

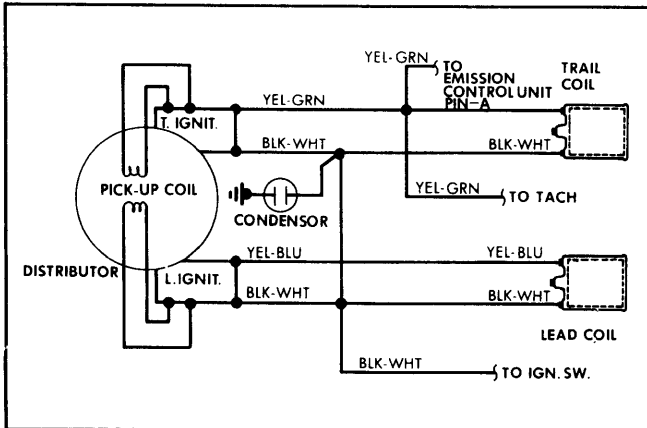
MITSUBISHI ELECTRONIC IGNITION MAZDA ROTARY ENGINE

Mazda RX7

DESCRIPTION

The Mitsubishi electronic ignition system, used on the Mazda RX7 rotary engine, is unique in that it has 2 sets of spark plugs (leading and trailing). There is one set in the front rotor housing and one in the rear rotor housing. See Fig. 1. There are also 2 ignition coils, 2 pick-up coils located in the distributor, and 2 coil-to-distributor high tension wires.

Fig. 1: Schematic of RX7 Ignition System



Also see chassis wiring in WIRING DIAGRAM Section.

There are 2 separate ignitors, mounted externally on the distributor housing. One is for the leading side and the other for the trailing side. Other system components include a battery, ignition switch, ignition control switches, (water temperature, altitude, etc.), and various relays.

All models are equipped with an ignition control system and centrifugal advance mechanisms. All models have vacuum control units for both leading and trailing sides.

OPERATION

A reluctor (signal rotor) is mounted on the reluctor (rotor) shaft. It turns inside 2 magnetic pick-up coils, one for the leading side and one for the trailing side. See Fig. 2.

As each tooth of the reluctor approaches and then passes the leading pick-up coil, a signal is generated. It is sent to the leading ignitor, which breaks the primary circuit in the leading ignition coil.

As each tooth passes the leading pick-up coil, the previous passing tooth approaches and becomes aligned with the trailing pick-up coil. This triggers a signal to the trailing ignitor, which breaks the primary circuit in the trailing ignition coil.

Therefore, immediately after the leading spark plug fires, the trailing spark plug also fires, providing more complete and efficient combustion while reducing HC and CO emissions.

As the primary circuit is broken in the leading and trailing ignition coils, a voltage surge occurs in the

secondary circuit of the ignition coils. This high voltage is transmitted through the leading and trailing high tension wires to the distributor, rotor and spark plugs.

An emission control unit is also included in the ignition control system, along with different sensing switches to provide proper timing under varying engine operating conditions.

SPECIFICATIONS

CENTRIFUGAL & VACUUM ADVANCE (OR RETARD)

See the appropriate Distributor Specifications Table in this section.

