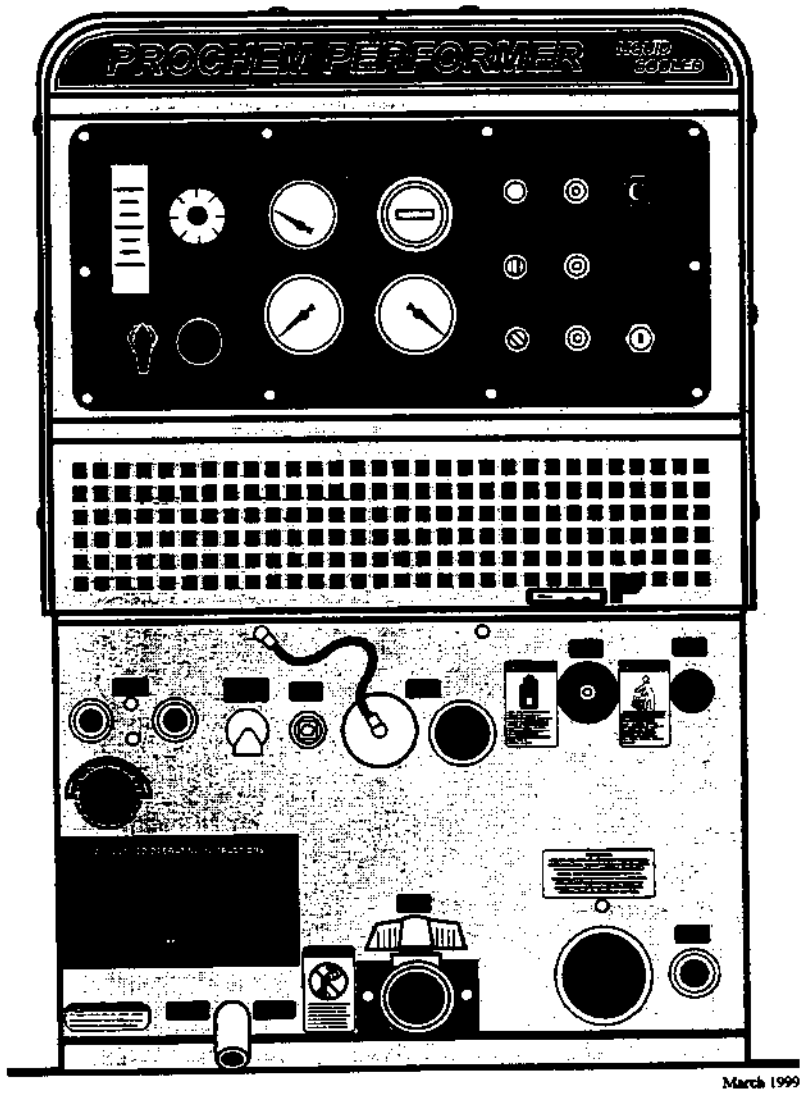
PERFORMER & PERFORMER 405

Mobile Cleaning Unit



March 1999

OPERATION & SERVICE MANUAL

67-945324

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Welcome...and congratulations on your purchase of the **PERFORMER/PERFORMER 405** Mobile Cleaning Unit. This instruction manual is a guide for operating and servicing your PROCHEM unit. **Read this manual completely before installing or operating this unit.**

This unit offers you personal convenience. All of your instrumentation and controls have been positioned to give you easy access for operation and daily maintenance.

Proper operation and service are essential to the efficient functioning of this unit. When maintained correctly, this unit will have a long, trouble-free life.

The service methods described in this manual are explained in such a manner that servicing may be performed accurately and safely. Proper service varies with the choice of procedure, the skill of the mechanic, and the tools or parts available. Before attempting any repair, make certain that you are thoroughly familiar with this equipment and are equipped with the proper tools. Any questions pertaining to operating or servicing this unit should be directed to your nearest PROCHEM dealer.

The headings: **CAUTION** or **WARNING** are used to warn you that steps must be taken to prevent damage to the unit and/or personal injury. Make certain that you read all instructions entirely before proceeding with the operation of the unit.

THIS UNIT MUST BE INSTALLED BY THE DEALER FROM WHOM YOU PURCHASED IT IN ACCORDANCE WITH PRESCRIBED PROCHEM INSTALLATION PROCEDURES.

MAKE CERTAIN THAT THE WARRANTY CARD IS FILLED OUT BY THE DISTRIBUTOR FROM WHOM YOU PURCHASED THIS UNIT AND RETURNED TO PROCHEM!

Please record your unit serial number here for future information or if you should need to contact the factory for any reason.

This operation and service manual is written specifically for the **PROCHEM PERFORMER/ PERFORMER 405** Mobile Cleaning Units which are manufactured by:

PROFESSIONAL CHEMICALS
CORPORATION
325 SOUTH PRICE ROAD
CHANDLER, ARIZONA 85224

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Published by Professional Chemicals Corporation.
Eighth printing: March 1999
Printed in USA

PERFORMER & PERFORMER 405 MANUAL #67-945324

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 its option, repair or replace products which prove to be defective. Any local or distant transportation, related service labor, normal maintenance, and diagnostic calls are not included.

Gasoline Engine (through manufacturer or local dealer)	1 year
Vacuum Pump (through manufacturer or local dealer)	18 months
Engine Heat Exchanger	1 year
Water Pump	2 years
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	1 year
Battery (through dealer only, pro-rated)	1 year (1-800-350-8068)

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, exposure to freezing temperature conditions, or damage due to hard water scaling.

Disposable filters, electrical components, belts, fittings, hoses, o-rings, and other maintenance items are not under warranty. Components provided by PROCHEM, but supplied by other manufacturers, will only be warranted to the extent that they shall be warranted to PROCHEM.

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.

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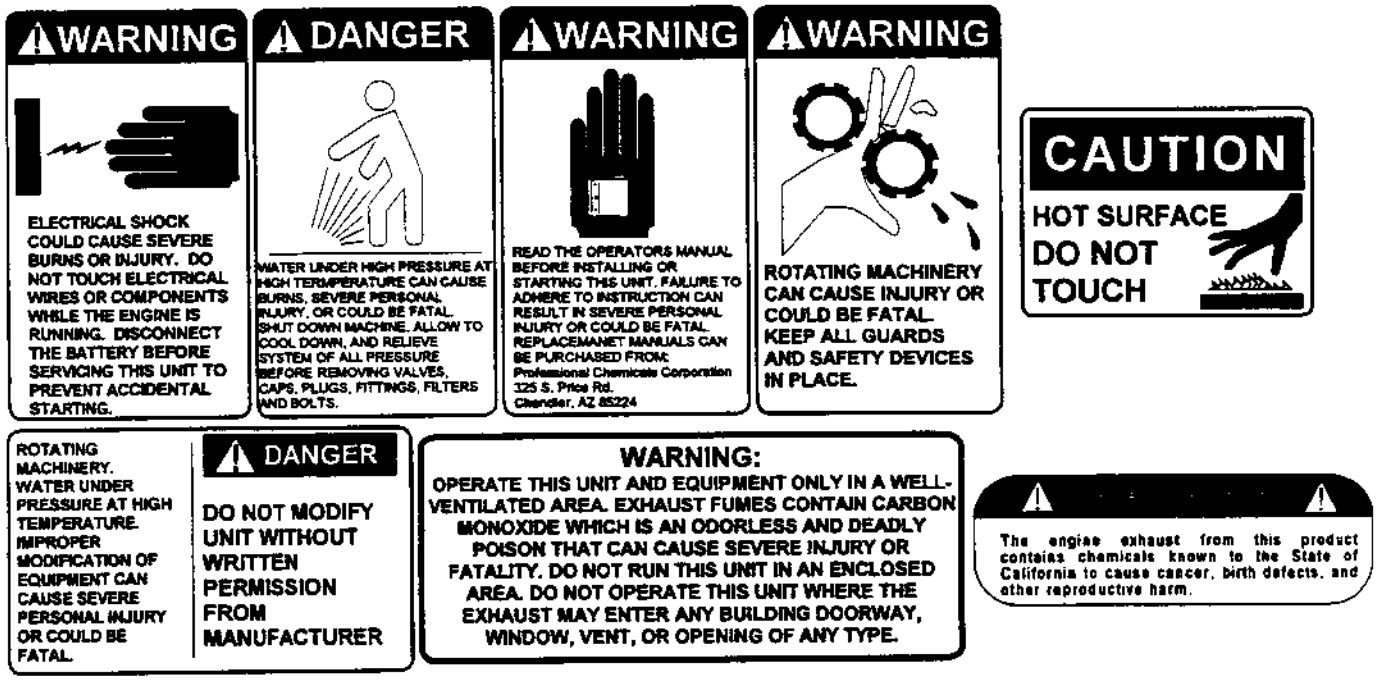
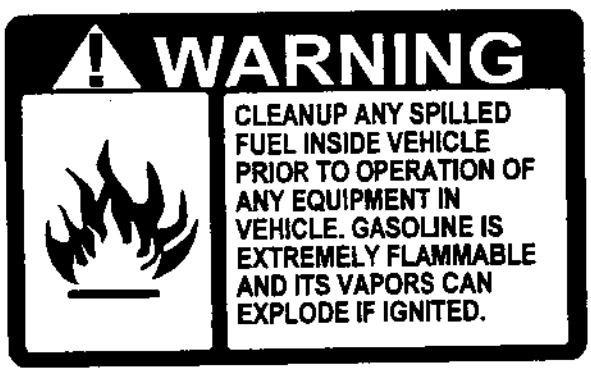
1 SAFETY

WARNING: For Your Safety!

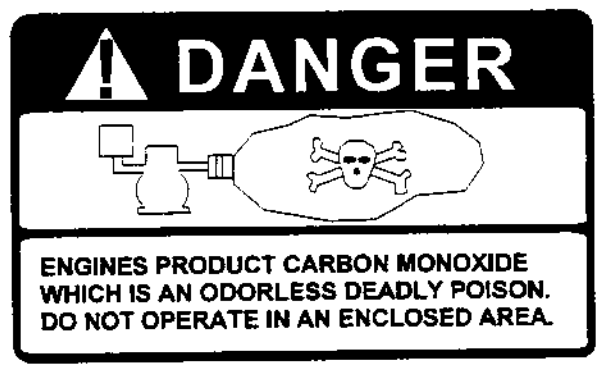
*The following **WARNING LABELS** are found on your PERFORMER/PERFORMER 405 console. These labels point out important **Warnings** and **Cautions** which should be followed at **all** times. Failure to follow warnings and cautions could result in fatality, personal injury to yourself and/or others, or property damage. Follow these instructions carefully! **DO NOT** remove these labels.*



Order Part #48-941212 to get a complete set of decals (safety and instrumentation) for your PROCHEM PERFORMER/PERFORMER 405 cleaning unit. The following decals must be placed in a prominent spot on the vehicle that your unit is to be installed in where access is given to operate the unit. See Figure 12 on page 22 for suggested locations for these decals.



Decal, Fuel Clean-up
Part #48-941317



Decal, Carbon Monoxide
Part #48-941316

This symbol means WARNING or CAUTION. Failure to follow warnings and cautions could result in fatality, personal injury to yourself and/or others, or property damage. Follow these instructions carefully!

WARNING!

*1. **Read the operator's manual before installing or starting this unit.** Failure to adhere to instructions could result in severe personal injury or could be fatal.*

*2. **Operate this unit and equipment only in a well-ventilated area.** Exhaust fumes contain carbon monoxide which is an odorless and deadly poison that can cause severe injury or fatality. **DO NOT** run this unit in an enclosed area. **DO NOT** operate this unit where the exhaust may enter any building doorway, window, vent, or opening of any type.*

*3. **Gasoline is extremely flammable and its vapors can explode if ignited.** Store gasoline only in approved containers, in well-ventilated, unoccupied buildings away from sparks or flames. Never carry any gasoline or flammable material in the vehicle. Fumes may accumulate inside the vehicle and ignite, causing an explosion. **DO NOT** store any type of flammable material in the vehicle.*

*4. **This unit must be operated with the vehicle or trailer doors open in order to ensure adequate engine ventilation.***

*5. **DO NOT operate engine if gasoline is spilled.** Avoid creating any ignition until the gasoline has been cleaned up. Never use gasoline as a cleaning agent.*

*6. **DO NOT place hands, feet, hair, or clothing near rotating or moving parts.** Avoid any contact with moving parts! Rotating machinery can cause injury or fatality.*

*7. **Never operate this unit without belt guards.** The high speed moving parts, such as belts and pulleys, should be avoided while this unit is running. Severe injury, damage, or fatality may result.*

*8. **DO NOT service this unit while it is running.** The high-speed mechanical parts as well as high temperature components may result in severe injury or severed limbs.*

*9. **Never touch electrical wires or components while the engine is running.** They can be sources of electrical shock.*

*10. **Engine components can get extremely hot from operation.** To prevent severe burns, **DO NOT** touch these areas while the engine is running - or immediately after the engine is turned off.*

*11. **DO NOT touch the exhaust diverter valve or any part of the exhaust system while this unit is running.** Severe burns may result.*

*12. **Before servicing this unit, allow it to "cool down."** This will prevent burns from occurring.*

*13. **Water under high pressure at high temperature can cause burns, severe personal injury, or fatality. Shut down machine, allow to cool down, and relieve system of all pressure before removing valves, caps, plugs, fittings, filters, and bolts.***

*14. **DO NOT leave the vehicle engine running while operating this unit.***

*15. **Dangerous Acid, Explosive Gases!** Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries produce explosive hydrogen gas while being charged. To prevent a fire or*

explosion, charge batteries only in well ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times. Keep batteries out of the reach of children. Remove all jewelry when servicing batteries.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. When disconnecting the battery, ALWAYS disconnect the negative (-) terminal FIRST.

16. DO NOT smoke around the unit. *Gas fumes may accumulate and be ignited. The battery is also extremely flammable. This will prevent possible explosions.*

17. DO NOT damage the vehicle in any manner during installation. *When routing fuel lines* ***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, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.*

18. DO NOT cut or splice any of the vehicle fuel lines during fuel line installation. *This may result in fuel leaks and potentially dangerous conditions. There is no fuel solenoid shut off on this unit. Use only the provided abrasion resistant fuel hose for fuel lines. When traversing the vehicle floor with fuel lines, always use a bulkhead adapter. This will prevent leakage and ensure that the hose is not punctured by vehicle vibration abrasion.*

19. DO NOT exceed your vehicle's weight limit. *The console with waste tank and accessories weighs approximately 1209 lbs. (Performer 405 is 1255 lbs.) Make certain that the vehicle has the correct axle rating. This will prevent unsafe vehicle driving conditions.*

20. We require high-back seats on all vehicles in which units are to be installed for head and neck protection. *We recommend using a metal partition between the seats and equipment.*

21. DO NOT operate this unit without the water supply attached and turned on. *The water pump and other vital components may be seriously damaged if this unit is permitted to operate dry without water. This unit is equipped with a low pressure shut-down device.* ***DO NOT*** *bypass or operate this unit without the low pressure shut-down switch.*

22. Keep your vehicle work area clean. *Wands, stair tools, and other accessories must be securely fastened before driving the vehicle.*

23. All high pressure hoses must be rated for 3000 PSI at 250°F. *Thermoplastic hoses do not meet these specifications and should not be used. Severe burns and injury may result if the hoses do not meet these requirements.*

24. The winterizing loop hose assembly, Part #10-805380, is for winterizing use only. *If used improperly, live steam may escape from this hose, causing it to whip around. Burns or injury may result.*

25. Make certain that you receive complete training by the distributor from whom you purchased this unit.

26. This unit uses high pressure and temperature. Improper or irresponsible use may result in serious injury.

27. Do not modify this unit in any manner. *Improper modification can cause severe personal injury or fatality.*

28. CALIFORNIA PROPOSITION 65 WARNING: *Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.*

SPECIFICATIONS:

Engine speed	2400 rpm (high speed in H.E. position) 1900 rpm (low speed in Muffler position - water pump "OFF") 900 rpm (idle speed in Muffler position – water pump "OFF")
Water pump rpm	1625 rpm
Vacuum pump rpm	2650 rpm
Water flow rate	5.0 GPM (maximum)
Water pump pressure	1000 PSI (maximum)
Vacuum relief valve	14" Hg (13" Hg – Performer 405)
Waste tank capacity	66 Gallons (55 gallons to shut-off)
Console weight	964 lbs. (1010 lbs. – Performer 405)
Console weight (with waste tank and accessories)	1209 lbs. (1626 lbs. if waste tank is full) 1255 lbs. (1672 lbs. if waste tank is full – Performer 405)

TORQUE VALUES

Component	inch/lbs	foot/lbs
Engine hub	720	60
Vacuum pump hub	192	16

JET SIZING

PROCHEM recommends **floor tool** tip sizing not exceed a total of ".06". Using larger jet sizes on your PERFORMER/PERFORMER 405 may reduce cleaning temperatures.

Example: Tri-jet wand uses three 9502 jets (95° spray angle w/ 02 orifice).
02 x 3 = 06

When using two floor tools while cleaning with this unit, PROCHEM recommends that each tool tip size does not exceed a total of ".045".

Example: Tri-jet wand uses three 95015 jets (95° spray angle w/ 015 orifice).
015 x 3 = 045.....045 x 2 tools = 09

Upholstery tool jet size: **80015**
Stair tool jet size: **9502**

1. INSTALLATION REQUIREMENTS

Prior to starting the installation, first read the **ENTIRE** "Installation" section of this manual. Since the PERFORMER cleaning unit (with waste tank and accessories) weighs 1209 pounds (PERFORMER 405 weighs 1255 lbs.), consider the following recommendations before installing this unit.

1. The unit should **NOT** be mounted in any motor vehicle of less than **3/4 ton capacity**.

CAUTION:

The console with waste tank and accessories must NOT exceed the vehicle's axle weight limit.

2. 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 with any State and Federal vehicle laws must be maintained.

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

4. We do not recommend using flooring materials that absorb water. This could result in rust and corrosion of the vehicle floor.

5. Padding under rubber floor mats should be removed before installing this unit.

6. We highly recommend using a galvanized drip tray under the console (Part #56-501845).

7. If using a trailer, the PERFORMER/PERFORMER 405 console should be positioned so that it balances properly with respect to the axle. Ten percent (10%) of the overall unit weight (without accessories or water) should be on the tongue.

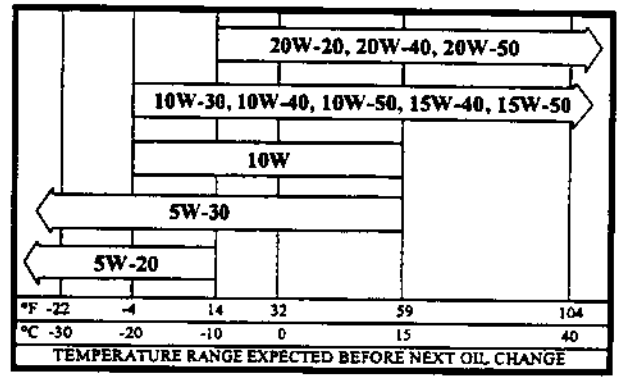
2. FUEL REQUIREMENTS

Use unleaded gasoline ONLY. DO NOT use any gasoline additives. We recommend the use of clean, fresh, unleaded gasoline intended for automotive use. High octane gasoline should **NOT** be used with the engine on this unit.

3. ENGINE OIL REQUIREMENTS

Use high quality detergent oil of at least API (American Petroleum Institute) service class SF or SG. Select the viscosity based on the air temperature at the time of operation as shown in the following table. **NOTE:** Using less than service class SF or SG oil or extending oil change intervals longer than recommended can cause engine damage.

RECOMMENDED SAE VISCOSITY GRADE



4. CHEMICAL REQUIREMENTS

The PROCHEM PERFORMER/PERFORMER 405, due to its chemical injection pump design, can be used with a variety of water-diluted chemical compounds (either acidic or alkaline), depending on the job to be done. However, to obtain optimum results with this unit, we recommend using the PROCHEM line of chemicals. For information on using the cleaning compounds, refer to the PROCHEM chemical manual.

5. WATER REQUIREMENTS

Hard water deposits will adversely affect the plumbing and heat exchange systems on this unit. The map below will give you an idea of where areas of high water hardness may occur. However, any water supply obtained from a well is almost always hard water and a water softener will be needed to protect your equipment.

NOTE:

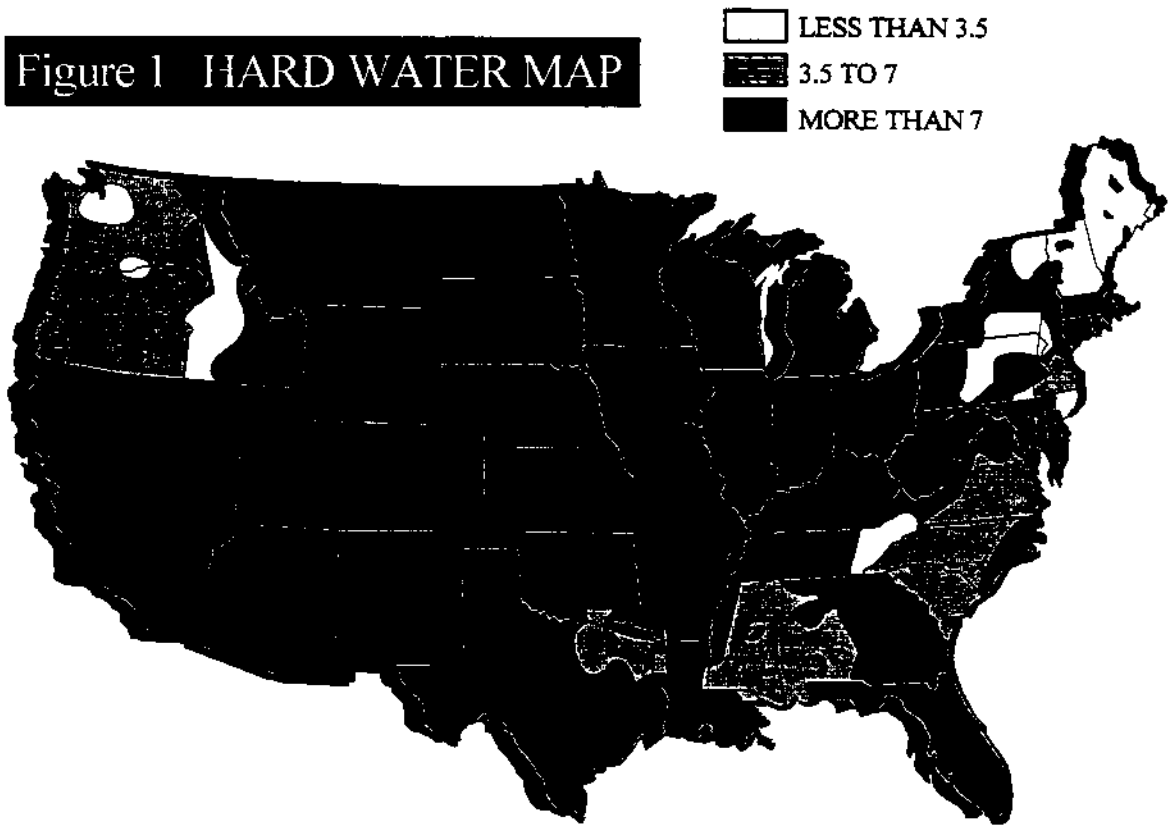
Equipment malfunction or component failure caused by hard water scaling is NOT covered under the warranty.

If you are operating this unit in an area where the unit will be using water in which the hardness exceeds 3-1/2 grains, we highly recommend a suitable water softener be installed. If using a water softener, it must have a five (5) GPM (or greater) flow capacity without any hose constrictions.

Using a water softener will reduce maintenance and decrease down time caused by hard water scaling. It will also allow cleaning chemicals to be more effective in lower concentrations.

If you require a water softener, PROCHEM has a model to meet your needs. Please contact your nearest distributor for information, price, and availability.

Figure 1 HARD WATER MAP



2 RECEIVING YOUR UNIT

This chapter of the operator's manual contains information on receiving your PROCHEM PERFORMER/PERFORMER 405.

1. DEALER RESPONSIBILITY

THE PROCHEM DISTRIBUTOR FROM WHOM YOU PURCHASED THIS MOBILE CLEANING UNIT IS RESPONSIBLE FOR THE CORRECT INSTALLATION OF THIS MACHINE. THE DEALER IS ALSO RESPONSIBLE FOR INITIAL TRAINING OF YOUR OPERATORS AND MAINTENANCE PERSONNEL IN THE PROPER OPERATION AND MAINTENANCE OF THIS UNIT.

2. ACCEPTANCE OF SHIPMENT

Every part of your PROCHEM PERFORMER/PERFORMER 405 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 damaged, notify the common carrier immediately.

2. Check your equipment and packing list. The standard PROCHEM PERFORMER/PERFORMER 405 cleaning unit should arrive equipped with the following items (unless otherwise specified) and any optional accessories which were ordered:

3. EQUIPMENT LIST

A) PROCHEM PERFORMER/PERFORMER 405 console.

B) Operation and service manual with engine, water pump, and vacuum pump manuals.

C) Installation bolting kit.

D) Installation mounting plates.

E) Fittings and hoses for fuel supply installation.

F) Hose clamps for fuel & vacuum hoses.

G) External fuel pump installation kit.

H) Carpet wand.

I) Waste tank w/float switch.

J) Waste tank filter and strainer basket (PERFORMER 405 units have two filters).

K) 150 ft. of 2" vacuum hose.

L) 2 vacuum hose connectors.

M) 150 ft. of 1/4" high pressure hose with quick connects.

N) 50 ft. water supply hose with quick connect.

4. OPTIONAL EQUIPMENT

O) Winterizing loop hose. Part #10-805380.

P) Upholstery tool and stair tool.

Q) Extra wands.

R) Hose reel.

S) Extra vacuum hoses. Part #10-805060.

T) Extra vacuum hose connectors. Part #12-800078.

U) Extra high pressure water hoses. Part #10-805122.

V) Van storage unit. Part #65-950392.

W) Dual auxiliary water tanks with demand pump. Part #66-945260.

X) Automatic waste pump kit. Part #66-945193.

Y) Galvanized drip tray. Part #56-501845.

Z) Water softener. Part #66-945430.

NOTES

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3 INSTALLATION

WARNING!

All units must be bolted to the floor of the vehicle by a PROCHEM DISTRIBUTOR.

1. LIFTING THE UNIT ONTO THE VEHICLE

Since the PROCHEM PERFORMER console weighs approximately 964 pounds (PERFORMER 405 weighs 1050 lbs.), we recommend using a fork lift to lift the unit onto the vehicle. Position the forks under the unit from the front and make **CERTAIN** that the forks are spread to the width of the base.

2. POSITIONING THE UNIT IN THE VEHICLE

Because vehicles vary in size and openings, individuals have their own preference as to where they want their units installed. We strongly recommend a side door installation for the PERFORMER/PERFORMER 405 and **DO NOT** recommend a rear door installation.

1. Enough space should be provided to assure adequate engine ventilation and room for service and maintenance.

2. The unit with waste tank and accessories must **NOT** exceed the vehicle's axle weight limit.

3. **DO NOT** position the console closer than 12" from the bottom of the driver and passenger seats.

NOTE: For individuals who wish to make an engineering layout prior to positioning the unit, refer to Figure 2 for waste tank and console dimensions.

3. BOLTING DOWN THE UNIT AND WASTE TANK

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

CAUTION:

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

1. Using the console and waste tank mounting holes as a template, drill six 13/32" diameter holes for mounting the console and six more 13/32" diameter holes for mounting the waste tank.

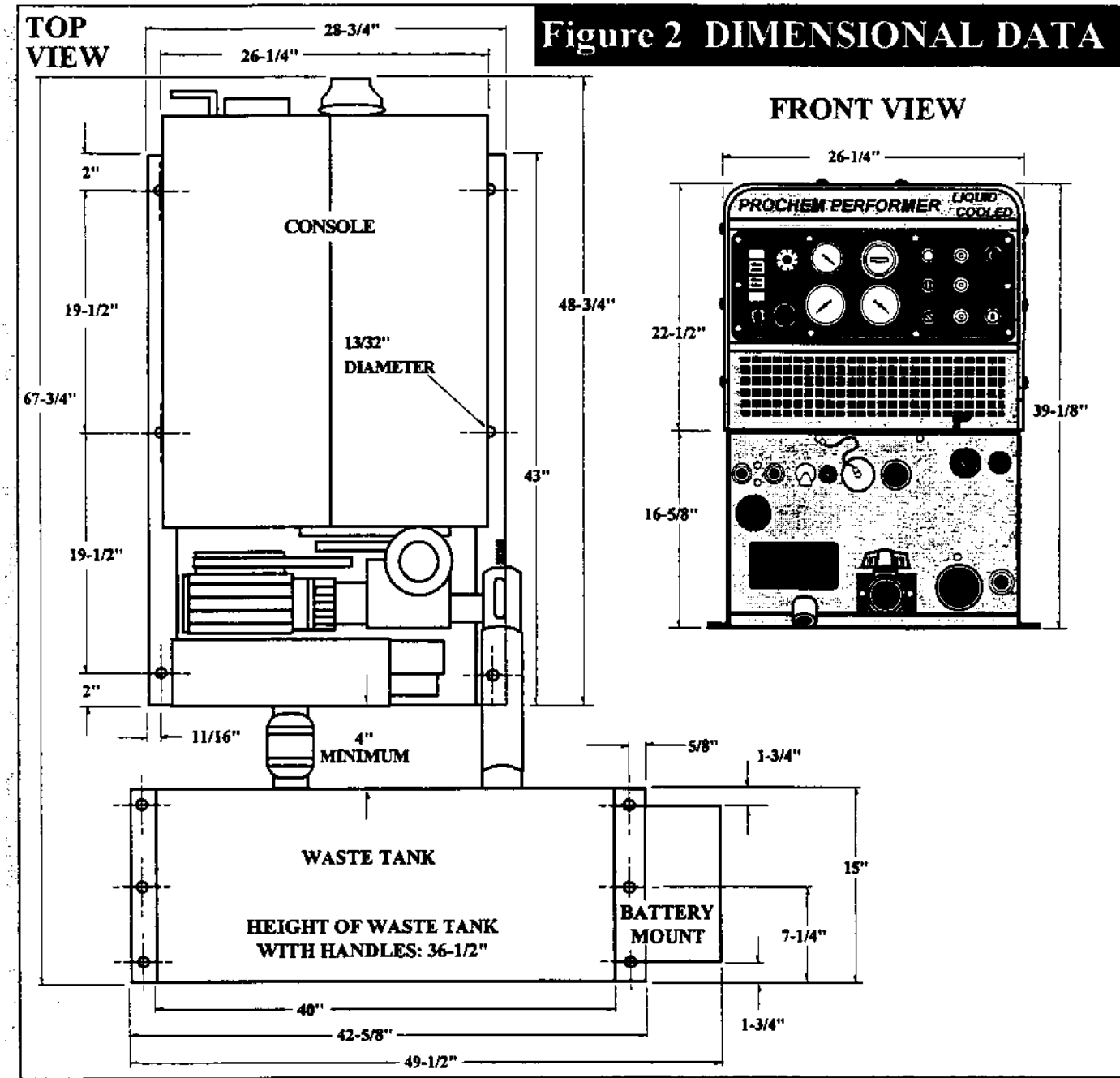
2. Using the installation hardware kit:

a) Insert six 3/8-16 x 2" hex head cap screws with flat washers through the mounting holes in the PROCHEM PERFORMER/ PERFORMER 405 console, and six 3/8-16 x 2" hex head cap screws with flat washers through the mounting holes in the waste tank.

b) Install the mounting plates underneath the vehicle floor.

c) Screw the 3/8-16 hex head locknuts on the mounting screws and tighten them until the console and the waste tank are firmly secured to the vehicle floor.

Figure 2 DIMENSIONAL DATA



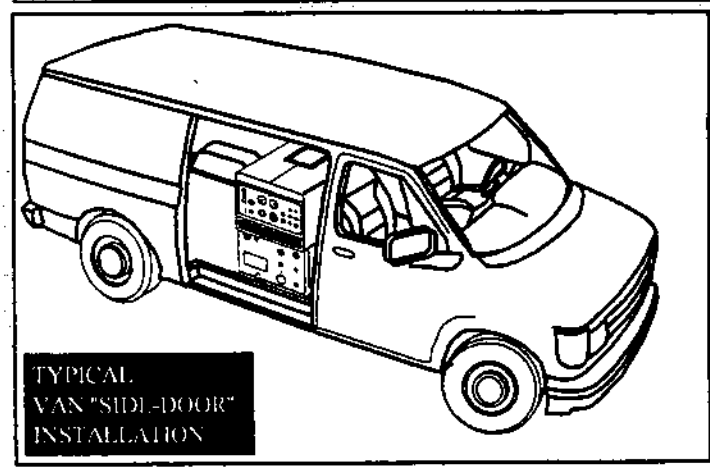
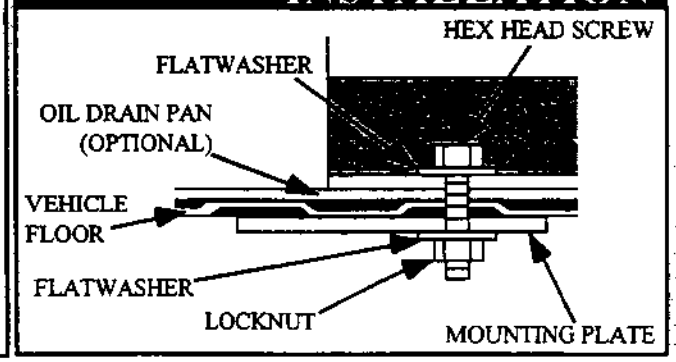


Figure 3 MOUNTING PLATE INSTALLATION



4. INSTALLING FUEL LINE ON THE VEHICLE

READ THESE INSTRUCTIONS ENTIRELY BEFORE PROCEEDING.

WARNING!

Under NO circumstances should you splice any of the vehicle fuel lines. Severe injury or fatality may result.

CAUTION:

DO NOT damage the vehicle in any manner during installation. When routing fuel lines 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, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.

The following text applies to vehicles other than 1992 (or later) Fords or 1997 (or later) Chevrolets, GMCs, and Dodges. See Figure 7 for 1992 (or later) Ford fuel line installation. See Figure 8 for 1997 (or later) Chevrolet and GMC fuel line installation. See Figure 9 for 1997 (or later) Dodge fuel line installation.

1. Select a location on the vehicle floor to drill a hole for the bulkhead adapter. This location should be situated in a position that eliminates the possibility of fuel 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 fuel line hole in the vehicle floor, make certain that when drilling you will not do any damage to the fuel tank(s), fuel lines, brake lines, heat shields, or any other vital component which might affect the operation or safety of the vehicle.

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

3. Install the 1/8P bulkhead adapter by inserting the adapter and tightening the nut on the opposite side of the van floor (Figure 4).

4. Attach a 1/8P x 1/4T elbow to the bulkhead adapter on one end (Figure 4). Attach a 1/8P street elbow and a 1/8P x 5/16H barb fitting to the other end of the bulkhead adapter.

5. Connect one 45-1/2" stainless steel hose from the fuel inlet on the console to the bulkhead adapter.

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

7. Remove the filler neck from the vehicle. Refer to the vehicle manual for instructions and cautions.

8. Select a suitable location for drilling the hole in the filler neck. 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.

9. Drill a 1/2" diameter hole in the filler neck after you are certain that you have chosen the proper location (Figure 6).

NOTE:

When assembling pipe fittings, Teflon thread sealant must be used.

10. Attach a 1/8P x 1/4T elbow to one end of the short bulkhead adapter (Figure 5).

FUEL LINE INSTALLATION

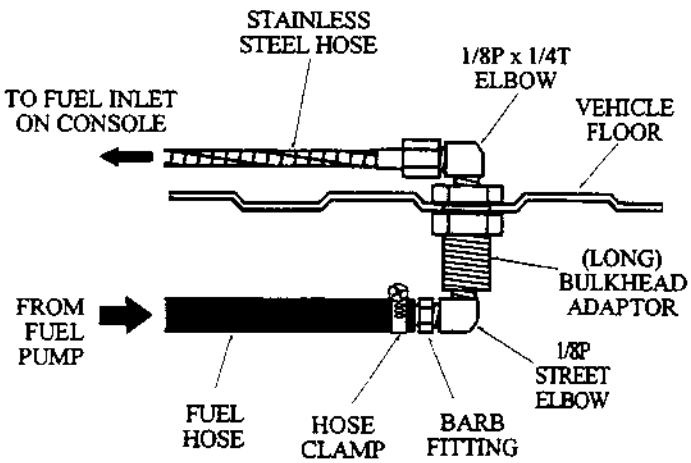


FIGURE 4

FUEL LINE INSTALLATION KIT Part # 66-945153 (For vehicles other than 1992 or later Fords or 1997 or later Chevrolet, GMC, and Dodges)

IF THE VEHICLE IN WHICH YOU ARE INSTALLING YOUR UNIT IS OTHER THAN A 1992 (or later) FORD OR A 1997 (or later) CHEVROLET, GMC, OR DODGE VAN, IT WILL BE NECESSARY TO FOLLOW THE INSTRUCTIONS THAT COME IN THIS KIT:

WARNING!

DO NOT smoke around the vehicle. Work in a well-ventilated area away from sparks or flames.

Gasoline is extremely flammable and its vapors can explode if ignited.

DO NOT damage the vehicle in any manner during installation. When routing fuel lines **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, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.

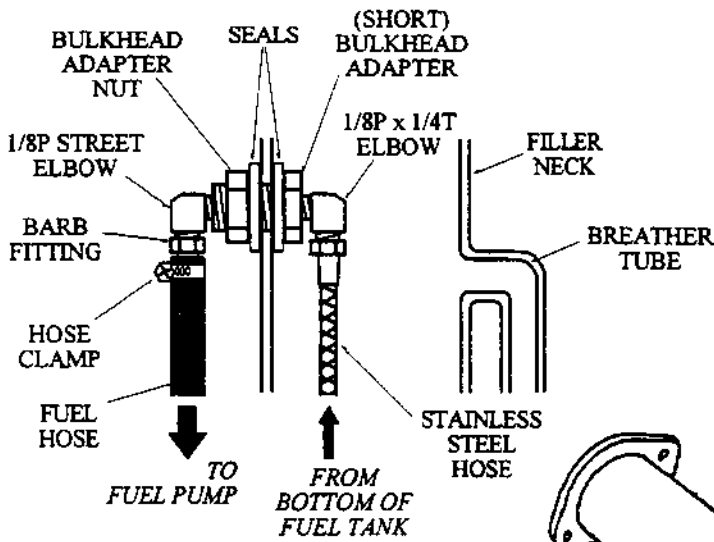


FIGURE 5

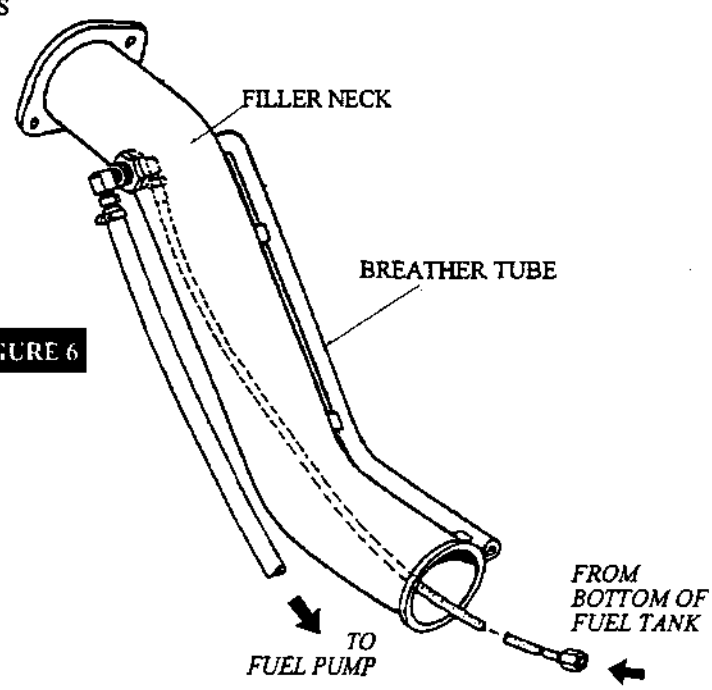


FIGURE 6

Figure 7 1992 (or later) FORD FUEL LINE MODIFICATION

FUEL LINE INSTALLATION KIT Part #66-945171
(For 1992 or later Fords)

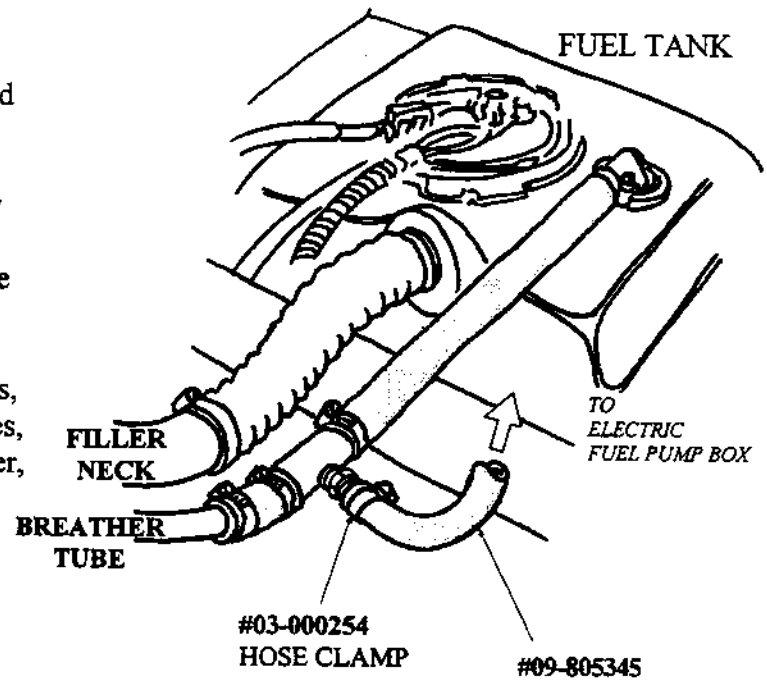
IF THE VEHICLE IN WHICH YOU ARE INSTALLING YOUR UNIT IS A 1992 (or later) FORD, IT WILL BE NECESSARY TO FOLLOW THE INSTRUCTIONS THAT COME IN THIS KIT:

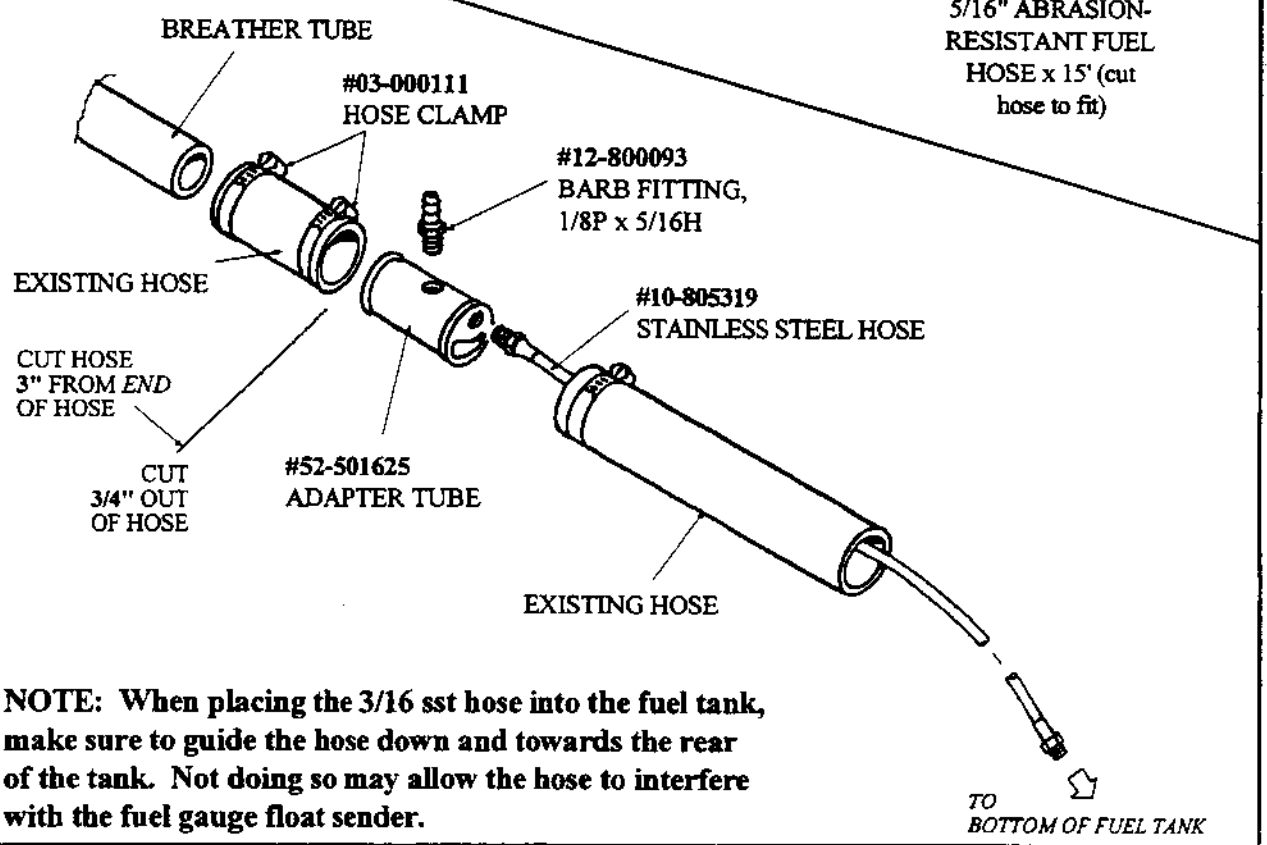
WARNING!

DO NOT smoke around the vehicle. Work in a well-ventilated area away from sparks or flames.

Gasoline is extremely flammable and its vapors can explode if ignited.

DO NOT damage the vehicle in any manner during installation. When routing fuel lines **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, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.





NOTE: When placing the 3/16 sst hose into the fuel tank, make sure to guide the hose down and towards the rear of the tank. Not doing so may allow the hose to interfere with the fuel gauge float sender.

Figure 8 1997 (or later) CHEVY and GMC FULL-SIZE VAN FUEL LINE MODIFICATION

FUEL LINE INSTALLATION KIT Part #66-945437
(For 1997 or later Chevrolet and GMC full-size vans with the center-mounted fuel tank)

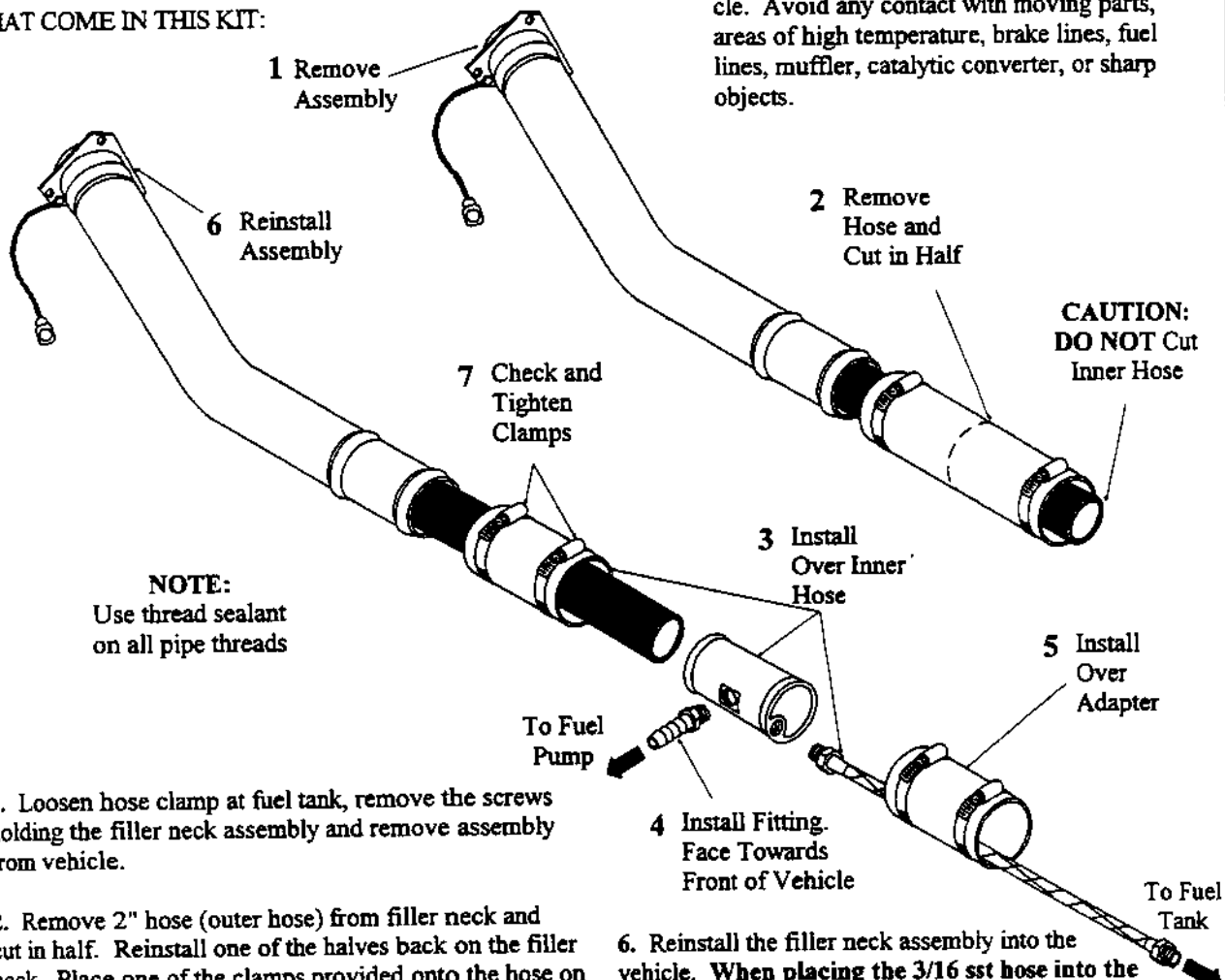
IF THE VEHICLE IN WHICH YOU ARE INSTALLING YOUR UNIT IS A 1997 (or later) CHEVROLET OR GMC FULL-SIZE VAN WITH THE CENTER-MOUNTED FUEL TANK, IT WILL BE NECESSARY TO FOLLOW THE INSTRUCTIONS THAT COME IN THIS KIT:

WARNING!

DO NOT smoke around the vehicle. Work in a well-ventilated area away from sparks or flames.

Gasoline is extremely flammable and its vapors can explode if ignited.

DO NOT damage the vehicle in any manner during installation. When routing fuel lines **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, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.



1. Loosen hose clamp at fuel tank, remove the screws holding the filler neck assembly and remove assembly from vehicle.

2. Remove 2" hose (outer hose) from filler neck and cut in half. Reinstall one of the halves back on the filler neck. Place one of the clamps provided onto the hose on the filler neck.

3. Install the 3/16 sst hose on fuel adapter. Install adapter over the small hose from filler neck and into the 2" hose, tighten hose clamp.

4. Be sure the adapter is positioned as shown. Install barb fitting onto the adapter, and be sure to use a thread sealant to prevent leakage.

