PERFORMER CUB XL
mobile carpet cleaner
and
BRIDGEPOINT
SYSTEM IV

OPERATION &
SERVICE
MANUAL

PROCHEM

PROFESSIONAL CHEMICALS CORP
325 S PRICE RD, CHANDLER, AZ

INDEX

INDEX TO ILLUSTRATIONS

The material contained within the *PROCHEM CUBXL Operation and Service Manual* is based on the latest information available at the time of publication. PROCHEM reserves the right to make changes in this manual without notice.

PROCHEM makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

PROCHEM shall not be liable for errors contained herein or for incidental or inconsequential damages in connection with the furnishing, performance or use of this material.

TABLE OF CONTENTS

LIMITED WARRANTY

PROCHEM warrants your machine to be free of defects in material and workmanship. This warranty shall extend to the designated parts for the specific time period listed from the date of delivery to the user. If PROCHEM receives notice of such defects during the warranty period, PROCHEM will either, at it's option, repair or replace products which prove to be defective.

Gasoline Engine *(thru manufacturer or local dealer)*	2 years
Vacuum Pump *(thru manufacturer or local dealer)*	2 years
Engine Heat Exchanger	1 year
Water Pump	1 year
Waste Pump	1 year
Wands (Except shut off valve and orifices)	1 year
Waste & Water Tanks	1 year
Pressure Regulator	1 year
All other components	6 months
Battery (thru Interstate dealer only) pro-rated	12 months

Disposable filters, electrical components, belts, fittings, hoses, o-rings, and other maintenance items are not under warranty.

This warranty shall not apply to defects resulting from improper installation or operation; inadequate maintenance by the customer; unauthorized modification; misuse; a unit which is improperly repaired; or exposure to freezing temperature conditions.

To obtain warranty service, products must be returned to a service facility designated by PROCHEM. Customer shall prepay shipping charges for products returned to PROCHEM for warranty service and PROCHEM shall pay for return of the products to customer.

PROCHEM makes no other warranty, either expressed or implied, with respect to this product. PROCHEM disclaims the implied warranties of merchantability and fitness for a particular purpose. Any implied warranty of merchantability or fitness is limited to the specific duration of this limited warranty.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state, or province to province.

The remedies provided herein are the customer's sole and exclusive remedies. In no event shall PROCHEM be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

Your PROCHEM unit is designed to give you years of reliable service. However, if a problem should arise after the warranty period, follow the troubleshooting procedures in the Operation and Service Manual. If you are still unable to determine the cause and solution to the problem, contact your nearest PROCHEM Service Center for details of the services available.

SPECIFICATIONS

VAC RELIEF VALVE	14"Hg
WATER PUMP RPM	1550 RPM
WATER FLOW RATE	4.25 GPM
ENGINE SPEED (with 100 ft vac hose and water pump on)	3000 RPM
WATER PUMP PRESSURE	1000 PSI
WASTE TANK CAPACITY	52 Gallons
WASTE TANK/ENGINE SHUT-OFF ACTIVATION POINT	appx. 44 gal
CONSOLE WEIGHT	appx. 442 lbs
CONSOLE W/WASTE TANK WEIGHT	appx. 480 lbs

PERFORMER CUBXL OPERATION AND SERVICE MANUAL

1 RECEIVING AND INSTALLING

This chapter of the operators manual contains information on receiving, preparing and installing the *Performer CubXL*.

GENERAL: This operation and service manual is written specifically for the ***PROCHEM PERFORMER CUBXL CARPET CLEANER***, manufactured by *PROFESSIONAL CHEMICALS CORPORATION*.

DEALER RESPONSIBILITY: The *PROCHEM* dealer from whom you purchased this mobile cleaning unit is responsible for supervising the correct installation of the machine and for initial training of your operators and maintenance personnel in the proper operation and maintenance of this unit. Make certain that you receive these instructions.

ACCEPTANCE OF SHIPMENT: Every part of your *PERFORMER CUBXL* Carpet Cleaning unit was carefully checked, tested, and inspected, before it left our manufacturing plant. Upon receiving the unit, make the following acceptance check:

1. The unit should not show any outward signs of damage. If any damage is found, notify the **CARRIER IMMEDIATELY.**

2. Check your equipment and packing list. The standard *PERFORMER CUBXL* unit should arrive equipped with the following items (unless otherwise specified) as well as any extra accessories which were ordered:

A) Performer CubXL console

B) Waste tank.

C) Carpet Wand.

D) 100 ft., of 1/4 I.D. pressure hose.

E) 100 ft., of 2" vacuum hose.

F) Vacuum hose connector.

G) 50 ft water hose

H) Convenience outlet hose.

J) Installation bolt kit

K) Waste tank drain valve.

L) Waste tank drain hose.

M) Installation mounting plates

N) Clamps for hoses.

O) Fuel line installation hoses and fittings.

P) Operation & Service Manuals
   a. Performer Cub
   b. Gas Engine
   c. Water Pump
   d. Vacuum Pump

FUEL REQUIREMENTS: We recommend the use of clean, fresh, unleaded gasoline intended for automotive use. DO NOT MIX OIL WITH GASOLINE. Leaded gasoline may be used if lead-free is not available. 77 Octane minimum is recommended. Using an unleaded gasoline will result in fewer combustion deposits and longer valve life.

NOTE; The use of gasoline which contains alcohol, such as gasohol, is NOT recommended. If, however, gasoline with alcohol is used, it MUST NOT contain more than 10 percent ethanol and MUST be removed from the engine during storage. DO NOT use gasoline containing Methanol.

For additional information see "*Storage Instructions*" in the *Briggs and Stratton Operation and Maintenance Manual* which has been provided.

OIL REQUIREMENTS: We recommend using Briggs and Stratton 10W/30 high quality detergent oil (B & S #272001) or 30 weight (B & S #100005). If these are not available, use a high quality detergent oil classified "for service SF, SE, SD or SC". No Special additives should be used with recommended oils. For additional information see page 2 of the *Briggs and Stratton Operation and Maintenance Manual* which has been provided.

WATER REQUIREMENTS: If you are operating this unit in an area where the unit will be using water in which the hardness exceeds five (5) grains (85 parts per million), a suitable water softener should be installed. The *PROCHEM PERFORMER CUBXL* at full pump output, requires 270 gallons per hour at 20 to 90 PSI. A water supply hose capable of delivering this volume at the above pressure is required.

CHEMICAL REQUIREMENTS: The *PROCHEM PERFORMER CUBXL*, due to its chemical injection pump design, can be used with a variety of chemical compounds, (either acid or alkaline), depending on the job to be done. However, to obtain optimal results with this unit, we recommend using the *PROCHEM* line of chemicals. For information on the Chemicals *PROCHEM* can provide for your cleaning operation, consult your *PROCHEM* manual or contact your nearest *PROCHEM dealer.*

INSTALLATION: Prior to starting the installation, **FIRST** read the **ENTIRE** "Installation Section" of this manual. The following recommendations should be considered **BEFORE** installing this unit.

A. Your unit should not be mounted in any motor vehicle of less than 1/2 ton capacity. If your unit is mounted on the large water tank assembly, a 3/4 ton capacity vehicle is required.

B. If mounting in a trailer, make certain that the trailer is rated for the total weight of the unit AND trailer. Electric or hydraulic brakes should be provided, and a strict compliance of any State or Federal vehicle laws **MUST** be maintained.

C. The vehicle tires should have a load rating above the combined vehicle and unit weight.

D. If a wooden floor between the vehicle's floor and the unit is desired, we recommend using 1/2" thick MARINE plywood.

E. If using a trailer, the *PERFORMER CUBXL* console should be positioned in order that it balances properly with respect to the axle.

WARNING:

DO NOT INSTALL THE *PERFORMER CUBXL* IN ANY MOTOR VEHICLE WHICH REQUIRES HIGH OCTANE GASOLINE. The *CUBXL* engine is designed to use unleaded gasoline. HIGH OCTANE GASOLINE WILL DAMAGE THE ENGINE.

1. LIFTING THE UNIT ON THE VEHICLE:

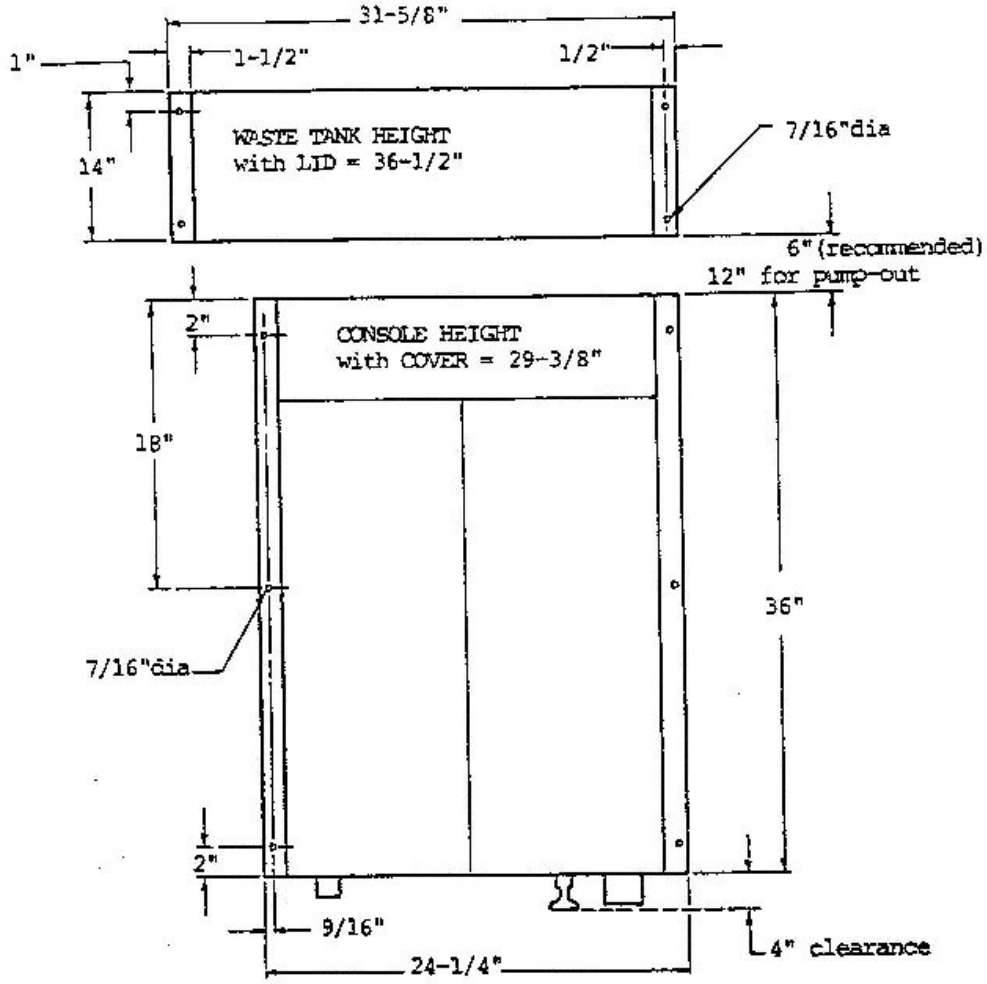
We recommend using a fork lift to lift the unit onto the vehicle. Position the forks under the unit from the front, making **CERTAIN** that the forks are spread to the width of the base.

2. POSITIONING THE UNIT IN VEHICLE:

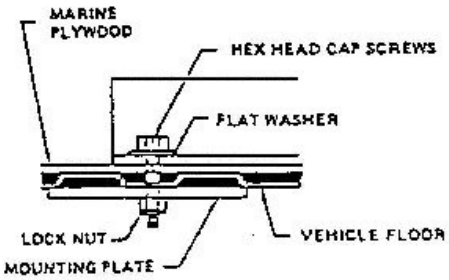
Because vehicles vary in size and openings, individuals have their own preferences as to where they want their units installed. We do not recommend any specific location for the *PERFORMER CUBXL CARPET CLEANER.* However, we do **STRONGLY** advise that enough space is provided to assure ample room for service and maintenance. In addition, the unit should be positioned in such a manner that mounting does not interfere with or endanger any vital components on the vehicle.

NOTE: For individuals who wish to make an engineering layout prior to positioning the unit, refer to page 4, figure 1, for console and waste tank dimensions.

DIMENSIONAL DATA (figure 1)



MOUNTING PLATE INSTALLATION (figure 2)



3. BOLTING DOWN THE UNIT AND WASTE TANK:

Once the unit and waste tank are positioned in the vehicle in the desired location, you may proceed. **NOTE:** When positioning the waste tank with respect to the console, hook up the vacuum hose and any other hoses which may connect the console and waste tank, This will ensure that the waste tank is positioned correctly.

CAUTION: Before drilling any mounting holes in the vehicle floor, make certain that when drilling, you will not do any damage to the gas tank, gas lines, or any vital component which might effect the operation or safety of the vehicle.

A. Using the console and waste tank mounting holes as a template, drill four 7/16" diameter holes for mounting the console and four more 7/16" diameter holes for mounting the waste tank.

B. Using the installation hardware kit:

a) Insert four 3/8" hex head cap screws through the mounting holes in the *PERFORMER CUBXL* console, and four more 3/8" hex head cap screws through the mounting holes in the waste tank.

b) Install the mounting plates underneath the vehicle floor. (Refer to page 4, figure 2,).

c) Screw the 3/8" hex head lock nuts on the mounting screws and tighten them until the console and the waste tank are firmly secured.

4. CONNECTION OF UNIT TO VEHICLE FUEL SUPPLY:
Under NO circumstances should you splice into any of the vehicle fuel lines.

READ THESE INSTRUCTIONS ENTIRELY BEFORE PROCEEDING.

CAUTION: Due to the positioning of the injection nozzle on certain vehicle fuel tanks, it may be necessary to drain the tank in order to prevent the spilling of an excessive amount of gasoline.

A. Select a location on the vehicle floor to drill a hole for the bulk head adaptor. **NOTE:** This location should be situated in a position that eliminates the possibility of gas line contact by either the operator(s) or accessories during the working hours or maintenance periods. We supply steel braid fuel hose. Make certain that the hose will reach the location you choose.

CAUTION: BEFORE DRILLING the gas line hole in the vehicle floor, make certain when drilling you will not do any damage to the gas tank(s), gas lines, brake lines, or any other vital component which might effect the operation or safety of the vehicle.

B. Drill a 5/8 (.625) diameter hole through the vehicle floor.

C. Install the 1/8" bulkhead adaptor by inserting adaptor and tightening the nut on the opposite side of the van floor. (figure 3).

D. Attach a 1/8P X 1/4T elbow to the bulkhead adaptor on one end (figure 3). Attach a 1/8" street elbow and a 1/8P x 5/16H barb fitting to the other end of the bulkhead adaptor.

E. Connect one 45-1/2" stainless steel hose from the fuel pump on the console to the bulkhead adaptor.

F. Disconnect from the filler neck the 2 hoses which connect the filler neck and the fuel tank by loosening the hose clamps.

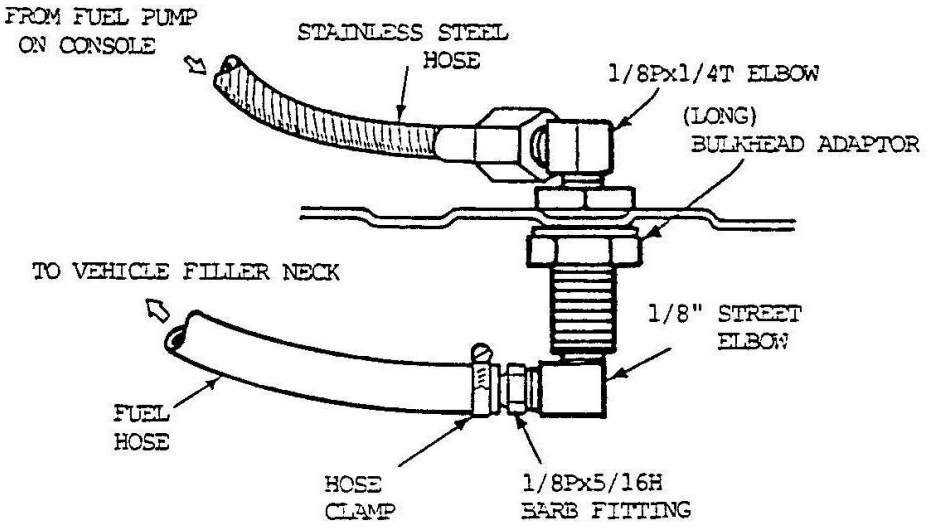
G. Remove the filler neck from the vehicle. If screws are used for mounting, remove them and save for re-installation. If the filler neck is mounted with rivets, it will be necessary to drill the rivets out and purchase the appropriate size sheet metal screws for re-installation.

H. Select a suitable location for drilling the hole in the filler neck (figure 4). **NOTE:** The desired location for this hole may vary. It is important that you are able to re-install the filler neck without interference from the fittings which you are adding. Therefore, choose this location wisely before proceeding.

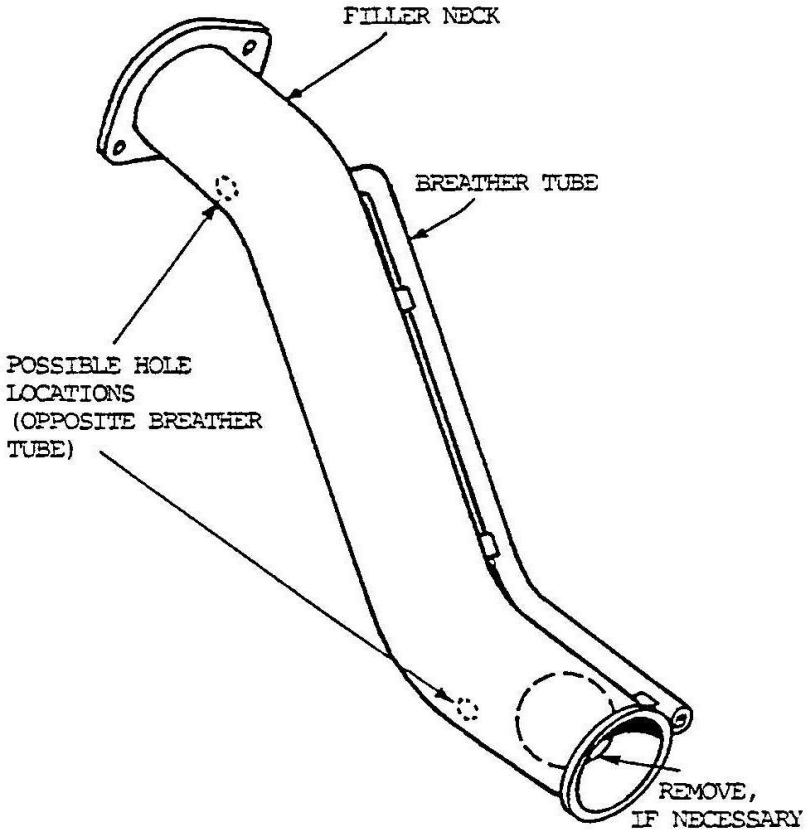
I. Drill a 1/2" diameter hole in the filler neck after you are CERTAIN that you have chosen the proper location (figure 4). **NOTE:** When assembling pipe fittings, teflon thread sealant must be used.

