SERVICE MANUAL

Cursor® 9
Tier 4B (final) and Stage IV
Engine

See the following page for engine model numbers

CNH INDUSTRIAL

Part number 48076851
1st edition English
November 2016
Replaces part numbers 47606172, 47606162, 47606142, 47606152

MidWestTech | New Holland Cursor 9 Tier 4B & Stage IV F2CFE613A*B041, F2CFE613A*B, F2CFE613B*B, F2CFE613C*B006, F2CFE613C*B041, F2CFE613C*B043, F2CFE613D*B, F2CFE613E*B043, F2CFE613F*B003, F2CFE613F*B041 , F2CFE613G*B001, F2CFE613G*B002, F2CFE614A*B002, F2CFE614A*B003, F2CFE614A*B, F2CFE614B*B006, F2CFE614C*B002, F2CFE614C*B003, F2CFE614D*B002, F2CFE614D*B003, F2CFE614E*B006, F2CFE614F*B004, F2CFE614F*B005, F2CFE614G*B002, F2CFE614G*B003, F2CFE614H*B004, F2CFE614H*B005 Engine Service Manual | Publication 48076851
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Engine - Service limits

Engine specifications	
Compression ratio	15.9:1
Bore	**117 mm (4.6 in)**
Stroke	**135 mm (5.3 in)**
Cylinder spacing	**138 mm (5.4 in)**
Displacement	**8710 cm³**
Turbocharging	Inter-cooled, Direct injection
Lubrication	Forced by gear pump, relief valve single action oil filter
Oil pressure (Warm engine) - Idling - Peak RPM	 **4 bar (58 psi)** **5 bar (73 psi)**
Cooling	Liquid cooled
Water pump control	Belt driven
Thermostat (Start of opening)	**83.5 - 86.5 °C (182.3 - 187.7 °F)**
Intake valve timing - Opens before TDC - Closes after BDC Exhaust valve timing - Opens before BDC - Closes after TDC	 **17 °** **31 °** **48 °** **9 °**
Valve lash setting (when engine is cold) - Intake - Exhaust (with brake and/or camshaft 504326209) - Exhaust (without brake)	 **0.4 mm (0.016 in)** **0.4 mm (0.016 in)** **0.6 mm (0.024 in)**
Firing Order	1 - 4 - 2 - 6 - 3 - 5
Injection pressure	**1800 bar (26100 psi)**
Injector calibration	**290 - 302 bar (4205 - 4379 psi)**
Cylinder block and piston	
Cylinder liner bore - Upper - Lower	 **130.500 - 130.525 mm (5.138 - 5.139 in)** **129.510 - 129.535 mm (5.099 - 5.100 in)**
Cylinder liner external diameter - Upper - Lower	 **130.461 - 130.486 mm (5.136 - 5.137 in)** **129.475 - 129.500 mm (5.097 - 5.098 in)**
Clearance between the OD of liners and ID of bores - Upper - Lower	 **0.014 - 0.064 mm (0.001 - 0.003 in)** **0.010 - 0.060 mm (0.0004 - 0.0024 in)**
Cylinder liner - ID A* - ID B* * Selection class - Protrusion	 **117.000 - 117.012 mm (4.606 - 4.607 in)** **117.010 - 117.022 mm (4.607 - 4.607 in)** **0.035 - 0.065 mm (0.001 - 0.003 in)**
Pistons - Measuring dimension - External diameter (supplied as spares) - External diameter (production only) - Pin bore	 **15 mm (0.591 in)** **116.894 - 116.906 mm (4.602 - 4.603 in)** **116.904 - 116.916 mm (4.603 - 4.603 in)** **52.016 - 52.022 mm (2.048 - 2.048 in)**
OD of piston - ID of cylinder liner	**0.094 - 0.118 mm (0.004 - 0.005 in)**
Piston protrusion	**0.873 - 1.117 mm (0.034 - 0.044 in)**
Piston pin diameter	**51.994 - 52.000 mm (2.047 - 2.047 in)**

