

Configuration of Glycol Pump is a trademark of Kimray, Inc.

Repair Manual
Glycol Pumps



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When a person needs to repair a Kimray glycol pump and has never done so before, it can appear to be the proverbial “can of worms” when it is disassembled and the many parts and “O” rings are exposed. Even with a parts drawing, it can be intimidating. Nothing is as good as experience and hopefully, this repair manual will help simplify the process. Years of valuable experience was used to put together this manual that details the disassembly, the examination of parts, and the assembly of the Kimray Glycol Pump. If these steps are followed, the pump should be “as good as new” and ready for service. Also after going through this manual, it will be easy to see why only replacing the “O” rings will probably not give any acceptable length of service.

There are typically four areas that can cause pump failure.

I. GLYCOL CONTAMINATION

This can be caused by various things such as compressor oils carrying over into the glycol that may cause “O” ring swelling. Condensate (drip gas) can be another. If glycol contamination is a constant and uncorrectable problem, there are other elastomer available. (See Elastomer Materials Chart)

II. HEAT

The Kimray Glycol Pump comes standard from the factory with Buna elastomer good for up to 200 degrees F. Heat exchangers are essential in a dehydrator system so that the dry glycol entering the pump can be less than 200 degrees and prevent breaking down the elastomer. This also enhances the dehydration process. However, if there are continuing temperature related failures, there are other materials available for elastomer that will allow the pump to be used in higher temperatures. (See Elastomer Materials Chart)

III. FILTRATION

A “Y” strainer or other LOW PRESSURE filter is recommended in the “dry” or “lean” suction line coming from the surge (storage) tank to the pump. This will catch any large particles that might cause the pump to malfunction or damage it.

A HIGH PRESSURE filter is recommended in the “wet” or “rich” glycol line coming from the bottom of the absorber to the pump. There are several manufactures and types of these filters.

This filter will catch smaller particles suspended in the glycol such as salt and sand.

All filters need to be checked frequently and changed if needed.

IV. IMPROPER REPAIR

Even with filtration, parts within the pump will wear over time. Metal parts need to be examined very closely every time a repair is done. Worn metal parts can cause lost tolerances and therefore cause lost seals. Replacing “O” rings ONLY, usually will not give long service. Piston rod, pilot piston, cylinder, and piston surfaces are critical. Anywhere there is an “O” ring surface should be checked closely.

To get the long service you have come to expect from Kimray products, always use **GENUINE KIMRAY PARTS** when doing repairs. Remember, parts made to less than Kimray specifications don't save you money!!!



NITRILE

TEMPERATURE:

Buna-N:
-40° to +200° F
-40° to +93° C
Low-Temp:
-85° to +120° F
-65° to +49° C

APPLICATION:

Crude Oil & Gas Production Glycol Dehydrator, Gasoline, Jet Fuel & Diesel Fuel Pumping, Water Disposal, Methanol Injection Pumps, Water pump seals, hydraulic pump seals

FLUID / GAS:

Crude Oil & Gas, Good to Poor in Sour Production (See HSN), Water, Glycols, Hydraulic Oils, Resistance to crude oil in the presence of hydrogen sulfide and amines, Diesel fuel, fuel oils

DO NOT USE WITH:

Aromatic hydrocarbons, chlorinated hydrocarbons, phosphate esters (hydraulic fluids)

HSN (Highly Saturated Nitrile)

TEMPERATURE:

-15° to +300° F
-26° to +149° C

APPLICATION:

Crude Oil & Gas Production w/ H₂S CO₂

FLUID / GAS:

Crude Oil & Gas H₂S, CO₂, Sea Water

VITON[®] is a trade mark of Dupont

TEMPERATURE:

-10° to +350° F
-23° to +177° C

APPLICATION:

Crude Oil & Gas Production, Glycol Dehydrators, Gasoline, Jet Fuel & Diesel Fuel Pumping, Water Disposal, Methanol Injection Pumps. (Also Vacuum Service) (Gas permeability is very low)

FLUID / GAS:

Crude Oil & Gas, Sour Gas (CO₂), Propane, Gasoline, Diesel, Fuel Oil Systems

DO NOT USE WITH:

Hot Water, Not preferred for wet H₂S, Methyl Alcohol, Amines, Sodium hydroxide solutions

AFLAS[®] is a trade mark of Asahi Glass Co

TEMPERATURE:

-25° to +500° F
-30° to +260° C

APPLICATION:

Crude Oil & Gas Production (High heat), Steam Flood Production Chemicals (corrosion inhibitors) Amine Sweetener Systems, Gasoline, Diesel, Fuel Oil Systems

FLUID / GAS:

Crude Oil & Gas Production, H₂S, Steam, Petroleum fluids, Sea Water

KIMRAY TOOLS USED



INSERT TOOLS FOR SUCTION SEAT

PART NUMBER	PUMP SIZE
1542	4015, 2015, 1715
1543	9015, 5015
1544	21015, 10015
1545	45015, 20015



SEAT REMOVAL TOOL

PART NUMBER	PUMP SIZE
615	4015, 2015, 1715
614	9015, 5015, 21015, 10015, 45015, 20015



SEAL RETAINER TOOL

PART NUMBER	PUMP SIZE
4456	4015, 2015, 1715
4457	9015, 5015
4458	21015, 10015
4459	45015, 20015

DISASSEMBLY

STEP 1

PRESSURE RELIEF

Loosen all plugs in inlet and outlet holes as there might still be some trapped gas in the pump (Fig. 1.1)

Slowly open control valves for any additional trapped gas (Fig. 1.2)

