



# Boxxer 318

## Owner's Manual

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**HydraMaster North America, Inc.**  
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# 1- General Information

The Boxxer™ 318 is a carefully engineered truckmount designed by HydraMaster Corporation.

The system utilizes an internal combustion engine to provide the power necessary to turn both a blower (also referred to as 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 blower and 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 truckmount. By following these guidelines carefully, you can expect years of reliable operation.

This section contains the following helpful information:

- Contact Information
- Warnings, Cautions, and Notices
- Responsibilities
- Machine Specifications
- Spare Parts Lists
- High Altitude Operation
- Local Water Precautions

## CONTACT INFORMATION

If you have any questions regarding the operation, maintenance or repair of this machine, please contact your local distributor.

To find a local distributor, please visit our website at <http://www.hydramaster.com/owners/locate/index.asp>.

If your question cannot be resolved by your distributor or by the information within this manual, you may contact HydraMaster Customer Service direct using the following phone numbers or e-mail addresses.

<u>Hours</u>	<u>Telephone Numbers</u>	<u>E-mail Addresses</u>
Monday-Friday	(425) 775-7275 Service	Tech Support: techsupport@hydramaster.com
7:00 a.m. to 5:00 p.m.	(425) 775-7276 Parts	Parts Support: partssupport@hydramaster.com
Pacific Standard Time	(800) 426-4225 Parts / Service FAX	

When calling your distributor, be sure to reference the serial number and the date of purchase.

### FOR YOUR REFERENCE:

**Serial Number:** \_\_\_\_\_

**Date of Purchase:** \_\_\_\_\_

**Purchased From (Distributor):** \_\_\_\_\_



## WARNINGS, CAUTIONS AND NOTICES

### **WARNING**

HydraMaster uses this WARNING symbol throughout the manual to warn of possible injury or death.

### **CAUTION**

This CAUTION symbol is used to warn of possible equipment damage.

### **NOTICE**

This NOTICE symbol indicates that federal or state regulatory laws may apply, and also emphasizes supplemental information.

## **⚠ WARNING**

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

## **⚠ WARNING**

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

## **⚠ WARNING**

The operation of this truckmount 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 truckmount 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 truckmount is in operation. Serious injury may result.

## **⚠ WARNING**

During the operation of the truckmount 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 truckmount 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 truckmount. Doing so will increase the risk of fire and explosion. Serious injury or death may result.

## **CAUTION**

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

## **CAUTION**

Never operate the truckmount 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 serious component or engine damage.

## **CAUTION**

Never perform cleaning operations when the truckmount 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 truckmount 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 truckmount water system or chemical system. Use of these products will cause serious component damage.

## **CAUTION**

Never operate the truckmount 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 truckmount water system. Scale build up causes serious component damage. Test all water prior to use and use water softening equipment if necessary.

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## CAUTION

Never allow water to freeze inside the truckmount. 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 truckmount, 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 truckmount. This is normally available from the installation dealer.

Prior to dropping your van off at the distributor for the truckmount to be installed, have a spray-on bed liner applied to the floor such as Rhino Lining® or Line-X®.

Prior to operating the truckmount 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 truckmount.

### **NOTICE**

Any modification of the truckmount may void the warranty.

### The Distributor's Responsibility

#### **Acceptance of Shipment**

Before accepting the truckmount, check the following:

- The truckmount should be free from any damage during shipping. Do not sign the delivery receipt until you have closely inspected the truckmount 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 truckmount, 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.
- Ensure proper connection of the fuel lines.
- Ensure 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 truckmount.
- Start and run the truckmount and check that all systems function properly.
- Test all hoses, wands, etc. for correct operation.
- Ensure 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 truckmount's systems function.
- All safety precautions and their importance.
- How to correctly start and shut down the truckmount.
- How to correctly clean with the truckmount.
- 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 truckmount.
- 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 truckmount's warranty and warranty procedures.

## MACHINE SPECIFICATIONS

Overall Dimensions	24.0" W x 36" D x 31" H	
Weight	570 lbs.	
Engine- Briggs and Stratton Vanguard 18 HP	Oil Type	Synthetic 5W-30
	Capacity	Approx. 1 1/2 quarts (48 oz.) when changing oil and filter
	Engine rpm	3,150 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	3,150 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	1,750 rpm
Operating Pressure	0 - 1,000 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 Line- 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	
	Operation 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 and Drive Train Components		
000-106-016	Plug, Spark	2
000-049-049	Filter, Fuel	1
000-049-014	Filter, Oil	1
000-049-012	Filter, Air	1
000-010-125	Belt, 9440HD	1
000-152-011	Coupler Element	1
Electrical Components		
000-056-010	Fuse, 25A	2
000-157-040	Switch, 20 Amp Rocker	2
000-157-022	Switch, Relay, 12V	2
Hydraulic Components		
000-052-050	Quick Connect, 440 Male	2
000-052-051	Quick Connect, 440 Female	2
000-052-052	Quick Connect, 660 Male	1
000-052-053	Quick Connect, 660 Female	1
000-046-010	Diaphragm, Chemical Pump	1
000-169-186	Valve, 100 psi, Last Step Chemical	1
000-180-006	Orifice, 0.061 dia.	1
000-180-004	Orifice, 0.033 dia.	1
000-074-007	Gauge, High psi (0-1,500)	1
000-049-023	Screen, Garden Hose	1
000-078-273	Kit, By-Pass Valve Repair w/Tapered Handle	1
Miscellaneous		
000-087-006	HydraMaster-Recommended Spray Lubricant (part number is for a quantity of 1 can)	1 ea

## HIGH ALTITUDE OPERATION

Elevation plays a key role in how the truckmount 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 <http://vanguardengines.via.infonow.net/locator/>.

## LOCAL WATER PRECAUTIONS

The quality of water varies greatly. Many areas have an excess of minerals in the water which results in what is commonly called “hard water.” These minerals tend to adhere to the insides of heater coils and other parts of the machines causing damage and a loss of cleaning effectiveness. This influences the reliability and efficiency of equipment in direct proportion to the level of hardness.

### Hard Water Advisory

HydraMaster recognizes that any hard water deposits which might occur within the water system of our truckmounts is a serious problem. The precision technology of truckmount heat exchanger systems is intolerant of any foreign material. Hard water deposits will ultimately decrease the performance of the system and are expected to seriously lower the reliability of the machine.

To validate a machine’s warranty, HydraMaster requires that all machines operating in designated “Hard Water Areas” (3.0 grains or more per gallon) be fitted with a water softening system, or a properly installed magnetic-type descaler must be used and maintained. Periodic descaling or acid-rinsing alone is not adequate in these areas. HydraMaster does not recommend any particular type or brand; however, the relative effectiveness of some types of magnetic descalers or softeners may require additional periodic use of descaling agents.

HydraMaster also recommends, in the strongest possible terms, that machines in all areas be fitted with a water softening system for improved operation and reliability.

## **CAUTION**

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

### Hard Water Area Map

The hard water map, shown in Figure 1-1, defines hard water areas in the continental United States which compromise fluid related components such as hoses, fittings, heaters, pumps, valves and water-cooled engines. For other countries, hard water area maps can be obtained from geological societies.

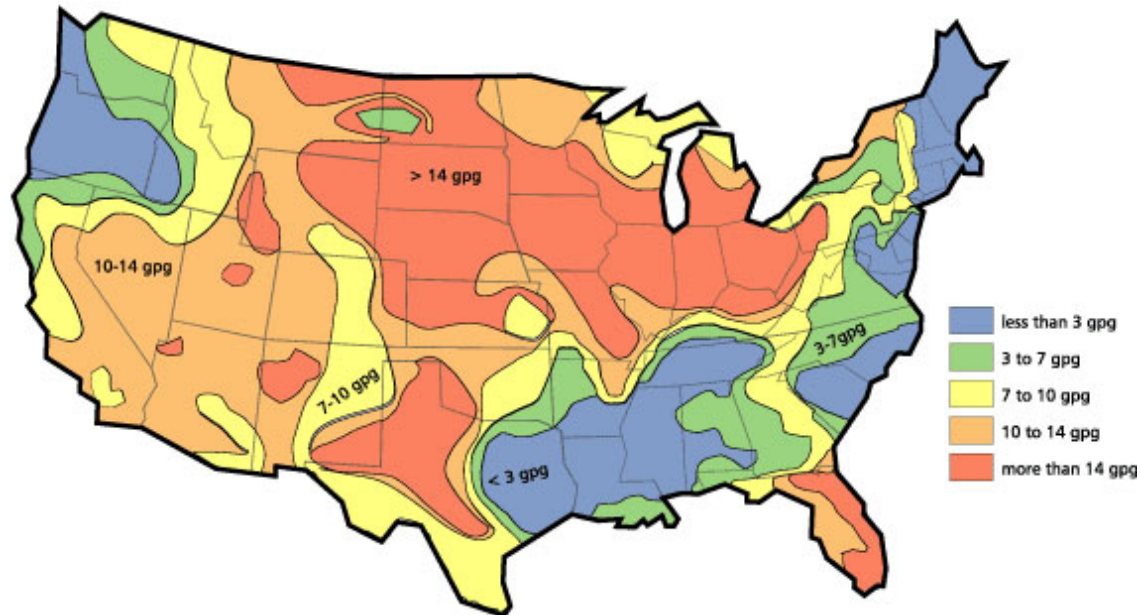


Figure 1-1. Hard Water Map of Mainland United States

## NOTICE

The map shown in Figure 1-1 is provided for general reference only. Water hardness in your geographical location should be confirmed by testing.

