SERVICE MANUAL

T9.390 / T9.450 / T9.505 / T9.560 / T9.615 / T9.670

Tractor

PIN ZCF200001 and above

PIN ZDF200001 and above

Part number 47488219
English
March 2013

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Automatic operation summary

(ATC switch set to "Auto," and "Auto" displays on the instrument cluster. No fault codes active.)		
Temperature argument	Controller needs a **2 °F (1 °C)** difference between the set point and temperature sensed at cab sensor before responding - engaging the compressor or opening the heater valve. Selecting a set point one degree cooler or warmer than the temperature desired may increase operator comfort.	
Blower speed	If difference between cab temperature and the set point is ...	Then the blower speed used by the controller is ...
	less than or equal to **2 °F (1 °C)**	25%
	greater than **2 °F (1 °C)** but less than or equal to **4 °F (2 °C)**	35%*
	greater than **4 °F (2 °C)** but less than or equal to **6 °F (3 °C)**	45%*
	greater than **6 °F (3 °C)** but less than or equal to **8 °F (4 °C)**	55%*
	greater than **8 °F (4 °C)** but less than or equal to **10 °F (5 °C)**	65%*
	greater than **10 °F (5 °C)** but less than or equal to **12 °F (6 °C)**	75%*
	greater than **12 °F (6 °C)**	100%*
Mode door position	If cab temperature setpoint is	Then the controller directs air flow to the
	greater than **23 °C (73 °F)**	Floor vents
	Less than **22 °C (72 °F)**	Mid-cab vents
	Raised by more than **5 °C (10 °F)** warmer	Floor vents
	Lowered by more than **5 °C (10 °F)** cooler	Mid-cab vents
Compressor clutch cycling	Compressor clutch is cycled On or Off by the controller as needed to drive to or maintain the desired cab temperature set point.	
Heater control valve	Heater control valve is opened or closed as needed to drive to or maintain the desired cab temperature set point.	
Manual override of blower control	• Blower speed remains in position selected by operator. • Instrument cluster display no longer displays "Auto" for automatic. • Temperature control remain automatic, but controller cannot use any speed beyond that selected to achieve the desired set point. • Turning ATC switch Off and then to "Auto" returns system to automatic operation.	
Maximum cool setting selected	• Blower speed at 100%. • The clutch is only cycled Off when the freeze setting – **0 °C (32 °F)** – is reached at the evaporator temperature sensor, and then On again when temperature sensed warms to **3 °C (37 °F)**. • Instrument cluster display no longer displays "Auto" for automatic. • Moving the temperature control outside the maximum range returns the system to automatic control of compressor, blower and mode door.	
Maximum heat setting selected	• Blower speed at 100%.* • Heater control valve at full open position • Instrument cluster display no longer displays "Auto" for automatic. • Moving the temperature control outside the maximum range returns the system to automatic control of valve, blower and mode door.	
Exception	* When heating is selected, blower speed remains at 25% until temperature sensed at evaporator exceeds **12.8 °C (55 °F)**.	

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2071-Shuttle lever forward switch is shorted to ground or is open circuit

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Cause:

Possible failure modes:

1. Faulty connector
2. Faulty shuttle lever forward switch
3. Faulty harness
4. Faulty tractor control unit (TCU)

Solution:

1. Check the shuttle lever forward switch.
   A. Disconnect the shuttle lever connector C630, located in steering console. Move the shuttle lever to forward and measure the resistance between connectorC630 pin 2 and C630 pin 1, if the resistance indicated is not approximately **500 - 600 Ohms**, and then in neutral approximately **2500 - 3000 Ohms**, remove and replace the shuttle lever switch.
   B. If the shuttle lever forward switch is okay, continue to step **2**
2. Check for an open circuit.
   A. Turn the ignition switch OFF. Disconnect the tractor control unit (TCU) connector C063. Check between connector C063 pin 28 and C630 pin 2. If an open circuit is indicated, repair or replace the harness as required.
   B. If an open circuit is not indicated, continue to step **3**
3. Check for a short to ground.
   A. Check between connector C063 pin 28 and ground. If 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 tractor control unit (TCU).

