RX-3, RX-4 & ROTARY PICKUP

GENERAL SPECIFICATIONS								
Engine & Year	cu. ins.	cc	Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Rotor Housing Width	
							in.	mm
1975								
RX-3	70	1146	4-Bbl	....	....	9.4:1	2.756	70
RX-4	80	1308	4-Bbl	....	....	9.2:1	3.1497	80
Rotary Pickup	80	1308	4-Bbl	....	....	9.2:1	3.1497	80

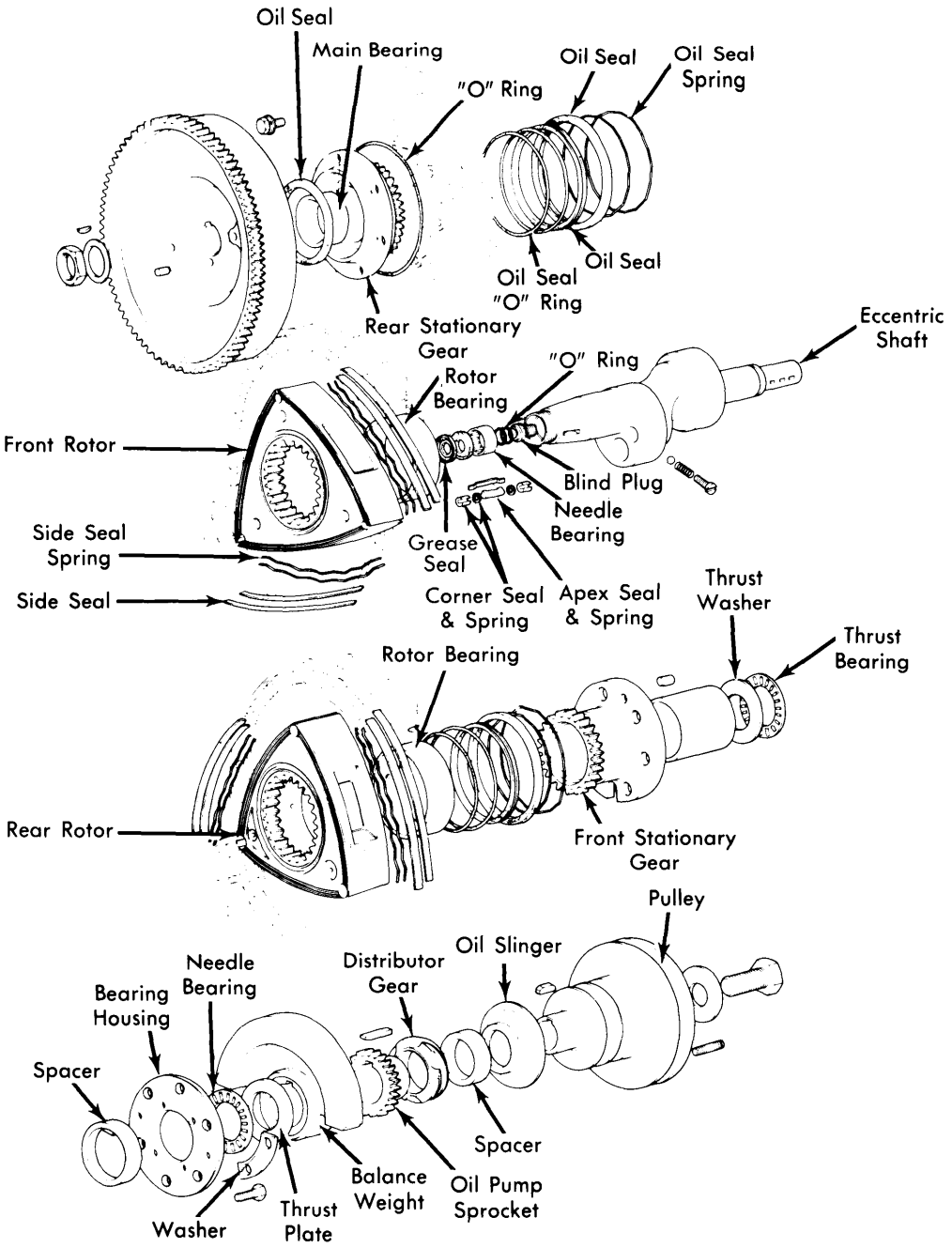

Fig. 1 Exploded View of Rotors & Eccentric Shaft Assembly

RX-3, RX-4 & ROTARY PICKUP (Cont.)

ENGINE IDENTIFICATION

Engine identification number is stamped on the front engine housing behind the distributor. Engines are identified with code numbers as follows:

Engine Codes

Application	Code
RX-3	12A
RX-4 & Rotary Pickup	13B

ENGINE REMOVAL

1) Remove hood and protective cover from under engine. Drain engine oil and cooling system. Disconnect battery and remove air cleaner.

2) Disconnect fuel line, accelerator cable and choke cable from carburetor. Disconnect ground cable from thermostat housing. Disconnect power brake unit vacuum line.

3) Remove radiator shroud, upper and lower radiator hoses and fan from eccentric shaft pulley. Remove spark plug wires and both distributor caps.

4) Disconnect starter, alternator, oil pressure switch and temperature sending unit. Disconnect heater hose and electrical connections for emission control system.

5) Disconnect oil hoses from engine front cover and rear rotor housing. Disconnect positive battery cable from engine. Remove clutch slave cylinder.

6) Disconnect exhaust pipe from exhaust manifold. Remove bolts securing bell housing to engine and support transmission with a jack. Remove engine mount nuts and bolts.

7) Attach hoist to engine, raise slightly and pull engine forward until it clears transmission shaft. Lift engine out of vehicle. To install engine, reverse removal procedure.

ENGINE DISASSEMBLY

NOTE — To facilitate engine disassembly, manufacturer recommends use of a special engine stand (49 0839 000) and special hanger (49 1114 005) for supporting the front housing. Also note that this front housing support may be used on any previous engines (where rear housing support units were previously used).

1) Remove oil hose support bracket from front housing, then mount engine on work stand and front housing support. Remove engine hanger bracket from front cover. Disconnect vacuum hoses, air hoses, and wiring, then remove deceleration valve (if equipped). Remove air pump attaching bolts and bar, then remove air pump and drive belt. Detach alternator and its belt.