### Water Softener

Cleaning efficiency and equipment life is increased, chemical use decreased, and the appearance of cleaned carpets enhanced when water softeners are incorporated in hard water areas. HydraMaster strongly urges the use of water softener units with the Boxxer 318 in areas exceeding 3.0 grains per gallon.

Failure to use a water softener in these areas will invalidate the machine's warranty. Referring to the hard water area map shown Figure 1-1, determine the quality of water in your area and take immediate action if the water hardness exceeds 3.0 grains per gallon.

The relatively low cost of a water softener service is more than made up for by an increased life of machine parts, reduced chemical costs and continued cleaning efficiency. The water softener will also increase the effectiveness of the cleaning chemicals, therefore less chemical will be needed.

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Contact a water softener distributor in your area for information on the rental of a simple water treatment unit to carry in your truck. Be sure to charge the water softener in accordance with the capability of the softener.

For example: If the softener will treat 900 gallons of water and the machine uses an average of 30 gallons/hour, for an average of 5 hours a day, this equals 150 gallons per day). In 6 days the machine would use 900 gallons of water. Therefore, the softener would need to be charged every 6 working days for maximum softening.

## **Waste Water Disposal Advisory**

There are laws in most communities prohibiting the dumping of recovered “gray” water from carpet cleaning in any place but a sanitary treatment system.

The cleaning rinse water, recovered into your unit’s vacuum tank, contains materials such as detergents, and must be safely processed before entering streams, rivers and reservoirs.

In most cases, an acceptable method of waste water disposal is to discharge into a municipal sewage treatment system after first filtering out solid material such as carpet fiber. Access to the sanitary system can be obtained through a toilet, laundry drain, RV dump, etc. Permission should first be obtained from any concerned party or agency.

One disposal method which usually complies with the law is to accumulate the waste water and haul it to an appropriate dump site. Another solution to the disposal problem is to equip your Boxxer 318 with an Automatic Pump-Out System (APO). These systems are designed to remove waste water from the extractor’s recovery system and actively pump the water through hoses to a suitable disposal drain.

HydraMaster makes an APO System which can be ordered with new equipment or installed later.

When properly configured, the systems will continuously monitor the level of waste water and pump it out simultaneously with the cleaning operation. The hidden benefit of this process is that the technician does not have to stop his/her cleaning to empty the recovery tank.

## **NOTICE**

**IN ACCORDANCE WITH EPA, STATE AND LOCAL LAWS, DO NOT DISPOSE OF WASTE WATER INTO GUTTERS, STORM DRAINS, STREAMS, RESERVOIRS, ETC.**

The penalties for non-compliance can be serious. Always check local laws and regulations to be sure you are in compliance.

## 2 - Cleaning and Chemicals

Your HydraMaster truckmount 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
- Overwetting
- Streaking

### PRECAUTIONS

The use of some chemicals (such as concentrated acids and/or solvents) in your truckmount 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 truckmount.

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 truckmount. 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 truckmount.

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™**.

## **OVERWETTING**

Overwetting 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.

## CLEANING TOOL TIPS

### Wands

With a wand, keep cleaning strokes short, front to back, and run a “dry pass”.

After pulling the wand for a strip of 3 or 4 ft long with the solution trigger activated, go back up to the top of the stroke, and make a “dry “ pass [i.e. no solution flowing]. This gives the wand a second chance to pick up the solution on the carpet.

If you do not run a dry pass, the carpet can take longer to dry, and, possibly, the pad under the carpet can become saturated.

Be aware of the carpet seams; try to use strokes that are parallel with the seam. Avoid pulling the wand across the seam. Every stroke can peel the seam connection and pull the carpet off the floor.

Also, tilt the wand handle down [head up] to move the tool forward, and away from you, on the carpet. This means less pull on the carpet and less work for you.



# BOXER 318



The Evolution Wand is truly the next evolution in wand design and performance. The Aluminum tube and roto-molded head make it extremely lightweight which helps to reduce fatigue on the technician. The sealed Delrin® glides help the wand to be easily pushed across the carpet, and are tapered to keep a good seal on the fibers.

No other tool has made such a dramatic increase in soil removal and water recovery. The laminar airflow design of the Evolution wand has boosted the performance of some portable extractors from a bronze to a gold level of certification from the Carpet and Rug Institute's Seal of Approval Program for tested cleaning performance. The Evolution will change the way carpets are cleaned.



13"

◀ **1-1/2" Evolution Wand**  
Item #163-034

Only 6.5 lbs

1-1/2" Tube, 12" Head, 2 Jets



## **1 1/2" HydraHoe Carpet Cleaning Wand**

Glides over carpet without chattering!  
12" wide head increases production. High temperature, high pressure, stainless steel fabrication, stainless valve, quick coupler and assist handle.

**Item #163-020**

## **2" S-Bend Wand**

This 12" wide wand has two jets. It uses a 1 3/4" tube for improved airflow and comes with an expanded 2" vacuum hose connection.

**Item #163-104**

## **1 1/2" S-Bend Two Jet Wand**

This 12" wide S-Bend wand has two jets. It uses a 1 1/2" tube and glides over the carpet for easy operation.

**Item #100-011-106**

## **UT-14 Truckmount Stair Tool**

The best stair tool on the market today. This tough stainless steel hand tool is 14" long with 6" wide cleaning head and stainless steel valve with quick coupler, assist handle.

**Item #163-009**

## **UT-40 Utility Cleaning Tool**

An all purpose tool for cleaning carpeted divider panels, under restaurant booths, landings, stairs and hard to reach carpeted areas. All stainless construction, 9" wide head and 40" long shaft allows operator to "stand-up" when cleaning stairs.

**Item #163-008**

## **Rotary Tool: RX-20**

Rotary tools are easier to move on the carpet, but harder to control at first. With a rotary tool, remember to keep strokes short and side-to-side.

Before turning on the RX-20, adjust the handle; it should rest right below or even with the bottom of your pants' front pockets, with the tool resting flat on the floor. Take your time in adjusting the tool's height; make sure the head of the tool is flat with the floor while you are holding the handle. Relax your posture; the more difficult it is to hold the tool's head flat on the floor surface, the more quickly you will tire.

While the tool is running, control the left and right movements of the tool by tilting the head to the front and back, and lifting the handles up and pushing the handles down. The tool can be driven to the forward and backward by tilting the head of the unit to the left and right. The head must be turning to use the self driving feature of the tool, and only requires a slight bit of pressure to handles to get the head to move the tool across the floor.

As with the wand, drying times will be improved if you run a dry pass between wet passes. Hold down the solution trigger and move the unit left or right across the floor 3 or 4 ft, then immediately back across the same pass, without the solution flowing, to make the dry pass. Make the next pass half-overlapping the previous pass.

Use the RX-20 in very heavily trafficked areas or if it has been a long time since the carpet has been cleaned. Beware of the seam edges of carpets and transition edges between floor surfaces. Use extreme caution when cleaning these areas.

Sometimes it is necessary to use an edge tool or wand to run the perimeter of the room on in difficult-to-reach areas where the circular head of the rotary units will not reach.

**For Truckmount & Portable Carpet Cleaning Systems**

- Aggressive Restorative Extraction Tool for Residential and Commercial Jobs
- Clean Carpet, Tile, and Grout with the RX-20 HE Total Floor Care System
- Works great on stains and heavily soiled, matted carpet.
- For truckmounts or portable carpet cleaning systems
- Optional "tall man" handle
- Length 27", Height 45", Base Width 15", 88 lbs.





**GOLD**

The five vacuum heads and three spray jets rotate at 130 RPM creating 650 complete clearing passes per minute.

## **Upholstery Tool: DriMaster**

Use the upholstery tool on small rugs and furniture. When you clean rugs, be sure that the temperature and chemicals are safe for that particular type of rug.

As with the larger tools, do not leave the surface of the upholstery too wet. Adjust the volume of water on the tool without it touching any surface: the water should just barely come out of the tool before the vacuum pulls it back in. The water will only just spray the top layer of the furniture and the vacuum will pull the dirty water back into the tool.

If you find it necessary to do a dry pass, keep strokes short to limit the amount of water that comes into contact with the fabric surface.

***DriMaster Upholstery Tool cleans faster, drier and better...all with less operator fatigue.***

- Ergonomically designed
- High flow/low residual moisture - super cleaning shears away soil
- No heat loss from atomizing solution
- Never needs a dry pass
- No overwetting or overspray to clean up - solution does not reach foam backing
- Fabrics are left 50% drier than conventional upholstery tools
- Durable - virtually unbreakable
- Lightweight with comfortable handgrip
- No trigger valve for less hand strain
- Cool to the touch
- Low profile design fits in tight spots

Combine the high performance cleaning of the DriMaster Tool with optional Comfort Grip and HydraMaster's state-of-the-art cleaning chemistry, and you're ready to treat most cleanable fabrics with fantastic results!

**Grip  
Part #061-144**



**Upholstery Tool  
Part #163-012**



# 3 - System Operation

## START-UP PROCEDURE

1. Perform all daily and periodic maintenance as specified in Section 4 of this Owner's Manual.
2. Connect a garden hose to supply water to the truckmount. If used, turn the "PUMP-IN" switch to the "ON" position.

## NOTICE

The water box must be full prior to starting the truckmount.

3. Connect the cleaning tool to the length of hose required to perform the cleaning job.
4. Turn the key to "ON". Pull the choke and start the truckmount with the throttle cable fully depressed ("IDLE" position.)
5. After the engine starts, push the choke in and allow the truckmount 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.

