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P600 Series Pneumatic Actuators

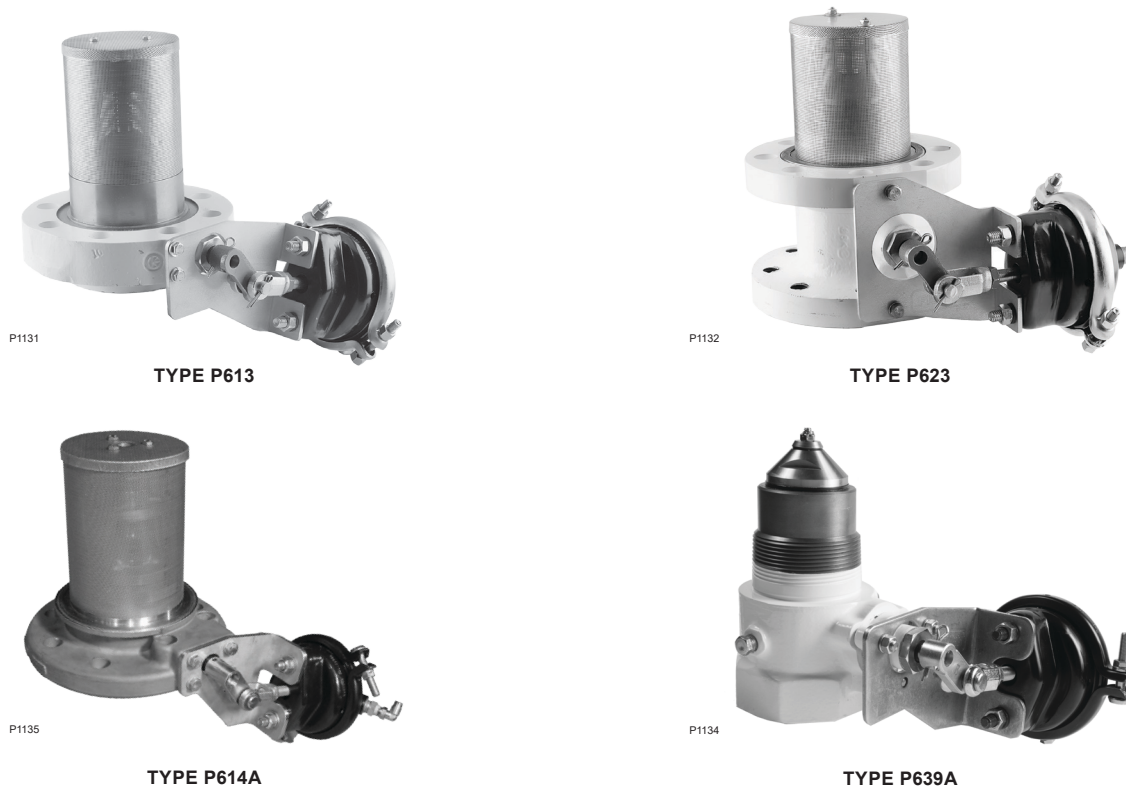


Figure 1. P600 Series Pneumatic Actuators



WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion, fire and/or fire causing property damage and personal injury or death.

Fisher™ equipment must be installed, operated and maintained in accordance with federal, state and local codes, rules and regulations and Emerson Process Management Regulator Technologies Inc. instructions. The installation in most states must also comply with NFPA No. 58, ANSI K61.1 and DOT standards.

Only personnel trained in the proper procedures, codes, standards and regulations of the LP-Gas or Anhydrous Ammonia (NH₃) industries should install and service this equipment.

WARRANTY NOTE

The use of non-Fisher actuators will void internal valve warranty and may result in leakage of the gland packing caused by premature wear. In addition to premature wear, the use of non-Fisher actuators may result in lower than expected flow rates and possible leakage across the valve seats.

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Specifications

The Specifications section lists the specifications for the P600 Series. Factory specification is stamped on the nameplate fastened on the actuator at the factory.