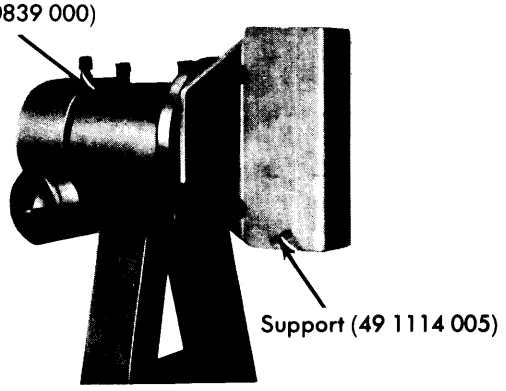

Fig. 2 Engine Supported on Work Stand

2) Disconnect metering oil pump connecting rod and oil tubes from carburetor. Remove intake manifold attaching nuts, then lift off carburetor and intake manifold assembly. Remove manifold gasket and two rubber rings. Detach thermal reactor (exhaust manifold). Remove distributor attaching nut and remove distributor. Remove eccentric shaft pulley for compressor from pulley boss. Remove water pump and gasket.

3) Invert engine on work stand. Remove oil pan and gasket and oil strainer with gasket. Mark front and rear housings for installation in their original positions. Return engine to upright position. Attach ring gear brake holding tool (49 1881 0) to flywheel or drive plate. Unscrew eccentric shaft pulley bolt and remove pulley.

4) Turn engine so that front end is up. Unbolt and remove front cover with gasket. Withdraw "O" ring from oil passage on front housing. Slide distributor drive gear off the shaft. Remove chain adjuster. Remove oil pump driven sprocket lock washer and nut. Slide drive sprocket and driven sprocket along with drive chain off shafts at the same time. Remove keys from eccentric shaft and pump shaft. Slide balance weight, thrust washer, and needle bearing off the shaft.

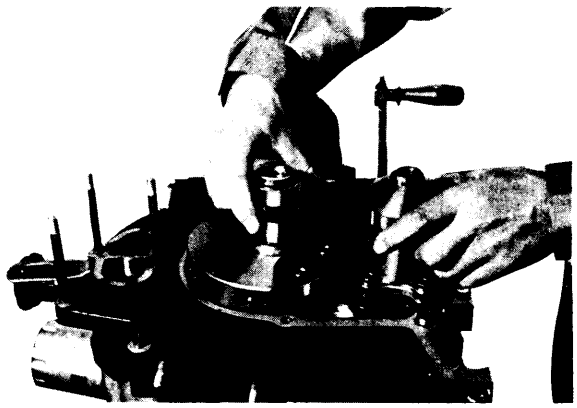

Fig. 3 Removing Sprockets & Chain from Engine

5) Remove bolts attaching bearing housing, and slide housing, needle bearing, spacer, and thrust plate off shaft. Return engine to upright position. If equipped with Man. Trans., remove flywheel as follows: Remove clutch pressure plate assembly. Straighten tab of lock washer and remove flywheel nut using special wrench 49 0820 035, then remove flywheel, using a suitable puller (49 0823 300).

6) If equipped with automatic transmission, remove counterweight as follows: Remove drive plate, then remove ring gear brake tool (49 1881 060). Straighten tab of lock washer and remove counter-weight nut using special wrench (49 0820 035). Attach suitable puller (49 0839 305) and remove counter-weight.

7) Turn engine so that rear end is upward. Loosen tension bolts according to illustrated sequence. *NOTE — Do not remove bolts in one sequence, but rather in two or three progressions.* Lift rear housing off the shaft.

RX-3, RX-4 & ROTARY PICKUP (Cont.)

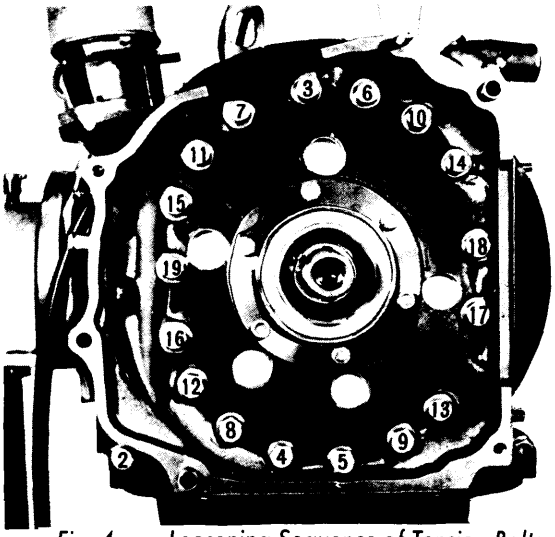

Fig. 4 Loosening Sequence of Tension Bolts

8) Remove any seals stuck to rotor sliding surface of rear housing and place them back into their respective original positions. Remove all corner seals, corner seal springs, side seals, and side seal springs from rear side of rotor. Keep these parts in proper order for reassembly. Withdraw two sealing rubbers and two "O" rings from rear rotor housing.

9) Attach dowel puller (49 0813 215) and pull tubular dowels off rear rotor housing (hold housing with hand to prevent it from turning or pulling up). Lift rear rotor housing away from the rotor, being careful not to drop the apex seals off the rear rotor. Remove two sealing rubbers and two "O" rings from the rear rotor housing.

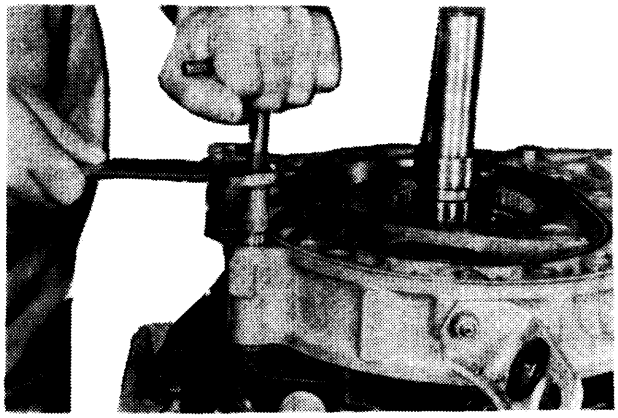

Fig. 5 Extracting Tubular Dowels from Engine

10) Remove each apex seal, side piece, and spring from rear rotor; also place these according to order for reassembly. Remove rear rotor away from eccentric shaft and place it upside down on a clean sheet of cloth. Remove each seal and spring on other side of rear rotor and carefully place in order for reassembly. Make identifying mark on rear rotor to distinguish it from front rotor. Remove oil seals from rear rotor using suitable prying tool (49 0813 225), being careful not to damage oil seal lip. *NOTE — Do not exert strong force at any one point to remove seal.* Mark rear oil seal springs of each rotor to aid in repositioning upon reassembly.