Wire harnesses - Electrical schematic frame 27 (55.100.DP-C.20.E.27)
Wire harnesses - Electrical schematic frame 27 (55.100.DP-C.20.E.27)
Wire harnesses - Electrical schematic frame 30 (55.100.DP-C.20.E.30)
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3546-Selective Catalytic Reduction (SCR) injector overheat protection, see other fault codes

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NOTE: *Engine fault codes 3546 and/or 3594 can be generated under normal engine operating conditions when the DEF/AdBlue® solution is frozen from environmental conditions. If this is the only fault code present in the DCU/ECU, no diagnostics are required.*

Context:
Protection of the Dosing Control Unit (DCU) is occurring either from frozen DEF/AdBlue® or a Technical Failure (TF). An engine torque derate will occur when this fault code is active. If the DEF/AdBlue® is not frozen and other fault codes are present in the Electronic Control Unit (ECU) and DCU, perform the proper diagnostic procedure(s) for the fault code(s) retrieved.

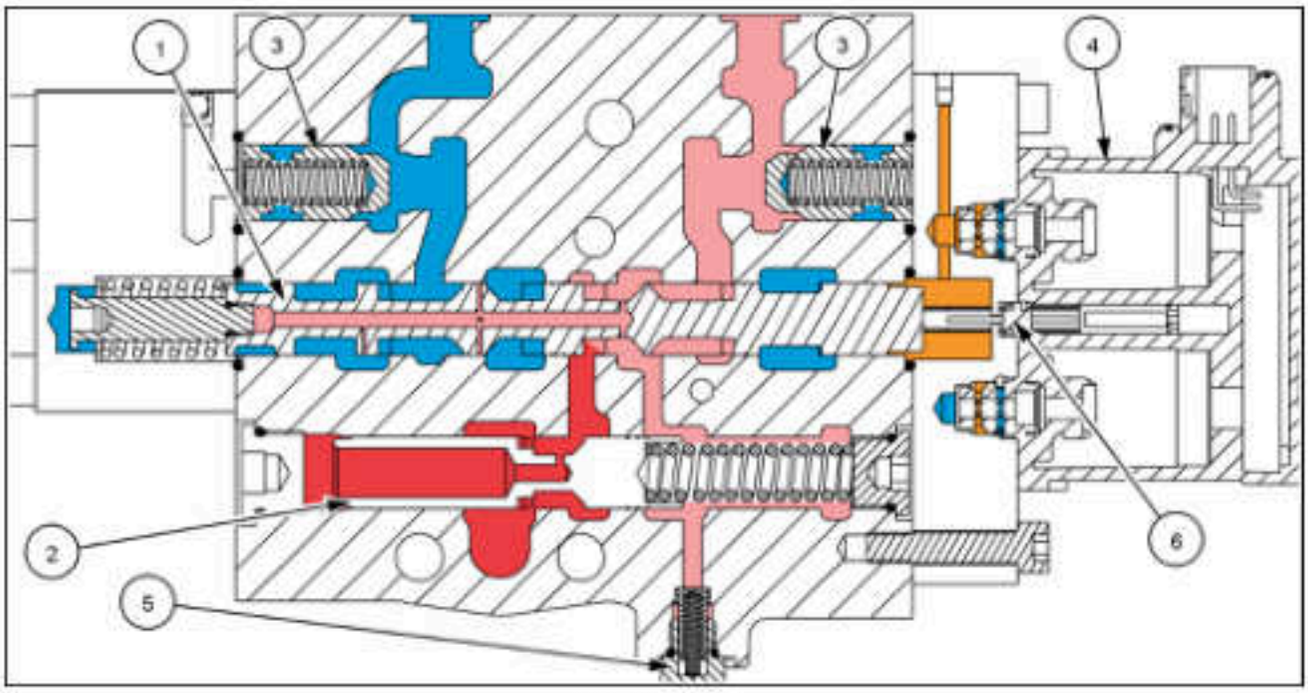
Possible failure modes:

1. The DEF/AdBlue® is frozen.
2. A Selective Catalytic Reduction (SCR) Technical Failure (TF) is present.

Solution:

1. Check the condition of the DEF/AdBlue®.
   A. The DEF/AdBlue® is frozen, allow the DEF/AdBlue® to thaw. Retest the system to verify proper operation.
   B. The DEF/AdBlue® is not frozen, continue to step **2**.
2. Check the DCU or (ECU) for other active fault codes. Proceed to other fault codes to resolve the root fault code.

