 2.

- Manual actuation: quarter turn (90°) manual gear operator and hand wheel
 - Automatic actuation: quarter turn (90°) gear operator and electric actuator
- For pneumatic actuator, contact an Argus service representative for more details.

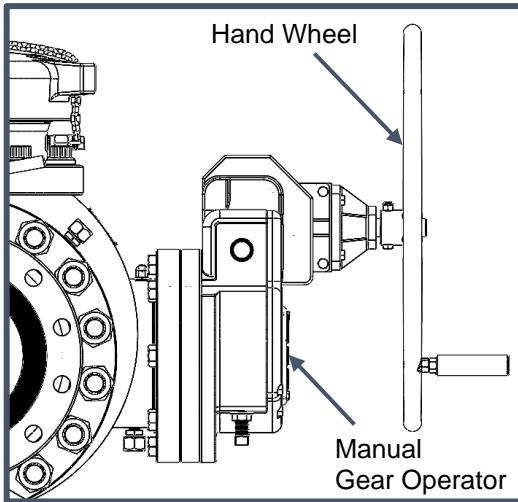


Figure 1: Manual Actuation

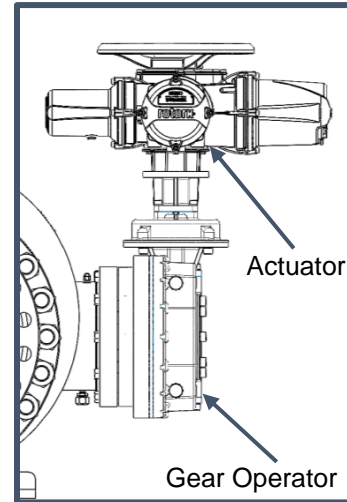
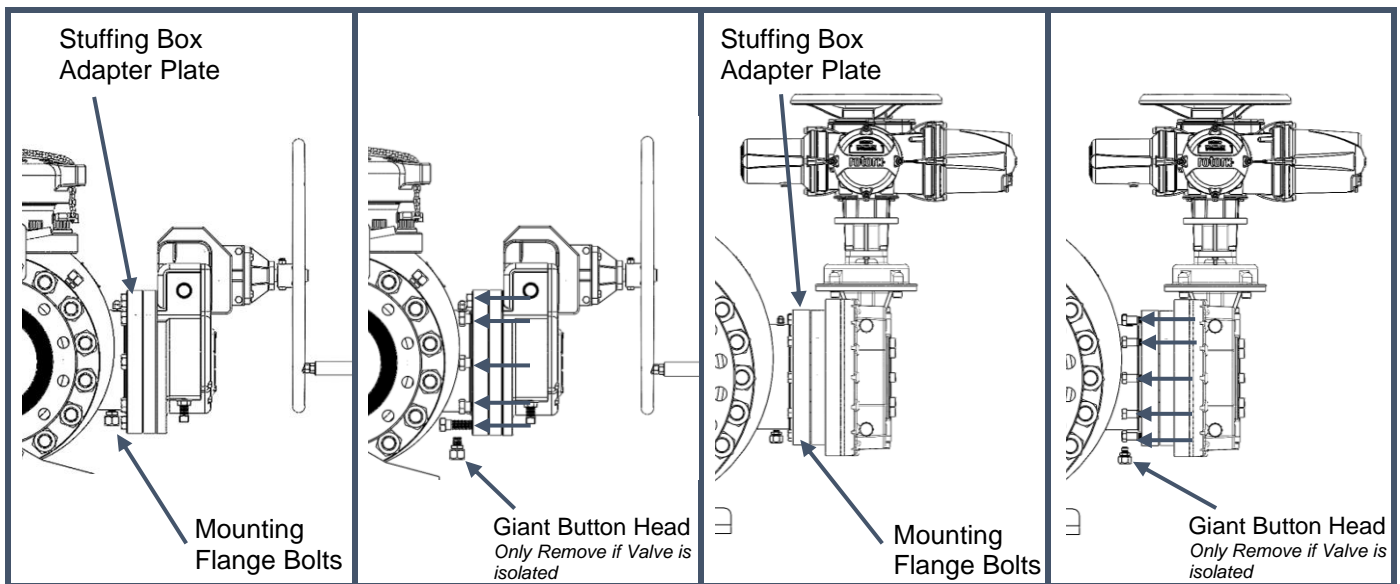


Figure 2: Automatic Actuation

4.4.1 Loosen the bolts on rear side of the stuffing box adapter plate, Figure 3.

Note: Access to some bolts is limited and may require progressive loosening as the gear operator is removed as shown in Figure 4. Mounting flange bolt size is outlined in Table 1.



