



Operation and Maintenance Manual

Series 365, 366, and 377 Vic-Plug™ AWWA Plug Valves 3 - 12" Sizes



WARNING



- Failure to follow instructions and warnings can result in serious personal injury.
- Always read and understand all installation instructions before attempting to assemble Victaulic piping products.
- Always wear safety glasses and foot protection.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

If you need additional copies of this manual, or if you have any questions about the safe operation of this product, contact Victaulic Company of America, P.O. Box 31, Easton, PA 18044-0031, 610-559-3300.

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IMPORTANT INFORMATION

Definitions for identifying the various hazard levels shown on warning labels appear below. These definitions also indicate proper safety procedures found throughout this instruction manual.



This safety alert symbol indicates important safety messages on warning labels in this instruction manual. When you see this symbol, be alert to the possibility of personal injury. Carefully read and fully understand the message that follows.

DANGER

- The use of the word "DANGER" always signifies an immediate hazard with a likelihood of severe personal injury or death if you do not follow instructions and recommended precautions.

CAUTION

- The use of the word "CAUTION" signifies possible hazards or unsafe practices that could result in minor personal injury and product or property damage if you do not follow instructions and recommended precautions.

WARNING

- The use of the word "WARNING" signifies the presence of hazards or unsafe practices that could result in severe personal injury if you do not follow instructions and recommended precautions.

NOTICE

- The use of the word "NOTICE" signifies special instructions that are important but not related to hazards.

PREFACE

The Victaulic Series 365 Vic-Plug Valve is a grooved-end, eccentric plug valve that is ideal for “dead-end” shutoff or flow balancing functions in municipal water and wastewater services. In addition, Series 365 Plug Valves are usable in a wide range of other piping systems where solids may present a problem. The ductile iron body conforms to AWWA C-509 standard end-to-end dimensions. The grooved ends conform to ANSI/AWWA C-606 rigid groove specifications.

The Vic-Plug valve’s design provides a long service life and does not require field maintenance. These valves are equipped with a packing gland and multiple chevron packing rings that you can adjust easily while the valve is in service. Self-lubricated stainless steel bearings maintain alignment and resist corrosion, which prevents shaft binding (no lubrication is required). Gear operators and actuators are factory lubricated and, under normal operation, do not require servicing.

The Series 365 Vic-Plug Valves are available for 175-psi (1205 kPa) bi-directional service in 3-inch (100,6 mm) to 6-inch (175,3 mm) sizes.

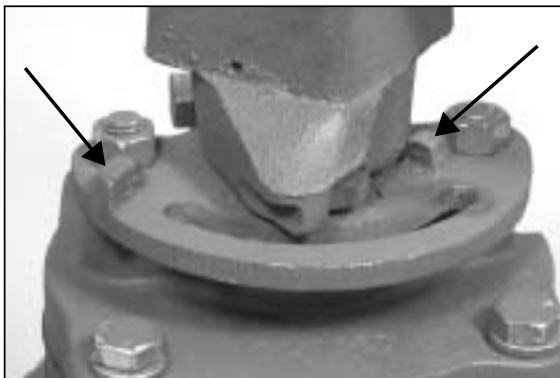
Valves in sizes 8-inch (229,9 mm) to 12-inch (335,3 mm) are rated for unidirectional service at 175-psi (1205 kPa) with a 25-psi (170 kPa) reverse sealing capability. Bi-directional service of 175-psi (1205 kPa) is available as an option on these sizes.

For sizes 8-inch (229,9 mm) to 12-inch (335,3 mm), refer to the markings on the valve to determine the acceptable service. Valves with a flow arrow marking (⇨) are for unidirectional services. Valves with a horizontal bar (—) are for balancing use. Valves with no markings are for bi-directional service.

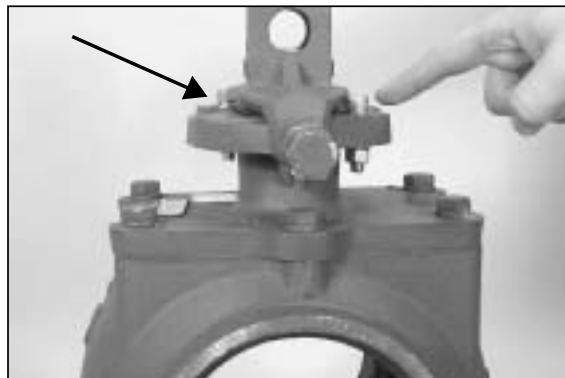
This operation and maintenance manual provides information that is essential to maintaining optimum valve performance. **NOTE:** Under normal operating conditions, the Series 365 Vic-Plug Valve does not require field maintenance. However, in the event that the valve requires adjustment, the information contained within this manual will provide assistance.

VALVE FEATURES

3 & 4-inch (100,6 & 121,9 mm)
Valves



6-inch (175,3 mm) Valve



Lever-operated valves in 3-inch (100,6 mm) to 6-inch (175,3 mm) sizes contain an open and closed travel stop to prevent the plug from over-traveling.

! WARNING

- Always depressurize and drain piping systems before attempting to disassemble and remove any Victaulic piping products.
Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

ALWAYS SPECIFY THE GASKET'S GRADE ON YOUR ORDER

GRADE	TEMP. RANGE	COMPOUND	COLOR CODE	*GENERAL SERVICE RECOMMENDATIONS
E	-30°F to +230°F (-34°C to +110°C)	EPDM	Green Stripe	Recommended for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 for cold +86°F (+30°C) and hot +180°F (+82°C) potable water service. Not recommended for petroleum services. Not recommended for steam services.
T	-20°F to +180°F (-29°C to +82°C)	Nitrile	Orange Stripe	Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. UL classified in accordance with ANSI/NSF 61 for cold +86°F (+30°C) and hot +180°F (+82°C) potable water service. Not recommended for hot water services over +150°F (+66°C) steam, or for hot dry air over +140°F (+60°C).
M	-20°F to +200°F (-29°C to +93°C)	Halogenated Butyl	Brown Stripe	Recommended for water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. Readily conforms to ductile pipe surfaces. UL classified in accordance with ANSI/NSF 61 for cold +86°F (30°C) potable water service. Not recommended for petroleum services.
S	-20°F to +180°F (-29°C to +82°C)	Nitrile	Red Stripe	Specially compounded to conform to ductile pipe surfaces. Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Not recommended for hot water services over +150°F (+66°C) or for hot dry air over +140°F (+60°C).

*The services listed are general service recommendations only. You must note that these gaskets might not be compatible with certain services. Always refer to the latest Victaulic Gasket Selection Guide (05.01) for specific gasket service recommendations.

ALWAYS CHECK THE GASKET SUPPLIED WITH THE PRODUCT TO ENSURE THAT IT IS SUITED FOR THE INTENDED SERVICE. REFER TO VICTAULIC'S GASKET SELECTION GUIDE (05.01).

ALWAYS APPLY A THIN AMOUNT OF VICTAULIC LUBRICANT TO THE GASKET FOR PROPER COUPLING ASSEMBLY.

Series 365 Vic-Plug™

**3-inch and 4-inch
(100,6 and 121,9 mm)
AWWA Plug Valves**

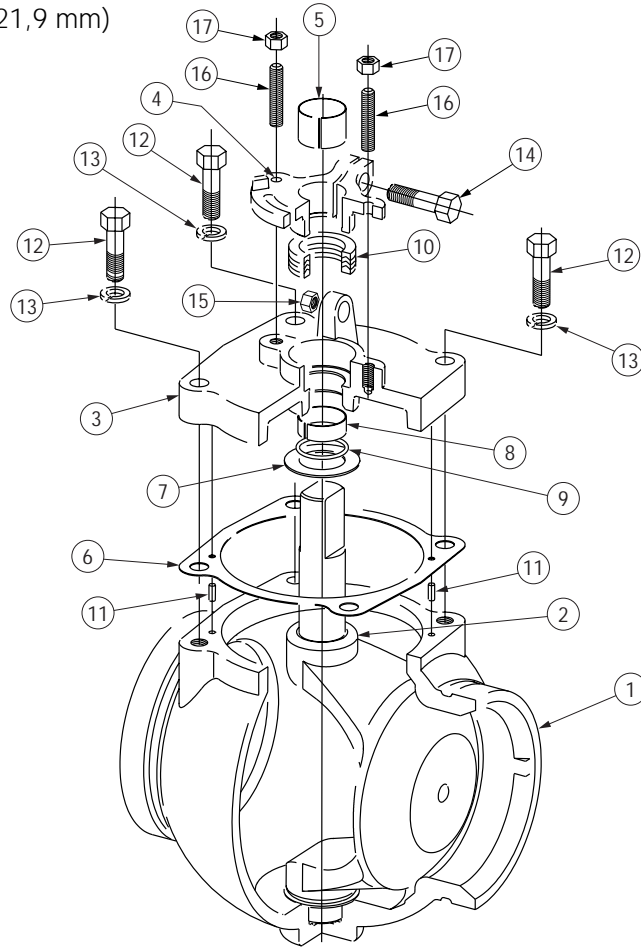


SECTION 1

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve

3" (100,6 mm) and 4" (121,9 mm)