Available Configuration See Figure 2	Temperature Capabilities⁽²⁾ -20 to 150°F / -29 to 66°C
Pressure Source Air or Nitrogen	Return Mechanism Spring only—no air
Types P613, P623 and P639A	Thermal Release 1/4 NPT fuse plug installed in center port of actuator housing
Actuator Pressure Limits⁽¹⁾ Minimum: 20 psig / 1.4 bar Maximum: 125 psig / 8.6 bar	Thermal Release Melt Point 212°F / 100°C
Type P614A Pressure Limits⁽¹⁾ Minimum: 40 psig / 2.8 bar Maximum: 125 psig / 8.6 bar	Approximate Weight 5.6 lbs / 2.5 kg

1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

P	-	6	3	9A
		6 = Internal Valves Actuator	1 = Single Flange 2 = Double Flange 3 = NPT	3 = 3 in. / DN 80 Valve 4A = 4 in. / DN 100 Valve 9A = Multiple Sizes

Figure 2. P600 Series Product Numbering

Introduction

Scope of the Manual

This manual provides specifications, installation, maintenance instructions and parts ordering information for the Types P613, P614A, P623 and P639A pneumatic actuators used to open and close Fisher™ Internal Valves.

Product Description

All Fisher, 3 and 4 in. / DN 80 and 100 internal valves can be fitted with a pneumatic actuator that can be used to open and close the internal valves at the valve or from a remote location. These pneumatic actuators attach directly to the valve after removal of the cable-operating lever. Included in each assembly is an operating lever and mounting hardware.

Use of pneumatic actuators permits the opening and closing of the internal valve to be tied into the air brake of the transport or bobtail. Pneumatic Actuators can also provide a convenient way to remotely operate a number of internal valves on stationary storage tanks at bulk plants.

Principle of Operation

A pneumatic supply air valve or switching valve installed at a desired location allows air pressure to be applied to the actuator. The pressure supply moves the clevis (key 8B, Figures 4 to 7) and the internal valve's operating lever (key 5, Figures 4 to 7), opening the valve. Upon loss of air pressure, the valve's operating lever immediately returns to the closed position. Pneumatic supply pressure sources include dry/filtered air, nitrogen or carbon dioxide. Before beginning, refer to Figure 8 for proper cam orientation.

Installation



CAUTION

Minimum air consumption and maximum internal valve life are obtained by using an actuator operating pressure as indicated in Table 1. A 67C Series Regulator can be used to supply pressure to the actuator if desired.

Table 1. Pneumatic Actuators Information

INTERNAL VALVE TYPE NUMBER	PNEUMATIC ACTUATOR TYPE NUMBER	RECOMMENDED OPERATING PRESSURE RANGE
C484-24 Jet Bleed Internal™ Valve C404-24 Internal Valve	P613	20 to 40 psig / 1.4 to 2.8 bar
C483-24 Jet Bleed Internal Valve C403-24 Internal Valve	P623	20 to 40 psig / 1.4 to 2.8 bar
C471 and C477 Jet Bleed Internal Valve C421 and C427 Internal Valve	P639A	20 to 40 psig / 1.4 to 2.8 bar
C404-32 Internal Valve	P614A	40 to 60 psig / 2.8 to 4.1 bar

To install an actuator kit, first remove any existing operating lever from the internal valve shaft. When installing the type:

Type P623—Mount the bracket (key 1) to the flanges with two bolts (key 2) and two lock washers (key 12) using 96 to 120 in-lbs / 10.85 to 13.56 N•m torque as shown in Figure 5, fitting the operating lever (key 5) on the internal valve shaft.

Type P613—Mount the bracket (key 1) to the flanges with two bolts (key 2) and two lock washers (key 14) using 96 to 120 in-lbs / 10.85 to 13.56 N•m torque as shown in Figure 4, fitting the operating lever (key 5) on the internal valve shaft.



WARNING

Downstream pressure in the internal valve must be released before mounting the Type P614A bracket. Failure to do so could result in personal injury.

Type P614A—There must be no downstream pressure in the internal valve. Mount the bracket (key 1) to the flanges with four bolts (key 4) and lockwashers (key 14) using 120 to 180 in-lbs / 13.56 to 20.34 N•m torque as shown in Figure 7, fitting the operating lever (key 5) on the internal valve shaft.