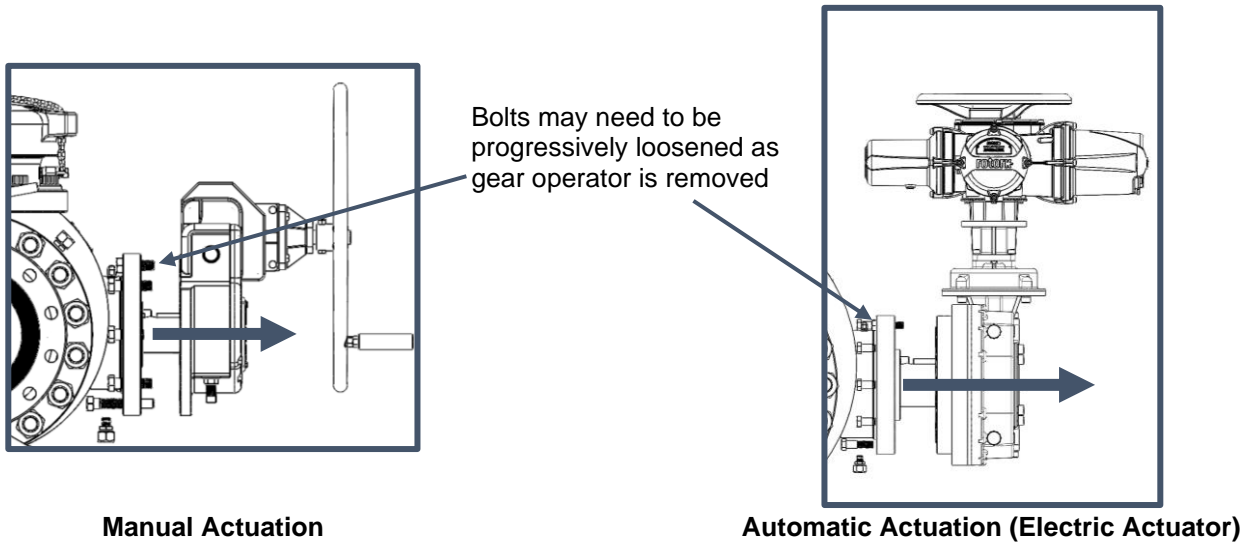
Manual Actuation

Automatic Actuation (Electric Actuator)

Figure 3: Loosen Mounting Flange Bolts for Actuation

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Figure 4: Progressively Loosen Bolts
Table 1: Mounting Flange Bolt Size Chart

Pig Valve		Mounting Flange Bolt		
Size ^[1]	Class	Thread Size	Length	Qty.
6"	900	1/2"-13 UNC	2"	6
	1500	3/4"-10 UNC	2 1/4"	
8"	150-900	3/4"-10 UNC	2 1/4"	6
	1500		2 1/2"	10
10"	150-600	3/4"-10 UNC	2 1/4"	6
12"	150-600	3/4"-10 UNC	3"	10
	900		2 1/4"	6
14"	150-600	3/4"-10 UNC	3"	10
16"	150-600	3/4"-10 UNC	3"	10
18"	150	3/4"-10 UNC	3"	10
20"	150	3/4"-10 UNC	3"	10
	600	1"-8 UNC		8

[1] 6" Model D Pig Valves are only available in class 900 and 1500.

- 4.4.2 Support the weight of the actuation using an appropriately rated sling.
Note: Gear operator and/or actuator weight appear on the respective nameplates.
- 4.4.3 Slide the actuation off the stem. Ensure the unit is appropriately supported in a balanced position for ease of removal.
- 4.4.4 After removal, place the original actuation aside.
- 4.4.5 Inspect the stem and the key on the pig valve for any signs of damage from disassembly or operation.
Note: Replacement Parts can be purchased through Argus. Contact an Argus service representative for more details.
- 4.4.6 Leave the mounting flange bolts on the Stuffing Box adapter for the later installation.

