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HYDRAMASTER® Corporation
Mukilteo, Washington

MAN-182-076-D

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1- General Information

This section contains the following helpful information:

- Contact Information
- Warnings, Cautions, and Notices
- Responsibilities
- High Altitude Operation
- Local Water Precautions

Contact Information

Hours

Monday - Friday
7:00 am to 5:00 pm
PACIFIC STANDARD TIME

Telephone Numbers

(425) 775-7276 Parts
(425) 775-7275 Service
(800) 426-4225 Parts / Service FAX

Warnings, Cautions, and Notices

WARNING

This symbol indicates a situation which, if not avoided, could result in death or serious injury.

CAUTION

This symbol indicates a hazardous situation which, if not avoided, could result in damage to the truck mount.

NOTICE

This symbol indicates that federal or state regulatory laws may apply.

⚠ WARNING

During the operation of the truck mount many components are in motion. Never touch any part of the truck mount that is in motion. Serious injury may result.

⚠ WARNING

During the operation of the truck mount many surfaces will become extremely hot. Never touch hot surfaces. Serious injury may result.

⚠ WARNING

The operation of this truck mount can produce noise levels exceeding 85 decibels to a distance of 10 feet. The Occupational Safety and Health Administration (OSHA) recommends the use of hearing protective equipment if a person is exposed to an average of 85 decibels over an eight hour period. Check with local and state agencies concerning hearing conservation rules.

⚠ WARNING

During the operation of the truck mount carbon monoxide and other toxic fumes are produced. Position the vehicle so that any fumes produced will be directed away from inhabited areas and any points of building entry (doors, windows, air conditioning units, fans, etc.). Do not occupy the vehicle while the truck mount is in operation. Serious injury may result.

⚠ WARNING

During the operation of the truck mount chemicals known to the State of California to cause cancer, birth defects and other reproductive harm are produced by the engine exhaust.

⚠ WARNING

Never operate the truck mount with a portable gas container inside the vehicle. Doing so will increase the risk of fire and explosion. Serious injury or death may result.

⚠ WARNING

Transporting a vented fuel container that presently contains, or has ever contained in the past, a flammable liquid is strictly forbidden by HydraMaster and by federal and state regulations. Doing so will increase the risk of fire and explosion. Serious injury or death may result.

⚠ WARNING

Never smoke in or around the truck mount. Doing so will increase the risk of fire and explosion. Serious injury or death may result.

CAUTION

During the operation of the truck mount the exhaust system will become extremely hot. Keep all flammable materials away from the truck mount exhaust system. Failure to do so will increase the risk of fire and explosion. Serious property damage may result.

CAUTION

Never operate the truck mount when the vehicle is tilted more than 10 degrees in any direction. Doing so will result in improper lubrication of the internal components, and will increase the risk of serious component or engine damage.

CAUTION

Never perform cleaning operations when the truck mount engine is running at the IDLE throttle position. Failure to do so will increase the risk of serious component or engine damage.

CAUTION

Never operate the truck mount with the vehicle doors closed. Doing so results in extremely high temperatures inside the vehicle and will lead to serious component or engine damage.

CAUTION

Never use concentrated acids or solvents (including d-limonene) in the truck mount water system or chemical system. Use of these products will cause serious component damage.

CAUTION

Never operate the truck mount with a water hardness reading measuring 3.0 grains per gallon or higher. Using reading than 3.0 grains per gallon will cause scale to build up inside the truck mount water system. Scale build up causes serious component damage. Test all water prior to use and use water softening equipment if necessary.

CAUTION

Never allow water to freeze inside the truck mount. Serious component damage will occur. Perform all freeze guarding procedures outlined in this digital Owner's Manual.

CAUTION

Many vehicles have critical components mounted directly below the floor that can easily be damaged. Before drilling holes in the floor of the vehicle inspect the underside of the vehicle for critical components. Failure to do so may result in damage to the vehicle.

Responsibilities

THE PURCHASER'S RESPONSIBILITIES

- Prior to purchasing a van, ensure that the payload is suitable for all of the equipment that will be installed and transported. This includes and is not limited to: the truck mount, recovery tanks, fresh water tanks, on-board water, hose reels, hoses, cleaning tools, chemicals, drying equipment, etc. Payload capacity information is available through the auto dealer, the manufacturer's web site, and is also located on the door pillar of the driver's side door.
- Purchase a heavy duty Group 24 battery for this truck mount. This is normally available from the installation dealer.
- Prior to dropping your van off at the distributor for the truck mount to be installed, have a spray-on bed liner applied to the floor such as Rhino Lining® or Line-X®.
- Prior to operating the truck mount read this manual in its entirety and familiarize yourself with the information contained here. Special attention should be paid to all cautions and warnings.
- The distributor is responsible for the correct installation of the truckmount. The distributor is also responsible to train you in the correct and proper operation and maintenance of the truck mount.

NOTICE

Any modification of the truck mount may void the warranty.

THE DISTRIBUTOR'S RESPONSIBILITY

Acceptance of Shipment

Before accepting the truck mount, check the following:

- The truck mount should be free from any damage during shipping. Do not sign the delivery receipt until you have closely inspected the truck mount and noted any damage on the delivery receipt. Hidden damage may be present even if the box looks okay. It is recommended that the box be opened before signing for the shipment.
- Check the packing list and verify that all items are accounted for.

Installation Responsibilities

- Ensure proper payload capacity. It is the distributor's responsibility to verify that the equipment package does not exceed the vehicle capacity.
- Ensure installation of a safe fuel tap system and through-floor fittings as provided by HydraMaster.
- Proper placement of the truck mount, recovery tank, fresh water tank, and accessories in the vehicle and securing them with bolts and back up plates. The distributor should verify that the owner is in agreement with the layout.
- Proper connection of the fuel lines.
- Proper connection and installation of the battery. Verify that the battery is in accordance with HydraMaster's recommendation.
- Check the pump, vacuum blower and engine oil levels prior to starting the truck mount.
- Start and run the truck mount and check that all systems function properly.
- Test all hoses, wands, etc. for correct operation.
- Timely return of the document package.

Training

The distributor should provide a thorough review of the operation manual with the purchaser along with instruction and familiarization in:

- How all the truck mount's systems function.
- All safety precautions and their importance.
- How to correctly start and shut down the truck mount.
- How to correctly clean with the truck mount.
- Where and how often to check and change component oil levels.
- Freezing damage and how to avoid it. This includes explaining proper freeze guarding procedures.
- How to do basic troubleshooting of the truck mount.
- Hard water damage and how to avoid it. This includes how to determine if hard water exists in your area and the installation and use of water softening systems.
- The truck mount's warranty and warranty procedures.

High Altitude Operation

Elevation plays a key role in how the truck mount will operate. Operation at high altitude (above 5,000 ft.) may require a high-altitude carburetor jet. Use of this jet at high altitude will improve power, reduce fuel consumption and help reduce excessive carbon build-up in the exhaust and heat exchanger systems.

Contact the local Briggs and Stratton dealer or HydraMaster to obtain the proper jet size. Your local Briggs and Stratton dealer can be located at www.briggsandstratton.com.

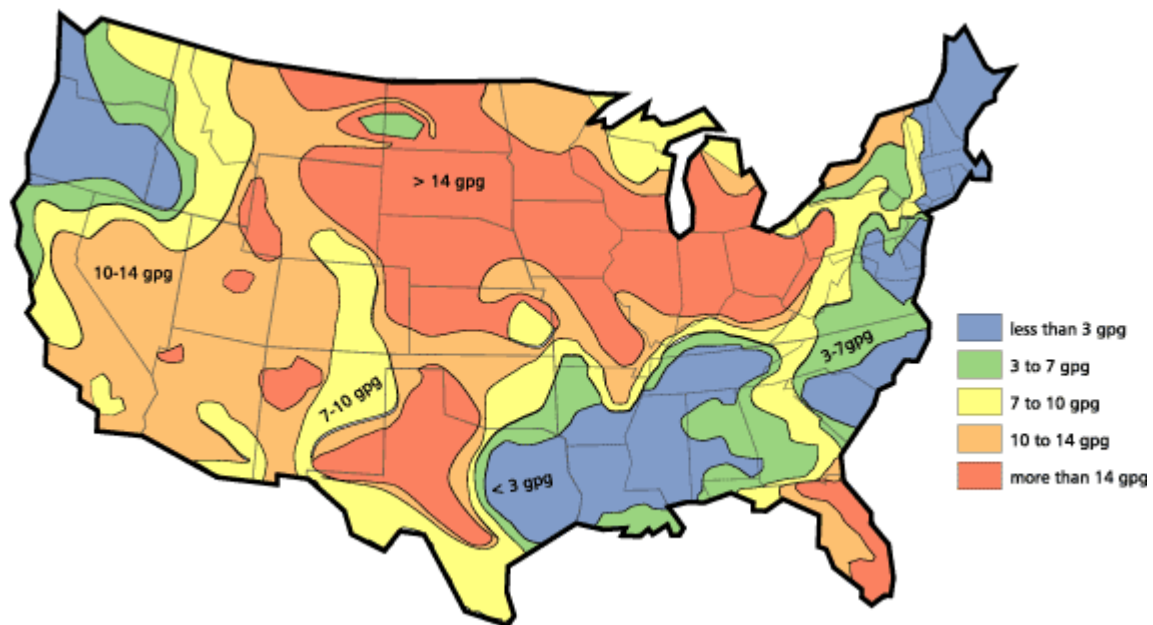
Local Water Precautions

Many areas of the country are regarded as hard water areas. Truck mounts operated in these areas are subject to heavy mineral buildup in internal machine components, hoses and cleaning tools. These mineral deposits cause many problems including reduced heat exchanger effectiveness, component failure and possible machine overheating. Below is a map that identifies areas of hard water. To get more info, visit www.systemsaver.com. You should always consider water from a well as hard water.

It is imperative that special precautions be taken with any truck mount operated in an area in which the water hardness exceeds 3.0 grains per gallon (60mg/l). HydraMaster strongly recommends the use of a water softener in these areas. The use of a water softener greatly reduces maintenance and related downtime. Periodic de-scaling and acid rinsing as described in this manual may not be adequate in hard water areas.

CAUTION

Failure to take appropriate measures to prevent scale build up can result in system failure and loss of warranty on affected parts.



2 - Cleaning and Chemicals

Your HydraMaster truck mount has been engineered using the latest and most sophisticated technology available to produce the finest carpet cleaning results possible. Despite this, it remains only a tool of the carpet cleaning trade and can produce only as good a job as the person operating it.

HydraMaster strongly recommends attending an Institute of Inspection, Cleaning and Restoration Certification (IICRC) approved school as soon as possible and to always follow the IICRC guidelines when cleaning.

This section describes the carpet cleaning procedure in the following areas:

- Precautions
- Preparing the Carpet for Extraction
- Rinse and Recover
- Over-Wetting
- Streaking

Precautions

The use of some chemicals (such as concentrated acids and/or solvents) in your truck mount can seriously damage the internal plumbing and high pressure pump.

HydraMaster strongly recommends purchasing a water softener to prevent the buildup of scale and hard water deposits in your truck mount.

HydraMaster recommends only the use of chemicals containing rust and corrosion inhibitors and water softening agents to prevent chemical buildup which may lead to component failure and warranty invalidation.

CAUTION

Increased demand for a neutralizing rinse results in the need for special care when using these acid based chemicals in your truck mount. The negative side of these products is the corrosive effects the acid can have on metals, including fittings, pumps, heat exchangers, etc.

HydraMaster's **ClearWater Rinse™** has been formulated to protect vital components. HydraMaster will not warranty parts that have been damaged from using acid products that have obviously caused failures.

Preparing the Carpet for Extraction

Pre-vacuum the carpet: Whether you instruct the customer to pre-vacuum or you offer it as part of your service, proper vacuuming will make your job easier with superior end results. The more time spent removing loose particulate soil, the easier it will be to remove the oily soil stuck to the fibers.

Pretreat the carpet: This process of applying traffic lane type chemicals to the carpet (whether by sprayer or rotary scrubber) is essential prior to extraction with your truck mount.

By applying cleaning agents to the carpet and letting them dwell 10-20 minutes prior to rinsing, you allow the product to dissolve and emulsify the oily, sticky binders holding the soil to the fiber. This will allow more soil to be removed in one or two cleaning passes and help prevent over-wetting.

Remember the solution coming out of your cleaning tool is only in contact with the carpet fiber for a few seconds. Relying on the rinse detergent to do the majority of the cleaning will result in overly long dry times and excess detergent residue left in the carpet.

HydraMaster recommends the use of our pre-sprays: **Fastbreak™** for residential carpet and **Blitz™** for commercial carpet needs.

Rinse and Recover

Whether you are using a wand, RDM™, or an RX-20™, you should clean an area approximately 3 ft. x 3 ft. with the solution valve open then immediately go over that area with vacuum only to remove any excess moisture.

CAUTION

Olefin fiber is becoming more popular, particularly in commercial installations. The process mentioned above can leave excessive residual moisture because olefin fibers will not absorb any of the cleaning solution. You must only apply solution during the backward stroke of the wand so it can be immediately captured by the vacuum head. RX-20™ and RDM™ users should follow each pass with a dry pass. Failure to follow this procedure will cause solution to flow to the back of the carpet along with some of the soil. This, along with any soil imbedded in the backing, will be wicked to the surface of the fibers as the carpet dries.

HydraMaster recommends the following rinse aids: Alkaline - **Hydra-Dri Powder™** or **Hydra-CleanLiquid™**. Acid - **Clear Water Rinse™**.

Over-Wetting

Over-wetting is an annoyance to all concerned. Extended drying times will leave the customer with a negative impression of both the cleaning company and the process used.

There are several factors that will cause over-wetting:

1. Too few vacuum strokes.
2. Clogged vacuum blower filter or vacuum tank lid not sealing properly.
3. Vacuum tank drain valve left partially open.
4. Obstructed, cut or kinked vacuum hoses.
5. Obstructed vacuum hoses while cleaning a heavily foam-saturated carpet (it is recommended to use a crystal type defoamer distributed evenly over the carpet).

Streaking

Streaks in the carpet can appear in both clean or dirty areas and normally appear in heavily soiled, light colored carpets.

Possible reasons of streaking may include:

1. Clogged or improperly angled spray nozzles.
2. Spray nozzles that overlap, concentrating the solution.
3. A partially clogged vacuum head.
4. Inconsistent solution temperature.

3 - System Operation

The Boxxer™ 318 is a carefully engineered truck mount designed by HydraMaster Corporation. The system utilizes an internal combustion engine to provide the power necessary to turn both a vacuum pump and a high pressure water pump. The heat of the engine and blower exhausts is transferred to the high pressure water in the finned tube heat exchanger of the system. Finally, the chemical is injected into the pressurized water stream and the heated solution is delivered to the cleaning tool. The solution is recovered by the vacuum generated by the vacuum pump. This solution is collected in the recovery tank for proper disposal.

It is the purpose of this manual to help the technician properly understand, maintain and service the truck mount. By following these guidelines carefully, years of reliable operation can be expected.

This section describes the system in the following areas:

- Machine Specifications
- Spare Parts Lists
- Operating Instructions

Machine Specifications

Overall Dimensions	24.0" W x 35" D x 31.5" H	
Weight	480 lbs. (console only)	
Engine- Briggs and Stratton Vanguard™ 18hp	Oil Type	Synthetic 5W-30
	Capacity	Approx. 1 1/2 quarts (48 oz.) when changing oil and filter
	Engine RPM	3150 rpm @ 14" Hg
Vacuum Blower- Tuthill® 3006 Competitor® Plus SL (Dual Splash Lubrication)	Oil Type	PneuLube™ or other ISO 100 rating
	Gear End Capacity	Approx. 7.0 oz.
	Drive End Capacity	Approx. 5.0 oz.
	Blower RPM	3150 rpm @ 14" Hg
Pump- HydraPump II	Oil Type	Synthetic 15W-50
	Capacity	Approx. 8.0 oz.
	Pump Rate	3.5 gallons per minute
	Pump RPM	1750 RPM
Operating Pressure	0-1000 psi	
Chemical System	Last Step Chemical Injection	
Heating System	Finned Tube Heat Exchanger	
Standard Equipment	High Pressure Hose	1/4" High Temperature Lined/Vinyl Cover - 100 ft.
	Vacuum Hose	2" Vacuum Hose- 100 ft.
		1-1/2" Wand Whip Hose- 10 ft.
	Recovery Tank	50 gallon MaxAir™ Universal Tank
	Cleaning Wand	Stainless Steel S-bend
		Replaceable Grip
		Rebuildable Solution Valve
	Chemical Jug	5 gallon
	Battery Box	
	Van Decal	
Van Installation Kit		
Owner's Manual		
Optional Equipment	Recovery Tank	70 gallon MaxAir™ Universal Tank
	Fresh Water Tank	85 gallon RotoMolded Tank
	Automatic Pump Out (APO)	Dura-Flow™ APO

Spare Parts List

Part No.	Description	Qty
Engine & Drivetrain Components		
106-016	Plug, Spark	2
049-049	Filter, Fuel	1
049-014	Filter, Oil	1
049-012	Filter, Air	1
010-125	Belt, Gates 9440HD	1
152-011	Coupler Element	1
Electrical Components		
056-010	Fuse, 25A	1
056-008	Fuse, 15A	1
157-040	Switch, 20 Amp Rocker	2
157-022	Switch, Relay, 12V	2
Hydraulic Components		
052-050	Quick Connect, 440 Male	2
052-051	Quick Connect, 440 Female	2
052-052	Quick Connect, 660 Male	1
052-053	Quick Connect, 660 Female	1
046-010	Diaphragm, Chemical Pump	1
169-186	Valve, 100 PSI, Last Step Chemical	1
180-006	Orifice, 0.061" dia.	1
180-004	Orifice, 0.033" dia.	1
074-007	Gauge, High PSI (0-1500)	1
049-023	Screen, Garden Hose	1
078-005	Kit, Seal and Spring High PSI Regulator	1

Operating Instructions

Start-up Procedure

1. Perform all daily and periodic maintenance as specified in this digital Owner's Manual.
2. Connect a garden hose to supply water to the truck mount. If used, turn the "PUMP-IN" switch to the "ON" position.

CAUTION

Water box must be full prior to starting the truck mount.

3. Connect the cleaning tool to the length of hose required to perform the cleaning job.
4. Pull the choke and start the truck mount with the throttle cable fully depressed ("IDLE" position.)
5. After the engine starts push the choke in and allow the truck mount to run in "IDLE" for 2-3 minutes to warm up.
6. Pull the throttle cable to full extension and twist the handle clockwise to lock.
7. Set the temperature to the desired level on the "TEMPERATURE" knob.
8. If used, turn the "AUTO PUMP-OUT" switch to the "ON" position.
9. Set the cleaning pressure to the desired level.
 - a. Suggested Settings:
 - i. Carpet Cleaning: 300-400 psi
 - ii. Hard Surface Cleaning: 1000 psi or as indicated on the tool
10. Turn the "CHEMICAL SELECTION VALVE" to the "PRIME" position to purge any air from the system.
 - a. With the truck mount running at full throttle, block off the vacuum intake to the recovery tank. The vacuum gauge should read 12"-14" Hg. This will assist in priming the chemical system.
 - b. Allow the chemical to flow through the chemical meter at full flow for 30 seconds.
 - c. Turn the "CHEMICAL SELECTION VALVE" to "ON." The restriction can now be removed from the vacuum inlet.
 - d. While spraying solution from the cleaning tool adjust the chemical flow by turning the "CHEMICAL METERING CONTROL KNOB".
11. Begin cleaning.

CAUTION

Never perform cleaning operations when the truck mount engine is running at the IDLE throttle position. Failure to do so will increase the risk of serious component or engine damage.

Shut Down Procedure

1. Flush clean water through the chemical system for 10 seconds. Turn the “CHEMICAL SELECTION VALVE” to “OFF.”
2. Cool the truck mount down by turning the “TEMPERATURE CONTROL” dial to the lowest position (counter-clockwise). Spray the cleaning wand into the vacuum hose for 3-5 minutes. The chemical is now flushed from the truck mount, hoses and cleaning tool.
3. Remove the vacuum hose.
4. Lubricate the blower. Cap off the inlet(s) to the vacuum tank. Inject a small amount of light lubricating oil such as WD-40 Company’s 3-in-One® or WD-40® into the “BLOWER LUBE PORT”.
5. If freeze guarding is necessary perform the procedure at this time. See Freeze Guarding section of this digital Owner’s Manual.
6. Return the engine throttle to the “IDLE” position.
7. Turn the key to “OFF.”

NOTICE

8. Drain the water box using the valve.
9. Drain the vacuum tank in an appropriate location.

In accordance with the EPA, state and local laws, do not dispose of water into gutters, storm drains, streams, reservoirs, etc.

10. Perform daily maintenance as specified in this digital Owner’s Manual.

4 - Machine Maintenance

To avoid costly repairs and downtime, it is imperative to develop and practice good maintenance procedures. These procedures fall into daily, weekly, monthly and quarterly increments and are outlined below. All maintenance must be performed by qualified service personnel.

A maintenance log is provided in the Owner's Guide. **This log must be maintained and may be required to be furnished to HydraMaster before a warranty claim is honored.** It is recommended that the log be affixed to the vehicle door near the truck mount for convenience and to serve as a maintenance reminder.

This section describes how to properly maintain the truck mount in the following areas:

- Operational Maintenance
- Overall Machine Maintenance
- High Pressure Pump Maintenance
- Vacuum System Maintenance
- De-scaling Procedure (Required)
- Freeze Guarding

Operational Maintenance

Daily Maintenance:

- Check the engine oil level. Add oil if needed.
- Check the high pressure pump oil. Add oil if needed.
- Inspect and clean the recovery tank filters.
- Inspect and clean the orifices and filters.
- Inspect and clean the garden hose screen.
- Inspect the truck mount for water and oil leaks, loose electrical connections, etc. and repair as needed.
- Lubricate the blower with a light oil based lubricant.

Weekly Maintenance:

- Inspect the recovery tank filters for tears, holes, etc. Repair or replace as needed.
- Inspect the vacuum relief valve. Clean and lubricate as necessary.
- Clean the recovery tank thoroughly with pressure washer.
- Check the oil level in the blower. Add oil if needed.
- Check the pump drive belt for wear and proper tension. Tighten as needed.
- Check all the hoses and wiring for wear and chafing. Secure as needed.
- Flush the water and chemical systems with solution of equal parts white vinegar and water.
- Check all the nuts and bolts. Tighten as needed.
- One time change of the high pressure pump oil after 50 hours of operation. (Every 500 hours thereafter.)
- One time change of the engine oil after 8 hours of operation.
- Change the engine oil every 50 hours. (Every 25 hours if operating in high ambient temperatures.) Change oil filter every other oil change.

Monthly Maintenance:

- Check the engine air filter. Clean or replace as necessary.
- Check the water level in battery. Fill as needed.
- Clean the battery terminals as needed.

Quarterly Maintenance:

- Check the fuel lines. Repair or replace as needed.
- Clean and gap the spark plugs to 0.030 in (0.76 mm). Replace if excessive carbon buildup is visible.
- Check the coupler element (rubber insert) for cracks or wear. Replace as necessary.
- Change the blower oil after first 100 hours of use.

500 Hours:

- Change the blower oil.
- Change the high pressure pump oil.
- Check the engine valve clearance (intake and exhaust 0.004-0.006 in (.10-.15mm))

Overall Machine Maintenance

Maintenance, troubleshooting and repair are much easier tasks to accomplish on a clean truck mount. Regular cleaning of the truck mount offers the user an opportunity to visually inspect all facets of the truck mount and spot potential problems before they occur. In addition to the operational maintenance the following “housekeeping” duties should be performed.

After each job:

- Check the recovery tank and the recovery tank filters. Empty and clean as necessary.

Daily:

- Wipe the truck mount down thoroughly with a damp cloth.
- Wipe down the vacuum and high pressure hoses as needed.
- Inspect and clean the vacuum slot on the cleaning wand.
- Check the wand head for sharp edges that could tear carpet. File down as needed.
- Clean the wand to maintain original appearance.
- Visually inspect the hoses for abrasions, cuts, etc. Repair or replace as needed.

Weekly:

- Empty the chemical container. Wash out thoroughly to remove any chemical buildup.
- Inspect the chemical feed line strainer and use solution of equal parts white vinegar and water to remove any chemical buildup.
- Thoroughly clean the wand and inspect for clogged jets, debris in vacuum slot and leaking fittings at valve.
- Thoroughly clean the vacuum and high pressure hoses including quick releases and cuffs.

High Pressure Pump Maintenance

DAILY

Check the oil level and the condition of the oil. The oil level should be up to the center of the sight glass on the rear of the pump or between the “MIN” and “MAX” lines on the dipstick. The dipstick may be found by removing the oil cap.

PERIODICALLY

Change the oil after the initial 50 hours of operation and every 500 hours after that. It may be necessary to replace the pump seals and check valves at 500 hours if the truck mount has been running in high ambient temperatures.

