



OPERATIONS
and
MAINTENANCE
MANUAL

White[®]
1090ST[™]

**Refrigerant
Recovery/Recycle/Recharge
Unit**

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Safety Notice

For your safety, read this manual thoroughly before operating your **1090ST™** unit.

Your **1090ST™** unit 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, **White Industries®** cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the automotive technicians 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, the vehicle or equipment being tested.

It is assumed that the operator has a thorough understanding of vehicle air conditioning systems before using this **1090ST™** unit. This understanding of principles and operating theories is necessary for competent, safe and accurate use of this instrument.

Before using your **1090ST™** unit, always refer to and follow the 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.

The signal word indicates the level of the 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 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 moderate or minor injury to the operator or to bystanders.

IMPORTANT

Indicates a situation which, if not avoided, may result in damage to the test equipment or vehicle.

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

WARNING

Risk of a lack of oxygen.

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

- Use your **1090ST™** unit in locations with mechanical ventilation providing at least four air changes per hour.

Impairment of breathing can cause injury.

Power

WARNING



Risk of electric shock and fire.

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

Electric shock and fire can cause injury.

Refrigerant

WARNING



Risk of expelling refrigerant under pressure.

- Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses. If any refrigerant gets into the eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.
- Do not remove master filter/dryer while under pressure. Follow instructions for removing master filter/dryer. For additional information refer to *Changing the Master Filter/Dryer*.
- Prevent refrigerant from contacting the skin.

Expelled refrigerant can cause injury.

WARNING



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.

WARNING



Risk of fire.

- Do not use this equipment in the vicinity of spilled or opened containers of gasoline.
- Do not use your **1090ST™** unit or any leak detector equipment if R-12 substitutes are suspected. R-12 refrigerant substitutes may be flammable.

Fire can cause injury.

WARNING

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 your 1090ST™ unit to remove refrigerant from air conditioning systems.**

Exposure can irritate eyes, nose and throat.

CAUTION

Risk of irritation to mucous membranes.

Avoid breathing air conditioning 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 the refrigerant and lubricant manufacturers.

Exposure can irritate eyes, nose and throat.

Oil (Lubricant)

WARNING



Risk of expelling oil under pressure.

Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses. If any oil gets into the eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.

Expelled oil can cause injury.

General

WARNING



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. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.**
- **Service should be performed by a certified A/C service technician.**

Engine systems that malfunction can cause injury.

WARNING



The 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.**
- **Barriers are recommended to help identify danger zones in test area.**
- **Prevent personnel from walking through immediate test area.**

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

WARNING



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

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

Service hoses can split or burst causing injury.

WARNING



Risk of explosion if improper tank is used. **Do not use any tank with this equipment other than part number EAA0275L05A. 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.

WARNING



Removing tubing assemblies may discharge refrigerant.

Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

Expelled 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 it when testing is completed.**
- **Do not leave a running engine unattended.**

A moving vehicle can cause injury.

WARNING



Risk of explosion.

- **Some vehicle fuel systems such as Mercedes, light trucks, and some Fiat models have the same service fittings as the A/C systems.**
- **Do not connect to similar fuel service fittings.**
- **Connect only to A/C service fittings.** If you mistakenly connect to fuel system:
- **Do not use any switches as this may cause sparks.**
- **Do not move any metal items as this may cause sparks.**
- **Unplug unit's power cord from the wall outlet.**
- **Immediately ventilate the work area and call your local service representative.**

Fuel in A/C recovery unit can explode and cause injury.

CAUTION

Risk of injury.

- **This equipment should be operated by qualified personnel only.**
- **Use this equipment only as described in this manual. Use only the manufacturer's recommended attachments.**
- **Do not operate equipment with a damaged cord or if the equipment has been dropped or damaged, until it has been examined by a qualified service representative. Care should be taken to arrange the power cord so that it will not be tripped over or pulled.**
- **Always unplug equipment from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp the plug and pull to disconnect.**
- **Let the equipment cool completely before putting it away. Loop the power cord loosely in proper location when storing.**

Operation of your 1090ST™ unit by anyone other than qualified personnel may result in injury.

⚠ CAUTION

Risk of refrigerant leakage.
Always close the quick coupler valves before disconnecting a hose coupling.
Loosened hose couplings can leak refrigerant into 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 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 *White Industries®* Representative.
Improper repair and/or adjustment may cause vehicle or equipment damage or unsafe operation.

SAVE THESE INSTRUCTIONS

Using This Manual

This manual contains instructions for use and set-up of your **1090ST™** 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 **White Industries®** Sales Representative can determine option availability.

Conventions

This section contains a list of conventions used in text.

Service Hose Couplers and Panel Valves

References in text to opening and closing the service hose couplers assume:

- Counterclockwise closes the valves, and
- Clockwise opens the valves.

References in text to opening and closing the panel valves assume:

- Valve pointed up closes the service hose passage, and
- Valve pointed to the left or right opens the service hose passage.


Check Note

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

Example:

- ✓ For additional information refer to *Connecting Service Hoses to the 1090ST™ Unit* and *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 a recovery tank during unit operation. For additional information refer to *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 the 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 moderate or minor injury to the operator or to bystanders.

Some safety messages also contain visual symbols with signal words.

Example:

WARNING



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. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

Engine systems that malfunction can cause injury.

Terms

Use the following definitions as a foundation to help understand your **1090ST™** unit's processes and/or components.

Virgin Tank

A refrigerant tank, disposable or refillable, that contains new refrigerant. When empty, a disposable virgin tank must be evacuated and cannot be refilled. Dispose of this 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 your **1090ST™** unit, refrigerant is filtered and dried before reaching the recovery tank. Once in the recovery tank, it is ready for reuse.

Recover

The process of removing refrigerant from a system to prevent release of refrigerant into the atmosphere. On your **1090ST™** unit, this process also recycles the refrigerant for reuse.

Recycle

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

Using This Manual

- ✓ Your **1090ST™** unit is a single pass unit. This means refrigerant is filtered and dried before reaching the recovery tank. Once in the recovery tank, it is ready for reuse. There is no separate "recycle" process to perform.

Evacuate

The process of drawing a vacuum on a refrigerant system to remove air and moisture. On your **1090ST™** unit, this process is known as vacuum.

Charge

The process of filling an air conditioning system with refrigerant.

Purging

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

Stable Scale

The situation where the reading from the refrigerant weight measuring device is steady. Moving your **1090ST™** unit causes the liquid refrigerant to slosh around in the recovery tank, resulting in an unsteady scale reading. Avoid moving your **1090ST™** unit before taking scale readings.

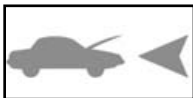
Panel Valves and Symbols

- ✓ Never open panel valves until prompted by the LCD display.



OFF Low-Side

Left panel valve pointed towards this symbol indicates the blue, low-side service hose passage is closed to unit operations while still registering vehicle A/C system pressure on the gauge.



CHARGE Low-Side

Left panel valve pointed towards this symbol indicates refrigerant being charged through the low-side service hose.



RECOVER/VACUUM Low-Side

Left panel valve pointed towards this symbol indicates system being recovered or evacuated through the low-side service hose.



