

Fisher Controls

Instruction Manual

Type 1066 On-Off Piston Rotary Actuator With H Mounting Adaptation



April 1984

Form 5231

Introduction

Scope of Manual

This instruction manual provides installation, operation, maintenance, and parts ordering information for the Type 1066 on-off piston rotary actuator with H mounting (see figure 1). Instructions for accessories are included in separate instruction manuals.

Description

The Type 1066 piston rotary actuator is double-acting, pneumatically operated, and is normally used for on-off applications. This actuator is field-reversible between push-down-to-close and push-down-to-open actuator action of the operated equipment.

The H mounting adaptation permits the actuator to be used with user-provided mounting brackets and couplings for rotary actuation of equipment other than Fisher valve bodies. This mounting adaptation includes a flat mounting-surface that is drilled and tapped for attaching the user-provided bracket. Cap screws for attaching the bracket are provided. H mounting also includes an output shaft (with milled flats) to provide rotary output either directly or through a user-provided coupling. Dimensional information for the mounting surface and the output shaft are shown in figure 3.

Specifications

Specifications are shown in table 1 for Type 1066 actuators. Some specifications for a given actuator as it originally comes from the factory are stamped on a nameplate (figure 2) attached to the actuator.



Figure 1. Type 1066 Actuator With H Mounting Adaptation

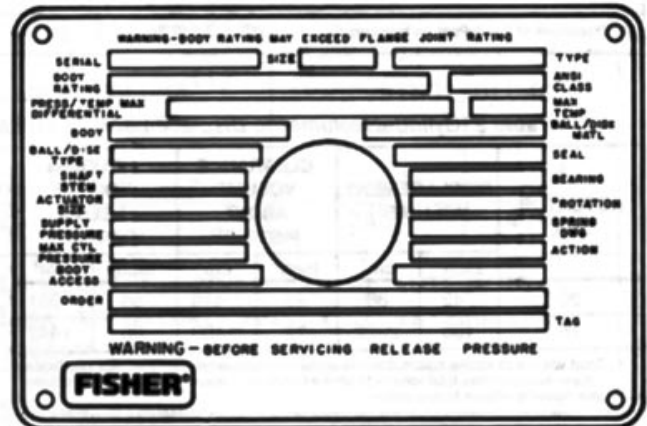


Figure 2. Nameplate Used on Type 1066 Actuators

Installation

If it is necessary to mount the actuator on a valve body or other equipment, perform the actuator mounting procedure.



Type 1066 With H Mounting

Table 1. Specifications

ACTUATOR SIZES	■ 20 and ■ 75	TEMPERATURE CAPABILITIES	Nitrile O-Rings: -40 to 180°F (-40 to 82°C) Viton⁽¹⁾ O-Rings: 0 to 300°F (-18 to 149°C)
CYLINDER PRESSURE	Maximum Allowable: 120 psig (8.3 bar) Minimum Recommended: 40 psig (2.8 bar)	CYLINDER VOLUMETRIC DISPLACEMENT	See table 2
MAXIMUM ROTATION	90 degrees, with travel stops adjustable to 60 degrees	TRAVEL INDICATION	Graduated scale and pointer combination located on actuator cover on side opposite actuator end of operated equipment shaft
OUTPUT SHAFT DIAMETERS, INCHES (mm)	Size 20: ■ 7/8 (22.2) and ■ 1-1/8 (28.6) Size 75: ■ 1-1/8 (28.6) and ■ 1-1/2 (38.1)	PRESSURE CONNECTIONS	1/4-inch NPT female
MAXIMUM ALLOWABLE OUTPUT TORQUE	Size 20: Up to 2,000 inch-pounds (226 N•m) Size 75 <i>For 1-1/8 inch (28.6 mm) output shaft—Up to 4,280 inch-pounds (484 N•m)</i> <i>For 1-1/2 inch (38.1 mm) output shaft—Up to 7,500 inch-pounds (847 N•m)</i>	MOUNTING POSITIONS	See figure 5
STROKING TIME	Dependent on actuator size, rotation, and supply pressure. If stroking time is critical, consult your Fisher sales office or sales representative	APPROXIMATE WEIGHTS, POUNDS (kg)	Size 20: 32 (15) Size 75: 85 (38)
		ADDITIONAL SPECIFICATIONS	For construction materials, see the parts list

1. Trademark of E.I. duPont de Nemours Co.

Table 2. Cylinder Volumetric Displacement

ACTUATOR SIZE	DISPLACEMENT VOLUME ⁽¹⁾		CLEARANCE VOLUME ABOVE PISTON ⁽¹⁾		HOUSING VOLUME BELOW PISTON ⁽¹⁾	
	Inch ³	cm ³	Inch ³	cm ³	Inch ³	cm ³
20	42	688	25	410	55	901
75	160	2622	72	1180	88	1442

1. Total volume to stroke piston down is equal to displacement volume plus clearance volume above piston; total volume to stroke piston up is equal to displacement volume plus housing volume below piston.

Actuator Mounting

Use the following steps to connect the actuator to a valve body or other equipment. Key numbers are shown in figure 6. Mounting dimensions are shown in figure 3.

Note

Find dimensions and center of gravity information in figures 3 and 4 and approximate weights in table 1. This information is required for fabrication of the proper bracket and coupling.

