SERVICE MANUAL

Cursor® 13
Single Stage Turbocharger
Tier 4B (final) and Stage IV
Engine

See the following page for engine model numbers

Part number 47869981
English
May 2015
Replaces part numbers 47607266, 47607276, 47607286, 47607296

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Engine - Service limits

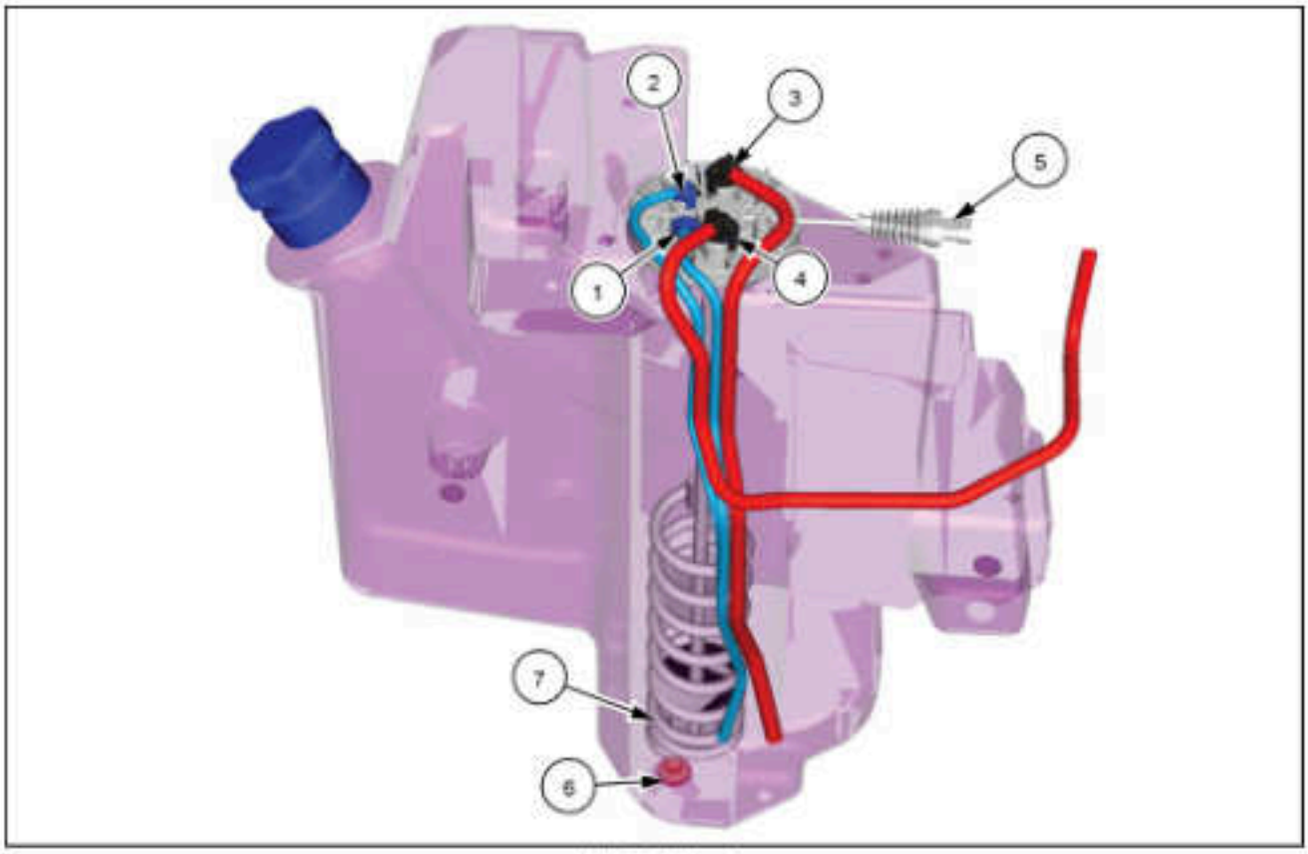
Engine specifications	
Compression Ratio	16.5 : 1
Bore	**135 mm (5.3 in)**
Stroke	**150 mm (5.9 in)**
Displacement	**12880 cm³**
Turbocharging	Inter-cooled, Direct injection
Turbocharger type	Holset HE551
Lubrication	Forced by gear pump, relief valve single action
Oil Pressure (Warm engine) - Idling - Peak RPM	 **3 bar (43.5 psi)** **4.5 bar (65.3 psi)**
Cooling	Liquid cooled
Water pump control	Belt driven
Thermostat (Start of opening)	**81 °C (177.8 °F)**
Intake valve timing - Opens before TDC - Closes after BDC Exhaust valve timing - Opens before BDC - Closes after TDC	 **17 °** **30 °** **50 °** **9 °**
Valve lash setting (when engine is cold) - Intake - Exhaust	 **0.4 mm (0.016 in)** **0.6 mm (0.024 in)**
Firing Order	1 - 4 - 2 - 6 - 3 - 5
Cylinder block and piston	
Bores for cylinder liners: - Upper - Lower	 **153.500 - 153.525 mm (6.043 - 6.044 in)** **152.000 - 152.025 mm (5.984 - 5.985 in)**
Cylinder liners external diameter: - Upper - Lower	 **153.461 - 153.486 mm (6.042 - 6.043 in)** **151.890 - 151.915 mm (5.980 - 5.981 in)**
Clearance between the OD of liners and ID of bores - Upper - Lower	 **0.014 - 0.039 mm (0.001 - 0.002 in)** **0.085 - 0.135 mm (0.003 - 0.005 in)**
Cylinder liner - ID - ID under a load of **800 N (179.8 lb)** - Protrusion	 **135.000 - 135.013 mm (5.315 - 5.315 in)** **135.011 - 135.024 mm (5.315 - 5.316 in)** **0.045 - 0.075 mm (0.002 - 0.003 in)**
Pistons - Measuring dimension - External diameter (supplied as spares - External diameter (production only) - Pin bore	 **18 mm (0.709 in)** **134.861 - 134.873 mm (5.309 - 5.310 in)** **134.872 - 134.884 mm (5.310 - 5.310 in)** **54.010 - 54.018 mm (2.126 - 2.127 in)**
OD of piston - ID of cylinder liner	**0.127 - 0.151 mm (0.005 - 0.006 in)**
Piston protrusion	**0.12 - 0.42 mm (0.005 - 0.017 in)**
Piston pin diameter	**53.994 - 54.000 mm (2.126 - 2.126 in)**
Piston pin OD - pin bore	**0.010 - 0.024 mm (0.0004 - 0.0009 in)**
Piston ring grooves - Top - Middle - Bottom	 **3.100 - 3.120 mm (0.122 - 0.123 in)** **1.550 - 1.570 mm (0.061 - 0.062 in)** **5.020 - 5.040 mm (0.198 - 0.198 in)**
Piston rings - Combustion ring	 **3.000 mm (0.118 in)**

