

OPERATING INSTRUCTIONS

**MODEL
LV2000/2001
REFRIGERANT
RECOVERY UNIT**



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MODEL LV2000/2001

The LV2000/2001 Unit can recover liquid refrigerant when using a recovery cylinder with a 2 port valve or a cylinder with 2 valves. One liquid and one vapor.

- For safety reasons the LV2001 is equipped with an automatic recovery cylinder shut off. This shut off maintains a maximum 80% fill of the recovery cylinder by volume.
- *ALWAYS USE CYLINDERS APPROVED FOR RECOVERY* (NRP model NC50 or equivalent).
- *DO NOT MIX DIFFERENT REFRIGERANTS IN A CYLINDER.* Mixtures cannot be separated.
- *ALWAYS WEAR RUBBER GLOVES AND GOGGLES WHEN TRANSFERRING REFRIGERANT.*
- *ALWAYS USE AN 052 FILTER DRIER AT INLET OF LV2000/2001 TO PROTECT LV2000/2001 COMPRESSOR, PRESSURE REGULATOR AND SOLENOID VALVES.*

NOTE:

1. All valves on the LV2000/2001 must be in the closed position except when the machine is in use. The LV2000/2001 should be treated as any refrigeration system and must not be open to air since moisture will damage the compressor.
2. Connect the LV2000/2001 to a properly grounded 115 volt 1 phase 60 HZ outlet. Do not use an extension cord longer than 25 ft. Voltage drop will damage the compressor.
3. Refrigeration hoses should not exceed eight feet in length. For optimum recovery rates use 1/4" ID hoses no longer than five feet.
4. **USE AN 052 DRIER ON THE INLET LINE OF LV2000/2001 UNIT TO PROTECT THE COMPRESSOR AND TO PREVENT PARTICLES FROM INTERFERING WITH PROPER OPERATION OF THE PRESSURE REGULATOR.** Drier must be changed after recovery from a burnout system. Drier must be changed before transferring another refrigerant to avoid mixing refrigerant. Drier must be changed after recovering 50 pounds of refrigerant.
5. LV2000/2001 unit is suitable for R12, R22, R502, R134a, R410A and most new refrigerants. The LV2000/2001 must be charged with refrigerant compatible lubricant.
6. Always remove Schrader cores from access fitting on disabled unit. This type of restriction reduces recovery rate drastically. (Use a Schrader core removing tool which allows hose connection without venting.)

COMPRESSOR OIL DRAIN

Refrigerant left in the LV2000/2001 must be recovered by following the Pump Out procedure.
(See Self Pump-Out, Pg. 6)

CAUTION: OIL IN COMPRESSOR MAY BE UNDER PRESSURE AND HOT. PROCEED WITH CAUTION.

The compressor oil drain is located on the bottom of the LV2000/2001 unit. Before draining oil, open all the valves on the unit to relieve pressure. Remove the oil charge port cap and Schrader. Then remove fitting cap and Schrader on compressor sight glass. Tilt unit on 45 degree angle; oil will drain quickly into container by gravity. (No hose needed.) Drain oil into a container for proper disposal. Oil in compressor can be under pressure and hot if unit has been running. Serious burns to operator could occur. Be careful! Drain compressor oil after recovery from a burned out system.

COMPRESSOR OIL SIGHT GLASS

During normal operation a very small amount of compressor oil (less than 1/4%) will be carried out of the LV2000/2001 unit. The compressor oil level should be at 1/2 sight glass (located on the side of the LV2000/2001). When oil level decreases, oil needs to be added to the compressor. Use 150 viscosity refrigeration oil. Open outlet valve to relieve pressure and leave outlet valve open. Inlet valve should be closed. To add oil, attach hose (Schrader core should be removed for faster oil filling) to "Oil Charge Port". Transfer fresh oil from a container by turning LV2000/2001 unit on until sight glass is 1/2 full. **DO NOT OVERFILL.** Then turn unit off, close oil charge port and outlet valve. Then evacuate LV2000/2001 unit. (Normal oil charge is approximately 14 ounces.)

