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A - ENGINE/VIN ID
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:41PM

ARTICLE BEGINNING

1983-88 ENGINE PERFORMANCE
Mazda VIN Code Identification

RX7

MODEL IDENTIFICATION

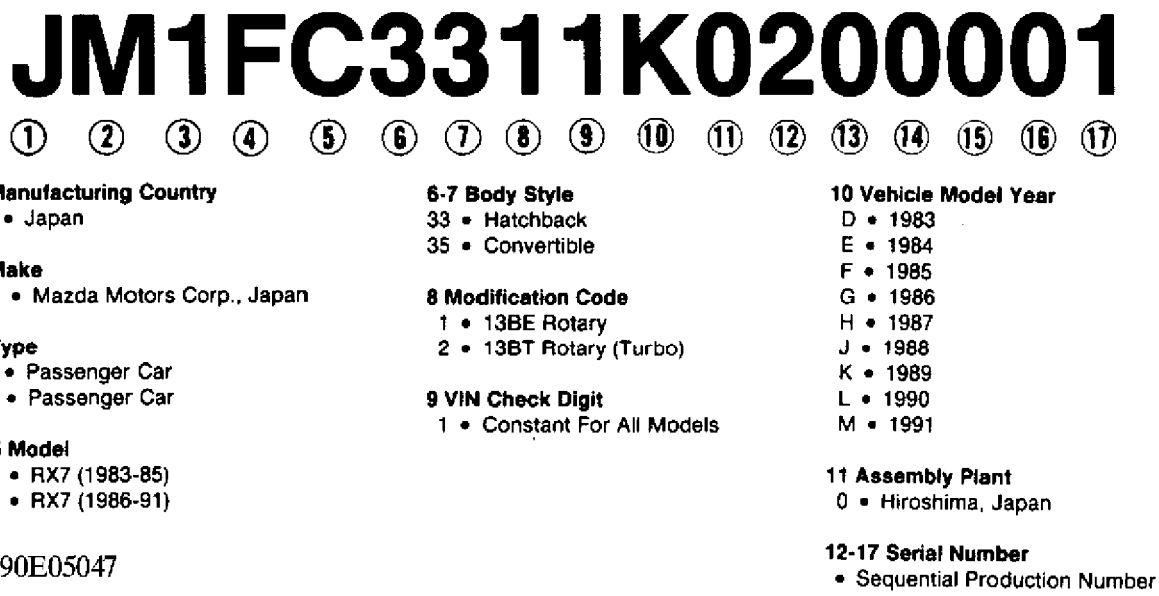


Fig. 1: VIN Code Identification

VIN CODE ID EXPLANATION

Numbers preceding the explanations in the legend below refer to the sequence of characters as listed on VIN identification label in Fig. 1. The legend listed below will also be found in Fig. 1.

1 Manufacturing Country
J * Japan

2 Make
M * Mazda Motors Corp., Japan

3 Type
1 * Passenger Car
V * Passenger Car

4-5 Model
FB * RX7 1983-85
FB * RX7 1986-88

6-7 Body Style
33 * HB RX7
35 * Convertible

8 Modification Code
1 * Not Specified By Manufacturer

9 VIN Check Digit

```
  1  *  Constant For All Models

10 Vehicle Model Year
  D  *  1983
  E  *  1984
  F  *  1985
  G  *  1986
  H  *  1987
  J  *  1988

11 Assembly Plant
  0  *  Hiroshima, Japan

12-17 Serial Number
  *  Sequential Production Number
```

END OF ARTICLE

AIR INJECTION SYSTEM - CARBURETED
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:42PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
CARBURETED MODELS
AIR INJECTION SYSTEM

DESCRIPTION

This system controls CO, HC and NOx emissions by injecting secondary air into the exhaust system to cause further burning of exhaust gases. System consists of an air pump, 2 check valves, an air control valve, relief solenoid valve, switching solenoid valve, heat hazard sensor and catalytic converters.

Air is drawn from the clean side of the air cleaner by the air pump and directed to the air control valve under pressure. From the air control valve, secondary air is directed (by the switching solenoid valve) "downstream" to the pellet converter or "upstream" to the exhaust port.

The secondary air system contains 2 check valves to prevent exhaust gas from leaking back into the air pump. The switching solenoid valve directs secondary air through the air control valve "downstream" and/or "upstream", based upon engine temperature, manifold vacuum and engine speed.

The relief solenoid valve controls the amount of air injected according to intake manifold vacuum. Under normal operating conditions, part of the secondary air supplied by the air pump is directed back to the air cleaner. The heat hazard sensor lights an exhaust temperature warning light on the instrument panel if exhaust temperatures become excessive.

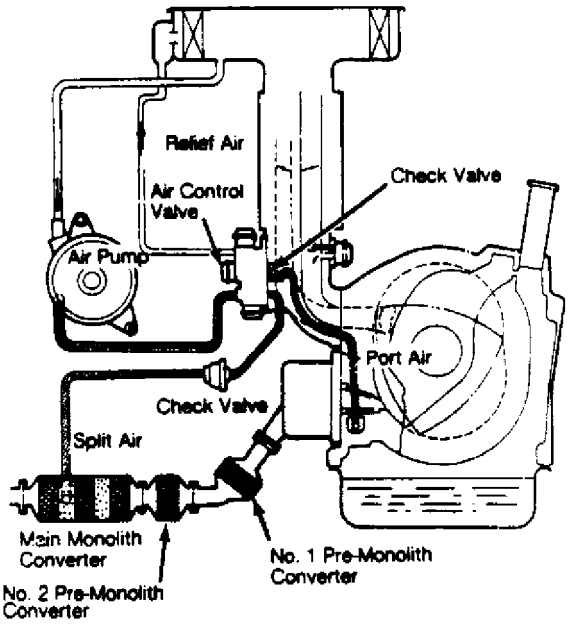


Fig. 1: Mazda RX7 Air Injection System

TESTING

AIR PUMP

1) With engine at normal operating temperature, inspect all hose connections for leaks. Check for pump noise and belt tension.

2) Stop engine and disconnect air line at air control valve. Connect hose to a pressure gauge. Connect tachometer to engine.

3) Start engine and run at idle speed. Gauge should register more than 1.64 psi (.12 kg/cm^2) with engine at 800 RPM. If pump pressure is below specification, replace air pump.

CHECK VALVES

Intake Manifold Valve

Disconnect the air hose at the air control valve. Connect a tachometer to the engine. Start the engine. Disconnect the connector from air switching solenoid valve. Increase engine speed to 1500 RPM. Watch for exhaust leak. If leak exists, replace check valve.

Conveter Air Line Valve

Disconnect the air hose at the rear side of the intake manifold. Connect a tachometer to the engine. Start the engine. Increase engine speed to 1500 RPM. Watch for exhaust leak at air pipe opening. If leak exists, replace check valve.

AIR CONTROL VALVE

1) After ensuring air pump and all hoses are correct, check carburetor and air control valve attaching nuts for tightness. Warm engine to normal operating temperature. Stop engine and connect a tachometer.

2) Disconnect air cleaner-to-air control valve hose at air cleaner. Place a finger over the hose opening. Increase the engine speed and make sure that air flows out when the engine speed is 1500-2500 RPM or higher.

3) Run the engine at idling speed. Disconnect the vacuum sensing tube (from relief solenoid valve to pipe) at the pipe. Air should flow out from the air hose. Reconnect the vacuum sensing tube and the air hose.

4) Disconnect the split air hose (from check valve to intake manifold) at the intake manifold. Place a finger over the port opening. Disconnect the vacuum sensing tube (from switching solenoid to pipe) at the pipe.

5) Air should flow out from the port. Reconnect the vacuum sensing tube and split air hose. If air control valve does not respond as described, replace air control valve.

RELIEF SOLENOID VALVE

1) Disconnect vacuum sensing tubes from relief solenoid valve and vacuum pipe. Blow through solenoid valve from vacuum sensing tube "B" in Fig. 2. Air should pass through valve and escape from port "C".

2) Disconnect electrical connector from relief solenoid valve and connect battery power to solenoid terminals. Blow through valve from the vacuum sensing tube "B". Air should pass through valve and escape through port "A" of the valve. If valve does not respond as described, replace valve.

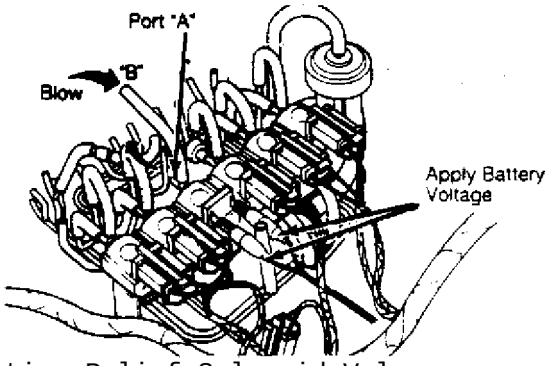


Fig. 2: Testing Relief Solenoid Valve

RELIEF SOLENOID VALVE SIGNAL CHECK

1) Warm engine to normal operating temperature. Connect tachometer to engine. Disconnect connector from throttle sensor and connect a jumper wire between terminals "A" and "C" of connector. See Fig. 3.

2) Disconnect the vacuum sensing tube (from relief solenoid valve to pipe) at the pipe. Place a finger over the vacuum sensing tube opening. Start engine. Air should be sucked into the tube.

3) Increase engine speed. Air should not be sucked into the tube when engine speed is 3600-4400 RPM or higher. Disconnect the connector from the catalyst thermosensor. Gradually increase the engine speed and make sure that air is not sucked into the tube when the engine speed is 1000-2000 RPM or higher.

4) Reconnect the connector to the catalyst thermosensor. Disconnect the jumper wire and connect the connector to the throttle sensor. Disconnect the sensor from the heat hazard sensor and connect a jumper wire to both terminals of the connector. Make sure that air is not sucked into the tube at any engine speed.

5) Disconnect the jumper wire and connect the connector to the heat hazard sensor. Stop the engine and disconnect the connector from the number 2 water temperature switch on the radiator. Disconnect the connector from the number 1 water temperature switch.

6) Connect a jumper wire to both terminals of the connector. Pull the choke knob out about .6" (15 mm). Start the engine. Gradually increase the engine speed and make sure that air is not sucked into the tube when the engine speed is 1000-2000 RPM or more.

7) Connect the vacuum sensing tube to the pipe. Stop the engine and connect the jumper wire. Connect connector to the number 1 water temperature switch.

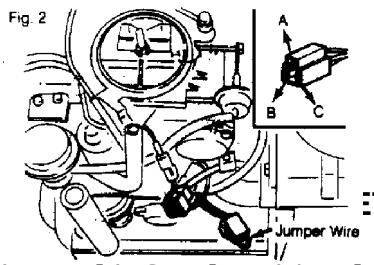


Fig. 3: Testing Relief Solenoid Valve Signal

SWITCHING SOLENOID VALVE

1) Disconnect vacuum sensing tubes from switching solenoid

valve and vacuum pipe. Blow through switching valve from vacuum sensing tube "B". See Fig. 2. Air should pass through valve and escape from port "C".

2) Disconnect electrical connector from switching solenoid valve and connect battery power to terminals on valve. Blow through hose again. Air should pass through valve and escape through port "A" of the valve. If valve does not respond as described, replace switching solenoid valve.

SWITCHING SOLENOID VALVE SIGNAL CHECK

1) Warm engine to normal operating temperature. Connect tachometer to engine. Disconnect the connector from the throttle sensor and connect a jumper wire to terminals "A" and "C" of the connector. Disconnect the vacuum sensing tube (from switching solenoid valve to pipe) at the pipe. See Fig. 3.

2) Place a finger over the vacuum sensing tube opening and make sure air is sucked into the tube. Gradually increase the engine speed and make sure that air is not sucked into the tube when engine RPM is 1000-2000 RPM or more.

3) Disconnect the connector from the number 1 water temperature switch and connect a jumper wire to both terminals of the connector. Pull the choke knob out about .6" (15 mm). Increase the engine speed and make sure that air is sucked into the tube at any engine speed.

4) Disconnect the jumper wire from water temperature switch connector and reconnect the connector to water temperature switch. Disconnect the jumper wire from terminals "A" and "C" and connect the connector to the throttle sensor.

5) Gradually increase the engine speed and make sure air is sucked into tube at any engine speed. Air should not be sucked into the tube if the engine is accelerated quickly. Reconnect the vacuum sensing tube to pipe.

WATER TEMPERATURE SWITCHES

1) Remove number 1 switch from water pump. Remove number 2 switch from radiator lower tank. Place switch in water with a thermometer and heat water gradually. On the number 1 switch, check the temperature at which continuity does not exist between both terminals in the connector.

2) On the number 1 switch, check the temperature at which continuity exits between both terminals in the connector. For the number 1 switch, there should be no continuity at temperatures above 146-169°F (63.5-76.5°C). For the number 2 switch, continuity should exist temperatures above 52-66°F (12-18°C).

CHOKE SWITCH & MAGNET

Disconnect the connector from the choke switch. Check the continuity between the numbered terminals in the connector using an ohmmeter. With choke knob pulled out .3-.5" (8-12 mm), there should be continuity between terminals 3 and 7 if switch is okay. With knob in any position, there should be continuity between terminals 6 and 8 if choke magnet is okay.

diaphragm shaft. Before installing air horn, make necessary float adjustments.

ADJUSTMENT SPECIFICATIONS

CARBURETOR ADJUSTMENT SPECIFICATIONS

Application	Specification
RX7	
Float Level In. (mm)	.61-.65 (15.5-16.5)
Float Drop In. (mm)	1.98-2.02 (50.5-51.5)
Choke Linkage In. (mm)	.040-.047 (1.0-1.2)
Accel. Cable Free Play In. (mm)	.04-.12 (1.0-3.0)
Choke Valve Opening In. (mm)	.22-.24 (5.6-6.2)

END OF ARTICLE

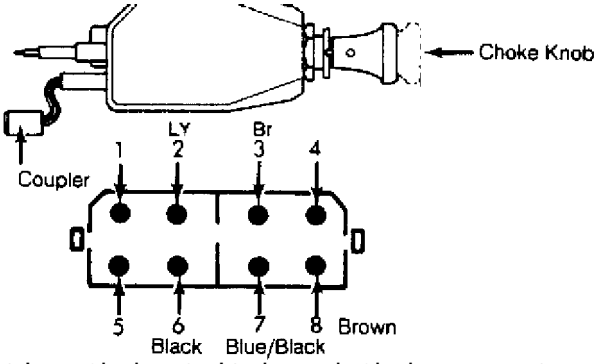


Fig. 4: Testing Choke Switch and Choke Magnet

CHOKE RELAY

Disconnect the connector from the relay. Check the continuity between the numbered terminals using an ohmmeter. With battery voltage applied between terminals 6 (positive) and 5 (negative), there should be continuity between 3 and 4 and no continuity between 1 and 2. With no power applied, there should be continuity between 1 and 2 and no continuity between 3 and 4.

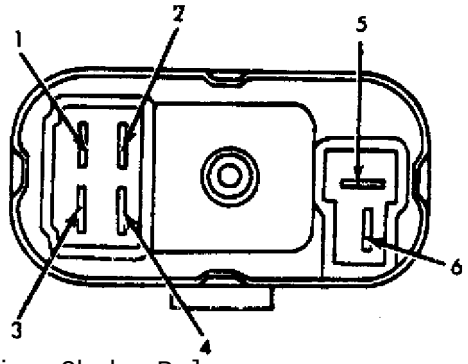


Fig. 5: Checking Choke Relay

HEAT HAZARD SENSOR

1) Turn ignition on; "Overheat Exh. System" warning light should glow. Start engine and warning light should go out. Remove passenger seat, fold back carpeting and disconnect heat hazard sensor connector.

2) Warning light should glow when jumper wire is connected to both terminals of the connector. If warning light does not respond as outlined, remove and test sensor. Wrap sensor and a thermometer in aluminum foil (electrical connector must be exposed for access).

3) Place sensor and thermometer (wrapped in aluminum foil) in container filled with oil. Place a second thermometer in container of oil. See Fig. 6.

4) Connect a battery and test lamp to sensor connector. Test lamp should glow. Gradually heat oil. Test lamp should go OFF when temperature inside aluminum foil is 248-284°F (120-140°C). If sensor does not respond as outlined, replace heat hazard sensor.

NOTE: Do not heat oil above 302°F (150°C).

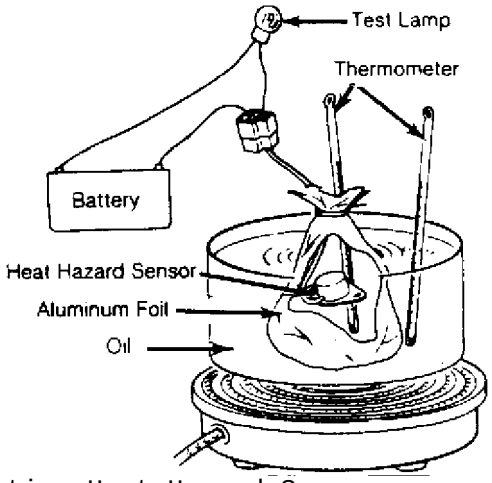


Fig. 6: Testing Heat Hazard Sensor

PORT AIR SOLENOID VALVE

1) Warm up engine and run at idle speed. Connect a tachometer to engine. Disconnect the connector from the throttle sensor and connect a jumper wire to "A" and "C" terminals of the connector. See Fig. 3. Connect a voltmeter to the port air solenoid terminal and ground.

2) Increase engine speed and watch voltmeter. With engine speed below 3000 RPM, voltage should be below 2 volts. With engine speed between 3000-4000 RPM, voltage should be about 12 volts. At above 4000 RPM, voltage should be below 2 volts.

3) Disconnect the jumper wire from "A" and "C". Position the vehicle securely on a rolling load tester. Increase the vehicle speed to to 50 MPH. At speeds below 50 MPH, reading should be below 2 volts. At speed above 50 MPH, voltage should be approximately 2 volts.

CATALYST THERMO SENSOR

Disconnect the connector for the catalyst thermo sensor and check for continuity. Sensor is no good if there is no continuity.

END OF ARTICLE

AIR INJECTION SYSTEM - EFI
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:42PM

ARTICLE BEGINNING

1984 EXHAUST EMISSION SYSTEM
Mazda Air Management Systems - Fuel Injected Models

RX7

DESCRIPTION

The air management system consists of the following sub-systems: Air Injection, Secondary Air Control, Air Induction and By-Pass Air Control. The air injection system controls CO, HC and NOx emissions by injecting secondary air into the exhaust system to cause further burning of exhaust gases. System consists of an air pump, 2 check valves, an air control valve, relief solenoid valve, switching solenoid valve, heat hazard sensor and catalytic converters.

Air is drawn from the clean side of the air cleaner by the air pump and directed to the air control valve under pressure. From the air control valve, secondary air is directed (by the switching solenoid valve) "downstream" to the pellet converter or "upstream" to the exhaust port.

The air induction system brings air into the engine for combustion functions. The system consists of : Air Cleaner, Air Flow Meter, Air Funnel, Throttle Chamber, Dynamic Chamber and Intake Manifold.

The secondary air control system contains 2 check valves to prevent exhaust gas from leaking back into the air pump. The switching solenoid valve directs secondary air through the air control valve "downstream" and/or "upstream", based upon engine temperature, manifold vacuum and engine speed.

The By-Pass Air Control System (BAC) controls the amount of by-pass air to maintain idling speed. System is controlled by a vent solenoid valve and vacuum solenoid valve.

COMPONENT OPERATION

CONTROL VALVES

Air Control Valve
Directs air to 1 of 3 locations; exhaust port, 3-way catalyst or back to the relief silencer. Consists of air relief valve, air switching valve and anti-afterburn valve.

Air Supply Valve
Supplies by-pass air into dynamic chamber during A/C and power steering operation.

By-Pass Air Control Valve
Controls amount of by-pass air to maintain idling speed. Controlled by vent solenoid valve and vacuum solenoid valve.

Check & Cut Valve
Releases excessive pressure or vacuum in fuel tank to atmosphere. Prevents fuel loss if vehicle overturns.

Relief Solenoid Valve
Relieves secondary air to air cleaner when unnecessary.

Split Air Solenoid Valve
Controls amount of split air. The valve increases split air

when the overdrive switch is open.

Switching Solenoid Valve
Switches secondary air to exhaust port or rear catalyst.

Vacuum Control Solenoid Valve
Cuts out vacuum to distributor during deceleration.

SENSORS

Heat Hazard Sensor
Detects floor temperature and sends signal to relief solenoid valve control unit.

Intake Air Temperature Sensor
Detects intake air temperature and controls pressure control valve and BAC valve through control unit.

Water Thermo Sensor
Detects engine coolant temperature and sends signal to control unit.

SWITCHES

Clutch and Neutral Switches
Detects in-gear condition and sends signal to control unit. Clutch switch closes when clutch pedal is depressed and opens when pedal is released. Neutral switch closes when transmission is in neutral and opens when transmission is in gear.

Overdrive Switch
Controls ACV solenoid, when transmission is in 5th gear the over drive switch is open. All other gears the overdrive switch is closed.

Vacuum Switch
Detects intake manifold vacuum and sends signal to control unit. The vacuum switch opens when theres approx. 15 in. Hg of vacuum.

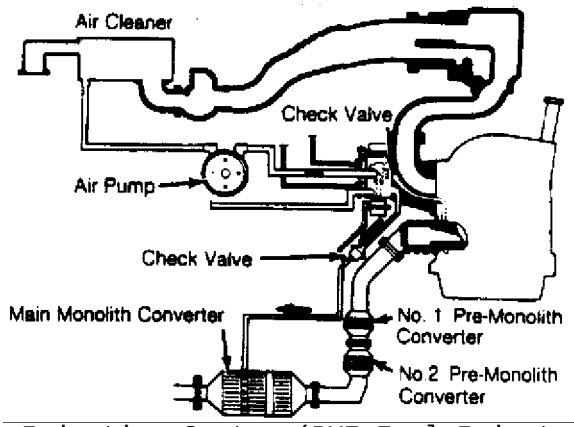


Fig. 1: Air Injection System (RX7 Fuel Injected Models)

TESTING

AIR INJECTION & SECONDARY AIR CONTROL

Air Pump

1) With engine at normal operating temperature, inspect all hose connections for leaks. Check for pump noise and belt tension.

2) Stop engine and disconnect air line at air control valve. Connect hose to a pressure gauge. Connect tachometer to engine. See Fig. 2.

3) Start engine and run at idle speed. Gauge should register more than 1.64 psi (.12 kg/cm^2) with engine at 800 RPM. If pump pressure is below specification, replace air pump.

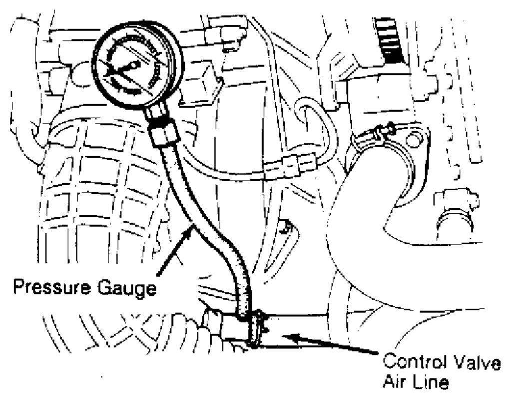


Fig. 2: Connecting Pressure Gauge to Air Pump

Intake Manifold Check Valve

Disconnect the air hose at the air control valve. Connect a tachometer to the engine. Start the engine. Disconnect the connector from air switching solenoid valve. Increase engine speed to 1500 RPM. Watch for exhaust leak. If leak exists, replace check valve.

Converter Air Line Check Valve

Disconnect the air hose at the rear side of the intake manifold. Connect a tachometer to the engine. Start the engine. Increase engine speed to 1500 RPM. Watch for exhaust leak at air pipe opening. If leak exists, replace check valve.

Air Control Valve

1) After ensuring air pump and all hoses are correct, check carburetor and air control valve attaching nuts for tightness. Warm engine to normal operating temperature. Stop engine and connect a tachometer.

2) Disconnect air cleaner-to-air control valve hose at air cleaner. Place a finger over the hose opening. Increase the engine speed and make sure that air flows out when the engine speed is 1500-2500 RPM or higher. See Fig. 3.

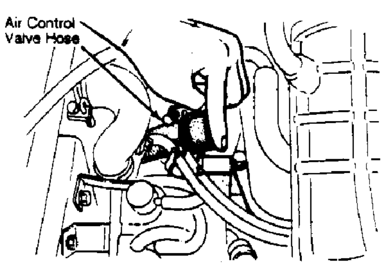


Fig. 3: Checking Air Control Valve

3) Run the engine at idling speed. Disconnect the vacuum sensing tube (from relief solenoid valve to triple) at the triple. Air

should flow out from the air hose. Reconnect the vacuum sensing tube and the air hose.

4) Disconnect the split air hose (from check valve to intake manifold) at the intake manifold. Place a finger over the port opening. Disconnect the vacuum sensing tube (from switching solenoid to pipe) at the pipe.

5) Air should flow out from the port. Reconnect the vacuum sensing tube and split air hose. If air control valve does not respond as described, replace air control valve.

Relief Solenoid Valve

1) Disconnect vacuum sensing tubes from relief solenoid valve and vacuum pipe. Blow through solenoid valve from vacuum sensing tube "B", air should pass through valve and escape from port "C".

2) Disconnect electrical connector from relief solenoid valve and connect battery power to solenoid terminals. Blow through valve from the vacuum sensing tube "B". Air should pass through valve and escape through port "A" of the valve. If valve does not respond as described, replace valve. See Fig. 4.

