CHRYSLER CORP. ELECTRONIC IGNITION

Dodge
Plymouth

DESCRIPTION

All Chrysler Corp. trucks and vans use Chrysler Corp. Electronic Ignition. This system consists of a battery, ignition switch, an electronic control unit, a distributor with a reluctor, magnetic pick-up coil, and vacuum advance unit, an ignition coil, and a single ballast resistor. See *Fig. 1*.

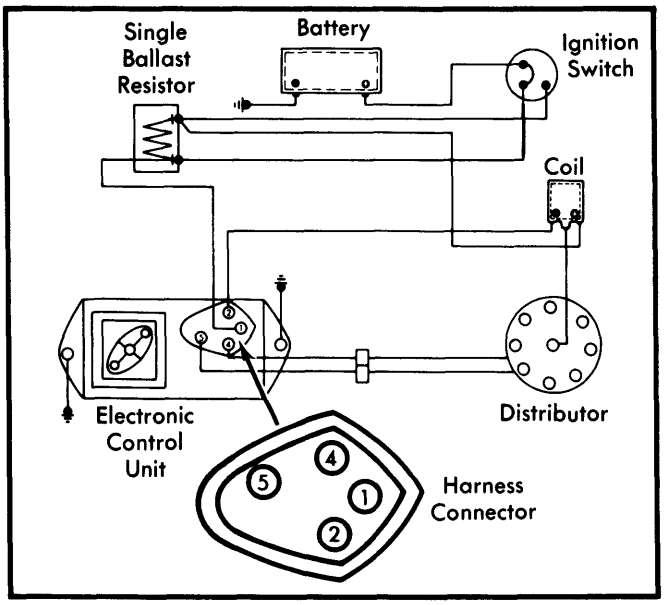

Fig. 1 Chrysler Corp. Electronic Ignition System Wiring Diagram for V8 and 6 Cylinder Engines (Note: No Pin "3")

All engines use an electronic control unit in 1980 with a 4 wire connector (1979 and earlier had 5 pin connector). A 2-wire connector is used at the distributor.

NOTE — *There is no terminal "3" on the 1980 electronic control unit.*

OPERATION

DISTRIBUTOR

The distributor consists of a reluctor (toothed wheel), mounted on the distributor shaft, and a permanent magnet, pick-up coil, and pole piece.

As the distributor shaft turns, the reluctor turns with it. See *Fig. 2*. As each tooth of the reluctor passes the magnetic pick-up coil, a voltage pulse is produced in the magnetic pick-up coil. This pulse is transmitted from the distributor to the switching transistor, mounted externally on the electronic control unit. No moving parts contact each other in the distributor and there is no need for regular adjustments.