CAUTION

If the oil becomes discolored or contaminated one of the oil seals may be damaged. Do not operate the pump if the crankcase oil has become contaminated. Do not rotate the drive shaft without oil in the crankcase reservoir.

CAUTION

The pump should never be run dry. Running the pump dry will cause premature wear on the seals, packing and plungers. Running the pump dry for a prolonged period of time may cause damage that cannot be repaired and voids warranty.

CAUTION

Do not run the pump with frozen water in the manifold. If there is a risk of freezing, freeze guard the truck mount. See the Freeze Guarding section of this manual.

SERVICE

The next few pages explain how to disassemble and inspect all user serviceable parts of the pump.

CAUTION

Do not disassemble the pump unless you are a skilled mechanic. For assistance, contact HydraMaster or your local HydraMaster distributor.

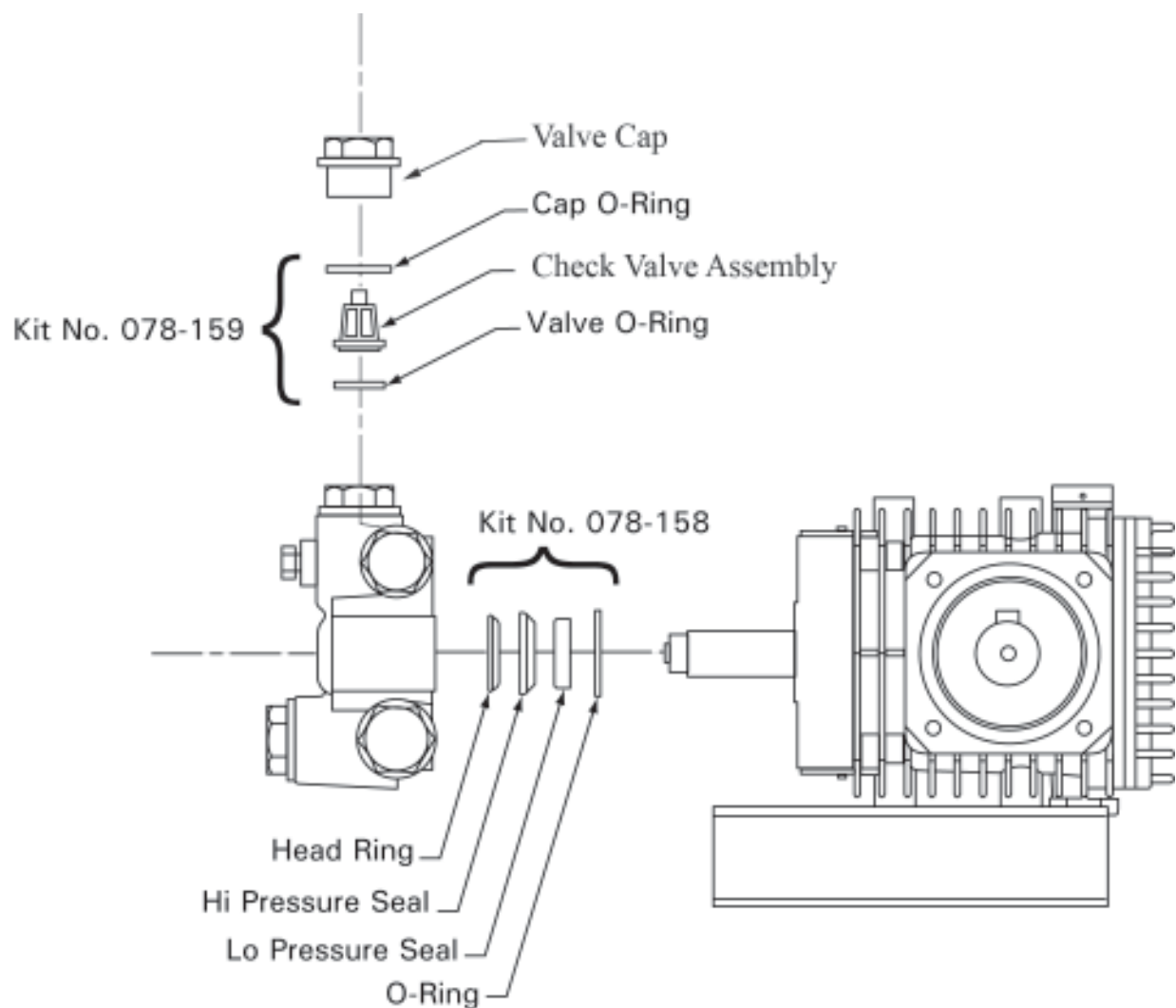


Figure 4-1. Servicing the Valves

Valve Maintenance (See Figure 4-1)

1. Using a 22mm wrench or socket, remove all six valve caps on the manifold of the pump.
2. Examine each valve cap o-ring for cuts or distortions and replace if worn.
3. Using needle nose pliers, remove the suction and delivery check valves. The valve assembly usually stays together when removing. If the valve comes apart, use the needle nose pliers or reverse pliers to remove the remaining parts.
4. Inspect each suction and delivery check valve assembly for wear, pitting, etc. and replace if necessary. The valve assembly consists of the plastic cage, spring, valve seat, poppet and o-ring. One valve kit is needed for complete valve change of one pump.
5. Replace old valves with new valves by placing the assembly in the valve chamber. Press down firmly on the top of the valve assembly.
6. Replace valve caps by applying LOCTITE® 243 to valve cap and torque to 33 ft-lbs.

Removing and Replacing Pump Manifold

1. Remove the manifold of the pump by taking a 5mm allen head wrench and removing the eight head bolts.
2. With the pump firmly secured, take a medium sized flat head screwdriver and apply pressure to the manifold by prying between the crankcase and manifold. Work around from all sides of the manifold evenly until it comes off of the pistons. Keep the manifold properly aligned with the pistons to prevent damage to the seals and pistons.
3. When replacing the manifold, turn the crankshaft of pump until the top of the pistons are closely aligned. Lubricate the pistons and cylinders with grease and evenly press the manifold toward crankcase until flush.

Seals and V-Packing Maintenance

1. Remove the manifold as described above. It is possible that the seal and brass retainer ring assembly will stay on the piston or will remain in the manifold when removing it.
2. Carefully remove the brass retainer ring/seal stack. Remove the low-pressure seal using needle nose pliers. Discard the old seal.
3. Remove the outer o-ring by taking a small flat head screwdriver and working it under the o-ring. Simply roll off the old o-ring and discard.
4. The old V-packing stack can be taken apart by hand and discarded.

Seals and V-Packing Reassembly

1. Generously lubricate parts with grease when reassembling. Examine all brass components for any damage or water residue build-up. Clean or replace as needed.
2. Insert a new low pressure seal by working it in by hand.
3. Install the new outer o-ring by simply starting on one side and working it into the groove.
4. Stack the new V-packing in the correct order and firmly press the assembly into the manifold.
5. Install a new low pressure oil seal by laying the seal into the opening and evenly pressing it into place.
6. Reinstall the manifold onto the pump as described above.

Plunger Maintenance

1. Remove the manifold as described above. Remove the packing retainers if they remain on the pistons after removing the manifold.
2. Remove the nut and washer on the end of the piston using a 13mm wrench or socket.
3. Slide the ceramic plunger and the remaining washer from the piston guide. Inspect the ceramic piston, o-ring and washers for wear. Replace if necessary.

Plunger Reassembly

1. Generously grease the piston guide. Replace the o-ring making sure it does not twist or roll.
2. Slide the lower washer and ceramic bushing onto the piston guide.
3. Place a small amount of LOCTITE 243™ on the piston guide threads. Replace the old washer and thread the nut onto the piston guide. Torque to 4.5 ft-lbs.

Servicing the Crankcase

1. While the manifold and plungers are removed, rotate the crankshaft by hand. Closely examine the crankcase oil seals for drying, cracking or leaking.
2. Consult the local HydraMaster distributor if crankcase servicing is necessary.

Vacuum System Maintenance

The vacuum pump in this machine is commonly referred to as a “rotary positive displacement blower” or “blower” for short. The performance and life of the truck mount is greatly dependent on the care and proper maintenance it receives. The manual for the blower has been included. Review the manual for a better understanding of this piece of machinery.

To protect the blower from overloading and damaging itself, there is a vacuum relief system installed on the vacuum tank. When the vacuum tank inlet is completely sealed off a maximum of 14" Hg will be attained.

CAUTION

Solid objects entering the blower will cause serious damage to the internal components of the blower. Extreme caution should be used when the truck mount is being run for test purposes with the inlet to the blower open to the atmosphere.

CAUTION

Foam passing through the blower can lead to serious problems with the truck mount. It is important to keep the vacuum tank free of foam. The tank is protected from overflowing by a float kill switch; however, this switch is not activated by foam.

DAILY

At the end of each day the internal components of the blower need to be lubricated. This helps to prevent rust deposits and prolongs the life of the truck mount.

With the truck mount running and the recovery tank inlet(s) capped off, inject a small amount of light lubricating oil such as 3-in-One® or WD-40® into the “BLOWER LUBE PORT” located on the front of the machine.

PERIODICALLY

Change the oil in both ends of the blower after the initial 100 hours of use. The oil is to be changed each 500 hours of use thereafter.

De-scaling Procedure (Required)

Scale deposits on the interior of the heating system can cause a noticeable loss in heating performance. Deposits of this kind result from hard water deposits. The frequency with which de-scaling procedures are required will vary. If the area has particularly hard water, you may have to de-scale often.

To de-scale the system, add an appropriate de-scaler chemical to the water box. Circulate it through the system. Let it stand. Flush and repeat as necessary. Clean all screens and strainers, and check them frequently following de-scaling.

NOTE: If using TM DeScaler™ through the flow meter, make sure to run clean water through the flow meter after this procedure.

To de-scale using the recirculation kit (part no. 078-058), start with an empty water box. Fill a third of the water box with TM DeScaler™. Follow the recommendations on the TM DeScaler™ label for proportions. Verify that the float is not lying horizontal, but floats below.

Attach the recirculation fitting provided in the kit to the garden hose quick connect (see Figure 4-2) and this combination to the front of the truck mount.

Attach one section of the solution hose to the outgoing solution fitting on the front of the truck mount and the other end to the garden hose and recirculation fitting combination that is attached to the front of the truck mount. Additional hoses may be attached inline if de-scaling of hoses is needed.

Start the truck mount and allow it to run for three to five minutes. Do not leave the TM DeScaler™ solution in the system. Flush the system with clean water and turn the truck mount OFF.

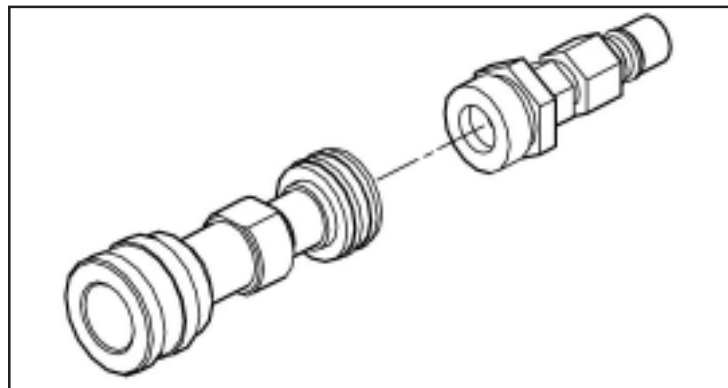


Figure 4-2 Recirculation Fitting

Freeze Guarding

To avoid permanent damage to the truck mount it is imperative to follow the Freeze Guard Procedure whenever the possibility of freezing temperatures exists.

CAUTION

When disposing of antifreeze follow local laws and regulations. Do not discard into storm sewers, septic systems, or onto the ground.

WARNING

Antifreeze is harmful or fatal if swallowed. Do not store in open or unlabeled containers. Keep out of reach of children and animals.

Freeze Guard Procedure

1. With the truck mount turned off and the incoming water line disconnected, open the water box drain valve on the front of the truck mount. Allow the system to fully drain.
2. Add 2 gallons of 50/50 antifreeze and water mix to the water box.

Attach a section of solution hose to the outgoing solution fitting on the front of the machine. Attach the opposite end to the recirculation fitting. (If more sections of hose are to be freeze guarded attach those inline.)

3. Start the truck mount and allow it to run for 2 to 3 minutes. This will distribute antifreeze solution throughout the truck mount.
4. Remove the chemical feed line from the chemical jug. Turn the selector valve to "Prime." This will vacuum the chemical remaining in the lines to the recovery tank.

When using the recirculation kit skip ahead to Step 7.

5. Remove the quick connect fitting from the garden hose. Attach the quick connect to the machine. Using a vacuum hose attached to the recovery tank, vacuum the water out of the quick connect. This will freeze guard the feed line to the water box.

6. Remove the quick connect from the truck mount.
7. Spray the antifreeze and water mix out of the truck mount and into a container to reclaim the solution. Run the truck mount until it stops.
8. The truck mount is now freeze guarded. **Remember to flush antifreeze from the system prior to carpet cleaning. See procedure below.**

NOTE: The reclaimed antifreeze solution may be used three times before being discarded.

NOTE: To freeze guard the hoses and wand perform Step 7 above with the items to be freeze guarded attached.

Recovering Antifreeze for Re-Use

1. Attach all hoses and wands which have been freeze guarded to the truck mount.
2. Attach the incoming water source to the front of the truck mount.
3. Start the truck mount.
4. Spray the solution through the hoses and wands into a sealable container until all signs of antifreeze are gone.

Freeze Protection of the Pump-In System

1. Drain the fresh water tank.
2. Remove the garden hose adapter from the pump-in pump hose and position the hose so it is pointing outside the van.
3. Turn on the pump-in pump and run for 1-2 minutes until all the water is purged from the hose.

NOTE: The next time the truck mount is used it may take a few minutes before the water box begins to fill.

5 - Water and Chemical System

This section describes the water and chemical systems in the following areas:

- Water and Chemical Flow Operation
- Water and Chemical Flow Diagrams

Water and Chemical Flow Operation

Fresh water is brought through the front of the truck mount into the water box. The level of water in the box is maintained by the use of a float valve. The water is then gravity fed to the pump where it is pressurized.

Next, the pressurized water enters the bypass valve. This valve allows manual adjustment of the pressure level. When the valve at the wand is closed, nearly all of the water in the system is re-circulated to the water box at this point. When solution is being used at the wand the necessary amount of high pressure water passes through the bypass valve and to the heat exchanger.

In the finned tube heat exchanger the temperature of the water is raised. The heat necessary to do this is provided by both the engine and blower exhausts. The heated water then travels to the high pressure manifold.

The high pressure manifold houses both the temperature sensor for the heat control system as well as a high temperature shutdown switch. There are also two orifices located in the manifold. The larger "secondary" orifice leads to the high temperature dump solenoid. This solenoid opens when the controller senses that the water has reached the set point then closes when the temperature drops back below the set point.

The smaller "primary" orifice allows a small amount of high pressure, high temperature water to pass back to the water box. This prevents excessive pressure building up in the heat exchanger when the wand valve is closed and no solution is exiting the truck mount.

The water that is being called for by the wand then exits the manifold and passes through a check valve. Finally, the water joins the chemical where the solution is created.

The chemical is pressurized by the HydraMaster diaphragm chemical pump attached to the head of the water pump. This pump pulls the chemical from the jug through the chemical meter. After being pressurized the chemical travels through the metering valve and is injected into the high pressure stream. This solution then exits the front of the truck mount and is delivered to the cleaning tool.

Figure 5-1 Flow Diagram
D-7027 Rev. - (Sheet 1)

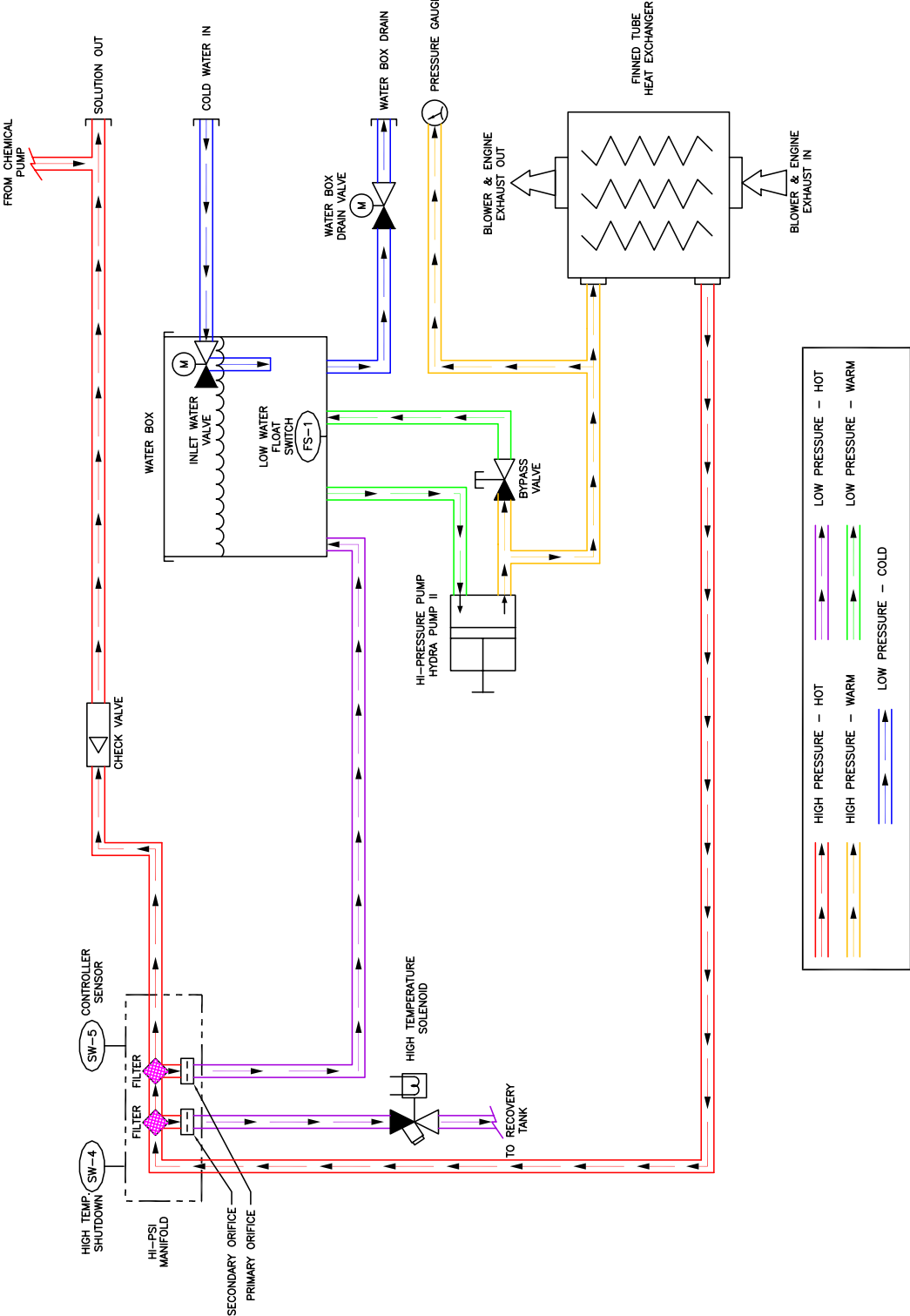


Figure 5-2 Flow Diagram

D-7027 Rev. - (Sheet 2)

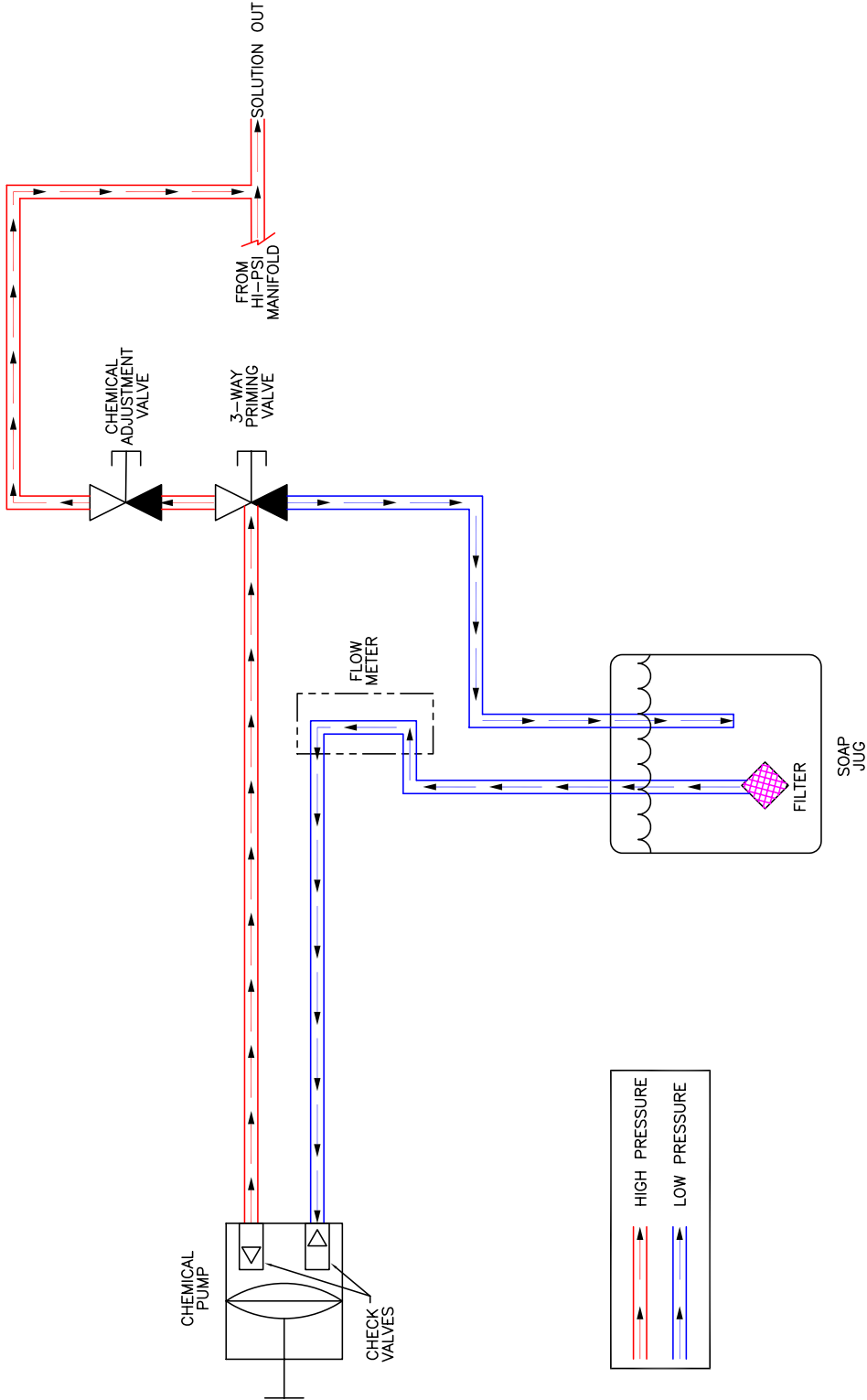
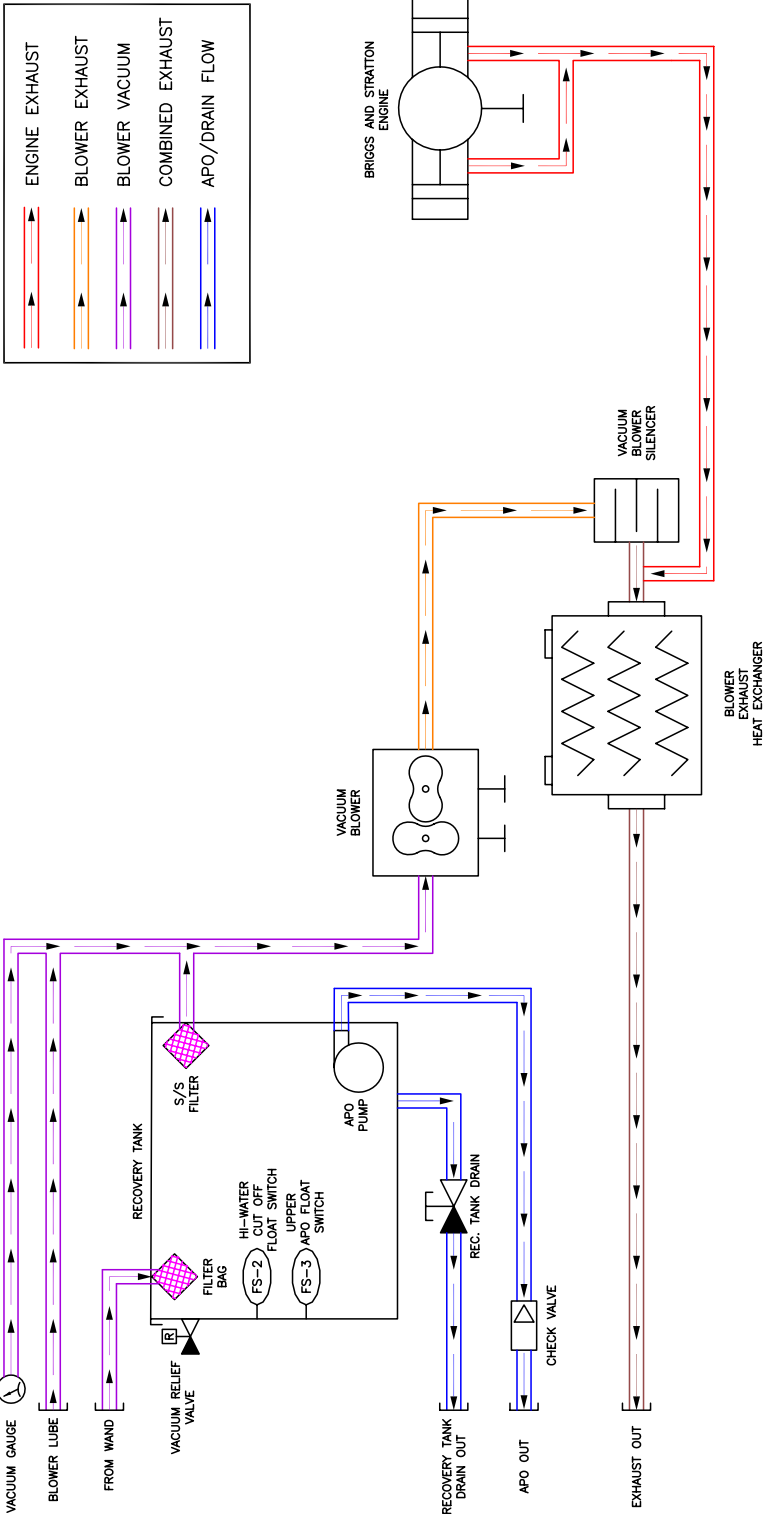


Figure 5-3 Flow Diagram

D-7027 Rev. - (Sheet 3)



6 - Electrical System

This section describes how the electrical system functions in the following manner:

- Electrical System Information
- Electrical Schematic
- Wiring Diagram

Electrical System Information

The Boxxer 318 electrical system operates on 12 Volts DC which is provided by the battery. Battery levels are maintained by a 20 Amp alternator mounted on the engine.

