

**INDUSTRIAL
DIESEL ENGINE
6BB1, 6BD1, 6BD1-T MODELS**

WORKSHOP MANUAL



ISUZU MOTORS LIMITED

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TORQUE SPECIFICATIONS

STANDARD BOLT

The torque values given in the following table should be applied where a particular torque is not specified.

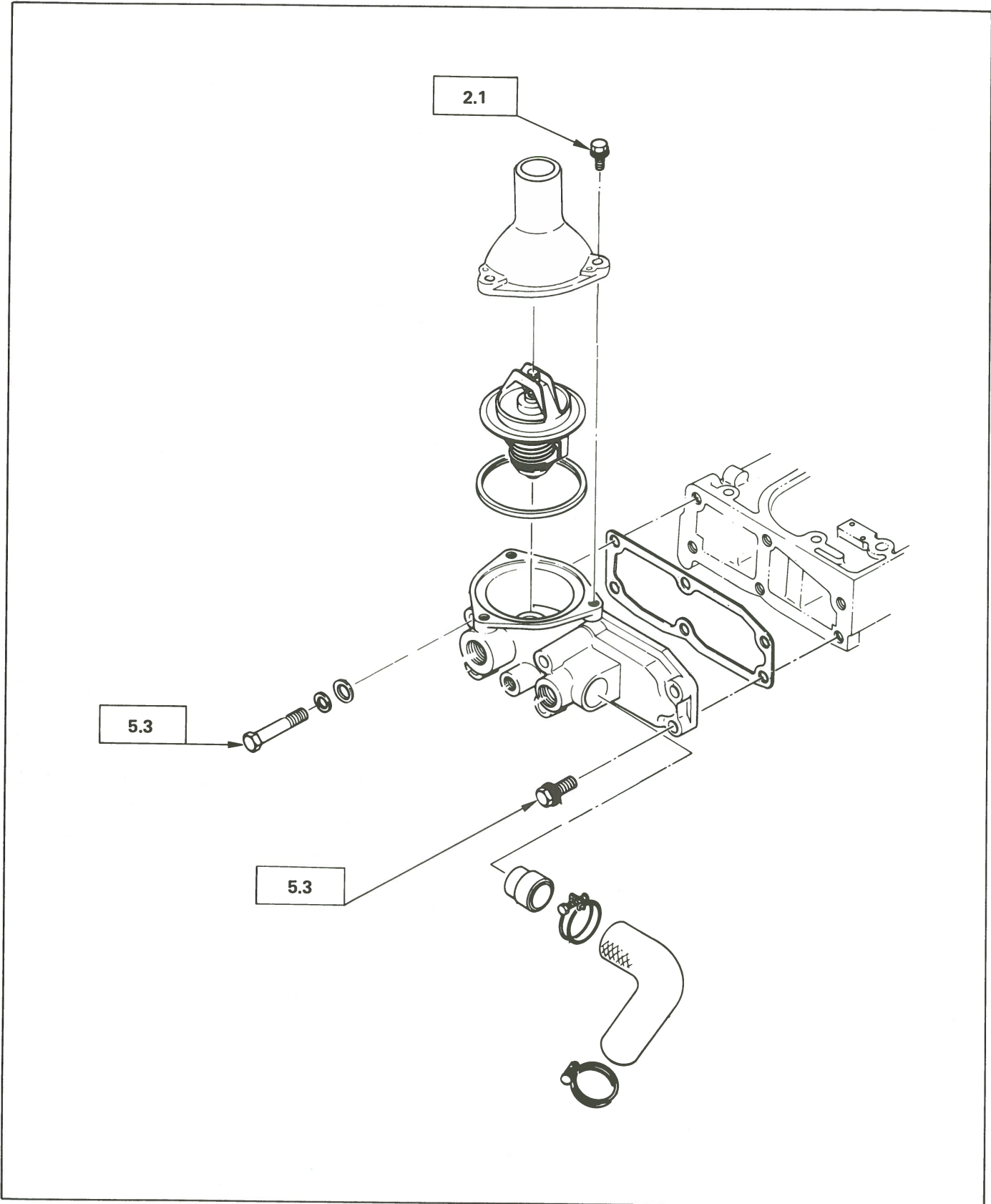
(kg-m)

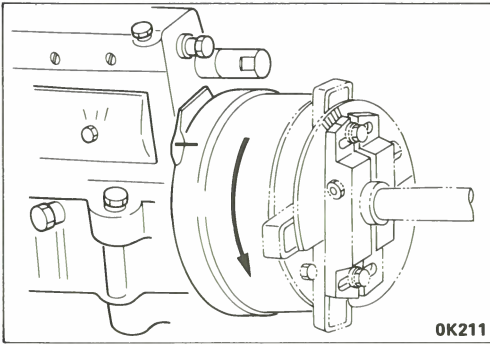
Bolt identification Bolt diameter x pitch (mm)			
	4 T (Low carbon steel)	7 T (High carbon steel)	9 T (Alloy steel)
6 x 1.0	0.4 – 0.8	0.5 – 1.0	—
8 x 1.25	0.8 – 1.8	1.2 – 2.3	1.7 – 3.1
10 x 1.25	2.1 – 3.5	2.8 – 4.7	3.8 – 6.4
*10 x 1.5	2.0 – 3.4	2.8 – 4.6	3.7 – 6.1
12 x 1.25	5.0 – 7.5	6.2 – 9.3	7.7 – 11.6
*12 x 1.75	4.6 – 7.0	5.8 – 8.6	7.3 – 10.9
14 x 1.5	7.8 – 11.7	9.5 – 14.2	11.6 – 17.4
*14 x 2.0	7.3 – 10.9	9.0 – 13.4	10.9 – 16.3
16 x 1.5	10.6 – 16.0	13.8 – 20.8	16.3 – 24.5
*16 x 2.0	10.2 – 15.2	13.2 – 19.8	15.6 – 23.4
18 x 1.5	15.4 – 23.0	19.9 – 29.9	23.4 – 35.2
20 x 1.5	21.0 – 31.6	27.5 – 41.3	32.3 – 48.5
22 x 1.5	25.6 – 42.2	37.0 – 55.5	43.3 – 64.9
24 x 2.0	36.6 – 55.0	43.9 – 72.5	56.5 – 84.7

The asterisk * indicates that the bolts are used for female-threaded parts that are made of soft materials such as casting, etc.