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4.5 Install new actuation.

Note: If flow direction change occurs at the same time, please see more details in GB-PV-005 for Argus Model D Pig Valve or GB-PV-014 for Argus Model D Pig Valve coming with upstream and downstream equalization.

4.5.1 Verify orientation of the stem stop plate and the stem stop pin depending on Pig Valve fully open/closed position and flow direction.

See Figures 5 & 6.

Left to Right – Clockwise to close

Right to Left – Counter-clockwise to close

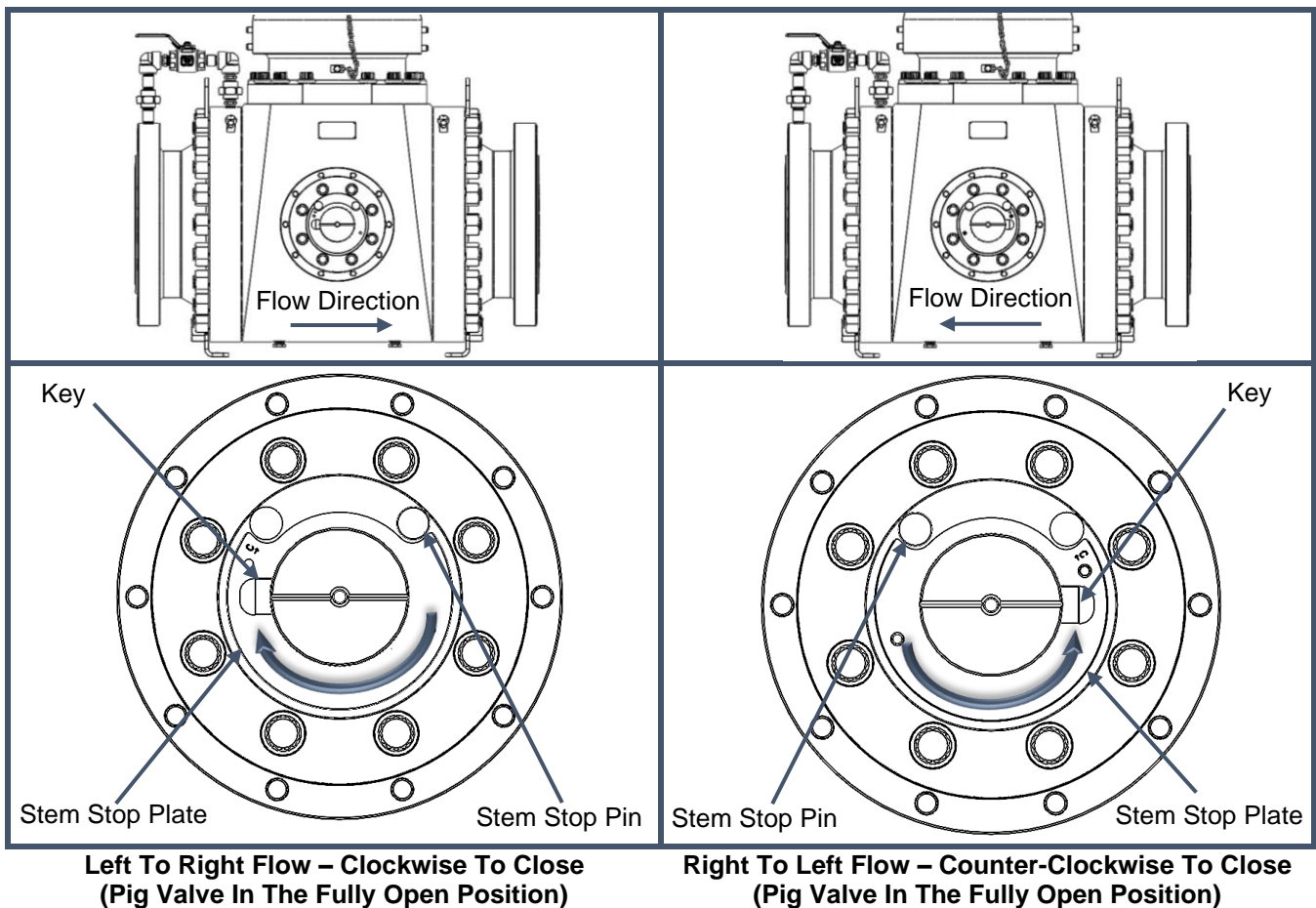


Figure 5: Stem Stop Plate And Stem Stop Pin Orientation When Pig Valve In The Fully OPEN Position

