SERVICE MANUAL

CR6.80 / CR6.90 / CR7.90 / CR8.90 / CR9.90
Tier 4B (final)
Combine

Part number 47865347
1st edition English
April 2015

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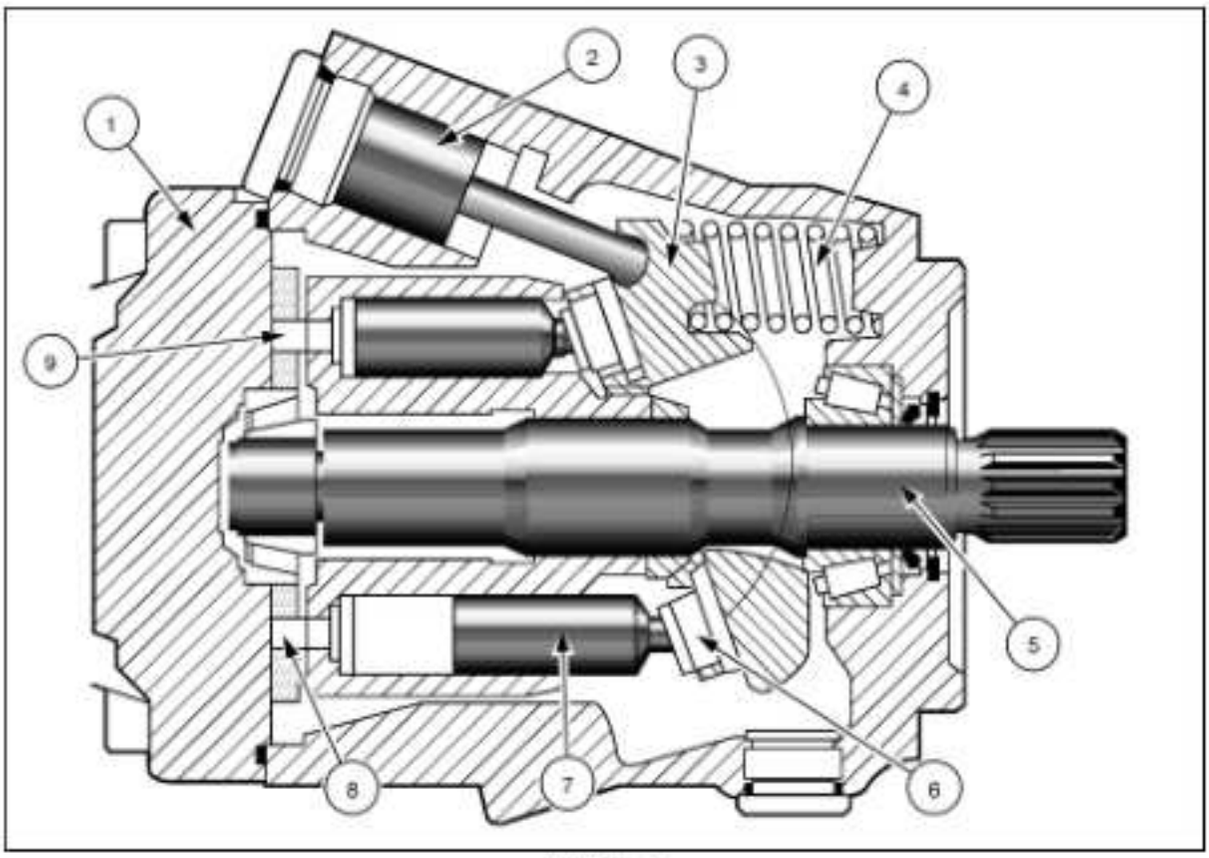
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Pump - Dynamic description

CR6.80 TIER 4B	NA
CR6.90	NA
CR7.90	NA
CR8.90	NA
CR9.90	NA



53870952A 1

Variable Displacement Piston Pump-Sectional Drawing

1. Pump End Plate
2. Swash Plate Servo Piston
3. Swash Plate
4. Swash Plate Return Spring
5. Drive shaft
6. Slipper (9 off)
7. Piston and Barrel
8. Inlet Port
9. Outlet Port

Principals of Operation - Fixed vs. Variable Displacement

A fixed displacement gear pump provides a constant flow of oil directly related to the rotation speed of the pump. A variable displacement piston pump, on the other hand, provides oil flow on demand and minimizes the engine power absorbed in driving the hydraulic pump when the hydraulic circuits do not require maximum pump flow.