J. Attach a 1/8" street elbow to one end of the short bulkhead adaptor (figure 5). Slide one of the seals over the threads of the bulkhead adaptor against the hexagon area. Next, attach the 25", 35" or 45" stainless steel hose to the 1/8" street elbow. Choose a length that will reach through the filler neck to the bottom of the fuel tank. **NOTE:** If the chosen hose is too short or too long, the unit will run out of fuel before the vehicle fuel tank is empty.

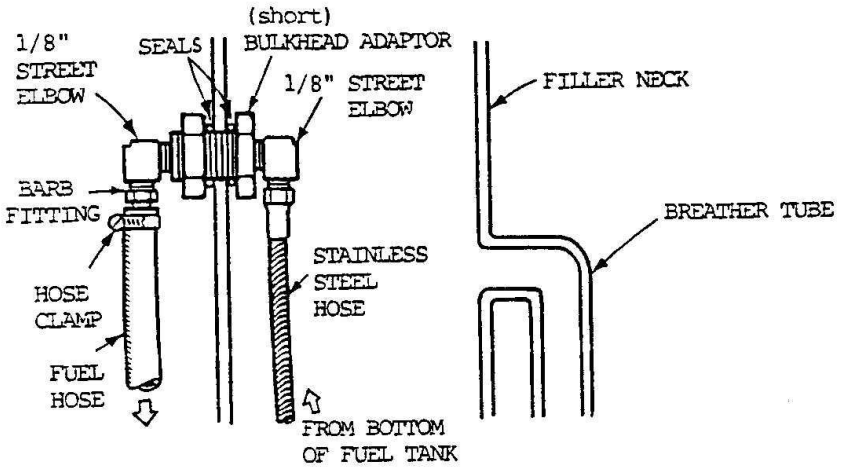
(FIGURE 3)



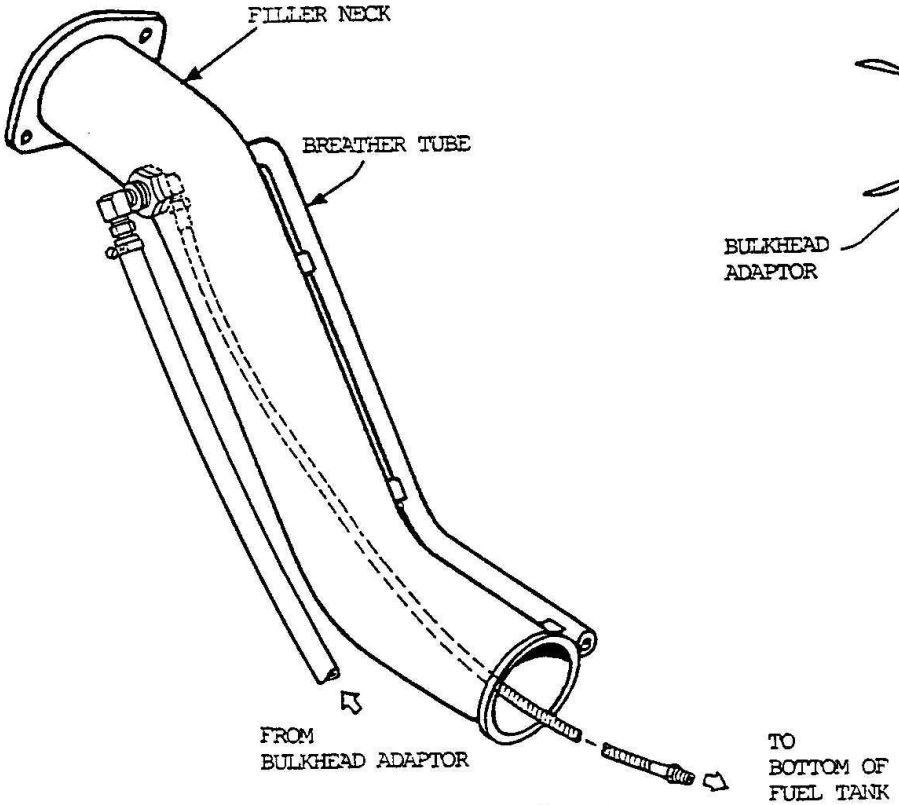
(FIGURE 4)



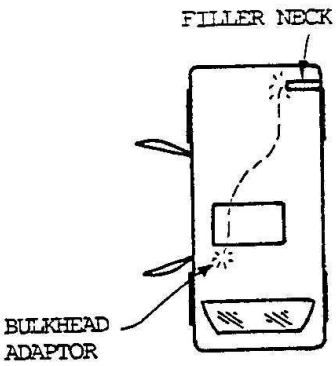
(FIGURE 5)



(FIGURE 6)



(FIGURE 7)



K. Insert the stainless steel hose (bulkhead connector first) into the filler neck until the male threads on the bulkhead connector are protruding through the 1/2" hole. Slide the other seal over the threads and tighten the hexhead nut over the seal (figure 5). Attach the 1/8" street elbow and 1/8P x 5/16H barb fitting to the bulkhead connector, outside the filler neck. Make certain the fuel hose and fittings remain positioned parallel to the filler neck (figure 6).

L. Using a hose clamp connect one end of the 5/16 fuel hose to the fittings on the outside of the filler neck (figure 5).

M. Re-install the filler neck on the vehicle.

N. Insert the filler neck fuel hose into the fuel tank and make certain the end is at the bottom of the tank.

O. Re-connect the 2 hoses which connect the filler neck and the fuel tank. Make certain they are clamped correctly.

P. Route the 5/16" fuel hose underneath the van from the filler neck to the bulkhead connector (figure 7). Use the cable ties to secure the hose. Cut off any excess hose and attach to the barb fitting with a hose clamp. **CAUTION:** When routing this hose underneath the vehicle, make CERTAIN that you do not place the hose in any location where damage may occur to the hose or vehicle. AVOID any contact with moving parts, areas of high temperature, or sharp objects.

5. **INSTALLING THE GAS TANK AND GAS LINE (TRAILER):**
For **TRAILER** installations we recommend the following.

A. Strict compliance of any Federal or State law must be maintained.

B. Provide a SAFE gas tank which is manufactured specifically for gasoline, has a proper filling cap, and an outlet connection that is the same size as the inlet connection on the unit.

C. DO NOT MOUNT THE GAS TANK INSIDE THE TRAILER WITH THE UNIT.

D. Mount the gas tank where it will be protected from any vehicle collision.

E. When installing the gas line from the tank to the unit, use the proper size gas line.

6. CONNECTING THE WASTE TANK TO THE UNIT:

Maintain the proper distance between the console and the waste tank when positioning the components in the vehicle. Do not reverse the hoses when reattaching them to the waste tank.

7. INSTALLING WASTE TANK DRAIN VALVE:

The drain valve may be installed directly on the waste tank with a flexible hose. If you prefer, it may be installed on the end of a lower flexible hose, in which case a 2" I.D. flexible heavy duty hose is required.

8. FIRE EXTINGUISHER:

We recommend that a fire extinguisher, preferably rated for A, B, & C type fires, be installed inside the vehicle.

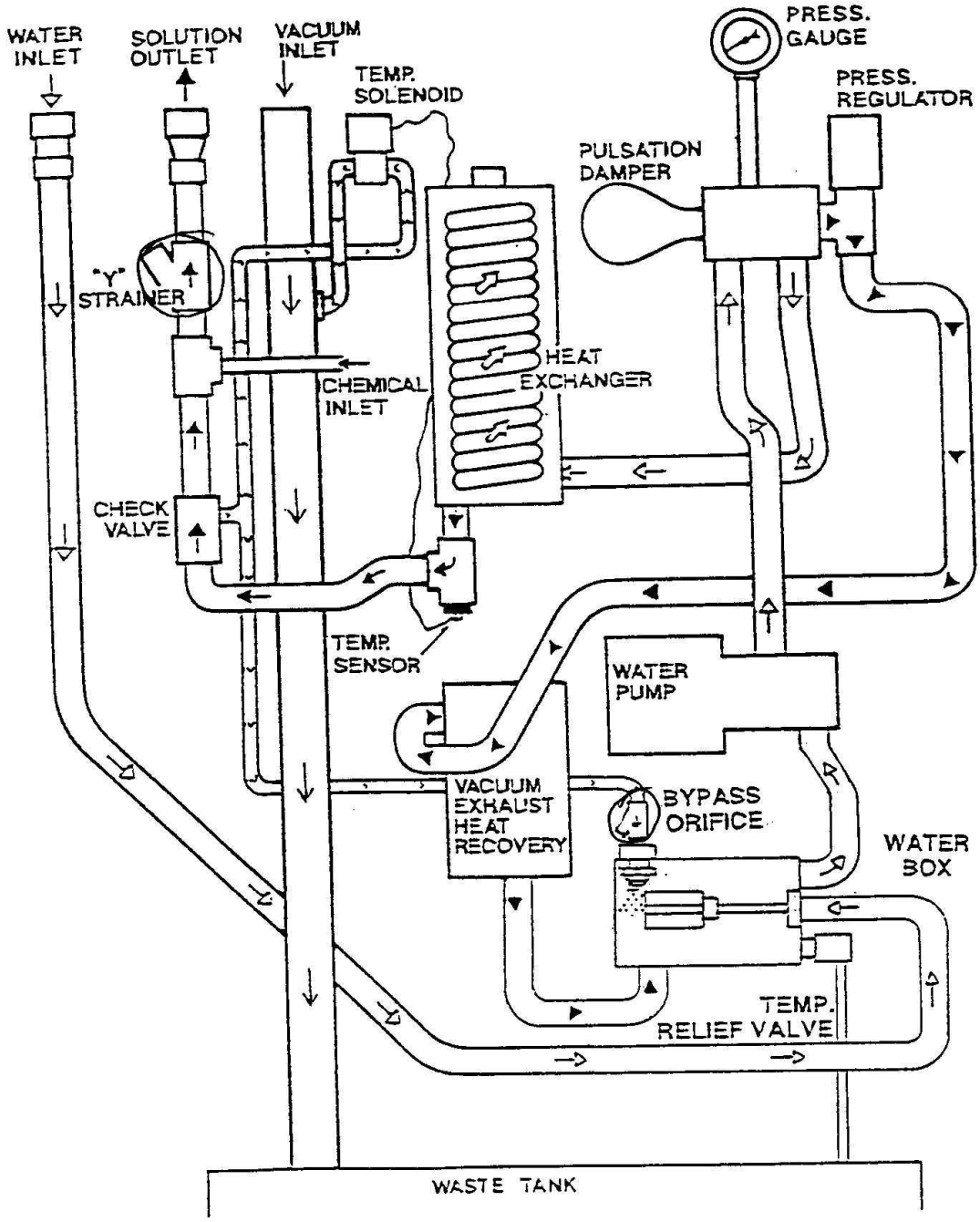
2 SYSTEMS

This chapter of the operators manual divides the unit up into systems and explains how each system works. Before proceeding into the operational and maintenance sections of this manual, we recommend acquiring a basic knowledge of how this unit functions, therefore, read the following section of this manual carefully and completely.

1. WATER PUMPING SYSTEM: (See figure 8, page 12)

Cold water enters the console through the water inlet connection at the front of the unit. The water then flows through a float valve into the water box. The float valve ensures that water flows into the system only when it is needed. The water box contains a temperature relief valve which protects the water pump from excessive temperature. If the temperature is over 165°F, the valve opens and allows the water box to empty into the waste tank. Next the water flows into the water pump. The water pump has a pulsation damper and a pressure regulator. The pulsation damper is a nitrogen–charged accumulator which reduces pressure fluctuations. The pressure regulator is a safety device which bypasses water back to the water box if it should exceed the desired settings. The pressurized water then goes into the exhaust heat exchanger which raises the temperature. On the check valve itself is a tee which allows water to constantly re–circulate through the heat exchanger and become continually hotter, unless the temperature solenoid valve is open. On the outlet side of the heat exchanger piping is a temperature sensor which is attached to a temperature solenoid valve. If the water temperature exceeds 240 degrees, the solenoid valve will open, allowing hot water to be released into the vacuum inlet tube and cold water to flow into the pumping system. This valve will close when the temperature drops down to 195 degrees. From the heat exchanger the hot pressurized water flows through a check valve to a tee where the chemical is injected. The check valve prevents separately pumped chemicals from reaching the water pump. The check valve constantly sends water to the water box which contains a bypass orifice. This creates constant water circulation and prevents excessive heat. The solution then flows through a Y–strainer, which filters debris, to the solution outlet at the front of the console.

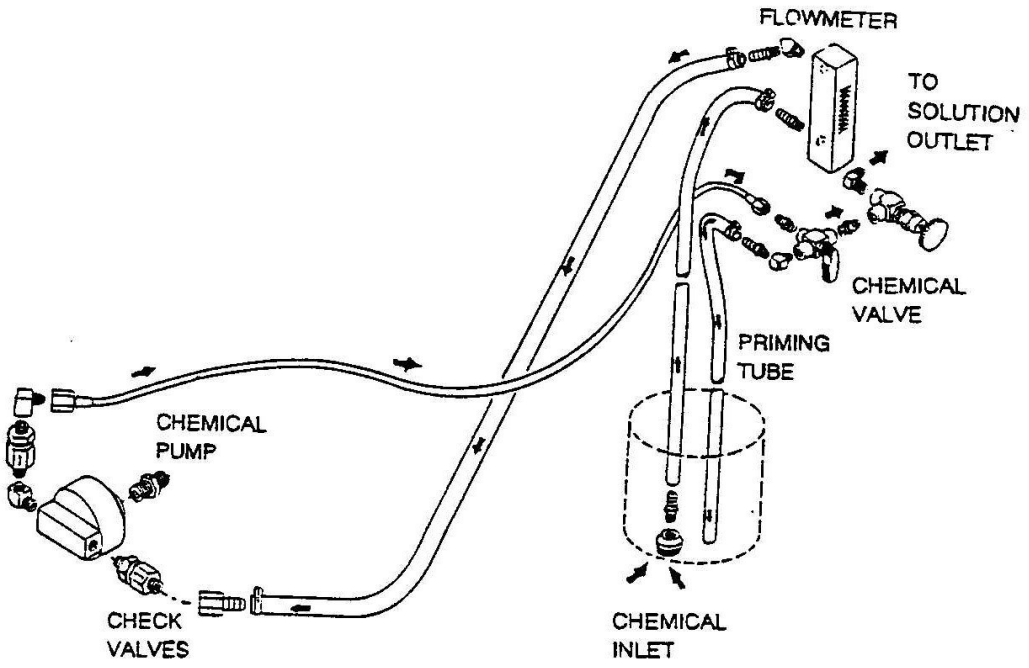
WATER PUMPING SYSTEM



2. CHEMICAL PUMPING SYSTEM: (See figure 9)

The chemical is drawn through a strainer from the chemical container to the flowmeter. The flowmeter indicates the rate of chemical flow. The chemical then flows through an inlet check valve into the chemical pump. The chemical pump then injects the chemical through an outlet check valve to the 3-way valve on the instrument panel. This valve turns the chemical flow on or off and primes the chemical pump as well. Next, the chemical flows to the solution outlet piping.

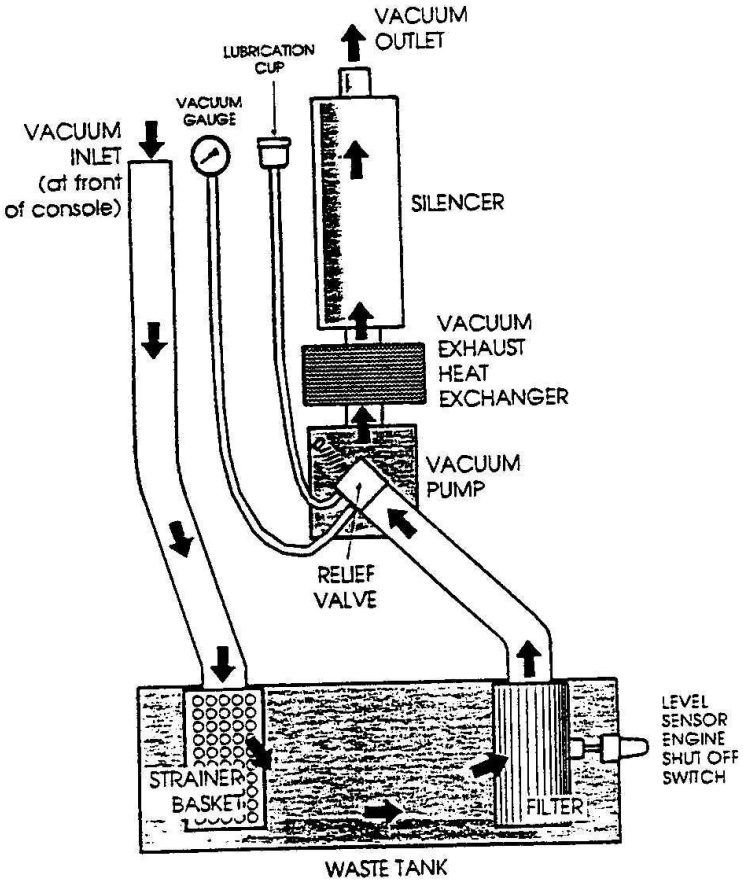
CHEMICAL PUMPING SYSTEM (figure 9)



3. VACUUM SYSTEM: (See figure 10)

Vacuum flow begins at the cleaning tool, with a mixture of air and spent chemicals being drawn into the vacuum inlet at the front of the console. This mixture then flows into the waste tank where larger particles are removed by a strainer basket. The fluid and smaller waste particles are deposited in the waste tank. A level sensor switch has been provided to automatically shut the unit down before it overfills past it's capacity. This prevents moisture from being drawn into the vacuum pump. Next, air flows through an additional filter, which removes smaller particles, to the vacuum pump. On the vacuum pump is a relief valve which releases air into the system if the vacuum exceeds 14"Hg. The air is then discharged from the vacuum pump through a silencer into the atmosphere.

