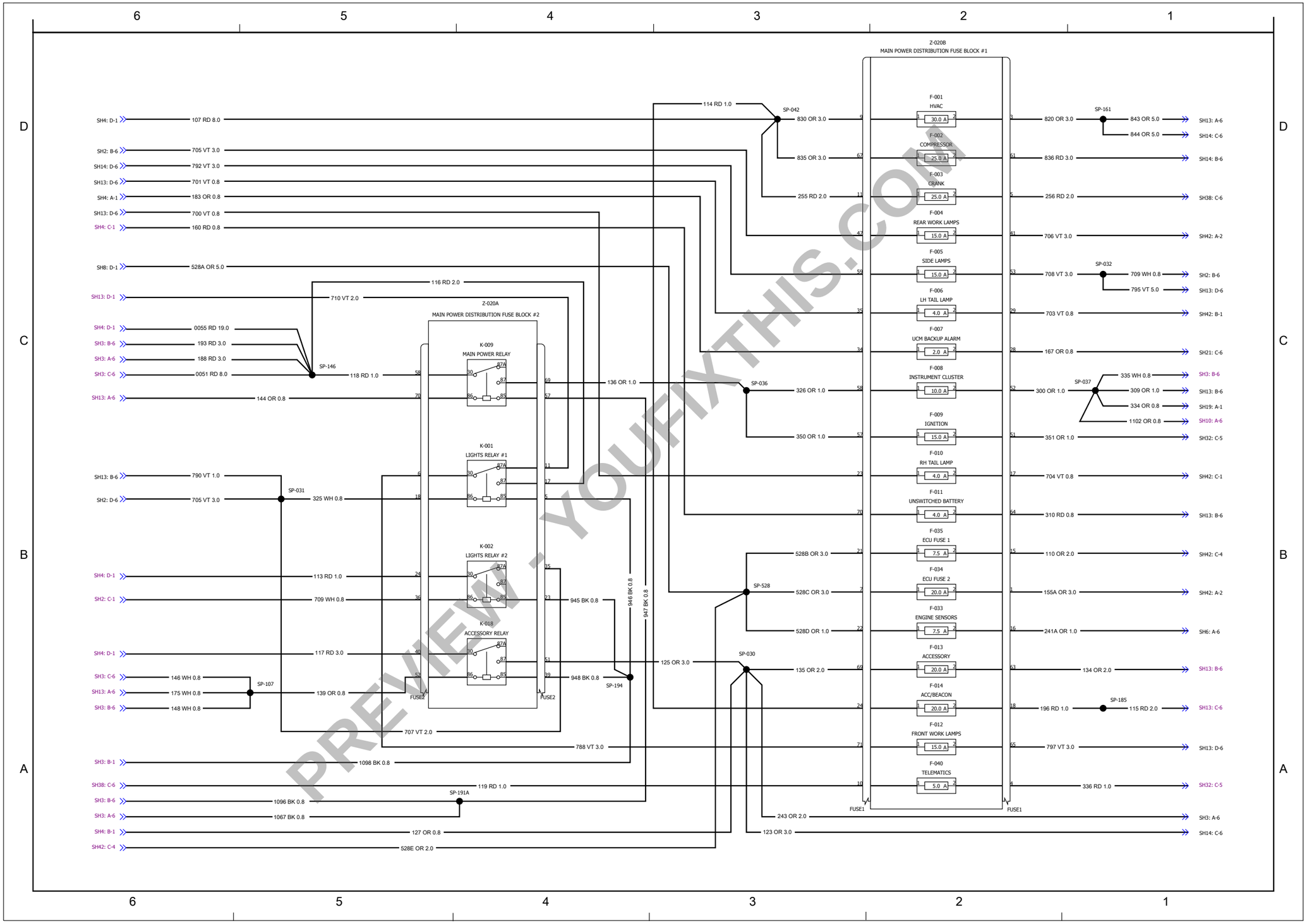
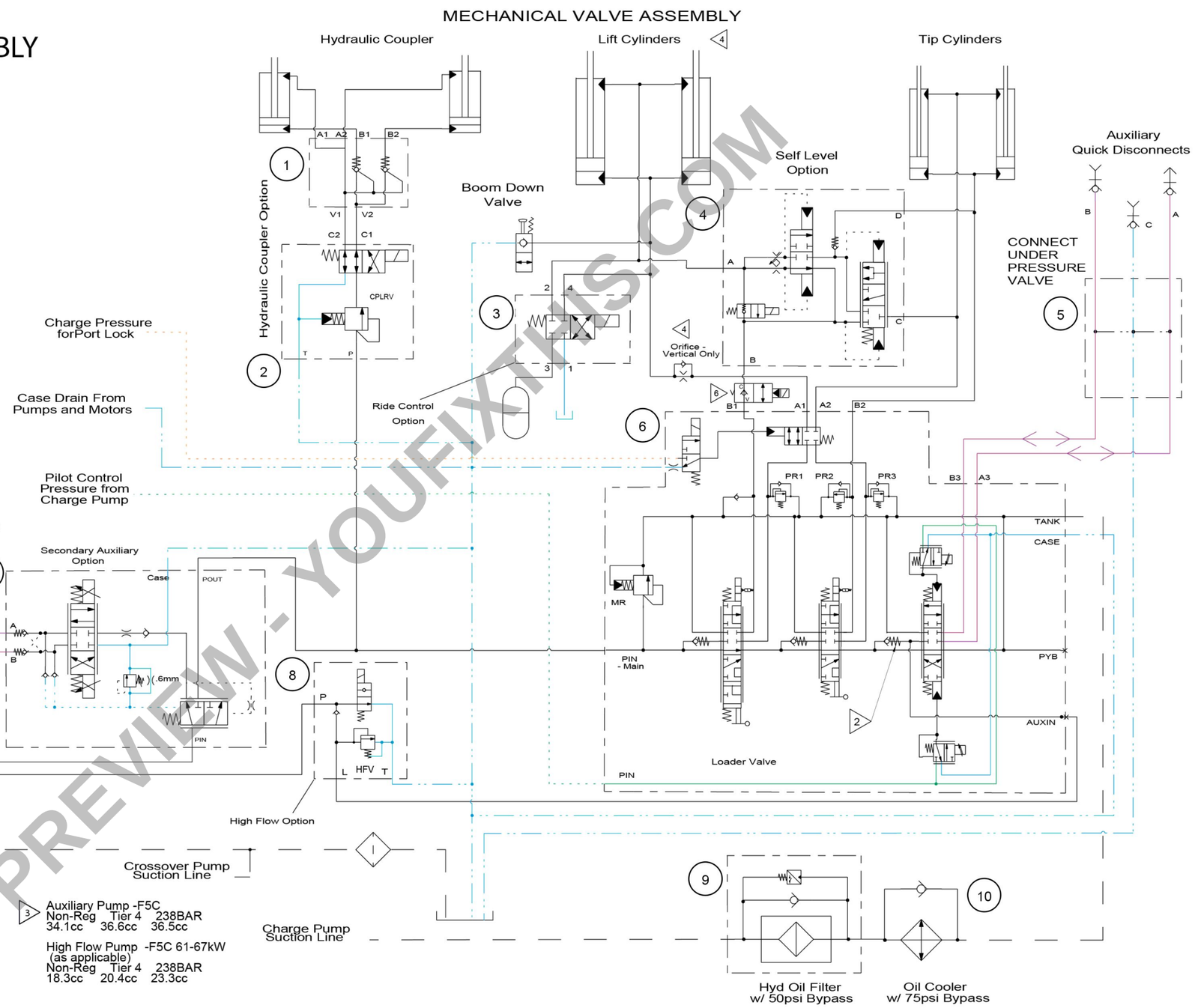


SHT_2 1

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LARGE FRAME
MECHANICAL VALVE ASSEMBLY



NOTES:

1. FLUSHING VALVE
   -10 BAR SPRINGS
   -2 mm FLUSHING ORIFICE
   -290 PSI (20BAR) CUTOFF RELIEF
2. LOAD CHECK REMOVED IF HIGH FLOW INSTALLED.
3. STANDARD PUMP STACK NOT USED ON EHF OPTION SEE NOTE ON DRAWING.
4. IN-LINE ORIFICE AT MANIFOLD BLOCK FOR VERTICAL MACHINES ONLY.
5. LIFT CYLINDERS ARE CUSHIONED FOR VERTICAL FRAME MACHINES ONLY.
6. BOOM ROD LOCK VALVE FOR LARGE FRAME VERTICAL MACHINES ONLY.

