



*RecoverX*TM Oil-Filled Hermetic Refrigerant Recovery System



Operation and Maintenance Manual

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General Safety Instructions

- 1) **Know your equipment.** Read and understand the operation manual and the labels affixed to the unit. Learn its applications and limitations, as well as the specific potential hazards of your equipment.
- 2) **Use the correct hoses.** Use only hoses designed for handling of refrigerants. The hoses should be the minimum length required to do the job and be equipped with a shut-off device (such as the compact ball valve) located within 12 inches of the end to reduce the likelihood of refrigerant leaks to the atmosphere. There is a *YELLOW JACKET hose for almost every type of refrigerant. See your distributor for more information.*
- 3) **Ground all equipment.** Plug this device into properly grounded receptacle with an appropriate plug.
- 4) **Do not pressure test with compressed air.** Some mixtures of air and refrigerant have been shown to be combustible at elevated pressures.
- 5) **Avoid dangerous environments.** Use with sufficient ventilation to keep operator exposure to a minimum.
Always perform recovery in well ventilated areas. Use this equipment only in locations with mechanical ventilation, providing at least four air changes per hour, or the equipment should be placed 18" above the floor.
This equipment should not be used near open containers of gasoline or any other flammable liquid. Do not allow refrigerants to contact open flame. Refrigerant decomposition in flame results in phosgene gas. Breathing phosgene gas can be fatal.
- 6) **Always wear safety goggles and gloves.** Personal protective equipment should be worn to protect operator from frostbite.
- 7) **Use caution when connecting or disconnecting.** Improper usage may result in refrigerant burns (frostbite).

If a major leak occurs, proceed immediately to a well ventilated area.

- 8) **Disconnect recovery machine from power before servicing.** An electrical shock hazard is present when the unit is disassembled.
- 9) **Repair damaged parts.** Do not operate the recovery machine with a defective part. Repair unit to proper operating conditions.
- 10) **Use recommended accessories.** Follow the instructions that accompany all accessories. Improper use of accessories may damage equipment or create a hazard.
- 11) **Use the RecoverX only with the correct refrigerants.** (See specifications for a complete list of compatible refrigerants.)
- 12) **Operate unit within the design parameters.** The RecoverX was designed to operate in a temperature range from 40° (4°C) to 120°F (49°C). Do not operate unit in a wet location.
- 13) **Caution:** All refrigerant hoses, recovery tanks, refrigerant lines, the RecoverX, and other vessels containing refrigerants should be handled as if under high pressure. When opening a tank with refrigerant in it, open valves slowly to prevent release of refrigerant if valves are damaged.
- 14) **Caution:** To avoid cross contamination of refrigerant and potential leakage to the atmosphere, the proper hoses and fittings should be used and checked for damage.
- 15) **Caution:** To avoid overfilling the refrigerant cylinder, read and follow the manufacturer's recommended filling instructions for the refrigerant being recovered.

To prevent the risk of fire DO NOT use an extension cord longer than 25ft (7.6m) and a minimum of 16 AWG (1.276mm²).

System Overview

The RecoverX offers significant flexibility to meet your refrigerant handling needs. Careful handling of refrigerant is an important part of servicing air-conditioning equipment. Specific regulations apply to refrigerant handling. Familiarize yourself with these regulations.

Refrigerant recovery is used to remove the working fluid of an air conditioning or refrigeration system. The refrigerant is transferred to a holding tank. For field service, this tank is normally a portable refrigerant tank. The refrigerant is subsequently transferred to a large collection tank when the service technicians return to the office at the end of the day.

Because the refrigerant is combined in a large tank, every technician must ensure of which refrigerant is in each tank. Your company procedures should help you

determine this. Mixing refrigerants can contaminate a large volume of refrigerant.

Use care when recovering refrigerant into a portable tank. As stated in the warnings, overfilling a tank can be extremely dangerous. The best method for monitoring tank level is a scale that continually monitors the weight of the tank.

The RecoverX is designed for recovery of vapor refrigerant only. It can also be used for the traditional push-pull method of recovering liquid refrigerant.

Liquid refrigerant will flush the oil from the compressor sump and cause the compressor to seize or could damage the compressor valve plates.

CAUTION: This unit IS NOT designed for the direct recovery of liquid refrigerant.

