

Model 360/361 Control Valves

Operation, Parts, and Instruction Manual



Figure 1 360 Control Valve & DFC Actuator

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NOTICE

These instructions are meant to be used with the Dyna-Flo 360/361 Technical Bulletin as they refer to Figures and Tables therein. If you do not have the Technical Bulletin, contact Dyna-Flo immediately, or visit **www.dynaflo.com**

Each control valve is factory checked. Check the calibration for the specific application, before a valve is put into service.

It is the intention of this document to provide users with an accurate guide for safe installation and maintenance of the 360/361 Control Valves. Revisions are available at above mentioned website.

GENERAL

The following instructions are to be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Work on this equipment should be performed by experienced personnel. Throughout the manual, safety and caution notes appear and must be strictly followed, to prevent serious injury or equipment malfunction.

SCOPE

The control valve configuration and construction materials were selected to meet particular pressure, temperature, and process conditions. Some material combinations are limited in their pressure and temperature ranges. Do not apply any other conditions to the valve without first contacting your Dyna-Flo sales office.

This manual is written to be a practical and useful guide to maintaining the Dyna-Flo 360 Control Valve.

SAFETY CAUTION

Only well trained experienced technicians should perform these procedures. Use safe work practices and lock out procedures when isolating valves and actuators. It is also important to wear the proper protective equipment when performing any installation or maintenance activity. Use only parts and materials rated for the process being used, operating conditions, and environmental conditions products will be used in.

To avoid personal injury or installation damage as a result of the sudden release of process pressure or damage to equipment, do not install the valve assembly where service conditions could exceed the limits stated in this manual, sales bulletin or on the equipment nameplates. Use government codes, accepted industry standards and good piping practices, and select proper pressure-relieving equipment for protection of your installation. Always be aware of flammable process and instrument gas.

Always be aware of the hazards of actuators, especially spring-loaded actuators. Be sure that the actuator is de-energized or in the failed position before performing any maintenance procedure.

These valves have dangerous pinch points. Never put your hands inside the valve unless you are certain that the plug and stem will not move.

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SPECIFICATIONS

Configurations

The Model 360 control valve is a high capacity single port, globe style valve with a bolted type bonnet. The standard valve plug action is push down to close. Refer to Table 1.

PTFE Seat and Metal Seat Available.

Consult your Dyna-Flo sales office for other available configurations.

Sizes and Connection Styles (Refer to Table 1)

Model:	360
Size:	1", 1-1/2", 2", 3", 4", 6", 8"
Body:	Globe (All Sizes), Angle (1" / 2" / 3" / 4" / 6")
Rating:	ASME 150 / 300 / 600
Connection:	RF / RTJ / BWE - All Sizes SWE / NPT - 1", 1-1/2", and 2"

Maximum Inlet Pressures and Temperatures

Flanged valves consistent with ASME Class 150, 300, and 600 rating as per ASME B16.34, unless limited.

Maximum Pressure Drops

Maximum pressure drop is the same as maximum inlet pressure unless restricted by the following:

Standard Valve Trim: Figures 10A - 10D.

Anti-Cavitation Trim: Figures 10A - 10D.

Low-Noise Valve Trim: Figures 10A - 10D.

Characteristic and Flow Direction

- Equal Percentage (Standard) - Flow Down
- Quick Opening - Flow Down
- Linear - Flow Down
- Low-Noise 3 (Linear) - Flow Up
- Anti-Cavitation 1-Stage (Linear) - Flow Down
- Anti-Cavitation 2-Stage (Linear) - Flow Down

Dimensions

Valve and Actuator Outline Dimension Diagram

Refer to Figure 2 of the Sales Bulletin.

Valve and Actuator Assembly Dimensions

Refer to Tables 8 to 19 of the Sales Bulletin.

Approximate Valve Body and Actuator Weights

Refer to Table 4.

Materials

Body and bonnet material options include:

LCC (A350-LF2 optional* bonnet material)

WCC (A350-LF2 optional* bonnet material)

WC9 (A182-F22 optional* bonnet material)

CF8M (A182-F316 optional* bonnet material)

***NOTE:** Dyna-Flo reserves the right to substitute a cast material with the forged bar equivalent in the event a casting is not available.

Refer to Figures 10A - 10D of the Sales Bulletin for valve construction material temperature limitations. Refer to Tables 23 - 25 of the Sales Bulletin for trim selections.

Cross-Section of the Model 360 Control Valves

Refer to Figures 32 to 40.

Port Diameters and Maximum Valve Plug Travel

Refer to Tables 4 to 6 of the Sales Bulletin.

Packing Type and Examples

The Standard packing is PTFE V-ring. Live-loaded low emission, graphite, KALREZ® and other packing arrangements are available. Refer to Figures 27, 29, 30, & 31.

Maximum Valve Sizing Coefficients

For standard coefficients at maximum travel, refer to Table 29 & 30 of the Sales Bulletin. For full list of coefficients refer to document P-CVSM.

Service Application

Refer to Tables 20 - 28 of the Sales Bulletin.

For more information and other options contact your Dyna-Flo sales office.



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Table 1

Available Valve Configurations

Valve Model	Valve Size Inch	End Connection					
		NPT ⁽¹⁾	RF ⁽²⁾ and RTJ ⁽³⁾ (Flanged)			BWE ⁽⁴⁾	SWE ⁽⁵⁾
			ASME Class 150	ASME Class 300	ASME Class 600		
360	1 / 1-1/2 / 2	✓	✓	✓	✓	✓	✓
	3 / 4 / 6 / 8	✕	✓	✓	✓	✓	✓
360A	1 & 2	✕	✓	✓	✓	✓	✓
	3 / 4 / 6	✕	✓	✓	✓	✓	✓
Notes:	1 - NPT = Screwed.						
	2 - RF = Raised Face.						
	3 - RTJ = Ring Type Joint.						
	4 - BWE = Butt Weld (ASME Class 600 Only).						
	5 - SWE = Socket Weld (ASME Class 600 Only).						

Table 2

Standard Shut-Off Classifications (in accordance with ANSI/FCI 70.2 and IEC 60534-4)

Valve Trim	Seat Option	Shut-Off Class	
All (Except Anti-Cavitation)	PTFE (Soft Seated)	Standard	Class V (Air Test)
		Optional	Class V
	Metal		Class VI ⁽¹⁾
		Standard	Class IV
		Optional	Class V ⁽²⁾
			Class VI ⁽¹⁾
Anti-Cavitation 1 Stage	Metal	Standard	Class IV
		Optional	Class V
Anti-Cavitation 2 Stage	Metal	Standard	Class V
Notes:		1 - Refer to Table 3.	
		2 - Class V shut-off requires a spring-loaded seal ring, radius-seat plug, and wide-bevel seat ring. Not available with 8 inch port quick opening cages.	

Table 3

Available Valve Configurations for Class VI Shut-Off (in accordance with ANSI/FCI 70.2 and IEC 60534-4)

Valve Model	Port Size Inch	Valve Seat	Minimum Seat Load
360 Refer to Table 23 for Trim	≥3.4375≤7	Metal ⁽¹⁾	300 lbs./lineal inch
	≥3.4375≤7	PTFE	Consult Dyna-Flo
Note: 1 - Class VI shut-off requires a spring-loaded seal ring, radius-seat plug, and wide-bevel seat ring.			

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UNPACKING VALVE FROM SHIPPING CONTAINER

Special Tools Required:

- Properly Rated Lifting Straps (2 – 4 Straps) refer to Table 4 for actuator weights.
- Lifting Device (Example: Crane)

Check the packing list, verify that the list includes all the materials in the shipping container before unpacking. Valve information can be found on the nameplate (Key 47). Refer to Figure 2 for nameplate location.

When lifting the valve from shipping container, place properly rated lifting straps securely around the neck of the actuator, refer to Figure 2 for strap placement. Straps should be placed to avoid damage to tubing and other mounted accessories.

For valve assemblies without an attached actuator, use caution when lifting or positioning straps so as not to damage the valve stem.

Lift the valve/actuator assembly using proper lifting techniques.

INSTALLATION

Before You Begin:

- Read the General and Scope section of this manual (Page 2).
- Read Safety Caution (Page 2).
- Sudden movement of actuator can cause damage or injury. It helps to have the actuator de-energized.
- Use safe work practices and lock out procedures before placing valve in-line.

NOTE: For butt weld valve bodies, depending on the body material, post-weld heat treatment might be required. Soft parts, seals, some metal trim, threading and shrink-fit parts can be damaged by post-weld heat treatment. If post-weld heat treatment is required, it is recommended that all internal valve parts be removed from the valve body. Contact Dyna-Flo for more information.

Parts Required:

- Appropriate Line Flange Nuts and Bolts
- Appropriate Line Flange Gaskets
- If the valve has small internal flow passages such as Anti-Cavitation or Low-Noise trim, the installation of an upstream strainer should be considered to prevent clogging of these small passages.

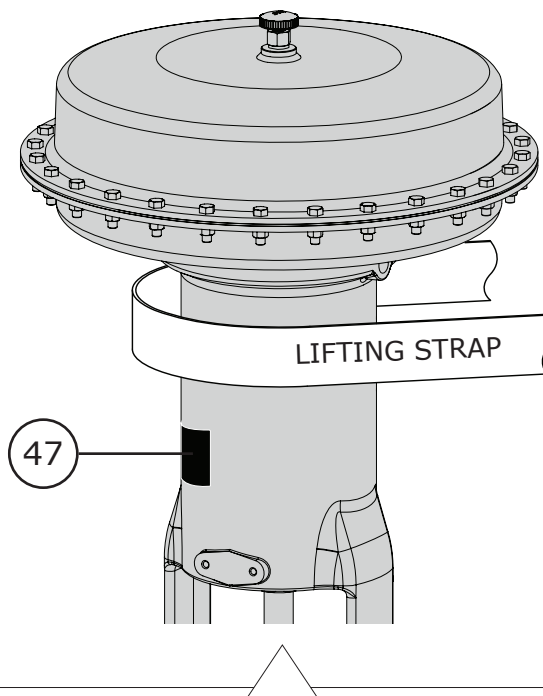


Figure 2 Actuator Lifting Suggestions

Installation Steps:

- 1 Check the packing box bolting (Key 38) for proper tightness. Refer to Packing Installation on Page 20 for proper packing tightening instructions.
- 2 The valve assembly may be installed in any position unless limited by vibration considerations, it is however recommended that the valve be installed with the valve stem (Key 5) perpendicular to the ground. **NOTE:** For some non-vertical orientations, the valve actuator may need to be supported.
- 3 Install the valve with flow through the valve in the direction shown by the flow arrow on the valve body.
- 4 Install the appropriate line flange gaskets.
- 5 Apply Permatex® Nickel Anti-Seize to the threads of the flange studs and install.
- 6 When possible, before tightening the line bolting, stroke the valve and check for smooth operation through the full stroke. Unsteady valve stem movement could be an indication of an internal problem.
- 7 Tighten the line flange bolting in even increments in a crisscross pattern until the correct line bolt torque specification is reached.



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INSTALLATION (Continued)

AIR PIPING

WARNING:

Property damage, environmental harm, and personal injury can result from the use of supply gas other than clean, non-corrosive, oil and moisture free air. Do not exceed the supply pressure indicated on the serial plate located on the actuator.

Before You Begin:

Note: Standard actuators accept 1/4" (6 mm) NPT connections.

- Refer to the appropriate actuator instruction manual when necessary.

Piping Installation Steps:

- 1 Use 3/8" (outside diameter) tubing (or equivalent) for air lines.
- 2 Install the required line vents, valves, drains, seals, and filters to the actuator.

Table 4					
Valve Body / Actuator Configurations and Approximate Weights					
Valve Size (inch)	Body Only lb (Kg)	With Fail Open Actuator Size	Valve and Actuator Assembly Weight lb (Kg)	With Fail Close Actuator Size	Valve and Actuator Assembly Weight lb (Kg)
1	30 (14)	DFO - 1046	66 (30)	DFC - 1046	64 (29)
		DFO - 1069	70 (32)	DFC - 1069	78 (26)
1-1/2	45 (20)	DFO - 1046	81 (37)	DFC - 1046	79 (36)
		DFO - 1069	85 (39)	DFC - 1069	93 (42)
2	85 (39)	DFO - 2069	136 (62)	DFC - 2069	135 (61)
		DFO - 2105	167 (76)	DFC - 2105	175 (79)
3	125 (57)	DFO - 2069	176 (80)	DFC - 2069	175 (79)
		DFO - 2105	207 (94)	DFC - 2105	215 (98)
4	170 (77)	DFO - 2105	252 (114)	DFC - 2105	260 (118)
		DFO - 2156	277 (126)	DFC - 2156	291 (132)
6	350 (159)	DFO - 3156	466 (211)	DFC - 3156	471 (214)
		DFO - 3220	585 (266)	DFC - 3220	604 (274)
8	900 (408)	DFO - 3220	1135 (515)	DFC - 3220	1154 (523)

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PERIODIC INSPECTION

Special Equipment Required:

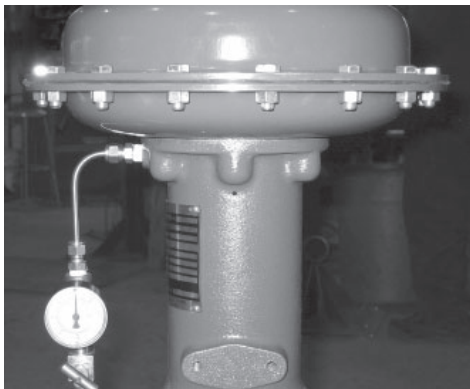
- Bypass or block valves.

Before You Begin:

- Read Safety Caution (Page 2).
- Use safe work practices and lock out procedures.
- Disconnect supply lines (air or gas), electric power, or control signal to the actuator. Sudden movement of actuator can cause damage or injury, make sure actuator will not operate.
- Vent any pneumatic actuator loading pressure and relieve any actuator spring preload if present.
- Relieve process pressure and drain the process fluid from up and down stream of valve.
- Be aware of potentially hazardous process material that may be present in-line and in-valve. Isolate the valve from process pressure. Use a bypass or block valve if necessary, or completely shut off the process.

Inspection Steps:

- 1 Check for visible signs of leakage around all seal and gasket areas.
- 2 Check the valve for damage, especially damage caused by corrosive fumes or process drippings.
- 3 Clean and repaint the areas as required.
- 4 Ensure all accessories, mounting brackets, and fasteners are secure.
- 5 Clean any dirt and foreign material from the valve stem (Key 5).



ACTUATOR REMOVAL

Note: Actuator removal does not require that the valve be removed from the pipeline.

Tools Needed:

- Properly Rated Lifting Straps or Chains
- Lifting Device (Example: Crane)
- Hammer and Blunted Chisel

Before You Begin:

- Read Safety Caution (Page 2).
- Use safe work practices and lock out procedures.
- Disconnect supply lines (air or gas), electric power, or control signal to the actuator. Sudden movement of actuator can cause damage or injury, make sure actuator will not operate.
- Vent any pneumatic actuator loading pressure and relieve any actuator spring preload if present.

- 1 Refer to the appropriate actuator instruction manual for more information regarding the actuator being removed.
- 2 If the valve has been removed from the pipeline, place the valve assembly on a flat work surface that can support the weight.
- 3 Before the actuator is removed, support the actuator using lifting hooks or straps rated to support the weight of the actuator.
- 4 If the actuator is a spring and diaphragm actuator, determine if that actuator is fail open or fail closed. Fail closed actuators will need to be energized to remove downward force from the stem connector. Connect a supply line to the inlet port of the actuator, be sure not to exceed the maximum casing pressure. Refer to Figure 3 for recommended needle valve and gauge setup.
- 5 Remove the stem connector (Refer to Figure 5).
- 6 Use a blunted heavy chisel to loosen the yoke nut (Key 44). Unscrew the yoke nut and remove the actuator from the valve. If the actuator was energize during removal, de-energize the actuator (Refer to Figure 4).
- 7 Remove the jam nut and hex nut (Keys 42 & 43) and travel indicator from the valve stem (Key 5).

Figure 3 Needle Valve with Gauge setup



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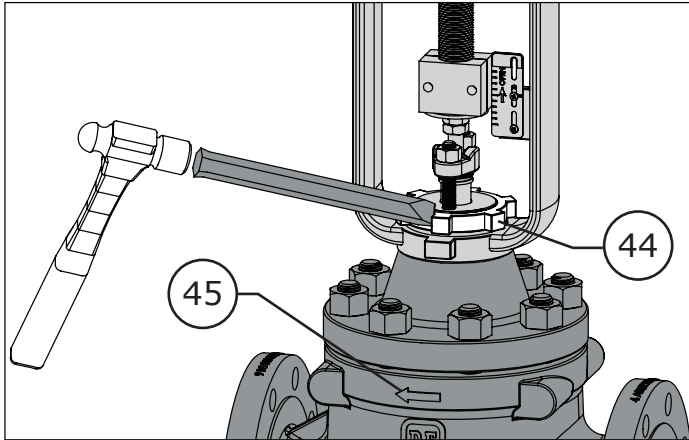


Figure 4 Yoke Nut being loosened with a Chisel

MAINTENANCE

Note: Seals, soft parts, and packing (including live loaded packing) should all be inspected frequently for leaks, wear and damage. Maintenance to the valve can be performed while the valve is still in-line, the actuator must be removed to replace packing (Refer to Page 6 for Actuator Removal instructions).

Before you begin:

- Read Safety Caution (Page 2).
- Determine if valve has standard or live loaded packing (Refer to Figures 27, 29, 30 & 31).
- Follow Steps 1 – 6 of Before You Begin from PERIODIC INSPECTION (Page 7).

Packing Maintenance

If the packing is leaking, proper tightening of the packing may correct the leak. If re-tightening the packing to the proper specifications does not stop the leakage it is possible that the stem or wall of the packing box is damaged. Replace or repair parts as necessary. For instructions on packing removal only, refer to the Disassembly, Packing Removal section on Page 9.

- 1 Determine the type of packing installed in the valve. Refer to Figures 27, 29, 30, and 31 for packing styles.

For Single PTFE V-Ring Packing (Spring-Loaded):

Tighten the packing nuts (Key 38) evenly in an alternating pattern until the shoulder of the packing follower (Key 35) makes contact with the top face of the bonnet (Key 26). Proceed to tighten the packing nuts to the torque specification listed in Table 6. Refer to Figure 27.

For Double PTFE V-Ring and Graphite Packing:

Tighten the packing nuts (Key 38) evenly in an alternating pattern to the minimum recommended torque specifications listed in Table 6 on Page 30, continue tightening until leakage stops or the maximum torque specification is reached. If leakage continues after reaching the maximum recommended torque the packing will need to be replaced, do not tighten the packing past the maximum recommended torque as this will cause excessive packing friction.

For Live-Loaded Packing:

Refer to the Sliding Stem Live-Loaded Packing Manual (P-LLPS) for proper maintenance procedures.

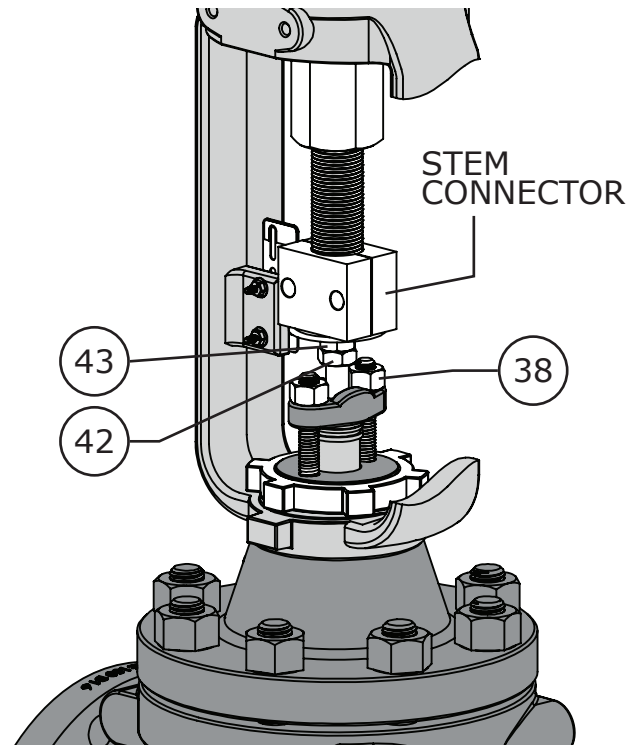


Figure 5 Packing Nut and Stem Connector Detail

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DISASSEMBLY

Before You Begin:

- Read Safety Caution (Page 2).
- Use safe work practices and lock out procedures.
- Remove the actuator from the valve (Refer to Actuator Removal Instructions, Page 7).
- Relieve process pressure and drain the process fluid from up and down stream of valve.
- Be aware of potentially hazardous process material that may be present in-line and in-valve. Isolate the valve from process pressure. Use a bypass or block valve if necessary, or completely shut off the process.
- For Angle Body Valves refer to Figure 34.

PACKING REMOVAL

For Live Loaded Packing refer to Figure 31 and the Live Loaded Sliding Stem Packing Manual (P-LLPS).

Special Tools Required:

- Mechanics Pick Set

NOTE: Packing box parts are easier to remove after the bonnet (Key 26) has been separated from the valve body (Key 1) and the valve stem (Key 5) has been removed. If the packing is all that needs to be removed, it is possible to extract packing box parts carefully using a mechanics pick set.

WARNING: Process medium and pressure may become stored in the packing, use caution when removing packing parts.

- 1 Remove the packing nuts (Key 38).
- 2 Remove the upper wiper (Key 36) if present, graphite packing does not include an upper wiper.
- 3 Remove the packing follower (Key 35).
- 4 It is recommended to proceed to the Bonnet Removal section to continue with valve disassembly. If the packing is all that needs to be removed, remove the contents of the packing box (Keys 30, 31, 32, 33, & 34) using a mechanics pick set being careful not to damage the valve stem (Key 5) or wall of the packing box of the bonnet (Key 26). For packing reassembly refer to Packing Installation section (Page 21).

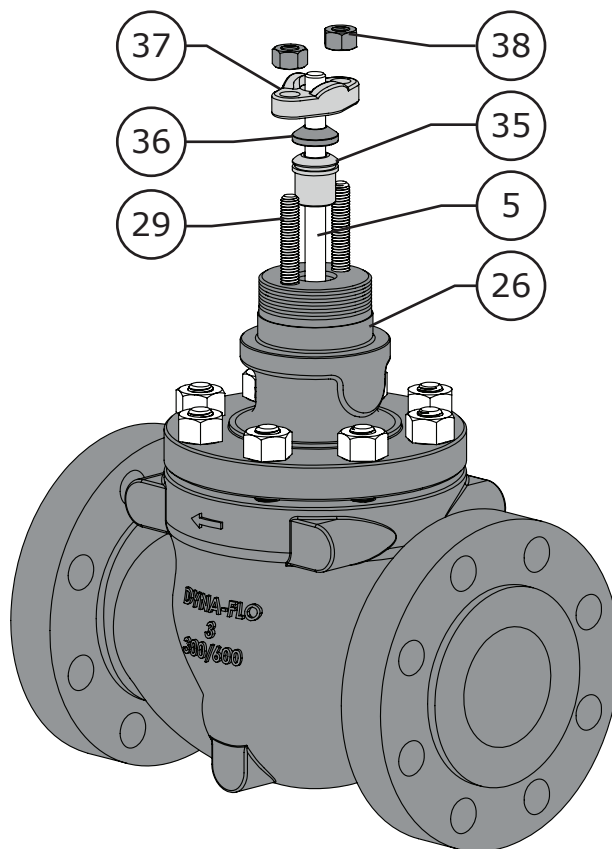


Figure 6 Packing Removal (Steps 1 - 3)

BONNET REMOVAL

WARNING: Process medium and pressure may be trapped inside the valve body (Key 1). Use caution when removing the valve bonnet (Key 26). Refer to Safety Caution on Page 2.

- 1 Loosen the bonnet nuts (Key 28) 1 full turn after the contact between the nuts and the top surface of the bonnet (Key 26) has been broken. Do not remove the bonnet nuts until any trapped process pressure has been vented. Refer to Figure 7.
- 2 Break the contact between the valve body (Key 1) and the bonnet (Key 26), use a pry bar or blunt chisel to help with the separation if necessary.



