

ENGINE BASE

SERVICE MANUAL

**MITSUBISHI
S4K,S6K**

REFERENCE ONLY
- EXCAVATOR(10TON, -7SERIES)

MANUAL

INTRODUCTION

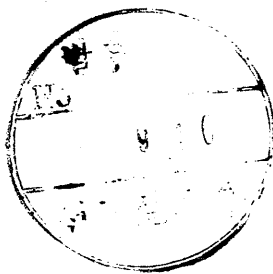
This service manual has instructions and procedures for the subject on the front cover.

The information, specifications and illustrations in this manual are on the basis of the information that was current at the time this issue was written.

Correct servicing, test and repair procedures will give the engine a long service life. Before starting a test, repair or rebuild job, the serviceman must read the respective sections of this manual to know all the components he will work on.

Continuing improvement of product design may have caused changes to your engine which are not included in this manual.

Whenever a question arises regarding your engine, or this manual, consult your Mitsubishi dealer for the latest available information.



HOW TO USE THIS MANUAL

This service manual covers standard specifications for the Mitsubishi Diesel Engine, and describes specifications, maintenance standards, adjustments, disassembly inspection and repair, and reassembly.

Following is a brief summary of the system used in compiling this service manual.

1. The fuel injection pump, governor, and turbocharger are covered in the supplement of this manual.
2. The sections of the manual and their contents are listed in the index furnished at the beginning of the manual. The contents of each section are listed in the index furnished at the beginning of the section.
3. For operation and periodic maintenance, refer to OPERATION MAINTENANCE MANUAL; for component parts and ordering of replacement parts, refer to PARTS CATALOGUE; for systems operation, refer to TRAINING MANUALS.
4. The parts read in the texts or shown in the disassembled views are numbered in the disassembly sequence.
5. What to be inspected for during disassembly are indicated in in the disassembled views.
6. The maintenance standards or specifications to be referred to for inspection and repair are indicated in easy-to-refer passages of the texts and also in Section 2 in a tabulated form.
7. The following symbols are used in this manual to emphasize important and critical instructions:

NOTE Indicates a condition that is essential to highlight.

CAUTION Indicates a condition that can cause engine damage.

WARNING Indicates a condition that can cause personal injury or death.

8. Tighten Torque in "wet" condition is indicated as [wet]. Unless indicated as such, the torque is to be considered in "dry" condition.

9. The following terms are used in the dimensional and other specifications:

Nominal size Is the named size which has no specified limits of accuracy.

Assembly standard Is the dimension of a part to be attained at the time of assembly, or the standard performance. Its value is rounded to the nearest whole number needed for inspection and is different from the design value.

Standard clearance Is the clearance to be obtained between mating parts at the time of assembly.

Repair limit Is the maximum or minimum dimension specified for a part. A part which has reached this limit must be repaired.

Service limit Is the maximum or minimum dimension specified for a part. A part which has reached this limit must be replaced.