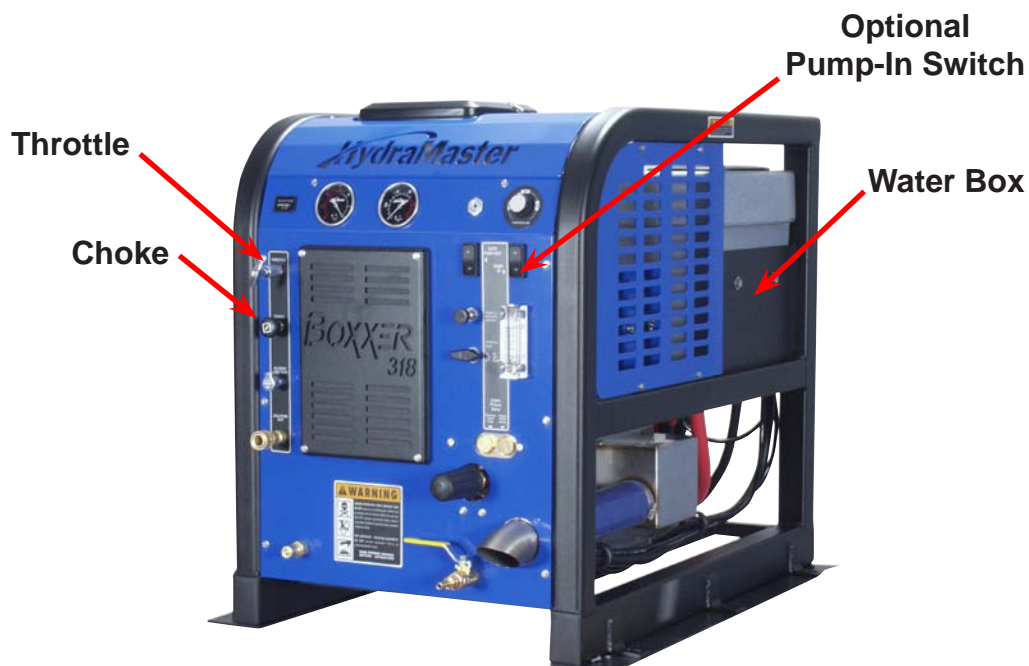


Figure 3-1. Location of Throttle, Choke, Optional Pump-In Switch and Water Box

# BOXXER 318

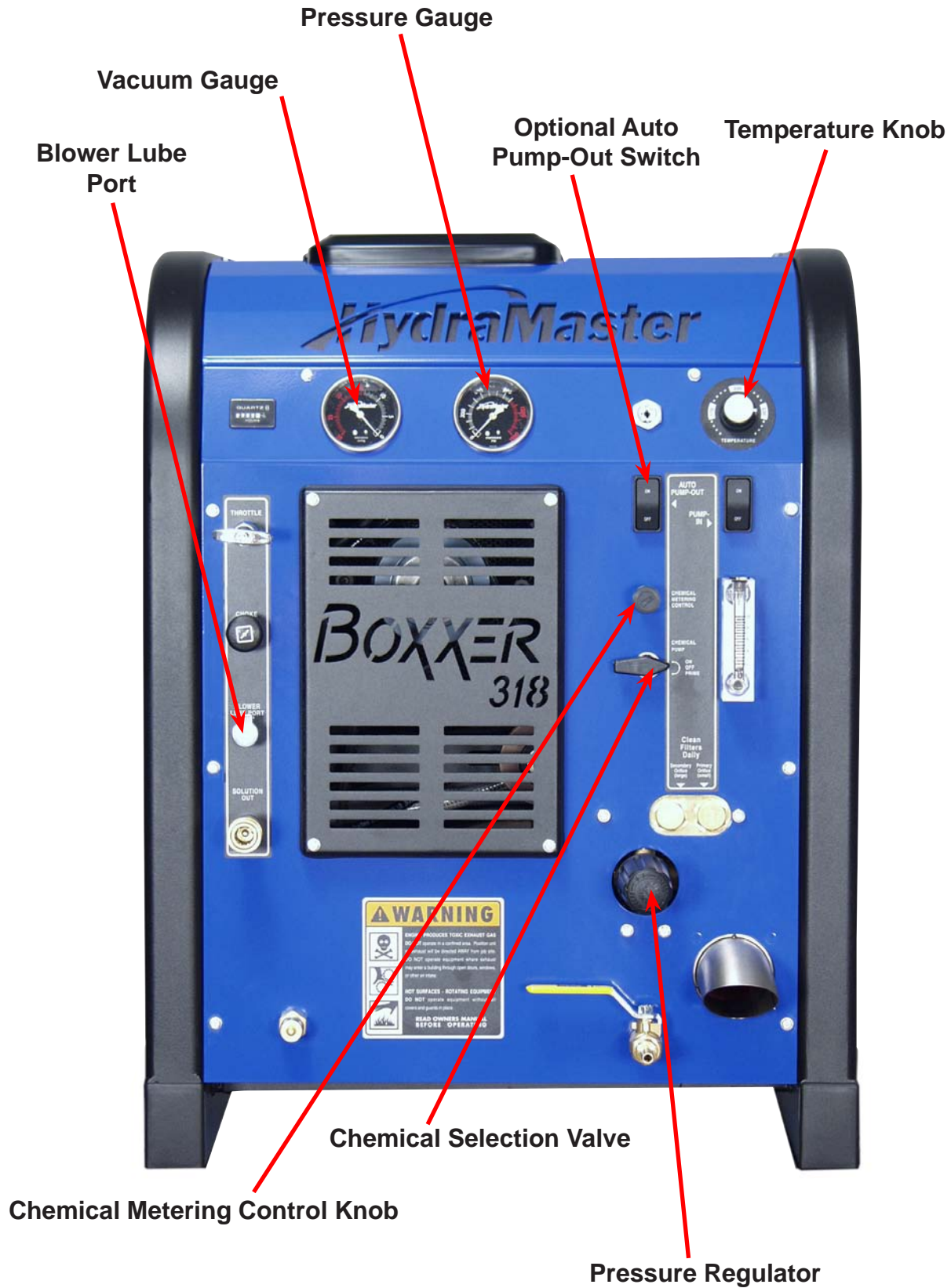


Figure 3-2. Front View of Boxxer 318 Console

9. Adjust the “PRESSURE REGULATOR” to the desired cleaning pressure level.
  - a. Suggested Settings:
    - Carpet Cleaning: 300 - 400 psi
    - Hard Surface Cleaning: 1,000 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 truckmount 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 truckmount 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 truckmount 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 truckmount, hoses and cleaning tool.
3. Remove the vacuum hose.
4. Lubricate the blower to prevent it from rusting internally.
  - a. Allow the unit to run for a few minutes with the vacuum hose disconnected in order to remove moisture from the blower.
  - b. Cap off the inlet(s) to the vacuum tank.
  - c. Spray a HydraMaster-recommended spray lubricant into the “BLOWER LUBE PORT” for about 5 to 10 seconds while the unit is running.
  - d. Uncap the inlet(s) and run the unit for another minute to allow the blower to cool down.
5. If freeze guarding is necessary perform the procedure at this time. See page 4-10, the Freeze Guarding section in this Owner’s Manual.
6. Return the engine throttle to the “IDLE” position.
7. Turn the key to “OFF.”
8. Drain the water box using the valve.
9. Drain the vacuum tank in an appropriate location.

## NOTICE

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 Section 4 of this 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 in the following paragraphs. 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 truckmount for convenience and to serve as a maintenance reminder.

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

- Operational Maintenance
- Overall Machine Maintenance
- High Pressure Pump Maintenance
- Vacuum System Maintenance
- Descaling 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 truckmount for water and oil leaks, loose electrical connections, etc. and repair as needed.
- Lubricate the blower with HydraMaster-recommended spray 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")

## **OVERALL MACHINE MAINTENANCE**

Maintenance, troubleshooting and repair are much easier tasks to accomplish on a clean truckmount. Regular cleaning of the truckmount offers the user an opportunity to visually inspect all facets of the truckmount 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 truckmount 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 truckmount 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 truckmount. See page 4-10 of this section for freeze guarding information.

