



OPERATIONS
and
MAINTENANCE
MANUAL

White[®] 1090AT
diagnostic[™]

Refrigerant
Recovery/Recycle/Recharge
Unit

1090AT diagnostic™ User's Manual

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Safety Information

Safety Notice

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

Your **1090AT diagnostic™** 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 technician's responsibility to be knowledgeable of the system that is to be tested. It is essential to use proper service methods and test procedures and to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, or the vehicle or equipment being tested.

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

Before using your **1090AT diagnostic™** unit, always refer to and follow safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested.

Read All Instructions

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

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT

Indicates a situation which, if not avoided, may result in damage to the 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 *1090AT diagnostic™* 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 protective grounding conductor must be connected to a properly grounded A.C. outlet.
- Use proper A.C. outlet for unit to operate correctly. See unit ID plate on back of unit. Extension cords are not recommended. If an extension cord is necessary, then use:
 - 16 AWG for cords up to 50 feet long, and
 - 14 AWG for cords greater than 50 feet but less than 100 feet long.
- Connect power cord to properly grounded outlet.
- Do not remove or bypass the grounding pin.
- 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 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. Perform maintenance procedure for removing master filter/dryer, 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 *1090AT diagnostic™* unit or leak detector equipment if R-12 substitutes are suspected. R-12 refrigerant substitutes may be flammable.

Fire can cause injury.

Safety Information

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 1090AT diagnostic™ unit to remove refrigerant from air conditioning systems.**

Exposure can irritate eyes, nose and throat.

CAUTION

Risk of irritation to mucous membranes.

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

Exposure can irritate eyes, nose and throat.

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 eyes, flush with water and seek a doctor's aid immediately, even though irritation may cease.

Expelled oil can cause injury.

General

WARNING



Risk of tank overfill or rupture.

Do not connect TSD (Tank-full Shutdown Device) to any equipment that is not designed for use with TSD tanks.

Tank overfill or rupture can cause injury.

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



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 moving or hot 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 the one originally provided. 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.

Refrigerant may cause injury.

WARNING

A test vehicle may move if not properly prepared.

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

A moving vehicle can cause injury.

CAUTION

Risk of injury.

This equipment should be operated by qualified personnel.

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

CAUTION

Risk of refrigerant leakage.

Always close the service valves and the control panel valves before disconnecting a hose coupling.

A loosened hose coupling 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 and data entry information are correct and that the test procedure was performed correctly. Refer also to the *Maintenance* and make repairs as required. If test information or results are still suspicious, do not use them for diagnosis. Contact your *WHITE*® Representative.

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

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 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.

SAVE THESE INSTRUCTIONS

Using this Manual

This manual contains instructions for use and setup of the **1090AT diagnostic™** 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®** Sales Representative can determine option availability.

Conventions

This section contains a list of conventions used in text.

Service Hose Couplers

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

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


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 Vehicle*.

Equipment Tips

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


Example:

-  Always oil the seals before connection to any tank, filter or fitting. A leaky connection or no-flow condition may result if the seal is dry.

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 unit.

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 bystanders.

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

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

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 **WHITE 1090AT diagnostic™** unit processes and/or components.

Virgin Tank

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

Recovery Tank

A refrigerant tank designed to store refrigerant removed from a virgin tank or recovered from a vehicle. On your **1090AT diagnostic™** unit, refrigerant is filtered and dried before reaching the recovery tank. Once in the recovery tank, it is ready for reuse.

Recycle

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

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

Recover

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

Evacuate

The process of drawing a vacuum on a refrigerant system to remove air and moisture. On your **1090AT diagnostic™** 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.

Introduction

Use your **WHITE 1090AT diagnostic™** unit to recover, recycle, evacuate and charge refrigerant on automotive air conditioning systems. Functions may be performed automatically or manually.

When powered up, the **1090AT diagnostic™** unit performs a self-test. Your **1090AT diagnostic™** unit monitors error conditions, and when an error is encountered, displays an appropriate error message.

Your **1090AT diagnostic™** unit is a single pass design. This means recovered refrigerant is filtered and dried before entering the recovered 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.

Your **1090AT diagnostic™** unit includes:

- A Full Graphic Display (240x64 pixel) and 8 buttons to control operation,
- The most popular fittings and adapters,
- Integral gauge set, automatic solenoid valves and service hoses,
- A 50 pound capacity recovery tank to ensure maximum refrigerant storage and accurate charging capabilities, and
 - Recovery tank is temperature-monitored to maintain accurate purging of non-condensable gases (air) under all conditions.
- Master filter/dryer with automatic replacement monitor,
- An oil drain bottle, and
- An oil injection bottle.

This manual applies to the following model:

Model #	Refrigerant Type	Voltage
EEAC720A	R-134a	120 VAC

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

Refrigerant Gases

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

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

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

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

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

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

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

- Refrigerant should 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 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 *1090AT diagnostic™* 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 *1090AT diagnostic™* unit to remove refrigerant from automotive air conditioning systems only.
- Read, understand and follow *Safety Information* in the front of this manual.

IMPORTANT

Tighten all tubing and hose 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 *1090AT diagnostic™* unit or leak detector equipment if R-12 substitutes are suspected. R-12 refrigerant substitutes may be flammable.
- Read, understand and follow *Safety Information* in the front of this manual.

