850M
Tier 4A (interim)
Crawler Dozer

PIN NDDC83000 and above; NEDC80000 and above; NFDC80000 and above

SERVICE MANUAL

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September 2015
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CASE CONSTRUCTION

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Schematic legend			
(1)	ECU connector X-120	(3)	Grid heater relay connector X-127 pin A and X-127 pin B
(2)	ECU ground	(4)	Positive battery to the ECU

A. The connectors are secure and the harness is free of damage. Go to step **3**.

B. The connectors or the harness has damage. Repair or replace the harness or connectors as required. Return to step **1** to confirm elimination of fault.

3. Measure the resistance through the grid heater relay.

   Turn the ignition switch OFF.

   Disconnect ECU connector X-120.

   Measure the resistance between X-120 pin 12 and X-120 pin 75. The resistance should be less than **1,000 Ω**. Wiggle the harness during measurement to reveal an intermittent condition.

   A. The resistance is greater than **1,000 Ω**. Go to step **4**.

   B. The resistance is less than **1,000 Ω**. Temporarily replace the ECU and retest. Return to step **1** to confirm elimination of the fault.

4. Measure the resistance through the signal wires.

   Turn the ignition switch OFF.

   Disconnect ECU connector X-120.

   Disconnect the grid heater relay.

   Fabricate a jumper wire that will connect between connector X-127 pin A and X-127 pin B.

   Connect the jumper wire between X-127 pin A and X-127 pin B.

   Measure the resistance between X-120 pin 12 and X-120 pin 75. The resistance should be less than **10 Ω**. Wiggle the harness during measurement to reveal an intermittent condition.

   A. The resistance is less than **10 Ω**. There is a problem with grid heater relay. Temporarily replace the grid heater and retest. Return to step **1** to confirm elimination of the fault.

   B. The resistance is greater than **10 Ω**. There is an open circuit in the wiring to the grid heater relay. Repair or replace the harness as required. Return to step **1** to confirm elimination of the fault.

Harnesses and connectors - Electrical schematic sheet 04 Engine Control (55.100-C.20.E.04)

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Temperature	Resistance
-40 °C (-40 °F)	170 Ω
-20 °C (-4 °F)	186 Ω
0 °C (32 °F)	201 Ω
25 °C (77 °F)	220 Ω
50 °C (122 °F)	239 Ω
100 °C (212 °F)	276 Ω
150 °C (302 °F)	313 Ω
200 °C (392 °F)	350 Ω
250 °C (482 °F)	385 Ω
300 °C (572 °F)	420 Ω
350 °C (662 °F)	455 Ω
400 °C (752 °F)	489 Ω
450 °C (842 °F)	522 Ω

A. If the Downstream exhaust temperature sensor resistance is within range, continue with step

B. If the Downstream exhaust temperature sensor resistance is out of range, the sensor has failed internally, replace the sensor.

5. Check wiring to the Upstream and Downstream exhaust temperature sensors. Use the product schematics to verify integrity of wiring between temperature sensors and the ECU.

A. Wiring damage found. Repair wiring.

B. No wiring damage found. Clear code and continue normal operation. If code reoccurs, update the software in the ECU.

6. 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 monitoring the Display.

A. If damage is found or other than normal display readings are indicated, 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 no damage or other than normal display readings are indicated, erase the fault code and continue operation.

Harnesses and connectors - Electrical schematic sheet 05 Exhaust Control (55.100-C.20.E.05)

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19605-CAN Receive Frame ET1 - Timeout

850M	NA

Possible failure modes:

1. Controller communication error.

Solution:

1. Check for other error codes being displayed. Are there other time out error codes displayed. Are there other can bus communication error issues.

   A. If any other error code is being displayed, continue to these tests.

   B. If no other error code is displayed, continue to step **2**.

2. Ensure all connectors are secured properly on the denox module/supply module connector , the denox terminator connector (located top of right front fender) and engine control module connector. Check for damage, loose connections or broken can bus wires.

