

Subject

Hydraulic Solenoid Diagnostic

SYSTEM OR PARTS AFFECTED

- VMAC 40cfm and 60cfm Hydraulic Air Compressors
- A700280 40cfm and 60cfm Hydraulic Air Compressor Cold Climate Kit
- A700190 and A700191 CLOSED CENTER MANIFOLD KIT for 40cfm and 60cfm (respectively)
- 9400155 ASSY, HYD, LOAD SENSE MANIFOLD

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OVERVIEW

Hydraulic solenoid valves electrically open and close hydraulic pathways, closing them off or changing the direction of flow.

In VMAC Hydraulic Driven compressor systems, these hydraulic solenoid valves can be used to:

- Direct flow to the hydraulic motor to drive the air compressor.
- Cause oil to flow through specific hydraulic circuits to warm the hydraulic oil when required.
- Change flow characteristics to achieve desired behaviour from the hydraulic pump. (Closed center and load sense)

If diagnostics indicate that there may be a problem with a hydraulic solenoid, testing of the solenoid should be performed.



If a solenoid coil fails testing, the coil and the poppet valve should be changed together.

TESTING

HYDRAULIC SOLENOID VALVE IN 9400048 MANIFOLDS OF ALL 40CFM AND 60 CFM HYDRAULIC AIR COMPRESSORS (Figure 1).

The hydraulic solenoid valve is normally open and is “ground switched” by the control box.

Voltage is always delivered to the solenoid from the control box.

The circuit is not complete until the control box switches to ground on the return wire from the solenoid.

Before the control box ground switches, battery voltage will be measured on both solenoid wires.

When the control box ground switches, providing a ground to the solenoid circuit, battery voltage will be measured on one wire to the solenoid (supply side), but voltage will drop off to almost zero on the other wire (ground side).

The open solenoid valve creates a closed loop through the hydraulic manifold to warm the hydraulic fluid.

Once the hydraulic fluid has warmed sufficiently the control box switches a ground to close the solenoid redirecting fluid flow through the hydraulic motor, activating the air compressor.

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Subject Hydraulic Solenoid Diagnostic

Check resistance of the solenoid coil:

- ☐ Disconnect the hydraulic solenoid connector.
- ☐ Using a multimeter, check the resistance value through the Part number 4500130 Solenoid Coil.
- ☐ Correct resistance range = 7.2Ω to 8.8Ω



The manual solenoid actuation process is intended for testing only. Once you have confirmed that the solenoid opens and allows hydraulic fluid to circulate to the motor disconnect the solenoid from the battery to close the Solenoid.

Manually activate the solenoid valve:

- ☐ Start the truck and turn on the hydraulics.
- ☐ Ensure that the Hydraulic Drive Air Compressor is turned "On" at the display box.
- ☐ Disconnect the solenoid coil connector.
- ☐ Apply +12V and ground to the solenoid coil from an external source such as the battery.
- ☐ Listen for the hydraulic motor and the compressor to start.
- ☐ If the air compressor does not start, then both the Solenoid Poppet Valve (P/N# 4500129) and the Solenoid Coil (P/N# 4500130) need to be replaced.

Measure the voltage coming from the control box connector by grounding one probe and measuring voltage with the other on each of the red wires. There should be at least 12 Vdc on each wire.

- ☐ If there is no voltage or less than 12VDC check wires for continuity.
- ☐ If the wires have good continuity replace the Control Box.