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

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

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

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

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

Refrigerant Oils

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

Refrigerant Oil Safety

⚠ 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 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

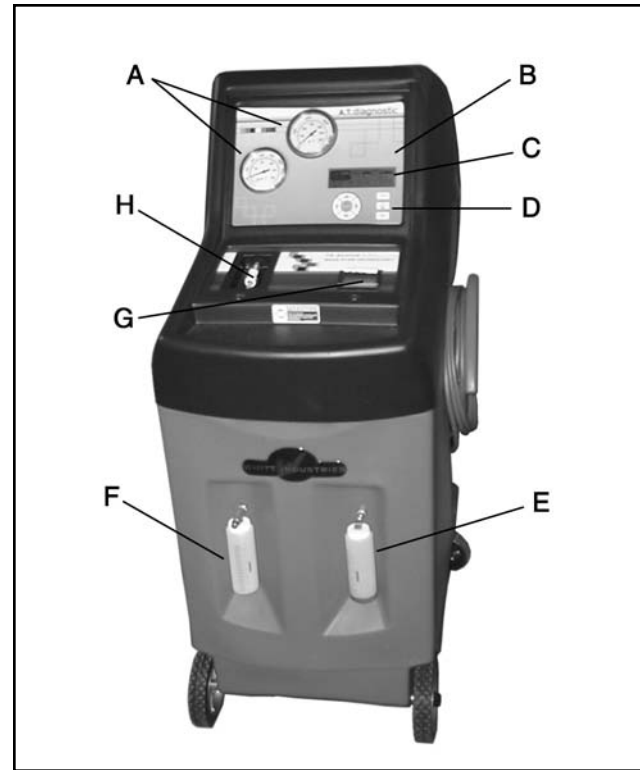


Figure 1: *1090AT diagnostic™* Front View

A — Integral Gauge Set

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

B — Control Panel

Houses graphic display screen and control buttons.

C — Graphic Display Screen

240 x 64 pixel screen.

D — Control Buttons

Eight buttons are used to enter information and control the *1090AT diagnostic™* system operation.

E — Oil Drain Bottle (right side)

Used to measure the amount of recovered oil.

F — Oil Injection Bottle with Button (left side)

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

G — Printer

H — Optional Identifier Filter

Used to protect the identifier from oil. Replace when filter element turns red.

Back View

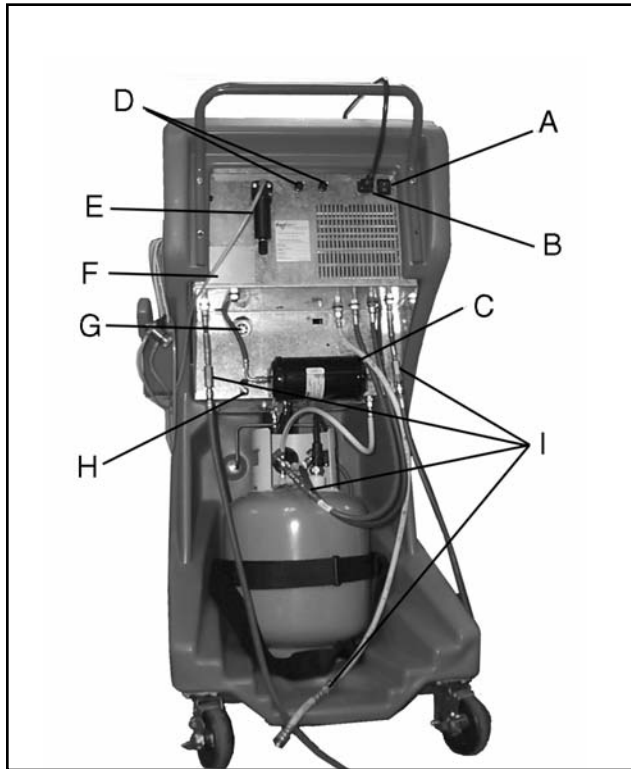


Figure 2: 1090AT diagnostic™ Back View

- A — Power Switch**
Turns power ON and OFF. Must be on (I) for unit operation.
- B — Power Entry Module**
- C — 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*.
- D — Blue Temperature Probe (optional)
Red Temperature Probe (optional)**
- E — Refrigerant Identifier Incoming Oil Separator with Drain Port (optional)**
Removes oil and other contaminants from the refrigerant being identified.
- F — Serial Tag**
- G — Vacuum Pump Oil Level Sight Glass**
Vacuum pump oil level should be in the middle of the sight glass.
- H — Vacuum Pump Oil Drain**
- I — Particle Filters (4)**

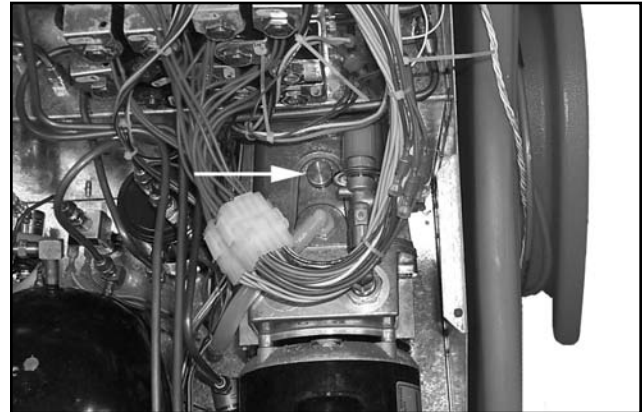


Figure 3: Vacuum Pump Fill Port

Vacuum Pump Fill Port

Located inside the unit under the control panel.

