KOMATSU

SHOP MANUAL

TB42

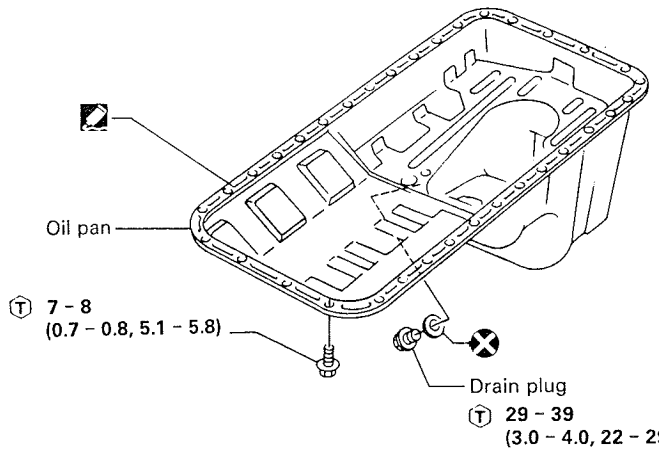
TB42

GASOLINE ENGINE

Komatsu Forklift Co., Ltd.
No. 3-4, 2-chome, Akasaka, Minato-ku, Tokyo, Japan

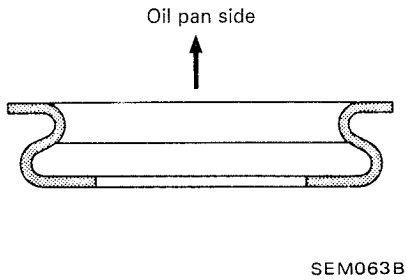
KOMATSU FORKLIFT

OIL PAN



REMOVAL

1. Drain engine oil.
- When installing drain plug washer, make sure it faces correct direction.
2. Remove oil pan.
   Remove oil pan bolts and nuts in numerical order.
- Do not insert screwdriver, or oil pan flange will be deformed.
- Do not insert Tool into rear oil seal retainer portion; otherwise, it will be damaged.



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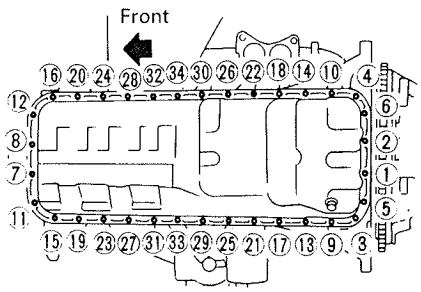


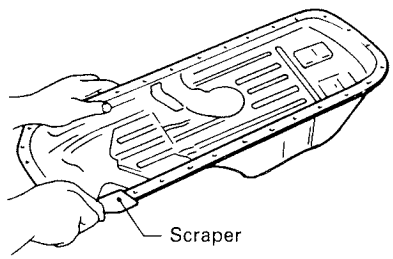
Loosen in numerical order

SEM010C

INSTALLATION

1. Before installing oil pan, remove all traces of gasket from mating surface using a scraper.
- Also remove traces of gasket from mating surface of cylinder block.

2. Install gasket and oil pan.
- Install bolts and nuts in reverse order of removal.



SEM066B

INSPECTION

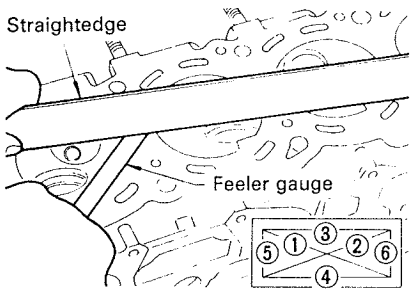
CYLINDER HEAD DISTORTION

Head surface flatness

Unit: mm (in)

Standard	Limit
Less than 0.07 (0.0028)	**0.2 (0.008)**

If beyond the specified limit, replace it or resurface it.