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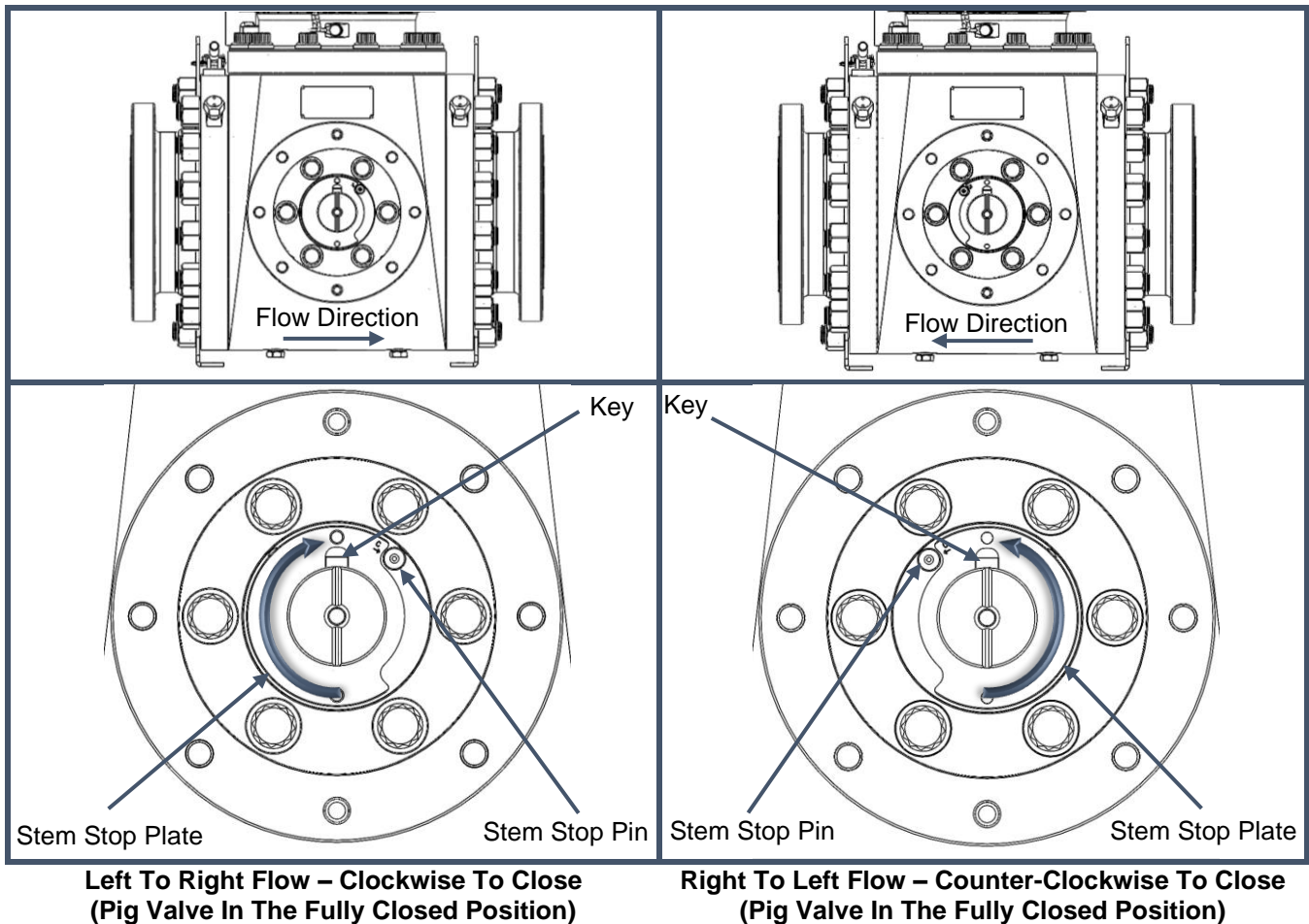