R-134a Accessories

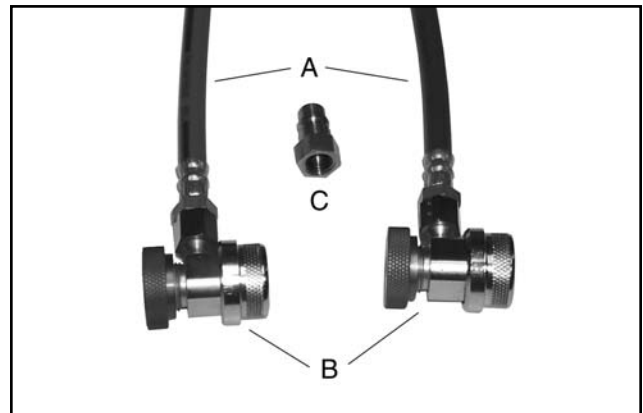


Figure 4: R-134a Accessories

- A — Service Hoses**
Red and blue hoses with shut-off adapters for your 1090AT diagnostic™ unit to connect to the vehicle. For additional information refer to *Connecting Service Hoses to Vehicle*.
- B — Auto Shut-off Adapters (Couplers)**
- Connects to high- and low-side service ports of vehicle.
 - 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 1090AT diagnostic™ unit, for new tank preparation and for evacuating a tank prior to preparing.

Specifications

General

Power
1090AT 120 VAC 1 PH 60 Hz

Shipping Weight
250 pounds

Dimensions
Depth 31"
Height 51.5"
Width 23"

Operating

Operating Temperature Range
50 to 120°F (10.0 to 48.8°C) ambient

Relative Humidity
Up to 80%, non-condensing

Compressor Pressure Range
15 inHg to 450 PSI

Maximum Operating Pressure
450 PSI

Single Refrigerant Charge Amount
0 to 15 lbs (4.999 kg)

Recovery Amount
0 to 45 lbs (20.41 kg) Maximum

Vacuum Pump
1.5 cfm Rotary Vane

Recovery Rate
1 pound/minute, Maximum

Storage

Temperature
-4 to 140°F (-20 to 60°C)

Relative Humidity
Up to 80%, non-condensing

Installation and Operation

Use this chapter to prepare your **White 1090AT diagnostic™** unit for initial use and perform routine recycling, evacuation and charging procedures.

Install the hose wrap to the side of the unit and the handle to the rear of the unit with the hardware supplied in the accessory kit.

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 **1090AT diagnostic™** unit.

WARNING



- Do not use any tank with this equipment other than part number EAA0253L62A. 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 **1090AT diagnostic™** 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 blue 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.

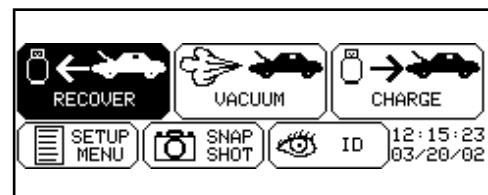
1. Vent dry air by slowly opening blue hand valve on the recovery tank.
2. Gently set the recovery tank in the **1090AT diagnostic™** cabinet with the hand valves up, and the ports facing the back of the unit.
3. Connect the float probe electrical connector to the recovery tank.
4. Place the shorter pair of *Velcro®* straps securely around the recovery tank.

- ✓ Use only the 50 pound capacity recovery tank supplied with your **1090AT diagnostic™** unit or one indicated by the warning label on the back of the unit. Using any other type or capacity tank could create the danger of explosion and potential for personal injury.

Power Up

Refer to this section to understand the power up sequence of the **1090AT diagnostic™** 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 **1090AT diagnostic™** unit will:
 - initialize, and
 - go to main menu screen.



- ✓ In the unlikely event the LCD screen is unreadable upon power up, adjust LCD contrast. Refer to *Adjusting LCD Contrast*.

Setup

After pressing setup, LCD will briefly display all software revisions and then display the setup topics.

Filter Reset

Use the procedure in this section to show the master filter/dryer usage time and to reset the filter timer.

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position > next to FILTER and press ENTER.
Master filter/dryer usage timer will appear.
5. Press Y to reset filter timer to zero. (The filter times out at 20 hours recovery time.) Press N to exit.

Adjusting LCD Contrast

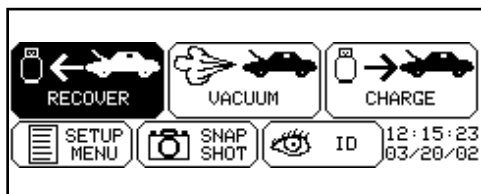
Use the procedure in this section to adjust the contrast on the LCD screen.

Unreadable Display

1. Shut OFF unit.
2. Hold the UP and DOWN arrows while turning the unit ON and then release arrows.
— The unit will automatically cycle through the contrast range.
3. Press N to set the contrast when the screen is acceptable.

Readable Display

1. Power up the **1090AT diagnostic™** unit.
The Main Menu default setting is RECOVER.



2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.

4. Position > next to LCD CONTRAST and press ENTER.

The **1090AT diagnostic™** will automatically cycle through the contrast range.

5. Press N to set the contrast when the screen is acceptable.

Adjusting Altitude

Use the procedure in this section to adjust the altitude reading. Altitude MUST be adjusted to the local altitude level for proper digital vacuum readings and identifier operation and calibration.

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position > next to ALTITUDE and press ENTER.
5. Press UP/DOWN arrows to adjust to your local altitude.
6. Press N to save/exit.

Adjusting Time and Date

Use the procedure in this section to adjust the time and date readout on the LCD display.

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position > next to CLOCK and press ENTER.
5. Press the LEFT/RIGHT arrows to select. Press the UP/DOWN arrows to change.
6. Press N to save/exit.

Adjusting Default Units

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

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position > next to UNITS and press ENTER.

5. Press the UP/DOWN arrows to select measurement.
Press the LEFT/RIGHT arrows to select unit.
6. Press **N** to save/exit.

Report Title Setup

Use the procedure in this section to setup the report title with the shop name, address, and phone number.

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position **>** next to REPORT TITLE and press ENTER.
5. Follow onscreen prompts to add information.

Charge Total

Use the procedure in this section to obtain total charge amount information.

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position **>** next to CHARGE TOTAL and press ENTER.
5. Total refrigerant charge amount since the last reset displays.
 - Follow onscreen prompts to change units of measure.
6. Press **Y** to reset charge total to zero.
7. Press **N** to exit.

