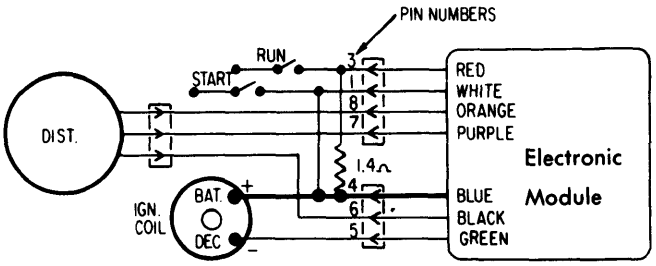
FORD MOTOR CO. SOLID STATE IGNITION

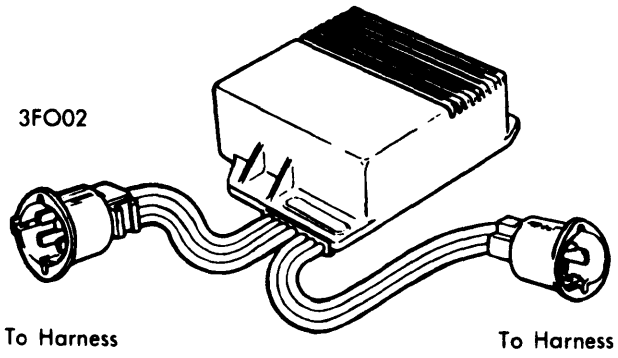
DESCRIPTION & OPERATION

Solid State Ignition system uses an electronic module to control system, a breakerless distributor and an oil filled coil. When ignition switch is on, primary circuit is on and ignition coil is energized. As distributor shaft rotates, the distributor generates signals causing module to break the primary current and induce secondary voltage in coil. A timing circuit in module turns primary circuit on again to energize coil for next spark cycle. The dwell varies with engine speed and cannot be altered, so any measurement is unnecessary.



PRIMARY CIRCUIT WIRING

Electronic Module — The module contains seven color coded wires (see illustration). The module receives power from ignition switch through red wire while engine is running and through white wire while engine is cranking. The orange and purple wires transmit signals from distributor while green wire receives primary ignition current from coil which is then transmitted to ground at distributor through black wire. System protection is provided through blue wire, which is a fusible link. The electronic module cannot be repaired.

