

ACDUAL

AUTOMOTIVE REFRIGERANT MANAGEMENT CENTER

**Recover, Recycle, Evacuate & Recharge A/C Systems
In Passenger Vehicles & Light Trucks**



For Use With R-134a and R-1234yf Refrigerants

OWNER'S MANUAL (English)

TO BE OPERATED BY QUALIFIED PERSONNEL ONLY

UL1963 EEI, CSA C22.2 120 DEI, SAE J3030

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GENERAL SAFETY INSTRUCTIONS

Only qualified service personnel should operate this machine. Most states, countries, etc... may require the user to be licensed. Please check with your local government agency.

DANGER – This unit's recovery tank contains liquid refrigerant. Overfilling of a recovery tank may cause a violent explosion resulting in severe injury or even death. Do not disable the overfill safety features. Always make sure the correct tank is on the scale.

DANGER – Only use the specified recovery tanks provided with this unit. See your distributor for replacement tanks.

DANGER – Avoid breathing refrigerant vapors and lubricant vapor or mist. Breathing high concentration levels may cause heart arrhythmia, loss of consciousness, or even cause suffocation.

DANGER – Electrical shock hazard!!!! Always disconnect power source when servicing this equipment.

DANGER – **DO NOT USE COMPRESSED AIR TO PRESSURE TEST OR LEAK TEST THE ACDUAL UNIT OR VEHICLE AIR CONDITIONING SYSTEM.** Mixtures of air and refrigerant are combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing personal injury or property damage.

CAUTION – All hoses may contain liquid refrigerant under pressure. Contact with refrigerant may cause frostbite or other related injuries. Wear proper personal protective equipment such as safety goggles and gloves. When disconnecting any hose, please use extreme caution.

CAUTION – Exposure to refrigerant vapors may irritate eyes, nose, throat, and skin. Please read the manufacturers Material Safety Data Sheet for further safety information on refrigerants and lubricants.

CAUTION – To reduce the risk of fire, avoid the use of extension cords thinner than NO. 16 awg. (1,5mm²). The following table references extension cord wire size vs. maximum length:

EXTENSION CORD (Imperial)		EXTENSION CORD (Metric)	
Gauge (awg)	Length (Ft)	Gauge (mm ²)	Length (m)
16	10	1.5	3
14	20	2.5	6.1
12	25	4	7.6

CAUTION – Do not use this equipment in the vicinity of spilled or open containers of gasoline or other flammable substances. Make certain that all safety devices are functioning properly before operating the equipment.

CAUTION – This equipment should be used in locations with mechanical ventilation that provides at least 4 air changes per hour.

CAUTION – RISK OF INJURY, the equipment should only be operated by certified personnel.

CAUTION – Use only CPS certified hose assemblies on this unit. The hose assemblies are made to proper length, contain shut-offs where required and have direct affect on the proper operation of this equipment.

CAUTION – R-1234yf is a Class III highly flammable refrigerant. Use in well ventilated areas. Minimize leakage from the unit. Periodically check ACDUAL machine for leaks.



High Pressure Alert

1. The ACDUAL will alert the user should a high pressure condition exist on the outlet side of the compressor.
2. When such a condition is detected, the compressor will turn OFF and won't restart until the high pressure condition is remedied.
3. If this occurs, check to ensure that Tank Valves and Hose Ball Valves running to the tank and filters are OPEN.
4. If all valves are open, contact CPS Technical Support to determine the cause of the alarm.

GENERAL SAFETY INSTRUCTIONS (Cont'd)



Tank Overfill Limit

1. The ACDUAL Series' 30lb internal storage tank is designed to contain a maximum of 20.96 Lbs (9.52 Kg) of refrigerant.
2. If this amount is exceeded, the user will be alerted and system operations will be halted.
3. Before normal operation can continue, the overfill condition must be remedied by moving refrigerant from the tank to another storage tank or into a vehicle AC system. The charge function may be used to transfer internally stored refrigerant to an external storage facility.

PRODUCT REGISTRATION

To register this ACDUAL Refrigerant Management Machine for the 1-2-3 Product Warranty, please visit www.cpsproducts.com/hvac-warranty-registration/. Please contact us, if you have any technical issues during registration of this machine.

You may also register this ACDUAL Machine by using the touch screen (See Page 21).

AGENCY APPROVALS, STANDARDS, PATENTS

UL 1963 EEI Issued: 2013/10/11 Ed: 4 Refrigerant Recovery/Recycling Equipment

CSA C22.2 120 DEI Issued: 2013/03/01 Ed: 4 Refrigeration Equipment (R2018)

SAE J3030 Issued: July 1, 2015. Automotive Refrigerant Recovery/Recycling/Recharging Equipment Intended for Use with Both R-1234yf and R-134a.

- This machine is covered under US Patent 8,082,750.

OVERVIEW

The ACDUAL Refrigerant Management Center is for use with both R-134a and R-1234yf refrigerants and has been designed for automotive technicians to easily Recover, Recycle, Evacuate and Recharge air conditioning systems in passenger vehicles and light trucks. It features a seven inch, color touch screen display, a 30 Lb refrigerant tank, an oil-less compressor and motorized ball valves.

KEY FEATURES/BENEFITS

Features	Benefits
7" Color Display, With Touch-Screen Icon	User-friendly icons allow fast, easy selection of Recovery, Evacuation, Charge, Full Cycle and Tank Refill functions, or Setup and Maintenance Menus.
Vehicle A/C System Database	ACDUAL machines include a database of refrigerants and refrigerant oil for most vehicles sold in North America since 1994.
Low and High Side "Barrier" Service Hoses & Couplings	The included barrier hoses and couplings minimize the loss of expensive refrigerant, which can also harm the atmosphere.
Filter/Dryer	The installed filter-drier filters the R-1234yf refrigerant inside the vehicle's A/C system, and absorbs any system contaminants which can reduce compressor life.
Motorized Ball Valves	Automatically open or close for a selected charge, recovery or evacuation routine.
Temperature Probe Accessory	ACDUAL machines include a corded probe (#TMX2P) for measuring temperature in AC vents.
1 Lb (454 Gm) Check Weight	For accurately calibrating the installed refrigerant charging scale.
30 Lb Refrigerant Tank	The DOT certified tank is designed to safely recover, charge and transport refrigerant used with ACDUAL machine. Available in single cylinders or in pallet quantities (see below).
Bluetooth Low Energy (BLE) Capable	ACDUAL machines can be used with the CPS® "CarSmart AC Inspector" wireless accessory (#TACI100) to log temperature, humidity, dew point and other diagnostic data inside of, or around a vehicle.
Wi-Fi Capable	ACDUAL Machines can be connected to other Wi-Fi devices or printers and job reports can be e-mailed directly from the machine.
Industry Leading Warranty (2-2-3)	Two Year Parts and Labor Warranty, Three Year Compressor Warranty.

Optional Accessories

- **Heater Blanket (#AR27XHB115)** – During colder weather, this CPS 120V AC accessory can be applied to the refrigerant tank to speed up charging, which eliminates the need to run a vehicle's AC system.
- **TACI100 CarSmart AC Inspector** – Includes 2 probes for measuring or data logging temperature, humidity, dew point, etc., inside of, or around a vehicle.
- **50 Lb Refrigerant Tank** – Available from CPS as individual tanks, or in pallet quantities (see page 8).
- **Dust Cover (#MXXC)** – Fits any ACDUAL machine.

Not Included (Shop Must Purchase)

- Refrigerants (R-134a, R-1234yf)
- Refrigerant oil/dye injection system.

SPECIFICATIONS

ACTUAL OVERALL SPECIFICATIONS

Power	115V 60Hz
Compressor	2/3 HP Twin Cylinder Oil-less
Gauges	3.5" Low side, 30 in/Hg to 250 psi; High Side, 0 to 600 psi
Hoses	10 Ft. (3.0 m), Barrier Type
Refrigerant	For Use With R-1234yf Only
ASHRAE Refrigerant Code	A1
Maximum Recovery Rate	Up To 1 Lb (0.453 kg) per minute
Storage Tank	1 x 30 lb DOT tank (specifications on page 8)
Display	7" Touch Screen with 256 color graphical display
Construction	Sheet metal frame with molded plastic panels. 1 piece handlebar, 4" front casters and 10" foam-filled rear tires for exceptional maneuverability
Operating Temperature Range	50°F to 122°F (10°C to 50°C)
Operating Humidity Range	0% to 95% (Non-Condensing)
Dimensions (H x W x D)	43.6" x 22.6" x 28.9" (1.1 x 0.57 x 0.28 m)
Weight (Without Packaging)	Gross Weight: 208 Lbs (With Packaging)
Warranty (1-2-3)	See Page 51

INSTALLED VACUUM PUMP SPECIFICATIONS

Stage	2
Maximum Free Air Displacement	2 CFM at 60 Hz / 48l/m @ 50 Hz
Motor Size (HP), RPM @ 50/60Hz	1/3 HP (@1440 RPM/50 Hz Or 1720 RPM/60 Hz)
Voltage, Watts, Amps	110~120VAC Or 220VAC @50/60 Hz
Ignition Proof Construction	Meets ANSI 12.12.1
Ultimate Vacuum	10 Microns
Refrigerant Class	A1, A2
Operating Temperature Range	32°F to 125°F (0°C to 52°C)
Storage Temperature Range	32 F to 104 F (0 C to 40 C)
Pro-Set® Vacuum Pump Oil Capacity	11 oz (330 ml)
Intake Fittings	1/4" & 3/8" SAE Male, ACME 1/2"
High Side Gauge (Analog)	0 ~ 550 psi, (38 bar ~ bar), 3792 ~ kPa
Low Side Gauge (Analog)	0 ~ 350 psi, (0 ~ 24 bar), 0 ~ 2400 kPa)
Motor Thermally Protected	Yes

INSTALLED REFRIGERANT SCALE SPECIFICATIONS

Tare (Empty) Weight Mode	Yes
Units (Weight) Readout	lb & oz, or kg & gm
Weight Accuracy	0.015% of Reading [or ± 0.25 oz (10 g) whichever >]
Display Resolution (Increments)	0.25 Oz (10 g)
Platform Dimensions	8.75" x 8.75" (22.3 x 22.3 cm)
Overload Protection	Mechanical (Internal Overload Stop)
Calibrated To NIST Standards	Yes
Declaration Of Conformity	EN 61326-1:2013, CISPR 11:2009/A1:2010

SPECIFICATIONS (Cont'd)

CPS REFRIGERANT TANK SPECIFICATIONS (Industry Standard)

	Weight Of Empty Tank		Tank Water Capacity		Max. Refrigerant Weight (80% Of Water Capacity)		Total Weight (Tank & Refrigerant)		Tank Foot Ring Diameter		Tank Outside Diameter		Tank Height		Max. Pressure Rating
	lb	kg	lb	kg	lb	kg	lb	kg	in	mm	in	mm	in	mm	psig (bar)
CRX430T 30 Lb (13.60 kg) Included	17.5	7.9	26.2*	11.9*	20.96*	9.52*	38.46	17.42	7.8	198.1	9.5	241.3	18.1	459.7	400 (27.57)
Optional Accessory: CRX400T 50 Lb (22.7 kg)	28.3	12.8	47.4	21.5	37.92*	17.2*	66.22	30.0	8	203.2	12.5	317.5	19.75	501.7	400 (27.57)

*Maximum weight of refrigerant that should be recovered

REFRIGERANT RECOVERY TANKS

- DOT Certified for refrigerant storage
- Refrigerant compatible sealant used on all mechanical connection points
- Auxiliary port for optional overfill sensor
- Liquid and Vapor UL listed
- Y-valve powder coated for maximum rust protection
- 1/4" SAE Male fittings



CRX430T (FACTORY INSTALLED ON ACDUAL MACHINES)
CRX430TB (40/PALLET-OPTIONAL ORDER QTY)



CRX400T (OPTIONAL SIZE TANK)
CRX400TB (24/PALLET-OPTIONAL ORDER QTY)

REFRIGERANT CYLINDER HEATER BLANKET (OPTIONAL ACCESSORY)

SPECIFICATIONS	AR27XHB115-1
Voltage (Hz)	120 VAC (50/60 Hz)
Watts	340 W
Amps	2.8
For Cylinder Sizes	From 8" (20 cm) to 14" (35 cm) Diameter Tanks
Control (Overheat Protection)	Automatic Thermal Cutoff (Encapsulated Thermostat)
Minimum Surface Temperature Of Tank	115°F (46°C)
Maximum Thermostat Temperature	130°F (55°C)
Power Cord Length	20" (0.50 m)
Adjustable Velcro Strap Max Length	19" (0.48 m)
Heater Blanket Width	3" (76 mm)
Heater Blanket Length	24" (.60 m)
Heater Blanket Color	Dark Orange
Electrical Connection Type	IEC320 C15 Female Connector



HEATER BLANKET
AR27XHB115 (120V)



SHOWN: HEATER BLANKET
APPLIED TO TANK

MACHINE LAYOUT

FRONT VIEW



CONTROL PANEL



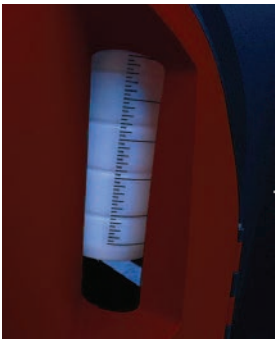
MACHINE LAYOUT (Cont'd)

SIDE VIEW

REAR VIEW



Refrigerant Identifier

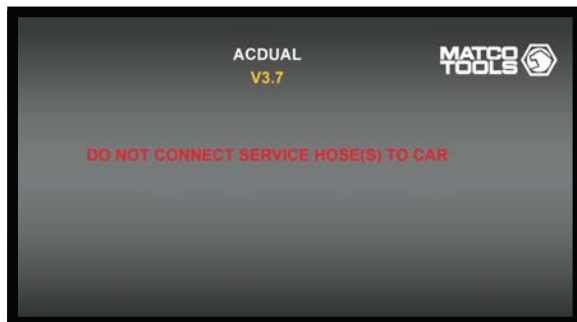


Refrigerant Oil Recovery Bottle

QUICK START GUIDE

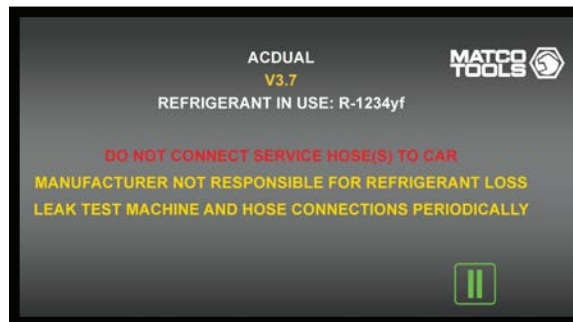
1. Remove the protective packaging between the storage tank and the scale.
2. **NOTE: BEFORE TURNING THE ACDUAL MACHINE ON, ENSURE THERE ARE NO HOSES CONNECTED TO VEHICLE**
3. The Vacuum Pump on ACDUAL Machines contains Vacuum Pump Oil (factory filled). Check the "Sight Glass" on the Vacuum Pump to ensure the oil level is between the MAX and MIN lines.
4. Plug the ACDUAL Power Cord into a proper power source.
5. On the front control panel, push the **POWER BUTTON**. A Blue Light will then turn ON.
6. Machine will go through the following internal status check (not all screens are shown)

7



- a. Initial Start-Up Screen (shows Version #)
- b. **SERVICE HOSES SHOULD NOT BE CONNECTED TO CAR AT THIS TIME.**

8



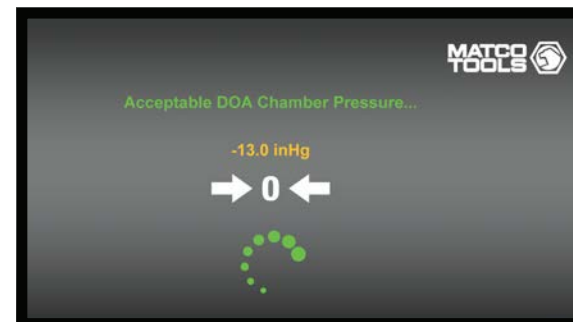
- a. **ENSURE SERVICE HOSES ARE NOT CONNECTED TO VEHICLE.**

9



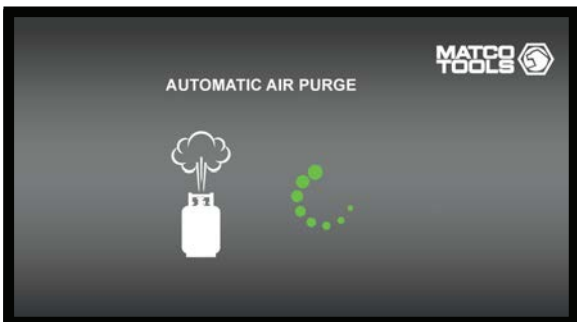
- a. Checking DOA Chamber (for oil separation) Pressure.

10



- a. Acceptable Distillation Chamber Pressure.

11



- a. Automatic Air Purge (if needed).

12



- a. Automatic Air Purge is now complete.
- b. Home Screen (will reappear once Air Purge has completed).
- c. Connect service hoses to the machine and install the include Oil Recovery Bottle.
- d. Machine can now be operated by using the color Touch Screen.

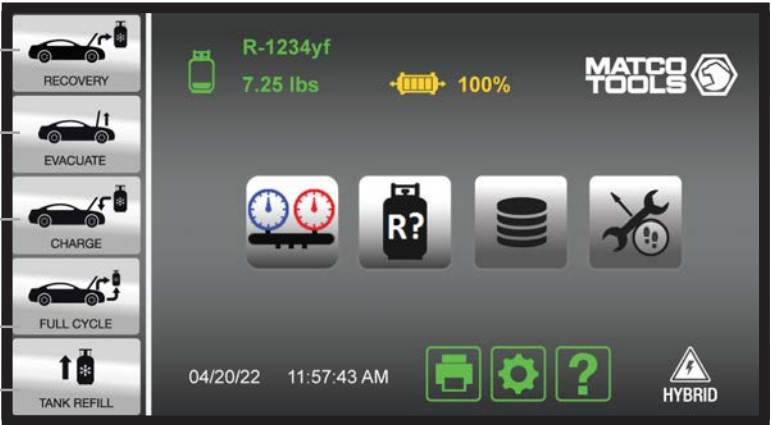
OVERVIEW (Primary Touch Screen Keys)

This ACDUAL machine features a 7” (17.8 cm), color, touch-screen LCD display from which all machine functions or settings can be accessed.

HOME SCREEN

5 Selectable Functions

- 1. Refrigerant Recovery Key Pg 24
- 2. A/C System Evacuation Key Pg 26
- 3. Refrigerant Charge Key Pg 27
- 4. Full Cycle Key (Recovery, Evacuate & Recharge) Pg 29
- 5. Refrigerant Tank Refill Key Pg 30



Touch Keys & Information Icons

RECOVERY

EVACUATE

CHARGE

FULL CYCLE

TANK REFILL

R-1234yf
7.25 lbs

100%

MATCO TOOLS

R?