Newer P614A models will have an additional hole on the lever (key 5) located 45 degrees CCW and approximately 1/4 in. / 6.35 mm towards edge of existing hole; mating up to the valve shaft; allowing easier install of the cotter pin (key 6).



CAUTION

For valves using the three-hole gland assembly, it is important to identify the hardware design that secures the gland to the body. For Screw-Type design using keys 2 and 12, proceed with instructions below in section labelled Screw-Type Mounting Hardware. For the Stud-Type

design using keys 12, 19 and 21, as shown in Figure 6 skip to Hardware section. All keys are referenced in Figure 6.



WARNING

Screw-Type Hardware: Downstream Pressure must be released before removing the screws holding the gland assembly to the internal valve body. Failure to do so could result in personal injury.

Type P639A with Screw-Type Hardware—There must be no downstream pressure in the internal valve.

Install new stud-mounted hardware—Position the lever (key 5) with Side B facing away from the bracket. Insert the clevis pin (key 8C) through the clevis (key 8B) and the lever and secure with the small cotter pin (key 8D). Remove the three cap screws holding the gland housing to the internal valve body and discard them. Install the provided long studs (key 20) in the top-most hole locations and the short stud (key 21) in the bottom-most “6 o’clock” location. Secure the gland to the body with the first set of washers (key 12) and nuts (key 19). Mount the actuator bracket (key 1) as shown in Figure 6 and secure using the second set of washers (key 12) and nuts (key 19) supplied with this unit. Fit the operating lever on the internal valve shaft as the bracket is moved into place.

Type P639A with Stud-Type Hardware—A Type P639A Actuator can be installed on a valve equipped with Stud-Type hardware without removing downstream pressure from the piping system. First, position the lever (key 5) with Side B facing outwards, away from the bracket. Insert the clevis pin (key 8C) through the clevis (key 8B) and the lever and secure with the small cotter pin (key 8D). Remove the protective caps from the studs, exposing the threads. Fit the operating lever on the internal valve shaft as the bracket is moved into place. Mount the actuator bracket (key 1) as shown in Figure 6, securing the bracket to the two long studs (key 20) with the two nuts (key 19) and washers (key 12) supplied with the unit.

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Using existing capscrews—Position the lever (key 5) with Side A facing away from the bracket. Insert the clevis pin (key 8C) through the clevis (key 8B) and the lever and secure with the small cotter pin (key 8D). Remove the three cap screws (key 3) holding the gland housing to the internal valve body and mount the actuator bracket (key 1) as shown in Figure 6 and secure using the same three cap screws. Fit the operating lever on the internal valve shaft as the bracket is moved into place.

For All Models:

1. Install the cotter pin (key 6) through the operating lever and the internal valve shaft. The clevis (key 8B) is factory installed at 0.79 in. / 20 mm from the face of the brake chamber for optimal operation and should not need additional adjustments. If the internal valve does not close, then adjust the clevis position as follows.
2. Loosen the clevis hex nut (key 8E), the cotter pin (key 8D) and clevis pin (key 8C) to adjust the clevis (key 8B).
3. Establish the clevis position by moving the lever (key 5) so that the cam inside the internal valve is touching the stem (see Figure 8).
4. Rotate the lever back 1/8 in. / 3.2 mm which moves the cam away from the follower (See Figure 8).
5. Adjust the clevis (key 8B) to fit the lever position in step 4.
6. Tighten the clevis hex nut (key 8E). Attach the clevis pin into the lever and clevis. Install the cotter pin on to the clevis pin.

The actuator has two 1/4 NPT supply ports. A thermal fuse plug is installed in the center port. Install the supply pressure tubing in the other port. If the center port is to be used for the supply pressure, remove the fuse plug and put it into the other opening.

The installation of fuse plugs (key 9) in the actuator piping at the valve will allow the pneumatic pressure to vent, closing the valve if the plug is exposed to temperature above 208 to 220°F / 98 to 104°C.

Before proceeding, make sure that the downstream system is prepared for product. After installing the unit, operate the actuator with pressure to see that it smoothly opens and closes the internal valve without sticking or jamming. If not, check the cotter pin and the lever to see if its binding with the bracket or binding on each other.

