Perkins

Perkins Phaser and 1000 Series

Models AA to AH and YA to YE

WORKSHOP MANUAL

Phaser 4 and 6 cylinder diesel engines for automotive applications

1000 Series 4 and 6 cylinder diesel engines for agricultural and industrial applications

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Connecting rod

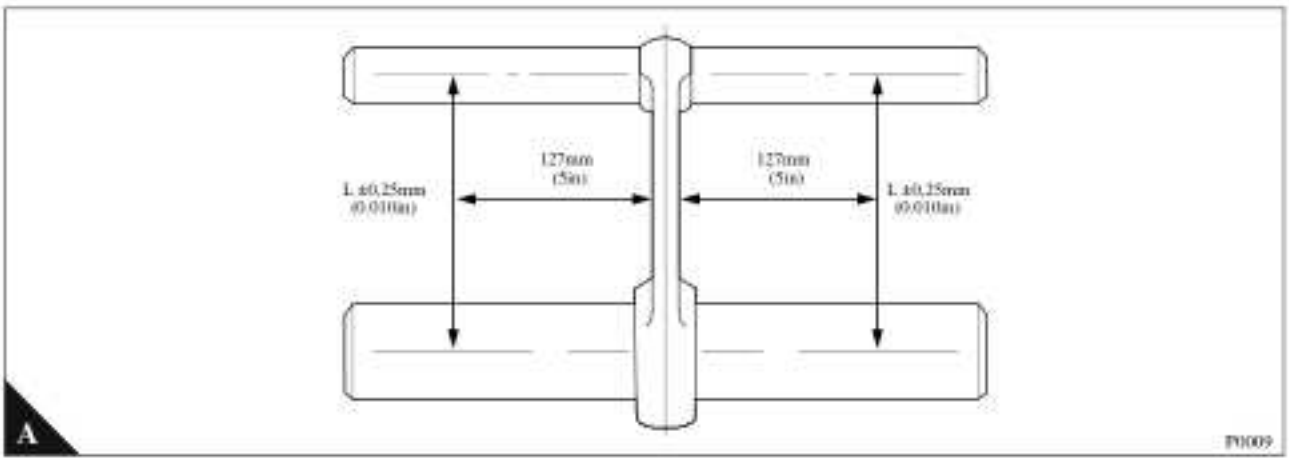
To inspect — Operation 4-11

1 Check the connecting rod for distortion (A).

Note: The large and small end bores must be square and parallel with each other within the limits of +/- 0,25 mm (0.010 in) measured 127 mm (5.0 in) each side of the connecting rod axis on a test mandrel. With the small end bush fitted, the limits are reduced to +/- 0,06 mm (0.0025 in).

2 Check the small end bush for wear or for other damage and renew it, if necessary.

3 Check the fit of the gudgeon pin in the small end bush and check the gudgeon pin for wear. Refer to the relevant Data and dimensions for "Gudgeon pins and small end bushes" on page 35.



Small end bush

To remove and to fit — Operation 4-12

1 Press out the old bush with a suitable adaptor.

2 Clean the connecting rod bore and remove any sharp edges.

3 Press in the new bush. Ensure that the lubrication hole in the bush is on the same side as, and is aligned with, the hole in the top of the connecting rod.

4 Ream the bush to get the correct clearance between the gudgeon pin and the bush. Refer to the relevant Data and dimensions for "Gudgeon pins and small end bushes" on page 35.

Note: On turbocharged engines the small end is wedge shaped. After the small end bush has been fitted, machine the bush to the shape of the small end and remove any sharp edges.

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Possible causes

1 Element of the air filter dirty
2 Restricted crankcase breather
3 Element of the air filter not fitted, or not sealing correctly. Loose connection to turbocharger.
4 Internal distortion or restriction in pipe from air filter to turbocharger.
5 Damaged/restricted crossover pipe, turbocharger to induction manifold.
6 Restriction between air filter and turbocharger.
7 Restriction in exhaust system.
8 Turbocharger loose or clamps/setscrews loose.
9 Induction manifold has cracks, is loose, or has flange distortion.
10 Exhaust manifold has cracks, is loose, or has flange distortion.
11 Restricted exhaust system.
12 Delay of lubricating oil to turbocharger at engine start.
13 Insufficient lubrication.
14 Dirty lubricating oil.
15 Incorrect lubricating oil.
16 Restricted lubricating oil supply pipe.
17 Restricted lubricating oil drain pipe.
18 Turbine housing damaged or restricted.
19 Leakage from turbocharger seals.
20 Worn turbocharger bearings.
21 Excessive dirt in compressor housing.
22 Excessive carbon behind turbine rotor.
23 Engine speed raised too rapidly at initial start.
24 Insufficient engine idle period.
25 Faulty fuel injection pump.
26 Worn or damaged atomisers.
27 Valves burned.
28 Worn piston rings.
29 Lubricating oil leakage from supply pipe.
30 Excessive preservation fluid (on initial engine start).
31 Excessive engine idle period.
32 Restriction in turbocharger bearing housing.
33 Restriction in lubricating oil filter.
34 Wet type air cleaner: restricted, dirty element, viscosity of oil to low/high.
35 Waste-gate actuator faulty or damaged.
36 Waste-gate valve not free.
37 Engine stopped too soon from high load.
38 Insufficient lubricating oil.
39 Fuel leakage from fuelled starting aid.
40 Crack in backplate of compressor.

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Cold start advance unit

Some Lucas/Delphi, Bosch and Stanadyne rotary fuel injection pumps have a cold start advance unit that holds the timing of the pump in an advanced position when the engine is cold.

Caution: *It is important that the electrical connections to the sender unit are connected correctly. Failure of the starting aid to operate correctly could result in damage to the engine as the timing will be fully advanced for normal operation.*

The sender unit, for engines fitted with belt driven coolant pumps, is on the top of the thermostat housing. The sender unit, for engines fitted with gear driven coolant pumps, is on the rear of the timing case on the left side of the engine.

As the engine warms, the sender unit energises to retard the pump timing to the correct timing for normal operation of the Lucas/Delphi and Bosch fuel injection pumps. The sender unit for the Stanadyne cold start unit de-energises to retard the pump timing to the correct timing for normal operation.

Note: The wiring diagrams on the following page show the sender unit (component 3) position when the engine is cold.

To ensure that the engine conforms to the emissions legislation, it is important that the electrical connections of the engine cold start advance unit are fitted correctly before the engine is operated.

Caution: *Damage to the engine will occur if the engine is load tested at more than 80% of full load with the cold start device disconnected.*

Continued

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