MAZDA ROTARY ENGINE IGNITION CONTROL SYSTEM

RX-7

DESCRIPTION

The Ignition Control system is used on all models to regulate operation of leading and trailing distributor systems. In addition, this system helps reduce HC and CO emissions by aiding thermal reactor warmup during cold engine starts. System consists of leading and trailing components of distributor, vacuum control valve (Man. Trans. only), relays and connecting wiring and tubing.

OPERATION

The trailing spark cut-out system operates when engine is cold and running between 1150-4600 RPM and when engine is hot and running between 1150-3000 RPM. System is inoperable during deceleration.

TESTING & ADJUSTMENT

NOTE – *For additional information and adjustments on distributor spark timing, see appropriate information in "Mazda Rotary Engines Systems & Tune-Up Service Procedures" article in this section.*

TRAILING IGNITION OPERATION

1) Warm engine to normal operating termperature. Stop engine and connect tachometer and timing light (at trailing spark plug wire on front rotor housing). Disconnect No. 1 water temperature switch coupler and connect jumper wire between both terminals of wiring harness.

2) On Federal models only, disconnect No. 2 water temperature switch coupler (located on top radiator tank) and connect jumper wire between both terminals of wiring harness. On Federal Man. Trans. models only, disconnect altitude compensator switch coupler and connect jumper wire between both terminals of wiring harness.

3) On all models, start engine and set engine speed to 2000 RPM, using choke knob. Slowly increase engine speed, using throttle. Timing light should flash when engine speed exceeds 4200-5000 RPM. Push choke knob back in and note that timing light continues to flash.

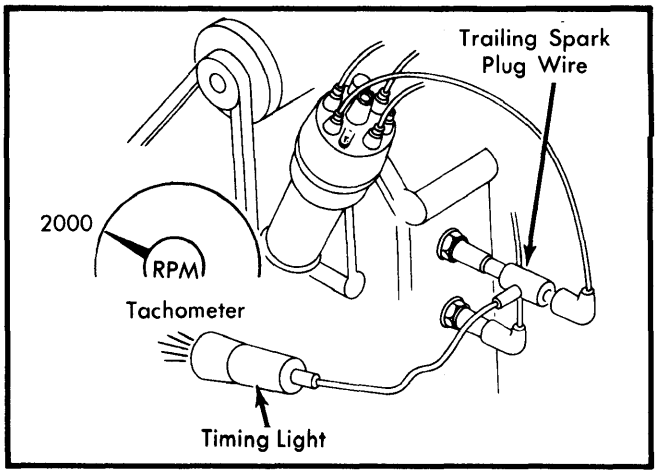

Fig. 1 Testing Trailing Ignition Operation

NOTE – *On Man. Trans. models, timing light flashes at engine speeds of 2700-3300 RPM 1 ½-2 minutes after pushing choke knob back into position. On Auto. Trans. models, timing light flashes at any engine speed 1 ½-2 minutes after pushing choke knob back into position.*

4) On Man. Trans. models only, increase engine speed to 2000 RPM, using throttle. Slowly decrease engine speed and note speed at which timing light starts flashing. It should be 1050-1250 RPM.

5) Again on Man. Trans. models only, slowly increase engine speed and record speed at which timing light stops flashing. This speed should not vary more than 80-220 RPM from speed recorded in step **4)**.

6) Again on Man. Trans. models only, slowly increase engine speed to 2000 RPM, using throttle. Depress clutch pedal and note that timing light flashes when shifting into 4th and/or 5th gear.

7) On all models, set engine speed to 2500 RPM, using throttle. Timing light should flash when idle switch lever is fully pushed up to idle position.

NOTE – *On Federal Auto. Trans. models, timing light flashes when coolant temperature is below 5° F (-15° C). On Federal Man. Trans. models, timing light flashes within 1 ½-2 minutes when coolant temperature is below 5° F (-15° C) when engine speed exceeds 3000 RPM.*

LEADING IGNITION OPERATION

1) Warm engine to normal operating temperature. Stop engine and connect tachometer and timing light (at leading spark plug wire on front rotor housing).

