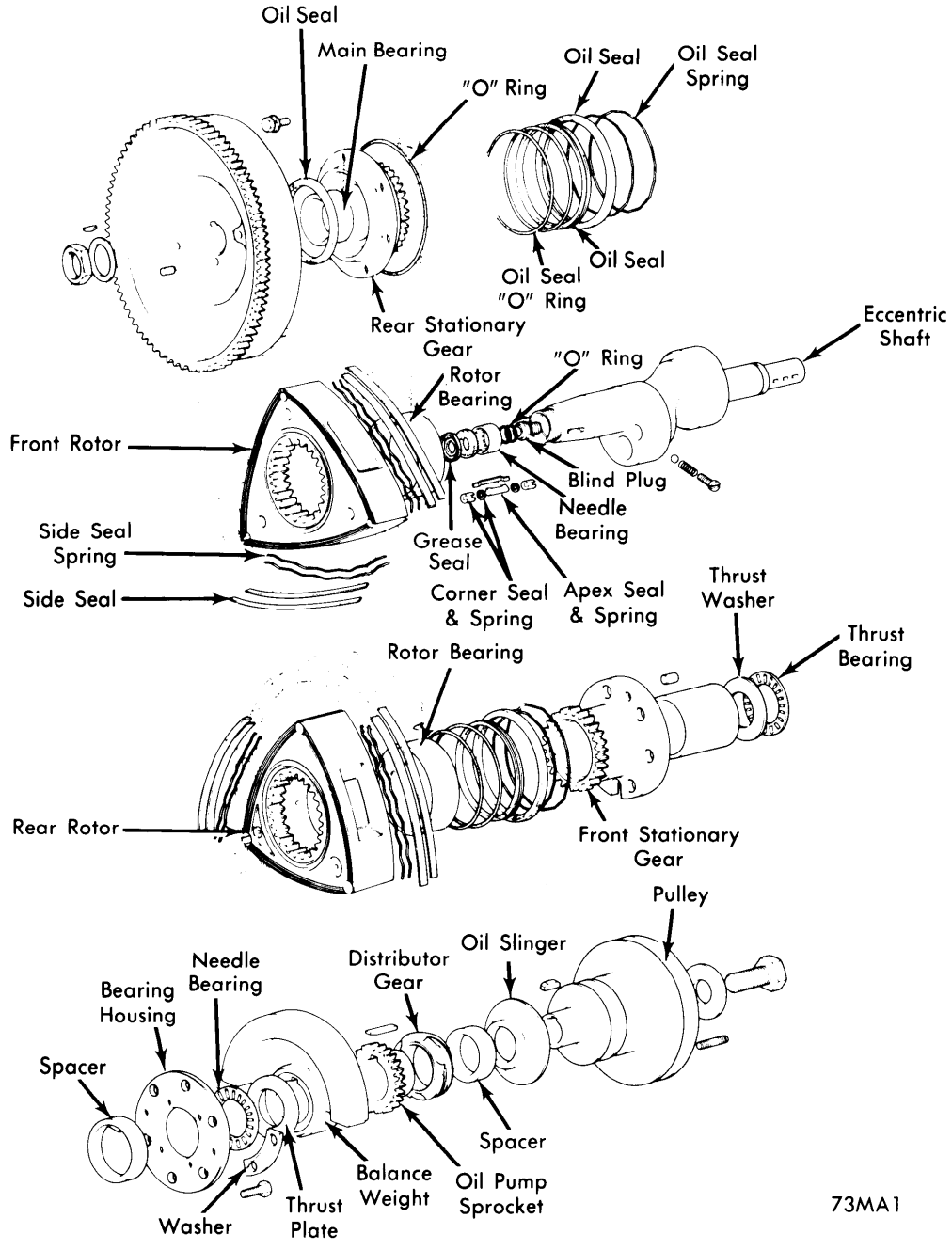
## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE

| GENERAL SPECIFICATIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Engine | cu. ins. | cc | Carburetor | HP at RPM | Torque (Ft. Lbs. at RPM) | Compr. Ratio | Rotor Housing Width | |
| | | | | | | | in. | mm |
| **1972-73** RX2 & RX3 | 70 | 1146 | 1x4-Bbl. | ..... | ..... | 9.4-1 | 2.7599 | 70 |




**ROTORS & ECCENTRIC SHAFT ASSEMBLY**

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

### ► CHANGES, CAUTIONS, CORRECTIONS

*See "Engine Notes" at end of article.*

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

1) Remove hot air duct from exhaust manifold. Remove exhaust manifold with thermal reactor. Mount engine in suitable engine stand (49 0839 000, 49 0813 005 and 49 0820 006).

2) Remove all emission control components from engine. Remove metering oil pump rod, oil lines and vacuum sensing line from carburetor. Remove intake manifold with carburetor.

3) Remove alternator, water pump pulley and water pump. Remove both distributors. Identify distributors with a mark to ensure that they are installed in same position. Remove distributor sockets.

4) Attach suitable flywheel holder (49 0820 060A) to flywheel. Remove eccentric shaft pulley bolt, pulley and key. Remove clutch assembly and flywheel retaining nut using suitable wrench (49 0820 035).

5) Remove flywheel using suitable puller (49 0823 300). Rotate engine in stand so that bottom of engine is facing up. Remove oil pan and oil pickup.