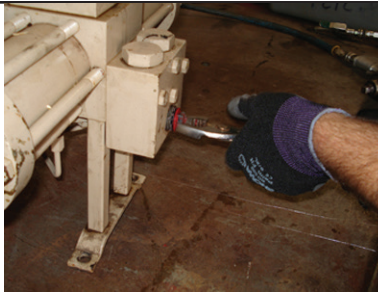


Figure 1.1

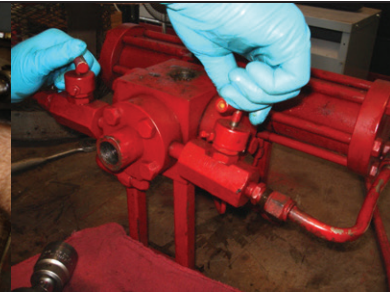


Figure 1.2

STEP 2

REMOVING SUCTION AND DISCHARGE BLOCKS

Remove Dart Caps from the Discharge Block from the Main Piston Body (Fig. 2.1)

Remove Dart Caps from Suction Block from the Main Piston Body (Fig. 2.2)

NOTE: *See special cases for further information (2).



Figure 2.1



Figure 2.2

Remove O-Ring from Dart Cap (Fig. 2.3)

Use a pair of needle nose pliers to remove the Darts from the Suction and Discharge Block (Fig. 2.4)



Figure 2.3



Figure 2.4

Remove upper and lower O-Rings from Darts (Fig. 2.5 and 2.6).

NOTE: Check for darts in caps if excessive wear DO NOT waste time cleaning. (Ref. Fig 6.1 Inspection section).



Figure 2.5



Figure 2.6

Use a wrench and the seat pullers to remove the suction seat (Fig. 2.7 and 2.8)

NOTE: Some times when condensate is present, the O-Rings swell and the seats are hard to pull. *See Special Cases for further information (1).



Figure 2.7



Figure 2.8

Remove O-Ring from Suction Seats (Fig. 2.9)

Remove Discharge Block from the Main Piston Body (Fig. 2.10)

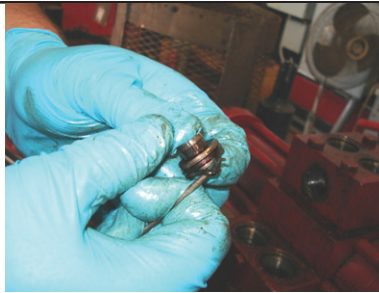


Figure 2.9

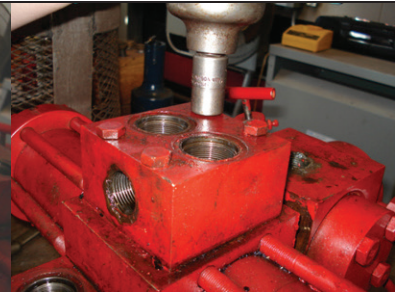


Figure 2.10

Use insert tool to remove Discharge Seats (Fig. 2.11)

Remove O-Ring From Discharge Seat (Fig. 2.12)



Figure 2.11



Figure 2.12

Remove Suction Block from Main Piston Body (Fig. 2.13)

Remove O-Rings from the back side of the Suction Block (Fig. 2.14)



Figure 2.13



Figure 2.14

STEP 3

PISTON DISCHARGE PIPING

Flip the pump upside down and loosen the fitting from the Pilot Piston Discharge Piping (Fig. 3.1). Leave the tubing attached to the Main Piston Valve Housing.



Figure 3.1

STEP 4

PILOT PISTON PIPING

Use the control valve tubing as a leverage to remove the Pilot Piston Discharge Piping fittings (Fig. 4.1 and 4.2)



Figure 4.1



Figure 4.2

DISASSEMBLY



STEP 5

MAIN PISTON VALVE HOUSING

Remove the Main Piston Valve Housing by loosening the bolts (Fig. 5.1)

Remove the O-Ring from the Main Piston Valve Housing (Fig. 5.2)



Figure 5.1

Figure 5.2

Use the needle nose pliers to remove the "D" Slide (Figure 5.3)



Figure 5.3

STEP 6

CONTROL VALVE ASSEMBLY TUBING

Use two wrenches to loosen both ends of the tubing. Hold the fitting elbow with one wrench and use the other one to loose the fitting cap (Fig. 6.1 and 6.2). This will prevent the fitting from breaking.

Note: *See Special Cases for further information (3).

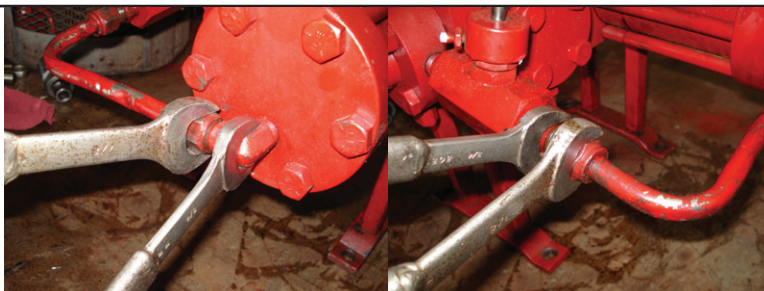


Figure 6.1

Figure 6.2

STEP 7

NEEDLE VALVE DISASSEMBLY

Loosen set screw and remove handle. (Fig. 7.1).

Loosen stem lock set screw and lift off stem. (Fig. 7.2).