Tank Setup

PERFORM THIS PROCEDURE AFTER EVACUATING RECOVERY TANK as explained in the next section.

Use the procedure in this section to finish preparing a new recovery tank before adding a sufficient amount of refrigerant for a charge operation.

- ✓ The recovery tank must be fully evacuated to perform this function, refer to *Tank Preparation*.
 - Recovery and virgin tank hoses must be installed.
 - Virgin tank must be installed with valve down.
 - All tank valves must be open.

1. Power up the **1090AT diagnostic™** unit.
2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
3. Press ENTER.
4. Position **>** next to TANK SETUP and press ENTER.
5. Follow onscreen prompts.
6. Press **Y** to continue.
Press **N** to exit.

- ✓ The **1090AT diagnostic™** unit will transfer a sufficient amount of refrigerant to the recovery tank to allow charging from the virgin tank only. There must be approximately 12 lbs of refrigerant in the recovery tank before charging is allowed from the recovery tank.

Evacuating Recovery Tank

1. Connect tank adapter, part number 1-15080, to liquid port of recovery tank.
2. Connect the blue hose, from low-side service coupler to the installed tank adapter.
3. Open the following:
 - Liquid recovery tank valve, and
 - Blue service hose coupler (CW).
4. 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*.
5. Turn power switch ON. The following screens will display:
 - **AT Diagnostic** welcome screen, and
 - Main Menu screen.

- ✓ In the unlikely event the LCD screen is unreadable upon power up, adjust LCD contrast. Refer to *Adjusting LCD Contrast*.

6. Select VACUUM and press ENTER.

7. Use UP/DOWN arrow buttons to adjust time to desired value.
8. Monitor the low-side panel gauge until a minimum of 25 inHg of vacuum is reached.
9. Close the following:
 - Liquid recovery tank valve, and
 - Blue service hose coupler (CCW).
 - Highlight QUIT and press ENTER.
10. Remove the blue service hose from the tank. Remove the tank adapter 1-15080.
11. Identify the short, yellow hose with the Schrader® valve depressor leading from the bottom of the unit. Connect the hose end to the tank purge port.
12. Identify the blue hose marked TANK VAPOR leading from the bottom of the unit. Connect the hose end with the anti-blowback valve to the vapor tank port.
13. Open the vapor recovery tank valve.
14. Identify the red hose marked TANK LIQUID leading from the bottom of the unit. Connect the hose end with the anti-blowback valve to the liquid tank port.
15. Open the liquid recovery tank valve.
16. Connect the yellow hose marked VIRGIN to the virgin tank port and open tank valve.
17. Install the virgin tank to the rear of the recovery tank with valve down to charge liquid refrigerant.
18. Place the longer pair of Velcro® straps securely around the virgin tank.
19. Follow *Tank Setup* instructions in SETUP to add nominal amount of refrigerant to prepared tank.

Basic Sequence of Operation

1. Identify Refrigerant.
 - Optional identifier accessory (mandatory with identifier installed).
2. Check vehicle vent temperature.
 - Optional temperature probe accessory.
3. Display before service snapshot.
4. Printout before service snapshot.
 - Optional printer accessory.
5. Recover vehicle A/C refrigerant.
6. Record and drain refrigerant oil.
7. Repair vehicle A/C system.
8. Evacuate vehicle A/C system.
9. Add refrigerant oil to vehicle A/C system as required.
10. Recharge vehicle A/C system.
11. Display after service snapshot.
12. Printout after service snapshot
 - Optional printer accessory.

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 when using your **1090AT diagnostic™** 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 1090AT diagnostic™ unit. Leaving tank valves open may result in refrigerant loss from tank.**

- Do not use your **1090AT diagnostic™** 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 **1090AT diagnostic™** unit to a moderate temperature and inspect for abnormalities.
- Contact your **White®** representative before operating if unsure of condition.
- Operating your **1090AT diagnostic™** 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 **1090AT diagnostic™** 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.

- ✓ **White Industries** highly recommends identifying refrigerant prior to connecting service hoses to a vehicle A/C system.

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

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 with out 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

- ✓ It is the responsibility of the technician 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.

- ✓ **White Industries** highly recommends identifying refrigerant prior to connecting service hoses to a vehicle A/C system.
- ✓ If the identifier option is installed, it will be necessary to identify the refrigerant to be recovered from the vehicle A/C system before connecting the service hoses to the vehicle.
- ✓ Be sure the vehicle is at normal operating temperature before recovering refrigerant.

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

If desired, a before service snapshot can be taken now and printed if the optional printer accessory is installed.

Recover/Recycle Program

Use this procedure to:

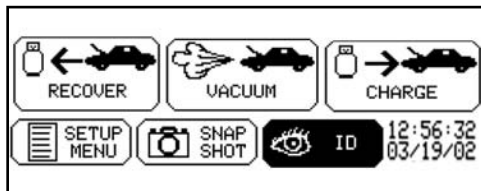
- Recover refrigerant from vehicle,
 - Recycle, and
 - Store the refrigerant in the recovery tank for later use.
- ✓ **White Industries** highly recommends identifying refrigerant prior to connecting service hoses to a vehicle A/C system.
 - ✓ If the identifier option is installed, it will be necessary to identify the refrigerant to be recovered from the vehicle A/C system before connecting the service hoses to the vehicle.
 - ✓ Be sure the vehicle is at normal operating temperature before recovering refrigerant.

Recover w/Identifier Option

- ✓ Before a recovery operation can be started, a successful refrigerant identification must be done.

A refrigerant identification can be completed by pressing the RECOVERY or the ID button.