2) On Federal models only, disconnect No. 2 water temperature coupler (located on top radiator tank) and connect jumper wire between both terminals of wiring harness. On Federal Man. Trans. models only, disconnect altitude compensator switch coupler and connect jumper wire between both terminals of wiring harness.

3) On all models, start engine and ensure timing light flashes at any engine speed. Stop engine. Disconnect No. 1 water temperature switch coupler and connect jumper wire between both terminals of wiring harness.

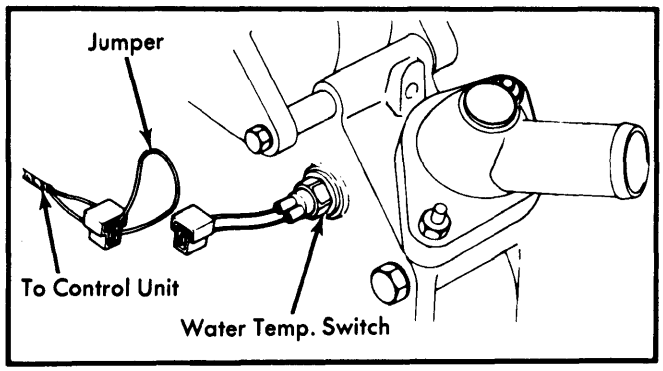

Fig. 2 Detaching No. 1 Water Temperature Switch Wiring and Attaching Jumper to Coupler

MAZDA ROTARY ENGINE IGNITION CONTROL SYSTEM (Cont.)

4) Start engine and set engine speed to 2000 RPM, using choke knob. Observe timing marks on eccentric shaft pulley. Timing indicator should point between leading and trailing ignition timing marks.

5) Increase engine speed with throttle. Check that leading timing mark (yellow) advances and portion "3" aligns with timing indicator when engine speed exceeds 4200-5000 RPM.

6) After 1½-2 minutes after pulling choke knob out, portion "1" should advance quickly and be replaced by portion "3".

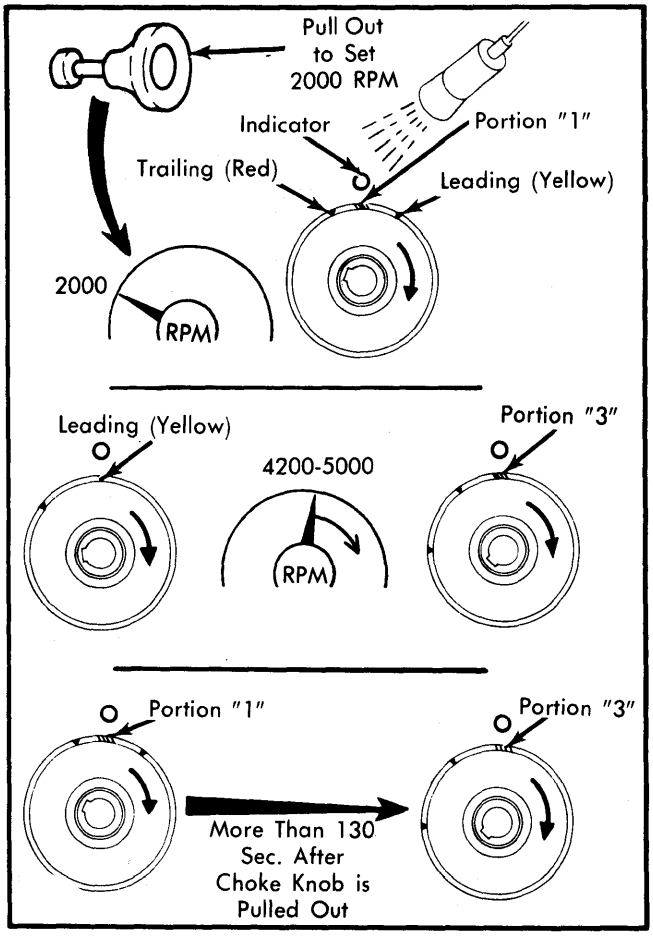

Fig. 3 Testing Leading Ignition Operation

VACUUM CONTROL VALVE (RX-7 MAN. TRANS. MODELS)

1) Disconnect vacuum sensing tubes from vacuum control valve and vacuum pipe. Disconnect electrical coupler from valve.

