

# Fisher™ V270 Full-Bore Ball Control Valve

## Contents

Introduction .....	1
Scope of Manual .....	1
Description .....	1
Specifications .....	2
Educational Services .....	3
Installation .....	3
Maintenance .....	6
Packing Maintenance .....	6
Stopping Leakage .....	6
Replacing Packing .....	7
Seal Ring Maintenance	
Disassembly .....	9
Assembly .....	11
Actuator Mounting .....	13
Determining Closed Position .....	14
Parts Ordering .....	14
Parts List .....	16

Figure 1. Fisher V270 Control Valve



X1492

## Introduction

### Scope of Manual

This instruction manual provides installation, operation, maintenance, and parts information for the Fisher V270 Full-Bore Ball control valve (see figure 1). Refer to separate manuals for information concerning the actuator, positioner, and accessories.

Do not install, operate, or maintain a V270 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](#) before proceeding.

### Description

The Fisher V270 is a three piece, trunnion mounted, full-bore control valve designed with features for optimized pressure, flow and process control. The V270 comes standard with dual seal construction allowing unidirectional or bidirectional flow and double block-and-bleed operation. The full-bore ball design presents little or no restriction to flow at full travel. The V270 construction meets ANSI / NACE MR0175 / ISO 15156 as standard.

Specifications

**Valve Body Size**

■ NPS 6, ■ 8, ■ 10, ■ 12, ■ 14, ■ 16, ■ 20, and ■ 24.

**Body/Shell Pressure Rating<sup>(1)</sup>**

■ CL150, ■ CL300, and ■ CL600 pressure-temperature ratings per ASME B16.34-2013

**Valve Body, Tailpiece and Packing Box Material**

SA350 LF2

**Ball Material**

SA350 LF2/ENP

**Seal/Insert Material<sup>(2)</sup>**

S31600/POM

**Packing**

Live-Loaded PTFE

**Valve Temperature Capability**

-40 to 82°C (-40 to 180°F)

**End Connections**

Raised Face per B16.5-2013

**Shaft Connection Style**

Keyed

**Face-to-Face Dimensions**

Long Pattern per B16.10-2009

**Shutoff Classification**

ANSI/FCI 70-2 Class VI

**Flow Direction**

Unidirectional or Bidirectional flow

**Flow Characteristic**

Modified equal percentage

**Maximum Ball Rotation**

90 degrees

**Approximate Weight**

See table 2

1. The pressure-temperature limits in this instruction manual and any applicable standard or code limitation for valve should not be exceeded.  
2. POM stands for polyoxymethylene

Table 1. Standard Materials of Construction

Part	Material
Valve Body	LF2 Carbon Steel
Ball	LF2 Carbon Steel / ENP
Seal	POM with S31600 SST Seal Carrier
Drive Shaft	S17400 H1150D
Spring	N07750
Tailpiece	LF2 Carbon Steel
Tailpiece Mounting and Packing Box Bolting	L7M Steel
Bearing Plate	LF2 Carbon Steel
Trunnion Bushings	Carbon Steel, Bronze, PTFE
Thrust Washer	Glass filled PTFE
Shaft Bushing	N04400 / Comp
Packing Box Housing	Carbon Steel
Packing	Live-Loaded PTFE
Packing Bolting	B7M Steel
Packing Follower, Packing Box Ring	S31600 SST
Straight Pins	S17400 H1150D
O-Rings, Backup Rings	Nitrile
Actuator Mounting Bolting	Steel Grade 5

## Educational Services

For information on available courses for Fisher V270 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)

## Installation

### **⚠ WARNING**

- To avoid personal injury, always wear protective gloves, clothing, and eyewear when performing any installation operations.
  - To avoid personal injury or property damage resulting from the bursting of pressure retaining parts, be certain the service conditions do not exceed the limits given in this manual.
  - To avoid personal injury or property damage that can result from the sudden release of process pressure if valve or mating pipe flange pressure ratings are exceeded, provide a relief valve for over-pressure protection as required by government or accepted industry codes and good engineering practices.
  - Personal injury could result from packing leakage. See the Packing Maintenance section for adjustment information.
  - Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
  - If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.
  - Use proper lifting and rigging practices while moving the valve or valve/actuator assembly.
-

