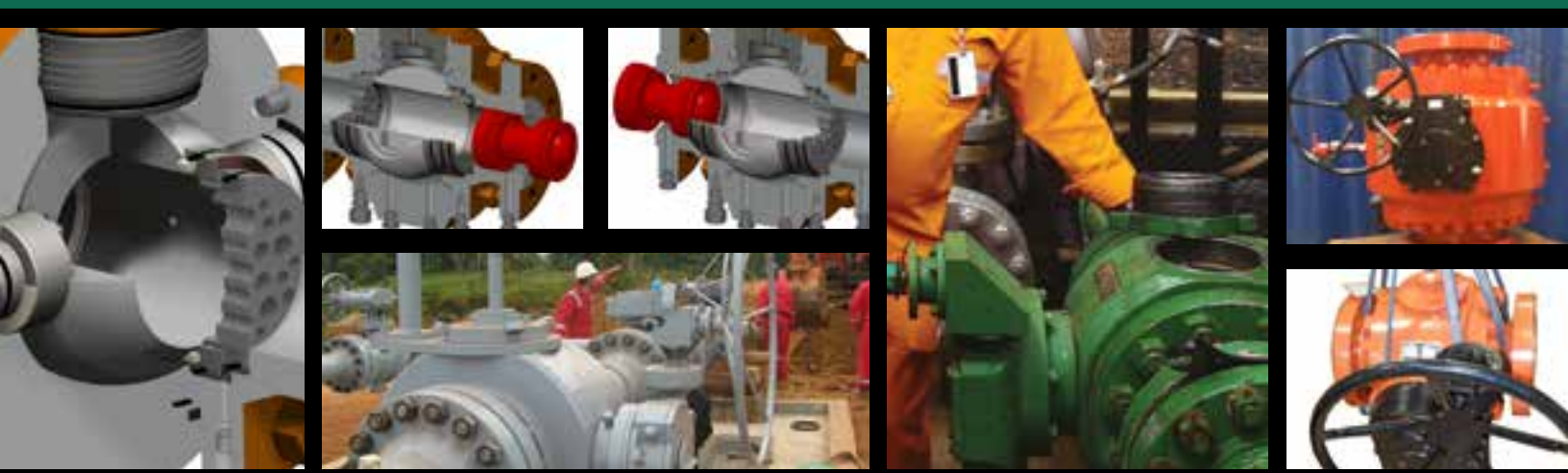


# Shut-off Pig Valve



## **⚠ CAUTION: READ FIRST!**

- Safe Lifting and Storage (page 1)
- Install Correctly (page 4)
- Optimize Pigging Operations (page 6-9)
- Increase Valve Life (page 10)

Installation Operation and  
Maintenance Manual

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# ⚠️ READ FIRST!

## SAFETY PRECAUTIONS

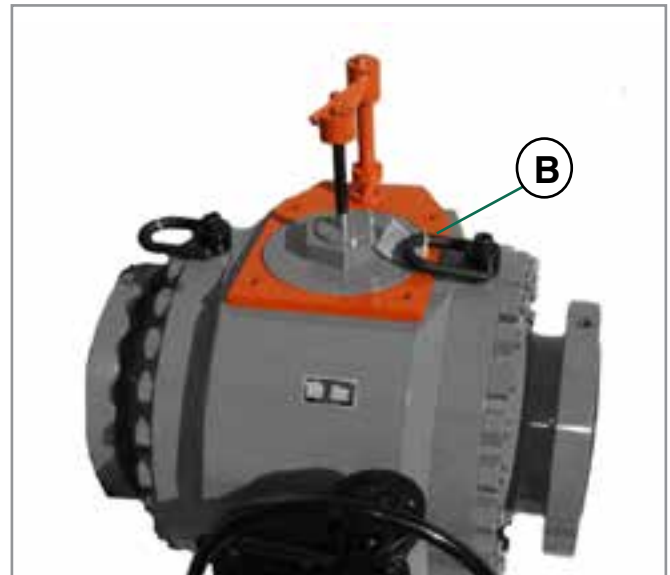
⚠️ **DANGER:** Installed valves are under high pressures. Opening any fitting or entry cap is dangerous. **Always use proper safety precautions!**

Follow procedures to vent pressure prior to performing pigging operations.

## LIFTING & VALVE HANDLING

**Use proper lifting equipment and procedures.**

- **Valve is NOT balanced.** Take care when lifting to prevent valve shifting or spinning.
- 3 POINT LIFTING **(A)** recommended to provide stable control of valve. (See *Installation, page 5*)
- On larger valves lifting lugs **(B)** are provided.
- **NEVER** hold or lift valve by Davit Assembly, Gear Operator or Handle.
- Lift valve (as shown) and transport with care to avoid damage.



