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COOLING SYSTEM SPECIFICATIONS
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:31PM

ARTICLE BEGINNING

1984 ENGINE COOLING
Mazda Cooling System Specifications

626, GLC, Pickup & RX7

ENGINE COOLANT SPECIFICATIONS

THERMOSTAT

Thermostat is a wax pellet type. On B2000, B2200, GLC and RX7, thermostat begins opening at 177-182°F (80.5-89.5°C), and fully opens at 203°F (95°C). Thermostat on 626 begins opening at 187-193°F (86.5-89.5°C), and fully opens at 212°F (100°C).

RADIATOR CAP

Radiator cap pressure relief valve opens at approximately 13 psi (.9 kg/cm^2).

COOLANT CAPACITY TABLE

Application	Quarts (L)
B2000	
Manual Transmission	
W/O Heater	7.0 (6.6)
W/Heater	7.6 (7.2)
Automatic Transmission	
W/O Heater	7.3 (6.9)
W/Heater	8.5 (8.0)
B2200	
W/O Heater	10 (9.5)
W/Heater	11.1 (10.5)
GLC	
Manual Transmission	
W/O Heater	5.3 (5.0)
W/Heater	5.8 (5.5)
Automatic Transmission	
W/O Heater	5.8 (5.5)
W/Heater	6.3 (6.0)
RX7	10 (9.5)
626	7.4 (7.0)

END OF ARTICLE

ENGINE COOLING FAN
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:31PM

ARTICLE BEGINNING

1984 ENGINE COOLING
Mazda Engine Cooling Fans

626, GLC, Pickup & RX7

DESCRIPTION

The basic liquid cooling system consists of a radiator, water pump, thermostat, cooling fan, pressure cap, heater (if equipped), and various connecting hoses and cooling passages in the block and cylinder head. In addition, many cars use a fan clutch (incorporating a thermostatic control) or flexible fan blade. These reduce noise and power requirements at higher engine speeds.

Some models may use a thermostatic vacuum switch to advance ignition timing in the event of overheating. Most models use a coolant recovery system to prevent loss of anti-freeze.

MAINTENANCE

DRAINING

Remove radiator cap and open heater control valve to maximum heat position. Open drain cocks or remove plugs in bottom of radiator and in engine block. In-line engines usually have one plug or cock, while "V" type engines will have two, one in each bank of cylinders.

CLEANING

A good cleaning compound removes most rust and scale. Follow manufacturer's instructions in the use of cleaner. If considerable rust and scale has to be removed, flushing should be used. Clean radiator air passages by blowing with compressed air from back to front of radiator.

FLUSHING

CAUTION: Some manufacturers use an aluminum and plastic radiator on some models (identified by a note below the filler neck). Material used for cleaning and flushing must be compatible with aluminum, according to manufacturer's recommendations.

1) Back flushing is a very effective means of removing rust and scale from a cooling system. For best results, the radiator, engine and heater core should be flushed separately.

2) To flush radiator, connect flushing gun to water outlet of radiator and disconnect water inlet hose. Use a leadaway hose, connected to radiator inlet, to prevent flooding engine. Use air in short bursts only, as this will prevent damage to radiator. Continue flushing until water runs clear.

3) To flush engine, first remove thermostat and replace housing. Connect flushing gun to water outlet of engine. Disconnect heater hoses from engine. Flush using short air bursts until water runs clean. Flush heater core as described for radiator. Make sure heater valve is set to maximum heat position before flushing heater.

REFILLING

Engine should be running while refilling cooling system to

prevent air from being trapped in the engine block. After system is full, continue running engine until thermostat is open, then recheck fill level. Do not overfill system.

THERMOSTAT

1) Visually inspect thermostat for corrosion and proper sealing of valve and seat. If satisfactory, suspend thermostat and a thermometer in a container with a 50/50 mixture of anti-freeze and water. See Fig. 1.

2) Do not allow either thermostat or thermometer to touch bottom of container, as this concentration of heat could cause an incorrect reading. Heat water until thermostat just begins to open.

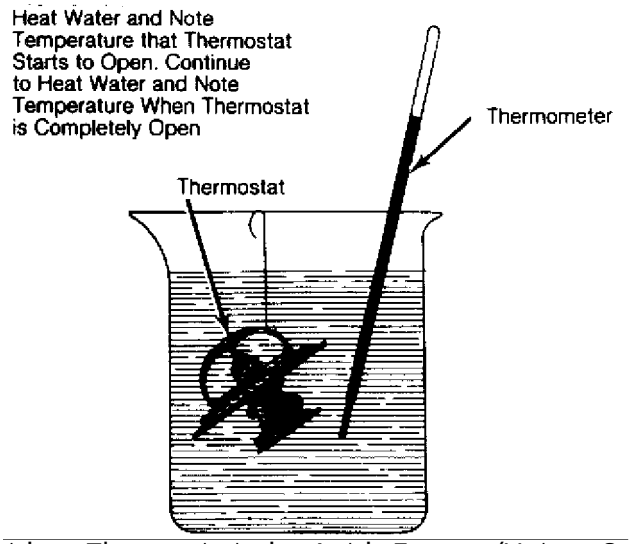


Fig. 1: Testing Thermostat in Anti-Freeze/Water Solution
Support thermometer so it does not touch bottom of container.

3) Read temperature on thermometer. This is the initial opening temperature and should be within specifications. Continue heating water until thermostat is fully open and note temperature. This is the fully opened temperature. If either reading is outside of specifications, replace thermostat, as it is not adjustable.

PRESSURE TESTING

A pressure testing tool is used to test both radiator cap and complete cooling system. Test as follows, following tool manufacturer's instructions.

Radiator Cap

Visually inspect radiator cap, then dip cap in water and connect to tester. Pump tester to bring pressure to upper limit of cap specifications. If cap fails to hold pressure within specifications, replace cap.

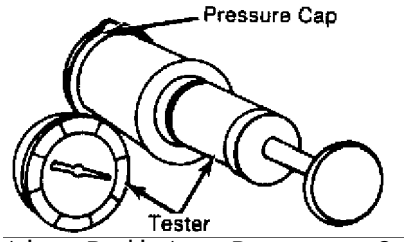


Fig. 2: Testing Radiator Pressure Cap
Wet cap gasket before testing.

Cooling System

1) With engine off, wipe radiator filler neck seat clean. Fill radiator to correct level. Attach tester to radiator and pump until pressure is at upper limit of radiator rating.

2) If pressure drops, inspect for external leaks. If no leaks are apparent, detach tester and run engine until normal operating temperature is obtained. Reattach tester and observe. If pressure builds up immediately, a possible leak exists from a faulty head gasket or crack in head or block.

CAUTION: Pressure may build up quickly. Release any excess pressure or cooling system damage may result.

3) If there is no immediate pressure build up, pump tester to within system pressure range (on radiator cap). Vibration of gauge pointer indicates compression or combustion leak into cooling system. Isolate leak by shorting each spark plug wire to cylinder block. Gauge pointer should stop or decrease vibration when leaking cylinder is shorted.

CAUTION: Do not disconnect spark plug wires while engine is operating, or operate engine with spark plug shorted for more than 1 minute, as catalytic converter may be damaged.

4) Remove engine and transmission (automatic only) oil dipsticks and check if water drops appear in oil. If so, a serious internal leak is indicated. If all checks are negative and system holds pressure for 2 minutes, there are no serious leaks in system.

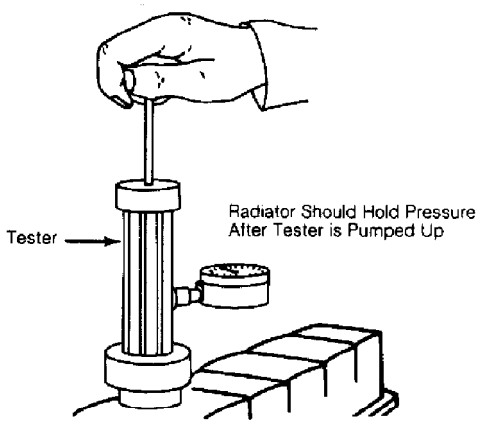


Fig. 3: Pressure Testing Cooling System
Pump up to specified pressure.

ANTI-FREEZE CONCENTRATION

NOTE: On models using aluminum engines or cooling system components, refer to Owners Manual for anti-freeze requirements and recommendations. Aluminum components require a different formulation of anti-freeze to prevent corrosion.

On all cooling systems, test anti-freeze concentration using anti-freeze tester. Tester should have a temperature-compensating feature, as failing to take temperature into consideration could cause an error as large as 30°F (16°C). Follow tester manufacturer's instructions for correct use of tester.

COOLANT RECOVERY SYSTEMS

DESCRIPTION

A coolant recovery system differs from other cooling systems in that an overflow bottle is connected to the radiator overflow hose. Overflow bottle is transparent or translucent to permit checking of coolant level without removing radiator cap. No adjustment or test is required except keeping vent hole or hose clean and checking pressure relief of radiator cap.

OPERATION

As coolant temperature rises and pressure in system exceeds pressure relief valve of radiator cap, excess coolant flows into overflow bottle. As engine cools and coolant contracts, vacuum is formed in the system. Vacuum draws coolant, stored in overflow bottle, back into radiator. In a properly maintained cooling system, the only coolant losses will be through evaporation.

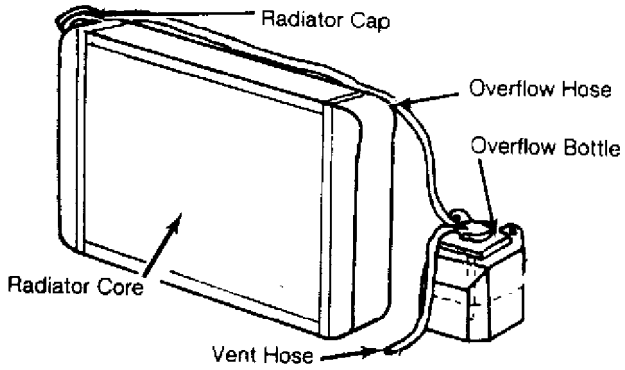


Fig. 4: Typical Coolant Recovery System

In a coolant recovery system the overflow bottle captures and releases coolant according to temperature.

THERMOSTATICALLY CONTROLLED ELECTRIC FANS

DESCRIPTION

Electrically-driven fans are actuated by thermal relay switches. Thermal switches turn fan motor on when necessary and shut fan motor off when not needed. Air conditioned vehicles are equipped with over-ride switches. These switches turn fan motor on whenever

motor control is returned to thermal relay.

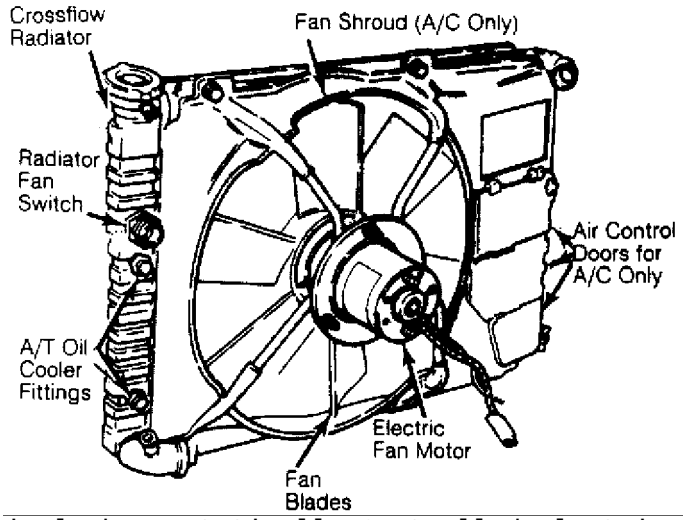


Fig. 5: Typical Thermostatically Controlled Electric Fan

TESTING

Disconnect fan motor wire connector and connect it with 14 gauge wire to a good 12-volt battery. If fan runs, motor is okay. This indicates car battery, thermal switch, radiator fan switch, coolant relay, timer relay, coolant temperature switch, or A/C relay may be defective. If fan motor does not run when connected directly to a good battery, replace fan motor.

VARIABLE SPEED COOLING FANS - FLEX-BLADE FANS

DESCRIPTION

This unit is a flexible blade assembly designed to flex blades as engine RPM increases. As RPM increases, blade pitch decreases, thereby saving power and decreasing noise level. Keep fan belt adjusted to proper tension as necessary.