   A. A connector/wiring issue was located and corrected. Erase fault code and return unit to field operation.

   B. No connector/wiring issues were located. Continue with step **3**.

3. Check the can bus terminators. Disconnect denox terminator connector . Check the terminators resistance from pin 1 to pin 2. The expected reading is **120 Ω**.

   A. Expected reading is not found. Replace denox terminator. Erase fault code and return unit to field operation.

   B. Reading is as expected. Continue with step **4**.

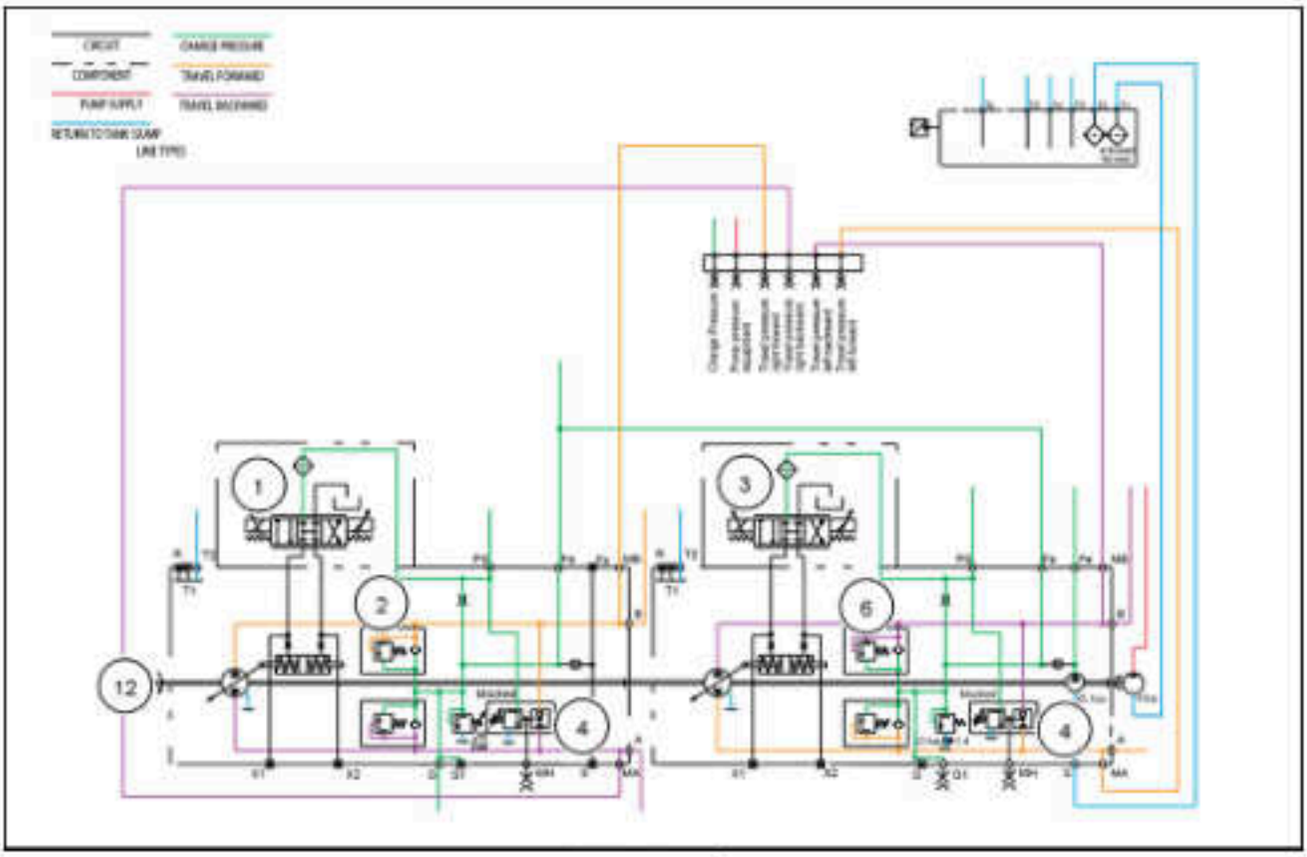
4. Next, check the harness end resistance on the denox terminator from pin 1 to pin 2. This will be checking the engine control modules internal terminator. The expected reading is **120 Ω**.