NOTE: When a new battery is installed, check that it is properly charged before installation or damage to the charging system may occur.

Ignition Switch

Terminal No.	Wire Color	Function
1	Brown	Ground
2	White	To terminal block (system power)
3	Black	To engine stop lug on engine
4	Yellow	To starter solenoid
5	Orange	To inline fuse #1
6	Red	To voltage regulator/rectifier

Switch Position	Continuity
Off	1 + 3 + 6
Run	2 + 5 + 6
Start	2 + 4 + 5

Figure 6-1 Electrical Schematic
C-7026 Rev. -

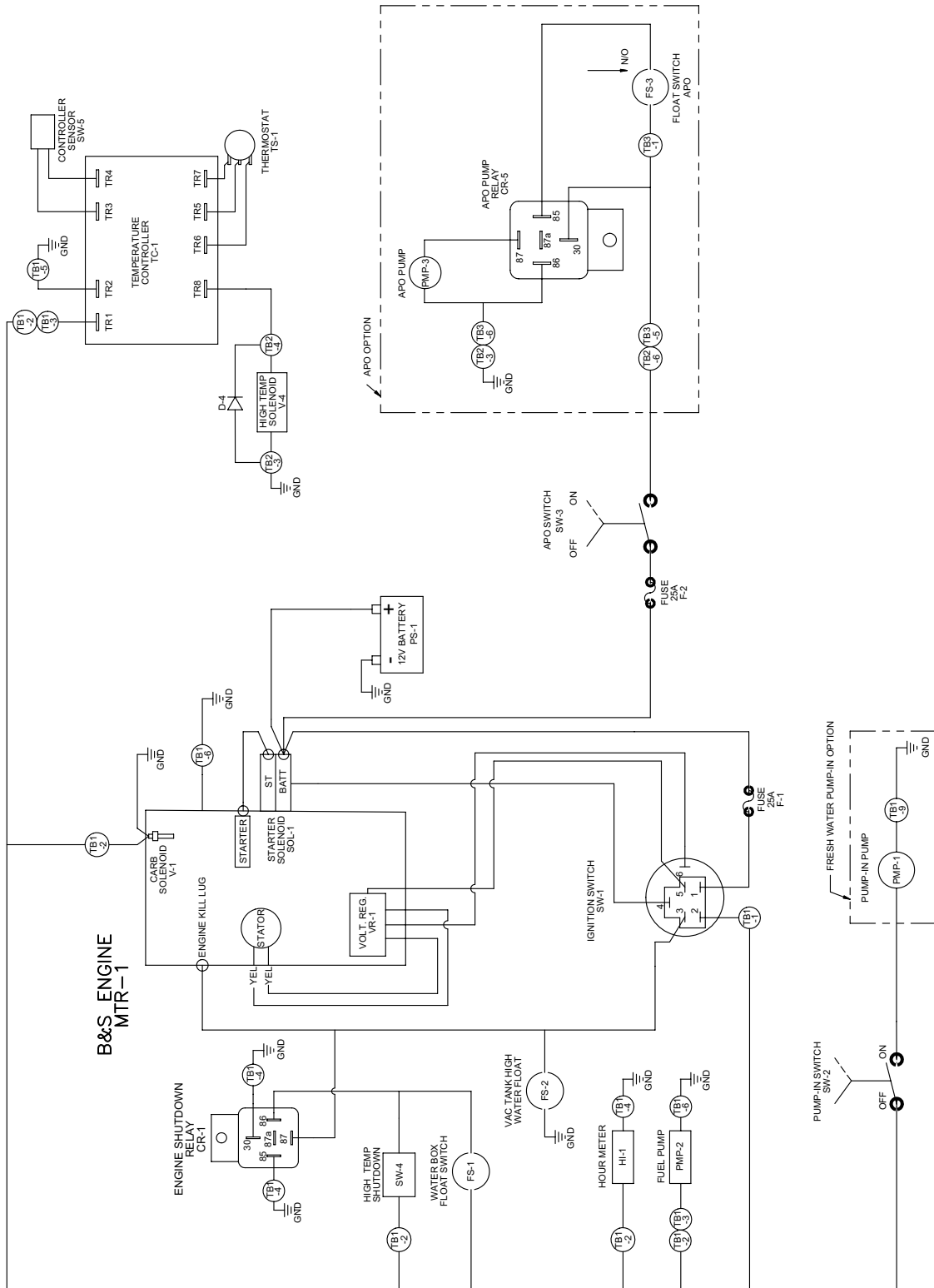


Figure 6-2 Wiring Diagram
C-7025 Rev. B (Sheet 1)

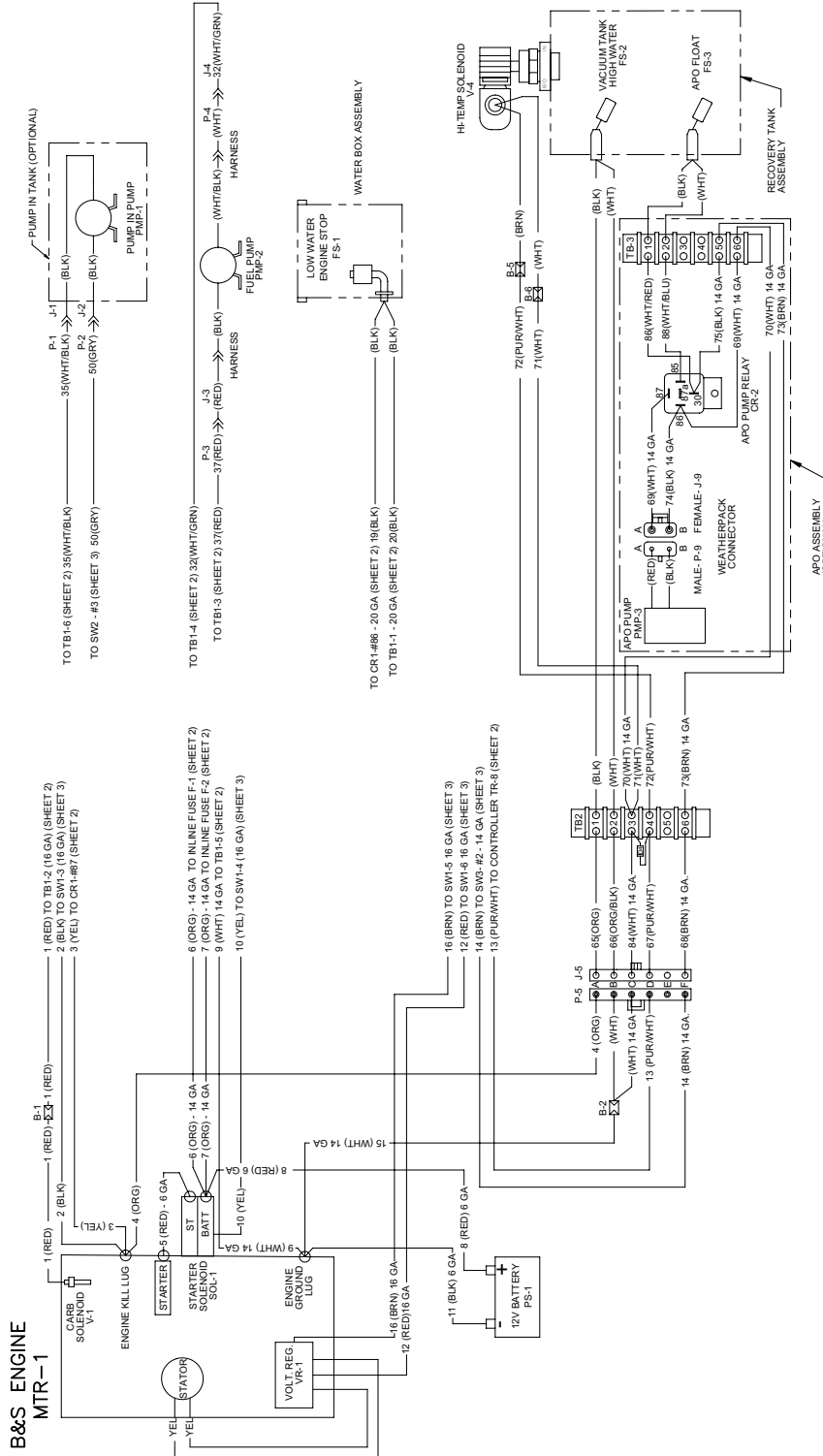


Figure 6-3 Wiring Diagram
C-7025 Rev. B (Sheet 2)

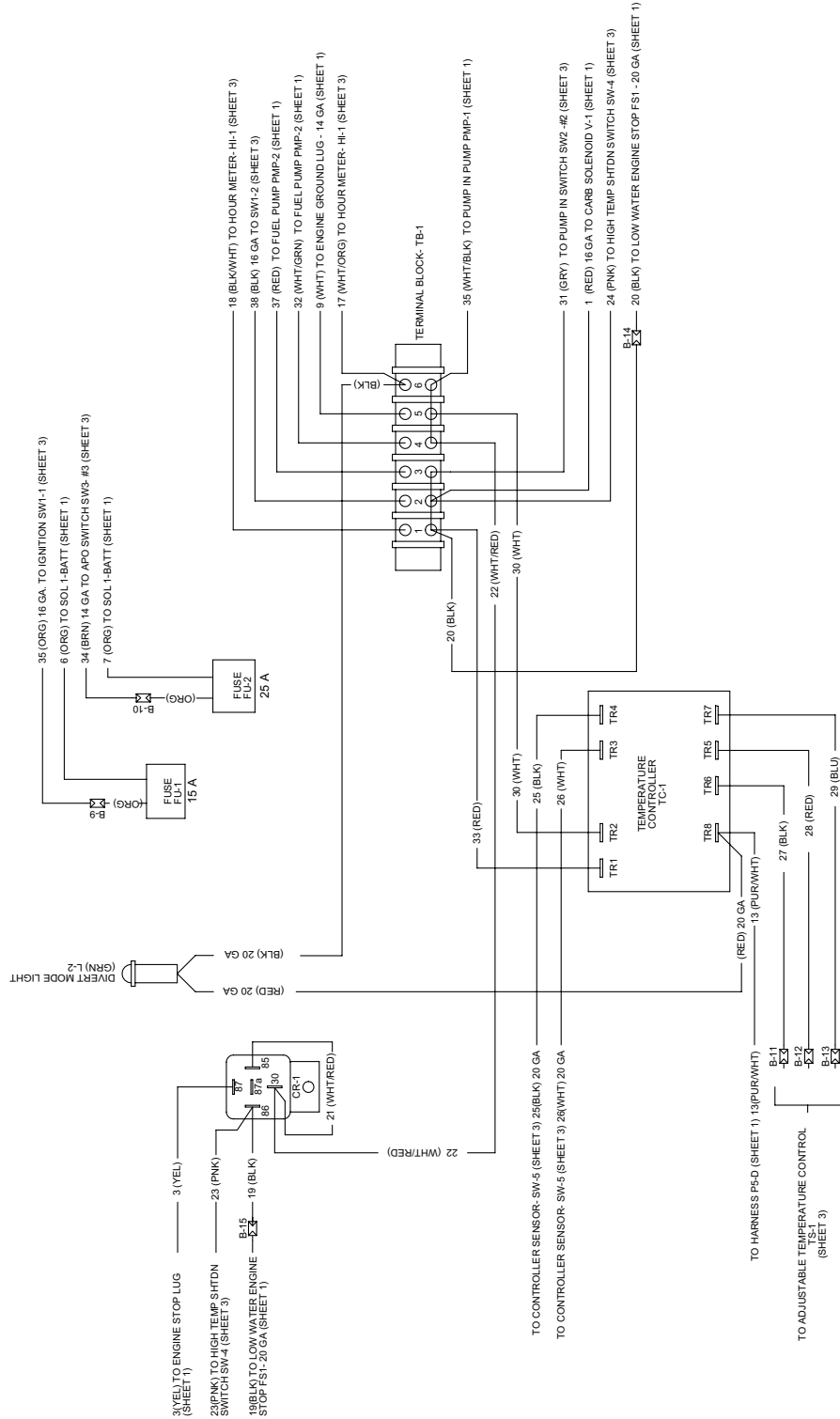
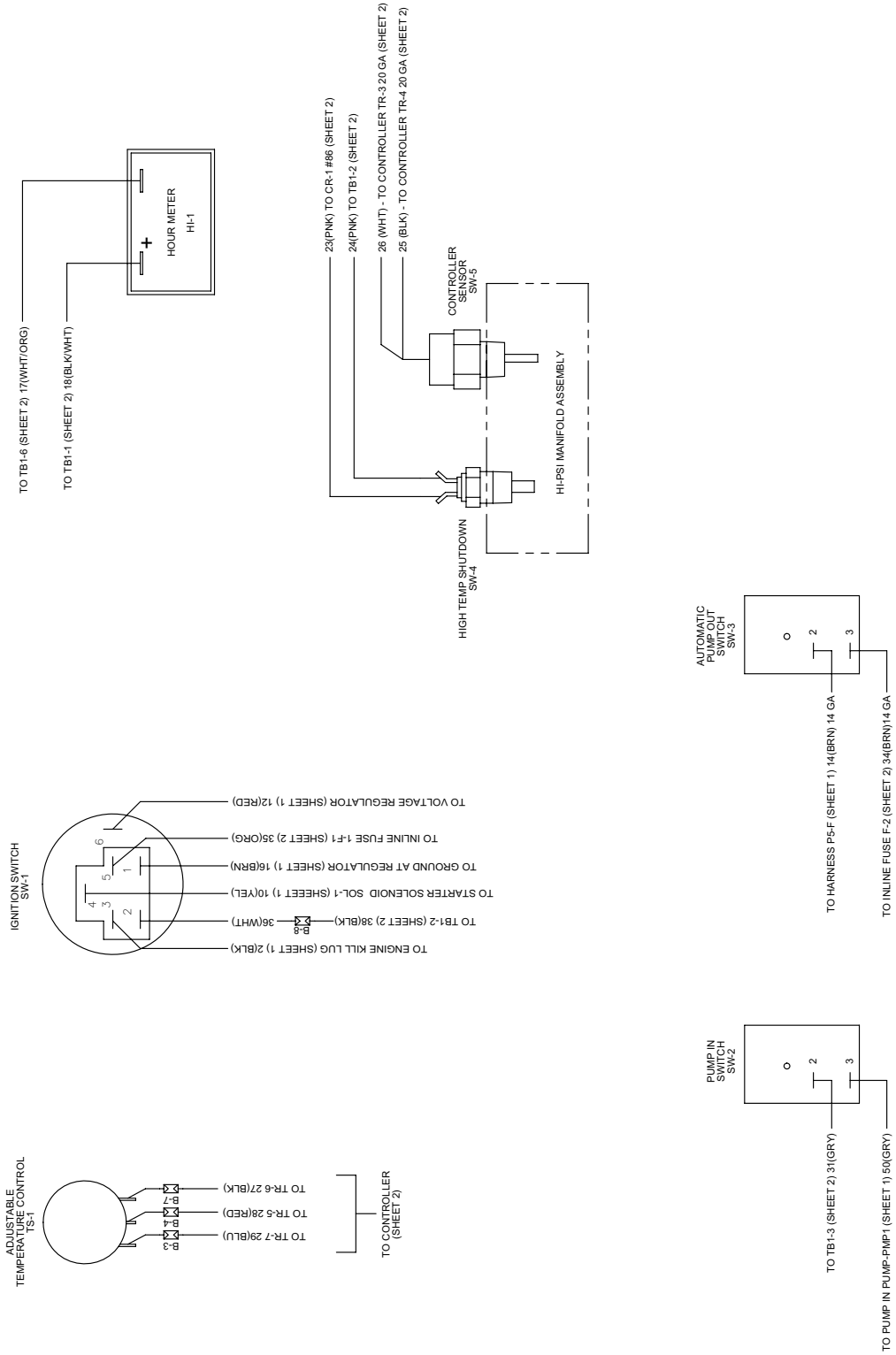


Figure 6-4 Wiring Diagram
C-7025 Rev. B (Sheet 3)



7 - Troubleshooting

This section describes the standard troubleshooting procedures in the following areas:

- Heating System
- Chemical System
- Engine
- High Pressure System
- Vacuum System

Heating System

The truck mount overheats and shuts down	
Possible Cause	Solution
The orifice(s) or filter screen(s) are restricted	Remove and inspect. Clean as necessary. Note: Ensure the orifices are not interchanged.
The high pressure dump solenoid is restricted	Inspect the solenoid and the hose that delivers water to it. Clean or replace as necessary.
The dump solenoid is faulty	Check the main fuse. If the fuse is blown, inspect electrical system for worn or shorted wires. Repair or replace as necessary.
	Inspect dump the solenoid and test for functionality. If the solenoid is operable, refer to a qualified service technician to test the temperature controller and sensor.
Unable to achieve normal cleaning solution temperature	
Possible Cause	Solution
Temperature control knob is turned down	Inspect the knob. Adjust if necessary.
The dumb solenoid is faulty	Inspect the solenoid and test for functionality. If the solenoid is operable, refer to a qualified service technician to test the temperature controller and sensor.
Excessive solution flow at tool	The cleaning tool jet is too large or worn. Inspect the jet. Replace if necessary.
The heat exchanger has hard water scale buildup	Descale the system.
The heat exchanger has blockage on the exhaust side	Inspect the interior of heat exchanger. Remove the debris and clean as necessary.

Chemical System

System will not prime	
Possible Cause	Solution
The check valves in chemical pump are faulty	Remove the valves and inspect. Clean or replace as necessary.
The chemical pump diaphragm is faulty	Remove and inspect. Replace as necessary.
The check valve in high pressure pump is faulty (piston which chemical pump is attached to)	Remove the valve and inspect. Clean or replace as necessary.
The filter on feed line in chemical jug is clogged	Inspect and clean.
The feed line from chemical jug is loose, pinched or damaged	Inspect and repair.
The chemical selector valve is faulty	Inspect the valve for leaks between ports. Replace as necessary.
Chemical flow is unstable or low	
Possible Cause	Solution
Air is in the lines	Check that all fittings and connections are tight and in good condition. Repair or replace as necessary.
The filter screen in the chemical jug is partially obstructed	Inspect and clean.
The chemical selector valve is faulty	Inspect the valve for leaks between ports. Replace as necessary.
The chemical metering valve is faulty	Remove and inspect the valve. Clean or replace as necessary.
The high pressure check valve is faulty	Remove and inspect the valve. Clean or replace as necessary.
Chemical is present in water box	
Possible Cause	Solution
The chemical pump diaphragm is faulty	Remove and inspect the chemical pump diaphragm. Replace as necessary.
The high pressure check valve is faulty	Remove and inspect the valve. Clean or replace as necessary.

Engine

The engine will not turn over	
Possible Cause	Solution
A loose or corroded battery terminal	Clean and tighten the battery terminal connections.
The battery is dead	Recharge or replace the battery. Test the charging system. Repair if necessary. WARNING: Do not attempt to jump start the truck mount from a running vehicle. The amperage output from an automobile will damage the charging system of the truck mount.
The main fuse is blown	Check the main fuse.
	If the fuse is blown, inspect the electrical system for worn or shorted wires. Repair or replace as necessary.
The vacuum blower has seized	Attempt to turn the coupler by hand. If it will not turn refer to the Vacuum System Troubleshooting Section.
The ignition switch is faulty	Test to see if there is power both to and from the switch. Refer to the Electrical Section.
The starter solenoid is faulty	Test to see if there is power to solenoid with ignition in "Start" position. Refer to Electrical Section.
The starter motor is faulty	Test to see if there is power to the motor with the ignition in "Start" position. Refer to the Electrical Section.
None of the above	Refer to a qualified service technician for further troubleshooting.

The engine turns over but will not start. There is NO SPARK. Note: To check for spark refer to engine manual.

Possible Cause	Solution
The recovery tank is full	Drain the tank.
The recovery tank float is faulty	Inspect the float. Repair or replace as necessary.
The engine ignition system in faulty	Refer to a qualified service technician for further troubleshooting.

The engine turns over but will not start. There IS SPARK. Note: To check for spark refer to engine manual.

Possible Cause	Solution
Fuel is not reaching the carburetor	Test for power to the fuel pump. Refer to Electrical Section.
	If power is present, inspect the fuel pump. Replace if necessary.
	Inspect the fuel lines between the source and the carburetor. Repair or replace as necessary.
The carburetor solenoid is faulty	Test for power to the solenoid. Refer to Electrical Section.
	If power is present, inspect the solenoid. Replace if necessary.
The engine is flooded	Pull the throttle cable completely and crank until the engine starts.
The spark plugs are worn or dirty	Inspect and replace as necessary.
None of the above	Refer to a qualified service technician for further troubleshooting.

Engine (cont.)

The Engine will not come up to normal operating RPM Note: Engine should be adjusted to run at 3150 RPM under a vacuum load of 14" Hg.

Possible Cause	Solution
The throttle linkage is out of adjustment	Inspect for broken or loose linkage. Repair or replace as necessary.
Excessive load on the engine	Inspect and clean the recovery tank filters.
	Inspect the recovery tank to the blower hose. Repair or replace as necessary.
Excessive back pressure on the engine exhaust	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

Runs rough at high speed

Possible Cause	Solution
The spark plug(s) are faulty	Remove and inspect the plugs. Clean or replace as necessary.
The spark plug wire(s) are faulty	Inspect the wires and connectors for damage or loose connections. Repair or replace as necessary.
Inadequate fuel supply to the carburetor	Check to see if the fuel pump is mounted in a vertical position near the fuel source. Correct if necessary.
	Check for blockage in the filter. Repair or replace as necessary.

Runs rich. (Black smoke)

Possible Cause	Solution
A dirty air filter	Inspect and replace as necessary.
The choke is partially closed	Inspect and adjust or repair as necessary.
Excessive fuel to the carburetor	Check to see if the proper fuel pump is installed.