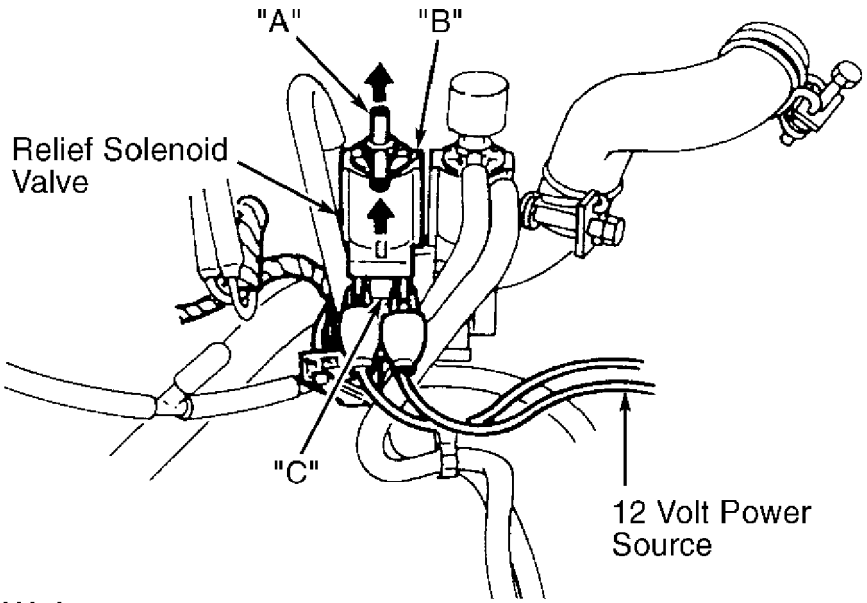


Fig. 4: Testing Relief Solenoid Valve

Switching Solenoid Valve

1) Disconnect vacuum sensing tubes from switching solenoid valve and vacuum pipe. Blow through switching valve from vacuum sensing tube "B". Air should pass through valve and escape from port "C".

2) Disconnect electrical connector from switching solenoid valve and connect battery power to terminals on valve. Blow through hose "B" again. Air should pass through valve and escape through port "A" of the valve. If valve does not respond as described, replace switching solenoid valve.

Switching Solenoid Valve Signal Check

1) Warm engine to normal operating temperature. Connect tachometer to engine. Disconnect the connector from the throttle sensor and connect a jumper wire to terminals of the connector. Disconnect the vacuum sensing tube (from switching solenoid valve to pipe) at the pipe.

2) Place a finger over the vacuum sensing tube opening and

make sure air is sucked into the tube. Gradually increase the engine speed and make sure that air is not sucked into the tube when engine RPM is 1000-2000 RPM or more.

3) Disconnect the connector from the number 1 water temperature switch and connect a jumper wire to both terminals of the connector. Pull the choke knob out about .6" (15 mm). Increase the engine speed and make sure that air is sucked into the tube at any engine speed.

4) Disconnect the jumper wire from water temperature switch connector and reconnect the connector to water temperature switch. Disconnect the jumper wire from terminals and connect the connector to the throttle sensor.

5) Gradually increase the engine speed and make sure air is sucked into tube at any engine speed. Air should not be sucked into the tube if the engine is accelerated quickly. Reconnect the vacuum sensing tube to pipe.

Water Temperature Switches

1) Remove number 1 switch from water pump. Remove number 2 switch from radiator lower tank. Place switch in water with a thermometer and heat water gradually. On the number 1 switch, check the temperature at which continuity does not exist between both terminals in the connector.

2) On the number 1 switch, check the temperature at which continuity exits between both terminals in the connector. For the number 1 switch, there should be no continuity at temperatures above 146-169°F (63.5-76.5°C). For the number 2 switch, continuity should exist temperatures above 52-66°F (12-18°C).

BY-PASS AIR CONTROL SYSTEM

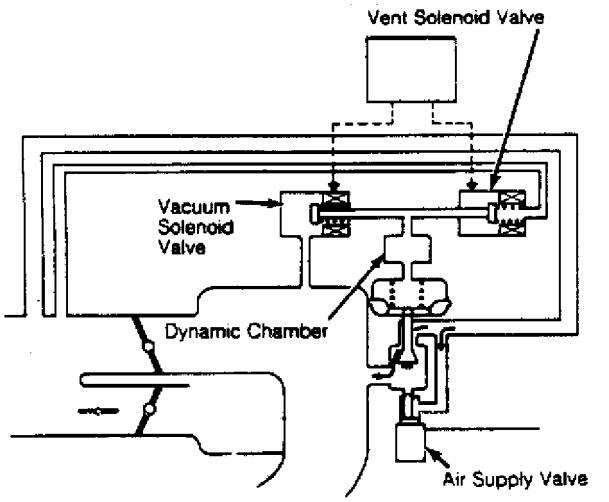


Fig. 5: By-Pass Air Control System Diagram

BY-PASS AIR CONTROL SYSTEM

By-Pass Air Control System Check

1) Warm up engine and run at idling speed. Turn headlight switch on an disconnect vent and vacuum solenoid valve connector.

2) Connect vent and vacuum solenoid valve connector and make sure that engine speed increases to 800 RPM. If RPM does not increase, perform component test.

Vent Solenoid Valve

1) Disconnect intake tube from vent solenoid and remove connector. Blow through vent solenoid valve from intake tube and make sure that air does not pass.

2) Apply power to vent solenoid terminals. See Fig. 6. Blow through vent solenoid valve from intake tube and make sure that air passes. If vent solenoid does not pass air, replace unit.

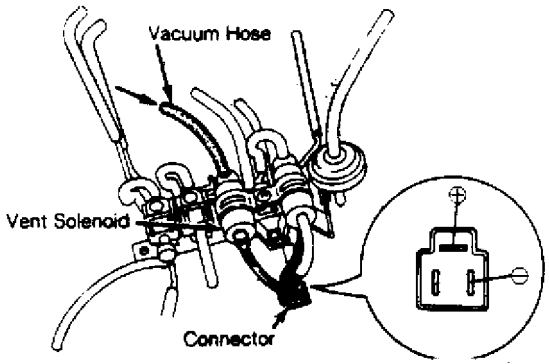


Fig. 6: Vent Solenoid Valve

Vacuum Solenoid Valve

1) Disconnect vacuum hose from solenoid valve. Remove vacuum solenoid valve connector. Blow through vacuum solenoid valve from connecting tube side and make sure that air passes through solenoid valve. See Fig. 7.

2) Apply electrical power to vacuum solenoid connector. Blow through vent solenoid valve from vacuum supply side and make sure that air does not pass. If air passes through valve, replace unit.

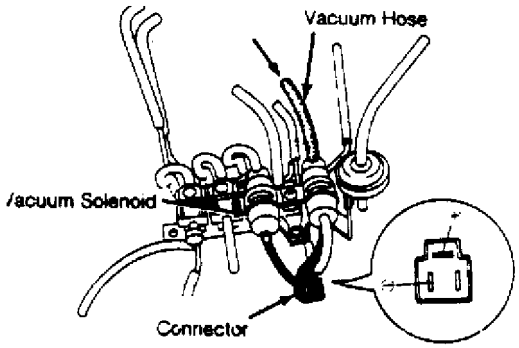


Fig. 7: Air Supply Valve

Air Supply Valve

1) Start engine and run at idling speed. Turn A/C switch on and make sure that engine speed does not decrease.

2) Disconnect air supply valve connector and make sure that engine speed decreases. Reconnect air supply valve connector and make sure that engine speed increases to idling speed (800 RPM). If air supply valve does not function, replace unit. See Fig. 8.

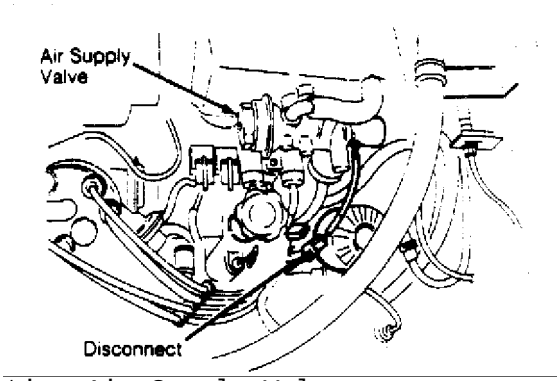


Fig. 8: Testing Air Supply Valve

Adjusting Air Supply Valve

1) Warm up engine and run at idling speed. Connect a tachometer to engine. Disconnect vent and vacuum solenoid valve connector.

2) Disconnect vent and vacuum solenoid valve connector. Check idling speed and adjust, if necessary. Disconnect air supply valve connector and apply electrical power to air supply.

3) Make sure engine speed is within 1000-1700 RPM. If engine speed is not within the RPM range, remove blind cap and adjust engine speed by turning adjusting. After adjusting, install blind cap.

Power Steering Switch

1) Start engine and run at idling speed. Disconnect power steering switch connector.

2) Connect a volt/ohmmeter to the power steering switch. Turn steering wheel either right or left, and make sure there is continuity between switch terminals.

3) When oil pressure is above 427 psi (30.0 kg/cm^2), power steering switch should be closed. When oil is below 427 psi (30.0 kg/cm^2), power steering switch should be open.

Clutch Switch

Disconnect clutch switch connector. Connect volt/ohmmeter to clutch switch, and then check continuity between switch terminals. When clutch pedal is depressed, switch should be closed. When clutch pedal is released, switch should be open. See Fig. 9.

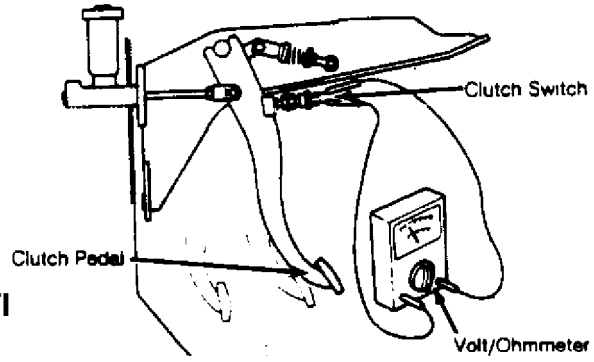


Fig. 9: Testing Clutch Switch

Neutral Switch

Disconnect neutral switch connector. Connect volt/ohmmeter to neutral switch, and then check continuity between switch. When

transmission is in neutral, switch should be closed. When transmission is in gear, switch should be open. See Fig. 10.

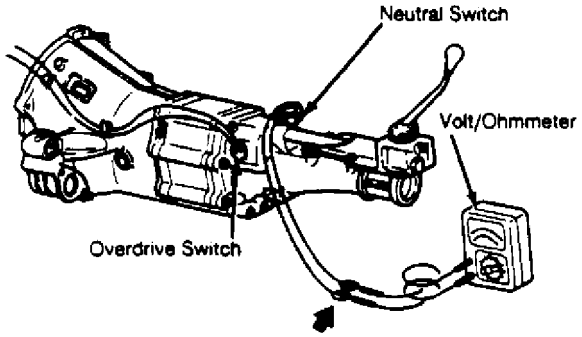


Fig. 10: Testing Neutral Switch

AIR INDUCTION SYSTEM

Throttle Chamber

1) The No. 1 secondary throttle valve starts to open when the primary valve opens 15° and completely opens at the same time when the primary valve fully opens.

2) Check the clearance between the primary throttle valve and the wall of the throttle bore when the No. 1 secondary valve starts to open.

3) If the clearance is not within .043-.067" (1.1-1.7 mm), bend the tab until the proper clearance is obtained. See Fig. 11.

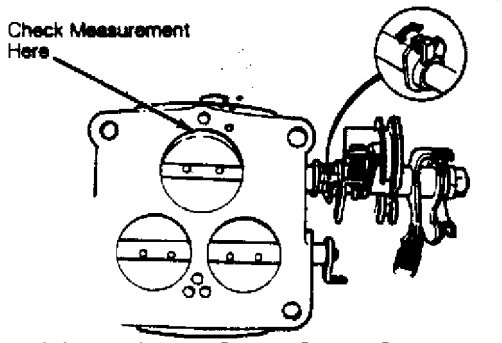


Fig. 11: Checking Throttle Valve Clearance

Fast Idle Operation

1) For this check the engine and throttle chamber must be at 77°F (25°C). For proper fast idle operation the matching mark on fast idle cam must be aligned with center of cam roller.

2) If the matching mark and center of the cam roller do not align, turn the cam adjusting screw until proper alignment is obtained. See Fig. 12.

NOTE: Fast idle adjustment in unnecessary unless it has been tampered with.

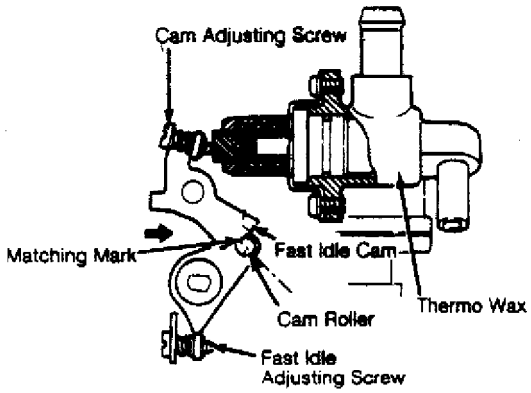


Fig. 12: Checking Fast Idle Cam

3) When the connect matching mark aligns with the center of the cam roller, clearance (throttle chamber to primary throttle valve) should be .016-.02" (.4-.5 mm). If clearance is off, turn the fast idling adjusting screw to bring into specifications.

Accelerator Linkage

Remove the air funnel and, with the accelerator pedal fully depressed, observe the position of the throttle valves. They should be horizontal (wide open position). Check that the accelerator linkage returns fully and does not bind. See Fig. 13.

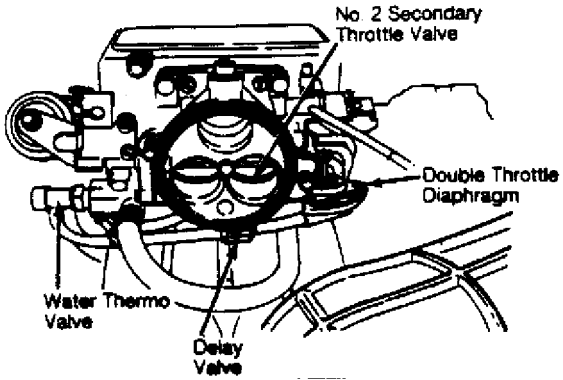


Fig. 13: Checking Accelerator Linkage

Double Throttle Diaphragm

1) Disconnect vacuum sensing tube from double throttle diaphragm. Apply vacuum of more than 7.8 in. Hg to the double throttle diaphragm.

2) Make sure that the No.2 secondary throttle valve is fully closed to its movable range. Check the calibration of the double throttle diaphragm. It should start to open 4.7 in Hg and be fully opened 0-1.8 in Hg. See Fig. 14.

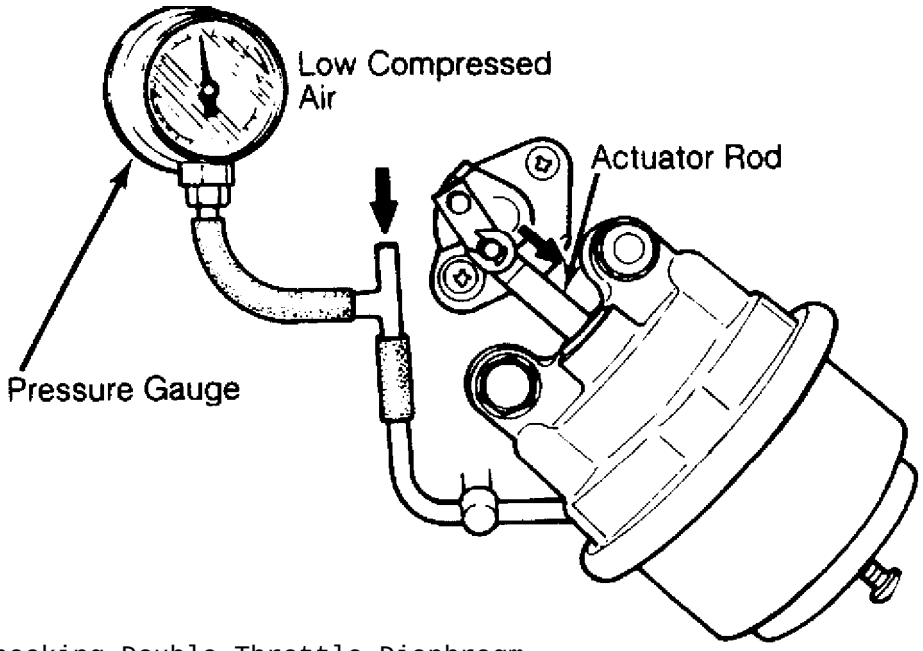


Fig. 14: Checking Double Throttle Diaphragm

Delay Valve

1) Disconnect vacuum delay valve. Connect approx. 3.5 Ft. of vacuum tube to the vacuum pump tester. Completely shut the other side of the vacuum delay valve with your thumb.

2) Apply a vacuum of over 19.7 in. Hg by using the vacuum pump tester. Release your thumb from vacuum delay valve and check time required for vacuum reading to decrease to 3.9 in. Hg from 15.7 in. Hg in approx. 13 seconds.

Water Thermo Valve

1) Remove water thermo valve from engine. Immerse water thermo valve in a container of water.

2) Heat up water gradually and observe the temperature. Below approx. 140°F (60°C) air should pass from top vacuum line to bottom vacuum line. Above approx. 140°F (60°C) air should pass from bottom vacuum line too orifice on top of thermo valve.

Actuator & Auxiliary Port Valve

Remove air hose and connect a pressure gauge to the valve. Apply low compressed air to the actuator and check operation. To start movement approx. 1.8 psi. To finish movement approx. 2.7 psi.

END OF ARTICLE

CARBURETOR - NIKKI 4-BBL
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:43PM

ARTICLE BEGINNING

1984 Nikki Carburetors
NIKKI 4-BARREL

Mazda RX7

DESCRIPTION

Carburetor is of 4-barrel, 2-stage design. Primary stage includes idle system, slow speed circuit, accelerator pump system and main metering system. In addition, Federal models are equipped with a sub-zero starting device which admits fluid into the primary stage.

Secondary stage contains secondary vacuum diaphragm operating system, stepping circuit and main metering system. Choking is accomplished through a semi-automatic choke. Other features include a deceleration control system, automatic choke return, hot start assist, idle compensation and dashpot (manual transmission).

ADJUSTMENTS

NOTE: For all on-vehicle adjustments not covered in this article, see the appropriate TUNE-UP article.

FLOAT LEVEL

1) Before assembling air horn to main body, adjust float level. Invert air horn and allow float to hang by its own weight.

2) Measure clearance between float and air horn gasket. See Fig. 1. Clearance should be .61-.65" (15.5-16.5 mm). If not within specifications, bend float seat to adjust.

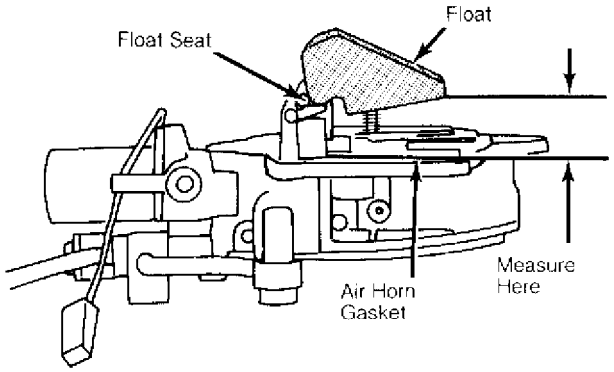


Fig. 1: Float Level Adjustment

FLOAT DROP

Turn air horn upright and allow float to hang by its own weight. Measure distance between bottom of float and air horn gasket. See Fig. 2. Distance should be 1.98-2.02" (50.5-51.5 mm). If not, bend float stop to adjust.

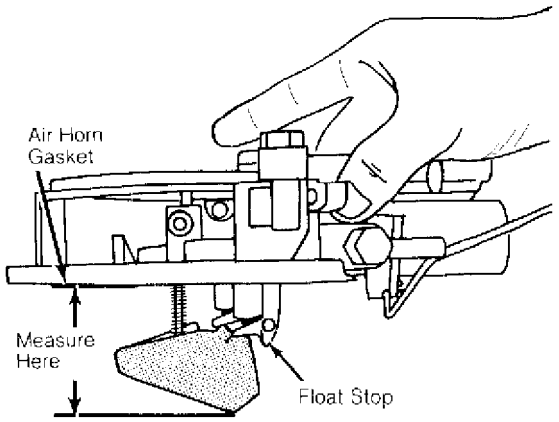


Fig. 2: Float Drop Adjustment

CHOKE LINKAGE
(FAST IDLE OPENING ANGLE)

Close choke valve fully and measure clearance between primary throttle valve and wall of throttle bore. Set clearance to .040-.047" (1.0-1.2 mm) by bending fast idle rod. See Fig. 3.

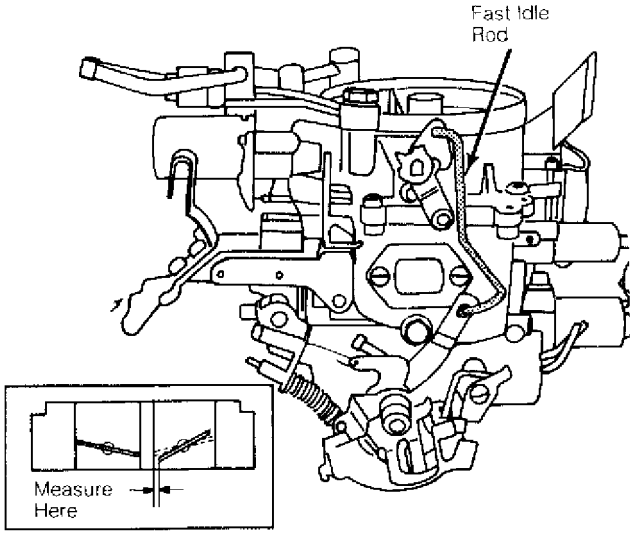


Fig. 3: Choke Linkage (Fast Idle Opening Angle)
Bend fast idle rod to adjust.

CHOKE VALVE OPENING ANGLE

NOTE: Choke diaphragm No. 1 is the dual diaphragm assembly, choke diaphragm No. 2 is the single diaphragm assembly.

1) Disconnect both vacuum sensing tubes from No. 1 vacuum diaphragms. Pull choke lever link out fully and hold in place. Apply more than 19.7 in. Hg to inner diaphragm. See Fig. 4.
2) Clearance should be .22-.24" (5.5-6.2 mm). Apply more than 19.7 in. Hg to both diaphragms and measure clearance again. Clearance should be .45-.51" (11.5-13.0 mm).

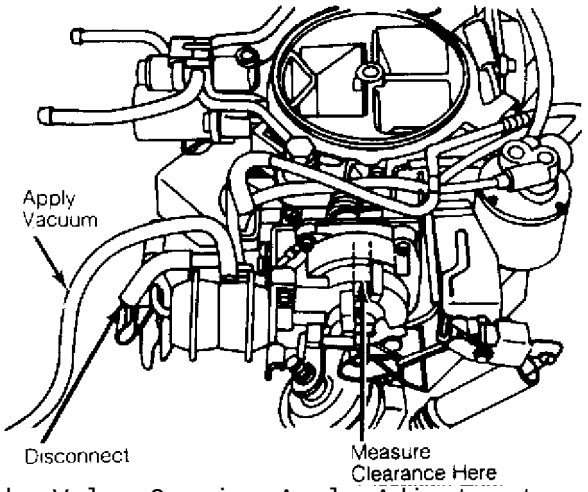


Fig. 4: Choke Valve Opening Angle Adjustment

NO. 2 CHOKE DIAPHRAGM

1) Disconnect vacuum sensing tube from No. 2 vacuum diaphragm. Pull choke lever link out fully and hold in place. Choke valve should close fully. (Cool bi-metallic coil if necessary).
2) Apply more than 19.7 in. Hg to vacuum diaphragm and measure clearance between choke valve and wall of air horn. Clearance should be .057-.070" (1.46-1.80 mm).

CHOKE DIAPHRAGM OPERATION
(NO. 1 & NO. 2 DIAPHRAGMS)

Remove air cleaner. Start engine and run at idle. Disconnect both vacuum sensing tubes from No. 1 diaphragm and one from the No. 2 diaphragm. Each diaphragm shaft should move outward from diaphragm.

CHECKING CHOKE DELAY
VALVE OPERATION

NOTE: Automatic transmission must be in Neutral.

1) Warm engine to normal operating temperature. Stop engine and remove air cleaner assembly. Disconnect inner vacuum sensing tube from choke diaphragm No. 1.
2) Start the engine and run at idle speed. Diaphragm shaft should move fully inward within 26-38 seconds after reconnecting vacuum sensing tube to No. 1 choke diaphragm.

CHECKING AUTOMATIC
CHOKE RELEASE

1) With engine cold and ignition "OFF", pull choke knob out fully and release. Knob should return automatically and freely. Connect tachometer to engine.
2) Start engine and set engine speed at 2000 RPM with choke knob. As engine temperature reaches range, choke knob should return automatically and freely. See Fig. 5.

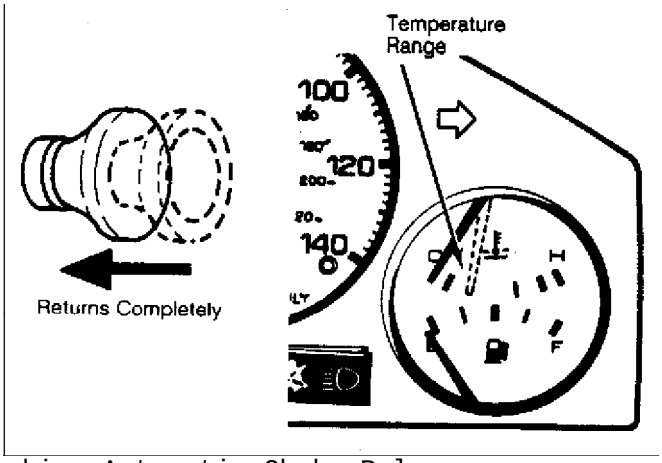


Fig. 5: Checking Automatic Choke Release

CHECKING CARBURETOR HEATER

1) Disconnect electrical connector from No. 1 water temperature switch and connect jumper wire to both terminals of connector. Connect tachometer to engine.
2) Disconnect carburetor heater electrical connector and connect voltmeter to connector. Start engine and set engine speed at 2000 RPM with choke knob.
3) With choke knob pulled out, current should flow to carburetor heater lead. Current should not flow to heater lead with choke knob pushed in.
4) Connect ohmmeter between carburetor heater lead and carburetor body. If ohmmeter shows no movement, carburetor heater is defective and must be replaced.