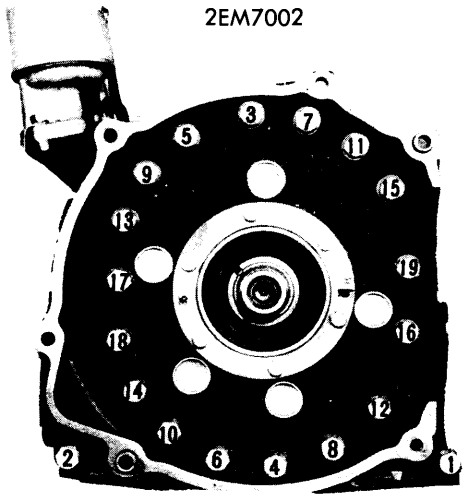
6) Mark rotor housings designating front and rear for reassembly. Rotate engine in stand until front of engine is facing up. Remove engine mounting bracket and engine front cover.

7) 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.

8) Remove nut securing sprocket to oil pump. Slide off oil pump drive sprocket and driven sprocket with chain. Remove key in eccentric shaft.

9) Slide off balance weight, thrust washer and needle bearing from shaft. remove bearing housing retaining bolts. Slide off bearing housing, needle bearing, spacer and thrust washer from eccentric shaft.

10) Loosen tension bolts in sequence shown in illustration. *NOTE — Do not remove bolts all at one time, slightly loosen bolts in sequence two or three times.*




**TENSION BOLT LOOSENING SEQUENCE**

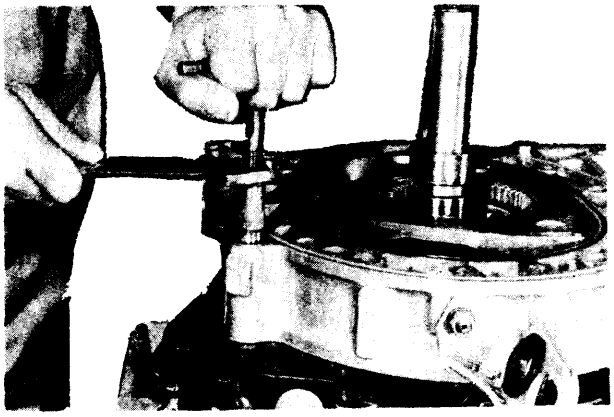
11) Remove front housing and check for any seals that might have stuck to rotor running surface. If any seals are found, reinstall in original position in rotor.

12) Remove three corner seals and springs, and six side seals and springs. Place seals in a suitable seal case (49 0813 250) in accordance with marks next to appropriate seal groove in rotor side face.

13) These marks are used to ensure that seals are installed in original grooves in rotor during installation. Remove sealing rubbers and "O" rings from front rotor housing.

14) Hold rotor housing down and withdraw tubular dowels using suitable extracting tool (49 0813 215). Remove front rotor housing. Remove "O" rings, sealing rubbers and air injection nozzles from front rotor housing.

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)



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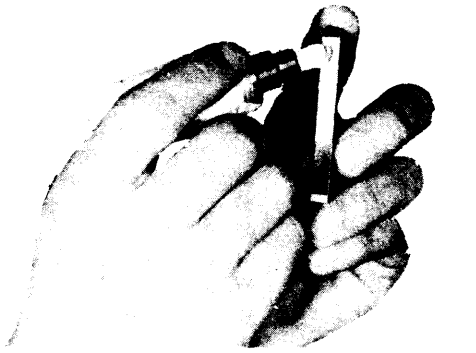
**EXTRACTING TUBULAR DOWELS**



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**IDENTIFYING APEX SEALS FOR REASSEMBLY**

15) Remove apex seals and springs. Place an identification mark on bottom of seal noting direction when installed. Place apex seal in seal case.

16) Remove front rotor from eccentric shaft. Remove seals from rear side of rotor and place in seal case. Hold intermediate housing down and withdraw tubular dowels as previously outlined.

17) Remove intermediate housing by sliding off of eccentric shaft. Pull eccentric shaft out of rear rotor and rotor housing. Remove rear rotor housing and rotor, following same procedure as outlined for front rotor housing and rotor.

**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) |
| 1972-73 RX2 & RX3 | 2.7551-.27559 (69.98-70.00) | .003 (.04) | 1.9646-1.9724 (49.90-50.10) | .002 (.04) | 3.1497-3.1504 (80.00-80.02) | .0051-.0067 (.13-.57) | .004-.006 (.10-.15) |

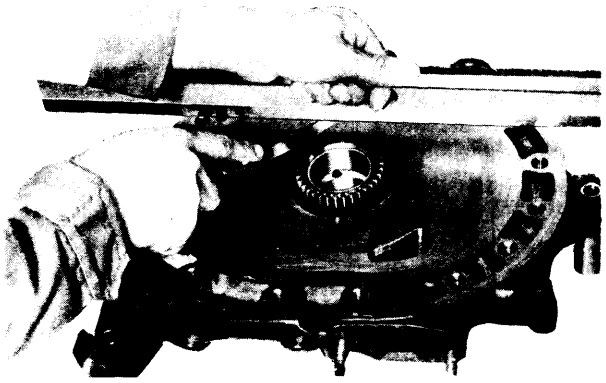
## INSPECTION & OVERHAUL

### 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 bearings for signs of scoring or flaking.

3) Place a straight edge across housing surface in positions shown in illustration. Using a feeler gauge measure distortion of front housing. Replace front housing if distortion exceeds .002".



