Chrysler Corp. Electronic Ignition

DESCRIPTION

All Chrysler Corp. vehicles come equipped with electronic ignition. System is composed of a magnetic distributor, an Electronic Control Unit (ECU), wiring harness, coil, and a dual ballast resistor.

The primary circuit consists of battery, ignition switch, compensating side of ballast resistor, primary winding of ignition coil, power switching transistor of control unit, and vehicle frame. The secondary circuit consists of the coil secondary winding, distributor cap and rotor, spark plugs, and vehicle frame.

The compensating resistance serves the same purpose as in the contact type ignition, that is to maintain constant primary current with various engine speeds. During starting this resistance is bypassed applying full battery voltage to ignition coil. In addition to the 2 basic circuits there have been 3 other circuits added, they are the pickup circuit, control unit feed circuit, and auxiliary ballast resistor circuit.

NOTE: If vehicle is equipped with the Electronic Lean Burn System, also see CHRYSLER CORP. ELECTRONIC LEAN BURN SYSTEM article in this section.

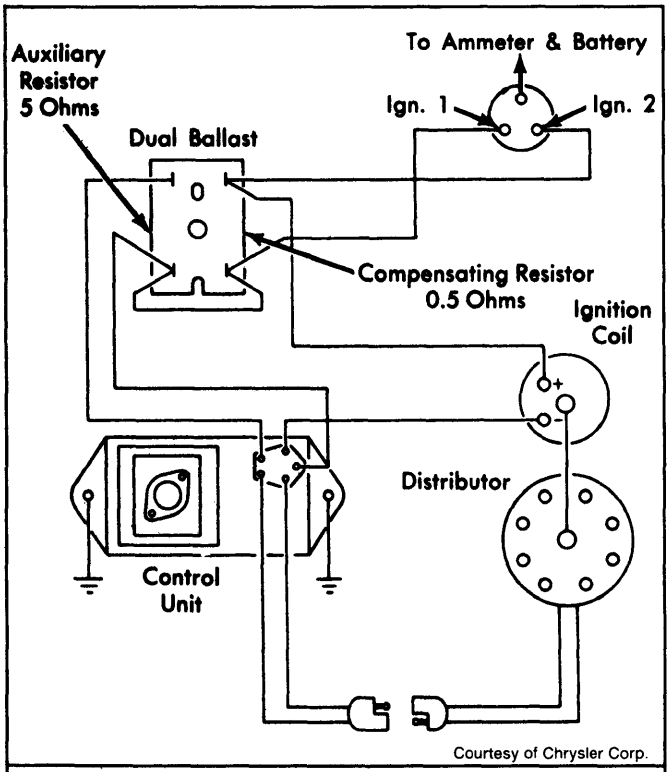


Fig. 1: Electronic Ignition Wiring Diagram

OPERATION

DISTRIBUTOR

The reluctor rotating with distributor shaft produces a voltage pulse in magnetic pick-up each time a spark plug should be fired. This pulse is transmitted through pick-up coil to power switching transistor in control unit and causes transistor to interrupt current flow through primary circuit. This break in primary circuit induces high voltage in secondary circuit and fires a spark plug.

ELECTRONIC CONTROL UNIT

The length of time switching transistor allows current flow is determined by electronic circuitry in control unit. The magnetic pick-up and control unit have replaced function of contact points. These show no signs of wear and periodic checks of timing and dwell are not necessary.

DUAL BALLAST RESISTOR

Normal side of dual ballast resistor is a compensating resistance in ignition primary circuit. During low speed operation, current is maintained in this side of ballast resistor for a longer period of time. This causes resistor to heat up, and resistance to increase. This action reduces voltage in ignition primary circuit protecting coil (do not replace resistor for this heated condition).

As engine speed increases, amount of time current is maintained in this side of resistor is shortened. This causes resistor to cool off, and resistance to decrease. This action raises voltage in primary circuit which is required for high speed operation. The auxiliary side of resistor limits voltage protecting control unit.

