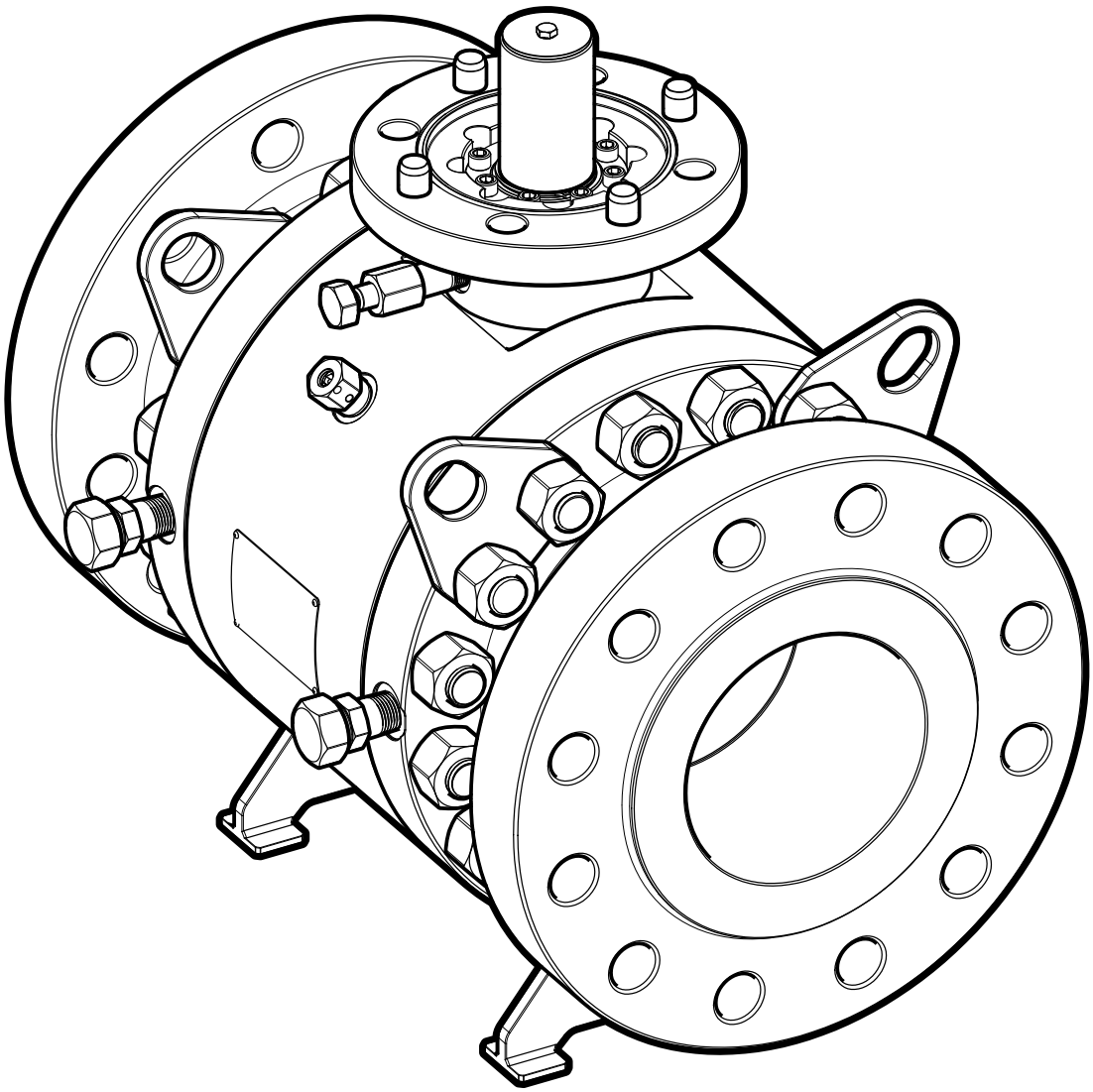
CAST STEEL
TRUNNION MOUNTED BALL VALVE

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

CAUTION

It is important to ensure safe operation of our valves that you read, understand, and follow all the contents of this manual, including all safety cautions and warnings to avoid personal injury or property damage.

