

Snap-on[®]

USER'S MANUAL

Kool

Kare[™]

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Using This Manual

This manual contains instructions for use and setup of the unit. A table of contents and table of illustrations are provided to make this manual easy to use.

Some of the information shown in text or illustrations is obtained using optional equipment. A **Sun Electric** Sales Representative can determine option availability.

Conventions

This section contains a list of conventions used in text.


Check Note

A check note provides additional information about the subject in the preceding paragraph.


Example:

- ✓ For additional information refer to **Chapter 2—Connecting Service Hoses to Vehicle**.

Equipment Tips

Equipment tips provide information that applies to specific equipment. Each tip is introduced by this icon  for easy identification.

Example:

-  Never attempt to change the recovery tank during unit operation. For additional information refer to **Chapter 2—Removing Recovery Tank**.

Equipment Damage

Situations arise during testing that could damage the vehicle or the test equipment. The word **IMPORTANT** signals these situations.

Example:

IMPORTANT

Failure to follow these instructions could damage compressor.

Safety Messages

Safety messages are provided to help prevent personal injury and equipment damage. All safety messages are introduced by a signal word indicating the hazard level. The types of safety messages are:

▲DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

▲WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

▲CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the operator or to bystanders.

Some safety messages contain visual symbols with signal words.

Example:



Engine systems can malfunction expelling fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris.

Wear safety goggles and protective gloves, user and bystander.

Engine systems that malfunction can cause injury.

Terms

Use the following definitions as a foundation to help understand **Kool Kare** processes and/or components.

Virgin Tank

A refrigerant tank, disposable or refillable, that contains new refrigerant. Disposable virgin tank must be evacuated and cannot be refilled. Dispose of evacuated tank in accordance with local, state and federal regulations that apply in your area. A refillable virgin tank should be returned to your supplier.

Recovery Tank

A refrigerant tank designed to store refrigerant removed from a virgin tank or recovered from a vehicle. On **Kool Kare**, refrigerant is filtered and dried before reaching the recovery tank. Once in the recovery tank, it is ready for reuse.

Recycle

The process of removing refrigerant from a system, filtering, drying and storing it in the recovery tank.

- ✓ Recycle is the only process that removes refrigerant. There is not a separate recovery process.

Recover

The process of removing refrigerant from a system to prevent release of refrigerant into the atmosphere. On **Kool Kare**, this process is part of recycle.

Evacuate

The process of drawing a vacuum on a refrigerant system to remove air and moisture. On **Kool Kare**, this process is known as vacuum.

Charge

The process of filling an air conditioning system with refrigerant.

Chargeable

Referred to as Chargeable Amount on **Kool Kare** screens. Chargeable Amount is the weight of refrigerant programmed into the unit for dispensing into the air conditioning system.

Purging

The process of bleeding off non-condensable gases from the recovery tank.

Stable Scale

Situation where the refrigerant weight measuring device reading becomes steady. Moving the unit may cause the scale reading to become unsteady.

Safety Information

Safety Notice

For your safety, read this manual thoroughly before operating **Kool Kare**.

Kool Kare is intended for use by properly trained, skilled professional automotive technicians. The safety messages presented below and throughout this user's manual are reminders to the operator to exercise care when using this unit.

There are many variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. Because of the vast number of test applications and variations in the products that can be tested with this instrument, **Sun Electric** cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the automotive technician's responsibility to be knowledgeable of the system that is to be tested. It is essential to use proper service methods and test procedures and to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, or the vehicle or equipment being tested.

It is assumed that the operator has a thorough understanding of vehicle air conditioning systems before using **Kool Kare**. This understanding of principles and operating theories is necessary for competent, safe and accurate use of this instrument.

Before using **Kool Kare**, always refer to and follow safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested.

Read All Instructions

Read, understand and follow all safety messages and instructions in this manual and on the test equipment. Safety messages in this section of the manual contain a signal word with a three-part message and, in some instances, an icon.

Safety Information

The signal word indicates the level of hazard in a situation.

- **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or bystanders.
- **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or bystanders.
- **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or bystanders.

Safety messages in this section contain three different type styles.

- Normal type states the hazard.
- **Bold type** states how to avoid the hazard.
- *Italic type* states the possible consequences of not avoiding the hazard.

An icon, when present, gives a graphical description of the potential hazard.

IMPORTANT SAFETY INSTRUCTIONS



Risk of suffocation.

- Vehicle exhaust gases contain carbon monoxide.
- Refrigerant gas can displace air in work area.

Use *Kool Kare* in locations with mechanical ventilation providing at least four air changes per hour.

Suffocation will cause injury.

Power



Risk of electric shock and fire.

- **To avoid electric shock the power cord protective grounding conductor must be connected to a properly grounded AC outlet.**
- **Use proper A.C. outlet for unit to operate correctly. See unit ID plate on back of unit. Extension cords are not recommended. If an extension cord is necessary, then use:**
 - 16 AWG for cords up to 50', and
 - 14 AWG for cords greater than 50' but less than 100'.
- **Connect power cord to properly grounded outlet. Do not remove or bypass the grounding pin.**
- **Use only fuses with the rating specified near the fuse holder.**

Electric shock and fire can cause injury.

Refrigerant



Risk of expelling refrigerant under pressure.

- Wear safety goggles and protective gloves, user and bystander. If any refrigerant gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.
- Do not remove master filter while under pressure. Perform maintenance procedure for removing master filter in **Chapter 3—Changing the Master Filter**.
- Prevent refrigerant from contacting the skin. *Expelled refrigerate can cause injury.*



Risk of explosion.

- Do not use compressed shop air for leak detection or to pressure test a system containing refrigerant. Refrigerant can form combustible mixtures at pressures above atmospheric and with air concentrations greater than 60% by volume.
- Do not heat a container of refrigerant above 125°F (52°C).

Explosion can cause injury.



Risk of fire.

- Do not use this equipment in the vicinity of spilled or opened containers of gasoline.
- Do not use **Kool Kare** or leak detector equipment if R-12 substitutes are suspected. R-12 refrigerant substitutes may be flammable.

Fire can cause injury.



Risk of poison.

- Avoid breathing air conditioning refrigerant and lubricant vapor or mist.
- Do not allow refrigerant to contact open flame or be drawn into a running engine. This can cause refrigerant to become poisonous phosgene gas.
- Use **Kool Kare** to remove refrigerant from air conditioning systems.

Exposure can irritate eyes, nose and throat.



Risk of irritation of mucous membranes.

- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. To remove HFC-134a from the A/C system, use service equipment certified to meet the requirements of SAE J2210 (HFC-134a Recycling Equipment). Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.

Exposure can irritate eyes, nose and throat.

Safety Information

Oil (Lubricant)



Risk of expelling oil under pressure.

- **Wear safety goggles and protective gloves, user and bystander.** If any oil gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.

Expelled oil can cause injury.

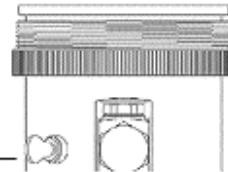
Oil Separator Bowl



Risk of expelling refrigerant under pressure.

- **Wear safety goggles, user and bystander.**
- **Never open the metal oil separator bowl when it is under pressure.**
- **Service should be performed by a certified A/C service technician.**
- **Remove bowl by performing maintenance procedure in *Chapter 3–Metal Oil Separator Bowl* in this manual.**
- **Remove bowl only when light is on continuously and no refrigerant is present.**
- **Loosen metal oil separator bowl vacuum release thumbscrew only when light is on continuously and no refrigerant is present.**

Vacuum
Release
Thumbscrew



Expelled refrigerant can cause injury.

General



Engine systems can malfunction expelling fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris.

Wear safety goggles and protective gloves, user and bystander.

Engine systems that malfunction can cause injury.



Engine compartment contains electrical connections and hot or moving parts.

- **Keep yourself, test leads, clothing and other objects clear of electrical connections and hot or moving engine parts.**
- **Do not place test equipment or tools on fenders or other places in the engine compartment.**

Contact with electrical connections and hot or moving parts can cause injury.



Service hoses can not withstand high temperatures or severe mechanical stress.

Keep the service hoses away from moving or hot engine parts.

Service hoses can split or burst causing injury.



Risk of explosion if improper tank is used.

Do not use any tank with this equipment other than part number 7009-2447-03 for R-12 or 7009-2447-01 for R-134a. These tanks are D.O.T. certified for refilling. D.O.T certified tanks are marked "D.O.T. 4BA 350" or "D.O.T. 4BA 400".

Explosion can cause injury.



Removing tubing assemblies from the pump may discharge refrigerant.

Wear safety goggles and protective gloves, user and bystander.

Refrigerant may cause injury.

