

MAZDA RX-4

WORKSHOP MANUAL

ENGINE

circle render

ENGINE

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1. Cooling fan
2. Water pump body
3. Water pump pulley
4. Cooling fan drive
5. Eccentric shaft pulley
6. Eccentric shaft pulley
7. Key
8. Eccentric shaft pulley bolt
9. Eccentric shaft front oil seal
10. Eccentric shaft pulley boss
11. Oil thrower
12. Distributor drive gear
13. Front cover
14. Oil pump driven sprocket
15. Oil pump body
16. Thermostat cover
17. Thermostat
18. Water thermo switch (for air conditioner)
19. Water thermo switch (for choke control)
20. Front housing
21. Thrust washer
22. Needle bearing
23. Thrust plate
24. Spacer
25. Oil filter
26. Intermediate housing
27. Oil filter cover
28. Rear rotor housing
29. Rear housing
30. Apex seal
31. Rear rotor
32. Oil seal (outer)
33. Oil seal (inner)
34. Rear rotor bearing
35. Rear main bearing
36. Flywheel lock nut
37. Key
38. Needle bearing
39. Eccentric shaft
40. Eccentric shaft rear oil seal
41. Oil jet
42. Sealing washer
43. Tension bolt

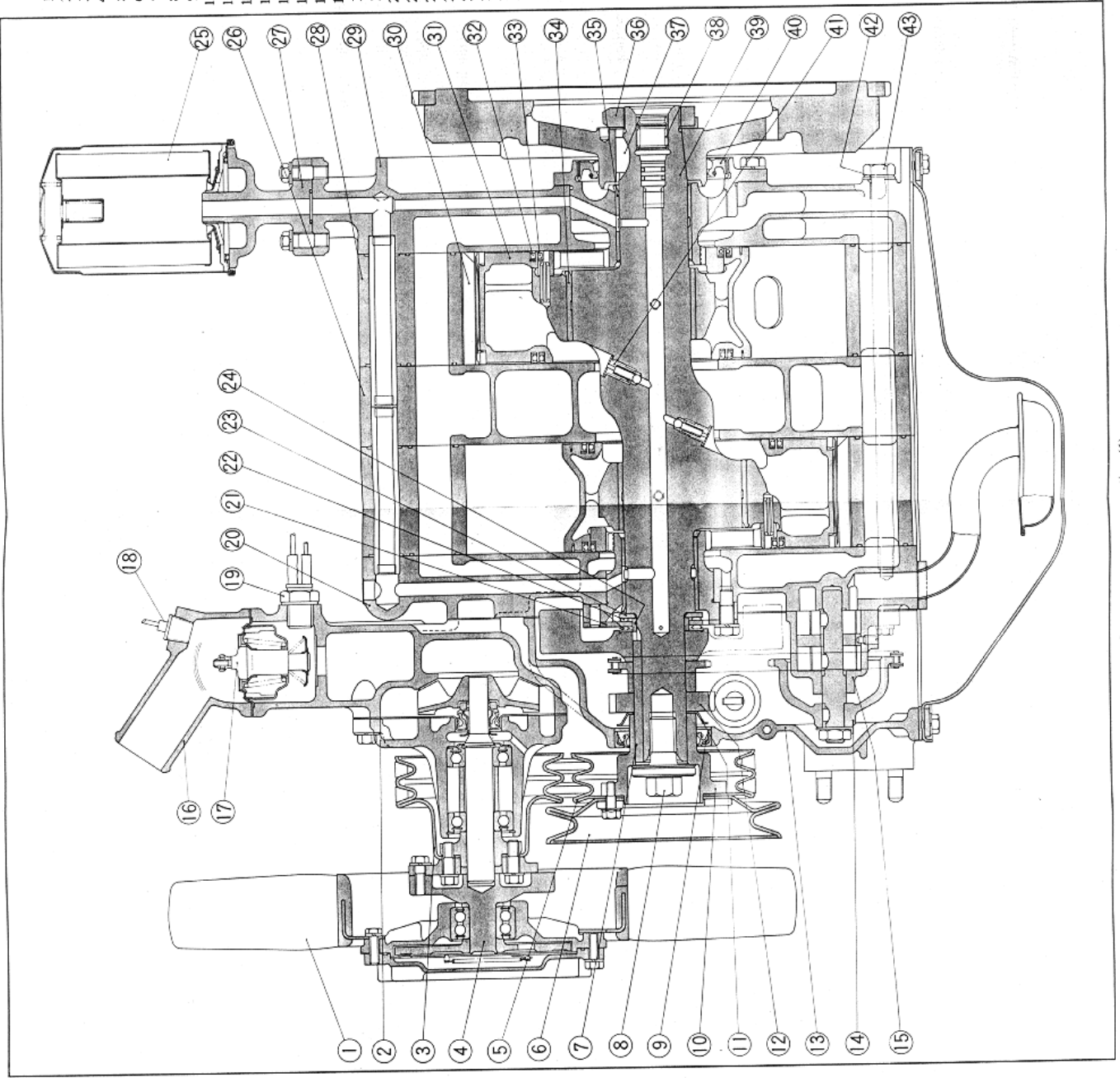


Fig. 1-1 Engine cross section (1)

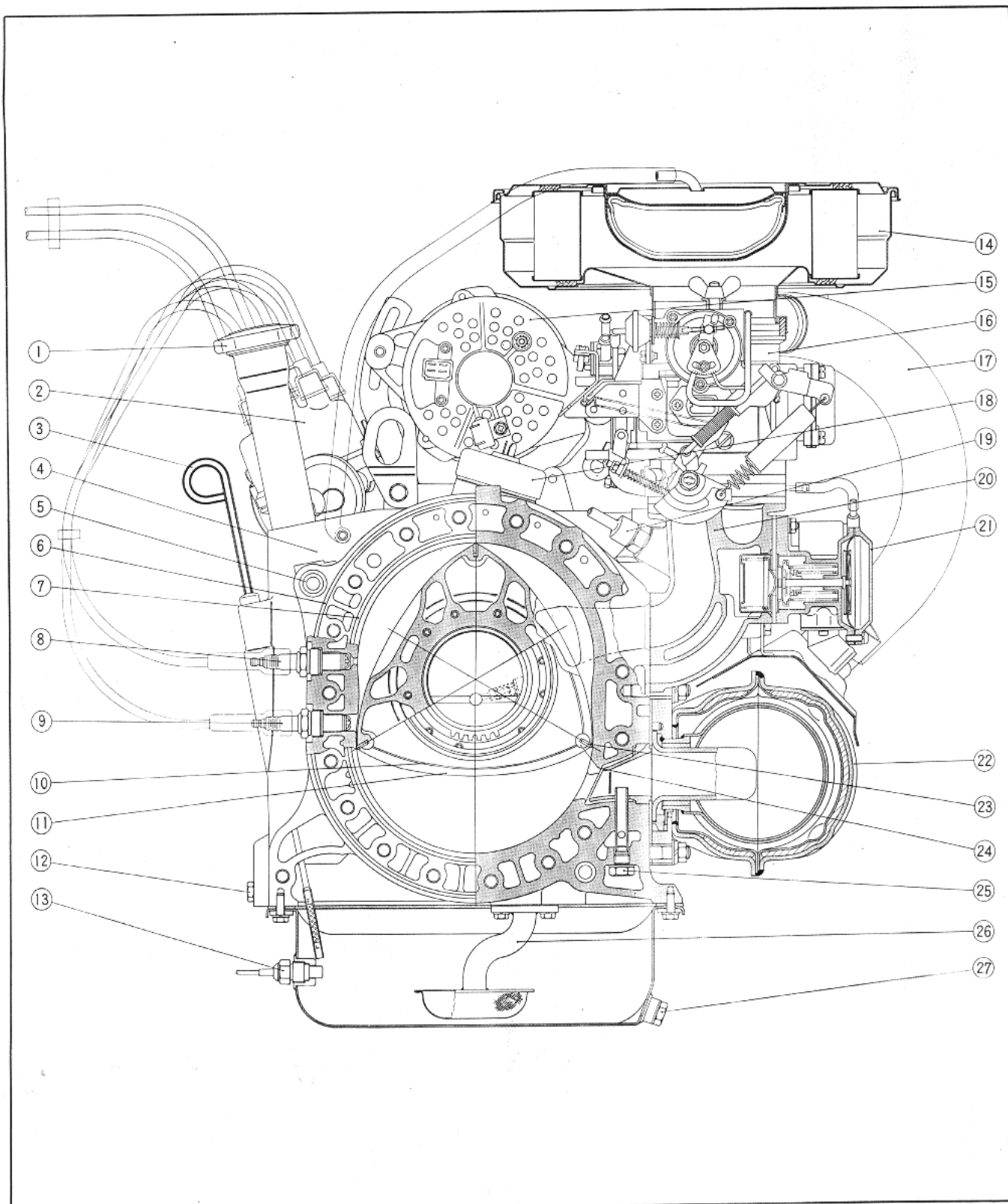


Fig. 1-2 Engine cross section (2)

- | | | |
|---------------------------|-------------------------|--------------------------|
| 1. Oil feller cap | 10. Side seal | 19. P.C.V. valve |
| 2. Distributor | 11. Rotor | 20. Intake manifold |
| 3. Dipstick gauge | 12. Coolant drain plug | 21. Air control valve |
| 4. Rotor housing | 13. Oil warning switch | 22. Thermal reactor |
| 5. Tubular dowel | 14. Air cleaner | 23. Apex seal |
| 6. Sealing rubber (outer) | 15. Alternator | 24. Corner seal |
| 7. Sealing rubber (inner) | 16. Carburetor | 25. Air injection nozzle |
| 8. Trailing spark plug | 17. Hot air hose | 26. Oil strainer |
| 9. Leading spark plug | 18. Water thermo sensor | 27. Oil drain plug |

1-B. ENGINE DISASSEMBLY

Disassemble the engine following the order numbered in Figs. 1-1, 1-2, 1-7 and 1-13.

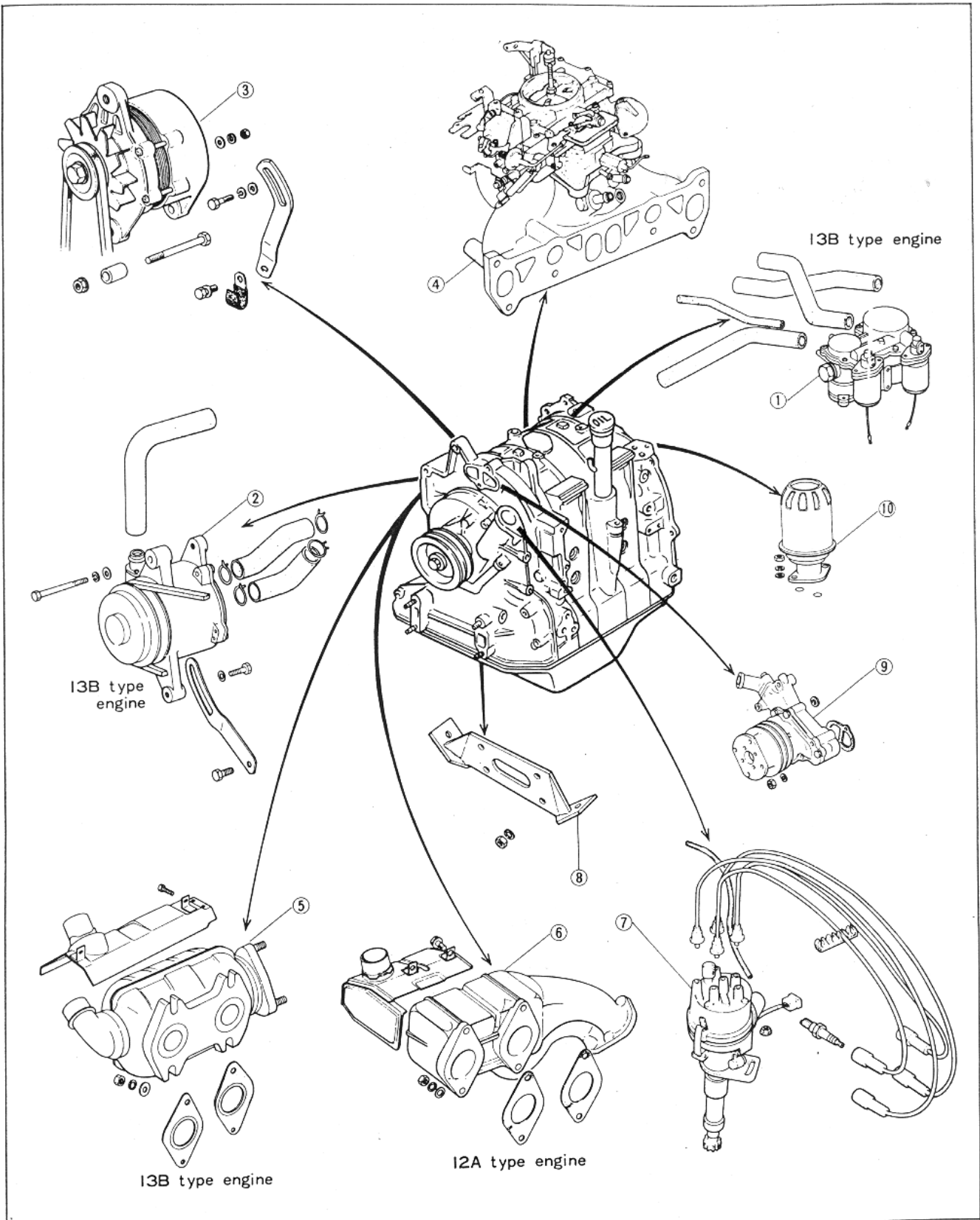


Fig. 1-1

- 1. Deceleration control valve
- 2. Air pump and V belt
- 3. Alternator and V belt