1. Power up the **1090AT diagnostic™** unit.
2. Press the RECOVERY or the ID button.

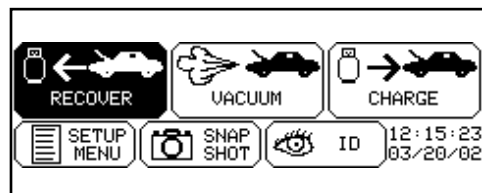


3. Have identifier sample hose disconnected from vehicle.
4. Press ENTER to calibrate identifier.
5. When calibration is complete, connect identifier sample hose to low-side port on vehicle A/C system.

6. Press ENTER to identify refrigerant.
7. If refrigerant is successfully identified as R-134a, the recovery process can be initiated.

Recover/Recycle

1. Open the liquid and vapor recovery tank valves.
 - ✓ Empty the oil drain bottle (right bottle) after each recovery.
2. Power up the **1090AT diagnostic™** unit.
 - ✓ If the identifier option is installed, it will be necessary to successfully identify the refrigerant in the vehicle as R-134a prior to initiating a recovery operation. Refer to *Recover w/Identifier Option*.
3. Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.
 - ✓ If the printer option is installed, before and after snapshots can be printed. Before snapshots must be setup before a recovery.
4. Check to make sure both panel gauges show pressure, then select RECOVER and press ENTER to begin recovery.



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

- ✓ During recovery, the display will show the amount recovered.
 - Units of measure will default to last units used for charging. Refer to *Adjusting Default Units*.
- ✓ The vehicle gauges may drop immediately, if not, they will begin dropping within approximately 30 seconds.

The **1090AT diagnostic™** unit will remove refrigerant from the vehicle system until it reaches a vacuum of 6 inHg at which time it will enter a 2 minute hold mode.

If at any time during the 2 minute hold the pressure rises to 3 PSI, the recovery process will automatically restart and once again pull the vehicle's A/C system down to 6 inHg.

The **1090AT diagnostic™** will continue this process as long as there is refrigerant left in the system. Depending upon ambient conditions and the temperature of the refrigerant, this cycle could continue a number of times.

✓ DO NOT shut the unit OFF during this process.

5. When recovery is complete, the **1090AT diagnostic™** will do an oil purge, and if necessary, will purge non-condensables (air).
6. The display will indicate a completed recovery and show the amount of refrigerant recovered.
7. Record the amount of oil recovered with the refrigerant. The amount indicated 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.
8. Press the **N** button to return to the main menu screen.
9. Close the blue and red service hose couplers before removing service hoses from the vehicle.

Purging Non-condensable Gas

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

Evacuating A/C System

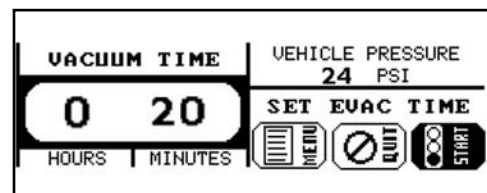
Use this procedure to remove non-condensable gases and moisture from the vehicle A/C system.

✓ 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. Power up the **1090AT diagnostic™** unit.
3. Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.
4. Select VACUUM and press ENTER.



5. Use the UP/DOWN arrow buttons to adjust time to desired value.



6. Select START and press ENTER to start the evacuation.

✓ If pressure exists in the vehicle A/C system, recover the system before starting the vacuum pump.

The panel gauges show vacuum increasing.

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

7. When evacuation is complete, monitor the low-side pressure for 5 minutes. Any rise in vacuum indicates a leak in the vehicle system, refer to *Vacuum Leak Check*.
8. Press the **N** button to return to the main menu screen.
9. Close the blue and red service hose couplers before removing service hoses from the vehicle.

Vacuum Leak Check

If a vacuum time of 20 minutes or more is programmed before pressing START, the **1090AT diagnostic™** unit will automatically perform a 5 minute leak check after the vacuum time has expired. This is a vacuum leak test. Although this test does not identify the location of the leak, it will prevent charging into a leaking system.

The leak test will count down from 5 minutes to zero in one second intervals.

If the **1090AT diagnostic™** unit counts down to zero, no vacuum leak is detected. However, if the unit detects a loss of 4 inHg. in the vehicle system during the 5 minute leak check, the display will read the time remaining and the words LEAK FAIL. The time left on the display will give an indication of the size of the vehicle system leak. The more time left on the display, the bigger the leak.

- ✓ If the source of the leak cannot be determined, partially charge the system and perform a leak test using an electronic leak detector.
- ✓ 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.

When the leak is identified, repeat Recover/Recycle procedure, repair the leak and attempt the Evacuation procedure again.

Adding Lubricant and Dye to the Vehicle A/C System

Lubricant and/or dye can be added to the vehicle system with the **1090AT diagnostic™** unit only when the vehicle system is in a vacuum and the vacuum pump has stopped running. Do not add lubricant or dye while the vacuum pump is running. Make sure you check the manufacturer's service procedures for the correct lubricant and dye.

To add oil and/or dye to the system, fill the oil charge bottle with oil in excess of the amount that will be replaced. Inject the desired amount by pressing the button on the injector until the oil has dropped to the desired level.

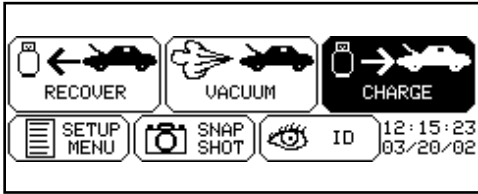
- ✓ Adding oil and/or dye to the system can only be done between the vacuum and charge operations. The vacuum within the system pulls the oil and/or dye into the A/C system and is chased by the subsequent refrigerant charge.

Charging A/C System

Use this procedure after a successful evacuation operation.

