

1971 R100 & RX2 ROTARY PISTON ENGINE

GENERAL SPECIFICATIONS								
Engine	cu. ins.	cc	Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Rotor Housing Width	
							in.	mm
1971								
R100	60	982	1x4-Bbl.	110@7000	100@4000	9.4-1	2.3622	60
RX2	70	1146	1x4-Bbl.	130@7000	115@4000	9.4-1	2.7599	70

► CHANGES, CAUTIONS, CORRECTIONS

See "Engine Notes" at end of article.

ENGINE REMOVAL

- 1) Remove hood, drain cooling system and engine oil. Disconnect battery and remove air cleaner. Disconnect fuel line at carburetor.
- 2) Disconnect accelerator and choke cables from carburetor. Disconnect electrical connections at starter and alternator. Disconnect oil pressure and water temperature switch connections.
- 3) Disconnect spark plug wires. Disconnect and remove radiator hoses and heater hose. Remove oil lines from engine front cover and rear rotor housing.
- 4) Remove radiator shroud. On R100 models, remove radiator and horn. On RX2 models, remove alternator and remove fan from eccentric shaft pulley.
- 5) Remove starter and clutch slave cylinder and place slave cylinder on frame. Disconnect exhaust pipe at exhaust manifold. Remove bolts securing bell housing to engine.
- 6) Remove hot air duct from exhaust manifold. Support transmission with a jack and remove front engine mounting bolts. Attach a hoist to engine and raise slightly.
- 7) Pull engine forward until it clears transmission shaft and lift engine from vehicle. To install engine, reverse removal procedure.

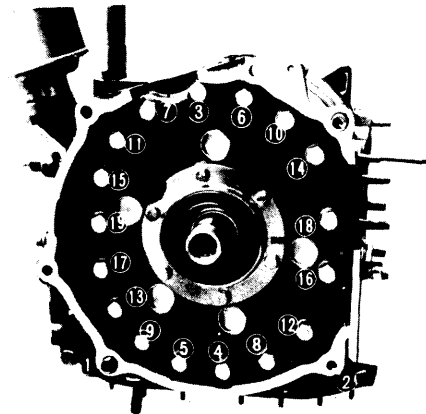
ENGINE DISASSEMBLY

NOTE — With engine removed from vehicle, disassemble in the following order.

- 1) Remove oil metering pump link, intake manifold with carburetor, exhaust manifold and engine mounting bracket. Mount engine in a suitable stand (49 0107 680A, 49 0813 005 and 49 0820 006).
- 2) Remove alternator, water pump pulley, water pump, both distributors, spark plugs and oil filter mount from rear housing. Attach a suitable flywheel holder (49 0820 060) to engine.
- 3) Remove clutch assembly, eccentric shaft pulley nut and pulley. Remove flywheel nut and remove flywheel using a suitable puller (49 0823 300). Remove oil pan and oil pickup.
- 4) Remove oil metering pump and engine front cover. Remove "O" ring from oil passage on front housing. Slide oil slinger, spacer, and distributor drive off of eccentric shaft. Remove oil pump drive chain adjuster. Remove nut securing oil pump sprocket and remove sprocket and chain.

- 5) Remove key from eccentric shaft and slide off balance weight, thrust washer and needle bearing from shaft. Remove bearing housing retaining bolts and slide off bearing housing, needle bearing, spacer and thrust washer from eccentric shaft.

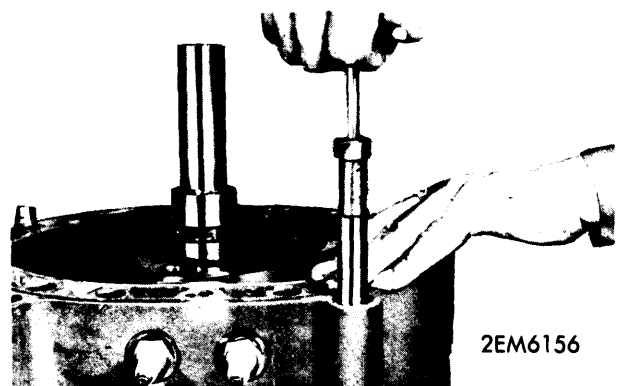
- 6) Remove front housing tension bolts in sequence shown in illustration and remove front housing. Remove sealing rubbers and "O" rings between front housing and front rotor housing.



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TENSION BOLT LOOSENING SEQUENCE

- 7) Remove corner and side seals with springs from rotor and place in a suitable holding case (49 0813 250). Place in case noting marks on rotor side face next to closest portion of seal.
- 8) These marks are used to insure that seals are reinstalled in same position as when removed. Hold rotor housing down and extract tubular dowels with a suitable removing tool (49 0813 215).



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EXTRACTING TUBULAR DOWELS

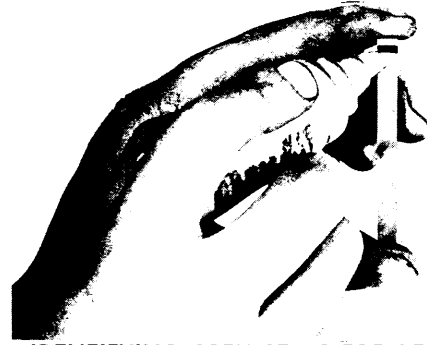
1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

9) Raise rotor slightly and install a suitable rotor clamp (49 0813 230) on rotor. With clamp installed, slide rotor housing off of rotor.

10) Remove rotor clamp, apex seals and springs. Place an identification mark on bottom of seals that will indicate direction when installed and correct groove for reassembly.

11) Pull rotor off of eccentric shaft and withdraw tubular dowels from intermediate housing using a suitable tool (49 0813 215). Remove intermediate housing and pull out eccentric shaft.

12) Follow same procedures for removing rear rotor and rotor housing as used for removing front rotor and rotor housing.