- 4. Inlet manifold and carburetor assembly
- 5. Thermal reactor
- 6. Exhaust manifold

- 7. Distributor
- 8. Engine mount
- 9. Water pump
- 10. Oil filter and cover

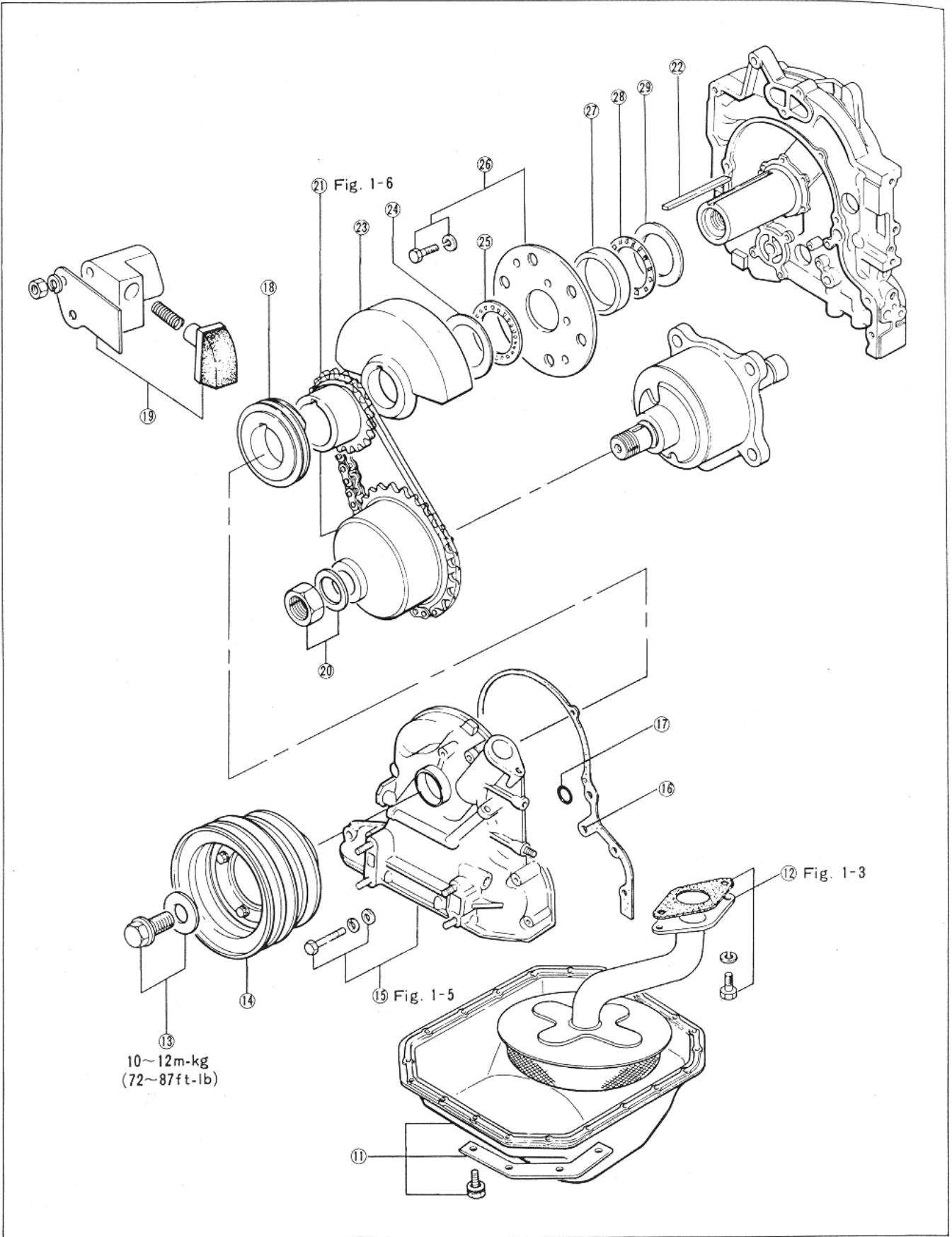


Fig. 1-2

- | | | | |
|-----------------------------|----------------------------|-------------------------|---------------------|
| 11. Oil pan and gasket | 16. Gasket | 21. Chain and sprockets | 26. Bearing housing |
| 12. Oil strainer and gasket | 17. "O" ring | 22. Key | 27. Spacer |
| 13. Bolt and washer | 18. Distributor drive gear | 23. Balance weight | 28. Bearing |
| 14. Eccentric shaft pulley | 19. Chain adjuster | 24. Thrust washer | 29. Thrust washer |
| 15. Front cover and bolt | 20. Nut and lock washer | 25. Bearing | |

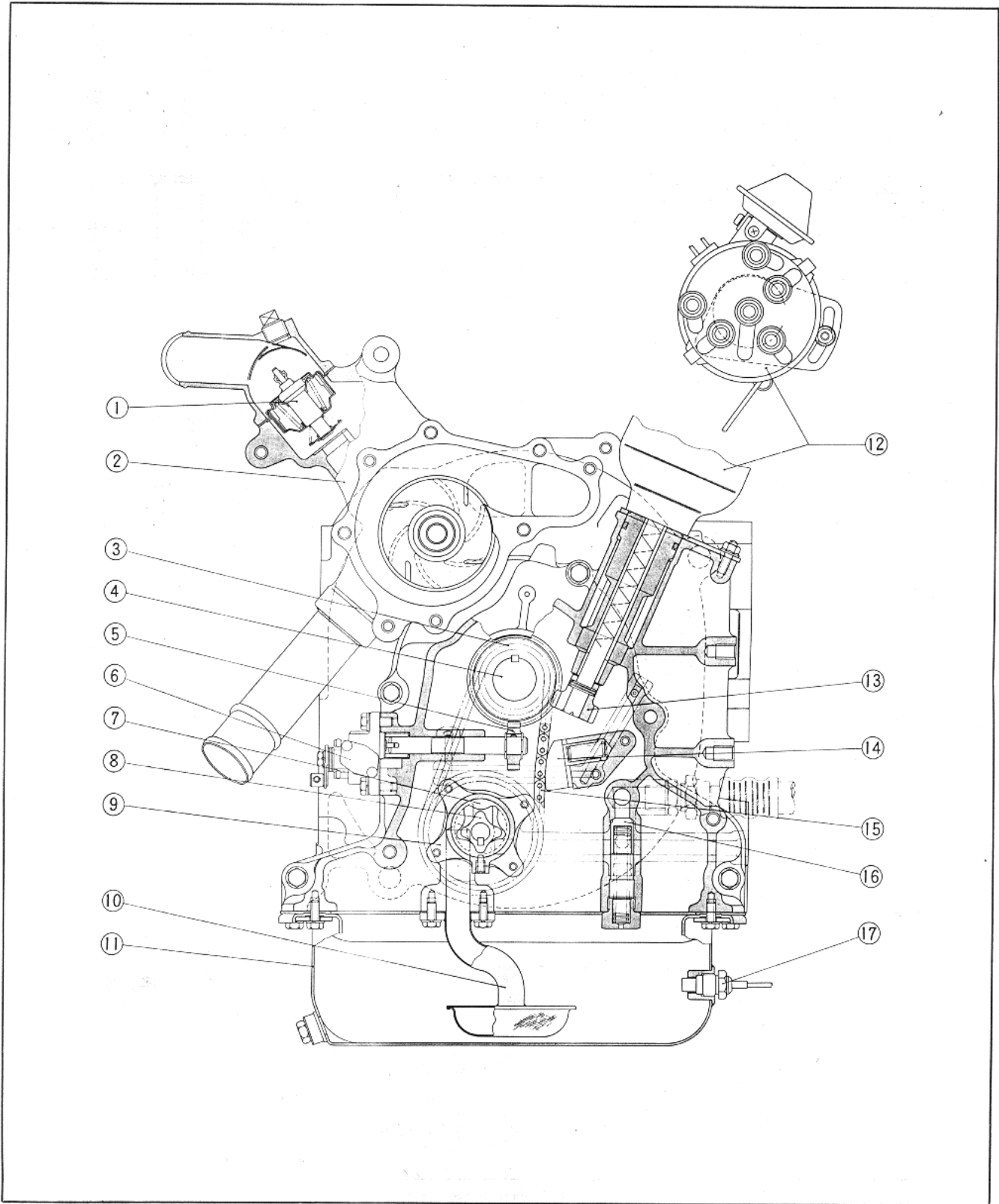


Fig. 1-3 Engine cross section (3)

- | | | |
|-----------------------------|------------------------|-----------------------------|
| 1. Thermostat | 7. Oil pump outer gear | 13. Distributor driven gear |
| 2. Water pump casing | 8. Oil pump inner gear | 14. Oil pump chain adjuster |
| 3. Distributor drive gear | 9. Oil pump body | 15. Oil pump chain |
| 4. Eccentric shaft | 10. Oil strainer | 16. Pressure control valve |
| 5. Metering pump drive gear | 11. Oil pan | 17. Oil warning switch |
| 6. Metering pump | 12. Distributor | |

1-A. ENGINE DISASSEMBLY

Engine disassembly should be done in the following order after removing the engine from the vehicle.

Note: When overhauling a rotary engine, the former method of mounting the engine on to the work stand was to support the rear housing. Henceforth, on this occasion when the '74 year-type of rotary engine is being introduced, we have adopted the method of supporting the front housing by using the **New Hanger** (49 1114 005) for the purpose of facilitating the working procedure. The new hanger can be used for any type of engine now in service.

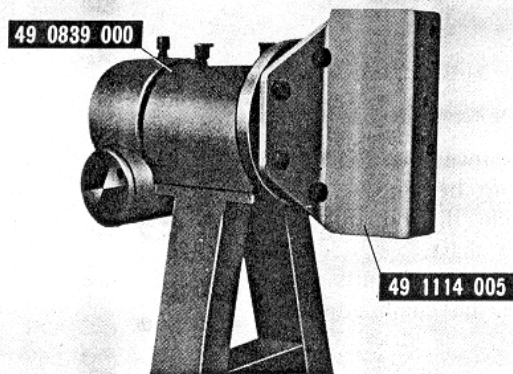


Fig. 1-4 Engine work stand

1. Remove the oil hose support bracket from the front housing.
2. Mount the engine on the **engine work stand** (49 0839 000) with the **hanger** (49 1114 005).
3. Remove the engine hanger bracket from the front cover.
4. Disconnect the vacuum hoses, air hoses and wires, then remove the deceleration valve if equipped.
5. Remove the air pump attaching bolts and bar, and remove the air pump if equipped and the V-belt.
6. Remove the alternator attaching bolts, and remove the alternator and V-belt.
7. Disconnect the metering oil pump connecting rod, oil tubes and vacuum sensing tube from the carburetor.
8. Remove the intake manifold attaching nuts, and remove the carburetor and intake manifold assembly.

