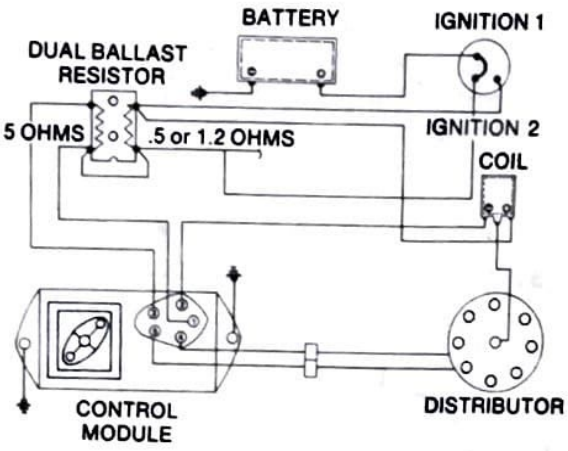
CHRYSLER CORP.
ELECTRONIC IGNITION SYSTEM
1972-82 EXCEPT HALL EFFECT

DESCRIPTION

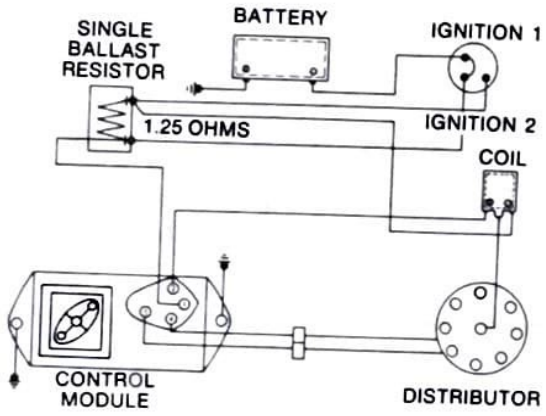
Chrysler Electronic Ignition was used in production in 1972 and became standard equipment on all engines in 1973. It is still used on many Chrysler vehicles today. The system consists of a magnetic pulse distributor, an electronic control module, a ballast resistor and a conventional coil. The distributor cap, rotor, advance mechanisms and spark plug cables are of conventional design. See Figs. 1, 2 and 3.

FIGURE 1



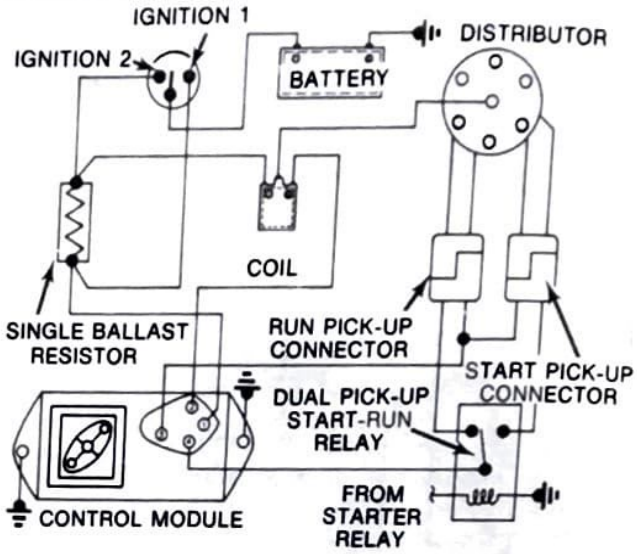
1972-79 Chrysler Corp. Electronic Ignition Wiring Diagram

FIGURE 2



1980 Chrysler Corp. Electronic Ignition Wiring Diagram

FIGURE 3



1981-82 Chrysler Corp. Electronic Ignition Wiring Diagram

The distributor has a toothed wheel called a reluctor in place of a conventional cam. The points are replaced by a permanent magnet. The 1980 and earlier models use a single pick-up coil and pole piece. The 1981-82 models use dual pick-up coils and a dual pick-up start-run relay. See Fig. 3. Signals generated by the distributor are sent to the control unit through one or two pair of leads. Since no moving parts contact each other in the distributor, there is no wear, and therefore no need for regular adjustments.