### Service

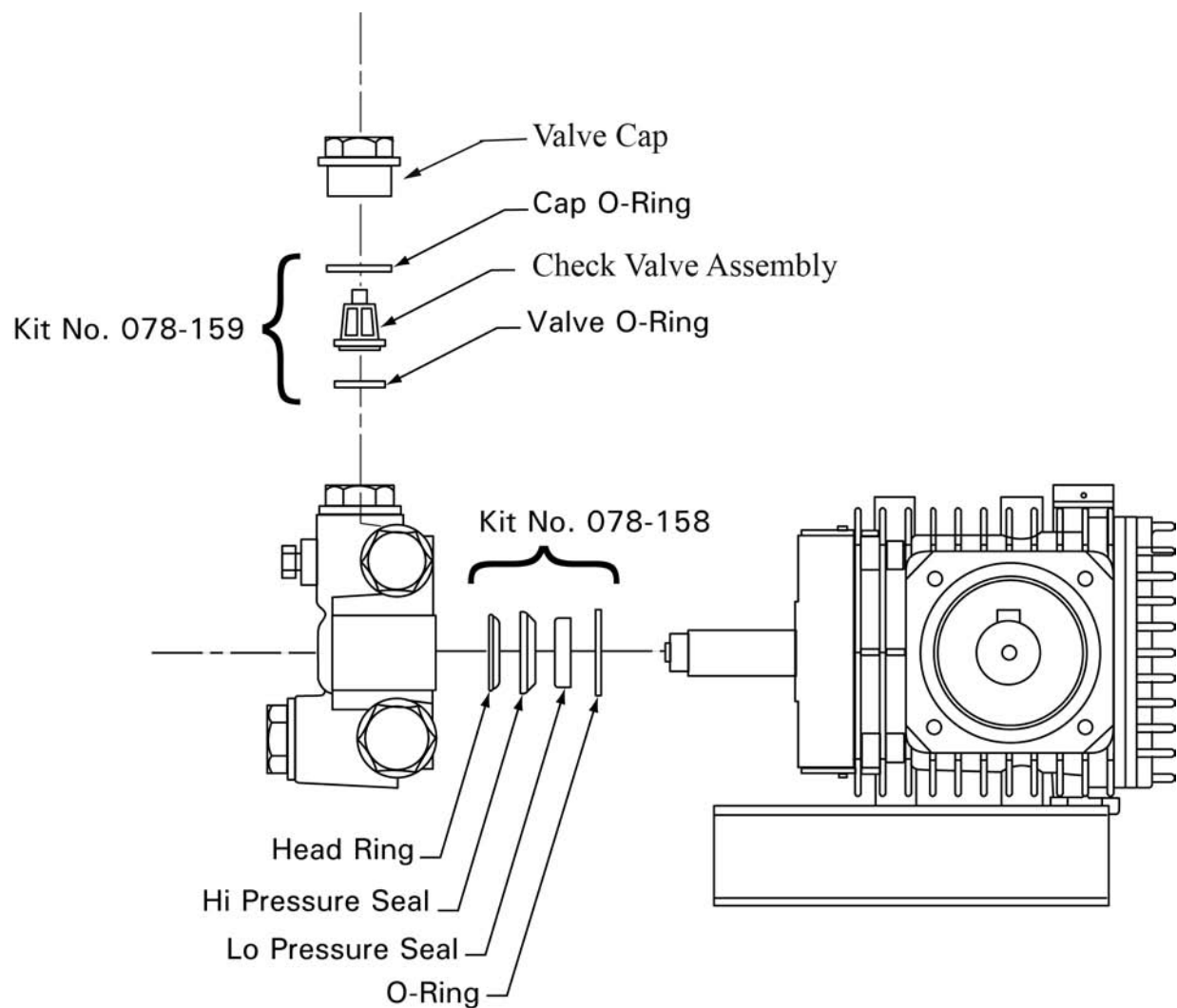
The next few pages explain how to disassemble and inspect all user serviceable parts of the pump.

### **CAUTION**

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

## Valve Maintenance (See Figure 4-1)

1. Using a 22-mm 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 and pitting, 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.



**Figure 4-1. Servicing the Valves**

# BOXXER 318

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. Re-install the manifold onto the pump as previously described.

## 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 Re-assembly

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 truckmount is greatly dependent on the care and proper maintenance it receives. Review the blower’s owner’s manual, which has been included, for a better understanding of this piece of machinery.

To protect the blower from overloading and damaging itself, a vacuum relief system is 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 truckmount 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 truckmount. 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 truckmount.

Lubricate the blower to prevent it from rusting internally by:

1. Allowing the unit to run for a few minutes with the vacuum hose disconnected in order to remove moisture from the blower.
2. Capping off the inlet(s) to the vacuum tank.
3. Spraying a HydraMaster-recommended spray lubricant into the “BLOWER LUBE PORT” for about 5 to 10 seconds while the unit is running.
4. Uncapping the inlet(s) and run the unit for another minute to allow the blower to cool down.

### Periodically

Change the oil in both ends of the blower after the initial 100 hours of use. Change the oil each 500 hours of use thereafter.



## DESCALING 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 descaling procedures are required will vary. If the area has particularly hard water, you may have to descale often.

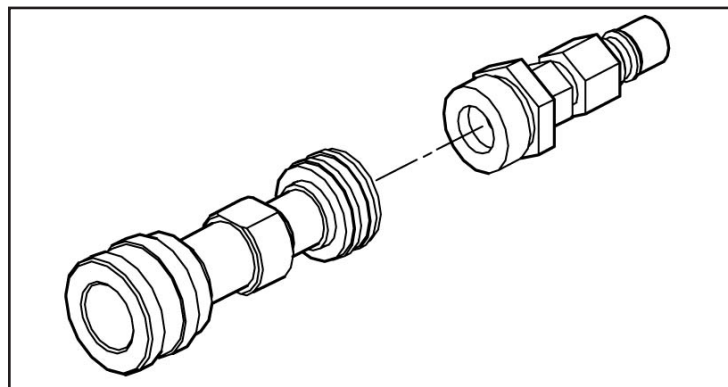
To descale the system, add an appropriate descaler chemical to the water box. Circulate it through the system. Let it stand. Flush and repeat as necessary. Clean all screens and strainers, and check them frequently following descaling.

### NOTICE

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

To descale using the recirculation kit (P/N 000-078-058), start with an empty water box.

1. 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.
2. 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 truckmount.
3. Attach one section of the solution hose to the outgoing solution fitting on the front of the truckmount and the other end to the garden hose and recirculation fitting combination that is attached to the front of the truckmount. Additional hoses may be attached inline if descaling of hoses is needed.
4. Start the truckmount and allow it to run for 3 - 5 minutes. Do not leave the TM DeScaler solution in the system. Flush the system with clean water and turn the truckmount OFF.



**Figure 4-2. Recirculation Fitting**

## **FREEZE GUARDING**

To avoid permanent damage to the truckmount, 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 truckmount turned off and the incoming water line disconnected, open the water box drain valve on the front of the truckmount. Allow the system to fully drain.
2. Add 2 gallons of 50/50 antifreeze and water mix to the water box.
3. 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.)
4. Start the truckmount and allow it to run for 2 to 3 minutes. This will distribute antifreeze solution throughout the truckmount.
5. 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.

### **NOTICE**

If using the recirculation kit, skip ahead to Step 8.

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

## NOTICE

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

## NOTICE

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 truckmount.
2. Attach the incoming water source to the front of the truckmount.
3. Start the truckmount.
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.

## NOTICE

The next time the truckmount is used it may take a few minutes before the water box begins to fill.

## TENSIONING THE PUMP DRIVE BELT

1. Remove the Boxxer 318 grill (P/N 000-100-170) to gain access to the idler pulley.
2. Loosen but **do not remove** the ½"-13 x 2 ¼" long bolt (P/N 000-143-041) on the idler pulley. See Figure 8-17.
3. Remove the right cover (P/N 000-041-452) of the machine to gain access to the tensioning screw.
4. Adjust the tension of the belt by turning the ¼"-20 x 4" long screw (P/N 000-143-376).
5. After the proper belt tension is achieved, tighten the ½" bolt on the idler pulley.

### CAUTION

Ensure there is no contact between idler assembly (including belt) and no other part of the truckmount. Contact between the parts could result in damage to the truckmount.

6. Replace the right cover and grill.

# 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 truckmount 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 recirculated 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.

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

The high pressure manifold houses both the temperature sensor for the heat control system and a high temperature shutdown switch. There is an orifice located in the manifold, referred to as a recirculation (or primary) orifice which 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 truckmount.

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 truckmount and is delivered to the cleaning tool.

Figure 5-1. Annotated Water, Chemical and Solution Flow Diagram - View 1 of 2  
7027 Rev. A

