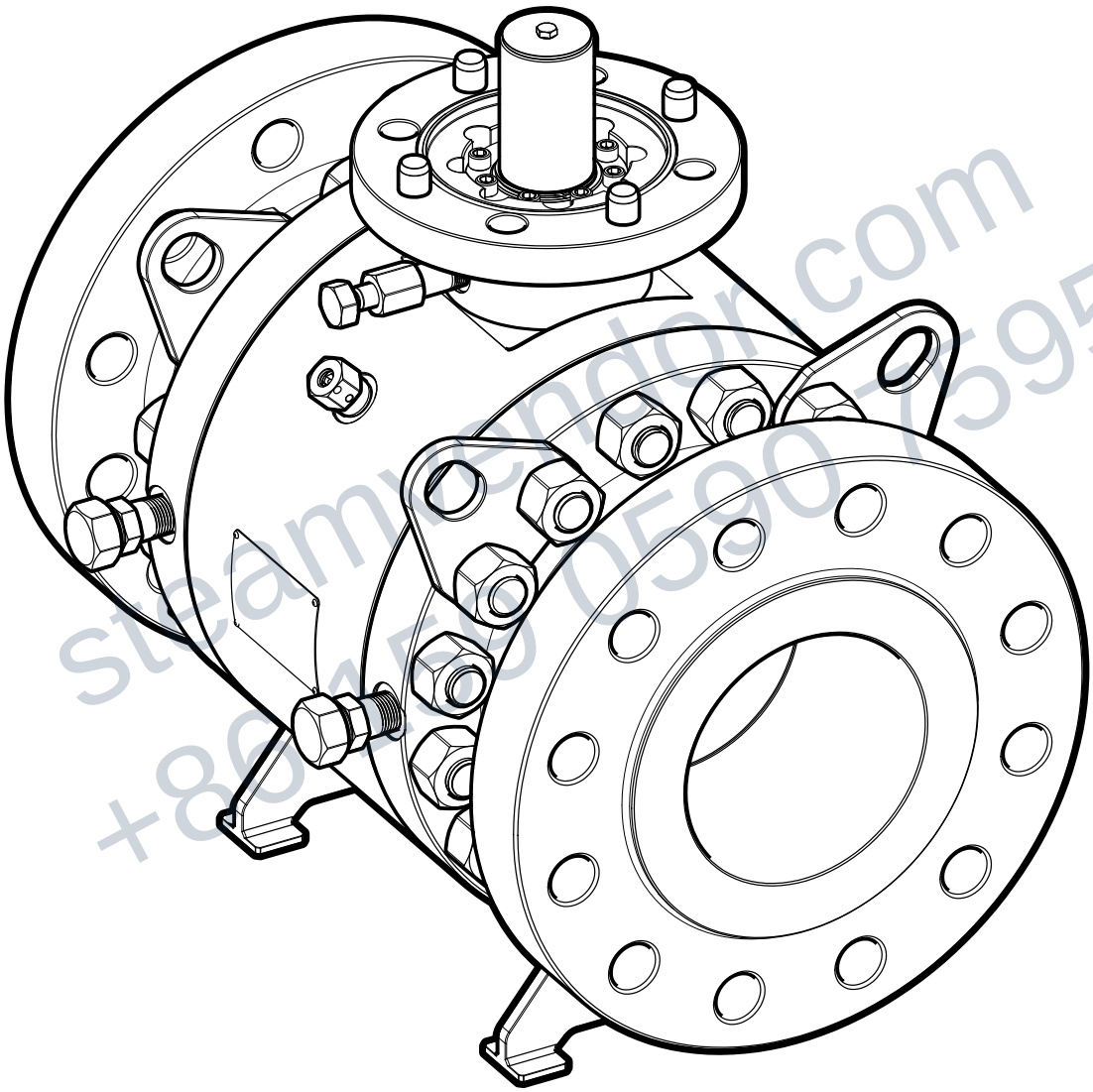
TRUNNION MOUNTED BALL VALVE

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.

2.0 GENERAL INFORMATION

2.1 Introduction

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.

