MAGNUM 180
MAGNUM 190
MAGNUM 210
MAGNUM 225

Tractor with CVT Transmission

from PIN ZARH06086

SERVICE MANUAL

Part number 84386820
English
November 2010

CASE IH AGRICULTURE

MidWestTech | Case Magnum 180, 190, 210, 225 CVT Tractor Service Manual | Publication 84386820

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Grade 10.9 bolts, nuts and studs

Size	Nm	lb in/lb ft
4 mm	4 - 5 Nm	36 - 48 lb in
5 mm	9 - 11 Nm	84 - 96 lb in
6 mm	15 - 18 Nm	132 - 156 lb in
8 mm	37 - 43 Nm	324 - 384 lb in
10 mm	73 - 87 Nm	54 - 64 lb ft
12 mm	125 - 150 Nm	93 - 112 lb ft
14 mm	200 - 245 Nm	149 - 179 lb ft
16 mm	310 - 380 Nm	230 - 280 lb ft
20 mm	610 - 730 Nm	450 - 540 lb ft
24 mm	1050 - 1275 Nm	780 - 940 lb ft
30 mm	2000 - 2400 Nm	1470 - 1770 lb ft
36 mm	3500 - 4200 Nm	2580 - 3090 lb ft

Grade 12.9 bolts, nuts and studs

Size	Nm	lb in/lb ft
Typically the torque values specified for grade 10.9 hardware can be used satisfactorily on grade 12.9 hardware.		

Steel hydraulic fittings

37° flare fitting

Tube outside diameter/Hose inside diameter		Thread size	Nm	lb in/lb ft
inch	mm			
6.4 mm	1/4 in	7/16-20 in	8 - 16 Nm	72 - 144 lb in
7.9 mm	5/16 in	1/2-20 in	11 - 22 Nm	96 - 192 lb in
9.5 mm	3/8 in	9/16-18 in	14 - 34 Nm	120 - 300 lb in
12.7 mm	1/2 in	3/4-16 in	20 - 57 Nm	180 - 504 lb in
15.9 mm	5/6 in	7/8-14 in	34 - 79 Nm	300 - 696 lb in
19.0 mm	3/4 in	1-1/16-12 in	54 - 108 Nm	40 - 80 lb ft
22.2 mm	7/8 in	1-3/16-12 in	81 - 135 Nm	60 - 100 lb ft
25.4 mm	1 in	1-5/16-12 in	102 - 158 Nm	75 - 117 lb ft
31.8 mm	1-1/4 in	1-5/8-12 in	169 - 223 Nm	125 - 165 lb ft
38.1 mm	1-1/2 in	1-7/8-12 in	285 - 338 Nm	210 - 250 lb ft

Straight threads with O-ring

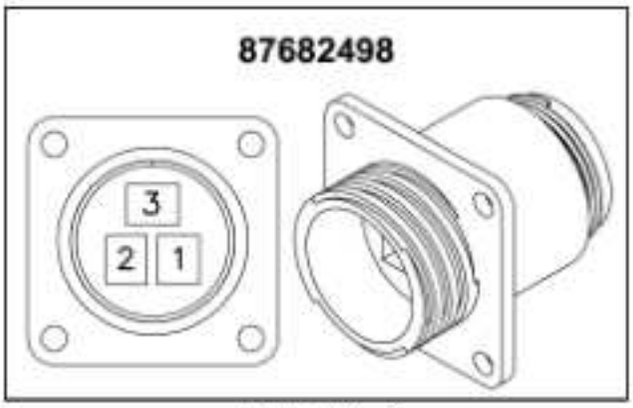
Tube outside diameter/Hose inside diameter		Thread size	Nm	lb in/lb ft
inch	mm			
6.4 mm	1/4 in	7/16-20 in	16 - 26 Nm	144 - 228 lb in
7.9 mm	5/16 in	1/2-20 in	22 - 34 Nm	192 - 300 lb in
9.5 mm	3/8 in	9/16-18 in	34 - 54 Nm	300 - 480 lb in
12.7 mm	1/2 in	3/4-16 in	57 - 91 Nm	540 - 804 lb in
15.9 mm	5/6 in	7/8-14 in	79 - 124 Nm	58 - 92 lb ft
19.0 mm	3/4 in	1-1/16-12 in	108 - 174 Nm	80 - 128 lb ft
22.2 mm	7/8 in	1-3/16-12 in	136 - 216 Nm	100 - 160 lb ft
25.4 mm	1 in	1-5/16-12 in	159 - 253 Nm	117 - 187 lb ft
31.8 mm	1-1/4 in	1-5/8-12 in	224 - 357 Nm	165 - 264 lb ft
38.1 mm	1-1/2 in	1-7/8-12 in	339 - 542 Nm	250 - 400 lb ft

