

**This manual has been edited for
training purposes.
v8.2.23jtm**

Original Instructions
Instrucciones originales
Consignes originales
Instruções originais

Models: 34988NI, 34988NI-230



Recover, Recycle, Recharge Machine
for R-134a A/C Systems

Safety Precautions

Explanation of Safety Signal Words Used in this Manual

The safety signal word designates the degree, or level, of hazard seriousness.

 **DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION: Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

These safety messages cover situations Robinair is aware of. Robinair cannot know, evaluate, or advise as to all possible hazards. The user must verify that conditions and procedures do not jeopardize personal safety.

Explanation of Safety Decals Used on the Machine

	Carefully read the instructions.
	Do not use in open air in case of rain or high humidity.
	Wear gloves.
	Wear protection goggles.
	Alternating voltage.
	Grounding protection.
	Electrical shock hazard.

Safety Precautions



WARNING: To prevent personal injury,



ALLOW ONLY QUALIFIED PERSONNEL TO OPERATE THE MACHINE. Before operating the machine, read and follow the instructions and warnings in this manual. The operator must be familiar with air conditioning and refrigeration systems, refrigerants, and the dangers of pressurized components. If the operator cannot read this manual, operating instructions and safety precautions must be read and discussed in the operator's native language.



USE THE MACHINE AS OUTLINED IN THIS MANUAL. Using the machine in a manner for which it was not designed will compromise the machine and nullify the protections provided.



PRESSURIZED TANK CONTAINS LIQUID REFRIGERANT. Do not overfill the internal storage vessel (ISV). Overfilling can cause explosion resulting in personal injury or death. Do not recover refrigerants into nonrefillable containers; use only type-approved refillable containers that have pressure relief valves.



HOSES CAN CONTAIN LIQUID REFRIGERANT UNDER PRESSURE. Contact with refrigerant can cause personal injury, including blindness and frozen skin. Wear protective equipment, including goggles and gloves. Disconnect hoses using extreme caution. Ensure the phase is complete before disconnecting the machine to prevent the release of refrigeration to the atmosphere.



AVOID BREATHING A/C REFRIGERANT AND LUBRICANT VAPOR OR MIST. Exposure can irritate eyes, nose, and throat. To remove refrigerant from the A/C system, use only equipment certified for the type of refrigerant being removed. Use the unit in locations with mechanical ventilation that provides at least four air changes per hour. If accidental system discharge occurs, ventilate the work area before resuming service.

DO NOT DISPERSE REFRIGERANT INTO THE ENVIRONMENT. Prevent the possible presence of refrigerant in the working environment.



TO REDUCE THE RISK OF FIRE, do not use the machine in the vicinity of spilled or open containers of gasoline or other flammable substances.

TO REDUCE THE RISK OF FIRE, do not use an extension cord. An extension cord can overheat and cause fire. If an extension cord must be used, use the shortest possible cord with a minimum size of 14 AWG.

TO REDUCE THE RISK OF FIRE, do not use the machine in the vicinity of flames and hot surfaces. Refrigerant can decompose at high temperatures and free toxic substances to the environment that can be noxious to the user.

TO REDUCE THE RISK OF FIRE, do not use the machine in environments containing explosive gases or vapors.

TO REDUCE THE RISK OF FIRE, do not use this machine in ATEX classified zones or areas. Protect the machine from conditions that can cause electrical failure or other hazards relating to ambient interaction.



CAUTION—DO NOT PRESSURE TEST OR LEAK TEST EQUIPMENT AND/OR VEHICLE AIR CONDITIONING SYSTEMS WITH COMPRESSED AIR. Mixtures of air and R-134a refrigerant can be combustible at elevated pressures. These mixtures are potentially dangerous and can result in fire or explosion causing personal injury and/or property damage.



HIGH VOLTAGE ELECTRICITY INSIDE THE MACHINE HAS A RISK OF ELECTRICAL SHOCK. Exposure can cause personal injury. Disconnect power before servicing the machine.

NEVER LEAVE THE MACHINE LIVE IF AN IMMEDIATE USE IS NOT SCHEDULED. Disconnect the electrical supply before a long period of inactivity or before internal maintenance is performed.

DO NOT MODIFY THE PRESSURE RELIEF VALVE OR CHANGE THE CONTROL SYSTEM SETTINGS. Using the machine in a manner for which it was not designed will compromise the machine and nullify the protections provided.

**Additional health and safety information can be obtained
from refrigerant and lubricant manufacturers.**

Safety Precautions

CAUTION : To prevent equipment damage,



TO PREVENT CROSS-CONTAMINATION, USE THIS MACHINE WITH R-134A REFRIGERANT ONLY.

The machine is equipped with special connectors to recover, recycle, and recharge only R-134a refrigerant. Do not attempt to adapt the machine for another refrigerant. Do not mix refrigerant types through a system or in the same container; mixing of refrigerants will cause severe damage to the machine and the vehicle air conditioning system.

DO NOT USE THIS MACHINE IN DIRECT SUNLIGHT. Position the machine far from heat sources, such as direct sunlight, which can cause excessive temperatures. The use of this machine under normal environmental conditions (10°C to 50°C) keeps pressures under reasonable limits.



DO NOT USE THIS MACHINE OUTDOORS DURING RAIN OR HIGH HUMIDITY. Protect the machine from conditions that can cause electrical failure or other hazards relating to ambient interaction.

DO NOT USE THIS MACHINE IN AREAS WHERE THERE IS A RISK OF EXPLOSION.

SET UP THE MACHINE ON AN EVEN SURFACE AND UNDER SUFFICIENT LIGHTING. LOCK THE FRONT WHEELS, AND DO NOT SUBJECT THE MACHINE TO VIBRATION.

TO AVOID CHEMICAL INCOMPATIBILITIES WITH THE INTERNAL COMPONENTS OF THE MACHINE, USE ONLY OILS APPROVED BY THE VEHICLE MANUFACTURER. Problems resulting from the use of non-approved oils will void the warranty.

**Additional health and safety information can be obtained
from refrigerant and lubricant manufacturers.**

Protective Devices

The machine is equipped with the following protective devices:

- Over pressure valves.
- A maximum pressure switch stops the compressor when excessive pressure is sensed.



WARNING: Tampering with these protective devices could result in serious injury.

Refrigerant Tank Test

Official records and recurring tests necessary for pressurized instruments are governed by laws and/or national regulations dependent upon the country where the refrigerant tank is used. The system manager is responsible for compliance with laws, regulations, and technical rules. During normal service, refrigerant tanks do not need maintenance. Refer to the Maintenance section of this manual for more information.

This machine is used on R-134a equipped vehicles and is designed to be compatible with existing service equipment and standard service procedures. This machine is a single-pass system (i.e. refrigerant flows through a filter once) that meets specifications for recycled refrigerant. Follow recommended service procedures for the containment of R-134a.

Note: Refrigerant systems require special oils. Refer to the A/C system manufacturer's service manual for oil specifications.