- ✓ The **1090AT diagnostic™** unit charges through the high-side service hose only.
 - ✓ When charging a vehicle after evacuation, allow for the capacity of the high-side service hose being used. A service hose holds approximately 3 ounces of refrigerant, the charge amount should be increased by 3 ounces.
- If there is not enough refrigerant in the recovery tank to charge, refer to *Adding Refrigerant to the 1090AT diagnostic™* unit or charge from the virgin tank.
1. Open the liquid and vapor recovery tank valves.
 2. Power up the **1090AT diagnostic™** unit.

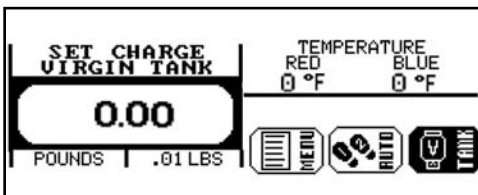
- Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.
- Select CHARGE and press ENTER.



- Press the Y button to change the desired unit of measurement shown, either pounds and ounces, decimal pounds or kilograms. The charge must be set at zero before you can switch between pounds and kilograms.

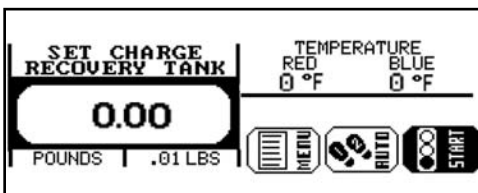
- Units of measure can also be accessed through Main Menu Setup.

- Use the UP/DOWN arrow buttons to adjust charge amount to desired value.



- Press the RIGHT arrow button to the TANK icon and press ENTER to switch between the virgin and the recycled refrigerant tank.

- It is recommended using the recycled refrigerant first. Should the recovery tank supply be insufficient to complete the charge, the **1090AT diagnostic™** unit will display a "Recovered Empty" message and default to the virgin tank.



- Select START and press ENTER to start the charge.

- The **1090AT diagnostic™** unit will automatically transfer refrigerant from the selected source to the batch chamber. Upon filling the batch chamber, the compressor will build pressure in the chamber to 150 PSI at which time the unit will begin charging the system.

The display will show zero and start counting up to the designated charge amount.

- When complete, press the N button to return to the main menu screen.
- Close the blue and red service hose couplers before removing service hoses from the vehicle.

- Any refrigerant in the batch chamber after a charge from a virgin or recovery tank, will be recovered into the recovery tank before the next recovery sequence.

Sequential Modes of Operation

When set to operate sequentially, the unit will perform all the programmed modes in the order listed below. If a setting is omitted the function will be skipped.

- Recover/Recycle, if necessary.
- Vacuum, if time is set.
- Recharge, if amount is set.

- Refrigerant oil cannot be added to the vehicle A/C system during an auto sequence.
- White Industries®** highly recommends identifying refrigerant prior to connecting service hoses to a vehicle A/C system.
- If the identifier option is installed, it will be necessary to identify the refrigerant to be recovered from the vehicle A/C system before connecting the service hoses to the vehicle.
- Be sure the vehicle is at normal operating temperature before recovering refrigerant.

Installation and Operation

Preparation

- Open the liquid and vapor recovery tank valves. If charging from the virgin tank, do not forget to open the virgin tank valve.
 - ✓ Empty the oil drain bottle (right bottle) after each recovery.
- Power up the **1090AT diagnostic™** unit.
 - ✓ If there is an optional refrigerant identifier installed, it will be necessary to successfully identify the refrigerant in the vehicle as R-134a prior to initiating a recovery operation. Refer to *Recover w/Identifier Option*.
- Connect the service hoses to the vehicle and open service hose couplers. For additional information refer to *Connecting Service Hoses to Vehicle*.

The sequential operation of the **1090AT diagnostic™** unit can be programmed by two methods, semi-automatic or fully automatic.

Semi-Automatic

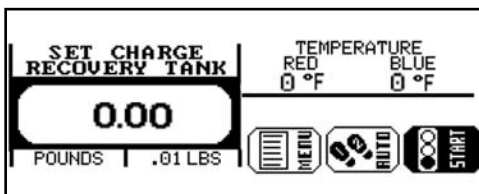
Vacuum time and charge amount can be set before operation.

- Select the menu item for the desired operation. The items can be programmed in any order.
- Select VACUUM and press ENTER, vacuum time will default to 20 minutes. If desired, time may be changed.

If a leak check is performed and a leak is detected after the vacuum process, the **1090AT diagnostic™** unit will not continue.

- ✓ If QUIT is selected, all settings will be lost.

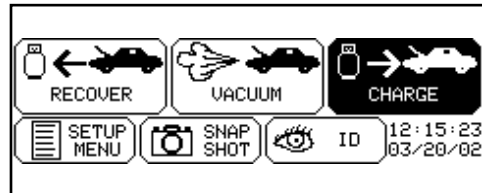
- Select CHARGE and press ENTER to change the refrigerant supply tank and the charge amount.
- Begin cycle by selecting START in any menu and pressing ENTER to begin cycle.



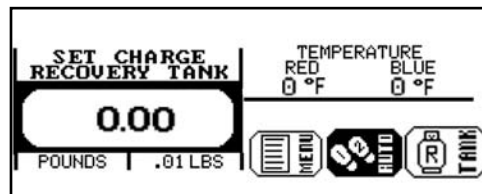
Fully Automatic (with 20 minute default vacuum time)

Only charge amount is set before operation.

- Select CHARGE and press ENTER.



- Select refrigerant tank to charge from, V (VIRGIN) or R (RECYCLED).
- Set charge amount.
- Select AUTO and press ENTER.

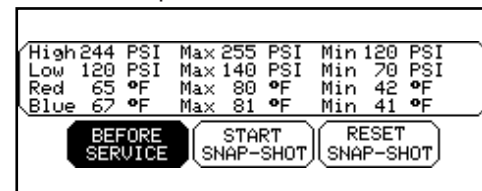


The **1090AT diagnostic™** unit will determine the need to RECOVER/RECYCLE and continue the remaining functions automatically.