Table 2. Face-to-Face Dimensions and Approximate Weights

VALVE SIZE, NPS	CLASS	FACE-TO-FACE DIMENSIONS		APPROXIMATE WEIGHT	
		mm	Inches	kg	Pounds
6	150	394	15.50	170	370
	300	403	15.88	190	415
	600	559	22.00	280	620
8	150	457	18.00	305	670
	300	502	19.75	350	775
	600	660	26.00	465	1020
10	150	533	21.00	430	950
	300	568	22.38	495	1095
	600	787	31.00	745	1640
12	150	610	24.00	645	1425
	300	648	25.50	770	1695
	600	838	33.00	1050	2320
14	150	686	27.00	1045	2305
	300	762	30.00	1065	2350
	600	889	35.00	1365	3015
16	150	762	30.00	1275	2810
	300	838	33.00	1455	3210
	600	991	39.00	1925	4250
20	150	914	36.00	2245	4945
	300	991	39.00	2580	5685
	600	1194	47.00	3450	7610
24	150	1067	42.00	3380	7450
	300	1143	45.00	4280	9435
	600	1397	55.00	5775	12740

Key number locations are shown in figures 4, 5 and 6, unless otherwise noted. Throughout this manual, the component key number will be identified for clarity.

1. Install a three-valve bypass around the control valve assembly if continuous operation will be necessary during inspection and maintenance of the valve.
2. The valve is normally shipped as part of a control valve assembly, with a factory adjusted actuator mounted on the valve. If the valve or actuator has been purchased separately, or if the actuator has been removed, refer to the Actuator Mounting section and the appropriate actuator instruction manual for installation and adjustment procedures.
3. The standard valve construction allows uni-directional or bi-directional flow. If possible, install the valve in a horizontal pipeline with the drive shaft vertical, however, the orientation of the valve does not affect the performance.

**CAUTION**

**Be certain the valve and adjacent pipelines are free of any foreign material that could damage the valve sealing surfaces.**

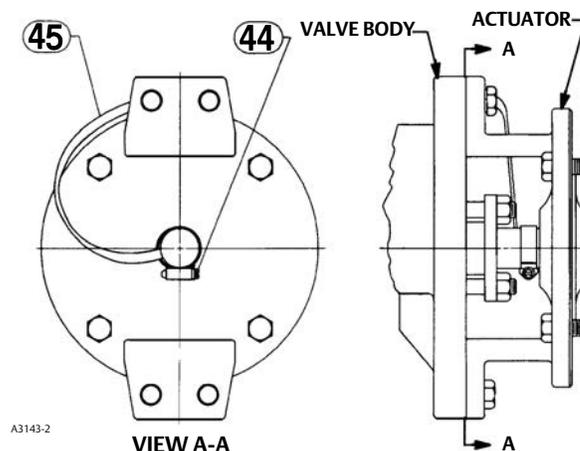
4. Provide appropriate flange gaskets, and place the valve in the pipeline. Tighten flange bolting in a star pattern to ensure the flange gaskets are compressed evenly.

**Note**

Standard Fisher V270 live-loaded PTFE packing is composed of partially conductive packing rings (carbon-filled PTFE male and female adaptors) to electrically bond the drive shaft to the valve body. For hazardous area service, an alternate shaft-to-body bonding strap is also available by using the following step (see figure 2).

5. For hazardous area applications where redundant shaft-to-body grounding is preferred, attach the optional bonding strap assembly (key 45) to the valve drive shaft (key 4) with the clamp (key 44) and connect the other end of the bonding strap assembly to the valve body with the mounting cap screw as shown in figure 2.

Figure 2. Optional Shaft-to-Body Bonding Strap Assembly



## Maintenance

Valve parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions.

### **▲ WARNING**

**Avoid personal injury or equipment damage from sudden release of process pressure or uncontrolled movement of parts. Before performing any maintenance operations:**

- Do not remove the actuator from the valve while the valve is still pressurized.
- Do not loosen any pressure retaining bolting while the valve is still pressurized. This includes the body to tailpiece nuts (key 21), packing box housing screws (key 10), packing nuts (key 36) or pipe plugs (keys 23 and 28).
- Avoid injury by keeping hands, tools, and other objects away from the ball while stroking the valve.
- 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. Check the actuator cannot suddenly open or close the valve.
- Vent the power actuator loading pressure and relieve any actuator spring precompression.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure, relieve any process pressure from both sides of the valve body, and drain the process media from both sides of the valve.
- Dual-seal constructions can retain pressure and process fluid even after process pressure has been removed from both sides of the valve. The ball should be partially opened to relieve this pressure before disassembling or removing the valve from the line. Take additional care if the process fluid is hot, flammable, caustic, or hazardous.
- A tip over hazard exists for the valve/actuator assembly. Ensure the valve/actuator assembly is properly secured and always supported to prevent falling or rolling which may cause injury or property damage.
- Use lock-out/tag-out best practices and procedures to be sure that the above measures stay in effect while you work on the equipment.
- The valve packing box housing 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.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

## Packing Maintenance

Refer to figure 3 for details of the standard live-loaded PTFE packing. All maintenance operations in this section may be performed on an unpressurized valve that is still installed inline.

