



(800) 541-1849  
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## GV ACTUATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS



**CAUTION:** CHECK MAXIMUM OPERATING PRESSURE LISTED ON CYLINDER LABEL BEFORE APPLYING PRESSURE TO CYLINDER. EXCEEDING THE PRESSURE RATING LISTED ON THE CYLINDER MAY CAUSE FAILURE WHICH MAY ENDANGER PERSONNEL AND/OR EQUIPMENT.

**WARNING:** READ INSTALLATION SERVICE INSTRUCTIONS AND GENERAL PARTS BREAKDOWN BEFORE INSTALLATION, OPERATION OR SERVICING. THIS MANUAL IS NOT FOR SPRING LOADED CYLINDERS.

**NOTICE:** DISASSEMBLY OF THIS PRODUCT WILL VOID WARRANTY

# GV ACTUATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS

1. **GENERAL:** The parts drawing on Page 3 shows a complete listing of parts and is applicable to all standard series GV air cylinders (2.50" through 24.00" bores only). This parts drawing when used in conjunction with the parts listed and kits, should facilitate the ordering of any replacement parts or kits by specifying:

- A. Cylinder Part Number as it appears on the identification label on the cylinder tube located on the port side.
- B. Item number and part name or kit type and name.

2. **INSTALLATION OF CYLINDER:** The seals and packing of standard air cylinders operate within the temperature range of -20°F (-29°C) to 220°F (104°C). Baffles are recommended to shield cylinder from heat, whenever practical. For unusually high or low temperatures, different seal materials may have been used. (Contact ITT Engineered Valves @ 800-541-1849). For the cylinder to perform well, it must be properly installed. Alignment of the cylinder with load is most important. Forcing the rod or mounting bolts into position indicates that the cylinder is not properly aligned, and permanent damage may result from such installation. Protective port covers should not be removed before installing air line connections as dirt or other foreign particles may enter the cylinder. All pipe and fittings must be clean before making final connections.

### 3. PROCEDURE FOR REPACKING CYLINDER:

**NOTE: DISASSEMBLY BEFORE WARRANTY PERIOD EXPIRES WILL VOID WARRANTY!**

- A. Disconnect air lines from head cap and rear cap ports of cylinder.
- B. Remove the tie rod nuts (5) and tie rods (4).  
**Note:** Measure and record tie rod length protruding from the head cap.
- C. Remove rear cap (2) and then head cap (1). The rod bearing (11) will come off with the head cap.
- D. Remove piston and rod assembly from tube (3).
- E. To disassemble rear cap (2), remove cap O-ring or gasket (13).
- F. To disassemble head cap (1):
  - 1. Remove head cap O-ring or gasket (13).
  - 2. 12.00"-24.00" bore sizes remove bearing retainer ring (12) and rod bearing (11) from head cap (1).  
**NOTE:** 2.50"-10.00" rod bearings (11) are press fit – DO NOT REMOVE.
  - 3. Remove rod seal (15). For 12.00"-24.00" bore sizes remove the rod bearing O-ring (17).
  - 4. Remove rod wiper (16) from the head cap.

4. **CLEANING:** Clean all parts thoroughly. The packing and seals in this cylinder are compatible with hydraulic oils, air, and neutral fluids. The cleaning agent must also be compatible to avoid damage to packing and seals. Whenever a particular lubricant is specified for a particular installation, do not deviate from the specification without checking for compatibility.

### 5. INSPECTION

- A. Inspect all packing and seals for swelling, shrinkage, wear, nicks, cuts, and indentations. Discard all damaged packing and seals.
- B. Check and inspect bore of tube for scratches, excessive wear, and any other defect that might damage piston packing or cause piston bypass.

- C. Inspect piston rod for signs of wear, nicks, dents, scratches, or anything that may damage rod packing or rod bearing.
- D. Inspect wear strip for excessive uneven wear.

**NOTE:** Excessive wear on one side of piston rod, rod bearing, or wear strip usually indicates misalignment in installation and should be corrected.

- 6. **REPLACEMENT:** Replace all damaged packing seals, rod wiper, and wear strip.
- 7. **LUBRICATION:** Series GV Actuators are pre-lubricated during initial assembly. During the repacking of an air cylinder, pre-lubrication should be re-applied to prevent seal damage and obtain maximum life. Lubricant is applied to the rod seals, piston packing, and liberally to the tube bore. Use NYE RHEOLUBE 368AXF or equivalent.
- 8. **REASSEMBLY:** The procedure for reassembly is essentially the reverse of disassembly. However, the following exceptions and considerations should be noted:
  - A. All O-rings and gaskets should be well-coated with lubricant after they are installed in their respective grooves and prior to reassembly with the mating part. Care must be taken when assembling O-rings, gaskets and packing that they are not damaged, as this will cause leakage.
  - B. Tie rod threads and nut bearing faces should be well lubricated to allow tightening the nuts evenly for proper pre-stressing. To avoid twisting of the tie rods during tightening, hold with vise grip or clamp. To assure equal pre-stressing of the tie rods, first thread on nuts evenly and snug to align assembly, then the nuts are to be tightened using a diagonal pattern. For proper tie rod pre-stressing, they should be torqued as recommended (See "GV Series Tie Rod Torque Reference" table below).

