

TABLE OF CONTENTS

INTRODUCTION to the C-VAC³	2
SAFETY INFORMATION	3
SYSTEM FEATURES & SPECIFICATIONS	9
MACHINE OVERVIEW	10
CONTROL PANEL OVERVIEW	12
OPERATING PROCEDURES	13
REPLACEMENT PARTS	16
MAINTENANCE PROCEDURES	19
CUSTOMER SERVICE CONTACT INFO	19
WARRANTY INFORMATION	20



INTRODUCTION

to the C-VAC³

Congratulations on the purchase of your C-VAC³ coolant service machine!

The C-VAC³ is a device that removes and refills engine coolant and also pressure tests the cooling system. Coolant is extracted and refilled through the upper radiator hose connection without the vehicle's engine running. Before the coolant is refilled, a vacuum is applied to the cooling system to eliminate any air in the system.

Simply put, this machine is the cleanest, safest, easiest, fastest, most thorough, and most cost-efficient method of radiator fluid exchange ever devised. Suddenly, cooling system maintenance has become a more realistic proposition. Fluid exchanges are cleaner and neater than ever!

Service neglect causes engine coolant to break down which can lead to the engine freezing or overheating. Historically, cooling system fluid service has been neglected, often due to the lack of a convenient method for providing such flush or fluid exchange services. Previous methods for flushing the cooling system or replacing the coolant were time consuming and often inefficient or incomplete. Now, it's easier than ever to replace virtually **all** of the old coolant in less than 8 minutes, to ensure your car's cooling system has a long, trouble-free life.

Please take time to read through this manual to familiarize yourself with the C-VAC³ before performing your first coolant exchange.

IMPORTANT SAFETY NOTICE

For your safety, read this manual thoroughly before operating this machine. Your C-VAC³ 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. Before using your C-VAC³ unit, always refer to and follow the safety messages and applicable service procedures provided by the manufacturer of the vehicle being serviced.

• Read All Safety Instructions

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

• Signal Words

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

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT

Indicates a situation which, if not avoided, may result in damage to the machine, or the vehicle being serviced.

• Safety Messages

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.

• Safety Symbols

A safety symbol, when present, gives a graphical description of the potential hazard, and how to avoid the hazard:



Risk of Fire



Read Instructions Before Use



Risk of Explosion



Mandatory Eye Protection



Risk of Entanglement



Mandatory Protective Gloves



Dangerous Fumes



Mandatory Protective Clothing



Do Not Pull or Move



Risk of Burns

IMPORTANT SAFETY INSTRUCTIONS

DANGER



Engine exhaust contains toxic gases.

- **Vent vehicle's exhaust away from work area.**
- **Do not breathe exhaust.**

Exhaust gases will cause injury or death.

WARNING



Improper use and operation.

- **Read, understand and follow all safety messages and operational procedures in this manual before operating this machine.**
- **This equipment should be operated only by qualified personnel.**
- **Use this equipment only as described in this manual.**

Improper use and operation of this product can result in injury.

WARNING



Engine systems can malfunction expelling fuel, oil vapors, hot steam, hot toxic exhaust gases and other flying particles.

- **Wear safety goggles and protective clothing, user and bystander. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.**
- **Do not position head directly over or in front of carburetor or throttle body. Engine backfire can occur when air cleaner is out of normal position.**
- **Make sure gauge reads zero before connecting or disconnecting hose connections to adapters.**
- **Make sure cooling system pressure has been relieved before connecting or disconnecting hose connections and adapters.**
- **Keep a dry chemical (Class B) fire extinguisher rated for gasoline, chemical & electric fires in the work area.**

Fire, explosion, or flying particles may cause serious injury.

WARNING



Risk of expelling pressurized fluids.

