RENAULT FEEDBACK CARBURETOR SYSTEM

Le Car (Calif. Only)

DESCRIPTION & OPERATION

California Le Car models use a feedback carburetor system to achieve good fuel economy and reduce emissions. The system includes a modified Weber 2-Bbl. carburetor, a vacuum solenoid regulator, electronic control unit, oxygen sensor, and sensor replacement reminder counter.

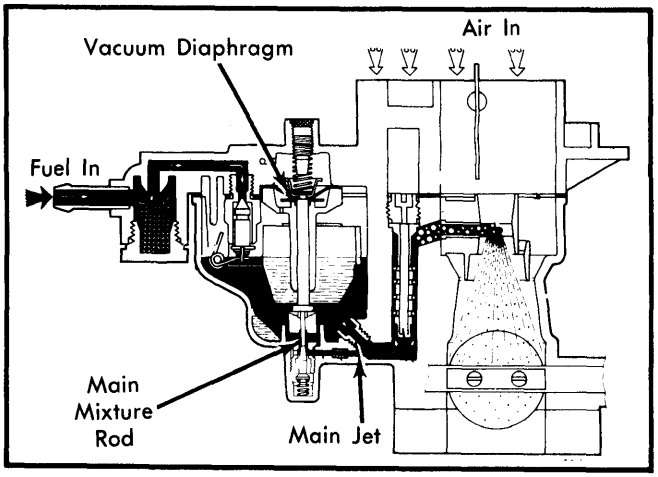

Fig. 1 Le Car Feedback Carburetor Main Jet

FEEDBACK CARBURETOR

The specially calibrated carburetor has 2 metering rods which vary idle and main fuel mixtures when they are moved. The rods are attached to vacuum diaphragms controlled by a signal from the vacuum regulator. The idle mixture rod controls an air bleed, and the main mixture rod controls a fuel passage.

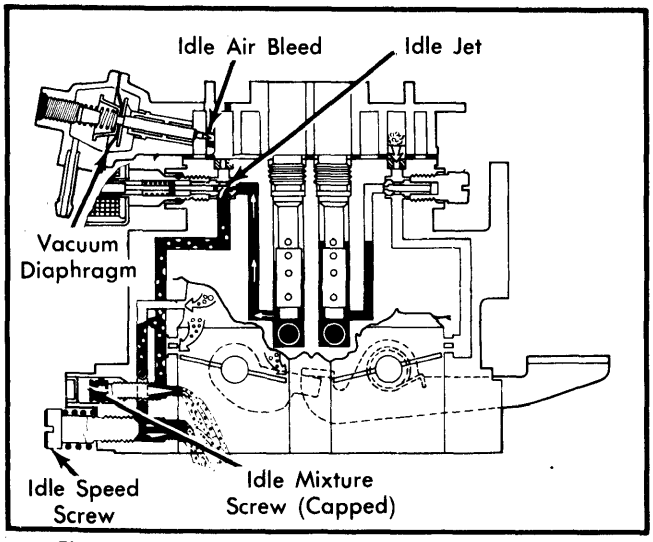

Fig. 2 Le Car Feedback Carburetor Idle Circuit

OXYGEN SENSOR

The oxygen sensor generates a small voltage when oxygen is present in the exhaust gases. When the mixture is lean, the sensor produces a voltage less than 100mv. When the mixture is rich, the voltage will be more than 600mv. The sensor gradually deteriorates and must be replaced after 30,000 miles or if leaded gasoline has been used.