   A. Expected reading not found. There may be a short to ground, or open wire between denox terminator and engine control module connector, or the engine control module terminator is faulty. Troubleshoot the wiring harness make repairs, or replace engine control module.

   B. Reading is as expected. Erase fault code. If the fault code reoccurs contact ASIST.

Harnesses and connectors - Electrical schematic sheet 28 CAN Bus System (55.100-C.20.E.28)

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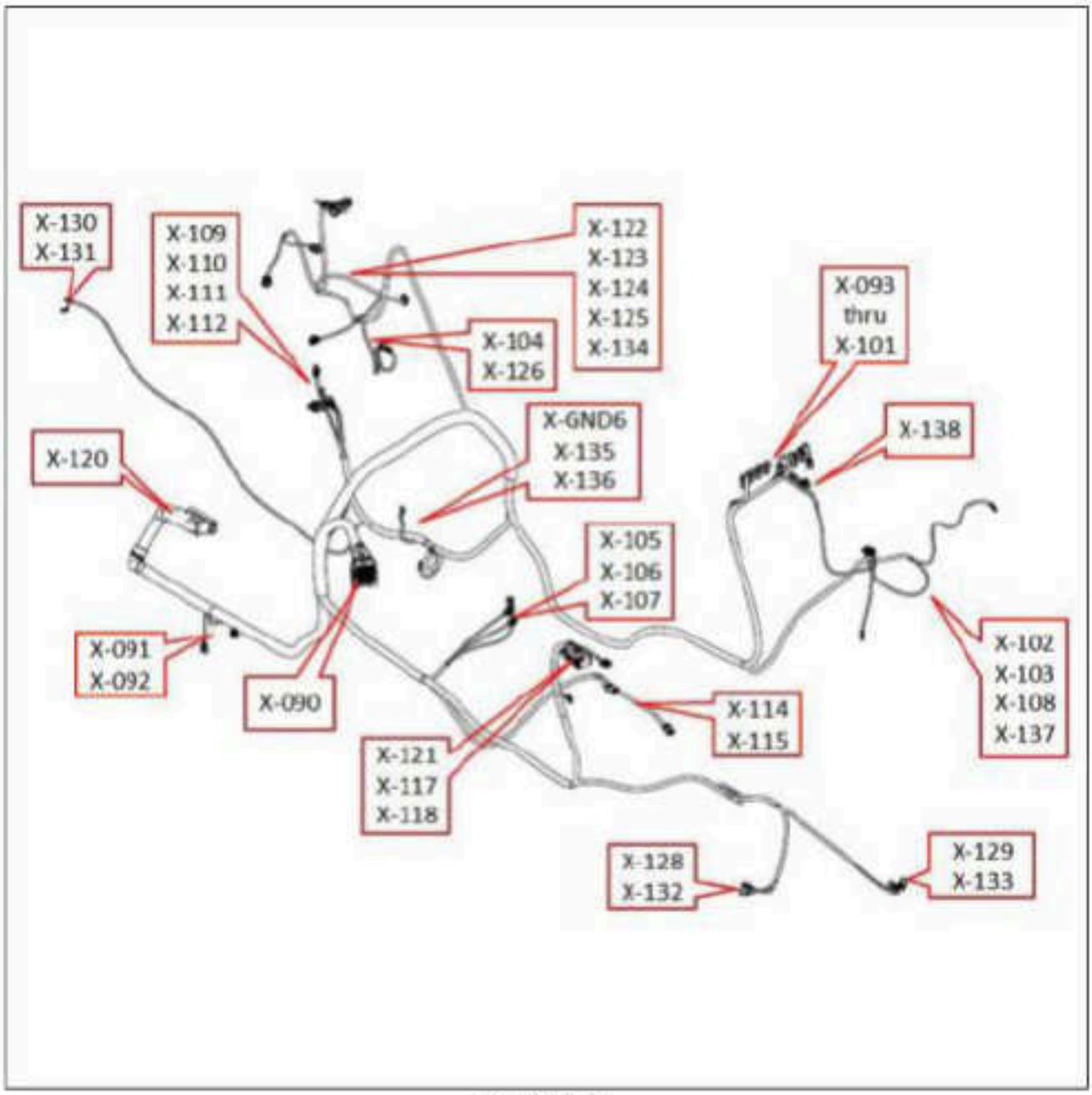
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Item	Description
(1,3)	Pump control solenoid valve
(2,6)	High pressure relief \ check valve
(4)	High pressure cutoff
(12)	Connection to engine

