

### CONTENTS

	PAGE
Introduction	1
Scope	1
Description	1
Installation	2
Start up	2
Maintenance	2
Float Weight & Buoyancy	3
Inspection	4
Troubleshooting	4

### INTRODUCTION

#### CAUTION

*Prior to installing, 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.*

#### Scope

This installation manual includes instructions and maintenance information for the Kimray mechanical oil valves and trunnions.

Do not install, operate, or maintain a mechanical oil valve and trunnion without being fully trained and qualified with the Kimray installation 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 these instructions, contact your Kimray applications support group before proceeding.

#### Description

These valves are designed to be operated by a float/lever trunnion assembly for use in liquid dump control applications. The valves have a single port body and a mechanical actuator.

The Piston Balanced and Piston Balanced Throttling valves are suitable for higher pressures than the Diaphragm Balanced valves.

#### Note

*A teflon packed rotary stuffing box seals the rotating shaft.*

The models Diaphragm and Piston Balanced feature quick-opening trim, but because of their direct mechanical link with the liquid level, normal action is a throttling mode. The valve is balanced allowing it to function smoothly and close completely regardless of the pressure differential from upstream to downstream. The valve's large opening provides high flowing capacity.

A name tag is attached to the actuator housing on each valve. The name tag lists the serial number, model number, and pressure rating. An additional tag is installed to indicate any special trim options, should they be required.

#### CAUTION

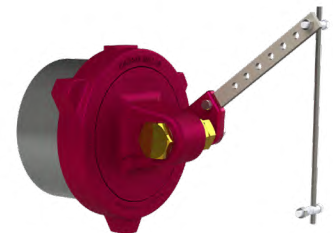
*When ordered, the mechanical oil valves and trunnion assembly configuration and construction materials were selected to meet specific pressure, temperature, pressure drop and fluid conditions. Since some body/trim material combinations are limited in their pressure drop and temperature ranges, do not subject the mechanical oil valves and trunnion assembly to any other conditions without first contacting the Kimray Inc, sales office or a sales / applications representative*



**Diaphragm Balanced & Piston Balanced Angle Body**



**Piston Balanced Throttling Angle Body**



**Hammer Union & Trunnion**

\*Configuration of Mechanical Oil Valve is a trademark of Kimray, Inc.

# Mechanical Dump Valves & Trunnion Assembly



Diaphragm Balanced, Piston Balanced, Piston Balanced Throttling & Trunnion Assemblies

## Installation, Operation & Maintenance

### Installation

Before installing the mechanical oil valve and trunnion assembly, inspect it for shipment damage and for foreign material that may have collected during shipment. Inspect the openings in the valve and clean the pipe lines to remove scale, chips and debris.

Verify all pressure connections are tight before pressurizing the system.

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.

### Note

If conditions indicate the possibility of backward flow you may wish to install check valves

2. Install the valve using good piping practices. For flanged bodies 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 rated ANSI class 150. Do not install the valve in a system where the working pressure can exceed ANSI class ratings.

### WARNING

Do not exceed the maximum supply pressure specified on the valve nameplate. Under no circumstances should the mechanical valve supply pressure ever exceed maximum psig.

### Before beginning installation of the mechanical oil valve and trunnion assembly.

- Read and follow instructions.
- Follow all safety warnings of the switch manufacturer.
- Make sure the valve cannot operate during installation.
- Observe all pressure, ratings and requirements for the devices and the operating environment.
- Make sure all pressure has been removed from the vessel before opening any connections.

### Note

Never stand directly in front of or over a valve when the system is pressurized. The valve could suddenly open, blowing debris into the person's face and eyes.

### Start-up and Test

With the installation completed and appropriate relief and check valves installed and set, slowly open the upstream and downstream shutoff valves. In order to test the function of the valve, allow only a small amount of upstream fluid to flow through the upstream shutoff valve. Check for proper valve operation by cycling the actuator arm several times. Then watch as the vessel fills to be sure the float and linkage are operating properly.

### WARNING

A leaking valve is an indication that service is required. Failure to take valve out of service immediately may cause a hazardous condition.

### 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.

Never assume that a check valve is fully blocking the downstream line.

Never tighten any fitting or the main connections to the valve while there is pressure on the line.

