

Andco* Series 7000 Actuator

Posi-Tork* Ball Screw

Instruction Manual



NOTICE

The information contained in this manual is essential to safe, successful, long term operation of your Andco Posi-Tork linear actuator. Read and follow the requirements concerning storage, installation, and adjustment. Failure to do so could void the warranty covering your actuator.

This manual describes the general operating principle of the Series 7000 Posi-Tork Linear Ball Screw Actuator and gives instructions for storing, installing, operating and servicing these actuators.

The Series 7000 Posi-Tork has been designed and manufactured to meet the highest quality standards and is thoroughly tested and inspected before shipment.

Since minimum attention is required to operate and maintain the Series 7000 Posi-Tork under normal operating conditions, it is important that the instructions for installation and maintenance, as outlined in this manual, be followed.

Should any questions occur that are not covered in this manual, contact GE Oil & Gas toll free at 1-800-945-9898, 832-590-2306 or e-mail us at andcoactuator.inquiries@ge.com. Be sure to include the serial number and order number on the name plate of your actuator in all communications and parts orders. The name plate is located on the limit switch cover.

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imagination at work

Storage Requirements

1. Store all actuators indoors in a clean, dry environment.
2. If outdoor storage cannot be avoided, the packaged actuator must be stored high enough to avoid immersion in snow or water.
3. Compartment heaters (optional) should be temporarily wired and energized if the actuator is to be stored in a damp location.
4. All covers must remain in place and securely fastened.
5. All pipe plugs must remain in place and tight.
6. The storage location should be selected so the actuator is not exposed to mechanical damage from mobile equipment, cranes, personnel traffic, etc.
7. For extended storage (over 3 months outdoors or 6 months indoors) desiccant bags must be placed inside of the electrical compartments. Tags must be attached to the outside of the compartment covers instructing removal of the bags before start of operation.
5. Route the electrical conduit up into the actuator to prevent internal condensation from running into the limit switch compartment.
6. Verify proper motor rotation relative to the limit switch actuation. Motor rotation may be reversed, if necessary, by reversing the motor lead connections. (Refer to Geared Position Limit Switch Adjustment instructions on page 9 and the electrical wiring diagram on page 11).
7. Verify proper electrical connection and operation of the brake release solenoid before operating the actuator. The brake is spring set and must be electrically released when the motor is operated.
8. Keep the position and thrust switch compartments dry and clean.

Installation Requirements

NOTICE

While it is possible to mount the actuator in any position, it is not recommended that the control compartment cover be positioned face down. In order to maximize seal integrity, the unit should be mounted with the extension rod pointed up (vertical installations) or motor up (horizontal installations).

1. The preferred mounting position of the actuator is with the motor and limit switch compartment oriented from pushing either horizontal or vertically up. This prevents the lubricant from pushing against the seals.
2. To prevent premature wear of any drive component, verify that alignment between the actuator mounting support and the driven equipment places no side loading on the actuator at any point throughout the full stroke of the actuator.
3. Before operating the actuator make sure all the attachments to the support and driven equipment are properly secured and all covers are properly tightened.
4. The actuator must be installed and wired in accordance with the most current version of the National Electric Code.
9. Readjust the geared position limit switch before operating the actuator if the switch has been removed from the actuator. Refer to the geared Position Limit Switch Adjustment instructions on page 9.
10. Keep the geared position limit switch contacts clean. Use CRC Lectra Clean® or other suitable solvent on a lint free cloth.
11. Do not use an abrasive cloth or paper to clean the silver contacts on the position limit switch.
12. Do not hammer or gouge the outside surface of the extension rod. This may damage the plating to or cause surface irregularities which can damage the rod seals.
13. Keep the extension rod and clevis pin clean and lubricated.
14. Dust-ignition proof actuators must have all covers secured before electrical circuits are energized.
15. Dust-ignition proof actuators must have the grounding lug connected to a suitable grounding system prior to operation.

WARNING

Disconnect all electrical power before removing or replacing the covers of either the position or thrust switch compartments or the brake cover.

WARNING

DO NOT defeat the purpose of the torque switch by jumping, by-passing or disconnecting the switch connection wiring (wire numbers 17, 17A, 18, or 18A per electrical wiring drawing on page 11). This could cause serious damage to the actuator or the driven equipment.

Ball Screw Actuator Operation

Motor Operation

The electric motor (30) has a pinion mounted on its shaft. This pinion (40) drives the gear (41) which is mounted on the end of the drive screw (45). The drive screw has external ball screw threads and is engaged in the internal re-circulating ball threads of the mating ball nut (2) which is threaded and locked into the ball nut coupling (73).

The ball-nut coupling is held from rotating by four tie rods. Rotation of the drive screw causes an axial movement on the ball nut. A tubular extension rod (47) is fastened on the one end of the ball nut coupling and is extended or retracted with the axial movement of the ball nut.

The back of the motor shaft is extended and engaged in the hub of the spring set brake. The brake is electrically released when the motor is energized. To manually operate the actuator for switch adjustment or upon loss of electrical power to the motor, the brake must be manually released.

The drive screw is supported by two ball bearings (13), which are spaced apart by multiple disc type springs. The disc springs are preloaded and prevent any axial movement on the drive screw. The external driven load is fastened to the extension rod by the clevis (8) and clevis pin (10). When the driven force exceeds the preload force of the disc spring, the drive screw moves axially. This axial movement of the drive screw is

translated by the sleeve (4) to rotational movement of the lever of the thrust switch (66) which, depending on its dial setting, will interrupt the electric circuit to the motor for both the extend or retract stroke.

Geared Position Limit Switch Operation

For most applications, the geared position limit switch controls the operating position of the actuator by interrupting the electrical control circuit to the motor at the completion of the extend and retract strokes. Rotation of the drive screw is transmitted through the helical gear (6) to the geared position limit switch assembly (52). The geared position limit switch normally has two independently adjustable trip points to control the end positions of the extend and retract strokes. An optional geared position limit switch assembly with four independently adjustable trip points normally use the two intermediate trip points for signal indication or electrical interlocking with other equipment requiring an electrical signal related to intermediate positions of the extend or retract strokes. The geared position limit switch is driven by direct gearing on the drive screw and is synchronized at all times with the linear movement of the extension rod (47).

