

Genuine
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Repair Manual
GEN II BACK MOUNT



INDEX

Introduction 1

Elastomer Materials 2

Disassembly 3

Assembly 9

Testing and Calibration 13

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SCOPE

This repair manual contains information concerning the Gen II BACKmount liquid level controller. Included are detailed instructions regarding disassembly, repair, assembly and calibration.

DESCRIPTION

The Kimray GEN II BACKmount Liquid Level Controller is designed for use in liquid level and liquid/liquid interface control applications.

OPERATION

The GEN-II uses displacement of a float to control a vessel's liquid level or it can be used as an interface controller to maintain multiple liquids in a vessel. Simply mount controller to vessel, set pilot to snap or throttle, and then set level with adjustment knob.

MAINTENANCE

Maintenance should be performed on a regular basis. Initial interval of 12 months is recommended. The maintenance interval may increase or decrease depending on changing application environments. The pilot can be repaired/replaced without removing the controller from the vessel, but any displacer maintenance will require controller removal.

WARNING

Before performing any service, make sure the liquid level controller is isolated from all gas sources. Verify that all instrument gas and operating lines have been disconnected.

GENERAL SPECIFICATIONS

Working Pressures 0 - 4000 psig

Materials	Mounting Piece	Low Temp Process Steel (Std.) Cast Steel Cast Stainless Steel	ASTM SA-352 ASTM A-216-WCB ASTM CF8M
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Elastomers	Highly Saturated Nitrile (HSN) Buna-N (Nitrile) Teflon Viton Neoprene
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Displacer	Polyvinyl Chloride (PVC)
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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!!!



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

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

NITRILE

TEMPERATURE:

Buna-N:
-40° to +220° F
-40° to +105° C
Low-Temp:
-85° to +120° F
-65° to +49° C

APPLICATION:

Crude Oil & Gas Production Glycol Dehydrators, 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)

GYLON

TEMPERATURE:

-350° to +500° F

APPLICATION:

High heat, high chemical resistance, highly resistance to gas permeation

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

ETHYLENE PROPYLENE

TEMPERATURE:

-65° to +300° F
-54° to +148° C

APPLICATION:

Steam Flood

FLUID / GAS:

Steam, Water, Alcohol

DO NOT USE WITH:

Crude Oil & Gas, Diester Lubricants (Lube Oils)

POLYURETHANE

TEMPERATURE:

-40° to +220° F
-40° to +104° C

APPLICATION:

High abrasion resistance Seats, Diaphragms

FLUID / GAS:

Crude Oil gas and Water, Sour Gas (CO₂), propane, butane, fuel, mineral oil and grease

POLYACRYLATE

TEMPERATURE:

±0° to +300° F
-17° to +149° C

APPLICATION:

Production Heaters, Thermostats

FLUID / GAS:

Crude Oil & Gas at High Temperature

DO NOT USE WITH:

Alcohol, Glycols

STEP 1
Cover

Inspect cover gasket and inspect for damage (Fig. 1.0).

The mounting bolt can be removed if you need to separate the cover from the back plate (Fig. 1.1).

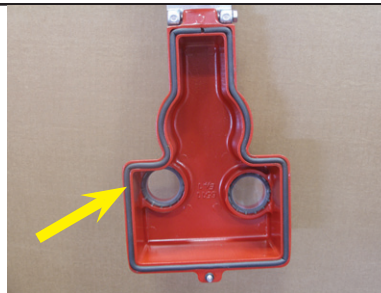


Figure 1.0

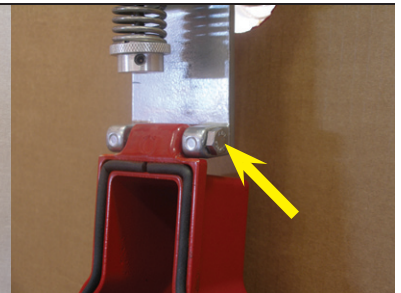


Figure 1.1

Warning! Before any further steps are taken remove controller from vessel.

STEP 2
Pilot Removal

Use a flat-head screwdriver to loosen the two screws attaching the pilot to the back plate (Fig. 2.0).

Remove the screws from the pilot body and set aside (Fig. 2.1).

Remove the pilot and set aside for disassembly (Fig. 2.2).

