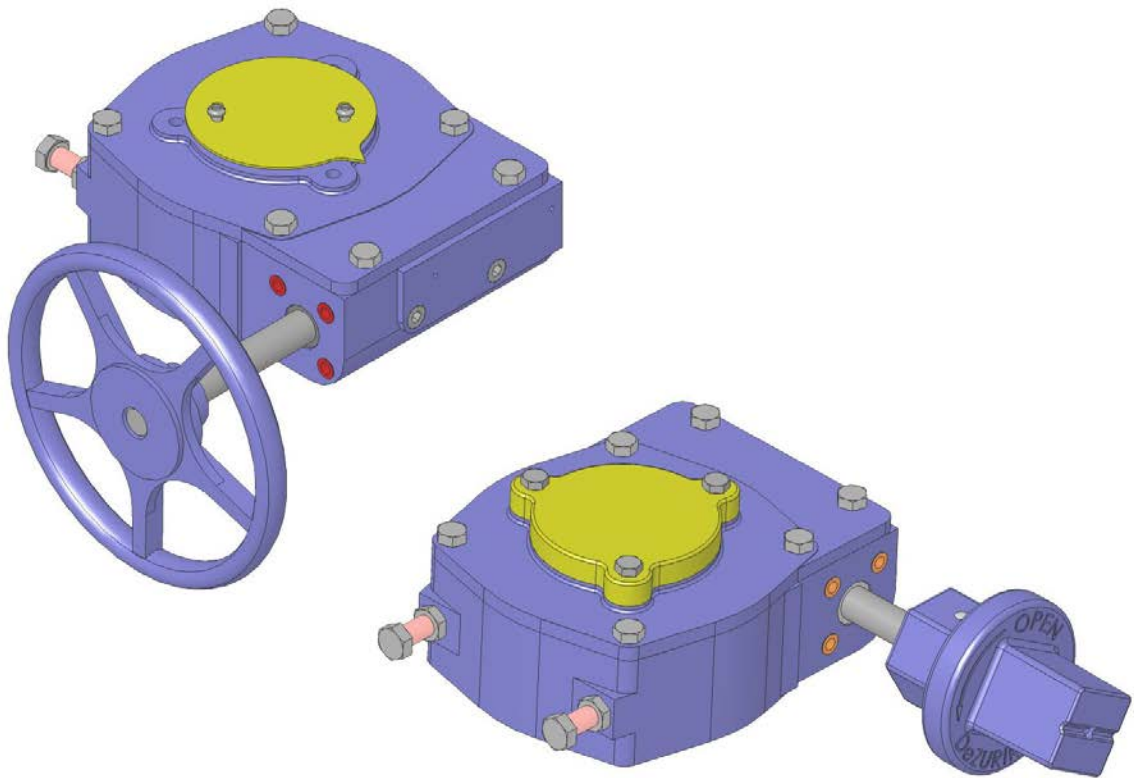


DEZURIK MANUAL

G-SERIES ACTUATOR

USED ON PEC 100% PORT PLUG VALVES



Instruction **D10456**
August 2012

DeZURIK

Manual G-Series Actuator used on PEF 100% Port Plug Valves

Instructions

These instructions provide information about Manual G-Series Actuators on PEF 100% Port Eccentric Plug Valves. They are for use by personnel who are responsible for installation, operation and maintenance of Manual G-Series Actuators.

Safety Messages

All safety messages in the instructions are flagged with an exclamation symbol and the word Caution, Warning or Danger. These messages indicate procedures that must be followed exactly to avoid equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).



WARNING!

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your Manual G-Series Actuator has been packaged to provide protection during shipment; however, it can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime.

Order parts from your local DeZURIK sales representative, or directly from DeZURIK. When ordering parts, please include the 7-digit part number and 4-digit revision number (example: **9999999R000**) located on the data plate attached to the valve assembly. Also include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

DeZURIK Service

DeZURIK service personnel are available to install, maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services.

For more information, contact your local DeZURIK sales representative or visit our website at www.dezurik.com.

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Description

The manual operated G-Series actuator is designed to operate a PEF 100% Port Eccentric plug valve. External adjustable stops limit actuator stroke for both the open and closed valve positions. This actuator is available in two sizes: Size 6 and Size 12. See Figure 1 to identify which unit you have.