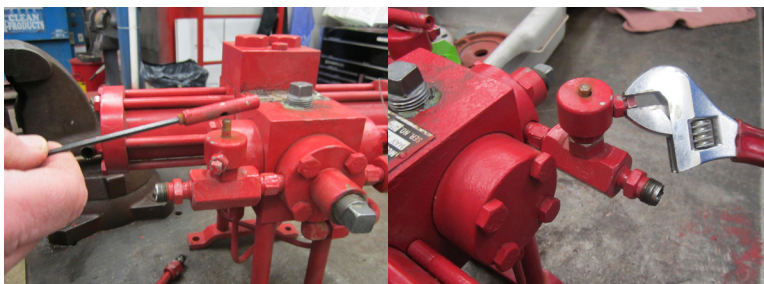


Figure 7.1

Figure 7.2

Loosen needle valve cap and remove. (Fig. 7.3)

Loosen needle valve bonnet and remove. (Fig. 7.4)



Figure 7.3

Figure 7.4

Remove stem from bonnet than remove backup and o-ring. (Fig. 7.5)



Figure 7.5

Loosen the bolts from the piston pilot valve housing (Fig. 7.6)



Figure 7.6

Remove the o-ring from the pilot piston valve housing. (Fig. 7.7)



Figure 7.7

STEP 8 CYLINDERS

*This procedure should be done in both sides of the pump.

Loosen the bolts Cylinder Head (Fig. 8.1)



Figure 8.1

Slide out the Cylinder Head and remove the O-Ring (Fig. 8.2)



Figure 8.2

Remove the cylinder (Fig. 8.3)



Figure 8.3

Use a wrench to hold the Piston Rod in place and loosen the lock nut from the other side of the piston (Fig. 8.4)



Figure 8.4

Slide out the piston (Fig. 8.5) and then remove the O-Ring and two backups (Fig. 8.6)



Figure 8.5



Figure 8.6

DISASSEMBLY

Remove the O-Ring from the Piston Retainer Groove (Fig. 8.7)



Figure 8.7

Remove the O-Ring from the Piston Rod Gland (Fig. 8.8)



Figure 8.8

Remove the two O-Rings located in the communicating hole grooves from the Pilot Piston Gland (Fig. 8.9)



Figure 8.9

Remove the O-Ring and the Backup from the Piston Rod Seal Retainer (Fig. 8.10)



Figure 8.10

Remove the Piston Rod Seal Retainer (Fig. 8.11 & 8.12)



Figure 8.11



Figure 8.12

Slide out the Piston Rod (Fig. 8.13)



Figure 8.13

Use the needle nose pliers to remove the index pin (Fig. 8.14)



Figure 8.14

Note: Remove the index pins only if they are loose, otherwise leave them in place.

STEP 9

PILOT PISTON CAPS

*This procedure should be done in both sides of the pump.

Loosen the bolts from the Pilot Piston Cap (Fig. 9.1)



Figure 9.1

Remove the Backup from the Pilot Piston Cap (Fig. 9.2)



Figure 9.2

Remove O-Ring from the Pilot Piston Bearing (Fig. 9.3)



Figure 9.3

STEP 10 PILOT PISTON

Tap the pilot piston with a rubber hammer until you slide it out of the pump (Fig. 10.1 and 10.2)



Figure 10.1



Figure 10.2

Remove O-Ring and Backup from the Pilot Piston Bearing (Fig. 10.3)

Note: If the Piston Bearing is tight use the Kimray Seal Retainer tool to remove it.

Using the Kimray Seal Retainer Tool:
Introduce the Seal Retainer Tool in the Pilot Piston Hole and tap it with the hammer (Fig. 10.4, 10.5 and 10.6). After removing the Pilot Piston Bearing, remove its O-Ring and Backup.



Figure 10.3



Figure 10.4



Figure 10.5



Figure 10.6

STEP 11

LEGS

Flip the pump upside down to remove the legs from the bottom part of the body (Fig. 11.1)



Figure 11.1

SPECIAL CASES

This section is provided to give assistance when you can not tear down the pump with the normal procedures.

(1) PULLING SUCTION SEATS

Light the torch and adjust it (Fig. 12.1)

Insert the torch in the seat hole lifting it in and out to prevent damage to torch tip (Fig. 12.2 and 12.3)



Figure 12.1

Figure 12.2

After seat in block is heated to glowing red or when you hear the O-Ring pop, then turn torch off and submerge suction block in water (Fig. 12.4)



Figure 12.3

Figure 12.4

Insert seat pullers and tap upwards with wrench to remove the seat (Fig. 12.5 and 12.6)

***NOTE: DO NOT REUSE THE SEATS AFTER HEATING THEM WITH THE TORCH.**

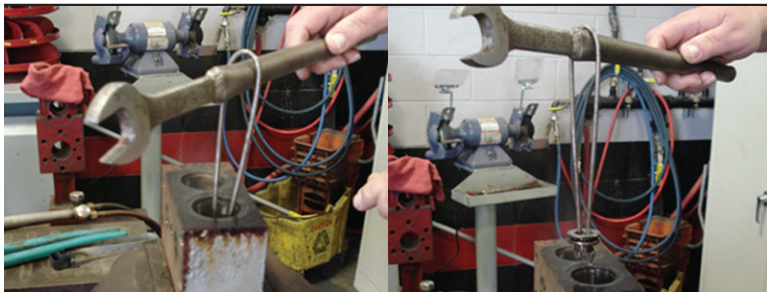


Figure 12.5

Figure 12.6

(2) DART CAPS

If the Dart Caps will not come apart, place the block on a flat solid surface and strike Dart Caps forcefully several times with a Shop Hammer (Fig. 13.1)

Note: A useful surface is the flat anvil side of the vice.