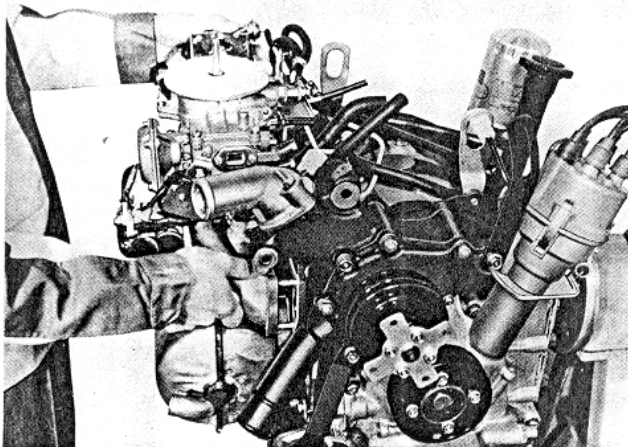


Fig. 1-5 Removing intake manifold ass'y

Then remove the gasket and two rubber rings.

9. Remove the thermal reactor (or exhaust manifold) attaching nuts and remove it with gaskets.

10. Remove the distributor securing nut and pull it out from the front cover.

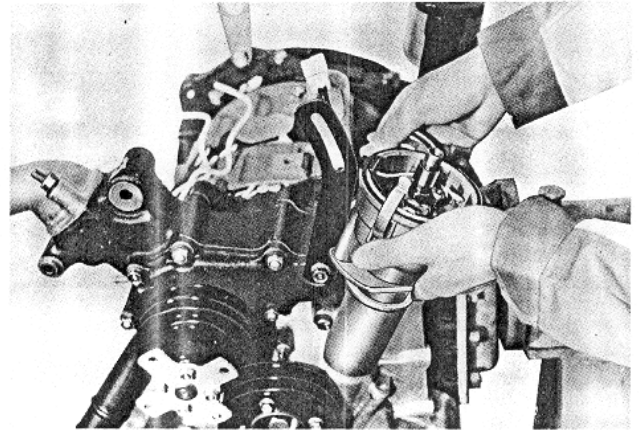


Fig. 1-6 Removing distributor

11. Remove the water pump attaching bolts, and remove the pump and gasket.

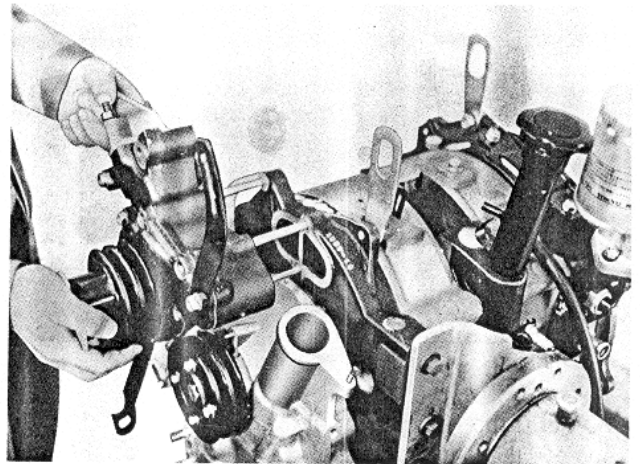


Fig. 1-7 Removing water pump

12. Invert the engine on the work stand.
13. Remove the bolts attaching the oil pan, and remove the oil pan and gasket.

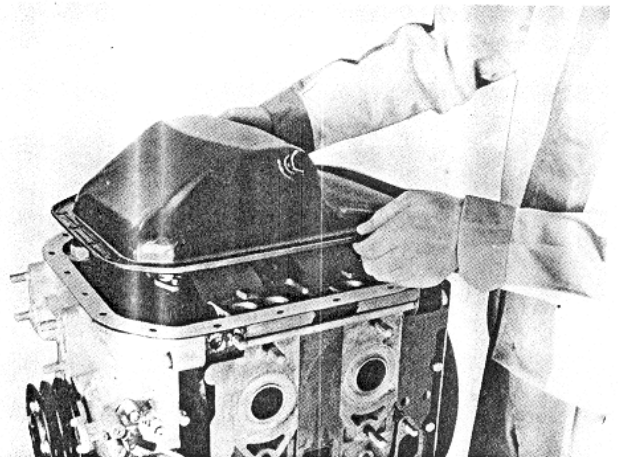


Fig. 1-8 Removing oil pan

14. Remove the bolts attaching the oil strainer, and remove the oil strainer and gasket.

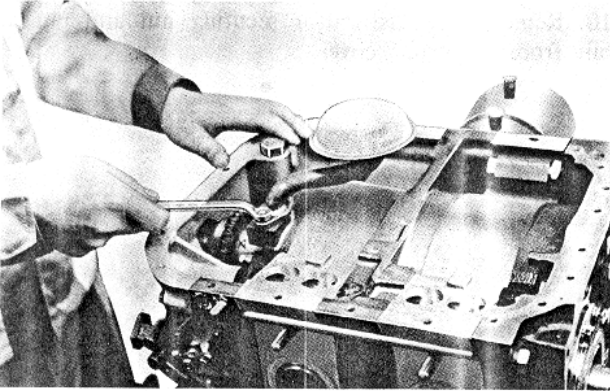


Fig. 1-9 Removing oil strainer

15. Apply identification marks onto the front rotor housing and rear rotor housing, which are common parts, so that they will be as they were when re-assembling the engine.

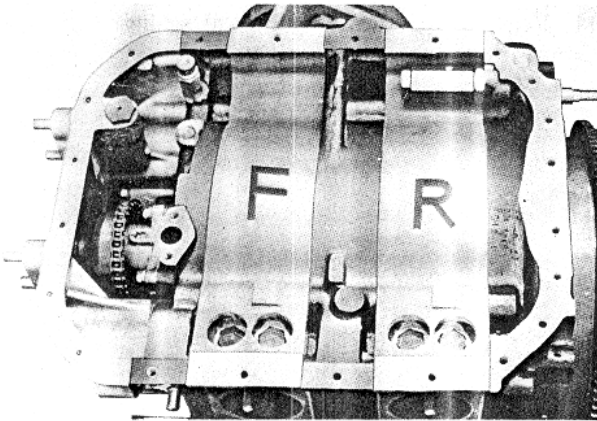


Fig. 1-10 Putting identification marks

16. Turn the engine on the work stand so that the top of the engine is up. Then remove the nuts attaching the engine mounting bracket to the front cover and remove the mounting bracket.

17. Attach the **ring gear brake** (49 1881 060) to the flywheel or drive plate.

18. Remove the eccentric shaft pulley bolt and remove the pulley.

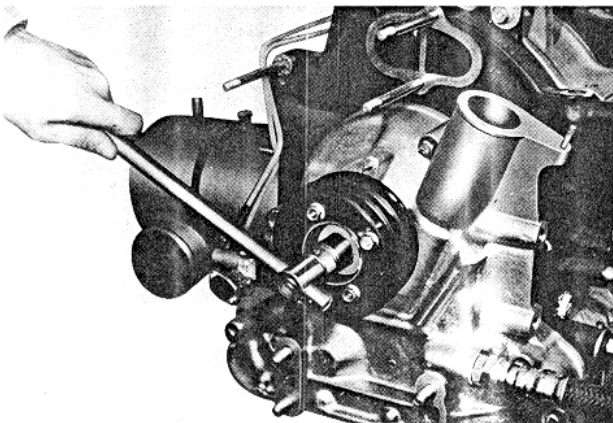


Fig. 1-11 Removing eccentric shaft pulley

19. Turn the engine on the work stand so that the front end of the engine is up.

20. Remove the front cover attaching bolts, and remove the front cover and gasket.

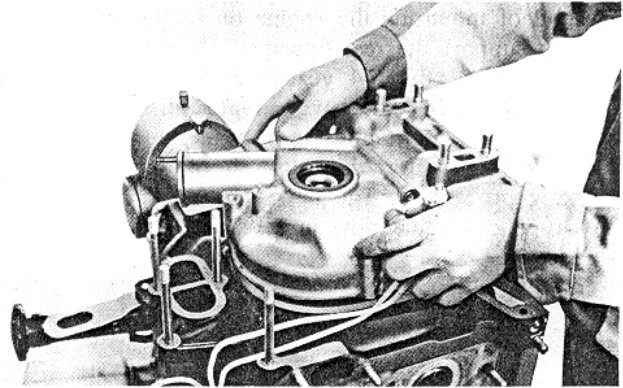


Fig. 1-12 Removing front cover

21. Remove the "O" ring from the oil passage on the front housing.

22. Slide the oil thrower and distributor drive gear off the shaft.

23. Remove the nuts attaching the chain adjuster and remove the chain adjuster.

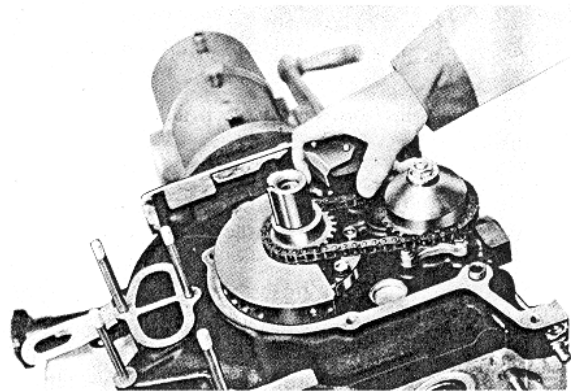


Fig. 1-13 Removing chain adjuster

24. Remove the lock nut and washer for the oil pump driven sprocket.

25. Slide the oil pump drive sprocket and driven sprocket together with the drive chain off the eccentric shaft and oil pump shaft simultaneously.