- **Wear safety goggles and protective clothing, user and bystander.**

- Engine systems can malfunction, expelling fuel, oil vapors, hot steam, hot toxic exhaust gases and other debris.
- Always unplug the machine from its power source when not in use.
- Keep the service hoses away from hot or moving engine parts. Hoses can split or burst causing fluid to be expelled.
- Avoid contact with engine coolant.
- Treatment methods are as follows:
 - Eyes: Flush eyes with plenty of water.
 - Skin: Wash with soap and water.
 - Inhalation: Move to uncontaminated area.
 - Ingestion: If large amount, get medical attention.
 - If any irritation persists, get medical attention.
- Dispose of used fluid according to environmental laws and regulations.

Fuel, oil vapors, hot steam, hot toxic exhaust gases, pressurized fluid, and other debris can cause serious injury.

WARNING

Risk of unexpected vehicle movement.

- Block drive wheels before starting vehicle's engine to begin an exchange.
- Unless instructed otherwise, set parking brake and put gear selector in park.
- Do not leave a running vehicle unattended.
- If vehicle has an automatic parking brake release, disconnect release mechanism for testing and reconnect when testing is completed.

A moving vehicle can cause injury.

WARNING



Risk of entanglement. Engine has moving parts.

- Do not place tools on fenders or other places in engine compartment.
- Keep yourself, clothing, battery cables and service hoses clear of moving parts such as fan blades, belts, pulleys, hood and doors.
- Barriers are recommended to help identify danger zones in test area.
- Prevent personnel from walking through immediate test area.

Contact with moving parts can cause injury.

WARNING



Risk of fire or explosion.

- Do not operate in the vicinity of open containers of flammable liquids such as gasoline.
- Keep hoses and jumper cables away from heat sources and sharp edges.
- Do not operate equipment with damaged cords or hoses until they have been examined by a qualified serviceman.

Fire or explosion can cause injury.

WARNING



Risk of fire or explosion. Gases produced by a battery are highly explosive.

- **Wear safety goggles and protective clothing, user and bystander.**
- **This machine is equipped to operate on 12-volt DC power only. A power source greater than this can result in serious injury to the user as well as damage to the machine.**
- **Do not smoke, place metal tools on battery or allow a spark or flame in vicinity of battery.**
- **Clean battery terminals before hooking the machine's battery clips to them. During cleaning, keep airborne corrosion from eyes, nose and mouth.**
- **Be sure both battery cables are tightly connected to the battery terminals as instructed before proceeding with a fluid exchange.**
- **Never remove battery cables from the battery terminals while the machine is operating.**

Battery explosion can cause injury.

WARNING



Risk of burns.

- **Wear gloves when handling hot engine components.**
- **Do not remove radiator cap unless engine is cold.**
- **Pressurized engine coolant may be hot.**
- **Do not touch hot exhaust systems, manifolds, engines, radiators, etc.**

Hot fluid and engine parts may cause injury.

WARNING



Battery acid is a highly corrosive sulfuric acid.

- **Wear safety goggles and protective gloves, user and bystander.**
- **Have plenty of fresh water and soap nearby. If battery acid contacts skin, clothing, or eyes, flush exposed area with soap and water for 10 minutes.**
- **While cleaning battery's terminals, keep airborne corrosion from eyes, nose and mouth.**
- **Do not touch eyes while working near battery.**

Battery acid can burn eyes and skin.

WARNING



Risk of burns.

- **Wear gloves when working near hot engine components.**
- **Do not touch hot exhaust systems, manifolds, engines, radiators, etc.**
- **The fluid coming from the vehicle along with some of the machine's components that the fluid comes into direct contact with (i.e. hoses and fittings) may reach temperatures uncomfortable to the touch. Exercise caution in avoiding contact with these items.**

Hot components can cause injury or discomfort.

CAUTION



Risk of injury.

- This equipment should be operated by qualified personnel only.
- Use this equipment only as described in this manual.
- Always unplug the machine from its power source when not in use.
- Loop the power cord loosely in its proper location when machine is not in use.
- Do not operate equipment with a damaged battery cables or hoses, or if the equipment has been dropped or damaged, until it has been examined by a qualified service representative.
- Care should be taken to arrange the battery cables and service hoses so that they will not be tripped over or pulled.
- Never pull on the power cables or service hoses to transport the machine. Damage may occur to these components, or machine may tip over.
- Keep area of operation clear of unnecessary tools and equipment. Utilize recessed tool storage areas on the top of the machine.
- Never leave the machine running unattended.
- The C-VAC³ is not designed for any other purpose than the servicing of automotive cooling systems.