### **Note**

For additional information on the live-loaded packing system refer to the ENVIRO-SEAL Packing System Instruction Manual ([D101643X012](#)).

## Stopping Leakage

Optimum performance of the PTFE live-loaded packing system is obtained when the Belleville springs are compressed to the required “target load.” The target load is the point where the springs are compressed to 85% of their maximum deflection.

Under normal conditions, the packing nuts should not require re-tightening. However, when servicing, if the springs do not remain at the target load of 85% compression, retighten the packing box nuts per the following:

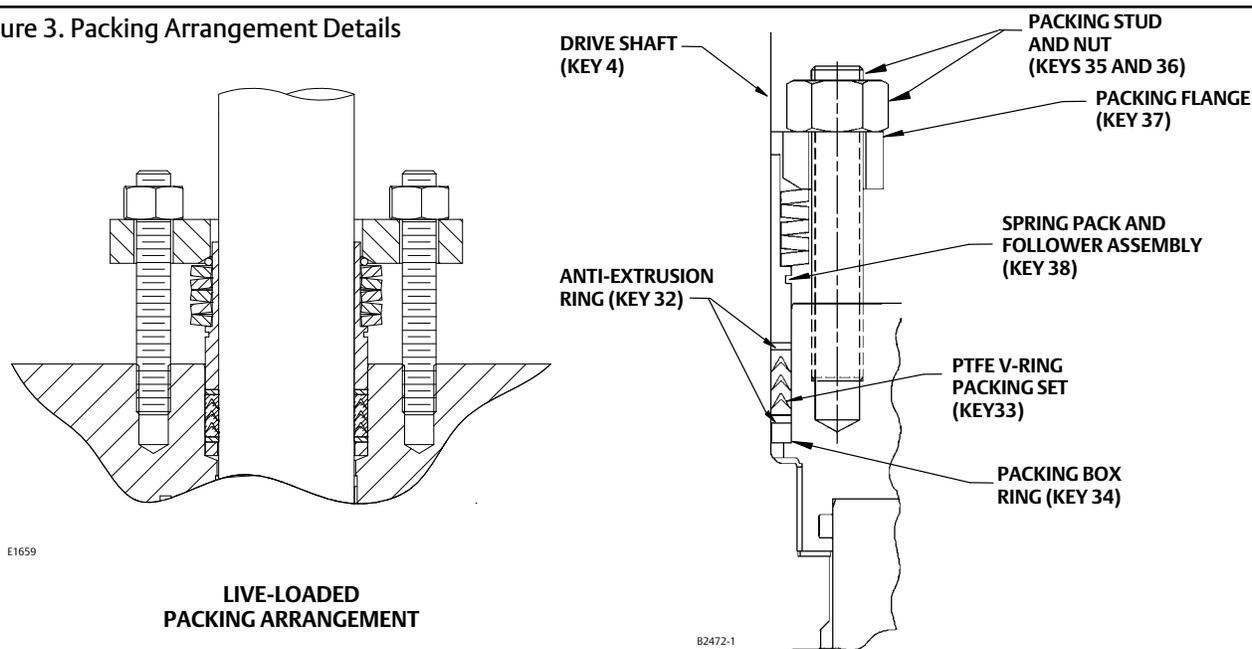
1. Tighten the packing flange nuts alternately and evenly, keeping the packing flange parallel with the valve flange (see figure 3), until the Belleville springs are compressed 100% (or completely flat).
  - a. For PTFE packing, loosen each packing flange nut one half turn (180° of rotation).
2. The target load of 85% compression has now been reached. If leakage continues, replace the packing components and inspect the packing box housing bore and valve drive shaft for damage as described in the following procedures.

### Replacing Packing

Replacing the packing requires bleeding off the system and removing the actuator from the valve. Valve/actuator adjustments cannot be made correctly without observing the fully open or closed position of the ball (key 3). It is not necessary to remove the valve from the pipeline to make adjustments, if care is taken to note the position and alignment of the shaft and coupler.

Refer to figure 3 which identifies the V270 packing components by key number.

Figure 3. Packing Arrangement Details



### Packing Disassembly

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, shut off all pressure lines (or other power source) to the power actuator, release pressure from the actuator, and disconnect the pressure lines from the actuator. Use lockout/tagout procedures to be sure that the above measures stay in effect while disassembling the equipment.

## **⚠ WARNING**

- See the **WARNING** at the beginning of the Maintenance section for more information before removing the valve from the pipeline.
- Use proper lifting and rigging practices while moving the valve or valve/actuator assembly.