WARNING

1. Avoid the use of an extension cord because the extension cord may overheat. However, if you must use an extension cord, the cord must be number 14/3 minimum, be oil resistant, meet N.E.C. and be 25 feet long maximum.
2. **THE FOLLOWING DAMAGES TO THE LV2000/2001 ARE NOT COVERED BY THE WARRANTY:**
 - A. Damage to the compressor that is due to liquid being introduced at the inlet valve of the LV2000/2001 unit that would slug the LV2000/2001 compressor and damage the compressor valves.
 - B. Damage to the compressor due to the compressor being run without oil.
 - C. Damage to the suction pressure regulator or to the due to particles which would have been brought in with contaminated refrigerant because the inlet filter drier 052 was not used. Particles such as shavings will interfere with the internal parts of the unit.

WARRANTY

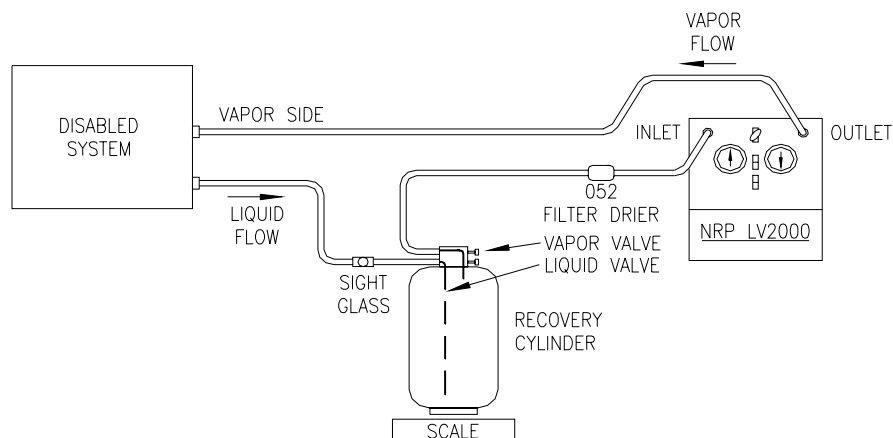
NRP Recovery Equipment is warranted to be free of manufacturing defect. NRP will repair or give credit for repair at NRP choice if any NRP Recovery Units or accessories have manufacturing defects. Any warranty claim must be submitted in writing within one year of purchase with copy of invoice. In no event shall NRP be liable for the cost of labor charges, lost profits, injury to good will or any other special consequential damages for defective goods, late delivery or non-delivery. There are no warranties which extend beyond the description of the face hereof, and NRP makes no warranty of merchantability or fitness for specific purpose. Warranty does not cover damage by improper operation or abuse.

Dear Customer:

Thank you for buying an LV2000/2001 Unit. Should you have any questions, please contact us. We want you to be satisfied with your NRP unit

DIAGRAM (1): Liquid Recovery-External Push/Pull Method

NOTE: Do Not connect liquid line to recovery unit. Compressor would be damaged. Always use a U.L. listed filter drier with a maximum design pressure of 500 PSI.



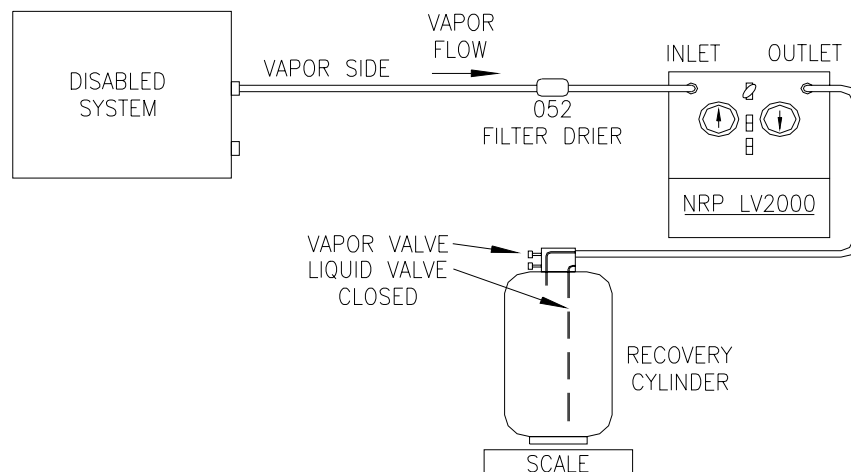
The recovery unit pumps refrigerant vapor from the top of the cylinder to the disabled unit. This maintains a lower pressure in the cylinder than in the disabled unit which pulls refrigerant to the cylinder. Liquid refrigerant is transferred directly from the disabled unit to the bottom of the recovery cylinder.