The variable displacement piston pump in hydraulic systems therefore has distinct power loss advantages over fixed displacement gear type pumps, which continually provide oil flow and absorb engine power even when the hydraulic circuits do not require the total pump output.

The feed oil for the variable displacement piston pump is called the charge oil. The charge oil is supplied by the return flow of the hydrostatic drive system. This supplies **60 l/min** (**16 gal/min**) of oil via the oil cooler. Only under high demand situations, **60 - 114 l/min** (**16 - 30 gal/min**), does an underpressure state develop in the charge supply line.

Variable Displacement Piston Pump

The major components of the variable flow piston pump with closed center load sensing are:

1. A nine element pumping head.

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Wiring harnesses - Electrical schematic sheet 82 – Precision farming

Type	Component	Connector / Link	Description
ECU	**A-036**	**X-036**	GRAIN CAMERA
Sensor	**B-186**	**X-186 SAMPLE LEVEL**	SAMPLE LEVEL SENSOR
Motor	**M-640**	**X-640**	SAMPLE MOTOR (AG LEADER)
Motor	**M-641**	**X-641**	SAMPLE MOTOR
Connector	X-036	**X-036**	
Connector	X-1049A	**X-1049A**	MOG
Connector	X-1049B	**X-1049B**	
Connector	X-186 MOG	**X-186 MOG**	
Connector	X-186 SAMPLE LEVEL	**X-186 SAMPLE LEVEL**	
Connector	X-640	**X-640**	
Connector	X-641	**X-641**	
Connector	X-708A	**X-708A**	
Connector	X-708B	**X-708B**	

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E0362-04-Stubble Light Relay - Shorted to low source

CR6.80	NA
CR6.90 TIER 4B	NA
CR7.90 TIER 4B	NA
CR8.90 TIER 4B	NA
CR9.90 TIER 4B	NA

Control Module : UCM2

NOTE: *For more information concerning this fault, refer to the electrical schematic on sheet 64.*

Context:
The Universal Control Module 2 (UCM2) monitors the operation of the stubble light relay K-004.

Cause:
UCM2 is sensing a short to low condition in the stubble light relay signal circuit.

Possible failure modes:

1. Faulty relay.
2. Faulty electrical wiring shorted to ground.
3. Faulty module.

Solution:

1. Verify that the fault is present and active.

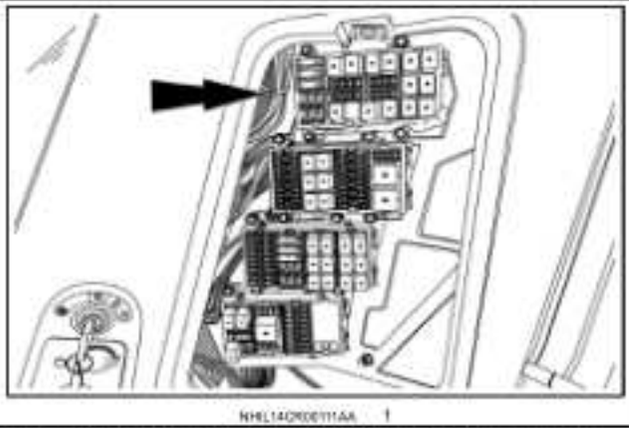
   Use the display monitor diagnostic capability to view parameter status to check the voltage level.

   For additional information about the monitor diagnostic capability, see **Electrical system - Dynamic description Theory of operation – Display monitor diagnostic screens (55.000)**.