⚠WARNING

A test vehicle may move if not properly prepared.

- **Block the drive wheels before performing a test with the engine running. Unless instructed otherwise, set the parking brake and put the gear selector in neutral (manual transmission) or park (automatic transmission). If the vehicle has an automatic parking brake release, disconnect the release mechanism for testing and reconnect when testing is completed.**
 - **Do not leave a running engine unattended.**
- A moving vehicle can cause injury.*

⚠CAUTION

Risk of injury.

This equipment should be operated by qualified personnel.

*Operation of **Kool Kare** by anyone other than qualified personnel may result in injury.*

⚠CAUTION

Hose couplings are not self closing.

Always close the valves on the gauge set before disconnecting a hose.

Loosened hose couplings can leak refrigerant to the atmosphere.

⚠CAUTION

Misdiagnosis may lead to incorrect or improper repair and/or adjustment.

Do not rely on erratic, questionable, or obviously erroneous test information or results. If test information or results are erratic, questionable, or obviously erroneous, make sure that all connections and data entry information are correct and that the test procedure was performed correctly. Refer also to the Maintenance/Troubleshooting section and perform tests and make repairs as required. If test information or results are still suspicious, do not use them for diagnosis. Contact your **Sun Electric Representative.**

Improper repair and/or adjustment may cause vehicle or equipment damage or unsafe operation.

SAVE THESE INSTRUCTIONS

Introduction

Kool Kare recovers, recycles, evacuates and charges refrigerant for automotive air conditioning systems. Functions may be performed automatically or manually.

When powered up, **Kool Kare** performs a self-test and displays the micro-controller software version. **Kool Kare** monitors error conditions, and when an error is encountered, displays an error message during all operating cycles.

Kool Kare includes:

- A Liquid Crystal Display (LCD) and five buttons to control operation,
- Integral gauge set and manifold valves with service hoses, fittings, and adaptors,
- A 50 pound capacity recovery tank and electronic scale to ensure maximum refrigerant storage and accurate charging capabilities, and
 - Recovery tank is temperature-monitored to maintain accurate purging of non-condensable gases under all conditions.
 - A pulsed air escaping sound emits while purging air from the system. Do not be alarmed by this noise or defeat this process.
- Master filter.

This manual applies to the following **Kool Kare** model:

Model Number	Refrigerant Type	Voltage
EEAC104B	R-134a	120 VAC

Refrigerant Gases

Halogens are any of the five elements (fluorine, chlorine, bromine, iodine and astatine) that form part of group 7a of the Periodic Table of Elements. The fluorine and chlorine elements of this family are used to create a methane organic compound used to form dichlorodifluoromethane (CCL_2F_2), a halogenated hydrocarbon called CFC-12 (chlorofluorocarbon 12). This refrigerant gas is commonly known as Refrigerant-12, or R-12, and has been used as a refrigerant in mobile air conditioning systems for many years.

The new refrigerant in the halogenated hydrocarbon family, HFC-134a (CH_2FCF_3), or R-134a, is now being incorporated in mobile air conditioning systems. HFC stands for hydrofluorocarbon.

The environmental impact of mobile air conditioning refrigerant containing chlorine (R-12) has caused regulatory action that will eventually eliminate the use of such products. Regulatory action is necessary because when the chlorine content in R-12 is exposed to the atmosphere:

- It depletes the protective ozone layer in the atmosphere,
- It has relatively high global warming potential, and
- Its long atmospheric lifetime is approximately 120 years.

R-134a has been developed for new vehicle production but does not replace or directly substitute for R-12 in existing vehicles. R-134a does not contain chlorine, does not deplete the ozone layer in the atmosphere and has an atmospheric lifetime of about 15.5 years.

Environmental Protection Agency (EPA) and state regulations specify that:

- Provisions be made to certify all air conditioning service, installation and repair personnel,
- Refrigerant be recovered, recycled or reclaimed from automotive air conditioning systems, instead of allowing vapors to be expelled, or vented, into the atmosphere, and
- Refrigerant be recycled and reused, or properly disposed of, instead of allowing vapors to be expelled, or vented, into the atmosphere.

Mobile air conditioning service, installation and repair technicians must be qualified and certified.

Refrigerant Handling

Mobile air conditioning systems contain chemical mixtures that require special handling to avoid injury and to avoid venting refrigerant into the atmosphere.

Do not discharge any refrigerant gas, vapor or liquid from a refrigeration system into the atmosphere. If service is required that involves opening the refrigerant system, use a certified recovery system.

Refrigerant Safety



- Wear safety goggles and protective gloves, user and bystander. If any refrigerant gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.
- Do not remove master filter while under pressure. Follow instructions for removing master filter. For additional information refer to **Chapter 3—Changing the Master Filter**.
- Prevent refrigerant from contacting the skin.
- Read, understand and follow **Safety Information** in the front of this manual.

WARNING

- Use **Kool Kare** in locations with mechanical ventilation providing at least four air changes per hour.
- Avoid breathing air conditioning refrigerant and lubricant vapor or mist.
- Do not allow refrigerant to contact open flame or be drawn into a running engine. This can cause refrigerant to become poisonous phosgene gas.
- Use **Kool Kare** to remove refrigerant from air conditioning systems.
- Read, understand and follow **Safety Information** in the front of this manual.

IMPORTANT

Tighten all tubing connections properly. Insufficient or excessive torque can result in loose joints or deformed parts. Either condition can result in refrigerant leakage.

Refrigerant Substitute Warning



- Do not use ***Kool Kare*** or leak detector equipment if R-12 substitutes are suspected. R-12 refrigerant substitutes may be flammable.
- Read, understand and follow ***Safety Information*** in the front of this manual.

Aftermarket R-12 refrigerant substitutes are being sold that are dangerous or potentially flammable gases. These products contain a blend of butane, isobutane and propane and have the potential for explosion. Some of these products are:

- OZ-12,
- Refrigerant-176,
- Arctic Chill R-176, and
- GHG Refrigerant 12.

Some vehicles using OZ-12 can be identified by a label that may be placed in the engine compartment, but many cannot be identified. Studies are currently being conducted to develop a procedure to identify the type of refrigerant in a refrigerant system. State agencies and the Environmental Protection Agency (EPA) are moving to ban flammable substitutes.

If it is suspected that a refrigerant system contains a product of this type:

- Question customers about previous service,
- Be aware of any unfamiliar odor from the system,
- Do not use a leak detector,
- Do not use recycling equipment, and
- Contact your state fire marshall or local EPA office.

Refrigerant Oils

In mobile air conditioning units, the lubricant needed for the compressor is blended with the refrigerant. Mineral (petroleum) oils were used with R-12 systems. Mineral oils are not soluble in R-134a and the industry had to substitute synthetic lubricating fluids for the mineral oils. Polyalkylene glycol oils (PAGs) were the first synthetics to meet the auto a/c compressor manufacturers performance criteria, and most automakers and compressor manufacturers devised their retrofit specifications with PAGs in mind. Since then, polyol ester oils (ESTERS or POEs) have been tested and also have been found to meet the the performance criteria. Although POEs have not been approved by the automakers or a/c compressor manufacturers, POEs are frequently used in a/c retrofits in the automotive aftermarket.

Refrigerant Oil Safety



Risk of irritation of mucous membranes.

- **Wear safety goggles and protective gloves, user and bystander. If any refrigerant gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.**
- **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. To remove HFC-134a from the A/C system, use service equipment certified to meet the requirements of SAE J2210 (HFC-134a Recycling Equipment). Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**

Exposure can irritate eyes, nose and throat.