OFF High-Side

Right panel valve pointed towards this symbol indicates red, high-side service hose passage is closed to unit operations while still registering vehicle A/C system pressure on the gauge.



CHARGE High-Side

Right panel valve pointed towards this symbol indicates refrigerant being charged through the high-side service hose.



RECOVER/VACUUM High-Side

Right panel valve pointed towards this symbol indicates system being recovered or evacuated through the high-side service hose.

Introduction

Use your **1090ST™** unit on automotive air conditioning systems to:

- Recover,
 - Remove refrigerant from vehicle,
- Recycle,
 - Filter, dry and store recovered refrigerant in a refillable tank,
- Evacuate,
 - Remove air and moisture from air conditioning system using a vacuum to draw the system into a deep vacuum, and
- Recharge,
 - Refill the air conditioning system with a specified amount of refrigerant.

Your **1090ST™** unit is a single pass design. This means recovered refrigerant is filtered and dried before entering the recovery tank. Refrigerant in the tank is always ready for use. Refer to *Recovering Refrigerant From Vehicle*. There is no need to perform a separate recycle function. Recover, evacuate and recharge functions are performed semi-automatically.

This manual applies to the following **1090ST™** models:

Model Number	Refrigerant Type	Voltage
EEAC721A (w/vacuum pump)	R-134a	120 VAC 60 cycles
EEAC722A (w/vacuum pump)	R-134a	230 VAC 50 cycles

- ✓ **WARRANTY IS VOID IF:**
 - Refrigerant other than R-134a is recycled, or
 - Refrigerant oil other than PAG, ESTHER or POE is recycled.

Your **1090ST™** unit includes:

- A Liquid Crystal Display (LCD) and four buttons to control operation,
- Integral gauge set and manual control valves with service hoses, fittings, and adapters,
- A 50 pound capacity recovery tank and electronic scale,
- Master filter/dryer with automatic replacement reminder,
- An oil drain bottle, and
- An oil injection bottle.

- ✓ The recovery tank is temperature-monitored to maintain accurate purging of non-condensable gases under all conditions.

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 (CCL₂F₂), 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 (CH₂FCF₃), 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

WARNING



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

WARNING

- Use your *1090ST™* unit 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 your *1090ST™* unit to remove refrigerant from air conditioning systems.
- Read, understand and follow *Safety Information* in the front of this manual.

IMPORTANT

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

Refrigerant Substitute Warning

WARNING



- **Do not use your 1090ST™ unit or any 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 the customer about previous service,
- Be aware of any unfamiliar odor from the system,
- Do not use any leak detector equipment,
- 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 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

WARNING



Risk of irritation of mucous membranes.

- **Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses. If any refrigerant gets into the 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 View

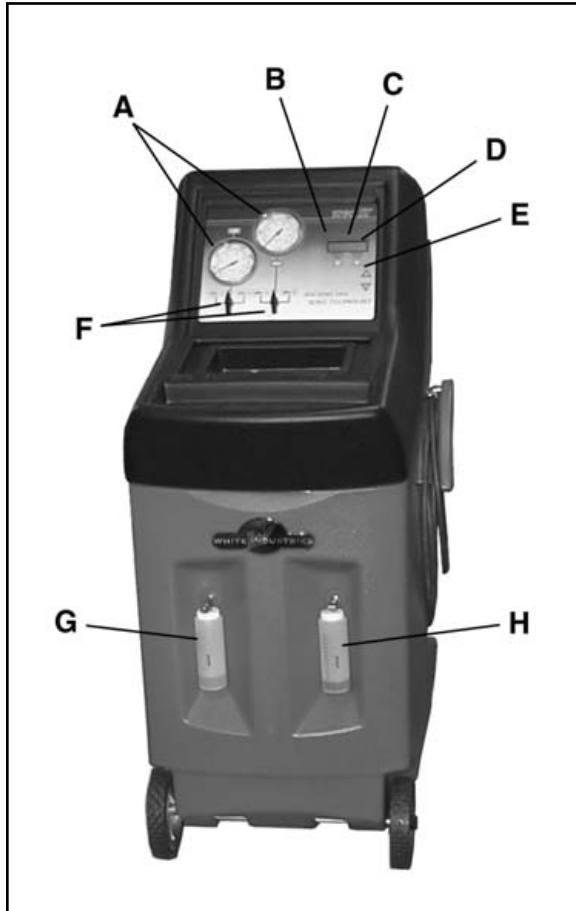


Figure 1: Front View

✓ DO NOT lift the **1090ST™** unit by top plastic cover.

A – Integral Gauge Set

High and low pressure, panel mounted gauge set for monitoring vehicle A/C system pressures.

B – Control Panel

Houses display screen, indicator light and control buttons.

C – LED Light

- Lights when the unit is first turned ON,
- Lights to indicate end of evacuation, and
- Blinks to indicate error conditions.

D – Liquid Crystal Display (LCD) Screen

Displays alpha-numeric information and key labels. Shows charged, recovered amounts or chargeable weight of the recovery tank. Also indicates software version, “Tank Full”, and “Tank Empty” conditions.

E – Control Buttons

Four buttons are used to enter information and control the **1090ST™** system operation:

- UP and DOWN buttons are used to select menu options on the screen.
- Two buttons with variable functions depending on the screen display.

F – Two Panel Valves

Used to select OFF, CHARGE, or RECOVER/VACUUM. Right panel valve opens and closes the high-side service hose passage to your **1090ST™** unit. Left panel valve opens and closes the low-side service hose passage to your **1090ST™** unit.

G – Oil Injection Bottle with Button (left side)

Used to inject oil back into the vehicle A/C system.

H – Oil Drain Bottle (right side)

Used to measure the amount of recovered oil.

Back View

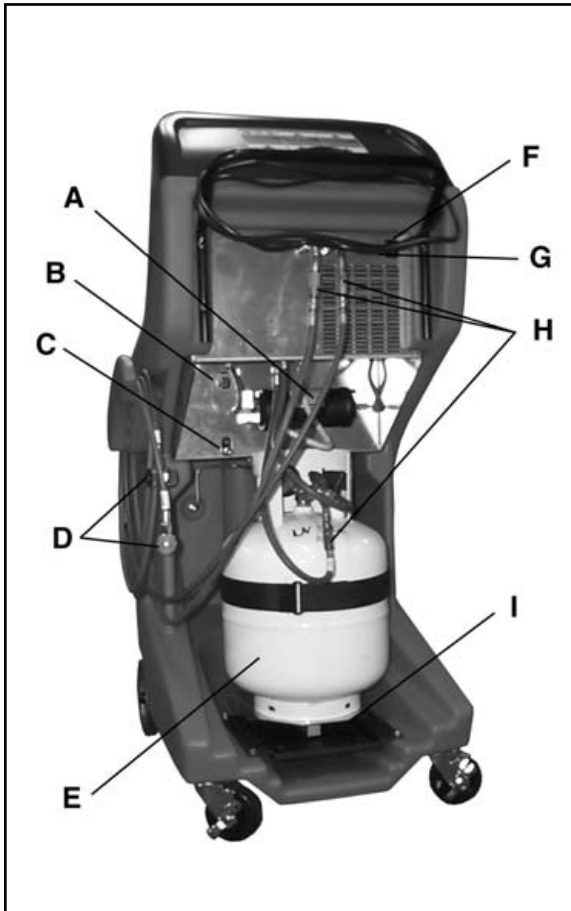


Figure 2: Back View

A – Master Filter/Dryer

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

B – Vacuum Pump Oil Level Sight Glass

Vacuum pump oil level should be in the middle of the sight glass.