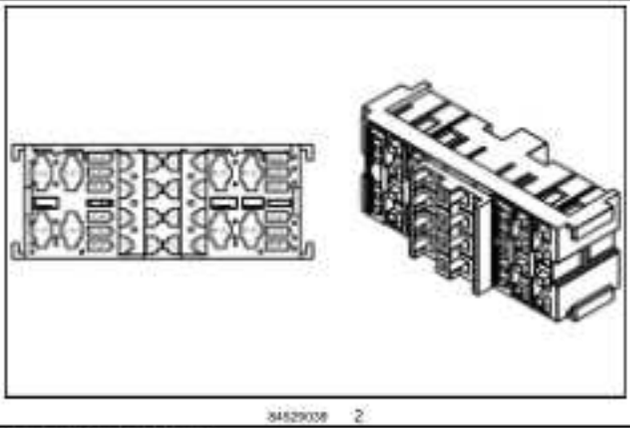
   A. If the voltage reading is low, continue to Step **2**.

   B. If there is voltage, the fault may intermittent and not currently active. Continue to Step **5**.
2. Verify that the relay functions properly.

   Disconnect the relay from the Cab Roof Lower (CRL) harness at connector X-901B.



Connector X-901B is located in the fuse/relay panel.



Connector X-901B.

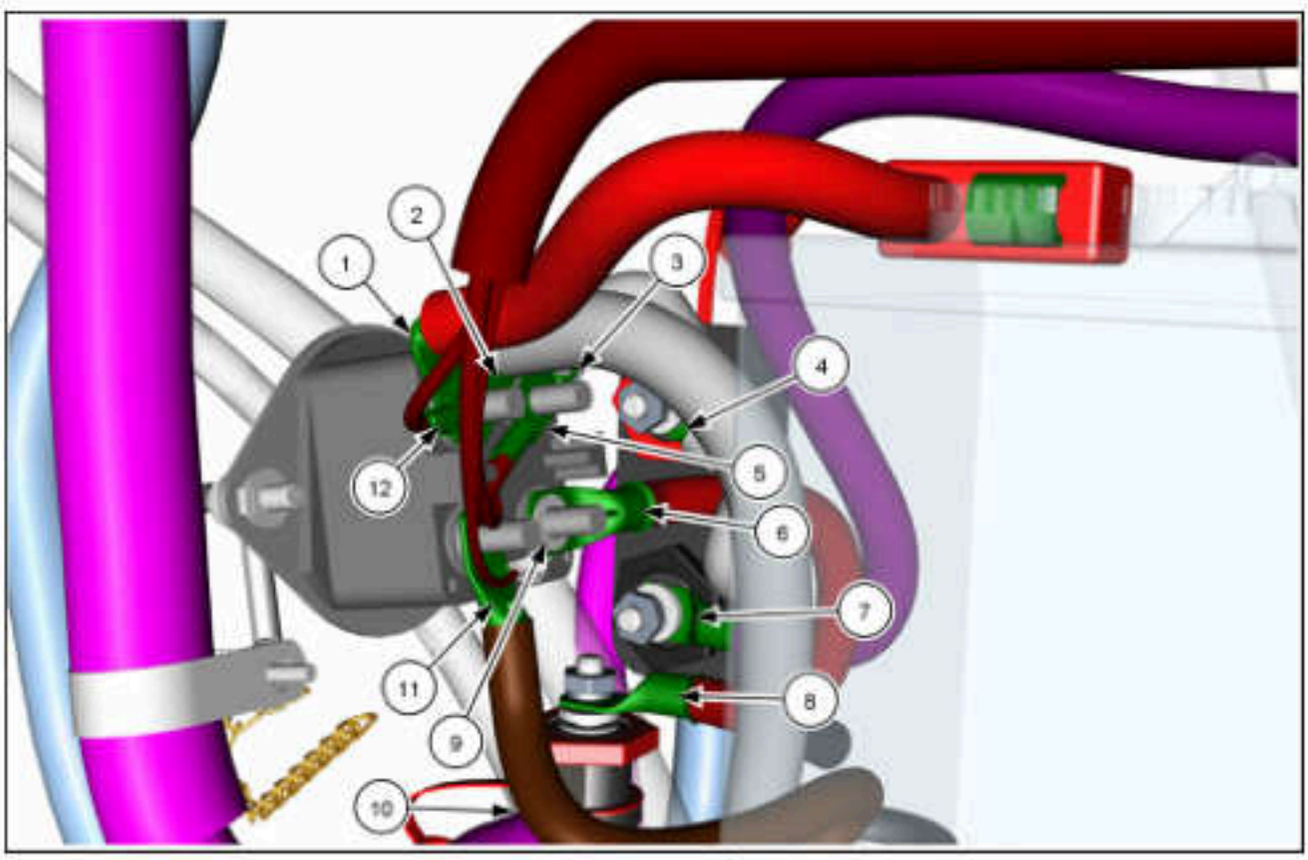
   Check the display monitor for other fault codes.

