

# Fisher™ EDR and ETR easy-e™ Valves

## Contents

Introduction .....	1
Scope of Manual .....	1
Description .....	1
Specifications .....	2
Educational Services .....	2
Installation .....	4
Maintenance .....	5
Trim Maintenance .....	5
Packing Maintenance .....	9
Parts Ordering .....	15
Packing Kits .....	16
Parts Kits .....	19
Parts List .....	20

Figure 1. Reverse Acting easy-e Valve with Actuator



W2080-1

## Introduction

### Scope of Manual

This instruction manual includes installation, maintenance, and parts information for NPS 1 through 4 EDR and ETR valves (see figure 1). The valves are available in CL150 through 600 ratings.

The valves are also available with full-size and restricted-trim designs. Refer to separate manuals for instructions covering the actuator and accessories.

Do not install, operate, or maintain an EDR or ETR valve without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your [Emerson sales office](#) or Local Business Partner before proceeding.

### Description

The EDR and ETR are single-port, globe-style valves that feature cage guiding, a balanced plug design, and push-down-to-open valve plug action. The valve constructions are available with metal-to-metal or metal-to-composition seats. These constructions permit access to the internal trim parts through the bottom flange without removing the actuator from the valve.

Table 1. Specifications

Available Valve Constructions	Shutoff Classification																								
See table 2	EDR: ANSI/FCI 70-2 and IEC 60534-4 Class II (standard); Class III for valves with a graphite piston ring and 78 mm (3.4375 inch) or larger port diameter																								
<b>End Connection Styles</b>	ETR: Standard air test (0.05 mL/minute/psid/inch of port diameter) using air at service pressure drop or 3.5 bar (50 psi), whichever is lower; or ANSI/FCI 70-2 and IEC 60534-4 Class V (optional) with PTFE seats; Class IV or V (optional) with metal seats																								
<b>Cast Iron Valves</b> <i>Flanged:</i> CL125 flat-face or 250 raised-face flanges per ASME B16.1 <b>Steel and Stainless Steel Valves</b> <i>Flanged:</i> CL150, 300, and 600 raised-face or ring-type joint flanges per ASME B16.5 <i>Screwed or Socket Welding:</i> All available ASME B16.11 schedules that are consistent with CL600 per ASME B16.34 <i>Buttwelding:</i> Consistent with ASME B16.25	<b>Flow Characteristics</b>																								
<b>Maximum Inlet Pressure<sup>(1)</sup></b>	Linear (all cages), quick-opening, or equal percentage																								
<b>Cast Iron Valves</b> <i>Flanged:</i> Consistent with CL125B or 250B pressure-temperature ratings per ASME B16.1 <b>Steel and Stainless Steel Valves</b> <i>Flanged:</i> Consistent with CL150, 300, and 600 <sup>(2)</sup> pressure-temperature ratings per ASME B16.34 <i>Screwed or Welding:</i> Consistent with CL600 pressure-temperature ratings per ASME B16.34	<b>Flow Directions</b>																								
	<b>Linear, Quick Opening, or Equal Percentage Cage:</b> Normally up, <b>Whisper Trim™ I Cage:</b> Always down																								
	<b>Approximate Weights</b>																								
	<table border="1"> <thead> <tr> <th rowspan="2">VALVE SIZE, NPS</th> <th colspan="2">WEIGHT</th> </tr> <tr> <th>kg</th> <th>Pounds</th> </tr> </thead> <tbody> <tr> <td>1 &amp; 1-1/4</td> <td>14</td> <td>30</td> </tr> <tr> <td>1-1/2</td> <td>20</td> <td>45</td> </tr> <tr> <td>2</td> <td>39</td> <td>67</td> </tr> <tr> <td>2-1/2</td> <td>45</td> <td>100</td> </tr> <tr> <td>3</td> <td>54</td> <td>125</td> </tr> <tr> <td>4</td> <td>77</td> <td>170</td> </tr> </tbody> </table>		VALVE SIZE, NPS	WEIGHT		kg	Pounds	1 & 1-1/4	14	30	1-1/2	20	45	2	39	67	2-1/2	45	100	3	54	125	4	77	170
VALVE SIZE, NPS	WEIGHT																								
	kg	Pounds																							
1 & 1-1/4	14	30																							
1-1/2	20	45																							
2	39	67																							
2-1/2	45	100																							
3	54	125																							
4	77	170																							

1. The pressure/temperature limits in this manual and any applicable standard or code limitation for the valve should not be exceeded.

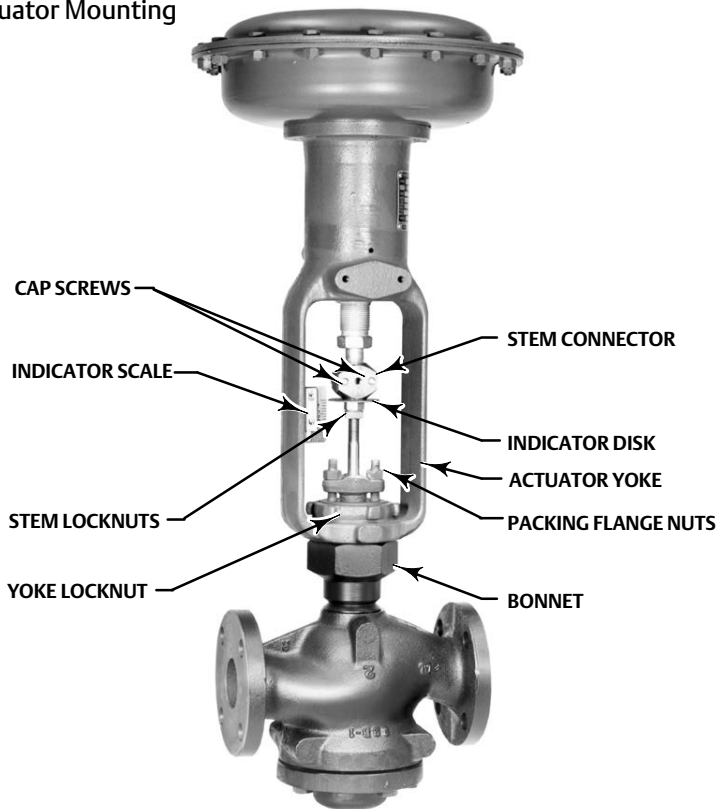
2. Certain bonnet bolting material selections may require a CL600 easy-e valve assembly to be derated. Contact your [Emerson sales office](#) or Local Business Partner.

## Educational Services

For information on available courses for Fisher EDR and ETR valves, as well as a variety of other products, contact:

Emerson Automation Solutions  
 Educational Services - Registration  
 Phone: 1-641-754-3771 or 1-800-338-8158  
 E-mail: [education@emerson.com](mailto:education@emerson.com)  
[emerson.com/fishervalvetraining](http://emerson.com/fishervalvetraining)

Figure 2. Actuator Mounting



W2080-1

Table 2. Available Valve Constructions

VALVE DESIGN	VALVE SIZE, NPS	VALVE MATERIAL AND END CONNECTION STYLE							
		Carbon Steel, Alloy Steel, or Stainless Steel Valve						Cast Iron Valve	
		Screwed	RF or RTJ Flanged			Butt-welding	Socket Weld	CL125B FF Flanged	CL250B RF Flanged
			CL150	CL300	CL600				
EDR	1, 1-1/2, or 2	X	X	X	X	X	X	X	X
	1-1/4	X	---	---	---	---	---	---	---
	2-1/2, 3, or 4	---	X	X	X	X	---	X	X
ETR	1, 1-1/2, or 2	X	X	X	X	X	X	---	---
	1-1/4	X	---	---	---	---	---	---	---
	2-1/2, 3, or 4	---	---	---	---	---	---	---	---

X = Available Construction

## Installation

### **⚠ WARNING**

Always wear protective gloves, clothing, and eyewear when performing any installation operations.