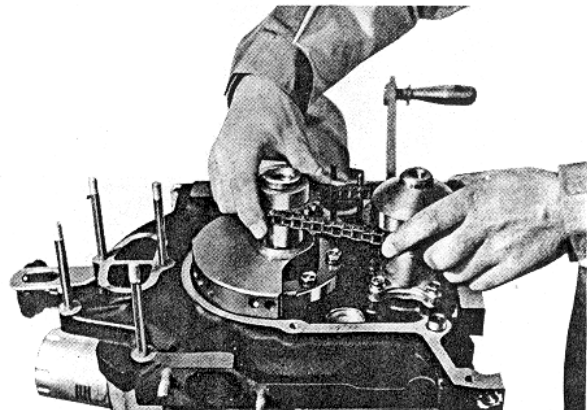


Fig. 1-14 Removing chain and sprockets

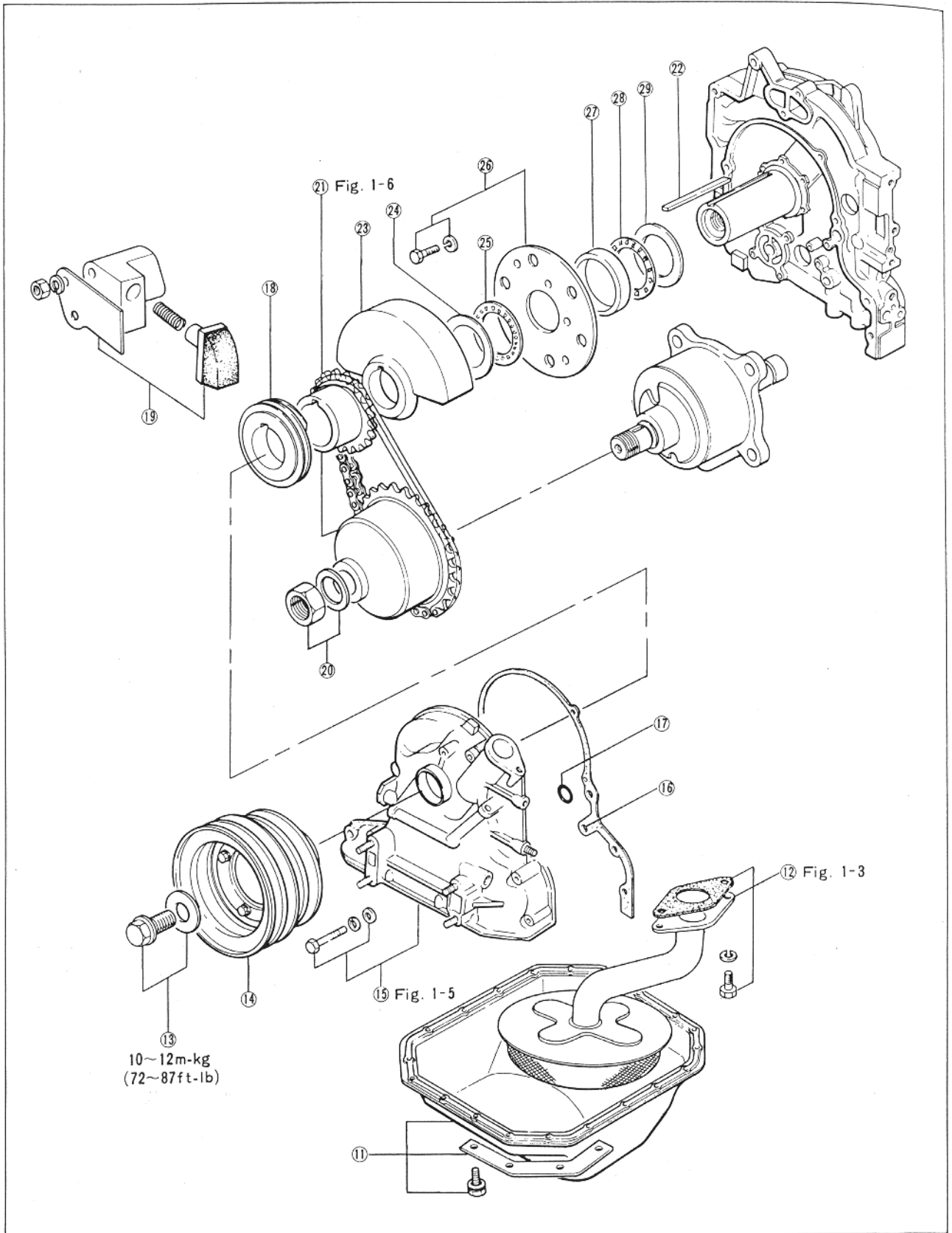


Fig. 1-2

- | | | | |
|-----------------------------|----------------------------|-------------------------|---------------------|
| 11. Oil pan and gasket | 16. Gasket | 21. Chain and sprockets | 26. Bearing housing |
| 12. Oil strainer and gasket | 17. "O" ring | 22. Key | 27. Spacer |
| 13. Bolt and washer | 18. Distributor drive gear | 23. Balance weight | 28. Bearing |
| 14. Eccentric shaft pulley | 19. Chain adjuster | 24. Thrust washer | 29. Thrust washer |
| 15. Front cover and bolt | 20. Nut and lock washer | 25. Bearing | |

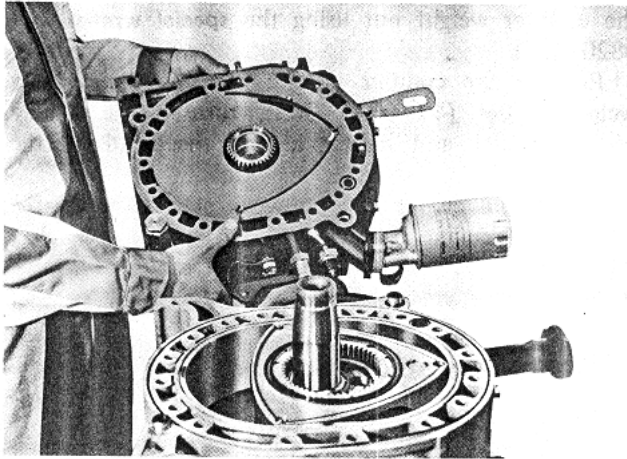


Fig. 1-19 Removing seals

37. Remove the two sealing rubbers and two "O" rings from the rear rotor housing.

38. Attach the **dowel puller** (49 0813 215), and pull the tubular dowels off the rear rotor housing holding the rotor housing down by hand to prevent it from moving up.

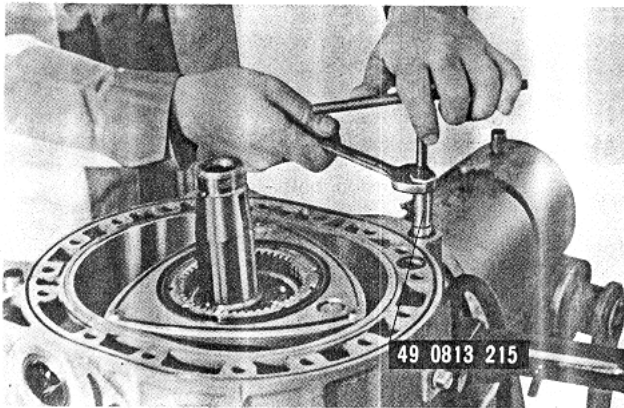


Fig. 1-20 Removing tubular dowel

39. Lift the rear rotor housing away from the rotor, being careful not to drop the apex seals on the rear rotor. Remove the two sealing rubbers and two "O" rings from the rear rotor housing.

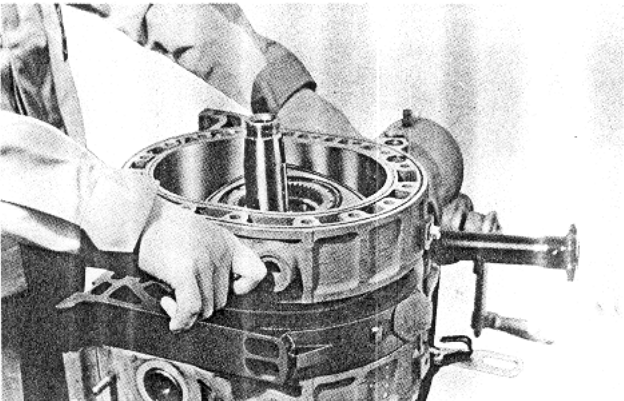


Fig. 1-21 Removing rear rotor housing

40. Remove the each apex seal, side piece and spring from the rear rotor and place them in the seal case.
41. Remove the rear rotor away from the eccentric shaft and place it upside down on a clean sheet of

cloth.

42. Remove each seal and spring on the other side of the rear rotor, and place them in the seal case as shown in Fig. 1-22.

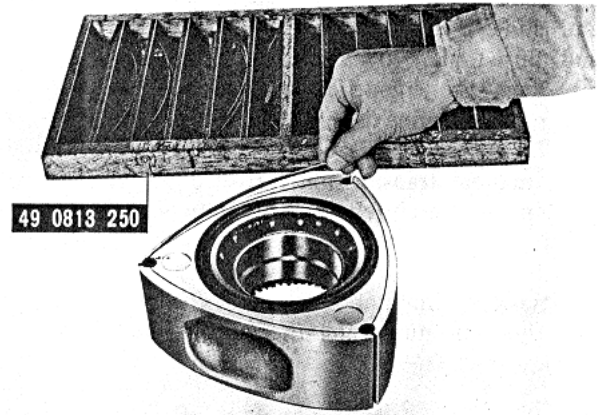


Fig. 1-22 Removing seals

Note:

- 1) If some of the seals drop off, be careful not to change the original position of each seal on the rotor.
- 2) Apply identification mark onto the rear rotor, which is a common part to front rotor, so that when reassembling the engine the rotor can be installed in its original position.

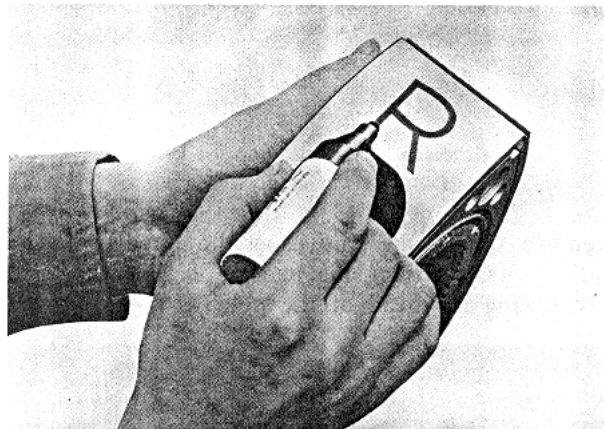


Fig. 1-23 Putting identification mark

43. Remove the oil seals by using the **oil seal remover** (49 0813 225). Remove the oil seal springs.

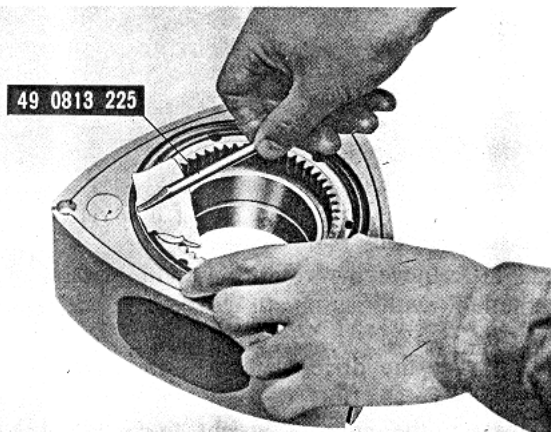


Fig. 1-24 Removing oil seal

Note:

- 1) Do not exert strong pressure at only one place to prevent deformation of the oil seal.
- 2) Be careful not to damage the oil seal lip. Use a suitable protector shown in Fig. 1-24.
- 3) Replace the "O" rings in the oil seals when the engine is overhauled.

44. Holding the intermediate housing down by hand, pull the tubular dowel off the intermediate housing using the **dowel puller** (49 0813 215).

45. Lift the intermediate housing off the shaft being careful not to damage the shaft. The intermediate housing should be removed by sliding it beyond the rear rotor journal on the eccentric shaft while holding the intermediate housing up and at the same time pushing up the eccentric shaft.

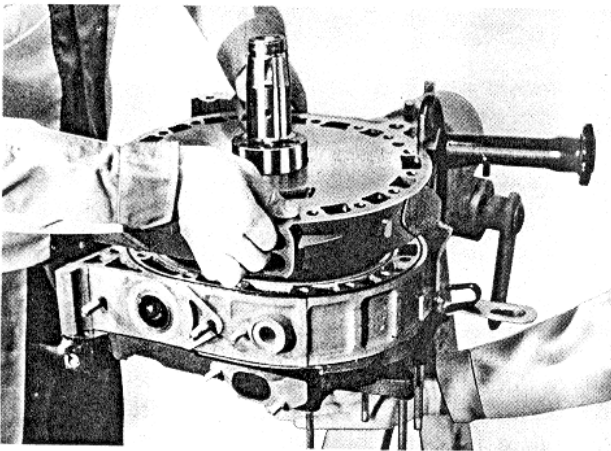


Fig. 1-25 Removing intermediate housing

46. Lift out the eccentric shaft.

47. Repeat the above procedures to remove the front rotor housing and the front rotor assembly.

1-B. INSPECTION AND REPAIR

1-B-1. Inspecting Front, Intermediate and Rear Housing

1. Check the side housings for traces of gas or water leakage.
2. Remove all carbon on the housings with an extra-

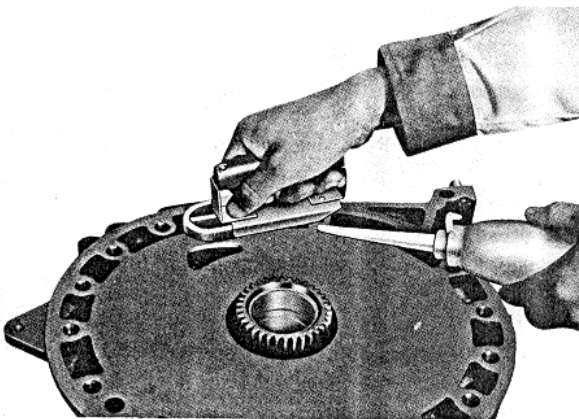


Fig. 1-26 Removing sealing agent

fine emery paper. When using a carbon scraper, be careful not to damage the finished surfaces of the housings.

