KIMRAY INC.®

INSTALLATION OPERATION & MAINTENANCE GUIDE

METERING VALVE

2" STEM GUIDED

Contents

A Before you start

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

A1 Scope

Do not install, operate, or maintain a metering valve without being fully trained and qualified with the Kimray installation, operation and maintenance manual.

To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings.

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

A2 Introduction

This repair manual contains information for the two inch ball and Stem metering valve.

A3 Description

Used anytime a reference control point is required in sixty fourths of an inch opening or may be used as a choke under low pressure drop conditions where freezing is not a problem.

The rotation of the adjusting Knob raises or lowers the valve plug relative to the valve seat. This Kimray valve can be used to meter or control flow of liquids and/or gasses on meter runs. Six full turns are required to fully open the valve.

A4 Maintenance

Maintenance should be performed on a regular basis. Initial intervals of 12 months is recommended. The maintenance interval may increase or decrease depending on changing application environments.

WARNING:
DO NOT remove the metering valve while the valve is still pressurized.

Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.

Disconnect any operating lines providing electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.

Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve. Drain the process media from both sides of the valve.

Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.

Related Publications

The following publications are applicable for the actuator.

Number	Type	Title

See catalog section E1 for product pages.

Abbreviations / Acronyms

The abbreviations that follow are used in this manual.

Term	Definition

Commonly Replaced Parts

Occasional Replacement Parts

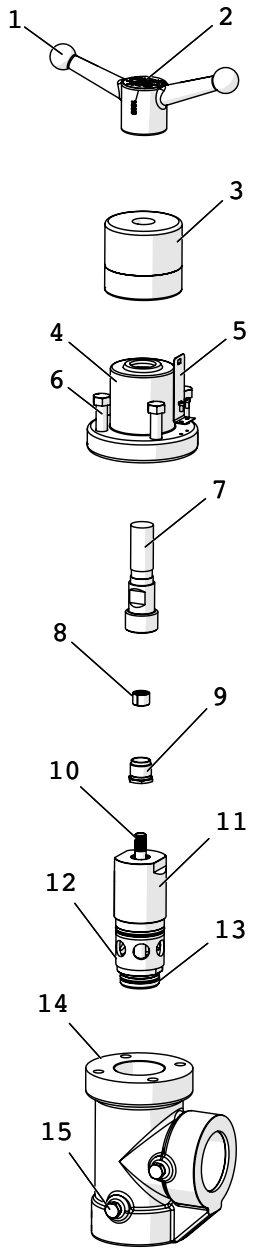
A5 Changes & Updates

SPECIAL TOOLS & EQUIPMENT

⚠ NOTICE:
The Kimray metering valve DOES NOT require special tools for disassembly, inspection and assembly.

A6

ORIENTATION



A7

✳ Recommended spare parts & stocked as repair kits
See catalog section E1 for product size & description.

Item	Description	Qty
1	Handle	1
2	Name Plate	1
3	Adjusting Knob	1
4	Bonnet	1
5	Indicator Plate	1
6	Screws	4
7	Adjusting Screw	1

Item	Description	Qty
8	Stem Keeper	1
9	Stem Nut	1
10	Lower Stem	1
11	Packing Box	1
12	Cage	1
13	Seat	1
14	Body	1
15	Plug	2

1 Installation

Before installing the two inch Ball and Stem metering valve, inspect it for shipment damage and for foreign material that may have collected during shipment. Inspect the surface of the mounting Yoke and clean the mating valve surface to remove scale, chips and debris.

Normally with valve in vertical orientation.

Utilize (any) quarter-turn actuator with ISO-5211 connection in conjunction with Kimray HPCV. To control level, flow, pressure, temperature of process fluid.

1. Install the valve with the arrow on the Body pointing in the direction of flow. The arrow signifies that the device will operate properly in the direction of flow indicated and will not necessarily prevent flow in the opposite direction.

2. Install the valve using good piping practice. 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.

3. The flanged valve bodies are listed ANSI class 2500RF. DO NOT install the valve in a system where the working pressure can exceed ANSI class ratings.

⚠ NOTE:
Use good electrical wiring practices and consult with electrican.

2 Start-up and Test

⚠ WARNING:
Before any service, be certain that the valve is fully isolated and that all pressure upstream and downstream has been relieved. Use bypass valves or fully shut off the process. Be sure that any operating or instrument gas lines have been disconnected. Never assume that a check valve is fully blocking the downstream line. Never tighten any fitting or the main connections to the regulator while there is pressure on the line. A leaking valve indicates that service is required. Failure to take the valve out of service immediately may create a hazardous condition.

Verify all pressure connections are tight before pressurizing the system.

⚠ NOTE:
When a Gasket Seat is disturbed during disassembly a new Gasket should be installed during re-assembly to ensure proper sealing.