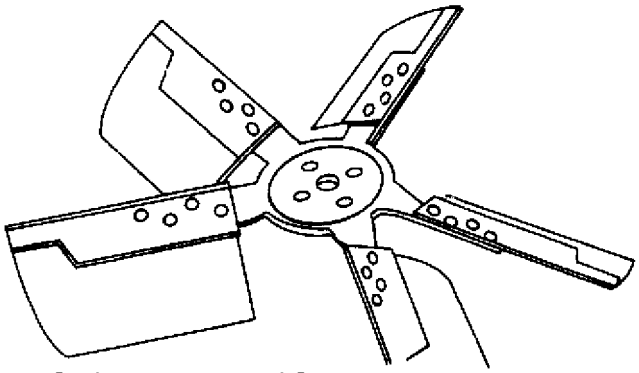


Fig. 6: Flex Blade Fan Assembly

VARIABLE SPEED FANS - FAN CLUTCH WITH THERMOSTATIC CONTROL

DESCRIPTION

Most air conditioned models use a thermostatically controlled fluid fan and torque control clutch. Thermal control drive is a silicone-filled coupling connecting fan to a fan pulley, and is operated by a control valve. Control valve is operated by a temperature sensitive bi-metallic coil or strip and controls flow of silicone through the clutch.

During periods of operation when radiator discharge air temperature is low, fan clutch speeds are slowed, decreasing load on fan belt. High radiator discharge air temperature causes bi-metallic coil or strip to allow a greater flow of silicone to enter clutch. This increases drag between driven member and driving member resulting in a higher fan speed and increased cooling.

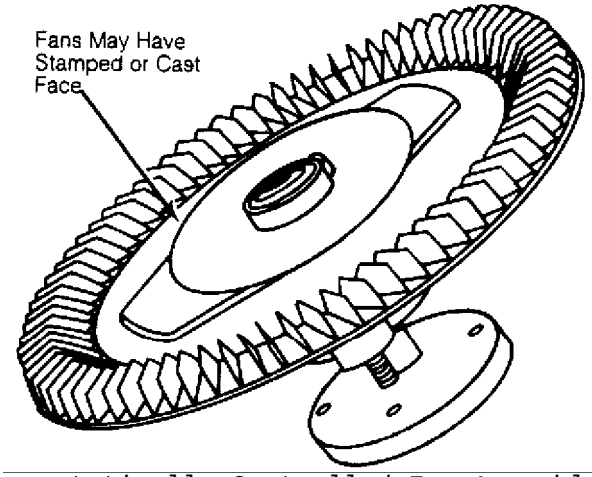


Fig. 7: Thermostatically Controlled Fan Assembly
Shown with stamped face and bi-metallic coil spring.

TESTING

In cases of engine overheating or insufficient air conditioning proceed with following tests:

1) Start with a cool engine to ensure complete fan clutch disengagement.

2) Cover radiator grille sufficiently to induce high engine temperature.

3) Start engine and operate at 2000 RPM. Turn on air conditioning if equipped.

4) A fan roar will be noticed when fan clutch engages.

NOTE: It will take approximately 5 to 10 minutes for temperature to become high enough to allow engagement of the fan clutch. While operating engine under these conditions, observe temperature light to prevent overheating. If hot light comes on, remove cover from radiator grille.

5) When clutch engages, remove radiator grille cover and turn A/C off to assist in engine cooling.

6) After several minutes fan clutch should disengage. This can be determined by a reduction in fan speed and roar. If fan fails to function as described, it should be replaced.

END OF ARTICLE

1.1L & 1.3L ROTARY
Article Text
1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:32PM

ARTICLE BEGINNING

1984 ENGINES
Mazda 1.1L & 1.3L Rotary

RX7

ENGINE CODING

ENGINE IDENTIFICATION

Engine identification number is stamped on front engine housing behind the distributor.

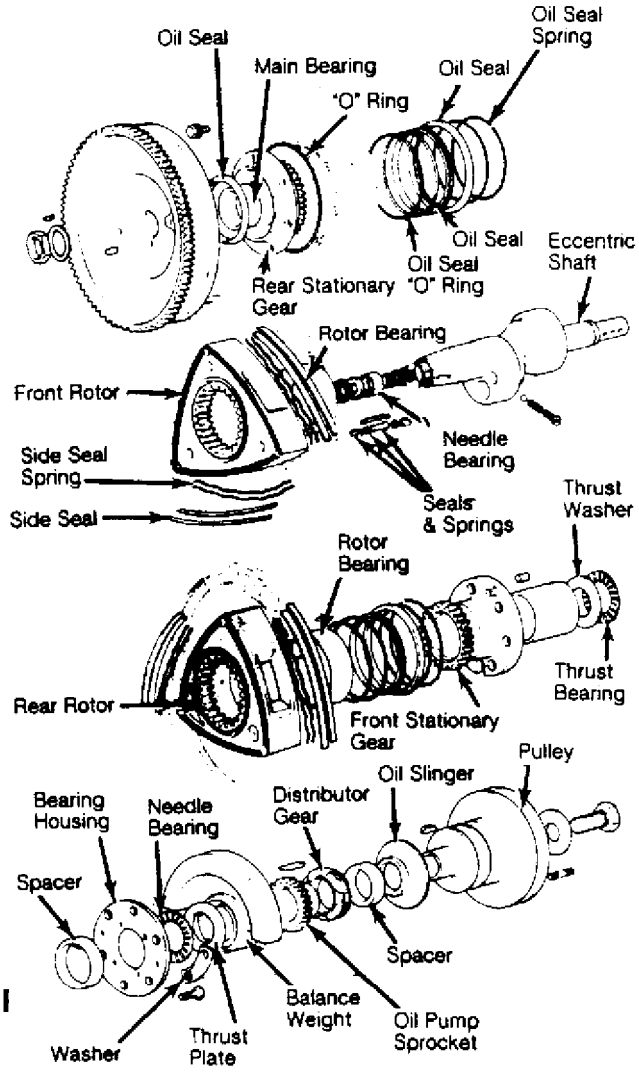
ENGINE IDENTIFICATION CODES TABLE

Application	Engine Code
RX7	
1.1L Rotary Carbureted	12A
1.3L Fuel Injected	13B

ENGINE

REMOVAL & INSTALLATION

Removal (1.1L)
1) Remove hood and disconnect battery ground cable. Drain engine oil and coolant. Remove engine under cover.
2) Disconnect following electrical wires: Primary and secondary ignition wires at coils, pick-up coil wiring connections, condenser lead, oil level sensor lead, temperature sensor and oil thermo sensor (except California vehicles).



1.1L & 1.3L I

Fig. 1: Exploded View of Rotors & Eccentric Shaft Assembly

3) Remove air cleaner assembly. Disconnect following tubes and hoses: Oil hoses at cooler, radiator hoses, automatic transmission cooler lines (if equipped), heater hoses, fuel supply and return lines, vacuum and evaporative hoses, and air pipe at rear of intake manifold.

4) Remove cooling fan and drive assembly, radiator and fan shroud assembly. Remove alternator connectors. Disconnect throttle sensor connector.

5) Without disconnecting refrigerant lines, remove compressor and air conditioning condenser (if equipped) and tie out of way.

6) Disconnect choke heater connector. Disconnect accelerator, choke and hot start assist cables. Disconnect any remaining wires, tubes or linkages between engine and chassis at top of engine. Remove upper engine-to-transmission bolts.

7) Raise and support vehicle. Remove starter. Remove lower engine-to-transmission bolts. Remove exhaust pipe front cover. Remove nuts and bolts, and disconnect exhaust pipe from exhaust manifold. Support front catalytic converter.

8) Support front of transmission with jack and remove left

and right engine mount nuts. Attach sling to engine and take up slack. Pull engine forward to clear clutch shaft, and lift engine from vehicle.

Removal (1.3L)

1) Remove hood and disconnect battery ground cable. Drain engine oil and coolant. Remove engine under cover.

2) Disconnect following electrical components: Secondary ignition wires, oil pressure and level gauge connectors, oil and coolant temperature sensor connectors, air flow meter connector, oxygen sensor and fuel injector connectors.

3) Disconnect harness from vacuum solenoid valves, alternator, starter and ground connectors. Disconnect accelerator and cruise control cables.

4) Disconnect following tubes and hoses: Fuel and evaporation hoses, oil hoses, radiator, heater and air hoses. Remove air funnel hose from dynamic chamber and remove air cleaner assembly.

5) Disconnect power steering pump and A/C compressor from engine and tie out of way. Remove cooling fan, shroud and radiator. Disconnect metering oil pump connecting rod.

6) Disconnect following components from dynamic chamber assembly: Intake air temperature sensor connector, 8 vacuum hoses (mark for reinstallation), air supply valve connector, throttle sensor connector and wire terminal connector. Remove intake manifold retaining nuts and lift dynamic chamber assembly off of engine.

7) Raise and support vehicle. Remove starter. Remove engine-to-transmission bolts. Remove exhaust pipe front cover. Disconnect exhaust pipe from exhaust manifold and support front catalytic converter.

8) Support front of transmission with jack and remove left and right engine mount nuts. Attach sling to engine and take up slack. Being careful not to damage A/C condenser, pull engine forward to clear clutch shaft and lift engine from vehicle.

Installation (1.1L & 1.3L)

To install engine, reverse removal procedure ensuring that linkages, tubes and electrical connections are restored in original position. Refill all fluids to specified levels, warm up engine and check for leaks.

DISASSEMBLY

NOTE: To ease engine disassembly, manufacturer recommends use of special Engine Stand (49 0107 680A) and Hanger (49 1114 005).

1.1L & 1.3L

1) Loosen drive belts and hoses, and remove air pump and alternator. Disconnect metering oil pump connecting rod and hoses at metering oil pump outlets. Remove exhaust manifold cover. Remove intake manifold and carburetor on 1.1L engine, or injectors on 1.3L engine. Remove gasket and "O" ring.

2) Remove exhaust manifold, engine mount and distributor. Remove oil filter and cover from front housing. Remove water pump and A/C drive pulley (if equipped).

3) Turn engine over, and remove oil pan (Be sure to disconnect oil level sensor) and strainer. Install Flywheel Brake (49 1881 060) on manual transmission models, or Stopper (49 1881 055) on automatic transmission models.

4) Remove eccentric shaft pulley. Take off front cover with gasket, and slide distributor gear off shaft. Remove "O" ring from oil passage. Remove oil pump sprocket nut. See Fig. 2. Slide oil pump sprocket, eccentric shaft sprocket and drive chain off together.

Remove oil pump.

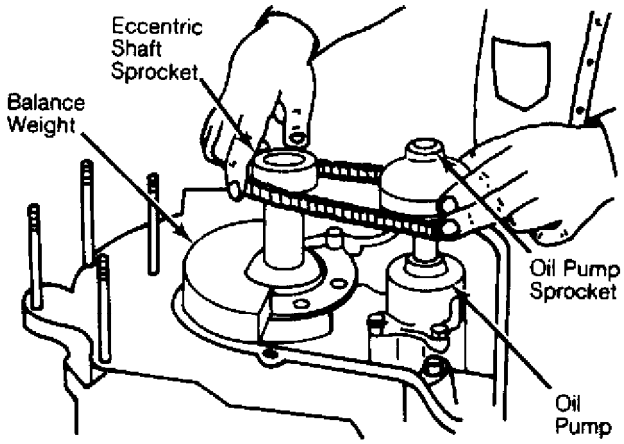


Fig. 2: Removing Oil Pump Drive and Sprocket
Pump drive and sprocket must be removed together.

5) Remove balance weight and bearing housing from front of engine. See Fig. 3.

6) On manual transmission models, remove clutch assembly. Remove flywheel nut using Socket (49-0820-035). Remove flywheel with puller. On automatic transmission models, mark position of drive plate on counterweight and remove drive plate. Remove flywheel nut using Socket (49-0820-035). Remove counterweight with puller.