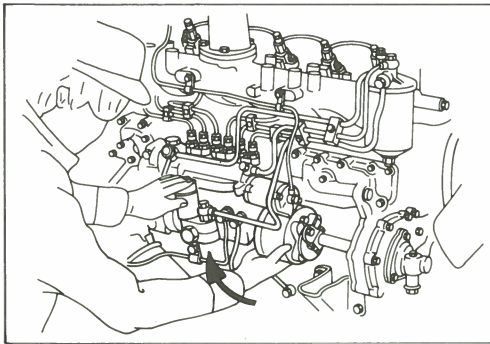
Thermostat and housing

(kg-m)

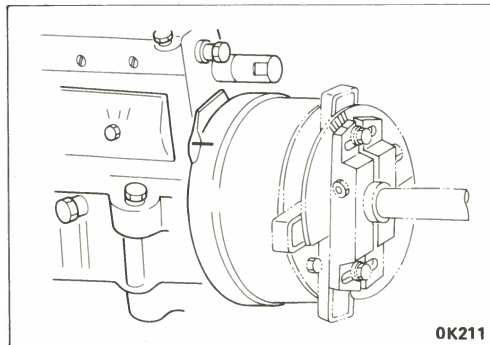
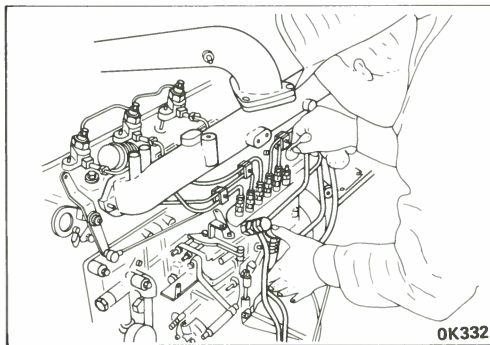




7. Turn the automatic timer in reverse direction of the rotation.

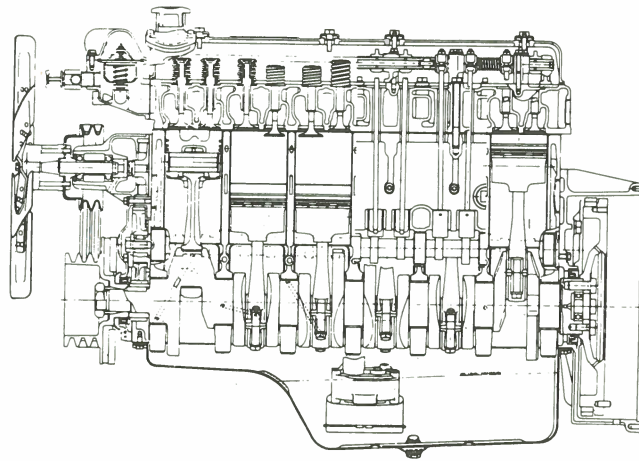
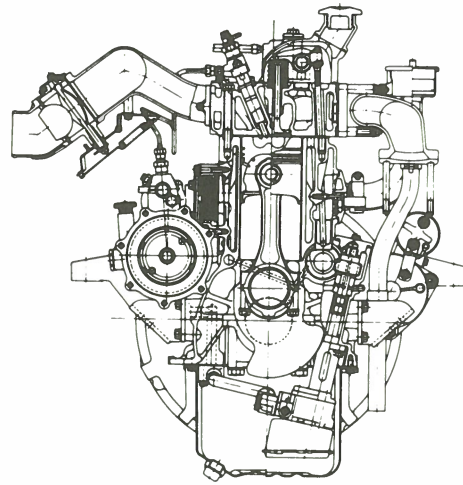


8. While operating the priming pump, turn the automatic timer in reverse direction indicated in paragraph 7 until fuel stops flowing from the delivery valve holder.



