

128 PILOT SECOND STAGE REPAIR PROCEDURES

DISASSEMBLY

(REFER TO SCHEMATIC FOR PART IDENTIFICATION)



STEP 1
Remove guard using guard tool as shown.



STEP 2
Remove lower and top screws. Then, using ball-end Allen wrench, loosen nut, ball, valve and O-ring being careful not to scratch large bore in housing.



STEP 3
Remove clip using needle-nose pliers. Withdraw clip this large round hole.



STEP 4
Remove switch plate, then remove switch retaining screws. Remove switch and internal switch parts including the switch spring. The next step disassembles switch spring from switch spacer, unless the spring requires replacement.



STEP 5
Remove diaphragm nut assembly by pulling up and tilting rear exhaust valve to disengage lever tabs. Then slide assembly off of lever.



STEP 6
Remove inter cap and inter plug using finger to grasp edge of plug. Plug can also be pushed out by pushing a pin into the open end of the slot.



STEP 7
Remove multiplier and lanyard. Then, using spanner wrench, unscrew and remove nut and cap. Also take out expansion.



STEP 8
Gauge pipette with modified pilot as shown. Then measure step using small crescent wrench.



STEP 9
Remove proper spring. Then grip stop the flying fingerplate in ground and pull out stop and proper assembly as a unit.



STEP 10
Remove pilot pin, O-ring retainer, pilot spring, piston, and external O-ring from pipette.



STEP 11
Insert inside regulator and push on nut corner with a slipping motion to push out housing with lever installed.



STEP 12
Using a pilot pin, push out the pilot spring and the O-ring bottom. The pilot pin will feel the spring and O-ring bottom.

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STEP 13

Remove all O-rings from metallic parts. The following O-rings should be discarded and replaced with new O-rings: 138-145, 138-141, 138-148, 138-150, 138-151 (2 req'd). Clean and inspect all other O-rings retaining those that appear to be good.

STEP 14

Separate all metallic and plastic parts in trichloroethylene and then dry. **Caution:** Do not let rubber parts in trichloroethylene.

STEP 15

Put all metallic parts in a solution of 50% nitric acid and 50% water. Soak nitric acid in gallon plastic container in easily accessible. **Caution:** Add acid water only to acid.

STEP 16

Thoroughly rinse all parts with water and blow dry with compressed air.



STEP 20

Using feeler/gage as shown, test valve plate in place, then turn over and proceed with next step.



STEP 21

Using feeler/gage, center switch plate screw holes in slot, then install switch.



STEP 22

Place piston into pilot spring. Put a small dab of silicone grease on the end of the piston before placing O-ring button and new O-ring (138-142) in place. The grease will hold the O-ring and button in place.

GENERAL ASSEMBLY PRACTICE

Lubricate O-rings using silicone grease Part #104. Lubricate O-rings just before assembly into unit in order to minimize hot and dry friction. Heavily lapped all sharp edges making sure they are free of nicks and scratches.



STEP 17

Apply silicone grease to inside of case around carburetor jet as shown.



STEP 23

Insert O-ring, O-ring button, piston and spring into poppet as shown.



STEP 25

Place valve spring attached to switch spacer into case as shown. Then place switch plate directly over switch spacer.



STEP 24

Using snap, compress spring and screw stop into poppet. Tighten stop holding poppet with metal feel gauge as shown. Note: Tightening stop only hand tight is not acceptable.



STEP 19

Soak and install O-ring 138-142 in grease in underside of valve. Also, place switch screws through holes on switch as shown.



STEP 26

Look through hole in bottom end of poppet to check carbon that pilot O-ring has contacted itself in its inspection hole.

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STEP 24

Label and install O-rings as shown. Be sure not to get silicone grease on surface "A".



STEP 25

Install support assembly from Step 23 into housing as shown, being careful not to stretch O-ring retainer on support.



STEP 27

Install O-ring retainer using fingernails as shown to separate O-ring into O-ring groove. When in place, rotate O-ring retainer 2 counter-turns to be sure O-ring is in place and seated.



STEP 28

Insert housing assembly into cast housing carefully to locate notch in housing. Finger above index pin protruding from cast inside the case. Be sure O-rings are pushed all the way down in hole.



STEP 29

Install O-rings as shown. Install new set screws. Secure set screws in about halfway.



STEP 34

Install poppet spring as shown.



STEP 35

Install O-ring on surface as shown. Surface "A" to be free of grease. Drop ball into housing. Then insert surface with O-ring into hole of housing. Using a spare poppet, with O-rings installed, push the surface and O-ring all the way down in the housing bore.



STEP 36

Install assembler in aspirator container. Then secure this assembly into case using optional wrench.



STEP 38

Install liner between ball and spherical end of set screw in housing. Grease should be installed 1/8" from notch in housing flange.



STEP 39

Using needle-nose pliers insert pin into small hole in surface.



STEP 40

Install inlet plug and inlet cap to either right or left side of inlet depending on whether you have a left or right handball (3rd step).

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STEP 37

Adjust pilot as follows: Pressure the pilot using any one of the diaphragm first stages. Place the second stage underneath with the mouthpiece downward. Using ball-end Allen wrench, turn the set screw clockwise until a leak is apparent. Then back off the set

screw just until the leak stops. Note: Sometimes the leak will not stop completely. However, this small amount of leakage is insignificant. Therefore, adjustment should proceed as follows: Turn the set screw counter-clockwise, noting how the bubble rate changes. When you notice that backing out the set screw does not cause the bubble rate to decrease, screw the set screw clockwise just until the bubble rate starts to increase. At this point, check the flow to make sure it has not become starved. Now float the amount of leakage per second existing from the pilot. You will need this information when making the diaphragm adjustment.