1. Consult figure 5 for available mounting styles and positions.

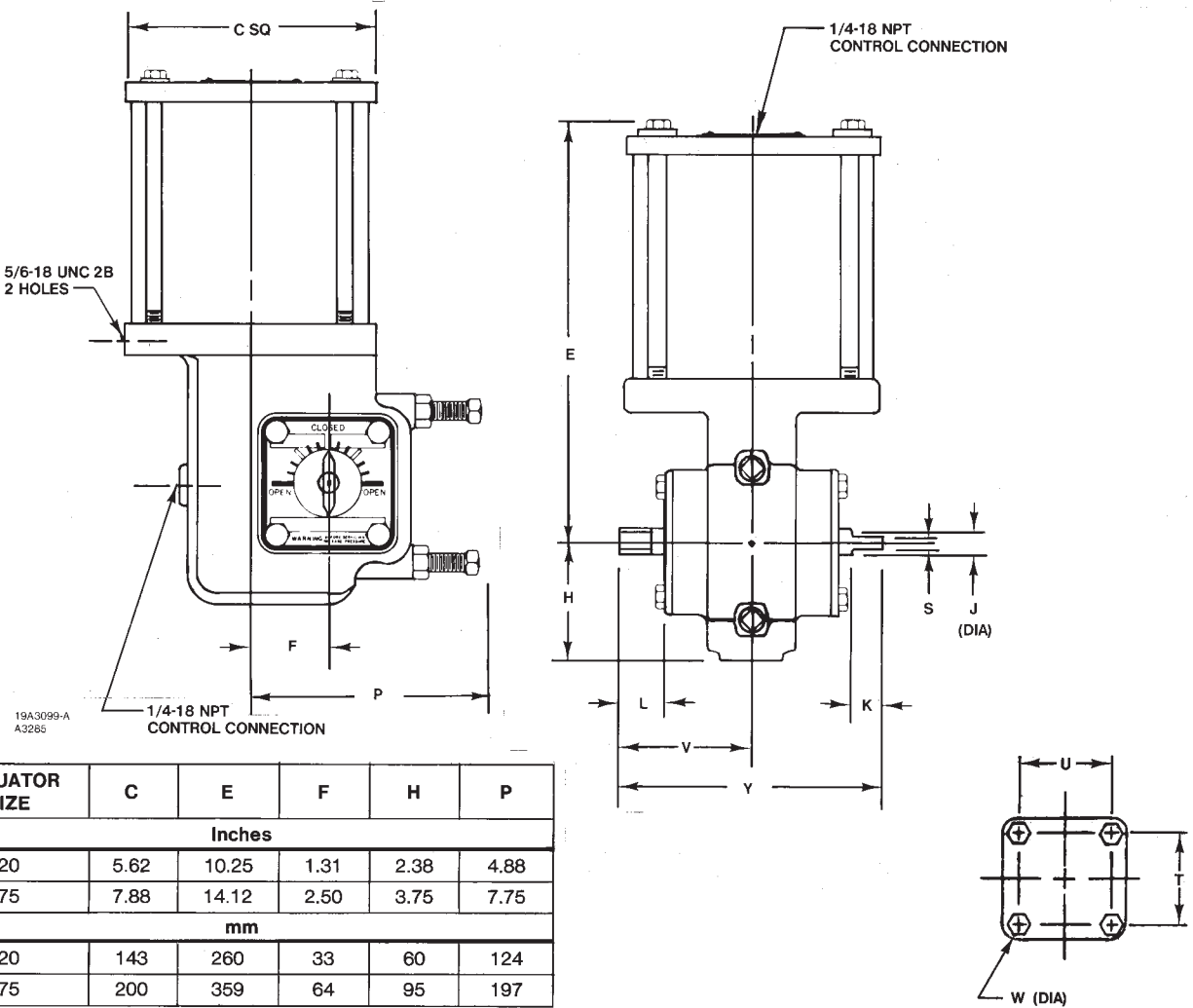
Note

For the desired mounting style and position, if the milled flats on the output shaft of the hub (key 6) are oriented such that the output shaft cannot accommodate the

WARNING

To avoid personal injury or property damage caused by bursting of pressure-retaining parts, be certain the cylinder pressure does not exceed 120 psig (8.3 bar). Use pressure-limiting or pressure-relieving devices to prevent the cylinder pressure from exceeding this limit.

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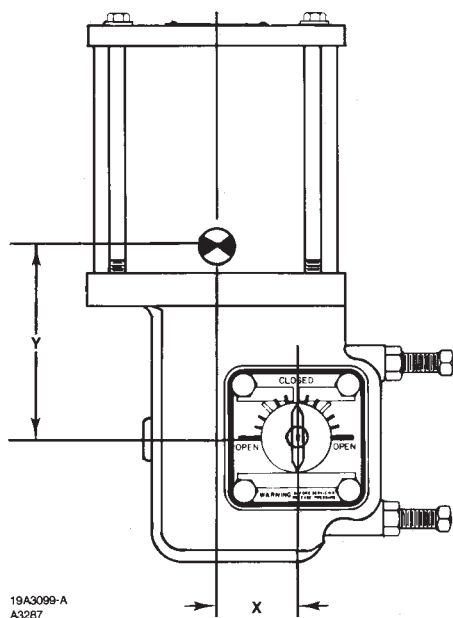


ACTUATOR SIZE	C	E	F	H	P
Inches					
20	5.62	10.25	1.31	2.38	4.88
75	7.88	14.12	2.50	3.75	7.75
mm					
20	143	260	33	60	124
75	200	359	64	95	197

ACTUATOR SIZE	J (ACTUATOR OUTPUT SHAFT DIAMETER)	K	L	S	T	U	V	W (DIA)	Y
Inches									
20	7/8	0.88	1.03	0.62	2.25	2.25	3.41	5/16-18 UNC	6.81
	1-1/8	0.88	1.03	0.87	2.25	2.25	3.41	5/16-18 UNC	6.81
75	1-1/8	0.88	1.03	0.87	3.50	3.50	3.69	1/2-13 UNC	7.38
	1-1/2	1.31	1.50	1.12	3.50	3.50	4.16	1/2-13 UNC	8.31
mm									
20	22.4	22	26	16	57	57	87	5/16-18 UNC	173
	28.4	22	26	22	57	57	87	5/16-18 UNC	173
75	28.4	22	26	22	89	89	94	1/2-13 UNC	187
	38.1	33	38	29	89	89	106	1/2-13 UNC	211

Figure 3. Type 1066 Mounting Dimensions

Type 1066 With H Mounting



ACTUATOR SIZE	CENTER OF GRAVITY DIMENSIONS			
	X		Y	
	Inches	mm	Inches	mm
20	0.75	19	3.00	76
75	2.00	51	4.50	114

Figure 4. Center of Gravity Dimensions

operated equipment shaft, refer to the changing positions procedure in the Changing Actuator Mounting section. This procedure describes how the output shaft can be repositioned to accommodate the operated equipment shaft.