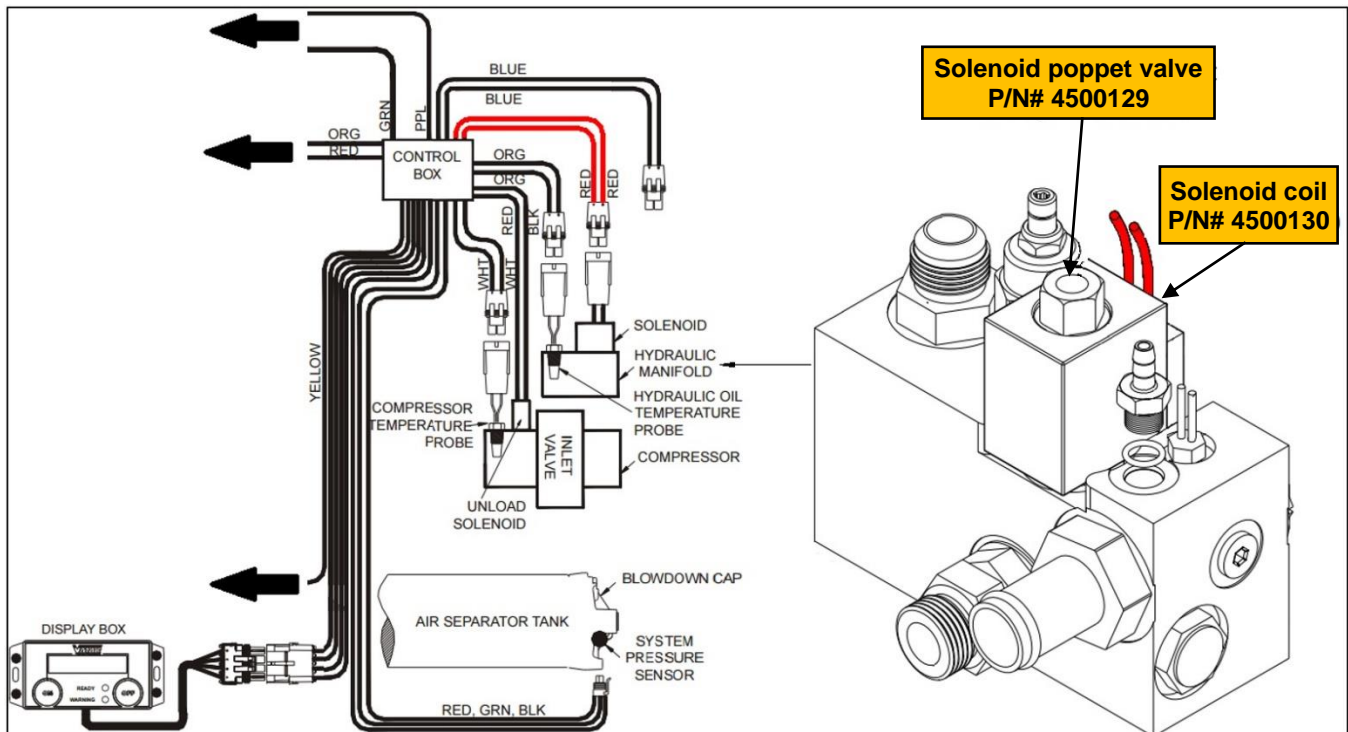


Figure 1

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HYDRAULIC SOLENOID VALVE IN A700280 COLD CLIMATE KIT (Figure 2).

This hydraulic solenoid valve is normally open and is “ground switched” by the control box (voltage is always present, but until the control box provides a ground there is no circuit).

Check resistance of the solenoid coil:

- ☐ Disconnect the hydraulic solenoid connector
- ☐ Using a multimeter, check the resistance value through the part number 3551039 Solenoid Coil.
- ☐ Correct resistance = approximately 5.2Ω