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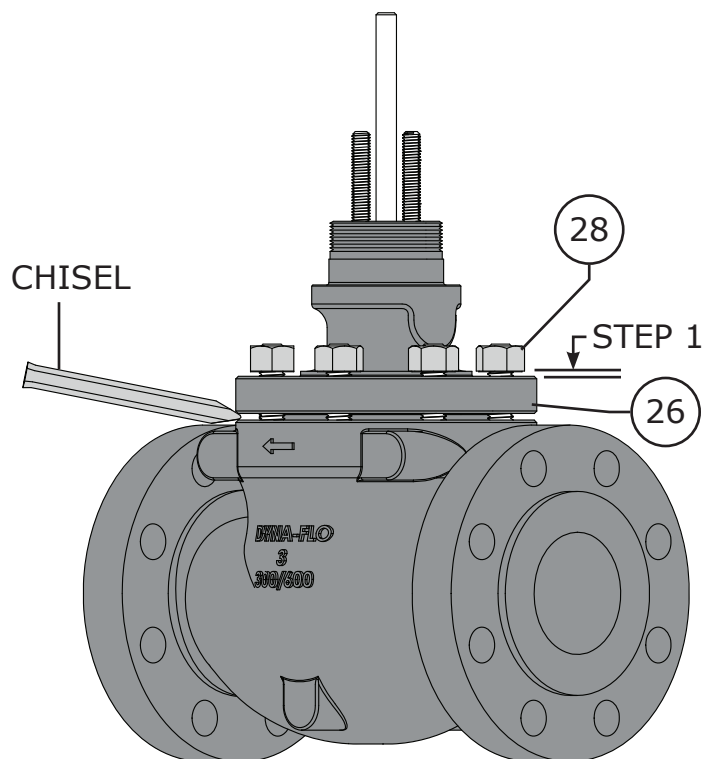


Figure 7 Bonnet Removal (Steps 1 - 2)

DISASSEMBLY (Continued)

BONNET REMOVAL (Continued)

- 3** If no process fluid or gas escapes from the body-to-bonnet joint proceed by completely removing the bonnet nuts (Key 28). Refer to Figure 8.
- 4** Carefully lift the bonnet (Key 26) from the valve body (Key 1), be sure that the valve stem (Key 5) and plug (Key 3) assembly do not drop from the bonnet and get damaged. Also, if the valve plug and stem assembly begin to lift when lifting the bonnet, it may be necessary to gently tap the stem from the bonnet using a rubber mallet as the bonnet is being lifted.
- 5** The bonnet gasket (Key 22) may stick to the bonnet during removal. Remove the bonnet gasket.

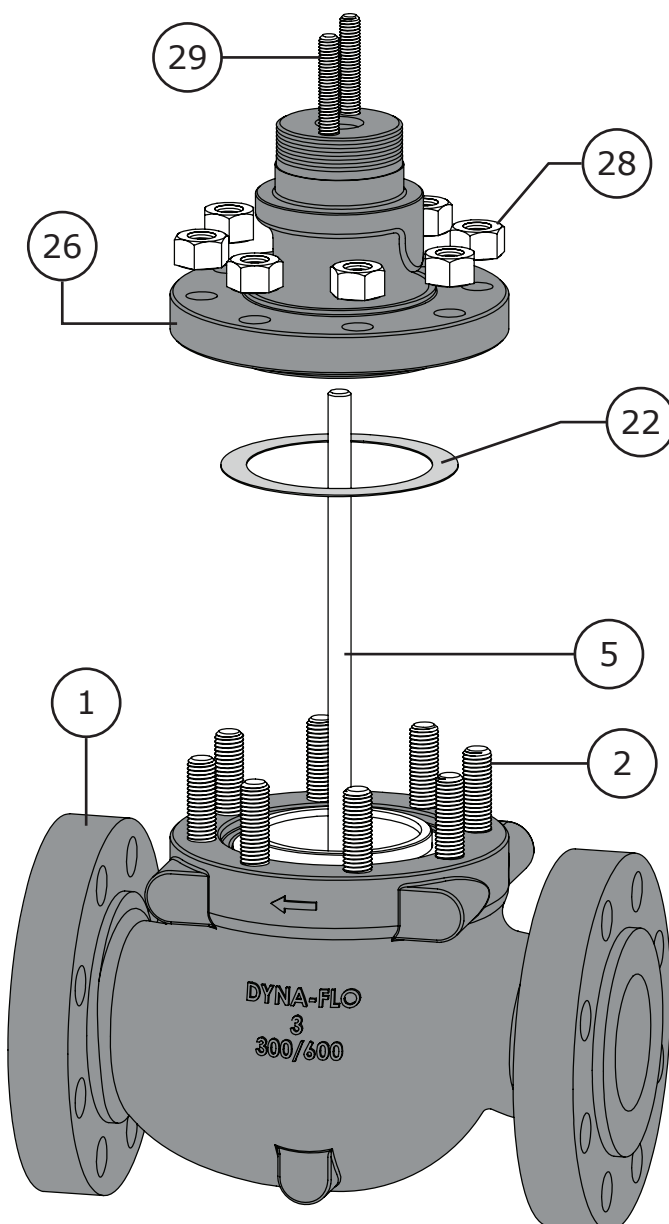


Figure 8 Bonnet Removal (Steps 3 - 4)

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DISASSEMBLY (Continued)

TRIM PARTS REMOVAL

For Reduced Trim:

- A** Remove the cage adapter ring (Key 24). Refer to Figure 37. **NOTE:** 6x4 inch valve do not use a cage adapter.
- B** Remove the cage adapter gasket (Key 25), metal shim (Key 21), and spiral wound gasket (Key 20).

For 8 inch valve assemblies:

- A** Remove the load ring (Key 23). Refer to Figure 38.
- 1** Remove the metal shim (Key 21) and spiral wound gasket (Key 20) if they haven't already been removed. Refer to Figure 9.
- 2** Remove the valve stem (Key 5) / valve plug (Key 3) assembly from the valve body (Key 1), refer to Figure 9. Refer to Plug Seal Removal section for disassembly instructions.
- 3** Carefully remove the cage (Key 19).
- 4** Remove the seat ring (Key 15) and seat ring gasket (Key 12). **For Soft Seat valves:** Remove the disk retainer (Key 18), PTFE disk (Key 17), disk seat (Key 16), and seat ring gasket (Key 12). Refer to Figure 38.
- 5 For Reduced Trim:** Remove the seat ring adapter (Key 13) and seat ring adapter gasket (Key 14). Refer to Figure 37. **NOTE:** 6x4 inch valves do not use a seat ring adapter.
- 6** Clean and inspect all parts for damage, especially gasket seal surfaces. Replace all damaged parts and gaskets with new parts as necessary, gaskets cannot be reused.

PACKING PARTS REMOVAL

WARNING: Compressed gasses could be trapped between packing rings.

NOTE: For Live Loaded Packing refer to Figure 31 and the Live Loaded Sliding Stem Packing Manual (P-LLPS).

- 1** Using a blunt or rounded tool or rod, carefully tap the packing parts (Keys 30, 31, 32, 33, and 34) out of the packing bore of the bonnet (Key 26). A mechanic's pick set can also be used to pull packing parts from the bore. For other packing arrangements, refer to Figures 29 to 31.

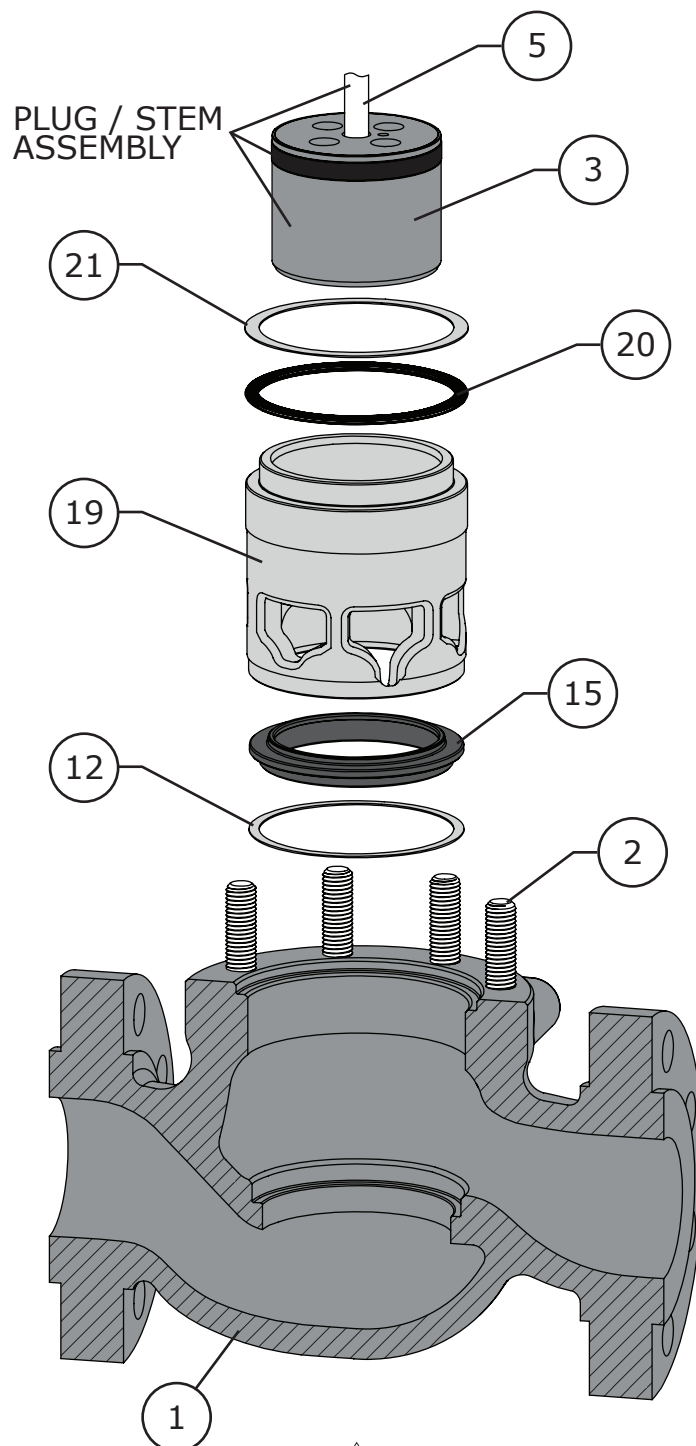


Figure 9 Standard Trim Parts Removal (Steps 1 - 6)



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DISASSEMBLY (Continued)

PACKING PARTS REMOVAL (Continued)

- 2 Clean and inspect the bonnet for damage, pay particular attention to the packing bore surface and the gasket sealing surface. Replace or repair the bonnet as necessary. Metal packing parts can be reused if they are not damaged, all other packing parts should be replaced.

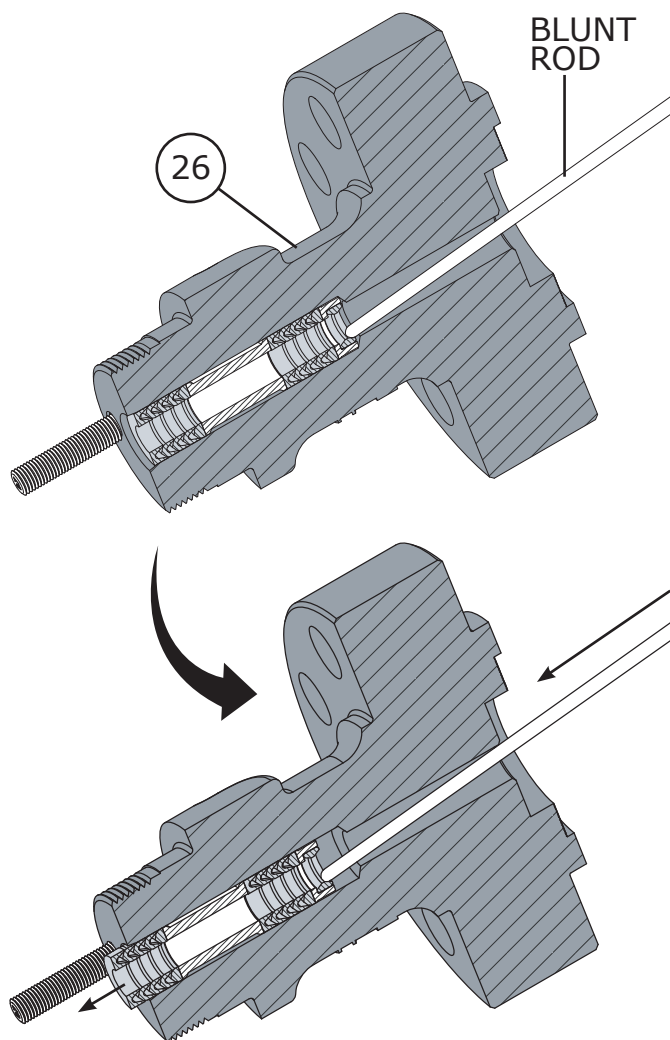


Figure 10 Packing Parts Removal (Step 1)

PLUG SEAL REMOVAL

For Model 360 Two-Piece Plug Seal Ring Assemblies:

- 1 Carefully remove the seal ring (Key 7) from the plug groove, a pick set or flat screw driver may be required. Refer to Figure 11.
- 2 Carefully remove the backup ring (Key 6) from the plug groove, a pick set or flat screw driver may be required.

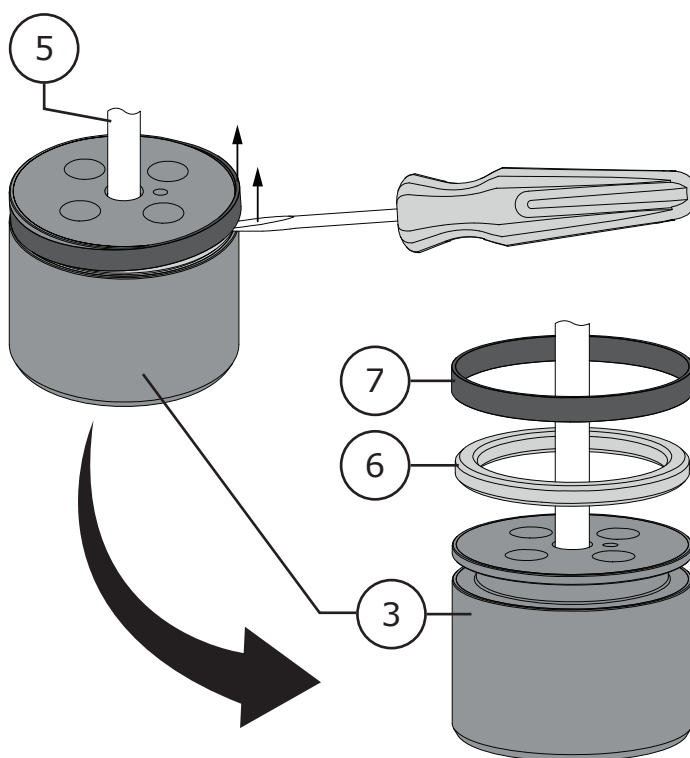


Figure 11 Two-Piece Plug Seal Ring Removal (Model 360)

For Model 360 Three-Piece Seal Ring Assemblies:

NOTE: 8 inch valve assemblies have only one-piece plug seals, they only use a seal ring (Key 8).

- 1 Carefully remove the retaining ring (Key 10) from the plug groove, a pick set or flat screw driver may be required. Refer to Figure 12.
- 2 Remove the backup ring (Key 9).
- 3 Remove the seal ring (Key 8).

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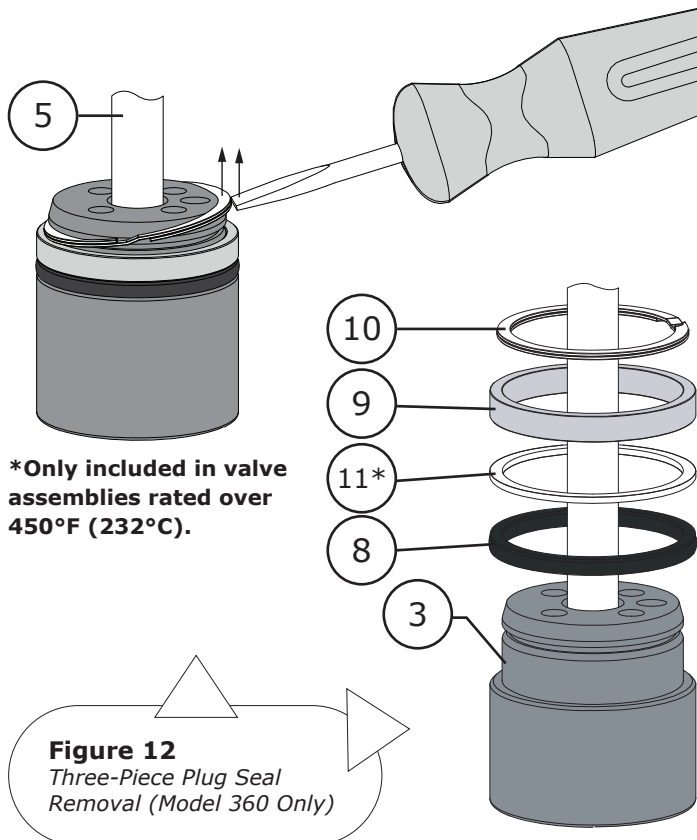


Figure 12
Three-Piece Plug Seal
Removal (Model 360 Only)

DISASSEMBLY (Continued)

PLUG SEAL REMOVAL (Continued)

For Model 360 Three-Piece Plug Seal Ring Assemblies with Anti-Extrusion Rings:

- 1 Carefully remove the retaining ring (Key 10) from the plug, a pick set or flat screw driver may be required to pry the spiral rings of the retaining ring apart to assist removal. Refer to Figure 12.
- 2 Remove the backup ring (Key 9).
- 3 Remove the anti-extrusion ring (Key 11). The anti-extrusion ring is only included in valve assemblies rated for over 450°F (232°C).
- 4 Remove the seal ring (Key 8).

For Model 361 Valves (Refer to Figure 13):

- 1 Remove the piston rings (Key 48). **NOTE:** Piston rings are broken in half and can be easily pulled apart.

For All Models:

Clean and inspect all parts for damage, especially the stem (Key 5) and plug (Key 3) surfaces. Minor scratches can be buffed or lapped out, major scratches (scratches that will stop a finger nail) will need to be machined or replaced. Replace all damaged parts and soft parts with new parts.

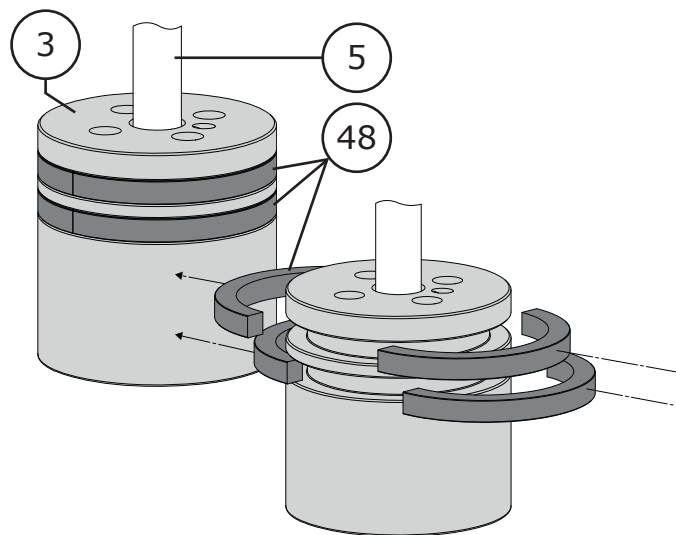


Figure 13 Model 361 Piston Ring Removal

LAPPING

Expect a certain amount of leakage in valves with metal seats. In some cases where leakage has become excessive, lapping can improve sealing performance. Before performing the lapping process, insure all trim parts have been thoroughly cleaned and are free of debris. Do not lap soft seat valves.

NOTE: Spiral wound gaskets (Key 20) make their seal by being crushed and cannot be reused, this includes gaskets required to be used during the lapping process. It may be desirable to use an already crushed gasket in the lapping process to be replaced with new gaskets during reassembly.

CAUTION: Once lapping has been performed with a previously crushed gasket, it is important to mark the position and alignment of all trim parts (Keys 3, 15, and 19) before removal and reassembly. If trim parts are reassembled out of their lapped alignment excessive leakage may result.



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LAPPING (Continued)

Special Tools Required:

- Soft felt marker
- Two wrenches that will slide over the valve stem (Key 5)
- 400 – 600 grit (fine grit) Loctite® Clover® compound (Key D)

Lapping Procedure

- 1 Install the used seat ring gasket (Key 12) into the valve body (Key 1).
- 2 Install the seat ring (Key 15). Mark the position of seat ring using the marker.
- 3 Install the cage (Key 19). Mark the position of cage using the marker.
- 4 Do not install any plug seals into the valve plug (Key 3). Apply fine grit Clover® compound to the seating surface of the valve plug. Install the valve plug / stem assembly (Keys 3, 4, 5) into the valve. Mark the position of the plug / stem assembly using the marker.
- 5 Install used bonnet gaskets (Keys 20, 21, & 22).
- 6 Carefully lift the bonnet (Key 26) into place and secure the bonnet using half of the bonnet nuts (Key 28). Mark the position of the valve plug (Key 3) on the bonnet (Key 26) using the marker.
- 7 Install the packing follower (Key 35).
- 8 Install the jam nut (Key 42) on to the valve stem (Key 5) and build a handle as shown in Figure 14 and 16 using the two wrenches and the hex nut (Key 43).
- 9 Rotate the valve plug (Key 3) back and forth about a quarter of a full rotation (only a small amount of movement is required, do not make full rotations) over the seat ring (Key 15) using the wrench handles.
- 10 If a seat leak test is to be performed after lapping to test valve shut off, disassemble the lapping setup after a few cycles of back and forth plug movement. Replace the used gaskets (Keys 12, 20, 21, & 22) with new gaskets and reassemble the valve for testing. **NOTE:** Another set of new gaskets will need to be used for the final valve assembly if the lapping procedure needs to be repeated after seat leak testing.