2. Attach an appropriate mounting bracket (not provided) against the travel indicator scale (key 21) in the desired orientation with the cap screws (key 20). See figure 3 for mounting dimensions on the travel indicator scale. Tighten the cap screws to 18 foot-pounds (25 N•m) for size 20 actuators and to 75 foot-pounds (102 N•m) for size 75 actuators.

3. Slide the actuator (with the user-provided mounting bracket attached) into the user-provided coupling on the operated shaft. Then, secure the actuator to the operated equipment in the desired mounting position with appropriate fasteners, such as mounting cap screws. See figure 3 for output shaft dimensions.

4. If necessary, perform the adjustment procedure before proceeding to the loading connections procedure.

Loading Connections

1. Type 1066 actuators should have either a loading solenoid, a four-way switching valve, or two three-way switching valves connected to the 1/4-inch NPT pressure connections located at the top and bottom of the actuator cylinder.

2. Connect either 1/4-inch (6.4 mm) or 3/8-inch (9.5 mm) tubing between the actuator pressure connections and a controlling instrument. Keep the length of tubing as short as possible to avoid transmission lag in the control signal.

3. When the actuator is completely installed and connected to the instrument, check the actuator for correct action (air-to-open or air-to-close) to match the controlling instrument. For successful operation, the piston rod (key 5) and equipment operating shaft must move freely in response to loading pressure changes on the piston (key 3).

Adjustment

Key numbers referenced in this section are shown in figure 6.

WARNING

Avoid personal injury or property damage from a sudden release of process pressure or uncontrolled process fluid. Before starting adjustment:

- Isolate the valve or other operated equipment from the process,
- Release process pressure, and
- Vent the actuator loading pressure.

The Type 1066 actuator is factory set for a full 90 degrees of operated shaft rotation unless otherwise specified by the customer. Adjustments may be made after installation by loosening the self-sealing nuts (key 37) and turning the set screws (key 12). Top and bottom piston position limits are set with the upper and lower set screws, respectively. If rotation of either set screw (key 12) seems difficult, apply Lubriplate MAG-1⁽¹⁾ lubricant or equivalent (key 35) to the threads of each set screw as shown in figure 6.

Principle of Operation

Refer to figure 6. Piston movement is accomplished by loading air pressure on one side of the piston (key 3), while unloading air pressure from the other side. The piston moves a lever (key 10) to open or close the operated equipment. To operate these actuators, a loading solenoid, a four-way switching valve, or two three-way valves are required.

Maintenance

Actuator 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. Instructions are given in this section for replacing the cylinder O-ring, the cylinder gasket, and the lever/bearing assembly. Unless otherwise specified, key numbers referenced in the following steps are shown in figure 6.

WARNING

Avoid personal injury or property damage from a sudden release of process pressure or uncontrolled process fluid. Before starting disassembly:

- Isolate the operated equipment from its process,
- Release process pressure, and
- Vent the actuator loading pressure.

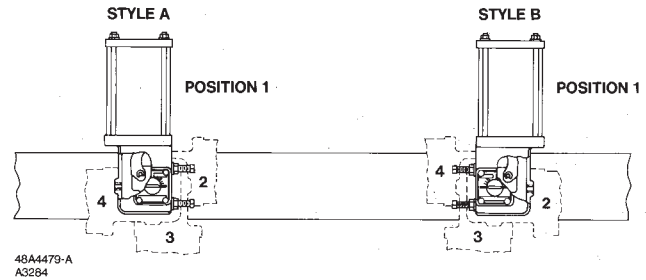
1. Disconnect the pressure tubing from the actuator. Then, remove the cap screws (key 16), the flat washers (key 15), the cylinder cover (key 2), and the cylinder (key 8).

2. Inspect the O-ring (key 17) and the gaskets (key 33) for nicks or flat spots that might cause leakage. Replace either part as necessary.

Note

If replacing the O-ring (key 17) or gaskets (key 33) is the only maintenance necessary, skip the remaining steps and reassemble the actuator as described in step 25 of this procedure.

3. Remove the limit switch, position switch, or other accessories, if used. Refer to the accessory instruction manual for instructions.



DESIRED ACTION OF		REQUIRED HOUSING CONSTRUCTION
Valve Body or Other Equipment	Actuator	
Clockwise to Close ⁽¹⁾	Push Down to Open (PDTO)	Style A
	Push Down to Close (PDTTC)	Style B
Counterclockwise to Close ⁽¹⁾	Push Down to Open (PDTO)	Style B
	Push Down to Close (PDTTC)	Style A

1. When viewed from actuator side of valve body or other equipment.

Figure 5. Actuator Housing Construction Styles and Mounting Positions

4. Remove the cap screws (key 20) from the operated shaft end of the actuator. Then, remove the actuator from the operated equipment.

5. With the actuator at the top of its stroke, mark the orientation of the flats on the output shaft end of the hub (key 6) with respect to the actuator housing (key 1). Also, mark the orientation of the travel indicator (key 22) with respect to the travel indicator scale (key 21). These markings are used during reassembly to allow for proper output shaft positioning. With the output shaft, housing, travel indicator, and travel indicator scale properly marked, remove the retaining ring (key 40) and the travel indicator. Then, remove both retaining rings (key 39). Unscrew the remaining cap screws (key 20) and remove both travel indicator scales (key 21) from both sides of the actuator. Mark the orientation of each travel indicator scale with respect to the actuator housing before removing it.