3. Remove the sealing agent on the housings by using a cloth or a brush soaked in a solution of ketone or thinner.

4. Check for housing distortion by placing a straight edge on the housing surface. Measure the clearance between the straight edge and the housing surface with a feeler gauge, as shown in Fig. 1-27. If the distortion exceeds **0.04 mm (0.0016 in)**, reface or replace the housing.

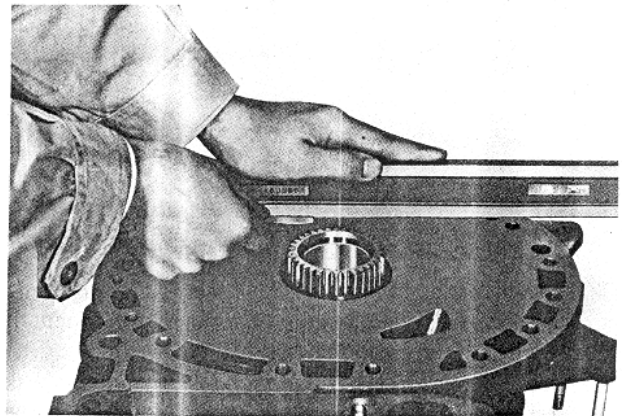
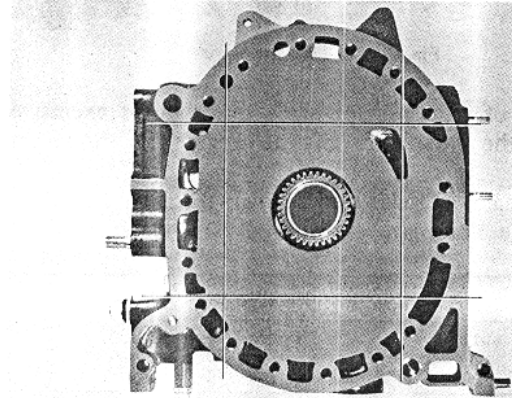


Fig. 1-27 Checking distortion

5. Check for wear on the rotor sliding surfaces of the housing and joint surfaces with rotor housing. The wear of sliding surface has a tendency of excessive wear occurring at following minor axis area of the housing.

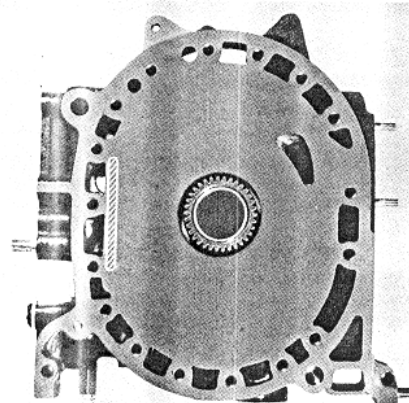


Fig. 1-28 Checking position of wear

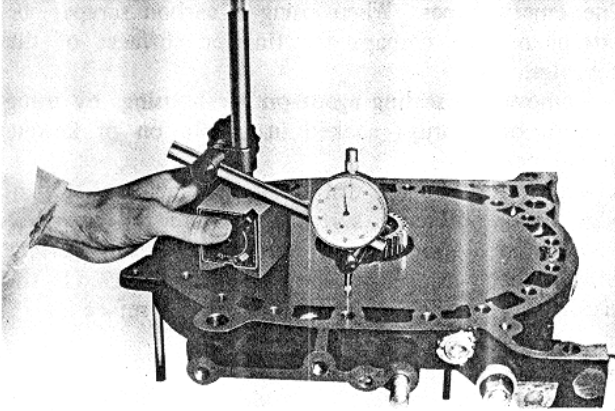


Fig. 1-29 Checking wear

The wear of joint surface has a tendency of excessive wear at the hot zone of the engine as shown in Fig. 1-28

If the wear exceeds the following limit, reface or replace the housing.

	Limit	
	Sliding surface	0.10 mm
Joint surface	0.05 mm	(0.0020 in)

1-B-2. Regrinding Side Housings

The side housings (front housing, intermediate housing and rear housing) can be reused by grinding them if the required finish can be maintained.

And when this work is performed on the markets, ask the detailed informations of Toyo Kogyo, and follow them.

1-B-3. Inspecting Front Stationary Gear and Main Bearing

1. Check the teeth on the stationary gear for wear, crack or damage.
2. Check the main bearing for wear, scratching, flaking or other damages.
3. Check the clearance between the main bearing and eccentric shaft main journal by measuring the inner diameter of the main bearing and outer diameter of the eccentric shaft main journal.

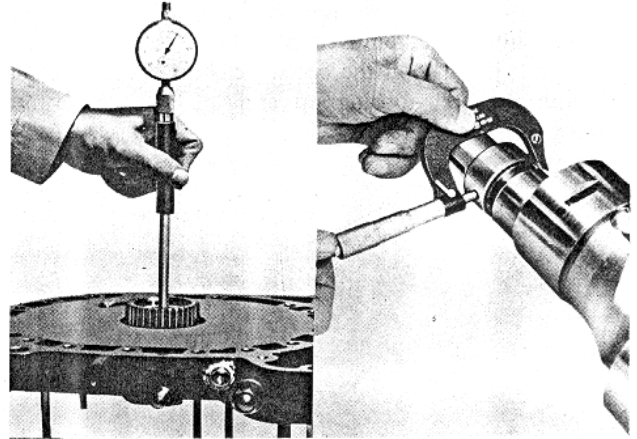


Fig. 1-30 Checking main bearing clearance

The standard clearance is 0.04 ~ 0.07 mm (0.0016 ~ 0.0028 in). If the bearing clearance exceeds 0.10 mm (0.0039 in), replace the main bearing or eccentric shaft. To replace the main bearing, proceeds as follows:

- 1) Remove the stationary gear and main bearing assembly from the housing, using the main bearing replacer (49 0813 235), shown in Fig. 1-31.

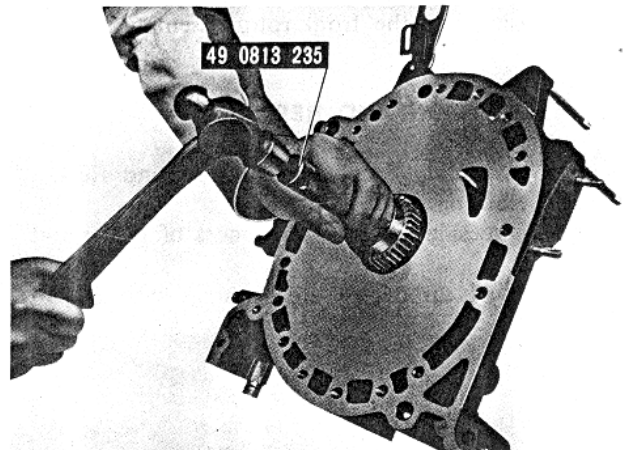


Fig. 1-31 Removing stationary gear assembly

- 2) Remove the adaptor on the main bearing replacer and press the main bearing out of the stationary gear by using the main bearing replacer (49 0813 235), as shown in Fig. 1-32.

- 3) Attach the adaptor onto the main bearing replacer (49 0813 235), aligning the tang of the bearing and the slot of the stationary gear, and press fit the main bearing into the stationary gear until the adaptor touches the stationary gear flange.

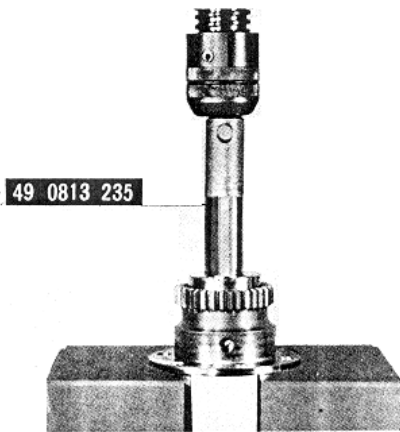


Fig. 1-32 Removing main bearing

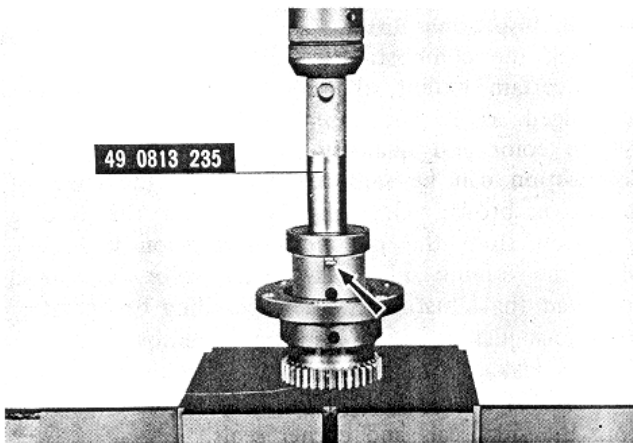


Fig. 1-33 Installing main bearing

4. Press in the stationary gear to the housing with the main bearing replacer (49 0813 235), aligning the slot of the stationary gear flange and the dowel pin on the housing, as shown in Fig. 1-34

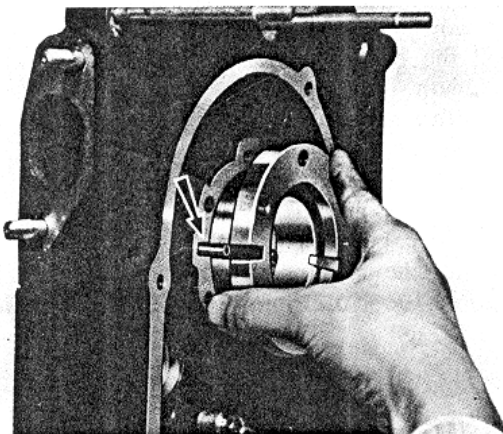


Fig. 1-34 Installing stationary gear

1-B-4. Inspecting Rear Stationary Gear and Main Bearing

1. Check the rear stationary gear and main bearing according to Par. 1-B-3.
 2. The "O" ring in the stationary gear for a damage. Replace the "O" ring if necessary.
- To remove and install the stationary gear, proceed as follows:
- 1) Remove the bolts attaching the stationary gear to

the rear housing.

- 2) Using the main bearing replacer (49 0813 235), remove the stationary gear from the rear housing.
- 3) Apply a thin coat of grease on the "O" ring and place it in the groove of the stationary gear.

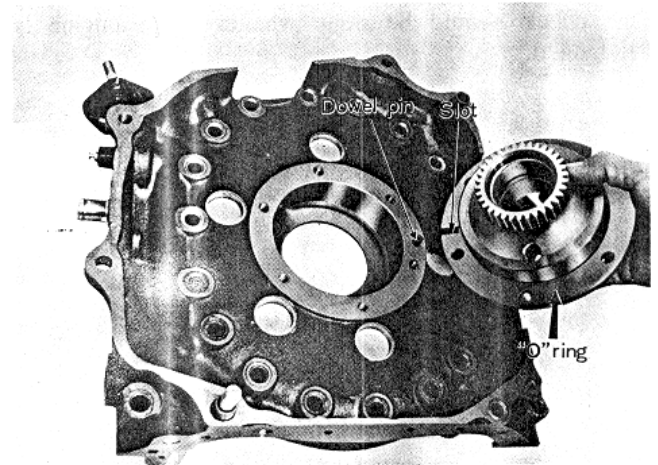


Fig. 1-35 Assembling stationary gear

- 4) Apply sealing agent onto the stationary gear flange.
- 5) Install the stationary gear to the rear housing being careful not to damage the "O" ring and aligning the slot of the stationary gear with the dowel pin on the rear housing.
- 6) Tighten the bolts attaching the stationary gear.

1-B-5 Inspecting Rotor Housing

1. Check for traces of gas or water leakage along the inner margin of each side face of the rotor housing.
2. Remove all carbon from the inner surface of the rotor housing by wiping with cloth. Soak the cloth in a solution of ketone or thinner if the carbon is difficult to remove.
3. Remove all deposits and rust from the cooling water passages on the housing.
4. Remove sealing agent by wiping with a cloth or brush soaked in a solution of ketone or thinner.