04/20/22 11:57:43 AM

HYBRID

Weight Of Refrigerant In Tank (4 Segment Icon)

Refrigerant Type In Tank

Weight Of Refrigerant In Tank

Filter Dryer Life (4 Segment Icon)

Car System Health Mode Key Pg 42

A/C Data Base & End User License Agreement Key Pg 44

Job Tracker Key Pg 46

Refrigerant Identification Key

Hybrid Vehicle Key Pg 15

Help Menu Key Pg 13

Machine Upkeep Key Pg 14

- Setup Function
- Maintenance Menu

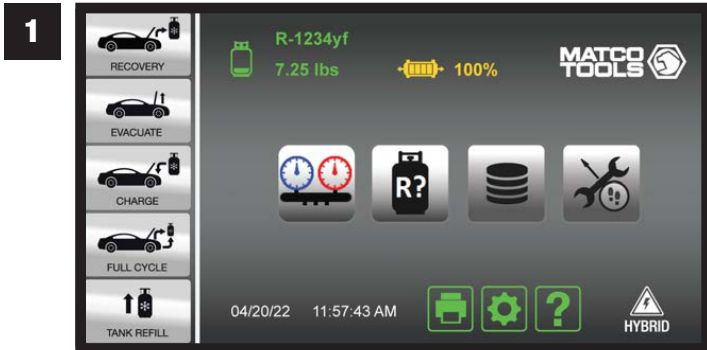
Print Key Pg 13


OVERVIEW (Primary Touch Screen Keys, Cont'd)



PRINT KEY

Home Screen

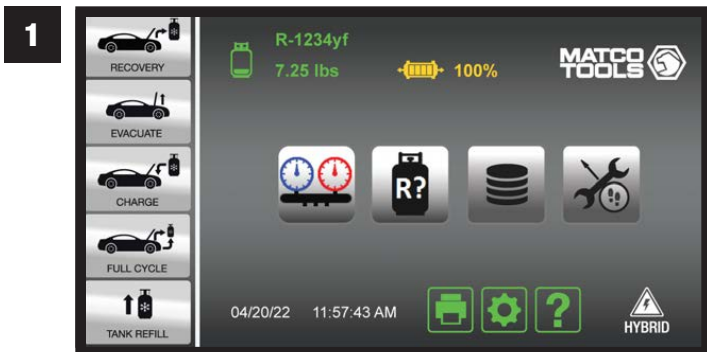


- Use the ACDUAL's Bluetooth Low Energy or Wi-Fi functions to connect to a wireless printer. The Bluetooth range is generally 30 ft, while Wi-Fi is generally 150 ft (both direct line of sight).
- Touch  to receive a printed copy showing results of the LAST function performed.



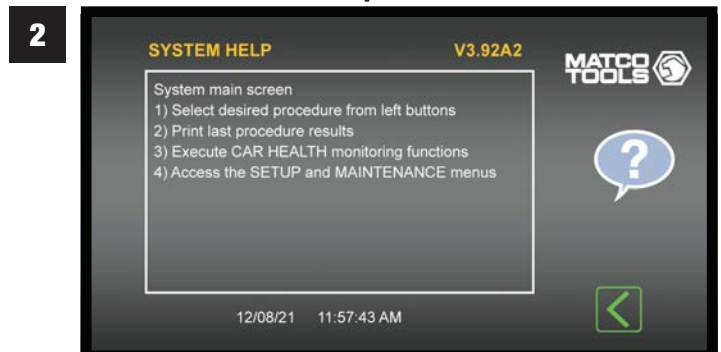
HELP MENU


Home Screen



- Touch  to enter the HELP MENU.

Help Screen



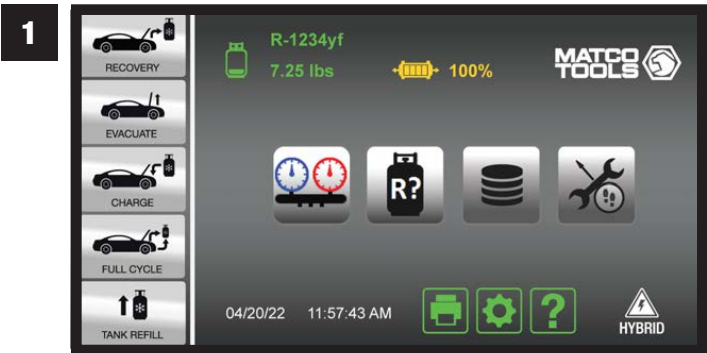
- Firmware Version** shown at **UPPER RIGHT**.
- Touch  to return to Home Screen.

OVERVIEW (Primary Touch Screen Keys, Cont'd)



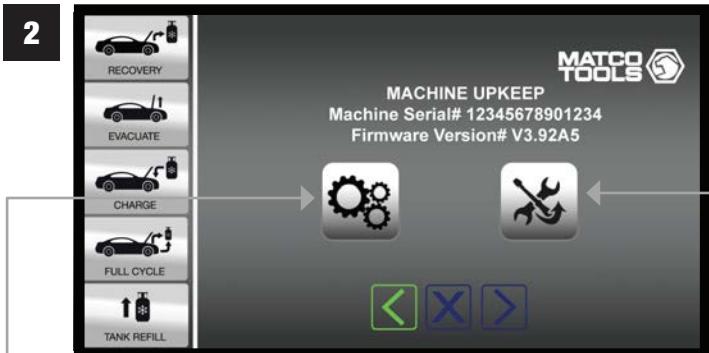
MACHINE UPKEEP (2 Functions)

Home Screen



a. Touch  to access the MACHINE UPKEEP Screen

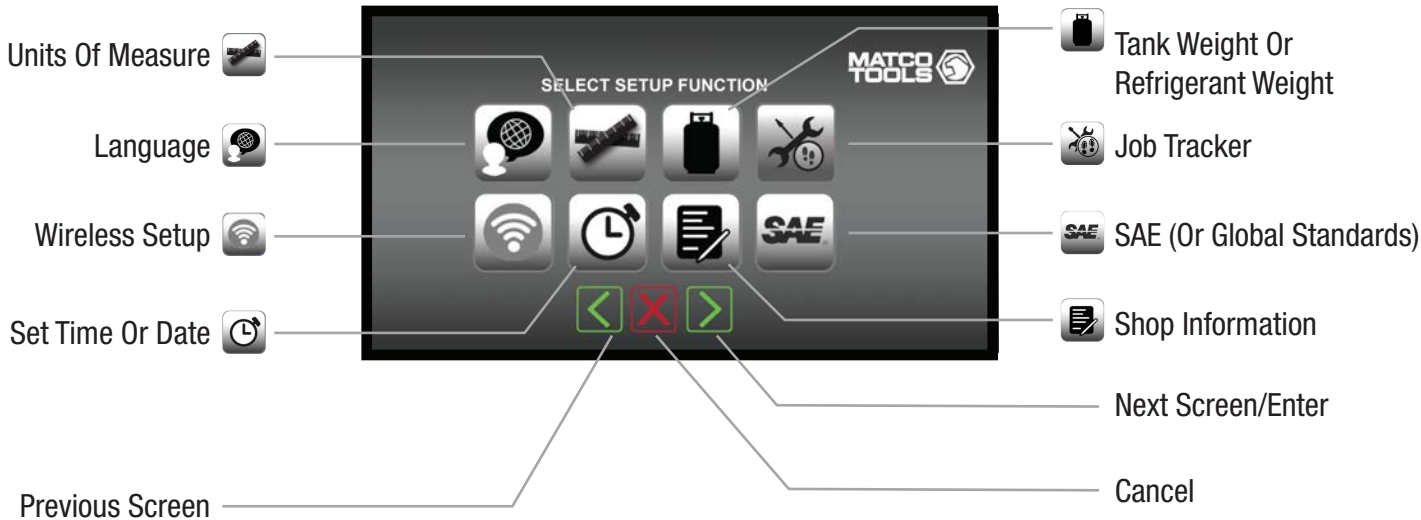
Machine Upkeep Screen



- a. To enter the SETUP FUNCTION, touch 
- b. Or to enter the MAINTENANCE MENU, touch 



SETUP FUNCTIONS



MAINTENANCE MENU

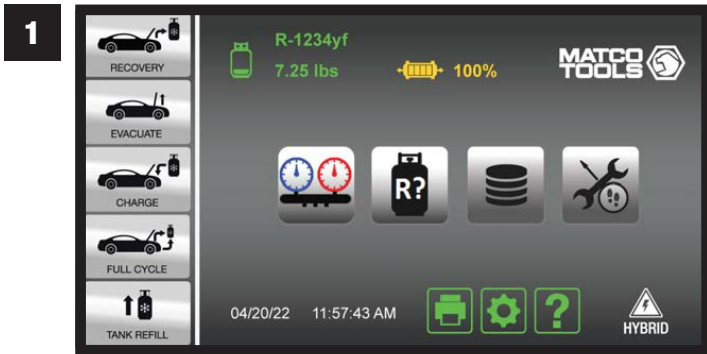


OVERVIEW (Primary Touch Screen Keys, Cont'd)

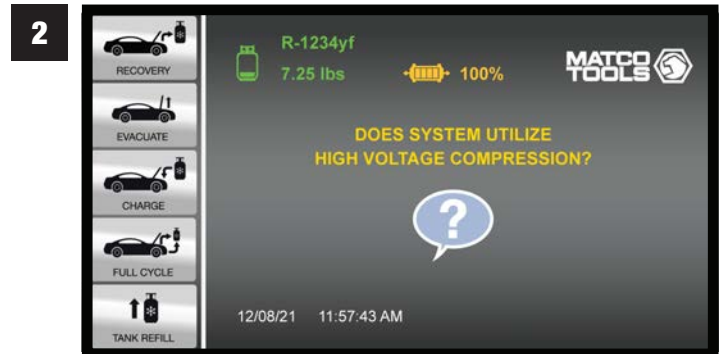


HYBRID VEHICLE KEY

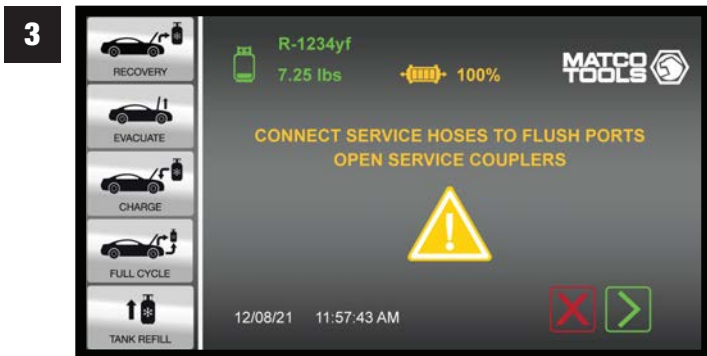
Home Screen



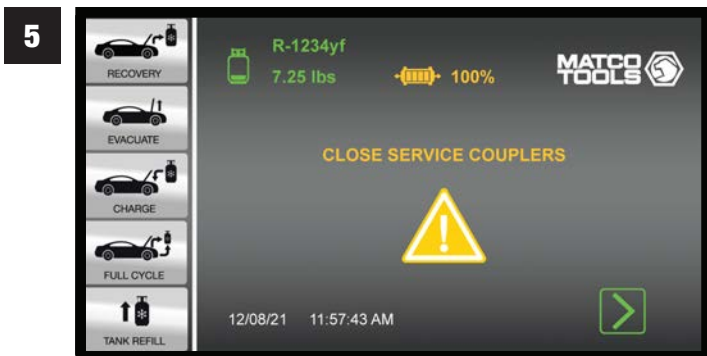
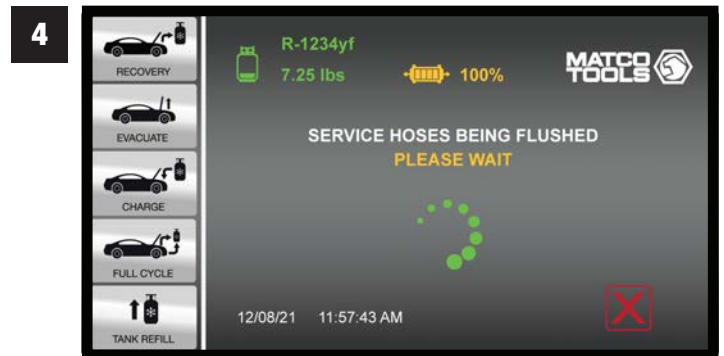
- a. Touch if the vehicle is Hybrid so service hoses are automatically flushed.



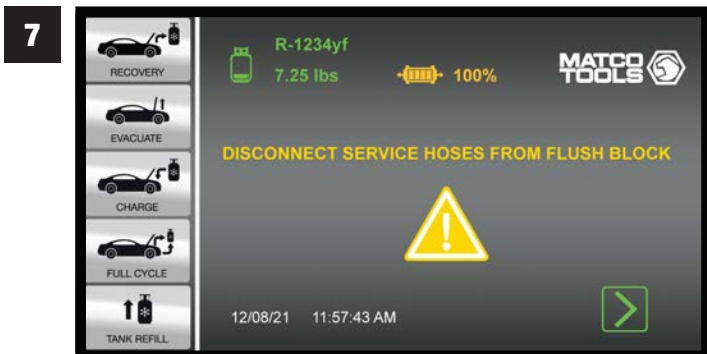
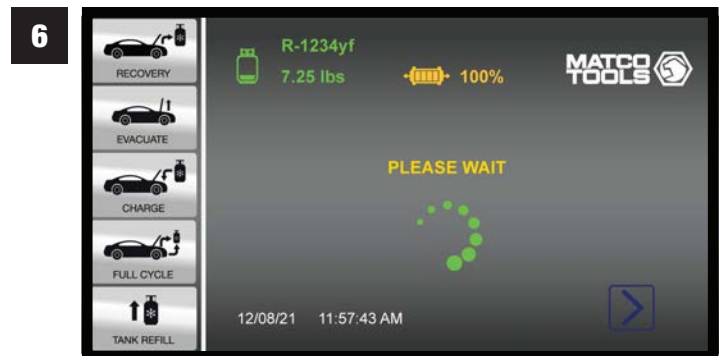
- a. Touch if vehicle uses a HIGH VOLTAGE COMPRESSOR
b. Or touch to return to HOME SCREEN



- a. Connect service hoses to FLUSH PORTS.
b. OPEN SERVICE COUPLERS



- a. CLOSE SERVICE COUPLERS



- a. DISCONNECT SERVICE HOSES from Flush Block
b. Touch to move to Home Screen.

SETUP




SET LANGUAGE

(Not All Screens Are Shown)

ACDUAL Machines have an English language default setting. To change the default FROM English TO either German, French or Spanish, use the following instructions.


Setup Function Screen



- a. Touch  to view languages to work in.

Select Default Language



- a. Touch a key that corresponds to the screen language you prefer: English / Spanish / French / German
- b. Touch  to enter selected language.

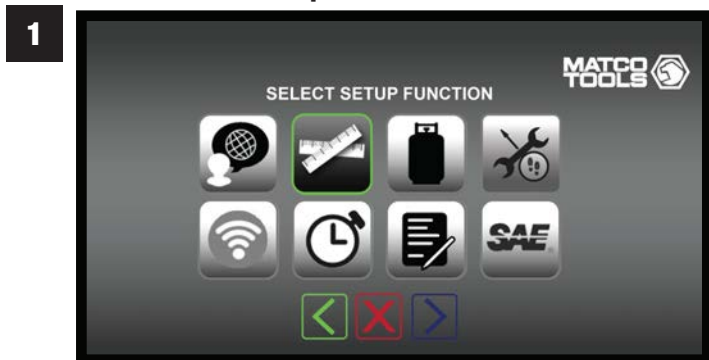


SET UNITS OF MEASURE

(Not All Screens Are Shown)

Use this function to set up the ACDUAL so that it displays Pressure, Temperature, Weight and Altitude in SAE or Metric units of measure that you want to work with.






Setup Function Screen



- a. Touch  to select Units Of Measure.

Select Pressure, Temperature, Weight, Altitude



- a. Touch keys to select default **Units Of Measure**:
- Pressure Units 
 - Temperature 
 - Weight Units 
 - Altitude  (enter value with keyboard).
- b. Touch  to enter data and move to next screen.

SETUP (Cont'd)



SET TANK & REFRIGERANT WEIGHTS

(Not All Screens Are Shown)

Setup Function Screen



- a. Touch and to move to next screen.

Confirm (Or Change) Weights* (*For 30 Lb Tank Shown)



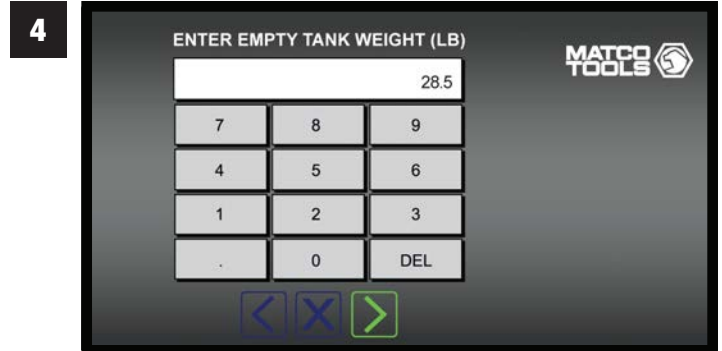
- a. If weights shown are correct, touch .
- b. If weights shown must be changed, touch .

Enter Password (Before Changing Weights)



- a. Use keypad to enter shop password (example only shown above).
- b. Touch to enter password and move to the next screen.

Confirm (Or Change) Tank Weight



- a. Enter EMPTY TANK WEIGHT. (example only shown above)
- b. Touch to enter tank weight and move to the next screen.

Enter Tank Water Capacity



- a. Touch "W" for WEIGHT, OR "V" for VOLUME.

Confirm Or Change Refrigerant/Tank Weights



- a. Touch if values are correct, and move to next screen.
- b. Touch if further changes needed.

SETUP (Cont'd)



JOB TRACKER (Not All Screens Are Shown)


Setup Function Screen



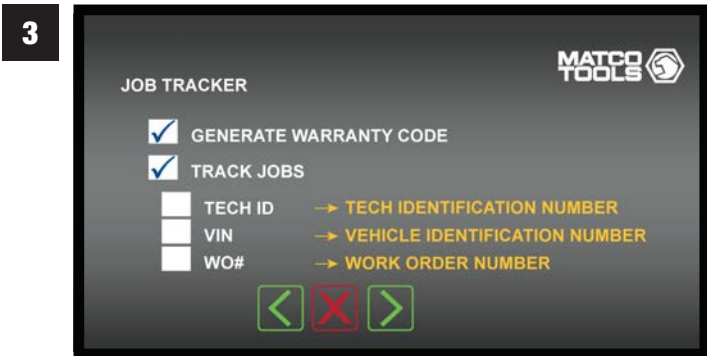
- a. Touch .


Job Tracker Screen



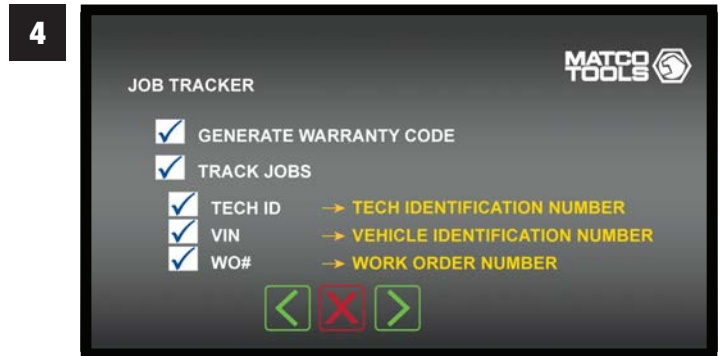
- a. Warranty Code – Touch white box to have ACDUAL machine generate an encrypted warranty code for manufacturer's vehicle being serviced.
b. Track Jobs- Touch white box to have Job Data appear (in next screen).
c. Touch  to enter selections and move to next screen.