STEP 41

Flip out onto lower and put the diaphragm inside case.



STEP 42

Seal the diaphragm clip as shown making sure diaphragm is not wrinkled under clip and it is not very protruded from making even contact against its seat. Also be sure top of the protrusion through round hole is even.



STEP 38

Move switch to "neutral" position. Check distance between switch spring and lever. The spring should be as close to the lever as possible but should not touch the lever.



STEP 43

Insert pilot without purge button in place by placing it in the case and rotating it 1/8 turn so the guard insulation fits.



STEP 39

To adjust spring, bend spring wire using set-up spring adjusting tool as shown. Correct functioning can be checked after completion of Step 44. Return switch to "rise" position.



STEP 44

Be sure the diaphragm is well centered in the assembly. Grease, and place the unit under water again, opening the mouthpiece at the top so that you can look into the mouthpiece in order to make your next adjustment.

If, when making the pilot adjustment, the pilot leaked completely, adjust the diaphragm, as follows: Turn the plastic knob (a 1/8 mm long round screw under water body counter-clockwise until bubble appear through the mouthpiece opening, then turn the leak checker just until the bubble stop. If, when making the pilot adjustment, a small leak was apparent (such as 4 or 5 bubbles per second), adjust as follows: Turn the plastic knob counter-clockwise until the bubble rate increases, then turn the leak checker until the bubble rate disappears that of the pilot adjustment. This adjustment has a great deal to do with the isolation effort. The isolation effort will be at a minimum when the diaphragm body is adjusted so that it is just on the verge of turning on the pilot valve.



STEP 40

Remove the regulator from the water and its protection. Rotate the diaphragm and roll assembly as shown by reaching in with the tape knife and of the top and lifting the lever up to align the lever key with the keyed hole in the red seal. (Importantly: the keyed hole in the red seal must be oriented as shown.)



STEP 45

With the switch in "positive", check switch spring adjustment by placing regulator in water as shown. If adjustment is correct, the regulator will not flow in this position. A very slight leak in this position is acceptable and will stop upon complete submerging.

12B PILOT SECOND STAGE REPAIR PROCEDURES

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STEP 36
Install purge spring and purge button as shown.



STEP 47
Before making the following adjustment, be sure the switch is in the "stop" position. Then, with the rubber mouthpiece installed on the regulator and the regulator coil (unsecured), press the purge button all the way in and release. This, of course, will open the valve and cause air to flow out of the mouthpiece. If, upon releasing the button, the regulator stops in a free-flow state, the aspirator is adjusted too strongly.



STEP 48
The aspirator is a cylindrical shaped plate with an elongated hole and can be viewed through the mouthpiece. It can be adjusted by inserting a flat-blade screwdriver through the mouthpiece and pushing against either edge of the elongated hole being careful not to touch the lower part of the mechanism. This will

rotate the aspirator to rotate. To decrease the aspirator effect, rotate it toward the left. Again, push the knob all the way in and release. If the aspirator does not free-flow, you know that the aspirator is not adjusted too heavily. The aspirator is adjusted correctly when it is just out to the left of, but as close to the point of free-flow as possible. **NOTE:** The regulator should not free-flow when the purge button is pressed all the way in and then released. The regulator should not be breathed upon until this adjustment is complete. Due to the unrestricted flow of the second stage, if the aspirator is out of adjustment to the extent that it points directly out of the mouthpiece tube, it is possible for an injury to occur upon deep inhalation.

STEP 49
Clean switch with isopropylalcohol, then apply new switch label.

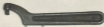
TROUBLE SHOOTING

PROBLEM	CORRECTION
1. Audible Air Leak_____	<p>A. Adjust pilot or diaphragm knobs.</p> <p>B. Replace main seal o-ring or pilot o-ring.</p> <p>C. Inspect housing seal and pilot seat for leaks. Replace if needed.</p> <p>D. Inspect housing o-rings.</p> <p>E. Inspect entire mechanism for dirt.</p> <p>F. Check first stage output pressure.</p>
2. Water Leaking into Regulator_____	<p>A. Inspect diaphragm and clip to make sure they are installed properly.</p> <p>B. Foreign matter under exhaust valve.</p>
3. Too Much Positive Pressure Breathing_____	<p>A. Adjust aspirator toward left of center.</p>
4. Breathing Effort Too High_____	<p>A. Adjust pilot and/or diaphragm knobs.</p> <p>B. Adjust aspirator.</p> <p>C. Orifice hole enlarged because of wear. Replace orifice and pilot pin.</p> <p>D. Lube poppet o-ring = 129-140 and pilot o-ring = 129-141.</p>
5. Free Flows in Pre-Bite Position_____	<p>A. Adjust switch spring.</p> <p>B. Check for audible leak.</p>

**128 PILOT REGULATOR
SPECIAL TOOLS REQUIRED**



**128-154
GUARD INSTALLATION TOOL**



**193
SPANNER WRENCH**



**128-153
BALL-END ALLEN WRENCH**



**STANDARD PLIERS
(MODIFIED)**

**File Off
Points**



SWITCH SPRING ADJUSTING TOOL
Can be made from a
pull rod to approximate
dimensions shown.