After initially setting the extend and retract trip points, as determined by position of the extension rod, the switch will trip repeatedly at these points.

See page 9 of this manual for instructions regarding access to and adjustment of the geared position limit switch.

Thrust Limit Switch Operation

The factory preset thrust switch (66) protects the actuator and the driven equipment from mechanical overloads. The thrust switch has a dial with pointer type settings which can be field adjusted to increase or decrease the thrust load at which the electric circuit to the motor is interrupted. The higher the number setting on the thrust switch, the higher the external thrust force that the switch will sense to interrupt the electric circuit to the motor.

See page 10 for instructions regarding access to and adjustment of the thrust limit switch.

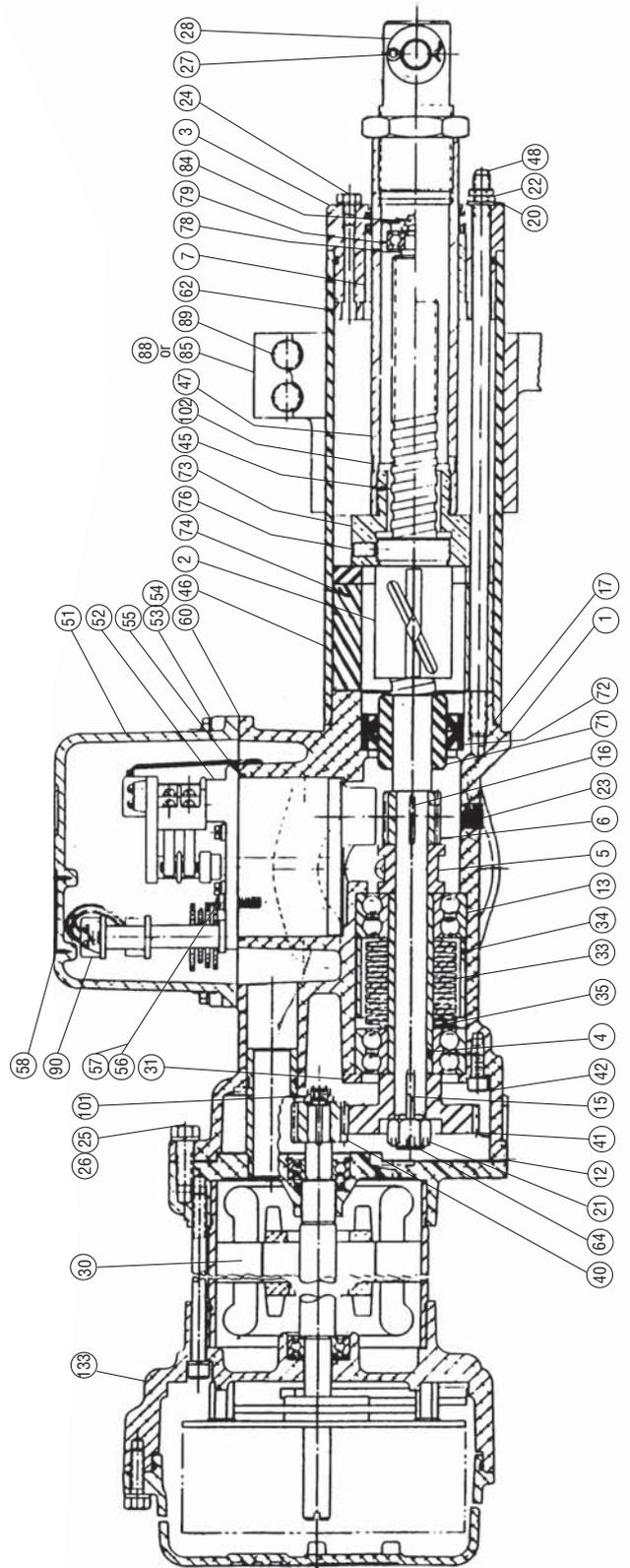
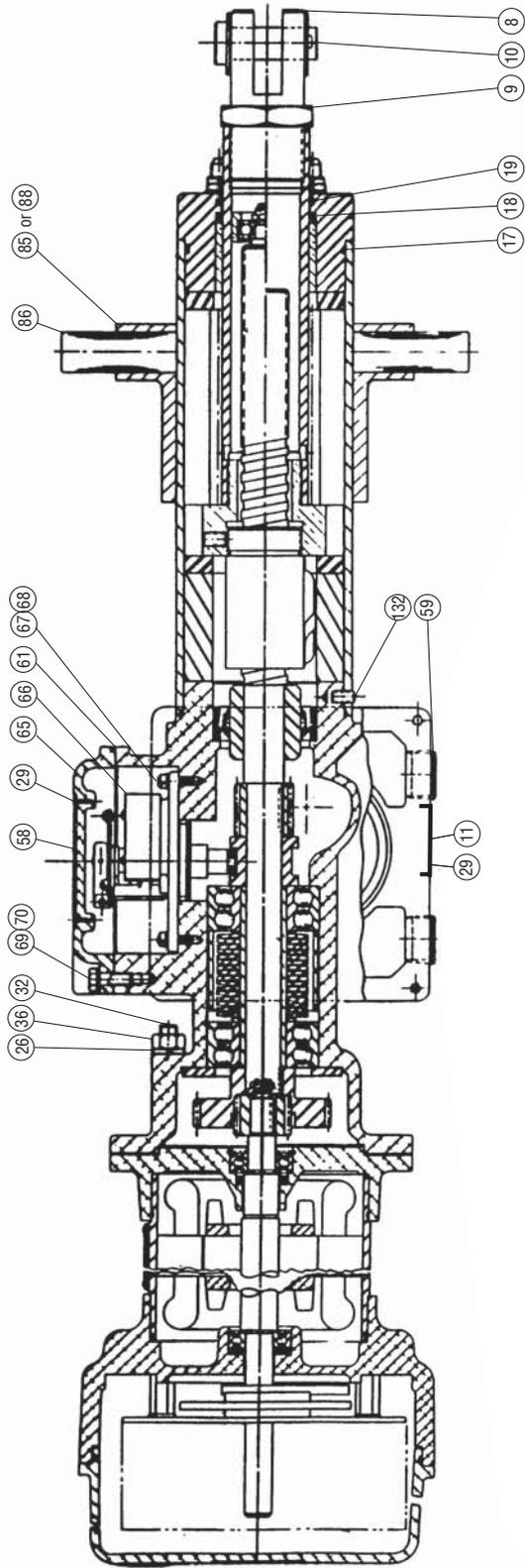