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6. Remove the bearing (key 4), and then remove the hub (key 6) from the housing (key 1). Inspect the O-rings (keys 18 and 34) for wear and damage. Replace the O-rings if necessary.
7. Lift the piston (key 3) with attached piston rod (key 5) and attached lever and bearing assembly (key 10) out of the actuator housing.
8. Unscrew the cap screw (key 19), and remove the sealing washer (key 11) and the piston from the piston rod. For size 20 actuators, a flat washer (key 23) will also be removed with these parts.
9. Remove one of the two E-rings (key 14) and then remove the pin (key 9). Separate the lever and bearing assembly from the piston rod.
10. Inspect the lever and bearing assembly for excessive wear. Replace the assembly if necessary.
11. Reconnect the lever and bearing assembly to the piston rod with the pin. Secure the pin with the E-ring.
12. Apply Lubriplate MAG-1 or equivalent lubricant (key 35) to the cap screw (key 19) and the O-ring (key 17) as shown in figure 6.
13. Attach the piston to the piston rod with the cap screw (key 19) and sealing washer (key 11). Torque the cap screw to 60 foot-pounds (81 N•m) for size 20 actuators and to 130 foot-pounds (176 N•m) for size 75 actuators. For size 20 actuators, a flat washer (key 23) is also installed with these parts.
14. Lower the piston rod assembly into the actuator housing.
15. Apply Lubriplate MAG-1 or equivalent lubricant (key 35) to the O-ring (key 34) as shown in figure 6.
16. Inspect the hub (key 6) for excessive wear. Replace the hub if necessary.
17. With the actuator at the top of its stroke, slide the hub into the housing and through the lever and bearing assembly so that the markings that were made in step 5 of this procedure are oriented correctly (output shaft to actuator housing).
18. Inspect the bearing (key 4) for excessive wear. Replace the bearing if necessary.
19. Apply Lubriplate MAG-1 or equivalent lubricant (key 35) to the outer surface of the bearing (key 4) and to the O-ring (key 18) as shown in figure 6.
20. Install the bearing into the housing.
21. Slide each travel indicator scale (key 21) onto the hub on each side of the actuator. When installing each travel indicator scale, make sure that the markings on each scale and housing that were made in step 5 of this procedure are oriented correctly.
22. Install each retaining ring (key 39) onto the hub on each side of the actuator.
23. With the actuator at the top of its stroke, slide the travel indicator (key 22) onto the end of the hub so that the markings that were made in step 5 of this procedure are oriented correctly (travel indicator to travel indicator scale). Secure the travel indicator to the hub with the retaining ring (key 40).
24. Slide the actuator onto the equipment operating shaft and secure it to the mounting bracket in the desired position with the cap screws (key 20). Install the cap screws (key 20) on both sides of the actuator housing and torque them to 18 foot-pounds (25 N•m) for size 20 actuators and to 75 foot-pounds (102 N•m) for size 75 actuators.
25. Apply Lubriplate MAG-1 or equivalent lubricant (key 35) to the wall of the cylinder as shown in figure 6. Then, install the cylinder and cylinder cover and secure them to the actuator with the cap screws (key 16) and flat washers (key 15). Torque the cap screws to 30 foot-pounds (41 N•m) for size 20 actuators and to 75 foot-pounds (102 N•m) for size 75 actuators.
26. Connect the pressure tubing to the actuator. Then, install the limit switch, position switch, or other accessories, if used. Refer to the accessory instruction manual for instructions.
27. Perform the adjustment procedure before placing the actuator into operation.

Changing Actuator Mounting

There are two possible mounting styles and four possible positions for each style. See figure 5.

WARNING

Avoid personal injury or property damage from sudden release of process fluid. Before starting disassembly:

- Isolate the valve or other operated equipment from the process,
- Release process pressure, and
- Vent the actuator loading pressure.

Use the following procedures along with figure 6 for key number references to convert from style A to style B, or vice versa, or to change the mounting position.

Changing Styles

1. Disconnect the pressure tubing from the actuator. Then, remove the limit switch, position switch, or other accessories, if used. Refer to the accessory instruction manual for instructions.

2. Remove the cap screws (key 20) from the operated shaft end of the actuator. Then, remove the actuator from the operated equipment.

3. Using a convenient air supply with 120 psig (8.3 bar) maximum pressure, position the actuator piston at the top of its stroke. Remove the retaining ring (key 40) and the travel indicator (key 22). Then, unscrew the remaining cap screws (key 20).

4. Rotate the actuator housing 180 degrees while maintaining the appropriate position (1, 2, 3, or 4).

5. The style change results in a 90-degree shift in flat orientation on the actuator output shaft end of the hub (key 6). If this shift can be accommodated conveniently by using a different coupling or by reorienting the coupling on the operated equipment shaft, skip steps 6 through 9 and proceed with step 10 of this procedure. Otherwise, proceed with the following step.

6. Remove both retaining rings (key 39) and both travel indicator scales (key 21) from both sides of the actuator. Then, remove the bearing (key 4) and the hub from the housing (key 1).

7. Before sliding the hub into the lever and bearing assembly, make sure that the milled flats on the output shaft end of the hub are positioned appropriately. The flats may be positioned either parallel with or perpendicular to the actuator cylinder (key 8) when the actuator is at the top of its stroke. If necessary, flip the hub end-over-end to obtain proper flat orientation. With the hub positioned appropriately, slide the hub into the housing and through the lever and bearing assembly.

8. Apply Lubriplate MAG-1 or equivalent lubricant (key 35) to the outer surface of the bearing (key 4). Then, install the bearing into the housing.

9. Slide each travel indicator scale (key 21) and each retaining ring (key 39) onto the hub on each side of the actuator.

10. With the actuator at the top of its stroke, slide the travel indicator (key 22) onto the end of the hub and position it so that it can show the proper position of the operated equipment when the operated equipment is in the open position. Secure the travel indicator to the hub with the retaining ring (key 40).