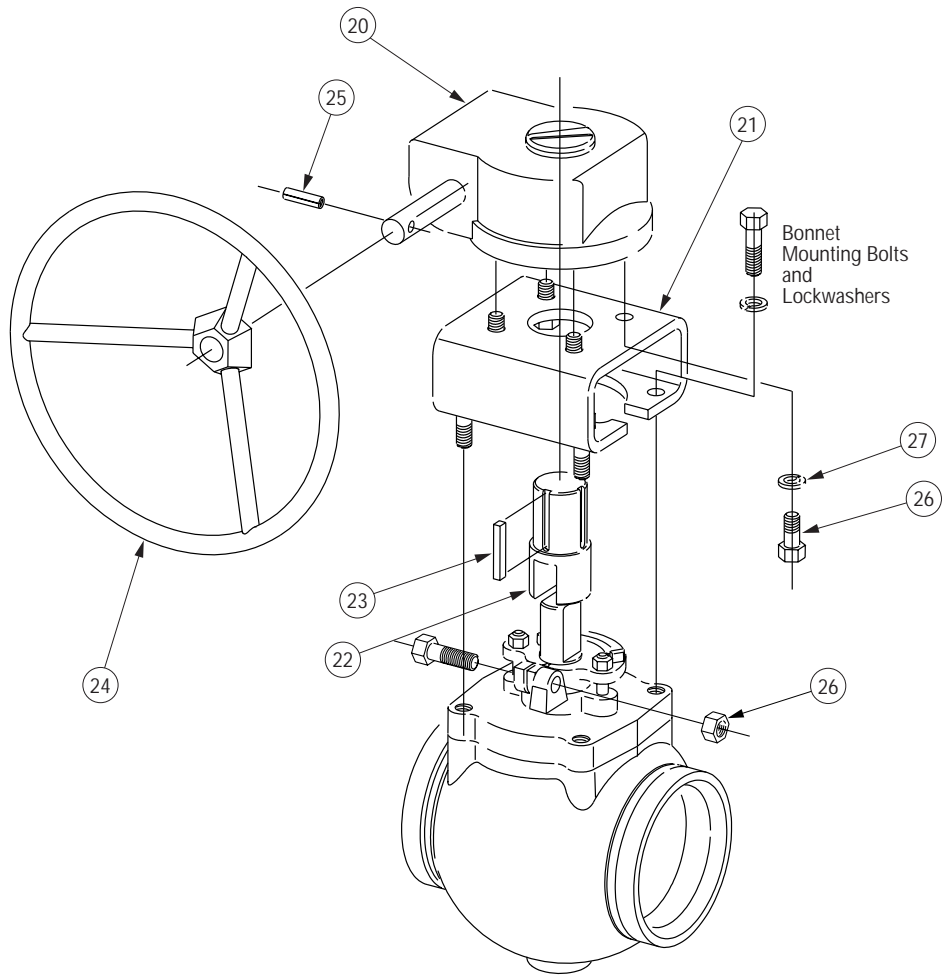
Item No.	Description	Qty.	Vic-Plug Valve Size	
			3"	4"
1	Valve Body	1	ASTM A-536 – Ductile iron	
2	Plug	1	ASTM A-536 – Ductile iron	
3	Bonnet	1	ASTM A-536 – Ductile iron	
4	Packing Gland	1	ASTM A-536 – Ductile iron	
5	Anti-Corrosion Insert	1	Stainless Steel – Type 316	
6	Gasket	1	See 23.06 for Plug/Coating Seal	
7	Thrust Washer	2	Glass Reinforced TFE	
8	Bearing	2	Type 316 Stainless Steel Backed – TFE (self lubricating)	
9	O-ring	2	Nitrile (Standard) Same as plug coating (Optional)	
10	Stem Packing	1 Set	Nitrile (Standard) Same as plug coating (Optional)	
11	Dowel Pin	2	$\frac{3}{16}$ Dia. X $\frac{1}{2}$ Lg.	$\frac{3}{16}$ Dia. X $\frac{1}{2}$ Lg.
12	Hex Head Bolt	–	(4) $\frac{3}{8}$ X $1\frac{1}{4}$ Lg.	(4) $\frac{1}{2}$ X $1\frac{3}{8}$ Lg.
13	Lock Washer	–	(4) $\frac{3}{8}$ Dia.	(4) $\frac{1}{2}$ Dia.
14	Hex Head Bolt	1	$\frac{3}{8}$ X 2 Lg.	$\frac{3}{8}$ X 2 Lg.
15	Hex Nut	1	$\frac{3}{8}$	$\frac{3}{8}$
16	Threaded Stud	2	$\frac{3}{8}$ X $1\frac{1}{2}$ Lg.	$\frac{3}{8}$ X $1\frac{1}{2}$ Lg.
17	Hex Nut	2	$\frac{3}{8}$	$\frac{3}{8}$

SECTION 1

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve – Gear Operator

3" (100,6 mm) and 4" (121,9 mm)

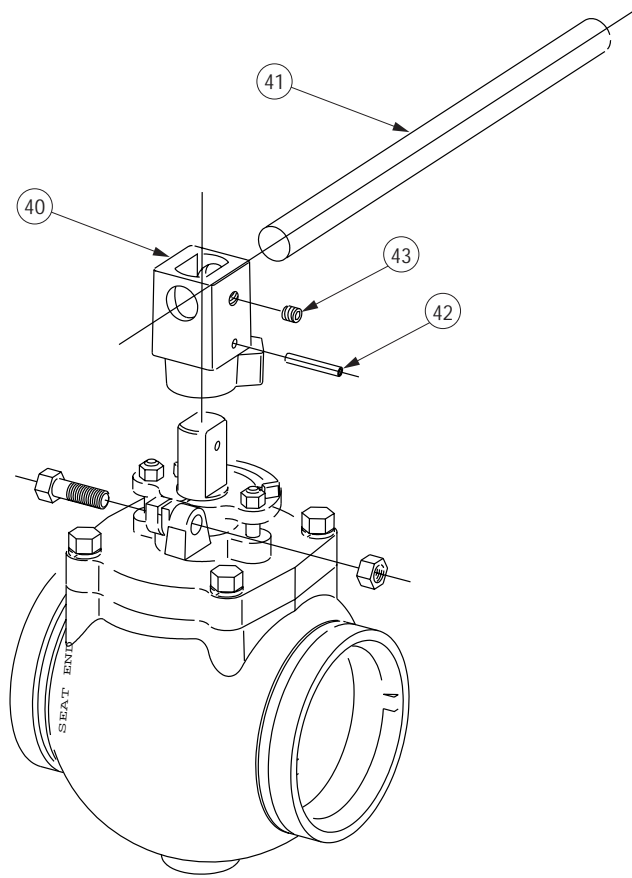


Item No.	Qty.	Description
20	1	Gear Operator
21	1	Mounting Bracket
22	1	Stem Adapter
23	1	Square Key
24	1	Handwheel
25	1	Roll Pin
26	4	Hex Head Cap Screw
27	4	Lockwasher

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve – Lever Handle

3" (100,6 mm) and 4" (121,9 mm)



Item No.	Qty.	Description
40	1	2" Square Nut
41	1	Handle
42	1	Roll Pin
43	1	Set Screw

INSTALLATION

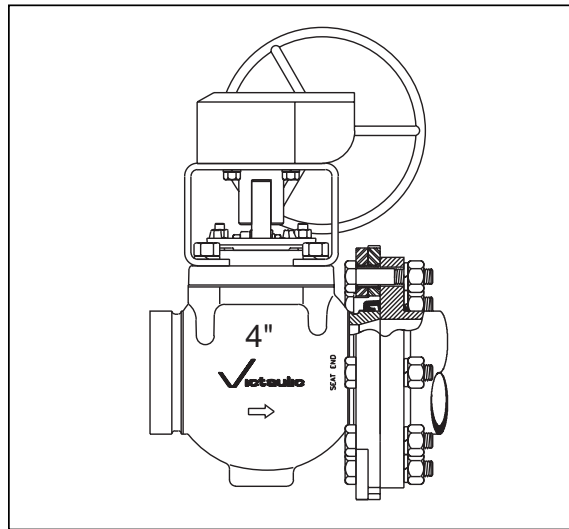
The 3-inch (100,6 mm) and 4-inch (121,9 mm) Victaulic Series 365 Vic-Plug Valves are easily installed with Style 31 Couplings and/or Style 341 Vic-Flange Adapters. For installation instructions, request I-31 for the Style 31 and I-341 for the Style 341.

The Series 365 Vic-Plug Valves in 3-inch (100,6 mm) and 4-inch (121,9 mm) sizes are available with full 175-psi (1205 kPa) bi-directional service capabilities. Install bi-directional valves to prevent solids from collecting inside the valve during shutoff.

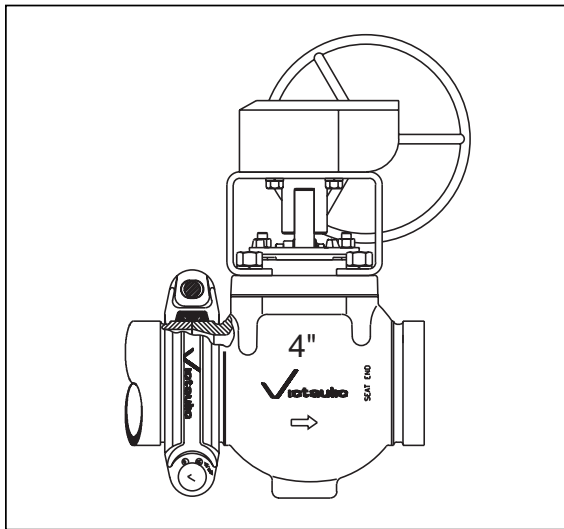
NOTE: When you install the plug valve horizontally, the plug should be on the upside of the flow path; this will provide optimum valve longevity.

NOTICE

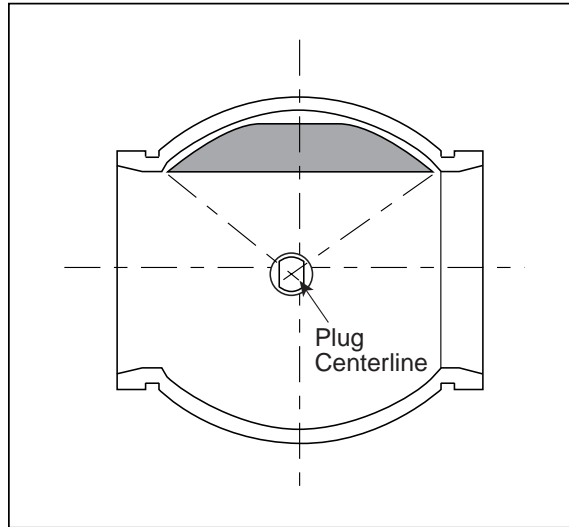
- When a Vic-Plug Plug Valve is used as a balancing valve, place the seat end of the valve closest to the pump.



Vic-Plug valve installed with Style 341 Vic-Flange adapter



Vic-Plug valve installed with Style 31 coupling



Vic-Plug valve installed horizontally with valve plug on upside of flow path

ACCESSORY INSTALLATION

LEVER HANDLE INSTALLATION PROCEDURE

! WARNING

- Always depressurize and drain piping systems before attempting to add any accessories to a product that is currently in service.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

1. Place the square nut onto the valve stem with the lug resting over the slot in the packing gland.
2. Drive the spring pin through the square nut and the valve shaft.
3. Slide the lever handle through the square nut.
4. Thread the set screw into the square nut until it contacts the lever handle.

GEAR OPERATOR INSTALLATION PROCEDURE

! WARNING

- Always depressurize and drain piping systems before attempting to add any accessories to a product that is currently in service.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

1. Remove the four bonnet mounting bolts.



2. Place the gear operator and the bracket assembly onto the valve.

3. Angle the bracket so that it passes over the packing gland.

4. Ensure that the stem adapter from the gear operator engages the valve's stem correctly.



5. Insert the bonnet mounting bolts.

6. Torque the bolts alternately and equally according to the values in the chart below.

	3" Size Valve	4" Size Valve
Torque Requirements	20 ft-lbs 27 N•m	45 ft-lbs 61 N•m

! CAUTION

- Do not under-torque or over-torque the bonnet mounting bolts.

Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.

SECTION 1

ACCESSORY REMOVAL

LEVER HANDLE REMOVAL PROCEDURE

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Drive out the roll pin with an 1/8-inch diameter punch.

2. Remove the handle and the 2-inch square nut from the valve.

GEAR OPERATOR REMOVAL PROCEDURE

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Remove the four mounting bracket bolts from the bonnet.



2. Remove the gear operator and the mounting bracket assembly.

ADJUSTMENT

SHAFT BRAKE ADJUSTMENT PROCEDURE FOR LEVER-OPERATED VALVES

NOTE: Series 365 Vic-Plug Valves in sizes 3" (76,2 mm) and 4" (101,6 mm) are equipped with an external adjustable brake that you can use to regulate plug travel when the valve contains lever handles.



1. Tighten or loosen the hex bolt and hex nut, as required, to provide smooth, non-slamming operation.

NOTE: Routine shaft brake adjustments are not required. Do not perform shaft brake adjustments on gear-operated valves. The brake is factory-adjusted to allow the shaft to turn freely.

! WARNING

- Adjusting the brake incorrectly could result in personal injury and/or improper valve operation.

PACKING GLAND ADJUSTMENT PROCEDURE FOR LEVER-OPERATED OR GEAR-OPERATED VALVES

NOTE: You can perform packing gland adjustments without removing the gear operator or actuator, and without taking the valve out of service.



