

1. **PRIMARY (HIGH PRESSURE) REGULATOR** — Figure 1.

Liquid fuel enters through passage (A), flows past the open primary valve (B), into primary chamber (C) and heat exchanger coil (D), which terminates at the secondary orifice (E). Under static conditions, (when there is no demand for fuel), secondary valve seat (F) is closed against the secondary orifice (E) and no fuel passes into the secondary chamber (G). When the pressure of the fuel in the primary chamber (C) becomes great enough to overcome the force of the primary spring (H), the diaphragm moves away from the primary chamber (C), rotates the primary lever (I) and closes the primary valve (B).

When a demand for fuel is made by the engine, pressure within the secondary chamber (G) is reduced to below atmospheric pressure and the secondary diaphragm moves toward the vacuum. This rotates the secondary lever (K) against the secondary lever spring and opens the secondary valve (F) to admit fuel. The flow out of the heat exchanger passages and primary cavity reduces the primary pressure and permits the primary diaphragm to open the primary valve, admitting more fuel, in accordance with engine demand.

To counteract the refrigerating effect of vaporizing the liquid LP-gas, heat is added to the fuel. Relatively warm engine coolant is circulated through coolant passages (W) and transferred to the fuel in the primary chamber (C) and heat exchanger passages (D). The coolant passages are sealed by back gasket (L), which also isolates the coolant passages (W) from expansion area (M). Should the engine coolant freeze, the expansion is harmlessly absorbed into the expansion area (M).

INSTALLATION

Locate the converter as near to the carburetor as is practical and where water hookup can be readily made. Under no circumstances should it be in an area exposed to excessive engine manifold heat.

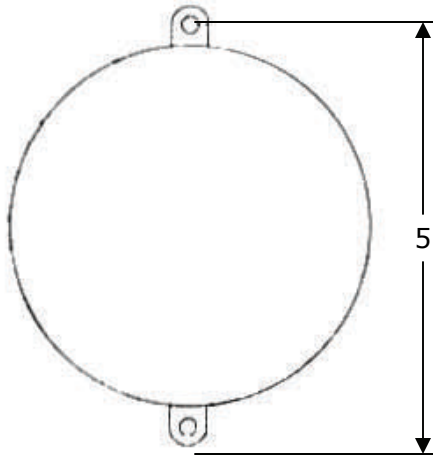


Figure 2

Drill two holes for clearance of 1/4" mounting bolts in a securely mounted bracket or other vertical surface. Hole pattern is shown in Figure 2. Care must be taken to make sure the mounting surface is flat to avoid damage to back casting.

Install approved SAE (flare) fitting in the fuel inlet, using thread sealing to compound carefully to avoid getting it into the converter. Tighten fitting to point in proper direction for attaching high pressure hose. (Figure 3)

Install the inlet water hose fitting in one of the two lower 1/4" pipe openings and the outlet fitting in the top 1/4" pipe opening using sealing compound and positioning fittings to facilitate hose connections. Plug the unused opening. Automotive type 5/8" heater hose can be used with elbow or straight fittings. Insert and tighten the vapor outlet fitting using the largest hose size fitting which can be reasonably assembled in the carburetor being installed. NEVER USE CONVENTIONAL PIPE STREET ELLS IN THE VAPOR LINE.

Mount the converter with two bolts and tighten securely. Install fittings in the filter, fuellock and carburetor and secure hoses.

Select an opening on the suction side of water pump. Install fitting, and attach hose from this point to the TOP water fitting in the converter. In case no opening in the suction side exists, it is necessary to drill and tap 1/4" or 3/8" pipe hole in the inlet side of the water pump.

Attach hose from lower water inlet in converter to any available opening on pressure side of water pump. Heater water supply openings are suitably located to provide good water circulation in most cases. DO NOT connect the converter in series with the heater. A parallel connection is usually acceptable, but it is preferable to select a completely independent water source if possible.

REMEMBER: Water circulation is of prime importance. Any frosting of the converter body indicates poor circulation, and must be corrected.