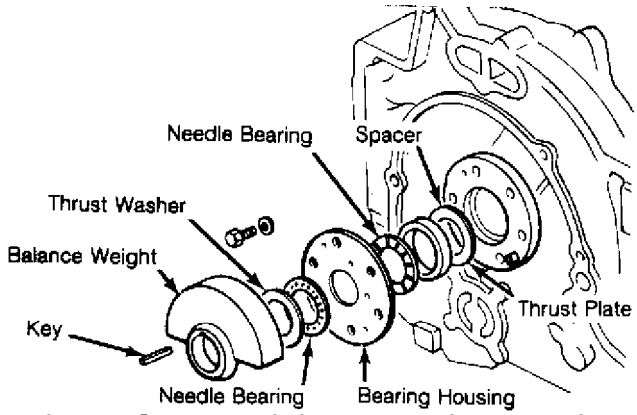


Fig. 3: Removing Balance Weight & Bearing Housing

7) On all models, remove rear housing bolts in sequence. See Fig. 4. Loosen in 2 or 3 steps. Lift rear housing off shaft. Remove any seals stuck to rotor sliding surface, and place them back in original positions. Remove seals and "O" rings from face of rear rotor housing.

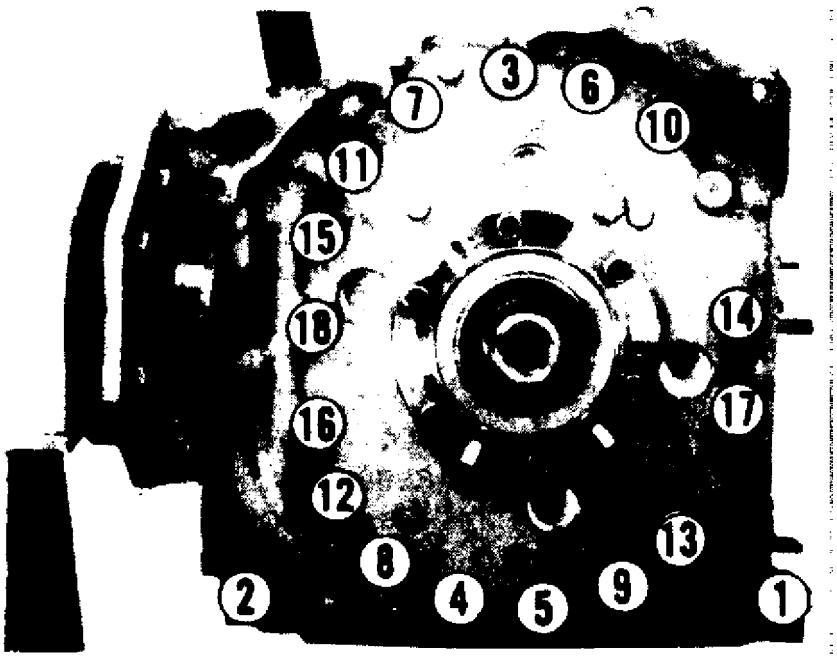


Fig. 4: Loosening Rear Housing Bolts
Loosen in 2 or 3 steps.

8) Attach Dowel Puller (49 0813 215A), and pull tubular dowels off rear rotor housing. See Fig. 5. Hold rotor housing by hand to keep it from moving up, and remove rear rotor housing. Be careful not to drop rotor apex seals and side pieces. Remove seals and "O" ring from front side of rear rotor housing.

9) Remove side pieces, apex seals and springs from rear rotor and store in order for reassembly. Remove all corner seals, corner seal springs, side seals and side seal springs and store in order for reassembly. Remove rear rotor, and place on clean pad with internal gear side down.

10) Remove seals and springs on remaining side of rotor, and store in order for reassembly. Place protector on seal inner lip, and remove outer seal with Remover (49 0813 225). Remove inner seal. Remove seals and springs and store in order for reassembly. Mark rear rotor for assembly identification.

11) Attach puller, and while holding housing down, pull tubular dowels off intermediate housing. Remove intermediate housing by sliding beyond rear rotor journal on eccentric shaft. Carefully lift out eccentric shaft to avoid damage to rotor bearing and main bearing. Repeat steps 7) through 10) to remove front rotor housing and rotor assembly.

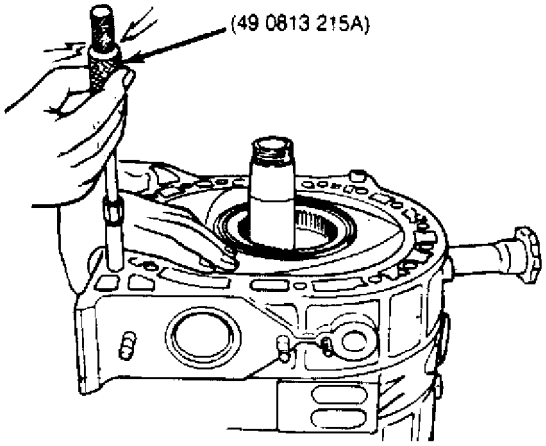


Fig. 5: Extracting Tubular Dowels from Engine
Hold housing down with hand.

INSPECTION & OVERHAUL

Front, Intermediate & Rear Housings

1) Clean housings, using extra fine emery paper to remove carbon deposits from rotor running surface. Use ketone or thinner to remove sealing agent.

2) Check front, intermediate and rear housings for distortion. Place a straightedge across housing surface. See Fig. 6. Measure distortion by inserting feeler gauge between housing and straightedge. Replace housing if distortion limit exceeds .0016" (.04 mm).

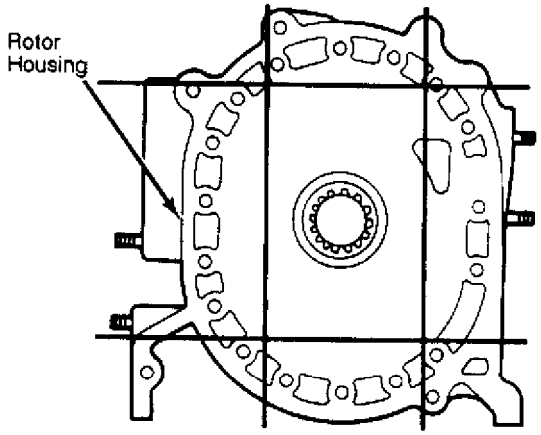


Fig. 6: Checking Housing Distortion With Straightedge
Replace housing if warpage exceeds limit.

3) Remove oil pressure control valve and spring from front cover. Check for damage or corrosion. Replace if defective. Measure control valve spring free length.

4) On 1.1L engine, free length of oil pressure control valve spring should be 2.74" (69.6 mm). On 1.3L engine, free length of oil pressure control valve spring should be 2.87" (73 mm). Cap bolt and valve spring are painted Yellow on 1.1L engine only.

5) Using a dial indicator and gauge body, measure rotor sliding surface stepped wear pattern on the 3 housings. See Fig. 7.

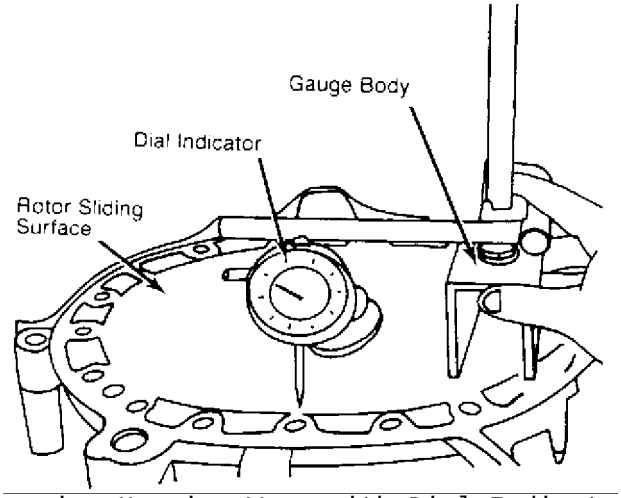


Fig. 7: Measuring Housing Wear with Dial Indicator
Check entire circumference of housing.

6) Check oil seal wear surface for variance. Check oil seal step by moving dial indicator from inside to outside of oil seal wear area. See Fig. 8.

OIL SEAL STEP WEAR TABLE

Location	Limit
Inside Oil Seal	
Tracing Mark	.0004" (.01 mm)
Outside Oil Seal	
Tracing Mark	.004" (.10 mm)
Oil Seal Step	.0008" (.02 mm)

7) Check side seal step wear by moving dial indicator around entire circumference of side seal tracing pattern. Side seal step wear limit is .0008" (.02 mm). See Fig. 8.

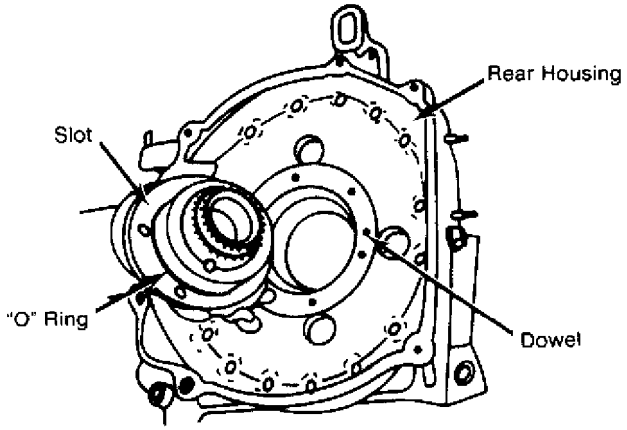


Fig. 8: Checking Oil Seal & Side Seal Step Wear
Replace housing if step wear exceeds limit.

8) Measure inner diameter of main bearing and outer diameter of bearing journal on eccentric shaft. Standard clearance is .0016" (.041 mm). If clearance exceeds .0030" (.12 mm),

replace bearing.

9) To replace front or rear main bearing, remove stationary gear retaining bolts. Using a Mandrel (49 0813 235), drive stationary gear out of housing.

10) Place stationary gear in a press. Use same mandrel and press main bearing out of stationary gear.

11) Install new bearings while aligning tang bearing with a slot of stationary gear. Press bearing into gear until adapter of mandrel just contacts stationary gear flange. Install the stationary gear into the housing, aligning the slot of the gear flange with the dowel pin on the housing. See Fig. 9.

NOTE: When installing rear main bearing, check condition of "O" ring and replace if necessary. Apply sealing agent on stationary gear flange prior to installing it on rear housing. Align pin and slot.

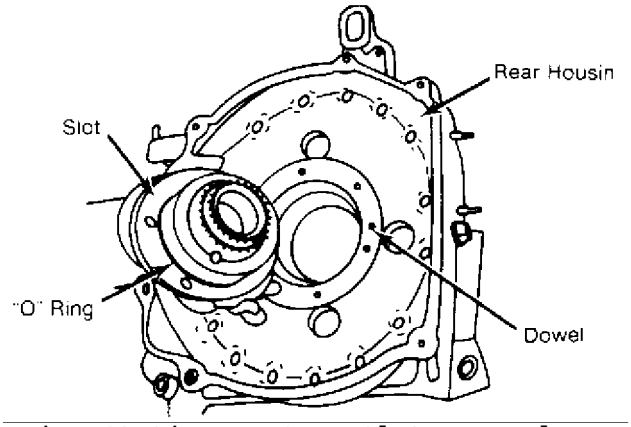


Fig. 9: Aligning Stationary Gear Slot & Dowel
Illustration applies to front and rear housings.

Rotor Housing

1) Inspect rotor housing for signs of water or gas leakage. Check for wear, scoring, cracking, flaking or any damage to chromium plated rotor running surface.

2) To clean housing, wipe off sealing agent or carbon in rotor running surface with a rag and ketone or thinner. Remove rust deposits in water cooling passages.

3) Place a straightedge across sealing surface of rotor housing and check for distortion with a feeler gauge. If distortion exceeds .0016" (.04 mm), replace housing. See Fig. 10.

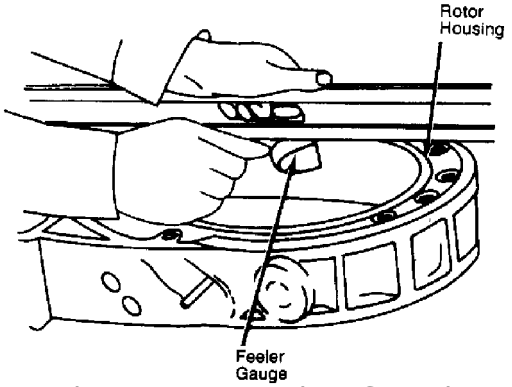


Fig. 10: Measuring Rotor Housing for Distortion
Replace if distortion exceeds limit.

4) Using an outside micrometer, measure rotor housing width at points A, B, C, and D in Fig. 11. Replace rotor housing if difference between point A and smallest value of points B, C and D exceeds .0024" (.06 mm).