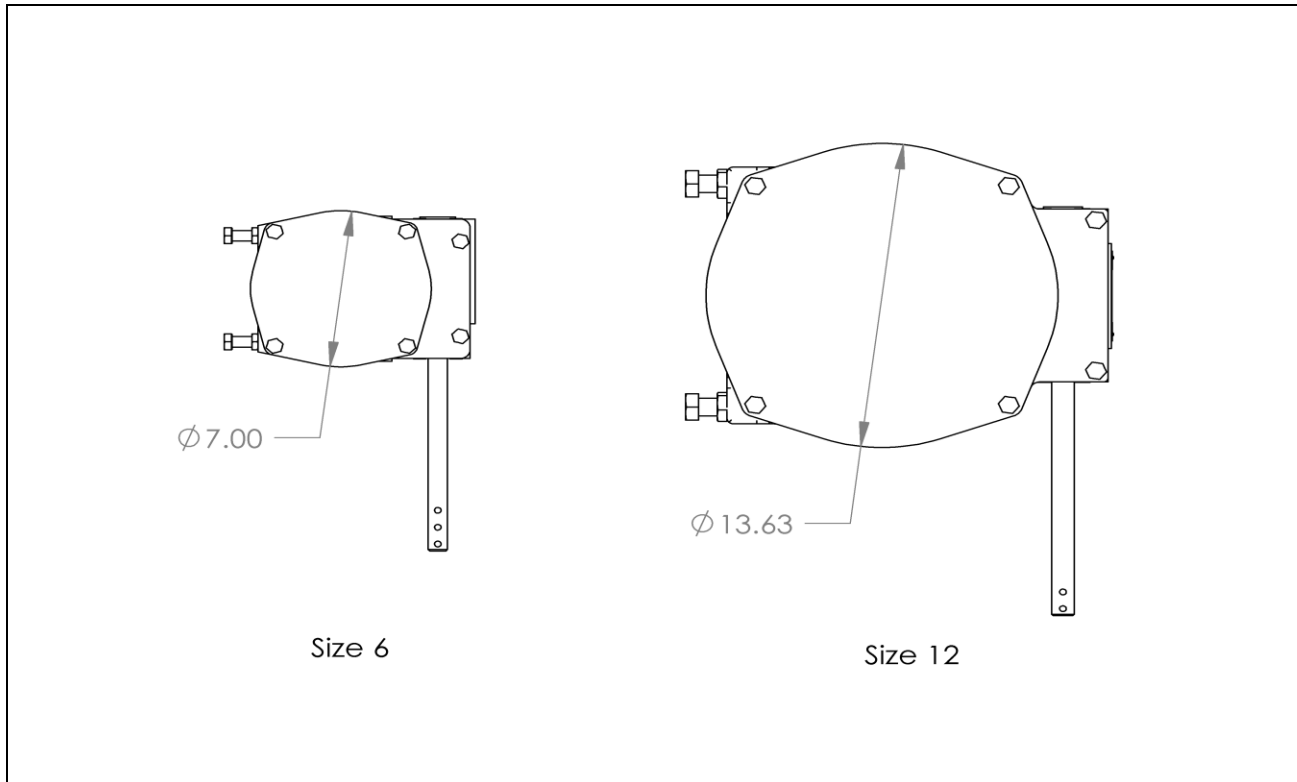


Figure 1— G-Series Actuator Identification

Operation

Rotating the operator (handwheel, chainwheel or 2" nut) clockwise closes the valve. Counterclockwise rotation of the operator opens the valve. To actuate the valve from full open to full closed (or vice-versa), the Size 6 requires 13 revolutions and the Size 12 requires 19 revolutions of the operator.

Tools Required

This actuator is assembled using metric fasteners. To service this unit, you should have a full set of combination or ratchet wrenches, Allen wrenches, flat tipped screwdrivers, a 1/4" pin punch and a dead blow hammer.

Lubrication

The G-Series actuator has been lubricated at the factory and requires no routine maintenance lubrication. If the actuator requires disassembly, see the ACTUATOR DISASSEMBLY AND ASSEMBLY section in this instruction for disassembly, lubrication and assembly procedures.

