RX7 ROTARY ENGINE

ENGINE CODING

ENGINE IDENTIFICATION

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

Engine Identification

Application	Code
RX7	12A

ENGINE REMOVAL & INSTALLATION

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

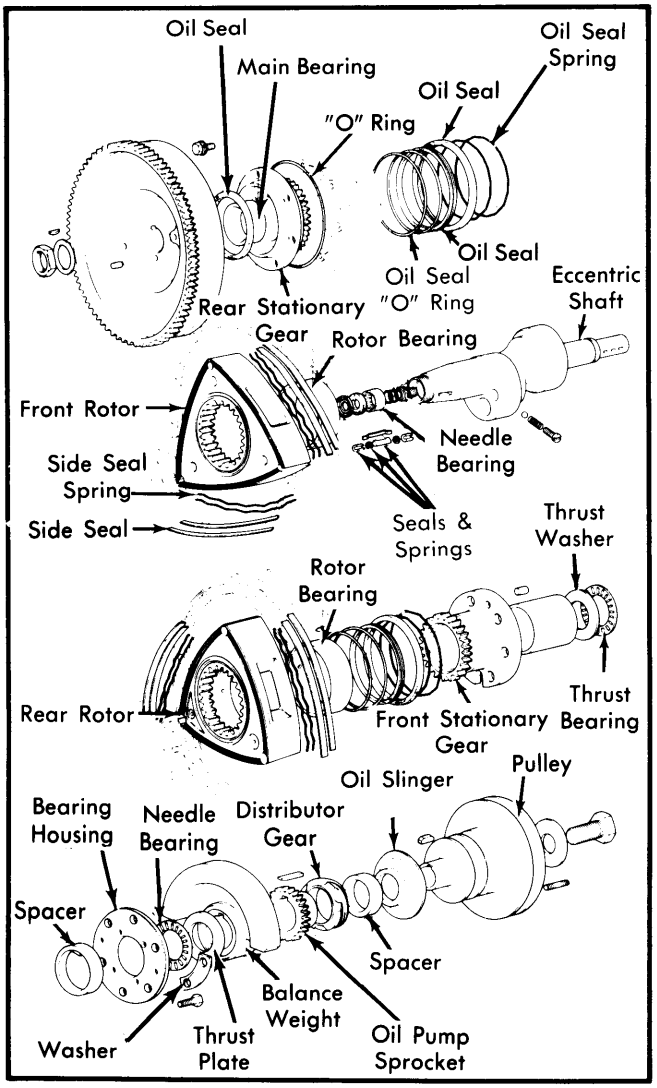

Fig. 1 Exploded View of Rotors & Eccentric Shaft Assembly

2) Remove air cleaner assembly. Disconnect the 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.

3) Remove cooling fan and drive assembly, radiator, and radiator shroud assembly. Disconnect connector and "B" terminal from alternator. Disconnect connector from throttle sensor. Dismount compressor and condensor of air conditioner and tie out of the way without disconnecting refrigerant lines (if equipped).

4) 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.

5) 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.

6) Support front of transmission with suitable jack and remove left and right engine mount nuts. Attach sling to engine and take up slack. Pull engine forward to clear clutch shaft, then lift engine from vehicle.

Installation – 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.

ENGINE DISASSEMBLY

NOTE – *To ease engine disassembly, manufacturer recommends use of special engine stand (49 0107 680A) and hanger (49 1114 005).*

1) Loosen drive belts and hoses and disconnect 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. Remove gasket and "O" ring.

2) Remove exhaust manifold and gasket. Remove engine mount and distributor lock nut. Remove distributor, oil filter and cover from front housing. Remove water pump and drive pulley from air conditioning compressor (if equipped). Turn engine over and remove oil pan and strainer. Install flywheel brake (49 1881 060) on manual transmission models or stopper (49 1881 055) on automatic transmission models.

3) 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 and slide oil pump sprocket, eccentric shaft sprocket and drive chain off together. Remove oil pump.

4) Remove balance weight and following parts in order: Thrust washer, needle bearing, bearing housing, needle bearing, spacer and thrust plate. On manual transmission models, remove clutch assembly, then use puller to remove flywheel. On automatic transmission models, remove drive plate, then use puller to remove counterweight.

RX7 ROTARY ENGINE (Cont.)

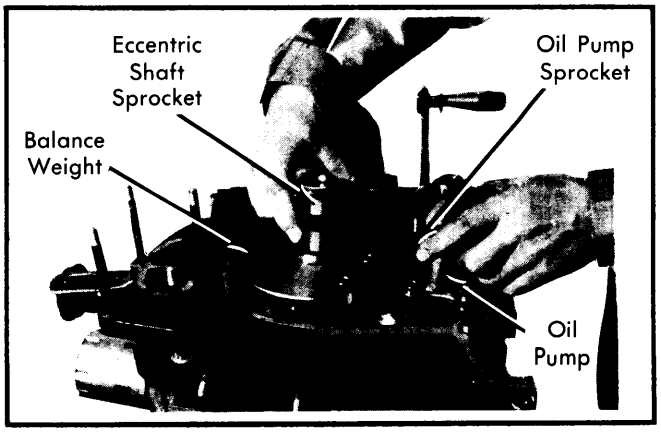

Fig. 2 Oil Pump Drive and Sprocket Removal

5) Remove tension bolts on rear housing in sequence shown in *Fig. 3* by loosening in 2 or 3 steps. Lift rear housing off shaft and remove any seals stuck to rotor sliding surface, placing them back in original positions. Remove seals and "O" rings from rear side of rear rotor housing.

6) Attach dowel puller (49 0813 215A) and pull tubular dowels off rear rotor housing. Hold rotor housing by hand to keep it from moving up and remove rear rotor housing. Use caution to avoid dropping apex seals and side pieces of rear rotor. Remove seals and "O" ring from front side of rear rotor housing.

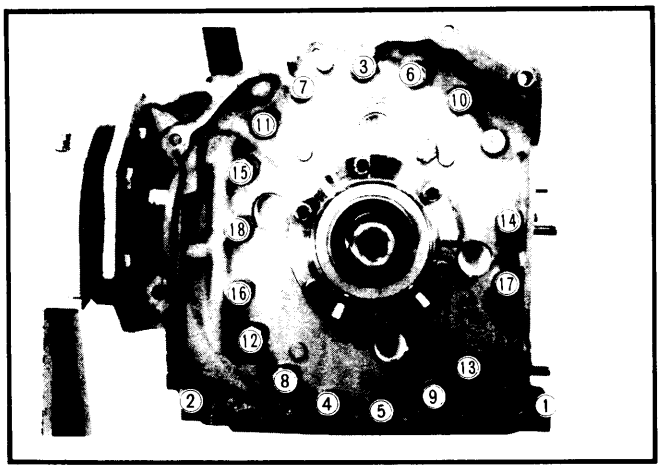

Fig. 3 Loosening Sequence of Tension Bolts

7) 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.