Engine Overheats

Possible Cause	Solution
Poor ventilation in the van	Open all the van doors.
	Install a roof vent in the van.
	Remove any dividers or other objects impeding airflow around the truck mount.
Low oil level	Check the level and fill as necessary.
The engine RPM is too high	Check the engine RPM. Adjust as necessary to run at 3150 RPM under a vacuum load of 14" Hg.
Excessive back pressure on the engine exhaust	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

High Pressure System

The pump will not come up to normal cleaning pressure	
Possible Cause	Solution
The pressure adjusting valve is faulty	Inspect the valve. Repair or replace if necessary.
Worn seals or valves in the pump	Test the pump output volume directly from the pump at normal running RPM. If the volume is below the manufacturer's specifications, replace the seals and inspect for defective valves.
The pump RPM is too low	Check for a loose pump belt. Adjust or replace as necessary.
	Check the engine RPM and adjust as necessary to 3150 RPM under a 14" Hg vacuum load.
The primary orifice is missing or loose	Remove and inspect. Tighten or replace as necessary.
The primary and secondary orifices have been installed incorrectly	Inspect and reverse if necessary. Refer to the Machine Assemblies & Parts List Section.
The primary orifice is worn	Measure the orifice size and replace as necessary. Correct size is .033 in.
No pressure reading on gauge	
Possible Cause	Solution
The pump belt is broken	Inspect and replace if necessary.
The gauge is faulty	Replace the gauge.
The PSI gauge reads normal; low pressure from wand	
Possible Cause	Solution
Restriction in the cleaning tool	Inspect the tool jet(s) and clean or replace as necessary.
	Inspect any filters in the cleaning tool and clean or replace as necessary.
Faulty quick connect in the system	Inspect each quick connect and replace as necessary.
Restriction in one of the solution hoses	Remove the quick connects and inspect hoses. Clean or replace as necessary.
Hard water deposits restricting the system	De-scale the truck mount.

High Pressure System (cont.)

Pressure pulsation	
Possible Cause	Solution
Air leak between the water box and pump	Check all the hoses and fittings for cuts, breaks, cracks, etc. Repair as necessary.
The check valve(s) in the pump are faulty	Remove each valve and inspect for correct operation. See the Machine Maintenance Section.
Water box empty or fills slowly	
Possible Cause	Solution
Restriction in the water supply system	Inspect the supply system from the source through the incoming quick connect.
The float valve in the water box is faulty	Disassemble and inspect the valve. Repair or replace as necessary.
The water box overflows	
Possible Cause	Solution
The float valve in the water box is faulty	Disassemble and inspect the valve. Repair or replace as necessary.
The float has absorbed water and lost buoyancy	Detach the float and check to see if it will float to the surface. Replace as necessary.
The float has come out of adjustment	Adjust the float as necessary.

Vacuum System

A weak vacuum at wand. The gauge reads normal.	
Possible Cause	Solution
Blockage in the hoses or wand tube	Disconnect the hoses and check for an obstruction.
Excessive length of hose connected to the truck mount	Do not attach excessive lengths of hose.
A weak vacuum	
Possible Cause	Solution
Air leak somewhere in the vacuum system	Check the vacuum relief valve for proper adjustment.
	Carefully check all the vacuum hoses for a cut or break.
	Check the recovery tank lid gasket.
	Make sure the recovery tank drain valve is fully closed.
The vacuum blower is turning too slowly	Check the RPM of the engine. Adjust as necessary to 3150 RPM under a 14" Hg. vacuum load.
The vacuum gauge is defective	Test the gauge and replace if necessary.
The vacuum gauge reads too high with no hoses attached	
Possible Cause	Solution
The filter in recovery tank is clogged	Remove and clean or replace as necessary.
The hose from recovery tank to the vacuum blower is collapsed internally	Inspect and replace as necessary.
Excessive noise produced by the blower	
Possible Cause	Solution
The blower is low on oil	Inspect the oil levels and replenish as necessary. Note: Running the blower with low oil levels can cause severe damage. If this situation occurs the blower should be inspected by a qualified service technician.
The vacuum blower has internal damage	Refer to a qualified service technician.

Vacuum System (cont.)

The vacuum blower is locked and will not turn	
Possible Cause	Solution
Truck mount has been inactive for a period of time and the blower was not properly lubricated prior to final shutdown. Rust has possibly built up on the internal surfaces.	Spray penetrating oil into the blower and let sit for at least one hour. Then very carefully use pipe wrench on the outer diameter of the pulley on the coupler to attempt to free lobes of the blower. Do not use a wrench directly on the blower shaft.
	If unable to free up the blower in this manner refer to a qualified service technician.
There is internal damage to the blower	Refer to a qualified service technician.
Water in truck mount exhaust	
Possible Cause	Solution
The recovery tank has been filled with foam or over filled with water	Inspect the recovery tank. If full, drain the tank.
	Inspect the high level shutoff switch for proper operation. Clean or replace the switch as necessary.
	If foam is in recovery tank, use defoamer on the carpet being cleaned.
Condensation in system	This will be more common in cool weather and humid climates. If this is the cause it should dissipate after a few minutes of running.
The heat exchanger is leaking water	Inspect and repair or replace as necessary.

8 - Machine Assemblies and Parts List

This section contains all the assemblies and parts lists associated with the truck mount.

- Machine Assembly
- Frame Assembly
- Engine Assembly
- Blower Assembly
- Pump Assembly
- Chemical Pump Assembly
- Heat Exchanger Assembly
- Silencer Assembly
- Water Box Assembly
- Dash Assembly
- Hi-PSI Manifold Assembly
- Bypass Assembly
- Idler Pulley Assembly
- Exhaust Assembly
- Electrical Panel Assembly
- 50 Gallon Universal Recovery Tank Assembly
- 70 Gallon Universal Recovery Tank Assembly
- Cover, 70 Gallon Universal Recovery Tank Assembly
- Vacuum Relief Valve Assembly
- Dura-Flow APO Assembly
- Machine Hose Routings

Figure 8-1 Machine Assembly - Front Left View
D-7010 Rev. -

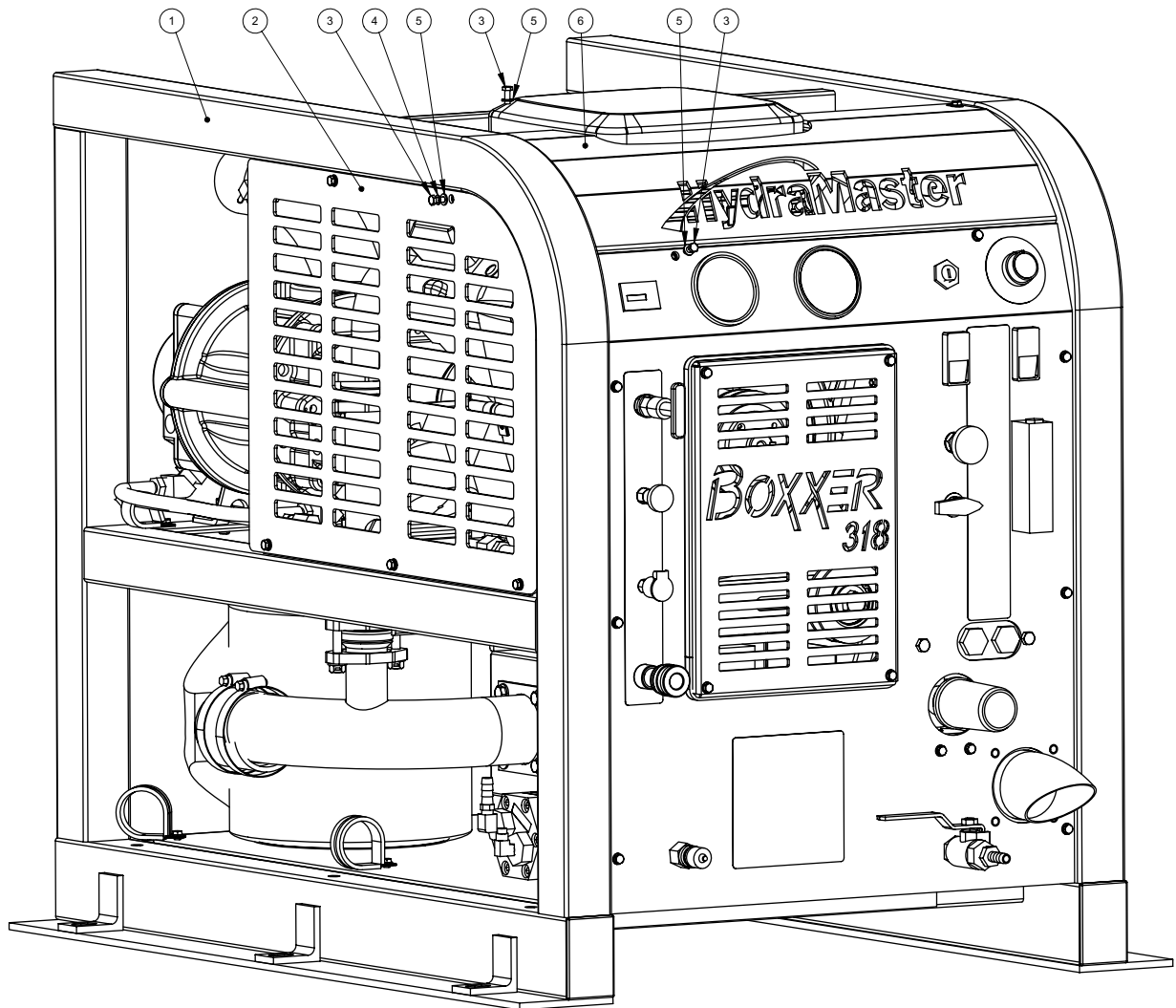
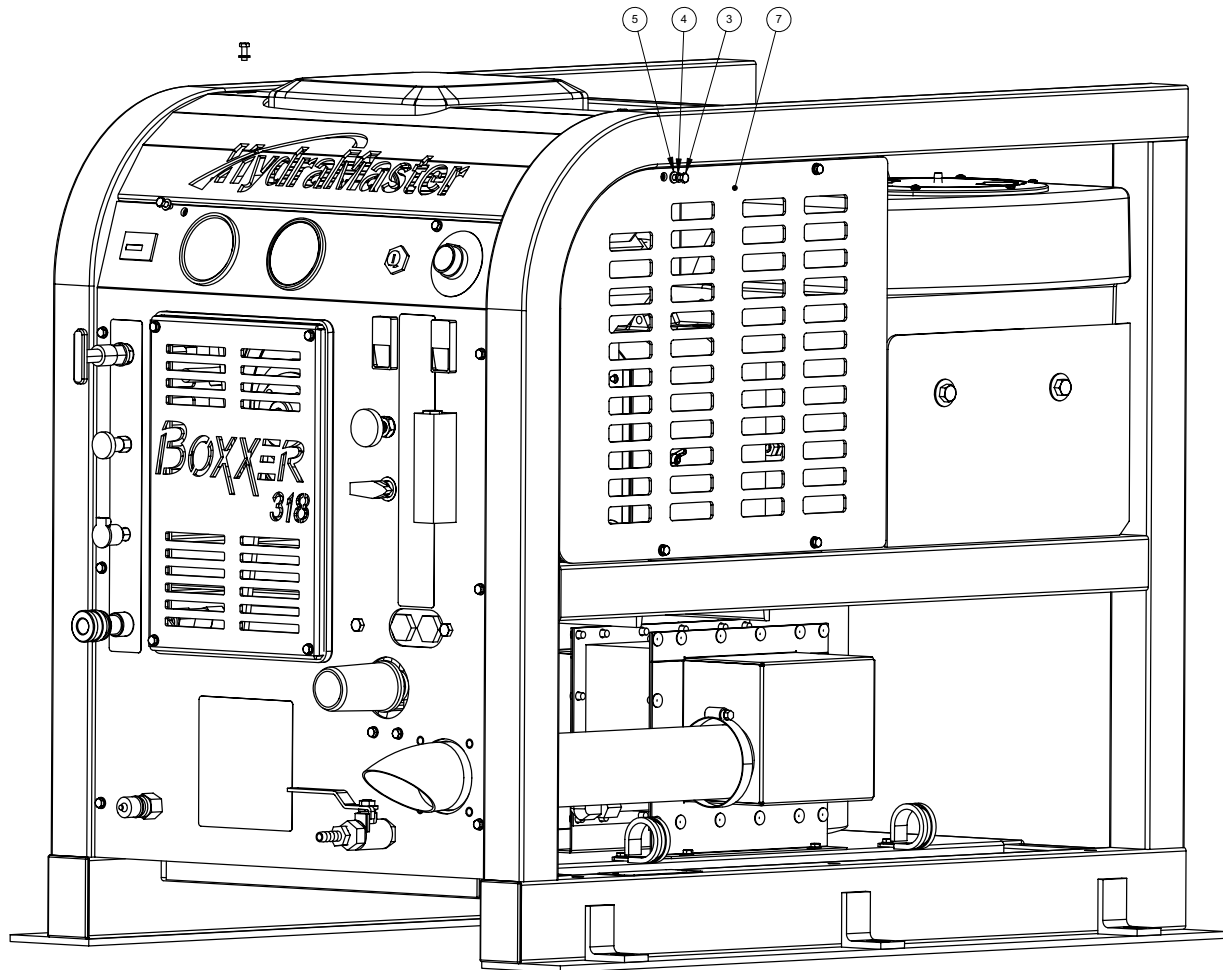


Figure 8-2 Machine Assembly - Front Right View
D-7010 Rev. -



Machine Assembly Parts List

Item	Part Number	Description	Qty
1	Fig. 8-3 - 8-5	Assembly, Frame	1
2	000-041-451	Cover, Side - 19.900" x 14.316"	1
3	000-143-126	Screw, #10-24UNC x 0.50" Lg Hex Head	13
4	000-174-014	Washer, #10 Lock	9
5	000-174-001	Washer, #10 Flat	13
6	000-041-453	Cover, Top - Machine	1
7	000-041-452	Cover, Side - 17.250" x 14.316"	1

Figure 8-3 Frame Assembly - Front Left View
D-7011 Rev. -

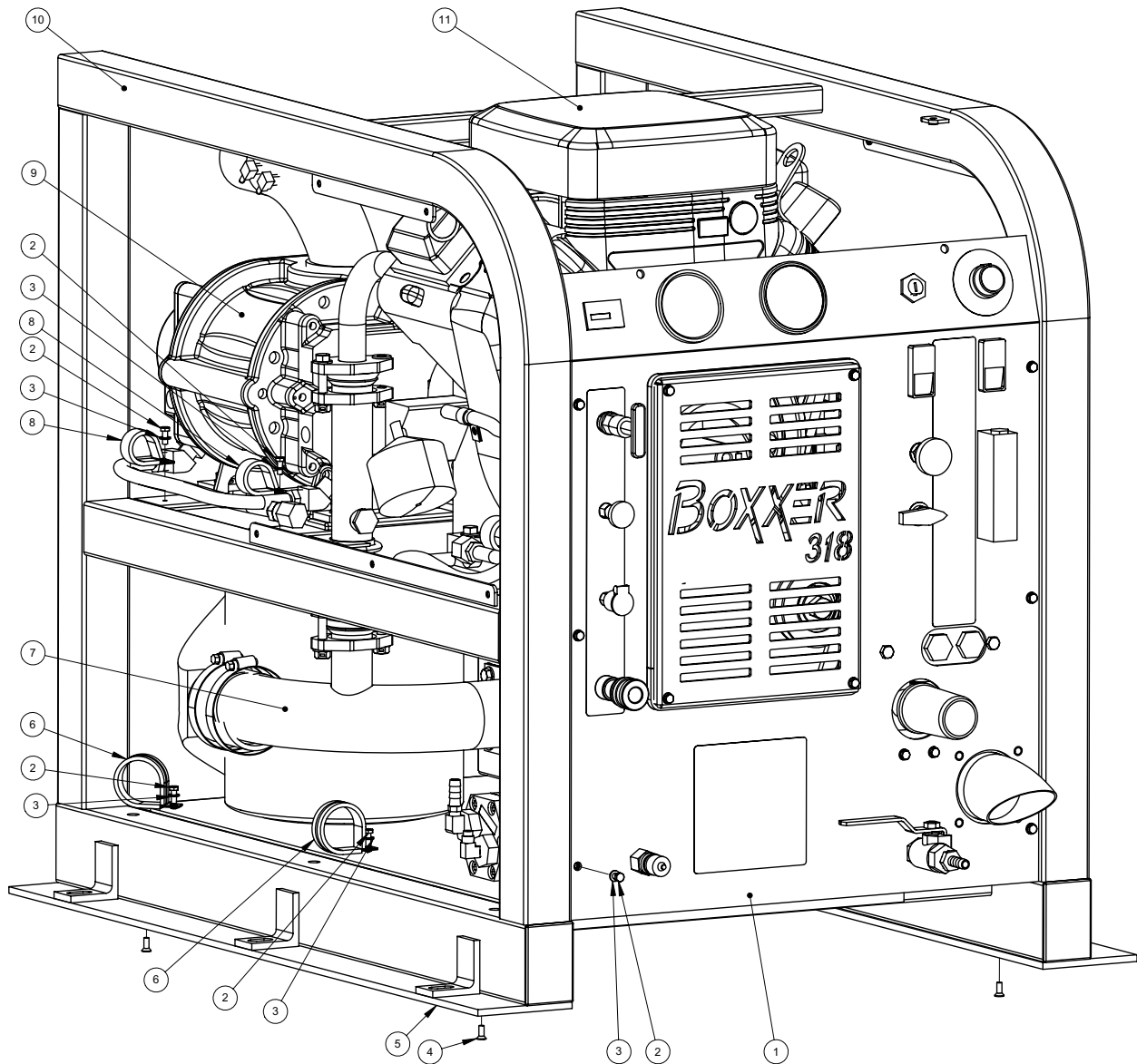


Figure 8-4 Frame Assembly - Front Right View
D-7011 Rev. -

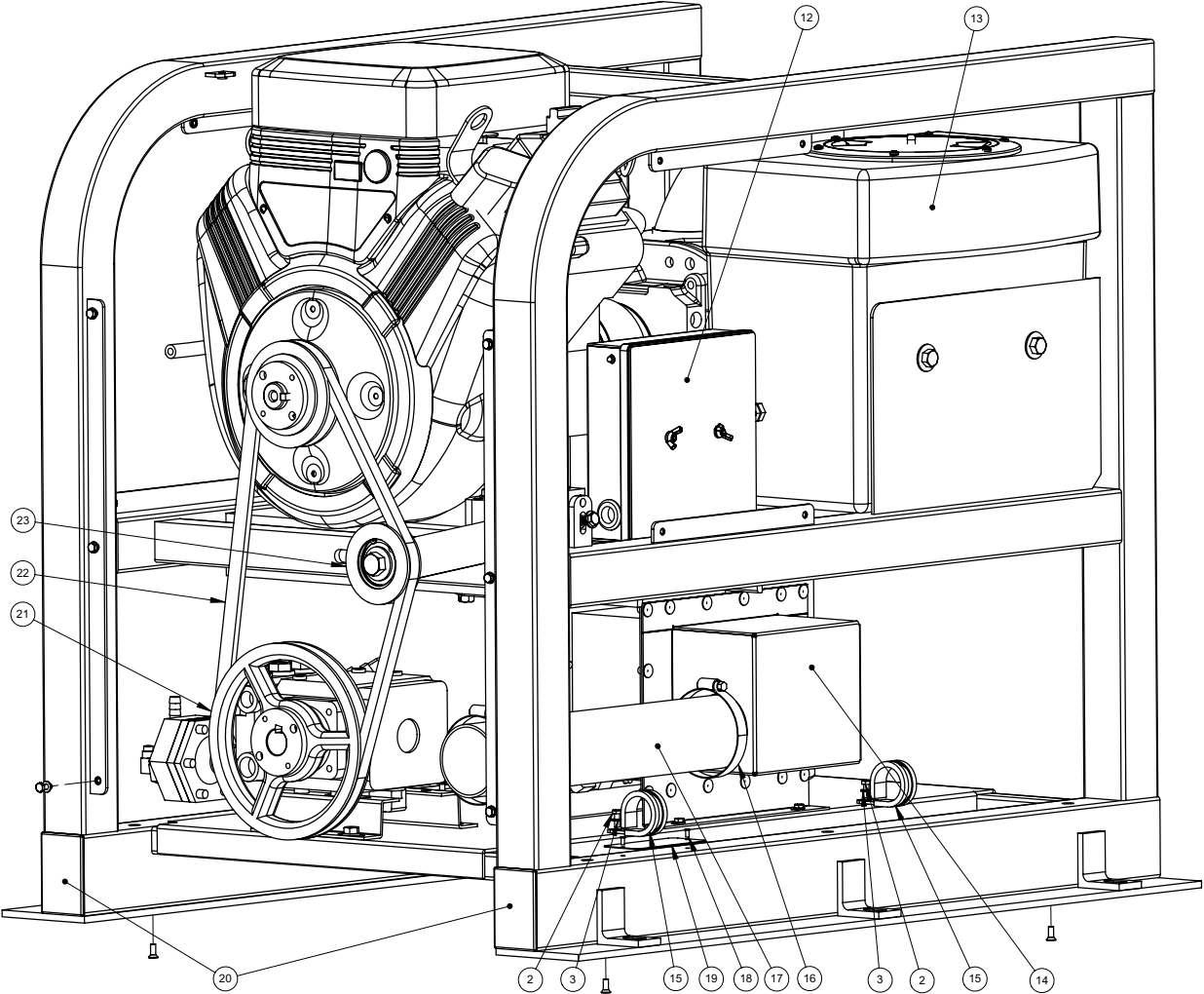
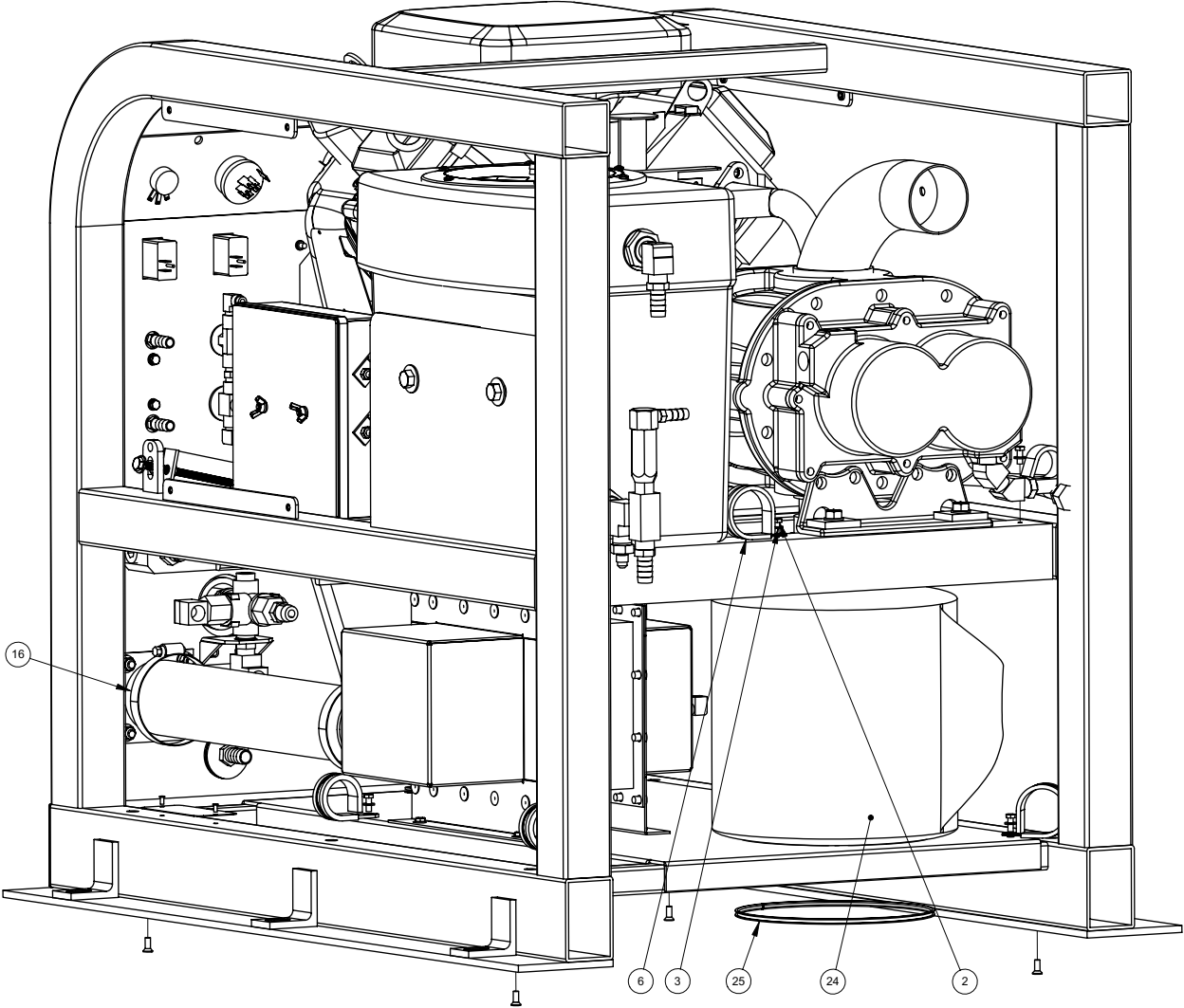