Operation of this machine by anyone other than qualified personnel may result in injury.

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. If test information or results are still suspicious, do not use them for diagnosis.

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

IMPORTANT

Risk of equipment damage.

- Connect battery cables to a 12-volt power source only (i.e. vehicle's battery).
- Servicing, transporting, or storing this machine in an attitude other than the normal operating position can result in fluid spillage and/or component damage.
- Never pull on the power cables or service hoses to transport the unit. Damage may occur to these components, or machine may tip over. Always use the handle to move.
- Periodically clean the machine by wiping down with a clean, soft, dry cloth.

Improper operation of equipment may result in damage to machine or components.

SAVE AND FOLLOW THESE INSTRUCTIONS!

DIMENSIONS & TECHNICAL SPECIFICATIONS

DIMENSIONS:

52" Tall
23" Wide
27" Deep

Service Hoses:

10' outside of machine

Wheels:

5" locking casters (front)
9 3/4" casters (back)

Fluid Tanks:

28-Quart New Fluid Tank
28-Quart Used Fluid Tank

Weight:

176 lbs

TECHNICAL SPECIFICATIONS:

Power:

12-Volt DC from vehicle battery

Fuse:

7.5 Amp

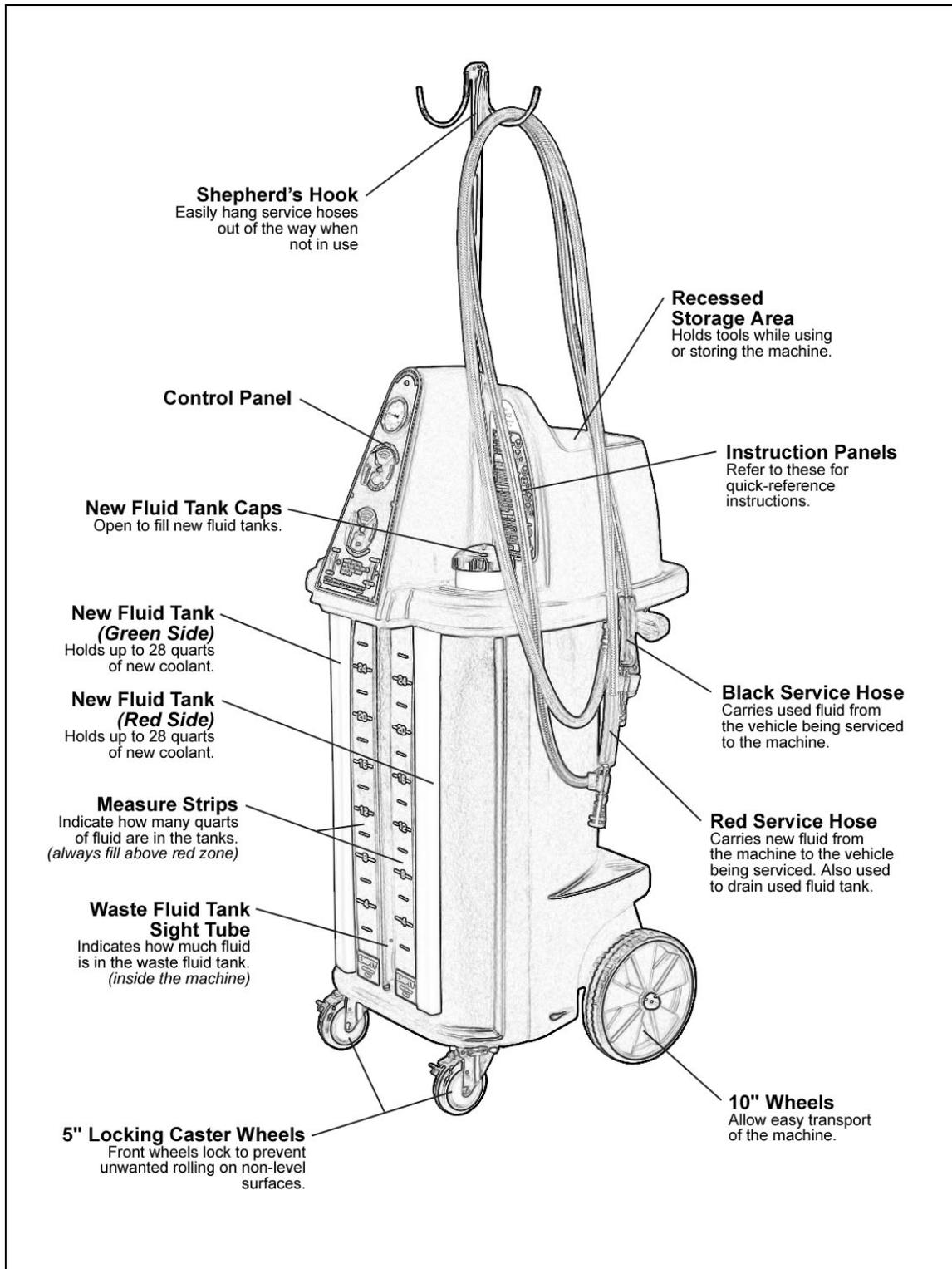
Operating Temperature:

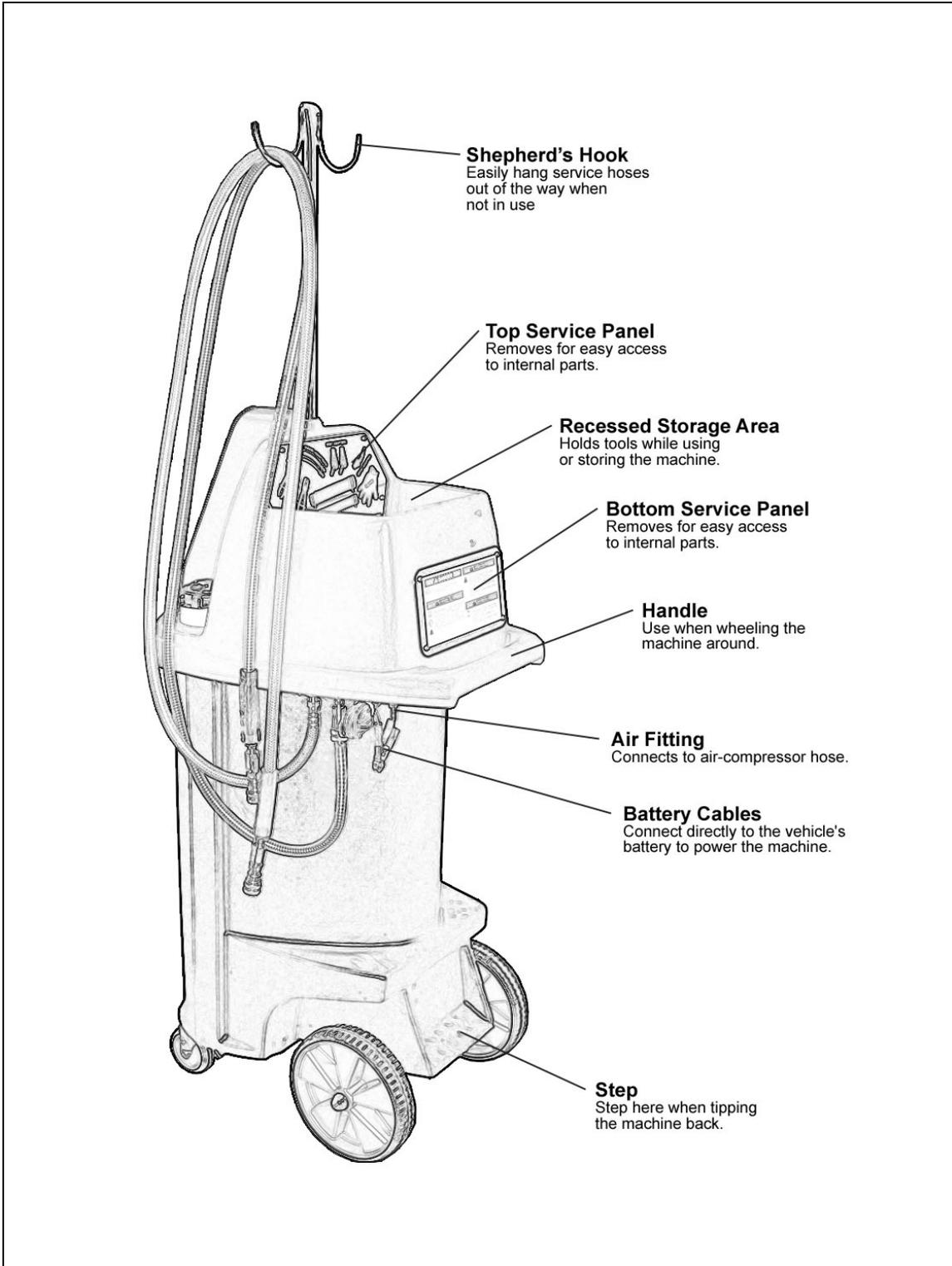
60° to 110°F (15° to 43°C)