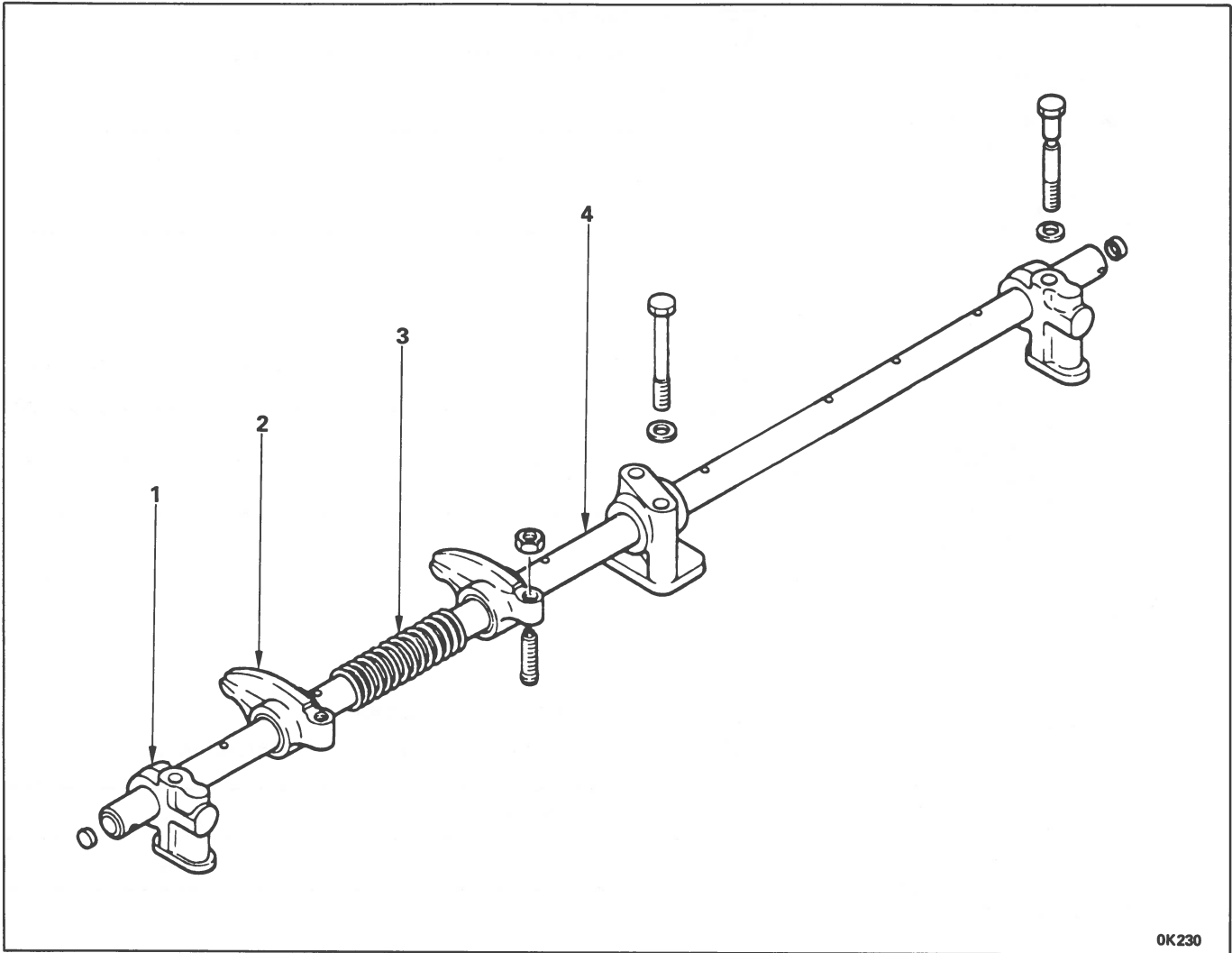
9. Blow out fuel remaining on the delivery valve holder and check that fuel is not being delivered as the priming pump is manually operated, then fix the coupling bolts.

GENERAL DESCRIPTION



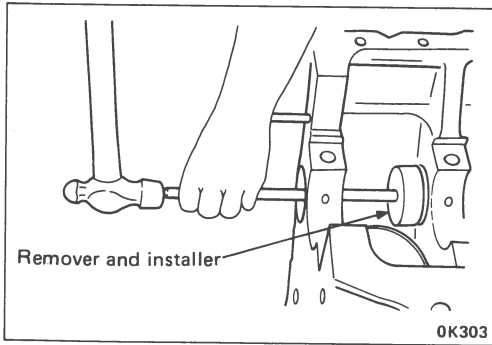
MINOR COMPONENTS

ROCKER ARM, BRACKET AND SHAFT ASSEMBLY



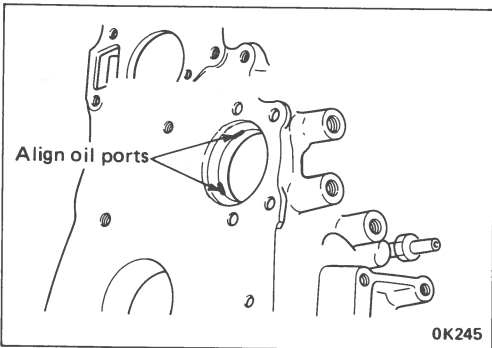
Disassembly steps

- | | |
|---------------|---------------------|
| 1. Bracket | 3. Spring |
| 2. Rocker arm | 4. Rocker arm shaft |

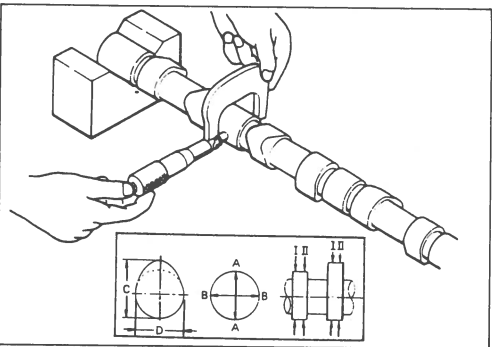


Camshaft bearing replacement

Remover and installer : 9-8523-1818-0

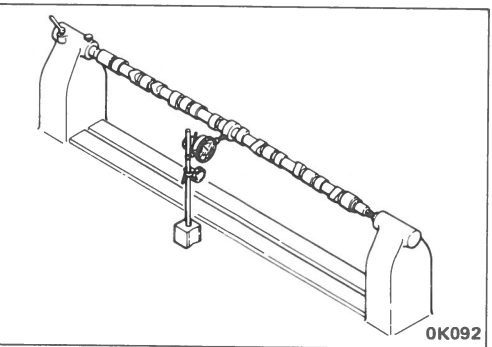


Align camshaft bearing oil ports with those in cylinder body. No. 1 camshaft bearing (front side) has two oil ports while other have only one oil port.