5. Install the other half of the 2" hose over the fuel adapter. Use clamp to secure.

6. Reinstall the filler neck assembly into the vehicle. **When placing the 3/16 sst hose into the fuel tank, make sure to guide the hose down and towards the rear of the tank. Not doing so may allow the hose to interfere with the fuel gauge float sender.**

7. Fit 2" hose over tank fitting, tighten clamp and resecure filler neck assembly.

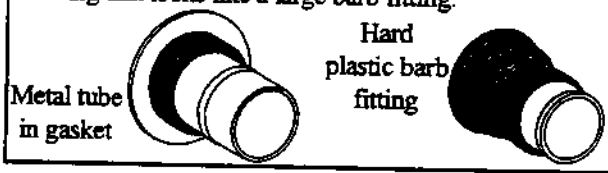
Parts for Fuel Modification Kit
03-000054.....CLAMP, HOSE #32
10-805319.....HOSE, 3/16 x 25"
12-800093.....FITTING, BARB 1/8P x 5/16H
52-501774.....ADAPTER, FUEL FILLER NECK

Figure 9 1997 (or later) DODGE FULL-SIZE VAN FUEL LINE MODIFICATION

FUEL LINE INSTALLATION KIT Part #66-945437
(For 1997 or later Dodge full-size vans)

IF THE VEHICLE IN WHICH YOU ARE INSTALLING YOUR UNIT IS A 1997 (or later) DODGE FULL-SIZE, IT WILL BE NECESSARY TO FOLLOW THE INSTRUCTIONS THAT COME IN THIS KIT:

Two styles of fittings on tank. One is a metal tube held in place by a gasket, the metal tube will slide in and out of the gasket. The other is a metal tube in a hard plastic housing that looks like a large barb fitting.

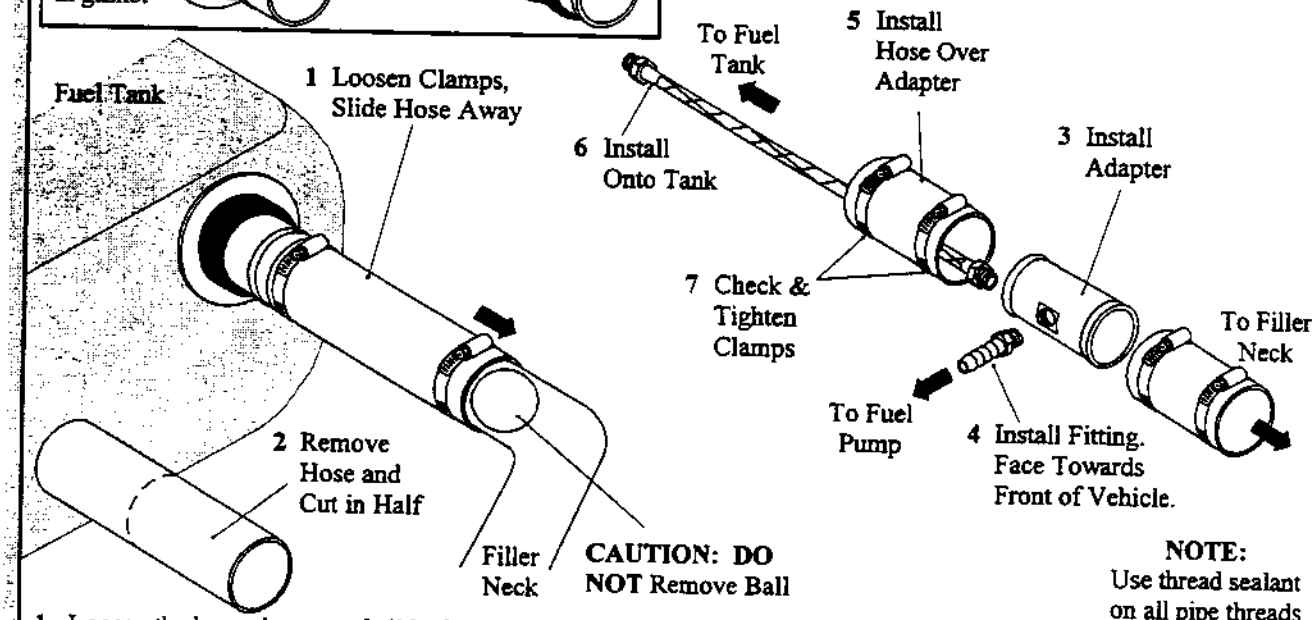


WARNING!

DO NOT smoke around the vehicle. Work in a well-ventilated area away from sparks or flames.

Gasoline is extremely flammable and its vapors can explode if ignited.

DO NOT damage the vehicle in any manner during installation. When routing fuel lines **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, brake lines, fuel lines, muffler, catalytic converter, or sharp objects.



NOTE: Use thread sealant on all pipe threads

1. Loosen the hose clamps and slide the hose away from the tank. This will allow the filler neck to drop down and away.

2. Remove 2" hose from filler neck and cut in half. Reinstall one of the halves back on the filler neck. Place one of the clamps provided onto the hose on the filler neck. Don't tighten the clamps yet.

3. Install the 3/16 sst hose on fuel adapter. Install adapter into the 2" hose.

4. Be sure the adapter is positioned as shown. Install barb fitting onto the adapter, and be sure to use a thread sealant to prevent leakage.

5. Install the other half of the 2" hose over the fuel adapter. Use clamp provided to secure.

6. Route the 3/16 sst hose into the fuel tank and reposition the filler neck. **When placing the 3/16 sst hose into the fuel tank, make sure to guide the hose down and towards the rear of the tank. Not doing so may allow the hose to interfere with the fuel gauge float sender.**

7. Slide the 2" hose over tank fitting, tighten clamps to resecure filler neck assembly. **NOTE: When working on vehicle with the metal tube in the gasket, be sure NOT to push the tube into the fuel tank while reconnecting the filler neck assembly.**

Parts for Fuel Modification Kit
03-000054.....CLAMP, HOSE #32
10-805319.....HOSE, 3/16 x 25"
12-800093.....FITTING, BARB 1/8P x 5/16H
52-501774.....ADAPTER, FUEL FILLER NECK

Slide one of the seals over the threads of the bulkhead adapter against the hexagon area. Next, attach the 25", 36" or 45" stainless steel hose to the 1/8P x 1/4T elbow. Choose a length that will reach through the filler neck to the bottom of the fuel tank. If the selected hose is too short or too long, the unit will run out of fuel before the vehicle fuel tank is empty.

11. 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 hex head nut over the seal (Figure 5).

Attach the 1/8P 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).

12. Using a hose clamp, connect one end of the 5/16" fuel hose to the fitting on the outside of the filler neck (Figure 5).

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

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

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

16. Route the 5/16" fuel hose underneath the van from the filler neck to the inlet side of the external electric fuel pump (Figure 10). Use the cable ties to secure the hose. Cut off any excess hose and attach to the barb fitting with hose clamp.

17. Attach the remaining hose to the outlet side of the external electric fuel pump with a hose clamp.

18. Using the 5/16" hose and hose clamps connect the fuel pump box to the bulkhead adapter.

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, muffler, catalytic converter, or sharp objects.

5. INSTALLING THE FUEL TANK AND FUEL LINE (TRAILER)

For trailer installations we recommend the following.

1. Strict compliance with all Federal and State laws must be maintained.

2. Use a safe fuel tank which is manufactured specifically for gasoline, has a proper vented filling cap, and an outlet connection that is the same size as the inlet connection on the unit.

3. DO NOT mount the fuel tank inside an enclosed trailer or van.

WARNING!

Never carry any gasoline or flammable material in the vehicle. NEVER store any type of flammable material in the vehicle.

4. Mount the fuel tank where it will be protected from any vehicle collision.

5. When installing the fuel line from the tank to the unit, use the proper size fuel line.

Figure 10 EXTERNAL ELECTRIC FUEL PUMP MOUNTING INSTRUCTIONS

STUDY ALL FUEL LINE INSTALLATION INSTRUCTIONS COMPLETELY BEFORE PROCEEDING

⚠ WARNING!

DO NOT INSTALL THIS ASSEMBLY IN ANY MANNER OR POSITION WHICH, IN SO DOING, MAY CAUSE DAMAGE TO THE VEHICLE OR ANY COMPONENT WHICH MIGHT AFFECT THE OPERATION OR SAFETY OF THE VEHICLE.

1. DETERMINE THE POSITION WHERE THE BOX ASSEMBLY WILL BE MOUNTED.

WARNING! DO NOT MOUNT THIS ASSEMBLY NEAR THE CATALYTIC CONVERTER, EXHAUST, OR ANY AREAS OF HIGH TEMPERATURE.

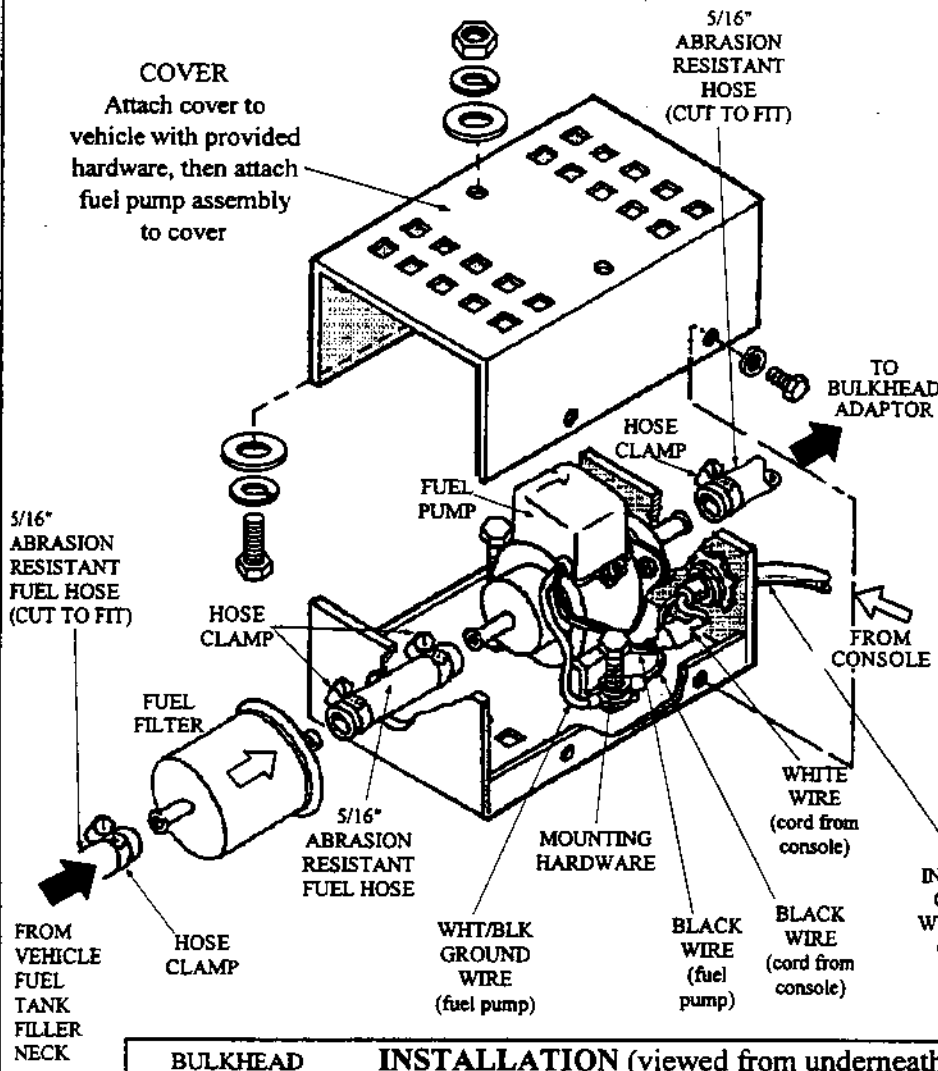
2. USING THE COVER AS A TEMPLATE, DRILL TWO 5/16" DIA. HOLES IN THE VEHICLE FRAME

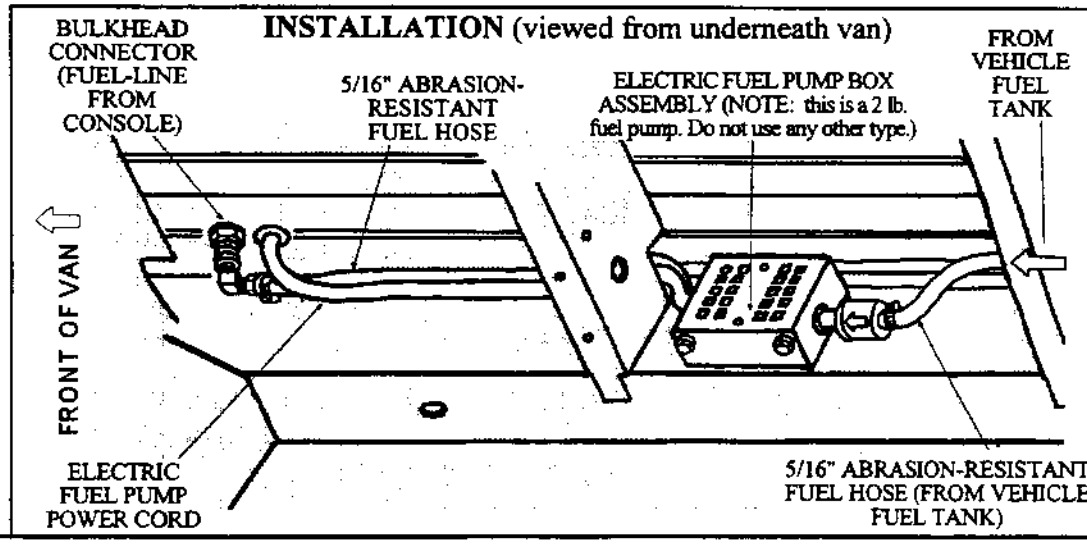
3. MOUNT THE COVER TO THE VEHICLE FLOOR.

4. CONNECT THE HOSES AND CORD AS SHOWN. TIGHTEN HOSE CLAMPS.

CAUTION: WHEN ROUTING THE HOSE AND CORD UNDERNEATH THE VEHICLE, MAKE CERTAIN THAT YOU DO NOT PLACE THEM IN ANY LOCATION WHERE DAMAGE MAY OCCUR TO THE HOSE, CORD, OR VEHICLE. AVOID ANY CONTACT WITH MOVING PARTS, AREAS OF HIGH TEMPERATURE OR SHARP OBJECTS.

5. INSTALL THE FUEL PUMP ASSEMBLY ON TO THE COVER WITH THE PROVIDED HARDWARE.





6. WASTE TANK TO CONSOLE CONNECTION

NOTE: Before connecting any hoses to the waste tanks, make certain the hose clamps are on each hose.

1. See Figure 11. Connect the 6-1/2" long section of 2-1/2" I.D. internal vac hose to the 2-1/2" dia. vac inlet tube on the console and the 2-1/2" dia. inlet tube on the waste tank. Tighten the hose clamps. **NOTE:** On the PERFORMER 405, the hose and tubing will be 3" diameter.

2. Connect the section of 2-7/8" I.D. internal vac hose to the 2-7/8" dia. vac outlet tube on the waste tank and to the vacuum pump relief valve on the console. It may be necessary to cut this hose to fit. Tighten the hose clamps. **NOTE:** On the PERFORMER 405, the hose and tubing will be 3-1/2" diameter.

3. Connect the 2" I.D. waste removal hose to the 2" dia. tube at the bottom of the waste tank. Tighten the hose clamps.

4. Connect the 5/16" I.D. water box hose to the barb fitting (pointed downward) on the waste tank, which is mounted on the outside of the waste tank. Tighten the hose clamps.

5. Connect the console engine shut-off cord to the waste tank level sensor cord.

6. Connect the 3/16 stainless steel hose from the bypass valve to the connector on the waste tank.

7. BATTERY CONNECTION

WARNING!

Dangerous Acid, Explosive Gases!

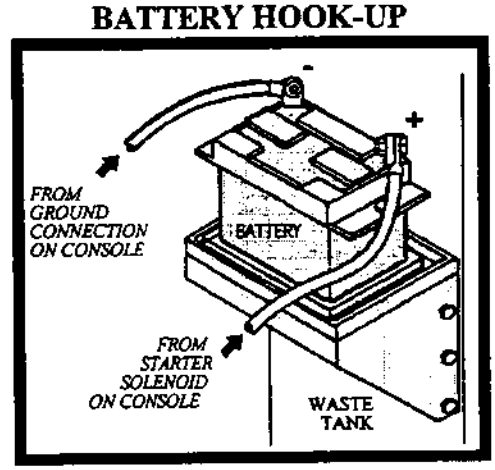
Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes, and clothing. Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well-ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times. Keep batteries out of the reach of children. Remove all jewelry when servicing batteries.

Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. When disconnecting the battery, ALWAYS disconnect the negative (-) terminal FIRST.

1. Attach the red positive (+) battery cable from the console starter solenoid to the positive (+) terminal on the battery and tighten the holding nut.

2. Next, attach the black negative (-) battery cable from the console ground to the negative (-) terminal on the battery and tighten the holding nut.

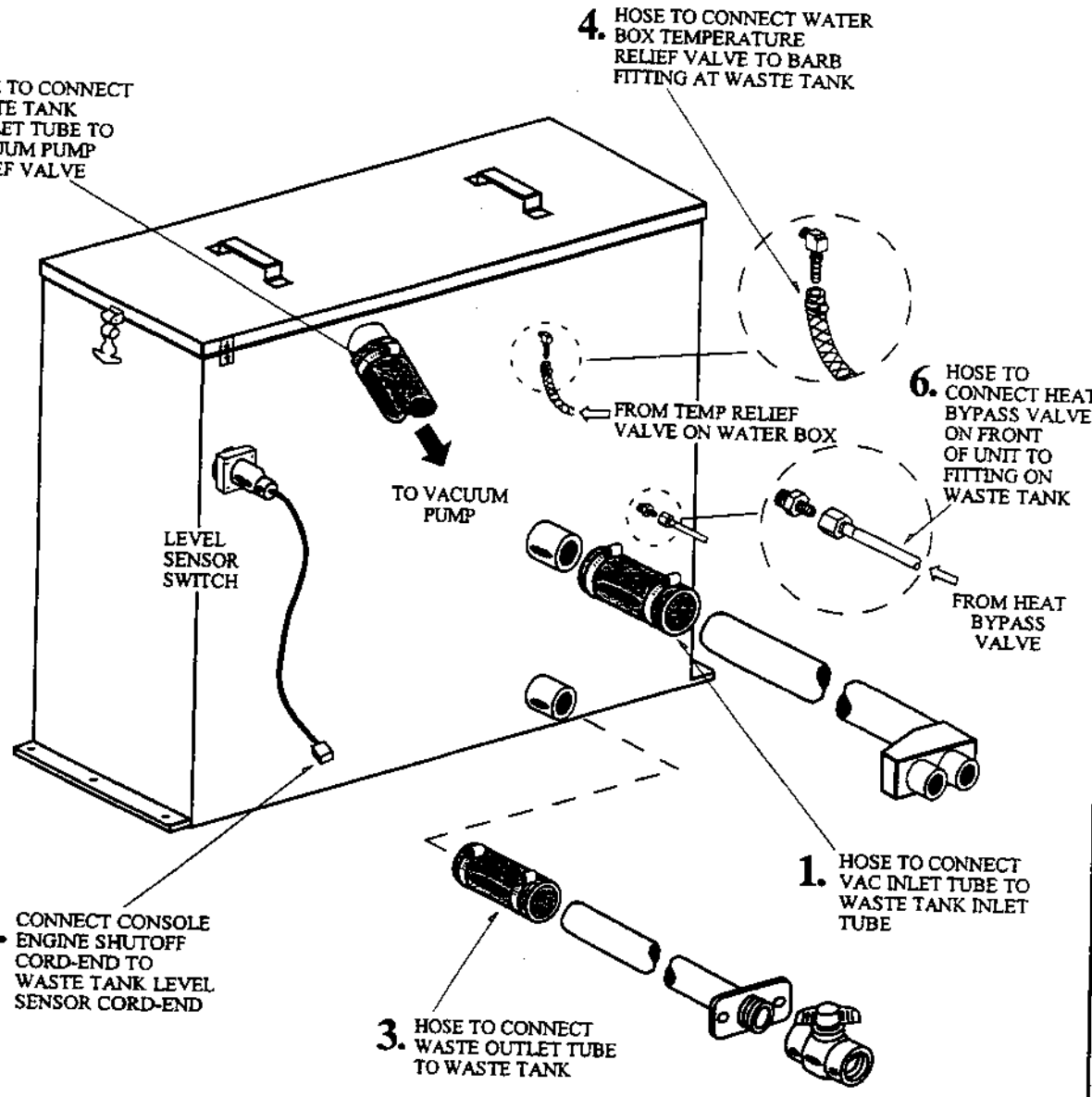
BATTERY HOOK-UP



8. FIRE EXTINGUISHER

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

Figure 11 WASTE TANK TO CONSOLE CONNECTION



SPECIAL INSTRUCTIONS:

1. Cut hoses to fit, if necessary.

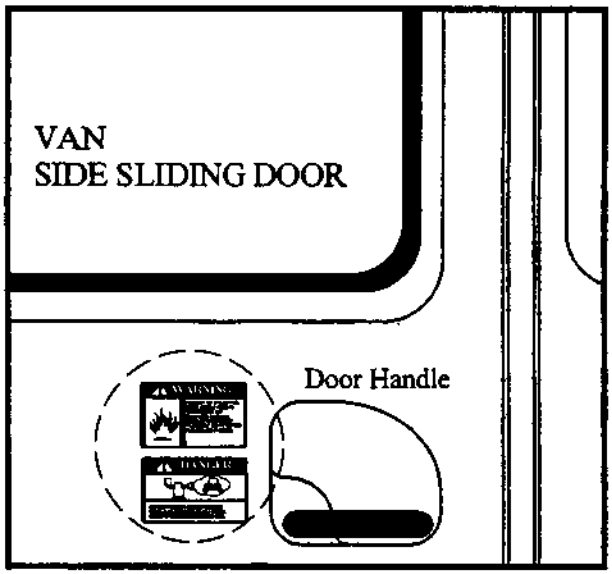
2. When cutting hoses, make certain that the cutting blade is facing away from your hands, fingers, or any other part of your body to avoid injury.

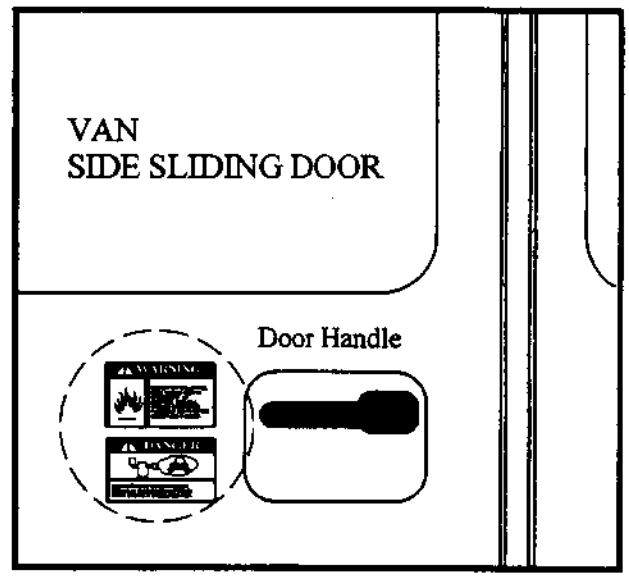
3. Do not install hoses with excessive bends or kinks.

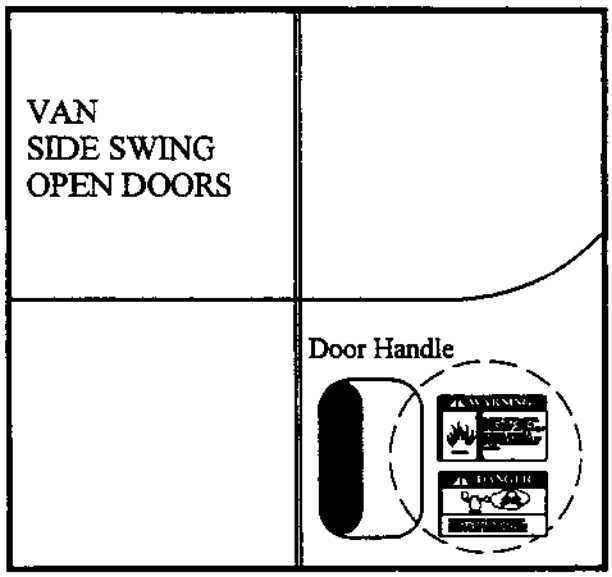
4. Place clamps on hoses before installing.

5. Tighten all hose clamps *firmly*.

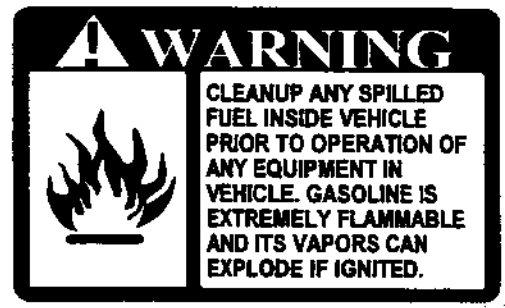
Figure 12 PLACEMENT OF EXTERNAL WARNING DECALS

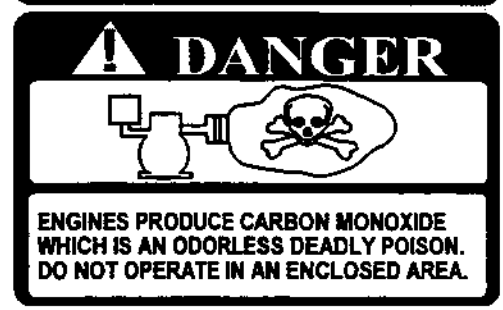






Decal, Fuel Clean-up
Part# 48-941317





Decal, Carbon Monoxide
Part# 48-941316

The decals should be placed in a prominent spot on the vehicle where access is given to operate the unit. The illustrations above suggest the location and placement of the decals.

When placing the decals, be sure the area is clean of any dirt and possible wax build-up. Place the decal by starting at one edge and smoothing the decal over to the other edge. This will help eliminate air bubbles and allow the decal to adhere better. After a time the decals may become damaged or worn. If they become unreadable, they should be replaced. The part numbers are shown above to help in ordering new decals.

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4 SYSTEMS

This chapter of the operator's manual divides the unit up into systems and explains how each system works. Before proceeding into the operation and maintenance sections of this manual, we recommend acquiring a basic knowledge of how this unit functions. Read the next section of this manual carefully and completely.

1. WATER PUMPING SYSTEM

See Figures 13 and 14. Cold water enters the console through the water inlet connection located on the lower front panel. The water flows to the water box through a float valve, which shuts off water flow when the water box is full.

Water then flows from the water box, through a strainer, into the water pump where it is pressurized. This pressurized water is pumped to the pressure regulator manifold where the pressure regulator provides and maintains the desired pressure setting.

The pressure regulator manifold includes a nitrogen-charged accumulator which helps reduce pressure pulsations. In addition, the manifold also contains a low-pressure switch and a high-pressure switch. These switches will shut the unit down if the water pressure drops below 50 PSI or exceeds 1200 PSI.

If the tool valve is closed, water flows from the pressure regulator through the vacuum exhaust radiator-type heat exchangers, where heat is transferred from the vacuum pump exhaust to the water.

The heated water then returns to the water box. If the temperature in the water box exceeds 180°F, a temperature relief valve will open and bleed a small amount of hot water into the waste tank, allowing cool water to flow into the water box.

When the tool valve is open, water flow is from the pressure regulator, through the heli-coil heat exchanger, to the engine exhaust heat exchanger, where it is super-heated by engine exhaust.

A bypass manifold, located next to the water box, constantly bleeds a small amount of hot water from the engine exhaust heat exchanger outlet to the water box.

Next, the hot water flows through the check valve manifold which contains a check valve and Y-strainer. This is where chemical injection occurs.

The hot solution then flows through the solution outlet manifold to the cleaning tool.

Temperature is adjusted primarily using the thermostatic temperature control. This control opens a solenoid valve if the water exceeds the temperature setting. When open, this valve allows hot water to be drawn into the waste tank. The temperature sensor for this control is located in the thermostat manifold en route to the solution outlet.

In addition, a heat bypass valve on the lower front panel lowers the solution temperature manually with a knob adjustment. When open, this valve allows hot water to be drawn into the waste tank.

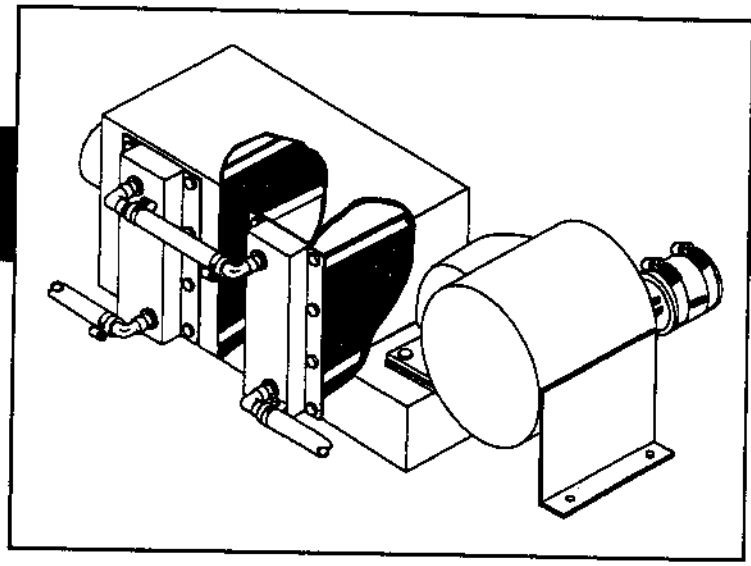
An additional temperature sensor on the engine exhaust heat exchanger outlet will shut down the engine if the water temperature exceeds 285°F. If this occurs, consult the "Trouble-shooting" section of this manual to determine the cause of overheating before restarting your unit.

2. HEAT TRANSFER SYSTEM

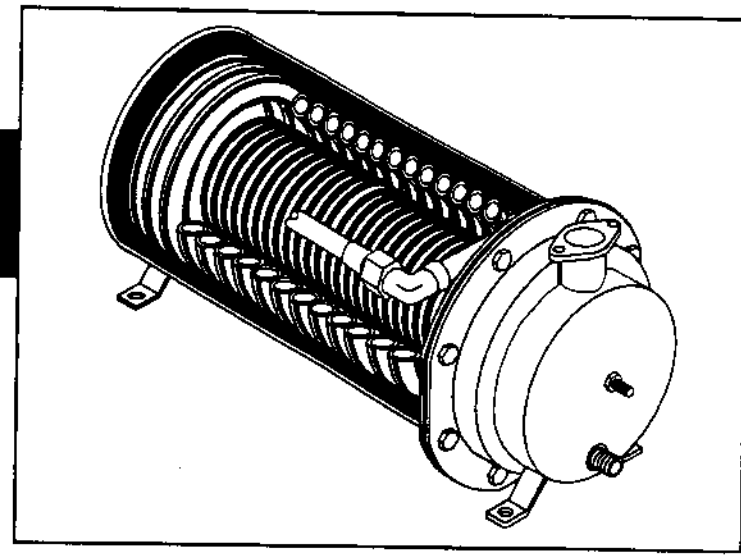
See Figures 13 and 14. Water is heated through a three stage heat exchange system which utilizes vacuum exhaust, engine coolant, and engine exhaust.

Stage one utilizes vacuum exhaust heat blowing over two radiator-type heat exchangers in series prior to discharging the exhaust into the atmosphere. When the tool valve is closed, the water bypasses from the pressure regulator manifold to the water box through the vacuum exhaust heat exchangers. Water then flows from the water box to the water pump, where it is pressurized. It then travels to the pressure regulator manifold.

When the tool valve is open, the water flows through the stage two heli-coil heat exchanger system which uses heated engine coolant pumped over copper coils. The pressurized water flows through the copper coils and collects heat from the engine's cooling system. The water then flows to the stage three heat exchange system.



VACUUM EXHAUST HEAT EXCHANGER



CATALYTIC ENGINE EXHAUST HEAT EXCHANGER

Figure 13 HEAT TRANSFER & WATER PUMPING SYSTEM

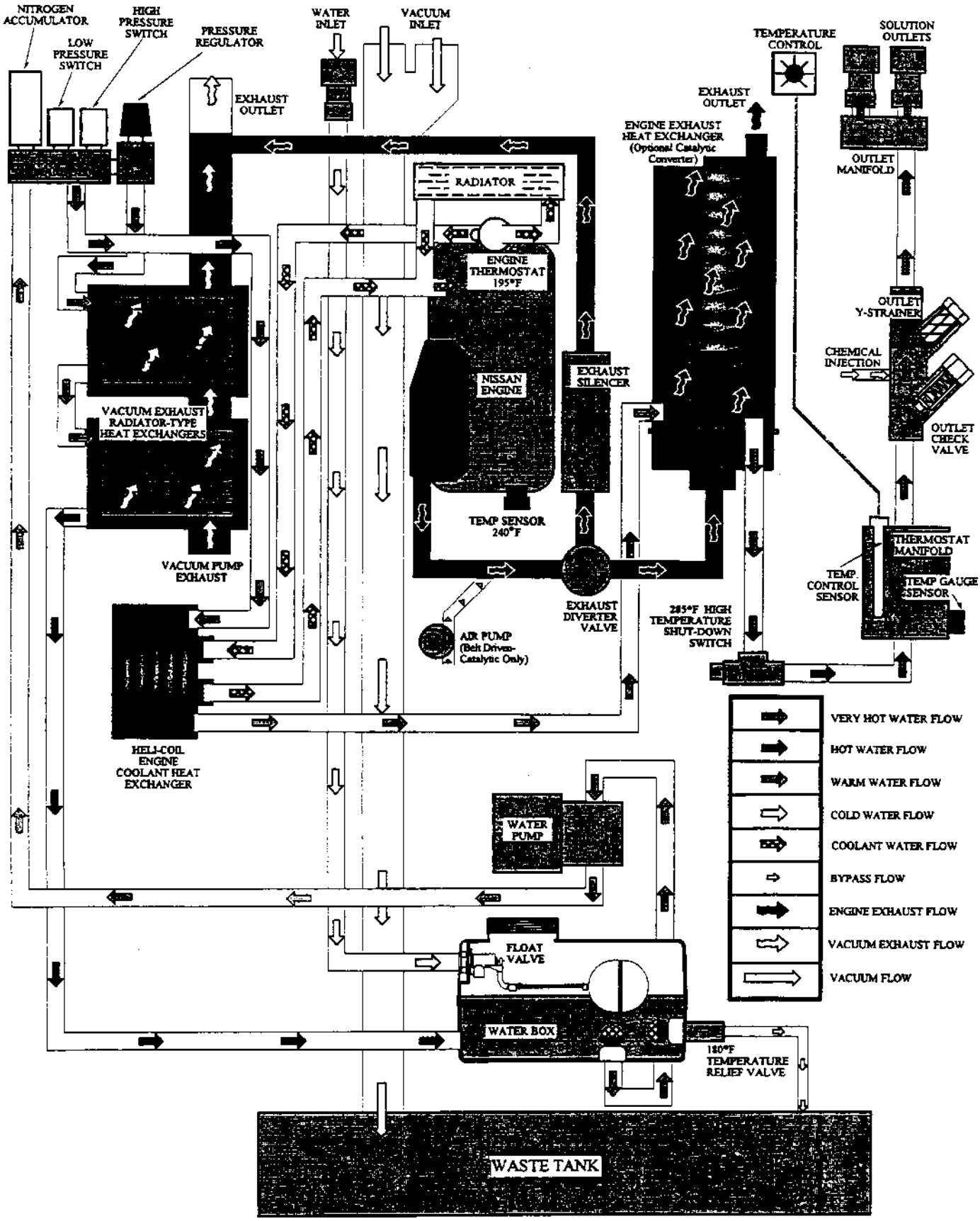
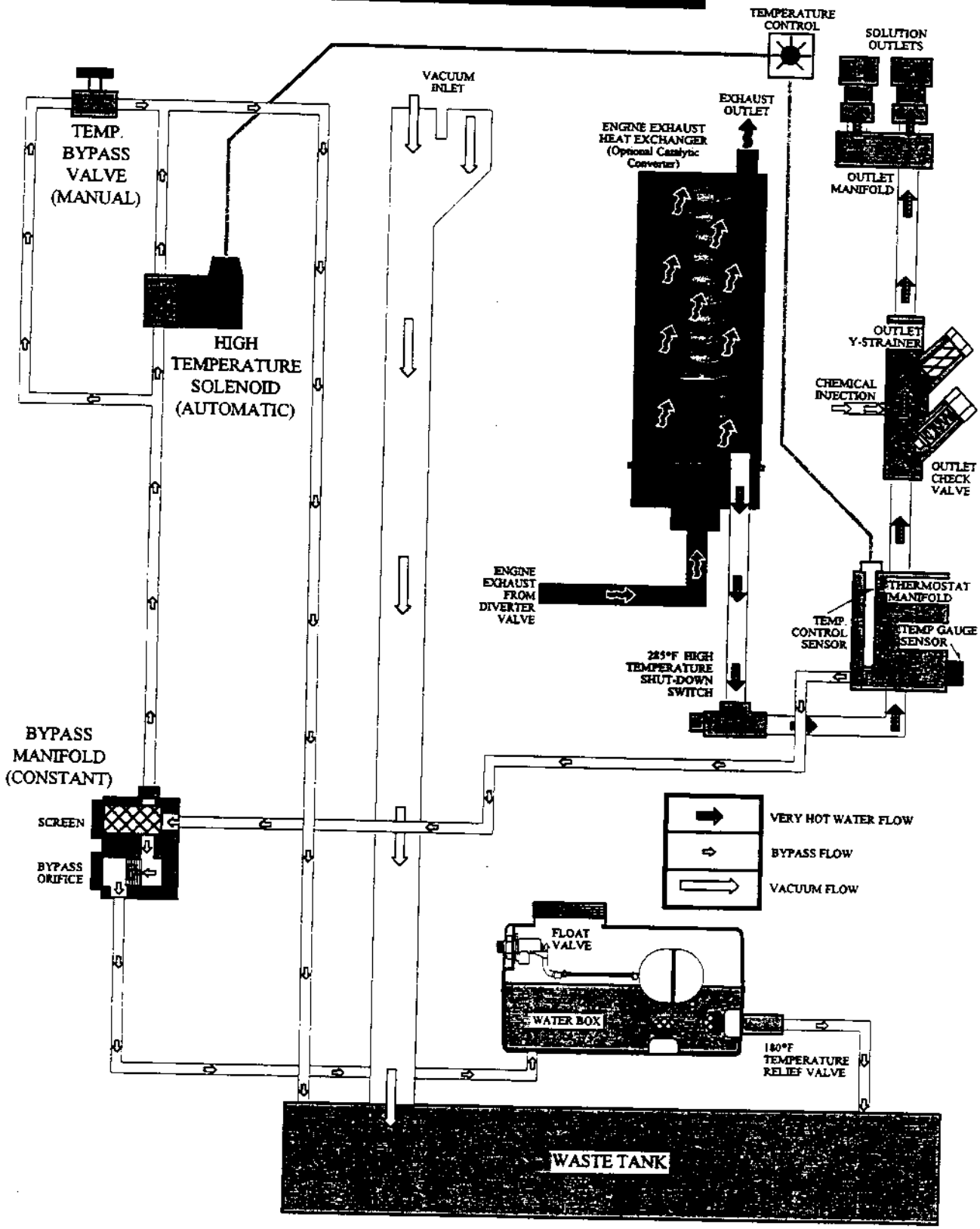


Figure 14 MANUAL & AUTOMATIC HOT WATER BYPASS SYSTEMS



The stage three heat exchanger is an engine exhaust chamber containing a stainless steel heating coil and catalytic converter (optional). Water flows through the coil and is heated by the engine exhaust as it leaves the engine. The catalytic heat exchanger uses a catalytic core.

The catalytic converter, combined with the injection of air pumped into the exhaust manifold, re-burns the exhaust waste gases. This results in super-heated water flowing through the outlet manifold to the cleaning tools.

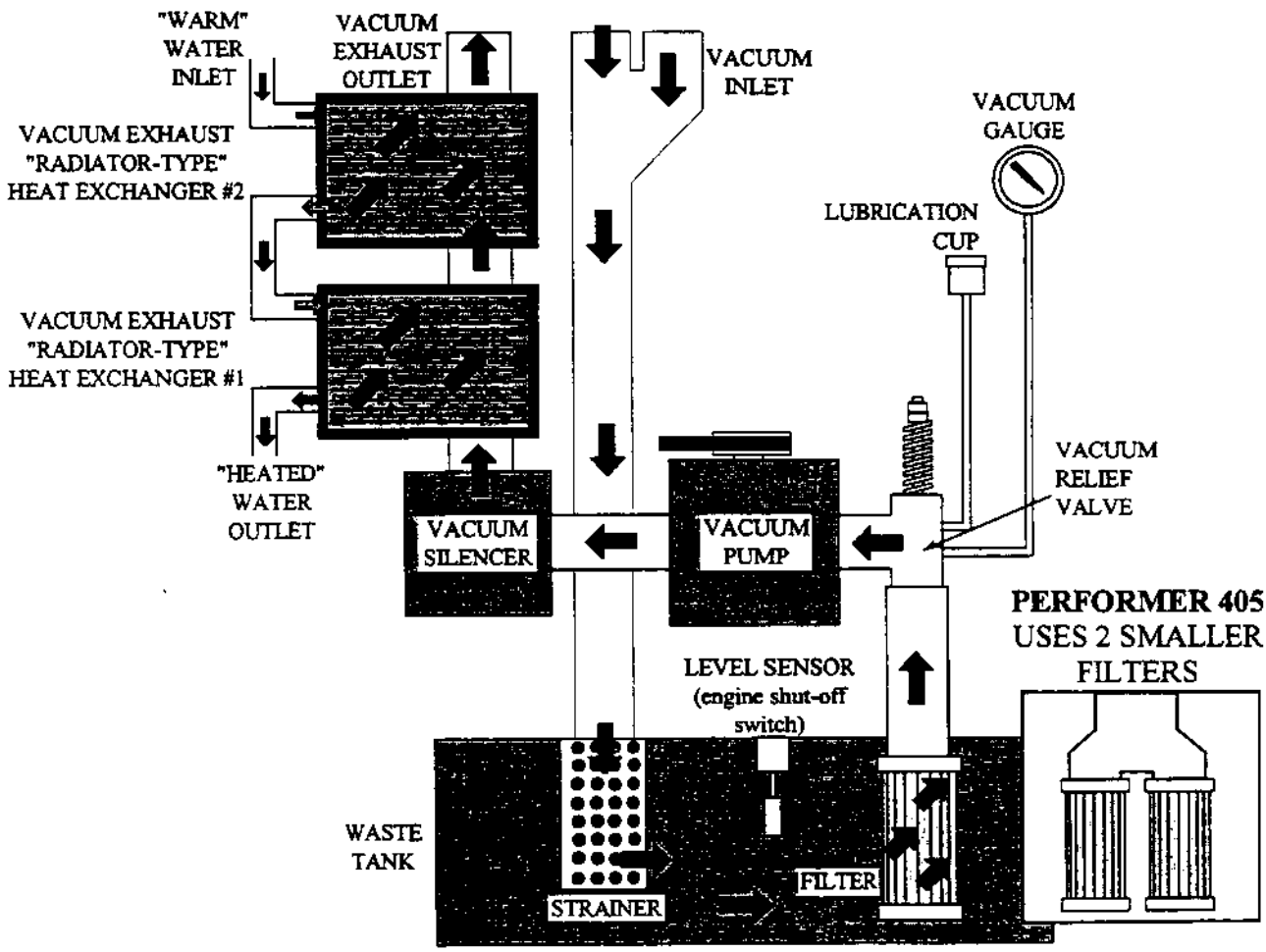
An exhaust diverter valve is located on the engine exhaust system. This allows you to direct the exhaust either to the heat exchanger for high temperature cleaning or to the exhaust muffler for low temperature cleaning or extraction, such as for flood restoration.

When the diverter valve is in the MUFFLER position, a microswitch automatically shuts off the water pump. An override switch on the control panel will enable you to turn the water pump ON, for low temperature cleaning.

3. VACUUM SYSTEM

See Figure 15. Vacuum flow is initiated by the vacuum pump, with air and water being drawn into the vacuum inlet at the front of the console.

Figure 15 VACUUM SYSTEM



The mixture then flows through a strainer basket into the waste tank. Air exits the waste tank through a 100-mesh filter (the PERFORMER 405 uses two filters), and then flows into the vacuum pump. A vacuum pump relief valve has been provided for vacuum pump protection.

The air is discharged from the vacuum pump through the stage one heat exchanger where the heated vacuum exhaust blows across two radiator-type heat exchangers before discharging into the atmosphere.

A level sensor switch located near the top of the waste tank will shut the unit down before the waste tank reaches its full capacity. This protects the vacuum pump from water damage.

CAUTION:

Use of a DEFOAMER will help prevent damage to the unit by a build-up of foam in the waste tank, which may be caused by some chemicals (foam build-up will not activate float switches).

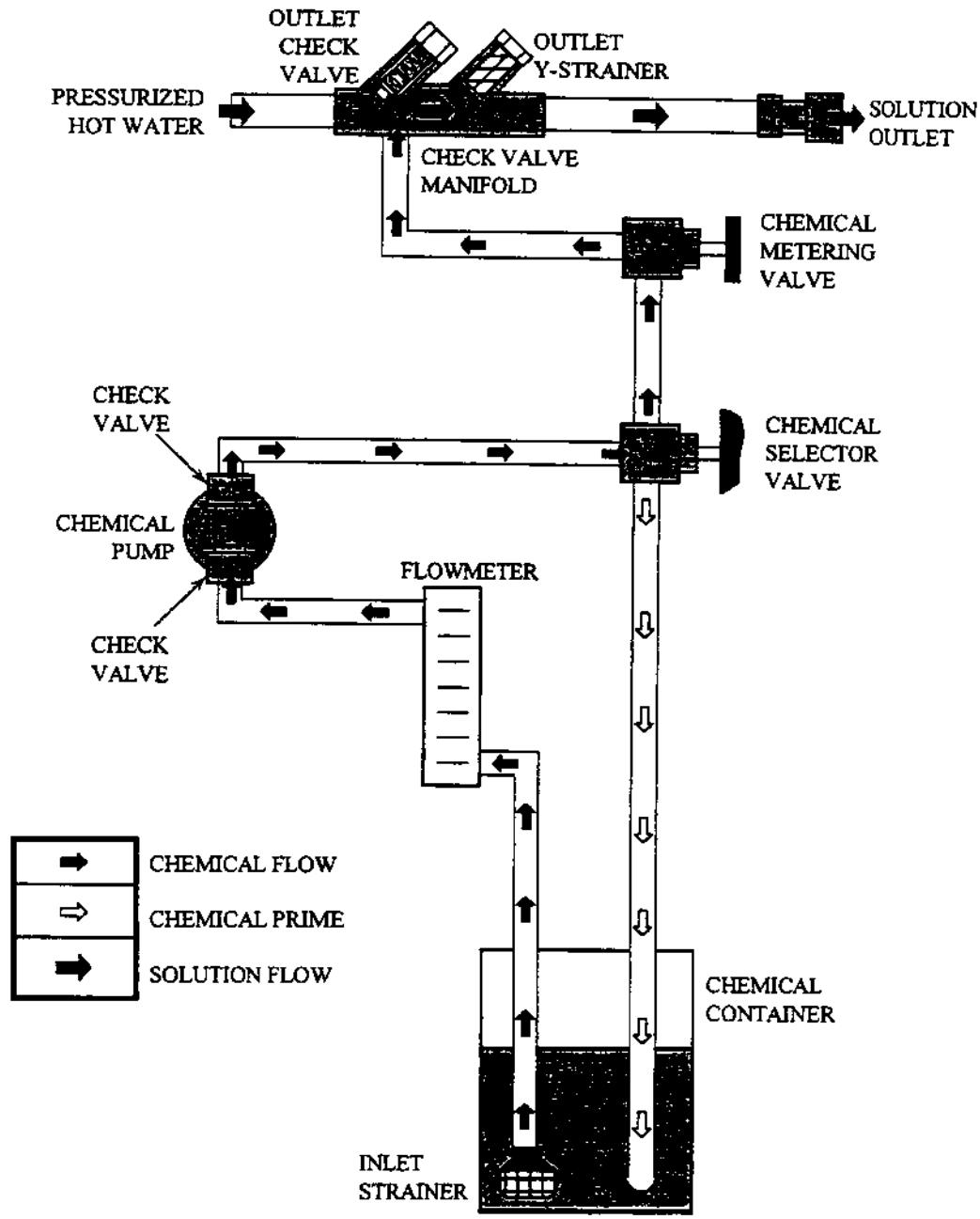
4. CHEMICAL PUMPING SYSTEM

See Figure 16. The chemical is drawn from the chemical container through a strainer into the flow meter. The flow meter indicates the rate of chemical flow.

The chemical then flows through a check valve into a pulse-powered chemical pump. Next, the chemical pump injects the chemical through a check valve to the 3-way selector valve on the control panel. This valve may turn the chemical flow ON, OFF, or PRIME the chemical pump.

The chemical then flows through a metering valve to the solution outlet. This valve controls the rate of flow of chemical injection into the cleaning solution, which is indicated on the flow meter.

Figure 16 CHEMICAL SYSTEM



5 OPERATION

This chapter of the operator's manual explains how to prepare, start, operate, shut down, and maintain the PROCHEM PERFORMER/ PERFORMER 405 cleaning unit. Operation of the PERFORMER/PERFORMER 405 is simple. However, only trained personnel should proceed.

WARNING!

Operate this unit and equipment only in a well-ventilated area. Exhaust fumes contain carbon monoxide which is an odorless and deadly poison that can cause severe injury or fatality. DO NOT operate this unit where the exhaust may enter any building doorway, window, vent, or opening of any type.

1. CHECK FOR ADEQUATE FUEL

Check the fuel tank to be certain there is adequate fuel to complete the job. This unit uses approximately .95 to 1.18 gallons of fuel per hour, depending on the speed setting.

2. REMOVE TOOLS FROM VEHICLE

Remove any **tools** or **hoses** from the van which you will require.

3. WATER SUPPLY CONNECTION

NOTE: Before connecting your water hose to the supply faucet, flush out the faucet until the water is free of any debris. Flush out any debris which may be in your water inlet hose.

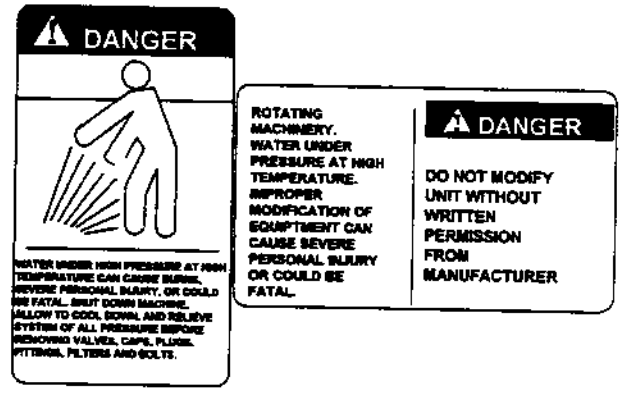
1. Connect the **water supply hose** to the **water inlet** quick-connect at the front of the unit. Connect the hose to the water supply faucet.

NOTE: Never use your waste pump outlet hose as a water inlet hose. Use only clean hoses for water inlet.

2. Turn the **water supply faucet** on. The water will fill the **water box**.

4. HIGH PRESSURE HOSE

Before starting the unit, connect the **pressure hose(s)** to the **outlet connection(s)** at the front of the unit. Connect the **cleaning tool(s)** to the **pressure hose(s)**.