Tighten Block in vice, then use any kind of wrench to remove the Dart Caps from the Block (Fig. 13.2)

Note: After hammering the Dart Caps they should come loose. If they don't, repeat procedure in (Fig. 13.1 and 13.2)

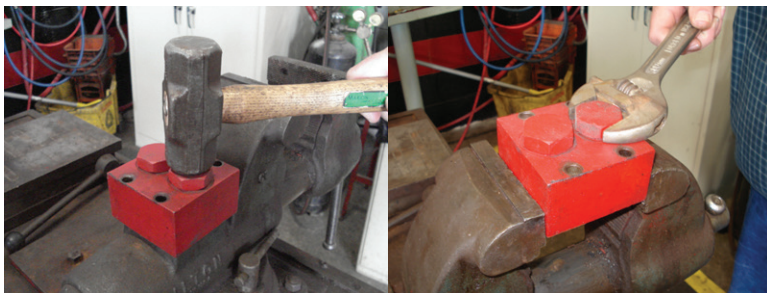


Figure 13.1

Figure 13.2

(3) FITTINGS

Sometimes the fittings will not come loose. If this happens, use a shop hammer on bottom side of fitting as a backup to keep it from bending. Strike top side of fitting with a ball pen hammer several times as this heats up the nut. Loosen fitting with a wrench (Fig. 14.1)



Figure 14.1



Most commonly replaced parts

- Piston Rod
- Pistons
- Cylinders
- Gland Seal Retainers
- Pilot piston rod
- Check Valve Caps
- Darts

Occasionally changed Parts

- Suction Block
- Suction Seat
- Discharge Seat
- Discharge Block
- Glands
- Pilot Piston Retainers

PISTON ROD ASSEMBLY

Check for scorings

Replace:

- If the scoring can be felt with the finger nail (Fig. 1.1)

Repair:

- If the rod has light scorings. They can sometimes be smoothed out with 220 grit or finer emery cloth.

Uneven rod wear

Replace:

- If an uneven surface is felt (make sure to inspect the whole rod surface, sometimes the wear is located on a small area) (Fig.1.2)



Figure 1.1



Figure 1.2

PISTONS

Replace:

- If the surface where the O-Ring seats shows wear. (Fig. 2.1)

Note: Check the outside surface where the O-Ring and backup are placed. Check surface for an O-Ring groove.



Figure 2.1

INSPECTING PARTS

CYLINDERS

Replace:

- If there are ripples at each end of stroke area (Fig. 3.1)
- If there are scorings in the cylinder (Fig. 3.2)

Note: A combination of cylinder wear and a piston wear will decrease O-Ring squeeze.



Figure 3.1

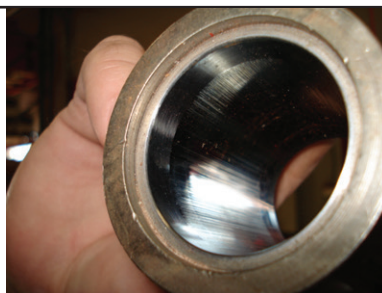


Figure 3.2

PISTON ROD SEAL RETAINER

These are very critical, since a lot of pump failures occur from letting mixing wet and dry glycol to mix.

Replace:

- If the surface where the O-Ring seats shows wear (Fig 4.1).

Note: Check the inside surface where the O-Ring and backup are placed. A good way to check this area is to take a pencil and run it across the width of the surface and see if there is any groove.



Figure 4.1

PILOT PISTON

Replace:

- If there is a presence of scratches (Fig. 5.1)
- If there is a presence of uneven wear (Fig. 5.2)

Repair:

- If the rod has light scratches. They can sometimes be smoothed out with 220 grit or fine emery cloth.



Figure 5.1

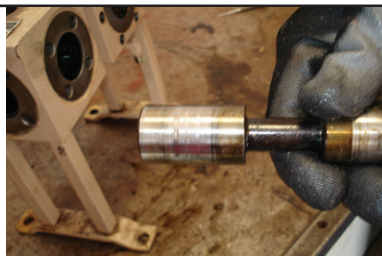


Figure 5.2

DART CAPS

Replace:

- If clearance between cap and dart is too much.

Note: Take a dart and slide it into a cap. Check for side to side play and make sure the dart goes in and out freely. A good way to check side to side play is to check for play with new parts to be able to tell the difference (Fig. 6.1)

Repair:

- If there is interference between Cap and Dart.

Note: To clean Dart Cap, insert appropriate size reamer.

- If O-Ring gets stuck up in the communicating hole.

Note: Make sure communicating hole is clear. That can be done with an air nozzle or a small drill bit. (Fig. 6.2)



Figure 6.1



Figure 6.2

DARTS

Replace:

- If there is damage on the O-Ring ledge or stem (Fig. 7.1)

Note: Inspect darts for wear on stem and ledge that holds the O-Ring. Sometimes when O-Ring comes off the darts start hammering creating damage to the ledge (Fig. 7.2)



Figure 7.1



Figure 7.2

SUCTION BLOCK

Replace:

- If O-Ring surface of wall has grooves or excessive wear. (Fig. 8.1)

Note: When installing seats in to the block make sure there is some resistance.

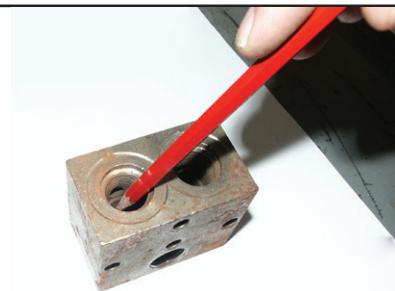


Figure 8.1

INSPECTING PARTS

DISCHARGE BLOCK

Replace:

- If seats are not flush with block surface

Note: Put seats in block. Take a straight edge and lay it across the seats. They should be close to flush with the block surface (Fig. 9.1). If seats sit low, this may cause a leak between block and body.



