DUCELLIER ELECTRONIC IGNITION — PEUGEOT

505

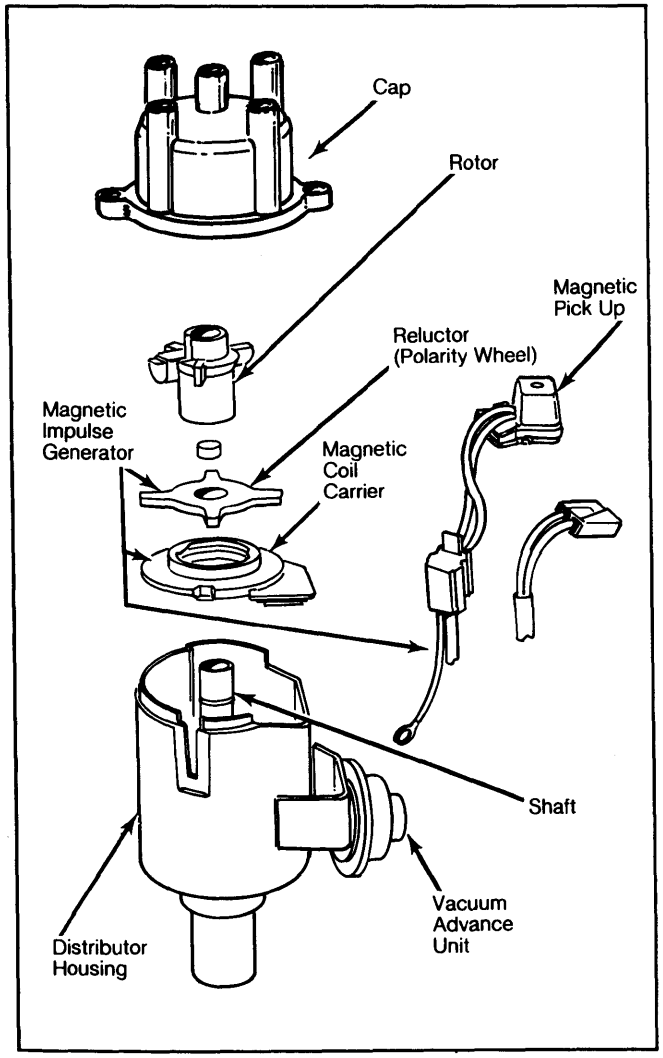
DESCRIPTION

The Ducellier electronic ignition system used by Peugeot consists of a Ducellier breakerless distributor, a Delco-Remy ignition coil and amplifier module, an ignition switch, and necessary wiring.

The distributor contains both centrifugal and vacuum advance mechanisms, a pick-up coil and a reluctor (polarity wheel). *See Fig. 1.* The ignition coil and amplifier module are mounted to a common light alloy base. The base provides both good grounding and cooling of the amplifier module.

Silicone grease, which comes with the module for application between the module and base, gives improved heat transfer. Since both units are grounded through the common base, all mounting bolts should be snug.

Fig. 1: Exploded View of Ducellier Breakerless Distributor



The ignition coil is encased in epoxy resin instead of oil. The amplifier module receives, amplifies and sends electronic signals to provide proper spark timing.