Job Tracker Screen



- a. Touch any white box to check or uncheck which items to appear on a report.
b. Touch  to enter selections and go to next screen.

Job Tracker Screen



SETUP (Cont'd)



WIRELESS DEVICE SETUP

(Not All Screens Are Shown)

The ACDUAL features Bluetooth Low Energy and Wi-Fi capability for wireless connection to other wireless devices.

Bluetooth LE

Bluetooth Low Energy (Bluetooth LE, colloquially BLE, formerly marketed as Bluetooth Smart) is a wireless personal area network technology designed and marketed by the Bluetooth Special Interest Group (Bluetooth SIG). BLE is independent of classic Bluetooth and has no compatibility. Mobile operating systems including iOS, Android, Windows Phone and BlackBerry, as well as macOS, Linux, Windows 8 and Windows 10, natively support Bluetooth Low Energy.

TAC100 CarSmart® A/C Inspector Temperature Probes

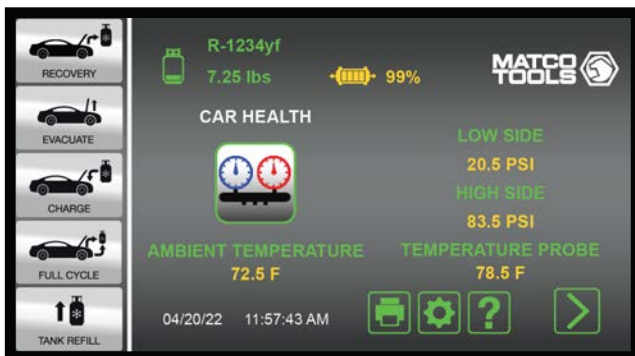
(an optional accessory from CPS Products) can be paired via BLE to any of the ACDUAL machines. These 2 probes allow technicians to data log temperature, feels like temperature, humidity, dry and wet bulb, and dew point readings inside of, or around passenger vehicles and light trucks over a preset period of time.



Storage Case



Measure temperature or humidity at 2 locations simultaneously.



- Ambient and Cabin Temperature values can be viewed when in the Car Health Mode (shown).

Other BLE devices such as a thermal printer can be connected to the ACDUAL.

SETUP (Cont'd)

Wi-Fi

Wi-Fi is the wireless technology used to connect computers, tablets, smartphones and other devices to the internet, and is the radio signal sent from a wireless router to a nearby device, which translates the signal into data you can see and use. ACDUAL Machines can be connected to other Wi-Fi devices or printers. The ACDUAL also has the ability to mail job reports by entering an e-mail address in the ACDUAL machine.

Setup Function Screen



- a. Touch  to access wireless devices to be set up.

BLE Or WiFi Device Screen



- a. Touch a key to connect that device to the ACDUAL machine.

3 Bluetooth Low Energy (BLE) Devices

- After the CPS brand CarSmart BLE devices have been set up, they can be enabled/disabled by touching a “checkbox” under the BT logo image.
- When a BLE device is enabled, the system will search for and connect to it when found and, when a BLE device has been connected, the Bluetooth icons will appear on the LCD touch screen.

4 Wi-Fi Devices

- Select one or more of the desired Wi-Fi devices (Wi-Fi Device, Printer, E-mail) to pair the ACDUAL.
- After a Wi-Fi device has been set up, it can be enabled/disabled by touching a “checkbox” under the image of that device.
- When a wireless device is enabled, the system will search for and connect to it when found and, when a Wi-Fi device has been connected, one or more of the 4 icons (from #a above) will appear on the touch screen.




SET DATE OR TIME

(Not All Screens Are Shown)


Setup Function Screen



- a. Touch  to set the Date or Time.

Set Date Or Time



- Touch keys to enter the current date (MM/DD/YYYY).
- In next screen, touch keys to enter the time of day (Hours, Minutes, Seconds).
- Touch  to enter data.

SETUP (Cont'd)



ONLINE WARRANTY / REGISTRATION

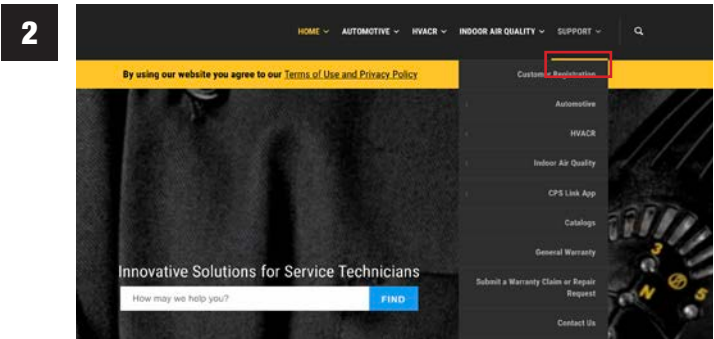
(Not All Screens Are Shown)

The ACDUAL warranty is serviced by CPS® Products, Inc. If you register on-line, use the path provided to follow the links in the CPS website.

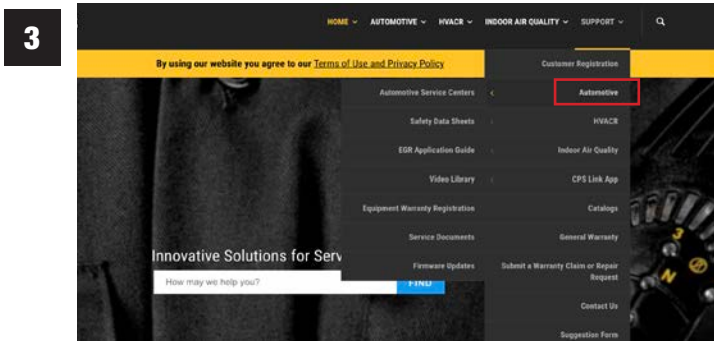
Please use one of the following methods to register the ACDUAL Refrigerant Management Center for warranty:

A. On-Line Method: Visit “www.cpsproducts.com/hvac-warranty-registration/”

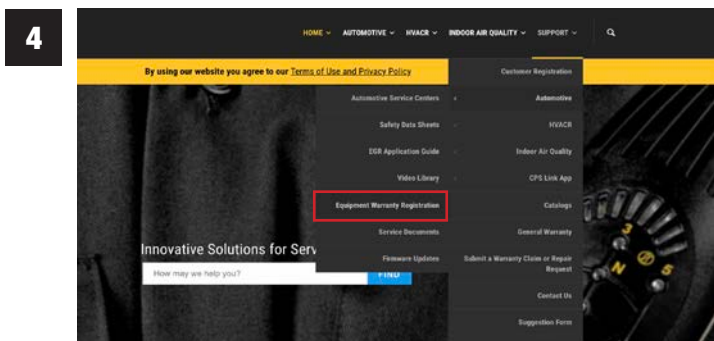
CPS Products Home Page (CPSPRODUCTS.COM)



a. On the “Support” tab, select the “Automotive” drop down.



a. Select **Equipment Warranty Registration**.



a. Enter information in the fields provided.

SETUP (Cont'd)

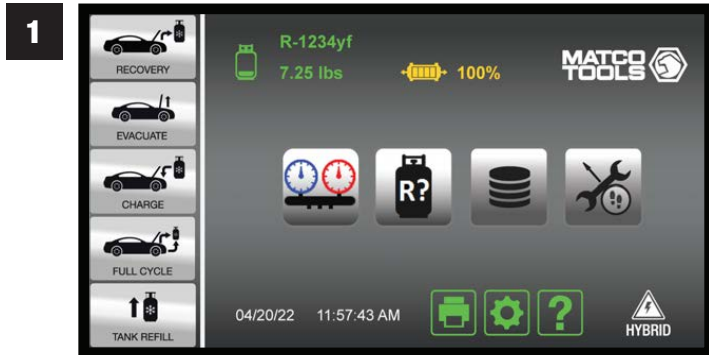


SHOP INFORMATION (Not All Screens Are Shown)

B. On-Screen Method:

Users may register an ACDUAL machine via the following “Onscreen” method:


Home Screen



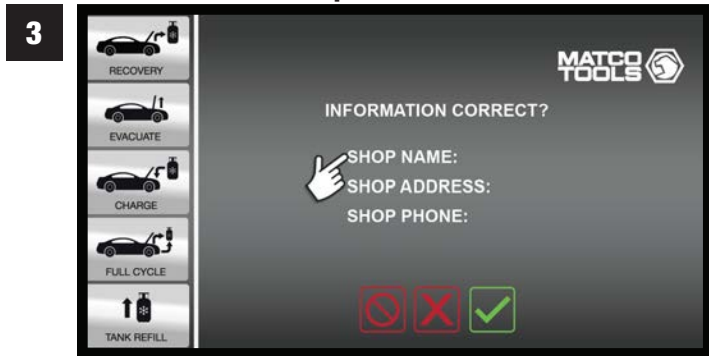
- Touch  ,
- Touch .


Setup Function Screen



- Touch  and enter information by following the prompts.

Shop Information



- Touch one of the the three lines where you want to enter data.
- Touch  to reveal keypad.

Enter Business Name



- Use the keypad to enter data (example shown).
- Touch  to enter data and move to next screen.

Shop Information



- If entries are OK, touch  to move to next screen.

SETUP (Cont'd)




SELECT SAE OR GLOBAL STANDARDS

(Not All Screens Are Shown)


ACDUAL machines are shipped with a default SAE Mode setting (for the U.S. and most Canadian markets). Yet, some Canadian and many global markets use the International setting.

Setup Function Screen







- a. To change the factory default SAE Mode setting TO International Mode, Touch the SAE  key.



- a. Enter password (example password shown. Contact CPS Technical Support for password to change to International Mode) that has been set up for this machine.
- b. Touch  to enter password.

Setup Function Screen



- a. Touch  so the ACDUAL machine operation follows SAE J2788 standard, then touch  OR,
- b. Touch  for the ACDUAL to follow INTERNATIONAL STANDARDS.
- c. Touch  to enter selection and move to next screen.

REFRIGERANT RECOVERY




REFRIGERANT RECOVERY

(Not All Screens Are Shown)

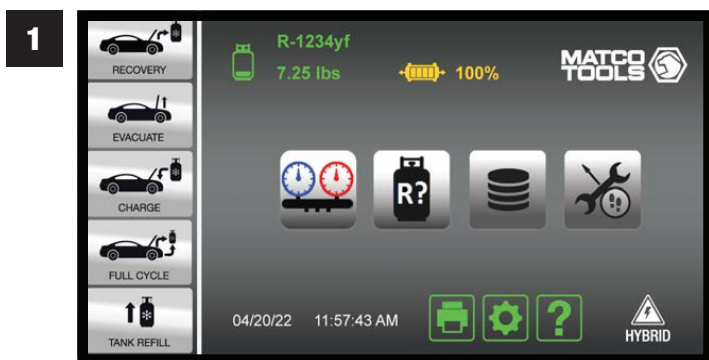
DO NOT CONNECT SERVICE HOSES TO REFRIGERANT SOURCE UNTIL INSTRUCTED TO DO SO.

The RECOVERY process pulls refrigerant into a distillation chamber which has a coil that is heated by compressor outlet gas. This distills the refrigerant (turns it to gas) and separates liquids and debris from the refrigerant. Refrigerant then passes through the distillation chamber and compressor and is condensed into a liquid before coming to rest in the internal (included 30 Lb) storage tank.

Refrigerant recovery automatically ends when the machine detects that the vehicle's system is void of refrigerant.

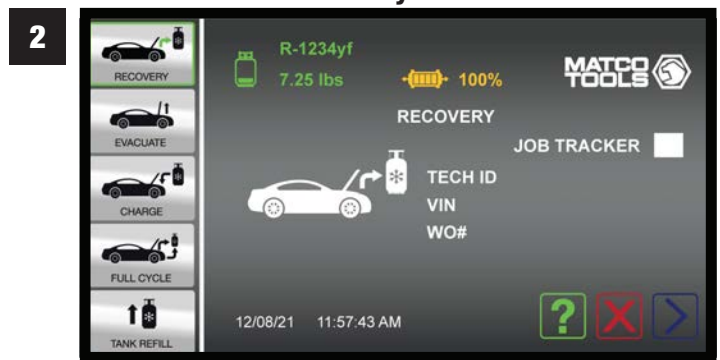
The color display will show the amount (weight) of refrigerant that has been recovered. This information may be printed by touching  on the Home Screen.



Home Screen

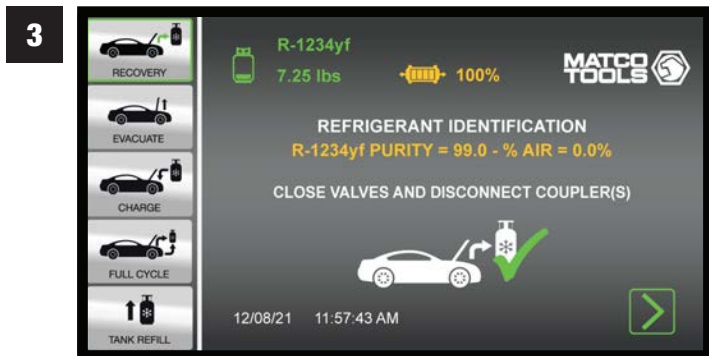


- a. Before opening the vehicles' A/C system for repair, first Recover & Recycle refrigerant from the A/C system.

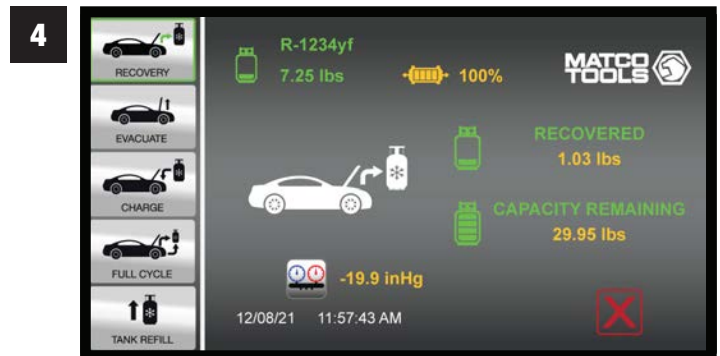
Recovery Screen



- a. Touch .
- b. Touch Job Tracker white box for Job Info to appear on reports.
- c. Touch  to move to next screen to begin the Refrigerant Identification process – follow onscreen instructions to walk-thru process.



- a. Once the Refrigerant Identification process is complete, follow onscreen instructions to begin the Refrigerant Recovery process.

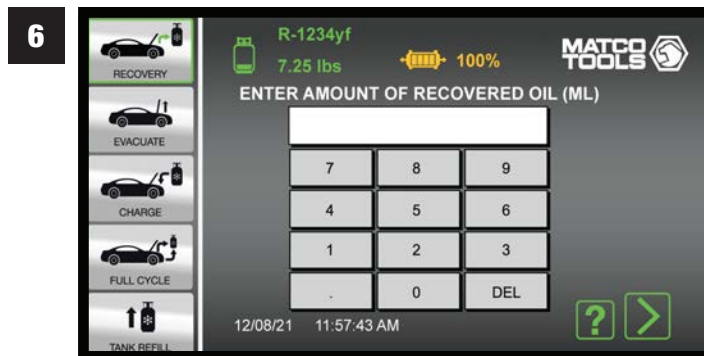



- a. Screen displays weight of refrigerant RECOVERED and REMAINING TANK WEIGHT CAPACITY.

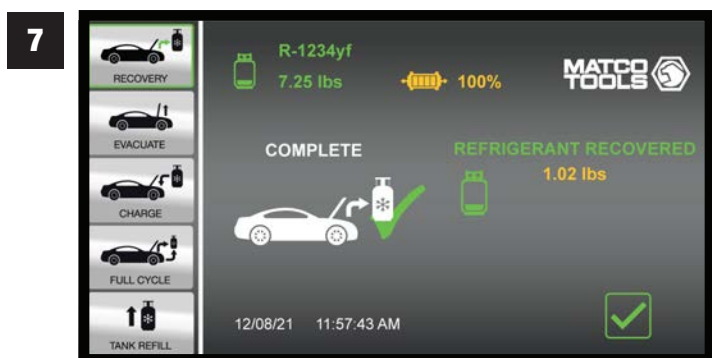
REFRIGERANT RECOVERY (Cont'd)



- Refrigerant Oil draining (into the ACDUAL machine's included Oil Recovery Bottle).
- Countdown timer shows remaining time.



- Use keypad to enter amount of recovered oil.
- Touch  to enter data and move to next screen.



- Touch  to return to Home Screen.

EVACUATION OF A/C SYSTEM



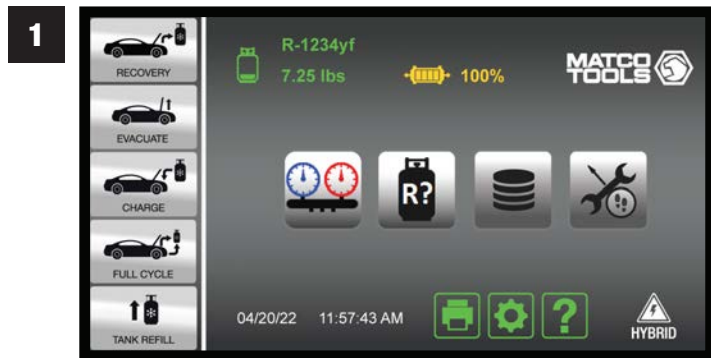
A/C SYSTEM EVACUATION (Not All Screens Are Shown)


After all refrigerant has been recovered from the vehicle's A/C system, and the system has been reassembled following any repairs, the AC system must be evacuated.

Within a vehicle's AC system, any moisture that is present can mix with oil to form "sludge", while moisture mixed with refrigerant forms hydrofluoric and hydrochloric acids all of which can permanently damage a system. The ACDUAL Refrigerant Management Center will "evacuate" (degas and dehydrate) an AC or refrigeration system prior to refrigerant charging.

A system that has been properly "evacuated" assures that non-condensable and moisture won't later harm the refrigerant or refrigerant oil in the system.


Home Screen



- a. Touch  for vehicle's 2 CFM vacuum pump to evacuate the A/C system.

Select Run Time



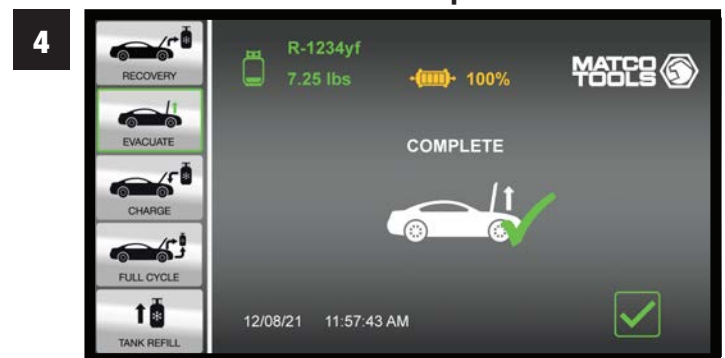
- a. A custom vacuum time may be entered, or one of the preset 15 or 30 minute times may be selected.
- b. If a vacuum time of 15 minutes or greater is selected, evacuation will be followed by a 2 minute leak test (vacuum decay test).
- c. Touch  to enter evacuation time and move to the next screen.


Evacuation In Progress



- a. "Vacuum Time Remaining" will appear on the display.