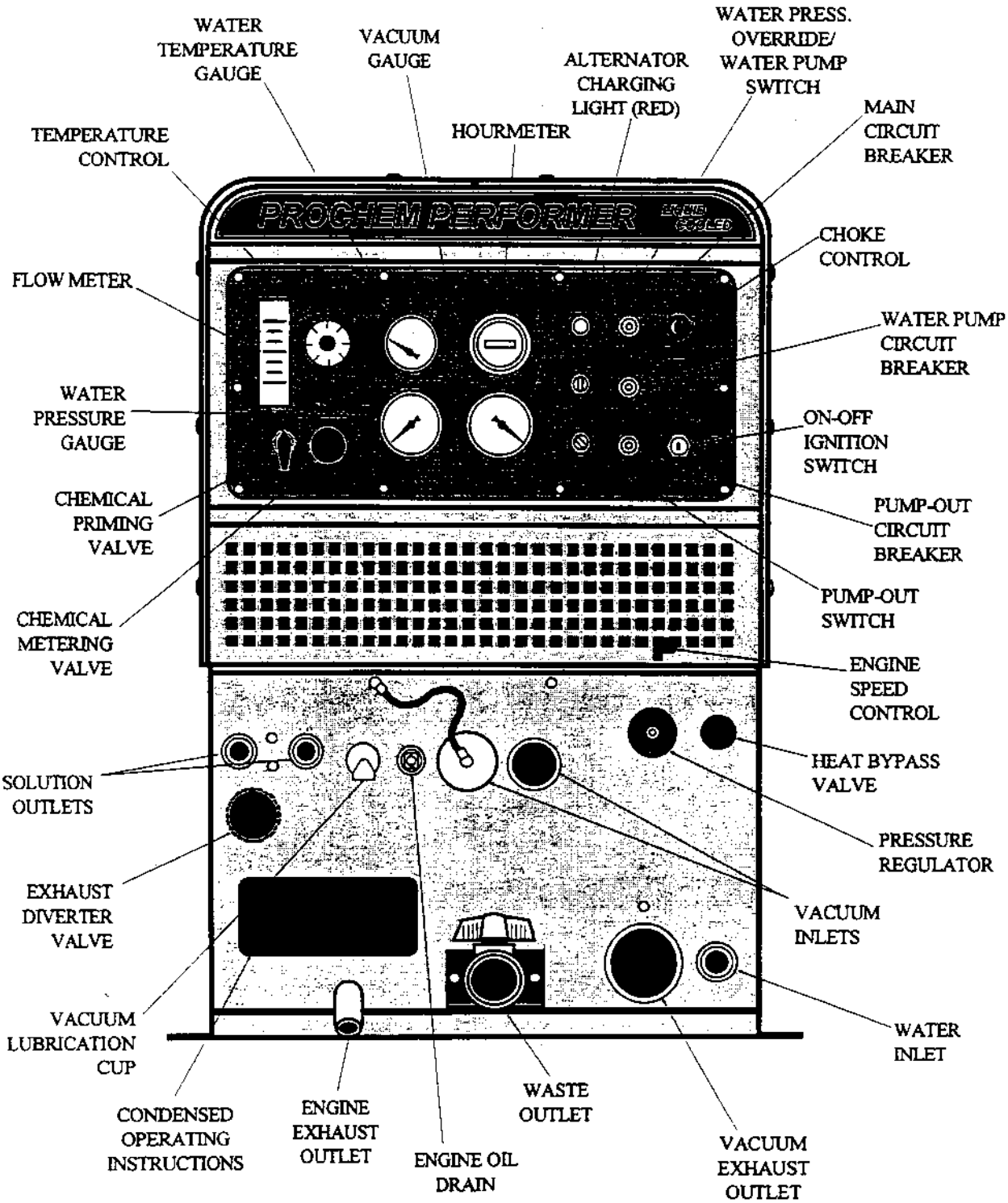
5. VACUUM HOSE

Connect the **vacuum hose(s)** to the **vacuum inlet** connection(s) at the front of the unit. Connect the other end of the **vacuum hose(s)** to the **cleaning tool(s)**.

6. JET SIZING

PROCHEM recommends **floor tool** tip sizing not exceed a total of "06". Using larger jet sizes on your PERFORMER/PERFORMER 405 may reduce cleaning temperatures.

Figure 17 INSTRUMENTATION



Example: Quad-jet wand uses four 95015 jets. (95° spray angle w/ 015 orifice)

015 x 4 = 06

When using two floor tools while cleaning with your unit, PROCHEM recommends that each tool tip size does not exceed a total of ".04".

Example: Quad-jet wand uses four 9501 jets.

01 x 4 = 04.....04 x 2 tools = 08

Upholstery tool jet size: 80015
Stair tool jet size: 9502

7. STARTING THE UNIT

1. Set the exhaust diverter valve to the **HEAT EXCHANGER** position. The diverter valve microswitch will automatically turn ON the water pump.

2. Set the **temperature control** on the control panel to the desired cleaning temperature. The thermostatic temperature control will allow you to increase or decrease the solution temperature automatically. Simply turn the **control knob** to the desired temperature setting.

3. Close the **heat bypass valve** by turning the knob clockwise. **DO NOT** over-tighten.

The **heat bypass valve** allows you to decrease the solution temperature manually. Opening the valve (counter-clockwise) decreases the temperature by allowing hot water to bypass to the waste tank.

CAUTION:

DO NOT operate this unit without constant water flowing into the console.

The water **low-pressure switch** will automatically shut the unit down if the water pressure in the system drops below 50 PSI.

The water **high-pressure switch** will automatically shut the unit down if the water pressure in the system exceeds 1200 PSI.

Before proceeding, be certain that the control panel indicators are at the following settings:

Engine – IDLE (Throttle Control Out)
Engine Choke – PULL OUT

NOTE: It will not be necessary to pull the choke out if the engine is already warmed up.

4. Turn the **ignition switch** to the START position while holding the **water pump switch** to the left (override position). The engine will start. Continue to hold the **water pump switch** in the override position until pressure is indicated on the pressure gauge.

NOTE: If your unit fails to build water pressure after 15 seconds, check for adequate water supply. If necessary, see "Loss of Water Pump Pressure" in the "Troubleshooting" section of this manual.

5. After starting the engine, push the **choke** in. After the engine has warmed up, push the **throttle** all the way in and lock it in the full throttle position.

Allow adequate time for the unit to warm up before beginning the cleaning operation, approximately 5-15 minutes.

8. PRIMING THE CHEMICAL PUMP

NOTE: PROCHEM recommends that the chemical pump be primed whenever the water pump is ON. This will eliminate possible pressure fluctuations and water pump pulsations related to a dry chemical pump.

1. Place the **chemical inlet tube** and the **chemical prime tube** into the chemical container.

NOTE: When placing the **chemical inlet tube** into the **chemical container**, make certain that it stays fully submerged since the chemical pump will not function if air is allowed to enter the inlet line. **DO NOT** operate the chemical pump without the inlet strainer properly installed.

2. Turn the **chemical selector valve** on the control panel to the PRIME position. The chemical will then flow from the chemical container through the chemical prime tube.

If the chemical does not flow, then:

a) Put the **chemical prime tube** into the **vacuum inlet** on the unit and seal off the vacuum inlet. The vacuum will quickly pull chemical from the chemical container. When the chemical starts to flow, turn the **chemical selector valve** to OFF, place the **chemical prime tube** back into the container, and turn the **chemical selector valve** back to PRIME to continue the procedure.

b) Once continuous chemical flow without air bubbles has been achieved, turn the **chemical selector valve** from PRIME to METER. With the **cleaning tool** open, observe the **flow meter** and adjust the **chemical metering valve** until the desired rate of chemical flow is obtained (the **chemical metering valve** is located on the control panel below the flow meter).

9. WASTE PUMP

1. If your unit is equipped with an **automatic waste pump**, connect one end of a garden hose to the **pump-out connection** on the console and the other end to an **appropriate waste disposal**.

2. Turn the **pump-out switch** on the control panel to the ON position. The waste pump will operate automatically throughout the cleaning operation.

We recommend that you use a 3/4" I.D. water hose as a waste pump outlet hose. **DO NOT** use a hose smaller than 5/8" I.D.

NEVER use your automatic waste pump outlet hose as a water inlet hose.

WARNING!

NEVER dispose of waste in storm drains, water ways, or on ground areas. Always dispose of waste in accordance with Local, State, and Federal laws.

10. OPERATION

Once you have completed steps 1 through 9, proceed with the cleaning operation. Your unit should be in the full throttle position when cleaning or extracting. A **float switch** located inside the waste tank will automatically shut down the unit when it reaches its full capacity. When this occurs, empty the waste tank before continuing.

EXHAUST DIVERTER VALVE

The **exhaust diverter valve** allows you to direct exhaust through either:

a) the **engine exhaust HEAT EXCHANGER** for high temperature cleaning, or

b) through the **exhaust MUFFLER** for extraction, such as flood restoration.

When the **exhaust diverter valve** is in the MUFFLER position, a microswitch automa-

tically shuts off the water pump. This protects the water pump from excessive heat during flood restoration work.

An **override switch** on the control panel will enable you to turn the water pump ON, when in the MUFFLER position. Make certain that this switch is in the OFF position during flood restoration.

11. CLEANING

Observe the following guidelines, while cleaning:

1. Before proceeding make sure the nozzles are functioning properly.

a) 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 nozzles.

b) If the nozzles are not showing a full spray pattern, adjust nozzles for proper pattern, clean, or replace nozzles, if required.

2. 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 push and pull strokes. Always finish up an area with a vacuum pull stroke.

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

4. The unit will automatically shut-down when the waste tank is full. This will prevent water being drawn into the vacuum pump. If shut-down occurs, empty the waste tank before proceeding.

WARNING!

NEVER dispose of waste in storm drains, waterways, or onto the ground. Always dispose of waste in accordance with Local, State, and Federal laws.

12. UPHOLSTERY CLEANING

Upholstery Tool, Part #60-950422
Multi-Head Tool, Part #60-950464

1. Since the upholstery and multi-head tools have a lower flow rate and smaller orifices, operate the unit with the **diverter valve** in the MUFFLER position and the **water pump switch** ON. This will prevent excessive heat in the water pumping system and limit bypass flow into the waste tank while cleaning upholstery.

2. To further reduce heat, slightly open the **heat bypass valve** located on the lower front panel. **NOTE:** If the unit is so equipped, turn the automatic **waste pump-out switch** ON. This will compensate for the extra bypass flow to the waste tank.

3. Use one (1) "80015" spray tip in either tool.

4. Pressure adjustment below 300 PSI should be made at the tool itself, by using the adjusting knob located on the valve.

13. STAIR TOOL CLEANING

Stair Tool, Long, Part #60-950421
Stair Tool, Short, Part #60-950450

1. Turn the **diverter valve** to the HEAT EXCHANGER position. Set the **temperature control** to the desired temperature setting.

2. To further reduce heat, slightly open the **heat bypass valve** located on the lower front panel. **NOTE:** If the unit is so equipped, turn the automatic **waste pump-out switch** ON. This will compensate for the extra bypass flow into the waste tank.

3. Use one (1) "9502" spray tip in your stair tool.

14. FLOOD RESTORATION

CAUTION:

Set the temperature control on the control panel to 150°F and open the heat bypass valve by turning the knob counter-clockwise. This will prevent excessive heat in the water pumping system.

During flood restoration, turn the diverter valve to the MUFFLER position and extract. The water pumping system is now OFF. Make certain that the water pump override switch is OFF to prevent all water being exhausted out of the water box and running the pump dry.

15. SHUTDOWN AND DAILY MAINTENANCE

1. Run fresh water through the **chemical injection system** to flush out chemicals.

2. We recommend removing as much moisture from your **vacuum hoses** as is reasonable. This will prevent spillage of solution in your vehicle when replacing hoses.

3. Position the **throttle control** to the first notch (low speed).

4. Disconnect the **vacuum hoses** from the unit.

5. Open the **heat bypass valve** two (2) turns and allow the unit to cool down to 180°F or less, and then close the **heat bypass valve** completely. **DO NOT** over-tighten the valve.

6. Pull the **throttle** all the way out to idle and allow the unit to run for **1 minute** in order to remove all moisture from the **vacuum pump**.

NOTE: If finishing for the day: Push the throttle all the way in, plug the **vacuum inlets** and spray WD-40 (or equivalent) into the **vacuum lubrication cup** (located at front of console) for **5 seconds**. This will lubricate the **vacuum pump**. Pull the **throttle** back to idle and continue to step #7.

7. Turn the **ignition switch** to the OFF position.

8. Turn the **water supply faucet** off. Bleed the pressure out of the **water supply hose** by loosening the hose at the water supply. Unhook the **water supply hose** and store in vehicle.

9. Relieve pressure from the **cleaning tools and pressure hoses** by activating the valve on the tools. Disconnect the **tools and pressure hoses** from the unit and store all items.

10. Drain the **waste tank** and dispose of waste in a proper manner.

WARNING!

NEVER dispose of waste in storm drains, water ways, or on ground areas. Always dispose of waste in accordance with Local, State, and Federal laws.

11. Remove the **strainer basket** from the waste tank, clean out any accumulated debris, and re-install. Inspect the **vacuum inlet filter** inside the **waste tank**. If there is any lint or debris, remove and clean filter.

NOTE: When removing the **vacuum inlet filter**, grip the plastic hexagonal section of filter. Grasping filter by the screen may collapse or ruin the filter. Re-install the filter hand-tight. **NEVER operate this unit with this filter removed, damaged or improperly installed.**

NOTE: When replacing this filter, we recommend using the stainless steel PROCHEM filter (Part #14-806518 for PERFORMER, #14-806509 for PERFORMER 405) only. This will prevent rust and corrosion from entering the vacuum system.

12. At the end of your work day, rinse out the waste tank with fresh water. DUO Deodorizer may be added to the waste tank to inhibit the growth of bacteria.

13. Clean the unit, tools, hoses, van interior, etc., as needed. Inspect ALL equipment for any damage, wear, leaks, etc.

16. FREEZING PROTECTION

CAUTION:

If the unit is exposed to freezing weather the water in the unit may freeze, causing SERIOUS DAMAGE to the unit. To avoid this, the following is recommended during the cold weather season:

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

While in operation, avoid long shutdowns as the unit provides heat while running. Shut it down just prior to leaving for the next job.

If a heated building is not available, we recommend that you winterize the unit with anti-freeze. At present, it is only possible to winterize units which do not have an auxiliary water tank. Units with auxiliary water tanks must be stored in a heated building when not in use.

ADDING ANTI-FREEZE TO YOUR UNIT:

1. Shut off the water supply. Disconnect the **water inlet hose** from the front of your console.

2. Connect all **high pressure hoses and tools** that may have water in them.

3. Start the unit with the **exhaust diverter valve** in the HEAT EXCHANGER position, and open the tool valve until the low-pressure switch shuts the unit down.

4. Fill the water box with approximately two gallons of 100% glycol base anti-freeze.

5. Turn the **diverter valve** to the MUFFLER position. Close the **heat bypass valve** by turning the knob all the way clockwise.

6. Turn the **water pressure override switch** to the override position and start the unit. Turn the **water pump switch** ON.

7. Open the tool valve until anti-freeze begins to come out of the tool. Recover **ALL** anti-freeze that comes out of the tools into an approved container. We strongly recommend that you re-cycle and re-use the anti-freeze.

Repeat this procedure with all the remaining tools. After all tools and pressure hoses have been filled with anti-freeze, disconnect and store them.

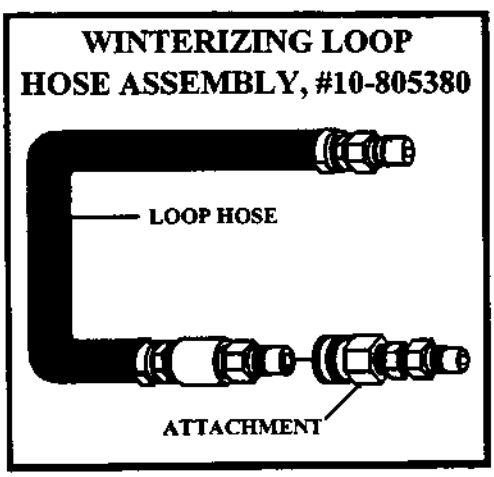
8. Turn the **water pump switch** OFF. Attach the **winterizing loop hose** with attachment, Part #10-805380, to the solution outlet connection and the water inlet connection. Turn the **water pump switch** ON.

Allow the unit to run for approximately 3 minutes with the winterizing loop hose attached.

9. Prime the **chemical system** with a 50/50 anti-freeze/water mix. Insert the chemical inlet and prime tubes into the anti-freeze container. Turn the **chemical valve** to PRIME until antifreeze begins to flow out of the prime hose.

Now turn the **chemical valve** to the ON (CHEMICAL) position, making certain that the flow meter indicates flow. Make certain that all anti-freeze drains out of the chemical hose into an approved container.

After 20 seconds, turn the **chemical valve** to the OFF position.



10. Open the **heat bypass valve** by turning the knob counter-clockwise. After 10 seconds, close the **heat bypass valve.**

Turn the **temperature control** on the control panel to 50°F for 10 seconds.

11. After completing these procedures, shut the unit down. The unit is now "winterized".

REMOVING ANTI-FREEZE FROM THE UNIT:

1. Connect one end of the **winterizing loop hose** to the solution outlet connection. Place the other end of the loop hose, without the attachment, into an approved container.

2. Start the unit. Allow the anti-freeze to flow into the container until the low-pressure switch shuts the unit down.

3. Fill the water box with fresh water and repeat step #2.

4. Connect the **water inlet hose** to the water inlet connection on the console. Turn the water supply on.

5. Connect all **solution hoses and any tools** which require purging of anti-freeze to the solution outlet connection(s).

6. Open the tool valves and drain the anti-freeze into an approved container until the flow is clear and all anti-freeze is purged from the tools and hoses.

7. Place the chemical prime hose into the approved container. Submerge the chemical inlet hose in water. Turn the **chemical valve** to the PRIME position until clear water comes through the prime hose, and then remove the prime hose from the container.

Turn the **chemical valve** to the ON(CHEMICAL) position. This will allow water to flow into the other side of the system.

Once all of the anti-freeze is removed, the unit is ready to use.

Eventually, the anti-freeze in your storage container will become diluted with water. If the anti-freeze level drops below 50% of the total, dispose of it and start with fresh 100% anti-freeze.

WARNING!

When disposing of used anti-freeze, observe local laws and regulations. Where permitted, we recommend disposal in sanitary sewer systems. Do not drain onto the ground or into storm drainage systems.

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MAINTENANCE CHART

daily maintenance

Engine	**daily**	Check engine oil level.*** Fill to proper level.
Engine	**daily**	Check coolant level in overflow bottle.
Vacuum Pump	**daily**	Spray WD-40 in lubrication cup at front of console for 5 sec.
Water Pump	**daily**	Check oil level.** Fill to proper level.
Vacuum Inlet Filter (in waste tank)	**daily***	Clean filter, inspect, replace if damaged.
Vacuum Hoses	**daily**	Wash out with clean water.
(Optional) Automatic Waste Pump	**daily***	Inspect and remove any debris or sediment.
Vacuum Pump	**weekly***	Check oil level. Fill to proper level.
Water Pump Inlet Filter (in water box)	**weekly***	Check for debris and clean.
Battery	**weekly***	Check for proper fluid level. Fill with distilled water only.
Bypass Manifold Orifice & Strainer	**weekly***	Inspect and remove any debris or blockage.
Solution Outlet Y-Strainer	**monthly***	Inspect and remove any debris or blockage.
High Pressure Hoses	**25***	Inspect for damage or impending damage.
Pressure Regulator	**100**	Lubricate o-rings.
Engine	**100**	Change engine oil.***
Engine	**100**	Change oil filter.***
Battery	**100***	Clean battery terminals.
Engine	**100**	Check fan belt tightness.
Engine	**200**	Service air cleaner element.*
Engine	**200**	Check radiator hoses and clamp tightness.
Engine	**200**	Check spark plugs for carbon deposits and proper gap.
Heat Bypass and Chemical Valves	**200***	Inspect and/or adjust packing nuts.
Temperature Solenoid	**200***	Remove any hard water deposits.
Vacuum Exhaust Heat Exchanger	**200**	Inspect core and remove debris.
Water Pump	**500**	Change oil.**
Vacuum Pump	**500**	Lubricate bearing on pulley end with grease.
Pulley Set Screws & Hub Cap Screws	**500**	Check for proper torque values. Re-torque, if required.****
Drive Pulleys	**500**	Inspect, clean, and check for pulley groove wear.****
Drive Pulleys	**500**	Check pulley alignment.****
Drive Belts	**500**	Inspect and clean.****
Drive Belts	**500**	Check belt tension.****
Engine	**1000**	Replace spark plugs.
Engine	**1000**	Flush radiator and change engine coolant.
Engine	**1000**	Drain and refill engine governor oil.
Chemical Pump & Check Valves	**1000**	Replace diaphragm and check valves.
Check Valve (Solution Outlet)	**1000**	Inspect, clean, and repair, if needed.
Vacuum Pump	**1500**	Drain, flush, and replace oil.*****
Engine	**yearly***	Replace in-line fuel filter on engine.
Engine	**yearly***	Replace air cleaner element.
Nitrogen Accumulator	**yearly***	Check and have re-charged with nitrogen, if required.
Engine	**2 years**	Replace radiator hoses and hose clamps.
Engine	**3 years**	Replace ignition wires.

* Or as often as required.

** Change water pump crankcase oil after the **first 50 hours** of operation.

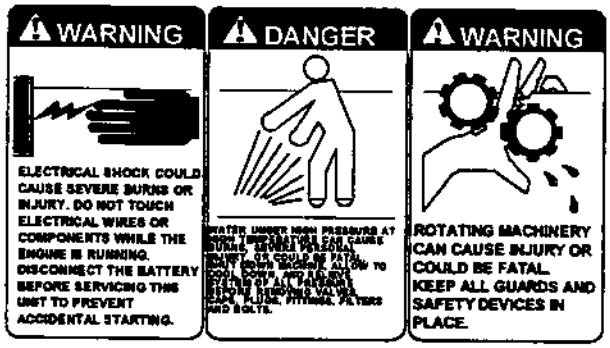
*** Change engine crankcase oil and filter after the **first 50 hours** of operation.

**** Perform drive belt, pulley, & hub maintenance after the **first 25 hours** of operation, and then again at **100 hours**.

***** If using **AEON PD** synthetic lubricant, **4500 hours** or every **2 years, whichever comes first.**

6 MAINTENANCE

This chapter of the operator's manual contains the maintenance information for this unit. Initiation of a planned preventative maintenance program will assure that your PROCHEM PERFORMER/PERFORMER 405 has optimum performance, a long operating life, and a minimal amount of "down" time.



WARNING!

DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

NOTE: Use the hour meter as a guide for coordinating the maintenance schedule.

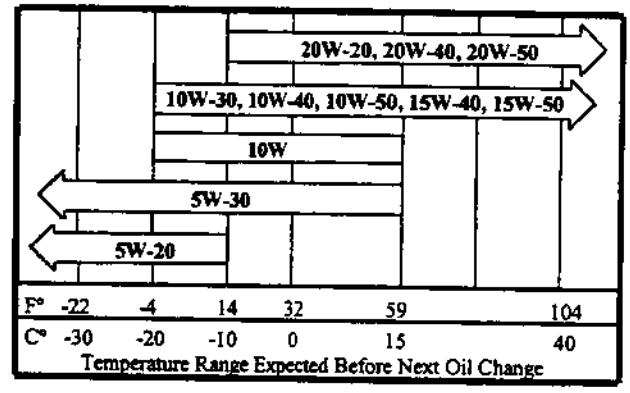
1. ENGINE

1. Check the engine oil level **daily**, when in use. Make certain that proper oil level is maintained. **NEVER** overfill.

2. Change the break-in oil after the first **50 hours** of operation. Thereafter, change oil every **100 hours** of operation. USE ONLY NISSAN BRAND OIL FILTERS. USING ANY OTHER TYPE OIL FILTER WILL VOID YOUR ENGINE WARRANTY.

Oil Recommendation. Use high-quality detergent oil of at least API (American Petroleum Institute) service class SF or SG. Select the viscosity based on the air temperature at the time of operation as shown in the following table:

RECOMMENDED SAE VISCOSITY GRADE



NOTE: Using less than service class SF or SG oil or extending oil change intervals longer than recommended can cause engine damage.

3. Re-torque the manifold and exhaust tube nuts, cylinder head bolts, and carburetor attaching nuts after the **first 200 hours** of use.

4. Check the oil level in the engine governor every **250 hours**. When empty, the governor requires approximately 1-1/2 fluid ounces of 30 weight non-detergent oil (see Figure 18).

Drain and refill the engine governor every **1000 hours**.

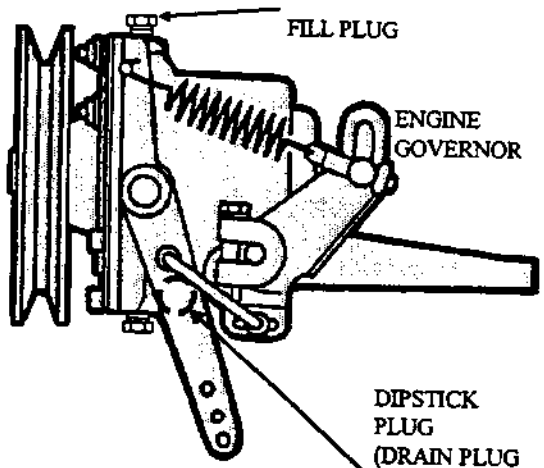
5. Check the spark plugs every **200 hours**. Clean if necessary. Replace the spark plugs every **1000 hours**. **NOTE:** Never sandblast spark plugs. Spark plugs should be cleaned by scraping or wire brushing.

6. Clean the air cleaner element every **200 hours**. Replace the element every **2400 hours**.

Figure 18 ENGINE GOVERNOR

CHECK ENGINE GOVERNOR OIL LEVEL EVERY 250 HOURS

WHEN FILLING, REMOVE THE GOVERNOR FILL PLUG AND, USING A SYRINGE OR OTHER MEASURABLE FILLING DEVICE, ADD 30-WEIGHT NON-DETERGENT OIL. REPLACE THE FILL PLUG. WHEN EMPTY, THE GOVERNOR REQUIRES 1-1/2 FLUID OZ.



7. Check the engine idle RPM every **200 hours** and adjust, if necessary. **NEVER** adjust engine RPM without a tachometer. Refer to Nissan Engine Operation and Service Manual.

8. Check the coolant level in the radiator overflow container **daily**. If no coolant is seen, remove the cap and add coolant. Change the coolant with a 70:30 coolant to water ratio every **1000 hours**.

9. Replace the in-line gas filter **yearly**.

NOTE: For additional engine service information, obtain a "Nissan A-12 Service and Repair Manual" from any authorized Nissan Service Center. If service or repair is required, contact an authorized Nissan Service Center. You will need to provide the serial number of the engine.

2. VACUUM PUMP

Refer to the Vacuum Pump Operation and Service Manual for specific instructions.

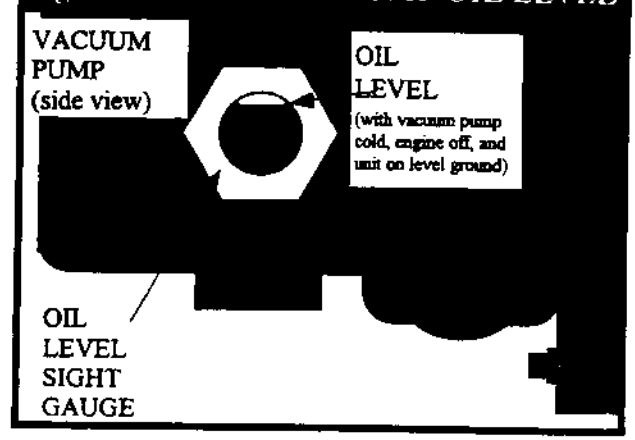
Lubrication: We recommend that you use AEON PD Synthetic Blower Lubricant in the gear end of the vacuum pump for all operating temperatures. AEON PD is formulated especially for positive displacement blower service to provide maximum blower protection at any temperature. One filling of AEON PD will last a minimum of 2 times longer than a premium mineral oil.

NOTE: AEON PD (Part# 05-008039) is the oil which PROCHEM puts in the vacuum pump at the factory. Topping off or adding petroleum oil to synthetic oil is **NOT** recommended.

If not using AEON PD synthetic blower lubricant, use oils with rust and oxidation inhibitors, anti-foam additives and the viscosities listed on the chart on the next page.

1. Check the oil level **weekly** to assure the proper level. **PROPER LEVEL** cannot be overemphasized. Too little oil will ruin bearings and gears. Too much oil will cause overheating. Use Figure 19 as a guide when adding oil.

Figure 19 VACUUM PUMP OIL LEVEL



2. 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 **1 minute** to remove any moisture from the vacuum pump. Next, fill the lubrication cup with WD-40, or a similar lubricant, for **5 seconds** while the unit is running and the vacuum inlets are sealed. Do this at the end of **each working day**.

3. Drain, flush and replace oil **every 1500 hours or yearly, whichever comes first.** Change oil more frequently if inspection so indicates. With AEON PD synthetic lubricant, perform the oil change maintenance **every 4500 hours or every 2 years, whichever comes first.**

VACUUM PUMP LUBRICANT

Blower Discharge Temperature	Oil Grade U.S.A.*	Oil viscosity, Centistokes @ 40° C
-40° to 32°F (-40° to 0°C)	SAE 10W	45
32° to 100°F (0° to 38°C)	SAE 20	100
100° to 275° F (38° to 135°C)	SAE 40	200
over 275° F (135° C)	SAE 50	250

* In applications with extreme variations in ambient temperature a 20W-50W multiple viscosity oil is recommended.

For Grease Lubricated Bearings

Service every 500 hours of operation

Blower Discharge Temperature	Type Grease
-40° to 275° F (-40° to 120° C)	No. 2 Non-Corrosive Bearing Grease

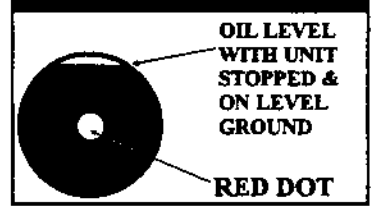
4. The bearings on the pulley end of the vacuum pump requires grease lubrication **every 500 hours**. Pack the bearings until grease comes out of the vent holes. Use extreme pressure bearing grease of the specification NLGI Grade 2 EP.

3. WATER PUMP

Refer to the Water Pump Operation and Service Manual for specific instructions.

1. Check the crankcase oil level **daily** to assure the proper level. Use Figure 20 as a guide when checking the oil level. If the level has dropped, check for the source of leakage and repair.

Figure 20 WATER PUMP CRANKCASE COVER SIGHT GLASS



2. Change the crankcase oil with Cat Pump Crankcase Oil, Part #05-008016, after the **first 50 hours** of operation. Drain and refill the crankcase oil with Cat Pump Crankcase Oil **every 500** hours thereafter.

3. Other Cat approved oil equivalents are: Mobil DTE 16, Amoco Rykow 68, and Shell Tellus T68.

4. VACUUM INLET FILTER (IN WASTE TANK)

1. The vacuum filter in the waste tank should be removed and cleaned **daily**. If this is done, the filter will last for a long period of time.

2. Inspect the vacuum inlet filter inside the waste tank. If there is any lint or debris, remove and clean filter. Re-install the filter **hand-tight**.

CAUTION:

When removing the vacuum inlet filter, grip the plastic hexagonal section of filter. Grasping filter by the screen may collapse or ruin the filter.

NOTE: When replacing this filter, we recommend using a stainless steel PROCHEM filter (#14-806518 for PERFORMER. The PERFORMER 405 requires two filters, #14-806509) only.

5. DRIVE BELTS, PULLEYS, & HUBS

1. Check pulley set screws and/or hub cap screws after the **first 25 hours** and then again at **100 hours**. Re-torque these screws with a torque wrench, using the values on the following chart. Check pulley set screws and/or hub cap screws **every 500 hours** thereafter.

CAUTION:

Make certain that when you re-torque these screws, that you use a clockwise pattern and continue until proper torque is achieved.

TORQUE VALUES		
Component	**inch/lbs**	**foot/lbs**
Engine hub	720	60
Vacuum pump hub	192	16

2. Check for pulley groove wear, clean belts and pulley grooves, check for worn belts, proper belt tension, and pulley alignment after the **first 25 hours** and then again at **100 hours**. Check for belt ride in the groove. In multiple groove drives, belt ride should be uniform, not more than 1/16" above or below top of pulley groove.

Check groove wear area for wear. Side wall of groove should be straight, not dished out. Bottom of groove should show no signs of belt contact.

Inspect belts for contaminants, such as oil or grease. Wipe belts clean with detergent and water. Inspect pulley grooves for buildup of such material and remove, if necessary.

Check wear surfaces of belt for excessive wear. If they have a slick, glazed look, belts are slipping. Check belt tension. Never replace one belt in a used set, as used belts will elongate. Replace entire set if replacement is necessary.

Place a straight-edge across the top of belt. There should be no more than 1/2" deflection in the center of the belt, halfway between the pulleys. If there is too much slack, tighten belt, making sure that it stays properly aligned.

See the "General Service Adjustments" section in this manual for details.

Check alignment with straight-edge, string, or machinist level. Correct alignment to as near perfect as possible.

6. FLOAT VALVE (WATER BOX)

Check the float valve at least once a month for proper operation. If overfilling is a problem, check the plunger for a proper seat. Replace tip on plunger if needed or damaged. Water level in the water box should be about 5-1/2" to 6".

For the procedure, see the "General Service Adjustments" section in this manual for details.

7. INLET FILTER (TO WATER PUMP)

The filter inside and on the bottom of the water box is rubber with a stainless steel screen. This should be inspected and cleaned on a **weekly** basis. Replace, if damaged.

NOTE: Vacuum all excess water and debris from water box prior to removing strainer.

8. WASTE TANK STRAINER BASKET

The strainer basket located inside the waste tank should be removed and cleaned whenever it is full of debris. This should be done on at least a **daily** basis.

9. BYPASS MANIFOLD (STRAINER AND JET BLOCK)

Check the strainer and the jet **weekly**. Remove any debris or blockage.

For the procedure, see the "General Service Adjustments" section in this manual for details.

10. Y-STRAINER (OUTLET)

Inspect the Y-strainer **after the first week** of running the unit by unscrewing the screen and remove any accumulated debris. Inspect the strainer again at **2** and **4 weeks.**

The Y-strainer should then be inspected **every month.** However, if the Y-strainer has a frequent build-up of debris it should be inspected and cleaned more often.

11. CHECK VALVE (OUTLET)

Inspect the check valve when rebuilding the chemical pump or as needed. Remove and disassemble the check valve. Check the Teflon seat for debris or abnormal wear. Clean or replace seat if needed.

NOTE: Improper seating of the check valve poppet, damaged spring, or o-rings will cause poor operation of the chemical system.

For the procedure, see the "General Service Adjustments" section in this manual for details.

12. CHEMICAL PUMP

Rebuild the chemical pump **every 1000 hours.** This involves changing the diaphragm and check valves.

For the procedure, see the "General Service Adjustments" section in this manual for details.

13. CHEMICAL AND HEAT BYPASS VALVES

Examine the packing nut on the chemical selector valve, heat bypass valve, and chemical metering valve **every 200 hours.** Keeping these valve packings properly adjusted will eliminate possible leakage from the valve stems and add to overall valve life.

For the procedure, see the "General Service Adjustments" section in this manual for details.

14. NITROGEN ACCUMULATOR

Check the nitrogen pre-charge **at least once a year**. Recharge the accumulator and replace the bladder, when needed. This should be performed by an Authorized Service Center.

WARNING!

Recharge accumulator with nitrogen ONLY. DO NOT charge accumulator over 250 PSI.

15. PRESSURE REGULATOR

Lubricate the o-rings **every 50 hours.** Use o-ring lubricant Part #05-008035.

For the procedure, see the "General Service Adjustments" section in this manual for details.

16. VACUUM HOSES

To assure maximum hose life, we recommend that the hoses be washed out with clean water at the end of **each working day.**

17. CATALYTIC AIR PUMP

Check and/or replace the air pump every **1500 hours**. When replacing, it will also be necessary to replace the air pump pulley.

18. TEMPERATURE SOLENOID

Remove hard water deposits from the temperature solenoid every **200 hours** or as often as required.

For the procedure, see the "General Service Adjustments" section in this manual.

19. BATTERY

WARNING!

Dangerous Acid, Explosive Gases!

Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries produce explosive hydrogen gas while being charged. To prevent a fire or explosion, charge batteries only in well ventilated areas. Keep sparks, open flames, and other sources of ignition away from the battery at all times.

Keep batteries out of the reach of children. Remove all jewelry when servicing batteries. Before disconnecting the negative (-) ground cable, make sure all switches are OFF. If ON, a spark will occur at the ground cable terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. When disconnecting the battery, ALWAYS disconnect the negative (-) terminal FIRST.

1. Check the fluid level in the battery **every 25** hours or **once a week.** If low, fill to the recommended level with **distilled water ONLY.**

NOTE: DO NOT overfill the battery. Poor performance or early failure due to loss of electrolyte will result.

2. Keep the cables, terminals, and external surfaces of the battery clean. A buildup of corrosive acid or grime on the external surfaces can cause the battery to self-discharge. Self-discharge occurs rapidly when moisture is present.

The battery terminals should be cleaned **every 100** hours to prevent corrosion build-up. Wash the cables, terminals and external surfaces with a mild baking soda and water solution. Rinse thoroughly with clear water.

CAUTION:

DO NOT allow the baking soda to enter the battery cells as this will destroy the electrolyte.

20. ENGINE EXHAUST HEAT EXCHANGER

If the engine and/or air pump are not properly maintained, the exhaust gases may deposit carbon on the outside of the heat exchanger coil and affect the cleaning solution temperature and damage the catalytic converter. If this condition exists, remove the heat exchanger from the unit and clean the carbon off the coil. This may be done by taking it to a radiator dealer and having it boiled out. **The catalytic converter must be completely removed before cleaning carbon deposits or damage may result.**

Proper maintenance of the unit, such as regular tune-ups, proper fuel, and a properly operating air pump will help prevent carbon build-up on the coil and increase the life of the unit.

Using A212 ULTRA CLEAN INDUSTRIAL CLEANER or A217-1 ULTRAPAC RENOVATE will also greatly enhance the removal of carbon deposits. Soak the coil and casing **ONLY, NEVER** soak the catalytic converter core.

21. VACUUM EXHAUST HEAT EXCHANGER

Removing and cleaning the vacuum exhaust pre-heater cores is recommended as needed or if the unit was operated with the vacuum inlet filter damaged, removed, or improperly installed. Pull out the core and remove all debris, being **careful not to drive debris deeper into the core.** We recommend removing the debris with water by either submerging the core and moving it back and forth until the debris loosens and falls off or by spraying the debris out of the core. Allow the core to dry before reinstalling.

22. HIGH PRESSURE HOSES

Inspect your high pressure hoses for wear after the **first 100 hours** of use. Inspect **every 25 hours thereafter**. If hoses show any signs of damage or impending rupture, **replace the hose.**

WARNING!

DO NOT attempt to repair high pressure hoses! Repairing high pressure hoses may result in severe burns and serious injury!

All high pressure hoses must be rated for 3000 PSI at 250°F. Thermoplastic hoses do not meet these specifications and should not be used. Severe burns and injury may result if the hoses do not meet these requirements.

23. OPTIONAL WASTE PUMP-OUT

At the end of each work day, make certain that you remove any debris or sediment which may be inside the waste pump.

Remove the waste pump unit from the waste tank and clean inside the screen at least **once a week, or more frequently if required.**

24. TEMPERATURE PROBE PACKING

Examine the temperature packing assembly for leaks every **200 hours**. Tighten the packing nut fitting just enough to stop leaks. **DO NOT** over-tighten.

For the procedure, see the "General Service Adjustments" section in this manual.

7 SERVICE GENERAL ADJUSTMENTS

WARNING!

DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

1. ENGINE SPEED

1. The PERFORMER/PERFORMER 405 uses a governor to set and maintain engine speed. The engine speed is adjusted by shifting the throttle adjustment lever located on the front panel. The throttle adjustment lever has three positions. The first position is idle, 900 RPM. At this position the throttle adjustment lever is pulled out and is not locked in at the console. The throttle adjustment lever has two notches at its base. Push in the throttle adjustment lever to the first notch and lock in position for low speed, about 1900 RPM. Push in and lock the throttle adjustment lever at the second notch for high speed, 2400 RPM.

2. The throttle adjustment lever is attached to a governor. The governor has internal weights that apply pressure to a shaft gear with an extending arm. Attached to the arm is the carburetor linkage, adjusting engine speed. **NOTE:** Units are pre-set at the factory.

3. Engine RPM should drop approximately 150-200 RPM on high and low speed when the vacuum inlets are covered.

LINKAGE ADJUSTMENT (Engine Off)
Unsnap the tip of the linkage from the throttle arm ball, Figure 22. Pull the throttle adjustment lever all the way out to the idle position.

While holding the throttle arm down with your finger, position the linkage underneath the ball as shown in Figure 23. The ball should barely touch the top of the adjustment arm.

If adjustment is required, loosen the locking nut, adjust the linkage to the proper length, and re-tighten the locking nut.

THROTTLE ARM ADJUSTMENT (Engine Off)
Push the throttle adjustment lever and lock at the second notch position (high speed). The lever should lock firmly. See Figure 21.

Check the governor limit screw. If the governor limit screw is not positioned firmly against the arm, tighten the governor limit screw and locking nut until firm. Do not over-tighten.

IDLE SPEED ADJUSTMENT (Engine Running)
Pull the throttle adjustment lever all the way out to the idle position. Using a tachometer, turn the idle adjustment screw, Figure 21, until 900 RPM is indicated.

HIGH SPEED ADJUSTMENT (Engine Running with the Water Pump On)
Push the throttle adjustment lever in and lock at the second notch position (high speed). Using a tachometer, adust the spring tension nut, Figure 21, until 2400 RPM is indicated.

CAUTION:

DO NOT attempt to adjust without a tachometer and NEVER adjust the engine above 2400 RPM or operate the unit over 2600 RPM. Permanent damage may occur.

NISSAN ENGINE SPEED CONTROL ADJUSTMENT

Figure 21

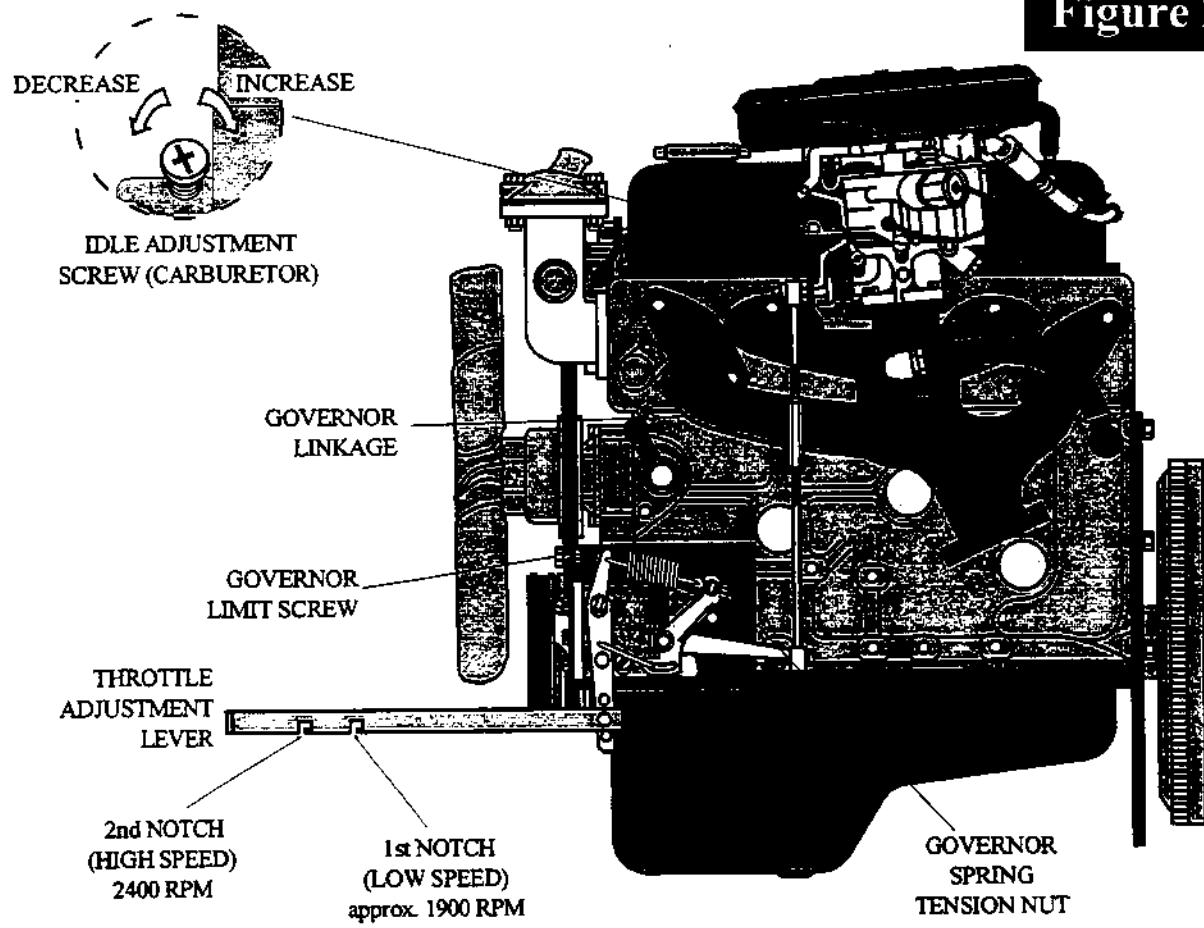


Figure 22

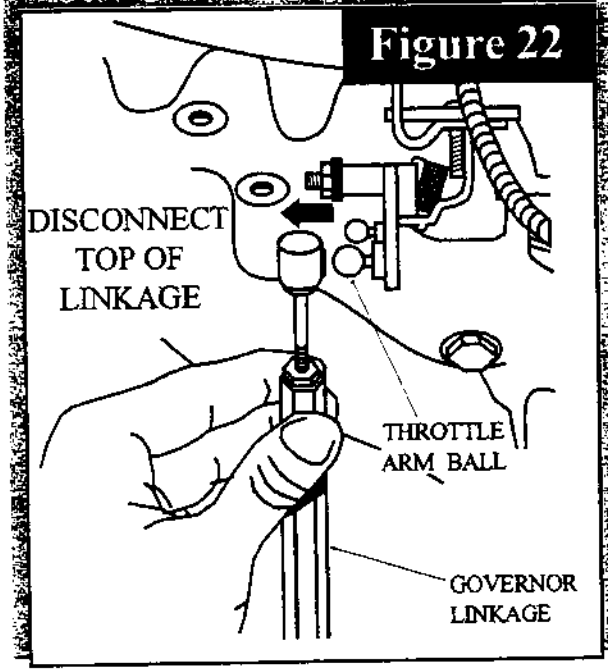
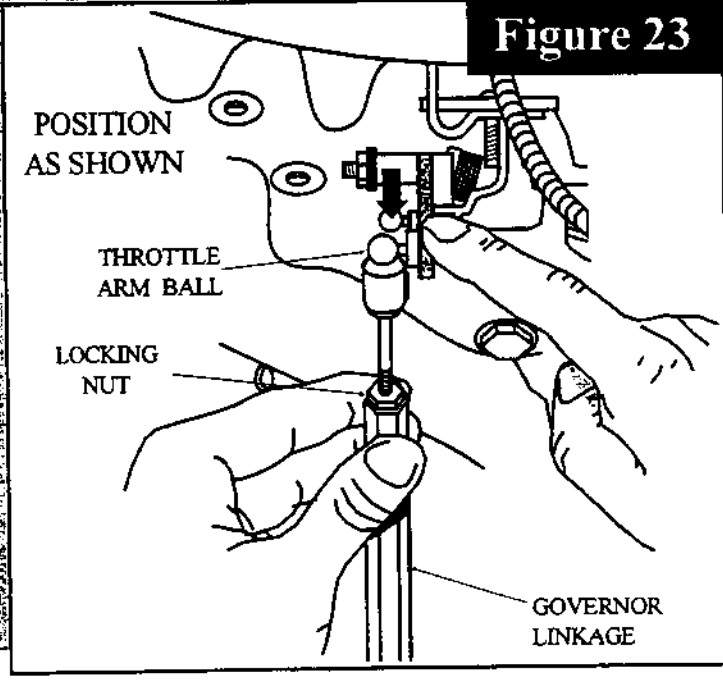


Figure 23



2. VACUUM RELIEF VALVE

While the unit is running at full RPM, block the air flow at the vacuum inlet connection and read the vacuum gauge. If adjustment is required, shut the unit down and adjust the vacuum relief valve locking nut tension. Start your unit and read the vacuum gauge. Repeat this process until the relief valve opens at 14" Hg (13" Hg for the PERFORMER 405).

3. VACUUM PUMP DRIVE BELTS

To tighten the vacuum pump belts:

1. Loosen the two nuts which hold the air pump mount in place (for units equipped with the catalytic engine exhaust heat exchanger and air pump).

2. Loosen the four nuts which hold the vacuum pump mount in place.

3. Turn the adjusting bolts until the proper belt tension is achieved (1/2" deflection in the center of the belt, halfway between the pulleys).

NOTE: When adjusting belt tension, make certain that the engine shaft and vacuum pump shaft remain parallel, and the belt tension is equal throughout the belt width.

4. After adjusting, re-tighten the four nuts which hold the vacuum pump mount in position. Check belt alignment with straight-edge.

5. Readjust and check air pump belt. **DO NOT** over-tighten belt. Re-tighten the two nuts which hold the air pump mount in place. Check belt alignment with straight-edge.

4. WATER PUMP DRIVE BELT

To tighten the water pump belt:

1. Loosen the nuts which hold the water pump mount to base.

2. Adjust the position of the belt tension adjusting bolt until the proper belt tension is achieved. (1/2" deflection in the center of the belt, halfway between the pulleys).

3. While checking the alignment, tighten the nuts which hold the water pump mount to base.

5. FLOAT VALVE (WATER BOX)

The float valve should only be adjusted if the water box is overflowing or the water level in the box is lower than 5-1/2":

1. If the box is overflowing, remove, and check the float valve for debris or damage.

NOTE: If the float ball has any water inside it must be replaced.

CAUTION:

When replacing float ball, DO NOT over-tighten, as the rod can puncture the ball. Make sure to tighten the nuts on the rod.

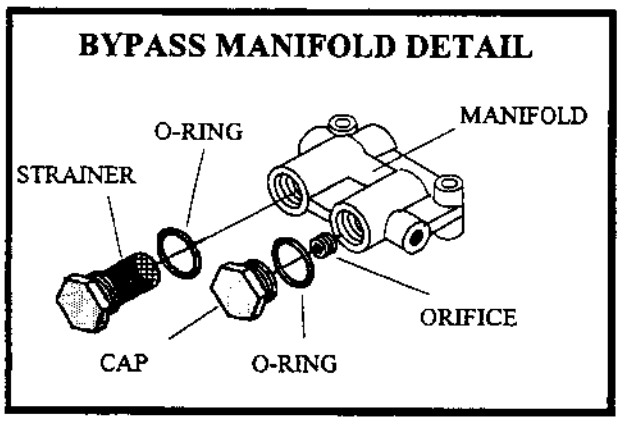
2. Disassemble the valve and check the piston and seat for damage, replace if needed. See the "Illustrated Parts Listing" for a parts break-down.

6. BYPASS MANIFOLD

Clean the bypass strainer and orifice **weekly**, using the following guidelines:

1. Remove the strainer. Clean and re-install. **DO NOT** over-tighten strainer.

2. Remove the cap. Remove the orifice, using a 3/16" Allen wrench (the 3/16" Allen wrench is provided with Part #66-945280, the bypass maintenance kit).



3. Re-install the cap and run the unit with the water pump ON for 15 seconds to flush out the bypass manifold.

4. Remove the cap and re-install the cleaned orifice, using the 3/16" Allen wrench. Tighten orifice just enough to seat. **DO NOT** over tighten. Re-install cap. **DO NOT** over-tighten cap.

NOTE: If o-ring seals leak, replace them. If strainer is damaged, replace strainer.

