Technical Support

Subject
Pressure and Temperature Switch Troubleshooting in belt driven Lincoln Air Vantage® welders.

SYSTEM OR PARTS AFFECTED

- VMAC S700157 in Lincoln AV500 with Cummins B3.3T Turbo-Charged Diesel
- VMAC S700159 in Lincoln AV650/700/800 with Cummins B3.3T Turbo-Charged Diesel EPA Tier 4i
- VMAC S700162 in Lincoln AV600 with Deutz Turbo Charged TD2.94L4 Diesel Engine EPA Tier 4

OVERVIEW

- There are two safety switches installed in series in the VMAC compressor systems indicated above. These switches prevent compressor operation under specific conditions to prevent compressor and clutch damage.
- If the compressor's oil temperature exceeds 290°F (143°C) the over-temp switch located in the air/oil separator tank (AOST) will disengage the compressor clutch and illuminate the 'Compressor Protection' indicator.
- The VMAC system is also protected from engaging the compressor clutch while at pressure. The clutch will not engage when air pressure measured in the compressor's inlet is above 2 psi, and the 'Compressor Protection' indicator will illuminate.
- These switches are non-latching. The compressor clutch will re-engage when pressure and temperature allow.
- Following are steps for troubleshooting to determine if a fault exists in these safety switches.

BEFORE YOU START

Allow VMAC system to cool.
Check the pressure gauge. Ensure there is no air pressure in the system.

TROUBLESHOOTING

OVER TEMP SWITCH:

The over temp switch is normally closed. When the switch measures compressor oil temperature meeting or exceeding 290°F/143°C it will open, breaking the circuit, disengaging the compressor clutch, and illuminating the warning light.
If the warning light is on, but the system has not reached 290°F/143°C:

1. Slide open the inspection panel on the side of the welder. Locate the over temp switch on the air/oil separator tank (AOST) near the dipstick/oil fill tube. (Figure 1)

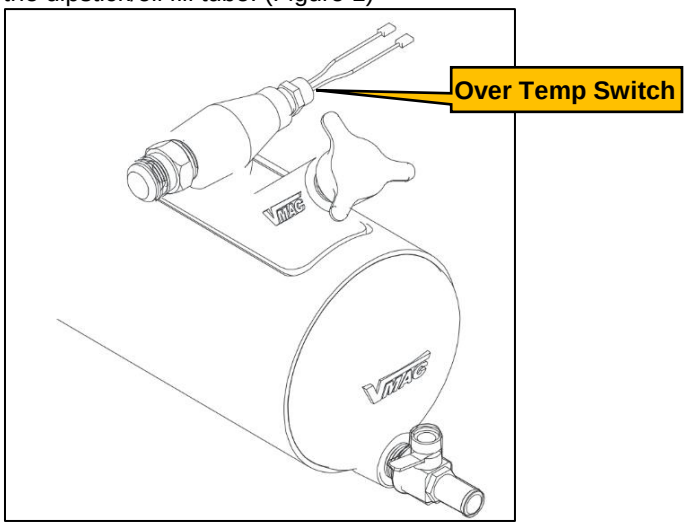

Figure 1

Version	Document	Department	Revision Details	Revised by	Tech	Engineering	Implemented
A	EXT-OEM-001	Tech	Document Release	BDJ 22Jan2019	RD 22Jan2019	N/A	22Jan2019

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2. Disconnect the wires from the over temp switch and measure continuity through the switch with a multimeter. If the over temp switch is open when cold, it must be replaced.
3. Connect the two wires together in the harness that would connect to the over temp switch. In this state, the switch is bypassed. The warning light should go out and the compressor should operate. If this happens, the over temp switch has failed.`

Do not continue to run the system with the over temp switch bypassed. If the compressor system overheats without the over temp switch connected, it will continue to run, allowing serious compressor system damage to occur.

4. If the over temp switch passes its test, but the system has not reached 290°F/143°C and the compressor protection light is on, check the pressure switch as follows.

PRESSURE SWITCH:

1. Locate the Pressure Switch assembly, which will be connected to the compressor's inlet valve (Figure 2) and disconnect the wires from the switch.

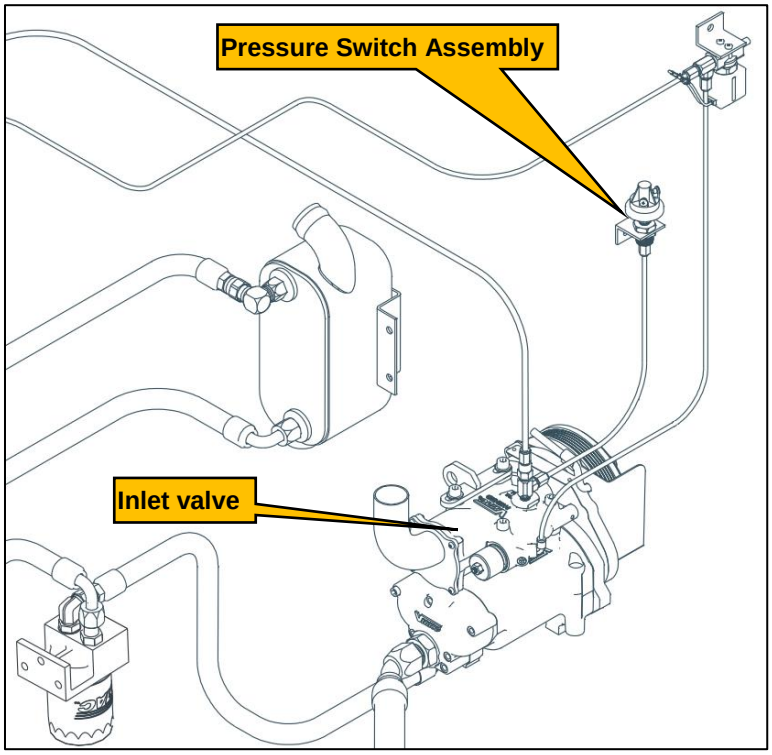

Figure 2

2. Troubleshooting the pressure switch is virtually the same as the over temp switch – There should be continuity through the switch with less than 2 psi in the system. By disconnecting the 2 wires going to the pressure switch and connecting them together the Compressor Protection light should go out.

Do not continue to run the system with the pressure switch bypassed. If the compressor clutch can engage while there is air pressure within the compressor system, clutch failure can result.

3. Check the wiring harness if the switch passes testing and Compressor Protection light still illuminates.

For more information (electrical diagram, parts list, troubleshooting etc.) see the manual for your specific product at https://www.vmacair.com/support/manuals/ under "OEM SYSTEMS MANUALS"

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