C – Vacuum Pump Oil Drain

D – Service Port, High-Side

For connecting to high pressure side of vehicle A/C system.

Service Port, Low-Side

For connecting to low pressure side of vehicle A/C system.

E – Recovery Tank

Holds refrigerant from a vehicle A/C service and supplies refrigerant for charging.

F – Power Switch

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

G – Power Entry Module

H – Particle Filters (3)

I – Scale

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

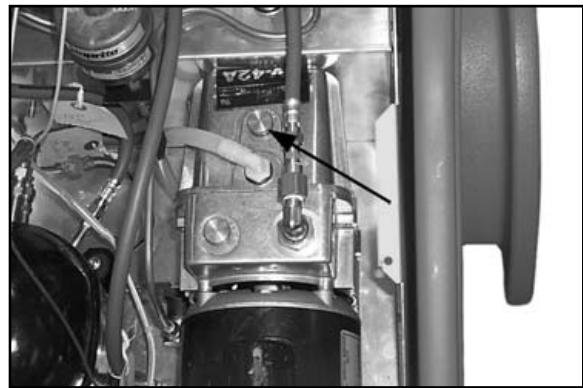


Figure 3: Vacuum Pump Fill Port

Vacuum Pump Fill Port

Located inside the unit under the control panel.

R-134a Accessories

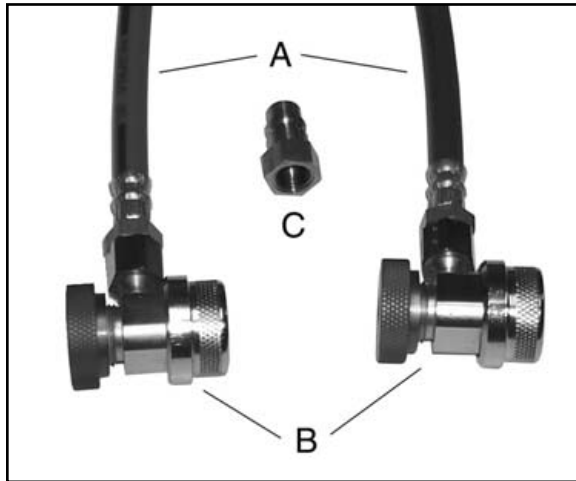


Figure 4: R-134a Accessories

A – Service Hoses

Red and blue hoses with shut-off adapters for your **1090ST™** unit to connect to the vehicle. For additional information refer to *Connecting Service Hoses to the 1090ST™ Unit* and *Connecting Service Hoses to Vehicle*.

B – Auto Shut-off Adapters (Couplers)

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

C – Low-Side Adapter Fitting

Adapter, part number 1-15080, to connect low-side service hose to a refrigerant tank for adding refrigerant to the **1090ST™** unit or for new tank preparation.

Specifications

General

Power

120 VAC, 60 Cycles, 8 amps maximum
230 VAC, 50 Cycles, 4 amps maximum

Shipping Weight

EEAC721A — 200 lbs (90.72 kg)
EEAC722A — 200 lbs (90.72 kg)

Dimensions

Depth 31"
Height 51.5"
Width 23"

Operating

Operating Temperature Range

50–120°F (10–49°C) ambient

Relative Humidity

Up to 80%, non-condensing

Maximum Operating Pressure

450 psi

Pressure Range

30 inHg–400 psi

Single Refrigerant Charge Amount

0–15 lbs (4.999 kg)

Vacuum Pump

1.5 cfm Rotary Vane

Recovery Rate

1 pound/minute, Maximum

Storage

Storage Temperature Range

-4–140°F (-20–60°C) ambient

Relative Humidity

Up to 80%, non-condensing

Capacities

Refrigerant Charge Amount

0–42 lbs (19.05 kg)

Recovery Amount

0–45 lbs (20.41 kg)

Recycled Refrigerant Tank

50 lb with purge port

Installation and Operation

Use the information in this chapter to:

- Prepare your **1090ST™** unit for initial use,
- Recover vehicle refrigerant,
- Create a vacuum before recharging, and
- Recharge with recycled refrigerant.

Install the handle onto the back of the unit using the four screws included.

Connecting Service Hoses to the 1090ST™ Unit

Use the following procedure to connect service hoses to your **1090ST™** unit.

WARNING



- Do not use your **1090ST™** unit or any 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.
- Refer to *pages 1-5*.

- ✓ Confirm refrigerant type in vehicle, and use the appropriate connections on the unit.
- ✓ Always lubricate rubber gaskets and seals at hose connections with fresh refrigerant oil before connecting.

1. Rotate coupler knobs fully CCW (closed).
2. Attach other end of red hose to upper, red labeled (high-side) port on the back panel of the **1090ST™** unit, if not already installed.
3. Attach other end of blue hose to lower, blue labeled (low-side) port on the back panel of the **1090ST™** unit, if not already installed.

Preparing and Installing Recovery Tank

The recovery tank is shipped with a dry air charge. The charge must be vented and the tank evacuated before use. Use the following procedure to evacuate the dry air from the recovery tank and install it in your **1090ST™** unit.

- ✓ Tighten hose connections finger tight, including master filter/dryer connections. Use electronic leak detector to insure connections are leak free.

WARNING



- Do not use any tank with this equipment other than part number EAA0253L72A. 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.

IMPORTANT

Vent and evacuate the recovery tank before first use. An unprepared tank can cause compressor burnout.

- ✓ 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.

Tank Preparation

Follow this procedure to install a new recovery tank in your **1090ST™** unit. New recovery tanks are charged with dry air which must be vented before using.

WARNING



- **Wear safety goggles, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.**
- **Cover the liquid hand valve port with a shop towel to help prevent debris from becoming projectiles.**
- **Read, understand and follow *Safety Information* in the front of this manual.**

1. Vent dry air by slowly opening liquid hand valve on the recovery tank.
2. Gently set the recovery tank on the scale with the hand valves up, facing the back of the unit.
3. Place the velcro strap securely around the recovery tank.