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Operating Guide

The RecoverX is a VAPOR ONLY recovery unit. It will not tolerate liquid. Use your RecoverX to pull vapor refrigerant directly out of the system and transfer it into your recovery cylinder.

Vapor recovery can be done by connecting to the low pressure system suction service port (Vapor port) side of the system. See diagram on following page.

Follow the steps below:

- 1) Ensure the recovery unit *Power Switch* is off (○) and power to the system to be serviced is off.
- 2) Connect the recovery unit, manifold set, the system to be serviced, and the recovery tank as shown on page 5.
- 3) Open the valves on the recovery cylinder.
- 4) Turn the *Bypass Valve* to “OPEN.”
- 5) Turn the *Power Switch* on (I).
- 6) Turn the *Bypass Valve* clockwise to “CLOSED.”
- 7) Slowly open the low pressure valve on the manifold set, regulating the

suction pressure at **no more than 40 psi**. This will prevent the compressor from stalling.

- 8) Monitor the manifold low-pressure gauge. Once the pressure has reached the required vacuum level, recovery is complete.
- 9) Turn the *Power Switch* off (○).
- 10) Wait five (5) minutes to ensure the pressure does not rise.
- 11) If the pressure rises above the required vacuum level, continue the recovery at Step 4.
- 12) If the pressure remains below the required level, close the low-pressure valve on the manifold set and the recovery tank valves. Disconnect the hoses.
- 13) Because oil can be removed from the HVAC system during recovery, the Oil Drain port should be drained after every usage. By draining this oil into a measuring device, it can be determined how much refrigerant oil was removed from the HVAC system. See the “Oil Level Check” procedure on page 7.

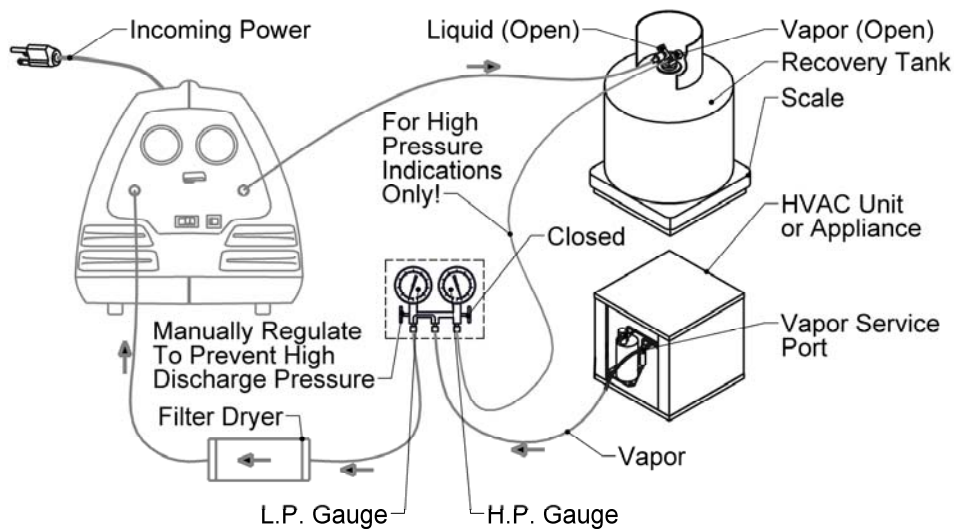
Restart Procedure

If the recovery unit was stopped during operation, it may be necessary to balance the internal pressures before the unit will start.

- ... Turn *Power Switch* off (○).
- ... Stop refrigerant flow to the suction port on the unit.

- ... Open “Bypass Valve”.
- ... Wait 30 seconds.
- ... Restart the recovery unit.
- ... Close “Bypass Valve”.
- ... Resume normal vapor recovery.

Vapor Recovery Diagram



Push-Pull Liquid Recovery

The Push-Pull Liquid Recovery method is used for transferring large volumes of liquid refrigerant. The RecoverX “pulls” vapor from the recovery cylinder and produces high pressure discharge gas that “pushes” liquid out of a HVAC system into a recovery cylinder (see page 6 for diagram).

Some systems may not allow push-pull liquid recovery. **If any of the following conditions apply to your recovery job, proceed directly to the Vapor Recovery Method.**

- ... Equipment contains less than 8 pounds of refrigerant.
- ... Equipment is a heat pump or other unit with a reversing valve.
- ... Equipment has an accumulator between the service ports used in liquid recovery.
- ... Liquid refrigerant has migrated and the location of the refrigerant is not known.
- ... The refrigerant system does not allow for a solid column of liquid refrigerant to be formed.

