F4CE9484 / F4CE9487A / F4CE9487N /
F4CE9684 / F4DE9484 / F4DE9684B*J111 /
F4DE9684M*J101 / F4DE9684M*J103 /
F4DE9684 / F4DE9687 / F4GE9484C*J601 /
F4GE9484 / F4GE9684 / F4HE0484G*J102 /
F4HE0484G*J109 / F4HE9484C*J102 /
F4HE9484C*J103 / F4HE9484 / F4HE9684 /
F4HE9687G*J100 / F4HE9687
NEF Tier 3
Engine

SERVICE MANUAL

Part number 47597684
1st edition English
October 2013

CASE CONSTRUCTION

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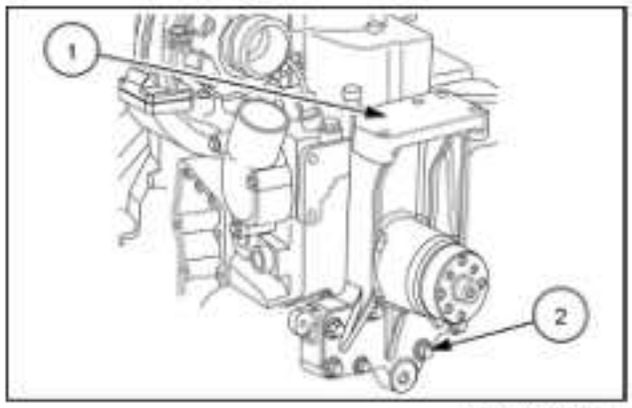
Clearance Data	
Thrust Bearing	37.28 - 37.38 mm (1.468 - 1.472 in)
Crankshaft End Play	0.095 - 0.265 mm (0.004 - 0.010 in)
Cylinder Head and Components	
Valve Guide Bore	7.042 - 7.062 mm (0.277 - 0.278 in)
Intake Valves	
Stem diameter	6.970 - 6.990 mm (0.274 - 0.275 in)
Face angle	59.75 - 60.25 °
Exhaust Valves	
Stem diameter	6.970 - 6.990 mm (0.274 - 0.275 in)
Face angle	44.75 - 44.25 °
Valve Stem and Guide Clearance	0.052 - 0.092 mm (0.002 - 0.004 in)
Valve Seat Bore	
Intake	34.837 - 34.863 mm (1.372 - 1.373 in)
Exhaust	34.837 - 34.863 mm (1.372 - 1.373 in)
Valve seat Outside Diameter:	
Intake	34.917 - 34.931 mm (1.375 - 1.375 in)
Exhaust	34.917 - 34.931 mm (1.375 - 1.375 in)
Valve Seat Angle	
Intake	60 °
Exhaust	45 °
Valve Sink	
Intake	0.59 - 1.11 mm (0.023 - 0.044 in)
Exhaust	0.96 - 1.48 mm (0.038 - 0.058 in)
Interference Between Valve Seat and Cylinder Head	
Intake	0.054 - 0.094 mm (0.002 - 0.004 in)
Exhaust	0.054 - 0.094 mm (0.002 - 0.004 in)
Valve Spring Height	
Free	47.75 mm (1.880 in)
Under a load equal to: 330.8 - 348.8 N (74.4 - 78.4 lb)	35.33 mm (1.391 in)
Under a load equal to: 702 - 780 N (157.8 - 175.4 lb)	25.2 mm (0.992 in)
Camshaft Bore	
No.1 (flywheel side)	59.222 - 59.248 mm (2.332 - 2.333 in)
No. 2,3,4,5 / 2,3,4,5,6,7	54.089 - 54.139 mm (2.129 - 2.131 in)
Camshaft Journals	
1-5 / 1-7	53.995 - 54.045 mm (2.126 - 2.128 in)
Bushing inside diameter	54.083 - 54.147 mm (2.129 - 2.132 in)
Bushing and Journal Clearance	0.038 - 0.162 mm (0.001 - 0.006 in)
Cam Lift	
Intake	7.582 mm (0.299 in)
Exhaust	6.045 mm (0.238 in)
Tappet Bore	16.000 - 16.030 mm (0.630 - 0.631 in)
Tappet outside diameter	
Top	15.924 - 15.954 mm (0.627 - 0.628 in)
Middle	15.960 - 15.975 mm (0.628 - 0.629 in)
Bottom	15.924 - 15.954 mm (0.627 - 0.628 in)
Tappets and Bore Clearance	0.025 - 0.070 mm (0.001 - 0.003 in)
Rocker shaft	21.965 - 21.977 mm (0.865 - 0.865 in)
Rockers	22.001 - 22.027 mm (0.866 - 0.867 in)
Rockers and Shaft Clearance	0.024 - 0.162 mm (0.001 - 0.006 in)
(*) Valid for engines: F4HE9684P, F4HE9684A, F4HE9687P, F4HE9687A	