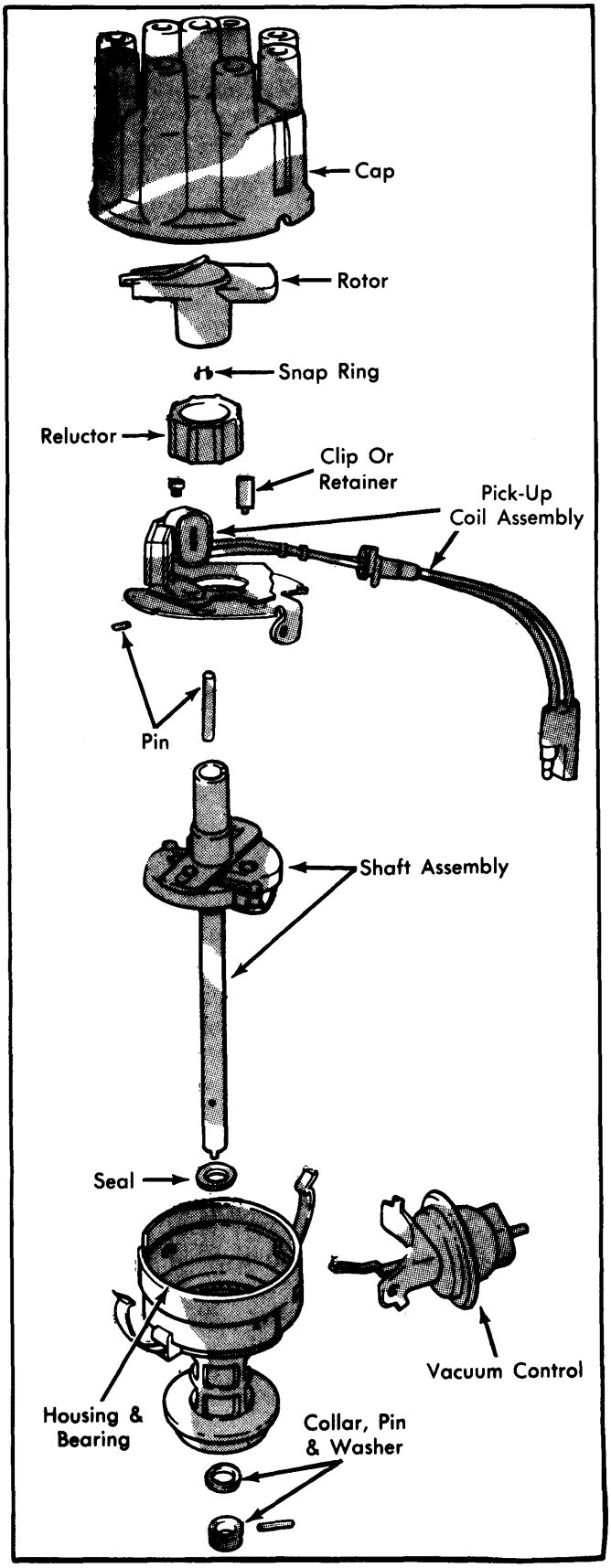

Fig. 2 Exploded View of Chrysler V8 Distributor

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CONTROL UNIT

The electronic control unit, located in a metal housing on the firewall, receives the voltage pulses or signals from the distributor. This causes the transistor to interrupt current flow to the ignition coil primary circuit. This break in the primary circuit causes a high voltage surge in the secondary circuit, firing the spark plugs. One plug fires each time a reluctor tooth passes the magnetic pick-up coil's pole piece.

The control unit functions whenever the ignition is switched to "START" or "ON". It allows current to flow through the primary side of the coil, creating a magnetic field in the coil. The length of time current flows through the primary (dwell) is determined by the control unit and is not adjustable.

BALLAST RESISTOR

A single ballast resistor is used on Chrysler Corp. truck engines. During cranking, the 1.25 ohm resistor is by-passed, allowing full battery voltage to the coil. In low speed operation, the ballast resistor limits voltage to the coil, protecting it from overheating. As engine speed increases, the resistor allows the coil to charge faster to prevent voltage loss.

ADJUSTMENT

PICK-UP COIL AIR GAP

1) To set air gap, loosen pick-up coil hold-down screw and align one reluctor tooth with the pick-up coil's pole piece. Install a .006" non-magnetic feeler gauge between the reluctor tooth and pole piece. See *Fig. 3*.

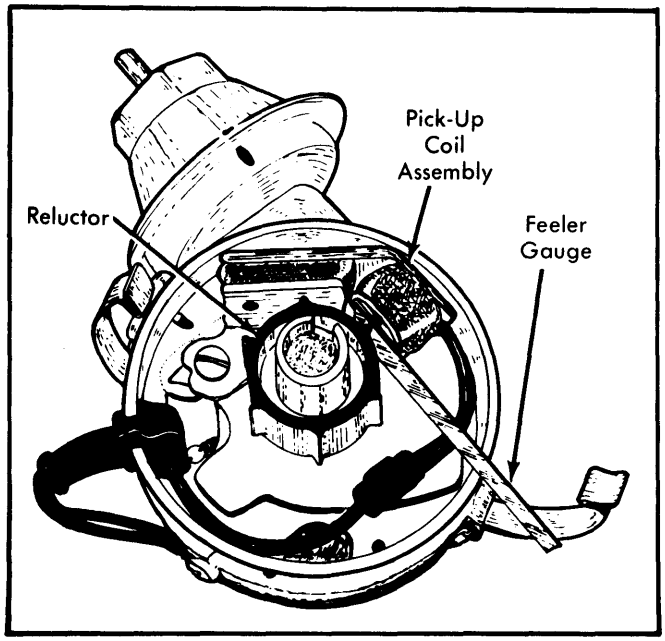

Fig. 3 Adjusting Air Gap Between Reluctor and Pick-Up Coil

2) Move pick-up coil so there is contact between pick-up coil pole piece, feeler gauge and reluctor tooth. Tighten pick-up coil hold-down screw. Remove feeler gauge.

