

PIG VALVE
2", 3", 4", 6"

SERVICE AND REPAIR MANUAL



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MODEL 2", 3", 4", 6"
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1.0 SCOPE

Argus Machine Co. Ltd. (Argus) manufactures double block and bleed Pig Valves (valve), in sizes ranging from 2" to 16". This manual covers typical service and repair procedures for the 2" thru 6", 150-900 ASME Class valves.

2.0 GENERAL

Service and repair of Pig Valves shall comply with the procedures as described in this specification.

3.0 APPLICABLE STANDARDS

The Pig Valve has been designed to meet the requirements of the following applicable standards:

- 1) API 6D/ISO 14313
- 2) NACE MR0175
- 3) ASME B16.5, B16.34, B31.3, & Section VIII
- 4) MSS SP-25

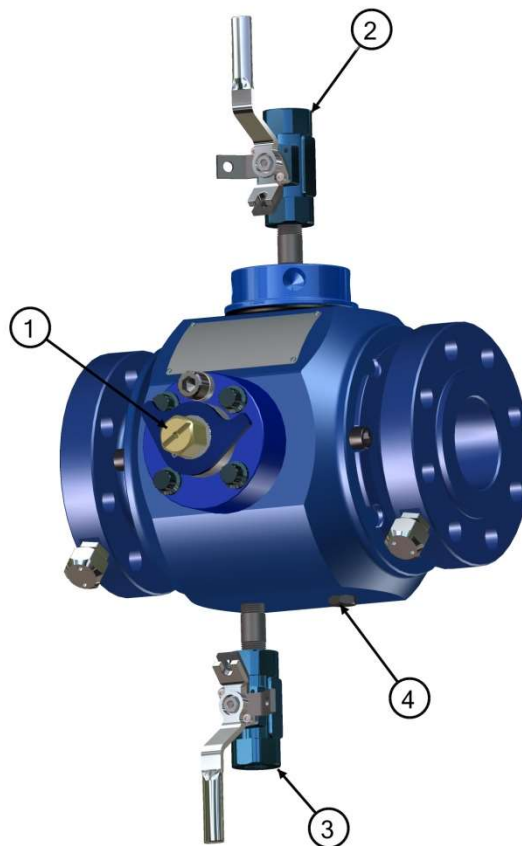


FIGURE 1



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4.0 PRE-DISASSEMBLE

CAUTION: The pig valve contains many sealing surfaces which can be easily damaged during the assembly/disassembly process. Exercise care during the assembly/disassembly process, to reduce the possibility of damage to these surfaces.

- 1) Visually inspect the valve before proceeding with further repair procedures. Note any missing or tampered with components.
- 2) Check the stem (1) (**FIGURE 1**) position, confirm the valve is partially open and the vent valve (2) is totally open.

WARNING: If the pig valve is not in the partially opened position, and the vent valve is not opened, treat the unit as containing noxious compounds under pressure.

- 3) If the pig valve is in the closed position and the vent valve has not been opened; place the valve in a well-ventilated area and carefully bleed the pressure off by opening the vent valve. Rotate the stem to partially open the valve.
- 4) Drain all fluids from the valve using the drain valve (3) if present or remove the drain plug (4).
- 5) Leave the opened and drained valve in a well-ventilated area until all vapors have been dissipated.
- 6) Clean the outside of the valve before disassembling.

5.0 DISASSEMBLE

5.1 BY-PASS / EQUALIZATION

- 1) If the unit is equipped with by-pass or equalizer options, disassemble these options first.

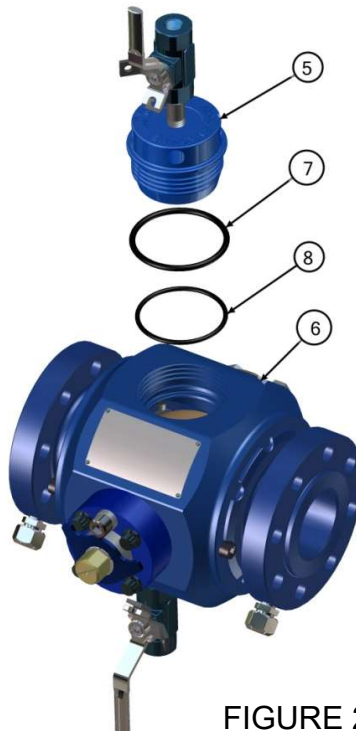


FIGURE 2



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5.2 ENTRY PLUG

- 1) To remove entry plug (5), (**FIGURE 2**) from the body use the appropriately sized Argus closure wrench or dowel and “dead blow” hammer to rotate the entry plug in a counter-clockwise direction.
- 2) Remove the entry plug weather seal (7) from the outside of the entry plug.
- 3) Remove the entry plug o-ring (Primary Seal) (8) from the groove inside of the entry opening of the body.
- 4) Do not remove the pipe plug from the bottom of the entry plug.

