SERVICE MANUAL

NEF
Four Cylinder Mechanical
Tier 2 and Stage II
Engine

See the following page for engine model numbers

Part number 47899763
1st edition English
July 2015

MidWestTech | New Holland NEF 4 Cylinder Mechanical Tier 2, Stage II F4GE0404B*D602, F4GE0454B*D601, F4GE0454B*D651, F4GE0454E*D601 Engine Service Manual | Publication 47899763

Order the manual at mid-west-tech.com >

Contents

INTRODUCTION

Engine 10

[10.001] Engine and crankcase 10.1

[10.101] Cylinder heads 10.2

[10.102] Pan and covers 10.3

[10.103] Crankshaft and flywheel 10.4

[10.105] Connecting rods and pistons 10.5

[10.106] Valve drive and gears 10.6

[10.110] Balancer and damper 10.7

[10.114] Pump drives 10.8

[10.206] Fuel filters 10.9

[10.210] Lift pump and lines 10.10

[10.218] Fuel injection system 10.11

[10.250] Turbocharger and lines 10.12

[10.254] Intake and exhaust manifolds and muffler 10.13

[10.304] Engine lubrication system 10.14

[10.400] Engine cooling system 10.15

[10.408] Oil cooler and lines 10.16

[10.414] Fan and drive 10.17

Electrical systems 55

[55.010] Fuel injection system 55.1

[55.012] Engine cooling system 55.2

[55.013] Engine oil system 55.3

[55.201] Engine starting system 55.4

[55.202] Cold start aid 55.5

[55.301] Alternator 55.6

MidWestTech | New Holland NEF 4 Cylinder Mechanical Tier 2, Stage II F4GE0404B*D... Order the manual at mid-west-tech.com >

Contents

INTRODUCTION

Foreword - Important notice regarding equipment servicing 3
Safety rules 4
Safety rules - Ecology and the environment 5
Torque 6
Torque - Minimum tightening torques for normal assembly 8
Basic instructions - Shop and assembly 13

MidWestTech | New Holland NEF 4 Cylinder Mechanical Tier 2, Stage II F4GE0404B*D... Order the manual at mid-west-tech.com >

Contents

Engine - 10

[10.001] Engine and crankcase 10.1

[10.101] Cylinder heads 10.2

[10.102] Pan and covers 10.3

[10.103] Crankshaft and flywheel 10.4

[10.105] Connecting rods and pistons 10.5

[10.106] Valve drive and gears 10.6

[10.110] Balancer and damper 10.7

[10.114] Pump drives 10.8

[10.206] Fuel filters 10.9

[10.210] Lift pump and lines 10.10

[10.218] Fuel injection system 10.11

[10.250] Turbocharger and lines 10.12

[10.254] Intake and exhaust manifolds and muffler 10.13

[10.304] Engine lubrication system 10.14

[10.400] Engine cooling system 10.15

[10.408] Oil cooler and lines 10.16

[10.414] Fan and drive 10.17

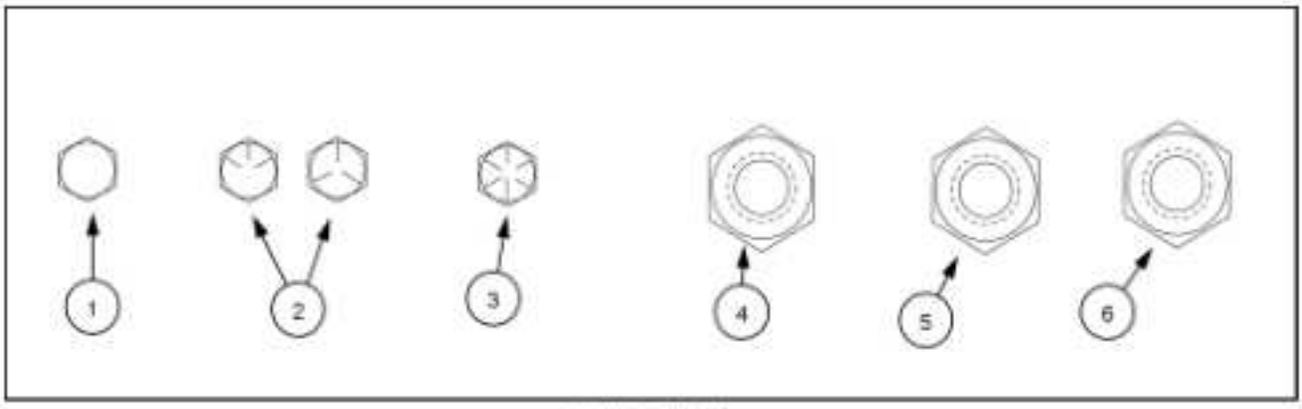
MidWestTech | New Holland NEF 4 Cylinder Mechanical Tier 2, Stage II F4GE0404B*D... Order the manual at mid-west-tech.com >