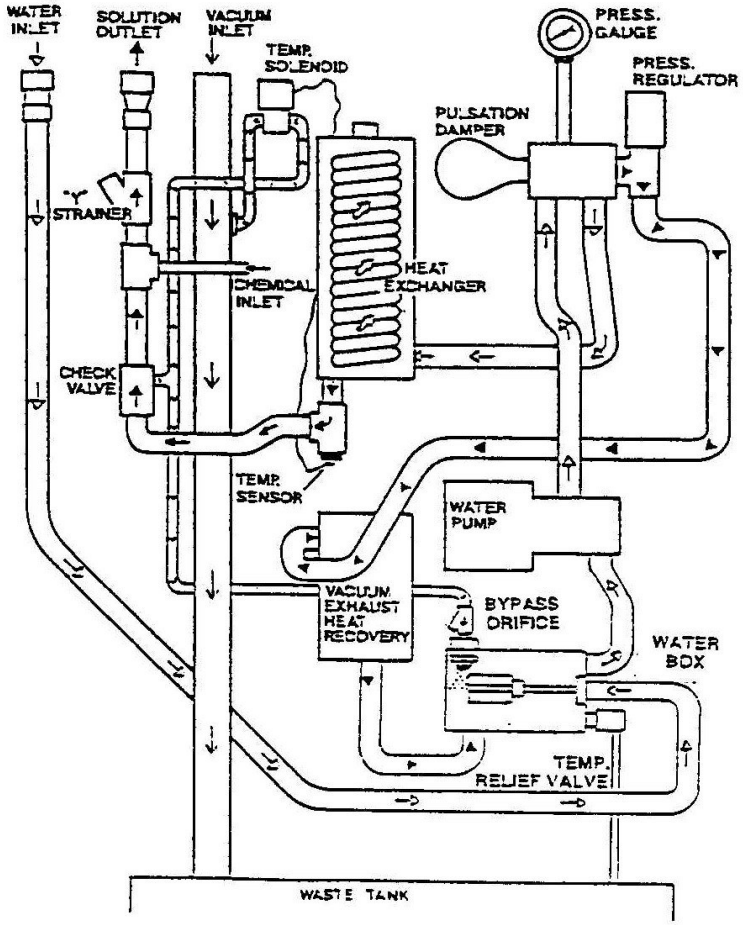
VACUUM SYSTEM (figure 10)



3. HEAT TRANSFER SYSTEM: (See figure 11)

Heat transfer begins with the hot exhaust from the engine which flows through a stainless steel tube into the heat exchanger. Pressurized water from the water pump flows through a coil inside the heat exchanger where heat is absorbed from the engine exhaust. On the outlet side of the heat exchanger is a temperature sensor which is attached to a temperature solenoid valve. If the water temperature exceeds 240 degrees the solenoid valve will open, allowing hot water to be released into the vacuum inlet tube and cold water to flow into the pumping system. This valve will close when the temperature drops back down to 212 degrees. The hot water then flows through a check valve to the solution outlet at the front of the console.

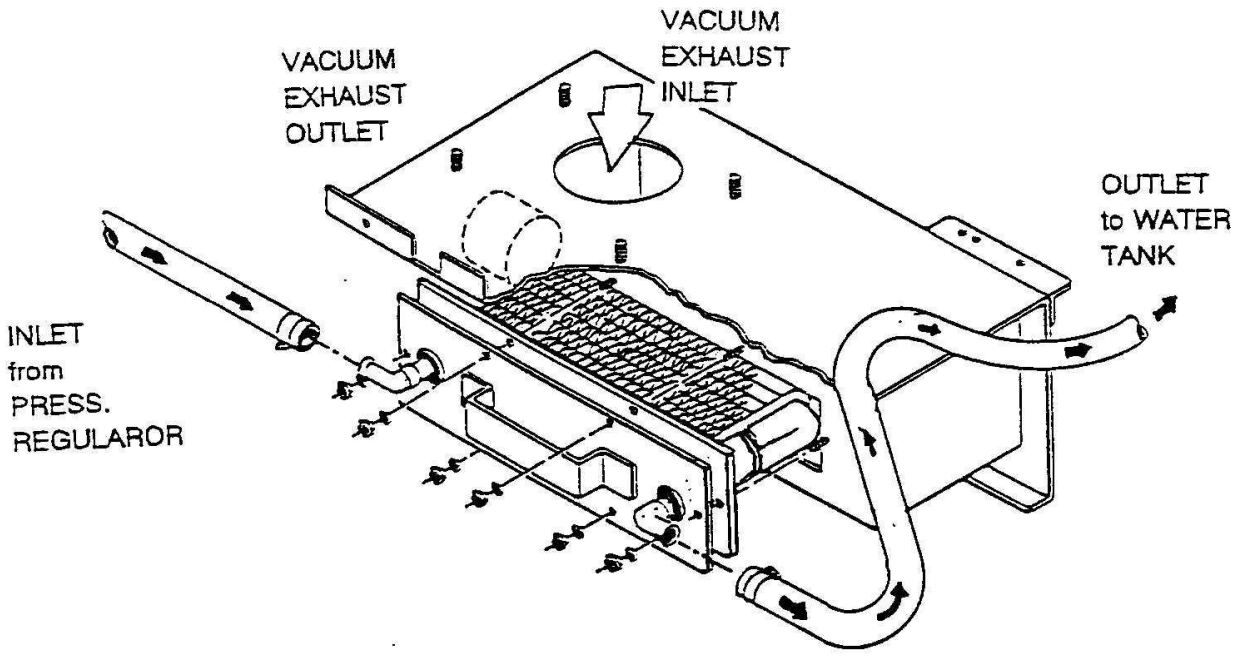
HEAT TRANSFER SYSTEM (figure 11)



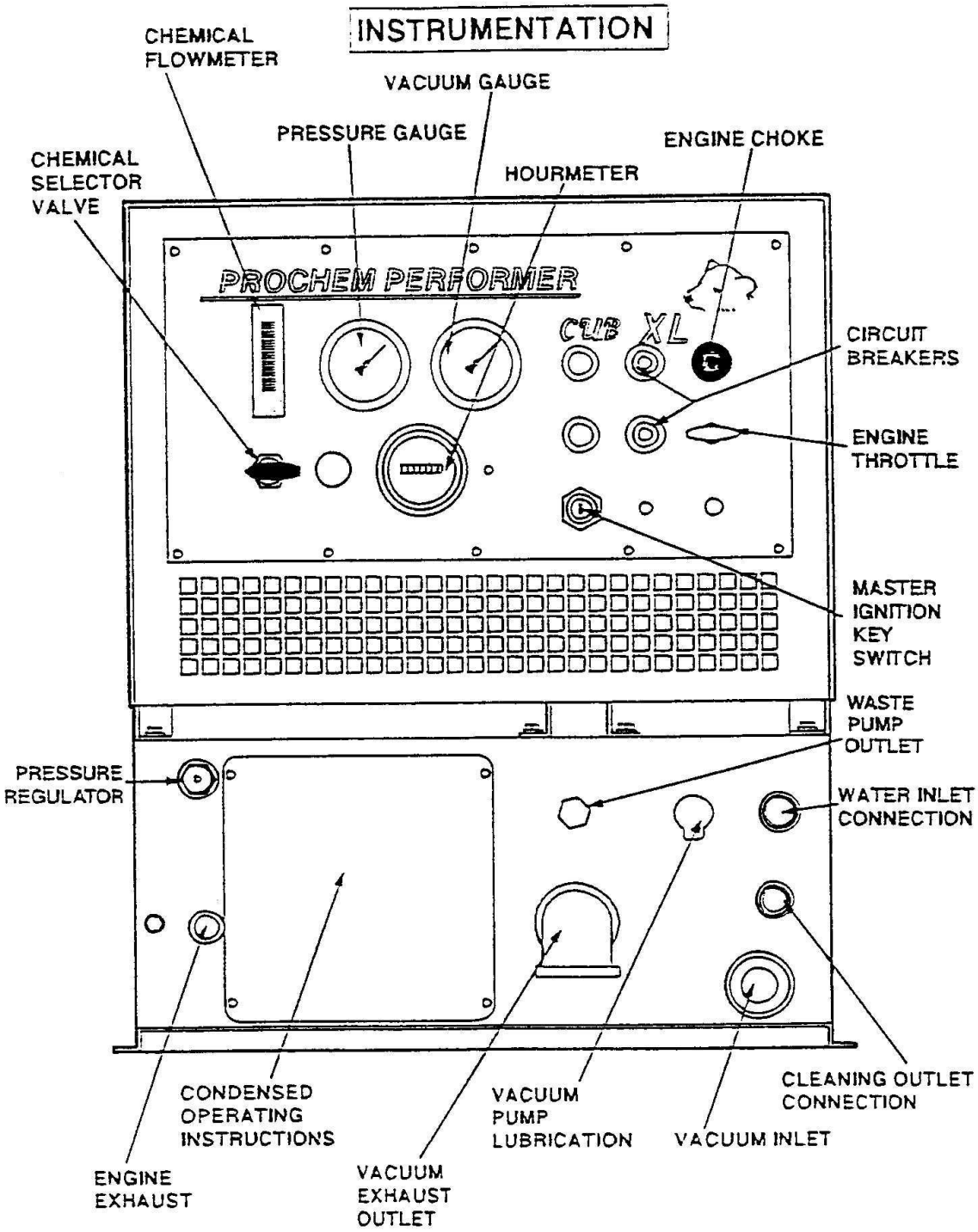
VACUUM FLOW HEAT EXCHANGER: (See figure 12)

On units equipped with a vacuum flow heat exchanger, the vacuum exhaust exits through a box which contains a heat exchanger. The vacuum exhaust then exits and flows through a silencer into the atmosphere. Water from the pressure regulator bypasses into this heat exchanger where it is heated by the vacuum exhaust. The water then flows through water tank to the water pump.

VACUUM FLOW HEAT EXCHANGER (FIGURE 12)



INSTRUMENTATION (FIGURE 13)



3 OPERATION

This chapter explains how to prepare, operate, shut down and daily maintain this unit. Operation of the *PERFORMER CUBXL CARPET CLEANER* is simple. However, only competent personnel who have had complete training should proceed.

CAUTION: This unit should NOT be operated inside a building or in any area where, in so doing, a violation of any Local, State, or Federal regulation(s) would be committed. It should only be operated in a well ventilated area because engine exhaust gases contain carbon monoxide.

1. WATER SUPPLY CONNECTION:

NOTE: If using a water supply hose which has not been used recently or if using a customer's hose, connect the hose to the faucet only and turn the water on to flush out any debris which may be in the hose. Do this before connecting the hose to console.

A. Connect the water supply hose to the water inlet connection.

B. Connect the other end of your water supply hose to the water supply faucet.

C. Turn the water supply faucet on. The water will fill the water tank.

2. HOSE CONNECTIONS:

A. Connect the pressure hose to the outlet connection at the front of the console and to the cleaning tool.

B. Connect the vacuum hose to the cleaning tool and to the vacuum inlet connection at the front of the console.

3. STARTING THE UNIT: (figure 13, page 17)

CAUTION: DO NOT operate this unit without constant water flowing into the console. This may result in damage to the pump or other vital components.

A. Turn the master switch on (the gas engine fuel pump will start operating).

B. Start your engine.

1. Pull the choke out.

2. Turn the ignition key to start.

C. After the engine is warmed up, push the choke in and turn the throttle counterclockwise. Then pull the throttle all the way out and turn it clockwise to lock it in the full throttle position. (This is the engine operating speed). (The engine operating speed is 3000 RPM with 100 feet of vacuum and pressure hose attached).

4. PRIMING THE WATER PUMP:

The water pump will prime itself when you start the engine. If the water pressure gauge reads 350 PSI when you open the cleaning wand, your pump is primed. If it does not, then refer to "LOSS OF WATER PUMP PRESSURE" in the troubleshooting section.

5. PRIMING THE CHEMICAL PUMP:

A. While your unit is running, place the chemical feed line and the chemical prime tubing into the chemical container. **NOTE:** In placing the chemical feed tubing into the chemical, make sure that it is fully submerged since the chemical pump will NOT function if air is allowed to enter the chemical feed tubing.

B. Turn the chemical valve on the front of the console to prime. This sets the chemical valve for priming. The chemical will then flow from the chemical container through the chemical feed tubing and back to the container through the chemical prime tube.

If the chemical does not flow:

a. Remove the chemical prime tubing from the chemical container.

b. Insert the prime tubing into the vacuum inlet at the front of the console. The vacuum will quickly pull the chemical from the chemical container.

c. When the chemical starts to flow, insert the chemical prime tube back into the chemical container.

C. Once continuous chemical flow without air bubbles has been achieved, turn the chemical valve on the front of the unit to "CHEMICAL" and open cleaning tool. Then adjust the chemical metering valve located on the front of the chemical flowmeter to achieve the desire flow. For most purposes the average chemical flow rate is approximately two gallons per hour.

6. **CLEANING:**

Once you have completed steps 1 through 6, proceed to put the unit to work cleaning as follows:

A. Before proceeding make sure the nozzle is functioning properly.

1. To check, hold the wand about one foot above the surface to be cleaned and open the wand valve. A full spray should be observed from the cleaning nozzle.

2. If the nozzle is not showing a full spray, clean or replace the nozzle.

B. Normally, chemical is applied on the push stroke of the wand when cleaning, and vacuuming is done on the pull stroke. For heavily soiled carpets the wand may be used in a scrubbing manner, applying chemical in both the push and pull strokes. Always finish up an area with a vacuum pull stroke.

C. When cleaning, keep the working opening (mouth) flat on the surface being cleaned. Keep the wand moving when the valve is open.

D. The unit will automatically shut down when the waste tank contains approximately 44 gallons. This will prevent water being drawn into the vacuum pump.

7. CLEANING SOLUTION HEAT:

Heat for the cleaning solution is provided by pumping the water through an extremely efficient heat exchanger connected to the cleaning unit engine exhaust. In cases of long period of no solution flow (wand closed) a fixed thermostat will open a solenoid to bleed, water only, into the waste tank. On units which are so-equipped, an additional vacuum exhaust heat exchanger is provided to absorb heat from the vacuum pump exhaust.

8. FLOOD RESTORATION:

CAUTION: When doing flood restoration, attach the 36" convenience outlet hose to the solution outlet on the front of the console. Open the ball valve to release solution. This will prevent excessive heat in the water pumping system and allow the water box to fill, sending cool water into the water pump.

9. STOPPING THE UNIT (and DAILY MAINTENANCE):

A. Turn the chemical valve on the instrument panel to the "OFF" position.

B. At the end of each working day, allow the unit to run for 3 minutes with the vacuum hose disconnected in order to remove all moisture from the vacuum pump. Next, spray WD40 (or an equivalent) into the oil cup (on the front of the console) while the unit is running. This will lubricate the vacuum pump as well as protect the gears from rusting.

C. Return the engine throttle to the IDLE position by pushing the throttle all the way in. Turn the ignition key to the "OFF" position.

D. Unhook the cleaning tool, vacuum hose, and pressure hose. Place them in their storage spaces inside the vehicle.

E. Turn the water supply faucet off. Bleed the pressure out of the water hose, unhook, and store the hose inside the vehicle.

F. Drain the waste tank. **CAUTION:** DO NOT dump waste in any area which, in so doing, would violate any local, state, or federal law. Open the waste tank drain valve and allow to drain.

G. Remove the strainer basket from the waste tank and clean out any accumulated debris. Re-install the strainer basket. Inspect the vacuum inlet filter in the waste tank. If there is any lint or debris, remove the filter and clean. When removing the filter, grip the plastic hexagonal section of the filter. Grasping the filter by the screen may collapse or ruin the filter. Re-install the filter, hand-tight.

H. Rinse out the waste tank with fresh water. A small amount of "DUO®" (dual-action deodorizer) may be added to the waste tank to inhibit the growth of bacteria.

I. Clean the unit, tools, hoses, van interior, etc., as needed. Inspect all equipment for any damage, wear, leaks, etc. Having a clean unit, which looks good cosmetically, provides a professional image to present customers and will attract future business as well.

10. FREEZING PROTECTION:

If the unit is exposed to freezing weather, the water in the unit can freeze and may do serious damage to the unit. To avoid this, the following is recommended during the cold weather season:

A. When the unit is not in use, always park it in a heated building.

B. If a heated building is not available, provide a thermostatically controlled electric heater inside the vehicle.

C. While in operation, avoid long shutdowns. Remember, the unit is providing heat while it is running. Shut it down just prior to leaving for the next job.