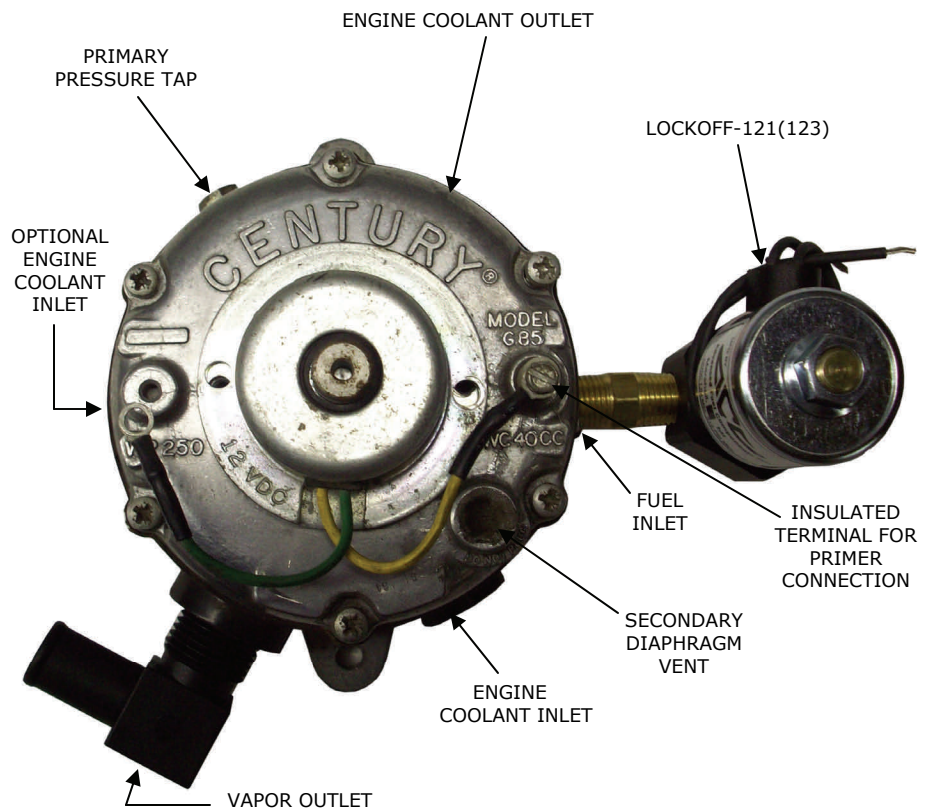


Figure 3

Connect a wire from battery, through a push button switch, to the solenoid primer terminal (unless hand primer is used). Primers as furnished are for operation on either 6 or 12 volts. The primer is to be actuated only to fill the vapor hose prior to starting and is energized only a second or two each time it is used. Fill cooling system with clean water and anti-freeze. Remove top water hose from converter to allow trapped air to escape. Failure to do this may result in freezing since coolant circulation may not occur until air is bled from the converter body.

If water only is used as coolant, it is recommended that the correct amount of quality rust inhibitor be added to the cooling system.

REBUILDING

A. DISASSEMBLY

Scribe or pencil alignment marks from the front cover and back cover to the converter body.