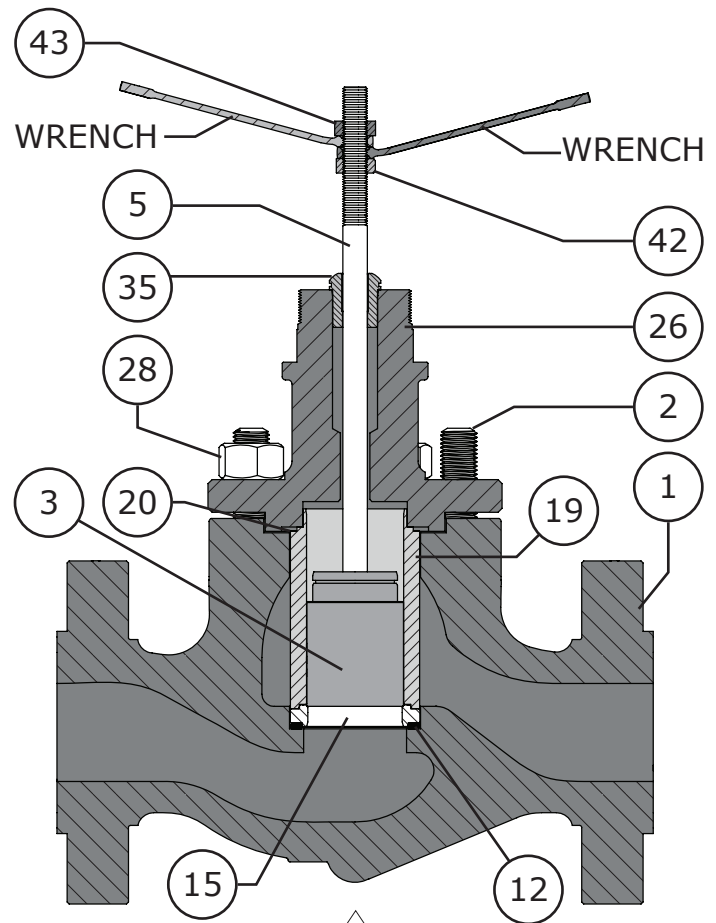


Figure 14 Lapping Procedure Setup (Steps 1 - 8)

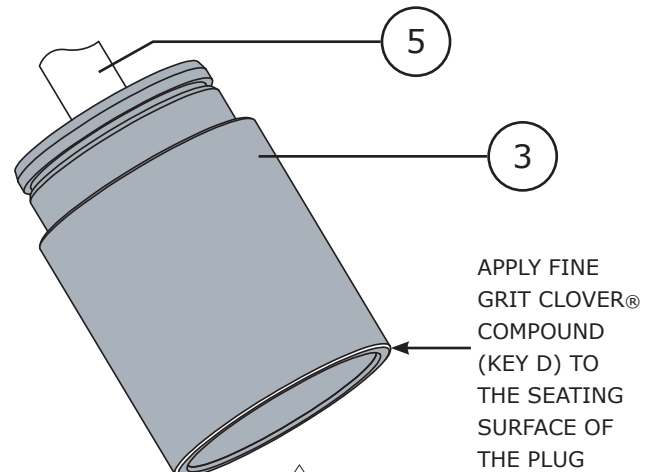


Figure 15 Lapping Compound Application

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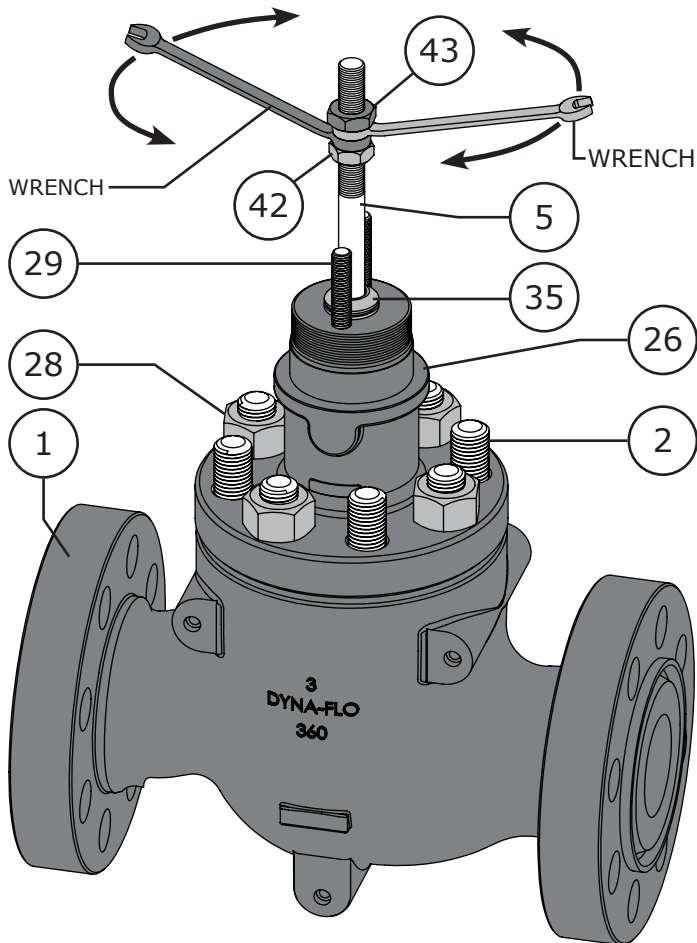


Figure 16 Lapping Procedure Setup (Steps 8 - 10)

ASSEMBLY

Before You Begin:

- Read Safety Caution (Page 2).
- Use safe work practices and lock out procedures.
- Clean and inspect all parts.
- Replace or repair damaged parts. Replace all soft parts (Seals, o-rings, gaskets, live loaded packing).

Lubricants Required:

- Permatex® Nickel Anti-Seize or equivalent (Key A)
- Dow Corning Molykote® 111 or equivalent (Key B)
- Lubriplate® No. 105 Grease or equivalent (Key C)

STUD INSTALLATION

- 1 If the studs (Key 2) were replaced, removed, or never installed, apply nickel anti-seize (Key A) to the threads of the end of the stud without a material stamp.
- 2 Thread the studs (Key 2) into the valve body (Key 1) nickel anti-seize coated end first, until they are completely threaded into the valve body.

PLUG SEAL ASSEMBLY

For Model 360 Two-Piece Plug Seal Ring Assemblies:

Note: Two-piece seals are not available for 8 inch valves.

- 1 Apply Lubriplate® No. 105 (Key C) to the surface of the backup ring (Key 6).
- 2 Carefully slide the backup ring (Key 6) over the top of the valve plug (Key 3) and into the groove. Refer to Figure 17.
- 3 Apply Lubriplate® No. 105 (Key C) to the seal ring (Key 7). Carefully slide the seal ring over the top edge of the valve plug (Key 3) and into the groove, refer to Figure 17.
- 4 Allow time for the seal ring (Key 7) to shrink back to its original size after installation.
- 5 Before installing the plug/stem assembly into the valve, apply Lubriplate® No. 105 (Key C) to the outside surface of the plug (Key 3) as shown in Figure 17.

For Model 360 Three-Piece Plug Seal Ring Assemblies:

- 1 Apply Lubriplate® No. 105 (Key C) to the surface of the seal ring (Key 8).
- 2 Install the seal ring (Key 8) onto the valve plug (Key 3), refer to Figure 18 for proper seal ring orientation. **NOTE:** 8 inch valves are technically one-piece plug seals, 8 inch valve assemblies use a seal ring only and do not make use of a backup ring (Key 9) or retaining ring (Key 10).
- 4 Apply Lubriplate® No. 105 (Key C) to the backup ring (Key 9) and install the backup ring onto the valve plug (Key 3).
- 5 Apply Lubriplate® No. 105 (Key C) to the retaining ring (Key 10) and install the retaining ring into the retaining ring groove on the valve plug (Key 3).
- 6 Allow time for the seal ring material to shrink back to its original size after being stretched over the valve plug before installing the plug assembly into the cage (Key 19).



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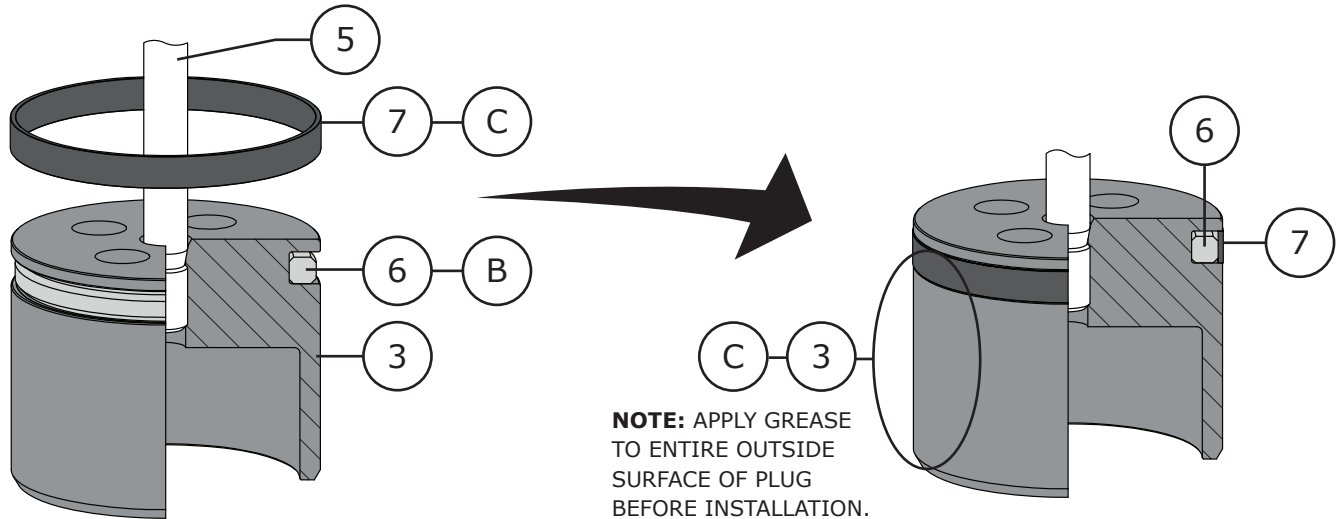


Figure 17 Two-Piece Plug Seal Assembly (Model 360 Only)

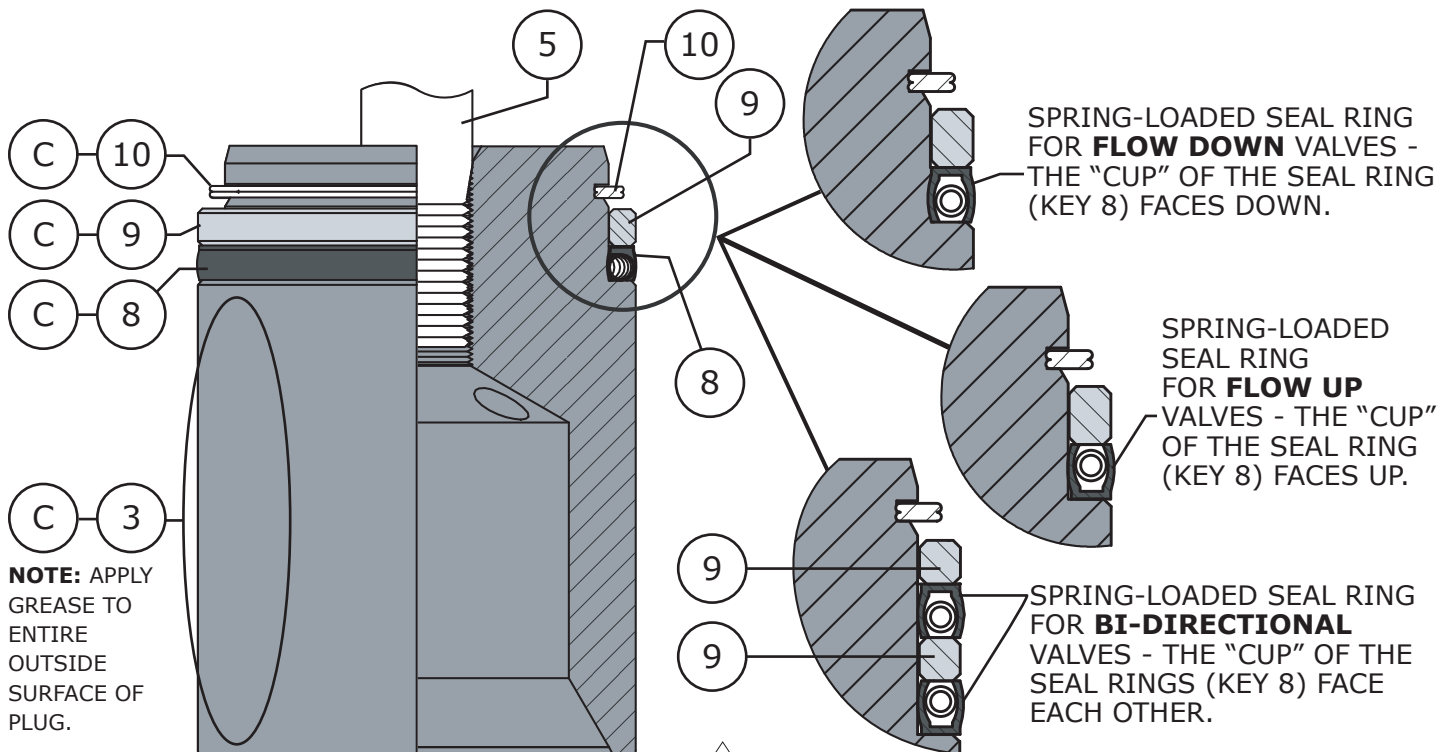


Figure 18 Three-Piece Plug Seal Assembly (Model 360 Only)

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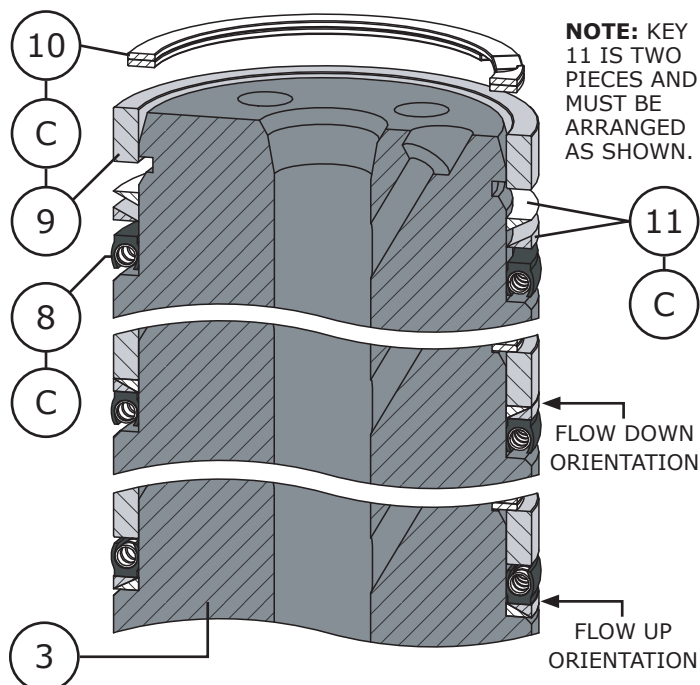


Figure 19 Plug Seal Assembly with Anti-Extrusion Ring

ASSEMBLY (Continued)

PLUG SEAL ASSEMBLY (Continued)

For Model 360 Three-Piece Plug Seal Ring Assemblies with Anti-Extrusion Rings:

- 1 Apply Lubriplate® No. 105 (Key C) to the surface of the seal ring (Key 8).
- 2 Install the seal ring (Key 8) onto the valve plug (Key 3), refer to Figure 18 for proper seal ring orientation. **NOTE:** 8 inch valves are technically one-piece plug seals, 8 inch valve assemblies use a seal ring only and do not make use of a backup ring (Key 9) or retaining ring (Key 10).
- 3 Apply Lubriplate® No. 105 (Key C) to the anti-extrusion ring (Key 11) and install the anti-extrusion ring on to the valve plug as shown in Figure 19. **NOTE:** Anti-extrusion rings are only used for valve assemblies rated to exceed 450°F (232°C).
- 4 Apply Lubriplate® No. 105 (Key C) to the backup ring (Key 9) and install the backup ring onto the valve plug (Key 3).
- 5 Apply Lubriplate® No. 105 (Key C) to the retaining ring (Key 10) and install the retaining ring into the retaining ring groove on the valve plug (Key 3).

- 6 Allow time for the seal ring material to shrink back to its original size after being stretched over the valve plug before installing the plug assembly into the cage (Key 19).

For Model 361 Valves:

NOTE: Replacement piston rings (Key 48) come in one piece. Before installation it is necessary to break the piston ring into two pieces. Do not saw or cut the piston rings. Use caution when breaking piston rings as they can be easily damaged.

Piston Ring Vise Break Method:

Piston rings (Key 48) can be broken into two pieces using a vise with smooth jaws or jaw softeners.

Special Tools Required:

- Vise
- Electrical Tape

- 1 Wrap electrical tape once around the outside diameter of the piston ring (Key 48). Electrical tape will help contain the piston ring while it is being broken. Refer to Figure 21.
- 2 Place the piston ring into the jaws of the vise as shown in Figure 22.
- 3 Slowly compress the piston ring in the vise until the ring snaps on both sides. If one side of the piston ring snaps first, continue compressing the piston ring until the other side snaps as well.

Piston Ring Scoring Break Method:

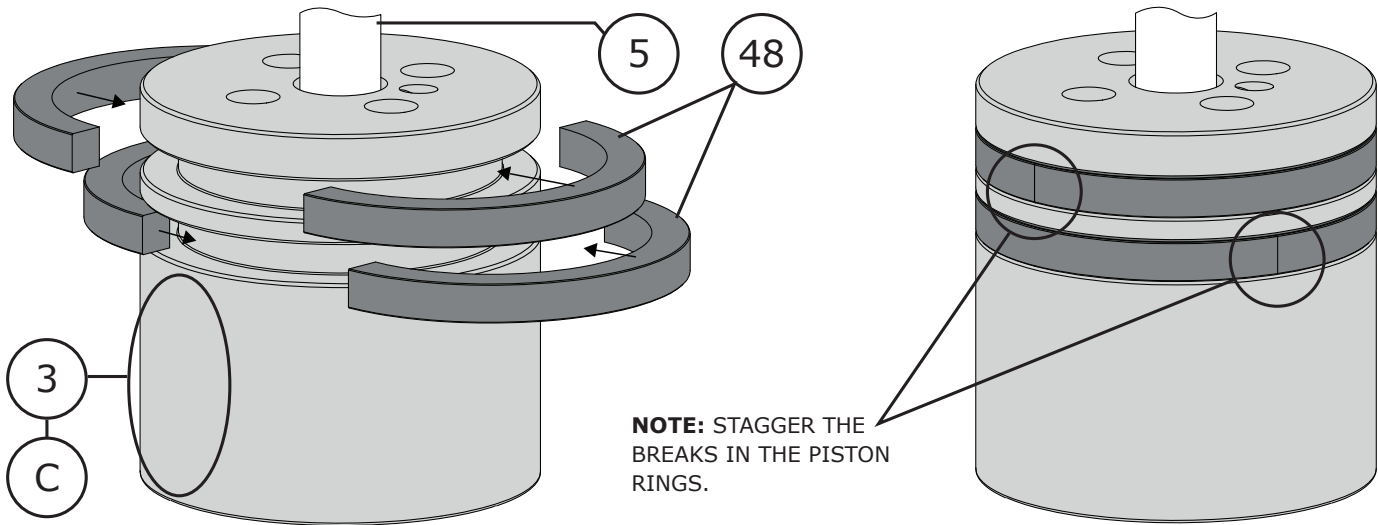
If no vise is available, piston rings (Key 48) can be scored with a knife and broken over a hard surface. Do not saw or cut the piston rings in half.

- 1 Wrap electrical tape once around the outside diameter of the piston ring (Key 48). Electrical tape will help contain the piston ring while it is being broken. Refer to Figure 21.
- 2 Score (do not cut) the top surface of the piston ring.
- 3 Place half of the piston ring over the edge of a hard surface (such as a table edge) so that the score marks are in a parallel line with the edge of the hard surface.
- 4 Apply downward pressure to both sides of the piston ring until it snaps in half.
- 5 Remove the electrical tape. Install each half of the broken piston ring into the piston ring groove in the valve plug (Key 3). Refer to Figure 20.



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NOTE: APPLY GREASE TO ENTIRE OUTSIDE SURFACE OF PLUG.

Figure 20 Model 361 Piston Ring Installation



Figure 21 Model 361 Piston Ring Vise Break Method (Step 1)



Figure 22 Model 361 Piston Ring Vise Break Method (Step 2)

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ASSEMBLY (Continued)

TRIM PARTS ASSEMBLY

NOTE: Spiral wound gaskets (Keys 20) make their seal by being crushed and cannot be reused.

- 1 Apply nickel anti-seize (Key A) to the seat ring pocket of the valve body (Key 1) and top surface of the seat ring gasket (Key 12). Install the seat ring gasket into the valve body (Key 1). Refer to Figure 23.
- 2 **For Reduced Trim:** Install the seat ring adapter (Key 13) into the valve body. Apply nickel anti-seize (Key A) to the top of the seat ring adapter and top of the second seat ring gasket (Key 14) and install it onto the seat ring adapter. Refer to Figure 37. **NOTE:** 6x4 inch reduced trim does not use a seat ring adapter, 6x4 inch valves have a special seat ring (Key 15).
- 3 Install the seat ring (Key 15) into the valve body (Key 1). Refer to Figure 34 for Angle Body valve assemblies.

For Soft Seat Valves: Install the disk seat (Key 16) onto the seat ring gasket (Key 12). Install the PTFE disk (Key 17) onto the disk seat. Install the disk retainer (Key 18) onto the PTFE disk. Refer to Figure 36.
- 4 Install the cage (Key 19). Install the baffle (Key 50) and cage retainer for Low-Noise trim, refer to Figure 35 for Low-Noise trim.
- 5 Apply Lubriplate® No. 105 (Key C) to the side of the valve plug (Key 3) (Refer to Figures 17, 18, & 20). Install the valve plug assembly into the cage (Key 19) (Refer to Figure 23).
- 6 Apply nickel anti-seize (Key A) to the gasket surface of the cage (Key 19) or cage retainer (Key 49) and top surface of the spiral wound gasket (Key 20), metal shim (Key 21), and bonnet gasket (Key 22). Install the gaskets and shim as shown in Figure 23 or 35 for Low-Noise trim.

For Low-Noise Valves: Install the bonnet spacer (Key 26A) as shown in Figure 35. Apply nickel anti-seize (Key A) to the gasket seating surface of the bonnet spacer (Key 26A) and top surface of the bonnet gasket (Key 22) and install. Install the load ring (Key 23).
- For 8 Inch Valves:** Apply nickel anti-seize (Key A) to the gasket seating surface of the valve body (Key 1) and top surface of the bonnet gasket (Key 22) and install. Install the load ring (Key 23). Refer to Figure 38.

- 7 **For Reduced Trim:** Install the cage adapter (Key 24). Apply nickel anti-seize (Key A) to the top of the cage adapter and top surface of the cage adapter gasket (Key 25) and install. Refer to Figure 37. **NOTE:** 6x4 inch reduced trim does not use a cage adapter, 6x4 inch valves have a special cage (Key 19).

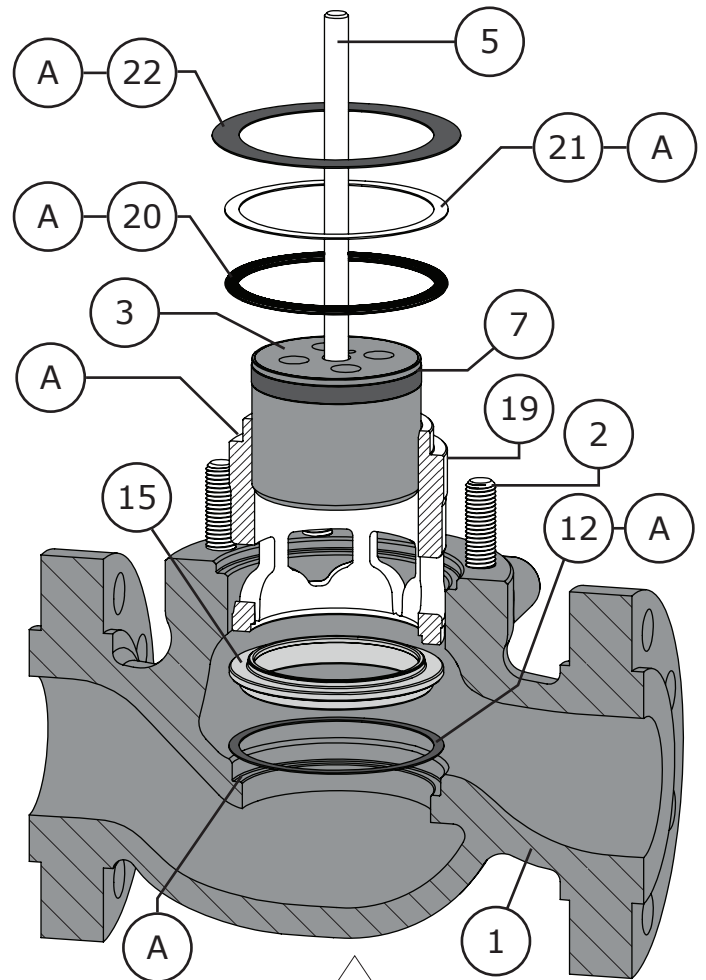


Figure 23 Trim Parts Assembly

BONNET INSTALLATION

Before You Begin:

- Read Safety Caution (Page 2).
- Clean and inspect all parts.
- Replace or repair damaged parts. Replace all soft parts (Seals, o-rings, gaskets, live loaded packing).