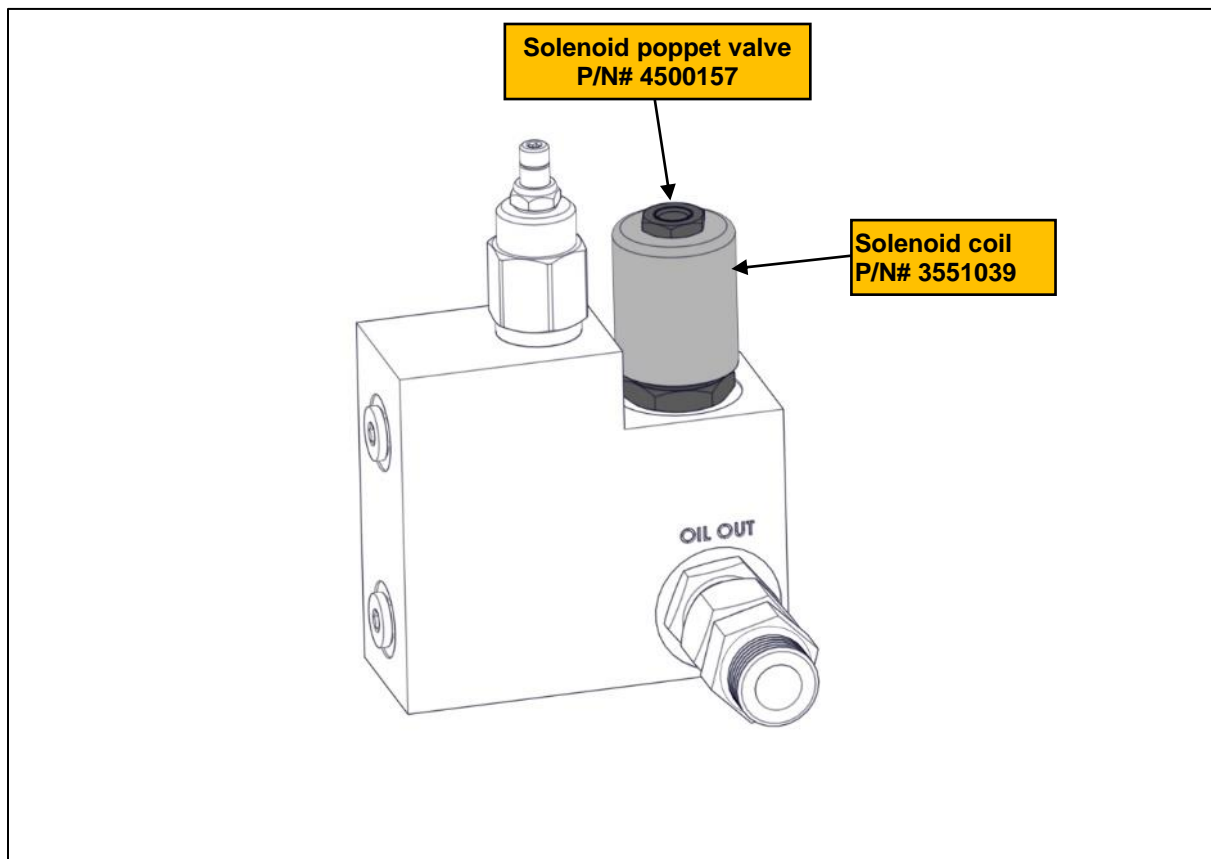


Figure 2

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HYDRAULIC SOLENOID IN A700190 AND A700191 CLOSED CENTER MANIFOLD KIT FOR 40CFM AND 60CFM (RESPECTIVELY) (Figure 3).

This hydraulic solenoid valve is normally closed and is “ground switched” by the control box (voltage is always present, but until the control box provides a ground there is no circuit).

Check resistance of the solenoid coil:

- ☐ Disconnect the hydraulic solenoid connector.
- ☐ Using a multimeter, check the resistance value through the part number 4500138 Solenoid Coil.
- ☐ Correct resistance = approximately 7.2Ω