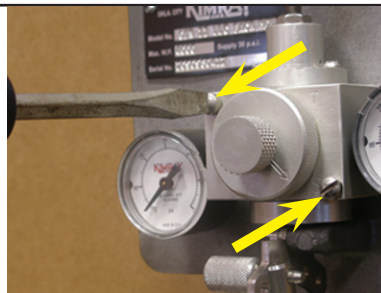


Figure 2.0



Figure 2.1

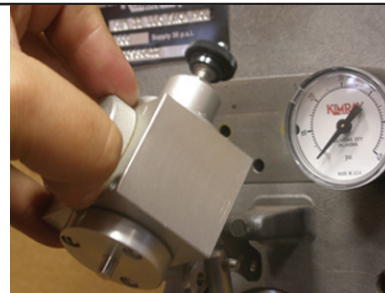


Figure 2.2

STEP 3
Waggle Arm Assembly

Wrench loose the set screw that locks the adjustment knob in-place (Fig. 3.0).

Turn the adjustment knob counter-clockwise to unthread from the adjustment screw (Fig. 3.1).

Remove the adjustment knob and spring (Fig. 3.2)

Remove the pull pin attaching the link body to the tangent arm (Fig. 3.3).

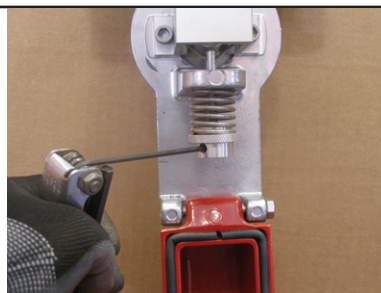


Figure 3.0

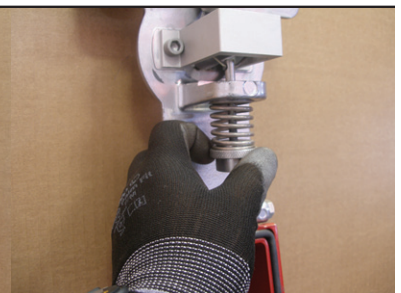


Figure 3.1



Figure 3.2

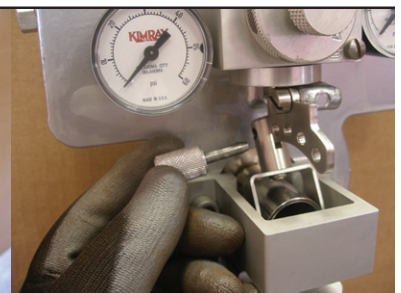


Figure 3.3

DISASSEMBLY

Remove the screw attaching the tangent arm to the back plate (Fig. 3.4).

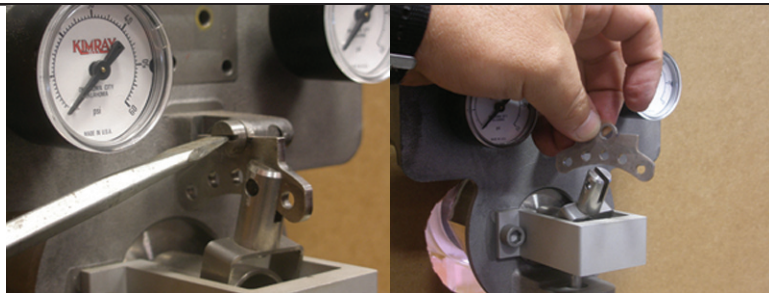


Figure 3.4

Figure 3.5

Remove the tangent arm and set aside (Fig. 3.5).

Wrench loose the mounting bolts attaching the retainer to the back plate (Fig. 3.6).

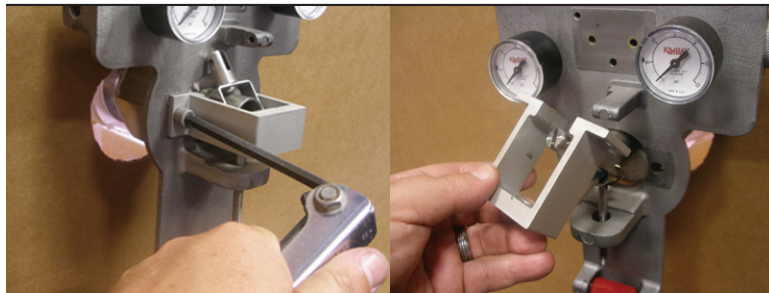


Figure 3.6

Figure 3.7

Remove the retainer and set aside (Fig. 3.7).

Remove the pivot rod and set aside (Fig. 3.8).



Figure 3.8

Figure 3.9

Pry loose the waggler arm wire adjustment screw that attaches the link to the waggler arm housing (Fig. 3.9).

Remove the link from the waggler arm housing (Fig. 3.10).

