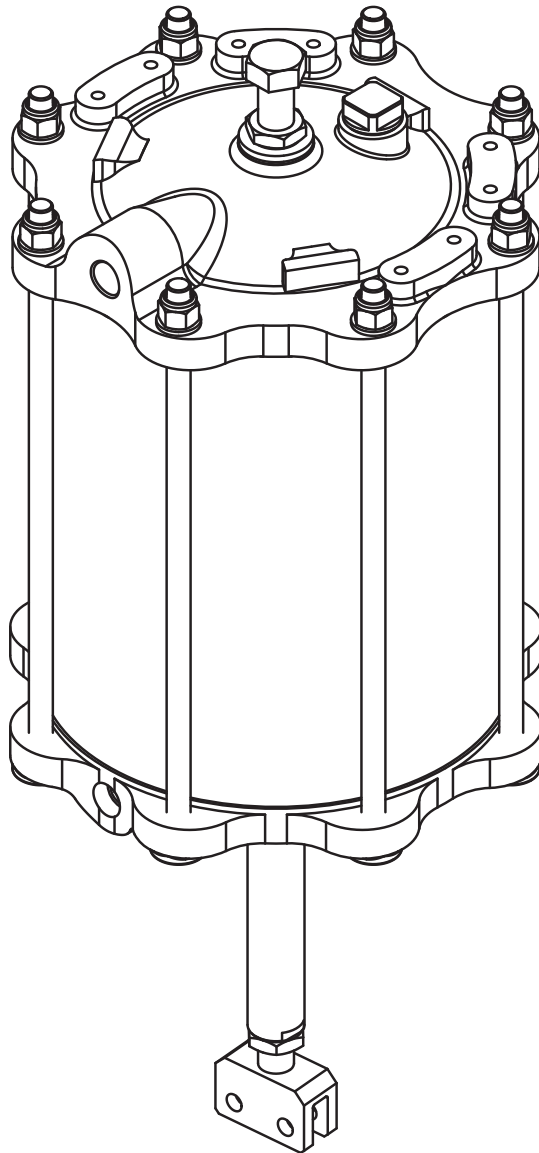

SERIES KCS/KCT

LINEAR PNEUMATIC ACTUATOR

Installation, Operation, and Maintenance Manual



 **Bray**[®]

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**READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY.
FOR THE LATEST IOM VERSION, VISIT BRAY.COM**

1.0 DEFINITION OF TERMS

All information within this manual is relevant to the safe operation and proper care of your Bray valve. Please understand the following examples of information used throughout this manual.

Specific instructions for non-standard materials of construction, temperature range, etc. should be referred to the factory.

1.1 Safety Statements

To prevent unwanted consequences, standard symbols and classifications are used as shown below:



DANGER

Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE

Used without the safety alert symbol, indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

NOTE: Provides important information related to a procedure.

For a detailed list of product certifications please contact your local Bray representative.

2.0 GENERAL INFORMATION

2.1 Description

The cylinder used with Bray knife gate valves is a pneumatic double-acting cylinder that has a recommended supply pressure between 50 and 100 psi (3.5 to 7 bar). Cylinder pressure not to exceed 100 psi, cylinder can operate at less than 50 psi. Use proper cylinder sizing to determine operating pressure.

NOTE: See applicable valve IOM for detailed instructions of valve and actuator assemblies.



NOTICE

Failure to follow these procedures and observe these notes, cautions and warnings including the use of non-OEM parts could lead to hazards and/or void product warranties, either expressed or implied.

Additional product information (such as application data, engineering specifications, actuator selection, etc.) is available from your local Bray distributor or sales representative, or online at **BRAY.COM**.

2.2 Inspection

Your cylinder actuator has been packaged to provide protection during shipment. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

2.3 Use

The following instructions are designed to assist in the unpacking, installation, and maintenance as required. Product users and maintenance personnel should thoroughly review this manual prior to installing, operating, or performing any maintenance. In most cases, Bray valves, actuators, and accessories are designed for specific applications (e.g. with regard to medium, pressure and temperature). For this reason, they should not be used in other applications without first contacting the manufacturer.



WARNING

Before installing this equipment, confirm that it is suitable for the intended service. The identification tags describe the maximum allowable service conditions for this product. Be sure that the installation is protected by appropriate pressure control and safety devices to ensure that acceptable limits are not exceeded.