STANDARD RELIEF PRESSURE TABLE

MAIN 3046 PSI ± 72.5 (210 BAR)
PR1- 3263 PSI +145/-73 (225 BAR)
PR2- 3263 PSI +145/-73 (225 BAR)
PR3- 3771 PSI +145/-73 (260 BAR)
PR3- OPTIONAL 80 BAR OR 100 BAR (SERVICE)
HFV- 3250 PSI (224 BAR)
CPLRV- 2500 PSI (172 BAR)

HIGH PRESSURE RELIEF PRESSURE TABLE

MAIN 3450 PSI ± 72.5 (238 BAR)
PR1- 3625 PSI +290/-73 (250 BAR)
PR2- 3625 PSI +290/-73 (250 BAR)
PR3- 3916 PSI +290/-73 (270 BAR)
HFV- 3655 PSI +218/-0 (252 BAR)
CPLRV- 2500 PSI (172 BAR)

- HYDROSTATIC PUMP
- CHARGE PUMP
- PILOT CONTROL PRESSURE
- RETURN TO TANK/SUMP
- QUICK DISCONNECTS

3 Auxiliary Pump -F5C
Non-Reg Tier 4 238BAR
34.1cc 36.6cc 36.5cc

High Flow Pump -F5C 61-67kW
(as applicable)
Non-Reg Tier 4 238BAR
18.3cc 20.4cc 23.3cc

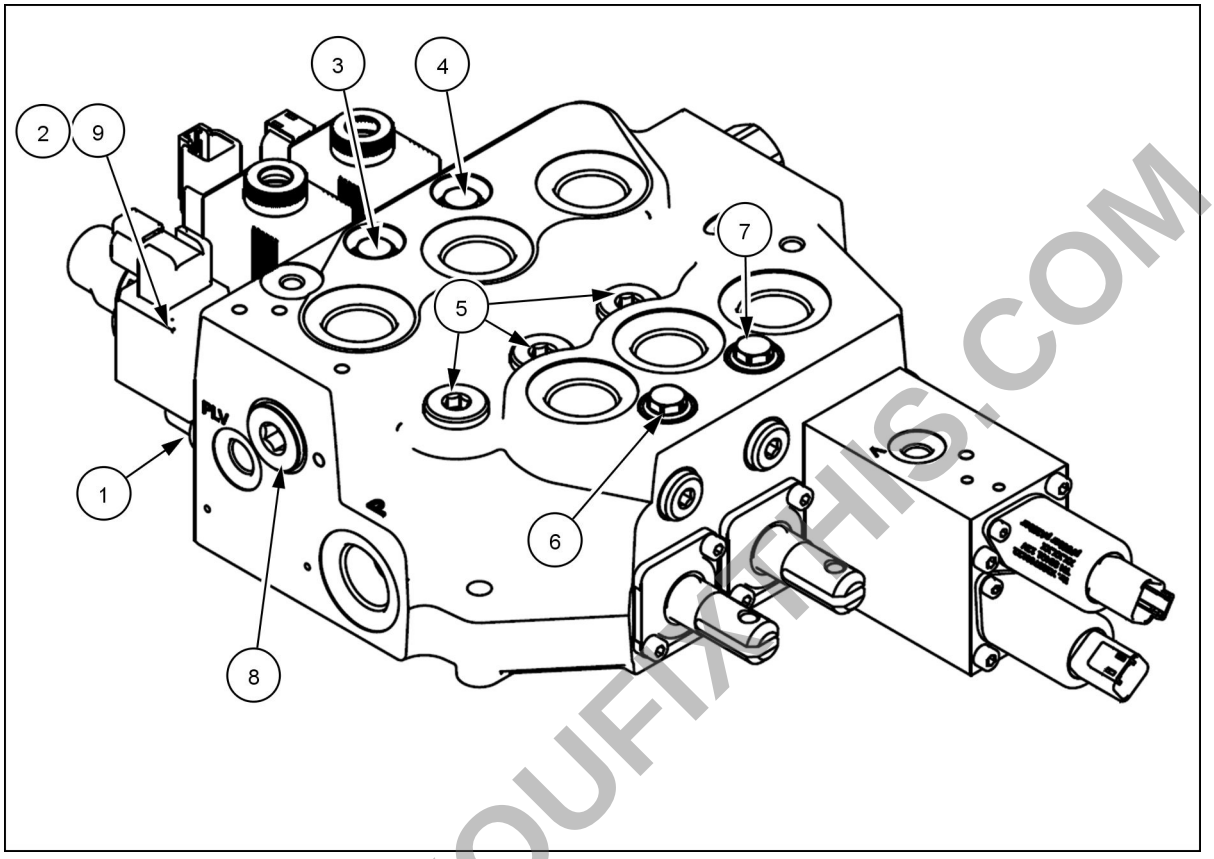
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Main control valve - General specification - Mechanical drive

C245 TIER 4B (FINAL) [NHM435463 -]	NA (Mechanical hydraulic controls)



RAPH18CTL0049FA 1

Main control valve - Mechanical drive

Main relief setting	**233 – 243 bar** (**3379 – 3524 psi**) @ **83.3 L/min** (**22 US gpm**)	Torque setting (Installation)
Circuit relief setting	A1 = **245 – 270 bar** (**3553 – 3915 psi**)	
	A2 = **265 – 290 bar** (**3843 – 4205 psi**)	
	B2 = **245 – 270 bar** (**3553 – 3915 psi**)	
Valve identification	**(1)** Main relief	**55.0 N·m** (**41.0 lb ft**)
	(2) Port lock cartridge	**24.0 N·m** (**18.0 lb ft**)
	(3) A1, pressure relief	**24.0 N·m** (**18.0 lb ft**)
	(4) A2, pressure relief	**24.0 N·m** (**18.0 lb ft**)
	(5) Load check	**42.0 N·m** (**31.0 lb ft**)
	(6) B1, hydraulic, anti-cavitation	**24.0 N·m** (**18.0 lb ft**)
	(7) B2, pressure relief	**24.0 N·m** (**18.0 lb ft**)
	(8) Plug	**42.0 N·m** (**31.0 lb ft**)

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1002 - Engine Coolant Temperature Is Above Normal

Context:
The instrument cluster has received a message from the ECU that the coolant temperature is above **111 °C** (**232 °F**) for a period greater than **5 s**.

Cause:
The coolant temperature is above normal. The instrument cluster has received a message from the ECU that the coolant temperature above **111 °C** (**232 °F**) for a period greater than **5 s**.

Possible failure modes:

1. The engine has a low coolant level.
2. Faulty wiring or connections.
3. A faulty coolant temperature sensor.
4. A faulty ECU.

Solution:

1. Verify that the fault code is active.

   Connect the Electronic Service Tool to the service tool connector .