8) Remove seals and springs on remaining side of rotor and store in order for reassembly. Place suitable protector on seal inner lip and remove outer seal with remover (49 0813 225), then remove inner seal. Remove seals and springs and store in order for reassembly. Mark rear rotor with felt tip pen for assembly identification.

9) Attach puller and pull tubular dowels off intermediate housing while holding housing down. Remove intermediate housing by sliding beyond rear rotor journal on eccentric shaft. Lift out eccentric shaft carefully to avoid damage to rotor bearing and main bearing. Repeat steps **6)** through **8)** to remove front rotor housing and rotor assembly.

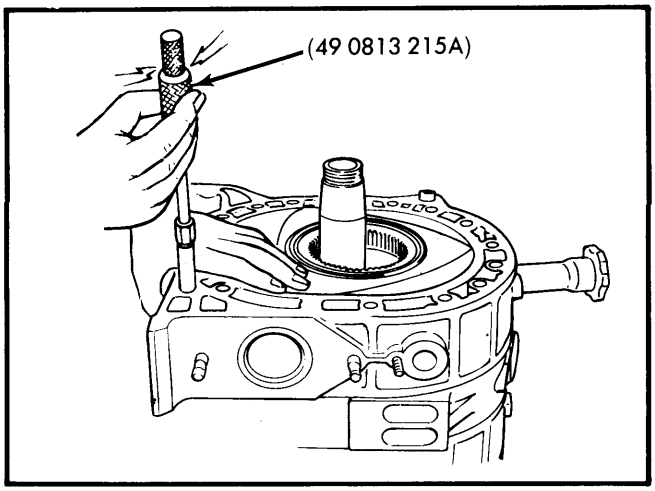

Fig. 4 Extracting Tubular Dowels from Engine

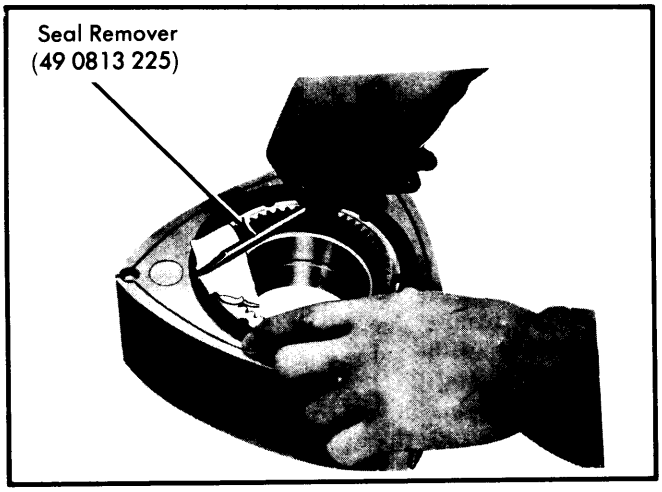

Fig. 5 Prying Oil Seal from Rotor

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 *Fig. 6*. Using a feeler gauge, measure distortion of front housing. Replace or reface housing if distortion limit of .0016" (.04 mm) is exceeded.

4) Check for wear on rotor sliding surfaces of housing and joint surfaces with rotor housing. Measurements are made using a dial indicator. If wear exceeds .0039" (.10 mm), reface or replace housing. *See Fig. 7.*

RX7 ROTARY ENGINE (Cont.)

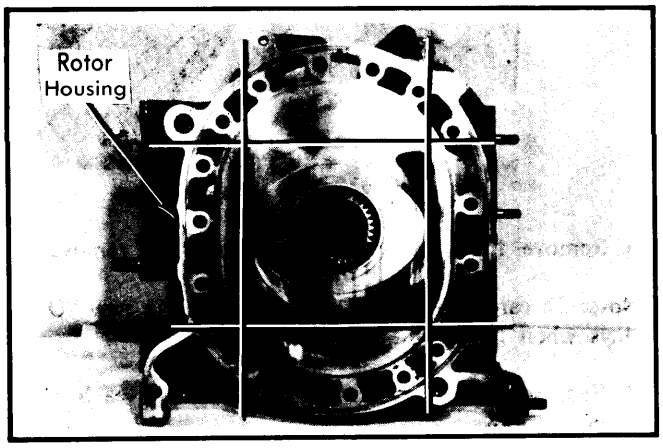

Fig. 6 Straightedge Positions for Checking Housing Distortions

NOTE – *Side housings (front, intermediate and rear housings) can be reused by grinding them, if the required finish can be maintained.*

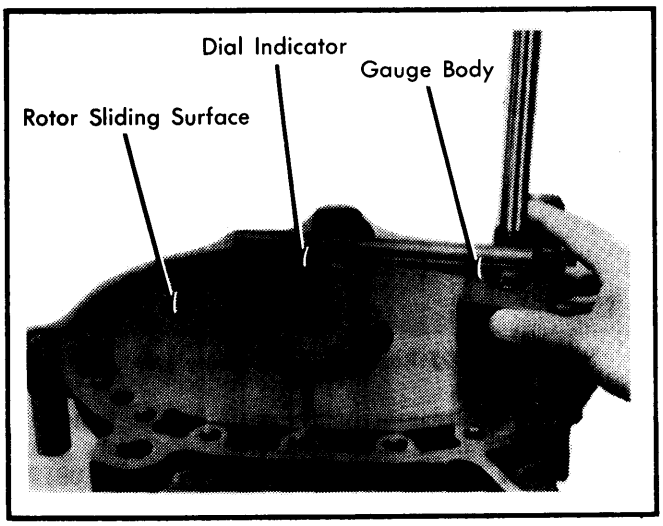

Fig. 7 Measuring Housing Wear with Dial Indicator

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.

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 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.