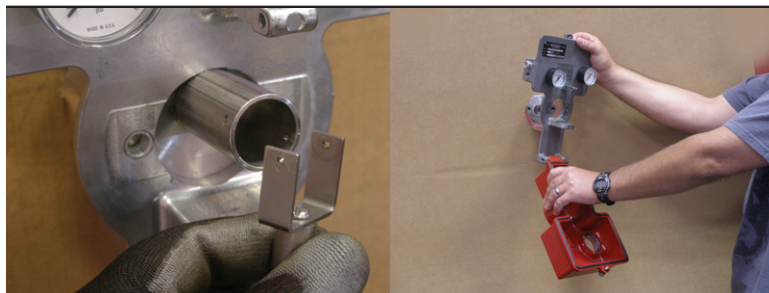


Figure 3.10

Figure 3.11

Remove the back plate from the waggler arm housing/mounting piece assembly (Fig. 3.11).

Remove the waggler arm from the mounting piece (Fig. 3.12 & Fig. 3.13).

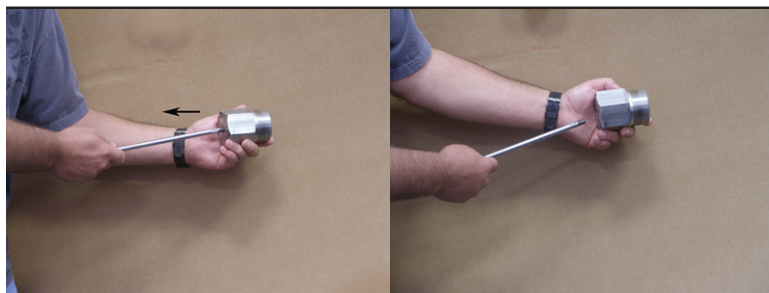


Figure 3.12

Figure 3.13

Remove the teflon seal ring and discard (Fig. 3.14).

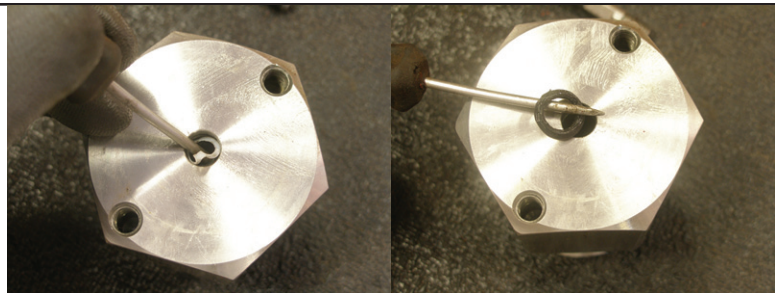


Figure 3.14

Figure 3.15

Remove the o-ring and discard (Fig. 3.15).

Note: A pic, or a similar tool, may be required to remove these items from the counter groove in the mounting piece.

STEP 4

Pilot

Remove and discard the o-rings (Fig. 4.0 & Fig. 4.1).

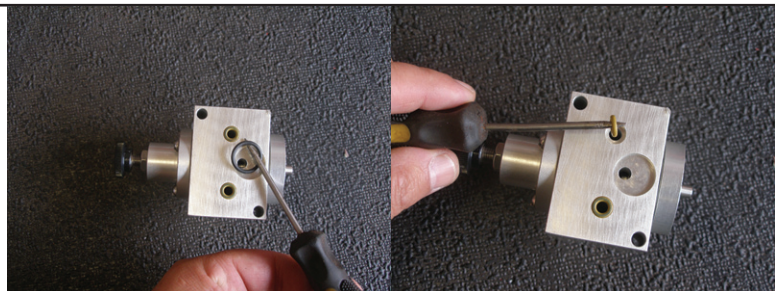


Figure 4.0

Figure 4.1

Remove the (3) screws attaching the snap adjustment housing to the pilot body (Fig. 4.2).



Figure 4.2

Figure 4.3

Remove the cap and set aside (Fig. 4.3).

Remove spring plate and set aside (Fig. 4.4).

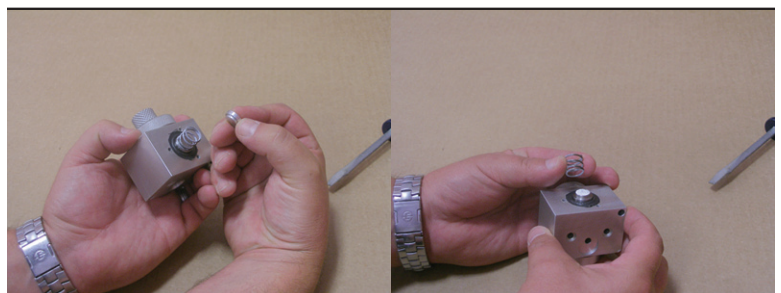


Figure 4.4

Figure 4.5

Remove spring and set aside (Fig. 4.5).