2EM6155

IDENTIFYING APEX SEALS FOR REASSEMBLY

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)
1971 R100	2.3622 (59.00)	.002 (.05)	1.9685 (49.00)	.002 (.05)	3.1497 (80.00)	.0051-.0067 (.13-.17)	.004-.006 (.10-.15)
RX2	2.7559 (69.00)	.002 (.05)	1.9685 (49.00)	.002 (.05)	3.1497 (80.00)	.0051-.0067 (.13-.17)	.004-.006 (.10-.15)

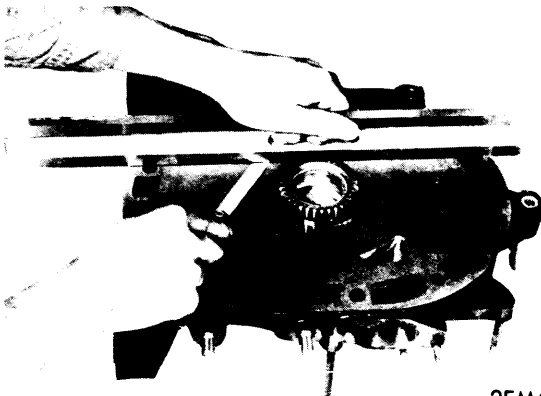
INSPECTION & OVERHAUL

FRONT HOUSING

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 bearing for signs of scoring or flaking.

3) Place a straight edge across face of housing and use a feeler gauge to check for distortion. If distortion exceeds .002", front housing must be replaced.

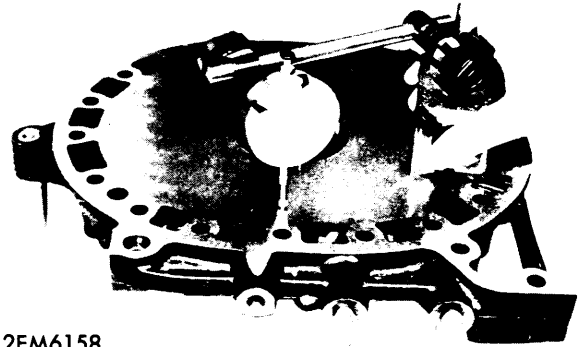


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CHECKING HOUSING DISTORTION

4) Check rotor running surface for wear with a dial indicator over entire surface. If difference in all measurements exceeds .004", front housing must be replaced.

5) Measure inner diameter of main bearing and outside diameter of bearing journal on eccentric shaft. If clearance exceeds .004", main bearing must be replaced.



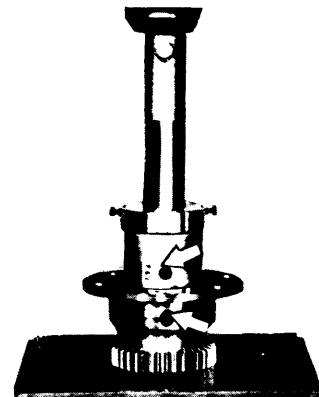
2EM6158

CHECKING HOUSING WEAR

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

7) Secure stationary gear in a vise and remove bearing lockpin with a suitable removing tool (49 0820 060). Press bearing out of gear using a suitable mandrel (49 0813 235).

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MAIN BEARING INSTALLATION & OIL HOLE ALIGNMENT

1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

8) Use same mandrel to install new bearing. Make sure oil hole in bearing aligns with oil hole in gear. Press bearing into gear until mandrel contacts flange on stationary gear. Install a new lockpin to prevent bearing from working loose.

9) Using same mandrel, install stationary gear and bearing in housing. When installing, make sure slot in gear flange aligns with dowel pin in housing. Tighten retaining bolts.



2EM6159
FRONT HOUSING STATIONARY GEAR INSTALLATION

INTERMEDIATE HOUSING

Clean and inspect intermediate housing using same procedures and values as outlined in front housing procedure.

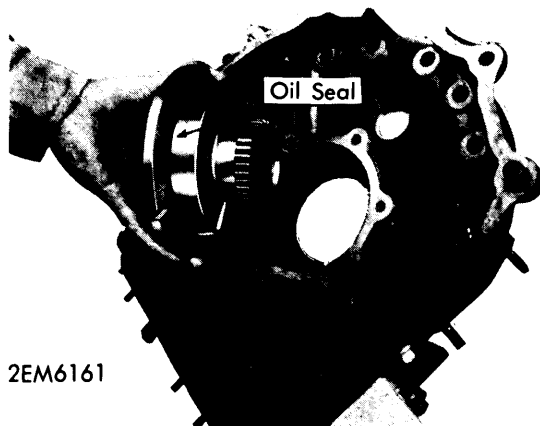
REAR HOUSING

1) Clean and inspect rear housing using same procedures and values as outlined in front housing procedure. Note the following additional procedures.

2) Check rear oil seal for signs of leakage or damage. Replace seal as necessary. Inspect stationary gear for wear or damage and replace as necessary.

3) To remove stationary gear, remove retaining bolts and drive gear out using a suitable mandrel (49 0813 235). Remove "O" ring from stationary gear.

NOTE — Always install a new "O" ring when stationary gear is removed.



2EM6161
REAR HOUSING STATIONARY GEAR INSTALLATION

4) Install "O" ring and apply sealer to gear flange. Lubricate "O" ring with grease to ease installation. Use same mandrel to install gear making sure slot in flange aligns with dowel pin.

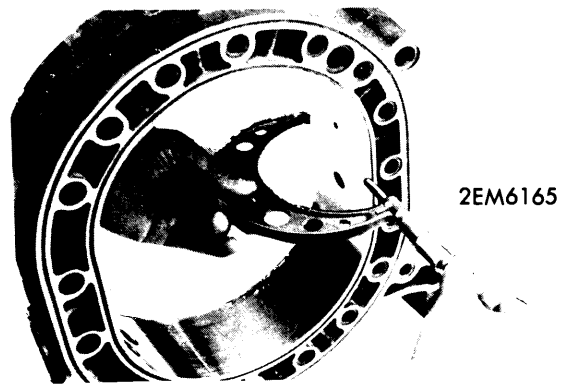
5) Make sure oil return hole in gear is facing toward bottom. This hole allows oil from rear main bearing to drain back into oil pan. Tighten retaining bolts.