Parts Identification

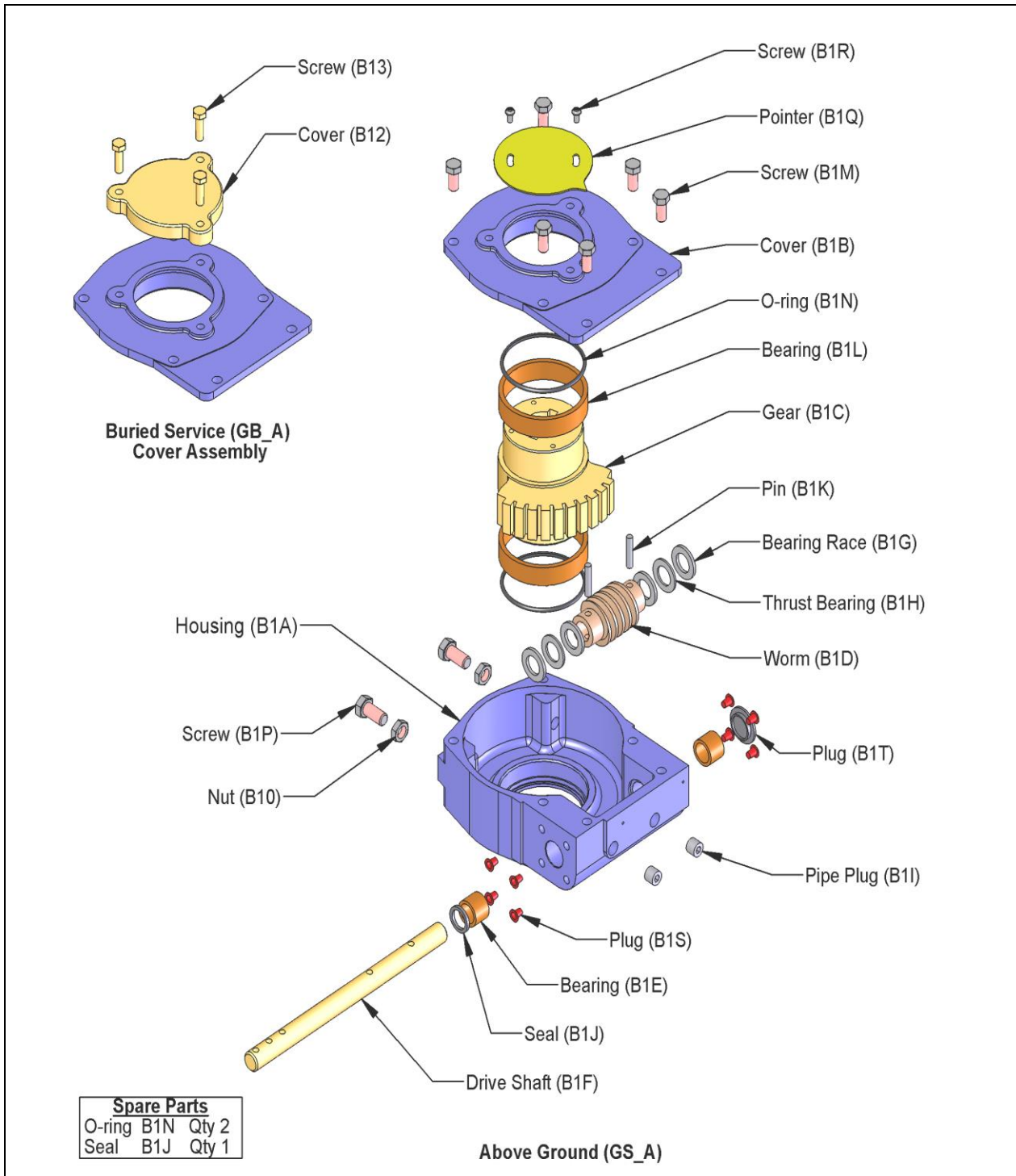


Figure 2— Actuator Parts Identification

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Stop Adjustments

The open and closed position stops prevent the valve plug from rotating beyond the optimum open and shutoff positions.

If the actuator is factory-mounted on the valve, the stops are preset, and do not require further adjustment. If the actuator is not factory mounted on the valve, or if the actuator has been removed, the stops will require adjustment as described below; also refer to the Valve Instructions for specific closed position requirements for the valve.

Valves can be mounted with Direct or Reverse pressure.

Direct Pressure - When the higher pressure is at the end opposite the seat. See Figure 3.

Reverse Pressure - When the higher pressure is at the seat end of the valve. See Figure 3.

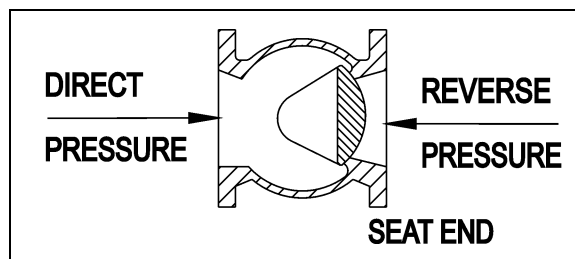


Figure 3— Pressure Direction

To Adjust the Closed Position Stop

See Figure 5 for stop Identification.



WARNING!

To adjust the closed position stop: (see Figure 5 for stop identification) Adjusting stops with flow in the pipeline can allow the valve to close causing personal injury and damaging the flow system.