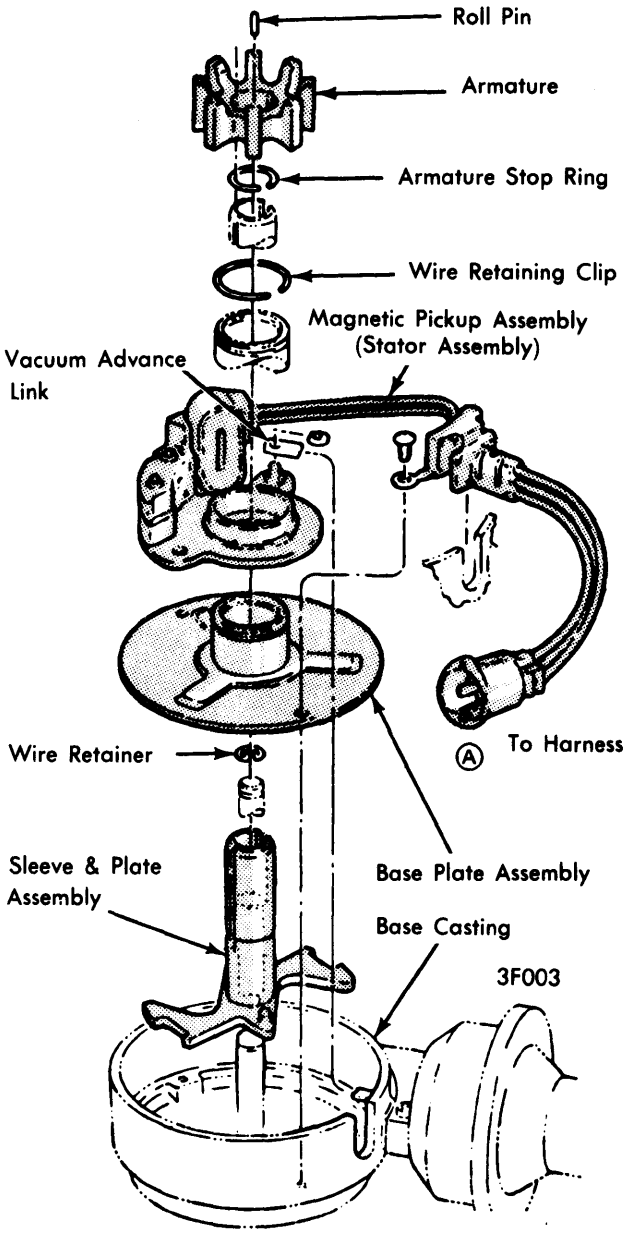


ELECTRONIC MODULE

Distributor — The Solid State distributor is similar in appearance to conventional distributors with the following differences: The cam and advance plate assembly has been replaced by a sleeve and advance plate assembly. The spring loaded upper and lower breaker plate assembly is replaced by a base plate mounted to base casting and fitted with a magnetic pickup assembly secured by a retaining ring. The breaker cam is replaced by an armature with poles and secured to sleeve and plate assembly. Movement of these poles passing by core of magnetic pickup assembly signals module to turn primary current off. Diaphragm assembly has a different rod. The shaft gear, weights, springs, cap and rotor have not been changed.

Coil — The new coil is oil filled and can be easily identified by the tower terminals which are labelled "BAT" (battery) and "DEC" (distributor electronic control). Solid State system coil and standard coils cannot be interchanged.

System Protection — System is protected against electrical currents produced or used by any vehicle component during normal operation. *NOTE — Damage to ignition system can occur if proper testing procedures are not followed.*



SOLID STATE DISTRIBUTOR

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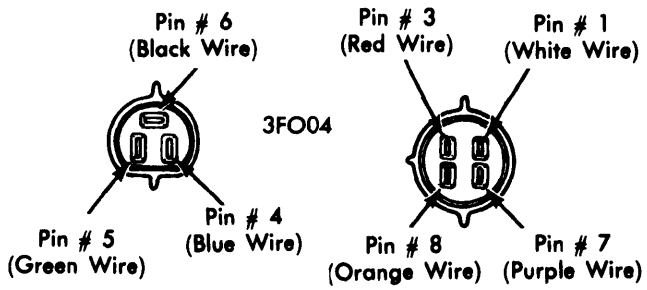
TESTING

CAUTION — Do not use volt-amp test procedure or any test equipment that utilizes a knife switch on battery terminal. Only test procedures as outlined in this section are to be used.

If the ignition system is suspected of a malfunction, inspect for loose connections and tighten as necessary, then check secondary ignition circuit as follows:

1) Remove coil high tension lead from distributor cap and turn ignition switch on. Hold high tension lead 3/16" from a good ground and crank engine. If spark is good then trouble is in secondary circuit.

2) If no spark is observed, ensure that high tension lead is good. If high tension lead is good, disconnect the 3-way and 4-way connectors at electronic module and test (see test procedure tables) system at harness connectors. *NOTE — Do not make tests at module terminals.* If all of the following tests comply with specifications, replace electronic module.



HARNESS CONNECTOR PINS

MODULE BIAS TEST

With key on, measure voltage at pin #3 (red wire) to engine ground. If observed voltage is less than battery voltage, repair voltage feed wire (red wire) to the module.