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) Using a micrometer, measure housing thickness at various points next to rotor running surface. Rotor housing must be replaced if measurements vary more than .002" (.05 mm).



2EM6165
CHECKING ROTOR HOUSING THICKNESS

ROTORS

1) Combustion condition of rotor can be determined by analyzing color of combustion area of rotor 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.

3) Inspect oil seals and replace if necessary. See *Rotor Oil Seal Replacement*. Remove carbon from rotor with fine emery paper. Remove carbon from grooves with a carbon remover.

4) Wash rotor in a suitable cleaning solution and blow dry with compressed air. Inspect rotor for wear or damage and check internal gear for cracking or chipped teeth.

5) Measure width of rotor housing and rotor. The difference is rotor-to-housing clearance. Rotor must be replaced if clearance exceeds .0067". See *Rotor Replacement*.

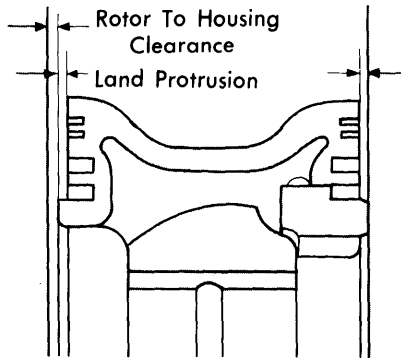
6) Place a straight edge across rotor and measure land protrusion with a feeler gauge. Replace rotor if land protrusion is less than .004". See *Rotor Replacement*.

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1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

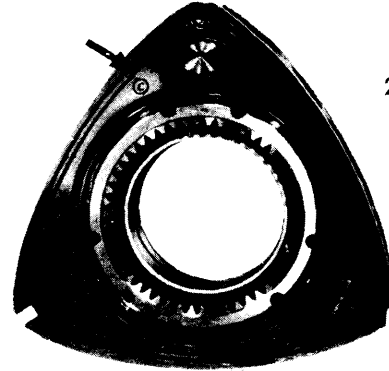
7) Measure inner diameter of rotor bearing and outer diameter of rotor bearing journal on eccentric shaft. Replace rotor bearing if clearance exceeds .0039". See *Rotor Bearing Replacement*.

1) Rotors are manufactured in five weight classifications. Classifications are designated by a letter code stamped in gear side of rotor.



2EM6166

ROTOR SIDE CLEARANCE & LAND PROTRUSION MEASURING POINTS



2EM6167

ROTOR WEIGHT CLASSIFICATION MARK

ROTOR REPLACEMENT

NOTE - If rotor is replaced for any reason, the following points must be considered.

2) Letter designations are "a", "b", "c", "d" and "e". If rotor is replaced, replace with a rotor with a "c" weight classification.

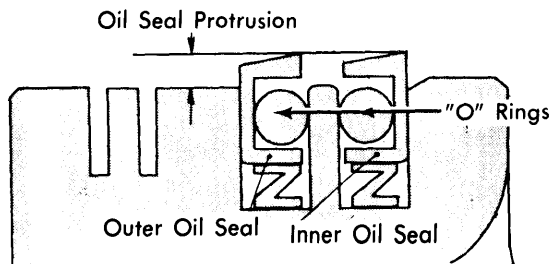
OIL SEAL						
Engine	Thickness In. (mm)	Width In. (mm)	Outside Diameter		Seal Lip Contact Width	
			Outer Seal In. (mm)	Inner Seal In. (mm)	Standard In. (mm)	Limit In. (mm)
1971 R100	.2165 (5.50)	.1319 (3.35)	4.9607 (126.00)	4.5670 (118.29)	.008 (.20)	.031 (.79)
RX2	.2165 (5.50)	.1327 (3.37)	4.9607 (126.00)	4.5670 (118.29)	.008 (.20)	.031 (.79)

ROTOR OIL SEAL REPLACEMENT

1) With seal still installed in rotor, measure contact lip width of seal. Seal must be replaced if contact width exceeds .031". Measure seal protrusion and replace seal if less than .020".

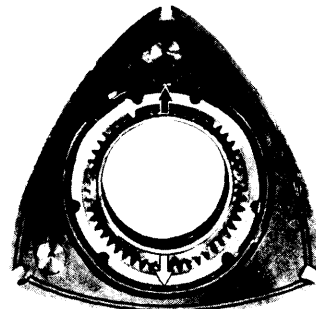
2) To remove oil seal, insert a suitable seal removing tool (49 0813 225) in slots in rotor and pry out oil seal. Take care not to damage rotor grooves.

3) Thoroughly clean seal grooves in rotor. Place rotor on a cloth and install oil seal springs with end gaps 180° apart. Ends of springs must point toward outside of rotor.



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OIL SEAL PROTRUSION MEASURING POINT



2EM6169

ROTOR OIL SEAL SPRING END GAP POSITION

1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

4) Install new "O" rings in seals and lubricate seal and grooves in rotor with oil. To install seal, push into groove slowly and evenly to prevent distortion of oil seal.

NOTE — A suitable seal installing tool (49 0820 220) is used to install oil seals in R100 models. Seals can be pressed in using this tool.

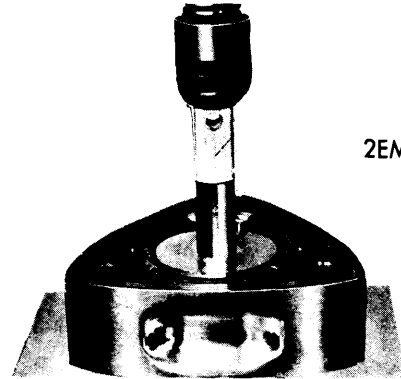
OIL SEAL SPRINGS			
Engine & Spring	Free Length In. (mm)	Installed Height In. (mm)	Installed Pressure (Lbs.) In. (mm)
1971 R100 & RX2 Inner	.102 (2.59)	.039 (.99)	26.5 (12.02)

OIL SEAL SPRINGS

ROTOR BEARING REPLACEMENT

1) Install a suitable bearing expander (49 0813 225) in bearing. Drill a .140" hole approximately .280" deep in bearing lockscrew. Lockscrew prevents bearing from working loose in rotor.