1. Tighten the two hex nuts, located at the top of the valve, alternately and evenly until leakage stops.

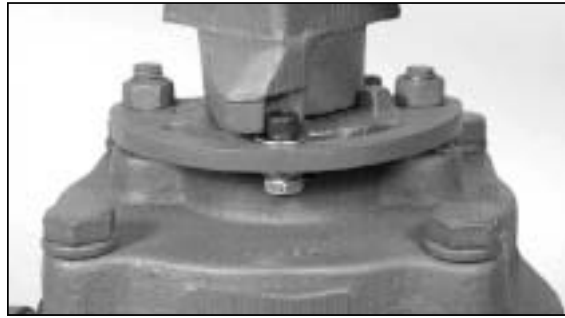
NOTE: If leakage persists, replace the stem packing and/or the internal o-rings. Refer to the “Stem Packing Replacement Procedure” on pages 15 - 16 and the “Plug Replacement Procedure” on pages 17 - 19.

MEMORY STOP ADJUSTMENT PROCEDURE FOR LEVER-OPERATED VALVES

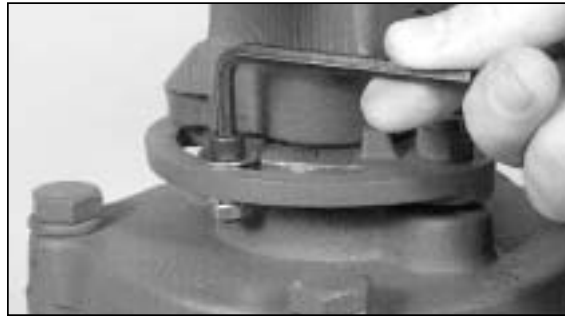
1. Move the plug into the desired position.



2. Loosen the bolt and nut on the packing gland assembly.



3. Slide the bolt and nut along the packing gland's groove until it contacts the square nut.



4. Tighten the bolt and nut.

5. Adjust the shaft brake to lock the valve's plug into this position, if desired.

NOTE: Gear-operated valves can also be equipped with memory stops. Contact Victaulic for details.

ADJUSTING AND SETTING THE GEAR OPERATOR'S CLOSED TRAVEL LIMIT STOP

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Loosen the hex lock nut located on the side of the gear operator.

SECTION 1

ADJUSTING AND SETTING THE GEAR OPERATOR'S OPEN TRAVEL LIMIT STOP

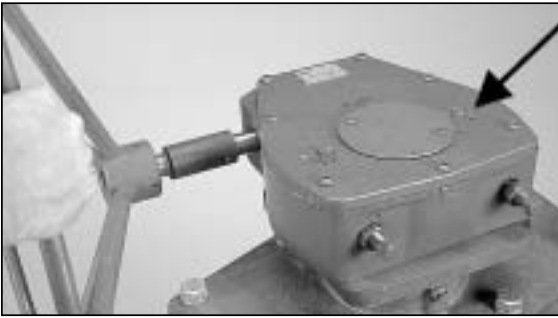
WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



2. Loosen the set screw approximately three turns.



3. Turn the hand wheel in the clockwise direction to place the plug in the closed (shut) position.

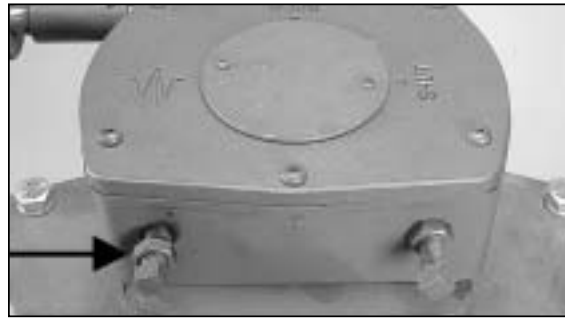
NOTE: You achieve the “closed” position when the resistance on the hand wheel increases sharply. This resistance happens as the plug seats, which creates sealing.



4. Tighten the set screw until it contacts the internal quadrant gear.



5. Tighten the lock nut. Check for proper valve operation.



1. Loosen the hex lock nut located on the side of the gear operator.



2. Loosen the set screw approximately three turns.



3. Turn the hand wheel counterclockwise to place the valve in the “open” position.



4. Tighten the set screw until it contacts the internal quadrant gear.



5. Tighten the lock nut. Check for proper valve operation.

MAINTENANCE

STEM PACKING REPLACEMENT PROCEDURE FOR LEVER-OPERATED VALVES

⚠ WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Drive out the roll pin with an 1/8-inch diameter punch.

2. Remove the handle and the 2-inch square nut from the valve.



3. Remove the hex nut and the hex bolt from the packing gland.



4. Loosen the two hex nuts located on the top of the valve.



5. Pry off and remove the packing gland gently by using a large screwdriver to separate the packing gland brake.



6. Remove the plastic packing adapter by using a small screwdriver or a punch. Discard the plastic packing adapter.

SECTION 1



7. Remove the chevron packing set and adapter by using a small screwdriver or a punch. Discard the chevron packing set and adapter.



8. Assemble and lubricate the packing set by placing the two chevron rings between the male and female adapters.

8a. Replace the packing assembly.



9. Tighten the packing gland's nuts.



10. Re-assemble the brake nut and bolt. Refer to the "Packing Gland Adjustment Procedure" on page 12 and the "Shaft Brake Adjustment Procedure" on page 11 for final adjustments.

11. Refer back to page 10 for the "Lever Handle Installation Procedure."

STEM PACKING REPLACEMENT PROCEDURE FOR GEAR-OPERATED VALVES

⚠ WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Remove the four mounting bracket bolts from the bonnet.



2. Remove the gear operator and the mounting bracket assembly.



3. Remove the hex nut and the hex bolt from the packing gland.



4. Loosen the two hex nuts located on the top of the valve.



5. Pry off and remove the packing gland gently by using a large screwdriver to separate the packing gland brake.



6. Remove the plastic packing adapter by using a small screwdriver or a punch. Discard the plastic packing adapter.



7. Remove the chevron packing set and adapter by using a small screwdriver or a punch. Discard the chevron packing set and adapter.



8. Assemble and lubricate the packing set by placing the two chevron rings between the male and female adapters.

8a. Replace the packing assembly.



9. Tighten the packing gland's nuts.



10. Re-assemble the brake nut and bolt. Refer to the "Packing Gland Adjustment Procedure" on page 12 and the "Shaft Brake Adjustment Procedure" on page 11 for final adjustments.

11. Refer back to page 10 for the "Gear Operator Installation Procedure."

SECTION 1

PLUG REPLACEMENT PROCEDURE FOR LEVER-OPERATED OR GEAR-OPERATED VALVES

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

1. Perform steps 1 through 7 of the “Stem Packing Replacement Procedure for Lever-Operated Valves” on page 14, or steps 1 through 7 of the “Stem Packing Replacement Procedure for Gear-Operated Valves” on page 15.



2. Loosen and remove the bonnet mounting bolts.



3. Remove the bonnet from the valve's body.
3a. Use a screwdriver, if necessary, to pry away the bonnet.



4. Remove the plug from the valve's body.
4a. To ease removal, rotate the plug, as

5. Inspect the nickel seat for corrosion or pitting.

5a. If the sealing surface shows signs of corrosion, pitting, or damage, you must replace the valve completely.

! WARNING

- Make sure the nickel seat does not show signs of corrosion, pitting, or damage.

Failure to follow this procedure may result in serious injury, property damage, joint leakage, and/or joint separation.



6. Remove the red nylon thrust washer from the valve's body.



7. Remove the steel journal bearing from the valve's body.



8. Remove the steel journal bearing from the bonnet.



9. Remove the bonnet gasket from the valve's body by using a putty knife.



13. Lubricate a new steel journal bearing.



10. Remove any excess residue on the valve's body, bonnet, and seat by using a mild-abrasive pad and a mild solvent.

10a. The gasket sealing area must be completely smooth and clean for proper assembly.

14. Install the bearing into the valve's bonnet.



15. Lubricate two new o-rings and two new thrust washers.

16. Place one thrust washer onto each end of the plug.

17. Place one o-ring onto each end of the plug.

! WARNING

- Make sure the gasket sealing area is completely smooth and clean to ensure proper assembly.

Failure to follow this instruction may result in personal injury, property damage, joint leakage, and/or joint separation.



18. Place the plug into the valve's body.

19. Place the plug in the open position.

20. Rotate the plug to ensure that the plug seats itself properly.



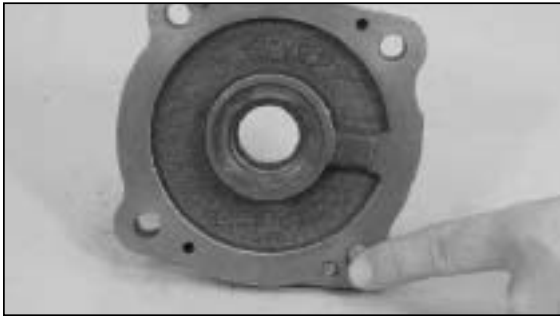
11. Lubricate a new steel journal bearing.

12. Install the bearing into the valve's body.

SECTION 1



21. Place the graphite gasket on top of the valve's body.



22. To ensure proper installation, align the body and the bonnet according to the dowel pin's orientation.



23. Install the bonnet onto the valve's body. Make sure that the dowel's pin engages properly.

NOTE: At this point, if you are installing a gear operator, refer back to page 10 for the "Gear Operator Installation Procedure." If you are installing a lever operator, continue with the steps below.



24. Assemble the bonnet with the bonnet mounting bolts.

25. Torque the bolts alternately and equally according to the values on the chart below.

	3" Size Valve	4" Size Valve
Torque Requirements	20 ft-lbs 27 N·m	45 ft-lbs 61 N·m

⚠ CAUTION

- Do not under-torque or over-torque the bonnet mounting bolts.

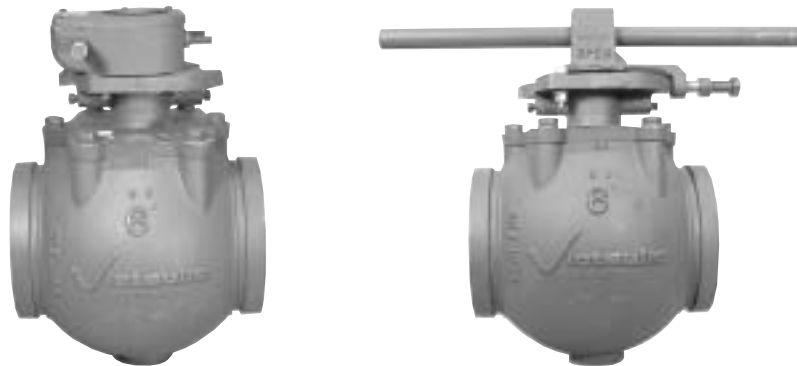
Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.

NOTE: At this point, if you are installing a lever handle, refer back to page 10 for the "Lever Handle Installation Procedure."

