

## GENERAL MOTORS TRANSMISSION CONTROLLED SPARK SYSTEM

### DESCRIPTION

Buick models incorporate a Transmission Controlled Spark (TCS) system on manual transmission-equipped vehicles. The system controls vacuum advance according to gear selection. It consists of a solenoid valve located in the ported vacuum line to the distributor, a shift linkage operated electrical switch, and necessary vacuum hoses and wiring.

### OPERATION

#### SOLENOID VALVE

The solenoid valve is normally open, but stops vacuum flow through it when it is energized by an electrical signal. When the solenoid is closed, a vent bleeds off vacuum.

#### GEAR SWITCH

The mechanically operated gear switch is normally closed, but opens to stop electrical flow to ground when transmission is in high gear. Vacuum advance is not operative until high gear is selected.

### TESTING

A failure of the TCS system can cause either of the following problems:

- Continuous vacuum advance in 1st and 2nd gears, which would prevent proper emission control (will not meet standards).
- No vacuum advance in high gear, causing lower gas mileage.

1) Connect vacuum gauge to distributor vacuum advance line at distributor. Position gauge so it can be read from driver's seat. Set parking brake, put transmission in neutral, start engine and set at 1000 RPM.

2) Vacuum reading should be zero. Shift into high gear; vacuum reading should change to show vacuum present at gauge. If no vacuum, proceed to next step.

3) Connect jumper wire with test light (1893 bulb or smaller) between 2 connector terminals of TCS solenoid. Transmission should still be in high gear, with engine running. Test light should be off.

4) If test light is on, check for grounded wire between solenoid connector and transmission. If wire is not grounded, replace transmission switch.

5) Shift transmission to neutral. Test light should come on. If not, check for open circuit. If no open exists, replace transmission switch.

6) If steps 3) through 5) show system to be okay, replace TCS solenoid.

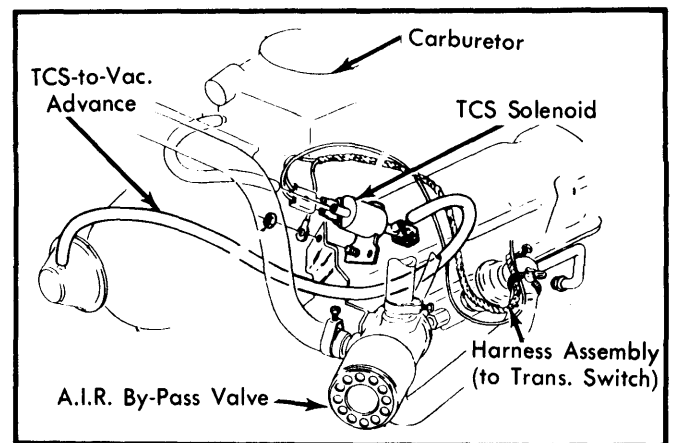


Fig. 1 Illustrating Typical Location of TCS Solenoid

## GENERAL MOTORS DECELERATION VALVE

### DESCRIPTION & OPERATION

The deceleration valve is used on some 4 and 6 cylinder engines to prevent backfiring in the exhaust system during deceleration. Valve is normally closed, but opens when sudden deceleration increases vacuum to a point which overcomes the internal spring pressure. This opening allows additional air into the intake manifold to prevent overly rich mixtures from reaching the combustion chambers.

Air trapped in chamber above vacuum diaphragm will bleed through delay valve inside deceleration valve in order to reduce vacuum signal acting on the diaphragm. When vacuum load on diaphragm and spring load are equal, valve assembly closes, shutting off air to intake manifold. Fig. 1.

Check valve portion of Check and Delay Valve assembly, provides quick balancing of chamber pressure when sudden decrease in vacuum is caused by acceleration rather than deceleration.

**NOTE** — Refer to "General Motors Vacuum Diagrams" in this section for valve location and hose routing.

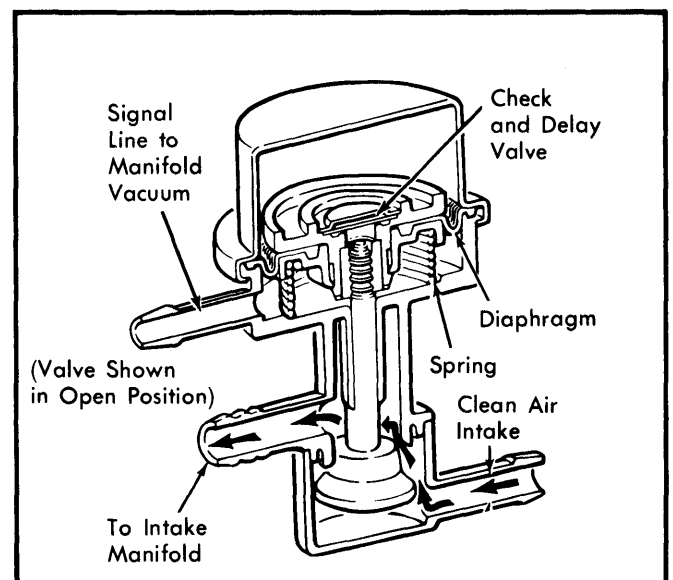


Fig. 1 Sectional View of Deceleration Valve Used on 1980 Engines