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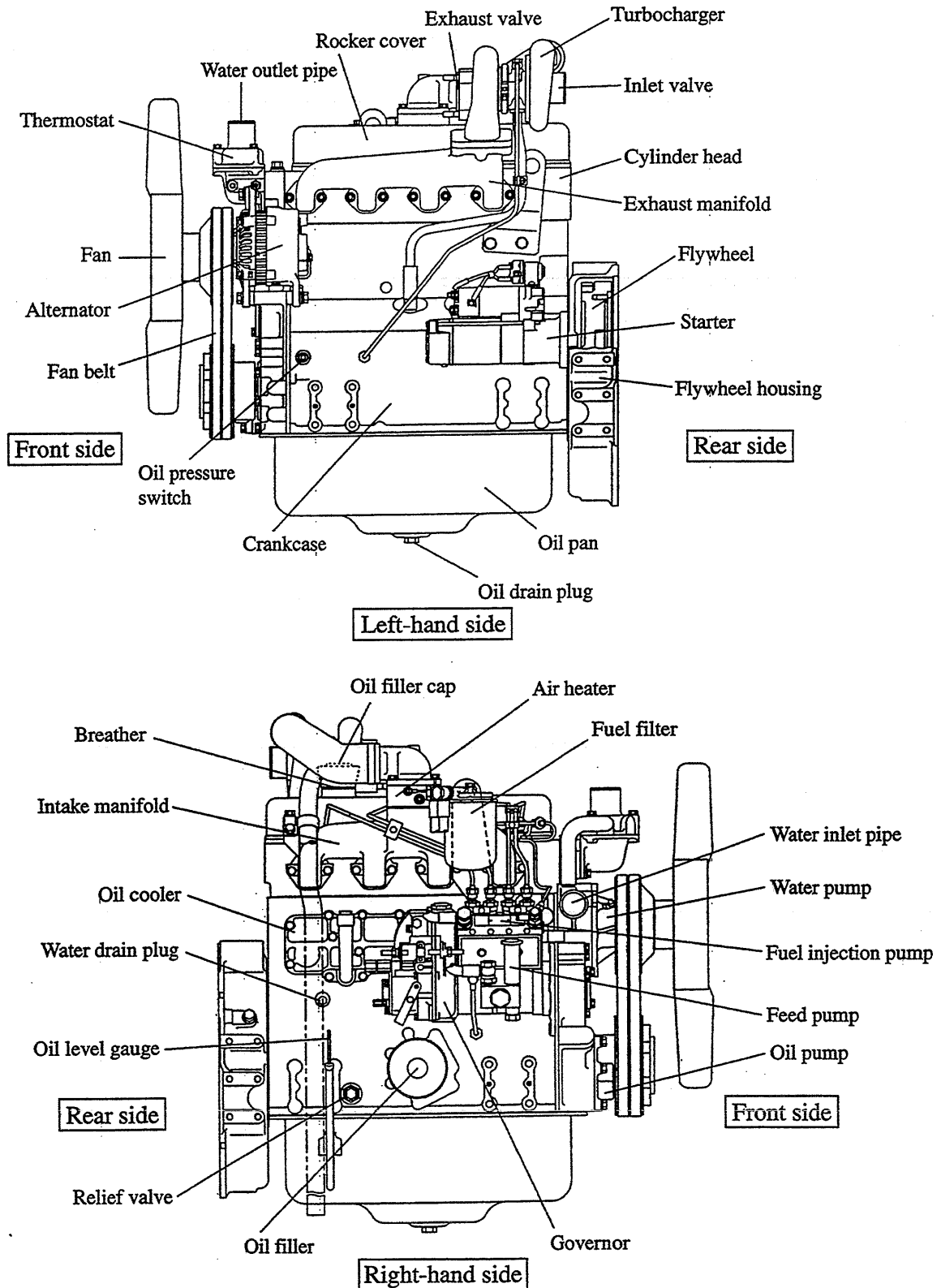
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GENERAL INFORMATION