Repair kits are available. See Section E1 of catalog or the packing slip enclosed with each valve for the correct repair kit numbers.

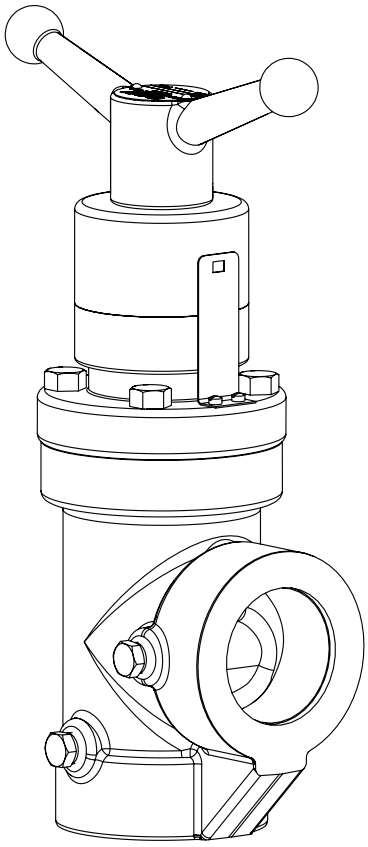


Fig. 2-1

1 in. Stem Guided

Setting the bullet in the indicator window

Full closed is determined by the first bullet at starting point, each bullet indicates a relative position of the Stem in relation to the seat. Full open is determined by the last bullet on each Label.

Align the starting point inside the Window Indicator, slowly turn the Knob to the next bullet.

Example: *1/4 in. Equal % Trim*
The distance from starting point to the next bullet is 2/64ths, etc.....

1/2 in. Equal % Trim
The distance from starting point to the next bullet is 4/64ths, etc.....

1/4 in. Linear Trim
The distance from starting point to the next bullet is 2/64ths, etc.....

1/2 in. Linear Trim
The distance from starting point to the next bullet is 4/64ths, etc.....

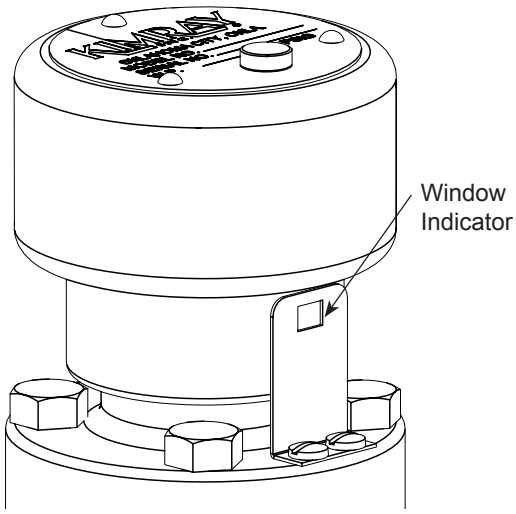
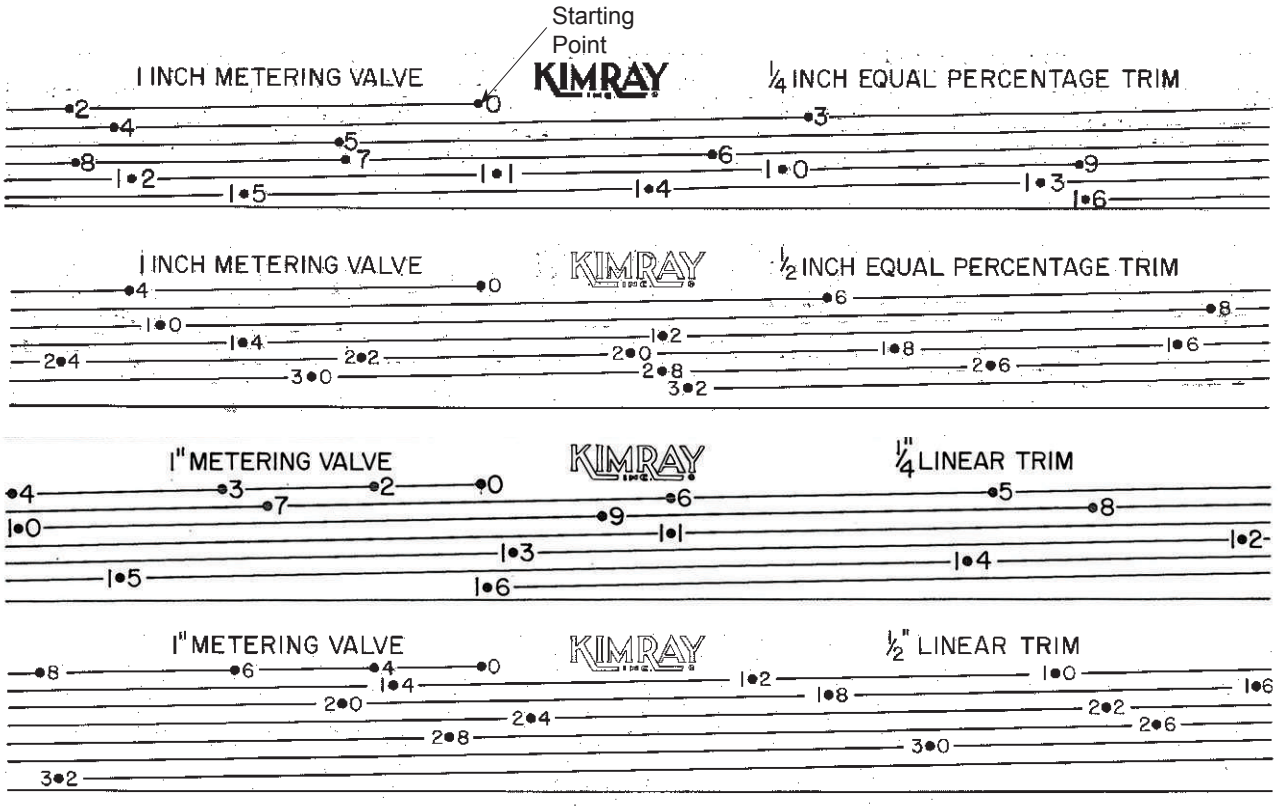


