SERVICE MANUAL

Boomer™ 54D CVT
Tier 4B (final)
Compact Tractor

Part number 48017704
1st edition English
October 2016

NEW HOLLAND AGRICULTURE

© 2016 CNH Industrial America LLC. All Rights Reserved.

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

[10.202] Air cleaners and lines 10.9

[10.206] Fuel filters 10.10

[10.218] Fuel injection system 10.11

[10.250] Turbocharger and lines 10.12

[10.304] Engine lubrication system 10.13

[10.400] Engine cooling system 10.14

[10.501] Exhaust Gas Recirculation (EGR) exhaust treatment 10.15

Transmission 21

[21.504] Continuously Variable Transmission (CVT) 21.1

Four-Wheel Drive (4WD) system 23

[23.101] Mechanical control 23.1

Front axle system 25

[25.100] Powered front axle 25.1

[25.102] Front bevel gear set and differential 25.2

[25.310] Final drives 25.3

Rear axle system 27

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >

[27.100] Powered rear axle 27.1
[27.106] Rear bevel gear set and differential 27.2
Power Take-Off (PTO) 31
[31.104] Rear electro-hydraulic control 31.1
[31.110] One-speed rear Power Take-Off (PTO) 31.2
[31.120] Central Power Take-Off (PTO) 31.3
Brakes and controls 33
[33.110] Parking brake or parking lock 33.1
[33.120] Mechanical service brakes 33.2
Hydraulic systems 35
[35.000] Hydraulic systems 35.1
[35.104] Fixed displacement pump 35.2
[35.204] Remote control valves 35.3
[35.300] Reservoir, cooler, and filters 35.4
Steering 41
[41.200] Hydraulic control components 41.1
[41.206] Pump 41.2
[41.216] Cylinders 41.3
Cab climate control 50
[50.100] Heating 50.1
[50.104] Ventilation 50.2
[50.200] Air conditioning 50.3
Electrical systems 55
[55.000] Electrical system 55.1
[55.010] Fuel injection system 55.2
[55.014] Engine intake and exhaust system 55.3
[55.024] Transmission control system 55.4
[55.100] Harnesses and connectors 55.5

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >

[55.201] Engine starting system 55.6
[55.202] Cold start aid 55.7
[55.301] Alternator 55.8
[55.302] Battery 55.9
[55.404] External lighting 55.10
[55.408] Warning indicators, alarms, and instruments 55.11
[55.518] Wiper and washer system 55.12
[55.640] Electronic modules 55.13
[55.989] Exhaust Gas Recirculation (EGR) electrical system 55.14
[55.DTC] FAULT CODES 55.15
Platform, cab, bodywork, and decals 90
[90.100] Engine hood and panels 90.1
[90.116] Fenders and guards 90.2
[90.124] Pneumatically-adjusted operator seat 90.3
[90.150] Cab 90.4
[90.151] Cab interior 90.5
[90.154] Cab doors and hatches 90.6

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >

Cylinder head - Dimension

Boomer™ 54D CVT | WE

	Boomer 3040	Boomer 3045	Boomer 3050
Engine Model	ISM N844	ISM N844L	ISM N844L
Head Warp			
Standard	0.05 mm (0.002 in)	0.05 mm (0.002 in)	0.05 mm (0.002 in) (Less than)
Maximum	0.12 mm (0.005 in)	0.12 mm (0.005 in)	0.12 mm (0.005 in)
Valve Seat Width			
Standard	1.7 - 2.1 mm (0.067 - 0.082 in)	1.7 - 2.1 mm (0.067 - 0.082 in)	1.7 - 2.1 mm (0.067 - 0.082 in)
Maximum	2.5 mm (0.098 in)	2.5 mm (0.098 in)	2.5 mm (0.098 in)
Valve Seat Sink			
Standard (Recess)	0.85 - 1.15 mm (0.0334 - 0.0453 in)	0.85 - 1.15 mm (0.0334 - 0.0453 in)	0.85 - 1.15 mm (0.0334 - 0.0453 in)
Maximum	1.8 mm (0.071 in)	1.8 mm (0.071 in)	1.8 mm (0.071 in)
Valve Angle	45 °	45 °	45 °

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >

2600-Variator solenoid open circuit or short to ground

Control Module : TCU

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Context:
This fault will occur when the variator solenoid **Y-007** signal is less than **0.2 A**.

