

ENGINE BASE

SERVICE MANUAL

mitsubishi

4G63-32HL, 4G64-33HL

FORKLIFT

REFERENCE ONLY
- FORK LIFT(LPG)

SERVICE MANUAL

4G63-32HL, 4G64-33HL

2004.Jun.

TABLE OF CONTENTS

GENERAL INFORMATION	2
SERVICE SPECIFICATIONS	9
TIGHTENING TORQUE	13
SEALANT	16
SPECIAL TOOLS	17
ENGINE ADJUSTMENT	20
IGNITION SYSTEM	21
TIMING BELT	25
INTAKE MANIFOLD	33
EXHAUST MANIFOLD AND WATER PUMP	34
ROCKER ARMS AND CAMSHAFT	36
CYLINDER HEAD AND VALVES	41
FRONT CASE AND OIL PAN	47
PISTON AND CONNECTING ROD	56
CRANKSHAFT AND CYLINDER BLOCK	63
STARTER MOTOR	69
ALTERNATOR MOTOR	77
DISTRIBUTOR	81
TROUBLESHOOTING	83

GENERAL INFORMATION

GENERAL INFORMATION

EXPLANATION OF MANUAL CONTENTS

Scope of Explanation

This book describes the service procedures for the engine removed from the vehicle.

For procedures concerning removal of the engine from the vehicle and on-vehicle inspection and servicing, refer to the appropriate service manuals separately prepared for the individual models.

Maintenance and Servicing Procedures

- (1) A diagram of the component parts is provided near the front each section in order to give the reader a better understanding of the installed condition of component parts.
- (2) The numbers provided within the diagram indicate the sequence for maintenance and servicing procedures; the symbol **[N]** indicates a non-reusable part; the tightening torque is provided where applicable.

- **Removal steps:**
The part designation number corresponds to the number in the illustration to indicate removal steps.
- **Installation steps:**
Specified in case installation impossible in reverse order of removal steps. Omitted if installation is possible in reverse order of removal steps.
- **Disassembly steps:**
The part designation number corresponds to the number in the illustration to indicate disassembly steps.
- **Reassembly steps:**
Specified in case reassembly is installation impossible in reverse order of disassembly steps. Omitted if reassembly is possible in reverse order of disassembly steps.

Classification of Major Maintenance/Service points

When there are major points relative to maintenance and servicing procedures (such as essential maintenance and service points, maintenance and service standard values, information regarding the use of special tools, etc.), these are arranged together as major maintenance and service points and explained in detail.

←A→ : Indicates that there are essential points for removal or disassembly.

→B← : Indicates that there are essential points for installation or reassembly.

Symbols for Lubrication, Sealants and Adhesives

Information concerning the locations for lubrication and for application of sealants and adhesives is provided, by using symbols, in the diagram of component parts, or on the page following the component parts page, and explained.

 . . . Sealant or adhesive

 . . . Engine oil or gear oil

Inspection

Only the inspections to be performed by using special tools or measuring instruments are covered. General service procedures not covered in this manual, such as visual inspections and cleaning of parts, however, should always be performed during actual service operations.