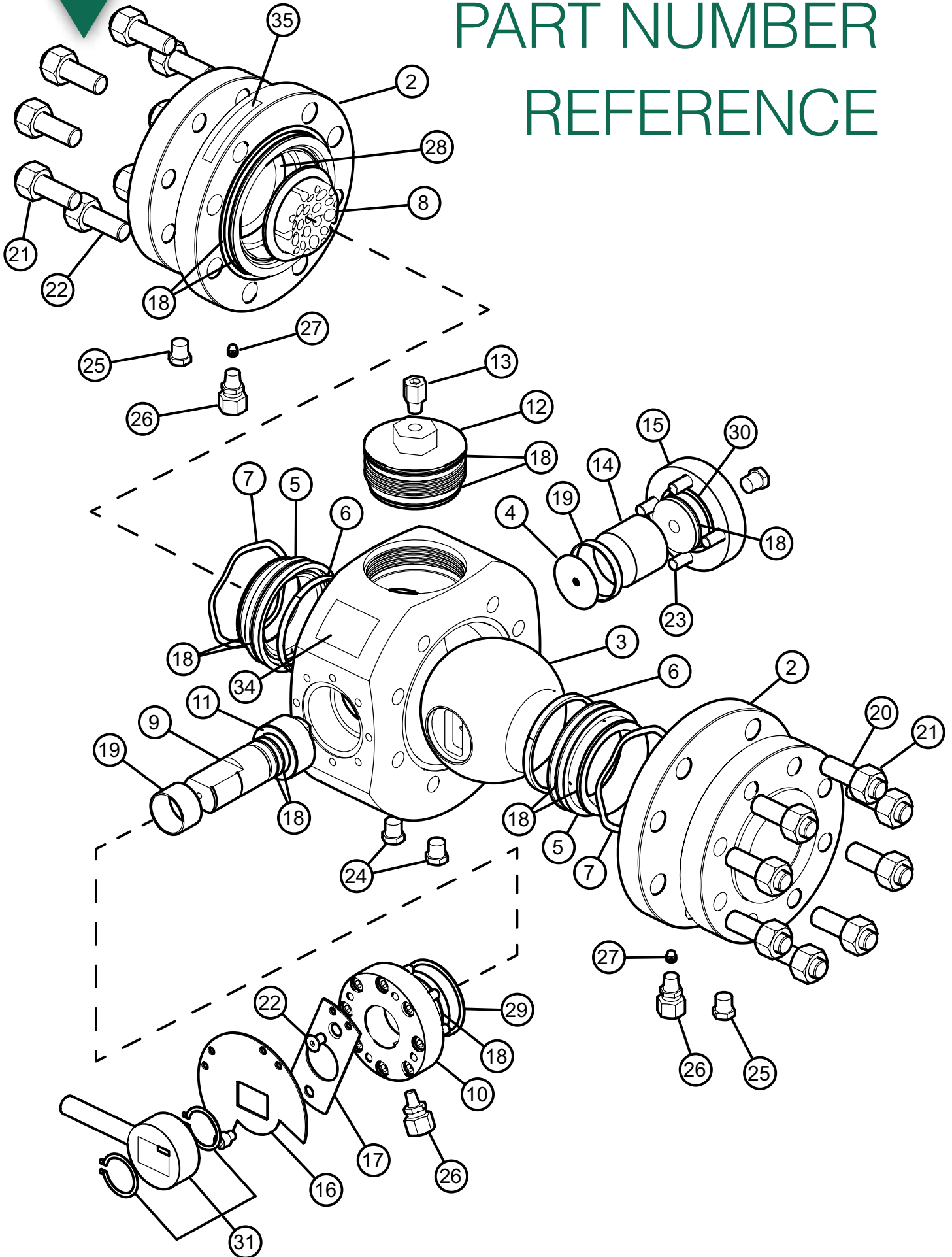
## VALVE STORAGE

- Pig valves must be stored in a clean, dry place, prior to installation.
- Store valves in FULLY OPEN position with FLANGE PROTECTORS in place to protect ball's sealing surface.
- Cycle valves and lubricate at least 2 times per year even when in storage. (See *General Maintenance, page 10*)

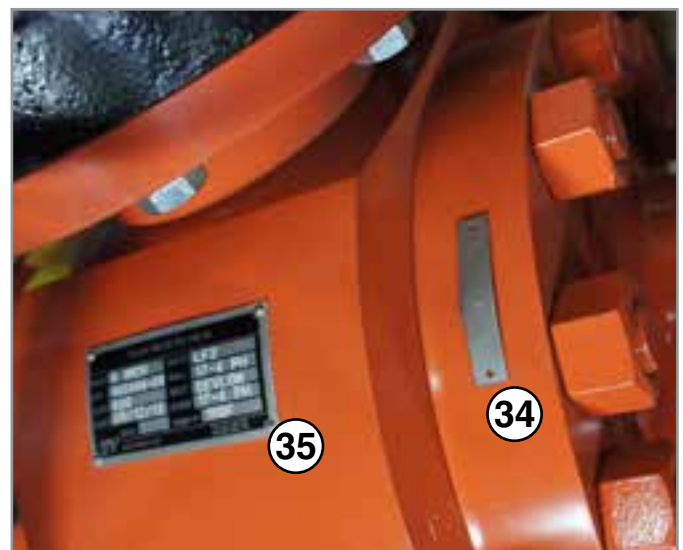
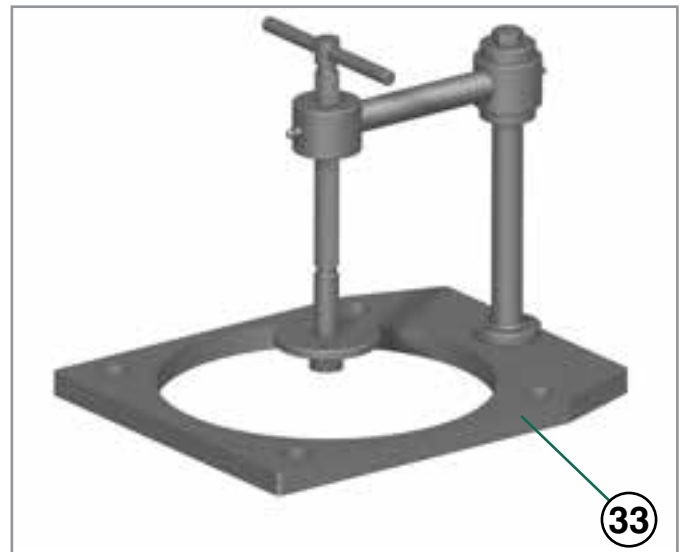
## CYCLE VALVES & REDUCE TORQUE

- Valve torque increases when a valve is not operated.
- Operate valves frequently to maintain their useful life, at least 4 times per year minimum.