1. GENERAL

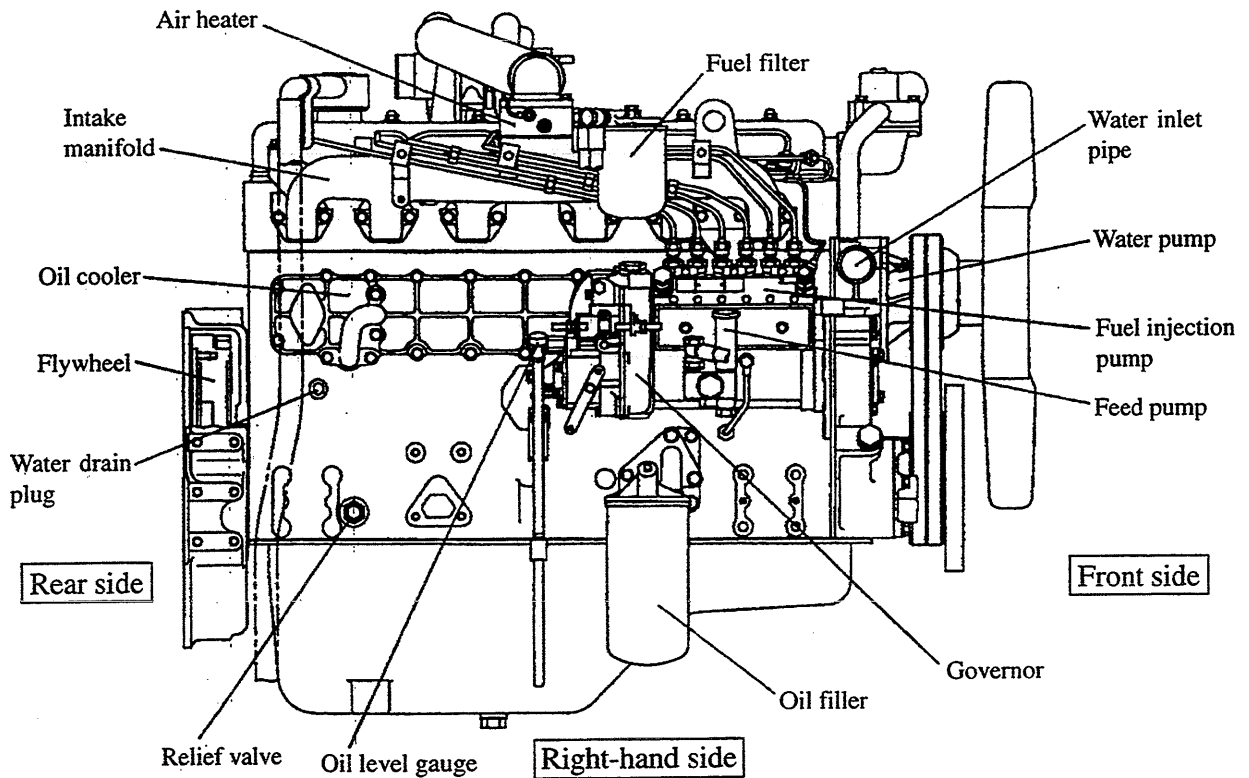
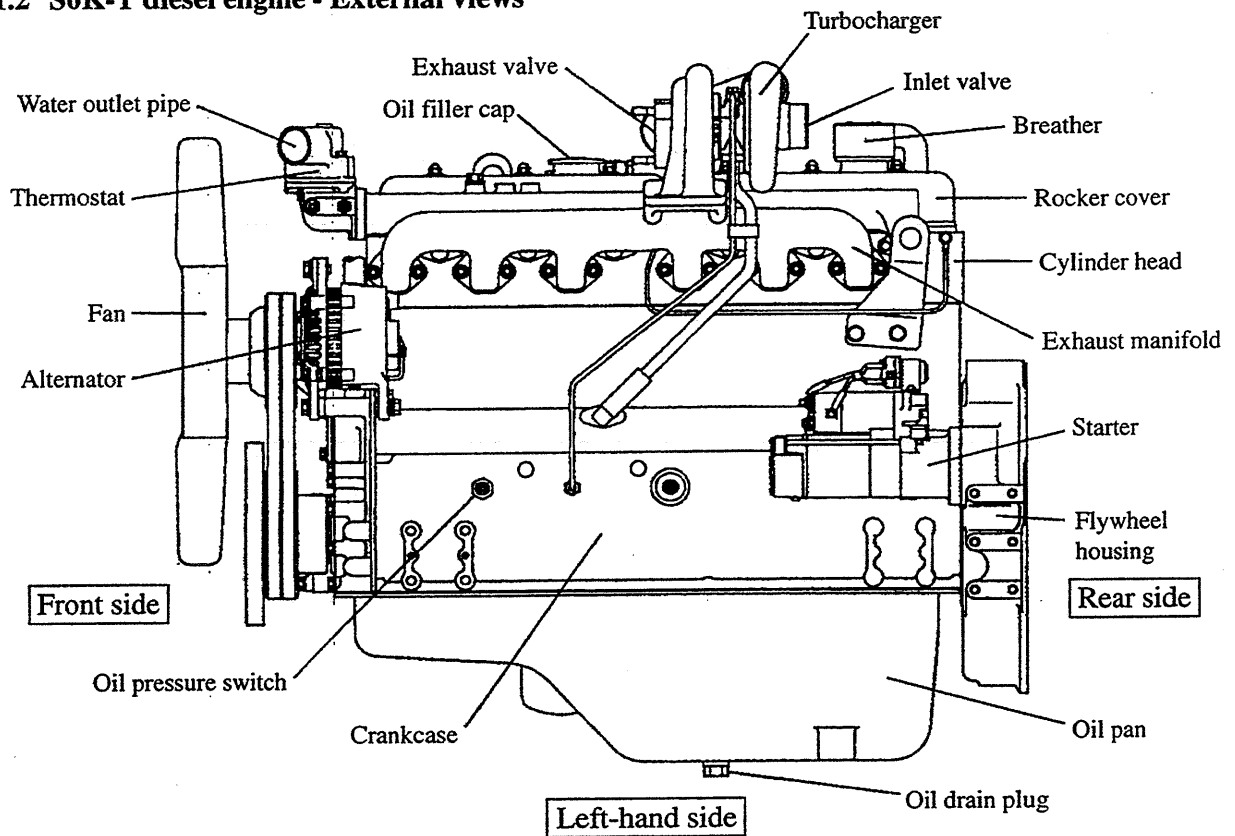
1.1 S4K-T diesel engine - External views