The valve should be maintained as part of a preventative maintenance program and in accordance with Bray's recommended pressure and temperature to ensure a long service life. During shipment, storage, and in operation, the valve should be fully open or fully closed ("open" is preferred for shipping and storage).

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**.

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

2.2 Design

The design features of this valve include a split body, 2 piece/3 piece construction, allowing for ease of maintenance without special tools. These valves feature a Trunnion-supported ball with upstream and downstream sealing.

As a result of these features, these valves are capable of handling high pressure and shut-off with flow in either direction (or) dead ended. The seating type may vary, depending on the customer requirements.

2.3 Use

The following instructions are designed to assist in the unpacking, installation, and maintenance as required for Bray ball valves. 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.

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.

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.

Confirm that line pressure has been removed and that there is no pressure trapped within the valve prior to beginning service (cycle the valve twice from fully open to fully closed position to release any pressure potentially trapped in the body cavity). Do not attempt to remove any packing components or other fittings before confirming that pressure has been completely removed!

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

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

Compliance with other notes, which may not be particularly emphasized, with regard to transport, assembly, operation and maintenance, and technical documentation (operating instructions, product documentation, or on the product itself) is essential to avoid faults, which can directly or indirectly cause severe personal injury or property damage.

2.4 Applicability

The following instructions are applicable to the maintenance and installation of Bray ball valves. 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

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

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 valve being 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 shall be cycled several times to assure there is no pressure trapped in body cavity.

WARNING

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

WARNING

While line is under pressure DO NOT remove packing gland or any other valve parts.

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 due to rough handling, impact, or improper storage. Do not use abrasive compounds to clean the valve, or scrape metal surfaces with any objects.

The control systems in which the valve 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 valve identification tag.

The valve 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.

4.0 PARTS IDENTIFICATION

4.1 Parts Callout - NPS 6 | DN 150

4.2 Parts List - NPS 6 | DN 150

ITEM	DESCRIPTION	RECOMMENDED SPARE PARTS[1]
1	Body	
2	End Connection	
3	Ball	
4	Bearing Retainer	
5	Bearing (Ball Trunnion)	
6	Grooved Pin - Bearing Retainer	
7	Seat Holder	■
8	Seat Insert	■
9	Spring (Seat Holder)	
10	O-Ring (Seat Holder)	■
11	O-Ring (Seat Sealant)	■
12	Stem	
13	Stem Housing	
14‡	Packing	■
15	Packing Energizer	
16	Packing Gland Flange	
17	Thrust Washer - Ball	■
18	Thrust Washer - Stem	■
19	Seal - Body	■
20	Seal - Stem Housing	■
21	O-Ring - End Connection	■
22	O-Ring - Stem Housing	■
23	O-Ring - Stem	■
24	O-Ring - Mounting Flange	■
25	Grooved Pin - Body	
26	Grooved Pin- Stem Housing	
27	Sealant Injector - Closure	
28	Check Valve - Sealant Injector	
29	Sealant Injector - Stem Housing	
30	Vent Plug	
31	Drain Plug	
32	Stud - Body	
33	Nut - Body	
34	Socket Head Cap Screw- Stem Housing	
35	Socket Head Cap Screw - Gland	
36	Circlip - Stem	
37	Lifting Lug	
38	Valve Support	
39	Grooved Pin - Mounting Flange	
40	Key	
41	Washer	
42	Hex Screw	

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

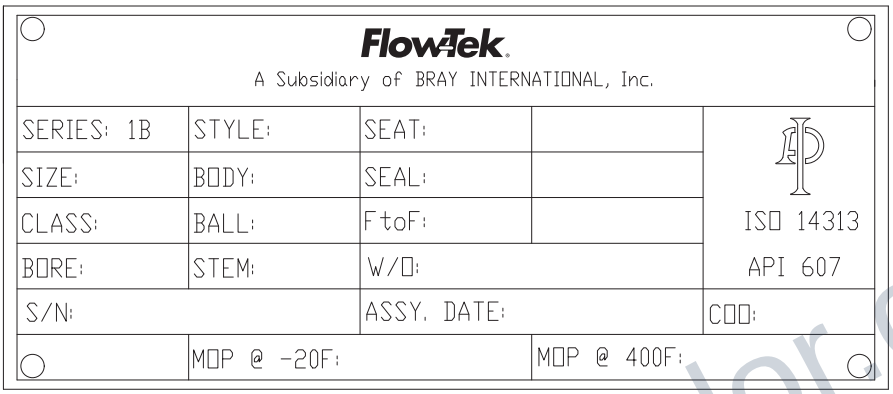
Before products are returned to Bray for repair or service, Bray must be provided with a certificate that confirms that the product has been decontaminated and is clean.