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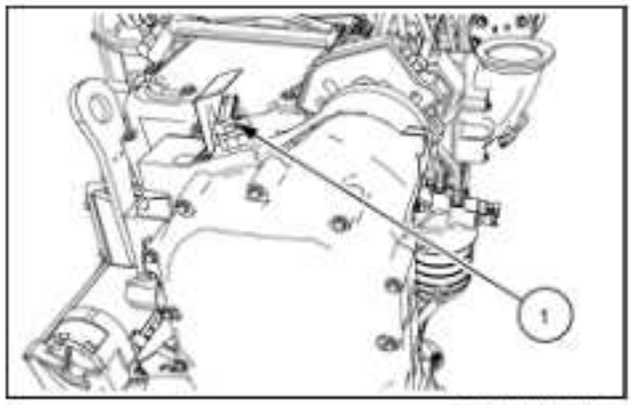
Engine - Troubleshooting

Problem	Possible Cause	Correction
Engine will not start	An engine no start is defined as an engine that will crank but will not start. The most likely causes of this failure are issues related to the battery, fuel system or low engine compression.	1. Faulty battery, voltage too low 2. Insufficient fuel level 3. Contaminated fuel (water or air) 4. Clogged fuel filter 5. Faulty fuel injectors 6. Faulty glow plugs (if equipped) 7. Faulty fuel lift pump (if equipped) 8. Faulty high pressure pump, (if equipped) 9. Faulty mechanical pump, (if equipped) 10. Low engine compression 11. Engine timing incorrect
The engine starts then stalls	This symptom is usually caused by fuel leakage or a clogged fuel filter.	Visually inspect the fuel system for external leakage. If leakage is found, repair as necessary. Check fuel system pressure for adequate pressure. If fuel pressure is lower than expected, repair as necessary.
Engine will not crank	An engine no-crank condition is defined as an engine that will not crank. Possible failures include a dead or weak battery, an open battery disconnect switch (if equipped) or a starting system failure.	1. Check battery voltage. Charge or replace the battery as necessary. 2. Verify the status of the battery disconnect switch (if equipped). The switch must be closed. 3. Check the starting system for possible failures. Check the starter relay and battery voltage at the starter. Perform a voltage drop test between the battery and the engine starter to check the starter wiring. Repair as necessary.
The engine is difficult to start	The cause of an engine hard start condition is similar to those of an engine no start condition. Failures can include inadequate fuel pressure, air supply, engine compression, faulty glow plugs or incorrect injection timing during start up.	1. Faulty battery, voltage too low. 2. Insufficient fuel level 3. Contaminated fuel (water or air) 4. Clogged fuel filter 5. Faulty fuel injectors 6. Faulty glow plugs (if equipped) 7. Faulty fuel lift pump (if equipped) 8. Faulty high pressure pump 9. Restricted air induction system 10. Low engine compression 11. Engine timing incorrect
Engine has a slow cranking condition	A slow engine crank condition can be caused by a weak battery, worn starter internal engine resistance. Extremely cold operating temperatures can also be a factor in a slow engine crank condition.	1. Load test the battery. Charge or replace the battery as necessary. 2. Perform a voltage drop test on the starting circuit. There should be a drop less than **0.5 V** on both the positive and negative circuits. If the drop is greater than **0.5 V**, repair as necessary. 3. Bench test the starter. If the starter operates slower than expected, replace the starter.

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Engine speed/RPM sensor Camshaft - Remove

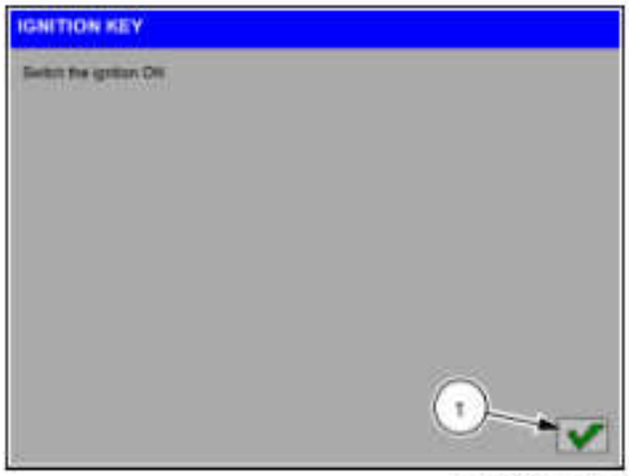
1. Disconnect the wire harness from the sensor.
2. Remove the retaining screw.
3. Remove the camshaft speed sensor **(1)**.