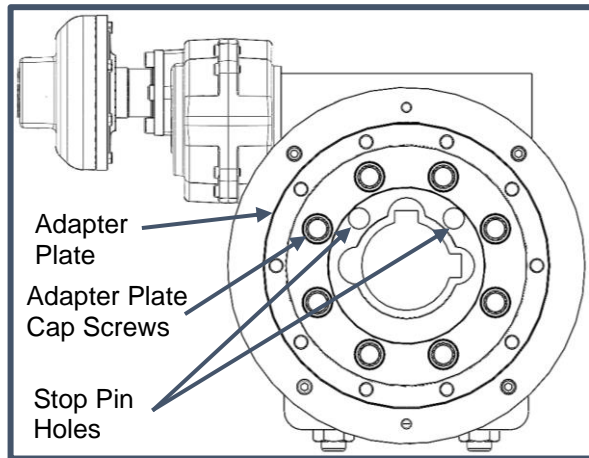
Figure 6: Stem Stop Plate And Stem Stop Pin Orientation When Pig Valve In The Fully CLOSED Position

- 4.5.2 Inspect the stem stop plate and the stop pin for any signs of damage from disassembly or operation.
Note: Replacement Parts can be purchased through Argus. Contact an Argus service representative for more details.

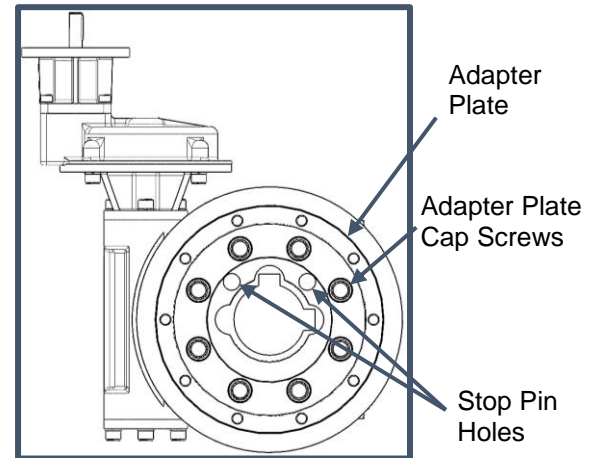
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- 4.5.3 Verify adapter plate orientation on replacement gear operator. The stop pin holes are always on the top side of the Pig Valve as shown in Figure 7.
- Note:** Orientation of gear operator may change depending on configurations. Adapter Plate 12-Point Cap Screw size is outlined in Table 2.



Manual Gear Operator – Manual Actuation



Gear Operator – Automatic Actuation

Figure 7: Gear Operator & Adapter Plate Layout Varies with Valve Size & Class

Table 2: Adapter Plate 12-Point Cap Screw Size Chart

Pig Valve		Adapter Plate 12-Point Cap Screw		
Size ^[1]	Class	Thread Size	Length	Qty.
6"	900	¾"-10 UNC	1 ¼"	4
	1500			8
8"	150-900	¾"-10 UNC	1 ¼"	8
	1500		1 ½"	
10"	150-600	¾"-10 UNC	1 ¼"	8
12"	150	¾"-10 UNC	1 ¼"	8
	300 & 600	1"-8 UNC	2"	
	900	¾"-10 UNC	1 ¼"	
14"	150-600	1"-8 UNC	2"	8
16"	150	¾"-10 UNC	1 ¼"	8
	300 & 600	1"-8 UNC	2"	
18"	150	1"-8 UNC	2"	8
20"	150 & 600	1"-8 UNC	2"	8