5.0 VALVE IDENTIFICATION

Identification Tag

All valves, 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.



Series	Valve Series
Size	Nominal Pipe Size
Class	Pressure Class
Bore	Type of bore through body
S/N	Valve Serial Number
Style	Double Block & Bleed or Double Isolation & Bleed Setup
Body	Body Material
Ball	Ball Material
Stem	Stem Material
Seat	Seat Material
Seal	Seal Material
F to F	Face to Face
W/O	Work Order Number
Assy. Date	Assembly Date
COO	Country of Origin
MOP @ -20°F	Maximum Operating Pressure at -20°F
MOP @ 400°F	Maximum Operating Pressure at 400°F
API 6D Monogram	Ability to Meet Standard
ISO 14313	Ability to Meet Standard
API 607	Ability to Meet Standard

6.0 HANDLING REQUIREMENTS

WARNING

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

6.1 Packed Valves

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

Cases: The lifting of packed valves 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

Lifting and handling of valves 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, 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

1. Product is shipped in protected position and must be transported in such a way as to avoid damage during movement.
2. 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.
3. Lifting and handling must be performed only by qualified personnel.
4. Fasteners must be protected by plastic covers in sharp corner areas.
5. 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 or 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. Failure to handle valves properly may cause a valve to shift, slip or fall causing serious injury or death and/or equipment damage.

6.3 Moving Valves

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.

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 stored according to these requirements.

These are general guidelines for valve storage. Storage guidelines for accessories fitted on valves 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, valves 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. Valves must be stored in a closed, clean, and dry environment.
2. Ball valves should be stored in the fully open position to protect the ball and seats.
3. Ball valves should remain in the original shipping container and be placed on pallets of wood or other suitable materials. End protectors should remain on the valve ends to prevent the entrance of dirt and removed only at time of installation.

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. Valves must be stored in a closed, clean, and dry environment.
2. Ball valves should be stored in the fully open position to protect the ball and seats.
3. Ball valves should remain in the original shipping container and be placed on pallets of wood or other suitable materials. End protectors should remain on the valve ends to prevent the entrance of dirt and removed only at time of installation.
4. 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
> Flange covers
> 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

Manually actuated valves may be stored in the vertical or horizontal position. For air or hydraulically actuated valves, the preferred orientation is with the valve stem in the vertical position. Access ports should be secured to prevent unauthorized entry and prevent contamination.

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.

End protectors shall remain on the valve ends to prevent the entrance of dirt, debris, or insects/wildlife.

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

Valves 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

DANGER

Before installation check the order number, serial number, and/or the tag number to ensure that the valve and actuator being installed are correct for the intended application.

CAUTION

Do not insulate extensions that are provided for hot or cold services.

Before installing a new valve in the line, check the nameplate instructions and tag plates on the valve for identification. Ensure that the characteristics of the valve match those specified by the piping specifications where the valve will be mounted. If this information is missing, consult factory.

CAUTION

Ensure pipeline is fully cleaned before installation of the valve into the pipeline. Pipeline debris, scaling, etc. will damage the soft seat inserts of the valve and cause seat leakage during commissioning. During commissioning and pipeline flushing, valve should be kept fully open to prevent damage to the internal parts.

NOTICE

Prevent damage to the valve during flushing and testing of pipelines by substituting them with spool pieces. If use of spool pieces is not possible, it is essential that the valve is kept is fully open. It's also advisable to install strainers at critical places to protect the soft seats of the valves from solid particles.