When using push-pull recovery, the RecoverX will not recover to the required vacuum level in the recovered system. Use a sight glass to determine when the liquid is being “pushed” into the recover tank. When liquid refrigerant is no longer visible, go to the Vapor Recovery section of this manual for further instructions.

The hose connections for push-pull liquid recovery are shown on page 6. Perform the following steps for push-pull liquid recovery:

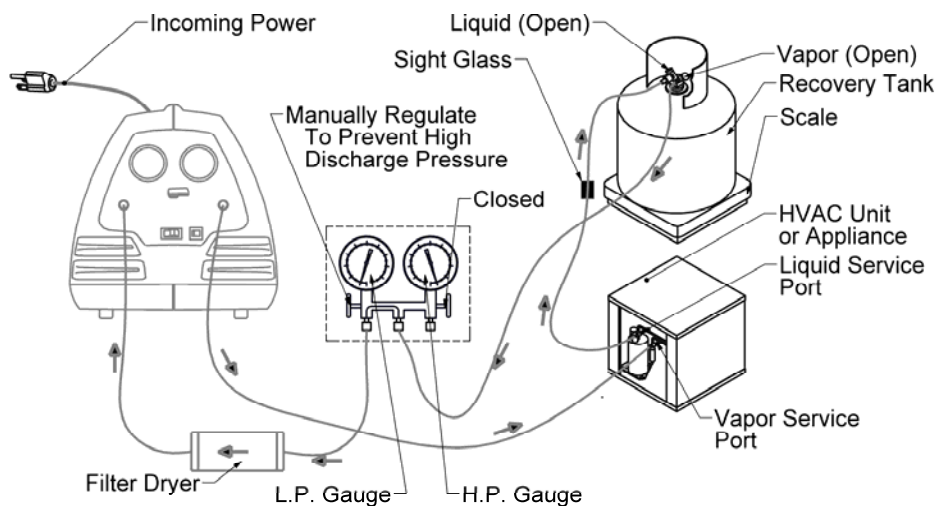
- 1) Ensure the recovery unit *Power Switch* is off (○) and the power to the system to be serviced is also turned off.
- 2) Connect the recovery unit, the system to be serviced, the manifold set, and the recovery tank as shown on page 6.
- 3) Open the valves on the recovery cylinder.
- 4) Turn the *Bypass Valve* to “OPEN.”
- 5) Turn the *Power Switch* on (I).

Push-Pull Liquid Recovery, cont.

- 6) Turn the *Bypass Valve* to “CLOSED.”
- 7) Slowly open the low pressure valve on the manifold set. Manually regulate the suction pressure at **no more than 40 psi**. This will prevent compressor from stalling.
- 8) Monitor the sight glass. When there is no longer significant liquid refrigerant passing through the sight glass, push-pull liquid recovery is complete.
- 9) Close the low pressure gage on the manifold set.
- 10) Turn the *Power Switch* off (○).
- 11) Close the valves on the recovery tank.

Proceed to the Vapor Recovery procedure to remove the remainder of the refrigerant and to evacuate the system to the required vacuum level.

Push-Pull Diagram



Change-over Procedure

Different types of refrigerant and refrigerant oil should not be mixed in the recovery unit. If recovering a different type of refrigerant, the recovery unit must be completely evacuated. Follow these steps to pump down the system for use with another refrigerant.

- 1) Place a cap on the suction port of the unit and turn the *Bypass Valve* to “CLOSED.” Turn the unit on and run it for two minutes.
- 2) Apply 10-30 psig pressure of inert gas such as nitrogen to the suction port.

- 3) Turn the *Bypass Valve* to “OPEN.”
- 4) Turn the *Power Switch* on (I).
- 5) Turn the *Bypass Valve* to “CLOSED” and run for 15 seconds.

Note: The inert gas will enter the recovery cylinder. This small amount of non-condensable gas will be removed during the reclamation process.

- 6) Turn the *Power Switch* off (○).
- 7) Close all valves and remove the hose from the recovery tank.
- 8) Connect the hose to a vacuum pump.

Change-over Procedure, cont.

