KIMRAY INC.®

INSTALLATION OPERATION & MAINTENANCE GUIDE

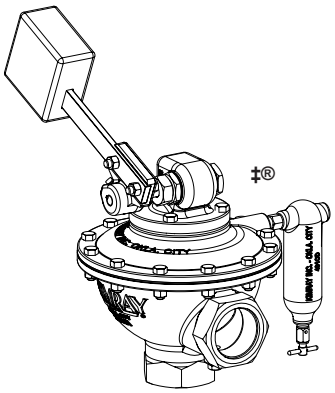
‡®

TREATER VALVE

‡ Configuration of Water Valve is a trademark of Kimray, Inc..

Contents

If you have any questions about this manual, contact your Kimray applications support group before proceeding.



All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.
‡ Configuration of Water Valve is a trademark of Kimray, Inc.
www.kimray.com

Introduction

⚠ CAUTION:
The instructions provided herein should be completely reviewed and understood before operating or repairing this equipment. All CAUTION and WARNING notes must be strictly observed to prevent personal injury or equipment damage.

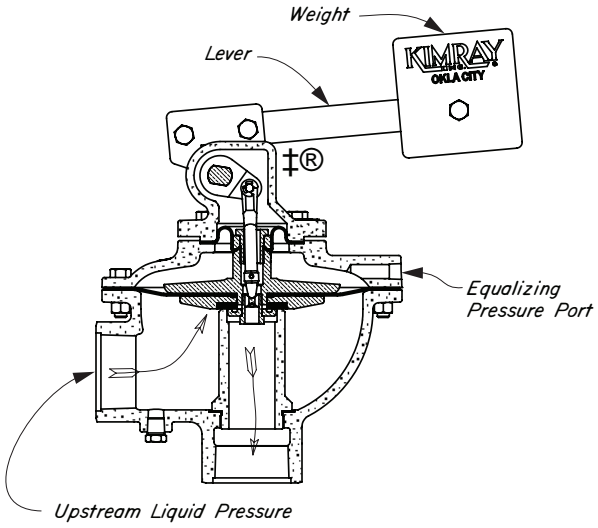
Do not install, operate, or maintain this valve without being fully trained and qualified. If you have any questions about this manual, contact the Kimray applications support team before proceeding.

A1 Scope

This document contains information for Kimray weight operated dump valves and includes detailed installation, operation, and repair/maintenance information for the product.

A2 Description

The Kimray weight operated valve is a zero-emissions product designed as an oil or water valve for emulsion treaters, water knockouts, salt water disposal and gun barrels. The valve is balanced by equalizing gas pressure directly from the vessel and actuates based on the hydrostatic pressure generated from the column of liquid in the vessel's discharge piping. The height of water column can be field adjusted by moving the weight in or out on the arm and ranges from 2 ft to 4 feet, with options up to 12 feet.



⚠ CAUTION:
When ordered, the weight operated valve configuration and construction materials were selected to meet specific pressure, temperature, pressure drop and fluid conditions. Some elastomer and trim material may allow for higher or lower temperatures and pressures.
Do not subject the valve to any other conditions. This information can be found in the technical specifications document at Kimray.com. For assistance in determining what your valve is capable of, contact your local Kimray store or authorized distributor.

⚠ NOTE:
The MAWP for this valve is lower than the connection type, ANSI class 150.

Installation

Before installing the weight operated valve, inspect it for shipment damage and for foreign material that may have collected during shipment. Check tightness of fasteners prior to valve installation. Fasteners have the potential to loosen in transit. This is recommended to ensure your safety and proper valve function.

Kimray assembly torque method below

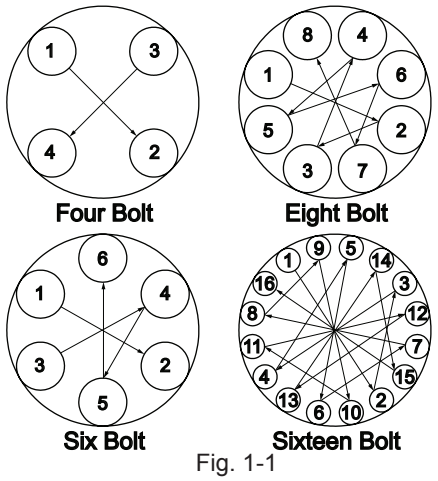


Fig. 1-1

1. For flanged bodies, remove the masking sticker from the raised face of each end connection & use a suitable gasket between the body and the pipeline flanges.. For threaded (NPT) bodies, use TFE tape or pipe thread sealant on external pipe threads.
2. Install valve with the arrow on the body pointing towards the direction of flow. The direction of flow indicated will not necessarily prevent flow in the opposite direction.
3. Install Drip Pot and ensure the drain valve is closed tightly.
4. Install gas equalizing line to 1/4” connection of Drip Pot. The equalizing line must be horizontal or sloping downward towards the drip pot so that any condensate liquids will accumulate in the drip pot. Any dips or low spots in the equalizing line could allow liquid to accumulate and freeze, blocking flow of equalizing gas, causing an imbalance.

NOTE:

DO NOT connect equalizing line with any other devices that could consume or vent gas. This would create an imbalance between the equalizing port and upstream liquid pressure

5. Adjust weight on Lever Arm for desired water column height. See figure 1-2 for adjustment heights.
6. Pressurize the system and check operation.

CAUTION:

Verify all pressure connections are tight before pressurizing the system.

NOTE:

To prevent injury, Never stand directly over or in front of a valve when the system is pressurized.