ADJUSTMENTS

PICK-UP COIL AIR GAP

1) To set air gap, loosen pick-up hold-down screw and align one reluctor blade with pick-up pole. Install a .006" non-magnetic feeler gauge between reluctor blade and pick-up pole. *See Fig. 2.*
2) Move pick-up until contact is made between pick-up, feeler gauge, and reluctor blade. Tighten pick-up hold-down screw. Remove feeler gauge. No force should be required to remove feeler gauge. Check air gap with .008" feeler gauge.
3) Apply vacuum to vacuum unit and rotate distributor shaft. Pick-up pole should not hit reluctor teeth. Gap is not properly adjusted if hitting occurs. If hitting occurs on only one side of reluctor, distributor shaft is bent.

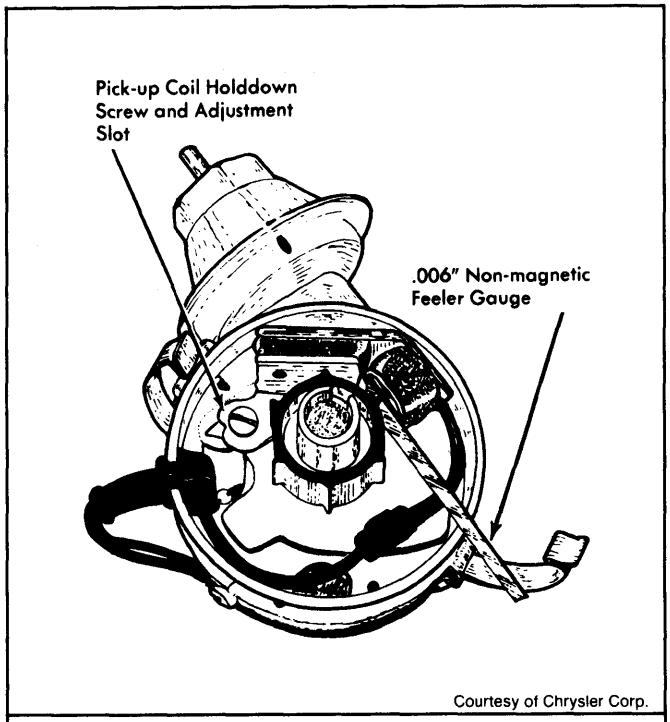


Fig. 2: Adjusting Pick-Up Coil Air Gap

TESTING

IGNITION SYSTEMS

NOTE: If Tester (C-4166) with Adapter (C-4166-1) is available, use tester and follow manufacturer's instructions. If tester is not available, proceed as follows:

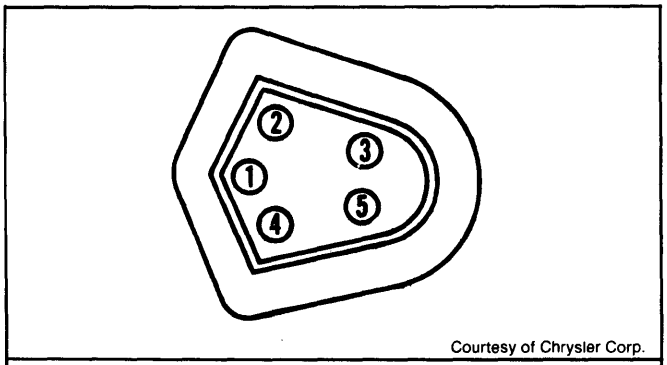
Check that all secondary cables, primary wire at coil and ballast resistor are not loose and not cracked excessively. Use a voltmeter with a 20,000 ohm/volt rating and an ohmmeter which uses a 1 1/2 volt battery for its operation. Check calibration of both meters.

Check and record battery voltage reading using voltmeter. Proceed with following tests.

WIRING HARNESS & CONNECTOR

NOTE: Ensure ignition is off when removing or installing wiring connector.