2.4 Applicability

The following instructions are applicable to the maintenance and installation of the pneumatic actuator. These instructions cannot claim to cover all details of all possible product variations, nor can they provide information for every possible example of installation, operation, or maintenance. This means that the instructions normally include only the directions to be followed by qualified personnel using the product for its defined purpose. If there are any uncertainties in this respect, particularly in the event of missing product related information, clarification must be obtained via the appropriate Bray sales office.

3.0 SAFETY INFORMATION



WARNING

This cylinder is a pressure vessel. Pressure in the cylinders can cause personal injury or equipment damage. Release pressure from both ends of the cylinder before servicing.



NOTICE

Failure to follow these procedures could affect product warranty.

Read completely and understand all instructions provided prior to beginning installation or maintenance.

Follow all instructions as described using the correct tools for the job.

Before installing this equipment, confirm that it is suitable for the intended service. The identifications tags describe the maximum allowable service conditions for this product.

Be sure that the installation is protected by appropriate pressure control and safety devices to ensure that acceptable limits are not exceeded.



WARNING

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



WARNING

Prior to servicing, remove actuation media and power and confirm there is no stored energy in the actuation such as compressed springs or trapped air before beginning service. Stored energy devices can cause serious injury if the energy is released without warning.

Confirm that line pressure has been removed and that there is no pressure trapped within the valve prior to beginning service. Do not attempt to remove any packing components or other fittings before confirming that pressure has been completely removed!



WARNING

Before working on an actuator in service, make sure that service media has been flushed and line is safe. Make sure that all applicable MSDS sheets are available. Follow all safety related procedures.

Do not begin service work without proper tools and protective safety measures.

The work area should be clear of obstructions and other safety hazards.



NOTICE

Before disassembly, valve and actuator shall be cycled several times to assure there is no pressure trapped in body cavity.



WARNING

During the pressure test of reassembled valve and actuator follow all safety precautions to avoid possible injury. (Use of proper test equipment, correct parts assemblies, follow test procedures.)

3.1 Protective Clothing

Bray products are often used in critical applications (e.g. under extremely high pressures with dangerous, toxic, or corrosive mediums). When performing service, inspection, or repair operations, always ensure that the valve and the actuator are depressurized, the valve has been cleaned, and the valve is free of harmful substances. In such cases, pay particular attention to personal protection (e.g. protective clothing, gloves, glasses, etc.).

3.2 Service and Repair

To avoid possible injury to personnel or damage to products, safety terms must be strictly adhered to. Modifying this product, substituting non-factory parts, or using maintenance procedures other than those outlined in these Installation, Operation and Maintenance instructions could drastically affect performance, be hazardous to personnel and equipment, and may void existing warranties.

Apart from the operating instructions and the obligatory accident prevention directives valid in the country of use, all recognized regulations for safety and good engineering practices must be followed.

3.3 Hazard-Free Use



NOTICE

Failure to follow these procedures could affect product warranty.

This device left the factory in proper condition to be safely installed and operated in a hazard-free manner. The notes and warnings in this document must be observed by the user if this safe condition is to be maintained and hazard-free operation of the device assured.

Take all necessary precautions to prevent damage to the valve and actuator due to rough handling, impact, or improper storage. Do not use abrasive compounds to clean the valve and actuator, or scrape metal surfaces with any objects.

The control systems in which the valve and actuator is installed must have proper safeguards — to prevent injury to personnel, or damage to equipment — should failure of system components occur.

The upper limits of permitted pressure and temperature (depending on the housing and liner materials) must be observed. These limits are shown on the identification tags.

The valve and actuator must not be operated until the following documents have been observed:

- > Declaration on EU Directives (if applicable)
- > IOM Manual (supplied with the product).

3.4 Qualified Personnel



NOTICE

Failure to follow these procedures could affect product warranty.

A **qualified person** (in terms of this document) is one who is familiar with the installation, commissioning, and operation of the device, and who has appropriate qualifications, such as:

1. Is trained in the operation and maintenance of pressure equipment and systems in accordance with established safety practices.
2. Is trained in the operation and maintenance of electrical equipment and systems in accordance with established safety practices.
3. Is trained or authorized to energize, de-energize, ground, tag, and lock electrical circuits and equipment in accordance with established safety practices.
4. Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.
5. Is trained in the commissioning, operation, and maintenance of equipment in hazardous locations — in cases where the device is installed in a potentially explosive (hazardous) location.