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RCSL08CCH015GAE 6

PFC pump pressure	Return to tank pressure
Remote valve operating pressure	Trapped oil
Pilot pressure	
1. Main valve spool	4. Extend/retract solenoid valve assembly with micro processor
2. Flow control spool	5. Signal check
3. Lock check	6. Spool position sensor

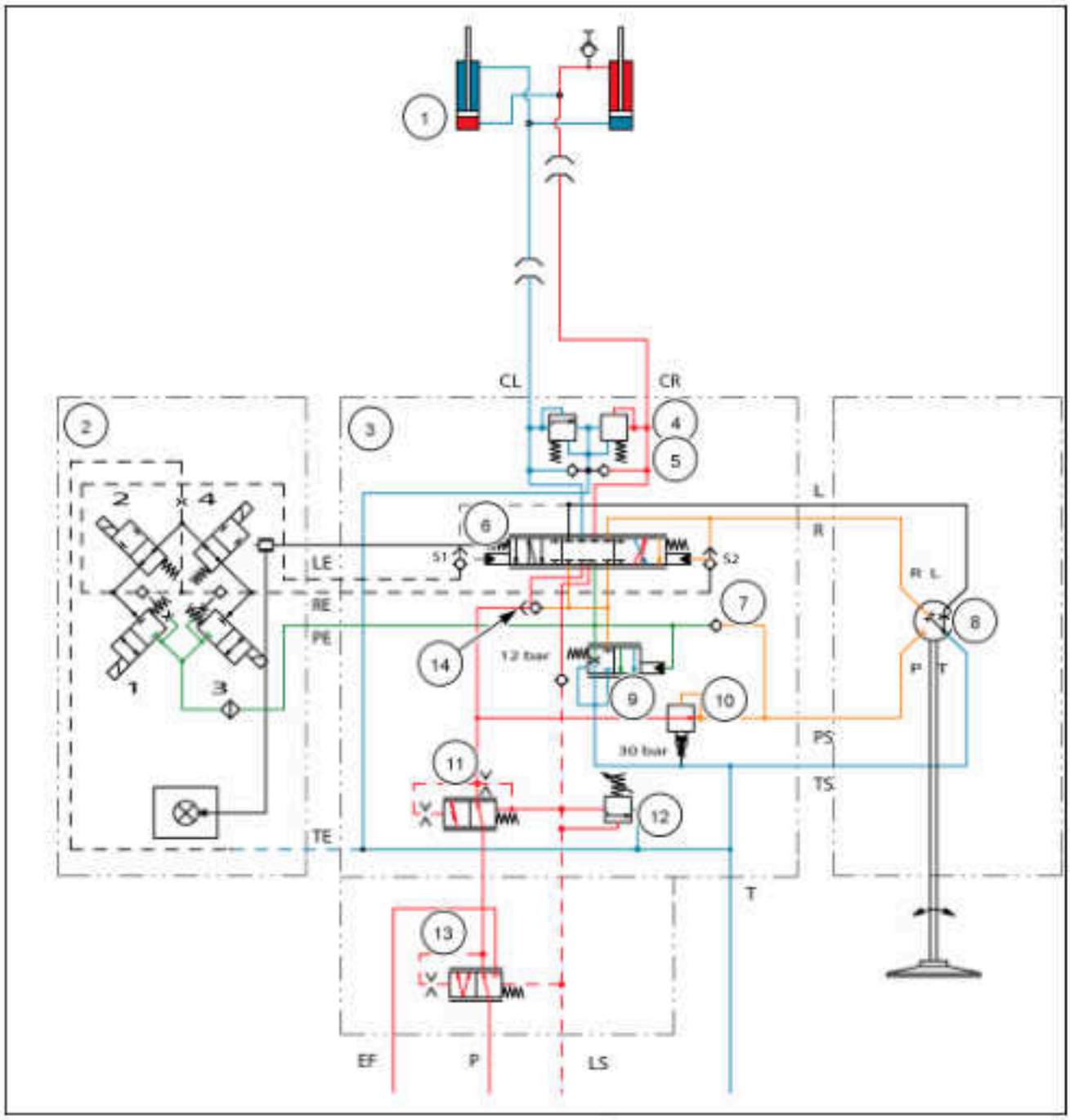
Retract position

When the remote control lever is moved to the retract position, the main valve spool shifts to the right a fixed distance by supply pressure from the retract solenoid valve. The main spool position is based on input from armrest controller, spool position sensor and the extend/retract valve solenoid assembly with micro processor. The position of the main valve spool determines the flow rate to the retract port.

At the same time, work pressure is communicated to the signal check through the center drilled passage in the main valve spool. The signal check is forced off the seat and signal pressure is directed to the pump compensator to increase pump flow.