CHECKING CHOKE MAGNET

Disconnect connector from choke switch. Using an ohmmeter, connect leads to terminals 6 and 8 of connector. Continuity should exist with choke knob in any position. With knob pulled out .4-.8" (8-12 mm), continuity should exist between terminals 3 and 7. See Fig. 6.

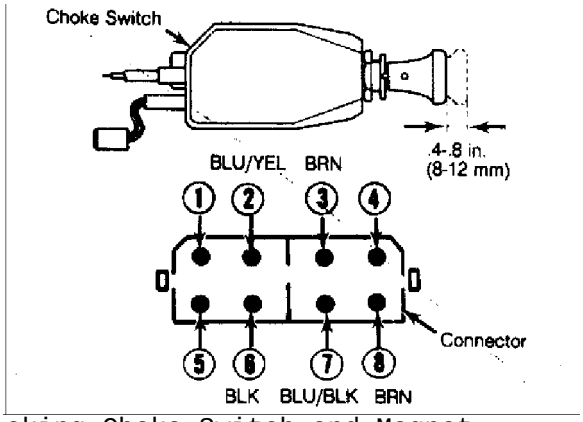


Fig. 6: Checking Choke Switch and Magnet

Continuity should be present at terminals 6 and 8 with choke knob in any position.

CHECKING CHOKE RELAY

1) Disconnect connector from relay. Using an ohmmeter without power applied, connect leads between terminals 1 and 2. There should be continuity between terminals 1 and 2, but not between 3 and 4.

2) Connect battery power to terminal 6 and ground terminal 5. Continuity should now exist between terminals 3 and 4, but not at terminals 1 and 2.

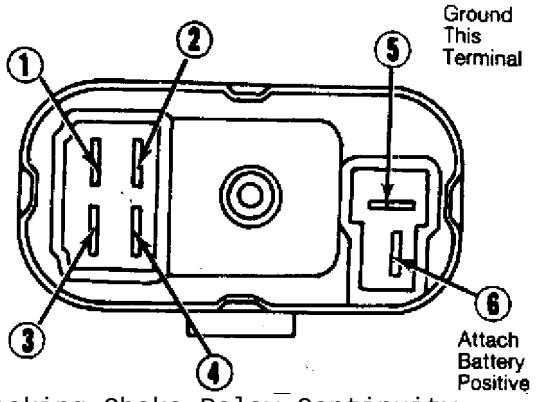


Fig. 7: Checking Choke Relay Continuity
Continuity should exist at terminals 1 and 2 without power applied; at terminals 3 and 4 with power applied.

HOT START ASSIST CABLE

Pull hot start assist motor inner cable until stopper lever touches start lever. Check for free play of .4-.8" (1-2 mm). See Fig. 8. If free play is not within specified range, loosen screw, adjust free play, and retighten screw.

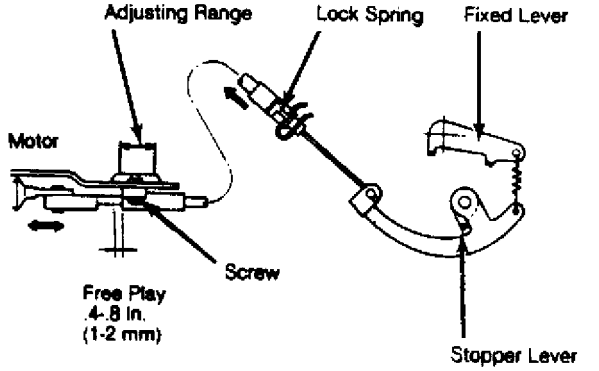


Fig. 8: Hot Start Assist Cable Adjustment

HOT START ASSIST RELAY

Disconnect connector from relay. Using an ohmmeter without power applied, continuity should exist between terminals 1 and 4. Connect battery power to terminal 2 and ground terminal 3. No continuity should exist between terminals 1 and 4. See Fig. 9.

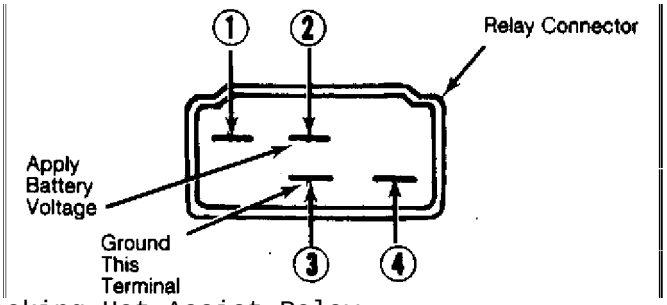


Fig. 9: Checking Hot Assist Relay

There should be no continuity between terminals 1 and 4 with power applied; continuity should exist without power.

THROTTLE OPENER

A/C Models Only

1) Turn off all accessories. Remove fuel filler cap. Disconnect and plug idle compensator tube at air cleaner. Connect tachometer to engine and warm engine to normal operating temperature.

2) Disconnect electrical connector from air switching solenoid valve (Gray color). Disconnect and plug vacuum sensing tubes from leading vacuum control units on distributor.

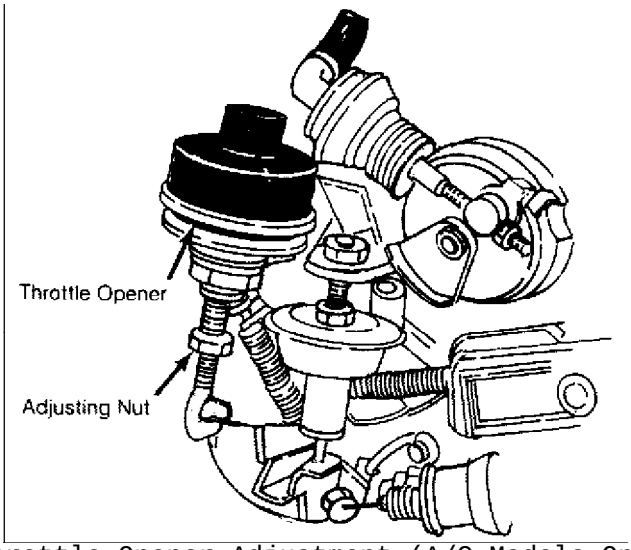


Fig. 10: Throttle Opener Adjustment (A/C Models Only)

3) Turn off air conditioner switch. Disconnect electrical connector from air conditioner solenoid. Connect battery power to one terminal in connector and ground other terminal.

4) Throttle opener should operate and engine speed should increase to 1150-1250 RPM in Neutral. If engine speed is not to specification, turn adjusting screw. See Fig. 10.

CHECKING ALTITUDE COMPENSATOR

NOTE: Altitude compensator must be checked at altitudes of 1640-4920 ft. (500-1500 m).

1) Remove air cleaner and start engine. Engine should run smoothly at specified idle. Place finger over slow port on carburetor air horn; idle speed should drop.

2) If idle speed did not drop, remove compensator valve and blow through valve from both ports. Air should pass through compensator valve. If not replace altitude compensator valve.

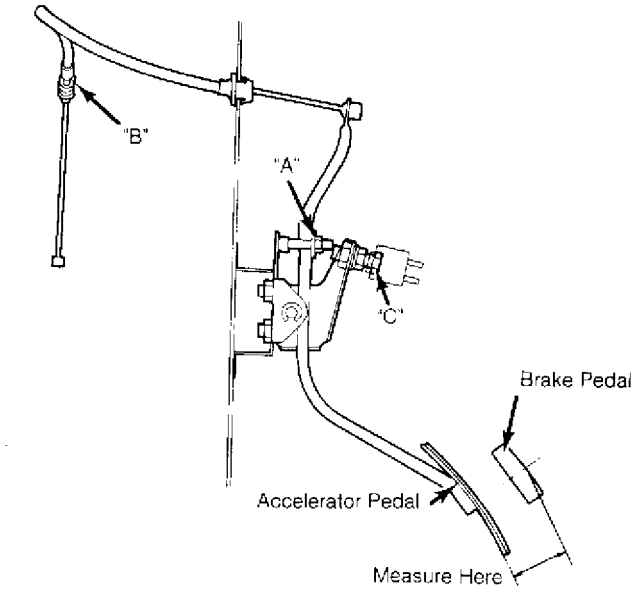


Fig. 11: Adjusting Accelerator Cable and Pedal Height

ACCELERATOR CABLE ADJUSTMENT

1) Check accelerator pedal position. Pedal should be 1.5-1.9" (37-47 mm) lower than brake pedal. See Fig. 11. If necessary, adjust nut "A" to obtain correct position.
2) Cable free play at carburetor should be .04-.12" (1-3 mm). To adjust free play, adjust nut "B". Depress accelerator to floor and check that throttle valves are wide open. If necessary, adjust stopper bolt.

OVERHAUL

NOTE: Disassembly and assembly procedures will vary from vehicle to vehicle due to emissions equipment and type of transmission. Some carburetors may not have all parts referred to in the following procedures.

DISASSEMBLY

1) Remove vacuum sensing tubes for altitude compensator valve and choke delay valve. Remove choke heater lead, choke diaphragm No. 2 vacuum sensing tube and altitude compensator valve.
2) Remove throttle opener and bracket assembly, No. 1 choke diaphragm vacuum sensing tube, dashpot diaphragm and bracket assembly (Man. Trans. only) and throttle return spring.
3) Remove sub-return spring, return spring bracket, bi-metal spring housing and bracket assembly. Remove split pin and fast idle rod, hot start assist lever spring and bracket assembly and choke lever.
4) Remove the choke return diaphragm and bracket, No. 2 choke diaphragm and air horn assembly from main body. Disconnect float pin and remove float, needle valve, spring, valve stem and retainer.

5) From main body, remove accelerator pump rod, secondary throttle valve rod, throttle sensor and main body attaching bolts. Remove main body from throttle body.

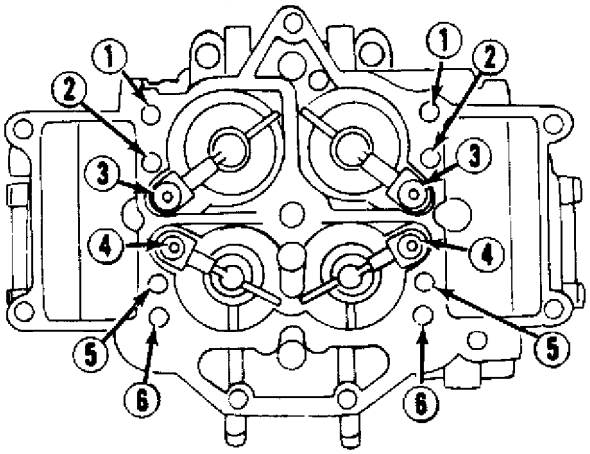


Fig. 12: Removing Jets and Air Bleeds

6) Remove secondary throttle attaching screws, cover, return spring, pin and clip, diaphragm, housing and gasket. Remove "E" clip, washer and shaft, accelerator pump lever, attaching screws, cover, diaphragm and return spring.

7) From main body, remove accelerator pump injection screw, nozzle, gasket, weight, outlet check valve, check valve seat, weight and inlet check valve. Remove retainer, blind plug and washer, primary main jet and secondary main jet.

8) Remove air bleeds and jets. See Fig. 12. Using a hacksaw, remove idle limiter cap by cutting through limiter cap, 0.4" (10 mm) from cap end. Remove and discard mixture adjusting screw and spring.

CLEANING & INSPECTION

1) Wash all parts in clean solvent and clear all passages using compressed air. Never use wire for cleaning jets, orifices or passages. Inspect air horn, main body and throttle body for cracks or breakage.

2) Inspect choke shaft and throttle shaft for wear, linkage and connecting rods for bends, and return springs for damage. Inspect float, needle valve and seat and strainer for damage.

3) To check air vent solenoid for proper operation, apply battery voltage to solenoid valve, valve stem should pull into valve body. Replace solenoid if it fails to operate properly.

REASSEMBLY

1) To reassemble, reverse the disassembly procedure, using new gaskets. Avoid mixing primary and secondary system parts having similar shape. When installing new mixture screw, seat lightly and back out 3 turns for initial adjustment.

2) When installing bi-metal spring housing, fit choke shaft lever to bi-metal spring housing choke valve and install lever

CHOKE RETURN & HOT START ASSIST SYSTEM
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:45PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 CHOKE RETURN & HOT
START ASSIST SYSTEMS

DESCRIPTION

The Choke Return system prevents the choke knob from being left unreturned to prevent overheating of the exhaust system. The Hot Start Assist system opens the throttle valve partially during cranking of warm engine to optimize air/fuel mixture to improve starting.

The choke return system components include No. 1 water temperature switch, choke relay, choke magnet and choke switch. The hot start assist system components include No. 1 water temperature switch, hot start relay and hot start motor.

OPERATION

CHOKE RETURN SYSTEM

When cold engine is started with assist of choke knob, the knob is held in pulled position by the choke magnet. Full release of choke knob is achieved as engine coolant temperature reaches 158°F (70°C). The No. 1 water temperature switch stops the flow of electrical current to magnet and the choke knob is released.

HOT START ASSIST SYSTEM

During cranking of a warm engine, the No. 1 water temperature switch provides power to the hot start relay when starter is engaged. When hot start relay is activated, the hot start motor pulls the hot start cable which opens the throttle valve.

TESTING

CHOKE RETURN SYSTEM

1) With engine cold and ignition switch "OFF", pull choke knob out fully. Choke knob should return automatically.
2) Connect tachometer to engine. Start engine and set engine speed at 2000 RPM with choke knob. With engine running, choke knob should automatically return when engine temperature indicator is in position shown in Fig. 1.

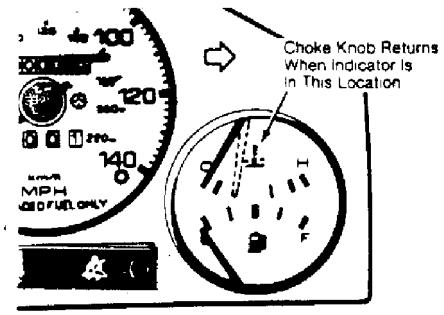


Fig. 1: Engine Temperature Indication for Release of Choke Knob

CHOKE MAGNET

Disconnect electrical connector from choke switch. Using an ohmmeter, check continuity between terminals. Continuity should exist between terminals number 6 and number 8. See Fig. 2.

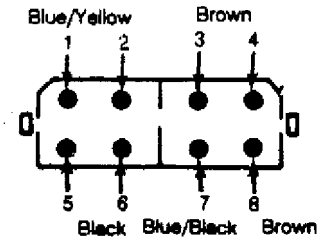


Fig. 2: Choke Switch Terminal Numbering

HOT START ASSIST SYSTEM

1) Inspect hot start assist cable and linkage for proper installation, no binding or sticking, and full return. Warm engine to normal operating temperature and stop engine.

2) Disconnect leading and trailing primary wires from ignition coils. Crank engine. Hot start lever should open throttle valve. If hot start system does not respond as outlined, check hot start assist relay.

HOT START ASSIST RELAY

Disconnect electrical connector from hot start relay. Using an ohmmeter, check continuity between the number 1 and number 4 terminals. Continuity should exist without power applied. Continuity should not exist when power is applied to number 2 (positive) and number 3 (negative) without power applied.

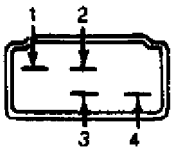


Fig. 3: Hot Start Assist Relay Terminal Numbering

HOT START ASSIST CABLE ADJUSTMENT

Pull the start assist motor inner cable until the stopper lever touches to the start lever and check free play. Free play should be .04-.08" (1-2 mm). If not within specifications, loosen cable and adjust.

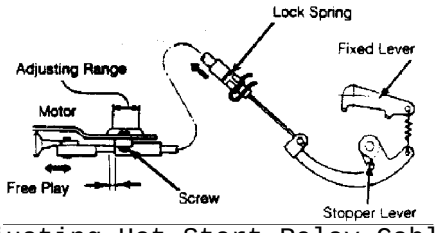


Fig. 4: Adjusting Hot Start Relay Cable

END OF ARTICLE

DECELERATION CONTROL SYSTEM - CARBURETED
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:45PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 CARBURETED MODELS
DECELERATION CONTROL SYSTEM

DESCRIPTION

The deceleration system is designed to maintain a balanced air/fuel mixture during deceleration. System consists of 2 anti-afterburn valves, shutter solenoid valve, coasting/shutter valve, throttle sensor, dashpot (manual transmission models) and connecting hoses and wiring.

OPERATION

The number 2 anti-afterburn valve (located below air cleaner) is actuated by the shutter solenoid valve to supply additional air from air cleaner to intake manifold at initial deceleration to prevent afterburning of fuel. The coasting/shutter valve work together to supply air (coasting valve) and fuel (shutter valve) during deceleration to prevent backfiring.

TESTING

NO. 1 ANTI-AFTERBURN VALVE

1) Warm up engine and run at idle speed. Disconnect the air pump hose at the air pump. Place a finger over the air hose opening and make sure that air is not sucked into the air hose at idling speed.
2) Increase the engine speed more than 3000 RPM and then decrease rapidly. Make sure the air is sucked into the air hose for a few seconds while decelerating. Replace air control valve if it does not operate properly.

NO. 2 ANTI-AFTERBURN VALVE

1) Warm engine and run at idling speed. Disconnect the air hose running from air cleaner to number 2 anti-afterburn valve and make sure that air is not sucked into the air hose at idling speed.
2) Increase the engine speed more than 3000 RPM and then decrease the speed rapidly. Make sure the air is sucked into the air hose for a few seconds while decelerating. Replace air control valve if it does not operate properly.

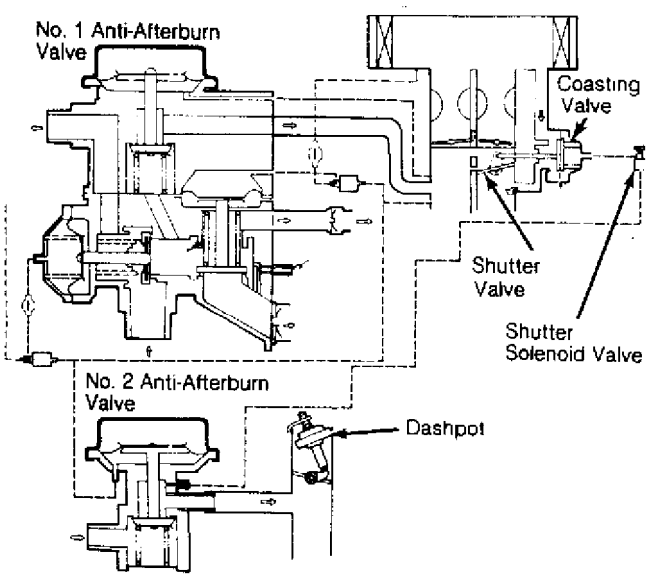


Fig. 1: Deceleration Control System

THROTTLE SENSOR

1) Warm engine to normal operating temperature. Stop engine and connect tachometer. Disconnect Brown connector under air cleaner on carbon canister side of engine.

2) Using 2 voltmeters, connect negative lead of each voltmeter to each terminal in connector. Connect positive leads to "B" terminal of alternator. See Fig. 2.

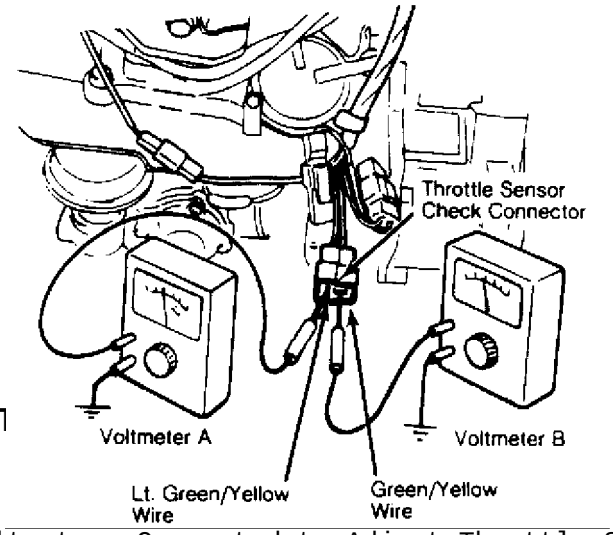


Fig. 2: Voltmeters Connected to Adjust Throttle Sensor

3) Start engine. Quickly decelerate engine from 3000 RPM and make sure that current flows to both terminals when engine speed is 1000-1200 RPM. If current does not flow to both terminals at specified speed, adjust throttle sensor.

4) To adjust sensor, remove cap from adjusting screw. Adjust timing of current flowing to voltmeter A in Fig. 2 by turning adjusting screw. Turning screw clockwise causes current to flow

earlier and turning screwing counterclockwise causes current to flow later. See Fig. 3.

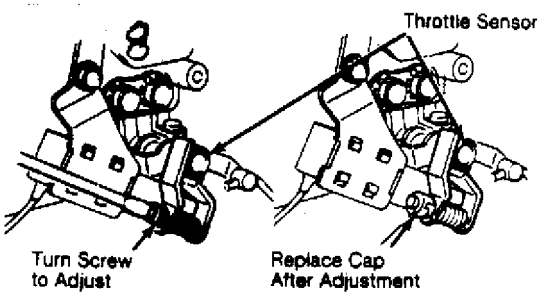


Fig. 3: Throttle Sensor Adjusting Screw Location

4) After adjustment, install cap over throttle sensor adjusting screw. Remove voltmeters and reconnect Brown connector. Remove tachometer.

SHUTTER SOLENOID VALVE

1) Disconnect vacuum sensing tubes from shutter solenoid valve (Yellow color dot). Blow through solenoid valve through vacuum hose "B" shown in Fig. 4;. Make sure air passes through the valve and comes out port "C".

2) Disconnect electrical connector and apply battery power to terminals on solenoid valve. Blow through hose again. Air should pass through valve and come out the air filter "A" of the valve.

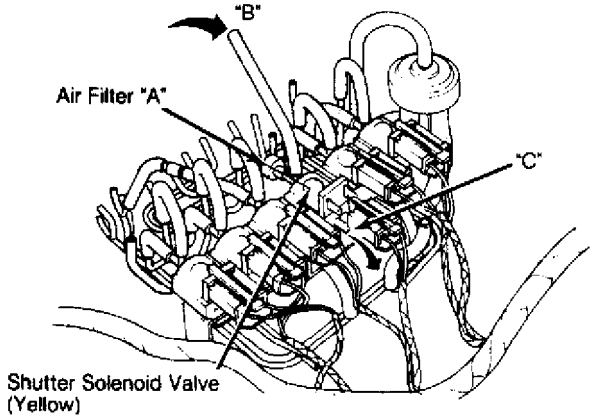


Fig. 4: Testing Shutter Solenoid Valve

SHUTTER SOLENOID VALVE SIGNAL CHECK

1) Warm engine to normal operating temperature and run at idle speed. Connect a tachometer to engine. Disconnect the connector from throttle sensor. Disconnect the air hose from the coasting valve to air cleaner at the air cleaner.

2) Place a finger over the air hose opening and make sure the air is not sucked into the air hose at idling speed. Increase the engine speed more than 3000 RPM and then decrease rapidly. Make sure the air is sucked into the air hose until the engine speed decreases to 1000-1200 RPM.

3) On automatic transmissions, shift into "P" or "N". Current should NOT flow to solenoid valve terminal at any engine speed. If solenoid valve does not respond as described, replace shutter solenoid valve.

DASHPOT (MAN. TRANS. ONLY)

1) Remove air cleaner. Check that dashpot rod does not bind throttle lever movement. Quickly operate throttle lever fully and make sure dashpot rod extends quickly.

2) Release throttle lever and make sure that throttle lever returns slowly to idle position after it has touched dashpot rod. Connect tachometer to engine. Start engine and warm to operating temperature.

3) Ensure engine idle speed is adjusted to specification. Operate throttle lever until it is away from dashpot rod. Slowly decrease engine speed and check speed at which throttle lever just touches dashpot rod. It should be 3800-4200 RPM. If not, loosen lock nut and turn dashpot diaphragm to adjust engine speed.

END OF ARTICLE

DECELERATION CONTROL SYSTEM - EFI
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:46PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 FUEL INJECTED MODELS
DECELERATION CONTROL SYSTEM

DESCRIPTION

The deceleration system is designed to maintain a balanced air/fuel mixture during deceleration. This helps prevent backfiring. System consists of a fuel cut operation, throttle sensor, anti-afterburn valve, and dashpot.

FUEL CUT SYSTEM TEST

During deceleration above a certain engine speed, fuel in not injected from injectors. Fuel cut speeds are listed in the Fuel Cut Speeds table. To check fuel cut operation, hold engine speed at 2000 RPM and make sure engine speed varies when throttle sensor is pushed in with a finger.

