

STEP 1
Bonnet

Wrench loose the breather plug and set aside (Fig. 1.0).



Figure 1.0

Figure 1.1

Remove the bonnet and set a side (Fig. 1.2).



Figure 1.2

Figure 1.3

Remove the spring and set aside (Fig. 1.3).

STEP 2
Lower Housing

Wrench loose the bolts attaching the yoke to the body (Fig. 2.0).



Figure 2.0

Figure 2.1

Remove the entire assembly from the valve body (Fig. 2.1).

Using a back-up on the ratio plug nut, wrench loose the nut holding the diaphragm plate in place (Fig. 2.2).



Figure 2.2

Figure 2.3

Remove the diaphragm plate (Fig. 2.3).

Remove the diaphragm and discard (Fig. 2.4).



Figure 2.4

Figure 2.5

Remove the lower diaphragm plate (Fig. 2.5).



Remove the lower housing from the piston assembly (Fig. 2.6).

Remove the gasket from the bottom of the lower housing and discard (Fig. 2.7).



Figure 2.6



Figure 2.7

STEP 1

Bonnet

Remove the travel indicator, replace if acrylic housing is opaque or cracked (Fig. 1.0).

Inspect indicator stem and replace as needed (Fig. 1.1).



Figure 1.0



Figure 1.1

Remove housing gasket and discard (Fig. 1.2).

Remove the spring and set aside (Fig. 1.3).



Figure 1.2



Figure 1.3

Wrench loose breather plug and set aside (Fig. 1.4).



Figure 1.4

Wrench loose the nuts and bolts attaching the bonnet to the lower housing and remove (Fig. 1.5).

Remove the bonnet and set aside for cleaning and inspection (Fig. 1.6).



Figure 1.5



Figure 1.6

Remove the diaphragm (Fig. 1.7).

Remove the diaphragm plate (Fig. 1.8).



Figure 1.7



Figure 1.8



Remove the diaphragm plate and set aside for inspection and cleaning (Fig. 1.9).



Figure 1.9

Remove the spring and set aside for inspection and cleaning (Fig. 1.10).



Figure 1.10

**STEP 2
LOWER HOUSING**

Wrench loose the bolts that attach the lower housing to the body (Fig. 2.0).



Figure 2.0

Remove bolts and set aside for inspection and cleaning (Fig. 2.1).



Figure 2.1

Remove lower housing from the body (Fig. 2.2)



Figure 2.2

Remove housing gasket and discard (Fig. 2.3).



Figure 2.3

Remove piston assembly from the body (Fig. 2.4)



Figure 2.4

STEP 3

Piston Assembly

Removed the lower lockingnut using the wrench flat on the stem as a back-up (Fig. 3.0).

Remove the ratio plug (Fig. 3.1).



Figure 3.0



Figure 3.1

Remove the polyurethane seat and discard (Fig. 3.2).

Remove the piston from the cylinder and stem (Fig. 3.3).



Figure 3.2



Figure 3.3

Remove the seal retainer (Fig. 3.4).

Remove the first back-up and discard (Fig. 3.5).



Figure 3.4



Figure 3.5

Remove the quad ring and discard (Fig. 3.6).

Remove the second back-up and discard (Fig. 3.7).



Figure 3.6



Figure 3.7

Remove the stem from the cylinder (Fig. 3.8).

Remove the o-ring from the cylinder and discard (Fig. 3.9).



Figure 3.8



Figure 3.9

PISTON & BODY

Using a pick-like tool remove the inner quad ring and discard (Fig. 3.10).



Figure 3.10

Figure 3.11

Remove the two spiral back-ups and discard (Fig. 3.11).

**STEP 4
Body**

It is recommended to use the proper Kimray seat removal tool at this point (Fig. 4.0 & 4.1).



Figure 4.0

Figure 4.1

See inspection and cleaning section for alternative to seat removal.

Remove the seat and set aside for cleaning and inspection (Fig. 4.2).

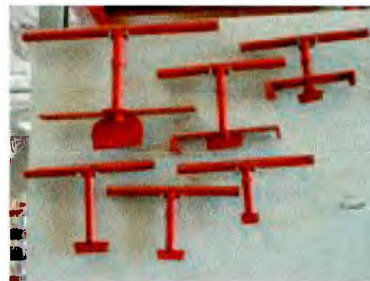


Figure 4.2

Figure 4.3

Remove the gasket from the seat and discard (Fig. 4.3).

Removable Seat Tools	
272SW	2"
273SW	3"
274SW	4"
275SW	6"



STEP 1
Cleaning

Diameter	Wire Size	Length	Stem Dia.
1/4"	.004"	3-1/2"	1/8"
3/4"	.006"	3-1/2"	1/4"
1-1/4"	.008"	3-1/2"	1/4"



It is important to inspect all thread surfaces for pits, debris and flat spots.