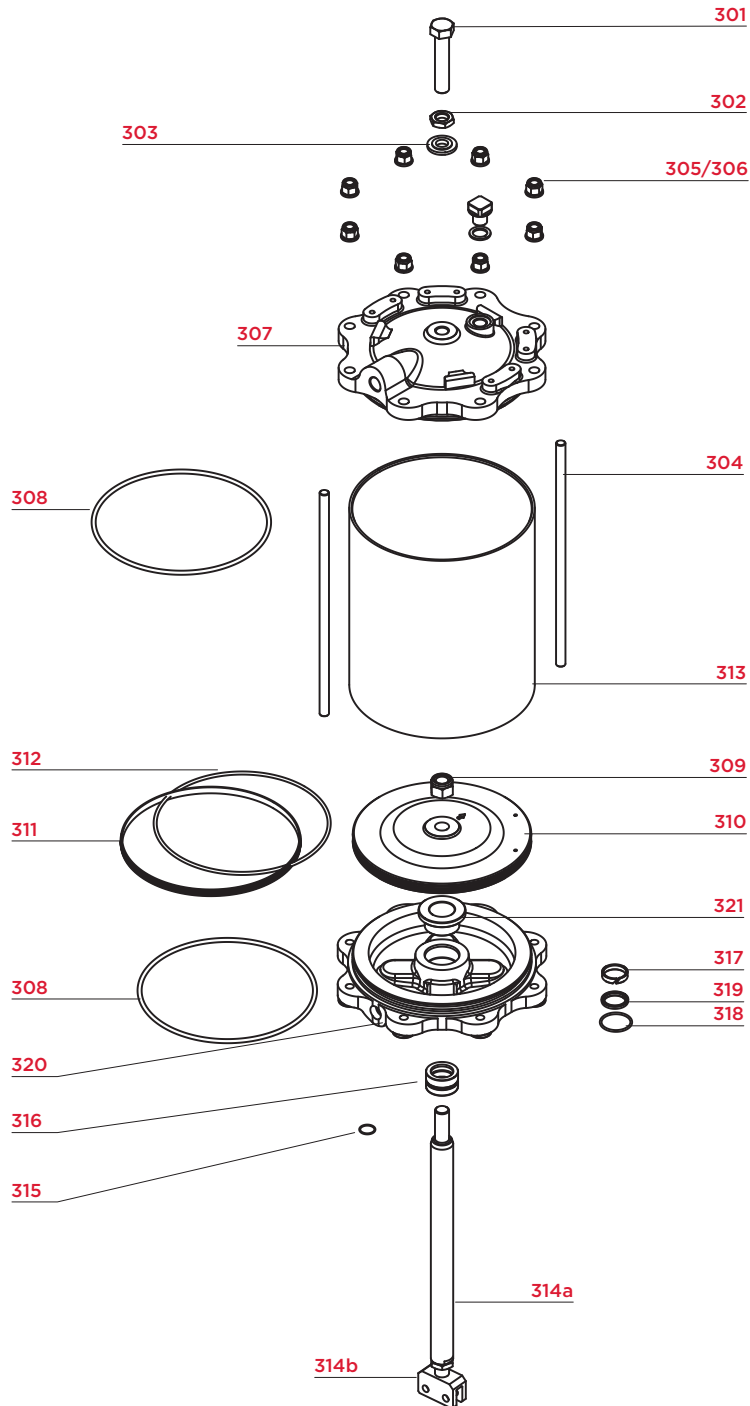
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4.0 PARTS IDENTIFICATION

4.1 Parts Callout



4.2 Parts List

ITEM	DESCRIPTION	RECOMMENDED SPARE PARTS ¹
301	Stopper Fasteners	
302	Jam Nut	
303	Thread Seal	
304	Tie Rod	
305	Tie Rod Nut	
306	Tie Rod Washer	■
307	Cylinder Cap	
308	O-Ring	■
309	Piston Rod Nut	
310	Piston	
311	Piston Seal	■
312	O-Ring	■
313	Cylinder Tube - FRP/Metallic	
314a	Piston Rod	
314b	Clevis	
315	O-Ring	■
316	Neck Seal Housing	■
317	Guide Ring	■
318	O-Ring	■
319	Wiper Seal	■
320	Cylinder Head	
321	Lower Stopper	