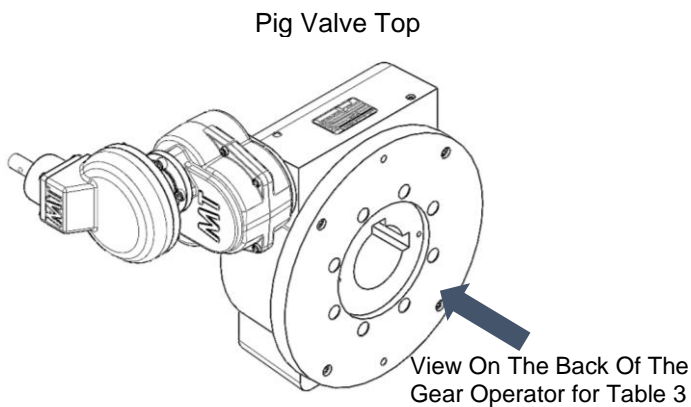
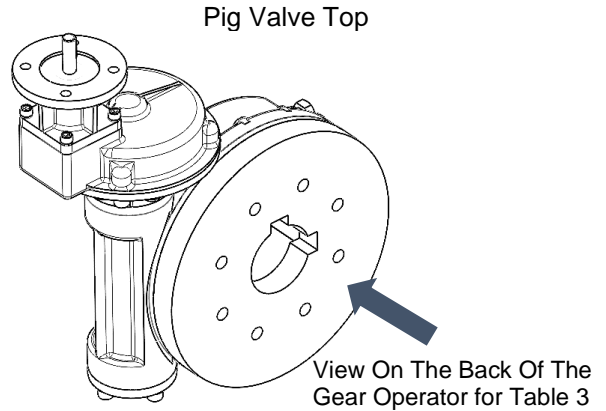
[1] 6" model D Pig Valves are only available in class 900 and 1500.

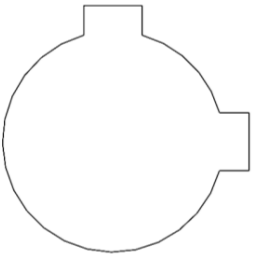
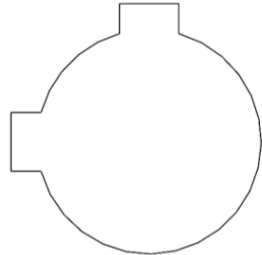
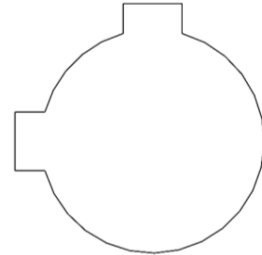
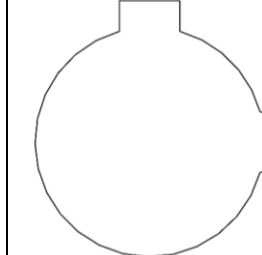
- 4.5.4 Verify the gear operator rotation matches the required rotation for the flow direction. See Figures 8 & 9 and Table 3 for details on keyway orientation of the gear operator depending on the Pig Valve fully open/closed position and flow direction.
- Note:**
- Before installed, the gear operator should always match Pig Valve ball orientation (fully OPEN or CLOSED).
 - If the gear operator is in a partially OPEN state, actuate the gear operator until it is in the fully OPEN position first when the Pig Valve is installed in pipeline.

⚠ Caution: For the 12" and larger Pig Valves manufactured and assembled before March 2017, ensure the Pig Valve and the gear operator are in the fully **CLOSED** position first before reassembly.

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Figure 8: Manual Quarter Turn (90°) Gear Operator

Figure 9: Quarter Turn (90°) Gear Operator
Table 3: Gear Operator Keyway Orientation on Output Bore

Gear Operator Keyway Orientation			
Fully OPEN Position		Fully CLOSED Position	
Flow Direction		Flow Direction	
Left – Right	Right – Left	Left – Right	Right - Left
Pig Valve Top	Pig Valve Top	Pig Valve Top	Pig Valve Top
			

- 4.5.5 Lubricate stem and key using Lubriplate, SYN-1602 Synthetic Grease, or equivalent.
- 4.5.6 Lift the the actuation using an appropriately rated sling.
Note: Gear operator and/or actuator weight appear on the respective nameplates.
- 4.5.7 Slide the actuation onto the stem. Ensure the weight is appropriately supported in a balanced position to prevent binding during installation.

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4.5.8 Reinstall all flange mounting bolts, see Figure 10.

