LDW 2204/T CHD ENGINE

FOR FORK LIFT TRUCKS

REPAIR RULES

Edited by
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Remove the start-up key. Should a member be jammed, release it only when the motor is stopped.
Move with the utmost care, when you are carrying out works under, on or close by the equipment. Put on the prescribed safety garments: hard hats, goggles and safety boots.
In the event of an operation outside the workshop, preferably transport the equipment on a flat ground and lock it.
In the event that the truck cannot be transferred to the designated working area and, therefore, an on-site operation is required, before beginning to work, take care of marking the boundary of the truck surrounding area by means of posts and of chains/strips in order to indicate that works are in progress.
When an operation on a slope cannot be avoided, previously lock the equipment and shift it to a level area as soon as it is possible with a reliable safety margin.
Beware of crushed and bended chains or ropes: do not use them to lift or to pull. Always put safety gloves on in order to handle them.
Chains should always be firmly fastened: make sure that they are fastened strongly enough as to support the expected load. No one should stand close to the junction, to the chains or to the ropes to be pulled.
The area where maintenance operations are carried out should always be kept clean and dry.
Immediately clean and dry any water pool or grease spot.
Do not heap up rags that are soaked with grease or oil: they could cause fires. Always put them in a closed metallic box.

Before starting up the equipment, check, adjust and lock the operator's seat.
Make sure that nobody is close to the area of operation of the machine or of the equipment.
Do not bring in your pockets objects that can fall, when unseen, in the open compartments of the equipment.
When you are likely to be hit by the projections of metallic or similar parts, use side-protected goggles, hard hats, special boots and safety gloves.
When welding operations must be performed, accident-prevention protections are to be used: dark-screened goggles, hard hats, overalls, gloves and boots. Also the persons, who are not welding but are close

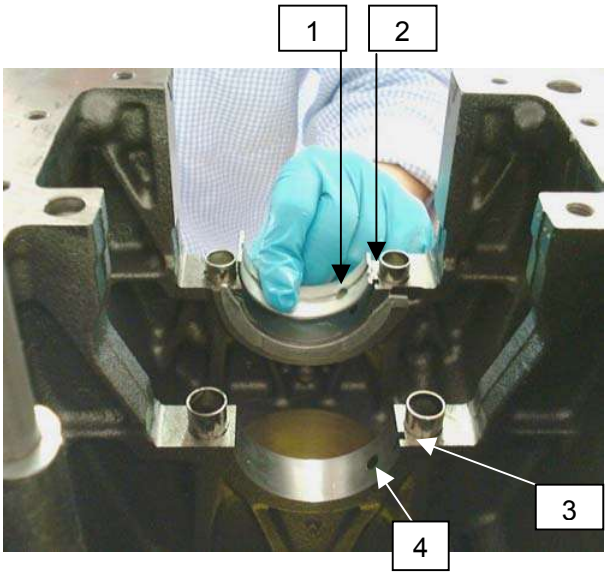
	PROBABLE CAUSE	DEFECTS										
		It does not start	It starts but stops at once	It does not accelerate	Erratic running	Black smoke	White smoke	Low oil pressure	Oil level increase	Excessive oil consumption	Oil and fuel dripping from the exhaust pipe	Coolant overheating
FUEL CIRCUIT	Clogged pipes	●										
	Obstructed fuel filter	●	●	●								
	Air in the fuel circuit	●	●	●								
	Plugged tank vent hole	●	●	●								
	Defective fuel pump	●	●									
	Blocked injector	●										
	Blocked injection pump valve	●										
	Non-adjusted injector					●						
	Pumping element excessive blow-by								●			
	Bound injection pump delivery control	●		●	●							
	Wrong injection pump delivery calibration			●		●						
LUBRICATION	High oil level				●		●			●		
	Blocked pressure adjustment valve							●				
	Worn oil pump							●				
	Air to the oil suction pipe							●				
	Defective pressure gauge or switch							●				
	Clogged oil suction pipe							●				
ELECTRIC SYSTEM	Burnt-out pre-heating glow plug fuse	●										
	Failure of the glow plug control unit	●										
	Exhausted battery	●										
	Insecure or wrong cable connection	●										
	Defective start-up switch	●										
	Defective starter	●										
MAINTENA-NCE	Obstructed air filter	●		●		●						
	Extended operation with idling engine						●				●	
	Incomplete running-in						●					
	Overloaded engine			●		●						●
AD	Advanced injection timing	●										