NOTE:

1. Items contained in repair kit

4.3 Spare Parts

1. Use only Bray original spare parts.
2. Recommended spare parts are identified in the Parts Identification drawing and list for each product model.
3. Bray cannot accept responsibility for any damages that occur from using spare parts or fastening materials from other manufacturers. If Bray products (especially soft good materials) have been stored for long periods of time, check them for corrosion or deterioration before putting them into use.



WARNING

Before products are returned to Bray for repair or service, Bray must be provided with a certificate that confirms that the product has been decontaminated and is clean.

5.0 VALVE IDENTIFICATION

Identification Tag

All actuators or control products are provided with a permanently affixed identification tag meeting the requirements of applicable standards and certifications for the product.

As each product is unique, data may vary.

Bray CONTROLS INDIA PVT. LTD.	
SALE ORDER NUMBER:	
SERIAL NUMBER:	
PART NUMBER:	
ACT SIZE:	
MAX PRESSURE:	MODEL:
MAX TEMPERATURE:	VALVE SIZE:
TUBE TYPE:	

Serial Number	Actuator Serial Number
Act Size	Nominal size of actuator cylinder
Model	Actuator Model
Valve Size	Nominal size of valve (if applicable)
Max Air PR	Maximum air supply pressure
Max Temp	Maximum operating temperature

6.0 HANDLING REQUIREMENTS



WARNING

A potential hazard exists with handling valves/actuators. Failure to handle valves/actuators properly may cause a valve and actuator to shift, slip or fall causing serious injury or death and/or equipment damage.

6.1 Packed Valves/Actuators

Crates: Lifting and handling of the packed valves/actuators in crates will be carried out by a forklift truck, by means of the appropriate fork hitches.

Cases: The lifting of packed valves/actuators in cases will be carried out in the lifting points and in the center of gravity position which has been marked. The transportation of all packed material must be carried out safely and following the local safety regulations.

Moving crated, packed, or palleted products must be done in a safe manner, using appropriate lifting equipment (i.e., forklift, hand truck, pallet jack, etc.)



NOTICE

When lifting the valve from shipping container, use straps through valve body. Take care to position lifting straps to avoid damage to the tubing and mounted accessories.

6.2 Unpacked Valves/Actuators

Lifting and handling of valves/actuators should be carried out by using appropriate means and observing the carrying limits. Handling must be carried out on pallets, protecting all machined surfaces to avoid any damage.

With large bore valves/actuators, rigging the load must be carried out by using the appropriate tools to prevent the valve from falling or moving during the lifting and handling.



CAUTION

Product is shipped in protected position and must be transported in such a way as to avoid damage during movement.

For handling and/or lifting, the lifting equipment (fasteners, hooks, etc.) must be sized and selected while considering the product weight indicated in our packing list and/or delivery note.

Lifting and handling must be performed only by qualified personnel.

Fasteners must be protected by plastic covers in sharp corner areas.

Caution must be taken during handling to avoid this equipment passing over workers, or over any other place where a possible fall could cause injury or damage. In all cases, local safety regulations must be respected.



CAUTION

The end connection necks are suitable places to attach lifting slings/straps. Never use hand wheels or other protruding parts of the gearbox or actuator not designated for this purpose.



NOTICE

During handling, protect the end connection faces and fittings against damage from the lifting devices. Failure to cover faces and fittings could cause damage to the valve.

While unpacking the valve, check the packing list against the materials received. Lists describing the valve and accessories are included in each shipping container and General Assembly drawing as applicable.



WARNING

Never lift the valve package by the actuator, positioner, limit switch or their piping. When lifting a valve, be aware that the center of gravity may be above the lifting point. Therefore, support must be given to prevent the valve from rotating. Failure to do so can cause serious injury to personnel and damage to the valve and nearby equipment.

Contact your shipper immediately if there is shipping damage. Should any problem arise, call your Bray representative.



WARNING

A potential hazard exists with handling valves/actuators. Failure to handle valves/actuators properly may cause a valve to shift, slip or fall causing serious injury or death and/or equipment damage.