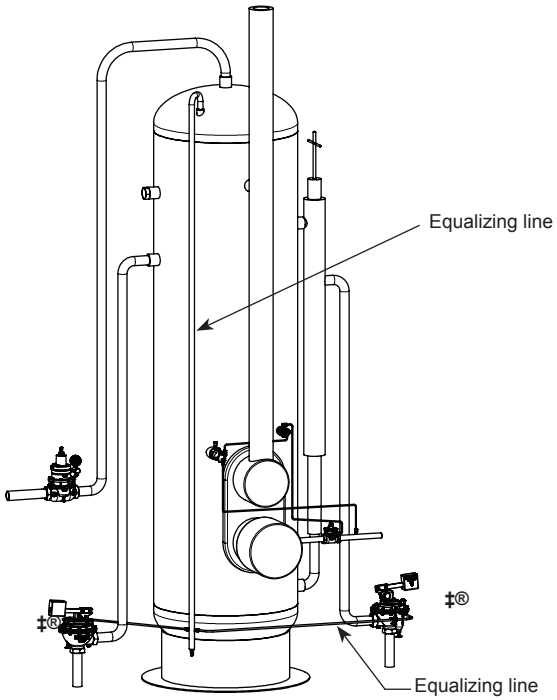


Fig. 1-2

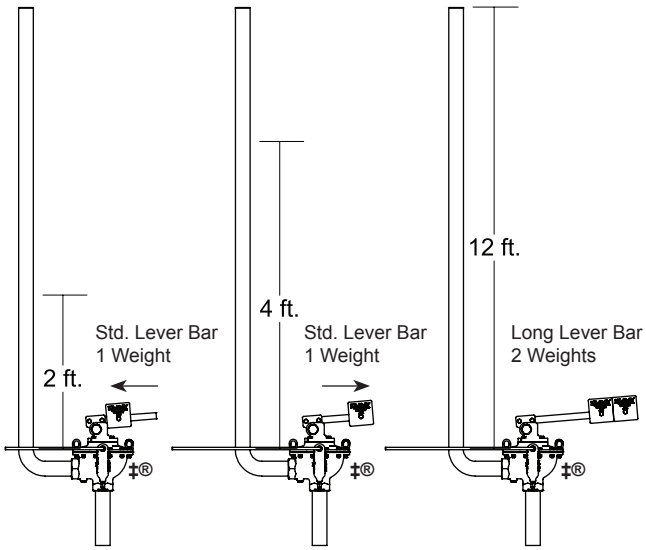


Fig. 1-3

Liquid head heights shown above are for water with Specific Gravity of 1.0. For other specific gravities, multiply the height by: $1 / \sqrt{SG}$

Maintenance

The drain valve at the bottom of the drip pot should be opened regularly to drain any accumulated liquids. Frequency will be dependent on application and ambient conditions. Start by draining daily and then extend interval if warranted. Ensure drain valve is closed/tightened after draining.

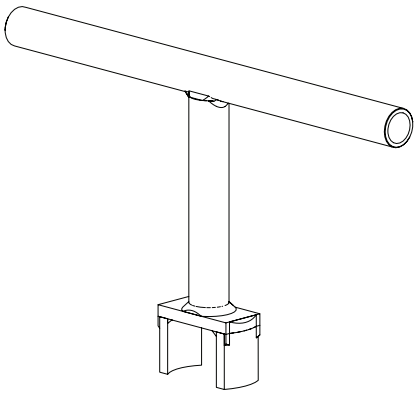
We recommend that the wearable components be replaced and critical components be inspected at an initial interval of 12 months. This interval may increase or decrease depending on application conditions. Wearable components are all included in Kimray Repair Kits. To order, contact your local Kimray store or authorized distributor.

The valve can be repaired without being removed from the piping.

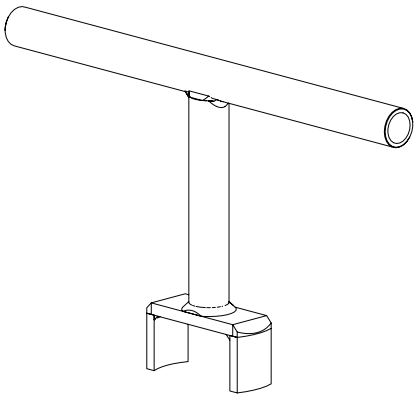
CAUTION: Block and bleed all pressure from the valve prior to performing any maintenance

⚠ Tip:
Kimray recommends using the special tools below for disassembly and re-assembly.

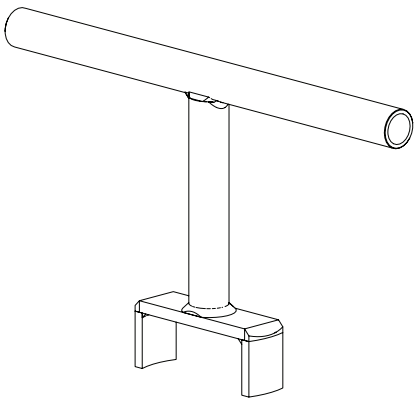
Special Tools Needed for Removal of Seat