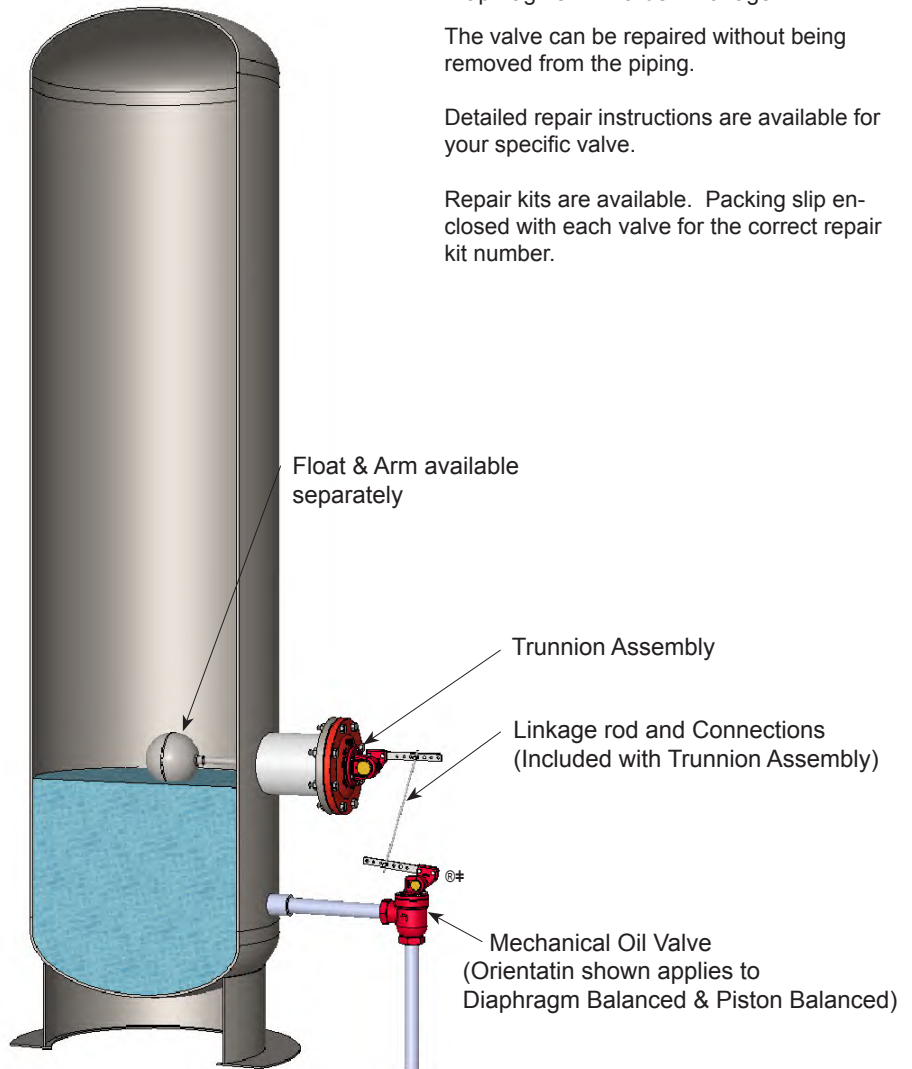
### Maintenance

Maintenance should be performed on a regular basis. An initial inspection interval of 12 months is recommended. Depending on the service conditions of the valve, the inspection interval may be decreased or increased. Diaphragms will harden with age.

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

Detailed repair instructions are available for your specific valve.

Repair kits are available. Packing slip enclosed with each valve for the correct repair kit number.



Mechanical Dump Installation  
Figure 1

### Float Weight & Buoyancy Calculation

A	<input type="text"/>	in.
B	<input type="text"/>	oz.
C	<input type="text"/>	in.
D	<input type="text"/>	in.
Tc	<input type="text"/>	in. oz.
To	<input type="text"/>	in. oz.
W	<input type="text"/>	oz.

- A = Length from float trunnion pivot to turnbuckle connection
- B = Net buoyancy of float
- C = Length from float trunnion pivot to center of float
- D = Length from valve trunnion pivot to turnbuckle connection
- Tc = Torque required to close valve at operating pressure
- To = Torque required to open valve at operating pressure
- W = Weight of float