Functional Description

Front Panel

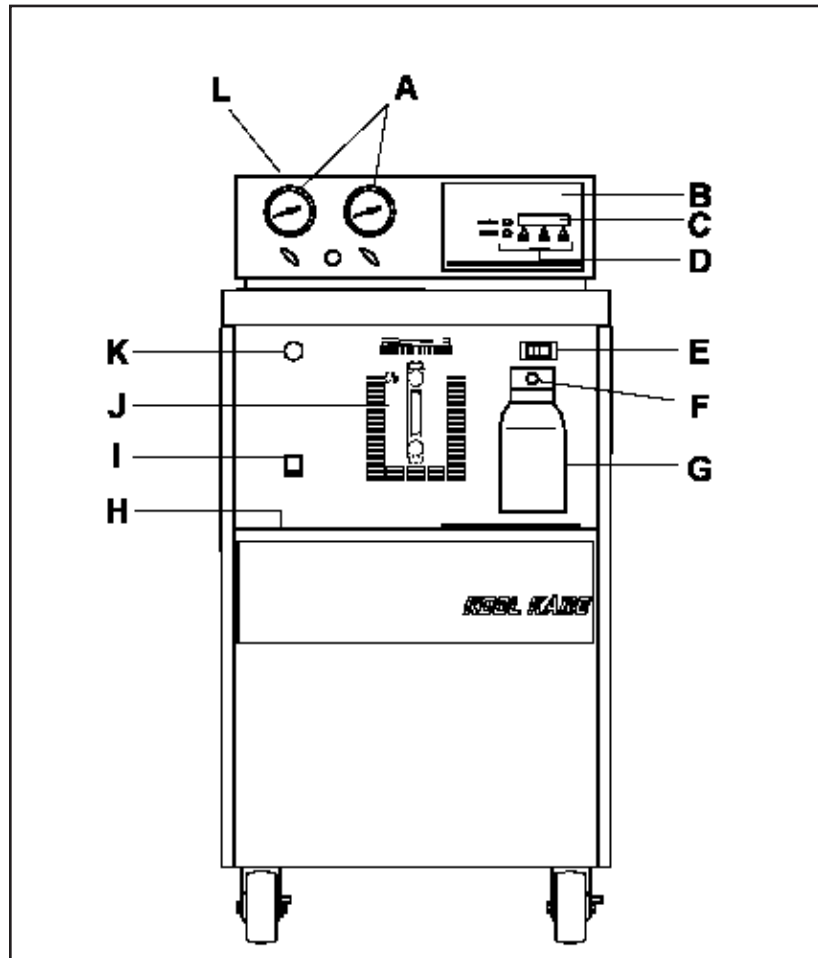


Figure 1-1: Front Panel

A — Integral Gauge Set and Manifold Valves

High and low pressure panel mounted gauges are for monitoring vehicle air conditioning system pressures. Right hand panel valve opens and closes the high-side service hose passage to **Kool Kare**. Left hand panel valve opens and closes the low-side service hose passage to **Kool Kare**.

B — Control Panel

Houses display screen, control buttons, gauges and manifold valves.

C — Liquid Crystal Display (LCD) Screen

Displays alpha-numeric information.

D — Control Buttons

Five buttons are used to enter information and control **Kool Kare** operation:

- RESTART cancels any information entered and begins the program selection sequence as if the tester were just powered up.
- AMOUNT displays refrigerant quantity in recovery tank and amount chargeable.
- Three buttons with variable functions depending on the screen display.

E — Main Power Switch

Turns power on and off. Must be on (I) for unit operation.

F — Oil Charge Hand Valve

For controlling the amount of new oil put into vehicle A/C system.

G — Oil Charge Bottle

Container for holding new oil.

H — Moisture Indicator

Shows the amount of moisture in the recycled refrigerant.

I — Oil Separator Light/Switch

Use to manually enter the maintenance mode for oil separator bowl maintenance. For additional information refer to **Chapter 3—Maintaining the Oil Separator Bowl**.

J — Oil Separator

Removes oil and other contaminant's from the refrigerant being recycled.

K — Beeper

Beeps to indicate successful completion of programmed sequence and other conditions.

L — Tray

Use for tool and adaptor storage.

Back Panel

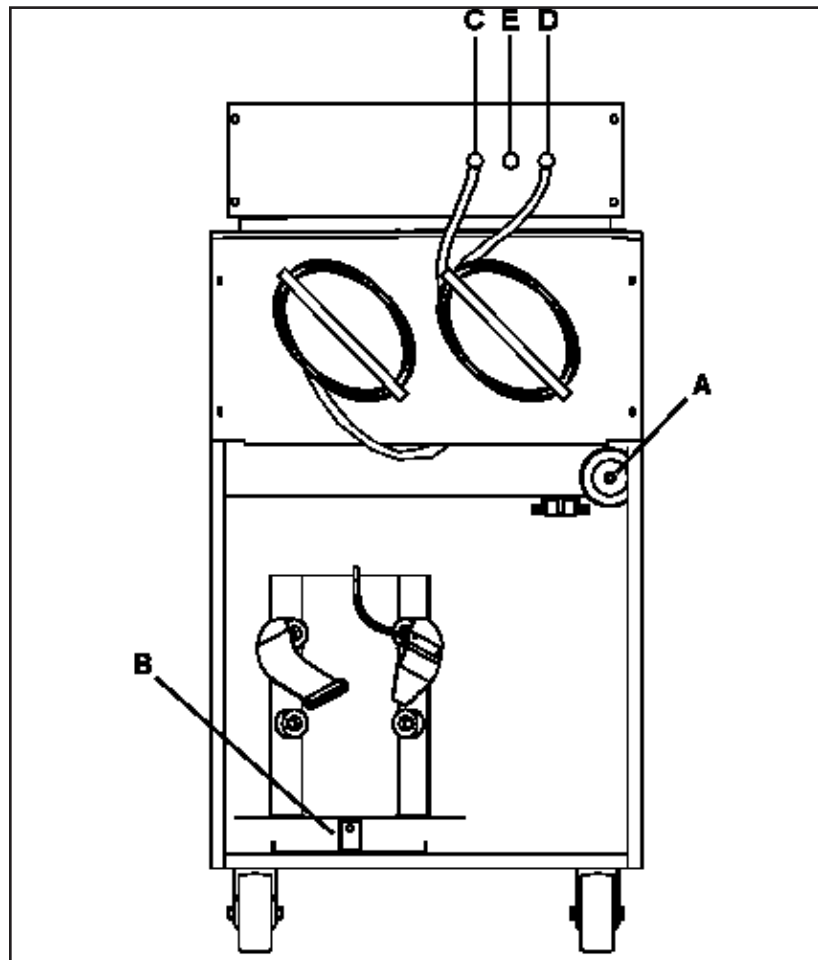


Figure 1-2: Back Panel

A — Master Filter

Consists of a 10 micron particulate filter and desiccant to remove moisture. For additional information refer to **Chapter 3—Changing the Master Filter**.

B — Scale

Electronically measures the amount of refrigerant dispensed, recycled, and remaining in the recovery tank.

C — Service Port, High Side

To high pressure side of vehicle A/C system.

D — Service Port, Low Side

To low pressure side of vehicle A/C system.

E — Vacuum Port

For connecting to external vacuum pump.

R-134a Accessories

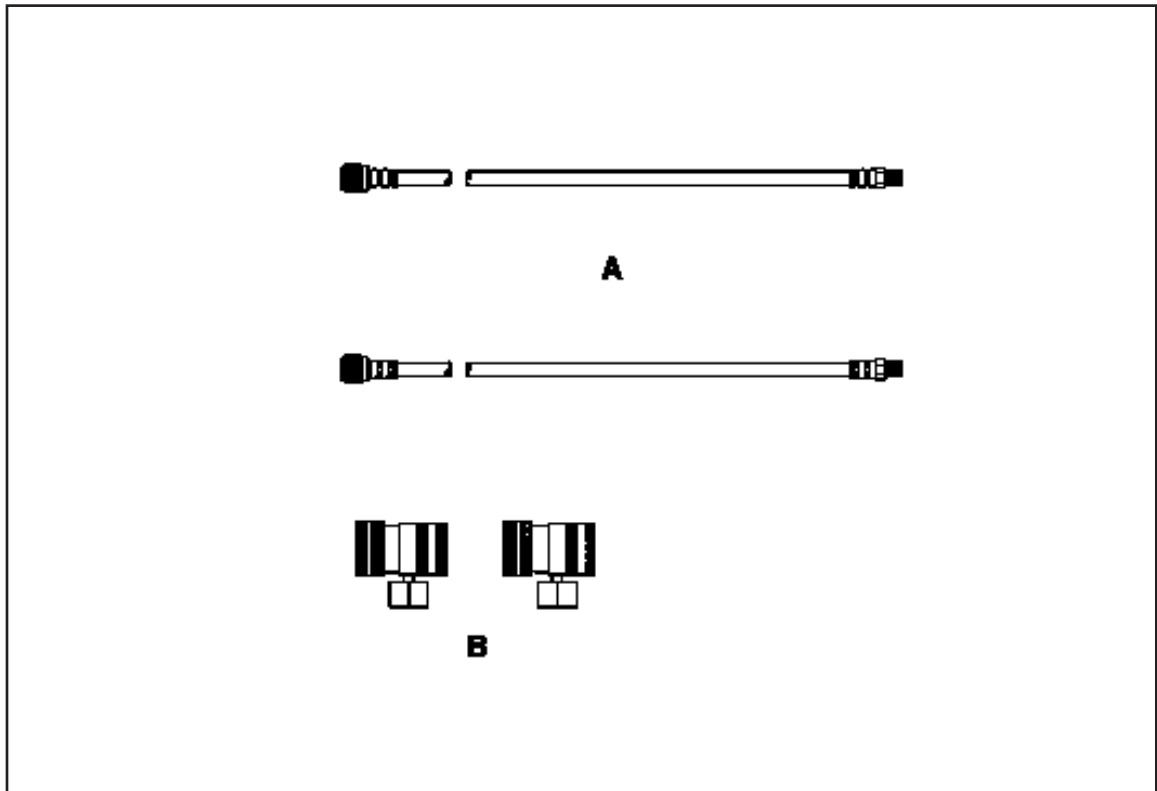


Figure 1-3: R-134a Accessories

A — Service Hoses

Red, and blue hoses for connecting **Kool Kare** to vehicle. For additional information refer to **Chapter 2—Connecting Service Hoses to Kool Kare** and **Chapter 2—Connecting Service Hoses to Vehicle**.