Figure 1 - Ball Screw Actuator Drawing

Table 1 - Ball Screw Actuator Parts List

Item	Description	Item	Description	Item	Description	Item	Description
1	Body Housing	23	Pipe Plug (for housing)	51	Limit Switch Compartment Cover	68	Internal Tooth Lockwasher
2	Ball Nut	24	Hex Head Cap Screw	52	Gear Limit Switch Assembly	69	Socket Head Cap Screw
3	End Cap	25	Hex Head Cap Screw	53	Socket Hd Cap Screw	70	Lockwasher
4	Bearing Sleeve	26	Lockwasher	54	Lockwasher	71	Oil Seal Bushing
5	Thrust Switch Sleeve	27	Cotter Pin	55	O-Ring	72	Oil Seal
6	Helical Gear	28	Flat Washer	56	Socket Head Cap Screw	73	Ball Nut Coupling
7	End Cap Bushing	29	Drive Studs	57	Internal Tooth Lockwasher	74	Coupling Stop
8	Clevis	30	Motor	58	Warning Plate	76	Socket Set Screw
9	Jam Nut	31	Bearing Plate	59	Pipe Plug (conduit opening)	78	Bearing Cartridge
10	Clevis Pin	32	Stud	60	Gasket	79	Bearing
11	Nameplate	33	Belleville Springs	61	Gasket	84	Flexlocnut
12	Motor Gasket	34	Thrust Limit Sleeve	62	End Cap Cushion	85	Body Tube Adapter
13	Ball Bearing	35	Support Washer	64	Cotter Pin	86	Dowel Pin
15	Key (for drive gear)	36	Hex Nut	65	Thrust Switch Compartment Cover	88	Body Tube Flange
16	Key (for helical gear)	40	Motor Pinion	66	Thrust Switch Assembly	89	Socket Head Cap Screw
17	O-ring (for body tube)	41	Drive Gear	67	Socket Head Cap Screw	90	Potentiometer Sub Assembly
18	Polypak Rod Seal	42	Low Head Socket Cap Screw			107	Flexlocnut
19	Rod Wiper	45	Drive Screw			132	Hex Head Cap Screw
20	Thread Seal	46	Body Tube			133	Electric Brake Housing
21	Castle Nut	47	Extension Rod				
22	Flexlocnut	48	Tie Rod				

Disassembly and Reassembly of the Model 7000 Posi-Tork Ball Screw Actuator

WARNING

Disconnect all electrical power to the actuator.

1. Remove the position limit and thrust switch compartment covers (51 and 65).
2. Disconnect the leads on the geared position limit switch and thrust switch, making sure they are properly marked for reconnection to the proper terminals. Remove a pipe plug (23) in the side of the housing (1) to make a path for vent air into the housing as the switch assembly is being pulled from it's mounting. The geared position limit switch assembly is retained by hardware (56 and 57). Remove the limit switch assembly by removing the hardware and rotating the switch assembly clockwise approximately 90° while pulling the assembly up out of the housing. This is required to move the helical gear input shaft out of mesh with the helical gear (6) on the drive screw (45). Remove the o-ring (55). The thrust switch assembly is retained by removing the hardware and pulling the assembly straight up. Both switches must be removed to permit removal of the drive screw sub-assembly.
3. Replace the complete geared position limit switch assembly rather than attempting field repairs.
4. Disconnect the motor leads making sure that they are properly marked for reconnection to the proper terminals.
5. Remove the motor (30), and brake housing (133) by removing the screw (25) and lockwasher (26).
6. Remove the locknut (101) if the motor pinion (40) is to be replaced.
7. With a socket wrench on the castle nut (21), turn the drive screw (45) counterclockwise extending the extension rod (47) until rotation becomes difficult due to the ball nut coupling (73) bottoming out against the cushion stops.
8. Remove the drive screw cotter pin (64) and slotted hex nut.
9. Pull out the drive gear (41) and remove the key (15) from the drive screw.
10. Remove the bearing plate (31) by backing out all four screws (42) equally.

WARNING

DO NOT back out the drive screw more than is required for access. To do so could cause loss of complete screw engagement in ball nut and allow balls to drop out. Slide thrust switch sleeve (5) and helical gear (6) off screw. Oil seal bushing (71) is loctited in place and will not require removal.

11. Rotate the drive screw (45) by hand counterclockwise to expose the bearings (13), disc springs and bearing sleeve (4) for removal.
12. Loosen the jam nut (9) from the face of extension rod.
13. Remove the clevis (8).
14. Scribe alignment marks on the side of the housing in line with the hex head cap screws in the body tube (46).
15. Remove the locknut (22), washer and, where applicable, o-ring or thread seal from the tie rods (48).
16. Remove the set screws from body tube.
17. By tapping on the outside surface of the end cap (3), pull out the body tube along with the end cap
18. Remove the ball nut coupling from the extension rod by using a spanner wrench on the holes. The threaded portion of the extension rod is loctited to the ball coupling, so that it may be necessary to heat the extension rod outside diameter over the threads. If heat is required, do not exceed the 350°F maximum surface temperature.
19. On longer stroke actuators the end of the drive screw is bearing supported. If your actuator has this feature, remove the flexlocnut and the bearing cartridge.
20. Loosen the set screws (76) from the ball nut coupling and turn off from the ball nut (2).
21. Secure with tape and leave the ball nut on the drive screw if both items are to be reused. If the ball nut will be reused and drive screw requires further work or replacement, remove ball nut on to a bar or tube with an outside diameter slightly less than the root diameter of the ball screw. If ball nut requires replacement, removal from the drive screw may be done.
22. To reassemble the actuator, reverse the procedure including the following information:

Step 20: When the ball nut coupling (73) is securely tightened to the ball nut (2) make sure the ball return tube(s) in the ball nut lined up with the clearance notches in the coupling stop/cushion (74) or (62). Use Loctite® 242 on the socket set screws (76) and tighten to the minimal torque.