2. Remove line bolting, remove the control valve from the pipeline, and place the actuator/valve assembly on a flat surface.
3. To assist with future reassembly, note and mark the orientation of the actuator with respect to the valve body and the coupler orientation with respect to the valve drive shaft.
4. Refer to the appropriate actuator instruction manual for info on removal.
5. Remove the actuator mounting screws, bolts, or nuts while properly supporting the actuator then separate the actuator and mounting bracket from the valve.
6. If necessary, remove the bonding strap assembly, shown in figure 2, from the valve before removing the packing parts.
7. Remove the packing follower nuts, packing flange, and spring pack and packing follower (keys 36, 37, and 38).
8. Remove the packing parts:
  - a. If the packing box housing (key 6) is mounted on the valve: Use a formed wire hook with a sharp end to pierce the packing rings, and pull the rings out of the packing box housing. Do not scratch the drive shaft or packing gland bore. Scratching these surfaces could cause leakage. Clean, inspect, and obtain replacement parts as necessary for reassembly. Examine the drive shaft and packing gland bore for any signs of damage that may prevent proper sealing.
  - b. If the packing box housing is separated from the valve (refer to Seal Ring Maintenance section of this manual for disassembly instructions): Remove the drive shaft (key 4) from the packing box housing. With the drive shaft removed, remove all internal packing parts. Clean, inspect, and obtain replacement parts as necessary for reassembly. Examine the drive shaft and packing gland bore for any signs of damage that may prevent proper sealing.

## Packing Assembly

For additional information on the live-loaded packing system refer to the ENVIRO-SEAL Packing System Instruction Manual ([D101643X012](#)).

1. If the packing housing box (key 6) is removed from the valve, use the valve assembly steps to reinstall the drive shaft (key 4) and packing box housing assembly on the valve. (Refer to Seal Ring Maintenance section of this manual for additional assembly instructions).
2. Place the new packing components over the drive shaft and slide each into the packing box housing until properly seated at the bottom of the packing gland. Use the parts sequence shown in figure 3 and verify the Belleville springs are in the correct configuration.
3. Secure the spring pack and packing follower assembly and packing flange with the packing nuts (keys 38, 37, and 36).
4. Tighten the packing flange nuts alternately and evenly, keeping the packing flange parallel with the valve flange (see figure 3), until the Belleville springs are compressed 100% (or completely flat).
  - a. For PTFE packing, loosen each packing flange nut one half turn (180° of rotation).
5. If necessary, install the bonding strap assembly shown in figure 2.
6. Use the steps provided in the Actuator Mounting section to install the actuator on the valve. For actuator travel adjustments, refer to the appropriate actuator instruction manual.

7. When the control valve is in operation, carefully examine the packing follower region for any signs of leakage.

## Seal Ring Maintenance

### **⚠ WARNING**

- See the **WARNING** at the beginning of the Maintenance section for more information before removing the valve from the pipeline.
- Use proper lifting and rigging practices while moving the valve or valve/actuator assembly.

## Valve Disassembly

Refer to figures 4, 5, and 6 to identify the V270 valve components by key number.

Disassemble the valve only to the extent necessary to accomplish the needed inspection and repairs. For some repairs complete disassembly of the valve is not necessary. Follow the disassembly procedures to the point necessary to accomplish the repair, then skip to the appropriate assembly steps to complete the reassembly of the valve. Always clean and protect sealing surfaces from damage.

Mark parts as necessary to allow them to be returned to the same position and orientation as removed. The tailpiece, for instance, shall be returned to the same end of the valve from which it was removed. The seal assembly shall also be returned to the same tailpiece and in the same orientation from which it was removed.

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, shut off all pressure lines to the power actuator, release pressure from the actuator, and disconnect the pressure lines from the actuator. Use lockout/tagout procedures to be sure that the above measures stay in effect while working on the equipment.
2. Remove line bolting, remove the control valve from the pipeline, and clean all valve surfaces. Place the actuator/valve assembly on a flat working surface.
3. Mark parts as necessary to allow them to be returned to the same position during re-assembly.
4. Refer to the appropriate actuator instruction manual for info on removal. Loosen the actuator mounting screws, bolts, or nuts while properly supporting the actuator then separate the actuator and mounting bracket from the valve. When valve maintenance is complete, refer to the Mounting Actuator procedure in this manual to reinstall the actuator on the valve.
5. Provide a clean soft working surface to protect the tailpiece-flange serrated surface. Lift the valve and place it on either tailpiece flange face. Be sure the valve is in a stable, upright position before releasing the hoist connection.