6.3 Moving Valves/Actuators

Moving crated, packed, or palleted products must be done in a safe manner, using appropriate lifting equipment (i.e., forklift, hand truck, pallet jack, etc.)

Lifting of products should be done using lifting points, and in the center of gravity position as marked, in observance of existing carrying limits.



CAUTION

Product is shipped in protected position and must be transported in such a way as to avoid damage during movement.

For handling and/or lifting, the lifting equipment (fasteners, hooks, etc.) must be sized and selected while considering the product weight indicated in our packing list and/or delivery note.

Lifting and handling must be performed only by qualified personnel.

Fasteners must be protected by plastic covers in sharp corner areas.

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Caution must be taken during handling to avoid this equipment passing over workers, or over any other place where a possible fall could cause injury or damage. In all cases, local safety regulations must be respected.

7.0 TRANSPORT AND STORAGE



NOTICE

Failure to follow these procedures could affect product warranty.

The packaging is designed to protect the products only during shipping. If the product is not installed immediately after delivery, then it must be stored according to these requirements.

These are general guidelines for valve and actuator storage. Storage guidelines for accessories fitted on valve and actuator shall be as per respective Installation, Operation and Maintenance manual. Please consult the factory for information regarding specific requirements.

7.1 Transport

Upon arrival at the site, actuator general condition should be inspected right away for any potential shipping damage. Any damage should be reported to Bray.

7.2 Short-Term Storage

Short-term storage is defined as storage of products and equipment to be used in the construction of a project for periods of one to three months. Short-term storage must be carried out in a controlled manner as follows:

1. Actuator must be stored in a closed, clean, and dry environment.
2. Actuator should be stored in the fully open position.
3. Actuator should remain in the original shipping container and be placed on pallets of wood or other suitable materials.

7.3 Long-Term Storage

Long-term storage is defined as storage of products and/or equipment for periods longer than 3 months. Long-term storage must be carried out in a controlled manner as follows:

1. Actuator must be stored in a closed, clean, and dry environment.
2. Actuator should remain in the original shipping container and be placed on pallets of wood or other suitable materials.
3. A visual inspection (with results recorded) shall be performed every three months to ensure the above conditions are maintained.

Inspection, as a minimum, shall include reviewing the following:

- > Packaging
- > Dryness
- > Cleanliness

These are general guidelines for valve storage. Please consult the factory for information regarding specific requirements.



CAUTION

Do not stack the products on top of each other.

7.4 General Storage Requirements

The preferred storage location is a closed, clean, and dry environment. Do not expose the product to temperature extremes.



NOTICE

The preferred temperature range is 40°F (4°C) to 85°F (29°C). For long-term storage in temperatures lower or higher than the preferred range, please consult the factory for information regarding specific requirements.

Product shall remain in the original shipping container with the original packaging materials.

Valve and actuator and equipment containing elastomers, including O-rings, must be stored in a climate-controlled warehouse according to SAE-ARP5316D requiring:

1. The ambient relative humidity to be less than 75%.
2. No exposure from direct ultraviolet or sunlight.
3. Protection from ozone generating equipment or combustible gases and vapors.
4. Storage at temperatures below 100°F (38°C), away from direct sources of heat.
5. No exposure to ionizing radiation.

8.0 INSTALLATION

8.1 Lubrication

The cylinder only requires lubrication when reassembling a unit that has been disassembled. When reassembling, lubricate the piston seal (311), O-rings (312), piston (310) grooves and cylinder wall (313) with Dow Corning No. 44 lubricant, or for cylinders that are for -40°C to -50°C (-40°F to -58°F) environments, lubricate with Dow Corning No. 55 lubricant

8.2 Aligning the Cylinder

See **Parts Identification** for component identification.

To work properly, the piston rod (314A) and gate must be aligned. The mounting holes in the cylinder and yoke or side plate are designed to allow for adjustment. Visually check the alignment with the valve in the open and close positions, and adjust as needed.

1. Align the piston rod (314A) and the gate with each other.
2. Check the piston rod (314A) and gate alignment in the valve open and closed positions.
3. Adjust the cylinder position if needed

Note: Oversized mounting holes in the cylinder and yoke or side plate will allow for adjustment.