Series 365 Vic-Plug™

6-inch (175,3 mm)

AWWA Plug Valves

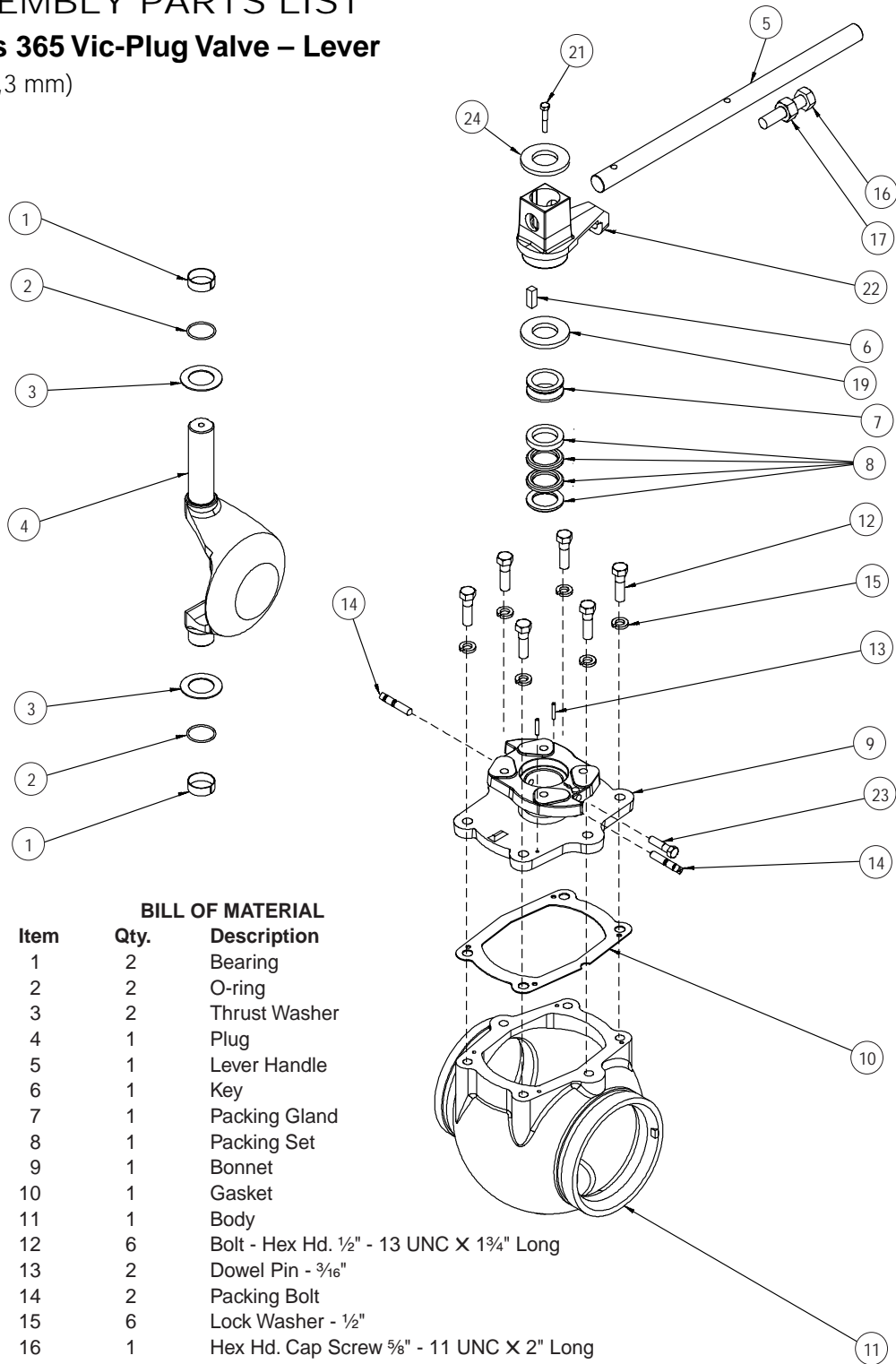


<h4>NOTICE</h4>
<ul style="list-style-type: none">• These instructions apply to valves with a manufacture date of July 1998 to present. <p>To obtain instructions for valves with a manufacture date of June 1998 or earlier, contact Victaulic.</p>

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve – Lever

6" (175,3 mm)

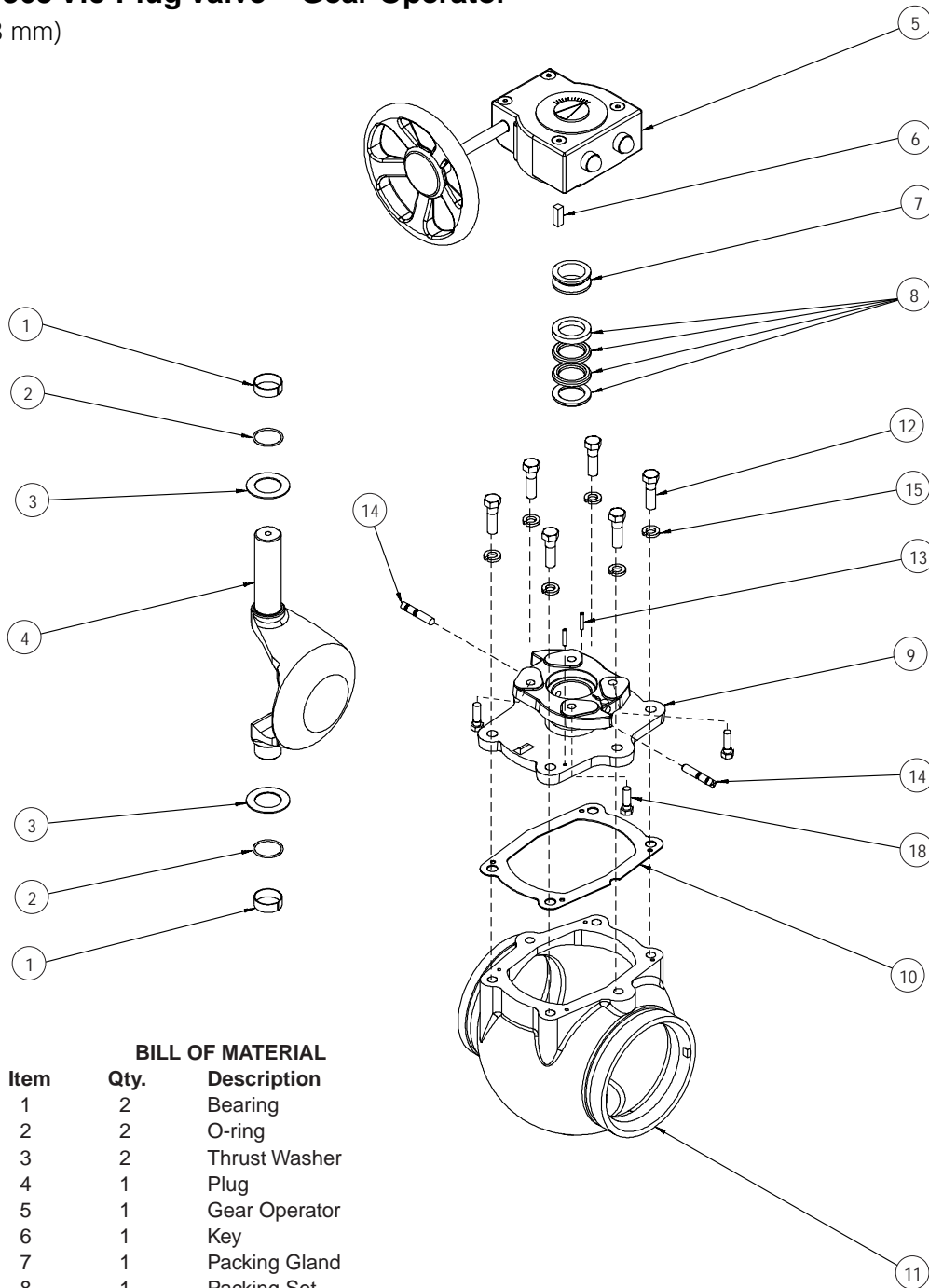


BILL OF MATERIAL		
Item	Qty.	Description
1	2	Bearing
2	2	O-ring
3	2	Thrust Washer
4	1	Plug
5	1	Lever Handle
6	1	Key
7	1	Packing Gland
8	1	Packing Set
9	1	Bonnet
10	1	Gasket
11	1	Body
12	6	Bolt - Hex Hd. 1/2" - 13 UNC X 1 3/4" Long
13	2	Dowel Pin - 3/16"
14	2	Packing Bolt
15	6	Lock Washer - 1/2"
16	1	Hex Hd. Cap Screw 5/8" - 11 UNC X 2" Long
17	1	Nut Hex 5/8" - 11 UNC
19	1	Brake Ring
21	1	Hex Hd. Cap Screw 5/16" - 18 UNC X 1 1/2" Long
22	1	Square Nut
23	1	Hex Hd. Cap Screw 3/8" - 16 UNC X 1 3/4" Long
24	1	Flat Washer

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve – Gear Operator

6" (175,3 mm)



BILL OF MATERIAL

Item	Qty.	Description
1	2	Bearing
2	2	O-ring
3	2	Thrust Washer
4	1	Plug
5	1	Gear Operator
6	1	Key
7	1	Packing Gland
8	1	Packing Set
9	1	Bonnet
10	1	Gasket
11	1	Body
12	6	Bolt - Hex Hd. 1/2 - 13 UNC X 1 3/4" Long
13	2	Dowel Pin - 3/16"
14	2	Packing Bolt
15	6	Lock Washer - 1/2"
18	4	Bolt - Hex Hd. 3/8 - 16 UNC X 1 1/4" Long

INSTALLATION

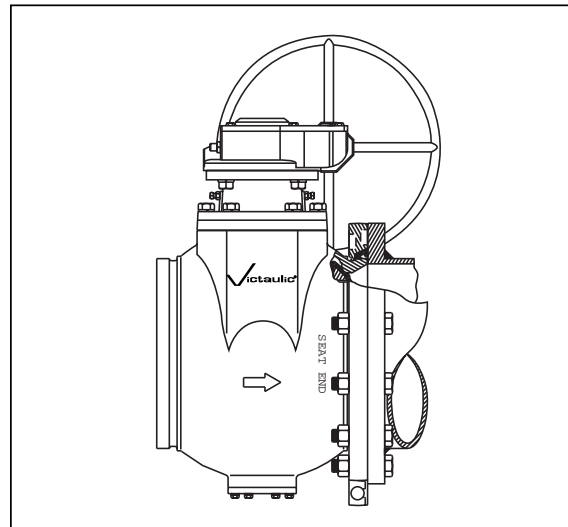
The Victaulic Series 365 6-inch (175,3mm) Vic-Plug Valve is easily installed with Style 31 Couplings and/or Style 341 Vic-Flange Adapters. For installation instructions, request I-31 for the Style 31 and I-341 for Style 341.

The 6-inch (175,3 mm) Series 365 Vic-Plug Valve is available with full (175 psi/1205 kPa) bi-directional service capabilities. Install bi-directional valves to prevent solids from collecting inside the valve during shutoff.

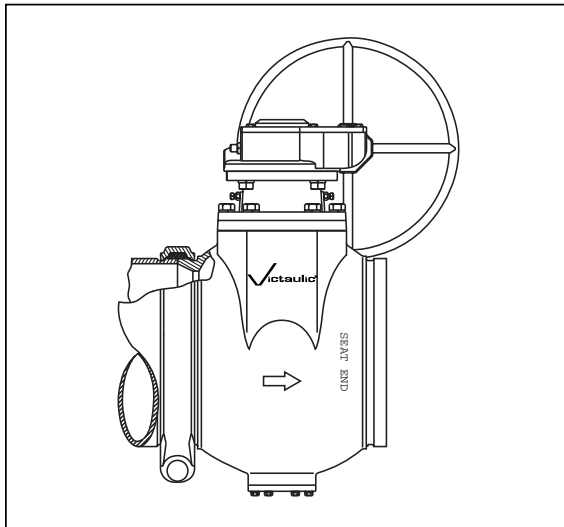
NOTE: When you install the plug valve horizontally, the plug should be on the upside of the flow path; this will provide optimum valve longevity.