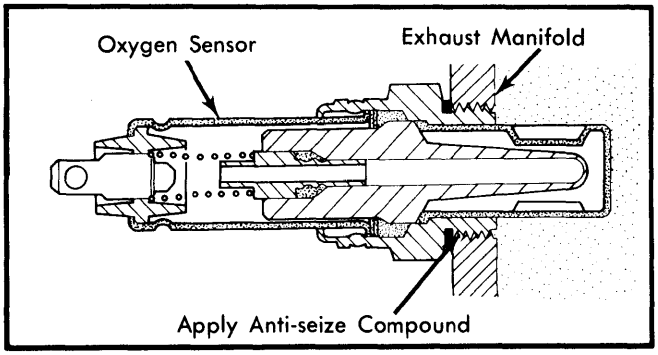

Fig. 3 Le Car Oxygen Sensor

VACUUM SOLENOID REGULATOR

The regulator provides the vacuum signal to the feedback carburetor. A solenoid and regulator are combined in one housing. When the solenoid is de-energized, the output port is blocked and vacuum is vented to atmosphere. When the solenoid is energized, vacuum passes to the carburetor. The average "ON" time versus "OFF" time determines the vacuum level provided.

When the oxygen sensor and control unit sense a rich mixture, the solenoid is "ON" longer, producing a higher vacuum signal. This allows more air through the idle circuit, and less fuel through the main mixture circuit. For lean conditions, the vacuum signal is lower.

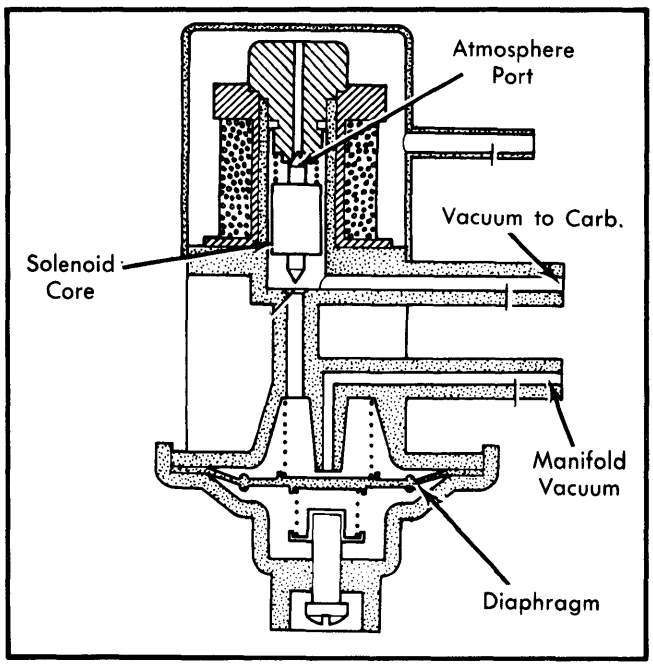

Fig. 4 Le Car Vacuum Solenoid Regulator

RENAULT FEEDBACK CARBURETOR SYSTEM (Cont.)

ELECTRONIC CONTROL UNIT

The electronic control unit processes inputs from the oxygen sensor, ignition coil (engine speed), and choke. It is also connected to battery voltage and ground. An output signal is sent from the control unit to the vacuum regulator to control mixture ratio.

When the choke is pulled out, the control unit is in "Open Loop" operation. The vacuum regulator then operates at a constant 40% of maximum vacuum, which is 2.4±0.8 in. Hg.

When the choke is off, the system is in "Closed Loop" operation. The oxygen sensor signal is processed, and if it reads rich, vacuum increases to a maximum of 5.5 in. Hg. If the signal is lean, vacuum is decreased to atomospheric pressure.

MAINTENANCE

Oxygen Sensor – The oxygen sensor is located in the exhaust pipe and must be replaced at 30,000 mile intervals. A maintenance reminder lamp will light at that time. The threads of the new sensor must be coated with anti-seize compound when it is installed.