Vacuum Complete




- a. When the specified Vacuum Time has expired, this screen will appear.
- b. Touch  to return to Home Screen.

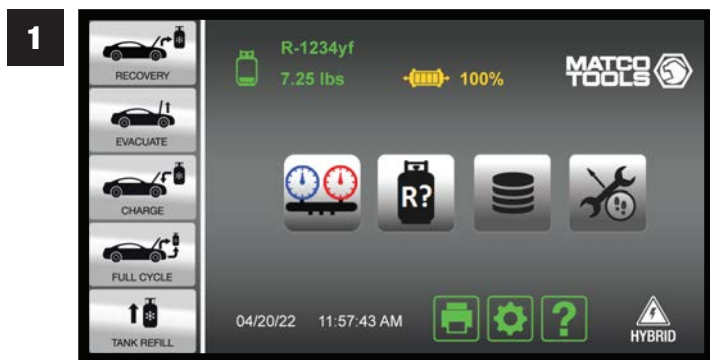
REFRIGERANT CHARGING



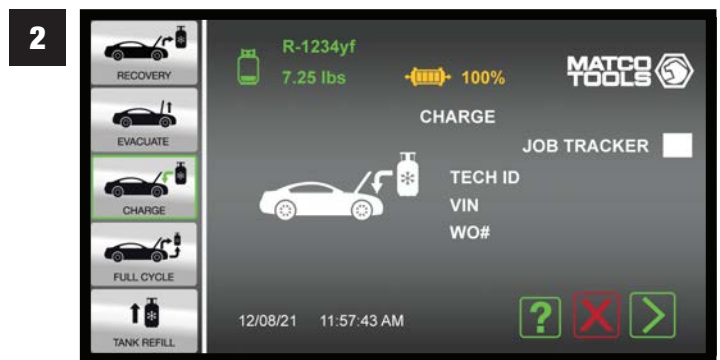
REFRIGERANT CHARGING (Not All Screens Are Shown)


1. An **A/C Database** is integrated into the ACDUAL and, can be accessed by touching the  key. This database will specify the correct type and amount (weight) of refrigerant and refrigerant oil for vehicles sold in North America.
2. The charging sequence begins with a 10-minute vacuum leak test. This is an SAE requirement in SAE J2843 (R-1234yf systems only). If the system passes the vacuum leak test, the machine will charge the system to 15% of the selected charge.
3. Use an electronic leak detector meeting SAE J2913 for R-1234yf to leak test the evaporator(s).
4. The ACDUAL will complete the remaining 85% of the charge.
5. Note; During cold conditions, a Heater Blanket (CPS optional accessory #AR27XHB115) may be wrapped around the Recovery Tank to assist with charging. If the ACDUAL cannot complete a charge due to pressure equalization, it will notify the user to close the high side coupler and start the vehicle.

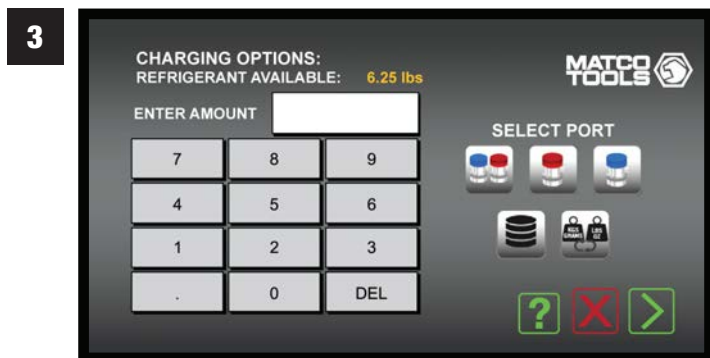
Home Screen



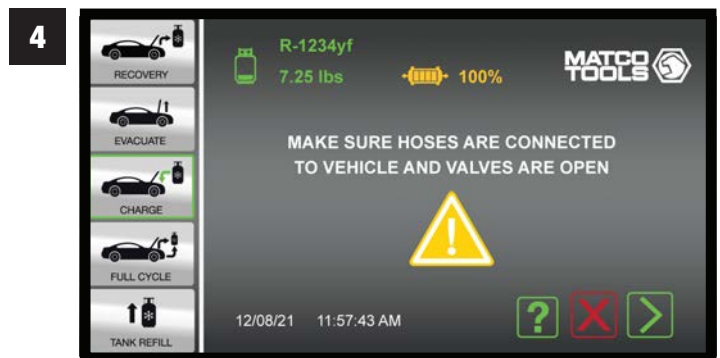
- a. Touch .



- a. Enter: 1. Tech ID#, 2. Vehicle VIN#, 3. Work Order #.
- b. Touch  White Box for Job Tracker and proceed to next screen.



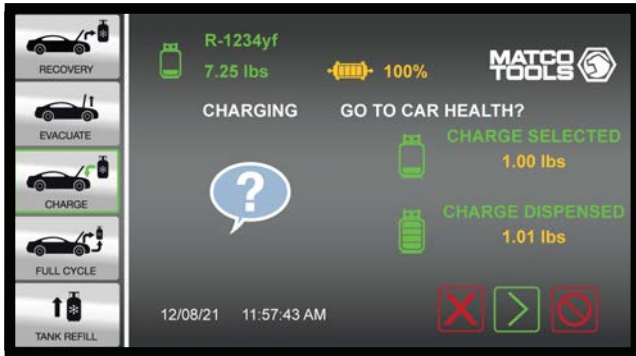
- a. Using the keypad, enter the desired charge amount (refrigerant weight).



- a. Ensure hoses are connected to vehicle and hose valves are OPEN.

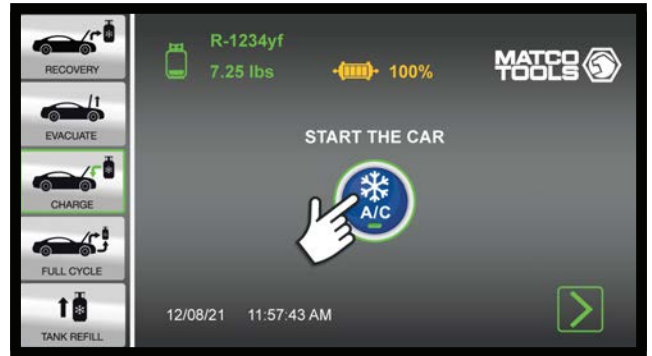
REFRIGERANT CHARGING (Cont'd)

5



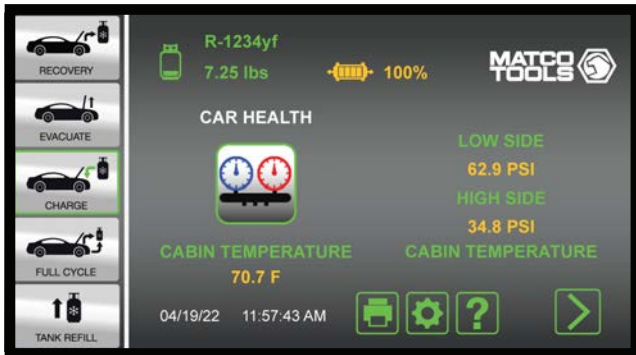
- a. Ensure hoses are connected to vehicle and hose valves are OPEN.

6



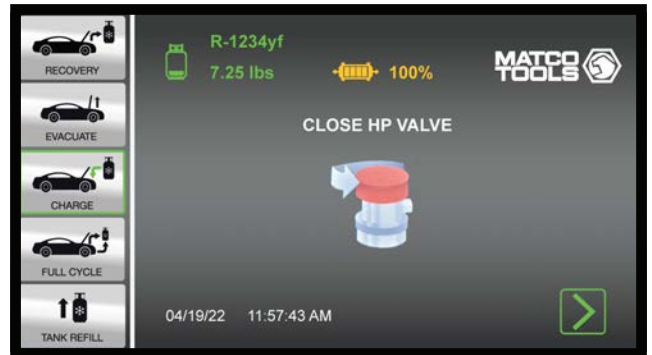
- a. Start the vehicle.

7



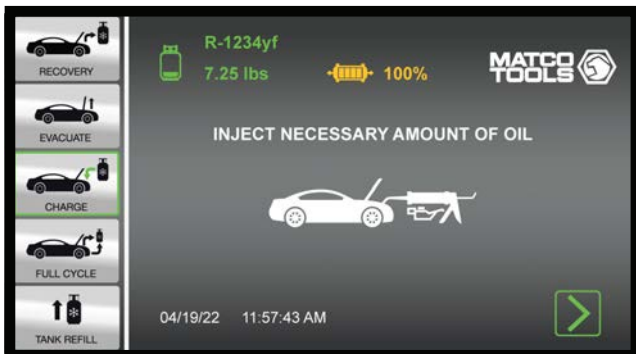
- a. Start the vehicle.

8



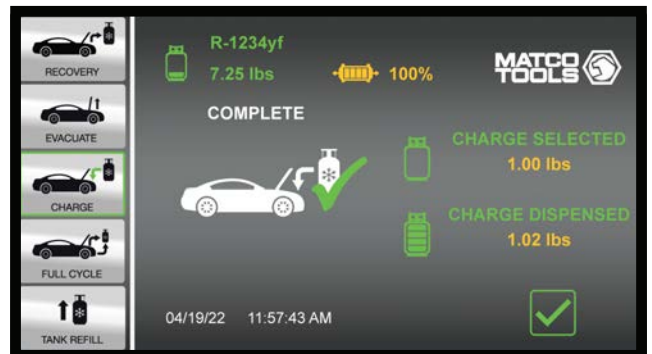
- a. Close HP Valve, follow screen instructions to;
- b. Close valves and disconnect coupler(s).


9



- a. Inject necessary amount of oil into vehicle.

10



- a. Final "Charge" Vs. "Dispensed" amounts shown.
- b. Touch  to proceed to the Home screen.

FULL CYCLE



FULL CYCLE

(Not All Screens Are Shown)

Select “Full Cycle” on the Home Screen to Recover, Recycle, Vacuum, Leak Check (if desired) and Charge the vehicle’s A/C system.

Home Screen

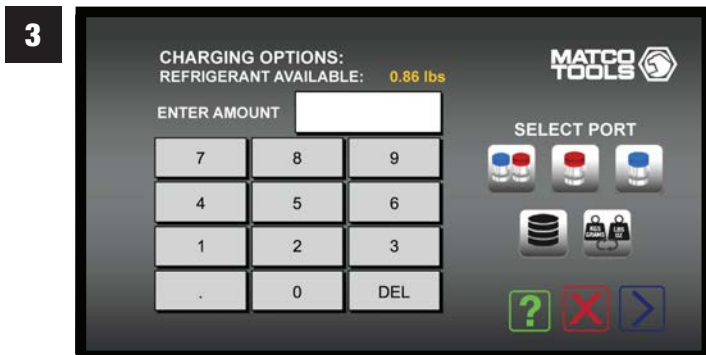


a. Touch  to go to FULLY CYCLE Function.

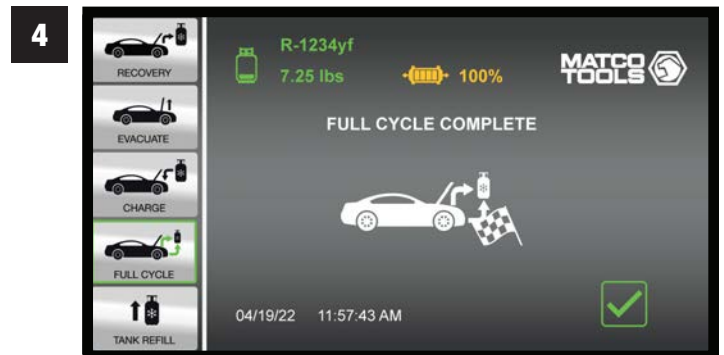
Full Cycle Screen



a. The display will prompt you to enter a vacuum time and a vehicle charge amount.




a. The display will prompt you to enter a vacuum time and a vehicle charge amount.



a. Checkered flag icon displayed when Full Cycle process is complete.

Full Cycle Process Outline

1. The display will prompt you to enter a vacuum time and a vehicle charge amount.
2. Once Full Cycle has been selected and started, the machine will proceed with the Refrigerant Identification process followed by the Recovery process described in a previous section.
3. At the end of Recovery, the ACDUAL will automatically proceed to Vacuum and Leak Test (if the vacuum time selected was greater than 10 minutes.)
4. Once the Vacuum process is complete, the desired charge amount will be installed in the vehicle.
5. The ACDUAL will then ask if you want to enter the Car Health Mode. Select this mode to check/print system pressures and vent temperature.
6. If Car Health Mode is not selected, the ACDUAL will instruct how to transfer refrigerant contained in the hoses into the vehicle’s AC system.
7. Final results of the Full Cycle process can be printed by touching the Print Key  found at the bottom of the “Home” screen.

REFRIGERANT TANK REFILL



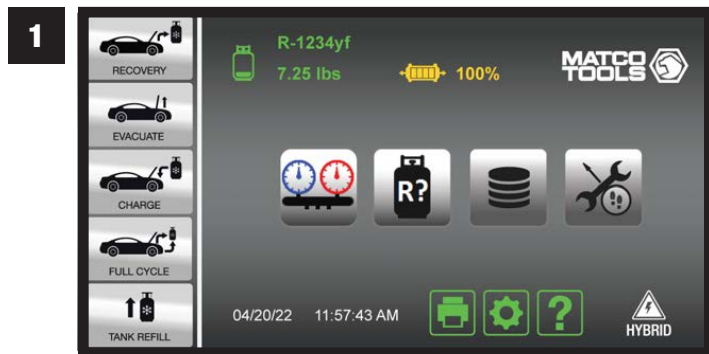
REFRIGERANT TANK REFILL (Not All Screens Are Shown)

FOLLOW DIRECTIONS ON SCREEN AND DO NOT OPEN COUPLE OR TANK VALVE UNTIL SCREEN SHOWS TO OPEN BOTH

It is suggested that at least 4.5 lbs (2 kg) of refrigerant be available in the storage tank to begin any operation. If less is observed, choose this operation to add refrigerant to the internal tank. This operation transfers refrigerant in the liquid state to the internal storage tank. The Refrigerant amount transferred in this mode is not counted toward the filter life.

CAUTION: If hoses were connected before instructed, the machine will post a warning and instruct that the couplers be closed and the hoses removed. Not doing so will result in refrigerant loss (at the user's expense).

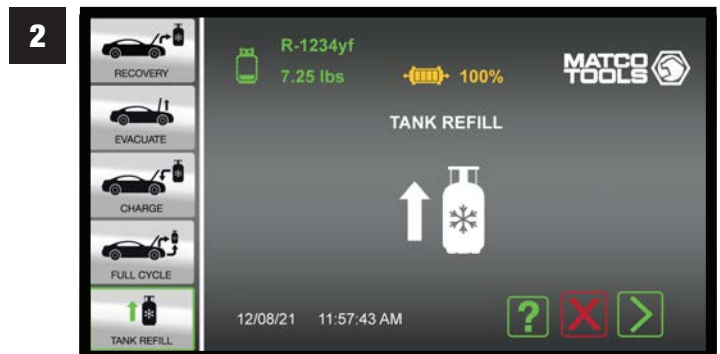
Home Screen




- a. Touch  to add refrigerant to the ACDUAL Tank.

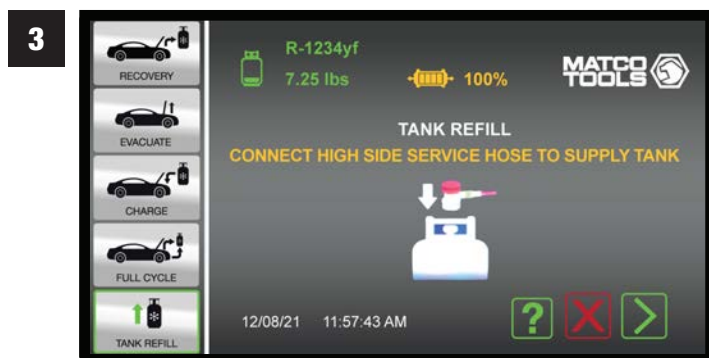
**FAILURE TO OPEN TANK VALVES WHEN INSTRUCTED
WILL RESULT IN HAVING TO START OVER FROM
BEGINNING**

Tank Refill



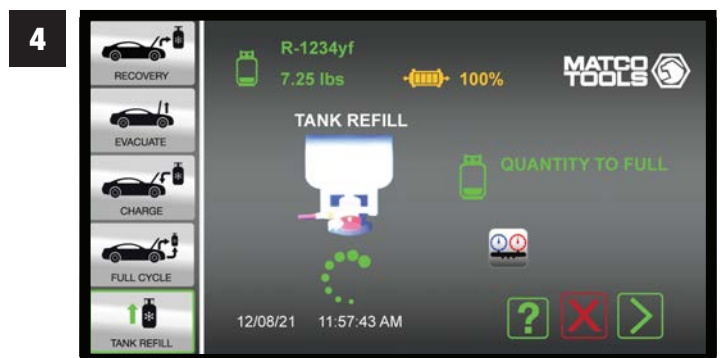
- a. Start with hoses disconnected and couplers closed.
b. Touch  and follow the on screen instructions.

Tank Refill



- a. Connect High Side Service Hose to Supply Tank.
b. Touch  and follow the on screen instructions.

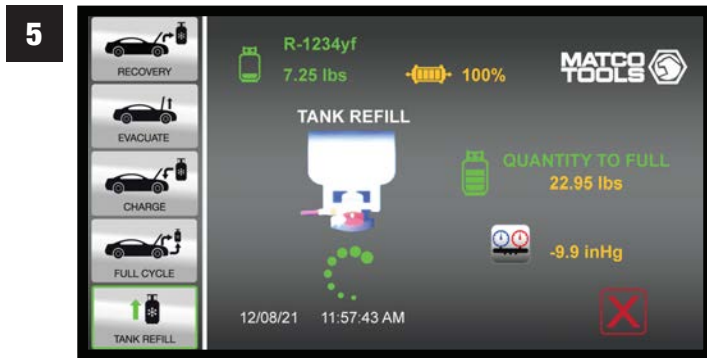
Tank Refill



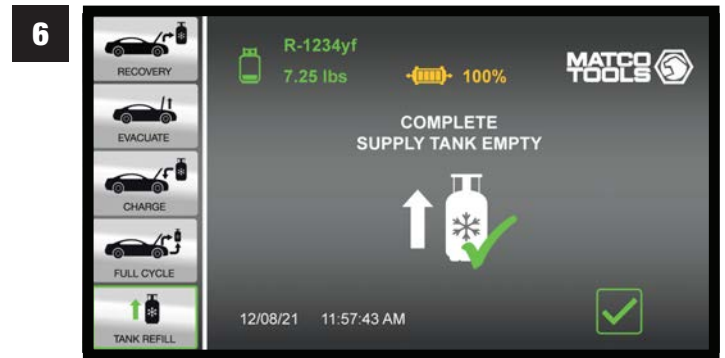
- a. Invert the Supply Tank (source of refrigerant for the ACDUAL tank) so that a liquid transfer can occur.


**FOLLOW DIRECTIONS ON SCREEN AND DO NOT OPEN COUPLER OR TANK VALVE UNTIL SCREEN SHOWS TO OPEN BOTH.
IF YOU FAIL TO OPEN TANK, START OVER.**


REFRIGERANT TANK REFILL (Cont'd)



- a. Refrigerant transfer in process (screen shows weight of refrigerant that can still be transferred to ACDUAL tank until it is full).