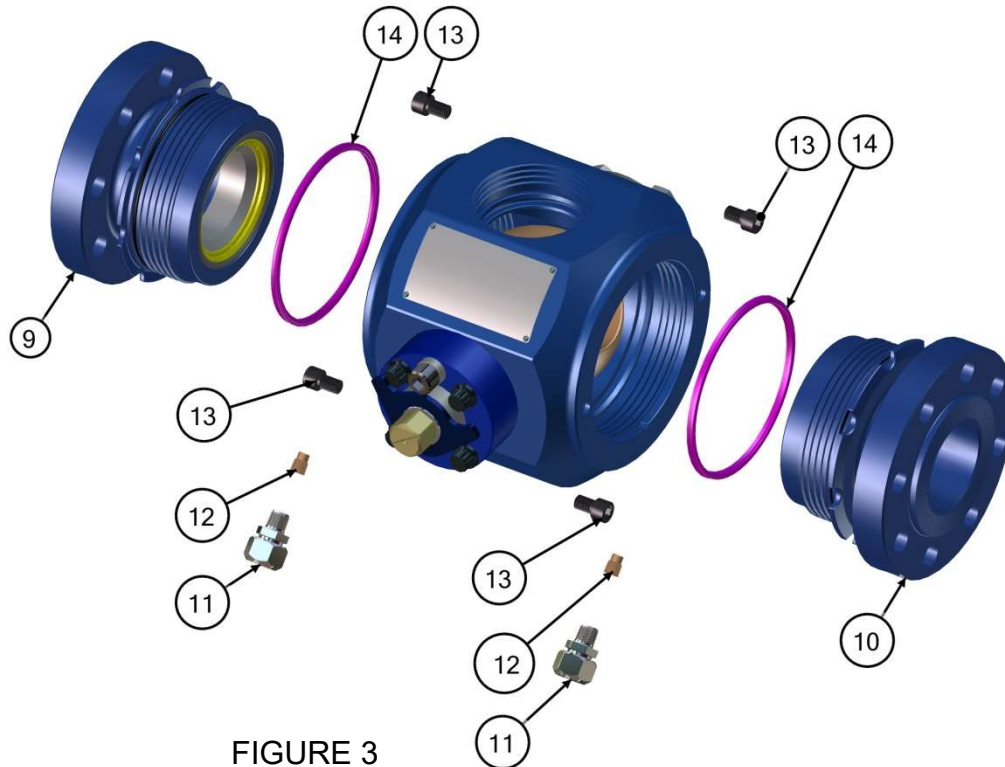


FIGURE 3

5.3 TAILPIECE

CAUTION: The left and right tailpieces are identical. However, when a stopper is assembled in the unit or the unit is equipped with an equalization option, the tailpieces must NOT be interchanged during re-assembly. Interchanging the tailpieces during re-assembly will result in the stopper (where fitted) and/or the equalization port, being placed on the incorrect side of the valve.

- 1) Mark the left (9) (**FIGURE 3**) and right (10) tailpieces so they are identified from which side of the body they originate.
- 2) Remove the button head fittings (11) and inner check valves (12) from the tailpiece flanges.
- 3) Remove the tailpiece locking bolts (13) from the valve.
- 4) Remove the tailpieces (9) and (10) from the assembly by rotating tailpieces in a counterclockwise direction.

NOTE: During factory assembly, the tailpieces are tightened using a torque tool. A torque tool is required to disassemble the tailpiece from the body.

- 5) Remove the seals (14) from the valve body or the tailpiece depending on the model.



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FIGURE 4

- 6) Remove the o-ring (15) (**FIGURE 4**) from the tailpiece.
- 7) Apply penetrating fluid to the outer diameter of the seat carrier assembly (16) to loosen it from the bore in the tailpiece.