To avoid personal injury or property damage resulting from the sudden release of pressure, do not install the valve assembly where service conditions could exceed the limits given on the valve and actuator nameplates. Use pressure-relieving devices as required by accepted industry, local, state, or Federal codes, and good engineering practices. Check with your process or safety engineer for any other hazards that may be present from exposure to process media.

If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

### **CAUTION**

The valve configuration and construction materials were selected to meet particular pressure, temperature, pressure drop, and controlled fluid conditions. Because some body/trim material combinations are limited in their pressure drop and temperature range capabilities, do not exceed these conditions without first contacting your [Emerson sales office](#) or Local Business Partner.

Inspect the valve and pipelines to ensure they are not damaged, are clean, and free of foreign material.

1. Before installing the valve, inspect the valve and associated equipment for any damage and any foreign material.
2. Make certain the valve body interior is clean, that pipelines are free of foreign material, and that the valve is oriented so that pipeline flow is in the same direction as the arrow (see figure 2) on the side of the valve.
3. The control valve assembly can be installed in any orientation unless limited by seismic criteria. However, the normal method is with the actuator vertical above the valve body (see figure 2). Other positions may result in uneven valve plug and cage wear, and improper operation. With some valves, the actuator may also need to be supported when it is not vertical. For more information, consult your Emerson sales office or Local Business Partner.
4. Use accepted piping and welding practices when installing the valve in the line. If a post-weld heat treatment process is to be applied to the valve end connections, and the valve has composition or elastomer trim parts, remove the trim to avoid damage to the soft parts.

### **CAUTION**

Depending on valve body materials used, post weld heat treating may be required. If so, damage to internal elastomeric and plastic parts, as well as internal metal parts is possible. Shrink-fit pieces and threaded connections may loosen. In general, if post weld heat treating is to be performed, all trim parts should be removed. Contact your Emerson sales office or Local Business Partner for additional information.

5. If continuous operation is required during inspection or maintenance, install a three-valve bypass around the control valve assembly.
6. If the actuator and valve are shipped separately, refer to the actuator mounting procedure in the appropriate actuator instruction manual and also see figure 2.

### **⚠ WARNING**

Personal injury could result from packing leakage. Valve packing was tightened prior to shipment; however some readjustment will be required to meet specific service conditions.

# Maintenance

## **⚠ WARNING**

Avoid personal injury from sudden release of process pressure. Before performing any maintenance operations:

- Do not remove the actuator from the valve while the valve is still pressurized.
- Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.
- Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve. Drain the process media from both sides of the valve.
- Vent the power actuator loading pressure and relieve any actuator spring precompression.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

Valve parts are subject to normal wear and must be inspected and replaced as necessary. Inspection and maintenance frequency depends on the severity of service conditions. This section includes instructions for trim maintenance, packing maintenance, and packing lubrication. All maintenance operations may be performed with the valve installed in the pipeline.

### **Note**

If the valve has ENVIRO-SEAL™ live-loaded packing installed (figure 8, 9, or 10), see the Fisher instruction manual entitled ENVIRO-SEAL Packing System for Sliding-Stem Valves ([D101642X012](#)) for packing instructions.

## Trim Maintenance

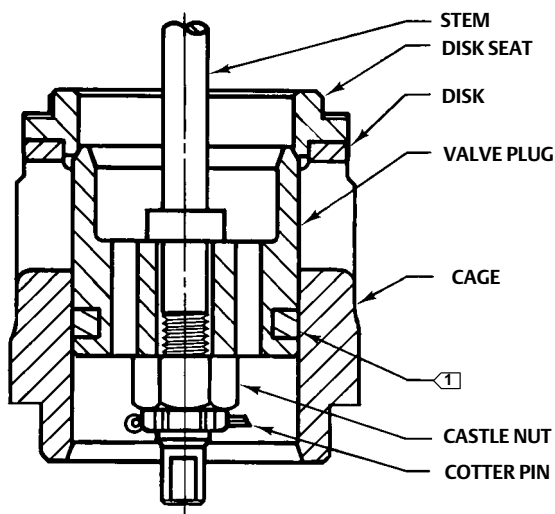
### Disassembly

#### **Note**

Whenever a gasket seal is disturbed by removing or shifting gasketed parts, install a new gasket upon reassembly. This is necessary to ensure a good gasket seal.

Key number locations are shown in figure 11 or 12 unless otherwise indicated.

Figure 3. Valve Plug Assembly

40A5479-B  
82360

NOTE:



ETR USES A SEAL RING (KEY 24) AND A BACKUP RING (KEY 25) (SEE FIGURE 11).

**CAUTION**

Take care when removing the bottom flange (key 31) in the following procedure, to prevent possible product damage from parts unexpectedly falling out of the valve body.

1. Isolate the control valve from the line pressure, release pressure from both sides of the valve body, and drain the process media from both sides of the valve. If using a power actuator, also shut off all pressure lines to the power actuator, release all pressure from the actuator. Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment. When removing the bottom flange (key 31), be careful that the cage and other parts are not damaged by unexpectedly falling out of the valve body. Remove the nuts (key 16) or cap screws from the bottom flange.
2. Removing the valve plug from the valve body, the valve plug can be removed independently of the valve stem by removing the cotter pin and castle nut (keys 30 and 8). Then, slide the valve plug out of the cage (see figure 3).
  - Disconnect the stem connector, and loosen the packing flange nuts (see figure 2).
  - Move the valve stem away from the actuator stem allowing room to remove the indicator disk and stem locknuts. Remove the parts indicated.
  - Remove the valve plug by pulling the valve plug/stem assembly through the packing and out of the bottom of the bonnet.
  - If the valve plug is to be re-used but the stem needs to be replaced, drive the pin (key 8) out of the plug/stem assembly and unscrew the valve stem.

**CAUTION**

Take care during disassembly in the following procedure, to prevent possible damage to sealing surfaces.

- Remove the seat ring (key 9), gaskets (keys 10, 11, 12, and 13), and any remaining parts if they did not come out with the valve plug. If the seat ring (key 9) is stuck in the valve body, strike the outside of the valve body at the seat ring line with a rubber hammer while pulling down on the seat ring. Carefully remove the seat ring without damaging sealing surfaces.

If necessary, machine or grind metal seats before installing the piston ring/seal ring or packing, or refer to the Lapping Metal Seats procedure in this section.

### CAUTION

The pressure balancing holes in the valve plug are necessary for the proper and safe operation of the valve. Inspect the balancing holes every time the valve is disassembled for service. Any build-up, blockage, or clogging of the balance holes should be removed.

### Lapping Metal Seats

A certain amount of leakage should be expected with metal-to-metal seating in any valve body. If the leakage becomes excessive, however, the condition of the seating surfaces of the valve plug and seat ring can be improved by lapping. (Deep nicks should be machined out rather than ground out.) Use a good quality lapping compound of a mixture of 280 to 600-grit.

Assemble the valve to the extent that the seat ring (key 9), cage (key 3), cage adaptor (key 4, if used), and bonnet are in place. Also, remove the piston ring or seal ring from the valve plug (if used).

- Insert the valve stem (key 7) into the bonnet and thread the plug (key 2) onto the end of the stem. Make a simple handle from a piece of strap iron; lock it to the valve with the stem locknuts.
- Apply the lapping compound to the seating surfaces. Rotate the handle alternately in each direction to lap the seats. After lapping the seats, remove the valve plug and stem, then clean all parts. Repeat the lapping procedure if necessary.