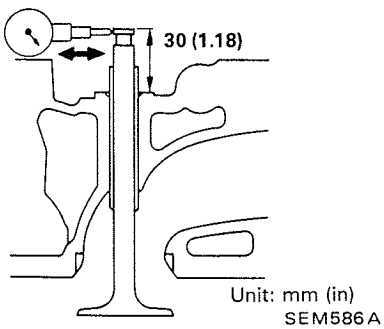


SEM868A

Resurfacing limit:
The resurfacing limit of cylinder head is determined by the cylinder block resurfacing in an engine.
Amount of cylinder head resurfacing is "A"
Amount of cylinder block resurfacing is "B"
The maximum limit is as follows:
A + B = 0.2 mm (0.008 in)
Nominal cylinder head height:
117.19 - 117.59 mm
(4.6138 - 4.6295 in)

VALVE GUIDE CLEARANCE

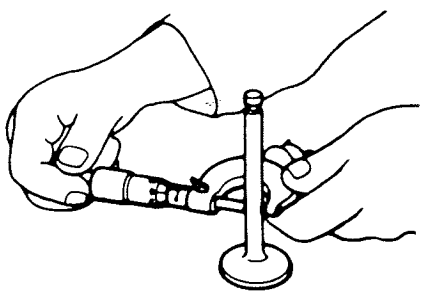
1. Measure valve deflection in a parallel direction with rocker arm.
(Valve and valve guide mostly wear in this direction.)
Valve deflection limit (Dial gauge reading):
0.2 mm (0.008 in)



Unit: mm (in)
SEM586A

2. If it exceeds the limit, check valve to valve guide clearance.
1) Measure valve stem diameter "d" and valve guide inner diameter.
2) Check that clearance is within the specification.
Valve to valve guide clearance limit:
0.1 mm (0.004 in)

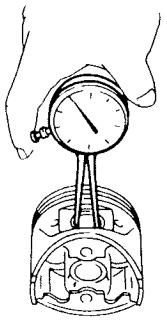
3) If it exceeds the limit, replace valve or valve guide.


EM030

INSPECTION

PISTON AND PISTON PIN CLEARANCE

1. Measure inner diameter of piston pin hole "dp".
   Standard diameter "dp":
   22.987 - 22.993 mm (0.9050 - 0.9052 in)

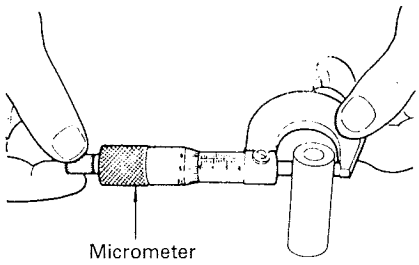


SEM149B

2. Measure outer diameter of piston pin "Dp".
   Standard diameter "Dp": **22.989 - 22.995 mm (0.9051 - 0.9053 in)**

3. Calculate interference fit of piston pin to piston.
   dp - Dp = -0.008 to 0.004 mm (-0.0003 to 0.0002 in)

   If it exceeds the above value, replace piston assembly with pin.



SEM821B

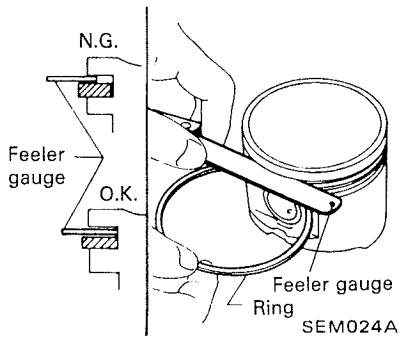
PISTON RING SIDE CLEARANCE

Side clearance:

Unit: mm (in)

Top ring	**0.040 - 0.073 (0.0016 - 0.0029)**
2nd ring	**0.030 - 0.063 (0.0012 - 0.0025)**
Oil ring	**0.015 - 0.185 (0.0006 - 0.0073)**

Max. limit of side clearance
(Top and 2nd rings): **0.1 mm (0.004 in)**
If out of specification, replace piston and/or piston ring assembly.



SEM024A

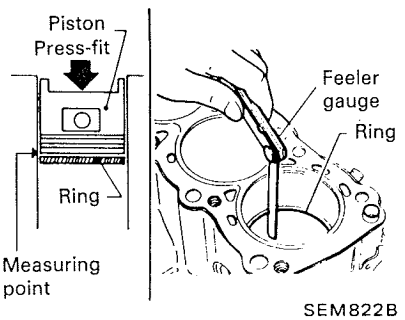
PISTON RING END GAP

End gap:

Unit: mm (in)