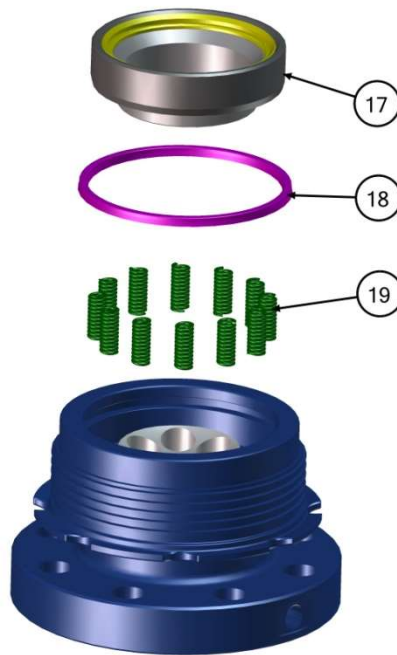


FIGURE 5

- 8) Remove the seat carrier assembly (17) (**FIGURE 5**) from the tailpiece.
- 9) Remove the seal (18) from the tailpiece or the seat depending on the model.
- 10) Remove the compression springs (19).



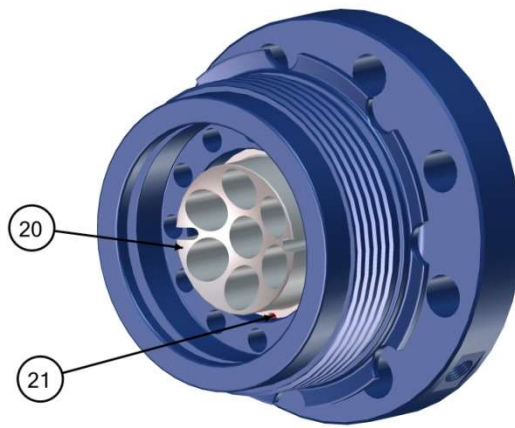


FIGURE 6

5.4 TAILPIECE WITH STOPPER

NOTE: Only remove the pig stopper if the intent is to modify the type (sender/receiver) of the valve or if it has been damaged.

- 1) To remove the pig stopper (20) (**FIGURE 6**) from the tailpiece the 1/8" split pin (21) must be driven into the tailpiece using an appropriate size punch.
- 2) Remove the pig stopper by rotating counter clockwise.
- 3) Drill out the split pin after removing the pig stopper (if required).

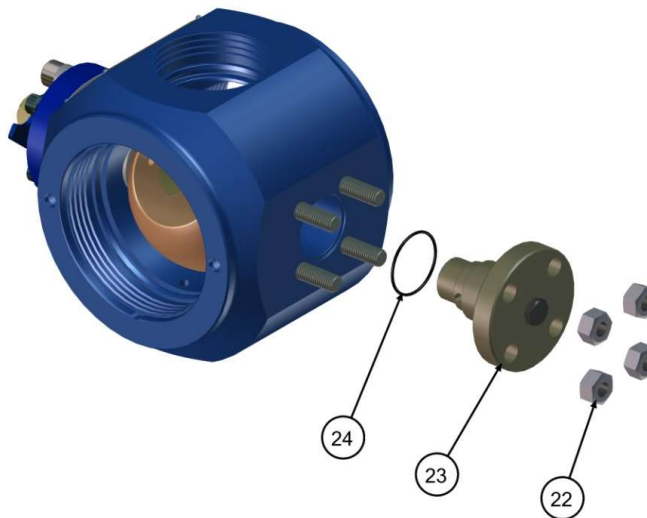


FIGURE 7

5.5 TRUNNION

- 1) Remove the trunnion mounting nuts (22) (**FIGURE 7**).
- 2) Remove the trunnion (23) from the body.
- 3) Remove the o-ring (24) from the trunnion.



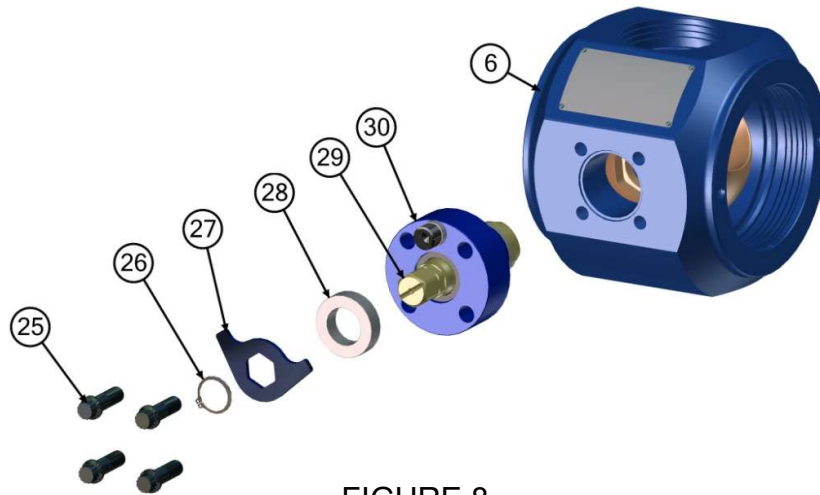


FIGURE 8

5.6 STUFFING BOX

NOTE: When removing the stem from the stuffing box, care must be taken to ensure that the antistatic ball (41) and spring (42) (**FIGURE 9**) are not misplaced. It is critical that these components are reassembled with the stem and stuffing box to maintain compliance with API 6D.