1. Remove primer and front cover. (Figure 4)
2. Remove secondary diaphragm assembly. (Figure 4)

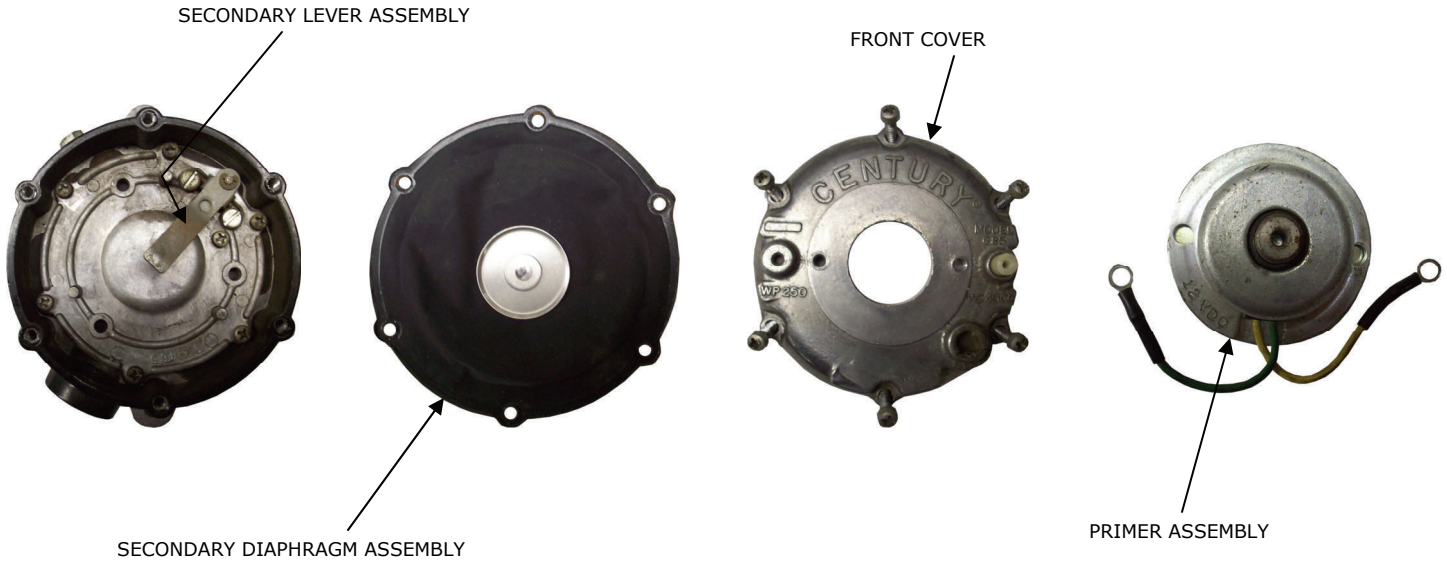


Figure 4

3. Remove (9) screws holding the primary cover. Remove the primary cover and spring, with the secondary lever intact.
 - a. Loosen the (2) screws holding the secondary lever pin and lift out the secondary lever assembly and pin. Remove secondary spring from body. (Figure 5)
4. Remove the primary diaphragm from the primary lever by sliding the diaphragm away from the fuel inlet. Remove gasket, primary lever and pin assembly. (Figure 5)
5. Remove (6) back cover screws and lift cover and gasket away from the converter body. Discard the gasket.

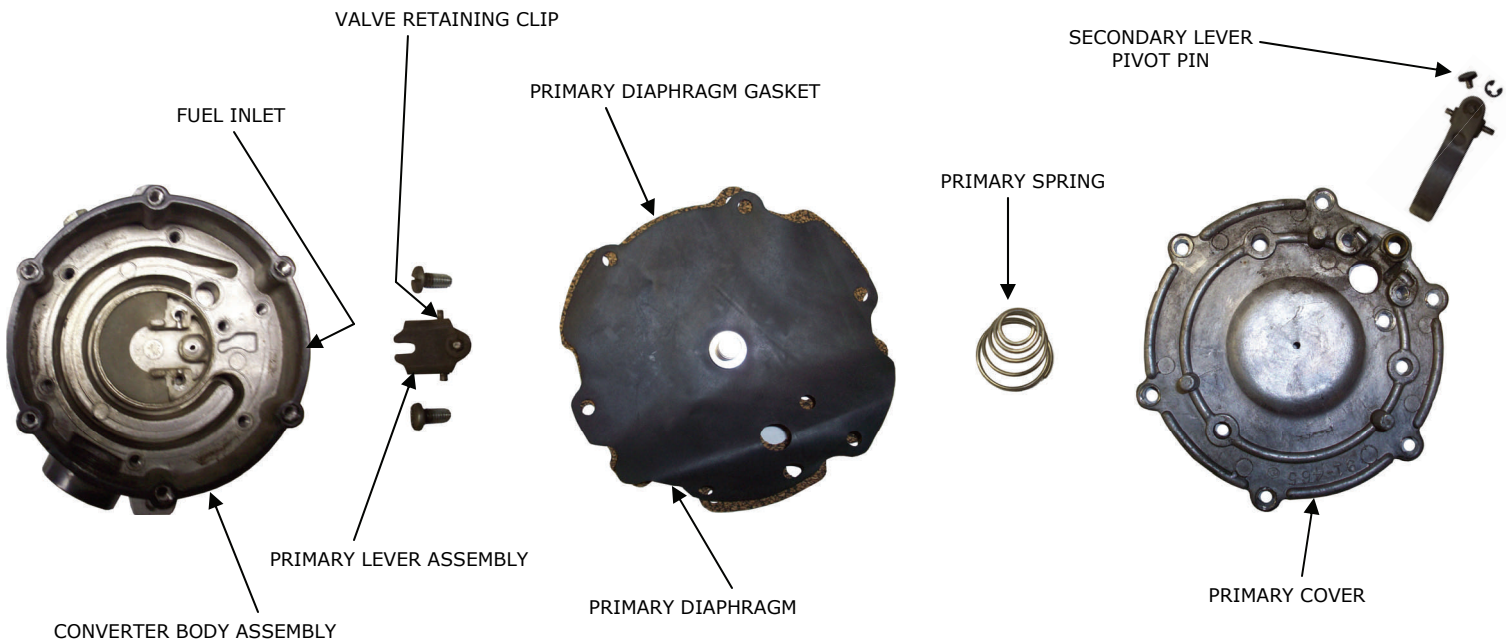


Figure 5

6. Wash all converter parts in solvent and dry thoroughly.
7. Inspect all parts for excessive wear, damage or distortion. It is recommended that all gaskets, diaphragms and valve seats be replaced at this time.

