



SERVICE MANUAL

4G33

for **FG10**
FG14
FG15
FG18

4G52

for **FG20**
FG25

4G54

for **FG30**
FG35A

'84-1



Quality makes the Difference

GENERAL DESCRIPTION

Engine oil

Recommended oil

Use engine oil of API SC class or better. Change the oil after every 200 hours of operation.

Ambient temperature	SAE viscosity grade
Below 0°C (32°F)	10W
-10°C (14°F) ~ 10°C (50°F)	20W
0°C (32°F) ~ 40°C (104°F)	30
Above 30°C (86°F)	40
All seasons	10W-30

Oil change

To change engine oil, proceed as follows:

Warm up the engine. Thoroughly drain the lubrication system by removing the drain plug at the bottom of the oil pan. After draining, tighten the plug securely, remove the filler cap at the rocker cover and refill with fresh oil at the filler.

Oil level check

Remove the oil level gauge and check the oil level in the oil pan. Add clean oil if the level is lower than the mark (MAX 3.5) on the gauge.

NOTE

Re-check the oil level about one minute after re-filling.

OIL FILTER

Description

The oil filter is easy-to-handle cartridge type, consisting of a filter case and an element which are integral in design. If the pressure difference across the filter exceeds 1 kg/cm² (14.2 psi) due to clogging of the element or other reasons, the bypass valve built in the body opens to let the oil bypass the filter. Change the cartridge periodically.

Removal

If it is difficult to manually remove the cartridge, use the filter wrench.

Installation

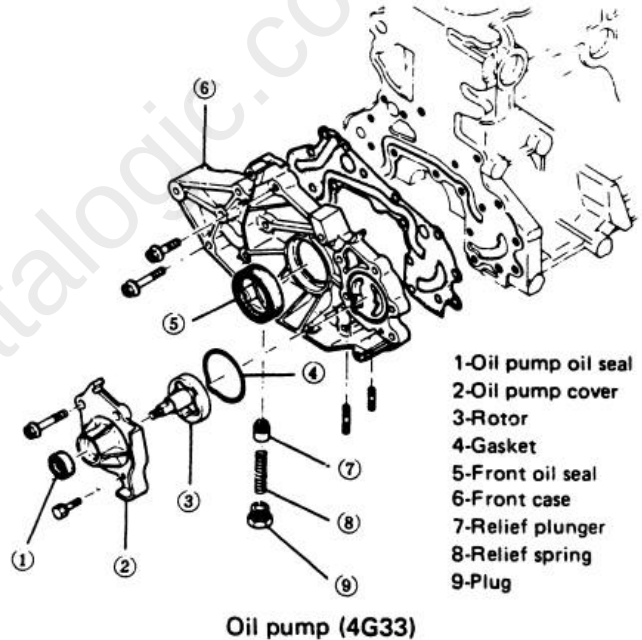
- (1) Apply a coat of lubricant to "O" ring before installing the cartridge.

- (2) Tighten up the cartridge by hand. [Torque specification: 1.1 ~ 1.3 kg-m (8.0 ~ 9.4 lb-ft)] Inspect the "O" ring for distortion and protrusion.
- (3) When replacing the cartridge, add 0.5 liter (0.13 U.S. gal.) of oil.
- (4) Start up the engine and check the cartridge for oil leakage.

OIL PUMP (4G33)

Description

The trochoid oil pump is installed inside of the oil pump cover and is driven by the timing belt. The relief valve, provided in the lower section of the front case, is set to open at 4 ~ 5 kg/cm² (56.9 ~ 71.1 psi) on pressure rise on the cartridge side.



Removal

- (1) Remove the oil filter.
- (2) Remove the oil pump cover bolts and remove the rotor assembly with the cover.

Inspection

See INSPECTION GUIDE (P. 40, 41).

Clean pump parts, inspect them for the following and replace if found in defective conditions.