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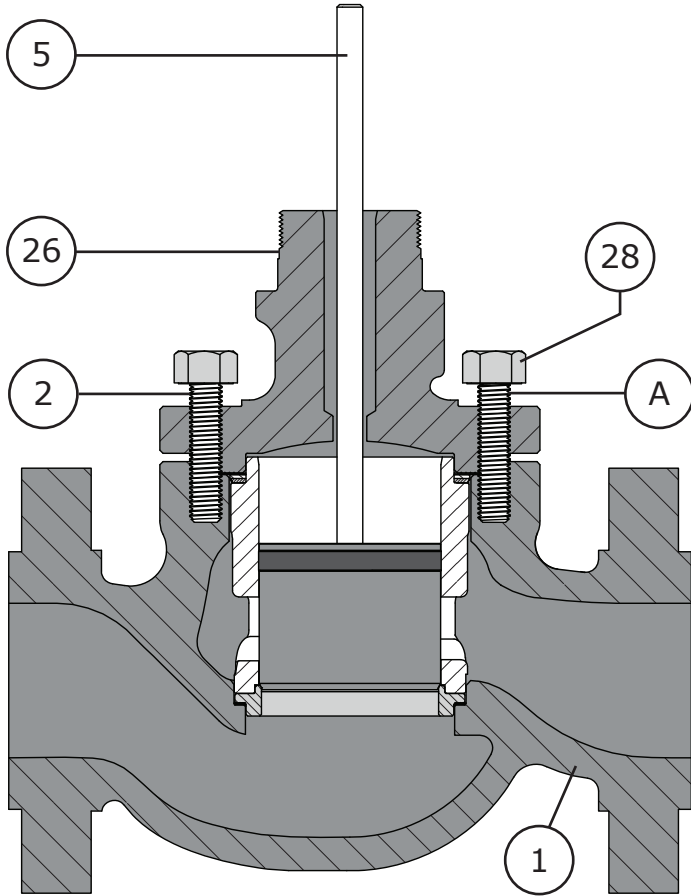


Figure 24 Bonnet Installation

ASSEMBLY (Continued)

BONNET INSTALLATION (Continued)

- 1 Apply nickel anti-seize (Key A) to the gasket sealing surface of the valve bonnet (Key 26).
- 2 Lift and lower the valve bonnet (Key 26) into place over the valve stem (Key 5). Be careful not to damage either the stem, bonnet, or valve body (Key 1).
- 3 Apply nickel anti-seize (Key A) to the threads of the bonnet studs (Key 2). Thread the bonnet nuts (Key 28) onto the bonnet studs until hand tight.
- 4 Stroke the valve a few times to center the valve trim.
- 5 It may help to install the packing follower (Key 22) during bonnet installation to act as a visual cue to indicate areas of over or under tightening. If the packing follower begins to bind or appear lop-sided, this is an indication that torquing procedures in Steps 6 & 7 need to be altered to correct areas that need more tightening or less. The packing follower should remain centered during the torquing process.
- 6 Follow proper body-to-bonnet bolting procedures. Begin to torque the bonnet nuts (Key 28) $\frac{1}{4}$ (25%) of the torque value listed in Table 5, torque the nuts in a crisscross pattern as shown in Figure 25. Hot torquing the valve nuts is not recommended.
- 7 Continue tightening the bonnet nuts (Key 28), increasing the torque by $\frac{1}{4}$ (25%) of the final torque specification each round of tightening while repeating the crisscross pattern until the final torque specification is reached.
- 8 Double check the tightness of all nuts by torquing the nuts to the final torque specification one more time after the final torque value was reached.

SAMPLE BOLT CONFIGURATION

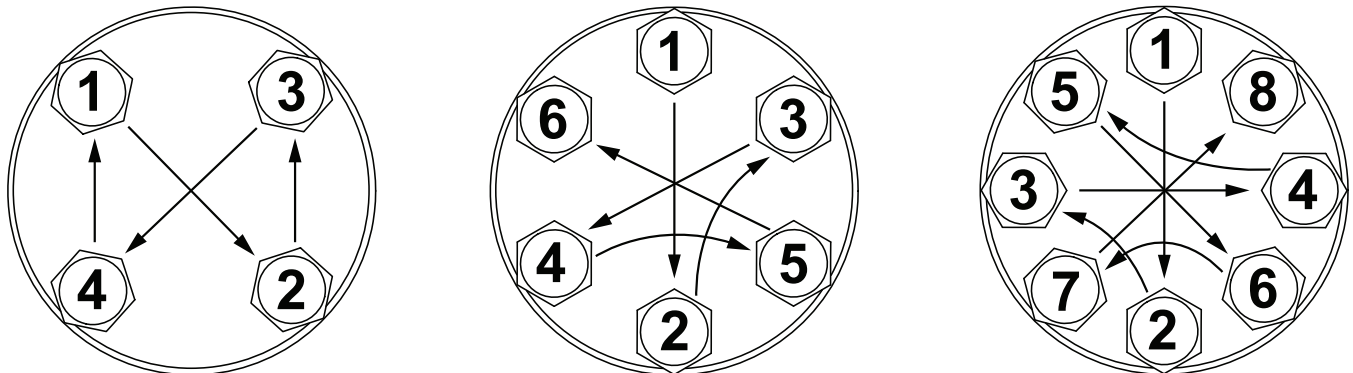


Figure 25 Bolt Tightening Pattern Diagram

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ASSEMBLY (Continued)

PACKING INSTALLATION

For Live Loaded packing instructions see the Live Loaded Sliding Stem Packing Manual (Part Number P-LLPS). For other packing arrangements refer to Figures 27, 29, 30, & 31.

Lubricants Required:

- Permatex® Nickel Anti-Seize or equivalent (Key A)
- Dow Corning Molykote® 111 or equivalent (Key B)
- Lubriplate® No. 105 Grease or equivalent (Key C)

NOTE: To prevent trapping air between packing during installation, it is recommended that packing rings be installed one at a time using the packing follower (Key 35) to push the packing rings in place. Do not force packing rings below the chamfer of the packing bore before adding another ring, packing rings should only be pushed down the thickness of the added ring. Refer to Figure 26.

- 1 If the packing studs (Key 29) were replaced, removed, or never installed, apply nickel anti-seize (Key A) to the threads of the end of the stud without a material stamp.
- 2 Thread the studs (Key 29) into the valve bonnet (Key 26) anti-seize coated end first until they are completely threaded into the bonnet.

For Single Style (Spring-Loaded) Packing:

- 1 Apply Molykote® 111 (Key B) to the lower stem wiper (Key 30). Insert the lower stem wiper into the packing box ring (Key 31). Insert the packing box ring into the packing bore of the valve bonnet (Key 26).
- 2 Install the packing spring (Key 32).
- 3 Install the special washer (Key 33).
- 4 Apply Molykote® 111 (Key B) to the PTFE packing rings (Key 34). Install the packing rings one ring at a time (as shown in Figure 26) in the proper order and orientation as shown in Figure 27. **WARNING:** For oxygen service do not apply Molykote® 111, Molykote® 111 in oxygen service applications can cause an explosion.
- 5 Install the packing follower (Key 35).
- 6 Install the upper stem wiper (Key 36).

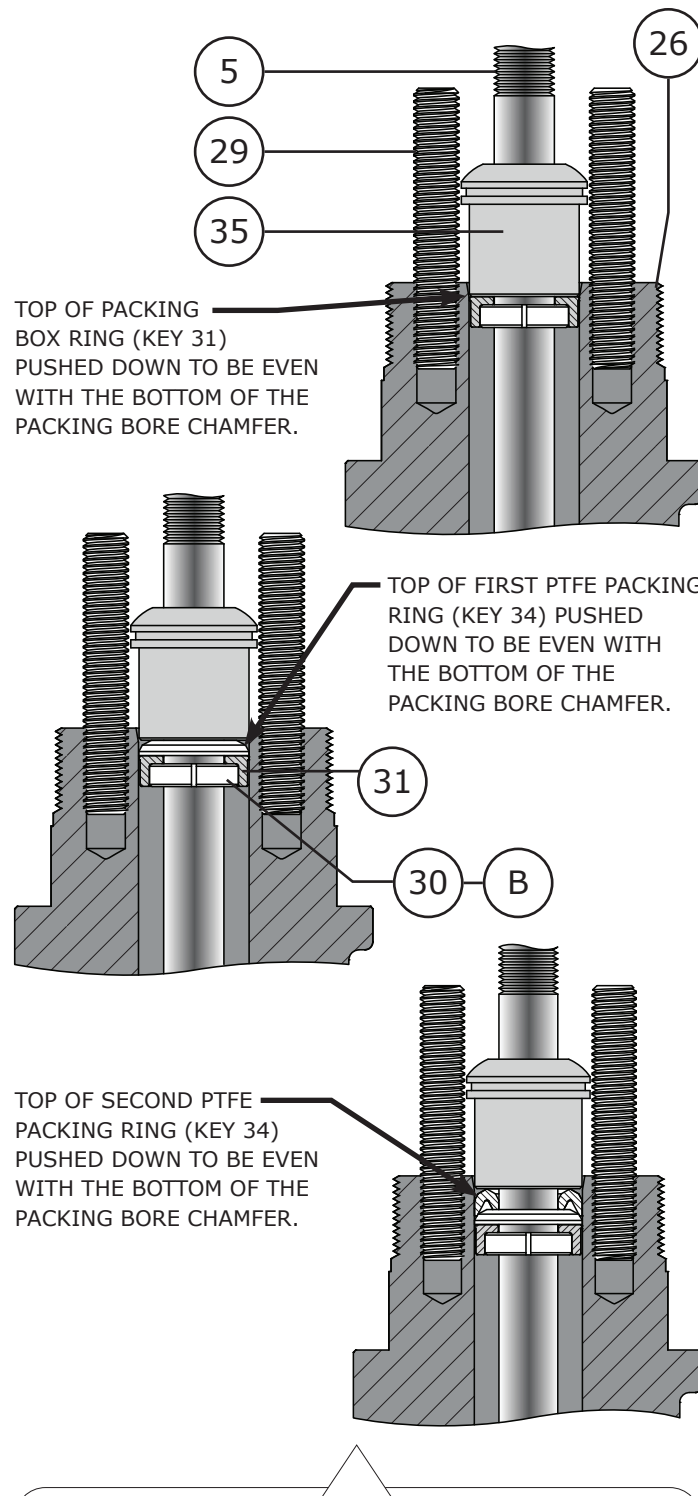
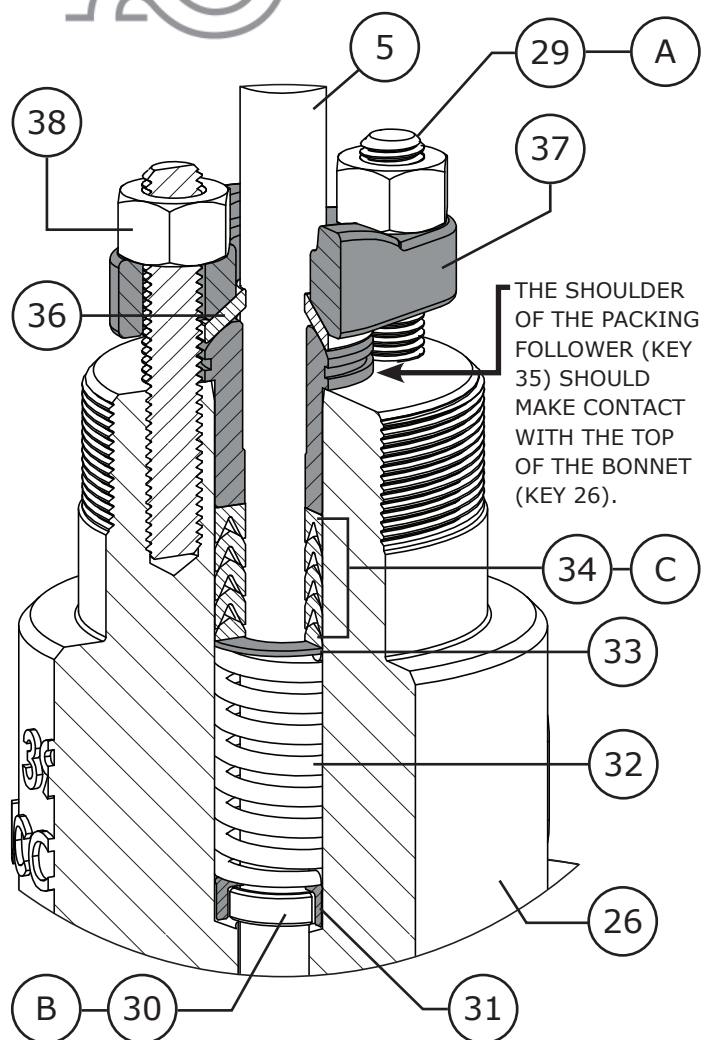


Figure 26 Proper Packing Ring Installation

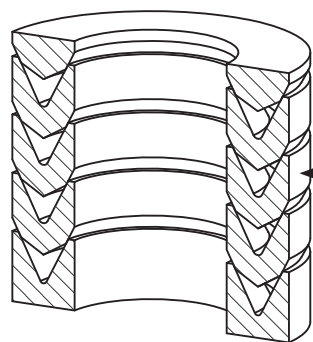


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NOTE: Molykote® 111 (KEY C) SHOULD NOT BE USED WITH OXYGEN SERVICE.



FOR VACUUM PACKING APPLICATIONS, REVERSE THE DIRECTION OF THE CUP OF THE PTFE PACKING RINGS (KEY 34) AS SHOWN.

Figure 27 Single Style Packing Installation Diagram

ASSEMBLY (Continued)

PACKING INSTALLATION (Continued)

For Single Style (Spring-Loaded) Packing (Continued):

- 7 Install the packing flange (Key 35).
- 8 Apply nickel anti-seize (Key A) to the top threads of the packing studs (Key 29). Thread the packing nuts (Key 38) onto the threads of the packing studs, tighten the packing nuts evenly in an alternating pattern until the shoulder of the packing follower (Key 35) makes contact with the bonnet (Key 26). Proceed to tighten the packing nuts to the torque specification listed in Table 6.

For Double Style PTFE Packing:

- 1 Apply Molykote® 111 (Key B) to the lower stem wiper (Key 30). Insert the lower stem wiper into the packing box ring (Key 31). Insert the packing box ring into the packing bore of the valve bonnet (Key 26).
- 2 Apply Molykote® 111 (Key B) to the first set of packing rings (Key 34). Install the packing rings one ring at a time (as shown in Figure 26) in the proper order and orientation as shown in Figure 29. **NOTE:** For 3/8" (9.5 mm) valve stems, remove a packing ring from the middle of the packing set. **WARNING:** For oxygen service do not apply Molykote® 111, Molykote® 111 in oxygen service applications can cause an explosion.
- 3 Install the lantern ring (Key 39).
- 4 Apply Molykote® 111 (Key B) to the second set of packing rings (Key 34). Install the packing rings one ring at a time (as shown in Figure 26) in the proper order and orientation as shown in Figure 29. **WARNING:** For oxygen service do not apply Molykote® 111, Molykote® 111 in oxygen service applications can cause an explosion.
- 5 Install the packing follower (Key 35).
- 6 Install the upper stem wiper (Key 36).
- 7 Install the packing flange (Key 37).
- 8 Apply nickel anti-seize (Key A) to the top threads of the packing studs (Key 29).

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ASSEMBLY (Continued)

PACKING INSTALLATION (Continued)

For Double Style PTFE Packing (Continued):

- 9 Thread the packing nuts (Key 38) onto the threads of the packing studs, tighten the packing nuts evenly in an alternating pattern until one of the packing nuts reaches the minimum torque requirement shown in Table 6. Tighten the remaining packing flange nut until the packing flange (Key 37) becomes level (is parallel with the top face of the bonnet), refer to Figure 28.

For Graphite Packing:

- 1 Install the packing box ring (Key 31).
- 2 Install the first lantern ring (Key 39A).
- 3 Install the second lantern ring (Key 39).
- 4 Install 1 ring of graphite filament (Key 40) as shown in Figure 26. **NOTE:** Graphite filament is a wound material that typically looks like rope and is split.
- 5 Install 1 ring of graphite ribbon (Key 41) as shown in Figure 26. **NOTE:** Graphite ribbon is compressed into rings and not split like the graphite filament.
- 6 Install the remainder of the graphite filament (Key 40) and graphite ribbon (Key 41) one at a time (as shown in Figure 26) in the proper order and orientation as shown in Figure 30.
- 7 Install the packing follower (Key 35).
- 8 Install the packing flange (Key 37).
- 9 Apply nickel anti-seize (Key A) to the top threads of the packing studs (Key 29). Thread the packing nuts (Key 38) onto the threads of the packing studs, tighten the packing nuts evenly in an alternating pattern until the packing nuts reach the maximum recommended torque shown in Table 6. Loosen the packing nuts and retighten them to the minimum recommended torque shown in Table 6.

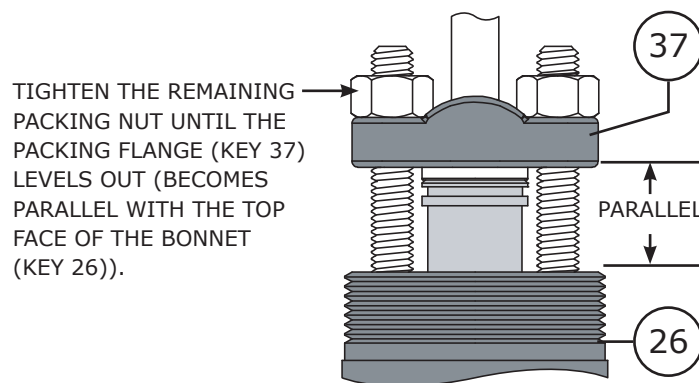
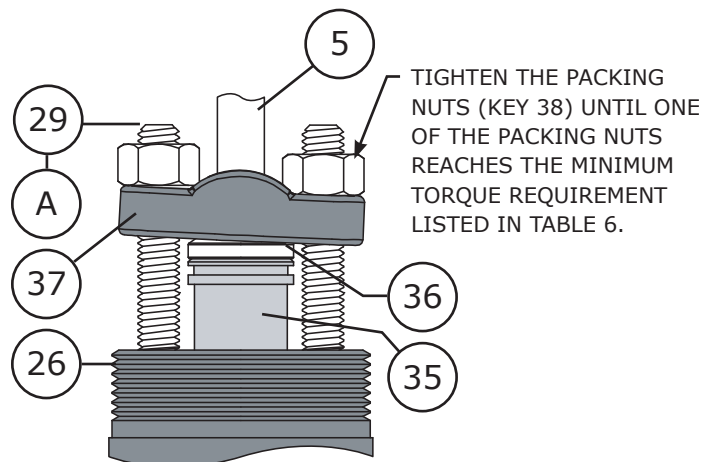


Figure 28 Double PTFE V-Ring Packing Tightening Diagram



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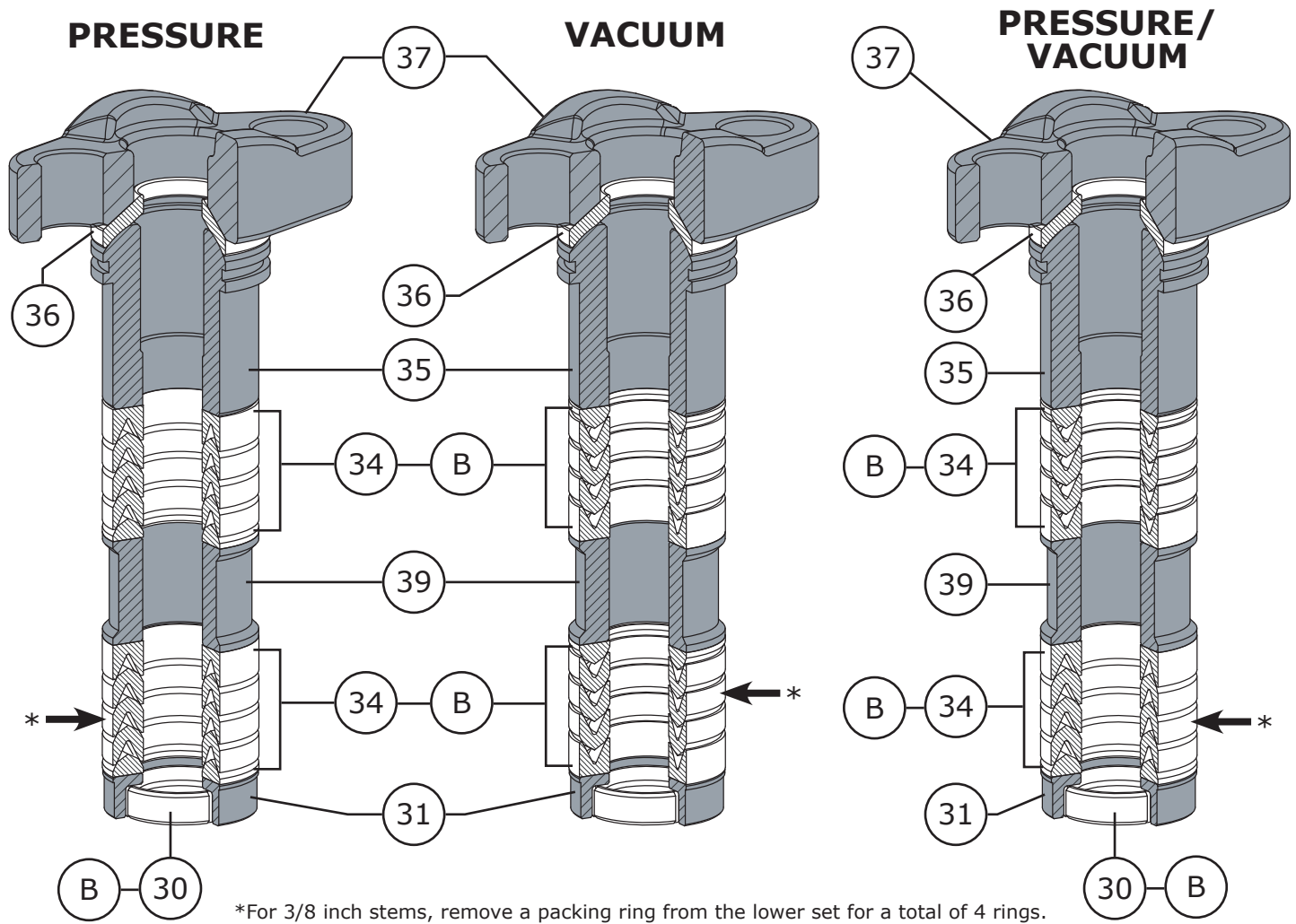


Figure 29 Model 360 Control Valve PTFE Packing Diagrams

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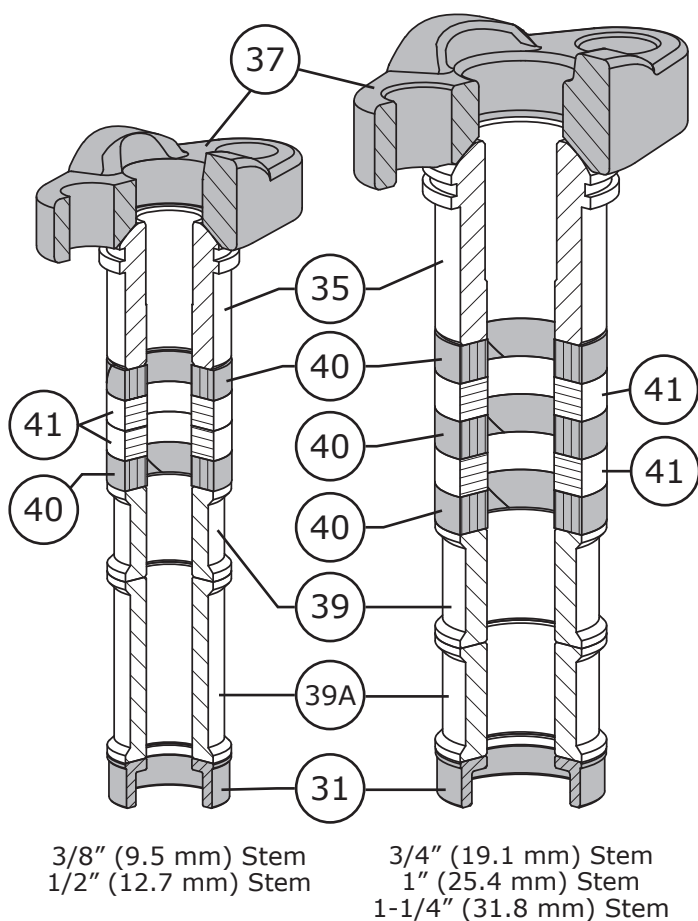


