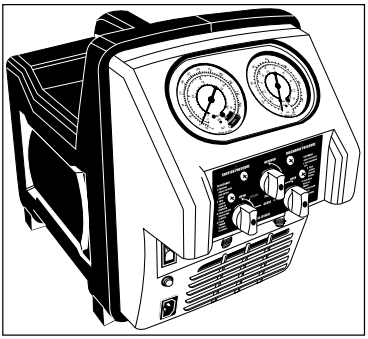
Mastercool®
"World Class Quality"

OPERATING INSTRUCTIONS
SPARK FREE RECOVERY MACHINE

69395, 69395-220, 69390-220



SAFETY INFORMATION! READ CAREFULLY BEFORE USING RECOVERY SYSTEM!

CAUTION! This equipment should only be operated by certified personnel.

SAFETY SUMMARY

The following safety information is provided as guidelines to help you operate your new system under the safest possible conditions. Any equipment that uses chemicals can be potentially dangerous to use when safety or safe handling instructions are not followed. The following safety instructions are to provide the user with the information necessary for safe use and operation. Please read and retain these instructions for the continued safe use of your service system.

SAFETY INFORMATION

Customers respect the tools with which they work. They know that the tools represent years of constantly improved designs and developments. The customer also knows that tools are dangerous if misused or abused. To reduce risk of discomfort, illness, or even death, read, understand, and follow the following safety instructions. In addition, make certain that anyone using this equipment understands and follows these safety instructions as well.

READ ALL SAFETY INFORMATION CAREFULLY before attempting to install, operate, or service this equipment. Failure to comply with these instructions could result in personal injury and/or property damage.

RETAIN THE FOLLOWING SAFETY INFORMATION FOR FUTURE REFERENCE.

Published standards on safety are available and are listed at the end of this section under ADDITIONAL SAFETY INFORMATION.

The National Electrical Code, Occupational Safety and Health Act regulations, local industrial codes and local inspection requirements also provide a basis for equipment installation, use, and service.

The following safety alert symbols identify important safety messages in this manual. When you see one of the symbols shown here, be alert to the possibility of personal injury and carefully read the message that follows.

ELECTRICAL SHOCK HAZARDS

- Make sure system is electrically connected to a properly grounded power source.
- To reduce the risk of electric shock, unplug the air service center from the outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
- Do not operate the machine with a damaged cord or plug - replace immediately. To reduce the risk of damage to electric plug and cord, disconnect recovery machine by pulling on the plug rather than the cord.

An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure:

a. That pins on plug of extension cord are the same number, size, and shape as those on machine recovery plug.

b. That extension cord is properly wired and in good electrical condition; and

c. That the wire size is large enough for the length of cord as specified below:

Length of cord in feet:	25	50	100	150
AWG size of cord:	16	12	10	8

MOTION HAZARDS

- Engine parts that are in motion and unexpected movement of a vehicle can injure or kill. When working near moving engine parts, wear snug fit clothing and keep hands and fingers away from moving parts. Keep hoses and tools clear of moving parts. Always stay clear of moving engine parts. Hoses and tools can be thrown through the air if not kept clear of moving engine parts.
- The unexpected movement of a vehicle can injure or kill. When working on vehicles always set the parking brake or block the wheels.

FUME HAZARDS

- FUMES, GASES, AND VAPORS CAN CAUSE DISCOMFORT, ILLNESS, AND DEATH! To reduce the risk of discomfort, illness, or death, read, understand, and follow the following safety instructions. In addition, make certain that anyone that uses the equipment understands and follows these safety instructions as well.
- Avoid breathing A/C refrigerant and lubricant vapor mist. Exposure may irritate eyes, nose, and throat.
- Always perform vehicle service in a properly ventilated area. Never run an engine without proper ventilation for its exhaust.

- Stop the recycling process if you develop momentary eye, nose, or throat irritation as this indicates inadequate ventilation. Stop work and take necessary steps to improve ventilation in the work area.