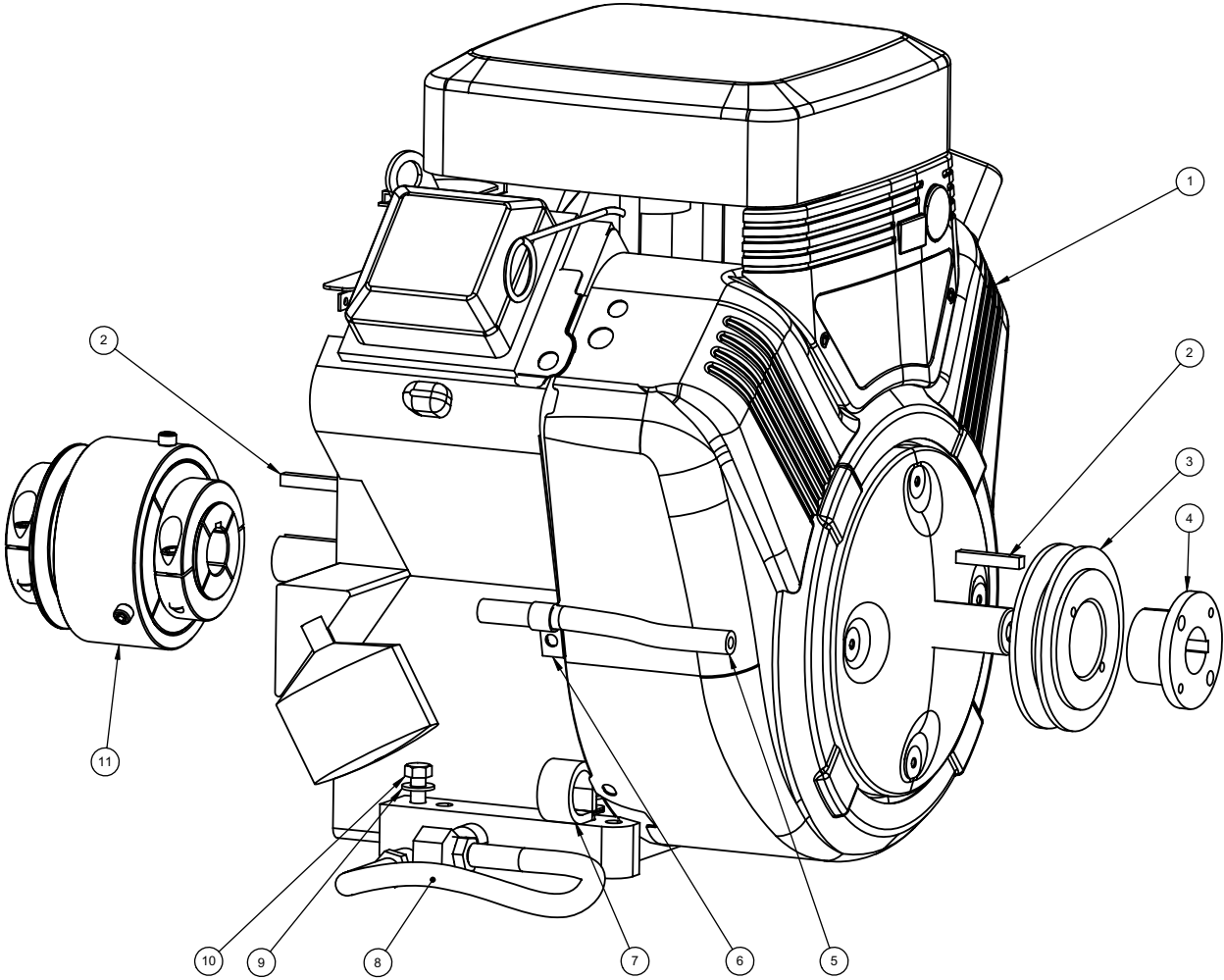
Figure 8-5 Frame Assembly - Rear View
D-7011 Rev. -



Frame Assembly Parts List

Item	Part Number	Description	Qty
1	Fig. 8-13&14	Assembly, Dash	1
2	000-143-126	Screw, #10-24UNC x 0.50" Lg Hex Head	13
3	000-174-001	Washer, #10 Flat	13
4	000-143-114	Screw, #10-24UNC x 1/2" Flat Head Phillips	4
5	000-154-156	Spacer, Machine Raising - 4" x 35" x 1/4" Thk.	2
6	000-033-050	Clamp, 1-3/4" Cushion Loop	3
7	Fig. 8-18	Assembly, Exhaust	1
8	000-033-057	Clamp, 1" Cushion Loop	2
9	Fig. 8-7	Assembly, Blower	1
10	000-055-188	Frame Weldment- Boxxer 318	1
11	Fig. 8-6	Assembly, Engine	1
12	Fig. 8-19	Assembly, Electrical Panel	1
13	Fig. 8-12	Assembly, Water Box	1
14	Fig. 8-10	Assembly, Heat Exchanger	1
15	000-033-052	Clamp, 1-1/4" s/s EPDM	2
16	000-033-012	Clamp, Size #44 Hose	2
17	000-068-780	Hose, 2.5" ID - Silicone	1
18	000-140-001	Rivet, AB4-3A Aluminum Pop (1/8" x 1/4")	2
19	000-105-012	Plate, Machine Serial I.D.	1
20	000-027-110	Cap, 2" x 3" Frame End	2
21	Fig. 8-8	Assembly, Pump	1
22	000-010-125	Belt, #9440HD Gates Automotive	1
23	Fig. 8-17	Assembly, Idler Pulley	1
24	Fig. 8-11	Assembly, Silencer	1
25	000-131-131	Trimlok, 3/8" x 1/8" Rubber	1

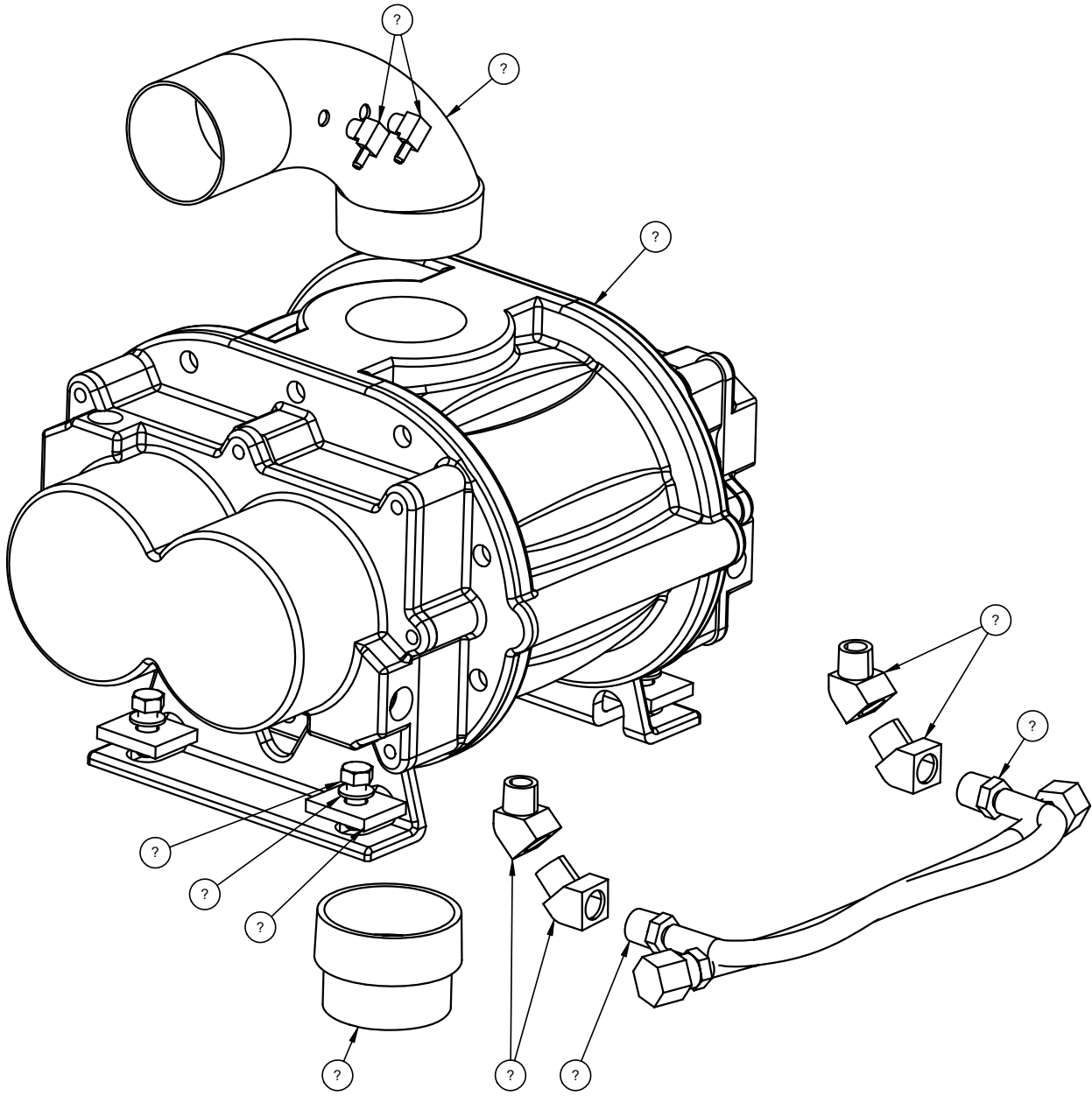
Figure 8-6 Engine Assembly
C-7013 Rev. -



Engine Assembly Parts List

Item	Part Number	Description	Qty
1	000-047-028	Engine, B&S 18HP	1
2	000-077-010	Key, 1/4" x 1-1/2" Lg.	2
3	000-109-040	Pulley, AK47-H	1
4	000-020-025	Bushing, H x 1"	1
5	000-068-660	Hose, 1/4" Fuel	1
6	000-033-046	Clamp, 1/2 Wide x 1/2 Tube	1
7	000-033-117	Clamp, 1" Cushion Loop w/ 7/16 Mount Hole	1
8	000-068-219	Hose, Drain	1
9	000-174-049	Washer, 5/16" Flat	4
10	000-143-015	Screw, 5/16-18UNC x 1 1/2" Hex Head	4
11	000-039-054	Coupler, 40 Series	1

Figure 8-7 Blower Assembly
D-7014 Rev. -

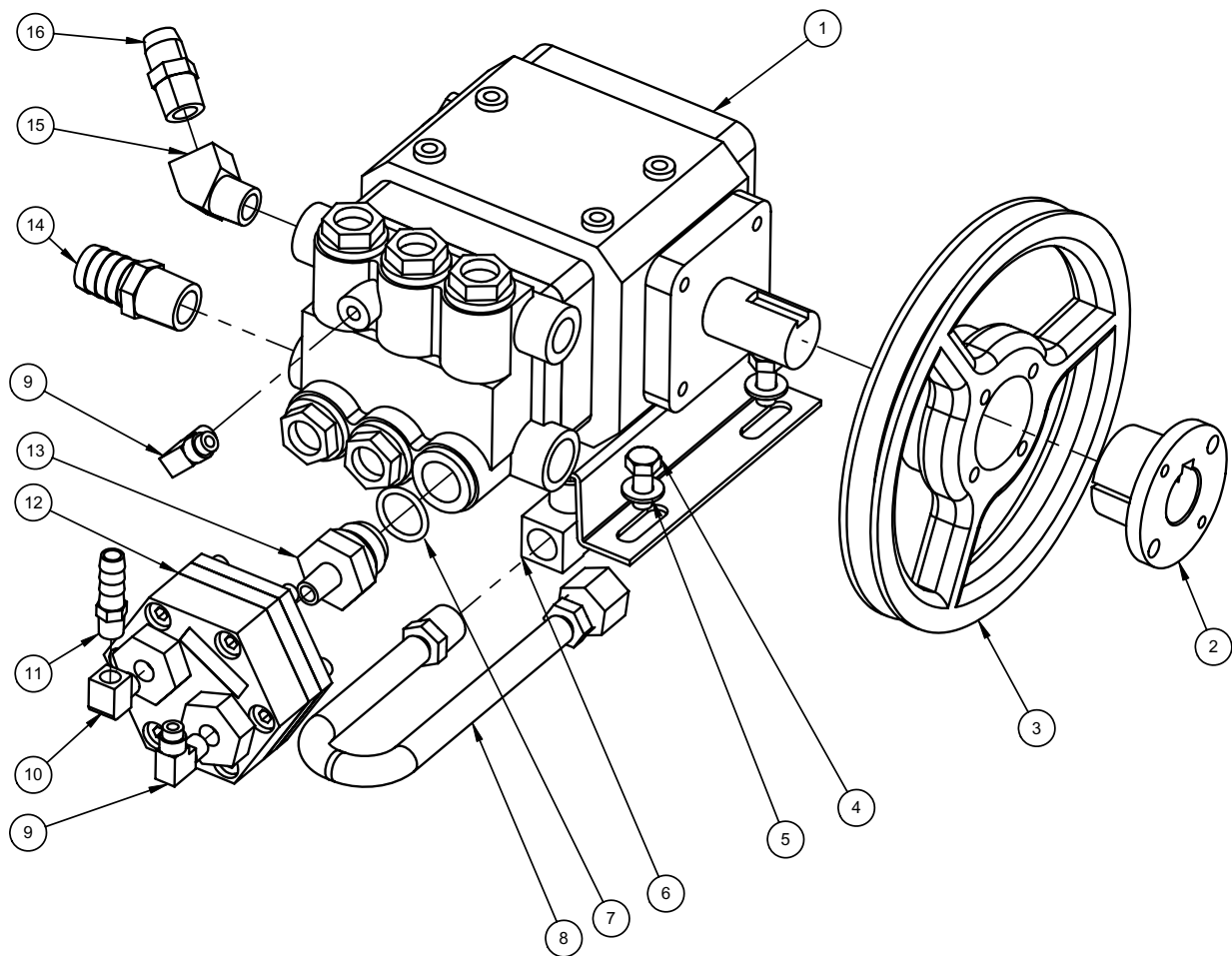


Blower Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-106	Insert, 1/8 NPT x 5/32 Barb - Elbow	2
2	000-001-141	Adapter, 2.5" NPT x 2.5" OD Tube - Elbow	1
3	000-111-134	Blower, 3006 Competitor SI	1
4	000-052-083	Elbow, 3/8" Brass x 45° Street	4
5	000-068-219	Hose, Drain	2
6	000-001-140	Adapter, 2.5" NPT To 2.5" OD Tube	1
7	000-174-068	Washer, Blower Feet	4
8	000-174-004	Washer, 5/16" Flat	4
9	000-143-018	Screw, 3/8-16UNC x 1" Hex Head - Grade 8	4

Figure 8-8 Pump Assembly

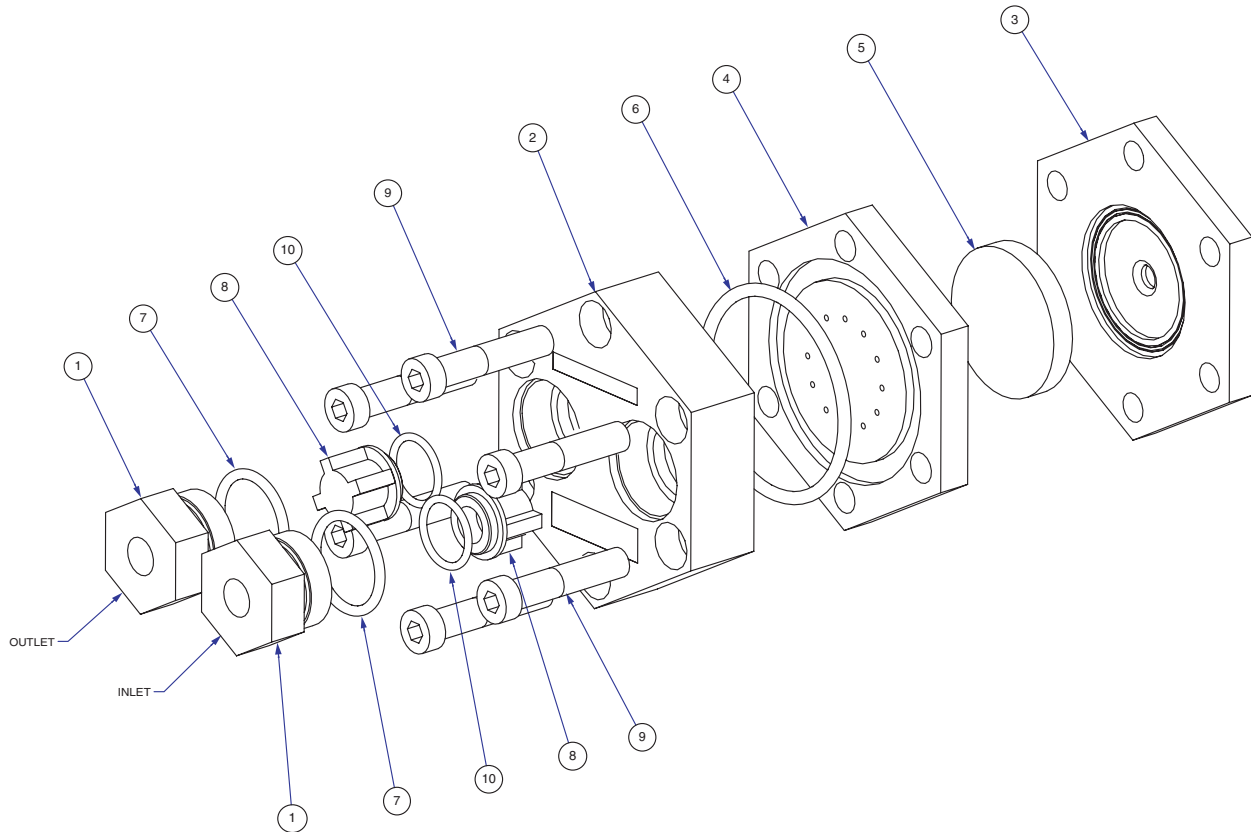
B-7016 Rev. -



Pump Assembly Parts List

Item	Part Number	Description	Qty
1	000-111-142	Pump, Hydrapump II	1
2	000-020-013	Bushing, H x 24mm	1
3	000-109-116	Pulley, AK74	1
4	000-143-012	Screw, 5/16"-18UNC x 3/4"	4
5	000-174-049	Washer, 5/16" Flat	4
6	000-052-086	Elbow, 3/8" NPT Street	1
7	000-097-057	O-Ring, Adapter - Chemical Pump	1
8	000-068-219	Hose, Drain	1
9	000-052-531	Elbow, 1/4" SAE x 1/8" NPT	2
10	000-052-084	Elbow, 1/8" NPT Street	1
11	000-052-099	Insert, #26 (1/8" NPT x 3/8" Barb)	1
12	000-111-035	Assembly - Pump, Chemical (Fig. 8-9)	1
13	000-001-096	Adapter, Comet Pump To Chemical Pump	1
14	000-052-129	Insert, #812	1
15	000-052-083	Elbow, 3/8" Brass x 45° Street	1
16	000-052-128	Nipple, 3/8" NPT x 3/8" M Propane	1

Figure 8-9 Chemical Pump Assembly
C-4416 Rev. B

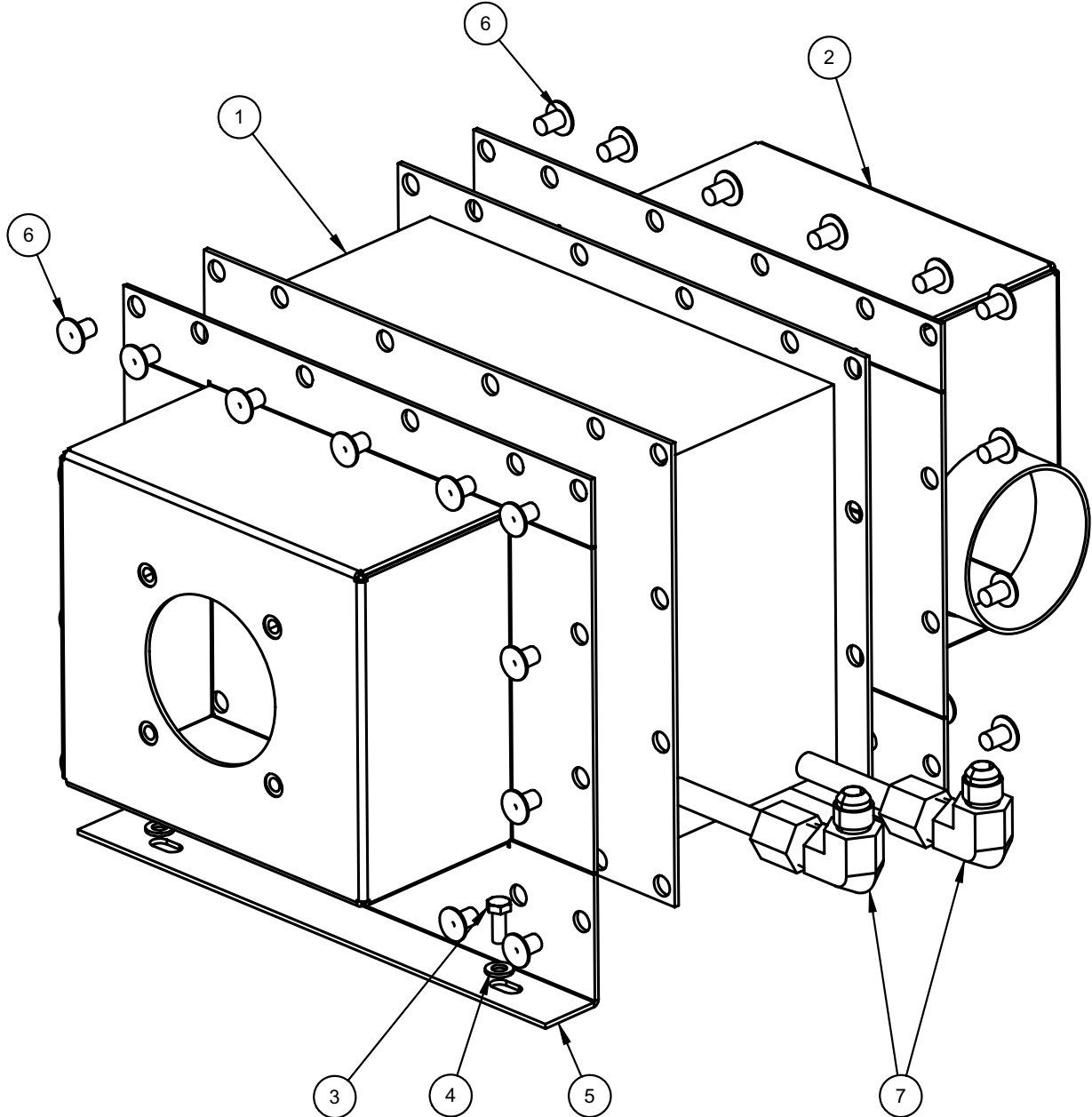


Chemical Pump Assembly Parts List

Item	Part Number	Description	Qty
1	000-106-110	Plug, Check Valve - Chemical Pump	2
2	000-064-015	Cover, Chemical Pump	1
3	000-111-030	Body, Chemical Pump	1
4	000-105-071	Mid Plate, Chemical Pump	1
5	000-046-010	Diaphragm, Chemical Pump	1
6	000-097-055	O-Ring, Chemical Pump Midplate AN Size -227 Viton	1
7	000-097-056	O-Ring, Check Valve Plug - Chemical Pump	2
8	000-169-155	Valve, Check - Last Step Chemical Injection	2
9	000-143-152	Screw, 5/16"-24UNF x 1.50" Lg. Socket Head	6
10	000-097-054	O-Ring, Chem. Pump Valve Viton-Parker 2-114	2