WINTERIZING KIT INSTRUCTIONS

for kit #66-945148 (p. 1 of 1)

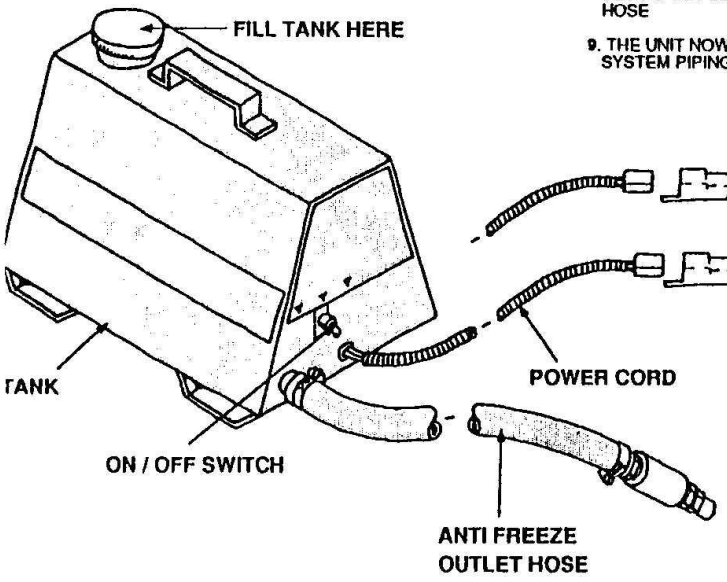
TO ADD ANTI FREEZE TO CONSOLE:

1. FILL WINTERIZING KIT TANK WITH 100% ANTI FREEZE SOLUTION. [USE ONLY *GLYCOL BASE* ANTI FREEZE]
2. CONNECT THE POWER CORD TO THE UNIT AS SHOWN BELOW.
3. CONNECT THE CONVENIENCE OUTLET HOSE TO THE SOLUTION OUTLET CONNECTION AT THE FRONT OF THE CONSOLE.
4. TURN UNIT ON AND SET THE ENGINE SPEED AT "IDLE". [FOR UNITS WHICH HAVE THE OPTION, THE WATER PUMP MUST BE "ON"]. SOLUTION WILL COME OUT OF THE CONVENIENCE OUTLET HOSE.
5. ALLOW UNIT TO RUN UNTIL ALL WATER AND SOLUTION ARE PURGED FROM THE UNIT.
6. ATTACH ANTI FREEZE OUTLET HOSE TO THE WATER INLET CONNECTION AT THE FRONT OF THE CONSOLE.
7. FLIP THE WINTERIZING KIT SWITCH TO THE "ON" POSITION.
8. SHUT THE UNIT & KIT DOWN WHEN ANTI FREEZE BEGINS TO FLOW OUT OF THE CONVENIENCE OUTLET HOSE
9. THE UNIT NOW CONTAINS ANTI FREEZE IN THE WATER SYSTEM PIPING AND HOSES.

TO REMOVE ANTI FREEZE FROM CONSOLE:

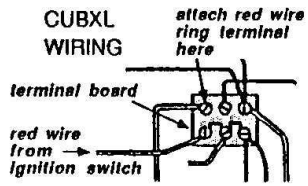
1. CONNECT THE CONVENIENCE OUTLET HOSE TO THE SOLUTION OUTLET CONNECTION AT THE FRONT OF THE CONSOLE.
2. INSERT THE END OF THE CONVENIENCE OUTLET HOSE IN THE WINTERIZING KIT TANK.
3. TURN UNIT ON AND SET THE ENGINE SPEED AT "IDLE". [FOR UNITS WHICH HAVE THIS OPTION, THE WATER PUMP MUST BE "ON".
4. ANTI FREEZE WILL FLOW OUT OF THE HOSE INTO THE WINTERIZING KIT TANK. ALLOW UNIT TO RUN UNTIL THE FLOW OF ANTI FREEZE BECOMES A *TRICKLE*
5. CONNECT WATER SUPPLY HOSE TO THE CONSOLE WATER INLET CONNECTION AND WATER SUPPLY.
6. ALLOW THE ANTI FREEZE TO CONTINUE FLOWING UNTIL IT TURNS TO WATER. REMOVE THE CONVENIENCE OUTLET HOSE FROM THE TANK AND DISCONNECT IT FROM THE SOLUTION OUTLET.
7. CONNECT A HIGH PRESSURE HOSE WITH CLEANING TOOL TO THE CONSOLE SOLUTION OUTLET. OPEN THE CLEANING TOOL VALVE UNTIL ALL OF THE ANTI FREEZE IS FLUSHED OUT OF THE UNIT.

DISPOSAL OF USED ANTI FREEZE: OBSERVE LOCAL LAWS AND REGULATIONS. WHERE PERMITTED, WE RECOMMEND DISPOSAL IN SANITARY SEWER SYSTEMS. DO NOT DRAIN ON TO THE GROUND OR INTO STORM DRAINAGE SYSTEMS.



Using *this* cord, you may also connect directly to your unit's battery terminals.
red : **positive** terminal
black : **negative** terminal

MODELS **800A & BRUIN**: Attach the **red** wire ring terminal to the ignition terminal on the ignition switch. Attach the **black** wire ring terminal to the control panel ground bolt.
CUBXL: Attach the **red** wire ring terminal to the terminal board on the control panel as shown in diagram below. Attach the **black** wire ring terminal to the control panel ground bolt.



A minimum 50/50 mix of anti freeze and water will generally give freezing protection down to -34 degrees farenheit. A 70/30 mix provides protection down to -84 degrees farenheit. We recommend that you use pure 100% anti freeze

Cooling System Capacity Quarts	QUARTS OF "ANTI FREEZE" REQUIRED						
	4	5	6	7	8	9	10
8	-34	-70					
9		-50	-82				
10		-34	-62	-84			
11			-47	-76			
12			-34	-57	-82		
13				-45	-66	-84	
14				-34	-54	-76	
15					-43	-62	-82
16					-34	-52	-70

Temperatures shown are shown in degrees farenheit

4 GENERAL SERVICE ADJUSTMENTS:

1. PRESSURE REGULATOR:

The pressure regulator serves only to hold locked up water pressure at a preset point and to bypass this water back to the open tank. Adjust as follows:

A. With your unit running, close the cleaning tool.

B. Loosen lock nut, turn the adjusting nut until you reach the desired pressure. The normal factory setting is 350 PSI (50 PSI above the operating pressure).

2. ENGINE SPEED:

To adjust the engine RPM, refer to the *"Engine Operation and Service Manual"* for instructions. **CAUTION: DO NOT** attempt to adjust without a tachometer and **NEVER** adjust the engine above 3000 RPM.

3. FLOAT VALVE:

As the water supply pressure will vary, it may be necessary to adjust the float in the water tank to either increase or decrease the water tank level. To accomplish this, remove the water tank cover and loosen the thumb nut on the valve, adjust the float, then tighten the thumb nut and replace the cover.

4. VACUUM RELIEF VALVE:

While the unit is running at full RPM, block the air flow at the vacuum inlet connection and adjust the tension on the relief valve until it opens at 14 inches of mercury.

5 MAINTENANCE

To assure that your *PERFORMER CUBXL CARPET CLEANER* has a maximum life with a minimum of down time, we strongly advise that a PLANNED PREVENTIVE MAINTENANCE PROGRAM be initiated.

1. GASOLINE ENGINE: **CAUTION:** Major engine repairs should not be attempted unless you have the proper tools and a THOROUGH knowledge of internal combustion engines.

   A. Check the engine oil level before starting and after every five (5) hours of operation. BE SURE OIL LEVEL IS MAINTAINED. **NEVER** over fill.

   B. Change the crankcase oil after the first eight (8) hours of operation. Thereafter, change oil every twenty–five (25) hours of operation. **NOTE:** Refer to the *Engine Operation and Service Manual* for type and grade of oil.

   C. Change oil filter every 50 hours of operation.

   D. Remove and service the paper cartridge filter in the air cleaner yearly or every 100 hours (which ever comes first). Service the pre–cleaner every 3 months or 25 hours. Replace the cartridge when ever necessary. (Refer to *Engine Operation and Service Manual).*

   E. Make sure that the cooling system is kept clean, clean yearly or every 100 hours, which ever comes first. (Refer to *Engine Operation and Service Manual*).

   F. Clean and reset gap on spark plugs every 100 hours, if necessary, replace. **NOTE:** Never sandblast spark plugs. Spark plugs should be cleaned by scraping or wire brushing.

   G. Replace in–line gas filter yearly.

NOTE; For additional engine service information, order # 272144 "*Vanguard Service and Repair Instructions*" from any authorized Briggs and Stratton Service Center. If service or repair is required, contact an authorized Briggs and Stratton Service Center. You will need model, type, and code number on the engine.

2. **VACUUM PUMP:** Refer to *Vacuum Pump Operation and Service Manual* for specific instructions.

   A. Check the oil level daily to assure the proper level. **PROPER LEVEL** cannot be overemphasized. Too little oil will ruin bearings and gears. Too much oil will cause overheating.

   B. Drain, flush and replace oil every 1500 hours or more frequently if inspection so indicates.

   C. The bearing on the pulley end of the vacuum pump requires grease lubrication every 200 hours.

   D. To prevent rust from building up inside the vacuum pump (if moisture exists) we have provided a lubrication cup on the front of the unit. First run the unit at least three minutes to remove any moisture from the vacuum pump. Next, fill the lubrication cup with WD40 or a similar lubricant while the unit is running and the vacuum inlet is sealed. Do this at the end of each working day.

3. **WATER PUMP:** Refer to the *Water Pump Operation and Service Manual* for specific instructions.

   A. Check the oil level daily to assure the proper level.

   B. After the first 200 hours, drain and refill the crankcase oil with 30 weight non-detergent oil.

4. **DRIVE BELTS:** The drive belts should be inspected daily. Check for loose belts, frayed belts, and mis-alignment. Correct any of these conditions, if damaged, replace.

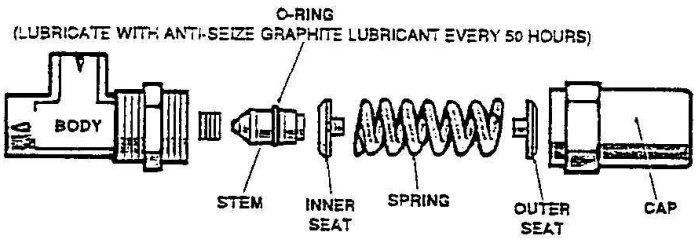
5. **VACUUM TANK FILTER:** The vacuum filter should be removed and cleaned **DAILY**. If this is done, the filter will last for a long period of time. Replace this filter at least once a year.

6. **BATTERY:** Check the fluid level in the battery once a week. If low, fill to the proper level with distilled water.

7. HEAT EXCHANGER: Proper and consistent heat exchange is a product of a well maintained engine. If an engine is not properly maintained the exhaust gases will deposit carbon on the outside of the heat exchanger coil and continuous running will affect the cleaning solution temperature. If this condition exists, remove the heat exchanger from the unit and clean the carbon off the coil. Using A212 ULTRACLEAN INDUSTRIAL CLEANER will greatly enhance the removal of carbon deposits. Plug one end of the heat exchanger and fill the heat exchanger with a mixture of one part of A212 to four parts of warm water. Allow one hour of soaking, then drain and rinse with hot water. If necessary, repeat.

Unplug the condensation drain tube every 250 hours, or monthly.

PRESSURE REGULATOR O-RING LUBRICATION



FOR BEST RESULTS WITH THE SUTTNER PRESSURE REGULATORS, WE RECOMMEND THAT YOU LUBRICATE THE O-RING WITH AN ANTI-SEIZE TYPE GRAPHITE LUBRICANT EVERY 50 HOURS OR WHEN REQUIRED.

THIS MAY BE DONE *CONVENIENTLY* BY FIRST REMOVING THE CAP, OUTER SEAT, SPRING, AND INNER SEAT WITH THE UNIT OFF. NEXT,WHILE HOLDING THE PALM OF YOUR HAND IN FRONT OF THE PRESSURE REGULATOR, START YOUR UNIT. THE STEM WITH THE O-RING WILL POP INTO YOUR HAND. AFTER LUBRICATING, RE-ASSEMBLE. *IT'S THAT SIMPLE.*

THIS WILL PREVENT THE STEM FROM STICKING.

6 COMPONENT REPAIR:

The following general instructions are for the repair of various components. ONLY FULLY TRAINED personnel should repair components.

1. **VACUUM PUMP:**

   Refer to the *Vacuum Pump Operation and Service Manual.*

2. **GASOLINE ENGINE:**

   Refer to the *Engine Operation and Service Manual.* If more detail is needed, you should procure a 272144 Service and Repair Book from a local authorized Briggs and Stratton Service Center.

3. **WATER PUMP:**

   Refer to *Water Pump Operation and Service Manual.*

7 TROUBLESHOOTING

Before proceeding, you can save time by checking:

A. That the engine speed is 3000 RPM with the throttle pulled all the way out.

B. That the water supply is turned on.

C. That the pump volume is correct. Check pump volume with your cleaning tool closed. Measure the water flow going back to the water tank directly from the pressure regulator. You should fill a gallon container in 20 seconds.

SPECIFIC PROBLEMS:

1. LOSS OF WATER PUMP PRESSURE: With the cleaning tool open, the water pressure gauge reads below the normal operating pressure.

PROBABLE CAUSES	CORRECTIVE ACTION
Water supply is turned off, or the float valve is improperly adjusted or stuck.	Turn the water supply on or up. Check for kinks in the water supply hose. Examine the float valve and adjust or replace. One gallon of water should be maintained in the water box.
Water inlet line plugged or drawing air.	Examine the water inlet filter inside the water box. Remove any excessive debris and replace, if required. Check for suction leaks and loose clamps or fittings. Tighten any loose fittings or clamps. Replace any ruptured hose.
Water pressure regulator dirty, stuck open, improperly adjusted, has worn seals, or is not seated properly.	Clean or repair water pressure regulator and adjust to 50 PSI above working pressure. If necessary, replace.
Improper engine speed.	Re-adjust engine speed to 3000 RPM. See *Briggs and Stratton Operation and Service Manual.*

PROBABLE CAUSES	CORRECTIVE ACTION
Low pump volume (check pump volume by closing the cleaning tool and measuring the amount of water being returned to the water tank by the pressure regulator. It should fill a gallon container in 20 seconds).	Examine the check valve assemblies in the water pump. Clean out or replace. (Refer to *Pump Operation and Service Manual.)*
Defective pressure gauge.	Replace gauge.
Orifice in cleaning tool worn or wrong.	Replace orifice.
Bleed solenoid stuck open or defective.	Clean seat in solenoid valve. Replace solenoid.

2. **LOSS OF WATER PUMP VOLUME:** With the cleaning tool open, a reduction in water volume through the tool. Pressure gauge reads normal.

PROBABLE CAUSES	CORRECTIVE ACTION
Plugged orifice in the cleaning tool.	Unplug orifice.
Cleaning tool valve is malfunctioning.	Repair or replace valve.
Defective quick–connect.	Replace defective quick–connect on high pressure hose.
"Y" strainer on unit plugged.	Clean or replace the strainer screen.
Outlet check valve is dirty, improperly seated, or the cage is improperly installed.	Examine the check valve and remove any debris. Inspect for complete seating. Repair or replace.

3. **LOSS OF VACUUM:** While cleaning, the vacuum is not up to par. Engine RPM is normal.

PROBABLE CAUSES	CORRECTIVE ACTION
Vacuum hose(s) is damaged, causing a suction leak.	Inspect the vacuum hose(s). Repair any damage or replace.
Waste tank gasket not sealing properly, causing a suction leak.	Inspect the gasket. Repair seal or replace.
Plugged vacuum line.	Unplug or repair the vacuum line.
Waste tank filter is plugged.	Clean or replace filter.
Loose vac pump drive belt.	Tighten the drive belt.
Waste tank drain valve is damaged. causing a suction leak.	Drain the waste tank. Remove the dump valve and, after inspecting, replace the defective components.
Vacuum relief has a suction leak.	Re-adjust the vacuum relief valve. If the vacuum does not increase, remove and inspect the relief valve diaphragm. If damaged, replace.
Vacuum pump is worn out.	Replace the vacuum pump.
Vacuum exhaust heat exchangers are plugged with lint.	Remove and clean.

4. **LOSS OF CHEMICAL:** With the cleaning tool valve open, no chemical.

PROBABLE CAUSES	CORRECTIVE ACTION
Chemical pump is improperly primed.	Refer to "Chemical pump priming instructions.
The strainer at the inlet end of the chemical inlet line is clogged.	Unclog the strainer, if damaged, replace.
Suction leak in the inlet line leading into the chemical pump.	Inspect inlet lines and flow meter for damage and replace, if required.
Chemical check valve(s) is clogged or has damaged o-ring(s).	Remove any debris from the chemical chemical check valve(s). Replace damaged o-ring(s) or entire chemical check valve(s) if necessary.
Chemical prime/on-off valve or chemical metering valve is defective.	Replace valve(s).
Chemical pump diaphragm is ruptured.	Disassemble the chemical pump and replace the damaged diaphragm.
Defective cylinder in the water pump.	Measure the pump volume. If the pump volume is less than normal, refer to "Loss of pump volume" section in this manual.

5. **ENGINE WILL NOT START:** During the normal start-up, the engine will either not start or will not turn over.

PROBABLE CAUSES	CORRECTIVE ACTION
Circuit breaker tripped on hot line to the master switch.	Reset circuit breaker.
Waste tank is full.	Empty the waste tank.
Defective key switch.	Replace switch.
Defective starter solenoid.	Replace starter solenoid.
Defective gas engine fuel pump.	Replace fuel pump.

PROBABLE CAUSES	CORRECTIVE ACTION
Vacuum pump frozen (If the pump impellers are rusted, then the engine will stall).	Free the vacuum pump. Refer to *Vacuum Pump Operation and Service Manual.*
Dead battery.	Recharge or replace battery.
Malfunction of the gasoline engine.	Repair engine. Refer to *Engine Operation and Service Manual.*

6. **ENGINE STOPS RUNNING:** While doing normal carpet cleaning, the engine stops running.

PROBABLE CAUSES	CORRECTIVE ACTION
Loss of oil pressure.	Check oil level, oil filter and oil pressure switch.
Waste tank full or defective float switch.	Drain waste tank or replace float switch.
Malfunction of the gasoline engine.	Repair engine. Refer to *Engine Operation and Service Manual.*
Defective fuel pump.	Check wiring, if intact replace fuel pump.
Defective anti-diesel solenoid.	Check wiring, if intact replace anti-diesel solenoid.

7. **LOSS OF TEMPERATURE:** The heat output of the unit is LESS than normal.