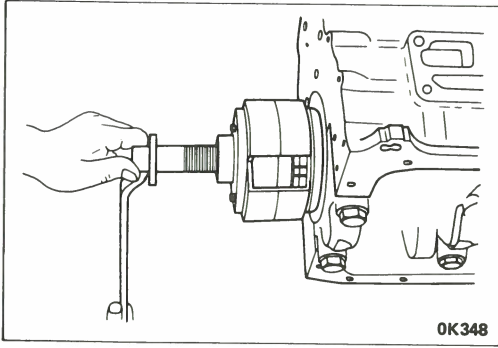
Cam lobe height

	(mm)	
	Standard	Limit
Height of cam lobe (C—D)	7.71	7.21



Run-out

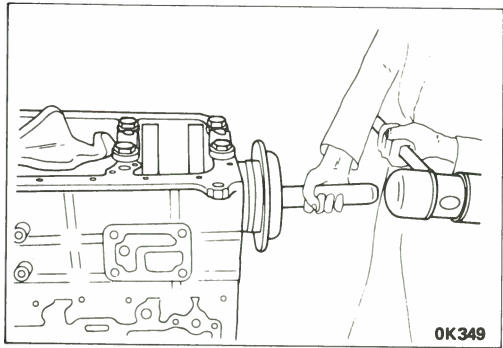
	(mm)	
Limit	0.1	



Oil seal wear ring replacement (6BD1-T only)

Removal :

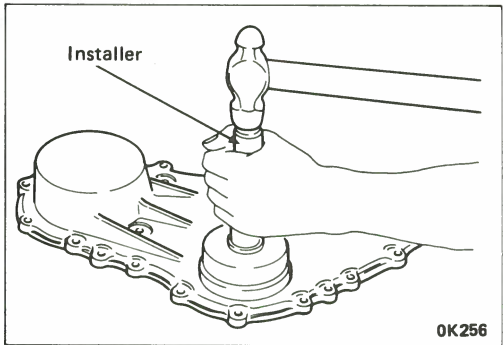
Use a suitable brass bar and a hammer or equivalent.



Installation :

Use a suitable brass bar and a hammer or equivalent.

GEAR CASE COVER



Oil seal replacement

Removal : pry off or pull out.

Installation

Installer : 9-8522-0034-0

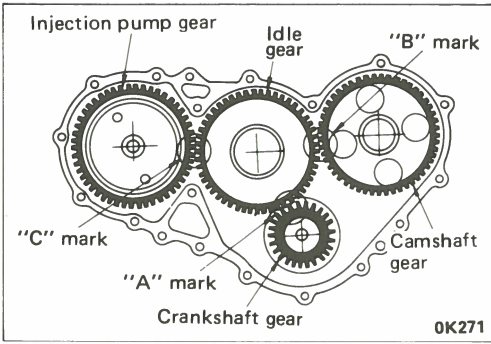
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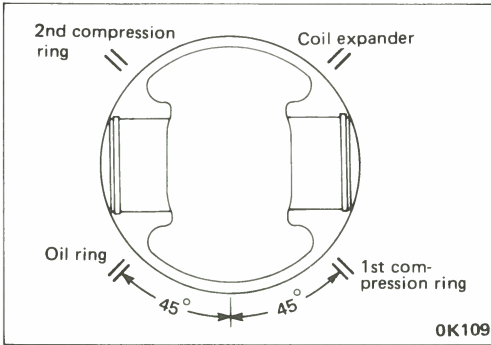
10. Idle gear

Align the timing marks "A" and "B" on the gears.



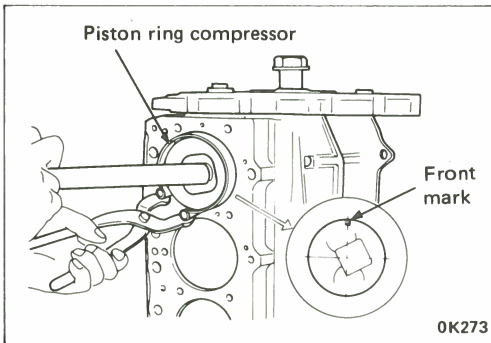
(kg-m)	
Torque	5.5

The thrust collar should be installed so that the chamfer side may be turned to the front.



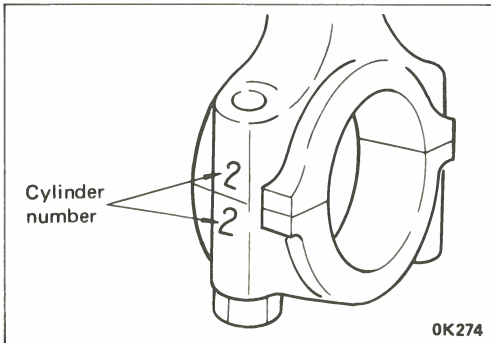
11. Piston and connecting rod assembly

Set the piston ring to the recommended setting position.



The front mark should be turned to the front side.

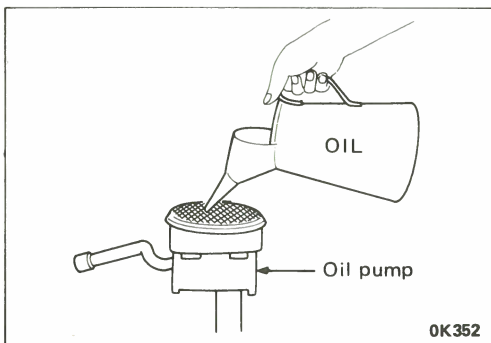
Piston ring compressor : 9-8522-1251-0



Align the cylinder numbers marked on the cap and connecting rod.



(kg-m)	
Torque	12.0



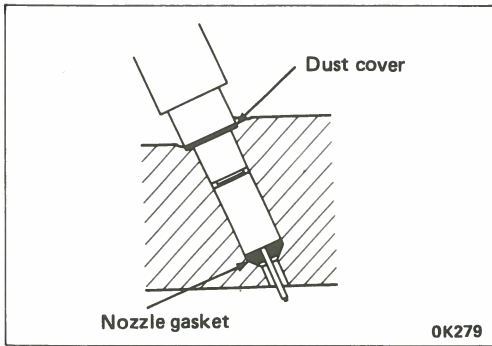
12. Oil pump and coupling assembly

Install the oil pump after filling it with engine oil.

