WSM

WORKSHOP MANUAL

DIESEL ENGINE

03-M-E2B SERIES

Kubota

KiSC issued 06, 2006 A

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Model		V2003-M-T	V2403-M
Number of Cylinders		4	
Type		Vertical, Water-cooled, 4 cycle diesel engine	
Bore × Stroke		83 × 92.4 mm (3.27 × 3.64 in.)	87 × 102.4 mm (3.43 × 4.03 in.)
Total Displacement		1999 cm^3 (121.99 cu.in.)	2434 cm^3 (148.53 cu.in.)
ISO Net Continuous		35.5 kW / 2800 min^{-1} (rpm) (47.6 HP / 2800 min^{-1} (rpm))	31.0 kW / 2600 min^{-1} (rpm) (41.6 HP / 2600 min^{-1} (rpm))
ISO/SAE Net Intermittent		41.0 kW / 2800 min^{-1} (rpm) (55.0 HP / 2800 min^{-1} (rpm))	35.8 kW / 2600 min^{-1} (rpm) (48.0 HP / 2600 min^{-1} (rpm))
SAE Gross Intermittent		44.0 kW / 2800 min^{-1} (rpm) (59.0 HP / 2800 min^{-1} (rpm))	38.0 kW / 2600 min^{-1} (rpm) (51.0 HP / 2600 min^{-1} (rpm))
Maximum Bare Speed		3000 min^{-1} (rpm)	2800 min^{-1} (rpm)
Minimum Bare Idling Speed		850 to 950 min^{-1} (rpm)	750 to 850 min^{-1} (rpm)
Combustion Chamber		Spherical Type (E-TVCS)	
Fuel Injection Pump		Bosch Type Mini Pump	
Governor		All speed mechanical governor	
Direction of Rotation		Counter-clockwise (viewed from flywheel side)	
Injection Nozzle		Bosch Throttle Type Mini Nozzle (OPD)	
Injection Timing		0.314 rad (18 °) before T.D.C.	
Firing Order		1-3-4-2	
Injection Pressure		13.73 MPa (140 kgf/cm^2, 1991 psi)	
Compression Ratio		22.0 : 1	23.8 : 1
Lubricating System		Forced Lubrication by Trochoid Pump	
Oil Pressure Indicating		Electrical type switch	
Lubricating Filter		Full flow paper filter (cartridge type)	
Cooling System		Pressurized radiator, forced circulation with water pump	
Starting System		Electric Starting with Starter	
Starting Motor		12 V, 1.4 kW	12 V, 2.0 kW
Starting Support Device		By glow plug in combustion chamber	
Battery		12 V, 100 to 120 AH equivalent	
Charging Alternator		12 V, 480 W	
Fuel		Diesel Fuel No.2-D (ASTM D975)	
Lubricating Oil		Class CF lubricating oil as per API classification is recommended. If this class of lubricating oil is not available, preferably use Class CD or CE lubricating oil. For details on recommended lubricating oils, see page G-5, 12.	
Lubricating Oil Capacity	Oil Pan Depth 90 mm (3.54 in.)	7.6 L (2.01 U.S.gals)	
	Oil Pan Depth 124 mm (4.88 in.)	9.5 L (2.51 U.S.gals)	
Weight (Dry)		186 kg (410 lbs)	184 kg (406 lbs)

* The specification described above is of the standard engine of each model.
* Conversion Formula : HP = 0.746 kW, PS = 0.7355 kW