- 9) Run the vacuum pump for at least 10 minutes to remove the remaining refrigerant and non-condensable gas.
- 10) Check the compressor oil for contamination and proper level. Add or change oil if needed.
- 11) Unit is ready for use with another refrigerant.

Compressor Maintenance

OIL LEVEL CHECK

This unit has been factory charged with 7 ounces POE oil. Check the compressor oil before and after each use. An overfilled oil sump can overload the compressor. Too little oil can cause the compressor to seize.

CAUTION: The recovery unit is under high pressure. Do not remove the cap on the compressor oil port without following this complete procedure!

To check the oil level:

- 1) Place a cap on the suction port of the unit and close the bypass valve. Turn the unit on and run it for two minutes.
- 2) Slowly remove the brass cap from the compressor oil port. If pressure is present, continue running the unit until there is no pressure on the port.
- 3) Place a small catch device under the open drain port or attach a hose and direct it toward a catch device.
- 4) With the machine on a flat surface, uncap the suction port. Excess oil will

come out of the oil drain port. Low pressure compressed air can be applied to the suction port to assist the draining process.

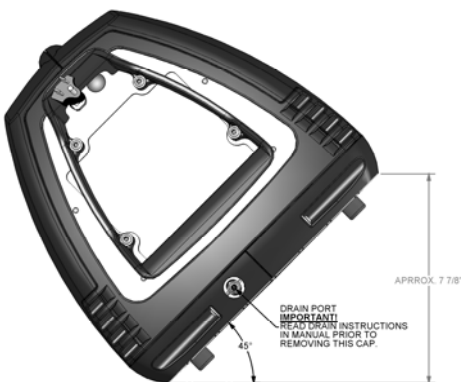
- 5) Allow excess oil to drain into the catch device.
- 6) If no oil comes from the drain, add one ounce of refrigerant oil to the compressor. Check the oil level. Once a small amount of oil comes from the drain, the oil level is correct. If not, repeat this step.
- 7) Replace the brass cap on the oil drain port.
- 8) Ensure the unit is working properly before using it to recover refrigerant.

COMPLETE OIL CHANGE

The compressor oil should be changed at least every six (6) months (more often if unit is used frequently). The oil may need to be changed after servicing a system that had a compressor burn out or high contamination levels.

To change the compressor oil:

- 1) Place a cap on the suction port of the unit. Turn the unit on and run it for two minutes.
- 2) Remove the brass cap from the compressor oil port
- 3) Place a catch device under the open drain port or attach a hose and direct it toward a catch device.
- 4) Tilt the machine on its side as shown. This allows most of the oil to drain out of the recovery unit.



Compressor Maintenance, cont.

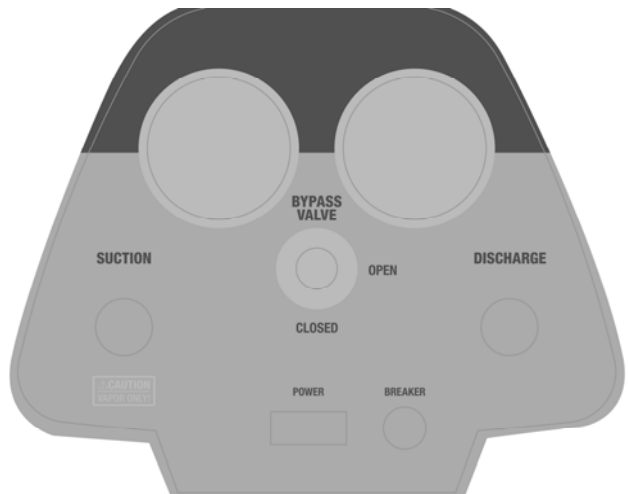
- 5) Uncap the suction port. The compressor oil will come out of the drain port. Low pressure compressed air can be applied to the suction port to assist the draining process.
- 6) Refill the oil sump with 7 ounces of POE refrigerant oil.
- 7) Return the machine to a flat position and check the oil level as described previously.