The electronic control module is located in a metal housing on the firewall or fenderwell. A switching transistor is exposed on top of the module for cooling. The module is connected to the rest of the system by a wiring harness and connector. On 1972-79 models a 5-pin connector was used along with the dual ballast resistor. On 1980-82 models, a single ballast resistor replaced the dual ballast resistor, requiring only a 4-pin connector.

The resistor assemblies, ceramic units mounted on the firewall, dissipate heat during normal operation, and therefore may be hot to the touch. A radio suppression capacitor, used since 1973, is mounted near the ballast resistor.

OPERATION

The control module functions when the ignition is switched to "START" or "ON". It allows current to flow through the primary side of the coil, creating a magnetic field. During cranking, the ballast resistor is by-passed to ensure adequate voltage through the coil. The ballast resistor limits voltage to the coil

during low speed operation, but allows it to increase as engine speed increases.

The pick-up coil(s) and toothed wheel (reluctor) replace points in the distributor. A permanent magnet near the pick-up coil(s) is the source of a weak magnetic field. When the teeth of the reluctor pass through the field, it builds and collapses, creating a weak current in the pick-up coil. This current acts as a signal to the electronic control module, which responds by continuously turning on and cutting off current flow through the coil primary circuit. The length of time current is allowed to flow for each firing impulse (dwell) is determined by the control module and is not adjustable.

On 1981-82 dual pick-up models, with the ignition switch in the "START" position, current is supplied through the dual pick-up start-run relay to the "START" pick-up coil in the distributor. With the ignition switch in the "RUN" position, current is furnished through the "switched" relay to the distributor's "RUN" pick-up coil. Only one pick-up coil operates at a time.

On models equipped with a dual ballast resistor, voltage to the electronic control module is limited by the auxiliary side of the ballast resistor. Some earlier models were equipped with speed limiter circuitry to prevent engine damage from excessive RPM.

SYSTEM SPECIFICATIONS

BALLAST RESISTANCE

NOTE:

- ***Refer to Fig. 14 for distinguishing features of the three ballast resistors used by Chrysler Corp. since 1972.***

Dual Ballast Resistor
1972-79 — NAPA ECHLIN ICR 24.
Primary wire resistor
Thermal resistor — 0.5 ohm.
Non-thermal resistor — 1.25 ohms.
Auxiliary resistor — 4.75 to 5.75 ohms.
Single Ballast Resistor
1980-82 — NAPA ECHLIN ICR 23 — 1.25 ohms.

NOTE:

- ***New non-thermal resistors can be substituted for all previous installations, including thermal resistors.***

IGNITION COIL RESISTANCE

Coil is of conventional design.
Primary resistance — 1.34 to 1.79 ohms.
Secondary resistance — 9,000 to 12,200 ohms.

NOTE:

- ***If either coil primary or secondary resistance is not to specifications, replace ignition coil.***

PICK-UP COIL RESISTANCE

Resistance should be from 150 to 900 ohms

CONTROL MODULE

1972-79 — 5-pin harness connector, NAPA ECHLIN TP 50.
1980-82 — 4-pin harness connector, NAPA ECHLIN TP 51.

DUAL PICK-UP START RUN RELAY RESISTANCE

Resistance between terminals 4 and 5 of relay should be 20 to 30 ohms.

AIR GAP

Single pick-up coil.
1972-76 — .008".
1977-80 — .006".
Dual pick-up coil.
1981-82
"START" pick-up coil — .006".
"RUN" pick-up coil — .012".

Air gap is adjustable, and is measured using a non-magnetic feeler gauge.

TEST PROCEDURES

PRELIMINARY SYSTEM CHECKS

- Ignition Secondary Checks and Coil Resistance Checks are basic system tests required whenever ignition problems are suspected. Please refer to the General System Checks at the beginning of the manual.