   To check for fault codes: Start and operate the machine.

   A. The fault is not recorded again. OK to return the machine to service.

   B. Fault code **1002 – Engine Coolant Temperature Is Above Normal** is recorded again.
   Refer to procedure **3007 - Engine coolant temperature sensor voltage is higher than expected (55.640)**.

Wiring harnesses - Electrical schematic sheet 22 Instrument Cluster (55.100.DP-C.20.E.22)

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Fluids and lubricants

Fuel tank

Capacity	**96.5 L** (**25.5 US gal**)
Specifications	#2 Diesel ultra-low sulfur

Cooling system

Capacity	**19.0 L** (**5.0 US gal**)
Specifications	**NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**

Hydraulic system

Reservoir capacity	**22.7 L** (**6.0 US gal**)
System capacity:	**45.4 L** (**12.0 US gal**)
Specifications	**TUTELA AUTO SUPREME™ ENGINE OIL SAE 10W-30**

Chain compartments

Capacity - each side	
L234	**22.2 L** (**23.5 US qt**)
Specifications	**TUTELA AUTO SUPREME™ ENGINE OIL SAE 10W-30**

Grease fittings

Quantity	As required
Specifications	**TUTELA MOLY GREASE GR-75** (Molydisulfide)

Engine crank case oil

Capacity - with filter change	**8.5 L** (**9.0 US qt**)
Specifications	**NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4**

Final track drive

Capacity - each side	
C234, C238, C245	**1.0 L** (**1.06 US qt**) +/- **0.1 L** (**0.1 US qt**)
Specifications	**TUTELA HYPOIDE EP GEAR LUBE SAE 80W-90**

Emissions fluid

Reservoir capacity	**10.7 L** (**2.8 US gal**)
DEF/ADBLUE® low volume indicator	**2.4 L** (**0.6 US gal**)
Specifications	**DEF/ADBLUE®**

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Hydrostatic transmission - Troubleshooting

Problem	Possible Cause	Correction
The machine steers more than 1.8 m (6 ft) from the centerline after traveling 30.5 m (100 ft) forward or 15.2 m (50 ft) backward	Throttle speed.	The machine is designed to properly operate at high throttle.
	Track(s).	1. Inspect the tension of the track(s). Please see **Rubber track - Tension adjust (48.100)**. 2. Inspect the track(s) for damage. 3. Inspect the track frame(s) and track frame components for damage.
	Joysticks are not calibrated correctly.	1. For electro hydraulic (EH) machines, calibrate the joysticks by using the electronic service tool (EST). 2. For mechanical controlled machines, inspect the linkage between the joysticks and the hydrostatic pumps. Please see **Mechanical control - Adjust - Machines with only hand controls (29.200)**.
	A hose is bent, kinked, or clogged.	Inspect the hoses between the hydrostatic pumps, the motors, and the brake valve.
	The parking brake is not releasing.	1. Inspect the hoses. 2. Check the charge pressure. Please see **Pump Charge pressure relief valve - Pressure test (29.218)**. 3. Check the operation of the solenoid at the brake valve. 4. Inspect the brakes inside the motor(s) for damage.
	The hydrostatic pump(s) need adjustment.	1. Inspect the pressure limiter valves. Please see **Pump Pressure limiter valve - Pressure test (29.218)**. 2. Adjust the servo(s) inside the pump(s). Please see **Servo control - Adjust - Mechanical drive (29.218)**.
	The hydrostatic drive components are damaged.	1. Inspect the motor. 2. Inspect the hydrostatic pump(s).

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[35.600] High flow hydraulics 35.6

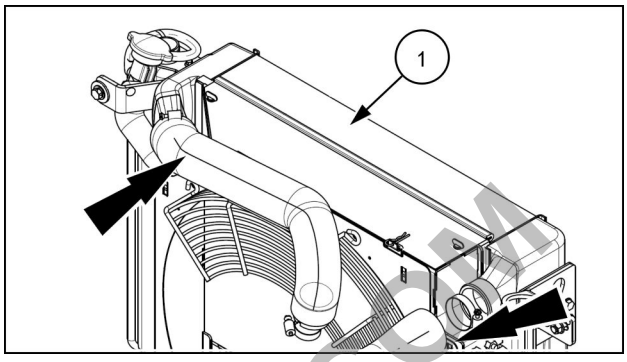
[35.724] Front loader hydraulic system control 35.7

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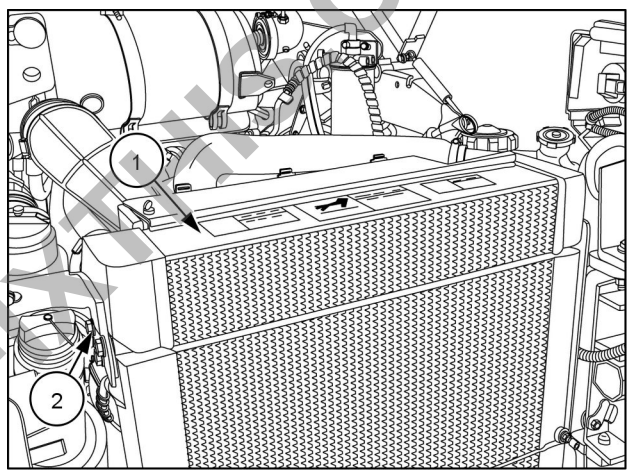
Aftercooler - Remove

1. Disconnect the inlet and the outlet hoses going to the air cooler **(1)**.



RAPH17SSL0260AA 1

2. Remove the air cooler **(1)** from the shroud by removing the bolts **(2)** on each side.



RAIL14SSL0798BA 2

Next operation:
Aftercooler - Install (10.310)

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Brakes and controls - 33

Parking brake or parking lock - 110

C245 TIER 4B (FINAL) [NHM435463 -]

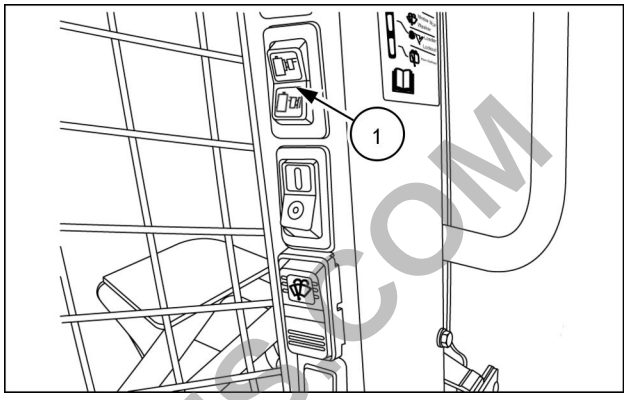
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High flow hydraulics - Overview - Enhanced High-Flow (EHF) system

C245 TIER 4B (FINAL) [NHM435463 -]	NA (Electro hydraulic controls)

NOTE: *The EHF system may require a jumper harness 84539488 to use the High Pressure/High Flow (HPHF) option on the approved attachment. The additional harness completes the electrical interlock circuitry within the electrical system for EHF operation.*



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If equipped with an enhanced auxiliary high flow system (EHF), the operator can command flow and higher pressure to an additional auxiliary circuit by selecting HF (high flow) or HP (high pressure) on the rocker switch **(1)**. Please see **High flow hydraulic pump - General specification - Enhanced High Flow (EHF) pump (35.600)** for specification about the EHF pump. The loader control valve standard auxiliary circuit is unaffected when High Flow is disabled. When enhanced high flow/pressure is enabled, the loader control valve standard auxiliary circuit is limited to 2nd Aux circuit flow of **30.3 l/min** (**8 US gpm**). The **275 bar** (**4000 psi**) high flow setting can only be used with approved attachments and is controlled by a circuit interlock installed at the multifunction plug with the attachment.