Shut down the flow and relieve pipeline pressure before making stop adjustments

1. Discontinue flow and relieve pipeline pressure.
2. Close the valve.
3. Loosen the nut on the closed position screw, and back out the screw about two turns.
4. Turn the handwheel, chainwheel or 2" wrenching square operator until the specified Actuator Input Torque from Table A is reached.
5. While maintaining the Actuator Input Torque from Table A, turn the closed position screw clockwise until resistance is felt from the screw contacting the gear (B1C).
6. Prevent the screw from turning and tighten the nut against housing (B1A).
7. Pipeline flow may now be restored.

Stop Adjustments *(Continued)*

To Adjust the Open Position Stop

See Figure 5 for stop identification.



WARNING!

Adjusting stops with flow in the pipeline can allow the valve to close causing personal injury and damaging the flow system.

Shut down the flow and relieve pipeline pressure before making stop adjustments.

1. Discontinue flow and relieve pipeline pressure.
2. To visually determine when the valve is in the open position:
Above Ground Service (GS_A) actuator - Remove the screws (B1R) and pointer (B1Q).
Buried Service (GB_A) actuator - Remove the screws (B13) and cover (B12).
3. Loosen the nut on the open position screw, and back out the screw about two turns.
4. Turn the handwheel, chainwheel or 2" wrenching square operator so the drive key/plug alignment is parallel to the valve flanges. See Figure 4 for valve open position.

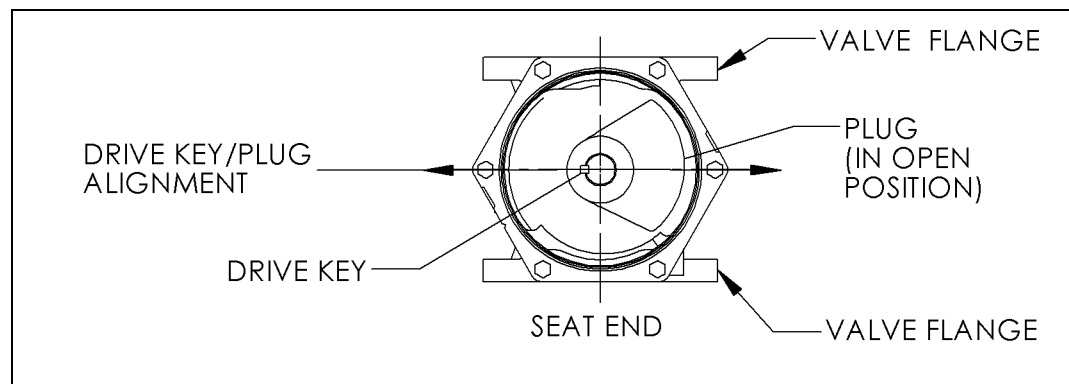


Figure 4— Valve Open Position

5. Turn the open position screw clockwise until resistance is felt from the screw contacting the gear (B1C).
6. Prevent the screw from turning, and tighten the nut against housing (B1A).
7. **Above Ground Service (GS_A) actuator** - Replace the pointer (B1Q) so it is pointing at the OPEN mark on the cover (B1B) and tighten screws (B1R).
Buried Service (GB_A) actuator - Remove old sealant from cover (B12) and cover (B1B) mating mounting surfaces. Apply a bead of silicone sealant DOW RTV-732 (1055515) or similar to the cover (B12) and cover (B1B) mating surfaces. Fasten the cover (B12) to cover (B1B) with screws (B13).
8. Pipeline flow may now be restored.

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Stop Adjustments *(Continued)*