Figure 1



2 in. Stem Guided

Setting the bullet in the indicator window

Full closed is determined by the first bullet at starting point, each bullet indicates a relative position of the Stem in relation to the seat. Full open is determined by the last bullet on each Label.

Align the starting point inside the Window Indicator, slowly turn the Knob to the next bullet.

Example: 1/4 ths. Inch Inner Valve
The distance from starting point to the next bullet is 2/64 ths, etc.....

5/8 ths. Inch Inner Valve
The distance from starting point to the next bullet is 8/64 ths, etc.....

7/8 ths. Inch Inner Valve
The distance from starting point to the next bullet is 11/64 ths, etc.....

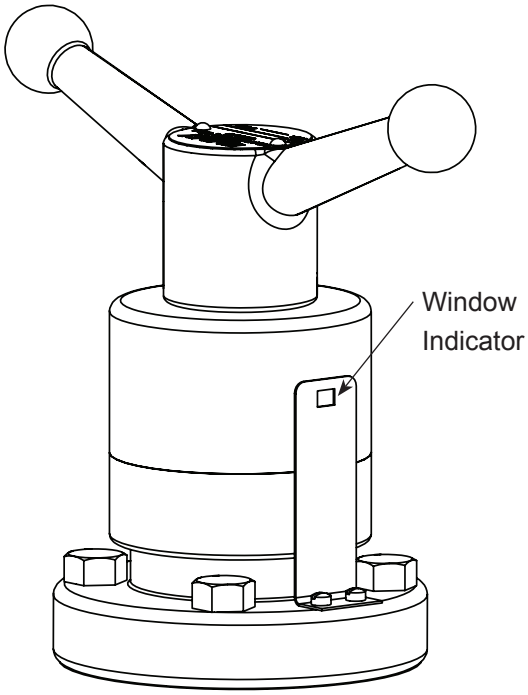
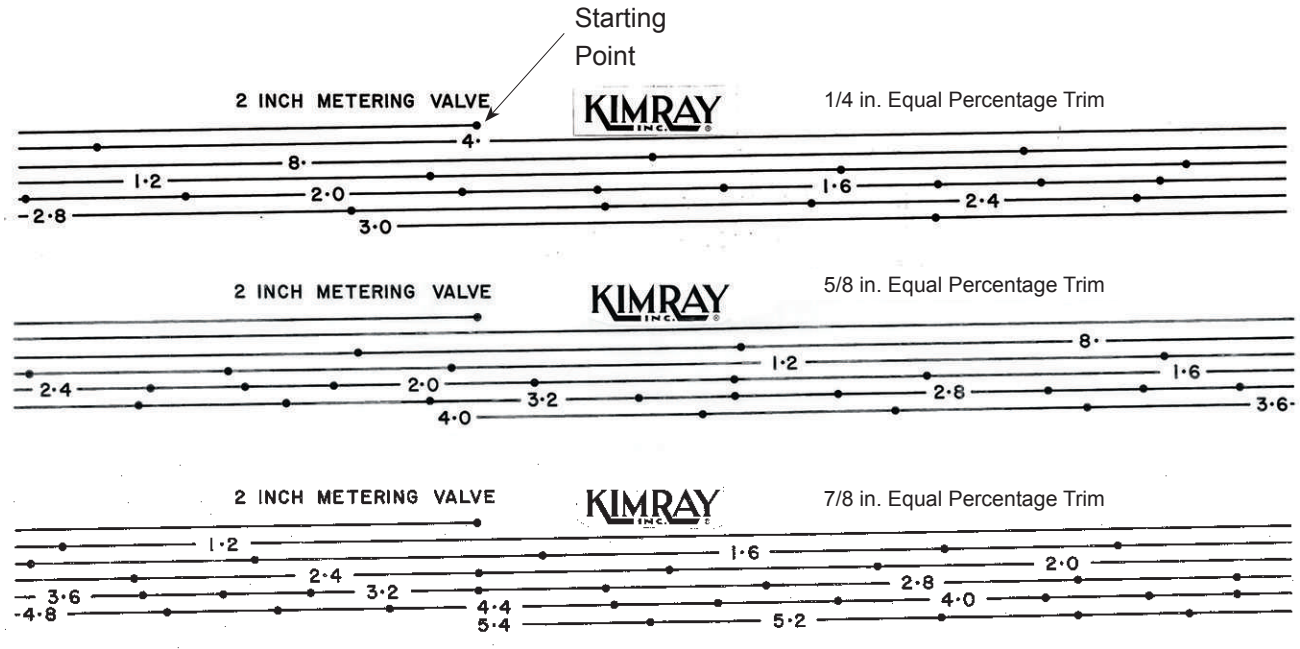