Top ring	**0.30 - 0.45 (0.0118 - 0.0177)**
2nd ring	**0.30 - 0.45 (0.0118 - 0.0177)**
Oil ring	**0.20 - 0.60 (0.0079 - 0.0236)**

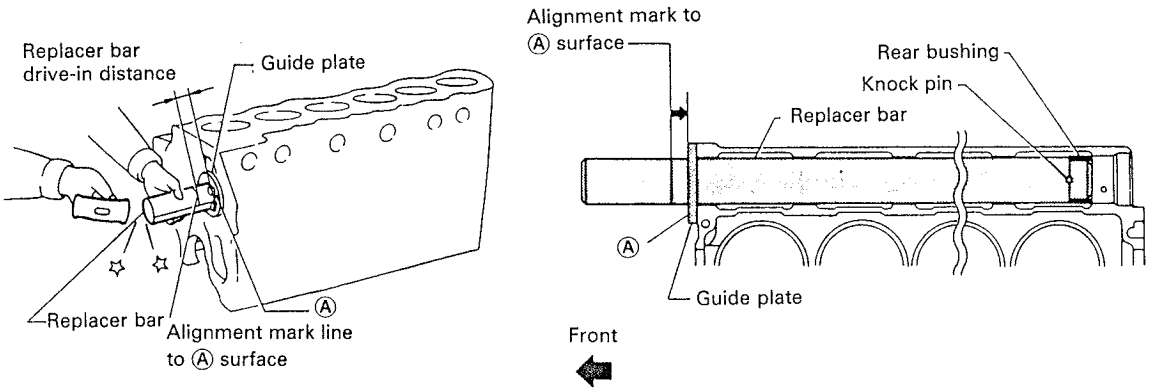
Max. limit of ring gap: **1.5 mm (0.059 in)**



SEM822B

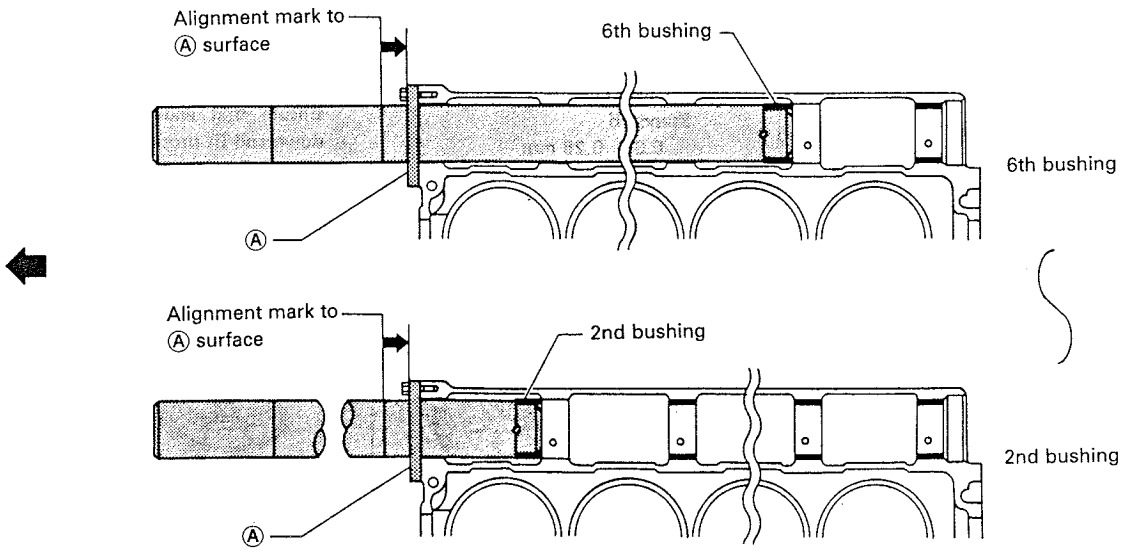
Drive replacer bar until the alignment mark on replacer bar is aligned with the end of guide plate.

Remove replacer set.
After installation, check that oil holes **4.3 mm (0.169 in)** dia. in camshaft bushings are aligned with oil holes **6 mm (0.24 in)** dia. in the cylinder block.



SEM997B

4) 6th, 5th, 4th, 3rd and 2nd camshaft bushings
Install in the same manner as rear camshaft bushing.