7. CHECK VALVE (SOLUTION OUTLET)

Inspect the check valve whenever doing service on the chemical pump or if flow problems occur in the chemical system:

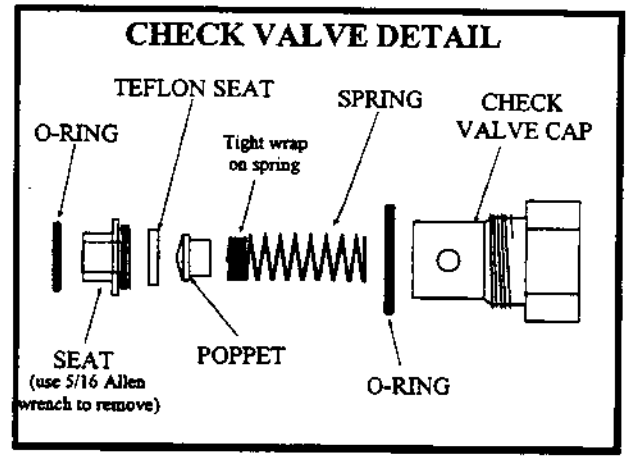
1. Remove the check valve. Be sure the small o-ring for the seat comes out with the check valve.

2. Remove the seat, using a 5/16" Allen wrench.

3. Check the Teflon seat for debris or wear. Clean or replace Teflon seat if needed.

4. Clean the poppet and spring, inspect for wear or damage, and replace as needed.

5. Re-assemble the check valve. Start the seat by hand, tighten using a 5/16" Allen wrench. **DO NOT** over-tighten seat.



NOTE: Improper seating of the check valve poppet, damaged spring or o-rings will cause poor operation of the chemical system.

6. Lubricate the o-rings with o-ring lubricant Part #05-008035 and reinstall.

8. CHEMICAL PUMP

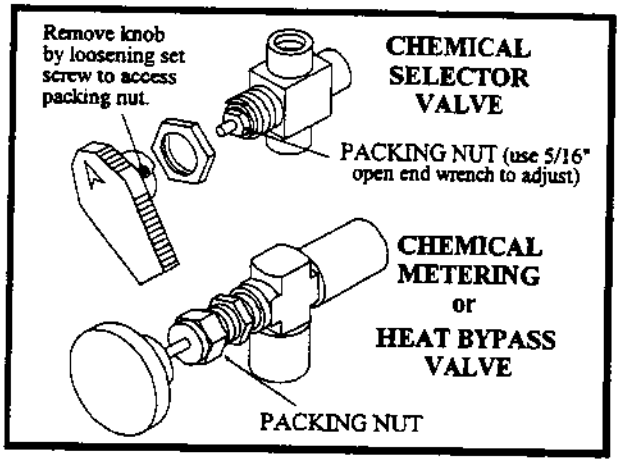
The only repairs which the chemical pump may require is the replacement of the diaphragm or check valves. To replace the diaphragm, unscrew the cover from the body. When replacing the diaphragm, lubricate the outer edges of the diaphragm with o-ring lubricant Part #05-008035 and reassemble. To replace the check valves, unscrew the check valve caps. Replace the check valves and reassemble, using new o-rings.

DO NOT attempt to re-use o-rings once the check valves have been removed. See the

"Illustrated Parts Listing" for a parts breakdown on the chemical pump.

9. PACKING NUT ADJUSTMENT FOR CHEMICAL METERING AND CHEMICAL SELECTOR VALVES

Examine the packing nut on the chemical metering, heat bypass, and chemical selector valves for proper tension every **200 hours**. When turning the knob, there should be a small amount of resistance. If not, slightly tighten the packing nut. **DO NOT** over-tighten. Keeping the valve packings properly adjusted will eliminate possible leakage from the valve stems and add to overall valve life.



10. PRESSURE REGULATOR

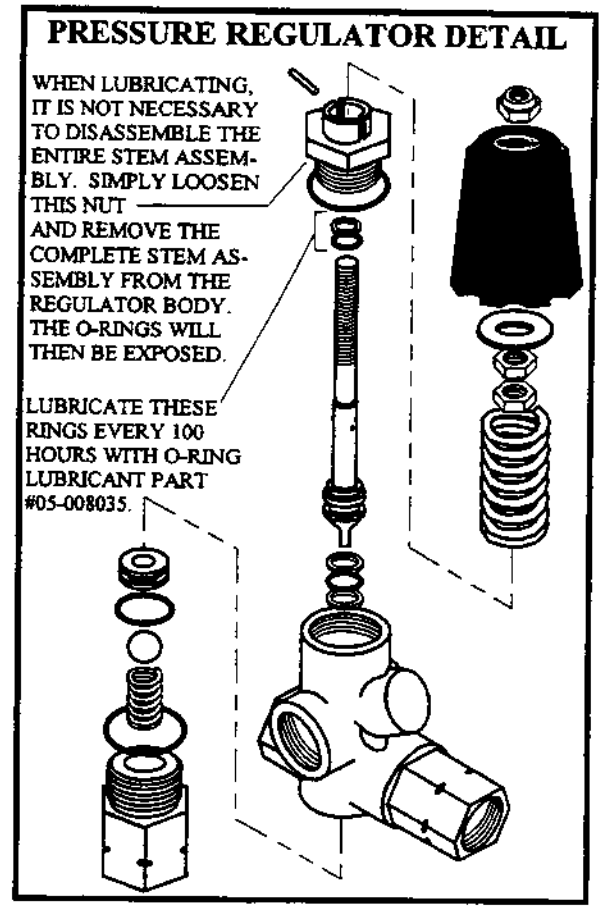
The pressure regulator serves only to hold locked up water pressure at a preset point and to bypass this water back to the water box.

To adjust:

1. With your unit running, close the cleaning tool. Check the pressure gauge. Open the tool valve. We recommend setting the pressure regulator so that the pressure gauge reads 350 PSI with the tool valve **open.**

When the tool valve is opened, there is an approximate drop of 100 PSI in pressure. **If there is a pressure drop greater than 100 PSI, it may be necessary to lubricate the o-rings in the pressure regulator.**

2. If the pressure regulator requires adjustment, turn the adjusting knob (while observing the pressure gauge on the control panel) until the desired pressure is obtained.



11. ADDING/DRAINING ENGINE COOLANT

Use a 70:30 coolant to water ratio in this unit's cooling system. **NOTE:** See the "Maintenance Chart" for specific details.

1. To drain the coolant, remove the radiator cap and turn the lower engine radiator draincock counter-clockwise. Also open the

draincock on the heli-coil and remove the lower heli-coil plug, until drained.

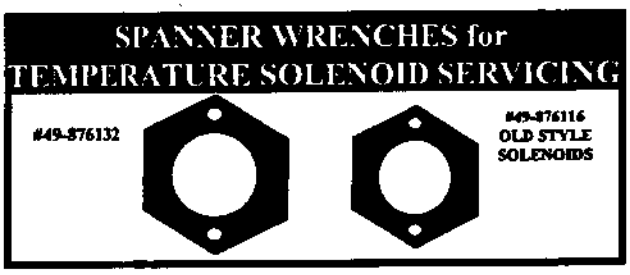
2. To add coolant, first install the heli-coil plug and fill the radiator. Next, bleed the air out of the system by turning the heli-coil heat exchanger draincock counter-clockwise. The heli-coil heat exchanger draincock is located on the heat exchanger casting on the right side of the console. After bleeding the air out of the heli-coil heat exchanger draincock, close the heli-coil heat exchanger draincock by turning it clockwise. Fill the engine radiator once again. Then add to the overflow container (fill **ONLY** halfway be-tween the "add" and "fill" marks). After running the unit, add more coolant, if necessary, into the overflow container only.

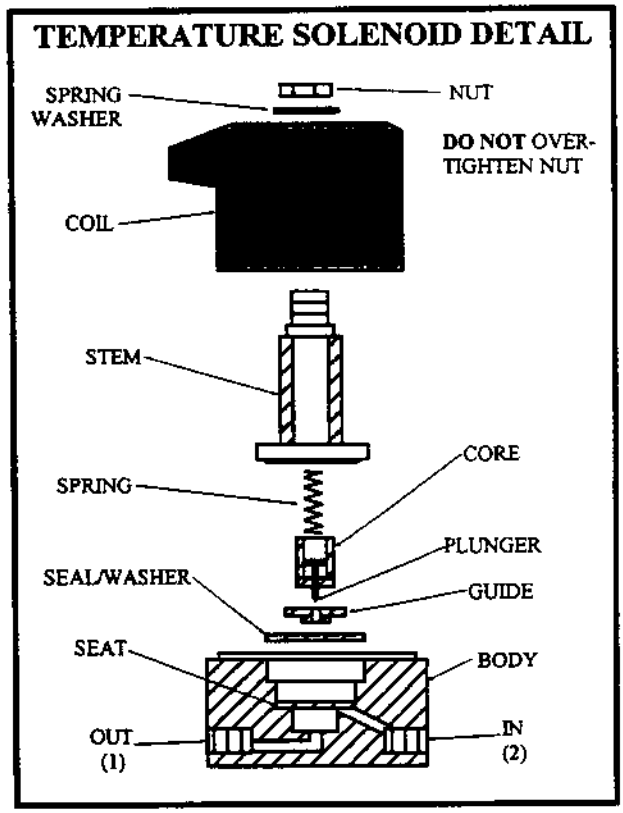
12. TEMPERATURE SOLENOID

The temperature solenoid may become seized due to hard water deposits. Make certain that the core moves freely in the stem. Also, the plunger must move freely within the guide. Clean with #0000 steel wool.

Check the seat to make sure that it is not distorted. Clean the seat, using a 3/64" drill bit. ROTATE THE DRILL BIT WITH YOUR FINGERS ONLY.

NOTE: DO NOT over-tighten nut when reassembling temperature solenoid. Over-tightening the nut will damage the coil.





13. TEMPERATURE CAPILLARY & PACKING ASSEMBLY

INSTALLATION INSTRUCTIONS

1. Using thread sealant, thread the tapered end of the union fitting into the thermostat manifold and tighten.

2. Slide the jam nut over the capillary bulb with the threaded end toward the end of the capillary bulb.

3. Insert the capillary bulb through the union fitting and into the thermostat manifold.

4. Place the rubber seal onto the capillary tube with the split facing 90° from the top (see the capillary union detail).

5. Fit the four brass disks onto the capillary tube, with two of the brass disks on each side

of the rubber seal. Face the notch on one brass disk toward the nearby brass disk to lock the brass disks together. Then face the notches on the brass disks 90° from the split in the rubber seal.

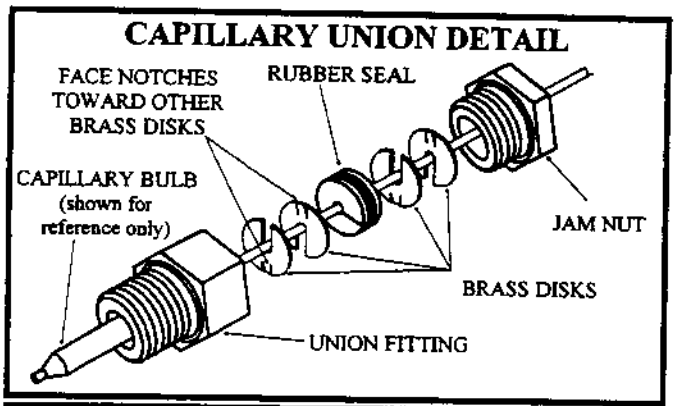
NOTE: Lubricating the facing sides of the brass disks will hold them together on the capillary tube during installation.

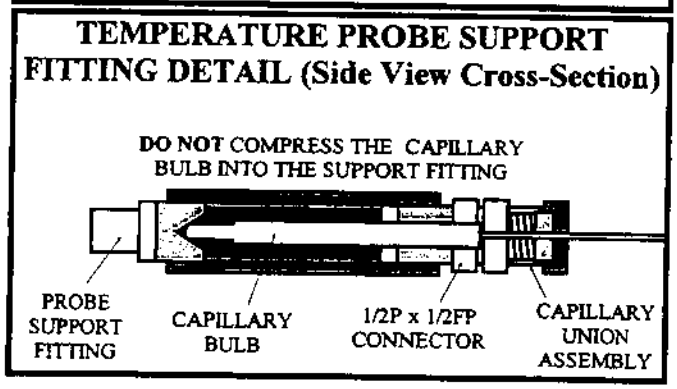
6. Insert the rubber seal and brass disks into the union fitting, hand tight.

7. Position the capillary bulb in the temperature manifold as shown in the illustration. When positioning the capillary bulb, do not allow the bulb to compress against the support fitting.

8. Tighten the jam nut lightly, about 1-1/2 turns.

9. Examine the capillary union assembly for leaks and tighten the union fitting just enough to stop leaks. **DO NOT** over-tighten.





8 TROUBLESHOOTING

WARNING!

DO NOT service this unit while it is running. The high-speed mechanical parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

This chapter of the operator's manual explains how to look for and repair malfunctions which may occur.

Intelligent, accurate troubleshooting is based on a complete and thorough understanding of the WATER, VACUUM, CHEMICAL, HEAT TRANSFER, SAFETY and WIRING systems on this unit.

If there is a malfunction occurring in a system which you do not fully understand, turn back to the "Operation" section of this manual and review "Systems".

In addition, prior to proceeding, you can save time by checking that:

1. The water supply is ON.

2. The engine speed at full throttle is 2400 RPM, with the diverter valve in the HEAT EXCHANGER position.

3. Check that water pump volume is correct. Check the pump volume with the cleaning tool closed. Measure the water flow returning to the water box from the pressure regulator. The flow rate should be 3.4 GPM. An additional .25 GPM of water should be flowing through the bypass manifold orifice, which is adjacent to the water box. If you block the heat bypass flow, the flow rate will be 3.65 GPM.

SPECIFIC PROBLEMS

1. LOSS OF WATER PUMP PRESSURE

*With the cleaning tool open, the water pressure gauge reads below the normal operating pressure. **NOTE:** If the water pump pressure drops below 50 PSI or exceeds 1200 PSI, the unit will automatically shut down.*

POSSIBLE CAUSES	CORRECTIVE ACTION
Water supply is turned off or the float valve is stuck or improperly adjusted. **NOTE:** This may also cause the water pressure switch to shut the unit down.	Turn the water supply on or up. Check for kinks in the water supply hose. Examine the float valve and adjust or replace.
Water pump inlet supply line is plugged or drawing air. **NOTE:** This may also cause the water pressure switch to shut the unit down.	Examine the water inlet filter inside the water box. Remove accumulated debris and replace if required. Check for suction leaks and loose clamps or fittings. Tighten any loose fittings or clamps. Replace any ruptured hose(s).
Improper engine speed.	Using a tachometer, check the engine speed. Full throttle engine speed is 2400 RPM. Idle speed is 900 RPM. Re-adjust in accordance with the instructions on pages 49-50 of this manual.
Pressure regulator o-rings are dry.	Lubricate o-rings, using o-ring lubricant Part #05-008035.
Pressure regulator has worn o-rings.	Check o-rings. If necessary, replace.
Pressure regulator is dirty, stuck open, or improperly adjusted.	Clean or repair pressure regulator. Adjust to working pressure. Lubricate o-rings, using o-ring lubricant Part #05-008035.
Low pump volume. (Measure the amount of water being returned to the water box from the pressure regulator. It should fill a gallon container about every 17 seconds.)	Examine the check valves, plunger cups, and cylinder head on the water pump. Repair, whenever required (refer to the water pump service manual.)
Defective water pressure gauge.	Replace gauge.
Orifice (spray nozzle) in the cleaning tool is worn, defective, or the wrong size.	Replace nozzle or change nozzle size.
Bypass manifold orifice not installed or installed improperly (threads damaged in manifold).	Check bypass manifold and orifice for proper installation and repair, if necessary.
Debris clogging water lines or water inlet disconnect.	Clean or replace as needed.
Belt loose or broken.	Re-tension or replace as needed.

2. LOSS OF SOLUTION VOLUME AT CLEANING TOOL ORIFICE

Water pressure gauge reads normal.

Plugged orifice and/or screen in the cleaning tool.	Unplug or replace orifice and/or screen.
Internal block between the pressure regulator manifold and the outlet Y- strainer, or the Y-strainer screen is clogged.	Inspect all lines, remove accumulated debris which is blocking proper flow. Replace any defective hoses. Remove, inspect, and clean the Y-strainer screen. De-scale unit and install a water softener, if necessary.
Outlet check valve is plugged.	Examine the check valve, remove any debris.
Defective quick-connect on one of more of the high pressure hoses.	Replace defective quick-connect(s) on high pressure hose(s).
Cleaning tool valve is malfunctioning.	Repair or replace valve.
Hose inner lining is constricted.	Remove restriction or replace hose.
Engine exhaust heat exchanger is scaled on inside of coil.	De-scale coil, and install the water softener, if necessary, to protect the equipment. If water contains 3-1/2 grains or more of water hardness, a water softener is needed.

3. LOSS OF VACUUM

While cleaning, the vacuum is not up to par. Engine RPM is normal.

Vacuum gauge is giving an improper reading.	Examine the tubing between the vacuum relief valve and the vacuum gauge and remove any blockage.
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, not positioned properly.	Inspect the gasket. Repair seal or replace. Re-position lid.
Plugged vacuum hose or vacuum plumbing between vacuum inlet and strainer basket.	Unplug vacuum hose or inlet plumbing.
Waste tank filter or strainer basket is plugged.	Clean or replace filter. Clean strainer basket.
Loose vacuum pump drive belts.	Tighten the drive belts.
Waste tank drain valve is damaged or left open, causing a vacuum leak.	Drain the waste tank. Close drain valve, if open. Remove the dump valve and, after inspecting, replace the defective components.

3. LOSS OF VACUUM *(continued from previous page)*

While cleaning, the vacuum is not up to par. Engine RPM is normal.

PROBABLE CAUSES	CORRECTIVE ACTION
Vacuum relief valve requires adjustment or has a vacuum leak due to damaged diaphragm.	Re-adjust the vacuum relief valve. If the vacuum does not increase, remove and inspect the relief valve diaphragm. If damaged, replace.
Vacuum exhaust heat exchangers are plugged with lint.	Remove and clean.
Vacuum pump is worn out.	Replace the vacuum pump.

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 pump check valve(s) is clogged.	Remove any debris from the chemical check valve(s). Replace chemical check valve(s) or seals, 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" in the "Troubleshooting" section in this manual.

5. CHEMICAL FLOW METER INDICATES FLOW WITH THE TOOL VALVE CLOSED

PROBABLE CAUSES	CORRECTIVE ACTION
External leak in chemical piping.	Tighten fittings. Re-apply thread sealant where required. If any fittings are damaged, replace.

5. CHEMICAL FLOW METER INDICATES FLOW WITH THE TOOL VALVE CLOSED
(continued from previous page)

PROBABLE CAUSE	CORRECTIVE ACTION
Outlet check valve is full of debris or damaged, not allowing it to close properly.	Close the chemical valve on the instrument panel. If the flow meter does not indicate flow, remove debris or replace check valve, if necessary.
Chemical pump diaphragm is ruptured.	Close the chemical valve on the instrument panel. If the flow meter still indicates flow, replace the chemical pump diaphragm.
Internal leak in chemical prime valve causing continual flow through prime tube returning to container.	Tighten valve packing nut (see "General Service Adjustments" section in this manual). Replace valve, if necessary.

6. WATER PUMP DOES NOT ENGAGE WHEN THE DIVERTER VALVE IS IN THE "HEAT EXCHANGER" POSITION

PROBABLE CAUSE	CORRECTIVE ACTION
Water pump circuit breaker has been tripped.	If the blue light is OFF, check the water pump circuit breaker on the control panel. Press the circuit breaker reset button.
Defective electrical connection in the console wiring or defective switch.	If the blue light is OFF and the water pump circuit breaker is not tripped, examine switch, electrical connections, and wiring. Repair any defective connections. If there is power going to the switch but not going out, replace the defective switch.
Water pump has not been activated.	Adjust activator arm to assure contact and activation of the microswitch. If the microswitch is defective or damaged, replace.
Defective water pump clutch. **NOTE:** The clutch may be MANUALLY set by inserting two ¼-20x1/2" bolts. Line up the holes on the clutch and insert the bolts. To disengage the pump, remove the bolts.	If the blue light is ON, check the white wire which leads from the switch to the clutch. If there is power in the switch, but no power at the clutch, replace the defective wire. If there is power at the clutch, replace the defective switch.
Loose or broken water pump belt.	Tighten or replace belt.

7. ENGINE WILL NOT START

The engine does not turn over.

PROBABLE CAUSES	CORRECTIVE ACTION
Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped circuit breaker, press the reset button.
Loose or corroded battery.	Clean, tighten, or replace the battery terminals.
Dead battery.	Recharge or replace battery.
Defective ignition switch.	Test ignition switch for power going into the switch. If there is power going in but NO power going out, replace the switch.
Defective starter motor.	Test the starter motor. If necessary, replace.
Engine problem.	Refer to the Nissan Engine Operation and Maintenance Manual.
Vacuum pump is seized.	Refer to Sutorbilt Service & Repair manual.

8. STARTER TURNS OVER ENGINE, BUT ENGINE WILL NOT START

PROBABLE CAUSES	CORRECTIVE ACTION
Waste tank is full.	Empty the waste tank.
Water pressure has not reached 50 PSI, triggering the pressure switch to prevent starting.	Turn water pump switch to the override position. If the unit shuts back down, refer to the "Loss of Water Pump Pressure" in the "Troubleshooting" section of this manual.
Engine temperature has exceeded 240°F, triggering the high temperature switch to shut the unit down.	Determine the cause of overheating before restarting the unit. See "Excessive Heating" in the "Trouble-shooting" section of this manual.
Defective fuel pump.	Replace the fuel pump.
Loose or broken wires leading to waste tank float switch.	Repair or replace any broken electrical connections.
Defective float switch in the waste tank.	Disconnect the float switch plugs and bypass the switch. If the unit starts, repair or replace the defective float switch.
Oil pressure switch (located on engine), anti-diesel solenoid (located on engine), high temperature switch (located on engine).	Test these components. If any are defective, replace. Consult the Nissan Engine Operation and Maintenance Manual.

8. STARTER TURNS OVER ENGINE, BUT ENGINE WILL NOT START *(continued from previous page)*

Defective 285°F high temperature shutdown switch (located at rear of exhaust heat exchanger).	Test. If necessary, replace.
Engine is malfunctioning.	Refer to Nissan Engine Operation and Maintenance Manual.

9. ENGINE STOPS RUNNING

While doing normal cleaning, the engine stops running.

Engine is out of gasoline.	Add gasoline to the fuel tank.
Waste tank is full.	Empty waste tank.
Water pressure has dropped below 50 PSI, triggering the pressure switch to shut the unit down.	Check water supply to your unit. Check water pump inlet screen in water box. Check supply hose for kinks.
Water pressure has exceeded 1200 PSI, triggering the pressure switch to shut the unit down.	Check pressure regulator for proper setting.
Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped circuit breaker, press the reset button.
Solution temperature has exceeded 285°F, causing the unit to shut down.	Refer to "Excessive Heating" in the "Troubleshooting" section of this manual.
Engine coolant temperature has exceeded 240°F, triggering the high temperature switch to shut the unit down.	Determine the cause of overheating **before** restarting the unit. Refer to the Nissan Engine Operation and Maintenance Manual.
Defective fuel pump.	Replace fuel pump.
Defective float switch inside the waste tank.	Disconnect the float switch plugs and bypass the float switch. If the unit starts, repair or replace the defective float switch.
Defective 240°F engine coolant high-temperature shutdown switch.	Test switch. If necessary, replace.
Oil pressure gauge on engine has shut down, due to insufficient oil pressure.	Refer to the Nissan Engine Operation and Maintenance Manual. **DO NOT** restart the engine until the cause is determined and corrected.
285°F solution temperature switch is defective.	Test switch. If necessary, replace.

9. ENGINE STOPS RUNNING *(continued from previous page)*

While doing normal cleaning, the engine stops running.

PROBABLE CAUSES	CORRECTIVE ACTION
No ignition in the engine or engine is malfunctioning.	Refer to the Nissan Engine Operation and Maintenance Manual.

10. EXCESSIVE HEATING

PROBABLE CAUSES	CORRECTIVE ACTION
Check instrumentation settings: Diverter valve is in the HEAT EXCHANGER position. Temperature bypass valve is closed. Temperature control is set at a high temperature.	Turn diverter valve to the MUFFLER position. (If cleaning, make certain that the water pump switch is in the ON position). Open the heat bypass valve. Set temperature control to a lower setting.
Strainer or orifice in bypass manifold is plugged.	Clean strainer screen and orifice. Replace, if necessary.
Defective solenoid – remains in closed position.	Inspect solenoid for proper operation. Clean, or replace, if needed.
Bypass valve is completely closed and unit is left running for a long period of time without using water.	Open bypass valve and allow system to cool down.
Defective temperature control or temperature control microswitch.	Inspect temperature control for proper operation. Repair, or replace, if necessary.
Flow restriction caused by hard water scaling.	Descale unit, repair or replace damaged plumbing components as necessary. Install water softener.

11. HEAT EXCHANGER LEAKS

PROBABLE CAUSES	CORRECTIVE ACTION
Engine and vacuum exhaust heat exchanger are damaged from frozen water.	Inspect heat exchangers for leaks. On pre-heaters visually inspect for damage. Pressure check both styles after removing them from the unit. (Maximum test pressure engine exhaust H.E. 1200 PSI, vacuum pre-heaters 300 PSI.)

NOTE: The engine exhaust heat exchanger will produce water condensation discharge at times during normal operation. **DO NOT** confuse this with a water leak.

12. LOSS OF TEMPERATURE

The heat output of the unit is LESS than normal.

PROBABLE CAUSES	CORRECTIVE ACTION
Check instrumentation settings: Diverter valve is in the MUFFLER position. Temperature bypass valve is open. Temperature control is set at a low temperature.	Turn diverter valve to the HEAT EXCHANGER position. Close the heat bypass valve. Set the temperature control to a higher setting.
Defective solenoid – remains in open position.	Inspect solenoid for proper operation. Clean, or replace, if needed.
Defective temperature control or temperature control microswitch.	Inspect temperature control for proper operation. Repair, or replace, if needed.
Temperature relief valve on water box is stuck open.	Clean temperature relief valve and test. Replace, if necessary.
Engine RPM is low.	Reset engine RPM. Refer to pages 49-50 in this manual.
Defective temperature gauge.	Test gauge and sensor. Replace failed component.
Defective air pump (catalytic converter not burning).	Replace air pump.
Engine exhaust heat exchanger is carbon-coated on outside of coil (defective air pump).	Soak coil section at a machine shop. Boil tank or soak in an industrial cleaner. Check air pump, replace if needed. **DO NOT** soak catalytic core.
Engine exhaust heat exchanger is scaled on inside of coil.	De-scale coil. Install water softener if needed.
Excessive bypass due to loose or damaged orifice.	Inspect bypass orifice. Repair or replace as needed.

13. AUTOMATIC WASTE PUMP IS MALFUNCTIONING OR NOT OPERATING NORMALLY

(for units equipped with an automatic waste pump)

PROBABLE CAUSES	CORRECTIVE ACTION
Debris interfering in the normal operation of pump, pump check valve, or float switch.	Remove pump-out from waste tank, thoroughly check all components. Inspect for proper operation.
Pump-out circuit breaker on the control panel has been tripped.	After inspecting the waste pump to determine the cause of the tripped circuit breaker, press the reset button. (Check for debris in the impeller inside the pump head.)
Defective waste pump float switch.	Replace float switch.

13. AUTOMATIC WASTE PUMP IS MALFUNCTIONING OR NOT OPERATING NORMALLY *(continued from previous page)*

(for units equipped with an automatic waste pump)

Worn out waste pump.	Check for voltage at the pump. If there is voltage and the pump does not run, replace the pump.

NOTE: When replacing either the pump or float switch, use new electrical connectors and heat shrink. Inspect connection for water tight seal.

Water has penetrated the electrical connectors.	Reseal or replace electrical connectors.
Broken wiring leading to the waste pump.	Check for voltage at the pump. If no voltage, find the broken connection and repair.
Weak battery. Battery charge too low to maintain pump-out operation.	Charge or replace battery if needed. Check charging system.
Pump wired incorrectly. Pump impeller rotates backwards.	Verify rotation using arrow marking on bottom of pump housing. Inspect wiring using a voltage meter.

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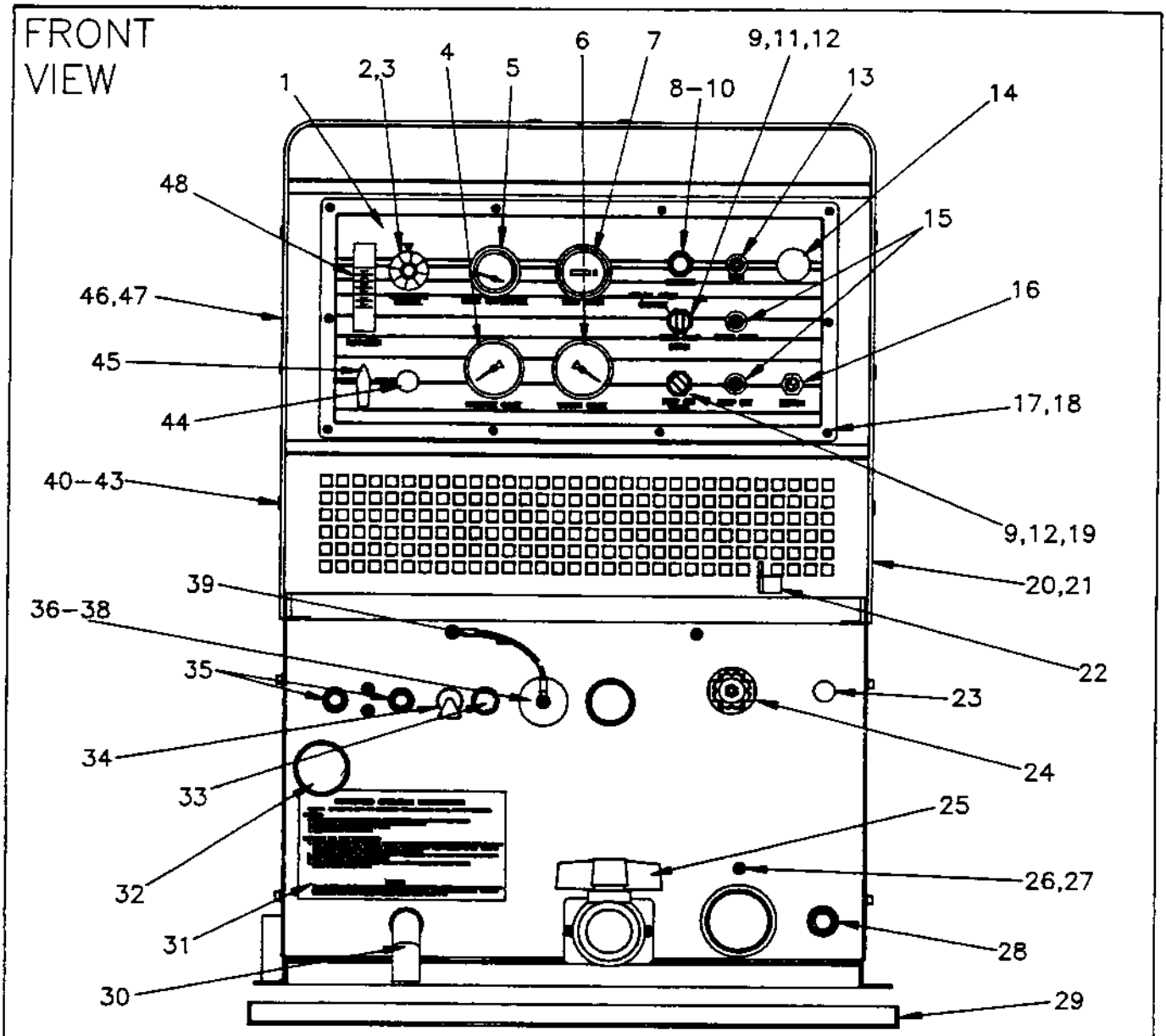
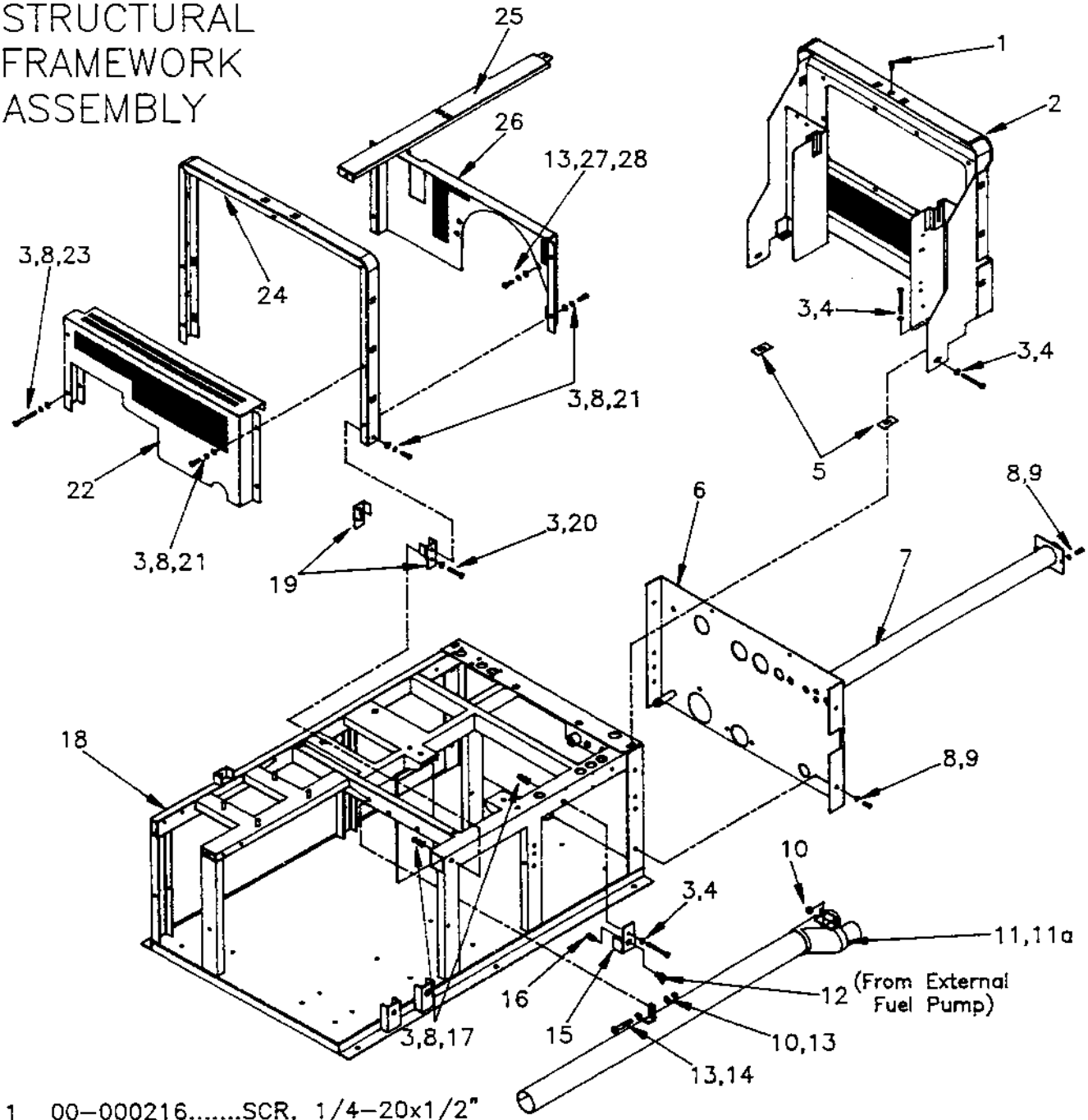


1 50–501738.....PANEL, CONTROL
2 35–900182.....CONTROL, TEMPERATURE 275deg
3 33–900193.....MICROSWITCH, TEMP CONTROL
4 18–808526.....GAUGE, WATER PRESSURE 1500PSI
5 18–808530.....GAUGE, WATER TEMP 320deg
6 18–808525.....GAUGE, VACUUM 30"Hg
7 34–903000.....HOUR METER, PANEL MT
8 34–900099.....LIGHT, INDICATING DOME RED
9 33–900169.....BULB, ROTARY SWITCH
10 34–900103.....COVER, LENS RED
11 61–950739.....ASSY, OIL/WATER OVERRIDE SWITCH
12 34–900101.....COVER, LENS RETRY SWITCH
13 33–900161.....BREAKER, CIRCUIT 30AMP
14 49–802518.....CABLE, CHOKE
15 33–900163.....BREAKER, CIRCUIT 20AMP
16 32–900198.....SWITCH, START w/KEY
17 00–000337.....SCREW, 10–32x1" SOCHD
18 01–000273.....NUT, WELL 10–32
19 32–900180.....SWITCH, RETRY ILLUMINATED
20 61–950720.....ASSY, RIGHT HOOD (Includes Parts 21 and 41–43)
21 50–501751.....HOOD, RIGHT PRF/PRF405
22 50–501679.....LEVER, THROTTLE CONTROL
23 15–808107.....VALVE, METERING 1/8FP BYPASS
24 15–808068.....REGULATOR, PRESSURE
25 15–808080.....VALVE, BALL 1–1/2FP PVC
26 02–000038.....LOCK WASHER, 1/4
27 00–000210.....SCREW, 1/4–20x3/4" SOCHD
28 13–806008.....DISCONNECT, 3/8Fx3/8FP
29 56–501845.....PAN, DRIP (Optional)
30 55–501672.....TUBE, EXHAUST DEFLECTOR
31 48–941197.....DECAL, CONDENSED OPERATING INSTRUCTIONS
32 04–000285.....KNOB, CONTROL
33 11–800168.....PLUG, 1/2 HXHD
34 19–800075.....CUP, OIL FILL 1/8P
35 13–806001.....DISCONNECT, 1/4Fx1/4FP
36 66–945236.....KIT, VAC INLET PLUG (Includes Parts 37–39)
37 52–501679.....PLUG, VACUUM INLET
38 43–810081.....O–RING, 1–3/8IDx1–3/4OD
39 64–950383.....CABLE, RETAINING VACUUM PLUG
40 01–000259.....RECEPTACLE, SNAP–IN 1/4 TURN
41 00–000272.....STUD, 1/4 TURN FASTENER
42 02–000268.....RETAINER, SPLIT RING 1/4 TURN
43 58–700023.....PAD, 1/4 TURN FASTENER
44 15–808106.....VALVE, METERING, 1/8FP CHEMICAL
45 15–808022.....VALVE, BALL 3–WAY 1/8FP
46 61–950721.....ASSY, LEFT HOOD (Includes Parts 47,41–43)
47 50–501752.....HOOD, LEFT PRF/PRF405
48 18–808513.....FLOW METER, 1/8FP

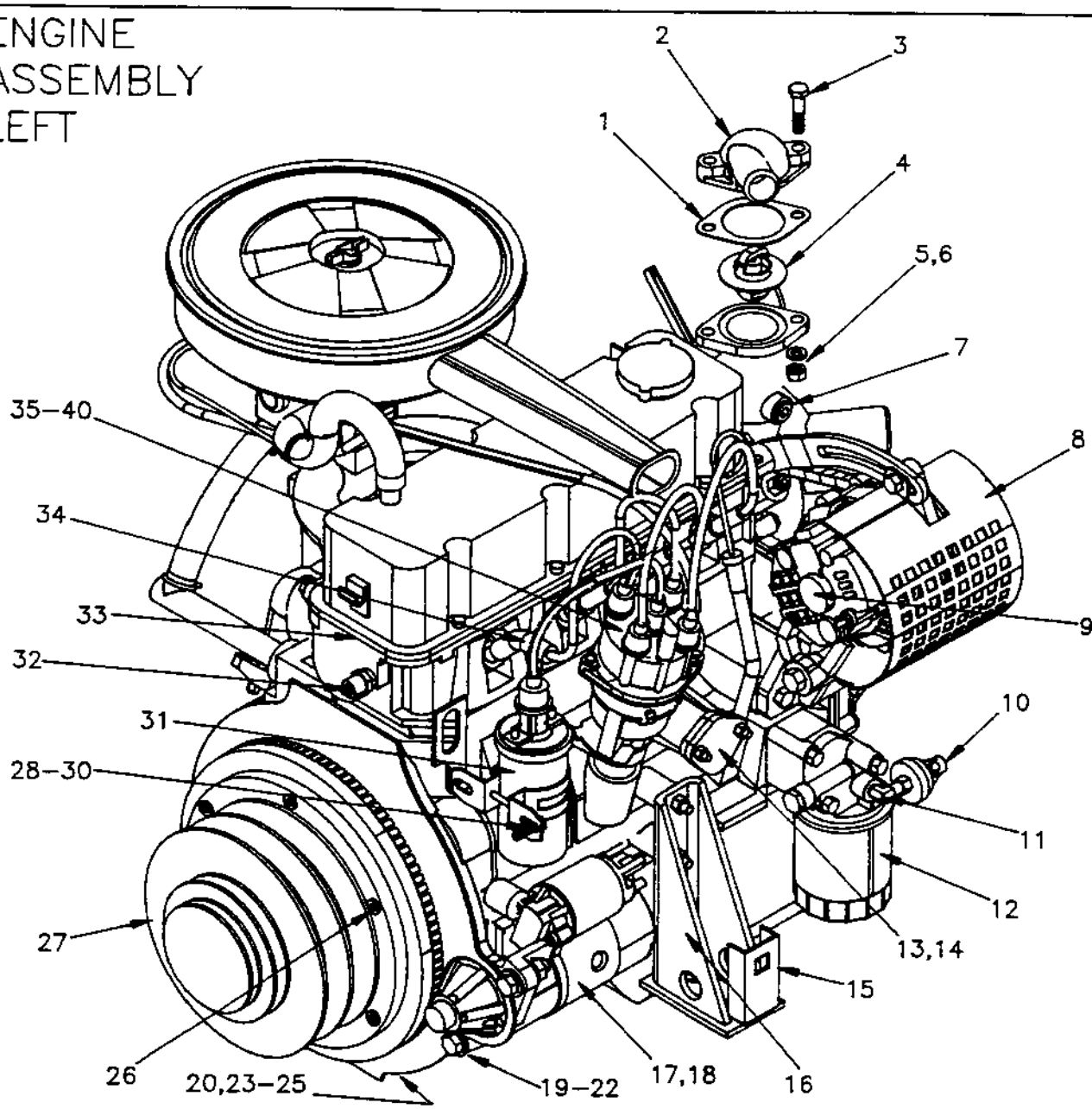
NOT SHOWN
48–941198.....DECAL, PANEL PERFORMER
48–941318.....DECAL, PANEL PERFORMER 405
48–941212.....SHEET, COMPLETE UNIT DECAL (Warn & Inst)
48–941195.....DECAL, HOOD PROCHEM

STRUCTURAL FRAMEWORK ASSEMBLY



1	00–000216.....SCR, 1/4–20x1/2"	15	56–501857.....BRACKET, FUEL LINE
2	56–501875PC...MT, CONTROL PNL	16	12–800065.....CONN, 1/8Px1/4T
3	02–000066.....FLAT WASHER, 1/4	17	01–000037.....NUT, 1/4–20 HXHD
4	00–000286.....SCREW, 1/4–20x2–3/4"	18	56–502222PC...BASE, PRF/PRF405
5	58–700024.....PAD, VIBRATION CONTR	19	56–502050.....BRACKET, HOOD MOUNT
6	56–501877PC...PANEL, LOWER FRONT	20	00–000122.....SCREW, 1/4–20x1–3/4"
7	56–501738.....TUBE, WASTE DUMP	21	00–000055.....SCREW, 1/4–20x3/4"
8	02–000038.....LOCK WASHER, 1/4	22	56–501903.....GUARD, BELT
9	00–000210.....SCREW, 1/4–20x3/4"	23	00–000142.....SCREW, 1/4–20x2–1/2"
10	01–000186.....LOCK NUT, 5/16–18	24	56–502051PC...BRACKET, REAR HOOD
11	56–502220PC...TUBE, VAC INLET PRF	25	56–502052PC...BRACKET, CENTER HOOD
11a	56–502221PC...TUBE, VAC IN PRF405	26	56–501904.....MOUNT, BELT GUARD
12	12–800040.....ELL, 1/8Px1/4T	27	02–000040.....LOCK WASHER, 5/16
13	02–000143.....FLAT WASHER, 5/16	28	00–000226.....SCREW, 8MM–1.25x20MM
14	00–000247.....SCREW, 5/16–18x2"		

ENGINE ASSEMBLY LEFT

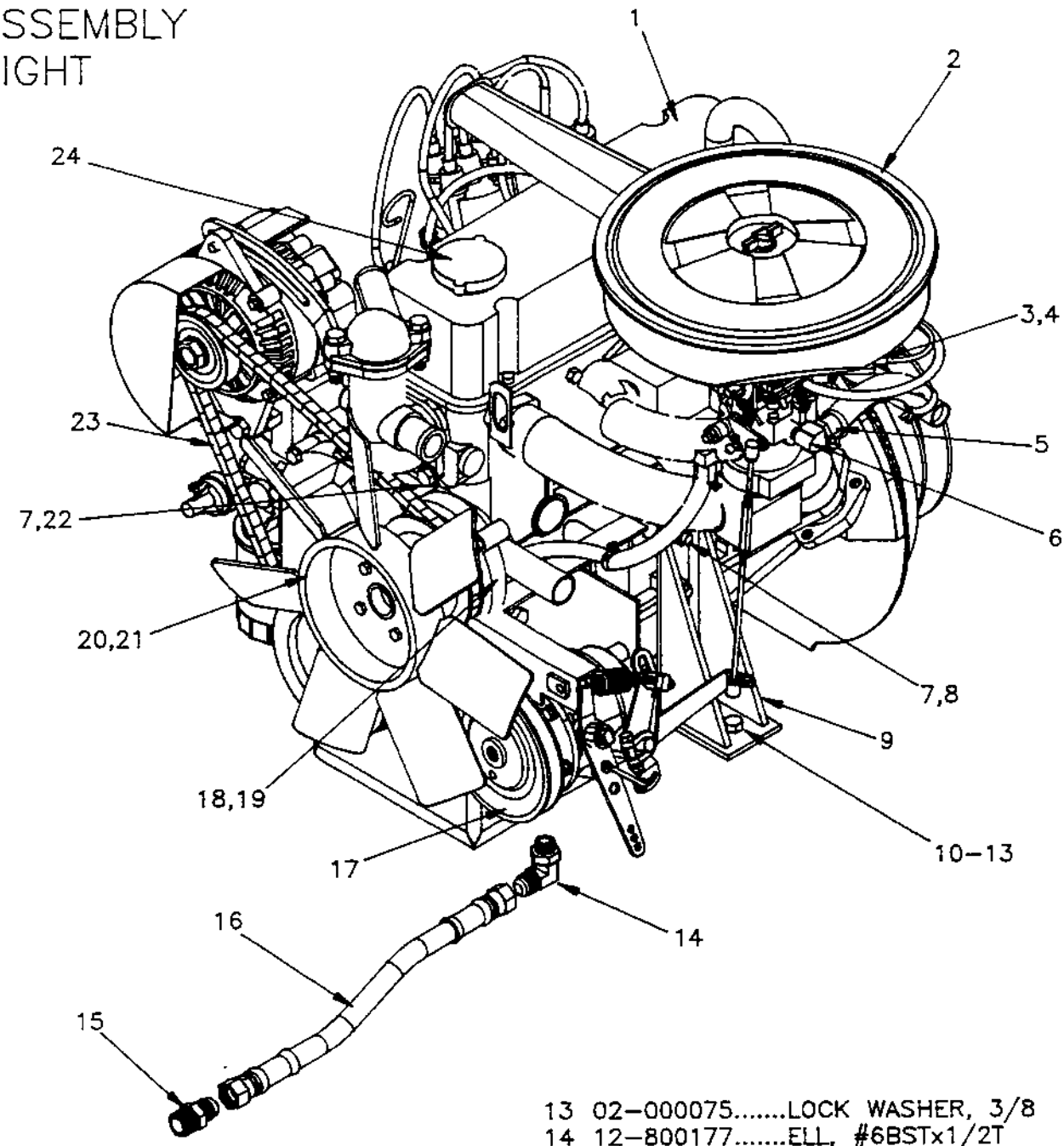


1	43–807067	GASKET, THERMOSTAT NISSAN A–12
2	42–902132	HOUSING, THERMOSTAT
3	00–000144	SCREW, 5/16–18x1–1/2" HXHD
4	35–900052	THERMOSTAT, A–12 NISSAN
5	02–000040	LOCK WASHER, 5/16
6	01–000041	NUT, 5/16–18 HXHD
7	11–800224	PLUG, 3/8 SOCHD
8	56–501740	GUARD, ALTERNATOR
9	42–902188	ALTERNATOR
10	32–900029	SWITCH, OIL PRESSURE
11	11–800014	ELL, STREET 1/8
12	42–902139	FILTER, OIL
13	50–501915	PLATE, FUEL PUMP COVER
14	42–902152	GASKET, FUEL PUMP
15	56–502006	BRACKET, LEFT HOOD
16	56–502007	MOUNT, LEFT ENGINE
17	42–902146	STARTER
18	42–902147	SOLENOID, STARTER
19	00–000222	SCREW, 7/16–14x1–1/2" HXHD
20	02–000074	FLAT WASHER, 3/8
21	02–000225	LOCK WASHER, 7/16
22	01–000224	NUT, 7/16–14 HXHD
23	00–000072	SCREW, 3/8–16x2" HXHD
24	02–000075	LOCK WASHER, 3/8
25	01–000073	NUT, 3/8–16 HXHD
26	00–000428	SCREW, 8MM–1.25x25MM SOCHD
27	52–501686	PULLEY, ENGINE PRF/PRF405
28	02–000066	FLAT WASHER, 1/4
29	02–000038	LOCK WASHER, 1/4
30	00–000055	SCREW, 1/4–20x3/4" HXHD
31	42–902144	COIL
32	35–900050	SENSOR, TEMPERATURE 240deg
33	42–902137	GASKET, VALVE COVER
34	42–902148	SPARK PLUG
35	42–902196	DISTRIBUTOR
36	42–902271	CAP, DISTRIBUTOR
37	42–902153	SEAL, DISTRIBUTOR CAP
38	42–902272	ROTOR
39	42–902352	MODULE, IGNITION
40	42–902143	WIRE SET, SPARK PLUG