### **Note**

If the packing is in good condition, it is possible to remove and replace the seal assembly without removing the packing box assembly. However, the packing box assembly must be removed to remove the ball (key 3) from the valve body.

6. Remove the packing box housing socket head cap screws (key 10).
  - a. If necessary, two packing box housing cap screws can be used as jack bolts to assist with separating the packing box housing assembly from the valve.
  - b. Remove the two plastic plugs (key 39) from the packing box housing and install two packing box housing cap screws until contact with the body occurs. Alternatively, and evenly turn each fastener clockwise until the packing box housing assembly is adequately separated from the valve body. Remove the packing box housing assembly from the valve body. The packing box housing assembly includes all packing parts, drive shaft (key 4),

o-ring seal (key 14), drive shaft bushing (key 8), and thrust washer (key 9). The two straight pins (key 7) may stay attached to the packing box.

- c. If necessary, use a punch and drive each straight pin towards the valve side of the packing box to remove.
7. If it is desired to separate the packing box assembly parts, loosen or remove the packing components and slide the shaft down and out the valve side of the packing box. Inspect the drive shaft bushing (key 8) and the thrust washer (key 9). If necessary, replace worn components.
8. Remove the heavy hex nuts (key 21) from the studs, if applicable, remove base brackets (key 25), and lift the upper tailpiece from the body. If studs (key 19 and 20) are removed from the valve body, mark installed locations of long studs (key 20) in valve body.

## CAUTION

**While lifting the tailpiece (key 2) from the valve body, check to see if the seal (key 5) is lifting with the tailpiece. If so, use caution in case the seal falls out and protect the ball's spherical surface. An additional strap can be employed to ensure the seal stays in place.**

9. Turn the tailpiece assembly over so the seal is facing up, and place it on a clean soft surface to protect the flange serrated surface. Note the tailpiece o-ring (key 13).
10. Lift the seal out of the tailpiece. Note the seal o-ring and back up ring (keys 15 and 16) and the multitude of springs (key 18). Ensure all springs and the bearing plate dowel pins (key 22) are accounted for. Clean and protect all sealing surfaces.

## ⚠ WARNING

**When lifting the ball, ensure the bearing plates (key 11) are secure on the ball trunnions to prevent parts from falling which may cause personal injury or property damage.**

### Note

Refer to figure 6 and note the NPS6 CL150 construction is different than the balance of the V270 product line in that it lacks bearing plates and the ball design does not have male trunnions. Specific to the NPS6 CL150, ball removal also requires removal of the follower trunnion (key 42) and fasteners (key 43).

11. Turn the ball (key 3) to the closed position. Use an approved lifting sling through the ball bore to lift the ball out of the valve body. Lift the ball and set it on a clean soft surface.
12. Remove the two bearing plates (key 11) and thrust washers (key 17) from the ball. Inspect the lined bushing (key 12) in each bearing plate and the thrust washers. If necessary, replace worn components.
13. Evenly loosen the heavy hex nuts (key 21) from the studs, if applicable, remove base brackets (key 25), and lift the body (key 1) from the lower tailpiece (key 2).
14. Lift the seal out of the lower tailpiece. Note the seal o-ring and back up ring (keys 15 and 16) and the multitude of springs (key 18). Ensure all springs and the lower bearing plate dowel pins (key 22) are accounted for. Clean and protect all sealing surfaces.

## Valve Assembly

Be sure to replace valve parts in the same position and orientation from which they were removed. Use the following steps to reassemble the valve.

---

### Note

Clean and protect all sealing surfaces from damage while installing parts. Lubricate components when necessary as an aid for installation, and to help protect sealing surfaces.

---

Refer to figures 4, 5, and 6 that identify the V270 valve components by key number.

During assembly, visually inspect component surfaces that interface with an o-ring or seal for any damage that may prevent proper sealing.