8.3 Cylinder Support

The unit may be mounted in any position around the pipeline, however it is best to mount the valve with the cylinder in a vertical position.

If the valve is installed with the cylinder in a position other than vertical, the customer must provide additional support on size 10 inch and larger valves.

This support can be mounted using the tapped holes in the cylinder head (320), but do not mount the supports on the cylinder tube (313).

See the installation drawing for dimension location of cylinder support

8.4 Cylinder Stroke Adjustment

The stopper fasteners (301) in the cylinder acts as the cylinder stroke adjustment. Adjust this stopper fasteners (301) so that the actuator does not pull the gate off the seat ring when the valve is fully opened

To adjust the open position: Open the valve and adjust the stopper fasteners (301) until the gate is clear of the flow port but fully on the seat ring. Tighten Jam nut (302).

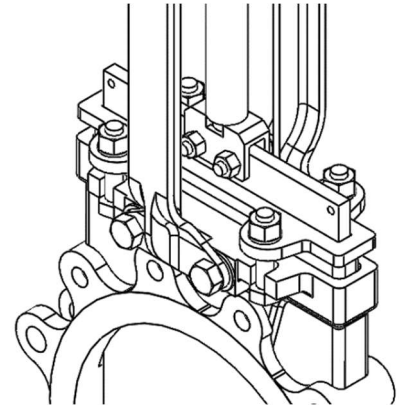


Figure 1: Connection to Valve.

9.0 OPERATION

Operation of the actuator accomplished by applying air pressure to one side of the cylinder at a time.

NOTE: Pneumatic controls are outside of the scope of this manual. Please consult with the relevant Bray Sales office for specifics relating to any control accessories provided.

9.1 Closing Operation

Apply air at the required pressure to the port on the top of the cylinder while venting the bottom port of the cylinder. Sufficient air volume should be available to minimize pressure drop during stroking.

Operating speed can be adjusted with speed control devices on the exhaust port. Device such as quick exhaust valves may be required if exhaust path is restricted.

NOTE: Typical recommended stroke time for knife gate valves is 1 inch per second (25 mm per second). Faster or slower speeds may have adverse effects on operation.

9.2 Opening Operation

Apply air at the required pressure to the port on the bottom of the cylinder while venting the top port of the cylinder. Sufficient air volume should be available to minimize pressure drop during stroking.

Operating speed can be adjusted with speed control devices on the exhaust port. Device such as quick exhaust valves may be required if exhaust path is restricted.

NOTE: Typical recommended stroke time for knife gate valves is 1 inch per second (25 mm per second). Faster or slower speeds may have adverse effects on operation, depending the design of the valve.

10.0 MAINTENANCE AND REPAIR

10.1 Disassembling the Cylinder



WARNING

This cylinder is a pressure-containing vessel! Removing any parts while under pressure could cause personal injury or equipment damage. Release the pressure from both end of the cylinder before attempting disassembly or repair.

1. Shut off the air/fluid supply to the cylinder and relieve pipeline and cylinder pressure.
2. Disconnect the air supply lines.

Note: When flexible tubing is used, only one swivel connector is used on each piece of tubing. The swivel connector is located on the end of the tubing attached to the cylinder port

3. Remove the nylock nuts (305) and washers (306) from the tie-rods (304).
4. Remove the cylinder cap (307) and remove the O-ring seal (308) from the cylinder cap (307).
5. Remove the cylinder tube (313), piston seal (311) and O-ring (312). Clean the parts and the grooves in the piston (310). See **Figure 2**.

Note: Rotating the cylinder tube (313) while pulling makes it easier to get it off the piston (310).

6. Remove the piston rod (314A) assembly and remove the O-ring (308) from the cylinder head (320).

Note: Cylinders for - 40°C to - 50°C (-40°F to -58°F) service applications do not have a piston seal (311). These cylinders have a larger O-ring (312) in the piston (310).

7. Clean all parts thoroughly. Replace damaged parts and seals.

10.2 Reassembling the Cylinder

1. Clean bore of cylinder head (320) and lubricate with Dow Corning Number 44 lubricant, or Dow Corning Number 55 on cylinders used in - 40°C to - 50°C (-40°F to -58°F) service.
2. Lubricate the O-ring (308) and place it on the cylinder head (320).
3. Clean neck seal (319) in to the cylinder head (320).
4. Carefully install the piston rod (314A).
5. Lubricate the piston seal (311), O-ring (312) and cylinder groove with Dow Corning Number 44 lubricant and place the O-ring (312) and seal (311) on the piston (310). For cylinders for - 40°C to -50°C (-40°F to -58°F) service applications, a piston seal (311) is not used and Dow Corning No. 55 lubricant should be applied.

