SEBM023412

SHOP MANUAL

KOMATSU®

170-3 SERIES

DIESEL ENGINE

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Check, measurement item	Symbol		Troubleshooting tool	Part Number	Remarks
Electrical components, wiring harnesses	L	1	Wiring harness checker	799-601-9000	T-adapter for HD30 and DT, box
		2	Socket (S)	795-799-5520	For speed sensor
		3	Socket (C)	795-799-5530	For intake air temperature sensor For coolant temperature sensor
		4	Socket (A)	795-799-5540	For fuel temperature sensor
		5	Cable	795-799-5540 (cummins No. 3824774)	Atmospheric pressure Fuel rail pressure sensor Timing rail pressure sensor Fuel pump actuator Fuel rail actuator Timing rail actuator Engine oil pressure sensor Boost pressure sensor Fuel pump pressure sensor
		6	Cable	795-799-5470 (cummins No. 3824775)	
		7	Cable	795-799-5480 (cummins No. 3824776)	

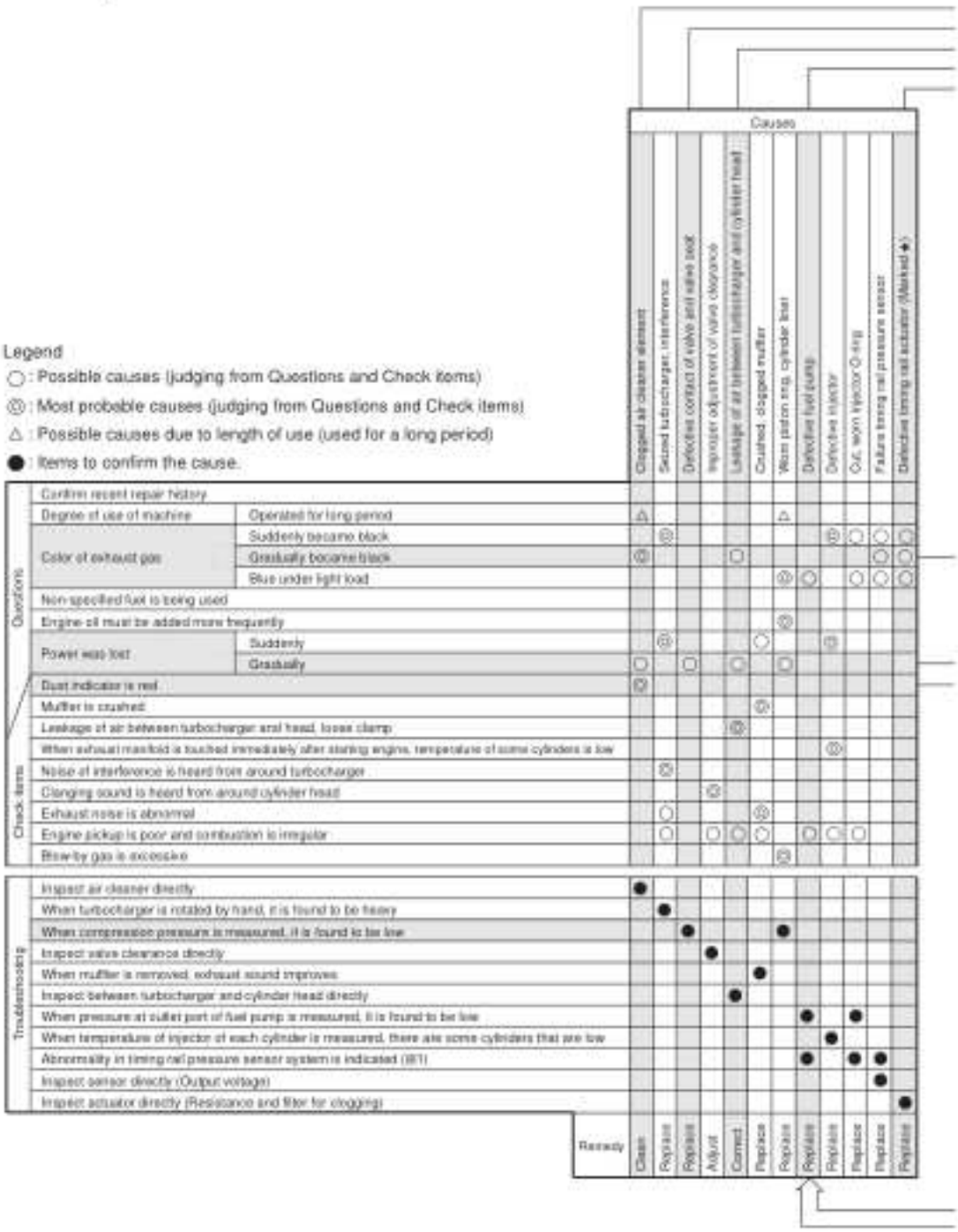
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- **Example of troubleshooting when exhaust gas is black**
  Let us assume that [Clogged air cleaner] is taken to be the cause of black exhaust gas. Three symptoms have causal relationship with this problem: [Exhaust gas slowly became black], [Power slowly became weaker], and [Dust indicator is red].
  If we look from these three symptoms to find the causes, we find that there is a relationship with five causes.
  Let us explain here the method of using this causal relationship to pinpoint the most probable cause.