Remove diaphragm plate and set aside (Fig. 4.6).

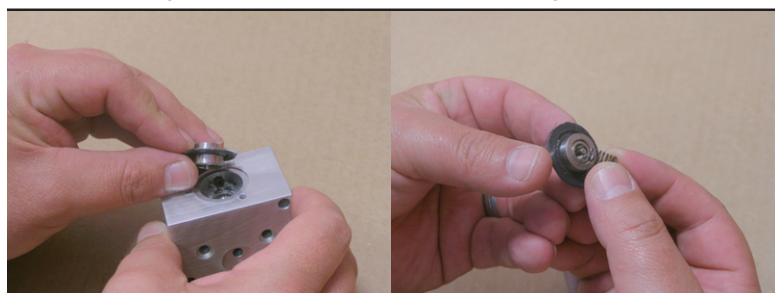


Figure 4.6

Figure 4.7

Remove the throttle spring and set aside (Fig. 4.7).

DISASSEMBLY

Notice the pilot plug remains in the pilot body; turning the body over will allow the pilot plug to simply fall out, and then can be discarded (Fig. 4.8).

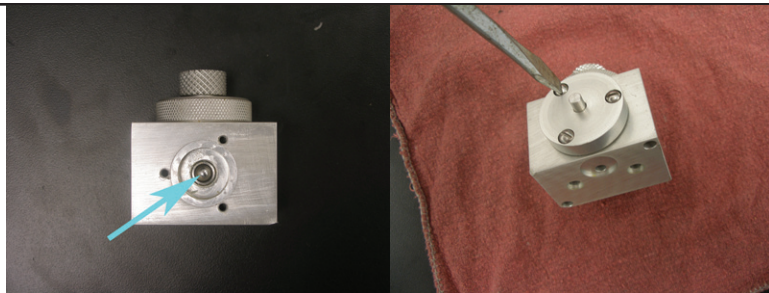


Figure 4.8

Figure 4.9

Remove the three retaining screws on the lower cap (Fig. 4.9).

Remove the lower cap and set aside (Fig. 4.10).

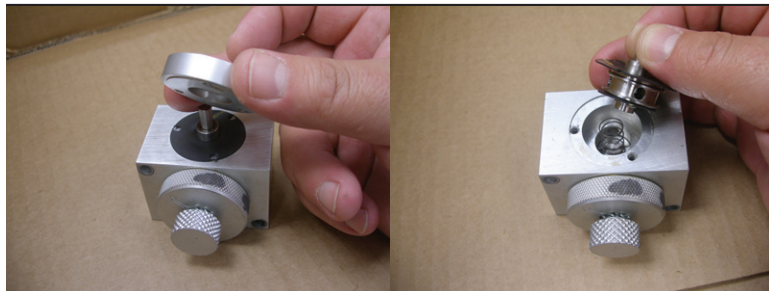


Figure 4.10

Figure 4.11

Remove the lower diaphragm assembly (**caution: spring may remain attached to seat**) (Fig. 4.11).

Remove the o-ring from the actuator assembly and discard (Fig. 4.12 & Fig. 4.13).



Figure 4.12

Figure 4.13

Remove the #5541 spring as set aside (Fig. 4.14).

Loosen the lower seat with a large screwdriver (Fig. 4.15).

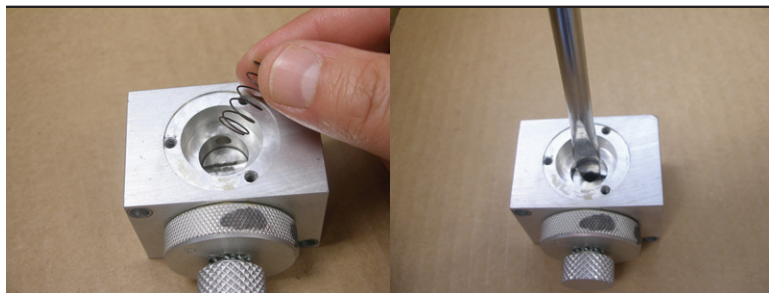


Figure 4.14

Figure 4.15

Remove the seat for inspection (Fig. 4.16).

Remove the o-ring from the seat and discard (Fig. 4.17).