DO NOT install, operate, or maintain valve without being fully trained and qualified in valve installation, operation, and maintenance. If you have any questions about this manual, contact Bray International, Inc. before proceeding.

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.

No repairs, such as welding and painting touch up, should be conducted when the valve is operating online.

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.

CAUTION

Ball valves can trap pressurized fluids in ball cavity when closed. If the valve has been used to control hazardous media, it must be decontaminated before disassembly. It is recommended that the following steps are taken for safe removal and reassembly:

1. Relieve the line pressure.
2. Place valve in half-open position and flush the line to remove any hazardous material from valve.
3. When being repaired offline, the valves closest to either end of the valve being repaired should be opened first, in order to relieve the line pressure.

After being removed from the pipeline, the valve should be vertically placed on the workbench for disassembly. In doing so, position the valve so that its inlet port faces the work surface to drain and remove any remaining liquid medium or rigid granules possibly left over inside the valve cavity.

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.

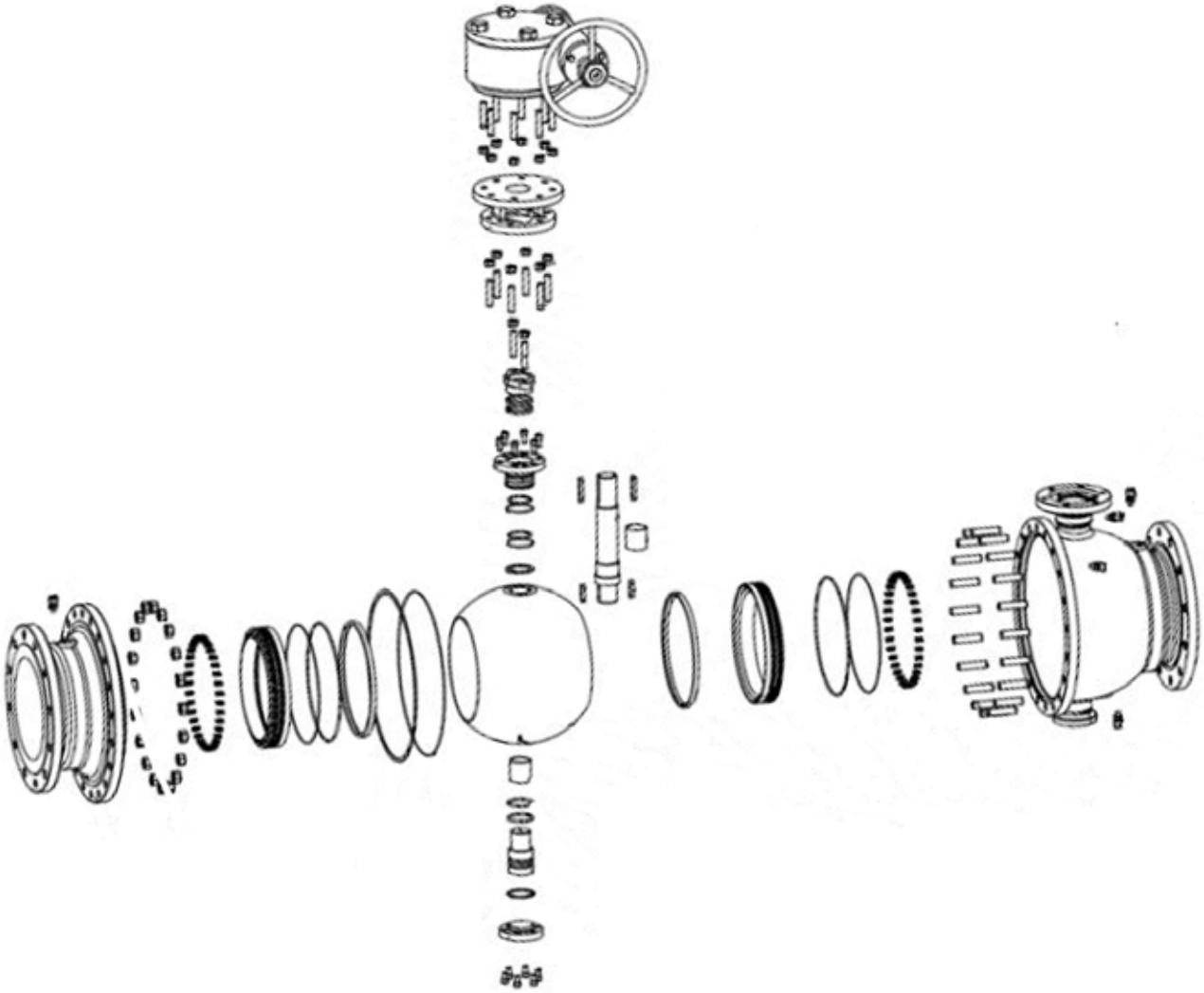
A **qualified person** (in terms of this document) is one who is familiar with the installation, commissioning, and operation of the device, and who has appropriate qualifications, such as:

