1974-79 EXHAUST EMISSION SYSTEMS
General Motors Catalytic Converters

LUV

DESCRIPTION

LUV pickups use a catalytic converter to reduce hydrocarbon (HC) and carbon monoxide (CO) emissions. Converter is mounted in front of muffler, in exhaust system.

An over-temperature control system may be used to sense catalyst temperature. Over-temperature control system helps prevent temperature buildup and activate a warning light should excessive temperatures occur. Over-temperature control system consists of a thermo sensor, thermo controller, vacuum switching valve, air switching valve, coasting fuel cut device, and warning light and buzzer.

OPERATION

Catalytic converter oxidizes hydrocarbon and carbon monoxide gases into harmless non-polluting gases. The over-temperature control system components work while coasting fuel cut device is engaged to prevent rich mixtures from reaching converter.

When converter reaches about 1350°F (732°C), due to high load conditions, air pump system air is diverted to atmosphere via action of the air switching valve and vacuum switching valve. This helps reduce chemical reaction in catalyst, which would create even higher temperatures.

Above 1830°F (999°C), warning lamp and buzzer will be activated, indicating an over-temperature condition. Such may be caused by misfiring engine.

NOTE: Buzzer will automatically stop when catalyst temperature returns to normal. Warning light will not turn off until battery positive cable is disconnected and reconnected.

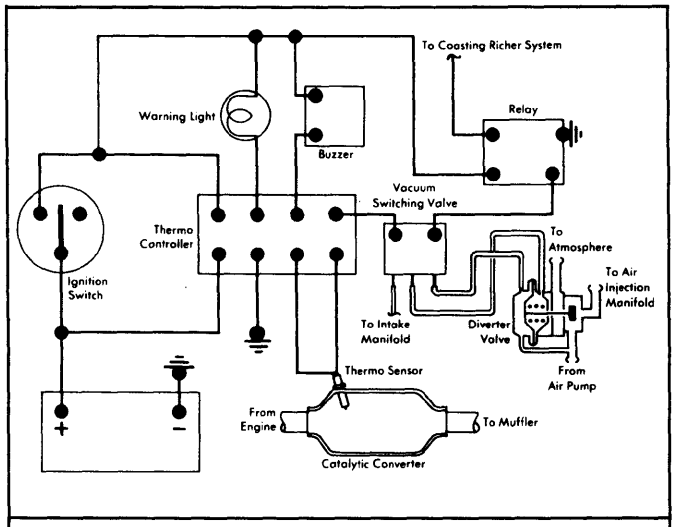

Fig. 1: Catalytic Converter System

VACUUM SWITCHING VALVE

This electro-vacuum valve contains a solenoid. Solenoid is activated when converter temperature reaches 1350°F (732°C) or more, intake manifold vacuum passes through vacuum switching valve and connects with air switching valve to dump air pump air. When de-energized, solenoid allows intake manifold vacuum to pass to air switching valve and connect normal passages of air pump-to-injection manifold.

AIR SWITCHING VALVE

When air is directed to chamber "B" from vacuum switching valve, air pump air is diverted to atmosphere, to protect converter. When vacuum reaches chamber "A", normal air pump air passage occurs.