It is recommended that valves be mounted in a horizontal position (with stem pointing vertically). We do not recommend installing the valve with the actuator on the underside because dirt in the pipeline may enter the body cavity and damage the gland packing.

To facilitate servicing, it may be necessary to firmly support the pipeline to protect the valve from excess stress and reduce pipeline vibrations. Ideally the valve should be supported by the body, using pipe clamps and supports. Do not fasten supports to the flange bolting or to the actuator.

Ensure there is enough space around the valve for it to operate from the fully open to fully closed position.

Flanged Valves

1. Do not attempt to correct misalignment by means of flange bolts.
2. During the tightening operation, ensure that piping stresses are not transferred to the valve.
3. To ensure tight sealing, pre-tighten the bolts in an alternating diagonal pattern. Do not tighten in an adjacent pattern.
4. Over-tightening of flange studs can cause damage and/or leakage of the end flanges or body/end connection joints.

Weld End Valves

A qualified welder must perform the welding operation following the welding procedure according to ASME Boiler and Pressure Vessel Code Section IX.

It is not recommended to have valve fully closed when welding. Weld slag should be minimized.

CAUTION

Do not allow temperature of the valve body seat area to exceed 200°F (94°C) to prevent seat and seal damage during welding operation. Thermal chalks are recommended for checking the temperature.

NOTICE

Any damage to the seats due to temperatures above 200°F (94°C) can cause valve leakage. It is recommended that the customer keep spare kits at their end.

CAUTION

Ensure that weld spatter does not fall over ball and body seals. This may damage the sealing surfaces and seals. After welding, flush the pipeline when the valve is in open condition to remove the weld spatter formed during welding and then operate the valve 3-4 times in order to ensure the proper operation of the valve.

Butt Weld Valves

When installing butt weld end valves, ensure proper alignment and use appropriate welding procedures.

If butt-welding the valve without pipe pups, never install the valve when the ball is in the closed position.

DANGER

To avoid serious injury, keep hands, hair, clothing, etc. away from the seat when the valve is working.

8.1 Valve Removal From Line

1. If an internal problem is suspected with the valve and disassembly is required, remove the valve from the line by proceeding as follows.
2. Attach a hoist or some means to support the valve.
3. Remove line bolting. Do not attempt to pry line flanges apart by pushing or pulling on the valve or actuator.
4. Slide the valve carefully from the line. To avoid damage to the gasket surfaces, do not twist the valve.

WARNING

Depressurize the line to atmospheric pressure, drain all process fluids and decontaminate the valve (if caustic or hazardous materials are present). Failure to do so can cause serious injury. Cycle the valves 2-3 times to make sure there is no trapped pressure. Leave the valve in the fully opened position.

8.2 Disassembly

1. Ensure that valve is in the closed position before disassembling.
2. Hold the valve in a horizontal position (stem vertical) in a secure manner. A vise or clamp could be used.
3. For gear-operated or actuated valves, remove the operator. Also, remove the bracket by removing the nuts and the studs. Then, remove the coupling from the stem and the keys. For lever-operated valves, remove the hand lever by removing the cap screw.

NOTICE

During this operation, take care not to damage the stem and key.

4. Remove the circlip from the stem.
5. Remove the stem housing cap screws and dowel pin.
6. Lift the stem with stem housing from the body.
7. Remove the stem housing O-ring and gasket.
8. Remove the stem from the stem housing.
9. Remove the stem O-ring and thrust washer.
10. Remove the anti-static device.
11. Keep the valve in a vertical position (stem slot horizontal) on plane and clean surface, taking care that end flange sealing surface does not get damaged.
12. Remove the body nuts in a crisscross pattern and lift the end connector with the seat and insert, taking care not to damage internals.

13. For a three-piece valve, lift the valve and place it so that the end flange surface of the second end connector is facing upward. Remove the end connector as mentioned above.
14. Remove the ball along with the bearing retainer from the body.

NOTICE

Take care not to damage the ball and the body seat or leakage could result, even when new seats are installed. Always place the ball on a soft liner on a table to prevent it from rolling.