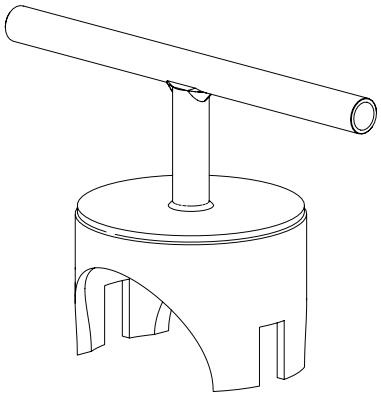
2 in.
#384SW



3 in.
#385SW



4 in.
#386SW

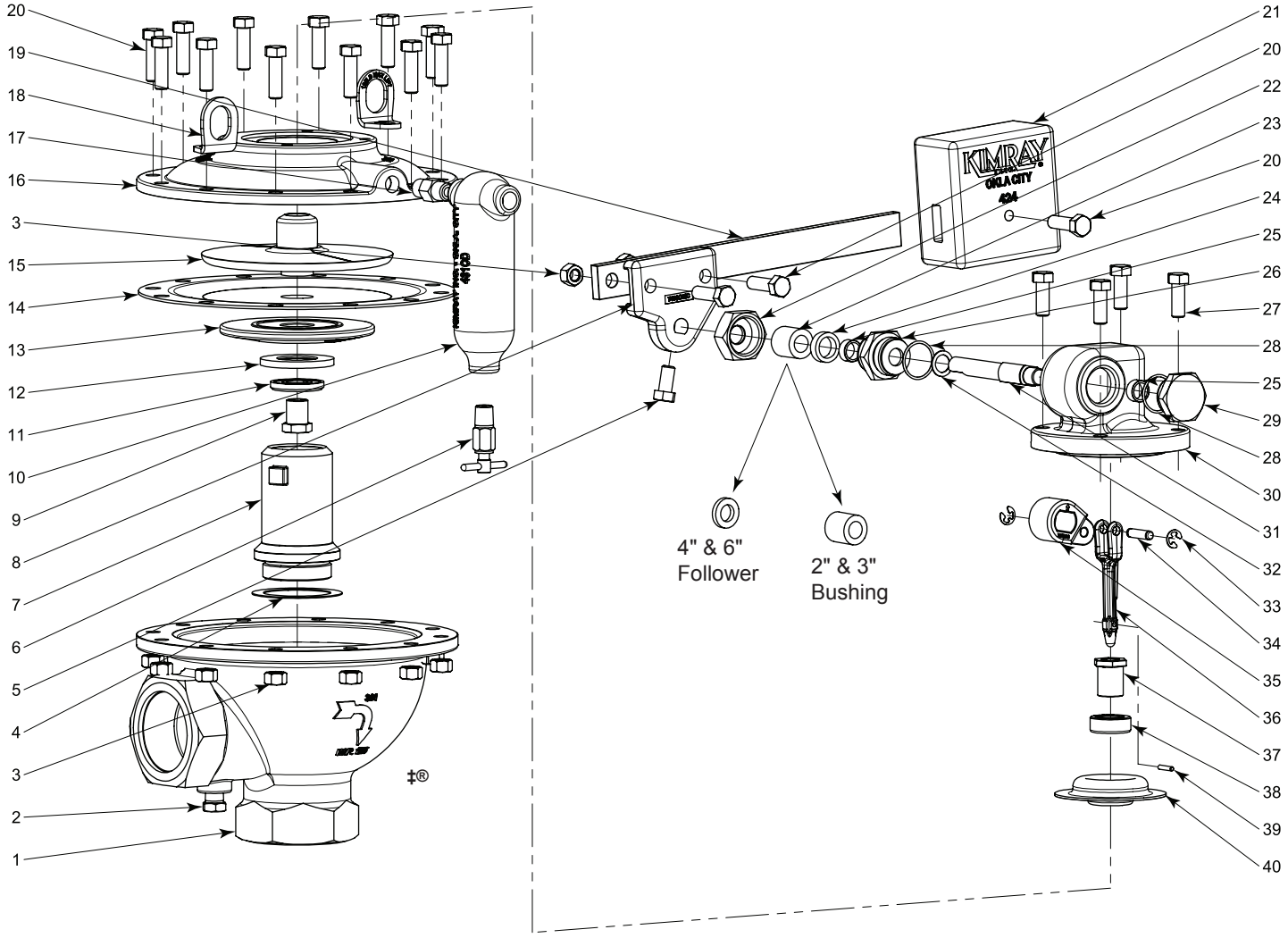


6 in.
#1771SW

All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.
‡ Configuration of Water Valve is a trademark of Kimray, Inc.

Page left blank

Configuration



Item	Description	Qty
1	Body	1
2	Plug	1
3	Nut	14
4	Gasket ⁎	1
5	Set Screw	1
6	Bleed Valve	1
7	Removable Seat	1
8	Lever Hub	1
9	Pivot Bolt	1
10	Drip Pot	1
11	Ratio Plug	1
12	Seat ⁎	1
13	Seat Disc	1
14	Large Diaphragm ⁎	1

Item	Description	Qty
15	Diaphragm Plate	1
16	Housing	1
17	Nipple	1
18	Lifting Ring	2
19	Lever Bar	1
20	Bolt	15
21	Weight	1
22	Stuffing Box Nut	1
23	Bushing / Follower ⁎	1
24	Packing Ring ⁎	1
25	Teflon Ring ⁎	2
26	Stuffing Box	1
27	Bonnet Bolt	4

Item	Description	Qty
28	O-Ring ⁎	2
29	Trunnion Plug	1
30	Bonnet	1
31	Trunnion Shaft	1
32	Thrust Washer ⁎	1
33	Snap Ring ⁎	2
34	Link Pin	1
35	Trunnion Hub	1
36	Stem	1
37	Diaphragm Bolt	1
38	Diaphragm Retainer	1
39	Dowel Pin	1
40	Small Diaphragm ⁎	1

⁎ Recommended spare parts and stocked as repair kits

All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.
‡ Configuration of Water Valve is a trademark of Kimray, Inc.

Disassembly

Weight & Lever

Remove the weight by loosening the Bolt and sliding weight off.

Remove both Bolts from the Lever Hub and remove Lever.