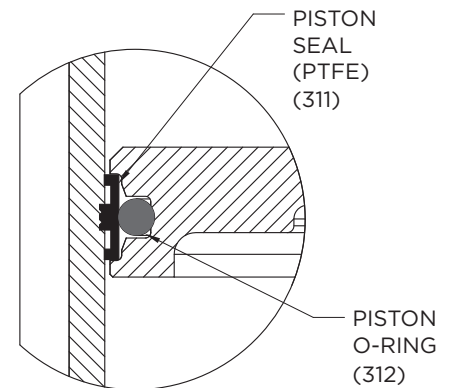


Figure 2: Piston Seal and O-ring

6. Carefully slide the cylinder tube (313) over the piston (310). The piston seal (311) must be well lubricated. Start the cylinder tube (313) at a 45° angle and rotate it into position onto the piston (310). See **Figure 3**.
7. Lubricate the O-ring (308) and place it on the cylinder cap (307).
8. Place the cylinder cap (307) on the cylinder tube (313) and place the washers (306) and nuts (305) on the tie-rods (304). Tighten the nuts (305) to the torque listed in Table A.

TABLE A: Tie-rod Nut Torques

Cylinder Size	Torque	
	Lbs. Ft.	NM
C4	12	16
C6 - C8	16	22
C10-Cw0	20	27

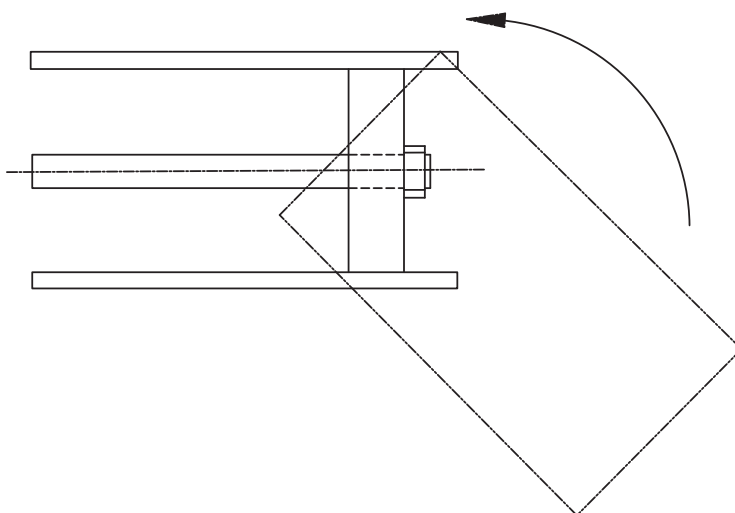


Figure 3: Assembling Cylinder

10.3 Neck Seals Assembly

To repair a cylinder actuator with the rod seal (317) and wiper damaged by outside contaminants on the piston rod (314A) during the retracting stroke.



WARNING

This cylinder is a pressure-containing vessel! Removing any parts while under pressure could cause personal injury or equipment damage. Release the pressure from both ends of the cylinder before attempting disassembly or repair.

See **Figure 4**. The rod seal (317) and wiper (319) are installed in the Neck seal housing. The housing (316) assembled with Head (320) in press fit. Attempting to replace the housing (316) and O-ring (318) may damage the cylinder head (320). Please contact your local Bray representative if the neck seal housing needs to be replaced.