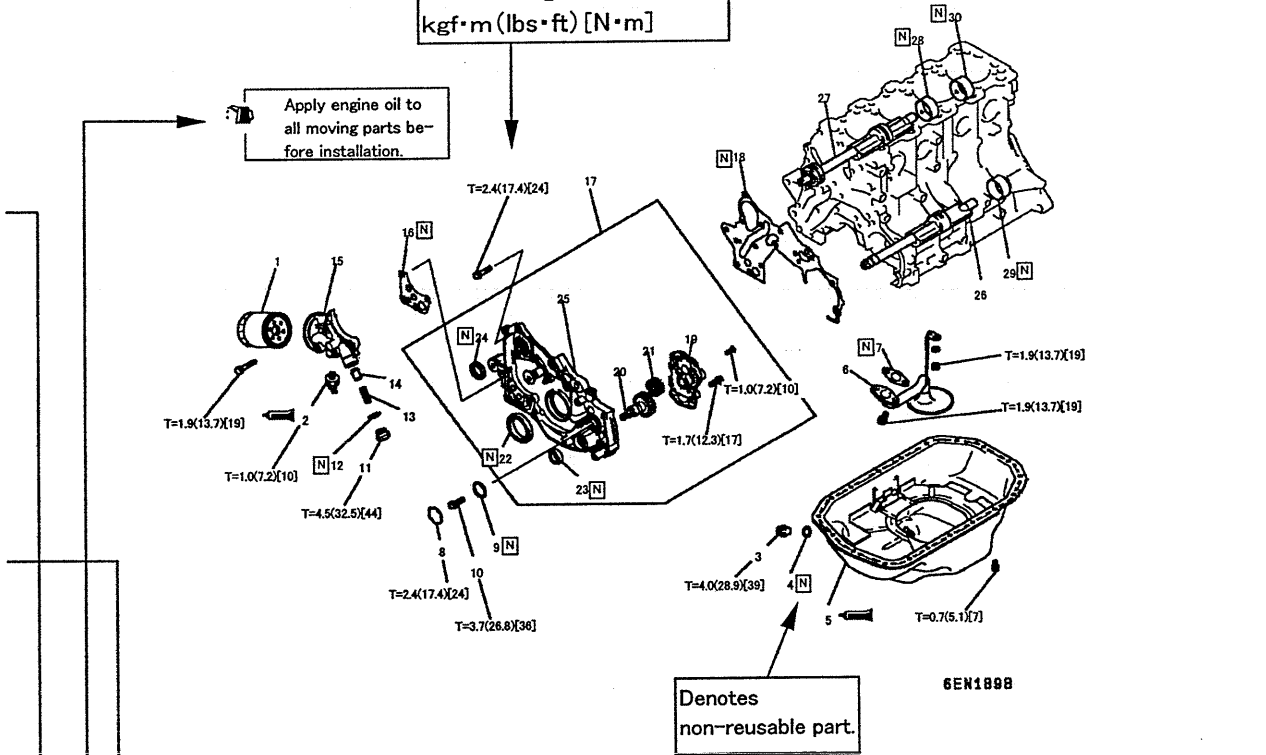
FRONT CASE AND OIL PAN

4G64 engine

Indicates the section title.

Denotes tightening torque.
kgf·m (lbs·ft) [N·m]

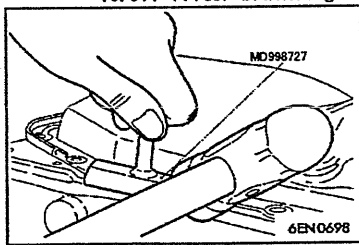
Apply engine oil to all moving parts before installation.



Removal steps

- N← 1. Oil filter
- M← 2. Oil pressure switch
- 3. Drain plug
- L← 4. Drain plug gasket
- ←A→K← 5. Oil pan
- 6. Oil screen
- 7. Oil screen gasket
- ←B→J← 8. Plug
- 9. O-ring
- ←C→I← 10. Flang bolt
- 11. Relief plug
- 12. Gasket
- 13. Relief spring
- 14. Relief plunger
- 15. Oil filter bracket
- 16. Oil filter bracket gasket

- H← 17. Oil pump case assembly
- 18. Front case gasket
- G← 19. Oil pump cover
- G← 20. Oil pump drive gear
- G← 21. Oil pump driven gear
- F← 22. Crankshaft front oil seal
- E← 23. Oil pump oil seal
- D← 24. Counterbalance shaft oil seal
- 25. Front case
- 26. Counterbalance shaft, left
- 27. Counterbalance shaft, right
- ←D→ →C← 28. Counterbalance shaft, front bearing
- ←E→ →B← 29. Counterbalance shaft, rear bearing, left
- ←E→ →A← 30. Counterbalance shaft, rear bearing, right



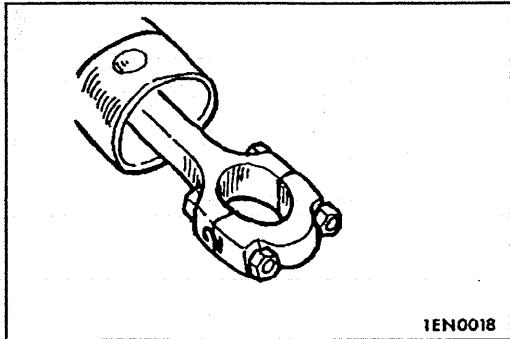
REMOVAL SERVICE POINTS

- ←A→ Oil pan removal
- (1) Remove the all oil pan bolts.
- (2) Drive in the special tool between the cylinder block and oil pan.
- (3) Side the tool by striking the edge of the special tool to separate

Indicates the page number. → 50

This alphabetical letter corresponds to the one assigned to a part in the removal, installation, disassembly or reassembly steps that are indicated in the drawing on the first page of each section.