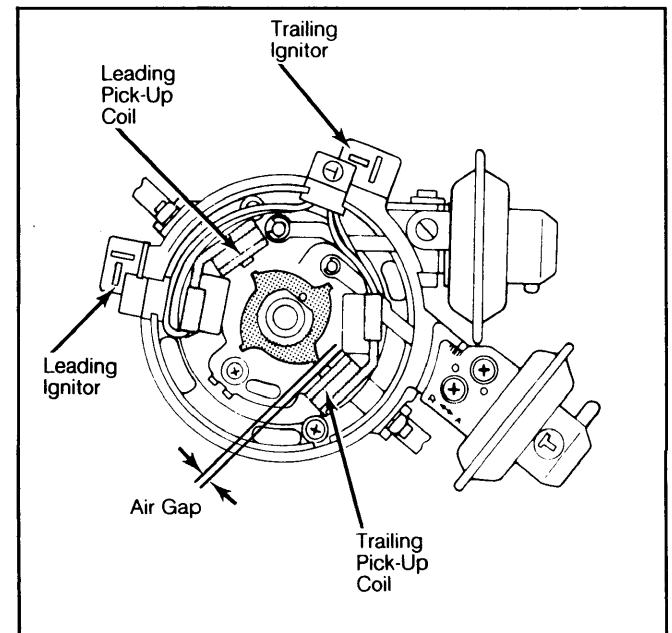
ADJUSTMENTS

RELUCTOR-TO-PICK-UP COIL AIR GAP

1) Remove distributor cap and rotor. Turn distributor shaft until the extended tooth of the reluctor (signal rotor) aligns with core of pick-up coil. See Fig. 2.

2) Using a feeler gauge, check for .020-.035" (.5-.9 mm) air gap. If gap is incorrect, replace pick-up coil and bearing assembly or distributor drive shaft, if necessary.

Fig. 2: Adjusting Distributor Air Gap



Check air gap at all teeth and both pick-up coils.

IGNITION TIMING

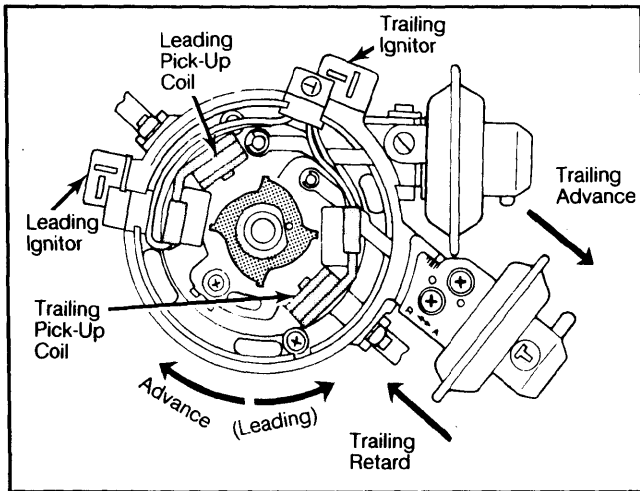
1) To adjust leading timing, loosen distributor lock nut, and rotate distributor housing until correct timing is obtained. See Fig. 3.

2) To adjust trailing timing, loosen the screws securing the trailing vacuum unit. Move the vacuum unit outward (to advance) or inward (to retard). Retighten screws when correct timing is obtained.

Distributors & Ignition Systems

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Fig. 3: Adjusting Ignition Timing



Distributor position determines leading time, while vacuum unit position adjusts trailing timing.

TESTING

HIGH TENSION WIRE RESISTANCE CHECK

Turn ignition switch "OFF". Connect ohmmeter leads to each end of coil-to-distributor high tension wire. Resistance should not exceed 16,000 ohms ($\pm 6,400$ ohms) per 39.37" (1 m).

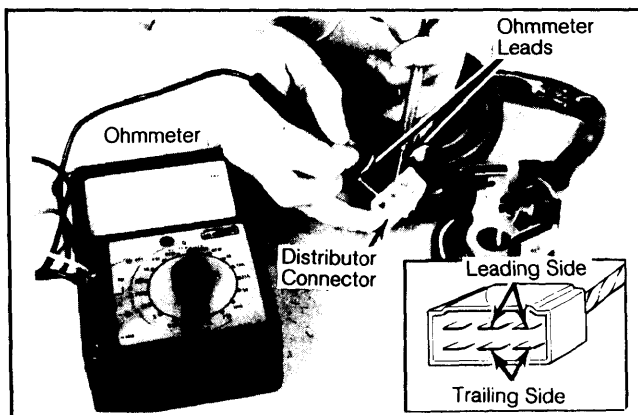
IGNITION COIL RESISTANCE CHECK

Set an ohmmeter in the low scale. With ignition switch turned "OFF", and coil wires disconnected, attach ohmmeter leads to primary terminals of leading coil and then trailing coil. Primary resistance should be 1.22-1.48 ohms for each ignition coil.