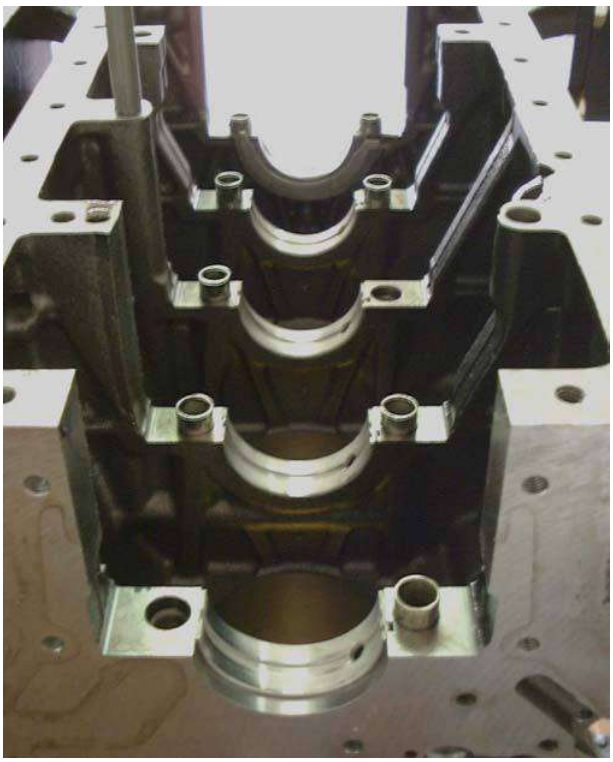
Attention:

In case one of the piston ring surfaces bears an inscription, it needs to be assembled upwards.

Driving Shaft Assembly

Crankshaft Bearing Positioning





The crankshaft bearing is made up of two half bearings.
Each half bearing has a reference notch (2), which should match the notch (3) made in the cylinder block.
Only one of the two half bearings has a hole (1).
This half bearing shall be housed on the cylinder block, so that the oil coming out of the hole (4), which is made in the cylinder block, can find a passage so as to lubricate the crankshaft bearings.

Piston Positioning

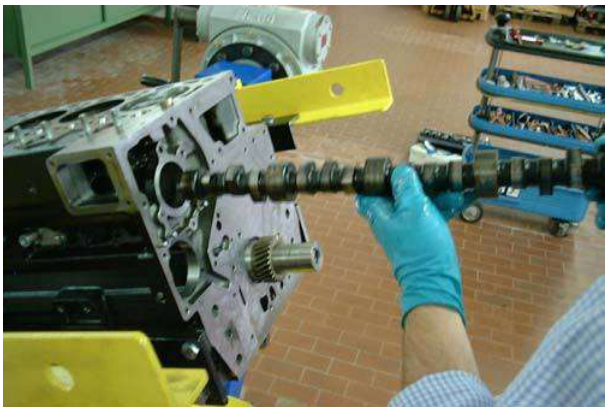
Fitting of Pistons in Liners

Using a ring-tightening tool, fit the piston into the cylinder with the combustion chamber turned towards the injection pump plane.

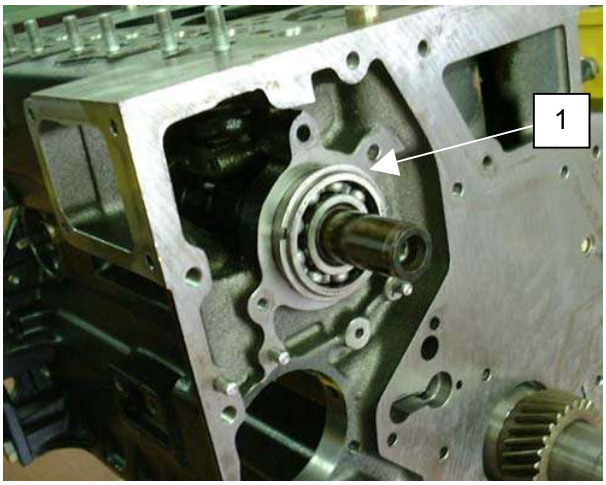
After having greased the cylinder block liner with motor oil, gently push the piston with your thumbs paying attention that no jamming occurs.