The Enhanced High Flow Auxiliary Control can be controlled only if all of the following conditions are met

1. Operator is seated properly
2. Operator Restraint engaged
3. The ignition is in the ON position
4. Engine is running
5. Hydraulic Enable switch is activated
6. Multifunction high pressure interlock plug connected ("HP" mode only)

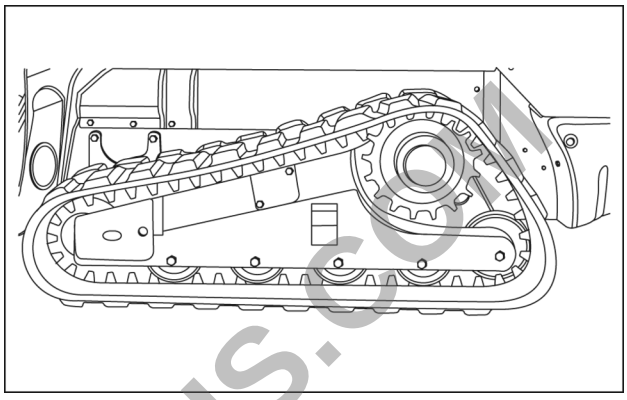
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Track tensioner - Remove

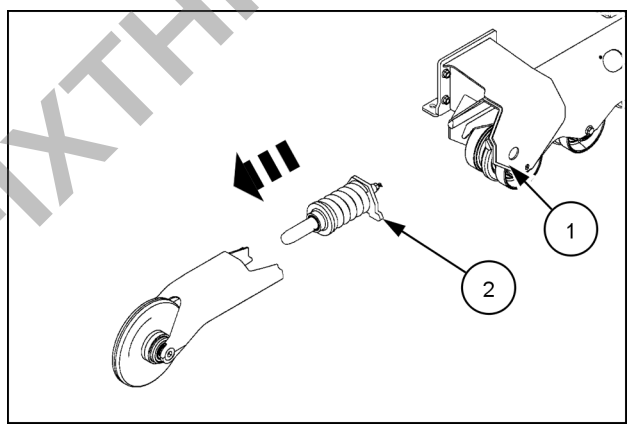
Prior operation:
Refer to **Rubber track - Remove (48.100)** and remove the track from the machine

1. Remove the track from the machine.



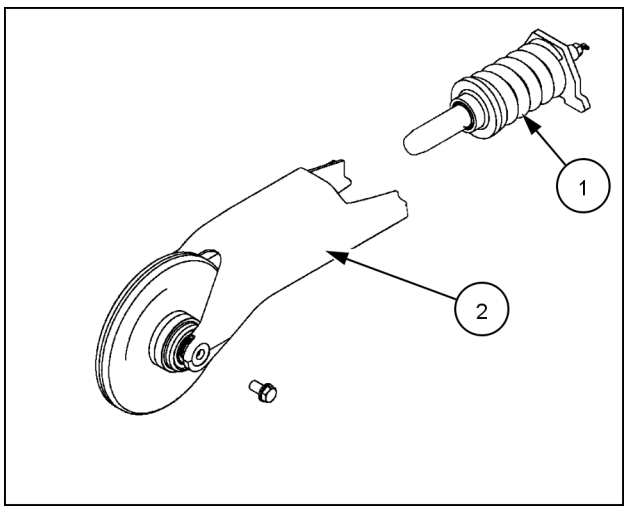
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2. Slide the track tension assembly **(2)** out of the main frame **(1)**.



RAPH16CTL0006BA 2

3. Slide the yoke assembly **(2)** off of the track tension assembly **(1)**.



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Grounding guidelines

A return path is necessary in an electrical circuit. In CNHi applications, the ground points are equivalent to the battery negative terminal.

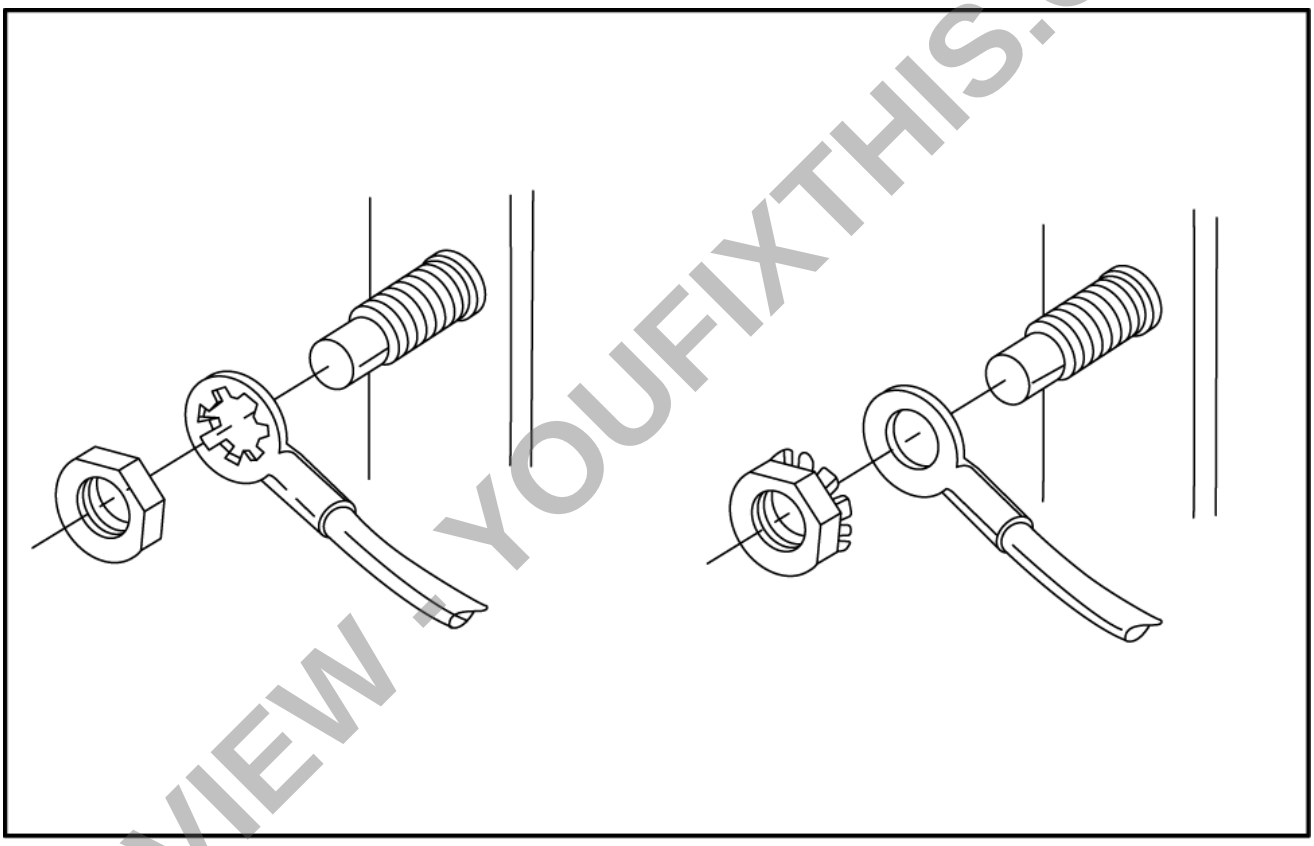
The electrical system should be properly grounded.

Use plated ground fasteners (studs, ring terminals, etc.) for better corrosion resistance.

The ground fasteners must be compatible with the ground terminals to reduce galvanic corrosion. Do not use rivets or sheet metal screws for grounding.