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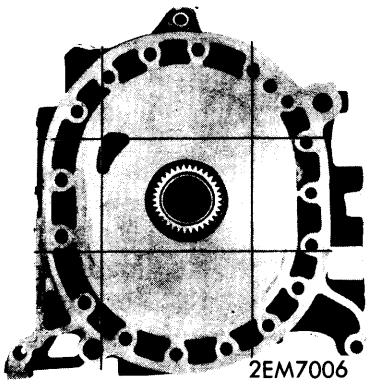
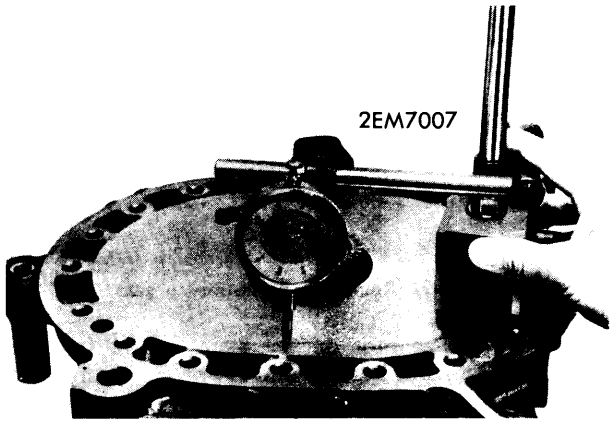
**CHECKING HOUSING DISTORTION**

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)




**STRAIGHT EDGE POSITIONS FOR CHECKING HOUSING DISTORTION**

4) Check rotor running surface over entire area with a dial indicator. If difference in all measurements exceeds .004", replace rotor housing.

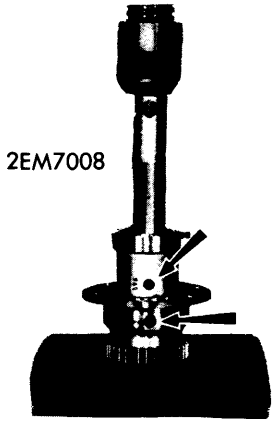



**CHECKING HOUSING WEAR**

5) Measure inner diameter of main bearing and outer diameter of bearing journal on eccentric shaft. If clearance exceeds .0039", main bearing must be replaced.

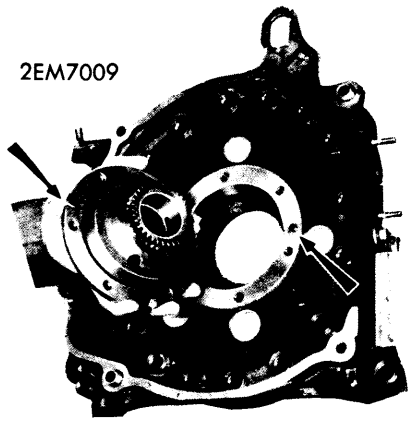
6) To replace main bearing, remove stationary gear retaining bolts. Drive stationary gear, with bearing, out of housing using a suitable mandrel (49 0813 235).

7) Place stationary gear in a press, use same mandrel and press main bearing out of stationary gear. Install new bearing, making sure oil hole in bearing aligns with hole in stationary gear.




**MAIN BEARING INSTALLATION & OIL HOLE ALIGNMENT**

8) 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.




**STATIONARY GEAR SLOT & DOWEL ALIGNMENT**

9) Stationary gears and rotor internal gears have matching letters stamped in each gear from factory. They have either an "A", "C" or no mark. If stationary gear is being replaced, replace with one that has no mark.

### 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 oultined in front housing procedure. Note the following additional procedures.

2) Stationary gear on rear housing has a rubber "O" ring installed next to flange. Remove stationary gear using same procedure as outlined in front housing procedure.

3) A new "O" ring must be installed whenever stationary gear is removed. Apply sealing agent to gear flange and lubricate "O" ring before installing.

4) Install stationary gear as outlined in front housing procedure. Take care not to damage "O" ring when installing. Tighten retaining bolts.

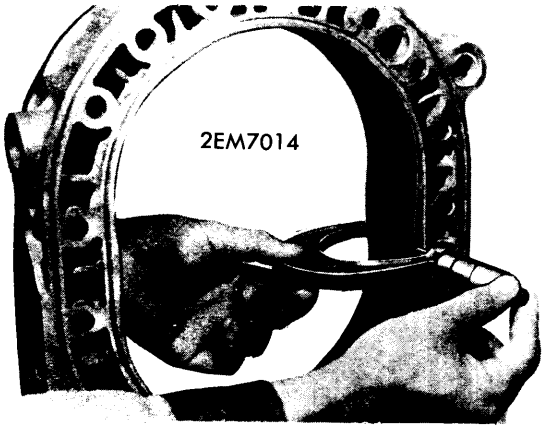
### ROTOR HOUSINGS

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.

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

3) Using a micrometer, measure rotor housing thickness at various points next to rotor running surface. Rotor housing must be replaced if measurements vary more than .0031" (.08 mm).




CHECKING ROTOR HOUSING WIDTH

### 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.

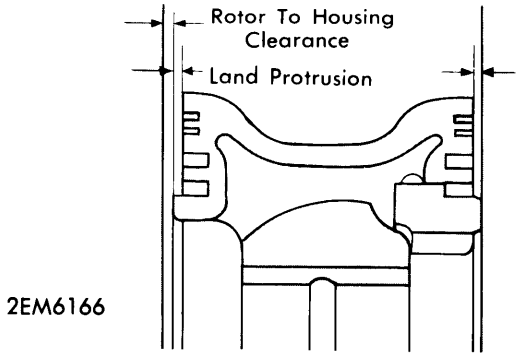
2) Combustion is correct if leading side area of rotor combustion area is brown and trailing side is a blackish color. Check side surface of rotor for signs of gas leakage.