NOTE: Rotor housing width variations exceeding .0024" (.06 mm) would indicate a possibility of gas or water leakage.

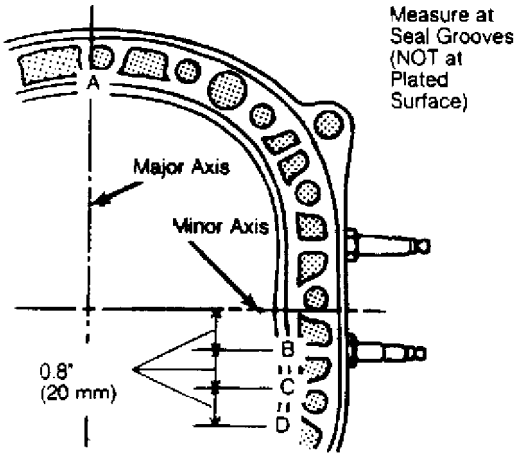


Fig. 11: Rotor Housing Width Check Points
Check width at A, B, C and D.

Rotors

1) Inspect rotor for wear or damage, and check internal gear for chips, cracks or scoring. Measure rotor width at 3 points on face of internal rotor gear. Compare maximum rotor width dimension with rotor housing width dimension "A" in Fig. 11 to determine clearance.

2) Clearance between housing width and rotor width should be .0047-.0074" (.12-.19 mm) on 1.1L engine, or .0047-.0083" (.12-.21 mm) on 1.3L engine. If clearance is greater than specified, replace rotor assembly.

3) If clearance is less than .004" (.10 mm), internal rotor gear is not seated. Strike internal gear lightly with plastic hammer to seat. Recheck clearance.

4) Measure inner diameter of rotor bearing and outside diameter of rotor bearing journal on eccentric shaft. Replace rotor bearing if clearance exceeds .0039" (.10 mm), or if damaged. See Rotor Bearing Replacement.

Rotor Oil Seal

With oil seal installed in rotor, measure contact lip width of seal. Seal must be replaced if contact width exceeds .020" (0.5 mm). Measure seal protrusion, and replace seal spring if protrusion is less than .020" (0.5 mm). See Fig. 12.

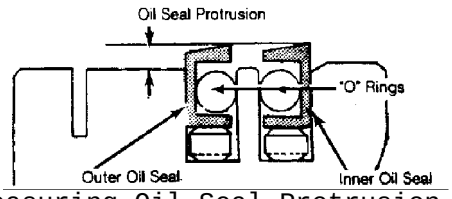


Fig. 12: Measuring Oil Seal Protrusion
Check for free movement of seals in groove.

Rotor Bearing Replacement

1) Place rotor on support so internal gear is facing downward. Using rotor bearing Replacer (49 0813 240), without adapter ring, press bearing out of rotor.

2) Place rotor on support with internal gear facing upward. Place a new rotor bearing on rotor with bearing lug in line with slot in rotor bore. Press new bearing (using tool with adapter) until bearing is flush with rotor boss. See Fig. 13.

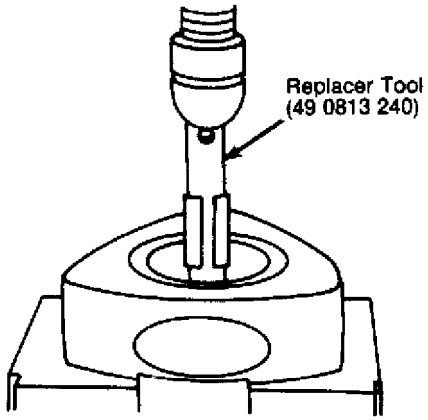


Fig. 13: Pressing Rotor Bearing from Rotor
Slot in rotor bore must be in line with bearing lug.

Apex Seal

1) Clean all carbon from apex seal and spring with cleaning solution (not emery paper). Measure height of apex seal with micrometer. See Fig. 14. Replace seal if height is less than .275" (7.0 mm).

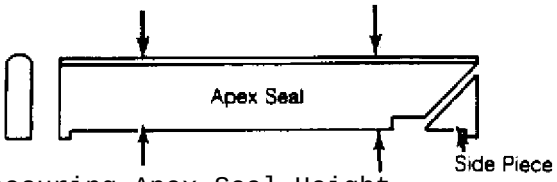


Fig. 14: Measuring Apex Seal Height
Clean thoroughly before measuring.

2) Check for warpage by measuring clearance between top surfaces of 2 apex seals with a feeler gauge. Replace all 3 seals if clearance exceeds .0024" (.06 mm). See Fig. 15.

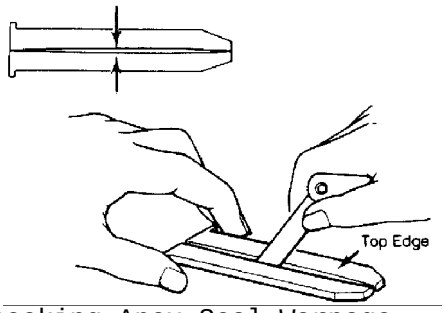


Fig. 15: Checking Apex Seal Warpage
Replace if clearance exceeds limits.

3) Using a feeler gauge, check gap between apex seal and

rotor groove. Standard clearance is .0020-.0035" (.05-.09 mm). Replace apex seal if gap exceeds .0059" (.15 mm).

4) Check apex seal spring height. See Fig. 16. Replace spring if free height is less than .2165" (5.5 mm) on 1.1L engine, or .150" (3.8 mm) on 1.3L engine.

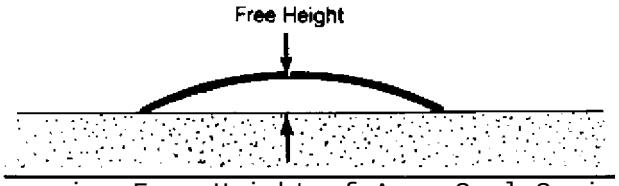


Fig. 16: Measuring Free Height of Apex Seal Spring

Side Seal

1) Remove all carbon from side seal and spring. With side seal and spring installed, press finger on seal and check that it moves freely in groove. Check that seal protrudes a minimum of .02" (.5 mm) above rotor face. If not, replace spring and recheck.

2) Check gap between side seal and groove with feeler gauge. Standard gap is .0012-.0031" (.03-.08 mm). Replace side seal if gap is .004" (.10 mm), or greater.

3) Install cylindrical corner seals in rotor and check gap between side seals and corner seals. See Fig. 18. Insert feeler gauge between end of side seal and round corner seal. Replace side seals if gap exceeds .016" (.4 mm).

4) When replacing side seals, adjust gap between side seal and corner seal by filing one end of side seal. Use a fine-cut file and shape cut to match contour of corner seal. Adjust gap to .002-.006" (.05-.15 mm).

Corner Seal

1) Clean carbon from corner seals and check for wear or damage. Check corner seal protrusion from rotor surface, and check free movement by pressing with finger. Replace corner seal springs and recheck if corner seals protrude less than .02" (.5 mm).

2) Measure corner seal bore wear in rotor using Gauge (49 0839 165). See Fig. 17.

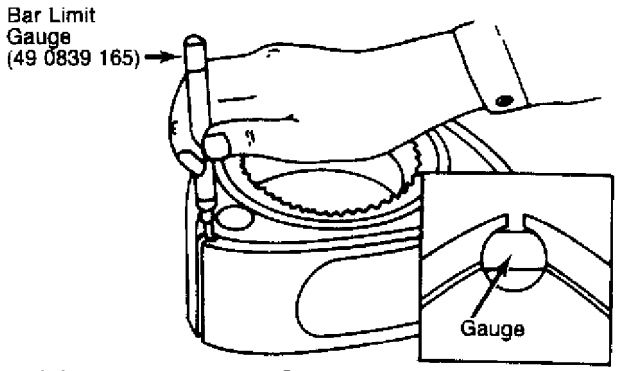


Fig. 17: Checking Corner Seal Bore Measurement

Replace rotor if both ends of gauge fit in gap.

3) If neither end of gauge fits into bore, use original corner seal. If "Go" end only fits into bore, use new corner seal. If both ends of gauge fit into bore, replace rotor.

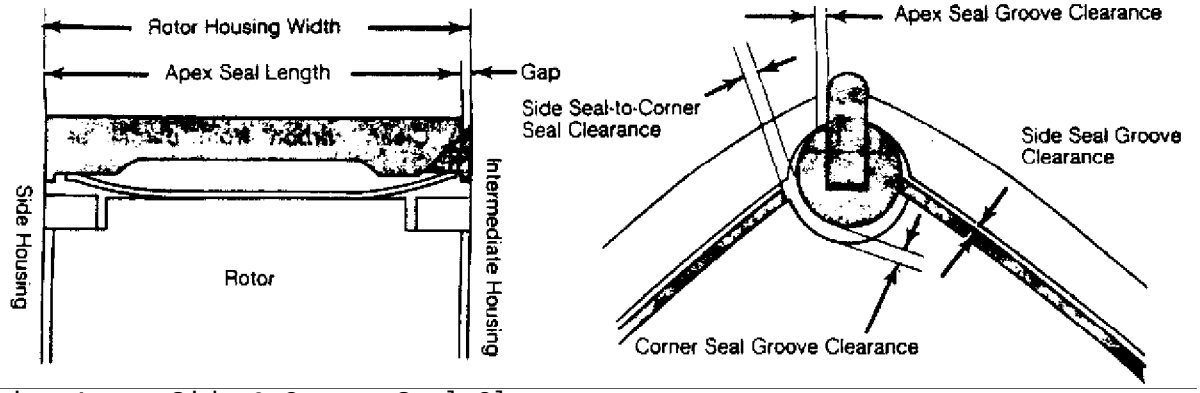


Fig. 18: Measuring Apex, Side & Corner Seal Clearance

Eccentric Shaft

1) Thoroughly clean eccentric shaft in cleaning solution and blow out oil passages with compressed air. Inspect shaft for scratching or scoring of bearing journals and possible blocked oil passages.

2) Place eccentric shaft in 2 "V" blocks. Mount a dial indicator and check runout of both ends by rotating shaft slowly. Runout equals one-half of the largest difference shown by dial indicator. Replace shaft if runout exceeds .0024" (.06 mm).

3) Measure eccentric shaft main and rotor journal diameters. See Eccentric Shaft Main and Rotor Bearings Specifications.

4) Oil passages in eccentric shaft are sealed by a blind plug in rear of shaft. Inspect plug for looseness or oil leakage. If leaking, remove plug with an Allen wrench, and install new "O" ring. Tighten plug.

5) Inspect needle bearings in end of shaft for wear or damage. Check oil jet for weak spring and stuck or damaged steel check ball. Inspect front needle bearing, bearing housing, and thrust plate for wear or damage.

6) Inspect front cover and rear stationary gear oil seals for leaks, replace as necessary. When replacing seals, do not coat outside of seal with lubricant or sealer.

7) Ensure that auxiliary port valve turns freely when inserted in side of engine housing. Slight wear or abrasion is normal on valve surface. Replace valve if damaged, cracked or abnormally worn.

REASSEMBLY

Oil Seals

1) Place rotor on rubber pad or cloth. Install oil seal springs in their respective rotor grooves. Fit each spring edge in stopper hole.

2) Ensure oil seal springs have been painted in Cream or Blue color: Cream colored springs must be placed on front edge faces of rotors and blue springs on rear faces of rotors. When installing, painted side of spring must face oil seal (upward). See Fig. 19.

