Tech Tips

Service Call:
Vacuum Prevention System Testing on Category A and B Aerial Devices

Tools Required:
1. Atmospheric Vent Test Set (P/N 488180)

P/N 488180 Vacuum Test Kit
*An automotive vacuum test kit with various fittings to hook up to the unit being tested may also be used.

Testing Vacuum Check Valve on a 5FC Tool Circuit

2. A jumper hose with pressure gauge and appropriate fittings (as outlined in the procedure) for in-line check valves

Model(s):
All Category A and B rated aerial devices
Tech Tip Safety Rules

Danger
Failure to obey the instructions and safety rules in the appropriate Operator's Manual and Service Manual for your machine will result in death or serious injury. Many of the hazards identified in the operator’s manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- You are trained and qualified to perform maintenance on this machine.
- You read, understand and obey:
  - manufacturer’s instructions and safety rules
  - employer’s safety rules and worksite regulations
  - applicable governmental regulations
- You have the appropriate tools, lifting equipment and a suitable workshop.

The information contained in this tech tip is a supplement to the service manual. Consult the appropriate service manual of your machine for safety rules and hazards.

WARNING

Escaping fluid under pressure can penetrate skin causing serious injury.

Relieve pressure before disconnecting hydraulic lines. Keep away from leaks and pin holes. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

Fluid injected into skin must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene will result.
The vacuum prevention system is required by the ANSI A92.2 Standards prior to 2015 on units with a platform height of 50 foot or greater to keep the hydraulic oil in the lines and prevent a vacuum from forming, which reduces the dielectric strength. Aerials built after June 26, 2016 do not require vacuum prevention on Category C, D, or E units. A method of vacuum prevention is required on all Category A or Category B units regardless of height or voltage rating.

Check valves are located in the hydraulic lines to keep the oil in the line. Typically, they are located just above the ‘collector block’ or hydraulic swivel joint. In the event that they do not hold a column of oil in the line, a vacuum check valve will open to prevent a vacuum from forming in the line.

Category B units will have the check or ‘foot’ valves and a vacuum check valve in the pressure and return lines that cross the insulated boom section for each control valve at the platform.

Category A units will have the check or ‘foot’ valves in the pressure and return lines as well as a vacuum check valve in each hydraulic line that crosses the insulated boom section.

Steps 1-8 will test the check or ‘foot’ valves; Steps 9-13 will test the vacuum check valves.
Step 1
Install the jumper hose with pressure gauge listed in Steps 5-7.

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<th>![Warning Icon]</th>
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Operate all unit functions to make sure hoses are filled with oil.

Step 2
Position upper and lower booms horizontally. Over-center units can be positioned out flat or in the stowed position.

Step 3
Turn off the chassis engine. Cycle the control handles to bleed off any trapped pressure.

Step 4
In each configuration, the pressure reading should stabilize at 30-60 PSI and hold for a minimum of 30 seconds, indicating that the check valves will hold oil in the line.
Step 5 - Full Flow Upper Controls
Install jumper hose with pressure gauge between the Tool Pressure and Tool Return couplers. If unit has “free flow return”, connect it to the Tool Return temporarily.

Step 6 – Pilot Operated Controls (If Equipped)
Install jumper hose with pressure gauge between the Power Assist pressure line and return.

Step 7 – Option Control Valve (If Equipped)
Install jumper hose with pressure gauge between the Option Valve pressure line and return.

Step 8
Record the value for each test performed and file the form with all other inspection records for unit tested.

Step 9
Connect a vacuum pump equipped with a gauge to the test coupler.
Examples:

- Category A: TM Series
- Category B: Vacuum Check Valves at Upper Controls
- Category B: Testing Tool Circuit – 5FC
- Foot Valve Example

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Relieve pressure before disconnecting hydraulic lines. Keep away from leaks and pin holes. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

Step 10
Draw vacuum until continuous oil or air flow is noted in the vacuum test hose.

Step 11
Vacuum must not exceed 5 inches of Hg.

Step 12
Record the value for the system tested in the inspection form for the unit tested.

Step 13
Repeat Steps 9 – 12 for all vacuum check valves installed on unit.
Tech Tips

Category A – TM Series

TM Prior to 2012

TM Test port location since 2012
Testing Vacuum Check Valve on a 5FC Tool Circuit
Vacuum Check Valve at Upper Control

Testing Foot Valves

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Foot Valve Example

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