Fuel Cut Speeds Chart

Application	RPM
In Neutral	1500-1600
In Gear	1200-1300

DECELERA

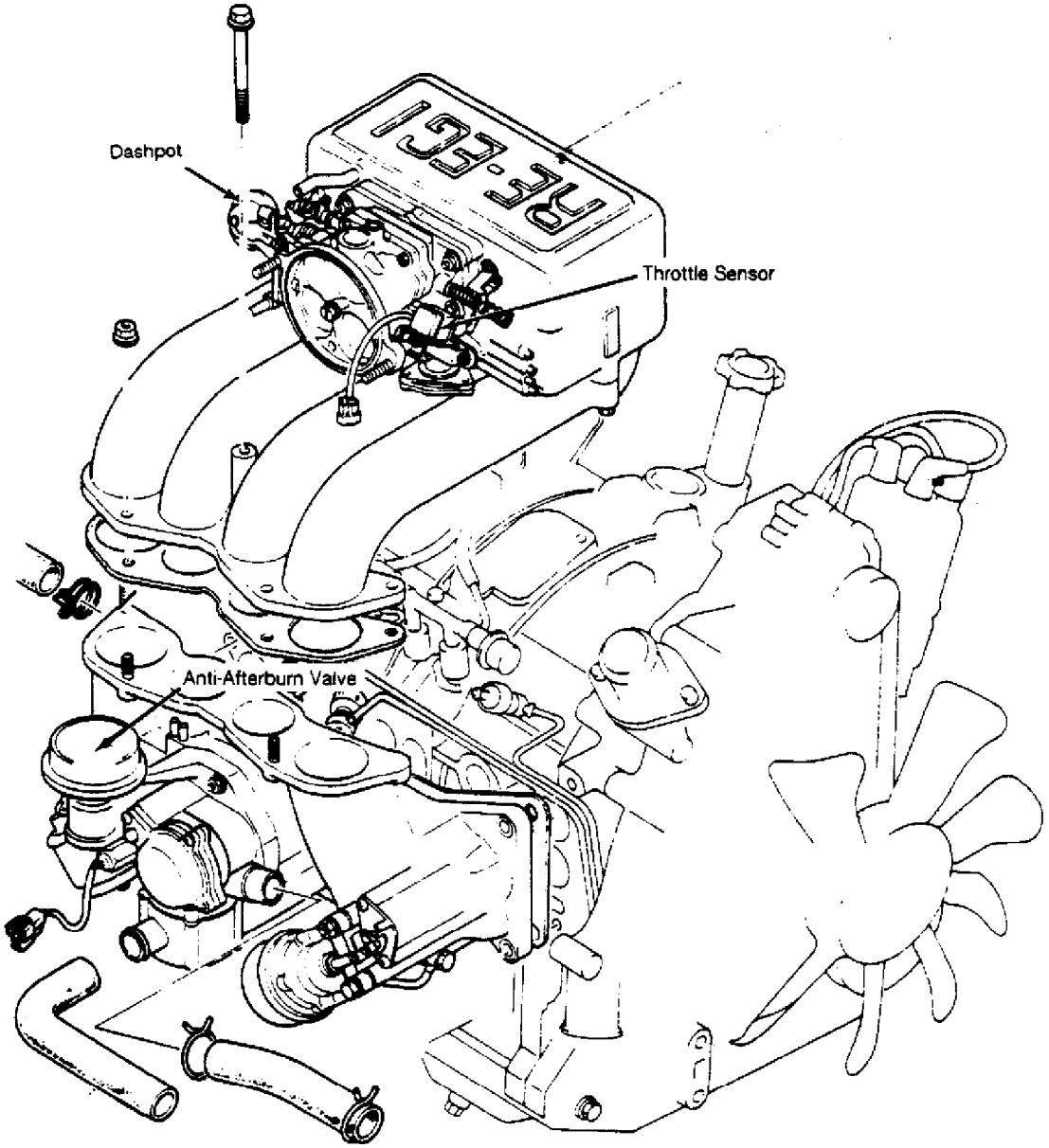


Fig. 1: Deceleration Control System

THROTTLE SENSOR TEST

1) To check and adjust throttle sensor, proceed as follows. Warm up engine then turn it off. Connect voltmeters to checking connector (Green) as shown in Fig. 2.

2) Turn ignition switch on and check to see if current flows to one of the voltmeters. If current flows to both voltmeters or does not flow at all, turn throttle sensor adjusting screw until current flows to one of the voltmeters.

3) If current flows to both voltmeters, turn adjusting screw counterclockwise. If current does not flow at all, turn adjusting screw clockwise. After adjusting, install cap onto adjusting screw.

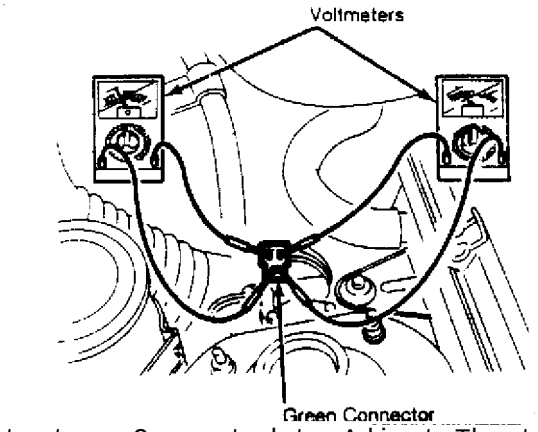


Fig. 2: Voltmeters Connected to Adjust Throttle Sensor

4) Disconnect connector for throttle sensor. Connect an ohmmeter to throttle sensor as shown in Fig. 3. Open throttle valve and observe ohmmeter reading. At idle reading should be about 1000 ohms. Wide open reading should be about 5000 ohms.

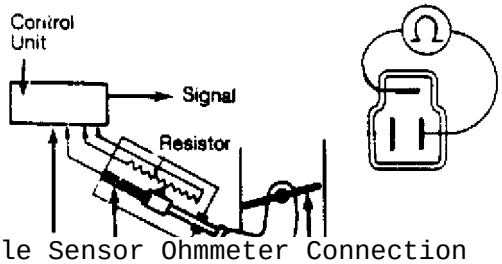


Fig. 3: Throttle Sensor Ohmmeter Connection

ANTI-AFTERBURN VALVE TEST

1) Warm up engine and run it at idling speed. Disconnect air hose (air control valve-to-air pump) at air pump. Place a finger over air hose opening and make sure that air is not sucked into air hose at idling speed.

2) Increase engine speed more than 3000 RPM then decrease engine speed rapidly. Make sure that air is sucked into air hose for a few seconds while decelerating. Replace air cntrl valve, if necessary.

DASHPOT TEST

1) Check that dashpot rod does not keep throttle lever from returning to idle stop. Quickly operate throttle lever fully and make sure dashpot rod extends quickly.

2) Release throttle lever and make sure throttle lever returns slowly to idle position after it has touched dashpot rod. Connect tachometer to engine. Start engine and warm to operating temperature. Make sure engine operates at specified idle speed.

3) Operate throttle lever until it is away from dashpot rod. Slowly decrease engine speed and check speed at which throttle lever just touches dashpot rod. It should be 2350-2650 RPM. If not, loosen lock nut and turn dashpot diaphragm to adjust engine speed.

END OF ARTICLE

EMISSION APPLICATION
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:46PM

ARTICLE BEGINNING

1984 ENGINE EMISSIONS
Mazda Emission Control Applications

626, GLC, Pickup, RX7

EMISSION CONTROL DEVICE APPLICATIONS

EMISSION CONTROL DEVICE APPLICATIONS TABLE

B2000 2.0L
PCV, AIS, EVAP, OC, EGR, AAV (1), ECC, DCS, HIC, ITCS, PAS (2), TOCS

B2000 2.2L Diesel
PCV, EGR

GLC 1.5L
PCV, TAC, AIS, EVAP, OC, EGR, AAV (1), ASV, DCS, DP, ECC, PAS, TOCS

RX7
TAC (3), EVAP, OC (3), O2, AAV, DCS, DP, ECC, EFE, EGI (4), HIC (3), ITCS, MCS

626 2.0L
PCV, TAC, AIS, EVAP, OC, O2, AAV, DCS, EEC, ITCS, PAS, TOCS

(1) - A/T only.
(2) - Federal models only.
(3) - With 12A engines only.
(4) - With 13B engines only.

ABBREVIATION DEFINITIONS

ABBREVIATIONS DEFINITIONS TABLE

Abbreviation	Description
AAV	Anti-Afterburn Valve
ACD	Auxiliary Control Device
AI	Air Injection
AIS	Air Injection System
ASV	Air Suction Valve
CEC	Computerized Engine Controls
CRV	Coasting Richer Valve
DCS	Deceleration Control System
DP	Dashpot
ECC	Electronic Controlled Carburetor
EEC	Electronic Engine Control
EFE	Early Fuel Evaporation
EGI	Electronic Gasoline Injection
EGR	Exhaust Gas Recirculation
EVAP	Evaporative Emission Control
FCO	Fuel Cut-Off
HIC	Hot Idle Compensator
IC	Integrated Control
ITCS	Ignition Timing Control System

MCS ..... Mixture Control System
OC ..... Oxyidation Catalyst
O2 ..... Oxygen Sensor
PAS ..... Pulse Air System
PCV ..... Positive Crankcase Ventilation
SPK ..... Spark
TAC ..... Thermostatic Air Cleaner
TOCS ..... Throttle Opener Cont. System
TWC ..... Three-Way Catalyst

END OF ARTICLE

FUEL EVAPORATION SYSTEM
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:46PM

ARTICLE BEGINNING

1984 Fuel Evaporation Systems
MAZDA ROTARY ENGINE

RX7

DESCRIPTION

System prevents escape of fuel vapors into atmosphere. Components include a non-vented fuel tank with integral vapor separator, check and cut valve (located at fuel tank), charcoal canister, air vent solenoid valve (12A carbureted engine), purge valve and connecting hoses.

OPERATION

When engine is not running, fuel vapors from fuel tank, float bowl (12A carbureted engine), and engine are routed through vent lines to charcoal canister where they are adsorbed. When engine is running above idle, purge valve opens and fuel vapors are drawn from canister and engine into intake manifold for burning. The purge valve operates as the PCV valve and controls crankcase ventilation and fuel evaporation.

CHECK & CUT VALVE

This valve has 3 functions: When fuel tank pressure becomes too high, valve releases pressure to atmosphere. When vacuum becomes too high, valve allows air into tank to prevent tank from collapsing. If vehicle is overturned, valve prevents fuel leakage by sealing the line with a check ball.

AIR VENT SOLENOID VALVE

When ignition key is off, air vent solenoid valve opens, allowing fuel vapors in float bowl to travel to canister. When ignition key is on, solenoid valve closes float bowl vent.

PURGE VALVE

A vacuum operated purge valve directs crankcase, fuel tank, and canister vapors into intake manifold when the throttle is opened.

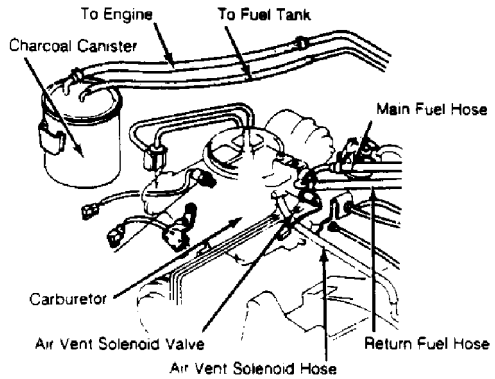


Fig. 1: Mazda RX7 Canister and Air Vent Solenoid Location

TESTING

EVAPORATION LINE

From canister, remove evaporation hose leading to fuel tank. Connect "U" tube pressure gauge to evaporation hose.

NOTE: Evaporation line test is the same as on piston engines. To complete testing procedure, see "TESTING, Evaporation Line" in "Mazda Piston Engine" article in this section.

CHECK & CUT VALVE

NOTE: Check and cut valve test is the same as on piston engines. See "TESTING, Check and Cut Valve" in "Mazda Piston Engine" article in this section.

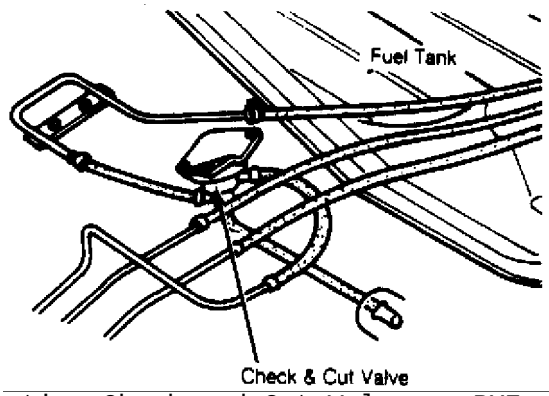


Fig. 2: Locating Check and Cut Valve on RX7

AIR VENT SOLENOID VALVE

Check solenoid air vent hose for cracks or damage. Disconnect solenoid air vent hose from line. With ignition switch off, slowly blow through hose. Air should pass through solenoid. Turn ignition switch on, and blow through hose again. Air should not pass through valve. If valve does not operate as described, replace valve.

PURGE VALVE

NOTE: Purge valve test is outlined in Mazda article in "Crankcase Ventilation" section. See "TESTING, Rotary Engines."

MAINTENANCE

Check system function every 15,000 miles. Check and Cut Valve should be tested every 25,000 miles. Replace parts as necessary.

END OF ARTICLE

FUEL INJECTION SYSTEM
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:47PM

ARTICLE BEGINNING

1984-85 Fuel Injection
MAZDA

RX7

DESCRIPTION

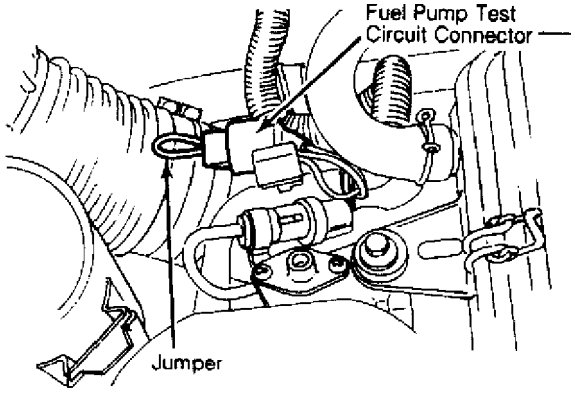
The electronically controlled fuel injection system precisely meters the amount of fuel injected in each rotor. The Electronic Control Unit (ECU) is the "brain" of the system.

The fuel delivery system consists of a fuel tank, filter, pump, injectors, pressure regulator and pulsation damper. The air delivery system consists of an airflow meter, air funnel, throttle chamber, dynamic chamber and intake manifold.

OPERATION

The ECU uses input information to determine fuel output from the following sensors and devices: airflow meter, throttle sensor, intake air temperature sensor, atmospheric pressure sensor, engine RPM (ignition pulse), coolant temperature, oxygen sensor and intake manifold vacuum sensor.

After receiving the input information, the ECU will determine the correct fuel pressure at the injectors by sending a signal to the pressure regulator control solenoid valve. The ECU will also control the fuel delivery volume by timing the duration of injector "ON" time.

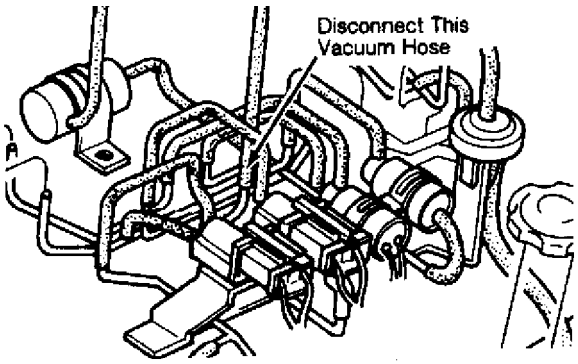


35533
Fig. 1: Testing Fuel Pump Output Pressure

FUEL PUMP PRESSURE TEST

1) Disconnect negative battery terminal. Using a shop rag wrapped around main fuel hose, disconnect main fuel hose from fuel line. Connect a pressure gauge to line and reconnect negative battery terminal.

2) Turn ignition on and jumper across 2 terminals of fuel pump test circuit connector. See Fig. 1. Fuel pump pressure should be 50-71 psi (3.5-5.0 kg/cm^2).



35534

Fig. 2: Disconnecting Vacuum Hose from Fuel Pressure Regulator Control Valve

PRESSURE REGULATOR FUEL PRESSURE

1) Disconnect negative battery terminal. Using a shop rag wrapped around main fuel hose, disconnect main fuel hose from fuel line. Using 3-way connector, connect pressure gauge to main fuel line.

2) Reconnect negative battery terminal. Start engine. Disconnect vacuum hose between pressure regulator and pressure regulator control valve at control valve. See Fig. 2.

3) With vacuum hose disconnected and engine idling, fuel pressure should be approximately 37 psi (2.6 kg/cm^2). Reconnect vacuum hose to control valve and measure pressure. Fuel pressure should be approximately 28.5 psi (2 kg/cm^2). If not, replace fuel pressure regulator.

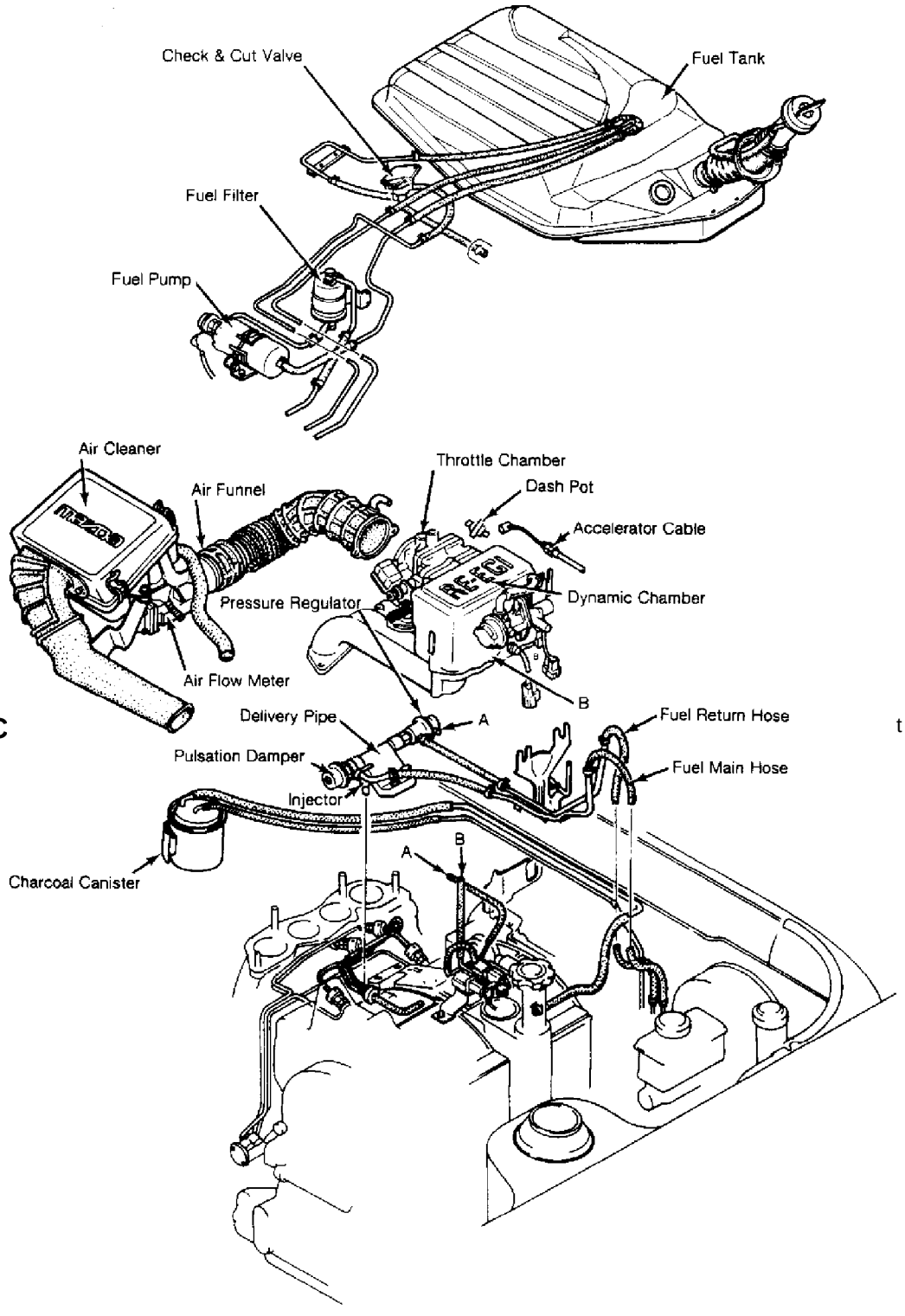


Fig. 3: Mazda RX7 Fuel Injection System Components

FUEL INJECTOR TESTS

INJECTOR OPERATION

1) Using a mechanic's stethoscope, listen to each injector for normal "clicking" operating noise at idle and under acceleration.
2) If both injectors do not operate, ensure that there is continuity in wire between trailing coil and terminal "U" of ECU connector. If there is continuity, check main fusible link located next to left strut tower.
3) If okay, turn ignition on and ensure that main relays (2) click each time key is turned on. Main relays are located behind left strut tower and are cylindrical in shape.
4) If main relays do not click when key is turned on, check that battery voltage is present at main relay connector number 2 (Black/White wire). If not, repair open in circuit.

INJECTOR RESISTANCE

With electrical connector removed from injector, measure resistance between injector terminals. Injector resistance must be in range of 1.5-3.0 ohms. If not, replace injector.

INJECTOR FUEL LEAKAGE & DELIVERY VOLUME

1) Remove dynamic chamber and loosen delivery pipe attaching bolts. Using wire, tie injectors tightly onto delivery pipe.

CAUTION: Ensure that injectors are tied tightly to fuel delivery pipe. Failure to do so will cause fuel to spray out of loose connections and cause fire hazard.

2) Turn ignition on and jumper between 2 terminals of fuel pump test circuit connector. See Fig. 1. With system pressurized, there should be no fuel leakage at injectors.
3) Leave system pressurized for 5 minutes and note any leakage. Only a very slight amount of fuel leakage is acceptable.
4) Remove jumper from fuel pump test connector. Attach piece of hose between injector and a graduated cylinder. Connect Injector Checker (49 9200 040) to injector electrical connector. See Fig. 4.

CAUTION: Be extremely careful when connecting injector checker to battery; always work away from sparks or open flames.

5) Turn ignition on, jumper fuel pump test connector and energize injector by connecting injector checker's leads to battery voltage. Measure injector fuel delivery volume for 15 seconds. Volume produced in 15 seconds should be 5-6.7 oz. (.15-.2 L).

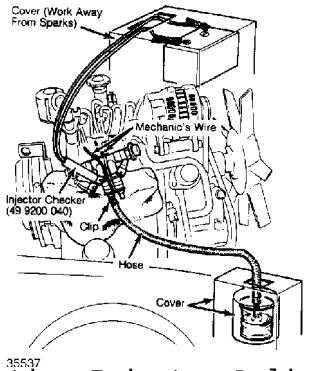


Fig. 4: Testing Injector Delivery Volume

PULSATION DAMPER TEST

Start engine and run at idle. Place finger over pulsation damper and ensure damper pulsates. If not, replace pulsation damper.

ATMOSPHERIC PRESSURE SENSOR TEST

Turn ignition on. Using a voltmeter connected to the atmospheric pressure sensor terminal "D", measure voltage. See Fig. 5. Voltage should be 3.5-4.5 volts at sea level, or 2.5-3.5 volts above an altitude of 6500 ft. (2000 m).

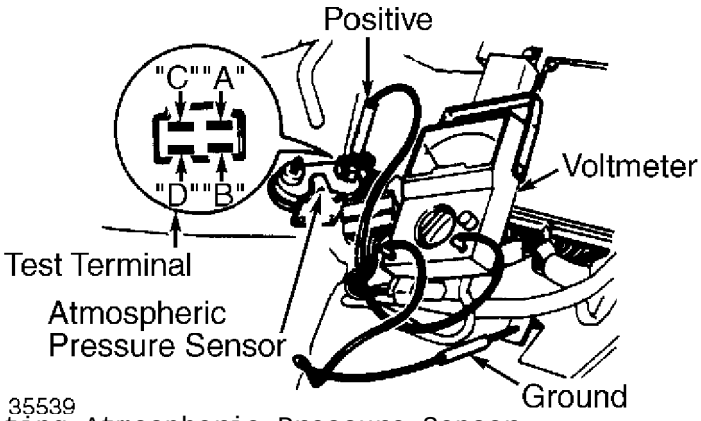


Fig. 5: Testing Atmospheric Pressure Sensor

PRESSURE REGULATOR CONTROL VALVE TEST

1) Disconnect vacuum hoses from control valve. Blow into valve port "B" and ensure that air passes out of valve through air filter port "C". See Fig. 6.

2) Remove connector from control valve and energize control valve by applying 12 volts to switch terminal. Ground other terminal. Blow into valve port "B" and ensure that air passes out of valve through port "C". If not, replace control valve.

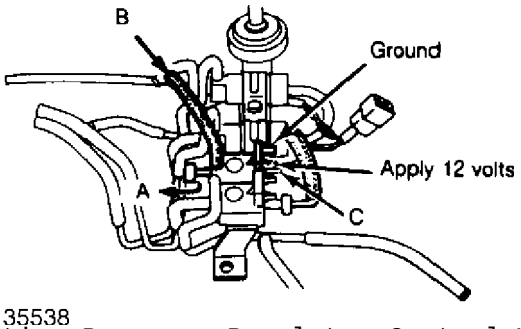


Fig. 6: Testing Pressure Regulator Control Valve

INTAKE AIR TEMPERATURE SENSOR TEST

Remove intake air temperature sensor from dynamic chamber. Using a heat lamp, ohmmeter and thermometer, measure resistance of sensor at various temperatures. See INTAKE AIR TEMPERATURE SENSOR RESISTANCE specification table.

INTAKE AIR TEMPERATURE SENSOR RESISTANCE

Temperature	Ohms
68°F (20°C)	45,650-37,350
122°F (50°C)	13,040-10,660
185°F (85°C)	3850-3150

THROTTLE SENSOR TEST

For complete throttle sensor testing procedures, see the ROTARY TUNE-UP article in the TUNE-UP section.

COOLANT TEMPERATURE SWITCH TEST

Coolant temperature switch is located in radiator. Using an ohmmeter, check that switch closes in the 52-66°F (12-18°C) temperature range.

COOLANT THERMO SENSOR TEST

Coolant thermo sensor is located in water pump. Using an ohmmeter, check sensor resistance at various temperatures. See COOLANT THERMO SENSOR RESISTANCE specification table.

COOLANT THERMO SENSOR RESISTANCE

Temperature	Ohms
-4°F (-20°C)	17,820-14,580
68°F (20°C)	2690-2210
176°F (80°C)	352-288

AIRFLOW METER TEST

Visually check airflow meter body for cracks or damage. Using an ohmmeter, check resistance between airflow meter connector terminals. See Fig. 7. See AIRFLOW METER RESISTANCE specification table for resistance values.

AIRFLOW METER RESISTANCE

Terminal	Ohms
E2 to VS	20-400
E2 to VC	100-300
E2 to VB	200-400
E2 to THA (1)	
-4°F (-20°C)	10,000-20,000
32°F (0°C)	4000-7000
68°F (20°C)	2000-3000
104°F (40°C)	900-1300
140°F (60°C)	400-700
E1 to FC	No Continuity

(1) - Intake air temperature sensor.