Figure 30 Graphite Packing Arrangement Diagram

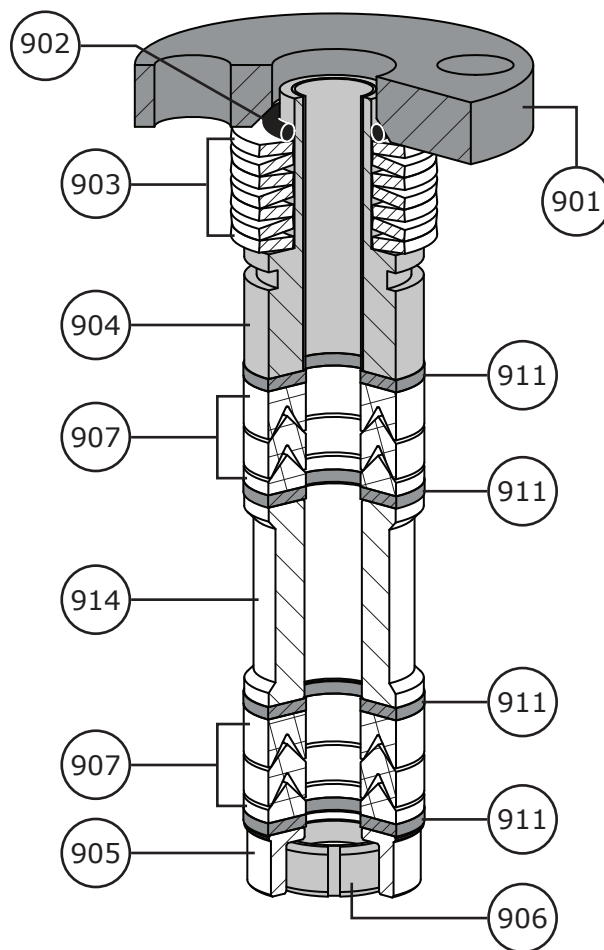


Figure 31 Live Loaded Packing Example



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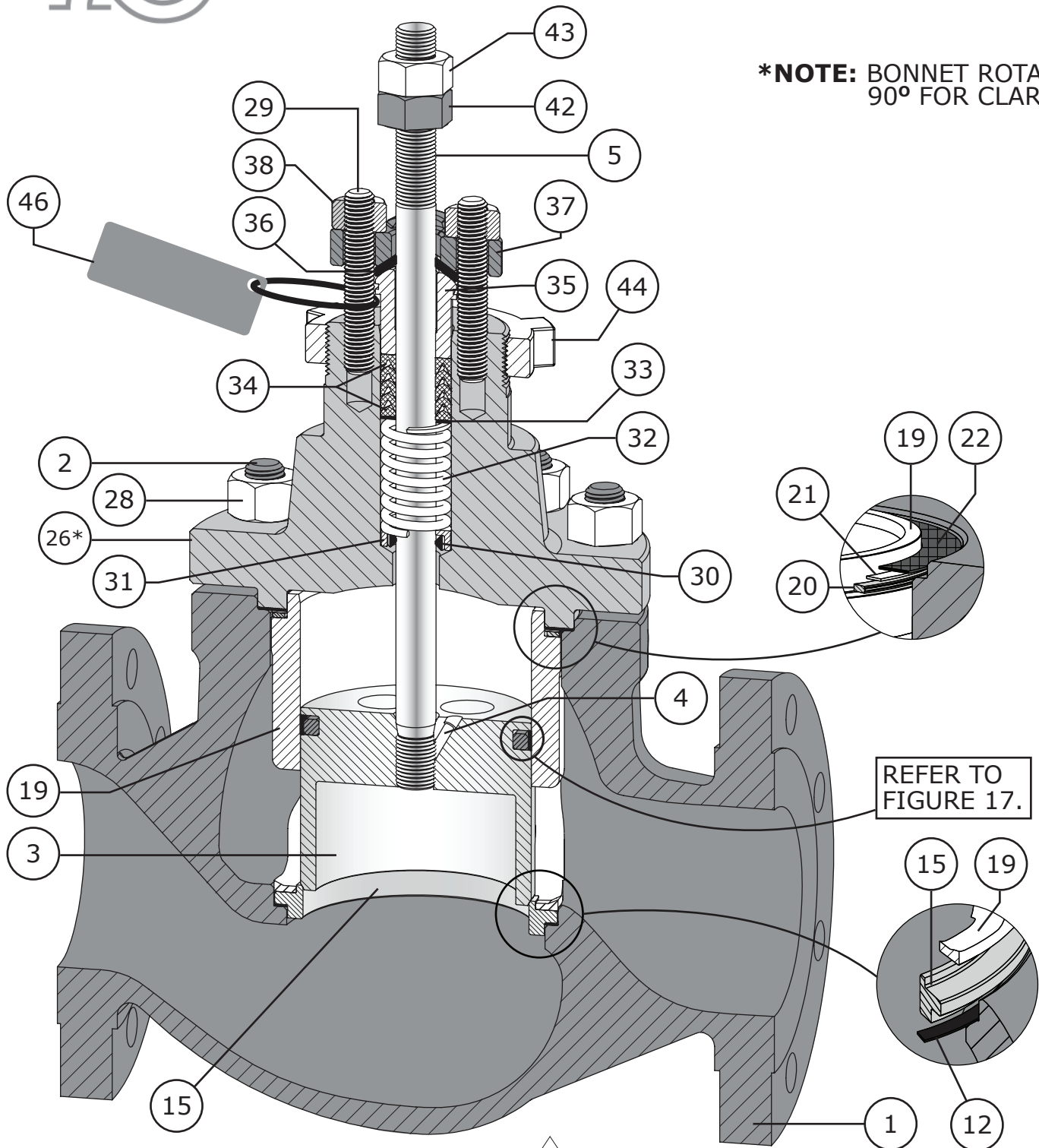


Figure 32 Model 360 Control Valve Cross Section

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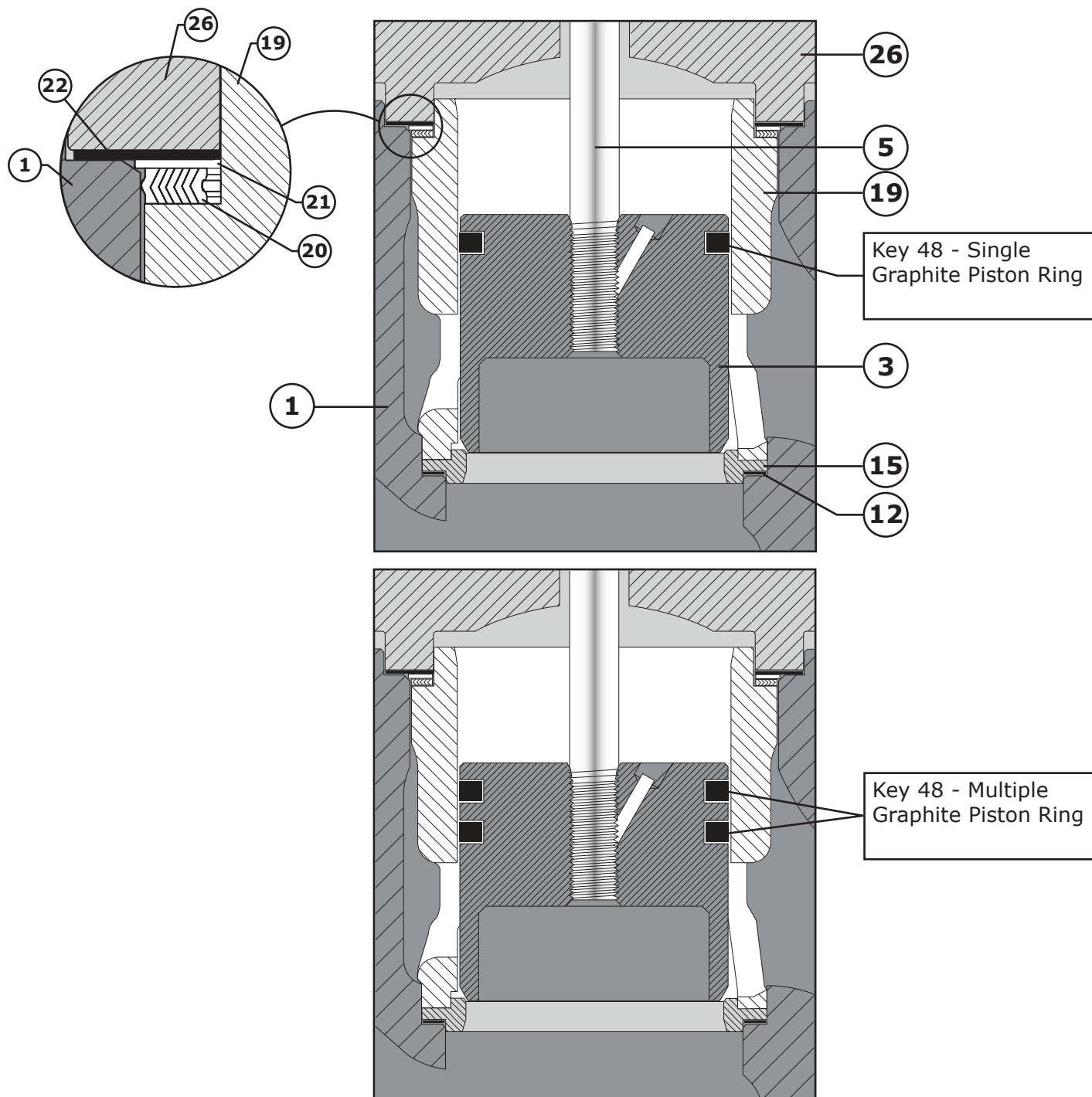


Figure 33 Model 361 Piston Ring Detail



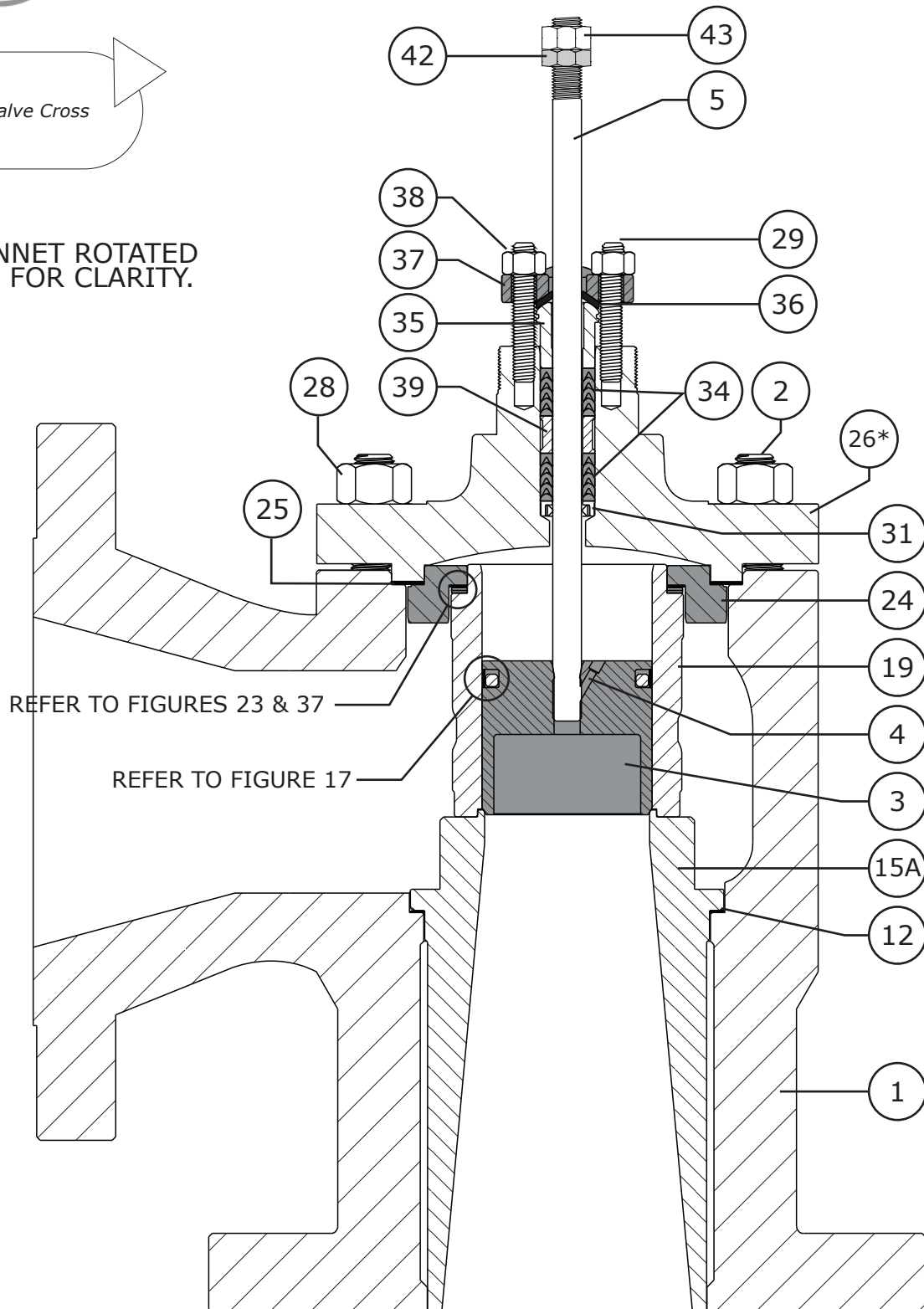
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Figure 34

Angle Body Valve Cross Section

***NOTE:** BONNET ROTATED 90° FOR CLARITY.



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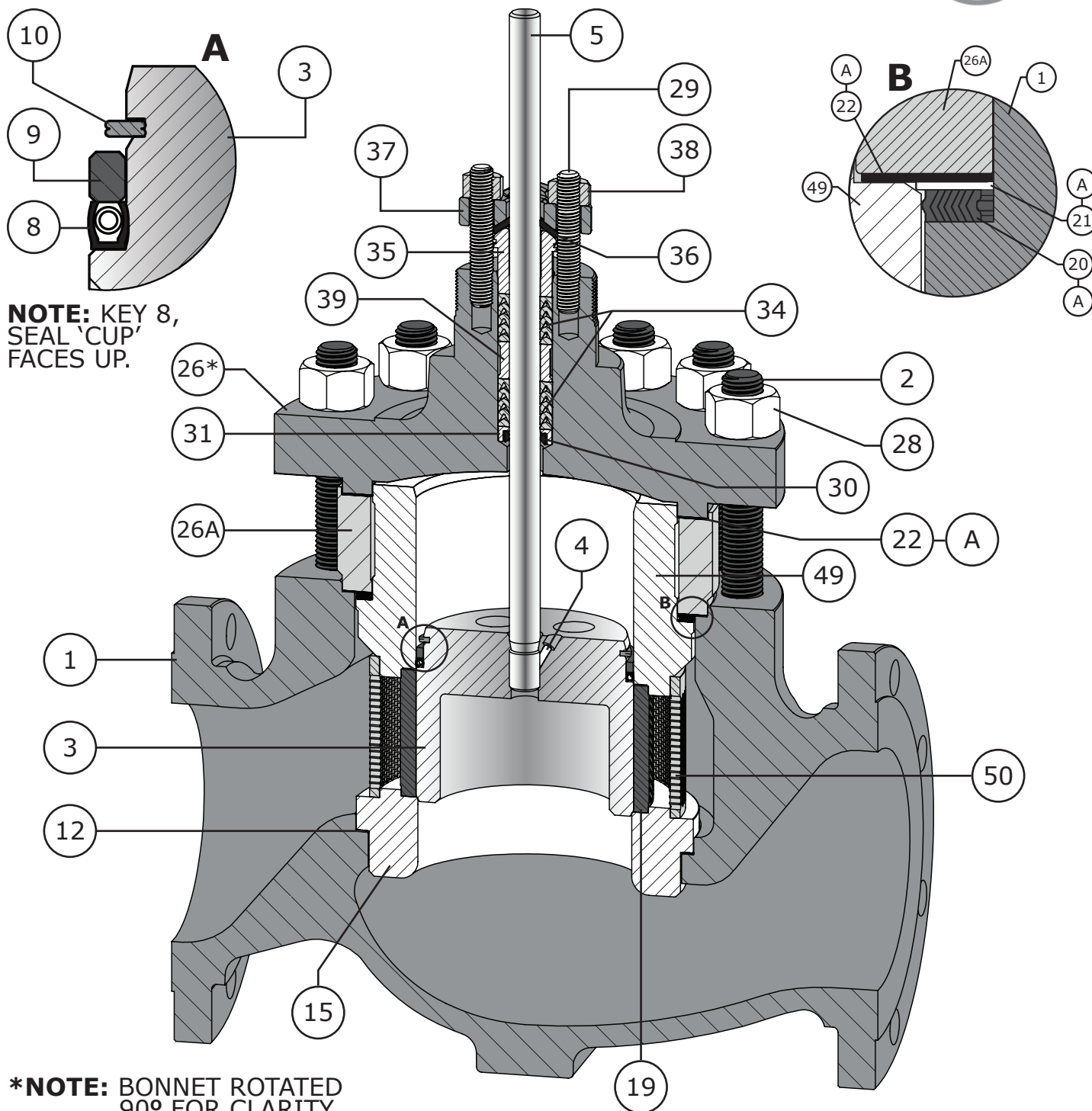


Figure 35 Model 360 Low-Noise Control Valve with Bonnet Spacer Cross Section



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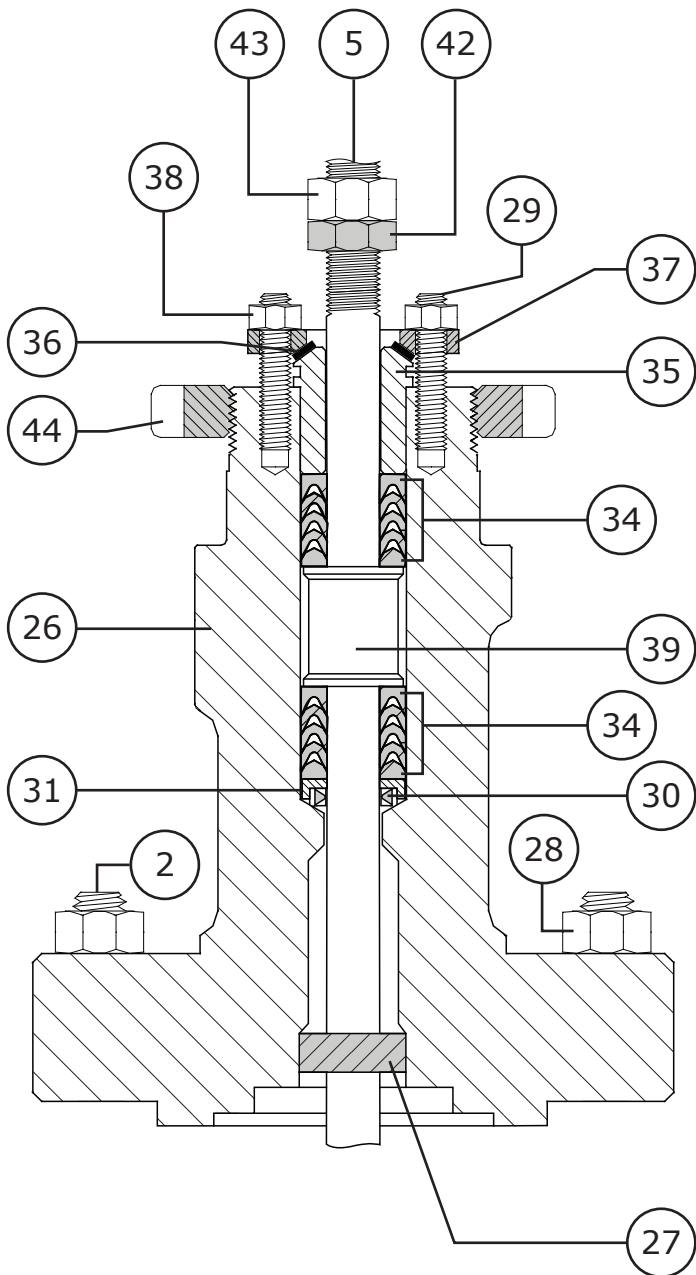


Figure 36 Extension Bonnet Diagram

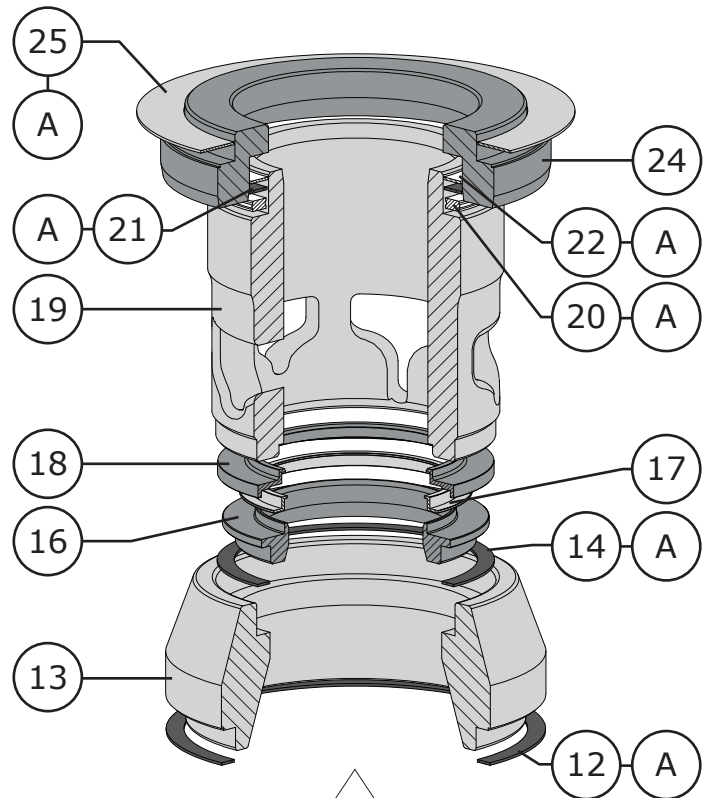


Figure 37 Restricted Trim / Soft Seat Diagram

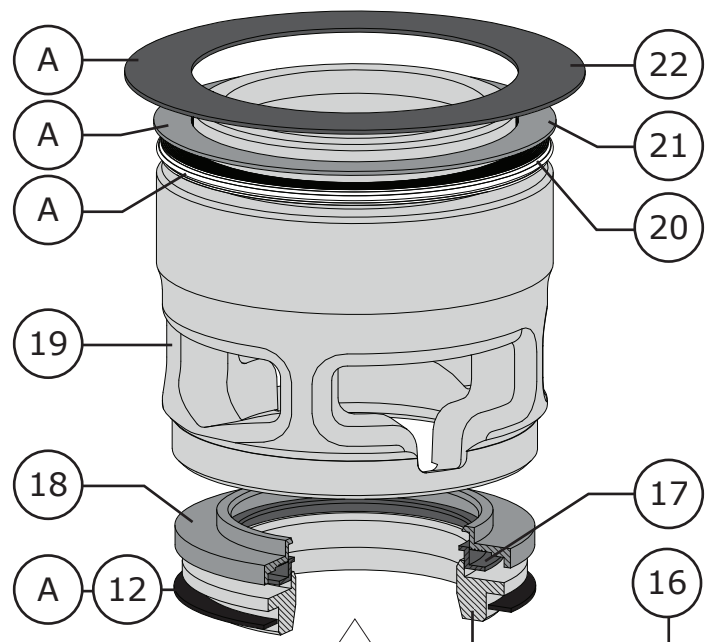


Figure 38 Soft Seat Diagram

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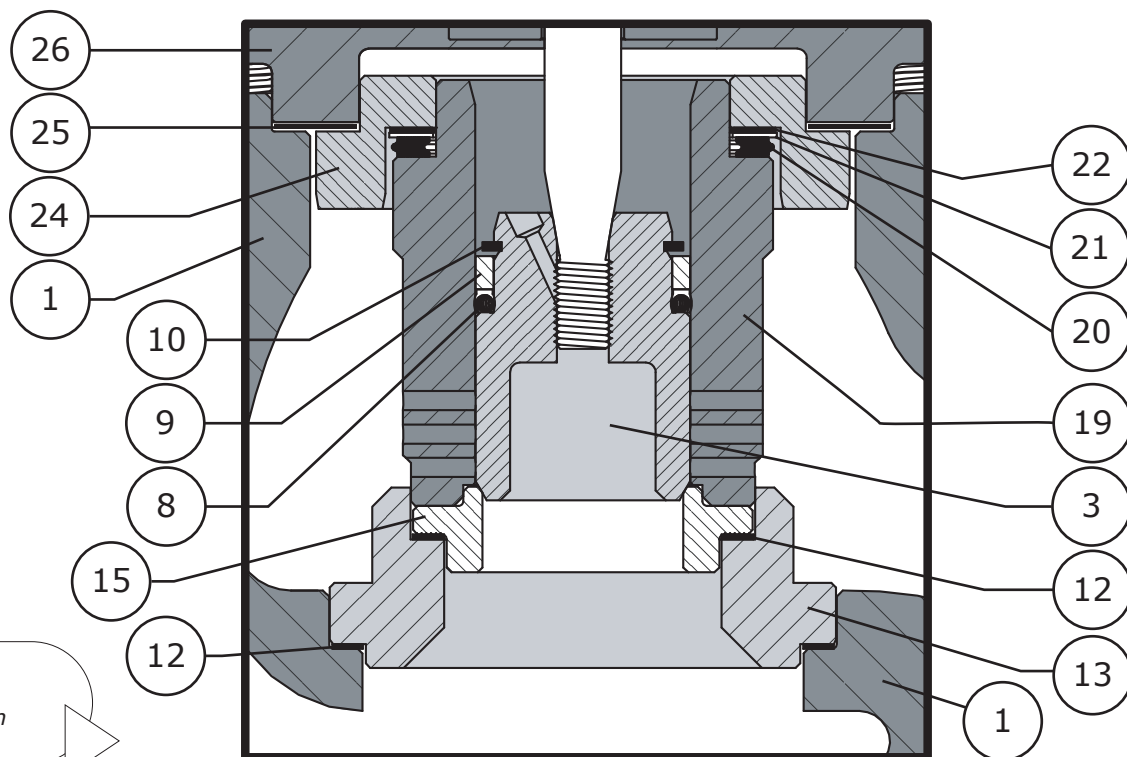


