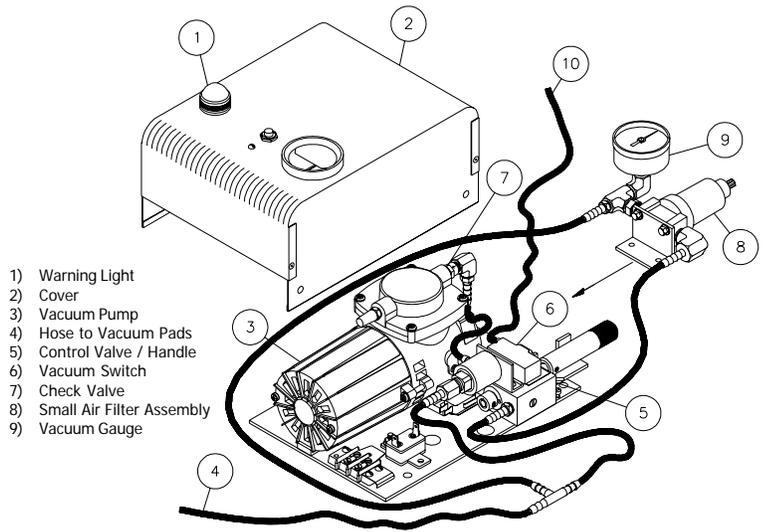


**Isolating Vacuum
Leaks:
MT Series Lifters
1 SCFM DC
Guide to Troubleshooting
and Repair**



- 1) Warning Light
- 2) Cover
- 3) Vacuum Pump
- 4) Hose to Vacuum Pads
- 5) Control Valve / Handle
- 6) Vacuum Switch
- 7) Check Valve
- 8) Small Air Filter Assembly
- 9) Vacuum Gauge

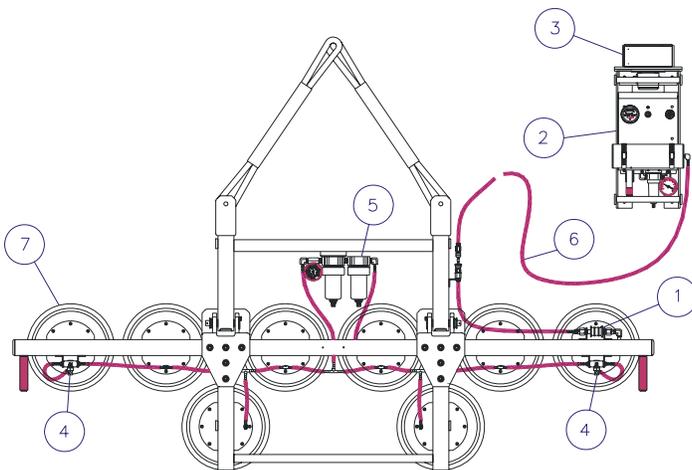
Figure 1

Any determination of leakage must be made while the lifter is attached to a clean, smooth, nonporous surface. Diagnostics in this guide also assume that the lifter's vacuum switch is set correctly, as directed in the maintenance section of the instructions manual.

Severe leakage is evidenced by a lifter's inability to draw full vacuum while attached to an appropriate test surface. In such cases, the vacuum pump runs continuously and the red low vacuum warning light remains illuminated. Moderate leakage is indicated by intermittent cycling of the vacuum pump and warning light. If the vacuum generating system turns on more than once every 10 minutes, leakage is serious enough to warrant repairing the lifter's vacuum system.

To locate the cause of leakage, begin by inspecting the vacuum pads, fittings and hoses of the entire vacuum system. Look for contamination, cuts or abrasions on pad faces, damaged fittings, cracks or cuts in hoses, a loose filter bowl, or loose hoses at connection points. If leakage is severe, it may be possible to pinpoint the source by carefully listening for airflow at each pad and along the length of the vacuum lines. (Note: Do not apply soapy water to fittings or vacuum hoses in an attempt to find leaks, since it will only be drawn inside the vacuum system.) Repair any leaks identified and re-evaluate the leakage rate, to determine whether other leaks exist.

If the source of leakage is not immediately evident, the various sections of the entire vacuum system must be systematically isolated to determine the leakage point, as follows:



- 1) Slide Valve
- 2) Remote Vacuum Generating System
- 3) Battery
- 4) Pad Shutoffs
- 5) Large Air Filter Assembly
- 6) Hose to Remote System
- 7) Vacuum Pad

Figure 2

Preliminary Test

This test determines whether leakage is located in the remote vacuum generating system (figure 2, #2) or the pad system.

- 1) Identify the quick connectors on the vacuum hose that leads from the lifter to the remote system (figure 2, #6), and make sure the connectors are attached securely.
- 2) Place the slide valve (figure 2, #1) in the “RELEASE” (closed) position.
- 3) Pull the handle of the control valve (figure 1, #5), to activate the vacuum generating system.
- 4) Observe the activity of the vacuum pump (figure 1, #3) and warning light (figure 1, #1), to locate the general area of leakage:
 - If the pump and light *turn off and remain off*, this indicates the vacuum generating system does *not* leak, so the leakage is in the pad system. Proceed to the Pad System Tests.
 - If the pump and light *continue to cycle or stay on continually*, this indicates the vacuum generating system *does* leak. Proceed to the Vacuum Generating System Tests.