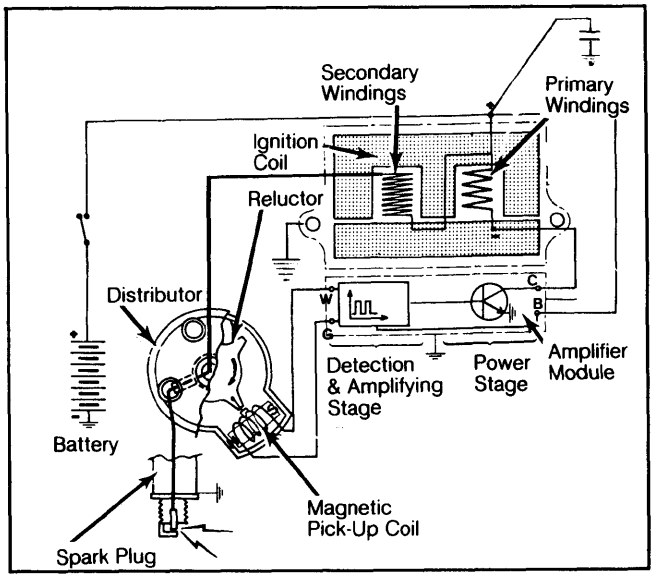
OPERATION

The distributor contains an electronic pulse generator, consisting of a pick-up coil and a reluctor (polarity wheel). As the distributor shaft turns, the reluctor teeth approach and pass the magnetic pick-up coil. *See Fig. 2.*

As the reluctor teeth break the magnetic field around the pick-up coil, it causes signals to be transmitted to the amplifier module. The signals open and close a transistorized switch in the module.

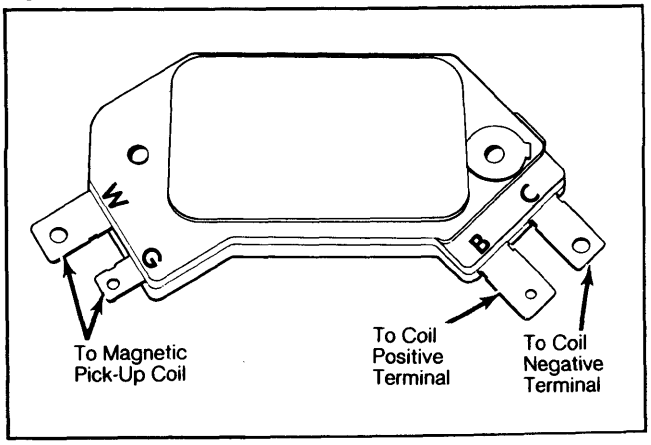
This turns the primary circuit of the ignition coil on and off. When the primary circuit is switched off, a high voltage surge occurs in the secondary circuit, firing the spark plugs.

Fig. 2: Schematic of Ducellier Electronic Ignition System



The amplifier module has 4 terminals. Terminals "W" and "G" are connected to the distributor magnetic pulse generator (pick-up coil). Terminal "B" is connected to the coil positive terminal, and terminal "C" to the coil negative terminal. *See Fig. 3.* The unit is grounded by one of its mounting bolts through the alloy base.

Fig. 3: Amplifier Module Connector Terminals



Module is grounded by mounting bolt through base.

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DUCELLIER ELECTRONIC IGNITION — PEUGEOT (Cont.)

SPECIFICATIONS

CENTRIFUGAL & VACUUM ADVANCE

See the appropriate Distributor Specifications Table in this section.

ADJUSTMENTS

RELUCTOR-TO-PICK-UP COIL AIR GAP

1) Loosen both magnetic pick-up coil mounting screws. *See Fig. 4.* Position reluctor tooth in line with pick-up coil pole piece. Insert a non-magnetic feeler gauge of the proper thickness (.016" or .40 mm) between one reluctor tooth and pole piece.

2) Pivot pick-up coil against feeler gauge, and tighten both screws. Gap should be .012-.020" (.30-.50 mm).

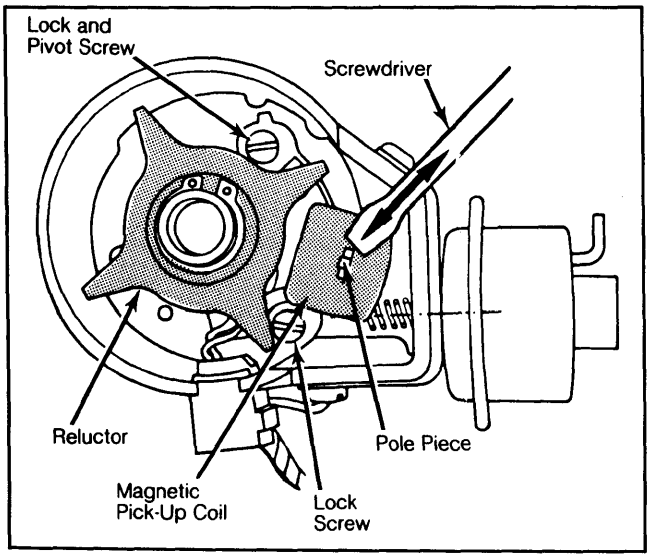
TESTING

NOTE: Before testing components, be sure battery is properly charged, all wires are sound, and connections are secure. Inspect distributor cap and rotor for cracks or carbon tracking. Turn ignition "OFF" when connecting test equipment or when replacing parts.