   A. If fault code **E0362-04 - Stubble Light Relay - Shorted to low source** is still present, continue to Step **3**.

   B. If fault code **E0362-05 - Stubble Light Relay - Line disconnected** is present, the circuit wiring functions properly. However, the relay has failed internally. Replace the relay.

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Item	Connector	Wiring harness	Description
(1)	X-858AA	Battery Cables (BT)	Battery disconnect switch S-858 positive
(2)	X-858AB	Battery Cables (BT)	Battery disconnect switch S-858 negative
(3)	X-858BA	Battery Cables (BT)	Battery disconnect switch S-858 to **12 V** battery jump stud J-531
(4)	X-531A	Battery Cables (BT)	**12 V** battery jump stud J-531 to battery disconnect switch S-858
(5)	X-858BB	Battery Box (BB)	Battery disconnect switch S-858 positive out
(6)	X-858DA	Battery Cables (BT)	Battery disconnect switch S-858 positive out post to **24 V** battery jump stud J-541
(7)	X-532A	Battery Cables (BT)	Battery negative jump start stud J-532 to top battery G-503 negative post
(8)	X-541A	Battery Cables (BT)	**24 V** battery jump stud J-541 to battery disconnect switch S-858 positive out
(9)	X-858DB	Battery Box (BB)	Battery disconnect switch S-858 positive out
(10)	X-541B	Engine Battery Cables (EA)	**24 V** battery jump stud J-541 to **24 V** starter M-616
(11)	X-858CA	Battery Cables (BT)	Battery disconnect switch S-858 to lower battery G-503 positive post
(12)	X-858AC	Battery Box (BB)	Battery disconnect switch S-858 **12 V**