11. Slide the actuator in the desired position (1, 2, 3, or 4) onto the equipment operating shaft and secure it to the mounting bracket with the cap screws (key 20). Install the cap screws (key 20) on both sides of the actuator housing and torque them to 18 foot-pounds (25 N•m) for size 20 actuators and to 75 foot-pounds (102 N•m) for size 75 actuators.

12. Connect the pressure tubing to the actuator. Then, install the limit switch, position switch, or other accessories, if used. Refer to the accessory instruction manual for instructions.

13. Perform the adjustment procedure before placing the actuator into operation.

Changing Positions

Note

If changing from mounting position 1 to position 3 or from position 2 to position 4, or vice versa, disregard steps 1 through 11 and proceed as follows. Remove the cap screws (key 20) from the operated shaft end of the actuator, remove the actuator from the operated equipment, and then rotate the actuator to the appropriate position. Slide the actuator in the desired position onto the equipment operating shaft and secure it to the mounting bracket with the cap screws (key 20). Torque the cap screws to 18 foot-pounds (25 N•m) for size 20 actuators and to 75 foot-pounds (102 N•m) for size 75 actuators. Perform the adjustment procedure before placing the actuator into operation.

1. Disconnect the pressure tubing from the actuator. Then, remove the limit switch, position switch, or other accessories, if used. Refer to the accessory instruction manual for instructions.

2. Using a convenient air supply with 120 psig (8.3 bar) maximum pressure, position the actuator piston at the top of its stroke. Remove the cap screws (key 20) from the operated shaft end of the actuator. Then, remove the actuator from the operated equipment.

3. Remove the retaining ring (key 40), the travel indicator (key 22), and both retaining rings (key 39). Then, unscrew the remaining cap screws (key 20) and remove both travel indicator scales (key 21) from both sides of the actuator.

4. Remove the bearing (key 4), and then remove the hub (key 6) from the housing (key 1).

5. Rotate the actuator housing either 90 degrees clockwise or 90 degrees counterclockwise as desired to obtain the appropriate mounting position.

6. Before sliding the hub into the lever and bearing assembly (key 10), make sure that the milled flats on the output shaft end of the hub are positioned appropriately. The flats may be positioned either parallel with or perpendicular to the actuator cylinder (key 8) when the actuator is at the top of its stroke. With the hub positioned appropriately, slide the hub into the housing and through the lever and bearing assembly.

7. Apply Lubriplate MAG-1 or equivalent lubricant (key 35) to the outer surface of the bearing (key 4). Then, install the bearing into the housing.

8. Slide each travel indicator scale (key 21) and each retaining ring (key 39) onto the hub on each side of the actuator. Then, with the actuator at the top of its stroke, slide the travel indicator (key 22) onto the end of the hub and position it so that it can show the proper position of the operated equipment when the operated equipment is in the open position. Secure the travel indicator to the hub with the retaining ring (key 40).

9. Maintaining the desired mounting position, slide the actuator onto the equipment operating shaft and secure it to the mounting bracket with the cap screws (key 20). Install the cap screws (key 20) on both sides of the actuator housing and torque them to 18 foot-pounds (25 N•m) for size 20 actuators and to 75 foot-pounds (102 N•m) for size 75 actuators.

10. Connect the pressure tubing to the actuator. Then, install the limit switch, position switch, or other accessories, if used. Refer to the accessory instruction manual for instructions.

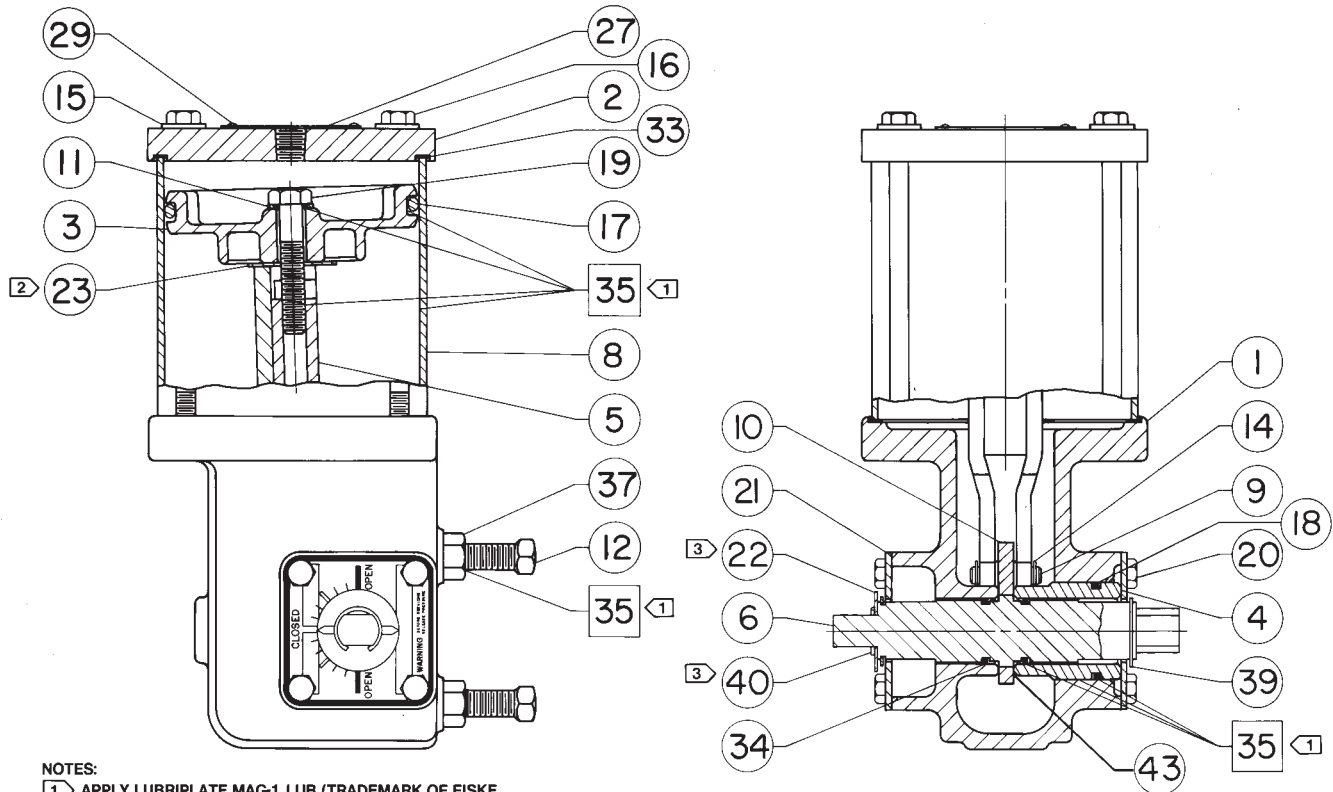
11. Perform the adjustment procedure before placing the actuator into operation.