B. ASSEMBLY

1. Back Cover.

- a. Inspect the gasket surfaces of the converter body and back cover for cleanliness, damage and distortion. Any casting that is warped or damaged should be lapped flat on a surface plate before assembly. Failure to have smooth, flat, gasket surfaces may result in back cover leakage.
- b. Place new back cover gasket in place and insert aligning pins. Align the back cover with the scribe marks and position. Replace the 6 back cover screws and snug down. Final tightening should be done in 1-4, 5-2, 3-6 criss-cross sequence.

2. Primary Regulator Assembly.

- a. Remove the primary valve seat from the primary lever by sliding the valve retaining clip to the side. Replace with a new valve seat. (Figure 5)
- b. Install primary valve lever and pin. Tighten the two hold down screws and check for valve seat alignment with the jet.
- c. Install a new primary diaphragm assembly. Be sure the diaphragm assembly link is engaged in the primary lever slot.
- d. Lay the conical primary pressure spring on top of the diaphragm plate with the large coil up, small coil against the diaphragm plate. (Note—secondary lever assembly may be replaced at this time. See section 4 a. and 4 b.)
- e. Replace primary diaphragm cover using locating pins, and tighten six outer screws in 1-4, 5-2, 3-6 criss-cross sequence. Replace three inner screws and tighten. (Figure 6)

3. Pressure Test

Attach compressed air hose to inlet fitting and screw gauge into 1/8" NPT pressure tap. (Note: If secondary lever has not been replaced, hold finger over secondary jet.)

Turn on air supply and proceed as follows:

- a. Note pressure gauge reading. It should be between 5 and 7 p.s.i. with inlet pressure of 130-180 p.s.i. If pressure does not fall within these limits, retrace previous operations to double-check work to this point. Pay particular attention to primary valve lever and pin. Wear or distortion at this point may be responsible. Extremely low pressure indicates spring has been left out.
- b. If pressure creeps upward, the primary valve is leaking and must be re-worked. Foreign material (such as metallic chips) is the most frequent cause of valve leakage. Inspect valve jet for nicks or scratches.
- c. Check pressure under simulated operating conditions by lifting valve seat or finger slightly away from the secondary jet, thus allowing air to escape. Pressure will drop slightly and return to original reading upon sealing the jet.