Loosen Set Screw and remove Lever Hub from Shaft.

⚠ **NOTE:**
If Lever Hub is difficult to remove from the Shaft, skip to next step to remove the Shaft from the Bonnet and then place into a vice. Heat the Lever Hub with a torch until it can be removed.

Shaft, Stuffing Box and Plug

Using an adjustable wrench, remove the Trunnion Plug.

Loosen and Remove the Stuffing Box Nut.

Loosen and unthread the Stuffing Box, then pull out the Stuffing Box with the Shaft. If stuck in place, tap the shaft out from the opposite end using a large center punch.

In rare cases where the shaft is bent, it may be necessary to cut the shaft off.

Remove Teflon Thrust Washer from Shaft

Remove Shaft from Stuffing Box

Remove Bushing, Packing Ring and Teflon Ring from Stuffing Box.

Bonnet and Trunnion Hub

Remove 4 Bolts from Bonnet and remove Bonnet.

Note: If Bonnet is stuck, pry gently with a flat blade screw driver.

Remove Snap Rings. Remove Pin.
Remove Trunnion Hub

Stem and Small Diaphragm Disassembly

Un-thread Diaphragm Bolt and remove Stem / Diaphragm Assembly from Body.

Pull Pin from Stem Assembly.

Pull Stem out through Diaphragm Bolt.
Remove Diaphragm Bolt and Retainer from Diaphragm.

Housing and Large Diaphragm

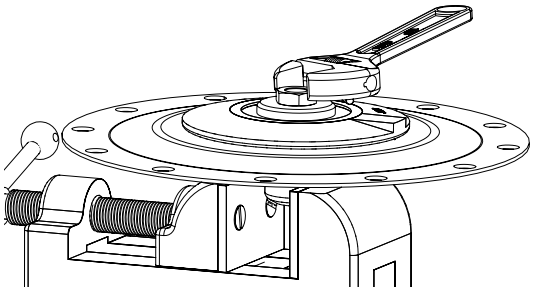
Before removing the housing, disconnect pressure line from the Drip Pot. Optionally, remove the Drip Pot from Housing to get it out of the way.

Remove all Housing Bolts and remove housing.
Pull up on Diaphragm to remove entire assembly from Body.

Turn assembly upside down and secure the neck of the Diaphragm Plate in a vise.

Unscrew and remove Pivot.

Disassemble Ratio Plug, Seat, Disc, and Diaphragm



Removable Seat

Using Seat Removal Tool, unscrew Removable Seat.

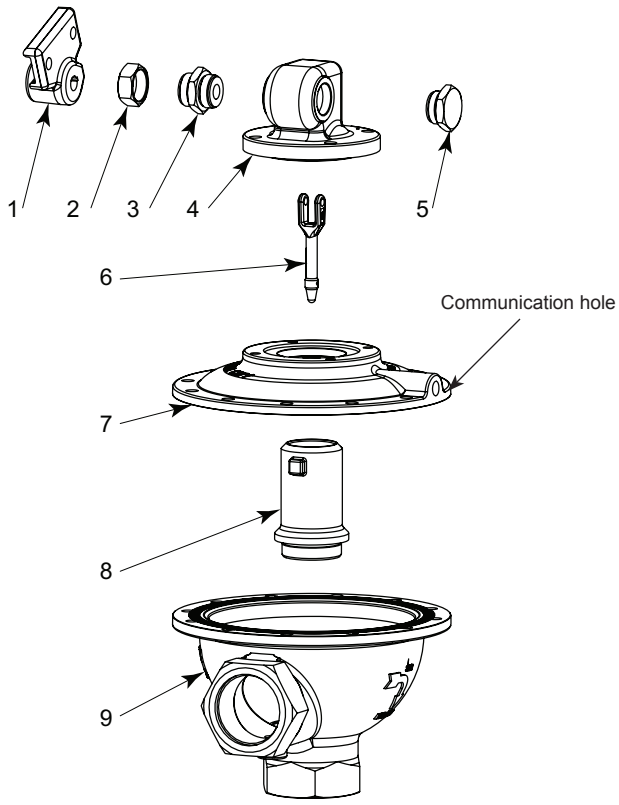
Remove Gasket from Removable Seat.

Inspection & Cleaning

Cleaning

Sand blast or wire brush to clean the following:

Item	Description	Qty
1	Lever Hub	1
2	Nut	1
3	Stuffing Box	1
4	Bonnet	1
5	Plug	1
6	Stem	1
7	Housing	1
8	Removable Seat (Metal only)	1
9	Body	1



Use an air nozzle to blow out the particles from inside.

NOTE:
Any loose particles left inside could cause leakage.

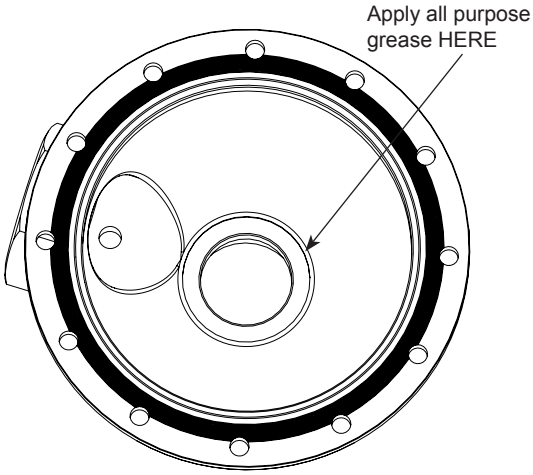
Flip Housing over and verify that communication hole is clear and free of debris.

Reassembly

The following are instructions on how to reassemble using components in the repair kit.