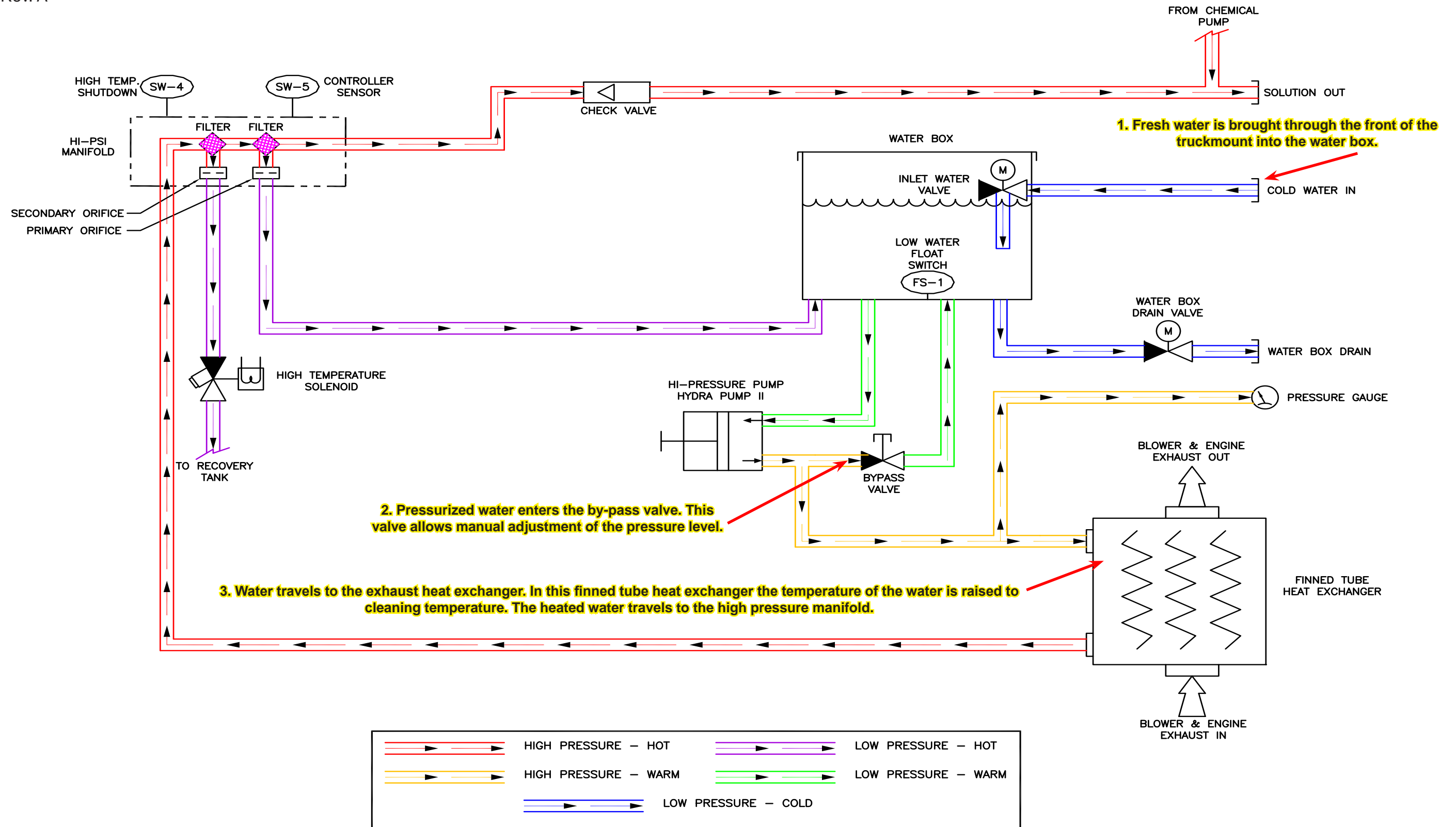


Figure 5-2. Annotated Water, Chemical and Solution Flow Diagram - View 1 of 2  
7027 Rev. A

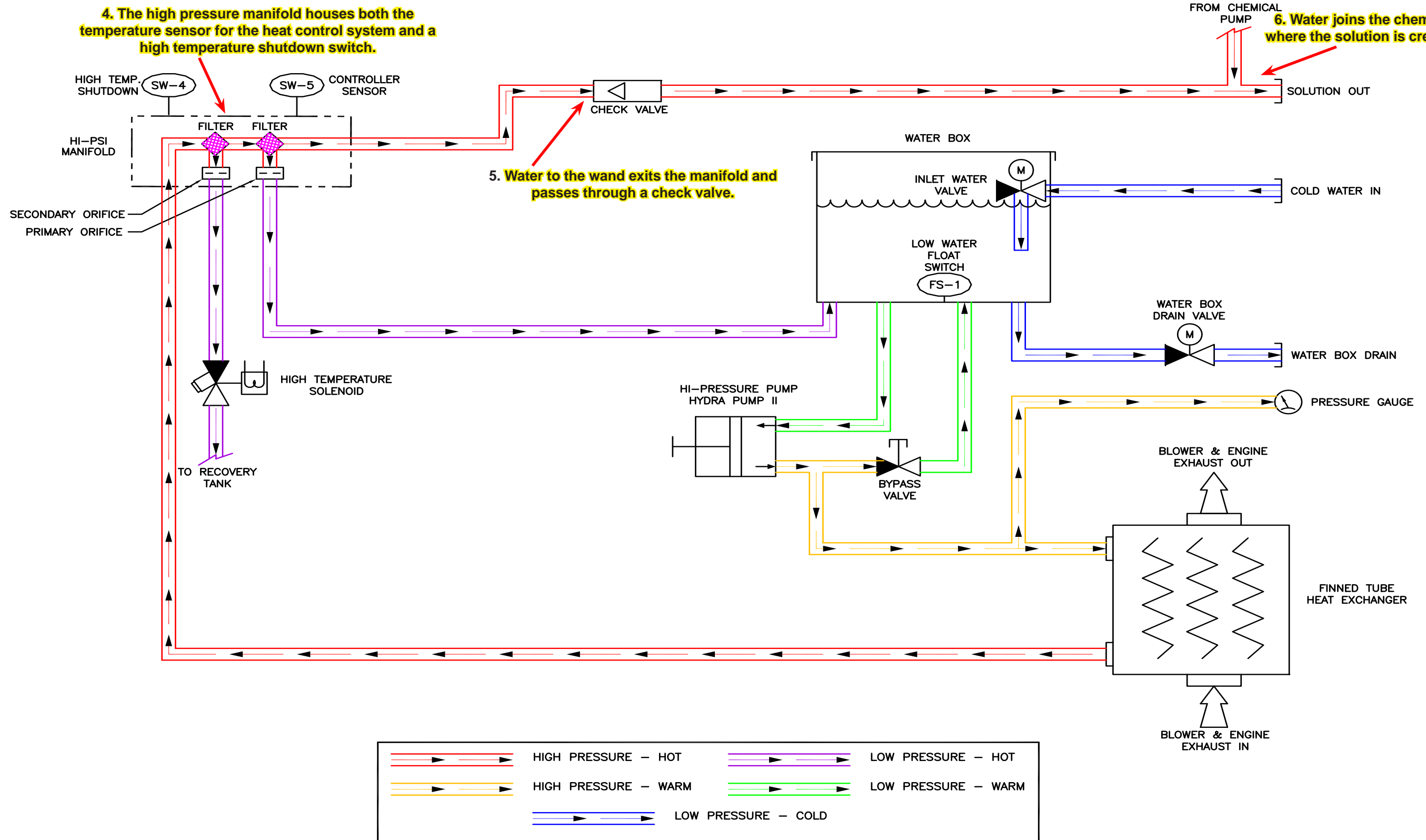


Figure 5-3. Annotated Chemical Flow Diagram  
7027 Rev. A

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 flow 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 truckmount and is delivered to the cleaning tool.