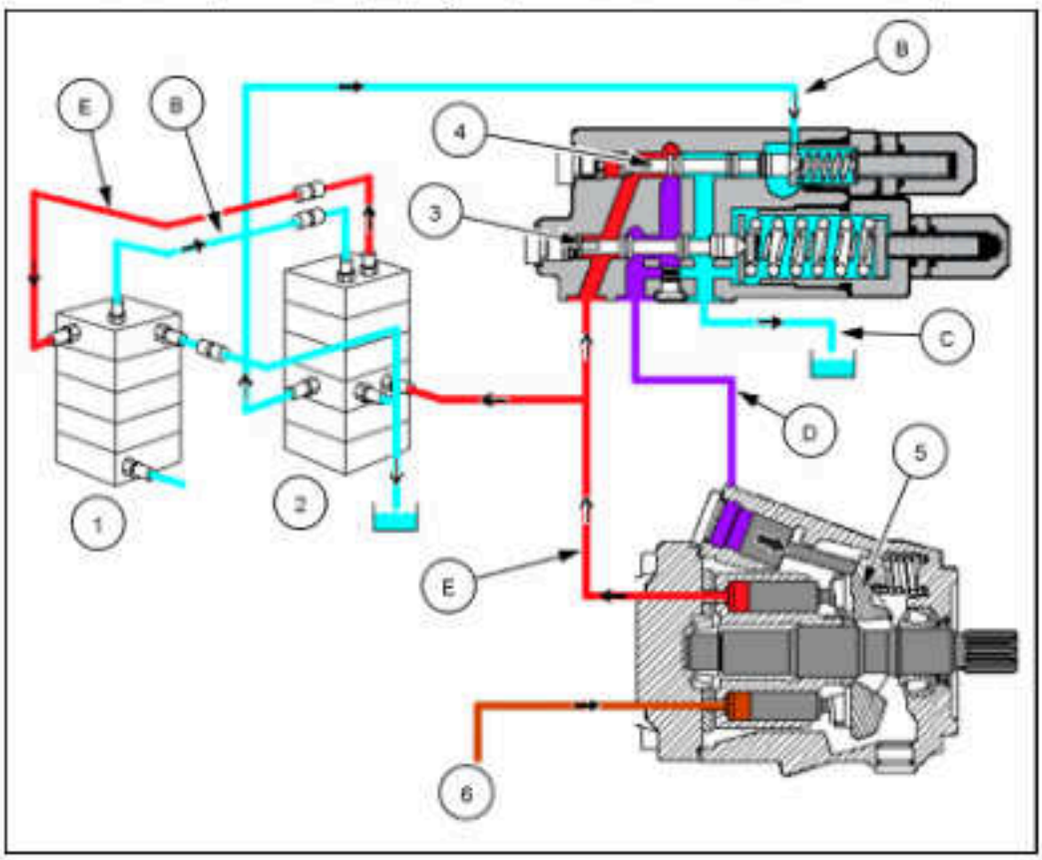
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Low Pressure Standby

Low pressure standby is the system pressure - **21 - 24 bar** (**305 - 348 psi**) - maintained by the hydraulic pump when high pressure hydraulic circuits are not being operated. During engine startup, standby pressure has not been generated and both the pressure and flow compensating valves **(3) (4)** are held to the left by spring pressure. While the spools are held to the left, oil pressure generated by the pump in gallery **(E)** cannot be applied to the swash plate servo piston via gallery **(D)**. The swash plate **(5)** consequently remains in the maximum flow position until the pump has developed sufficient flow to produce pressure at low pressure standby.

As pump output pressure increases to **21 - 24 bar** (**305 - 348 psi**), this pressure is sensed in gallery **(E)** and applied to the flow compensating spool **(4)**. The spool gradually moves against the spring, allowing oil flow from gallery **(E)** to gallery **(D)**. The controlled pressure rise in gallery **(D)** operates the swash plate servo piston, changing the angle of the swash plate in relation to the pumping head. The change in angle reduces the operating stroke of the pistons and output of the pump.

As pump output decreases and the pressure in gallery **(D)** decreases to less than **24 bar** (**348 psi**), the flow compensating valve gradually moves under spring pressure to the left, bleeding gallery **(D)** to sump through gallery **(C)**. This reduces the control pressure applied to the servo piston, allowing the servo piston to retract at a controlled rate under pressure from the swash plate return spring and re-adjust the angle of the swash plate to increase pump output. This control process continues, maintaining pump output pressure at **21 - 24 bar** (**305 - 348 psi**) (low pressure standby) until a high pressure circuit is operated and pump system pressure needs to be increased to operate the service.