B — Auto Shut-off Adaptors (Couplers)

1 - Connects to high-side and low-side service ports of vehicle.
2 - Quick connect/disconnect valve actuation without refrigerant venting. Couplers contain manual shutoff hand valves to control flow of refrigerant while connected to service ports and prevent blow back while connecting/disconnecting hoses.

Particle Filter Assembly

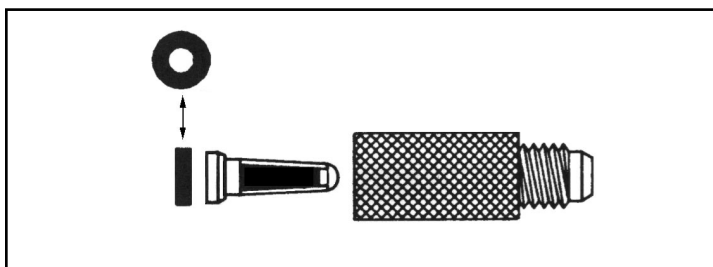


Figure 1-4: Particle Filter Assembly

Particle Filter Assembly

Removes particles from refrigerant. Use part number:

- 7009-2418-01 for R-134a.

Specifications

General

Power

EEAC104B R-134a 120 VAC, 1 PH, 60 Hz @ 10 amps

Shipping Weight

210 pounds (95.00 kg)

Dimensions

Depth	18" (45.72 cm)
Height	41.25" (104.78 cm)
Width	23" (58.42 cm)

Operating

Operating Temperature Range

50 to 120°F (10.0 to 48.8°C) ambient

Pressure Range

30 inHg to 450 psi

Refrigerant Charge Amount

0–46 pounds (20.87 kg)

Recovery Amount

0–46 pounds (20.87 kg)

Pump

1/3 hp reciprocating compressor

Recovery Rate

1 pound/minute, maximum

Storage

Temperature

-4 to 158°F (20 to 70°C)

Relative Humidity

Up to 80% non-condensing

Capacities

Charge

Up to 46 lbs (20.87 kg)

Recovery

Up to 46 lbs (20.87 kg) total

Pump Displacement

1.12 cfm

Vacuum

25 inHg minimum

28 inHg typical

Oil Separator

7 oz (198.4 grams) in 1 oz (28.3 grams) graduations

Installation and Operation

Use this chapter to prepare **Kool Kare** for initial use and perform routine recycling, evacuation and charging procedures.

Component Identification

Unpack and locate all components shipped with **Kool Kare** using the packing list.

Installation

Before using **Kool Kare** for the first time:

- Prepare and install the recovery tank,
- Add refrigerant to **Kool Kare**, and
- Connect service hoses to **Kool Kare**.

Preparing and Installing Recovery Tank

The recovery tank is shipped from the factory with a dry air charge and must be evacuated before use. Use the following procedure to evacuate the dry air from the recovery tank and install the tank in **Kool Kare**.



- Do not use any tank with this equipment other than part number 7009-2447-03 for R-12 or 7009-2447-01 for R-134a. These tanks are D.O.T. certified for refilling. D.O.T. certified tanks are marked "D.O.T. 4BA 350" or "D.O.T. 4BA 400".
- Read, understand and follow **Safety Information** in the front of this manual.



Vent and evacuate tank before first use. Unprepared tank can cause compressor burnout.

1. With recovery tank out of **Kool Kare** cabinet, carefully open both hand valves on tank to release dry air charge.
2. Connect tank adaptor (part number: 1-15080) to liquid side of recovery tank (port nearest blue hand valve).

3. Connect blue (low side) service hose between low port on unit and previously installed tank adaptor.
4. Open blue (liquid) tank valve. Close red (vapor) tank valve, red (high side) service hose coupler, and high side panel valve.
5. Open blue service hose coupler, and low side valve on control panel.
6. Plug power cord into a properly grounded supply line. Refer to ID Plate on back of **Kool Kare** for proper supply voltage.
7. Turn on power switch. The following screens display:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
8. Select NO. The Vacuum screen displays.
9. Select YES. The Vacuum Time screen displays.
10. Press UP key twice until Minutes field displays 10.
11. Press ENTER. The Hold Vacuum screen displays.
12. Press ENTER. The Charging screen displays.
13. Select NO. The Connection Check screen displays.
14. Select CONTINUE. The following messages display:

**I'M CHECKING FOR PRESSURE IN VEHICLE BEFORE
PULLING VACUUM!**

**SETTING UP FOR VACUUM MODE
PLEASE WAIT!**

PULLING VACUUM ON VEHICLE.

- ✓ The last message also displays the number of minutes remaining for the vacuum cycle.

15. The evacuation procedure runs for ten minutes. **Kool Kare** beeps twice when the procedure is complete. The final screen in the cycle displays with the following message:

COMPLETED!

Installation and Operation

- ✓ The recovery tank must have a minimum of 25 inHg vacuum when evacuation is complete. If there is not 25 inHg vacuum, check connections and repeat the procedure.
 - After vacuum is pulled, close blue service hose coupler and blue tank hand valve.
 - Remove blue hose from tank.
 - Close low side valve on control panel.

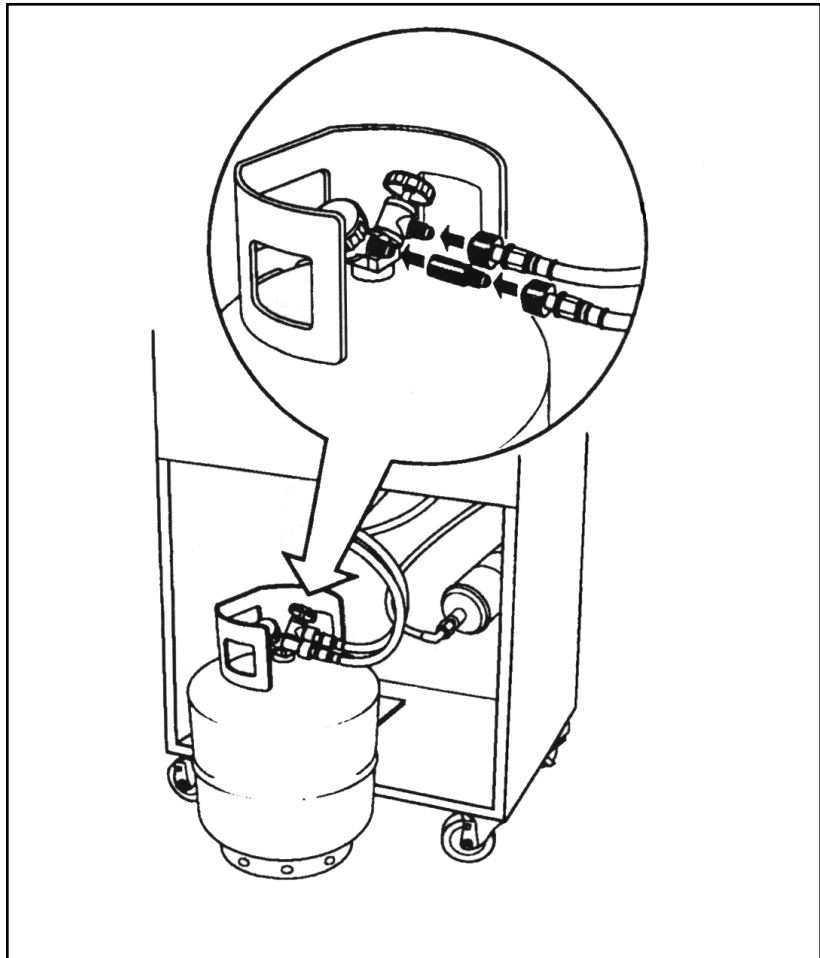


Figure 2-1: Recovery Tank and Particle Filter

16. Recovery tank is ready for installation.
17. Carefully place tank on scale inside back of **Kool Kare** with valves up and ports facing rear.
 - ✓ Use only the 50 pound capacity recovery tank supplied with **Kool Kare** or one indicated by the warning label on the back of the unit. Using any other type or capacity tank could create the danger of explosion and potential for personal injury. Inaccurate refrigerant amount may display if the correct tank is not used.

