SEN04211-03

Shop Manual

ENGINE

82E-6 - 98E-6 SERIES

MidWestTech | Komatsu 82E-6, 98E-6 Series Engine Service Manual | Publication SEN04211-03

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Table of contents

00 Index and foreword
Index SEN04213-03
Composition of shop manual 2-2
Table of contents 2-3

Foreword and general information SEN04214-03
Introduction 3-2
Applicable machine model and serial number 3-3
Safety Statements 3-4
Safety Precautions 3-5

01 Specification
Specification and technical data SEN04216-00
Component identification 4-3
Function of major engine components 4-5
Main electronic control components and features 4-6
Function of cooling system components 4-8
Diesel fuel 4-9
Engine oil 4-12
Engine coolant 4-15
Specifications 4-18
Principal engine specifications 4-20
Engine service standards 4-40
Tightening torques for standard bolts and nuts 4-41
Abbreviations and symbols 4-43
Unit conversions 4-44

30 Testing and adjusting
Testing and adjusting, Part 1 SEN04218-00
Periodic maintenance
Before you begin servicing 5-3
Introduction 5-16
Periodic maintenance schedule 5-17
Periodic maintenance procedures 5-20
Testing and adjusting, Part 2 SEN04219-00
Engine
Before you begin servicing 6-3
Introduction 6-6
Cylinder head specifications 6-6
Camshaft and timing gear train specifications 6-11
Crankshaft and piston specifications 6-14
Cylinder block specifications 6-23
Special torque chart 6-24
Special service tools 6-27
Measuring instruments 6-31
2-valve cylinder head 6-33
4-valve cylinder head 6-48
Measuring and adjusting valve clearance 6-65
Crankshaft and camshaft components 6-70
EGR system 6-98

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Testing and adjusting, Part 3 SEN04220-03
Fuel system
Before you begin servicing ... 7-3
Introduction ... 7-8
Fuel system specifications ... 7-11
Special service tools ... 7-13
Measuring instruments ... 7-13
Fuel system diagram ... 7-14
Fuel system components ... 7-15
Fuel injection pump ... 7-19
Checking and adjusting fuel injection timing ... 7-30
Fuel injectors ... 7-35
Testing and adjusting, Part 4 SEN04221-00
Cooling system
Before you begin servicing ... 8-3
Introduction ... 8-6
Cooling system diagram ... 8-6
Engine coolant pump components ... 8-7
Engine coolant system check ... 8-8
Engine coolant pump ... 8-8
Testing and adjusting, Part 5 SEN04222-00
Lubrication system
Before you begin servicing ... 9-3
Introduction ... 9-5
Oil pump service information ... 9-5
Lubrication system diagram ... 9-8
Checking engine oil pressure ... 9-9
Trochoid oil pump ... 9-9
Trochoid oil pump ... 9-13
Trochoid oil pump ... 9-17
Testing and adjusting, Part 6 SEN04223-00
Turbocharger
Before you begin servicing ... 10-3
Introduction ... 10-5
Specifications ... 10-5
Troubleshooting ... 10-6
Turbocharger components ... 10-8
Turbocharger component functions ... 10-10
Washing procedure ... 10-12
Periodic inspection ... 10-13
Testing and adjusting, Part 7 SEN04224-00
Starter motor
Before you begin servicing ... 11-3
Introduction ... 11-5
Starter motor information ... 11-5
Starter motor specifications ... 11-7
Starter motor troubleshooting ... 11-8
Starter motor components ... 11-9
Starter motor ... 11-10
Testing and adjusting, Part 8 SEN04225-00
Alternator
Before you begin servicing ... 12-3
Introduction ... 12-6
Dynamo and alternator information ... 12-6
Alternator specifications ... 12-7
Dynamo specifications ... 12-7

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Alternator troubleshooting 12-8
Alternator components 12-9
Alternator wiring diagram 12-10
Alternator standard output 12-11
Alternator 12-12
Dynamo component location 12-17
Dynamo wiring diagram 12-18
Operation of dynamo 12-18
Dynamo standard output 12-19
Testing of dynamo 12-20
Dynamo 12-20

40 Troubleshooting
Troubleshooting of mechanical system SEN04227-00
Special service tools 15-217
Troubleshooting by measuring compression pressure 15-219
Quick reference table for troubleshooting 15-222
Failure Diagnostic List 15-223

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4D84E (– EPA Tier2)