Recovery Tips and Techniques

Here are a few time saving techniques to help you on your next job:

- 1) Use the shortest hoses possible and when possible avoid hoses with schrader depressors. This will help assure the fastest and quickest recovery possible.
- 2) Know what kind of refrigerant you are going to recover and the amount. You need to know what kind to avoid contamination. More importantly you need to know how much refrigerant you plan to recover. This will help you avoid overfilling your recovery cylinder which can have disastrous results.
- 3) If you plan on recovering large amounts of refrigerant (20lbs or more) it would be a good idea to use the push-pull method. **Note: This process requires you to switch hoses to finish recovering the remaining vapor. See the “Push-Pull Liquid Recovery” section of this manual.**
- 4) Protect your RecoverX by using an in-line filter drier. Failure to use a suction filter drier can cause damage to your compressor.
- 5) Recovery machines are not vacuum pumps. For proper evacuation use your YELLOW JACKET vacuum pump. To speed up the evacuation process try using your TITAN™ manifold and core removal tool (P/N 18975). For more information contact your local YELLOW JACKET wholesaler.

RecoverX
Front View



Troubleshooting Guide

Problem	Possible Cause	Solution
Compressor will not start	... Power cord not plugged in	... Plug in to energized 110V receptacle
	... 110V receptacle not energized	... Check 110V receptacle for power
	... High Pressure Switch not reset	... Reduce discharge pressure and reset. ... If switch will not reset, check discharge for restrictions or schrader core not fully depressed.
	... Circuit Breaker is tripped	... Reset circuit breaker
	... Defective system switch	... Replace switch
Unit starts but stops after a short period	... Restriction on the discharge port	... Open valve on recovery tank ... Ensure schrader core on discharge port is fully depressed ... Check for other restrictions
Compressor starts but trips the circuit breaker upon start up	... High differential pressure across compressor	... Turn Bypass Valve to "OPEN."
	... Liquid refrigerant present in the sump of the compressor	... Remove liquid refrigerant from sump of compressor.
	... Compressor oil level is too low or too high.	... Check oil level and add or drain if necessary
Unit will not perform liquid push-pull recovery	... System to be serviced does not allow liquid recovery	... Use Vapor Recovery method

UL Certified Rates to ARI Standard 740-98

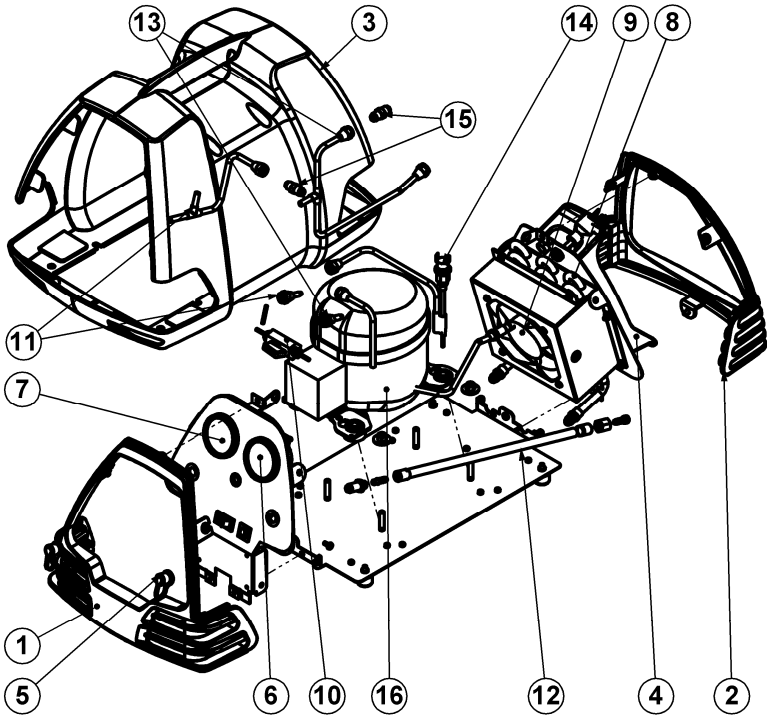
	R12	R134a	R22	R500	R502
Vapor lbs./min	.24	.20	.29	.24	.24
Liquid lbs./min	N/A	N/A	N/A	N/A	N/A
Push-Pull lbs./min	10.4	9.3	8.8	9.6	7.6
Vacuum Level	15 in. Hg	15 in. Hg	15 in. Hg	15 in. Hg	15 in. Hg

Other Refrigerants:

YELLOW JACKET RecoverX is approved for use with the following refrigerants which has not been certified for a particular recovery rate.

R-12, R-134a, R-401C, R-406A, R-500, R-401A, R-409A, R-401B, R-412A, R-411A, R-407D, R-22, R-411B, R-502, R-407C, R-402B, R-408A, R-509.