3) Inspect oil seals and replace if necessary. *See Rotor Oil Seal Replacement.* Remove carbon from rotor with fine emery paper. Remove carbon from seal 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 and rotor housing. The difference is rotor-to-housing clearance. Rotor must be replaced if clearance is not within .0051-.0067". *See Rotor Replacement.*

6) Place a straight edge across rotor side running surface and measure rotor land protrusion with a feeler gauge. Rotor must be replaced if land protrusion is less than .004". *See Rotor Replacement.*




ROTOR SIDE CLEARANCE & LAND PROTRUSION MEASURING POINTS

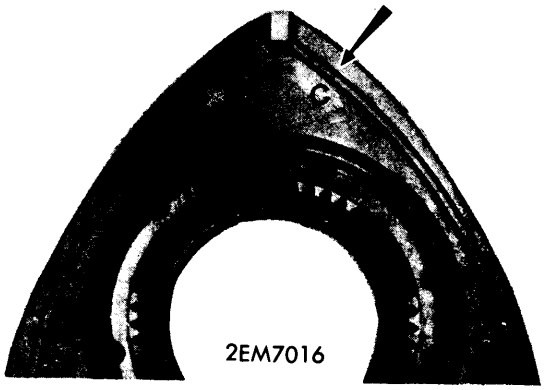
7) Measure inner diameter of rotor bearing and outside diameter of rotor bearing journal on eccentric shaft. Replace rotor bearing if clearance exceeds .0039". *See Rotor Bearing Replacement.*

### ROTOR REPLACEMENT

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

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

2) Letter designations are "a", "b", "c", "d" and "e". If rotor is being replaced, replace with one that has a "c" stamped in it.




ROTOR WEIGHT CLASSIFICATION

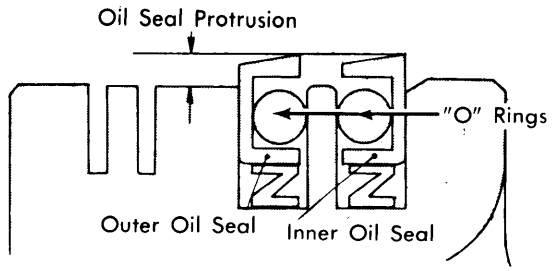
| OIL SEAL | | | | | | |
|---|---|---|---|---|---|---|
| Engine | Thickness In. (mm) | Width In. (mm) | Outside Diameter | | Seal Lip Contact Width | |
| | | | Outer Seal In. (mm) | Inner Seal In. (mm) | Standard In. (mm) | Limit In. (mm) |
| **1972-73①** RX2 & RX3 | .2165-.2244 (5.50-5.70) | .1288-.1347 (3.27-3.42) | 4.9568-4.9591 (125.90-125.96) | 4.5635-4.5658 (115.91-115.97) | .008 (.20) | .031 (.80) |
| **1973②** RX2 & RX3 | .2165-.2244 (5.50-5.70) | .1240-.1319 (3.15-3.35) | 4.9529-4.9552 (125.80-125.86) | 4.5596-4.5619 (115.81-115.87) | .008 (.20) | .031 (.80) |

① – Engines produced to 5-1-73.
② – Engines produced from 5-1-73.

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

### ROTOR OIL SEAL REPLACEMENT

1) With oil seal 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".

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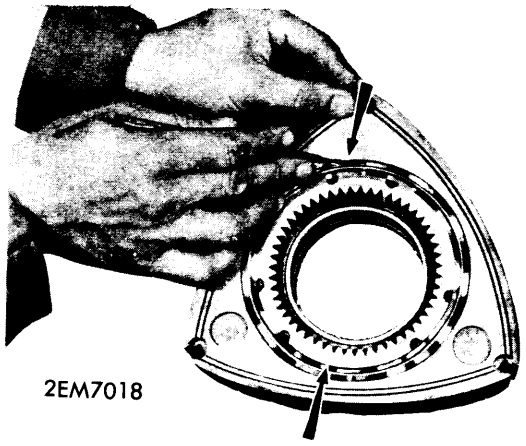
OIL SEAL PROTRUSION MEASURING POINT

2) To remove oil seal, insert a suitable seal removing tool (490813 225) in slots in rotor and pry out old seal. Take care not to damage rotor grooves.

3) Thoroughly clean rotor seal grooves. Install oil seal springs in rotor grooves with ends up and spring end gaps 180° apart.

4) Install new "O" rings in seals and lubricate seal and seal grooves with oil. Position seal in groove with white mark on seal down. To install seal, push into groove slowly and evenly to prevent deforming oil seal.



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ROTOR OIL SEAL SPRING END GAP POSITION

| OIL SEAL SPRINGS | | | |
|---|---|---|---|
| Engine & Spring | Free Length In. (mm) | Installed Height In. (mm) | Installed Pressure (Lbs.) In. (mm) |
| **1972-73①** RX2 & RX3 | | | |
| Inner | .106 (2.70) | .039 (1.00) | 28.7-35.3 (13.0-16.0) |
| Outer | .102 (2.60) | .039 (1.00) | 28.7-35.3 (13.0-16.0) |
| **1973②** RX2 & RX3 | | | |
| Inner | .1023-.1063 (2.60-2.70) | .039 (1.00) | 26.5-28.7 (12.5-13.0) |
| Outer | .0984-.1023 (2.50-2.60) | .039 (1.00) | 26.5-28.7 (12.5-13.0) |

① — Engines produced to 5-1-73.
② — Engines produced from 5-1-73.

### ROTOR BEARING REPLACEMENT

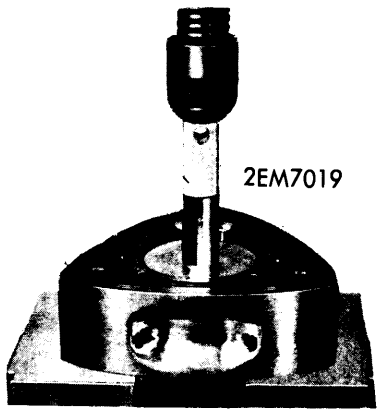
1) Install a suitable bearing expander (49 0813 245) in bearing. Drill a .140" hole approximately .280" deep in bearing lock screw. Remove bearing expander.