1/4 - 20	6 FT-LBS
5/16 -18	12 FT-LBS
3/8 -16	20 FT-LBS
1/2 -13	43 FT-LBS

Step 18: Use Loctite® 242 on the threads when reassembling the ball nut coupling to the extension rod (47).

Step 17: Realign the set screw hole in the body tube (46) with alignment mark scribed on the side of the housing (1) in Step 14.

Step 11: Use a spacer to compress the multiple disc springs enough to draw up tightly these items:

Helical gear (6), thrust switch sleeve (5) and bearing sleeve (4).

The spacer should match the following dimensions of the hub of the drive gear (41):

1. Hub outside diameter.
2. Hub inside bore.
3. Length along hub inside bore.

Step 10: With the bearing plate (31) in place remove the spacer used above and resume assembly the procedure.

After completing reassembly, mounting adjustments can be made by threading the clevis (8) in or out of the extension rod (47). Upon realignment, tighten the jam nut (9) to lock the clevis.

The actuator must be lubricated before being returned to operation. Use the lubricant listed in Table 6. Fill the gear cavity under the recess for the geared position limit switch assembly (52) before reinserting the switch assembly into the housing.

Remove the loctited hex head cap screw (24) in the end cap (3); it may be necessary to heat the end cap near the cap screw. If heat is required, do not exceed 350° F. Temporarily install a grease fitting in the 1/4 - 28 tapped hole. Add the lubricant through this fitting in the amount listed in Table 5.

When lubrication of the area is completed, remove the temporary grease fitting and reinstall the screw (24) after applying Loctite® 242 or equivalent to the screw threads.

Remove the pipe plugs (23) in the bottom and side of the housing. Install lubricant through the bottom opening until lubricant starts to flow out through the side opening. Reinstall pipe plugs.

Lubrication is completed.

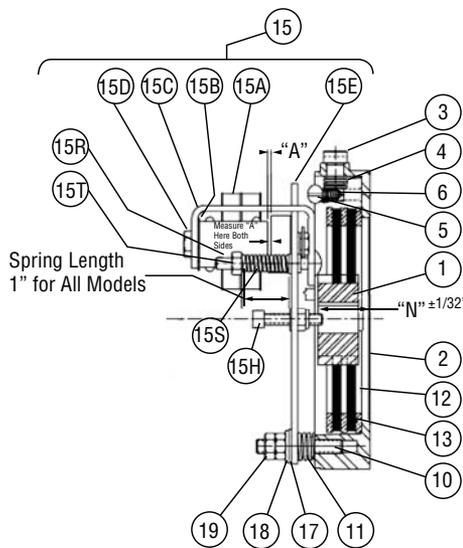


Figure 2 - Electric Brake Drawing

Table 2 - Electric Brake Parts List

Item	Description
1	Splined Hub
3	Release Knob
13	Friction Disc
15H	Wear Adjustment Screw
15S	Spring
15A	Magnet Assembly
45	Terminal Strip (Not shown)

Electric Brake

The electric brake provides a positive clamping force to the actuator motor shaft and holds the actuator in position when the motor is off. The high efficiency ball screw is not self-locking and can be back driven by an external load. Normally, the brake is spring set to prevent motor shaft rotation when electrical power is off and released when the motor is energized. The brake is engaged directly on an extended motor shaft and housed within a cast cover bolted directly to the motor end bell.

Brake Adjustment

Before the air gap "A" reaches .100", adjustment is required. Any delay in adjusting the magnet air gap will result in eventual loss of torque. Refer to Figure 2.

1. To adjust, remove the brake cover to expose square head wear adjusting screws (15H) and expose the magnetic air gap "A".
2. Measure the air gap "A" using 3/8" to 1/2" wide feeler gauge. (Measure at center of magnet.)
3. Turn the two square head wear adjusting screws until the air gap "A" measures:
 - .045/.050 for 3'# models
 - .050/.055 for 6'# models
 - .050/.055 for 10'# models

Air gap should be the same on both sides.

Manual Brake Release

The brake may be released manually to permit manual operation of the actuator for limit switch adjustment or during an electrical power failure..

1. Remove the brake cover and conduit pipe plug from the motor end bell.
2. With a flat head screwdriver inserted into the motor end bell conduit port, turn the release knob (3) clockwise to the stop position to release the brake. The brake will remain released until the release knob is turned counterclockwise (approx. 65°) or until the brake coil is energized, automatically resetting the brake.
3. Use a screwdriver in the slotted motor shaft to rotate the shaft clockwise to extend the actuator extension rod.
4. When the adjustment is completed or power is restored, replace the brake cover and conduit pipe plug securely.

Brake Removal and Replacement

Complete replacement of the electric brake is recommended rather than attempting field repairs.

WARNING

Disconnect all electrical power to the actuator.

1. Remove the brake cover from the motor end bell.
2. Disconnect the coil power wires, leading into the actuator motor housing, from the terminal strip.
3. Remove the four socket head cap screws and lockwashers securing the brake assembly to the motor end bell. Remove the entire brake assembly.

Replacement of the brake assembly is done by reversing the above procedure.

Table 3 - Geared Position Limit Switch Parts List

Item	Description
1-4	Slotted Adjustment Shaft
36	Rotor Sub- Assembly
37	Rotor Driver
38	Rotor Plate
39	Terminal Block
41	Fillister Head Machine Screw
42	Flat Head Machine Screw
43	Socket Head Machine Screw
44	Hi-Collar Lockwasher
45	Lockwasher
51	Decal-Extend
101	Gear Frame Sub-Assembly
102	Finger Base Sub-Assembly