Standby Pressure @ **21 - 24 bar** (**305 - 348 psi**)

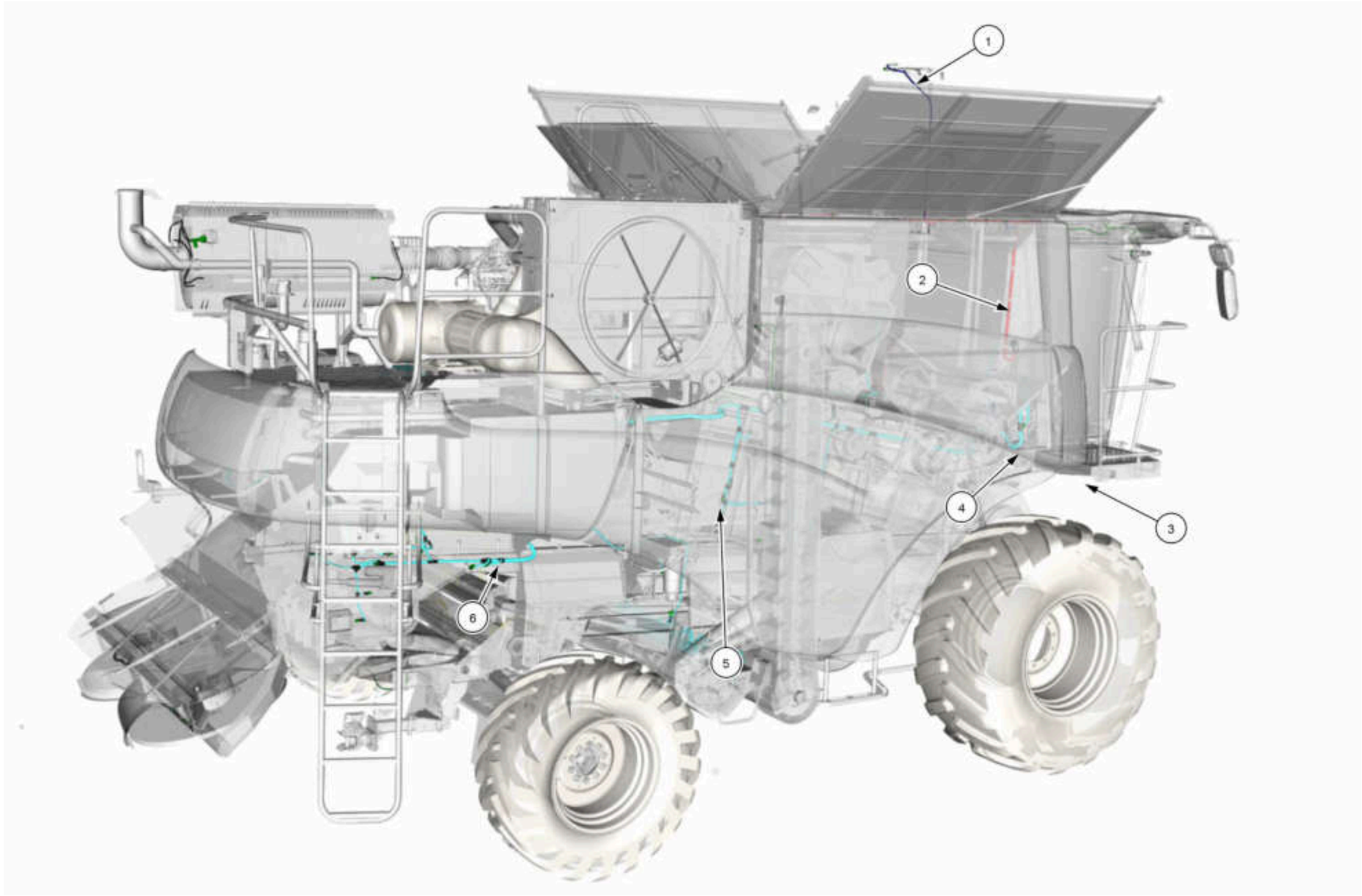
Control Pressure

Return to Reservoir

Charge Pressure

1. Feeder stack valve (in neutral)
2. Main frame stack valve (in neutral)
3. Pressure Compensating Valve
4. Flow Compensating Valve
5. Swash Plate
6. Return from Hydrostatic Motors

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