Figure 9.1

MAIN PISTON BODY

Replace:

- If Main Piston Body has nicks or washouts around communicating holes (Fig.10.1)

Repair:

- Check for wear in the body due to seats impact.

Note: After continuous hammering of darts on discharge seats, the seats can wear the body surface (Fig. 10.2)



Figure 10.1



Figure 10.2

SUCTION AND DISCHARGE SEATS

Replace:

- If there is excessive wear on seats (Fig. 11.1)
- If the segments of the Collet on Suction Seat are bent (Fig. 11.1)
- If Dart doesn't fit freely in seats (Fig. 11.2)



Figure 11.1



Figure 11.2

PILOT PISTON BEARING

Replace:

- If there is a groove in the O-Ring surface

Note: Check inside wall for any groove (Fig. 12.1)



Figure 12.1

PISTON ROD GLAND

Replace:

- If the surface where the Backup sits shows inward wear. Check this area for flatness (Fig. 13.1)
- If excessive washouts are present (Fig. 13.1)
- If communicating holes get damage (Fig. 13.2)

Note: This surface gets damaged very easily and could result in leaks between the Body and the Gland.



Figure 13.1



Figure 13.2





KIMRAY TOOLS USED



INSERT TOOLS FOR SUCTION SEAT

PART NUMBER	PUMP SIZE
1542	4015, 2015, 1715
1543	9015, 5015
1544	21015, 10015
1545	45015, 20015



9.5mm 7.924mm 4.737mm

REAMERS *

DIAMETER	PUMP SIZE
9.5mm (0.3740")	45015, 20015
7.924mm (0.3120")	21015, 10015
4.737mm (0.1865")	4015, 2015, 1715, 9015, 5015

CLEANING TOOLS USED *



POWER TUBE BRUSH

Diameter	Wire Size	Length	Stem Diameter
1/4"	0.004"	3 1/2"	1/8"
3/4"	0.006"	3 1/2"	1/4"
1 1/4"	0.008"	3 1/2"	1/4"

*NOTE: These are not Kimray tools

CLEANING

STEP 1

Wire brush the Piston rod gland retainer (Fig.1.1), Pilot piston bearing (Fig 1.2), Piston (Fig. 1.3) and the Piston Rod Gland (Fig.1.4)



Figure 1.1



Figure 1.2



Figure 1.3



Figure 1.4

Take a proper size reamer and spin the Dart Cap until it spins freely (Fig. 1.5)



Figure 1.5

STEP 2

AIR CLEANING

Use the air nozzle to make sure tubing and communicating hole in Dart Cap is clear (Fig. 2.1 and 2.2)



Figure 2.1



Figure 2.2

STEP 3

PILOT PISTON ROD AND PISTON ROD REPAIR

*It can just be repaired if there are light scratches. (Fig. 3.1)

Pilot Piston Rod: Wrap the Pilot Piston Rod with sand paper and sand it until the scratches disappear. (Fig. 3.2 and 3.3)

Piston Rod: Use one strip of sand paper to sand the surface as shown (Fig.3.4)

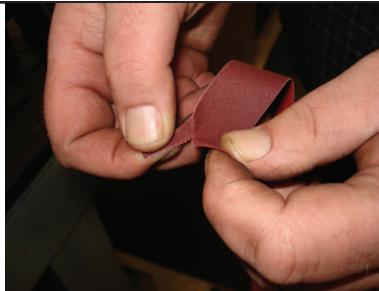


Figure 3.1

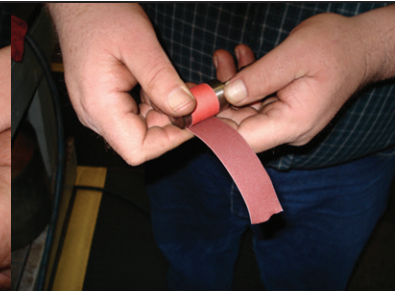


Figure 3.2



Figure 3.3



Figure 3.4

STEP 4

PILOT PISTON VALVE HOUSING REPAIR

Remove "D" Slides Guides with a screw driver and place them apart in their same side. (Fig. 4.1)

Apply pressure with your hand in the top side by creating a flat surface when sanding it (use 80 grit sandpaper). Move up and down 3 to 4 times. To make sure the worst scratches have disappeared, rotate the pilot piston housing 90°, press lightly and sand it one more time. This will show if there are more scratches to be sanded out (Fig. 4.2 and 4.3)

After sanding it, use the air nozzle to make sure the inside orifices are clear (Fig. 4.4)



Figure 4.1



Figure 4.2

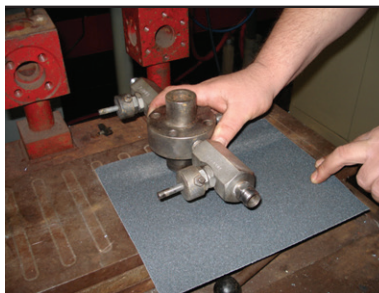


Figure 4.3



Figure 4.4

Blue Loctite the screws when you put back together the "D" Slides Guides. (Fig. 4.5)

Note: These surfaces must be sanded evenly, if not the housing needs to be replaced.

New style Port plate uses a gasket (Fig. 4.6) port plate can be replaced or resurfaced.