Split flange mounting bolts

Size	Nm	lb in/lb ft
5/16-18 in	20 - 27 Nm	180 - 240 lb in
3/8-16 in	27 - 34 Nm	240 - 300 lb in
7/16-14 in	47 - 61 Nm	420 - 540 lb in
1/2-13 in	74 - 88 Nm	55 - 65 lb ft
5/8-11 in	190 - 203 Nm	140 - 150 lb ft

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Connector 514F – Auxiliary power outlet, right hand fender



Schematic reference: Wiring harness - Electrical schematic frame 70 (A.30.A)

Pin/cavity number	Wire identification/color	Circuit reference
A	1109B - OR	Switched B+
B	1109A - R	Unswitched B+
C	1103B - BK	Ground

Connector 515F – Ring terminal ground

Schematic reference: Wiring harness - Electrical schematic frame 70 (A.30.A)

Pin/cavity number	Wire identification/color	Circuit reference
1	- BK	Ground

Connector 516F – Unswitched B+

Schematic reference: Wiring harness - Electrical schematic frame 14 (A.30.A)

Pin/cavity number	Wire identification/color	Circuit reference
1	- R	Unswitched B+

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3104-Rail Pressure Relief Valve - Open

Magnum 180, Magnum 190, Magnum 210

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

Cause:
Normally the fuel pressure in the rail is regulated by the metering unit of the high pressure pump. However, if this component is malfunctioning the rail pressure can rise to critical levels. For this reason the common rail has a Pressure Relief Valve (PRV) which is a mechanical safety valve (no electrical connectors) that opens at a certain pressure level.

Possible failure modes:

1. Faulty fuel rail pressure sensor
2. Fuel system leak
3. Faulty injection component

Solution:

1. Before proceeding clear the error code with the approved diagnostic equipment. Run the machine under normal conditions and retest.
   A. If the error code is not indicated, check that the system is operating correctly.
   B. If the error code is indicated, continue to step **2**
2. Check for other engine related error codes.
   A. If other engine error codes are indicated, continue to these tests.
   B. If no other engine related error codes are not indicated, continue to step **3**
3. Check the fuel injection system for signs of fuel leakage.
   A. If a leak in the fuel system is indicated, repair as necessary.
   B. If a leak in the fuel injection system is not indicated, continue to step **4**
4. Ensure that the fuel system mechanical operation is okay. Run the tractor under normal conditions. Using a fuel pressure gauge check that the pressure is correct.
   A. If a fault with the fuel injection system is indicated, repair as necessary.
   B. If a fault with the fuel system is not indicated, remove and replace the fuel rail pressure sensor.

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4112-Rear remote no.1 - unable to reach neutral

Magnum 225 [ZARH06086 -] CVT Transmission, Magnum 180 [ZARH06086 -] CVT Transmission, Magnum 190 [ZARH06086 -] CVT Transmission, Magnum 210 [ZARH06086 -] CVT Transmission

NOTE: *Follow the maintenance schedules in operator manual for hydraulic fluid and filter change intervals. Improper maintenance can lead to sticking valve spools.*