- 1) Mark the main body (6) (**FIGURE 8**) and stuffing box (30) to identify the orientation for a reassembly.
- 2) Remove the stuffing box mounting bolts or nuts (25).
- 3) Remove the retaining ring (26), stem stop (27), and spacer ring (28) (only on 2" and 3" valves).
- 4) Remove the stuffing box from the valve body with the stem (29). On occasion the stem will be left in the ball because of a tight fit between the spigot of the stem and locator bore in the ball.
- 5) To remove the stem, it may be necessary to use a small jack or pry bar arrangement within the ball to push the stem out. Care should be taken to avoid damaging the ball.

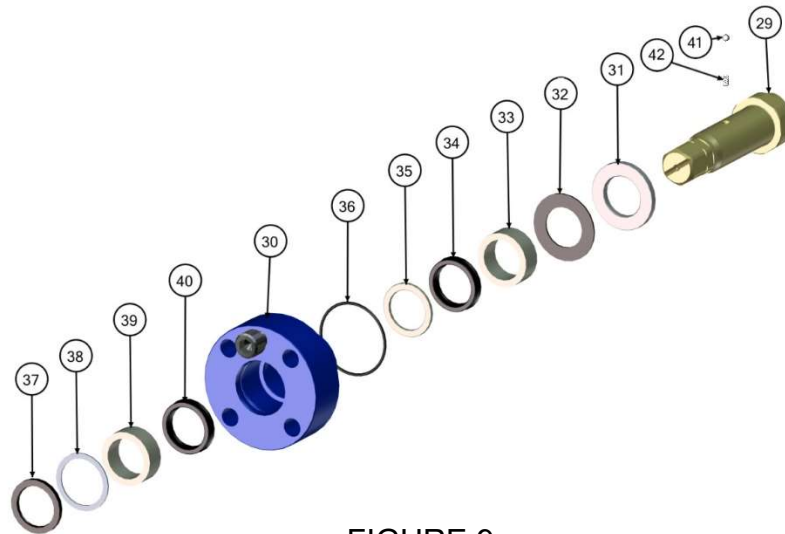


FIGURE 9



- 6) Remove the items from the stuffing box assembly in the following order as shown in **FIGURE 9**: stem (29), antistatic ball (41), and spring (42), thrust ring (31), thrust bearing (32), bearing ring (33), polypak (34), back-up ring (35), and the o-ring (36).
- 7) From the other end remove the weather seal (37), retaining ring (38), bearing ring (39), and polypak (40).



FIGURE 10

5.7 BALL

CAUTION: Care must be taken to avoid damaging the ball.

- 1) Remove the ball (43) (**FIGURE 10**) from the body.
- 2) Remove the bearing ring (44) from the ball.

6.0 CLEANING

- 1) Wash all parts with Varsol or equivalent cleaner.
- 2) Discard all soft seals.

7.0 INSPECTION

- 1) Inspect all valve components for wear and damage. Special attention should be taken examining all seal surfaces. All bearings should be tight on outside diameter when fitted to mating part. All bearing inside diameters should be free to move on mating part; but not excessively loose.
- 2) Repair or replace all damaged components. It is recommended that all o-rings, polypaks and weather seals be replaced.

CAUTION: Always use Original Equipment Manufactured components when replacing components and/or seals.

8.0 ASSEMBLE

NOTE: Recommended lubricant; is a mixture of 2-parts Faxam and 1-part Procon corrosion inhibiting oil.

Valve sizes 2", 3" and 4"

Orient the body such that the face with the two drain holes faces down, with the stuffing box opening facing the assembler.



Valve size 6"

Orient the body such that a tailpiece opening faces down, with the stuffing box opening facing the assembler.