S-7 Exhaust smoke is black (incomplete combustion)

General causes why exhaust smoke is black

- Insufficient intake of air
- Defective condition of fuel injection
- Excessive injection of fuel



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2. Grinding couterbore

After grinding the top surface of the cylinder block **a** , measure the depth of the counterbore. If it is not within the standard dimension, or if there are blackened portions on the cylinder liner **b** contact surface of the counterbore (patricularly in the front-to-rear direction), or there is speckled wear, and these portions extend over more than half of the contact width of the deck, correct the counterbore depth **L** within the repair limit. After correcting, if the counterbore depth is within 14.05 – 15.525 mm, combine with shims and adjust so that the liner protrusion "ℓ" is 0.07 – 0.15 mm.

★ Counterbore depth **L**:

Standard dimension $14^{+0.05}_{0}$ mm

Repair limit: 15.46 mm

★ Protrusion of cylinder liner "ℓ" :

Standard value: 0.07 – 0.15 mm

★ Roughness of counterbore: Max. 12.5S (See diagram on the right)

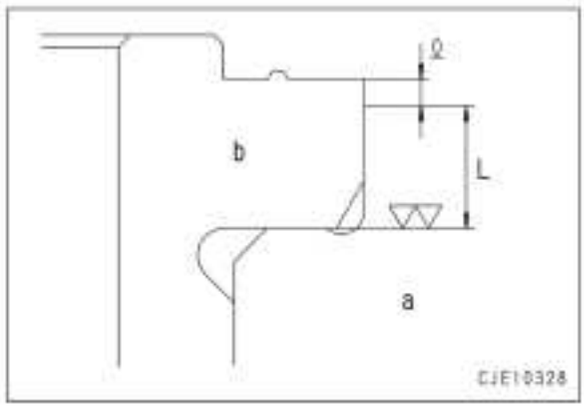
★ Machined shape: (See diagram on the right)

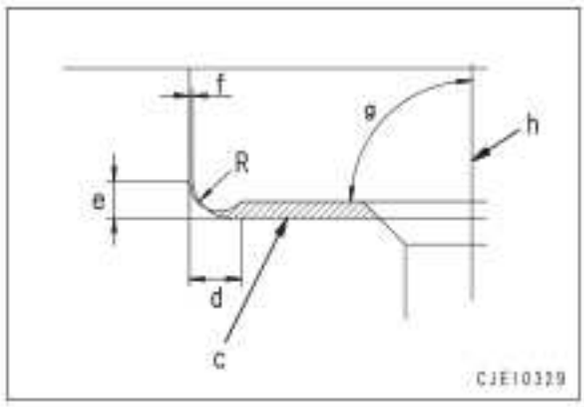
- Machine only the shaded area to adjust the depth of part **c** of the counterbore.
- Machining dimension of part **d**: Max. 0.4 mm
- Machining dimension of part **e**: Max. 0.7 mm
- Machining dimension of part **f**:

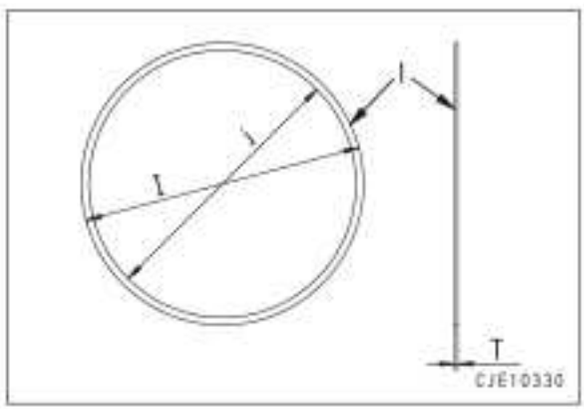
  0 – Max. 0.06 mm
- Angle of part **g** to center (straight line) of cylinder: $90° {}^{+30'}_{0}$
- Remove burrs from the tapered parts, etc.
- Letter **h** indicates the center of the cylinder.
- Set **R** to 0.2 – 0.4 mm.

For the extra amount for counterbore depth **L**, decide the machining amount so that the protrusion of the cylinder liner will be within the standard value.

When grinding within the repair limit when counterbore depth **L** exceeds the standard dimension, set the machining amount so that 1 of the shims (1) shown below will be used for each cylinder.







[Reference] Adjustment shims for counterbore depth

Unit: mm

Part No.	T	t	Weight (kg)	Remarks
6162-29-2260	1.50	0.025	0.004	
6162-29-2250	0.80	0.025	0.002	
6162-29-2240	0.50	0.025	0.001	
6162-29-2230	0.26	0.025	0.001	
6162-29-2220	0.20	0.020	0.001	
6162-29-2210	0.16	0.016	0.001	

★ Inside diameter **j** and outside diameter **I** of shims (1)

- **I**: 205.5 ± 0.15 mm
- **j**: $194.6 {}^{+0.030}_{0}$ mm

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