

Maintenance instructions

9.1 Basic requirements

In order to maintain the engine in good condition and always ready for service, various parts have to be dismantled and inspected at regular intervals. How frequently this has to be done depends largely on the service conditions, the quality of fuel and, to a large extent, on the care and ability of the engineers in charge to detect irregularities in their early stages and to correct them before they become serious.

Besides the following recommended maintenance schedule, some additional maintenance may be required or the recommended intervals may be shorted by user according to the actual conditions.

Maintenance record should be made

9.2 Maintenance schedule

20000	10000	5000	1000	500	100	50	8~12	Maintenance tasks
						See 9.3		Check the oil level in lube oil tank; fill it if necessary. If the oil level rises or drops suddenly, find the trouble and remedy it
								Check governor oil level; fill it if necessary. If the oil level rises or drops suddenly, find the trouble and remedy it.
								Check the fuel level in daily fuel tank. Drain the water accumulated in the fuel tank and fuel filter.
								Check the pressure in the air reservoir and drain the accumulated water.
								Inspect the turbocharger bearing oil level.
								Check temperatures of cylinder head, cylinder block, bedplate, injection pumps, air distributor and starting air pipes by touch.
								Open the cylinder head inspection holes to check and observe the working condition of rocker arms and valves.
								Check turbocharger, after-cooler and pipes for vibration.
								Check crankcase, cylinder head, driving gears, camshaft and turbocharger for abnormal noise
								Observe exhaust color and density of fuel mist emerging from vent hole of crankcase.
							Check all pipes for leakage and repair leakages.	

									<p>Check all monitoring and protective devices including thermometers, pressure gauges and tachometers. Remedy them if required.</p>
									Change engine lube oil and governor oil.
									Check working surfaces of cam and rollers. In the case of being slightly damaged, smooth them with an oilstone.
									Check freedom of movement of fuel regulation mechanism and governor linkage as well as the clearances between the pin and its socket of all lever joints in maneuvering system and remedy them if required.

20000	10000	5000	1000	500	100	50	8~12	Maintenance tasks
								<p>Check all valves on maneuvering system for easy movement and leakage and remedy them if required.</p>
								Change turbine oil in turbocharger
								Start the pre-lubricating pump, open crankcase covers and camshaft covers, revolve crankshaft for two turns to check if lube oil flows through the piston cooling cavities and rollers fluently.
								Check injector and replace nozzle if necessary.
								Check injection pumps delivery valve for tightness and lap it if required.
								Check or replace the anticorrosive zinc plates in after-cooler, lube oil cooler and fresh water cooler.
								Dismount cylinder head, lap contact surfaces between valve and valve seat, starting valve and its seat, replace valves and valves seats if required.
								Check nozzle bush in the middle of cylinder head. Remedy or replace it if damage or leakage is found.
								Check anticorrosive zinc plate and sealing parts of cylinder head. Replace them if necessary.

								<p>Check distance difference between crank webs of crankshaft when piston and connecting rod is not dismantled. Dismount piston and connecting rod assembly and check piston ring grooves and clean the carbon deposit on piston.</p> <p>Measure outer diameter of piston pin and make detection of defects. Check piston rings and replace them if required.</p> <p>Check serrated interfaces of connecting rod. Check bolts, nuts and their interfaces. Make detection of defects on bolts.</p> <p>Check and measure big and small end bearings of connecting rod, replace them if excessive wear or insufficient expansion is found.</p>
								<p>Check and measure cylinders. Polish the cylinder with an oilstone if slight defect is found, replace it, if excessively worn.</p> <p>Check injection pumps. Replace the plunger couple if leakage or damage is found.</p> <p>Check valve –actuating mechanism, such as rocker shaft, bearing, valve adjusting screw and block. Replace them if required.</p>

20000	10000	5000	1000	500	100	50	8~12	Maintenance tasks
								<p>Check intake and exhaust valves, rollers and roller pins for injection pumps. Replace them if necessary.</p> <p>Check all transmission gears and idle gears, Measure gear lashes, Replace them if required.</p>
								<p>Disassemble and check water pump, lube oil pump, fuel transfer pump and etc. Replace the damaged parts.</p> <p>Check air distributor, main starting valve and valves on air reservoir.</p> <p>Inspect and clean lube oil cooler, fresh water cooler and after-cooler for leakage.</p> <p>Check turbocharger and governor according to their instruction books.</p>

								<p>Dismantle No.4 and 5 main bearing bushes, check their alloy layer worn conditions. Dismantle and check other bushes if necessary.</p>
								<p>Check or replace monitoring instruments, alarming system and electric wires</p>
								<p>Remove cylinder liner from the cylinder block, measure its inner diameter and check its outer surface for corrosion. Repair or replace the cylinder liner if necessary. Replace the cylinder liner seal rings and gaskets.</p>
								<p>Check all main bearing bushes and thrusts. Replace them if required. Measure diameters of crank pins and make a record.</p>
								<p>Measure wears of main journals of crankshaft with a bridge gauge in four positions, calculate the average value and make a record.</p>
								<p>Check wears of camshaft bearings. Replace them if required.</p>
								<p>Check flexible transmission parts of output coupling. Replace them if required.</p>
								<p>Check cylinder head safety valve and explosion-proof door on crankcase.</p>
								<p>Check valve push rods, push rod seats, push rod rollers, injection pump rollers and injection pump supporters. When getting back, recheck if fuel supply pre-stroke of injection pump plunger is up to requirements.</p>
								<p>Check engine installation foundation, pipes and vessels. Adjust and clean them if required.</p>
								<p>Dismantle and overhaul the diesel engine.</p>

9.3 Maintenance tasks after the first 50 operating hours

The following maintenance tasks are only carried out on new or overhauled engine after the first 50 operating hours.

Item	Maintenance tasks
1	Change engine lube oil, turbocharger lube oil and governor oil.
2	Clean oil filters.
3	Check and adjust valve lash. Make sure that Valve Bridge is in contact with two valve stem tops on its both ends (when one end of Valve Bridge is in full contact, the clearance between another end and valve stem top should be less than 0.05mm).
4	Check all bolted or threaded connections and apparatuses including piping.
5	Check connection between engine and its power output device. Retighten foundation bolts and bolts on power output device.
6	Check lubricated surfaces of cams and rollers. Remove greasy dirt in cam casing.