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.

3) Install 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 left or right of original hole. Center of hole should be .020" from edge of bearing bore.

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



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ROTOR BEARING REMOVAL

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

| 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) |
| 1972-73 RX2 & RX3 | 2.7528-2.7536① (69.94-69.96)① | .2337-.2344 (5.94-5.95) | .3898-.3937 (10.00-10.10) | .0020-.0028② (.05-.07)② | .0059 (.15) | .0014-.0028 (.04-.07) | .004 (.10) |

① — Seal length is 2.7537-2.7547" (69.97-69.99 mm) in vehicles built for cold weather areas.
② — Clearance is .0004-.0020" (.01-.05 mm) in vehicles built for cold weather areas.

### APEX SEAL

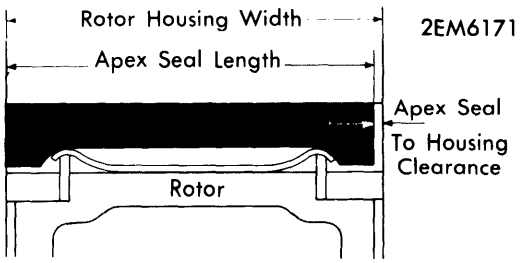
1) Use a carbon remover to remove carbon deposits from apex seal sides. Take care not to damage or scratch apex seal sides. Clean seals in a suitable cleaning solution.

*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 .3937", apex seal must be replaced.

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

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



APEX SEAL TO HOUSING CLEARANCE

| APEX SEAL SPRINGS | | | |
|---|---|---|---|
| Engine & Spring | Free Length In. (mm) | Installed Height In. (mm) | Installed Pressure (Lbs.) In. (mm) |
| 1972-73 RX2 & RX3 | .228 (5.80) | .079 (2.00) | 5.7±.04 Lbs. (2.6±.02 kg) |

| 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) |
| 1972-73 RX2 & RX3 | .0379-.0388 (.96-.99) | .1339-.1378 (3.50-3.60) | .001-.003 (.03-.08) | .004 (.10) | .002-.006 (.05-.15) | .016 (.40) |

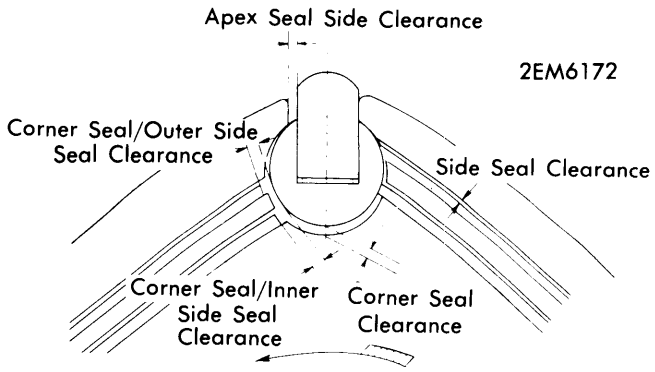
### SIDE SEAL

With side seals installed in rotor, measure side clearance with a feeler gauge. If clearance exceeds .0039", replace side seals. See *Seal Installation*.

| SIDE SEAL SPRINGS | | | |
|---|---|---|---|
| Engine & Spring | Free Length In. (mm) | Installed Height In. (mm) | Installed Pressure (Lbs.) In. (mm) |
| 1972-73 RX2 & RX3 | .075 (1.90) | .039 (1.00) | 8.8±.22 Lbs. (4.0±.10 kg) |

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

| 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) |
| 1972-73 RX2 & RX3 | .4319-.4323 (10.97-10.98) | .2677-.2756 (7.00-7.20) | .0008-.0019 (.02-.05) | .0031 (.08) | .002-.006 (.05-.15) | .016 (.40) |




**VARIOUS SEAL CLEARANCE MEASURING POINTS**

### CORNER SEAL

1) Measure clearance between corner seal and bore in rotor (see illustration). Use a suitable gauge (Bar Limit Gauge No. 49 0839 165).

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 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 corner-to-side seal 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) |
| 1972-73 RX2 & RX3 | .098 (2.50) | .039 (1.00) | 2.9±.07 Lbs. (1.3±.07 kg) |

### ROTOR CORNER SEAL REBORING

1) Remove all carbon deposits from rotor side surface and apex seal groove. Position a suitable jig (2113 99 900) in rotor and tighten bar. Do not over tighten bar as it will damage rotor bearing and apex seal groove.

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.

| 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) |
| 1972-73 RX2 & RX3 | 1.6917-1.6935 (42.97-43.01) | .0016-.0028 (.04-.07) | .0016-.0028 (.04-.07) | 2.9122-2.9128 (74.03-74.07) | .0016-.0031 (.04-.08) |

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (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 of shaft by rotating slowly. If runout exceeds .0008", replace eccentric 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 two new "O" rings. Tighten plug.

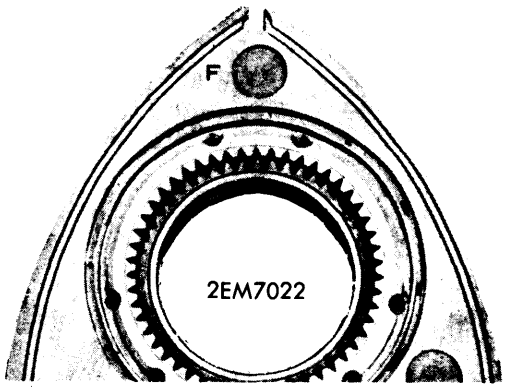
5) Inspect needle bearings in end of shaft for wear or damage. Insert a pilot shaft in needle bearings and check for excessive side clearance and for binding during rotation.