6BD1T	CD grade
Others	CC or CD grade



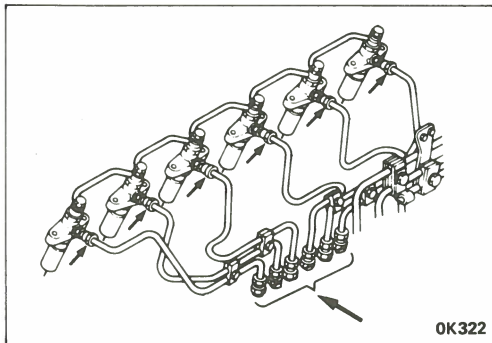
Important operations



2. Injection nozzle

Use new gaskets and dust covers. The flange nuts should be tightened after tightening the injection pipe sleeve nut.

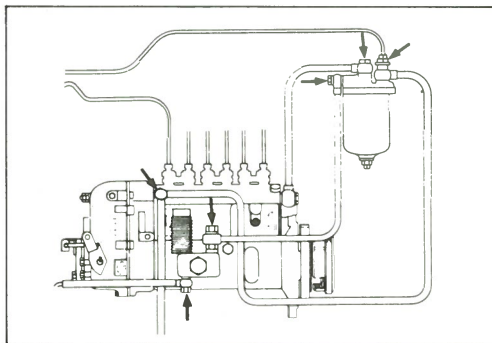
	(kg-m)
Torque	2.6



3. Injection pipe assembly

	(kg-m)
Torque	3.0

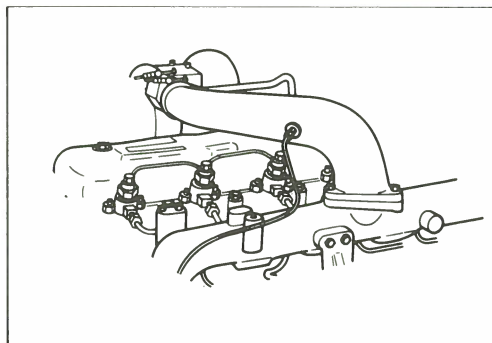
Over-tightening of the delivery valve holder, holder clip and injection pipe nut will invite malfunction of injection pump.



9., 10., 11., Pipe ; fuel

When installing fuel pipe, avoid interchanging check valve and joint bolt.