SPARKING TEST

1) Remove distributor cap, and position reluctor with one tooth on each side of the pick-up coil pole piece. *See Fig. 4.* Remove the high tension lead from the distributor cap, and turn the ignition switch "ON".

Fig. 4: Reluctor Position When Making Sparking Test



Pass screwdriver blade back and forth over pick-up coil pole piece.

2) Hold the high tension lead with a pair of electrician's pliers about 1/4" from a good ground. The ground should be as far from the coil and amplifier assembly as possible.

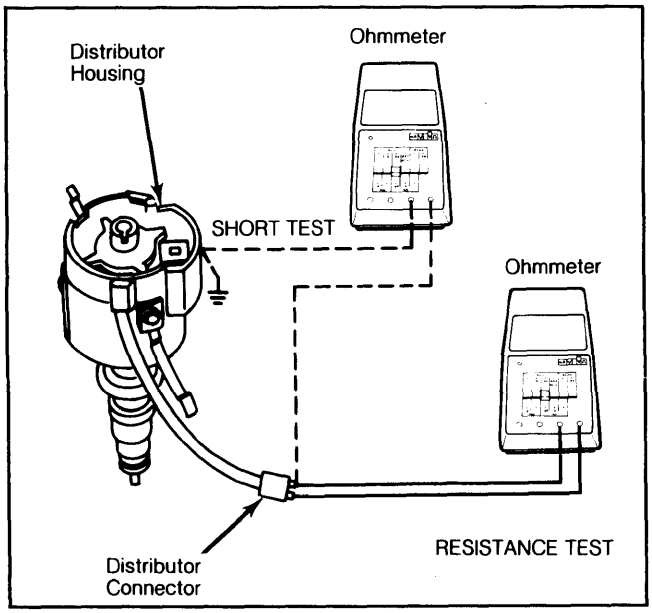
3) Alternately pass the blade of a screwdriver back and forth over the pick-up coil pole piece. A spark should occur at gap each time screwdriver passes pole piece.

4) If no spark occurs, suspect the magnetic pick-up coil, ignition coil or amplifier module. If spark occurs, but engine does not perform properly, check distributor cap, rotor, high tension cables and battery condition.

PICK-UP COIL RESISTANCE TEST

1) Turn ignition switch "OFF". Disconnect connector for terminals "W" and "G" at amplifier module. Using an ohmmeter set in the x100 scale, check the resistance between terminals of harness connector leading to the distributor. *See Fig. 5.*

Fig. 5: Ohmmeter Hookup for Pick-Up Coil Resistance and Short Tests



Set ohmmeter in x100 scale for this test.

2) Reading should be 700-800 ohms. If resistance is not within specifications, replace the magnetic pick-up coil. If resistance is high, check for corroded contacts.

PICK-UP COIL SHORT TEST

Using an ohmmeter, connect leads to engine ground and either terminal of harness connector leading to distributor. An infinity reading should exist. If not, replace magnetic pick-up coil and harness assembly. *See Fig. 5.*

ELECTRICAL CIRCUIT TEST

1) Connect a 12-volt test lamp between the coil positive terminal and ground. Turn ignition switch "ON". Test lamp should light. If not, check feed wire to coil. *See Fig. 6.*

2) Connect test lamp between the coil negative terminal and ground. Turn ignition switch "ON". Test lamp should again light. If not, check if coil primary circuit is broken or if amplifier module's power transistor is shorted.