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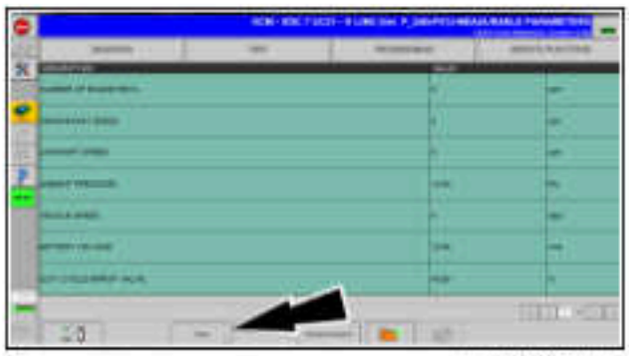
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6. Ignition Key “on” then click the check mark **(1)**.



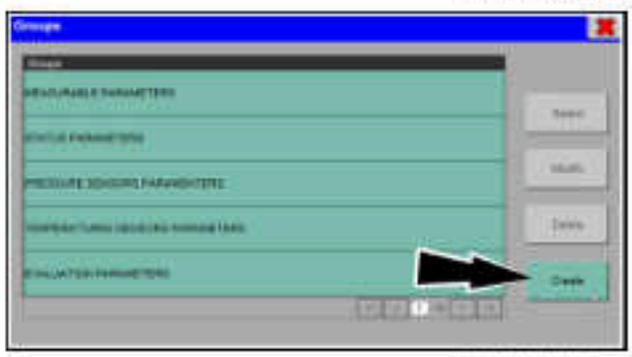
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7. Click on “Groups”.



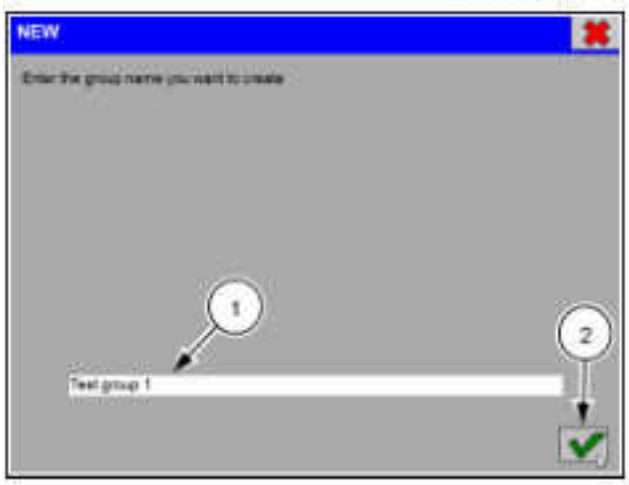
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8. Click on “Create” to build a custom list of engine operating parameters to view.