	(kg-m)
Torque	1.7 - 1.8



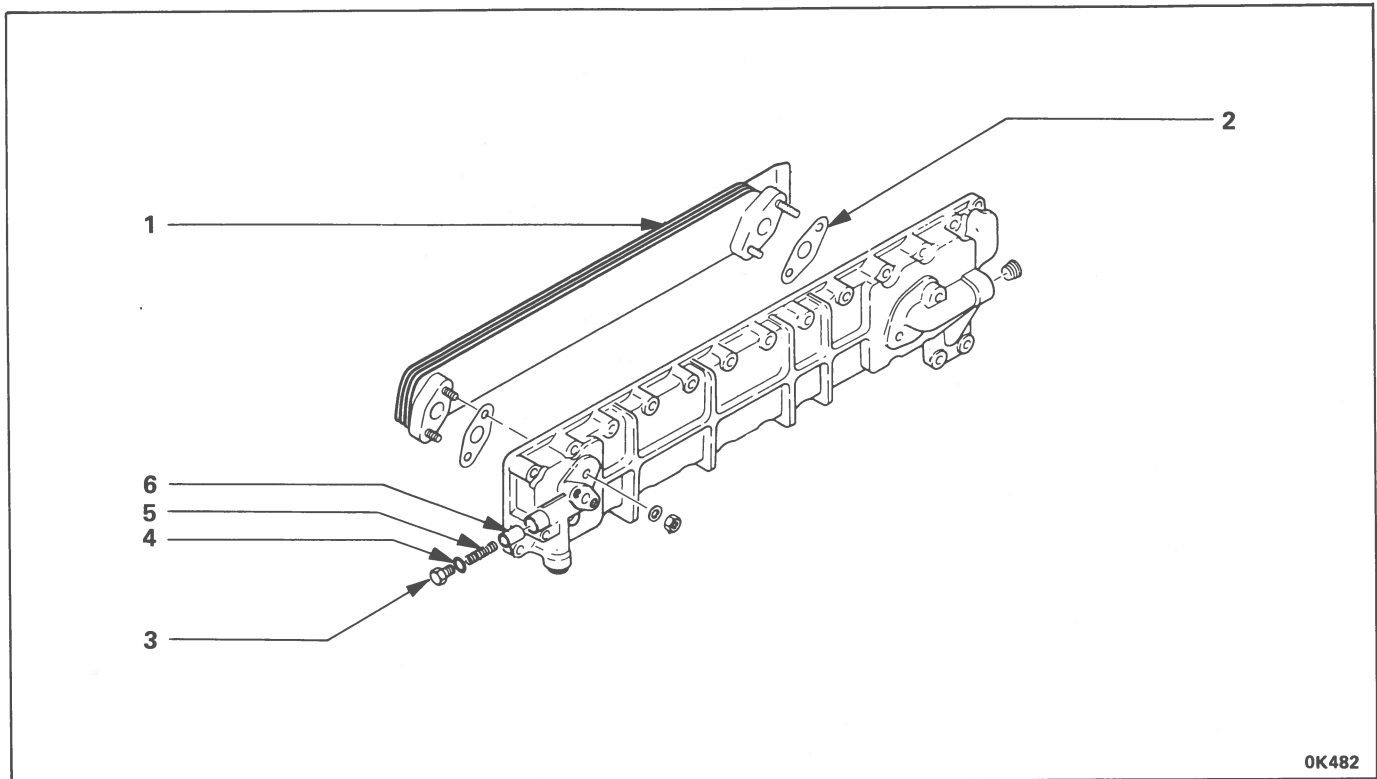
12. Pipe ; intake

	(kg-m)
Torque	2.6

OIL COOLER



DISASSEMBLY



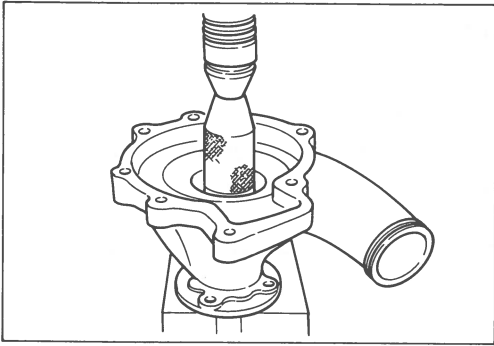
Disassembly steps

1. Oil cooler element
2. Element gasket
3. By-pass valve plug
4. O-ring ; plug
5. By-pass valve spring
6. By-pass valve

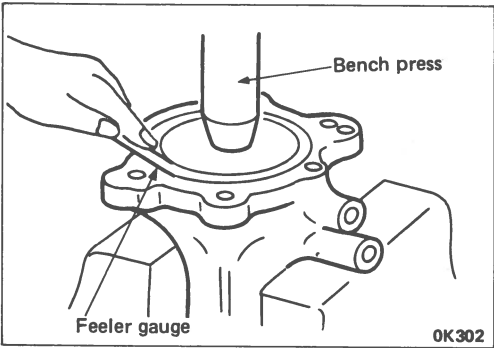


INSPECTION AND REPAIR

Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.



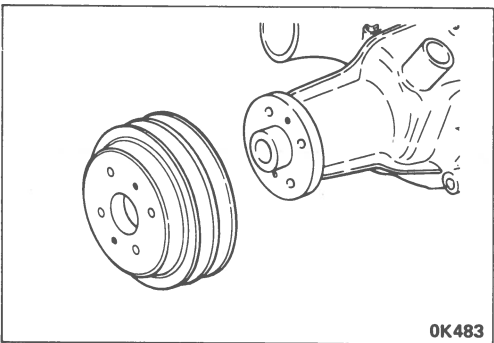
Install the seal unit to pump body using a bench press and suitable installer.



6. Impeller

Install the impeller using a bench press so that the clearance between the impeller and body may be held within the specified value.

	(mm)
Standard	0.3 – 0.8



8. Pulley

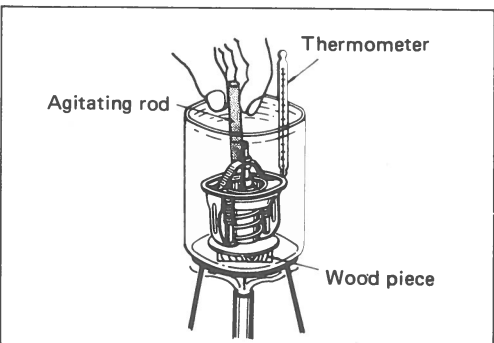
	(kg-m)
Torque	2.6

THERMOSTAT



INSPECTION AND REPAIR

Make necessary correction or part replacement if wear, damage or any other abnormal conditions are found through inspection.



	(°C)
Standard	80 – 84

Valve lift

Standard	Approx. 10 mm at 95°C
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5-10 FUEL SYSTEM

6BD1 PW (101602-0380)

TEST CONDITIONS

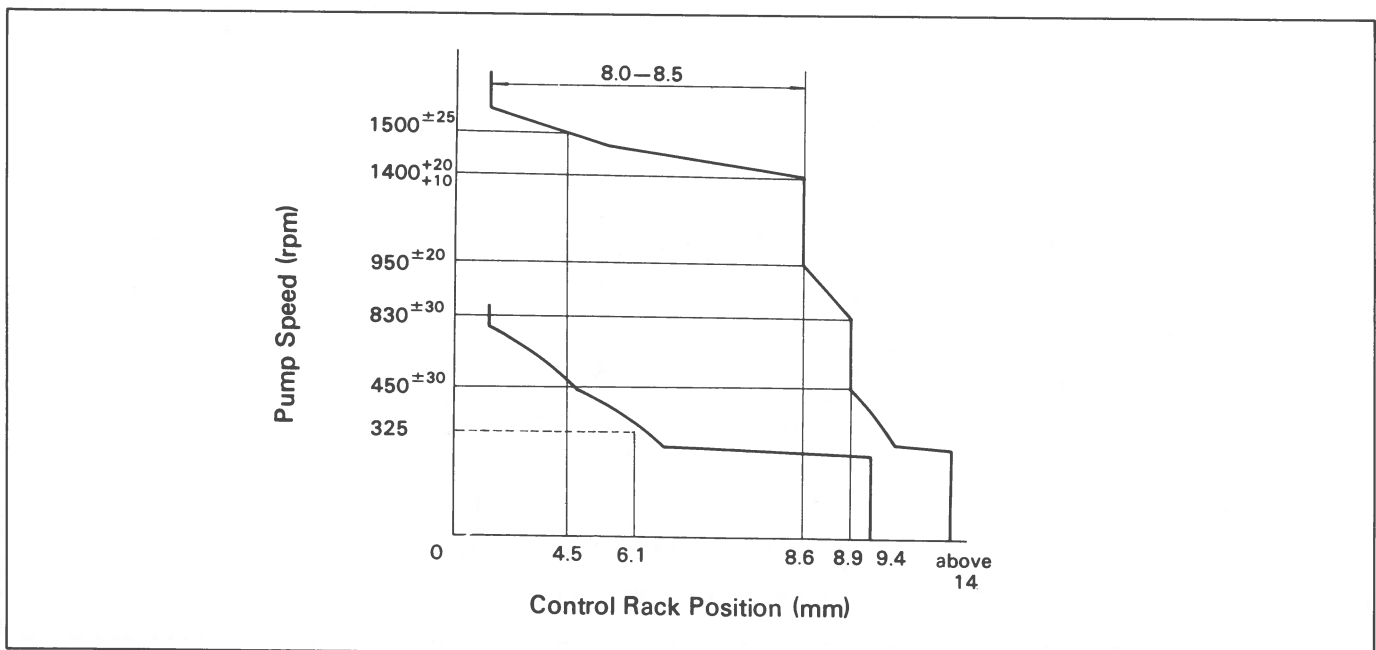
Injection nozzle	D.K.C. P. No. 105780-0000 Bosch Type No. DN12SD12T
Injection nozzle holder	D.K.C. P. No. 105780-2080 Bosch Type No. EF8511/9A
Injection starting pressure	175 kg/cm ²
Injection line	Outside dia. 6mm x Inside dia. 2mm — Length 600mm
Transfer pump pressure	1.6 kg/cm ²
Test diesel fuel	SAE STANDARD TEST OIL (SAE 967C) BOSCH OIL OL61V11 (Shell V-Oil 1253)
Temperature of in use	40 ⁺⁵ °C