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Problem	Possible Cause	Correction
The engine is consuming an excessive amount of engine oil.	Engine oil consumption can be caused by faulty piston rings, valve guide seals, main bearings, connecting rod bearings, camshaft bearings, crankshaft journals, tapered or out-of-round cylinders etc.	Verify that the engine is using the correct engine oil. Perform testing on the engine to help locate the cause of oil consumption. Perform an engine leak down test or wet cylinder compression test.
The cooling system is leaking coolant.	Cooling system leaks can be caused by faulty seals, gaskets, hoses, radiator or radiator cap etc.	Visually inspect all hoses, thermostat housing, water pump, radiator, and all other cooling system components for signs of leakage. If no visual leakage is found, pressure test the cooling system and check for leakage.
The engine is leaking engine oil.	Engine oil leakage can be caused by faulty seals or gaskets, excessive crankcase pressure, faulty lubrication system components, or the wrong engine oil.	Visually inspect the engine lubrication system for any signs of leakage. Inspect the engine oil filter, oil cooler, oil pump, and all seals and gaskets for leaks. Verify that the engine oil is the recommended oil. Verify that the engine oil level is not overfull.
The engine is leaking refrigerant.	Refrigerant leaks can be caused by faulty air condition components such as the compressor, condenser, evaporator, or faulty seals.	Use a refrigerant dye kit to locate the leak.
The engine is firing when not commanded.	A runaway engine condition is caused when diesel fuel continues to be injected or leaked into the engine when not commanded by the operator. Engine oil leakage into the cylinder can also cause this condition.	Leaking fuel injectors Engine oil leakage into cylinders Faulty ECU software
The engine is misfiring.	Engine misfires can be caused by faulty injection timing, malfunctioning injectors, malfunctioning injection pump or internal engine failures such as a burnt valve or a hole in a piston.	Check injection timing. Test for proper fuel pressure. Test fuel injectors for proper operation. Perform an engine compression test.
Low oil pressure	Engine oil level low	Fill to proper level
	Wrong grade of oil	Replace with correct grade oil
	Clogged oil filter	Change oil and filter
	Faulty oil pressure relief valve	Replace relief valve
	Worn oil pump drive shaft gears, or broken oil pipe	Inspect oil system and components. Replace defective components
	Excessive main or connecting rod bearing clearances	Replace bearings or shaft if necessary
	Oil pump axial clearance not properly set	Check pump clearance and shim as needed to proper tolerance.
	Faulty oil pressure sensor/oil pressure switch or electrical circuit	Check for fault codes, and testing procedures to check electrical circuits.

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Diesel Exhaust Fluid (DEF)/AdBlue® tank - Overview



NHWH1HDNG1270FA 1

(1) Suction pipe hose assembly
(2) Supply module return hose assembly
(3) Coolant hose assembly supply module
(4) Coolant control valve hose assembly
(5) Level and temperature sensor
(6) Quality sensor
(7) Suction line, level and temperature sensor

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