2) Place rotor in a press with gear side up and press out bearing using a suitable mandrel (49 0813 240). Inspect bearing bore in rotor for signs of scoring. Use Emery paper to smooth out.



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ROTOR BEARING REMOVAL

3) Install a new bearing using same mandrel. Make sure oil hole in bearing aligns with oil hole in apex side of rotor and bearing is flush with rotor.

4) Install bearing expander and drill a .140" hole .280" deep and approximately .280" either to the left or right of original hole. Center of hole should be .020" from edge of bearing bore in rotor.

5) Thread hole with a M4, P=0.70 mm tap. Install a new lockscrew and tighten. Clean rotor in a suitable cleaning solution and blow dry with compressed air.

APEX SEAL							
Engine	Seal			Seal-to-Housing		Seal-to-Rotor	
	Length In. (mm)	Width In. (mm)	Height In. (mm)	Clearance In. (mm)	Wear Limit In. (mm)	Groove Clearance In. (mm)	Wear Limit In. (mm)
1971 R100	2.3611 (59.97)	.2362 (5.00)	.3937 (9.00)	.0004-.0020 (.01-.05)	.0059 (.15)	.0014-.0028 (.04-.07)	.004 (.10)
RX2	2.7548 (69.97)	.2362 (5.00)	.3937 (9.00)	.0004-.0020 (.01-.05)	.0059 (.15)	.0014-.0028 (.04-.07)	.004 (.10)

APEX SEAL

1) Use a carbon remover to remove carbon deposits from apex seal sides. Take care not to scratch or damage apex seal. Clean seal in a suitable cleaning solution and blow dry with compressed air.

CAUTION — Apex seals are easily damaged, do not remove carbon deposits from apex seal with emery paper.

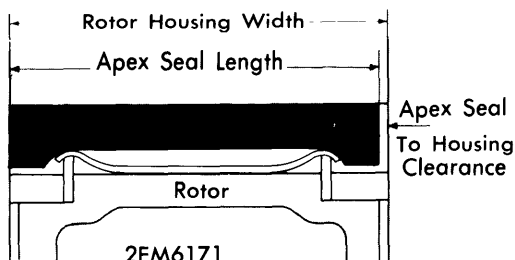
2) Inspect seal for wear or damage. Measure apex seal height with a micrometer. If height is less than .3150", apex seal must be replaced.

3) Insert apex seal in appropriate groove in rotor and measure side clearance with a feeler gauge. If side clearance exceeds .004" (.10 mm), apex seal must be replaced.

4) Measure apex seal length and compare with minimum width of rotor housing already determined. The difference is seal-to-housing clearance. If clearance exceeds .0059" apex seal must be replaced.

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1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

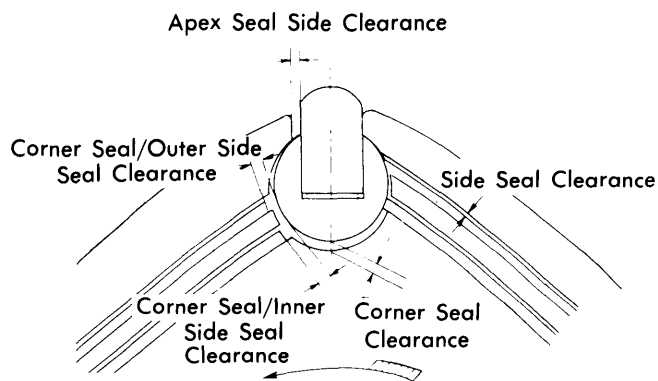


APEX SEAL TO HOUSING CLEARANCE

APEX SEAL SPRINGS			
Engine & Spring	Free Length In. (mm)	Installed Height In. (mm)	Installed Pressure (Lbs.) In. (mm)
1971 R100	.197 (5.00)	.079 (2.00)	6.4±.04 (2.9±.02)
RX2	.228 (5.79)	.079 (2.00)	5.7±.04 (2.9±.02)

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)
1971 R100	.0394 (1.00)	.1378 (3.50)	.0016-.0028 (.04-.07)	.004 (.10)	.0051-.0098 (.13-.25)	.016 (.41)
RX2	.0394 (1.00)	.1378 (3.50)	.0016-.0028 (.04-.07)	.004 (.10)	.002-.006 (.05-.15)	.016 (.41)

SIDE SEAL SPRINGS			
Engine & Spring	Free Length In. (mm)	Installed Height In. (mm)	Installed Pressure (Lbs.) In. (mm)
1971 R100	.087 (2.21)	.039 (.99)	7.1±.07 (3.2±.03)
RX2	.079 (2.00)	.039 (.99)	7.9±.07 (3.6±.07)



2EM6172

VARIOUS SEAL CLEARANCE MEASURING POINTS

SIDE SEAL

With side seals still installed in rotor, measure side clearance of seal in groove with a feeler gauge. If clearance exceeds .004" (R100) or .0039" (RX2), side seals must be replaced. See *Seal Installation*.

CORNER SEAL						
Engine	Diameter 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)
1971 R100	.4331 (11.00)	.2756 (7.00)	.0013-.0024 (.03-.06)	.003 (.08)	.0051-.0098 (.13-.25)	.016 (.41)
RX2	.4331 (11.00)	.2756 (7.00)	.0008-.0019 (.02-.05)	.003 (.08)	.002-.006 (.05-.15)	.016 (.41)

CORNER SEAL

R100 - 1) Measure clearance between corner seal and bore in rotor (see illustration). Corner seal must be replaced if clearance exceeds .003".

2) With side seal installed, insert a feeler gauge between rear of side seal (against direction of rotation) and corner seal and determine clearance.

3) A new side seal must be installed if clearance exceeds .016". See *Seal Installation*. With new side seal installed, recheck clearance.

1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

4) If clearance is less than .003" (.08 mm), file a small portion of side seal with a fine file until correct clearance with a corner seal is obtained.