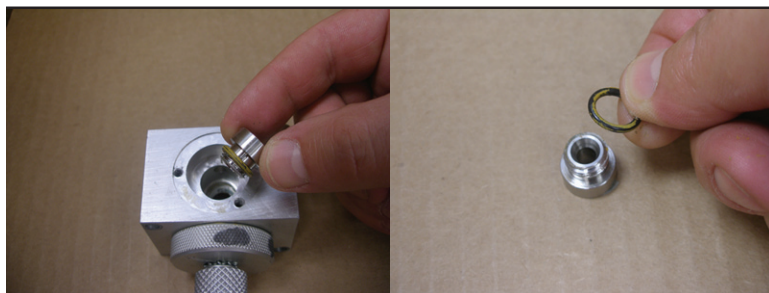


Figure 4.16

Figure 4.17

Remove the lock nut and set aside (Fig. 4.18).



Figure 4.18

Figure 4.19

Remove and discard the (4) o-rings set into the pilot body (Fig. 4.20).

Inspect the (4) holes machined into the selector plate. Use shop air as needed and keep in mind all four holes communicate (Fig. 21).

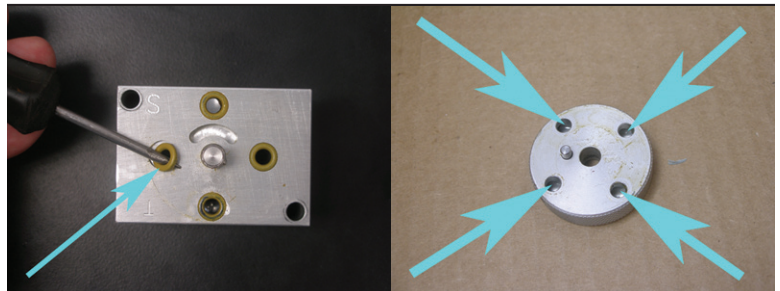


Figure 4.20

Figure 4.21



STEP 1

Pilot

Replace the (4) o-rings into the pilot body (Fig. 1.0).

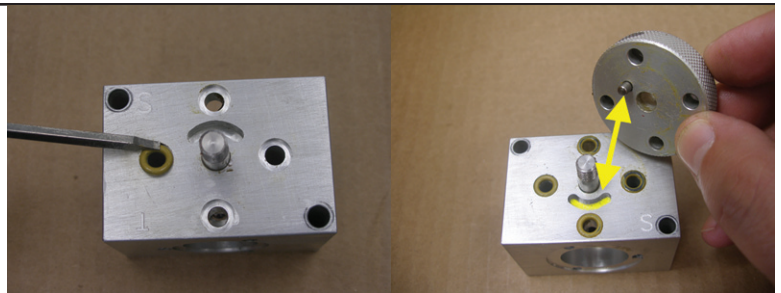


Figure 1.0

Figure 1.1

Replace the lock washer onto the knob post making sure it rests on the switch plate (Fig. 1.2).

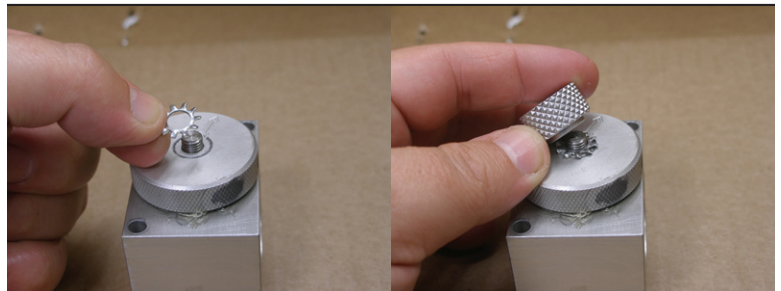


Figure 1.2

Figure 1.3

Thread the selector knob onto the knob post (Fig. 1.3).

Replace the o-ring onto the seat and apply blue thread lock (Fig. 1.4).



Figure 1.4

Figure 1.5

Thread the seat into the pilot block using a screwdriver (Fig. 1.5).

Install the pilot plug into the seat (small ball first) (Fig. 1.6).



Figure 1.6

Figure 1.7

Install the throttle spring onto the diaphragm plate (Fig. 1.7).

Install the diaphragm assembly into the pilot housing (Fig. 1.8).

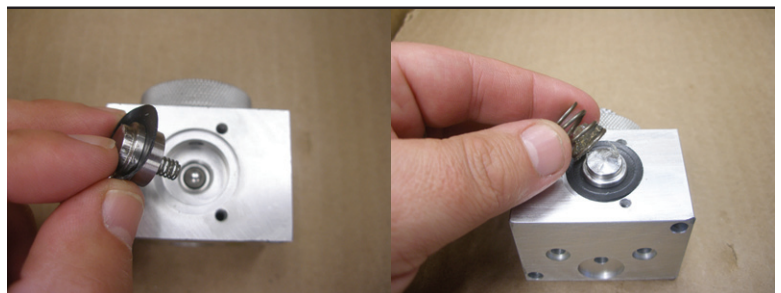


Figure 1.8

Figure 1.9

Install the #6528 spring onto the diaphragm plate (Fig. 1.9).