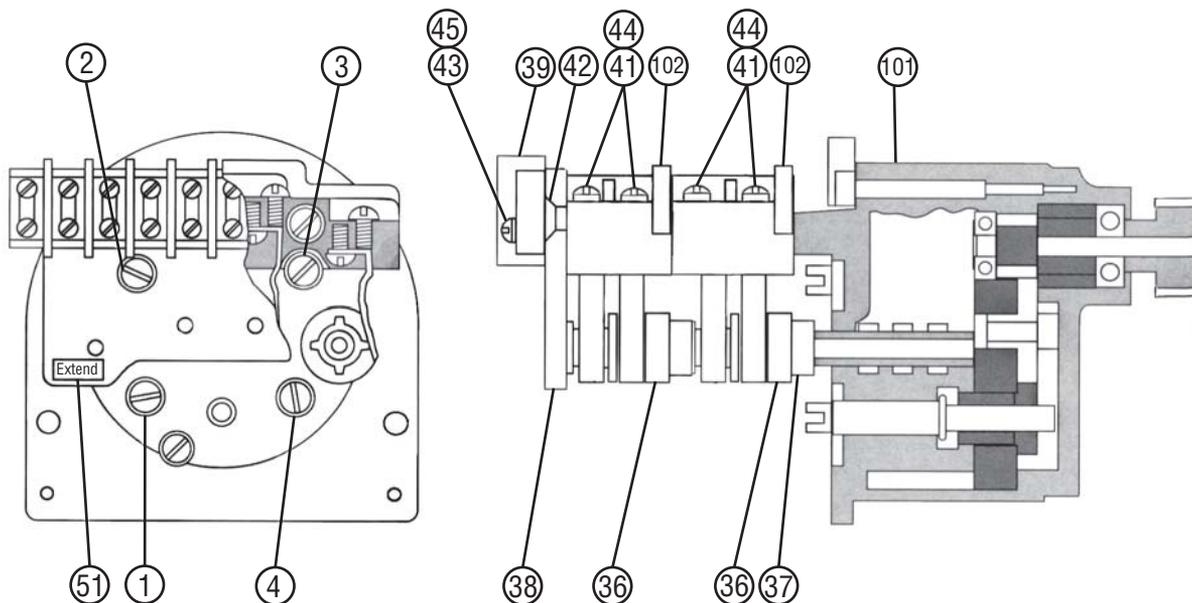


Figure 3 - Geared Position Limit Switch Parts Drawing

Geared Position Limit Switch Adjustment

The geared position limit switches have been preset at the factory to trip and interrupt the electric control circuit for the extend and retract positions according to the specified stroke. However, should the trip points need to be readjusted to a shorter actuator stroke the setting is as follows:

WARNING

Disconnect all electrical power to actuator prior to removing position limit switch compartment cover and performing any setting adjustment.

1. Remove the position limit switch compartment cover to gain access to the position switch assembly.
2. Remove the brake cover to gain access to the slot in the end of the motor shaft. Depress and hold the solenoid plunger, tagged "BRAKE RELEASE".
3. With a manual or power screw driver rotate the shaft in a clockwise direction to extend the clevis pin of the actuator to the desired position.
4. If the bridge type contact on the "extend" rotor (36) is in contact with the fingers (closed contact position) adjust the rotor contact to the open position by pushing down slotted shaft (1) and turning clockwise until the "extend" rotor turns about 90° counterclockwise to break the electrical contact and interrupt the control circuit to the motor for the fully extended position. If the rotor has turned so the contacts are already open, push and turn slotted shaft (1) counterclockwise until the rotor turns about 90° and the contacts close. Then push and turn slotted shaft (1) clockwise until the rotor turns to open the contacts. This rotor is now set to trip and stop the actuator in the fully extended position.
5. After retracting the clevis pin to the desired position by rotating the motor shaft in a counterclockwise direction the same procedure is followed for the setting of the rotor for the retracted position setting, with the difference being that all the directions of rotation described in No. 4 are reversed.
6. If the switch has been supplied with four rotors, the additional rotors with their corresponding slotted shafts (2) and (3) are for intermediate tripping points of other electrical circuits. Follow the procedure described in No. 4 to set rotors at desired clevis pin positions.
7. Make sure the mating surfaces of the cover and housing are clean. Replace the compartment cover and gasket and secure tightly in place with the hardware.
8. Replace the brake cover and tighten securely.
9. Re-energize all electrical power to the actuator.

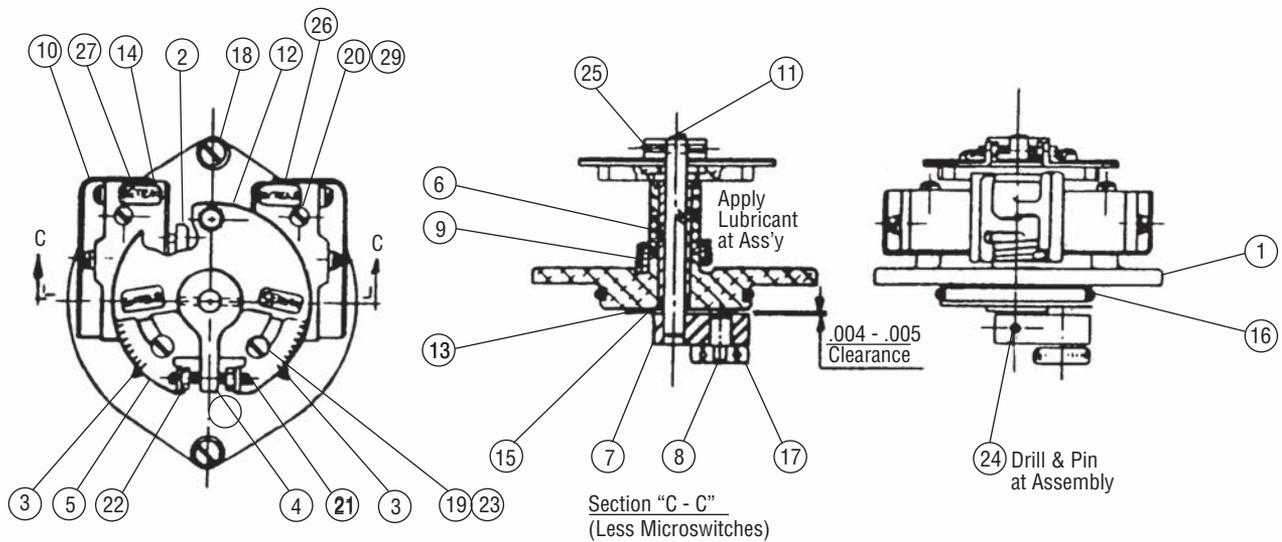


Figure 4 - Thrust Limit Switch Parts Drawing

Table 4 - Thrust Limit Switch Parts List

Item	Description	Item	Description	Item	Description
1	Thrust Switch Base	11	Thrust Switch Shaft	21	Socket Screw
2	Thrust Switch Arm	12	Thrust Limiter Plate	22	Hex Nut
3	Pointer	13	Thrust Washer	23	Hi-Collar Lockwasher
4	Adjusting Arm	14	Microswitch	24	Groove Pin
5	Thrust Switch Dial	15	O-Ring	25	Groove Pin
6	Thrust Switch Bushing	16	Quad Seal	26	Decal-Extend
7	Bearing Lever	17	Ball Bearing	27	Decal-Retract
8	Bearing Lever Pin	18	Socket Head Machine Screw	29	Lockwasher
9	Torsion Spring	19	Socket Head Machine Screw		
10	Insulator	20	Socket Head Machine Screw		