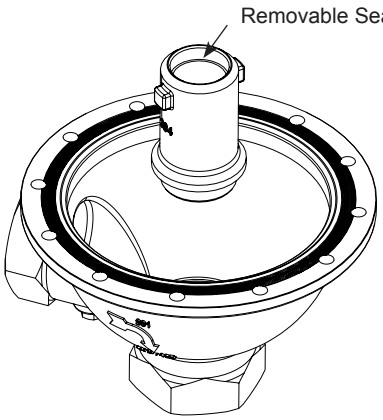
Removable Seat

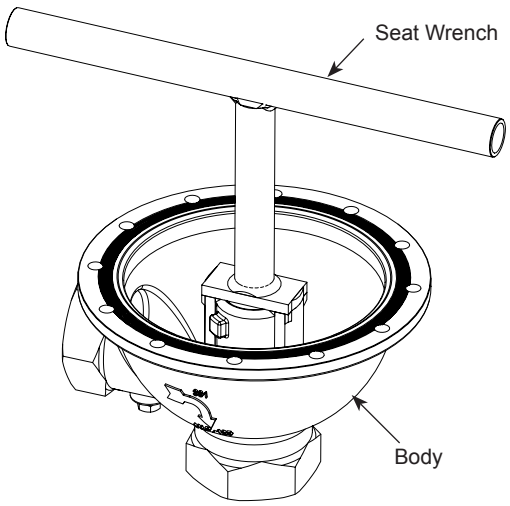
Apply all purpose grease to the Seat area of the Body as shown.



Flip Removable Seat upside down, apply all purpose grease & install new Gasket.

Install Removable Seat in Body, may have to use Seat Wrench.



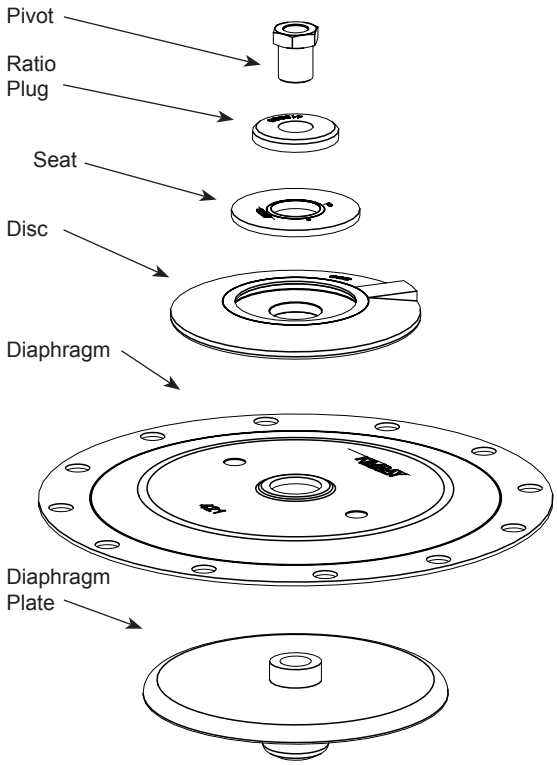


⚠ CAUTION:
Over tightening the Seat can tear the Gasket.

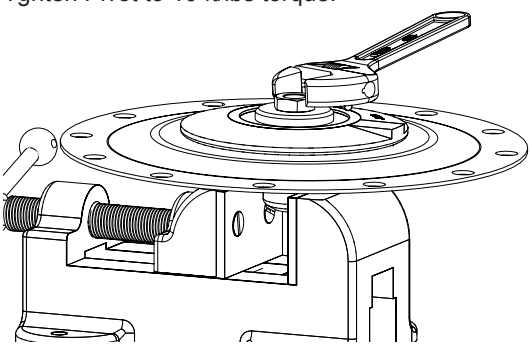
Reassembly

Diaphragm Assembly

Secure Diaphragm Plate into vise, upside down. And stack the following components on top as with “KIMRAY” logo facing up.
Stack the Disc, new Seat, and Ratio Plug, with the grooved side of the Ratio Plug facing the Seat..
Insert the Pivot and thread it into Diaphragm Plate.

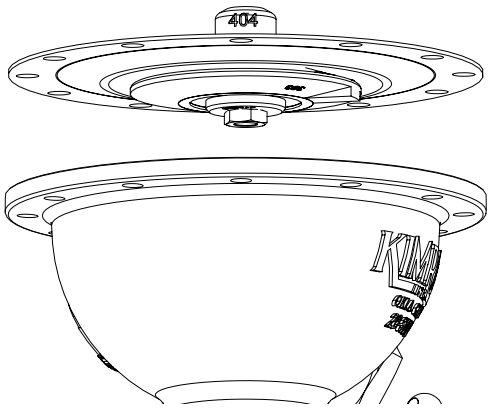


Tghten Pivot to 10 ft/lbs torque.



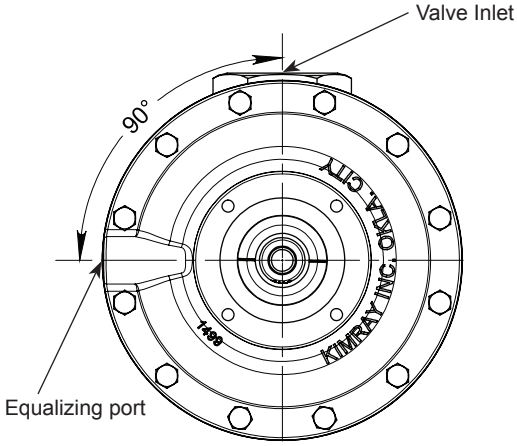
CAUTION: Overtightening could tear Gasket.