4. Is trained in the operation and maintenance of pressure equipment and systems in accordance with established safety practices.
5. Is trained in the operation and maintenance of electrical equipment and systems in accordance with established safety practices.
6. Is trained or authorized to energize, de-energize, ground, tag, and lock electrical circuits and equipment in accordance with established safety practices.
7. Is trained in the proper use and care of personal protective equipment (PPE) in accordance with established safety practices.

8. 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	Bolt	
3	Nut	
4	Spring	
5	O-Ring	
6	Seat Insert	
7	Seat	
8	O-Ring	
9	Gasket	
10	Cover	
11	Ball	
12	Anti-static Device	
13	Bearing	
14	O-Ring	
15	Trunnion	
16	Gasket	
17	Plug	
18	Hex Socket Screw	
19	Gland	
20	Bearing	
21	Upper Stem	
22	Gland	
23	Gasket	
24	O-Ring	
25	Gland	
26	Hex Socket Screw	
27	Packing	
28	Bushing	
29	Bolt	
30	Nut	
31	Bolt	
32	Nut	
33	Yoke	
34	Nut	
35	Bolt	
36	Gearbox	
37	Grease Fitting	
38	Vent Valve	
39	Drain Plug	

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

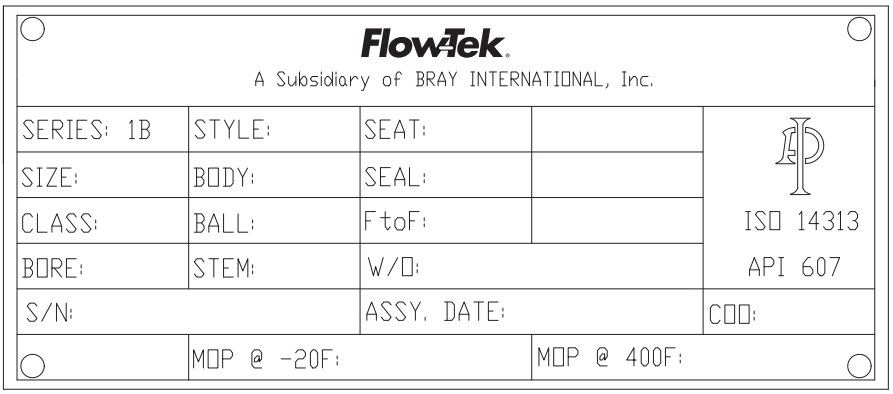
Before products are returned to Bray for repair or service, Bray must be provided with a certificate that confirms that the product has been decontaminated and is clean.

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.

6.4 Lifting Valves

When lifting the valve with chains, the operation device should not touch the chains. At the same time, avoid the angle between the chains to be less than 60 degrees, see Figure 1.

CAUTION

NEVER use hand wheels, gearbox, actuator or any other protruding part of the valve as a support for lifting the valve. Lifting lugs, if provided, are attached to balance the weight. Never use just one lifting lug for lifting.