1) Remove wiring connector from control unit. Use adapter or jumper wires to connect wiring connector to control unit for testing purposes. Turn ignition switch on and connect negative lead of voltmeter to a good ground.
2) Connect positive lead to terminal No. 1 of wiring harness connector. *See Fig. 3.* Reading should be within one volt of battery voltage with all accessories off.
3) If voltage is not within limits, check wire between terminal No. 1 at connector and ballast resistor. Also check wire between ballast resistor and ignition switch (Ign. 1 connection) and wire between ignition switch, ammeter, and battery. *See Fig. 1.*
4) Connect positive lead to terminal No. 2 at wiring harness connector. Reading should be within one volt of battery voltage with all accessories off. If voltage is not within limits, check wire from terminal No. 2 at connector to negative side of coil.
5) Also check wire between positive side of coil to ballast resistor. Check wire between ballast resistor and ignition switch (Ign. 1 connection) and wire between ignition switch, ammeter, and battery. *See Fig. 1.*
6) Connect positive lead to terminal No. 3 at wiring harness connector. Reading should be within one volt of battery voltage with all accessories off. If voltage is not within limits, check wire between terminal No. 3 at connector and ballast resistor.
7) Also check wire between ballast resistor and ignition switch (Ign. 1 connection) and wire between ignition switch, ammeter, and battery. *See Fig. 1.*



Courtesy of Chrysler Corp.

Fig. 3: Identification of Wiring Harness Connector Terminals

PICK-UP COIL

1) Turn ignition switch to "OFF" position. Disconnect battery. Connect an ohmmeter to terminals No. 4 and 5 at wiring harness connector. Ohmmeter resistance reading should be 150-900 ohms.
2) If reading is not within limits, disconnect dual lead connector coming from distributor. Check resistance at dual lead connector. If reading is not 150-900 ohms, replace pick-up coil assembly in distributor.
3) Connect one ohmmeter lead to a good ground and other lead to either connector of distributor. Ohmmeter should show an open circuit. If ohmmeter shows a reading, pick-up coil is grounded and must be replaced.

ELECTRONIC CONTROL UNIT GROUND CIRCUIT

Connect one ohmmeter lead to a good ground and other lead to terminal No. 5 of control unit connector. Ohmmeter should show continuity between ground and connector terminal. If continuity does not exist, tighten bolts holding control unit to firewall. Recheck continuity. If continuity is still not present, replace electronic control unit.

CENTRIFUGAL ADVANCE CURVE

Install distributor in test stand. Adjust tester speed control to operate distributor at speeds called for in distributor tables. See appropriate DISTRIBUTOR SPECIFICATION tables in this section. If advance is not according to specifications, replace distributor shaft assembly. *See Figs. 4 and 5.*

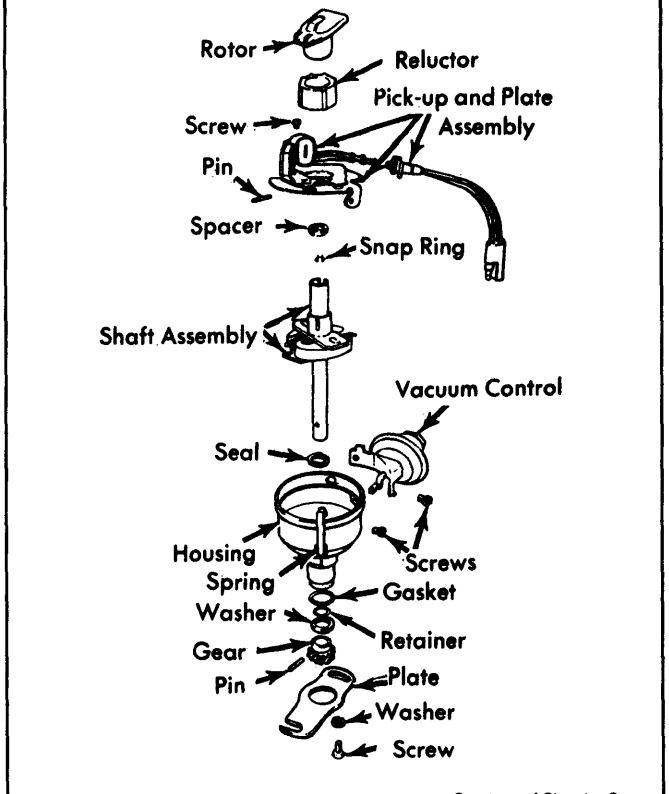
IGNITION COIL

Coil is designed to operate with an external ballast resistor. When testing coil for output, include resistor in tests, also inspect coil for external leaks and arcing. Test coil according to coil tester instructions. Replace coil or ballast resistor that does not meet specifications. See IGNITION SYSTEM SPECIFICATIONS table in this article.