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

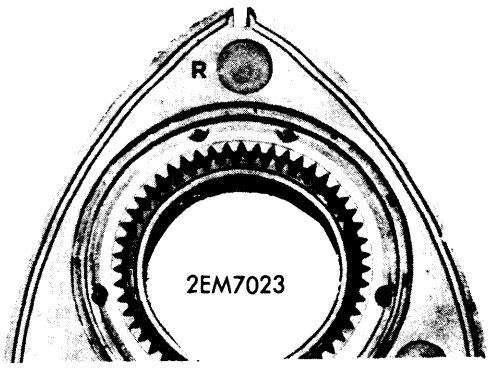
## ENGINE ASSEMBLY

### SEAL INSTALLATION

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




FRONT ROTOR IDENTIFICATION MARK




REAR ROTOR IDENTIFICATION MARK

2) Noting identification marks made during disassembly, install apex seals in grooves without springs. Lubricate corner 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.*

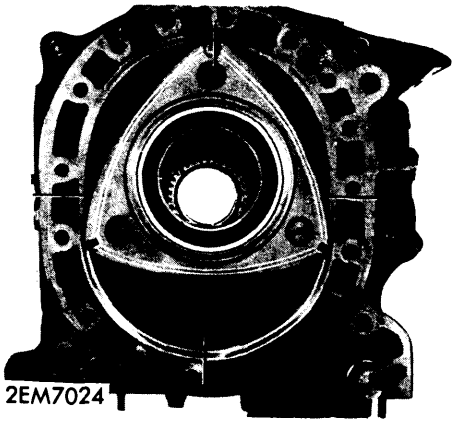
3) Install side seal springs with ends facing upward. Lubricate grooves with oil and install side seals. Install side seals correctly, depending on whether seals are installed in front or rear side of rotor.

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

4) Apply motor oil to all seals and internal gear. Make sure all seals will move in grooves.

### ENGINE ASSEMBLY

1) Mount rear housing in engine stand with rotor running surface up. Install rotor, making sure seals do not fall out. Make sure gears mesh and position rotor apexes in any one of four positions shown in illustration.




ROTOR APEX POSITIONING FOR REASSEMBLY

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

2) Remove apex seals and place on rotor close to their respective grooves. Lubricate rear rotor and main bearing journal of eccentric shaft. Install eccentric shaft, taking care not to damage bearings.

3) Install air injection nozzles in rear rotor housing. Apply sealer to rear side of rotor housing, making sure sealer does not enter water or oil passages. Install new "O" rings and sealing rubbers on rear side of rotor housing.

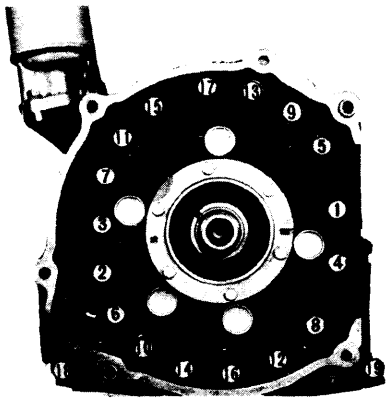
4) Install rear rotor housing over rear rotor in position against rear housing. Lubricate tubular dowels and install in rotor housing and rear housing. Install apex seals and springs in correct grooves in rotor.

5) Install corner and side seals as previously outlined in front side of rear rotor. *See Seal Installation.* Lubricate rotor running surface and seals. Apply sealing agent to front side of rear rotor housing.

6) Install new "O" rings and sealing rubbers on rear rotor housing. Install intermediate housing over eccentric shaft and against rear rotor housing. Install front rotor and rotor housing using same procedure given for installation of rear rotor and housing.

7) Lubricate stationary gear and front main bearing of front housing. Install "O" rings and sealing rubbers to front housing as previously outlined. Place front housing over shaft and against front rotor housing. Turn shaft to mesh gears if necessary.

8) Install tension bolts and screws in two or three turns. Tighten tension bolts to specifications in sequence shown in illustration. Rotate eccentric shaft to insure that engine rotates freely.



2EM7025

**TENSION BOLT TIGHTENING SEQUENCE**

### FLYWHEEL INSTALLATION

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

2) Secure flywheel with a suitable holding tool (49 0820 060A) and tighten flywheel nut to specification. Secure nut by bending tab over on lock washer.

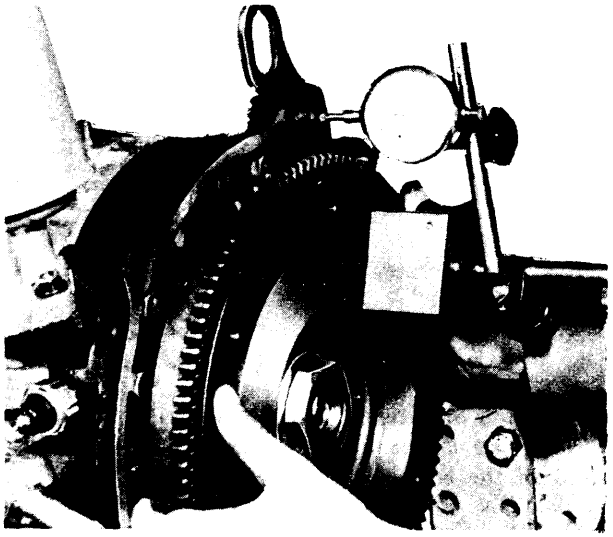
### ECCENTRIC SHAFT ENDTHRUST ADJUSTMENT

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, spacer and oil slinger on eccentric shaft. Install eccentric shaft pulley on shaft and tighten nut to specification.

4) Attach a dial indicator on flywheel and measure back and forth movement of crankshaft. If endplay is not within .0016-.0018", spacer will have to have a small portion removed or an oversize spacer installed.