1. Connect the disabled unit to the cylinder and recovery unit as shown in Diagram (1). Use 1/4" hose less than 5 feet long. Connect a sight glass onto the liquid port of the recovery cylinder as shown. Connect the yellow electric cord on the LV2001 to the float switch on the recovery cylinder. Cylinder must be standing upright.
2. Open both valves on cylinder and both valves on recovery unit.
3. Pump out switch should be in the recovery position.
4. Turn on the recovery unit. (The yellow electrical cord on the LV2001 must be connected to the NC50U in order to run the unit.)
5. Refrigerant liquid should be visible in sight glass.
6. When liquid transfer is completed or cylinder is 80% full, **shut off valves on cylinder and recovery unit immediately**. The LV2001 will stop automatically when the NC50U cylinder is 80% full. The tank full light will also come on.
7. Turn off the recovery unit.

Note:

- In some cases it may not be possible to recover the refrigerant in liquid form. There may not be much liquid refrigerant or it has migrated to another part of the system. In such cases the refrigerant must be recovered in vapor form.
- The Push/Pull method is recommended only for systems with service valves, having an access port, that can be front seated. (Isolating the high side from the low side on the disabled unit is recommended when using the Push /Pull method)

DIAGRAM (2): Vapor Recovery



Once liquid has been removed as shown in Diagram (1), remaining vapor can be extracted with recovery unit as shown in Diagram (2). Vapor is transferred at a rate of approximately 1/2 pound per minute depending on suction pressure.

1. Connect disabled unit to cylinder and to recovery unit as shown in Diagram (2). Use a 1/4" hose less than five feet long. (Discharge and suction valves at disabled compressor can be manifolded for faster recovery.) Connect yellow electrical cord to float switch on cylinder (LV2001). Cylinder must be standing upright.
2. Open vapor valve on cylinder (liquid valve on cylinder is shut). Open both valves on recovery unit.
3. Turn on recovery unit (pump out switch must be in recovery position). Note: The yellow cord on the LV2001 must be connected to the NC50U cylinder in order to run the unit.
4. When the pressure on the inlet gauge reaches 10" Hg vacuum, vapor recovery is complete. Turn LV2000/2001 unit off and wait two minutes. If pressure rises, turn recovery unit on until inlet pressure is down to 10" Hg vacuum.
5. When vapor transfer is complete, or cylinder is 80% full, shut **valves off on cylinder and recovery unit**.
6. Pump out recovery unit at the end of each transfer operation per instructions. (See page 6)
7. Turn off the recovery unit.

Note:

- This recovery unit can recover refrigerant vapor to 20" Hg of vacuum if required. This is accomplished by connecting an evacuated cylinder to the discharge side of the unit after the above instructions have been followed.
- The recovery flow rate is slower at inlet pressures below 0 PSIG.

SELF PUMP-OUT RECOVERY UNIT

To meet EPA venting requirements and to avoid mixing refrigerant, it is important that before recovering a different refrigerant, the remaining refrigerant left in the LV2000/2001 recovery unit be pumped out into a recovery cylinder.

The LV2000/2001 has a self pump-out system (patented) which is very easy to use.