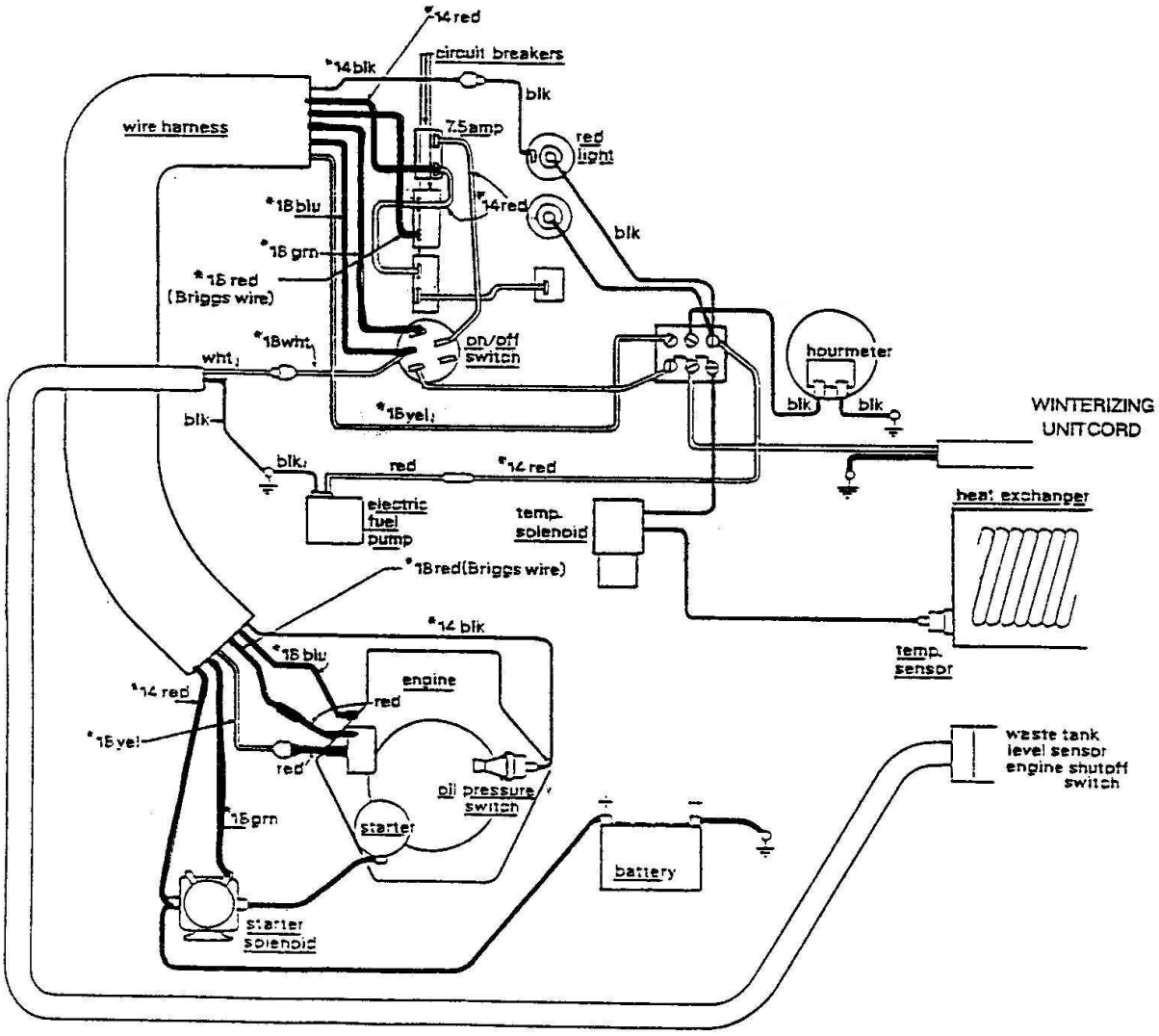
PROBABLE CAUSES	CORRECTIVE ACTION
Heat bypass valve on the control panel is open further than necessary.	Close the temperature control valve by turning the knob clockwise.
Defective temperature gauge.	If defective, replace.

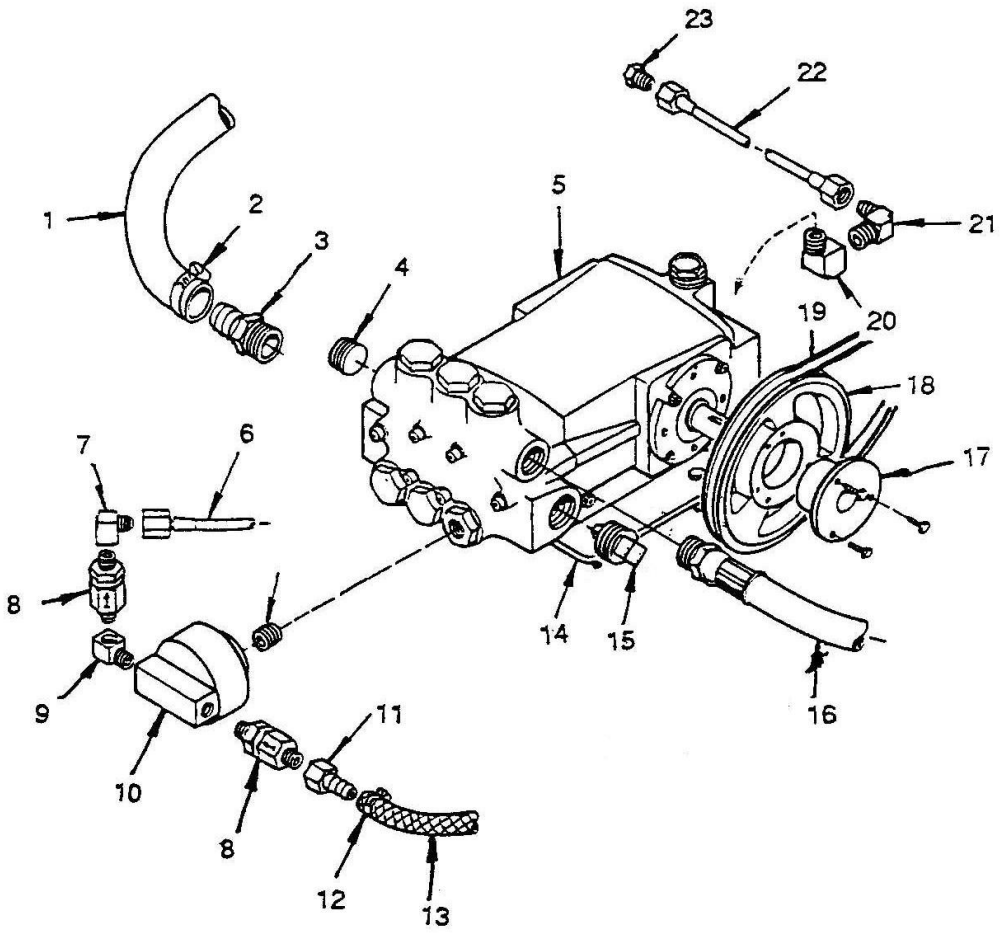
PROBABLE CAUSES	CORRECTIVE ACTION
Defective engine thermostat which is stuck in the open position.	If defective, replace.
Thermal valve in water box is defective or stuck.	Clean unit and test. If defective, replace.
Solenoid valve is stuck open.	Check hi-temperature sensor at heat exchanger. Disassemble and check for residue.
Engine RPM is low.	Reset engine RPM, refer to "*Engine Operation and Maintenance Manual*".
Damaged or plugged radiator core in vac preheater.	Remove and inspect cores, replace if defective.
Heat exchanger is carbon coated on outside of coil.	Soak coil section at a radiator shop. Boil tank or soak in PROCHEM Ultraclean Industrial (A212).
Heat exchanger is scaled on inside of coil.	Descale coil using E521 "Inhibited Descaler". See Maintenance section #12.

8. **CHEMICAL FLOWMETER INDICATES FLOW WITH THE CLEANING TOOL VALVE CLOSED:**

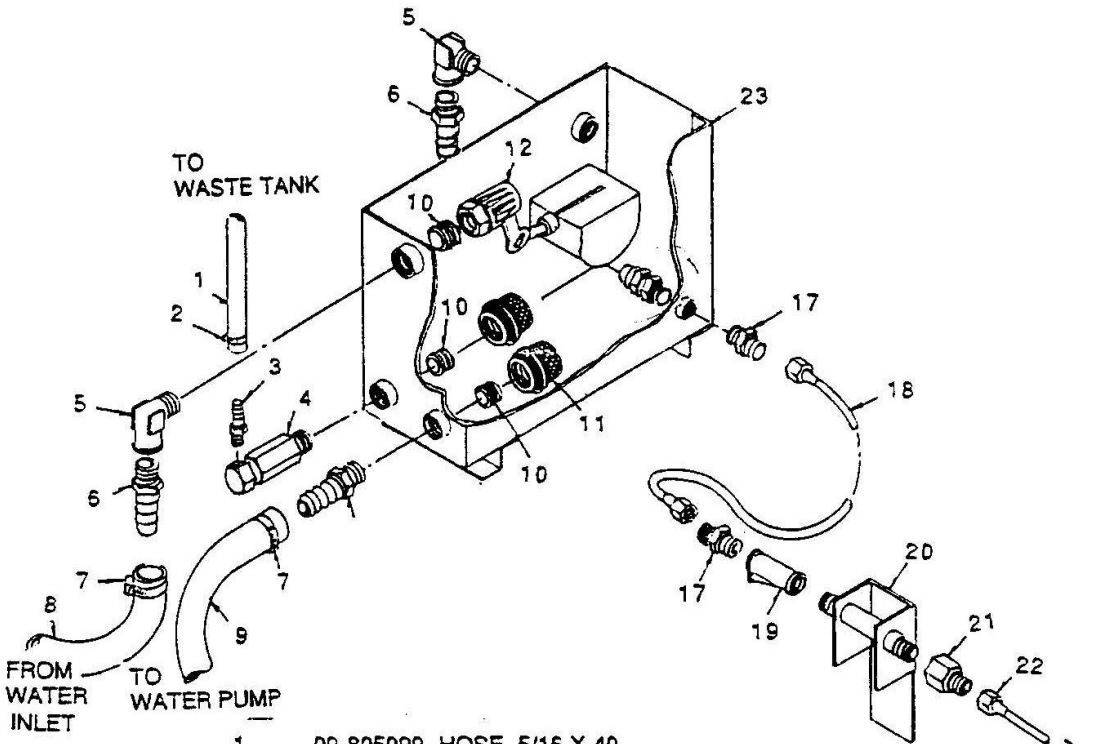
PROBABLE CAUSES	CORRECTIVE ACTION
Chemical pump diaphragm is ruptured.	Close the chemical valve on the instrument panel. If the flowmeter still indicates flow, examine the water which is bypassing from the pressure regulator to the water tank. If there is chemical in this water, replace the chemical pump diaphragm.
Spring weak or defective in 1/2" check valve.	Replace check valve spring.

CUBXL
WIRING DIAGRAM

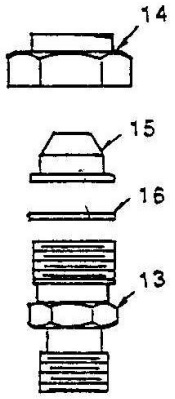




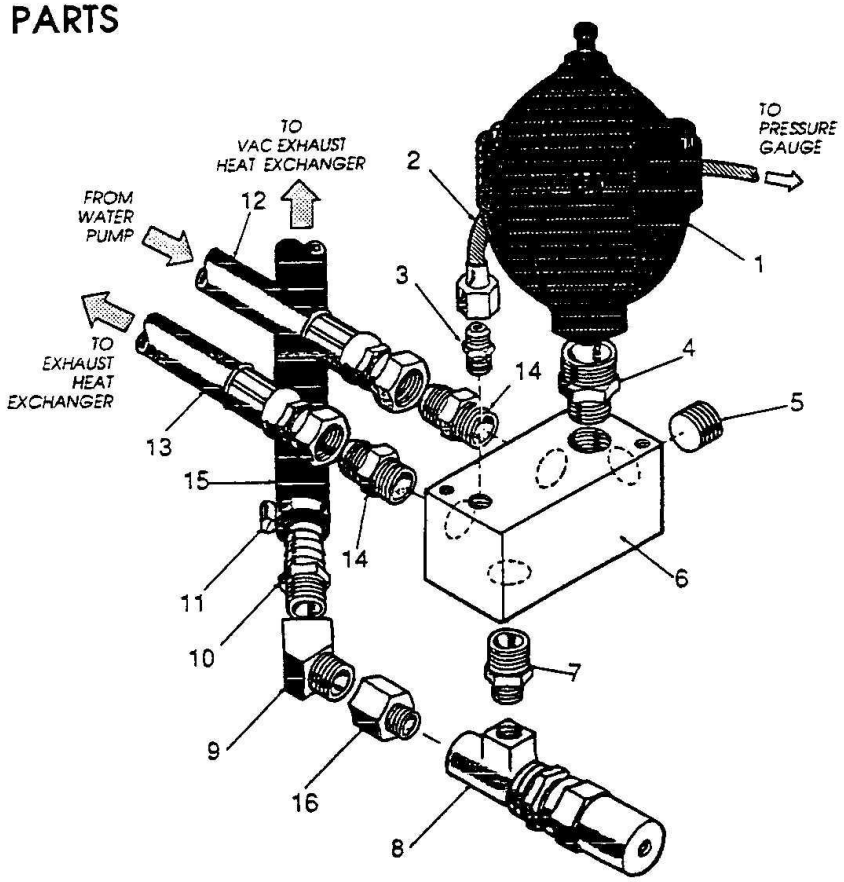
1	09-805331	HOSE, 5/8 X 6"
2	03-000113	HOSE CLAMP
3	12-800269	BARB FITTING,1/2P X 5/8H
4	11-800224	PLUG, 3/8
5	41-809061	WATER PUMP
6	10-805289	SST HOSE, 3/16 X 27-1/2"
7	12-800142	ELBOW, 1/8FP X 1/4T
8	15-808030	CHECK VALVE
9	11-800014	STREET ELBOW, 1/8
10	41-809044	CHEMICAL PUMP
11	12-800098	BARB FITTING, 1/8FP X 5/16H
12	03-000065	HOSE CLAMP
13	09-805309	HOSE, 5/16 X 30"
14	56-501682	MOUNT, WATER PUMP
15	11-800168	PLUG, 1/2
16	10-805228	HOSE, 3/8 X 19-1/4"
17	44-802204	HUB, WATER PUMP
18	44-802205	PULLEY, WATER PUMP
19	44-802215	BELT,WATER PUMP
20	11-800045	STREET ELBOW, 1/4
21	12-800031	ELBOW, 1/4P X 1/4T
22	10-805130	SST HOSE, 3/16 X 13-1/2
23	12-800029	PLUG,1/4T



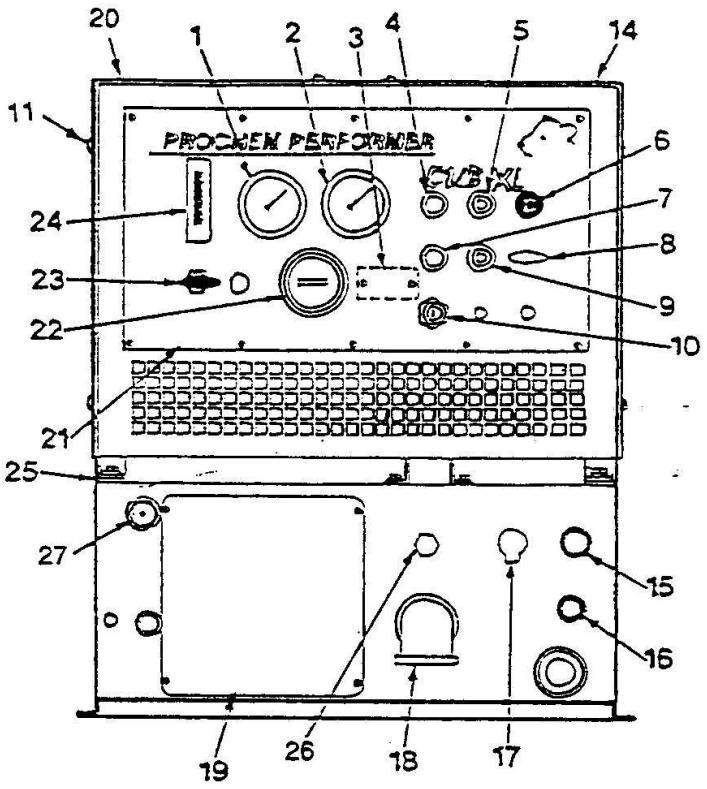
1	09-805099	HOSE, 5/16 X 40
2	03-000065	HOSE CLAMP
3	12-800093	BARB FITTING, 1/8P X 5/16H\
4	15-808083	TEMPERATURE RELIEF VALVE
5	11-800041	STREET ELBOW, 1/2
6	12-800269	BARB FITTING, 1/2P X 5/8H
7	03-000113	HOSE CLAMP
8	09-805330	HOSE, 5/8 X 53
9	09-805268	HOSE, 5/8 X 12
10	11-800300	CLOSE NIPPLE, 1/2
11	14-806540	SUCTION END STRAINER 40 MESH
12	15-808086	FLOAT VALVE
13	17-803043	NOZZLE BODY
14	17-803041	NOZZLE BODY CAP
15	17-803042	TEEJET
16	17-803006	SPRAY TIP WASHER
17	12-800060	CONNECTOR, 1/4P X 1/4T
18	10-805351	SST HOSE, 3/16 X 5-1/2
19	14-806548	Y-STRAINER 40 MESH
20	56-501778	Y-STRAINER BRACKET
21	12-800087	CONNECTOR, 1/4FP X 1/4T
22	10-805130	SST HOSE, 3/16 X 13-1/2
23	56-501776	WATER BOX



PRESSURE REGULATOR PARTS



1	41-809016	PULSATION DAMPER
2	10-805130	HOSE, 3/16SST X 10-1/2"
3	12-800065	CONNECTOR, 1/8P X 1/4T
4	11-800023	HEX NIPPLE, 1/2 X 3/8
5	11-800224	PLUG, 3/8
6	52-501603	MANIFOLD
7	11-800381	SST NIPPLE, 3/8 X 1/4 SST
8	15-808081	PRESSURE REGULATOR
9	11-800341	STREET ELBOW,3/8 45°
10	12-800345	BARB FITTING, 3/8P X 5/8H
11	03-000113	HOSE CLAMP
12	10-805228	HOSE, 3/8 X 19"
13	10-805275	HOSE, 3/8 X 19"
14	12-800282	CONNECTOR, 3/8P X 1/2T
15	09-805322	HOSE, 5/8 X 36"
16	11-800090	CONNECTOR, 3/8FP X 1/4P