15. Remove the ball trunnion bearing from the bearing bore in the ball on both the stem and trunnion side.
16. Remove the O-ring, and body gaskets from both the connectors.
17. Remove the seat and insert from both the connectors.
18. Remove the seat O-ring from the seat.
19. Remove the springs from the connectors.
20. Where applicable, the sealant injection fittings, and drain/vent plugs may be removed for cleaning.

NOTICE

Recommended spare parts are listed on the exploded view. These parts should be stocked to minimize down time.

After the complete disassembly of the valve, all the components should be stored in a clean place to avoid damage.

8.3 Visual Inspection

Perform visual inspection during any operation performed .

Valve mounting: Inspect raised faces on the end flanges and body bolting for any damage.

Valve repair: Inspect ball surface and all sealing surfaces for any imperfections and scratches. Inspect Seats and seals for dents and scratches. All parts shall be maintained in good clean condition.

8.4 Reassembly

1. Clean and inspect all parts for damage and change part(s) as necessary.

NOTICE

If complete disassembling becomes necessary, replacement of all seats and seals is recommended.

2. Place the body on a clean wooden surface.
3. Coat body studs with anti-corrosive paste.
4. Place both end connectors with their flange surfaces resting on a clean wooden surface.

5. Place the springs in holes provided on connectors or the seat and fit the O-ring on seat assembly.
6. Fit the seat O-ring on the seat assemblies. Lower the seat assemblies into the connectors.
7. Fit the O-ring (body) and the body gaskets on both the connectors.
8. Fit the O-ring (stem) and thrust washer (stem) on the stem.
9. Locate the stem in the stem housing.
10. Fit the O-ring (stem housing) and gasket (stem housing) into the stem housing.
11. Fit the thrust washers (trunnion) on the top and bottom flats of the ball.
12. Fit the ball trunnion bearing into the bearing bore in the bearing retainer.
13. Fit the bearing retainer onto the ball trunnion.
14. Assemble the packing energizer, packing kit, O-ring [(stem) and (stem housing)], and thrust washer (stem) onto the stem.
15. Lift the ball and lower it into the body in the appropriate position.
16. Locate the stem in the ball recess and tighten the gland cap screws according to the Bolting Torque Charts.
17. Lift the valve and place it so that the direction of the flow axis is horizontal (stem vertical).
18. Locate the dowel pins and place the stem housing on the body so the stem housing fits into the ball trunnion bearing and stem flats located in the ball slot.
19. Place and tighten the cap screws for the housing according to Bolting Torque Charts.
20. Fit both end connectors with seats to the body and tighten the nuts according to the Bolting Torque Charts.
21. Fit the gasket (stem) in the stem housing recess.
22. Locate the dowel pins, place the ISO mounting flange on the stem housing and tighten the cap screws.
23. Fit the stem key in the stem key way.
24. For lever-operated valves, place the hand lever on the stem and tighten the cap screw. For gear-operated or actuated valves, place the coupling on the stem, place the bracket to the ISO mounting flange, fit the studs and tighten the nuts. Place the gear operator or actuator on the coupling and the bracket, fit the studs and tighten the nuts.

25. Where applicable, fit the sealant injection fittings [(stem) and (seat)] and drain/vent plugs.
26. Rotate the ball slowly back and forth to a full quarter-turn. This will allow the seat to assume its permanent position and shape against the ball and body. A fast turning motion may damage the seat before it has a chance to form a proper seal.

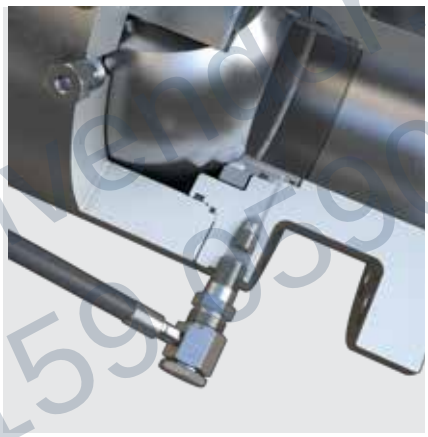
9.0 SEALANT INJECTION

The secondary sealant injection system is used only when damage has been caused to the seat sealing area or stem seals by hard particles or dirt in the process media when a temporary tight shut off is required for maintenance or other purpose.