Fig. 2-2



2 & 3 in. Cage Guided

Setting the bullet in the indicator window

Full closed is determined by the first bullet at starting point, each bullet indicates a relative position of the Stem in relation to the seat. Full open is determined by the last bullet on each Label.

Align the starting point inside the Window Indicator, slowly turn the Knob to the next bullet.

Example: 96/64 ths. Inch Inner Valve
The distance from starting point to the next bullet is 20/64 ths, etc.....

1 3/8 ths. Inch Inner Valve
The distance from starting point to the next bullet is 24/64 ths, etc.....

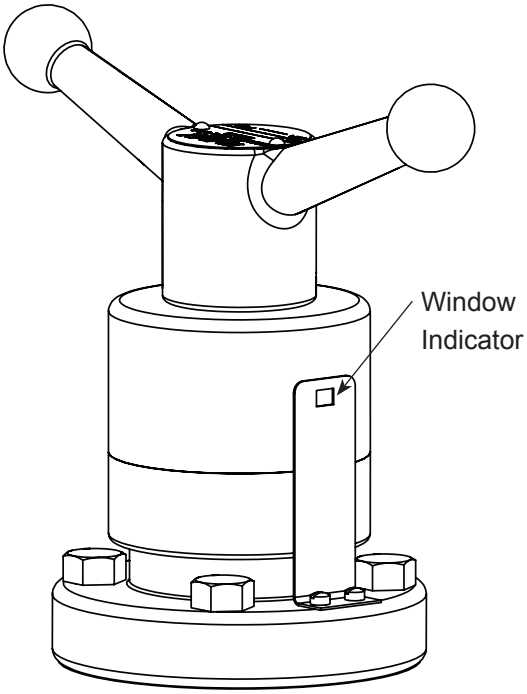
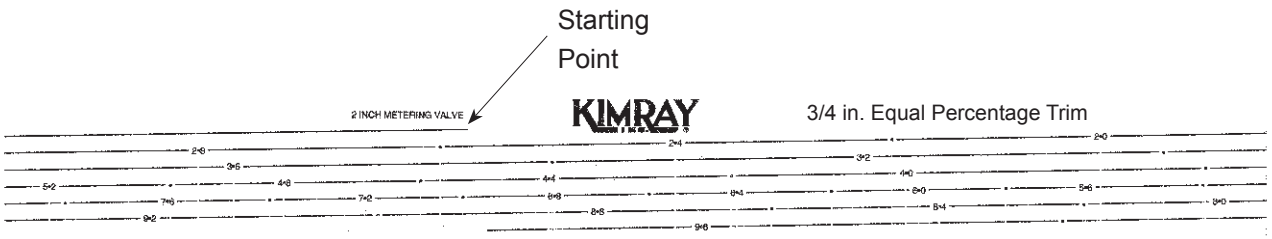
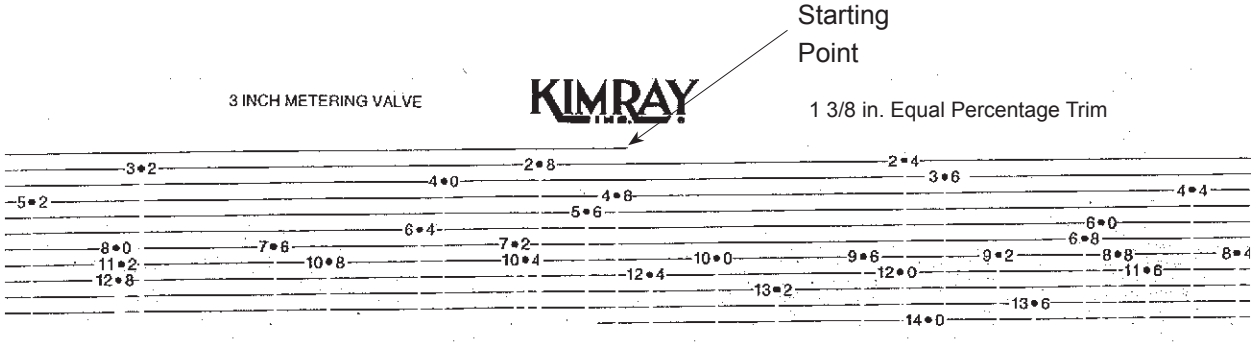