NOTE

Direction of rotation when viewed from the flywheel side is to the rear left (counterclockwise).

1.2 S6K-T diesel engine - External views



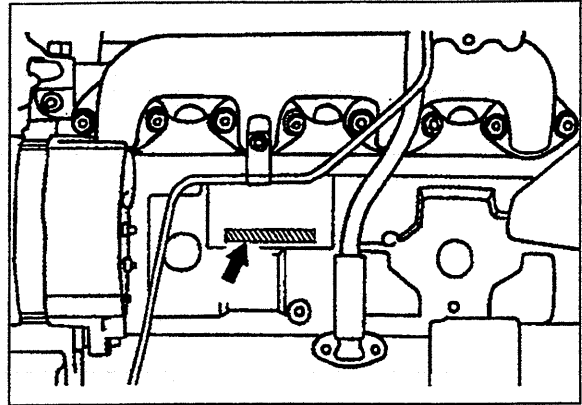
NOTE

Direction of rotation when viewed from the flywheel side is to the rear left (counterclockwise).

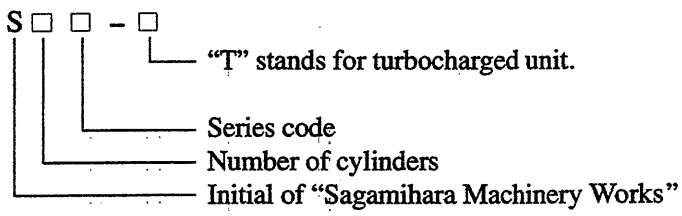
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1.3 Engine serial number location

The engine serial number is stamped on the left side face of crankcase.