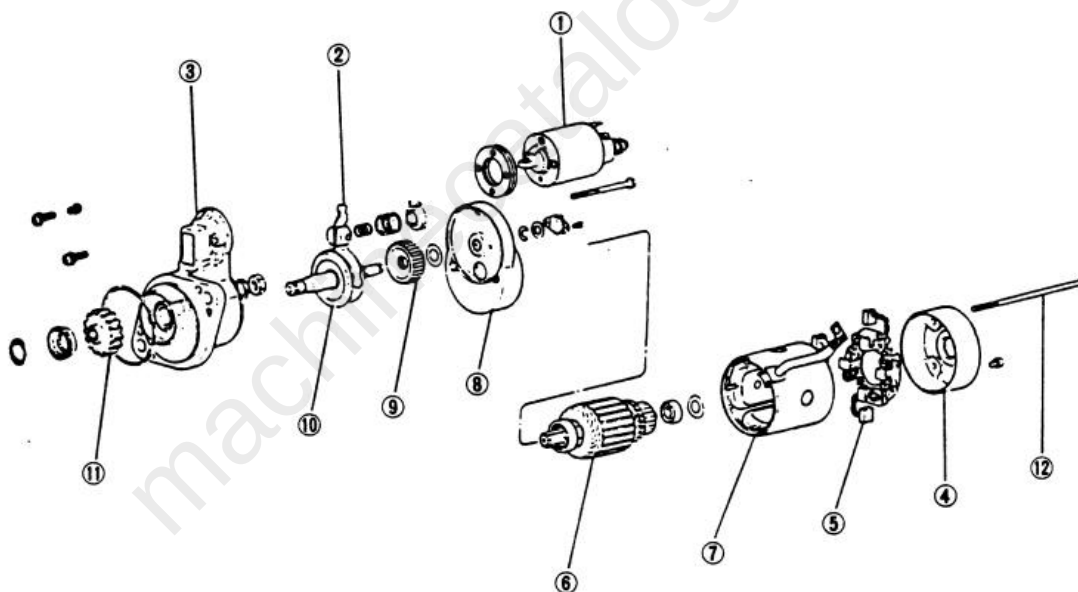
Oil pump cover and front case

- (1) Inspect each part for damage, crack and for excessive wear.

STARTING MOTOR (FOR WET CLUTCH)

Specifications

Item		MG33	MG52	MG54
Starter output (kW – V)		1.6 – 12		
Direction of rotation		Clockwise as viewed from pinion side		
No-load characteristic	Voltage (V)	11.5		
	Current (A)	90 max.		
	Speed (rpm)	3600 min.		
Locked-rotor characteristic	Voltage (V)	4		
	Current (A)	880 max.		
	Torque (kg-m)	2.6, min.		
Electromagnetic switch operating voltage (V)		8, max.		



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|--------------------------|-----------------------|
| 1-Electromagnetic switch | 7-Yoke assembly |
| 2-Lever assembly | 8-Center bracket |
| 3-Front bracket | 9-Reduction gear |
| 4-Rear bracket | 10-Overrunning clutch |
| 5-Brush holder | 11-Pinion |
| 6-Armature | 12-Through bolt |

Starting motor components

TROUBLESHOOTING

Complaint	Cause	Remedy
Excessive oil consumption – con't	- Loose timing gear case cover or damaged cover gasket - Defective crankshaft oil seal - Damaged cylinder head cover gasket - Loose oil filter mounting bolts Excessive oil reaching combustion chambers due to – - Improperly positioned ring gaps - Worn piston rings or ring grooves - Excessive accumulation of carbon in oil return hole in oil ring - Worn pistons and cylinders Too much oil in oil pan Excessive downward flow of oil along valve stems due to – - Worn valve stems or guides - Damaged valve stem oil seals	Retighten attaching bolts. Replace gasket. Replace oil seal. Replace gasket. Retighten bolts. Replace gasket if necessary. Reposition ring gaps. Replace rings or pistons. Replace rings. Rebore cylinders oversize and install new pistons. Drain oil to specified level. Replace valves or guides. Replace oil seals.
Noisy operation	Main bearings worn, resulting in too much oil clearance, or melting Crankpin bearings worn or melting Connecting rods bent or twisted Excessive piston clearance in cylinder Pistons or piston pins worn Piston sticking Piston rings damaged Too much camshaft end play Crankshaft thrust bearing worn Timing gears worn Excessive valve clearance	Replace bearings. If bearings are found to have melted, check lubrication system. Replace bearings. If bearings are found to have melted, check lubrication system. Straighten or replace connecting rods. Bore cylinders oversize and install new pistons. Replace pistons or piston pins. Replace pistons. Replace rings. Replace camshaft thrust plate. Replace thrust bearing. Replace gears. Readjust to specification.