5) Corner seals and rotors are stamped with matching letters from factory. If a corner seal is replaced, one with a letter matching one removed must be installed.

6) Install a corner seal stamped with a "P" if rotor is stamped with a "K" or a "P". Install a corner seal stamped with a "T" if rotor is stamped with a "Q" or a "T". Install corner seals correctly. See *Seal Installation*.

RX2 - 1) Measure clearance between corner seal and bore in rotor (see illustration). Use a suitable gauge (Bar Limit Gauge No. 5619 91 100) to measure clearance.

2) If neither end of gauge can be inserted in gap, clearance is as specified. If the "go-end" of gauge can be inserted but the other end cannot, a .0012" oversize corner seal must be installed.

3) If both ends of gauge can be inserted in gap, clearance is excessive. Corner seal bore in rotor must be bored for a .0079" oversize corner seal. See *Rotor Corner Seal Reboring*.

4) With side seals installed, insert a feeler gauge between rear of side seal (against direction of rotation) and corner seal to determine clearance.

5) If clearance exceeds .016", side seal must be replaced. See *Seal Installation*. With new side seal installed, recheck clearance.

6) If clearance is less than specified, file a small portion from end of side seal (against direction of rotation) until correct clearance is obtained. Install corner seals correctly. See *Seal Installation*.

CORNER SEAL SPRINGS			
Engine & Spring	Free Length In. (mm)	Installed Height In. (mm)	Installed Pressure (Lbs.) In. (mm)
1971 R100	.102 (2.59)	.039 (.99)	3.1±.07 (1.4±.03)
RX2	.106 (2.69)	.039 (.99)	2.9±.07 (1.3±.03)

ROTOR CORNER SEAL REBORING (RX2 ONLY)

1) Remove all carbon deposits from rotor side surface and apex seal groove. Position a suitable jig (5870 94 15) in rotor and tighten bar. Do not over tighten bar as it will damage rotor bearing or apex seal groove.

2) Using a suitable reamer (5363 91 180), thoroughly oiled, bore out corner seal. 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.

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)
1971 R100	1.6929 (43.00)	.0016-.0024 (.04-.06)	.0016-.0031 (.04-.08)	2.1934 (74.00)	.0016-.0031 (.04-.08)
RX2	1.9629 (43.00)	.0016-.0028 (.04-.07)	.0016-.0028 (.04-.07)	2.9134 (74.00)	.0020-.0035 (.05-.09)

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 of shaft by rotating slowly. If runout exceeds .0012", eccentric shaft must be replaced.

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 two new "O" rings. Tighten plug sufficiently.

5) Inspect needle bearings in end of shaft for wear or damage. Insert a pilot shaft in needle bearings and check for excessive clearance and for binding during rotation.

6) The end thrust of eccentric shaft is regulated by thrust bearings installed in front of shaft. Inspect thrust bearings, bearing housing and thrust plate for wear or damage.

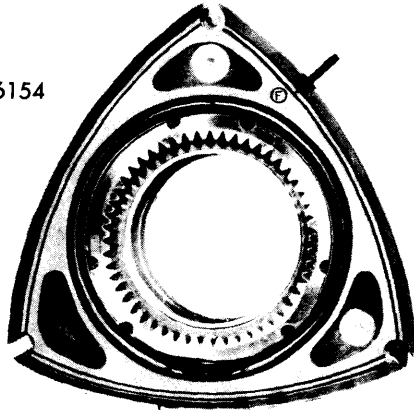
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ENGINE ASSEMBLY

SEAL INSTALLATION

1) Rotors are identified as to front and rear by an "F" or an "R" stamped in internal side of gear of rotor. Place rear rotor on a cloth with internal gear side up.

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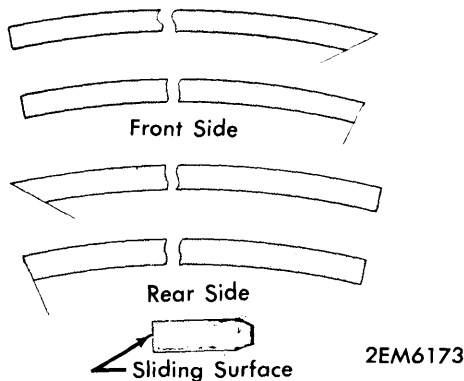


FRONT & REAR ROTOR IDENTIFICATION MARK

2) Noting identification marks made during disassembly, install apex seal in grooves without springs. Lubricate corner seal grooves and install springs and corner seals. Make sure corner seals rotate freely when turned by hand.

NOTE — Corner seals must protrude .050-.060" from rotor surface.

3) Install side seal springs with ends facing upwards. Lubricate grooves with oil and install side seals. Install side seals correctly, depending on whether they are installed in front or rear side of rotor (see illustration).



SIDE SEAL INSTALLATION POSITION

NOTE — Side seals must protrude .040" from rotor surface.

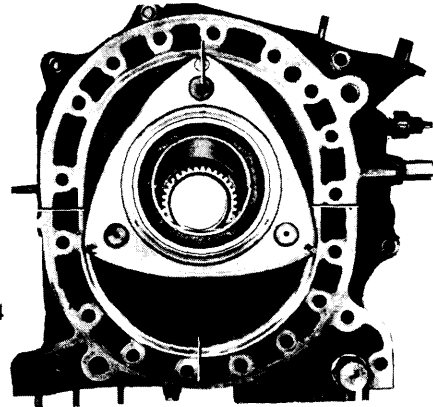
4) Lubricate internal gear and seals in rotor with oil. Install a suitable rotor clamp (49 0813 230). Seals must be installed in rear side of front rotor in the same manner.

ENGINE ASSEMBLY

1) Mount rear housing in engine stand with rotor running surface up. Install rotor, making sure gear meshes with stationary

gear on rear housing. Position rotor with apexes facing in any one of the four ways shown in illustration.

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ROTOR APEX POSITIONS FOR REASSEMBLY

2) Remove rotor clamp. Apply sealer to rear side of rear rotor housing making sure sealer does not enter oil or water passages. Install new "O" rings and sealing rubbers on rear side of rear rotor housing.