Engine Model		4D84E							
Version		CL		VM					
Type		Vertical In-line Diesel Engine							
Combustion System		Direct Injection							
Aspiration		Natural							
No. of Cylinders		4							
Bore × Stroke		84 × 90mm							
Displacement		1.995L							
Continuous Rated Output	min^{-1}	1500	1800						
	kW	14.9	17.7						
	PS	20.3	24.1						
Max. Rated Output (Net)	min^{-1}	1500	1800	2000	2200	2400	2600	2800	3000
	kW	16.4	19.5	21.9	24.1	26.3	28.5	30.7	32.9
	PS	22.3	26.5	29.8	32.8	35.8	38.7	41.7	44.7
High Idle	min^{-1}	1600 ± 25	1895 ± 25	2180 ± 25	2400 ± 25	2590 ± 25	2810 ± 25	2995 ± 25	3210 ± 25
Engine Weight (Dry) *with Flywheel Housing		183kg		170kg					
PTO Position		Flywheel End							
Direction of Rotation		Counterclockwise Viewed From Flywheel End							
Cooling System		Liquid-Cooled with Radiator							
Lubricating System		Forced Lubrication with Trochoid Pump							
Normal Oil Pressure at Rated Engine Speed		0.34 – 0.49 MPa		0.39 – 0.54 MPa					
Normal Oil Pressure at Low Idle Speed		0.06 MPa							
Starting System		Electric Starting (Starter Motor: DC12V (1.4 kW)) ***							
		Alternator: DC12V, 40A***							
		Recommended Battery Capacity: 12V, 64Ah*** (5h rating)							
Dimensions (L × W × H)*		683 × 498.5 × 617 mm		658 × 498.5 × 617mm					
Engine Oil Pan Capacity**		7.4/4.0L (Dipstick Upper Limit / Lower Limit)							
Engine Coolant Capacity		2.7L Engine Only							
Standard Cooling Fan		370mm O.D., 6 Blade Pusher-Type ***							
Crank V-pulley dia./ Fan V-pulley dia.		ϕ120/ ϕ90mm ***		ϕ110/ ϕ110mm ***					

* Engine specifications without radiator.

** Engine oil capacity for a "Deep Standard" oil pan. Refer to the operation manual for the actual engine oil capacity of your machine.

*** May vary depending on application.

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Removing the glow plugs

1. Remove the glow plug harness **(Figure 6-6, (2))** from each glow plug **(Figure 6-6, (1))**.
2. Remove the glow plug from the cylinder head.

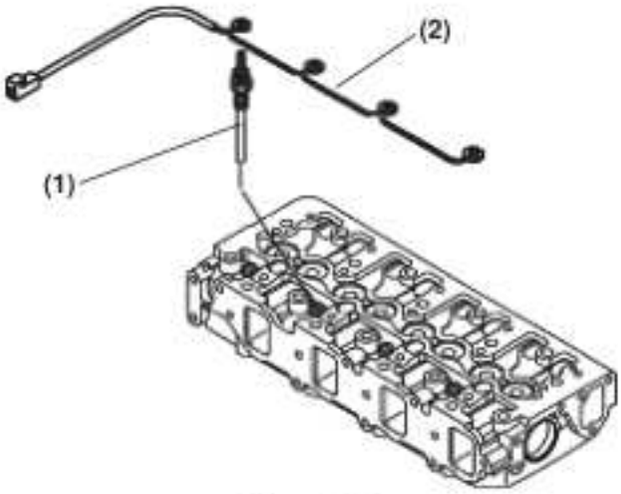


Figure 6-6

Note: Removing the cylinder head from the engine requires that the glow plugs be removed in advance.
Failure to remove the glow plugs in advance could result in damages to the glow plugs because their tips are protruding from the cylinder head combustion chamber surface.

Removal of valve cover

1. Remove the valve cover nuts **(Figure 6-7, (1))**.
2. Remove the O-ring **(Figure 6-7, (2))** on each valve cover nut.

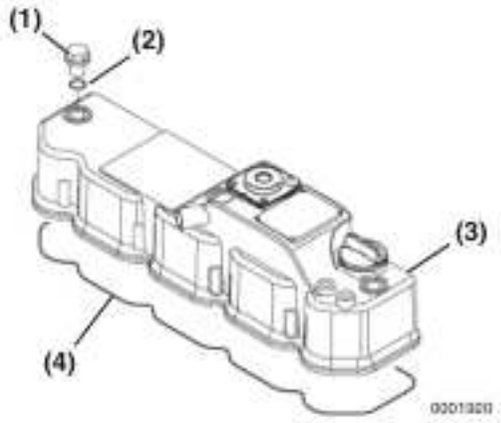
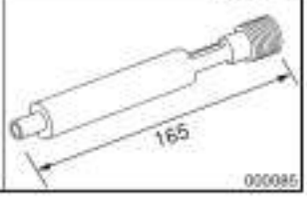


Figure 6-7

3. Remove the valve cover **(Figure 6-7, (3))** and the valve cover gasket **(Figure 6-7, (4))**.

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Special service tools

Compression Gauge Kit	For measuring compression pressure Part No. YMTOL-97190080	
	Adapter for direct injection 2-valve cylinder head Part No. 795-111-1130	
	Adapter for direct injection 4-valve cylinder head for 4D94LE/98E/S98E Part No. YM129906-92950	