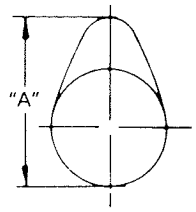


SEM998B

CAMSHAFT AND CAMSHAFT BEARING

Unit: mm (in)

	Standard	Limit
Camshaft journal to bushing clearance [Oil clearance]	0.020 - 0.109 (0.0008 - 0.0043)	0.15 (0.0059)
Inner diameter of camshaft bushing		
Front	50.76 - 50.83 (1.9984 - 2.0012)	—
2nd	50.56 - 50.63 (1.9905 - 1.9933)	—
3rd	50.36 - 50.43 (1.9827 - 1.9854)	—
4th	50.16 - 50.23 (1.9748 - 1.9776)	—
5th	49.96 - 50.03 (1.9669 - 1.9697)	—
6th	49.76 - 49.83 (1.9591 - 1.9618)	—
Rear	49.56 - 49.63 (1.9512 - 1.9539)	—
Outer diameter of camshaft journal		
Front	50.721 - 50.740 (1.9969 - 1.9976)	—
2nd	50.521 - 50.540 (1.9890 - 1.9898)	—
3rd	50.321 - 50.340 (1.9811 - 1.9819)	—
4th	50.121 - 50.140 (1.9733 - 1.9740)	—
5th	49.921 - 49.940 (1.9654 - 1.9661)	—
6th	49.721 - 49.740 (1.9575 - 1.9583)	—
Rear	49.521 - 49.540 (1.9496 - 1.9504)	—
Camshaft bend (Total indicator reading)	Less than 0.02 (0.0008)	0.06 (0.0024)
Camshaft end play	0.08 - 0.28 (0.0031 - 0.0110)	0.5 (0.020)



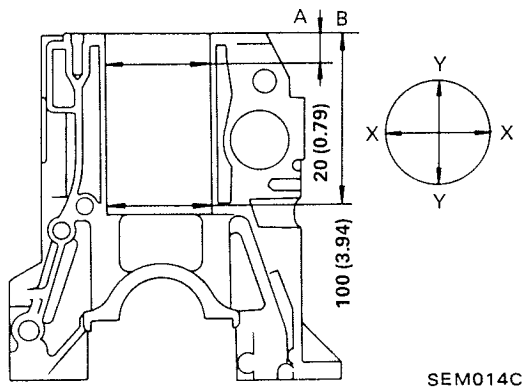
EM671

Unit: mm (in)

Cam height "A"	
Intake	42.311 - 42.561 (1.6658 - 1.6756)
Exhaust	
Wear limit of cam height	0.15 (0.0059)

CYLINDER BLOCK

Unit: mm (in)



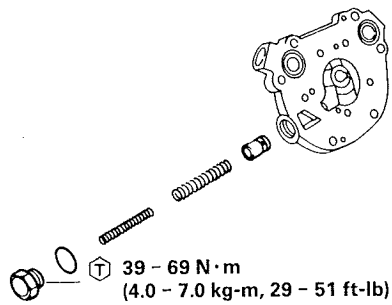
SEM014C

Surface flatness	
Standard	Less than 0.03 (0.0012)
Limit	0.10 (0.0039)
Cylinder bore	
Inner diameter	
Standard	
Grade No. 1	96.000 - 96.010 (3.7795 - 3.7799)
Grade No. 2	96.010 - 96.020 (3.7799 - 3.7803)
Grade No. 3	96.020 - 96.030 (3.7803 - 3.7807)
Grade No. 4	96.030 - 96.040 (3.7807 - 3.7811)
Grade No. 5	96.040 - 96.050 (3.7811 - 3.7815)
Wear limit	0.20 (0.0079)
Out-of-round (X — Y)	Less than 0.015 (0.0006)
Taper (A — B)	Less than 0.010 (0.0004)
Difference in inner diameter between cylinders	
Standard	Less than 0.05 (0.0020)
Wear limit	0.20 (0.0079)

OIL PUMP REGULATOR VALVE

1. Visually inspect components for wear and damage.
2. Check oil pressure regulator valve sliding surface and valve spring.
3. Coat regulator valve with engine oil and check that it falls smoothly into the valve hole by its own weight.