HEAT/FREEZING HAZARDS

- When under pressure, refrigerants become liquid. When accidentally released from the liquid state they evaporate and become gaseous. As they evaporate, they can freeze tissue very rapidly. When these gases are breathed in, the lungs can be seriously damaged. If sufficient quantities are taken into the lungs, death can result. If you believe you have exposed your lungs to released refrigerant, seek immediate medical assistance.
- Refrigerants can cause frostbite and severe burns to exposed skin. Refrigerants are under pressure and can be forcibly sprayed in all directions if carelessly handled. Avoid contact with refrigerants and always wear protective gloves and make certain other exposed skin is properly covered.
- Refrigerants can also severely injure or cause permanent blindness to unprotected eyes. Refrigerants are under pressure and can be forcibly sprayed in all directions if carelessly handled. AVOID CONTACT WITH REFRIGERANTS AND ALWAYS WEAR SAFETY GOGGLES.

EXPLOSION/FLAME HAZARDS

- Check hose gaskets for damage that could cause leaks before each use.
- For general safety reasons, at the end of the working day or in between services (when services do not immediately follow), make sure all valves on hoses and tanks are closed.
- Do not use this Recovery System in the vicinity of spilled or open containers of flammable substances (gasoline, solvents, etc.).

ADDITIONAL SAFETY INFORMATION

For additional information concerning safety, refer to the following standards.
ANSI Standard Z87.1 — SAFE PRACTICE FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION - obtainable from the American National Standards Institute

CAUTION: This equipment should be used in locations with mechanical ventilation that provides at least four air changes per hour or the equipment should be located at least 18 inches (457 mm) above the floor," or the equivalent.

CAUTION: Do not pressure test or leak test refrigerant service equipment and/or vehicle air conditioning systems with compressed air. Some mixtures of air and refrigerant have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.

Attention: Technicians using this equipment must be certified under EPA Section 609 (Environmental Protection Agency).

CAUTION: This equipment should be serviced by authorized personnel only to maintain flammability rating.

WARNING: There is the possibility of refrigerant and equipment contamination from hydrocarbons or leak sealants in the refrigerant container or the mobile A/C system being serviced or refrigerant container.

NOTE: Use only new refrigerant oil to replace the amount removed during the recycling process. Used oil should be discarded per applicable federal, state, and local requirements.

The manufacturer shall not be responsible for any additional costs associated with a product failure including, but not limited to, loss of work time, loss of refrigerant, cross contamination of refrigerant, and unauthorized shipping and/or labor charges.

PERIODICALLY INSPECT AND MAINTAIN REFRIGERANT HOSES AND SEALS TO ENSURE THAT HOSES AND SEALS PREVENT THE ADDITION OF EXCESS AIR, DUE TO LEAKS, DURING THE RECOVERY PROCESS, WHICH WOULD INCREASE THE NCG LEVEL IN THE RECOVERED REFRIGERANT AND COULD MAKE AN EXPLOSIVE MIXTURE WITH HYDROCARBON REFRIGERANTS.

All hoses used for interconnecting system should have shut off valves (manual or automatic) on both ends. Treat all hoses and connections with caution. Hoses or connections will contain liquid refrigerant or gas under pressure. Connect and disconnect fittings with caution.

The Recovery System includes a fine screen filter at the inlet port. Screen should be checked often or whenever contamination prevents proper operation of recovery system.

SPECIFICATIONS:

- Rated Voltage: 120 V, Frequency: 60 HZ or Rated Voltage: 220V, Frequency: 50/60 Hz
- Output: 1/2 HP
- Continuous Duty
- Full Load Amperage: 7.6A
- Locked Rotor Amperage: 25.2 A
- Class: A
- Design Pressure: 400 psi outlet, 175 psi inlet

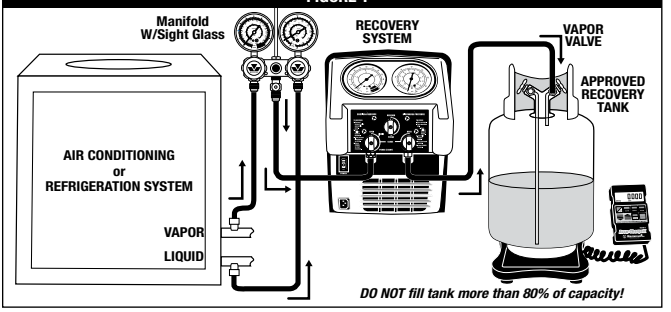
HVAC APPLICATIONS

FOR DIRECT VAPOR OR LIQUID RECOVERY

(Refer to fig.1) Connect System per fig. 1 and following instructions

1. Make sure on-off switch is off, “O” pushed in. Connect system to grounded power connection. If equipped, push “HPCO” reset button on front panel of system. This switch will “trip” (shut Recovery System off) if Recovery System is pressurized above 38 bar (550 psi).