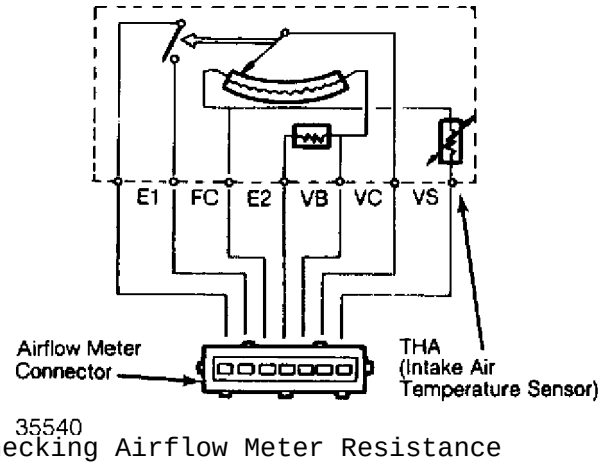


Fig. 7: Checking Airflow Meter Resistance

AIRFLOW MEASURING PLATE TEST

Using a screwdriver, depress measuring plate fully and measure resistance between terminals on airflow meter connector. See AIRFLOW MEASURING PLATE RESISTANCE table for resistance values.

AIRFLOW MEASURING PLATE RESISTANCE

Terminals	Ohms
E1 to FC	
Plate Fully Closed	No Continuity
Plate Fully Open	0
E2 to VS	
Plate Fully Closed	20-400
Plate Fully Open	20-1000

FUEL INJECTORS R & I

REMOVAL

1) Remove dynamic chamber assembly by removing air funnel, accelerator cable, throttle sensor connector, metering oil pump connecting rod and coolant hoses.
2) Disconnect negative battery cable, terminal cover, vacuum hoses, air supply valve connector and intake air temperature sensor connector.
3) Lift chamber assembly off of intake manifold and cover intake manifold ports. Remove delivery pipe from top of injectors and remove injectors.

INSTALLATION

Install new "O" rings on injectors and lubricate with gasoline. To install injectors, reverse removal procedure. Check for fuel leakage before installing dynamic chamber.

FUEL PUMP R & I

REMOVAL

1) Remove storage compartment located behind driver's seat. Disconnect fuel pump connector and raise vehicle on hoist.
2) Remove pump bracket clamp bolt. Disconnect and plug inlet and outlet hoses. Remove fuel pump from bracket.

INSTALLATION

To install, reverse removal procedure. Check for fuel leakage.

IDLE SPEED ADJUSTMENT

For complete adjustment procedures, see the ROTARY TUNE-UP article in the TUNE-UP section.

END OF ARTICLE

FUEL PUMP - ELECTRIC
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:48PM

ARTICLE BEGINNING

1984 Electric Fuel Pump
MAZDA

RX7, PICKUP

DESCRIPTION & OPERATION

Pulsating electric fuel pump is mounted near fuel tank on frame member. Power is supplied when ignition switch is in "RUN" position. This circuit is protected by a 15 amp fuse (20 amp on RX7) at fuse panel. In-line fuel filter must be changed within recommended mileage interval before performing tests. If in doubt, install new filter.

TESTING

PRESSURE TEST

Fuel Pump (Carburetted Models)
1) Remove air cleaner assembly and disconnect fuel line at carburetor. Connect pressure gauge with restrictor and a flexible hose. See Fig. 1. Disconnect connector from fuel pump cut relay and connect a jumper wire. See Fig. 2.
2) Turn ignition on and briefly vent the system into container by opening hose restrictor. Pressure should stabilize at 2.8-3.6 psi (.19-.25 kg/cm^2). If not within specifications, and lines and filter are in satisfactory condition, replace pump.

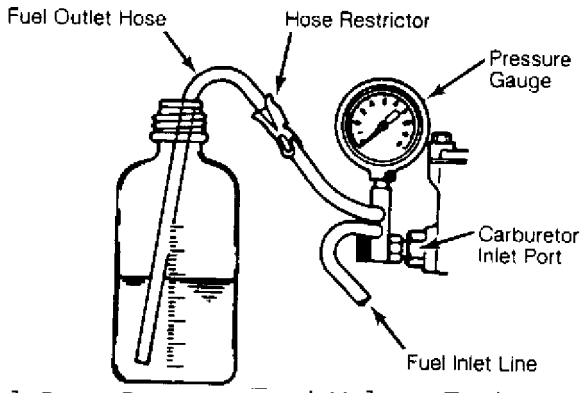


Fig. 1: Fuel Pump Pressure and Volume Test

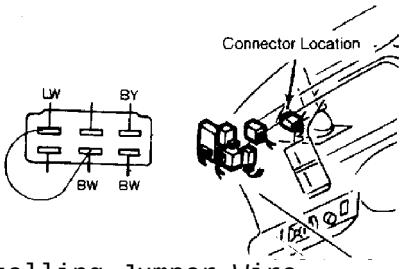


Fig. 2: Installing Jumper Wire

Fuel Pump (Fuel Injected Models)
1) Disconnect battery negative cable from battery. Disconnect

fuel main hose from fuel pipe. Connect a pressure gauge.

NOTE: Cover the hose with waste cloth since fuel is splashed out when disconnecting the hose.

2) Reconnect battery negative terminal. After turning ignition switch to "ON" position, short-circuit fuel pump short circuit terminal to start pump. See Fig. 3. Measure fuel pressure. Outlet pressure should be 49.8-71.1 psi (3.5-5 kg/cm^2).

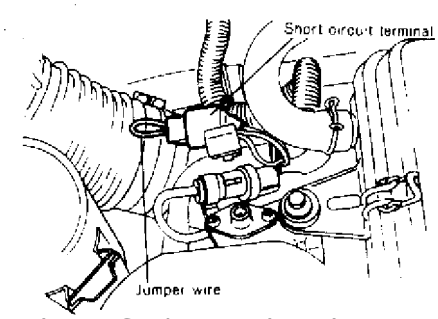


Fig. 3: Location of Short Circuit Terminal

Pressure Regulator (Fuel Injected Models)

1) Disconnect battery negative terminal. Disconnect fuel main hose from fuel pipe. Connect pressure gauge between fuel main hose and pipe by using 3-way joint.

NOTE: Cover hose with waste cloth since fuel is splashed out when disconnecting the hose.

2) Connect battery negative terminal, and start engine. Disconnect vacuum hose connected to pressure regulator at pressure regulator control valve. Measure fuel pressure at idle. Pressure should be 36.97 psi (2.6 kg/cm^2). Connect vacuum hose as it was, and measure fuel pressure. Pressure should be 28.44 psi (2.0 kg/cm^2).

VOLUME TEST

With fuel pressure within limits, open restrictor for one minute and measure fuel expelled. If not within specifications, check for restrictions in tank, line or filter. Replace pump if required.

FUEL PUMP VOLUME

Application	Volume Qt./Min. (cc/Min.)
RX7 (Carbureted Only)	1.5 (1400)
Pickup	0.8 (800)

REMOVAL & INSTALLATION

FUEL PUMP

Removal & Installation (B2000)

Disconnect negative battery cable. Unplug connector at fuel pump. Disconnect inlet and outlet hoses at fuel pump. Remove fuel pump-to-mounting bracket nuts and remove pump. To install, reverse removal procedure.

Removal & Installation (RX7)

Remove rear floor mat and disconnect fuel pump electrical lead. Raise and support vehicle. Remove fuel pump cover. Disconnect inlet and outlet hoses from pump. Remove fuel pump. To install, reverse removal procedure.

PRESSURE REGULATOR

Removal & Installation

1) Remove intake manifold. Disconnect vacuum hose and fuel return hose.

NOTE: Cover starter motor with waste cloth to absorb any fuel splashed on it.

2) Remove pressure regulator mounting nut and remove pressure regulator. To install, reverse removal procedure and check for fuel leaks.

END OF ARTICLE

IGNITION CONTROL SYSTEM - CARBURETED
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:49PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 CARBURETED MODELS
IGNITION CONTROL SYSTEM

DESCRIPTION

The Ignition Control system is used to regulate vacuum advance of leading and trailing distributor systems. In addition, this system helps reduce CO and HC emissions by aiding pellet converter warm-up during cold engine starts.

System consists of leading and trailing components of the distributor system, vacuum control solenoid valve and connecting wiring and tubing.

OPERATION

The Ignition Control system operates when engine is cold and running between 1000-1200 RPM and when engine is hot during quick deceleration from 3000 RPM.

TESTING

NOTE: For additional information and adjustments on distributor spark timing, see appropriate information in "Mazda RX7 Systems & Tune-Up Service Procedures," article in this section.

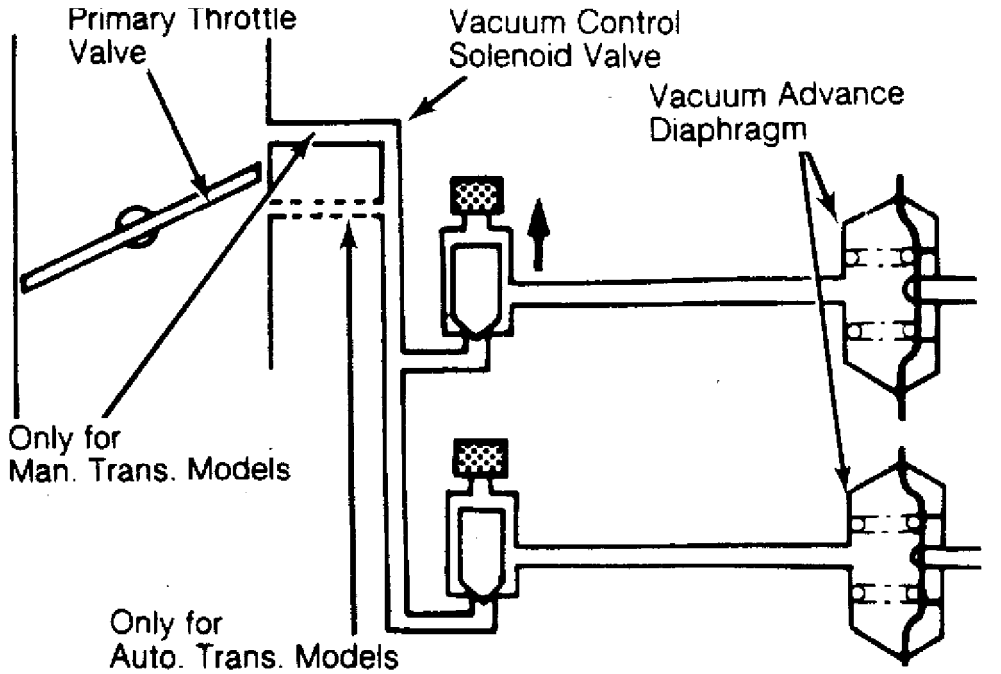


Fig. 1: Ignition Control System

VACUUM CONTROL SOLENOID VALVE
SIGNAL CHECK

Leading Vacuum Control
Solenoid Valve Signal

1) Warm up engine to normal operating temperature. Connect a tachometer to engine. Disconnect the vacuum sensing tube (from leading vacuum advance diaphragm to pipe) at the pipe. Place a finger over the pipe opening and make sure that air is not sucked into the pipe.

2) Gradually increase the engine speed and make sure that air is sucked into the pipe when the engine speed is 1000-2000 RPM or more. Decrease the engine speed from 4000 RPM rapidly and make sure air is not sucked into pipe while decelerating.

3) On vehicles with automatic transmissions, run the engine at idling speed and make sure that air is sucked into the pipe when the shift lever is in the "R", "D", "D1" or "D2" positions. On all models, disconnect the connector from the number 1 water temperature switch.

4) Connect a jumper wire to both terminals in the connector. Pull out the choke knob about .6" (15 mm) and make sure that air is not sucked into the pipe at any engine speed. Stop the engine and disconnect the connector for the number 2 water temperature switch on the radiator.

5) Pull the choke knob out about .6" (15 mm) and start the engine. Increase the engine speed and make sure that air is sucked into the pipe when the engine speed is 1000-2000 RPM or more.

Trailing Vacuum Control Solenoid
Valve Signal

1) Warm up engine to normal operating temperature. Connect a tachometer to engine. Disconnect the vacuum sensing tube (from trailing vacuum advance diaphragm to pipe) at the pipe. Place a finger over the pipe opening and make sure that air is not sucked into the pipe.

2) Gradually increase the engine speed and make sure that air is sucked into the pipe when the engine speed is 2900-3100 RPM or more. Decrease the engine speed from 4000 RPM rapidly and make sure air is not sucked into pipe while decelerating.

3) On vehicles with automatic transmissions, run the engine at idling speed and make sure that air is sucked into the pipe when the shift lever is in the "R", "D", "D1" or "D2" position. On all models, disconnect the connector from the number 1 water temperature switch and connect a jumper wire to both terminals in the connector.

4) Pull out the choke knob about .6" (15 mm) and make sure that air is not sucked into the pipe at any engine speed. Stop the engine and disconnect the connector for the number 2 water temperature switch on the radiator. Pull the choke knob out about .6" (15 mm) and start the engine. Increase the engine speed and make sure that air is sucked into the pipe when the engine speed is 1000-2000 RPM or more.

VACUUM SOLENOID VALVE

Leading Valve

1) Disconnect the vacuum solenoid sensing tubes from the solenoid valve and vacuum pipe. Blow through the solenoid valve from the vacuum sensing tube "B". Make sure the air passes through the valve and comes out the air filter "C".

2) Disconnect the connector from the leading vacuum control valve and connect battery power to terminals on the valve. Blow through the valve from the vacuum sensing tube "B". Make sure the air passes through the valve and comes out the port "A" of the valve.

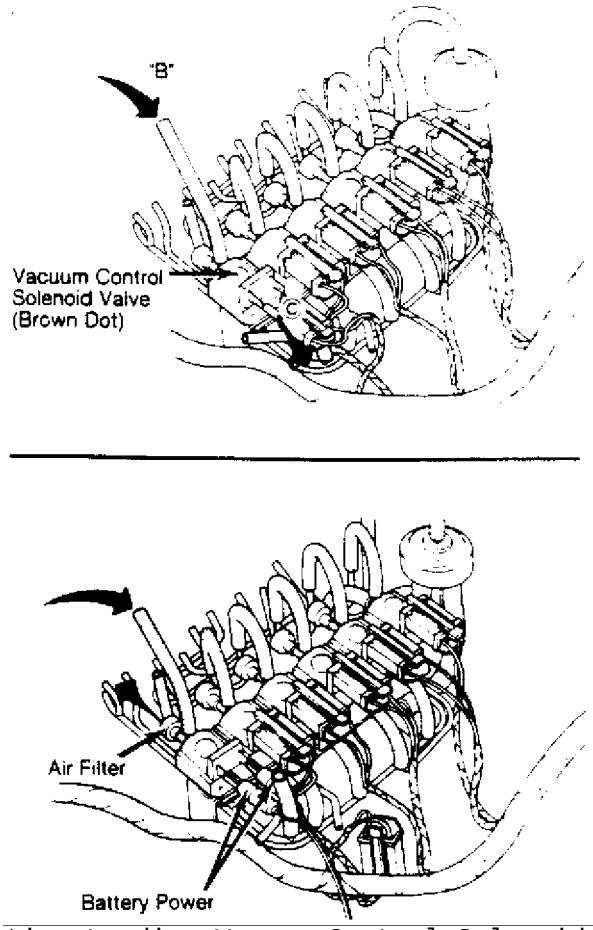


Fig. 2: Testing Leading Vacuum Control Solenoid Valve

Trailing Valve

1) Disconnect the vacuum solenoid sensing tubes from the solenoid valve and vacuum pipe. Blow through the solenoid valve from the vacuum sensing tube "B". Make sure the air passes through the valve and comes out the air filter "C".

2) Disconnect the connector from the trailing vacuum control valve and connect battery power to terminals on the valve. Blow through the valve from the vacuum sensing tube "B". Make sure the air passes through the valve and comes out the port "A" of the valve.

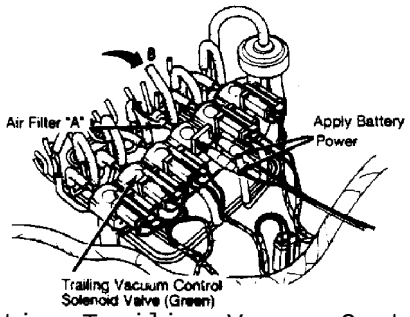


Fig. 3: Testing Trailing Vacuum Control Solenoid Valve

IGNITION CONTROL SYSTEM - EFI
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:49PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 FUEL INJECTED MODELS IGNITION CONTROL SYSTEM

DESCRIPTION

The Ignition Control system is used to regulate vacuum advance of leading and trailing distributor systems. In addition, this system helps reduce CO and HC emissions by aiding pellet converter warm-up during cold engine starts.

System consists of leading and trailing components of the distributor system, vacuum control solenoid valve and connecting wiring and tubing.

OPERATION

The Ignition Control system operates when engine is cold and running between 1000-1200 RPM and when engine is hot during quick deceleration from 3000 RPM.

TESTING

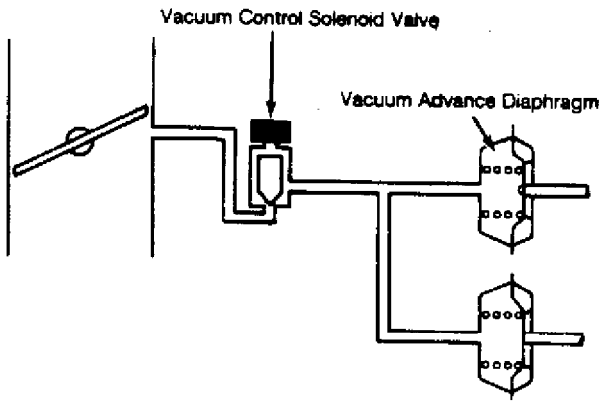


Fig. 1: Ignition Control System

VACUUM CONTROL SOLENOID VALVE

Checking for Signal

1) Warm up engine to normal operating temperature. Connect a tachometer to engine. Disconnect the vacuum sensing tube (from leading vacuum advance diaphragm to pipe) at pipe. Place a finger over pipe opening and make sure air is not sucked into pipe. See Fig. 2.

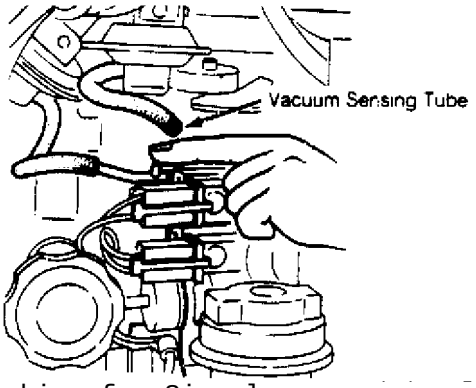


Fig. 2: Checking for Signal

2) Gradually increase engine speed and make sure air is sucked into pipe when engine speed is 1000-1200 RPM or more. Decrease the engine speed from 4000 RPM rapidly and make sure air is not sucked into pipe while decelerating. Turn A/C switch on and make sure air is sucked into pipe at idling speed.

Testing for Faulty Valve

1) Disconnect vacuum sensing tubes from solenoid valve and vacuum pipe. Blow through solenoid valve from port "B". Make sure air passes through valve and comes out from air filter "C". See Fig. 3.

2) Disconnect connector from vacuum control solenoid valve and connect battery power to terminals on valve. Blow through valve from port "B". Make sure air passes through valve and comes out from port "A" of valve.

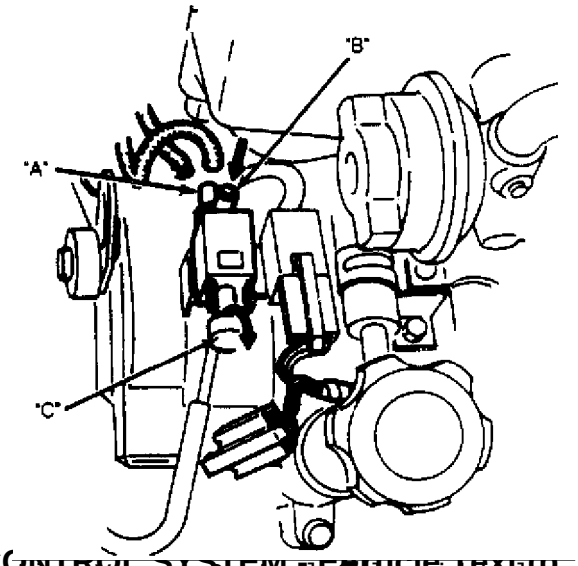


Fig. 3: Testing Vacuum Control Solenoid Valve

END OF ARTICLE

IGNITION SYSTEM
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:50PM

ARTICLE BEGINNING

1984 Distributors & Ignition Systems
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.

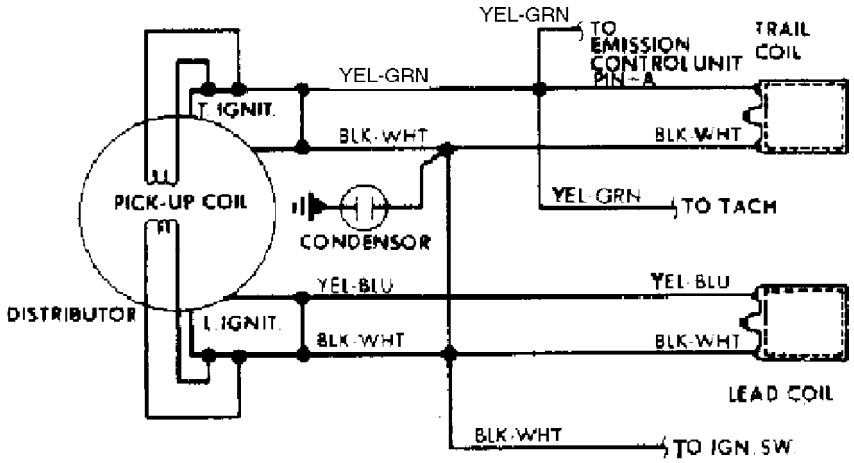


Fig. 1: Schematic of RX7 Ignition System

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.

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, as required.

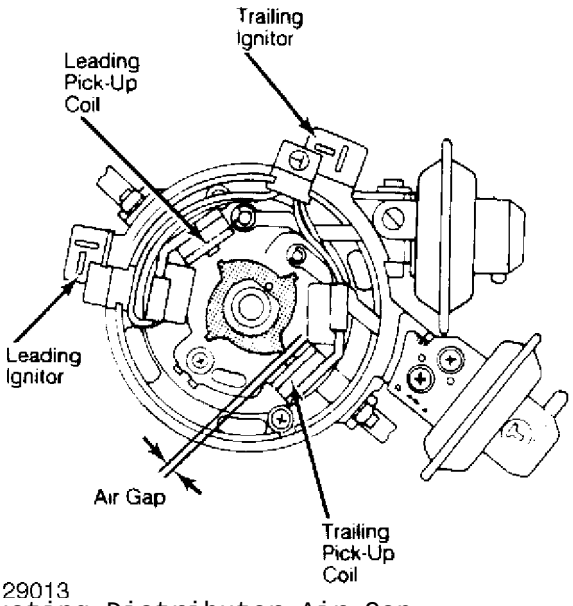


Fig. 2: Adjusting Distributor Air Gap
Check air gap at all teeth and both pick-up coils.

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.

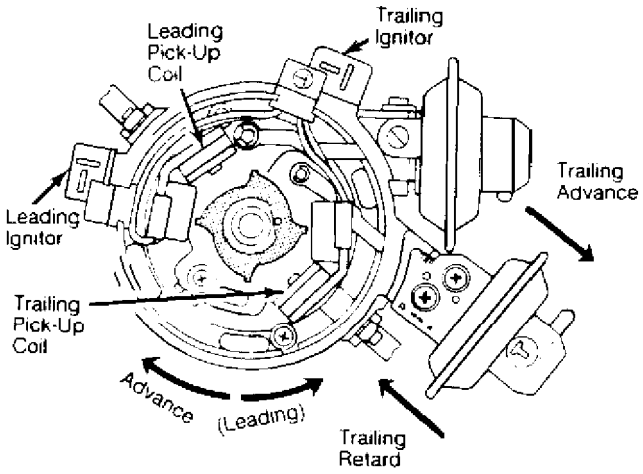


Fig. 3: Adjusting Ignition Timing
Distributor position determines leading timing. Vacuum unit position adjusts trailing timing.

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 (plus or minus 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.

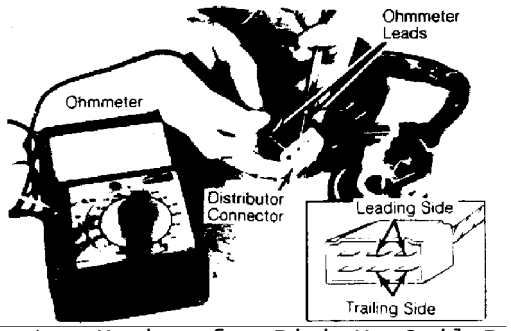


Fig. 4: Ohmmeter Hookup for Pick-Up Coil Resistance Check
Replace pick-up coil & bearing plate if reading is not 600-700 ohms.

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.

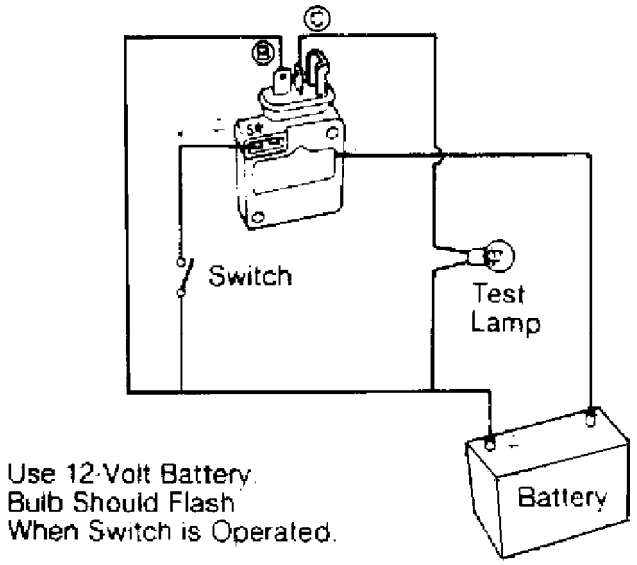


Fig. 5: Test Lamp Hookup for Checking Ignitor Operation
Bulbs should flash when switch is operated.