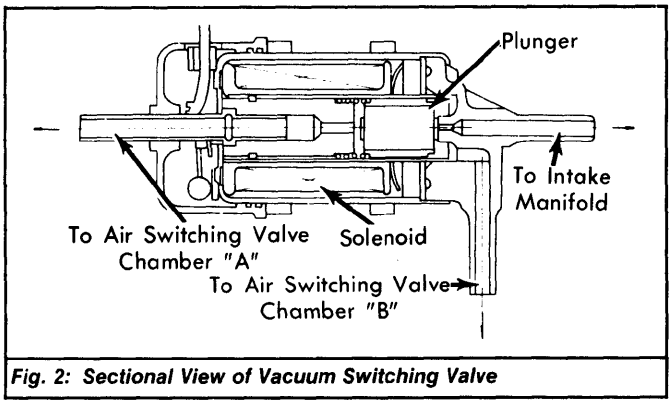

Fig. 2: Sectional View of Vacuum Switching Valve

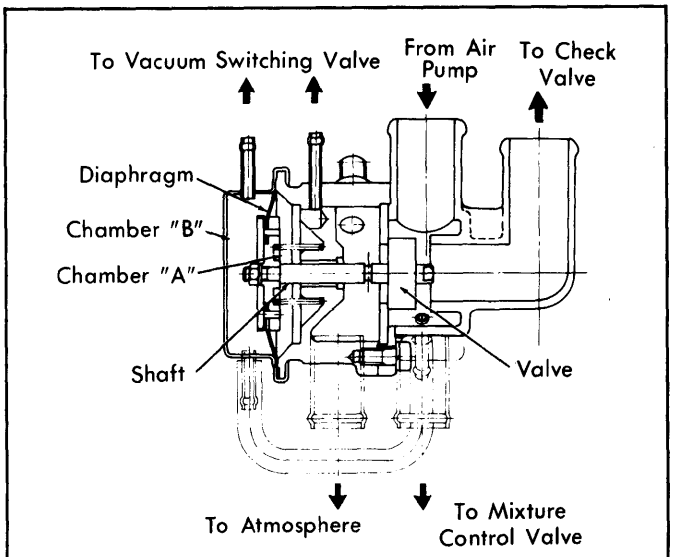

Fig. 3: Sectional View of Air Switching Valve

THERMAL SENSOR & THERMO CONTROLLER

Thermo sensor is inserted into converter, in a special stainless steel sheath, to determine converter temperatures. This device sends varying electrical signals to thermo controller, which sends signal to energize or de-energize solenoid portion of vacuum switching valve. Thermo controller also connects to the relay which controls warning buzzer and warning lamp. *See Fig. 1.*

COASTING FUEL CUT DEVICE

A fuel cut solenoid (which also acts as anti-dieseling solenoid) is mounted on carburetor. It is connected in series with several switches to detect engine coasting conditions. When coasting is sensed, solenoid valve (installed on primary side of carburetor) is energized, closing throttle valve and stopping fuel flow. This protects converter against poor combustion conditions caused by rich mixture. On manual transmission equipped models, accelerator switch, clutch switch, transmission Neutral switch and engine speed switch are used. On automatic transmission equipped models, accelerator switch, inhibitor switch and engine speed switch are used.

TESTING

VACUUM SWITCHING VALVE

With valve removed from vehicle, apply 12 volts to connector terminals and listen for clicking of solenoid as it moves inside valve. If no clicking is heard, select a new valve and repeat check.

1974-79 EXHAUST EMISSION SYSTEMS
General Motors Catalytic Converters (Cont.)

AIR SWITCHING VALVE

With vacuum switching valve installed, apply 12 volts to valve and start engine. If air switching valve is okay, air will flow from atmospheric outlet of air switching valve. If not, replace valve.

THERMO SENSOR

Run engine at idle for a few minutes. Disconnect thermo sensor connector. Check for continuity between connector terminals of thermo sensor. If no continuity exists, replace thermo sensor.

THERMO CONTROLLER

If thermo controller is okay, warning light and buzzer will operate when ignition key is in "ON" position. Light and buzzer will go off automatically after a few seconds. If they do not activate initially, check wiring. If okay, replace thermo controller.

ENGINE SPEED SENSOR

Detach speed sensor connector and connect "B", "BR" and "BY" color-coded wiring terminals to each other with jumper wires. Start engine and check for continuity between "BW" color-coded wiring terminals. Above 1900 RPM, speed sensor is okay if continuity exists. If not, replace sensor.

ACCELERATOR SWITCH & CLUTCH SWITCH

Check clearance between accelerator switch and brake pedal stop. Clearance should be .04-.05" (1.0-1.3 mm). Adjust if required. Detach wiring from accelerator switch and attach continuity tester. Operate pedal, noting that continuity exists when pedal is released and no continuity is present when pedal is depressed. Repeat test with clutch switch. Replace switch if necessary.

TRANSMISSION SWITCH & NEUTRAL SWITCH

Check switch by moving gearshift lever, with wiring detached and tester hooked to connector. If tester indicates switch is on when in 3rd or 4th (Federal) or any gear except Neutral (Calif.), switch is okay. If not, replace switch.