Pad System Tests

Isolate the vacuum pads, fittings and vacuum line sections until the leak point can be located, as follows:

Note: On lifters equipped with shutoff valves for all vacuum pads (figure 2, #7), you can accomplish these tests by closing all the pad shutoffs (figure 2, #4). Then, if no leak is apparent, open the shutoff valve to one pad at a time, in order to determine which pad is affected (see diagnostic to follow). Once a leakage area is identified, check the hose and pad fitting between the valve and the pad, as well as the pad itself, to determine which specific part may be causing the leak. Otherwise, follow these steps:

- 1) Remove each pad fitting, disconnecting all the pads from the vacuum system.
- 2) Cap all the pad fittings, to seal off the vacuum lines.
- 3) Activate the vacuum generating system (pull handle of control valve), place the slide valve in the “APPLY” (open) position, and observe the pump and warning light activity:
 - If the pump and light *turn off and remain off*, the leakage is in one or more pads. Reconnect one pad to its vacuum line and retest. If indications of leakage resume, replace that pad. Continue testing until all pads have been reconnected and all defective pads have been replaced.
 - If the pump and light *continue to cycle or stay on continually*, the leakage is in the large air filter assembly (figure 2, #5), fittings or vacuum lines.

If you determine that the leak is in the filter assembly, reattach the hoses in their original locations and make certain each filter bowl is tight; then retest. **CAUTION: Do not use any tools to tighten a bowl; it should only be tightened by hand.** If leakage persists, service the filter according to the maintenance directions for 4.4 oz [130 ml] filters in the instructions manual, and check for loose or cracked fittings.

Fittings may be tested in the same manner as the pads, by removing each fitting from its vacuum line and plugging the hose. Vacuum line sections may be tested by moving up each line (toward slide valve) to the next fitting, removing the hose and plugging it at the fitting. Continue until all fittings and lines are tested or the leak is located.

Vacuum Generating System Tests

The most likely leak points in the vacuum generating system are the vacuum hose leading to the remote system (figure 2, #6), small air filter assembly (figure 1, #8), check valve (figure 1, #7) or control valve (figure 1, #5). Test these items as follows:

Test the remote system vacuum hose for leakage:

CAUTION: *Disconnect the battery (figure 2, #3) before removing the vacuum generating system cover.*

- 1) Carefully remove the vacuum generating system cover (figure 1, #2) and lay it to one side, so that exposed wire terminals do not touch any conductive material.
- 2) Remove the vacuum hose marked “to vacuum pads” (figure 1, #4) from the T fitting that ties into lines from the filter assembly and vacuum switch (figure 1, #6).
- 3) Cap the open end of the barbed fitting, to seal off the vacuum generating system from the pad system.
- 4) Reconnect the battery and activate the vacuum generating system (pull handle of control valve).
- 5) Observe the pump and warning light activity:
 - If the pump and light *turn off and remain off*, this indicates the vacuum generating system does *not* leak, so the leakage is in the vacuum hose between it and the slide valve. In this case, reconnect each vacuum hose component (hose, quick connector, etc) one section at a time, continuing until all parts are tested or the leak is located.
 - If the pump and light *continue to cycle or stay on continually*, this indicates the vacuum generating system *does* leak. Leave the vacuum line to the pad system sealed off, and test the filter assembly as follows:

Test the filter assembly for leakage:

- 1) Remove the hose from the barbed fitting on the control valve (which leads directly to the small air filter), and remove the hose from the barbed fitting adjacent to the vacuum gauge (figure 1, #9).
- 2) Connect the hose end that was removed from the vacuum gauge directly to the barbed fitting on the control valve. (The gauge will no longer register any vacuum, since it has been by-passed.)
- 3) Activate the vacuum generating system and observe the pump and warning light activity:

Note: It may be difficult to determine conclusively whether or not a filter leak exists; keep in mind that several small leaks may be contributing to the overall leakage rate.

 - If the pump and light *turn off and remain off*, the leak is in the filter assembly. Reattach the hoses in their original locations and make certain the filter bowl is tight; then retest. **CAUTION: Do not use any tools to tighten the bowl; it should only be tightened by hand.** If leakage persists, service the filter according to maintenance directions for 1 oz [30 ml] filters in the instructions manual, and check for loose or cracked fittings.
 - If the pump and light *continue to cycle or stay on continually*, the leak is not in the filter assembly. Test the check valve, as follows.

Test the check valve for leakage:

- 1) Cap the barbed fitting on the side of the small filter assembly opposite from the vacuum gauge.
- 2) The check valve is screwed directly into the pump head, followed immediately by a 90° barbed fitting. Remove the hose from this barbed fitting and connect a short section of hose directly between the pump head fitting and the barbed fitting on the gauge side of the filter assembly.

Vacuum Generating System Tests continued

- 3) Activate the vacuum generating system and allow the pump to run until vacuum registers in the green range on the vacuum gauge. Then turn off the vacuum generating system, and watch the gauge. It will indicate any leakage of air through the check valve.
 - If the gauge registers leakage, remove the hose connecting to the pump and unscrew the check valve with barbed fitting from the pump head. Soak the check valve in alcohol and use a pressure nozzle to clean out any contamination (blow through in direction of arrow on valve). If the check valve is functioning correctly, there will be relatively free airflow in one direction, but it will be impossible to draw any air the other way. Apply thread sealant or Teflon tape to the threads and reinstall the check valve on the pump (with arrow pointing towards pump) and retest. If the check valve still leaks, replace it and reattach all hoses in their original locations.
 - If the gauge does not register leakage, reattach all hoses in their original locations. If no leakage is detected in the remote system vacuum hose, the filter assembly or the check valve, the leakage is likely to be in the control valve. In this case, contact Wood's Powr-Grip or an authorized dealer for assistance.

Additional Information

There are various ways to approach leak-testing this lifter. For further suggestions or information, please contact Wood's Powr-Grip Co, Inc.