PICK-UP COIL RESISTANCE CHECK

1) Set an ohmmeter in the x100 scale. Turn ignition switch "OFF". Disconnect connector between ignitor and distributor. See Fig. 4.

Fig. 4: Ohmmeter Hookup for Pick-Up Coil Resistance Check



Replace pick-up coil and bearing plate assembly if reading is not 600-700 ohms.

2) Connect ohmmeter leads to leading terminals and then to trailing terminals. Resistance should be 600-700 ohms at 68° F (20° C) for each set of pick-up coils. If not, replace pick-up coil and bearing assembly.

PICK-UP COIL OPERATION CHECK

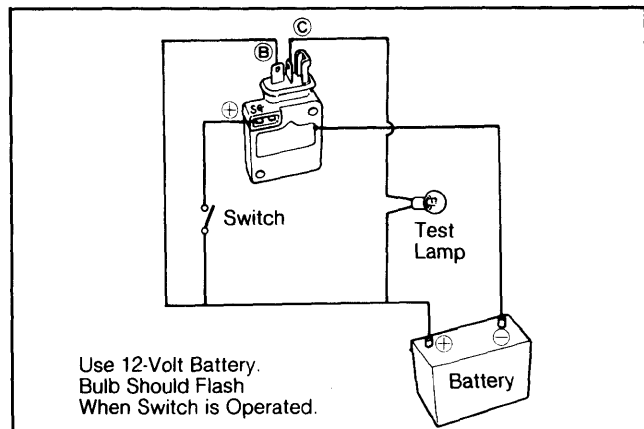
1) With distributor connector still disconnected, touch ammeter leads to leading terminals and then to trailing terminals.

2) Place a screwdriver against core of pick-up coil being tested. Indicator of meter should move each time screwdriver is taken quickly away from core. If not, replace pick-up coil and bearing assembly.

IGNITOR CHECK

1) Remove ignitor from distributor base. Make a circuit as shown in Fig. 5 using wire and a test bulb. Use a 12 volt bulb of less than 10 watts.

Fig. 5: Test Lamp Hookup for Checking Ignitor Operation



Bulbs should flash when switch is operated.

2) Quickly operate switch "ON" and "OFF", and make sure test lamp flashes. If not, replace ignitor.

OVERHAUL

DISASSEMBLY

1) Remove distributor cap, rotor and seal cover. See Fig. 6. Remove ignitors and attaching screws from distributor housing. Remove clips holding vacuum diaphragm links. Remove attaching screws and vacuum control units from distributor housing. Remove condenser.

2) Remove reluctor shaft attaching screw from end of shaft. Remove pick-up coil base bearing attaching screws. Remove reluctor, reluctor shaft, pick-up coils and coil base bearing assembly from top of distributor drive shaft.

3) Remove reluctor from reluctor shaft, using puller. Remove spring pin. Remove governors by removing springs. Drive lock pin out of drive gear, using a small drift. Remove gear and washers. Remove drive shaft through top of distributor housing.

REASSEMBLY

1) Inspect distributor cap and rotor for cracks, carbon tracks, and burned or corroded terminals.

Distributors & Ignition Systems

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2) Assemble distributor in reverse order of disassembly, noting the following: Install reluctor shaft onto distributor drive shaft, engaging slots of reluctor

shaft and governor pins. Install pick-up coil and coil base bearing assembly and tighten attaching screws. Install reluctor on shaft, driving spring pin in with a punch.

Fig. 6: Disassembled View of RX7 Mitsubishi Distributor for Overhaul Purposes