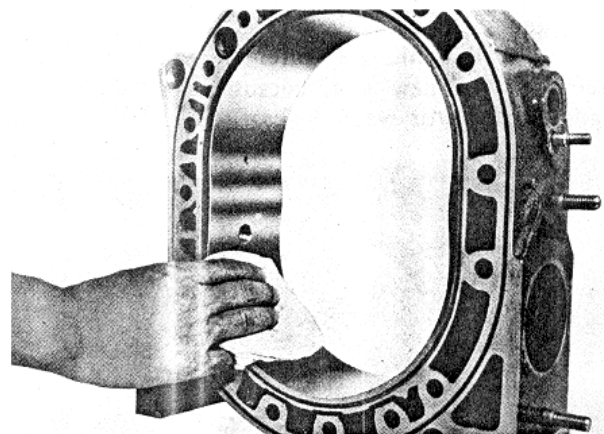


Fig. 1-36 Removing carbon

5. Check the chromium plated surface on the rotor housing for scoring, flaking or any other damage. If any of these condition exists, replace the rotor housing.

6. Check for rotor housing distortion by placing a straight edge at the position shown in Fig. 1-37. Measure the clearance between the straight edge and rotor housing surface with a feeler gauge. If the distortion exceeds **0.04 mm (0.0016 in)**, replace the rotor housing.

This check should be done whenever the engine is overhauled.

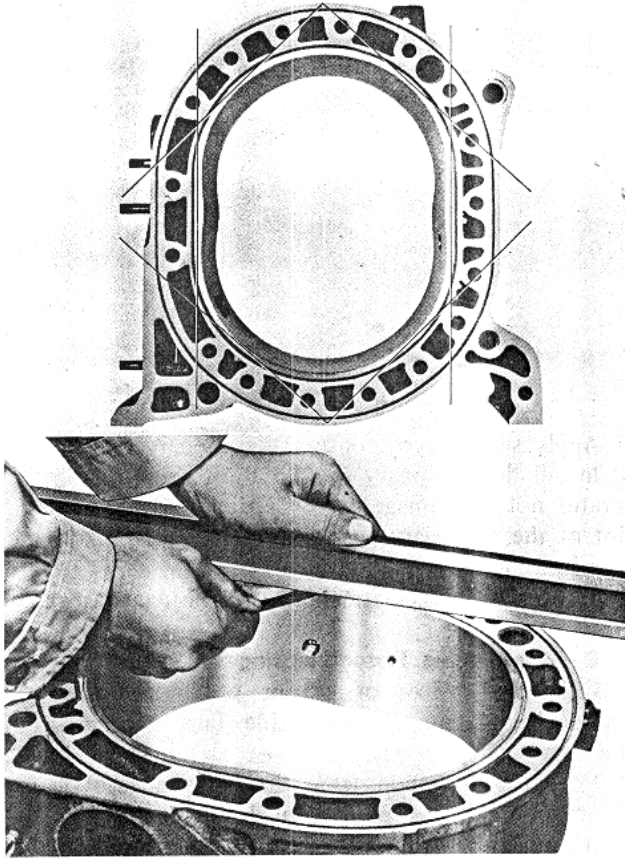


Fig. 1-37 Checking distortion

7. Check the rotor housing width at points close to the trochoid surface by using a micrometer. The measurements should be taken at least at 4 points. If the difference between the value of **A** point and the minimum value of the points **B C D**, exceeds **0.06 mm (0.0024 in)**, the rotor housing should be replaced with a new one, because there should be possibility of gas or water leakage.

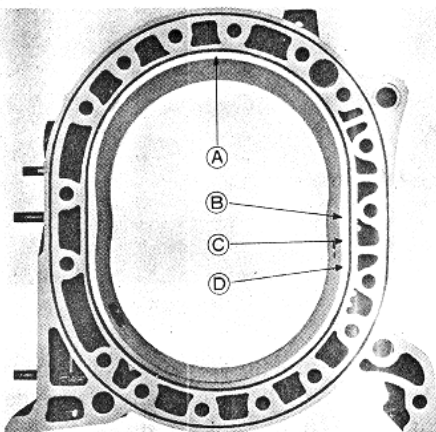


Fig. 1-38 Checking points

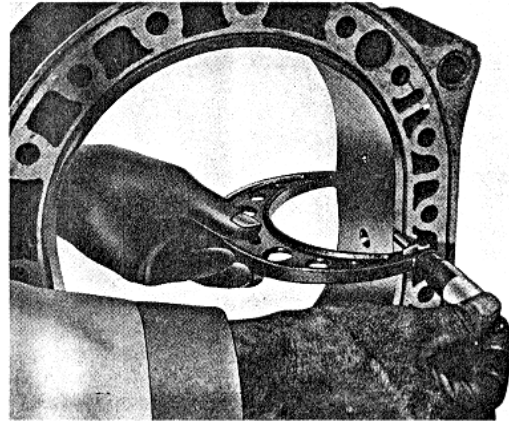


Fig. 1-39 Checking rotor housing width

1-B-6. Inspecting Rotor

1. Check the combustion condition and gas leakage. To a certain extent, the combustion condition can be judged as in the case of reciprocating engines by the color and quantity of carbon on the rotor. Combustion can be said to be good if the color of carbon is brown. Generally carbon on the leading side seen from the direction of rotation is brown, while the trailing side shows black color. It should be noted that this color varies according to operating conditions just before the engine is removed.

The gas leakage can be judged by checking the color of the rotor side surface for blow-by traces originating from the side seals and corner seals.

2. Remove the carbon on the rotor by using a carbon remover or emery paper. Carbon in the seal grooves of the rotor should be removed with a carbon remover being careful not to damage the grooves. Wash the rotor in cleaning solution and dry by blowing with compressed air.

3. Carefully inspect the rotor and replace if it is severely worn or damaged.

4. Check the internal gear for cracks, score, worn or chipped teeth.

5. Check the gap between the side housing and the rotor by measuring the rotor housing width and rotor width. The rotor width should be measured at 3 points as shown in Fig. 1-40.

The difference between the minimum width of rotor housing and the maximum width of the rotor should be within **0.10 ~ 0.21 mm (0.0039 ~ 0.0083 in)**.

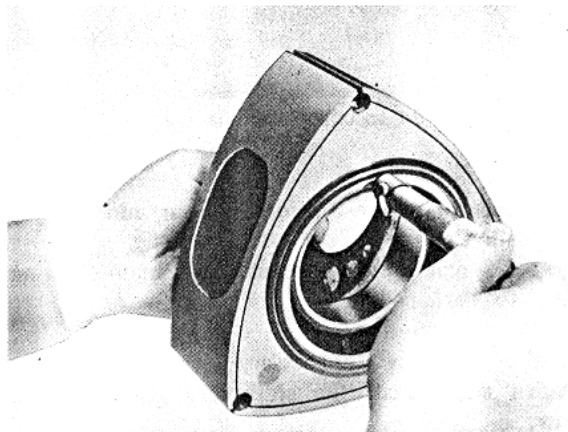


Fig. 1-40 Checking rotor width

If the clearance is more than the specifications, replace the rotor assembly. If the clearance is less than the specifications, it indicates that the internal gear has come out, so strike the internal gear lightly with plastic hammer being careful not to damage.

1-B-7. Inspecting Rotor Bearing

1. Check the rotor bearing for wear, flaking, scoring or any damage. If any of these conditions is found, replace the bearing.

2. Check the rotor bearing clearance by measuring the inner diameter of the rotor bearing and outer diameter of the eccentric shaft rotor journal. The standard clearance is 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in). Replace the bearing if it is more than 0.10 mm (0.0039 in).

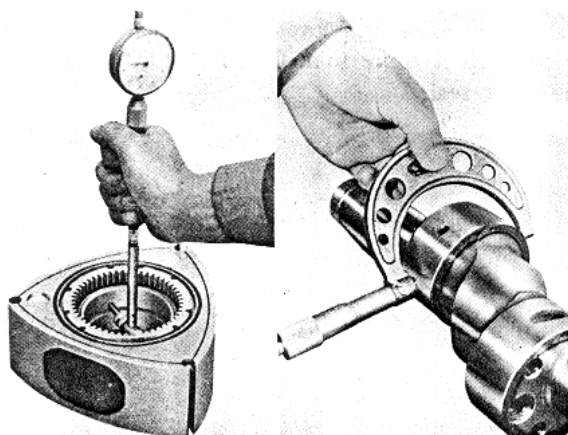


Fig. 1-41 Checking rotor bearing clearance

To replace the rotor bearing, proceed as follows:

1) Place the rotor on the support so that the internal gear is facing downward. Using the rotor bearing replacer (49 0813 240) without the adaptor ring, press the bearing out of the rotor, being careful not to damage the internal gear. If the bearing bore in the rotor is damaged, finish the bore with emery paper and blow with compressed air.

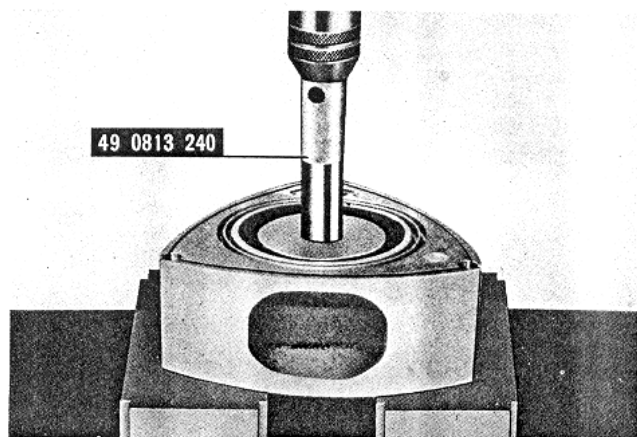


Fig. 1-42 Removing rotor bearing

2) Place the rotor on the support with internal gear faced upward. And place the new rotor bearing on the rotor so that the rotor bore is in line with the bearing lug.
3) Press fit the new bearing using the rotor bearing

replacer (49 0813 240) with the adaptor removed attaching screws, until the bearing is flush with the rotor boss.

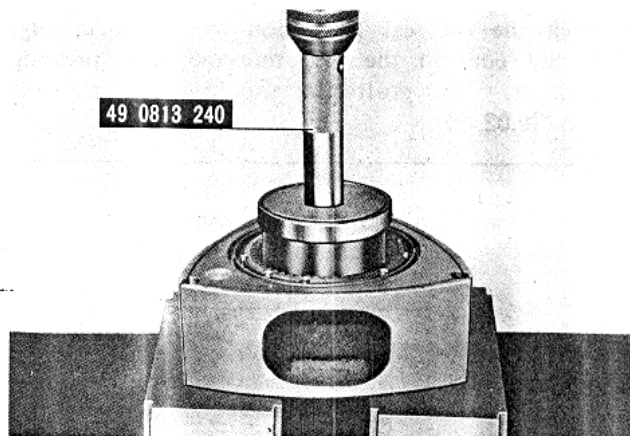


Fig. 1-43 Installing rotor bearing

4) Wash the rotor thoroughly and blow with compressed air.

Note:

The rotors are classified into five grades according to their weight and marked a, b, c, d, and e on the internal gear side.

In order to balance the front rotor and rear rotor, the following combinations are adopted in the factory.

Combination of rotor

a - b	c - b, c, d	e - e
b - a, b, c	d - c, d, e	

If it becomes necessary to replace a rotor, use the rotor marked "C" in all cases.

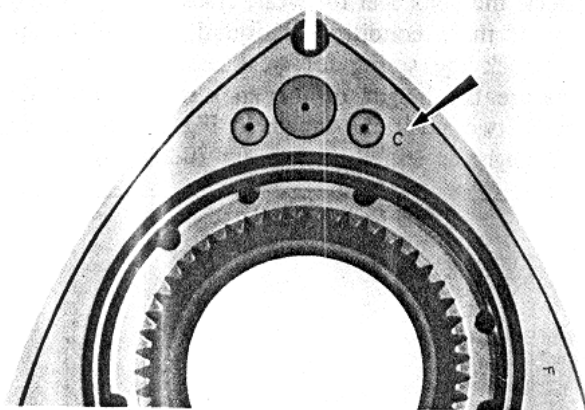


Fig. 1-44 Rotor weight mark

1-B-8. Inspecting Seal Springs

1. Check for weakness, wear or damage of the seal springs, especially the sections of the springs contacting the rotor or seal.