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.*

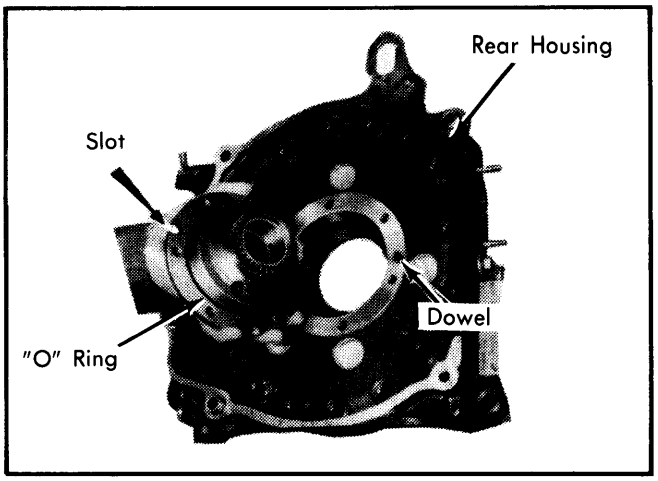

Fig. 8 Stationary Gear Slot & Dowel Alignment

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.

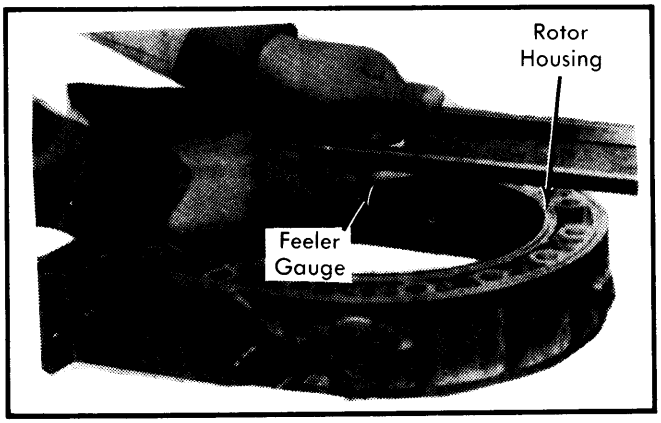

Fig. 9 Measuring Rotor Housing for Distortion

3) Place a straightedge across sealing surface of rotor housing and check for distortion, using a feeler gauge. If distortion exceeds .0016" (.04 mm), replace housing. See *Fig. 9*.

4) Check rotor housing thickness at points A, B, C, and D in *Fig. 10*. If micrometer readings vary between point A and minimum value for B, C, and D by more than .0024" (.06 mm), replace rotor housing.

NOTE – *This excessive clearance would indicate a possibility of gas or water leakage.*

ROTORS

1) Inspect rotor for wear or damage and check internal gear for chips, cracks or scoring. Measure rotor width at 3 points

RX7 ROTARY ENGINE (Cont.)

and subtract maximum width from width of rotor housing at point "A". Difference should be between .0047" (.12 mm) and .0071" (.18 mm). If clearance is excessive or rotor is damaged, replace rotor assembly.

2) If clearance is less than specified, internal gear may have come out. Strike internal gear lightly with plastic hammer and remeasure. 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 any damage is shown. *See Rotor Bearing Replacement.*

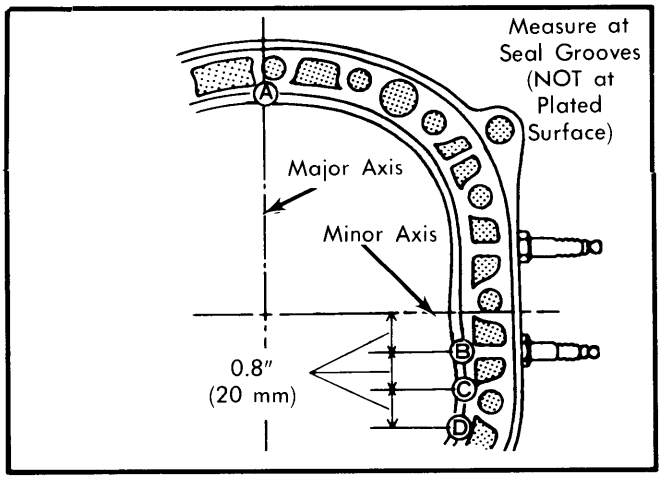

Fig. 10 Rotor Housing Thickness Check Points

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. 11.*

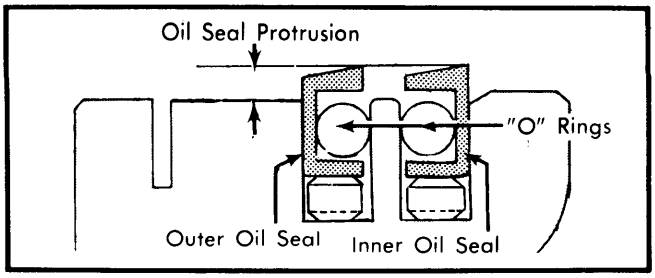

Fig. 11 Measuring Point of Oil Seal Protrusion

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. Place rotor on support with internal gear facing upward. Place a new rotor bearing so slot in rotor bore is in line with bearing lug. Press new bearing (using tool with adapter) until bearing is flush with rotor boss. *See Fig. 12.*

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 Fig. 13.* Replace seal if height is less than .275" (7.0 mm). Check for warpage by measuring the clearance between the top surfaces of 2 apex seals with a feeler gauge. Replace all 3 seals if clearance exceeds .0024" (.06 mm). *See Fig. 14.*