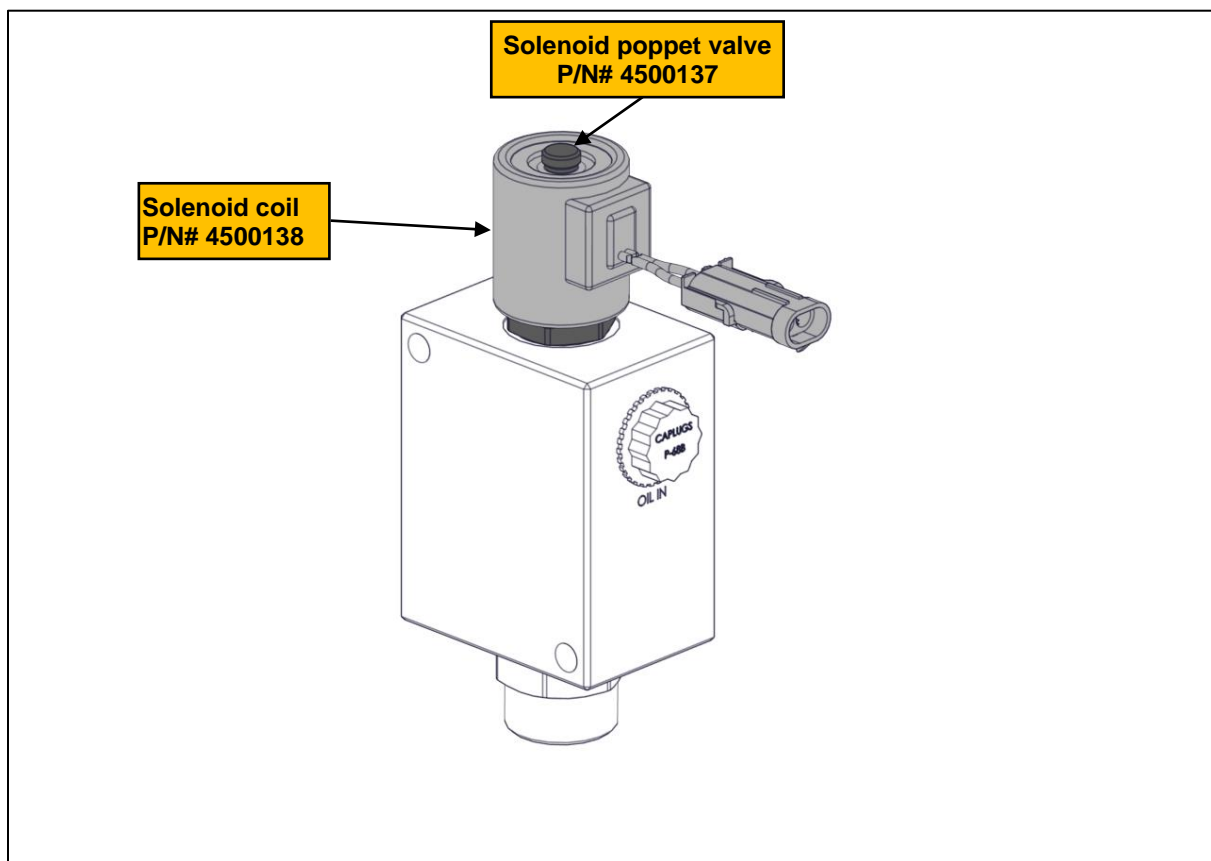


Figure 3

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HYDRAULIC SOLENOID IN 9400155 HYDRAULIC LOAD SENSE MANIFOLD ASSEMBLY (Figure 4).

This hydraulic solenoid valve is normally closed and is “ground switched” by the control box (voltage is always present, but until the control box provides a ground there is no circuit).

Check resistance of the solenoid coil:

- ☐ Disconnect the hydraulic solenoid connector.
- ☐ Using a multimeter, check the resistance value through the part number 4500168 Solenoid Coil.
- ☐ Correct resistance = approximately 6.2Ω

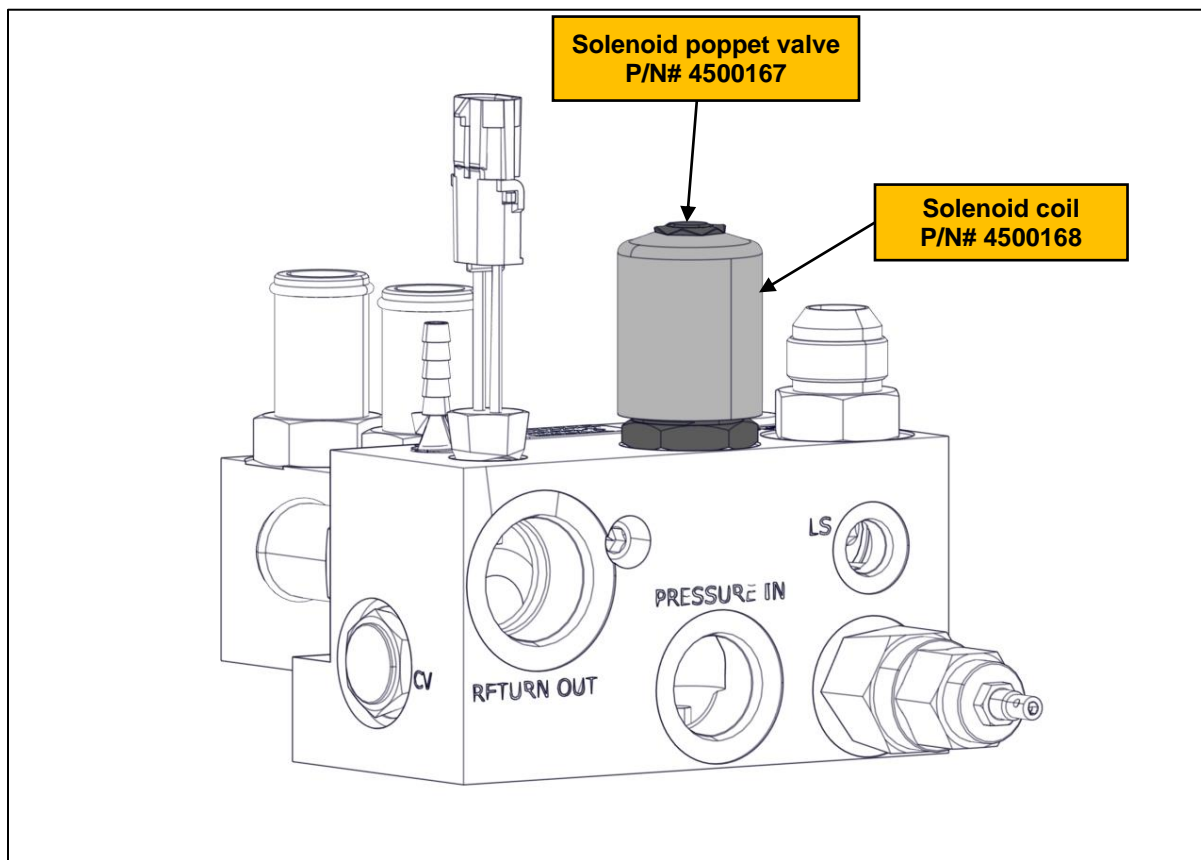


Figure 4

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					Tech.	Eng.	
D	EXT-PRED-017	Tech	Ground switch details	BDJ	RDB	N/A	27 Sept 2022