### Trim Assembly

Carefully clean all gasket surfaces. Use new gaskets during reassembly of the valve.

Table 3. Valve Body-to-Flange Nut Torques<sup>(3)</sup>

VALVE SIZE, NPS	TORQUES <sup>(1)</sup>			
	SA193-B7		SA193-B8M <sup>(2)</sup>	
	N•m	Lbf•ft	N•m	Lbf•ft
1 and 1-1/4	129	95	64	47
1-1/2, 1-1/2 x 1, 2, or 2 x 1	96	71	45	33
2-1/2, 2-1/2 x 1-1/2, or 3 x 1-1/2	129	95	64	47
3, 3 x 2, 3 x 2-1/2, or 4 x 2	169	125	88	65
4, 4 x 2-1/2, or 4 x 3	271	200	156	115

1. Determined from laboratory tests.  
 2. SA193-B8M annealed.  
 3. For other materials, contact your [Emerson sales office](#) or Local Business Partner.

### Replacing the Seal or Piston Ring

### CAUTION

Be careful not to scratch the surface of the ring groove in the valve plug (key 2), or the new ring may not seal properly.

- For EDR, if the piston ring (key 6) is visibly damaged, remove the ring and replace it with a new part. Refer to the Parts List at the end of this manual for a replacement part.
- For ETR, if the seal ring and backup ring (keys 24 and 25) are visibly damaged, remove the rings by prying or cutting them from the groove. Be careful not to scratch valve plug surfaces. Refer to the Parts List at the end of this manual for replacement parts.

### Assembling the Valve Plug and Stem

1. For EDR and ETR, perform the following steps:

- Insert the stem (key 7) into the plug (key 2, figure 3) and thread the castle nut (key 8) onto the end of the stem and hand tighten.

### CAUTION

**To prevent possible product damage, take care that the stem and plug are not damaged during the following tightening procedure.**

- When tightening the castle nut with a wrench, line up the hole in the end of the stem with a slot in the castle nut. Ensure that the stem and plug are not damaged during the tightening procedure.
- Insert the cotter pin (key 30) and lock it in place.

### Installing the Piston Rings or Backup Ring/Seal Rings

1. For EDR: When using a carbon-filled PTFE piston ring, spread the ring apart slightly at the split, start one end of the split into the groove in the valve plug. Work the ring around the valve plug inserting the ring into the groove in the valve plug.

The replacement graphite piston rings will arrive in one piece. Use a vise with smooth or tapered jaws to break the replacement piston ring into two halves. Place the new ring in the vise so that the jaws compress the ring into an oval. Compress the ring slowly until the ring snaps on both sides. If one side snaps first, do not try to tear or cut the other side. Instead, keep compressing the ring until the other side snaps. The piston ring can also be fractured by scoring and snapping over a hard surface such as a table edge. Sawing or cutting the ring is not recommended.

2. For ETR: Apply a lubricant to both backup and seal rings (keys 25 and 24). Place the backup ring over the stem (key 7) and into the groove in the valve plug (key 3). Slowly and gently stretch the seal ring over the valve plug and work it into the groove. Stretching the ring over the valve plug can cause it to appear too large for the groove, but it will contract to its original size when inserted into the cage.

### CAUTION

**When installing the EDR or ETR valve plug into the cage, make sure the piston or seal ring is evenly engaged in the entrance chamfer of the cage to avoid damage to the ring.**

#### Note

Use the preceding procedures to assemble the valve plug and stem before installing the parts into the valve body. Insert the valve plug into the cage (figure 3), then stack the parts as recommended in steps below.



## Installing the Parts into the Valve Body

1. Stack the valve trim parts using figures 11 and 12 to determine the sequence of parts.
2. Lubricate the stud bolts (key 15) before installing the valve trim into the valve body. (Note: For ease of installing trim parts, remove all packing parts from the packing box before installing the trim parts.)
3. When inserting the stack of trim parts into the valve body, carefully align the parts in the recess of the valve body.
4. Slide the bottom flange onto the stud bolts (key 15). Secure the bottom flange (key 31) in place on the valve body with the hex nuts (key 16). Tighten the hex nuts to the torque value shown in table 3.
5. Torque the nuts in a criss-cross pattern. Repeat the pattern until all nuts are torqued to the value indicated in table 3.
6. Refer to the Packing Maintenance procedures below.

## Packing Maintenance

This procedure covers PTFE V-ring, graphite ribbon/filament, and PTFE composition packing rings. Key numbers refer to figure 5 for PTFE V-ring packing and PTFE/composition packing, unless otherwise indicated.

---

### Note

If the valve has ENVIRO-SEAL live-loaded packing installed (figure 8, 9, or 10), see the Fisher instruction manual entitled ENVIRO-SEAL Packing System for Sliding-Stem Valves ([D101642X012](#)) for packing instructions.

---

For all except spring-loaded packing, if the packing is relatively new and tight on the stem, and if tightening the packing flange nuts does not stop the leakage, it is possible that the valve stem is worn or nicked so that a seal cannot be made. If the leakage comes from the outside diameter of the packing follower, it is possible that the leakage is caused by nicks or scratches around the inside of the packing box wall.

For spring-loaded single PTFE V-ring packing, the spring (key 8) maintains a sealing force on the packing. If leakage is noted around the packing follower (key 13), check to be sure the shoulder on the packing follower is touching the bonnet. If the shoulder is not touching the bonnet, tighten the packing flange nuts (key 5, figure 4) until the shoulder is against the bonnet. If leakage cannot be stopped in this manner, proceed to the Removing Packing and Installing Packing procedures below.

## Removing Packing

### WARNING

Refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

---

The packing may have been removed in earlier steps, or during trim maintenance procedures. Use the following steps, when necessary, to remove packing and associated assemblies.

Key number locations for packing parts are shown in figures 5 and 6. For valve parts and the live loaded packing system, refer to figures 8 through 10 (in the Parts List section), for key number locations.

1. Isolate the control valve from the line pressure, release pressure from both sides of the valve body, and drain the process media from both sides of the valve. If using a power actuator, also shut off all pressure lines to the power

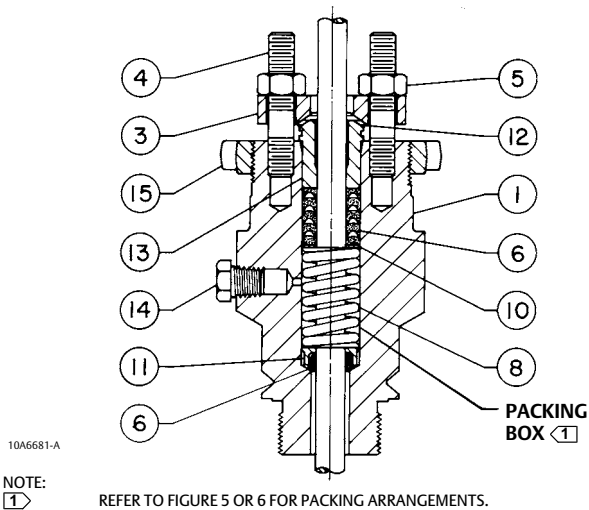
actuator and release all pressure from the actuator. Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.