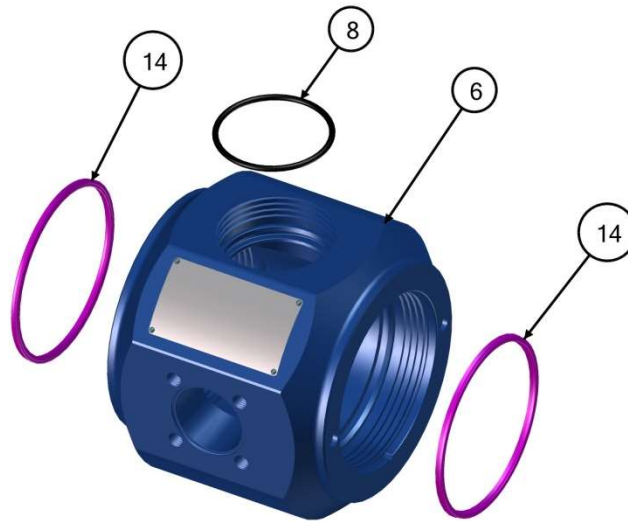


FIGURE 11

8.1 BODY

- 1) Generously lubricate the seal grooves and threads with oil.
- 2) Install the entry plug primary o-ring (8) (**FIGURE 11**).
- 3) Install the seals (14) into the grooves in the bore of the body or tailpiece. For 2" and 3" valves only, polypak sealing lips must face towards the center of the body.

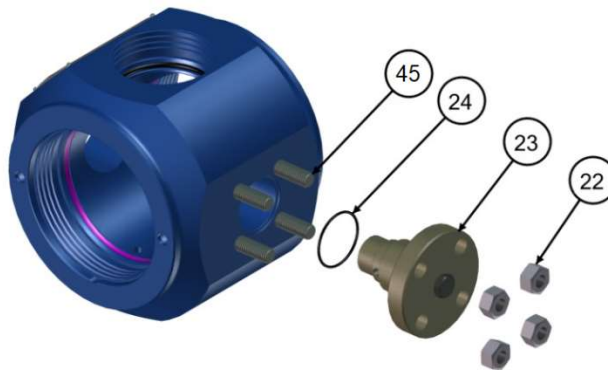


FIGURE 12



8.2 TRUNNION

- 1) Lubricate the o-ring (24) (**FIGURE 12**) and install it onto the trunnion (23).
- 2) Mount the trunnion onto the studs (45), do not thread the nuts (22) on the studs at this time.

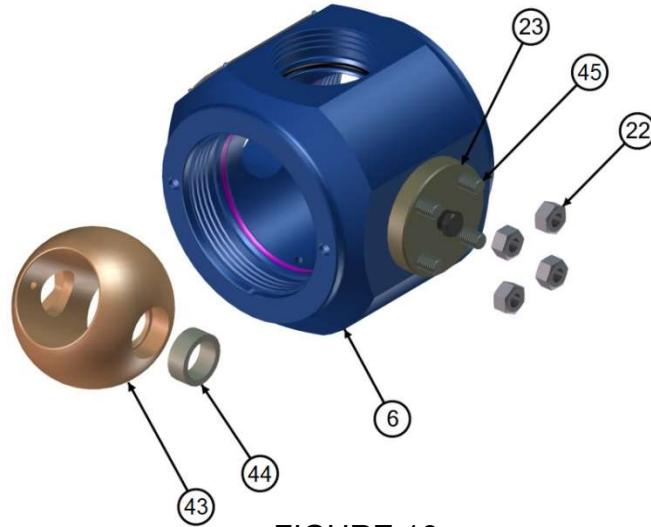


FIGURE 13

8.3 BALL

- 1) Install the bearing ring (44) (**FIGURE 13**) it into the ball (43).
- 2) Carefully insert the ball into the body (6) while guiding the trunnion (23) into the bearing ring in the ball.
- 3) Thread the nuts (22) onto the studs (45), finger tighten only. Nuts will be properly torqued in step 8.4.23.
- 4) Turn the ball so the bore is aligned with the bore of the body.