NOT SHOWN

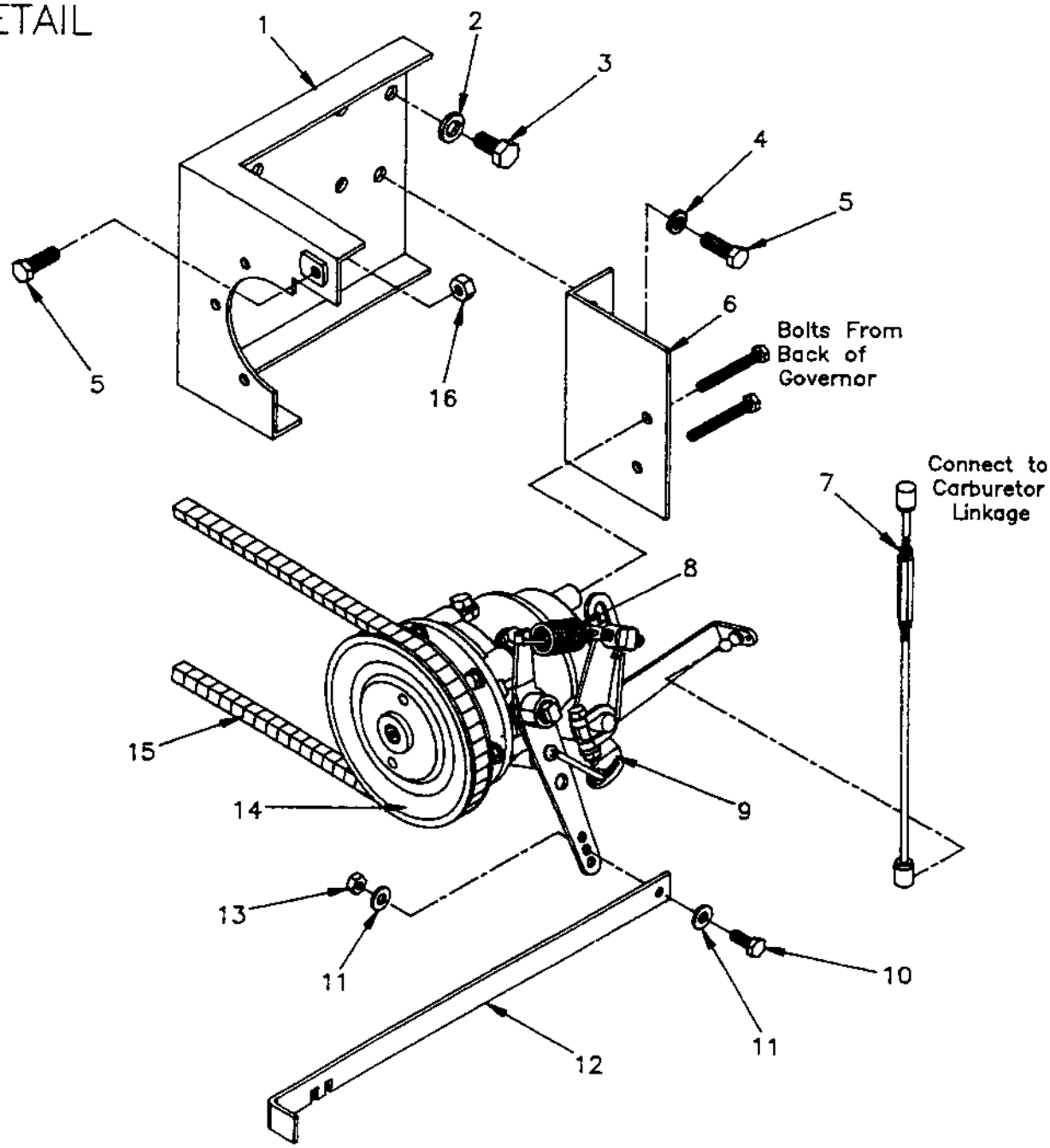
10–805357	FUEL HOSE, 3/16x38"
03–000249	CLAMP, CABLE 1/4ID
42–902134	GASKET, OIL PAN

ENGINE ASSEMBLY RIGHT



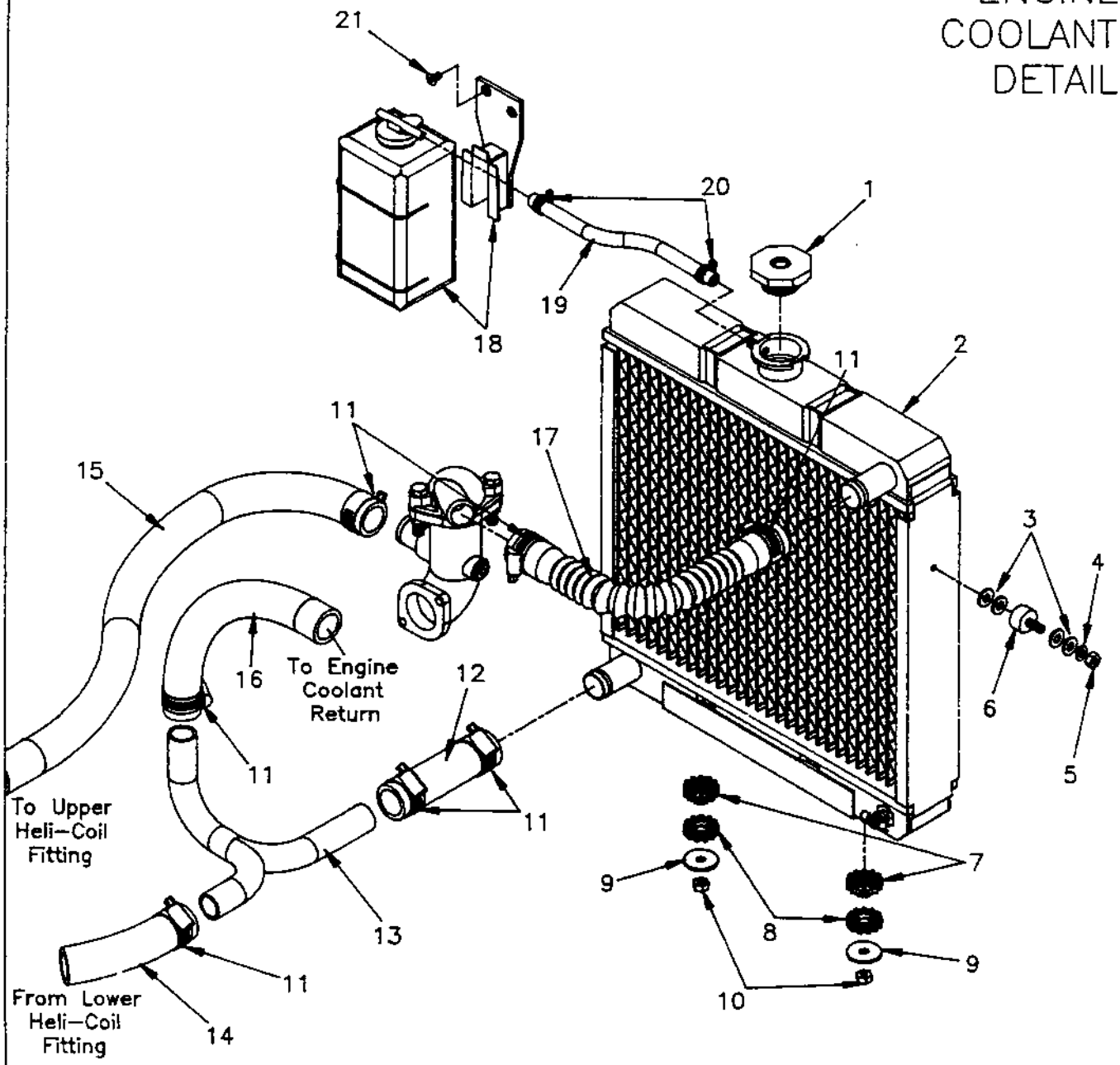
1	66–902016.....ENGINE, NISSAN A–12	13	02–000075.....LOCK WASHER, 3/8
2	42–902140.....FILTER, AIR	14	12–800177.....ELL, #6BSTx1/2T
3	42–902208.....CARBURETOR, A–12	15	12–800141.....CONN, 1/2Px1/2T
4	42–902149.....SOLENOID, ANTI–DIESEL	16	10–805315.....HOSE, HP 3/8x13"
5	42–902138.....VALVE, PCV	17	42–902199.....GOVERNOR
6	11–800045.....ELL, STREET 1/4	18	42–902349.....PUMP, WATER
7	02–000040.....LOCK WASHER, 5/16	19	42–902350.....GASKET, WATER PUMP
8	01–000210.....NUT, 8MM–1.25 HXHD	20	42–902209.....BLADE, FAN
9	56–501953.....MOUNT, RIGHT ENGINE	21	42–902253.....BOLT, FAN
10	00–000095.....SCREW, 3/8–16x1"	22	00–000237.....SCREW, 8MM–1.25x25MM
11	00–000295.....SCREW, 3/8–16x3"	23	44–802230.....BELT, 11720–77702
12	02–000074.....FLAT WASHER, 3/8	24	42–902258.....CAP, OIL FILLER
			NOT SHOWN
			42–902198.....KIT, CARBURETOR REPAIR

ENGINE GOVERNOR DETAIL



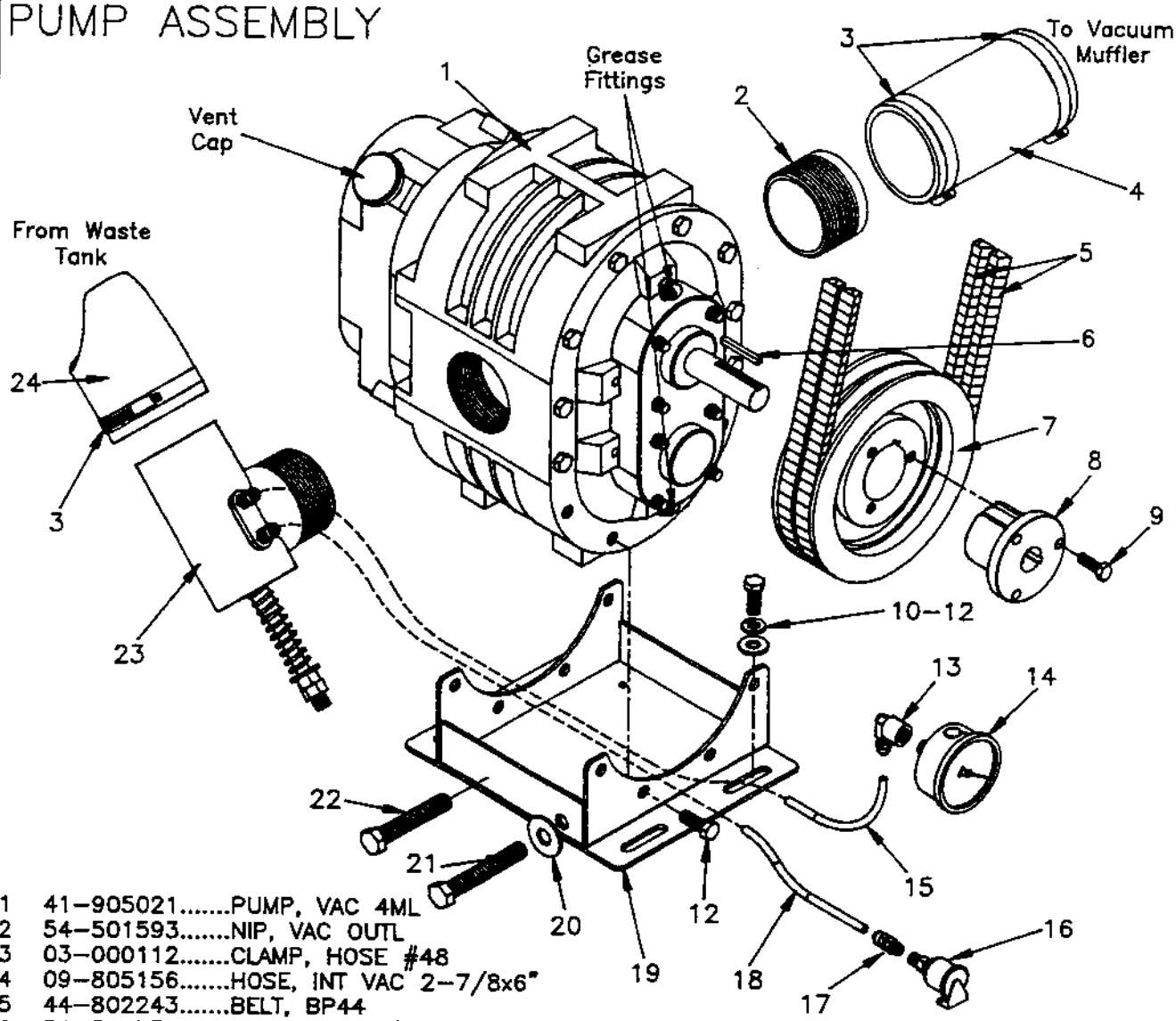
1	56–501869.....BRACKET, GOVERNOR	10	00–000055.....SCREW, 1/4–20x3/4"
2	02–000225.....LOCK WASHER, 7/16	11	02–000066.....FLAT WASHER, 1/4
3	00–000298.....SCREW, 10MMx20MM	12	50–501679.....LEVER, THROTTLE CONTRL
4	02–000040.....LOCK WASHER, 5/16	13	01–000023.....LOCK NUT, 1/4–20
5	00–000039.....SCREW, 5/16–18x1"	14	44–802221.....PULLEY, GOVERNOR (Part of Governor)
6	56–501870.....BRACKET, REAR GOV	15	44–802234.....BELT, AP29
7	42–902200.....ASSY, ROD GOV LINK	16	01–000041.....NUT, 5/16–18 HXHD
8	04–000288.....SPRING, GOVERNOR		
9	42–902199.....GOVERNOR		

ENGINE COOLANT DETAIL



1	49–802010.....CAP, RADIATOR	12	09–805375.....HOS, RAD 1–1/8x5–1/2"
2	57–520035.....RADIATOR	13	58–500654.....CSTG, COOLANT MANIFOLD
3	02–000143.....FLAT WASHER, 5/16	14	09–805423.....HOS, RAD 1–1/8x4–1/2"
4	02–000040.....LOCK WASHER, 5/16	15	09–805422.....HOS, RAD 1–1/8x15"
5	01–000041.....NUT, 5/16–18 HXHD	16	09–805432.....HOS, RD 1–1/8x13–1/2"
6	04–000294.....MOUNT, RAD 5/16–18	17	09–805444.....HOSE, UPPER RADIATOR
7	04–000296.....FLEX, FINGER BUSHING	18	42–902308.....BOTTLE, OVERFLOW
8	04–000295.....FLEX, FINGER RING	19	09–805159.....HOS, BRD 5/16x13–1/2"
9	50–501761.....WASHER, RADIATOR	20	03–000065.....CLAMP, HOSE #4
10	01–000186.....LOCK NUT, 5/16–18	21	00–000216.....SCR, 1/4–20x1/2" SOC
11	03–000248.....CLAMP, HOSE #16		

PERFORMER VACUUM PUMP ASSEMBLY



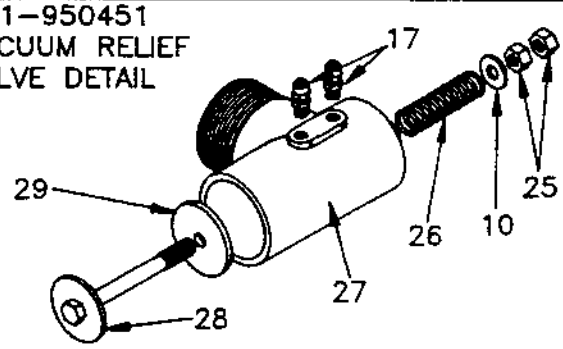
1	41–905021	PUMP, VAC 4ML
2	54–501593	NIP, VAC OUTL
3	03–000112	CLAMP, HOSE #48
4	09–805156	HOSE, INT VAC 2–7/8x6"
5	44–802243	BELT, BP44
6	54–501735	KEYSTOCK, 3/16x1–5/8" (Part of Vacuum Pump)
7	44–802242	PULLEY, 2TB68
8	44–802196	HUB, P1x7/8
9	00–000340	SCREW, 5/16–18x1" GR8
10	02–000074	FLAT WASHER, 3/8
11	02–000075	LOCK WASHER, 3/8
12	00–000095	SCREW, 3/8–16x1"
13	12–800101	ELL, 1/4FPx1/4POLY
14	18–808525	GAUGE, VACUUM 30"Hg
15	09–805427	TUBING, IMPOLENE 1/4x54"
16	19–800075	CUP, OIL FILL 1/8P
17	12–800059	CONN, 1/8Px1/4POLY
18	09–805429	TUBING, IMPOLENE 1/4x42"
19	56–501866	BRACKET, VAC ADJUST PRF
20	02–000057	FLAT WASHER, 1/2 HEAVY
21	00–000323	SCREW, 1/2–13x3–1/2"
22	00–000324	SCREW, 1/2–13x3"
23	61–950451	ASSY, VAC RELIEF VLV PRF
24	09–805341	HOSE, INT VAC 2–7/8x25"
25	01–000224	NUT, 7/16–14 HXHD
26	04–000091	SPRING, VAC RELIEF VALVE
27	52–501573	ELL, VAC RELIEF VALVE PRF
28	56–501615	STEM, VAC RELIEF VALVE PRF
29	43–807074	DIAPHRAGM, VAC REL VLV

NOT SHOWN

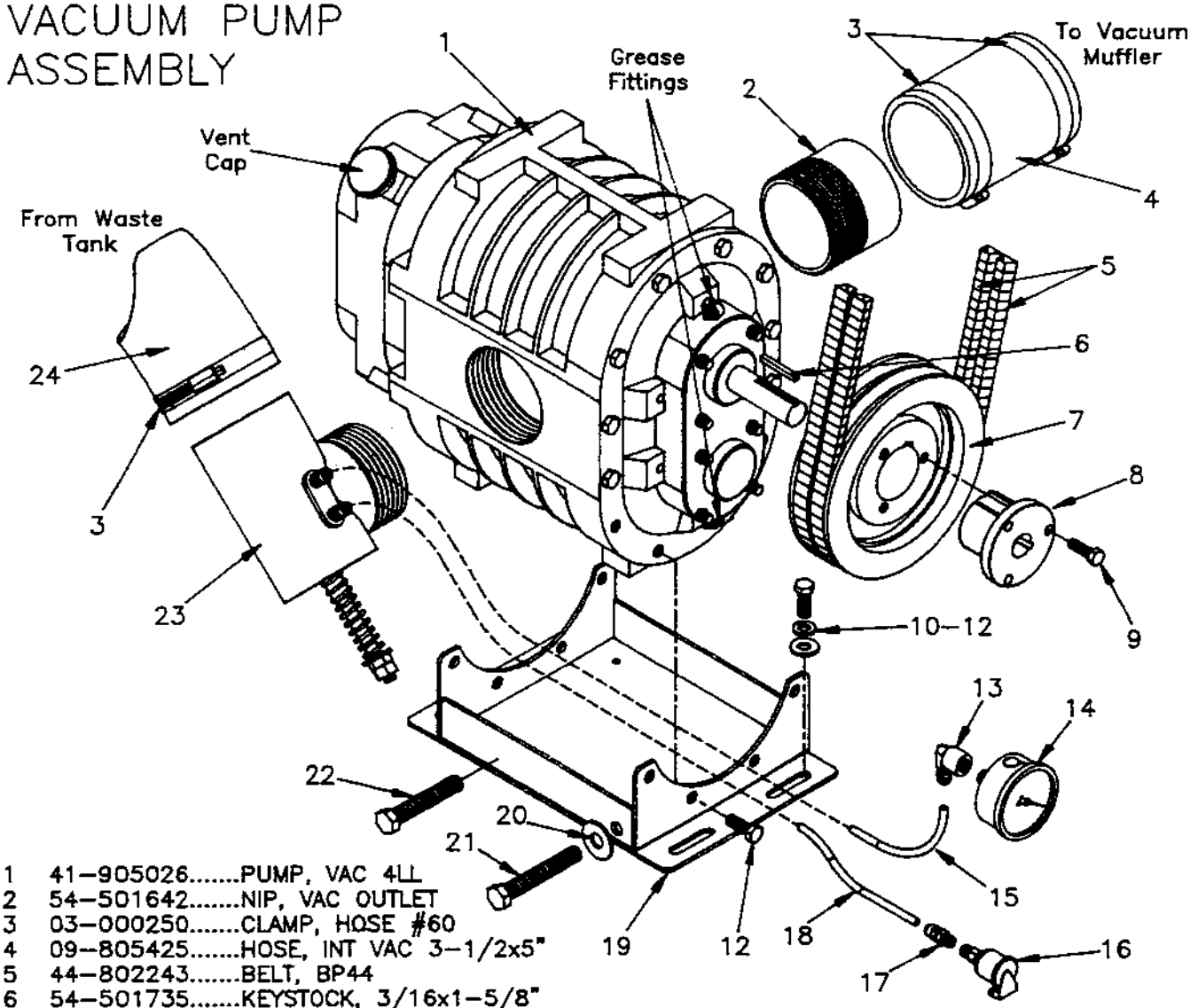
05–008039.....OIL, AEON PD (28G24 SUTOR.)

05–008032.....GREASE, LUBRIPLT 14–1/2oz

#61–950451
VACUUM RELIEF
VALVE DETAIL



PERFORMER 405 VACUUM PUMP ASSEMBLY

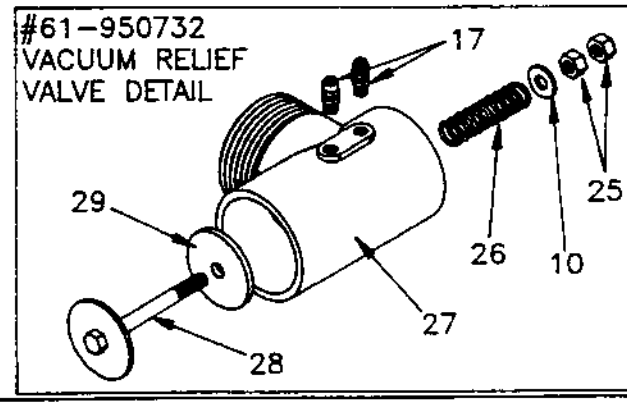


1	41–905026	PUMP, VAC 4LL
2	54–501642	NIP, VAC OUTLET
3	03–000250	CLAMP, HOSE #60
4	09–805425	HOSE, INT VAC 3–1/2x5"
5	44–802243	BELT, BP44
6	54–501735	KEYSTOCK, 3/16x1–5/8" (Part of Vacuum Pump)
7	44–802242	PULLEY, 2TB68
8	44–802196	HUB, P1x7/8
9	00–000340	SCREW, 5/16–18x1" GR8
10	02–000074	FLAT WASHER, 3/8
11	02–000075	LOCK WASHER, 3/8
12	00–000095	SCREW, 3/8–16x1"
13	12–800101	ELL, 1/4FPx1/4POLY
14	18–808525	GAUGE, VACUUM 30"Hg
15	09–805566	TUBING, IMPOLENE 1/4x57"
16	19–800075	CUP, OIL FILL 1/8P
17	12–800059	CONN, 1/8Px1/4POLY
18	09–805567	TUBING, IMPOLENE 1/4x45"
19	56–501935	BRACKET, VAC ADJUST PRF405
20	02–000057	FLAT WASHER, 1/2 HEAVY
21	00–000323	SCREW, 1/2–13x3–1/2"
22	00–000324	SCREW, 1/2–13x3"
23	61–950732	ASSY, VAC RELIEF VLV PRF405
24	09–805426	HOSE, INT VAC 3–1/2x25"
25	01–000224	NUT, 7/16–14 HXHD
26	04–000091	SPRING, VAC RELIEF VALVE
27	52–501684	ELL, VAC REL VLV PRF405
28	56–501994	STEM, VAC RELIEF VLV PRF405
29	43–807106	DIAPHRAGM, VAC REL VLV

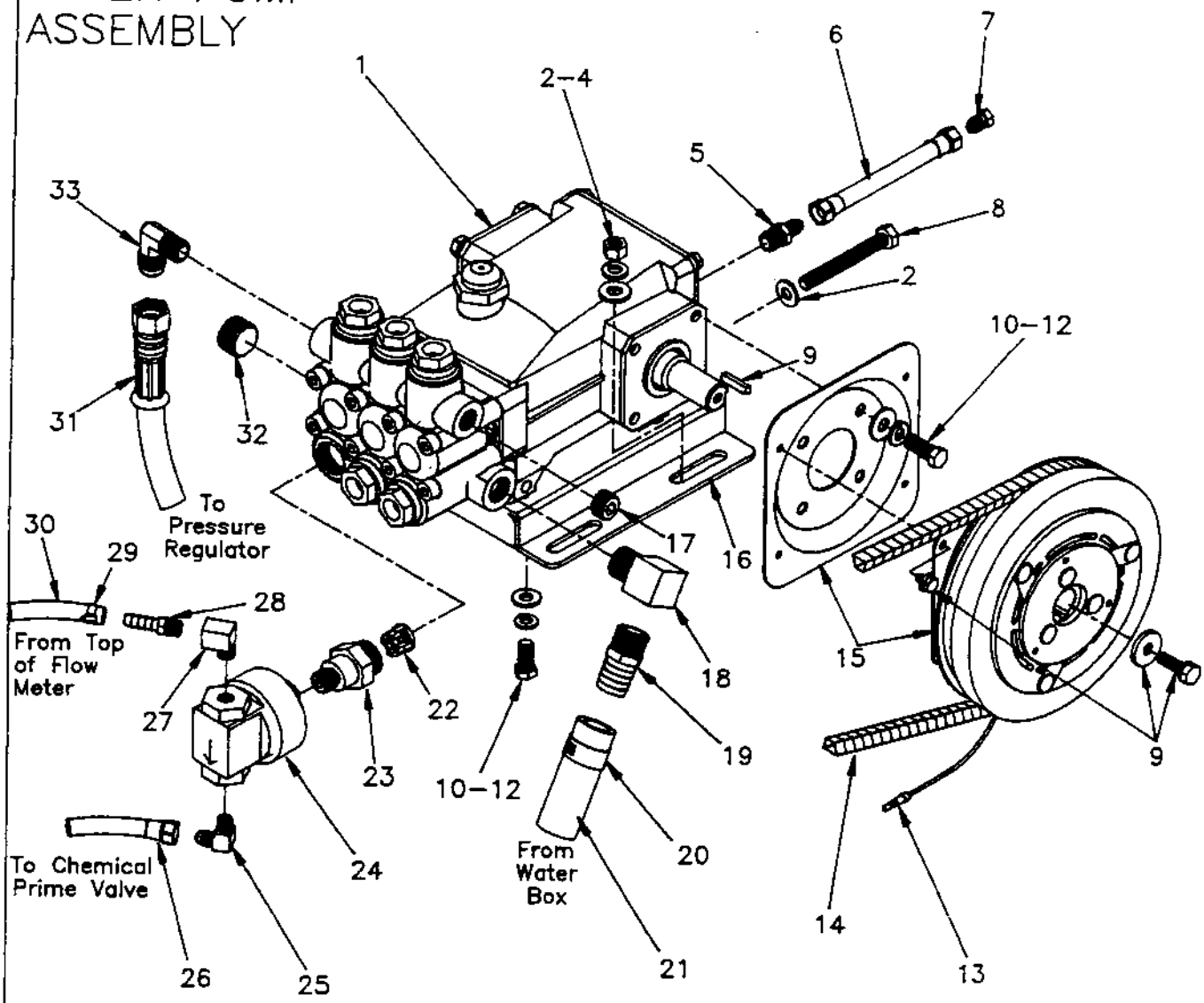
NOT SHOWN

05–008039.....OIL, AEON PD (28G24 SUTOR.)
05–008032.....GREASE, LUBRIPLT 14–1/2oz

#61–950732
VACUUM RELIEF
VALVE DETAIL



WATER PUMP ASSEMBLY

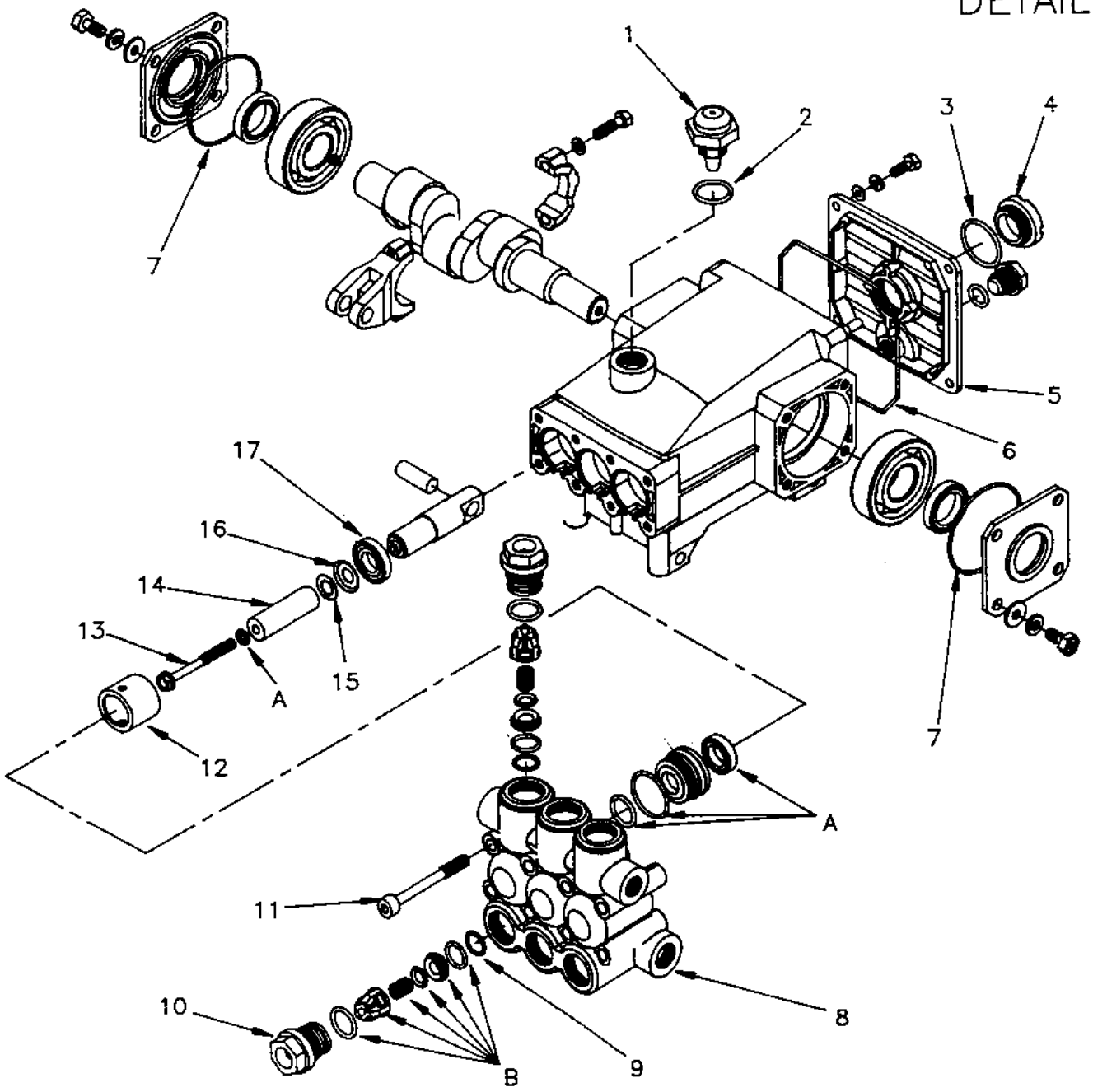


1	41–809149	PMP, CAT 5CP2150
2	02–000074	FLAT WASHER, 3/8
3	02–000075	LOCK WASHER, 3/8
4	01–000073	NUT, 3/8–16 HXHD
5	12–800060	CONN, 1/4Px1/4T
6	10–805316	HOSE, 3/16x5"
7	12–800029	PLUG, 1/4T
8	00–000278	SCR, 3/8–16x3–1/2"
9	42–809395	PACK, HRDWR CLUTCH
10	02–000143	FLAT WASHER, 5/16
11	02–000040	LOCK WASHER, 5/16
12	00–000226	SCR, 8MM–1.25x20MM
13	31–900185	CONN, BULLET M
14	44–802224	BELT, AP39
15	36–900141	CLUTCH, ELEC PUMP
16	56–501995	BRKT, PUMP ADJUST
17	11–800224	PLUG, 3/8 SOCHD
18	52–800315	ELL, STRT 1/2 (mach'd)
19	12–800278	FTTG, BARB 1/2Px3/4H
20	03–000113	CLAMP, HOSE #12
21	09–805435	HOSE, WATER 3/4x33"
22	52–809123	CAT RETAIN, VLV SPRING
23	52–809125	ADPT, CAT CHEMICAL PMP
24	41–809144	PUMP, CHEMICAL
25	12–800040	ELL, 1/8Px1/4T
26	10–805278	HOSE, 3/16x54"
27	11–800014	ELL, STREET 1/8
28	12–800093	FTTG, BARB 1/8Px5/16H
29	03–000065	CLAMP, HOSE #4
30	09–805088	HOSE, BRAID 5/16x64"
31	10–805359	HOSE, HP 3/8x42"
32	11–800069	PLUG, 1/2 SOCHD
33	12–800225	ELL, 3/8Px1/2T

NOT SHOWN

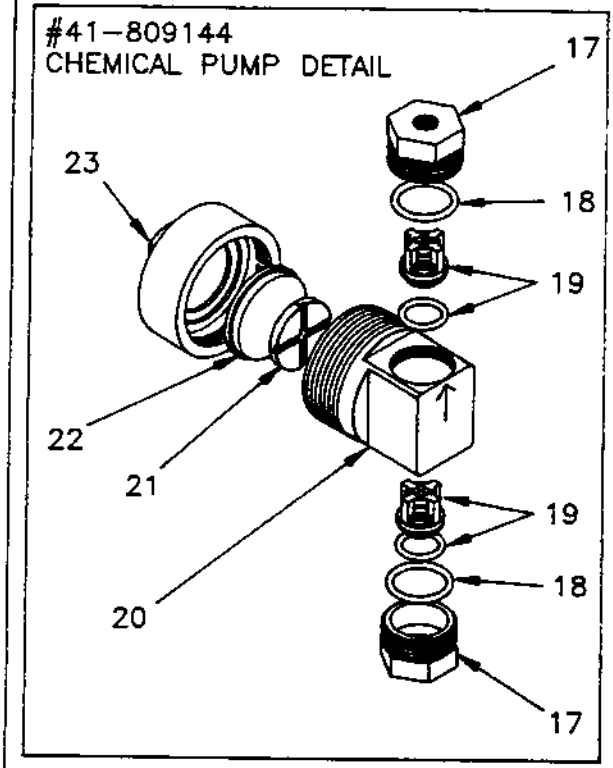
05–008016 OIL, 21oz CAT WTR PUMP

WATER PUMP DETAIL

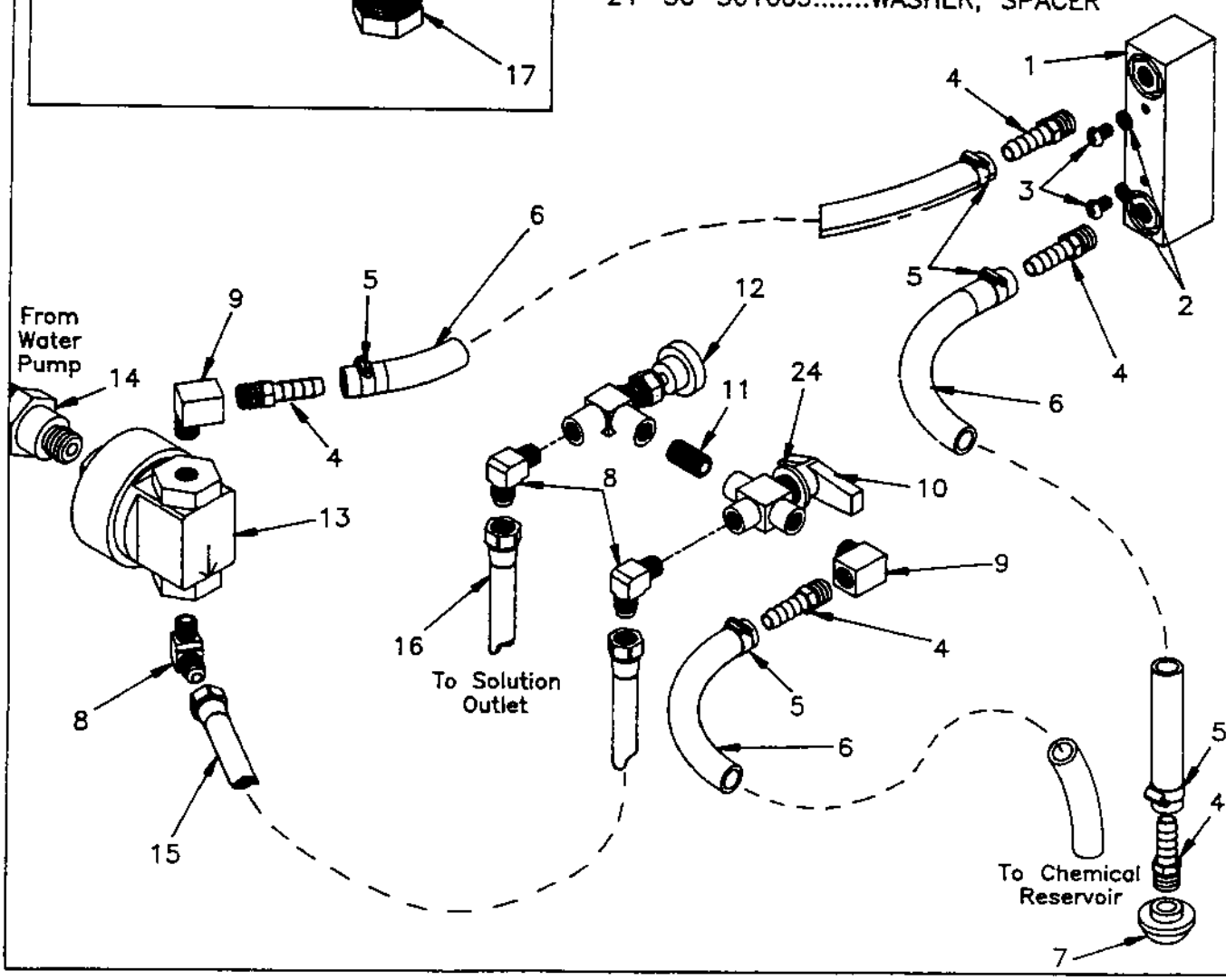


1	42–809393.....CAP, OIL FILLER	12	42–809384.....RETAINER, SEAL
2	42–809239.....O–RING, OIL FILL CAP	13	42–809383.....RETAIN, PLNGR W/STUD
3	43–807063.....GASKET, OIL GAUGE	14	42–809413.....PLUNGER, 5CP2150
4	42–902380.....GAUGE, OIL LEVEL	15	42–809249.....WASHER, KEYHOLE M18
5	42–809392.....COVER, CRANKCASE	16	42–809246.....SLINGER, BARRIER
6	42–809391.....O–RING, CRANK CVR	17	42–809380.....SEAL, OIL CRANKCASE
7	42–809394.....O–RING, BRNG CVR	A	42–809396.....KIT, SEAL (order 1 each to replace all seals)
8	42–809412.....MANIFOLD, HEAD		
9	42–809398.....RING, BACK–UP SEAT	B	66–950440.....KIT, VALVE (order 1 ea. to replace all valves)
10	42–809253.....PLUG, VALVE		
11	42–809385.....BOLT, MNFLD M8x70		

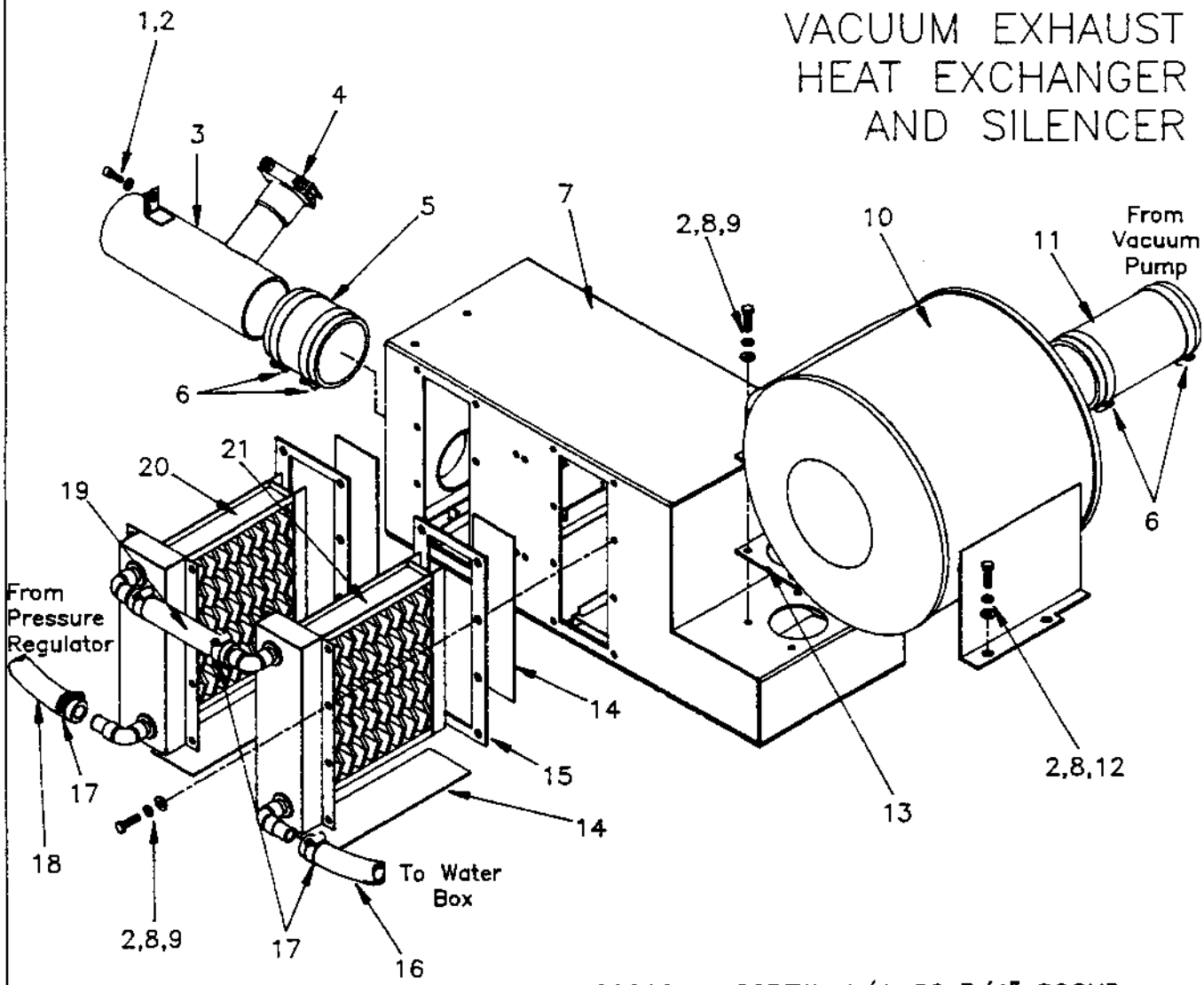
CHEMICAL SYSTEM



1	18–808513	FLOW METER, 1/8FP
2	02–000032	LOCK WASHER, #10
3	00–000065	SCREW, 10–32x3/8"
4	12–800093	FTTG, BARB 1/8Px5/16H
5	03–000065	CLAMP, HOSE #4
6	09–805088	HOSE, BRAID 5/16x64"
7	14–806506	STRNR, SUC END 1/8FP
8	12–800040	ELL, 1/8Px1/4T
9	11–800014	ELL, STREET 1/8
10	15–808022	VLV, BALL 3–WAY 1/8FP
11	11–800105	NIP, 1/8 CLOSE
12	15–808106	VALVE, METERING 1/8FP
13	41–809144	PUMP, CHEMICAL
14	52–809125	ADAPT, CHEM PUMP
15	10–805278	HOSE, 3/16x54"
16	10–805131	HOSE, 3/16x20–1/2"
17	16–808237	CAP, CHK VLV CHEM PMP
18	43–810079	O–RING, 7/8IDx1–1/16OD
19	42–809265	CHECK VALVE, CHEM PMP
20	42–809358	BODY, CHEM PUMP
21	42–809264	DISK, CHEM PUMP
22	42–809047	DIAPHRAGM, CHEM PUMP
23	42–809045	COVER, CHEM PUMP
24	50–501663	WASHER, SPACER

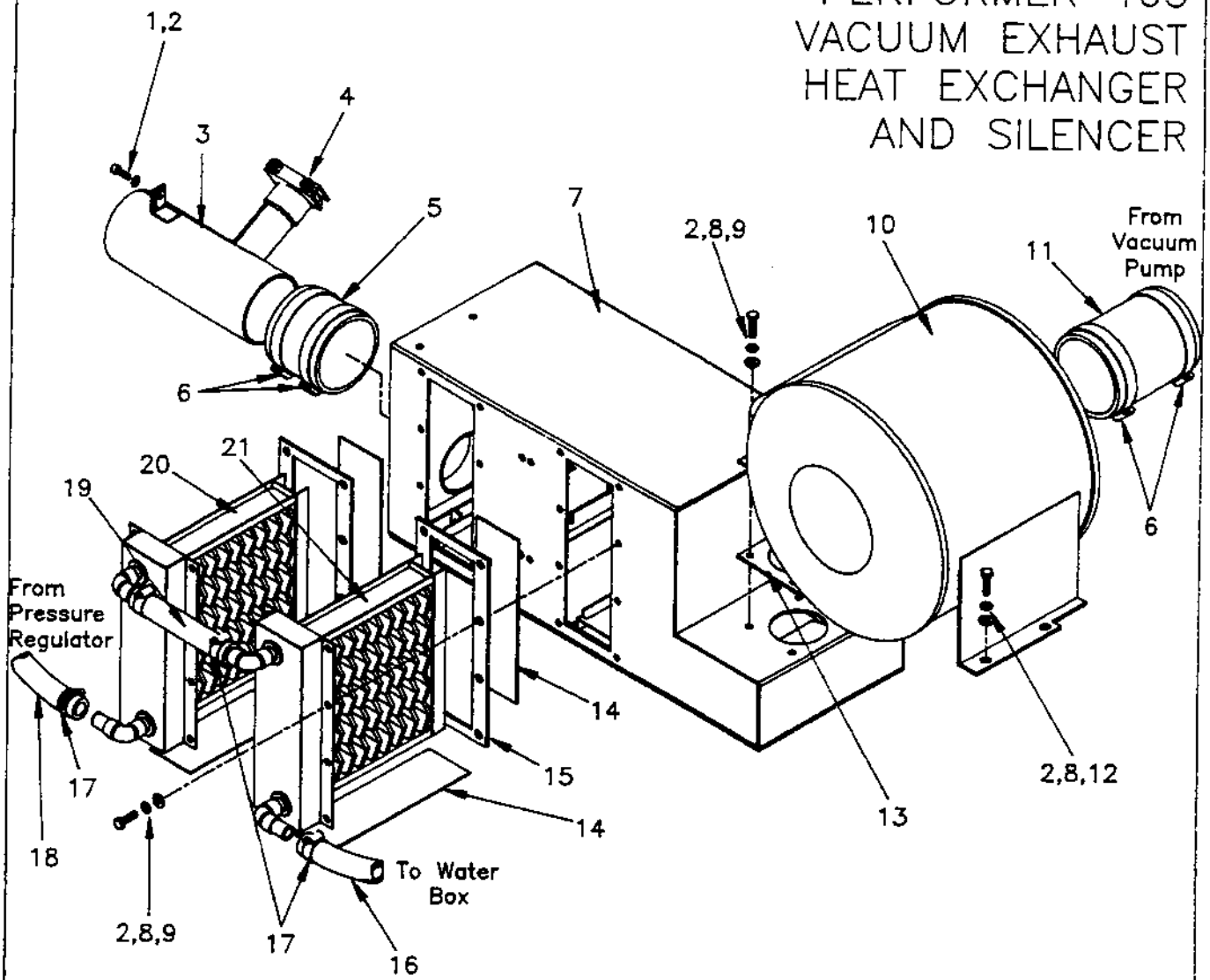


PERFORMER VACUUM EXHAUST HEAT EXCHANGER AND SILENCER



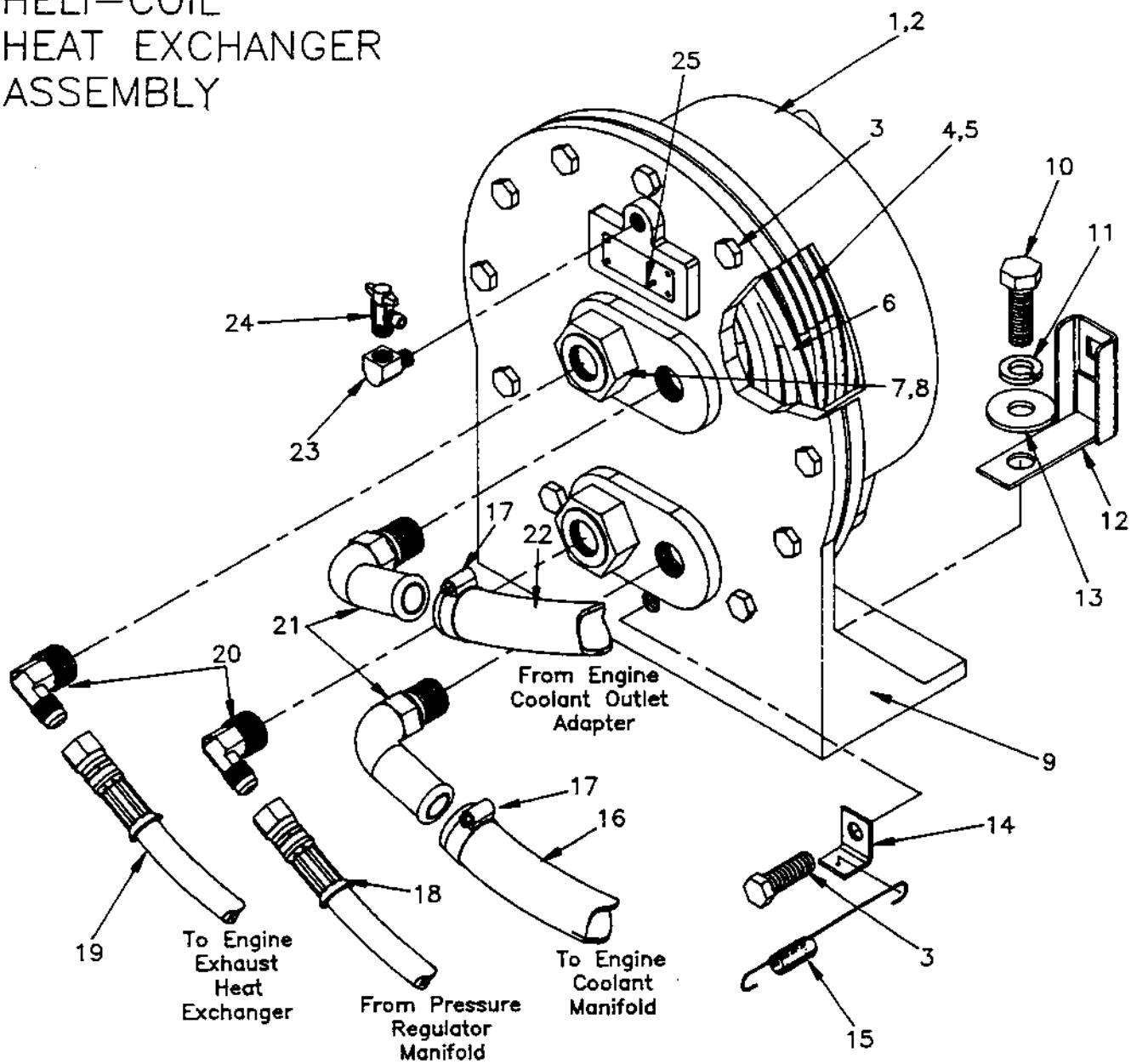
1	00-000210	SCREW, 1/4-20x3/4" SOCHD
2	02-000038	LOCK WASHER, 1/4
3	56-501939	ASSY, EXHAUST OUTLET PRF
4	03-000081	CLAMP, MUFFLER 1-1/2"
5	09-805344	HOSE, INT VAC 2-7/8x3"
6	03-000112	CLAMP, HOSE #48
7	56-501881	HOUSING, VAC HEAT EXCHNGR PRF
8	02-000066	FLAT WASHER, 1/4
9	00-000055	SCREW, 1/4-20x3/4" HXHD
10	57-520082	MUFFLER, VACUUM PRF
11	09-805156	HOSE, INT VAC 2-7/8x6"
12	00-000078	SCREW, 1/4-20x1" HXHD GR8
13	43-807080	GASKET, VAC HE INLET PRF
14	58-700027	PAD, VAC HE CORE
15	43-807081	GASKET, VAC HE CORE
16	09-805288	HOSE, WATER 5/8x27"
17	03-000246	CLAMP, HOSE #8
18	09-805343	HOSE, WATER 5/8x17"
19	09-805372	HOSE, WATER 5/8x6-1/2"
20	61-950695	ASSY, VAC HE CVR (Front)
21	61-950696	ASSY, VAC HE CVR (Rear)