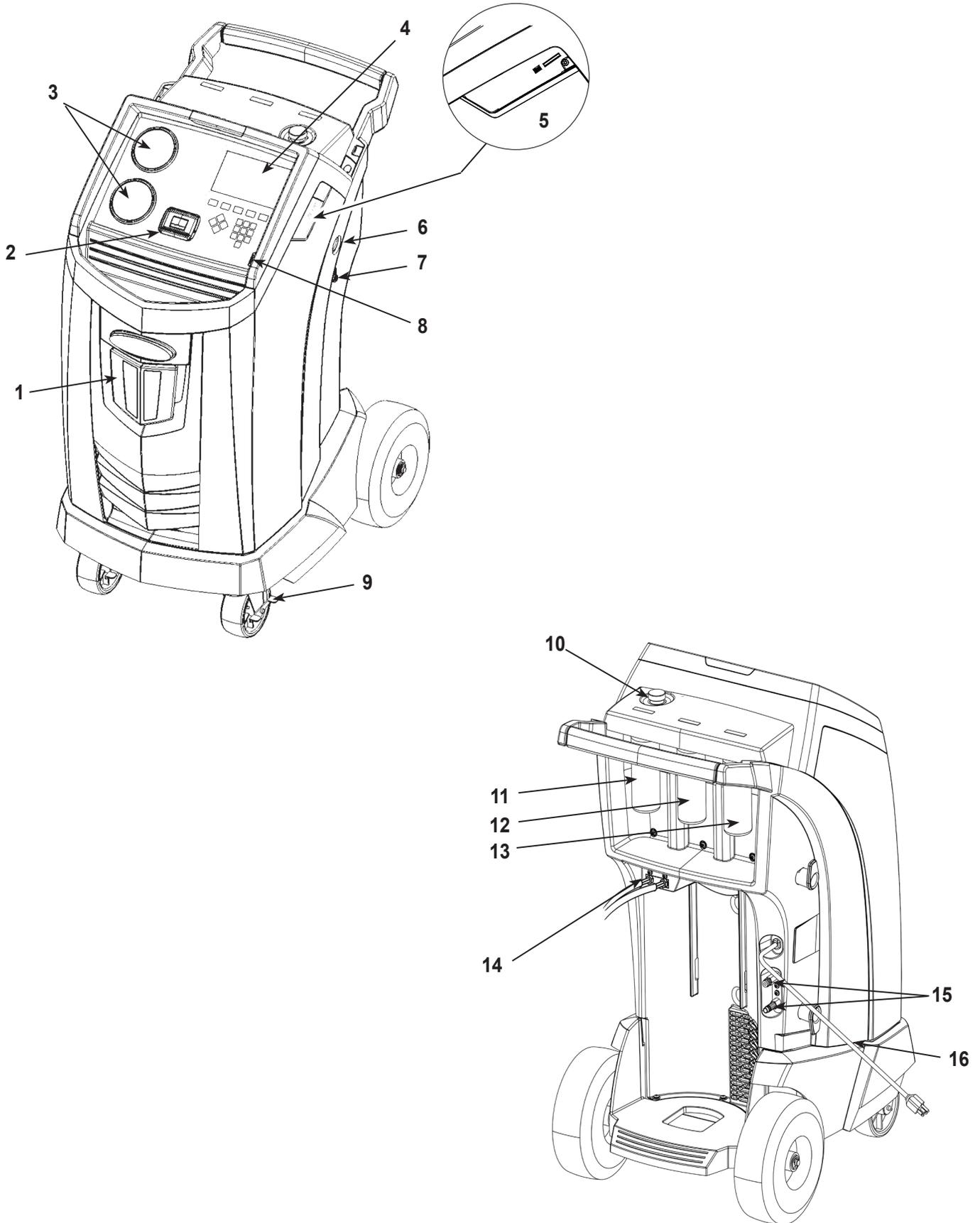


Technical Specifications

Dimensions	107 cm x 61 cm x 76 cm
Display	17.8 cm (7 in.) Graphical LCD
Filter	68 kg (150 lb)
Humidity	32.2°C (90°F), 80% RH non-condensing
Manometer	Ø 100 mm (3.9 in.)
Maximum Pressure	27 bar (390 PSI)
Noise	<70 dB(A)
Nominal Voltage	
34988NI	115V, 60 Hz
34988NI-230	230V, 50/60 Hz
Oil Bottle Capacity	355 ml (12 oz)
Operating Temperature	10°C to 50°C (50°F to 122°F)
Power Consumption	1380 VA
Vacuum Pump Free-Air Displacement	
.....	1.5 CFM (42 L/m) @ 60 Hz
.....	1.25 CFM (35 L/m) @ 50 Hz
Service Hoses	250 cm / SAE J2196
Tank Capacity	10 kg (22 lb)
Weight	73 kg (161 lb)

Introduction

Features

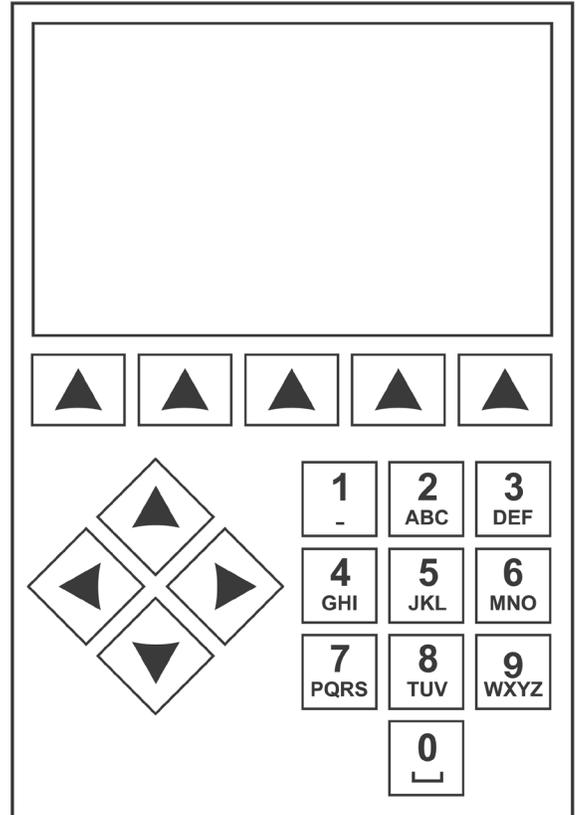


Item No.	Description
1	Oil Drain Bottle
2	Printer
3	Low-side (blue) and High-side (red) Manifold Gauges
4	Graphic Display and Keypad
5	USB and SD Card Connections (detailed view shown without protective cover)
6	Vacuum Pump Oil Sight Glass
7	Vacuum Pump Oil Drain Fitting
8	Power Switch
9	Wheel Lock
10	Vacuum Pump Oil Fill Cap and Port
11	Oil 1 Inject Bottle
12	Oil 2 Inject Bottle
13	UV Dye Inject Bottle
14	Service Hoses
15	Service Hose Storage Ports
16	Power Cord

Introduction

Control Panel Functions

- ARROW UP** highlights the previous item.
- ARROW DOWN** highlights the following item.
- ARROW RIGHT** scrolls to next screen.
- ARROW LEFT** scrolls to previous screen.
- SELECTION ARROWS** make a selection or answer a query.