NOTE – *No force should be required to remove feeler gauge.*

3) Without forcing gauge, recheck air gap with an .008" feeler gauge. It should not fit. Apply vacuum to vacuum unit and rotate distributor shaft. Pick-up coil pole piece should not touch reluctor teeth. If it strikes reluctor teeth on one side, distributor shaft is probably bent.

TESTING

NOTE – *If a suitable tester (C-4166 or C-4503 and their adapters) is available, use tester and follow manufacturer's instructions. If tester is not available, proceed as follows.*

Visually 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 1½ volt battery for its operation. Check calibration of both meters. Check and record battery voltage reading, using voltmeter. Proceed with the following tests.

CONTROL UNIT HARNESS CONNECTOR CHECKS

CAUTION – *When removing or installing wiring harness connector to control unit, ignition switch must be in "OFF" position to prevent damage or injury.*

1) Attach positive lead of voltmeter to battery positive post and negative voltmeter lead to battery negative terminal. Battery voltage should be at least 12 volts. Turn ignition switch "OFF" and disconnect harness connector from control unit. Connect voltmeter negative lead to a good ground and turn ignition switch back "ON".

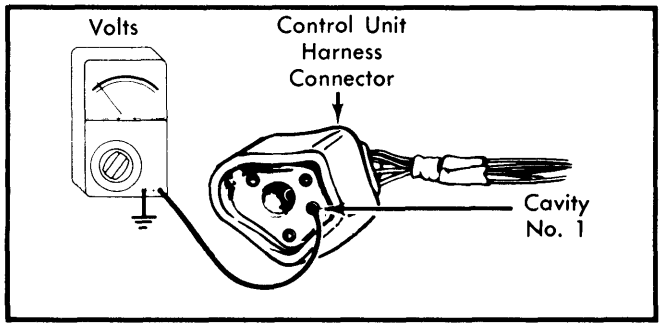

Fig. 4 Checking Voltage at Cavity No. 1

2) Connect voltmeter positive lead to harness connector cavity No. 1. Reading should be within 1 volt of battery voltage. See *Fig. 4*. If not, check and repair wiring and components illustrated by dark lines in *Fig. 5*.

3) Now, connect positive voltmeter lead to harness connector cavity No. 2. Voltmeter reading should be within 1 volt of battery voltage. See *Fig. 6*. If reading is not to specifications, check and repair wiring harness and components illustrated by dark lines in *Fig. 7*.

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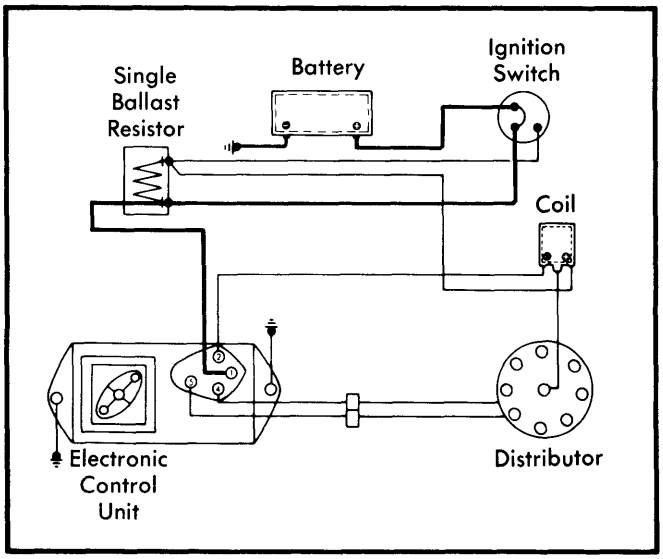