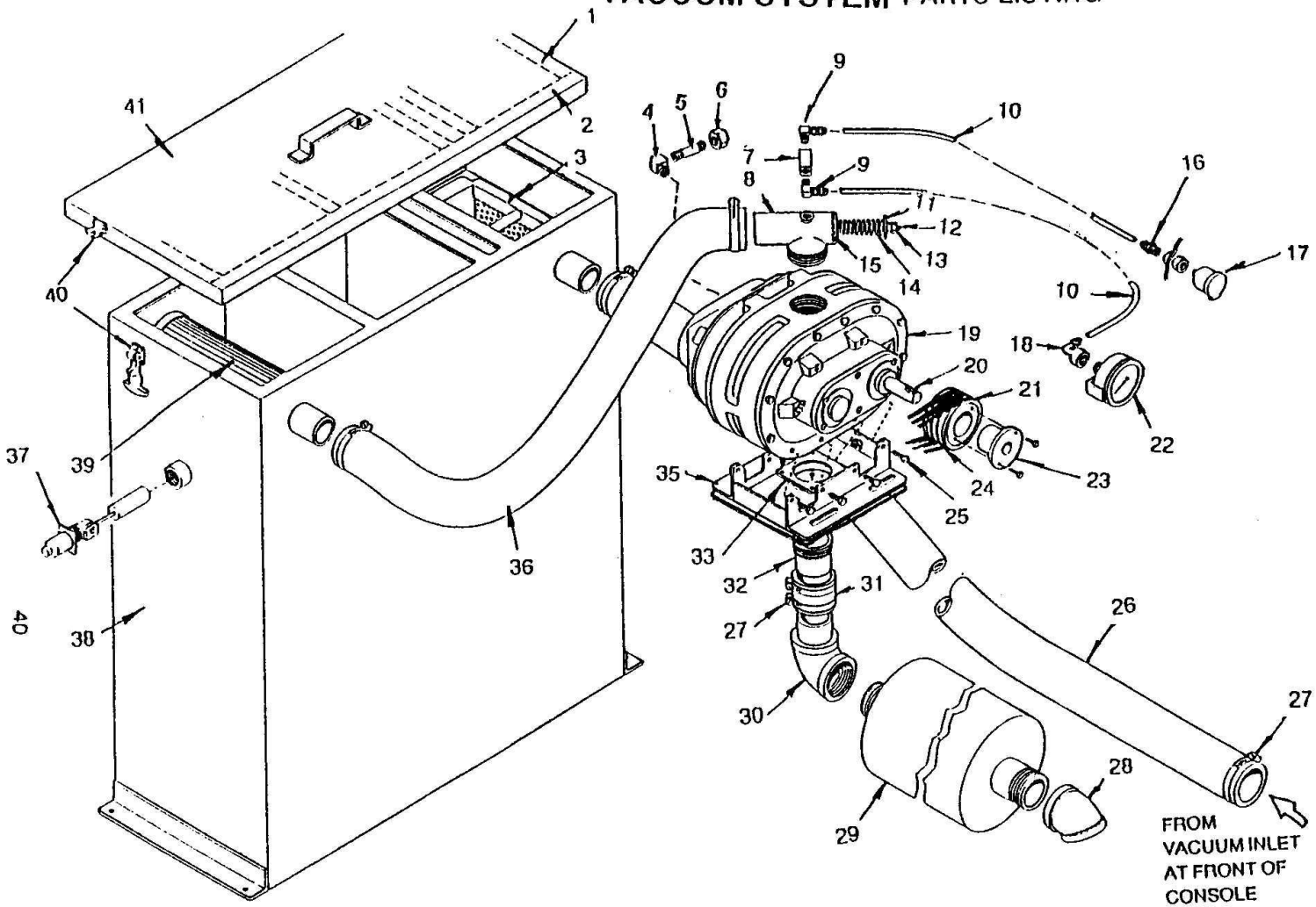
1	18-808506	GAUGE, WATER PRESSURE
2	18-808519	GAUGE, VACUUM
3	33-900168	TERMINAL BOARD
4	34-900039	LIGHT, RED
5	33-900164	CIRCUIT BREAKER, 7.5 AMP
5A	33-900162	PLATE,RESET
6	49-802518	CHOKE CABLE
7	34-900094	LIGHT,GREEN
8	49-802505	THROTTLE CABLE
9	33-900163	CIRCUIT BREAKER, 20 AMP
9A	33-900162	PLATE, RESET
10	32-900174	SWITCH, IGNITION
11	00-000272	1/4 TURN LATCH
12	02-000268	RETAINER WASHER
13	01-000259	FASTENER, TURN LATCH
14	61-950475	RIGHT HOOD ASSY
15	13-806008	DISCONNECT, 3/8F
16	13-806001	DISCONNECT, 1/4F
17	19-800075	LUBRICATION CUP
18	11-800359	ELBOW, 1-1/2 45 DEG
19	50-501601	PLATE,INSTRUCTION
20	61-950476	LEFT HOOD ASSY
21	50-501648	CONTROL PANEL
22	34-903000	HOURMETER
23	15-808022	CHEMICAL VALVE
24	18-808513	FLOW METER
25	58-700024	VIBRATION PAD
26	11-800019	CAP, 1/2
27	15-808081	PRESSURE REGULATOR

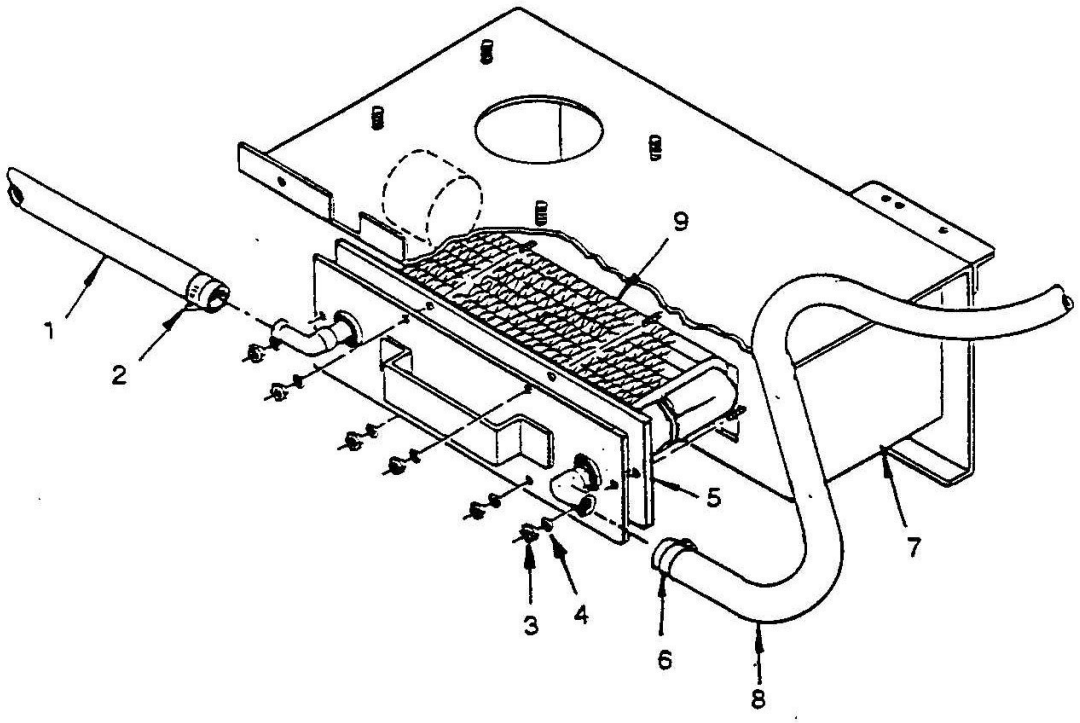
NOT SHOWN

15-808029 DUMP VALVE

66-945134 TEMP REDUCTION KIT

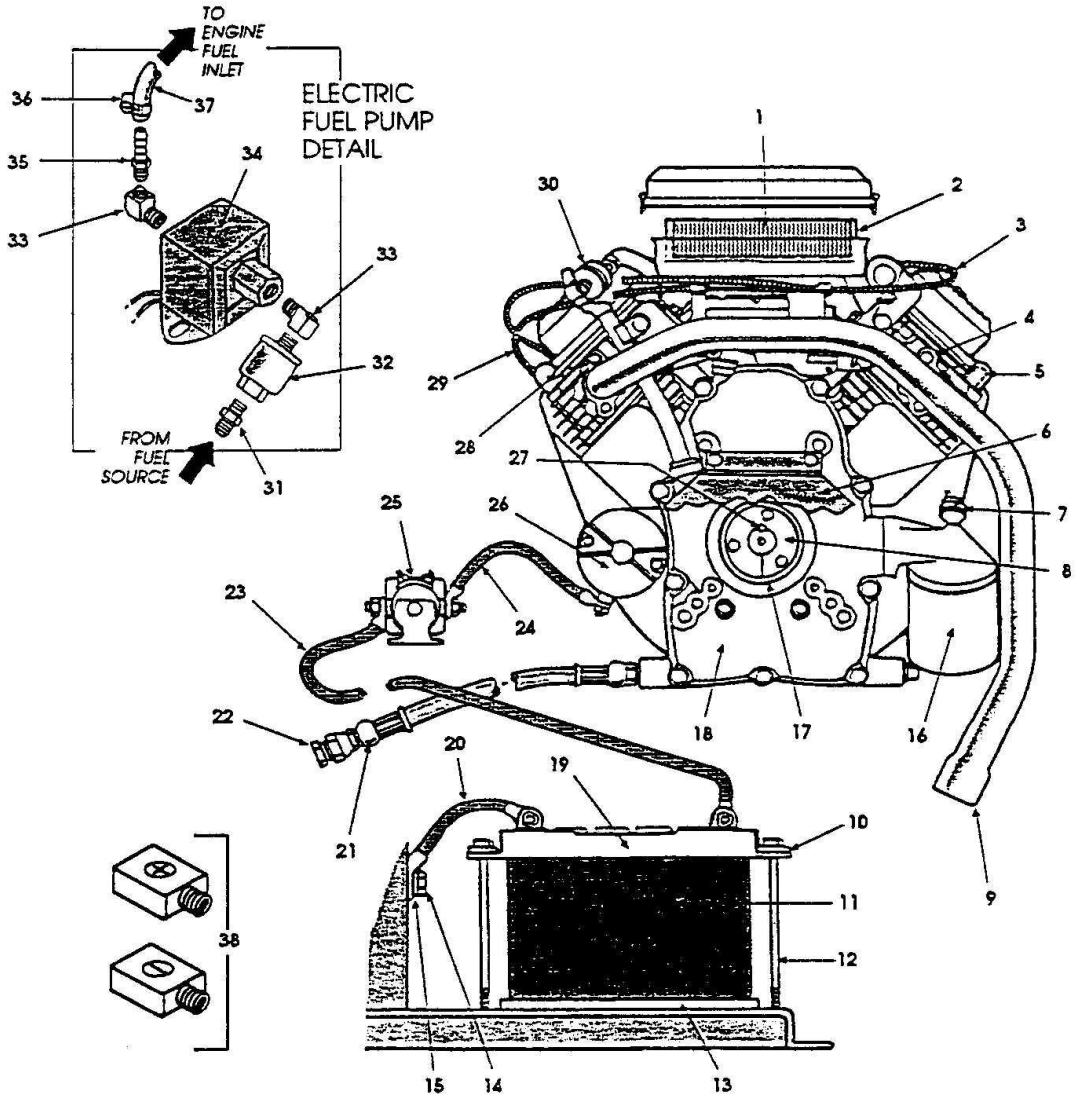
VACUUM SYSTEM PARTS LISTING



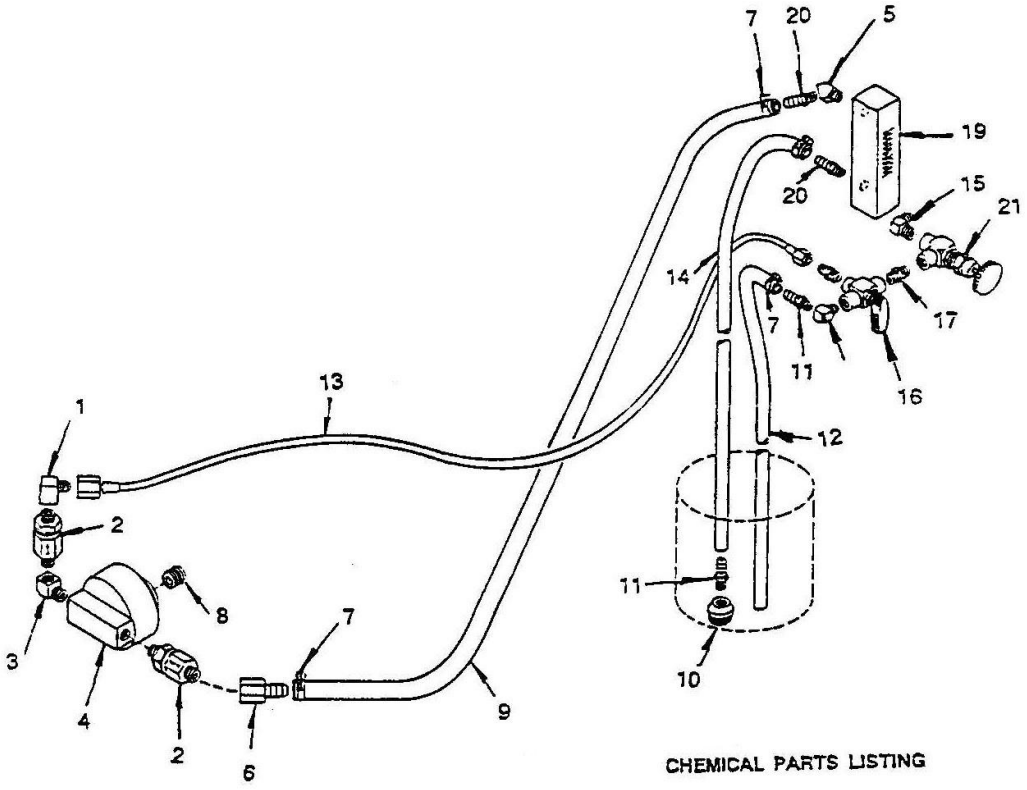


1	09-805322	HOSE, 5/8 X 36
2	03-000113	HOSE CLAMP
3	01-000037	NUT
4	02-000038	LOCKWASHER
5	43-807078	GASKET
6	03-000113	HOSE CLAMP
7	56-501638	BODY
8	09-805228	HOSE, 5/8 X 27"
9	57-520055	HEAT EXCHANGER

ENGINE ASSEMBLY PARTS



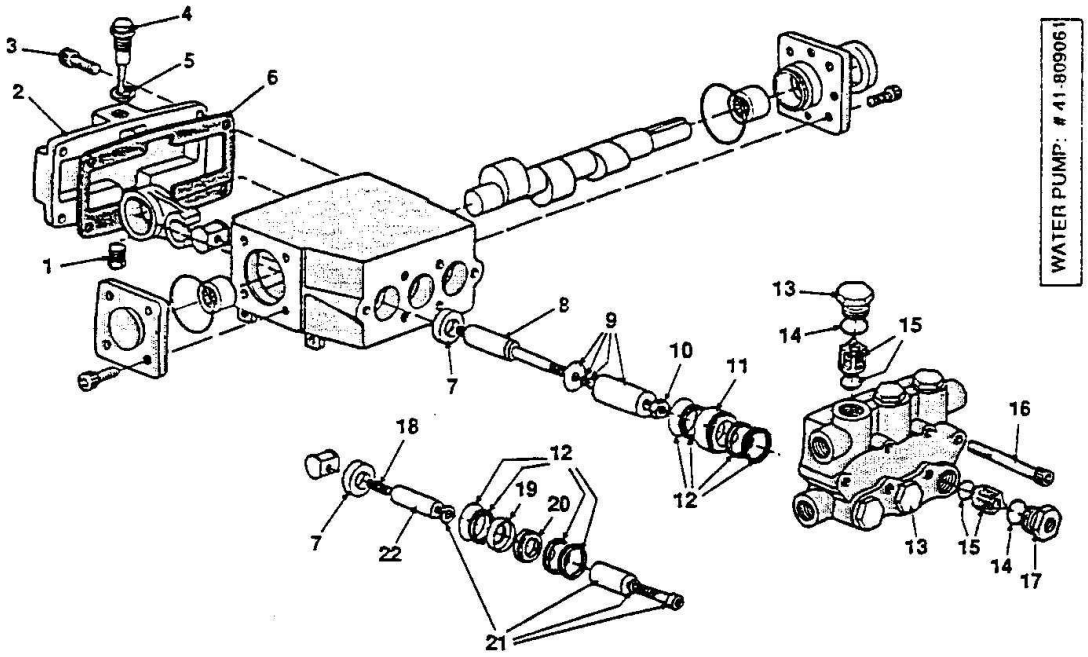
1	42-902005.....CARTRIDGE, AIR CLEANER	20	64-950060.....BATTERY CABLE x 8"
2	42-902006.....ELEMENT, AIR CLEANER	21	10-805291.....HOSE, OIL DRAIN
3	49-802518.....CHOKE CABLE	22	12-800062.....PLUG, OIL DRAIN
4	42-902174.....GASKET,EXHAUST MANIFOLD	23	64-950491.....BATTERY CABLE x 37"
5	42-902169.....SPARK PLUG	24	64-950456.....BATTERY CABLE x 14"
6	56-501630.....BELT GUARD	25	35-901002.....STARTER SOLENOID
7	35-900169.....OIL PRESSURE SWITCH	26	42-902176.....STARTER MOTOR
8	44-802202.....HUB, ENGINE	27	54-500412.....KEY, ENGINE
9	56-501613.....EXHAUST TUBE	28	42-902168.....GASKET VALVE COVER
10	02-000066.....FLATWASHER, 1/4	29	49-802505.....THROTTLE CABLE
11	36-900056.....BATTERY	30	42-902172.....FUEL FILTER, ENGINE
12	00-000167.....SCREW, 1/4-20 x 6"	31	12-800067.....CONNECTOR, 5/16 INV FLARE x 1/4T
13	47-700007.....HEAT SHIELD	32	14-806542.....FUEL FILTER
14	01-000037.....NUT, 1/4-20	33	11-800014.....STREET ELBOW, 1/8
15	02-000038.....LOCKWASHER, 1/4	34	41-809003.....ELECTRIC FUEL PUMP
16	42-902158.....OIL FILTER	35	12-800041.....BARB FITTING, 1/8P x 1/4H
17	44-802203.....SHEAVE, ENGINE	36	03-000065.....HOSE CLAMP
18	61-950458.....ENGINE	37	09-805351.....FUEL HOSE, 1/4 x 7-1/4"
19	56-500188.....HOLD-DOWN, BATTERY	38	31-900179.....TERMINAL PROTECTORS (1 pair)