Grounding surfaces must be free of sealants, paint and/or any non-conductive coatings.

Whenever possible, use ring terminals with an anti-rotation feature. In case of terminals without an anti-rotation feature, use lock washers.



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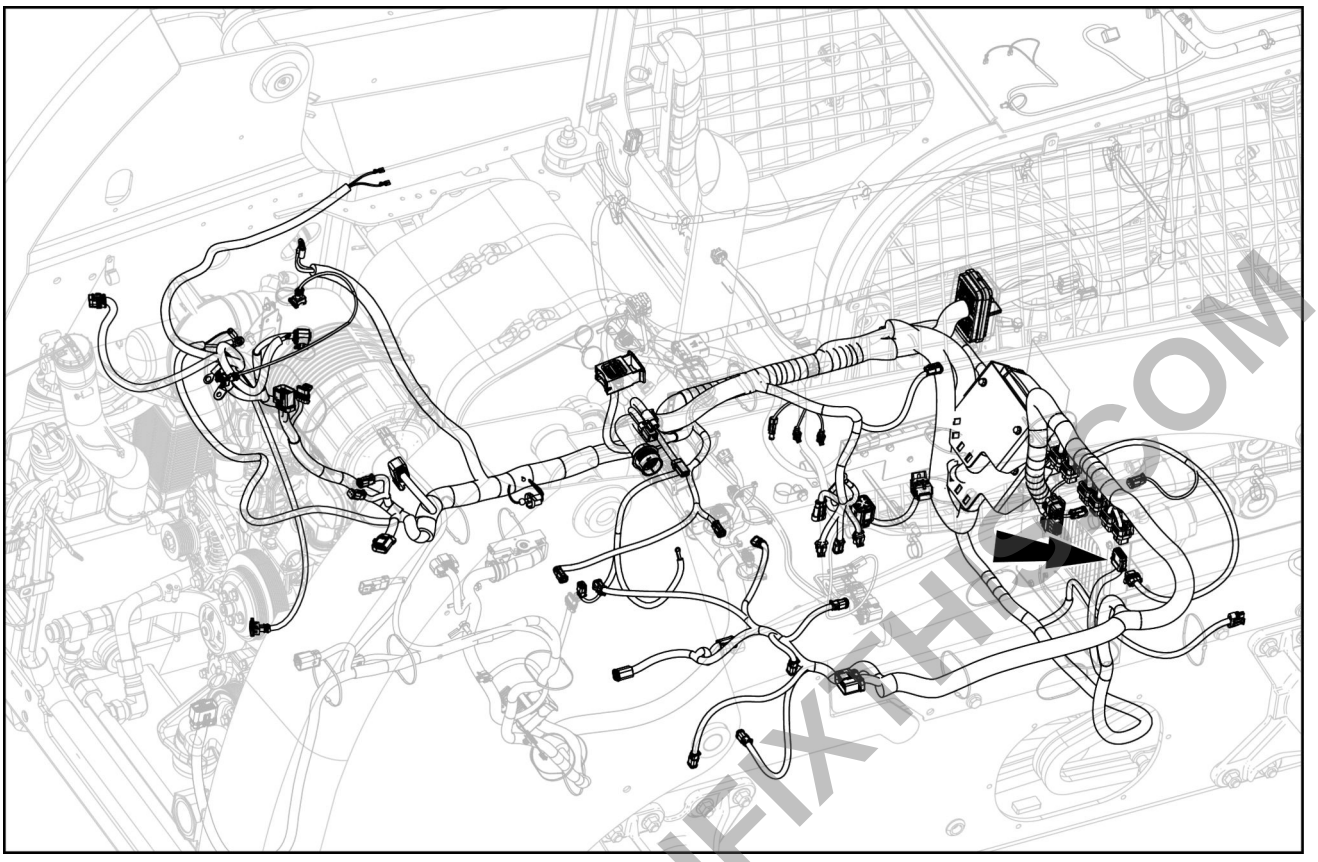
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Connector Number	Connector Name	Connector Diagram
X-275	Air Conditioning (A/C) Switch	**Wire connectors - Component diagram 27 Connectors X-270 to X-279 (55.100)**
X-300	Hydraulic Coupler Switch	**Wire connectors - Component diagram 30 Connectors X-300 to X-309 (55.100)**
X-301	Beacon Switch	**Wire connectors - Component diagram 30 Connectors X-300 to X-309 (55.100)**
X-302	Hazard Switch	**Wire connectors - Component diagram 30 Connectors X-300 to X-309 (55.100)**
X-303	High Flow Switch	**Wire connectors - Component diagram 30 Connectors X-300 to X-309 (55.100)**
X-306	Loader Lockout Switch	**Wire connectors - Component diagram 30 Connectors X-300 to X-309 (55.100)**
X-310	2–Speed Indicator	**Wire connectors - Component diagram 31 Connectors X-310 to X-319 (55.100)**
X-311	Light Selector Switch	**Wire connectors - Component diagram 31 Connectors X-310 to X-319 (55.100)**
X-317	Self-Level Switch	**Wire connectors - Component diagram 31 Connectors X-310 to X-319 (55.100)**
X-330	Right Speaker	**Wire connectors - Component diagram 33 Connectors X-330 to X-339 (55.100)**
X-331	Right Speaker	**Wire connectors - Component diagram 33 Connectors X-330 to X-339 (55.100)**
X-332	Left Speaker	**Wire connectors - Component diagram 33 Connectors X-330 to X-339 (55.100)**
X-333	Left Speaker	**Wire connectors - Component diagram 33 Connectors X-330 to X-339 (55.100)**
X-335	Radio Connector	**Wire connectors - Component diagram 33 Connectors X-330 to X-339 (55.100)**
X-365	Park Brake Switch	**Wire connectors - Component diagram 36 Connectors X-360 to X-369 (55.100)**
X-502	Door Wiper Motor	**Wire connectors - Component diagram 50 Connectors X-500 to X-509 (55.100)**
X-502A	Rear Window Wiper Motor	**Wire connectors - Component diagram 50 Connectors X-500 to X-509 (55.100)**
X-503	Wiper/Washer Switch	**Wire connectors - Component diagram 50 Connectors X-500 to X-509 (55.100)**
X-505	Cab/Door Switch Interface	**Wire connectors - Component diagram 50 Connectors X-500 to X-509 (55.100)**

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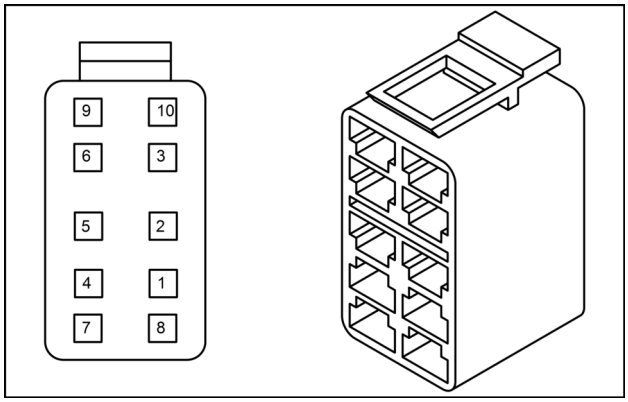
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Pin	From	Wire	Description	Color-Size	Frame
1	X-BULKHEAD-Female-P-92 CAB/CHASSIS INTERCONNECT	925	TELEMATIC GROUND	BK/WH - 0.8	**SHEET 32 Telematics**
2	SP-186–P-X	802	TELEMATICS IGNITION POWER	OR - 0.8	
3	SP-503–P-X	503D	TELEMATICS CAN HI	YE - 0.8	
4	SP-504–P-X	504D	TELEMATICS CAN LO	GN - 0.8	
6	X-BULKHEAD-Female-P-94 CAB/CHASSIS INTERCONNECT	208	TELEMATICS RS232 TX	BL - 0.8	
7	X-BULKHEAD-Female-P-93 CAB/CHASSIS INTERCONNECT	207	TELEMATICS RS232 RX	TN - 0.8	
8	X-6-Female-STARTER/ ALTERNATOR	244	ALTERNATOR LAMP - TELEMATICS - ENGINE ON	YE - 0.8	
11	SP-187–P-X	308	VEHICLE WORKING CONDITION	YE - 0.8	
12	X-FUSE2–P-37 FUSE BOX	336	TELEMATICS UNSWITCHED BATTERY	RD - 0.8	