1. Place both tailpieces (key 2), flange end down on a clean soft surface with the seal assembly cavity facing up. Use caution to protect the flange end serrated surfaces.
2. Lubricate the tailpiece counterbores where the seal will insert and inject lubricant into each of the spring holes. Install the seal springs (key 18).
3. On both seals (key 5), install the o-ring (key 15) and backup ring (key 16) in the correct orientation (see figures 5 and 6).
4. Lubricate the seal o-rings and insert the seal assembly into the tailpiece counterbores. Maintain axial alignment of the two components as the seal assembly is pushed into place.
5. Lubricate and install the o-rings (key 13) in both tailpieces.
  - a. For NPS 6 through NPS 12 constructions, one o-ring per tailpiece is required.
  - b. For NPS 14 through NPS 24 constructions, two o-rings per tailpiece are required.
6. Place the body (key 1) on an appropriate work surface.
7. If studs (keys 19 and 20) were removed from valve body during disassembly, apply anti-seize lubricant (Key 47) to threaded stud holes. Apply anti-seize lubricant to the long studs (key 20), which are used to attach the base brackets (key 25). Install the long studs first in the stud hole locations marked during disassembly. (Note: Base brackets are not available for the NPS6 CL150 and NPS6 CL300 valve constructions.) Apply anti-seize compound to the balance of studs (key 19) and install in the body.
8. Lubricate the tailpiece o-ring gland of the body and lower the tailpiece into place, guiding the male o-ring gland of the tailpiece within the female gland of the body. Take special care to prevent pinching of the o-ring. The tailpiece must be oriented such that, the bearing plate dowel pin holes are in alignment and parallel with the body shaft bore axis. Refer to figure 4 and note the tailpiece (key 2) orientation in relation to the body (key 1), bearing plates (key 11), and dowel pins (key 22).
9. Apply anti-seize lubricant compound to the face and threads of the heavy hex nuts (key 21). If applicable, place the base bracket (key 25) over the long studs. Install the heavy hex nuts on the studs by hand with the material identifier facing outwards. Use an appropriate torque device to apply the final torque specification (see table 3).
10. Lift and orient the assembly so the raised face of the tailpiece end connection flange is sitting on a clean, soft surface. Take special care to prevent damage to the raised face serrated surface. Install the bearing plate dowel pins (key 22) in the tailpiece. (Note: The dowel pins are not applicable to the NPS6 CL150, as this construction does not incorporate bearing plates.)
11. If necessary, install new bushings (key 12) in the bearing plates (key 11) by driving out the old and pressing in the new.

## **⚠ WARNING**

**When lifting the ball, ensure the bearing plates (key 11) are secure on the ball trunnions to prevent parts from falling which may cause personal injury or property damage.**

12. Use an approved lifting sling through the ball bore to lift the ball (key 3).
  - a. Lubricate and install the thrust washers (key 17) and bearing plates on both ball trunnions.
  - b. Install the ball and bearing plate assembly into the body.
  - c. Guarantee the dowel pins (key 22) in the lower tailpiece have engaged the holes in the bearing plates and that the ball shaft interface geometry is aligned with the body shaft bore.
  - d. Note: Specific to the NPS 6 CL150 construction, lubricate and place the follower end thrust washer (key 17) in the follower end bore of the ball then lubricate and press in the follower end bushing (key 12) prior to installing the ball assembly into the body. See figure 6.
13. Insert the upper bearing plate dowel pins (key 22) into the intended holes and refer to steps 7 through 10 for the installation procedure of the upper studs, tailpiece, base bracket, and heavy hex nuts.
14. Insert the drive shaft (key 4) into the body shaft bore and engage the ball interface geometry. Slide the shaft thrust washer (key 9) into place.
15. Install the drive shaft bushing (key 8) in the packing box from the end that engages the body. Lubricate and install the o-ring (key 14) in the packing box housing.
16. After lubricating the body shaft bore and thrust washer (key 9), position the packing box housing assembly over the drive shaft and slide into place ensuring the o-ring (key 14) properly engages the body shaft bore. For all V270 constructions, other than the NPS6 CL150, skip to step 18.
17. Specific to the V270 NPS 6 CL150 construction, inject lubricant into the spring hole of the follower trunnion (key 42) and install the grounding spring (key 40) by pressing firmly into place (see figure 6).
  - a. Lubricate and install the o-ring (key 41) in the gland of the follower trunnion.
  - b. Lubricate the body follower bore and install the follower trunnion assembly.
  - c. Apply anti-seize lubricant to the socket head cap screws (key 43) and tighten in a star pattern to 60 ft•lbf.
18. Apply anti-seize lubricant to the packing box housing socket head cap screws (key 10). Thread in all fasteners, but do not tighten.
19. The packing box holes for the straight pins (key 7) were originally staked at the factory. Use a file to remove the deformed material at the top of each pin hole to allow the pin to slide by with minimal interference. Lubricate the straight pins (key 7) and drive each through the packing box housing and into the valve body. When properly installed and bottomed out, the pin top surface will be slightly below the packing box top surface. Stake all pins in place making sure the packing box housing material has been deformed within the bore to prevent the pins from disengaging.
20. Tighten the socket head cap screws (key 10) in a star pattern to the appropriate torque specification (see table 3). Reinstall the two plastic packing box plugs (key 39) into their respective jack bolt counterbores to prevent environmental ingress.
21. Install the packing components as detailed in the Packing Maintenance section of this manual.
22. Install the valve shaft key (key 29), flat washer (key 30) and hex head bolt (key 31). The purpose of the washer and hex bolt is to prevent the key from migrating axially out of the keyway in-service.