FIGURE 1



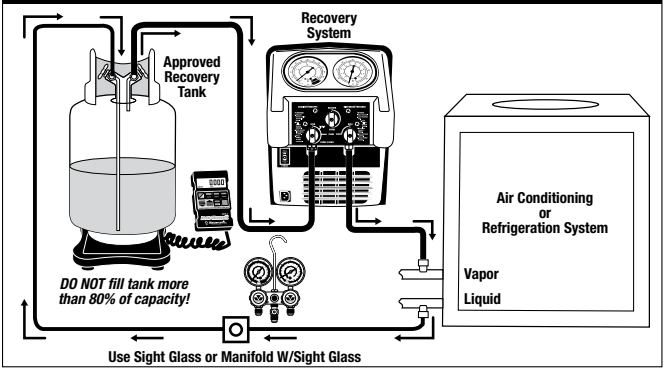
2. Turn **INLET** (blue color) valve to **CLOSE** position. Turn center valve (yellow color) to **RECOVER** position.
3. Turn **OUTLET** (red color) valve to **OPEN** position.
4. Connect the inlet and outlet hoses to the Recovery System (per fig. 1). The inlet hose should be connected to the unit to be serviced. The outlet hose should be connected to vapor valve on recovery tank. Recovery tank must be used on a scale that can be set to shut off refrigerant flow when tank reaches 80% of capacity. Recovery tank must have a minimum pressure rating of 38 bar (550 psi).
5. Open the valve on the unit being serviced (feeding inlet hose).
6. Open the vapor valve on the recovery tank.
7. Turn **INLET** valve on Recovery System to **OPEN**.
8. Turn on Recovery System (push power switch “I”).
9. Observe operation of system. In rare instances “slugging “ may be apparent (loud compressor noise or high vibration). If this condition is apparent turn inlet valve to **LIQUID** position. System can be run with this setting continuously. It is suggested that operator periodically turn inlet valve to **OPEN** position and check for proper operation of system. Best operation of the system is with inlet valve fully **OPEN.**
10. Recovery is complete when inlet reading is about 380 - 510mm (about 15 - 20”) of mercury vacuum. Turn inlet valve to close position and turn power switch off. Recovery is complete.

RECOVERY SYSTEM PURGE

1. Turn off power switch. Turn inlet valve to **PURGE** position. Turn center valve to **PURGE** position. Make sure outlet valve is in **OPEN** position. Start System.
2. Purge may take a few minutes as some liquid refrigerant may be in the Recovery System. The liquid must become vapor, which may require some time. System will shut-off automatically when proper vacuum level is reached.
3. Shut **OFF** Recovery System power switch. If system is to be used with the same refrigerant next operation, shut outlet valve and disconnect outlet hose. If opening of Recovery System is required, disconnect outlet hose to relieve residual pressure.
4. The inlet port has a fine screen filter. Remove inlet nut and clean or replace filter after every use. A clean filter is very important for the proper operation of the System.

PUSH – PULL LIQUID RECOVERY METHOD (Refer to fig. 2)

FIGURE 2



The push –pull liquid recovery technique permits recovery of large volumes of liquid refrigerant from HVAC or refrigeration systems. The Recovery System pulls vapor from the recovery cylinder and produces high pressure vapor that is discharged into vapor service port of system being evacuated. The liquid service port is connected to liquid inlet on recovery tank.

Note: Recovery tank must be used with a scale that shuts off refrigerant flow when tank reaches 80% of its capacity.

When the Recovery System is started vapor from the recovery tank is compressed and sent, at high pressure, to HVAC or refrigeration system. As pressure builds, the liquid is “pushed” out of unit into recovery tank. Vapor from recovery tank is “pulled” out of recovery tank, compressed, and then pressurizes unit.

Note: Some systems may not have liquid service port. This prevents the push-pull technique from being used.