Control Panel Keypad

Icon Legend



AUTOMATIC ICON

Pressing the key under this icon will enter the automatic refrigerant recovery, vacuum, and charge process.



RECOVER ICON

Pressing the key under this icon will enter the refrigerant recovery process.



VACUUM ICON

Pressing the key under this icon will enter the system vacuum process.



CHARGE ICON

Pressing the key under this icon will enter the refrigerant charge process.



NEXT/FORWARD ICON

Pressing the key under this icon will proceed to additional menu selection options, or proceed to an additional step in a function or process.



BACK ICON

Pressing the key under this icon will return to previously seen menu selection options, or return to the previous screen within a function or process.



HELP ICON

Pressing the key under this icon will provide help and information corresponding to the current screen and/or function being viewed or performed.



DATABASE ICON

Pressing the key under this icon will enter the vehicle database retrieval process.



SETUP MENU ICON

Pressing the key under this icon will enter the Setup Menu.



YES/ACCEPT ICON

Pressing the key under this icon will accept any choices made on the current screen and proceed to the next step of the function.



NO/CLOSE ICON

Pressing the key under this icon will reject any choices made on the current screen and return to the previous step of the function or the Main Menu.



RETRY ICON

Pressing the key under this icon will retry the current process or function.



CHARGE PATH SELECTION ICON

Pressing the key under this icon will toggle the desired path of refrigerant charge between high side, low side, and both side.



OIL INJECT BOTTLE SELECTION ICON

Pressing the key under this icon will toggle which bottle will be utilized to inject oil during the subsequent charge.



ON/OFF ICON

Pressing the key under this icon will toggle the highlighted function on or off as desired.



BACKSPACE ICON

Pressing the key under this icon will delete a text character to the left of the current selection.



PAUSE ICON

Pressing the key under this icon will pause the current process.



RESUME ICON

Pressing the key under this icon will resume a process that has been paused.



PRINT ICON

Pressing the key under this icon will print a summary corresponding to the current completed process.



DELETE ICON

Pressing the key under this icon will delete a selected entry from the memory of the machine.



CHANGE UNITS ICONS



Pressing the key under one of these icons will toggle the unit of measurement for the current entry field.

Introduction

Setup Menu Functions

Access the following functions by pressing the Menu key and selecting Setup.

Calibration Check

Use to verify internal scale calibration. Refer to Calibration Check in the Maintenance section of this user manual.

Edit Print Header

Programs information that will appear on the printout each time a print function is used.

Filter Maintenance

The filter removes acid, particulates, and moisture from the refrigerant. To meet requirements, it is mandatory to replace the filter after 68 kg (150 lb) of refrigerant has been filtered.

This menu item displays the filter capacity remaining until the machine locks down and no longer functions. Refer to Filter Maintenance in the Maintenance section.

Flush Hoses

Flushes residual oil from the machine's service hoses to prepare for service of next vehicle.

Production Menu

For Robinair production use only.

Pump Maintenance

Displays the amount of time remaining until the next vacuum pump oil change is needed. For maximum vacuum pump performance, change vacuum pump oil every time the filter is replaced. Refer to the Change Vacuum Pump Oil in the Maintenance section.

Refrigerant Management

Displays the amount of refrigerant recovered, charged, and replenished (for the life of the machine), and filtered since the last filter change.

Rename Oil Bottle

Default oil inject bottle designations are Oil 1 and Oil 2. This function allows the user to rename each bottle to specify oil type/viscosity.

Select Language

Select a language for screen prompts. English is the default language.

Service Menu

For Robinair service center use only.

Select Units

Program the machine to display units of measure in kilograms or pounds. The default display is kilograms.

Date and Time

Program the machine for current date and time.

System Flush

Provides a method of removing oil by forcing liquid refrigerant through an A/C system or components of an A/C system. After flushing, the refrigerant is recovered by the machine and filtered by the recycling circuit.

System Information

Displays the revision level of the software in the machine.

Tank Fill

Use this Setup Menu item to transfer refrigerant from a source tank to the ISV. The tank fill value may be adjusted up or down to suit the user's needs. Refer to Tank Fill in the Maintenance section.

Unit Activation

Failure to register and activate the machine within 30 days of initial startup will cause the machine to lock out and no longer function. Select this Setup Menu item and follow the prompts before the trial period expires.

View Service Data

Displays vehicle information that was entered into the Enter Service Data screen. Vehicles are displayed by date of service and VIN number. The database stores 25 VIN entries.

Hose Equalize

Use this Setup Menu item to recover refrigerant from the service hoses back into the vehicle A/C system. This item is useful after performing diagnostics which do not require the need to recover the A/C system into the RRR machine. The user will be prompted to connect the low side service hose to the appropriate port and to start the vehicle's A/C system on max.

Operating Instructions

Enter Service Data

After selecting any service function, information about the vehicle may be entered into and stored in the machine's database.

The machine displays

Enter service data new

1. Select ✓ to enter a new record, or scroll to select a previously serviced vehicle and then select ✓. The highlighted selection will be in red. The machine displays

Enter service data

VIN: _____

Mileage: _____

Make: _____

Model: _____

2. Use the arrow keys to move between rows and the multi-tap keypad to enter text.

Information entered on this screen is stored by date and vehicle identification number (VIN). The database stores the latest 25 entries, with the most recent at the top of the list.

The information will also appear on service summary printouts.



Recover Refrigerant from a Vehicle

1. Empty the oil drain bottle before starting a recovery. Remove the oil drain bottle from the machine by pulling the bottle straight down—do not use a twisting or rocking motion. Reinstall the oil drain bottle. Refer to Figure 2.

Note: Use caution when removing/installing oil drain bottle. Excessive force may damage internal load cell.

2. Connect the high-side (red) and low-side (blue) service hoses to the vehicle A/C system.
3. Open the coupler valves on the hoses by turning the collars clockwise.
4. Select **RECOVER**  from the **MAIN MENU**.
5. The machine will enter the service data entry form. Enter all applicable data and select to continue.
6. The machine will ask whether to record diagnostic pressures. Select to continue recovery process or select to record operating pressures of the vehicle's AC system. Follow on-screen prompts and vehicle's service manual specifications to continue.

The machine begins the recovery process. A clicking noise indicates the solenoid is opening and closing — this is normal.

The machine runs a self-clearing cycle to clear any internal refrigerant from its internal plumbing.

System recovery begins and includes a timed vacuum, deep recovery process.

After recovery, the machine will perform an oil drain, which may require up to 90 seconds to complete.

7. After the oil drain is complete, a summary is displayed showing the total amount of refrigerant and oil recovered. Recovery information and pre-recover diagnostics can be printed by selecting . Select **▶▶** to return to the Main Menu.

Note: The displayed recovered weight can vary depending on ambient conditions and should not be used as an indicator of scale accuracy.



WARNING: To prevent personal injury while working with refrigerant, read and follow the instructions and warnings in this manual, and wear protective equipment such as goggles and gloves.

Note: The amount of oil that was removed from the A/C system is the amount of new oil that should be charged into the A/C system after evacuation is complete.

- Use only **new** oil to replace the oil removed during the recycling process.
- Dispose of used oil according to government regulations.

