



Locating Suction Line Leaks

Technical Form RZ-NA 660

Applies to: **Models RA/RAD**
110/140/235/350/500

Installation Tips to Prevent Suction Line Leaks

(Suction line on a Model RA/RAD is the portion of line running from the supply tank to the remote pump assembly.)

- Consult and follow heater installation manual instructions when installing the fuel supply line.
- Use as few fittings as possible.
- Do not use compression fittings.
- Do not use TEFLON® tape or TEFLON®-based pipe dope. (TEFLON® is a trademark of DuPont Chemical Corporation.)
- Do not use unions.
- Remove canister from oil filter assembly and lubricate O-ring with new motor oil.
- Tighten drain plug on oil filter assembly.
- Mount the remote pump as close to the fuel tank as possible.
- DO NOT install the suction line vacuum gauge tee lower than the pump inlet. See Figure 1.

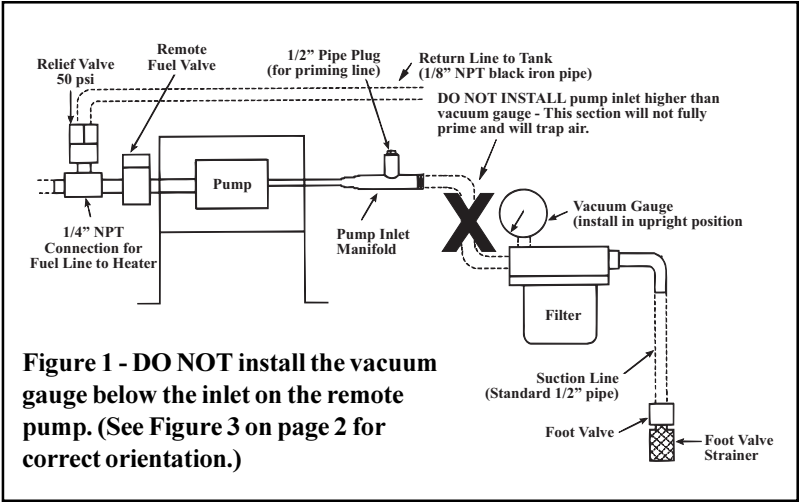


Figure 1 - DO NOT install the vacuum gauge below the inlet on the remote pump. (See Figure 3 on page 2 for correct orientation.)

Symptoms Indicating Air in the Oil Line

- Persistent air bubbles when bleeding the oil pump and/or supply lines
- Loss of oil prime causing lockout on safety
- Rough or noisy starts and stops
- Pump whine

Test Procedures

Read procedures and note highlighted items to determine other field-supplied requirements.

1. Vacuum Test the Remote Fuel Pump

- (1) *Prepare Remote Pump for Vacuum Test* - Refer to Figure 2. Disconnect the supply line at the pump inlet. (If the pump has been running "dry", pour oil into the pump.) Install a **vacuum gauge** (0-30" Hg.) into the inlet port. Connect a **bleed hose** to the bleeder port. Run the hose into an **empty, open container**.

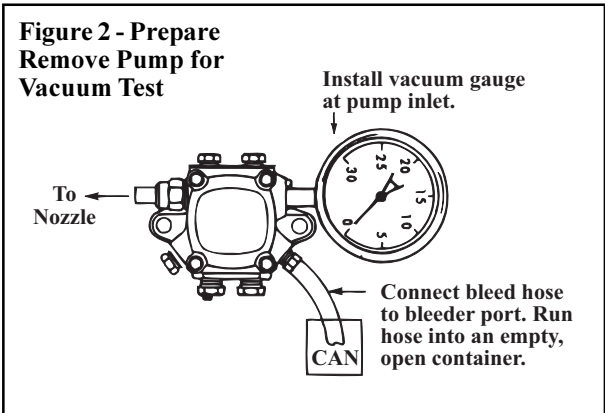


Figure 2 - Prepare Remote Pump for Vacuum Test

- (2) *Disable the Burner* - On the heater, locate the rubber tubing which connects the pressure switch (in the electrical box) to the air compressor. Oil will not flow to the burner if this tube is disconnected. Disconnect the tubing at the compressor. Remove the cad-cell wire from the FF terminals of the ignition controller.
- (3) *Start the Pump* - Set the thermostat below room temperature and wait for the burner/compressor motor to run (start-up will be delayed until the oil pre-heaters are up to temperature). After the burner/compressor motor starts, place a **jumper wire** across the cad-cell terminals on the ignition control. Observe remote pump to be certain that it is operating.
- (4) *Vacuum Test the Pump* - Run the pump until the gauge at the inlet port indicates a vacuum of 15" hg. (**Note:** If pump cannot attain 15" hg., it should be replaced.) When the gauge reaches 15" hg. (with pump continuing to run), close the bleed port. Turn the power off but continue to monitor the gauge.