2. Exhaust all actuator pressure, disconnect the operating lines from the actuator, and disconnect any leakoff piping from the actuator. Relieve any actuator precompression from the stem connector. (If necessary, refer to the appropriate actuator instruction manual for warnings, cautions, and disassembly procedures.)
3. When removing the bottom flange (key 31), be careful that the cage and other parts are not damaged by unexpectedly falling out of the valve body. Remove the nuts (key 16) or cap screws from the bottom flange.
4. To remove the packing for maintenance, disconnect the stem connector (see figure 2). Remove the yoke locknut, and lift the actuator off the valve.
5. Remove the packing flange nuts (key 5, figure 4), packing flange (key 15), upper wiper (key 12), and packing follower (key 13). If maintaining the packing while the valve stem is in place, ensure that the valve stem surface is not scratched or marred while working with the packing.

Table 4. Recommended Torque for Packing Flange Nuts

VALVE STEM DIAMETER		PRESSURE RATING	GRAPHITE PACKING				PTFE PACKING			
			Minimum Torque		Maximum Torque		Minimum Torque		Maximum Torque	
mm	Inches		N•m	Lbf•in	N•m	Lbf•in	N•m	Lbf•in	N•m	Lbf•in
9.5	3/8	CL125, 150	3	24	5	48	1	12	3	24
		CL250, 300	4	36	7	60	2	18	3	30
		CL600	5	48	8	72	3	24	4	36
12.7	1/2	CL125, 150	5	48	8	72	3	24	4	36
		CL250, 300	7	60	10	84	3	30	5	42
		CL600	10	84	14	120	5	42	7	60
19.1	3/4	CL125, 150	11	96	16	144	5	48	8	72
		CL250, 300	14	120	20	180	7	60	10	90
		CL600	20	180	30	264	10	90	15	132

Figure 4. Bonnet Assembly



## CAUTION

To prevent possible product damage, avoid scratching the packing box walls when removing old packing parts. Also inspect valve stem threads and packing box surfaces for sharp edges which may damage packing.

6. Avoid scratching the packing box walls when removing the old packing parts. Clean the packing box (see figure 4), and clean, inspect, or replace metal packing parts. Generally, the metal packing parts are not part of the packing kits listed in the Parts List section, and they must be ordered individually.
  7. Inspect the valve stem threads and packing box surfaces for any sharp edges which might cut the packing. Scratches or burrs on the stem surfaces can cause packing box leakage or damage to new packing. If the surface condition cannot be improved by light sanding, replace the damaged parts by following the appropriate steps in the Trim Maintenance procedure.
- 

**Note**

If the control valve assembly was purchased for an application where the service temperatures are under 232°C (450°F), the bonnet may be unscrewed from the valve body. Where temperatures are greater than 232°C (450°F), the bonnet is seal welded to the valve body.

---

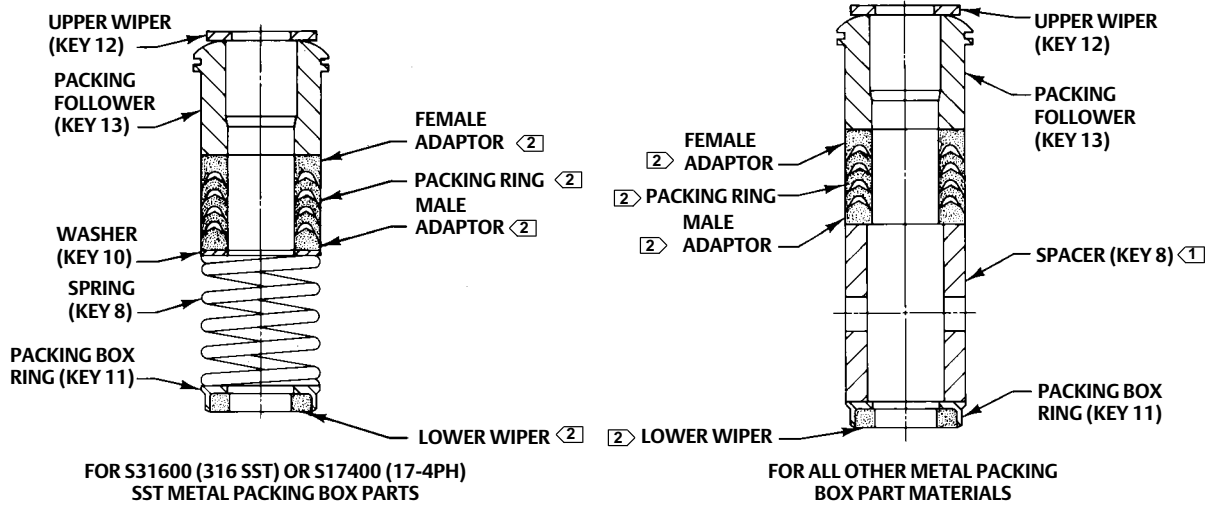
**CAUTION**

**To prevent possible product damage, set the bonnet on a protective surface in the following procedure.**

---

8. If necessary, remove the bonnet assembly from the valve by unscrewing it. Some applications require seal welding the bonnet to the valve body, and the bonnet should not be removed. Set the bonnet on a protective surface to prevent damage to the bonnet gasket surface.

Figure 5. Packing Arrangements



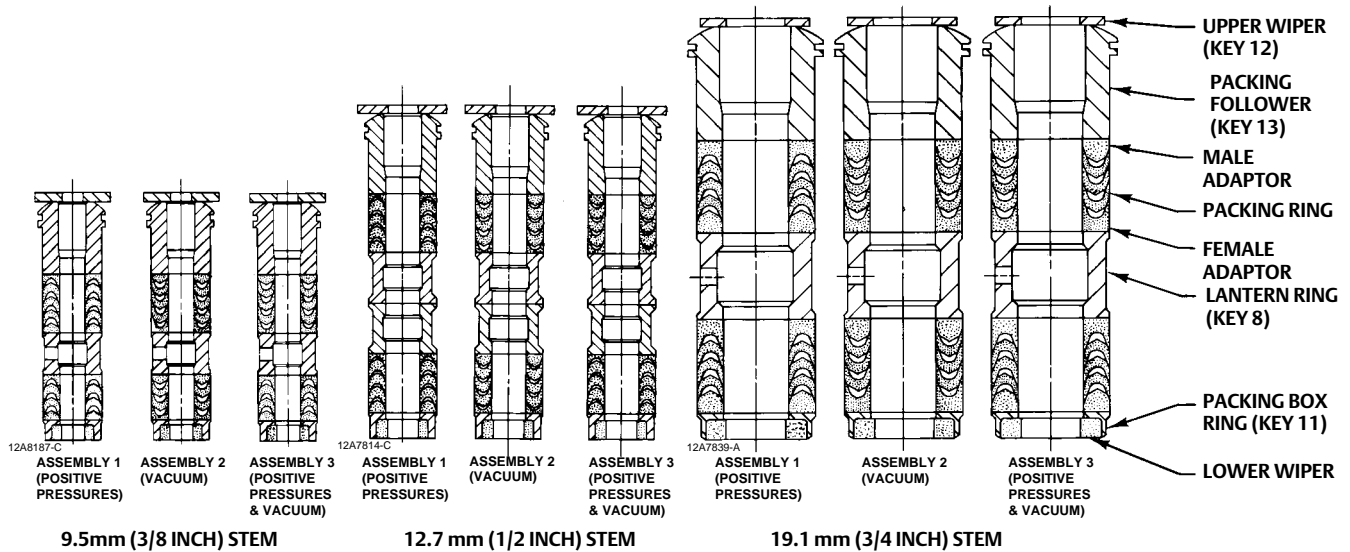
FOR S31600 (316 SST) OR S17400 (17-4PH)  
SST METAL PACKING BOX PARTS

FOR ALL OTHER METAL PACKING  
BOX PART MATERIALS

- NOTES:  
 [1] REFER TO THE VALVE SERIAL NUMBER AND THE PARTS ORDERING SECTION FOR THE SPACER AND OTHER METAL PARTS.  
 [2] PACKING SET (KEY 6) (2 REQ'D FOR DOUBLE ARRANGEMENTS).