TEST PROCEDURES

VOLTAGE TESTS①	SPECIFICATIONS	CORRECTIONS
With Key On Pin #3 and engine ground	Battery voltage ±.1V	Module bias test
Pin #5 and engine ground	Battery voltage ±.1V	Battery source test
While Cranking Engine Pin #1 and engine ground	8 to 12 volts	Cranking test
Pin #5 and engine ground	8 to 12 volts	Starting circuit test
Pin #7 and pin #8	Any D.C. wiggle ½ V. min.	Distributor hardware test

RESISTANCE TESTS①	SPECIFICATIONS	CORRECTIONS
With Key Off Pin #7 and pin #8 Pin #6 and engine ground Pin #7 and engine ground Pin #8 and engine ground	 400 to 800 ohms 0 ohms more than 70,000 ohms more than 70,000 ohms	Magnetic pickup stator test
Pin #3 and coil tower Pin #5 and pin #4	7,000 to 13,000 ohms 1.0 to 2.0 ohms	Ignition coil test
Pin #5 and engine ground	more than 4.0 ohms	Short test
Pin #3 and pin #4	1.0 to 2.0 ohms	Resistance wire test

① — Make test between points indicated.

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BATTERY SOURCE TEST

Without disconnecting coil, connect voltmeter between coil BAT terminal and engine gound. Connect a jumper wire from coil DEC terminal to a good ground. Turn all lights and accessories off and ignition on. A voltmeter reading between 4.9 and 7.9 volts indicates primary circuit from battery to coil is satisfactory. If reading is less than 4.9 volts, inspect primary wiring and resistance wire for worn insulation, broken strands and loose or corroded terminals. If reading is greater than 7.9 volts, check and replace resistance wire as necessary.

CRANKING TEST

With engine cranking, measure voltage from pin #1 to engine ground. If voltage is not between 8 and 12 volts, repair voltage feed wire (white wire) to the module.

STARTING CIRCUIT TEST

Voltage between pin #5 and engine ground with engine cranking should read between 8 and 12 volts. If reading not within limits, the ignition by-pass circuit is open or grounded from either the starter solenoid, the ignition switch to pin #5 or primary connections at the coil. Repair or replace as necessary.

DISTRIBUTOR HARDWARE TEST

Disconnect distributor 3-way pigtail. With voltmeter on 2.5 volts scale and connected between pin #7 and pin #8 and engine cranking, meter needle should oscillate. If meter does not oscillate, remove distributor cap and check for visual damage or incorrect assembly. Armature must be tight on sleeve and roll pin, aligning armature, in position. Iron stator must not be broken and armature must rotate when engine is cranking. If internal components are all good and voltmeter still will not oscillate, replace magnetic pickup (stator assembly).

MAGNETIC PICKUP (STATOR ASSEMBLY) TEST

With key off, check resistance between pin #7 and pin #8. Reading should be between 400 and 800 ohms. Check resistance between pin #6 and engine gound to read zero ohms. Check resistance between pin #7 and engine ground, and between pin #8 and engine ground. Both readings should be more than 70,000 ohms. If any of above tests fail, the distributor magnetic pickup is inoperative and must be replaced.

IGNITION COIL TEST

With key off, check secondary resistance between pin #3 and coil tower to be 7,000 to 13,000 ohms. Check primary resistance between pin #5 and pin #4 to be 1.0 to 2.0 ohms. If coil is not within limits, follow manufacturers instructions for testing standard coils.

SHORT TEST

If resistance between pin #5 and engine ground is less than 4.0 ohms, check for a short to ground at coil "DEC" terminal or in primary wiring (green wire) to coil.

PRIMARY RESISTANCE WIRE TEST

Resistance between pin #3 and pin #4 should be 1-2 ohms. If not within limits, replace ignition resistance wire (red/light green).

OVERHAUL

Disassembly – Remove distributor cap and rotor. Disconnect distributor harness plug. Using a small gear puller or two screwdrivers, lift or pry armature from advance plate sleeve and remove roll pin. Remove wire retaining clip, then remove snap ring securing vacuum advance link to pickup assembly. Remove pickup assembly retaining screws and lift assembly from distributor. Lift vacuum advance arm from pickup assembly and position against distributor housing. Remove vacuum advance diaphragm unit. Remove attaching screws and lift base plate assembly from distributor.

Reassembly – Reverse disassembly procedures.