Figure 4.5

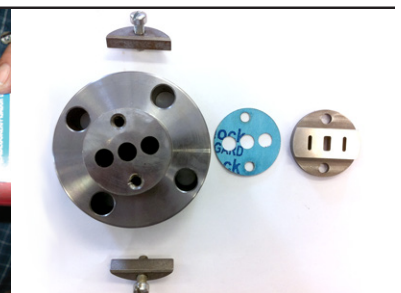


Figure 4.6

STEP 5

MAIN PISTON VALVE HOUSING REPAIR

Sand the Main Piston Valve Housing applying pressure with your hand in the side creating a flat surface (use 80 sandpaper). Move up and down 3 or 4 times. To make sure the worst scratches disappear, rotate the main piston valve housing 90°, press lightly and sand it one time. This show if there are more scratches to be sanded out (Fig. 5.1). Use the air nozzle to make sure the piston valve housing orifices and tubing clear (Fig. 5.2) Blue Loctite the screws when you put together the "D" Slides Guides. Note: These surfaces must be sanded evenly, if not the housing needs to be replaced.



Figure 5.1

Figure 5.2

ASSEMBLY

STEP 6 GROUPING O-RINGS

Group your O-Rings and Backups in the right order on top of the pump. This will prevent you from assembling them backwards or in different place (Fig. 6.1)



Figure 6.1

STEP 7

PILOT PISTON ASSEMBLY

Insert the Pilot Piston Seal Retainer with the bevel side facing inside the pump. (Fig. 7.1) Insert the Pilot Piston Bearing with its O-Ring and two backups in to the Pilot Piston Body. (Fig. 7.2, 7.3 and 7.4) Place in both sides the O-Ring and Backup in top of the Pilot Piston Bearing (Fig. 7.3) Place the Pilot Piston Cap over bearings and seat the O-Rings in place. (Fig. 7.4)



Figure 7.1

Figure 7.2



Figure 7.3

Figure 7.4

Place the Pilot Piston Cap by bolting it to the body. (Fig. 7.5) Insert the Pilot Piston Rod in the other side of the Pilot Piston Body (Fig. 7.6) Place the Pilot Piston Cap in the other side by bolting it to the body. (Fig. 7.7) Use a screw driver to move the pilot piston making sure it is loose. If the pilot piston is stuck loosen bolts on the caps until you release it, then retighten bolts and check again (Fig. 7.8)

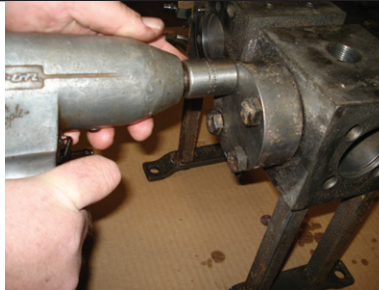


Figure 7.5



Figure 7.6



Figure 7.7



Figure 7.8

STEP 8 CYLINDERS ASSEMBLY

A change was made with the position of the index pin hole on new pump bodies was moved 180° on bodies to insure fool proof assemble. The glands has an extra index pin hole added to work on new style and old style bodies. (Fig. 8.1)

NOTE:

Make sure communication holes are aligned when assembling. (Fig. 8.1)

This procedure should be done in both sides of the pump. Insert the Piston Rod in to the Main Piston Body. (Fig. 8.2) Insert the two O-Rings in the communicating hole grooves on the Piston Rod Gland (Fig. 8.3)

Insert the piston rod seal retainer with its o-ring and two backups into the piston rod gland (Fig. 8.4) make sure index pins are in body. Slide gland and seal retainer assembly on piston rod and align index pin with hole on gland (Fig. 8.5).

Place piston seal retainer on piston rod. Put o-ring on and use piston to seat o-ring in place (Fig. 8.6).

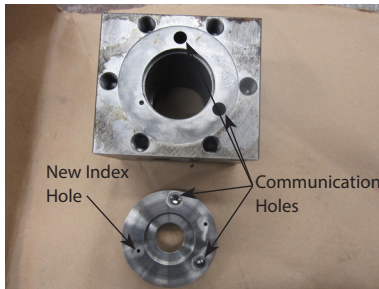


Figure 8.1



Figure 8.2



Figure 8.3



Figure 8.4



Figure 8.5



Figure 8.6

ASSEMBLY

Insert the piston along with its o-ring and two backups (Fig. 8.7).

Thread on Lock nut with the locking marks facing outside (Fig. 8.8)

Tighten the lock nut with the air gun. Hold the piston rod with a wrench on the back side. (Fig. 8.9).

Make sure Gland did not move out of place when tightening the lock nut. Insert the Piston Rod Gland O-Ring (Fig. 8.10) Insert the Cylinder Head O-Ring (Fig. 8.11).

Slide the Cylinder on piston (Fig. 8.12). Make sure the "1B" stamp on cylinder is on top and next to the gland side. Note: If the cylinder slides on easily with very little O-Ring squeeze, then you need to check closer for wear in cylinder and piston. Place the Cylinder Head and tighten bolts in a criss-cross pattern. (Fig. 8.13)

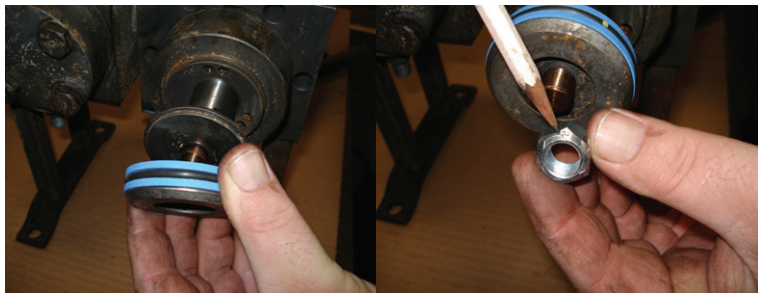


Figure 8.7

Figure 8.8



Figure 8.9

Figure 8.10



Figure 8.11

Figure 8.12



Figure 8.13

STEP 9
Main Piston Valve Housing Assembly
Turn the pump upside down (Fig. 9.1)

Place O-Ring on the Main Piston Valve Housing. (Fig. 9.2)

Place "D" Slide on the plate, use lubricant to keep it in place while inserting Main Piston Valve Housing (Fig. 9.3). Make sure that actuator and "D" Slide match without forcing otherwise damage will occur.