18. Connect short red and blue hoses (not hoses marked high and low) in rear of cabinet to respective ports on recovery tank. A particle filter is installed on the liquid port (nearest blue hand valve).
19. Turn both valves on recovery tank counter-clockwise until completely open.
20. Rotate tank so hoses are slack and do not interfere with scale movement.
21. Secure tank using hook and loop strap. Be sure strap is not twisted and temperature probe is against tank.

Adding Refrigerant to **Kool Kare**

The recovery tank must contain enough refrigerant to charge the vehicle. Before complete charging operation can occur, the tank must contain enough refrigerant for the charge desired plus 3 pounds. For example, to charge 2 pounds there must be at least 5 pounds in the tank. If there is not enough refrigerant in the tank the charge operation does not function. Depending upon these requirements, the recovery tank may be filled with as much or as little refrigerant as desired.

1. Attach adaptor (part number: 1-15080) to virgin tank.
2. Attach blue (low) service hose coupler to adaptor.
3. Open valve on virgin tank. Open blue (low) service coupler and control panel valve. Keep virgin tank in an upright position.
4. Plug power cord into a properly grounded supply line. Refer to ID plate on back of **Kool Kare** for proper supply voltage.
5. Turn on power switch. Four screens display in the following order:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
6. Select YES. The Vacuum screen displays.
7. Select NO. The Charging screen displays.
8. Select NO. The Connection Check screen displays.

9. Select CONTINUE. The following messages display:

WAITING FOR STABLE SCALE!

RECYCLING REFRIGERANT FROM VEHICLE!

- Refrigerant continues to recycle until the virgin tank valve is closed, or is empty.
- If there is air in the recovery tank when the recycling process is completed the following message displays:

PURGING AIR FROM TANK!

- ✓ A pulsed air escaping sound emits while purging air from the system at the end of the recycling process. Do not be alarmed by this noise or defeat this process.
- When the process is complete the following message displays:

COMPLETED!

10. Close virgin tank valve, blue (low) service hose coupler and control panel hand valve.
11. Remove hose from virgin tank.

Operation

This section contains:

- Procedures for connecting service hoses to the vehicle, and
- A full sequence program to:
 - Recycle vehicle refrigerant,
 - Create a vacuum in the A/C system before recharging, and
 - Recharge the A/C system with recycled refrigerant.

After performing all installation procedures, follow these recommended vehicle service procedures before using **Kool Kare** for A/C work.



Keep the service hoses away from moving or hot engine parts. Service hoses can not withstand high temperatures or severe mechanical stress.

IMPORTANT

- Close tank valves when not in use. Open tank valves may result in refrigerant loss from tank.
- Do not use **Kool Kare** outside of the following limits:
 - Warmer than 49°C (120°F),
 - Colder than 10°C (50°F), and or
 - Relative humidity greater than 80%.
- Stabilize **Kool Kare** to a moderate temperature and inspect for abnormalities.
- Contact your **Sun Electric** representative before operating if unsure of condition.
- Operating **Kool Kare** with the following conditions may reduce its functionality:
 - Visible evidence of damage,
 - Has been subjected to prolonged storage under unfavorable conditions, or
 - Has been subjected to severe transportation stresses.

Preliminary Checks

Precondition Vehicle

Warm up the vehicle being serviced prior to a refrigerant recovery/recycling operation to obtain the fastest and most complete refrigerant recovery possible. Connect service hoses. Lower the vehicle hood as much as possible without damaging or crimping the service hoses. Run the engine with the A/C system off. Turn off the engine when normal operating temperature is reached. The unit and vehicle are ready to recover and recycle refrigerant.

Allow Adequate Evacuation Time

A minimum evacuation period of 30 minutes prior to charging helps ensure a system is free from non-condensables and moisture. Also, there is often a small amount of refrigerant left in the system that is not practical to recover. If the evacuation time is too short, this parasitic refrigerant may begin to expand during the vacuum hold cycle, a leak test, and falsely report a leak condition that does not really exist.

Follow Vehicle Manufacturer's A/C Service Procedures

When charging, a slow charge condition may occur due to pressure equalization between **Kool Kare** and the vehicle A/C system. Charging may be completed by closing the high-side panel valve and starting the vehicle. It is the responsibility of the technician to be familiar with vehicle manufacturer recommended service procedures.

- ✓ Never operate vehicle A/C system with high side panel valve open.

Connecting Service Hoses To Vehicle

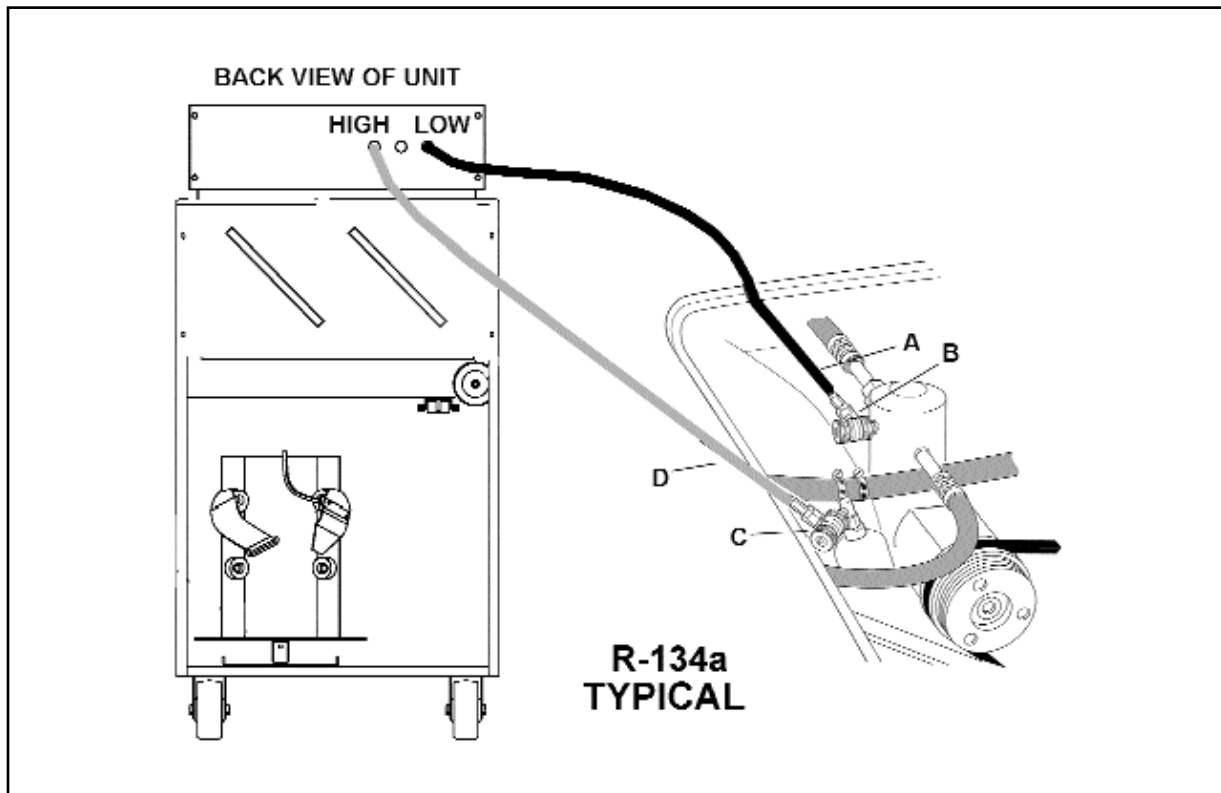


Figure 2-2: Service Hose Connections to Vehicle

- A – Blue Hose**
- B – Low-Side (Blue) Hose Coupler**
- C – High-Side (Red) Hose Coupler**
- D – Red Hose**

Follow this procedure to connect the service hoses to the vehicle.

1. Connect red high-side hose with service hose coupler from unit to high-side service port on vehicle.
2. Connect blue low-side hose with service hose coupler from unit to low-side service port on vehicle.
 - ✓ If the vehicle has more than one low-side service port, use the service port closest to the evaporator.
3. Open service couplers.
 - Refer to the vehicle manufacturer's service manual for proper diagnostic procedures and specifications.