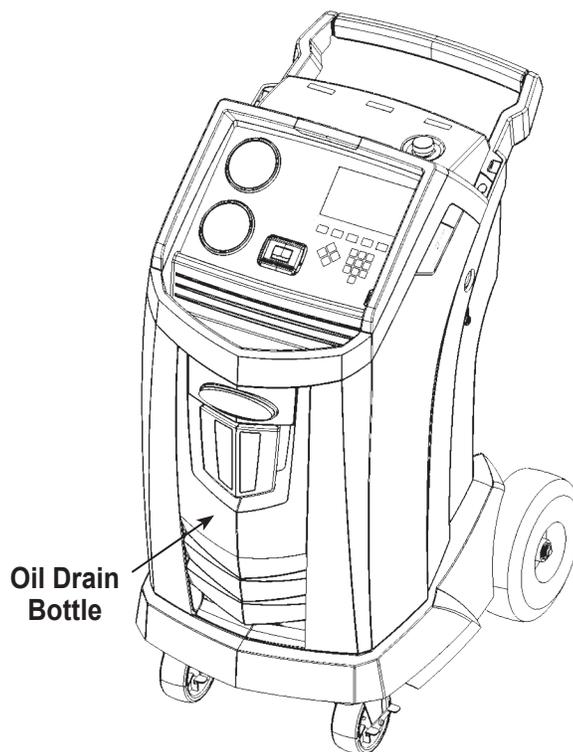


Figure 2

Operating Instructions



Evacuate the Vehicle A/C System

1. Connect the service hoses to the vehicle's service ports.
2. Open the service hose coupler valves by turning the collars clockwise.
3. Select **VACUUM**  from the **MAIN MENU**.
4. Select Vacuum Leak Check, if desired, to automatically perform a 5-minute pressure rise leak check after the vacuum.
5. Select  to accept the 10-minute default evacuation time, or enter a desired vacuum time using the number keys.

Note: The vacuum process will halt if pressure rises above .35 bar (5 psi). Recover refrigerant before proceeding.

The machine pulls a vacuum on the A/C system for the programmed amount of time.

The machine stops when the specified amount of time has elapsed.

6. To print vacuum information, select .
7. Select  to return to the Main Menu.



WARNING: To prevent personal injury while working with refrigerant, read and follow the instructions and warnings in this manual, and wear protective equipment such as goggles and gloves.

Flushing the Hoses

If the next vehicle to be serviced contains a different type of oil than the previous vehicle serviced, it is recommended the service hoses be flushed of residual oil to prevent contamination.

1. Select **FLUSH HOSES** from the **SETUP MENU**. The machine displays

Connect hoses to storage ports
and open coupler valves.

2. Connect the service hoses to the machine's storage port connections as shown in Figure 3.
3. Open the service hose coupler valves by turning the collars clockwise.
4. Select to begin the hose flush process, which runs for three minutes, followed by a recovery.

When the hose flushing process is complete, the display reads

FLUSH HOSES
Complete

5. Select **▶▶** to return to the Setup Menu.
6. Close the coupler valves by turning the collars counterclockwise.

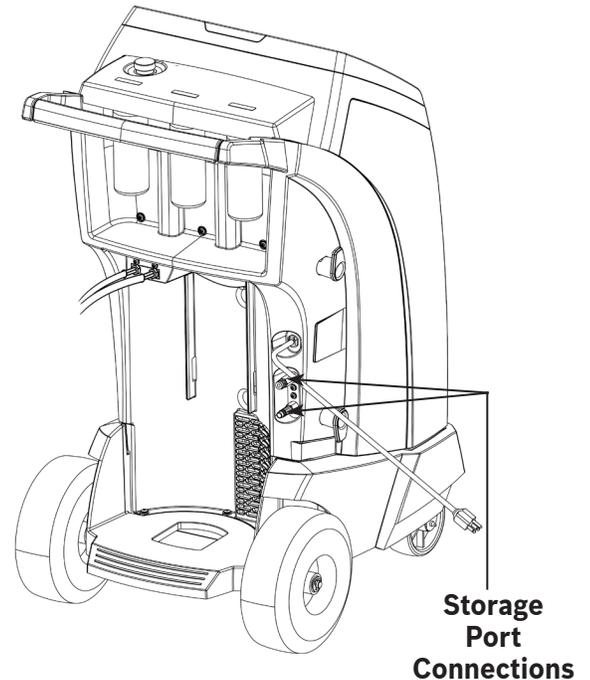


Figure 3

Operating Instructions



Recharge the Vehicle A/C System

1. Connect both service hoses to the vehicle's service ports.
2. Select **CHARGE**  from the **MAIN MENU**.
3. The user will be prompted to enter service data. Select  once complete to continue. The display shows

Charge: XX.XXX kg	on High Side
Oil Amount: XXX ml	Bottle: XX
Dye Inject: Y/N	
Min Charge quantity 10g	

4. Use the arrow keys and the numeric keypad to enter the desired charge amount. Select **kg|lbs|oz** to change units.
5. Using the arrow keys, maneuver to the charge path selection. High Side is default. To change, select **HSL** on the control panel. This will allow the user to toggle between high, low, and both side charge paths. The current selection is indicated on the display.
6. Oil can also be injected into the system during the charge. Use the numeric keypad to enter the desired oil inject amount. Select **m|oz** to change units. If desired, select **Y** for Dye Inject. This will add approximately 7 mL (0.25 oz) of UV dye to the charge. Make sure there is available oil in the oil/dye inject bottle located on the rear of the machine.
7. Select  to start the charge process. Moving or bumping the machine at this point may result in an inaccurate charge. When the charge cycle gets close to the desired weight value, the machine slows down. It will charge, settle, charge again, settle, etc.
8. When prompted, select  to perform hose equalization. Select  to perform hose compensation.

Note: Hose equalization requires the user to start the vehicle. Hose compensation adds a preset amount of refrigerant to the chart to compensate for service hose volume.

9. When the **CHARGE COMPLETE** screen appears, it includes a summary of charge results. Select  to print the summary. Select  to proceed to clear the service hoses.
10. The user will be prompted to close the coupler valves and disconnect the hoses from the vehicle. Select  to recover any remaining refrigerant from the hoses. Once the hose clear is complete, the machine will return to the Main Menu.

The vehicle A/C system is now ready for use.



WARNING: To prevent personal injury while working with refrigerant, read and follow the instructions and warnings in this manual, and wear protective equipment such as goggles and gloves.

Note: The charging process differs from vehicle to vehicle. Charge function for vehicles equipped with a single-service fitting should be carried out manually. Refer to the vehicle service manual for specific instructions.

CAUTION: If the low-side (blue) or high-side (red) coupler valve is left open during the hose clearing process, the system will pull refrigerant back out of the vehicle.



Automatic Function

The **AUTOMATIC** function allows a user to perform an automatic recovery, vacuum, leak test, and/or charge sequence. A total automatic sequence may take up to an hour to complete.