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.
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.

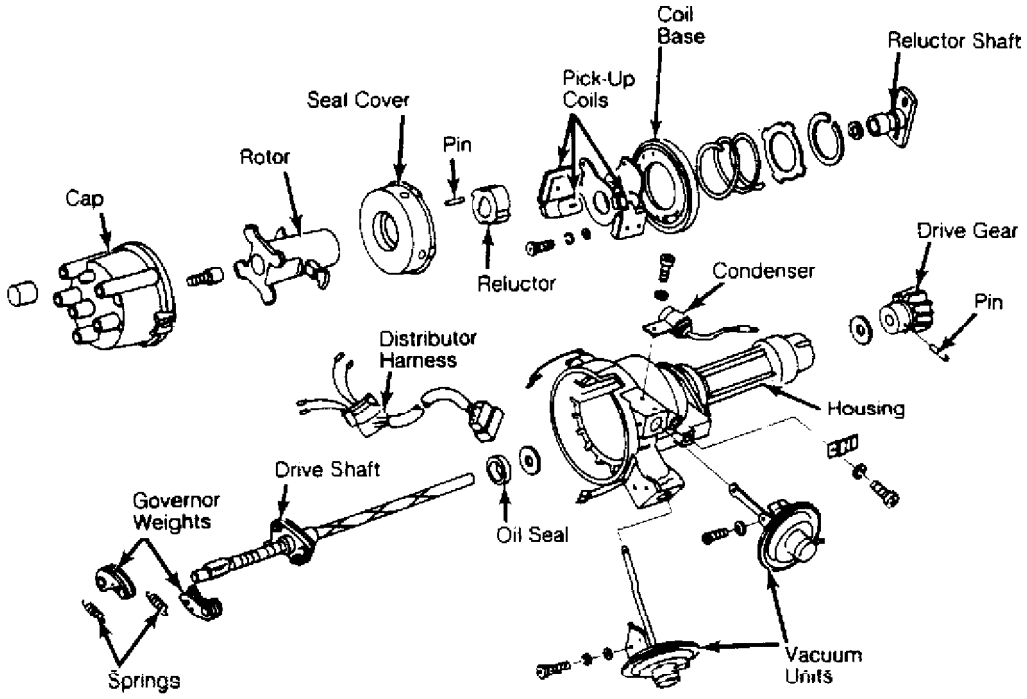


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Fig. 6: Disassembled View of RX7 Mitsubishi Distributor

END OF ARTICLE

MIXTURE CONTROL SYSTEM - CARBURETED MODELS
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:51PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 CARBURETED MODELS
MIXTURE CONTROL SYSTEM

RX7

DESCRIPTION

Mixture control system controls air/fuel mixture ratio to maintain optimum emission levels under a variety of operating conditions. System consists of richer solenoid, various air bleeds, altitude compensator and main air bleed control solenoid valve.

OPERATION

Signals from the electronic control unit (ECU) control the richer solenoid and main air bleed control solenoid valve to control fuel mixture.

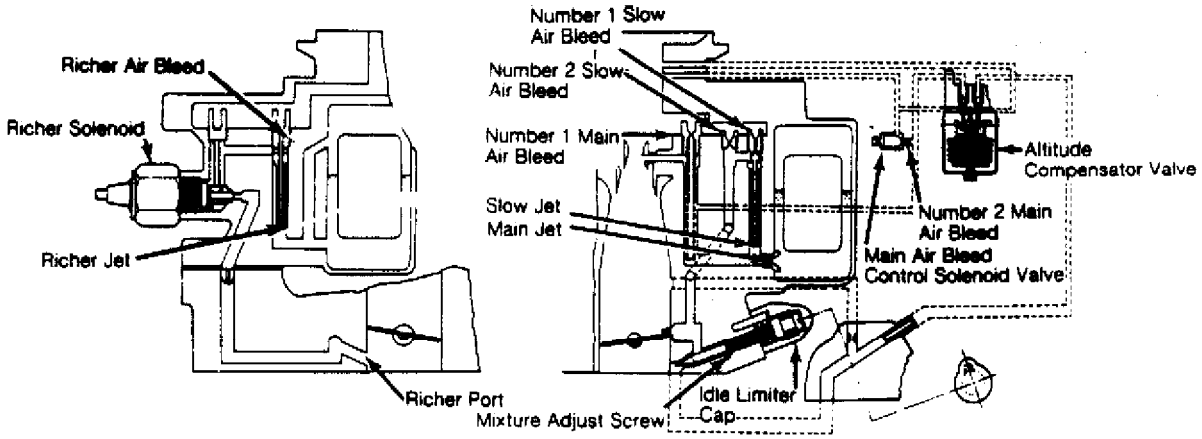


Fig. 1: Mixture Control System

TESTING

MAIN AIR BLEED CONTROL SOLENOID VALVE

1) Warm up engine and run at idling speed. Connect a tachometer to the engine. Disconnect the connector from the throttle sensor and connect a jumper wire to "A" and "C" terminals of the connector.

2) Connect a voltmeter to the main air bleed control solenoid (Brown) terminal and ground. Increase the engine speed and observe the meter reading. At any engine speed between idle and 3000 RPM, voltage should be approximately 12 volts.

3) Between 3000-4000 RPM, voltage should be below 2 volts. At more than 4000 RPM, voltage should be approximately 12 volts. Disconnect the jumper wire connected to "A" and "C" terminals and connect the connector to the throttle sensor.

4) Position the vehicle securely on a rolling road-tester. Increase the vehicle speed and observe the voltmeter reading. At speeds below 50 MPH, voltage should be approximately 12 volts. Above 50 MPH, voltage should be less than 2 volts.

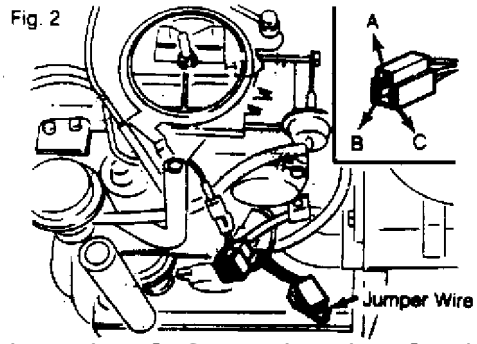


Fig. 2: Checking Signal for Main Air Bleed Control Solenoid Valve

RICHER SOLENOID VALVE SIGNAL

1) Start the engine and run at idle speed. Connect a voltmeter to the richer solenoid valve terminal and ground, and take reading. Voltage should be 12 volts. Increase the engine speed more than 1500 RPM and then decrease it.

2) Voltmeter should show below 2 volts for 30 seconds when the engine speed becomes 1100 RPM or less. Disconnect the vacuum sensing tube of the vacuum switch at the idle compensator and take a voltmeter reading. Voltage should be zero.

3) Reconnect the vacuum sensing tube to the idle compensator. Disconnect the connector for the clutch switch. Depress the clutch pedal and shift into first through fifth gears. Increase the engine speed more than 1500 RPM and then decrease it. Voltmeter should read 12 volts.

RICHER SOLENOID VALVE

Start the engine and run at idling speed. Ground the richer solenoid terminal and make sure a clicking sound can be heard.

VACUUM SWITCH

Remove the vacuum switch. Connect a vacuum pump to the vacuum switch. Connect an ohmmeter to the vacuum switch, and check continuity between terminals. With 0-4.7 in. Hg vacuum applied, switch should be open. With more than 4.7 in. Hg vacuum applied, switch should be closed.

CLUTCH SWITCH

Disconnect clutch switch connector. Connect an ohmmeter to the clutch switch, and check the continuity between the switch terminals. There should be continuity when pedal is depressed, and none when released.

NEUTRAL SWITCH

Disconnect neutral switch connector. Connect an ohmmeter to the switch, and check the continuity between the switch terminals. There should be continuity when transmission is in neutral range, and none when in other ranges.

END OF ARTICLE

PCV SYSTEM
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:52PM

ARTICLE BEGINNING

1984 Crankcase Ventilation
MAZDA

B2000, B2200, GLC, RX7 & 626

DESCRIPTION & OPERATION

PISTON ENGINE MODELS

Gasoline

The PCV system includes 2 hoses and a PCV valve. Crankcase vapors are normally drawn from valve cover through PCV valve and into intake manifold. A hose from the air cleaner to the valve cover supplies fresh air to the crankcase.

When intake manifold vacuum drops due to heavy loads, the amount of blow-by exceeds the capacity of the PCV valve. Air then flows directly from the valve cover into the air cleaner and carburetor. When engine is not running, the PCV valve is closed and vapors are stored in the crankcase.

Diesel

The crankcase ventilation system on diesel engines consists of a breather hose connecting an upper chamber in valve cover with air intake. Oil baffle plates are located in upper chamber of valve cover. Blow-by gases are fed into the air intake and prevented from entering the atmosphere. Servicing is limited to keeping breather hose and passages free of obstructions.

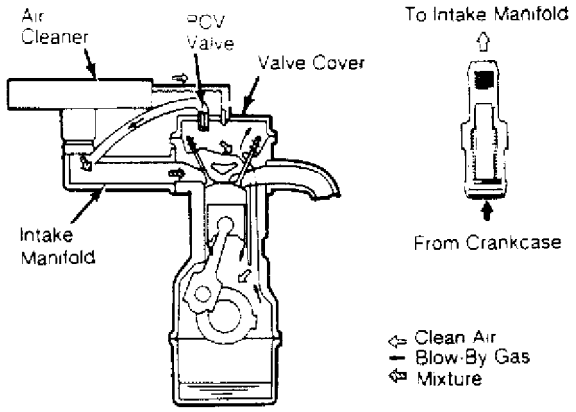


Fig. 1: 626 Crankcase Ventilation System
Note direction of flow.

ROTARY ENGINE MODELS

The crankcase ventilation system on the rotary engine (RX7) is an integral part of the fuel evaporation system. A vacuum operated purge valve directs crankcase, fuel tank, and canister vapors into intake manifold when the throttle is opened.

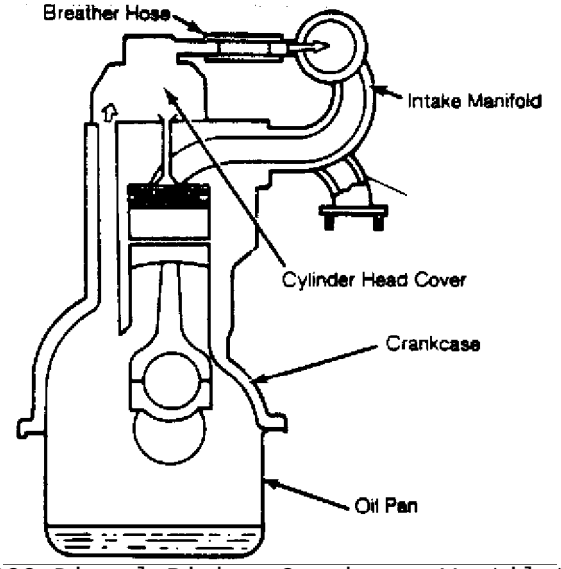


Fig. 2: B2200 Diesel Pickup Crankcase Ventilation System

TESTING

PISTON ENGINE MODELS

GLC

Remove PCV valve. Blow through valve with mouth pressure from valve cover side of valve. Air should pass through. Blow through valve from opposite end. Air should not pass through. If valve does not operate as described, replace valve.

626

With engine idling at normal operating temperature, remove PCV valve from valve cover. Close off valve opening with finger and check that idle speed drops. If idle speed does not drop, replace valve. See Fig. 3.

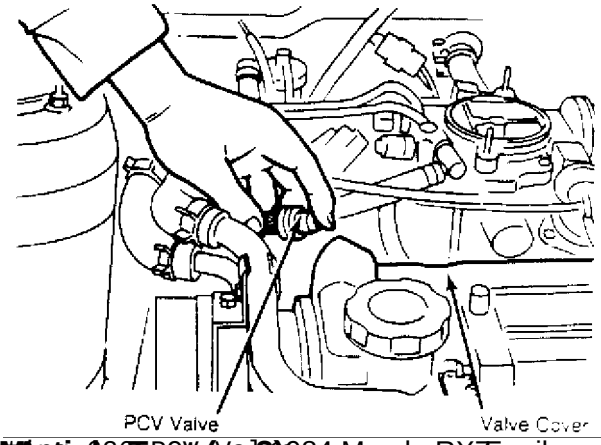


Fig. 3: 626 PCV Valve

PCV valve is connected to ventilation hose.

B2000

With engine at normal operating temperature and key off, remove hose from PCV valve. Run engine at idle and place finger over

the PCV valve inlet. If idle speed does not drop, replace PCV valve.

NOTE: To replace PCV valve on California models with automatic transmissions and on all Federal models, first remove carburetor. Carburetor removal is not necessary on other B2000 models.

ROTARY ENGINE MODELS

1) Disconnect purge valve-to-oil filler tube hose from purge valve. Start engine and run at idle speed. Place finger over open purge valve port and feel that no vacuum is present. See Fig. 4.
2) Increase engine speed to 2000 RPM and feel that vacuum is present at purge valve port. If valve does not operate as outlined, replace purge valve.

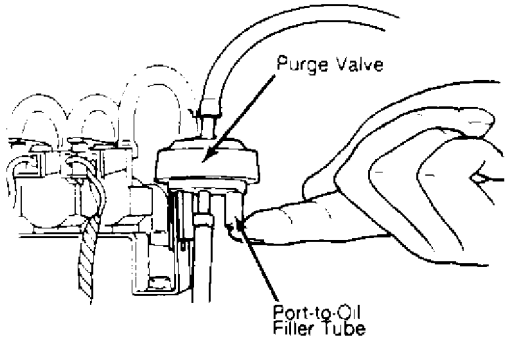


Fig. 4: RX7 Rotary Engine Purge Valve
Check air flow at port leading to oil filler tube.

MAINTENANCE

Check PCV system operation every 30,000 miles or 30 months.

END OF ARTICLE

VACUUM DIAGRAMS
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:52PM

ARTICLE BEGINNING

1984 Exhaust Emission Systems
MAZDA RX7 VACUUM DIAGRAMS

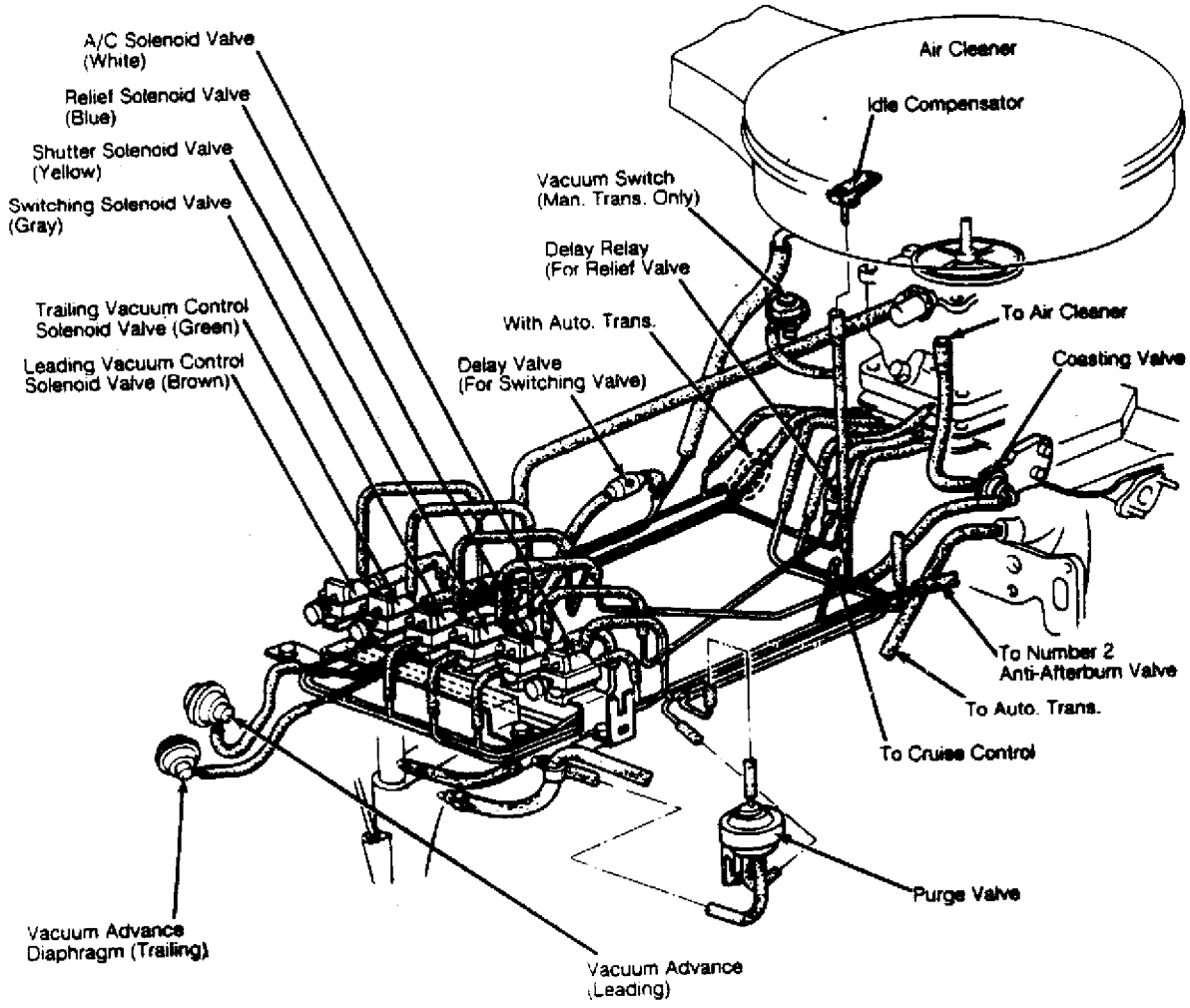


Fig. 1: Vacuum Diagram For Carbureted RX7 Models

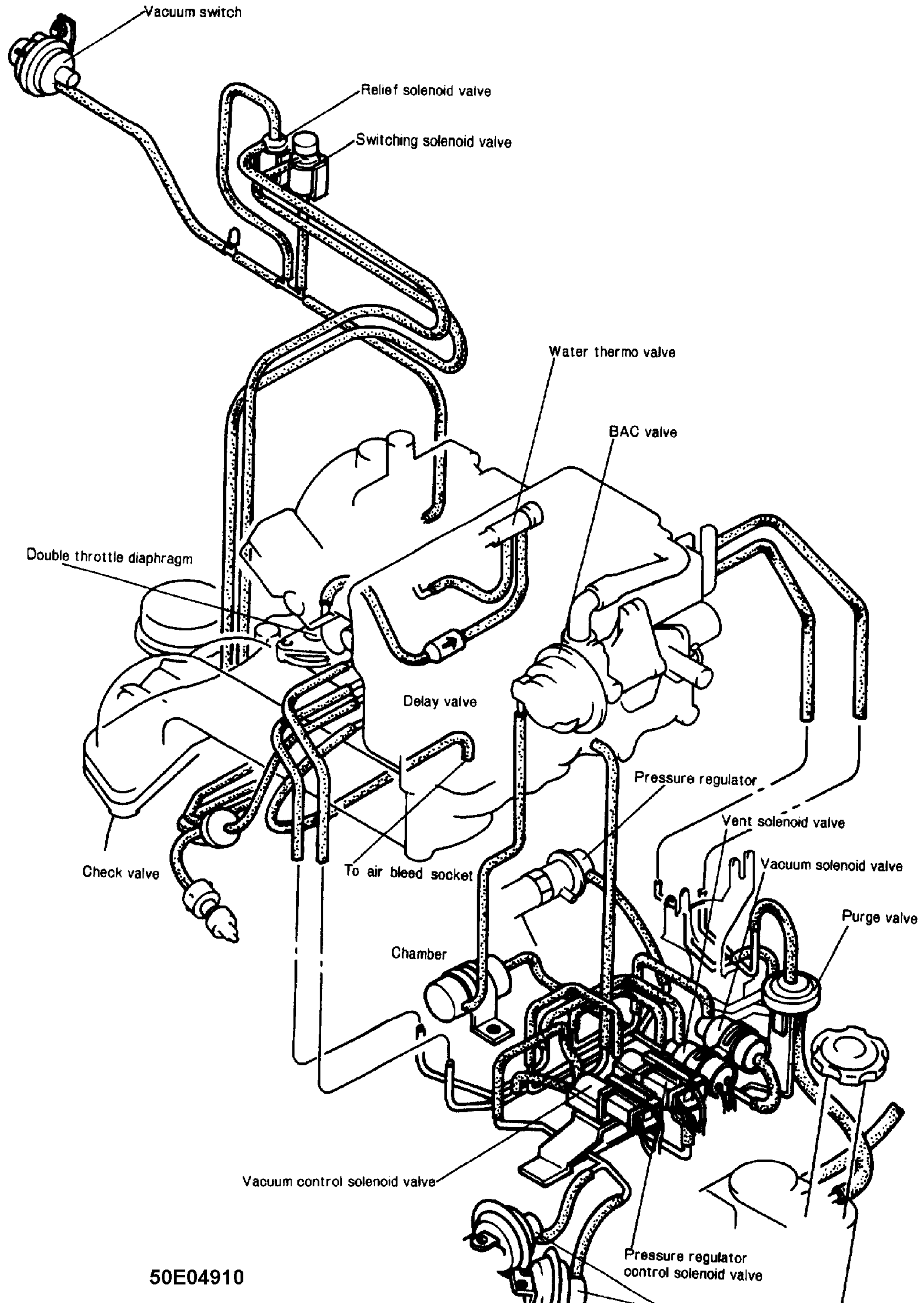


Fig. 2: Vacuum Diagram For Fuel Injected RX7 Models

END OF ARTICLE

TUNE-UP - ROTARY
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:52PM

ARTICLE BEGINNING

1984 Mazda Rotary Tune-Up
TUNE-UP

RX7

IDENTIFICATION

ENGINE IDENTIFICATION

The RX7 will have one of two engines, a carbureted model and a EGI (Electronic Gasoline Injection) model, regulated by a computer. The engine code for both models is stamped on the rear rotor housing, to the rear of the oil filter. The engine serial number is stamped on the front rotor housing behind the distributor.

ENGINE CODE

Application	Code
1.1L Carbureted	12A
1.3L Fuel Injected	13B

TESTING

ENGINE COMPRESSION

The manufacturer recommends using a special compression tester (49 0820 280K or 49 H075 280). Compression testers for piston engines will read only the highest pressure of the 3 combustion chambers in the rotor housing.

Warm engine to operating temperature. On 12A engine, remove both trailing spark plugs. On 13B engine remove trailing spark plug on chamber being tested only.

COMPRESSION SPECIFICATIONS TABLE

Application	Specification
Min. Compression Pressure	85 psi (6.0 kg/cm²)
Max. Variation	21 psi (1.5 kg/cm²)
Compression Ratio	9.4:1

SPARK PLUGS

SPARK PLUG TYPE

Nippondenso No.	NGK No.
W25EDR14	BR8EQ14

SPARK PLUG SPECIFICATIONS TABLE

Gap: In. (mm)	Torque: Ft. Lbs. (N.m)
0.055 (1.4)	11 (15)

HIGH TENSION WIRE RESISTANCE

Carefully remove high tension wires from spark plugs and distributor cap. Using an ohmmeter, measure resistance of wires while gently twisting wires. If resistance is not to specifications, or fluctuates from infinity to any value, replace high tension wire(s).

HIGH TENSION WIRE RESISTANCE

Application	Ohms
All Models	4880 per Foot

ADJUSTMENTS

DISTRIBUTOR

All models are equipped with Mitsubishi electronic ignition with 2 pickup coils. Air gap is nonadjustable.

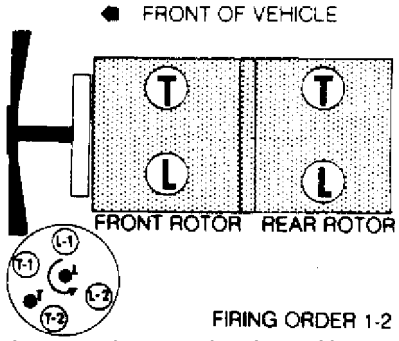


Fig. 1: Firing Order and Distributor Rotation

IGNITION TIMING

NOTE: On vehicles equipped with automatic transmission, block the wheels and place selector lever in "D" position.

1) Warm engine to normal operating temperature. Connect a tachometer, then connect timing light to leading (lower) spark plug of front rotor. Start engine and run at idle speed.

2) Aim timing light at timing indicator pin on front cover and check ignition timing. Rotate distributor to correct timing, if necessary. Tighten distributor lock nut and recheck timing.

3) Connect timing light to trailing (upper) plug of front rotor. Start engine and check timing. If not correct, loosen vacuum unit attaching screws. Move vacuum unit in or out to adjust trailing timing. Remove test equipment.

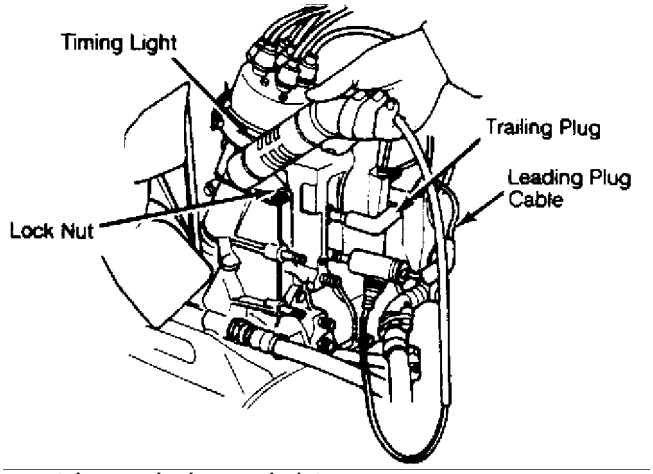


Fig. 2: Connecting Timing Light
Check leading plug timing first.