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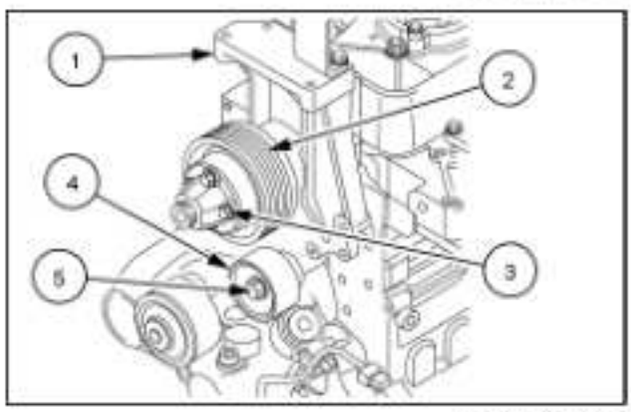
Fan and drive - Install

Prior operation:
Fan and drive - Remove (10.414)

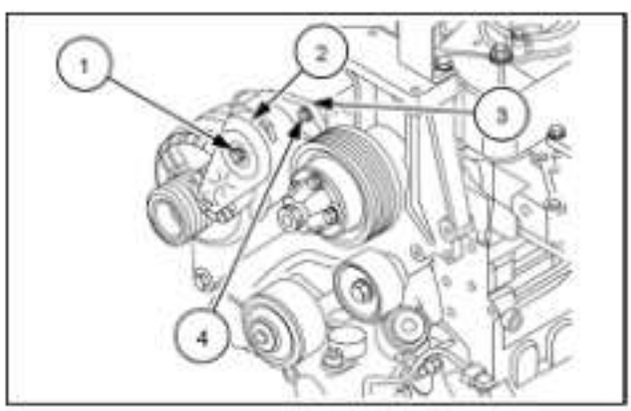
1. Install the fan pulley support **(1)** and torque the bolts **(2)** to **28 - 38 N·m** (**21 - 28 lb ft**).



2. Install the fan pulley **(2)** to the support **(1)** and torque the bolts **(3)** to **8 - 12 N·m** (**71 - 106 lb in**).
3. Install the idler pulley **(4)** and torque the bolt **(5)** to **37 - 49 N·m** (**27 - 36 lb ft**).



4. Install the automatic belt tensioner support **(3)** and torque the bolts **(4)** to **28 - 38 N·m** (**21 - 28 lb ft**).
5. Install the automatic belt tensioner **(2)** and torque the bolt **(1)** to **37 - 49 N·m** (**27 - 36 lb ft**).



Next operation:
Belt - Install (10.414)

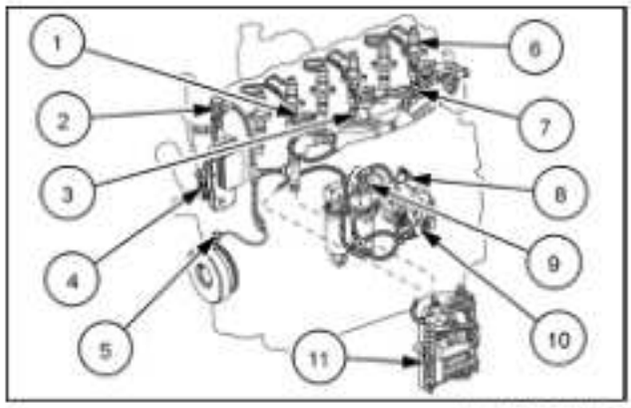
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Engine wire harness - Connect

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Prior operation:
Engine wire harness - Disconnect (55.015)

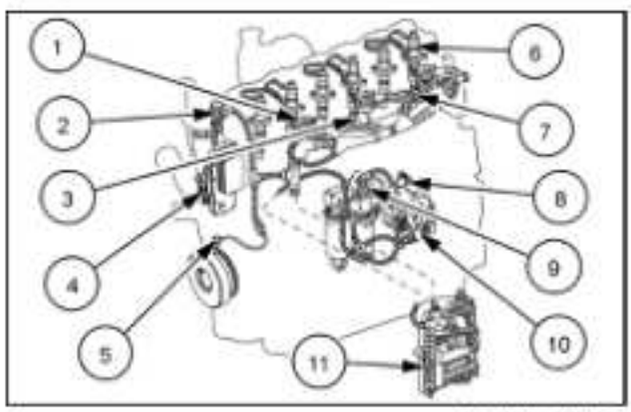
1. Reconnect the engine wiring harness to all the sensors, the engine control module and the common rail.



NHBL13ENG0208AA 1

(1) Connections for electro-injectors
(2) Coolant temperature sensor
(3) Fuel pressure sensor
(4) Oil pressure/temperature sensor
(5) Driving shaft sensor
(6) Electro-injector
(7) Air pressure/temperature sensor
(8) Timing system sensor
(9) Fuel temperature sensor
(10) Pressure regulating gauge
(11) EDC 7 UC31

2. Connect the engines cable from the connectors **(1)** to electro-injector **(6)**, air pressure/temperature sensor **(7)**, fuel pressure sensor **(3)**, engine control module **(11)**, high pressure pump sensor **(10)**, timing system sensor **(8)**, coolant temperature sensor **(2)**, driving shaft sensor **(5)**.



NHBL13ENG0208AA 2

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