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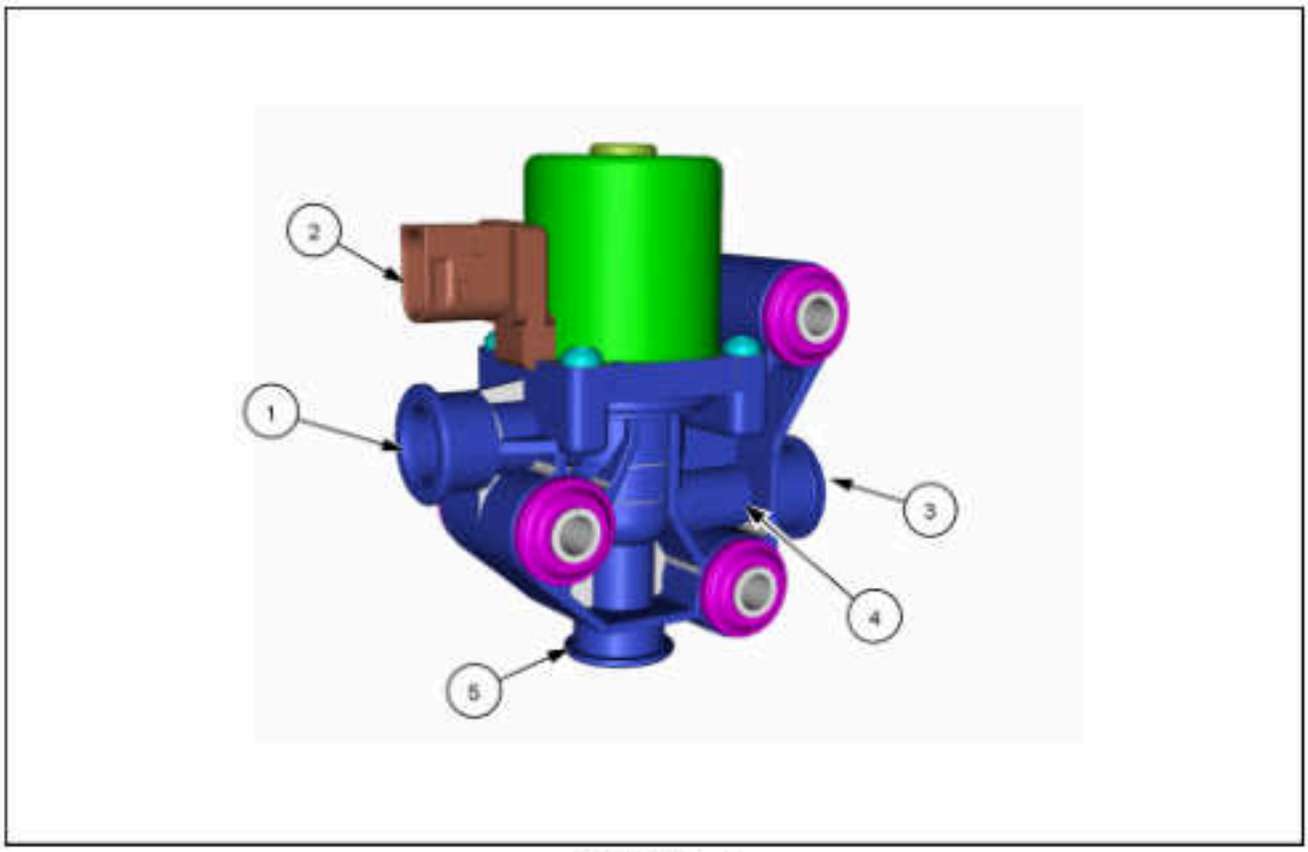
9. Enter a name **(1)** for the custom list, then click check mark **(2)**.



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Coolant control valve - Overview



NHVM19ENG0001FA 1

(1) Outlet port for system defreeze
(2) Electrical connector
(3) Inlet port
(4) Directional arrow
(5) Bypass port for dosing module injector

NOTICE: *The coolant control valve is directional, if the coolant flow through the valve is reverse (hoses hooked up incorrectly), the valve will be damaged. Verify the coolant is flowing the correct direction as indicated by the arrow* ***(4)*** *on the valve.*

The coolant control valve is located in a coolant line connected to the engine. When this two position three way valve is not activated, it sends engine coolant through both the supply module, and the Diesel Exhaust Fluid (DEF)/AdBlue® supply lines as well as the dosing module injector to thaw the DEF/AdBlue® fluid as the engine is started in freezing climates. DEF/AdBlue fluid freezes at **-11 °C** (**12 °F**). It also degrades at elevated temperatures.

When the DEF/AdBlue® fluid is above freezing, the coolant control valve is activated to only send engine coolant through the DEF/AdBlue® dosing module injector to then control the maximum temperature of the module as the engine is operated under load. This temperature regulation minimizes the degradation of the fluid because of the elevated exhaust temperature. When the engine coolant control valve is activated, coolant is not circulated through the supply module to prevent heating of the fluid.

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