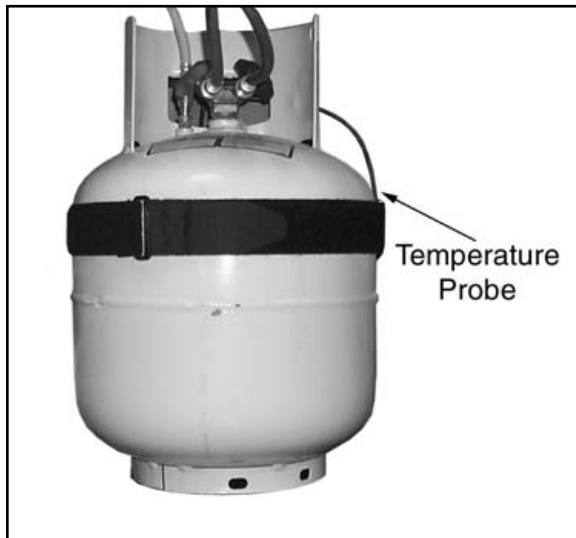


Figure 5: Recovery Tank and Temperature Probe

- ✓ Use only the 50 pound capacity recovery tank supplied with your **1090ST™** unit or one indicated by the warning label on the back of the unit. Inaccurate refrigerant amount may display if the correct tank is not used. Using any other type or capacity tank could create the danger of explosion and potential for personal injury.

4. Connect tank adapter, part number 1-15080, to liquid port of recovery tank.
5. Connect blue service hose from low-side port of the **1090ST™** unit to installed tank adapter.
6. Open the following:
 - Liquid recovery tank valve, and
 - Blue service hose coupler (CW).
7. Turn both panel valves to OFF.

- ✓ Never open panel valves until prompted by the LCD display.

8. Connect the power cord to the proper wall outlet with the correct voltage for the unit. For additional information refer to *Power Up* in this chapter and *Specifications*.
9. Turn power switch ON. The following screens will display:
 - Software Version screen, and
 - Main Menu screen.

- ✓ In the unlikely event the LCD screen is unreadable or a different language is displayed upon power up, adjust LCD contrast or change language selection. Refer to *Adjusting LCD Contrast* or *Accessing Language* in this chapter.

10. Select VACUUM and press ENTER, the following message displays:

OPEN PANEL VALVES

VACUUM

TIMER xx:xx

UP/DOWN TO ADJUST TIME

Press UP/DOWN buttons to adjust time to desired value.

11. Turn the left, low-side panel valve to VACUUM, press START.
12. Monitor the low side panel gauge until a minimum of 25 inHg of vacuum is reached.
13. Close the following:
 - Liquid recovery tank valve, and
 - Blue service hose coupler (CCW).
14. Press EXIT and the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.

15. Turn the left, low-side panel valve to OFF and press NEXT.
16. Remove the blue service hose from the tank. Remove the tank adapter 1-15080.
17. Identify the yellow hose leading from the bottom of the unit. Connect the hose end to the tank purge port. Rotate the tank so the valves face towards the back of the unit.
18. Identify the red hose leading from the bottom of the unit. Connect the hose end with the anti-blowback valve to the liquid tank port.
19. Open the liquid recovery tank valve.
20. Identify the blue hose leading from the bottom of the unit. Connect the hose end with the anti-blowback valve to the vapor tank port.
21. Open the vapor recovery tank valve.
22. Connect tank adapter, part number 1-15080, to port of virgin refrigerant tank.
23. Connect the blue service hose from low-side port of the **1090ST™** unit to installed tank adapter.

- ✓ Position the virgin tank with the valve up. Do not use the virgin tank with the valve underneath the tank.
- ✓ Do not recover liquid refrigerant from a supply tank.

24. Open the following:
 - Virgin tank hand valve, and
 - Blue service hose coupler (CW).
25. Select RECOVER and press ENTER, the following message displays:

OPEN PANEL VALVES

RECOVER

AMOUNT RECOVERED

xx lb xx oz

26. Turn the left, low-side panel valve to RECOVER, press START.

- ✓ Never open panel valves until prompted by the LCD display.

The refrigerant flows from the virgin tank through your **1090ST™** unit and into the prepared recovery tank.

- ✓ A minimum of 6 lbs. of refrigerant needs to be in the recovery tank before a charge operation can be accomplished. Refer to *Tank Full/Empty*.

27. When the desired amount of refrigerant has been transferred into the recovery tank, close the virgin tank hand valve.

WARNING



Risk of expelling refrigerant under pressure.

- **Always close the tank valves before removing the hoses or fittings.**
- **Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses. If any refrigerant gets into the eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.**
- **Prevent refrigerant from contacting the skin.**

Expelled refrigerant can cause injury.

28. Allow the recover/recycle operation to run until display indicates FINISHED. Then close the blue service hose coupler.

29. Press EXIT when complete, the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.

30. Turn the left, low-side panel valve to OFF and press NEXT, the following messages display:

PLEASE WAIT . . .

.

OIL DRAIN

RECORD AMOUNT

.

PLEASE WAIT . . .

- ✓ Discard refrigerant oil in accordance with local, state and federal regulations that apply in your area.

After purging, the **1090ST™** unit will display Main Menu.

Power Up

Refer to this section to understand the power up sequence of the **1090ST™** unit.

1. Connect the power cord to the proper wall outlet with the correct voltage for the unit. For additional information refer to *Specifications*.
2. Turn power switch ON.
3. The **1090ST™** unit will power up. The following screens will appear in order:
 - Software Version screen:

White Industries
1090ST
Software Rev
(C)2002 White Ind.

— Main Menu screen with default arrow position:

→ RECOVER	• CHARGE
• VACUUM	• SET-UP

(ENTER) (AMOUNTS)

- ✓ In the unlikely event the LCD screen is unreadable or a different language is displayed upon power up, adjust LCD contrast or change language selection. Refer to *Adjusting LCD Contrast* or *Accessing Language* in this chapter.

Accessing Set-Up

Adjusting LCD Contrast

Use the procedure in this section to adjust the contrast on the LCD screen, with or without being able to read the screen.

1. Power up the **1090ST™** unit.
 - ✓ Wait until red LED is OFF.
2. Press UP button once to select SET-UP from the Main Menu and then press ENTER, the left button under the LCD display.
3. Select CONTRAST from the Set-Up Menu, press ENTER.

— CONTRAST will be the default selection when the Set-Up Menu screen displays:

→ CONTRAST	• LBS/KG
• LANGUAGE	• - - -
• FILTER	• - - -

(ENTER) (EXIT)

4. Press ENTER a second time to automatically reset LCD contrast to default settings, or press UP button to lighten contrast or DOWN button to darken it.
5. Press EXIT twice to return to Main Menu.

Accessing Language

Use the procedure in this section to change the language selection of the **1090ST™** unit.

1. Power up the **1090ST™** unit.
 - ✓ Wait until red LED is OFF.
2. Press UP button once to select SET-UP from the Main Menu and then press ENTER, the left button under the LCD display.
3. Press DOWN button once to select LANGUAGE from the Set-Up Menu, press ENTER.

• CONTRAST	• LBS/KG
→ LANGUAGE	• - - -
• FILTER	• - - -

(ENTER)	(EXIT)

4. Press UP or DOWN button to scroll through language selections.
5. Press SAVE/EXIT to select a language.

Accessing Master Filter/Dryer Reset

Use the procedure in this section to reset the automatic reminder monitor for the master filter/dryer.

- ✓ This procedure should only be done when the master filter/dryer is replaced.