Figure 39 *Restricted Trim Metal Seat Design*

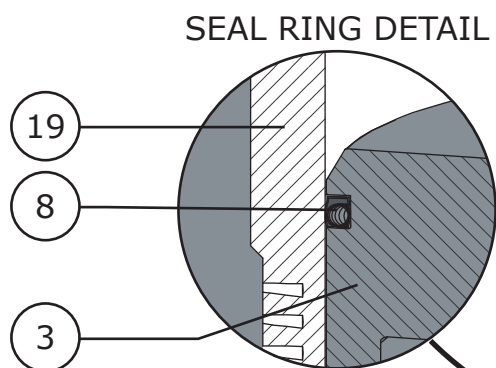
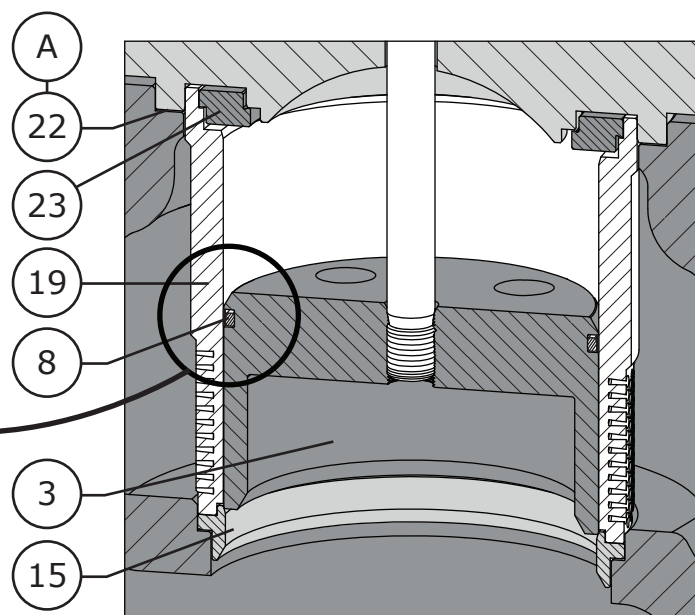


Figure 40 *Load Ring Diagram (8 Inch Valve Assembly)*





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Table 5

Body to Bonnet Stud Torque

Valve Sizes (Inch)		Bolt Torques					
Globe Body Valves	Angle Body Valves	B7 B7 Fluorokote #1		B7M B7M Fluorokote #1 B8M CL2 (strain hardened)		B8M CL1 (annealed)	
		N•m	lbf-ft.	N•m	lbf-ft.	N•m	lbf-ft.
1	1	127	94	102	75	62	46
1-1/2, 1-1/2x1, 2, or 2x1	2 or 2x1	88	65	71	52	43	32
-	3 ⁽¹⁾	127	94	102	75	62	46
3, 3x2	4 or 4x2	175	129	141	104	87	64
4, 4x3	6	312	230	250	184	153	113
6	-	549	405	549	405	370	273
8	-	746	550	746	550	544	401

NOTES: (1) - 3 inch Angle Body valves require the same size stud as the 1 inch valve bodies.

Table 6

Packing Nut Torque Values

Valve Stem Diameter Inch (mm)	ASME Class	PTFE Single and Double Type Packing				Graphite Single and Double Type Packing			
		Min. Torque		Max. Torque		Min. Torque		Max. Torque	
		lbf-in.	N•m	lbf-in.	N•m	lbf-in.	N•m	lbf-in.	N•m
3/8 (9.5)	150	9	1	17	2	27	3	44	5
	300	17	2	27	3	35	4	53	6
	600	27	3	35	4	53	6	71	8
1/2 (12.7)	150	17	2	35	4	44	5	71	8
	300	27	3	44	5	58	7	89	10
	600	35	4	58	7	80	9	124	14
3/4 (19.1)	150	44	5	71	8	97	11	150	17
	300	62	7	97	11	133	15	204	23
	600	89	10	133	15	186	21	274	31
1 (25.4)	300	106	12	159	18	230	26	336	38
	600	150	17	221	25	310	35	469	53

Table 7

Valve Stem Connection Assembly Torque and Pin Replacement

VSC Diameter Inches (mm)	Torque lbf-ft. (N•m)	Hole Size Inches (mm)
3/8 (9.5)	25 - 35 (34 - 47)	0.095 - 0.097 (2.41 - 2.46)
1/2 (12.7)	60 - 85 (81 - 115)	0.126 - 0.128 (3.20 - 3.25)
3/4 (19.1)	175 - 250 (237 - 339)	0.189 - 0.192 (4.80 - 4.88)
1 (25.4)	310 - 355 (420 - 481)	0.251 - 0.254 (6.38 - 6.45)

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Parts

Key	Description	Part Number
1	Body If you need a body as a replacement part, order by valve size and stem diameter, serial number and desired material.	
2	Stud, Bonnet/Body NOTE: Anti-Cavitation 2 Stage and Low-Noise III D3 Trim may require a bonnet spacer and will require special studs. Consult Dyna-Flo. Refer to Table 5 for Angle Body stud size equivalents.	
	-B7	
	1 inch (4 Required)	1R2848X057D
	1-1/2 inch (8 Required)	1K2429X056D
	2 inch (8 Required)	1K2429X056D
	3 inch (8 Required)	1A3781X045D
	4 inch (8 Required)	1R3690X042D
	6 inch (12 Required)	1A36563101D
	8 inch (16 Required)	1D94523101D
	-B8M	
	1 inch (4 Required)	1R28483522D
	1-1/2 inch (8 Required)	1K24293522D
	2 inch (8 Required)	1K24293522D
	3 inch (8 Required)	1A3781CL28D
	4 inch (8 Required)	1R3690CL28D
	6 inch (12 Required)	1A36563522D
	8 inch (16 Required)	1D9452CL28D
	-B7M	
	1 inch (4 Required)	1R2848B7MDD
	1-1/2 inch (8 Required)	1K2429B7MDD
	2 inch (8 Required)	1K2429B7MDD
	3 inch (8 Required)	1A3781B7MDD
	4 inch (8 Required)	1R3690B7MDD
	6 inch (12 Required)	1A3656B7MDD
	8 inch (16 Required)	1D9452X011D
	-B7 Fluorokote #1	
	1 inch (4 Required)	1R2848XFK1D
	1-1/2 inch (8 Required)	1K2429XFK1D
	2 inch (8 Required)	1K2429XFK1D
	3 inch (8 Required)	1A3781XFK1D
	4 inch (8 Required)	1R3690XFK1D
	6 inch (12 Required)	1A3656XFK1D
	8 inch (16 Required)	1D9452XFK1D
	-B7M Fluorokote #1	

Key	Description	Part Number
	1 inch (4 Required)	1R2848XFK3D
	1-1/2 inch (8 Required)	1K2429XFK3D
	2 inch (8 Required)	1K2429XFK3D
	3 inch (8 Required)	1A3781XFK3D
	4 inch (8 Required)	1R3690XFK3D
	6 inch (12 Required)	1A3656XFK3D
	8 inch (16 Required)	1D9452XFK3D
3	Valve Plug	Refer to Tables 8 - 18
4	Pin, S31600	
	3/8 inch (9.5 mm) Stem	1V32263507D
	1/2 inch (12.7mm) Stem	1V32273507D
	3/4 inch (19.1mm) Stem	1V32603507D
	1 inch (25.4 mm) Stem	1V3340NT05D
5	Valve Stem	Refer to Tables 8 - 18
6	Backup Ring, Two-Piece Plug Seal,	
	-Fluoroelastomer (Viton)	
	1-5/16 inch port diameter	1V65900529D
	1-7/8 inch port diameter	1V65920529D
	2-5/16 inch port diameter	1V55070529D
	2-7/8 inch port diameter	1V65940529D
	3-7/16 inch port diameter	1V65960529D
	4-3/8 inch port diameter	1V65980529D
	7 inch port diameter	1V66000529D
	-Nitrile	
	1-5/16 inch port diameter	1V65900305D
	1-7/8 inch port diameter	1V65920305D
	2-5/16 inch port diameter	1V55070305D
	2-7/8 inch port diameter	1V65940305D
	3-7/16 inch port diameter	1V65960305D
	4-3/8 inch port diameter	1V65980305D
	7 inch port diameter	1V66000305D
	-Ethylene Propylene	
	1-5/16 inch port diameter	1V6590X004D
	1-7/8 inch port diameter	1V6592X003D
	2-5/16 inch port diameter	1V5507X004D
	2-7/8 inch port diameter	1V6594X003D
	3-7/16 inch port diameter	1V6596X003D
	4-3/8 inch port diameter	1V6598X002D
	7 inch port diameter	1V6600X002D
7	Seal Ring, Two-Piece Plug Seal,	
	-Carbon-filled PTFE (Standard)	
	1-5/16 inch port diameter	1V65910509D
	1-7/8 inch port diameter	1V65930509D



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Parts (Continued)

Key	Description	Part Number
7	Seal Ring, Two-Piece Plug Seal (Continued)	
	-Carbon-filled PTFE (Standard)	
	2-5/16 inch port diameter	1V55080509D
	2-7/8 inch port diameter	1V65950509D
	3-7/16 inch port diameter	1V65970509D
	4-3/8 inch port diameter	1V65990509D
	7 inch port diameter	1V66010509D
8	Seal Ring, Three-Piece Plug Seal, Carbon-filled PTFE/Elgiloy	
	1-5/16 inch port diameter	10A4207X03D
	1-7/8 inch port diameter	10A4216X03D
	2-5/16 inch port diameter	10A4206X03D
	2-7/8 inch port diameter	10A4215X03D
	3-7/16 inch port diameter	10A5351X06D
	4-3/8 inch port diameter	10A4223X03D
	7 inch port diameter	10A2643X03D
	8 inch port diameter	10A3261X03D
9	Backup Ring, Three-Piece Plug Seal, S31600/S31603 Dual Grade	
	1-5/16 inch port diameter	10A4209X02D
	1-7/8 inch port diameter	10A4218X01D
	2-5/16 inch port diameter	10A4208X02D
	2-7/8 inch port diameter	10A4217X02D
	3-7/16 inch port diameter	10A5349X02D
	4-3/8 inch port diameter	10A4224X02D
10	Retaining Ring, Three-Piece Plug Seal, S31600	
	1-5/16 inch port diameter	10A4211X01D
	1-7/8 inch port diameter	10A4220X01D
	2-5/16 inch port diameter	10A4210X01D
	2-7/8 inch port diameter	10A4219X01D
	3-7/16 inch port diameter	10A5350X01D
	4-3/8 inch port diameter	10A4225X01D
11	Anti-Extrusion Ring, Three-Piece Plug Seal, PolyEtherEtherKetone (PEEK)	
	1-5/16 inch port diameter	23B6125X01D
	1-7/8 inch port diameter	22B4694X01D
	2-5/16 inch port diameter	21B9340X01D
	2-7/8 inch port diameter	22B2617X01D
	3-7/16 inch port diameter	23B6126X01D
	4-3/8 inch port diameter	21B9341X01D
	7 inch port diameter	22B5998X01D

Key	Description	Part Number
12	Gasket, Seat Ring, S31600/Graphite	
	1 inch	1R2862X011D
	1-1/2 inch	1R3098X005D
	2 inch	1R3296X004D
	3 inch	1R3481X005D
	4 inch	1J5047X006D
	6 inch	1U5086X003D
	8 inch	10A3266X08D
13	Seat Ring Adapter, Reduced Trim, S31600/S31603 Dual Grade	Refer to Table 27
14	Gasket, Seat Ring Adapter, S31600/Graphite	
	2 x 1 inch	1R2862X011D
	3 x 2 inch	1R3296X004D
15	Seat Ring	Refer to Tables 28 - 29
15A	Liner, Angle Body Valves	Contact Dyna-Flo
16	Disk Seat, Soft Seat Valves, S31600/S31603 Dual Grade	Refer to Table 30
17	PTFE Disk, Soft Seat Valves, PTFE	Refer to Table 30
18	Disk Retainer, Soft Seat Valves, S31600/S31603 Dual Grade	Refer to Table 30
19	Cage	Refer to Tables 18 - 26
20	Spiral Wound Gasket	
	- S30400/Graphite	
	1 inch	1R2860X006D
	1-1/2 inch	1R30999928D
	2 inch	1R32979928D
	3 inch	1R34829928D
	4 inch	1R37229928D
	6 inch	1U50859928D
	-N06600/Graphite	
	1-1/2 x 1 inch	1R28609944D
	2 x 1 inch	1R28609944D
	6 x 4 inch	1U50859944D
21	Metal Shim, S30400	
	1 inch	16A1936X01D
	1-1/2 inch	16A1937X01D
	2 inch	16A1938X01D
	3 inch	16A1940X01D
	4 inch	16A1941X01D
	6 inch	16A1942X01D

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Parts (Continued)

Key	Description	Part Number
22	Gasket, Body/Bonnet, S31600/Graphite	
	1 inch	1R2859X004D
	1-1/2 inch	1R3101X003D
	1-1/2 x 1 inch	1R2861X004D
	2 inch	1R3299X004D
	2 x 1 inch	1R2861X004D
	3 inch	1R3484X004D
	3 x 2 inch	1R3298X003D
	4 inch	1R3724X004D
	6 inch	1U5081X005D
	8 inch	10A3265X11D
23	Load Ring, 8 inch valve only, S17400	20A3267X01D
24	Cage Adapter, Reduced Trim, S31600/S31603 Dual Grade	Refer to Table 27
25	Bonnet Gasket for Cage Adapter, S31600/Graphite	
	1-1/2 x 1 inch	1R3101X003D
	2 x 1 inch	1R3299X004D
	3 x 2 inch	1R3484X004D
26	Bonnet If you need a bonnet as a replacement part, order by valve size and stem diameter, serial number and desired material.	
26A	Bonnet Spacer If you need a bonnet spacer as a replacement part, order by valve size and stem diameter, characteristic, serial number and desired material.	
27	Baffle, included as part of extension bonnet assembly	
28	Nut, Body/Bonnet	
	-2H	
	1 inch (4 Required)	1C33062407D
	1-1/2 inch (8 Required)	1A3772X066D
	2 inch (8 Required)	1A3772X066D
	3 inch (8 Required)	1A3760X059D
	4 inch (8 Required)	1A3520X060D
	6 inch (12 Required)	1A44092407D
	8 inch (16 Required)	1A44522407D
	-2HM	
	1 inch (4 Required)	1C33062HMDD
	1-1/2 inch (8 Required)	1A37722HMDD
	2 inch (8 Required)	1A37722HMDD
	3 inch (8 Required)	1A37602HMDD

Key	Description	Part Number
	4 inch (8 Required)	1A35202HMDD
	6 inch (12 Required)	1A44092HMDD
	8 inch (16 Required)	1A44522HMDD
	-8M	
	1 inch (4 Required)	1C33063525D
	1-1/2 inch (8 Required)	1A3772X023D
	2 inch (8 Required)	1A3772X023D
	3 inch (8 Required)	1A37603525D
	4 inch (8 Required)	1A35203525D
	6 inch (12 Required)	1A44093525D
	8 inch (16 Required)	1A44523525D
	-2H Fluorokote #1	
	1 inch (4 Required)	1C3306XFK1D
	1-1/2 inch (8 Required)	1A3772XFK1D
	2 inch (8 Required)	1A3772XFK1D
	3 inch (8 Required)	1A3760XFK1D
	4 inch (8 Required)	1A3520XFK1D
	6 inch (12 Required)	1A4409XFK1D
	8 inch (16 Required)	1A4452XFK1D
	-2HM Fluorokote #1	
	1 inch (4 Required)	1C3306XFK3D
	1-1/2 inch (8 Required)	1A3772XFK3D
	2 inch (8 Required)	1A3772XFK3D
	3 inch (8 Required)	1A3760XFK3D
	4 inch (8 Required)	1A3520XFK3D
	6 inch (12 Required)	1A4409XFK3D
	8 inch (16 Required)	1A4452XFK3D
29	Stud, Packing, B8M, 2 Required	
	3/8 inch (9.5 mm) Stem	1E94413522D
	1/2 inch (12.7mm) Stem	1E94443525D
	3/4 inch (19.1mm) Stem	1E94493525D
	1 inch (25.4 mm) Stem	0V00253522D
30	Lower Wiper, Teflon	
	3/8 inch (9.5 mm) Stem	1J87210699D
	1/2 inch (12.7mm) Stem	1E94443522D
	3/4 inch (19.1mm) Stem	1E94493522D
	1 inch (25.4 mm) Stem	1J87240699D
31	Packing Box Ring, S31600/S31603 Dual Grade	
	3/8 inch (9.5 mm) Stem	1J87313507D
	1/2 inch (12.7mm) Stem	1J87323507D
	3/4 inch (19.1mm) Stem	1J87333507D
	1 inch (25.4 mm) Stem	1J87343507D
32	Spring, Packing, SST	Refer to Table 32



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Parts (Continued)

Key	Description	Part Number
33	Special Washer, SST	Refer to Table 32
34	Packing Set, PTFE	Refer to Table 32
35	Packing Follower, S31600/S31603 Dual Grade	
	3/8 inch (9.5 mm) Stem	1E94393507D
	1/2 inch (12.7mm) Stem	1E94433507D
	3/4 inch (19.1mm) Stem	1E94473507D
	1 inch (25.4 mm) Stem	1H98233507D
36	Upper Wiper, Felt	
	3/8 inch (9.5 mm) Stem	1J87260633D
	1/2 inch (12.7mm) Stem	1J87270633D
	3/4 inch (19.1mm) Stem	1J87280633D
	1 inch (25.4 mm) Stem	1J87290633D
37	Packing Flange	
	-Carbon Steel - Plated	
	3/8 inch (9.5 mm) Stem	1E94372410D
	1/2 inch (12.7mm) Stem	1E94422307D
	3/4 inch (19.1mm) Stem	1E94482307D
	1 inch (25.4 mm) Stem	0V00242505D
	-S31600/S31603 Dual Grade	
	3/8 inch (9.5 mm) Stem	1E94373507D
	1/2 inch (12.7mm) Stem	12B6924X01D
	3/4 inch (19.1mm) Stem	12B6925X01D
	1 inch (25.4 mm) Stem	0V00243507D
38	Nut, Packing, 8M, 2 Required	
	3/8 inch (9.5 mm) Stem	1E94403525D
	1/2 inch (12.7mm) Stem	1E94453525D
	3/4 inch (19.1mm) Stem	1E94463525D
	1 inch (25.4 mm) Stem	1A34333525D
39	Lantern Ring,	Refer to Table 32
	S31600/S31603 Dual Grade	
40	Graphite Filament,	Refer to Table 32
41	Graphite Ribbon,	Refer to Table 32
42	Jam Nut, Valve Stem, Steel/Zinc Plated	
	3/8 inch (9.5 mm) Stem	NHJFZ38
	1/2 inch (12.7mm) Stem	NHJFZ12
	3/4 inch (19.1mm) Stem	NHJFZ34
	1 inch (25.4 mm) Stem	NHJFZ100
43	Hex Nut, Valve Stem, Steel/Zinc Plated	
	3/8 inch (9.5 mm) Stem	NHFZ38
	1/2 inch (12.7mm) Stem	NHFZ12
	3/4 inch (19.1mm) Stem	NHFZ34
	1 inch (25.4 mm) Stem	NH8FZ100

Key	Description	Part Number
44	Yoke Locknut, Steel Plated	
	2-1/8 inch (54 mm) Yoke Boss	1E79302306D
	2-13/16 inch (71 mm) Yoke Boss	1E80742306D
	3-9/16 inch (127 mm) Yoke Boss	1E83272306D
45	Flow Arrow, S30400	
	1 inch	1V10593898D
	1-1/2" - 8"	1V10603898D
46	Name Tag, S30400	NAMEXSBODYD
47	Name Plate, S30400	Refer to Actuator
48	Piston Ring, Graphite	Refer to Table 34
49	Cage Retainer	Contact Dyna-Flo
	Low-Noise III A3, B3, C3 Trim	
50	Baffle	Contact Dyna-Flo
	Low-Noise III A3, B3, C3 Trim	
49/50	Cage Retainer/Baffle Assembly	Contact Dyna-Flo
	Low-Noise III D3	

Parts (Live Loaded Packing)

Key	Description	Part Number
901	Live Loaded Packing Flange,	
	Refer to the P-LLPS Manual	
902	O-Ring,	
	Refer to the P-LLPS Manual	
903	Spring Washers,	
	Refer to the P-LLPS Manual	
904	Live Loaded Packing Follower,	
	Refer to the P-LLPS Manual	
905	Live Loaded Packing Box Ring,	
	Refer to the P-LLPS Manual	
906	Live Loaded Lower Wiper,	
	Refer to the P-LLPS Manual	
907	Live Loaded V-Ring Packing Set,	
	Refer to the P-LLPS Manual	
911	Anti-Extrusion Ring,	
	Refer to the P-LLPS Manual	
914	Live Loaded Lantern Ring,	
	Refer to the P-LLPS Manual	

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Parts Ordering

Whenever corresponding with Dyna-Flo about a 360 Series Control Valves, refer to the nameplate (Key 46) or name tag (Key 47) for the serial number of the unit. Please order by the complete part number (as given in the part lists) of each part required. **NOTE:** Not all the available replacement part numbers are shown in this manual, if you have inquiries about parts that are not listed please contact your Dyna-Flo Sales Representative.