CHEMICAL PARTS LISTING

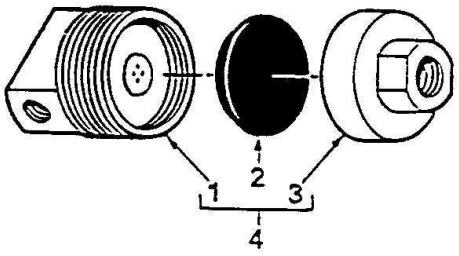
1	12-800142 ELL 1/8FP x 1/4T
2	15-808030 CHEMICAL CHECK VALVE
3	11-800014 ST. ELBOW, 1/8
4	41-809044 CHEMICAL PUMP
5	11-800112 ST. ELBOW, 1/8 45 DEG
6	12-800098 BARB FITTING, 1/8FP X 5/16H
7	03-000065 HOSE CLAMP
8	11-800369 CLOSE NIPPLE, 1/4 SST
9	09-805309 HOSE, 5/16 X 30"
10	14-806506 END STRAINER
11	12-800093 BARB FITTING, 1/8P X 5/16H
12	09-805099 VINYL TUBING, 5/16 X 40"
13	10-805142 SST HOSE, 3/16 X 29"
14	09-805099 VINYL TUBING, 5/16 X 40"
15	12-800040 ELL 1/8P X 1/4T
16	15-808022 CHEMICAL VALVE
17	11-800022 NIPPLE,HEX 1/8
18	10-805131 SST HOSE, 3/16 X 20-1/2"
19	18-808513 FLOMETER
20	12-800093 BARB FITTING, 1/8P X 5/16H
21	15-808087 METERING VALVE

WATER PUMP DETAIL
PARTS LISTING

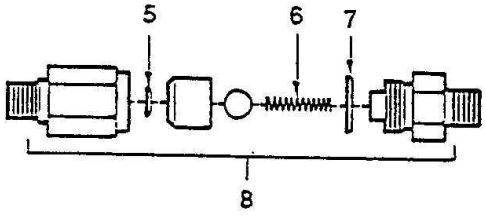


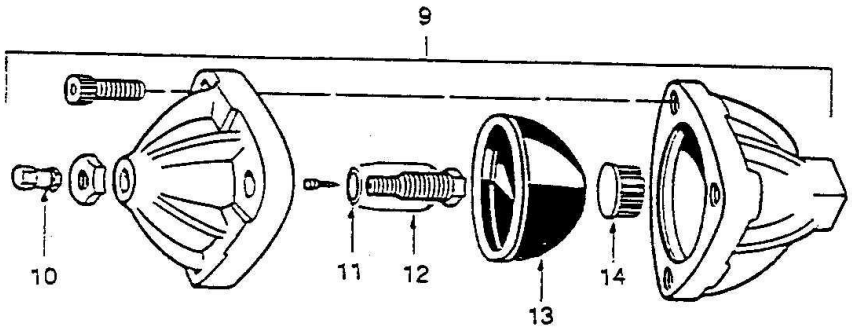
PARTS LISTING

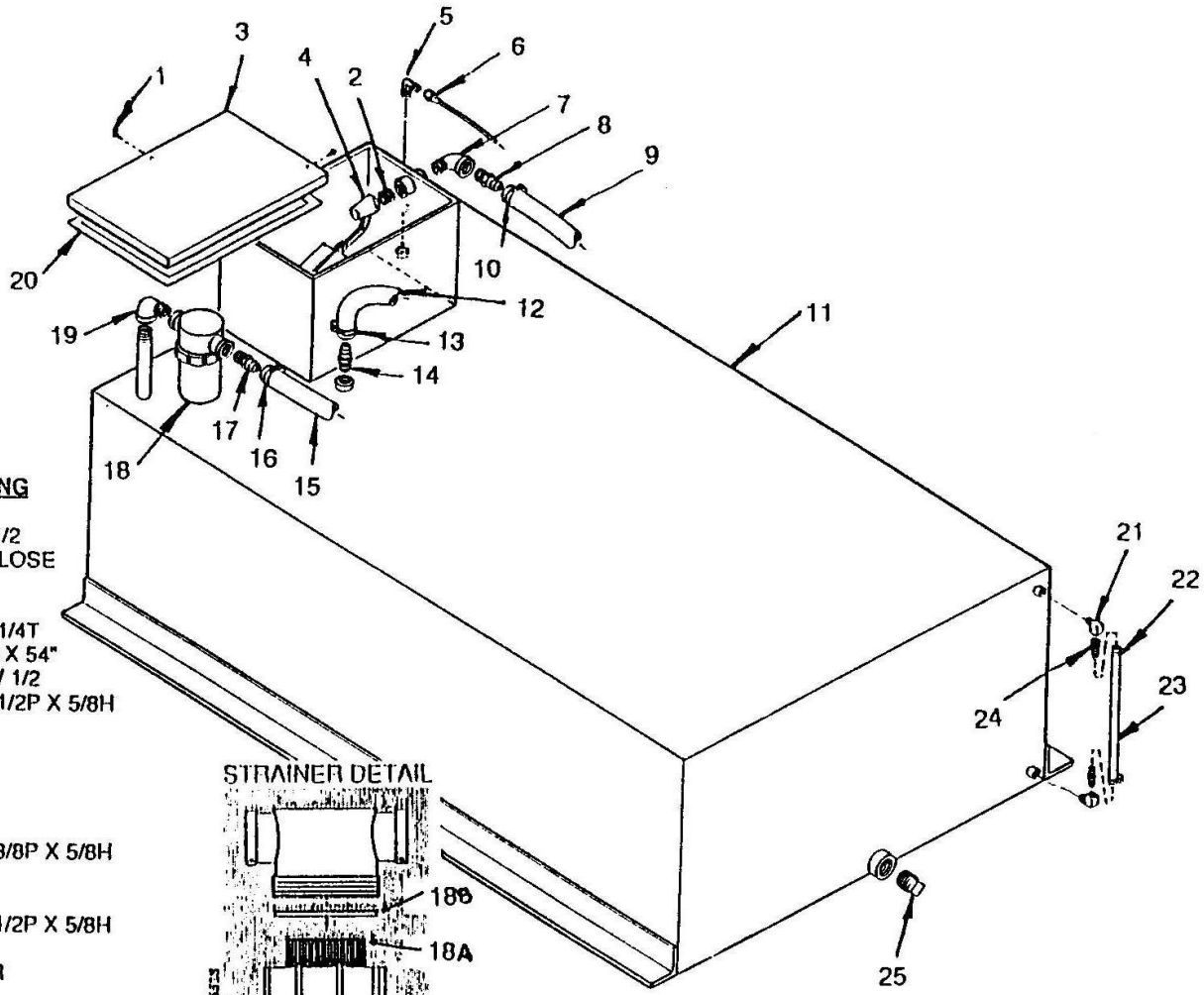
1	11-800220	PLUG
2	42-809170	COVER
3	00-000140	SCREW, R. COVER
4	42-809171	DIPSTICK
5	42-809102	GASKET
6	43-810060	GASKET, COVER
7	42-809198	OIL SEAL
8	42-809199	LOWER PLUNGER [2345B]
9	42-809196	PLUNGER KIT [2345B]
10	42-809200	RETAINING NUT [2345B]
11	42-809201	CUP RETAINER [2345B]
12	42-809216	PLUNGER SEAL KIT
13	42-809206	CAP, CHECK VALVE
14	43-810046	O-RING
15	42-809165	VALVE KIT
16	00-000037	SCREW
17	42-809209	CAP,CHECK VALVE [1/4 FNPT]
18	42-809106	STUD
19	42-809203	CUP RETAINER [8745B]
20	42-809202	SPACER [8745B]
21	42-809105	PLUNGER KIT [8745B]
22	42-809107	LOWER PLUNGER [8745B]
23	42-809204	PLUNGER CONVERSION KIT [from 8745 to 2345] *Includes connecting rod, wrist pin, lower plunger[ref.#8], plunger kit[ref.#9], and retaining nut[ref.#10].*



1 42-809046 BODY
2 42-809047 DIAPHRAGM
3 42-809045 COVER
4 41-809044 CHEMICAL PUMP
5 43-810022 O-RING
6 16-808182 SPRING
7 16-808181 WASHER
8 15-808030 CHEMICAL CHECK VALVE
9 41-809016 PULSATION DAMPER
10 42-809026 CAP
11 43-810012 0-RING
12 42-809028 CHECK VALVE
13 42-809029 DIAPHRAGM
14 42-809030 BAFFLE PLUG





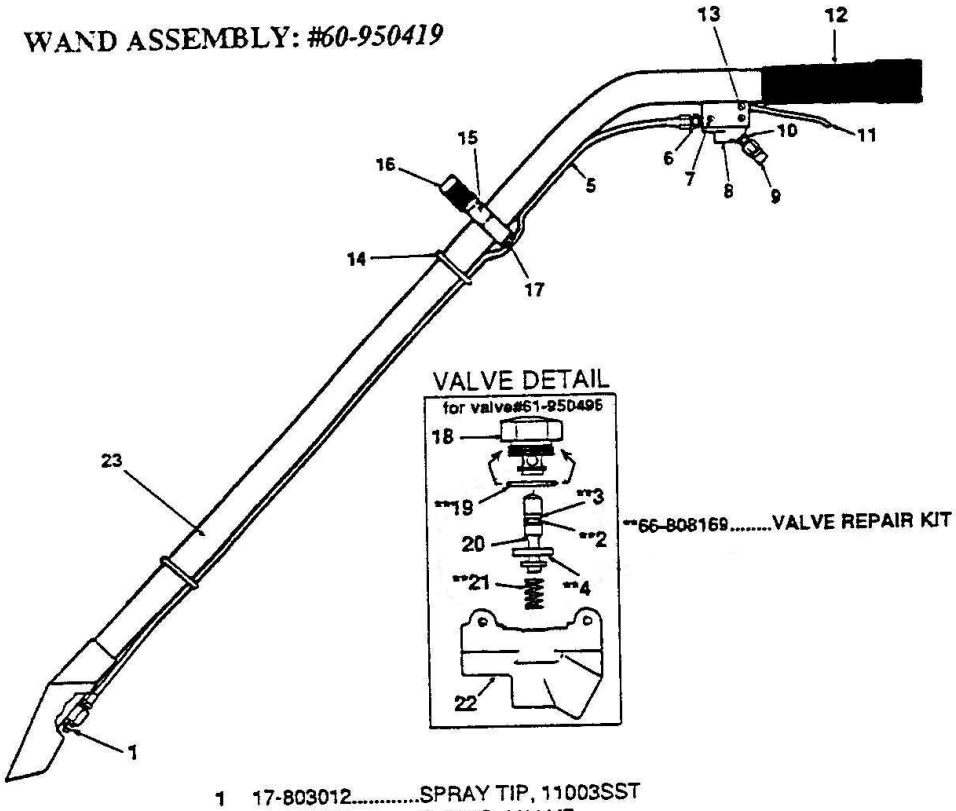


WATER TANK PARTS LISTING

1	00-000067 SCREW, #10 X 1/2
2	11-800068 NIPPLE, 1/2 X CLOSE
3	50-501611 LID
4	15-808086 FLOAT VALVE
5	12-800031 ELBOW, 1/4P X 1/4T
6	10-805278 SST HOSE, 3/16 X 54"
7	11-800041 STREET ELBOW 1/2
8	12-800269 BARB FITTING, 1/2P X 5/8H
9	09-805287 HOSE, 5/8 X 42"
10	03-000113 HOSE CLAMP
11	56-501633 WATER TANK
12	09-805321 HOSE, 5/8 X 15"
13	03-000113 HOSE CLAMP
14	12-800345 BARB FITTING, 3/8P X 5/8H
15	09-805268 HOSE, 5/8 X 12"
16	03-000113 HOSE CLAMP
17	12-800269 BARB FITTING, 1/2P X 5/8H
18	14-806528 FILTER, IN-LINE
18A	14-806530 SCREEN, FILTER
18B	43-807041 SEAL,FILTER
19	11-800041 STREET ELBOW, 1/2
20	43-807070 GASKET, LID
21	11-800014 STREET ELBOW, 1/8
22	03-000065 HOSE CLAMP
23	09-805021 HOSE, 5/16 X 9"
24	12-800093 BARB FITTING, 1/8P X 5/16H
25	11-800303 PLUG, 1"

CARPET WAND
PARTS LISTING

WAND ASSEMBLY: *#60-950419*



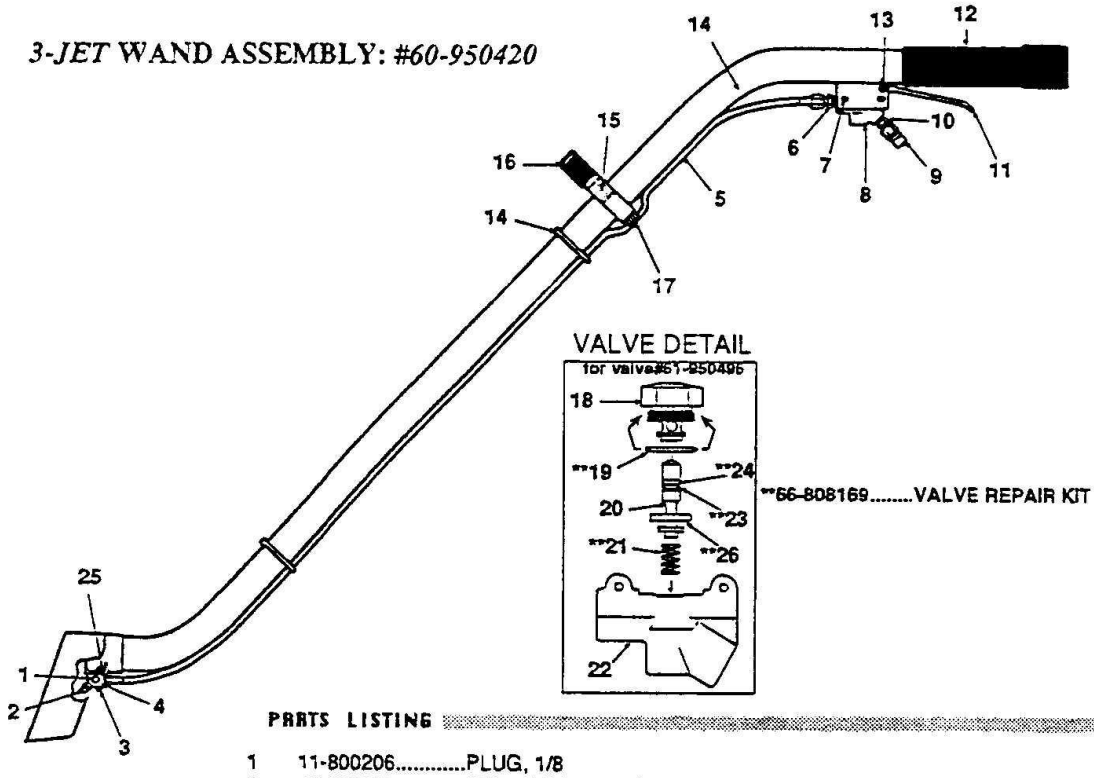
VALVE DETAIL

**66-808169.....VALVE REPAIR KIT

1	17-803012	SPRAY TIP, 11003SST
2	43-810062	O-RING, VALVE
3	43-810064	BACK-UP RING, VALVE
4	16-808187	SEAT, VALVE
5	10-805063	3/16 SST HOSE X 48"
6	12-800060	CONNECTOR, 1/4P X 1/4T
7	00-000233	SCREW,8-32 X 3/8
8	61-950496	VALVE
9	13-806000	DISCONNECT, 1/4M
10	11-800029	HEX NIPPLE, 1/4
11	52-501619	LEVER
12	09-805359	SLEEVE
13	00-000068	SCREW, 10-32 X 1-1/4"
13A	01-000019	LOCKNUT, 10-32
14	04-000053	NYLON TIE
15	52-501577	HOLD-DOWN, HANDLE
16	52-501576	BODY, HANDLE
17	00-000282	SCREW,HANDLE
18	16-808188	CAP, VALVE
19	43-810063	O-RING, VALVE
20	16-808169	STEM, VALVE
21	16-808190	SPRING, VALVE
22	52-501590	BODY, VALVE
23	56-501713	WAND BODY