- a. Refill function has been completed (the SCDUAL tank has been filled to capacity).
- b. Touch  to return to the Home Screen.

7. A "NO PRESSURE DETECTED IN THE TANK!" message will appear. Touch Continue to proceed.
8. A "STILL NO PRESSURE DETECTED!" message will appear. Touch Continue to proceed.
9. The main menu will appear. Touch  and refer to page 30 (previous page) for further instructions on how to fill the tank.
10. Please contact CPS* Technical Support if you have any problems registering this machine.

NOTE: Repairs and service for the ACDUAL is provided by CPS® Products, Inc. Please contact CPS technical support (1-800-277-3808 (TF)) if you need assistance with registration.

MAINTENANCE MENU



FILTER/DRYER

(Not All Screens Are Shown)




The included filter Filter/Dryer has the capacity to dry 150 Lbs of recovered refrigerant. The remaining FILTER life is graphically displayed TOP CENTER of the HOME SCREEN. When all 4 segments are no longer visible, change the Filter/Dryer.

Filter/Dryer

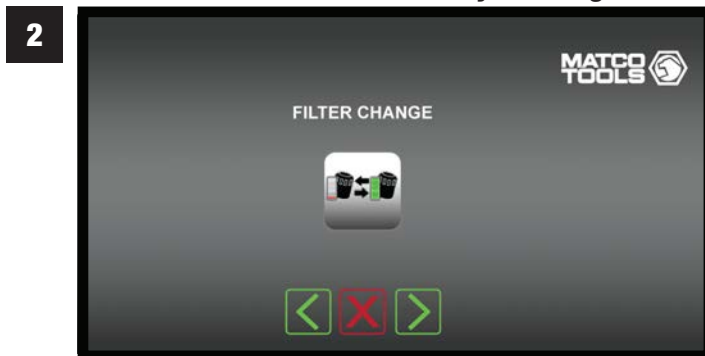


Maintenance Screen



- On the Home Screen touch  and select  from the Machine Upkeep Screen. Follow the displayed directions and enter the "Filter Reset Code" found in the NEW Filter/Dryer.
- On the above screen, touch  to change the Filter/Dryer.

Maintenance – Filter/Dryer Change



- Touch  to change the Filter/Dryer.

Maintenance – Filter/Dryer Change



- Refrigerant Recovery cannot be performed if Filter Dryer life has been exceeded.

Maintenance – Filter/Dryer Change

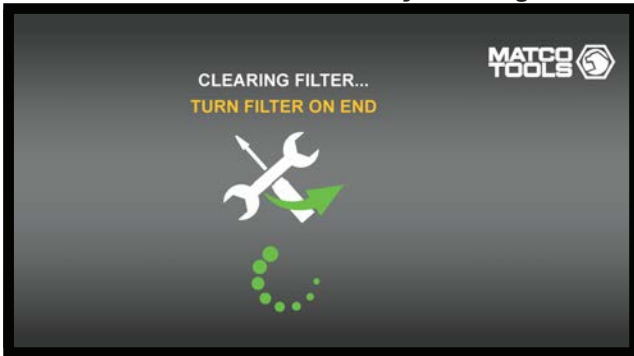


- Close Liquid Valve on Recovery Tank Ball Valve.

MAINTENANCE (Cont'd)

Maintenance – Filter/Dryer Change

5



- a. Turn Filter Dryer on end.

Maintenance – Filter/Dryer Change

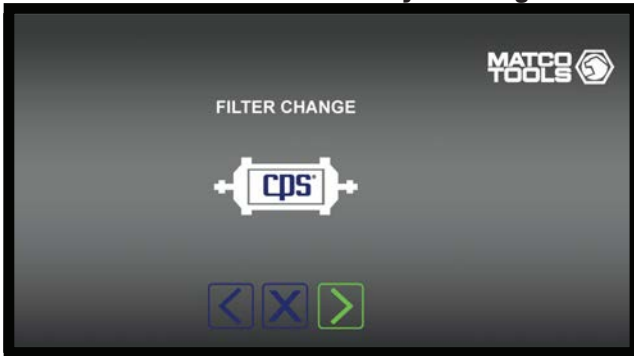
6



- a. Replace the Filter Dryer with CPS part #FX3030X1.

Maintenance – Filter/Dryer Change

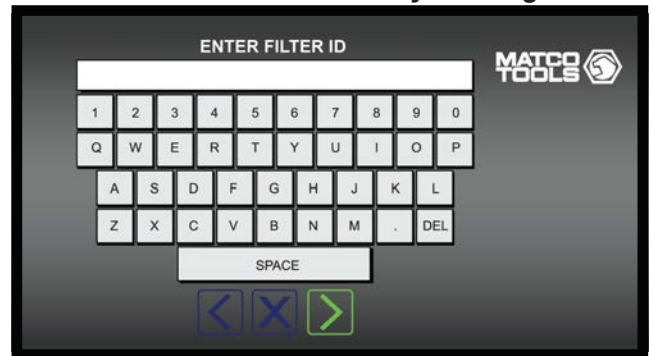
7



- a. Install the Filter Dryer.

Maintenance – Filter/Dryer Change

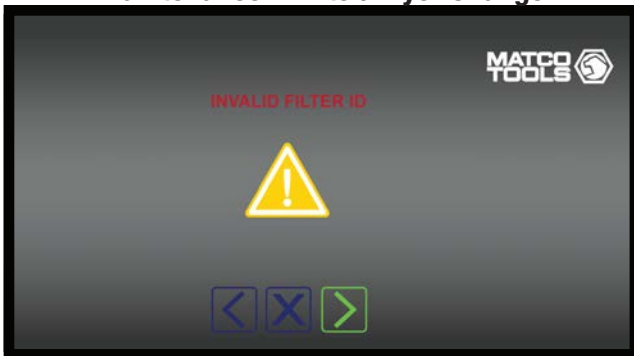
8




- a. Using the keypad, enter the NEW Filter Dryer ID #.

Maintenance – Filter/Dryer Change

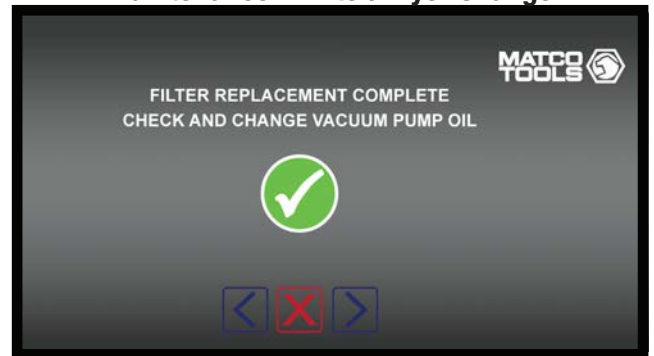
9




- a. This screen will appear if an incorrect Filter ID# has been entered.
b. Touch  to return to the keypad screen and re-enter the correct Filter/Dryer ID #.

Maintenance – Filter/Dryer Change

10



- a. Filter Dryer replacement is complete.
b. Check or change the Vacuum Pump Oil.
c. Touch  to move to the next screen.

MAINTENANCE (Cont'd)

Replacement parts for the ACDUAL are manufactured by CPS® Products, Inc. Please see the following recommendations for replacement parts.

VACUUM PUMP OIL CHANGE (FREQUENCY)

CPS® recommends replacing the oil with fresh CPS® brand Premium Vacuum Pump Oil when:

- Oil becomes contaminated (condensation, particles) or is discolored.
- A 100 hour run time break-in period has been reached.
- NOT RUNNING the pump for an extended time.
- Vacuum pump level is significantly higher than the rated blank-off vacuum.
- When pump no longer reaches a desired vacuum level (test with a vacuum gauge attached directly on the pump).
- Depending on your oil type, application, and possible contaminants acquired when servicing A/C systems, oil change frequency may range from daily to monthly.

CAUTION: DO NOT RUN THIS ACDUAL MACHINE WITH LOW OR NO OIL. RUNNING THIS EQUIPMENT WITH NO OR IMPROPER OIL WILL CAUSE PREMATURE FAILURE.

OIL CHANGE PROCEDURE

1. Before draining the Vacuum Pump Oil from an ACDUAL machine, ensure oil is warmed up. If not, run pump for 10 minutes. **Then, before draining oil, allow oil to reach room temperature.**
If in doubt as to the temperature, use an infrared thermometer to check the housing temperature.
2. Turn ACDUAL Machine OFF then **REMOVE POWER CORD FROM OUTLET.**
3. Place ACDUAL Machine series pump over a suitable container for draining oil.
4. Remove Oil Drain CAP, then remove Oil Drain PLUG from drain port. **AVOID CONTACT WITH HOT OIL. HOUSING COMPONENTS MAY BE HOT.** Let contaminated oil drain into suitable container. Reinstall OIL DRAIN PLUG.
5. **Add fresh Pro-Set Premium Vacuum Pump Oil (by CPS) until level is between the MAX and MIN lines on the pump housing.**

PRO-SET® PREMIUM VACUUM PUMP OIL

Pro-Set® Premium Vacuum Pump Oil is an extremely high quality, severely hydro-treated vacuum pump oil and can be used in pumps made by most manufacturers.

Vacuum pump oil should always be clean and free of contaminants such as moisture, acids, vapors, dirt etc., to extend the life of your pump. So, replace the oil at the appropriate interval with Pro-Set Premium Vacuum Pump oil (available in pints, quarts and gallons).

VPOG6	(1 Gallon, 6/Case)	VPOG	(1 Gallon)
VPOQ12	(1 Quart, 12/Case)	VPOQ	(1 Quart)
VPOP12	(1 Pint, 12/Case)	VPOP	(1 Pint)



MAINTENANCE (Cont'd)

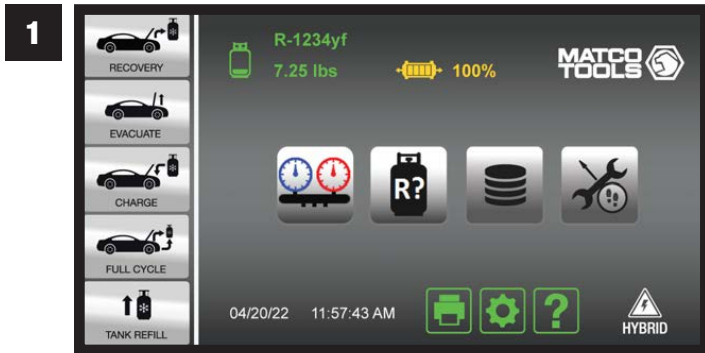



REFRIGERANT CHANGE

(Not All Screens Are Shown)

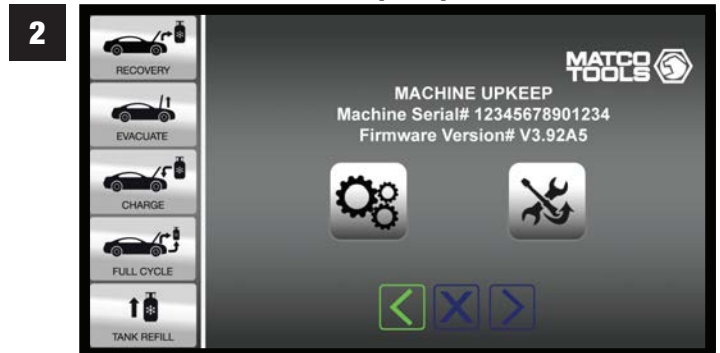
The ACDUAL Refrigerant Change function feature allows you to switch between the R-134a and R-1234yf refrigerant type; specific to that used in the vehicle.

Home Screen



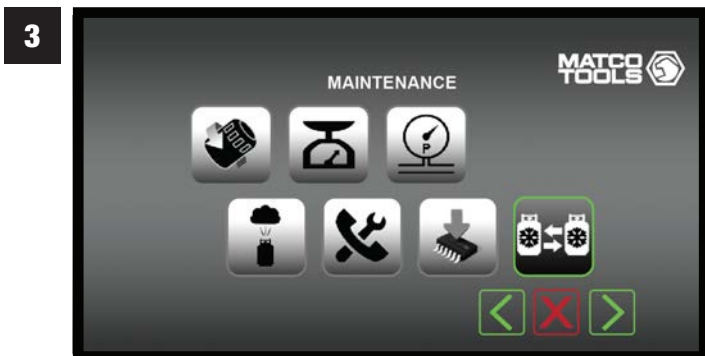
On the Home Screen touch  to access the MACHINE UPKEEP Screen.

Machine Upkeep Screen



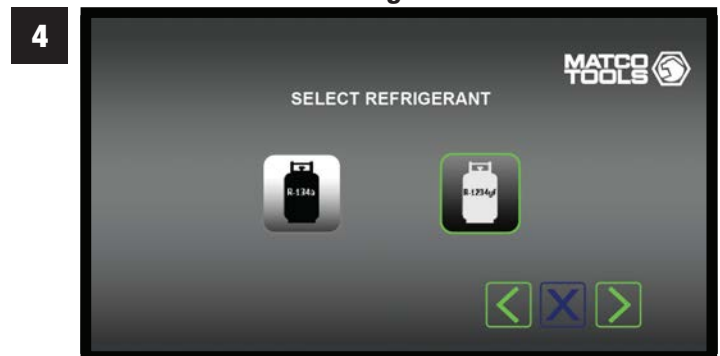
Touch  to enter the MAINTENANCE MENU.

Maintenance Menu Screen



Touch  then .

Select Refrigerant Screen



Touch icon to select refrigerant type:

- R-134a
- R-1234yf

Change Refrigerant Screen



Follow onscreen instructions to close both valves 1 and 2. The ACDUAL unit indicates when complete.

Change Refrigerant Screen



After a 3 – 5 minute purge/deep vacuum to remove any remaining trace of the refrigerant, you will be prompted to replace tank.

MAINTENANCE (Cont'd)

REFRIGERANT CHANGE *(continued)*

1. Disconnect Tank from the ACDUAL

Once the the refrigerant is purged, disconnect the tank from the ACDUAL unit:

1. Using a Philips head screwdriver, remove the hose bracket cover (Figure 1) located on the left-side of the back of the unit.
2. Then, using a $\frac{9}{16}$ " wrench, disconnect both the tank's liquid feed hose (red) and the vapour return hose (blue) from the unit. (Figure 1; inset)

2. Connect New Hoses to Unit and Tank Filter Bracket

After the old tank has been removed:

1. Using a $\frac{9}{16}$ "wrench, connect the new hoses to the $\frac{1}{4}$ " SAE Male brass fittings (Figure 2) located on the left side of the unit (red hose on top, blue hose on bottom)
2. Then, attach the red hose to the filter bracket and the blue hose to the new tank.
3. Open all valves to check for leaks.

Neither MATCO nor the refrigerant supplier is responsible lost refrigerant.

3. Replace the Service Hoses

Service hoses are located on the right-side of the back of the unit, again, red (top), blue (bottom). (Figure 3)

1. Using a Philips head screwdriver, remove the hose bracket cover.
2. Disconnect the service hoses with a $\frac{9}{16}$ " wrench and attach the new service hoses.
3. Once attached, re-install the hose bracket cover.

4. Refer back to screen as the unit goes through the Refrigerant Identification process to ensure proper changeover. (Figure 4)

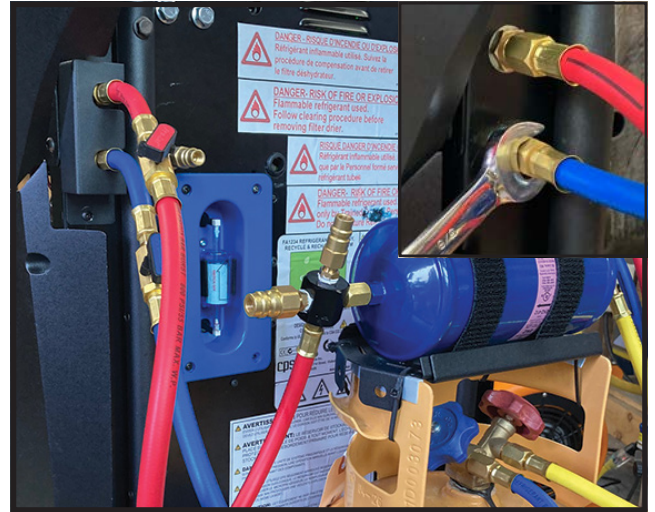


Fig 1: Disconnect hoses on the left side, back of the ACDUAL unit.



Fig 2: 1/4" SAE Male fittings

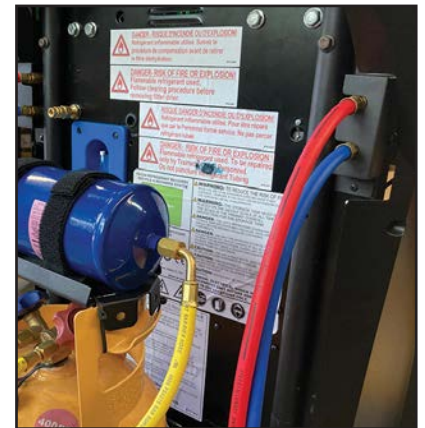


Fig 3: Service hoses attached to right-side, back of unit.

Change Refrigerant Confirmation Screen

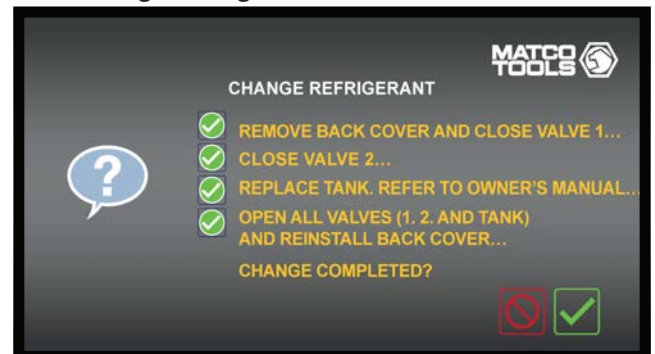



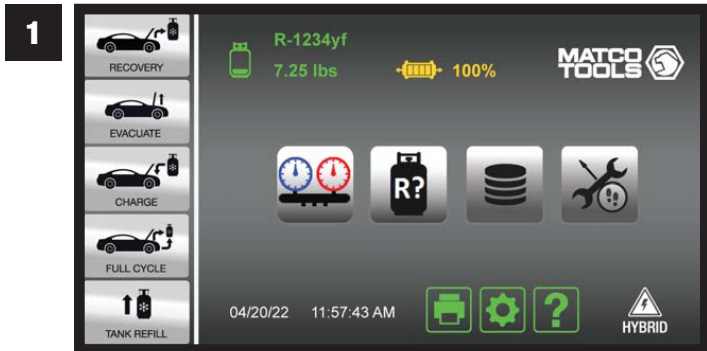
Fig 4: Select  to confirm that all steps have been completed so that the unit can run through the refrigerant identification process.

