1972-73 FORD MOTOR CO. ELECTRONIC SPARK CONTROL

DESCRIPTION & OPERATION

The Electronic Spark Control System (ESC) reduces engine emissions by delaying vacuum advance during specified periods of acceleration and deceleration. System consists of a speed sensor, ambient air temperature switch, distributor modulator valve (solenoid) and an electronic amplifier. In some applications a spark delay valve is also used. Vacuum is controlled by distributor modulator valve located in vacuum line between carburetor and distributor. This valve is normally open and closes off vacuum supply to distributor when energized. An ambient temperature switch in either right or left front door post senses outside air temperature. A temperature below 49°F will cause switch to open and allow normal vacuum advance at all speeds. A temperature of 65°F will close switch and allow normal operation of ESC system. The speed sensor, connected to speedometer cable, sends a signal to the electronic amplifier in proportion to speed of vehicle. When vehicle reaches a preset speed (see specifications), amplifier will de-energize distributor modulator valve, restoring normal vacuum advance. When vehicle speed decreases to about 18 mph, amplifier responds to close modulator valve and retard spark.

SYSTEM TEST

1) Raise rear wheels, disconnect vacuum hose at distributor advance diaphragm and connect it to a vacuum gauge. Ensure that temperature switch is above 65°F, warm with hand or a sponge saturated with hot water if necessary. Start engine and engage transmission.

2) Vacuum gauge should read zero until specified speed is obtained, at which point, it should register at least 6 inches Hg.

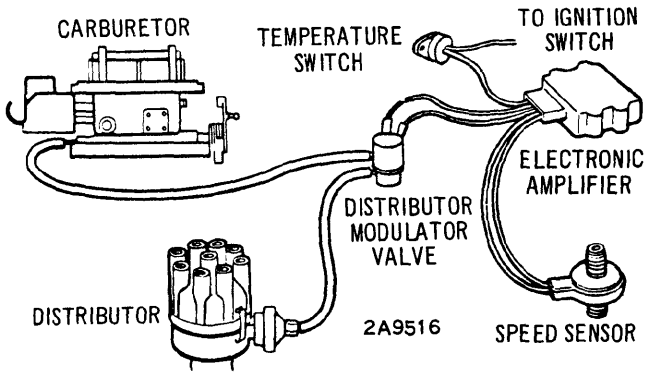
3) If there is no vacuum, check the following: Determine that there is vacuum at carburetor vacuum port: Check for pinched, blocked, mis-routed, or disconnected vacuum hoses. Make sure that distributor vacuum control valve is open (if fitted). Disconnect one or both electrical leads at distributor modulator valve and throttle down engine. If there is no vacuum at all, replace distributor modulator valve. If there is vacuum below cut-in speeds, trouble exists in ESC system and it will be necessary to test the individual system components.

TEMPERATURE SWITCH TEST

Disconnect wiring to switch and connect ohmmeter to both terminals of switch. Place switch in palm of hand and allow it to warm up. A reading with switch at 65°F or higher indicates a good switch. Next, chill switch with ice water. At temperatures below 49°F, switch should be open and no reading will register on ohmmeter if switch is operating correctly. If switch does not function as indicated above, replace switch.

POWER SUPPLY TEST

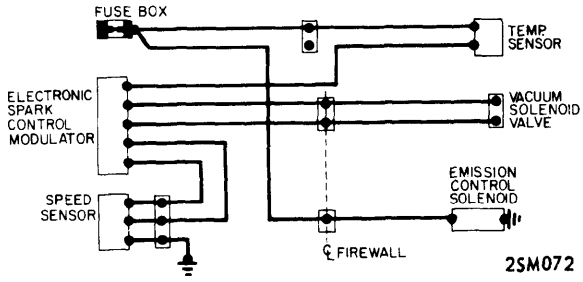
Ground lead on test lamp and check for voltage at temperature switch connector of instrument panel wiring (red-yellow wire). With ignition on, lamp should light. If lamp does not light, check wiring and ignition switch.



ELECTRONIC SPARK CONTROL SYSTEM (ESC)

SPEED SENSOR TEST

Disconnect speed sensor wiring and connect ohmmeter. Resistance of speed sensor at room temperature should be 40-60 ohms. Next, check resistance between black wire case. Reading should indicate an open circuit. Replace speed sensor if either reading is incorrect.



ELECTRONIC SPARK CONTROL WIRING SCHEMATIC

ELECTRONIC AMPLIFIER

If the above tests have failed to locate the problem, replace the electronic amplifier.

Electronic Amplifier Specifications

Case Color	Cut In Speed (MPH)	Cut Out Speed (MPH)
Black	23	18
White	28	18
Blue	33	18
Gray	35	18

Thermal Switch Specifications

Close	65°F Max.
Open	49°F Min.

Speed Sensor Specifications

Resistance	40-60 Ohms @ Room Temperature
Coil to Case Resistance	Open Circuit