Table 3. Torque Values

VALVE SIZE, NPS	CLASS	VALVE BODY HEAVY HEX NUT TORQUE <sup>(1)</sup>		PACKING BOX HOUSING SOCKET HEAD CAP SCREW TORQUE <sup>(1)</sup>	
		N • m	ft • lbf	N • m	ft • lbf
6	150	255	188	81	60
	300	255	188	81	60
	600	525	387	81	60
8	150	376	277	81	60
	300	525	387	81	60
	600	711	524	81	60
10	150	376	277	81	60
	300	376	277	81	60
	600	941	694	81	60
12	150	376	277	81	60
	300	711	524	81	60
	600	1267	934	81	60
14	150	525	387	81	60
	300	525	387	81	60
	600	1660	1224	81	60
16	150	525	387	81	60
	300	711	524	81	60
	600	2126	1568	81	60
20	150	711	524	81	60
	300	1267	934	81	60
	600	3305	2437	153	113
24	150	941	694	153	113
	300	2777	2048	153	113
	600	5782	4264	247	182

1. Fasteners must be lubricated to achieve proper preload

## Actuator Mounting

Use the appropriate actuator instruction manual for mounting the actuator or changing the actuator position. Attach the actuator mounting bracket to the valve packing box and tighten the mounting bracket fasteners as detailed in table 4.

Table 4. Required Actuator Mounting Bracket-to-Valve Bolt Torque

VALVE SIZE, NPS	FASTENER SIZE INCH	GRADE 5/NC F3 <sup>(1)</sup>	
		N • m	ft • lbf
6	¾-10	339	250
8			
10	¾-9	508	375
12			
14	1-1/4-8	1491	1100
16			
20			
24			

1. Fasteners must be lubricated to achieve proper preload

## Determining Closed Position

1. To confirm proper actuator adjustment visually check the position of the ball.
2. Adjust the actuator linkage or travel stops as described in the actuator instruction manual so that at the end of stroke, the valve ball bore diameter in the full open (100%) position is in alignment and centered within the upstream and downstream valve seal inside diameters. The actuator linkage or travel stops should be adjusted so that the full closed (0%) valve position is precisely 90 degrees from the visually verified 100% open position.
3. For reference, two parallel lines are machined on the actuator mounting end of the valve drive shaft (key 4). The lines represent the orientation of the valve ball bore. The ball is in the closed position when the two lines are perpendicular to the pipeline bore.

## Parts Ordering

A serial number is assigned to each valve and stamped on the nameplate. Always refer to the valve serial number when corresponding with your [Emerson sales office](#) regarding spare parts or technical information. When ordering replacement parts, also specify the part name and desired material.