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Harnesses and connectors - Wiring schema – Wiring harnesses with connector locations

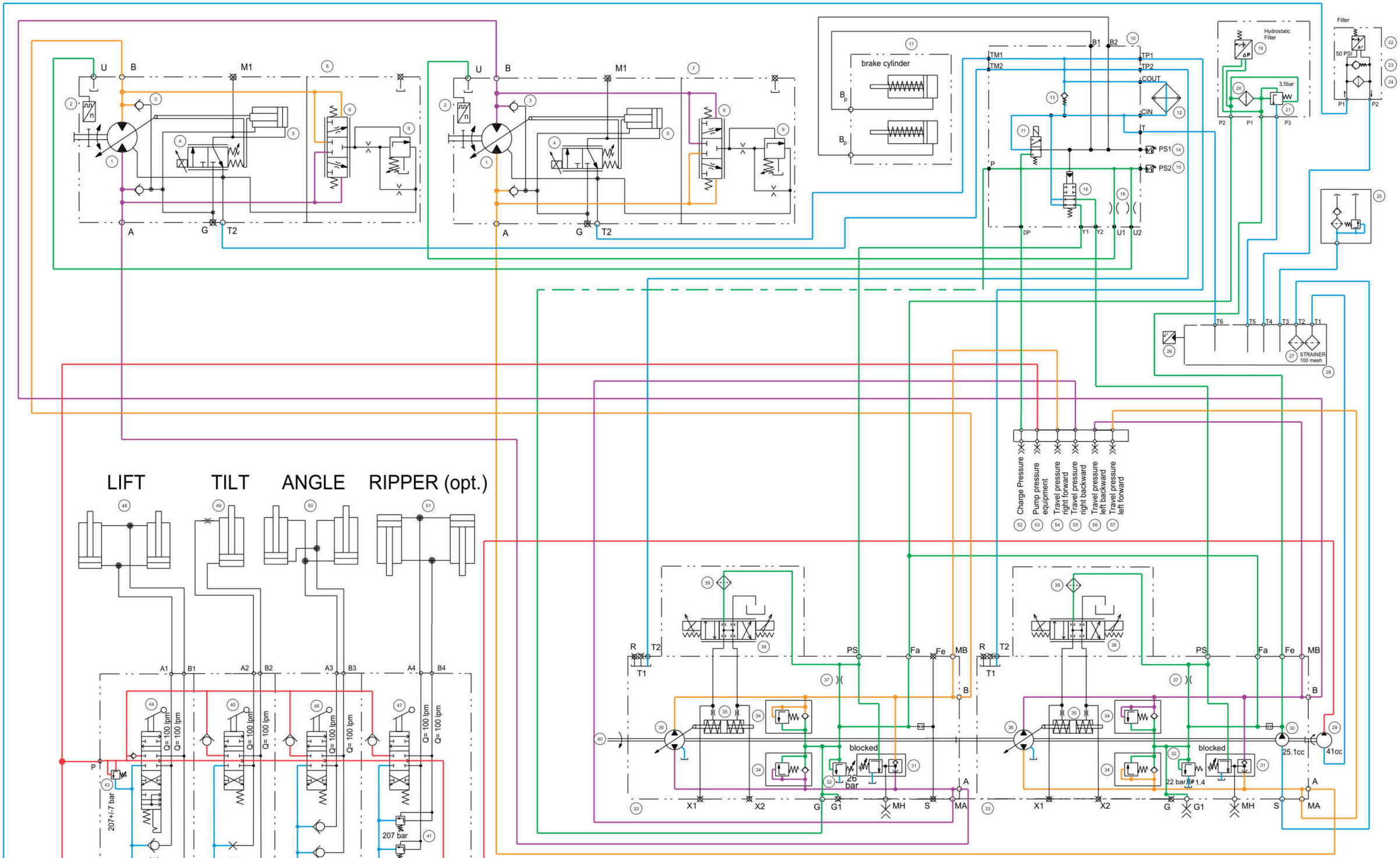
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Chassis harness