Fig. 5 Circuitry Checked if Cavity 1 Reading Is Not to Specifications

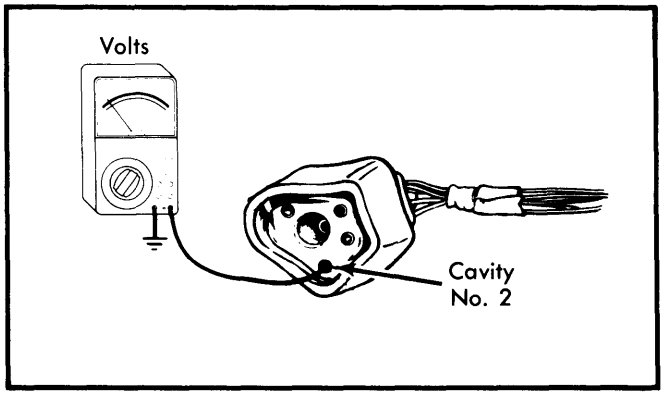

Fig. 6 Checking Voltage at Cavity No. 2

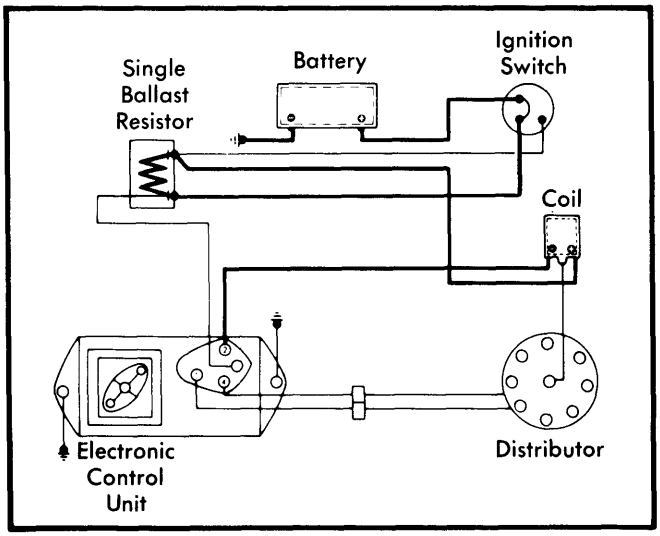

Fig. 7 Circuitry Checked if Cavity 2 Reading Is Not to Specifications

4) If when checking wiring in previous step (dark lines in *Fig. 7*), battery voltage exists at positive terminal of ignition coil, make primary and secondary coil resistance checks and check resistance of ballast resistor. See *Fig. 8*. Remove wires from resistor and attach leads of an ohmmeter to each resistor terminal. Resistance should be 1.1-1.3 ohms. If reading is not to specifications, replace resistor.

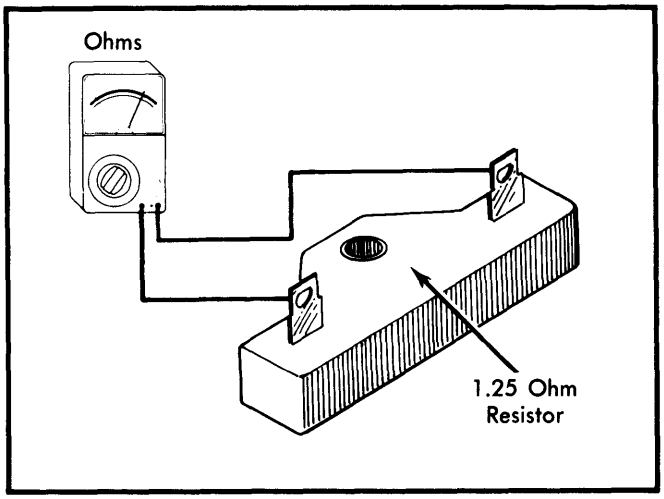

Fig. 8 Checking Ballast Resistor Resistance

DISTRIBUTOR PICK-UP COIL CHECK

1) Turn ignition switch "OFF". Disconnect harness connector from control unit. Connect ohmmeter leads to connector cavities No. 4 and 5. See *Fig. 9*. Ohmmeter reading should be 150-900 ohms. If reading is not to specifications, make same check at distributor 2-wire connector. If reading is still not correct, replace defective pick-up coil assembly. If correct reading is found at distributor connector, but not at control unit connector cavities No. 4 and 5, replace or repair harness.