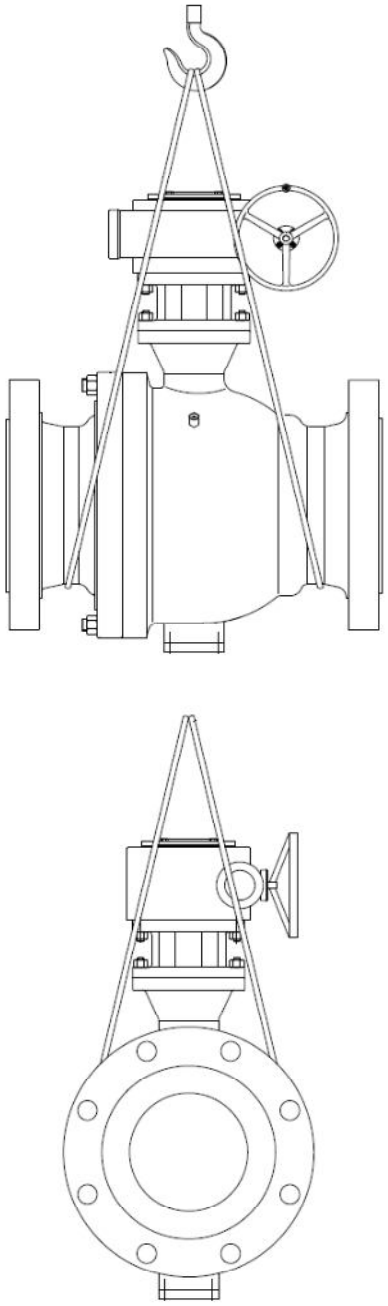


Figure 1 - Lifting Valves

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

Valves stored for long periods should be subject to scheduled inspections, which include:

1. Removal of foreign substances, rust, or stains
2. Re-application of a coating of rust preventive oil (grease) on any non-machined surfaces
3. Opening and closing of the valve to verify proper and agile operation
4. Visually inspect to assure that it is free of rust which could cause jamming during operation. After the inspection, seal the valve and store it back in place.

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.

7.5 Warehousing

For acceptance inspection and testing before warehousing, it shall be carried out according to API 6D, API 598 or PO requirements;

For the trunnion ball valves, the pressure tests shall be performed to the pressure-temperature rating of the valve body material.

The order of testing should be:

> Shell
> High Pressure Hydrostatic Seat Closure
> Low Pressure Pneumatic Seat Closure

For shell test, no observable leakage is allowed.

CAUTION

After shell test, the fluid can be remained but the pressure shall be relieved before proceeding seat tests.

For bi-directional ball valves, seat leakage shall be monitored from each seat via the valve body cavity vent or drain connection, where provided.

For valves without a body-cavity vent or drain connection, seat leakage shall be monitored from the respective downstream end of the valve.

If the testing procedure and inspection method different than the standard procedure, the PO requirements shall be followed.

The shell test pressure shall be 1.5 or more times the pressure rating determined in accordance with Pressure-Temperature Rating for material at 38 °C (100 °F) in ASME B16.34-2009.

For testing during, please see Table 1 and 2 (API 6D reference).

Table 1 - Minimum Duration of Hydrostatic Shell Tests

Valve Size DN	Valve Size NPS	Test Duration Minutes
15 to 100	½ to 4	2
150 to 250	6 to 10	5
300 to 450	12 to 18	15
≥ 500	≥ 20	30

Table 2 - Minimum Duration of Hydrostatic Seat Tests

Valve Size DN	Valve Size NPS	Test Duration Minutes
15 to 100	½ to 4	2
≥ 150	≥ 6	5

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.

Before installation, remove the end connection seal covers and make sure that the flange or butt-weld ends are free of rust or dirt.

During installation, keep the valve in the full-open position.

For uni-directional single seated and bi-directional double seated valves, the direction of valve installation shall comply with the direction mark on the valve body.

The valve should be mounted in its natural state (i.e. without additional fabrication modifications, such as piping or supports) to prevent undue and improper installation stresses which will be generated by added pipe or supports.