Cause:
There is a short or open circuit in the variator solenoid **Y-007** or circuit.

Possible failure modes:

1. Faulty connector
2. Faulty variator solenoid **Y-007**
3. Faulty harness
4. Faulty Transmission Control Unit (TCU) **A-001**

Solution:

1. Check the variator solenoid **Y-007** connector **X-063** and the TCU **A-001** connectors **X-061** and **X-062**.
   A. Ensure the connectors are connected, not damaged, the pins are in the correct position and that the fit is tight. Repair or replace as required.
   B. If the connectors are okay, continue to step **2**.
2. Check the variator solenoid **Y-007**.
   A. Disconnect connector **X-063**. Measure the resistance between the component side of connector, **X-063 (Female) pin 1** and **X-063 (Female) pin 2**. If the resistance indicated is not approximately **9 Ohms** at **20 °C** (**68.0 °F**), remove or replace the variator solenoid **Y-007**.
   B. If the variator solenoid **Y-007** is okay, continue to step **3**.
3. Check for an open circuit.
   A. Disconnect connectors **X-061**, **X-062**, and **X-063**. Check between connector:
   X-063 (Female) pin 1 and **X-061 (Female) pin 18**
   X-063 (Female) pin 2 and **X-062 (Female) pin 3**
   If an open circuit is indicated, repair or replace the harness as required.
   B. If an open circuit is not indicated, continue to step **4**.
4. Check for a short to ground
   A. Check between connector: **X-063 (Female) pin 1** and ground**X-063 (Female) pin 2** and groundIf a short to ground is indicated, repair or replace the harness as required.
   B. If the harness is okay, download the correct level of software. If the fault reoccurs, remove and replace the TCU **A-001** .

Wiring harnesses - Electrical schematic sheet 10 (55.100)

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >

4. Determine the condition of the ECU A-9000 CAN circuit.

   With the key switch in the OFF position, use a multimeter to measure the resistance of the CAN connection on the vehicle (VE) harness side:

From	To	Value
X-9102 pin K24	**X-9102 pin K25**	There should be **120 Ω**.
X-9102 pin K24	chassis ground	There should be no continuity
X-9102 pin K25	chassis ground	There should be no continuity

   Use a multimeter to measure the resistance of the CAN termination resistor, internal to the ECU A-9000:

From	To	Value
X-9102 pin K24	**X-9102 pin K25**	There should be **120 Ω**.

   A. If the measured resistances are correct and neither conductor is grounded, check the ECU A-9000 for the appropriate software and re-flash, if necessary.

   B. If the measured resistances are not correct or one or both of the conductors is grounded, see the appropriate vehicle service manual and electrical schematics, if necessary, to locate and restore the termination resistance to the CAN circuit.