Parts Ordering

When corresponding with your Fisher sales office or sales representative about this equipment, refer to the serial number found on the actuator nameplate (figure 2 and key 27, figure 6). Also, specify the complete 11-character part number from the following parts list when ordering replacement parts.

Parts List			Key	Description	Part Number	Key	Description	Part Number
1	Housing, cast iron		8	Cylinder, steel (ENC; heat treated)		18*	O-Ring	
	Size 20	48A4400 X012		Size 20	18A4420 X012		Nitrile	
	Size 75	58A4402 X012		Size 75	18A4455 X012		Size 20	15A8508 X012
2	Cylinder Cover, steel		9	Pin, 17-4PH stainless steel (heat treated)			Size 75	1J1079 X0052
	Size 20	38A4406 X012		Size 20	18A4421 X012		Viton	
	Size 75	38A4433 X012		Size 75	18A4456 X012		Size 20	15A8508 X022
3	Piston, aluminum		10	Lever & Bearing Assembly, Steel/TFE		19	Cap Screw, zn pl steel	
	Size 20	38A4481 X012		Size 20	18A4422 X012		Size 20	1A4439 24052
	Size 75	28A4409 X012		Size 75	18A4422 X022		Size 75	1A4278 24052
4	Bearing, steel (ENC)		11	Sealing Washer, pl carbon steel & rubber		20	Cap Screw, zn pl steel (8 req'd)	
	Size 20	28A4407 X012		Size 20	1H7207 99012		Size 20	1C5958 X0022
	Size 75	28A4444 X012		Size 75	1J7641 99012		Size 75	1A5823 24052
5	Piston Rod, steel		12	Set Screw, steel (2 req'd)		21	Travel Indicator Scale, Stainless steel (2 req'd)	
	Size 20	38A4411 X012		Size 20	15A2638 X012		Size 20	28A4487 X012
	Size 75	38A4446 X012		Size 75	18A4458 X012		Size 75	38A4489 X012
6	Hub & Bearing Assembly, Stainless steel/TFE		14	E-Ring, pl carbon steel (2 req'd)		22	Travel Indicator, stainless steel Standard	
	Size 20			Size 20	1F6252 28992		Size 20	
	7/8-inch (22.2 mm) output shaft diameter	38A4418 X012	15	Flat Washer, steel (4 req'd)			Use w/ 7/8-inch (22.2 mm) output shaft diameter	18A4490 X012
	1-1/8 inch (28.6 mm) output shaft diameter	38A4484 X012		Size 20	1D7162 28982		Use w/ 1-1/8 inch (28.6 mm) output shaft diameter	18A4491 X012
	Size 75		16	Cap Screw, zn pl steel (4 req'd)			Size 75	
	1-1/8 inch (28.6 mm) output shaft diameter	38A4485 X012		Size 20	15A2640 X012		Use w/ 1-1/8 inch (28.6 mm) output shaft diameter	18A4492 X012
	1-1/2 inch (38.1 mm) output shaft diameter	38A4486 X012		Size 75	15A2678 X012		Use w/ 1-1/2 inch (38.1 mm) output shaft diameter	18A4493 X012
			17*	O-Ring				
				Nitrile				
				Size 20	1D2672 X0032			
				Size 75	1D4446 X0052			
				Viton				
				Size 20	1D2672 X0012			
				Size 75	1D4446 X0012			

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NOTES:

- 1 APPLY LUBRIPLATE MAG-1 LUB (TRADEMARK OF FISKE BROTHERS REFINING CO.) OR EQUIVALENT.
- 2 KEY 23 REQUIRED FOR SIZE 20 ACTUATORS ONLY.
- 3 ACTUATOR SHOWN WITH STYLE A MOUNTING; FOR STYLE B MOUNTING, ASSEMBLE KEYS 22 AND 40 ON OPPOSITE SIDE OF HOUSING.