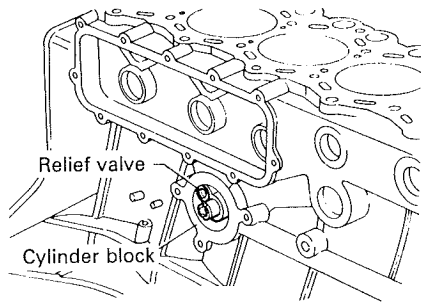
If damaged, replace regulator valve set or oil pump assembly.



FEL027

OIL FILTER RELIEF VALVE

Inspect oil filter relief valve for movement, cracks and breaks by pushing the ball. If replacement is necessary, remove valve by prying it out with suitable tool.
Install a new valve in place by tapping it.

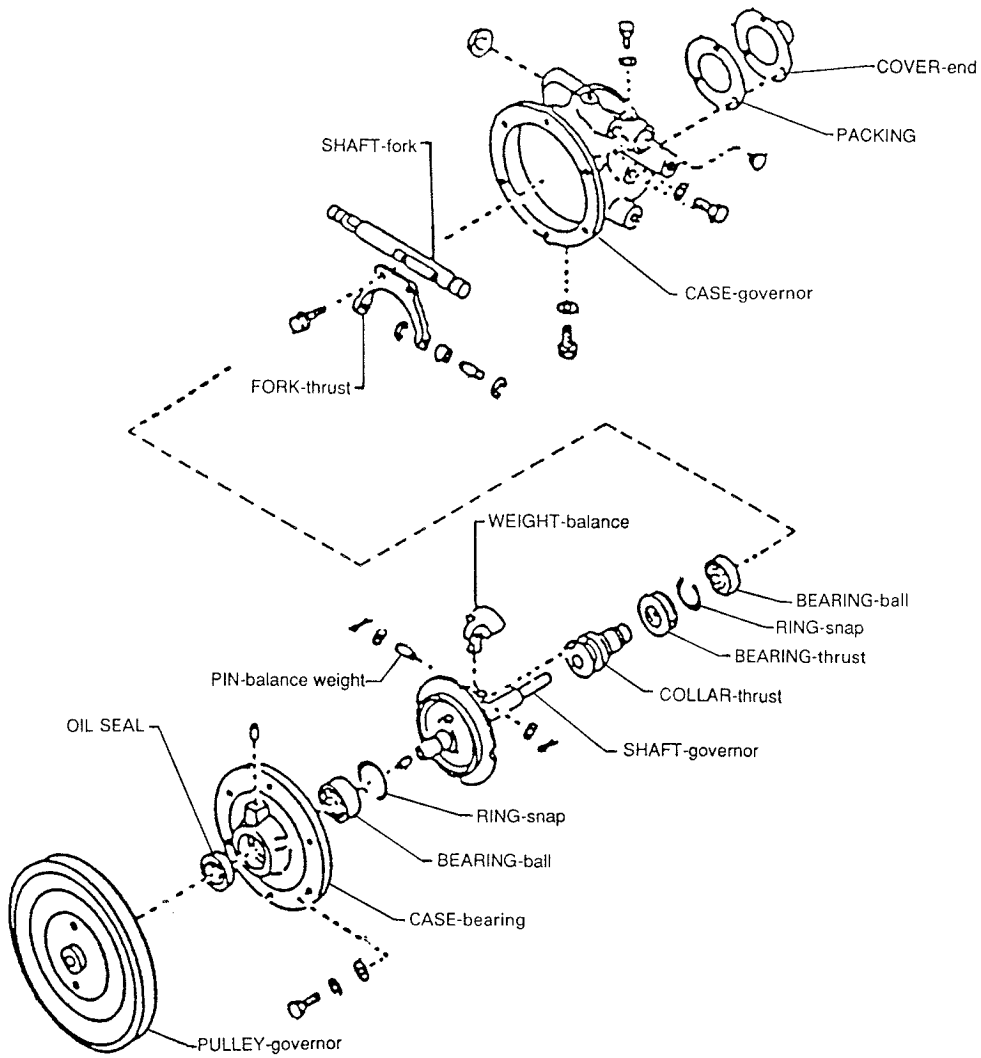


FEL028

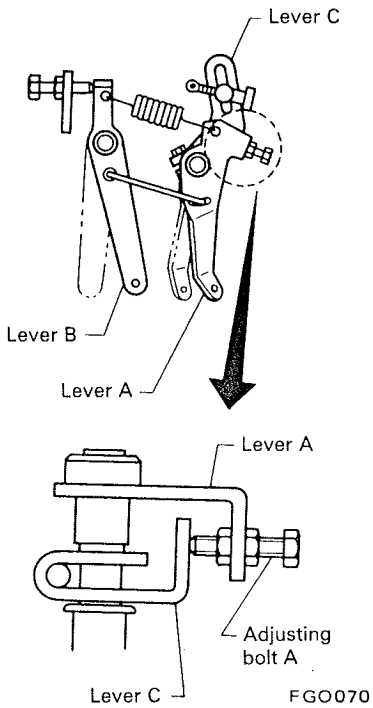
MECHANICAL GOVERNOR

DESCRIPTION

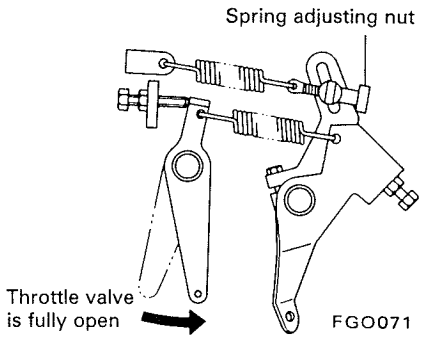
The governor serves to restrict the maximum engine speed under no-load to prevent overrunning, and at the same time, it acts to hold the engine output within its rated capacity, keeping the hydraulic mechanism from yielding to excessive force. It also prevents a sudden change in engine speed that results from fluctuation of load.

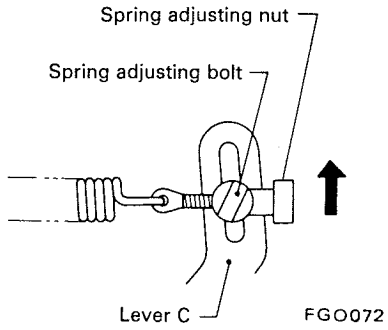


3. Ensure that carburetor throttle valve is fully open when lever B is in fully open position.
   With throttle valve held in that position, turn adjusting bolt A until it contacts lever C.

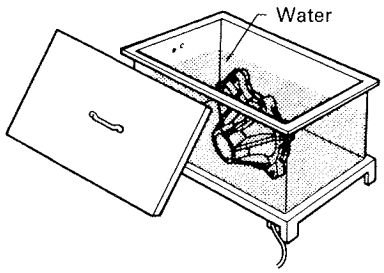


4. Adjust maximum engine speed under no-load, using the following instructions.