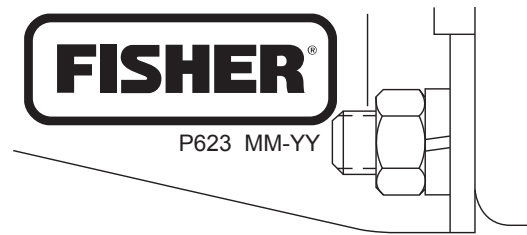


Figure 3. Actuator Date Code

Maintenance

A simple preventive maintenance program for the valve and its controls will reduce potential problems. Regulator Technologies recommends these steps be conducted once a month:

1. Regularly inspect the operating lever to see that it operates freely and that there is no leakage around the stub shaft. If there is leakage or sticking, the packing should be replaced.
2. Check for tight closure of the Internal Valve seat disks regularly. Any leakage indicates damage to the seat caused from wear or from dirt or scale lodging and embedding in the seat. To check for leakage, close the internal valve and exhaust downstream pressure. Close the first valve downstream from the internal valve and note any pressure build-up by means of a pressure gauge. If leakage is indicated, the seat disks should be replaced.
3. Because the actuator has a diaphragm seal, internal lubrication is not required. Periodic lubrication of the operating lever/actuator rod pivot is recommended.
4. All operating controls should be regularly inspected, cleaned and oiled. Periodic lubrication of the operating lever/clevis pivot is recommended.

Check to see that the actuator fully opens and closes the internal valve without sticking. A build-up of mud, corrosion or foreign material could prevent the actuator from closing, jamming the internal valve open. Do not permit this condition to occur.

Parts Ordering



These actuators are produced with common automotive service chambers, customized specifically for use with Fisher™ valves. Do not use a standard, off-the-shelf service chamber for replacement as valve damage can occur. The service chamber push rod has been modified to work specifically with Fisher valves. Regulator Technologies recommends contacting your local distributor for replacement service chambers.

When corresponding about this equipment, always reference the equipment type number found on the nameplate. When ordering replacement parts reference the complete 11-character part number of each part.

Should the user desire to repair the service chamber diaphragm and outer clamp, it is recommended to contact the local Haldex (www.haldex.com) office for a listing of replacement parts and procedures for repairing your service chambers. Reference the SC09 brake chamber for the Types P613, P623, P639A and P614A and the SC20 brake chamber for the Type P614.

When ordering parts for your actuator you must note the month and date code on the actuator bracket (Figure 3). If your actuator was made prior to 10/09, order from the "prior to 10/09" list. If produced 10/09 or later, then use the "10/09 or later" list. Also, parts lists section on page 7 distinguishes the part numbers applicable for Type P614 or P614A. When ordering parts for Type P614A, use the corresponding part number provided for this model.

Please note that an Actuator model that is before or after the 10/09 are fully interchangeable with the respective valves.

Parts Lists for Types P613, P623 and P639A (Figures 4 through 6)

Key	Description	Part Number	
		Prior to 10/09	10/09 or Later
	Brake Chamber Assembly Repair Kits (include keys 8A, 8B, 8C, 8D and 8E) For Types P613, P623 and P639A		
1	Mounting Bracket, Stainless steel	GE31134X012	GE40920X012
	Type P613	GE29439X012	GE40003T012
	Type P623	GE29437X012	GE40004T012
	Type P639A	GE29438X012	GE40002T012
2	Hex Head Screw, Zinc-plated steel (2 required)		
	Type P613	1A407824052	1A407824052
	Type P623	1A411624052	1A411624052
3	Hex Head Screw (3 required)		
	Type P639A	T12499T0012	-----
5	Lever		
	Types P613 and P623	GE29444X012	GE39989T012
	Type P639A	GE29444X012	ERAA02647A0
6	Cotter Pin	1H837128982	1H837128982
8	Brake Chamber Assembly	-----	GE40920X012
9	Fuse Plug	T1033699982	T1033699982
10	Push-in Fitting, Brass	GE33586X012	GE33586X012
12	Spring Lock Washer (2 required)		
	Type P613, Zinc-plated Carbon steel	1C225628982	1C225628982
	Type P623, Plated Carbon steel	1C225728982	1C225728982
12	Spring Lock Washer (3 required)		
	Type P639A	1C225728982	1C2257K0012
19	Nut, Stainless steel (3 required)		
	Type P639A	-----	1A309338992
20	Long Stud (2 required)		
	Type P639A	-----	ERAA02623A0
21	Short Stud		
	Type P639A	-----	ERAA02652A0