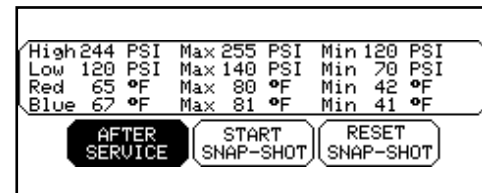
Snapshot

Snapshots can be taken to obtain vehicle information before and after an A/C service.

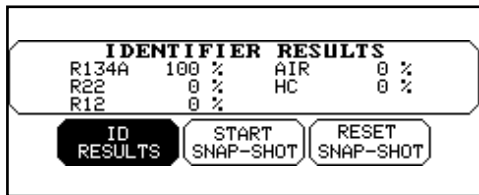
- Select SNAPSHOT and press ENTER.
- With the button on the left highlighted, press ENTER to change menus.
 - Menu options are:



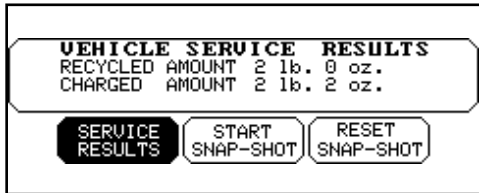
- Before Service,



- After Service,



- ID Results, and



- Service Results.

- To start snapshot, choose appropriate snapshot menu, select START SNAPSHOT and press ENTER.
- To reset snapshot, select RESET SNAPSHOT and press ENTER.

Tank Messages

Messages display when the recovery tank is full or empty.



- ✓ “Recovered Empty” is displayed when the approximate amount in the recovery tank is less than approximately 11 lbs.
- ✓ The unit may be used to recover/recycle or evacuate an A/C system when the recovery tank is empty.
- ✓ “Tank Full” is displayed when the amount of refrigerant in the recovery tank is above 45 lbs.
- ✓ The unit may not be used to recover an A/C system if the recovery tank is full.

Removing Recovery Tank

- ✓ Ensure all hand valves are closed on both virgin and recycled tanks.

- Disconnect the hose from the virgin tank.
- Remove the *Velcro*® straps from the virgin tank.
- Remove the virgin tank from the **1090AT diagnostic™** unit.
- Disconnect the hoses from the recovery tank.
- Disconnect the tank float probe cable.
- Remove the *Velcro*® straps from the recovery tank.
- Gently remove the recovery tank from the **1090AT diagnostic™** unit.

Recovering Service Hoses

Recover the service hoses after charging vehicle. Service hoses are not connected to a vehicle during this procedure.

- Open the liquid and vapor recovery tank valves.
- Power up the **1090AT diagnostic™** unit.
- Select RECOVER and press ENTER to begin recovery.
- Monitor the high- and low-side panel gauges.
Service hose recovery is complete when 6 inHg of vacuum is reached.
- The display will indicate a completed recovery.
- Press the **N** button to return to the main menu screen.

Recover Service Hoses w/Identifier Option

Follow this procedure to recover service hoses.

1. Open the liquid and vapor recovery tank valves.
2. Power up the **1090AT diagnostic™** unit.
3. Select the RECOVER icon and press ENTER.
4. Select HOSE CLEAR to clear the hoses.

Evacuating Contaminated Service Hoses

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

Adding Refrigerant to the Recovery Tank

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

- ✓ **White Industries®** highly recommends identifying refrigerant before adding it to the recovery tank.
 - ✓ If the identifier option is installed, it will be necessary to identify the refrigerant in the supply tank before recovering into the recovery tank.
 - ✓ The recovery tank should have at least 11 lbs of refrigerant to charge from the recovery tank.
 - ✓ If this is a new tank installation, refer to *Tank Preparation and Evacuating Recovery Tank*.
1. 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 must be upright (valve up).

- ✓ Do not recover liquid refrigerant from a supply tank.

2. Connect the blue service hose from the **1090AT diagnostic™** unit to the virgin refrigerant supply tank.
3. Open the following:
 - Virgin supply tank valve, and
 - Blue service hose coupler.
4. Power up the **1090AT diagnostic™** unit.
5. Select RECOVER and press ENTER.

The refrigerant flows from the virgin tank through your **1090AT diagnostic™** unit and into the prepared recovery tank.
6. When the desired amount of refrigerant has been transferred into the recovery tank, close the virgin tank hand valve.
7. Allow the recover/recycle operation to run until 6 inHg of vacuum is reached, then close the blue service hose coupler.
8. Drain any accumulated waste oil expelled into the oil drain bottle.
 - ✓ Discard refrigerant oil in accordance with local, state, and federal regulations that apply in your area.
9. Press the **N** button to return to the main menu screen.

Errors and Messages

Error messages will flash on the LCD display until conditions are corrected.

Temperature Error

Temperature errors can occur when the unit is operating outside its normal temperature range or a temperature probe is damaged. Warm the unit to normal operating temperature and if 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 happen if the recovery tank valve is closed or the hose fitting on the tank is not installed or tight. Open the tank valve or install or tighten the hose fitting on the recovery tank.

High Pressure Error

If a high pressure error occurs, call service.

Tank Full/Empty

Tank full or tank empty icons will display when the recovery tank is full or empty.

No Tank Present

A no tank present error can occur if the electrical cord is not connected to the recovery tank. Connect cable to recovery tank.

Replace Filter

A replace filter message will occur when master filter/dryer usage time has expired. Replace the master filter/dryer and reset the automatic reminder monitor, refer to *Filter Reset*.

Maintenance

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

- Master filter/dryer,
- Particle filter,
- O-rings and gaskets,
- Vacuum pump, and
- When storing the unit for prolonged periods.