# PART NUMBER REFERENCE



Bill Of Materials		
ID	Valve Components	Materials
1	Body	A350 LF2
2	End Connect	A350 LF2
3	Ball	17-4 PH H1150+1150
4	Ball Thrust Bearing	15% Glass reinforced Teflon
5	Seat	17-4 PH H1150+1150
6	Seat Insert	Devlon V
7	Wave Spring	Inconel X-750
8	Baffle Plate	17-4 PH H1150+1150
9	Stem	17-4 PH H1150+1150
10	Stem Bonnet	A350 LF2
11	Stem Thrust Bearing	15% Glass reinforced Teflon
12	Entry Cap	A350 LF2 w/ Xylan Coated
13	Vent Fitting	Stainless Steel
14	Trunnion	17-4 PH H1150+1150
15	Trunnion Cover	A350 LF2
16	Lock Plate	A36
17	Stop Plate	A36
18	O-rings	HNBR-90D
19	DU Bearing	Self-lubricating
20	Body Studs	A320 Gr. L7
21	Heavy Hex Nuts	A194 Gr. 7
22	Socket Head Cap Screw (Stem Bonnet)	A320 Gr. L7
23	Socket Head Cap Screw (Trunnion Cover)	A320 Gr. L7
*24	Body Drain - 1/2" Pipe Plug -STANDARD	Stainless Steel
	OPTION: 1/2" Drain Valve	SS Spring Return Ball Valve
*25	Flange Port - 1/2" Pipe Plug -STANDARD	Stainless Steel
26	Grease Fitting	Stainless Steel
27	Buried Check	Stainless Steel
28	Body Gasket	304 SS Spiral wound Grafoil
29	Stem Bonnet Gasket	304 SS Spiral wound Grafoil
30	Trunnion Cover Gasket	304 SS Spiral wound Grafoil
31	Lever Handle + retaining rings	A572
32	Gear & Gear Plate for 6"+	A36
33	Davit assist for Entry Cap removal - valves ≥ 8"	Carbon Steel, Xylan coated
34	Baffle Plate Tag identifies locations in valve	"Catcher" on aluminum tag



Typical Materials List. Variations may exist with special service and older models.

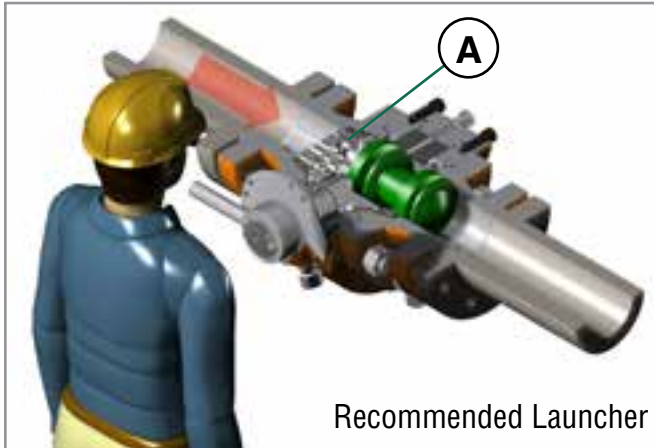


# INSTALLATION

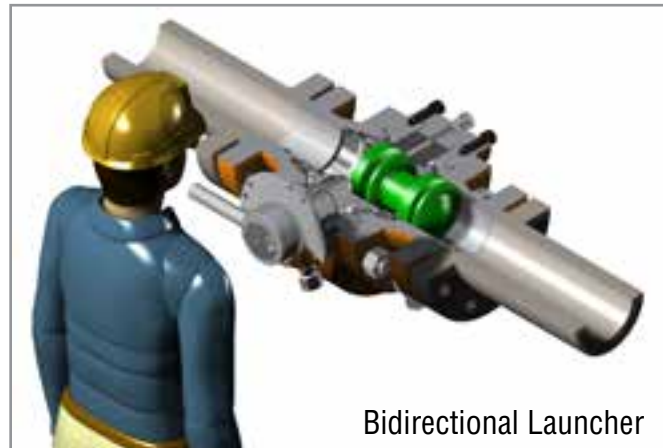
## VALVE ORIENTATION

TULSA VALVES Shut-off Pig Valve can be used as either a Launcher or a Receiver. Position of Baffle Plate **(A)** and flow direction determines function.

## LAUNCHING

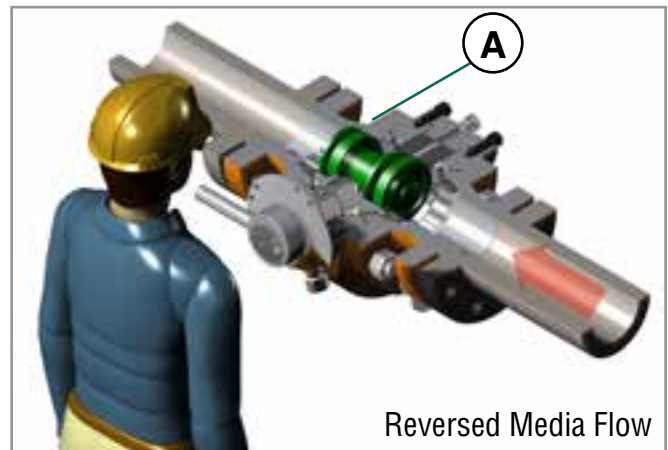
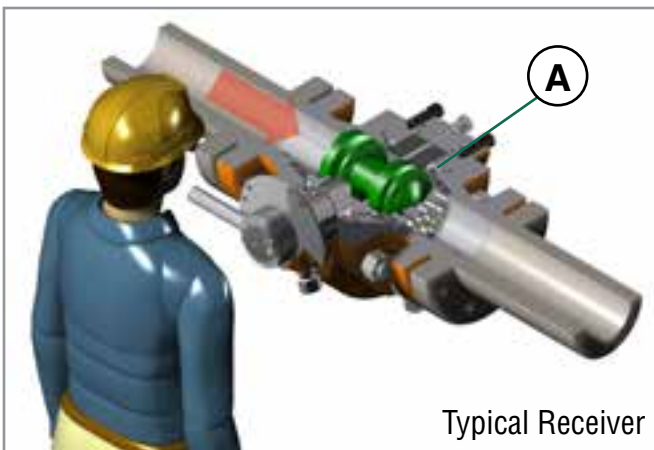


Baffle plate on the upstream side of the pig is recommended to prevent pig migration upstream from occasional reverse flow.