System may be tested using a voltmeter and an ohmmeter. If ignition problems are suspected, proceed as follows:

CAUTIONS

- ***Control module must be grounded when battery is connected.***
- ***Always disconnect power to module when performing a compression test.***
- ***Always disconnect the battery cables before disconnecting control module.***
- ***DO NOT touch switching transistor on control module when engine is running, because of high voltage shock hazard.***
- ***DO NOT file edges of reluctor teeth, they must have sharp corners.***

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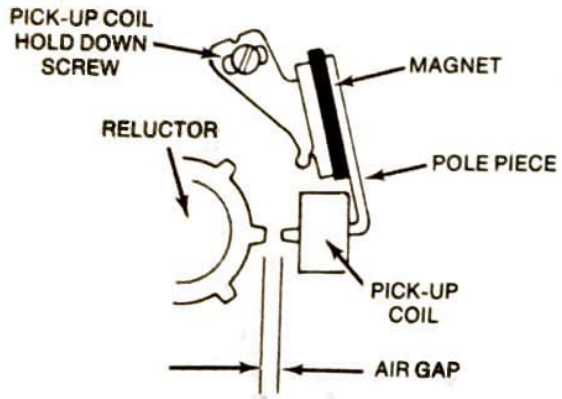
- *If replacing reluctor, make sure it is installed for correct rotation.*
- *Whenever checking continuity or voltages, make sure all connections are tight and clean of corrosion. If poor connections exist, incorrect readings may be obtained.*

1) Check battery and battery connections for tightness and cleanliness. Clean or repair as necessary.

2) Check the air gap between one reluctor tooth and the center of the pick-up coil. To set the air gap, first loosen pick-up coil hold-down screw(s). See Fig. 4.

FIGURE 4



Measuring Air Gap

3) Align one reluctor tooth with the center of the pick-up coil. Insert a non-magnetic feeler gauge of specified size (.008" for 1972-76 models; .006" for 1977-80 models; .006" for "START" pick-up coil, .012" for "RUN" pick-up coil for 1981-82 models).

4) Adjust the pick-up coil so that contact is made between the reluctor tooth, feeler gauge and pick-up coil. Tighten screw. Remove feeler gauge. It should be snug, but should not require any force to remove it.

5) Rotate engine two complete turns, and make sure there is no more than a .002" variation on any reluctor tooth.

6) Check the distributor cap for cracks, excessive tower corrosion, and carbon tracking. If there is evidence of any of these problems, replace with a new cap and rotor.

7) Check primary wires at the ignition coil and ballast resistor for tightness.

If the preceeding checks do not determine the problem, the following steps will determine if a component is faulty.

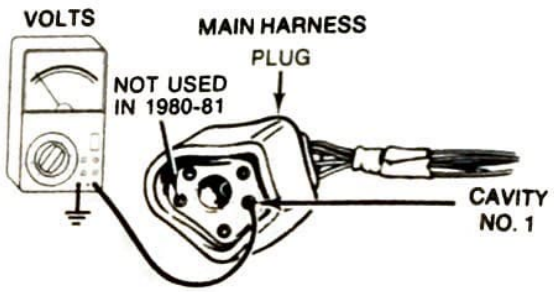
PRIMARY TEST NO. 1
CAVITY 1 VOLTAGE CHECK

1) To check wiring harness and connectors of cavity number 1, turn ignition switch "OFF", and remove the multi-wiring connector from the control module. This will expose the connector cavity (female) terminals for testing.

2) Turn ignition switch "ON". Set a voltmeter on 0-16V scale. Connect negative lead of voltmeter to a good ground.

3) Connect the positive lead of the voltmeter to the module harness connector cavity number 1. See Fig. 5.

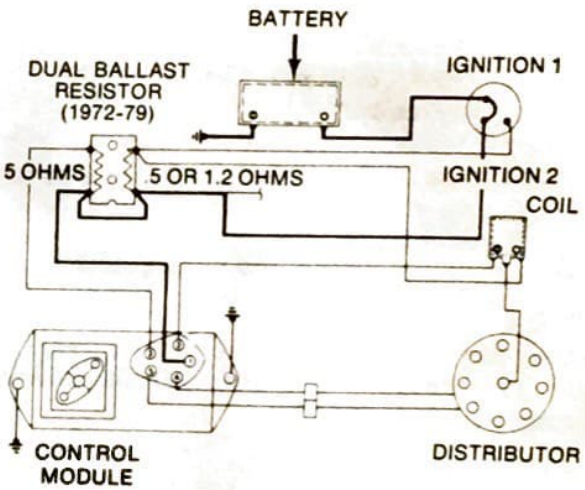
FIGURE 5



Test No. 1 Voltmeter Hookup for Cavity 1 Voltage Check

4) Available voltage at cavity number 1 should be within 1.0 volt of battery voltage with all accessories off. If there is more than 1.0 volt drop, the circuitry outlined must be checked and repaired as necessary. See Figs. 6 and 7.