ASSEMBLY

Install the diaphragm plate onto the spring (Fig. 1.10).



Figure 1.10

Figure 1.11

Install upper cap onto pilot block, making sure it seats evenly, then tighten screws (Fig. 1.11).

Note: A small amount of grease applied to the springs will help hold them in place while installing the diaphragm assembly.

Install the #5541 spring over the pilot plug and onto the seat (Fig. 1.12).

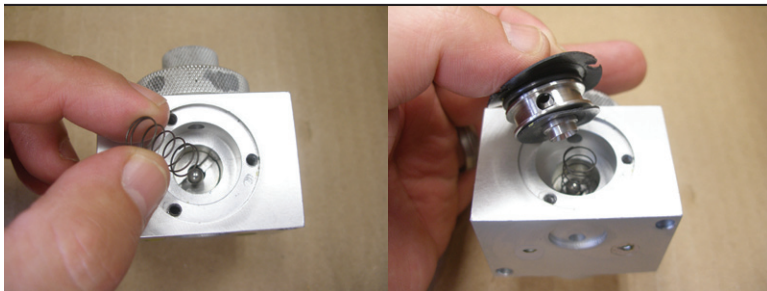


Figure 1.12

Figure 1.13

Install the actuator assembly into pilot block. The seat needs to fit into the spring and onto the pilot plug (Fig. 1.13).

Install the lower cap over the actuator and evenly seated into the counter-bore machined into the pilot body (Fig. 1.14).

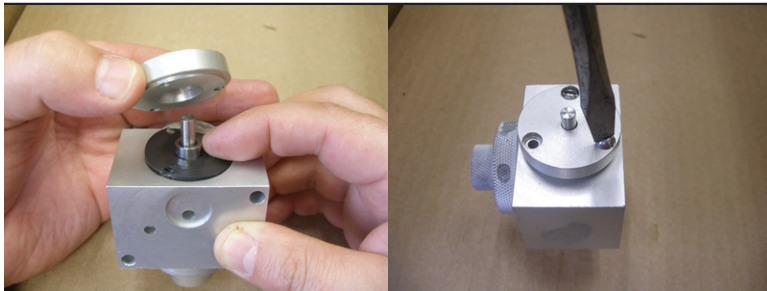


Figure 1.14

Figure 1.15

Tighten screws down (Fig. 1.15)

Install (2) new #647V o-rings into the pilot block (Fig. 1.16)

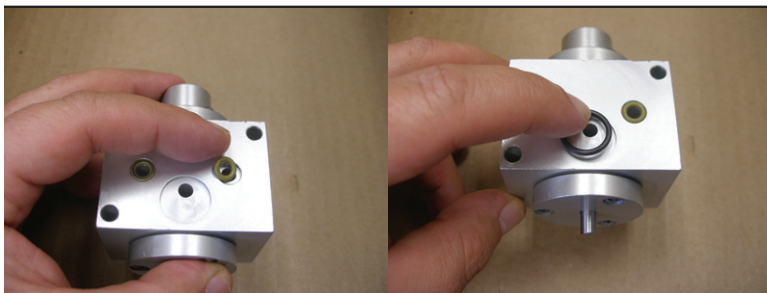


Figure 1.16

Figure 1.17

Install a new #920V o-ring into the pilot body (Fig. 1.17).

**STEP 2
Pilot Installation**

Install pilot onto the back plate and tighten the (2) mounting screws (Fig. 2.0 & Fig. 2.1).



Figure 2.0

Figure 2.1

STEP 3
Mounting Piece

Install the o-ring into the groove machined into the body (Fig. 3.0).

Install the teflon back-up into the groove and above the o-ring (Fig. 3.1).



Figure 3.0

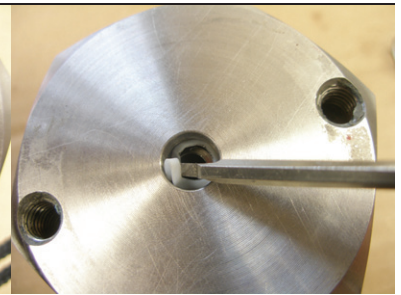


Figure 3.1

Install the waggle arm into the mounting piece threaded end first, a small amount of grease should be applied to help avoid damage to the o-ring (Fig. 3.2).