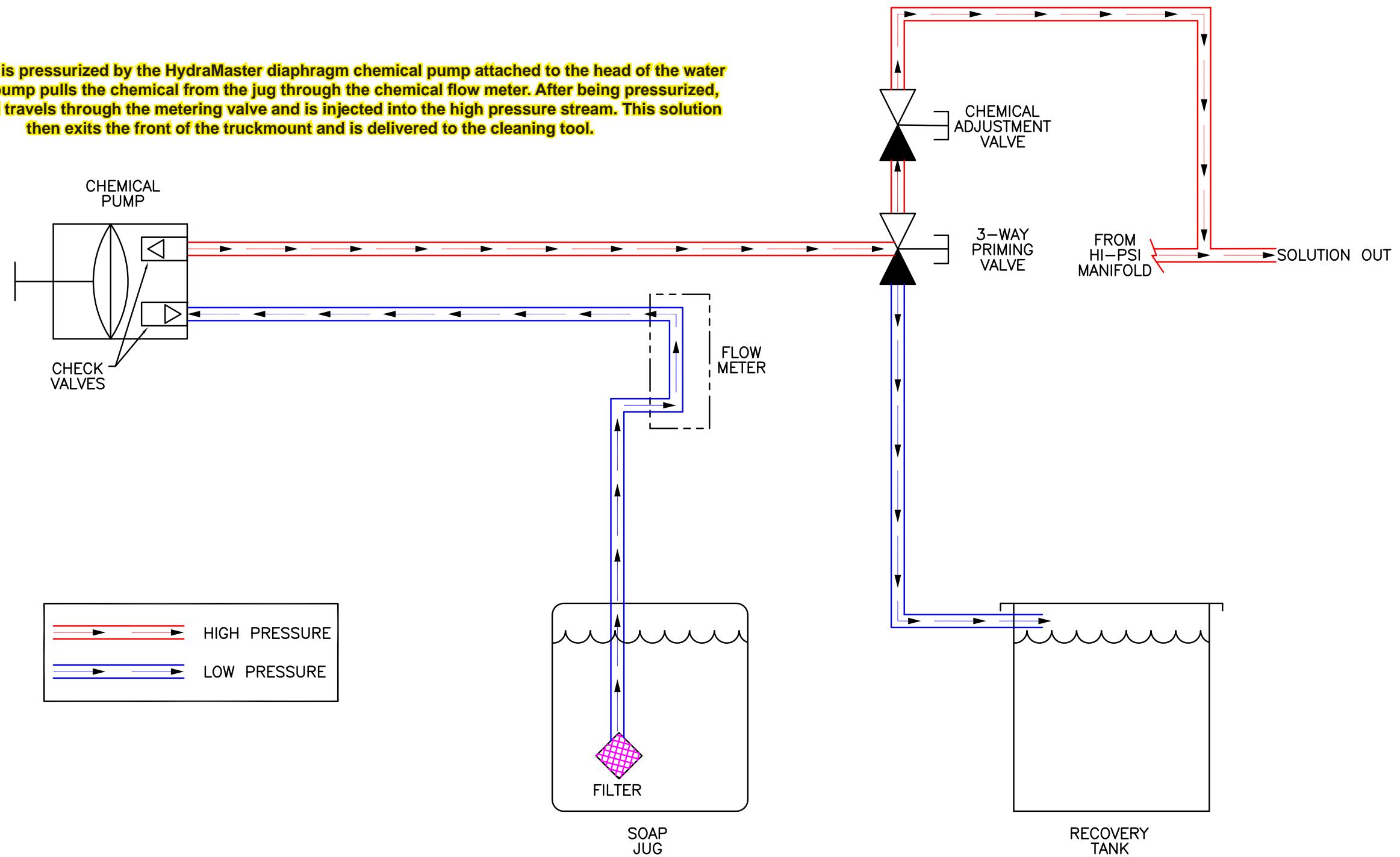
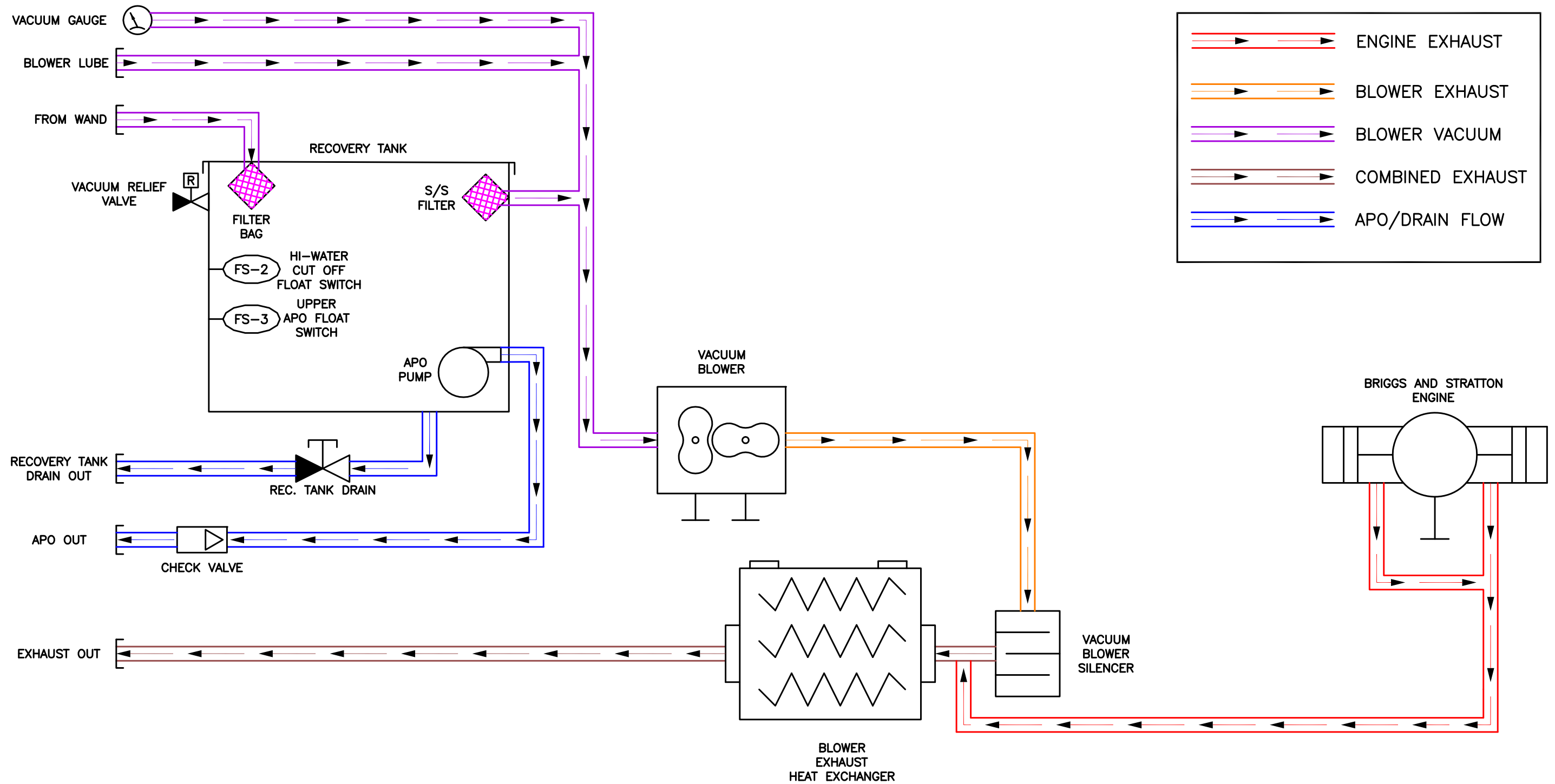