FEATURES

- Durable roto-cast polyethylene body and tanks prevent vehicle damage
- Ergonomically correct working height
- 5" locking front caster wheels & 10" rear wheels allow easy maneuverability
- Clear service hoses allow visual confirmation of new and used fluid movement
- Easy access service panel
- Self-contained battery cables hook up to the vehicle's 12-volt battery
- Indicating lamps are activated to show all machine operations and status functions

MACHINE OVERVIEW





Shepherd's Hook
Easily hang service hoses
out of the way when
not in use

Top Service Panel
Removes for easy access
to internal parts.

Recessed Storage Area
Holds tools while using
or storing the machine.

Bottom Service Panel
Removes for easy access
to internal parts.

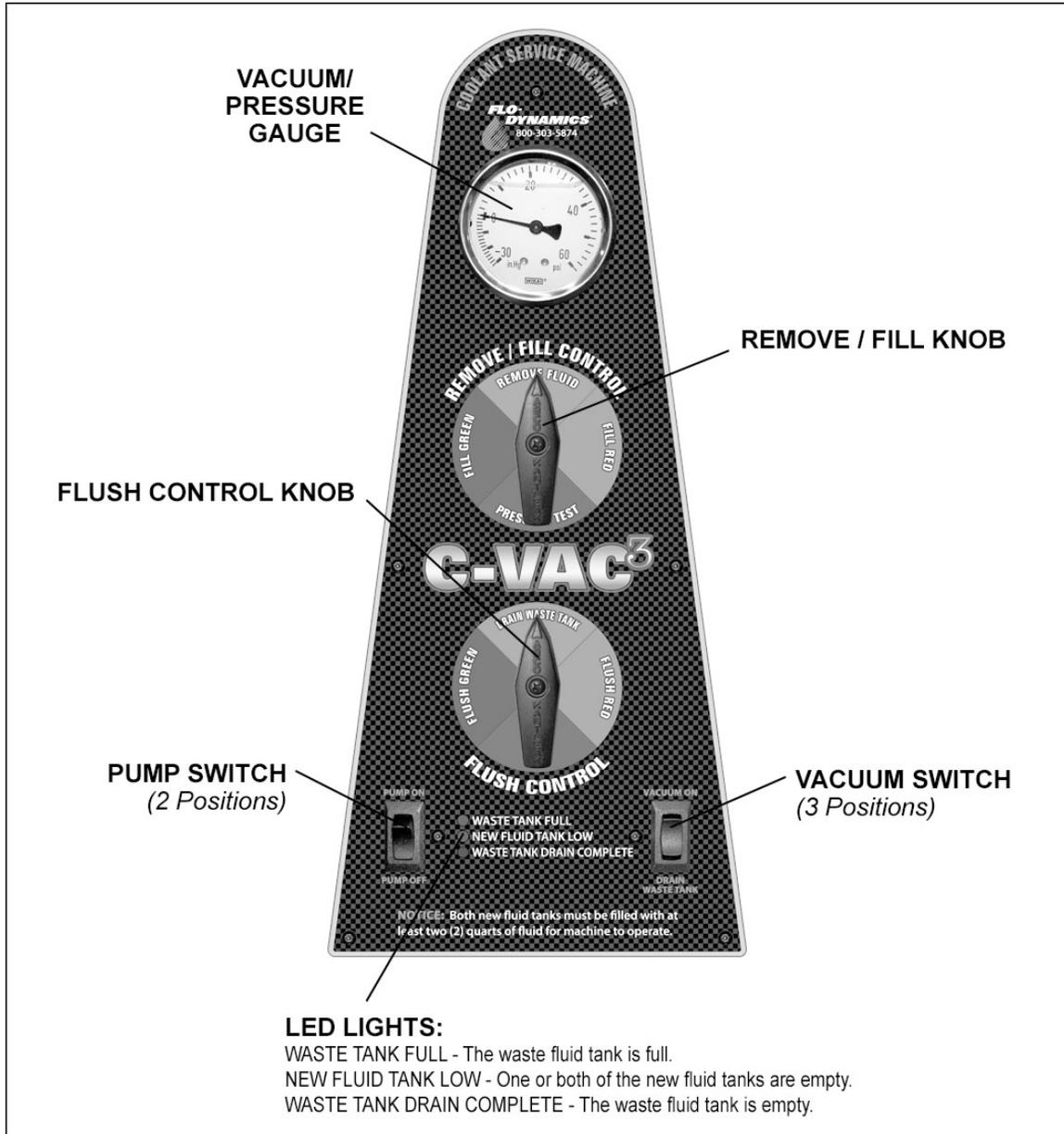
Handle
Use when wheeling the
machine around.

Air Fitting
Connects to air-compressor hose.

Battery Cables
Connect directly to the vehicle's
battery to power the machine.

Step
Step here when tipping
the machine back.

CONTROL PANEL OVERVIEW

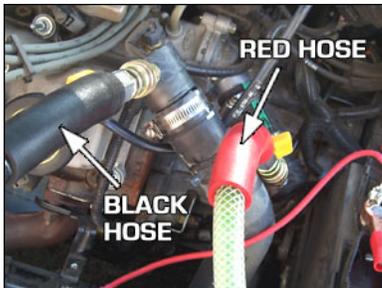


OPERATING PROCEDURES

IMPORTANT: Hook machine up to at least 115psi of air and connect battery clamps to vehicle's battery before using.

SYSTEM FLUSH PROCEDURE:

1. Make sure vehicle is turned off.
2. Use suction wand to remove fluid from overflow bottle. (see "Suction Wand" procedure)
3. Remove radiator cap, and use suction wand to lower fluid level below the upper radiator hose. Re-install cap.
4. Disconnect upper radiator hose.
5. Connect black service line to radiator.
6. Connect red service line toward block.



7. Use included hose clamps to pinch off all lines going to the overflow bottle.
8. Open ball valves on both hoses (it may be necessary to adjust the black ball valve slightly to balance the exchange process).
9. Turn top dial to "Remove Fluid" position, and bottom dial to desired fluid type.
10. Turn vacuum switch & pump switch on to begin flush.
11. Turn both switches off when finished.
12. Disconnect service lines and repeat step 3.
13. Disconnect adapters and replace upper radiator hose.
14. Top off radiator and refill overflow. (see *top-off procedure*)

DRAIN & FILL PROCEDURE (use to service a cooling system component)

1. Make sure vehicle is turned off.
2. Remove radiator cap.
3. Connect cone adapter to black service line & insert into radiator.