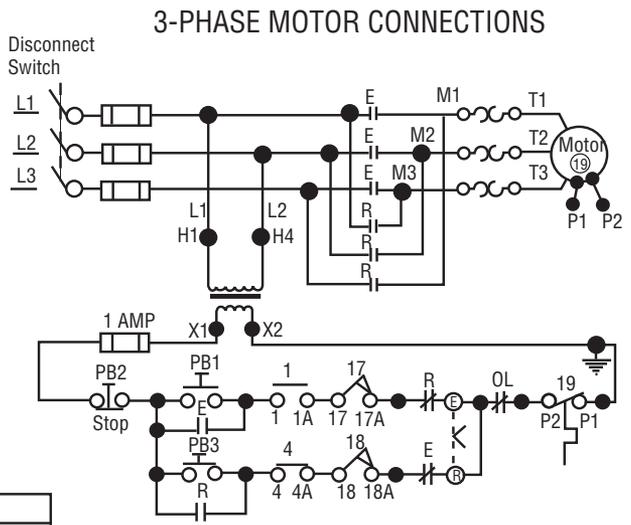
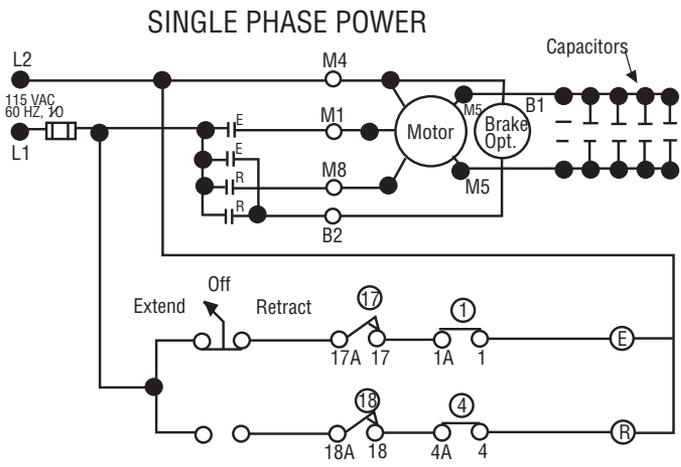
Thrust Limit Switch Setting Procedure

The thrust switches have been preset at the factory according to the information provided by the customer. However, for field adjustment to decrease or increase the thrust force that will trip the thrust limit switches to interrupt the electric circuit to the motor, proceed as follows.

WARNING

Disconnect all electrical power to actuator prior to performing any thrust limit switch adjustment.

1. Remove the thrust limit switch compartment cover to gain access to the thrust switch assembly.
2. To set the thrust load tripping point for extend or retract direction strokes, loosen the screw (19) and move the appropriate pointer (3) to the desired thrust setting. The higher the number, the higher the thrust output of the actuator.
3. Tighten the screw (19).
4. Make sure the mating surfaces of the cover and housing are clean. Replace the compartment cover and gasket and secure tightly in place with the hardware.
5. A maximum stop setting is furnished on all actuators. DO NOT EXCEED THIS SETTING WITHOUT CONSULTING THE FACTORY.



		GEARED LIMIT SWITCH CONTACT DEVELOPMENT			
Rotor	Contact	ACTUATOR POSITION			Function
		Fully Retracted	Intermediate	Fully Extended	
Extend	1	—	—	—	Full Extend Position
	5	—	—	—	Indicating Light
Inter-mediate	2	—	—	—	Spare
	6	—	—	—	Spare
Inter-mediate	3	—	—	—	Spare
	7	—	—	—	Spare
Retract	4	—	—	—	Full Retract Position
	8	—	—	—	Indicating Light

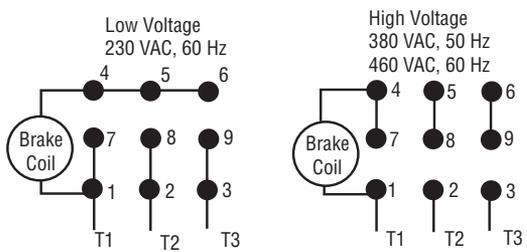
ACTUATOR SHOWN IN FULLY EXTENDED POSITION

Switch Contact Closed
 Switch Contact Open

⑰ Extend thrust switch interrupts control circuit if mechanical overload occurs during extend cycles.
 ⑱ Retract thrust switch interrupts control circuit if mechanical overload occurs during retract cycles.
 Trip points of contacts 2, 6, 3, & 7 are adjustable between the fully retract and fully extended positions.
 Contacts on each rotor can be arranged for identical operation.

LEGEND

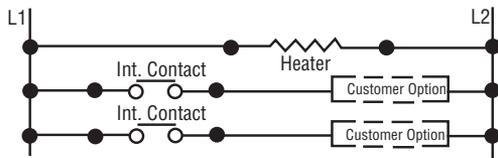
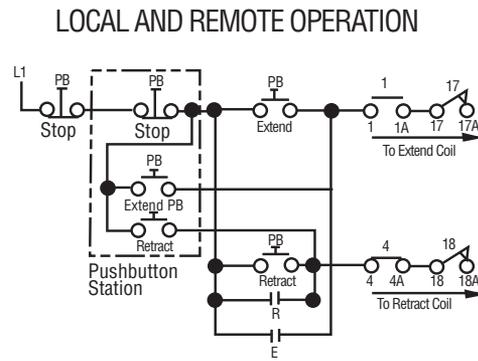
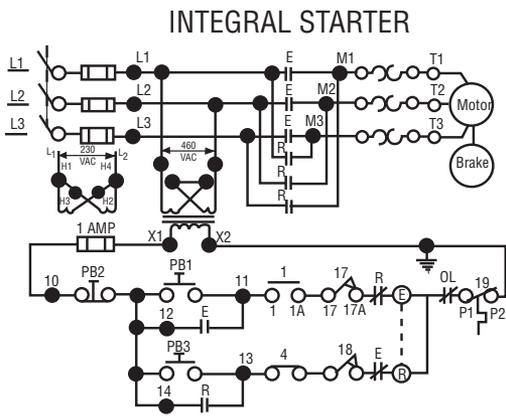
- – Switch Contacts
- – Wiring Connections
- ① – Extend Position Limit Switch
- ④ – Retract Position Limit Switch
- ⑰ – Extend Thrust Limit Switch
- ⑱ – Retract Thrust Limit Switch
- Ⓣ – Thermal Overload
- OL – Overload Relay
- ⓔ – Extend Coil
- Ⓡ – Retract Coil
- ⌞ – Mechanical Interlock
- PB – Pushbutton
- – Fuses or Circuit Breakers
- ⏏ – Disconnect Switch