3) Position rear rotor housing with side that has sealer against rear housing. Lubricate and install tubular dowels using a suitable installing tool (49 0813 215).

4) Lubricate all running surfaces of eccentric shaft with oil. Carefully insert in rear main bearing and rotor bearing. Install apex seal springs between apex seals and grooves in rotor.

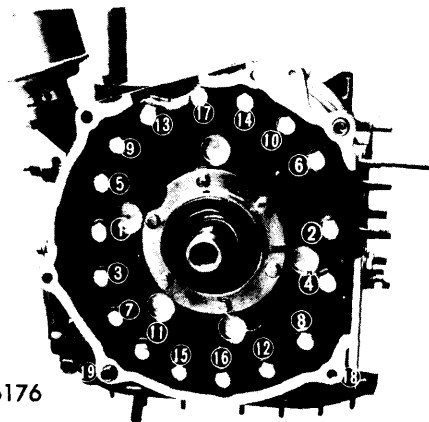
5) Install corner and side seals in front side of rotor using same procedure as previously outlined. See *Seal Installation*. Lubricate all seals and rotor side running surface with oil.

6) Apply sealer to front sealing surface of rear rotor housing. Install new "O" rings and sealing rubbers. Make sure side surface is clean and install intermediate housing.

7) Use same procedure to install front rotor and housing. Apply oil to front rotor gear and stationary gear of front housing.

8) Apply sealing agent to sealing surface of front rotor housing. Install new "O" rings and sealing rubbers. Install front housing, rotating rotor to mesh gears if necessary.

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TENSION BOLT TIGHTENING SEQUENCE (RX2)

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9) Tension bolts are of different lengths and must be installed in correct holes. Lightly tighten bolts in sequence shown in illustration. Tighten bolts to specification in same sequence.

10) Install eccentric shaft pulley bolt in shaft. Rotate shaft by turning pulley bolt with a wrench and check for freedom of rotation of engine.

FLYWHEEL & CLUTCH ASSEMBLY INSTALLATION

1) Apply oil to sealing lip of rear oil seal and install flywheel. Apply sealer to both sides of lockwasher and apply a locking agent to threads in eccentric shaft. Install flywheel retaining nut.

2) Secure flywheel with a suitable holding tool (49 0820 060) and tighten flywheel nut to specification. Secure nut by bending tab of lockwasher.

3) Position clutch disc on flywheel and install a suitable aligning tool (49 0813 310) in center of clutch disc. Install clutch cover and align "O" stamped in cover with reamed hole in flywheel.

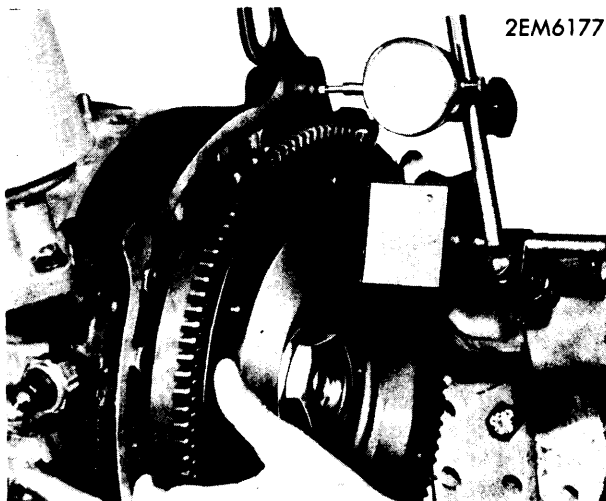
4) Install clutch cover retaining bolts and tighten to specification. Remove clutch alignment tool.

ECCENTRIC SHAFT ENDTHRUST ADJUSTMENT

1) Install thrust plate, spacer and needle bearing on eccentric shaft and lubricate with engine oil. Install bearing housing, tighten bolts and secure by bending lock tabs.

2) Lubricate and install needle bearing, thrust washer, balance weight, oil pump drive gear, distributor drive gear, key, spacer, and oil baffle plate, in that order.

3) Install eccentric shaft pulley and tighten nut to 50 ft. lbs. Position engine in stand with pulley facing up. Mount a dial indicator with pointer contacting pulley.



CHECKING ECCENTRIC SHAFT ENDPLAY

4) Move pulley back and forth to check endplay. If endplay exceeds .0028" an oversize spacer must be installed. Spacer thickness is designated by a letter on side of spacer.

Spacer Size Designation

Letter Code	Thickness
N.....	.3543±.0004"
M.....	.3559±.0004"
L.....	.3574±.0004"

5) After correct size of spacer has been determined and installed, recheck eccentric shaft endplay. Remove eccentric shaft pulley and key.

FRONT COVER & OIL PAN INSTALLATION

1) Install a new "O" ring around oil passage in front housing. Apply grease to front seal in front cover. Install gasket on front cover and install front cover.

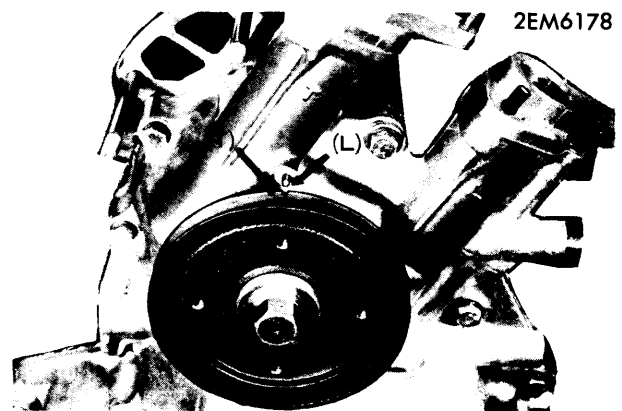
2) Install front cover retaining bolts. Rotate engine in stand and cut off excess front cover gasket at oil pan mating surface. Install eccentric shaft pulley and tighten nut to specification.

3) Install gasket on oil pump inlet hole and install oil pump pickup. Secure oil pickup bracket to rear housing. Apply sealing agent to oil pan mating surface.