If no Baffle plate is used, a pig can be launched in either direction using reverse flow. Reverse the pig insertion position when using reverse flow.

## RECEIVING



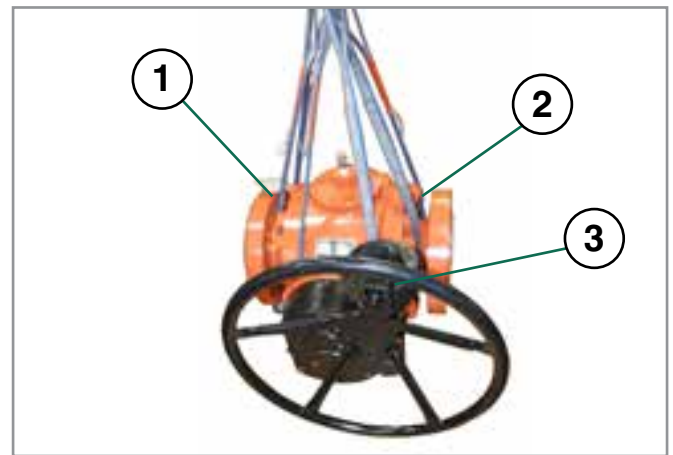
Baffle plate on the downstream side of valve “catches” the pig.

When installing pig valve in pipeline system:

- Use correct size and type of mating flanges or ring gaskets and bolting.
- Provide clearance above and below valve to insert and remove pig.

## INSTALLATION

1. Cycle valve open/close a couple times before installing to lessen break torque.
2. Valve should be in the open position during and prior to installation to protect the sealing surface of the ball.
3. Use a three point lifting method with straps to position the valve in the pipeline, keeping the valve level and stable.
4. Bolt the valve into place.
5. Tighten bolts to the recommended torque specification.



3 POINT LIFTING: Strap both end flanges and neck of stem bonnet.

## AFTER INSTALLATION / BEFORE OPERATION

Ensure proper working conditions prior to operating valve:

- Verify the Entry Cap (12) is securely closed.
- Verify Vent Fitting (13) on Entry Cap is closed.
- Verify Body Drains (24) are securely closed.
- Verify Ball is in open position before applying pressure (Gear Indicator or Lever Handle should be horizontal).
- Rotate the Ball by turning the Gear's hand wheel, or Handle.
- Fully cycle valve prior to proceeding with operations.

# OPERATIONS

**⚠ DANGER:** Always use proper safety precautions!

**VALVE MUST BE FULLY CLOSED FOR PIG INSERTION AND REMOVAL**

- Valves are under high pressure. Opening any fitting or entry cap is dangerous.
- All body openings and fittings must be securely **CLOSED** prior to launching and receiving.\*

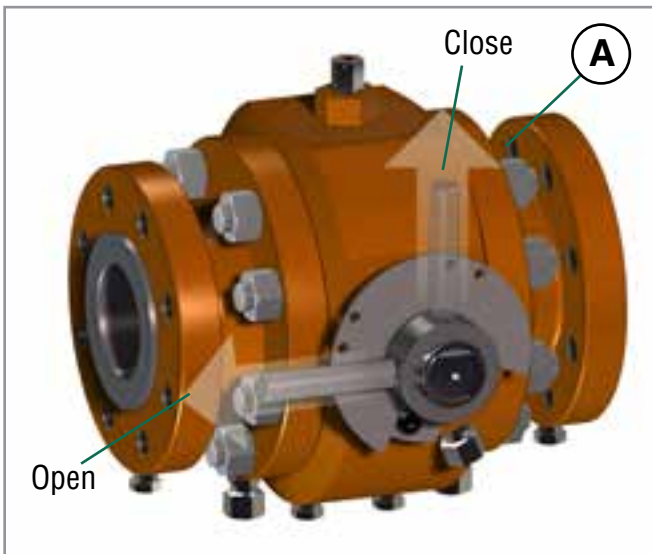
## VALVE OPEN / CLOSED

### MANUAL OPERATOR

Baffle Plate location is indicated by TAG **(A)** on the End Connection.

**OPEN:** Handle is parallel to flow.

**CLOSE:** Handle is perpendicular to flow.



### GEAR OPERATOR

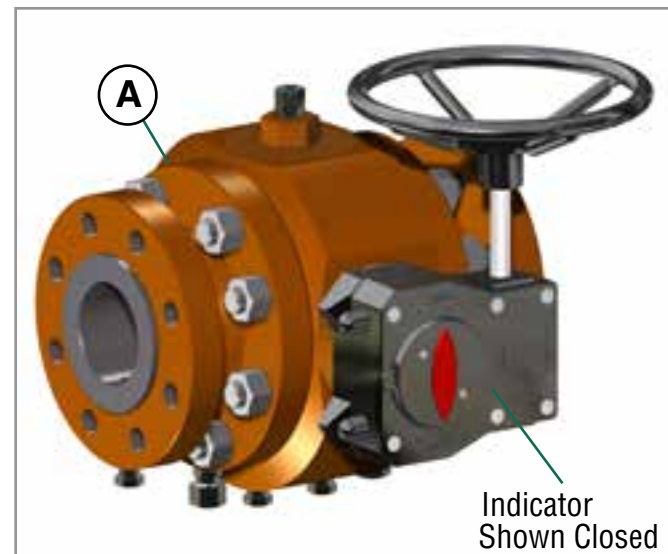
Indicator on top cover of Gear Operator indicates Open / Close position.