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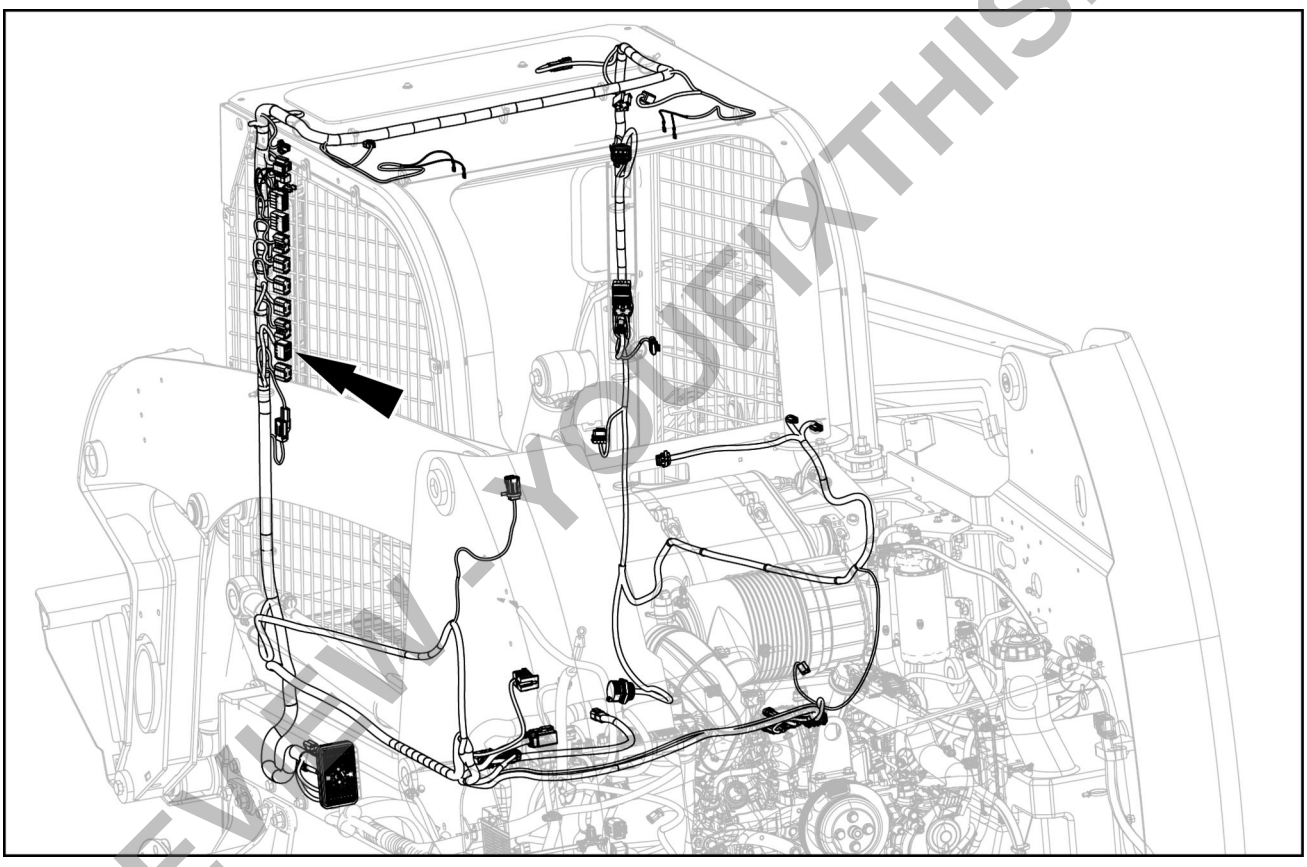
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X-503 - WIPER/WASHER SWITCH [S-016] (87716755) (Male)



87716755 5

87716755



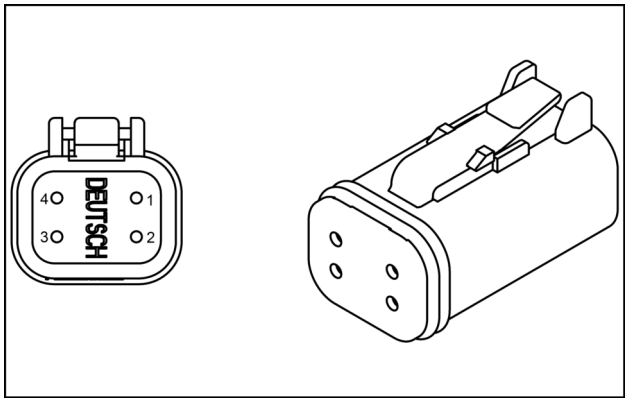
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Pin	From	Wire	Description	Color-Size	Frame
1	SP-014-P-X	931	WIPER/WASHER SW GROUND	BK - 0.8	**SHEET 26 Wipers / Washers**
2	SP-022-P-X	225	WIPER MOTOR AND INDICATOR LAMP POWER OUTPUT	WH - 0.8	
3	SP-023-P-X	229	WIPER/WASHER SWITCH MOTOR POWER IN	OR - 0.8	
5	**X-506 (Female) pin 2** - FRONT WASHER PUMP (87699736)	224	WASHER PUMP SIGNAL	WH - 0.8	
6	SP-023-P-X	230	WIPER/WASHER SW PUMP POWER IN	OR - 0.8	
7	SP-022-P-X	226	WIPER/WASHER LAMP SIGNAL	VT - 0.8	
8	SP-014-P-X	932	WIPER/WASHER SW INDICATOR GROUND	BK - 0.8	

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X-344 - LEFT-HAND FRONT STROBE (87694153) (Female)

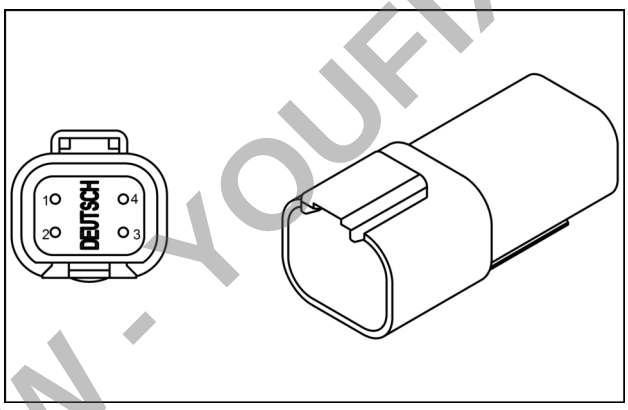


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Pin	From	Wire	Description	Color-Size	Frame
1	SP-082-P-X	740	LH FRONT STROBE POWER	VT - 0.8	**SHEET 17 Lamps**
2	SP-083-P-X	1005	LH FRONT STROBE GND	BK - 0.8	
3	SP-084-P-X	681	LH FRONT STROBE SYNC	PK - 0.8	