GENERAL DESCRIPTION

Antifreeze solution

Coolant change

- (1) Drain the cooling system and flush it with flushing solvent.
- (2) When re-filling the system, add a rust inhibitor or an antifreeze.
- (3) After re-filling the system, operate the engine for a while and check the water level in the radiator. Add water if the level is low.

Antifreeze and rust inhibitor

The cylinder head and water pump body are aluminum alloys, materials more susceptible to corrosion. With this kept in mind, select rust inhibitor which will not attack the head and pump.

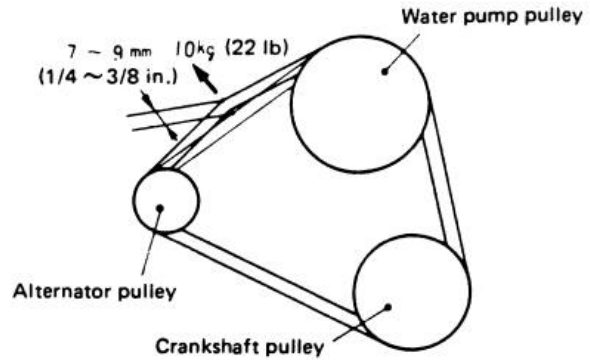
Item	Quantity	Dilution limit
Antifreeze	2.0 liters (0.53 U.S. gal.) (more than 30% in mixing ratio)	5%
Rust inhibitor	0.6 liters (0.16 U.S. gal.) (more than 10% in mixing ratio)	4%

Adjustment

Fan belt tension

- (1) Loosen the nut on the alternator support bolt and the alternator brace bolt.

- (2) Move the alternator and adjust to the specification.



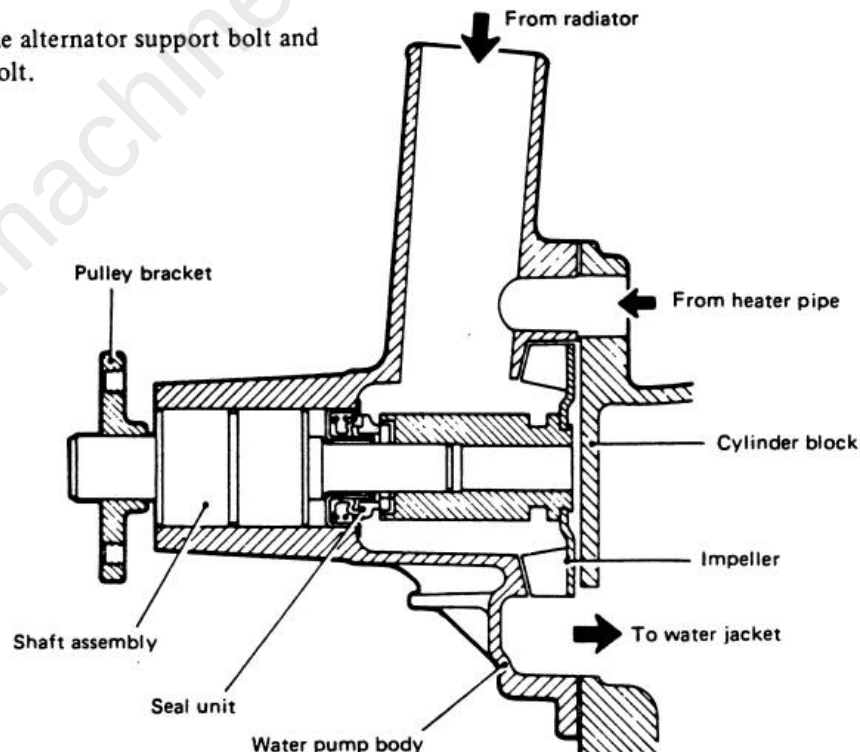
Adjusting belt tension

- (3) After adjusting the belt tension, tighten the brace bolt and the nut on the alternator supporting bolt to the torque specification.

WATER PUMP (4G33)

Description

The water pump is installed in front of the cylinder block. The pump shaft is supported by closed type double-row ball bearings. Grease for lubricating these bearings is hermetically contained, so that there is no need of periodically relubricating them.



Water pump (4G33) — Cross section

Full Version Available

Mitsubishi FG14 Forklift Engine Service Manual (99719-42120)

Mitsubishi FG14 engine service manual, LPG forklift engine repair and diagnostic procedures in scanned PDF format. Instant PDF download.

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