



**Repair Manual**  
**GEN II**



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**SCOPE**

This repair manual contains information for the GEN-II Liquid Level Controller. Included is detailed instructions in regard to its unique pilot.

**DESCRIPTION**

The GEN-II Liquid Level Controller uses a spring loaded float to operate a 3 way valve or pilot. This revolutionary pilot can be set for snap mode or throttle mode with the simple turn of a knob. Controlling vessel liquid level has been simplified with 1 control knob to adjust spring tension on float. The pilot assembly is easily removed by taking out 2 screws. This gives you the choice of repairing the pilot or simply putting a new one in and repairing the old one at your convenience. Replacement of the pilot assembly can be done in minutes without taking the controller off line.

The GEN-II is NACE compliant out of the box and comes with a tapped vent hole to pipe bleed gas away. Side and back npt connections are provided for ease of gas supply and output installation.

**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. An initial interval of 12 months is recommended. Depending on the service conditions and the condition of the controller, the inspection interval may be decreased or increased. The pilot can be repaired without removing the controller from the vessel, but the controller will need to be removed for any float related repair.

**WARNING**

Before performing any service, make sure level controller is isolated from all gas sources. Be sure that all operating or instrument gas lines have been disconnected. Never tighten any fittings or the main connections to the level controller while there is pressure in the lines.

**NOTE**

Because of the how convenient the pilot assembly is to remove and replace, we suggest replacing the pilot and rebuild old one on bench if a field repair is necessary.

- Use repair kit RMD

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<sup>®</sup> 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, H<sub>2</sub>S, Steam, Petroleum fluids, Sea Water

### HSN (Highly Saturated Nitrile)

**TEMPERATURE:**

-15° to +300° F  
-26° to +149° C

**APPLICATION:**

Crude Oil & Gas Production w/ H<sub>2</sub>S CO<sub>2</sub>

**FLUID / GAS:**

Crude Oil & Gas H<sub>2</sub>S, CO<sub>2</sub>, 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<sup>®</sup> 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 (CO<sub>2</sub>), Propane, Gasoline, Diesel, Fuel Oil Systems

**DO NOT USE WITH:**

Hot Water, Not preferred for wet H<sub>2</sub>S, 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 (CO<sub>2</sub>), propane, butane, fuel, mineral oil and grease