Fig. 2-2

2 in. Cage Guided



3 in. Cage Guided



DISASSEMBLY

3 Packing Box

Disassembly

Remove Snap Ring (Item 1).

Remove Retainer (Item 2).

Remove Wiper (Item 3).

Remove O-Ring (Item 5).

Remove Spring (Item 9).

Remove Follower (Item 8).

Remove Packing Rings (Item 7).

Remove Packing Sleeve (Item 6).

NOTE:
Using a punch, tap the Packing Rings and Sleeve through the bottom of the Packing Box.

Tip:
Use Kimray replacement parts only.

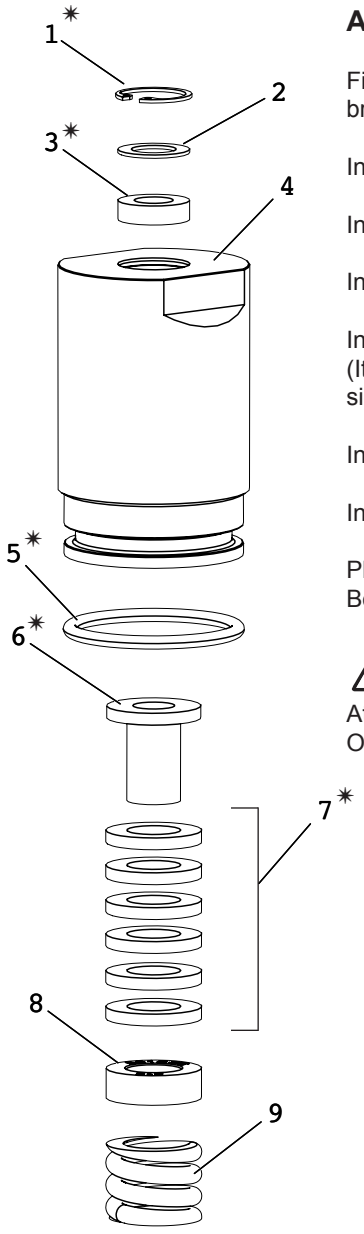


Fig. 3-1

Assembly

Fill the Packing-Box with grease using a brush or grease gun.

Insert Wiper (Item 3).

Insert Retainer (Item 2).

Insert Snap Ring (Item 1).

Insert Packing Ring (Item 7) and Sleeve (Item 6). Apply all purpose grease on the sides of the assembled parts.

Insert Follower (Item 8).

Insert Spring (Item 9).

Place O-Ring (Item 5) in outer groove of Body.

NOTE:
At this point, lightly grease the outside O-Ring before install (Item 2).

Item	Description	Part No.	Qty
1	Snap Ring ✷	940 (2")	1
2	Retainer	528 (2")	1
3	Wiper ✷	527 (2")	1
4	Packing Box	526 (2")	1
5	O-Ring ✷	520 (2")	1
6	Packing Sleeve ✷	534 (2")	1
7	Packing Rings ✷	533 (2")	6
8	Follower	531 (2")	1
9	Spring	509 (2")	1

✷ Recommended spare parts and stocked as repair kits

INSPECTION

4 Inspection & Cleaning

Clean male and female threads thoroughly.

Replace if the Packing Box shows excessive corrosion and wear.

Fill the Packing Box with all purpose grease.

