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

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

*An automotive vacuum test kit with various fittings to hook up to the unit being tested may also be used.

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 ANSI Standard 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.

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, a vacuum check valve will open, thus preventing 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 line that crosses 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
Operate all unit functions to make sure hoses are filled with oil.

Step 2
Position Upper and lower booms horizontally. Over center units should be positioned out flat.

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

Step 4
Install the jumper hose with pressure gauge in the configuration listed in steps 5 – 7. 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.

⚠ Escaping fluid under pressure can penetrate skin causing serious injury
Step 5
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 (If Equipped)
Install jumper hose with pressure gauge between the Power Assist pressure line and return.

Step 7 (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.
Unit shown during manufacturing for clarification
Unit shown with all hoses installed

Examples:
- Category A: **TM105**
- Category B Tool Circuit: **5FC**
- **Foot Valves**

⚠️ Escaping fluid under pressure can penetrate skin causing serious injury
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 each valve tested and file the form with all other inspection records for unit tested.

Step 13
Repeat Steps 9 – 12 for all vacuum check valves installed on unit.
If you look closely, you can see 9 test points, and 7 of the vacuum prevention check valves. On this model, there are 13 total.
Testing Vacuum Check Valve on a 5FC Tool Circuit

Back to Top
Tech Tips

Testing Foot Valves

Back to Top
### Tech Tips

**Example Form**

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>HOSE QTY.</th>
<th>BREATHER QTY</th>
<th>VACUUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leveling (except 6H-70/75)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6H-70/75 Leveling Only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Holding Valve Vacuum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Coupler w/Holding Valve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Coupler w/o Holding Valve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lift</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elbow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyd. Lift</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winch (Lower)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jib (Lower)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basket Rot. (Lower)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Assist Control Head</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TESTED BY:**

*NOTE: Holding valve vacuum test is done uninstalled. Vacuum @ coupler w/holding valve must not exceed 5 inches of Hg plus holding valve vacuum.*

[Back to Top](#)
Vacuum Test with Schroeder Pressure Test Kit components