### POLYACRYLATE

**TEMPERATURE:**

±0° to +300° F  
-17° to +149° C

**APPLICATION:**

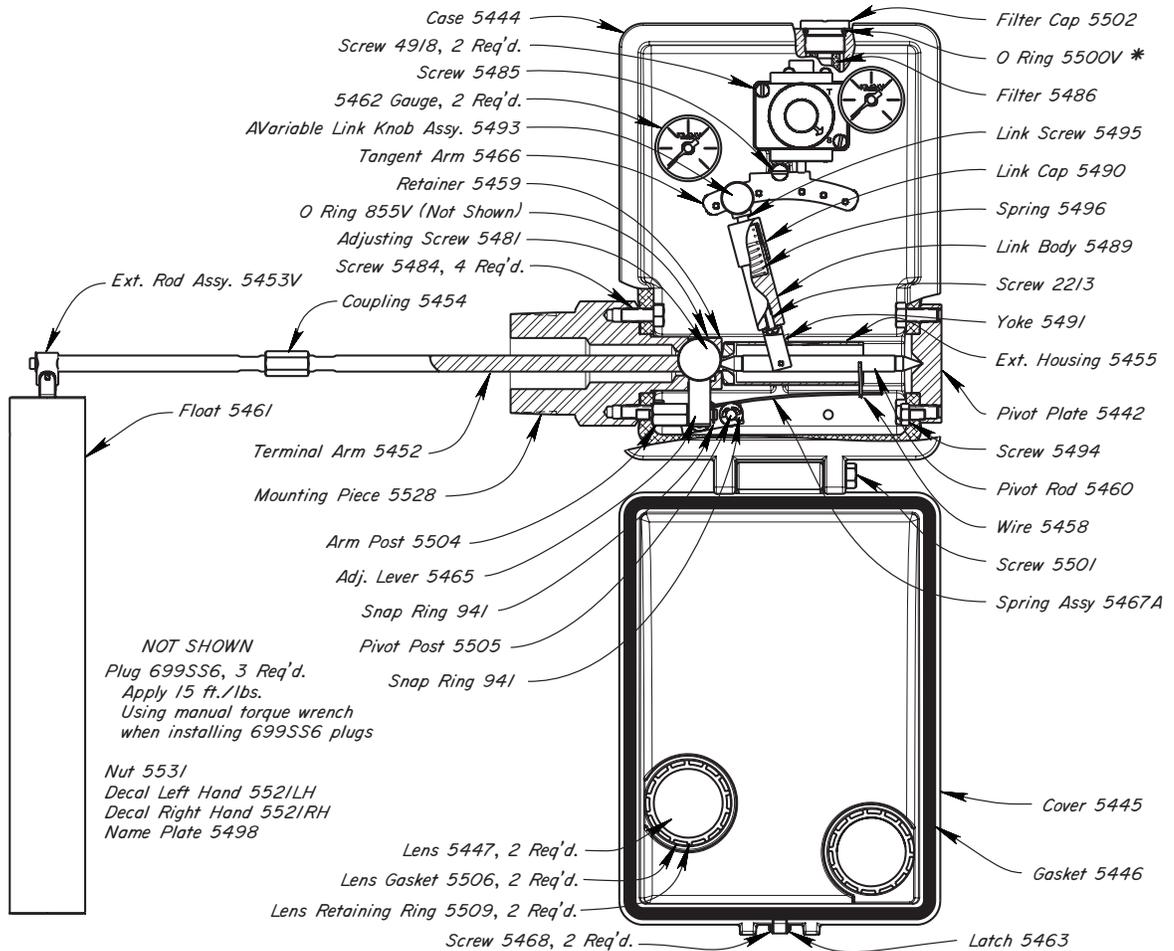
Production Heaters, Thermostats

**FLUID / GAS:**

Crude Oil & Gas at High Temperature

**DO NOT USE WITH:**

Alcohol, Glycols



**STEP 1**

Mount Controller in vise or stand if available (Fig 1.1).



Figure 1.1

**STEP 2**

Open case and inspect Gasket between cases for rips or tears (Fig 1.2).

If the Gen II is not able to be put on a stand now is a good time to separate case by removing Hinge Screw (Fig 1.3).



Figure 1.2



Figure 1.3



**STEP 3**

Pull out on Variable Link Knob and slide off of Tangent Arm (Fig 1.4).

Using a flat blade screwdriver pry off lower end of Variable Link Knobs yoke. Do not turn the Link Arm for it is set at factory (Fig 1.5).



Figure 1.4

Figure 1.5

**STEP 4**

Remove retainer Snap Rings from Pivot Post (Fig 1.6).

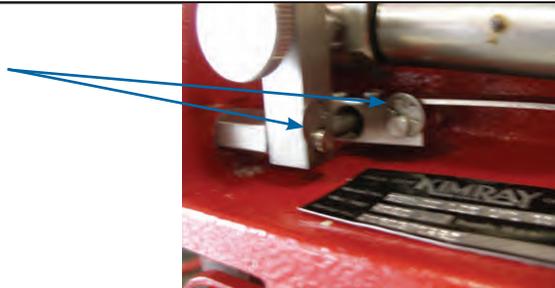


Figure 1.6

**STEP 5**

Remove Adjustment Lever and Leaf Spring assembly by pulling out on spring then slide Adjustment Lever off (Fig 1.7) and (Fig 1.8).

- 1. Slide out
- 2. Slide back

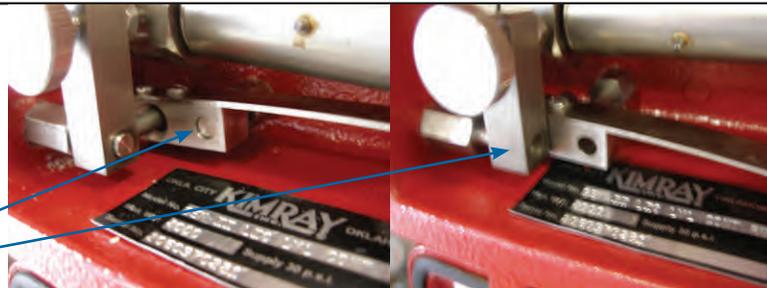


Figure 1.7

Figure 1.8

**STEP 6**

Remove Pivot Plate Screws and pull Pivot Rod out (Fig 1.9) and (Fig 1.10).