Figure 8-10 Heat Exchanger Assembly

C-7012 Rev. -

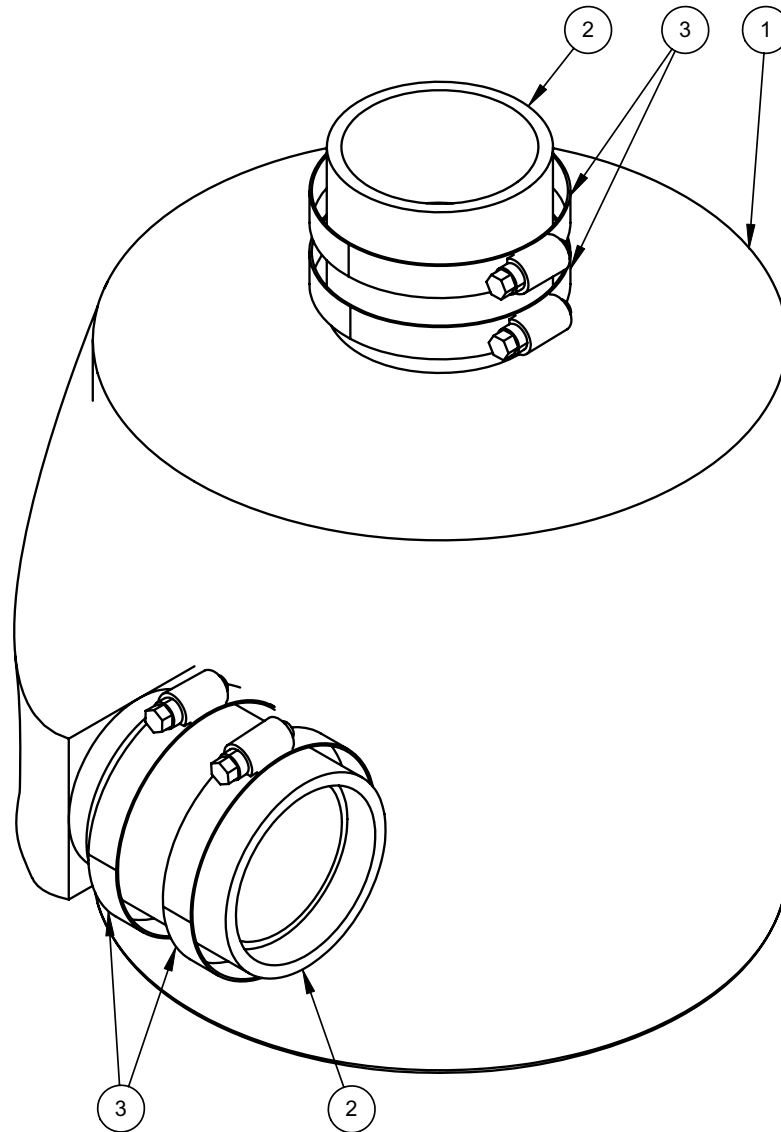


Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-038-072	Heat Exchanger, 4 Row	1
2	000-013-073	Box, Outlet Plenum - Weldment	1
3	000-143-126	Screw, #10-24UNC x 0.50" Lg.	4
4	000-174-001	Washer, #10 Flat	4
5	000-013-072	Box, Inlet Plenum - Weldment	1
6	000-140-021	Rivet, 1/4" Blind x 0.50" Lg.	32
7	000-052-766	Elbow, 3/8 NPT x 3/8 JIC	2

Figure 8-11 Silencer Assembly

B-7075 Rev. -

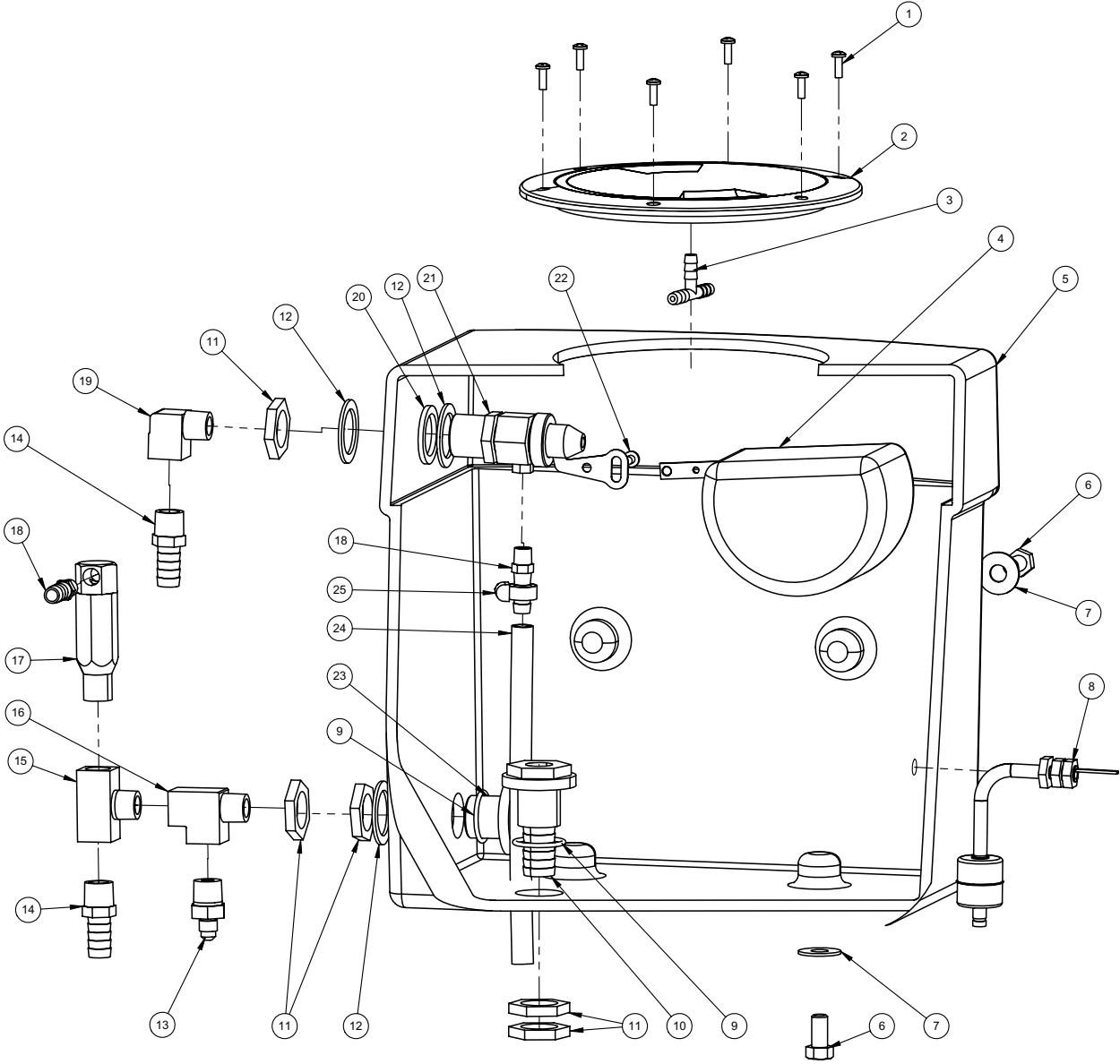


Silencer Assembly Parts List

Item	Part Number	Description	Qty
1	000-093-108	Silencer, Ø2.5" O.D. Inlet/Outlet	1
2	000-068-780	Hose, Ø2-1/2" I.D. Silicone	2
3	000-033-012	Clamp, Size #44 Hose	4

Figure 8-12 Water Box Assembly

D-7015 Rev. -



Water Box Assembly Parts List

Item	Part Number	Description	Qty
1	000-143-314	Screw, #8 x 1/2" Lg. Pan Head	6
2	000-041-005	Cover, 6"	1
3	000-052-156	Tee, 1/4" Plastic	1
4	000-005-007	Float, Water Box	1
5	000-159-107	Tank, Poly Water Box - Modified	1
6	000-143-017-1	Screw, 3/8"-16UNC x 3/4" Lg. Hex Head	3
7	000-174-032	Washer, 3/8" Flat	3
8	000-157-0801	Switch, With Protector	1
9	000-097-041	O-Ring, 1/2" Bulk Head	2
10	000-052-661	Insert, 3/4" Barb x Straight	1
11	000-094-097	Nut, 1-14" Brass	5
12	000-174-063	Washer, 1.5" O.D. x 1.073" I.D. x 0.075" Thk.	3
13	000-052-662	Nipple, 3/8" NPT x 1/4" M SAE	1
14	000-052-105	Insert, #68 (3/8" NPT x 1/2" Barb)	2
15	000-052-447	Tee, 3/8" Male Branch	1
16	000-052-023	Tee, 3/8" NPT Male Street	1
17	000-169-027	Valve, 165° F Thermal	1
18	000-052-099	Insert, #26 (1/8" NPT x 3/8" Barb)	2
19	000-052-086	Elbow, 3/8" NPT Street	1
20	000-057-052	Gasket, 1" Garden Hose	1
21	000-169-167	Valve, Mechanical - Incoming Water	1
22	000-143-336	Screw, #10-32UNF x 0.25" Lg. Phillips Head	1
23	000-052-660	Bulkhead, 3/8" FPT x 3/8" FPT	1
24	000-068-326	Hose, 3/8" I.D. Clear w/ Braid	1
25	000-033-003	Clamp, Size #4 Mini Hose	1

Figure 8-13 Dash Assembly - Front
D-7018 Rev. -

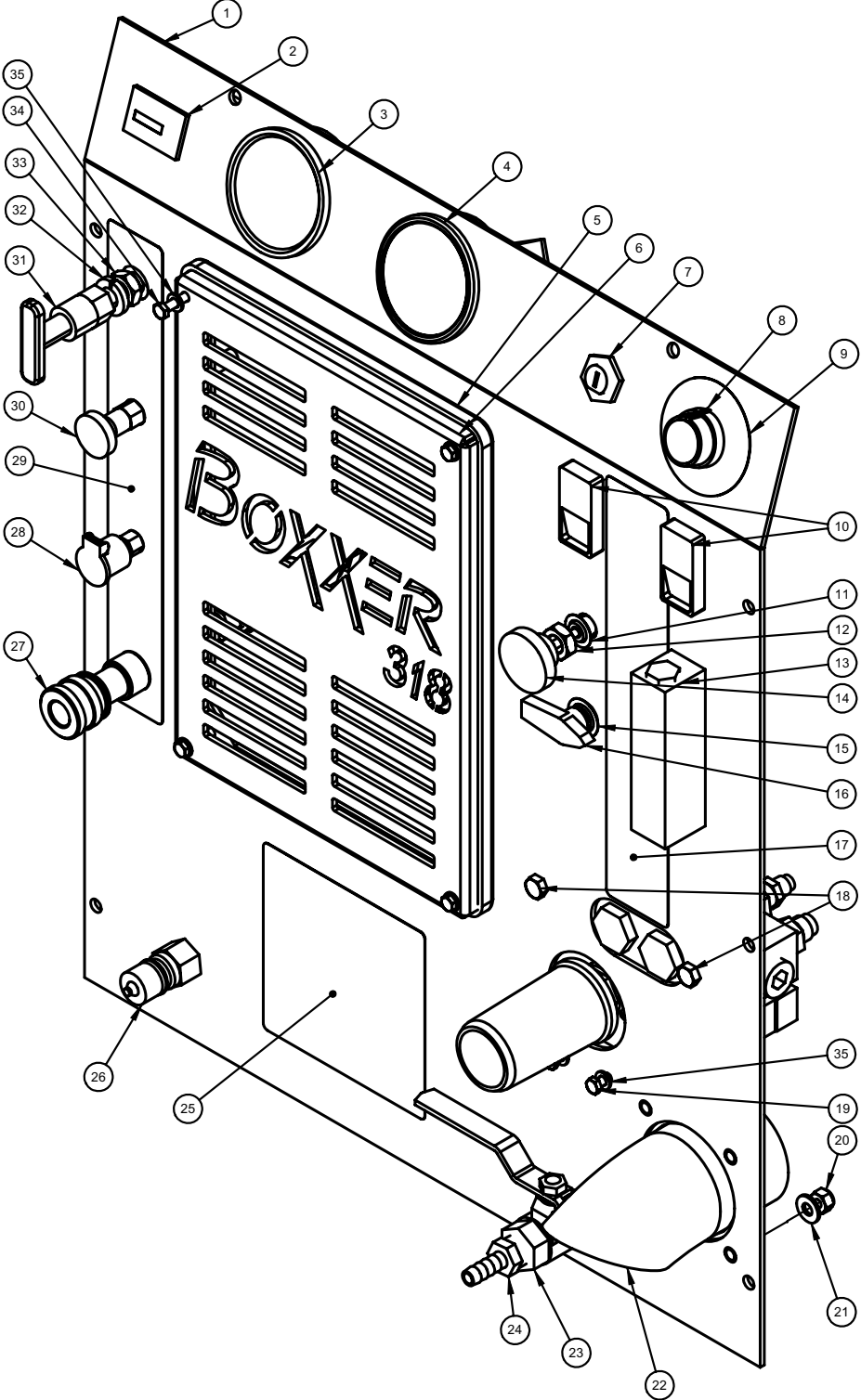
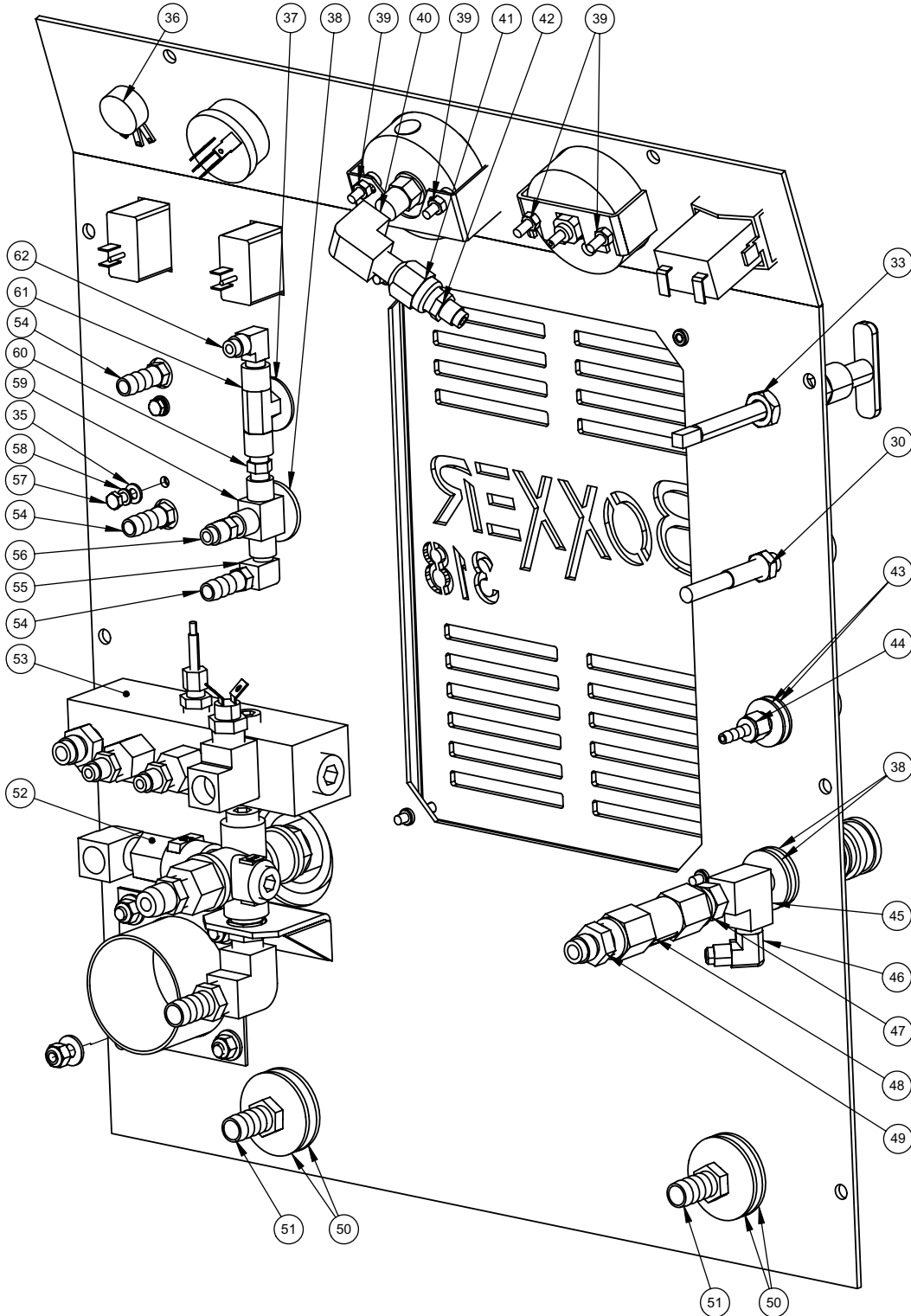


Figure 8-14 Dash Assembly - Back

D-7018 Rev. -



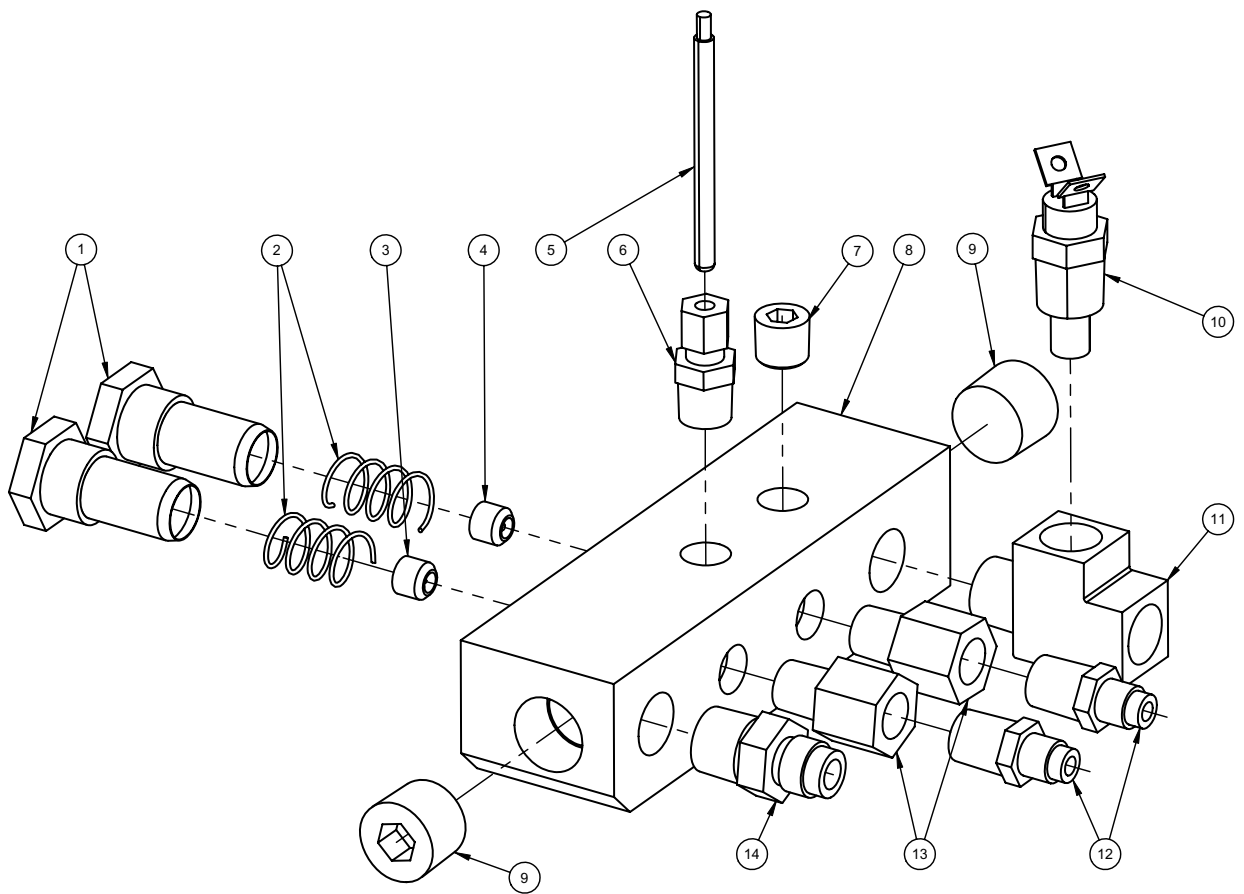
Dash Assembly Parts List

Item	Part Number	Description	Qty
1	000-100-169	Panel, Dash	1
2	000-074-018	Meter, Hour Rectangular w/o Bezel	1
3	000-074-017	Gauge, 30" Hg. Vacuum - Hydramaster	1
4	000-074-007	Gauge, Pressure 0 -1500 PSI	1
5	000-131-131	Trimlok, 3/8" x 1/8" Rubber	1
6	000-100-170	Panel, Grill	1
7	000-157-017	Switch, Ignition - B & S	1
8	000-061-056	Knob, Temperature Adjustment	1
9	000-081-039	Label, Temperature	1
10	000-157-040	Switch, 20 AMP Rocker	2
11	000-174-062	Washer, 1/2" ID x 3/4" OD x 0.010" Thk	1
12	000-094-098	Nut, 7/16-24UNF Jam	1
13	000-074-030	Meter, Chemical Flow Raw	1
14	- - -	Chemical Metering Valve - Knob Only	1
15	000-174-030	Washer, 5/8" Id x 7/8" Od x 0.010" Thk	1
16	000-169-0171	Knob, 3-Way Ball Valve	1
17	000-081-039	Label, Right Dash	1
18	000-143-542	Screw, 1/4"-28UNF x 0.50" Lg. Hh	2
19	000-143-126	Screw, #10-24UNC x 0.50" Lg.	2
20	000-094-009	Nut, 1/4"-20UNC Nylock	4
21	000-174-003	Washer, 1/4" Flat	4
22	000-001-148	Adapter, 2.5" Exhaust Turndown	1
23	000-169-064	Valve, 3/8" NPT Full Port Ball	1
24	000-052-104	Insert, #66 (3/8" NPT x 3/8" Barb)	1
25	000-081-039	Label, Dash Warning	1
26	000-052-052	Quick Connect, 660 3/8" Brass w/ Epdm O-Ring	1
27	000-052-051	Quick Connect, 440 Female w/ Epdm O-Ring	1
28	000-052-272	Cup, Gravity Feed Oil Blower Lube Port	1
29	000-081-039	Label, Left Dash	1
30	000-025-003	Cable, Choke With Detent	1
31	000-025-020	Cable, Throttle Locking	1

Dash Assembly Parts List

Item	Part Number	Description	Qty
32	000-174-022	Washer, 7/16" Lock	1
33	000-094-092	Nut, 7/16"-20UNF Hex Jam	2
34	000-143-171	Screw, #10-24UNC x 1-1/4" Hex Head	4
35	000-174-001	Washer, #10 Flat	8
36	000-149-560	Thermostat, Potentiometer	1
37	000-174-038	Washer, 7/16 SAE Flat	1
38	000-174-007	Washer, 1/2 Flat	3
39	000-094-070	Nut, 5mm Nylock	4
40	000-052-088	Elbow, 1/4" FPT x FPT	1
41	000-135-052	Regulator, Hi PSI Snubber	1
42	000-052-527	Nipple, 1/4" SAE x 1/4" NPT	1
43	000-174-032	Washer, 3/8" Flat	2
44	000-052-096	Insert, #F23 (1/8" FPT x 3/16" Barb)	1
45	000-052-090	Tee, 1/4" NPT Branch M-F-F	1
46	000-052-532	Elbow, 1/4" SAE x 1/4" NPT	1
47	000-052-073	Nipple, 3/8" NPT x 1/4" NPT Hex	1
48	000-169-186	Valve, 100 PSI - Last Step Chemical	1
49	000-052-528	Nipple, 3/8" M JIC x 3/8" NPT	1
50	000-174-008	Washer, 5/8" Flat	4
51	000-052-105	Insert, #68 (3/8" NPT x 1/2" Barb)	2
52	Fig. 8-16	Assembly, Bypass Valve	1
53	Fig. 8-15	Assembly, Hi PSI Manifold	1
54	000-052-099	Insert, #26 (1/8" NPT x 3/8" Barb)	3
55	000-052-084	Elbow, 1/8" NPT Street	1
56	000-052-530	Nipple, 1/4" SAE x 1/8" NPT	1
57	000-143-166	Screw, #10-24UNC x 3/8" Lg. Hex Head	2
58	000-174-014	Washer, #10 Lock	2
59	000-169-0171	Valve, 3-Way Ball O-Ring Style	1
60	000-052-069	Nipple, 1/8" NPT Hex	1
61	000-169-160	Chemical Metering Valve	1
62	000-052-531	Elbow, 1/4" SAE x 1/8" NPT	1