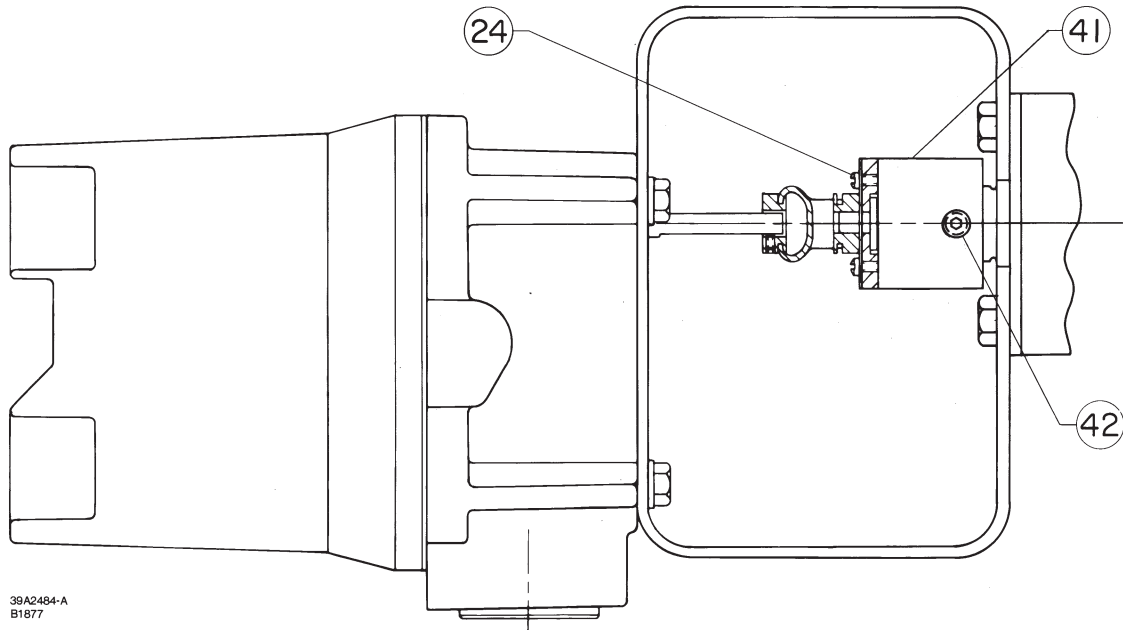
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B1880

Figure 6. Type 1066 Actuator with H Mounting Adaptation

Key	Description	Part Number	Key	Description	Part Number	Key	Description	Part Number
22	Travel Indicator (Continued) Use w/Type 304 or 3552 switch Size 20 Use w/ 7/8-inch (22.2 mm) output shaft diameter 28A4482 X012 Use w/ 1-1/8 inch (28.6 mm) output shaft diameter 28A4483 X012 Size 75 Use w/ 1-1/8 & 1-1/2 inch (22.2 & 28.6 mm) output shaft diameter 28A4483 X012 Use w/limit switch ⁽²⁾ Size 20 28A4426 X012 Size 75 28A4460 X012		23	Flat Washer, pl carbon steel Size 20 only 18A4427 X012		34*	O-Ring (2 req'd) Nitrile Size 20 1V1157 06992 Size 75 1K1365 X0042 Viton Size 20 1V1157 X0012 Size 75 1K1365 X0052	
			24	Machine Screw, pl carbon steel (2 req'd) (use w/switches only) (see figure 7) Size 20 1B8776 28992 Size 75 1B2752 28982		35	Lubriplate Mag-1 Lubricant, 14 oz. (0.396 kg) can (not furnished with actuator) 1M1100 X0012	
			27	Nameplate, stainless steel 17A5511 X012		37	Self-Sealing Nut, brass (2 req'd) 15A2639 X012	
			29	Drive Screw, stainless steel (4 req'd) 1A3682 28982				
			33*	Gasket, asbestos/nitrile (2 req'd) Size 20 18A4432 X012 Size 75 18A4443 X012				

*Recommended spare part.

2. Limit switches include NAMCO Switches (Trademark of NAMCO Controls/Acme-Cleveland Co.), Micro Switches (Trademark of Micro Switch Co.), and GO Series Switches (Trademark of General Equipment Co.).



39A2484-A
B1977

Figure 7. Adaptor (Key 41) for Type 1066 Actuators
(Shown with Type 304 Position Switch)

Key	Description	Part Number	Key	Description	Part Number	Key	Description	Part Number
39	Retaining Ring, pl carbon steel (2 req'd) Size 20	18A4508 X012	40	Retaining Ring (Continued) Size 75 Use w/ 1-1/8 inch (28.6 mm) output shaft diameter	19A5505 X012	41	Adaptor, steel (Continued) Size 75 Use w/ 1-1/8 inch (28.6 mm) output shaft diameter	28A4517 X012
	Size 75	18A4497 X012		Use w/ 1-1/2 inch (38.1 mm) output shaft diameter	19A5506 X012		Use w/ 1-1/2 inch (38.1 mm) output shaft diameter	28A4518 X012
40	Retaining Ring, stainless steel Size 20 Use w/ 7/8-inch (22.2 mm) output shaft diameter	19A5504 X012	41	Adaptor, steel (see figure 7) (Use w/switches only) Size 20 Use w/ 7/8-inch (22.2 mm) output shaft diameter	28A4515 X012	42	Set Screw, stainless steel (see figure 7) (Use w/switches only)	12A9113 X012
	Use w/ 1-1/8 inch (28.6 mm) output shaft diameter	19A5505 X012		Use w/ 1-1/8 inch (28.6 mm) output shaft diameter	28A4516 X012	43	Washer, stainless steel Size 20	19A5989 X012
							Size 75	19A5990 X012

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September 1984

Errata Sheet for

Type 1066 On-Off Piston Rotary Actuator With H Mounting Adaptation Instruction Manual Form 5231, April 1984

Make the following additions for the size 27 actuator as well as the indicated changes to this manual.

- o In table 1 on page 2, add the following specification information:

ACTUATOR SIZES	20, 27, and 75
OUTPUT SHAFT DIAMETERS INCHES (mm)	Size 27: 7/8 (22.2) and 1-1/8 (28.6)
MAXIMUM ALLOWABLE OUTPUT TORQUE	Size 27: Up to 2,000 inch-pounds (226 N.m)
APPROXIMATE WEIGHT, POUNDS (kg)	Size 27: 62 (28)
MAXIMUM ALLOWABLE CYLINDER PRESSURE	Size 27: 90 psig (6.2 bar)

- o In table 2 on page 2, add the following information:

ACTUATOR SIZE	DISPLACEMENT ⁽¹⁾ VOLUME		CLEARANCE VOLUME ⁽¹⁾ ABOVE PISTON		HOUSING VOLUME ⁽¹⁾ BELOW PISTON	
	Inch ³	cm ³	Inch ³	cm ³	Inch ³	cm ³
27	42	688	25	410	245	4,014

1. Total volume to stroke piston down is equal to displacement volume plus clearance volume above piston; total volume to stroke piston up is equal to displacement volume plus housing volume below piston.