Table 8

360 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - For Two-Piece Plug Seals with Standard Bonnets

Valve Size	Port Size	Stem Diameter	Travel	Plug Material			
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S41600 HT	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1", 2" X 1"	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN03D	1V6571XN05D	11A5315XN3D	11A5317XN4D
		1/2 (12.7)	3/4 (19.1)	1V6572XN02D	1V6572XN06D	11A5316XN2D	11A5318XN4D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	1V6573XN04D	1V6573XN05D	11A5321XN2D	10A4438XN2D
		1/2 (12.7)	3/4 (19.1)	1V6574XN01D	1V6574XN03D	10A4439XN4D	10A4611XN4D
1-1/2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN04D	1V6571XN09D	11A5315XN7D	11A5317XN7D
		1/2 (12.7)	3/4 (19.1)	1V6572XN04D	1V6572XN09D	11A5316XN4D	11A5318XN3D
2, 3 x 2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	1V6575XN05D	1V6575XN06D	11A5324XN2D	11A5326XN2D
		3/4 (19.1)	1-1/8 (28.6)	1V6576XN01D	1V6576XN03D	11A5325XN2D	11A5327XN1D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	1V6579XN09D	1V6579XN11D	11A5336XN3D	11A5337XN8D
		3/4 (19.1)	1-1/2 (38.1)	1V6580XN01D	1V6580XN03D	11A5014XN1D	11A5338XN1D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	1V6581XN04D	1V6581XN05D	11A5341XN3D	11A5344XN2D
		3/4 (19.1)	2 (50.8)	1V6582XN02D	1V6582XN07D	11A5342XN1D	11A5345XN4D
4 x 2-1/2 ⁽²⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	1V6577XN04D	1V6577XN06D	11A5330XN2D	11A5332XN2D
		3/4 (19.1)	1-1/2 (38.1)	1V6578XN01D	1V6578XN02D	11A5331XN2D	11A5333XN1D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	1V6584XN04D	1V6584XN06D	11A5350XN3D	21A5351XN6D
		1 (25.4)	2 (50.8)	1V6585XN01D	1V6585XN02D	10A5107XN1D	20A0103XN1D
6 x 4 ⁽²⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	1V6582XN01D	1V6582XN05D	11A5342XN4D	11A5345XN7D
		1 (25.4)	2 (50.8)	360N6503N1D	360N6503N2D	360N6504N3D	360N6505N5D

NOTE: For 8 inch valves refer to Table 10.

* - Stem material is S20910.

1 - Valve plugs for 8 inch (203.2 mm) ports use one-piece plug seals constructed with a seal ring (Key 8) only, they do not use backup rings (Key 9) or retaining rings (Key 10). These valves are also assembled with a style 1 extension bonnet as standard construction.

2 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 9

360 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - For Two-Piece Plug Seals with Style 1 Extension Bonnets

Valve Size	Port Size	Stem Diameter	Travel	Plug Material			
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S41600 HT	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN07D	1V6571XN06D	11A5315X13D	11A5317XN8D
		1/2 (12.7)	3/4 (19.1)	1V6572XN03D	1V6572XN12D	11A5316XN3D	11A5318X14D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	1V6573XN07D	1V6573XN12D	11A5321XN4D	10A4438XN3D
		1/2 (12.7)	3/4 (19.1)	1V6574XN05D	1V6574XN06D	10A4439XN5D	10A4611X11D
1-1/2x1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN10D	1V6571XN12D	11A5315X17D	11A5317XN5D
		1/2 (12.7)	3/4 (19.1)	1V6572XN15D	1V6572XN19D	11A5316X14D	11A5318X13D
2 3x2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	1V6575XN18D	1V6575XN12D	11A5324XN4D	11A5326XN6D
		3/4 (19.1)	1-1/8 (28.6)	1V6576XN11D	1V6576XN13D	11A5325X12D	11A5327X13D
2x1 ⁽²⁾	1-5/16 (33.3)	1/2 (12.7)	3/4 (19.1)	1V6572XN03D	1V6572XN12D	11A5316XN3D	11A5318X14D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	1V6579XN08D	1V6579XN07D	11A5336X13D	11A5337XN6D
		3/4 (19.1)	1-1/2 (38.1)	1V6580X101D	1V6580X103D	11A5014X11D	11A5338X11D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	1V6581XN07D	1V6581XN06D	11A5341X13D	11A5344XN5D
		3/4 (19.1)	2 (50.8)	1V6582X102D	1V6582X107D	11A5342X11D	11A5345XN5D
4x2-1/2 ⁽²⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	1V6577XN05D	1V6577XN12D	11A5330X12D	11A5332X20D
		3/4 (19.1)	1-1/2 (38.1)	1V6578XN11D	1V6578XN12D	11A5331X12D	11A5333X11D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	1V6584XN05D	1V6584XN11D	11A5350X12D	21A5351XN5D
		1 (25.4)	2 (50.8)	1V6585X101D	1V6585X102D	10A5107X11D	20A0103X11D
6x4 ⁽²⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	1V6582X101D	1V6582X105D	11A5342X14D	11A5345X17D
		1 (25.4)	2 (50.8)	360N650311D	360N650312D	360N650413D	360N650515D

* - Stem material is S20910.

1 - Valve plugs for 8 inch (203.2 mm) ports use one-piece plug seals constructed with a seal ring (Key 8) only, they do not use backup rings (Key 9) or retaining rings (Key 10). These valves are also assembled with a style 1 extension bonnet as standard construction.

2 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

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Table 10

360 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - For Three-Piece Plug Seals without Anti-Extrusion Rings (Standard Bonnets)

Valve Size	Port Size	Stem Diameter	Travel	Plug Material			
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S41600 HT	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1, 2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	20A4103XN5D	20A4103XN6D	360N1104N3D	20A4104XN2D
		1/2 (12.7)	3/4 (19.1)	360N1112N1D	360N1112N2D	360N1113N3D	360N1114N5D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	20A6711XN3D	20A6711XN4D	360N5138N3D	22A5941XN2D
		1/2 (12.7)	3/4 (19.1)	20A4150XN6D	20A4150XN2D	360N5147N3D	20A4151XN5D
1-1/2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	20A4103XN4D	20A4103XN7D	360N5104N3D	20A4104XN3D
		1/2 (12.7)	3/4 (19.1)	360N5112N1D	360N5112N2D	360N5113N3D	360N5114N5D
2 3 x 2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	20A4097XN6D	20A4097N18D	360N2008N3D	20A4099N10D
		3/4 (19.1)	1-1/8 (28.6)	20A4098XN6D	20A4098N18D	360N2181N3D	20A4100N10D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	20A5414XN6D	20A5414XN5D	360N3342N3D	22A3458XN2D
		3/4 (19.1)	1-1/2 (38.1)	20A5342XN8D	20A5342XN2D	360N3351N3D	20A5344XN4D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	20A2641XN4D	20A2641N16D	360N4428N3D	21A0187XN2D
		3/4 (19.1)	2 (50.8)	20A4194XN5D	20A4194XN2D	360N4437N3D	20A4197XN1D
4 x 2-1/2 ⁽²⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	20A9533XN5D	20A9533XN6D	360N9312N3D	20A9534XN9D
		3/4 (19.1)	1-1/2 (38.1)	20A4144XN1D	20A4144XN2D	360N9321N3D	20A4146XN1D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	20A2642XN5D	20A2642XN6D	360N6532N3D	21A8443XN3D
		1 (25.4)	2 (50.8)	20A5621XN5D	20A5621XN6D	360N6541N3D	20A6706XN3D
6 x 4 ⁽²⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	20A4194XN3D	20A4194XN7D	360N6498N3D	20A4197XN3D
		1 (25.4)	2 (50.8)	360N6506N1D	360N6506N2D	360N6507N3D	360N6508N5D
8 ⁽¹⁾	8 (203.2)	3/4 (19.1)	2 (50.8)	21A5356XN1D	21A5356XN2D	21A5359XN1D	21A5362XN1D
		1 (25.4)	2 (50.8)	21A5357XN1D	21A5357XN2D	21A5360XN1D	21A5363XN1D
		3/4 (19.1)	3 (76.2)	21A5356XN1D	21A5356XN2D	21A5359XN1D	21A5362XN1D
		1 (25.4)	3 (76.2)	21A5357XN1D	21A5357XN2D	21A5360XN1D	21A5363XN1D

* - Stem material is S20910.

1 - Valve plugs for 8 inch (203.2 mm) ports use one-piece plug seals constructed with a seal ring (Key 8) only, they do not use backup rings (Key 9) or retaining rings (Key 10). 8" plug/stems are assembled with a style 1 extension bonnet as standard construction.

2 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 11

360 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - Three-Piece Plug Seals with Anti-Cavitation 2 Stage (Standard Bonnets)

Valve Size	Port Size	Stem Diameter	Travel	Plug Material	
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S42000 HT	S31600 / Alloy 6 Seat & Guide
1	1 (25.4)	1/2 (12.7)	1 (25.4)	24A5265XN8D	24A5519XN2D
1-1/2	1-5/16 (33.3)	1/2 (12.7)	1-1/2 (38.1)	24A5266XN2D	24A5286XN2D
2	1-7/8 (47.6)	1/2 (12.7)	2 (50.8)	24A3038XN2D	24A5287XN2D
		3/4 (19.1)	2 (50.8)	24A5550XN2D	24A5551XN2D
3	2-7/8 (73.0)	1/2 (12.7)	3 (76.2)	24A5269XN2D	24A5290XN2D
		3/4 (19.1)	3 (76.2)	23A9452XN2D	24A5291XN2D
4	2-7/8 (73.0)	1/2 (12.7)	4 (101.6)	360N4462N8D	360N4463N5D
		3/4 (19.1)	4 (101.6)	23A5818XN3D	24A5292XN5D
4 x 2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	2-1/2 (63.5)	360N4454N8D	360N4455N5D
		3/4 (19.1)	2-1/2 (63.5)	360N4458N8D	360N4459N5D
6	5-3/8 (136.5)	3/4 (19.1)	4 (101.6)	23A5803XN2D	24A5294XN2D
		1 (25.4)	4 (101.6)	24A3028XN5D	24A5295XN3D

* - Stem material is S20910.

2 - Indicated Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 12

360 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - Anti-Cavitation 1 stage with Standard Bonnets (without Anti-Extrusion Rings)

Valve Size	Port Size	Stem Diameter	Travel	Plug Material
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S42000 HT
1	1-5/16 (33.3)	1/2 (12.7)	3/4 (19.1)	360N1001N8D
1-1/2	1-7/8 (47.6)	1/2 (12.7)	3/4 (19.1)	28A1002XN1D
2	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	28A1003XN1D
		3/4 (19.1)	1-1/8 (28.6)	28A1004XN1D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	28A1007XN1D
		3/4 (19.1)	1-1/2 (38.1)	28A1008XN1D
4 x 2-1/2	2-7/8 (73)	1/2 (12.7)	1-1/2 (38.1)	28A1005XN1D
		3/4 (19.1)	1-1/2 (38.1)	28A1006XN1D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	360N4002N8D
		3/4 (19.1)	2 (50.8)	28A1010XN1D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	360N6000N8D
		1 (25.4)	2 (50.8)	28A1013XN1D
6x4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	28A1010XN2D
		3/4 (19.1)	2 (50.8)	28A1011XN2D

* - Stem material is S20910.

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Table 13

360 Globe Valve Plug / Stem* Assembly High Temperature (Keys 3, 4, & 5) - For Three-Piece Plug Seals with Anti-Extrusion Rings (Standard Bonnets) - No Radius on Plug Seat

Valve Size	Port Size	Stem Diameter	Travel	Plug Material		
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1, 2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N1106HN2D	360N1107HN3D	360N1108HN5D
		1/2 (12.7)	3/4 (19.1)	360N1004HN2D	360N1116HN3D	360N1003HN5D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	360N5140HN2D	360N5141HN3D	360N5142HN5D
		1/2 (12.7)	3/4 (19.1)	360N5149HN2D	360N5150HN3D	360N5151HN5D
1-1/2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N5106HN2D	360N5107HN3D	360N5108HN5D
		1/2 (12.7)	3/4 (19.1)	360N5115HN2D	360N5116HN3D	360N5117HN5D
2 3 x 2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	360N2006HN2D	360N2175HN3D	360N2176HN5D
		3/4 (19.1)	1-1/8 (28.6)	360N2183HN2D	360N2184HN3D	360N2185HN5D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	360N3344HN2D	360N3345HN3D	360N3346HN5D
		3/4 (19.1)	1-1/2 (38.1)	360N3353HN2D	360N3354HN3D	360N3355HN5D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	360N4430HN2D	360N4431HN3D	360N4432HN5D
		3/4 (19.1)	2 (50.8)	360N4439HN2D	360N4440HN3D	360N4441HN5D
4 x 2-1/2 ⁽²⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	360N4314HN2D	360N4315HN3D	360N4316HN5D
		3/4 (19.1)	1-1/2 (38.1)	360N4323HN2D	360N4324HN3D	360N4325HN5D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	360N6534HN2D	360N6535HN3D	360N6536HN5D
		1 (25.4)	2 (50.8)	360N6543HN2D	360N6544HN3D	360N6545HN5D
6 x 4 ⁽²⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	360N6500HN2D	360N6501HN3D	360N6502HN5D
		1 (25.4)	2 (50.8)	360N6509HN2D	360N6510HN3D	360N6511HN5D
8 ⁽¹⁾	8 (203.2)	3/4 (19.1)	2 (50.8)	360N8593H12D	360N8594H13D	360N8595H15D
		1 (25.4)	2 (50.8)	360N8599H12D	360N8600H13D	360N8601H15D

* - Stem material is S20910.

1 - 8" plug/stems are assembled with a style 1 extension bonnet as standard construction.

2 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 14

360 Globe Valve Plug / Stem* Assembly High Temperature (Keys 3, 4, & 5) - For Three-Piece Plug Seals with Anti-Extrusion Rings (Style 1 Extension Bonnets) - No Radius on Plug Seat

Valve Size	Port Size	Stem Diameter	Travel	Plug Material		
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1, 2 x 1 ⁽¹⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N1106H12D	360N1107H13D	360N1108H15D
		1/2 (12.7)	3/4 (19.1)	360N1004H12D	360N1116H13D	360N1003H15D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	360N5140H12D	360N5141H13D	360N5142H15D
		1/2 (12.7)	3/4 (19.1)	360N5149H12D	360N5150H13D	360N5151H15D
1-1/2 x 1 ⁽¹⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N5106H12D	360N5107H13D	360N5108H15D
		1/2 (12.7)	3/4 (19.1)	360N5115H12D	360N5116H13D	360N5117H15D
2 3 x 2 ⁽¹⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	360N2006H12D	360N2175H13D	360N2176H15D
		3/4 (19.1)	1-1/8 (28.6)	360N2183H12D	360N2184H13D	360N2185H15D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	360N3344H12D	360N3345H13D	360N3346H15D
		3/4 (19.1)	1-1/2 (38.1)	360N3353H12D	360N3354H13D	360N3355H15D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	360N4010H12D	360N4431H13D	360N4432H15D
		3/4 (19.1)	2 (50.8)	360N4439H12D	360N4440H13D	360N4441H15D
4 x 2-1/2 ⁽¹⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	360N4314H12D	360N4315H13D	360N4316H15D
		3/4 (19.1)	1-1/2 (38.1)	360N4323H12D	360N4324H13D	360N4325H15D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	360N6534H12D	360N6535H13D	360N6536H15D
		1 (25.4)	2 (50.8)	360N6543H12D	360N6544H13D	360N6545H15D
6 x 4 ⁽¹⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	360N6500H12D	360N6501H13D	360N6502H15D
		1 (25.4)	2 (50.8)	360N6509H12D	360N6510H13D	360N6511H15D

* - Stem material is S20910.

1 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

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Table 15

361 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - For Double Piston Rings with Standard Bonnets

Valve Size	Port Size	Stem Diameter	Travel	Plug Material			
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S41600 HT	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1", 2" X 1"	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN03D	1V6571XN05D	11A5315XN3D	11A5317XN4D
		1/2 (12.7)	3/4 (19.1)	1V6572XN02D	1V6572XN06D	11A5316XN2D	11A5318XN4D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	1V6573XN04D	1V6573XN05D	11A5321X02D	10A4438XN2D
		1/2 (12.7)	3/4 (19.1)	1V6574XN01D	1V6574XN03D	10A4439XN4D	10A4611XN4D
1-1/2 x 1 ⁽¹⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN04D	1V6571XN09D	11A5315XN7D	11A5317XN7D
		1/2 (12.7)	3/4 (19.1)	1V6572XN04D	1V6572XN09D	11A5316XN4D	11A5318XN3D
2, 3 x 2 ⁽¹⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	1V6575XN05D	1V6575XN06D	11A5324XN2D	11A5326XN2D
		3/4 (19.1)	1-1/8 (28.6)	1V6576XN01D	1V6576XN03D	11A5325XN2D	11A5327XN3D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	1V6579XN09D	1V6579XN11D	11A5336XN3D	11A5337XN8D
		3/4 (19.1)	1-1/2 (38.1)	1V6580XN01D	1V6580XN03D	10A5104XN3D	11A5338XN1D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	1V6581XN04D	1V6581XN05D	11A5341XN3D	11A5344XN2D
		3/4 (19.1)	2 (50.8)	1V6582XN02D	1V6582XN07D	11A5342XN3D	11A5345XN4D
4 x 2-1/2 ⁽¹⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	1V6577XN04D	1V6577XN06D	11A5330XN2D	11A5332XN2D
		3/4 (19.1)	1-1/2 (38.1)	1V6578XN01D	1V6578XN02D	11A5331XN2D	11A5333XN2D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	1V6584XN04D	1V6584XN06D	11A5350XN3D	21A5351XN6D
		1 (25.4)	2 (50.8)	1V6585XN01D	1V6585XN02D	10A5107XN1D	20A0103XN1D
6 x 4 ⁽¹⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	1V6582XN01D	1V6582XN05D	11A5342XN4D	11A5345XN7D
		1 (25.4)	2 (50.8)	360N6202N1D	360N6202N2D	360N6203N3D	360N6204N5D

NOTE: For 8 inch valves refer to Table xx.

* - Stem material is S20910.

1 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 16

361 Globe Valve Plug / Stem* Assembly Standard Temperature (Keys 3, 4, & 5) - For Double Piston Rings with Style 1 Extension Bonnets

Valve Size	Port Size	Stem Diameter	Travel	Plug Material			
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S41600 HT	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1, 2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN07D	1V6571XN06D	11A5315X13D	11A5317XN8D
		1/2 (12.7)	3/4 (19.1)	1V6572XN03D	1V6572XN12D	11A5316XN3D	11A5318X14D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	1V6573XN07D	1V6573XN12D	11A5321XN4D	10A4438XN3D
		1/2 (12.7)	3/4 (19.1)	1V6574XN05D	1V6574XN06D	10A4439XN5D	10A4611X11D
1-1/2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	1V6571XN10D	1V6571XN12D	11A5315X17D	11A5317XN5D
		1/2 (12.7)	3/4 (19.1)	1V6572XN15D	1V6572XN19D	11A5316X14D	11A5318X13D
2 3 x 2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	1V6575XN18D	1V6575XN12D	11A5324XN4D	11A5326XN6D
		3/4 (19.1)	1-1/8 (28.6)	1V6576XN11D	1V6576XN13D	11A5325X12D	11A5327X13D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	1V6579XN08D	1V6579XN07D	11A5336X13D	11A5337XN6D
		3/4 (19.1)	1-1/2 (38.1)	1V6580X101D	1V6580X103D	11A5014X11D	11A5338X11D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	1V6581XN07D	1V6581XN06D	11A5341X13D	11A5344XN5D
		3/4 (19.1)	2 (50.8)	1V6582X102D	1V6582X107D	11A5342X11D	11A5345XN5D
4 x 2-1/2 ⁽²⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	1V6577XN05D	1V6577XN12D	11A5330X12D	11A5332X20D
		3/4 (19.1)	1-1/2 (38.1)	1V6578XN11D	1V6578XN12D	11A5331X12D	11A5333X11D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	1V6584XN05D	1V6584XN11D	11A5350X12D	21A5351XN5D
		1 (25.4)	2 (50.8)	1V6585X101D	1V6585X102D	10A5107X11D	20A0103X11D
6 x 4 ⁽²⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	1V6582X101D	1V6582X105D	11A5342X14D	11A5345X17D
		1 (25.4)	2 (50.8)	360N650311D	360N650312D	360N650413D	360N650515D
8 ⁽¹⁾	8 (203.2)	3/4 (19.1)	2 (50.8)	27A3956XN1D	27A3956XN2D	360N823913D	27A3962XN1D
		1 (25.4)	2 (50.8)	27A3957XN1D	27A3957XN2D	360N824213D	27A3963XN1D

* - Stem material is S20910.

1 - 8" plug/stems are assembled with a style 1 extension bonnet as standard construction.

2 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

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Table 17

361 Globe Valve Plug / Stem* Assembly High Temperature (Keys 3, 4, & 5) - For Double Piston Rings with Standard Bonnets

Valve Size	Port Size	Stem Diameter	Travel	Plug Material		
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1", 2" X 1"	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N1500HN2D	360N1501HN3D	11A5319XN2D
		1/2 (12.7)	3/4 (19.1)	360N1503HN2D	360N1504HN3D	11A5320XN2D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	360N5506HN2D	360N5507HN3D	11A5322XN2D
		1/2 (12.7)	3/4 (19.1)	360N5509HN2D	360N5510HN3D	11A5323XN2D
1-1/2 x 1 ⁽¹⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N5512HN2D	360N5513HN3D	11A5319XN5D
		1/2 (12.7)	3/4 (19.1)	360N5515HN2D	360N5516HN3D	11A5320XN4D
2, 3 x 2 ⁽¹⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	360N2118HN2D	360N2119HN3D	11A5328XN2D
		3/4 (19.1)	1-1/8 (28.6)	360N2121HN2D	360N2122HN3D	11A5329XN2D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	360N3148HN2D	360N3149HN3D	11A5339XN2D
		3/4 (19.1)	1-1/2 (38.1)	360N3154HN2D	360N3155HN3D	11A5340XN1D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	360N4172HN2D	360N4173HN3D	360N4174HN5D
		3/4 (19.1)	2 (50.8)	360N4178HN2D	360N4179HN3D	11A5347XN2D
4 x 2-1/2 ⁽¹⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	360N4142HN2D	360N4143HN3D	11A5334XN4D
		3/4 (19.1)	1-1/2 (38.1)	360N4145HN2D	360N4146HN3D	11A5335XN2D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	360N6208HN2D	360N6209HN3D	21A5353XN4D
		1 (25.4)	2 (50.8)	360N6214HN2D	360N6215HN3D	21A5354XN1D
6 x 4 ⁽¹⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	360N6196HN2D	360N6197HN3D	11A5348XN9D
		1 (25.4)	2 (50.8)	360N6202HN2D	360N6203HN3D	360N6204HN5D

NOTE: For 8 inch valves refer to Table 18.

* - Stem material is S20910.

1 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 18

361 Globe Valve Plug / Stem* Assembly High Temperature (Keys 3, 4, & 5) - For Double Piston Rings with Style 1 Extension Bonnets

Valve Size	Port Size	Stem Diameter	Travel	Plug Material		
Inch	Inch (mm)	Inch (mm)	Inch (mm)	S31600	S31600 / Alloy 6 Seat	S31600 / Alloy 6 Seat & Guide
1, 2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N1500H12D	360N1501H13D	11A5319X13D
		1/2 (12.7)	3/4 (19.1)	360N1503H12D	360N1504H13D	11A5320XN3D
1-1/2	1-7/8 (47.6)	3/8 (9.5)	3/4 (19.1)	360N5506H12D	360N5507H13D	11A5322XN3D
		1/2 (12.7)	3/4 (19.1)	360N5509H12D	360N5510H13D	11A5323XN3D
1-1/2 x 1 ⁽²⁾	1-5/16 (33.3)	3/8 (9.5)	3/4 (19.1)	360N5512H12D	360N5513H13D	11A5319XN7D
		1/2 (12.7)	3/4 (19.1)	360N5515H12D	360N5516H13D	11A5320X11D
² 3 x 2 ⁽²⁾	2-5/16 (58.7)	1/2 (12.7)	1-1/8 (28.6)	360N2118H12D	360N2119H13D	11A5328XN3D
		3/4 (19.1)	1-1/8 (28.6)	360N2121H12D	360N2122H13D	11A5329XN3D
3	3-7/16 (87.3)	1/2 (12.7)	1-1/2 (38.1)	360N3148H12D	360N3149H13D	11A5339XN3D
		3/4 (19.1)	1-1/2 (38.1)	360N3154H12D	360N3155H13D	11A5340X11D
4	4-3/8 (111.1)	1/2 (12.7)	2 (50.8)	360N4172H12D	360N4173H13D	11A5347XN3D
		3/4 (19.1)	2 (50.8)	360N4178H12D	360N4179H13D	11A5348X15D
4 x 2-1/2 ⁽²⁾	2-7/8 (73.0)	1/2 (12.7)	1-1/2 (38.1)	360N4142H12D	360N4143H13D	11A5334XN6D
		3/4 (19.1)	1-1/2 (38.1)	360N4145H12D	360N4146H13D	11A5335X11D
6	7 (177.8)	3/4 (19.1)	2 (50.8)	360N6208H12D	360N6209H13D	21A5353XN3D
		1 (25.4)	2 (50.8)	360N6214H12D	360N6215H13D	21A5354X11D
6 x 4 ⁽²⁾	4-3/8 (111.1)	3/4 (19.1)	2 (50.8)	360N6196H12D	360N6197H13D	11A5348X19D
		1 (25.4)	2 (50.8)	360N6503H12D	360N6504H13D	360N6505H15D
8 ⁽¹⁾	8 (203.2)	3/4 (19.1)	2 (50.8)	360N8238H12D	360N8239H13D	27A3965X11D
		1 (25.4)	2 (50.8)	360N8241H12D	360N8242H13D	27A3966XN1D

* - Stem material is S20910.