Before the installation of a threaded valve, a socket-weld valve or a butt-weld valve, make sure that there is no rust or dirt remaining on the thread, socket, or butt-weld end. For weld connections, greasy dirt left over on the weld end must be cleaned.

When tightening flange bolts, use the crisscross method and gradually tighten each nut, repeating several times, to ANSI or gasket manufacturer's specifications. Excessive tightening can cause damage and/or leakage to the end flanges or body-to-body end joint.

In high temperature applications, valves and piping can get very hot causing possible skin injury when in contact. Proper pipe and valve insulation is suggested. An eye-catching warning should be provided to avoid scalding or burns in such applications.

After installation, the valve should be fully opened for pipe purging and pressure testing so as to examine the sealing performance of valve, valve connection ends and the entire pipeline system as well as the valve operation.

For the bare stem valves without actuator, when the actuator is being installed, please do not impose the high downward install stress from the stem side to avoid high levels of impact strength from stem to ball, and make the ball supporting part lose effectiveness, diverge to the middle and cause leakage.

8.1 Disassembly

Before taking any step to remove the valve from the pipeline, make sure you have read and understand all instructions as prescribed in "Caution". Key steps of valve removal are shown below:

Before removing the actuator, fully close the valve, see **Figure 2**,

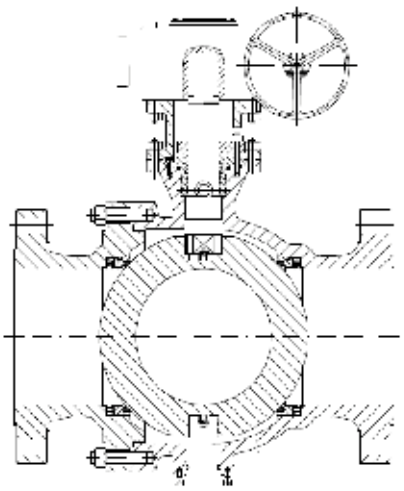


Figure 2 - Fully Closed

After the valve is fully closed, remove valve actuating parts and sealing parts, like actuator (12), top-mounted flange, stem (9), packing and packing case, and lay them out in order on the workbench to prevent the loss of parts, see **Figure 3**

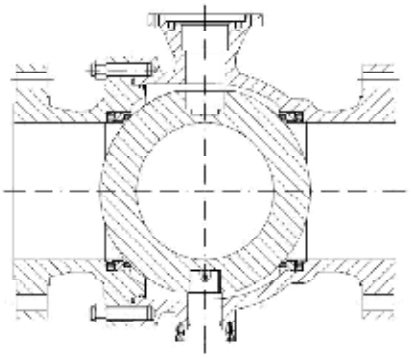


Figure 3

Place the valve vertically on a rubber-cushioned surface to prevent the flange face from being damaged, see **Figure 4**

Remove the exposed accessories including grease injection valve, drain valve (blow-out cock), and pressure relief valve.

Remove the lower end cover, lower fixed shaft, lower fixed shaft sleeve, and O-ring.

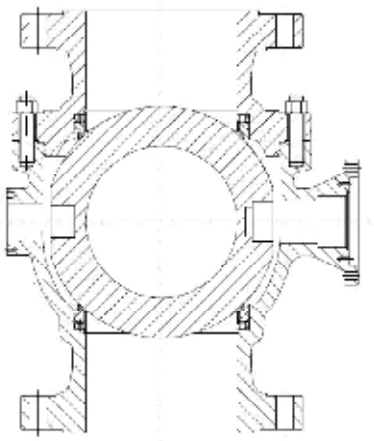


Figure 4

Remove the intermediate flange bolts (10, 11), valve seat (6) sub-assembly, and left upper valve body (8), and the pin from the supporting plate, see **Figure 5.**

Wrap up a rope with a piece of soft cloth and pass it through the ball (7) passageway. In doing so, the ball port or ball surface can be protected from scratches. Then hoist the ball as shown in **Figure 5**