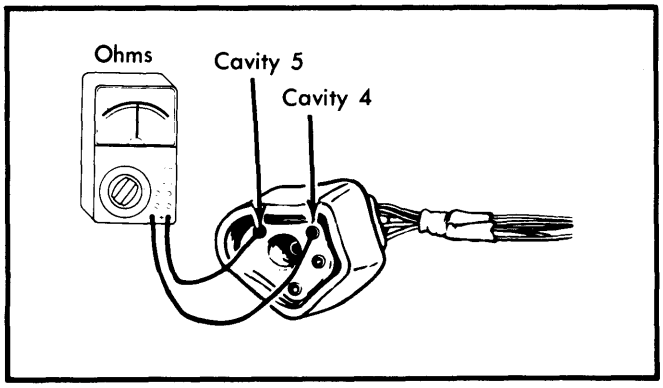

Fig. 9 Checking Resistance at Cavities 4 and 5 (Pick-Up Coil Resistance)

2) Connect one ohmmeter lead to a good ground and the other lead to either terminal of distributor connector. Ohmmeter should show an open circuit. If ohmmeter reading exists, replace pick-up coil in distributor.

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ELECTRONIC CONTROL UNIT GROUND CIRCUIT CHECK

1) With harness connector removed from control unit, attach one ohmmeter lead to a good ground and the other to pin No. 5 of the control unit (not the harness connector cavity No. 5, but to pin on control unit).

2) Ohmmeter should show full continuity. If not, make sure electronic control unit is making good contact at its hold-down bolts. If it is, replace control unit.

CENTRIFUGAL ADVANCE CURVE CHECK

Install distributor in test stand. It is important that appropriate adapter for checking electronic type distributors is used. Adjust tester speed control to operate distributor at speeds called for in Distributor Advance Specifications Tables. If advance is not according to specifications, replace distributor shaft assembly (shaft, reluctor, weights, etc.).

IGNITION COIL RESISTANCE CHECK

1) The ignition coil is designed to work with an external ballast resistor. When testing coil for output, include resistor tests. Inspect coil for external cracks and arcing. To check primary resistance, attach ohmmeter leads to both primary terminals with coil wire removed to isolate it from the system.

2) To check secondary resistance connect ohmmeter leads to coil negative terminal and to terminal in coil tower.

Ignition Coil Resistance Specifications

Application	Ohms
Ignition Coil	
Primary Resistance	
Prestolite	1.60-1.70
Essex	1.34-1.55
Secondary Resistance	
Prestolite	9,400-11,700
Essex	9,000-12,200
Ballast Resistor	
Single Resistor	1.1-1.3

OVERHAUL

DISASSEMBLY

1) Remove distributor, rotor and vacuum control unit. Remove reluctor. Some reluctors may be pulled off with fingers, however, if this is not possible, pry 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 pick-up 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. On V8 models, remove distributor shaft retaining pin and slide retainer off end of shaft. 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.

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. Lubricate and install upper thrust washer on shaft and slide shaft into distributor body.

2) On V8 engines, install distributor shaft retainer and pin. On 6 cylinder engines, install lower thrust washer and original gear on lower end of shaft and install roll pin. If gear is not in good condition, replace it.

3) On all models, install lower plate, upper plate, and pick-up coil assembly. Attach vacuum advance unit arm to pick-up plate and install attaching screws.

4) Position reluctor keeper pin into place on reluctor sleeve. Slide reluctor down reluctor sleeve and press firmly into place. Make sure keeper pin is in place. Lubricate felt pad in top of reluctor sleeve and install rotor.