X-344 - LEFT-HAND FRONT STROBE (87694154) (Male)

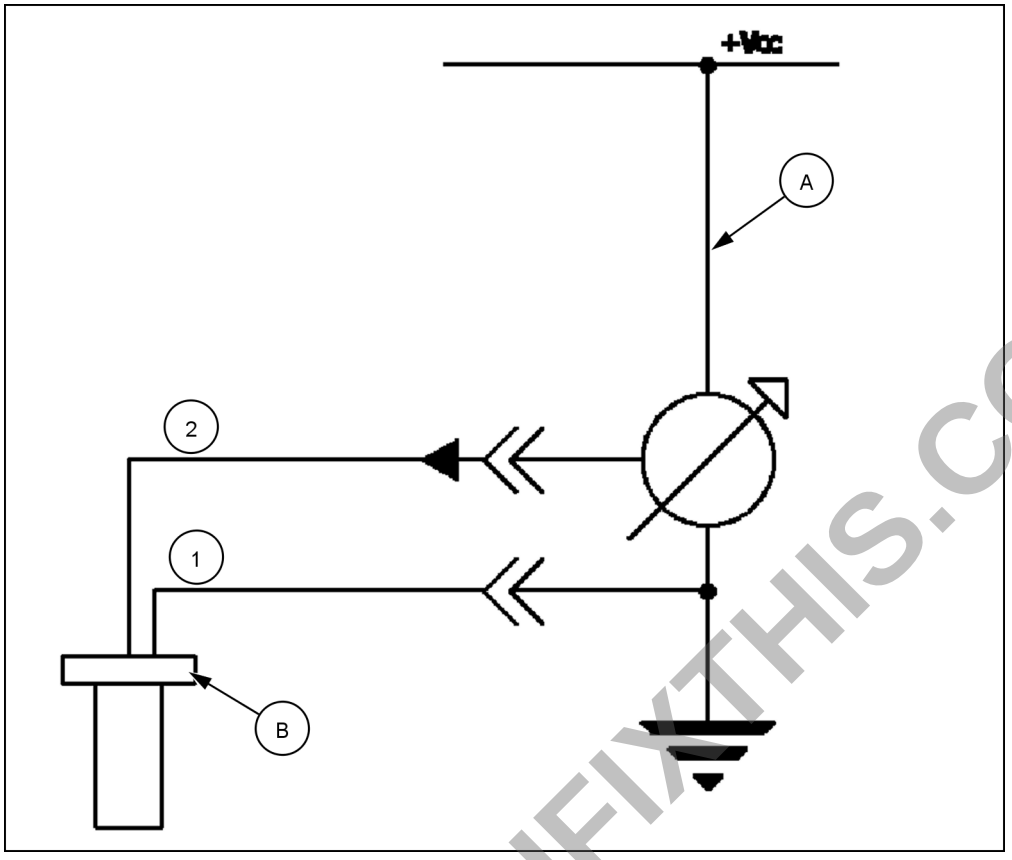


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RAPH18SSL0202FA 2

Fuel level sender - Electrical schematic

Reference	Description
(A)	Instrument cluster (**X-C23 (Male) pin 24**- EH) (**X-C23 (Female) pin 24**- Mechanical)
(B)	Fuel sensor
(1)	Signal
(2)	Ground

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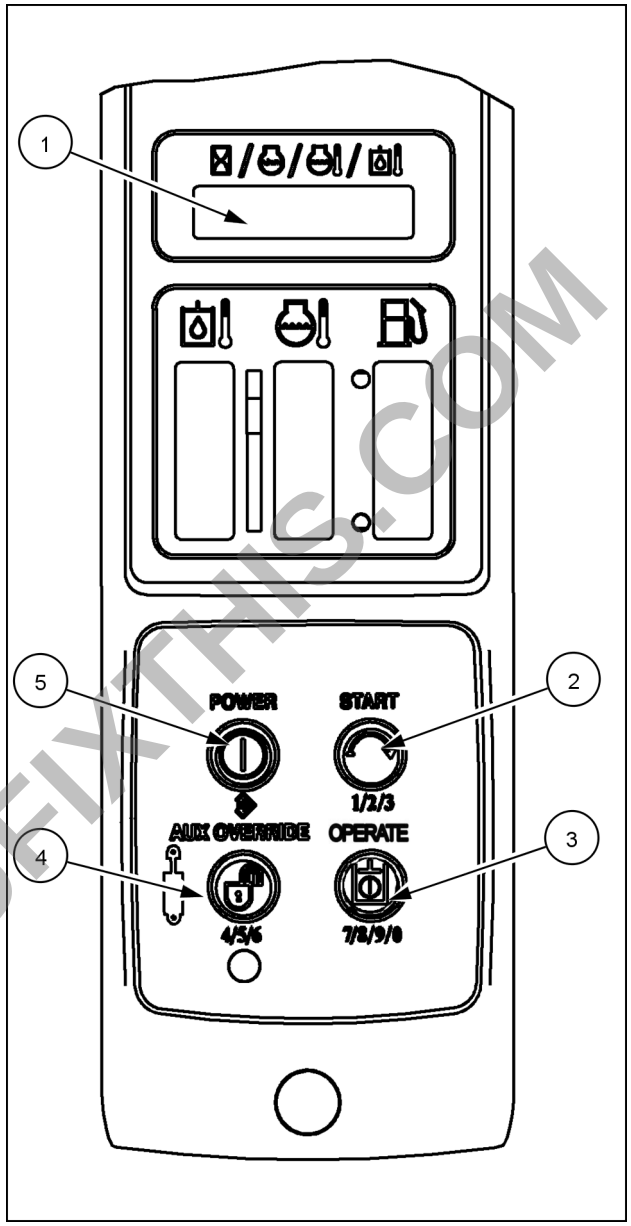
To modify the owner code:

Once in the LOCK menu, the display will show OWNER. Press the POWER button to enter the OWNER menu. The display will show open followed by 00000 .

1. Enter the current owner code by using multiple presses of the START button **(2)**, AUX OVERRIDE button **(4)**, and OPERATE button **(3)**. Press the POWER button **(5)** to save each digit and move to the next.

   NOTE: *For numbers 1, 2, 3 use the START button. For numbers 4, 5, 6 use the AUX OVERRIDE button. For numbers 7, 8, 9, 0 use the OPERATE button.*

2. Press the POWER button **(5)** after the fifth digit to save the code. The display **(1)** will show the word OWNCR followed by the saved owner code.
3. Enter a new owner code to overwrite the existing code. The panel will return to the SETUP menu.



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1917 - UCM - Rail 12VU2: Park Brake Solenoid Input Power Off

C245 TIER 4B (FINAL) [NHM435463 -]	NA (Electro hydraulic controls)

Context:
The UCM has sensed that the voltage on **X-CN3A (Female) pin 2** and **X-CN3A (Female) pin 3** is less than **9 V**. Diagnostic Trouble Code **1917 – UCM - Rail 12VU2: Park Brake Solenoid Input Power Off** has an error priority of Red.
Ground drive is disabled while Diagnostic Trouble Code **1917 – UCM - Rail 12VU2: Park Brake Solenoid Input Power Off** is active.

Cause:
The UCM has sensed that the voltage on **X-CN3A (Female) pin 2** and **X-CN3A (Female) pin 3** is less than **9 V**. The fault is active while the ignition is ON, the engine is not cranking, and Diagnostic Code **1903 – VCM - VCM Supply Voltage Below Operational Limit** is not active.

Possible failure modes:

1. Fuse F-016 is blown or missing.
2. An open circuit in the wiring.
3. A failure of the UCM.

Solution:

1. Verify that the fault code is active.

   Connect the Electronic Service Tool to the service tool connector.