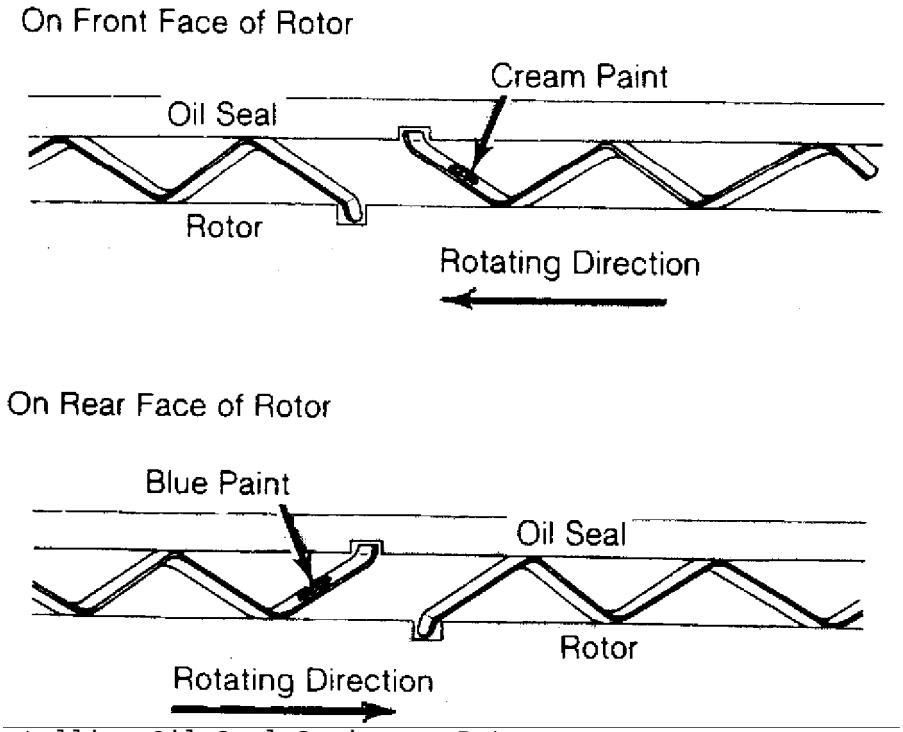


Fig. 19: Installing Oil Seal Spring on Rotor
Painted side of spring must face oil seal.

3) Insert new "O" ring in each oil seal. Install inner oil seal to each side of rotor as follows: Position oil seal to groove so square edge of spring fits in stopper notch of oil seal. Press into position by using a used inner oil seal so lip of inner oil seal sinks into position approximately .016" (.4 mm) below surface of rotor.

4) Install outer oil seal so square edge of spring fits in stopper notch of oil seal. Slowly push oil seal in position with fingers. Confirm smooth movement of each oil seal by pressing oil seal.

5) Check oil seal protrusion. Install oil seal springs and oil seals on the other side of rotor. Take care not to deform lip of oil seal.

Apex, Corner & Side Seals

1) Before installing apex seal, cut the assist piece to a length of .08-.011" (2.0-2.8 mm). Peel off paper and install assist piece on apex seal. See Fig. 20.

2) With rotor internal gear facing upward, install apex seals without springs and side pieces into rotor grooves. Position apex seal with side piece end toward rear side of rotor. Install the soft seal into the corner seal.

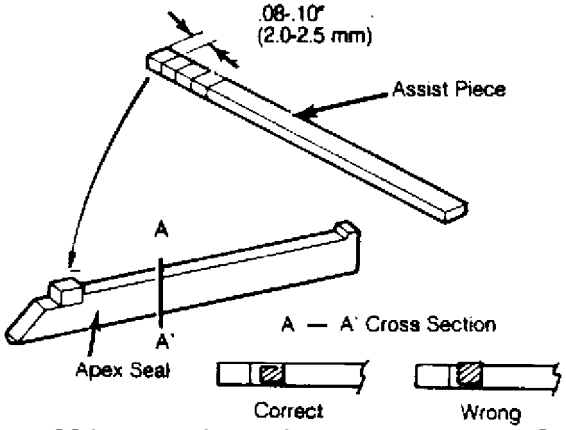


Fig. 20: Installing Assist Piece on Apex Seal
Check each seal for smooth movement.

3) Install corner springs and seals into bores, then install side seals and springs into proper grooves. Ensure smooth movement of each seal by pressing its head. Install a large rubber ring around outside of rotor to prevent apex seals from falling out.

Installing Front Rotor

Mount front housing on engine stand and place front rotor assembly on housing. Use care not to drop seals into port. Mesh internal and stationary gears so that one rotor apex is set to one of 4 positions on housing. See Fig. 21.

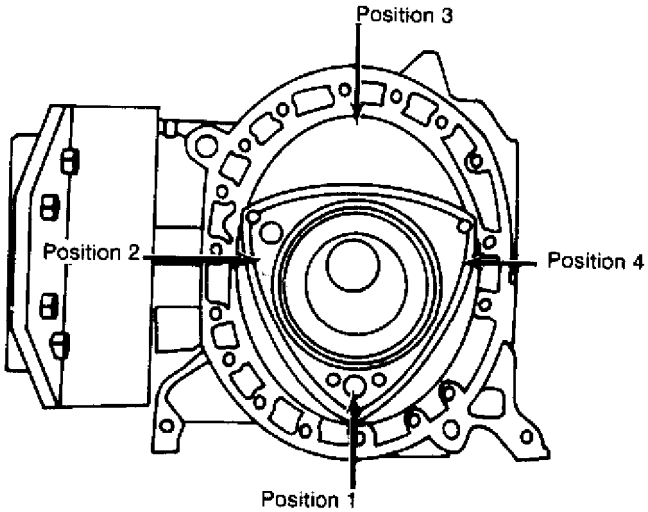


Fig. 21: Positioning Rotor Apex for Reassembly
Use care not to drop seal into port.

Installing Eccentric Shaft

Lubricate front rotor journal and main journal on shaft with engine lubricant. Being careful not to damage rotor and main bearing, install eccentric shaft.

Installing Front Rotor Housing

NOTE: Front and rear rotor housings are not interchangeable, ensure that they are installed in correct sequence.

1) Apply sealing agent to front side of rotor housing, and

apply a light coating of MOS2 (molybdenum disulphide) grease to surfaces on front and rear housing. See Fig. 22.

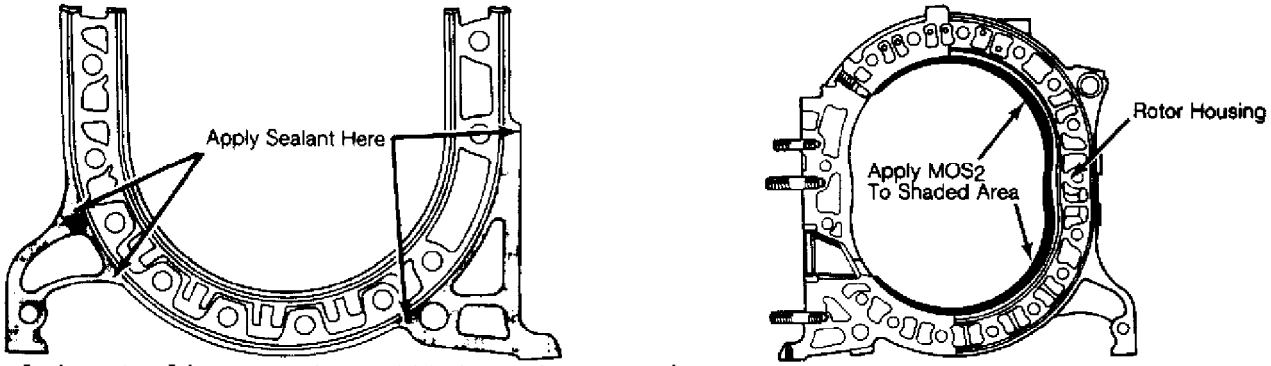


Fig. 22: Applying Sealing Agent & MOS2 to Rotor Housing
Apply MOS2 (Molybdenum disulphide) to shaded areas on front and rear housings.

2) To ensure greater sealing rubber durability, install a protector behind each inner sealing rubber. See Fig. 23. Install new "O" ring, sealing rubbers and protector in front side of engine housing. Apply light coat of petroleum jelly to hold seals in place.

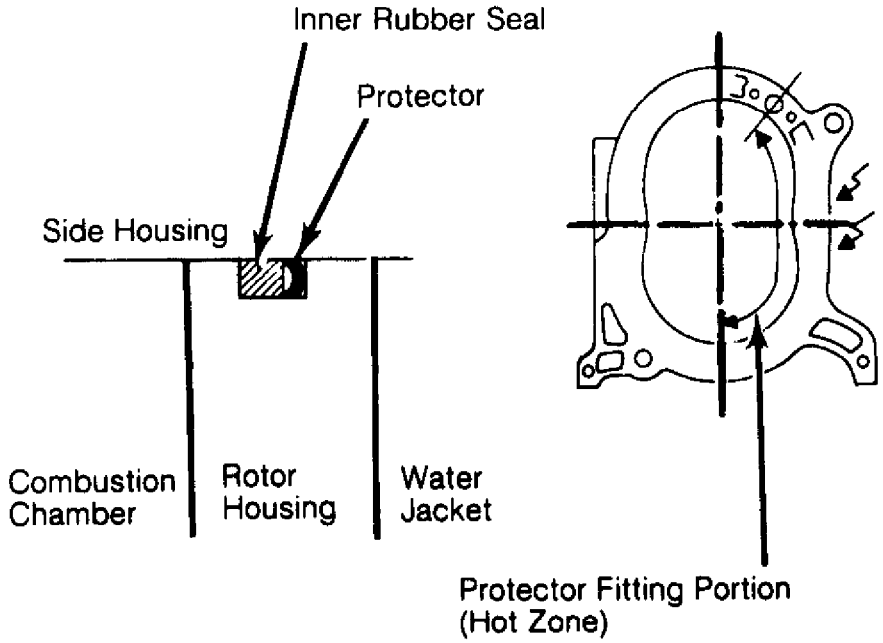


Fig. 23: Installing Protectors for Inner Sealing Rubbers
Apply light coat of petroleum jelly to hold seals in place.

NOTE: Inner sealing rubber is square type. The wider white line of sealing rubber should face toward combustion chamber and seam of rubber should be placed as shown in Fig. 24. Do not stretch sealing rubbers.

3) Invert front rotor housing using care that seals remain in position, and install on front housing. Lubricate tubular dowels and insert through front rotor housing holes into rotor housing.

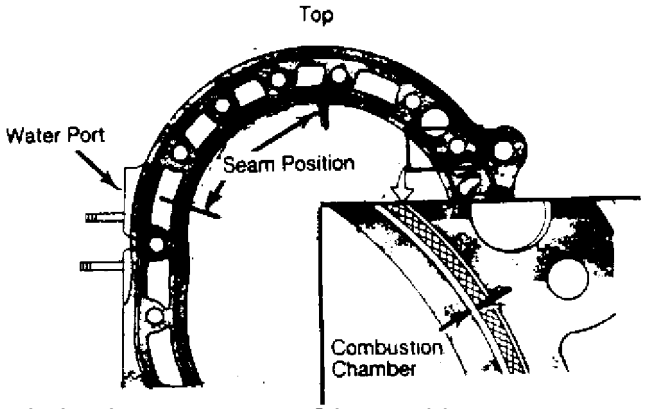


Fig. 24: Positioning Inner Sealing Rubber
Wider white line of sealing rubber must face toward combustion chamber.

4) Insert apex seal springs so that both ends of spring support back side of apex seal. Install soft seal into corner seal. Install corner seal springs and seals into bores.

5) Install side pieces in proper positions on end of apex seals. Lubricate with engine oil. Check that side pieces are set correctly on springs. See Fig. 25.

6) Apply sealing agent on the rear side of front housing. See Fig. 22. Install new "O" ring, sealing rubbers and protector on rear side of front housing. Lubricate seals and sliding surfaces of front rotor housing with engine oil.

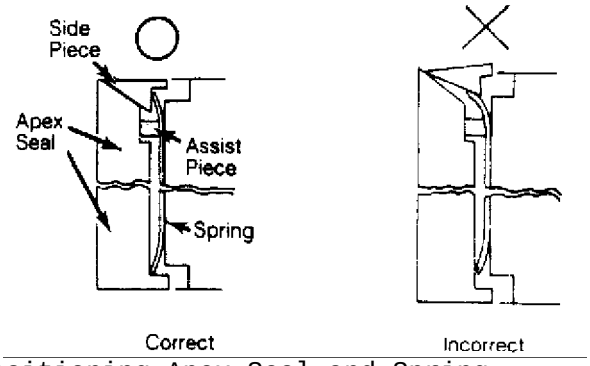


Fig. 25: Positioning Apex Seal and Spring
Check side piece for correct installation.

Installing Intermediate Housing

1) Pull eccentric shaft outward approximately 1.0" (25 mm), but not more than 1.5" (38 mm).

2) Rotate eccentric shaft until eccentric portion points to 2 o'clock position. Carefully install intermediate housing over eccentric shaft and set on front rotor housing.

Installing Rear Rotor & Housing

To install rear rotor and housing, follow same procedures for installing front rotor and front rotor housing.