Use standard grades of valve sealants, which are suitable for the media in the valve. The factory recommends Sealweld 5050.

Push sealant onto the seat surface through the sealant injection port provided on the valve body using a hand pump. Push sealant onto the stem surface through the sealant injection port provided on the stem housing using a hand pump. Prior to injecting sealant, flush the sealant port with suitable valve cleaner. This will purge any old sealant and debris from the valve seats.

During an emergency seat sealing operation, the valve shall be in the fully closed position. Once the valve is cycled again, the re-sealing operation must be repeated.



10.0 OPERATION

Operation of the valve is done by turning the stem a ¼ turn (90° turn). Clockwise to close, and counter clockwise to open.

Wrench operated

Open position:
The handle is in parallel with the valve or pipe line.

Closed position:
The handle is in perpendicular with the valve or pipe line.

Gear and Actuator operated

The position of the valve is shown on the indicator or the marking on the gear box and actuator.

Conditions

The rim pull effort/force applied on the hand wheel of the gearbox or lever shall not exceed 360N (80 lbf).

Do not apply extra leverage using a pipe or bar, when the end stops of the gearbox reach the final setting position.

Valves always close in clockwise direction. The ball should always be rotated through 90° to the fully opened or fully closed position.

Keeping the valve at any intermediate position should especially be avoided, as high fluid velocity through the narrow opening will produce erosion of the seat, ball and possibly the body.

CAUTION
Valves with a gear box and actuators should be checked for actuator-valve alignment. Misalignment will result in high operation torque and damage to valve stem and seal.

OPEN POSITION

NEED ARTWORK

CLOSED POSITION

NEED ARTWORK

11.0 MAINTENANCE AND REPAIR

The type of process, fluids involved, working condition(s) and location of the valves in the process plants will determine the frequency of periodic preventive maintenance. Valves should be inspected for smooth operation and leak free performance a minimum of once every 3 months. This is recommended for stored valves also.

1. Look for signs of gasket leakage through the body/end connector joint and body/stem housing joint. If necessary, retorque the nuts/bolts according to the Bolting Torque Chart.
2. If possible, stroke the valve and check for smooth, full stroke operation. Unsteady stem movement may indicate an internal problem.
3. Ensure all brackets, gear, and actuator bolting are securely fastened.
4. Periodically flush the sealant ports with suitable valve cleaner to flush debris from the sealant system.
5. Cavity flushing is recommended for preventing accumulation of dirt/debris in the body cavity. Supply compatible fluid into the vent port and flush through the drain port provided at the bottom of the valve.

To avoid possible injury to personnel or damage to products, adhere to all safety terms. 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.

Follow all recognized regulations for safety and good engineering practices, in addition to the operating instructions and the obligatory accident prevention directives valid in the country of use.

WARNING

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

Use only Bray original spare parts. Bray cannot accept responsibility for any damages that occur from using spare parts or fastening materials from other manufacturers. If Bray products (especially sealing materials) have been stored for long periods of time, check them for corrosion or deterioration before putting them into use.

Bolting Torque (lb.in.)