2EM7026

**CHECKING ECCENTRIC SHAFT ENDPLAY**

5) Thickness of oversize spacers is designated by a letter code. Letter is stamped in side of spacer. With a suitable spacer installed recheck endplay.

**Spacer Size Designation**

| Letter code | Thickness |
|---|---|
| X | .3181±.0001" |
| Y | .3166±.0001" |
| V | .3158±.0001" |
| Z | .3150±.0001" |

6) If endplay is within specifications, remove eccentric shaft pulley and install front engine cover. *See Front Cover and Oil Pan Installation.*

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

### FRONT COVER & OIL PAN INSTALLATION

1) Tighten nut on oil pump drive sprocket and secure by bending over lock tab. Install a new "O" ring in oil passage in front cover.

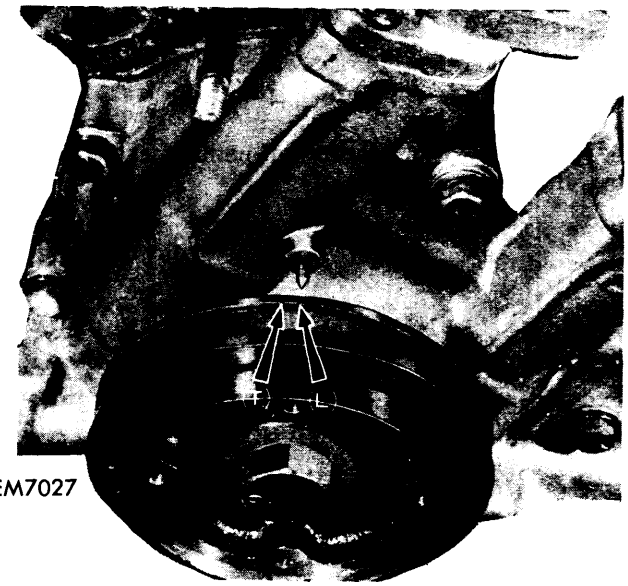
2) Install oil pump drive chain adjuster and tighten retaining nuts. Place front engine cover and gasket on front housing and tighten retaining bolts.

3) Apply oil to sealing lip of front cover oil seal. Install eccentric shaft pulley and tighten bolt to specification. Cut excess front cover gasket off of oil pan mating surface.

4) Install oil pickup gasket and oil pickup on front cover and tighten bolts. Apply sealer to oil pan and engine mating surfaces. Install gasket and oil pan on engine and tighten bolts to specifications.

### DISTRIBUTOR INSTALLATION

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

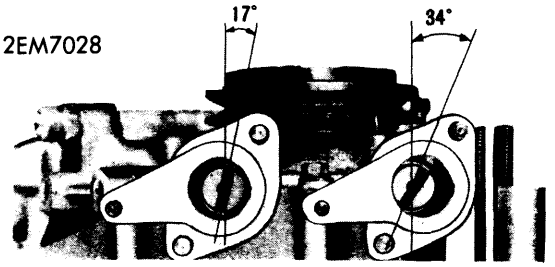


2EM7027

**POSITIONING ENGINE AT TDC**

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

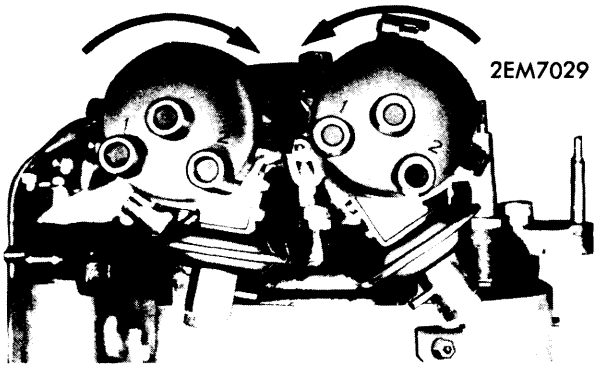
3) Install socket for leading distributor through gasket in front cover position so that groove on upper side of drive shaft is 17° to right side of center line of engine (see illustration).




2EM7028

**DISTRIBUTOR SOCKET INSTALLATION**

4) Align identification marks on distributor housing and gear, noting whether it is trailing or leading distributor. Insert distributors into sockets aligning drive shaft end with groove in drive shaft.



2EM7029

**DISTRIBUTOR ROTATION DIRECTION**

5) With distributors installed, rotate in correct direction (see illustration) until contact points just start to open. Tighten distributor lock nut and install distributor caps. Install remaining engine components by reversing removal order.

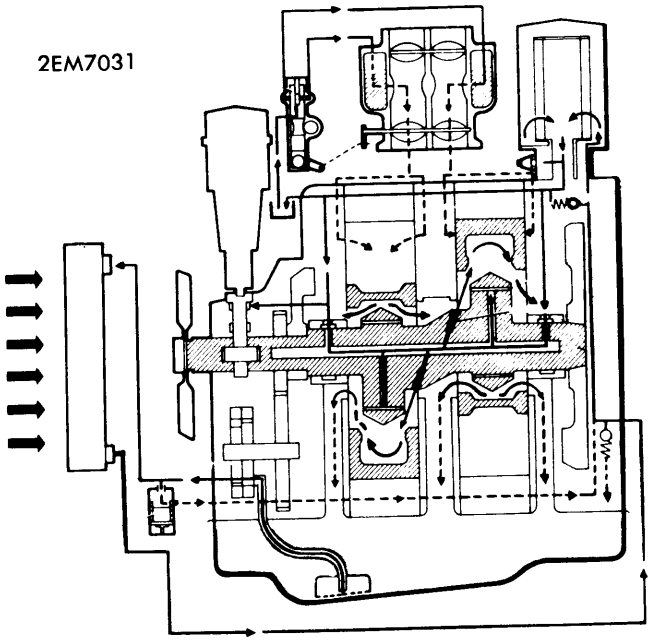
| PORT TIMING | | | | |
|---|---|---|---|---|
| | INTAKE | | EXHAUST | |
| Engine | Open (ATDC) | Close (ABDC) | Open (BBDC) | Close (ATDC) |
| 1972-73 RX2 & RX3 | 32° | 40° | 71° | 48.5° |