Remove Screws

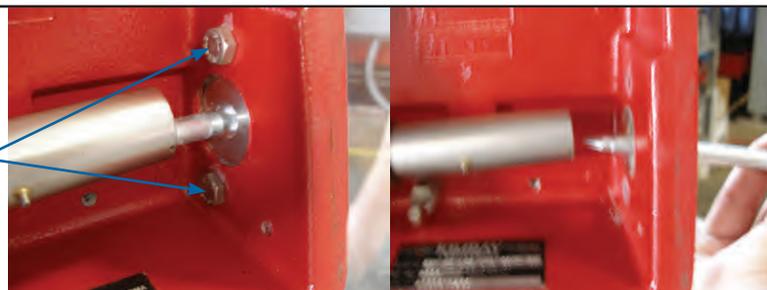


Figure 1.9

Figure 1.10

**STEP 7**

Remove Coupling on end of Terminal Arm (Fig 1.11).

This step is optional if you cannot get a wrench around housing. Remove Arm Post only to make clearance for wrenches (Fig 1.12).

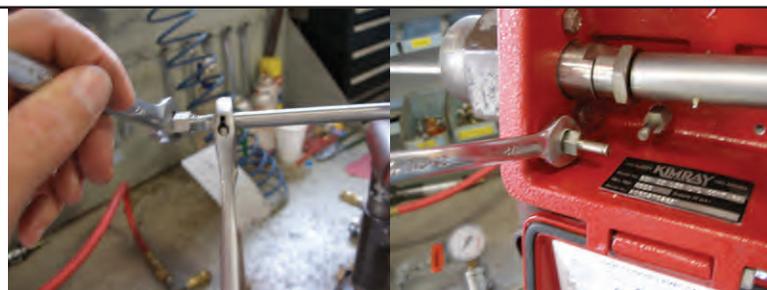


Figure 1.11

Figure 1.12

**STEP 8**

Remove terminal Retainer Nut, make sure to use a wrench around housing. (Fig 1.13).

Pull Terminal Arm out from mounting housing (Fig 1.14).



Figure 1.13

Figure 1.14

**STEP 9**

Remove Retaining Nut from Arm and discard O ring and seal (Fig 1.15).



Figure 1.15



**STEP 1**

Install retaining nut, seal and O ring on terminal arm. Do not push O ring over threads or it may be cut by threads. **Roll O ring over threads** (Fig 1.1).

Roll over threads  
Very important



Figure 1.1

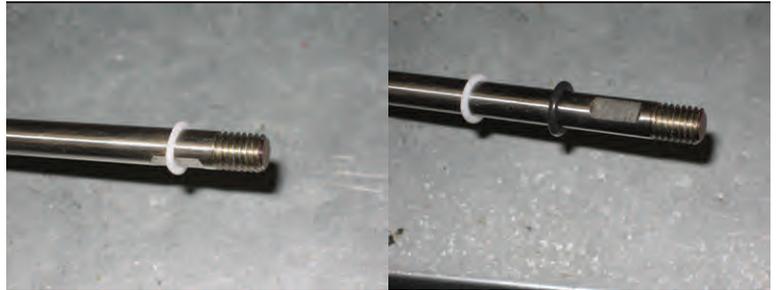


Figure 1.2

Figure 1.3

**STEP 2**

Apply Blue Loctite to housing threads (Fig 1.2). Insert terminal arm and tighten (Fig 1.3).

Loctite

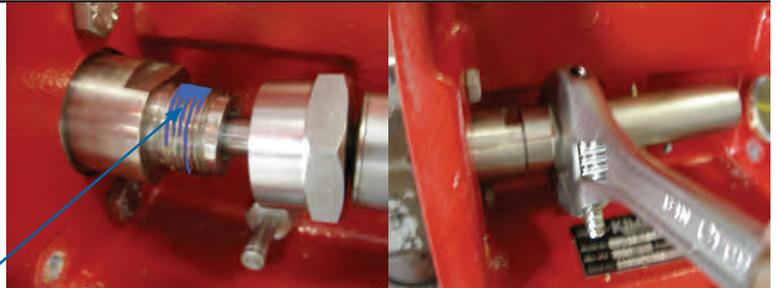


Figure 1.4

Figure 1.5

**STEP 3**

Apply Blue Loctite to arm post and tighten (Fig 1.4).

