



CIRCUIT OPERATION

Ignition

The ELECTRONIC SPARK TIMING (EST) DISTRIBUTOR contains the ignition coil, amplifier, timer core, electronic switches, and magnetic pickup coil. Voltage is available to the EST DISTRIBUTOR when the IGNITION SWITCH is in "Run," "Bulb Test," or "Start."

PICKUP ASSEMBLY—

As the timer core turns, a magnetic circuit closes before each time a spark plug is to fire. See Figure 26-1. The magnetic circuit is like an electric circuit with the magnet acting as battery and the pole pieces and shaft acting as wires. The pointed teeth on the pole piece and timer core act as a switch. When the teeth separate, the switch opens. When the teeth come together, the switch closes and a magnetic pulse flows through the pickup. As the timer core turns, the magnetic circuit is rapidly opened and closed. Each rapid magnetic pulse produces a low voltage pulse which is applied to the amplifier. The amplifier increases the pulse voltage and sends reference pulses to terminal 21 of the ELECTRONIC CONTROL MODULE (ECM).

The ECM receives and processes these pulses. Based on the rate of these input reference pulses and the data it receives from engine sensors, the ECM selects the spark timing (retard or advance) needed for best engine performance. Then the ECM sends a control signal from terminal 22 to electronic switch A in the EST DISTRIBUTOR. This signals the switch to move to position 1 which allows the EST output

COMPONENT LOCATION

Electronic Control Module	Behind RH side of I/P, below glove box	41-4
EST Distributor	Front LH side of engine	
Idle Speed Control	LH side of engine, behind A/C compressor	111-1
Ignition Switch	At base of steering column	
Relay Convenience Center	Under LH side of I/P, near fuse block	5-1
C100A (20 cavities)	RH half of LH bulkhead connector	120-1
C100B (20 cavities)	LH half of LH bulkhead connector	
C101B (20 cavities)	LH half of center bulkhead connectors	31-1
C103 (44 cavities)	Behind LH side of I/P, above steering column	38-4
C106 (22 cavities)	Center engine cowl, above center bulkhead connector	38-2
C432 (4 cavities)	LH front of engine, below EST distributor	
G191	LH rear of engine, at cruise control power unit	
S323	I/P harness, above steering column	
S410	Engine harness, behind rear portion of LH valve cover	30-1
S411	I/P harness, near relay center	
S625	I/P harness, near ECM	
S626	Engine harness, near C106	
S627	Engine harness, near distributor	

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timing pulse from terminal 13 of the ECM to be applied to electronic switch B.

When electronic switch B closes, it connects the ignition coil primary (PRI) to ground.

Current flows through the coil and builds up a magnetic field around the coil. When the switch opens, the magnetic field at the ignition coil primary (PRI) quickly falls. The quick fall of the magnetic field produces a high voltage in the ignition coil secondary (SEC). The high voltage passes

BY-PASS MODE—

Under certain conditions, for example during start or with a problem in the EST circuit, the ECM will ignore the inputs from sensors. In such cases, the control signal sent from terminal 22 of the ECM will tell electronic switch A contacts to remain in position 2. This is called the By-Pass Mode

because the spark control circuitry of the ECM does not control engine timing. Instead, the spark control voltage goes directly from the amplifier, through switch A to electronic switch B.

The ECM can also be operated in the bypass mode by disconnecting the ELECTRONIC SPARK TIMING pigtail connector, C432. This disconnects the control signal from the ECM.

Idle Speed Control

The THROTTLE SWITCH closes when the engine is idling. This instructs the ECM to begin sending idle speed adjustments to the IDLE SPEED CONTROL MOTOR. The ECM monitors the Distributor reference pulses to determine the engine speed.

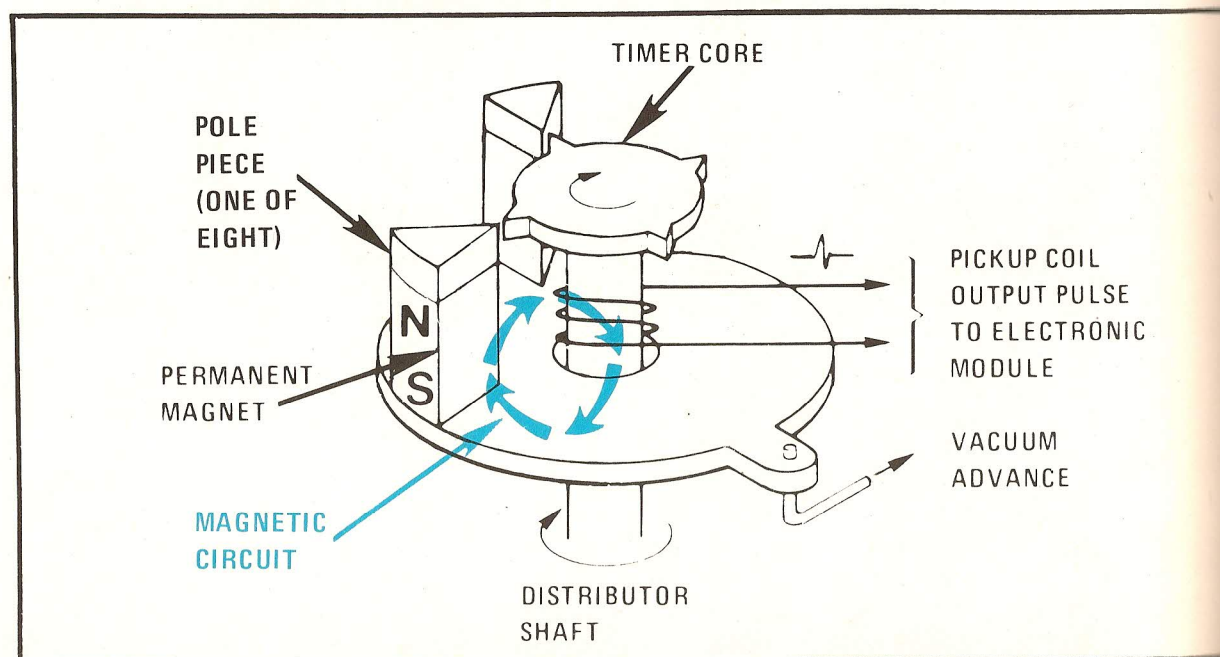


Figure 1 - Distributor Pickup Coil