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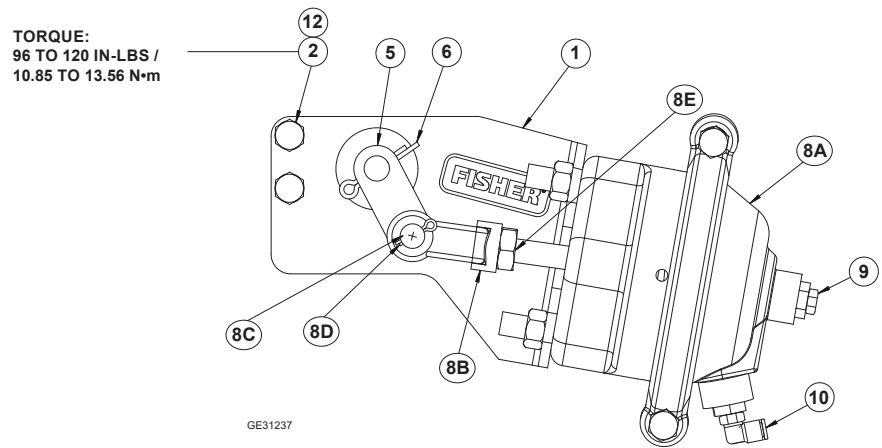