Operating procedures, cautions, etc. on removal, installation, disassembly and reassembly are described

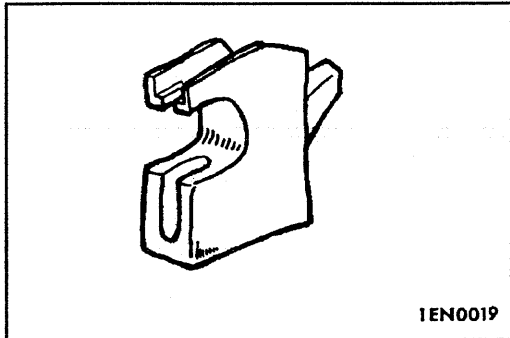


1EN0018

PRECAUTIONS BEFORE SERVICE

Removal and Disassembly

For prevention of wrong installation or reassembly and for ease of operation, put mating marks to the parts where no function is adversely affected.

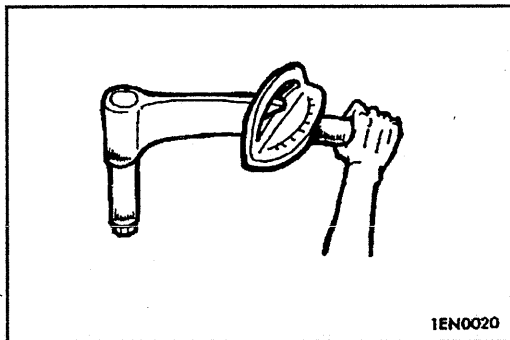


1EN0019

Special Tool

Be sure to use Special Tools when their use is specified for the operation.

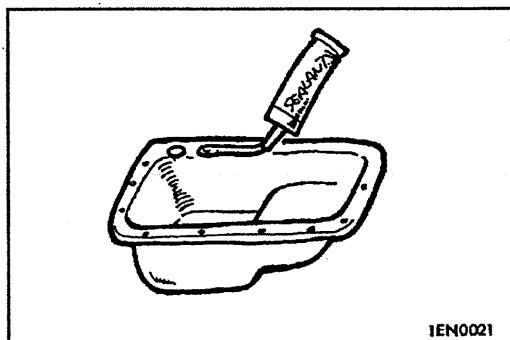
Use of substitute tools will result in malfunction of the part or damage it.



1EN0020

Tightening Torque

Tighten the part properly to specified torque.

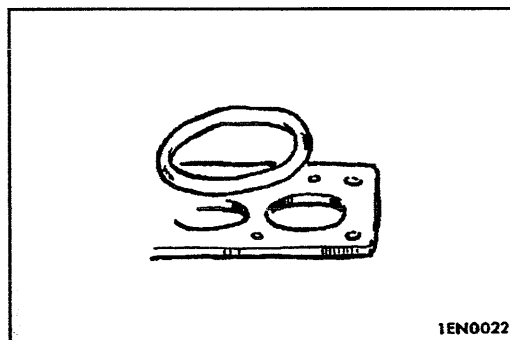


1EN0021

Sealant

Use specified brand of sealant.

Use of sealant other than specified sealant may cause water or oil leaks.

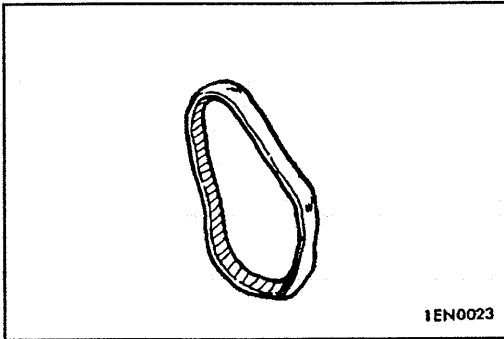


1EN0022

Replacement Part

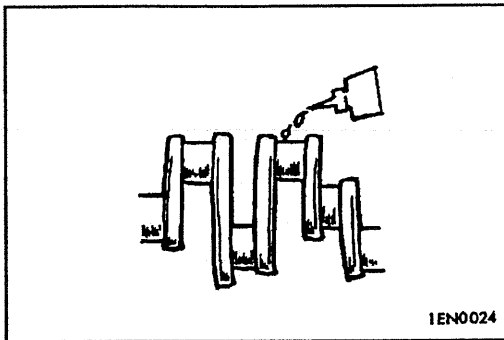
When oil seal, O-ring, packing and gasket have been removed, be sure to replace them with new parts.