12A7837-A  
B2358-1

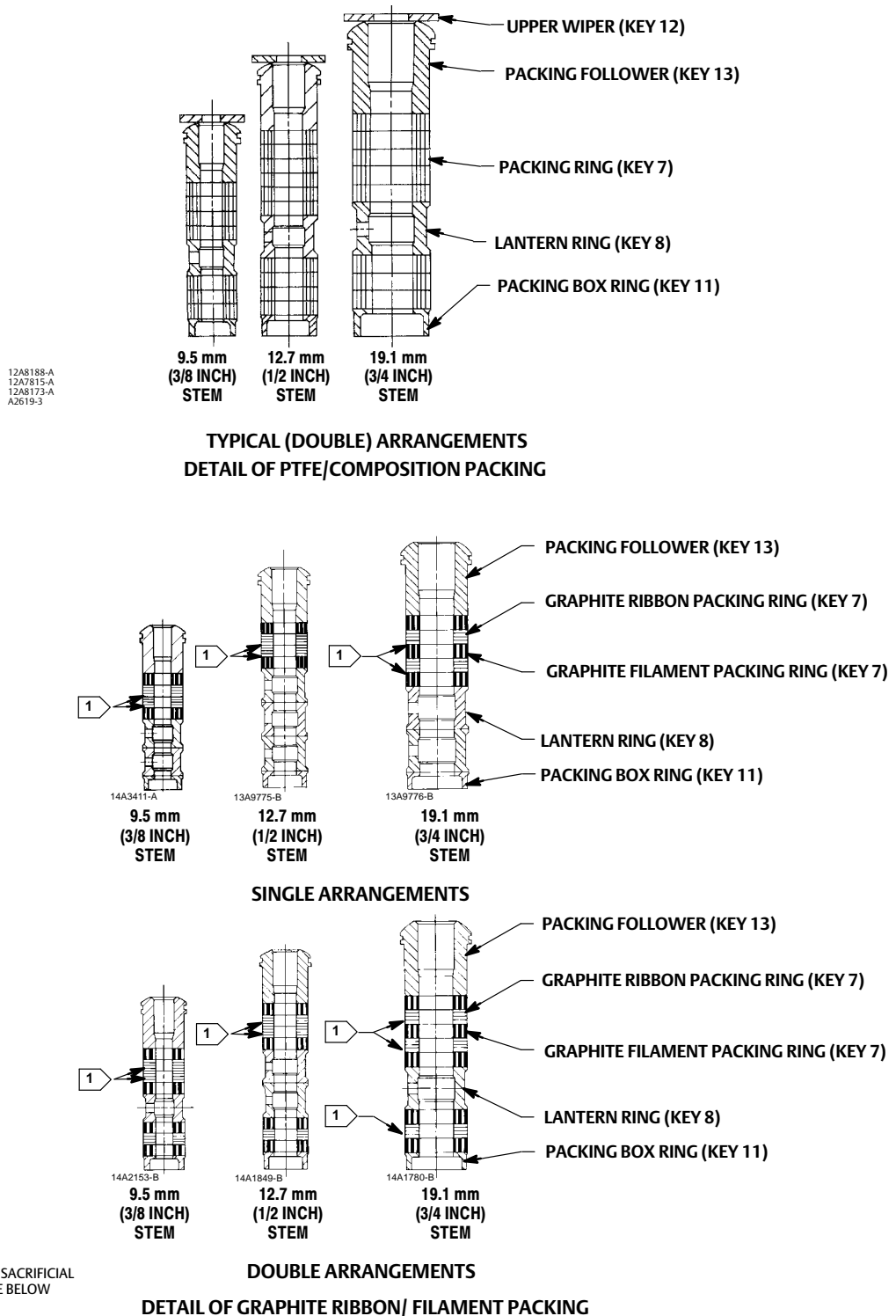
TYPICAL SINGLE ARRANGEMENTS



TYPICAL DOUBLE ARRANGEMENTS

B2359

Figure 6. Packing Arrangements



A5864

## Installing Packing

If the trim is removed, refer to Trim Maintenance procedures, and install the trim (including the valve stem) before installing the packing. If necessary, use the Lapping Metal Seats procedures before installing packing. Key number locations are shown in figure 5 or 6 unless otherwise indicated.

### CAUTION

**To prevent possible product damage, take care when installing the bonnet over the valve stem in the following procedure.**

1. If the bonnet has been removed from the valve body, install the replacement bonnet (see figure 4). Carefully slide the bonnet over the valve stem without damaging the stem surfaces.
2. Refer to figure 5 or 6 for the sequence of parts to make up the appropriate packing set for your application. Arrange the packing parts in sequence before installing them into the packing box.
3. For split-ring packing, alternate the positions of the splits to avoid creating a leak path. Place a smooth-edged pipe over the valve stem and gently tap each soft packing ring into the packing box. Be sure that air is not trapped between adjacent soft parts.
4. Install the packing follower (key 13), packing flange (key 3), and upper wiper (key 12, if required). Install the packing flange nuts (key 5).
5. Refer to actuator installation procedures in the actuator instruction manual, and the installation procedures in the manual when mounting and connecting the actuator to the valve. If lubrication is required, refer to the Packing Lubrication section below.
6. For spring-loaded PTFE V-ring packing, tighten the packing flange nuts until the shoulder on the packing follower (key 13, figure 4) contacts the bonnet.

For **graphite packing**, tighten the packing flange nuts to the maximum recommended torque shown in table 4. Then, loosen the packing flange nuts, and retighten them to the recommended minimum torque shown in table 4.

For **other packing types**, tighten the packing flange nuts alternately in small equal increments until one of the nuts reaches the minimum recommended torque shown in table 4. Then, tighten the remaining flange nuts until the packing flange is level and at a 90-degree angle to the valve stem.

### Note

If the valve has ENVIRO-SEAL live-loaded packing installed (figure 8, 9, or 10), see the Fisher instruction manual entitled ENVIRO-SEAL Packing System for Sliding-Stem Valves ([D101642X012](#)) for packing instructions.

## Packing Lubrication

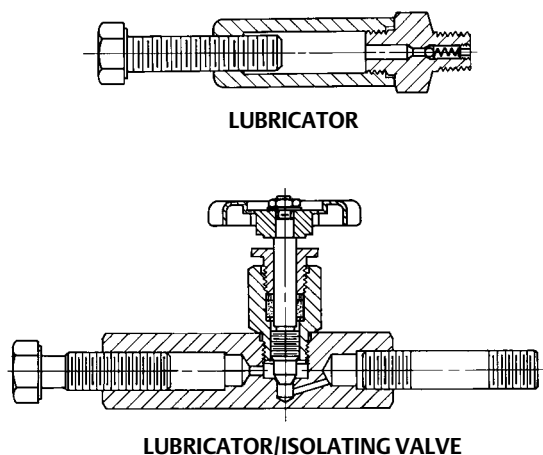
### ⚠ WARNING

**To avoid personal injury or property damage resulting from fire or explosion, do not lubricate packing used in oxygen service or in processes with temperatures over 260°C (500°F).**

Packing used in oxygen service or in processes with temperatures over 260°C (500°F) should not be lubricated. If a lubricator or lubricator/isolating valve (see figure 7) is required for the packing, install the lubricator or lubricator/isolating valve into the threaded hole in the side of the bonnet (see figure 7). Use a good quality silicon-base lubricant.