PERFORMER 405 VACUUM EXHAUST HEAT EXCHANGER AND SILENCER



1	00–000210	SCREW, 1/4–20x3/4" SOCHD
2	02–000038	LOCK WASHER, 1/4
3	56–501955	ASSY, EXHAUST OUTLET PRF405
4	03–000081	CLAMP, MUFFLER 1–1/2"
5	09–805433	HOSE, INT VAC 3–1/4x2–1/2"
6	03–000250	CLAMP, HOSE #60
7	56–501938	HOUSING, VAC HEAT EXCHG PRF405
8	02–000066	FLAT WASHER, 1/4
9	00–000055	SCREW, 1/4–20x3/4" HXHD
10	57–520089	MUFFLER, VACUUM PRF405
11	09–805425	HOSE, INT VAC 3–1/2x5"
12	00–000078	SCREW, 1/4–20x1" HXHD GR8
13	43–807108	GASKET, VAC HE INLET PRF405
14	58–700027	PAD, VAC HE CORE
15	43–807081	GASKET, VAC HE CORE
16	09–805288	HOSE, WATER 5/8x27"
17	03–000246	CLAMP, HOSE #8
18	09–805343	HOSE, WATER 5/8x17"
19	09–805372	HOSE, WATER 5/8x6–1/2"
20	61–950695	ASSY, VAC HE CVR (Front)
21	61–950696	ASSY, VAC HE CVR (Rear)

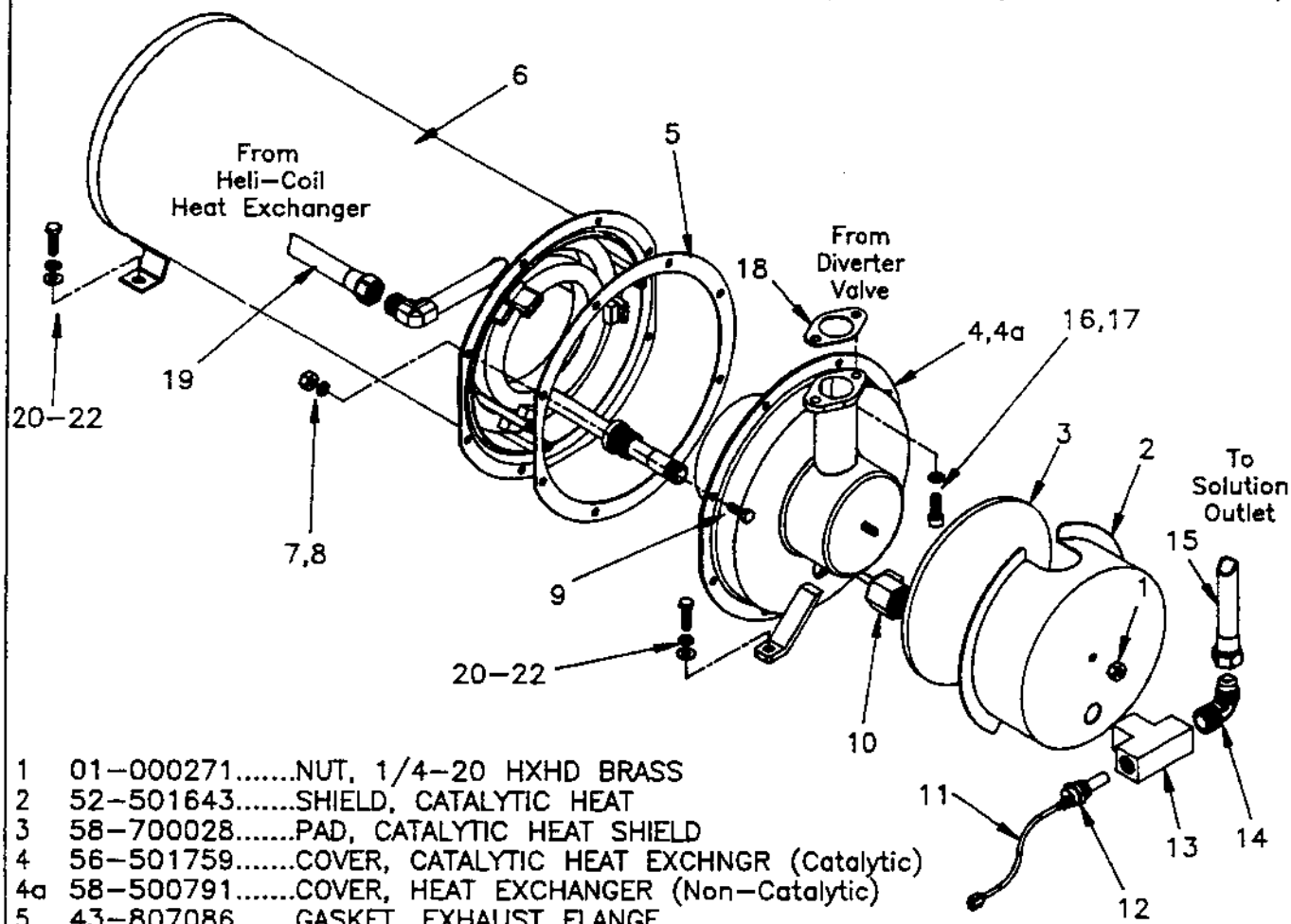
HELI–COIL HEAT EXCHANGER ASSEMBLY



1	57–520073.....HEAT EXCHANGER, PRF (Includes Parts 2–9)	15	04–000287.....SPRING, DIVERTER RETURN
2	52–501583.....SHELL, HEAT EXCHNGR	16	09–805423.....HOS, RAD 1–1/8x4–1/2"
3	00–000293.....SCR, 1/2–13x1–1/4"	17	03–000248.....CLAMP, HOSE #16
4	57–520033.....COIL, HEAT EXCHNGR	18	10–805375.....HOSE, HP 3/8x19"
5	43–807051.....GSKT, MNFLD (2 req'd)	19	10–805274.....HOSE, HP 3/8x26"
6	43–807049.....GSKT, HEAT EXCHNGR	20	12–800326.....ELL, 3/4Px1/2T
7	52–000124.....NUT, 1–3/4–12 HXHD	21	52–501627.....INLET, HEAT EXCHANGER
8	56–501505.....RING, LOCK MNFLD	22	09–805422.....HOSE, RAD 1–1/8x15"
9	52–501631.....PLATE, COVER HE	23	11–800045.....ELL, STREET 1/4
10	00–000363.....SCR, 5/8–11x2"	24	15–808073.....COCK, DRAIN 1/4Px1/4H
11	02–000232.....LOCK WASHER, 5/8	25	00–000015.....SCR, DRIVE .098Dx3/16"
12	56–502005.....BRKT, RIGHT HOOD		
13	02–000088.....FLAT WASHER, 5/8		NOT SHOWN
14	50–501686.....CLIP, SPRING		66–945200.....KIT, HELI–COIL w/GSKTS (Includes Parts 4–6)

ENGINE EXHAUST HEAT EXCHANGER

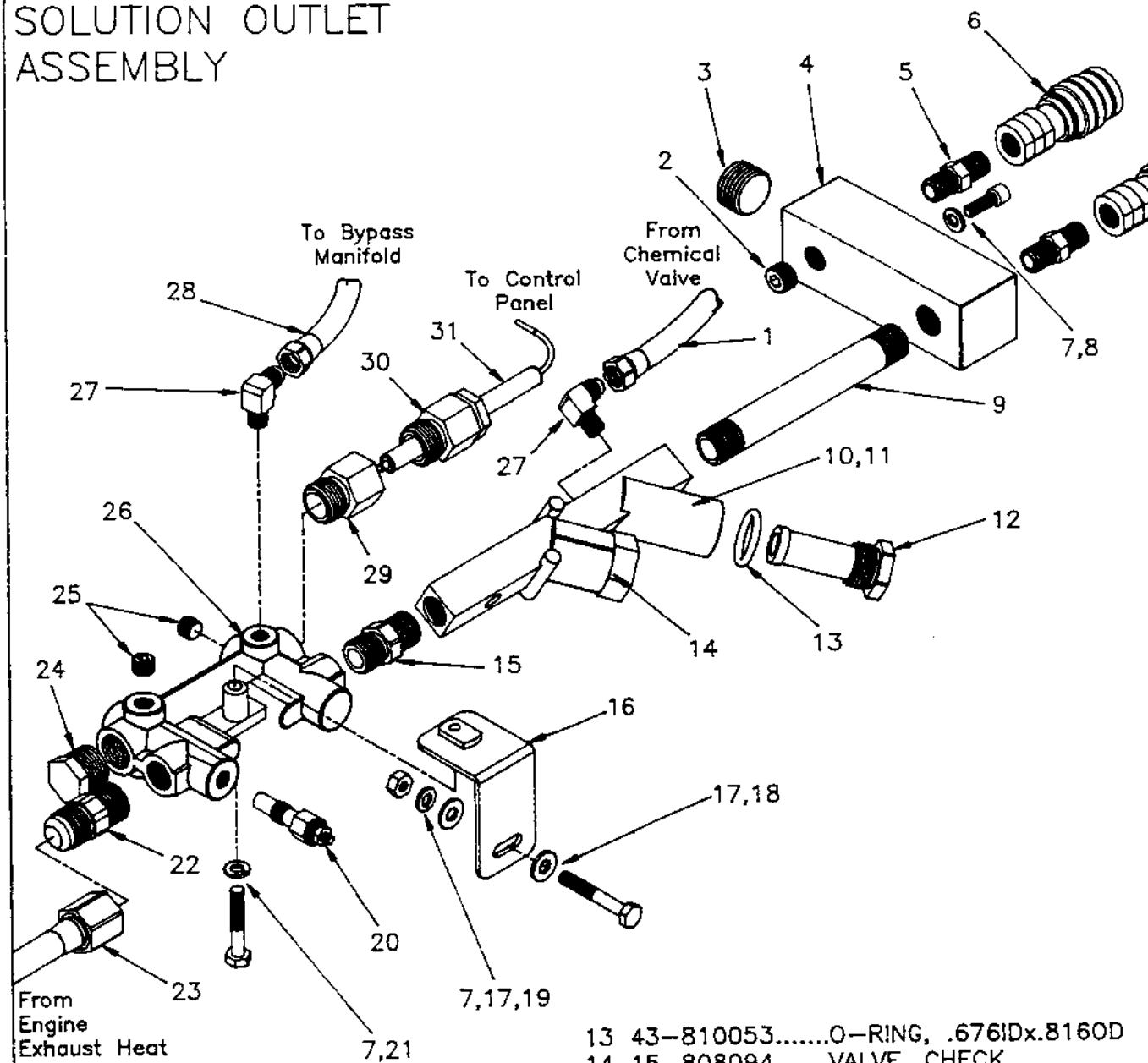
CATALYTIC ASSEMBLY #61-950628 (Includes Parts 1-4, 5-14)
NON-CATALYTIC ASSEMBLY #61-950582 (Includes Parts 4a-14)



1	01-000271	NUT, 1/4-20 HXHD BRASS
2	52-501643	SHIELD, CATALYTIC HEAT
3	58-700028	PAD, CATALYTIC HEAT SHIELD
4	56-501759	COVER, CATALYTIC HEAT EXCHNGR (Catalytic)
4a	58-500791	COVER, HEAT EXCHANGER (Non-Catalytic)
5	43-807086	GASKET, EXHAUST FLANGE
6	57-520074	ASSEMBLY, COIL MOUNT & CASING
7	01-000045	NUT, 1/4-20 HXHD SST
8	02-000044	LOCK WASHER, 1/4 SST
9	00-000019	SCREW, 1/4-20 HXHD SST
10	52-501654	NUT, ADAPTER BUSHING
11	64-950546	ASSEMBLY, HI TEMP SHUTOFF WIRE
12	35-900184	SENSOR, TEMPERATURE 285deg
13	52-501671	FITTING, TEMP SENSOR ADAPTER
14	12-800171	ELL, 1/2Px1/2T
15	10-805376	HOSE, 1/2x14-1/2" (1/2FT BS) SST
16	02-000274	LOCK WASHER, 5/16 (Allen screw)
17	00-000315	SCREW, 5/16-18x7/8" SOCHD
18	42-902212	ONAN GASKET, EXHAUST
19	10-805274	HOSE, HP 3/8x26" (1/2FT BS)
20	02-000066	FLAT WASHER, 1/4
21	02-000038	LOCK WASHER, 1/4
22	00-000078	SCREW, 1/4-20x1" HXHD GR8

NOT SHOWN
66-945532.....CORE, EXHAUST HEAT EXCHANGER CORE
(Includes Parts 3,5,6, and 18)

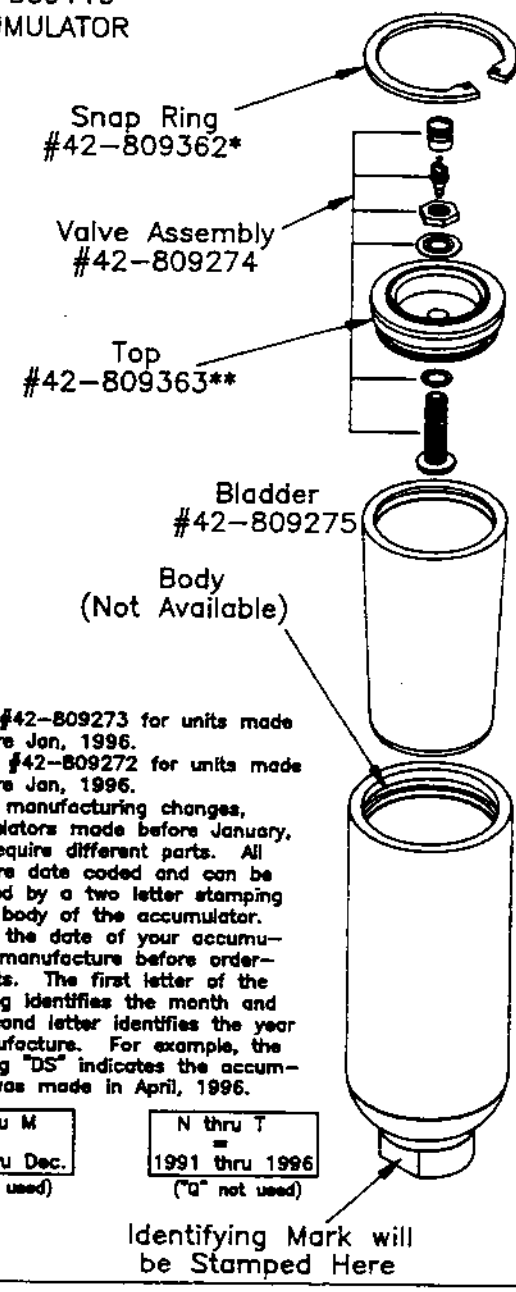
SOLUTION OUTLET ASSEMBLY



1	10–805131	HOSE, 3/16x20–1/2"
2	11–800345	PLUG, 1/4 SOCHD
3	11–800069	PLUG, 1/2 SOCHD
4	52–501653	MANIFOLD, OUTLET
5	11–800029	NIP, HEX 1/4 BR
6	13–806001	DSC, 1/4Fx1/4FP
7	02–000038	LOCK WASHER, 1/4
8	00–000210	SCREW, 1/4–20x3/4"
9	11–800426	NIP, 3/8x5" SST
10	15–808095	ASSY, CHK VLV MNFLD (Includes Parts 11–14)
11	52–501621	MANIFOLD, CHK VLV
12	14–806549	SCREEN, CHK VLV (Includes O–ring)
13	43–810053	O–RING, .676IDx.816OD
14	15–808094	VALVE, CHECK
15	11–800429	NIP, HEX 3/8 SST
16	56–501975	BRKT, THERM MNFLD MT
17	02–000066	FLAT WASHER, 1/4
18	00–000122	SCREW, 1/4–20x1–3/4"
19	01–000037	NUT, 1/4–20 HXHD
20	34–903019	SENDER, TEMP 140–320
21	00–000132	SCREW, 1/4–20x1–1/2"
22	12–800282	CONN, 3/8Px1/2T
23	10–805376	HOSE, 1/2x14–1/2" SST
24	52–501680	FTTG, SENSOR SUPPORT
25	11–800206	PLUG, 1/8 SOCHD
26	52–501683	MANIFOLD, THERMOSTAT
27	12–800040	ELL, 1/8Px1/4T
28	10–805357	HOSE, 3/16x38"
29	11–800342	CONN, 1/2Px1/2FP
30	12–800391	UNION, CAPILLARY–THERM
31	35–900182	CONTROL, TEMP

ACCUMULATOR DETAIL

#41–809119
ACCUMULATOR

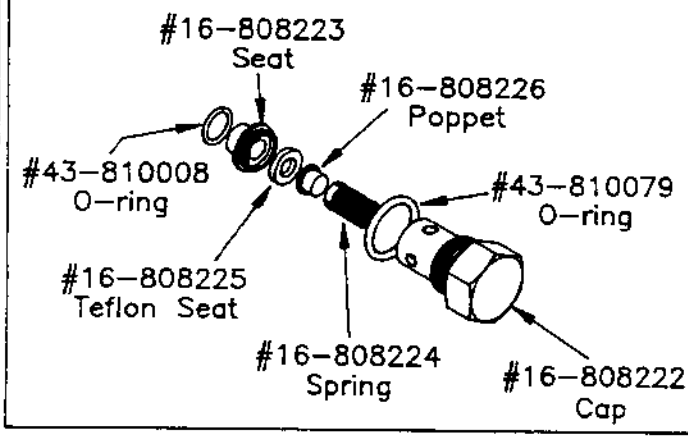


* Use #42–809273 for units made before Jan, 1996.
** Use #42–809272 for units made before Jan, 1996.
Due to manufacturing changes, accumulators made before January, 1996 require different parts. All units are date coded and can be identified by a two letter stamping on the body of the accumulator. Identify the date of your accumulator's manufacture before ordering parts. The first letter of the stamping identifies the month and the second letter identifies the year of manufacture. For example, the stamping "DS" indicates the accumulator was made in April, 1996.

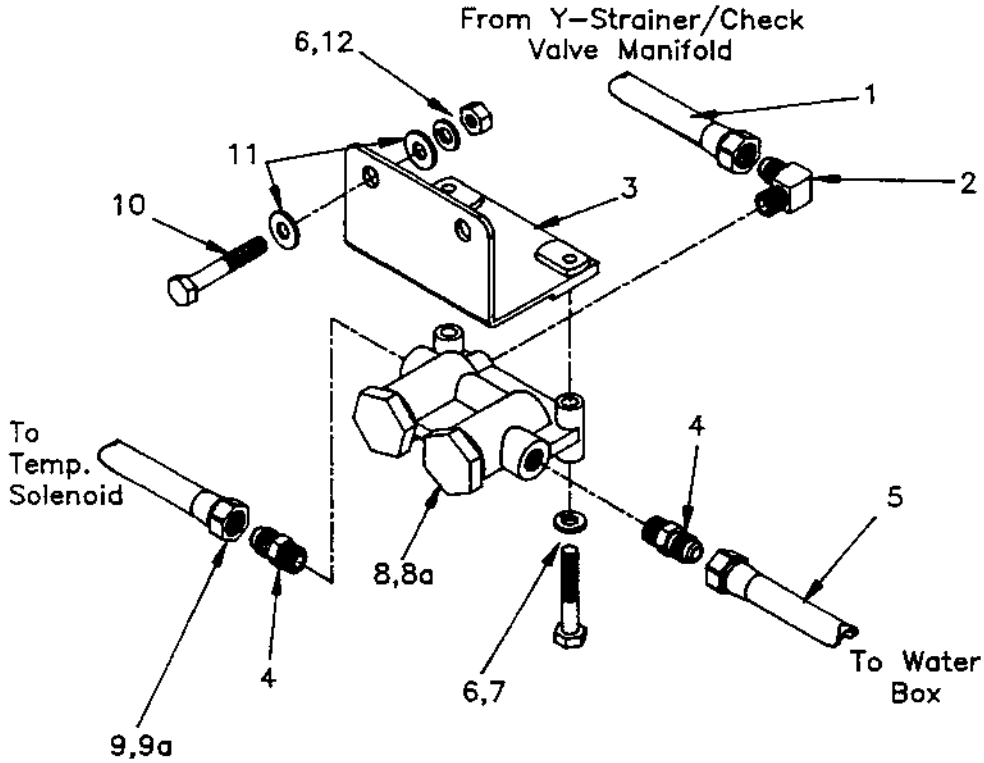
A thru M	N thru T
=	=
Jan. thru Dec.	1991 thru 1996
("I" not used)	("Q" not used)

SOLUTION OUTLET CHECK VALVE DETAIL

#15–808094
VALVE, CHECK

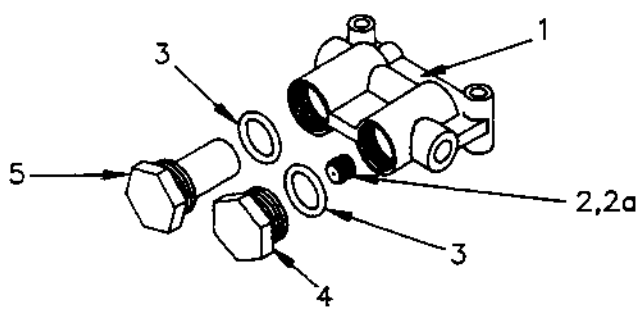


BYPASS MANIFOLD ASSEMBLY



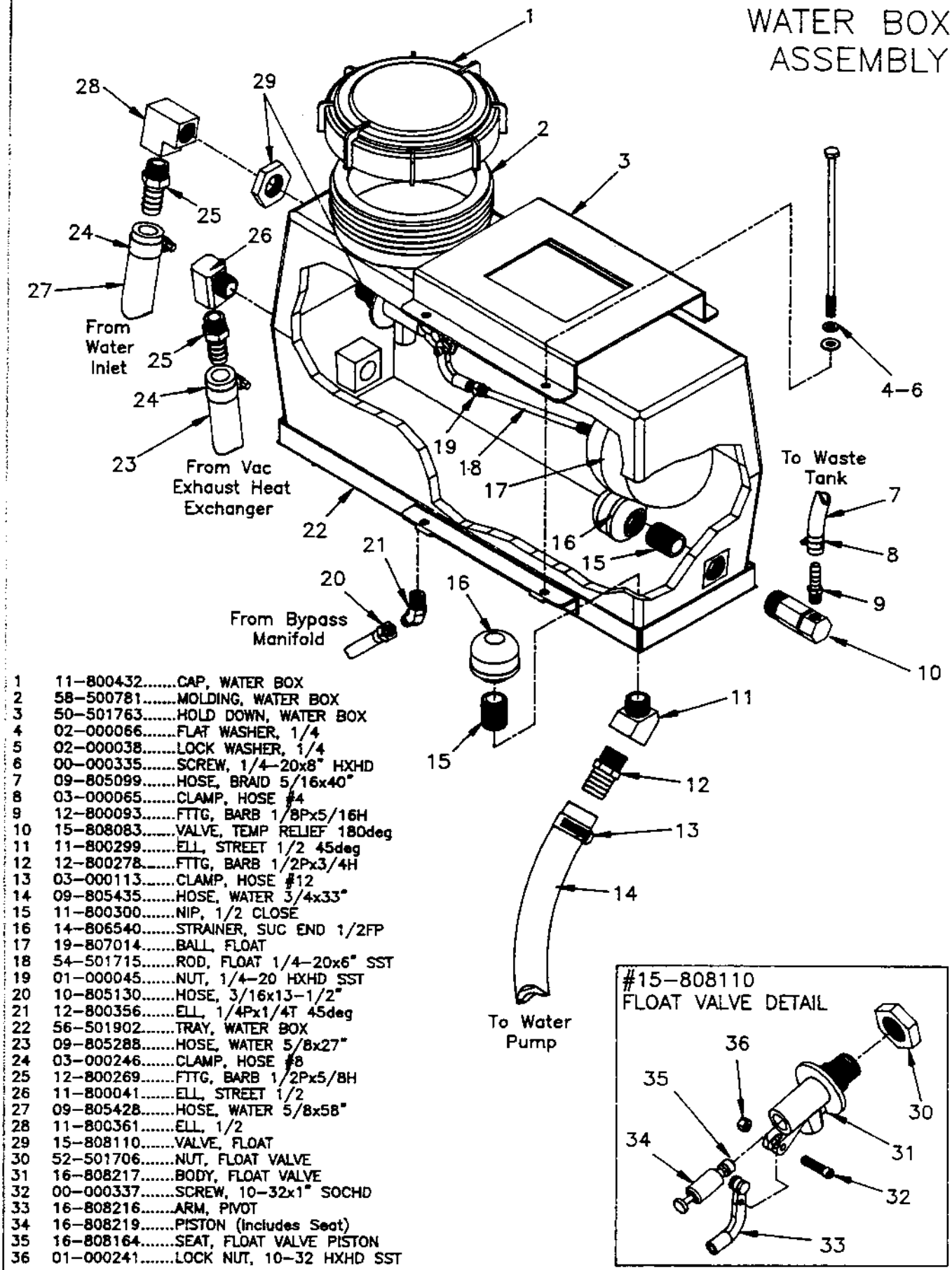
1	10–805357.....HOSE, 3/16x38"	8	15–808112.....ASSY, BYP (Catalytic)
2	12–800040.....ELL, 1/8Px1/4T	8a	15–808111.....ASSY, BYP (Non–Cat.)
3	56–501906.....BRACKET, BYPASS MTG	9	10–805130.....HOS, 13–1/2" (PRF)
4	12–800065.....CONN, 1/8Px1/4T	9a	10–805393.....HOS, 14–1/4"(PRF405)
5	10–805130.....HOSE, 3/16x13–1/2"	10	00–000122.....SCR, 1/4–20x1–3/4"
6	02–000038.....LOCK WASHER, 1/4	11	02–000066.....FLAT WASHER, 1/4
7	00–000132.....SCR, 1/4–20x1–1/2"	12	01–000037.....NUT, 1/4–20 HXHD

#15–808112 (Catalytic Heat Exchanger)
#15–808111 (Non–Catalytic Heat Exchanger)
BYPASS MANIFOLD DETAIL



1	52–501659.....MANIFOLD, BYPASS
2	52–501701.....ORIFICE, BYPASS GRN (Catalytic)
2a	52–501665.....ORIFICE, BYPASS BLU (Non–Cat)
3	43–810053.....O–RING, .676IDx.816OD
4	53–501523.....CAP, CHECK VALVE
5	14–806552.....SCREEN, BYPASS MANIFOLD

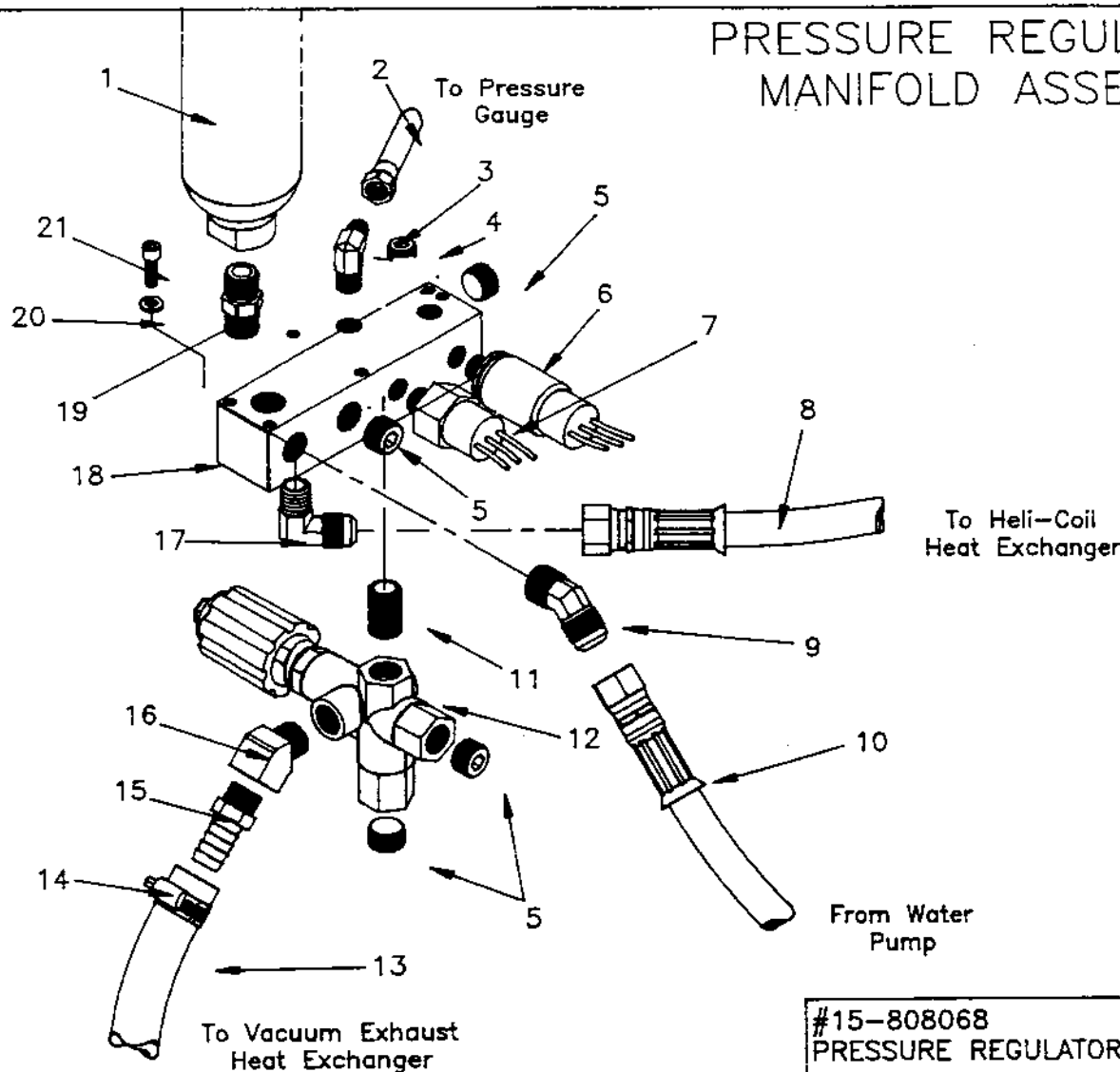
WATER BOX ASSEMBLY



1	11–800432	CAP, WATER BOX
2	58–500781	MOLDING, WATER BOX
3	50–501763	HOLD DOWN, WATER BOX
4	02–000066	FLAT WASHER, 1/4
5	02–000038	LOCK WASHER, 1/4
6	00–000335	SCREW, 1/4–20x8" HXHD
7	09–805099	HOSE, BRAID 5/16x40"
8	03–000065	CLAMP, HOSE #4
9	12–800093	FTTG, BARB 1/8Px5/16H
10	15–808083	VALVE, TEMP RELIEF 180deg
11	11–800299	ELL, STREET 1/2 45deg
12	12–800278	FTTG, BARB 1/2Px3/4H
13	03–000113	CLAMP, HOSE #12
14	09–805435	HOSE, WATER 3/4x33"
15	11–800300	NIP, 1/2 CLOSE
16	14–806540	STRAINER, SUC END 1/2FP
17	19–807014	BALL, FLOAT
18	54–501715	ROD, FLOAT 1/4–20x6" SST
19	01–000045	NUT, 1/4–20 HXHD SST
20	10–805130	HOSE, 3/16x13–1/2"
21	12–800356	ELL, 1/4Px1/4T 45deg
22	56–501902	TRAY, WATER BOX
23	09–805288	HOSE, WATER 5/8x27"
24	03–000246	CLAMP, HOSE #8
25	12–800269	FTTG, BARB 1/2Px5/8H
26	11–800041	ELL, STREET 1/2
27	09–805428	HOSE, WATER 5/8x58"
28	11–800361	ELL, 1/2
29	15–808110	VALVE, FLOAT
30	52–501706	NUT, FLOAT VALVE
31	16–808217	BODY, FLOAT VALVE
32	00–000337	SCREW, 10–32x1" SOCHD
33	16–808216	ARM, PIVOT
34	16–808219	PISTON (Includes Seat)
35	16–808164	SEAT, FLOAT VALVE PISTON
36	01–000241	LOCK NUT, 10–32 HXHD SST

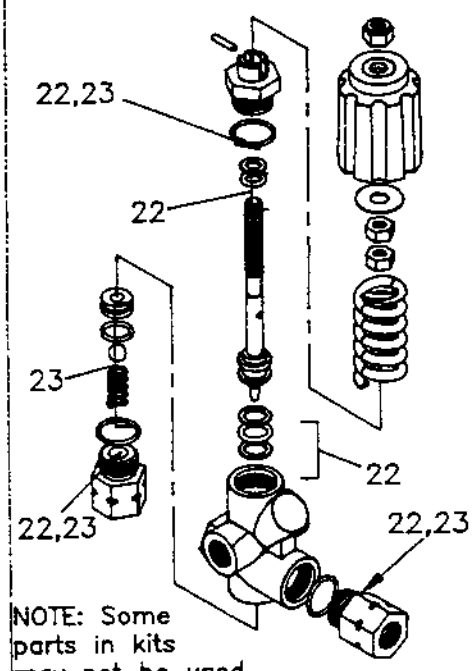
#15–808110
FLOAT VALVE DETAIL

PRESSURE REGULATOR MANIFOLD ASSEMBLY



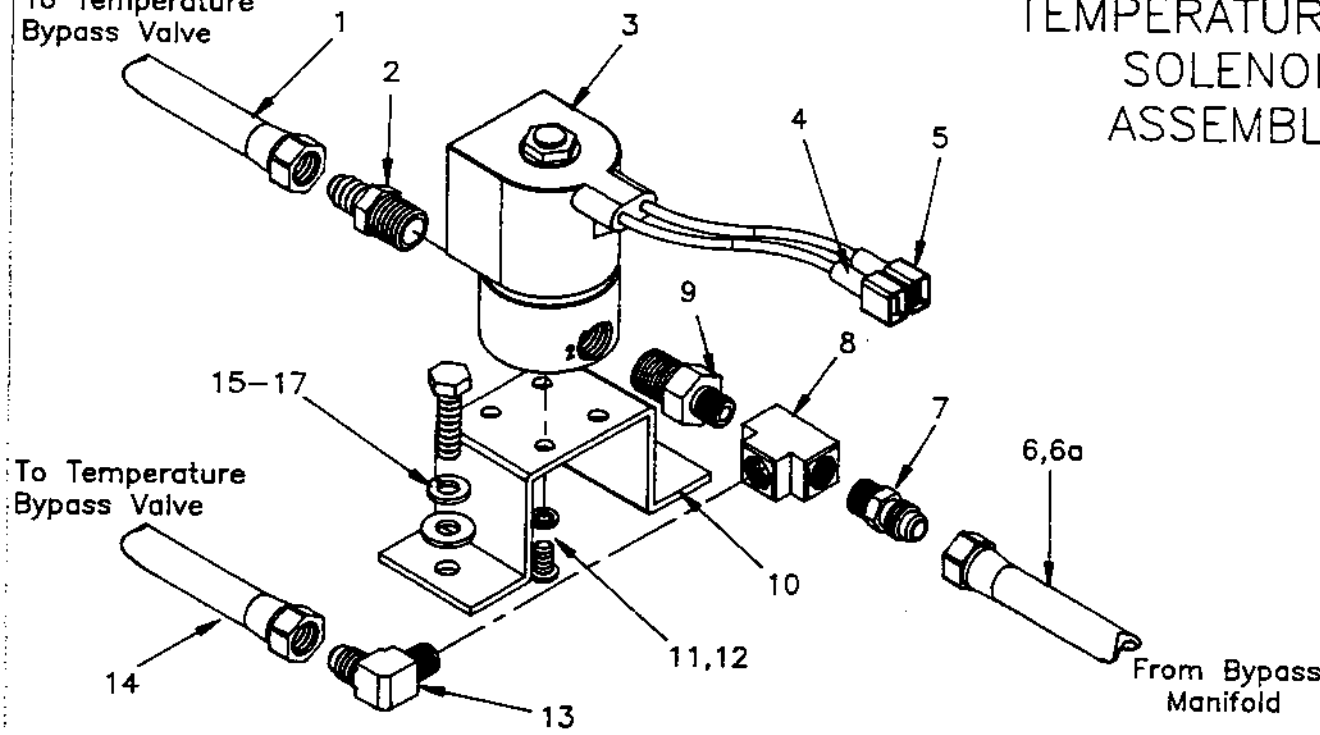
1	41–809119	ACCUMULATOR
2	10–805362	HOSE, 3/16x16–1/2"
3	12–800031	ELL, 1/4Px1/4T
4	11–800345	PLUG, 1/4 SOCHD
5	11–800224	PLUG, 3/8 SOCHD
6	32–900186	SWITCH, PRESSURE 1200PSI
7	32–900184	SWITCH, PRESSURE 50PSI
8	10–805375	HOSE, HP 3/8x19" w/HEAT BARRIER
9	12–800347	ELL, 3/8Px1/2T 45deg
10	10–805359	HOSE, HP 3/8x42" w/HEAT BARRIER
11	11–800368	NIP, 3/8 CLOSE SST
12	15–808068	REGULATOR, PRESSURE
13	09–805343	HOSE, WATER 5/8x17"
14	03–000246	CLAMP, HOSE #8
15	12–800345	FTTG, BARB 3/8Px5/8H
16	11–800341	ELL, STREET 3/8 45deg
17	12–800225	ELL, 3/8Px1/2T
18	52–501682	MANIFOLD, REGULATOR
19	11–800429	NIP, HEX 3/8 SST
20	02–000038	LOCK WASHER, 1/4
21	00–000210	SCREW, 1/4–20x3/4" SOCHD
22	16–808201	KIT, O–RING REPAIR
23	16–808200	KIT, VALVE REPAIR

#15–808068
PRESSURE REGULATOR DETAIL



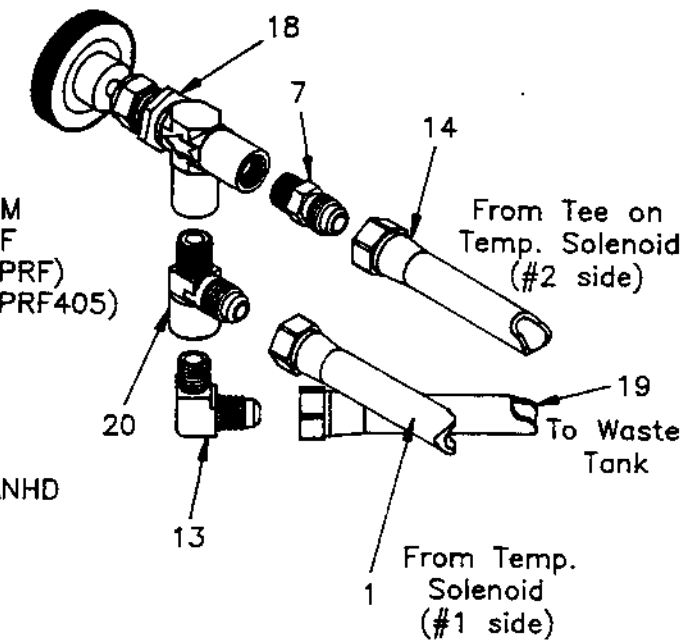
NOTE: Some parts in kits may not be used.

TEMPERATURE SOLENOID ASSEMBLY



Part #66–945280, Bypass Maintenance Kit is available. This kit contains the tools necessary to disassemble and reassemble the interior parts of the bypass manifold and temperature solenoid.

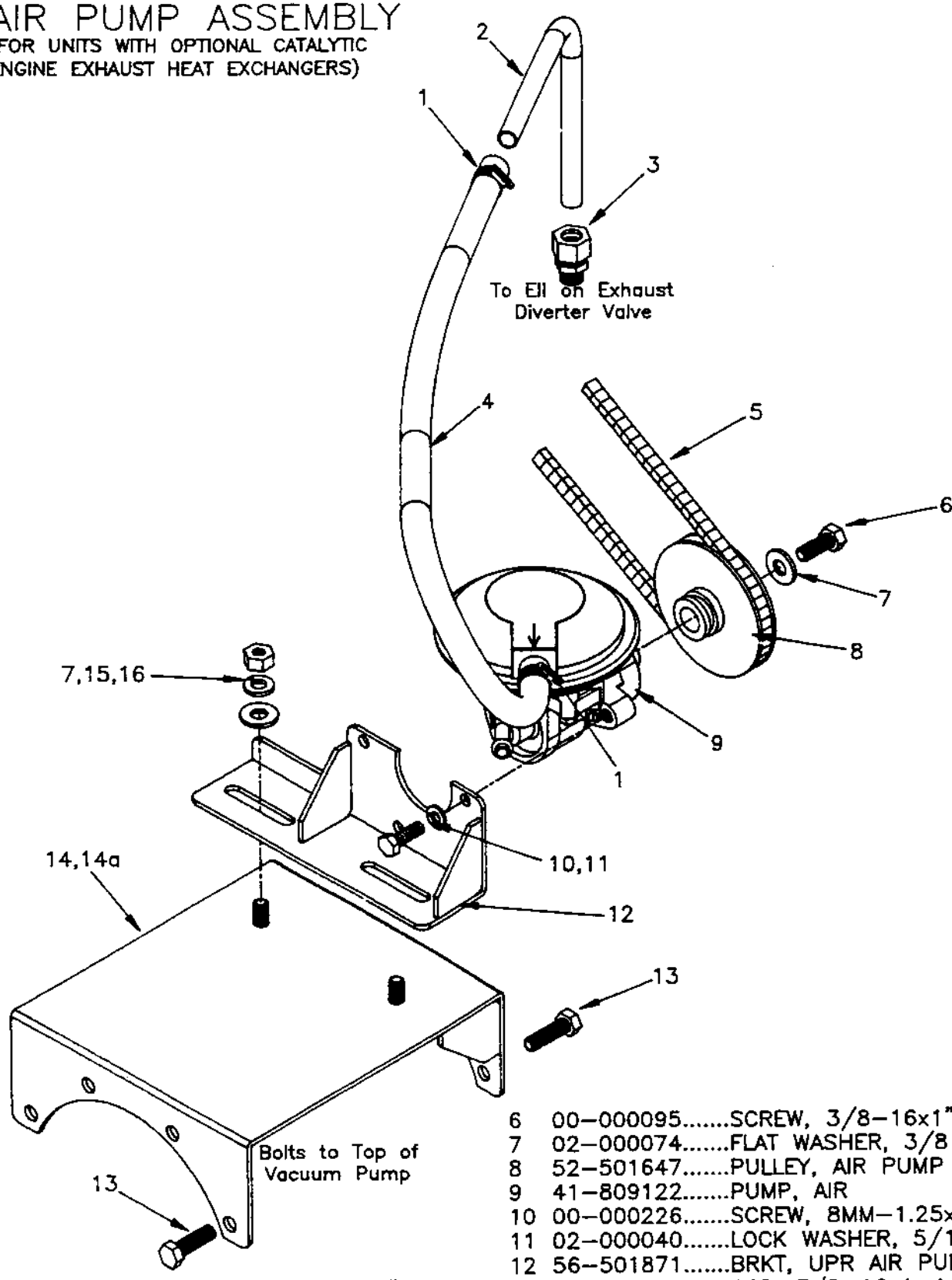
TEMPERATURE BYPASS VALVE ASSEMBLY



1	10–805000	HOSE, 3/16x9"
2	12–800060	CONN, 1/4Px1/4T
3	15–808105	VALVE, SOLENOID
4	31–900028	TERMINAL, INS DSC 1/4M
5	31–900027	TERMINAL, INS DSC 1/4F
6	10–805130	HOSE, 3/16x13–1/2" (PRF)
6a	10–805393	HOSE, 3/16x14–1/4" (PRF405)
7	12–800065	CONN, 1/8Px1/4T
8	11–800133	TEE, 1/8
9	11–800380	NIP, HEX 1/4x1/8 SST
10	50–501744	BRACKET, SOLENOID
11	02–000032	LOCK WASHER, #10
12	00–000065	SCREW, 10–32x3/8" PANHD
13	12–800040	ELL, 1/8Px1/4T
14	10–805327	HOSE, 3/16x10"
15	02–000066	FLAT WASHER, 1/4
16	02–000038	LOCK WASHER, 1/4
17	00–000055	SCREW, 1/4–20x3/4"
18	15–808107	VALVE, METERING 1/8FP
19	10–805363	HOSE, 3/16x63–1/2"
20	12–800088	TEE, ADAPTER 1/8FPx1/8Px1/4T

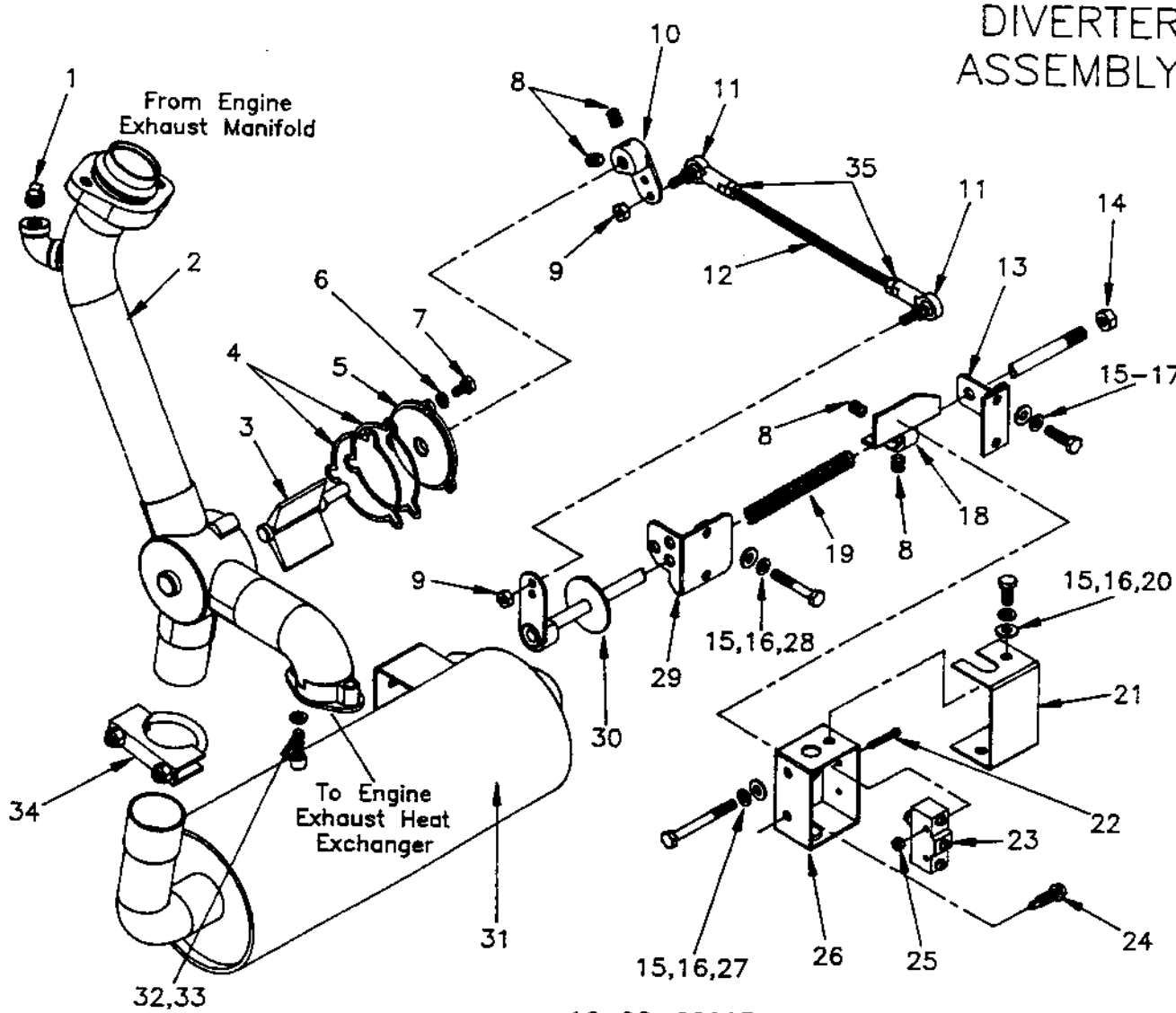
AIR PUMP ASSEMBLY

(FOR UNITS WITH OPTIONAL CATALYTIC ENGINE EXHAUST HEAT EXCHANGERS)



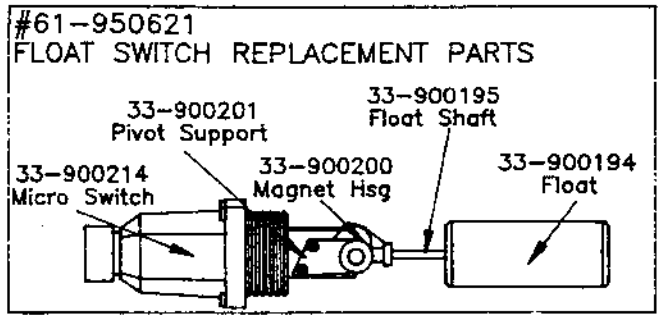
1	03–000246.....CLAMP, HOSE #8	6	00–000095.....SCREW, 3/8–16x1"
2	55–501745.....TUBE, AIR PUMP	7	02–000074.....FLAT WASHER, 3/8
3	12–800355.....CONN, 1/4Px1/2T COMP	8	52–501647.....PULLEY, AIR PUMP
4	09–805397.....HOSE, WTR 1/2x24"	9	41–809122.....PUMP, AIR
5	44–802168.....BELT, 3VX250	10	00–000226.....SCREW, 8MM–1.25x20MM
		11	02–000040.....LOCK WASHER, 5/16
		12	56–501871.....BRKT, UPR AIR PUMP
		13	00–000266.....SCR, 3/8–16x1–1/4"
		14	56–501849.....BRKT, LWR PMP (PRF)
		14a	56–501936.....BRKT, LWR PMP(PRF405)
		15	02–000075.....LOCK WASHER, 3/8
		16	01–000073.....NUT, 3/8–16 HXHD