Seal Remover (49 0813 225)

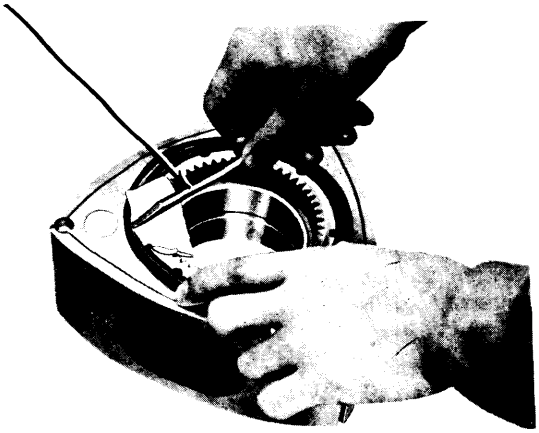

Fig. 6 Prying Oil Seal from Rotor

11) Holding intermediate housing down by hand, pull tubular dowel off intermediate housing, using dowel puller (49 0813 215). Lift intermediate housing off shaft by sliding housing beyond rear rotor journal on eccentric shaft while holding intermediate housing up and at same time pushing up eccentric shaft. Lift out eccentric shaft.

12) Repeat the preceding procedures to remove the front rotor housing and rotor assembly.

INSPECTION & OVERHAUL

FRONT, INTERMEDIATE & REAR HOUSINGS

1) To clean front housing, use extra fine emery paper to remove carbon deposits from rotor running surface. Use ketone or thinner to remove sealing agent.

2) Inspect housing for signs of water or gas leakage. Check for wear or damage to rotor running surface or stationary gear. Check main bearings for signs of scoring or flaking.

3) Place a straightedge across housing surface in positions shown in illustration. Using a feeler gauge, measure distortion of front housing. Replace housing if distortion limit of .0016" (.04 mm) is exceeded.

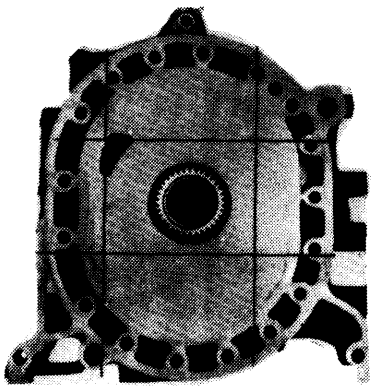

Fig. 7 Straightedge Positions for Checking Housing Distortion

RX-3, RX-4 & ROTARY PICKUP (Cont.)

4) Check for wear on rotor sliding surfaces of housing and joint surfaces with rotor housing. Measurements are made using a dial indicator as shown in illustration. If wear exceeds .0039" (.10 mm), reface or replace the housing.

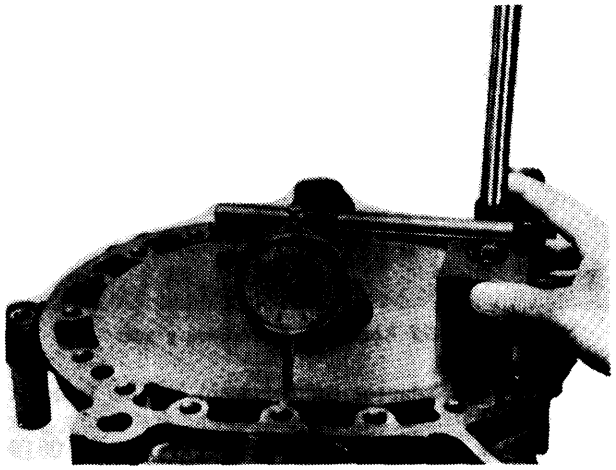

Fig. 8 Measuring Housing Wear with a Dial Indicator

5) Measure inner diameter of main bearing and outer diameter of bearing journal on eccentric shaft. Standard clearance is .0016-.0028" (.04-.07 mm). If clearance exceeds .0039" (.10 mm), replace bearing or eccentric shaft.

6) To replace main bearing, remove stationary gear retaining bolts. Drive stationary gear, with bearing, out of housing using a suitable mandrel (49 0813 235).

7) Place stationary gear in a press, use same mandrel and press main bearing out of stationary gear. Install new bearing while aligning tang of bearing with slot of stationary gear. Press bearing into gear until adapter of mandrel just contacts stationary gear flange. Drive stationary gear into housing with same mandrel. Align dowel in housing with slot in gear flange. Tighten stationary gear retaining bolts.

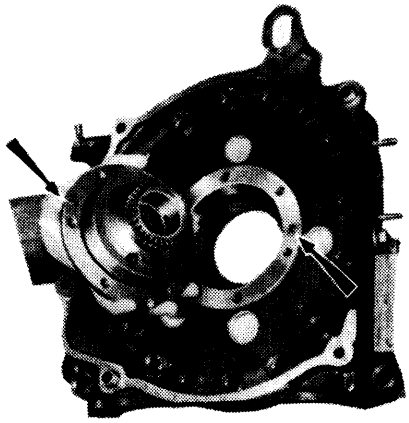

Fig. 9 Stationary Gear Slot & Dowel Alignment

ROTOR HOUSINGS

1) 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.

2) Inspect for cracks or damage to chromium plated surface. Check for signs of gas or water leakage. Housing must be replaced if any of these conditions exist.

3) Place a straightedge across sealing surface of rotor housing and check for distortion, using a feeler gauge. If distortion exceeds .0039" (.10 mm), replace rotor housing.