Once the operation is completed, remove the ring-tightening tool.

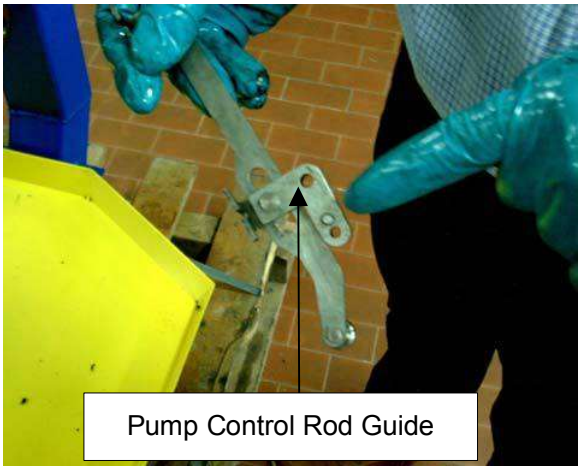
Camshaft Positioning



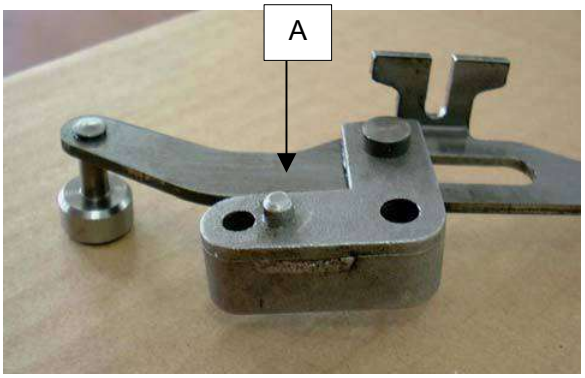
Fit the camshaft in, paying attention not to hit the bearings with the cams.



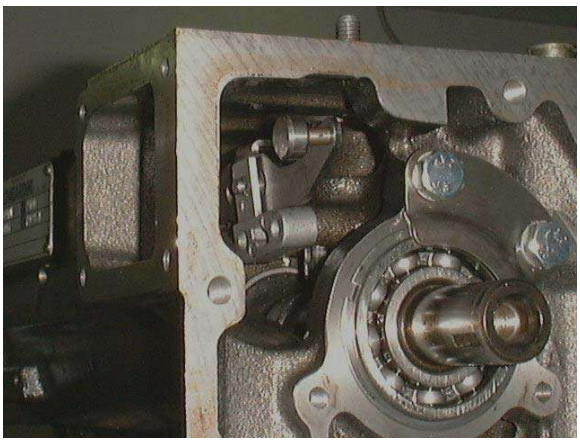
Complete the operation by bringing the retaining outer ring (1), which is part of the bearing, till a stop.



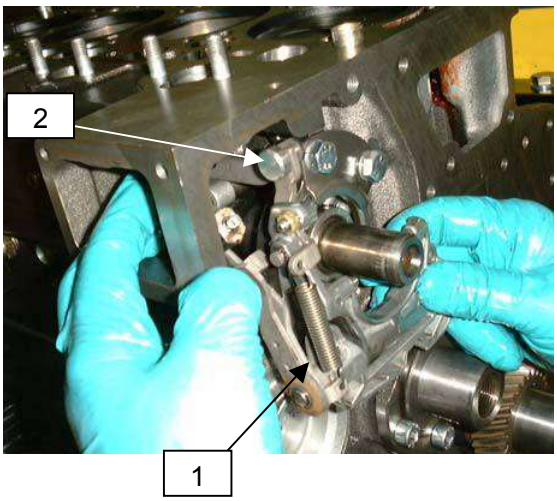
The opposite end of the rod is equipped with a sliding bearing surface for the rod itself.