Figure 4. Type P613 for Type C484-24 Internal Valves

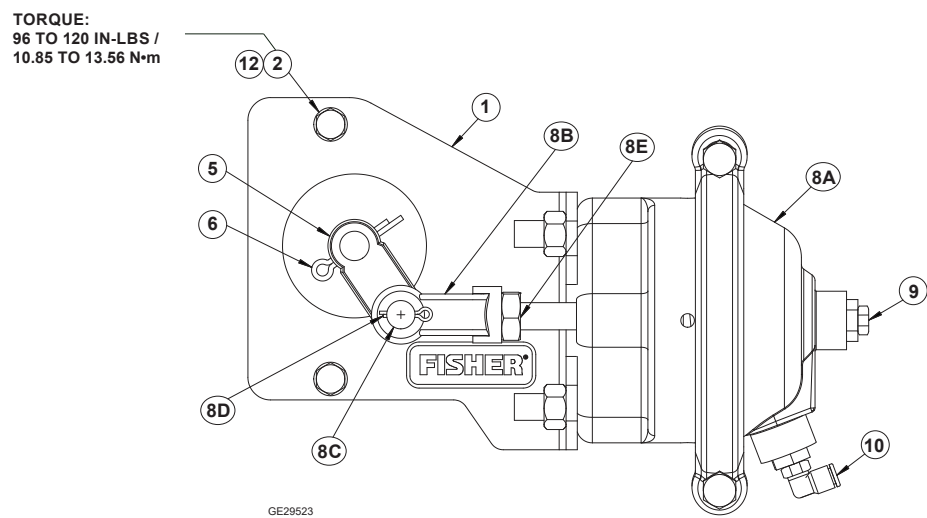


Figure 5. Type P623 for Type C483-24 Internal Valves

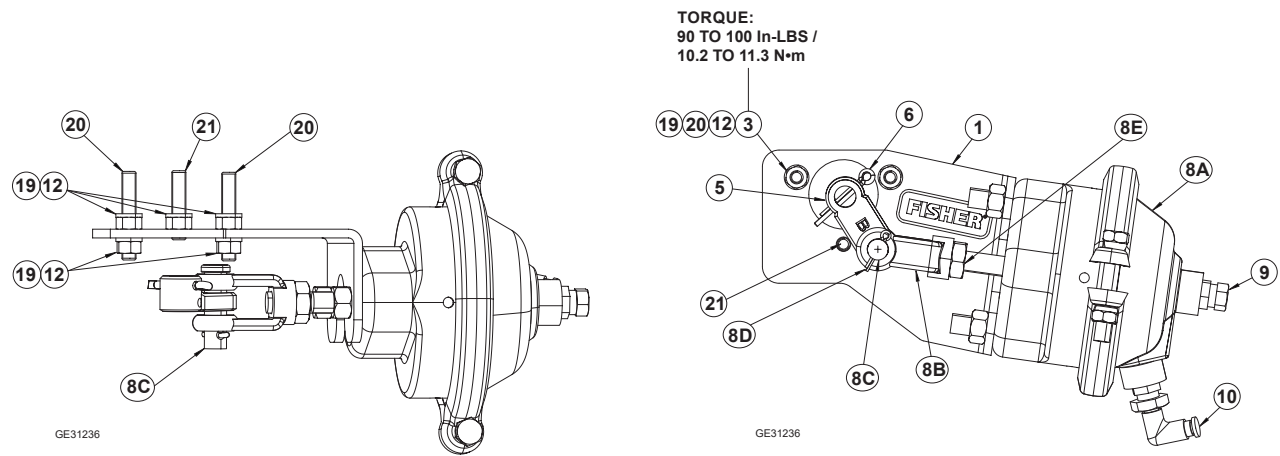


Figure 6. Type P639A for Types C407, C471 and C477 (2 and 3 NPT) Internal Valves

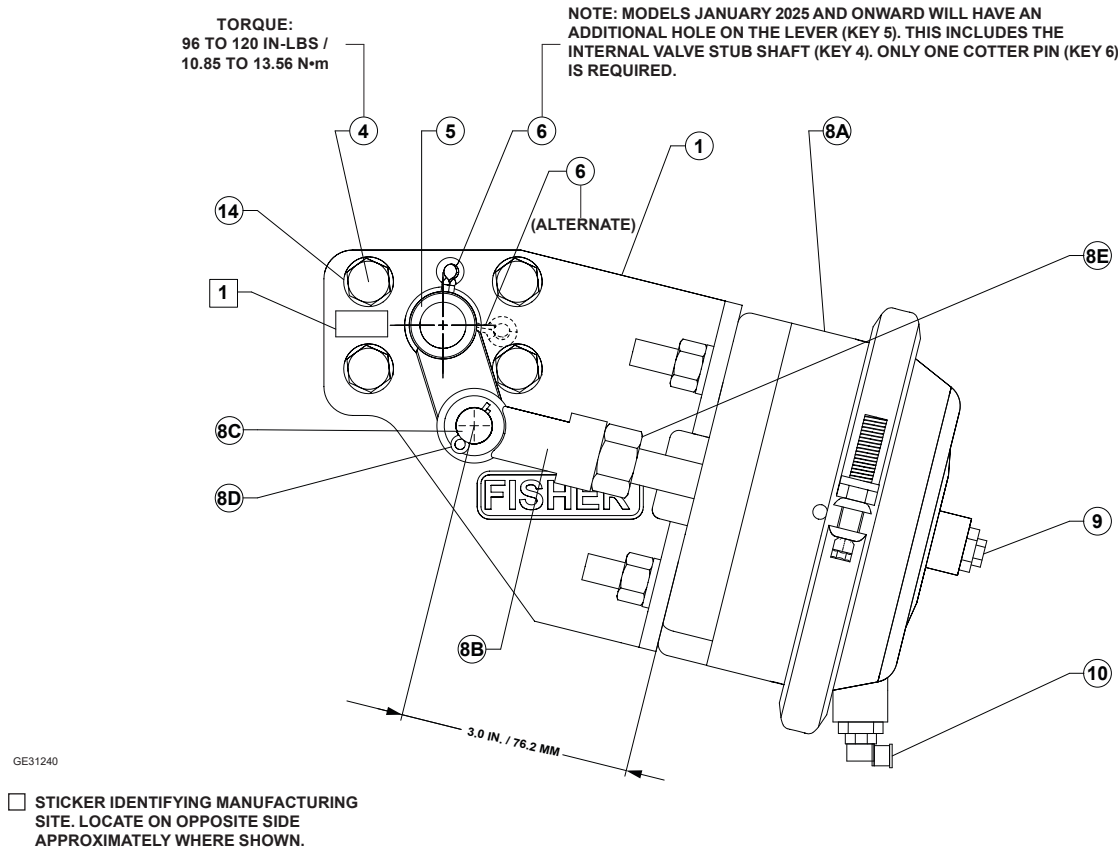


Figure 7. Type P614A for Type C404-32 Internal Valves

Parts Lists for Types P614 and P614A (Figure 7)