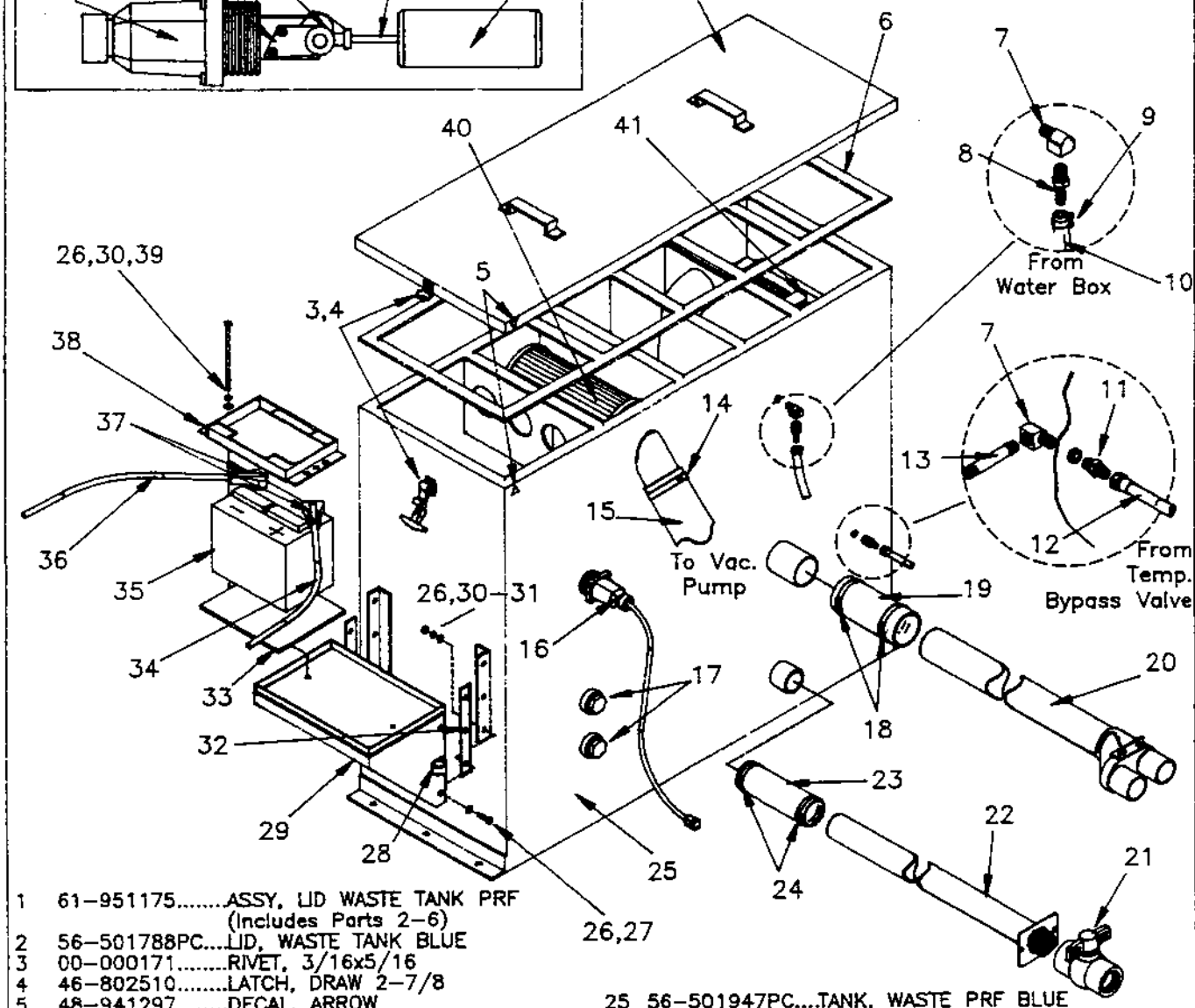
EXHAUST DIVERTER ASSEMBLY



1	11–800169.....PLUG, 1/4 (Non–Cat. Units Only. See Air Pmp Assy for Catalytic Units)	16	02–000038.....LOCK WASHER, 1/4
2	56–501941.....VALVE, EXH DIVERTER (Includes Parts 3–7)	17	00–000055.....SCREW, 1/4–20x3/4"
3	52–501641.....DIVERTER, EXHAUST	18	56–501761.....LEVER, ACTIVATING DIVRTR
4	43–807087.....GSKT, DIVERTER CAP	19	04–000286.....SPRING, DIVERTER VALVE
5	52–501642.....CAP, EXH DIVERTER	20	00–000070.....SCREW, 1/4–20x1/2"
6	02–000044.....LOCK WASHER, 1/4 SST	21	50–501689.....COVER, SWITCH MOUNT
7	00–000005.....SCR, 1/4–20x1/2" SST	22	00–000014.....SCREW, 6–32x1" PANHD
8	00–000442.....SCR, SET 5/16–24x3/8	23	35–900180.....SWITCH, MICRO
9	01–000230.....LOCK NUT, 1/4–28	24	00–000255.....SCREW, SLFDRIVE #14x1"
10	56–501768.....ARM, REAR DIVERTER	25	01–000059.....LOCK NUT, 6–32
11	04–000284.....END, ROD	26	56–501770.....BRKT, SWITCH MOUNTING
12	52–501687.....ROD, CONN DIVRTR VLV	27	00–000142.....SCREW, 1/4–20x2–1/2"
13	56–501772.....BRKT, FR DIVERTER RD	28	00–000122.....SCREW, 1/4–20x1–3/4"
14	01–000272.....NUT, JAM 3/8–16	29	56–501882.....GUIDE, DIVERTER ROD
15	02–000066.....FLAT WASHER, 1/4	30	56–502071.....ROD, ADJUSTING DIVRTR
		31	57–520072.....MUFFLER, EXHAUST
		32	02–000274.....LOCK WSHR, 5/16 (Allen)
		33	00–000315.....SCR, 5/16–18x7/8" SOC
		34	03–000081.....CLAMP, MUFFLER 1–1/2"
		35	01–000290.....NUT, JAM 1/4–28 HXHD

PERFORMER WASTE TANK ASSEMBLY

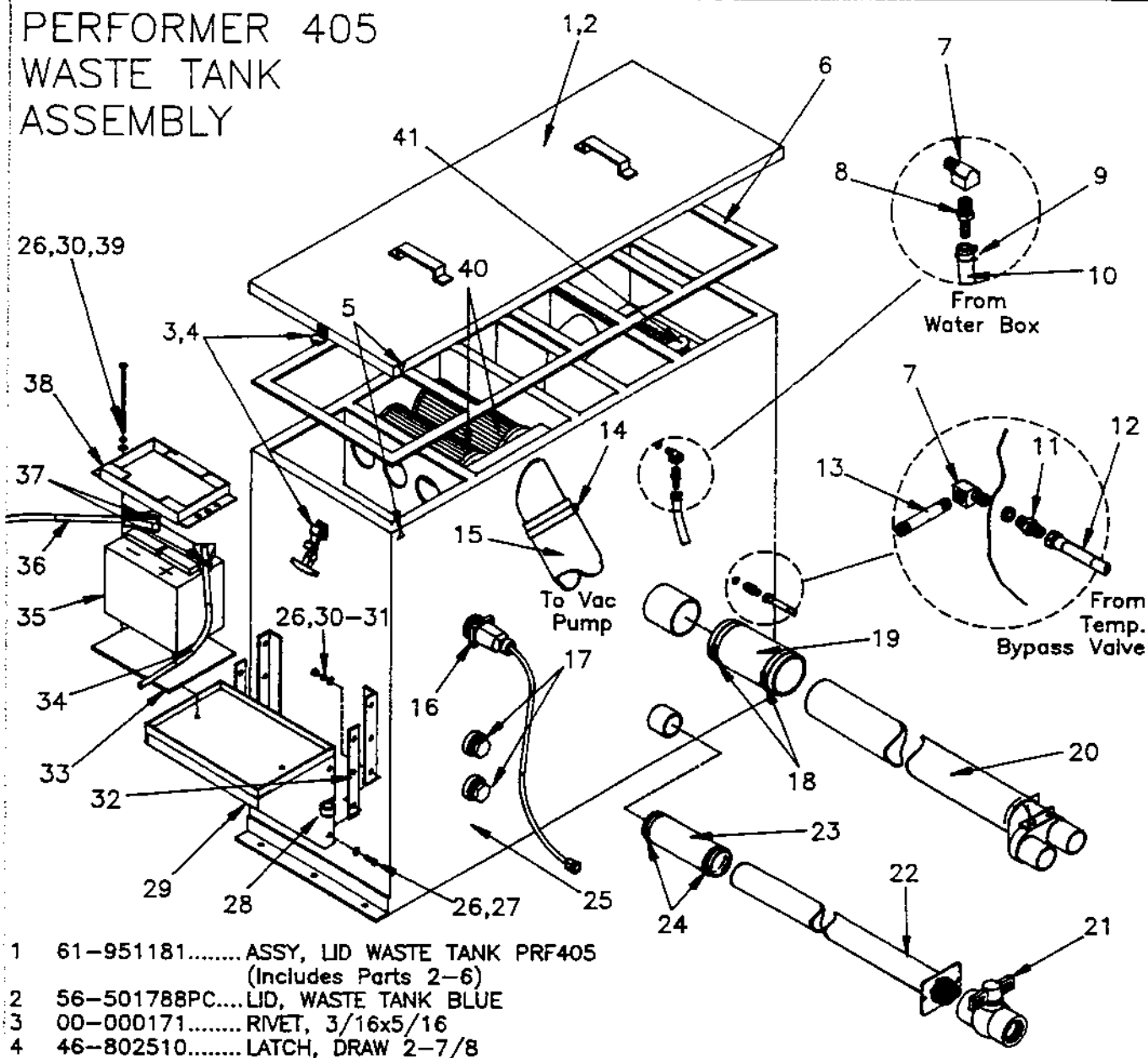




1 61-951175.....ASSY, LID WASTE TANK PRF (Includes Parts 2-6)
2 56-501788PC....LID, WASTE TANK BLUE
3 00-000171.....RIVET, 3/16x5/16
4 46-802510.....LATCH, DRAW 2-7/8
5 48-941297.....DECAL, ARROW
6 43-807094.....GASKET, WASTE TANK LID PRF
7 11-800045.....ELL, STREET 1/4
8 12-800092.....FTTG, BARB 1/4Px5/16H
9 03-000065.....CLAMP, HOSE #4
10 09-805099.....HOSE, BRAID 5/16x40"
11 12-800060.....CONN, 1/4Px1/4T
12 10-805363.....HOSE, 3/16x63-1/2"
13 11-800404.....NIP, 1/4x5" SST
14 03-000112.....CLAMP, HOSE #48
15 09-805341.....HOSE, INT VAC 2-7/8x25"
16 61-950621.....ASSY, LEVEL SENSOR SWITCH
17 11-800402.....PLUG, 1-1/4 HXHD PVC
18 03-000000.....CLAMP, HOSE #40
19 09-805143.....HOSE, INT VAC 2-1/2x6-1/2"
20 56-502220PC....TUBE, VAC INLET PRF BLUE
21 15-808080.....VALVE, BALL 1-1/2FP
22 56-501738.....TUBE, WASTE DUMP
23 09-805339.....HOSE, INT VAC 2x7"
24 03-000054.....CLAMP, HOSE #32
25 56-501947PC....TANK, WASTE PRF BLUE
26 02-000066.....FLAT WASHER, 1/4
27 00-000078.....SCREW, 1/4-20x1" GR8
28 03-000242.....CLAMP, CABLE
29 56-501779.....TRAY, BATTERY
30 02-000038.....LOCK WASHER, 1/4
31 01-000037.....NUT, 1/4-20 HXHD
32 50-501697.....SPACER, BATTERY SHELF MTG
33 47-700007.....SHIELD, BATTERY MOUNT
34 64-950499.....CABLE, BATTERY 61" RED
35 36-900056.....BATTERY, 300 CCA
36 64-950498.....CABLE, BATTERY 71" BLACK
37 31-900179.....COVER, BATTERY TERMINALS
38 56-500188.....COVER, BATTERY
39 00-000167.....SCREW, 1/4-20x6"
40 14-806518.....STRAINER, WASTE TANK 2-1/2"
41 56-501793.....BASKET, STRAINER

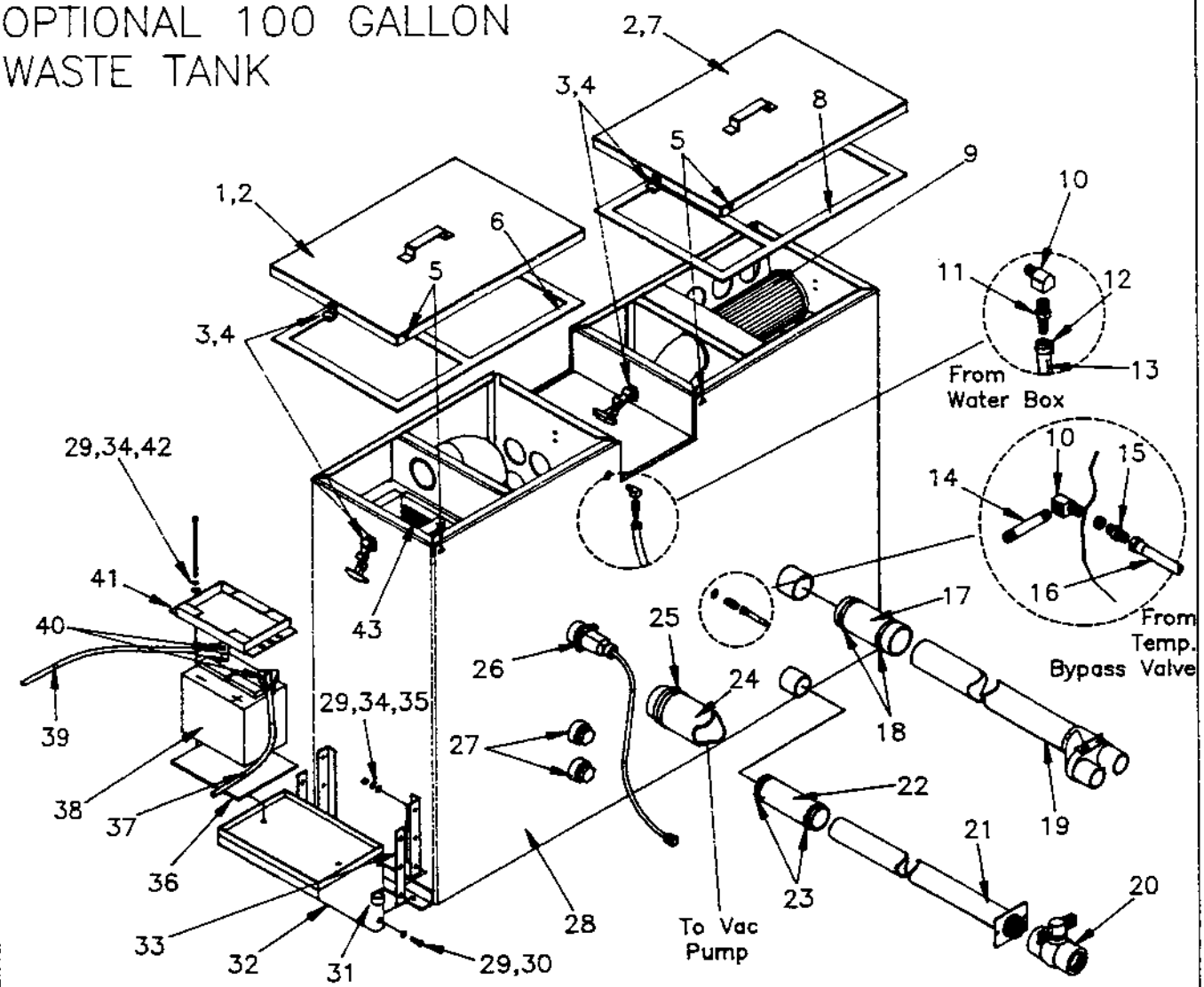
NOT SHOWN
05-008002.....ADHESIVE, GASKET (10.3oz tube)

PERFORMER 405 WASTE TANK ASSEMBLY



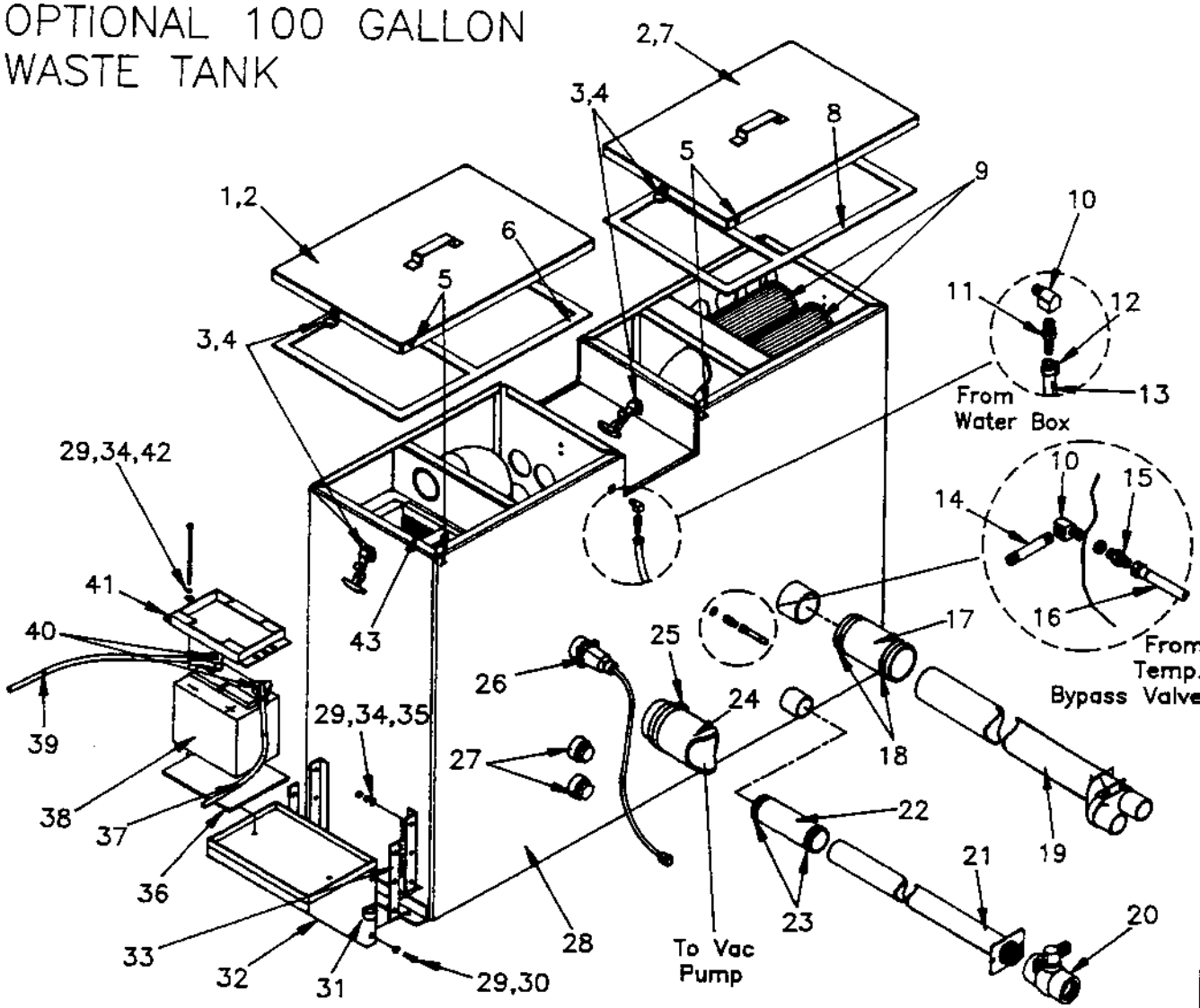
1	61–951181.....	ASSY, LID WASTE TANK PRF405 (Includes Parts 2–6)
2	56–501788PC....	LID, WASTE TANK BLUE
3	00–000171.....	RIVET, 3/16x5/16
4	46–802510.....	LATCH, DRAW 2–7/8
5	48–941297.....	DECAL, ARROW
6	43–807107.....	GSKT, WST TNK PRF405
7	11–800045.....	ELL, STREET 1/4
8	12–800092.....	FTTG, BARB 1/4Px5/16H
9	03–000065.....	CLAMP, HOSE #4
10	09–805099.....	HOSE, BRAID 5/16x40"
11	12–800060.....	CONN, 1/4Px1/4T
12	10–805363.....	HOSE, 3/16x63–1/2"
13	11–800404.....	NIP, 1/4x5" SST
14	03–000250.....	CLAMP, HOSE #60
15	09–805426.....	HOSE, INT VAC 3–1/2x25"
16	61–950621.....	ASSY, LEVEL SENSOR SW
17	11–800402.....	PLUG, 1–1/4 HXHD PVC
18	03–000112.....	CLAMP, HOSE #48
19	09–805434.....	HOSE, INT VAC 3x6–1/2"
20	56–502221PC....	TUBE, VAC IN PRF405 BLU
21	15–808080.....	VALVE, BALL 1–1/2FP
22	56–501738.....	TUBE, WASTE DUMP
23	09–805339.....	HOSE, INT VAC 2x7"
24	03–000054.....	CLAMP, HOSE #32
25	56–501944PC....	TANK, WASTE PRF405 BLUE
26	02–000066.....	FLAT WASHER, 1/4
27	00–000078.....	SCREW, 1/4–20x1" GR8
28	03–000242.....	CLAMP, CABLE
29	56–501779.....	TRAY, BATTERY
30	02–000038.....	LOCK WASHER, 1/4
31	01–000037.....	NUT, 1/4–20 HXHD
32	50–501697.....	SPACER, BATTERY SHELF MTG
33	47–700007.....	SHIELD, BATTERY MOUNT
34	64–950499.....	CABLE, BATTERY 61" RED
35	36–900056.....	BATTERY, 300 CCA
36	64–950498.....	CABLE, BATTERY 71" BLACK
37	31–900179.....	COVER, BATTERY TERMINALS
38	56–500188.....	COVER, BATTERY
39	00–000167.....	SCREW, 1/4–20x6"
40	14–806509.....	STRAINER, WASTE TANK 2"
41	56–501793.....	BASKET, STRAINER
		NOT SHOWN
	05–008002.....	ADHESIVE, GSKT (10.3oz tb)

PERFORMER OPTIONAL 100 GALLON WASTE TANK



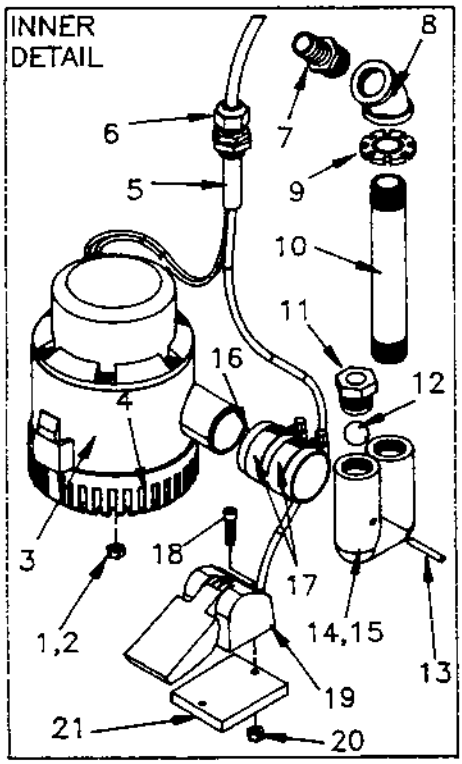
1	61-951164.....ASSY, WST TNK LID BASKET SD (Includes Parts 2-6)	23	03-000054.....CLAMP, HOSE #32
2	56-502264PC...LID, WST TNK 100G DUAL LID	24	09-805341.....HOSE, INT VAC 2-7/8x25"
3	00-000171.....RIVET, 3/16x5/16"	25	03-000112.....CLAMP, HOSE #48
4	46-802510.....LATCH, DRAW 2-7/8	26	61-950621.....ASSY, LEVEL SENSOR SWITCH
5	48-941297.....DECAL, ARROW	27	11-800402.....PLUG, 1-1/4 HXHD PVC
6	43-807547.....GSKT, WST TNK LID BASKET SD	28	56-502263PC...TNK, WST PRF 100GAL
7	61-951163.....ASSY, WST TNK LID FILTER SD (Includes Parts 2-5 and 8)	29	02-000066.....FLAT WASHER, 1/4
		30	00-000078.....SCREW, 1/4-20x1" GR8
		31	03-000242.....CLAMP, CABLE 3/4ID
8	43-807546.....GSKT, WST TNK LID FILTER SD	32	56-501779.....TRAY, BATTERY
9	14-806518.....STRAINER, WASTE TANK 2-1/2"	33	50-501697.....SPACER, BATTERY SHELF MTG
10	11-800045.....ELL, STREET 1/4	34	02-000038.....LOCK WASHER, 1/4
11	12-800092.....FITTING, BARB 1/4Px5/16H	35	01-000037.....NUT, 1/4-20 HXHD
12	03-000065.....CLAMP, HOSE #4	36	47-700007.....SHIELD, BATTERY MOUNT HEAT
13	09-805099.....HOSE, BRAID 5/16x40"	37	64-950499.....CABLE, BATTERY 61" RED
14	11-800404.....NIP, 1/4x5" SST	38	36-900056.....BATTERY, 300 CCA
15	12-800060.....CONN, 1/4Px1/4T	39	64-950498.....CABLE, BATTERY 71" BLACK
16	10-805363.....HOSE, 3/16x63-1/2"	40	31-900179.....COVER, BATTEY TERMINALS
17	09-805143.....HOSE, INT VAC 2-1/2x6-1/2"	41	56-500188.....COVER, BATTERY
18	03-000000.....CLAMP, HOSE #40	42	00-000167.....SCREW, 1/4-20x6"
19	56-502220PC...TUBE, VAC INLET PRF BLUE	43	56-501793.....BASKET, STRAINER
20	15-808080.....VALVE, BALL 1-1/2FP		
21	56-501738.....TUBE, WASTE DUMP		NOT SHOWN
22	09-805339.....HOSE, INT VAC 2x7"		05-008002.....ADHESIVE, GASKET (10.3oz tube)

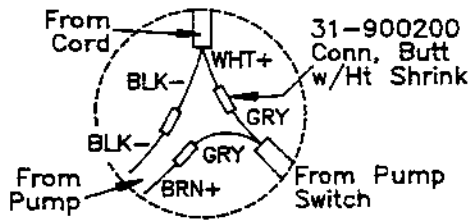
PERFORMER 405 OPTIONAL 100 GALLON WASTE TANK

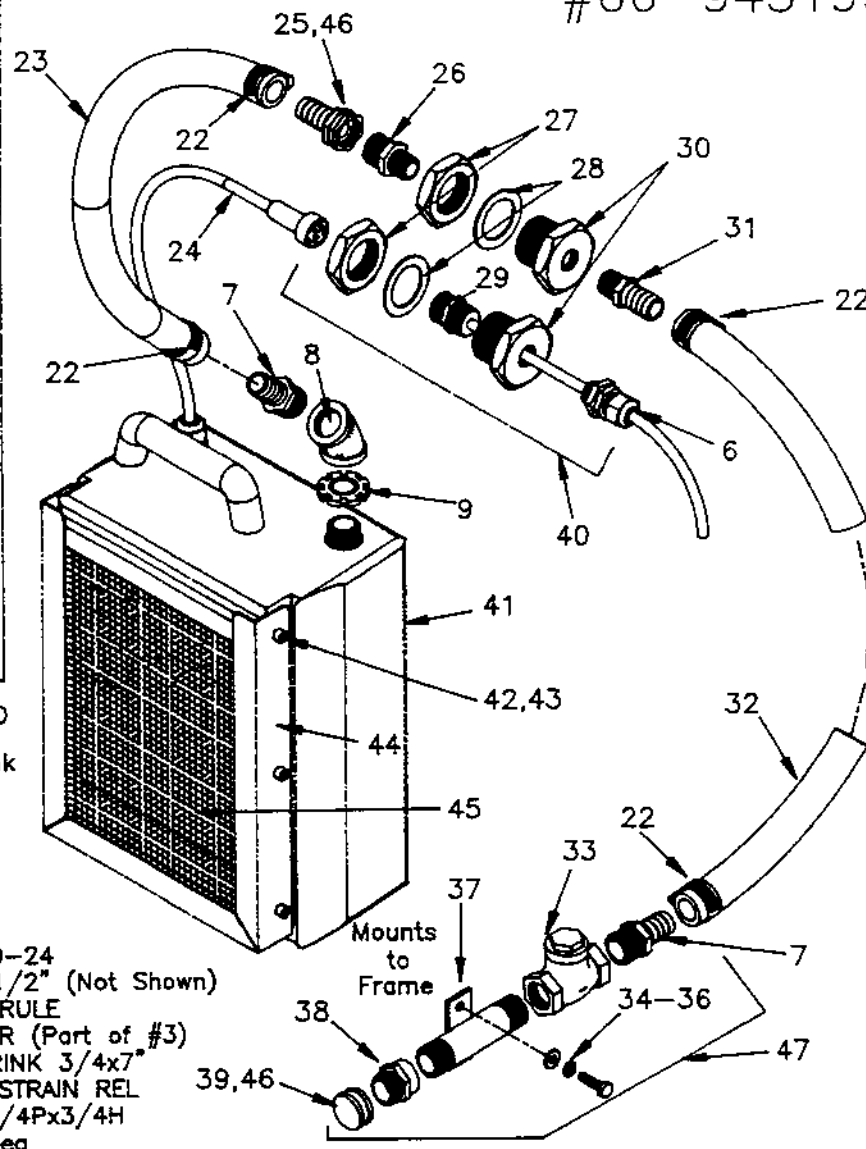


1	61–951164.....ASSY, WST TNK LID BASKET SD (Includes Parts 2–6)	23	03–000054.....CLAMP, HOSE #32
2	56–502264PC...LID, WST TNK 100G DUAL LID	24	09–805426.....HOSE, INT VAC 3–1/2x25"
3	00–000171.....RIVET, 3/16x5/16"	25	03–000250.....CLAMP, HOSE #60
4	46–802510.....LATCH, DRAW 2–7/8	26	61–950621.....ASSY, LEVEL SENSOR SWITCH
5	48–941297.....DECAL, ARROW	27	11–800402.....PLUG, 1–1/4 HXHD PVC
6	43–807547.....GSKT, WST TNK LID BASKET SD	28	56–502262PC...TNK, WST PRF405 100GAL
7	61–951163.....ASSY, WST TNK LID FILTER SD (Includes Parts 2–5 and 8)	29	02–000066.....FLAT WASHER, 1/4
		30	00–000078.....SCREW, 1/4–20x1" GR8
		31	03–000242.....CLAMP, CABLE 3/4ID
8	43–807546.....GSKT, WST TNK LID FILTER SD	32	56–501779.....TRAY, BATTERY
9	14–806509.....STRAINER, WASTE TANK 2"	33	50–501697.....SPACER, BATTERY SHELF MTG
10	11–800045.....ELL, STREET 1/4	34	02–000038.....LOCK WASHER, 1/4
11	12–800092.....FITTING, BARB 1/4Px5/16H	35	01–000037.....NUT, 1/4–20 HXHD
12	03–000065.....CLAMP, HOSE #4	36	47–700007.....SHIELD, BATTERY MOUNT HEAT
13	09–805099.....HOSE, BRAID 5/16x40"	37	64–950499.....CABLE, BATTERY 61" RED
14	11–800404.....NIP, 1/4x5" SST	38	36–900056.....BATTERY, 300 CCA
15	12–800060.....CONN, 1/4Px1/4T	39	64–950498.....CABLE, BATTERY 71" BLACK
16	10–805363.....HOSE, 3/16x63–1/2"	40	31–900179.....COVER, BATTEY TERMINALS
17	09–805434.....HOSE, INT VAC 3x6–1/2"	41	56–500188.....COVER, BATTERY
18	03–000112.....CLAMP, HOSE #48	42	00–000167.....SCREW, 1/4–20x6"
19	56–502221PC...TUBE, VAC INLET PRF405 BLUE	43	56–501793.....BASKET, STRAINER
20	15–808080.....VALVE, BALL 1–1/2FP		
21	56–501738.....TUBE, WASTE DUMP		NOT SHOWN
22	09–805339.....HOSE, INT VAC 2x7"		05–008002.....ADHESIVE, GASKET (10.3oz tube)

WASTE PUMP #66-945193

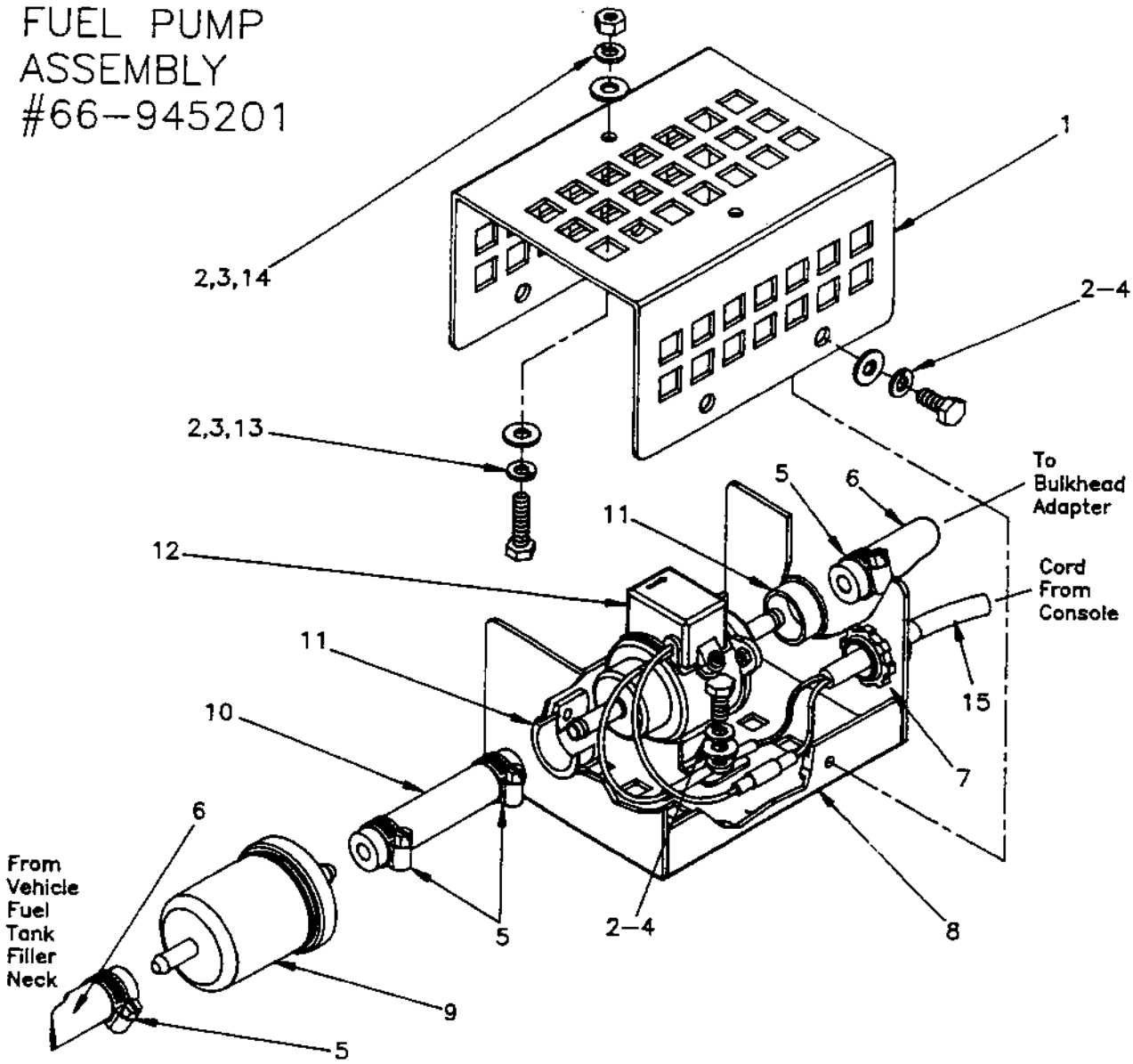






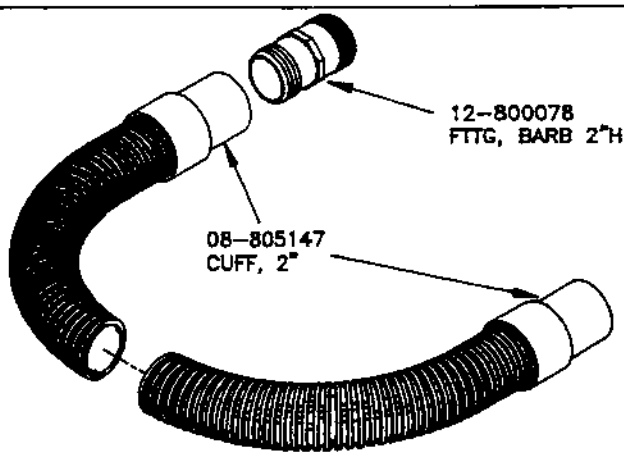
1	01-000188.....	LOCK NUT, 10-24
2	00-000071.....	SCR, 10-24x1/2" (Not Shown)
3	41-809128.....	PUMP, BILGE RULE
4	42-809267.....	BASKET, STRNR (Part of #3)
5	09-805563.....	TUBE, HT SHRINK 3/4x7"
6	31-900194.....	CONN, CORD STRAIN REL
7	12-800095.....	FTTG, BARB 3/4Px3/4H
8	11-800434.....	ELL, 3/4 45deg
9	01-000119.....	LOCK NUT, 3/4NPT
10	11-800419.....	NIP, 3/4x6-5/8" PVC
11	52-501666.....	SEAT, 1.00-20x1/2P
12	04-000291.....	BALL, NYLON 3/4dia
13	04-000290.....	PIN, 3/16x1-3/8"
14	52-501662.....	BODY, WASTE PUMP VLV
15	15-808101.....	ASSY, WASTE PUMP VLV (Includes Parts 11-14)
16	08-805262.....	CUFF, WASTE PUMP
17	03-000110.....	CLAMP, HOSE #24
18	00-000317.....	SCREW, 10-32x1-1/4"
19	32-900183.....	SWITCH, PUMP RULE
20	01-000241.....	LOCK NUT, 10-32
21	50-501730.....	SPACER, WASTE PUMP
22	03-000113.....	CLAMP, HOSE #12
23	09-805436.....	HOSE, WATER 3/4x21"
24	31-900197.....	CONN, WASTE PUMP F
25	12-800370.....	CONN, 3/4SWIVx3/4BARB
26	12-800051.....	CONN, 1/2Px3/4H
27	52-501651.....	NUT, HOS&CD FITTING
28	43-807092.....	SEAL, WASTE PUMP
29	31-900198.....	CONN, WASTE PUMP M
30	52-501649.....	FTTG, CORD WASTE PUMP
31	12-800278.....	FTTG, BARB 1/2Px3/4H
32	09-805320.....	HOSE, WATER 3/4x85"
33	15-808065.....	VALVE, SWING CHECK 3/4FP
34	00-000078.....	SCREW, 1/4-20x1" GR8
35	02-000038.....	LOCK WASHER, 1/4
36	02-000066.....	FLAT WASHER, 1/4
37	56-501794.....	BRKT, OUTL WST PMP
38	12-800360.....	CONN, 3/4FxHOSE CONN
39	12-800052.....	CAP, HOSE 3/4
40	64-950541.....	ASSY, WASTE PUMP CORD (Includes Parts 6 and 27-30)
41	58-500643.....	MOLDING, WASTE PUMP
42	00-000210.....	SCREW, 1/4-20x3/4"
43	01-000023.....	LOCK NUT, 1/4-20
44	50-501706.....	GUIDE, STRAINER
45	14-806550.....	STRAINER, WASTE PUMP
46	43-807008.....	WASHER, HOSE 5/8IDx1"OD
47	66-950412.....	ASSY, OUTL WST PMP (Parts 7,33,37-39, and 46)

EXTERNAL ELECTRIC FUEL PUMP ASSEMBLY #66–945201

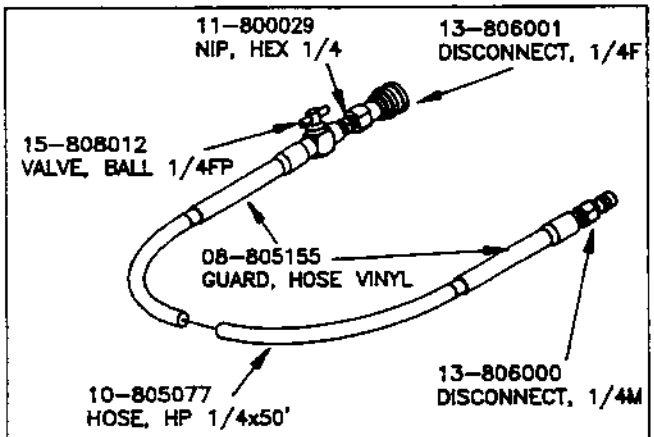


1	50–501739	COVER, FUEL PUMP BRACKET
2	02–000066	FLAT WASHER, 1/4
3	02–000038	LOCK WASHER, 1/4
4	00–000055	SCREW, 1/4–20x3/4" HXHD
5	03–000254	CLAMP, HOSE #6
6	09–805345	HOSE, FUEL 5/16x15' ABRASION RESIST (cut to fit)
7	31–900017	CONN, CORD 1/2
8	56–501880	BRACKET, FUEL PUMP MTG
9	42–902311	FUEL FILTER
10	09–805417	HOSE, FUEL 5/16x3–1/2" ABRASION RESIST
11	31–900067	BUSHING, SNAP
12	41–809132	PUMP, FUEL
13	00–000078	SCREW, 1/4–20x1" HXHD GR 8
14	01–000037	NUT, 1/4–20 HXHD
15	64–950548	CORD, FUEL PUMP

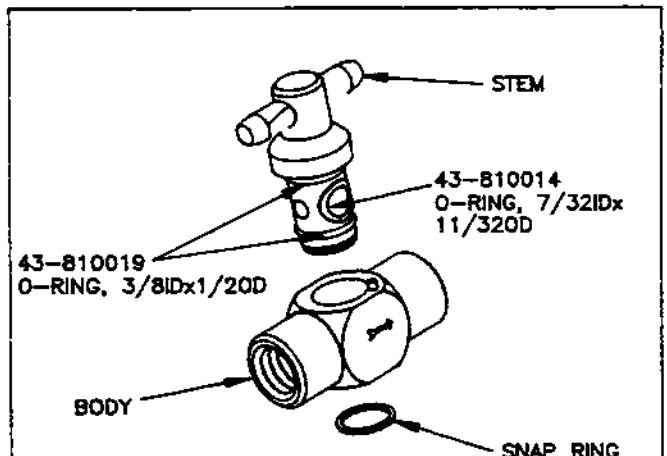
HOSE ACCESSORIES



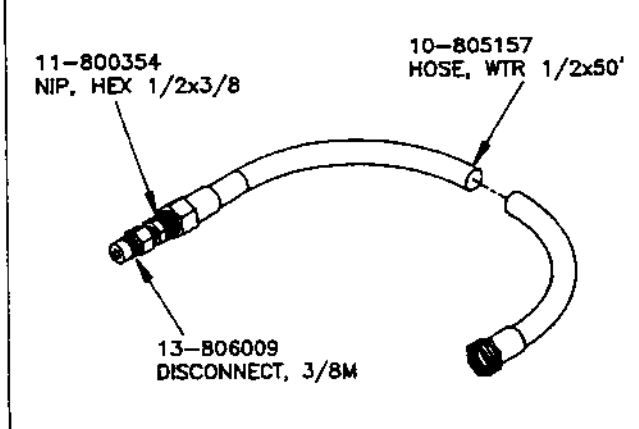
#10–805060, & #12–800078
HOSE, VAC 2"x50 FT w/ CUFFS, & HOSE CONNECTOR



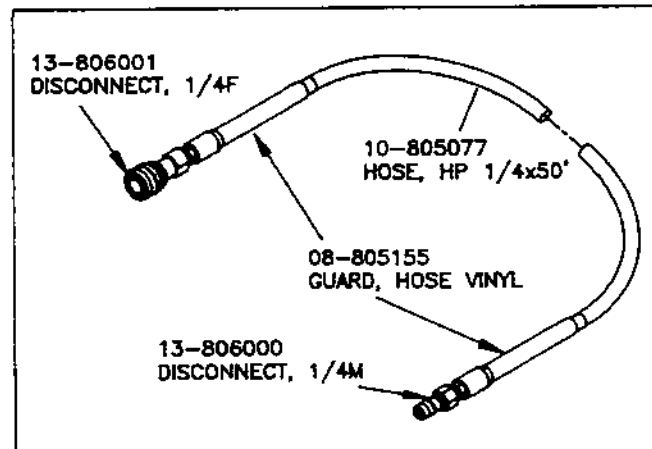
#10–805108
HOSE, HP 1/4"x50 FT w/VALVE & DSC



#15–808012
VALVE, BALL 1/4FP (Detail)



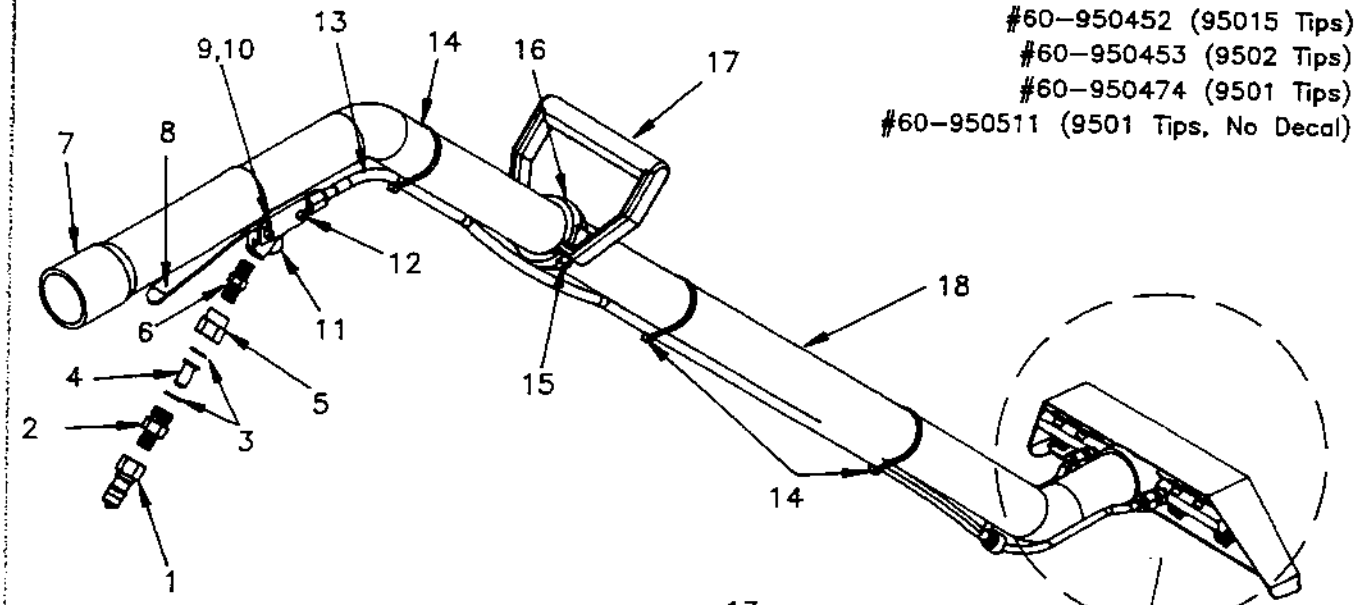
#10–805295
HOSE, WATER 1/2"x50 FT w/DISCONNECT

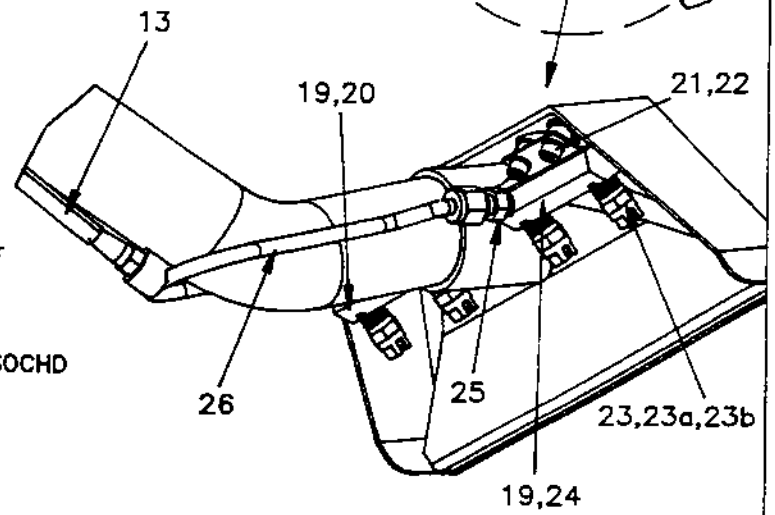


#10–805122
HOSE, HP 1/4"x50 FT w/DISCONNECTS

QUAD–JET WAND

#60–950452 (95015 Tips)
#60–950453 (9502 Tips)
#60–950474 (9501 Tips)
#60–950511 (9501 Tips, No Decal)



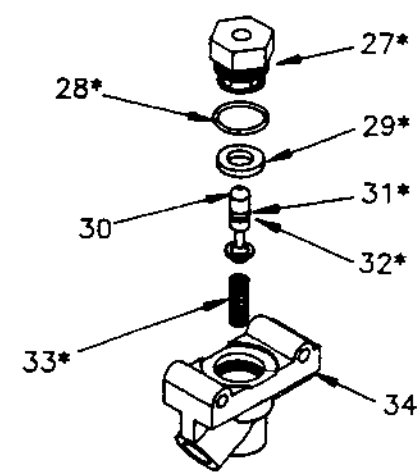


1	13–806000	DSC, 1/4Mx1/4FP
2	17–803010	CONN, 1/4Px11/16–16M
3	17–803006	WASHER, NYLON
4	14–806512	STRAINER, JET 50MESH
5	17–803036	CONN, 1/4FPx11/16–16F
6	11–800029	NIP, HEX 1/4
7	09–805359	SLEEVE, WAND HANDLE
8	52–501619	TRIGGER, WAND VALVE
9	00–000317	SCREW, 10–32x1–1/4" SOCHD
10	01–000241	LOCK NUT, 10–32 HXHD
11	61–950496	ASSY, EXTRACTOR VALVE
12	12–800060	CONN, 1/4Px1/4T
13	10–805387	HOSE, 3/16x43–1/2"
14	04–000053	TIE, CABLE 8" WHITE
15	00–000282	SCREW, 1/4–20x1–1/4"
16	52–501569	HOLD DOWN, WAND HANDLE
17	52–501568	BODY, WAND HANDLE
18	56–501940	WAND&HEAD, CAST SST
19	11–800206	PLUG, 1/8 SOCHD
20	56–501966	ASSY, LEFT S–BEND MNFLD
21	00–000347	SCREW, 10–24x1/4" SOCHD
22	02–000032	LOCK WASHER, #10
23	17–803001	TIP, SPRAY 95015x1/8P (60–950452)
23a	17–803002	TIP, SPRAY 9502x1/8P (60–950453)
23b	17–803018	TIP, SPRAY 9501x1/8P (60–950474/511)
24	56–501986	ASSY, RIGHT S–BEND MNFLD
25	12–800322	CONN, 1/8Px1/4T COMP
26	56–501967	ASSY, S–BEND MANIFOLD
27	16–808229	HOLDER, VALVE STEM
28	43–810063	O–RING, .551IDx.691OD
29	16–808228	SEAT, EXTRACTOR VALVE
30	16–808189	STEM, EXTRACTOR VALVE
31	43–810064	BACK–UP, .250DIA
32	43–810062	O–RING, .114IDx.254OD
33	16–808190	SPRING, EXTRACTOR VALVE
34	52–501590	BODY, EXTRACTOR VALVE

NOT SHOWN
48–941186 DECAL, WAND HEAD (CAST SST)

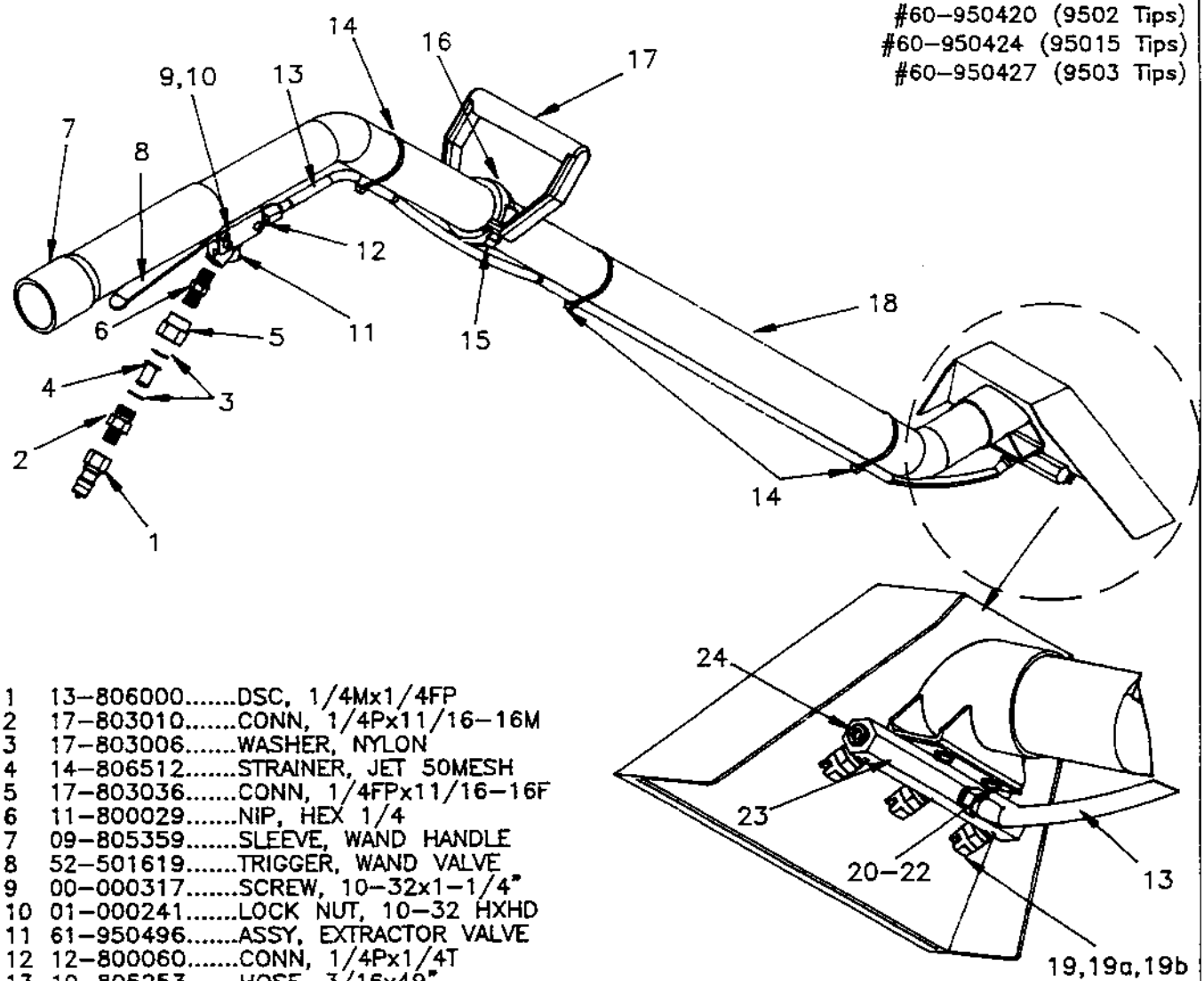
#61–950496
EXTRACTOR VALVE DETAIL

REPAIR KIT, PART #66–808169
(Includes parts with "*")