INCH FLANGED HARDWARE

NOM-INAL SIZE	SAE GRADE 5 BOLT and NUT		SAE GRADE 8 BOLT and NUT		LOCKNUT GrF W/ Gr5 BOLT	LOCKNUT GrG W/ Gr8 BOLT
	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD		
1/4	9 N·m (80 lb in)	12 N·m (106 lb in)	13 N·m (115 lb in)	17 N·m (150 lb in)	8 N·m (71 lb in)	12 N·m (106 lb in)
5/16	19 N·m (168 lb in)	25 N·m (221 lb in)	26 N·m (230 lb in)	35 N·m (310 lb in)	17 N·m (150 lb in)	24 N·m (212 lb in)
3/8	33 N·m (25 lb ft)	44 N·m (33 lb ft)	47 N·m (35 lb ft)	63 N·m (46 lb ft)	30 N·m (22 lb ft)	43 N·m (32 lb ft)
7/16	53 N·m (39 lb ft)	71 N·m (52 lb ft)	75 N·m (55 lb ft)	100 N·m (74 lb ft)	48 N·m (35 lb ft)	68 N·m (50 lb ft)
1/2	81 N·m (60 lb ft)	108 N·m (80 lb ft)	115 N·m (85 lb ft)	153 N·m (113 lb ft)	74 N·m (55 lb ft)	104 N·m (77 lb ft)
9/16	117 N·m (86 lb ft)	156 N·m (115 lb ft)	165 N·m (122 lb ft)	221 N·m (163 lb ft)	106 N·m (78 lb ft)	157 N·m (116 lb ft)
5/8	162 N·m (119 lb ft)	216 N·m (159 lb ft)	228 N·m (168 lb ft)	304 N·m (225 lb ft)	147 N·m (108 lb ft)	207 N·m (153 lb ft)
3/4	287 N·m (212 lb ft)	383 N·m (282 lb ft)	405 N·m (299 lb ft)	541 N·m (399 lb ft)	261 N·m (193 lb ft)	369 N·m (272 lb ft)
7/8	462 N·m (341 lb ft)	617 N·m (455 lb ft)	653 N·m (482 lb ft)	871 N·m (642 lb ft)	421 N·m (311 lb ft)	594 N·m (438 lb ft)
1	693 N·m (512 lb ft)	925 N·m (682 lb ft)	979 N·m (722 lb ft)	1305 N·m (963 lb ft)	631 N·m (465 lb ft)	890 N·m (656 lb ft)

IDENTIFICATION

Inch Bolts and free-spinning nuts



Grade Marking Examples

SAE Grade Identification			
1	Grade 2 - No Marks	4	Grade 2 Nut - No Marks
2	Grade 5 - Three Marks	5	Grade 5 Nut - Marks **120 °** Apart
3	Grade 8 - Five Marks	6	Grade 8 Nut - Marks **60 °** Apart

MidWestTech | New Holland NEF 4 Cylinder Mechanical Tier 2, Stage II F4GE0404B*D... Order the manual at mid-west-tech.com >

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.

MidWestTech | New Holland NEF 4 Cylinder Mechanical Tier 2, Stage II F4GE0404B*D... Order the manual at mid-west-tech.com >