**OPEN:** Indicator is parallel to flow.

**CLOSE:** Indicator is perpendicular to flow.

The Open/Close flow Indicator is set at factory. Parallel with flow = OPEN

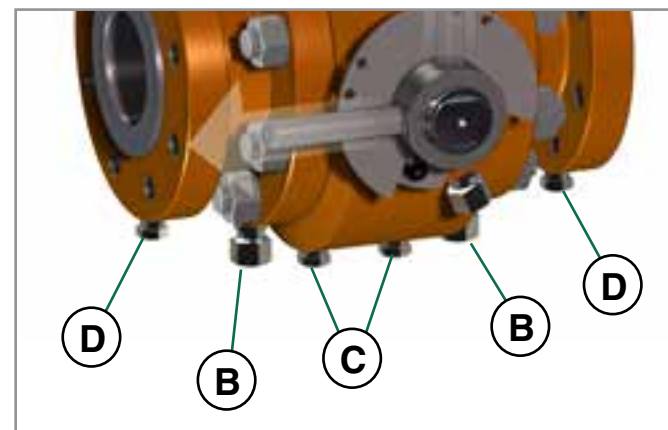
Perpendicular to flow = CLOSED (Shown).



## CLOSED CHECK LIST\*

Verify all valve openings are **CLOSED** prior to valve operation.

- Grease Fittings **(B)**
- Body Drains **(C)**
- Flange Ports **(D)**
- Entry Cap **(E)**
- Vent Fitting **(F)**



Valve Body Openings and Fittings



## ENTRY CAP

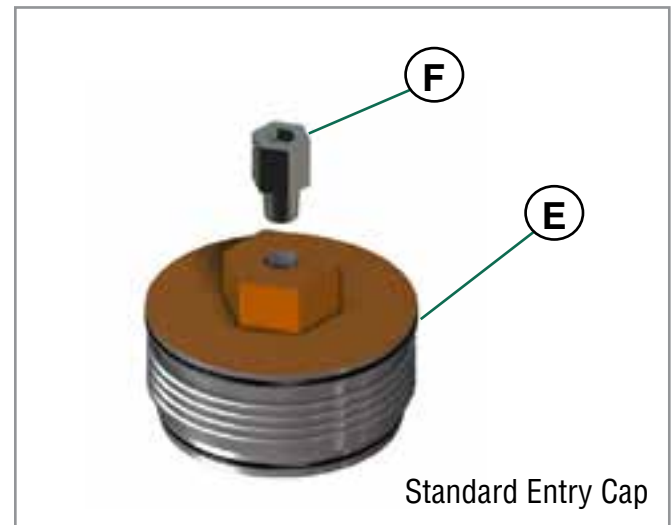
ALWAYS verify valve is **completely closed** with pressure fully relieved before opening Entry Cap.

Use standard wrench to open & close Entry Cap **(E)** and Bleed Fitting **(F)**.

Securely hand tighten for optimal performance.



Old hammer head style entry cap.

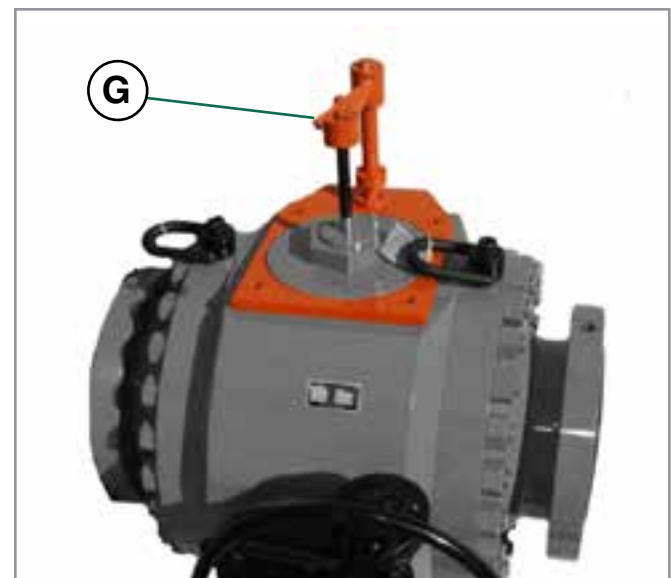


## ENTRY CAP WITH DAVIT ASSIST

To open Davit assisted Entry Cap use lever **(G)** to completely unscrew the Entry Cap.

When the Entry Cap has completely cleared the valve, swing the cap out of the way to perform pigging operations.

Reverse order to close the Entry Cap when operations are completed.



## PIG VALVE BYPASS LINES

The Bypass line around the Pig Valve, should be in the open position to reduce the differential pressure (DP).

**High DP can cause the pig to slam into the Baffle Plate with extreme force resulting in:**

- Cut pigs that can lodge pieces between ball and seat.
- Debris on the pig can be scraped across the seat insert.
- Downstream seat stuck or deviated in seat pocket caused by pigs entering the valve at a high velocity.

**NEVER hammer the Entry Cap closed!**

## PIGGING

### LAUNCHING PROCEDURES

1. Stand facing the Launcher Pig Valve Stem and CLOSE the valve. Valve handle (A) or Gear Indicator is perpendicular to flow in closed position.
2. VENT Body Cavity chamber with Vent Fitting (B) on the top of the Entry Cap (C).