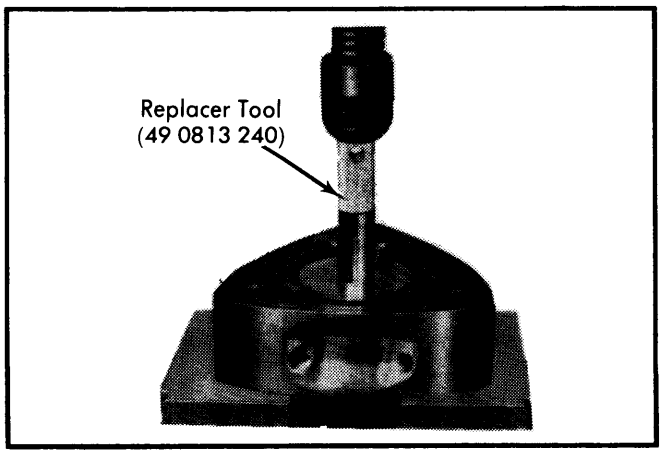

Fig. 12 Pressing Rotor Bearing from Rotor

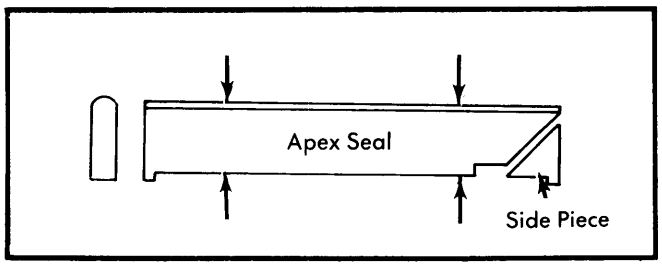

Fig. 13 Measuring Apex Seal Height

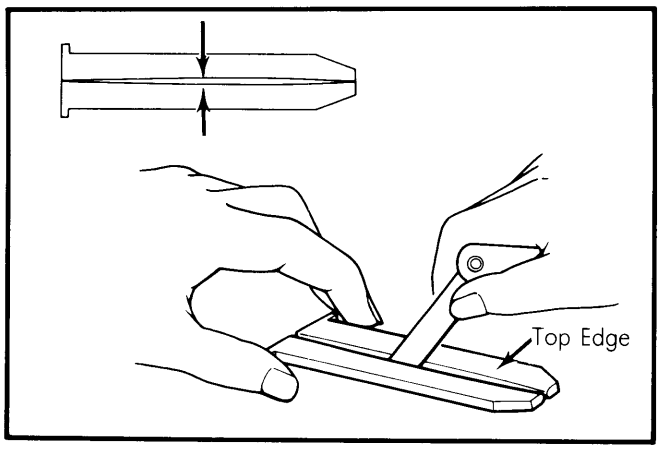

Fig. 14 Apex Seal Warpage

2) Check gap between apex seal and groove in rotor with a feeler gauge. Feeler gauge should be inserted until tip of feeler gauge reaches bottom of groove. Standard clearance is .0020-.0035" (.05-.09 mm). Replace apex seal if gap exceeds .0059" (.15 mm). Check seal spring height as shown in *Fig. 15.* Replace spring if free height is less than .2165" (5.5mm).

SIDE SEAL

1) Remove all carbon from side seal and spring. Check side seal protrusion from rotor surface, and confirm free movement

RX7 ROTARY ENGINE (Cont.)

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 .0012-.0031" (.03-.08 mm). If wear limit of .004" (.10 mm) is measured, replace side seal.

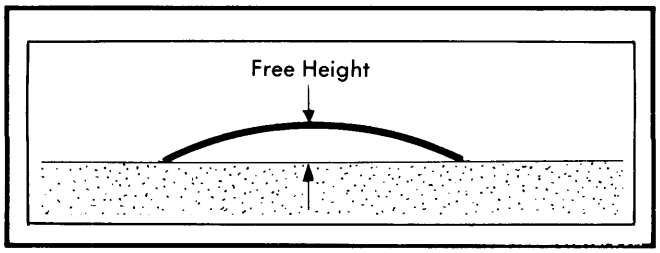

Fig. 15 Measuring Free Height of Apex Seal Spring

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) Extent of corner seal groove wear is determined by using special Bar Limit Gauge (490839165), 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,*(Fig. 16)*.

Both Ends of Gauge ("Go" and "No Go") Fit in Groove – Indicates that gap exceeds wear limit. Replace rotor.

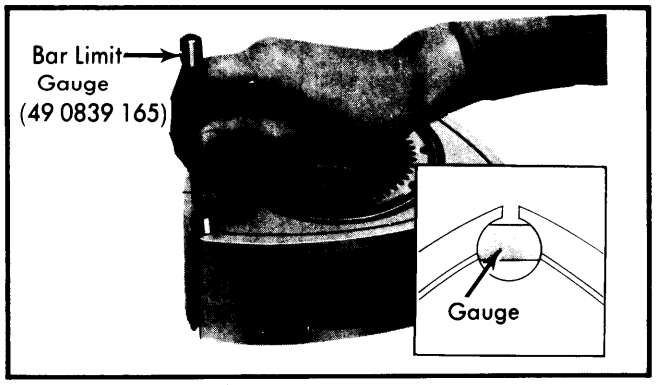

Fig. 17 Checking Corner Seal Groove Measurement

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) Check rotor bearing clearance by measuring inner diameter of the rotor bearing and outer diameter of the eccentric shaft rotor journal. Clearance should be .0016-.0031" (.04-.08 mm). Replace the bearing if clearance exceeds .0039" (.10 mm). Replace eccentric shaft if journal diameters are under specified limits.

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.

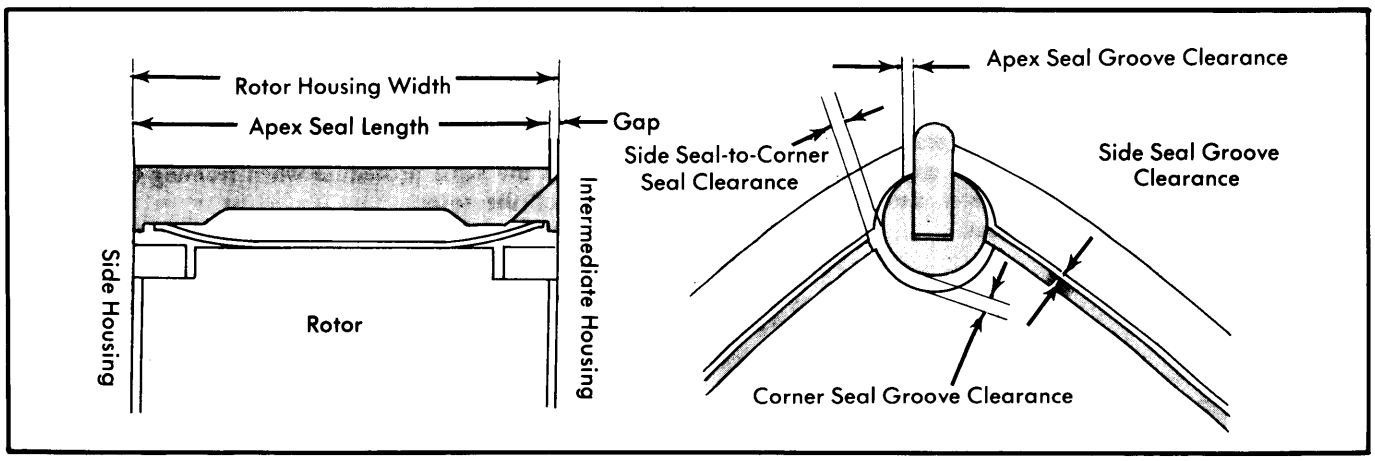

Fig. 16 Measuring Clearance of Apex, Side & Corner Seals

RX7 ROTARY ENGINE (Cont.)

ENGINE REASSEMBLY

OIL SEALS

1) Place the 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 edge faces of rotors and blue springs on rear faces of rotors. When installing, painted side of spring must face oil seal (upwards). *See Fig. 18.*

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.