NOTICE

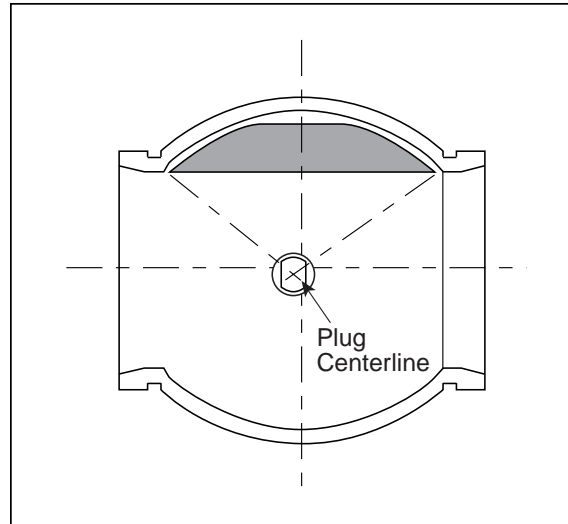
- When a Vic-Plug Plug Valve is used as a balancing valve, place the seat end of the valve closest to the pump.



Vic-Plug valve installed with Style 341 Vic-Flange adapter



Vic-Plug valve installed with Style 31 coupling



Vic-Plug valve installed horizontally with valve plug on upside of flow path

ACCESSORY INSTALLATION

LEVER HANDLE INSTALLATION PROCEDURE

WARNING

- Always depressurize and drain piping systems before attempting to install any accessories onto a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Insert the key into the keyway on the shaft.



2. Place the brake ring into the bore of the bonnet.



3. Place the square nut assembly on top of the valve's stem.

4. Place the washer into the bore of the square nut.



5. Place the lever handle through the horizontal bore of the square nut.

6. Thread the handle's bolt through the washer and the handle. Tighten the bolt.

7. Refer to the "Shaft Brake Adjustment Procedure for Lever-Operated Valves" on page 26 to complete the valve's assembly.

NOTE: If the valve is not equipped with a lever handle, thread the bolt through the washer and into the valve's stem.

GEAR OPERATOR INSTALLATION PROCEDURE



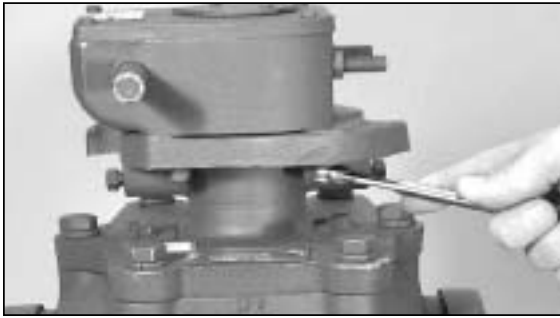
1. Insert the key into the keyway on the shaft.



2. Place the gear operator on top of the bonnet.

3. Ensure that the key engages with both the stem and the gear operator's drive bushing.

SECTION 2



4. Install the gear operator with the four bolts.
5. Torque the bolts alternately and evenly to 15 - 20 ft-lbs (20 - 27 N•m) on each bolt.



CAUTION

- Do not under-torque or over-torque the bolts. Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.

ACCESSORY REMOVAL

LEVER HANDLE REMOVAL PROCEDURE

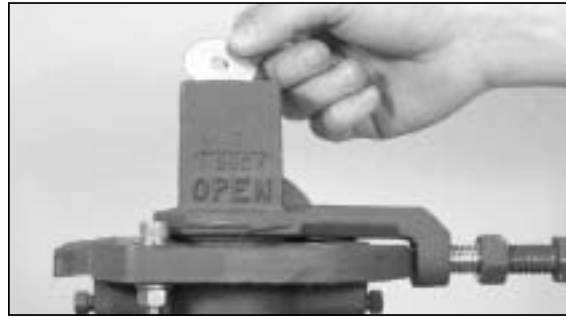


WARNING

- Always depressurize and drain piping systems before attempting to install any accessories onto a valve. Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

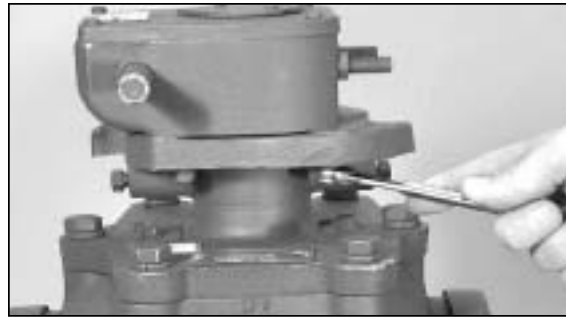


1. Remove the hex head bolt from the top of the square nut assembly.



2. Remove the handle from the square nut assembly.
3. Remove the flat washer.
4. Lift the square nut from the valve's stem.

GEAR OPERATOR REMOVAL PROCEDURE



1. Remove the four mounting bolts from the bonnet.



2. Lift the gear operator from the valve.

ADJUSTMENT

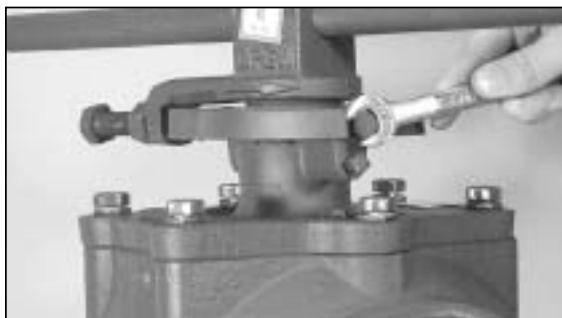
SHAFT BRAKE ADJUSTMENT PROCEDURE FOR LEVER-OPERATED VALVES

! WARNING

- Always depressurize and drain piping systems before attempting to install any accessories onto a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

NOTE: Series 365 Vic-Plug Valves in size 6" (175.3 mm) are equipped with an external adjustable brake that you can use to regulate plug travel when the valve contains a lever handle.



1. Tighten or loosen the hex bolt and hex nut, as required, to provide smooth, non-slamming operation.

NOTE: Routine shaft brake adjustments are not required. Do not perform shaft brake adjustments on gear-operated valves. The brake is factory-adjusted to allow the shaft to turn freely.

! WARNING

- Adjusting the brake incorrectly could result in personal injury and/or improper valve operation.

PACKING GLAND ADJUSTMENT PROCEDURE FOR LEVER-OPERATED OR GEAR-OPERATED VALVES

NOTE: You can perform packing gland adjustments without removing the gear operator or actuator, and without taking the valve out of service.



1. Tighten the two square head bolts alternately and evenly until leakage stops.

NOTE: If leakage persists, replace the stem packing and/or the internal o-rings. Refer to the "Stem Packing Replacement Procedure for Lever-Operated Valves" on pages 28 - 31, or the "Stem Packing Replacement Procedure for Gear-Operated Valves" on pages 31 - 33. In addition, refer to the "Plug Replacement Procedure for Lever-Operated or Gear-Operated Valves" on pages 34 - 35.

MEMORY STOP ADJUSTMENT PROCEDURE FOR LEVER-OPERATED VALVES



1. Move the plug into the desired position.
2. Tighten the bolt and the nut on the arm of the square nut assembly until the bolt engages the bonnet.
3. Adjust the shaft brake to lock the valve's plug into this position.

NOTE: Gear-operated valves can also be equipped with memory stops. Contact Victaulic for details.

ADJUSTING AND SETTING THE GEAR OPERATOR'S CLOSED TRAVEL LIMIT STOP

! WARNING

- Always depressurize and drain piping systems before attempting to install any accessories onto a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Loosen the hex lock nut located on the side of the gear operator.



2. Loosen the set screw approximately three turns.



3. Turn the hand wheel in the clockwise direction to place the plug in the closed (shut) position.

NOTE: You achieve the "closed" position when the resistance on the hand wheel increases sharply. This resistance happens as the plug seats, which creates sealing.



4. Tighten the set screw until it contacts the internal quadrant gear.



5. Tighten the lock nut. Check for proper valve operation.

ADJUSTING AND SETTING THE GEAR OPERATOR'S OPEN TRAVEL LIMIT STOP

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Loosen the hex lock nut located on the side of the gear operator.



2. Loosen the set screw approximately three turns.



3. Turn the hand wheel counterclockwise to place the valve in the "open" position.



4. Tighten the set screw until it contacts the internal quadrant gear.



5. Tighten the lock nut. Check for proper valve operation.

MAINTENANCE

STEM PACKING REPLACEMENT PROCEDURE FOR LEVER-OPERATED VALVES

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Remove the hex head bolt from the top of the square nut assembly.



2. Remove the handle from the square nut assembly.

3. Remove the flat washer.

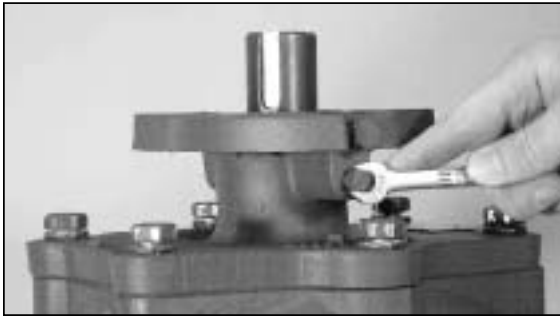
4. Lift the square nut from the valve's stem.



5. Note the position of the key.

5a. Remove the key from the key way on the

SECTION 2



6. Remove the packing adjustment bolts.



7. Remove the brake adjustment bolt.



8. Remove the six bolts from the valve's body.



9. Pry the bonnet off the valve's body by using a screwdriver.



10. Remove the packing gland and the packing set from the bonnet. Use a screwdriver to pry the items from the bottom side of the bonnet.



11. Remove the gasket by using a putty knife.
11a. Clean off any excess residue with a mild-abrasive pad.



12. Clean the mounting surface of the valve's body with a mild-abrasive pad.

! WARNING

- Make sure the mounting surface is completely smooth and clean to ensure proper assembly.

Failure to follow this instruction could result in serious personal injury, property damage, joint leakage, and/or joint separation.



13. Place a new graphite gasket onto the top of the valve's body. Ensure that the holes are in correct alignment with the dowel pins.



14. Align the bonnet with the dowel pins.

15. Ensure that the journal bearing is in place in the bonnet.

16. Place the bonnet back on top of the valve's body



17. Lubricate a new packing set. Place the new packing set into the bonnet.



18. Place a packing gland into the bonnet.



19. Fasten the bonnet to the valve's body with the six bolts that you removed previously.

20. Torque each bolt alternately and equally in 10 - 20 ft-lb (14 - 27 N•m) increments. Continue this until you reach 40 - 50 ft-lbs (54 - 68 N•m) on each bolt.

CAUTION

- Do not under-torque or over-torque the bolts. Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.