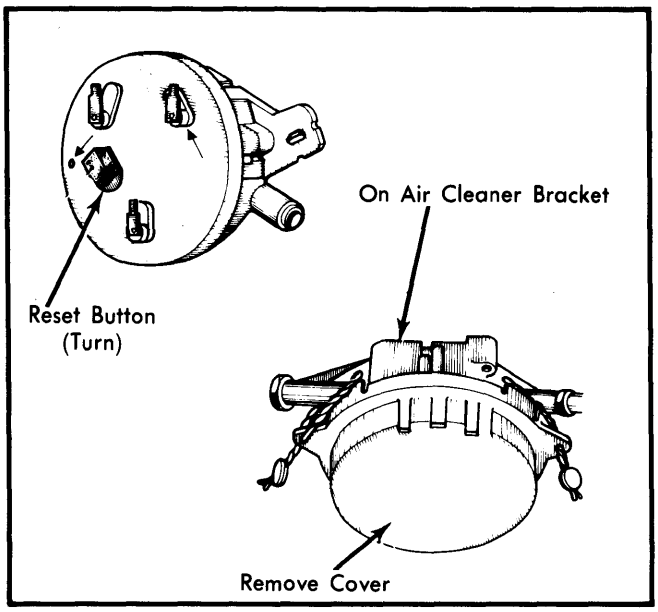

Fig. 5 Oxygen Sensor Indicator Reset

Maintenance Indicator Reset – The maintenance switch is located on the air filter bracket inline with the speedometer cable. Cut safety wires and remove cover. Turn button one quarter turn in direction of arrow to reset. Replace cover and wire in place.

TESTING

Vacuum Solenoid Regulator – **1)** Start engine and run until warm. Connect a vacuum gauge (using "T" fitting) to vacuum line from regulator to carburetor.

2) Accelerate engine quickly several times. Vacuum should increase quickly to 5.5 in. Hg.

3) Pull choke knob out slightly until choke light comes on. Vacuum should quickly stabilize between 1.8-3.0 in. Hg.

4) If regulator does not work properly, check vacuum hose connections, check for presence of vacuum at inlet line from manifold, and be sure all electrical connections are clean and tight. If electronic control unit functions properly when tested, replace vacuum regulator.

Electronic Control Unit – **1)** Pull back rubber sleeves to expose wire terminals, but do not disconnect wires. Connect a 20,000 ohms/volt multimeter to the following wires:

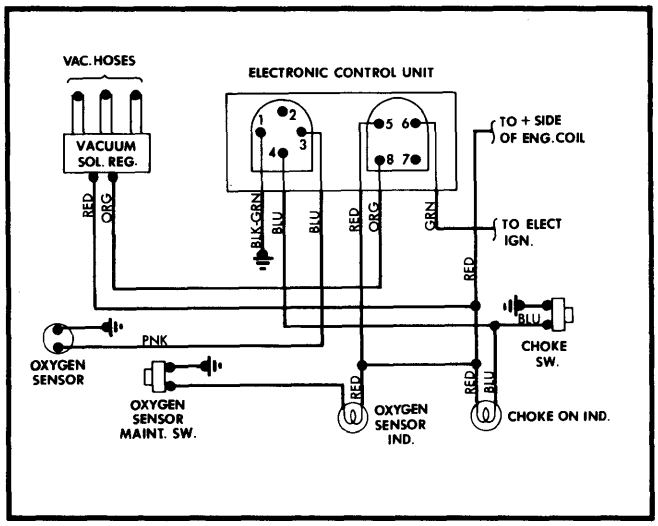

Fig. 6 Feedback Carburetor Wiring Diagram

2) At pin 1 (black/green wire), there should be continuity with ground. Pin 2 is not used. Pin 3 (pink) is connected to oxygen sensor. With engine warm and choke knob pulled out, there should be more than 600mv at pink wire. With choke in, accelerate engine quickly several times. Voltage should vary between zero and more than 600mv.

3) Pin 4 (blue) is connected to choke. With knob in, 12 volts should be present. With knob out, no voltage. Pin 5 (red) should show battery voltage.

4) Connect a tachometer to pin 6 (green). Engine speed should be shown. Pin 7 is not tested. Pin 8 (orange) is output wire to solenoid regulator.

5) Connect a voltmeter (–) lead to pin 8, and (+) lead to battery voltage (pin 5, red). Voltage should vary between zero and 12 when accelerating engine. Voltage should be stable between 1.5-5 volts when choke is pulled out, even with engine accelerating.

6) If control unit readings are incorrect, check source of signal and all wire connections. Replace oxygen sensor if voltage is incorrect. Check and adjust choke switch if voltage is not correct. If all other items are operational, replace electronic control unit.