Figure 5-4. Exhaust Flow Diagram  
7027 Rev. A



# 6 - Electrical System

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

- Electrical System Information
- Electrical Schematic
- Wiring Diagram

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

## **NOTICE**

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

**Figure 6-1. Electrical Schematic**  
7026 Rev. A

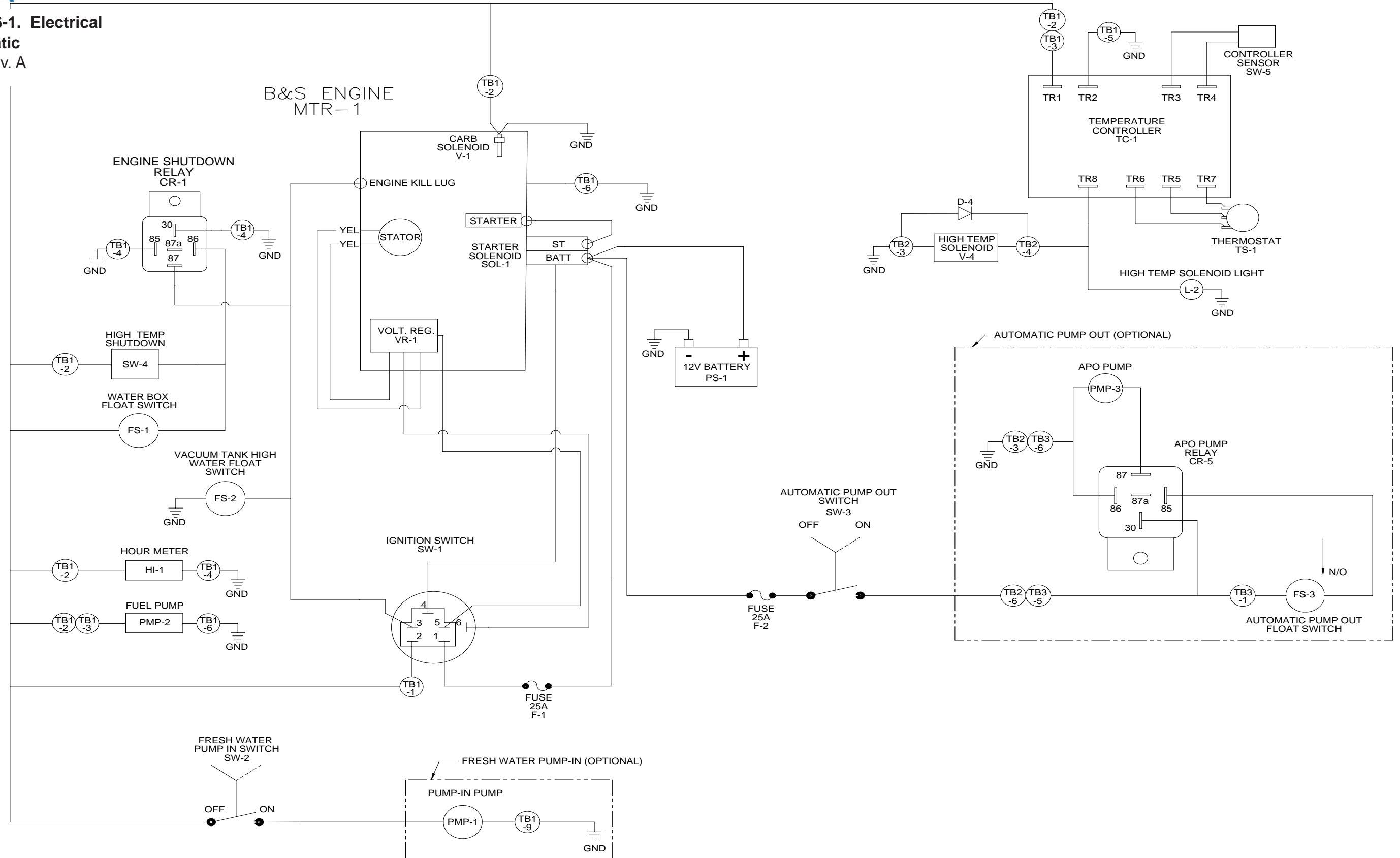
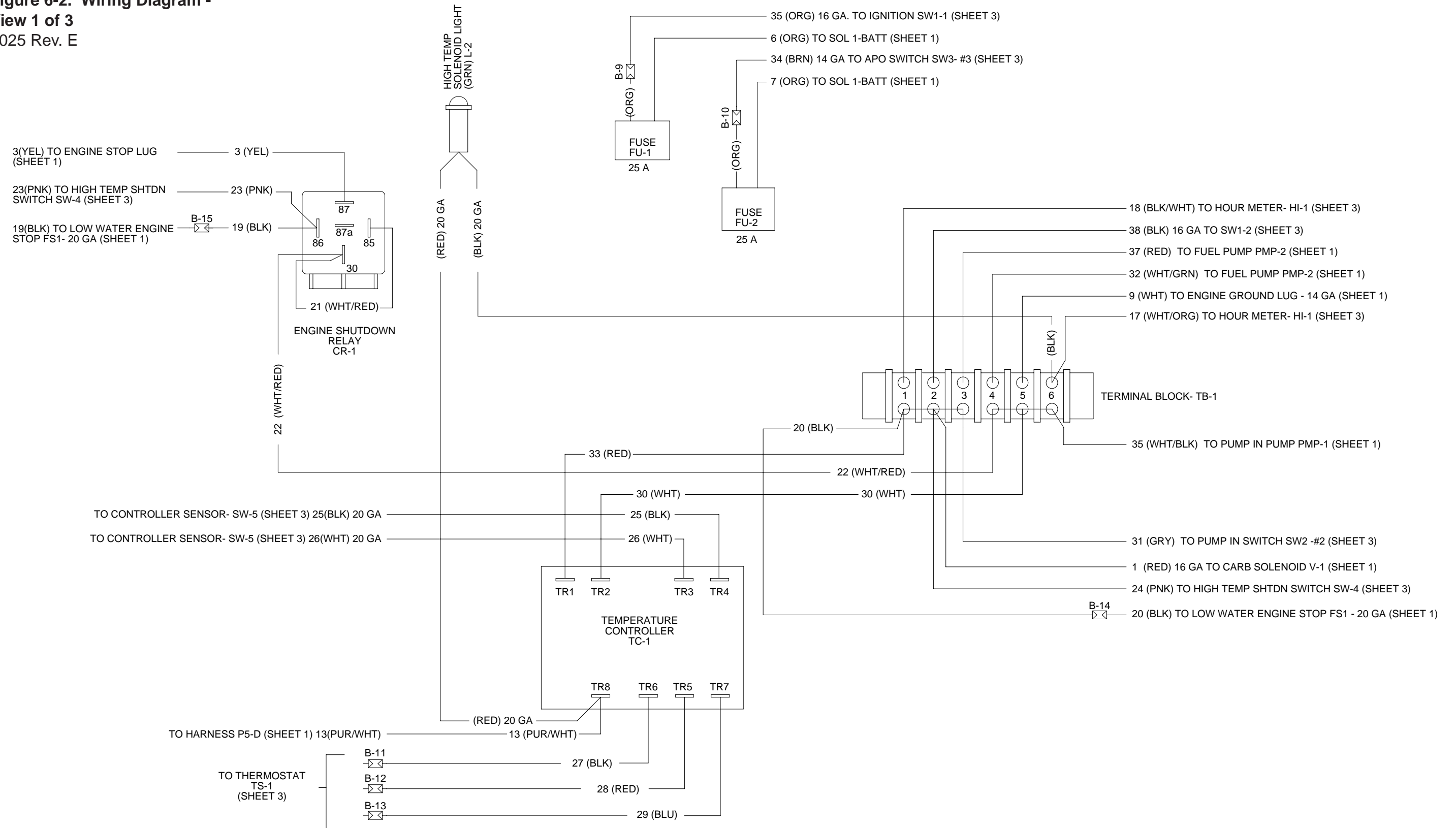
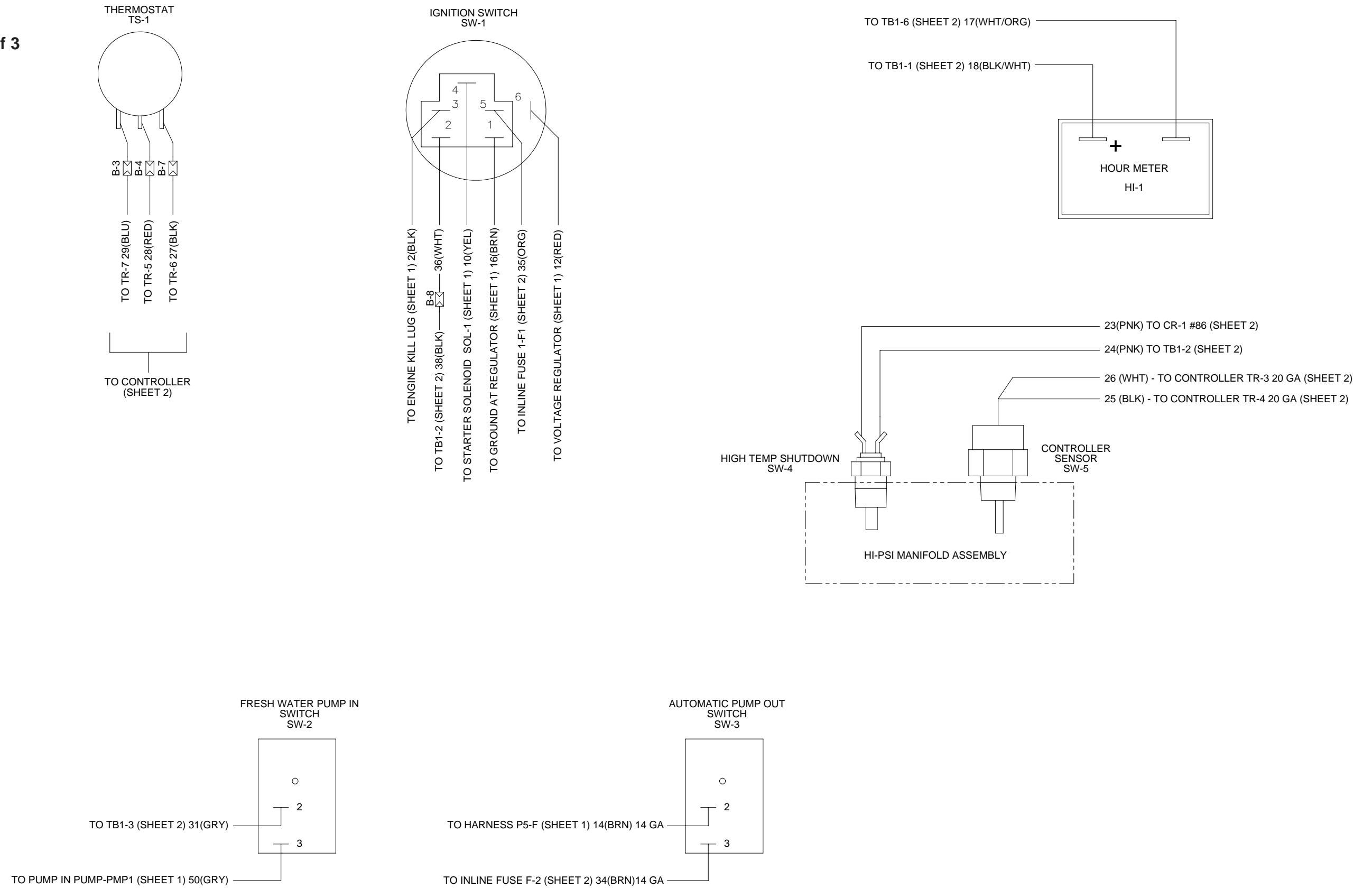