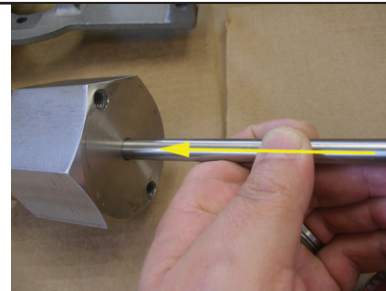


Figure 3.2

STEP 4
Waggle Arm Assembly

Align the tangent arm with the mounting hole on the back plate (Fig. 4.0).

Tighten tangent arm using #5485 screw (Fig. 4.1).

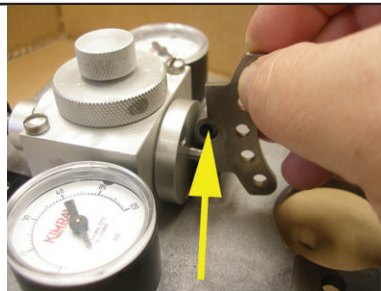


Figure 4.0



Figure 4.1

Insert the waggle arm housing through the back plate and the adjustment screw through the adjustment screw plate (Fig. 4.2).

Align link body with desired hole in tangent arm (Fig. 4.3).

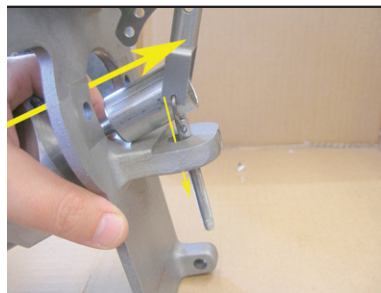


Figure 4.2

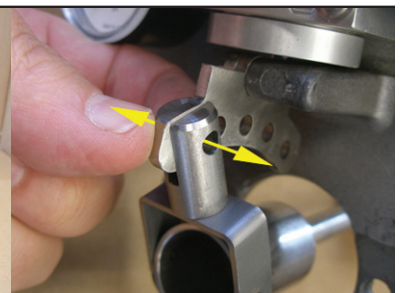


Figure 4.3

Install the pull pin through the waggle arm/link body assembly (Fig. 4.4).

Insert pivot rod into waggle arm housing (Fig. 4.5).

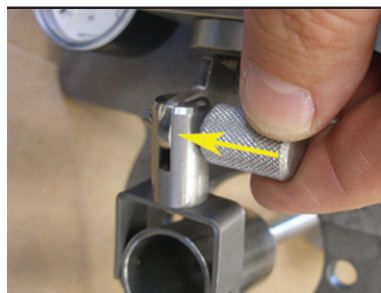


Figure 4.4

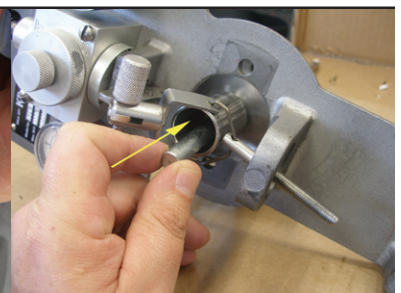


Figure 4.5

ASSEMBLY

Notice the counter bore in the pivot rod retainer (Fig. 4.6).

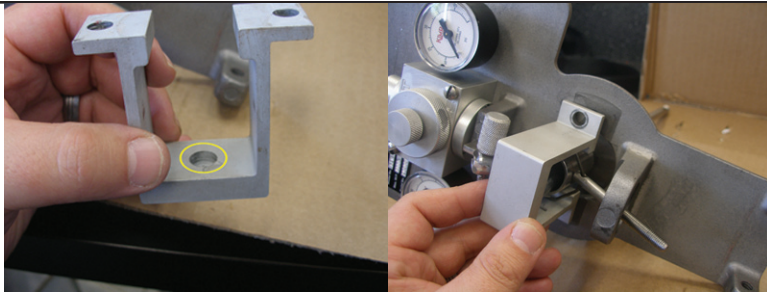


Figure 4.6

Figure 4.7

Place the retainer over the waggle arm housing, verifying the pivot rod sits in the counter bore shown in (Fig. 4.7).

Install mounting screws through the retainer, back plate and into the mounting piece and tighten with a hex wrench (Fig. 4.8 & Fig. 4.9).