1.4 Engine model and application codes



2. SPECIFICATIONS [Sections marked with ☆ indicate Mitsubishi Standard specifications (external diagram).]

Model designation			S4K	S4K-T	S6K	S6K-T	
General	Type		Diesel	Diesel engine with turbocharger	Diesel	Diesel engine with turbocharger	
	Cooling system		Watercooled				
	Cycle		4-stroke cycle				
	No. of cylinders – arrangement		4-in line		6-in line		
	Type of combustion chamber		Direct injection				
	Valve mechanism		Overhead				
	Bore × stroke		mm (in.) 102 × 130 (4.02 × 5.12)				
	Piston displacement		liter (cu in.) 4.249 (259.3)		6.373 (388.9)		
	Compression ratio		17:1				
	Fuel (ASTM specification)		Diesel fuel (JIS K2204 Special Grade 2)				
	Firing order		1-3-4-2		1-5-3-6-2-4		
	Direction of rotation		Counterclockwise as viewed from flywheel side				
	Dimensions (☆)	Overall length	mm (in.)	857 (33.74)	873 (34.37)	1143 (45)	1143 (45)
		Overall width	mm (in.)	631 (24.84)	634 (24.96)	634 (24.96)	634 (24.96)
Overall height		mm (in.)	868 (34.17)	929 (36.57)	918 (36.14)	976 (38.43)	
Weight (dry)		kg (lb)	340 (750)	350 (770)	465 (1025)	475 (1047)	
Engine proper	Type of cylinder sleeves		Dry, special cast iron				
	No. of piston rings	Compression ring	2				
		Oil ring	1 (w/spring expander)				
	Valve timing	Inlet valves	Open	10° B.T.D.C.			
			Close	50° A.B.D.C.			
		Exhaust valves	Open	54° B.B.D.C.			
			Close	10° A.T.D.C.			
Starting system		Electric starter					
Starting aid		Air heater					
Inlet/exhaust systems	Air cleaner	Type	Paper element				
	Turbocharger	Type	-	TD06H or TD04H	-	TD06H	
Lubrication system	Type		Pressure feed by oil pump				
	Engine oil	API service classification	CD	CD	CD	CD	
		Refill capacity (incl. filter) liter (U.S. gal)	13 (3.4)		20.5 (5.4)		
	Oil pump	Type	Gear				
		Speed ratio to crankshaft	1.0				
Delivery capacity liter (U.S. gal)/min/rpm		40 (10.57)/2000		66 (17.44)/1800			

GENERAL INFORMATION

Model designation		S4K	S4K-T	S6K	S6K-T	
Lubrication system	Relief valve	Type	Piston valve			
		Opening pressure kgf/cm ² (psi) [MPa]	3.5 ± 0.2 (49.79 ± 2.85) [0.34 ± 0.02]			
	Oil cooler	Type	Water-cooled multi-plate type			
	Oil filter	Type	Cartridge type paper element			
	Safety valve (primary)	Opening pressure kgf/cm ² (psi) [MPa]	—		12 ± 1(170.7±14.225)[1.2 ± 0.1]	
	Safety valve (secondary)	Opening pressure kgf/cm ² (psi) [MPa]	10 ± 1(142.25±14.225) [1.0 ± 0.1]			
Cooling system	Refill capacity (engine water jacket) liter (U.S. gal)		6 (1.6)		9 (2.4)	
	Water pump	Type	Centrifugal			
		Delivery capacity liter (U.S. gal)/min/rpm	130 (34.3)/ 1800	145 (38.3)/ 1800	174 (45.9)/1800	
	Water pump pulley	Speed ratio to crankshaft	1.26	1.0	1.0	1.15
	Fan belt	Type	Low-edge cog B type V-belt			
	Thermostat	Type	Wax pellet			
		Valve opening temperature °C (°F)	71 ± 2 (159.8 ± 35.6)			
	Fan	Type	Polypropylene-blade circular arc			
No. of blades		7				
Diameter mm (in.)		600 (23.6)				
Fuel system	Injection pump	Type	Bosch A or AD			
		Diameter of plunger mm (in.)	9.5 (0.374) or 10.5 (0.413)			
	Feed pump	Type	Bosch, piston			
		Cam lift mm (in.)	1.5 (0.06)			
	Governor	Type	Centrifugal			
	Injection nozzles	Type of nozzle holder	Bosch RSV			
		Type of nozzle tip	KBAL-P			
		No. of spray holes	4			
		Diameter of spray hole mm (in.)	0.3 (0.012)			
		Spray angle	155°			
	Valve opening pressure kgf/cm ² (psi) [MPa]	220 (3128) [21.6]				
Fuel filter	Type	Cartridge of paper element				