MAINTENANCE (Cont'd)



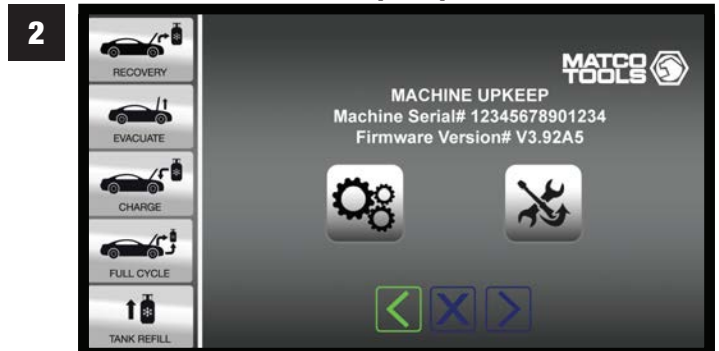
MAINTENANCE MODES (Not All Screens Are Shown)

Home Screen



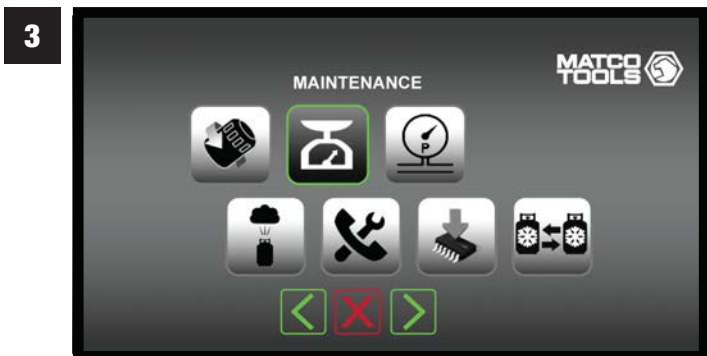
- a. On the Home Screen touch to access the MACHINE UPKEEP Screen.

Machine Upkeep Screen



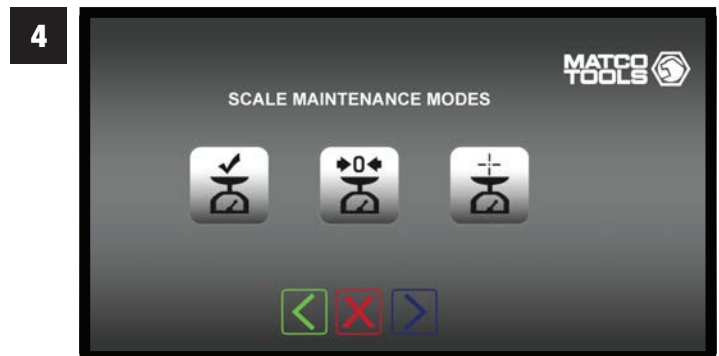
- a. Touch to enter the MAINTENANCE MENU.

Maintenance Menu Screen



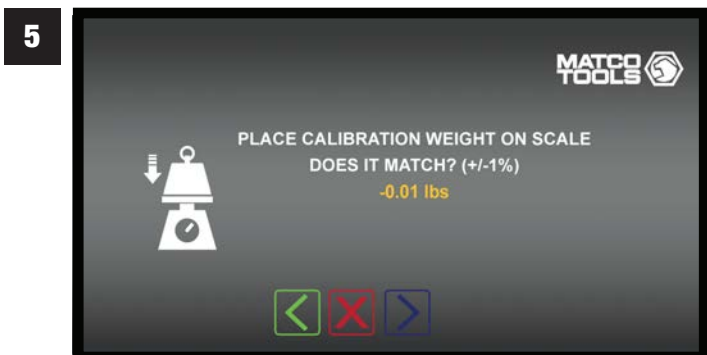
- a. Touch then .

Scale Maintenance Modes



- a. Touch Maintenance Mode Icon to: (left to right)
- Check Calibration
 - Tare (Zero) the Scale
 - Scale Calibration (ACDUAL Scale calibration is only provided by CPS® Products, Inc.).

Check Calibration Screen



- a. Set the included 1 lb weight on the scale.
b. If the scale weight is within $\pm 1\%$ of 1lb (0.99 – 1.01 lbs), touch the .

Tare (Zero) The Scale



- a. On the “Scale Maintenance Modes” screen, touch .
b. Remove the refrigerant tank from the scale.
c. Touch .
- b. Touch to reset the empty tank weight to zero.
e. Touch to move to next screen.

MAINTENANCE (Cont'd)

- 7** Actual scale calibration is suggested only if the calibration test was off by more than 0.02 lbs. Calibration may be performed by a CPS® authorized service center. CPS Technical Support can also assist with the process. Scale calibration requires a certified 25 lb weight.

Note: The scale is powered by the ACDUAL machine (no batteries to replace)



PRESSURE TRANSDUCER (Tare Or Calibrate)

(Not All Screens Are Shown)

The internal pressure transducers are used during recovery, vacuum, air purge and in the manifold mode. Access this menu if you suspect that the internal pressure transducer readings are inaccurate.

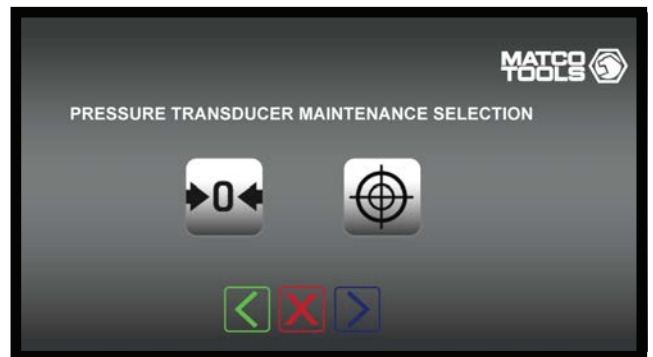
- Calibration will require a certified pressure source above 70 PSIG.
- Follow the displayed direction for the select transducer maintenance function.
- Select Maintenance Mode for Pressure Transducer.

1



- a. On the Maintenance Screen, touch .

2



- a. Touch either the “Tare”  or “Calibrate”  keys.

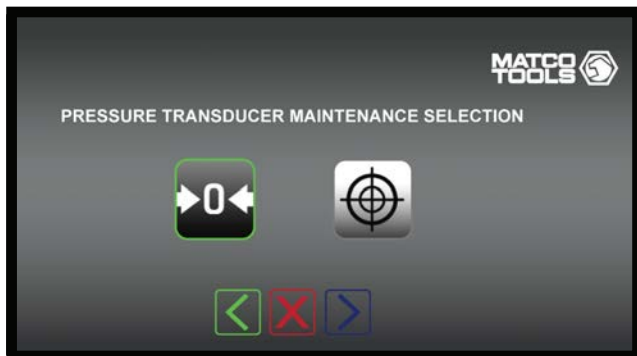



Tare (Zero) The Pressure Transducer

(Not All Screens Are Shown)

Zero The Pressure Transducer

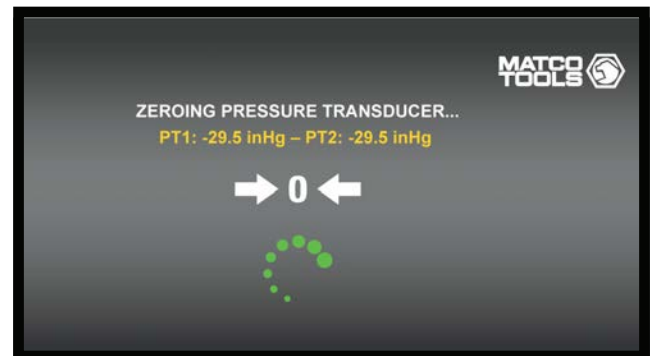
3



- a. Touch  to “Tare” (zero out) the Pressure Transducer (PT).

Zero The Pressure Transducer

4



- a. Wait while PT1 zeros out.

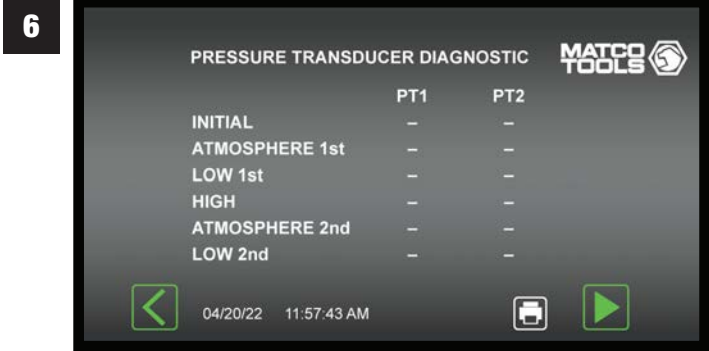
MAINTENANCE (Cont'd)

Zero The Pressure Transducer



a. Wait while PT2 zeros out.

Zero The Pressure Transducer



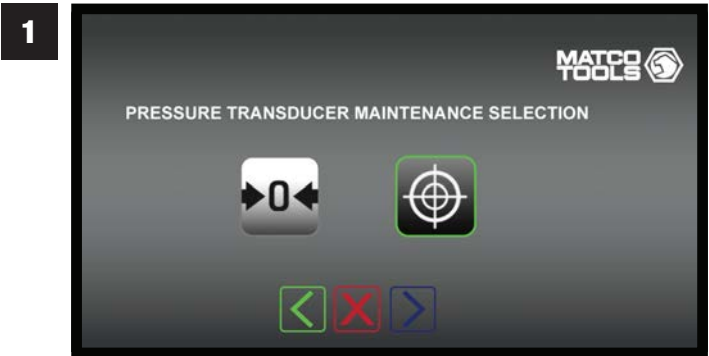
a. Chart will populate with PT data



Calibrate Pressure Transducer

(Not All Screens Are Shown)

Calibrate Pressure Transducer



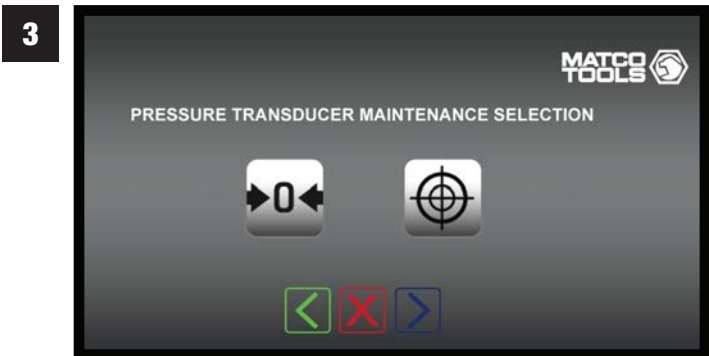
a. Touch to calibrate the Pressure Transducer.

Calibrate Pressure Transducer



a. Touch for HELP or to proceed.

Calibrate Pressure Transducer



a. Touch to proceed to the next Maintenance step.

MAINTENANCE (Cont'd)



AUTOMATIC AIR PURGE

(Not All Screens Are Shown)

The ACDUAL features automatic air purge at machine start up. Air Purge may also be selected in the Maintenance Mode. Air Purge reduces “non-condensable gases” in the storage tank to an acceptable level and may take a few minutes to complete. **DO NOT TURN THE MACHINE OFF OR UNPLUG THE MACHINE DURING AN AIR PURGE CYCLE.**

1. This mode should only be entered with direction by CPS® Products Technical Support or by a CPS® Authorized Service Center.
2. This mode enables the testing of each device controlled by the ACDUAL computer. These devices include the ball valves, vacuum pump, compressor and pressure transducers.

Maintenance Screen



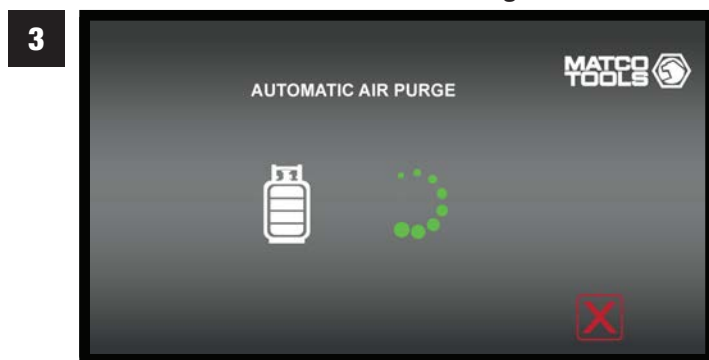
- a. Touch  on the Maintenance Screen.

Automatic Air Purge



- a. The ACDUAL will check the Refrigerant Tank Pressure.

Automatic Air Purge



- a. Automatic Air Purge in process.
- b. When Air Purge has been completed, the Maintenance Home Screen will appear.

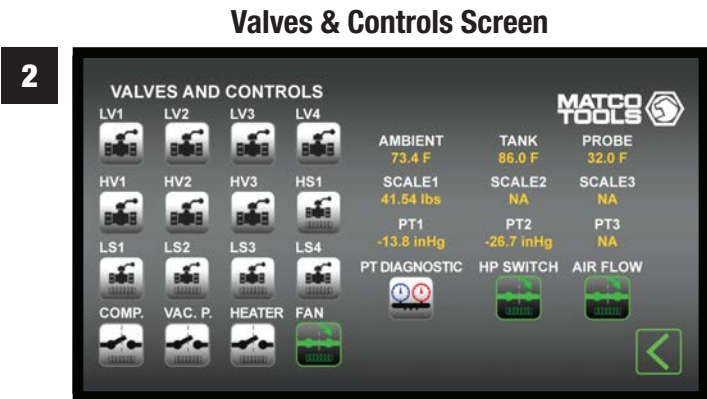
MAINTENANCE (Cont'd)



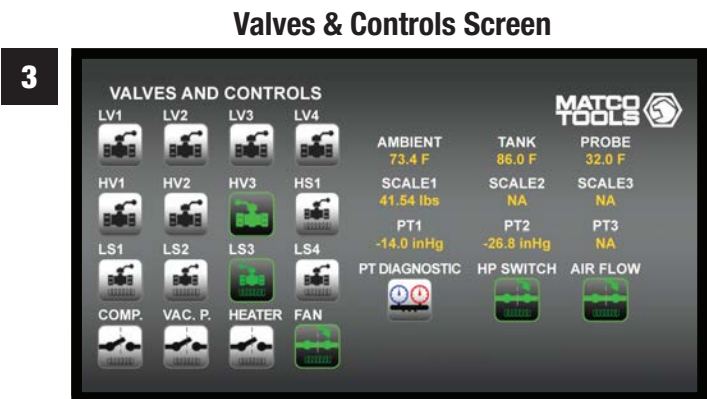
DIAGNOSTICS OF INDIVIDUAL VALVES, CONTROLS, SCALE, TANK, ETC (Not All Screens Are Shown)



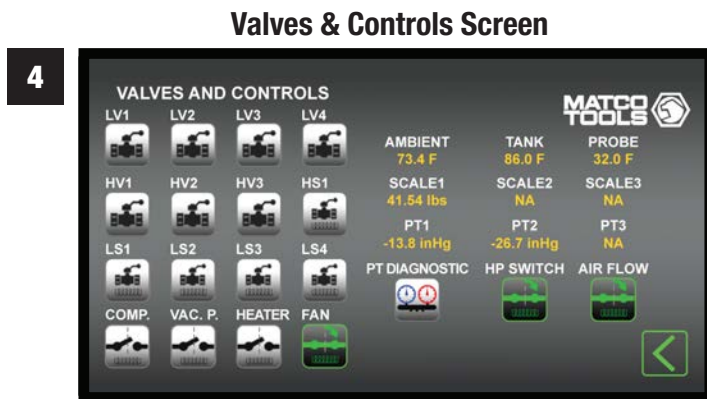
a. Touch (Valves & Controls Icon).



a. List of Valves, Controls, PT's Scale, etc. to select for diagnostics.



a. Select a valve or control for individual diagnostics.

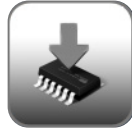


a. Or, select PT1 or PT2 for diagnostics.



a. Zeroing PT1 & PT2.

MAINTENANCE (Cont'd)



FIELD SOFTWARE UPGRADE

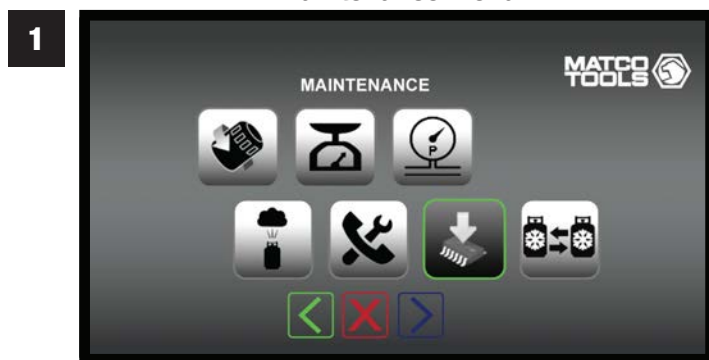
(Not All Screens Are Shown)



Use this mode to update the ACDUAL system software.

Loading New Firmware

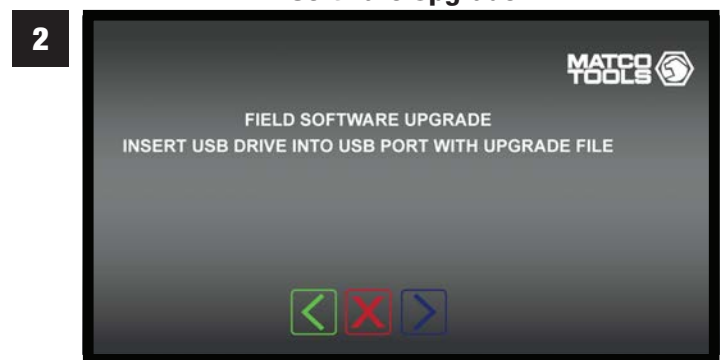
1. The latest ACDUAL firmware can be downloaded at <https://www.cpsproducts.com/support/firmware-updates/>.
2. Select the ACDUAL model and follow the instructions also available on this page.


Maintenance Menu



- a. Touch the SOFTWARE UPGRADE  key.
- b. Touch  to proceed to the next screen.

Software Upgrade



- a. To upgrade the ACDUAL software in the field, insert a USB drive (with an upgraded file) into USB Port on the Control Panel.
- b. Ensure power remains on during this operation.
- c. After new software has been loaded, touch  to move to the next screen.

TOUCH SCREEN DISPLAY CALIBRATION

Under certain conditions, the touch screen may lose its calibration (i.e., touches on the screen don't result in the desired result). When touching a screen function key, if it does not actuate the function, or engages an adjacent function, the screen needs to be calibrated.

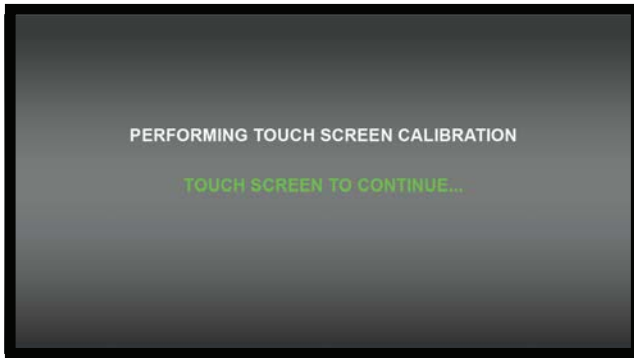
Touch Screen Calibration:

1. Turn the machine's power off.
2. Then, while pressing and holding any spot on the touch screen turn the power back on. A screen SET UP menu will be displayed.
3. Select Screen Calibration and follow the on-screen directions. (next page)
4. Calibration is then complete.