2. Check the free height of the apex seal spring. It should be more than 3.8 mm (0.15 in).

Note:

About the springs of oil seal, side seal and corner seal, confirm the protrusion of seals when installing seals to the rotor.

1-B-9. Inspecting Rotor Oil Seal

1. Check the oil seal for wear or any damage. If the lip width of the oil seal is more than 0.8 mm (0.031 in), replace the oil seal.
2. Check the oil seal protrusion as shown in Fig. 1-45 and confirm the free movement by pressing with finger. The protrusion should be more than 0.5 mm (0.02 in)

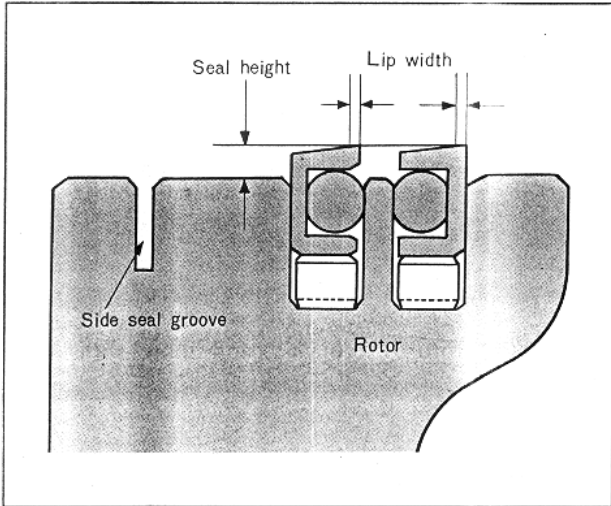


Fig. 1-45 Checking oil seal

Note:

When installing oil seal, refer to Par. 1-C-1.

1-B-10. Inspecting Apex Seal

1. Remove all carbon from the apex seal and spring, being careful not to damage the apex seal. **Never** use emery paper as it will damage the apex seal. Wash them with cleaning solution.
2. Check the apex seal for wear, crack or any damage. If any of these conditions is found, replace the apex seal. Check the spring for weakness.
3. Measure the height of the apex seal with a micrometer at two positions shown in Fig. 1-46. Replace if the height is less than 7.0 mm (0.275 in).

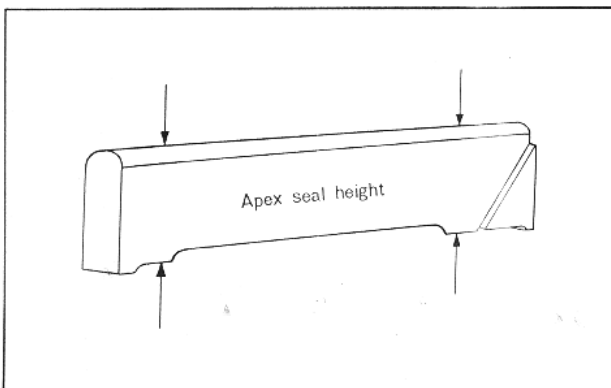


Fig. 1-46 Apex seal height

4. Check the gap between the apex seal and the groove. To check the gap, place the apex seal in its respective groove on the rotor and measure the gap between the apex seal and the groove with a feeler gauge. The feeler gauge should be inserted until the tip of the



Fig. 1-47 Checking apex seal

gauge reaches the bottom of the groove, for the apex seal tends to wear unevenly as shown in Fig. 1-48. If the gap is more than 0.15 mm (0.0059 in), replace the apex seal.

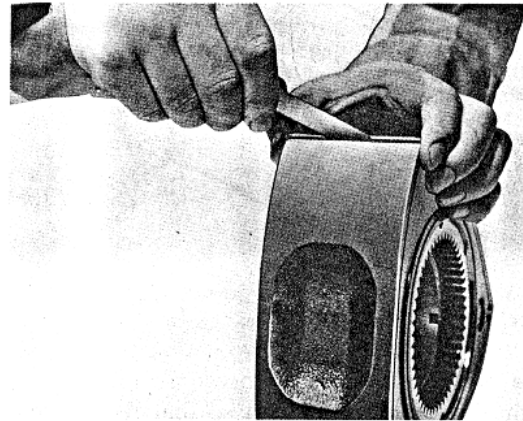


Fig. 1-48 Checking apex seal and groove

5. Check the gap between the apex seal and side housing. To check, measure the length of the apex seal with a micrometer.

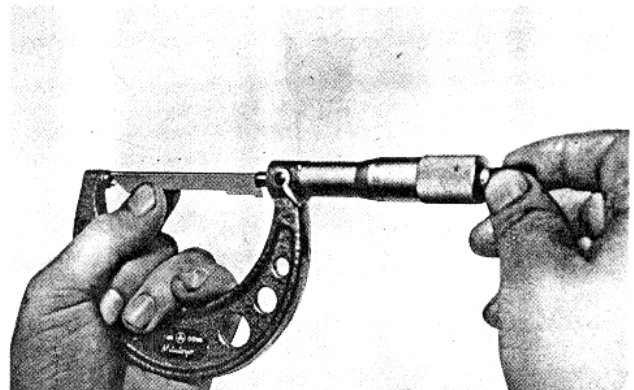


Fig. 1-49 Measuring apex seal length

Compare the measured apex seal length with the minimum value among ③ ④ and ⑤ points of the rotor housing (see Fig. 1-38). The standard gap is 0.13 ~ 0.17 mm (0.0051 ~ 0.0067 in). If it is more than 0.30 mm (0.0118 in), replace the apex seal. If necessary, correct the apex seal length with emery paper.

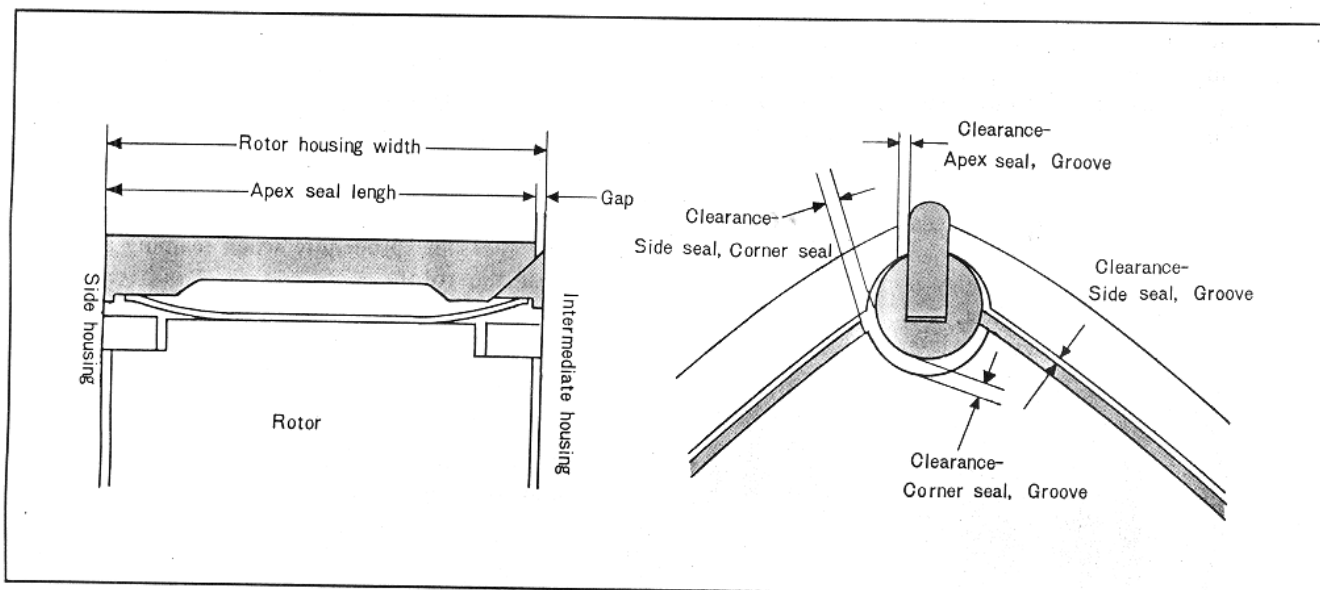


Fig. 1-50 Clearance of seals

1-B-11. Inspecting Side Seal

1. Remove all carbon from the side seal and spring with a carbon remover.
2. Check the side seal for wear, crack or any other damage and replace if any of these conditions is found.
3. Check the side seal protrusion from the rotor surface, and also confirm the free movement by pressing with finger. The protrusion should be more than **0.5 mm (0.02 in)**.
4. Check the gap between the side seal and the groove

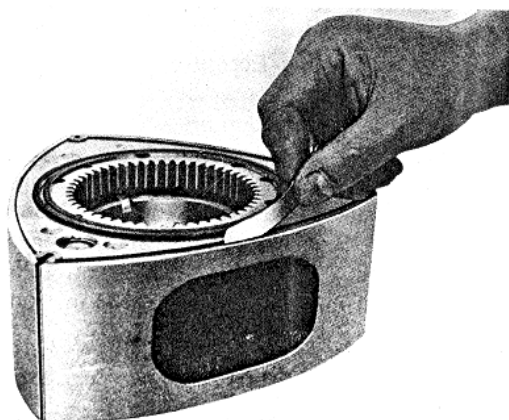


Fig. 1-51 Checking side seal gap

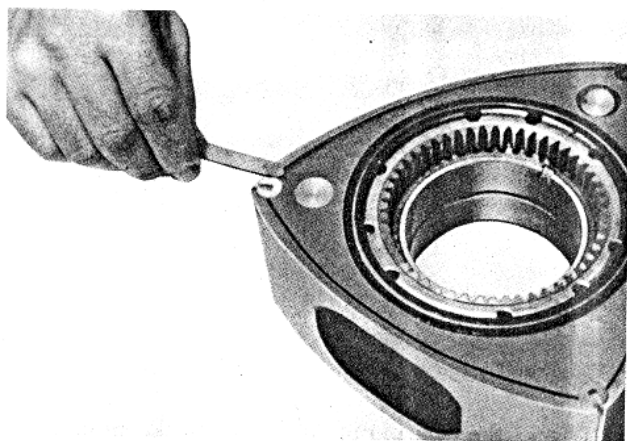


Fig. 1-52 Checking corner seal and side seal gap

with a feeler gauge as shown in Fig. 1-51. The standard gap is **0.04 ~ 0.07 mm (0.0016 ~ 0.0028 in)**. If the gap exceeds **0.10 mm (0.0040 in)**, replace the side seal.

5. Check the gap between the side seal and the corner seal with these seals installed on the rotor.

To check, insert a feeler gauge between the end of the side seal (against the rotating direction of rotor) and the corner seal. If the gap exceeds **0.4 mm (0.016 in)**, replace the side seal.

When the side seal is replaced, adjust the gap between the side seal and the corner seal by grinding the one end of the side seal along the round shape of the corner seal with a fine file so that the gap will be **0.05 ~ 0.15 mm (0.002 ~ 0.006 in)**. And then make respective identification notches on the reverse side of the side seal. If this gap is too large, gas-sealing performance will deteriorate.

1-B-12. Inspecting Corner Seal

1. Remove carbon from the corner seal.
2. Check the corner seal for wear or damage.
3. Check the corner seal protrusion from the rotor surface, and also confirm the free movement by pressing with finger. The protrusion should be more than **0.5 mm (0.02 in)**.
4. Check the gap between the corner seal and the corner seal groove. The standard gap is **0.020 ~ 0.048 mm (0.0008 ~ 0.0019 in)** and the limit is **0.08 mm (0.0031 in)**. This gap enlargement shows uneven wear of the corner seal groove, which occur when the engine is operated with dust entering through a clogged element, damaged air cleaner or any other cause. When the wear is permitted to increase, the engine power will be reduced and the engine will become hard to start. The extent of wear of the corner seal groove is determined by the **bar limit gauge (49 0839 165)** and classified into three conditions.
 - a. Neither end of the gauge goes into the groove. This means that the gap conforms to the specifications.
 - b. While the go-end of the gauge goes into the groove,

the not-go-end does not. This means the gap is more than standard dimension and less than the limit. In this case, replace the corner seal with a **0.03 mm (0.0012 in)** oversize one. **Do not** rebore the groove.

c. If the both ends of the gauge go into the bore, it means that the gap exceeds the limit of 0.8 mm (0.0031 in). Rebore the corner seal groove with the **Jig and reamer (49 2113 030 and 49 0839 170)** to 11.2 mm (0.4410 in) diameter and use a **0.2 mm (0.0079 in)** oversize corner seal.