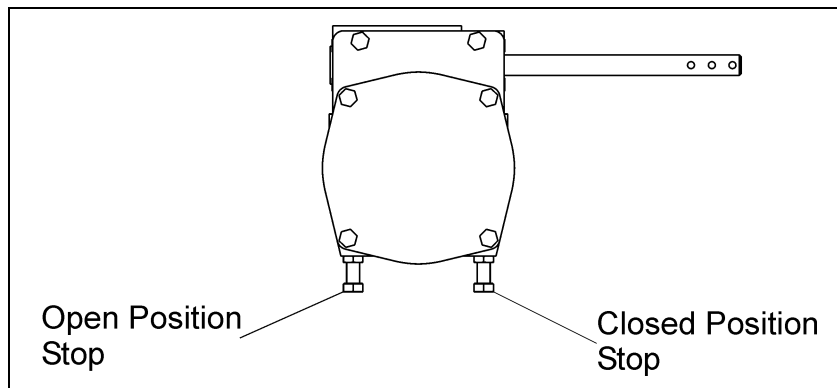


Figure 5— Open and Closed Position Stop Identification

Valve Size	Actuator Size	Actuator Input Torque (ft-lbs)							
		Direct Pressure Drop (psi)	Reverse Pressure Drop (psi)						
			25	50	75	100	125	150	175
3 & 4	G6	4	4	4	5	5	5	5	5
5	G6	8	8	9	10	11	11	11	11
6	G6	8	8	9	10	11	11	11	11
8	G6	15	15	17	19	20	21	21	21
10	G6	22	22	25	29	33	36	N/A	N/A
10	G12	11	11	18	18	18	18	18	18
12	G6	29	29	29	29	N/A	N/A	N/A	N/A
12	G12	15	15	15	15	15	15	15	15
14	G12	18	18	24	29	34	34	34	N/A
16	G12	22	22	29	37	45	45	45	N/A
18	G12	26	26	35	45	55	55	N/A	N/A
20	G12	29	29	44	55	55	N/A	N/A	N/A

Note: The “N/A” designation in Table A indicates that the Valve/Actuator combination cannot be used for that particular reverse pressure.

Removing Actuator from Valve

Refer to Figure 6 for connecting parts identification.

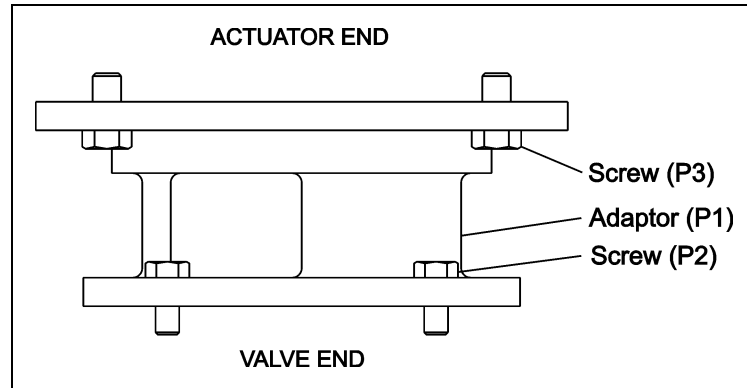


Figure 6— Connecting Parts Identification



WARNING!

Flow in the pipeline with the actuator removed can slam the valve closed causing personal injury and damaging the flow system. Shut down the flow in the pipeline before removing the actuator from the valve.

1. Discontinue flow and relieve pipeline pressure.



WARNING!

When Eccentric Plug valves are mounted in a vertical pipeline, or mounted in a horizontal pipeline with the plug stem horizontal, there is a chance that gravity will cause the plug to swing to a lower position in the valve body when the actuator is removed.

To avoid this hazard, rotate the plug to the lowest position before removing the actuator.

2. Close the valve or rotate the plug to the lowest position in the valve body.
3. Remove the four adaptor mounting screws (P3).
4. Remove the actuator from the adaptor (P1).
5. Do not loose the drive key used in the valve plug and actuator gear.

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Replacing Actuator on Valve

Refer to Figure 2 and Figure 6 for parts identification.

1. Place the valve in the position it was in when the actuator was removed. Normally this will be so the plug is in the lowest position in the valve body.
2. **For Buried Service (GB_A) actuators only** - Before reassembly, remove old sealant from all mating mounting surfaces. Apply a thin bead of silicone sealant DOW RTV-732 (1055515) or similar to the adaptor (P1) and the actuator housing (B1A) mounting surfaces.
3. **Above Ground Service (GS_A) actuator only** - Remove the screws (B1R) and pointer (B1Q).
Buried Service (GB_A) actuator only - Remove the screws (B13) and cover (B12).
4. Mount the actuator to the adaptor with the four mounting screws (P3). Tighten screws.
5. Insert the drive key into the valve plug/gear (B1C) keyway.
6. **Above Ground Service (GS_A) actuator only** - Fasten the pointer (B1Q) to the gear (B1C) with the two screws (B1R).
Buried Service (GB_A) actuator only - Remove old sealant from cover (B12) and cover (B1B) mating mounting surfaces. Apply a bead of silicone sealant DOW RTV-732 (1055515) or similar to the cover (B12) and cover (B1B) mating surfaces. Fasten the cover (B12) to cover (B1B) with screws (B13).
7. Check the closed position stop setting and readjust if necessary as described in the “STOP ADJUSTMENT” Section of this Instruction.
8. Pipeline flow may now be restored.

Changing Actuator Mounting Position

The actuator can be mounted in 90° increments around the valve shaft.