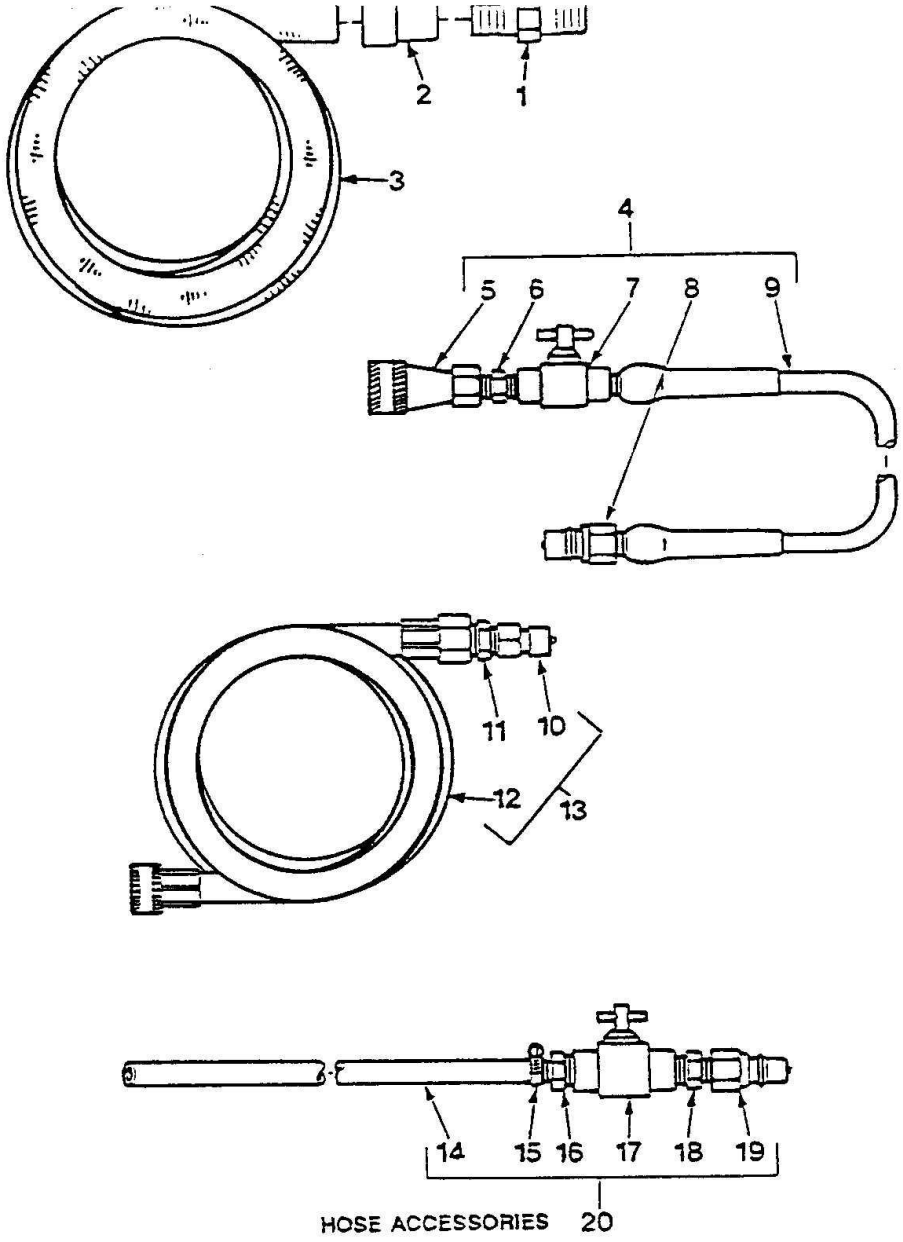
CARPET WAND
PARTS LISTING

3-JET WAND ASSEMBLY: *#60-950420*



PARTS LISTING

1	11-800206	PLUG, 1/8
2	17-803002	SPRAY TIP,9502 SST
3	00-000042	SCREW,10-32 X 1"
3A	01-000019	LOCKNUT, 10-32
4	52-500160	MANIFOLD
5	10-805063	3/16 SST HOSE X 48"
6	12-800060	CONNECTOR, 1/4P X 1/4T
7	00-000233	SCREW,8-32 X 3/8
8	61-950496	VALVE
9	13-806000	DISCONNECT, 1/4M
10	11-800029	HEX NIPPLE, 1/4
11	52-501619	LEVER
12	09-805359	SLEEVE
13	00-000068	SCREW, 10-32 X 1-1/4"
13A	01-000019	LOCKNUT, 10-32
14	56-501712	WAND
15	52-501569	HOLD-DOWN, HANDLE
16	52-501568	HANDLE
17	00-000282	SCREW,HANDLE
18	16-808188	STEM HOLDER, VALVE
19	43-810063	O-RING, VALVE
20	16-808169	STEM, VALVE
21	16-808190	SPRING, VALVE
22	52-501590	BODY, VALVE
23	43-810062	O-RING, VALVE
24	43-810064	BACK-UP RING, VALVE
25	52-500160	MANIFOLD
26	16-808187	SEAT, VALVE

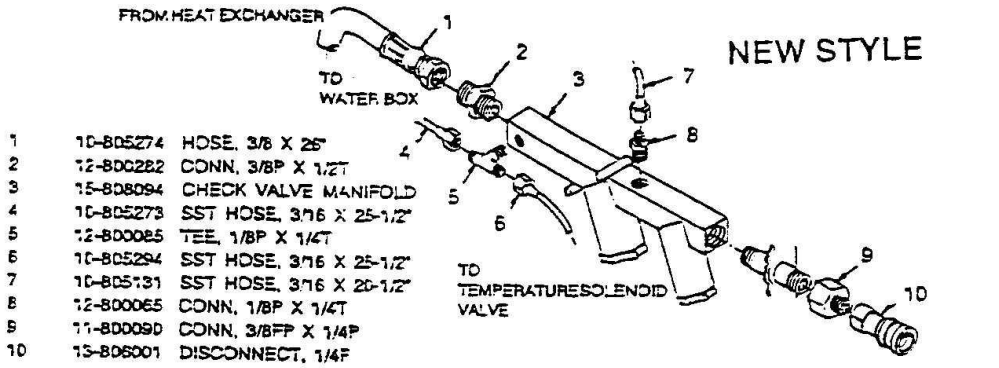


HOSE ACCESSORIES

1	12-800078 CONNECTOR
2	08-805147 CUFF
3	10-805060 VAC HOSE, 50' W/CUFFS
4	10-805108 HOSE ASSY, 50' W/VALVE
5	13-805001 DISCONNECT, 1/4F
6	11-800029 HEX NIPPLE, 1/4
7	15-808012 BALL VALVE
7A	43-810014 O-RING (1)
7B	43-810019 O-RING (2)
8	13-806000 DISCONNECT, 1/4M
9	10-805077 HOSE ASSY, 1/4 X 50' WITHOUT DISCONNECTS
10	13-806009 DISCONNECT, 3/8M
11	11-800354 HEX NIPPLE, 1/2 X 3/8
12	10-805157 HOSE, 1/2 X 50'
13	10-805295 HOSE ASSY, 1/2 X 50'
14	09-805270 RAW HOSE, 3/8 X 36
15	03-000065 HOSE CLAMP
16	12-800264 BARB FITTING, 3/8P X 3/8H
17	15-808041 BALL VALVE, 3/8P
18	11-800151 HEX NIPPLE, 3/8 X 1/4
19	13-806000 DISCONNECT, 1/4M
20	10-805268 HOSE, CONV. OUTLET
	NOT SHOWN
21	10-805122 HOSE ASSY, 1/4 X 50' WITH DISCONNECTS
22	65-950078 HOSE REEL
23	10-805309 HOSE ASSY, 1/4 X 25' WITHOUT DISCONNECTS

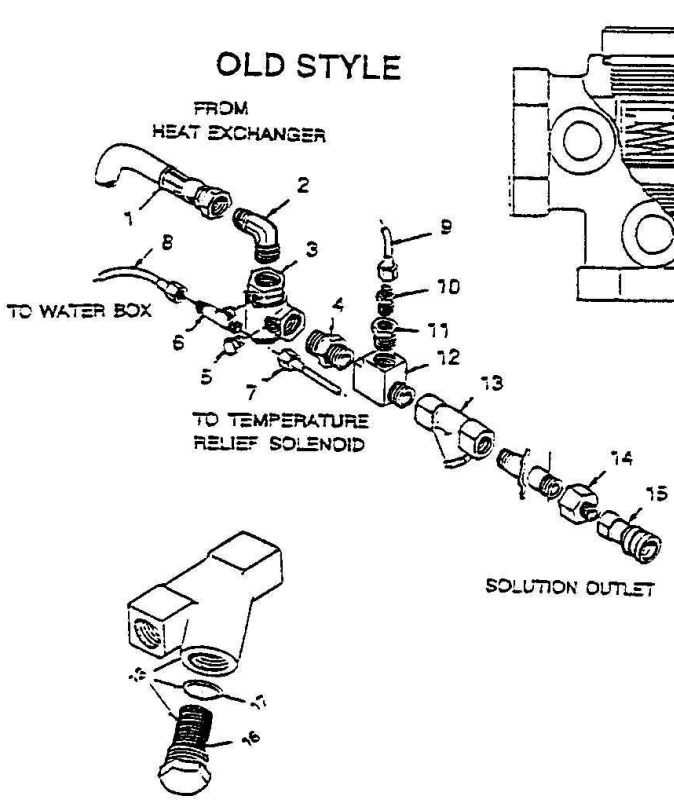
SOLUTION OUTLET SYSYTEM

NEW STYLE



1	10-805274	HOSE, 3/8 X 25"
2	12-800282	CONN, 3/8P X 1/2T
3	15-808094	CHECK VALVE MANIFOLD
4	10-805273	SST HOSE, 3/16 X 25-1/2"
5	12-800085	TEE, 1/8P X 1/4T
6	10-805294	SST HOSE, 3/16 X 25-1/2"
7	10-805131	SST HOSE, 3/16 X 20-1/2"
8	12-800065	CONN, 1/8P X 1/4T
9	11-800090	CONN, 3/8FP X 1/4P
10	13-806001	DISCONNECT, 1/4F

OLD STYLE



15-808049 1/2" CHECK VALVE

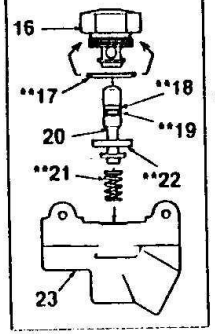
1	15-808123	CAP
2	43-810007	O-RING
3	15-808124	BODY
4	15-808187	SPRING
5	15-808125	CAGE
6	15-808127	DISC
7	43-810008	O-RING
8	15-808126	SEAT

1	10-805274	HOSE 3/8 X 25"
2	12-800171	ELBOW, 1/2P X 1/2T
3	15-808049	CHECK VALVE, 1/2
4	11-800023	HEX NIPPLE, 1/2 X 3/8
5	11-800101	PLUG, 1/8
6	12-800085	TEE, 1/8P X 1/4T
7	10-805294	SST HOSE, 3/16 X 11-1/2"
8	10-805273	SST HOSE, 3/16 X 25-1/2"
9	10-805131	SST HOSE, 3/16 X 20-1/2"
10	12-800060	CONN.1/4P X 1/4T
11	11-800111	BUSHING, 3/8 X 1/4
12	11-800326	M—F TEE, 3/8
13	14-806508	Y—STRAINER,3/8
14	11-800090	CONN, 3/8FP X 1/4P
15	13-806001	DISCONNECT, 1/4F
16	14-806523	Y—STRAINER SCREEN
17	43-810002	Y—STRAINER O—RING

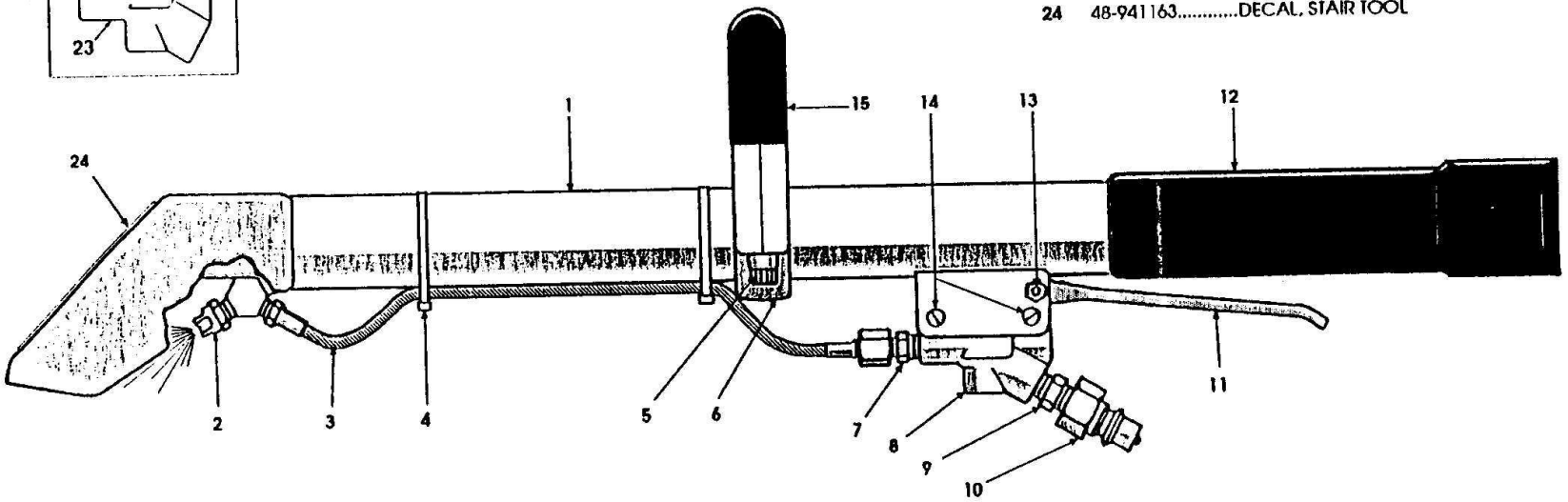
STAIR TOOL
PARTS LISTING

1	56-501715	STAIR TOOL BODY
2	17-803003	SPRAY TIP, 11002 SST
3	10-805330	3/16" SST HOSE x 14"
4	04-000053	NYLON TIE
5	00-000282	SCREW, 1/4 x 1-1/4"
6	52-501569	HOLD-DOWN, HANDLE
7	12-800060	CONNECTOR, 1/4P x 1/4I
8	61-950496	VALVE
9	11-800029	HEX NIPPLE, 1/4
10	13-806000	DISCONNECT, 1/4M
11	52-501619	TRIGGER, VALVE
12	49-802525	GRIP SLEEVE
13	00-000233	SCREW, 8-32 x 3/8"
14	00-000068	SCREW, 10-32 x 1-1/4
14A	01-000019	LOCKNUT, 10-32
15	52-501568	BODY, HANDLE
16	16-808188	CAP, VALVE
17	43-810063	O-RING, VALVE
18	43-810064	BACK-UP RING, VALVE
19	43-810062	O-RING, VALVE
20	16-808189	STEM, VALVE
21	16-808190	SPRING, VALVE
22	16-808187	SEAT, VALVE
23	52-501590	BODY, VALVE
24	48-941163	DECAL, STAIR TOOL

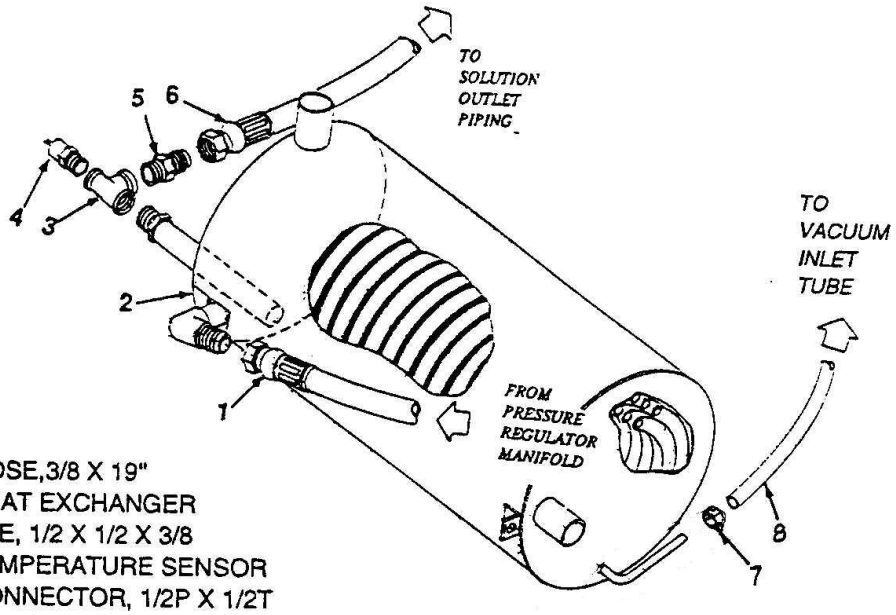
VALVE DETAIL
for valve #61-950496



**66-808169.....VALVE REPAIR KIT

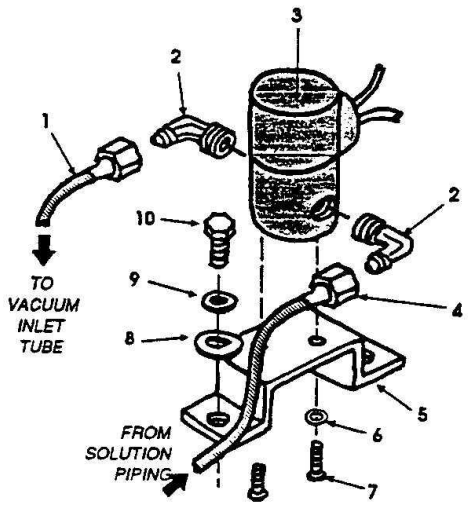


HEAT EXCHANGER PIPING



1	10-805275	HOSE,3/8 X 19"
2	57-520069	HEAT EXCHANGER
3	11-800115	TEE, 1/2 X 1/2 X 3/8
4	35-900050	TEMPERATURE SENSOR
5	12-800141	CONNECTOR, 1/2P X 1/2T
6	10-805346	HOSE, 3/8 X 24"
7	03-000065	HOSE CLAMP
8	09-805180	HOSE, 5/16 X 10"

TEMPERATURE SOLENOID PARTS DETAIL



1	10-805130.....HOSE, 3/16SST x 13-1/2"
2	12-800031.....ELBOW, 1/4P x 1/4T
3	15-808000.....TEMPERATURE SOLENOID
4	10-805311.....HOSE, 3/16SST x 10-1/2"
5	50-501610.....MOUNT, SOLENOID
6	02-000032.....LOCKWASHER, #10
7	00-000031.....SCREW, 10-24 x 1/2"
8	02-000066.....FLATWASHER, 1/4
9	02-000038.....LOCKWASHER, 1/4
10	00-000070.....SCREW, 1/4-20 x 1/2"