Also as the main spool begins to shift, any pressure trapped on the spring end of both lock checks is drained to tank. The flow exiting the retract port is now in a free flow condition shifting the lock check and out the retract port: Return oil from the extend coupler is directed into the extend port, shifting lock check to right, continuing past the spool and returning to tank.

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RCPH19FWD01SHAG 4

Engine running, turning right

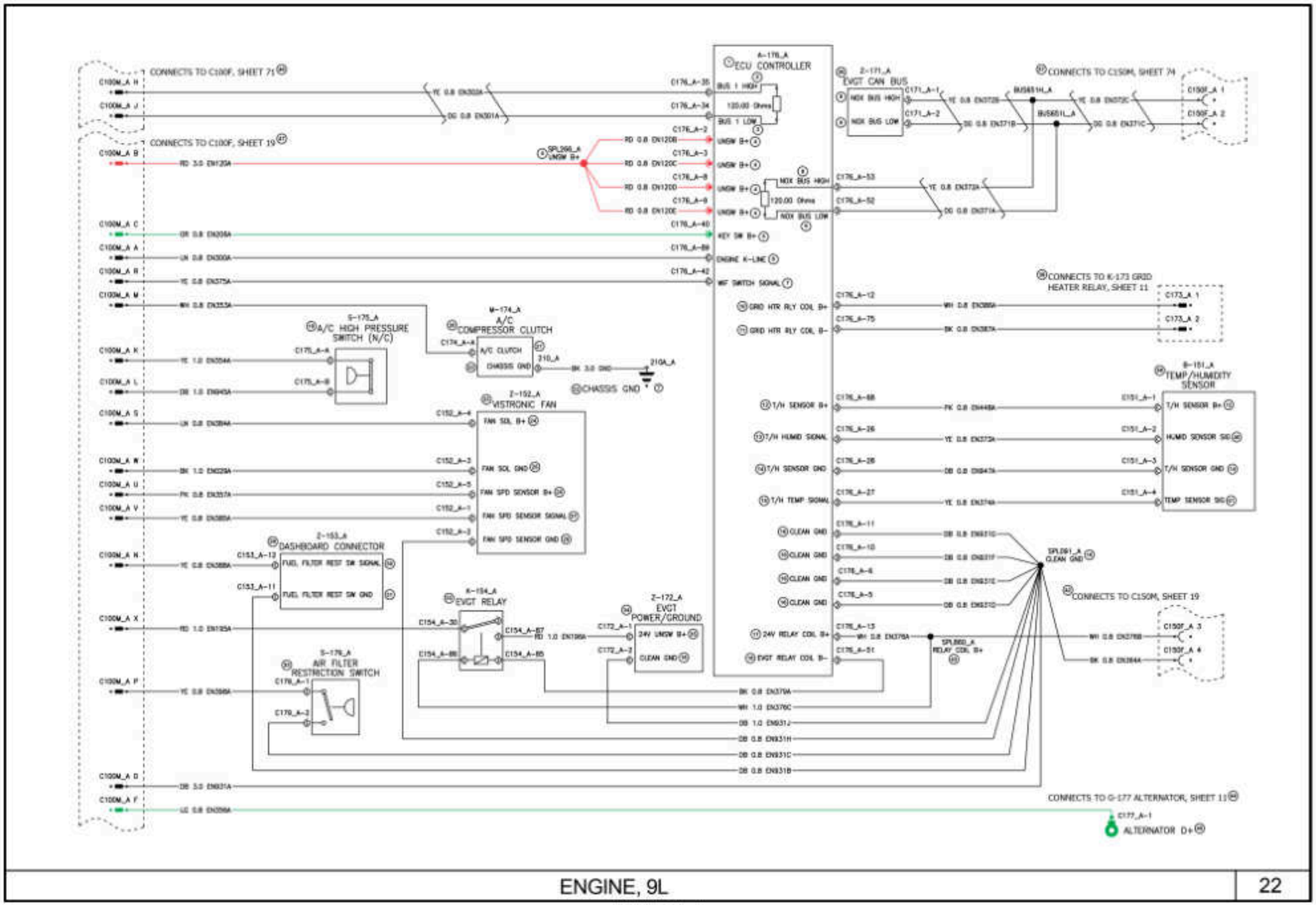
Pressure/flow compensating supply pressure

Steering hand pump **30 bar** (**435 psi**) supply

Electrical actuation module (PVE) **12 bar** (**174 psi**) supply

Return to tank

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ENGINE, 9L

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