Loctite

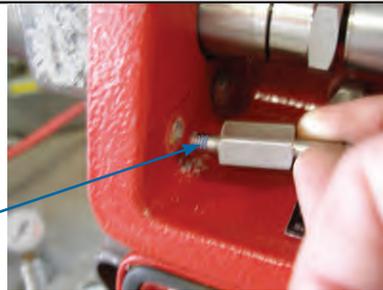


Figure 1.6

**STEP 4**

Install adjustment assembly and spring assembly. Put adjustment arm on first then rotate back to align spring assembly on post (Fig 1.5).

Install snap rings make sure they snap into grooves on post (Fig 1.6).

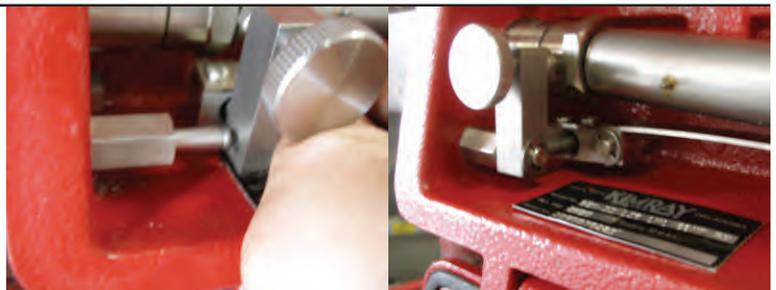


Figure 1.7

Figure 1.8

**STEP 5**

Install Spring Clip. Insert back first then use needle nose pliers to finish (Fig 1.9).



Figure 1.9

**STEP 6**

Insert Pivot Rod (Fig 1.10).

Make sure Pivot Rod moves freely & does not bind Terminal Arm Assy.

Install Pivot Plate, be sure to use Loctite on screws (Fig 1.11).

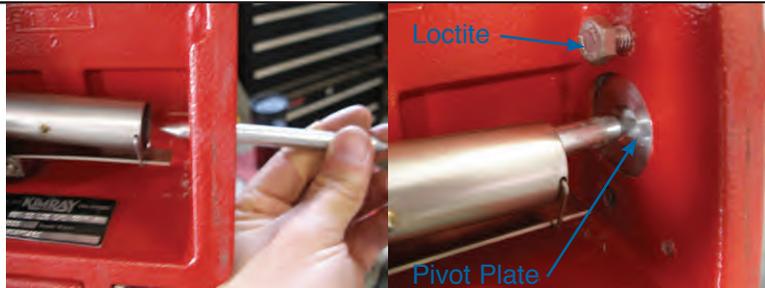
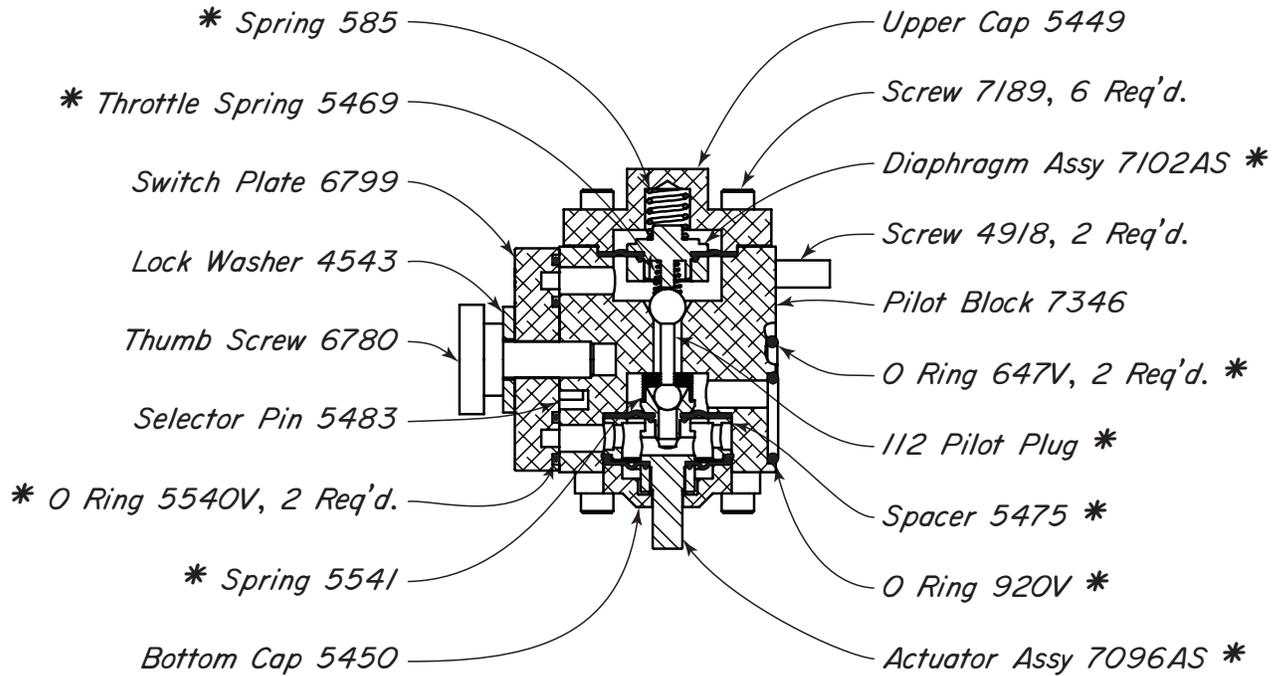