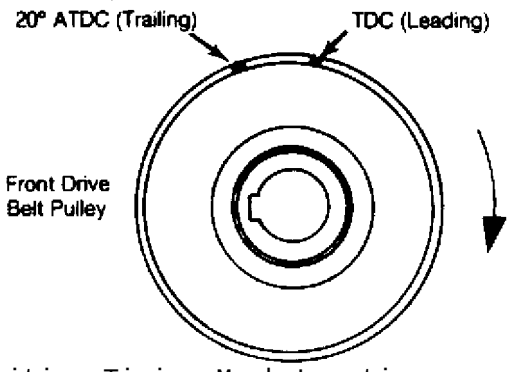


Fig. 3: Ignition Timing Mark Location

IGNITION TIMING (ATDC @ 800 RPM)

Application	Timing
Leading	
Carbureted Models	0°
Fuel Injected Models	5°
Trailing	
Carbureted Models	20°
Fuel Injected Models	20°

IDLE SPEED

Carbureted Models

1) Switch off all accessories. Remove fuel filler cap. Disconnect and plug idle compensator tube at air cleaner. Connect tachometer to engine. Ensure parking brake is engaged and wheels are blocked.

2) On manual transmission models, make sure dashpot rod does not keep throttle lever from returning to stop. On air conditioned models, make sure throttle opener does not keep throttle lever from returning to stop.

3) Warm engine to normal operating temperature. Place automatic transmission in "D". Check idle speed. Adjust curb idle speed to specification by turning throttle adjusting screw.

Fuel Injected Models

1) Turn off all accessories. Connect a tachometer to engine. Ensure parking brake is engaged and wheels are blocked. Remove fuel filler cap. Warm up engine until it reaches normal operating temperature.

2) Check and adjust throttle sensor before adjusting idle speed. Disconnect vent and vacuum solenoid harness connector located near oil filler hole. See Fig. 4.

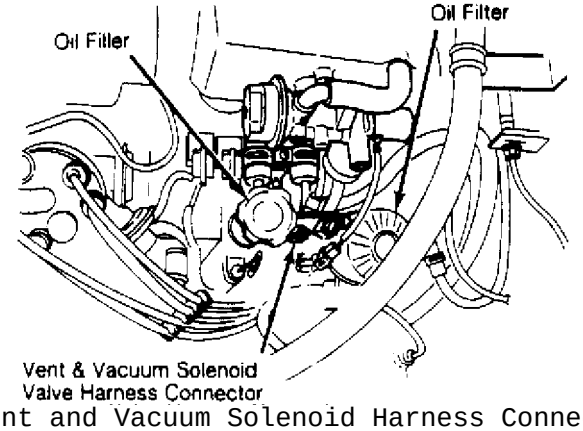


Fig. 4: Vent and Vacuum Solenoid Harness Connector
Disconnect harness before adjusting idle speed on EFI Models.

3) Place transmission in Neutral and check idle speed. Adjust idle speed by removing plug and turning air adjusting screw. See Fig. 5. After adjustment, reinstall plug and reconnect vent and vacuum solenoid harness connector. Install fuel filler cap and remove tachometer.

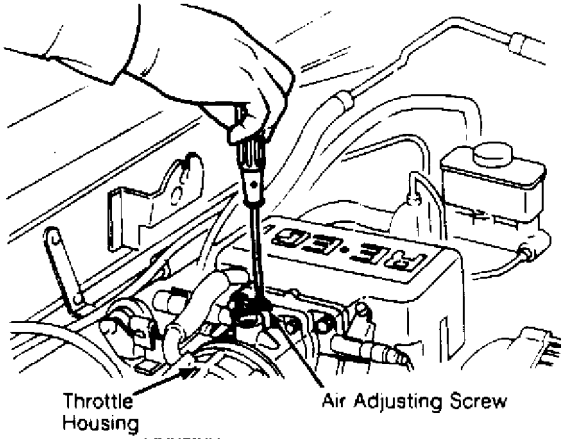


Fig. 5: Adjusting Idle Speed on Fuel Injected Models
Remove plug and turn air adjusting screw to obtain idle speed.

IDLE SPEED

Application	RPM
Carbureted Models	(1) 750
Fuel Injected Models	800

(1) - Man. Trans. in Neutral & Auto. Trans. in "D".

IDLE MIXTURE

NOTE: Mixture adjustment is not part of normal tune-up procedure and should not be performed unless carburetor is overhauled or vehicle fails emissions testing.

Carbureted Models

1) Idle mixture adjustment requires removal of carburetor to remove limiter cap. Using a hacksaw, cut through limiter cap and mixture screw 0.4" (10 mm) from cap end. Remove mixture screw and install new mixture screw.

2) To install new mixture screw, tighten screw lightly and ensure it is fully seated. Back screw out 3 turns for preliminary adjustment. Reinstall carburetor with new gaskets and warm engine to normal operating temperature.

3) To adjust idle mixture, set idle speed to idle set specification by turning throttle set screw (automatic transmission in "N"). Set idle speed to highest RPM obtainable by turning mixture screw. Reset idle speed to idle set specification by turning throttle screw. See Fig. 6.

4) Turn mixture screw until lean drop specification is obtained (automatic transmission in "N"). On automatic transmission, shift transmission to "D" and set idle speed to curb idle specification by turning throttle screw.

MIXTURE ADJUSTMENT (CARBURETED MODELS ONLY)

Application	Idle Set RPM	Lean Drop RPM
Man. Trans.	770	750
Auto. Trans. (1)	870	840

(1) - Transmission in Neutral.

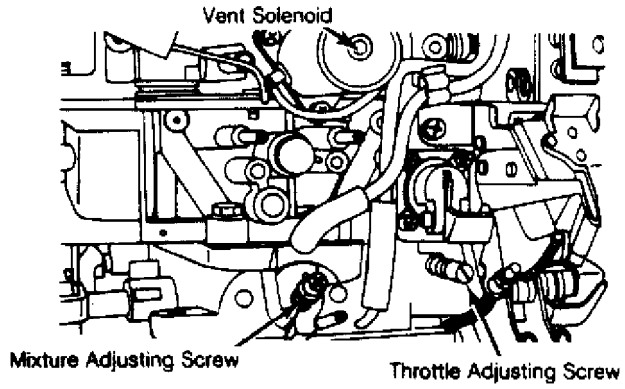


Fig. 6: Carburetor Adjusting Screw Locations

Fuel Injected Models

1) With ignition off, disconnect harness connector at variable resistor on airflow meter and connect ohmmeter leads to variable resistor. If resistance is not 500-4500 ohms between terminals A-C and B-C, replace resistor and adjust mixture.

2) Switch off all accessories. Remove fuel filler cap and connect tachometer to engine. Warm engine to operating temperature. Check and adjust throttle sensor as required. Disconnect vent and vacuum solenoid valve harness connector. See Fig. 4.

3) Adjust idle speed by turning air adjusting screw. Turn

variable resistor to obtain highest idle speed. Turn air adjusting screw to set idle speed. Turn variable resistor counterclockwise until idle speed is 780 RPM and then turn resistor clockwise until idle speed is 800 RPM.

4) Connect vent and vacuum solenoid harness. Install plug over air adjusting screw. Fill space above variable resistor screw with adhesive (N304 23 795). Remove tachometer and install fuel filler cap.

THROTTLE SENSOR

Carbureted Models

1) Warm engine to normal operating temperature. Stop engine and connect tachometer. Disconnect Brown connector under air cleaner on carbon canister side of engine.

2) Using 2 voltmeters or 12-volt, 3-watt bulbs, connect negative lead of each voltmeter to each terminal in connector. Connect positive leads to "B" terminal of alternator. See Fig. 7.

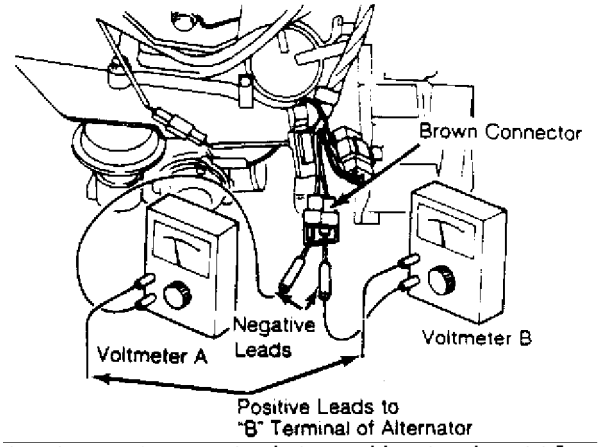


Fig. 7: Voltmeters Connected to Adjust Throttle Sensor
This applies only to carbureted models.

3) Start engine. Quickly decelerate engine from 3000 RPM and make sure that current flows to both voltmeters or bulbs at the same time. If current does not flow at the same time, adjust throttle sensor.

4) To adjust sensor, remove cap from adjusting screw. Adjust timing of current flowing to voltmeter "A" in Fig. 7 by turning adjusting screw. Turning screw clockwise causes current to flow earlier and turning screw counterclockwise causes current to flow later. See Fig. 8.

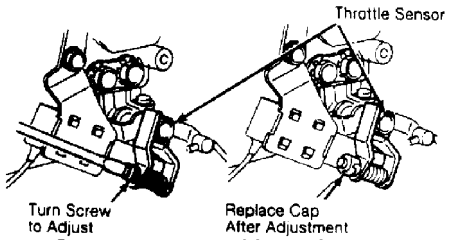


Fig. 8: Throttle Sensor Adjusting Screw Location
This applies to carbureted models.

5) After adjustment, install cap over throttle sensor adjusting screw. Remove voltmeters and reconnect Brown connector.

Remove tachometer.

Fuel Injected Models

1) Warm engine to operating temperature. Stop engine and disconnect Green connector. Using 2 voltmeters, connect leads to Green connector terminals. See Fig. 9. Turn ignition on and observe voltmeters. Current should flow to 1 of the voltmeters.

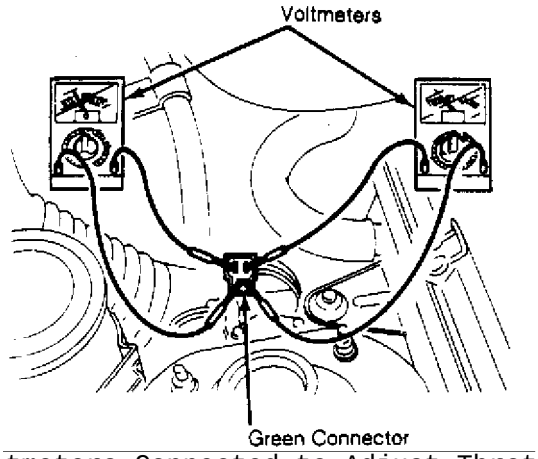


Fig. 9: Voltmeters Connected to Adjust Throttle Sensor
This applies to fuel injected models.

2) If current flows to both voltmeters, remove throttle sensor adjusting screw cap and turn adjusting screw counterclockwise. If current does not flow to either voltmeter, turn adjusting screw clockwise. See Fig. 10. Remove test equipment. Reconnect Green connector and insert cap over throttle adjusting screw.

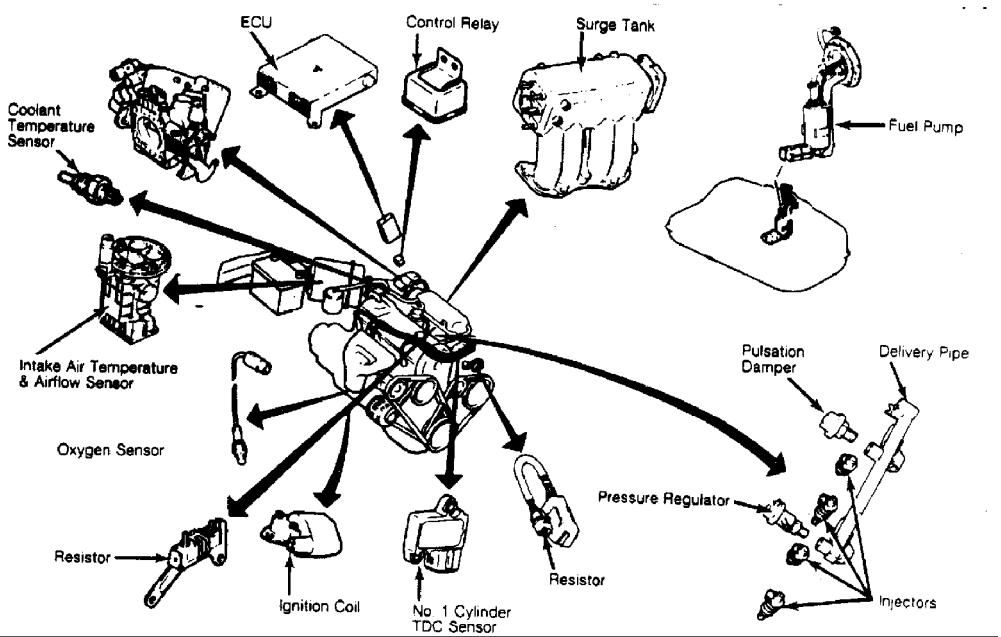


Fig. 10: Adjusting Throttle Sensor
Turn adjusting screw to adjust current flow to voltmeters.

COLD (FAST) IDLE RPM

NOTE: Carburetor must be removed to check and/or adjust fast idle.

Carbureted Models Only
Adjust fast idle by setting angle of primary throttle valve with choke valve fully closed. Clearance between primary throttle valve and throttle bore should be .040-.047" (1.0-1.2 mm). If not to specification, bend fast idle rod until correct clearance is obtained.

SERVICING

EMISSION CONTROL

See EMISSIONS section.

SPECIFICATIONS

IGNITION

Distributor
All models are equipped with Mitsubishi electronic ignition with 2 pickup coils. Air gap is nonadjustable.

IGNITION COIL RESISTANCE - OHMS @ 68°F (20°C)

Application	Primary	Secondary
All Models	.9	N/A

FUEL SYSTEM

FUEL PUMP PERFORMANCE

Application	Pressure: psi (kg/cm²)	Volume in 30 Sec.: Pints (L)
Carbureted	2.8-3.6 (.2-.3)	3.0 (1.4)
Fuel Injected	49.8-71.1 (3.5-5.0)	3.6 (1.7)

Carburetor
Carbureted models use a Nikki 4-Bbl. carburetor.

Fuel Injection
Fuel injected models employ the EGI (Electronic Gasoline Injection) system.

BATTERY

BATTERY SPECIFICATIONS TABLE

Application	Amp Hr. Capacity
Standard	50
Optional	55

STARTER

All models are equipped with a Mitsubishi starter using an overrunning clutch.

STARTER SPECIFICATIONS TABLE

Application	Volts	Amps	Test RPM
Man. Trans.	11.5	60	6500
Auto. Trans.	11.5	100	3500

ALTERNATOR

All models are equipped with a Mitsubishi alternator.

ALTERNATOR SPECIFICATIONS TABLE

Application	Rated Amp Output
All Models	50

ALTERNATOR REGULATOR

All models are equipped with a Mitsubishi voltage regulator.

REGULATOR OPERATING VOLTAGE @ 68°F (20°C)

Application	Voltage
All Models	13.5

BELT ADJUSTMENT

BELT ADJUSTMENT

Application	(1) Deflection In. (mm)
Alternator Belt	.5-.7 (13-17)
Air Pump Belt	.43-.51 (11-13)
A/C Belt	.39-.47 (10-12)
Pwr. Stg. Belt	.39-.47 (10-12)

(1) - Deflection is with 22 lbs. (10 kg) pressure applied midway on longest belt run.

INTERVALS

REPLACEMENT INTERVALS

Component	Interval (Miles)
Engine Oil	7500
Oil Filter	(1) 15,000
Air Filter	30,000
Spark Plugs	30,000

(1) - Every 7500 miles under severe conditions.

CAPACITIES

FLUID CAPACITIES

Application	Quantity
Crankcase (Includes Filter)	
Carbureted Models	4.9 qts. (4.6L)
Fuel Injected Models	5.8 qts. (5.6L)
Cooling System (Includes Heater)	10.0 qts. (9.5L)
Man. Trans. (SAE 90)	1.8 qts. (1.7L)
Auto Trans. (ATF Type F)	7.9 qts. (7.5L)
Rear Axle (SAE 90)	
Standard	2.6 pts. (1.2L)
Limited Slip	3.4 pts. (1.6L)
Fuel Tank	16.4 gals. (63L)

END OF ARTICLE

1.2L ENG NO POWER/STUMBLE/ROUGH IDLE/BUCKING CAT. 4, NO. 014/85
Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:54PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

APPLICATION

1981-85 RX7 (High Altitude Vehicles)

SUBJECT

No Power, Stumble, Rough Idle, Bucking, Etc.

REFERENCE

Mazda Motors Corp., Service Bulletin, No. 4 014/85, August, 1985

CONDITION & CAUSE

Some 1981-85 RX7 high altitude vehicles may exhibit one or more of the following driveability problems:

* Lack of acceleration, hesitation on acceleration
* No power under load
* Engine stumble, surge or bucking below approximately 3000 RPM
* Rough idle

One or more of the above conditions may be caused by the altitude compensator valve. The altitude compensator valve is attached to the carburetor to supply additional air into the carburetor at high altitudes (1640-4920 ft.)

REPAIR

1) Remove the altitude compensator valve. Blow through the valve from port "A" and "B". Above 4920 feet, air from port "A" should exit from port "D" and air into port "B" exits from port "C".
2) Below 1640 feet air should not pass through valve. If not, replace the altitude compensator valve (N249 20 770).

END OF ARTICLE

1.2L HARD CRANK/NO START - CARBON IN ROTOR/HOUSING CAT. 1, NO. 103/83
Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:55PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

HARD CRANKING

Models	RX7
Bulletin No.	103/83
Category	1
Date	5/7/83
Symptom	Hard Cranking/No Start

DESCRIPTION

If RX-7 vehicles have not been in use for a long period of time and the engine is cranked with a weak battery, hard cranking may occur due to carbon trap.

When the vehicles have been stored for such a long period of time carbon accumulated on the rotor surface may be flaked off, and it can be trapped between the rotor and rotor housing by the sweeping motion of the apex seals only when the engine is started. It will not occur when the engine is running.

To verify carbon trap, the following two conditions must be confirmed:

l) The problem occurred when the engine was started.
2) The apex seal can be observed through one of the leading spark plug holes. (If carbon trap occurs, the rotor will always stop at this location).

If carbon trap is verified, please use the following procedure:

Procedure:

I. For vehicles with manual transmission:
   1) Disconnect the negative battery cable and remove the spark plugs.
   2) Hoist the vehicle, remove the starter and install the Flywheel Turning Tool, P/N 49FA 42 065. This special tool is newly established for vehicles with manual transmission.
   3) Turn the Flywheel Turning Tool counterclockwise (as shown in Fig. 1 until the force is reduced considerably).

CAUTION: Do not turn the Flywheel in the direction of normal engine rotation.

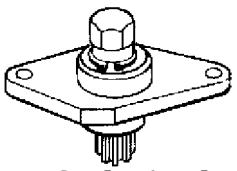


Fig. 1: View of Flywheel Turning tool (49FA 42 065)

4) Remove the special tool (Fig. 2) and reinstall the starter.

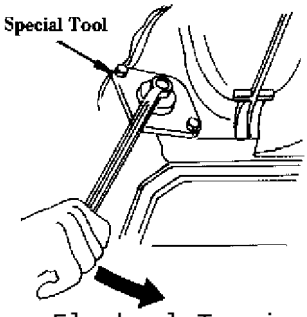


Fig. 2: Using Flywheel Turning Tool

5) Lower the vehicle. Turn the front pulley clockwise, facing the rear of the car, with a l9mm wrench. At the same time, inject 20-30 cc of engine oil through carburetor. Do not exceed the specified quantity of oil.
6) Turn the engine approximately five (5) revolutions to make certain the engine rotates freely.

NOTE: Do not use the starter to rotate the engine.

7) Install the spark plugs.
8) Check that the battery is fully charged.
9) Start the engine and warm up to normal operating temperature.
10) Stop the engine. Remove the spark plugs and check compression. If the compression is over 6.0 kg/cm^2, the repair is completed.

II. For vehicles with automatic transmission:
1) Disconnect the negative battery cable and remove the spark plugs.
2) Remove the inspection plate from the converter housing. (Fig. 3).

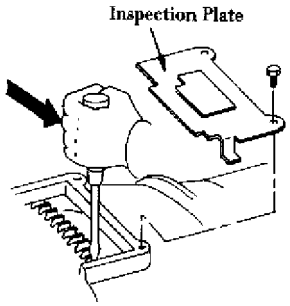


Fig. 3: Removing Inspection Plate From Convertor Housing

3) Insert a standard screwdriver through the inspection hole. Turn the flywheel by prying against the flywheel teeth and converter housing as shown until the force is reduced considerably.

CAUTION: Do not turn the flywheel in the direction of normal engine rotation.

4) Follow the procedure in I, steps 5-10.

END OF ARTICLE

1.3L ENG NO START/BLOWN FUSE - SHORT IN WIRE HARNESS CAT. 15, NO. 012/85

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:55PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

APPLICATION

1979-84 RX7

SUBJECT

"ENGINE" Fuse Blows/No Start

REFERENCE

Mazda Motors Corp., Service Bulletin, No. 15 012/85, September, 1985

CONDITION & CAUSE

Some 1979-84 RX7 vehicles may exhibit an "ENGINE" fuse that blows, preventing the engine from starting. This problem may be caused by an electrical short circuit in the wiring harness.

REPAIR

Check for a short circuit in the wire harness in the area of the thermostat and air hose to the air cleaner. See Fig. 1.

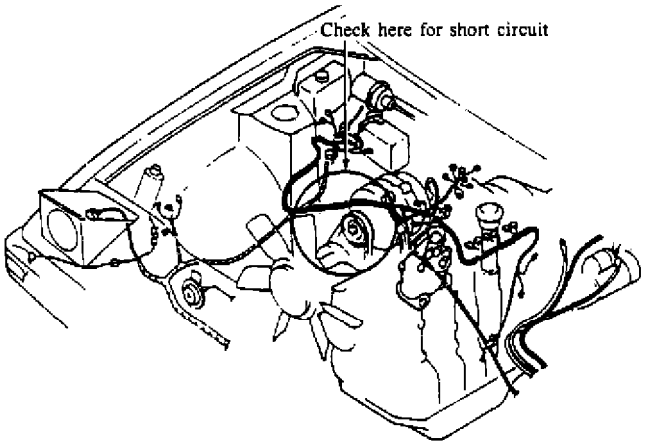


Fig. 1: View of Wiring Harness

END OF ARTICLE

1.3L ENG SECONDARY AIR CONTROL SYSTEM MODIFICATION CAT. 4, NO. 002/84
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:56PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

SECONDARY AIR CONTROL SYSTEM MODIFICATION

Model: 1984 RX-7 (12A)
Bulletin No.: 002/84
Date: 7/13/84
Category: 4

DESCRIPTION

The Secondary Air Control System has been modified since the production date of March 1984.

Now air is injected behind the No. 1 pre-month converter when the Port Air Switching Valve (newly added to the Air Control Valve) is open. Port and split air operation remain the same as previous years.

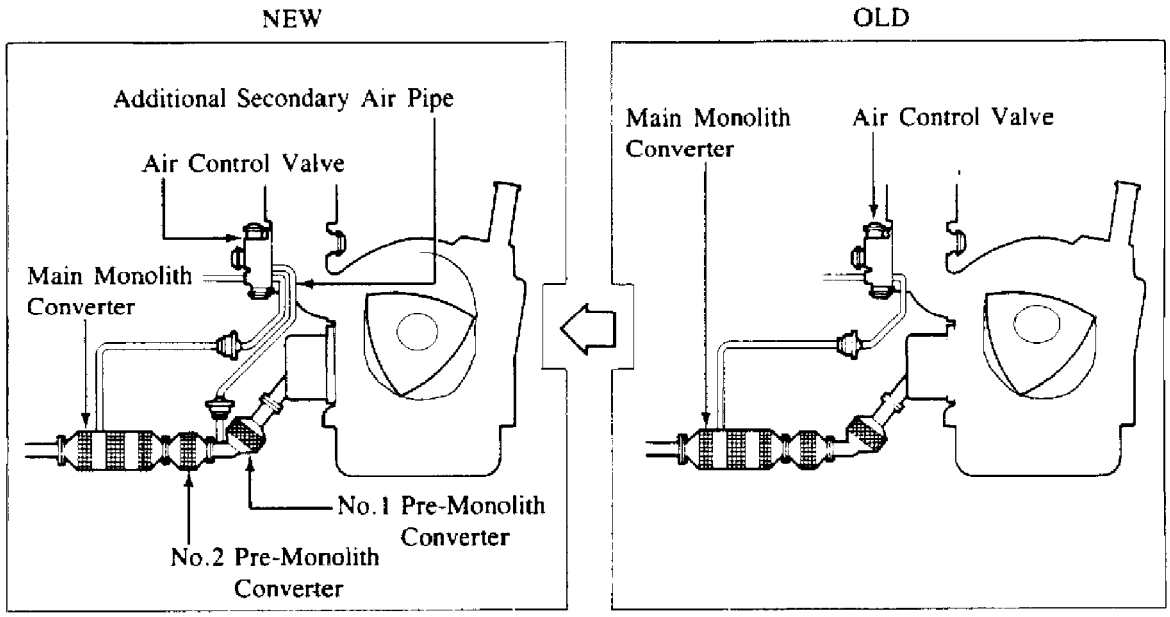


Fig. 1: Secondary Air Control System Modification

OPERATION

The Port Air Switching Valve will open between 3,000-4,000 rpm or above 50 mph.