To move the actuator mounting position in 90° increments from its present position, follow these steps.

1. Remove the actuator from the valve as described in the REMOVING ACTUATOR FROM VALVE Section of this Instruction.
2. Rotate the actuator to the desired position.
3. Install the actuator on the valve as described in the REPLACING ACTUATOR ON VALVE Section of this Instruction.

Actuator Disassembly and Assembly

Under normal operating conditions the G-Series actuator does not require routine maintenance. If the actuator has excessive wear or has been damaged, it is recommended that the actuator be replaced, not repaired.

Use the following procedure for replacing leaking seals and o-rings. Refer to Figure 2 for component identification.

Actuator Disassembly



WARNING!

Flow in the pipeline with the actuator removed can slam the valve closed causing personal injury and damaging the flow system. Shut down the flow in the pipeline before removing the actuator from the valve.

1. Discontinue flow and relieve pipeline pressure.
-



WARNING!

When Eccentric Plug valves are mounted in a vertical pipeline, or mounted in a horizontal pipeline with the plug stem horizontal, there is a chance that gravity will cause the plug to swing to a lower position in the valve body when the actuator is removed.

To avoid this hazard, rotate the plug to the lowest position before removing the actuator.

2. Close the valve or rotate the plug to the lowest position in the valve body.
3. Remove the actuator from the valve as described in the REMOVING ACTUATOR FROM VALVE Section of this Instruction.
4. **Above Ground Service (GS_A) actuator only** - Note the position of the pointer (B1Q), then remove the screws (B1R) and pointer.
Buried Service (GB_A) actuator only - Remove screws (B13) and cover (B12).
5. Remove the screws (B1M) and cover (B1B).
6. Remove the o-ring (B1N) thru the top of the cover (B1B).
7. Note the position of the gear (B1C) in the housing (B1A), then slide the gear (B1C) out of the housing.
8. Remove the two pipe plugs (B1I) from the housing (B1A).
9. Rotate the drive shaft (B1F) until the pins (B1K) line up with the pipe plug holes in the housing (B1A).

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Actuator Disassembly and Assembly *(Continued)*

10. Drive both pins (B1K) thru the worm (B1D) and drive shaft (B1F).
11. Slide the drive shaft (B1F) out of the housing (B1A).
12. Remove the seal (B1J) from the housing (B1A).
13. Remove the o-ring (B1N) thru the bottom of the housing (B1A).
14. Remove old gasket sealant from the top of the housing (B1A) and bottom of the cover (B1B).

Buried Service (GB_A) actuator only - Remove old gasket sealant from the bottom of the housing (B1A), valve adaptor (P1), top of cover (B1B) and bottom of cover (B12) mating surfaces.

Actuator Assembly

1. Install a new seal (B1J) into the housing (B1A).
2. Slide the drive shaft (B1F) into the housing (B1A) and thru bearing race (B1G), thrust bearing (B1H), bearing race (B1G), worm (B1D), bearing race (B1G), thrust bearing (B1H) and bearing race (B1G).
3. Rotate the drive shaft (B1F) until the pin holes in the drive shaft and the worm (B1D) line up.
4. Drive the two pins (B1K) thru the worm (B1D) and drive shaft (B1F).
5. Apply removable thread sealant to the threads of pipe plugs (B1I) and install the pipe plugs flush or below the surface of the housing (B1A).
6. Apply a light film of grease to a new o-ring (B1N) and insert it into the groove in the bottom of the housing (B1A).
7. Grease the bearing (B1L) in the housing (B1A) and slide the gear (B1C) into the bearing in the position noted in Step 7 of the ACTUATOR DISASSEMBLY section.
8. **Above Ground Service (GS_A) actuator only** - Apply a liberal amount of Lithium based grease such as Shell Alvania EP2 or Mobilux EP2 to the gear (B1C), bearings (B1L) and worm (B1D).
Buried Service (GB_A) actuator only - Pack the housing (B1) full of Lithium based grease such as Shell Alvania EP2 or Mobilux EP2.
9. Apply a light film of grease to a new o-ring (B1N) and insert into groove in the cover (B1B).
10. Apply a bead of silicone sealant DOW RTV-732 (1055515) or similar to the housing (B1A) or cover (B1B) mating surface. Grease the bearing (B1L) in the cover, slide the cover onto the gear (B1C) and fasten with screws (B1M) to the housing.
11. Insert the drive key into the valve plug/gear (B1C) keyway.
12. **Above Ground Service (GS_A) actuator only** - Fasten the pointer (B1Q) to the gear (B1C) with the two screws (B1R) in the position noted in Step 4. of the ACTUATOR DISASSEMBLY section.
Buried Service (GB_A) actuator only - Apply a bead of silicone sealant DOW RTV-732 (1055515) or similar to the cover (B12) or cover (B1B) mating surface. Fasten the cover (B12) to cover (B1B) with screws (B13).
13. Install the actuator on the valve as described in the "REPLACING ACTUATOR ON VALVE" section of this Instruction.