INJECTION VOLUME

Control rack position (mm)	Pump speed (rpm)	Injection volume (cc/1,000st.)	Diviation (%)	Fixed with	Remarks
8.9	800	55.0—58.0 (57.3—60.3)	± 2	Lever	Basis
8.6	1,400	56.8—60.8 (59.2—63.2)	± 4	Lever	
Approx. 6.5	325	8.0—10.8 (9.2—12.0)	±14	Rack	

Injection volume without () SAE STANDARD TEST OIL
Injection volume with () BOSCH OIL OL61V11

GOVERNOR CHARACTERISTIC DIAGRAM

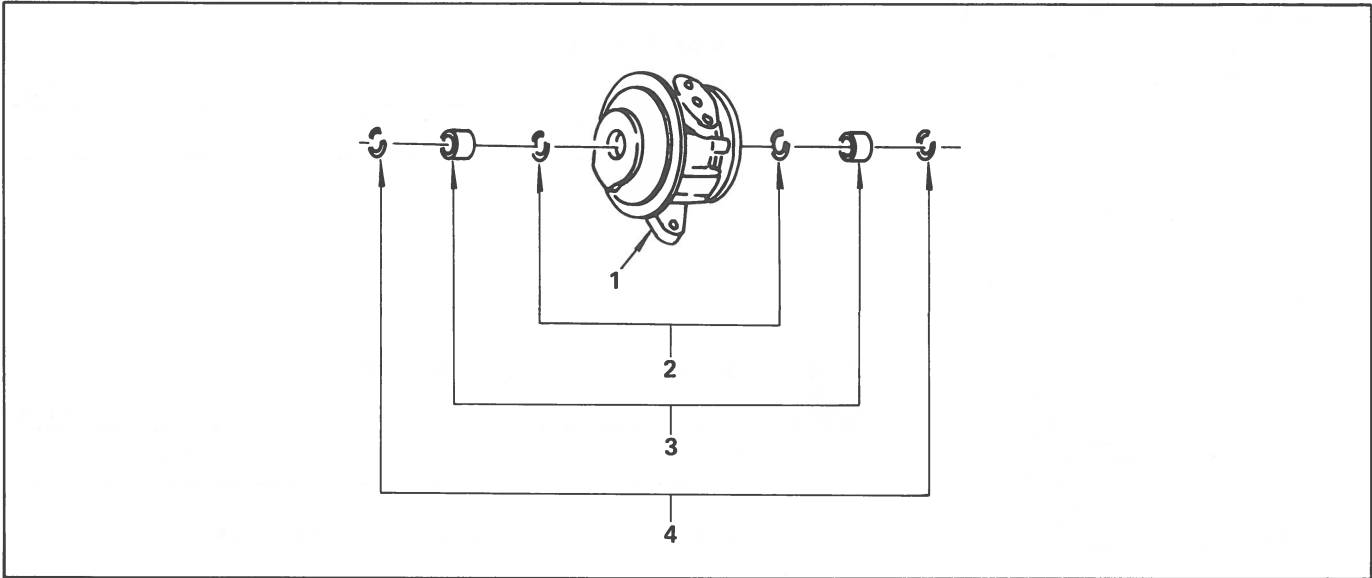




REASSEMBLY

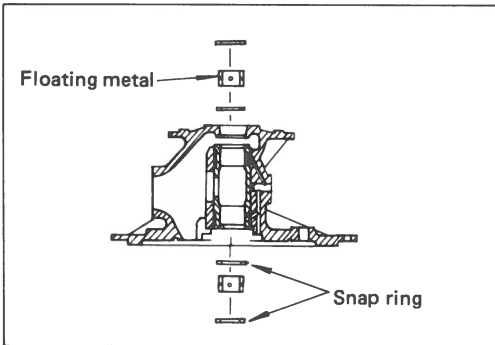
MINOR COMPONENTS

BEARING CASE ASSEMBLY



Reassembly steps

- ▲ 1. Bearing case
- ▲ 2. Snap ring (inner)
- ▲ 3. Floating metal
- ▲ 4. Snap ring (outer)



- 1. Snap ring (inner)
- 4. Snap ring (outer)

Insert the snap ring with the gap side turned to the bearing case oil outlet and with the roundish side turned to the floating metal.