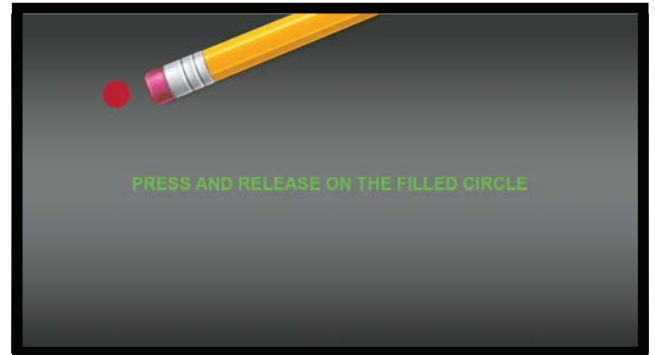
TOUCH SCREEN DISPLAY CALIBRATION (Cont'd)

1



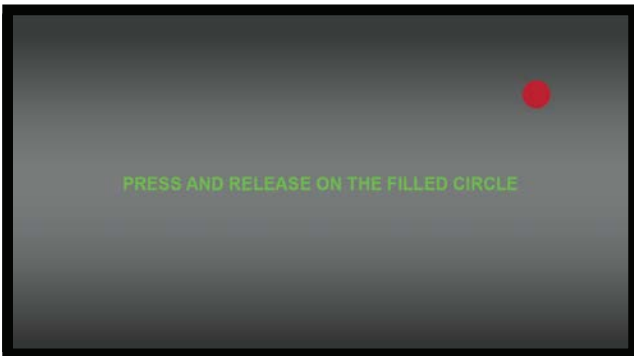
a. Touch screen to continue.

2



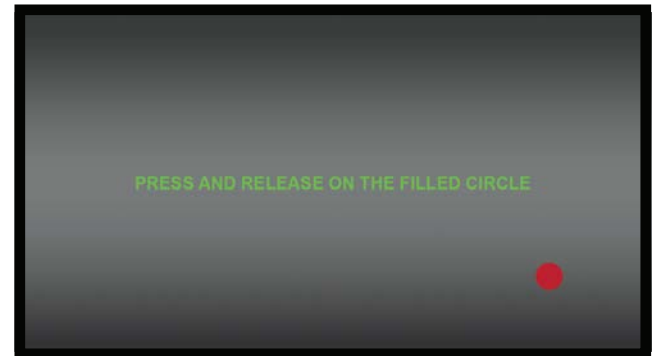
a. Touch and release the "filled" circle (UPPER LEFT).

3



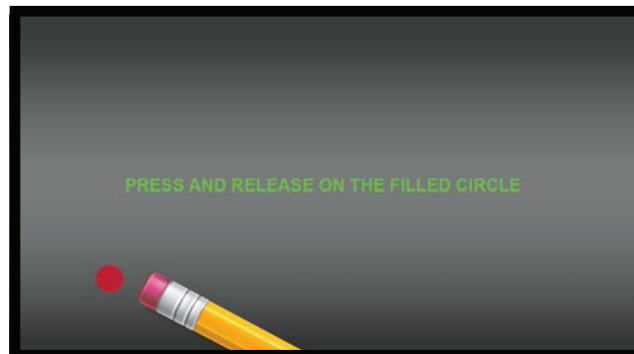
a. Touch and release the filled circle (UPPER RIGHT).

4



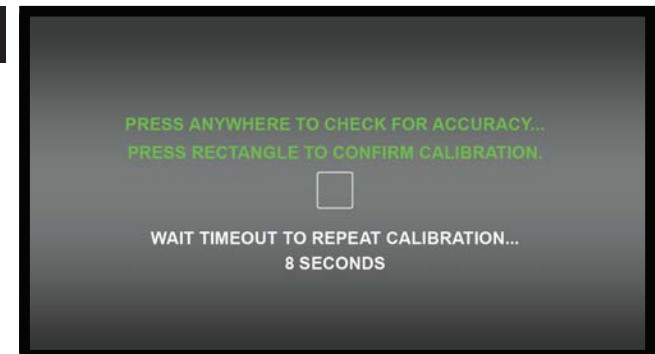
a. Touch and release the filled circle (LOWER RIGHT).

5



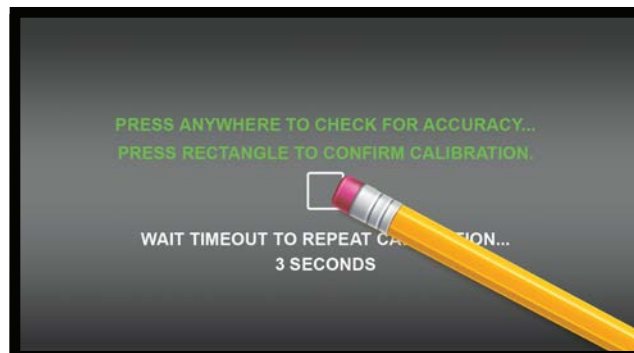
a. Touch and release the filled circle (LOWER LEFT).

6

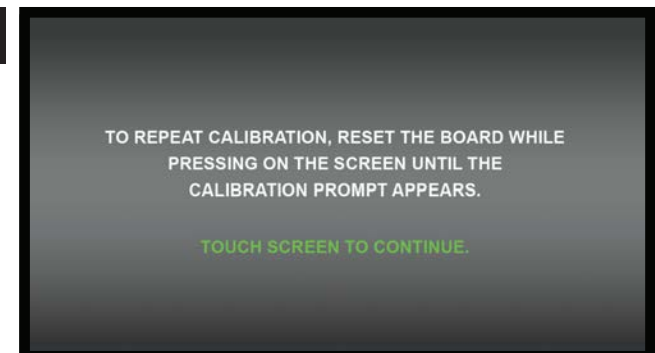


- a. Touch anywhere to check for accuracy
- b. Touch rectangle to confirm accuracy.
- c. Wait timeout to REPEAT calibration.

7



8



- a. To repeat calibration, reset the board while touching the screen until calibration prompt appears.

CAR SYSTEM HEALTH MODE

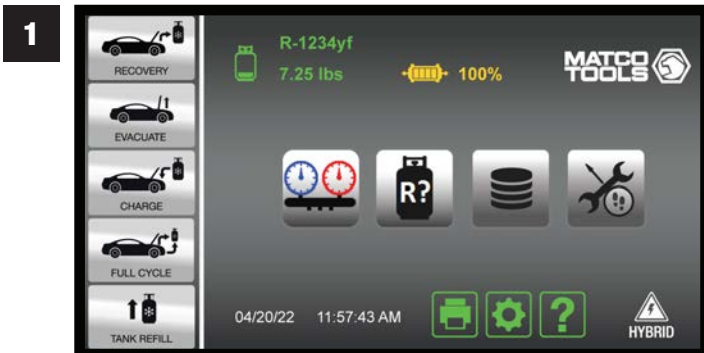


CAR SYSTEM HEALTH MODE (Not All Screens Are Shown)

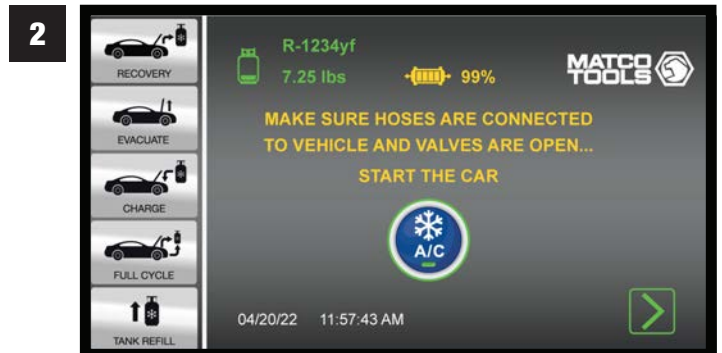
Use this mode for checking system pressures and vent temperature before and after servicing the A/C system.

1. System parameters can be printed while in this mode to provide a before and after comparison.
2. When entering the Car Health mode, the machine will provide a prompt to start the vehicle's A/C system.
3. Readings can then be collected and printed.
4. If Refrigerant Recovery is planned next, touch . This will take users to the Home Screen. If all is well, touch and the machine will guide users through clearing the hoses of refrigerant back into the AC system.

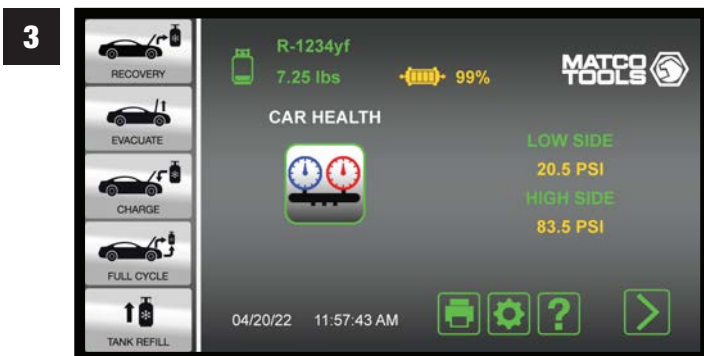
Home Screen



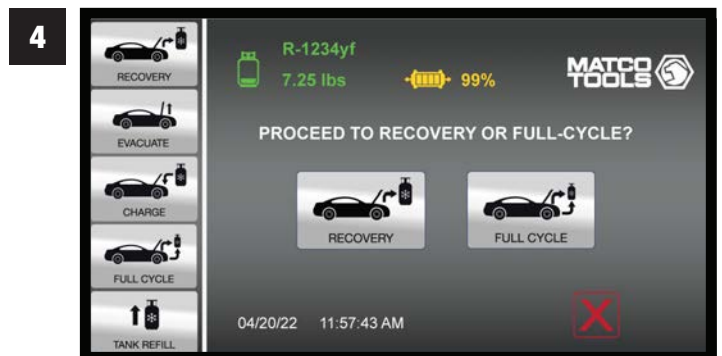
- a. Touch to view vehicle's AC system Low & High Side Pressures, and Probe Temperature (if used).



- a. Ensure HOSES are CONNECTED TO VEHICLE and \ VALVES are OPEN.



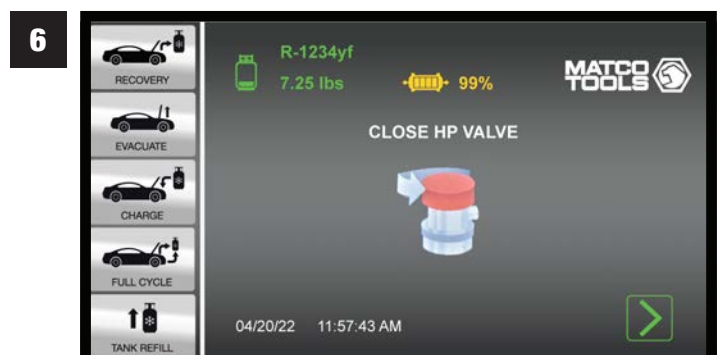
- a. Ambient, High & Low Side pressures shown
- b. Touch to proceed to next screen.



- a. Select RECOVERY or FULL CYCLE.

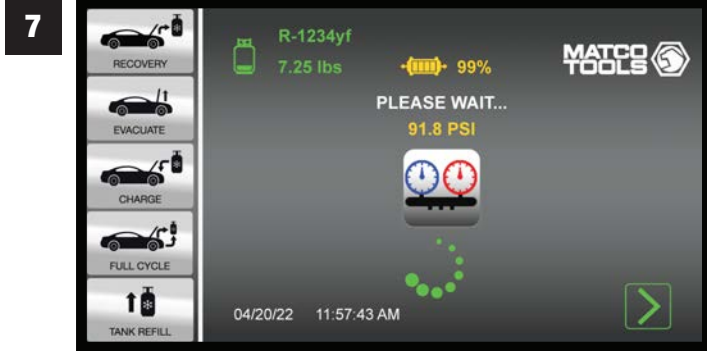


- a. CONFIRMATION - Touch to proceed to RECOVERY or FULL CYCLE.

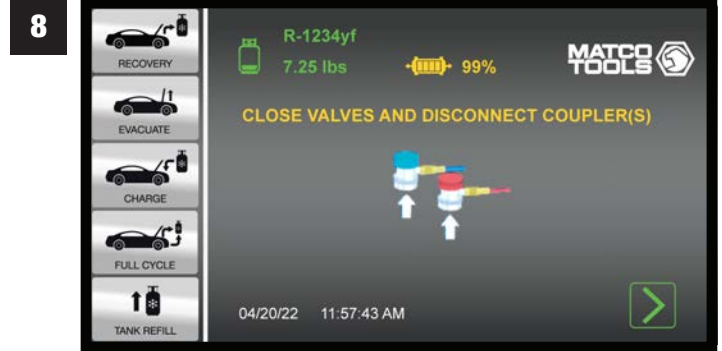


- a. CLOSE HIGH PRESSURE VALVE.

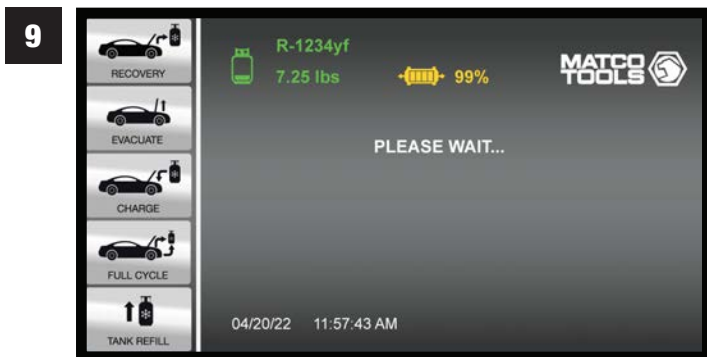
CAR SYSTEM HEALTH MODE (Cont'd)



a. Wait.



a. CLOSE VALVES and DISCONNECT COUPLERS.



a. Wait.



a. Home Screen.

CORDED TEMPERATURE PROBE ACCESSORY #TMX2P (INCLUDED)

The TMX2P has a 15' (4.5m) cord is commonly used to measure vent or liquid temperatures in vehicles. It has an operating temperature range of -40°F to 257°F / -40°C to +125°C.



- At any time, plug the end of the corded Temperature Probe into the RCA jack on the FRONT of the ACDUAL Control Panel.
- Insert the probe end into a vehicle's A/C Vent or other location where a temperature reading is needed (Note: Keep metal portion of probe away from any moving or electrical parts).



- View the resulting temperature in the Car System Health Mode section, or in the Valves & Controls Screen #2,3 or 4 on page 39.

A/C DATABASE FOR NORTH AMERICAN VEHICLES



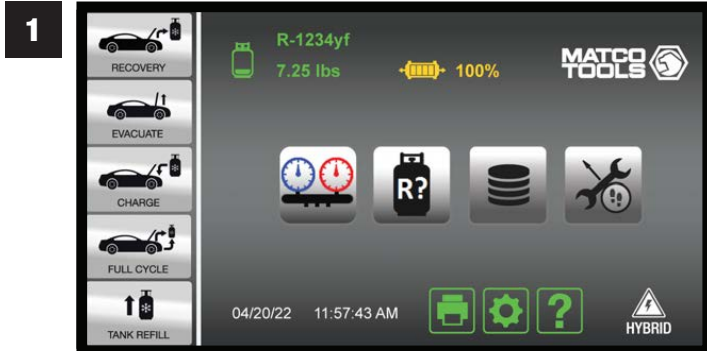
A/C DATABASE FOR NORTH AMERICAN VEHICLES (Since 1994) (Not All Screens Are Shown)



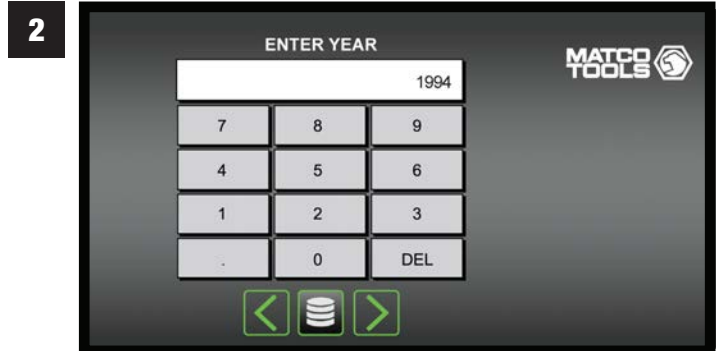
SD Card Slot On Back Of ACDUAL Machine


NORTH AMERICAN VEHICLE A/C DATA BASE

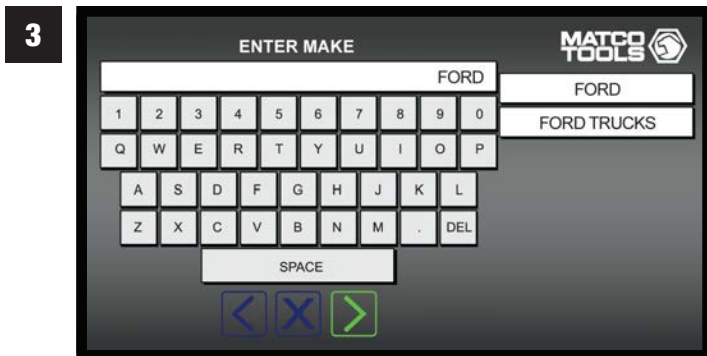
1. Insert the included SD Card (Secure Digital Memory Card) into the back of the ACDUAL machine.
2. An "End User License Agreement" (see APPENDIX in this manual) will appear on the ACDUAL color screen.
3. By accessing any of the motor databases via this website, you automatically agree to all the the terms and conditions of this agreement. If you do NOT agree to all terms and conditions, do NOT access or use the databases.
4. This database shows the type and weight of all refrigerants/oil used in vehicles sold in North America since 1994.




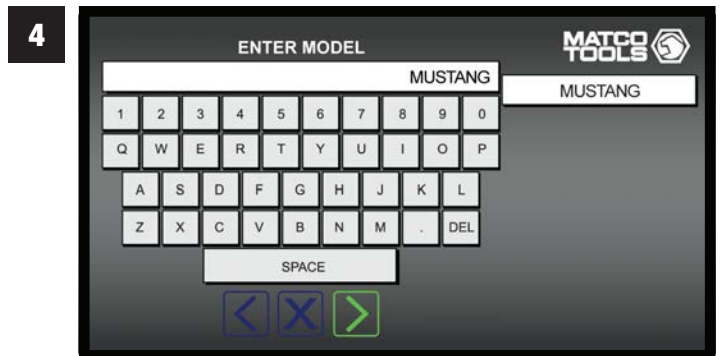
- a. Touch .



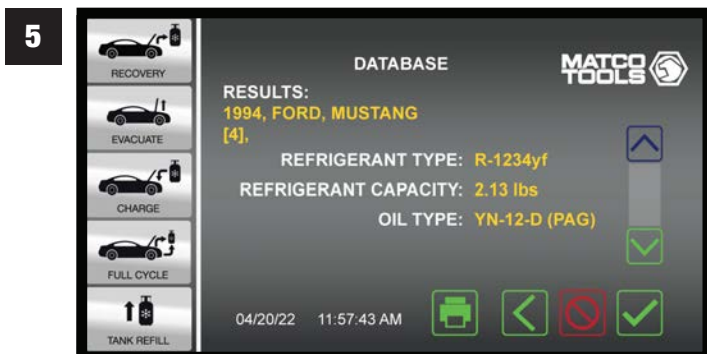
- a. Use keypad to enter YEAR vehicle was made.
b. Touch  to enter data and proceed to next screen.




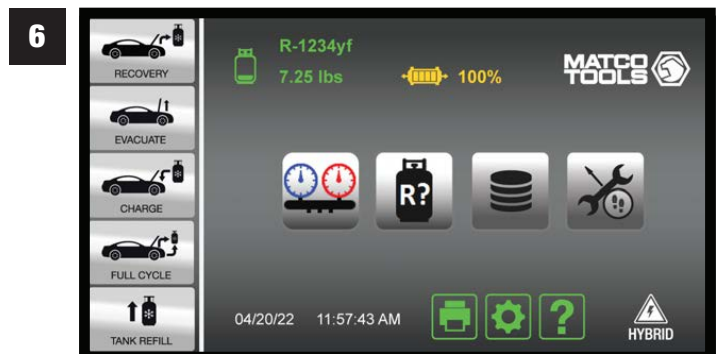
- a. Enter vehicle "MAKE" (BRAND).
b. Touch  to enter data and move to next screen.