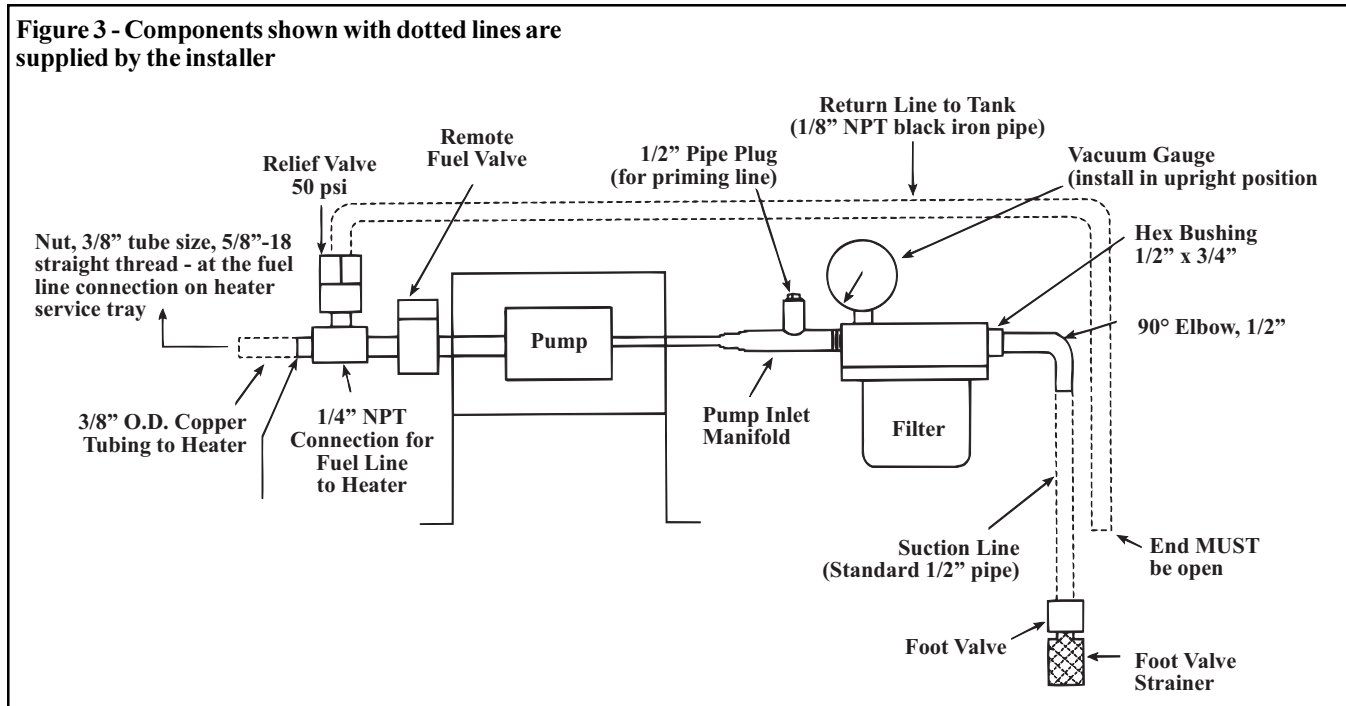
The reading should hold at 15" hg. for a five-minute period after shutdown. If the vacuum does not hold steady, re-tighten

connections to the pump and repeat the test. If vacuum reading “leaks down” again, the pump has an internal air leak and should be replaced.

If motor passes vacuum test, remove test gauge and reconnect the oil line to the inlet port of the pump.

Remove the jumper wire from the cad-cell wires on the ignition controller.

2. Vacuum Test the Suction Line (Line between the supply tank and the remote pump)



- (1) Install a **shutoff valve** in the line near the oil tank. Close the valve.
- (2) Disconnect the vacuum gauge from the tee in the fuel line. Through the opening, fill the suction fuel line with **new motor** oil. Replace the vacuum gauge.
- (3) If the burner is still disabled (Step 2 in the Pump Test above), continue to Step 4 of the Suction Line Test. If the burner is operable, repeat the following procedure to disable the burner during the test:
Disable the Burner - On the heater, locate the rubber tubing which connects the pressure switch (in the electrical box) to the air compressor. Disconnect the tubing at the compressor. Remove the cad-cell wire from the FF terminals of the ignition controller.
- (4) *Start the Pump* - Set the thermostat below room temperature and wait for the burner/compressor motor to run (start-ups will be delayed until the oil pre-heaters are up to temperature). After the burner/compressor motor starts, place a **jumper wire** across the cad-cell terminals on the ignition control.
 Observe remote pump to be certain that it is operating.

- (5) *Vacuum Test the Suction Line* - Run the pump until the reading on the vacuum gauge stabilizes. Turn off the power to the pump, observing the vacuum gauge. The reading should hold steady for five minutes.
 If the vacuum reading DOES NOT hold steady and you have verified the pump vacuum (Step 1 of the Pump Testing), then there is an air leak in the suction line (between the tank and the pump).
 Re-tighten all connections. Re-run the test until the vacuum gauge reading holds steady.
 After the line is tested to be free of air leaks, remove the shutoff valve installed in Step (1). Re-connect the supply line and tighten securely.
- (6) On the heater, remove the jumper from the cad-cell terminals on the ignition controller, re-connect the compressed air tubing to the compressor fitting, and rewire the cad-cell wire to the FF terminals on the ignition controller.

3. **Re-Start the Heater.** Set the thermostat above the room temperature to re-start the heater. (Start-up may be delayed until the pre-heaters reach required temperature.) Observe for proper operation.

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