1. Power up the **1090ST™** unit.
 - ✓ Wait until red LED is OFF.
2. Select SET-UP from the Main Menu, press ENTER.
3. Select FILTER from the Set-Up Menu, press ENTER.
4. Press RESET button.
5. Press CONFIRM to reset the master filter/dryer reminder monitor.

Accessing Units of Weight

Use the procedure in this section to change the refrigerant unit of weight measurement.

1. Power up the **1090ST™** unit.
 - ✓ Wait until red LED is OFF.
2. Select SET-UP from the Main Menu, press ENTER.
3. Select lbs/kg from the Set-Up Menu, press ENTER.
4. Press UP or DOWN button to scroll through lb-oz, lb, kg or oz.
5. Press SAVE/EXIT to select a unit of measurement.

Operation

This section contains:

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

After performing all of the installation procedures, follow these recommended vehicle service procedures before using your **1090ST™** unit for A/C work.

⚠ WARNING



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

IMPORTANT

- Close the tank valves when not using your **1090ST™** unit. Leaving tank valves open may result in refrigerant loss from tank.
- Do not use your **1090ST™** unit outside of the following limits:
 - Warmer than 120°F (49°C),
 - Colder than 50°F (10°C), and/or
 - Relative humidity greater than 80%.
- Stabilize your **1090ST™** unit to a moderate temperature and inspect for abnormalities.
- Contact your **White Industries®** representative before operating if unsure of condition.
- Operating your **1090ST™** unit 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

Successful use of your **1090ST™** unit depends on several external factors. The following information explains these.

Precondition Vehicle

The refrigerant in the vehicle A/C system is recovered faster and more completely when the components are warm.

1. Connect the service hoses to the vehicle, refer to *Connecting Service Hoses to Vehicle* in this chapter.

To efficiently recover refrigerant, the vehicle should be at normal operating temperature. Run the engine until normal operating temperature is reached, with

- The A/C system off, and
 - The hood lowered as much as possible without damaging or crimping the service hoses.
2. 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

Evacuate the vehicle A/C system for a minimum of 30 minutes. This helps ensure vehicle A/C system is free of non-condensable gases (mostly air) and moisture.

- ✓ Sometimes a small amount of refrigerant is left in the vehicle A/C system that is not practical to recover. If recovery time is too short or if vehicle components are cold, this parasitic refrigerant can expand during a vacuum hold cycle or a leak test, and falsely report a leak condition that does not exist.

Follow Vehicle Manufacturer's A/C Service Procedures

When charging, a slow charge condition may occur due to pressure equalization between your **1090ST™** unit and the vehicle A/C system. Finish charging by:

- Turn the panel valves to OFF,
- Starting the engine,
- Turning the A/C system ON,
- Turn the left, low-side panel valve to CHARGE, and
- The charge will stop when the programmed amount of refrigerant is reached.

- ✓ Never open panel valves until prompted by the LCD display.
- ✓ Never operate the vehicle A/C system with the high-side panel valve open.
- ✓ It is the technician's responsibility to be familiar with vehicle manufacturer recommended service procedures.

Connecting Service Hoses to Vehicle

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

1. Connect the red, high-side service hose from the **1090ST™** unit to the high-side service port on the vehicle.
2. Connect the blue, low-side service hose from the **1090ST™** unit to the low-side service port on the vehicle.

✓ If the vehicle has more than one low-side service port, use the service port closest to the evaporator.

3. Open the service hose couplers.
 - Refer to the vehicle manufacturer's service manual for proper diagnostic procedures and specifications.

Recover/Recycle Refrigerant from Vehicle

✓ Be sure that the vehicle is at normal operating temperature before recovering refrigerant.

1. Open the liquid and vapor recovery tank valves.
2. Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.
3. Select RECOVER and press ENTER, the following message displays:

OPEN PANEL VALVES

RECOVER

AMOUNT RECOVERED

xx lb xx oz

4. Turn both panel valves to RECOVER, press START.

✓ Never open panel valves until prompted by the LCD display.

Refrigerant flows from the vehicle, through your **1090ST™** unit, and into the recovery tank.

The **1090ST™** unit will continue recovering until the low-side manifold gauge indicates a vacuum.

5. If a vehicle A/C system leak is suspected, add a partial charge to the system and leak test with an electronic leak detector to find the leak. Recover refrigerant when done testing.
6. Press EXIT when finished, the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.

7. Turn both panel valves to OFF and press NEXT, the following messages display:

PLEASE WAIT . . .

.

OIL DRAIN

RECORD AMOUNT

.

PLEASE WAIT . . .

8. Any accumulated waste oil expels into the bottle.
9. The amount indicated on the bottle is the amount to add back into the vehicle A/C system when recharging.

✓ Discard refrigerant oil in accordance with local, state and federal regulations that apply in your area.

10. When Main Menu screen appears, close the red and blue service hose couplers.

Purging Non-condensable Gas

- ✓ Purging non-condensable gases is an automatic feature executed by the **1090ST™** unit.

Evacuating A/C System

Use this procedure to remove non-condensable gases and moisture from the vehicle A/C system.

- ✓ Always check the oil level of the vacuum pump before operation. The oil level should be half way up the sight glass. If no oil level is shown, fill the vacuum pump with oil. Run the vacuum pump for several seconds and turn OFF before checking oil level.
1. Open the liquid and vapor recovery tank valves.
 2. Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.
- ✓ If the gauges indicate pressure, recover refrigerant from the service hoses before proceeding. Refer to *Recovering Service Hoses*.
3. Select VACUUM and press ENTER, the following message displays:

OPEN PANEL VALVES

VACUUM

TIMER xx:xx

UP/DOWN TO ADJUST TIME

Press UP/DOWN buttons to adjust time to desired value.

4. Turn both panel valves to VACUUM, press START.

The panel gauges show vacuum increasing.

- ✓ Follow the manufacturer recommendations for evacuation time, usually at least 30 minutes.

When evacuation time is done, LED will light and the following message displays:

FINISHED

5. Press EXIT and the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.

6. Turn both panel valves to OFF.
 7. Monitor the low-side pressure for 5 minutes. Any rise in vacuum indicates a leak in the vehicle system.
- ✓ If the source of the leak cannot be determined, partially charge the system and perform a leak test using an electronic leak detector.
8. When the leak is identified, repeat Recover/Recycle procedure, repair the leak and attempt the Evacuation procedure again.

Evacuation is complete.

Charging A/C System

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

— If there is not enough refrigerant in the recovery tank to charge, refer to *Adding Refrigerant to the 1090ST™ Unit* in this chapter.

1. Open the liquid and vapor recovery tank valves.
2. Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.
3. Select CHARGE and press ENTER, the following message displays:

PRESS ^/v TO SET

CHARGE AMOUNT

xx lb xx oz

(NEXT) (lbs/kg)

4. Press NEXT, the following message displays:

OPEN HIGH-SIDE PANEL VALVE
5. Turn the right, high-side panel valve to CHARGE.
6. Press START, the following message displays:

CHARGE OIL NOW.

PRESS NEXT WHEN

FINISHED.

(NEXT) (EXIT)
7. Press the button on the oil injection bottle, left, until desired amount of oil is charged into the A/C system.
8. Press NEXT to start the programmable A/C charge.