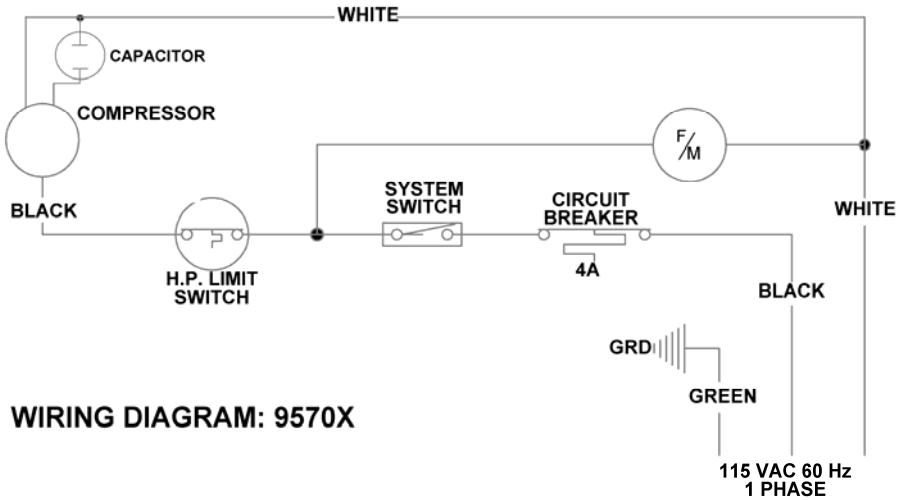
Parts Location and List



95700 Parts

Item #	Part#	Description	Item #	Part#	Description
1	95444	Case, Front	9	95178	4" Fan Motor Assembly
2	95445	Case, Rear	10	95460	Bypass Valve
3	95446	Case Half (both halves)	11	95463	Compressor Inlet Assembly
4	95447	Case, Cord Wrap	12	95464	Discharge Hose Assembly
5	93394	1/4" Flare Cap & Strap	13	95473	Compressor Discharge Assembly
6	95461	High Pressure Gauge Panel Mount	14	95423	High Pressure Switch
7	95462	Low Pressure Gauge Panel Mount	15	95163	Check Valve (2) 1/4" mfl x 1/4" mfl
8	95178	Condenser Coil	16	95472	Service Compressor
N/A	95158	Start Relay	N/A	95465	Operation Manual

Wiring Diagrams



Technical Data

Compressor:	1/6 HP hermetically sealed reciprocating	
Power Source:	115Vac 60 Hz	
Amperage:	Run Load Amps:	1.5
	Full Load Amps:	2.0
	Locked Rotor Amps:	8.0
Size:	Height:	12.5"
	Width:	12.4"
	Depth:	19.3"
	Weight:	29 lbs.

Important Notice To Purchaser

Check for damage immediately.

Prior to shipment, all YELLOW JACKET RecoverX Recovery Systems are completely tested and inspected to assure compliance with Ritchie Engineering factory specifications.

If the recovery system carton is damaged, check contents immediately. Note damage on shipper's Bill of Lading and have shipper sign statement. Notify the carrier immediately of the damage to arrange inspection of the recovery system and packaging.

The CARRIER ALONE is responsible for handling and settling your claim. Ritchie Engineering will cooperate in assessing damage if the recovery system is returned to the factory prepaid.

Carton contents include:

- ... RecoverX Series Recovery System
- ... Owner's manual
- ... Warranty registration card

To validate warranty, mail registration card within 10 days.

Warranty Information

Ritchie Engineering guarantees YELLOW JACKET products to be free of defective material and workmanship which could affect the life of the product when used for the purpose for which it was designed. Warranty does not cover items that have been altered, abused or returned solely in need of field service maintenance. If found defective, we will either replace or repair at our option products returned within 15 months of factory shipment. All returns must be return freight prepaid.

The following steps must be taken by you or your wholesaler before the unit can be returned:

1. Call our technical service personnel at (800)769-8370 to see if the problem can be resolved over the phone.
2. Obtain an RMA number from Ritchie Engineering.
3. Fax a copy of the original invoice to (952)943-1140.

If at any time after the warranty period you have problems with your YELLOW JACKET recovery unit, call our technical service department for help in selecting the correct replacement parts, or arrange for us to make the repair at a reasonable cost.



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