Figure 1.10

Figure 1.11



**STEP 1**

Remove 2 flat head screws from Pilot and remove Pilot from case. (Fig 1.1).

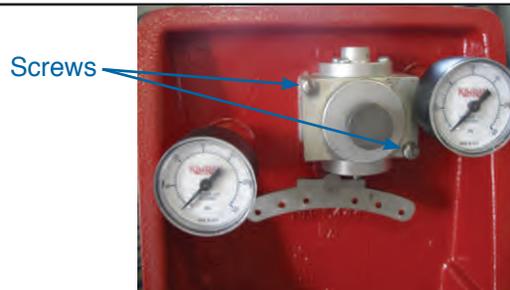


Figure 1.1

**STEP 2**

Remove 3 O-Rings from back of body and discard (Fig 1.2).



Figure 1.2

**STEP 3**

Remove 3 screws from Upper Cap on Pilot, be careful of Spring when removing Cap (Fig 1.3 and 1.4).



Figure 1.3

Figure 1.4

**STEP 4**

Remove Diaphragm Plate being careful of Spring (Fig 1.5).

Diaphragm may be stuck, do not pry with screwdriver. To peel up use pliers and pull up on Diaphragm Plate.

Remove Pilot Plug at this time, turn Pilot Assembly over and it will fall out.

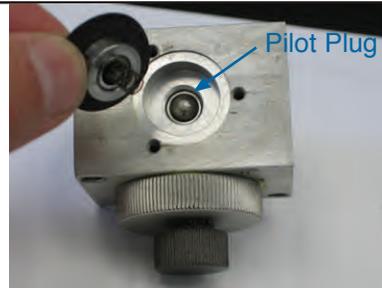


Figure 1.5

**STEP 5**

Remove 3 Retaining Screws on Lower Cap and remove (Fig 1.6 and 1.7).

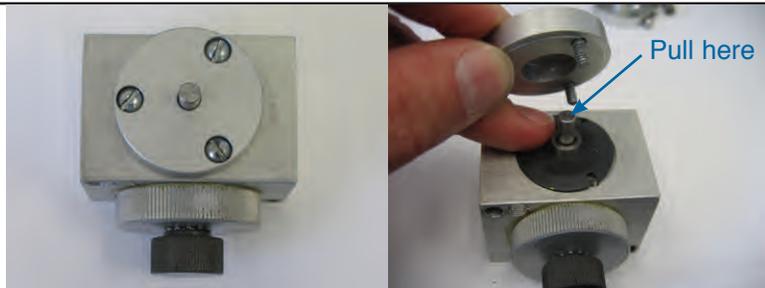


Figure 1.6

Figure 1.7

**STEP 6**

Remove Lower Diaphragm watch for Spring to fall out (Fig 1.8).