Full Sequence Program

Use this program to perform the following procedures:

- Recycle vehicle refrigerant,
 - Create a vacuum before recharging, and
 - Recharge with recycled refrigerant.
1. Plug power cord into a properly grounded supply line. See ID plate for proper supply voltage.
 2. Turn on power switch. Four screens display in the following order:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
 3. Select YES. The Vacuum screen displays.
 4. Select YES. The Vacuum Time screen displays.
 5. Press UP key until Minutes field displays at least 30. Press ENTER. The Hold Vacuum screen displays.
 6. Press UP key until required hold time displays in Minutes field. Press ENTER. The Charging screen displays.
 7. Select YES. The Select Units screen displays.
 8. Select one of the following options:
 - Pounds—Ounces (1),
 - Decimal—Pounds (2),
 - Ounces (3), or
 - Kilograms (4).The Charge Amount screen displays.
 9. Press UP until required charge amount displays. Press ENTER.
 - ✓ When selecting options 1, 2, or 4 the decimal part must also be entered.
 - ✓ The Oil Charge Selection screen will display only if the amount of refrigerant being charged is 6 ounces or greater.
 10. Press ENTER again. The Oil Charge Selection screen displays.
 11. Select YES (or MAYBE). Press ENTER.
 12. The Recycle and Vacuum sequence executes. The unit then pauses for Oil Charge Sequence.

13. Manually open Oil Bottle Valve by turning counter-clockwise until desired amount of oil is put into system. Close Oil Bottle Valve by turning clockwise.

✓ For vehicles not specified in fluid ounces, 1 fluid ounce equals 30ml (30cc).

✓ When charging a vehicle after pulling a vacuum, allow for the capacity of the hoses. Each hose holds approximately two ounces, so the charge amount should be increased by two ounces for each hose used.

— **Kool Kare** verifies there is enough refrigerant in the tank to meet charge requirements. If there is, the Connection Check screen displays.

— If there is not enough refrigerant in the tank to charge, the following message displays:

**CHARGE AMOUNT SELECTED IS GREATER THAN
'CHARGEABLE' IN TANK!**

✓ For additional information refer **Adding Refrigerant to Kool Kare** in this chapter.

14. Select CONTINUE. Procedure completes when **Kool Kare** beeps twice and the following message displays:

COMPLETED!

Recycle Only Program

Use this procedure to:

- Recover refrigerant from vehicle,
- Recycle, and
- Store the refrigerant in the recovery tank for use later.

1. Plug power cord into properly grounded supply line. See ID Plate for proper supply voltage.
2. Turn on power switch. Four screens display in the following order:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
3. Select YES. The Vacuum screen displays.
4. Select NO. The Charging screen displays.
5. Select NO. The Connection Check screen displays.
6. Select CONTINUE. The following messages display:

**WAITING FOR STABLE SCALE!
RECYCLING REFRIGERANT FROM VEHICLE!
PURGING AIR FROM TANK!**

- ✓ An additional message may display anytime after a tank check.

COMPLETED!

A pulsed air escaping sound emits while purging air from the system at the end of the recycling process. Do not be alarmed by this noise or defeat this process.

The following message displays at the start of a cycle if a recovery tank is not installed:

**NO TANK PRESENT
TURN POWER OFF AND INSTALL TANK!**

Vacuum Only Program

Use this procedure to pull a vacuum on the A/C system to remove non-condensables and moisture.

1. Plug power cord into properly grounded supply line. See ID plate for proper supply voltage.
2. Turn on power switch. Four screens display in the following order:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
3. Select NO. The Vacuum screen displays.
4. Select YES. The Vacuum Time screen displays.
5. Press UP key until Minutes field displays at least 30. Press ENTER twice. The Charging screen displays.
6. Select NO. The Connection Check screen displays.
7. Select CONTINUE. The following messages display:

**I'M CHECKING FOR PRESSURE IN VEHICLE BEFORE
PULLING VACUUM!**

- If there is pressure in the A/C system the recycle sequence begins.

SETTING UP FOR VACUUM MODE PLEASE WAIT!

PULLING VACUUM ON VEHICLE.

- If there is a leak in the system or at service hose connections the following message displays:

I WAS UNABLE TO PULL AND HOLD VACUUM! CHECK CONNECTIONS TO VEHICLE!

- If the vacuum sequence is successful the following message displays:

COMPLETED!

Charge Only Program

Perform this procedure after a successful Vacuum Only Program.

1. Plug power cord into properly grounded supply line. See ID plate for proper supply voltage.
2. Turn on power switch. Four screens display in the following order:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
3. Select NO. The Vacuum screen displays.
4. Select NO. The Charging screen displays.
5. Select YES. The Select Units screen displays.
6. Select one of the following options:
 - Pounds–Ounces (1),
 - Decimal Pounds (2),
 - Ounces (3), or
 - Kilograms (4).The Charge Amount screen displays.
7. Press UP until required charge amount displays. Press ENTER.

- ✓ When selecting options 1, 2, or 4 the decimal part must also be entered.
- ✓ When charging a vehicle after pulling a vacuum, allow for the capacity of the hoses. Each hose holds approximately two ounces, so the charge amount should be increased by two ounces for each hose used.

Kool Kare verifies there is enough refrigerant in tank to charge.

- If there is enough refrigerant, the Connection Check screen displays.
- If there is not enough refrigerant, the following message displays for five seconds, then the Charging screen displays:

**CHARGE AMOUNT SELECTED IS GREATER THAN
'CHARGEABLE' IN TANK!**

- ✓ For additional information refer to ***Adding Refrigerant to Kool Kare*** in this chapter.

8. Select CONTINUE. The following messages display:

PURGING AIR FROM TANK...PLEASE WAIT

CHARGE SEQUENCE! WAITING FOR STABLE SCALE!

CHARGE SEQUENCE! I AM CHARGING!

- ✓ Select HOLD to pause the charging sequence. Select CONTINUE to resume charging.

COMPLETED!

The procedure is complete when ***Kool Kare*** beeps twice.

Displaying Refrigerant Amount

Use this procedure to determine the amount of refrigerant in the recovery tank and the amount able to be charged.

1. Select AMOUNT key. The Recovery Tank screen displays for five seconds.
2. Select POUNDS or KGS to select a unit of measure. Read recovery tank weight.
3. Select CHARGEABLE. The Chargeable screen displays for five seconds.
4. Select POUNDS or KGS to select a unit of measure. Read amount.

Tank Full/Empty

Messages display when the recovery tank is full or empty.

- ✓ The unit may be used to vacuum or charge an A/C system even when the recovery tank is full.

Removing Recovery Tank

1. Turn both valves on recovery tank clockwise to close.
-

2. Disconnect red and blue hoses from recovery tank.
3. Release hook and loop strap.
4. Gently remove tank from scale.

Evacuating Service Hoses

Evacuate the service hoses before removing them from the unit and whenever contamination is suspected. Service hoses are not connected to a vehicle during this procedure.

1. Close red and blue service couplers.
2. Open panel hand valves.
3. Plug power cord into properly grounded supply line. See ID plate for proper supply voltage.
4. Turn on power switch. Four screens display in the following order:
 - **Kool Kare** Welcome screen,
 - Software Version screen,
 - Adjust Contrast screen—Adjust or Skip, and
 - Recycle screen.
5. Select YES. The Vacuum screen displays.
6. Select NO. The Charging screen displays.
7. Select NO. The Connection Check screen displays.
8. Select CONTINUE. The following messages display:

WAITING FOR STABLE SCALE!

RECYCLING REFRIGERANT FROM VEHICLE!

PURGING AIR FROM TANK!

- ✓ An additional message may display anytime after a tank check.

COMPLETED!

A pulsed air escaping sound emits while purging air from the system at the end of the recycling process. Do not be alarmed by this noise or defeat this process.

The following message displays at the start of a cycle if a recovery tank is not installed:

**NO TANK PRESENT
TURN POWER OFF AND INSTALL TANK!**

Maintenance

Use this chapter to maintain the **Kool Kare**:

- Oil separator bowl,
- Master filter,
- Pump,
- Particle filter, and
- Unit for prolonged periods.

✓ Troubleshooting information and a list of parts and accessories are also included.

Equipment Tips

- A stable scale weight reading, with the refrigerant not moving around in the recovery tank, is performed at the beginning and end of a recycle or charge program. Do not lean on or move the unit at these times.
- Never attempt to change the recovery tank during unit operation. For additional information refer to **Chapter 2—Removing Recovery Tank**.
- Always evacuate the service hoses before disconnecting them from **Kool Kare**. For additional information refer to **Chapter 2—Evacuating Service Hoses**.
- Never drop a recovery tank onto the scale. This may result in damage to the scale assembly.
- Always oil the seals before connection to any tank, filter or fitting. A leaky connection or no-flow condition may result if the seal is dry.
- Always close both tank valves—clockwise—on the recovery tank when **Kool Kare** is not in use.
- Kool Kare** emits a pulsed air escaping sound while purging air from the system as an integral part of the recycling process. Do not be alarmed by this noise or defeat this process. Refrigerant is not vented to the atmosphere, only air and other non-condensables from the recovery tank.