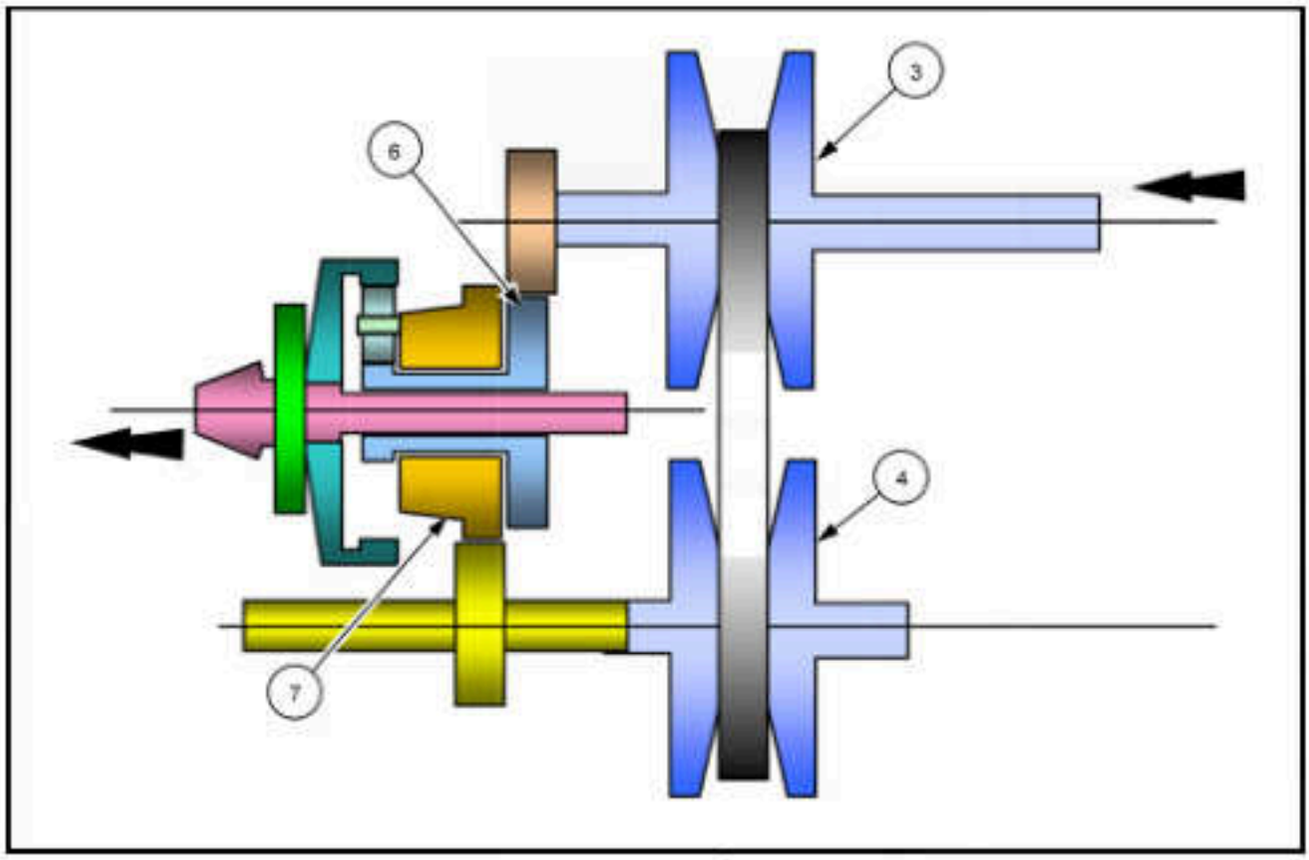
5. Visually inspect the relevant harnesses and connectors for damage, bent or dislocated pins, corroded terminals, or broken wires. Verify that the connectors are fully installed. Flex the harnesses involved to reveal intermittent breaks or shorts in the wiring concerned. Operate the machine while you monitor the display.

   A. If you find damage or the display indicates other than normal display readings, then repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

   B. If you do not find damage and the display indicates only normal readings, then erase the fault code and continue operation.

Wiring harnesses - Electrical schematic sheet 02 - Engine Control Unit (ECU) power and after treatment system (engine schematics) (55.100.DP-C.20.E.02)