Figure 8-15 Hi-PSI Manifold Assembly
C-7019 Rev. A

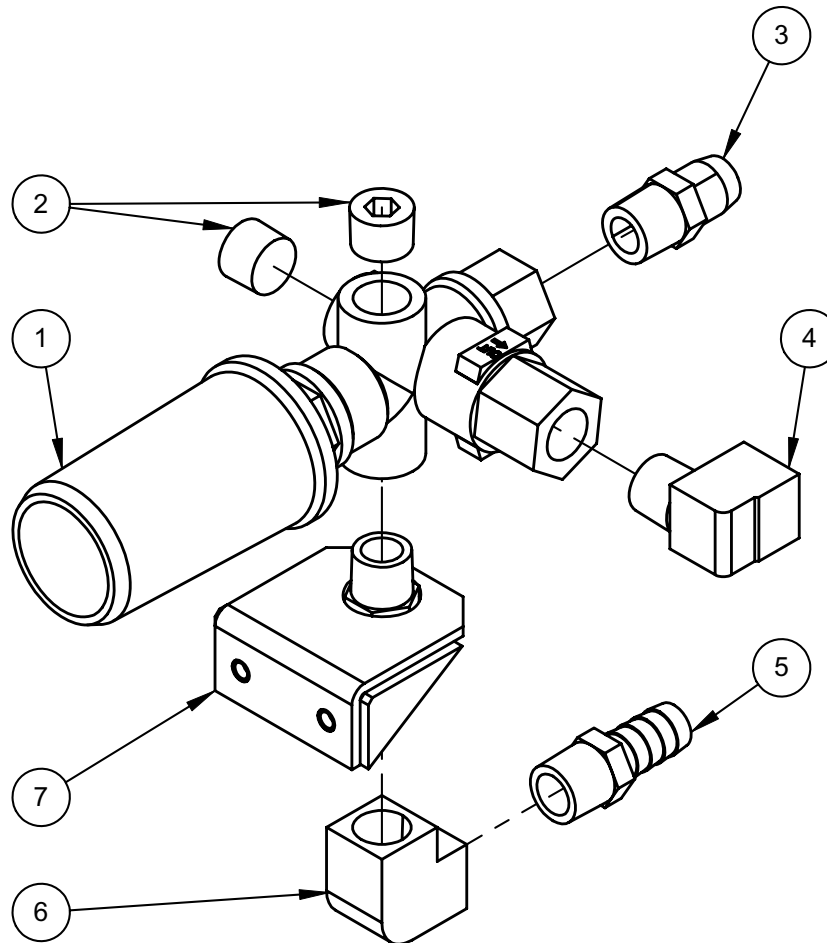


Hi-PSI Manifold Assembly Parts List

Item	Part Number	Description	Qty
1	000-049-016	Filter, 1/4" NPT Replacement "Y"	2
2	000-155-020	Spring, 0.540 O.D. x 0.041 Wire x 1.00 Lg.	2
3	000-180-004	Orifice, Set Screw 0.033"	1
4	000-180-006	Orifice, Set Screw 0.061"	1
5	000-149-540	Sensor, RTD Compression Fitting Style	1
6	000-052-587	Compression, 3/16" x 1/4" NPT Thermocouple	1
7	000-106-007	Plug, 1/4" NPT Allen Head	1
8	000-090-010	Manifold, Hi PSI	1
9	000-106-111	Plug, 1/2" NPT Allen Head	2
10	000-149-027	Sensor, 285°F Nason- 3/8" NPT	1
11	000-052-023	Tee, 3/8" NPT Male Street	1
12	000-052-527	Nipple, 1/4" SAE x 1/4" NPT	2
13	000-052-423	Bushing, Modified Set Screw Orifice	2
14	000-052-528	Nipple, 3/8" M JIC x 3/8" NPT	1

Figure 8-16 Bypass Valve Assembly

B-7078 Rev. -

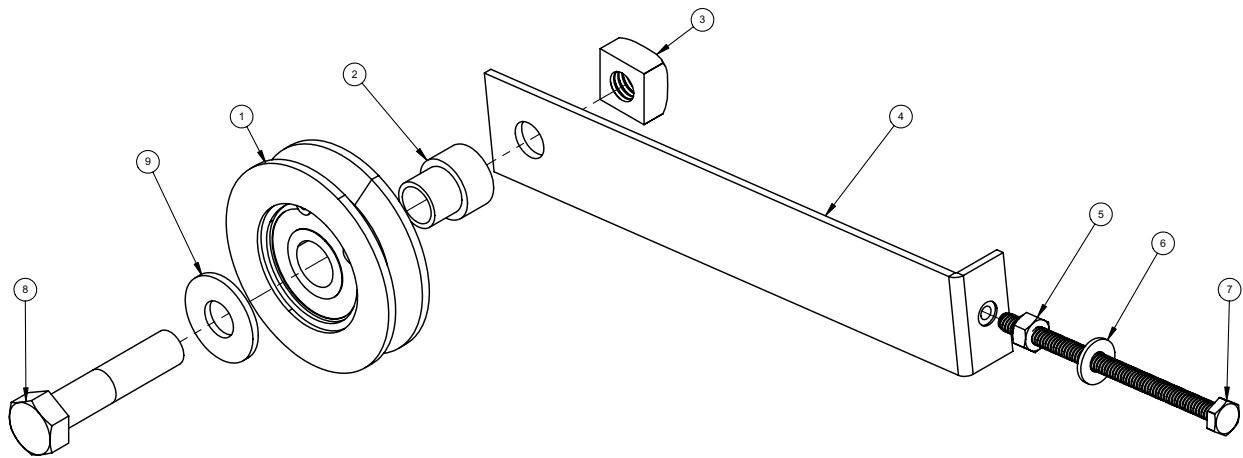


Bypass Valve Assembly Parts List

Item	Part Number	Description	Qty
1	000-169-188	Valve, PA Press Reg Mod.	1
2	000-106-008	Plug, 3/8" NPT Allen Head	2
3	000-052-128	Nipple, 3/8" NPT x 3/8" M Propane	1
4	000-052-086	Elbow, 3/8" NPT Street	1
5	000-052-105	Insert, #68 (3/8" NPT x 1/2" Barb)	1
6	000-052-142	Elbow, 3/8" F x F Brass	1
7	000-015-515	Bracket, Bypass Valve Mounting	1

Figure 8-17 Idler Pulley Assembly

B-7080 Rev. -

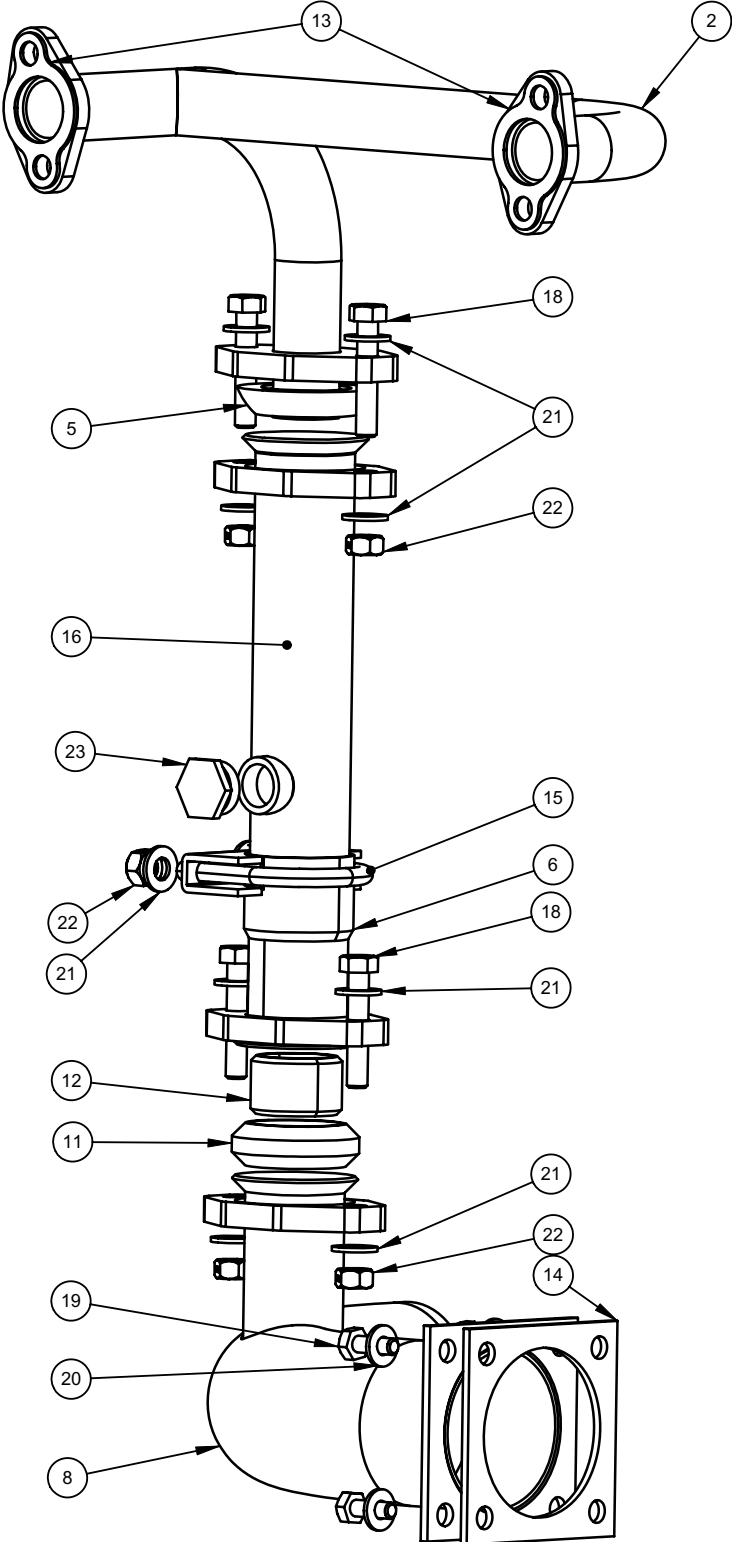


Idler Pulley Assembly Parts List

Item	Part Number	Description	Qty
1	000-109-093	Pulley, 3" O.D.x 1.85" Bore	1
2	000-154-049	Spacer, Pump Idler	1
3	000-094-119	Nut, 1/2-13UNC Zinc Plated Square	1
4	000-015-942	Bracket, Idler Tension	1
5	000-094-009	Nut, 1/4"-20UNC Nylock s/s	1
6	000-174-003	Washer, 1/4" Flat	1
7	000-143-376	Screw, 1/4"-20UNC x 4" Lg. s/s - Full Thread	1
8	000-143-041	Screw, 1/2"-13UNC x 2-1/4" Lg. Hex Head	1
9	000-174-012	Washer, 1/2 SAE H/D	1

Figure 8-18 Exhaust Assembly

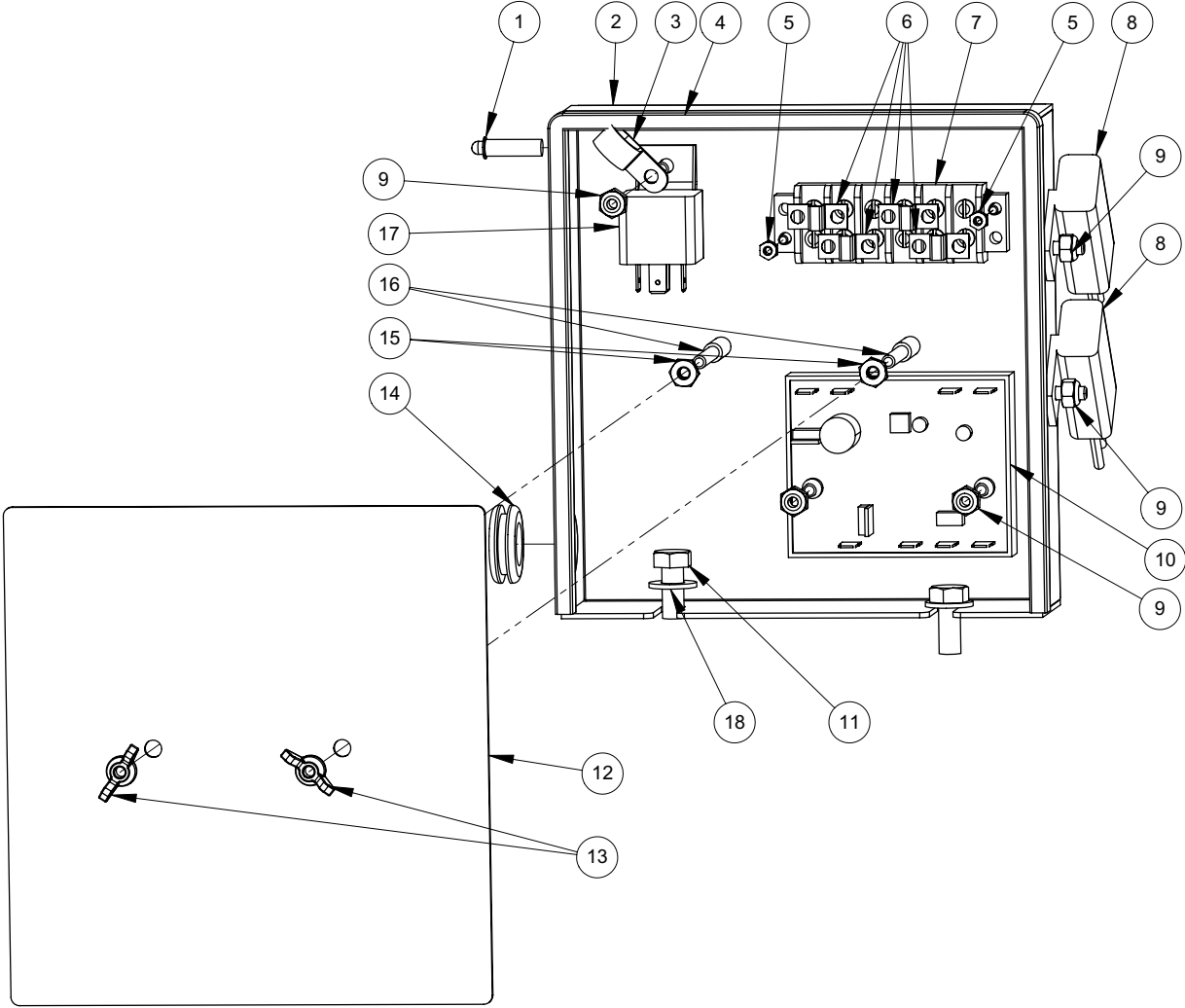
C-7079 Rev. -



Exhaust Assembly Parts List

Item	Part Number	Description	Qty
1	000-057-010	Gasket, Exhaust Manifold - Vanguard	2
2	000-125-228	Tube, Upper Exhaust Weldment	1
3	000-143-124	Screw, 5/16"-18UNC x 1.75" Lg. Hex Head	4
4	000-174-049	Washer, 5/16" Flat	10
5	000-094-081	Nut, 5/16"-18UNC Hex 2 Way Locking	6
6	000-033-068	Clamp, 1-1/2" Exhaust	1
7	000-001-116	Adapter, Exhaust Flange To 1.5" F Slip	1
8	000-057-209	Gasket, Ø2.5" x 3.5" BCD	1
9	000-125-227	Tube, Lower Exhaust Weldment	1
10	000-174-003	Washer, 1/4" Flat	4
11	000-143-001	Screw, 1/4"-20UNC x 0.75" Lg. Hex Head	4
12	000-057-177	Gasket, Exhaust Donut 1.50"	1
13	000-125-128	Tube, 1-3/8" OD x 1/8" Wall x 7/8" Lg.	1
14	000-106-120	Plug, M18 x 1.5	1
15	000-125-096	Tube, 1.5" OD Exhaust w/ Port	1
16	000-057-212	Gasket, Half Donut	1

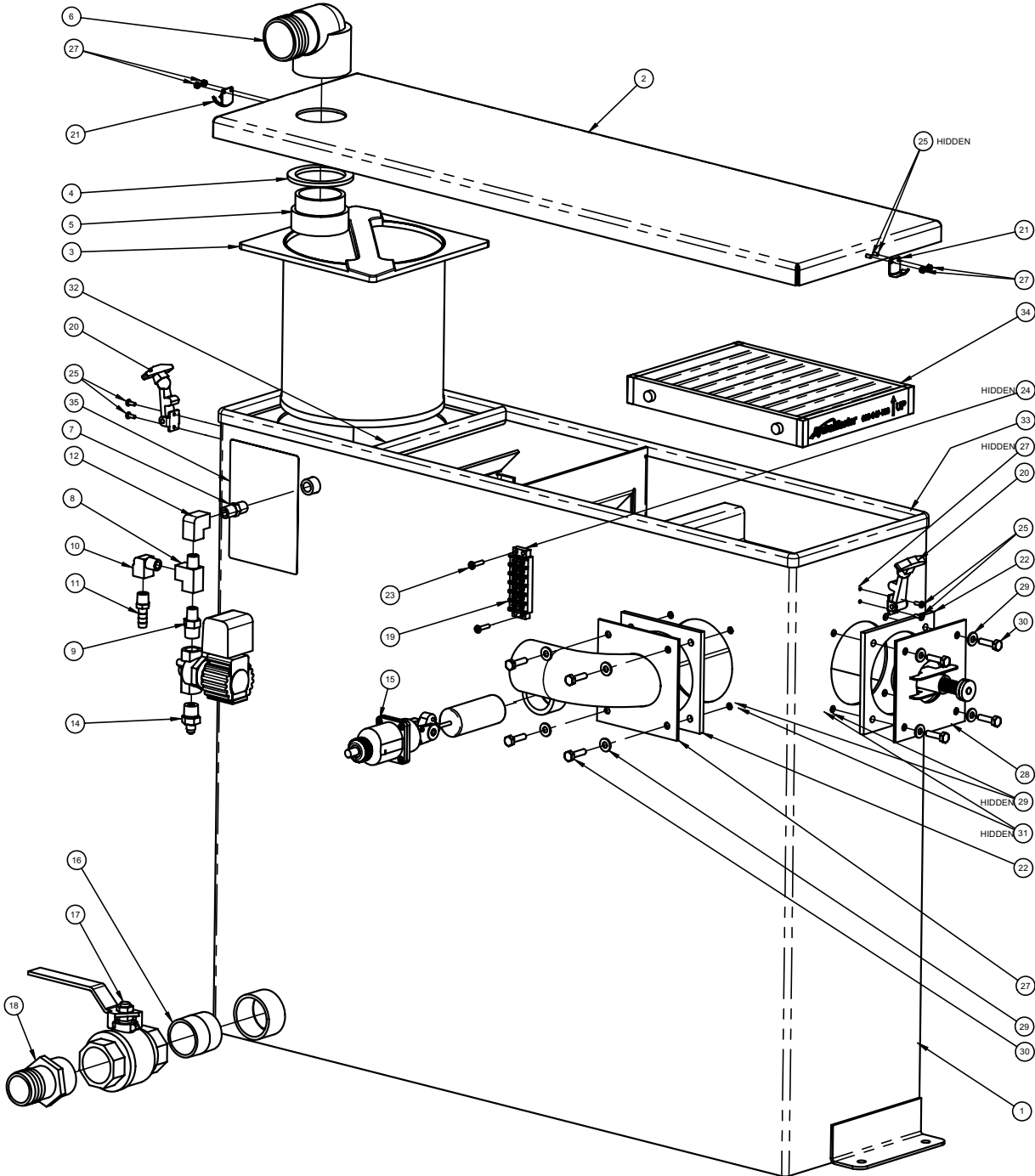
Figure 8-19 Electrical Panel Assembly
C-7020 Rev. A



Electrical Panel Assembly Parts List

Item	Part Number	Description	Qty
1	000-084-010	Light, Green LED Indicator Mini	1
2	000-100-171	Panel, Electrical - 7" x 7.25"	1
3	000-033-022	Clamp, 1/2" Nylon Hose	1
4	000-131-131	Trimlok, 3/8" x 1/8"	1
5	000-094-063	Nut, #6-32UNC Nylock s/s	2
6	000-037-011	Connector, "Jumper" Terminal Block	4
7	000-012-002	Block, 6 Post Terminal	1
8	000-056-006	Fuse Holder, In-Line - Weatherproof	2
9	000-094-034	Nut, #10-24UNC Nylock s/s	5
10	000-074-125	Controller, Temp Single Analog Input - RTD	1
11	000-143-012	Screw, 5/16"-18UNC x 3/4" Lg.	2
12	000-041-460	Cover, Electrical Panel	1
13	000-094-108	Nut, #10-32UNF Wing	2
14	000-060-002	Grommet, Large Wiring	1
15	000-094-058	Nut, #10-32UNF - Nylock	2
16	000-156-030	Stud, #10-32UNF x 2" Lg. s/s	2
17	000-157-022	Switch, Relay	1
18	000-174-049	Washer, 5/16" Flat	2

Figure 8-20 50 Gallon Universal Recovery Tank Assembly
D-7230 Rev. A



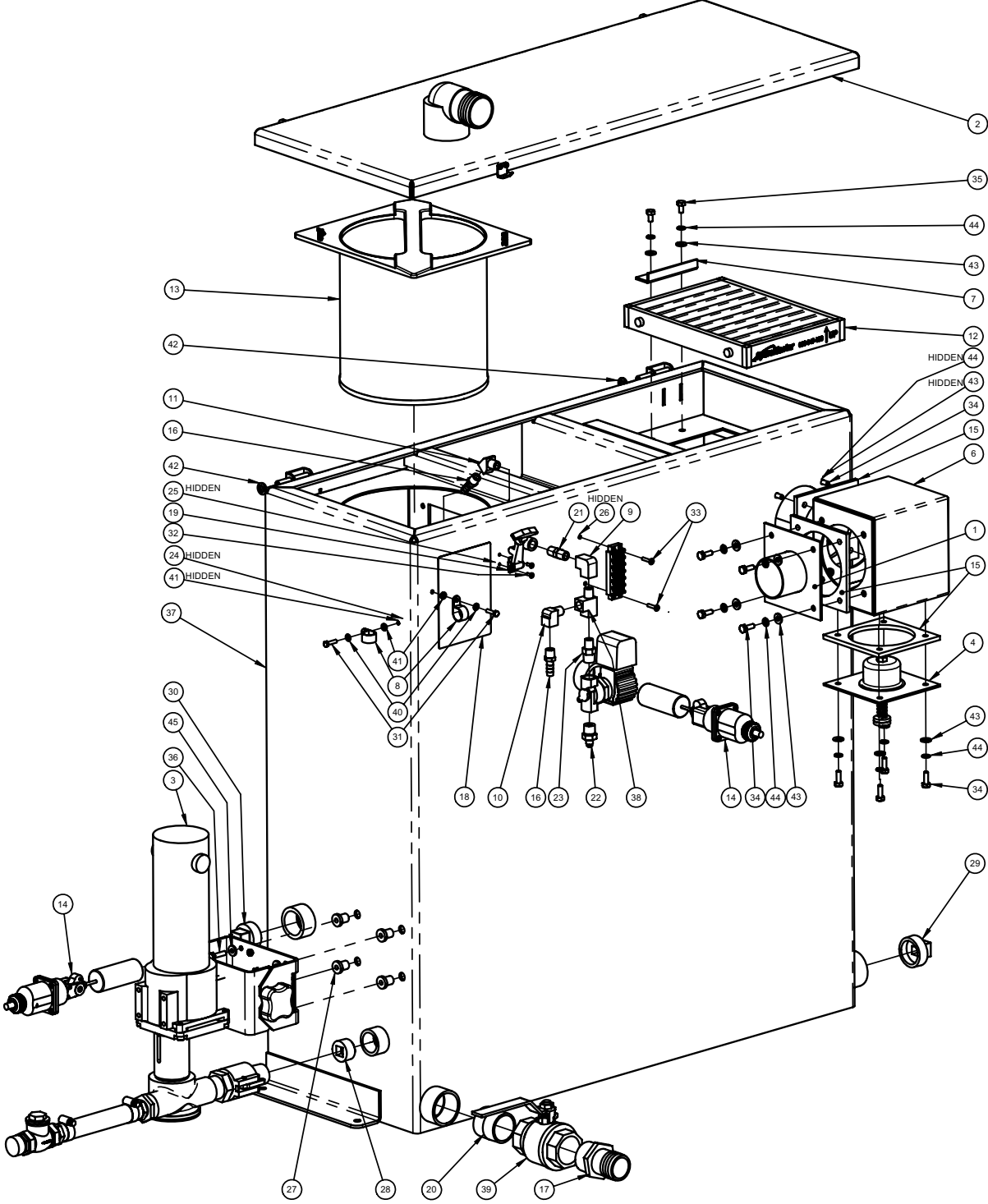
50 Gallon Universal Recovery Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-159-132	Tank, 50 Gallon Universal Recovery	1
2	000-041-459	Cover, Recovery Tank - Weldment	1
3	000-049-155	Basket, Filter - Small	1
4	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	1
5	000-052-219	Adapter, 2" NPT x 2" F Slip	1
6	000-052-222	Elbow, 2" Barb x 2" FPT	1
7	000-052-071	Nipple, 1/4" NPT Hex	1
8	000-052-090	Tee, 1/4" NPT Branch M-F-F	1
9	000-052-073	Nipple, 3/8" NPT x 1/4" NPT Hex	1
10	000-052-085	Elbow, 1/4" NPT Street	1
11	000-052-102	Insert, #46 (1/4" NPT x 3/8" Barb)	1
12	000-052-088	Elbow, 1/4" FPT x FPT	1
13	000-169-082	Valve, 12 Volt Solenoid 1200 PSI	1
14	000-052-662	Nipple, 3/8" NPT x 1/4" M SAE	1
15	000-157-090	Float, Lever Switch	1
16	000-052-763	Nipple, 1-1/2" IPS Close s/s	1
17	000-169-022	Valve, 1-1/2" Full Port Ball	1
18	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	1
19	000-012-002	Block, 6 Post Terminal	1
20	000-086-008	Latch, Bungie - Strike	2
21	000-086-008	Latch, Bungie - Catch	2
22	000-057-206	Gasket, Adpater - URT	2
23	000-143-051	Screw, #8-32UNC x 3/4" Lg. Binder Head	2
24	000-094-059	Nut, #8-32UNC Nylock	2
25	000-143-165	Screw, #6-32UNC x 3/8" Lg. Button Head	8
27	000-001-134	Adapter, Tank To Ø2.5" x 90° Blower Hose	1
27	000-094-063	Nut, #6-32UNC Nylock s/s	8
28	Fig. 8-23	Assembly, Vacuum Relief Valve - URT	1
29	000-174-003	Washer, 1/4" Flat	16
30	000-143-002	Screw, 1/4"-20UNC x 1.00" Lg. Hex Head	8