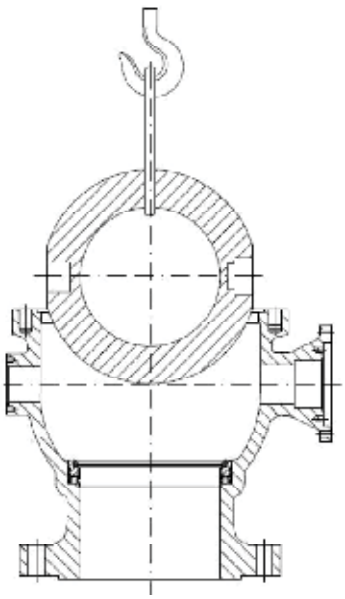


Figure 5

8.2 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.

8.3 Reassembly

Inspect all parts prior to assembly looking for possible damage. Replace spiral-wound gaskets, thrust bearings and sleeves. Other parts and components which are believed to have an impact on valve operation must be replaced as well.

The repair of damaged ball and seat seal faces must be done by licensed valve manufacturer.

Start valve re-assembly after all components have been inspected and vulnerable replacements parts are ready in place.

Valve Seat Subassembly: Insert the valve seat seal ring into the valve seat bracing ring. Apply a small amount of non-corrosive non-liquid grease on the valve seat spring and then insert it into the bracing ring, preventing the spring from dropping off during installation. Mount the seat O-ring followed by the seat insert, as shown in **Figure 6**. Place the valve seat into the valve body

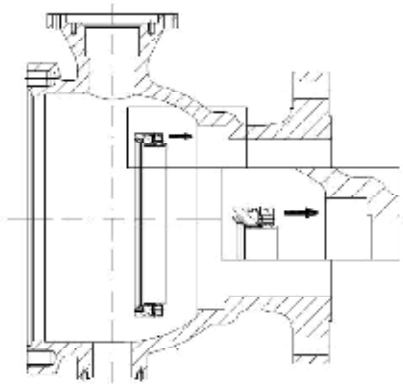


Figure 6

Place the other valve seat into the valve body in the same fashion. Mount O-ring on the intermediate flange of the bonnet.

After the valve seats are mounted in place, point the flange face of valve body downward and then place the body vertically on the work surface. Lift up the ball and place it carefully into the body. Hold the ball while it is lifted and being placed in order to prevent scratches and abrasions to the ball due to swinging. For specific steps, see Figure 5.

Place the intermediate flange gasket seal on the body (4).

Lift and assemble the bonnet to the body and initially hand-tighten the bolts located in the symmetrical bolt holes on the intermediate flange. When final tightening flange bolts, use the crisscross method and gradually tighten each nut, repeating several times.

Mount the trunnion, the stem, the bushing, the thrust washer, the stuffing box, the packing, the gland flanged respectively.

Hoist the valve placing it horizontally on the work surface. Mount the grease injection valve, pressure relief valve, drain valve, and operating mechanism;

Without placing the valve under pressure, operate the valve, fully opening and closing the valve several times;

Carry out a pressure test to determine the post-repair operating performance of the valve.

8.4 Gear Box Environmental Requirements

Operating temperature: -20°C to 60°F.

Operating condition shall not contain corrosive, flammable or explosive medium.

Installation

Check if the adjusting bolts (3)(8) are unfastened, if not, do so;

Install flat key (14) to the worm, then handwheel (12), fix them with gasket (11) and screw (10);

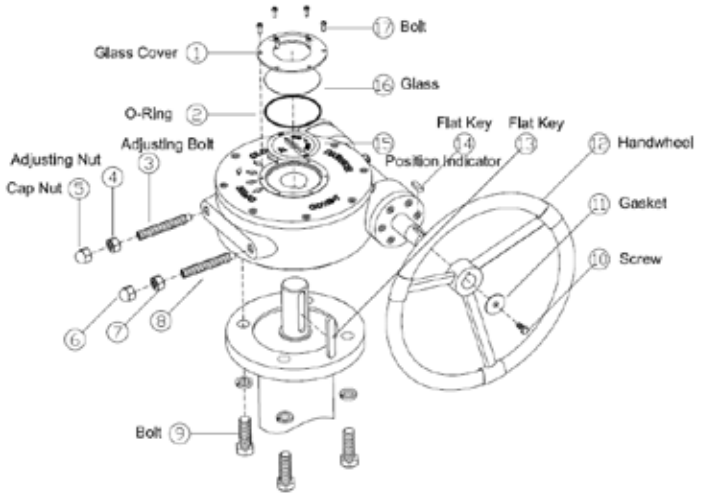
Turn handwheel until the position indicator pointing to the fully closed position, meanwhile check if valve is fully closed, if not, close valve;