- a. Enter vehicle MODEL NAME.
b. Touch  to enter data and move to next screen.



- a. AC Database will provide REFRIGERANT TYPE, REFRIGERANT CAPACITY AND REFRIGERANT OIL TYPE
b. If all information shown is OK, touch  to enter data and move to next screen.

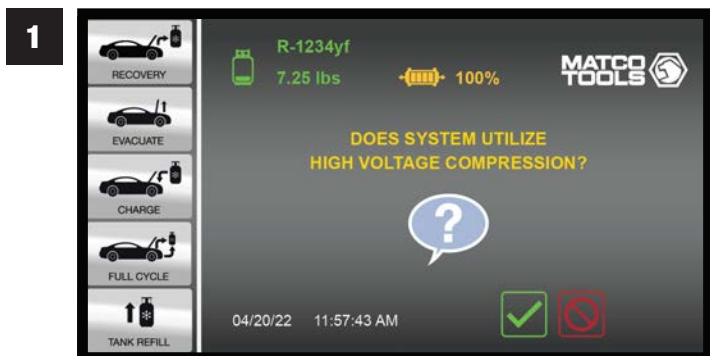




FLUSH REFRIGERANT HOSES




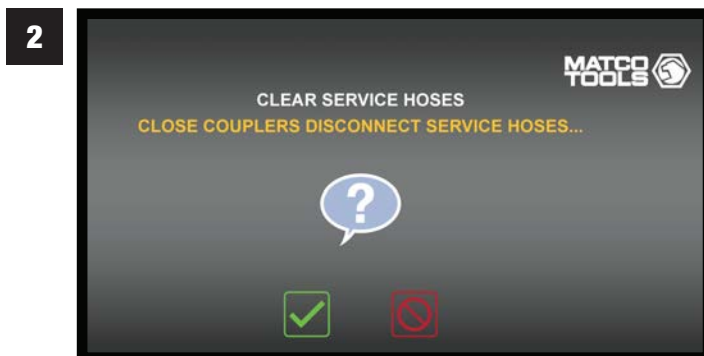
FLUSH REFRIGERANT HOSES


(Not All Screens Are Shown)



- On the HOME screen, touch  if the vehicle is Hybrid/Electric to flush service hoses.
- Touch  to continue.

If machine is in non-SAE mode, touch  to flush service hoses.



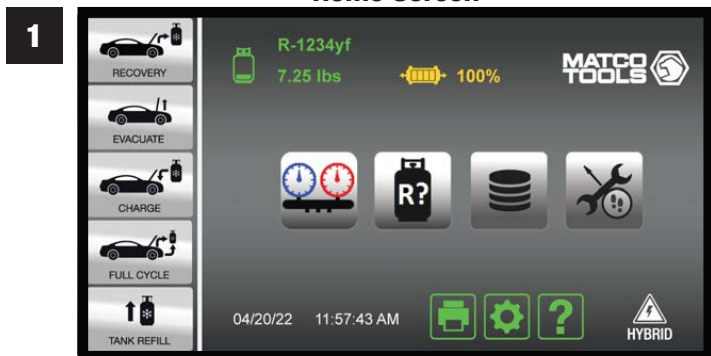
- If you want to Clear Service Hoses (of refrigerant), CLOSE COUPLERS and DISCONNECT SERVICE HOSES, then
- Touch  to continue.
- The Home Screen will appear after the clearing process has been completed



JOB TRACKER

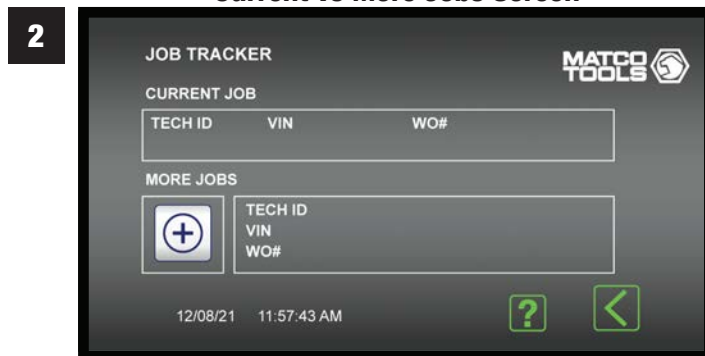
(Not All Screens Are Shown)

Home Screen

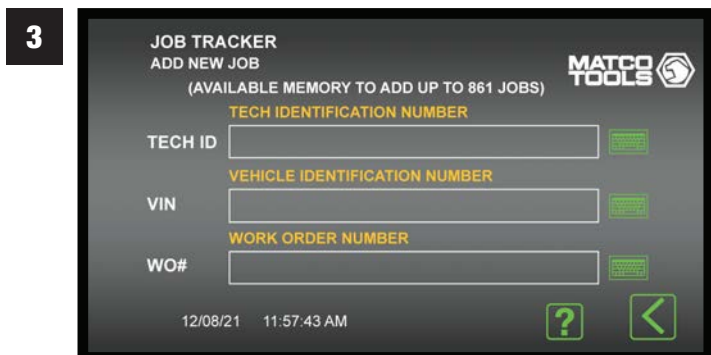




- Touch  on the Home Screen.

Current vs More Jobs Screen





















































- If CURRENT JOB data was previously entered, it will appear in TOP portion of screen.
- Touching the "+" icon brings up the next screen.
- Enter your Shop Password.



- Touch any  to enter data for each field.
- Touch  to proceed to next screen.

APPENDIX (Complete Icon Library)

ICON NAME	DESCRIPTION	OFF/ON
AIR PURGE	Touch to select AIR PURGE	
AMERICAN	Touch to select AMERICAN Units	
BAR	Touch to select BAR	
BOTH COUPLERS	Touch to select BOTH couplers	
° C	Touch to select CELSIUS	
CALIBRATION	Touch to select CALIBRATION	
CAR SYSTEM HEALTH MODE	Touch to launch CAR SYSTEM HEALTH MODE	
CHANGE TANK	The CHANGE TANK icon notifies the user to change the tank	
CHANGE UOM	Touch to change the unit of measurement	
CHARGE	Touch to perform a CHARGE service	
CHARGE COMPLETE	Indicates that the CHARGE service is COMPLETE	
Charge Low Side	Press to select Low Side Charging	
CHECK SCALE COMPLETE	The SCALE CHECK COMPLETE notifies users that a scale check is complete	
Close Ball valve	Press to close ball valve	
CLOSE COUPLER	The CLOSE COUPLER icon notifies the user to close the coupler during a recharge service	
CLOSE HP	Notifies the user to CLOSE HP valve during a CHARGE service	
CLOSE VALVE	Notifies user to CLOSE VALVE	
CONNECT HP	Notifies user to connect HP port during tank refill	
CPS FILTER	CPS FILTER	
DISCONNECT COUPLERS	Notifies the user to DISCONNECT COUPLERS	
DRAIN OIL	The DRAIN OIL icon notifies the user that oil is draining from the vehicle	
END-USER AGREEMENT	Touch to access the End-User License Agreement	
ERROR	Displays when there is an ERROR	
° F	Touch to select FARENHEIGHT	
FAILED	Indicates that a given operation FAILED	

ICON NAME	DESCRIPTION	OFF/ON
FILTER	Displays the current status of the filter life.	
FILTER CHANGE	Displays when a filter change is required	
FILTER CHANGE	Touch to CHANGE FILTER	
FILTER CHANGE	Touch to CHANGE FILTER	
FULL CYCLE COMPLETE	Indicates that the FULL CYCLE service is COMPLETE	
GRAMS	Touch to select GRAMS as UOM	
HELP	Touch to launch the HELP Menu	
HELP	Provides Firmware version	
HIGH COUPLER	Touch to select the HIGH SIDE coupler only	
HOME	Touch to launch the HOME screen	
INJECTION	Notifies the user to INJECT oil and/or dye at this point in the service	
INTERNATIONAL	Touch to select INTERNATIONAL UOM	
KGCM2	Touch to select KGCM2	
KGS	Touch to select KGS as UOM	
KPA	Touch to select KPA	
LANGUAGE	Touch to select LANGUAGE	
LBS	Touch to select LBS as UOM	
LBS:OZ	Touch to select LBS:OZ as UOM	
LOW COUPLER	Touch to select the LOW SIDE coupler only	
MAINTENANCE	Touch to launch the MAINTENANCE menu	
METRIC	Touch to select METRIC UOM's	
MPA	Touch to select MPA	
NOT NOW	Touch to postpone suggested operation	
Open Ball Valve	Press to Open Ball Valve	
OZ	Touch to select OZ as UOM	

APPENDIX (Complete Icon Library)

ICON NAME	DESCRIPTION	OFF/ON
PLACE WEIGHT	Notifies user to PLACE WEIGHT on the scale	
PRINT	Touch to PRINT a report of the service	
PSIG	Touch to select PSIG	
PT	Touch to select PRESSURE TRANSDUCER	
PURITY	PURITY	
QUIT	Touch to quit the current function	
R-1234yf	Touch to select R-1234yf Refrigerant	
R134a	Touch to select R134a Refrigerant	
R22	Touch to select R22 Refrigerant	
R407	Touch to select R407 Refrigerant	
RECOVERY	Touch to perform an RECOVERY service	
RECOVERY COMPLETE	Indicates that the RECOVERY service is COMPLETE	
REFRIGERANT	REFRIGERANT	
REFRIGERANT CHANGE	Touch to CHANGE REFRIGERANT	
REFRIGERANT IDENTIFICATION	Touch to perform REFRIGERANT IDENTIFICATION process	
REGISTER	Touch to REGISTER unit	
RELAY	Touch to select RELAY	
REMOVE WEIGHT	Notifies user to REMOVE WEIGHT from scale	
SAE	Touch to select SAE	
SAE CHARGE	Touch to perform a SAE CHARGE service	
SAE CHARGE COMPLETE	Indicates that the SAE CHARGE service is COMPLETE	
SCALE	Touch for SCALE functions	
SCALE CHECK	Touch to perform SCALE CHECK	
SCALE CHECK	The SCALE CHECK icon notifies users that a scale check is in progress	
FULL CALIBRATION	Touch to perform full calibration	

ICON NAME	DESCRIPTION	OFF/ON
SCALE ZERO	Touch to RE-ZERO the scale	
SERVICE	Touch to select SERVICE	
SERVICE HOSES BEING FLUSHED	Indicates that the SERVICES HOSES are BEING FLUSHED	
SET TIME	Touch to SET TIME	
SETTINGS	Touch to launch the SETTINGS screen	
SETUP	Touch to launch the SEUP menu	
SPEAKER	Touch to enable sound	
START AC	Notifies user to start vehicle and turn on AC during service	
TANK	Indicates the level of refrigerant in the TANK	
TANK FULL	Notifies user that TANK is FULL	
TANK REFILL	Touch to perform a TANK REFILL	
Tank Tare Setup	Press to change tank weight and WC	
TANKS REFILL COMPLETE	Indicates that the TANK REFILL is COMPLETE	
TURN UPSIDE DOWN	Notifies user to TURN TANK UPSIDE DOWN during tank refill	
UNIT	Touch to select UOM	
UPDATE	Touch to UPDATE	
UPGRADE	Touch to select UPGRADE	
UPKEEP	Touch to launch the UPKEEP menu	
VACUUM	Touch to perform a VACUUM service	
VACUUM COMPLETE	Indicates that the VACUUM service is COMPLETE	
WARNING	The WARNING icon appears to caution users of a potential hazard	
WEIGHT	Touch to Choose WEIGHT UOM	
ZERO	Touch to RE-ZERO the pressure transducer	
ZEROING	Indicates that the unit is ZEROING	

ACDUAL ERROR CODES

- “E1-BAD TXT EPROM”; A bad scale may cause this, also.
- “E2-SCALE ADC”; Connection to the scale electronics lost.
- “E3-SCALE EPROM”; Scale not calibrated?
- “E4-CANNOT CAL”; Scale cannot be calibrated or bad calibration.
- “E5-MBV FAULT: X”; Where X is a number from 1 to 5 indicating which MBV has failed.
- “E6-AMB. THRM”; Ambient thermistor in the “head” is bad.
- “E7-TNK THRM”; Thermistor attached to the oil sep. is bad.
- “E8-PT TRANS”; Pressure transducer is bad.
- “E9-WEAK BATT”; Should never appear.
- “E10-BAD FILTERTIME”; Filter code problems.
- “E11-DEFAULTS NOT SET”; What it says...
- “E12-BAD GRAPH MEM”; Problems with the graphics like Chinese and Russian.
- “E13-BAD PTR. TO INFO MEM”; Major software corruption, fatal error.
- “E15 FLOW SWITCH ERROR” Air flow switch is open.
- “UNKNOWN ERROR”; Cause of problem cannot be identified

IDENTIFIER CODES

- “00001” Error #1: The air or gas readings were unstable.
- Solution: Move the unit away from sources of EMF or RFI such as radio transmitters and arc welders.
- “00002” Error #2: The air or gas readings were excessively high.
- Solution: Move the unit away from sources of EMF or RFI such as radio transmitters and arc welders.
- “00003” Error #3: The air calibration resulted in a low output.
- Solution: Prevent refrigerant from flowing into the unit through the sample inlet during air calibration.
 - Solution: Allow any refrigerant in the atmosphere to dissipate before performing air calibration.
 - Solution: Verify that the air intake and the exhaust are not obstructed
 - Solution: Verify that the white filter is correctly plugged into the rubber grommets.
- “00004” Error #4: The unit is beyond the operating temperature range
- Solution: Move the unit to an area where the ambient temperature is within the specified operating range.
- “00005” Error #5: The refrigerant sampled has an excessively large amount of air or there was little or no sample flow due to a closed valve or plugged sample filter. This is the code to prompt the user to change the brass filter. This should be considered more as a prompt than an actual error.
- Solution: Verify the coupler valve is open.
 - Solution: Verify the sample filter is not plugged with debris or oil.
 - Solution: Replace brass sample filter
 - Solution: Verify that the white filter is correctly plugged into the rubber grommets.
- “00006” Error #6: The air sensor has expired and must be replaced before the analyzer can be used.
- “00007” Error #7: The pressure read by the sensor has been determined to be too high.
- Solution: Verify that the exhaust is not obstructed.

REPLACEMENT PARTS

Part Number	Description
FX3030X1	FX Series Maintenance Kit—Filter, Vacuum Pump oil and Coupler O-rings
QCL134	Auto Coupler Brass Low Side 14mm
QCH134	Auto Coupler Brass High Side 14mm
AR2788X14A	R134a Refill Hose Adaptor 1/2 ACME
AR2788X14B	R134a Refill Hose Adaptor 1/4 SAE
CRX430T	30lb 400psi Recovery Tank
CRX400T	50lb 400psi Recovery Tank
481500 / 481500YF	Spotgun™ Oil Injection Kit

WARRANTY

2-2-3 WARRANTY

Two Years Full Warranty

CPS® Products, Inc. (herein CPS), warrants this ACDUAL machine to be free from defects in materials, workmanship, and components for Two Years from the date of purchase. If equipment should fail during the warranty period, it will be repaired or replaced* (at our option), at no charge to the original owner. Any parts or labor required to repair a defective machine or components covered under the warranty will be covered at no charge to the original purchaser of the machine.

Three Year Compressor Warranty

From the end of Year One through the end of Year Three, CPS will repair or replace (at our option)* the compressor (at no charge to the original owner, except for labor) that is found to be defective.

Restrictions That Apply To This Limited Warranty:

- This machine must be used in normal use situations only (as described in this Owner's Manual).
- This limited warranty does NOT apply if: This machine, or a product part is broken by accident; this machine is misused, tampered with or modified in any way; this machine is used for recovering or recycling any substance other than the specified refrigerant type.
- This machine must be serviced and maintained (as specified in this Owner's Manual
- All warranty service claims must be made within the specified warranty periods mentioned above. **Proof-of-purchase date by the original owner must be supplied.**
- Warranty or service claims are subject to authorized inspection for product defect(s).
- *At the discretion of CPS, any part that fails or must be repaired within the warranty period, may be a new or reconditioned part.
- *At the discretion of CPS, if this machine fails or must be repaired within the warranty period, will be repaired or replaced with a different reconditioned machine.
- All repaired equipment will carry an independent 90 day warranty.
- Transportation charges for warranty service will be reimbursed by CPS upon verification of the warranty claim and submission of a freight bill for normal ground service. Approval from CPS must be obtained prior to shipping to a CPS authorized service center.
- CPS shall not be responsible for any additional costs associated with a product failure including, but not limited to, loss of work time, loss of refrigerant, cross-contamination of refrigerant, and unauthorized shipping and/or labor charges.
- Use of recovery/recycling equipment with unauthorized refrigerants or sealants voids this warranty.
- **Authorized refrigerants are listed on the equipment or are available through the CPS Technical Service Department.**
- CPS is not responsible for lost refrigerant. Owners should leak test this machine regularly and store this machine with all valves closed.
- This warranty does not apply to equipment that has been altered, misused or solely in need of field service maintenance. This repair policy does not include equipment that is determined to be beyond economical repair. **WARRANTY VOIDED IF MACHINE USED FOR ANY OTHER PURPOSE.**

A/C DATABASE END-USER LICENSE AGREEMENT

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A/C DATABASE END-USER LICENSE AGREEMENT (Cont'd)

- 5. TERM; TERMINATION.** This Agreement is effective for the period of time set forth in your Agreement with the web site owner hosting the DATABASES, but in no event longer than the term of the agreement between MOTOR and that web site Distributor. MOTOR may terminate this Agreement if You do not comply with any term or condition of this Agreement. Should this Agreement terminate, You agree to destroy any data previously obtained from the DATABASES.
- 6. MISCELLANEOUS.**
- (a) This Agreement is the complete and exclusive statement between You and MOTOR relating to the subject matter hereof and supersedes all prior oral, written and/or contemporaneous negotiations, commitments and understandings of the parties.
 - (b) This Agreement shall be governed by the laws of the State of New York without giving effect to any principles of conflicts of law. The United Nations Convention on Contracts for the International Sale of Goods shall not apply. You hereby irrevocably and unconditionally submit to the exclusive jurisdiction of any state or federal court sitting in New York, New York over any suit, action or proceeding arising out of or relating to this Agreement; provided that the foregoing shall not restrict Licensor or its agents from filing suits, actions or proceedings arising out of Host's failure to pay in any jurisdiction of Licensor or its agent's choice.
 - (c) No delay or failure by MOTOR to exercise or enforce at any time any right or provision hereof shall be considered a waiver thereof or of MOTOR's right thereafter to exercise or enforce each and every right and provision of this Agreement.
 - (d) If any provision hereof shall be held illegal, invalid or unenforceable, in whole or in part, such provision shall be modified to the minimum extent necessary to make it legal, valid and enforceable, and the legality, validity and enforceability of all other provisions of this Agreement shall not be affected thereby.
 - (e) This Agreement may only be amended, modified, suspended or canceled by a writing signed by MOTOR.
 - (f) This Agreement may be assigned by MOTOR, but may not be assigned by You.

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