Perkins

Perkins New 1000 Series

Models AJ to AS and YG to YK

WORKSHOP MANUAL

4 and 6 cylinder diesel engines for industrial and agricultural applications

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Turbocharger faults

The chart below is given to assist in the correct diagnosis of turbocharger faults.

If the inside of the induction manifold is wet, check that there is not a fuel leak from the fuelled starting aid, if there is one fitted, see operation 23-9.

Problems	Possible causes code numbers
Not enough power	1, 4, 5, 6, 7, 8, 9, 10, 11, 18, 20, 21, 22, 25, 26, 27, 28, 34, 35, 36
Black smoke	1, 4, 5, 6, 7, 8, 9, 10, 11, 18, 20, 21, 22, 25, 26, 27, 28, 34, 35, 36
Blue smoke	1, 2, 4, 6, 8, 9, 17, 19, 20, 21, 22, 30, 31, 32, 34
High lubricating oil consumption	2, 8, 15, 17, 19, 20, 28, 29, 31, 32, 34
Too much lubricating oil at turbine end	2, 7, 8, 17, 19, 20, 22, 28, 30, 31, 32
Too much lubricating oil at compressor end	1, 2, 4, 5, 6, 8, 19, 20, 21, 28, 31, 32
Not enough lubrication	8, 12, 14, 15, 16, 23, 24, 29, 32, 33, 37, 38
Lubricating oil in the exhaust manifold	2, 7, 17, 18, 19, 20, 22, 28, 31, 32
Inside of the induction manifold wet	1, 2, 3, 4, 5, 6, 8, 10, 11, 17, 18, 19, 20, 21, 28, 32, 34, 39, 40
Damaged compressor impeller	3, 4, 6, 8, 12, 15, 16, 20, 21, 23, 24, 29, 32, 33, 37, 38
Damaged turbine rotor	7, 8, 12, 13, 14, 15, 16, 18, 20, 22, 23, 24, 25, 27, 29, 32, 33, 37, 38
Rotating assembly does not turn freely	3, 6, 7, 8, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 29, 32, 33, 37, 38
Worn bearings, bearing bores, journals	6, 7, 8, 12, 13, 14, 15, 16, 23, 24, 29, 33, 37, 38
Noise from turbocharger	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 29, 32, 33, 34, 37, 38
Sludge or carbon deposit in bearing housing	2, 11, 13, 14, 15, 17, 18, 24, 29, 33, 37, 38

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To assemble

The service kit for the pump contains two bearings, the shaft, a circlip, a key, a joint and a coolant seal. Each bearing is filled with grease and sealed by the bearing manufacturer. The bearings will not need attention during service.

1 Support the impeller end of the pump body. Apply a narrow ring of POWERPART Retainer (oil tolerant) to the face of the outer race of each bearing. Put the bearing (A5) into position on the pump housing. Use a suitable adaptor on the outer race and press the bearing fully into the back of the bearing housing.

2 Support the inner race of the bearing just fitted from the impeller end of the pump body. Use a suitable adaptor which will allow the shaft (A3) to pass through it. Press the new shaft into the bearing until the shoulder of the shaft is fully against the inner race of the bearing. Put the bearing (A4) into position on the pump housing and shaft. Use a suitable adaptor on the inner and outer race to ensure the pressure is applied evenly. Press the bearing onto the shaft and housing until the inner race of the bearing is against the shoulder of the shaft. Remove excess retainer and fit the new circlip (A2).

3 Fit a new coolant seal (A1) as follows:

Caution: *It is important that only the tool, shown in (B), is used to fit the new coolant seal.*

The coolant seal is an interference fit on the shaft and a tool will be necessary to fit the seal correctly.

The tool should be made of mild steel bar to the dimensions shown in (B), listed as follows:

A 44,0 mm (1.73 in)

B 40,0 mm (1.57 in)

C 10,7 mm (0.42 in)