Lubricate stationary gear and main bearing with engine oil. Install rear housing onto rear rotor housing, and turn rear rotor slightly to engage rear housing stationary gear with rear rotor internal gear.

Tightening Rear Housing Bolts

Place new sealing washers on housing bolts and oil bolt threads. Tighten bolts in increasing steps and according to sequence pattern. See Fig. 26. Turn eccentric shaft to make sure rotation is light and smooth.

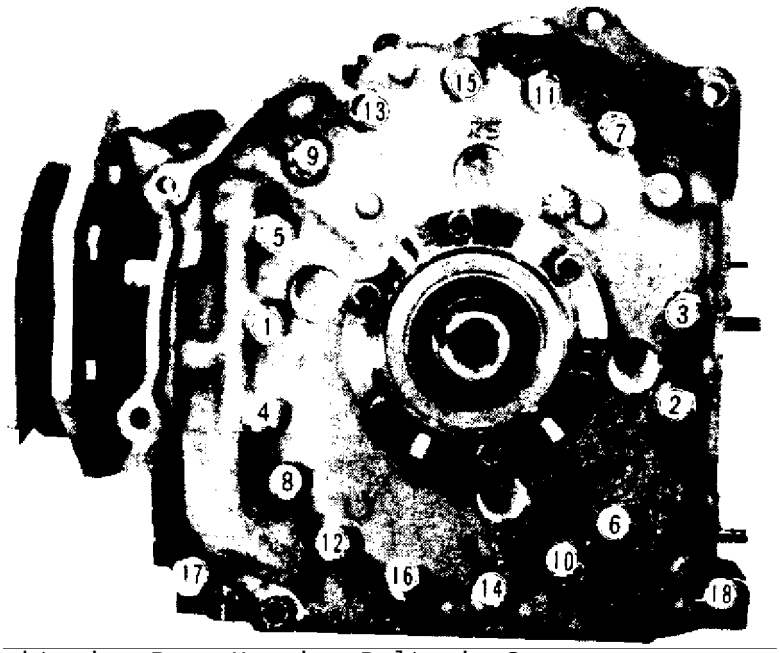


Fig. 26: Tightening Rear Housing Bolts in Sequence

Replace all housing bolt sealing washers when engine is overhauled.

Flywheel Installation

(Manual Transmission)

1) Lubricate rear housing oil seal with engine oil and install flywheel key on eccentric shaft. Install flywheel on eccentric shaft.

2) Apply sealer to lock nut surface that contacts flywheel. Hold flywheel with Flywheel Brake (49 1881 060), and tighten lock nut to specification.

3) Hold clutch disc in position with Clutch Disc Center (49 0813 310 or equivalent). Mount clutch cover and pressure plate assembly on flywheel, and align "O" marks of clutch cover and flywheel.

4) Install 4 standard and 2 reamer bolts finger tight. Avoid distortion of pressure plate cover by tightening bolts in increasing steps.

Counterweight & Drive Plate Installation

(Automatic Transmission)

1) Lubricate rear housing oil seal with engine oil and install key on eccentric shaft. Align counterweight with key and install on eccentric shaft.

2) Apply sealer to lock nut surface that contacts

counterweight. Hold counterweight with Stopper (49 1881 055), and tighten lock nut. Install drive plate on counterweight with hole in counterweight and drive plate aligned.

Eccentric Shaft End Play Adjustment

1) Turn engine so front is up. Install thrust plate with chamfer downward. Slide spacer and needle bearing on eccentric shaft. Lubricate shaft and bearings, and install bearing housing.

NOTE: If bearing housing has not been removed, use care that center of needle bearing in bearing housing comes to center of eccentric shaft and that spacer is seated on thrust plate.

2) Lubricate and install needle bearing, thrust washer, and balance weight on shaft. Install oil pump assembly on front housing and keys in oil pump and eccentric shaft keyways. Place oil pump drive chain on oil pump sprocket and eccentric shaft sprocket. Install sprockets on shafts.

3) Align keyways of eccentric shaft sprocket and balance weight. Install key. Install distributor drive gear, with "F" mark on gear facing front of engine. Install eccentric shaft pulley on shaft. Use new washer, and tighten pulley bolt to specification.

4) Turn engine so top is up. Attach a dial indicator on the flywheel or counterweight so it contacts rear housing. Move flywheel or counterweight back and forth.

5) Standard end play is .0016-.0028" (.04-.07 mm). If end play is more than .0035" (.09 mm) grind spacer on surface plate with emery paper or install thinner spacer. If end play is less than .0016" (.04 mm), install thicker spacer.

6) Oversize spacers are available in 5 sizes from .3181" to .3150" (8.08 mm to 8.00 mm), and are identified by stamped letter "X", "K", "Y", "V", and "Z" respectively. Recheck end play after installing spacer.

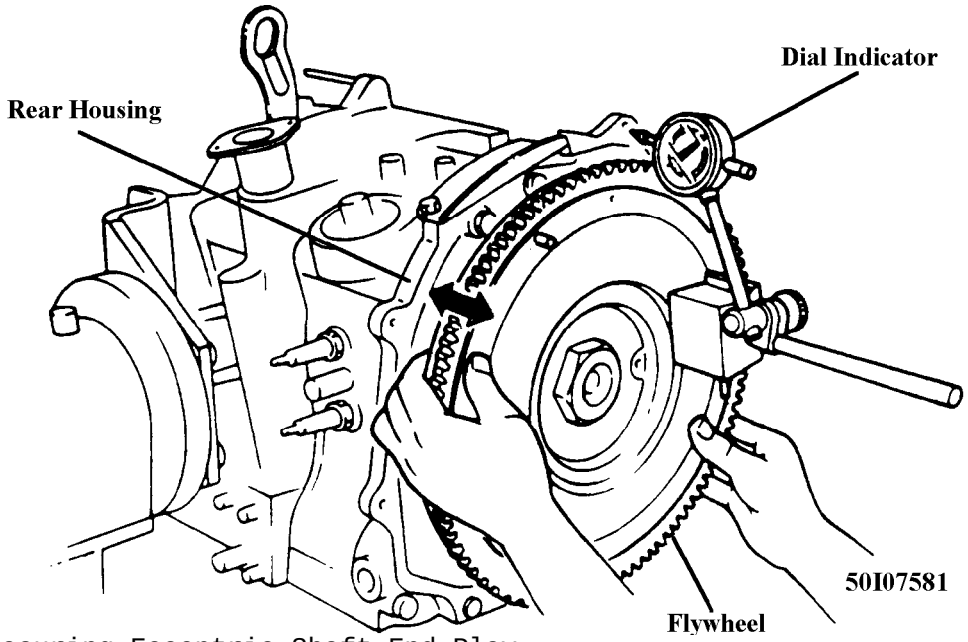


Fig. 27: Measuring Eccentric Shaft End Play
Standard end play is .0016-.0028" (.04-.07 mm).

Installing Front Cover & Eccentric Shaft Pulley

1) Turn engine upright and remove eccentric shaft pulley.

Tighten oil pump sprocket nut and bend lock washer tab.

2) Check oil pump chain slack measurement by pressing finger against chain. See Fig. 31. Replace chain if slack exceeds .47" (12 mm).

3) Install new "O" ring on front housing oil passage. Lubricate front cover oil seal and install front cover and gasket on front housing. Using a new washer, install pulley on eccentric shaft. Tighten pulley bolt to specification.

Installing Oil Strainer & Oil Pan

1) Invert engine so bottom of engine is up. Install oil strainer and gasket on front housing. Cut off excess gasket along oil pan mounting surface.

2) Apply a .16-.24" (4-6 mm) continuous bead of sealer (silicone base) on mounting surface of oil pan (to inside of bolt holes). Install gasket on oil pan. Apply a similar bead of sealer to gasket. Install pan and tighten bolts. Reconnect oil level sensor.

Installing Water Pump

On 1.1L engine, position gasket and water pump on front housing and tighten mounting bolts. On 1.3L engine, install shims between front cover and water pump housing at points 2 and 4. See Fig. 28. Tighten bolts and nuts in sequence.

NOTE: On 1.3L engine, failing to install shims at points 2 and 4 between front cover and water pump housing will cause coolant leakage. See Fig. 28.

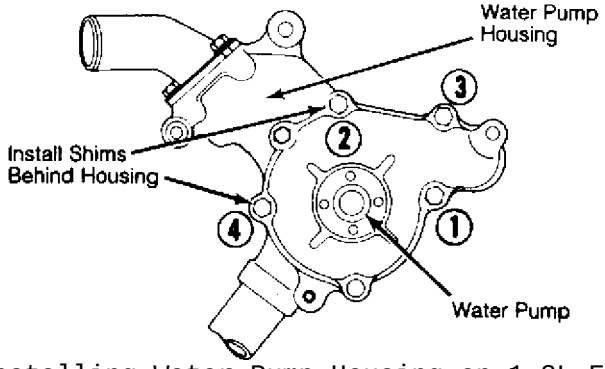


Fig. 28: Installing Water Pump Housing on 1.3L Engine
Install shims behind housing at points 2 and 4 to prevent coolant leakage.

Installing Oil Filter Body

On 1.1L engine, install 2 "O" rings and oil filter on oil cooler. Install oil cooler on rear housing and install front cover and oil cooler side oil pipes. First tighten front cover oil pipe, then tighten oil cooler side pipe.

On 1.3L engine, install 2 "O" rings on oil filter body and install on engine.

Installing Distributor

1) Rotate eccentric shaft until Yellow mark (leading timing mark) on pulley aligns with indicator pin on front cover. Align notch on distributor housing with punch mark on driven gear.

2) Insert distributor and lock nut. Turn distributor housing until a trigger wheel blade aligns with pick-up coil. Tighten lock nut.

Installing External Components

1.1L Engine

1) Install exhaust manifold, engine mount, intake manifold with carburetor, alternator and drive belt.

2) Install air pump with spacer in original position (between engine and upper air pump housing mount). Install drive belt and all other external components. Before removing engine from stand, install engine hanger bracket to front cover.

1.3L Engine

1) Install exhaust manifold gasket and exhaust manifold on engine. Install hot air duct and absorber plate on exhaust manifold.

2) Install auxiliary ports in side of engine housing with larger sides of auxiliary port valve shafts facing index mark on gasket. See Fig. 29. Install "O" rings, gasket and intake manifold on engine.

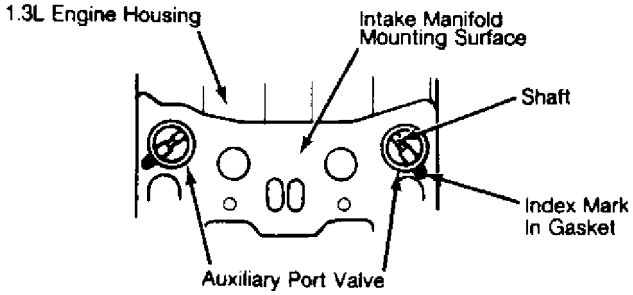


Fig. 29: Installing Auxiliary Port Valves on 1.3L Engine
Larger end of shaft must face index mark.

3) Install metering oil pump lines, fuel injection nozzles, delivery pipe assembly, dynamic chamber, vacuum solenoids and vacuum hoses.

4) Install alternator, air pump and drive belts.

ENGINE OILING

ENGINE OILING SYSTEM

A two rotor oil pump produces pressure necessary for proper internal engine lubrication. Oil pump is mounted on front housing and is chain driven by eccentric shaft. Oil pressure is limited by a regulator valve and pressure control valve. Full flow oil filter and oil cooler are used on both 1.1L and 1.3L engines.

Both engines use a metering oil pump to ensure proper rotor seal lubrication. On 1.1L engine, metering oil pump delivers oil to carburetor where it mixes with air/fuel mixture.

On 1.3L engine, metering oil pump delivers oil to intake manifold and also to direct oil ports located in both rotor housings. Metering pump control lever is actuated by a rod connected to throttle lever.

Oil pressure control valve is located in front cover and is designed to open at 114 psi (8 kg/cm^2). On 1.1L engine, free length of oil pressure control valve spring should be 2.74" (69.6 mm). On 1.3L engine, free length of oil pressure control valve spring should be 2.87" (73 mm). Cap bolt and valve spring are painted yellow on 1.1L engine only.