### 9. PISTON-ROD

**NOTE:** The piston-rod assembly should not require disassembly unless replacement of piston (7) or the piston rod (8) is required. It is recommended this be returned to the factory for repair. (Contact ITT Engineered Valves @ 800-541-1849 for additional information.)

### 10. TESTING

After the cylinder has been completely reassembled, it should be tested, either on a test bench or in the regular installation. Watch for the following as the cylinder is cycled at operating pressures.

- A. Rod gland leakage.
- B. Leakage at the head and rear cap locations of the tube O-rings or gaskets.

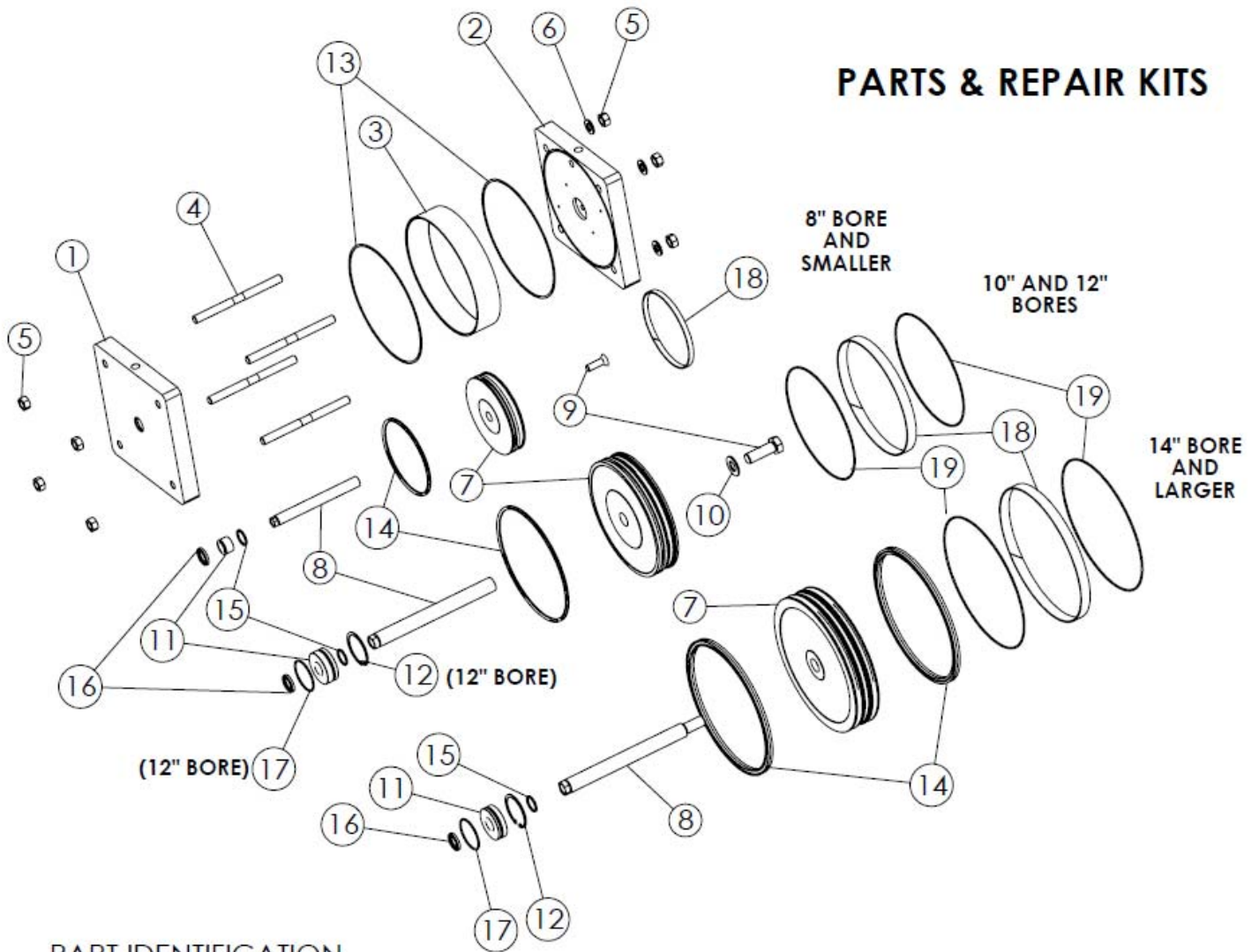
**NOTE:** This product is not to be modified in any fashion without prior written approval from ITT.