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Symptom	Probable Cause	Solution	Reference Page
Low Oil Pressure	Engine oil insufficient	Replenish	G-6
	Oil strainer clogged	Clean	S-45
	Relief valve stuck with dirt	Clean	–
	Relief valve spring weaken or broken	Replace	–
	Excessive oil clearance of crankshaft bearing	Replace	S-50, 68, 69
	Excessive oil clearance of crankpin bearing	Replace	S-46, 67
	Excessive oil clearance of rocker arm	Replace	S-32, 57
	Oil passage clogged	Clean	–
	Different type of oil	Use specified type of oil	4, 5, 6, G-8
	Oil pump defective	Replace	S-17, 44, 71
High Oil Pressure	Different type of oil	Use specified type of oil	4, 5, 6, G-8
	Relief valve defective	Replace	–
Engine overheated	Engine oil insufficient	Replenish	G-8
	Fan belt broken or elongated	Replace or adjust	G-11, 18
	Coolant insufficient	Replenish	G-7
	Radiator net and radiator fin clogged with dust	Clean	–
	Inside of radiator corroded	Clean or replace	G-17
	Coolant flow route corroded	Clean or replace	G-17, 18
	Radiator cap defective	Replace	S-18
	Overload running	Reduce the load	–
	Head gasket defective	Replace	S-33
	Incorrect injection timing	Adjust	S-20
	Unsuitable fuel used	Use specified fuel	4, 5, 6
Battery Quickly Discharged	Battery electrolyte insufficient	Replenish distilled water and charge	G-10, 19
	Fan belt slips	Adjust belt tension or replace	G-10, 11, 18
	Wiring disconnected	Connect	–
	Rectifier defective	Replace	S-52, 76
	Alternator defective	Replace	S-53, 75
	Battery defective	Replace	–

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Alternator on Unit Test

(Before testing)

- Before alternator on unit test, check the battery terminal connections, circuit connection, fan belt tension, charging indicator lamp, fuses on the circuit, and abnormal noise from the alternator.
- Prepare full charged battery for the test.

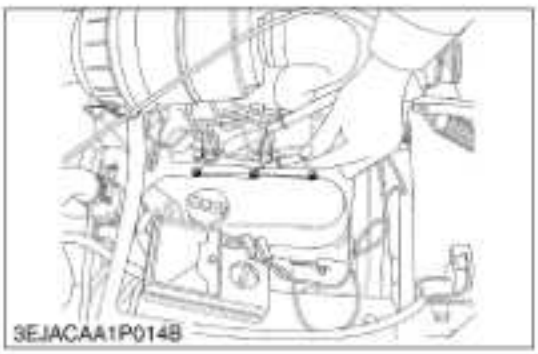
■ **NOTE**

- **Be careful not to touch the rotating engine parts while engine is running.**
  Keep safety distance from the engine rotating parts.

1. Start the engine.
2. When the engine is operating measure the voltage between two battery terminals. If the voltage is between 13.8 V and 14.8 V, the alternator is operating normally.
3. If the results of alternator on unit test are not within the specifications, disassemble the alternator and check the each component part for finding out the failure. See the "DISASSEMBLING AND ASSEMBLING" and "SERVICING" for alternator.

Regulating voltage at no load	Factory spec.	13.8 to 14.8 V at 25 °C (77 °F)

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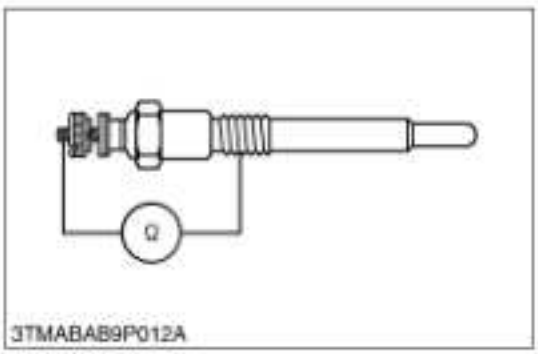


Glow Plug Lead Terminal Voltage

1. Turn the key switch to the "**GLOW** (or **PREHEAT**)" position, and measure the voltage with a circuit tester between the lead terminal and the engine body.
2. If the voltage differs from the battery voltage, the wiring harness or main switch is faulty.

Voltage	Main switch key at **GLOW** (or **PREHEAT**)	Approx. battery voltage

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Glow Plug Continuity

1. Remove the glow plug.
2. Measure the resistance with a circuit tester between the glow plug terminal and the glow plug housing.
3. If the factory specification is not indicated, glow plug is faulty.

Resistance	Factory spec.	Approx. 0.9 Ω

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