Maintaining the Oil Separator Bowl

Press the oil separator light switch to access the separator maintenance mode. The following message displays:

**RECYCLING REFRIGERANT FROM OIL SEPARATOR!
PLEASE WAIT!**

A five minute deep recovery is performed on the oil separator bowl. After recycling is finished, the oil separator light switch illuminates continuously and two short beeps sound.

Kool Kare attempts to recycle the contents of the bowl during a recycling program when the separator float switch activates. Recovery continues for an additional three minutes and then returns to normal recycling operation if the float switch deactivates within three minutes.

- ✓ If the float switch remains activated after the three minute recovery, separator maintenance mode is entered and the following message displays:

**RECYCLING REFRIGERANT FROM OIL SEPARATOR!
PLEASE WAIT!**

- ✓ Record maintenance on *Oil Separator Bowl Maintenance Schedule* in this chapter.

Metal Oil Separator Bowl

Use the procedure in this section to remove the metal oil separator bowl.



- Wear safety goggles, user and bystander.
- Never open the metal oil separator bowl when it is under pressure.
- Service should be performed by a certified A/C service technician.
- Remove bowl by performing maintenance procedure in **Chapter 3–Metal Oil Separator Bowl** in this manual.
- Remove bowl only when light is on continuously and no refrigerant is present.
- Loosen metal oil separator bowl vacuum release thumbscrew only when light is on continuously and no refrigerant is present.
- Read, understand and follow **Safety Information** in the front of this manual.

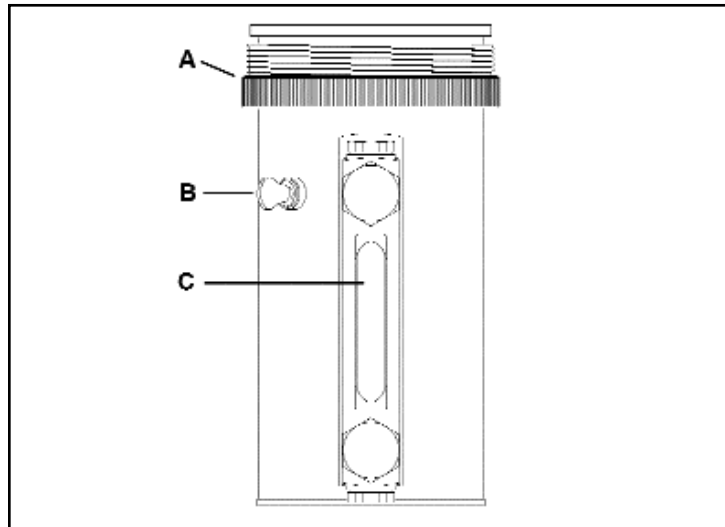


Figure 3-1: Metal Oil Separator Bowl

A – Slip Ring
B – Vacuum Release
C – Sight Glass

1. Open vacuum release only when red separator service light is on continuously. Loosen vacuum release thumbscrew on front of bowl, turning counterclockwise.
2. Remove the separator bowl by turning upper slip ring counterclockwise. Dispose of the used oil according to the local, state and federal regulations that apply in your area.
3. Push the float switch up. The light goes out and two short beeps sound.
4. Release the float switch. The light goes on and two short beeps sound again.
5. Clean the oil separator bowl with a clean, dry, lint-free cloth. Inspect bowl for damage.
6. Remove the rubber gasket from the top of the separator bowl. Clean and inspect for damage.
7. Moisten gasket with a small amount of refrigerant oil and reinstall. A replacement gasket is included with every master kit.
8. Install oil separator bowl. Hand tighten only.
9. Tighten vacuum release thumb screw clockwise until hand tight.
10. Press RESTART on the control panel.

Master Filter

The master filter must be changed after six oil separator service procedures or sooner if the moisture indicator approaches the 50 ppm—pink—indication for R-134a. Refer to the Moisture Indicator Chart below. Complete the ***Oil Separator Bowl Maintenance Schedule*** on the following page to track when to change the master filter.

Moisture Indicator

Moisture Indicator Chart				
Indicator Color	Model	Temperature		
		75°F/24°C	100°F/38°C	125°F/52°C
Purple <i>Very Dry</i>	R-134a	20 ppm	35 ppm	60 ppm
Violet <i>Dry/Caution</i>	R-134a	35 ppm	55 ppm	85 ppm
Pink <i>Caution/Wet</i>	R-134a	90 ppm	120 ppm	150 ppm
Orange <i>Very Wet</i>	R-134a	130 ppm	160 ppm	190 ppm

Oil Separator Bowl Maintenance Schedule

<u>Service #</u>	<u>By Whom</u>	<u>Date</u>
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____

CHANGE FILTER NOW

<u>Service #</u>	<u>By Whom</u>	<u>Date</u>
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____

CHANGE FILTER NOW

<u>Service #</u>	<u>By Whom</u>	<u>Date</u>
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____

CHANGE FILTER NOW

<u>Service #</u>	<u>By Whom</u>	<u>Date</u>
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____

CHANGE FILTER NOW

<u>Service #</u>	<u>By Whom</u>	<u>Date</u>
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____

CHANGE FILTER NOW

Changing the Master Filter

Use the procedure in this section to change the master filter.



- Wear safety goggles and protective gloves, user and bystander. If any refrigerant gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.
- Do not remove master filter while under pressure. Perform maintenance procedure for removing master filter in this section.
- Prevent refrigerant from contacting the skin.
- Read, understand and follow **Safety Information** in the front of this manual.

1. Turn off power to **Kool Kare**.
2. Release hook and loop strap around the body of the master filter.

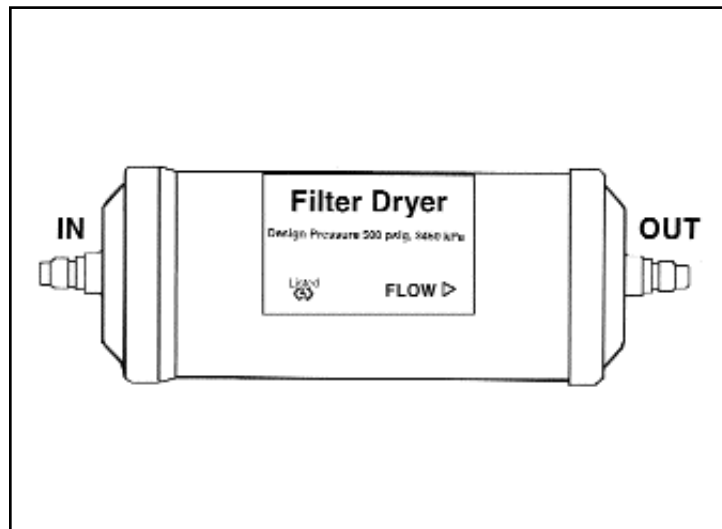


Figure 3-2: Master Filter

3. Remove master filter.
 - ✓ Dispose of the filter according to local, state and federal regulations that apply in your area.
4. Unscrew two hose fittings from master filter.
5. Install new master filter, matching direction of FLOW on filter with flow decal on cabinet.
6. Attach fittings hand tight.
7. Mount master filter securely by tightening hook and loop strap.
8. Check for leaks.

Pump

The oil in the pump assembly must be changed quarterly to prolong pump life. The optional oil change kit is recommended. For additional information refer to **Replacement Parts** in this chapter. All parts necessary to change the pump oil are included in this kit.

Maintaining the Pump

1. Perform a Recycle on the service hoses. For additional information refer to **Chapter 2—Evacuating Service Hoses**.
2. Wait for COMPLETED! to display.
3. Turn power off and unplug **Kool Kare** from electrical outlet.
4. Remove screws holding rear cover.
5. Remove rear cover.

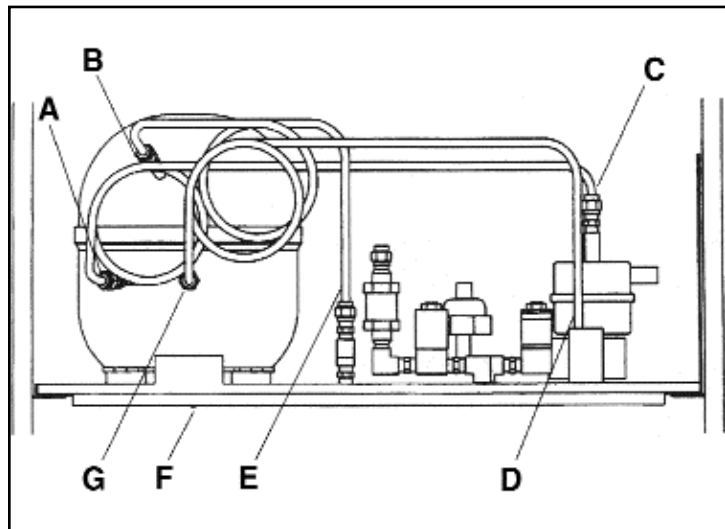


Figure 3-3: Pump

- A – Outlet Line Connection at Pump
- B – Input Line Connection at Pump
- C – Outlet Line
- D – Process Line
- E – Input Line
- F – Pump Retaining Nut
- G – Process Line Connection at Pump



- Wear safety goggles and protective gloves, user and bystander.
- Read, understand and follow **Safety Information** in the front of this manual.