- o In figure 3 on page 3, add the following dimensions:

ACTUATOR SIZE	C	E	F	H	P	K	L
Inches							
27	7.88	15.25	1.31	2.38	5.50	0.88	1.03
mm							
27	200	387	33	60	140	22	26

ACTUATOR SIZE	J (ACTUATOR OUTPUT SHAFT DIAMETER)	S	T	U	V	W (DIA)	Y
INCHES							
27	7/8	0.62	3.00	3.00	3.41	3/8-16 UNC	6.81
	1-1/8	0.88	3.00	3.00	3.41	3/8-16 UNC	6.81
mm							
27	22.2	16	76	76	87	3/8-16 UNC	173
	28.6	22	76	76	87	3/8-16 UNC	173

- o In figure 4 on page 4, add the following dimensions:

ACTUATOR SIZE	CENTER OF GRAVITY DIMENSIONS			
	X		Y	
	Inches	mm	Inches	mm
27	1.00	25	6.25	159

- o Refer to the following bolting torques when either performing maintenance on or mounting a size 27, Type 1066 actuator:

KEY NUMBER	BOLTING TORQUE	
	Foot-Pounds	N.m
16	75	102
19	100	135
20	30	41

- o In the parts list on pages 8, 9, and 10, add the following parts:

<u>KEY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
1	Housing, cast iron Size 27	48A4404 X012
2	Cylinder Cover, steel Size 27	38A4433 X012
3	Piston, aluminum Size 27	28A4409 X012
4	Bearing, steel (ENC) Size 27	28A4407 X012
5	Piston Rod, steel Size 27	38A4434 X012

<u>KEY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
6	Hub & Bearing Assembly Stainless steel/carbon-filled TFE Sizes 20 and 27 Standard Hub Construction (1) 7/8-inch (22.2 mm) output shaft diameter 1-1/8 inch (28.6 mm) output shaft diameter	38A4418 X012 38A4484 X012
	Reverse Hub Construction (2) 7/8-inch (22.2 mm) output shaft diameter 1-1/8 inch (28.6 mm) output shaft diameter	39A8333 X012 39A8334 X012
	Size 75 Standard Hub Construction (1) 1-1/8 inch (28.6 mm) output shaft diameter 1-1/2 inch (38.1 mm) output shaft diameter	38A4485 X012 38A4486 X012
	Reverse Hub Construction (2) 1-1/8 inch (28.6 mm) output shaft diameter 1-1/2 inch (38.1 mm) output shaft diameter	39A8335 X012 39A8336 X012
8	Cylinder, steel (ENC; heat-treated) Size 27	18A4438 X012
9	Pin, 17-4PH stainless steel (heat-treated) Size 27	18A4421 X012
10	Lever & Bearing Assembly, steel/TFE Size 27	18A4422 X012
11	Sealing Washer, pl carbon steel & rubber Size 27	1J7641 99012
12	Set Screw, steel (2 required) Size 27	15A2679 X012
14	E-Ring, pl carbon steel (2 required) Size 27	1F6252 28992
15	Flat Washer, steel (4 required) Size 27	1A5189 25072
17*	O-Ring Size 27 Nitrile Fluoroelastomer	1D4446 X0052 1D4446 X0012

*Recommended spare part.

1. Use this hub construction for mounting positions 2 and 4 for clockwise to close equipment action, and for mounting positions 1 and 3 for counterclockwise to close equipment action. (Refer to figure 5 in the instruction manual for mounting positions.)
2. Use this hub construction for mounting positions 1 and 3 for clockwise to close equipment action, and for mounting positions 2 and 4 for counterclockwise to close equipment action. (Refer to figure 5 in the instruction manual for mounting positions.)

<u>KEY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
18*	O-Ring Size 27 Nitrile Fluoroelastomer	15A8508 X012 15A8508 X022
19	Cap Screw, zn pl steel Size 27	1A4278 24052
20	Cap Screw, zn pl steel (8 required) Size 27	1A3531 24052
21	Travel Indicator Scale, stainless steel Size 27 (2 required)	38A4488 X012
22	Travel Indicator, stainless steel Size 27 Standard Use w/Type 304 or 3552 switch 7/8-inch (22.2 mm) output shaft diameter 1-1/8 inch (28.6 mm) output shaft diameter Use with limit switch	18A4491 X012 28A4482 X012 28A4483 X012 28A4426 X012
24	Machine Screw, pl carbon steel (2 required) (Use w/switches only - see figure 7 in manual) Size 27	1B8776 28992
30	Stud, zn pl steel (4 required) Size 27	18A4442 X012
31	Hex Nut, zn pl steel (4 required) Size 27	1A3412 24122
33*	Gasket, asbestos/nitrile Size 27	18A4443 X012
34*	O-Ring Size 27 Nitrile Fluoroelastomer	1V1157 06992 1V1157 X0012
39	Retaining Ring, pl carbon steel (2 required) (Not required with switches) Size 27	18A4508 X012
40	Retaining Ring, stainless steel (Not required with switches) Size 27 7/8-inch (22.2 mm) output shaft diameter 1-1/8 inch (28.6 mm) output shaft diameter	19A5504 X012 19A5505 X012

*Recommended spare part.

<u>KEY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
41	Adaptor, steel (Use with switches only - see figure 7 in manual) Size 27 7/8-inch (22.2 mm) output shaft diameter 1-1/8 inch (28.6 mm) output shaft diameter	28A4515 X012 28A4516 X012
43	Thrust Washer, stainless steel Size 27	19A5989 X012