SHOP MANUAL

KOMATSU®

68E-88E SERIES

DIESEL ENGINE

As a part of revision of this shop manual, special descriptions of the engines certified by the EPA (Environmental Protection Agency) are added to the latter half of the manual (Chapter 20).
For the descriptions other than the above, see the first half, since they are same as those of the conventional engines.

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4.2 Trouble diagnosis through measurement of compression pressure

★ For the compression pressure measuring procedure, refer to chapter 6, 6.1.Measurement of compression pressure.

Reduction in compression pressure of the cylinder is one of major causes of an increase in blow-by gas (which causes contamination and increased consumption of lubricating oil, and other trouble) as well as the engine starting failure.The compression pressure is influenced by the following factors:

1. Degree of clearance between the piston and cylinder.
2. Degree of clearance around intake/exhaust valve seats.
3. Gas leak through the nozzle gasket or cylinder head gasket.

In addition, the compression pressure decreases as the engine parts are worn and lose durability through use of the engine for a long period.
Scratches on the cylinder or piston caused by dust or foreign matter through the soiled air cleaner element, and wear or breakage of piston ring also decrease the compression pressure.
For this reason, diagnose the engine status by measuring the compression presure.

(1) Causes and contermeasures to be taken when the compression pressure is less than the limit value.

★ For the compression pressure limit values, refer to Chapter 6, 6.1 Measurement of compression pressure.

No.	Item	Cause	Countermeasures
1	• Filter element of air cleaner	• Clogged filter element • Broken filter element • Defective filter element seal	• Clean the filter element. • Replace the filter element with a new one.
2	• Valve clearance	• Excessive valve clearance or no clearance	• Adjust the valve clearance (Refer to Chapter 6, 6.2.)
3	• Valve timing	• Improper valve timing • Improper valve clearance	• Adjust the valve clearance (Refer to Chapter 6, 6.2) • Inspect and adjust the valve rocker arm. (Refer to Chapter 7, 7.3, 7.3 and 7.8.)
4	• Cylinder head gasket • Nozzle gasket	• Gas leak through the gasket	• Replace the gasket. • Re-tighten the cylinder head and nozzle to the specified torque. (Refer to Chapter 10, 10.1.)
5	• Intake/exhaust valve • Valve seat	• Gas leak caused by worn valve seats or trapped foreign matter • Seizure of valves	• Rap valve seats. (Refer to Chapter 7, 7.1.2.) • Replace the intake/exhaust valves.
6	• Piston • Piston ring • Cylinder	• Gas leak caused by scratches and wear of piston, piston ring and cylinder	• Perform honing and use oversize parts. (Refer to Chapter 7, 7.2.3 and 7.4.8.)

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20.5 Secifications

(1) 2D68E

Model			unit	2D68E					
Type				Vertical, 4-cycle water-cooled diesel engine					
Combustion system				Swirl pre-combustion					
Aspiration				Natural aspiration					
No. of cylinders				2					
Cylinder bore x Stroke			mm	68 x 72					
Displacement			ℓ	0.522					
Application			—	VM					
Engine speed			rpm	2,000	2,200	2,400	2,600	2,800	3,000
Output	Continuous rating	Net	kW {HP}	—					
		Gross	kW {HP}	—					
	Rated output (max.)	Net	kW {HP}	5.7 {7.7}	6.2 {8.4}	6.8 {9.2}	7.4 {10.0}	7.9 {10.6}	8.5 {11.4}
		Gross	kW {HP}	5.9 {7.9}	6.4 {8.7}	7.1 {9.5}	7.7 {10.4}	8.3 {11.0}	8.8 {11.9}
Idle engine speed		High	rpm	2,180 ± 25	2,375 ± 25	2,590 ± 25	2,780 ± 25	2,995 ± 25	3,195 ± 25
		Low	rpm	≤800					
Fuel injection pump				Bosch inline (integrated mechanical governor)					
Fuel injection timing			degree	B.T.D.C. 14 ± 1.5 (FID)					
Fuel injection pressure			MPa {kg/cm²}	11.8 $^{+0.98}_{0}$ {120 $^{+10}_{0}$}					
Firing order				1 – 2 – 1 (No.1 cylinder on flywheel side)					
Power take off				Flywheel					
Direction of rotation				Counterclockwise (viewed from flywheel)					
Cooling system			ℓ	Radiator [Cooling water capacity (engine only): 0.6]					
Cooling fan				Pusher type• ϕ 260 x 5 blades					
V-pulley dia.				ϕ 105/85 (Crank/Cooling fan)					
Lubrication system				Forced lubrication with trochoid pump					
Starting system				Electric starting (Starter: 12V-0.8kW, Alternator: 12V-15A) [Battery capacity (recommendation): 12V-28Ah (5 hours rate)]					
Applicable fuel oil				Diesel fuel oil [ISO 8217 DMA, BS 2869 A1 or A2 (Cetane No. 45 min.)]					
Applicable lub. oil				API grade, class CC or higher grade					
Lubricating oil capacity (Oil pan)			ℓ	Max/Effective: 1.6/0.6					
Engine operation Permissible inclination angle		Continuous	degree	≤25° (front, back / left, right)					
		Instantaneous	degree	≤30° (front, back / left, right) (Note) Operating time: 3 minutes max.					
Dimensions (L x W x H)			mm	400 x 401 x 495					
Dry weight			kg	65					

NOTE: Engine dimensions and weight:

- Flywheel housing for direct couple with power machinery
- Radiator fan equipped (Radiator not included)

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