Diaphragm may be stuck, do not pry with screwdriver. To remove use pliers on stem of Actuator and pull out.

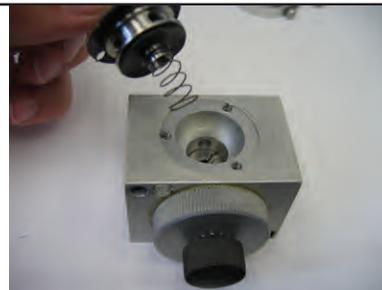


Figure 1.8

**STEP 7**

Remove Lower Seat with large screwdriver. This was installed using Loctite . Remove and discard O ring (Fig 1.9).



Figure 1.9

**STEP 8**

Remove Lock Nut from switch and pull up on Selector Knob (Fig 1.10 and 1.11).

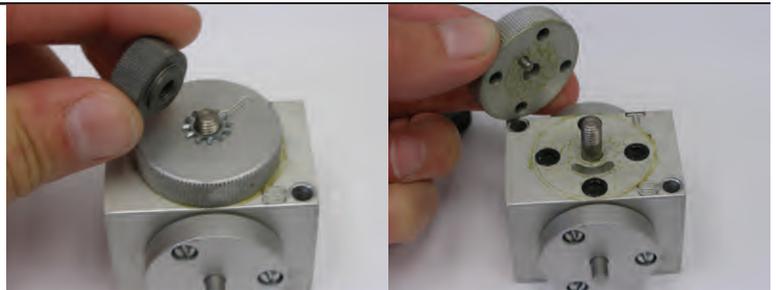


Figure 1.10

Figure 1.11

**STEP 9**

On Selector Knob make sure holes are clear. These holes connect to one another so blow air in to them in order so see if pathway is clear (Fig 1.12).



Figure 1.12



**STEP 1**

Clean Pilot Block and replace 4 O-rings under Selector Knob. Clear holes of any obstructions (Fig 1.1).

Apply grease between Selector Knob and Pilot body before installing (Fig 1.2).



Figure 1.1

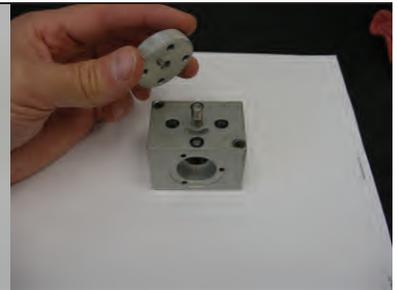


Figure 1.2

**STEP 2**

Tighten Lock Nut (Fig 1.3).



Figure 1.3

**STEP 3**

Install new O ring on Seat #5473. Make sure to use Loctite on threads and tighten Seat with screwdriver (Fig 1.4).

Place Booster Spring #5541 on Lower Diaphragm Assembly and install (Fig 1.5). Make sure O ring #5540V is on Diaphragm Assembly.



Figure 1.4



Figure 1.5



Figure 1.6

**STEP 4**

Make sure Lower Diaphragm is aligned in bore before securing Lower Cap in place use loctite on 3 screws (Fig 1.7).

Tighten 3 screws and check around edge to make sure Diaphragm has not shifted from bore (Fig 1.8).

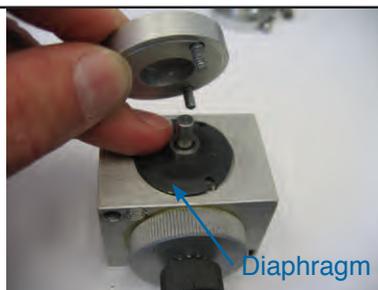


Figure 1.7



Figure 1.8

**PILOT ASSEMBLY**

**STEP 5**

Install Pilot Plug small ball first (Fig 1.9).

Place Spring #5469 on Upper Diaphragm Assembly. Apply grease to Assembly were Spring rests (Fig 1.10).



Figure 1.9



Figure 1.10

**STEP 6**

Place Spring #585 in Upper Cap. Use grease in Cap were Spring sets (Fig 1.11).