2) Blow through vacuum sensing tube. Air should pass through valve and come out the side fitting (vacuum pipe).

3) Apply battery power to vacuum control valve at one valve electrical terminal and ground the other. Again, blow through vacuum sensing tube. Air should come out of air filter. If valve does not respond in this manner, replace it.

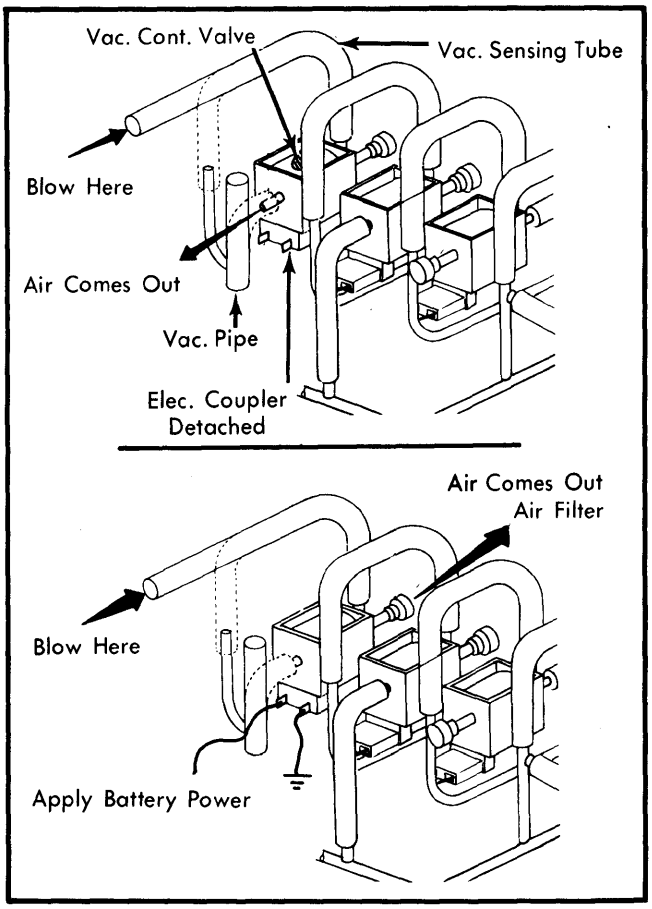

Fig. 4 Testing Vacuum Control Valve (Federal Models Shown)

RELAY TESTING

1) Detach coupler from relay. Using an ohmmeter, and referring to *Fig. 5*, check continuity according to the following:

2) With no power applied, continuity should exist between No. 1 and No. 2. No continuity should exist between No. 3 and No. 4.

3) Now, connect battery power: positive to No. 6 and negative to No. 5. Proceed with check as follows:

4) Continuity should exist between No. 3 and No. 4. No continuity should exist between No. 1 and No. 2.

5) If relay does not respond as described, replace it.

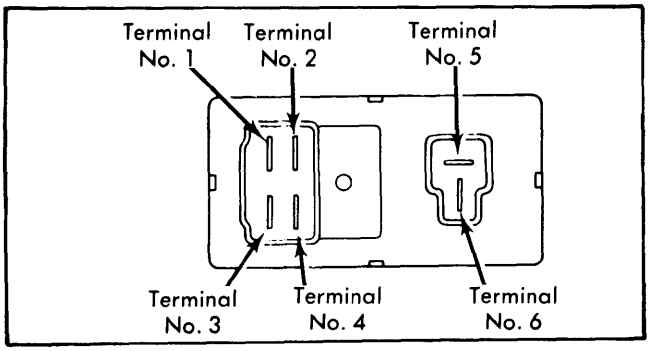

Fig. 5 Showing Relay Numbered Terminals