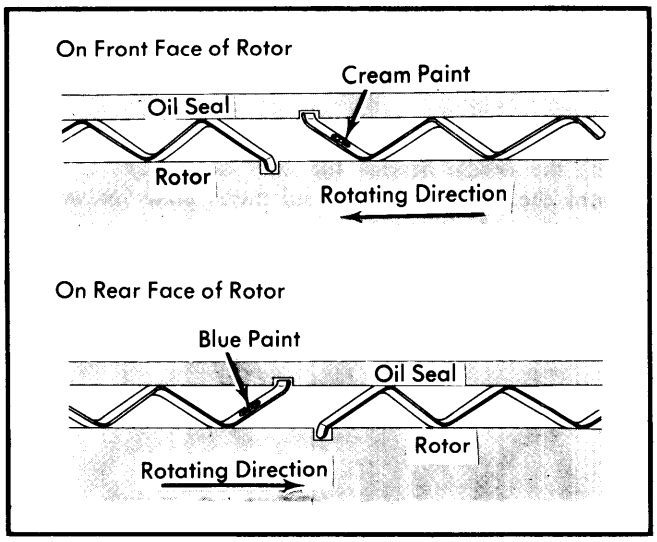

Fig. 18 Installing Oil Seal Spring on Rotor

3) Install outer oil seal so square edge of spring fits in stopper notch of oil seal. Push oil seal in position slowly with fingers. Confirm smooth movement of each oil seal by pressing oil seal. Check oil seal protrusion. Install oil seal springs and oil seals on the other side of rotor.

NOTE – *Take care not to deform lip of oil seal.*

APEX, CORNER & SIDE SEALS

NOTE – *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 of apex seal. See Fig. 19.*

Position apex seals without springs and side pieces into their respective grooves so that each side piece rests on rear side of each rotor. Install the soft seal into the corner seal. Place corner seals and springs into their respective grooves, then position side seals and springs into proper grooves. Ensure smooth movement of each seal by pressing its head.

INSTALLING FRONT ROTOR

Mount front housing on engine stand and place front rotor assembly on housing. Use care not to drop seal into port. Mesh internal and stationary gears so that one rotor apex is set to one of 4 positions shown in *Fig. 20.*

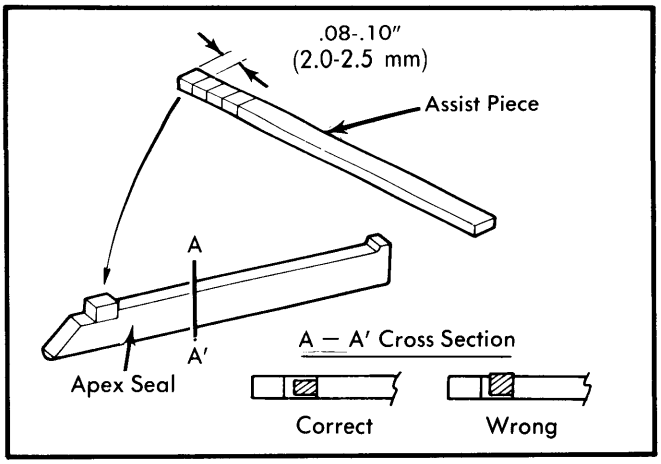

Fig. 19 Installing Assist Piece on Apex Seal

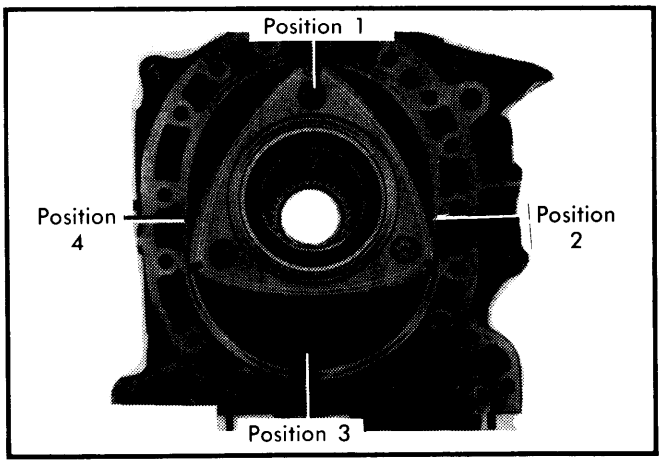

Fig. 20 Positioning Rotor Apex for Reassembly

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

NOTE – *Front and rear rotor housings are not interchangeable. Be sure they are installed in correct sequence.*

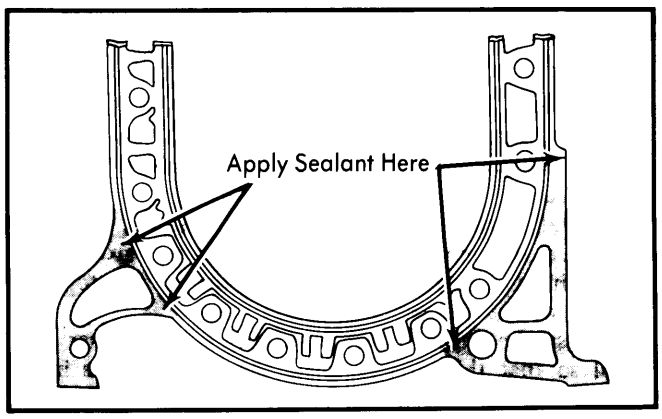

Fig. 21 Applying Sealing Agent to Rotor Assembly

RX7 ROTARY ENGINE (Cont.)

1) Apply sealing agent to front side of rotor housing as shown in *Fig. 21*. To provide greater durability to sealing rubbers, install a protector behind each inner sealing rubber. *See Fig. 22*. Install a new "O" ring, sealing rubbers and protector in front side of engine housing. Apply light coat of petroleum jelly to hold seals in place.

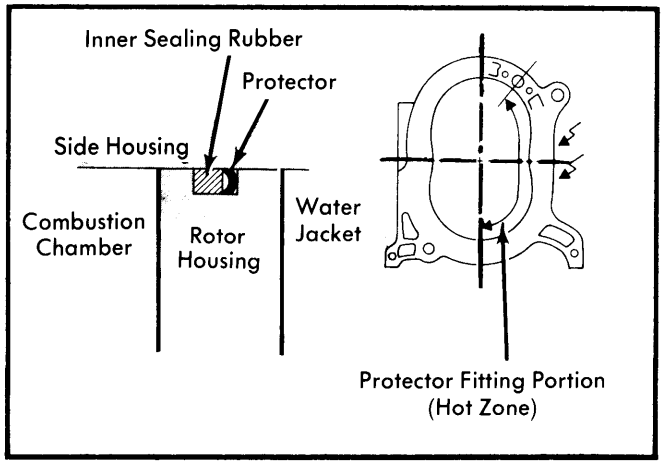

Fig. 22 Installing Protectors for Inner Sealing Rubbers

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. 23. Do not stretch sealing rubbers.*

2) 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.