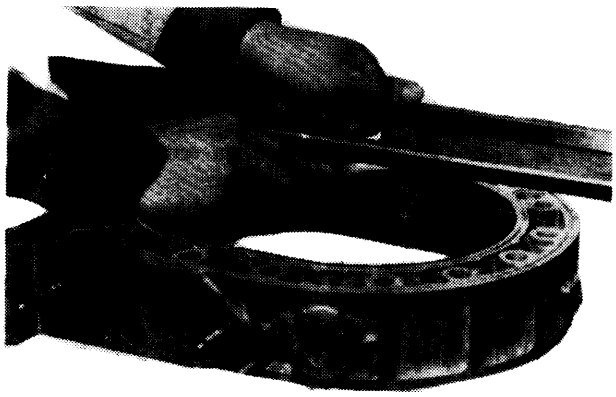

Fig. 10 Measuring Rotor Housing for Distortion

4) Check rotor housing thickness at points A, B, C, and D as shown in illustration. If difference between A and the minimum values for B, C, or D exceed .0024" (.06 mm), rotor housing should be replaced. *NOTE — This excessive clearance would indicate a possibility of gas or water leakage.*

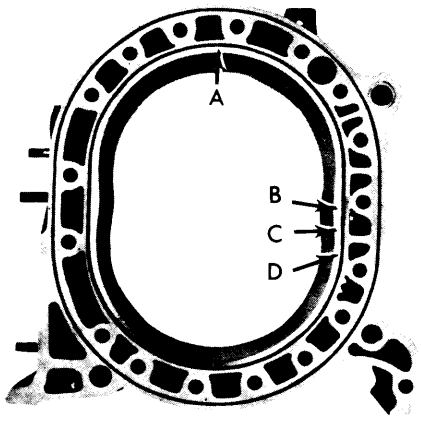

Fig. 11 Rotor Housing Thickness Check Points

ROTORS

1) Combustion condition of rotor can be determined by analyzing color of combustion area before cleaning. General color of combustion area should be brown.

2) Combustion is correct if leading side area of rotor combustion area is brown and trailing side is a blackish color. Check side surface of rotor for signs of gas leakage.

RX-3, RX-4 & ROTARY PICKUP (Cont.)

3) Inspect oil seals and replace if necessary. Remove carbon from rotor with fine emery paper. Remove carbon from seal grooves with a carbon remover. Wash rotor in a cleaning solution and blow dry, with compressed air. Inspect rotor for wear or damage and check internal gear for cracking or chipped teeth.

4) Measure width of rotor and rotor housing at three points around edge. Difference between the minimum width of the rotor housing and the maximum width of the rotor should be within .0039-.0083" (.10-.21 mm). If clearance is exceeded, replace rotor assembly. If less than specified clearance is measured, it indicates that internal gear has come out; strike internal gear lightly with a plastic hammer and remeasure clearance.

5) 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). *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 .031" (.8 mm). Measure seal protrusion (as illustrated) and replace seal if protrusion is less than .020" (.5 mm).

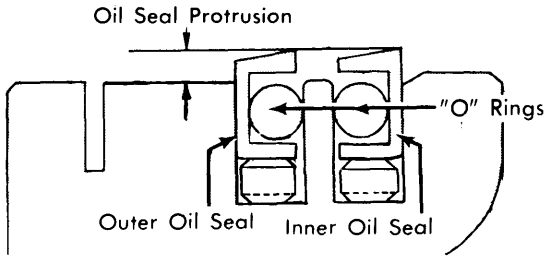

Fig. 12 Measuring Point of Oil Seal Protrusion

ROTOR BEARING REPLACEMENT

Place rotor bearing on support so internal gear is facing downward. Using rotor bearing replacer (49 0813 240) without adapter ring, press bearing out of rotor. Clean bearing bore with emery paper if necessary. Place rotor on support with internal gear upward. Place new rotor bearing so rotor bore is in line with bearing lug. Press new bearing using replacer tool without adapter, until bearing is flush with rotor boss.

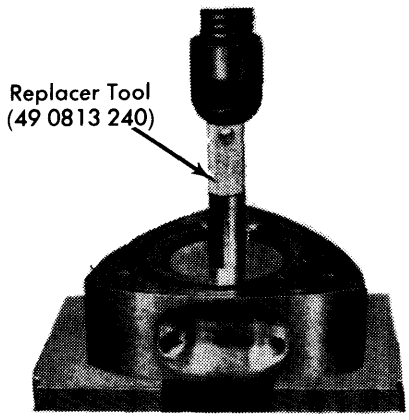

Fig. 13 Pressing Rotor Bearing from Rotor

APEX SEAL

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

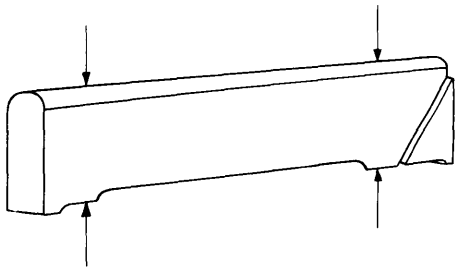

Fig. 14 Measuring Apex Seal Height

2) Check gap between apex seal and groove. To check gap, place apex seal in its respective groove on rotor and measure gap between apex seal and groove with a feeler gauge. Feeler gauge should be inserted until tip of gauge reaches bottom of groove. Standard clearance is .0020-.0035" (.05-.09 mm). If gap exceeeds wear limit of .0059" (.15 mm), replace apex seal.

3) Check gap between apex seal and side housing (measure length of seal with a micrometer). Compare measured apex seal length with minimum value of B, C, or D as indicated in Rotor Housing Thickness Check Points illustration. Standard gap should be .0051-.0067" (.13-.17 mm); however, if gap is more than .0118" (.30 mm), replace apex seal. If necessary, correct apex seal length with emery paper. Ensure that free height of apex seal spring (as shown in illustration) is a minimum of .22" (5.5 mm) on RX3 models and .15" (3.8 mm) on all other models.

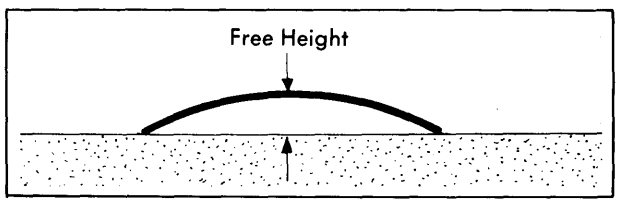

Fig. 15 Measuring Free Height of Apex Seal Spring

RX-3, RX-4 & ROTARY PICKUP (Cont.)