1. Connect high-side (red) and low-side (blue) service hoses to the A/C system.
2. Open the service hose coupler valves by turning the collars clockwise.
3. Select **AUTOMATIC**  from the **MAIN MENU**. The display shows:

Vacuum Time: XX:XX
Vacuum Leak Test: ON
Charge: XX.XXX kg on High Side
Additional Oil: XXX ml Bottle: XX
Dye Inject: Y/N
Min Vacuum time is 1 sec

4. Use the numeric keypad to enter the desired length of vacuum.
5. Using the arrow keys, maneuver downwards to choose whether to perform a vacuum leak test or not. ON is the default setting. To toggle, select **I/O** on the control panel.
6. Using the downwards arrow key, maneuver to the “charge amount” entry field. Use the arrow keys and numeric keypad to enter the desired charge amount. Select **kg|lbs|oz** to change units.
7. Using the arrow keys, maneuver to the “charge path selection.” High Side is default. To change, select **H|S|L** on the control panel. This will allow the user to toggle between high, low, and both side charge paths. The text on the display will change to the current selection.
8. Using the arrow keys, maneuver to the “additional oil” entry field. Use the numeric keypad to enter the desired additional oil inject amount. Select **m|oz** to change units. If desired, select **Y** for Dye Inject. This will add approximately 7 mL (0.25 oz) of UV dye to the charge. Make sure there is available oil in the oil/dye inject bottle located on the rear of the machine.

Note: Additional oil amount specified is in addition to the amount recovered. If no additional oil is specified, the machine will inject the same amount of oil as was recovered (automatic mode only).

9. Select  to begin the **AUTOMATIC** cycle. The unit will now automatically proceed through all applicable functions: **RECOVER**, **VACUUM**, and **CHARGE**. If the vehicle being serviced has previously undergone a recover and vacuum procedure, the machine will only perform a **CHARGE**.
10. When the **AUTOMATIC COMPLETE** screen appears, it includes a summary of results. Select  to print the summary. Select  to proceed.
11. The user will be prompted to close the coupler valves and disconnect the hoses from the vehicle. Select  to recover any remaining refrigerant from the hoses. Once the clear is complete, the machine will return to the Main Menu.

The vehicle A/C system is now ready to use.

Notes:

- The **CHARGE** function for vehicles equipped with a single-service fitting should be carried out manually according to procedures in the vehicle manufacturer’s service manual.
- If **RECOVER** was not performed, the amount of oil to be injected may be entered while programming the **CHARGE** information.
- If problems are encountered during the automatic sequence, an audio alert sounds three times. The sequence remains paused until the user enters a decision regarding how to proceed.

Maintenance

Maintenance Schedule

Maintenance Task	Recommended Interval
Change filter	After 68 kg (150 lb) of refrigerant has been filtered. Refer to Filter Maintenance in the Maintenance section of this manual.
Change vacuum pump oil	When the filter is replaced. Refer to Change Vacuum Pump Oil in the Maintenance section of this manual.
Check casters and wheels for ease of operation	Monthly.
Check internal scale calibration	Monthly. Refer to Calibration Check in the Maintenance section of this manual.
Check machine for leaks	Monthly. Check hoses and connections for leakage. Disconnect power, remove the shroud, and use an electronic leak detector to check fittings.
Clean airflow outlet panel (see Figure 5)	Monthly. Use a clean cloth.
Clean cabinet and control panel	Monthly. Use a clean cloth.
Inspect power cord and hoses for cuts and abrasions	Daily.
Lubricate wheel bearings and inspect brake components	Monthly.
Pressure Test	Every 10 years. Performed by an authorized Robinair service center.

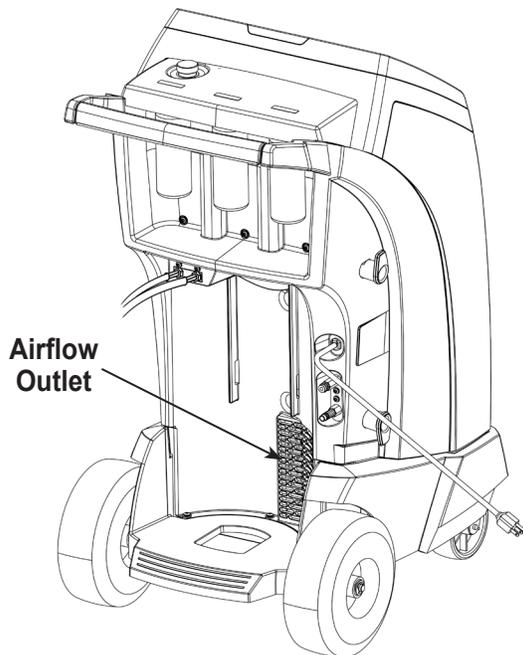


Figure 5



WARNING: To prevent personal injury only qualified personnel may perform inspections and repairs to this machine. Read and follow instructions and warnings in this manual, and wear protective equipment such as goggles and gloves.

Maintenance

Adjust Background Fill Target

This machine possesses a background tank fill feature. An external refrigerant storage vessel can be fluidly connected to the machine (using the black tank fill hose) for a continuous topping off of the internal storage vessel. Drawing from the refrigerant within the connected external storage vessel, the machine will periodically charge the ISV tank to the desired fill target.

1. To choose the background refrigerant fill target of the machine, select **ADJUST BACKGROUND FILL TARGET** in the **SETUP MENU**.
2. Using the arrows and the numeric keypad, enter the desired fill target. Select ✓ to save the new value and exit. Select ✗ to exit and continue to use the previously entered amount.

Tank Fill

This menu item is used to transfer refrigerant from a source tank to the ISV.

The maximum capacity of the internal storage vessel (ISV) is 10 kg. Use the arrow keys to move the cursor; use the keypad to enter a value. Note: Add at least 3.6 kg of refrigerant to ensure enough is available for charging.

1. Connect the tank fill (black) hose to the liquid connector on a full source tank.
2. Position the source tank in such a way that liquid refrigerant is supplied to the connection. Open the source tank valve.
3. Select **TANK FILL** from the **SETUP MENU**. The machine displays

Tank Fill
Fill Amount: XX.XYY
Charge Capacity: XX.XXYY
Recover Capacity: XX.XXYY

4. Enter the quantity to recover, and select ✓. Add at least 3.6 kg of refrigerant to ensure enough is available for charging.
5. The machine begins filling the ISV and automatically stops when the preset tank fill level is reached. To stop the tank fill before the preset level is reached, select ✓. An option to exit will appear on the display.
6. Once complete, remove the hose from the source tank.



WARNING: To prevent personal injury while working with refrigerant, read and follow the instructions and warnings in this manual, and wear protective equipment such as goggles and gloves.

Filter Maintenance

The filter is designed to trap acid and particulates, and to remove moisture from refrigerant. To meet the mandate for adequate moisture and contaminant removal, the filter must be replaced after 68 kg (150 lb) of refrigerant has been filtered.

The machine gives a warning when 57 kg (125 lb) of the filter capacity has been used; the machine locks down when the 68 kg (150 lb) filter capacity has been reached and will no longer function.

Check Remaining Filter Capacity

1. Select **FILTER MAINTENANCE** from the **SETUP MENU** or when the machine prompts. The machine displays

Remaining Filter Capacity: XXX.XO kg
Replace filter now?

The machine displays the amount of filter capacity remaining until the machine locks down.