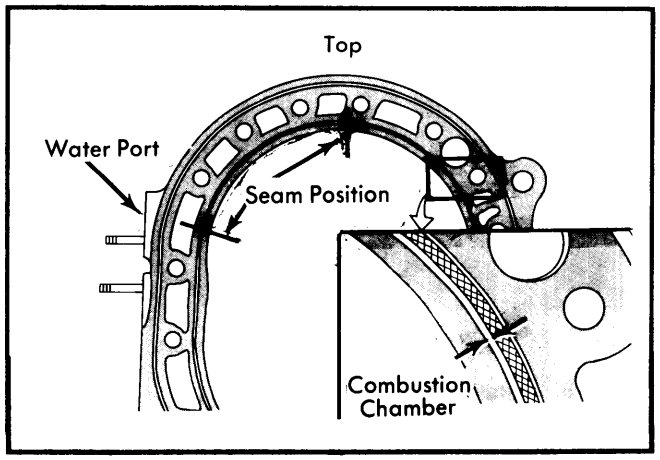

Fig. 23 Positioning Inner Sealing Rubber

3) Insert apex seal springs so that both ends of spring may support the back side of the apex seal. Install the soft seal into corner seal. Install corner seal springs and seals into their respective grooves. Fit side pieces to original positions and lubricate with engine oil.

4) Confirm that spring is set correctly on side piece. *See Fig. 24*. Confirm smooth movement of each seal by pressing on head. Apply sealing agent on the rear side of front housing in areas shown in *Fig. 21* and then place new "O" ring, sealing rubbers and protector on rear side of front housing. Apply engine oil to sliding surfaces of front rotor housing.

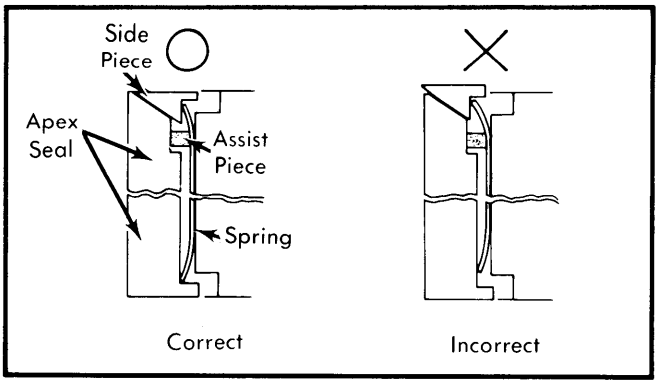

Fig. 24 Positioning of Apex Seal and Spring

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" (38 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

Use same procedures up to *Intermediate Housing* when installing rear rotor and rotor 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. Tighten bolts in sequence shown in *Fig. 25* in stages until final torque is reached. After tightening, turn eccentric shaft to make sure rotation is light and smooth.

FLYWHEEL COUNTERWEIGHT INSTALLATION

Man. Trans. — 1) Apply engine oil to oil seal in the rear housing. Mount flywheel to rear end of eccentric shaft so that key fits into flywheel keyway. Apply sealing agent to lock nut surface that contacts flywheel and install lock nut. Hold flywheel with ring gear brake (49 1881 060) and tighten lock nut.

2) Hold clutch disc in position with clutch disc centering tool (49 0813 310). Mount clutch cover and pressure plate assembly on flywheel and align the "0" marks of clutch cover and flywheel. Install 4 standard and 2 reamer bolts finger tight. To avoid distortion of pressure plate cover, tighten bolts in steps, a few turns at a time, until all are tight.

Auto Trans. — 1) Apply engine oil to oil seal in rear housing. Fit key to eccentric shaft. Install counterweight to eccentric shaft. Apply sealing agent to lock nut surface that will

RX7 ROTARY ENGINE (Cont.)

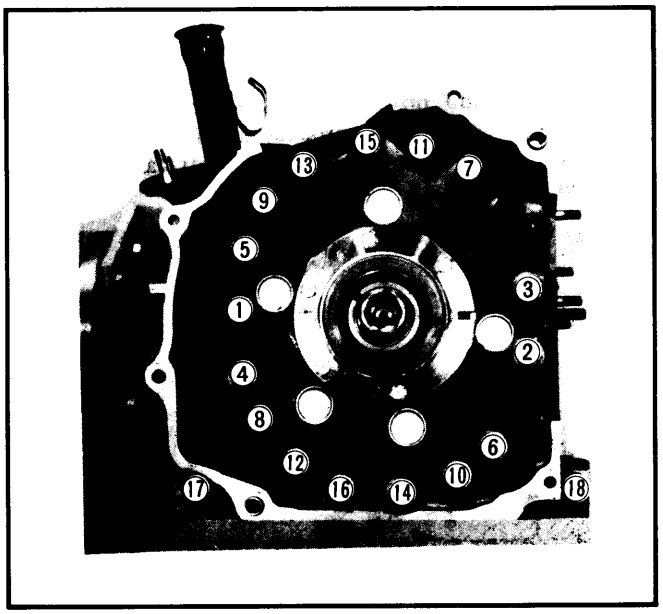

Fig. 25 Tightening Sequence of Tension Bolts

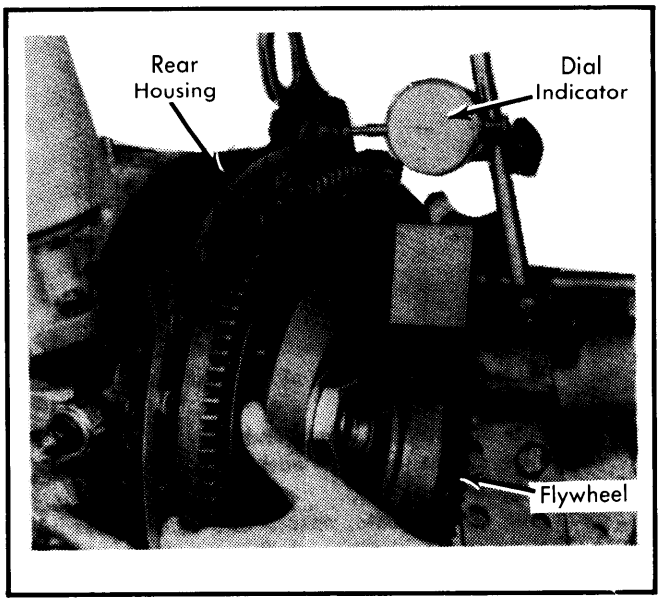

Fig. 26 Measuring Eccentric Shaft End Play with Dial Indicator

contact counterweight and install lock nut. Hold counterweight with stopper (49 1881 055) and tighten lock nut. Install drive plate to counterweight so hole in counterweight and drive plate line up.