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

### 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 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

**Crankcase Capacity** – 4.5 qts.

**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.

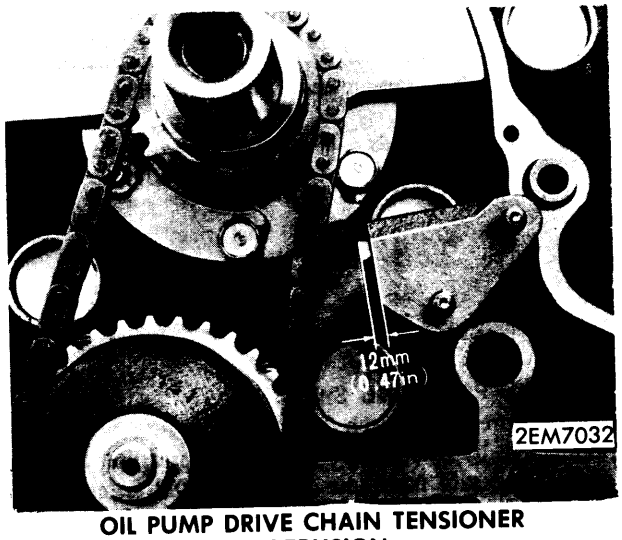
**Pressure Regulator Valve** – Mounted in rear housing, valve regulates oil pressure at high RPM. Valve opens to release oil pressure. If oil pressure is less than normal, check regulator valve piston for wear and check spring free length. *See Oil Pump Specifications.* Replace as necessary.

#### OIL PUMP

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

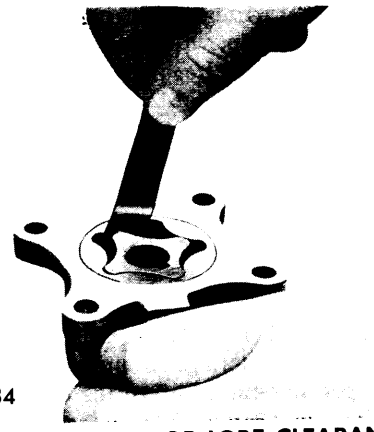
1) With front engine cover removed, check protrusion of chain adjuster. If adjuster protrudes more than .47", replace chain or adjuster.

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 TENSIONER PROTRUSION

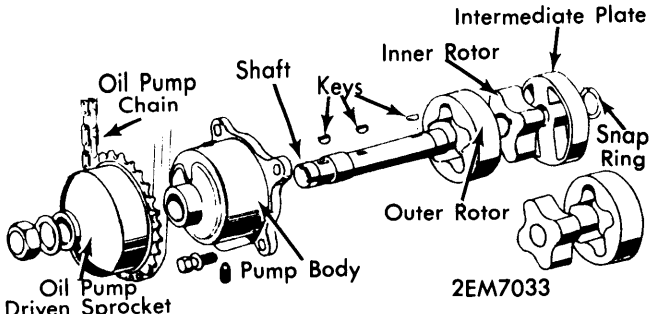
3) Insert a feeler gauge between lobes of rotors (see illustration) and check clearance. If clearance exceeds .006", replace both rotors.




CHECKING ROTOR LOBE CLEARANCE

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

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




OIL PUMP COMPONENTS

## 1972-73 RX2 & RX3 ROTARY PISTON ENGINE (Cont.)

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" |
| Pressure Regulator Spring | |
| Free Length | 1.827" |
| Installed Length | 1.390" |
| Load Installed | 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) To check oil metering pump, disconnect oil lines at carburetor. Start engine and adjust idle to 2000 RPM. Pump should discharge 2.4-2.9 cc in six minutes.

4) Amount of oil pumped to carburetor can be adjusted by turning adjustment screw counterclockwise to decrease amount or clockwise to increase amount.

5) At ends of pump actuating rod there are three holes that will vary amount pumped. First hole closest to stop will allow 248 cc @ 6000 RPM in one hour. Second hole will allow 174 cc @ 6000 RPM in one hour. Third hole will allow 104 cc @ 6000 RPM in one hour.

## ENGINE COOLING

### WATER PUMP

1) Drain cooling system and remove air cleaner. Remove drive belt and pulley with fan from water pump.

2) Remove bolts securing pump to front cover and remove pump. Separate pump from pump housing. To install, reverse removal procedure.

**Thermostat** – Starts opening at 180°F and is fully open at 203°F.

**Cooling System Capacity** – 8.5 qts. with heater. 7.5 qts. without heater.

### TIGHTENING SPECIFICATIONS

| Application | Ft. Lbs. (mkg) |
|---|---|
| Tension Bolts | 22 (3.0) |
| Flywheel Nut | 350 (48.4) |
| Eccentric Shaft Pulley | 45 (6.2) |
| Oil Pan Bolts | 7 (1.0) |
| Front Cover | 15 (2.1) |
| Bearing Housing | 15 (2.1) |
| Rear Stationary Gear | 15 (2.1) |
| Oil Pump | 5 (.07) |
| Oil Pump Drive Sprocket Nut | 25 (3.5) |
| Water Pump | 15 (2.1) |
| Intake Manifold | 15 (2.1) |
| Exhaust Manifold | 30 (4.1) |

### 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"±.004" (.5 mm ± .1 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.