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

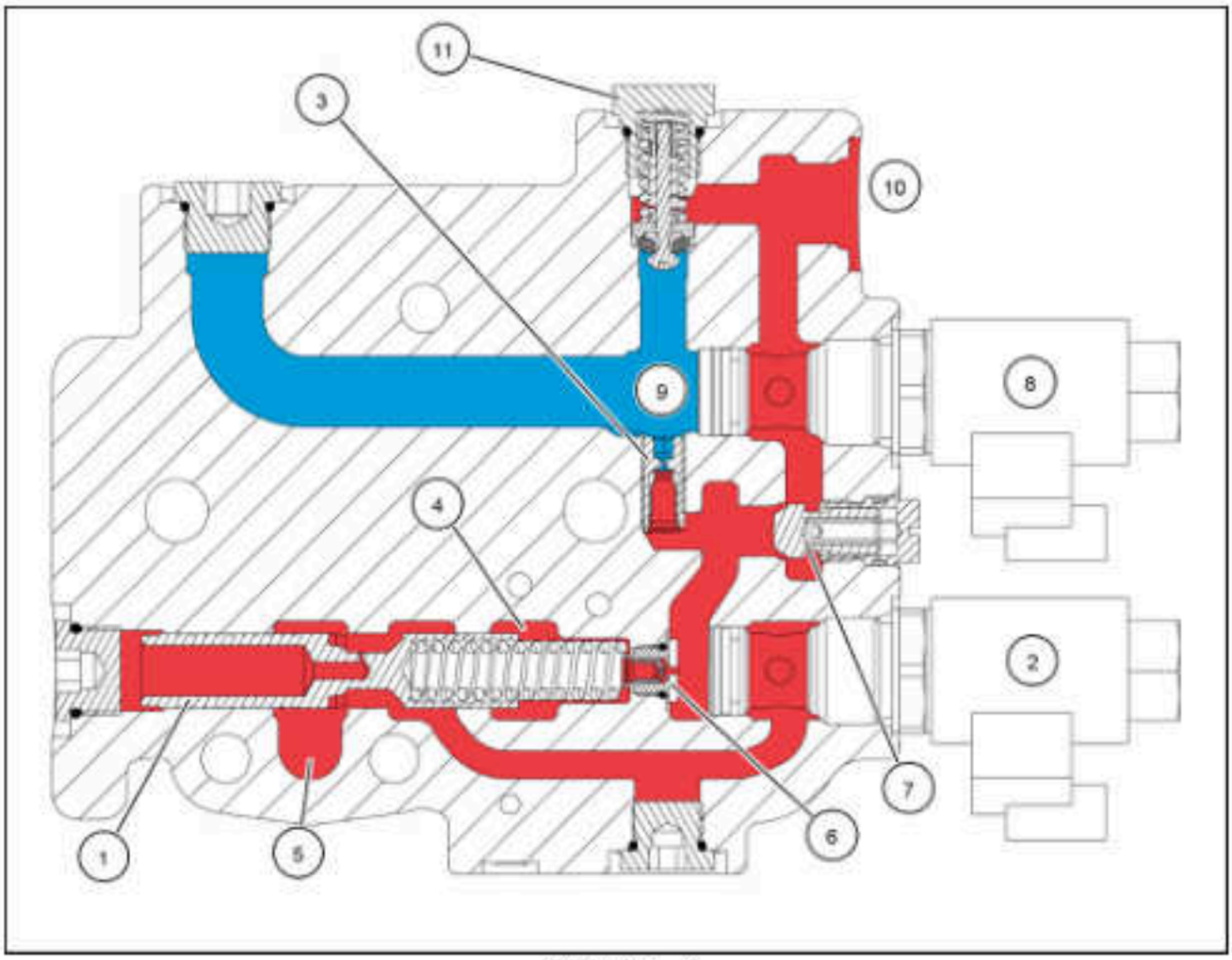
Possible failure modes:

1. A valve section was recently replaced and the tie bolts over torqued
2. Stuck spool due to contamination
3. Faulty EHR valve

Solution:

1. If a remote valve section was replaced recently check the valve tie bolt torque. Tie bolts must be tightened to a torque of **47 - 52 N·m** (**35 - 38 lb ft**).
   A. Tie bolts were over torqued. Spool now returns to neutral. Troubleshooting complete.
   B. Valve sections are not over torqued, continue to step **2**
2. Check for other EHR error code(s).
   A. Make a note of the error code(s), clear the error code(s) and test the system for normal operation.
   B. If the fault is still present, continue to step **3**
3. Check the system oil for contamination.
   A. If the oil is contaminated, replace as required. Attempt to operate the remote section repeatedly, checking to see if normal operation returns. If not continue with step **4**
   B. If the oil is not contaminated, continue to step **4**
4. Download the correct level of software and configure the EHR valve.
   A. If the fault code does not re- occur troubleshooting is complete.
   B. If the fault reoccurs, remove, replace, and configure the EHR valve section.