2. Select to change the filter; select to resume using the machine.

⚠ WARNING: The components in the machine are under high pressure. To prevent personal injury, change the filter only when the machine prompts.

Caution: To prevent equipment damage, use only authentic Robinair No. 34724 filters in this machine. All performance tests and claims are based on using this specific filter.

Maintenance

Replace the Filter

1. If ✓ was selected to change the filter, the machine prompts for the new filter code to be entered.

Enter new filter serial number

Use the keypad to enter the serial number that appears on the new filter, and select ✓ to continue.

Note: If "Invalid serial number" is displayed, the serial number has been incorrectly entered, or the filter has already been used in this machine.

2. The machine clears the existing filter and displays:

Serial number accepted.

Turn power off and replace filter.

Turn off the machine. Remove the oil bottle. Remove the four screws holding the shroud. See Figure 7.

3. Hang the shroud on the back of the machine as shown in Figure 8.
4. Remove the filter by turning it counterclockwise (as viewed from the bottom of the filter).
5. Look at the new filter. Verify both o-rings are lubricated and correctly located in the grooves.
6. Install the new filter by threading it clockwise into place. Verify the filter is positioned correctly as shown in Figure 8. Tighten the filter to 20 Nm.
7. Power the machine on. The Change Vacuum Pump Oil operation will begin, and the screen will display

Warming oil for drain XX:XX

See "Change Vacuum Pump Oil" on page 30 for more information.

The machine will then begin the Leak Check operation. See "Leak Check" on page 31 for more information.

Caution: To prevent equipment damage, use only authentic Robinair No. 34724 filters in this machine. All performance tests and claims are based on using this specific filter.

Remove the four screws holding the shroud.

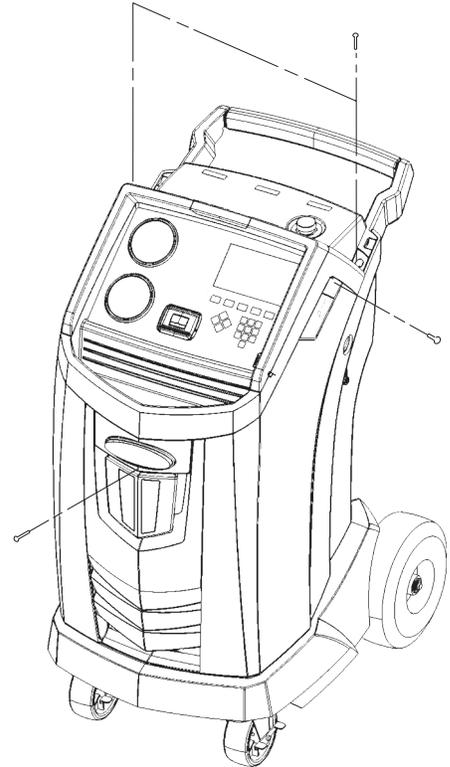


Figure 7

Hang Shroud Here

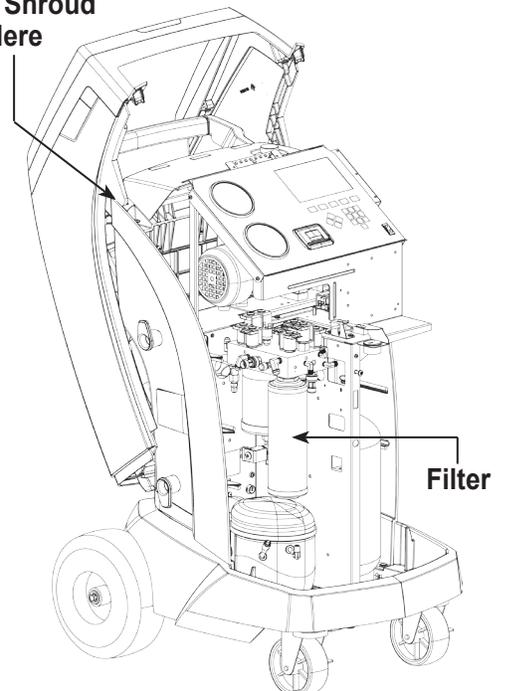


Figure 8

Calibration Check

This function is used to ensure the machine's internal scale is always calibrated. During this test, use only the calibration weight that is provided with the machine.

1. Refer to Figure 9, and verify the magnet on the bottom of the machine is clean.
2. Select **CALIBRATION CHECK** from the **SETUP MENU**.
The machine displays

Place calibration weight on magnet located on the bottom of the unit

3. Attach the calibration weight to the magnet on the bottom of the machine. Select ✓ to continue.
4. The machine displays

Remove calibration weight from magnet located on the bottom of the unit

Remove the calibration weight from the magnet. Select ✓ to continue.

- If the display shows

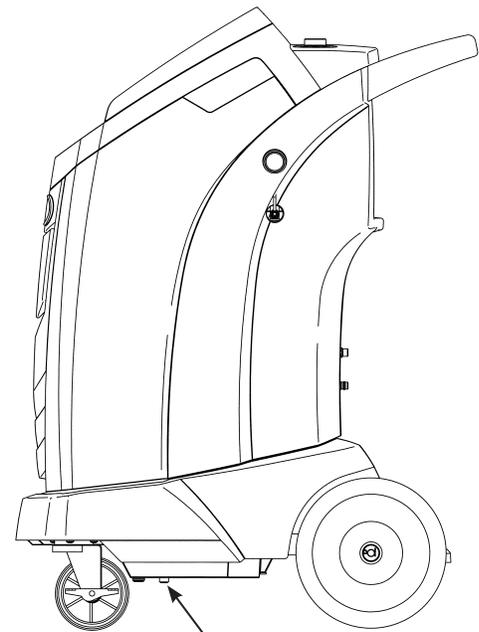
Calibration check passed

the scale is in calibration. Select ►► to return to the Setup Menu.

- If the display shows

Calibration check failed. Retry?

the scale is out of calibration. To retry, select ↺. If calibration continues to fail, contact an authorized Robinair service center for assistance.



Magnet

Figure 9

Maintenance

Change Vacuum Pump Oil

1. Select **PUMP MAINTENANCE** from the **SETUP MENU** or when prompted. The display shows how long the vacuum pump has operated since the last oil change.

Oil life remaining
XXX:XX (hhh:mm)
Change oil now?

2. Select to change vacuum pump oil. If the machine displays

Warming oil for drain
XX:XX

allow the vacuum pump to run for two minutes to warm up the oil. If the oil is already warm, the display shows

Drain used oil from pump
and replace with 150 ml of new oil
Remove fill cap to speed draining of oil

3. Slowly open the oil fill cap to verify there is no pressure in the machine. Then carefully remove the cap. See Figure 10.
4. Remove the oil drain fitting cap and drain the oil into a suitable container for disposal. Replace the cap and close tightly. Select **▶▶** to continue.
5. The machine displays

Fill vacuum pump to the center
of the sight glass
Reinstall fill cap

Slowly add vacuum pump oil to the pump through the oil fill port until the oil reaches the center of the sight glass. Install the cap on the oil fill port and close tightly. Select **▶▶** to return to the **SETUP MENU**.