Operator Component Identification

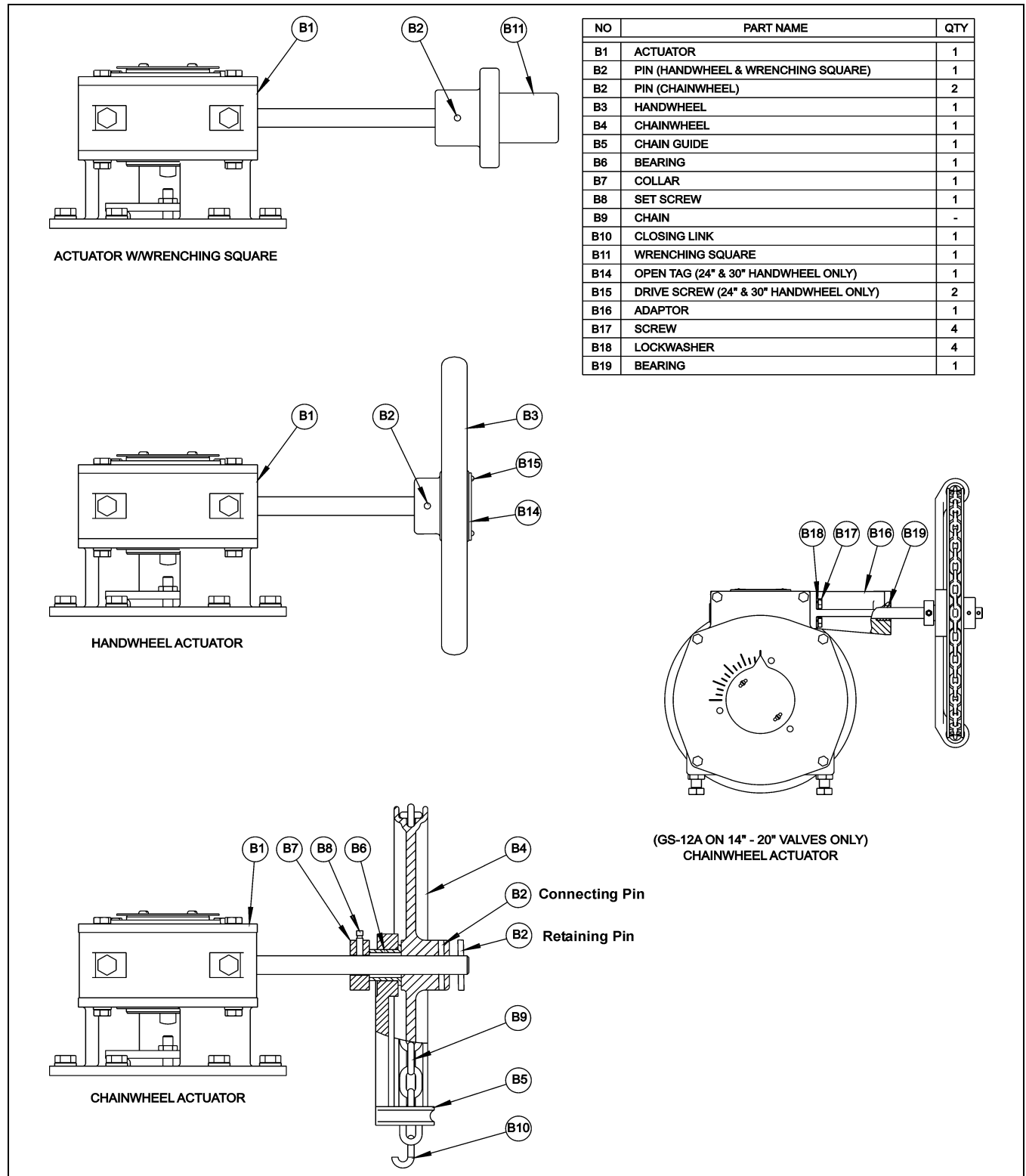


Figure 7— Operator Component Identification

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Replacing Handwheel or Wrenching Square with Chainwheel

Refer to Figure 7 for component identification.