3-PHASE MOTOR CONNECTIONS

Note:
 1. Thermal wires, P1 and P2, must be wired to motor starter coils for Class II, Division 1, Groups E, F, and G enclosure

Figure 5 - Wiring of motor



OPTIONAL POTENTIOMETER

SELECTOR SWITCH FOR LOCAL OR REMOTE OPERATION

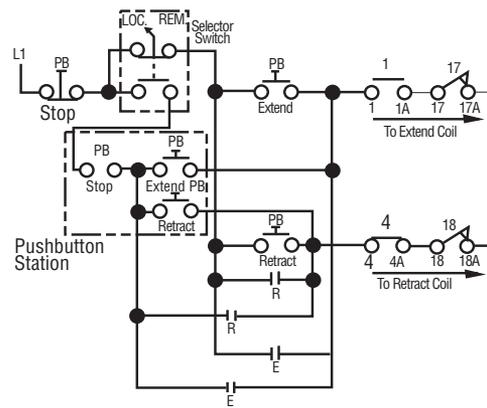


Figure 6 - Wiring of Selector Switch and Integral Starter

Lubrication Instructions

Every Posi-Tork Linear Actuator has been lubricated for life at the factory and should not require further lubrication if operated at the published duty cycle, thrust rating and in appropriate environmental conditions.

As part of a good preventative maintenance practice, inspection of satisfactory lubricant amounts, at six month intervals, is recommended. The quality of the lubricant should also be inspected to verify proper consistency and quality. The inspection can be made by removing the pipe plug located in the side of the housing. After completing a satisfactory inspection, the pipe plug must be replaced tightly. If the lubricant level is obviously low or visibly contaminated, the actuator should be further inspected to determine the cause.

The amount of lubricant in each actuator depends on the size and stroke of the actuator. Table 5 shows the required amounts.

Table 5 - Lubricant Required per Actuator Size and Stroke

Actuator Lubricant Amount, Pounds			
Stroke (Inches)	7200 Ball Screw	7300 Ball Screw	74-7300 ACME
6	0.50	0.75	0.75
12	0.75	1.00	1.25
18	1.00	1.25	1.75
24	1.25	1.75	2.25
30	1.50	2.25	2.75
36	1.75	2.50	3.25
46	N/A	3.25	4.00
60	N/A	4.00	5.00

Lubrication Information

Acceptable lubricants for use in the actuator are given in Table 6. Equivalent lubricants of the same base are acceptable except where noted.

Table 6 -Acceptable Standard Lubricants

Actuator Area	Name	Base	Temperature Range (°F)	Manufacturer
Housing, Gear Box, Thrust Ass'y	Aeroshell 6	Mineral Oil	-40 to 250	Shell
Geared Limit Switch	Mobilgrease 28	polyalphaolefin (PAO) synthetic	-65 to 350	ExxonMobil

Substitute lubricants are listed in Table 6A.

Table 6A -Substitute Lubricants

Name	Manufacturer
Litholene HEP1	Arco
Mobilux EP1	Mobil
Gulfcrown EP1	Gulf

Optional Equipment

Dust-Ignition Proof Enclosure Class II Division I, Groups E, F & G Indoor and Outdoor Hazardous Locations

Actuators provided to comply with NEC specifications must have properly designed and installed electrical compartment access covers that exclude ignitable amounts of dust. When installing these covers the mating surfaces and gaskets must be clean and all the attachment fasteners securely tightened. If the motor end bell pipe plug has been removed to adjust the actuator, that pipe plug must be reinstalled tightly.

The actuators must be able to operate at it's full rating without developing surface temperatures high enough to cause excessive dehydration or gradual carbonization of any organic dust deposits on the actuator enclosure.

The motor thermal overload switch must be wired as shown and noted in the electrical wiring diagram provided with the actuator.

The grounding lug on the actuator enclosure exterior must be wired to a suitable ground system with a minimum #10 AWG wire as noted in the electrical wiring diagram provided with the actuator.

Gear Driven Potentiometer

This optional assembly is direct driven by the operation of the actuator and gives the capability of providing a continuous, linear output control signal directly proportional to the actuator's stroke. The signal can be interfaced with automatic control equipment to position or sense the actuator at any desired stroke position between fully extended and fully retracted.

The potentiometer assembly is mounted directly to and driven by the geared position limit switch. Input gearing to the potentiometer accommodates the full range of actuator strokes and acme screw pitches. The potentiometer has been factory adjusted so the 0 and 1000 ohm resistance points correspond respectively, to the fully extended and fully retracted rod positions. Field adjustments may be done by loosening the set screw in the drive pinion on the potentiometer shaft, rotating the shaft as required and retightening the set screws.

Limit Switch Compartment Heater

An optional space heater, mounted within the geared position limit switch compartment, is available. The heater is powered by 120 VAC. The input voltage is continuous unless externally interrupted.

Integral Motor Starter

For information concerning the integral motor starter and any other related control components provided, refer to the electrical diagram provided with the actuator.