- ✓ When charging, a slow charge condition may occur due to pressure equalization between your **1090ST™** unit and the vehicle A/C system. Finish charging by:
 - Turn the panel valves to OFF,
 - Starting the engine,
 - Turning the A/C system ON,
 - Turn the left, low-side panel valve to CHARGE, and
 - The charge will stop when the programmed amount of refrigerant is reached.

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

9. To monitor the high- and low-side system pressures, always have panel valves in the OFF position. Refer to the manufacturer's specifications for proper operation and diagnosis.
10. Press EXIT when complete, the following message displays:

DO YOU WANT

TO RECOVER

HOSES NOW?

(YES) (NO)

11. If YES, the following message displays:

DISCONNECT HOSES.

SET PANEL VALVES

TO RECOVER.

12. Close the service hose couplers to recover the hoses and press NEXT, the following message displays:

RECOVERING

AMOUNT RECOVERED

xx lb xx oz

13. The recycler will run until a vacuum is reached and then stop.
14. Press EXIT when complete, the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.

15. Turn both panel valves to OFF.
Charge is complete.

Displaying Refrigerant Amount

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

1. Press the AMOUNTS button to obtain RECOVERED and CHARGED amounts.
2. Press the MORE button to obtain TANK amount and FILTER/DRYER percentage.

TANK amount is the total weight of the chargeable refrigerant in the recovery tank. Approximately 3 lbs of refrigerant is needed to meet the quill tube in the tank. This makes the "Tank Empty" point 3 lbs. Any refrigerant over this amount is usable for charging.

FILTER/DRYER percentage is the percentage left before the master filter/dryer needs to be replaced. This percentage number counts down from 100%.

Tank Full/Empty

Messages display when the recovery tank is full or empty.

- ✓ The unit may only be used to charge or evacuate an A/C system when the recovery tank is full.
- ✓ The unit may be used to recover/recycle or evacuate an A/C system when the recovery tank is empty.
- ✓ "Tank Empty" is displayed when the weight in the recovery tank is less than approximately 3 lbs.
- ✓ "Tank Full" is displayed when the Chargeable amount of refrigerant in the recovery tank is above 45 lbs.

Removing Recovery Tank

- ✓ Ensure both valves on the recovery tank are closed.

1. Disconnect the hoses from the recovery tank.
2. Remove the velcro strap on the recovery tank.
3. Gently remove the recovery tank from the scale.

Recovering Service Hoses

Recover the service hoses before removing them from the **1090ST™** unit. Service hoses are not connected to a vehicle during this procedure.

1. Connect the power cord to the proper wall outlet with the correct voltage for the unit. For additional information refer to *Specifications*.
2. Turn power switch ON.
3. Select RECOVER and press ENTER, the following message displays:

OPEN PANEL VALVES

RECOVER

AMOUNT RECOVERED

xx lb xx oz

4. Turn both panel valves to RECOVER, press START.

Refrigerant flows through your **1090ST™** unit, and into the recovery tank.

Service hose recovery is complete when a of vacuum is reached.

5. Press EXIT when FINISHED, the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.

Service hose recovery is complete.

Evacuating Contaminated Service Hoses

- ✓ If contaminated refrigerant or refrigerant other than R-134a is present in service hoses, use separate recover only machine to collect refrigerant.

Adding Refrigerant to the 1090ST™ Unit

Follow this procedure to add virgin or recycled refrigerant to your **1090ST™** unit.

- ✓ The recovery tank should have at least six pounds of refrigerant or the charge procedure may not be completed.
1. Refer to *Preparing and Installing Recovery Tank* in this chapter.
 2. Open the liquid and vapor recovery tank valves.
 - ✓ Install the supplied tank adapter, part number 1-15080, between the tank valve and the blue service hose. The virgin tank should be upright (valve up).
 - ✓ Do not recover liquid refrigerant from a supply tank.
 3. Connect the blue service hose from the **1090ST™** unit to the refrigerant supply tank.
 4. Open the following:
 - Supply tank valve, and
 - Blue service hose coupler.
 5. Connect the power cord to the proper wall outlet with the correct voltage for the unit. For additional information refer to *Power Up and Specifications*.
 6. Turn power switch ON.

7. Select RECOVER and press ENTER, the following message displays:

OPEN PANEL VALVES

RECOVER

AMOUNT RECOVERED

xx lb xx oz

8. Turn the left, low-side panel valve to RECOVER, press START.

The refrigerant flows from the virgin tank through your **1090ST™** unit and into the prepared recovery tank.

- ✓ Monitor the weight on the LCD display until the desired amount of virgin refrigerant has been transferred. Refer to *Tank Full/Empty*.
9. When the desired amount of refrigerant has been transferred into the recovery tank, close the virgin tank hand valve.
 10. The recycler will run until a vacuum is reached and will stop, then close the blue service hose coupler.
 11. Press EXIT when complete, the following message displays:

CLOSE PANEL VALVES

THEN PRESS NEXT.
 12. Turn the left, low-side panel valve to OFF and press NEXT, the following messages display:

PLEASE WAIT . . .

.

OIL DRAIN

RECORD AMOUNT

.

PLEASE WAIT . . .

13. Any accumulated waste oil expels into the bottle.

- ✓ Discard refrigerant oil in accordance with local, state and federal regulations that apply in your area.

After purging, the **1090ST™** unit will display Main Menu.

Errors and Messages

Error messages will flash on the bottom line of LCD screen and the LED will flash until conditions are corrected.

Temperature Error

Temperature errors can occur when the **1090ST™** unit is operating outside its normal temperature range or a temperature probe is damaged. If this should occur, the compressor will shut down. Warm the **1090ST™** unit to normal operating temperature, turn unit OFF and then ON. If the temperature error is still present, call service.

Pressure Switch Error

A pressure switch error can occur when internal excessive pressure is seen. This high pressure will be seen if the hand valves on the recovery tank is closed or the hoses on the recovery tank are not installed or tight. While in recovery, if this should occur, the compressor will shut down. Open the tank valves or install or tighten the hose fittings on the recovery tank to alleviate the pressure and restart recovery sequence.

High Pressure Error

A high tank pressure error can occur if air pressure in the recovery tank reaches 350 psi. This high pressure will be seen if there is excessive air in the recovery tank due to vehicle A/C system having a leak. If this should occur, turn both panel valves to OFF and press EXIT. Ignore oil drain prompt, press NEXT to allow the **1090ST™** unit to purge and fix vehicle A/C system leak.

Tank Empty

A weight error will occur if one of these conditions arises:

- The tank is empty or below 3lbs in the tank, or
- The scale circuitry malfunctions.

If this should occur:

- Add refrigerant to recovery tank, or
- Call service to repair the scale circuitry.

Tank Full

A full tank message will occur if one of these conditions arises:

- A full recovery tank weight is seen, or
- The scale circuitry malfunctions.

If this should occur:

- Empty a portion of the recovery tank into a certified tank,
- Replace the recovery tank, or
- Call service to repair the scale circuitry.

No Tank Present

A no tank message will occur if one of these conditions arises:

- There is no tank on the scale, or
- The scale circuitry malfunctions.

