

# 1975-79 EXHAUST EMISSION SYSTEMS

## General Motors Transmission Controlled Spark

### 1975 Models

### DESCRIPTION

Control of exhaust emission is accomplished by eliminating ignition vacuum advance when vehicle is operating in reverse, neutral or low forward gears. System consists of an idle stop solenoid, time relay, vacuum advance solenoid, transmission switch and a coolant temperature override switch.

### OPERATION

**Vacuum Advance Solenoid** - This electrically operated 2-position plunger control valve serves as a on/off vacuum supply switch to distributor vacuum advance unit. When de-energized, spring loaded plunger seats against vacuum inlet and opens distributor advance unit to atmospheric vent. When energized, plunger opens vacuum port from carburetor to advance unit. In opening vacuum port, plunger also closes atmospheric vent. Vent to atmosphere is provided to prevent advance unit from becoming locked in an advanced position.

**Idle Stop Solenoid** - Idle stop solenoid is a 2-position electrically operated solenoid with an adjustable plunger. When energized, solenoid plunger contacts carburetor throttle plates and holds idle speed at specification. When de-energized, solenoid plunger allows throttle plates to close beyond normal idle position, shutting off air supply so engine will shut down without dieseling.

**Temperature Switch** - Temperature switch provides a path to ground for cold override feature. When engine coolant temperature is below 93°F, vacuum is allowed to reach advance unit. When engine coolant temperature exceeds 93°F, temperature switch opens, returning vacuum advance to transmission gear position control.

**Transmission Switch** - Automatic transmissions use a pressure sensitive switch which is activated by transmission fluid pressure. Manual transmissions use a switch which is activated by shifter shaft. The switch is normally open. When transmission is shifted to high gear, switch contacts close energizing vacuum advance solenoid.

**Time Relay Switch** - Relay is an electrically operated on/off type switch. When relay switch is energized through temperature switch, it opens normally closed relay points, opening circuit to vacuum advance solenoid. This energizes vacuum advance solenoid, and opens vacuum port providing vacuum to distributor vacuum advance unit.

### TESTING

**Vacuum Advance Solenoid** - Disconnect vacuum hose from intake manifold and connect an external vacuum source to hose. Disconnect vacuum hose at distributor and connect hose to a vacuum gauge. Connect one terminal of vacuum advance solenoid to ground and the other terminal to battery voltage. With 12 volts applied to solenoid (solenoid energized), vacuum gauge should show vacuum. If not, replace vacuum advance solenoid.

**Idle Stop Solenoid** - Check to ensure that solenoid is de-energized when ignition is off. If solenoid is energized (plunger extended) with ignition off, it should be replaced. Check solenoid plunger for free movement and proper adjustment.

**Temperature Switch** - With engine cold and at idle, vacuum advance solenoid should be energized (vacuum to distributor). If solenoid is not energized, ground the wire from the coolant override switch. If solenoid energizes, replace coolant override switch.

**Transmission Switch** - With engine at idle and at normal operating temperature, place transmission in low forward gear. The vacuum advance solenoid should be de-energized. Raise vehicle drive wheels off ground. Place transmission in high gear. Vacuum advance solenoid should energize. If not, remove and ground connector at switch. If solenoid energizes, replace transmission switch.

**Time Relay** - Remove coolant override switch connector. Check time relay to make sure it is cool. Turn ignition on. Vacuum advance

solenoid should energize for 20 seconds and then de-energize. If solenoid does not de-energize, remove Blue lead from time relay. Solenoid will de-energize if relay is at fault.

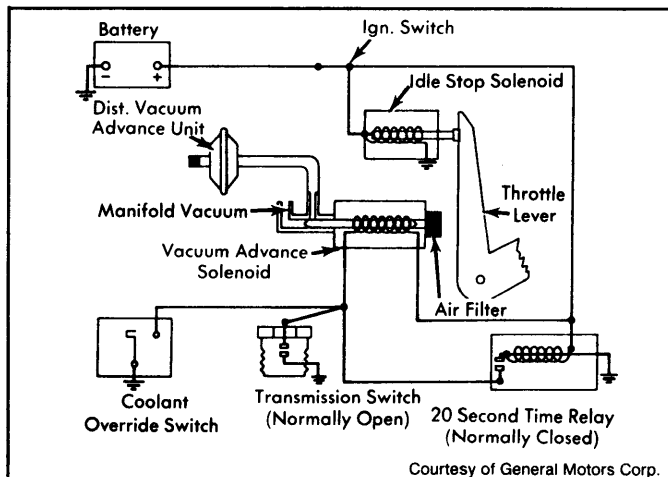


Fig. 1: TCS System (Not High Gear)

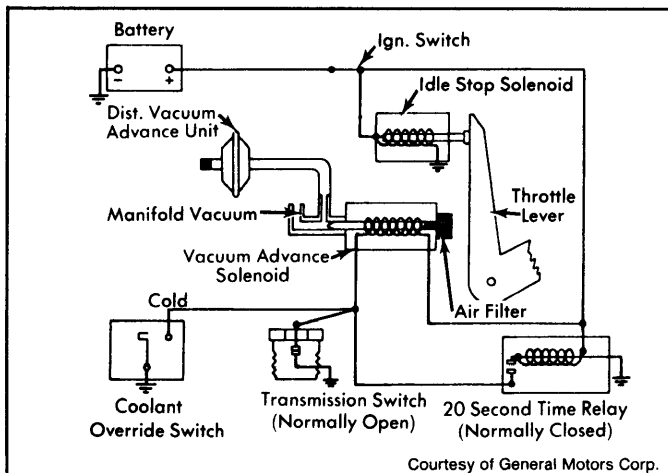


Fig. 2: TCS System (High Gear)

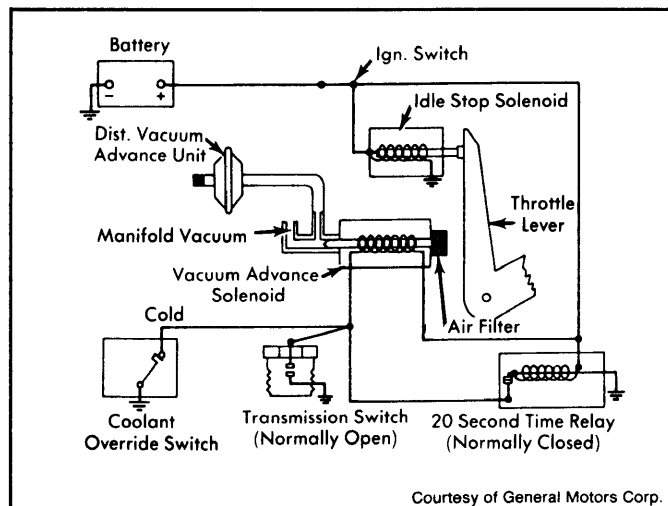


Fig. 3: TCS System (Cold Temp. Override)