To operate the lubricator, simply turn the cap screw clockwise to force the lubricant into the packing box. The lubricator/isolating valve operates the same way except the isolating valve must first be opened and then closed after lubrication is completed.

Figure 7. Lubricator and Lubricator/Isolating Valve



10A9421-A  
A15428-D  
A0832-2

## Parts Ordering

Each body-bonnet assembly is assigned a serial number which can be found on the valve body. This same number also appears on the actuator nameplate when the valve is shipped from the factory as part of a control valve assembly. Refer to the serial number when contacting your [Emerson sales office](#) or Local Business Partner for technical assistance. When ordering replacement parts, refer to the serial number and to the eleven-character part number for each part required from the following parts kit or parts list information.

### **⚠ WARNING**

**Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Automation Solutions should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.**

## Packing Kits

### Standard Packing Repair Kits (Non Live-Loaded)

#### Standard Packing Repair Kits (non live-loaded)

Stem Diameter, mm (Inches) Yoke Boss Diameter, mm (Inches)	9.5 (3/8) 54 (2-1/8)	12.7 (1/2) 71 (2-13/16)	19.1 (3/4) 90 (3-9/16)
PTFE (Contains keys 6, 8, 10, 11, and 12)	RPACKX00012	RPACKX00022	RPACKX00032
Double PTFE (Contains keys 6, 8, 11, 12)	RPACKX00042	RPACKX00052	RPACKX00062
PTFE/Composition (Contains keys 7, 8, 11, and 12)	RPACKX00072	RPACKX00082	RPACKX00092
Single Graphite Ribbon/Filament (Contains keys 7 [ribbon ring], 7 [filament ring], 8, and 11)	RPACKX00102	RPACKX00112	RPACKX00122
Single Graphite Ribbon/Filament (Contains keys 7 [ribbon ring], 7 [filament ring])	RPACKX00132	RPACKX00142	RPACKX00152
Double Graphite Ribbon/Filament (Contains keys 7 [ribbon ring], 7 [filament ring], 8, and 11)	RPACKX00162	RPACKX00172	RPACKX00182

### ENVIRO-SEAL Packing Retrofit Kits

Retrofit kits include parts to convert valves with existing standard bonnets to the ENVIRO-SEAL packing box construction. Refer to figure 8 for key numbers for PTFE packing, to figure 9 for key numbers for graphite packing, and to figure 10 for key numbers for duplex packing. PTFE kits include keys 200, 201, 211, 212, 214, 215, 216, 217, 218, tag, and cable tie. Graphite kits include keys 200, 201, 207, 208, 209, 210, 211, 212, 214, 217, tag, and cable tie. Duplex kits include keys 200, 201, 207, 209, 211, 212, 214, 215, 216, 217, tag, and cable tie.

Stems and packing box constructions that do not meet Fisher stem finish specifications, dimensional tolerances, and design specifications, may adversely alter the performance of this packing kit.

For part numbers of individual components in the ENVIRO-SEAL packing kits, refer to instruction manual ENVIRO-SEAL Packing System for Sliding-Stem Valves ([D101642X012](#)).

#### ENVIRO-SEAL Packing Retrofit Kits

PACKING MATERIAL	STEM DIAMETER AND YOKE BOSS DIAMETER, mm (INCH)		
	9.5 (3/8) 54 (2-1/8)	12.7 (1/2) 71 (2-13/16)	19.1 (3/4) 90 (3-9/16)
Double PTFE	RPACKXRT012	RPACKXRT022	RPACKXRT032
Graphite ULF	RPACKXRT262	RPACKXRT272	RPACKXRT282
Duplex	RPACKXRT212	RPACKXRT222	RPACKXRT232



## ENVIRO-SEAL Packing Repair Kits

Repair kits include parts to replace the “soft” packing materials in valves that already have ENVIRO-SEAL packing arrangements installed or in valves that have been upgraded with ENVIRO-SEAL retrofit kits. Refer to figure 8 for key numbers for PTFE packing, to figure 9 for key numbers for graphite packing, and to figure 10 for key numbers for duplex packing. PTFE repair kits include keys 214, 215, and 218. Graphite repair kits include keys 207, 208, 209, 210, and 214. Duplex repair kits include keys 207, 209, 214, and 215.

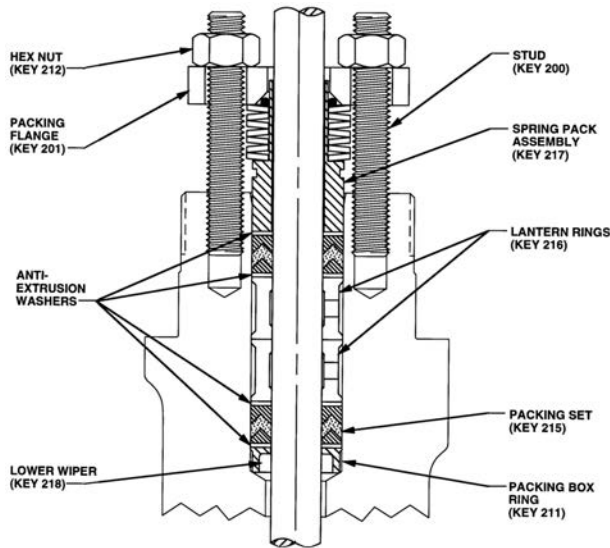
Stems and packing box constructions that do not meet Fisher stem finish specifications, dimensional tolerances, and design specifications, may adversely alter the performance of this packing kit.

For part numbers of individual components in the ENVIRO-SEAL packing kits, refer to instruction manual ENVIRO-SEAL Packing System for Sliding-Stem Valves ([D101642X012](#)).

### ENVIRO-SEAL Packing Repair Kits

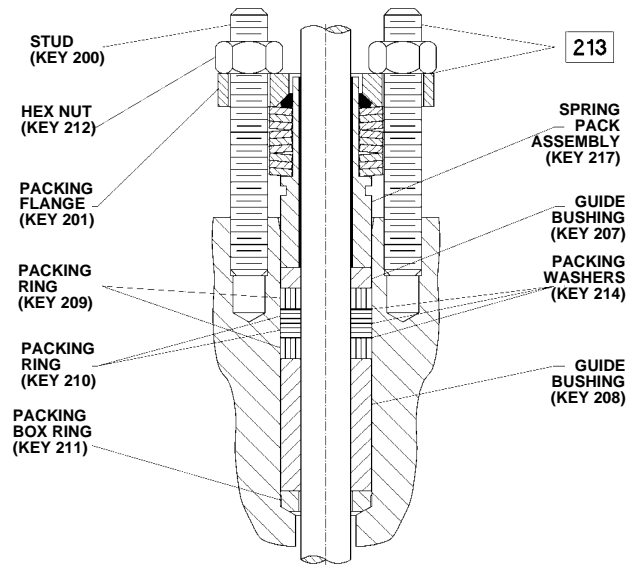
Stem Diameter, mm (Inches) Yoke Boss Diameter, mm (Inches)	9.5 (3/8) 54 (2-1/8)	12.7 (1/2) 71 (2-13/16)	19.1 (3/4) 90 (3-9/16)
Double PTFE (contains keys 214, 215, & 218)	RPACKX00192	RPACKX00202	RPACKX00212
Graphite ULF (contains keys 207, 208, 209, 210, and 214)	RPACKX00592	RPACKX00602	RPACKX00612
Duplex (contains keys 207, 209, 214, and 215)	RPACKX00292	RPACKX00302	RPACKX00312