### **⚠ WARNING**

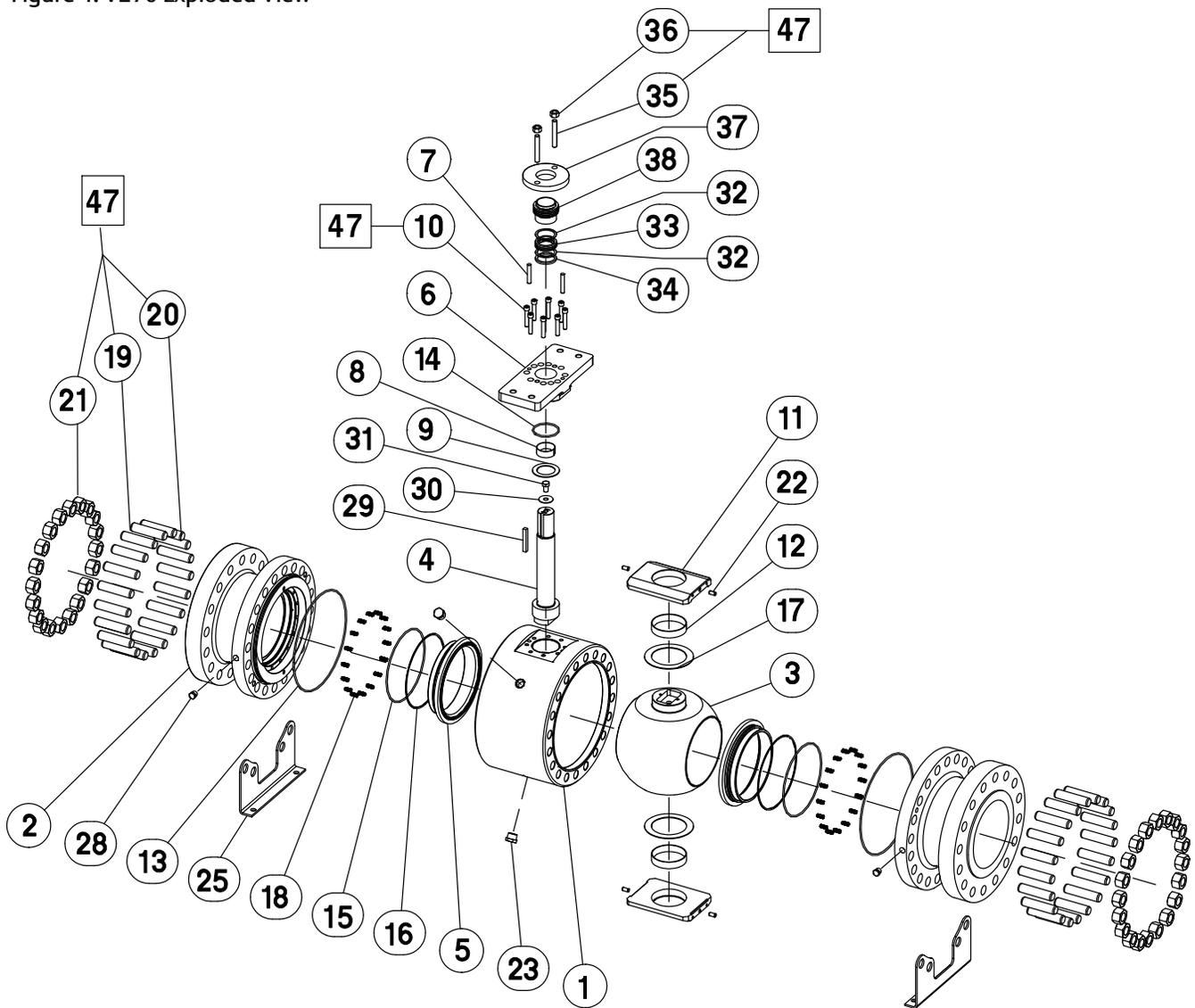
**Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Automation Solutions should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and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

## Parts Kits

### V270 Seal Spring kits

VALVE SIZE, NPS	CLASS	KEY NUMBER	QUANTITY IN KIT	KIT PART NUMBER
6	150-600	18	4	RV270SPX002
8-24	150-600	18	4	RV270SPX012

Figure 4. V270 Exploded View



NOTE:  
1. KEY NUMBERS 24, 26, 27, 39, 44, 45 AND 46 ARE NOT SHOWN  
□ APPLY LUBRICANT

GE89572

## Parts List

### Note

Contact your [Emerson sales office](#) for Part Ordering information.

Key	Description
-----	-------------

1	Valve Body If you need a valve body as a replacement part, order the valve size, pressure rating, serial number, and desired material.
2	Tailpiece
3	Ball
4	Drive Shaft Assembly
5*	Seal (2 req'd)
6	Packing Box Housing
7	Pin, Straight
8*	Drive Shaft Bushing (1 req'd)
9*	Thrust Washer (1 req'd)
10	Hex Socket Screw Cap
11	Bearing Plate
12*	Lined Bushing (2 req'd)
13*	O-Ring (2 req'd NPS 6-NPS 12; 4 req'd NPS 14-NPS 24)
14*	O-Ring (1 req'd)
15*	O-Ring (2 req'd)
16*	Back up Ring (2 req'd)

Key	Description
-----	-------------

17*	Thrust Washer (2 req'd)
18	Spring
19	Continuous Thread Stud - short
20	Continuous Thread Stud - long
21	Heavy Hex Nut
22	Dowel Pin
23	Hex Head Pipe Plug
24	NACE Label (not shown)
25	Base Bracket
26	Nameplate (not shown)
27	Drive Screw, for nameplate (not shown)
28	Hex Head Pipe Plug
29	Square Key
30	Flat Washer
31	Hex Head Screw Cap
32*	Anti-Extrusion Ring (2 req'd)
33*	Packing Set (1 req'd)
34	Packing Box Ring
35	Bolt Stud
36	Heavy Hex Nut
37	Packing Flange
38	Spring Pack Assembly
39*	Packing Box Plug (not shown) (2 req'd)
40	Spring
41*	O-Ring (1 req'd)
42	Follower Trunnion
43	Hex Socket Screw Cap
44	Clamp (not shown)
45	Ground Strap (not shown)
46	Round Head Screw Machine (not shown)
47	Lub Anti-seize/Lub-3







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 and ENVIRO-SEAL 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)