Oil pressure regulator valve relieves pressure above 71 psi (4.9 kg/cm^2) at 3000 RPM. Its spring length (free length) should be 1.83" (46.4 mm).

Oil cooler contains a by-pass valve which opens when oil

pressure exceeds 43 psi at 140° F (3 kg/cm² at 60° C).

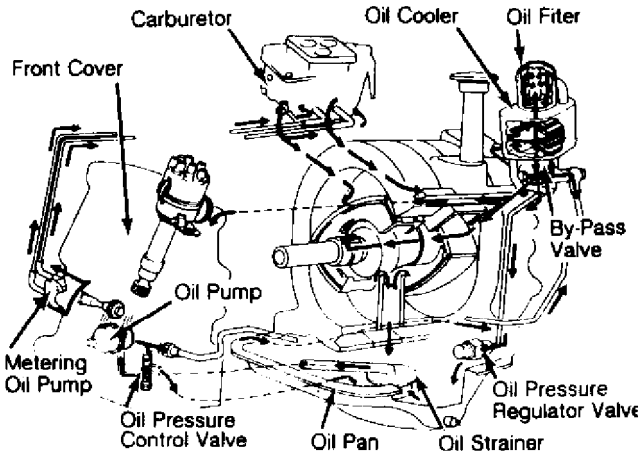


Fig. 30: Mazda 1.1L Engine Oiling System

CRANKCASE CAPACITY

Crankcase capacity for 1.1L engine is 4.9 qts. (4.6L), including filter. Crankcase capacity for 1.3L engine is 5.8 qts. (5.6L), including filter.

OIL FILTER

A full-flow, disposable cartridge-type filter is mounted on the rear housing.

NORMAL OIL PRESSURE

Normal oil pressure is 13-38 psi (.9-2.7 kg/cm²) at idle speed, 64-78 psi (4.5-5.5 kg/cm²) at 3000 RPM.

OIL PUMP

NOTE: Oil pump is mounted on the front engine housing and must be overhauled with front engine cover removed.

Removal & Inspection

1) Remove front engine cover. Check oil pump drive chain slack by pressing finger against chain and measuring slack. If measurement exceeds .47" (12 mm), replace drive chain. See Fig. 31.

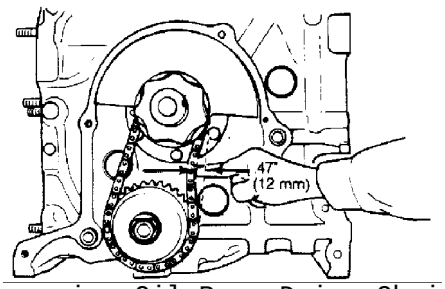


Fig. 31: Measuring Oil Pump Drive Chain Slack
Replace chain if slack exceeds limit.

2) Disassemble oil pump in following order: Remove snap

ring, rear outer and inner rotor, key, lock screw and middle plate. Remove front outer and inner rotor, key shaft, spring pin, and front outer rotor. See Fig. 32.

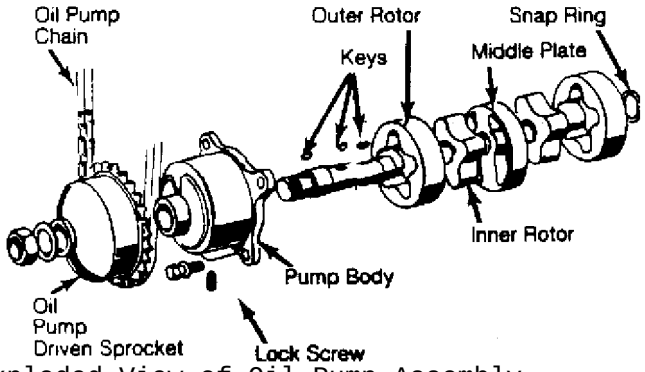


Fig. 32: Exploded View of Oil Pump Assembly

3) Insert a feeler gauge between lobes of both rotors and check clearance. Replace both rotors if clearance exceeds .006" (.15 mm).

4) Check clearance between outer rotor and pump housing with a feeler gauge. If clearance exceeds .012" (.30 mm), replace rotor or housing.

5) Place straightedge across pump body mounting surface, and check rotor end play with feeler gauge. Place straightedge across oil pump body mounting surface on front engine housing and check clearance. If beyond .006" (.15 mm), surface oil pump body by grinding.

Assembly & Installation

1) To assemble oil pump, reverse disassembly procedure. Assembly marks on inner and outer rotors must be aligned and facing front engine housing. Apply Locktite to locking screw and install in pump body. Align locking screw with recess portion of middle plate.

2) Prime and install oil pump. Tighten bolts and rotate shaft by hand checking for smooth rotation. Install sprockets and chain and install front cover as previously outlined in this article. See Installing Front Cover and Eccentric Shaft Pulley.

METERING OIL PUMP

1.1L Engine

1) Check and adjust clearance between metering pump lever and washer. See Fig. 33. Clearance must not exceed .04" (1.0 mm).

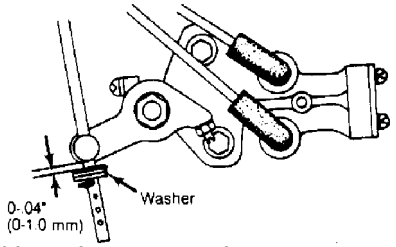


Fig. 33: Adjusting Metering Pump Control Rod
Adjust clearance by changing washers.

2) Measure oil output by warming engine to normal operating temperature and disconnecting oil metering hoses from carburetor.

Place hoses in measuring cylinder.

3) Start engine and run at 2,000 RPM. When oil flow from hoses becomes steady, measure output volume for 6 minutes. Pump should discharge .07-.08 oz. (2.0-2.4 cc) in 6 minutes. Replace metering oil pump if output is not within volume specified.

NOTE: Rotors will not be receiving oil through air intake during test. Add small amount of clean oil to carburetor or air intake to provide proper lubrication during testing.

1.3L Engine

1) Check metering pump clearance by setting fast idle cam against metering pump actuating lever. See Fig. 34.

2) Check and adjust clearance of metering pump rod at pump lever. See Fig. 33. Clearance must not exceed .04" (1 mm).

3) Remove oil metering check valves from intake manifold and rotor housings. Test each check valve by applying low air pressure to oil supply end. Air should pass through valve. Apply low air pressure to opposite end of each valve and check that air flow is blocked.

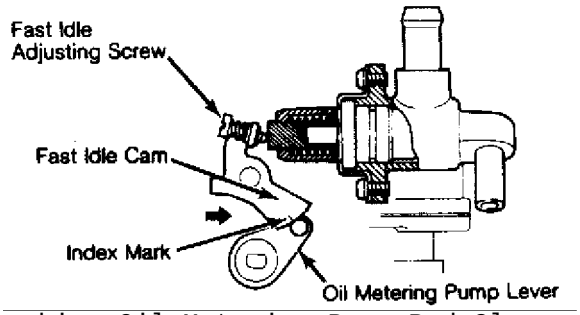


Fig. 34: Checking Oil Metering Pump Rod Clearance on 1.3L Engine

OIL COOLER

Inspection

Check the oil cooler for damage, cracks, or leaks. Replace the oil cooler if defective.

On 1.3L engine, check oil cooler by-pass valve operation by draining engine oil, removing plug from bottom of oil cooler, and removing by-pass valve from bottom of oil cooler. Submerge by-pass valve in a container of engine oil heated to 149° F (65° C). Check that valve protrudes a minimum of .2" (5 mm).

Removal & Installation

1.1L Engine

1) Remove water hoses installed on the inlet and outlet sides of cooler. Remove oil pipe and sealing washer. Remove oil cooler and filter housing as an assembly.

2) Remove "O" rings. Do not disassemble. Replace as an assembly if necessary. To install, reverse removal procedure. Use new filter, "O" rings, and sealing washer. Add engine oil and coolant. Start engine and check for leaks.

WATER PUMP

Removal

1) Drain cooling system. Remove air cleaner, water temperature switch connector, air conditioner drive belt, and air pump drive belt.

2) Remove alternator, cooling fan, and drive belts. Remove

air conditioning pulley (if equipped). Disconnect radiator hoses and remove water pump.

Disassembly

1) Press pulley boss off of pump shaft. Remove snap ring.

2) While supporting pump body, apply pressure to rear end of shaft to press shaft, spacer, and bearing assembly out through front of pump body. See Fig. 35.

3) Remove impeller and seal assembly from pump body. Press bearings and spacer from shaft.

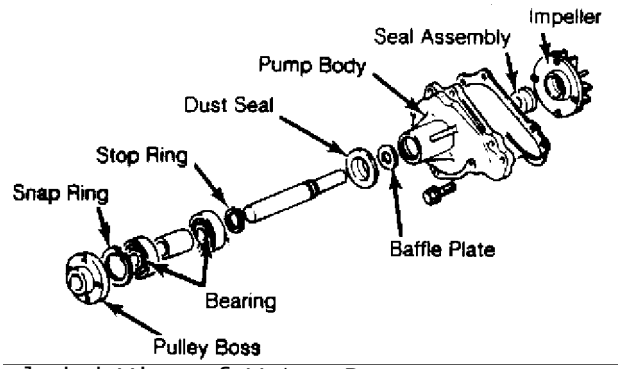


Fig. 35: Exploded View of Water Pump

Reassembly

1) Install stop ring and dust seal on shaft. Drive baffle plate onto taper of shaft.

2) Press rear bearing onto shaft with sealed side rearward until it contacts stop ring. Press shaft and bearing assembly into pump body.

3) Place spacer on shaft. Install front bearing (sealed side forward) until snap ring can be installed. Press pulley boss onto pump shaft.

4) Install seal assembly into the body. Press impeller onto shaft until it is flush with end of shaft.

Installation

Install water pump as previously outlined in engine reassembly procedure. Adjust drive belt tension and refill cooling system.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Eccentric Shaft Pulley	72-87 (98-118)
Exhaust Manifold	
1.1L	32-43 (44-59)
1.3L	23-34 (32-47)
Flywheel Lock Nut	289-362 (393-492)
Intake Manifold	
1.1L	14-19 (19-26)
1.3L	12-17 (16-23)
Oil Cooler (1.1L Only)	
Oil Pipe Nut	29-36 (40-50)
Oil Cooler Bolt	43-61 (60-85)
Oil Pump Sprocket	23-34 (32-47)

Pressure Plate	13-20 (18-27)
Rear Housing Bolts	23-27 (32-38)
Water Pump	13-20 (18-27)

ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS TABLE

Displacement	
Cu. In.	70
Liters	1.1
Fuel System	4 Bbl.
HP @ RPM	...
Torque Ft. @ RPM	...
Compr. Ratio	9.4:1
Rotor Housing Width	2.7559 (70)
Displacement	
Cu. In.	80
Liters	1.3
Fuel System	Fuel Inj.
HP @ RPM	...
Torque Ft. @ RPM	...
Compr. Ratio	9.4:1
Rotor Housing Width	3.1497 (80)

ROTOR SPECIFICATIONS

ROTOR HOUSING, INTERMEDIATE HOUSING & ROTOR SPECIFICATIONS TABLE

Application	In. (mm)
1.1L	
Front	
Rotor Housing	
Width	2.7559 (70)
Distortion Limit	.0024 (.06)
Front, Intermediate & Rear Housing	
Width	1.575 (40)
Distortion Limit	.0016 (.40)
Rotor	
Width In (mm)	2.748 (69.8)
Housing-to-Rotor Protrusion	.0047-.0075 (.12-.19)
Land Protrusion	...
Center	
Front, Intermediate & Rear Housing	
Width	1.969 (50)
Distortion Limit	.0016 (.40)
Rear	
Rotor Housing	
Width	2.7559 (70)
Distortion Limit	.0024 (.06)
Front, Intermediate & Rear Housing	
Width	2.362 (60)
Distortion Limit	.0016 (.40)
Rotor	

Width In (mm)	2.748 (69.8)
Housing-to-Rotor Protrusion	.0047-.0075 (.12-.19)
Land Protrusion	...
1.3L	
Front	
Rotor Housing	
Width	3.1497 (80)
Distortion Limit	.0024 (.06)
Front, Intermediate & Rear Housing	
Width	1.575 (40)
Distortion Limit	.0016 (.40)
Rotor	
Width	3.144 (79.85)
Housing-to-Rotor Protrusion	.0047-.0083 (.12-.21)
Land Protrusion	...
Center	
Front, Intermediate & Rear Housing	
Width	1.969 (50)
Distortion Limit	.0016 (.40)
Rear	
Rotor Housing	
Width	3.1497 (80)
Distortion Limit	.0024 (.06)
Front, Intermediate & Rear Housing	
Width	2.362 (60)
Distortion Limit	.0016 (.40)
Rotor	
Width	3.144 (79.85)
Housing-to-Rotor Protrusion	.0047-.0083 (.12-.21)
Land Protrusion	...