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >



NHL12CT306286A 2

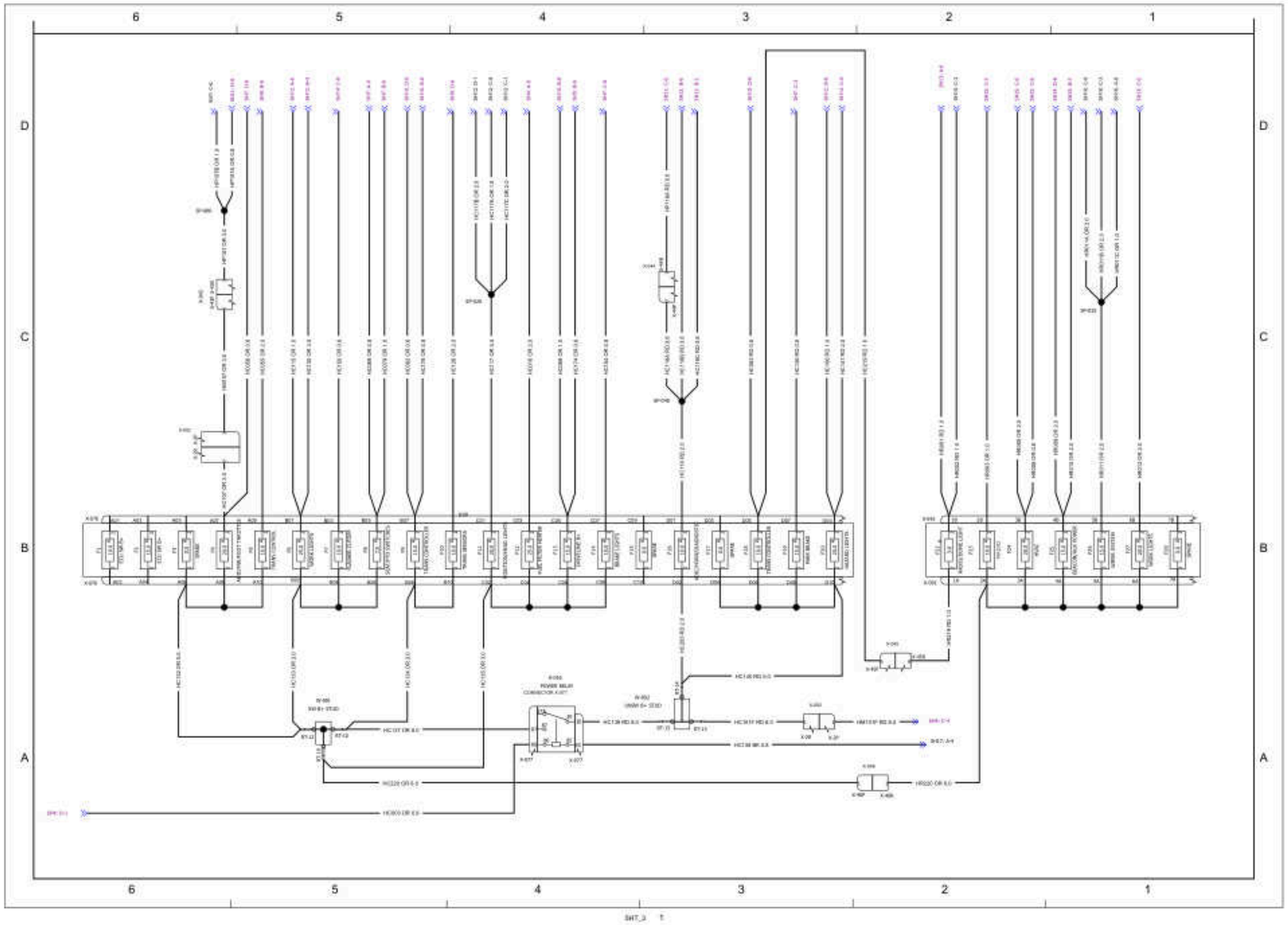
Variator Assembly

The variator assembly **(2)** is an electro-hydraulically controlled variable speed transmission. The variator assembly consists of a gerotor style fixed displacement hydraulic pump, input drive pulley, output driven pulley, drive chain and mechanical torque sensor. The fixed displacement gerotor pump produces the oil flow for the complete transmission system except for the Forward/Reverse clutch which oil is supplied by the power steering hydraulic pump. The throat of the input and output pulleys are adjusted simultaneously by the use of both hydraulic and spring pressure to set the desired speed of the transmission. The driven output pulley also incorporates a mechanical torque sensor that acts similar to a mechanical governor. As the torque sensor senses torque rise it adjusts and increases the pressure to the input (P1) **(3)** and the output (P2) **(4)** pulleys to compensate and apply more force to the variator assembly. If the torque load increase to the point where the variator cannot hold the chain assembly safely, the transmission logic will dump the Forward/Reverse clutches and the unit will lose drive pressure, similar to blowing a pressure relief valve in a hydrostatic transmission.

Planetary Reduction

The planetary reduction **(5)** uses the speed from the input pulley assemblies to control the sun gear **(6)** and carrier **(7)**. By controlling the speed at which the sun gear turns in comparison to the carrier, we can reduce the high speed revolutions of the variator assembly to a usable drive piniion ratio. The drive pinion is the direct out put of the planetary assembly.

MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manua... Order the manual at mid-west-tech.com >



MidWestTech | New Holland Boomer 54D CVT Tier 4B Compact Tractor Service Manual | Publication 48017704
Order the manual at mid-west-tech.com >