**⚠ CAUTION: Always take care to prevent spilling or venting hazardous materials!**

3. After venting the body cavity pressure with the Vent Fitting (B), REMOVE the Entry Cap (C).

**⚠ CAUTION: If gas or liquids start to emerge STOP!**

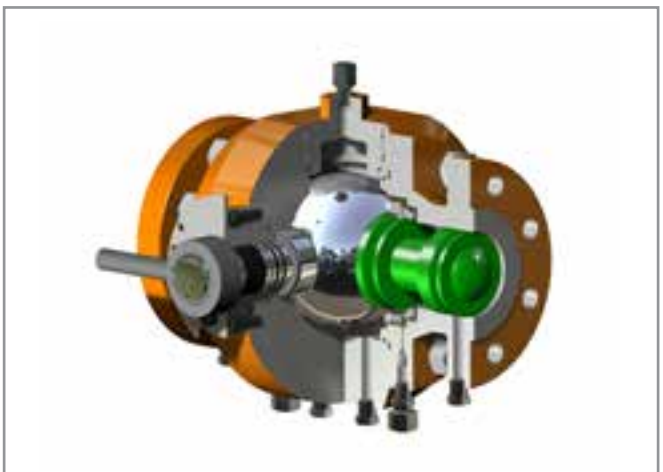
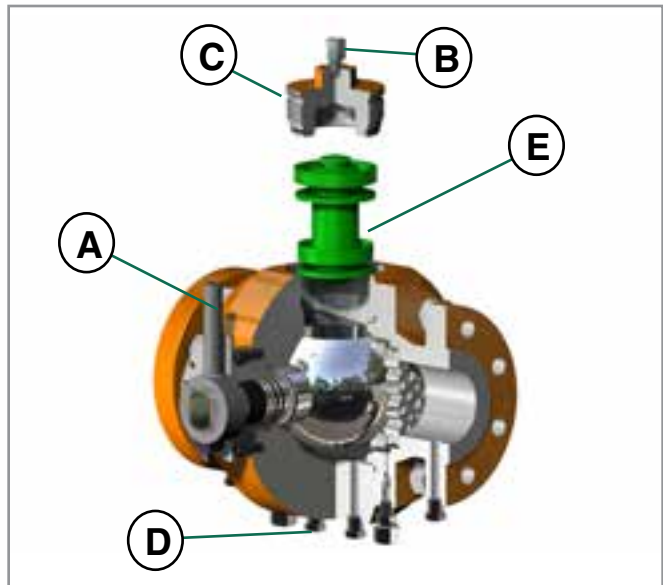
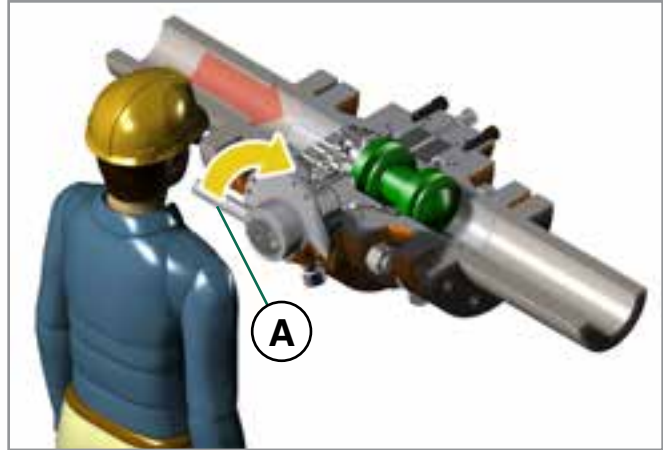
4. Replace Entry Cap and verify Step 1.
5. After valve is vented, drain or flush residue from the body cavity using the Body Drain (D).
6. Stand facing the valve stem to INSERT the pig (E).
7. Open Entry Cap and **INSPECT** for seal integrity and LUBRICATE ACME threads with Anti-seize.

Cold Climates: A light coat of oil works well.

8. INSERT pig in chamber.
  - **NEVER** use oversized pigs.
  - Install pig conical side DOWN if flow is from left to right.
  - Ensure pigs travel nose first for ease of retrieval with knob on pig's butt end.
  - Install pig conical side UP if flow is from right to left.

Use only pigs designed for use with pigging valve.

9. REPLACE Entry Cap (C) securely and CLOSE the Vent Fitting (B).
10. VERIFY the Entry Cap and ALL fittings and pressure containing openings are closed.
11. Open the valve to LAUNCH the pig.



## RECEIVING PROCEDURES

1. To receive pigs the valve must be installed as shown with the ball open to flow. The Baffle Plate **(F)** must be downstream to allow the pig to enter fully into the ball cavity.
2. After the pig **(E)** has entered the ball cavity, VERIFY both the Entry Cap **(C)** and the Vent Fitting **(B)** are securely closed.
3. CLOSE the valve. To verify CLOSED position, the Valve Handle **(A)** or Gear Indicator will be perpendicular to the flow.
4. BLEED the body cavity pressure using the Vent Fitting **(B)** on the Entry Cap **(C)**.
5. After venting, the Entry Cap may be opened.
6. Remove the pig **(E)**.

**⚠ CAUTION: Watch for trapped pressure when loading and unloading pigs!**

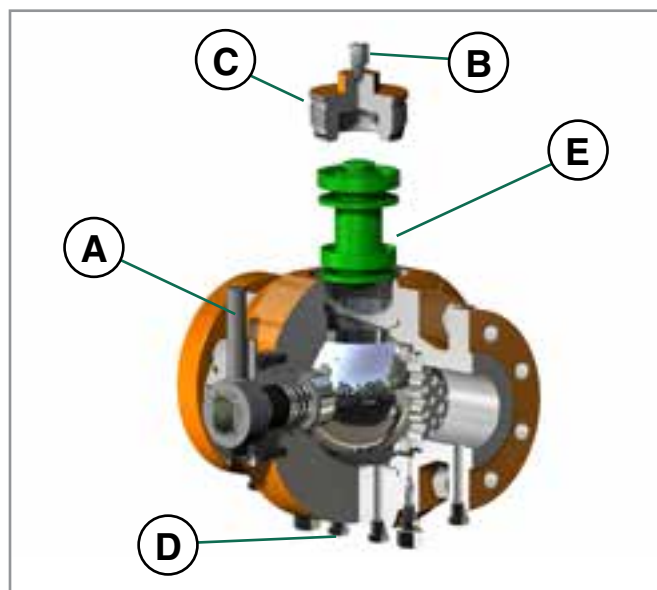
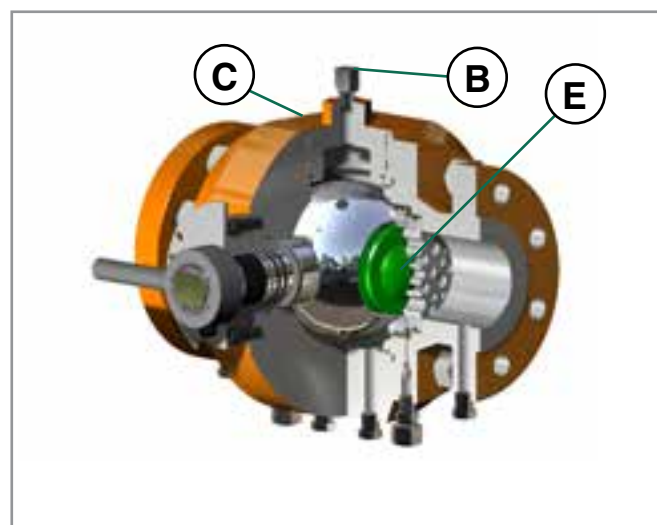
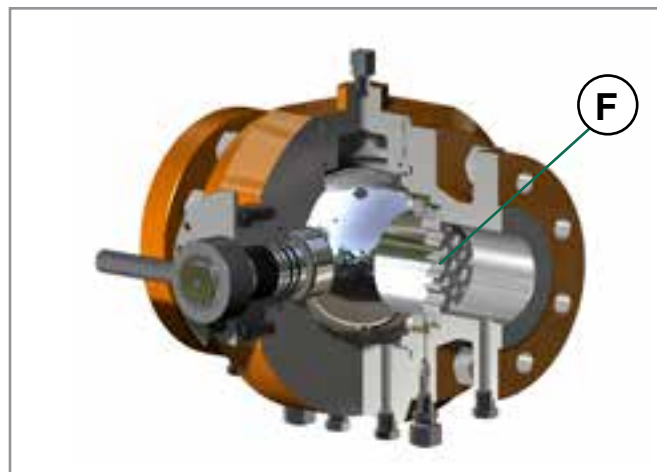
7. FLUSH the valve by opening Body Drains **(D)** with the standard pipe plugs or optional drain valve.