FIGURE 6



Test No. 1 Circuitry Checked in Primary Test No. 1 (1972-79 Models)

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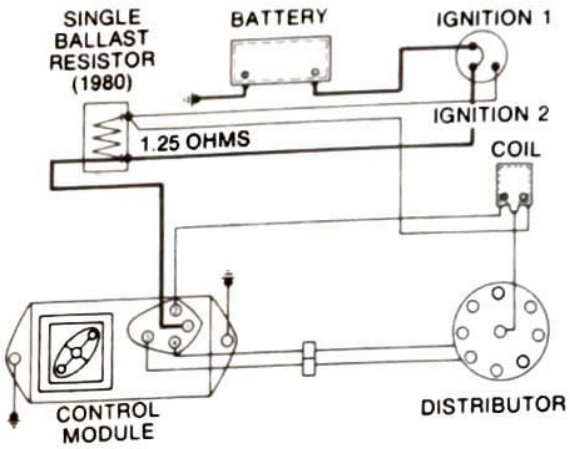
FIGURE 7



Test No. 1 Circuitry Checked in Primary Test No. 1 (1980-82 Models)

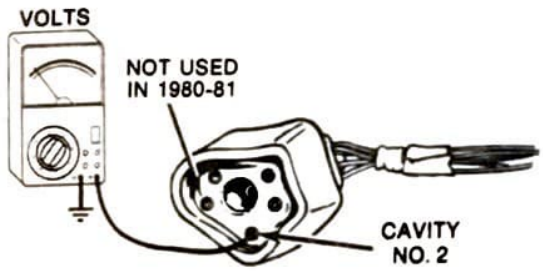
CAUTION

- *A drop in voltage at this point does not imply a loss of voltage due to high resistance connections, but to voltage used to run dash lights and meters when the key is in the "ON" position.*

PRIMARY TEST NO. 2
CAVITY NO. 2 VOLTAGE CHECK

1) Set voltmeter to 0-16V scale. With negative lead connected to ground, touch positive lead of voltmeter to the module harness connector cavity number 2. See Fig. 8.

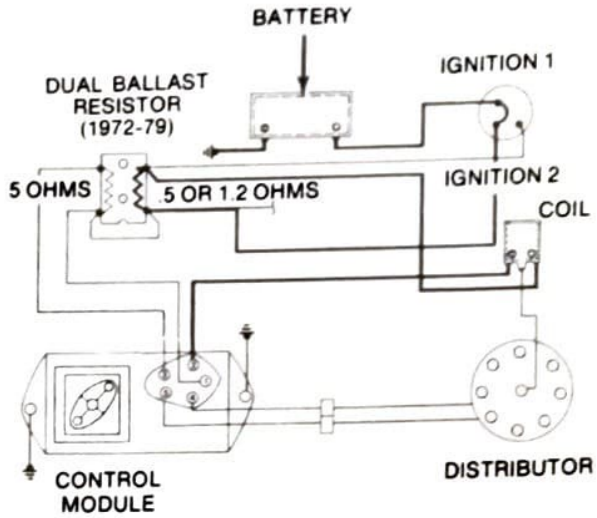
FIGURE 8



Test No. 2 Voltmeter Hookup for Voltage Check of Cavity No. 2

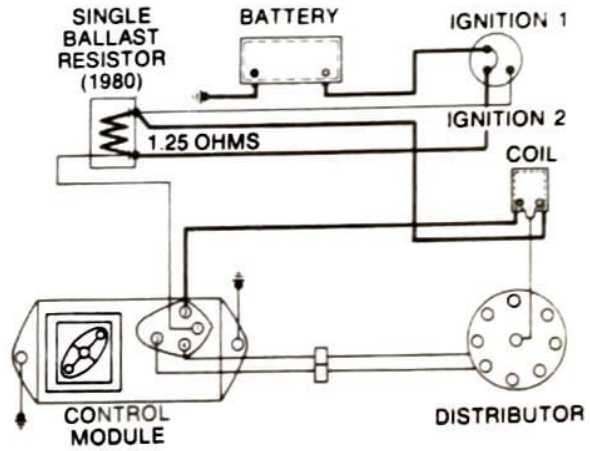
2) Available voltage at cavity number 2 should be within 1.0 volt of battery voltage with all accessories off. If there is more than 1.0 volt drop, the circuitry outlined must be checked and repaired as necessary. See Figs. 9 and 10.