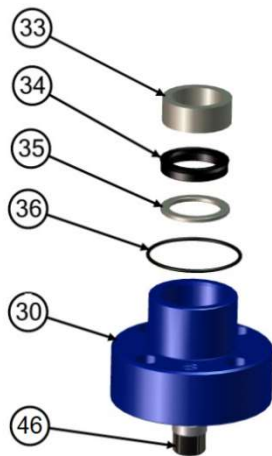


FIGURE 14

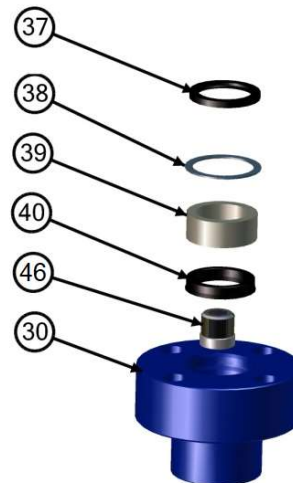


FIGURE 15



8.4 STUFFING BOX

- 1) Apply lubricant to seals, bearing rings, stem, and o-ring before installing.
- 2) Set the stuffing box (30) (**FIGURE 14**) with the stop bolt (46) to the bottom.
- 3) Slide the o-ring (36) over the stuffing box so it rests against the flange.
- 4) Install the back-up ring (35) into the stuffing box, so that it sits on the shoulder. 4" valves do not require a back-up ring.
- 5) Install the first polypak (34) against the back-up ring with the sealing lips facing upward.
- 6) Press a bearing ring (33) into the stuffing box so it is flush with the end of the stuffing box.
- 7) Turn the stuffing box so the stop bolt (46) is at the top.
- 8) Install the second polypak (40) (**FIGURE 15**), with the sealing lips facing downward, against the shoulder in the bore.
- 9) Press the second bearing ring (39) into the bore so the top is slightly below the retainer ring groove.
- 10) Install the retainer ring (38) into the groove.
- 11) Press the weather seal (37), sealing lips facing downward, into the bore so rests against the retaining ring.

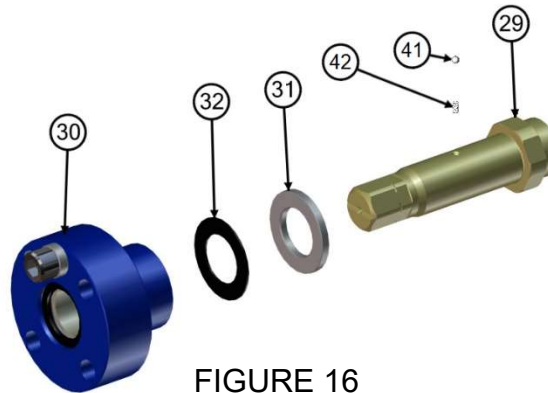


FIGURE 16

- 12) Place the thrust ring (31) (**FIGURE 16**) onto the stem (29), so it is against the hexagonal face of the stem.
- 13) Install the thrust bearing (32) onto the stem so it rests on the thrust ring.
- 14) Install the spring (42) and antistatic ball (41) into the small recess on the stem shaft. Ensure the antistatic ball remains flush with the stem during assembly. A tool to assist with this can be purchased from Argus.
- 15) Insert the stem into the stuffing box (30), ensure the thrust bearing sits against the stuffing box and the antistatic ball and spring remain in place.

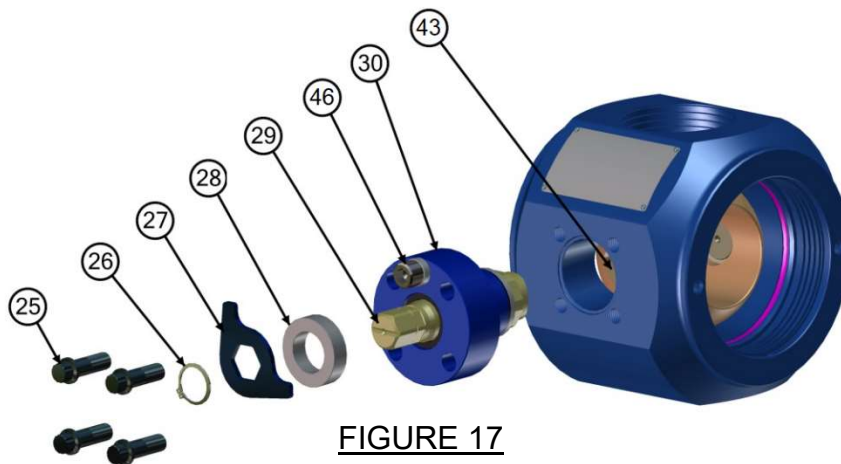


FIGURE 17



- 16) Align the stem (29) (**FIGURE 17**) so the direction of media flow through the ball is parallel to the arrow/groove on the end of the stem.
- 17) Install the stuffing box assembly (30) into the stuffing box bore, ensuring the indicator groove at the end of the stem is aligned with the inside diameter of the ball (43).
- 18) Push down on the stuffing box assembly so the stem engages into the spigot bore and hex section of the ball.
- 19) Turn the stuffing box to position the stem stop bolt (46) so it is positioned 90° to the flow of the valve and toward the entry cap side of the valve.
- 20) For 2" and 3" valves only, install the spacer ring (28) over the stem and against the stuffing box.
- 21) Orient the stem stop (27) and slide it over the stem. The protruded portion should rest against the stem stop bolt.

NOTE: Care must be taken to ensure the stem stop (27) is orientated according to flow direction.

- 22) Install the retaining ring (26) in the groove of the stem.
- 23) Using four stuffing box mounting bolts (25) secure the stuffing box to the body.