Trunnion and Clevis Mounting

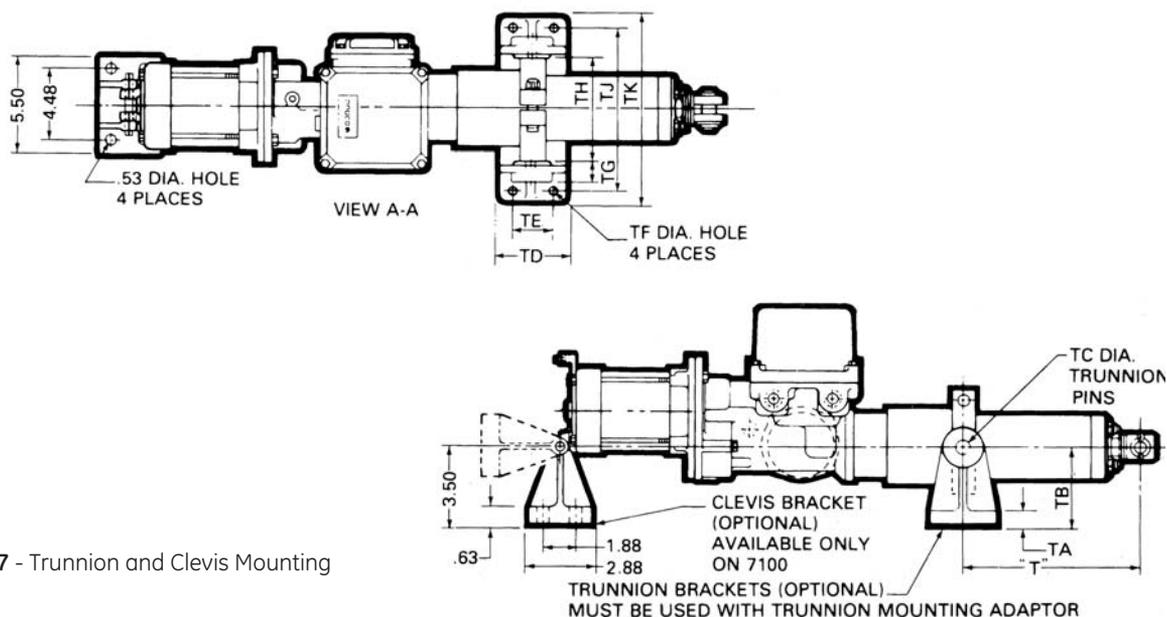


Figure 7 - Trunnion and Clevis Mounting

Table 7A - Trunnion Mounting

Series	TA	TB	TC	TD	TE	TF	TG	TH	TJ	TK
7200-B	0.75	4.66	0.87	7.56	5.50	0.66	1.19	6.50	9.50	11.25
7400-B	0.75	4.66	1.00	7.56	5.50	0.66	1.50	7.50	10.50	12.25
7500-B	1.50	6.00	1.75	8.50	6.00	1.06	2.50	10.00	14.50	17.00

Table 7B- "T" (Shown with Actuator Fully Retracted)

Series	6" Stroke		12" Stroke		18" Stroke		24" Stroke		30" Stroke		36" Stroke		48" Stroke		60" Stroke	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
7300-B	13.00	14.00	18.00	20.00	21.00	26.00	24.00	32.00	28.00	38.00	32.00	44.00	40.00	56.00	-	-
7400-B	-	-	33.62	33.62	39.62	39.62	45.62	45.62	-	-	57.62	57.62	69.62	69.62	81.62	81.62
7500-B	-	-	36.44	36.44	42.44	42.44	48.44	48.44	-	-	60.44	60.44	72.44	72.44	84.44	84.44

Notes

1. An adjustable trunnion mount is standard on 7200, 7300, and 74-7300 Series actuators (optional on 7100 and 7400 Series).
For 7400 Series ball screw actuators with an adjustable trunnion mount use "T" dimension from the 7400 flange mount table.
Fixed location trunnion pins are standard on 7400 and 7500 Series actuators.
2. Trunnion brackets are optional on all models.
3. Actuators supplied with adjustable trunnion mounting are set at the maximum dimension unless otherwise specified.
4. Dimensions are for reference only. Contact GE for engineering drawings.

Trunnion and Clevis Mounting

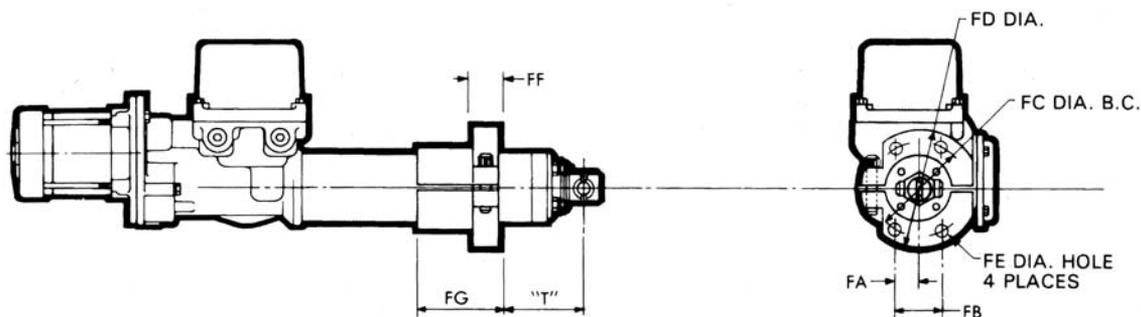


Figure 8 - Face/Flange Mounting

Table 8A - Face/Flange Mounting

Series	FA	FB	FC	FD	FE	FF	FG
7300-B	1.50	3.00	5.75	7.00	0.69	1.38	4.00
7400-B	2.30	4.60	6.50	8.00	0.81	1.00	5.00

Table 8B - "T" (Shown with Actuator Fully Retracted)

Series	6" Stroke		12" Stroke		18" Stroke		24" Stroke		30" Stroke		36" Stroke		48" Stroke		60" Stroke	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
7300-B	12.00	13.50	18.00	19.50	24.00	25.28	30.00	31.50	36.00	37.58	42.00	43.50	54.00	55.500	-	-
7400-B	-	-	20.00	24.00	25.00	30.00	30.00	36.00	-	-	38.00	43.00	40.00	46.00	43.00	50.00

Notes

1. Face/flange actuator may be rotated 90° from arrangement shown.
2. Face/flange location is set at maximum dimension unless otherwise specified.
3. Dimensions are for reference only. Contact GE for engineering drawings.



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