FIGURE 9



Test No. 2 Circuitry Checked In Primary Test No. 2 (1972-79 Models)

FIGURE 10



Test No. 2 Circuitry Checked In Primary Test No. 2 (1980-82 Models)

CAUTION

- *A drop in voltage at this point does not imply a loss of voltage due to high resistance connections, but to voltage used to run dash lights and meters when the key is in the "ON" position.*

3) The components that would cause an ignition failure in checking cavity number 2 are the ignition coil, ballast resistor, ignition switch or the corresponding wires and connections. Check these components before proceeding to other tests.

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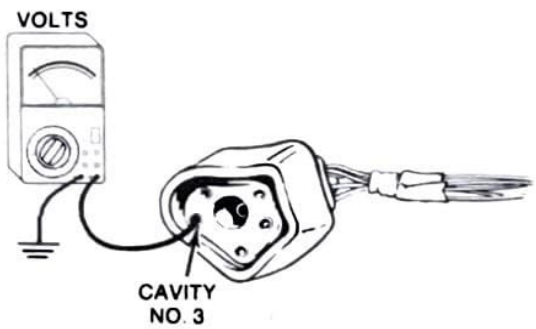
PRIMARY TEST NO. 3
CAVITY NO. 3 VOLTAGE CHECK
(1979 AND EARLIER MODELS ONLY)

1) Make sure the ignition switch is in the "OFF" position. Set a voltmeter to the 0-16V scale. Connect the positive voltmeter lead to the module harness connector cavity number 3. Connect the negative voltmeter lead to ground. See Fig. 11.

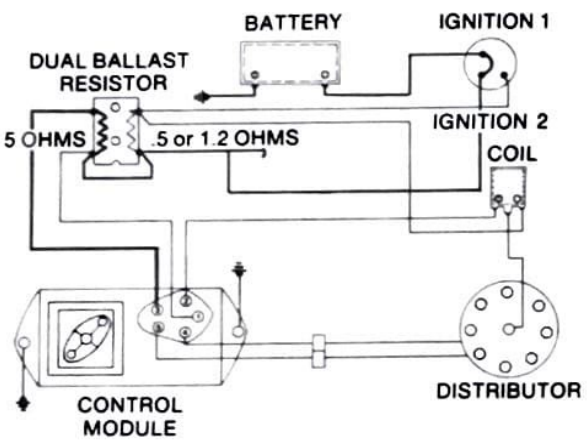
FIGURE 11



Test No. 3 Voltmeter Hookup for Voltage Check of Cavity No. 3 (1979 and Earlier Models Only)

2) Turn ignition switch "ON". Voltage at cavity number 3 should be within 1 volt of battery voltage with all accessories off. If there is more than one volt difference, the circuit outlined must be checked and repaired as necessary. See Fig. 12.

FIGURE 12



Test No. 3 Circuitry Checked in Primary Test No. 3 (1979 and Earlier Models Only)

CAUTION

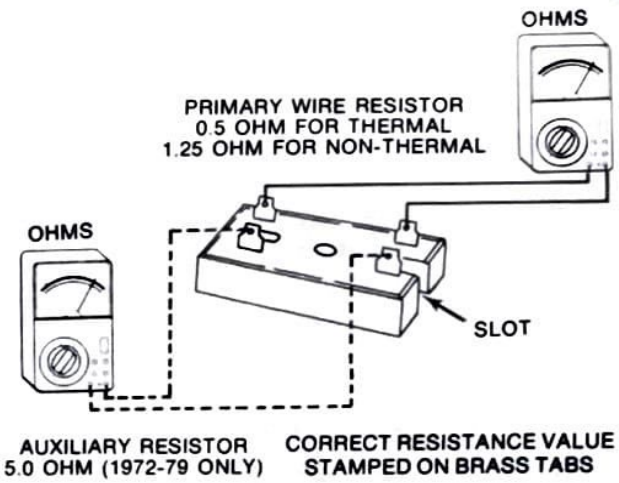
- ***A drop in voltage at this point does not imply a loss of voltage due to high resistance connections, but to voltage used to run dash lights and meters when the key is in the "ON" position.***

PRIMARY TEST NO. 4
BALLAST RESISTOR CHECK

1) To test the ballast resistor, calibrate an ohmmeter to the x1 scale. Make sure the ignition switch is "OFF".