4. Turn top dial to "Remove Fluid" position.
5. Turn bottom dial to "Drain Waste" position.
6. Open ball valve on black service line.
7. Turn on vacuum switch.
8. Wait until no more waste fluid is being removed.
9. Turn machine off and replace component.
10. Turn top dial to desired fluid type to fill the radiator.
11. Turn vacuum switch off.
12. Wait until there is no longer vacuum in the radiator & remove cone adapter.
13. Top off radiator if needed.
14. Top off overflow bottle if needed & replace radiator cap. (*see top-off procedure*)

NOTE: Whether you are servicing a vehicle with a traditional radiator cap or one with only an overflow bottle, the rubber cone adapter must be immersed in the coolant slightly for the machine to remove coolant from the vehicle. In order to do this, coolant may need to be added to the radiator or overflow bottle.

TOP OFF PROCEDURE:

1. Connect wand adapter to red service line.



2. Make sure ball valve is closed.
3. Turn bottom dial to desired fluid type.
4. Turn pump switch on.
5. Open ball valve at the end of the red service line to regulate fluid flow.
6. Turn pump switch off when finished.

SUCTION WAND PROCEDURE:

1. Connect wand adapter to black service line & open ball valve.



2. Turn top dial to "Remove Fluid" position.
3. Turn vacuum switch on.
4. Turn switch off when finished.

PRESSURE TEST:

NOTE: Do not perform a pressure test unless machine is connected to upper radiator hose.

1. Unclamp overflow lines.
2. Close red ball valve, open black ball valve.
3. Turn top dial to "Pressure Test".
4. Turn bottom dial to desired fluid type.
5. Turn pump switch on.
6. Slowly open ball valve on red service hose until desired pressure is obtained.
(See chart in manual for reference.)
7. To relieve the pressure in the system, turn the top dial to the "Remove Fluid" position.

WARNING: Do not exceed cap rating by more than 4psi. Relieve pressure in system before disconnecting adapters.

DRAIN TANKS PROCEDURE:

DRAIN WASTE TANK

1. Turn bottom dial to "Drain Waste Tank" position.
2. Attach open-end adapter to red service hose.
3. Flip the right side switch to "Drain Waste Tank".
4. Pump will shut off automatically when complete.

DRAIN NEW TANK

1. Turn bottom dial to desired fluid type.
2. Attach open-end adapter to red service hose.
3. Turn pump switch on.
4. Turn pump switch off when complete.

COMPLETELY DRAIN NEW TANK

1. To do this, the "Waste Tank Drain Complete" LED must be OFF.
2. Turn top dial to "Remove Fluid" position.
3. Turn bottom dial to desired fluid type.
4. Flip the right side switch to "Drain Waste Tank".
5. Turn switch to "OFF" when complete.

REPLACEMENT PARTS LIST

Part #	Description
941301	Control Panel w/ Label
R941284	Electronic Box w/ Wire Harness
941408	Wire Harness Only
941409	Control Box Only
941278	Pressure Gauge
R941304	Upper Service Panel Label
R941305	Lower Service Panel Label
R941302	Instruction Label (<i>L</i>)
R941303	Instruction Label (<i>R</i>)
940989	Red Label
940988	Green Label
R941306	Measure Strip Label
941343	Vinyl Mat
941277	4-Way Ball Valve
941341	2-Way Pump Switch
941342	3-Way Vacuum Switch
40200875	Vacuum Generator
941276	Solenoid Valve
941285	Fluid Pump
941396W	Battery Cable Assembly
R941348	Internal Hose Kit
941463	External Filter
R941251	Level Switch (<i>New Fluid Tank</i>)
941294	Level Switch (<i>Waste Fluid Tank</i>)
941346	Red Service Hose
941467	Black Service Hose
941347	Jumper Hose
941283	Black Plastic Body
941282	Red Plastic Top
941314	Used Fluid / Air Tank (<i>Steel</i>)
941280	White Plastic Tank (<i>L</i>)
941281	White Plastic Tank (<i>R</i>)
942113	Tank Cap
R942118	Locking Caster Wheel
941300	10" Wheel
P941321	Shepherd's Hook
941286	Operations Manual