Place Diaphragm Assembly on Body.



Housing

Place Housing on Body with the equalizing port at 90 degrees counterclockwise from the Valve inlet.
Insert all Housing Bolts and hand start into huts. Tighten all to 25 ft-lbs torque.



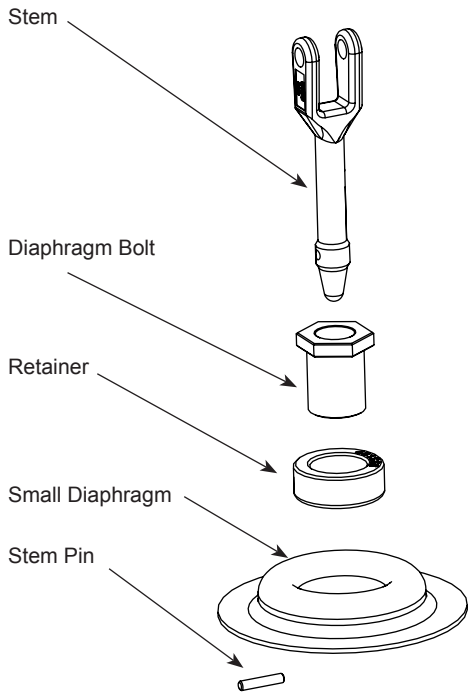
NOTE:
Bolts should be tightened in a criss-cross pattern to avoid any misalignment. See Page 5, Fig. 1-1.

Reassembly

Stem and Hub Assembly

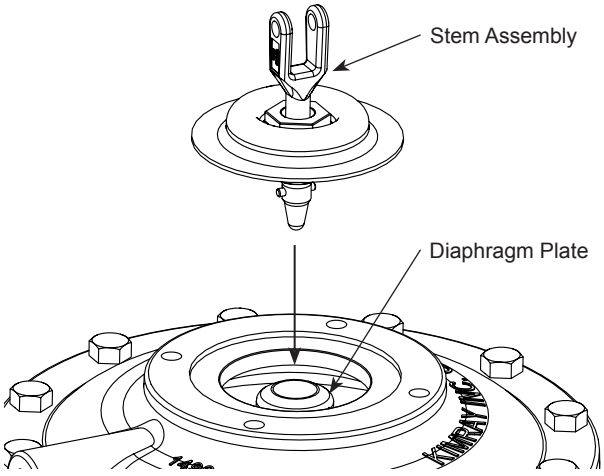
Insert Diaphragm Bolt and Retainer into new Diaphragm.

Insert Stem, then slide Stem Pin through the hole in the lower end of the Stem.

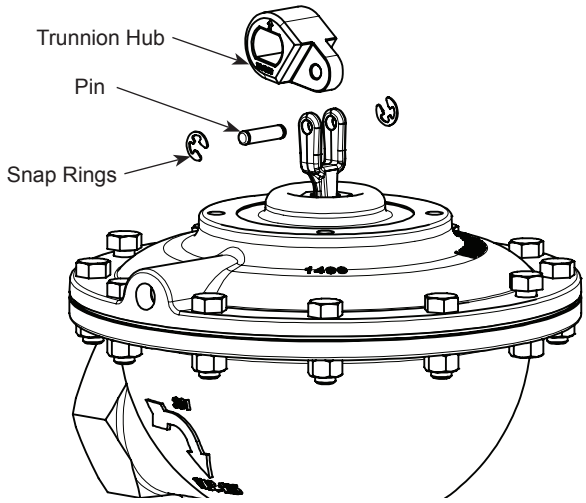


Hold Stem Pin in place and insert the end of the stem into Diaphragm Plate.
Hand tighten the Diaphragm Bolt, then tighten with a wrench to 10 ft-lbs torque.

⚠ **CAUTION**:
Overtightening could tear Gasket.



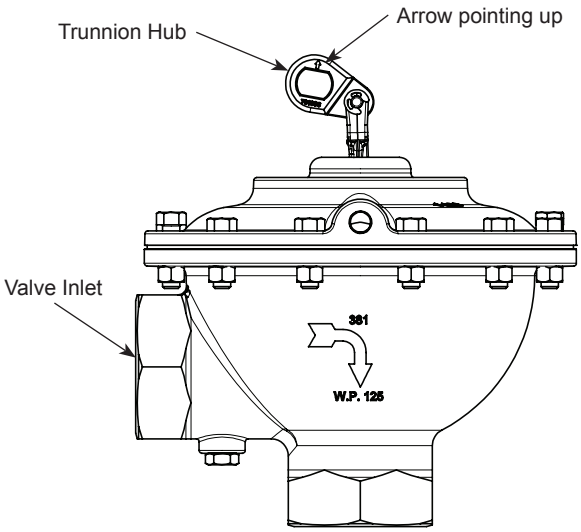
Line up small hole of Trunnion Hub with Stem holes, and insert Link Pin.
Press both new Snap Rings into place.