2) Attach ohmmeter leads to two terminals for primary (wire) resistor. Reading should be 0.5 to 0.6 ohms for thermal resistors or 1.25 ohms for non-thermal resistors. See Fig. 13.

FIGURE 13



Test No. 4 Ohmmeter Hookup for Ballast Resistor Check

3) On models with dual ballast resistors, move the ohmmeter leads to terminals for auxiliary resistor. Reading should be between 4.75 and 5.75 ohms. See Fig. 13.

NOTE:

- *To distinguish between thermal and non-thermal resistors, refer to Fig. 14.*

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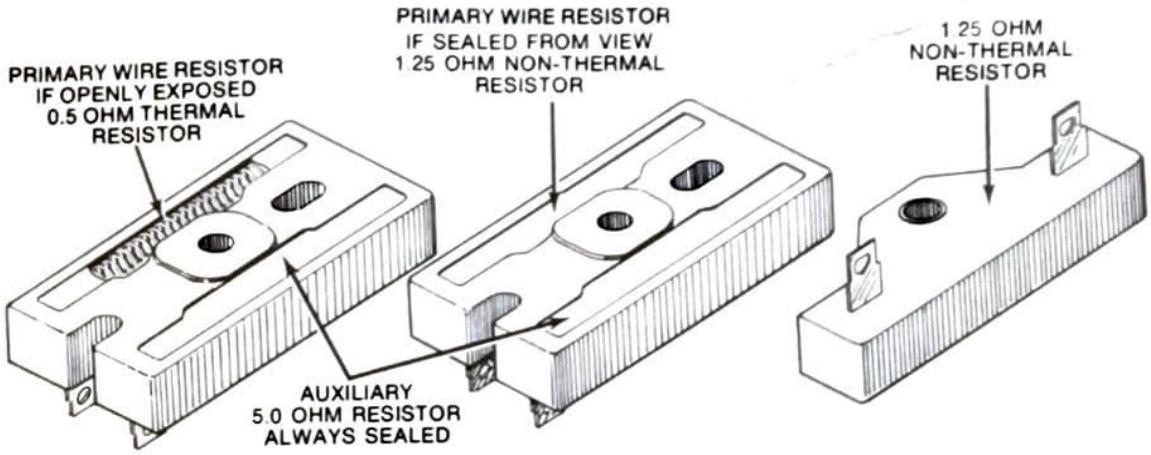
FIGURE 14



DUAL BALLAST RESISTOR (BOTTOM VIEW)

SINGLE BALLAST RESISTOR (TOP VIEW)

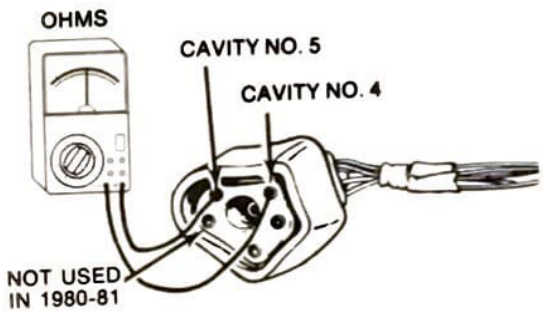
Distinguishing Features of Chrysler Corp. Ballast Resistors.

PRIMARY TEST NO. 5
DISTRIBUTOR PICK-UP COIL CHECK

1) To check the distributor pick-up coil, use an ohmmeter calibrated to the x100 scale. Turn ignition "OFF".

2) Connect the ohmmeter leads to the module harness connector cavities number 4 and 5. Ohmmeter reading should be between 150 and 900 ohms. See Fig. 15.