21. Thread the packing adjustment bolts back into the bonnet. Do not tighten.



22. Thread the brake adjustment bolts back into the bonnet. Do not tighten.

SECTION 2



23. Place the key back into the key way. Ensure that the orientation is the same as when you removed the key.



24. Place the 2-inch square nut assembly back onto the bonnet.

25. Align the hole in the lever arm with the hole in the 2-inch square nut.

26. Thread the bolt through the washer and back into the valve's stem. Tighten firmly.

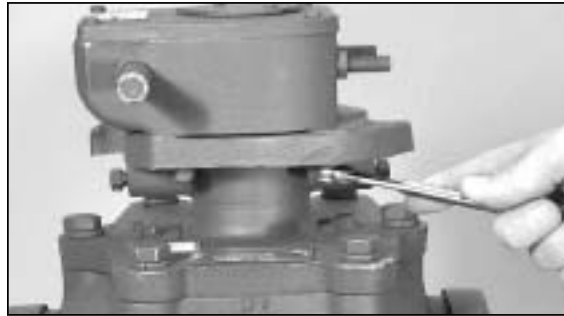
27. Adjust the packing and the brake, as described in the "Packing Gland Adjustment Procedure for Lever-Operated or Gear-Operated Valves" on page 26 and the "Shaft Brake Adjustment Procedure for Lever-Operated Valves" on page 26 (if applicable).

STEM PACKING REPLACEMENT PROCEDURE FOR GEAR-OPERATED VALVES

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



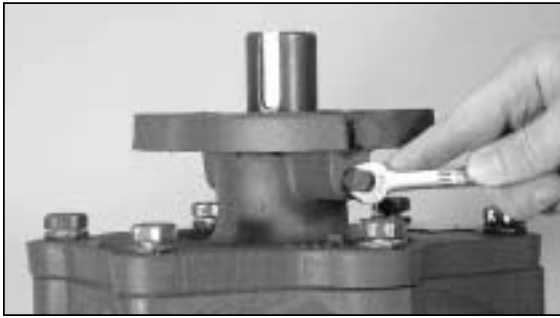
1. Remove the four mounting bolts from the bonnet.



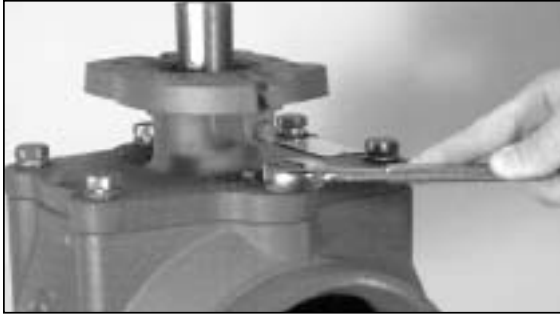
2. Lift the gear operator from the valve.



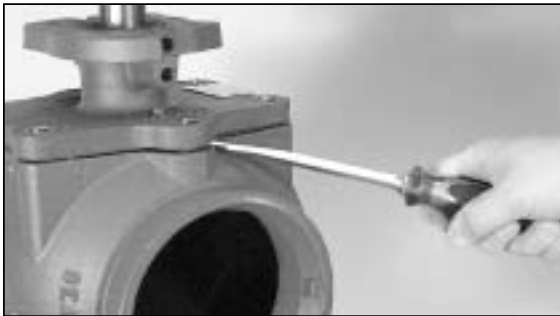
3. Note the position of the key.
3a. Remove the key from the key way on the shaft.



4. Remove the packing adjustment bolts.



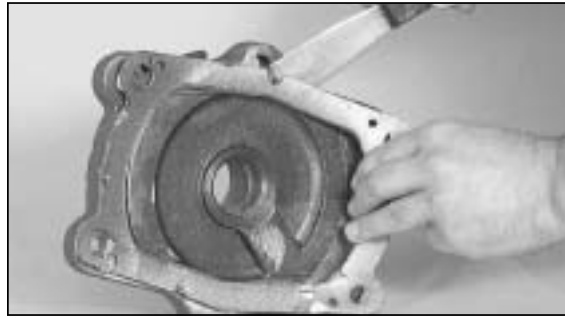
5. Remove the six bolts from the valve's body.



6. Remove the bonnet from the valve's body by using a screwdriver.



7. Remove the packing gland and the packing set from the bonnet. Use a screwdriver to pry the items from the bottom side of the bonnet.



8. Remove the gasket by using a putty knife.
8a. Clean off any excess residue with a mild-abrasive pad.



9. Clean the mounting surface of the valve's body with a mild-abrasive pad.

! WARNING

- Make sure the mounting surface is completely smooth and clean to ensure proper assembly. Failure to follow this instruction could result in serious personal injury, property damage, joint leakage, and/or joint separation.



10. Place a new graphite gasket into position.



11. Align the bonnet with the dowel pins.

SECTION 2

12. Ensure that the journal bearing is in place in the bonnet.

13. Place the bonnet back on top of the valve's body.

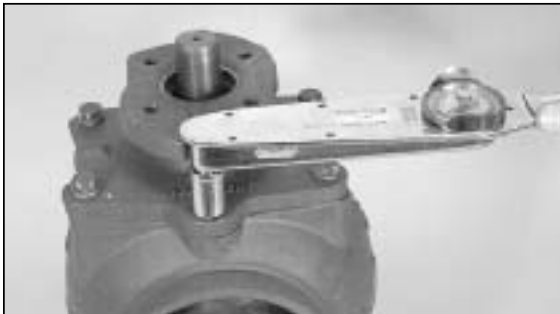


14. Lubricate a new packing set. Place the new packing set into the bonnet.

14a. Place the two chevron rings between the male and female adapters.



15. Place the packing gland into the bonnet.
15a. Ensure that the gland seats correctly by tapping it down with a screwdriver.



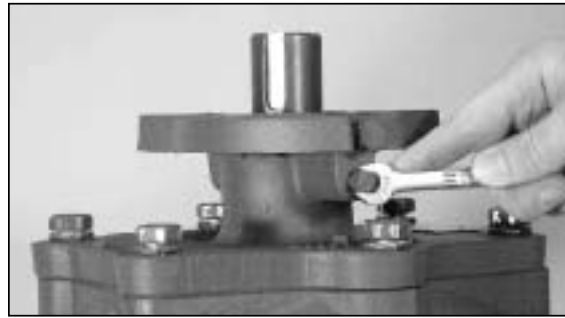
16. Fasten the bonnet to the valve's body with the six bolts that you removed previously.

17. Torque each bolt alternately and equally in 10 - 20 ft-lb (14 - 27 N•m) increments. Continue this until you reach 40 - 50 ft-lbs (54 - 68 N•m) on each bolt.

! CAUTION

- Do not under-torque or over-torque the bolts.

Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.



18. Insert the packing adjustment bolts back into the bonnet. Do not tighten at this time.



19. Re-insert the key into the shaft's key way.



20. Align the key way on the gear operator with the key way on the valve's stem.

21. Lower the gear operator onto the valve.



22. Fasten the gear operator to the valve with four mounting bolts.

23. Tighten the mounting bolts until the lock washers are completely compressed.

24. Adjust the packing, as described in the "Packing Gland Adjustment Procedure for Lever-Operated or Gear-Operated Valves" on page 26.

SECTION 2

PLUG REPLACEMENT PROCEDURE FOR LEVER-OPERATED OR GEAR-OPERATED VALVES

⚠ WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

1. Follow steps 1 through 12 of the “Stem Packing Replacement Procedure for Lever-Operated Valves” on pages 28 - 31, or steps 1 through 9 of the “Stem Packing Replacement Procedure for Gear-Operated Valves” on pages 31 - 33.



2. Make sure the plug is in the open position.

3. Remove the plug from the valve's body.



4. Remove the thrust washer from the valve's body.



5. Remove the o-ring from the plug.



6. Remove the journal bearing from the bonnet and the valve's body.



7. Lubricate a new journal bearing.

8. Place the bearing into the valve's body.



9. Lubricate another new journal bearing.

10. Place the bearing into the bonnet.



11. Lubricate two new o-rings and two new thrust washers.

12. Place one thrust washer onto each end of the plug.

13. Place one o-ring onto each end of the plug.

SECTION 2



14. Place the plug back into the body.

15. Place the plug in the open position.

16. Follow steps 13 through 27 of the “Stem Packing Replacement Procedure for Lever-Operated Valves” on pages 28 - 31, or steps 10 through 24 of the “Stem Packing Replacement Procedure for Gear-Operated Valves” on pages 31 - 33.

Series 365 Vic-Plug™

8-inch, 10-inch and 12-inch (229,9, 281,9 and 335,3 mm)

AWWA Plug Valves



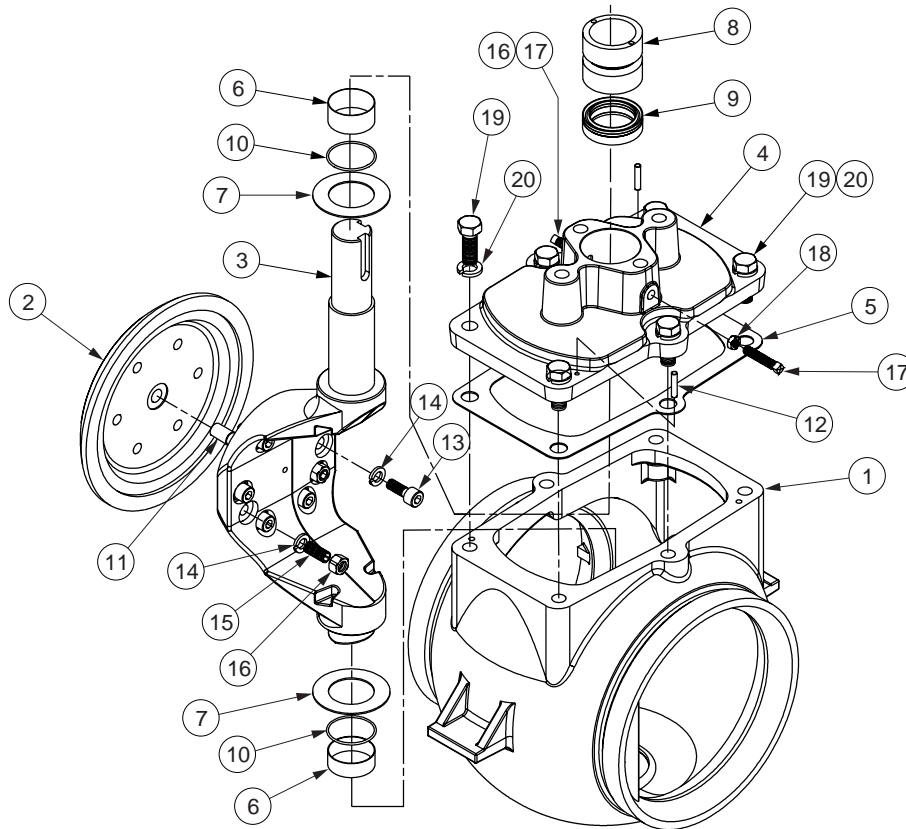
NOTICE

- | |
|--|
| <ul style="list-style-type: none">• These instructions apply to valves with a manufacture date of July 2000 to present. <p>To obtain instructions for valves with a manufacture date of June 2000 or earlier, contact Victaulic.</p> |
|--|

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve

8" (229,9 mm), 10" (281,9 mm) and 12" (335,3 mm)