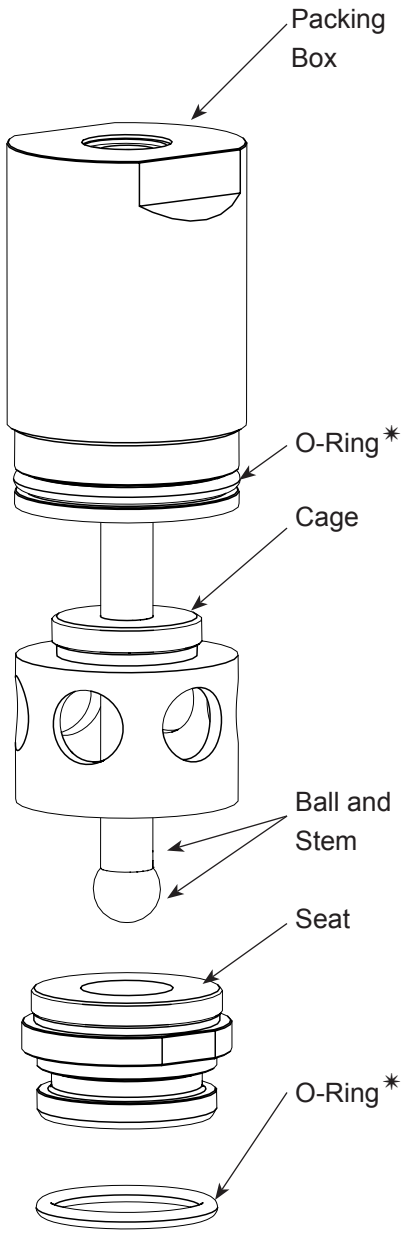
⚠ Check Point
Verify the Packing-Assembly and Follower are properly seated in the Packing Box. Failure to do so could lead to Packing-Sleeve damage upon Stem installation. A socket is a handy and safe tool to perform this action.

Ball and Stem
Inspect the ball for pits and or grooves, and inspect the Stem for extensive scoring or scratches. Check for any bends on the Stem.

⚠ NOTE:
If the valve is improperly disassembled, there is a high possibility that the Cage is out of round.

Cage
Replace if Cage has lost it's shape.

⚠ NOTE:
Inspect O-Ring on seat and replace if nessessary.



✶ Recommended spare parts and stocked as repair kits

ASSEMBLY

5 Installing Packing Box Into Body

Hand start the two steel Plugs and tighten bolts to 20-30 ft/lbs torque.

Install the Packing Box / Inner Valve Assembly and apply grease all around the O-Rings.

⚠ NOTE:
To prevent galling or seizing use a nickel impregnated paste on threads

Use an adjustable wrench on flats for tightening Packing Box. DO NOT use pipe wrench on Body. DO NOT OVER TIGHTEN. See Fig. 5-1

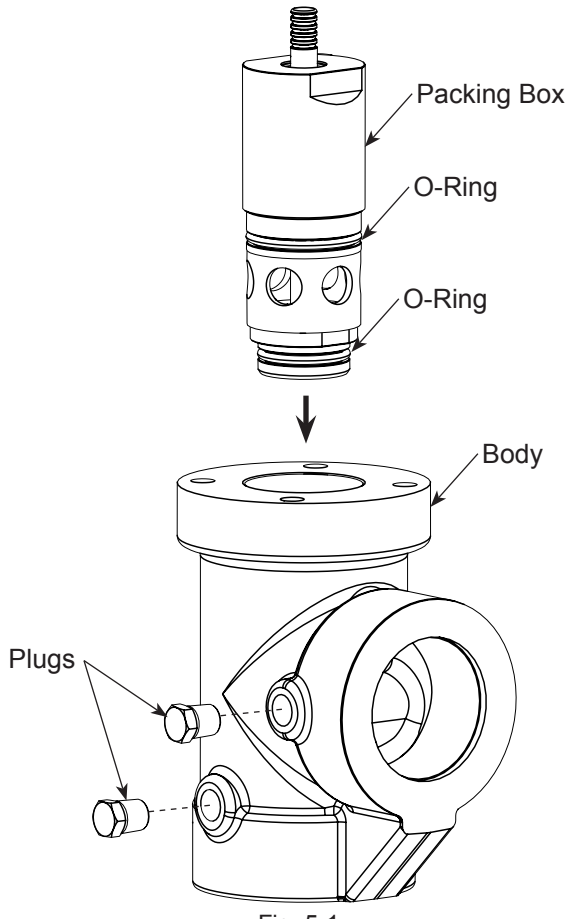


Fig. 5-1

Use a rubber mallet and tap the Valve Stem down until it rests against the Seat.

Close the upstream Bleed Valve and open the downstream Bleed Valve.

⚠ NOTE:
On angle Body valve it's not necessary to open the downstream Bleed Valve.

Apply upstream (table) pressure to the valve.

Close the upstream pressure valve and watch the upstream pressure gauge for a pressure drop.

Spray soapy water around the Valve Stem, the Body, and the Plugs where used. Leaks will produce bubbles or foaming action.

Check Body vent hole for leaks.