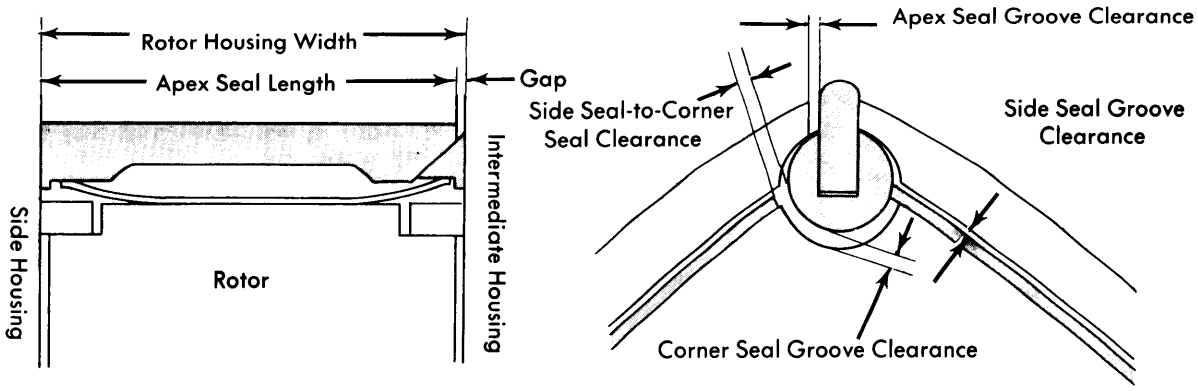

Fig. 16 Measuring Clearance of Apex Side & Corner Seal

SIDE SEAL

1) Remove all carbon from side seal and spring. Check side seal protrusion from rotor surface, and confirm free movement by pressing with finger. Protrusion should be more than .02" (.5 mm). Check gap between side seal and groove with a feeler gauge. Standard gap is .0016-.0028" (.04-.07 mm). If wear limit of .004" (.10 mm) is measured, replace side seal.

2) Check gap between side seal and corner seal with seals installed on rotor. Insert feeler gauge between end of side seal (against rotating direction of rotor) and the corner seal. If gap exceeds .016" (.4 mm), replace side seal.

3) When side seal is replaced, adjust gap between side seal and corner seal by grinding one end of side seal along round shape of corner seal, using a fine file. Make gap .002-.006" (.05-.15 mm).

CORNER SEAL

1) Clean carbon from corner seal. Check corner seal protrusion from rotor surface, and check free movement by pressing with finger. Protrusion should be more than .02" (.5 mm).

2) Check gap between corner seal and seal groove. Gap limit is .0031" (.08 mm). A gap this large indicates uneven wear of corner seal groove caused by dirt entering engine (due to damaged or clogged air cleaner).

3) Extent of corner seal groove wear is determined by using special Bar Limit Gauge (49 0839 165), and is classified according to the following:

Neither End of Gauge Goes Into Groove – Indicates that gap conforms to specifications.

"Go" End of Gauge Goes Into Groove – Indicates that gap is more than standard, but less than wear limit. In this case, replace corner seal with a .0012" (.03 mm) oversize seal. Do not rebore groove.

Both Ends of Gauge ("Go" and "No Go") Go in Groove – Indicates gap exceeds wear limit of .0031" (.8 mm). **Rebore** corner seal groove with suitable jig and reamer (49 2113 030 and 49 0839 170) to .4410" (11.2 mm) diameter and use a .0079" (.2 mm) oversize corner seal.

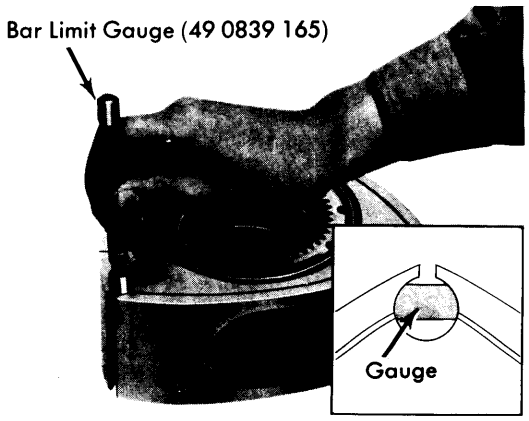

Fig. 17 Checking Corner Seal Groove Measurement

ROTOR CORNER SEAL REBORING

1) Remove all carbon deposits from rotor side surface and apex seal groove. Position a suitable jig (49 2113 030) in rotor and tighten bar. Do not overtighten.

2) Using a suitable reamer (49 0839 170), thoroughly oiled, bore out corner seal groove. Reamer must be rotated approximately twenty times to bring corner seal groove to correct size. Carefully remove reamer and jig.

3) Clean rotor in a suitable cleaning solution and blow dry with compressed air. Inspect for possible damage to rotor bearing or apex seal groove, done while reboring corner seal groove. Install oversize corner seal and recheck clearance.

RX-3, RX-4 & ROTARY PICKUP (Cont.)

ECCENTRIC SHAFT

1) Thoroughly clean eccentric shaft in a suitable 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) Measure diameter of rotor or main bearing journals with a micrometer. Replace eccentric shaft if diameters are less than specified.

3) Place eccentric shaft in two "V" blocks. Mount a dial indicator and check runout of both ends by rotating shaft slowly. If runout exceeds .0024" (.06 mm), replace shaft.

4) Oil passages in eccentric shaft are sealed by a blind plug in rear of shaft. Inspect plug for possible oil leakage. If leakage is detected, 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 for spring weakness, stuck, or damaged steel ball at the oil jets. Inspect front needle bearing, bearing housing, and thrust plate for wear or damage. Inspect front and rear oil seals for leaks, replace as necessary.

ENGINE ASSEMBLY

OIL SEALS

1) Place rotor on rubber pad or cloth. Install oil seal springs in their respective grooves on rotors, with each edge of spring fitted in stopper hole. Ensure oil seal springs have been painted in cream or blue color: cream colored springs must be placed on front faces of both rotors and blue springs on rear faces of rotors. When installing, painted side or spring must face oil seal (upward).

2) 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.