ECCENTRIC SHAFT END-THRUST ADJUSTMENT

1) Turn engine so front is up. Install thrust plate with chamfer downward, and 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 to thrust plate.*

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

3) Install key in eccentric shaft. 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.

4) Turn engine so top is upward. Attach a dial indicator on the flywheel or counterweight so it contacts rear housing. Move flywheel or counterweight back and forth. Standard end play is .0016-.0028" (.04-.07 mm). If end play is more than .0035" (.09 mm) arind spacer on surface plate with emery paper or install thinner spacer. If end play is less than .0016" (.04 mm), install thicker spacer.

5) 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. When spacer has been installed, recheck end play.

NOTE – *If end play is below specified amount, spacer thickness is too small; if end play is beyond specifications, spacer is too thick.*

INSTALLING FRONT COVER & ECCENTRIC SHAFT PULLEY

1) Turn engine so front is upward. Remove eccentric shaft pulley. Tighten oil pump sprocket nut and bend tab of lock washer.

2) Check oil pump drive chain slack by pressing finger against chain. *See Fig. 28.* Chain slack measurement should not exceed .47" (12 mm). If the slack exceeds the limit, replace drive chain.

3) Install new "O" ring on front housing oil passage. Install front cover and gasket on front housing. Lubricate oil seal in front cover. Install eccentric shaft pulley on shaft. Use new washer and tighten pulley bolt.

INSTALLING OIL STRAINER & OIL PAN

Invert engine so that bottom of engine is up. Install oil strainer gasket and strainer on front housing. Cut off excess gasket along mounting surface of oil pan. Apply a .16-.24" (4-6 mm) bead of sealer on mounting surface of oil pan (to the inside of pan bolt holes) and install gasket. Apply a similar bead of sealant to gasket, install pan and tighten bolts.

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 (leading timing mark) on pulley aligns with indicator pin on front cover. Align notch

RX7 ROTARY ENGINE (Cont.)

on distributor housing with punch mark on driven gear. Insert distributor and lock nut. Turn distributor housing until a trigger wheel blade aligns with pick-up coil. Tighten lock nut.

INSTALLING EXTERNAL COMPONENTS

Install exhaust manifold, engine mount, intake manifold with carburetor, and alternator and drive belt. Check clearance between alternator support and bracket. Limit is .0059" (.15 mm). Adjust with shim if necessary. Install air pump and drive belt, oil filter assembly and all other external components. Before removing engine from stand, install engine hanger bracket to front cover.

ENGINE OILING

Crankcase Capacity – 5.5 quarts.

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

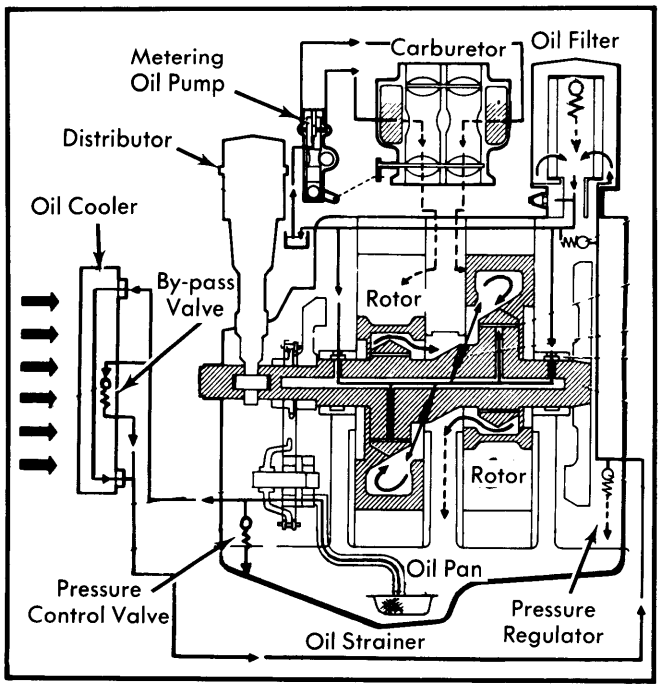

Fig. 27 Cutaway View of Engine Oiling System

Normal Oil Pressure — 10-26 psi (0.7-1.8 kg/cm^2) at idle speed, 64-78 psi (4.5-5.5 kg/cm^2) 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 1.827" (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.

OIL PUMP

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

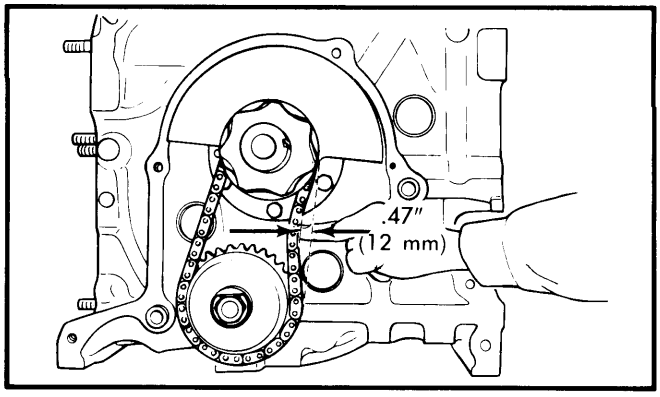

Fig. 28 Measuring Oil Pump Drive Chain Slack

1) With front engine cover removed, 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. 28.*

2) With oil pump removed, disassemble in following order: Remove snap ring, rear outer rotor, rear inner rotor, key and middle plate; remove front inner rotor, key, shaft, spring pin and front outer rotor.