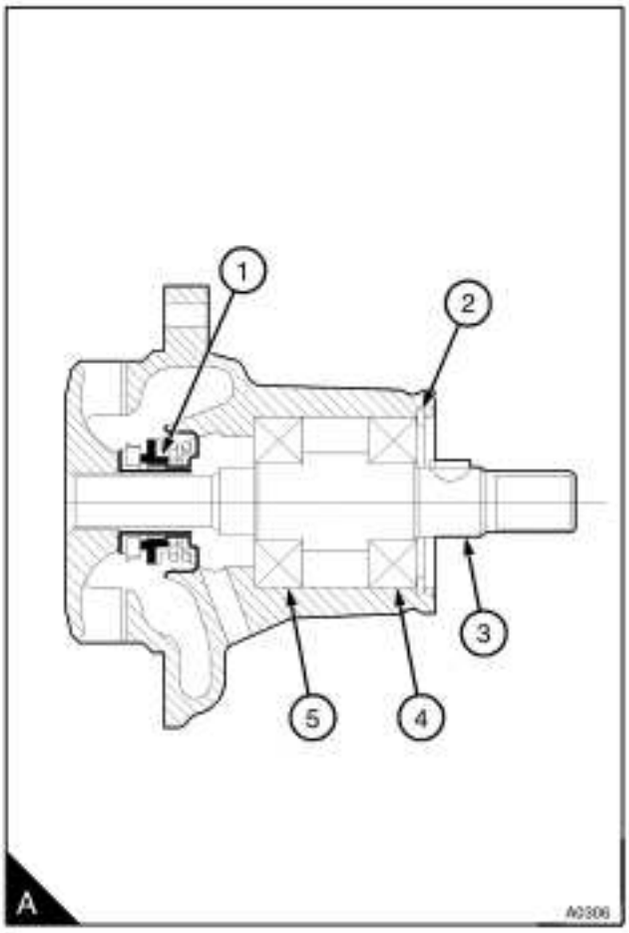
D 37,3 mm (1.47 in)

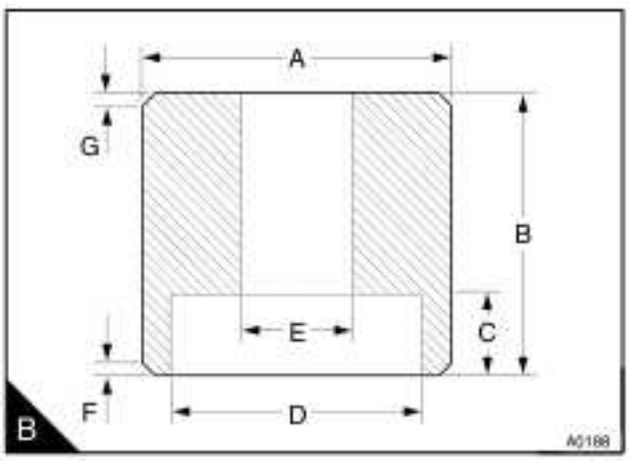
E 16,1 mm (0.63 in)

F 1,00 mm (0.04 in) at 45°

G 2,00 mm (0.08 in) at 45°

The dimensions of the tool to fit the coolant seal, will ensure that the seal is the correct length after it is installed. It will also prevent axial distortion of the seal when it is pressed onto the shaft.





Continued

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Cylinder block

To dismantle and to assemble 16-1

Consumable products:

POWERPART Nutlock

Note: If the cylinder block is to be renewed, it may be necessary to change the grade connecting rods, see operation 13-7. This will occur if the correct piston height above the block face cannot be maintained with the original piston and connecting rod assemblies, see operation 13-4.

To dismantle

1 Drain the cooling system and the lubricating oil.

2 Remove the engine from the vehicle or machine.

3 Remove the alternator drive belts and the alternator and its mounting brackets, see section 23.

4 Remove the fan, the fan drive and the water pump, see section 21.

5 Remove the compressor or the exhauster, where fitted, see section 24.

6 Remove the fuel filter, the atomisers and the fuel injection pump, see section 20.

7 Remove the lubricating oil cooler, where fitted, see operation 21-11.

8 Remove the lubricating oil filter assembly and the lubricating oil sump, see section 19.

9 If necessary, remove the turbocharger, see operation 18-1.

10 Remove the fuel lift pump, see operation 20-4

11 Remove the starter motor, see operation 23-6.

12 Remove the cylinder head assembly, see operation 12-7.

13 Remove the timing case and the timing gears, see section 15.

14 Remove the lubricating oil pump and the pressure relief valve, see section 19, or remove the balancer unit, see operation 14-12.

15 Remove the piston and connecting rod assemblies, see operation 13-3.

16 Remove the camshaft and the tappets, see operation 15-10.

17 Remove the flywheel and the flywheel housing, see section 22.

18 Remove the rear oil seal assembly and the crankshaft, see section 14.

19 Remove the piston cooling jets, see operation 13-11.

20 Inspect the cylinder block, see operation 16-2.

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