Procedure for Push-Pull technique (Connect system per fig. 2 and following instructions).

1. Connect outlet port of Recovery System to vapor port of unit to be serviced. Use hoses with automatic or manual valves on both ends to prevent refrigerant release when disconnecting.
2. Connect liquid port on unit to be serviced to liquid port on recovery tank. Recovery tank should be on a scale that stops flow when 80% tank capacity is reached. This connection should be made with a manifold gauge set with sight glass to verify liquid flow. Recovery tank must have a minimum pressure rating of 38 bar (550 psi).
3. Connect vapor port of recovery tank to inlet port of Recovery System. Use hose with automatic or manual valve on both ends.
4. Open valves on unit to be evacuated. Open valves on recovery tank.
5. On Recovery System, rotate outlet valve to **"OPEN"** position. Rotate center valve to **"RECOVER"** position. Rotate inlet valve to **"OPEN"** position.
6. Start Recovery System.
7. Check the sight glass for the presence of liquid flow. When liquid stops flowing, rotate inlet valve on Recovery System to **"CLOSED"** position. When Recovery system is shut down due to vacuum, turn **OFF** the power switch. Reconnect system for direct vapor recovery following instructions listed under "Operating Guide for Direct Vapor or Liquid Recovery".

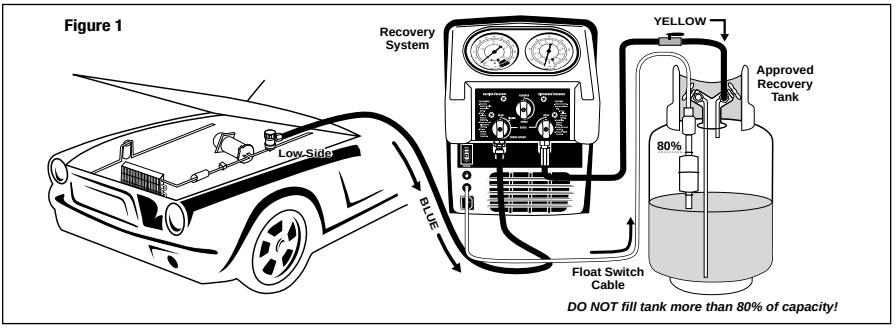
AUTOMOTIVE APPLICATIONS

OPERATING GUIDE FOR DIRECT VAPOR OR LIQUID RECOVERY (Refer to fig.1)

Note: If recovery machine shuts off due to full tank, close valve on tank and shut off machine. Replace and connect empty recovery tank to yellow hose and restart Recovery Machine.

1. Make sure on-off switch is off, "O" pushed in. Connect system to grounded power connection.
2. Turn INLET (blue color) valve to CLOSE position. Turn center valve (yellow color) to RECOVER position.
4. Connect blue hose from low side system connection to inlet port.
5. Connect yellow hose from outlet port of recovery machine to vapor (gas) connection on recovery tank.
6. Connect float switch cable from recovery machine to recovery tank.
   NOTE: Recovery system will not operate if float switch cable is not connected. Recovery tank must be Mastercool part #62011 or 65010 and have a maximum capacity switch to prevent over filling of tank. Purge air and moisture from system by bleeding lines or use a vacuum pump.
7. Open the vapor valve on the recovery tank.
8. Turn OUTLET (red color) valve to OPEN position.
9. Turn INLET valve on Recovery System to OPEN.
11. Observe operation of system. In rare instances "slugging" may be apparent (loud compressor noise or high vibration). If this condition is apparent turn inlet valve to LIQUID position. System can be run with this setting continuously. It is suggested that operator periodically turn inlet valve to OPEN position and check for proper operation of system. Best operation of the system is with inlet valve OPEN and automatic pressure regulating valve controlling flow conditions.
12. When the inlet pressure is 15" Hg or more, the recovery is done. To purge the Recovery System, leave the system running. Turn the center valve to PURGE. Turn the inlet valve to PURGE. It may take 1 or 2 minutes to purge the Recovery machine of refrigerant, depending on how much liquid is in it.
13. Make sure the Recovery system is off. Turn the inlet and outlet valves to CLOSE. Close the valve on the tank and remove the hoses.

Figure 1



WARNING: This product contains one or more chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.