**⚠ CAUTION: Take care to prevent spilling or venting hazardous materials!**

8. Drain and/or flush body to remove debris and residue.

Residue left in the bottom of the valve will cause corrosion and shorten the valve life.

9. INSPECT all seals on the Entry Cap and body to ensure seal integrity.
10. LUBRICATE the ACME threads on the Entry Cap **(C)**.
11. REPLACE Entry Cap.
12. VERIFY the Entry Cap **(C)**, Vent Fitting **(B)**, and Body Drains **(D)** are closed.
13. Open the valve to media flow.



# GENERAL MAINTENANCE

## INCREASE VALVE LIFE AND OPERATIONAL EASE

Routine, ongoing, consistent maintenance is required to assure proper valve function and life.

### CYCLE VALVES FREQUENTLY!

Operate valves frequently to maintain their useful life and **decrease valve torque**. Valve torque increases when a valve is not operated.

#### MINIMUM RECOMMENDED CYCLING

- Valves in Service: Every 90 days
- Valves in Storage: Every 180 days or twice per year.

### ENTRY CAP

For operational ease apply anti-seize to ACME threads on entry cap regularly. This is best done after each Launch or Receive cycle. In cold climates, a light coat of oil works well.

**NEVER hammer the Entry Cap closed!** This includes old style caps with hammer lugs! Securely hand tighten for optimal performance.

If Entry Cap leaks, vent cavity pressure, remove Entry Cap and inspect for debris or damaged seal.

### SEATS

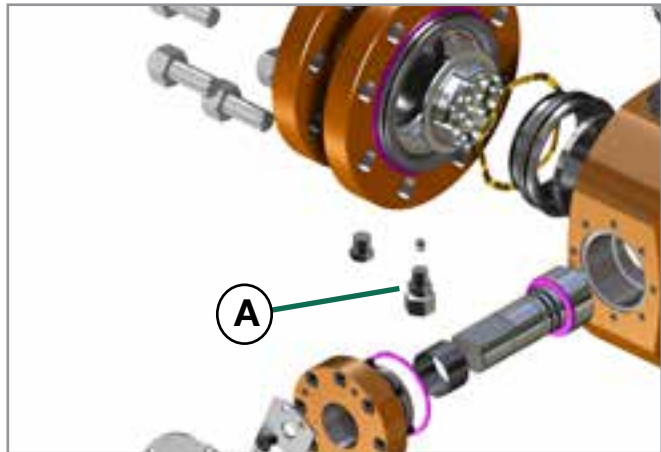
**LUBRICATE** Grease Fittings **(A)** at each seat after each pigging procedure for optimal valve life and ease of operation.

**⚠ CAUTION: Do NOT Use Automotive Grease, Plug Valve Grease, or similar heavy sealing greases.**

**VERIFY** sealant is compatible prior to use.

*Contact TULSA VALVE for approved compounds.*

*Consult manufacturers of the grease and sealants for compatibility with media flow.*



### SEAT LUBRICATION CHART

Valve size	Maintenance Lubrication	Full Lubrication
2" Valves	0.5 oz. per seat	2 oz. per seat
3" Valves	1.0 oz. per seat	4 oz. per seat
4" Valves	1.5 oz. per seat	6 oz. per seat
6" Valves	2.0 oz. per seat	8 oz. per seat
8" Valves	2.5 oz. per seat	10 oz. per seat
10" Valves	3.0 oz. per seat	12 oz. per seat
12" Valves	3.5 oz. per seat	14 oz. per seat

## SEAT MAINTENANCE LUBRICATION

Refer to the Seat Lubrication Chart for recommended lubrication with each valve cycling. Frequent lubrication keeps the seats in good working condition, assisting in the removal of debris and media from the seat areas.

With valve OPEN, pump a compatible lubricant into the seat pockets through the Seat Injection Grease Fittings **(A)**.

- **VERIFY** lubrication equipment is working properly.
- Remove Grease Fitting safety cap.
- Clean and verify the fittings are in good working condition.

If the valve is open, pressure may not increase on the grease gun gauge — this is normal. If the valve is closed and under line pressure, gauge pressure may increase.

**⚠ CAUTION:** Make certain the gauge pressure does not exceed the working pressure of the valve.

If SEAT INJECTION GREASE FITTING IS LEAKING, the buried check valves are not working properly. Flush the fitting with grease. Often this will remove debris to restore the seal.