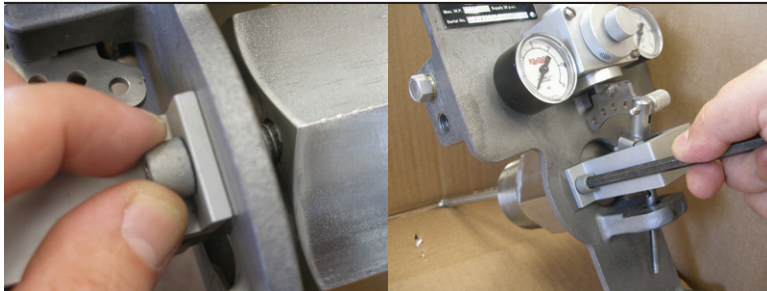


Figure 4.8

Figure 4.9

Install the spring and thread the adjustment knob onto the adjustment screw (Fig. 4.10).



Figure 4.10

Figure 4.11

Thread coupler onto the waggle arm, making sure thread-lock is used (Fig. 4.11).

STEP 5
Pre-setting Level For Throttle

Apply 20-30 psi supply to the controller (Fig. 1.0).

Move link body forward on the tangent arm to set in throttle mode (Fig. 1.1).

Move selector plate to T for throttle service (Fig. 1.2).

Use the adjustment knob (Fig. 1.3) to set liquid level to where the float is 3/4" summersed (Fig. 1.4) before output occurs (Fig.1.5).

Note: Right-hand turns will lower the level, left-hand turns will raise liquid level.

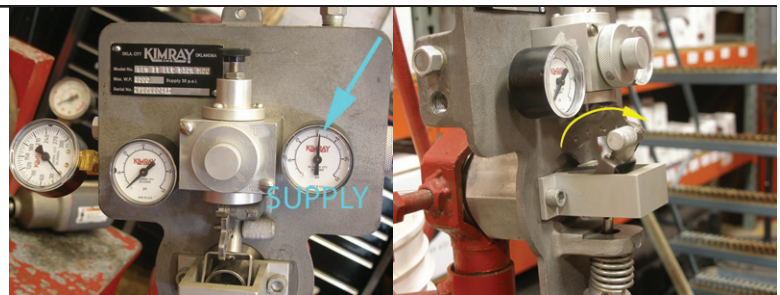


Figure 1.0

Figure 1.1

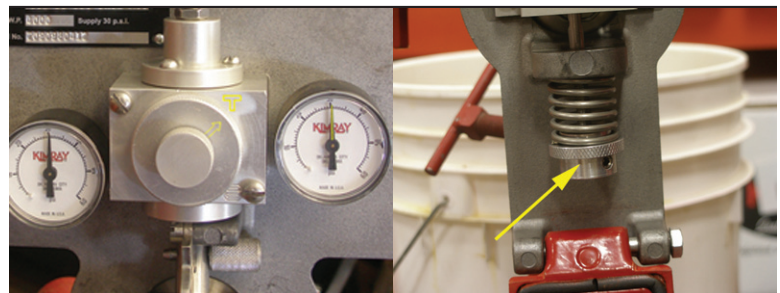


Figure 1.2

Figure 1.3



Figure 1.4

Figure 1.5

STEP 6
Pre-setting Level For Snap

Move the link body back on the tangent arm to set in snap mode (Fig. 2.0).
Move the selector plate to S for snap service (Fig. 2.1).

Repeat the steps used for setting the liquid level as for throttle mode (Fig. 2.2).

Once the controller set-up is complete return the waggler arm to center position, remove the displacer and close the cover.

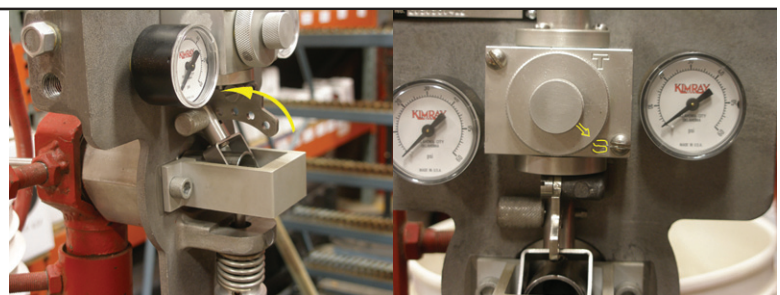


Figure 2.0

Figure 2.1

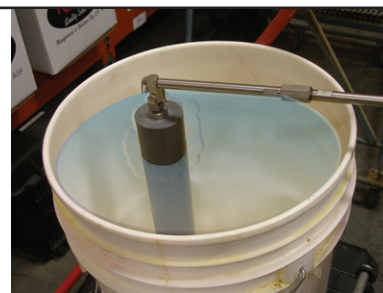


Figure 2.2





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