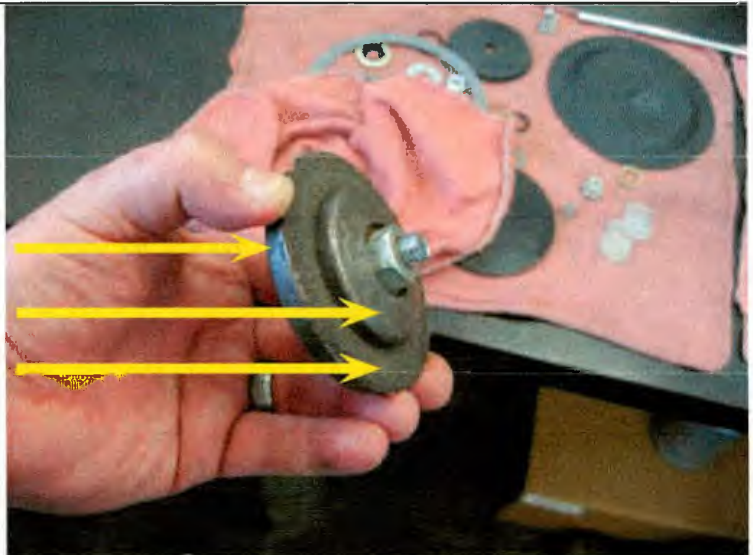
The listed wire brushes will allow you to thoroughly clean virtually all threaded surfaces on Kimray products.

Often times the seat cannot be removed and/or replaced due to the length of time in service. A seat cleaning tool can be made from a 3" ratio plug (Fig. 1.1), a 2" ratio plug (Fig. 1.2), and glue-on sandpaper (Fig. 1.3). Attach the seat cleaning tool to a speed wrench, make flat contact and spin the speed wrench to dress the seat, inspect the seat for scratches and repeat the process as needed.

Figure 1.1

Figure 1.2

Figure 1.3



In the process of cleaning the valve there are a few essential areas that must be addressed:

1. All thread surfaces
2. Ensure all gasket material is removed.
3. Exterior free of solvents, debris and fluids if the product is to be re-painted.
4. Interior free of solvents, debris and fluids that may damage elastomers and affect O-ring / gasket seals.



STEP 2
Inspection

Inspect all internal and **seating** surfaces for damage. Replace or repair as needed:

- A. Seat surface
- B. Cylinder
- C. Piston
- D. Ratio Plug
- E. Stem - Emery cloth can be used to repair light scratches.
- F. Removable Seat
- G. Housing gasket surface

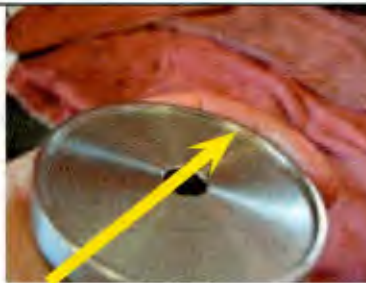


Figure A



Figure B



Figure C



Figure D



Figure E



Figure F



Figure G

STEP 1
Piston Assembly

Install the new o-ring onto the cylinder (Fig. 1.0).



Figure 1.0

Install new quad ring into the machined cylinder groove (Fig. 1.1).



Figure 1.1

Install the two new back-ups on either side of the quad ring (Fig. 1.2 & 1.3).



Figure 1.2



Figure 1.3

Install the stem into the cylinder (Fig. 1.4).



Figure 1.4

Install the seal retainer onto the flat of the stem (Fig. 1.5).

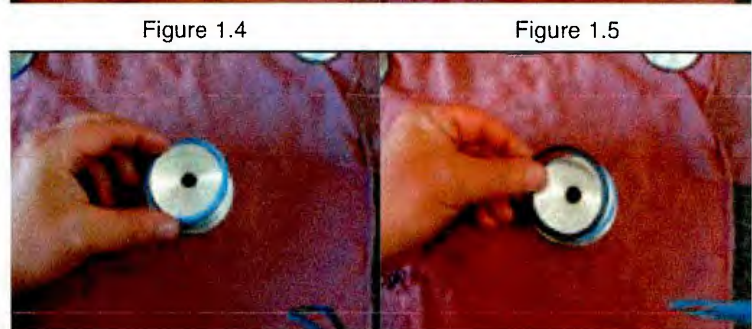


Figure 1.5

Install the new back-up onto the piston (Fig. 1.6).



Figure 1.6

Follow with the new o-ring (Fig. 1.7).

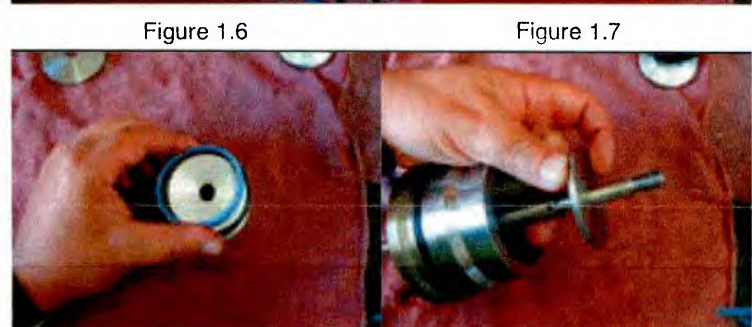


Figure 1.7

Install the second back-up over the o-ring (Fig. 1.8).



Figure 1.8

Install the seal retainer on the stem flat (Fig. 1.9).