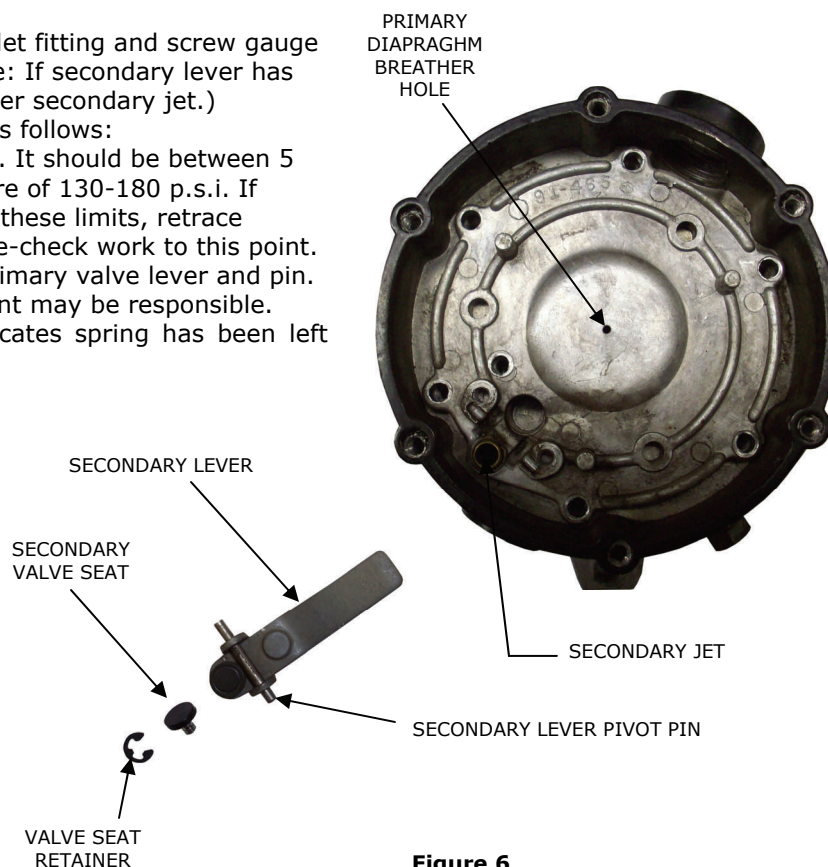


Figure 6

4. Secondary Regulator

- a. Install new secondary valve seat assembly onto secondary lever. The secondary valve seat stem should fit freely in the lever hold. (Figure 6)

- b. Replace secondary spring and secondary lever assembly. Be sure lever pivot pin is held securely by both hold down screws, and spring is properly located around boss on the lever.
- c. Adjust lever height, .130" to .150" (9/64) above surface of converter body, using gage. (Figure 7)
- d. Open the secondary valve by pressing on free end of the secondary lever and allow to snap shut several times to align the seat with the orifice. The secondary lever must move freely on the pivot pin but should have a minimum of side play.

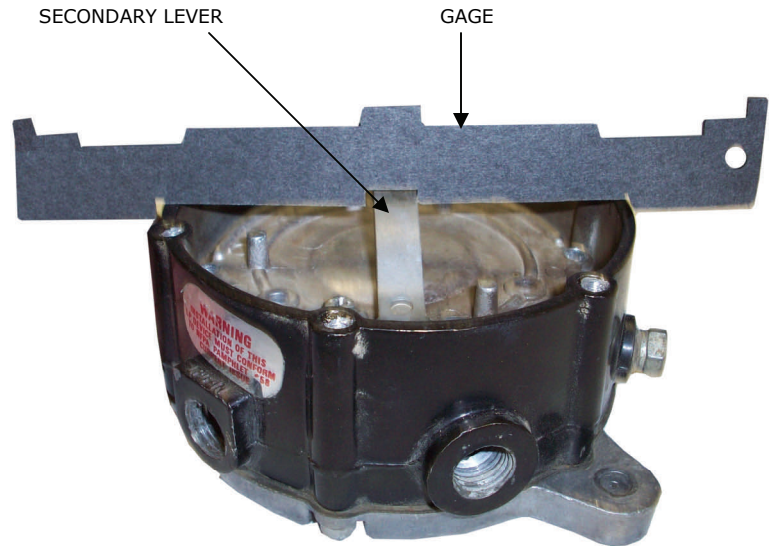


Figure 7

5. Final Testing, Semi-Assembled Converter.
 - a. Reconnect air supply to converter inlet. Plug two water fitting openings and apply soap bubble to the remaining water outlet. Any continuous growth of the soap bubble indicates leakage through the casting and will require replacement of the body casting.
 - b. Test ALL gasket surfaces, edges, openings, etc., for leaks with soap solution or by immersing the entire unit in water. Any leaks must be corrected before proceeding further. Pay particular attention to secondary valve. If correctly installed, it will not leak.
6. Secondary Diaphragm and Front Cover Assembly.
 - a. Place the secondary diaphragm (with the large diaphragm plate toward the secondary lever) against the body casting gasket surface.
 - b. Align scribe marks and place the cover against the diaphragm assembly.
 - c. Before tightening cover screws, pull forward on the secondary diaphragm or blow gently into the vapor fuel outlet connecting with the secondary chamber. This will prevent "drumming" of the diaphragm and possible tension on the secondary lever.
 - d. Tighten front cover screws in a criss-cross 1-4, 5-2, 3-6 sequence.
 - e. Replace primer, making sure that there is free movement between the primer plunger and secondary diaphragm. Check electric primer for operation with a 6 volt or 12 volt power source.



Figure 8

7. Final Check.
 - a. Apply air pressure to inlet and check for secondary valve leakage with a soap bubble over the vapor outlet. The soap bubble should not continue to increase in size.
 - b. Manually, or electrically, depress primer to check for fuel flow. A small volume of fuel is all that is required.