A list of parts and accessories are also included.

Equipment Tips

- ❑ Never attempt to change the recovery tank while your **1090AT diagnostic™** unit is in use.
- ❑ Always recover the service hoses before disconnecting them from your **1090AT diagnostic™** unit. For additional information refer to *Recovering Service Hoses*.
- ❑ 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 **1090AT diagnostic™** unit is not in use.

Master Filter/Dryer

Change the master filter/dryer when the filter time monitor has reached 20 hours since the last master filter/dryer change. Replacement of the master filter/dryer will also be indicated by the REPLACE FILTER message on the screen. The filter monitor has a reset of 20 hours of recovery time. During the course of recycling, this number increases from zero. When 20 hours is reached, the master filter/dryer needs to be replaced and the monitor reset. Refer to *Resetting Master Filter/Dryer Monitor or Filter Reset*. Recovered refrigerant quality may be comprised if the filter is not replaced when required.

Changing the Master Filter/Dryer

Follow this procedure 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 the service hoses by recovering if necessary and pulling a vacuum. For additional information refer to *Recovering Service Hoses*.
 2. Turn power OFF to the **1090AT diagnostic™** unit and remove power cord from wall outlet.
 3. Unscrew the two hose fittings from the 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 time monitor.

Resetting Master Filter/Dryer Monitor

Follow this procedure 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 **1090AT diagnostic™** unit.
 2. Press the UP/DOWN arrows until SETUP MENU is highlighted.
 3. Press ENTER.
 4. Position > next to FILTER and press ENTER.
Master filter/dryer usage timer will appear.
 5. Press **Y** to reset filter timer to zero. (The filter times out at 20 hours.)
Press **N** to exit.

Changing a Particle Filter

After 20 hours of operation all four of the particle filter assemblies should be checked and cleaned or replaced. The particle filter assemblies are located on the system and tank hoses.

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 a particle filter while under pressure. Perform the maintenance procedure for removing a particle filter in this section.**
 - **Prevent refrigerant from contacting the skin.**
 - **Read, understand and follow *Safety Information* in the front of this manual.**
1. Evacuate the service hoses by recovering if necessary and pulling a vacuum. For additional information refer to *Recovering Service Hoses*.
 2. Turn power OFF to the **1090AT diagnostic™** unit and remove power cord from wall outlet.
 3. Unscrew the two hex connectors for the particle filter housing between the cabinet and the service hose couplers.
 4. Pull particle filter screen out of the housing.
 5. Clean or replace filter as needed.
 6. Reattach particle filter housing connection.
 7. Check for leaks.

Check and Replace O-rings

After 20 hours of operation, inspect the o-rings in the service hose couplers for signs of wear or damage. If they are worn or damaged, replace them.

Maintaining the Vacuum Pump

Checking Vacuum Pump Oil Level

1. Look through oil level sight glass to verify vacuum pump oil level.
2. Oil level should appear to be in the middle of the sight glass.
3. If oil 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 power OFF to the **1090AT diagnostic™** 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.

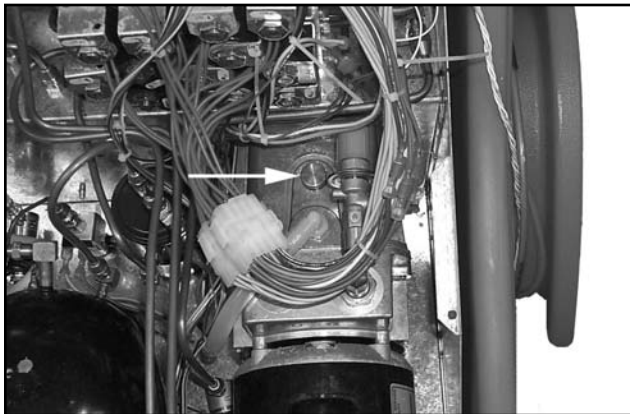


Figure 5: Vacuum Pump Fill Cap

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 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 power OFF to the **1090AT diagnostic™** 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*.

Changing Identifier Filter

If the identifier option is installed. Replace the white refrigerant identifier filter when it starts to show color changes to pink or red.

1. Turn power OFF to the **1090AT diagnostic™** unit and remove power cord from wall outlet.
2. Gently pull filter out of holding bracket.
3. Disconnect lines to filter.
 - ✓ Dispose of filter according to local, state and federal regulations that apply in your area.
4. Connect lines to new filter, paying attention to flow markings on filter.
5. Mount new filter in holding bracket.

Replacing Printer Paper

Follow this procedure to replace printer paper.

1. Open the printer access door.
2. Place new printer paper roll inside.
3. Close access door with edge of paper hanging out.

Storing the 1090AT diagnostic™ Unit

Follow this procedure when storing your **1090AT diagnostic™** 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*.
 2. Close both hand valves on the recovery and virgin tanks.
 3. Remove the yellow hose from the recovery tank.
 4. Close both service hose couplers.

Replacement Parts

Part Number	Description
1-27280	Service Fitting, Low-side
1-27180	Service Fitting, High-side
EAK0027C00AS	Coupler Repair Kit
1-15080	Low-side Adapter Fitting
1-9881	Master Filter/Dryer
EAK0227L01A	Vacuum Pump Oil Kit
EAK0218L33A ..	10 Micron Filter Kit, 10pcs
EAA0253L62A	Recovery Tank, 50 pound

Upgrade Kits

EEAC720ACV	Cover
EAK0218L23A	Temperature Probe Kit
Service only installable kits.	
EAK0218L22A	Identifier Upgrade
EEAC300A1	Identifier Filter
EAK0218L21A	Printer Upgrade
8-00910A	Printer Paper, Thermal

For service or to order replacement parts contact an authorized **WHITE®** service center 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.