Note: Access to some bolts is limited and may require progressive tightening as gear operator is installed. See Table 1 for bolt sizes.

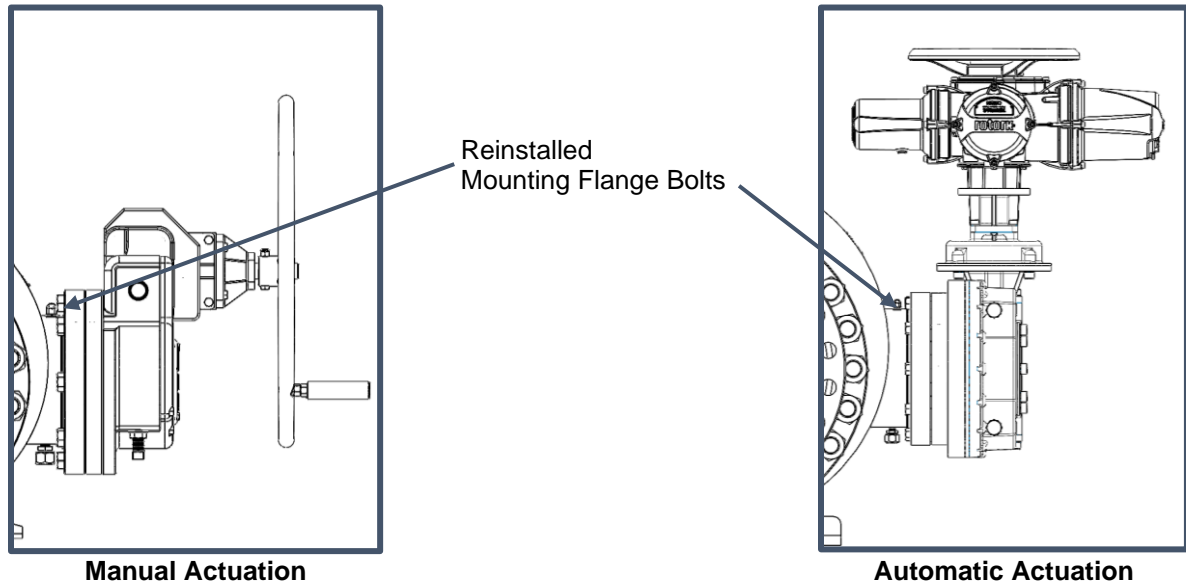


Figure 10: Reinstall Flange Mounting Bolts

4.6 Set CLOSED position for actuation.

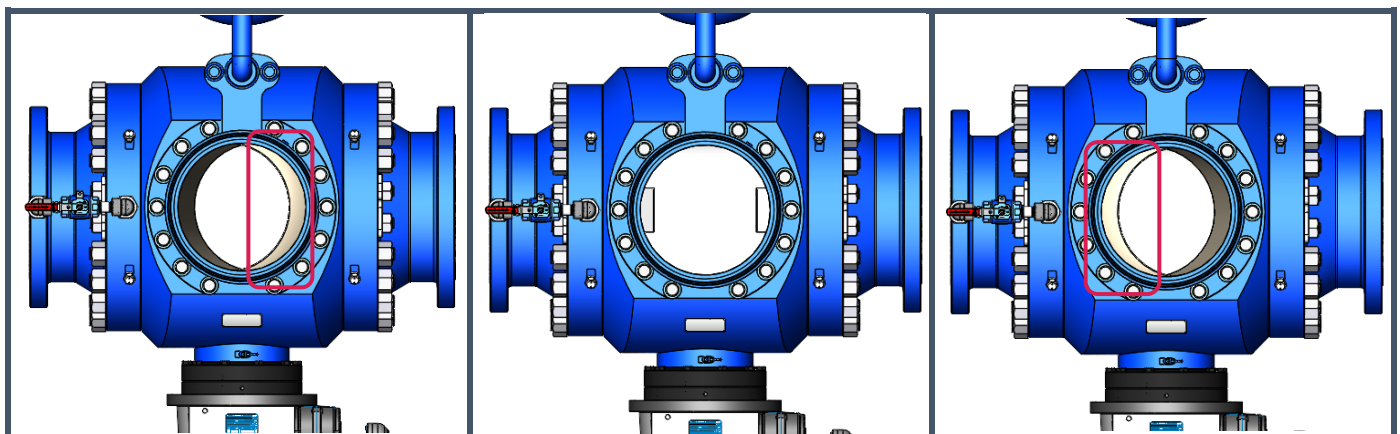
Consult gear operator and/or actuator manufacturers for more detailed instructions.