Figure 1.11

**STEP 7**

Place Diaphragm Assembly in Pilot Block Spring side down (Fig 1.12).

As with lower side it is very important to make sure the Diaphragm sits in bore and not hanging over bore (Fig 1.13).



Figure 1.12

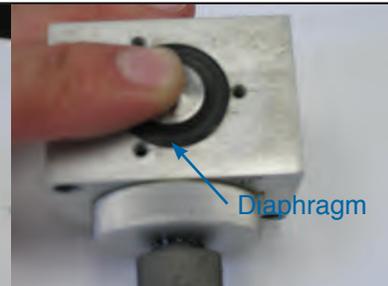


Figure 1.13

**STEP 8**

Making sure Diaphragm is aligned, place top Cap over assembly and secure use loctite on 3 screws (Figure 1.14).

Check around edges to make sure Top Cap sits evenly this way you know the Diaphragm is still in bore (Fig 1.15).

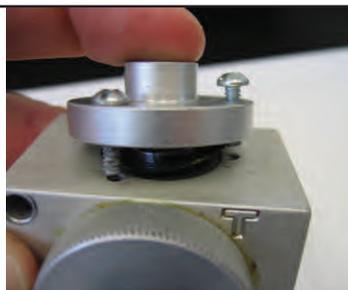


Figure 1.14



Figure 1.15

**STEP 1**

Replace 3 O-rings on back of Pilot Body (Fig 1.1).



Figure 1.1

Figure 1.2

Secure Pilot Body to Case with 2 screws (Fig 1.2 and 1.3) do not use loctite on these screws.



Figure 1.3

**STEP 2**

Install Variable Link Assembly by first putting back side of Yoke into guide pin then front side, you may need to use a screwdriver as when removing it (Fig 1.4).



Figure 1.4

Figure 1.5

Pull out Adjustment Knob and slide on to end of Tangent Arm and position pin in hole it was removed from (Fig 1.5).

**STEP 3**

If vertical controller, Install coupling on end of Terminal Arm, be sure to use loctite on threads (Fig 1.6).



Figure 1.6

Figure 1.7

If cover was removed return screw and shut lid (Fig 1.7).



**PRE-SETTING LEVEL FOR THROTTLE**

**STEP 1**

Attach Float at Coupling (Fig 1.1).  
Regulate Supply Pressure to 20 pounds  
and connect to side of GennII (Fig 1.1).

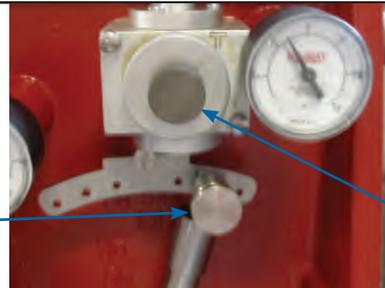


Supply Line

Figure 1.1

**STEP 2**

Switch Selector Knob on Pilot to throttle  
and move Variable Link Arm to throttle  
side (Fig 1.2).



Variable Link Arm

Selector Knob

Figure 1.2

**STEP 3**

With Supply Pressure turned on submerge  
float in water until output begins. You can  
see this by watching output gauge on Gen  
II (Fig 1.3). Set level so that 3/4" of float  
is underwater before you receive output.



Figure 1.3

**STEP 4**

Adjustment Knob is left hand thread. If  
Liquid Level is to low turn Adjustment  
Knob clockwise to allow more coverage  
on Float or turn counter-clockwise to  
bring level lower (Fig 1.4). After you find  
the correct level tighten Lock Nut behind  
Adjustment Knob.



Output Gauge  
or use your own

Spring Adjustment Knob  
for Level Control,  
reverse threaded.

Figure 1.4

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**PRE-SETTING LEVEL FOR SNAP**

**STEP 1**

Move Selector Knob from T to S for Snap and move Variable Link Arm over to Snap side (Fig 1.5).



Figure 1.5

---

**STEP 2**

Perform same test as for Throttle mode with Float and Adjust Spring if necessary with reverse threaded Adjustment Knob (Fig 1.6).

When finished remove Float at Coupling and remove all air lines and gauges. Return Pilot and Variable Link to throttle mode and shut case.



Figure 1.6

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# ***KIMRAY GEN II Level Controller***

***Repair Manual  
www.kimray.com***

