

# 1975-79 EXHAUST EMISSION SYSTEMS

## General Motors Transmission Controlled Spark System

### 1979 General Motors

#### DESCRIPTION

1979 Buick models incorporate a Transmission Controlled Spark (TCS) system on vehicles with man. trans. This system controls spark advance according to gear selection. The system consists of a solenoid valve located in the ported vacuum hose 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 on 3 and 4-speed transmissions or in 4th or 5th on 5-speed transmissions. Vacuum advance is not allowed until the proper 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 drivers' seat. Set parking brake, put transmission in Neutral, start engine and set at 1000 RPM.

**2)** Note vacuum reading; it should be zero. Shift into high gear (use 4th or 5th on 5-speed transmission). Note vacuum reading. Vacuum

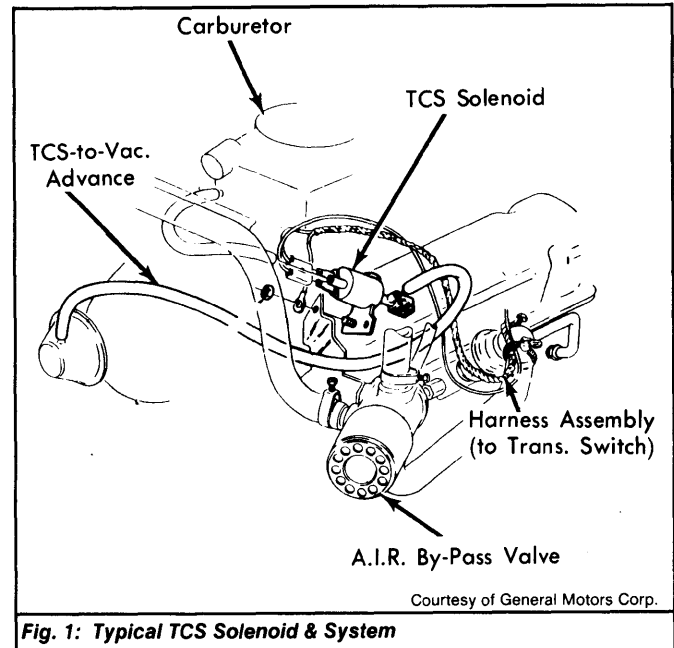
should now register on gauge. If no vacuum, proceed to next step.

**3)** Connect jumper wire with test light (dash light 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: Typical TCS Solenoid & System**