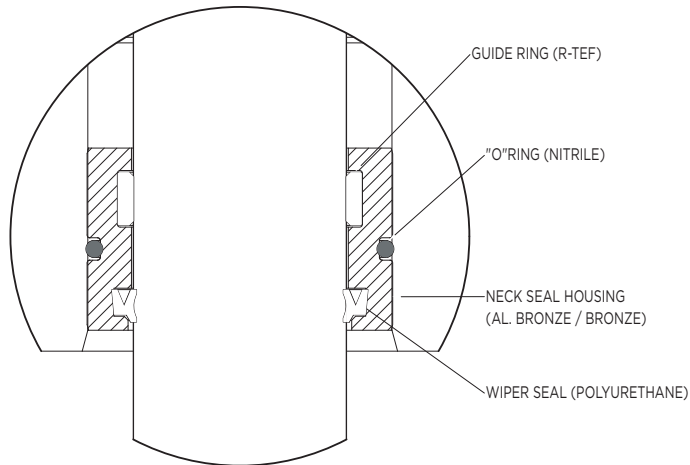


Figure 4: Neck Seal Assembly (319)

10.4 Neck Seals Replacement

1. Shut off the air supply
2. Disassemble the cylinder as per the procedure given in Section 10.1
3. Remove the wiper (319) and rod seal (317) from the Neck seal housing (316).
4. Clean the housing (316) grooves and lubricate with Dow Corning Number 44 lubricant, or Dow Corning Number 55 in cylinders for -40°C to -50°C service.
5. Insert the rod seal (317) into its groove, making sure it lies flat in the groove.
6. Insert wiper (319) into its groove.
7. Reassemble the cylinder as per the procedure given in Section 10.2
8. Mount cylinder onto valve and perform cylinder stroke adjustment as needed.

11.0 TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	SOLUTION
External Leakage	Worn or damage head/cap o-rings	Replace cylinder head or cap o-rings
	Worn or damaged neck seals	Replace neck seals
	Jam nut is loose	Tighten jam nut
	Worn or damaged thread seal	Replace thread seal, re-adjust travel stop and tighten jam nut
	Accessory port plug is loose	Tighten plug.
	Air supply overpressure	Reduce air pressure below maximum pressure of 100 psi (7 bar)
Internal Leakage	Piston seal wear	Replace piston seal and o-ring
	Piston misalignment	Correct misalignment of other components in linkage
Cylinder fails to operate valve	Low air supply pressure	Confirm required air pressure for assembly and check pressure at cylinder
	Internal leakage	Diagnose per above
	Cylinder is not sized for application	Contact the relevant Bray Sales office to review sizing
	Piston rod damage	Contact the relevant Bray Sales office to order required replacement components
Cylinder Operation is not smooth	Piston misalignment	Correct misalignment of other components in linkage
	Insufficient air supply capacity	Reduce restrictions in air supply system. Contact the relevant Bray Sales office for assistance as required.
	Excessive restrictions in air exhaust	Reduce restrictions in cylinder exhaust path. Contact the relevant Bray Sales office for assistance as required.
	Cylinder is not sized for application	Contact the relevant Bray Sales office to review sizing.
Cylinder operates too slow	Insufficient air supply capacity	Reduce restrictions in air supply system. Contact the relevant Bray sales office for assistance as required.
Cylinder operates too fast	Insufficient back pressure in exhaust path	Install speed control devices in control circuit.

NOTES:

- > Bray does not accept any responsibility for the product if wear parts not tested and approved by Bray are used.
- > Bray does not accept any responsibility for the product if maintenance instructions are not followed during maintenance.

12.0 RETURN MERCHANDISE AUTHORIZATION



WARNING

Before products are returned to Bray for repair or service, Bray must be provided with a certificate that confirms that the product has been decontaminated and is clean.

All products that are returned require a Return Merchandise Authorization (RMA). Contact a Bray representative to obtain authorization and shipping instructions.

The following information must be provided when submitting RMA.

- > Serial number
- > Part number
- > Month and year of manufacture
- > Time of purchase (if known)
- > Actuator and actuator accessories/controls specifics
- > Application
- > Media
- > Operating temperature
- > Operating pressure
- > Total estimated cycles (since last installation or repair)

NOTE: Product information is provided on identification tag attached to device.



NOTICE

Materials must be cleaned and sanitized prior to return. MSDS sheets and Declaration of Decontamination are required.

SINCE 1986, BRAY HAS PROVIDED FLOW CONTROL SOLUTIONS FOR A VARIETY OF INDUSTRIES AROUND THE WORLD.

VISIT **BRAY.COM** TO LEARN MORE ABOUT BRAY PRODUCTS AND LOCATIONS NEAR YOU.

HEADQUARTERS

BRAY INTERNATIONAL, INC.

13333 Westland East Blvd.

Houston, Texas 77041

Tel: +1.281.894.5454

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