G₋6A and G₋12A (3" - 12" valves)

1. Support the actuator shaft with a solid surface, drive out the pin (B2), and remove the handwheel (B3) or wrenching square (B11) from the actuator shaft.
2. Slide the collar (B7) onto the actuator shaft
3. Assemble the bearing (B6), chain guide (B5) and the chainwheel (B4) onto the actuator shaft.
4. Align the second pin hole in the actuator shaft and the pin hole in the chainwheel hub. Support the hub of the chainwheel with a solid surface and drive the connecting pin (B2) into position. See Figure 7 for location of connecting pin.



WARNING!

The connecting pin securing the chainwheel hub to the actuator shaft could potentially shear allowing the chainwheel to disengage from the actuator shaft and cause personal injury or equipment damage.

A retaining pin at the end of the actuator shaft must be in-place to insure the chainwheel can not disengage from the actuator shaft.

5. Support the hub of the chainwheel with a solid surface and drive the retaining pin (B2) into the remaining pin hole at the end of the actuator shaft. See Figure 7 for location of retaining pin.
6. Slide the collar (B7) up to the bearing (B6) and tighten with set screw (B8).
7. Feed the chain (B9) over the chainwheel (B4) and through both openings in the chain guide (B5).
8. Connect the ends of the chain (B9) with closing link (B10).

G₋12A (14" - 20" valves)

1. Support the actuator shaft with a solid surface, drive out the pin (B2), and remove the handwheel (B3) or wrenching square (B11) from the actuator shaft.
2. Remove the plastic plugs from the mounting holes on the shaft side of the actuator housing.
3. Slide the adaptor (B16) onto the actuator shaft. Tighten with screws (B17) and lockwashers (B18).
4. Slide the collar (B7) onto the actuator shaft
5. Assemble the bearing (B6), chain guide (B5) and the chainwheel (B4) onto the actuator shaft.

Replacing Handwheel or Wrenching Square with Chainwheel *(Continued)*

6. Align the second pin hole in the actuator shaft and the pin hole in the chainwheel hub. Support the hub of the chainwheel with a solid surface and drive the connecting pin (B2) into position. See Figure 7 for location of connecting pin.



WARNING!

The connecting pin securing the chainwheel hub to the actuator shaft could potentially shear allowing the chainwheel to disengage from the actuator shaft and cause personal injury or equipment damage.

A retaining pin at the end of the actuator shaft must be in-place to insure the chainwheel can not disengage from the actuator shaft.

7. Support the hub of the chainwheel with a solid surface and drive the retaining pin (B2) into the remaining pin hole at the end of the actuator shaft.
8. Slide the collar (B7) up to the bearing (B6) and tighten with set screw (B8).
9. Feed the chain (B9) over the chainwheel (B4) and through both openings in the chain guide (B5).
10. Connect the ends of the chain (B9) with closing link (B10).

Replacing Chainwheel with Handwheel or Wrenching Square

Refer to Figure 7 for component identification.

1. Support the chainwheel hub with a solid surface and drive out the two pins (B2).
2. Remove the chainwheel (B4) and chain guide (B5) assembly from the actuator shaft.
3. Loosen the set screw (B8) and slide the collar (B7) off the actuator shaft.
4. **GS-12A on 14" - 20" valves only** - Remove screws (B17), lockwashers (B18) and slide adaptor (B16) off the actuator shaft.
5. Slide the handwheel (B3) or wrenching square (B11) onto the actuator shaft. Align the pin hole in the handwheel or wrenching square with the second pin hole in the actuator shaft. Support the actuator shaft with a solid surface and drive the pin (B2) into position.

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Manual G-Series Actuators used on PEF 100% Port Plug Valves

Troubleshooting

Condition	Possible Cause	Corrective Action
Actuator closes to wrong position.	Closed position stop is set incorrectly.	Adjust closed position stop. See STOP ADJUSTMENTS section.
	Pointer is installed incorrectly.	Rotate pointer to correct position.
Actuator opens to wrong position.	Open position stop is set incorrectly.	Adjust closed position stop. See STOP ADJUSTMENTS section.
	Pointer is installed incorrectly.	Rotate pointer to correct position.
Actuator will not fully operate valve.	Pipeline obstruction in valve is preventing closure.	Remove obstruction.
High operating torque.	Misalignment of adaptor.	Check valve-adaptor actuator alignment and adjust.
	Misalignment of ENK extension.	Check valve-extension-actuator alignment and adjust.
	Bent actuator input shaft.	Replace actuator.

Limited Warranty

DeZURIK, Inc. ("Seller") manufactured products, auxiliaries and parts for a period of twenty-four (24) months from date of shipment from Seller's factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller's recommendations and instructions.

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