Figure 8. Typical ENVIRO-SEAL Packing System with PTFE Packing



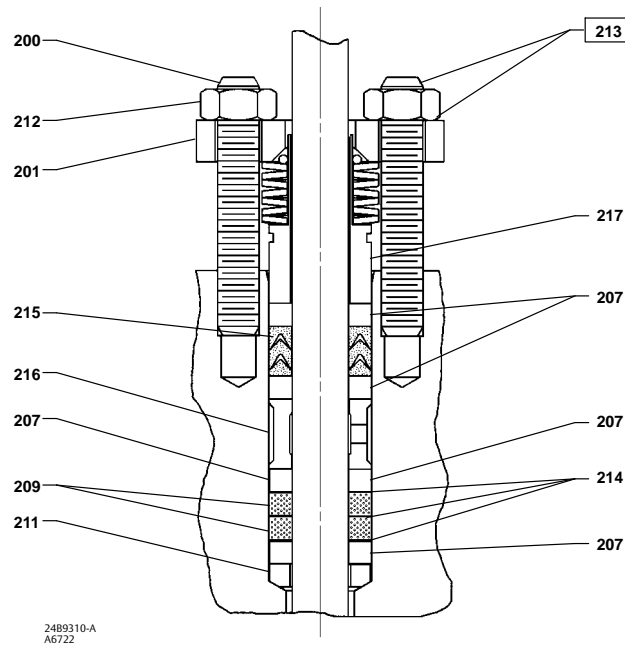
A6297-1

Figure 9. Typical ENVIRO-SEAL Packing System with Graphite ULF Packing



39B4612/A

Figure 10. Typical ENVIRO-SEAL Packing System with Duplex Packing



2489310-A  
A6722

## Parts Kits

### Note

Kits do not apply to alloy C (N10276 & CW2M), Alloy 20 (N08020 & CN7M), or alloy 400 (N04400 & M35-1) trims.

Kits for full- and restricted- capacity trims with service temperature to 593°C (1100°F) include S31600 [316 stainless steel (SST)] shim and N06600/graphite spiral wound gasket.

### Gasket Kits and Shims<sup>(1)</sup>

Valve Size, NPS	Key Number	To 593°C (To 1100°F)	Valve Size, NPS	Key Number	To 593°C (To 1100°F)	
1 or 1-1/4	Set	RGASKETX162	2-1/2 x 1-1/2	Set	RGASKETX262	
	10	1R2859X0042		10	1R3847X0032	
	12	1R286099442		11	1R3100X0032	
	13	1R2862X0062		12	1R309999442	
	32	16A1936X012		13	1R3098X0052	
1-1/2	Set	RGASKETX172	3	14	1R3844X0052	
	10	1R3101X0032		32	16A1937X012	
	12	1R309999442		Set	RGASKETX202	
	13	1R3098X0052			10	1R3484X0042
	32	16A1937X012			12	1R348299442
1-1/2 x 1	Set	RGASKETX242	3 x 2		13	1R3481X0052
	10	1R3101X0032			32	16A1940X012
	11	1R2861X0042		Set	RGASKETX272	
	12	1R286099442			10	1R3484X0042
	13	1R3098X0052			11	1R3298X0032
20	1U2152X0042	12	1R329799442			
32	16A1936X012	13	1R3296X0042			
2	Set	RGASKETX182	4	14	1R3481X0052	
	10	1R3299X0042		32	16A1938X012	
	12	1R329799442		Set	RGASKETX212	
	13	1R3296X0042			10	1R3724X0042
	32	16A1938X012			12	1R372299442
2 x 1	Set	RGASKETX252	4 x 2-1/2		13	1J5047X0062
	10	1R3299X0042			32	16A1941X012
	11	1R2861X0042		Set	RGASKETX282	
	12	1R286099442			10	1R3724X0042
	13	1R2862X0062			11	1R3846X0042
14	1R3296X0042	12	1R384599442			
32	16A1936X012	13	1R3844X0052			
2-1/2	Set	RGASKETX192	4 x 2-1/2	14	1J5047X0062	
	10	1R3847X0032		32	16A1939X012	
	12	1R384599442		Set	RGASKETX282	
	13	1R3844X0052			10	1R3724X0042
	32	16A1939X012			11	1R3846X0042
2-1/2	Set	RGASKETX192	4 x 2-1/2		12	1R384599442
	10	1R3847X0032			13	1R3844X0052
	12	1R384599442		14	1J5047X0062	
	13	1R3844X0052		32	16A1939X012	
	32	16A1939X012				

1. The bonnet gasket (key 10), spiral gasket (key 12), seat gasket (key 13), adapter gasket (key 14), adapter gasket (key 20) and shim (key 32) are included in gasket kit (RGASKET).

### Gasket Descriptions

KEY NUMBER	DESCRIPTION	MATERIAL
		FGM -198° to 593°C (-325° to 1100°F)
10	Bonnet Gasket	Graphite/S31600
11	Cage Gasket	
13	Seat Ring or Liner Gasket	
14 or 20	Adapter Gasket	
12	Spiral-Wound Gasket	N06600/Graphite
32	Shim	S31600

## Parts List

### Note

Contact your [Emerson sales office](#) or Local Business Partner for Part Ordering information.

## Bonnet Assembly (figure 4)

### Note

For ENVIRO-SEAL packing box parts, see instruction manual ENVIRO-SEAL Packing System for Sliding-Stem Valves ([D101642X012](#)).

Key	Description
1	Bonnet If you need a bonnet as a replacement part, order by valve size and stem diameter, serial number, and desired material.
3	Packing flange
4	Packing flange stud
5	Packing flange nut
6*	Packing Set, Single PTFE V-ring, (2 req'd)
7*	Packing ring
8	Spring
8	Lantern ring
8	Spacer Please refer to the valve serial number and the Parts Ordering section for the spacer and packing replacement parts information.
11*	Packing Box ring, S31600 (standard)
14	Pipe plug
14	Optional lubricator
14	Optional lubricator/isolating valve
15	Yoke Locknut

### Key Description

27	Pipe nipple for optional lubricator/isolating valve
30*	Lower Wiper, PTFE
31*	Male Adapter, PTFE
32*	Female Adaptor, PTFE