Figure 1.9



Install the partially assembled piston onto the stem until at rest on the seal retainer (Fig. 1.10).

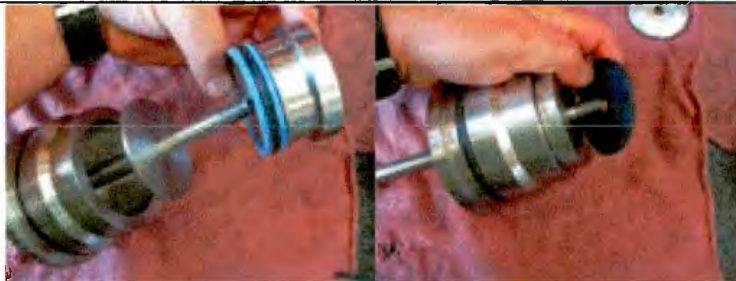


Figure 1.10

Figure 1.11

Install the seat onto the piston assembly (Fig. 1.11).

Install ration plug over the seat (Fig. 1.12).



Figure 1.12

Figure 1.13

Install the lock nut onto the stem (Fig. 1.13).

Place a back-up on the stem wrench-flat and tighten the lock nut (Fig. 1.14).



Figure 1.14

**STEP 2
BODY**

Install the new gasket onto the seat (Fig. 2.0).

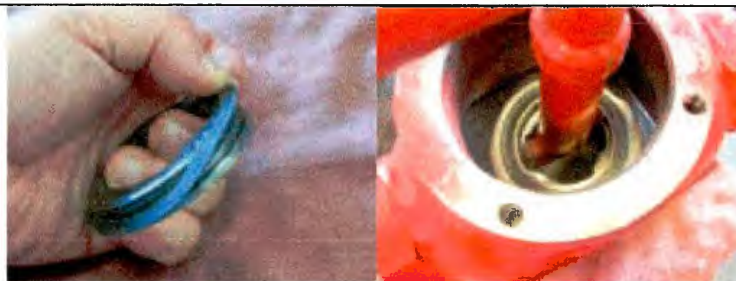


Figure 2.0

Figure 2.1

Thread the seat into the valve body and tighten using a seat wrench (Fig. 2.1).

Install the piston assembly into the body (Fig. 2.2).



Figure 2.2

Figure 2.3

Install new gasket onto piston assembly (Fig. 2.3).

Note: It is recommended to apply a small amount grease to both sides of the gasket.

STEP 1
LOWER HOUSING

Install the lower housing onto the body (Fig. 1.0)



Figure 1.0

Figure 1.1

Reinstall the screws attaching the lower housing to the body and wrench tight (Fig. 1.1).

Install the lower diaphragm plate onto stem (Fig. 1.2).

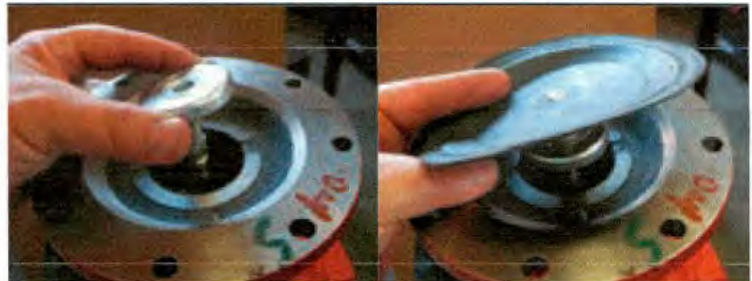


Figure 1.2

Figure 1.3

Install the diaphragm onto the lower plate (Fig. 1.3).

Install the upper diaphragm plate onto the diaphragm (Fig. 1.4).



Figure 1.4

Figure 1.5

Install spring onto the spring plate (Fig. 1.5).

STEP 2
BONNET

Place the bonnet onto the lower housing (Fig. 2.0).



Figure 2.0

Figure 2.1

Install the nuts and bolts attaching the bonnet to the lower body (Fig. 2.1, 2.2).

Wrench the nuts and bolts tight (Fig. 2.3).



Figure 2.2

Figure 2.3



Install breather plug into bonnet and wrench tight (Fig. 2.4).



Figure 2.4

This test example shows a **pressure-open** motor valve. Notice the actuation pressure is **below** the diaphragm (Fig. 1).

PRESSURE OPEN

With zero actuator pressure involved, apply upstream pressure (Fig. 2) and verify that no pressure is recorded downstream (Fig. 3).

With actuator pressure applied the valve should open and the upstream pressure should register downstream (Fig. 4) until actuator pressure is removed and the valve closes.



Figure 1



Figure 2



Figure 3



Figure 4

TESTING

This test example shows a **pressure close** motor valve. Notice the actuation pressure is **above** the diaphragm (Fig. 5).

PRESSURE CLOSE

With zero actuator pressure involved, apply upstream pressure (Fig. 6) and verify that pressure is recorded downstream (Fig. 7).

With actuator pressure applied the valve should close and the upstream pressure should cease to register downstream (Fig. 8) until actuator pressure is removed and the valve closes.



Figure 5



Figure 6



Figure 7



Figure 8