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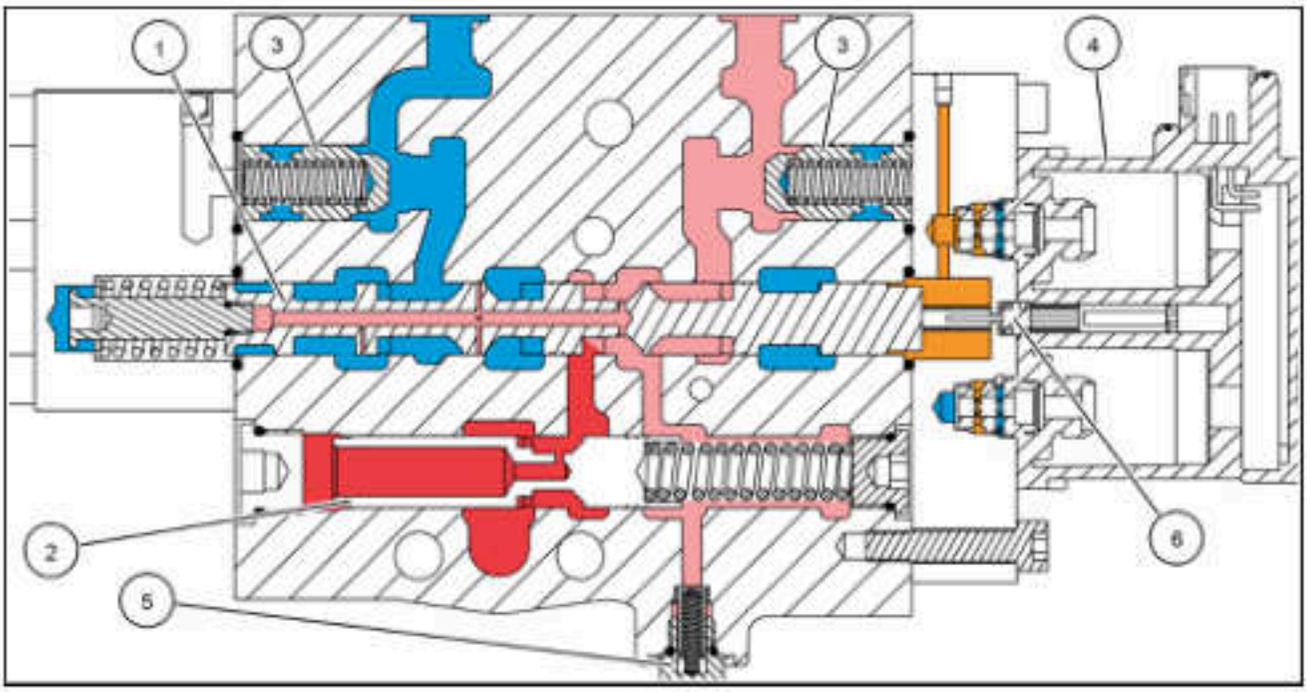
RAISE POSITION

PFC pump pressure	Return to tank pressure
Trapped oil	
1. Flow control spool	7. Load check
2. Raise solenoid	8. Lower solenoid
3. Screened orifice plug	9. Return to tank
4. Pilot signal to compensator	10. Hitch cylinders
5. PFC pump supply	11. Relief valve
6. Check/orifice plug	

Lowering Function

To lower the hitch, the lower proportional solenoid valve must be energized by the central control unit (RM). The amount of spool movement depends on the amount of current supplied by the controller to the proportional solenoid. Once the lower solenoid is energized, the solenoid valve shifts opening a flow path directly back to tank.