Use an air gun to tight the bolts (Fig. 9.4)

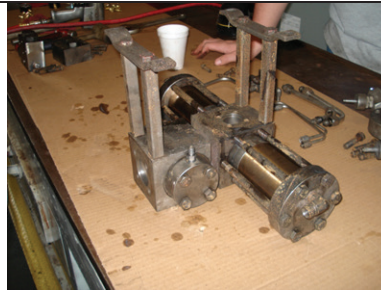


Figure 9.1



Figure 9.2



Figure 9.3



Figure 9.4

STEP 10
PILOT PISTON TUBING ASSEMBLY
Pilot Piston Tubing comes in two sizes. (Fig. 10.1) Connect the shorter tubing first and then connect the larger tubing on top (Fig. 10.2)



Figure 10.1



Figure 10.2

STEP 11
PILOT PISTON VALVE HOUSING
Place "D" Slide on the plate. Use lubricant to keep it in place while inserting Pilot Piston Valve Housing (Fig. 11.1). Insert the bolts to hold the Pilot Piston Valve Housing in place. Before tightening the bolts start the threads of the Pilot Piston Discharge Piping Fitting (Fig. 11.2) Tight the bolts and the then fully tighten the Pilot Piston Discharge Piping fitting (Fig. 11.3).



Figure 11.1

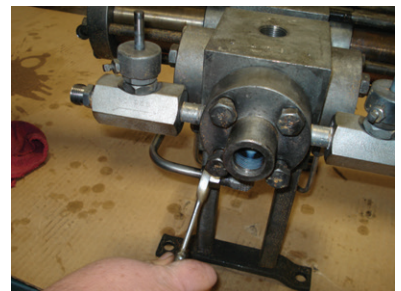


Figure 11.2



Figure 11.3

STEP 12
CONTROL VALVE TUBING
Connect the Control Valve Tubing
(Fig. 12.1).



Figure 12.1

STEP 13
DISCHARGE AND SUCTION BLOCK ASSEMBLY
Insert discharge seats into block along with
their O-Rings (Fig. 13.1) Place O-Rings on
suction seats (Fig. 13.2)



Figure 13.1



Figure 13.2

Use Insert Tool to put suction seat in
suction block (Fig. 13.3). Gently tap seat in
place being very careful not to shear O-Ring
(fig 13.4) Seat should have resistance when
pressing in place. If seat presses in easily
block may need to be replaced



Figure 13.3



Figure 13.4

Place O-Rings on dart (Fig. 13.6)



Figure 13.5



Figure 13.6

Place the O-Rings on Dart cap (Fig. 13.7)

Insert darts in Blocks then thread caps and
tighten them (Fig. 13.8). *See special notes
for Teflon Darts.



Figure 13.7



Figure 13.8

Place two O-Rings in the back part of the suction block. (Fig. 13.9)

Double check that the Darts are freely moving inside of the blocks before attaching the blocks in the body (Fig. 13.10). If they are stuck, remove the caps and check for the problem.



Figure 13.9

Figure 13.10

Bolt discharge and suction blocks to pump (Fig. 13.11 and 13.12)

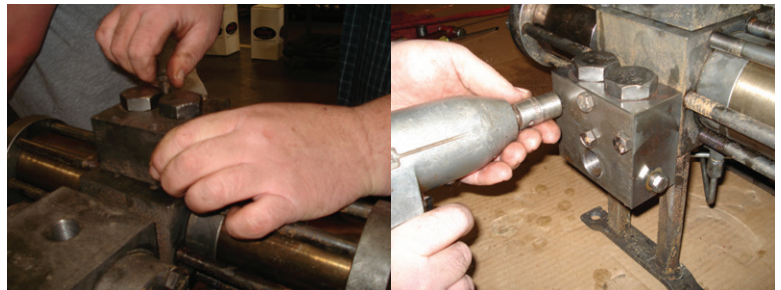


Figure 13.11

Figure 13.12

STEP 14

CONTROL VALVE REPAIR

Insert stem into bonnet and thread in. (Fig. 14.1)

Add o-ring and backup. (Fig. 14.2)

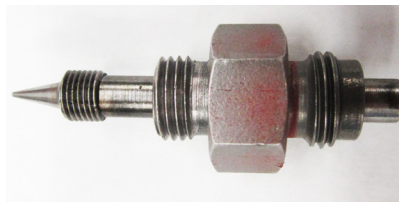


Figure 14.1

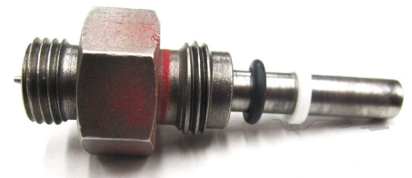


Figure 14.2

Take cap and invert over stem and seat them in place. (Fig. 14.3, 14.4)