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ITEM #	DESCRIPTION	ITEM #	DESCRIPTION	ITEM #	DESCRIPTION	ITEM #	DESCRIPTION
1	TRACK DRIVE MOTOR	16	NEUTRAL OVERRIDE VALVE	31	HIGH PRESSURE CUTOFF	46	ANGLE SPOOL
2	TRACK DRIVE MOTOR SPEED SENSOR	17	PARK BRAKE RELEASE PISTON	32	CHARGE PRESSURE RELIEF	47	RIPPER SPOOL
3	MOTOR CONTROL CHECK VALVE	18	MOTOR COOLING ORIFICE	33	TANDEM PUMP ASSEMBLY	48	LIFT CYLINDERS
4	TRAVEL SPEED CONTROL VALVE	19	CHARGE FILTER PRESSURE SWITCH	34	HIGH PRESSURE RELIEF \ CHECK VALVE	49	TILT CYLINDER
5	MOTOR SPEED CONTROL PISTON	20	CHARGE FILTER	35	PUMP CONTROL PISTON	50	ANGLE CYLINDERS
6	MOTOR FLUSHING VALVE	21	CHARGE FILTER BYPASS VALVE	36	TRACK DRIVE PUMPS	51	RIPPER CYLINDERS
7	LEFT TRACK DRIVE MOTOR ASSEMBLY	22	HYDRAULIC FILTER PRESSURE SWITCH	37	PUMP SPEED CONTROL ORIFICE	52	CHARGE PRESSURE - TEST POINT
8	RIGHT TRACK DRIVE MOTOR ASSEMBLY	23	HYDRAULIC FILTER BYPASS VALVE	38	PUMP CONTROL SOLENOID VALVE	53	PUMP PRESSURE EQUIPMENT - TEST POINT
9	MOTOR FLUSHING VALVE FLOW CONTROL	24	HYDRAULIC FILTER	39	SCREEN	54	TRAVEL PRESSURE RIGHT FORWARD - TEST POINT
10	BRAKE RELEASE (MULTIFUNCTION) VALVE	25	RESERVOIR PRESSURE CAP	40	CONNECTION TO ENGINE	55	TRAVEL PRESSURE RIGHT BACKWARD - TEST POINT
11	PARK BRAKE RELEASE SOLENOID	26	RESERVOIR TEMPERATURE SENSOR	41	CIRCUIT RELIEF	56	TRAVEL PRESSURE LEFT BACKWARD - TEST POINT
12	OIL COOLER	27	RESERVOIR SUCTION SCREEN	42	EQUIPMENT VALVE	57	TRAVEL PRESSURE LEFT FORWARD - TEST POINT
13	OIL COOLER BYPASS	28	HYDRAULIC RESERVOIR	43	MAIN PRESSURE RELIEF VALVE		
14	BRAKE RELEASE PRESSURE SWITCH	29	EQUIPMENT HYDRAULIC PUMP	44	LIFT SPOOL		
15	CHARGE PRESSURE SWITCH	30	CHARGE PUMP	45	TILT SPOOL		

SHOWS CIRCUIT CROSSING NOT CONNECTED

SHOWS CIRCUIT CONNECTED

CIRCUIT DIAGRAM LEGEND

CHECK VALVE

RESTRICTOR

FILTER OR SCREEN

OIL COOLER

CIRCUIT

COMPONENT

PUMP SUPPLY

RETURN TO TANK \ SUMP

LINE TYPES

CHARGE PRESSURE

TRAVEL FORWARD

TRAVEL BACKWARD

CONVERSION INFORMATION

1 bar = 14.5 pounds per square inch (PSI)

1 liter per minute = .264 gallons per minute

HYDRAULIC SCHEMATIC
850M DOZER Tier 4A (interim)

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