Release the pressure from the valve. See Fig. 5-2

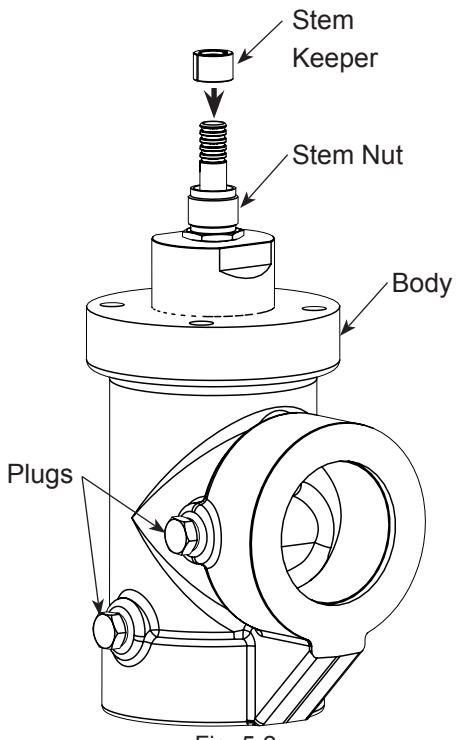


Fig. 5-2

ASSEMBLY

Grip the Stem using pliers and pull the Stem all the way up until it stops.

Install the Stem Nut and place over the Stem of the Packing Box Assembly See Fig. 5-2
Remove any debris from the end of the Stem especially in the grooves with an air nozzle.

Install the Keeper and do the following:

1.) Install one half on each side of the Valve Stem making sure grooves are properly aligned and the end of the Keeper is flush with the end of the Stem.

2.) Pry the Stem Nut up over the Keeper Set making sure not to damage any of the parts in this process.

3.) Make sure the end of the Stem Nut is flush with the end of the Keeper set. Apply a couple drops of Loctite™ to the threads of the Stem Nut. See Fig. 5-2.

Install the Adjusting Screw onto the Stem. See Fig. 5-3 Hold the Stem Nut up with one hand and screw the Adjusting Screw onto the Stem Nut. Tighten these parts together using two adjustable wrenches.

Install the Bonnet over the Adjusting Screw with Indicator Plate holes over the direction of flow. Make sure that the Adjustment Screw stays all the way up during this process.

Install the Indicator Plate to the Bonnet using the two screws and a screwdriver with orientation as shown in Fig. 5-4

Hand start the four screws through the Bonnet and into the Body using a 5/8 in. socket. See Fig. 5-4.

⚠ NOTE:
Tighten the bolts in a criss-cross pattern to avoid any miss alignment. Tighten bolts from 25-30 ft/lbs torque.

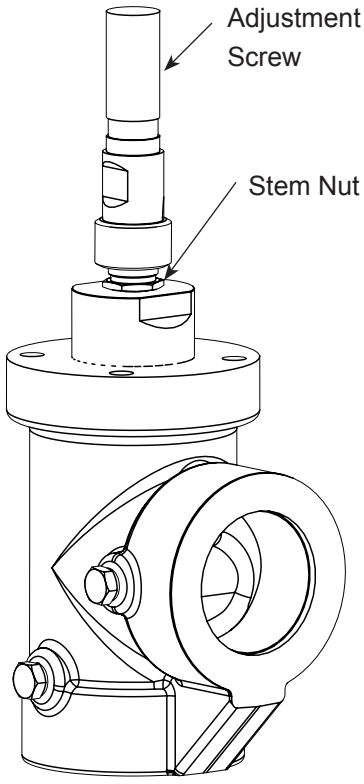


Fig. 5-3

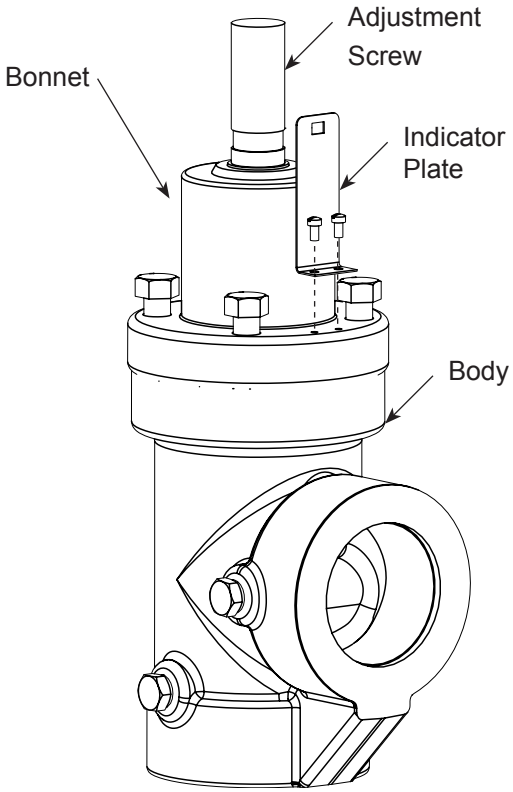


Fig. 5-4

ASSEMBLY

Place the Adjusting Knob onto the Bonnet and over the Adjusting Screw. See Fig. 5-5

Install the Set Screw, use all purpose grease and apply. Screw the Set Screw into the threaded holes on the side of Adjusting Knob. Use one hand to turn the allen wrench and the other hand to reach inside the bore of the Adjusting Knob to feel for the Set Screw end.