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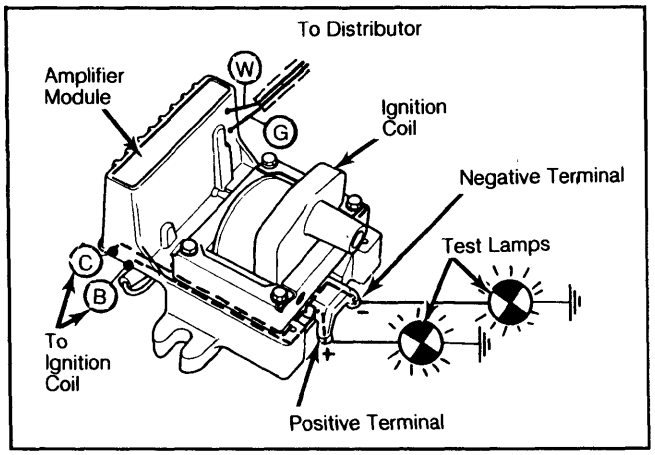
DUCELLIER ELECTRONIC IGNITION — PEUGEOT (Cont.)

Fig. 6: Test Lamp Hookup for Electrical Circuit Test

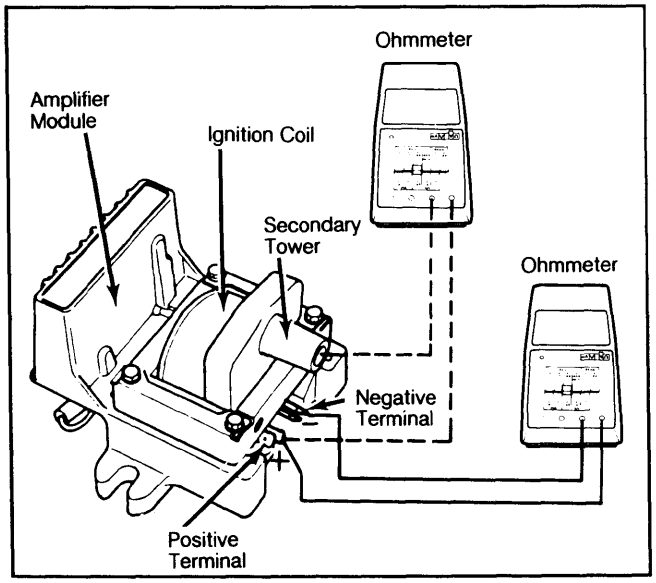


Lamp should light in both tests with ignition "ON".

IGNITION COIL RESISTANCE TEST

1) Using an ohmmeter set in the low scale, connect leads to coil primary (positive and negative) terminals. Resistance should be .48-.61 ohm. *See Fig. 7.*

Fig. 7: Ohmmeter Hookup for Making Ignition Coil Resistance Tests



Be sure ignition is "OFF" and coil wires are disconnected before making this test.

2) Connect ohmmeter set in the x1000 scale to the coil positive terminal and its secondary tower. Reading should be 9,000-11,000 ohms. If either reading is not to specifications, replace ignition coil.

AMPLIFIER MODULE TEST

1) Disconnect distributor harness connector from amplifier module "W" and "G" terminals. Disconnect the high tension lead from distributor cap. Turn ignition switch "ON".

2) Hold high tension lead with a pair of electrician's pliers and position it 1/4" from good engine ground. The ground should be as far from the coil and amplifier module assembly as possible.

3) Use a jumper wire to feed terminal "G" of amplifier module with successive impulses from battery positive terminal. At each impulse, a spark should jump the gap to ground. If not, repeat same test with a new amplifier module. If spark now jumps gap, install new module.

OVERHAUL

DISASSEMBLY

1) Remove distributor cap, rotor, and plastic protector. Remove screw in the side of distributor. Pull upward on electrical connector to remove it from distributor housing. Remove 2 screws securing magnetic pick-up coil. *See Fig. 1.*

2) Lift out pick-up coil assembly. Remove reluctor, vacuum advance unit, magnetic coil carrier. Remove drive pinion from distributor shaft and pull shaft and centrifugal advance mechanism from housing.

REASSEMBLY

To install, reverse removal procedure.

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