

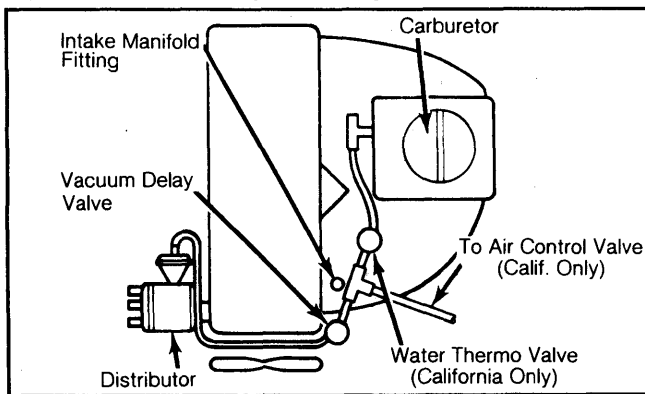
## COURIER SPARK TIMING CONTROL SYSTEM

### DESCRIPTION

The spark timing control system aids in reduction of exhaust emissions by delaying vacuum to distributor vacuum advance unit during acceleration. On 2.0L engines, system consists of a vacuum delay valve, which is located in vacuum line between distributor and carburetor (Federal) or thermo valve (California).

On 2.3L engines (Calif. only), system consists of a spark delay valve (man. trans. only), and a distributor solenoid valve installed in vacuum line between intake manifold and distributor. The distributor solenoid valve is controlled by a timer and, on vehicles with automatic transmissions, a thermo switch.

**Fig. 1: Schematic of Spark Timing Control System**



### OPERATION

The vacuum delay valve has an internal restrictor to slow air flow in one direction and a check valve which allows free air flow in opposite direction. During normal acceleration, vacuum to distributor vacuum advance mechanism is delayed by the restrictor. This results in a delayed spark advance.

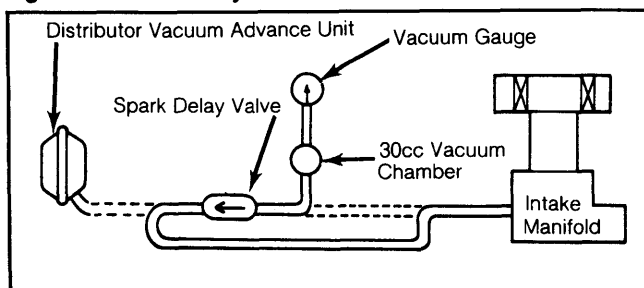
Upon rapid acceleration, the pressure difference at restrictor allows check valve to open so decreasing vacuum is not delayed by restrictor. On Calif. 2.0L engines, vacuum advance is restricted by thermo valve, which reacts to changes in coolant temperature.

### TESTING

#### VACUUM DELAY VALVE

1) Remove air cleaner. Disconnect vacuum line from distributor and connect to intake manifold fitting.

**Fig. 2: Vacuum Delay Valve Test Connections**



Vacuum should drop by 11.8 in. Hg in 4-6 seconds.

2) Remove vacuum line from carburetor (thermo valve) side of vacuum delay valve. Attach a vacuum gauge and 30cc vacuum reservoir to line. See Fig. 2. Start engine, run at idle and check vacuum reading.

3) Disconnect vacuum line from intake manifold fitting. Note time required for vacuum reading to decrease by 11.8 in. Hg from idle vacuum. This should take 4-6 seconds. If system does not respond properly, replace delay valve and reconnect vacuum lines.

#### DISTRIBUTOR SOLENOID VALVE

##### California 2.3L Engines Only

1) Start engine and run at idle. Separate connector at distributor solenoid valve and apply battery power to terminals to energize valve.

2) Disconnect vacuum hose from distributor vacuum advance unit. Remove battery power to solenoid valve. Valve is functioning properly if air is drawn into vacuum hose as soon as power is removed.

#### THERMO SWITCH

##### California 2.3L Engines Only

1) Remove thermo switch. Connect an ohmmeter across switch terminals and place sensor end of switch in a water-filled container. Heat water gradually, using a thermometer to check temperature.

2) Continuity should exist between both terminals above 131°F (55°C). Replace switch if no continuity.

#### TIMER

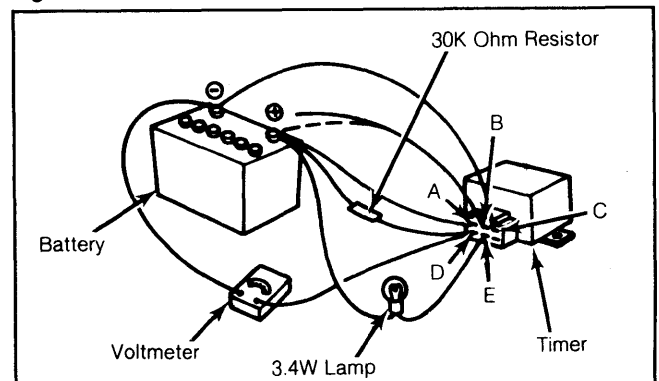
##### California 2.3L Engines Only

1) Remove timer. Connect jumper wires to timer terminals "A", "B" and "C". Connect jumper wire with 30K ohm resistor to terminal "D". Connect jumper wire with 3.4W lamp to terminal "E". See Fig. 3.

2) Connect positive test lead of a voltmeter to terminal "D" and negative test lead to battery negative terminal. Connect jumper wires from timer terminals "A", "D" and "E" to battery positive terminal. DO NOT connect wire from terminal "B" at this time.

3) Connect wire from terminal "C" to battery negative terminal. Voltmeter reading should now be 6 volts or above. Connect jumper wire from terminal "B" to battery positive terminal. Voltmeter should immediately drop to less than 1 volt and lamp should light.

**Fig. 3: Timer Test**



Test applies to 2.3L California vehicles only.

4) Maintain the connections for about 2 minutes. Voltmeter should read approximately 8 volts. If specifications are not met, replace timer.