FIGURE 15



Test No. 5 Ohmmeter Hookup for Distributor Pick-up Coil Resistance Check

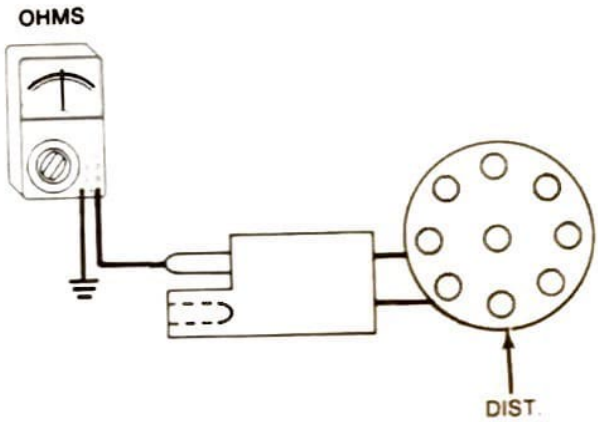
3) On 1981-82 models, proceed to step **9)**. On 1980 and earlier models, manually operate the vacuum advance. If the reading is still correct (150 to 900 ohms), proceed to step **7)**. If reading is not within specifications or if it fluctuates, proceed to the following step.

4) Disconnect the dual lead connector coming from distributor. Connect ohmmeter leads to each terminal of the distributor connector. If ohmmeter reading is now correct, repair wires from the distributor connector to the module harness connector.

5) Manually operate the vacuum advance. If the reading is not within specifications or if it fluctuates, the wire core is fractured and the pick-up coil must be replaced.

6) If the wires from the distributor connector to the module harness connector were not defective, and the engine still will not start, proceed to the following step.

FIGURE 16



Test No. 5 Ohmmeter Hookup for Distributor Harness Short Check

7) Connect one ohmmeter lead to a good ground and the other to either terminal 4 or 5 of module harness connector. Ohmmeter should show an open circuit.

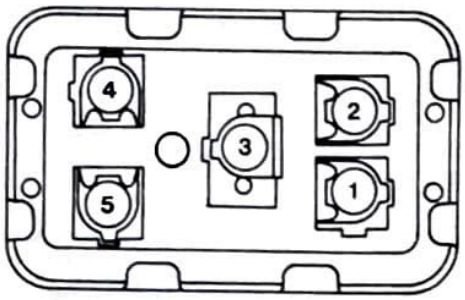
8) If ohmmeter shows continuity, perform the same test at the distributor connector coming from the distributor. See Fig. 16. If the ohmmeter now shows an open circuit, repair wiring harness from the distributor connector to the module harness connector. If the ohmmeter shows continuity at the distributor connector, the pick-up coil is defective and must be replaced.

9) On 1981-82 models, connect ohmmeter leads, in turn at each 2-wire connector leading to the distributor. If readings at the distributor connectors are not correct, replace faulty pick-up coil assembly. If readings at each pick-up coil are correct, but problem exists, dual pick-up start-run relay, wiring harness, or connectors MAY be defective.

10) Turn the ignition switch "OFF". Remove the 2-wire connector from the dual pick-up start-run relay terminals 4 and 5. Using an ohmmeter, connect leads to terminals 4 and 5 of the relay. See Fig. 17. Resistance should be 20 to 30 ohms. If not to specification, replace the relay.

11) Connect one ohmmeter lead to a good ground (distributor housing). See Fig. 16. Connect other lead to either terminal of "START" pick-up coil distributor connector; then to either terminal of "RUN" pick-up coil connector. If ohmmeter shows a reading for either test, replace faulty pick-up coil.

FIGURE 17



Test No. 5 Ohmmeter Hookup for Dual Pick-Up Start-Run Relay Resistance Check

PRIMARY TEST NO. 6
CONTROL MODULE GROUND CHECK

1) To check the ground circuit of the electronic control module, connect one ohmmeter lead to a good ground. Connect the other lead to the control module pin number 5. Note this is not the connector cavity, but on the module pin itself.

2) The ohmmeter should show continuity between ground and the module pin. If continuity does not exist, tighten the bolts holding the control module to the firewall.

3) Recheck for continuity. If the ohmmeter does not show continuity, the control module must be replaced.

4) If all tests are within specifications, and the vehicle does not perform properly or is still inoperative, replace the control module.