   1) Start and warm up engine until water temperature indicator points to the middle of gauge.
   2) Adjust engine idle speed to **700 rpm.**
   3) Position spring adjusting bolt at extreme end of inner side of groove along which lever C slides.
   4) Move lever B to fully open position under no-load so that carburetor throttle valve is fully open.
   5) With lever B held in that position, adjust spring adjusting nut until engine runs at **2,400 to 2,550 rpm.**
5. Check for hunting.
   Term "Hunting" means sudden fluctuation of engine speed attended with vibration. Be sure to check engine for hunting when maximum engine speed under no-load has been adjusted.
   1) Quickly move lever B to fully open position under no-load to see whether engine "hunting" action occurs more than three times. If so, slide spring adjusting bolt approx. **4 mm (0.16 in)** towards the outside of lever C sliding groove, and secure it in that position.



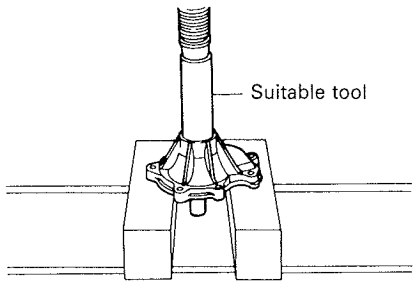


1. Install water pump bearing.
   1) Heat water pump body to **80 to 100°C (176 to 212°F).**



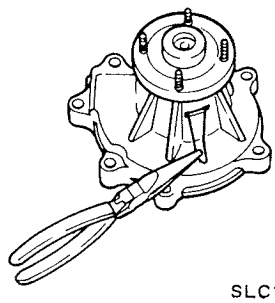
SLC117A

   2) Using a suitable tool and press, press in outer race of bearing.