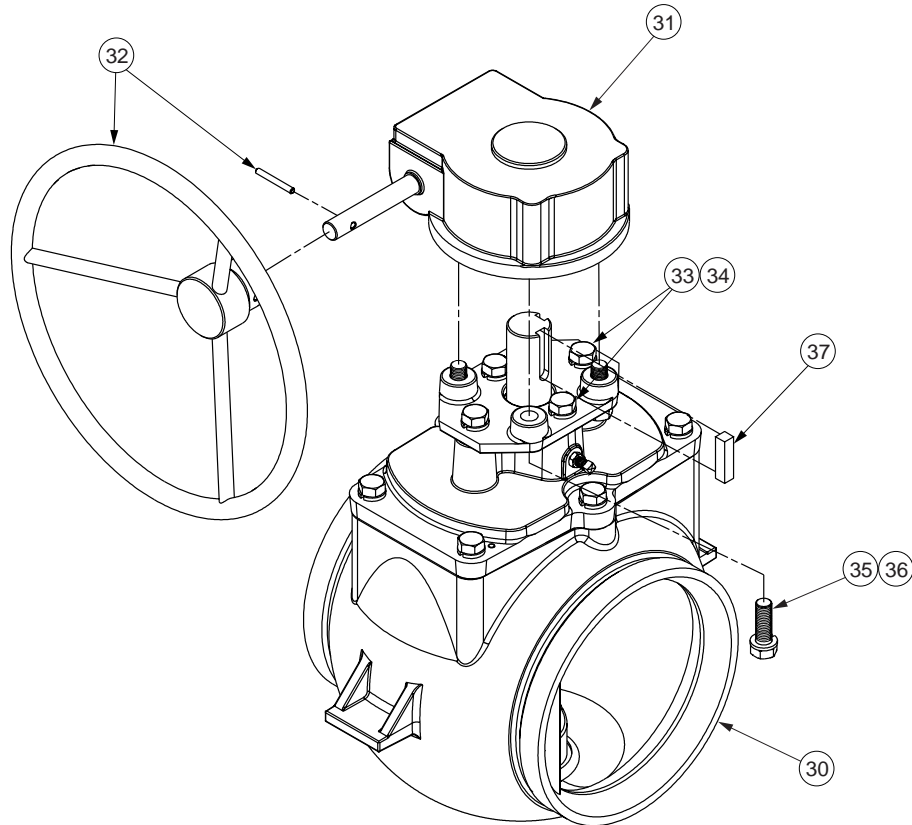
Item No.	Qty.	Description
1	1	Body Plug Valve Machining
2	1	Disc – Rubber Coated
3	1	Shaft Ecc. Machining
4	1	Bonnet Machining
5	1	Gasket
6	2	Bearing
7	2	Thrust Washer
8	1	Packing Gland
9	1	V-Packing Material
10	2	O-ring
11	1	Dowel Pin 316 SS
12	2	Dowel Pin
13	6	Hex Socket Head Cap Screw 316 SS
14	9	Lock Washer 304 SS
15	3	Set Screw Socket Head Oval Pt. 316 SS
16	3	Hex Jam Nut 316 SS
17	2	Set Screw Square Head Cone Pt. 0.38–16UNC X 2.0 Lg. Zinc Pl.
18	2	Hex Jam Nut Zinc Pl.
19	6	Hex Head Cap Screw Zinc Pl.
20	6	Lock Washer Zinc Pl.

SECTION 3

ASSEMBLY PARTS LIST

Series 365 Vic-Plug Valve – Gear Operator

8" (229,9 mm), 10" (281,9 mm) and 12" (335,3 mm)



Item No.	Qty.	Description
30	1	Eccentric Plug Valve – Bare Assembly
31	1	Gear Operator
32	1	Hand Wheel with Roll Pin
33	4	Hex Head Cap Screw
34	4	Lock Washer
35	4	Hex Head Cap Screw
36	4	Lock Washer
37	1	Key

INSTALLATION

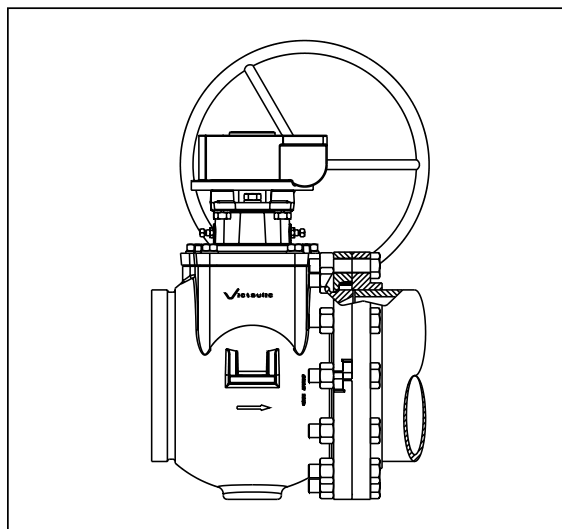
The 8-inch (229,9 mm), 10-inch (281,9 mm), and 12-inch (335,3 mm) Victaulic Series 365 Vic-Plug Valve is easily installed with Style 31 Couplings and/or Style 341 Vic-Flange Adapters. For installation instructions, request I-31 for the Style 31 and I-341 for Style 341. The Series 365 Vic-Plug Valves in sizes 8" (229,9 mm), 10" (281,9 mm), and 12" (335,3 mm) are equipped with integral, side-support lugs that prevent rotation during installation onto the pipeline.

The Series 365 Vic-Plug Valve is available with either unidirectional or full, bi-directional service capabilities. You must install the valve with the seat in the proper orientation in order to achieve the desired performance. Install unidirectional valves with the seat downstream of the flow to provide 175 psi (1205 kPa) shutoff pressure. A nominal back-pressure of 25 psi (170 kPa) is available with unidirectional valves in the 8-inch (229,9 mm), 10-inch (281,9 mm), and 12-inch (335,3 mm) sizes. Install bi-directional valves to prevent solids from collecting inside the valve during shutoff.

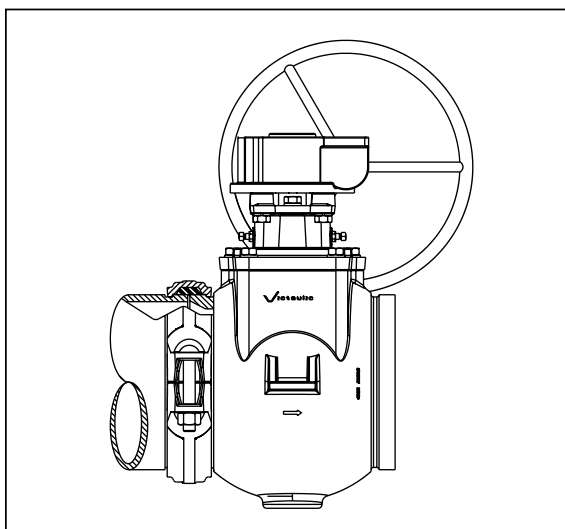
NOTE: When you install the plug valve horizontally, the plug should be on the upside of the flow path; this will provide optimum valve longevity.

NOTICE

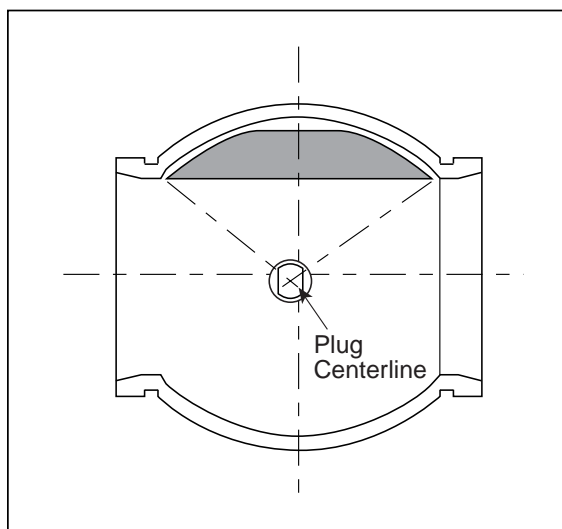
- When a Vic-Plug Plug Valve is used as a balancing valve, place the seat end of the valve closest to the pump.



Vic-Plug valve installed with Style 341 Vic-Flange adapter



Vic-Plug valve installed with Style 31 coupling



Vic-Plug valve installed horizontally with valve plug on upside of flow path

ACCESSORY INSTALLATION

GEAR OPERATOR INSTALLATION PROCEDURE

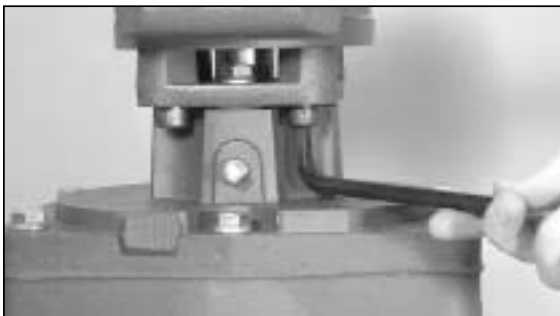
! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Place the gear operator on the top of the bonnet.
2. Ensure that the key engages with both the stem and the gear operator's drive bushing.



3. Install the four socket head cap screws to the underneath of the gear operator by using an allen key wrench.

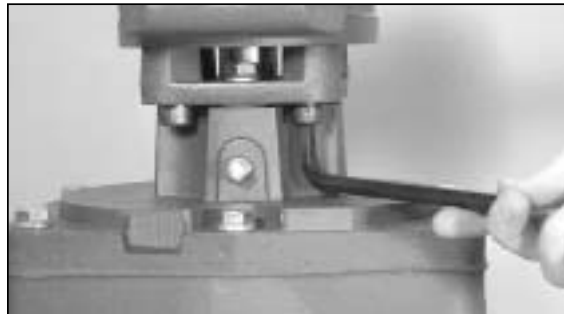
ACCESSORY REMOVAL

GEAR OPERATOR REMOVAL PROCEDURE

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Loosen and remove the four socket head cap screws, beneath the gear operator, by using an allen key wrench.



2. Lift the gear operator vertically to disengage it from the shaft.

3. Note the location of the key.
3a. Remove the key.

ADJUSTMENT

PACKING GLAND ADJUSTMENT PROCEDURE

! WARNING

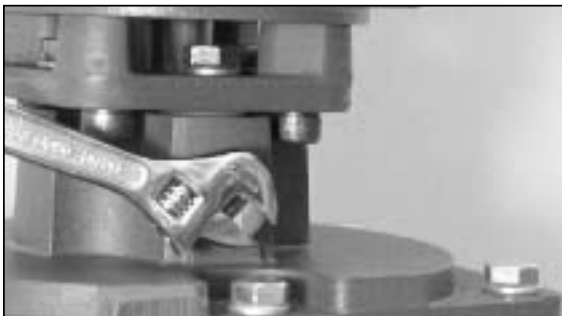
- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

NOTE: You can perform packing gland adjustments without removing the gear operator or actuator, and without taking the valve out of service.



1. Loosen the hex nuts on both sides of the valve's neck, while preventing the square head set screw from rotating.



2. Tighten the square head set screws alternately and evenly until the leakage stops.

3. Tighten the hex nuts against the valve's body.

NOTE: If leakage persists, replace the stem packing and the internal o-rings. Refer to the "Stem Packing Replacement Procedure" on pages 43 - 44 and the "Plug Replacement Procedure" on pages 45 - 47.