Note: For proper oil level, ensure the machine is on a flat, level surface.

⚠ WARNING: To prevent personal injury, do **NOT** operate the machine at any other time without the oil fill port cap installed, because the vacuum pump is pressurized during normal operation.

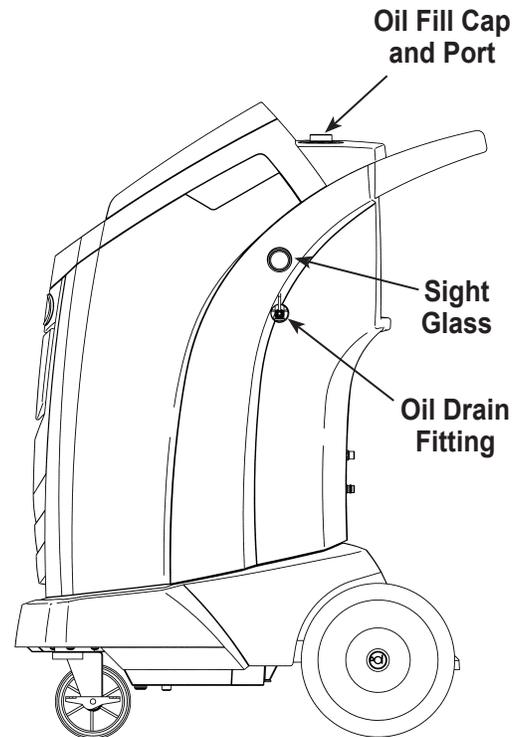


Figure 10

CAUTION: It is the responsibility of the user to monitor vacuum pump oil level and clarity. If contaminated oil is not removed from the vacuum pump and replaced, the vacuum pump will be permanently damaged.

Leak Check

A leak test may be performed on the machine at any time. During this test, components containing refrigerant are pressurized and monitored for pressure decay, which could indicate a leak.

1. Select **LEAK CHECK** from the **SETUP MENU**. The machine displays

Connect service hoses to storage ports and open coupler valves

2. Connect the service hose couplers to the storage ports at the rear of the machine. Open the couplers by turning the collars clockwise.
3. Select ✓ to start. The machine performs a self-recovery and displays

Recover in progress

The machine performs a 30-second vacuum test and displays

Vacuum leak check in progress

If the vacuum test fails, the machine will prompt to check for leaks.

Once the machine passes the vacuum test, a controlled pressure is applied to its internal components. The machine displays

Pressure leak check in progress

Pressure is held for five minutes and monitored for decay. Minutes and seconds count down on the display.

- If an acceptable pressure decay is detected, the machine recovers refrigerant and returns to the Setup Menu, ready for normal operation.
- If an unacceptable pressure decay is detected, the machine will prompt to check for leaks. Take the machine to an authorized Robinair service center for repair.



WARNING: To prevent personal injury while working with refrigerant, read and follow the instructions and warnings in this manual, and wear protective equipment such as goggles and gloves.

⚠ WARNING: To prevent personal injury should the machine require transport to a local Robinair service center, follow local government regulations regarding transportation of equipment containing R-134a.

Maintenance

Edit Print Header

To make changes to text that appears in this screen:

1. Select **EDIT PRINT HEADER** from the **SETUP MENU**.
2. The cursor is in the first field. Update the text by using the arrows and the multi-tap interface on the numeric keypad:
 - **ARROW LEFT** and **X** act as a backspace key.
 - **ARROW RIGHT** moves the cursor to the right.
 - **ZERO (0)** key acts as a spacebar.
 - **ARROW UP** and **DOWN** navigate between the rows.
3. Select **✓** to save the changes and return to the Setup Menu; select **X** to return to the previous header and exit to the Setup Menu.

Replace Printer Paper

To install a new paper roll in the printer:

1. Remove the cover on the printer by pulling out on the tab as shown in Figure 11.
2. Remove the paper core.
3. Install the new roll of paper with the end of the paper at the top of the roll.
4. Assemble the cover onto the printer with the leading edge of the paper over the roller.

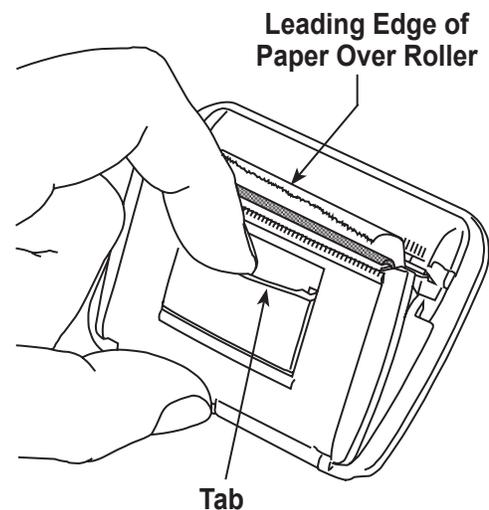


Figure 11

Replacement Parts

Component	Replacement Part No.
Calibration Weight	16214
Filter	34724
Oil Drain Bottle	19100
Oil/Dye Inject Bottle	19103
Printer	30038
Printer Paper (3 rolls)	34214
LP Service Coupler	18190A
HP Service Coupler	18191A
Service Coupler Set (high-side [red] and low-side [blue] couplers)	18192
Hose Set without Couplers (high-side [red] and low-side [blue])	71789
Service Hose without Coupler (low-side, blue)	70020
Service Hose without Coupler (high-side, red)	70021
Vacuum Pump Oil (pint)	13119
Vacuum Pump Oil (quart)	13203
Vacuum Pump Oil (gallon)	13204
Vinyl Dust Cover (optional)	17499

⚠ WARNING: To prevent personal injury, use only those repair parts called out in this parts list. Items found in this parts list have been carefully tested and selected by Robinair.

Glossary

A/C System : The vehicle air conditioning system being serviced.

Evacuation : Moisture and other non-condensables are removed from an A/C system by a vacuum pump.

Internal Storage Vessel (ISV) : The refillable refrigerant storage tank designed specifically for this machine; 10 kg (22 lb) capacity.

Leak Test (Vacuum) : Components containing refrigerant are evacuated and monitored for pressure rise, which could indicate a leak.

Machine : Model No. 34988NI.

Leak Check : Components containing refrigerant are pressurized and monitored for pressure decay, which could indicate a leak.

Recovery / Recycling : Refrigerant is recovered from an A/C system, filtered, and stored in the ISV.

Refrigerant : R-134a.