TRI–JET WAND

#60–950420 (9502 Tips)
#60–950424 (95015 Tips)
#60–950427 (9503 Tips)

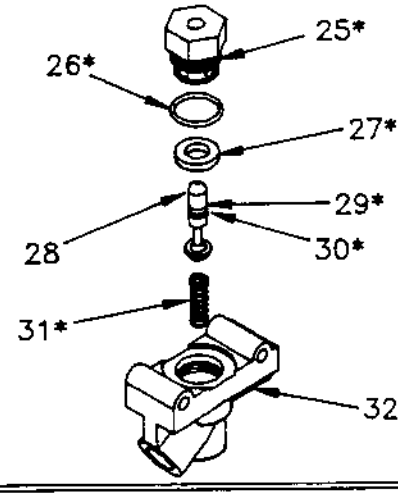


1	13–806000	DSC, 1/4Mx1/4FP
2	17–803010	CONN, 1/4Px11/16–16M
3	17–803006	WASHER, NYLON
4	14–806512	STRAINER, JET 50MESH
5	17–803036	CONN, 1/4FPx11/16–16F
6	11–800029	NIP, HEX 1/4
7	09–805359	SLEEVE, WAND HANDLE
8	52–501619	TRIGGER, WAND VALVE
9	00–000317	SCREW, 10–32x1–1/4"
10	01–000241	LOCK NUT, 10–32 HXHD
11	61–950496	ASSY, EXTRACTOR VALVE
12	12–800060	CONN, 1/4Px1/4T
13	10–805253	HOSE, 3/16x49"
14	04–000053	TIE, CABLE 8" WHITE
15	00–000282	SCREW, 1/4–20x1–1/4"
16	52–501569	HOLD DOWN, WAND HANDLE
17	52–501568	BODY, WAND HANDLE
18	56–501712	WAND&HEAD, TRI–JET WAND
19	17–803002	TIP, SPRAY 9502x1/8P (60–950420)
19a	17–803001	TIP, SPRAY 95015x1/8P (60–950424)
19b	17–803046	TIP, SPRAY 9503x1/8P (60–950427)
20	00–000331	SCREW, 10–32x3/8" SST
21	02–000032	LOCK WASHER, #10
22	01–000018	NUT, 10–32 HXHD SST
23	56–501739	MANIFOLD, WAND TRI–JET
24	11–800206	PLUG, 1/8 SOCHD
25	16–808229	HOLDER, VALVE STEM
26	43–810063	O–RING, .551IDx.691OD
27	16–808228	SEAT, EXTRACTOR VALVE
28	16–808189	STEM, EXTRACTOR VALVE
29	43–810064	BACK–UP, .250DIA
30	43–810062	O–RING, .114IDx.254OD
31	16–808190	SPRING, EXTRACTOR VALVE
32	52–501590	BODY, EXTRACTOR VALVE

NOT SHOWN
48–941166 DECAL, WAND HEAD

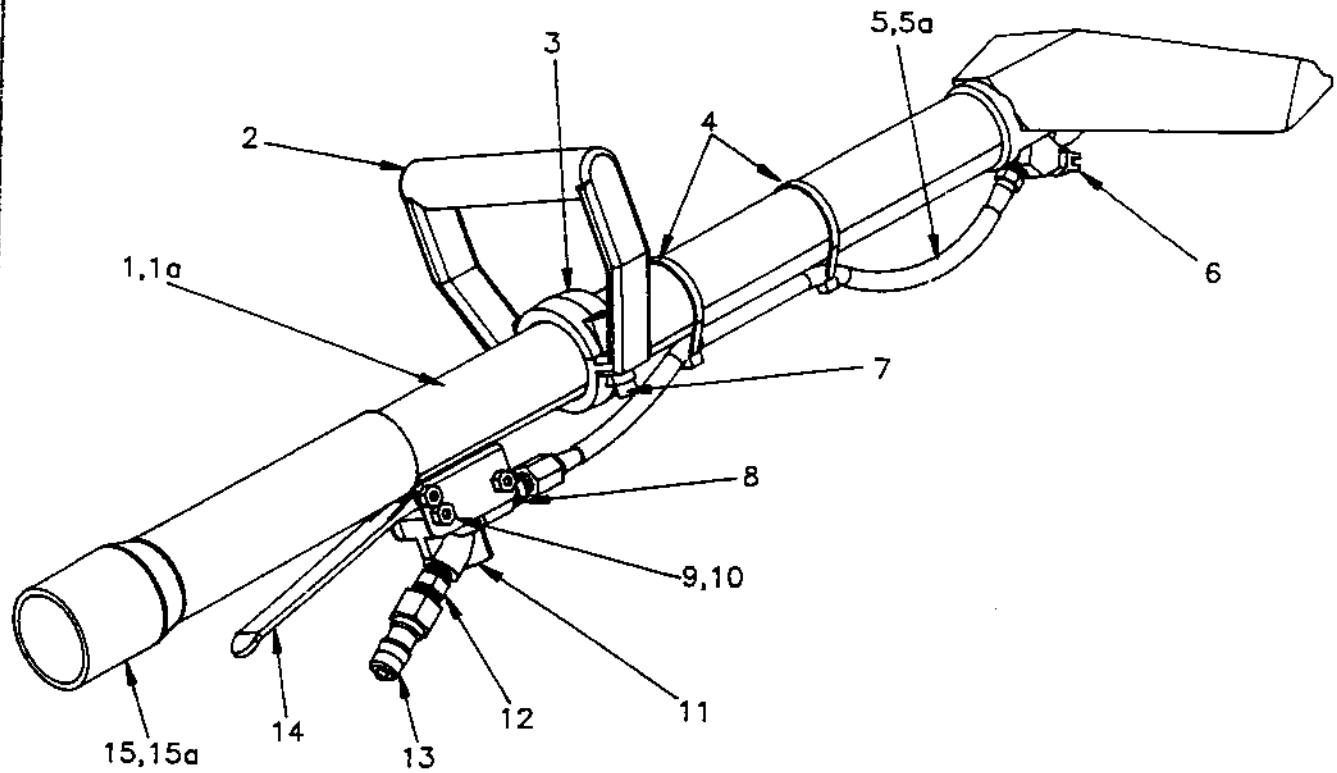
#61–950496
EXTRACTOR VALVE DETAIL

REPAIR KIT, PART #66–808169
(Includes parts with "*")



Truck Mount STAIR TOOL

Long (28–1/2") Truck Mt #60–950421
Short (20") Truck Mt #60–950450

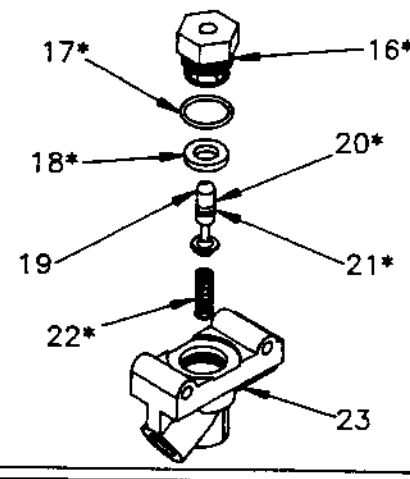


1	56–501715	WD&HD, STAIR TL (Long)
1a	56–501907	WD&HD, STAIR TL (Short)
2	52–501576	BODY, WAND HANDLE
3	52–501577	HOLD DOWN, WAND HDL
4	04–000053	TIE, CABLE 8" WHITE (Long)
5	10–805330	HOSE, 3/16x13–1/2" (Long)
5a	10–805397	HOSE, 3/16x7–1/2" (Short)
6	17–803002	TIP, SPRAY 9502x1/8P
7	00–000282	SCREW, 1/4–20x1–1/4"
8	12–800060	CONN, 1/4Px1/4T
9	00–000317	SCREW, 10–32x1–1/4"
10	01–000241	LOCK NUT, 10–32 HXHD
11	61–950496	ASSY, EXTRACTOR VALVE
12	11–800029	NIP, HEX 1/4
13	13–806000	DSC, 1/4Mx1/4FP
14	52–501619	TRIGGER, WAND VALVE
15	09–805359	SLEEVE, WAND HANDLE (Long)
15a	09–805504	SLEEVE, WAND HANDLE (Short)
16	16–808229	HOLDER, VALVE STEM
17	43–810063	O–RING, .551IDx.691OD
18	16–808228	SEAT, EXTRACTOR VALVE
19	16–808189	STEM, EXTRACTOR VALVE
20	43–810064	BACK–UP, .250DIA
21	43–810062	O–RING, .114IDx.254OD
22	16–808190	SPRING, EXTRACTOR VALVE
23	52–501590	BODY, EXTRACTOR VALVE

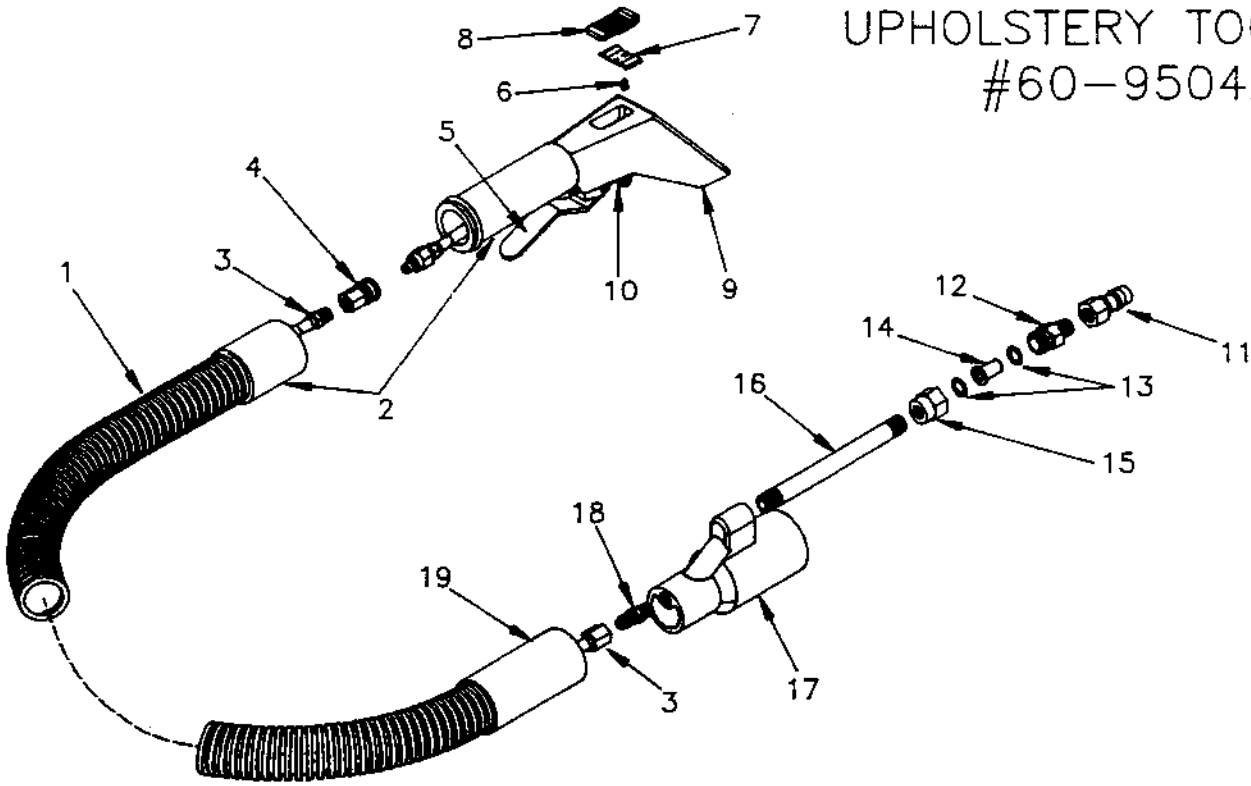
NOT SHOWN
48–941163.....DECAL, STAIR TOOL

#61–950496
EXTRACTOR VALVE DETAIL

REPAIR KIT, PART #66–808169
(Includes parts with "*")



UPHOLSTERY TOOL #60-950422

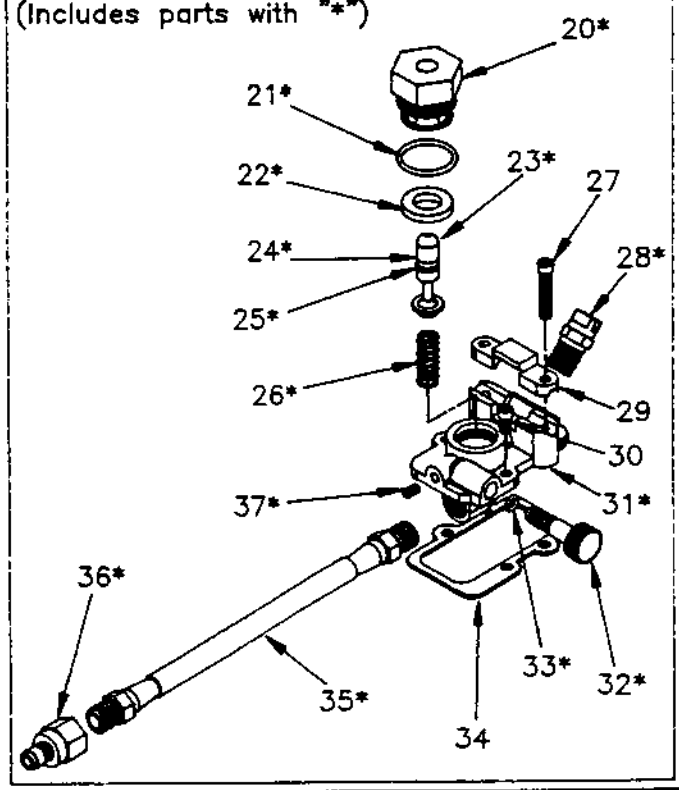


1	09-805131	HOSE, VAC 1-1/4x10'
2	08-805243	CUFF, SWIV 1-1/4Hx1-1/4T
3	10-805347	HOSE, 3/16x119-1/2"
4	13-806023	DSC, 1/8Fx1/8FP
5	58-500639	CASTING, UPHLST TL TRIG
6	00-000310	SCREW, 4-40x7/32"
7	04-000282	SPRING, VAC ADJUST
8	52-501624	BUTTON, VAC ADJUST
9	52-501842	TOOL, UPHOLSTERY
10	61-950570	ASSY, UPHLST TOOL VALVE
11	13-806000	DSC, 1/4Mx1/4FP
12	17-803010	CONN, 1/4MPx11/16-16M
13	17-803006	WASHER, NYLON
14	14-806512	STRAINER, JET 50MESH
15	17-803036	CONN, 1/4FPx11/16-16F
16	11-800404	NIP, 1/4x5" SST
17	52-501585	COUPLER, UPHOLSTERY TL
18	12-800065	CONN, 1/8Px1/4T
19	08-805138	CUFF, 1-1/4Hx1-1/2T
20	16-808229	HOLDER, VALVE STEM
21	43-810063	O-RING, .551IDx.691OD
22	16-808228	SEAT, EXTRACTOR VALVE
23	16-808189	STEM, EXTRACTOR VALVE
24	43-810064	BACK-UP, .250DIA
25	43-810062	O-RING, .114IDx.254OD
26	16-808190	SPRING, EXTRACTOR VALVE
27	00-000306	SCREW, 6-32x1"
28	17-803033	TIP, SPRAY 80015x1/8P
29	58-500638	CASTING, TRIGGER CLAMP
30	00-000307	SCREW, 6-32x3/8"
31	52-501623	VALVE, UPHOLSTERY TOOL
32	52-501626	VALVE, ADJUST UPHLST TL
33	43-810016	O-RING, 5/32IDx9/32OD
34	43-807513	GASKET, UPHLST TOOL VLV
35	10-805348	HOSE, 3/16x6-1/2"
36	13-806030	DSC, 1/8Mx1/8FP
37	00-000408	SCREW, SET 8-32x1/4"

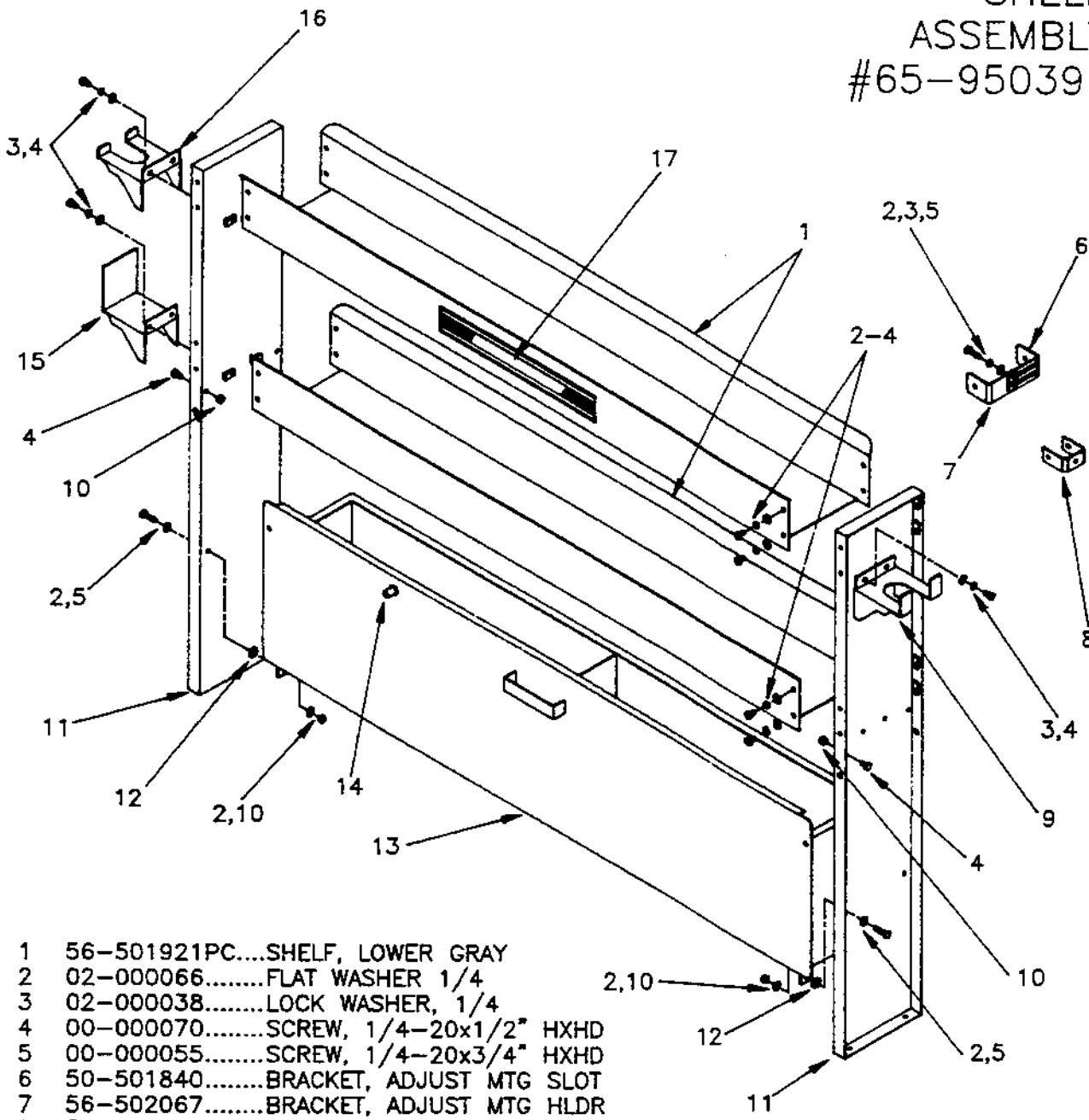
NOT SHOWN

48-941164	DECAL, UPHOLSTERY TOOL
66-808169	KIT, REPAIR WAND VALVE (Includes Parts 20-22, and 24-26)

#61-950570
UPHOLSTERY TOOL VALVE DETAIL
(Includes parts with "*")



SHELF ASSEMBLY #65–950392

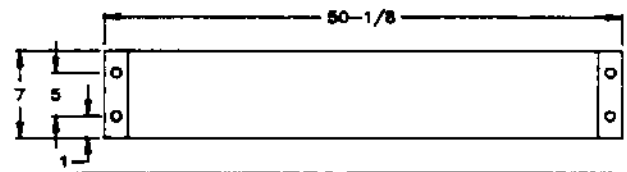


1	56–501921PC....	SHELF, LOWER GRAY
2	02–000066.....	FLAT WASHER 1/4
3	02–000038.....	LOCK WASHER, 1/4
4	00–000070.....	SCREW, 1/4–20x1/2" HXHD
5	00–000055.....	SCREW, 1/4–20x3/4" HXHD
6	50–501840.....	BRACKET, ADJUST MTG SLOT
7	56–502067.....	BRACKET, ADJUST MTG HLDR
8	56–501942.....	BRACKET, SHELF MOUNTING
9	50–501753.....	HOLDER, STAIR TOOL
10	01–000105.....	LOCK NUT, 1/4–20 HXHD
11	56–501922PC....	PANEL, SHELF END GRAY
12	50–501749.....	WASHER, NYLON
13	56–501920PC....	DRWR, SHLF GRAY
14	46–802506.....	LATCH, ADJ GRIP
15	50–501755.....	HLDR, UP TL HOS
16	50–501754.....	HLDR, UPHLST TL
17	48–941152.....	DECAL, PROCHEM

NOT SHOWN
66–945424.....KIT, ADJ BRACKET (includes items 6,7 & mtg hardware)

OVERALL DIMENSIONS:
41–1/2" TALL
50–1/8" WIDE
57" WIDE (with tool holders)
7–7/8" DEEP

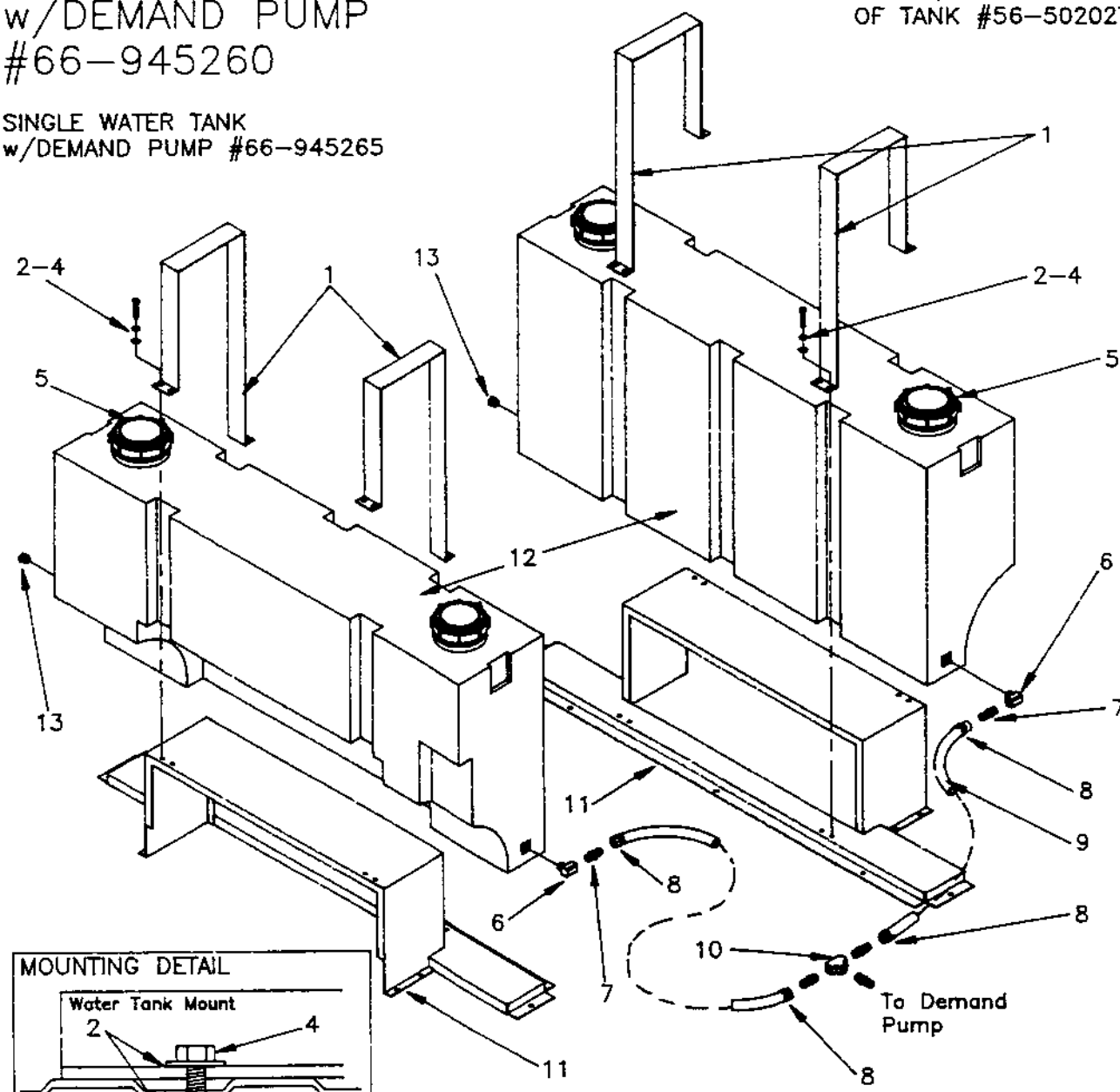
DIMENSIONAL DATA



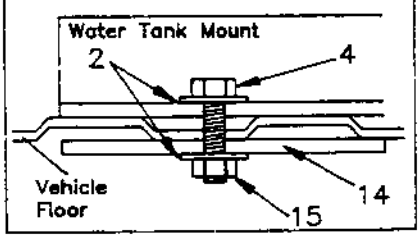
DUAL WATER TANK w/DEMAND PUMP #66-945260

SINGLE WATER TANK w/DEMAND PUMP #66-945265

ACCESSORIES NOT SHOWN:
JUG HOLDER, MOUNTS ON TOP OF TANK #56-502027PC



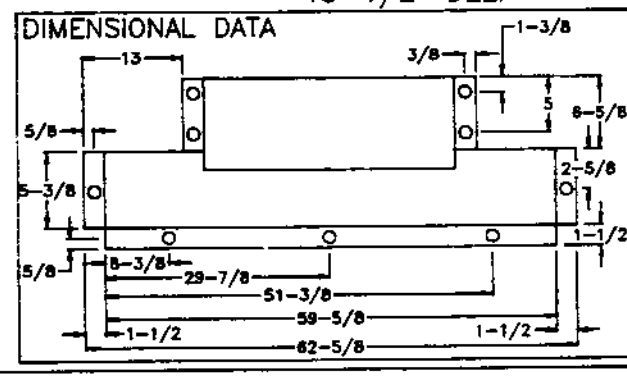
MOUNTING DETAIL



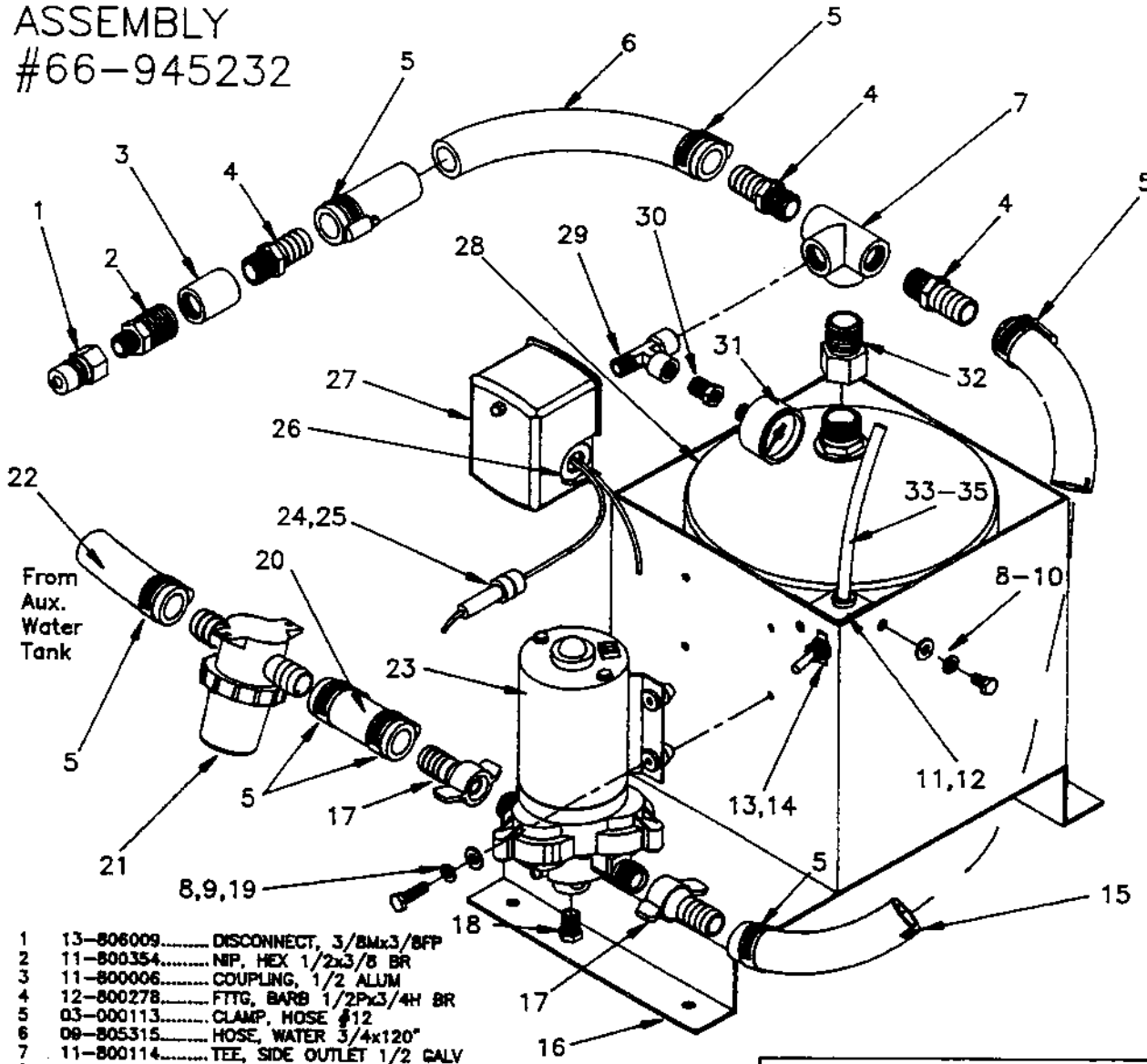
1	50-501774PC	HOLD DOWN, SADDLE TANK GRAY
2	02-000074	FLAT WASHER, 3/8
3	02-000075	LOCK WASHER, 3/8
4	00-000072	SCREW, 3/8-16x2" HXHD
5	11-800432	CAP, WATER BOX
6	11-800041	ELL, STREET 1/2 BRASS
7	12-800278	FITTING, BARB 1/2Px3/4H BR
8	03-000113	CLAMP, HOSE #12
9	09-805456	HOSE, WTR 3/4x8' (cut to fit)
10	11-800085	TEE, 1/2 BRASS
11	56-502000PC	ASSY, BASE SADDL TNK GRY
12	58-500661	MOLDING, WATER TANK
13	11-800168	PLUG, 1/2 BRASS HXHD
14	50-500511	PLATE, INSTALL MT
15	01-000158	LOCK NUT, 3/8-16 HXHD NYLOK

OVERALL DIMENSIONS:
32-1/2" TALL
62-5/8" WIDE
15-1/2" DEEP

DIMENSIONAL DATA



DEMAND PUMP ASSEMBLY #66-945232



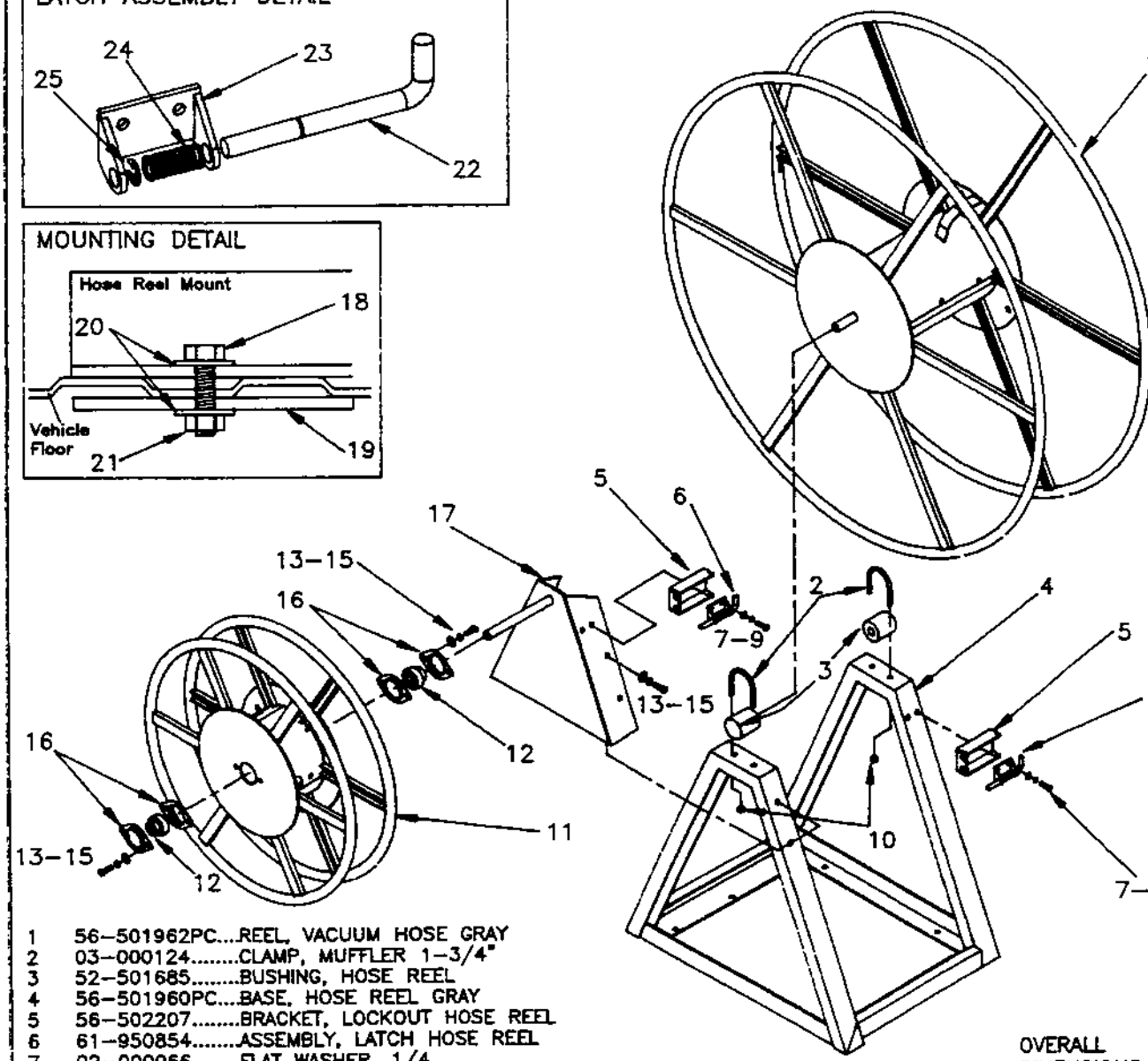
1	13-806009	DISCONNECT, 3/8Mx3/8FP
2	11-800354	NIP, HEX 1/2x3/8 BR
3	11-800006	COUPLING, 1/2 ALUM
4	12-800278	FTTG, BARB 1/2Px3/4H BR
5	03-000113	CLAMP, HOSE #12
6	09-805315	HOSE, WATER 3/4x120"
7	11-800114	TEE, SIDE OUTLET 1/2 GALV
8	02-000066	FLAT WASHER, 1/4
9	02-000038	LOCK WASHER, 1/4
10	00-000070	SCREW, 1/4-20x1/2" HXHD
11	56-501954	HOLDER, SWITCH-DEMAND PUMP
12	43-807502	GROMMET, 3/8IDx5/8OD
13	32-900087	SWITCH
14	49-876249	PLATE, SWITCH ON/OFF
15	09-805291	HOSE, WATER 3/4x19"
16	56-501950PC	HOLDER, DEMAND PUMP GRAY
17	12-800392	FTTG, BARB 1/2Px3/4H PLSTC
18	11-800169	PLUG, 1/4 BR
19	00-000078	SCREW, 1/4-20x1 HXHD GR 8
20	09-805278	HOSE, WATER 3/4x3"
21	14-806553	FILTER, DEMAND PUMP
22	09-805061	HOSE, WATER 3/4x63"
23	41-809145	PUMP, SHURFLO 2088-343-500
24	31-900171	HOLDER, FUSE
25	33-900167	FUSE, AGW 20AMP
26	43-807506	GROMMET, 5/8IDx1-1/8OD
27	35-900187	SWITCH, WATER PRESSURE
28	41-700001	VESSEL, PRESSURE
29	11-800472	TEE, 1/4FxMxF BR
30	11-800039	BUSHING, 1/4x1/8 BR
31	18-808536	GAUGE, PRESSURE 0-60PSI
32	12-800369	CONNECTOR, 3/4FPx1/2P
33	64-950641	CORD, 14-2x10 FT
34	31-900187	CONNECTOR, 2 TERM FEMALE
35	31-900157	TERM, DSC 1/4F 14-16 WIR

ACCESSORIES NOT SHOWN:
HOSE REEL, VACUUM HOSE ONLY #65-950438
DOOR-MOUNT HP HOSE REEL #65-950482

HOSE REEL ASSEMBLY #65-950393

#61-950854
LATCH ASSEMBLY DETAIL

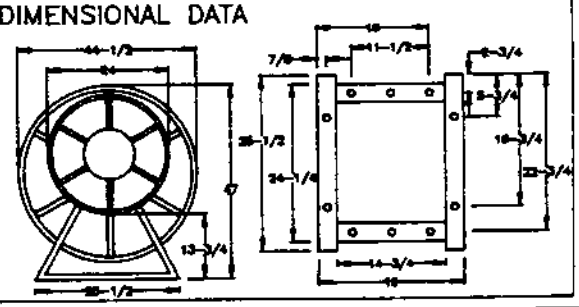
MOUNTING DETAIL

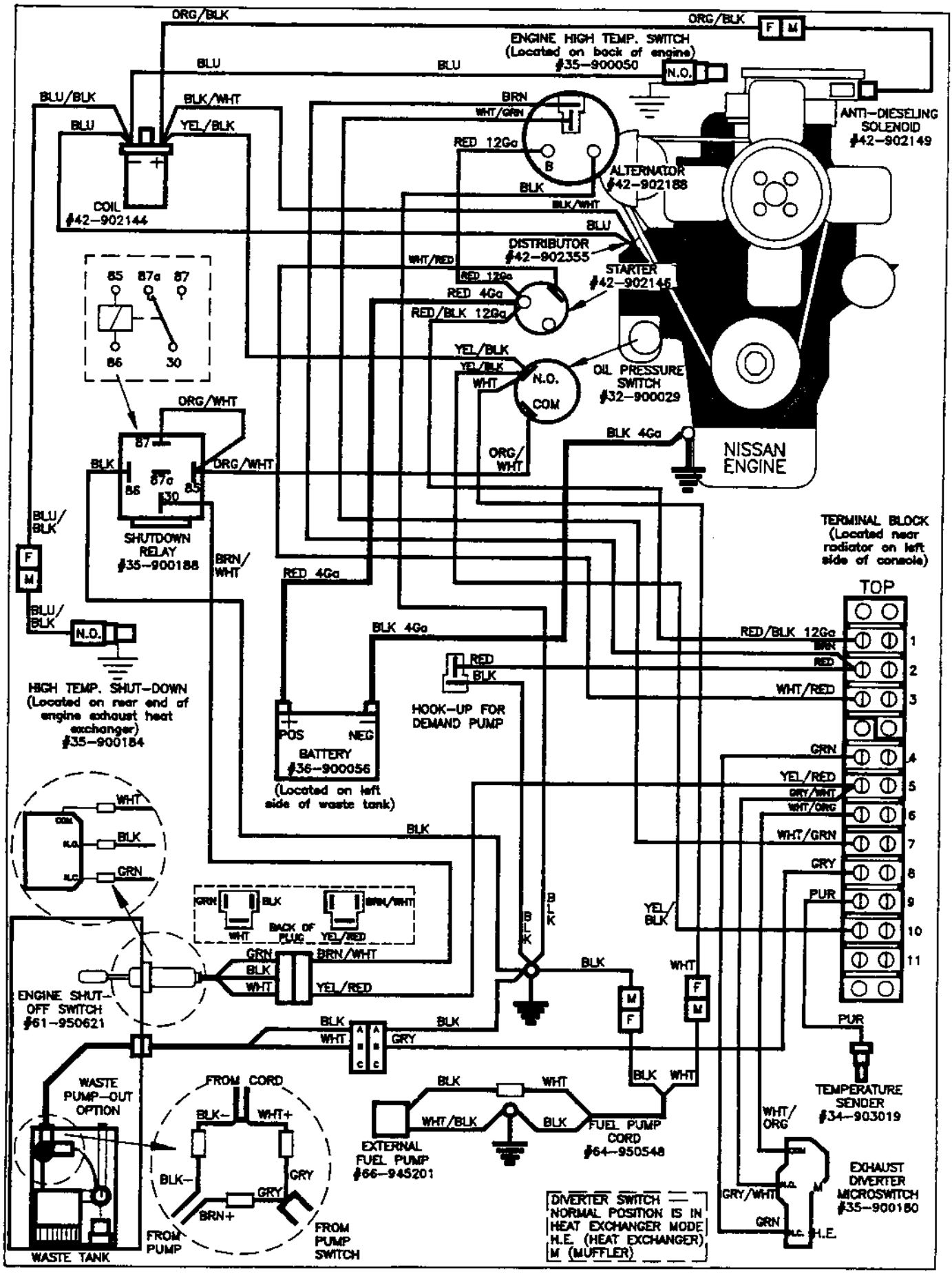


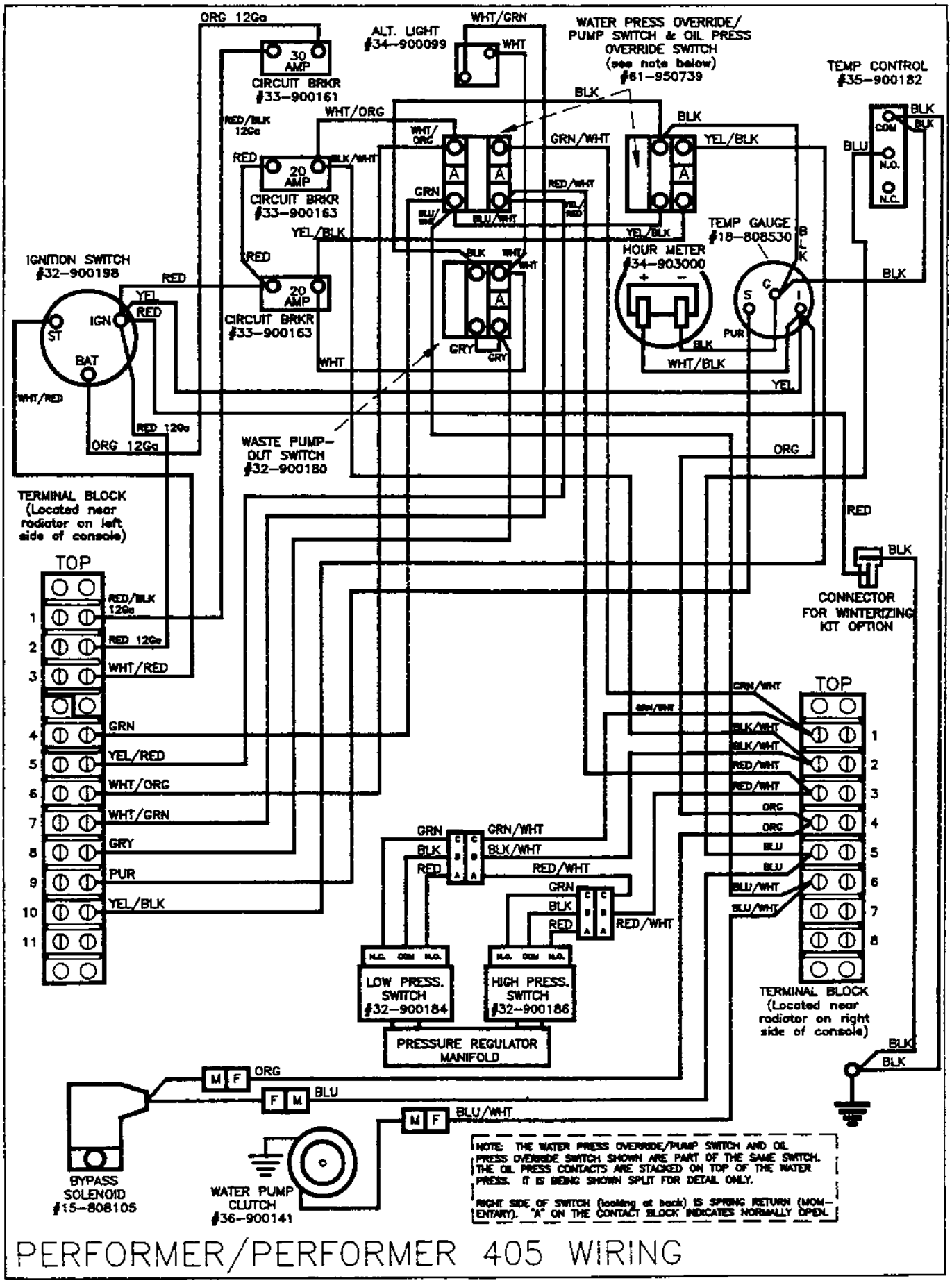
1	56-501962PC	REEL, VACUUM HOSE GRAY
2	03-000124	CLAMP, MUFFLER 1-3/4"
3	52-501685	BUSHING, HOSE REEL
4	56-501960PC	BASE, HOSE REEL GRAY
5	56-502207	BRACKET, LOCKOUT HOSE REEL
6	61-950854	ASSEMBLY, LATCH HOSE REEL
7	02-000066	FLAT WASHER, 1/4
8	02-000038	LOCK WASHER, 1/4
9	00-000055	SCREW, 1/4-20x3/4"
10	01-000041	NUT, 5/16-18 HXHD (Part of item #2)
11	56-501968PC	REEL, HP HOSE GRAY
12	45-802138	BEARING, HOSE REEL
13	02-000143	FLAT WASHER, 5/16
14	02-000040	LOCK WASHER, 5/16
15	00-000039	SCREW, 5/16-18x1"
16	44-802122	FLANGE, 47MST
17	56-501961PC	BODY, HP HOSE GRAY
18	00-000072	SCREW, 3/8-16x2"
19	50-500511	PLATE, INSTALL MOUNT
20	02-000074	FLAT WASHER, 3/8
21	01-000158	LOCK NUT, 3/8-16 HXHD NYLOK
22	55-501789	PIN, LOCK HOSE REEL
23	50-501812	BRACKET, HOSE REEL LOCK
24	04-000302	SPRING, LOCK-LOCK PIN ASSY
25	04-000303	CLIP, RETAINER-LOCK PIN ASSY

OVERALL DIMENSIONS:
47" TALL
29" WIDE
44-1/2" DEEP

DIMENSIONAL DATA




ORG/BLK
ORG/BLK
F M
ENGINE HIGH TEMP. SWITCH
(Located on back of engine)
#35-900050
N.O.
BLU
BLU
BLU/BLK
BLK/WHT
BLU
YEL/BLK
BRN
WHT/GRN
RED 12Ga
B
ALTERNATOR
#42-902188
ANTI-DIESELING
SOLENOID
#42-902149
BLK
BLK/WHT
BLU
COIL
#42-902144
DISTRIBUTOR
#42-902355
WHT/RED
RED 12Ga
STARTER
#42-902145
RED 4Ga
RED/BLK 12Ga
85 87a 87
86 30
YEL/BLK
YEL/BLK
WHT
N.O.
COM
OIL PRESSURE
SWITCH
#32-900029
ORG/WHT
BLK 4Ga
ORG/
WHT
NISSAN
ENGINE
87
BLK
87a
86
85
30
ORG/WHT
SHUTDOWN
RELAY
#35-900188
BLU/
BLK
F
M
BRN/
WHT
RED 4Ga
TERMINAL BLOCK
(Located near
radiator on left
side of console)
TOP
BLU/
BLK
N.O.
BLK 4Ga
RED/BLK 12Ga
RED
BLK
RED
WHT/RED
HIGH TEMP. SHUT-DOWN
(Located on rear end of
engine exhaust heat
exchanger)
#35-900184
HOOK-UP FOR
DEMAND PUMP
POS
NEG
BATTERY
#36-900056
(Located on left
side of waste tank)
GRN
YEL/RED
GRY/WHT
WHT/ORG
WHT/GRN
GRY
PUR
WHT
COM
N.O.
N.C.
BLK
GRN
BLK
BRN/WHT
WHT
BACK OF
PLUG
YEL/RED
BLK
BLK
YEL/
BLK
BLK
GRN
BRN/WHT
BLK
WHT
YEL/RED
ENGINE SHUT-
OFF SWITCH
#61-950621
BLK
WHT
BLK
GRY
A
B
C
BLK
WHT
F
M
PUR
WASTE
PUMP-OUT
OPTION
FROM CORD
BLK-
WHT+
BLK-
GRY
GRY
BRN+
FROM
PUMP
FROM
PUMP
SWITCH
WASTE TANK
BLK
WHT
BLK
WHT
WHT/BLK
BLK
EXTERNAL
FUEL PUMP
#66-945201
FUEL PUMP
CORD
#64-950548
TEMPERATURE
SENDER
#34-903019
WHT/
ORG
GRY/WHT
GRN
N.O.
N.C.
M
H.E.
EXHAUST
DIVERTER
MICROSWITCH
#35-900180
DIVERTER SWITCH
NORMAL POSITION IS IN
HEAT EXCHANGER MODE
H.E. (HEAT EXCHANGER)
M (MUFFLER)



PERFORMER/PERFORMER 405 WIRING