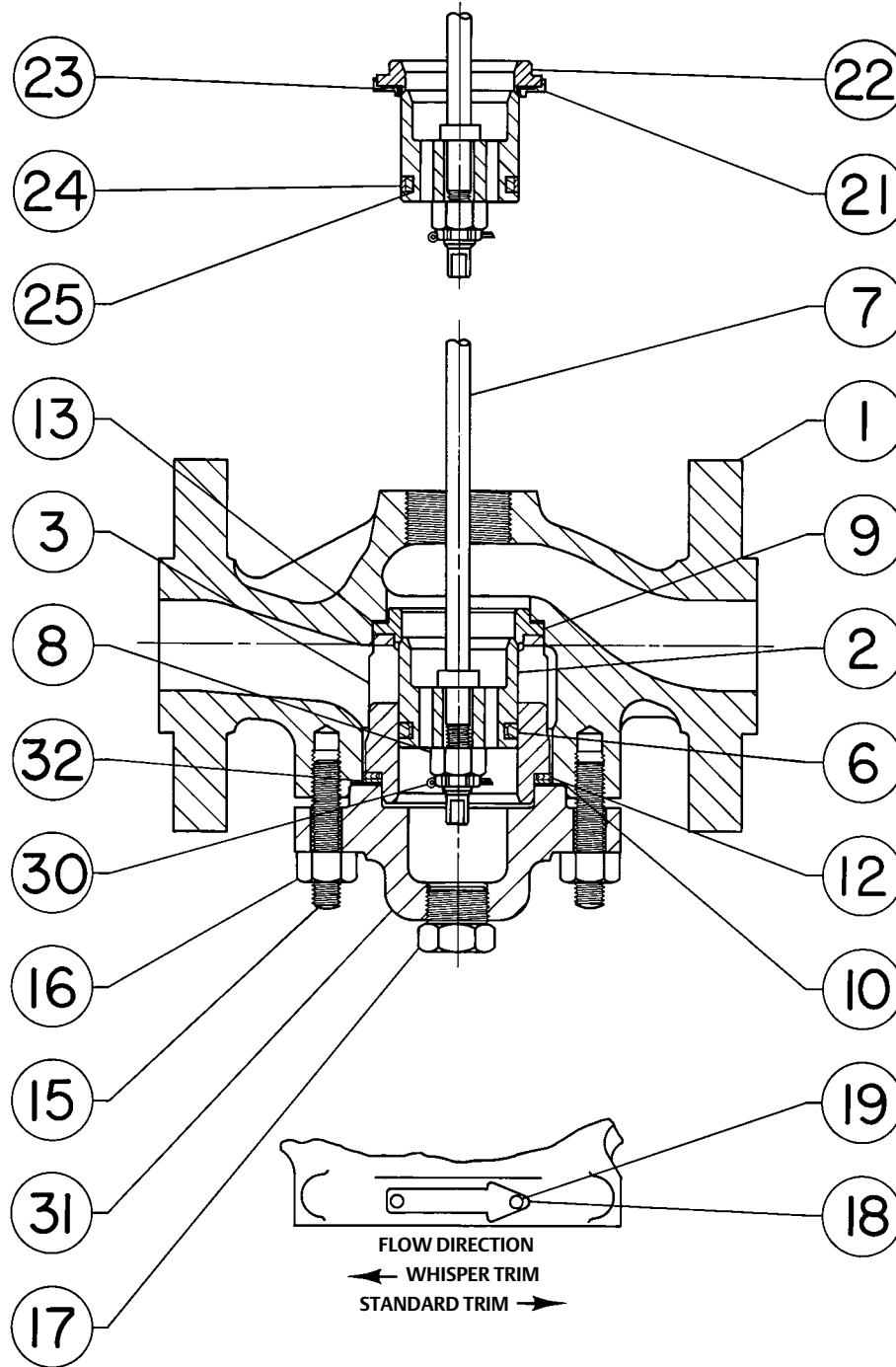
## Valve Assembly (figures 11 and 12)

1	Valve Body If you need a valve body as a replacement part, order by valve size, serial number, and desired material.
2*	Valve plug
3*	Cage
4	Cage adaptor
5	Seat Ring Adaptor
6*	Piston Ring
7*	Valve Stem
8*	Castle Nut (standard), SST
9*	Seat Ring
10*	Bonnet Gasket
11*	Cage Gasket
12*	Spiral-Wound Gasket
13*	Seat Ring or Liner Gasket
14*	or
20*	Adapter Gasket
15	Cap Screw or Stud Bolt
16	Hex Nut
17	Pipe plug for tapped bottom flanges
18	Flow Arrow
19	Drive screw
21*	Disk retainer, S31600, For ETR only
22*	Disk Seat, For ETR only
23*	Disk
24*	Seal ring, carbon filled PTFE, For ETR only
25*	Backup ring, For ETR only
30	Cotter pin
31	Bottom Flange
32*	Shim
33	Nameplate

**Group 1 Actuators by Type Number**

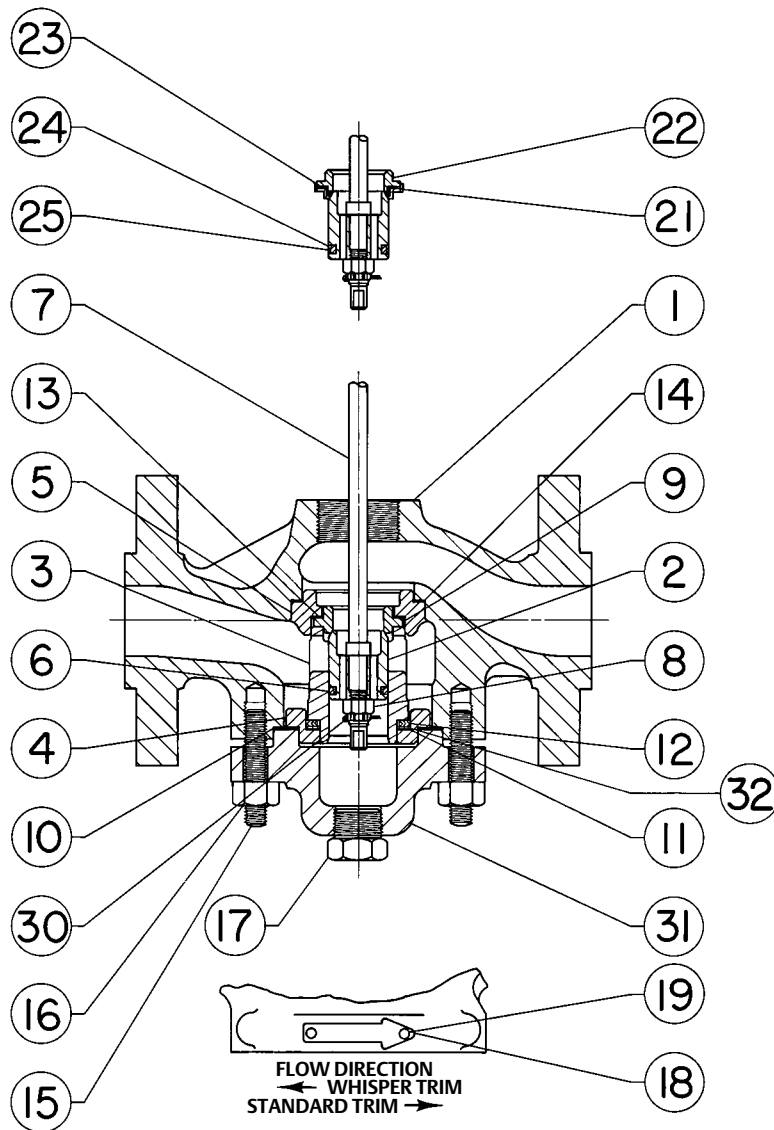
<b>54 mm (2-1/8 inches), 71 mm (2-13/16 inches), or 90 mm (3-9/16 inches) Yoke Boss</b>
585C Series—50.8 mm (2 inches) maximum travel 585C 1B 644 & 645 655
657 & 667—76.2 mm (3 inches) maximum travel 1008—71.4 mm (2-13/16 inches) yoke boss

Figure 11. EDR and ETR with Full-Size Trim Valve Assembly



40A5480-D

Figure 12. EDR and ETR with Restricted Trim Valve Assembly



40A5482-D

Neither Emerson, Emerson Automation Solutions, nor any of their affiliated entities assumes responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use, and maintenance of any product remains solely with the purchaser and end user.

Fisher, easy-e, ENVIRO-SEAL, and Whisper Trim are marks owned by one of the companies in the Emerson Automation Solutions business unit of Emerson Electric Co. Emerson Automation Solutions, Emerson, and the Emerson logo are trademarks and service marks of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

Emerson Automation Solutions  
Marshalltown, Iowa 50158 USA  
Sorocaba, 18087 Brazil  
Cernay, 68700 France  
Dubai, United Arab Emirates  
Singapore 128461 Singapore

[www.Fisher.com](http://www.Fisher.com)