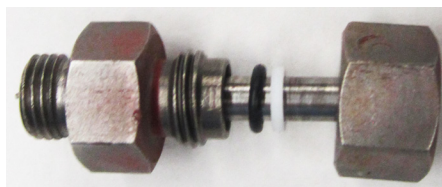


Figure 14.3

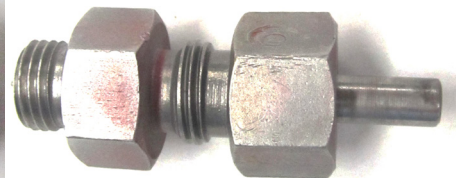


Figure 14.4

Take cap and thread into bonnet. (Fig. 14.5)

NOTE:

The new style needle valve bodies has a bore for the o-ring. (Fig. 14.6)

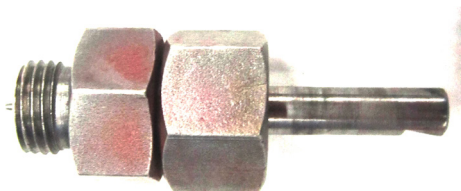


Figure 14.5



Figure 14.6



ASSEMBLY

New style body, add o-ring on bonnet. (Fig. 14.7) or old style body, use Loctite™ on bonnet. (Fig. 14.8)

CAUTION:
DO NOT use o-ring on old style as this will cause leaks.



Figure 14.7

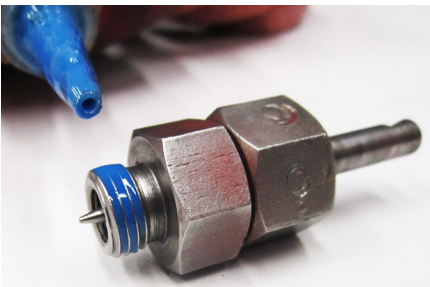


Figure 14.8

Thread bonnet assembly into body and tighten. (Fig. 14.9)

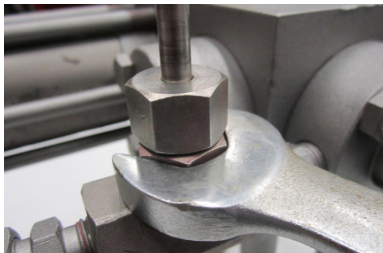


Figure 14.9

Put stem lock assembly on. (Fig. 14.10)

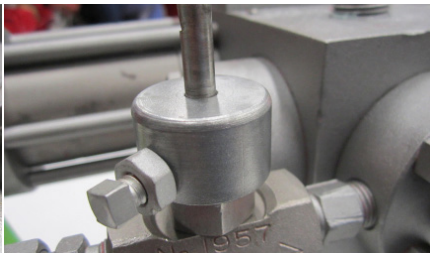


Figure 14.10

Install handle and tighten set screw. (Fig. 14.11)



Figure 14.11

SPECIAL NOTES

TEFLON DARTS

If a problem arises where the O-Rings will not stay on Dart, then you might consider using Teflon Darts (Fig.15.1).

If you are having other kinds of problems with the swelling of O-Rings, then Teflon Darts will not solve them.



Figure 15.1

TEFLON DARTS	
PART NUMBER	PUMP SIZE
1735	4015, 2015, 1715
1736	9015, 5015
1737	21015, 10015
1738	45015, 20015



FINDING ASSEMBLY PROBLEMS	
PUMP WILL NOT STROKE	<ul style="list-style-type: none"> • Pilot Piston Rod in a Bind • Loosen bolts on end caps (if the pump starts stroking tighten bolts evenly) • D-Slides were pinched when port end valve housing were installed. Remove valve housing and check D-Slides for damage • Make sure discharge Darts are free • Make sure control valves are open • When installing Gland the Gland rotated and index pin is in the communicating hole.
PUMP STROKES ONE TIME	<ul style="list-style-type: none"> • Make sure Piston Retainer has the right thickness <p>NOTE: 4015 and 9015 Piston Retainers look identical but one is thicker than the other.</p>
PUMP DOES NOT STROKE EVENLY	<ul style="list-style-type: none"> • Check control valves that they are opened evenly • Dart caps have too much clearance • Dart is stuck • Sheared O-Ring when installing seat in suction block • Suction block is worn out • Leaking wet and dry glycol together • Check piston area • Check gland retainer area
TESTING PROCEDURES TO PINPOINT PROBLEM AREAS	
SUCTION SEAT/DARTS LEAK	<ul style="list-style-type: none"> • Use split Block Assembly w/o darts. • Apply pressure to each side and check dry suction for leaks.
PISTON O-RINGS LEAK	<ul style="list-style-type: none"> • Remove control tubing • Remove Discharge Caps • Remove Darts • Apply pressure to discharge port. • Check cylinder head ports for leaks
MAIN PISTON ROD O-RINGS LEAK	<ul style="list-style-type: none"> • Close control valves • Remove discharge block • Apply pressure to wet glycol inlet • Check discharge ports for leak
DISCHARGE SEATS/DARTS LEAK	<ul style="list-style-type: none"> • Remove suction block • Apply pressure to discharge block assembly • Check suction ports for leaks



If the Kimray Glycol Pump has to be serviced excessively, it is very likely the symptom of a more serious problem. Most pump problems stem from poor maintenance, filtration, chemical contamination, high temperature, Ph control and sludge among other system problems. Proper system design, preventive maintenance and good operation procedures should provide for ideal service conditions and less down time for Kimray Glycol Pump.

This manual shows the best way of tearing down, cleaning, inspecting, assembling and troubleshooting Kimray Glycol Pumps. Following these procedures will save you time and will assure a reliable repair. If you continue to have problems and need further assistance, please contact Kimray Sales and Service in Oklahoma City.

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KIMRAY Glycol Pump

Repair Manual
www.kimray.com