50 Gallon Universal Recovery Tank Assembly Parts List

Item	Part Number	Description	Qty
31	000-094-009	Nut, 1/4"-20UNC Nylock	8
32	000-131-021	Trimlok, 5/8" x 1/8"	1
33	000-131-021	Trimlok, 5/8" x 1/8"	1
34	000-049-153	Filter, Flat - Universal Recovery Tank	1
35	000-081-039	Label, Maintenance & Lube Schedule	1

Figure 8-21 70 Gallon Universal Recovery Tank Assembly
D-7067 Rev. A



70 Gallon Universal Recovery Tank Assembly Parts List

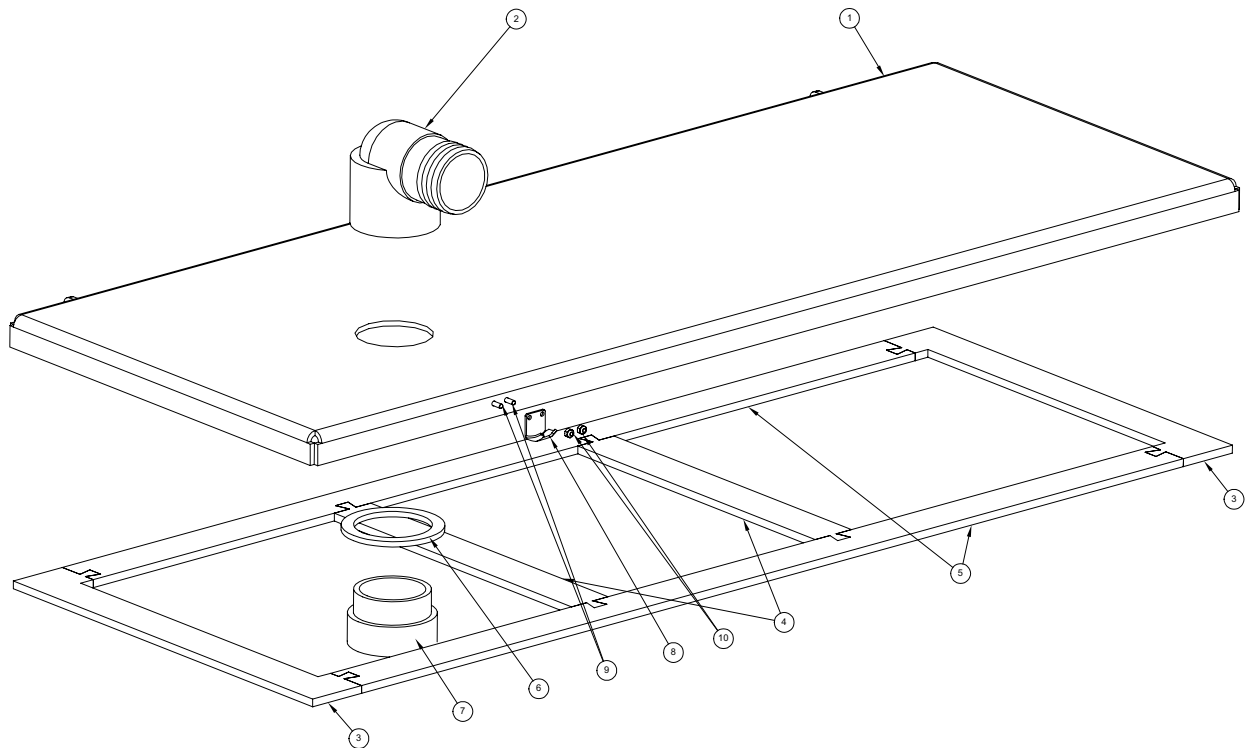
Item	Part Number	Description	Qty
1	000-001-131	Adapter, Tank To Ø2.50" Blower Hose	1
2	Fig. 8-22	Assembly, Cover - Single Vacuum	1
3	Fig. 8-24	Assembly, Dura-Flow APO - Production	1
4	Fig. 8-23	Assembly, Vacuum Relief Valve - URT	1
5	000-012-002	Block, 6 Post Terminal	1
6	000-013-070	Box, Vacuum Relief Valve Box - URT	1
7	000-015-932	Bracket, Flat Filter Securing	1
8	000-033-023	Clamp, 3/4" Nylon Hose	2
9	000-052-088	Elbow, 1/4" FPT x FPT	1
10	000-052-085	Elbow, 1/4" NPT Street	1
11	000-052-082	Elbow, 1/4" NPT Street x 45°	1
12	000-049-153	Filter, Flat - Universal Recovery Tank	1
13	000-049-152	Filter, Recovery Tank Basket	1
14	000-157-090	Float, Lever Switch	2
15	000-057-206	Gasket, Adpater - URT	3
16	000-052-102	Insert, #46 (1/4" NPT x 3/8" Barb)	2
17	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	1
18	000-081-039	Label, Maintenance & Lube Schedule	1
19	000-086-008	Latch, Bungie - Strike	1
20	000-052-763	Nipple, 1-1/2" IPS Close s/s	1
21	000-052-071	Nipple, 1/4" NPT Hex	1
22	000-052-662	Nipple, 3/8" NPT x 1/4" M SAE	1
23	000-052-073	Nipple, 3/8" NPT x 1/4" NPT Hex	1
24	000-094-034	Nut, #10-24UNC Nylock s/s	2
25	000-094-063	Nut, #6-32UNC Nylock s/s	2
26	000-094-059	Nut, #8-32UNC Nylock s/s	2
27	000-094-113	Nut, 1/4"20UNC Neoprene Wellnut	4
28	000-106-049	Plug, 1" NPT Allen Head	1
29	000-106-019	Plug, 1-1/2" NPT	1
30	000-106-046	Plug, 1-1/4" NPT	1

70 Gallon Universal Recovery Tank Assembly Parts List

Item	Part Number	Description	Qty
31	000-143-132	Screw, #10-24UNC x 0.75" Lg. Hex Head	2
32	000-143-165	Screw, #6-32UNC x 3/8" Lg. Button Head	2
33	000-143-051	Screw, #8-32UNC x 3/4" Lg. Binder Head	2
34	000-143-001	Screw, 1/4"-20UNC x 0.75" Lg. Hex Head	12
35	000-143-333	Screw, 1/4"-20UNC x 0.50" Lg. Hex Head	2
36	000-143-002	Screw, 1/4"-20UNC x 1.00" Lg. Hex Head	4
37	000-159-128	Tank, 70 Gallon Urt - Weldment	1
38	000-052-090	Tee, 1/4" NPT Branch M-F-F	1
39	000-169-022	Valve, 1-1/2" Full Port Ball	1
40	000-174-001	Washer, #10 Flat	2
41	000-174-036	Washer, #10 Flat Rubber Backed	4
42	000-174-029	Washer, 3/8" Rubber Backed	2
43	000-174-003	Washer, 1/4" Flat	14
44	000-174-019	Washer, 1/4" Lock	14
45	000-174-060	Washer, 1/4" Rubber Backed	4
46	000-169-082	Valve, 12 Volt Solenoid 1200 PSI	1

Figure 8-22 Cover, 70 Gallon Universal Recovery Tank Assembly

D-6891 Rev. A

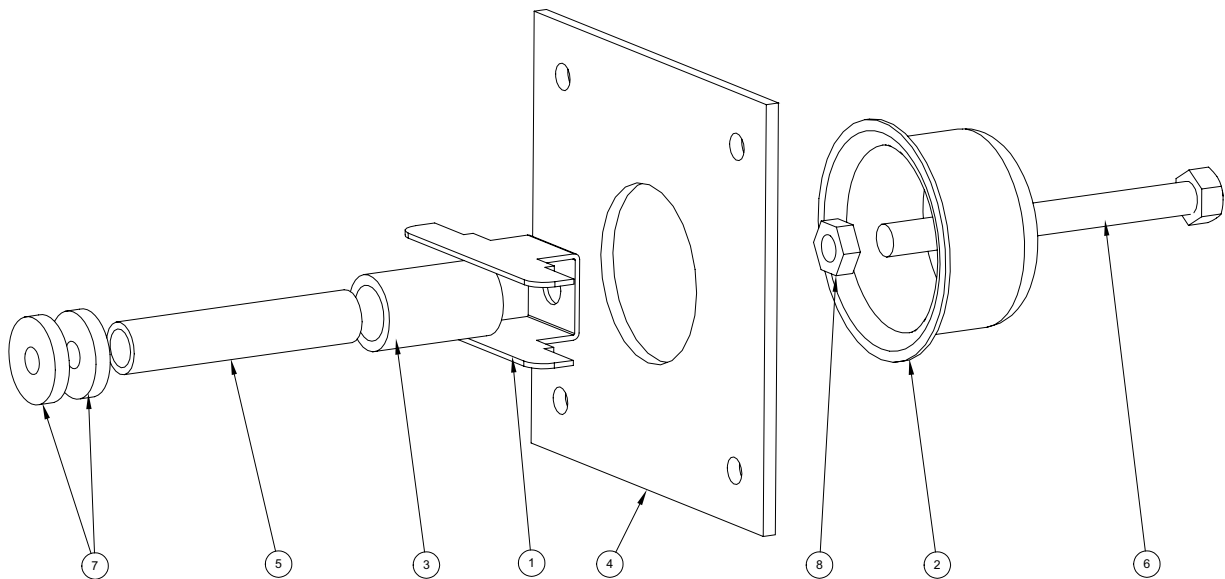


Cover, 70 Gallon Universal Recovery Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-443	Cover, Single Vac. 70 Gallon Universal Recovery Tank - Wel	1
2	000-052-222	Elbow, 2" Barb x 2" FPT	1
3	000-057-202	Gasket, End - Recovery Tank	2
4	000-057-203	Gasket, Middle - Recovery Tank	2
5	000-057-204	Gasket, Middle - Recovery Tank - 70 Gallon	2
6	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	1
7	000-052-219	Adapter, 2" NPT x 2" F Slip	1
8	000-086-008	Latch, Bungie - Strike	1
9	000-143-539	Screw, #6-32UNC x 0.50" Lg. Button Head Allen	2
10	000-094-063	Nut, #6-32UNC Nylock	2

Figure 8-23 Vacuum Relief Valve Assembly

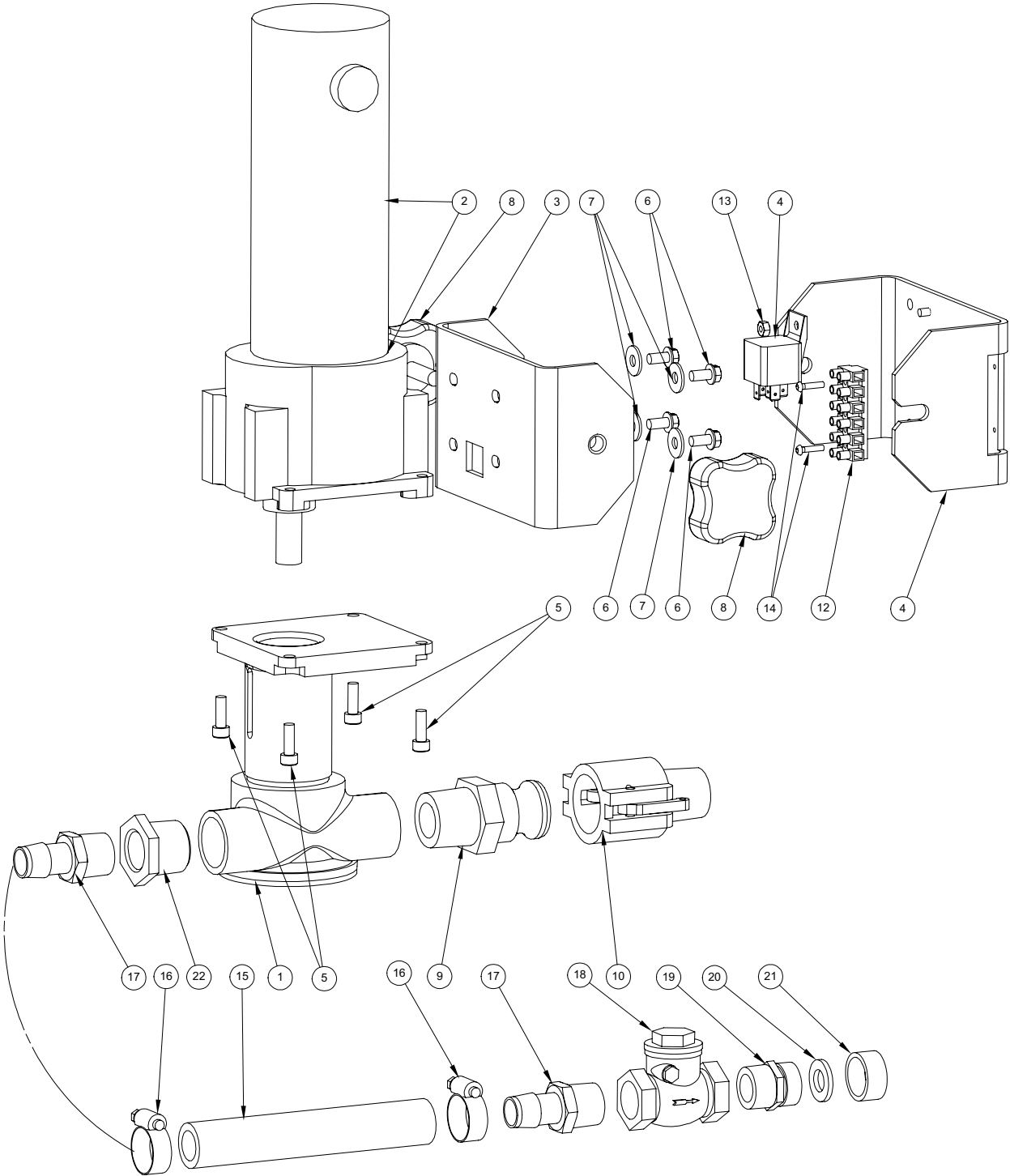
C-6894 Rev. -



Vacuum Relief Valve Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-182	Bracket, Vacuum Relief Valve	1
2	000-027-032	Cap, Vacuum RelEIF Valve	1
3	000-125-111	Pipe, Vacuum Relief Spring Guide	1
4	000-105-332	Plate, Vacuum Relief Valve Mounting - Universal Recovery T	1
5	000-155-026	Spring, Vacuum Relief	1
6	000-143-198	Screw, 3/8"-16UNC x 4" Lg. Hex Head Full Thread	1
7	000-094-077	Nut, 3/8"-16UNC x 1.00" O.D. Knurled	2
8	000-094-101	Nut, 3/8"-16UNC Hex Jam	1

Figure 8-24 Dura-Flow APO Assembly
D-5654 Rev. E



Dura-Flow APO Assembly Parts List

Item	Part Number	Description	Qty
1	000-111-169	Assembly, APO Pump - Jabsco	1
2	000-091-042	Motor, Bison 438 Series	1
3	000-015-891	Bracket, APO Clamp	1
4	000-015-890	Bracket, Tank Mounted APO Support	1
5	000-143-566	Screw, 1/4-28UNF x 0.75" Lg. Socket Head	4
6	000-143-074	Screw, 1/4"-20UNC x 0.50" Lg. Hex Head Self-Tapping	4
7	000-174-002	Washer, 1/4" Flat	4
8	000-061-131	Knob, Handle - RDM	2
9	000-052-723	Fitting, 1" NPT Cam Lock - Banjo 100F	1
10	000-052-724	Fitting, 1" NPT Cam Lock - Banjo 100B	1
11	000-157-022	Switch, Relay	1
12	000-012-011	Block, 6 Post	1
13	000-094-027	Nut, #10-24UNC Hex	1
14	000-143-532	Screw, #6-32UNC x 5/8" Lg. Socket Head	2
15	000-068-069	Hose, 3/4" I.D. Weatherhead - Blue - Bulk.	1
16	000-033-026	Clamp, Size #10 Hose	2
17	000-052-338	Insert, #1212 (3/4" NPT x 3/4" Barb)	2
18	000-169-009	Valve, 3/4" FPT Swing Check	1
19	000-052-281	Nipple, 3/4" NPT x 3/4" Male Garden Hose	1
20	000-057-055	Gasket, Garden Hose	1
21	000-027-014	Cap, Garden Hose	1
22	000-052-425	Bushing, 1" NPT x 3/4" FPT	1

Machine Hose Routings

Manufactured Hoses (Crimped Ends)			
Part No.	Description	Hose Routing	
		From	To
068-587	3/8" X 17.5" Lg. - Throb	High Pressure Pump	Bypass Valve
068-518	3/16" X 18.25" Lg. Teflon (JIC Ends)	High Pressure Pump	Pressure Gauge
068-070	3/8" X 12" Lg. Teflon (JIC & MNPT Ends)	Bypass Valve	Heat Ex. Inlet
068-070	3/8" X 12" Lg. Teflon (JIC & MNPT Ends)	Heat Ex. Outlet	Manifold
068-517	3/16" X 23" Lg. Teflon (JIC Ends)	Chemical Pump	Chem. Selector Valve
068-517	3/16" X 23" Lg. Teflon (JIC Ends)	Chem. Selector Valve	Solution Out Elbow
068-723	3/16" X 75" Lg. Teflon (JIC Ends)	Secondary Orifice	Dump Solenoid
068-626	3/8" x 28.5" Lg. Teflon (JIC Ends)	Manifold	Solution Out Check Valve
068-627	3/16" X 44" Lg. Teflon (JIC Ends)	Primary Orifice	Water Box

Cut-to-Length Hoses (Clamps on Ends)			
Part No.	Description	Hose Routing	
		From	To
068-018	1/2" Rubber - 67" Lg.	Inlet on Dash	Water Box
068-069	3/4" Parker GST II - 50" Lg.	Water Box	High Pressure Pump
068-086	1/2" Hi-Temp Rubber - 7" Lg.	Plastic Wye	Drain Valve
068-086	1/2" Hi-Temp Rubber - 6" Lg.	Bypass Valve	Plastic Wye
068-086	1/2" Hi-Temp Rubber - 37" Lg.	Plastic Wye	Water Box
068-085	3/8" Hi-Temp Rubber - 33" Lg.	Chem. Selector Valve	Brass Tee
068-085	3/8" Hi-Temp Rubber - 8.5" Lg.	Water Box	Brass Tee
068-085	3/8" Hi-Temp Rubber - 72" Lg.	Brass Tee	Insert on Recovery Tank
068-326	3/8" Clear w/ Braid - 28.5" Lg.	Chemical Meter	Chemical Pump
068-326	3/8" Clear w/ Braid - 60" Lg.	Chemical Jug	Chemical Meter
068-030	5/32" Rubber Vacuum - 54" Lg.	Vacuum Gauge	Elbow on Blower
068-030	5/32" Rubber Vacuum - 45" Lg.	Blower Lube Port	Elbow on Blower

9 - How to Order Parts

This section describes how to obtain a proper diagnosis of any malfunctions, and how to order warranty replacement parts or repairs as outlined in the following areas:

- Warranty Parts Orders
- Parts Orders
- Emergencies
- One Final Note

WARRANTY PARTS ORDERS

1. Call the local distributor where you purchased your equipment and ask for the Service Department.
2. Have the following information ready:
 - A. Equipment Model
 - B. Date of Purchase
 - C. Hours on the Unit
 - D. Unit Serial Number
 - E. Description of Malfunction
3. Once it has been determined which parts are needed to correct the problem with your truck mount, make arrangements with your distributor to either perform the repairs or ship the parts to you.

PARTS ORDERS

Call your local distributor. In most instances, they either stock or have access to parts through a regional service center.

EMERGENCIES

If, for any reason, your distributor is unable to supply you with the necessary parts, they may call us and arrange for expedited shipping.

HydraMaster sells parts only through authorized distributors and service centers.

ONE FINAL NOTE

Any questions you have regarding the warranty program should be directed to the:

HydraMaster Customer Service Department
(425) 775-7275,
7 a.m. to 5 p.m.
Monday through Friday (PST).

We shall always endeavor to be fair in our evaluation of your warranty claim, and shall provide you with a complete analysis of our findings.

HydraMaster warranty covers only defective materials and/or workmanship for the periods listed. **Labor and/or diagnostic reimbursement is specifically excluded.**

10 - Warranty Information

This section lists causes of component failure that specifically void warranty coverage to avoid misunderstandings which might occur between truck mount owners and manufacturer. Such causes as listed in this section shall constitute **abuse** or **neglect**.

The following areas are covered in this section:

- Blower
- High Pressure Water Pump
- Vacuum Tank
- Chemical System
- Control Panel
- Vacuum and Solution Hoses
- Cleaning Wand
- Water Heating System
- Hard Water Deposits
- Warranty Procedure

BLOWER:

- Failure to lubricate the impellers daily with an oil based lubricant.
- Failure to lubricate the bearings as recommended in the blower manual.
- Failure to maintain the proper oil levels in the blower.
- Failure to use the correct oil grade and viscosity as recommended in the blower manual.
- Failure to properly maintain blower safeguard systems such as waste tank filter screen, vacuum safety relief valve and waste tank automatic shut-off system.
- Allowing foam to pass through the blower.

HIGH PRESSURE WATER PUMP:

- Failure to maintain the proper oil level as recommended in the pump manual.
- Failure to change the oil in the pump at recommended intervals.
- Failure to protect the pump against freezing.
- Failure to maintain the pump protection shut-off system.
- Failure to use water softener in hard water areas.
- Use of improper chemicals.

VACUUM TANK:

- Failure to properly maintain the filtering devices in the tank.
- Failure to clean the tank as recommended by manufacturer.
- Failure to maintain the vacuum safety release in the tank.
- Use of improper chemicals.

CHEMICAL SYSTEM:

- Use of improper chemicals.
- Failure to use water softener in hard water area.
- Operating truck mount without a proper chemical filter screen.
- Failure to protect against freezing.

CONTROL PANEL:

- Failure to protect flowmeter and water pressure gauge against freezing.

VACUUM AND SOLUTION HOSES:

- Failure to protect the hoses against freezing.
- Failure to protect the hoses against burns from the engine and blower exhaust.
- Damage to the hoses from being run over by vehicles.
- Kinking or cracking from failure to store or unroll the hoses correctly.
- Normal wear and tear from everyday use.

CLEANING WAND:

- Failure to protect against freezing.
- Obvious physical abuse of the wand.

WATER HEATING SYSTEM:

- Over-pressurization of the system (recommended maximum working pressure-1,000 PSI).
- Failure to protect against freezing.

HARD WATER DEPOSITS:

- Failure to use or maintain a water softening system or a properly installed magnetic-type de-scaler, whichever might be necessary, with truck mount's operating in designated "Hard Water Areas" (3.0 grains or more per gallon).

WARRANTY PROCEDURE

Warranty coverage is available to you through *your local distributor*.

If you have moved to a new area or have purchased a used machine and need information regarding your local distributor, call HydraMaster at (425) 775-7275 or email us at custsvc@hydramaster.com.

When calling your distributor, be sure to have the machine's information (model and serial number) ready for the service representative.

IMPORTANT: HydraMaster's warranty policy provides replacement parts without charge for thirty (30) days to distributors maintaining current account status. An invoice will be sent to the distributor for the amount of the parts sent. The customer's faulty parts **must be** returned for evaluation prior to the expiration of the thirty (30) day period. Upon warranty approval, a credit will be issued the distributor for the replacement parts invoice. **Warranty disapproval or failure to return the faulty parts within the thirty (30) day period allowed will result in the customer being charged for the replacement parts sent.**

Accessories

This section of the Owner's Manual is devoted to accessories and detergents which we have found to be helpful and useful. These products can enhance your cleaning and reduce your labor costs!

Genuine HydraMaster Accessories & Detergents

HydraMaster truck mount accessories are the most innovative collection available in the cleaning industry. Our patented **RX-20™ Rotary Extractors** have changed the shape of steam cleaning. Our hoses and tanks are of the finest quality construction.

HydraMaster chemicals have been specially prepared, not only to give you exceptional cleaning, but also to optimize your truck mount's operation and reliability. Most detergents don't work well under the high heat, high pressure conditions of truck mount use. SafeClean will maintain your machines's water pump and water heating systems at peak efficiency and help ensure fewer breakdowns.

For more information, or to order
Genuine HydraMaster Accessories and Detergents
Call your nearest authorized HydraMaster Distributor.