6. Remove three tubing assemblies from pump and solenoid assemblies.
 - ✓ Discard the O-rings from tube ends.
7. Remove pump retaining nut on bottom of plumbing shelf near front of unit.
8. Tilt pump, mounted on hinged pump plate, out of unit and drain oil into an approved container. Pump will rest on plumbing shelf edge. Approximately 9 oz of oil should be obtained.
9. Tilt pump to normal upright position.
10. Reinstall pump retaining nut.
11. Use plastic bottle supplied with oil change kit to pour 9.3 oz (275 cc) of 3GS compressor oil, part number 681-0179-2, into input port of pump.
12. Install new O-rings on ends of the tubing assemblies.
13. Place a small amount of compressor oil on O-rings and reinstall tubing assemblies.
14. Replace rear cover.

Particle Filter Maintenance

There is one particle filter on each unit, located on the blue, liquid side of the tank valve. A clogged particle filter may limit or block refrigerant flow. Perform the following procedure to clean the particle filter.

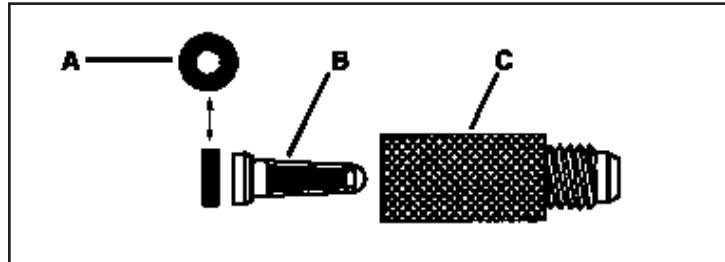


Figure 3-4: Particle Filter Assembly

- A – O-ring
- B – Filter
- C – Screen Fitting

Tank Particle Filter

1. Turn unit off.
2. Close blue recovery tank valve.
3. Remove blue hose from filter.
4. Remove filter from tank valve.
5. Carefully remove O-ring and screen element from brass housing.
6. Wash screen element with mild soap and water and blow dry with compressed air.
7. Reassemble filter taking care not to damage screen or O-ring. Lubricate O-rings with refrigerant oil. Order replacement parts by mail or call **Sun** Service.
8. Install filter onto tank valve.
9. Attach hose to filter.
10. Open tank valve and check for leaks.

Prolonged Storage of *Kool Kare*

Follow this procedure before storing ***Kool Kare*** for prolonged periods.

1. Service oil separator using ***Maintaining the Oil Separator Bowl*** procedure in this chapter.
2. Change pump oil using ***Maintaining the Pump*** procedure in this chapter.
3. Close both hand valves on recovery tank.

Troubleshooting

Symptom	Possible Cause	Remedy
Machine does not turn on	<ul style="list-style-type: none">• Power cord not plugged in• No power in AC outlet• Circuit breaker on machine tripped	<ul style="list-style-type: none">– Plug in cord– Check power source– Reset 15 amp circuit breaker by turning power switch off, then on
Refrigerant not being removed from vehicle	<ul style="list-style-type: none">• Panel hand valves not open• Service couplers not open	<ul style="list-style-type: none">– Open panel hand valves– Open service couplers
Excessive purging of non-condensables	<ul style="list-style-type: none">• Fitting(s) not properly connected to master filter• Leaky service hose or adaptor connection drawing in air• Loose oil separator bowl, or damaged/missing bowl gasket	<ul style="list-style-type: none">– Tighten fitting(s) finger tight– Tighten fittings or replace seals in finger tight fittings– Replace bowl gasket and/or tighten bowl hand tight
Does not charge	<ul style="list-style-type: none">• Blue hand valve on recovery tank not open• Fitting not properly connected to recovery tank• Panel hand valves not open• No refrigerant in tank• Clogged particle filter	<ul style="list-style-type: none">– Open blue hand valve– Tighten fitting finger tight– Open panel hand valves– Fill tank with refrigerant– Clean filter
Machine does not draw a vacuum	<ul style="list-style-type: none">• Loose hose connection• Oil separator gasket cut or missing	<ul style="list-style-type: none">– Tighten loose hose connections– Replace oil separator gasket

Maintenance

Symptom	Possible Cause	Remedy
Hissing noise from oil separator during recycle and/or vacuum mode	<ul style="list-style-type: none">• Oil separator bowl loose• Oil separator gasket cut or missing	<ul style="list-style-type: none">– Tighten oil separator bowl– Replace oil separator gasket
Excessive liquid refrigerant drawn into oil separator in recycle mode	<ul style="list-style-type: none">• Vehicle's high-side service port is located in liquid phase of A/C system	<ul style="list-style-type: none">– Close high-side panel hand valve until system pressure reads 30 psi, then reopen
Refrigerant losses from tank on scale over time	<ul style="list-style-type: none">• Leaky hand valve(s) on tank• Leaky fitting(s)	<ul style="list-style-type: none">– Make sure hand valves are open completely—CCW—and leak test– Oil seal with refrigerant oil and reconnect OR, replace fitting, oil seal and reconnect
Long recycle times	<ul style="list-style-type: none">• System being recycled is cold and has components that hold a substantial amount of liquid refrigerant	<ul style="list-style-type: none">– Heat A/C system by running engine with A/C OFF and keep hood closed as much as practical to hold in heat

Replacement Parts

Part Number	Description
EAH0001C02A	Service Hose, Blue
EAH0001C01A	Service Hose, Red
0647-0287-08	Service Coupler, low-side
0647-0287-07	Service Coupler, high-side
7009-2447-01	Recovery Tank, 50 pound
7009-2418-01	Particle Filter Assembly

Optional Accessories

EAK0027C00AS	Vehicle Adaptor Repair Kit (O-rings)
EEAC301ACV	Protective Cover
EAK0030C01AB	Master Drier Kit
EAK0029C00AB	Oil Change Kit

For service or to order replacement parts or optional accessories, contact your **Sun Electric** Representative or call 1-800-CALL-**SUN** (1-800-225-5786).

Snap-on Tools Company Limited One (1) Year Warranty

Snap-on Tools Company (the "Seller") warrants only to the original purchaser that under normal use, care and service, the Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for one year from the date of original invoice. Items such as leads, probes, external hoses, adapters and all other attachments, supplies and consumables (except as otherwise provided herein) are warranted for 90 calendar days from the date of original invoice. Filter elements are not warranted.

SELLER'S OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED SOLELY TO THE REPAIR OR, AT SELLER'S OPTION, REPLACEMENT OF EQUIPMENT OR PARTS WHICH TO SELLER'S SATISFACTION ARE DETERMINED TO BE DEFECTIVE AND WHICH ARE NECESSARY, IN SELLER'S JUDGMENT, TO RETURN THIS EQUIPMENT TO GOOD OPERATING CONDITION. NO OTHER WARRANTIES, EXPRESS OR IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED.

This warranty does not cover (and separate charges for parts, labor and related expenses shall apply to) any damage to, malfunctioning, inoperability or improper operation of the Equipment caused by, resulting from or attributable to (A) abuse, misuse or tampering; (B) alteration, modification or adjustment of the Equipment by other than Seller's authorized representatives; (C) installation, repair or maintenance (other than specified operator maintenance) of the Equipment or related equipment, attachments, peripherals or optional features by other than Seller's authorized representatives; (D) improper or negligent use, application, operation, care, cleaning, storage or handling; (E) fire, water, wind, lightning or other natural causes; (F) adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, or dust or other air contaminants, radio frequency interference, electric power failure power line voltages beyond those specified for the Equipment, unusual physical, electrical or electromagnetic stress and/or any other condition outside of Seller's environmental specifications; (G) use of the Equipment in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller; or (H) failure to comply with any applicable federal, state or local regulation, requirement or specification governing emission analyzers and related supplies or consumables.

Repairs or replacements qualifying under this Warranty will be performed on regular business days during Seller's normal working hours within a reasonable time following purchaser's request. All requests for Warranty service must be made during the stated warranty period. This Warranty is non-transferable.

**Snap-on Tools Company
Kenosha, Wisconsin 53141-1410**