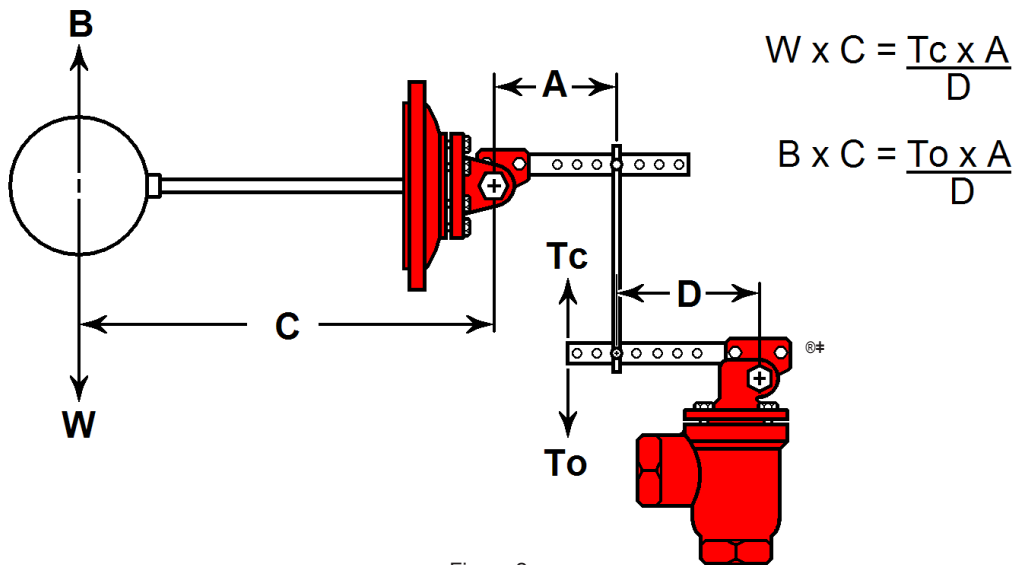


Figure 2

Torque Required to Open and Close Valve (inch-ounces) *								
Press. Drop Across Valve PSI	2 in. (50 mm)		3 in. (76 mm)		4 in. (101 mm)		6 in. (152 mm)	
	Open	Close	Open	Close	Open	Close	Open	Close
1	61	62	56	387	128	765	59	3332
5	141	80	72	603	240	944	59	4726
10	213	100	144	640	336	1016	59	5372
20	286	100	326	640	528	1163	59	5916
30	397	100	541	640	912	1163	437	6494
40	506	117	1152	640	1152	1163	824	6494
50	613	117	1152	640	1344	1163	1391	6494
60	720	135	1185	640	1520	1163	1632	6494
70	840	135	1410	640	1720	1163	2278	6664
80	960	135	1640	640	1890	1163	2856	6664
90	1060	135	1860	640	2080	1163	3060	6800
100	1170	135	2080	640	2280	1163	3264	6800

\* NOTE: The values in the chart were determined thru testing based on a Diaphragm Balanced Valve. Values could be different for other style valves.

# Mechanical Dump Valves & Trunnion Assembly

Diaphragm Balanced, Piston Balanced, Piston Balanced Throttling & Trunnion Assemblies



## Installation, Operation & Maintenance

Inspection Schedule	
Valve Seat *	Inspect every 6 months under normal service and conditions. Under severe service conditions such as sand, corrosion, salt, or high pressure drop, inspect every 2 months until a predictable pattern can be established.
Seals	Should be replaced every time valve is disassembled. Check for cracks or if the seals feel hard.
Body	Under normal conditions, the body will last years. Severe conditions will require inspection more frequently. The body should be inspected every time valve trim is inspected.

\* Under severe operating conditions the following maintenance schedule will not be adequate and a shorter time schedule may be required.

Trouble Shooting		
Problem	Possible Cause(s)	Possible Solution
Fluid leaking from bonnet.	Shaft packing or the shaft itself is worn.	Replace packing. Check for porosity.
Fluid leaking from body / actuator joint.	Screws attaching bonnet to body are loose.	Tighten bolts.
	Diaphragm between body and actuator is worn or damaged.	Replace diaphragm.
Excessive trim leakage with the valve closed.	Debris is interfering with seat contact.	Clean seat and any obstructions.
	Insufficient shut-off force from actuator.	Loosen stuffing box nut.
Valve stem movement is sticky or jerks.	Seat surfaces are worn or damaged.	Clean surfaces and / or replace.
	Valve stem is bent or misaligned.	Replace either stem, cage, stem guided or cylinder.

### Related Publications:

See Catalog Section C2:i  
See Tech Mail - #6

Kimray is an ISO 9001- certified manufacturer.  
Kimray quality assurance process maintains strict controls  
of materials and the certification of parts used in Kimray mechanical oil valve & trunnion assembly.

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