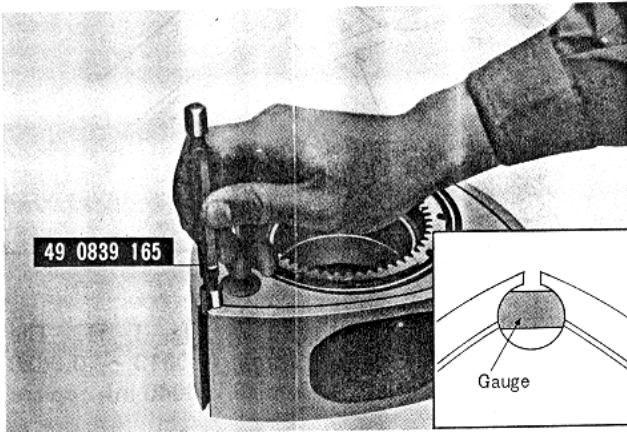


Fig. 1-53 Checking corner seal groove

Note:

- As the corner seal groove tends to show a heavy wear in the direction of the rotation, the side arcs on the gauge are partially cut off. Be sure to take the measurement in the direction of the maximum wear of the groove.
- If the gauge is not available, use a feeler gauge.
- The dimensions of the outer diameter of the gauge are as follows:

Go-end	$11.0 \begin{matrix} +0.019 \\ +0.021 \end{matrix} \text{ mm } (0.4331 \begin{matrix} +0.0007 \\ +0.0008 \end{matrix} \text{ in})$
Not-go-end	$11.0 \begin{matrix} +0.044 \\ +0.046 \end{matrix} \text{ mm } (0.4331 \begin{matrix} +0.0017 \\ +0.0018 \end{matrix} \text{ in})$

To rebore the corner seal groove, proceed as follows:

- Remove carbon, rust and other deposits from the groove, being careful not to damage.
- Install the **jig (49 2113 030)** onto the rotor and tighten the correct bar being careful not to damage

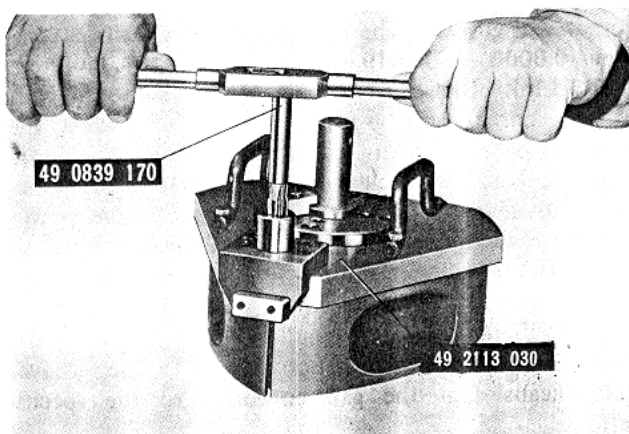


Fig. 1-54 Reaming corner seal groove

the rotor bearing and apex seal groove.

- Ream the groove with the **Reamer (49 0839 170)** by hand applying sufficient engine oil as a coolant. When feeding the reamer, it must be turned by about 20 rotations or over before the reaming work is accomplished completely.
- Remove the reamer and jig from the rotor.
- Repeat the same procedure when reaming the other grooves of the rotor.
- Thoroughly clean the rotor, and check and confirm by visual inspection the condition of the reaming groove and to see if there is any damage to the rotor.
- Fit a **0.2 mm (0.0079 in)** oversize corner seal into the groove, and check the gap between the corner seal and the groove. The standard gap is 0.020 ~ 0.048 mm (0.0008 ~ 0.0019 in).

Note:

- When installing or removing the jig, be careful not to hit the rotor.
- If the reaming is carried out without applying oil, it will be difficult to obtain the proper surface roughness no matter how many times the reaming may be repeated.
- Avoid two stage reaming, that is, drawing the reamer halfway during the reaming work and then resuming the reaming, because chips may affect the surface roughness.
- Before starting the reaming work, it must be confirmed that the reamer diameter is up to specifications, because the reamer could be worn in excess of the limit if it was used many times.

1-B-13. Inspecting Eccentric Shaft

- Wash the shaft in a cleaning solution and blow the oil passage with compressed air.
- Check the shaft for cracks, scratches, wear or any other damage. Be sure that the oil passages are open.
- Measure the diameter of the shaft journals with a micrometer. Replace the shaft if the wear is excessive. The standard diameter is **43 mm (1.6929 in)** on the main journal and **74 mm (2.9134 in)** on the rotor journal.

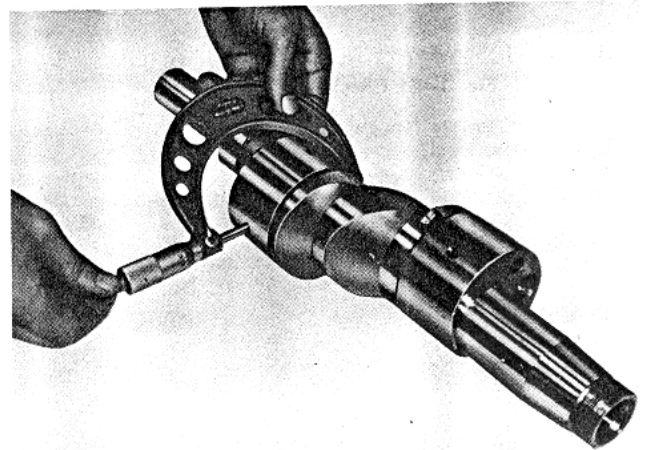


Fig. 1-55 Measuring rotor journal diameter

- Check the shaft run-out. To check, mount the shaft on "V"-blocks and apply a dial indicator. Slowly

rotate the shaft and note the reading on the indicator. If the run-out is more than 0.06 mm (0.0024 in), replace the shaft with a new one.

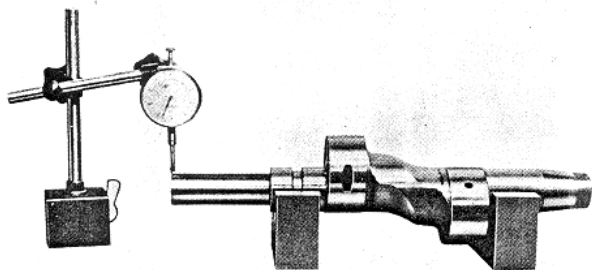


Fig. 1-56 Checking run-out

5. Check the blind plug in the shaft end for oil leakage or looseness. If any oil leakage is found, remove the blind plug with a hexagonal Allen key and replace the "O" ring.

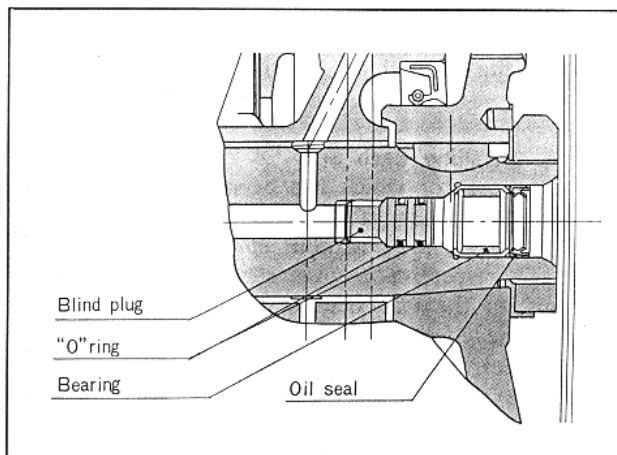


Fig. 1-57 Blind plug

6. Check the needle roller bearing in the shaft end for wear or any damage. Then insert the main drive shaft into the needle roller bearing and check the needle bearing for smooth operation and proper clearance. (Only the car with manual transmission)

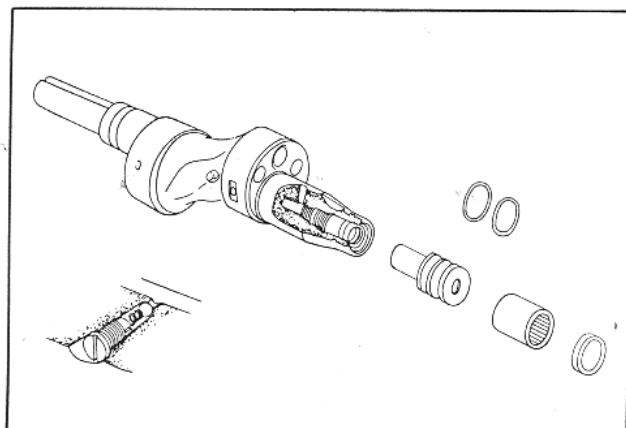


Fig. 1-58 Roller bearing and oil jet

To replace the bearing, use the bearing replacer (49 0823 070A).

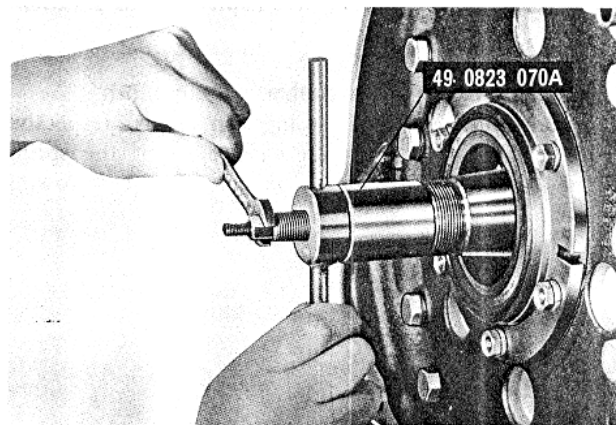


Fig. 1-59 Removing roller bearing

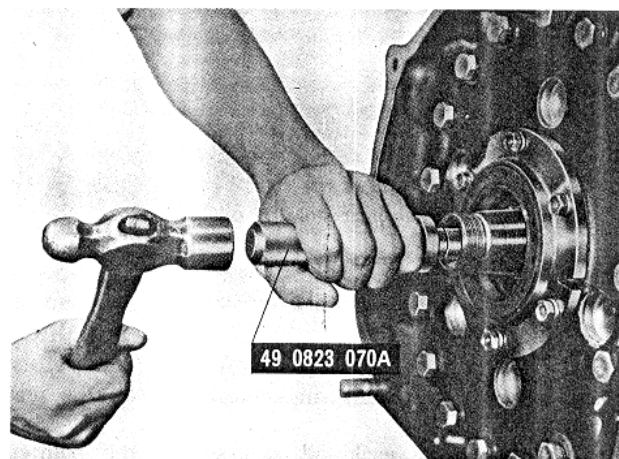


Fig. 1-60 Installing roller bearing

7. The oil jets are installed in the eccentric shaft. The oil jets open when the number of engine revolutions increases and the oil pressure rises. Check for spring weakness, stick or damage of the steel ball. (Fig. 1-58)

1-B-14. Inspecting Needle Bearing

Check the needle bearing for wear or damage. Inspect the bearing housing and thrust plate for wear or any damage.

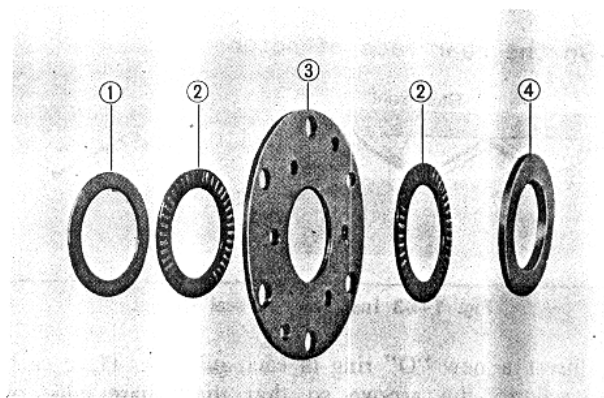


Fig. 1-61 Needle bearings

- 1. Thrust washer
- 2. Needle bearing
- 3. Bearing housing
- 4. Thrust plate