Reassembly

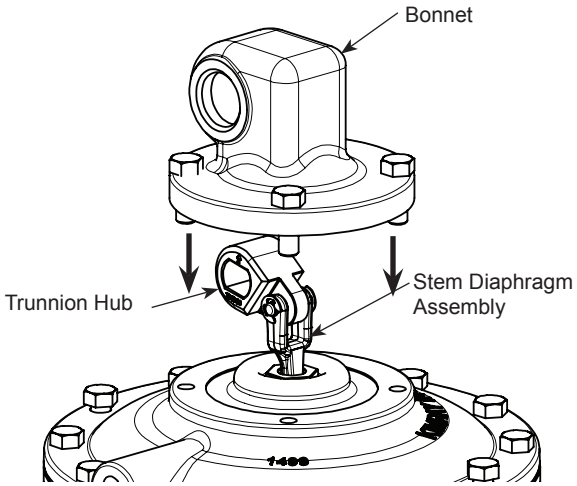
Bonnet

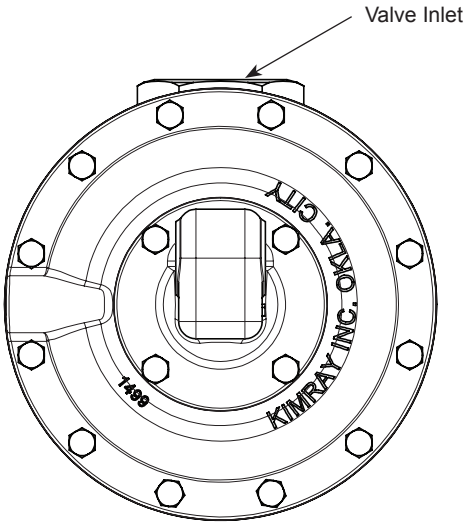
Before installing Bonnet, orient the head of the Trunnion Hub towards the valve inlet with arrow pointing UP.



Lift Trunnion Hub slightly and place Bonnet over it.

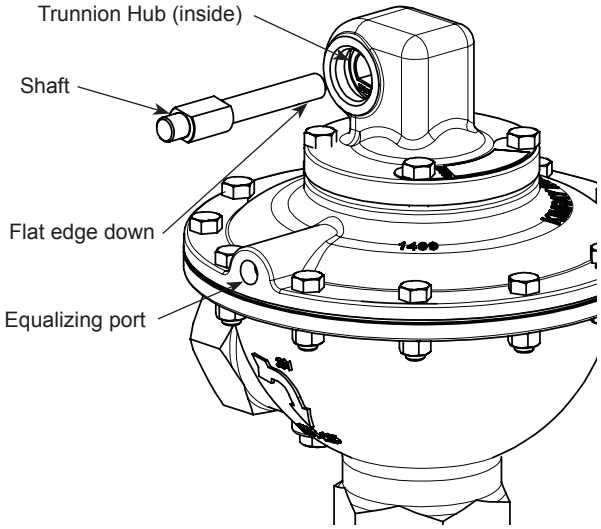
Double check orientation as shown. Rounded side of Bonnet should face Valve inlet.
Hand start the 4 Bonnet Bolts. Tighten to 25 ft-lbs torque Bolts should be tightened in a criss-cross pattern to avoid any misalignment. See Page 5, Fig 1-1





Stem

With flat edge facing downward as shown, insert Shaft through Trunnion Hub so that long end is sticking out the side opposite the equalizing port.

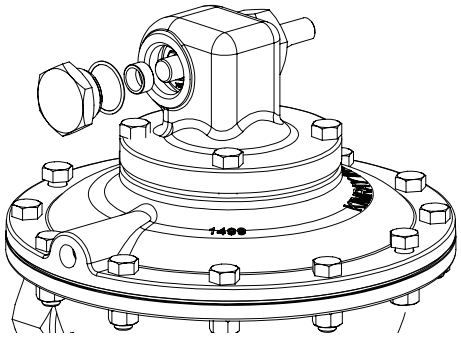


Reassembly

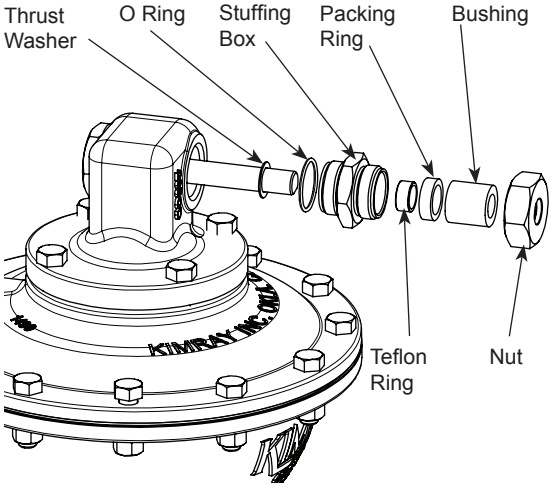
Trunnion Plug and Stuffing Box

2"-3" Valves:

Install new O-rings on Trunnion Plug and Stuffing Box, using grease on the threads to avoid O-ring damage, then apply grease to both O-rings after installed.
Thread Trunnion Plug into Bonnet
and tighten to 25 ft/lbs torque.



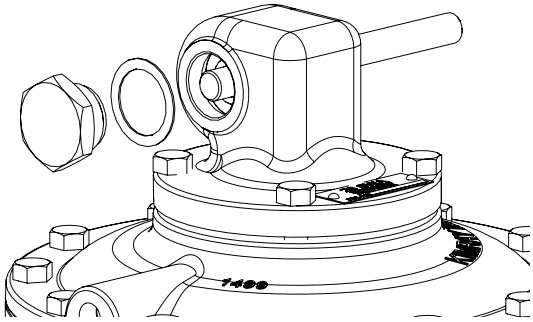
Slide Thrust Washer onto Shaft then thread Stuffing Box into Bonnet. Tighten to 25 ft-lbs torque.