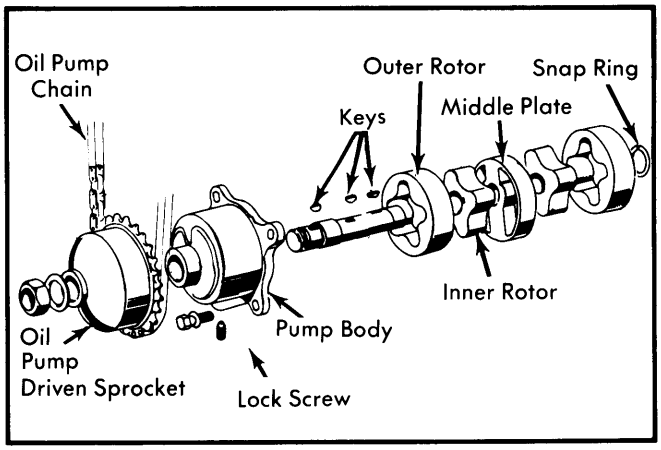

Fig. 29 Exploded View of Oil Pump Assembly

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

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), replace pump body or 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.*

RX7 ROTARY ENGINE (Cont.)

METERING OIL PUMP

Metering oil pump regulates the 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 is actuated by a rod connected to throttle lever. Before measuring output, check clearance between metering pump lever and washer as shown in *Fig. 30*. Clearance should be no more than .04" (1.0 mm). To check 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 2.0-2.4 cc in 6 minutes.

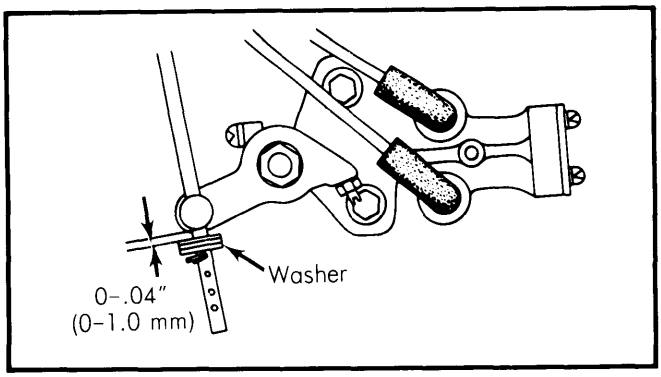

Fig. 30 Metering Pump Control Rod Adjustment

NOTE – *As carburetor will not be receiving oil during test, add a small amount of clean oil to carburetor to provide proper lubrication during testing.*

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 0.2-0.3 cc for six minutes of operation. Make sure lock nut of adjustment screw is locked, then recheck metering oil pump discharge rate.

OIL COOLER

1) Inspect oil cooler for damage, cracks and leakage. Any defects found are repaired by aluminum welding or replacement.

2) Drain engine oil and remove engine under cover. Remove cap nut at bottom of oil cooler and pull out by-pass valve.

3) Check by-pass valve after removing it from bottom of oil cooler. Heat and soak by-pass valve in oil gradually to 158°F (70°C) and check if protrusion of valve exceeds 0.2" (5 mm). If less, replace by-pass valve.

4) Install by-pass valve in reverse of removal procedure and fill engine with oil.

ENGINE COOLING

Thermostat — Wax pellet type, starts to open at 180°F (82°C), fully opens at 203°F (95°C).

Pressure Cap – 13 psi (0.9 kg/cm²)

WATER PUMP

Removal and Installation — 1) Drain cooling system. Remove air cleaner, water temperature switch connector, drive belt for air conditioner (if equipped), and air pump and drive belt.

2) Remove alternator and drive belt, cooling fan and fan drive assembly. Remove air conditioning pully (if equipped). Disconnect radiator hoses and remove water pump. To install, reverse removal procedures.

ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS

Year	cu. ins.	cc	Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Rotor Housing Width	
							in.	mm
1981	70	1146	4-Bbl.	.....	.....	9.4:1	2.756	70

ROTOR HOUSING, INTERMEDIATE HOUSING & ROTOR

Engine	ROTOR HOUSING		INTERMEDIATE HOUSING		ROTOR		
	Width In. (mm)	Distortion Limit In. (mm)	Width In. (mm)	Distortion Limit In. (mm)	Inside Diameter In.(mm)	Housing-to-Rotor Clearance In. mm)	Land Protrusion In. (mm)
1146 cc Rotary	2.756 (70)	.0024 (.06)	1.969 (50)	.0016 (.04)	.....	.0047-.0071 (.12-.18)	.....

RX7 ROTARY ENGINE (Cont.)

ENGINE SPECIFICATIONS (Cont.)

① APEX SEAL

Engine	Length	Seal Width	Height	Seal-to-Housing		Seal-to-Rotor	
				Clearance	Wear Limit	Groove Clearance	Wear Limit
1146 cc Rotary	2.750 (69.8)	.118 (3.0)	.335 (8.5)	.0051-.0075 (.13-.19)	.....	.0020-.0035 (.051-.089)	.006 (.15)

① — In. (mm)

SIDE SEAL

Engine	Thickness In. (mm)	Width In. (mm)	Seal-to-Groove		Side Seal-to-Corner Seal	
			Clearance In. (mm)	Limit In. (mm)	Clearance In. (mm)	Limit In. (mm)
1146 cc Rotary	.039 (1.0)	.138 (3.5)	.0012-.0031 (.03-.08)	.004 (.10)	.0020-.0059 (.05-.15)	.016 (.40)

CORNER SEAL

Engine	Diameter In. (mm)	Height In. (mm)	Seal-to-Groove		Side Seal-to-Corner Seal	
			Clearance In. (mm)	Limit In. (mm)	Clearance In. (mm)	Limit In. (mm)
1146 cc Rotary	.433 (11.0)	.276 (7.0)	.....	.....	.0020-.0059 (.05-.15)	.016 (.40)

ECCENTRIC SHAFT MAIN & ROTOR BEARINGS

Engine	MAIN BEARINGS			ROTOR BEARINGS	
	Journal Diameter In. (mm)	Clearance In. (mm)	Eccentric Shaft Endplay In. (mm)	Journal Diameter In. (mm)	Clearance In. (mm)
1146 cc Rotary	1.6929 (43)	.0016-.0031 (.04-.08)	.0016-.0028 (.04-.07)	2.9134 (74)	.0016-.0028 (.04-.07)

OIL SEAL

Height In. (mm)	Seal Lip Contact Width	
	Standard In. (mm)	Limit In. (mm)
.220 (5.6)	.020 (.5)	.....

PORT TIMING

Engine	INTAKE		EXHAUST	
	Open (ATDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
1146 cc Rotary	32°	40°	75°	38°

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N·m)
Oil Pump Sprocket	23-34 (32-47)
Eccentric Shaft Pulley	72-87 (98-118)
Intake Manifold	14-19 (19-26)
Flywheel Lock Nut	289-362 (393-492)
Water Pump	13-20 (18-27)
Clutch Cover	13-20 (18-27)