Key	Description	Part Number	
		Prior to 03/15/12	03/15/12 or Later
	Brake Chamber Assembly Repair Kits (include keys 8A, 8B, 8C, 8D and 8E)		
	For Type P614A only	-----	GE40920X012
	For Type P614 only	GE31135X012	-----
1	Mounting Bracket, Stainless steel		
	Type P614A	-----	GE45399X012
	Type P614	GE29442X012	-----
4	Hex Head Cap Screw, Zinc-plated steel (4 required)		
	Types P614A and P614	T1133624052	T1133624052
5	Lever, Stainless steel		
	Type P614A	-----	GE45407X012
	Type P614	GE29510X012	-----
6	Cotter Pin, Plated Carbon steel		
	Types P614A and P614	1H837128982	1H837128982
8	Brake Chamber Assembly		
	Type P614A	-----	GE40920X012
9	Fuse Plug	T1033699982	T1033699982
10	Push-in Fitting, Brass	GE33586X012	GE33586X012
14	Spring Lock Washer, Plated Carbon steel (4 required)		
	Types P614A and P614	1A505628982	1A505628982

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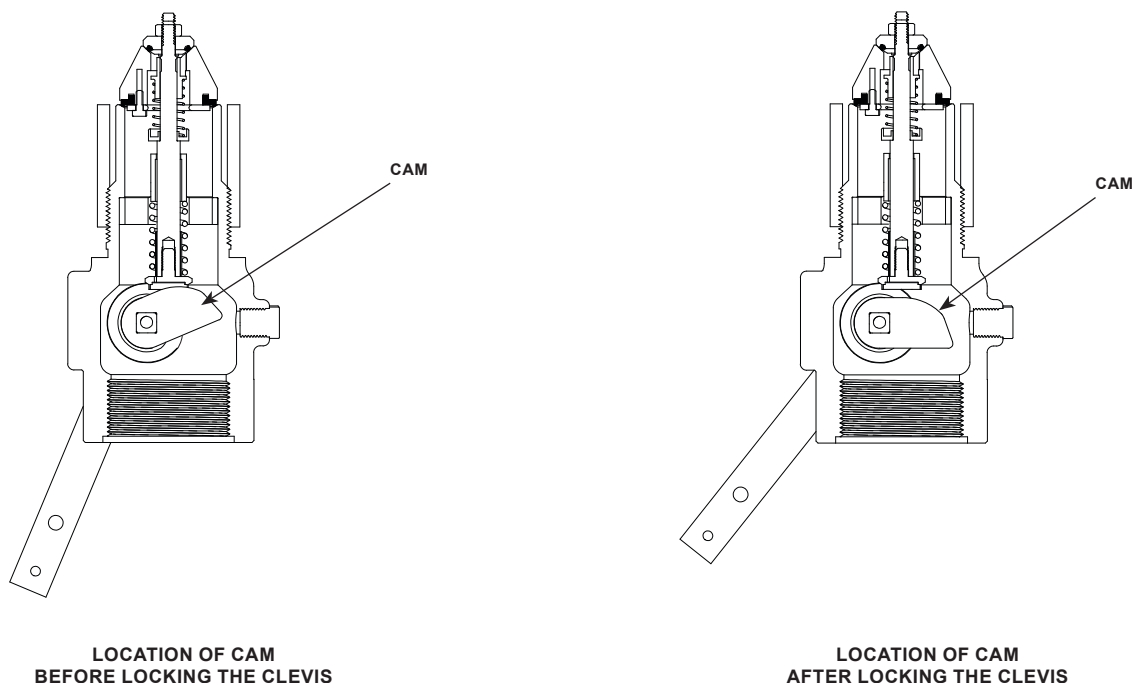


Figure 8. Cam Location

✉ Webadmin.Regulators@emerson.com

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