4) Install oil pan gasket and oil pan. Install retaining nuts and tighten to specification. Install metering pump on front cover and tighten bolts.

DISTRIBUTOR INSTALLATION

1) Rotate engine in correct rotation direction until first mark on pulley aligns with pointer on front cover. This positions front rotor at TDC of compression stroke.



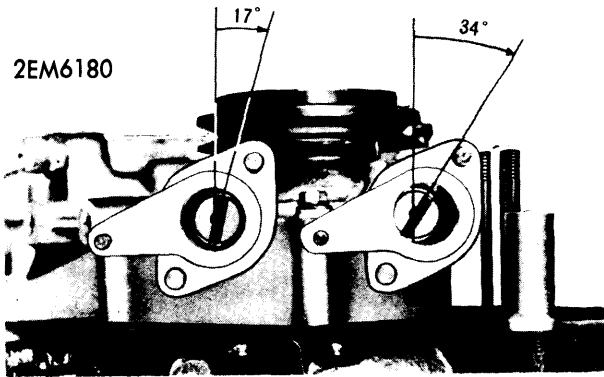
POSITIONING ENGINE AT TDC

2) Install socket for leading distributor through gasket in front of cover and position so that groove on upper side of drive shaft is 17° to right of center line of engine (see illustration).

3) Install socket for trailing distributor through gasket in front cover so that groove on upper side of drive shaft is 34° to right side of center line of engine (see illustration).

Mazda Engines

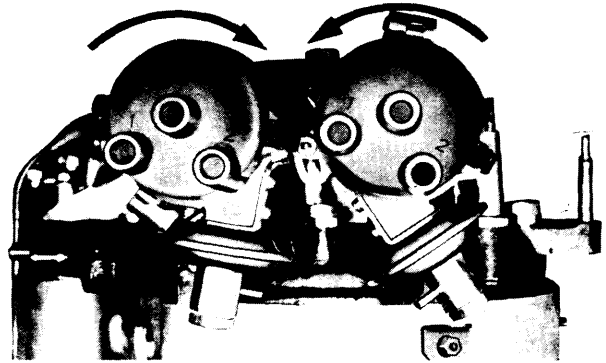
1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)



DISTRIBUTOR SOCKET INSTALLATION

4) Install distributors in front cover noting "T" and "L" marks on vacuum advance units of distributor. This denotes trailing and leading distributors. Align key of distributor with groove in drive shaft.

5) Rotate distributors in direction shown in illustration until contact points just start to open. Tighten lockplates, securing both distributors. Install remaining components on engine by reversing removal procedure.

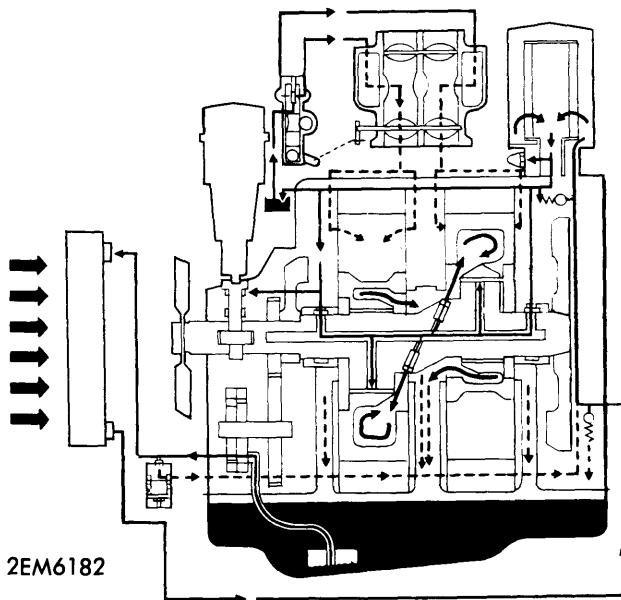


DISTRIBUTOR ROTATION DIRECTION

ENGINE OILING

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 a 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.



ENGINE OILING SYSTEM

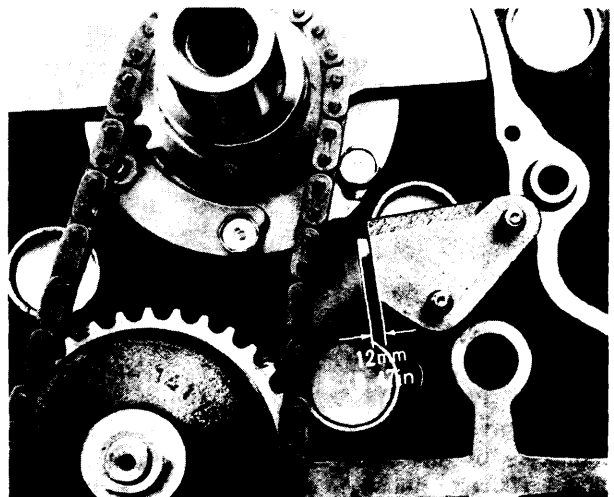
Pressure Regulator Valve — Located in rear housing. Valve opens as engine revolutions increase allowing oil pressure to rise. If oil pressure is low, remove plug and withdraw spring and valve. Inspect valve for wear and replace as necessary. Check spring against values given in Oil Pump Specifications and replace as necessary.

OIL PUMP

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

1) With front cover removed, check protrusion of chain adjuster. If adjuster protrudes more than .47" (11.94 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.



OIL PUMP DRIVE CHAIN ADJUSTER

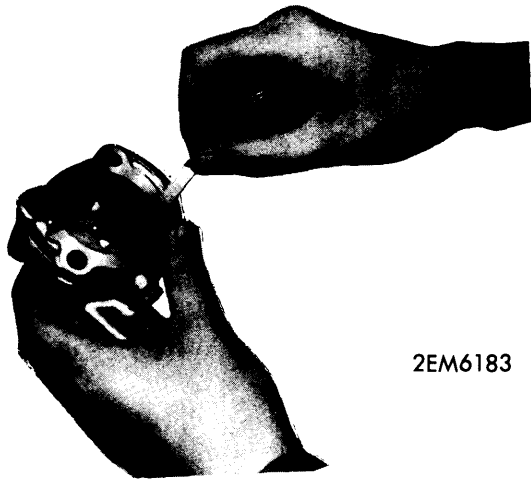
Crankcase Capacity — 5 qts.