**NOTE:** If cylinders are to be stored for prolonged periods, contact ITT for instructions.

## GV Series Tie Rod Torque Reference

Tube Material	Cylinder Bore Size (Inches)														
	2.5	3.25	4.0	5.0	6.0	7.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0
Aluminum lb-ft (Nm)	6 (8.1)	18 (24.4)	18 (24.4)	37 (50.1)	N/A										
Fiberglass lb-ft (Nm)	N/A				13 (17.6)	25 (33.9)	29 (39.3)	56 (75.9)	81 (109.8)	128 (173.4)	198 (268.3)	282 (382.1)	359 (486.4)	734 (994.6)	787 (1,066.4)

# GV ACTUATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS



## PART IDENTIFICATION

### ACTUATOR PARTS

1. HEAD CAP
2. REAR CAP
3. TUBE
4. TIE RODS
5. TIE ROD NUTS
6. TIE ROD WASHERS
7. PISTON
8. PISTON ROD
9. PISTON TO ROD SCREW
10. PISTON TO ROD WASHER
11. ROD BEARING
12. RETAINING RING

### SEALS

13. TUBE SEALS
14. PISTON SEALS
15. ROD SEAL
16. ROD WIPER
17. ROD BEARING O-RING
18. PISTON WEAR STRIP
19. WEAR STRIP O-RING EXPANDERS

## GV Actuator Repair Kits

Cylinder Bore		Piston Rod Diameter		Seal Material		Repair Kits Contain the Following Item Numbers
Inches	(mm)	Inches	(mm)	Buna-N	Fluorocarbon	
2.5	(63.5)	0.63	(16.0)	RKGV25	RKGVF25	#13, #14, #15, #16, #18
3.25	(82.6)	1	(25.4)	RKGV325	RKGVF325	#13, #14, #15, #16, #18
4	(101.6)	1	(25.4)	RKGV4	RKGVF4	#13, #14, #15, #16, #18
5	(127.0)	1	(25.4)	RKGV5	RKGVF5	#13, #14, #15, #16, #18
6	(152.4)	1	(25.4)	RKGV6	RKGVF6	#13, #14, #15, #16, #18
7	(177.8)	1	(25.4)	RKGV7	RKGVF7	#13, #14, #15, #16, #18
8	(203.2)	1	(25.4)	RKGV8	RKGVF8	#13, #14, #15, #16, #18
10	(254.0)	1	(25.4)	RKGV10	RKGVF10	#13, #14, #15, #16, #17, #18, #19
12	(304.8)	1.38	(35.1)	RKGV12	RKGVF12	#13, #14, #15, #16, #17, #18, #19
14	(355.6)	1.38	(35.1)	RKGV14	RKGVF14	#13, #14, #15, #16, #17, #18, #19
16	(406.4)	1.75	(44.5)	RKGV16	RKGVF16	#13, #14, #15, #16, #17, #18, #19
18	(457.2)	2	(50.8)	RKGV18	RKGVF18	#13, #14, #15, #16, #17, #18, #19
20	(508.0)	2	(50.8)	RKGV20	RKGVF20	#13, #14, #15, #16, #17, #18, #19
22	(558.8)	3	(76.2)	RKGV22	RKGVF22	#13, #14, #15, #16, #17, #18, #19
24	(609.6)	3.5	(88.9)	RKGV24	RKGVF24	#13, #14, #15, #16, #17, #18, #19

## **GV ACTUATOR INSTALLATION AND MAINTENANCE INSTRUCTIONS**

# **GV SERIES WARRANTY**

Seller warrants for one year from the date of shipment Seller's manufactured products to the extent that Seller will replace those having defects in material or workmanship when used for the purpose and in the manner which Seller recommends. If Seller's examination shall disclose to its satisfaction that the products are defective, and an adjustment is required, the amount of such adjustment shall not exceed the net sales price of the defective products only and no allowance will be made for labor or expense of repairing or replacing defective products or workmanship or damage resulting from the same. Seller warrants the products which it sells of other manufacturers to the extent of the warranties of their respective makers. Where engineering design or fabrication work is supplied, Buyer's acceptance of Seller's design or of delivery of work shall relieve Seller of all further obligation, other than as expressed in Seller's product warranty. THIS IS SELLER'S SOLE WARRANTY. SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED SELLER'S AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS WARRANTY. Seller neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of its engineering designs or products. This warranty shall not apply to any products or parts of products which (a) have been repaired or altered outside of Seller's factory, in any manner; or (b) have been subjected to misuse, negligence or accidents; or (c) have been used in a manner contrary to Seller's instructions or recommendations. Seller shall not be responsible for design errors due to inaccurate or incomplete information supplied by Buyer or its representatives.

**SELLER'S LIABILITY:** Seller will not be liable for any loss, damage, cost of repairs, incidental or consequential damages of any kind, whether based upon warranty (except for the obligation accepted by Seller under "Warranty" above), contract or negligence, arising in connection with the design, manufacture, sale, use or repair of the products or of the engineering designs supplied to Buyer.