1. To pump out the LV2000/2001 unit, first close the inlet valve on LV2000/2001.
2. Open outlet valve on LV2000/2001 and recovery cylinder valve.
3. Turn pump out switch to pump out position.
4. Turn LV2000/2001 power on.
5. When inlet pressure gauge on LV2000/2001 drops to 4" Hg vacuum, self pump out is complete.
6. When self pump out is complete, shut cylinder valve and outlet valve.
7. After completing self pump out, turn pump out switch to recovery position and power switches off.
8. A total evacuation of the unit can only be obtained by using a vacuum pump.
9. To facilitate the pump out cycle during high ambient condition when handling R22 or R502 it might be necessary to pump out the refrigerant into an empty cylinder or a cylinder which is less than half full. This will prevent the LV2000/2001 from going off on high-pressure cut out.

PROCEDURE AFTER TRANSFERRING REFRIGERANT FROM A "BURN OUT"

1. Drain LV2000/2001 compressor oil and replace with approximately 14 ounces of fresh refrigeration oil. Less than 14 ounces of oil will drain out because oil is carried out during recovery.
2. Replace filter drier in suction line.
3. Evacuate LV2000/2001 recovery unit and hoses.

PROCEDURE TO FOLLOW BEFORE TRANSFERRING A DIFFERENT REFRIGERANT

To avoid mixing different refrigerants in a recovery cylinder, always pump out the recovery unit at the end of each transfer operation. This pump-out operation will remove the refrigerant from the condenser and internal piping of the recovery unit.

Replace filter drier in suction line before recovering a different refrigerant.

Evacuate the recovery unit with a vacuum pump for 15 minutes or 1000 microns. This evacuation will remove any refrigerant trace left in the recovery unit's internal piping.

Mark refrigerant type on each recovery cylinder at time of recovery.

Remember that mixed refrigerant cannot be separated and that it is expensive to dispose of mixtures.

INSTRUCTIONS FOR HIGH AMBIENT APPLICATIONS

NRP Recovery Unit model LV2000/2001 has been tested and adjusted to operate in ambient conditions up to 104° F.

The liquid recovery rate is not reduced at temperatures of 104° F ambient. The vapor recovery rate at 104° F will be approximately 1/2 lb./min. and may vary slightly with the refrigerant being pumped and the suction pressure.

120° F Ambient

For ambient temperatures between 104° F and 120° F it is necessary to adjust the LV2000/2001 suction pressure regulator. The suction pressure regulator or CRO valve adjustment hole is located on the left side panel. The suction pressure regulator comes from the factory set at 37 PSIG. With an ambient temperature of 120° F the CRO should be adjusted CCW to allow a maximum compressor inlet pressure of 21 PSIG. The CRO setting for an ambient temperature of 110° is 31 PSIG and the CRO setting for an ambient of 115° is 26 PSIG

At 120° F ambient temperature the liquid recovery rate will not be affected and will be about 12 lb./min. The vapor recovery rate will decrease to about 1/3 lb./min.

RECOMMENDATION

When recovering refrigerant it is always better not to stop and start the recovery unit compressor. As you are aware the compressor should not be allowed to short cycle which increases the compressor temperature. The compressor may go off on thermal overload to protect the motor winding. Therefore do not stop the LV2000/2001 compressor until the recovery job is complete.

USING YOUR LV2000/2001 TO RECOVER REFRIGERANT HFC Refrigerants

The compressor in your LV2000/2001 is compatible with refrigerant 134a and other HFC refrigerants. The LV2000/2001 may be used to recover R134a or other HFC refrigerants as long as the alkylbenzene oil it is charged with is flushed and replaced with Polyolester oil.

Procedure For Preparing and Flushing System With Polyolester Oil

Your unit should not be used for at least one hour prior to this procedure. Ensure there is no existing pressure in the recovery unit. Tilt side of unit up on 45 degree angle. Remove cap and Schrader valve on oil charge port. Remove cap and Schrader valve on compressor oil drain. Allow oil to drain into a bottle or container that can be later disposed of properly as per state and local codes. Follow the procedure for adding oil to your LV2000/2001. Charge with 14 oz. of NRP polyolester oil. Drain and repeat this procedure a second time. This ensures that there is less than 1% crossover between oils. Evacuate unit for 30 minutes by manifolding to both inlet and outlet valves.