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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

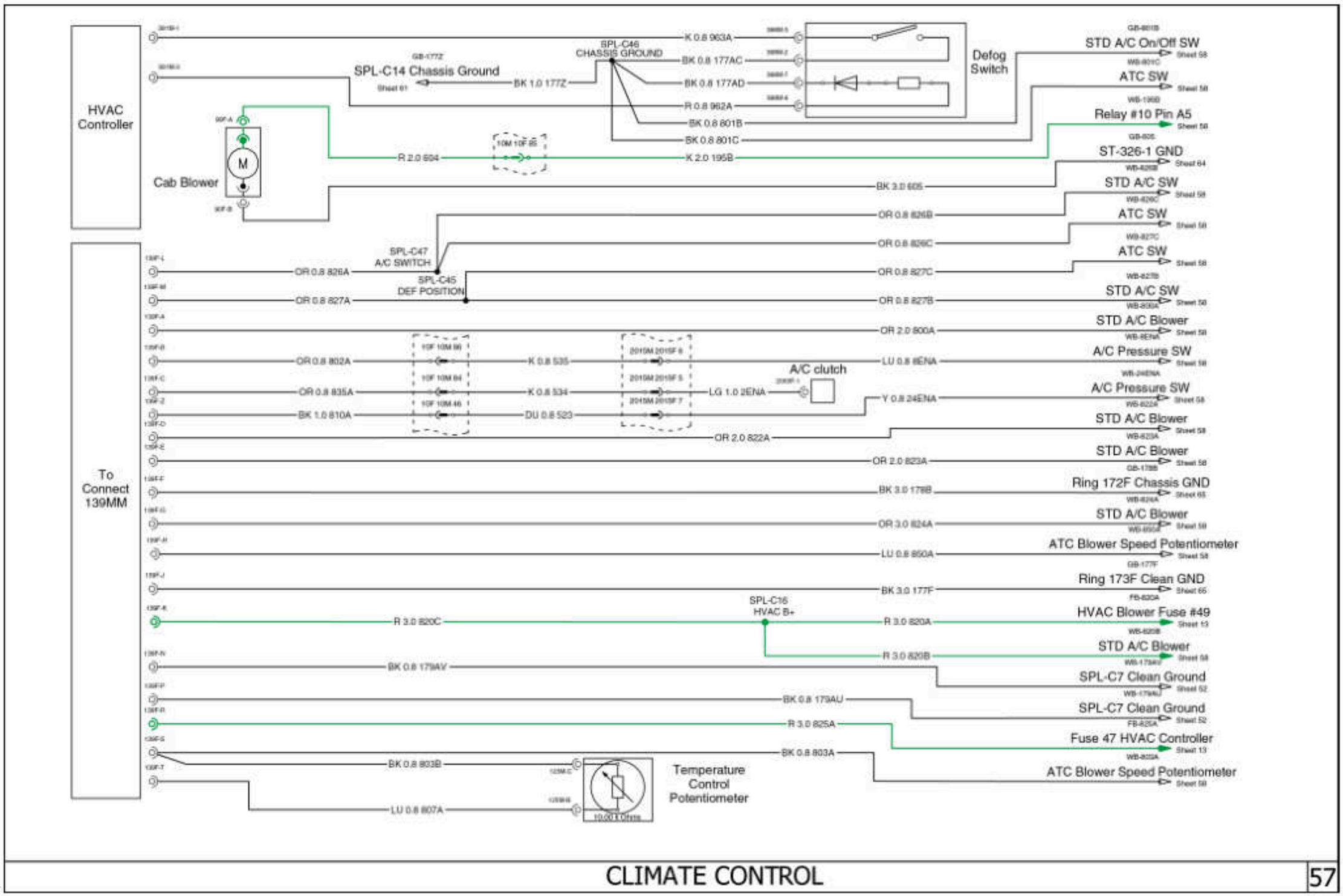
Retract position

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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CLIMATE CONTROL 57

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