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Failure Diagnostic List

	Symptoms and conditions of failures / Cause	Defective start: Starter not rotate: ECU indicator lamp not on just after key-on	Defective start: Starter not rotate: ECU indicator lamp on just after key-on (2 seconds)	Defective start: Starter rotates: Engine not start (not even initial combustion)	Defective start: Starter rotates: Engine not start (stall after serial combustion)	Defective start: Starter rotates: Engine starts later then ever	Engine stall after start: Exhaust fume: None	Engine stall after start: Exhaust fume: Little	Engine stall after start: Exhaust fume: Much	Defective rotation control: Speed change by accelerator not available (constant speed)	Defective rotation control: Without load: Specified speed setting not available	Defective rotation control: Without load: Poor acceleration	Defective rotation control: Without load: Return to low speed not smooth	Defective rotation control: Without load: Hunting	Defective rotation control: At work: Hunting	Insufficient engine output: Exhaust color: Normal	Insufficient engine output: Exhaust color: White	Insufficient engine output: Exhaust color: Black	Noise/vibration: Knocking noise at combustion too high	Noise/vibration: Combustion noise uneven	Noise/vibration: Noise other than combustion from engine	Noise/vibration: Engine vibration too big	Lubricant: Lubricant consumption too much	Lubricant: Lubricant diluted with fuel	Lubricant: Lubricant mixed with water	Lubricant: Oil pressure too low (oil pressure lamp on)	Cooling water: Overheated (water temperature lamp on)	Cooling water: Water temperature too low	Intake: Pressure down (air cleaner lamp on)	Intake: Pressure up	Exhaust: At work: White exhaust color	Exhaust: At work: Black exhaust color	Exhaust: Blow-by too much	Exhaust: Exhaust temperature up	Fuel: Fuel consumption too much	Fuel: Fuel mixed with water (oil-water separator lamp on)	Fuel: Fuel filter contaminated too early	Electrics/electronics: Battery charge defect (charge lamp on)	Electrics/electronics: ECU indicator lamp flashing	Electrics/electronics: ECU indicator lamp not on just after key-on (2 seconds)	Electrics/electronics: Prescribed ECU control function not operate	Electrics/electronics: Fuse meltdown, disconnection (repeated)	Action	Referenced page number
Engine system	Intake/exhaust valve clearance incorrect			○			○									○					○							○				○									Valve clearance adjustment	See "Measuring and adjusting valve clearance" (on page 6-65)
	Compression failure at valve seat			○												○		○			○							○			○	○	○	○							Valve seat facing	See "Valve face and valve seat" (on page 6-42) for 2-valve head, and "Valve face and valve seat" (on page 6-58) for 4-valve head.
	Intake/exhaust valve seizure			○					○						○	○		○			○	○		○				○			○	○								Correction or replacement of intake/exhaust valve	See "Removal of intake / Exhaust valves" (on page 6-38).
	Cylinder head gasket blow-out															○							○			○														Gasket replacement	See "Removal of cylinder head" (on page 6-53).
	Piston ring sticking or breakage			○					○				○			○			○	○	○	○			○				○		○	○								Piston ring replacement	See "Reassembly of pistons" (on page 6-88).
	Wear of piston ring, piston or cylinder			○					○							○					○	○						○			○								Honing work and usage of over-sized parts	See "Honing and boring" (on page 6-87).
	Seizure of crank pin metal or bearing parts			○			○						○	○					○	○											○								Repair or replacement	See "Inspection of crankshaft" (on page 6-85).
	Closed gap position fault of piston ring						○									○					○										○								Correction of closed gap position	See "Reassembly of pistons" (on page 6-88).
	Reverse assembling of piston ring															○					○							○			○								Correction of assembling	See "Reassembly of pistons" (on page 6-88).
	Wear of crank pin metal and journal metal												○	○	○				○	○				○															Measurement and replacement	See "Inspection of crankshaft" (on page 6-85).
	Connecting rod bolt loose																		○	○				○															Tightening at specified torque	See "Torque for bolts and nuts" (on page 6-24).
	Foreign material entered into combustion chamber			○															○		○										○								Disassembling and repair	See "Disassembly of engine" (on page 6-71).
	Gear backlash too big																		○																				Gear mesh adjustment	See "Checking timing gear backlash" (on page 6-72).
	Wear of intake/exhaust valve guide															○					○										○								Measurement and replacement	See "Inspection of valve guides" (on page 6-40).
	Governor misalignment			○			○				○	○	○						○																				Adjustment	See "Check and adjust the governor lever and engine speed control (This does not apply to the following electronically controlled engines: S4D84E-Z, 4D98E-E, Z and S4D98E-Z.)" (on page 5-30).
	Open/close timing failure of intake/exhaust valve			○												○	○		○												○	○								Valve clearance adjustment	See "Measuring and adjusting valve clearance" (on page 6-65).
	Engine vibration isolating support loose, damage												○	○					○	○																				Repair or replacement of faulty parts	
Turbocharger	Floor contamination																○															○		○						Floor cleaning	See "Washing procedure" (on page 10-12).
	Operation defect of waste gate																○															○		○						Disassembling and inspection	See "Waste gate valve test" (on page 10-14).
	Wear of radial metal															○					○										○								Disassembling and inspection	See "Radial bearing" (on page 10-11).

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