Install flat key (13) to valve stem, followed by gearbox, fine tune handwheel for easier positioning of the bolts (9);

Turn handwheel clockwise until valve is fully closed, then fasten adjusting bolts (8) tightly, lock the position with adjusting nut (7) and then install the cap nut (6);

Adjust the position indicator to point to fully closed position, fix the position indicator with rivets;

Turn handwheel counter clockwise until the valve is fully opened, then install adjusting bolt (3), nut (4) and cap nut (5) in order, after confirming that position indicator is pointing to fully open position, install O-ring (2) and then the glass (16) and finally the glass cover (1) fixed with bolts (17). The gearbox is now ready to be used.



Maintenance

Humidity, outdoor and high temperature environment can cause problems for which routine check for good lubricating every half a year is required, injecting suitable amount of lubricants as necessary.

Under normal operating condition, routine check every year for lubricating is recommended, injecting suitable amount of lubricants as necessary.

Cautions

When the position indicator indicates the valves is fully opened or closed, DO NOT apply excessive force to operate the gearbox, doing so could cause damage to the gearbox.

DO NOT operate when the gearbox cover is not installed or present.

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 8i 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.

12.0 DISCLAIMER

The customer is obliged to consider the suitability of each valve's material for actual working conditions and determine the applicability of such material in terms of corrosion, temperature and impact resistances.

The maximum operating temperature-pressure rating of the valve shall not exceed the rating specified in Table 2 Rated Temperatures-Pressures, ASME B16.34-2009. If there exists such a working condition where the working pressure exceeds the limit of the specified pressure but the temperature-pressure rating table of such material lacks corresponding working temperature (including operation beyond tolerance in extreme working condition), then the user should given full consideration to such case during the selection of a specific type of valve.

This valve takes into account only applications considered ordinary working conditions during its design. In case of special working environments, such as unattended standby on field or the existence of any vibration, fire, storm, or earthquake, or prior special requirements, if any, regarding valve design must be given prior to order.

In general, a slight corrosive working condition is taken into account for valve design. If the selected material for a valve housing has to be exposed to a good deal of corrosive substances in the working condition or medium, which may result in a greater possibility of leakage at sealing positions inside the valve, like gasket, packing and O-ring, such material is regarded as not suitable for such kind of medium having special and high corrosive property. When the user selects a material to satisfy this kind of working condition, he shall consider the impact of internal and external leakage caused by corrosion on seal face to the process pipe when there is a sufficient corrosion allowance for the housing material.

For a valve which has a relatively high degree of vacuum in its cavity and whose housing has to be subject to an external pressure, due notice should be given to the manufacturer when selecting a proper model.

13.0 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.

14.0 TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	SOLUTION
Body-to-Bonnet connection leaks.	Connecting bolts are not evenly tightened up	Tighten up bolts evenly.
	Gasket is broken or invalid	Replace gasket.
Stem leaks	Packing and gasket are damaged	Replace with new packing and gasket.
Seat leaks	The seat spring exceeds its designed service life and generates insufficient pre-tightening force	Check seat bracing ring and replace supporting spring.
	The ball or seal face is deformed	It can't be used to control the flow any more except opening.
	Valve isn't fully closed	Close the valve completely.
	Seating surface is damaged	Use the emergency grease fitting to block up the leakage and then arrange the timing for inspecting the damaged seal face according to the actual operation of the pipeline.
Valve can't operate normally	Actuator is damaged	Repair and replace the actuator.

15.0 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.

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