If this should occur:

- Replace the recovery tank, or
- Call service to repair the scale circuitry.

Replace Filter

A replace filter message will occur when master filter/dryer percentage has expired. When this occurs, replace the master filter/dryer and reset the automatic reminder monitor, refer to *Accessing Master Filter/Dryer Reset*.

Maintenance

Use this chapter to maintain your **1090ST™** units':

- Master filter/dryer,
- Vacuum pump, and
- When storing the 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 needed at the beginning and end of a recover/recycle or charge program. Do not lean on or move the unit at these times.
- ❑ Never attempt to change the recovery tank while your **1090ST™** unit is in use.
- ❑ Always recover the service hoses before disconnecting them from your **1090ST™** unit. For additional information refer to *Recovering Service Hoses*.
- ❑ Never drop the recovery tank onto the scale. This may damage the scale assembly.
- ❑ Always oil the seals before connecting to any tank, filter or fitting. A leaky connection or no-flow condition may result if the connection is assembled dry.
- ❑ Always close all recovery tank valves, clockwise, when your **1090ST™** unit is not in use.

Master Filter/Dryer

Change the master filter/dryer when the filter percentage monitor has diminished to 0% since the last master filter/dryer change. Replacement of the master filter/dryer will also be indicated by the flashing of the LED and the REPLACE FILTER message on the LCD screen. The filter monitor has a reset of 95 lbs. During the course of recycling, this number decreases until it reaches zero. When zero is reached, the master filter/dryer needs to be replaced and the monitor reset. Refer to *Resetting Master Filter/Dryer Monitor* or *Accessing Master Filter/Dryer Reset*. Recovered refrigerant quality may be compromised if the filter is not replaced when required.

Changing the Master Filter/Dryer

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

WARNING



- **Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses. If any refrigerant gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.**
 - **Do not remove the master filter/dryer while under pressure. Perform the maintenance procedure for removing the master filter/dryer in this section.**
 - **Prevent refrigerant from contacting the skin.**
 - **Read, understand and follow *Safety Information* in the front of this manual.**
1. Evacuate service hoses by recovering if necessary and pulling a vacuum. For additional information refer to *Recovering Service Hoses*.
 2. Turn OFF power to the **1090ST™** unit and remove power cord from wall outlet.
 3. Unscrew the two hose fittings from the master filter/dryer.

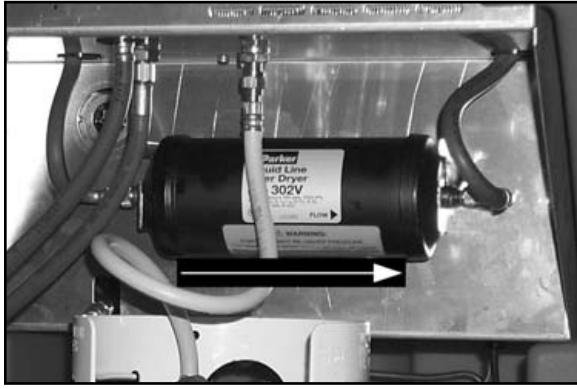


Figure 6: Master Filter/Dryer

4. Remove the master filter/dryer from its bracket.
 - ✓ Dispose of the filter according to local, state and federal regulations that apply in your area.
5. Lightly oil hose seals and install a new master filter/dryer, matching the direction of FLOW on the filter with the flow decal on the cabinet.
6. Attach the hose fittings hand tight.
7. Reset master filter/dryer percentage monitor.

Resetting Master Filter/Dryer Monitor

Use the procedure in this section to reset the automatic reminder monitor for the master filter/dryer.

- ✓ This procedure should only be done when the master filter/dryer is replaced.
1. Power up the **1090ST™** unit.
 - ✓ Wait until red LED is OFF.
 2. Select SET-UP from the Main Menu.
 3. Select FILTER from the Set-Up Menu.
 4. Press RESET button.
 5. Press CONFIRM to reset the master filter/dryer reminder monitor.

Maintaining the Vacuum Pump

Checking Vacuum Pump Oil Level

1. Look through oil level sight glass to verify vacuum pump oil level.

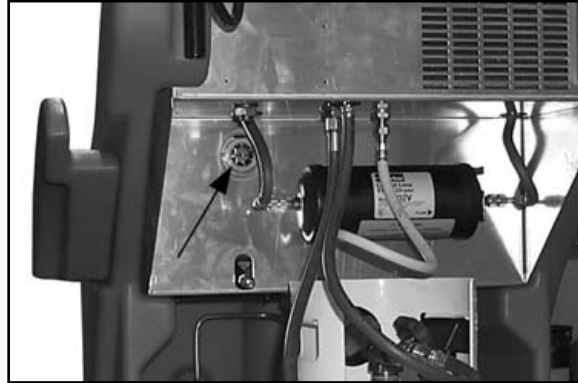


Figure 7: Oil Level Sight Glass

2. Oil level should appear to be in the middle of the sight glass.
3. If oil level is low, add oil to vacuum pump, refer to *Adding Oil to Vacuum Pump*.

Adding Oil to Vacuum Pump

Follow this procedure to add oil to the vacuum pump.

1. Turn OFF power to the **1090ST™** unit and remove power cord from wall outlet.
2. Remove all screws located around the lower edge of the plastic top cover.
3. Gently lift the plastic top cover off the unit.
4. Lift the hinged control panel up and lay towards the back of the unit.
5. Remove oil fill screw cap.

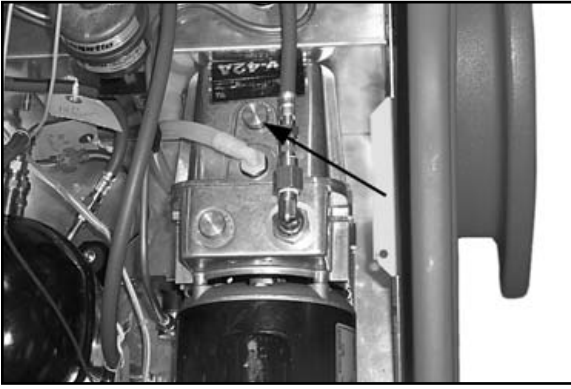


Figure 8: Vacuum Pump Fill Cap

6. Add oil to vacuum pump fill port until the oil is visible halfway up the sight glass.
7. Install the oil fill screw cap.
8. Replace control panel to original position.
9. Replace plastic top cover and screws.

Changing Vacuum Pump Oil

The vacuum pump contains approximately 19.5 oz. of oil. The oil must be changed at least every 6 months. The oil may have to be changed earlier if the oil is no longer clear when viewed through the sight glass.

1. Turn OFF power to the **1090ST™** unit and remove power cord from wall outlet.

WARNING



- **Wear safety goggles and protective gloves, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses. If any refrigerant gets into eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.**
 - **Prevent refrigerant from contacting the skin.**
 - **Read, understand and follow *Safety Information* in the front of this manual.**
2. Put a container under the oil drain tube of the vacuum pump.
 3. Remove the oil drain screw cap and drain oil.