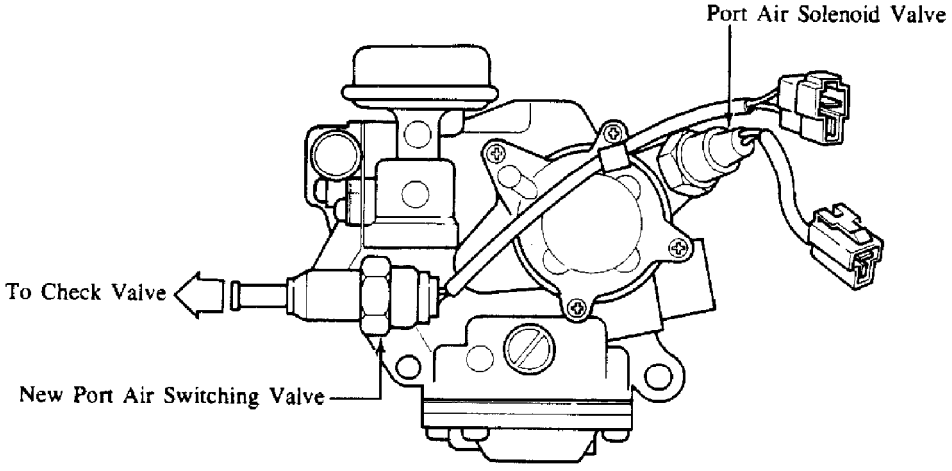
VIN OF PRODUCTION CHANGE

RX-7 (12A): JMIFB331 E0824687 March, 1984

PARTS INFORMATION

PART NUMBER		DESCRIPTION	QTY	INTERCHANGEABILITY	APPLIED MODEL
NEW	OLD				
N249 13 720B	N249 13 720A	Air Control Valve	1	NO	M/T (Federal)
N250 13 720A	N250 13 720	Air Control Valve	1	NO	A/T (Federal)
N251 13 720B	N251 13 720A	Air Control Valve	1	NO	M/T (California)
N252 13 720A	N252 13 720	Air Control Valve	1	NO	A/T (California)
N249 18 941D	N249 18 941C	Control Unit	1	NEW → OLD	M/T
N250 18 941C	N250 18 941B	Control Unit	1	NEW → OLD	A/T
N249 18 051F	N249 18 051E	Engine Wiring	1	NEW → OLD	
N250 20 725	–	Solenoid Valve	1	NO	
N249 40 718	–	Air Hose	1	NO	
N249 40 720	–	Air Pipe	1	NO	
N249 40 780C	N249 40 780B	No.1 Pre-Converter	1	NO	
N304 40 814E	N304 40 814D	Protector	1	NEW → OLD	M/T
N250 40 814E	N250 40 814D	Protector	1	NEW → OLD	A/T
FA54 67 010K	FA54 67 010J	Front Harness	1	NEW → OLD	

Fig. 2: Parts Information Table



Air Control Valve

Fig. 3: Air Control Valve Assembly

1.3L ENG SE... 2/84 Available Text (p...

CHECKING PROCEDURE

PORT AIR SWITCHING VALVE

Checking Port Air Switching Valve:
1. Warm up the engine and run it at idling speed.

2. Connect a tachometer to the engine.

3. Disconnect the connector from the throttle sensor and connect a jumper wire to A and C terminals of the connector.

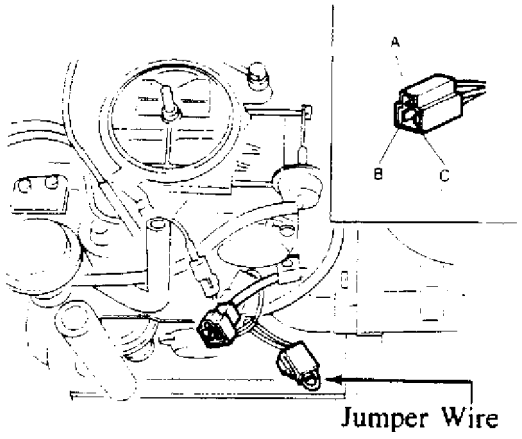


Fig. 4: Jumper Wire Installation

4. Connect a voltmeter to the port air switching valve (R) terminal and ground.

5. Increase the engine speed and observe the voltmeter reading.

Engine Speed (rpm)	Voltage (V)
Idling speed - 3.000	approx. 12
3,000-4,000	below 2
more than 4.000	approx. 12

6. Disconnect the jumper wire connected in step 3 and connect the connector to the throttle sensor.

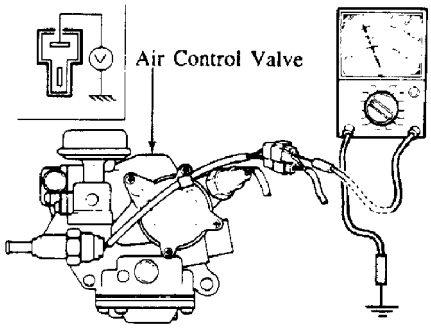
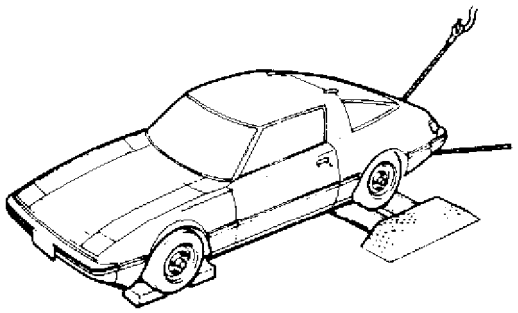


Fig. 5: Voltmeter Connections

7. Position the vehicle on a rolling-road tester. See Fig. 6

WARNING: Use wire rope to secure the vehicle to the rolling road.

forward.



the Air Control Valve the wiring harness has been

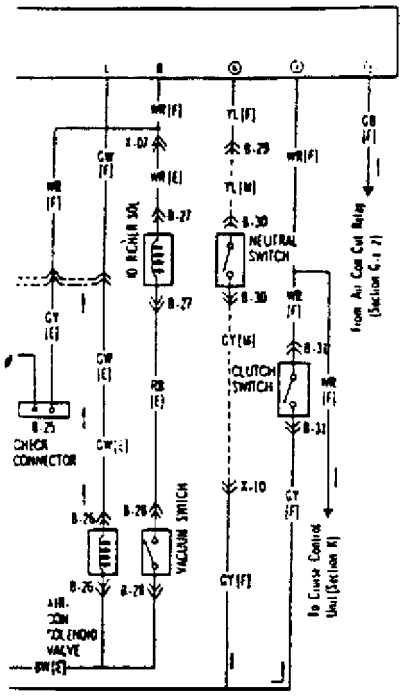
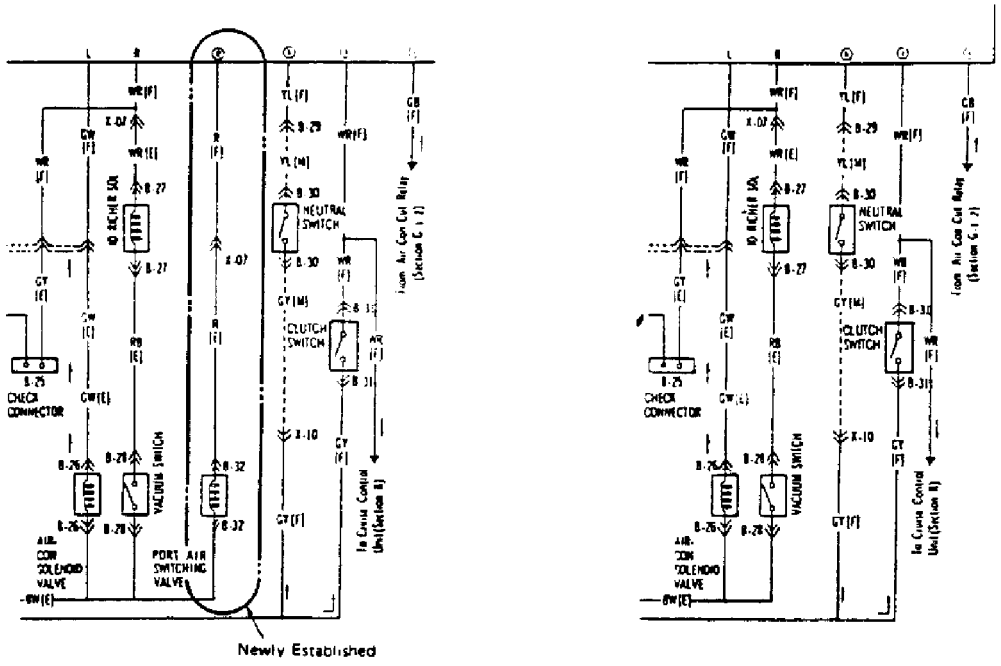


Fig. 6: Positioning Vehicle on Road Tester

8. Increase the vehicle speed and observe the voltmeter reading.

   Below 50 MPH - approx. 12V
   Above 50 MPH - below 2V

Due to the addition of the Port Air Switching Valve in the Air Control Valve the wiring harness has been changed as shown in Fig. 7.



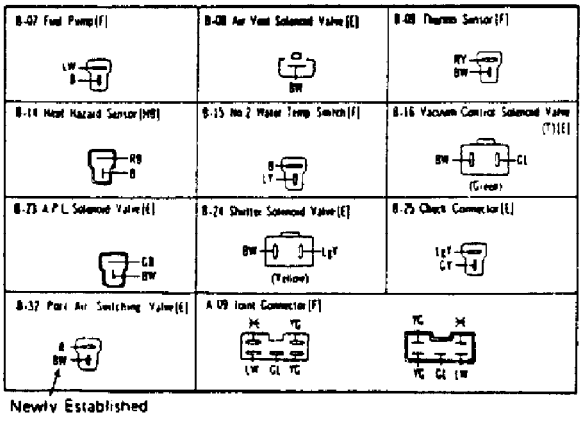
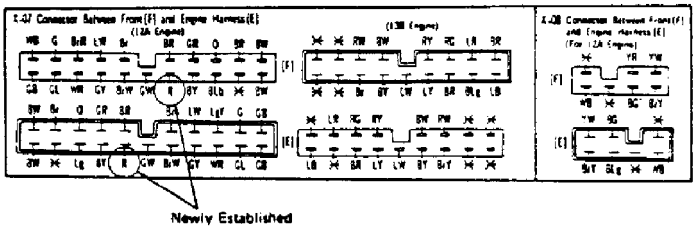


Fig. 7: Wiring Harness Modifications



1.3L ENG SE **NO. 00-04 Vehicle Text (p.**

Fig. 8: View of Fuse Panel

1.3L ENG STALL/POOR IDLE - THROTTLE SENSOR ADJ CAT. 4, NO. 009/84
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:56PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

IDLE SPEED ADJUSTMENT

Model: 1984-1985 RX-7 (13B)
Bulletin No.: 009/84
Date: 10/26/84
Symptom: Stall, Poor Idle
Category: 4

DESCRIPTION

Improper adjustment of the idle speed may cause poor idle stability or engine stall when coming to a stop. Either of these problems are encountered, please follow the Checking Procedure described.

CHECKING PROCEDURE

1. Warm up the engine to the normal operating temperature. Confirm that the fast idle cam separates from the roller as shown. If the fast idle cam is contacting the roller, the engine is not fully warmed. (Fig. 1)

2. Stop the engine and turn the key to the "ON" position.

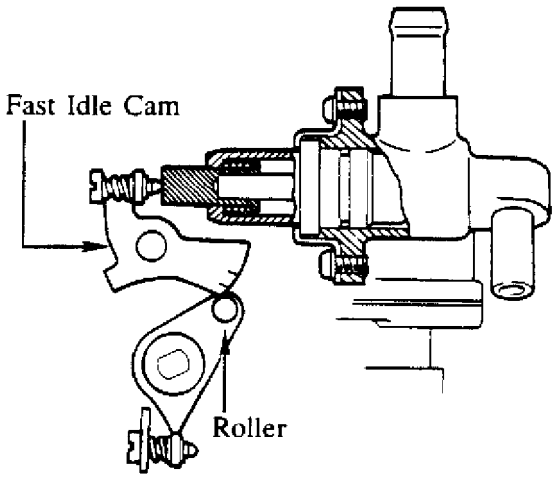


Fig. 1: View of Fast Idle Cam

3. Connect the voltmeter to the throttle sensor checking connector (Green) and check the voltage as shown. (Fig. 2)

   (a) Terminal (A) - approximately 12v & Terminal(B) - 0v: Throttle sensor adjustment is OK, Go to Step 4.

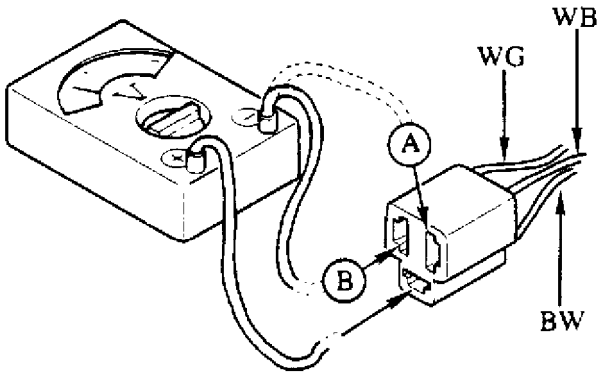


Fig. 2: Checking Throttle Sensor Voltage

(b) Terminal (A) - approximately 12v & Terminal(B) - approximately 12v: Throttle sensor out of adjustment. Adjust as follows:

Turn the adjust screw counter-clockwise until the voltage at terminal(B) becomes 0. Then turn the adjust screw an additional 1/4 to 1/2 turn counter-clockwise. Confirm that the voltages at terminals (A) and (B) are as shown in Step 3(a).

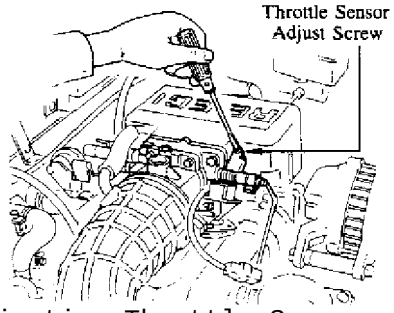


Fig. 3: Adjusting Throttle Sensor

(c) Terminal (A) - Ov &
    Terminal (B) - Ov:
Throttle sensor out of adjustment. Adjust as follows:

Turn the adjust screw clockwise until the voltage at terminal (A) becomes approximately 12v. Then turn the adjust screw an additional 1/4 to 1/2 turn clockwise. Confirm that the voltages at terminals (A) and (B) are as shown in Step 3(a). (Fig. 3)

4. Start the engine and run it at idle.

5. Disconnect the connector for the vent and vacuum solenoid valves. Turn all accessories off. (Fig. 4)

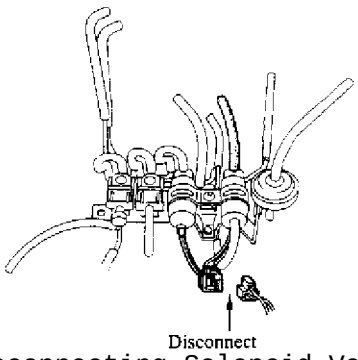


Fig. 4: Disconnecting Solenoid Valves Connector

Check the idle speed. Adjust the idle speed to specification, if necessary, by turning the air adjust screw. (Fig. 5)

Idle speed: 800 rpm

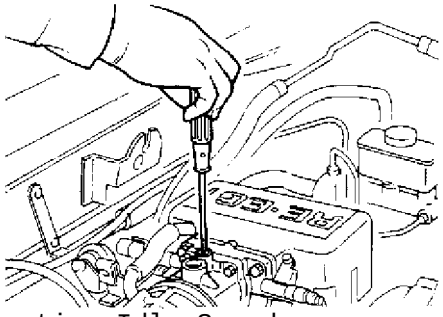


Fig. 5: Adjusting Idle Speed

Use a jumper wire to ground the LW wire for the air supply valve as shown. Confirm that the engine speed increases to 1000-1070 rpm. (Fig. 6)

NOTE: Step 7 must be done with the connector for vent and vacuum solenoid valves disconnected

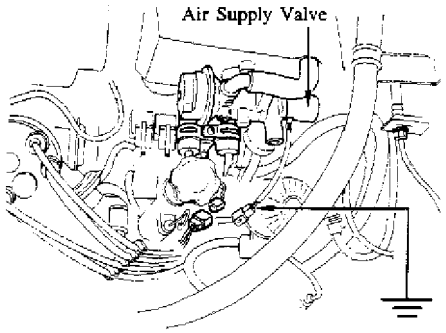


Fig. 6: View of Air Supply Valve

Adjust the engine speed to specification, if necessary, by turning the air supply valve adjust screw as shown. (Fig. 7)

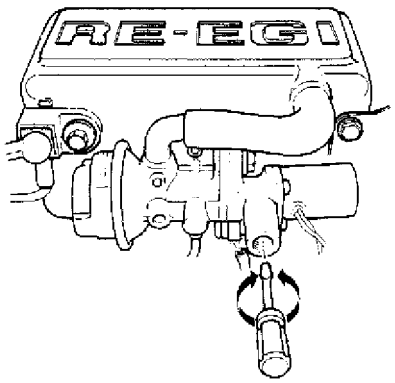


Fig. 7: Adjusting Engine Speed

Reconnect the vent and vacuum solenoid valve connectors disconnected in Step 5.

END OF ARTICLE

BAD SHUTTER VALVE CAUSES ROUGH IDLE/NO IDLE
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 11:00PM

ARTICLE BEGINNING

TECHNICAL INFORMATION TIP

ROTARY ROUGH IDLE

YEAR(S): 1982-85
MANUFACTURER: Mazda
MODELS: RX-7
DATE OF ISSUE: June 1993

ISSUE: BAD SHUTTER VALVE CAUSES ROUGH IDLE/NO IDLE

A bad shutter valve may cause a rough or no idle on 1982-85 Mazda RX-7 models. To test the shutter valve, remove the hose from the valve (it's located below the carburetor) and check for vacuum. If there is vacuum at idle, the shutter valve is bad and should be replaced.

Another thing to check that may be causing your idle problems is the vacuum hose that leads from the carburetor to the AA valve. This large hose may be burned or split at the bend in the hose near the intake manifold and can introduce a large vacuum leak if it's leaking.

Courtesy of Import Service Magazine
with thanks to:

Bill Jasper
Charles Levy Motor Company
Columbus, Georgia

REFERENCE NUMBER: MAZ0518AP

END OF ARTICLE

HI IDLE SPRRD OR HUNTING IDLE - NEW THROTTLE BODY CAT. 4, NO. 008/84
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:57PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

HIGH IDLE SPEED OR IDLE SPEED HUNTING

Model: 1984 RX-7 (13B)
Category: 4
Bulletin No.: 008/84
Date: 10/15/84

DESCRIPTION

If you encounter either of the following problems on 1984 RX-7 (13B) vehicles with the engine fully warmed, please follow the repair procedure described.

1. Engine speed hunts between approximately 1500-2000 rpm at idle.
2. Engine speed stays approximately 1200-1500 rpm at idle.

REPAIR PROCEDURE

1. Throttle Body.

Rotate the secondary throttle valve lever counter-clockwise by hand as shown while the idle speed is high or hunting.

If this procedure corrects the problem, the high idle is due to sticking of the secondary throttle valve, shown in Fig. 1. Replace the throttle chamber (N304 20 S00B) in this case.

If this procedure does not correct the problem, go to Step 2.

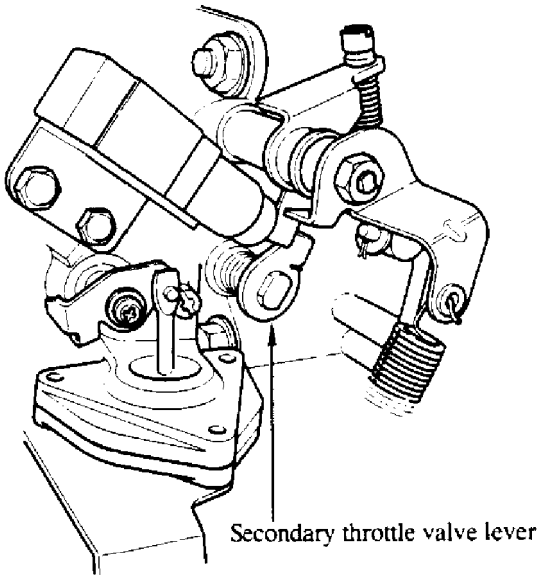


Fig. 1: View of Secondary Throttle Valve Lever

2. Vent Solenoid Valve.

Disconnect the vacuum hose (Fig. 2) from the vent solenoid valve and

plug the inlet port of the vent solenoid valve with a finger as shown in Fig. 3 while the idle speed is high or hunting.

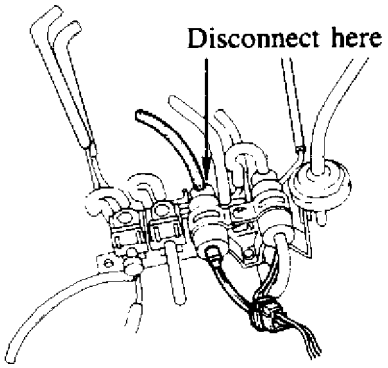


Fig. 2: Disconnecting Vent Solenoid Valve Vacuum Hose

If this procedure corrects the problem, the high idle is due to a faulty vent solenoid valve. Replace the vacuum switch valve (N304 13 240), which includes the vent solenoid valve, in this case.

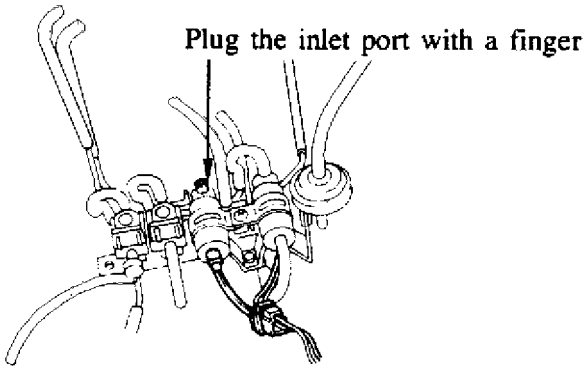


Fig. 3: Plugging Vent Solenoid Valve Inlet Port

END OF ARTICLE

TAS (THROTTLE ADJUSTMENT SCREW) LOCATION/ADJUSTMENT CAT. F, NO. 014/98
Article Text

1988 Mazda RX7

For iluvmyrx7.com

Tuesday, June 11, 2002 09:33AM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

TAS (THROTTLE ADJUSTMENT SCREW) ADJUSTMENT

Model(s): All Mazda Models with Fuel Injection
Category: F (01) - Fuel & Emission Control
Bulletin No.: 014/98
Date: December 9, 1998

VEHICLES AFFECTED

All fuel injected models.

DESCRIPTION

Fuel injected vehicles with idle speed control motors should NOT have the TAS (Throttle Adjustment Screw) adjusted for any reason. The TAS functions as a stopper when the throttle valve is fully closed. During production, the TAS is accurately set by measuring the airflow rate past a closed throttle plate. Any adjustment to this screw will affect PCM control of idle speed.

Customers complaining of low idle speed should have their vehicle repaired using the Workshop Manual.

NOTE: * Tampering with this screw will affect the idle contact switch and/or throttle position sensor settings. This can lead to rough idle and difficulty in diagnosis of idle quality concerns.

* The TAS locations on the examples below may vary depending on model year of vehicle. See Fig. 1.

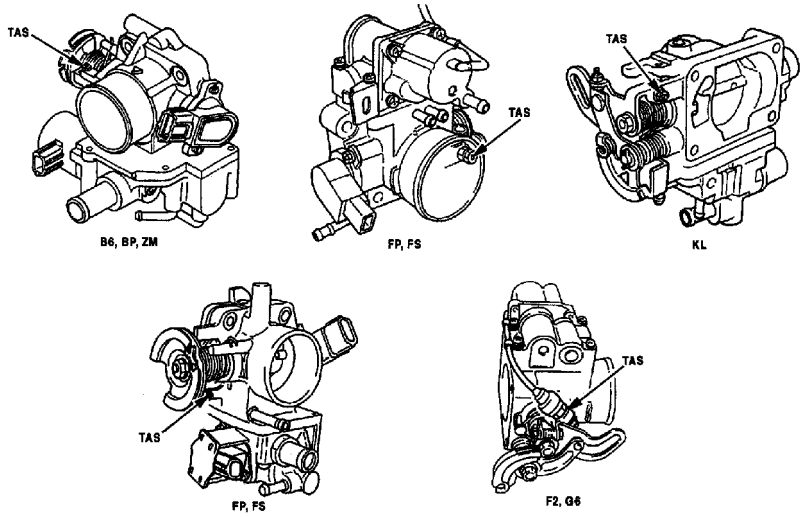


Fig. 1: Throttle Adjustment Screw Locations

END OF ARTICLE

WHISTLE NOISE FROM CHECK &CUT VALVES - REPL VALVES CAT. 4, NO. 015/85
Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:59PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

APPLICATION

1980-85 RX7 & 1981-85 GLC

SUBJECT

Whistle Noise From Check & Cut Valve

REFERENCE

Mazda Motors Corp., Service Bulletin, No. 4 015/85, September, 1985

CONDITION & CAUSE

Some 1980-85 RX7 and 1981-85 GLC vehicles may exhibit a whistle noise from the check and cut valve. The whistle noise is most noticeable at high temperature and low fuel level, and can be heard from the rear of the vehicle.

REPAIR

Replace the check and cut valve with the new service component (RX7 - 8341-42-910, GLC - BA01-42-910).

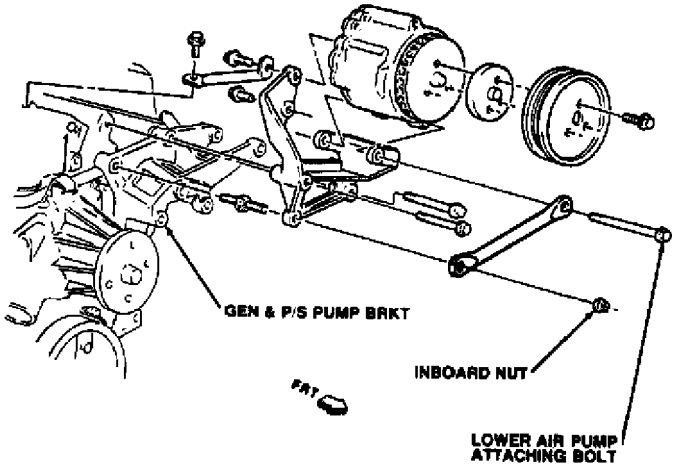


Fig. 1: Anything Installation

END OF ARTICLE