Assembly Torque Values

Tighten the stuffing box mounting bolts/nuts and the trunnion mounting nuts to the specified torque, listed in Argus Technical Bulletin TB-PV-034.

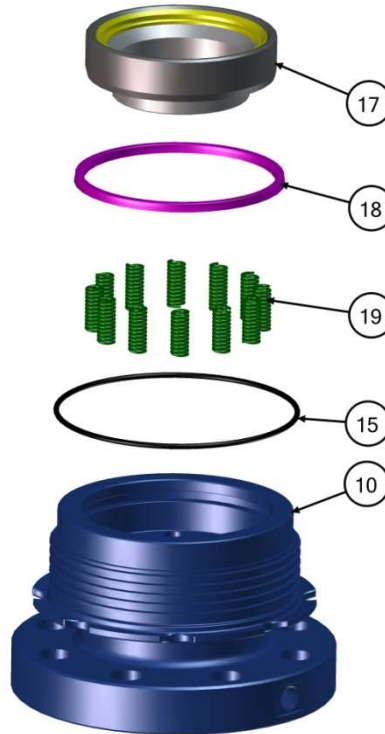


FIGURE 18



8.6 TAILPIECE WITHOUT STOPPER

- 1) Set the tailpiece (10) (**FIGURE 18**) on the flanged end.
- 2) Apply lubricant to seals and seats.
- 3) Install the o-ring (15) over the threads of the tailpiece and against the scalloped flange.
- 4) Insert the compression springs (19) into the spring holes.
- 5) Install the internal polypak (18), with the sealing lip facing downward. For 4" valves install the external polypak and o-ring on the seat carrier.
- 6) Install the external o-ring with backup ring or polypak with the sealing lip facing away from the flanged end of the tailpiece. (For 4" and larger sizes only).
- 7) Install the seat carrier assembly (17) into the tailpiece. (Use a combination of down force and rotation to assist installation.)

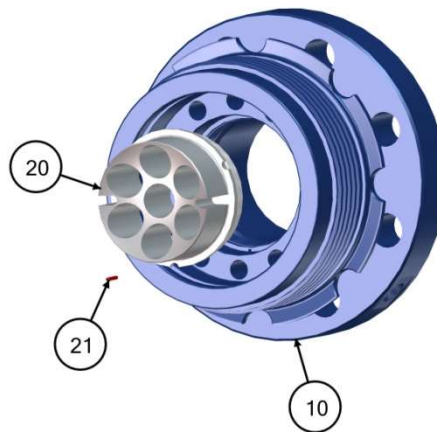


FIGURE 19



TAILPIECE WITH STOPPER (IF REQUIRED-STEPS 1 THRU 4)

- 1) Set the tailpiece (10) (**FIGURE 19**) on the flange end.
- 2) Apply lubricant to seals and seats
- 3) Screw the pig stopper (20) into the flange until it "bottoms out".
- 4) Drill a $\varnothing 1/8"$ x $1/2"$ deep hole into tailpiece (10), located at one of the scallops in the pig stopper.
- 5) Install $\varnothing 1/8"$ x $1/2"$ long split pin (21) into the hole until the end is flush with the flange of the pig stopper.

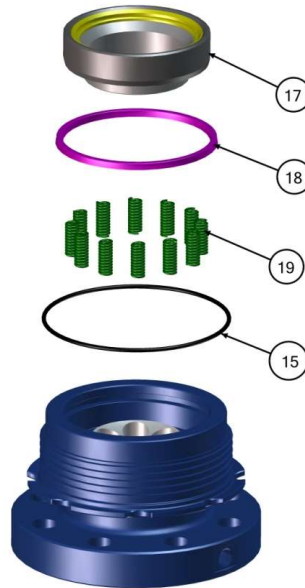


FIGURE 20



- 6) Install the o-ring (15) (**FIGURE 20**) over the threads of the tailpiece and against the scalloped flange.
- 7) Insert the compression springs (19) into the spring holes.
- 8) Install the internal polypak (18), with the sealing lip facing downward. For 4" valves install the external polypak and o-ring on the seat carrier.
- 9) For 4" and larger sizes only, install the external polypak with the sealing lip facing away from the flanged end of the tailpiece.
- 10) Install the seat carrier assembly (17) into the tailpiece. Use a combination of down force and rotation to assist installation.