1 - 8" plug/stems are assembled with a style 1 extension bonnet as standard construction.

2 - Indicates Reduced Trim.

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

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Table 19

Cage (Key 19) - 360 Quick Opening

Valve Size Inch		Port Size	Cage Material		
Globe Body	Angle Body	Inch (mm)	S17400 H900	S17400 DH1150	S31600 / ENC
1, 1-1/2x1, 2x1	1, 2x1	1-5/16 (33.3)	2U21503327D	2U21501150D	2U74034893D
1-1/2	2, 3x1-1/2	1-7/8 (47.6)	2U21923327D	2U21921150D	2U72544893D
2, 3x2	4x2	2-5/16 (58.7)	2U22343327D	2U22341150D	2U74044893D
-	3	2-7/8 (73.0)	2U22763327D	2U22761150D	2U74054893D
3	4	3-7/16 (87.3)	2U23183327D	2U23181150D	2U74064893D
4	6	4-3/8 (111.1)	2U23603327D	2U23601150D	2U74074893D
4x2-1/2	-	2-7/8 (73.0)	2U22763327D	2U22761150D	2U74054893D
6	-	7 (177.8)	2U50633327D	2U50631150D	2U80694893D
6x4	-	4-3/8 (111.1)	2V37223327D	2V37221150D	2V37194617D
8	-	8 (203.2)	20A3249X01D	20A3249X02D	20A5469X01D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 20

Cage (Key 19) - 360 Linear

Valve Size Inch		Port Size	Cage Material		
Globe Body	Angle Body	Inch (mm)	S17400 H900	S17400 DH1150	S31600 / ENC
1, 1-1/2x1, 2x1	1, 2x1	1-5/16 (33.3)	2U21563327D	2U21561150D	2U74144893D
1-1/2	2, 3x1-1/2	1-7/8 (47.6)	2U21983327D	2U21983150D	2U74154893D
2, 3x2	4x2	2-5/16 (58.7)	2U22403327D	2U22401150D	2U74164893D
-	3	2-7/8 (73.0)	2U22823327D	2U22821150D	2U74174893D
3	4	3-7/16 (87.3)	2U23243327D	2U23241150D	2U74184893D
4	6	4-3/8 (111.1)	2U23663327D	2U23661150D	2U74194893D
4x2-1/2	-	2-7/8 (73.0)	2U22823327D	2U22821150D	2U74174893D
6	-	7 (177.8)	2U50613327D	2U50611150D	2U80684893D
6x4	-	4-3/8 (111.1)	2V37183327D	2V37181150D	2V37124893D
8	-	8 (203.2)	20A3247X01D	20A3247X05D	20A5468X01D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 21

Cage (Key 19) - 360 Equal Percentage

Valve Size Inch		Port Size	Cage Material		
Globe Body	Angle Body	Inch (mm)	S17400 H900	S17400 DH1150	S31600 / ENC
1, 1-1/2x1, 2x1	1, 2x1	1-5/16 (33.3)	2U21533327D	2U21531150D	2U74084893D
1-1/2	2, 3x1-1/2	1-7/8 (47.6)	2U21953327D	2U21951150D	2U74094893D
2, 3x2	4x2	2-5/16 (58.7)	2U22373327D	2U22371150D	2U74104893D
-	3	2-7/8 (73.0)	2U22793327D	2U22791150D	2U74114893D
3	4	3-7/16 (87.3)	2U23213327D	2U23211150D	2U74124893D
4	6	4-3/8 (111.1)	2U23633327D	2U23631150D	2U74134893D
4x2-1/2	-	2-7/8 (73.0)	2U22793327D	2U22791150D	2U74114893D
6	-	7 (177.8)	2U50593327D	2U50591150D	2U80674893D
6x4	-	4-3/8 (111.1)	2V37233327D	2V37231150D	2V37134893D
8	-	8 (203.2)	20A3245X01D	20A3245X05D	20A5467X01D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 22

Cage (Key 19) - 360 Anti-Cavitation (S17400 H900 Cage Material)

Valve Size Inch	Port Size Inch (mm)	Stage Stage 1
1	1 (25.4)	38A1018X01D
1-1/2	1-5/16 (33.3)	38A1019X01D
2	1-7/8 (47.6)	38A1020X01D
3	2-7/8 (73.0)	38A1023X01D
4	4-3/8 (111.1)	38A1025X01D
4 x 2-1/2 ⁽¹⁾	2-7/8 (73.0)	38A1021X01D
6	7 (177.8)	38A1027X01D
8	8 (203.2)	360C8000X1D

1 - Indicates Reduced Trim

Table 23

Cage (Key 19) - 360 Anti-Cavitation (S17400 H900 Cage Material)

Valve Size Inch	Port Size Inch (mm)	Stage Stage 2
1	1 (25.4)	24A5558X01D
1-1/2	1-5/16 (33.3)	24A5559X02D
2	1-7/8 (47.6)	24A3031X03D
3	2-7/8 (73.0)	23A9453X02D
4	2-7/8 (73.0)	23A5817X03D
4 x 2-1/2 ⁽¹⁾	2-5/16 (58.7)	360C4009X1D
6	5-3/8 (136.5)	360C6011X1D
8	7 (177.8)	360C8004X1D

1 - Indicates Reduced Trim

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Table 24

Cage (Key 19) - 361 Equal Percentage - Double Piston Ring

Valve Size Inch	Port Size	Cage Material		
Globe Body	Inch (mm)	S17400 H900	S17400 DH1150	S31600 / ENC
1, 1-1/2x1, 2x1	1-5/16 (33.3)	2U21533327D	2U21531150D	2U74084893D
1-1/2	1-7/8 (47.6)	2U21953327D	2U21951150D	2U74094893D
2, 3x2	2-5/16 (58.7)	2U22373327D	2U22371150D	2U74104893D
3	3-7/16 (87.3)	2U23213327D	2U23211150D	2U74124893D
4	4-3/8 (111.1)	2U23633327D	2U23631150D	2U74134893D
4x2-1/2	2-7/8 (73.0)	2U22793327D	2U22791150D	2U74114893D
6	7 (177.8)	2U50593327D	2U50591150D	2U80674893D
6x4	4-3/8 (111.1)	2V37233327D	2V37231150D	2V37134893D
8 2 Inch Travel	8 (203.2)	20A3245X01D	20A3245X05D	20A5467X01D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 25

Cage (Key 19) - 361 Linear - Double Piston Ring

Valve Size Inch	Port Size	Cage Material		
Globe Body	Inch (mm)	S17400 H900	S17400 DH1150	S31600 / ENC
1, 1-1/2x1, 2x1	1-5/16 (33.3)	2U21563327D	2U21561150D	2U74144893D
1-1/2	1-7/8 (47.6)	2U21983327D	2U21983150D	2U74154893D
2, 3x2	2-5/16 (58.7)	2U22403327D	2U22401150D	2U74164893D
3	3-7/16 (87.3)	2U23243327D	2U23241150D	2U74184893D
4	4-3/8 (111.1)	2U23663327D	2U23661150D	2U74194893D
4x2-1/2	2-7/8 (73.0)	2U22823327D	2U22821150D	2U74174893D
6	7 (177.8)	2U50613327D	2U50611150D	2U80684893D
6x4	4-3/8 (111.1)	2V37183327D	2V37181150D	2V37124893D
8 2 Inch Travel	8 (203.2)	20A3247X01D	20A3247X05D	20A5468X01D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 26

Cage (Key 19) - 361 Quick Opening - Double Piston Ring

Valve Size Inch	Port Size	Cage Material		
Globe Body	Inch (mm)	S17400 H900	S17400 DH1150	S31600 / ENC
1, 1-1/2x1, 2x1	1-5/16 (33.3)	2U21503327D	2U21501150D	2U74034893D
1-1/2	1-7/8 (47.6)	2U21923327D	2U21921150D	2U72544893D
2, 3x2	2-5/16 (58.7)	2U22343327D	2U22341150D	2U74044893D
3	3-7/16 (87.3)	2U23183327D	2U23181150D	2U74064893D
4	4-3/8 (111.1)	2U23603327D	2U23601150D	2U74074893D
4x2-1/2	2-7/8 (73.0)	2U22763327D	2U22761150D	2U74054893D
6	7 (177.8)	2U50633327D	2U50631150D	2U80694893D
6x4	4-3/8 (111.1)	20A3249X01D	20A3249X02D	20A5469X01D
8 2 Inch Travel	8 (203.2)	2V37223327D	2V37221150D	2V37144893D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 27

Reduced Trim Adapters (Keys 13 & 24)

- S31600/S31603 Dual Grade Material

Globe Body Inch	Angle Body Inch	Part	
		Seat Ring Adapter (Key 13)	Cage Adapter (Key 24)
1-1/2 x 1	2x1	-	1U2218X316D
2x1	-	1U2262X316D	1U1207X316D
-	3 x 1-1/2	1U2304X316D	1U2302X316D
3 x 2	4 x 2	1U2346X316D	1U1246X316D
4 x 2-1/2	-	1U2396X316D	1U1251X316D

- LF2 (ASTM A350/A105 DUAL GRADE FORGED MATERIAL)

Globe Body Inch	Angle Body Inch	Part	
		Seat Ring Adapter (Key 13)	Cage Adapter (Key 24)
1-1/2 x 1	2x1	-	1U22182449D
2x1	-	1U22622449D	1U12072449D
-	3 x 1-1/2	1U23042449D	1U23022449D
3 x 2	4 x 2	1U23462201D	1U12462201D
4 x 2-1/2	-	1U23962201D	1U12512201D

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Table 28

Seat Ring (Keys 15) - For Standard Trim

Globe Body Inch	Angle Body Inch	Material		
		S41600 HT	S31600	S31600 / Alloy 6 Hard Faced Seat
1, 2 x 1	1	1U22254617D	1U22253507D	1U22253910D
1-1/2	2 x 1	1U22194617D	1U22193507D	1U22193910D
1-1/2 x 1	2	1U22204617D	1U22203507D	1U22203910D
2, 3 x 2	4 x 2	1U22264617D	1U22263507D	1U22263910D
-	3	1U22274617D	1U22273507D	1U22273910D
3	4	1U22284617D	1U22283507D	1U22283910D
4	6	1U22294617D	1U22293309D	1U22293910D
6	-	1U50804617D	1U50803309D	1U50803910D
6 x 4	-	2V37194617D	2V37193507D	2V37204605D
8	-	20A3260X01D	20A3260X02D	20A3260X15D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 29

Seat Ring (Keys 15) - For Anti-Cavitation Trim

Globe Body Inch	Stage			
	Stage 1		Stage 2	
	S17400 H900	S31600 / Alloy 6 Hard Faced Seat & Bore	S17400 H900	S31600 / Alloy 6 Hard Faced Seat & Bore
1	23A7567X01D	23A7567X02D	24A5231X01D	24A5239X01D
1-1/2	23A7568X01D	23A7568X02D	24A5232X01D	24A5240X01D
2	23A7569X01D	23A7569X02D	24A3039X01D	24A5241X01D
3	24A3016X01D	24A3016X02D	360R338X09D	360R3001X5D
4	24A1135X01D	24A1135X02D	23A5813X01D	24A5244X01D
6	23A5820X03D	23A5820X01D	360R6015X9D	360R6016X5D
8	360R8000X9D	360R8001X3D	360R8002X9D	360R8004X5D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).



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Table 30

Soft Seat Valve Parts (Keys 16, 17, & 18)

Valve Size inch		Parts		
Globe Valve	Angle Valve	Disk Seat (S31600)	Disk (PTFE)	Disk Retainer (S31600)
1, 2 x 1	1	1V71023507D	1V71010624D	1V71003507D
1-1/2	2, 3 x 1-1/2	1V71053507D	1V71040624D	1V71033507D
1-1/2 x 1	2 x 1	1V71223507D	1V71010624D	1V71213507D
2, 3 x 2	4 x 2	1V71063507D	1V71070624D	1V71083507D
4 x 2-1/2	3	1V71113507D	1V71100624D	1V71093507D
3	-	1V71143507D	1V71130624D	1V71123507D
4	6	1V71173309D	1V71160624D	1V71153309D
6	-	1V71203309D	1V71190624D	1V71183309D
6 x 4	-	2V71243507D	1V71160624D	1V71233507D
8		20A4467X01D	20A4468X01D	10A4466X01D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

Table 31

Gaskets and Shim Repair Kits (Keys 12, 14, 20, 21, 22, & 25)

Valve Size inch		Gasket Kit
Globe Valve	Angle Valve	
1	1	RGASKETX31D
1-1/2	2	RGASKETX32D
1-1/2 x 1	2 x 1	RGASKETX24D
2	-	RGASKETX33D
2 x 1	-	RGASKETX25D
-	3	RGASKETX34D
-	3 x 1-1/2	RGASKETX26D
3	4	RGASKETX35D
3 x 2	4 x 2	RGASKETX27D
4	6	RGASKETX36D
4 x 2-1/2	-	RGASKETX28D
6	-	RGASKETX37D
6 x 4	-	RGASKETX37D
8	-	RGASKETX23D

- All S31600 barstock is dual grade S31600/S31603 (316/316L).

NOTE: Low-Noise III trim requires 2 bonnet gaskets (Key 22). Consult Dyna-Flo.

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Table 32

Packing Parts (Keys 32, 33, 34, 39, 40, & 41)

PTFE Packing

Key #	Description		Stem Diameter Inch (mm)			
			3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	1 (25.4)
32	Packing Spring (S30400) For Single Packing Only.	Part #	1F12543701D	1F12553701D	1F12563701D	1D58293701D
		Qty.	1	1	1	1
33	Special Washer (S30400) For Single Packing Only.	Part #	1F12523604D	1F12513604D	1F12503604D	1H98223604D
		Qty.	1	1	1	1
34*	Packing Set (Refer to Table 25 for Repair Kits)	Part #	1R2900010DD	1R2902010DD	1R2904010DD	1R29060101D
		Qty. Single	1	1	1	1
		Qty. Double	2	2	2	2
39	Lantern Ring (S31600/S31603 Dual Grade) For Double PTFE Packing	Part #	DFX0000031D	DFX0000001D	DFX0000041D	DFX0000051D
		Qty.	1	1	1	1

Single Graphite Packing

Key #	Description		Stem Diameter Inch (mm)			
			3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	1 (25.4)
39	Lantern Ring (S31600/S31603 Dual Grade)	Part #	DFX0000031D	DFX0000021D	DFX0000041D	DFX0000051D
		Qty.	2	1	2	2
39A	Lantern Ring (S31600/S31603 Dual Grade)	Part #	N/A	DFX0000001D	N/A	N/A
		Qty.	N/A	1	N/A	N/A
40	Graphite Filament Ring	Part #	1F3370X032D	1E3190X022D	1E3191X028D	1D7518X013D
		Qty.	2	2	3	3
41	Graphite Ribbon Ring	Part #	1V3160X002D	1V3802X002D	1V2396X002D	1U6768X002D
		Qty.	2	2	2	2

* - For 3/8 inch stems, remove a packing ring from the lower set for a total of 4 rings.

Table 33

Packing Repair Kits

Stem Diameter [Yoke Boss Diameter] inches (mm)	Single		Double
	PTFE	Graphite	PTFE
3/8 (9.5) [2-1/8 (54)]	RPACKX0001D	RPACKXD010D	RPACKXD004D
1/2 (12.7) [2-13/16 (71)]	RPACKX0002D	RPACKXD011D	RPACKXD005D
3/4 (19.1) [3-9/16 (90)]	RPACKX0003D	RPACKXD012D	RPACKXD006D
1 (25.4) [5 (127)]	RPACKX00034D	RPACKX0053D	RPACKX0036D



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Table 34

Model 361 Parts - Piston Ring (Graphite)

Key	Description	Part Number
48	1-5/16" Port	1U2174X002D
	1-7/8" Port	1U2216X002D
	2-5/16" Port	1U2258X002D
	2-7/8" Port	1U2300X002D
	3-7/16" Port	1U2342X002D
	4-3/8" Port	1U2392X002D
	7" Port	1U5069X002D
	8" Port	10A3262X03D

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Model 360/361 Control Valves

MODEL NUMBERING SYSTEM



SAMPLE PART NUMBER: 361-3AFL-2FP2-GES2

BODY STYLE								-
-	GLOBE	A	ANGLE					-
VALVE SIZE								3
1	1 INCH	5	1-1/2 INCH	2	2 INCH	3	3 INCH	
4	4 INCH	6	6 INCH	8	8 INCH	E	10 X 8 INCH	
ASME RATING								A
A	150	B	300	C	600			
END CONNECTION								F
F	RF	J	RTJ	N	NPT	T	BWE SCH 40	
L	BWE SCH 80	S	SOCKET WELD					
BODY MATERIAL								L
L	LCC	W	WCC	M	CF8M	9	WC9	
BOLTING								-
-	B7 / 2H (STANDARD)			A	B7M / 2HM			
B	B8M / 8M			K	B7 / 2H FLUOROKOTE #1			
L	B7M / 2HM FLUOROKOTE #1							
TRIM								2
1	TRIM D1	2	TRIM D2	4	TRIM D4	6	TRIM D6	
C	TRIM DC	E	TRIM DE	J	TRIM DJ	2H	TRIM D2H	
4H	TRIM D4H	6H	TRIM D6H	7H	TRIM D7H	8H	TRIM D8H	
PORT SIZE								F
F	FULL PORT	R	REDUCED PORT					
PACKING STYLE								P
P	SINGLE PTFE V-RING (PRESSURE)			J	DOUBLE PTFE V-RING (PRESSURE)			
G	SINGLE GRAPHITE (PRESSURE)			V	DOUBLE PTFE V-RING (VACUUM)			
R	DOUBLE PTFE V-RING (VACUUM / PRESSURE)			L	LIVE LOADED PTFE V-RING (PRESSURE)			
T	LIVE LOADED GRAPHITE (PRESSURE)			D	LIVE LOADED DUPLEX (PRESSURE)			
K	LIVE LOADED KALREZ®							
YOKE BOSS SIZE								2
1	2-1/8" (3/8" STEM)	2	2-13/16" (1/2" STEM)	3	3-9/16" (3/4" STEM)	5	5" (1" STEM)	
PAINT								-
-	DFPS-01 (STANDARD)			2	DFPS-02 (SEVERE SERVICE)			
3	DFPS-03 (HIGH TEMPERATURE)							
PISTON RING								G
G	GRAPHITE PISTON RING			H	MULTIPLE GRAPHITE PISTON RINGS			
CHARACTERISTIC								E
E	EQUAL PERCENT	L	LINEAR	Q	QUICK OPENING			
Z	LOW-NOISE III A1 (LINEAR)			Y	LOW-NOISE III B3 (LINEAR)			
C	LOW-NOISE III C3 (LINEAR)			1	LOW-NOISE III D1 (LINEAR)			
D	LOW-NOISE III D3 (LINEAR)							
CHARACTERISTIC (EXTENDED TRAVEL)								
R	MODIFIED EQUAL PERCENT			S	MODIFIED LINEAR			
T	MODIFIED QUICK OPENING			W	MODIFIED LOW-NOISE III A1 (LINEAR)			
BONNET STYLE								S
S	STANDARD	T	STANDARD TAPPED	E	EXTENSION STYLE 1			
H	EXTENSION STYLE 2							
SHUT-OFF CLASS								2
2	CLASS II	3	CLASS III	4	CLASS IV			

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Model 360/361 Control Valves

MODEL NUMBERING SYSTEM

SAMPLE PART NUMBER: 360-3AFL-5FP2-VES4

BODY STYLE						-		
-	GLOBE	A	ANGLE					
VALVE SIZE						3		
1	1 INCH	5	1-1/2 INCH	2	2 INCH		3	3 INCH
4	4 INCH	6	6 INCH	8	8 INCH			
ASME RATING						A		
A	150	B	300	C	600			
END CONNECTION						F		
F	RF	J	RTJ	N	NPT		T	BWE SCH 40
L	BWE SCH 80	S	SOCKET WELD					
BODY MATERIAL						L		
L	LCC	W	WCC	M	CF8M		9	WC9
BOLTING						-		
-	B7 / 2H (STANDARD)			A	B7M / 2HM			
B	B8M / 8M			K	B7 FLUOROKOTE #1 / 2H FLUOROKOTE #1			
L	B7M FLUOROKOTE #1 / 2HM FLUOROKOTE #1							
TRIM						5		
1	TRIM D1	2	TRIM D2	4	TRIM D4		5	TRIM D5
6	TRIM D6	7	TRIM D7	8	TRIM D8		9	TRIM D9
L	TRIM DL	J	TRIM DJ	T	TRIM DT		C	TRIM DC
E	TRIM DE	N	TRIM DN	R	TRIM DR		2H	TRIM D2H
4H	TRIM D4H	6H	TRIM D6H	7H	TRIM D7H		8H	TRIM D8H
PORT SIZE						F		
F	FULL PORT	R	REDUCED PORT					
PACKING STYLE						P		
P	SINGLE PTFE V-RING (PRESSURE)			J	DOUBLE PTFE V-RING (PRESSURE)			
G	SINGLE GRAPHITE (PRESSURE)			V	DOUBLE PTFE V-RING (VACUUM)			
R	DOUBLE PTFE V-RING (VACUUM / PRESSURE)			L	LIVE LOADED PTFE V-RING (PRESSURE)			
T	LIVE LOADED GRAPHITE (PRESSURE)			D	LIVE LOADED DUPLEX (PRESSURE)			
K	LIVE LOADED KALREZ®							
YOKE BOSS SIZE						2		
1	2-1/8" (3/8" STEM)	2	2-13/16" (1/2" STEM)	3	3-9/16" (3/4" STEM)	5	5" (1" STEM)	
PAINT						-		
-	DFPS-01 (STANDARD)			2	DFPS-02 (SEVERE SERVICE)			
3	DFPS-03 (HIGH TEMPERATURE)							
BACKUP RING / SEAL RING						V		
V	VITON / CARBON-FILLED PTFE			E	EPDM / CARBON-FILLED PTFE			
C	S31600 / CARBON-FILLED PTFE-ELGILOY			K	S31600 / KEL-F - ELGILOY			
P	CARBON-FILLED PTFE-ELGILOY (8" 360)							
R	S31600 / CARBON-FILLED PTFE-ELGILOY WITH PEEK AE RINGS							
CHARACTERISTIC						E		
E	EQUAL PERCENT	L	LINEAR	Q	QUICK OPENING			
A	ANTI-CAVITATION 1 STAGE (LINEAR)			K	ANTI-CAVITATION 2 STAGE (LINEAR)			
Z	LOW-NOISE III A1 (LINEAR)			Y	LOW-NOISE III B3 (LINEAR)			
C	LOW-NOISE III C3 (LINEAR)			1	LOW-NOISE III D1 (LINEAR)			
D	LOW-NOISE III D3 (LINEAR)							
CHARACTERISTIC (EXTENDED TRAVEL)						S		
R	EQUAL PERCENT - EXTENDED TRAVEL			S	LINEAR - EXTENDED TRAVEL			
T	QUICK OPENING - EXTENDED TRAVEL			W	LOW-NOISE III A1 (LINEAR) - EXTENDED TRAVEL			
V	ANTI-CAVITATION 1 STAGE (LINEAR) -EXTENDED TRAVEL							
4	LOW-NOISE III A1 (LINEAR) EXTENDED 4" TRAVEL (8" VALVE ONLY)							
BONNET STYLE								
S	STANDARD	T	STANDARD TAPPED	E	EXTENSION STYLE 1			
H	EXTENSION STYLE 2							
SHUT-OFF CLASS						4		
4	CLASS IV	5	CLASS V	6	CLASS VI			

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