Note: After the installation of actuation, the position of ball in the Pig Valve and the gear operator shall match (both in whether the fully OPEN or the fully CLOSED position).

⚠ Caution: Gear operator travel can be limited using the threaded stop bolts on the flat face of the gear operator. These stops are factory set to allow exactly 90° of rotation and shall only be adjusted by trained personnel.

4.6.1 Verify the Pig Valve and the gear operator are in the fully CLOSED position. See Figure 11 for fully CLOSED position of Pig Valve.

Note: Opening Entry Cap can help verify the Pig Valve in the fully CLOSED position. If Model D Multi-Pig Launcher barrel replacement occurs at the same time, please see more details in GB-ML-002 for barrel replacement.



Incorrect – Partially Open

Correct – Fully Closed

Incorrect – Partially Open

Figure 11: Pig Valve In The Fully CLOSED Position (Top Views Of Pig Valve)

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4.6.2 Set this position as the CLOSED position. Refer to the gear operator and/or actuator manufactures' manual for more detailed instructions.

4.6.2.1 For automatic actuation **ONLY**.

Set 'Rotation to Close' setting on actuator for the desired flow direction, see Table 4.

Table 4: 'Rotation to Close' Setting on Actuator

Desired Flow Direction	Actuator Rotation to Close Setting
Left - Right	Clockwise
Right - Left	Counter-Clockwise

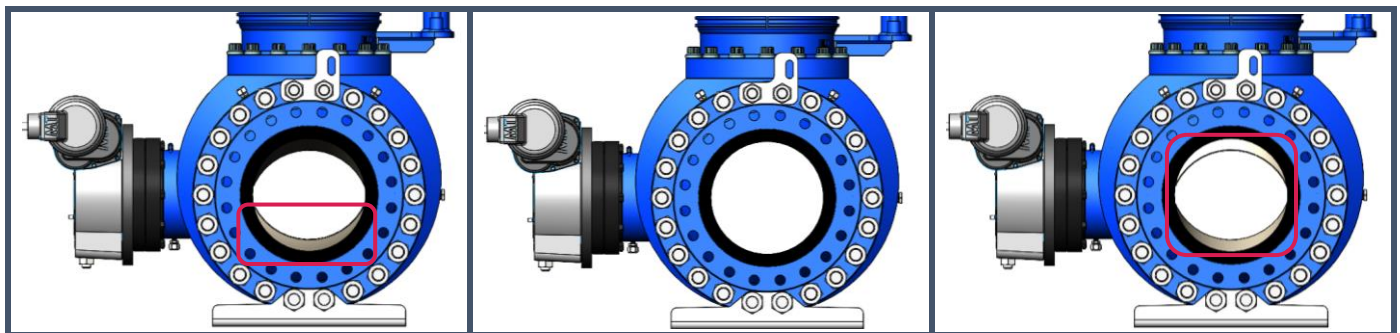
4.7 Set OPEN position for actuation

4.7.1 Actuate the Pig Valve to the fully OPEN position.

4.7.2 Verify the Pig Valve and the gear operator are in the fully OPEN position.

Note: For the pig valve is off pipeline **ONLY**.

See Figure 12 for fully OPEN position of Pig Valve.



Incorrect – Partially Open

Correct – Fully Open

Incorrect – Partially Open

Figure 12: Pig Valve In The Fully OPEN Position (Side Views Of Pig Valve)

4.7.3 Set this position as the OPEN position. Refer to the gear operator and/or actuator manufactures' manual for more detailed instructions.

4.8 Verify OPEN and CLOSED position once again by operating the actuation. Ensure the ball is in the vertical position when CLOSED, as shown in Figure 11 and that the actuation will not allow over-rotation.

4.9 Ensure entry cap is closed and pressure alert valve has been reinstalled **BEFORE** operating. Actuation replacement is completed.