"Recharge" Procedure for
Telemark TVP-2000 and TVP-3500

Required items:

1.) Refrigeration service "manifold".
2.) Charge recovery system.
3.) Dry nitrogen gas. If a high pressure cylinder is used, a pressure regulator will be needed
4.) Cylinder of R-22 halogen gas.
5.) Halogen leak detector for refrigerants.
6.) Leak check soap
7.) Vacuum pump capable of 5×10^{-2} Torr or 50 microns.

Insure Technician is properly certified and follows US Federal Law when doing any refrigerant recovery.

The following terms will be used to describe the position of the 3 way compressor service valve:

Back Seated Position: Turn valve stem counter-clockwise until the valve stem is fully extended. This closes off the service port (the small port on the side of the valve with the brass blank off nut).

Mid Seated: From the backseat (per above) turn the valve stem three turns clockwise. This allows refrigerant to flow to the service port. This is a common position during servicing.

Front Seated Position: Turn valve stem clockwise until fully shortened. This stops any flow of refrigerant. THE COMPRESSOR SHOULD NOT BE RUN WITH THE VALVE IN THIS POSITION.

Step #1 Check the TVP for Leaks.

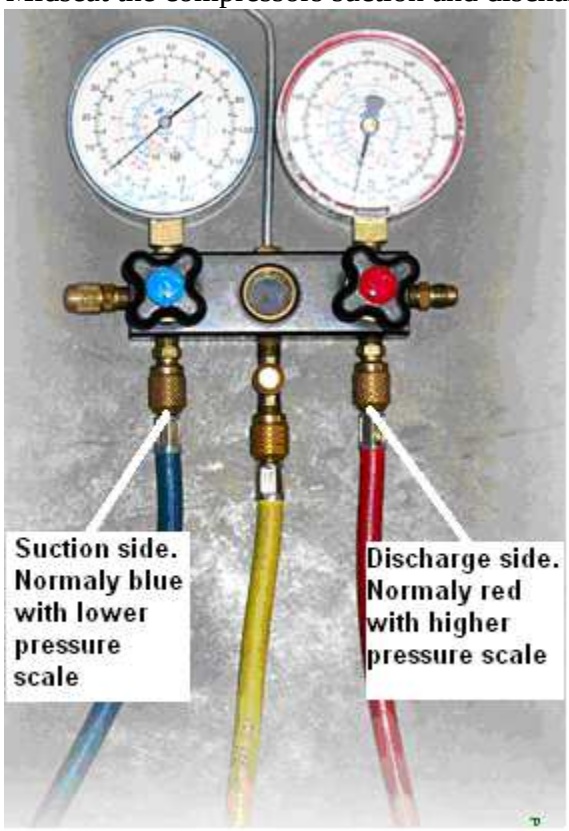
You must locate the source of leak before putting new a charge into the TVP.

Remove side panels to access compressor area.

Leak check the full system before adjusting any valves or installing the manifold. You don't want to inveterately fix the leak by adjusting a valve before you find the leak. Leak test the line and coil as well as the TVP. Check the water side of the condenser by removing the water lines and blowing out the water.

Step #2 Connect the Manifold to the Unit

1.) Insure Manifold's valves are closed.
2.) Connect the manifolds suction hose to the compressors suction service valve.
3.) Connect the manifolds discharge hose to the compressor's discharge service valve.
4.) Midseat the compressors suction and discharge service valves.



Step #3 Recover Any Remaining Refrigerant from the Unit

You may need one or two 50lb recovery cylinders depending on how much gas in the TVP. Remove the cap from the recovery cylinder's vapor access port (the one with the blue hand valve). Evacuate each recovery cylinder according to the cylinder manufacturer's instructions. Follow all local and federal codes. US federal law requires that cylinders be evacuated to 25-29 Hg vacuum.

1.) Connect the manifold's center port to your charge recovery system's inlet. Connect a recovery cylinder to the outlet of your charge recovery system. (If the discharge side of your recovery system does not have a pressure gauge, install a gauge between your recovery system and the cylinder.)
2.) Open the valves on the manifold and on the recovery cylinder. Turn on the charge recovery system to pump the refrigerant out of the TVP.

When the recovery cylinder is filled to its rated pressure, turn off the charge recovery system. Close the valves on the recovery system and on the recovery cylinder. Remove the full recovery cylinder and connect an empty recovery cylinder. Continue this process until the unit is evacuated to the required level (per your local codes or to US federal law which requires refrigerant to be recovered to 10 inches Hg vacuum.)