However, rocker cover gasket may be reused if it is not damaged.



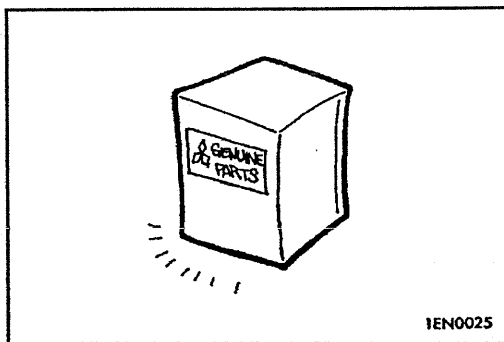
Rubber Parts

Do not stain timing belt and V-belt with oil or water. Therefore, do not clean the pulley and sprocket with detergent.



Oil and Grease

Before reassembly, apply specified oil to the rotating and sliding parts.



Genuine Part

When the part is to be replaced, be sure to use genuine part. For selection of appropriate parts, refer to the Parts Catalog.

GENERAL

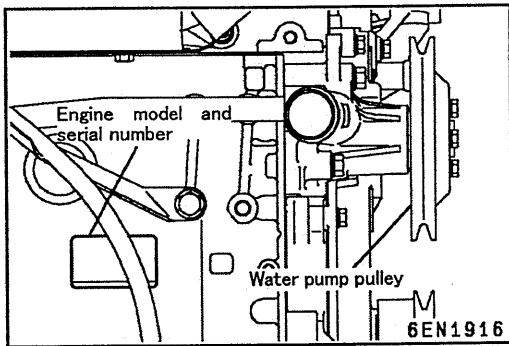
Engine models and numbers

Engine model	Fuel type
4G63-32HL	L.P.G.
4G64-33HL	L.P.G.

Indication of engine model and number

The engine model and serial number are stamped on the right side of cylinder block surface.

Engine model	Engine number
4G63,4G64	AA0001 to YY9999



GENERAL SPECIFICATIONS

Item		Engine model	4G63	4G64
Type		Water-cooled, 4-cycle		
No. of cylinders and arrangement		4, in-line		
Combustion chamber type		Semi-spherical		
Valve mechanism		OHC		
Total displacement, cm ³ (cc) [cub in.]		1997 (1997) [122]		2350 (2350) [143]
Bore x stroke, mm (in.)		85 × 88 (3.35 × 3.46)		86.5 × 100 (3.41 × 3.94)
Dry weight, kg (lbs)		145 (320)		148 (326)
Compression ratio		8.5		8.6
Compression pressure, kPa (kgf/cm ²) [psi]		1128 (11.5) [163.5]		
Valve timing	Intake valve	Open	12° BTDC	
		Close	40° ABDC	
	Exhaust valve	Open	54° BBDC	
		Close	6° ATDC	
Firing order		1 - 3 - 4 - 2		
Lubrication system		Pressure feed, full-flow filtration type		
Oil pump		Gear, driven by timing belt		
Oil filter		Filter paper, cartridge type		
Cooling system		Water-cooled, forced circulation		
Water pump		Centrifugal, driven by V-belt		
Thermostat		Wax type		
Electrical system		12V DC, negative ground		
Alternator, (12V-50A)		Alternator current, built-in fan and regulator		
Starter motor, (12V-1.2kW)		Reduction drive		
Distributor		Igniterless and centrifugal mechanismless type		
Spark plug		BPR5ES or W16EP		
Quantity of lubricating oil, cm ³ (liter) [U.S.gal]		4000(4.0)[1.06](including 300 cm ³ (0.3 liter)[0.08 U.S. gal]in oil filter		
Quantity of coolant, cm ³ (liter) [U.S.gal]		3100 (3.1) [0.82] (in engine proper)		