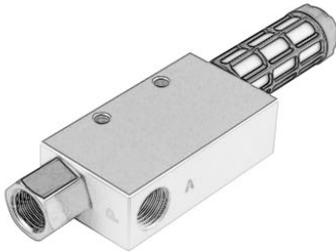
941285
Fluid Pump



R941251
*Level Switch
(New Fluid Tank)*



941294
*Level Switch
(Waste Fluid Tank)*



40200875
Vacuum Generator



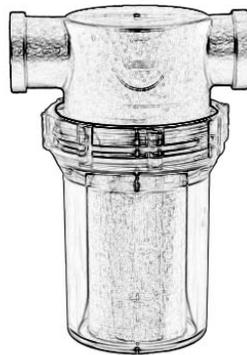
941276
Solenoid Valve



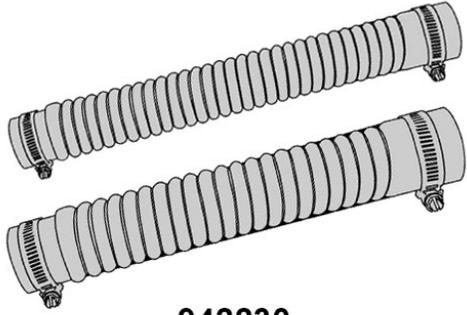
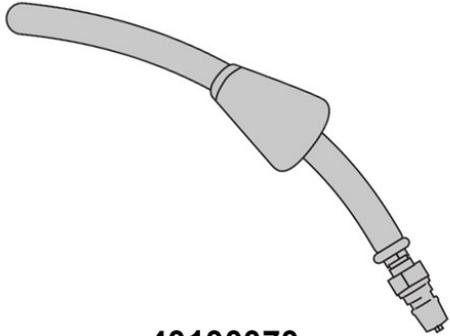
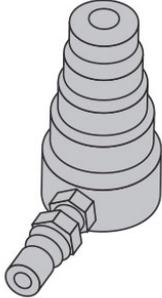
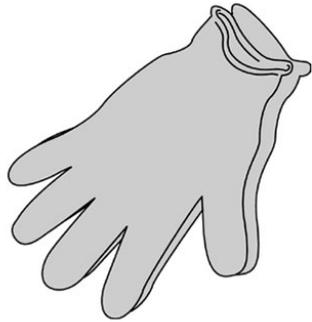
941347
Jumper Hose



941300
10" Wheel
R942118
Locking Caster Wheel



941463
External Filter

 <p>942230 <i>Small Adapter Hose (1-1/4" dia.)</i></p> <p>942231 <i>Large Adapter Hose (1-1/2" dia.)</i></p>	 <p>40100070 <i>Cone / Wand Combo Adapter</i></p>	
 <p>941293 <i>Step Adapter Assembly</i></p>	 <p>941290 - <i>Sm. Hose Clamp Pliers</i> 941291 - <i>Med. Hose Clamp Pliers</i> 941292 - <i>Lg. Hose Clamp Pliers</i></p>	 <p>941298 <i>Gloves</i></p>

To order replacement parts for the C-VAC³, call:

1-800-303-5874

MAINTENANCE PROCEDURES

To keep your machine working properly...

- Keep debris out of new fluid tanks.
- Ensure filter screen is clean before each use.
- Avoid spilling fluid on the control panel.
- Periodically wipe down exterior using a soft, damp cloth.

CUSTOMER SERVICE CONTACT INFORMATION

If you are experiencing problems with this machine,
call technical support at:

1-800-303-5874

LIMITED ONE (1) YEAR WARRANTY

Flo-Dynamics warrants only to the original Purchaser that under normal use, care and service, the Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for one year from the date of original invoice. External hoses, remote control modules, adapters and all other attachments, supplies and consumables (except as otherwise provided herein) are warranted for 90 calendar days from the date of original invoice. Filter elements are not warranted. Printed circuit boards purchased from, but not installed by Seller are not warranted.

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

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

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