Turn Set Screw in until the end of the Set Screw can be felt by the builder's finger and stop.

Clean hands thoroughly of oil and grease.

Clean the Adjusting Knob outside surface in preparation for the Label. Peel the backing off of the Indicator Label. Wrap Label around the Knob in such a way that the two ends will meet in proper alignment.

Install the Key in the Adjusting Screw Keyway.
See Fig. 5-5
Tap the Key in place using a ball peen hammer.

⚠ NOTE:
Be careful not to damage the key during installation.

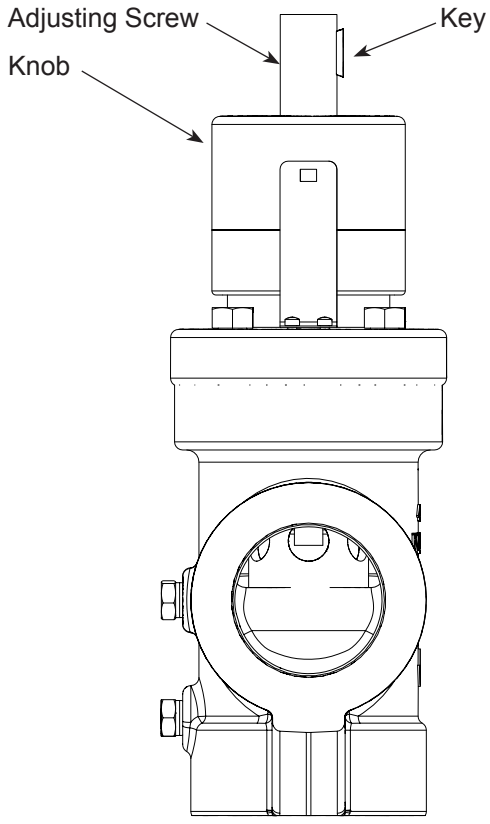


Fig. 5-5

6 Handle and Set Screw

Hand start the Set Screw into the Handle at least three rotations.

Screw the Set Screw in until it is visible in the Keyway and then back off one full turn.

Install the Handle Assembly over the Adjusting Screw. Align the Keyway in the Handle with the Key on the Adjusting Screw. Tap down if necessary using a rubber mallet.

Tighten the Handle Set Screw down against the Key as shown. The bottom mount Set Screw is screwed in until it touches the Adjusting Screw and then backed out one half to one full turn. See Fig. 6-1

Serial Tag

Lightly tap Drive Screws with small hammer. Leave Tag slightly loose until remaining Drive Screws are in place. Then tap the Drive Screws tight against the Tag.
See Fig. 6-1

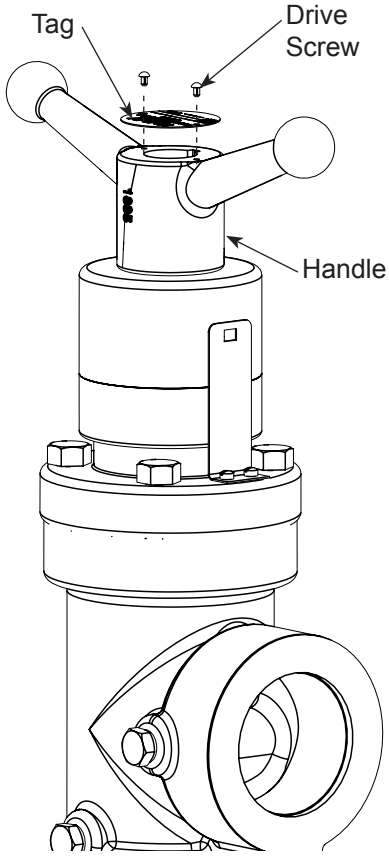


Fig. 6-1

Page left blank

TESTING

7 Assembly Test Procedures

Step	Method	Criteria
1	Turn Adjusting Screw Knob clockwise until the Knob stops turning.	
2	Close upstream Bleed Valve.	
3	Apply upstream pressure.	Upstream gauge registers table pressure.
4	Turn off upstream pressure.	Upstream gauge should hold table pressure. "No leak for two seconds".
5	Slowly turn Adjusting Knob counter clockwise until pressure drop registers on upstream gauge. Stop turning Adjusting Knob.	Upstream guage registers pressure drop.
6	Verify bullet is set within the Indicator Window.	First bullet is set within the window.
7	"ASSEMBLY ONLY" if necessery reposition adjusting Knob without effecting airflow to set bullet inside the indicator window. If adjustment is necessary restart test.	
8	Release table pressure	

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 metering valves.

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