3.) Re-install the flare cap on the recovery cylinder's vapor access port.

Step #4 ReCheck the TVP for Leaks.

Connect the R-22 cylinder to the manifolds enter hose. Open both manifold valves and the R-22 cylinder valve to pressurize the unit to 10 to 20 psig (70 – 140 kPa). Close both manifold valves and the R-22 cylinder valve. Remove the R-22 cylinder from the center hose.

Attach the dry nitrogen to the manifold's center hose. Open both manifold valves and the cylinder valve and increase pressure in the unit to 250 psig.

Check the entire system (including lines and in-chamber cryosurface) for leaks with the halogen leak detector. Insure that there are no leaks anywhere in the system.

Step #5 Evacuate the TVP.

Turn on the unit and allow the compressor to run for 30 seconds.
Remove the dry nitrogen connection from the manifold's center hose. Release the vapors/gasses from the unit by opening both manifold valves.

Connect the vacuum pump to the manifold's center hose and turn on the pump. Evacuate the system to at least 2.5 inches Hg vacuum (17 kPa). Continue pumping for another 30 minutes. Upon finishing, close both manifold valves.

b.) Evacuate the unit for a second time

Connect the dry nitrogen to the manifold's center hose. Open the manifold's suction valve and pressurize to 100 – 120 psig. Turn on the unit and allow the compressor to run for 30 seconds.
Remove the dry nitrogen connection from the manifold's center hose. Release the vapors/gasses from the unit by opening both manifold valves.

Connect the vacuum pump to the manifold's center hose and turn on the pump. Evacuate the system to at least 0.1 Torr or 100 microns (13 Pa) to insure it is completely clean and

dry. Use caution to prevent any contaminants from entering the system while connecting or disconnecting any part of the unit or manifold.

Step #6 Recharge the Refrigeration Unit

1.) Insure manifold's valves are closed. Insure the compressor's suction and discharge valves are in the midseated position.
2.) Connect tank #1 of the replacement refrigerant charge to the manifold's center hose.
3.) Purge the manifold's center hose of air: loosen the hose where it connects to the manifold; slightly open the cylinder's valve for no more than 1 to 2 seconds; then immediately tighten the hose at the manifold.
4.) Open the cylinder valve. Turn the cylinder upside down so that the liquid refrigerant will be drawn into the unit first.
5.) Open the manifold's discharge valve. Wait for the pressure to equalize (suction and discharge gauge's would show the same pressure). The pressures should equalize within 2 minutes.
6.) Close the manifold's discharge valve.
7.) Repeat steps 1 – 6 for Tank #2 and Tank #3 of the replacement refrigerant charge.

You will need to draw the remaining gas out of the cylinders. This can be accomplished one of the following ways:

A) <u>With a charge recovery system (preferred)</u>

- A1) Connect the manifold's center port to the outlet of your charge recovery system. Connect cylinder #1 to the inlet of your charge recovery system. Purge hoses of air.
- A2) Open the valves on the manifold and on the cylinder. Turn on the charge recovery system to pump the refrigerant into the TVP.
- A3) Repeat steps 8 – 9 for Tank #2 and Tank #3 of the replacement refrigerant charge. Stop charging when the replacement charge cylinder is empty or the DP reaches 260 psig.

B) **Using the units compressor**

- B1) Connect Tank #1 to the manifold's center port.
- B2) Start compressor and open the manifold's suction valve and the valve on tank #1.
- B3) When the system reaches the Standby Ready mode, close the manifold's suction valve and the valve on Tank #1. The compressor should be left operation while this work is done.

- B4) Remove Tank #1 and Connect Tank #2 to the manifold's center port. Open the manifold's suction valve and the valve on Tank #2.

- B5) When the pressure in Tank #2 reaches the compressors suction pressure close the manifold's suction valve and the valve on Tank #2.

- B6) Remove Tank #2 and Connect Tank #3 to the manifold's center port. Open the manifold's suction valve and the valve on Tank #3.

- B7) When Tank #3 reaches the compressors suction pressure, close the manifold's suction valve and the valve on Tank #3.

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Step #7 Prepare the Refrigeration Unit for Operation

Remove the manifold

1.) Backseat the compressor's suction and discharge service valves.
2.) Remove the hoses.
3.) Re-install the Re-install the flare nuts and seals on the access fittings of the service valves.
4.) Leak check the stems of the service valves. Replace valve stem caps

Refrigerant recharges are shipped in disposable cylinders. They are intended for one time use only. Cylinders should be properly disposed of per US federal regulations or local regulations.