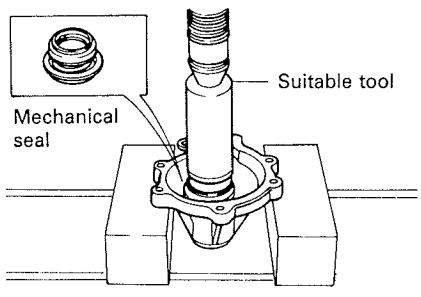


SLC118A

   3) Install wire lock.


SLC113A

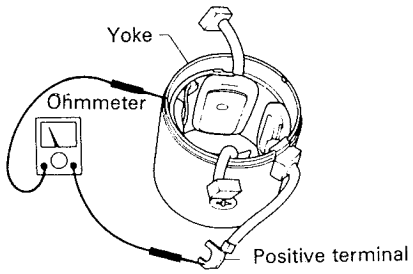
2. Install mechanical seal.
   1) Using a suitable tool and press, press in a new mechanical seal.



SLC119A

2. Insulation test (between field coil positive terminal and yoke).

- Continuity exists ... Replace field coil.

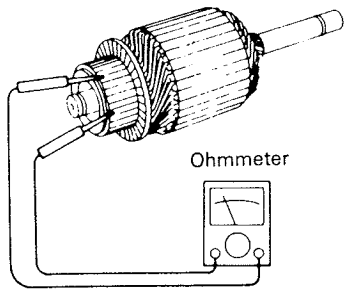


SEL103E

Armature

1. Continuity test (between two segments side by side).

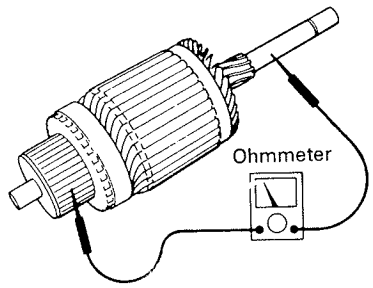
- No continuity ... Replace.



SEL625B

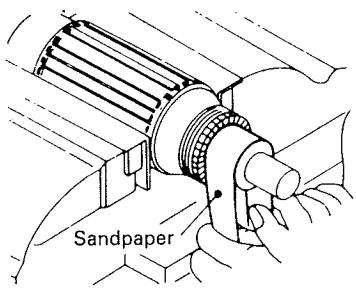
2. Insulation test (between each commutator bar and shaft).

- Continuity exists ... Replace.



SEL104E

3. Check commutator surface.
- Rough ... Sand lightly with No. 500 — 600 sandpaper.



SEL624B

Condition	Probable cause	Corrective action
IMPROPER ENGINE IDLING		
Fuel system trouble	Clogged or damaged carburetor jets.	Clean or replace.
	Incorrect idle adjustment.	Adjust.
	Clogged air cleaner.	Replace element.
	Damaged manifold gaskets or carburetor insulator.	Replace gasket or insulator.
	Improper float level adjustment.	Adjust.
Low compression		Previously mentioned.
Others	Incorrect valve clearance.	Adjust.
	Extremely low revolution.	Adjust.
ENGINE POWER NOT UP TO NORMAL		
Low compression		Previously mentioned.
Ignition system trouble	Incorrect ignition timing.	Adjust.
	Faulty spark plugs.	Clean, adjust or replace plugs.
	Burnt distributor points.	Dress, or replace points. Also check condenser.
Fuel system trouble	Malfunction of choke system.	Adjust.
	Clogged fuel pipe.	Clean.
	Dirty or clogged fuel strainer.	Replace.
	Fuel pump will not work properly.	Repair or replace.
	Clogged carburetor jets and/or needle valve.	Disassemble and clean.
	Throttle valve does not open fully.	Readjust.
	Fuel pump out of adjustment.	Readjust.
Air intake system trouble	Clogged air cleaner.	Replace element.
	Air inhaling from manifold gasket or carburetor gasket.	Replace gasket.
Overheating	Insufficient coolant.	Replenish.
	Loose fan belt.	Adjust fan belt.
	Worn fan belt.	Replace.
	Faulty thermostat.	Replace.
	Faulty water pump.	Replace.
	Clogged or leaky radiator.	Flush, repair or replace.