APEX SEAL SPECIFICATIONS

APEX SEAL SPECIFICATIONS TABLE

Application	In. (mm)
1.1L	
Length	2.748 (69.8)
Seal Width	.1181 (3.0)
Height	.3347 (8.5)
Seal-To-Housing	
Clearance	...
Wear Limit	...
Seal-To-Rotor	
Groove Clearance	.0020-.0035 (.05-.09)
Wear Limit	.0059 (.15)
1.3L	
Length	3.148 (79.8)
Seal Width	.1181 (3.0)
Height	.3347 (8.5)
Seal-To-Housing	
Clearance	...
Wear Limit	...
Seal-To-Rotor	
Groove Clearance	.0020-.0035 (.05-.09)
Wear Limit	.0059 (.15)

SIDE SEAL SPECIFICATIONS

SIDE SEAL SPECIFICATIONS TABLE

Application	In. (mm)
Thickness	.0394 (1.0)
Width	.1378 (3.5)
Seal-To-Groove	
Clearance	.0012-.0031 (.03-.08)
Limit	.0039 (.10)
Side Seal-To-Corner Seal	
Clearance	.0020-.0059 (.05-.15)
Limit	.0157 (.40)

SHAFT & ROTOR BEARING SPECIFICATIONS

ECCENTRIC SHAFT MAIN & ROTOR BEARINGS SPECIFICATIONS TABLE

Application	In. (mm)
Main Bearings	
Journal Diameter	1.6929 (43)
Clearance	.0016-.0031 (.04-.08)
Eccentric Shaft End Play	.0016-.0028 (.04-.07)
Rotor Bearings	
Journal Diameter	2.9134 (74)
Clearance	.0016-.0031 (.04-.08)

CORNER SEAL SPECIFICATIONS

CORNER SEAL SPECIFICATIONS TABLE

Application	In. (mm)
Diameter	.4331 (11.0)
Height	.2756 (7.0)
Seal-To-Groove	
Clearance	...
Limit	...
Side Seal-To-Corner Seal	
Clearance	.0020-.0059 (.05-.15)
Limit	.0157 (.40)

OIL SEAL SPECIFICATIONS

OIL SEAL SPECIFICATIONS TABLE

Application	In (mm)
Height	.2205 (5.6)
Seal Lip Contact Width	
Standard	Less than .02 (Less than .5)
Limit	...

PORT TIMING SPECIFICATIONS

PORT TIMING SPECIFICATION TABLES

Application	Specification
1.1L	
Intake	
Open (ATDC)	32°
Close (ABDC)	40°
Exhaust	
Open (BBDC)	75°
Close (ATDC)	38°
1.3L	
Intake	
Open (ATDC)	(1) 32°
Close (ABDC)	(2) 40°
Exhaust	
Open (BBDC)	75°
Close (ATDC)	38°

(1) - 32° Primary and Secondary, and 45° Auxiliary.
(2) - 40° Primary, 30° Secondary, and 70° Auxiliary.

END OF ARTICLE

1.2L ENG FLYWHEEL THREAD HOLE MODIFICATIONS CAT. 40, NO. 003/84

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:33PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

FLYWHEEL MODIFICATION

Model: 1984 RX-7
Bulletin No.: 003/84
Date: 7/31/84
Category: 40

DESCRIPTION

The thread pitch of the two holes in the flywheel has been changed from 1.50mm to 1.25mm in order that the same puller can be used to remove the flywheel for manual transmission and the counter weight for automatic transmission. Because of this change, the flywheel puller (4908 23 300A) cannot be used for the modified flywheel. When removing the flywheel, use the counter weight puller (4908 39 305A).

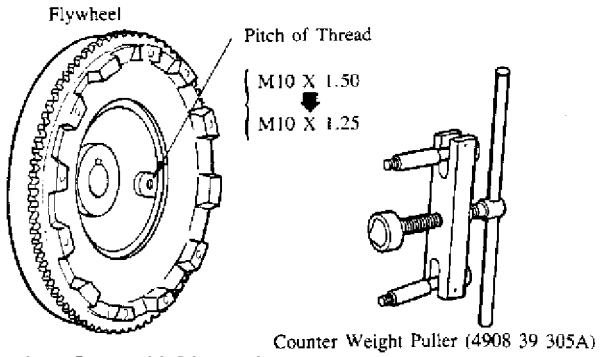


Fig. 1: Flywheel Modifications

VIN OF PRODUCTION CHANGE

12A:	JM1FB331 E0834333	May, 1984
13B:	JM1FB332 E0834333	May, 1984

PARTS INFORMATION

NEW PART NO.	OLD PART NO.	DESCRIPTION	MODEL	INTERCHANGEABLE
N231 11 700A	N231 11 700	Flywheel	12A	NEW = OLD
N304 11 700A	N304 11 700	Flywheel	13B	NEW = OLD

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 10:34PM

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.

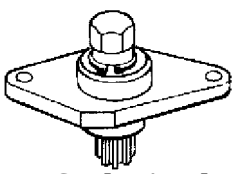


Fig. 1: View of Flywheel Turning tool (49FA 42 065)

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

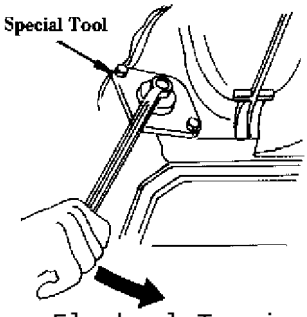


Fig. 2: Using Flywheel Turning Tool

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).

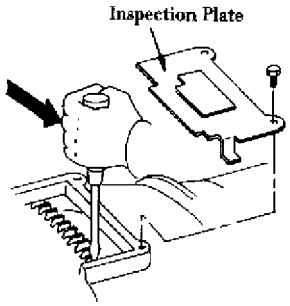


Fig. 3: Removing Inspection Plate From Convertor Housing

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 CLUTCH VIB - REPL FLYWHEEL ALIGNMENT PINS CAT. 6, NO. 002/86

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:35PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

CLUTCH ALIGNMENT PINS

Models	1983-86 RX-7
Bulletin No.	002/86
Category	6
Date	4/8/86
Symptom	Clutch Vibration

DESCRIPTION

Replacement flywheels for the 1983-1986 RX-7 are shipped without clutch alignment pins. These pins are necessary to accurately align the clutch cover to the flywheel during assembly. Failure to use the alignment pins will result in vibration of the flywheel and clutch assembly. See Fig. 1.

When replacing the flywheel, please order the pin by the part number listed below.

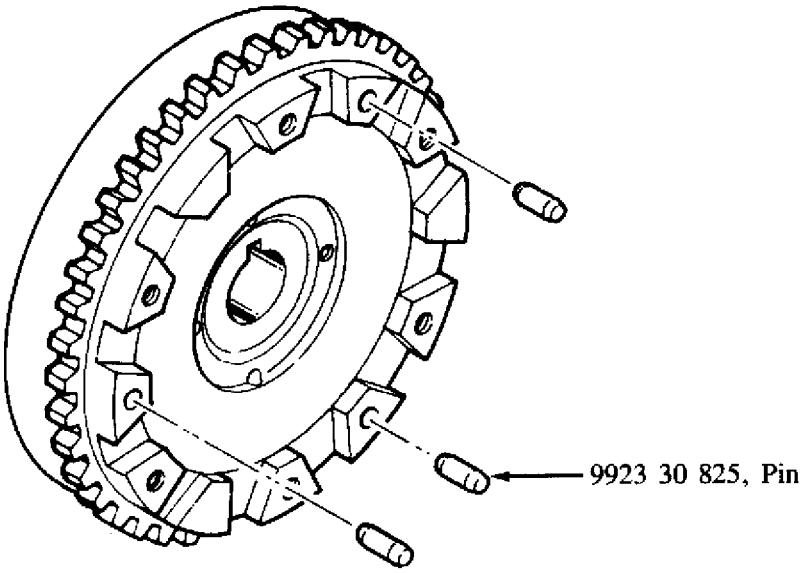


Fig. 1: 83-86 RX7 Flywheel and Alignment Pins

PARTS INFORMATION

PART NUMBER	DESCRIPTION	QTY
9923 30 825	Knock Pin	3

END OF ARTICLE

1.3L ENG ECCENTRIC SHAFT PULLEY TIMING MARK CAUTION CAT. 1, NO. 007/84

Article Text

1984 Mazda RX7

For iluvmyrx7.com

Saturday, June 08, 2002 10:35PM

ARTICLE BEGINNING

TECHNICAL SERVICE BULLETIN

ECCENTRIC SHAFT PULLEY

Model: RX-7
Bulletin No.: 007/84
Date: 10/8/84
Category: 1

DESCRIPTION

No alignment dowels are provided for aligning the eccentric shaft pulley to the eccentric shaft on later model RX-7 vehicles. Consequently, the pulley may be misaligned during reinstallation, resulting in an incorrect location of the timing mark.

For this reason, whenever the eccentric shaft pulley is removed, please mark the location of the timing mark on the pulley in relation to the eccentric shaft in order that the pulley may be reinstalled correctly.

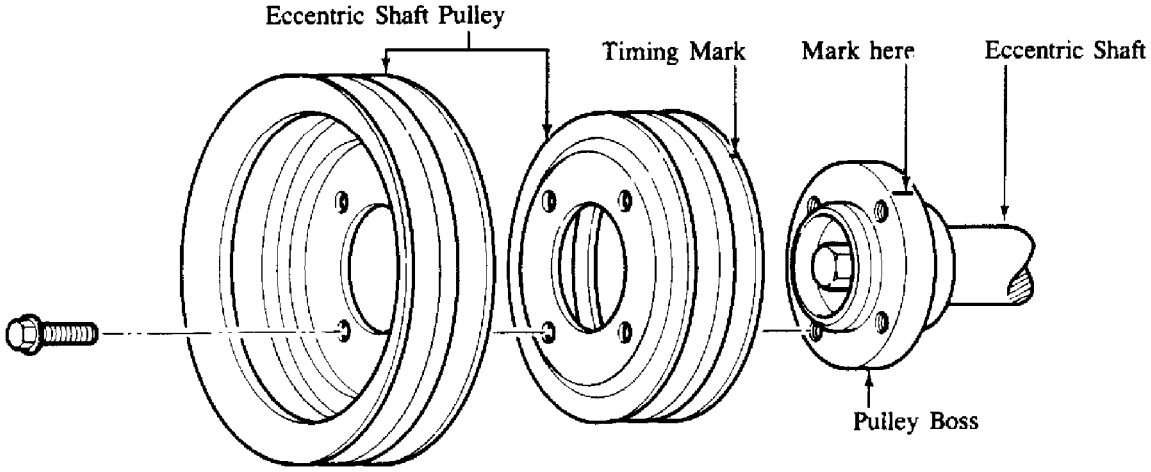


Fig. 1: Marking Location of Timing Mark

END OF ARTICLE

RX-7 OIL REPLACEMENT TIP
Article Text

1984 Mazda RX7
For iluvmyrx7.com

Saturday, June 08, 2002 10:37PM

ARTICLE BEGINNING

TECHNICAL INFORMATION TIP

RX-7 OIL FILTER REPLACEMENT

YEAR(S): All RX-7 Engines
MANUFACTURER: Mazda
MODELS: RX-7

ISSUE: OIL FILTER REPLACEMENT

The oil filter is mounted face down on Mazda RX-7 engines. This makes filter replacement an unnecessarily messy job. To cut down on the spilled oil, punch two holes in the top of the filter to let the filter drain into the crankcase. Remove the drain plug, then let the filter drain while the crankcase drains. Now you can remove an empty filter rather than a full one (due to the check valve inside the filter). No more mess filters dripping all over the top of the engine.

Courtesy of Import Service Magazine
with thanks to:

A.J. Diamant
LMT Auto Repair
Columbia, Maryland

REFERENCE NUMBER: MAZ0045AP

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