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

Normal Oil Pressure — 43-71 psi at 3000 RPM (R100); 71 psi at 3000 RPM (RX2).

1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.) ENGINE OILING (Cont.)

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

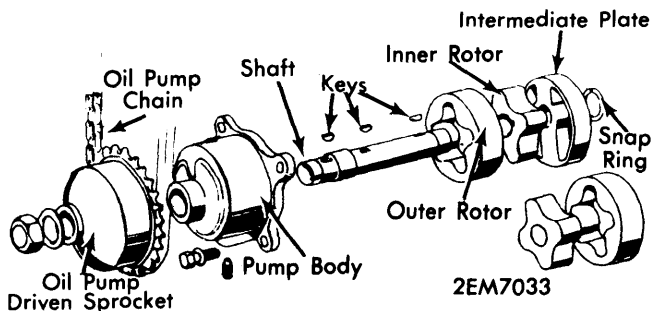


2EM6183

CHECKING ROTOR CLEARANCE

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

5) Place a straight edge across pump mating surface and check rotor endplay with a feeler gauge. If end play exceeds .012" (.30 mm), replace rotors or face off a small portion of pump housing until correct end play is obtained.



2EM7033

OIL PUMP COMPONENTS

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*.

Oil Pump Specifications

Application	Measurement
Rotor-to-Rotor Clearance.....	.0004-.0035"
Rotor-to-Pump Housing Clearance.....	.008-.010"
Rotor Endplay.....	.004-.008"
Drive Gear-to-Pump Housing Clearance.....	.004-.008"
Pressure Regulator Spring	
Free Length.....	1.8268"
Installed Length.....	1.3898"
Load Installed (R100).....	11 lbs.
Load Installed (RX2).....	15.6 lbs.

METERING OIL PUMP

1) Metering oil pump regulates amount of oil pumped to float chamber of carburetor. Oil enters combustion chamber with air fuel mixture to lubricate seals within chamber.

2) Amount of oil pumped into float chamber increases as engine RPM increases. Control lever on metering pump is actuated by a rod connected to throttle lever.

3) Measure clearance between stopper on control rod and lever on metering pump. If distance is more or less than .43±.07", bend control rod to obtain correct clearance.

4) To check if pump is discharging correct amount to carburetor, disconnect oil line to carburetor. Start engine and adjust to 2000 RPM. Pump should discharge 6.5±1 cc in ten minutes.

5) If pump does not meet specifications, it must be adjusted. Turn adjusting screw clockwise to increase amount and counterclockwise to decrease amount.

THERMO-VALVE

1) A thermo-valve is mounted in front engine cover to regulate flow of oil into oil cooler, depending upon oil temperature.

2) Valve is closed when engine is cold. Valve starts to open when oil reaches 170°F and is fully open at 187°F. This allows full flow of oil through oil cooler.

3) Make sure valve in housing slides freely. Check spring for damage and measure free length. If free length is less than 1.7244", replace return spring.

ENGINE COOLING

WATER PUMP

1) Loosen alternator mount and remove fan belt. Remove water pump retaining bolts and remove water pump.

2) To install, reverse removal procedure. Clean mating surfaces and use new gasket with sealer.

Thermostat — R100: starts opening at 170°F and is fully open at 194°F. RX2: starts opening at 180°F and is fully open at 203°F.

Cooling System Capacity — R100: 6 1/2 qts. RX2: 8 1/2 qts.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Tension Bolts.....	22 (3.0)
Flywheel Nut.....	350 (48.4)
Eccentric Shaft Pulley.....	50 (6.9)
Oil Pan Nuts	
6 mm.....	6 (.9)
8 mm Bolt & Nut.....	15 (2.1)
10 mm Bolt & Nut.....	30 (4.1)

1971 R100 & RX2 ROTARY PISTON ENGINE (Cont.)

ENGINE NOTES

▶ **ALL PRODUCTION MODELS AS OF 5/1/73 – TENSION BOLT "O" RING CHANGE** – "O" rings on tension bolts have been replaced by a rubber coated washer on all production models as of May 1, 1973. Rubber coated washers are interchangeable with all "O" rings used on earlier models.

▶ **ALL PRODUCTION MODELS AS OF 5/1/73 – INNER OIL SEAL SPRING CHANGE** – Inner oil seal spring has been changed on all production models as of May 1, 1973. The new front oil seal spring is identified by a cream color on spring and new rear oil seal spring is identified by a blue color on spring. New design inner springs are interchangeable with springs in earlier models, but additional holes must be drilled in groove in rotor to prevent spring and seal from rotating. A suitable jig (No. 49-0862-190) is required to drill new holes in rotor. A .1" (3 mm) diameter drill is used and holes are drilled approximately $.02" \pm .004"$ ($.5 \text{ mm} \pm .1 \text{ mm}$).

▶ **ALL PRODUCTION MODELS AS OF 5/1/73 – OIL COOLER BY-PASS VALVE INSTALLATION** – All production models as of May 1, 1973 (also some earlier models) are equipped with an oil cooler by-pass valve. This valve prevents loss of engine supply oil in cold weather. Oil will flow directly to engine until engine temperature is 185°F. Oil cooler by-pass valve is available to be installed on earlier models not equipped with valve from factory.

▶ **ALL PRODUCTION MODELS AS OF 10/1/72 – LARGE ROTOR HOUSING "O" RING CHANGE** – A new large rotor housing "O" ring oil seal of more durable material has been installed on all production models from October 1, 1972. New "O" ring is recognizable by being red in color with a tan liner and has a square cross section. Old style "O" ring is black in color with a round cross section. New seal is to replace old seal in all engines. Install new "O" ring with tan liner toward combustion chamber and bound resin joint placed at upper side of rotor housing.