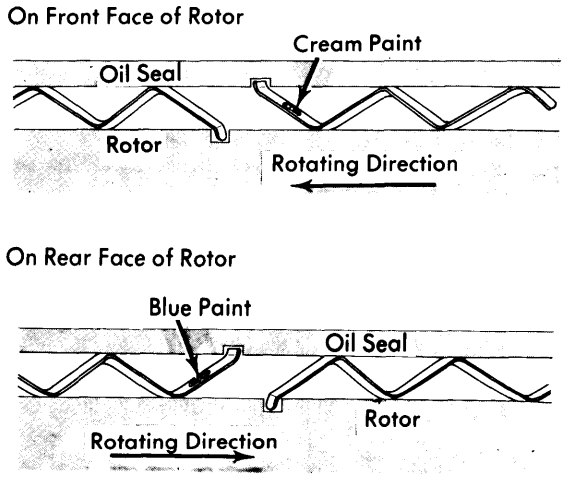

Fig. 18 Installing Oil Seal Springs on Rotor

3) Install outer oil seal so square edge of spring fits in stopper notch of oil seal. Push head of oil seal in position slowly with fingers. *NOTE — Take care not to deform lip of oil seal.* Apply sufficient lubricant to each oil seal and groove, and confirm smooth movement of each seal by pressing head of seals. Check oil seal protrusion. *See Rotor Oil Seal Replacement.*

APEX, CORNER & SIDE SEALS

1) Position apex seals, without springs, and side pieces into their respective grooves so that each side piece rests on rear side of each rotor. Place corner seals and springs into their respective grooves, then position side seals and springs in proper grooves.

2) Apply engine lubricant to each spring. Ensure smooth movement of each spring. Check seal protusion, as described previously. Invert rotor and install seals on other side of rotor.

INSTALLING FRONT ROTOR

1) Mount front housing on work stand (49 0839 000) and special hanger (49 1114 005). Turn front housing on stand so that top of housing is upward. Apply engine lubricant to internal gear of rotor. Hold apex seals in place by using the old "O" ring and position rotor assembly on front housing. Turn housing so that sliding surface of front housing faces upward.

2) Mesh internal gear and stationary gear so that one of the rotor apexes is set to any one of the four positions as illustrated. Remove old "O" ring. *NOTE — Take care not to drop corner seals into ports.*

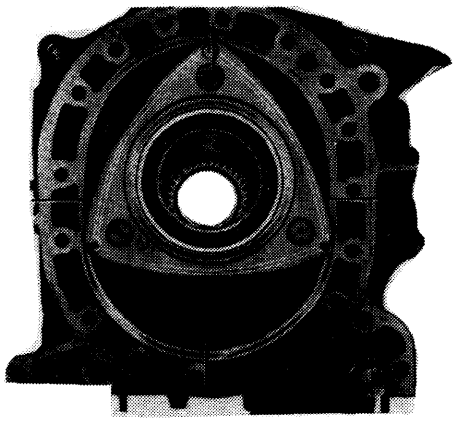

Fig. 19 Positioning Rotor Apex for Reassembly

INSTALLING ECCENTRIC SHAFT

Lubricate front rotor journal and main journal on shaft with engine lubricant. Insert eccentric shaft being careful not to damage rotor bearing and main bearing.

INSTALLING FRONT ROTOR HOUSING

1) Apply sealing agent to front side of housing mating surfaces. Lightly coat new "O" rings and sealing rubbers with

RX-3, RX-4 & ROTARY PICKUP (Cont.)

petroleum (to hold them in place), then install on front side of rotor housing. *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 illustrated.*

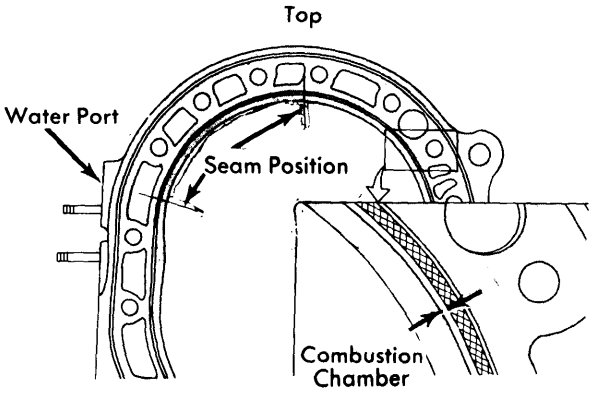

Fig. 20 Positioning Inner Sealing Rubber

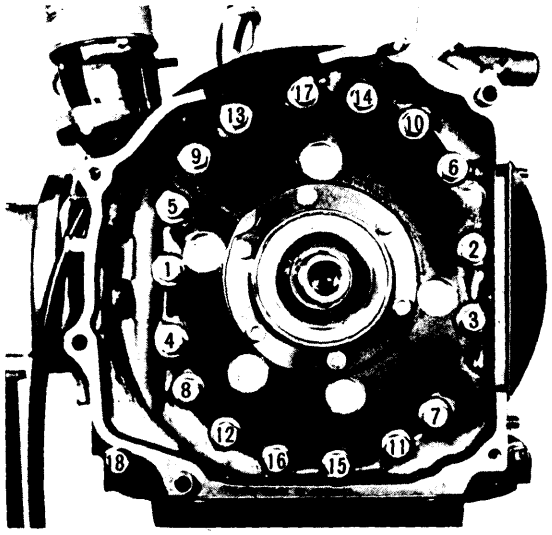

Fig. 21 Tightening Sequence of Tension Bolts

2) Invert front rotor housing, being careful of seals; mount front rotor onto tubular dowels and insert dowels through housing onto front housing. Apply lubricant front rotor housing holes. Apply sealing agent to front side of rotor housing which mates to front housing. Install new "O" rings and sealing rubbers as previously done on other side.

3) Insert each apex seal spring, then fit each side piece to its original position, ensure spring is set correctly on side piece. Apply engine lubricant on side pieces. Make sure front rotor housing is free from foreign matter, and lubricate front housing sliding surface.

INSTALLING INTERMEDIATE HOUSING

Turn front housing and rotor assembly so that top of housing is upward. Pull eccentric shaft outward approximately 1.0" (25 mm), but not more than 1.5" (35 mm). Rotate eccentric shaft until eccentric portion points to 2 o'clock position. Install intermediate housing over eccentric shaft and turn engine so that rear of engine is upward.

INSTALLING REAR ROTOR & HOUSING

See procedures as previously outlined up to Intermediate Housing.

INSTALLING REAR HOUSING

Position engine with rear end upward. Apply sufficient lubricant onto stationary gear and main bearing. Install rear housing onto rear rotor housing, and turn rear rotor slightly to engage rear housing stationary gear with rear rotor internal gear.

TIGHTENING TENSION BOLTS

Place a new sealing washer on each tension bolt and oil threads of each bolt. Refer to illustration and tighten bolts in sequence shown, working in steps until final torque setting is reached: 23-27 ft. lbs. (3.2-3.8 mkg). After tightening, turn eccentric shaft and make sure that rotation is light and smooth.