OVERHAUL

DISTRIBUTOR

Disassembly - 1) Remove distributor, rotor, and vacuum control unit. Remove reluctor by prying up from bottom with 2 screwdrivers. Be careful not to damage or distort teeth on reluctor.
2) Remove screws attaching lower plate to housing and lift out lower plate, upper plate, and pickup coil as an assembly. Do not attempt to remove distributor cap clamp springs.
3) On 6-cylinder models, remove distributor drive gear retaining pin and slide gear off end of shaft. *See Fig. 4.* On V8 models, remove distributor shaft retaining pin and slide retainer off end of shaft. *See Fig. 5.*
4) On all models, use a file to clean burrs from around pin hole in shaft and remove lower thrust washer. Push shaft up and remove shaft through top of distributor body.



Courtesy of Chrysler Corp.

Fig. 4: Exploded View of Distributor Used on 6-Cylinder Engines

Reassembly - 1) Test operation of governor weights and inspect weight springs for distortion. Lubricate governor weights. Inspect all bearing surfaces and pivot pins for roughness, binding, or looseness.

Chrysler Corp. Electronic Ignition (Cont.)

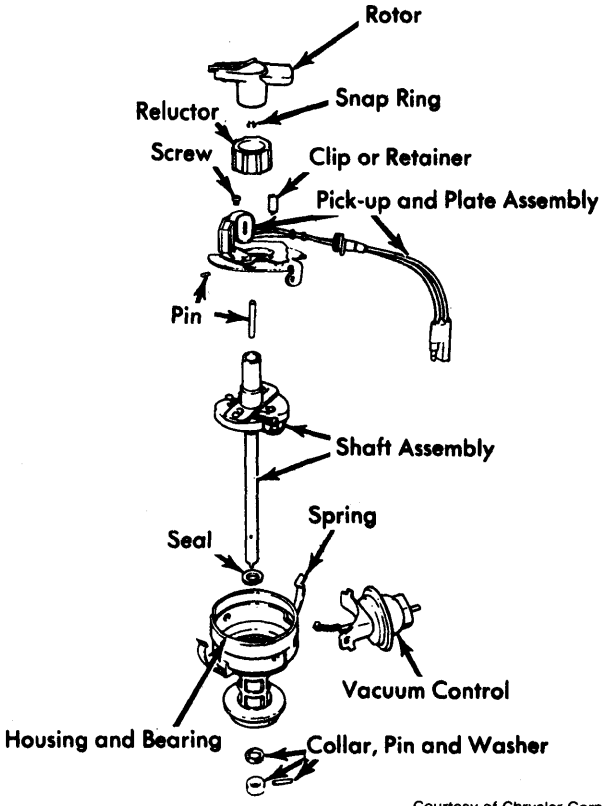


Fig. 5: Exploded View of Distributor Used on V8 Engines

2) Lubricate and install upper thrust washer on shaft and slide shaft into distributor body. Install distributor shaft retainer or gear and pin. Install lower plate, upper plate and pickup coil assembly.

3) Attach vacuum advance unit. Position reluctor keeper pin into place on reluctor sleeve. Slide reluctor down reluctor sleeve and press firmly into place. Install reluctor so that two arrows are on top.

4) In a clockwise distributor, arrow at keeper pin holding reluctor in place should point clockwise. In a counterclockwise distributor, arrow should point counterclockwise.

5) If arrow at the distributor pin does not point in direction of distributor rotation, remove reluctor, turn it 180 degrees and reinstall it. Be careful not to lose keeper pin. Lubricate felt pad in top of reluctor sleeve with a drop of light oil and install rotor.

IGNITION SYSTEM SPECIFICATIONS

Application	Specification
Primary Resistance @ 70-80°F	
Essex	1.41-1.55 Ohms
Prestolite	1.60-1.79 Ohms
Secondary Resistance @ 70-80°F	
Essex	9000-11,200 Ohms
Prestolite	9400-11,700 Ohms
Ballast Resistance @ 70-80°F	
Coil Side	.50-.60 Ohm
Control Side	4.75-5.25 Ohms