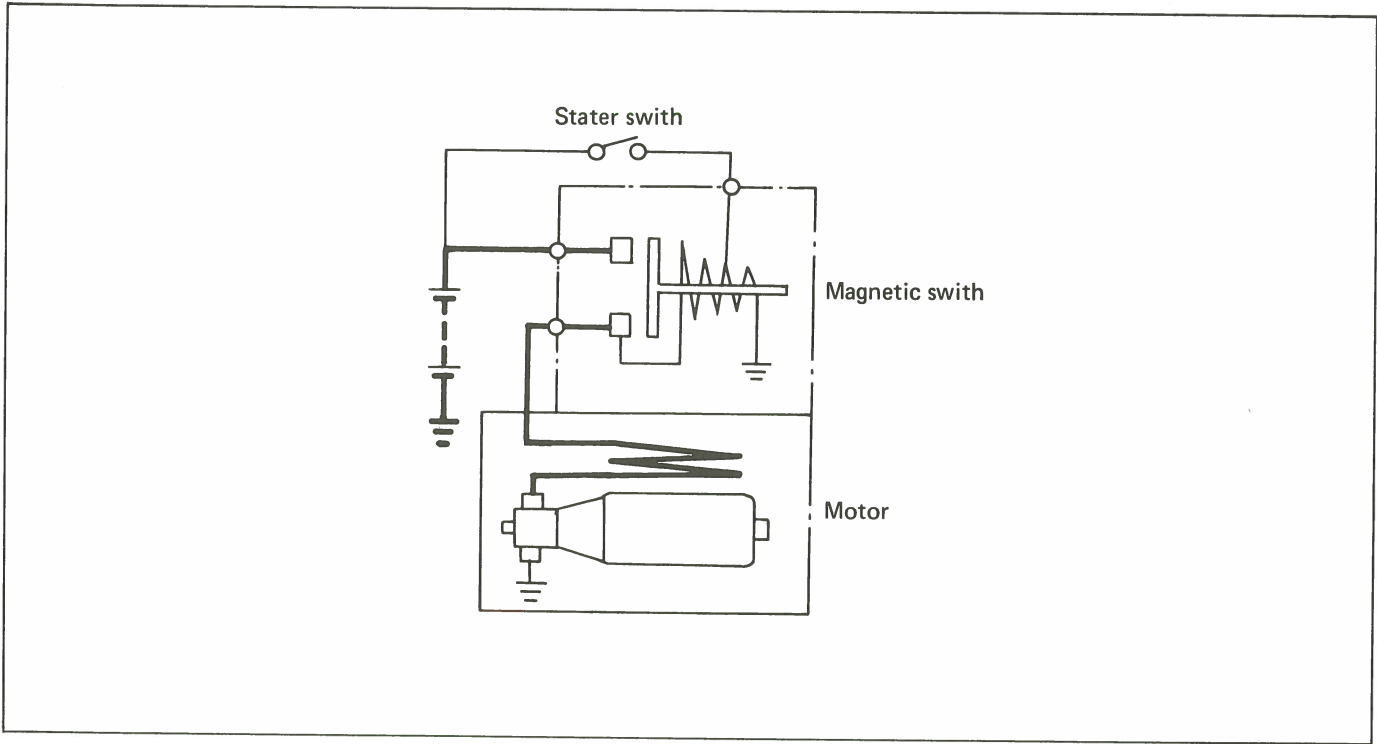


- 3. Floating metal

Apply engine oil to the floating metal.

CIRCUIT ARRANGEMENT

NIPPON DENSO (Manufacturer's code No. 0-28000-6561)

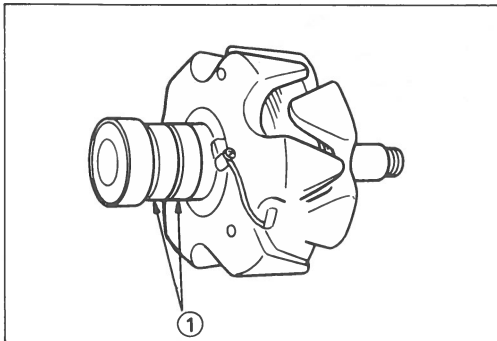




INSPECTION AND REPAIR

Make necessary correction or parts replacement if wear, damage or any other abnormal conditions are found through inspection.

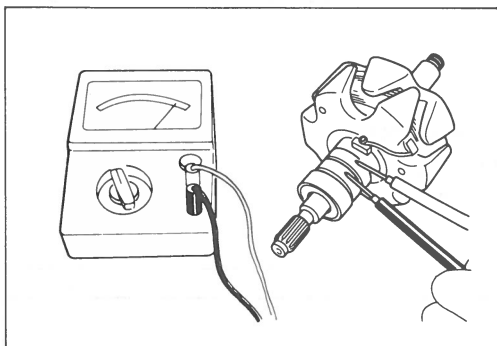
ROTOR ASSEMBLY



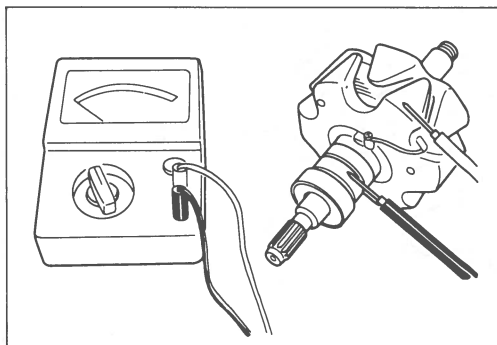
Visual check

Check the face of the slip rings ① for contamination or roughness. If found to be roughened, dress with a fine sand paper (#500 - 600). If necessary, clean with a cloth saturated with alcohol.

Measure the outside diameter of the slip rings. Refer to "slip ring diameter" of Main data specifications.



Check the rotor coil resistance across the slip rings. Refer to "rotor coil resistance" of Main data specifications.

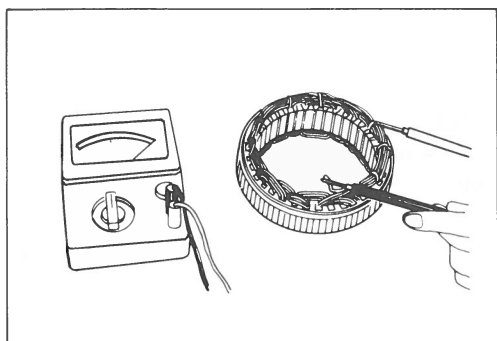


Check for continuity across the slip ring and rotor core or shaft. If the tester indicates a continuity, the parts should be replaced.

(MΩ)	
Resistance	Higher than 1.0

Note: Check resistance with the circuit tester set to high range. Replace the parts even if a slight continuity is indicated.

STATOR ASSEMBLY



Check for continuity across the stator coils. If no continuity exists, replace the coil.

(Ω)	
Across coil and terminal N	
Resistance	Lower than 1.0

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