Troubleshooting

Display	Cause	Solution
CALIBRATION CHECK FAILED	Internal scale is out of calibration.	Select  to retry calibration check. If calibration continues to fail, exit current test and contact a Robinair authorized service center for repair.
CHARGE STALLED! CHECK CONNECTIONS AND VALVES	Refrigerant is stalled in the ISV or the machine.	Verify connections are secure and valves are in correct position.
DATABASE NOT INSTALLED	Machine is not shipped with database installed.	Contact a Robinair authorized service center for more information.
EXCESS TANK WEIGHT	Overfill safety circuit tripped. Machine is locked out because of too much refrigerant in ISV.	Contact a Robinair authorized service center for more information.
FILTER EXHAUSTED FILTER WEIGHT XXX.XYY REPLACE FILTER NOW?	68 kg (150 lb) or more refrigerant has been recovered since last filter change.	Refer to Filter Maintenance section of this manual for instructions to change filter.
HIGH PRESSURE IN ISV	Machine is locked out because pressure in ISV is too high, possibly because of excessively high tank temperature.	Allow machine to cool before performing additional A/C service. If problem continues, contact a Robinair authorized service center for more information.
IDENTIFY REFRIGERANT PURITY TEST FAILED	Refrigerant tested is not R-134a or it is contaminated.	Do not recover contaminated refrigerant into the machine; use an external refrigerant recovery machine dedicated to contaminated refrigerant.
INLET PRESSURE IS TOO HIGH FOR VACUUM	Before the machine begins evacuating the A/C system, it checks for pressure in the system that could damage the vacuum pump. In this case, system pressure is above 0.35 bar gauge.	Select  . Refer to Recover section of this manual to recover refrigerant before proceeding.
INSUFFICIENT OIL AMOUNT TO INJECT	Oil inject bottle selected may not contain enough oil to complete the injection.	Fill bottle, re-enter oil amount, or continue charge without oil inject.

Troubleshooting

Display	Cause	Solution
INSUFFICIENT REFRIGERANT. 6.00 KG REQUIRED FOR SYSTEM FLUSH	Not enough refrigerant in the ISV to perform a system flush.	<i>Refer to Tank Fill in Maintenance section of this manual.</i>
INSUFFICIENT REFRIGERANT AVAILABLE FOR CHARGE SELECTED: XX.XXYY AVAILABLE: XX.XXYY	After a desired weight is entered, if the charge process will leave less than 0.67 kg (1.4 lb) of refrigerant in ISV, the charge function will not start.	<i>Refer to Tank Fill in the Maintenance section of this manual.</i>
INVALID CODE	Activation code entered into the machine is not correct.	<i>Verify activation code is entered exactly as received. Capitalization is required.</i>
INVALID SERIAL NUMBER!	Filter serial number entered into the machine is not correct.	<i>Verify serial number entered matches serial number on filter. Verify filter has not been used on machine previously.</i>
LEAK TEST FAILED	A leak in the vehicle A/C system.	<i>Exit current test and perform repairs on vehicle A/C system.</i>
NO PRESSURE ON INLETS CHECK CONNECTIONS RECOVER ANYWAY?	System pressure is below 0.35 bar gauge.	<i>Verify high-side (red) and low-side (blue) hoses are connected and coupler valves open. Select  to RECOVER; select  to bypass recover and proceed to VACUUM.</i>
OIL DRAIN HALTED	Accumulator pressure failed to rise above 1.10 bar within the minute before an oil drain was supposed to occur.	<i>Adequate pressure is required within the accumulator to force the oil, which has been separated from the refrigerant, out of the system. Select  to retry; select  to exit.</i>
OIL LIFE REMAINING XX:XXX CHANGE OIL NOW?	Display shows vacuum pump oil life remaining until machine locks down.	<i>Refer to Maintenance section of this manual for instructions to change vacuum pump oil.</i>
OUT OF RANGE ACCUMULATOR PRESSURE	Accumulator pressure transducer is not reading pressure correctly.	<i>Exit current test and contact a Robinair authorized service center for more information.</i>

Troubleshooting

Display	Cause	Solution
OUT OF RANGE ISV PRESSURE	Internal storage vessel pressure transducer is not reading pressure correctly.	<i>Exit current test and contact a Robinair authorized service center for more information.</i>
OUT OF RANGE ISV TEMPERATURE	Internal storage vessel temperature sensor is not reading temperature correctly.	<i>Exit current test and contact a Robinair authorized service center for more information.</i>
OUT OF RANGE LOW SIDE PRESSURE	Low-side pressure transducer is not reading pressure correctly.	<i>Exit current test and contact a Robinair authorized service center for more information.</i>
POWER BOARD COMMUNICATION FAILED	Failed communication with relay board.	<i>Cycle power. If problem continues, contact a Robinair authorized service center for more information.</i>
PRESSURE TEST FAILED CHECK FOR LEAKS	A leak in vehicle A/C system.	<i>Exit current test and perform repairs on vehicle A/C system.</i>
SERIAL NUMBER HAS ALREADY BEEN USED	Filter serial number entered into the machine is not correct.	<i>Filter has already been used on this machine. Obtain new Robinair filter No. 34724.</i>
SOURCE TANK IS EMPTY	Refrigerant cannot be transferred to the ISV because the source tank is empty.	<i>Exit current test and replace the source tank.</i>
TANK FULL. REMOVE REFRIGERANT BEFORE CONTINUING	ISV is too full to recover additional refrigerant.	<i>Perform a charge process to remove refrigerant from ISV before any further recovery attempts.</i>
TRIAL PERIOD EXPIRED UNIT ACTIVATION REQUIRED TO CONTINUE USE	Failure to register and activate the machine within 30 days of initial startup will cause the machine to lock out and no longer function.	<i>Select ✓ and refer to Unit Activation section in this manual to register the machine.</i>
VACUUM TEST FAILED. CHECK FOR LEAKS	A leak in the vehicle A/C system.	<i>Exit current test and perform repairs on vehicle A/C system.</i>

Storage and Transportation of Equipment

Storage

Never leave the machine live if an immediate use is not scheduled.

1. Disconnect the machine from its power supply.
2. Loop the service hoses around the handle twice and attach them to the storage ports. See Figure 12.
3. Store the machine in a dry, stable area, away from flames and hot surfaces. The temperature of the storage area should range between -18°C and 60°C (0°F and 140°F).
4. Lock the front wheels.

Transportation of Equipment

 **WARNING:** To prevent personal injury, should the machine require transport to a Robinair service center, follow local government regulations regarding transportation of equipment containing R-134a.

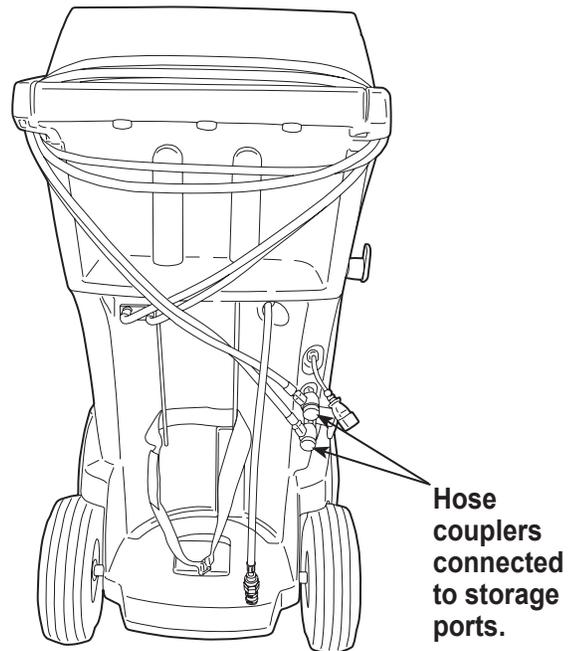


Figure 12