- ✓ Discard refrigerant oil in accordance with local, state and federal regulations that apply in your area.

4. Install the oil drain screw cap.
5. Refill vacuum pump with oil, refer to *Adding Oil to Vacuum Pump*.

Storing the **1090ST™** Unit

Follow this procedure when storing your **1090ST™** unit for prolonged periods (3 months or more) of time.

- ✓ Storage temperature should not exceed the limits of -4° to 140°F.

1. Change the vacuum pump oil. Refer to *Changing Vacuum Pump Oil* procedure.
2. Close both hand valves on the recovery tank.
3. Remove the yellow hose from the recovery tank.
4. Close both service hose couplers.
5. Turn both panel valves to OFF.

Troubleshooting

Symptom	Possible Cause	Remedy
Machine does not turn on	<ul style="list-style-type: none">• Power cord not plugged in• Power switch OFF• No power in A.C. outlet	<ul style="list-style-type: none">– Plug in the power cord– Turn power switch ON– Check power source
Refrigerant not being removed from vehicle	<ul style="list-style-type: none">• Hand valves on tank not open• Panel valves or service hose couplers not open• Recovery tank full	<ul style="list-style-type: none">– Open hand valves– Open panel valves or couplers– Change tank or Charge refrigerant
Excessive purging of non-condensable gases	<ul style="list-style-type: none">• Fitting(s) not properly connected to master filter/dryer• Leaky service hose or adapter connection drawing in air	<ul style="list-style-type: none">– Tighten fitting(s) finger tight– Tighten fittings or replace seals in finger tight fittings
Does not charge	<ul style="list-style-type: none">• Liquid hand valve on recovery tank not open• Fitting not properly connected to recovery tank• No refrigerant in tank• Leak in vehicle system• Service hose couplers not open	<ul style="list-style-type: none">– Open liquid hand valve– Tighten fitting finger tight– Fill tank with refrigerant– Repair vehicle system leak– Open couplers
Machine does not draw a vacuum	<ul style="list-style-type: none">• Loose hose connection• Leak in vehicle system	<ul style="list-style-type: none">– Tighten loose hose connections– Repair vehicle system leak
Refrigerant loss 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 either open completely (CCW) or closed completely (CW) and leak test– Oil seal with refrigerant oil and reconnect, or replace fitting, oil seal and reconnect

Symptom	Possible Cause	Remedy
Long recover times	<ul style="list-style-type: none"> • System being recovered 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
Temperature Error	<ul style="list-style-type: none"> • Operating outside normal temperature range • Temperature probe damaged 	<ul style="list-style-type: none"> – Warm to normal operating temperature, turn unit OFF then ON – Call service
Pressure Switch Error (Internal excessive pressure)	<ul style="list-style-type: none"> • Vapor hand valve on recovery tank is closed • Red hose fitting on the recovery tank is not installed, or tight 	<ul style="list-style-type: none"> – Open vapor hand valve on recovery tank – Install or tighten red hose fitting on recovery tank
High Pressure Error (Excessive tank pressure)	<ul style="list-style-type: none"> • Excessive air in tank 	<ul style="list-style-type: none"> – Turn both panel valves OFF, exit out of recovery screen, allow unit to purge, and fix leak
Tank Full	<ul style="list-style-type: none"> • Recovery tank full or overloaded • Scale circuitry malfunctions 	<ul style="list-style-type: none"> – Empty recovery tank – Replace the recovery tank – Call service
No Tank Present	<ul style="list-style-type: none"> • No tank on the scale • Scale circuitry malfunctions 	<ul style="list-style-type: none"> – Install a recovery tank – Call service
Tank Empty	<ul style="list-style-type: none"> • Not enough refrigerant in tank to charge • Scale circuitry malfunctions 	<ul style="list-style-type: none"> – Add refrigerant to recovery tank – Call service
Replace Filter	<ul style="list-style-type: none"> • Master filter/dryer monitor has reached 0% 	<ul style="list-style-type: none"> – Replace master filter/dryer and reset monitor

Replacement Parts

Part Number	Description
1-27280	Service Fitting, Low-Side
1-27180	Service Fitting, High-Side
EAA0253L72A	Recovery Tank, 50 pound

Optional Accessories

EAK0030C01AB	Master Drier Kit
EAK0027C00AS	Vehicle Adapter
.....	Repair Kit (O-rings)
1-15080	Low-Side Adapter Fitting

General

EAK0227L01A	Vacuum Pump Oil Kit
EEAC720AV	Protective Cover

For service or to order replacement parts or optional accessories, contact your **White Industries®** Representative or call 1-800-225-5786.

White Industries Limited Product Warranty

Seller warrants only to the original purchaser (user) that under normal use, care and service, this unit shall be free from defects in material and workmanship for one year from the date of original invoice provided:

1) warranty card and proof of purchase is submitted to the factory within 30 days from date of sale and
2) freight charges are prepaid to the authorized service center*. Gauge calibration, filter elements, light bulbs, hoses, O-rings, gaskets, depressors, tank stems, lost refrigerant or fluid (new or recovered), and all other attachments, supplies and consumables (except as otherwise provided herein) are not warranted.

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 this unit caused by, resulting from or attributable to (A) abuse, misuse or tampering; (B) alteration, modification or adjustment of this unit by other than Seller's authorized representatives; (C) installation, repair or maintenance (other than specified operator maintenance) of this unit or related equipment, attachments, peripherals or optional features by other than Seller's authorized representatives; (D) processing of, or contamination with, materials or chemicals other than those recommended for processing or recycling with this equipment; (E) improper or negligent use, application, operation, care, contamination, cleaning, storage or handling; (F) fire, water, wind, lightning or other natural causes; (G) adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, dust or other air contaminants; radio frequency interference; electric power failure; power line voltages beyond those specified for this unit; unusual physical, electrical or electro-magnetic stress; and/or any other condition outside of Seller's environmental specifications; (H) use of this unit in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller; or (I) failure to comply with any applicable federal, state or local regulation, requirement or specification governing emission analyzers and related supplies or consumables (including, without limitation, filters, printer paper, printer ribbons and calibration gases).

NO OTHER WARRANTIES, EXPRESS, 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 EXCLUDED.

Seller's obligations under this warranty are limited solely to the repair or, at Seller's option, replacement of or refund of the original purchase price for, Equipment or parts which to Seller's satisfaction are determined to be defective and which are necessary, in Seller's judgment, to return this unit to good operating condition. Repairs or replacements qualifying under this Warranty will be performed or made by a factory authorized service center on regular business days during Seller's normal working hours within a reasonable time following Buyer's request and provided: 1) the warranty card and proof of purchase is on file with the manufacturer, 2) if proof of purchase is not on file with the manufacturer, the original purchaser (user) must provide proof of purchase to a factory authorized service center before service is rendered, and 3) freight is pre-paid one way. All requests for warranty service must be made during the stated warranty period.

*** Call 1-800-225-5786 for factory authorized service information.**

Return Goods Authorization (RGA): If the *manufacturer requests* that a product be shipped to its facility, an RGA (Return Goods Authorization) number must be issued prior to shipment, and transportation charges must be prepaid to the factory.