OPTIONAL MEMORY STOP ADJUSTMENT PROCEDURE

1. If the valve is equipped with the optional memory stop, adjust the memory stop plate to the desired position. Follow the memory stop literature supplied with the valve when you order this option.

ADJUSTING AND SETTING THE GEAR OPERATOR'S CLOSED TRAVEL LIMIT STOP

! WARNING

- Always depressurize and drain piping systems before attempting to install any accessories onto a valve.

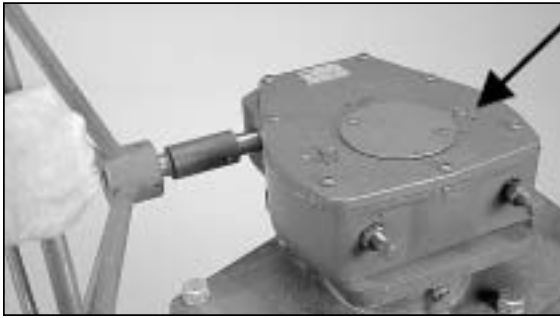
Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Loosen the hex lock nut located on the side of the gear operator.



2. Loosen the set screw approximately three turns.



3. Turn the hand wheel in the clockwise direction to place the plug in the closed (shut) position.

NOTE: You achieve the “closed” position when the resistance on the hand wheel increases sharply. This resistance happens as the plug seats, which creates sealing.



4. Tighten the set screw until it contacts the internal quadrant gear.



5. Tighten the lock nut. Check for proper valve operation.

ADJUSTING AND SETTING THE GEAR OPERATOR'S OPEN TRAVEL LIMIT STOP

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.



1. Loosen the hex lock nut located on the side of the gear operator.



2. Loosen the set screw approximately three turns.



3. Turn the hand wheel counterclockwise to place the valve in the “open” position.



4. Tighten the set screw until it contacts the internal quadrant gear.



5. Tighten the lock nut. Check for proper valve operation.

MAINTENANCE

STEM PACKING REPLACEMENT PROCEDURE

! WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

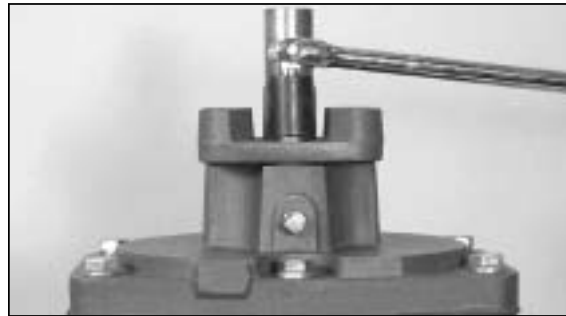


1. Loosen and remove the four socket head cap screws, beneath the gear operator, by using an allen key wrench.

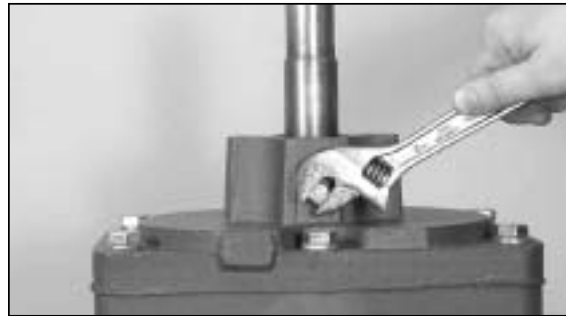


2. Lift the gear operator vertically to disengage it from the shaft.

3. Note the location of the key.
3a. Remove the key.



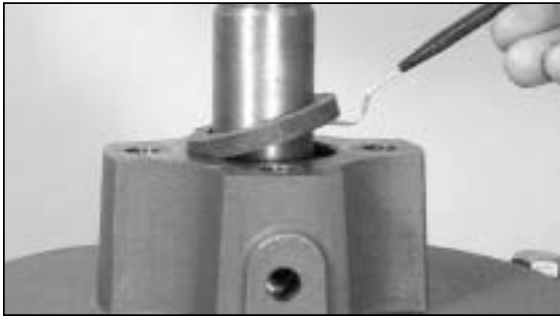
4. Remove the four hex head bolts from the gear operator's mounting plate.



5. Remove the two packing gland adjustment bolts.



6. Remove the packing gland by using two lengths of 1/4 - 20 threaded rod.



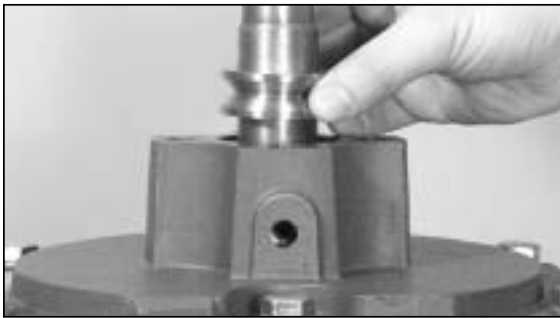
7. Remove the stem packing by using a pick or a small screwdriver.

NOTE: The packing consists of male and female adapters and two chevron rings.



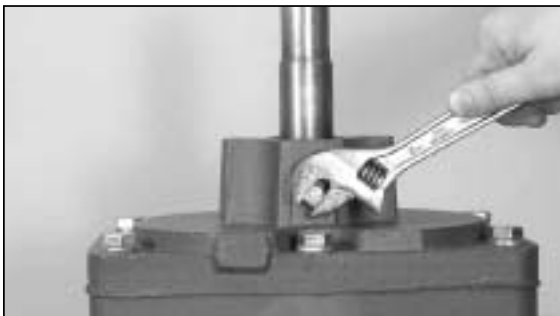
8. Lubricate the new packing set.

9. Install the new packing set.

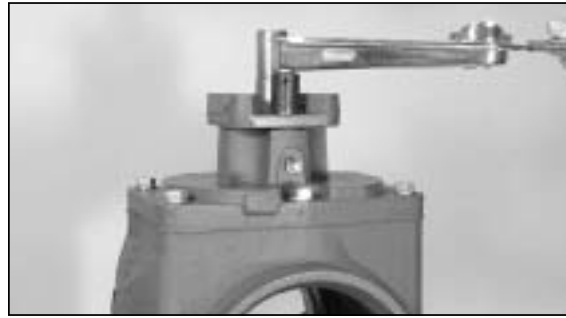


10. Install the packing gland.

11. Tap the gland with a screwdriver to ensure that the gland has seated correctly.



12. Install the packing adjustment bolts. Do not tighten at this time.



13. Install the mounting plate by using four hex head bolts.

13a. Torque the bolts alternately and equally according to the values on the chart below.

	8" Size Valve	10" Size Valve	12" Size Valve
Torque Requirements	40 - 50 ft-lbs 54 - 68 N•m	90 ft-lbs 122 N•m	160 ft-lbs 217 N•m

⚠ CAUTION

- Do not under-torque or over-torque the bonnet mounting bolts.

Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.

14. Refer back to the "Gear Operator Installation Procedure" on page 40 and the "Packing Gland Adjustment Procedure" on page 41.

SECTION 3

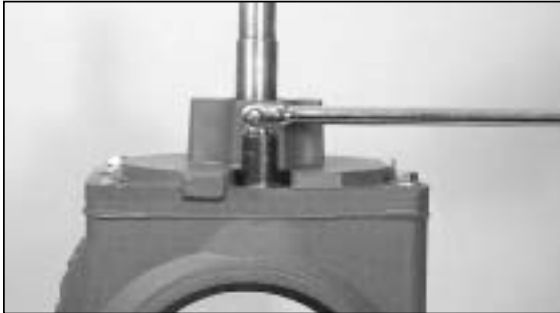
PLUG REPLACEMENT PROCEDURE

WARNING

- Always depressurize and drain piping systems before attempting to remove any accessories from a valve.

Failure to do so could result in serious personal injury, property damage, joint leakage, and/or joint separation.

NOTE: Perform steps 1 through 4 of the “Stem Packing Replacement Procedure” on page 43 - 44.



1. Remove six hex head bolts from the valve's body.



2. Separate the bonnet from the valve's body by using a large screwdriver.

3. Remove the bonnet.



4. Place the plug in the open position.

5. Lift the plug vertically. Rotate the plug toward the seat. Tilt it back out of the valve's body.



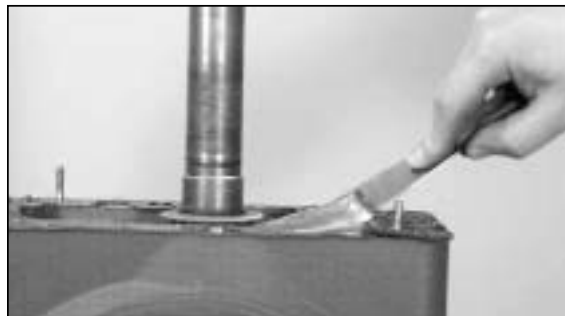
6. Remove the bearing from the bottom of the valve's body. Discard the bearing.



7. Remove the bearing from the valve's bonnet. Discard the bearing.



8. Remove the thrust washers and the o-rings from both ends of the plug shaft.



9. Remove the gasket material from the top of the valve's body and bonnet.



10. Clean the gasket surface of the valve's body and bonnet by using a mild-abrasive pad and a mild solvent.

10a. The gasket sealing area must be completely smooth and clean for proper assembly.

! CAUTION

- Make sure the gasket sealing area is completely smooth and clean to ensure proper assembly. Failure to follow this instruction may result in property damage, joint leakage, and/or joint separation.



11. Place a new gasket onto the valve's body.



12. Lubricate a bearing with silicone.

13. Install the bearing into the bonnet.



14. Lubricate another bearing with silicone.

15. Install the bearing into the bottom of the valve's body.



16. Remove six socket head cap screws from the plug shaft. Do not adjust the set screws.



17. Install the new plug onto the valve's shaft.

18. Install the socket head cap screws. Torque each screw to 25 - 30 ft-lbs (34 - 41 N•m).

! CAUTION

- Do not under-torque or over-torque the bonnet mounting bolts. Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.



19. Lubricate two new o-rings and two new thrust washers.

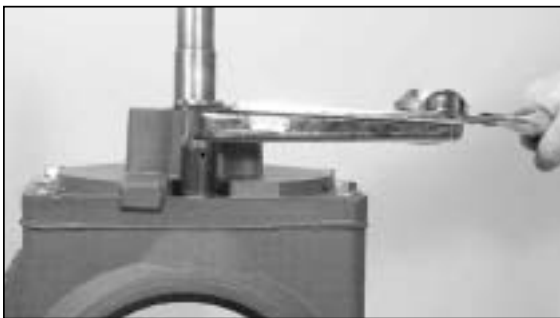
20. Place one thrust washer onto each end of the plug.

21. Place one o-ring onto each end of the plug.



22. Install the bonnet onto the valve's body.

23. Ensure that the dowel pins align with the holes in the bonnet.



24. Assemble the bonnet by using six hex head bolts and lock washers.

25. Torque the bolts alternately and equally according to the values on the chart below.

	8" Size Valve	10" Size Valve	12" Size Valve
Torque Requirements	40 - 50 ft-lbs 54 - 68 N•m	90 ft-lbs 122 N•m	160 ft-lbs 217 N•m

! CAUTION

- Do not under-torque or over-torque the bonnet mounting bolts.

Failure to install these bolts correctly could result in joint leakage, joint separation, and/or property damage.

26. Perform steps 5 through 11 of the "Stem Packing Replacement Procedure" on pages 43 - 44.



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