In its turn, this surface is equipped with a reference pin **A**, which shows the right position inside the engine compartment.

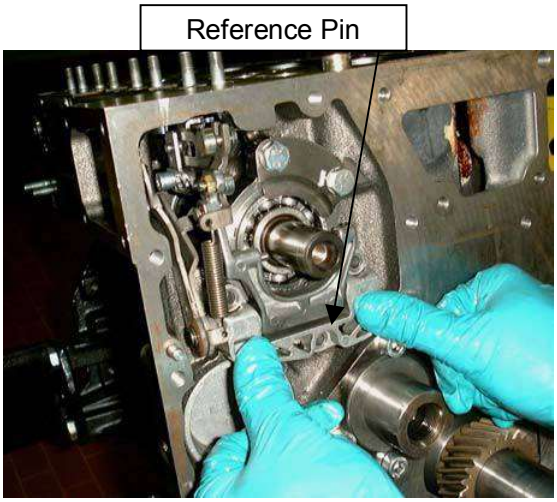


(Correct position of the rod).

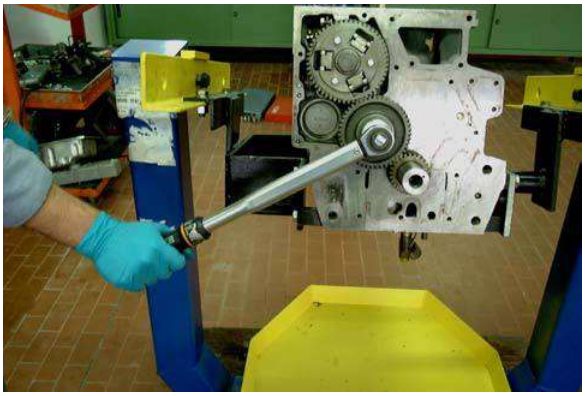


Spring for Fuel Supplement at Start-up

It is an automatic device: when the engine is stopped, the fuel supplement spring (**1**) pulls the injection pump control lever (**2**) at full delivery until the starting-up of the speed regulator.

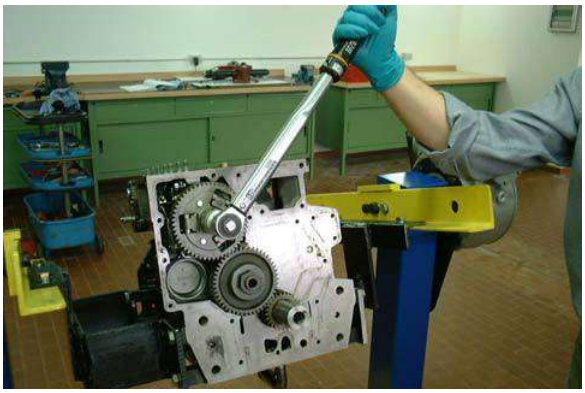


Insert the injection pump delivery control fork, by making its base match the engine casing through two reference pins.



Tighten at 200 Nm in an anticlockwise direction.

To tighten the camshaft gear, it is necessary to block the timing kinematical mechanism by means of a special soft metal.
In this case, we used a copper screw nut so as to avoid to damage the toothing of the gears.



Once this has been done, tighten at 80Nm in a clockwise direction.

Before putting back in place the pump cover, make sure that the sealing devices (driving shaft gasket and O-ring) are not out-of-shape, hardened or damaged.

In case of replacement:

- Thoroughly clean the seat.
- Keep the ring immersed in motor oil for half an hour approximately.
- Drive it in its seat by means of a stopper, by exerting a uniform pressure on its whole front surface.
- Fill the inner compartment with grease and lubricate the sealing lip with thick oil.

In any case, we recommend the replacement of sealing devices for safety reasons.

Note:
If you notice oil drippings in the ring sealing zone, you can remedy the fault by pushing the ring itself inwards of about 2 mm.

By an ambient temperature lower than –35°C, the rings may get damaged.