   To check for fault codes: Start and operate the machine.

   A. Fault code is not recorded again. OK to return the machine to service.

   B. Fault code **1917 – UCM - Rail 12VU2: Park Brake Solenoid Input Power Off** is recorded again. Go to step **2**.
2. Verify the harness is not damaged.

   Turn the ignition switch OFF.

   Inspect the UCM connections and the accessory power distribution fuse block #1 connections. All connections should be secure, tight, free of corrosion, abrasion, and damage.

   Inspect the harness from the UCM connector **X-CN3A (Female)** to the accessory power distribution fuse block #1. Verify that the harness is free of damage, corrosion, abrasion, and incorrect attachment.

   A. The wiring harness is not damaged and all connections are secure. Go to step **3**.

   B. The harness is damaged or the connectors are loose or damaged. Repair or replace the harness as required. Return to step **1** to confirm elimination of fault.
3. Measure the voltage at the fuse.

   Turn the ignition switch ON.

   Measure voltage between the accessory power distribution fuse block #1 pin 13 and chassis ground. The voltage should be approximately **12 V**.

   A. The voltage is between **9 V** and **14.8 V**. Go to step **4**.

   B. The voltage is less than **9 V**. Go to step **5**.
4. Test the UCM connection.

   Turn the ignition switch OFF.

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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.

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4731 - Right Swash Plate Angle Sensor - Pin A Short to Ground/ Open Circuit

C245 TIER 4B (FINAL) [NHM435463 -]	NA (Electro hydraulic controls)

Context:
The UCM has sensed that the swash plate angle sensor signal has failed. Diagnostic Trouble Code **4731 – Right Swash Plate Angle Sensor - Pin A Short to Ground/ Open Circuit** has an error priority of Amber.
Ground drive will operate in limp home mode while Diagnostic Trouble Code **4731 – Right Swash Plate Angle Sensor - Pin A Short to Ground/ Open Circuit** is active.

Cause:
The UCM has sensed that the swash plate angle sensor signal has failed low. The fault is active while the engine is ON and the right swash plate angle sensor voltage, **X-CN2B (Male) pin 32** is less than **0.2 V**.

Possible failure modes:

1. The sensor signal wire is shorted to chassis ground.
2. An open circuit in the sensor signal wire.
3. A failure of the swash plate angle sensor.
4. The UCM has an internal failure.

Solution:

1. Verify that the fault code is active.

   Connect the Electronic Service Tool to the service tool connector.

   To check for fault codes: Start and operate the machine.

   A. The fault code is not recorded again. OK to return the machine to service.

   B. Fault code **4731 – Right Swash Plate Angle Sensor - Pin A Short to Ground/ Open Circuit** is recorded again. Go to step **2**.
2. Verify that the wiring and connectors are free of damage.

   Inspect the UCM, the left-hand swash plate sensor connection and the right-hand swash plate sensor connection. All connections should be secure, tight, free of corrosion, abrasion, and damage.

   Inspect the harness from the UCM to the swash plate sensors. Verify that the harness is free of damage, corrosion, abrasion, and incorrect attachment.

   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 the connectors as required. Return to step **1** to confirm elimination of fault.
3. Measure the voltage at the sensor.

   Turn the ignition switch OFF.

   Disconnect the right-hand swash plate sensor connector **X-93 (Female)** .

   Turn the ignition switch ON.

   Measure the voltage between **X-93 (Female) pin 5** and **X-93 (Female) pin 1**. The voltage should be approximately **12 V**. Wiggle the harness during measurement to reveal an intermittent condition.

   Measure the voltage between **X-93 (Female) pin 2** and **X-93 (Female) pin 6**. The voltage should be approximately **12 V**. Wiggle the harness during measurement to reveal an intermittent condition.

   A. The voltage measurement is approximately **12 V**. Go to step **4**.

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Connect the jumper wire between **X-CN1A (Male) pin 13** and chassis ground. The chassis ground connection must be clean and free of paint, oil, and dirt.

Measure the resistance between **X-25 (Female) pin 2** and chassis ground. The resistance should be less than **10 Ω**. Wiggle the harness during measurement to reveal an intermittent condition.

A. Both resistance measurements are less than **10 Ω**. Go to step **4**.

B. One or both resistance measurements are greater than **10 Ω**. There is an open circuit in the wiring. Repair or replace the harness as required. Return to step **1** to confirm elimination of the fault.

4. Measure the solenoid resistance.

   Measure the resistance across the retract solenoid terminals, pin 1 and pin 2. The resistance should be less than **20 Ω**.

   A. The resistance is less than **20 Ω**. Go to step **5**.

   B. The resistance is greater than **20 Ω**. There is an open circuit in the solenoid. Replace the solenoid and retest. Return to step **1** to confirm elimination of the fault.

5. Measure the resistance through the circuit.

   Leave UCM connectors **X-CN3B (Female)** and **X-CN1A (Male)** disconnected.

   Fabricate a jumper wire that will connect between **X-25 (Female) pin 1** and **X-25 (Female) pin 2**.

   Connect the jumper wire between **X-25 (Female) pin 1** and **X-25 (Female) pin 2**.

   Measure the resistance between **X-CN3B (Female) pin 17** and **X-CN1A (Male) pin 13**. 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**. Temporarily replace the UCM 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. Repair or replace the harness as required. Return to step **1** to confirm elimination of the fault.

Wiring harnesses - Electrical schematic sheet 20 Unit Control Module (55.100.DP-C.20.E.20)
Wiring harnesses - Electrical schematic sheet 21 Unit Control Module (55.100.DP-C.20.E.21)
Wiring harnesses - Electrical schematic sheet 12 Loader Valve and Sensors (55.100.DP-C.20.E.12)

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17360 (DTC 7662) - Glow plug 3 control circuit shorted to ground

Context:
The Engine Control Unit (ECU) requests operation of the glow plug control module via a Pulse Width Modulated (PWM) control circuit and monitors the status of possible electrical defects via a diagnostic feedback signal from the glow plug control module. If the ECU is notified of a short circuit condition in the glow plug 3 circuit, this fault will occur. For information regarding the functional operation of the glow plug control module, refer to the engine service manual **Glow plug system Glow plug control module - Overview (55.202)**.

Cause:
The glow plug control module has communicated to the ECU, via a diagnostic connection, that a short circuit condition exists in the glow plug 3 circuit.

Possible failure modes:

1. Faulty glow plug 3, internal failure.
2. Faulty glow plug 3 control circuit wiring, shorted to ground.
3. Faulty ECU, software.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active. Continue with step **7**.
2. Check the glow plug for a short to ground condition.

   Disconnect glow plug 3.

   Use a multimeter to check the component for a grounded (shorted) condition :

From	To	Result
Glow plug 3	Chassis ground	There should be **0.2 – 5.0 Ω**.

   A. If there is greater than **0.2 Ω**, leave the glow plug disconnected and continue with step **3**.

   B. If there is less than **0.2 Ω**, the glow plug 3 has failed internally, replace the glow plug and retest.
3. Check the glow plug 3 control circuit for a short to ground condition.

   With the key switch in the OFF position, use a multimeter to check for continuity on the harness :

From	To	Result
Glow plug 3 connector pin 1	Chassis ground	There should be no continuity.

   A. If there is continuity, continue with step **4**.

   B. If there is no continuity, continue with step **6**.
4. Locate the short to ground condition.

   Disconnect connector X-017.

   With the key switch in the OFF position, use a multimeter to check for continuity in the harness :

From	To	Result
X-017 pin 58	Chassis ground	There should be no continuity.

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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.

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(*) See content for specific models

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