The SEAT LUBRICATION procedure is the same for Full Lubrication but the amount of grease increases as indicated in the Seat Lubrication Chart.

## SEAT INJECTION CLEANING

When valve operation becomes more difficult, a valve cleaner may be used to improve performance. Follow the procedure used for Full Lubrication, replacing the grease with a cleaner such as *Sealweld Valve Cleaner*.

After cleaning the seat pockets with the valve cleaner, follow with the Full Lubrication procedure with the approved grease.

Usually the cleaner works quickly, but occasionally a longer soaking in the cleaner is necessary.

Cycle the valve several times to ensure the problem has improved.

- Block and bleed the valve to ensure the valve is sealing properly.
- Follow all necessary precautions when opening fittings.

## EMERGENCY SEALING

### SEAT SEALING

Seat Injection Grease Fittings provide a temporary method to stop valve leakage. Use a special sealant, (such as SEALWELD 50/50), that flows easily through the fittings and will not damage the seals.

SEALWELD 50/50 contains small Teflon particles and will seal most leaks caused by normal wear.

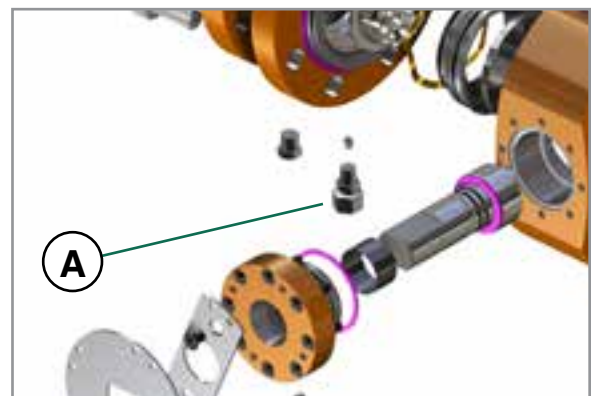
Valve must be closed for Emergency Seat Sealing.

The procedure is the same as the Seat Lubrication with this exception.

With valve CLOSED, pump sealant into the seat pockets through the Seat Injection Grease Fittings **(A)**.

**⚠ CAUTION:** Grease is very heavy and should be pumped at a slow rate.

Watch gauge carefully! Pressure in the gauge will rise indicating leak has been stopped. Testing pressure should not exceed the valve class being worked on.





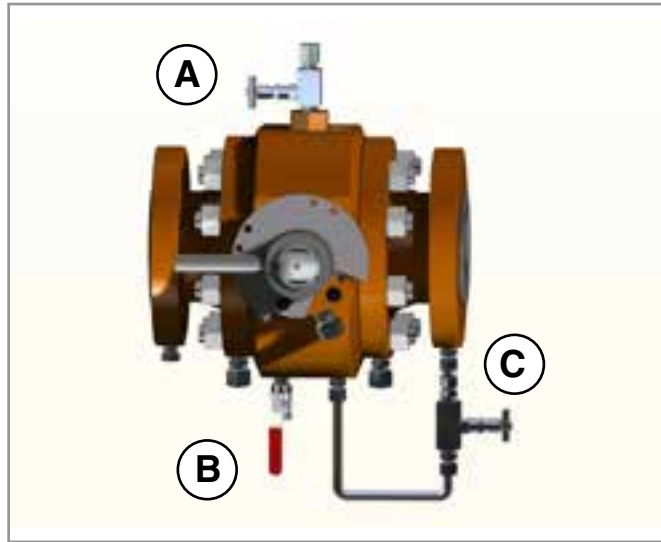
## OPTIMIZE OPTIONS

Several options are available to increase field operation efficiency and ease. Add in the field or order from the factory. Ports are pre-drilled and tapped to facilitate the upgrades.

**(A)** Replace Vent Fitting with Needle Valve on Entry Cap for faster and easier venting.

**(B)** Replace a Drain Plug with a Ball valve to make draining and flushing simpler.

**(C)** Reduce break torque by adding a Pressure Equalization Line with piping and needle valve connecting a body Drain Plug to a Flange Port.



# TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Entry Cap Leaks	Debris or damage to seal, or sealing area	Vent cavity pressure, Remove Entry Cap and Inspect for debris or damage to seal.
Emergency Stem Leak	Low sealant	Pump sealant into seat grease fitting slowly. <ul style="list-style-type: none"> <li>• Only pump in enough sealant to obtain seal. STOP when the leak stops.</li> <li>• Watch the gauge carefully!</li> <li>• Sealant pressure should not exceed the working pressure of the valve.</li> </ul>
Stem Leak	Unknown	Remove from service and send for repair.
Seat Injection Grease Fitting Leaks	Buried check valves are not working properly	Flush the fitting with grease. Often this will remove debris to restore the seal. If this does not work – Remove from service and send for repair.
Open/Close Difficult	<i>Break torque high</i>	Cycle valve frequently-best after each operation. Make sure bypass line around pig valve is open to reduce differential pressure. Add a Pressure Equalization Line.
Valve Operation Becomes Difficult	<i>Seat needs cleaning</i>	<i>Seat Injection Cleaning (page 11) may solve problem.</i> If this does not, remove from service and send for repair.

**⚠ DANGER:** Damaged fittings are dangerous. **DO NOT REMOVE** fitting if the valve is under pressure for any reason! Replace or fix ASAP.



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 Safety Relief Valves



CACTUS FLOW PRODUCTS

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 Casing Ball Valves  
 Threaded Ball Valves  
 Swing & Ball Checks



PRODUCTS

**RETURN MERCHANDISE AUTHORIZATIONS**

Contact Tulsa Valve Service to obtain authorization for return and shipping instructions.

All valve returns require a Return Merchandise Authorization (RMA). Please provide the following information with any RMA request:

- Serial number
- Valve owner
- Application specifics (where the valve was used)
- Media through the valve
- Manual Entry Cap or Davit Operated
- Manual or Gear Operated