FLYWHEEL COUNTERWEIGHT INSTALLATION

With Man. Trans. – 1) Apply lubricant to oil seal in rear housing. Mount flywheel to rear end of eccentric shaft so that key fits into flywheel keyway. Apply sealing agent to both sides of flywheel lock washer, and place washer in position. Fit lock nut by fingers. Hold flywheel with suitable ring gear brake tool (49 1881 060) and tighten lock nut to specified torque. Bend up lock tabs of washer.

2) Hold clutch disc in position with clutch disc arbor (49 0813 310). Mount clutch cover and pressure plate assembly on flywheel, and align the "O" mark on clutch cover with reamed hole of the flywheel. Install attaching bolts.

With Auto. Trans. – Fit key, lock washer and lock nut on eccentric shaft as described for Man. Trans. vehicles. Hold counterweight with suitable tool (49 1881 055) and tighten lock nut to specified torque. Attach drive plate on counterweight with retaining nuts.

ECCENTRIC SHAFT END-THRUST ADJUSTMENT

1) Install thrust plate, spacer and needle bearing on eccentric shaft and lubricate. Install bearing housing and tighten bolts. Secure bolts by bending over lock tabs.

2) Lubricate and install needle bearing, thrust washer and balance weight. Position oil pump drive chain on drive sprocket and driven sprocket and install on eccentric shaft and oil pump.

3) Install key in eccentric shaft. Install distributor drive gear onto eccentric shaft with "F" mark on gear facing front of engine. Install eccentric shaft pulley on shaft and tighten pulley bolt to specifications.

4) Attach a dial indicator on flywheel and measure back and forth movement of eccentric shaft. If end play is not within .0016-.0028" (.04-.07 mm), spacer will have to be reduced in size or an oversize spacer will have to be installed.

5) Oversize spacers are available in four oversizes from .3181" to .3150" (8.08 mm to 8.00 mm) and are identified by stamped letter "X", "Y", "V", and "Z" respectively. When

RX-3, RX-4 & ROTARY PICKUP (Cont.)

spacer has been installed, recheck end play. *NOTE — When making end play adjustment, note that if end play is below specified amount, spacer thickness is too small; if end play is beyond specifications, spacer is too thick.*

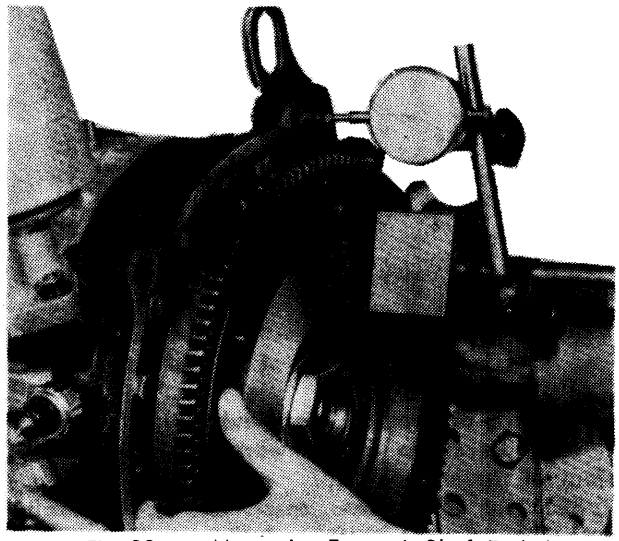

Fig. 22 Measuring Eccentric Shaft End Play with a Dial Indicator

6) When end play is within specifications, remove eccentric shaft pulley and proceed with engine assembly.

INSTALLING FRONT COVER & ECCENTRIC SHAFT PULLEY

Turn engine on work stand so that front of engine is up. Tighten oil pump driven sprocket nut and bend up tab of lock washer. Place chain adjuster in position and tighten attaching nuts. Position new "O" ring on oil passage of front housing. Install front cover and gasket on front housing. Apply lubricant to oil seal in front cover. Install eccentric shaft pulley and tighten pulley bolt.

INSTALLING OIL STRAINER & OIL PAN

Invert engine assembly on work stand and cut off excess gasket on front cover along mounting surface of oil pan. Place oil strainer (with gasket) on front housing and tighten attaching bolts. Apply sealant onto joint surfaces of each housing, then place gasket and oil pan in position. Insert bolts through stiffeners and tighten bolts evenly and in steps to final torque.

INSTALLING WATER PUMP

Turn engine upright, position gasket and water pump on front housing and tighten attaching bolts. *NOTE — For further information on cooling system components, see Cooling System in this article.*

INSTALLING DISTRIBUTOR

Rotate eccentric shaft until yellow mark, or leading side mark, on pulley aligns with needle on front cover. Align notch on distributor housing with punch mark on driven gear. Insert distributor so that distributor lock bolt is located in center of its slot and engage distributor gears. Rotate distributor clockwise until leading contact point starts to separate, then tighten distributor lock nut. Install cap.

INSTALLING EXTERNAL COMPONENTS

Install exhaust manifold, intake manifold, alternator, air pump, and all other external components in reverse of removal procedure. Before removing engine assembly from work stand, install engine hanger bracket to front cover.

ENGINE OILING

Crankcase Capacity
RX-3 — 4.4 quarts without filter change.
RX-4 & Rotary Pickup — 5.3 quarts without filter change.

Oil Filter — Full-flow, disposable cartridge type filter mounted on rear housing.

Normal Oil Pressure — 35.6 psi at 700 RPM, 71.1 psi at 3000 RPM.

Pressure Regulator Valve — Mounted in rear housing, valve regulates oil pressure at high RPM. Valve opens to release oil pressure. If oil pressure is less than normal, check regulator valve piston for wear and ensure that spring free length is 1.83" (46.4 mm).

ENGINE OILING SYSTEM

Engine oiling system is forced circulation utilizing a two rotor type oil pump. Oil pump is mounted on front housing and is chain driven through eccentric shaft. A full-flow oil filter is mounted on rear housing. An oil metering pump, pressure regulator valve and an oil cooler in radiator are also employed.