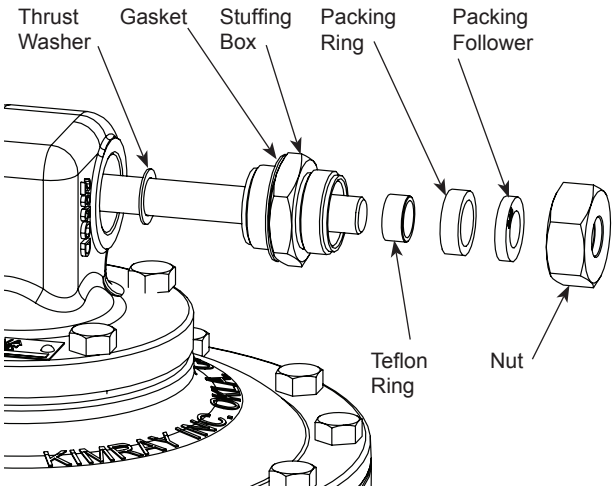
Grease the inside of the Stuffing Box and the end of the Shaft. Slide the Teflon Ring, Packing Ring, and new Bushing onto the shaft. See Fig 18-2.
Thread the Stuffing Box Nut onto the Stuffing Box, just hand tight, then another ½ turn with a wrench.

4"-6" Valves:

Grease both sides of Gaskets and install onto Trunnion Plug and Stuffing Box.
Thread Trunnion Plug into Bonnet and tighten to 25 ft/lbs torque.



Slide Thrust Washer onto Shaft then thread Stuffing Box into Bonnet. Tighten to 25 ft-lbs torque. Grease the inside of the Stuffing Box and the end of the Shaft. Slide the Teflon Ring, Packing Ring, and Packing Follower onto the shaft.



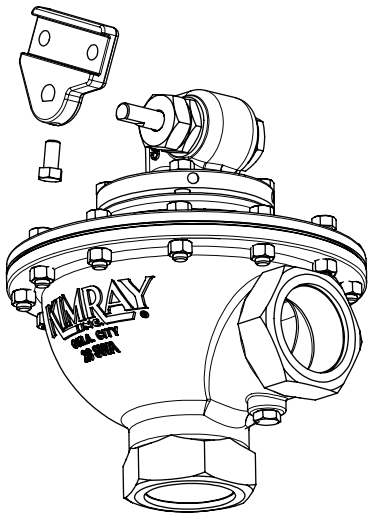
Thread the Stuffing Box Nut onto the Stuffing Box, just hand tight, then another ½ turn with a wrench.

⚠ NOTE: Overtightening of Stuffing Box Nut could prevent rotation of the shaft.

Reassembly

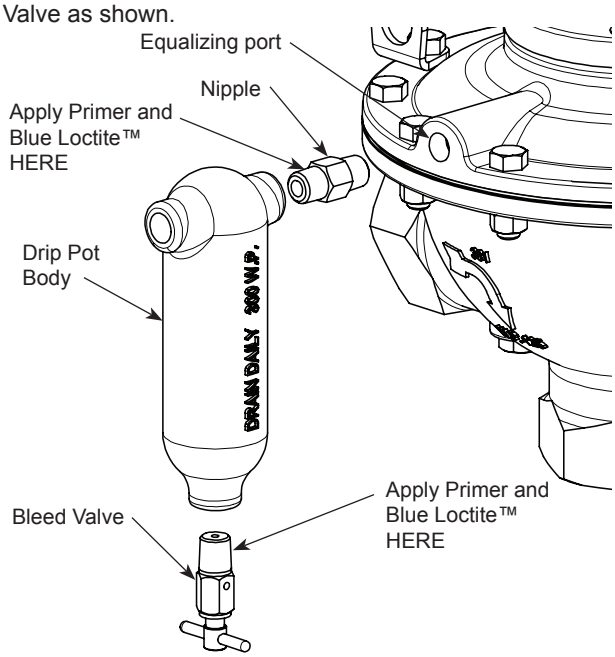
Lever Hub

Install Lever Hub as shown and securely tighten the set screw.



Drip Pot

NOTE:
Apply Blue Loctite™ to threads on the Nipple and Bleed Valve as shown.



Thread the Nipple into the equalizing port of the valve housing 3 full turns.
Thread the Drip Pot onto Nipple 3 full turns.
Thread the Bleed Valve Body into the bottom of the Drip Pot and tighten.

Troubleshooting		
Problem	**Possible Cause(s)**	**Possible Solution**
Fluid leaking from stuffing box	Stuffing box Nut loose. Teflon Packing worn.	Tighten stuffing box nut until leaking stops. Replace packing.
Valve leaks when closed	Tape or sealant stuck in valve. Soft Seat worn. Removable Seat worn.	Disassemble and clean Seat & Diaphragm. Replace Seat. Loosen stuffing box Nut to free Shaft.
Erratic Operation	Packing box Nut too tight. Soft Seat leaking. Diaphragms hardened. Wet supply	Loosen Stuffing Box Nut. Inspect for deformations or obstructions in Seat. Replace Seat.

Page left blank

Kimray is an ISO 9001- certified manufacturer.
Kimray quality assurance process maintains strict controls
of materials and the certification of parts used in the Kimray low pressure balanced valve.

Please visit our website for up to date product data www.Kimray.com

WHO WE ARE

Kimray is a manufacturer of oil and gas control equipment based in Oklahoma City, Oklahoma, USA.

Trusted for generations, Kimray has been creating simple, effective solutions for temperature, level, flow, and pressure control since 1948. Common applications include separation, heating, compression, dehydration, and artificial lift.

Buying from Kimray is about much more than the product. We are partners with hearts to serve. The relationships between our representatives and our customers extend from before the sale through the life of the product. Our focus is not on short-term profits but long-term growth for our customers.

Visit Kimray.com to learn more about our company and the products we create.

KIMRAY INC.®

Kimray.com

Issued 12/23