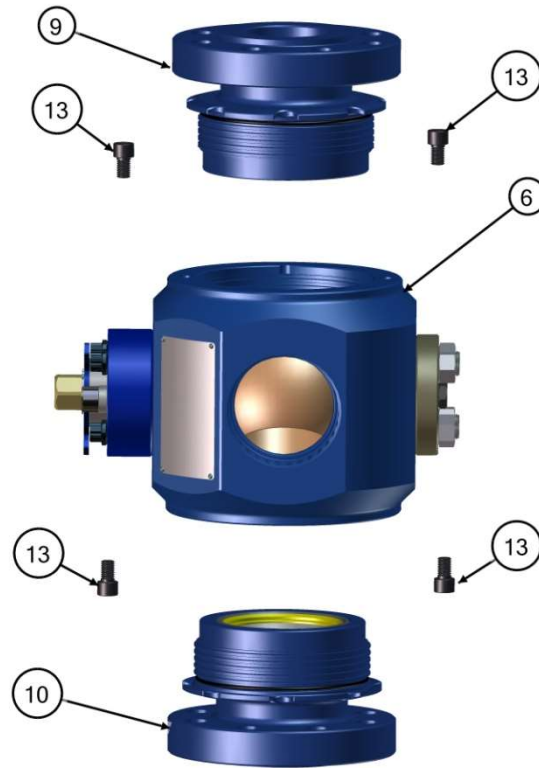


FIGURE 21

8.7 TAILPIECE GENERAL

- 1) Ensure the seat and ball are free of debris.
- 2) Turn the tailpiece (9) (**FIGURE 21**) so the flange is upward.
- 3) Lubricate the threads and seal surface on the tailpiece and the main body (6).
- 4) Position the valve body on the work table with the tailpiece opening to the top.
- 5) Select the tailpiece which came from this end of the body.
- 6) Lift the tailpiece so it is over the top of the body. For larger valves the use of a hoist is recommended.
- 7) Gently lower the tailpiece into the body. Take care not to damage the threads of the tailpiece or the body.
- 8) Carefully and smoothly screw the tailpiece assembly into the body until the scalloped flange contacts the body.

CAUTION: If any resistance is encountered during this process, remove the tailpiece and resolve the cause of the interference before tightening the tailpiece assembly.



- 9) Tighten the tailpiece until the scallop on the flange, nearest to the locking bolt hole, evenly straddles the locking bolt hole in the body.

NOTE: During factory assembly the tailpieces are tightened using a torque tool.

- 10) Install and tighten the two locking bolts (13) into the main body.
- 11) Turn the body and tailpiece over and install the other tailpiece (10) as per the previous procedure.

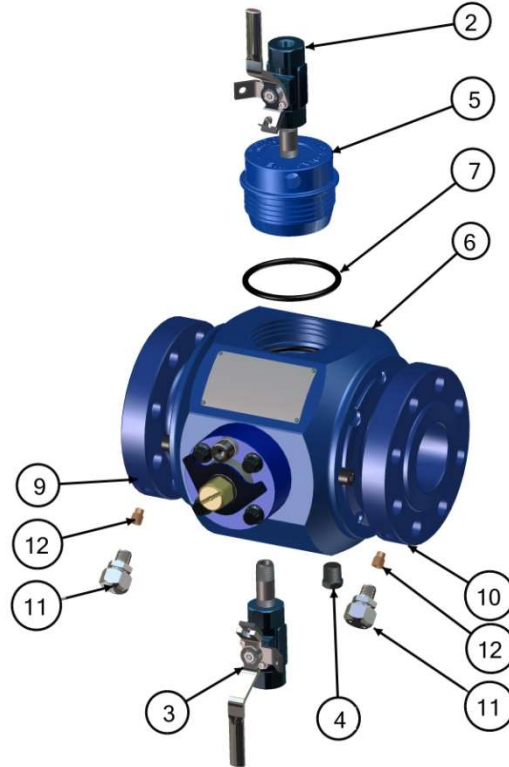


FIGURE 22

8.8 INJECTION PORTS

- 1) Apply thread sealant to threads of inner check valves (12) (**FIGURE 22**).
- 2) Install the inner check valves into the tailpiece flanges (9) and (10).
- 3) Once pressure testing of the valve is complete, install the button head check valves (11) into the tailpiece flanges using thread sealant.

8.9 ENTRY PLUG and AUXILIARY VALVES

- 1) Install the weather seal (7) on the entry plug (5).
- 2) Install the entry plug into the body (6) with vent valve (2), if required.
- 3) Install drain plugs (4) and/or drain valve (3).

8.10 BY-PASS / EQUALIZATION

- 1) If the unit is equipped with by-pass or equalizer options, re-assemble these options.



9.0 PRESSURE TESTING

- 1) Test the assembled unit as per API 6D & 598: contact Argus for further requirements.

10.0 CONTACT INFORMATION

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