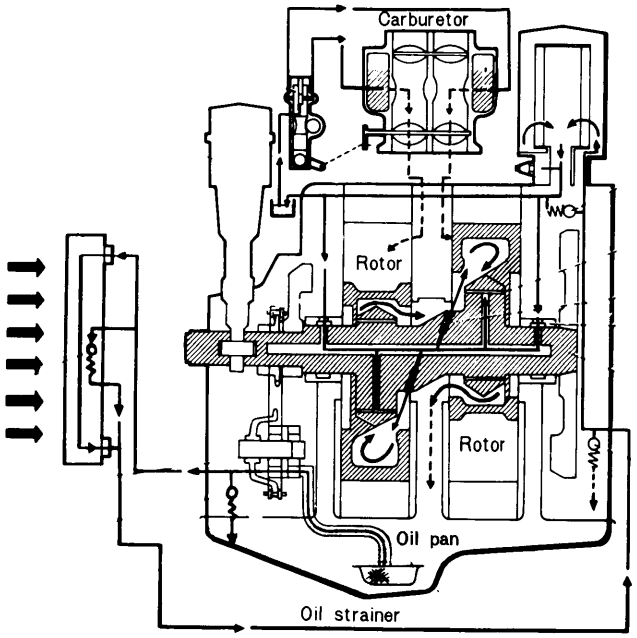

Fig. 23 Cutaway View of Engine Oiling System

RX-3, RX-4 & ROTARY PICKUP (Cont.)

ENGINE OILING (Cont.)

OIL PUMP

NOTE — Oil pump is mounted on front engine housing and must be checked or overhauled with front engine cover removed.

1) With front engine cover removed, check protrusion of chain adjuster. If more than .47" (12 mm), replace chain or adjuster.

2) With oil pump removed, remove snap ring from shaft, rear rotors and key. Remove intermediate plate lock screw and remove intermediate plate.

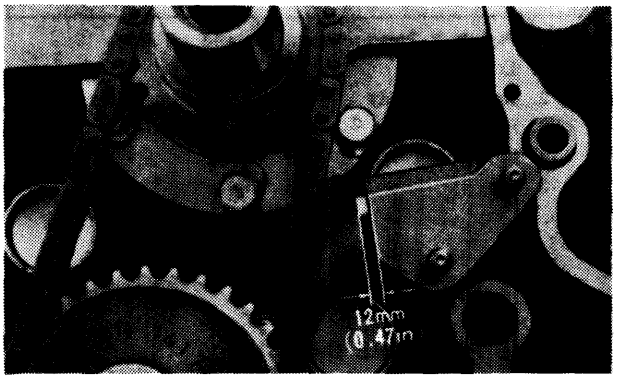

Fig. 24 Measuring Oil Pump Drive Chain Tensioner Protrusion

3) Insert a feeler gauge between lobes of rotors and check clearance. If beyond .006" (.15 mm), replace both rotors.

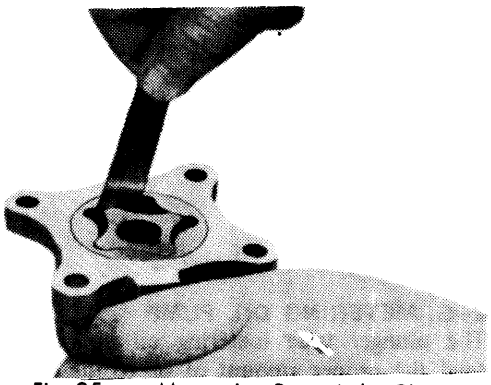

Fig. 25 Measuring Rotor Lobe Clearance

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

5) Place a straightedge across pump mounting surface and check rotor end play with a feeler gauge. If beyond .006" (.15 mm), correct pump body or replace rotors.

6) To assemble oil pump, reverse disassembly procedure. Install oil pump and tighten bolts. Install sprockets and chain as previously outlined. See *Eccentric Shaft Endthrust Adjustment.*

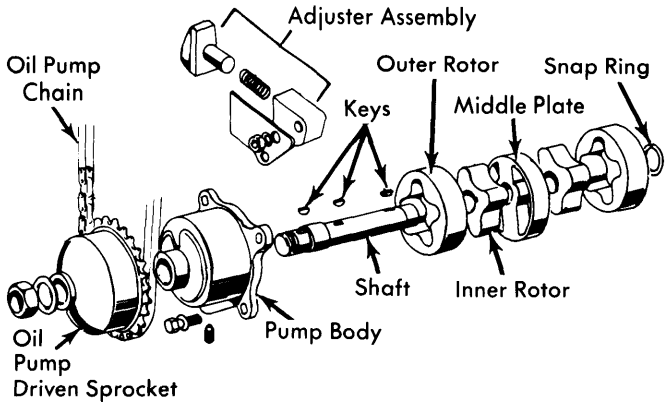

Fig. 26 Exploded View of Oil Pump Assembly

METERING OIL PUMP

Metering oil pump regulates amount of oil pumped to float chamber of carburetor. The oil enters combustion chamber with air/fuel mixture to lubricate seals within chamber. Amount of oil increases as engine RPM increases and the control lever on metering pump is actuated by a rod connected to throttle lever. To check amount of oil discharge proceed as follows:

1) Disconnect connecting rod, then disconnect oil lines at carburetor. Start engine and adjust idle to 2000 RPM. Once oil flow from hoses becomes steady, measure volume discharged. Pump should discharge .068-.085 ounces in six minutes.

2) To adjust oil metering pump, turn the adjusting screw clockwise to increase flow or counterclockwise to decrease flow. One complete turn will change oil discharge flow by .0068 ounces for six minutes of operation. Make sure lock nut of adjustment screw is locked, then recheck metering oil pump discharge rate.

ENGINE COOLING

WATER PUMP

1) Drain cooling system and remove air cleaner. Remove attaching bolts and drive fan. Loosen water pump pulley bolts. Remove air pump and drive belt.

2) Remove alternator and drive belt. Remove water pump pulley bolts and pulley. Remove water pump attaching nuts and bolts, then remove water pump. To install, reverse removal procedure.

Thermostat — Starts opening at 180°F (82°C) and is fully open at 203°F (95°C).

Cooling System Capacity
RX-3 — 9.6 quarts.
RX-4 — 10.0 quarts.
Rotary Pickup — 10.2 quarts.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Oil Pump Sprocket	22-25 (3.0-3.5)
Oil Pan	5-7 (0.7-1.0)
Eccentric Shaft Pulley	54-69 (7.5-9.5)
Intake Manifold	12-17 (1.6-2.3)
Exhaust Manifold	32-43 (4.4-5.9)
Spark Plugs	9-13 (1.3-1.8)
Oil Pressure Switch	9-13 (1.3-1.8)
Tension Bolts	23-27 (3.2-3.8)
Flywheel Lock Nut	350 (45.0)