Size NPS	Class	Body Bolting		Stem Housing Bolting		Gland Bolting
		Material		Material		Material
		B7, L7, 2H	B7M, L7M, 2HM B8M Class 2, B8 Class 2	B7, L7	B7M, L7M, B8M Class 2, B8 Class 2	B7, L7, B7M, L7M, B8M Class 2, B8 Class 2
2	150	655	522	71	62	35
2	300	655	522	71	62	35
2	600	655	522	71	62	35
3	150	655	522	71	62	35
3	300	655	522	150	124	35
3	600	1301	1044	150	124	35
4	150	655	522	150	124	35
4	300	655	522	150	124	35
4	600	1301	1044	150	124	35
6	150	655	522	150	124	44
6	300	1301	1044	150	124	44
6	600	3753	3000	266	212	62
8	150	1301	1044	266	212	62
8	300	1301	1044	266	212	62
8	600	5629	4505	266	212	71
10	150	1301	1044	266	212	62
10	300	2328	1859	266	212	71
10	600	8311	5399	655	522	97
12	150	2328	1859	266	212	71
12	300	3753	3000	655	522	97
12	600	11718	7612	655	522	97
14	150	2328	1859	266	212	71
14	300	3753	3000	655	522	97
14	600	15940	9568	1301	1044	115
16	150	3753	3000	655	522	97
16	300	5629	4505	1301	1044	115
16	600	21074	12648	1301	1044	204
18	150	3753	3000	655	522	97
18	300	8311	5399	1301	1044	204
18	600	34429	20658	2328	1859	230
20	150	5629	4505	1301	1044	115
20	300	11718	7612	1301	1044	230
20	600	42740	25641	3753	3000	266
24	150	8311	5399	1301	1044	230
24	300	15940	9568	3753	3000	266
24	600	52414	31447	3753	3000	283

Bolting Torque (N m)

Size DN	Class	Body Bolting		Stem Housing Bolting		Gland Bolting
		Material		Material		Material
		B7, L7, 2H	B7M, L7M, 2HM B8M Class 2, B8 Class 2	B7, L7	B7M, L7M, B8M Class 2, B8 Class 2	B7, L7, B7M, L7M, B8M Class 2, B8 Class 2
50	150	74	59	8	7	4
50	300	74	59	8	7	4
50	600	74	59	8	7	4
80	150	74	59	8	7	4
80	300	74	59	17	14	4
80	600	147	118	17	14	4
100	150	74	59	17	14	4
100	300	74	59	17	14	4
100	600	147	118	17	14	4
150	150	74	59	17	14	5
150	300	147	118	17	14	5
150	600	424	339	30	24	7
200	150	147	118	30	24	7
200	300	147	118	30	24	7
200	600	636	509	30	24	8
250	150	147	118	30	24	7
250	300	263	210	30	24	8
250	600	939	610	74	59	11
300	150	263	210	30	24	8
300	300	424	339	74	59	11
300	600	1324	860	74	59	11
350	150	263	210	30	24	8
350	300	424	339	74	59	11
350	600	1801	1081	147	118	13
400	150	424	339	74	59	11
400	300	636	509	147	118	13
400	600	2381	1429	147	118	23
450	150	424	339	74	59	11
450	300	939	610	147	118	23
450	600	3890	2334	263	210	26
500	150	636	509	147	118	13
500	300	1324	860	147	118	26
500	600	4829	2897	424	339	30
600	150	939	610	147	118	26
600	300	1801	1081	424	339	30
600	600	5922	3553	424	339	32

12.0 REPAIR KITS

Only Bray repair parts shall be used to service Bray products. Contact Bray for ordering proper repair kit and any valve replacement parts not provided in the repair kit.

When ordering repair kit and replacement parts, include

1. Valve identification information
2. Valve serial number if provided
3. Replacement part item number, part description and quantity.

13.0 TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	SOLUTION
Leakage through a closed valve	Damaged ball surface	Replace the ball
	Damaged seats	Replace seats
	Ball might not be closed fully	Check ball Open/Close settings (for example, the gear stops on a gear operator)
Irregular ball movement	Impurities between the ball and seat or the ball, body I.D., and seats	Flush the ball from inside, Clean the sealing surfaces and replace seats
Valve torque too high	Damaged seats	Use emergency seal, by filling end connection injection ports with sealant. Replace seats and seals as soon as possible.
	High application pressure / temperature	Confirm the application pressure / temperature rating
	Foreign particles in Valve	Clean the valve internals.
Water hammer or noisy operation	Error in valve sizing or flow of fluid with high velocity	Confirm valve sizing with respect to flow
Leakage through stem	Gland cap screw loose	Tighten gland cap screw
	Damaged stem, stem sealing surface	Replace the stem
	Damaged stem seal	Replace the stem seal

14.0 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
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