Figure 6-2. Wiring Diagram -  
View 1 of 3  
7025 Rev. E

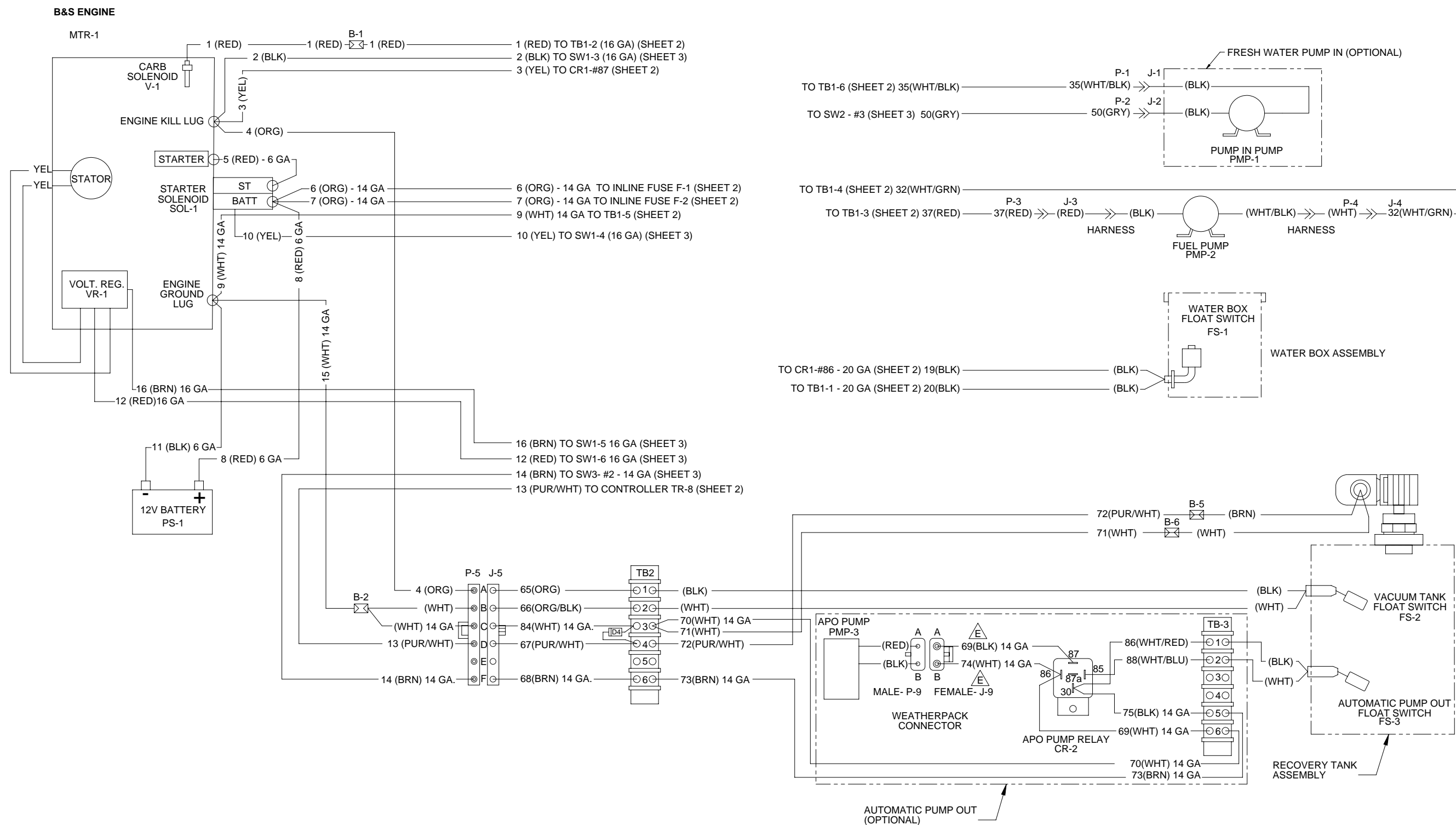


# BOXER 318

**Figure 6-3. Wiring Diagram - View 2 of 3**  
7025 Rev. E



**Figure 6-4. Wiring Diagram - View 3 of 3**  
7025 Rev. E



# 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

### 1.0 Truckmount overheats and shuts down

1.1	The orifice or filter screen are restricted.	Remove and inspect. Clean as necessary.
1.2	The low pressure dump solenoid is restricted.	Inspect the solenoid and the hose that delivers water to it. Clean or replace as necessary.
1.3	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 the solenoid and test for functionality. If the solenoid is operable, refer to a qualified service technician to test the temperature controller and sensor.

### 2.0 Unable to achieve normal cleaning solution temperature

2.1	Temperature control knob is turned down.	Inspect the knob. Adjust if necessary.
2.2	The dump 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.
2.3	Excessive solution flow at tool.	The cleaning tool jet is too large or worn. Inspect the jet. Replace if necessary.
2.4	The heat exchanger has hard water scale buildup.	Descale the system.
2.5	The heat exchanger has blockage on the exhaust side.	Inspect the interior of heat exchanger. Remove the debris and clean as necessary.
2.6	The heat selector valve is in the wrong position.	Move the heat selector valve to the "HOT" position.



## CHEMICAL SYSTEM

### **1.0 System will not prime**

1.1	The check valves in chemical pump are faulty.	Remove the valves and inspect. Clean or replace as necessary.
1.2	The chemical pump diaphragm is faulty.	Remove and inspect. Replace as necessary.
1.3	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.
1.4	The filter on feed line in chemical jug is clogged.	Inspect and clean.
1.5	The feed line from chemical jug is loose, pinched or damaged.	Inspect and repair.
1.6	The chemical selector valve is faulty.	Inspect the valve for leaks between ports. Replace as necessary.

### **2.0 Chemical flow is unstable or low**

2.1	Air is in the lines.	Check that all fittings and connections are tight and in good condition. Repair or replace as necessary.
2.2	The filter screen in the chemical jug is partially obstructed.	Inspect and clean.
2.3	The chemical selector valve is faulty.	Inspect the valve for leaks between ports. Replace as necessary.
2.4	The chemical metering valve is faulty.	Remove and inspect the valve. Clean or replace as necessary.
2.5	The high pressure check valve is faulty.	Remove and inspect the valve. Clean or replace as necessary.

### **3.0 Chemical is present in water box**

3.1	The chemical pump diaphragm is faulty.	Remove and inspect the chemical pump diaphragm. Replace as necessary.
3.2	The high pressure check valve is faulty.	Remove and inspect the valve. Clean or replace as necessary.

## ENGINE

### 1.0 Will not turn over

1.1	A loose or corroded battery terminal.	Clean and tighten the battery terminal connections.
1.2	The battery is dead.	Recharge or replace the battery. Test the charging system. Repair if necessary. <b>CAUTION</b> Do not attempt to jump start the truckmount from a running vehicle. The amperage output from an automobile will damage the charging system of the truckmount.
1.3	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.
1.4	The vacuum blower has seized.	Attempt to turn the coupler by hand. If it will not turn refer to the Vacuum System Troubleshooting Section.
1.5	The ignition switch is faulty.	Test to see if there is power both to and from the switch. Refer to the Electrical Section.
1.6	The starter solenoid is faulty.	Test to see if there is power to solenoid with ignition in "Start" position. Refer to Electrical Section.
1.7	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.
1.8	None of the above.	Refer to a qualified service technician for further troubleshooting.

### 2.0 Turns over but will not start. there is no spark. (To check for spark, refer to engine manual.)

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

**3.0 Turns over but will not start; there is spark.** (To check for spark, refer to engine manual.)

3.1	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.
3.2	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.
3.3	The engine is flooded.	Pull the throttle cable completely and crank until the engine starts.
3.4	The spark plugs are worn or dirty.	Inspect and replace as necessary.
3.5	None of the above.	Refer to a qualified service technician for further troubleshooting.

**4.0 Will not come up to normal operating rpm** note: engine should be adjusted to run at 3,150 rpm under a vacuum load of 14" hg.

4.1	The throttle linkage is out of adjustment.	Inspect for broken or loose linkage. Repair or replace as necessary.
4.2	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.
4.3	Excessive back pressure on the engine exhaust.	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

## 5.0 Runs rough at high speed

5.1	The spark plug(s) are faulty.	Remove and inspect the plugs. Clean or replace as necessary.
5.2	The spark plug wire(s) are faulty.	Inspect the wires and connectors for damage or loose connections. Repair or replace as necessary.
5.3	Inadequate fuel supply to the carburetor.	Check 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.
		If operating altitudes have changed, contact your distributor to have the engine carburetor jets checked.

## 6.0 Runs rich. (Black smoke)

6.1	The air filter is dirty.	Inspect and replace as necessary.
6.2	The choke is partially closed.	Inspect and adjust or repair as necessary.
6.3	Excessive fuel to the carburetor.	Check to see if the proper fuel pump is installed.
		If operating altitudes have changed, contact your distributor to have the engine carburetor jets checked.

## 7.0 Engine overheats

7.1	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 truckmount.
7.2	Low oil level.	Check the level and fill as necessary.
7.3	The engine rpm is too high.	Check the engine rpm. Adjust as necessary to run at 3,150 rpm under a vacuum load of 14" Hg.
7.4	Excessive back pressure on the engine exhaust.	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

## HIGH PRESSURE SYSTEM

### **1.0 The pump will not come up to normal cleaning pressure**

1.1	The pressure adjusting valve is faulty.	Inspect the valve. Repair or replace if necessary.
1.2	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.
1.3	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 3,150 rpm under a 14" Hg vacuum load.
1.4	The primary orifice is missing or loose.	Remove and inspect. Tighten or replace as necessary.
1.5	The primary and secondary orifices have been installed incorrectly.	Inspect and reverse if necessary. Refer to the Machine Assemblies & Parts List Section.
1.6	The primary orifice is worn.	Measure the orifice size and replace as necessary. Correct size is .033 in.

### **2.0 No pressure reading on gauge**

2.1	The pump belt is broken.	Inspect and replace if necessary.
2.2	The gauge is faulty.	Replace the gauge.

### **3.0 The psi gauge reads normal: low pressure from wand**

3.1	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.
3.2	Faulty quick connect in the system.	Inspect each quick connect and replace as necessary.
3.3	Restriction in one of the solution hoses.	Remove the quick connects and inspect hoses. Clean or replace as necessary.
3.4	Hard water deposits restricting the system.	Descale the truckmount.

## **4.0 Pressure pulsation**

4.1	Air leak between the water box and pump.	Check all the hoses and fittings for cuts, breaks, cracks, etc. Repair as necessary.
4.2	The check valve(s) in the pump are faulty.	Remove each valve and inspect for correct operation. See the Machine Maintenance Section.

## **5.0 Water box empty or fills slowly**

5.1	Restriction in the water supply system.	Inspect the supply system from the source through the incoming quick connect.
5.2	The float valve in the water box is faulty.	Disassemble and inspect the valve. Repair or replace as necessary.

## **6.0 The water box overflows**

6.1	The float valve in the water box is faulty.	Disassemble and inspect the valve. Repair or replace as necessary.
6.2	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.
6.3	The float has come out of adjustment.	Adjust the float as necessary.

## VACUUM SYSTEM

### **1.0 A weak vacuum at wand. The gauge reads normal.**

1.1	Blockage in the hoses or wand tube	Disconnect the hoses and check for an obstruction.
1.2	Excessive length of hose connected to the truckmount	Do not attach excessive lengths of hose.

### **2.0 A weak vacuum**

2.1	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.
2.2	The vacuum blower is turning too slowly.	Check the rpm of the engine. Adjust as necessary to 3,150 rpm under a 14" Hg vacuum load.
2.3	The vacuum gauge is defective.	Test the gauge and replace if necessary.

### **3.0 The vacuum gauge reads too high with no hoses attached**

3.1	The filter in recovery tank is clogged.	Remove and clean or replace as necessary.
3.2	The hose from recovery tank to the vacuum blower is collapsed internally.	Inspect and replace as necessary.

### **4.0 Excessive noise produced by the blower**

4.1	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.
4.2	The vacuum blower has internal damage.	Refer to a qualified service technician.

## **5.0 The vacuum blower is locked and will not turn**

5.1	Truckmount 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 1 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.
5.2	There is internal damage to the blower.	Refer to a qualified service technician.

## **6.0 Water in truckmount exhaust**

6.1	The recovery tank has been filled with foam or overfilled 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.
6.2	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.
6.3	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 Boxxer 318:

- Machine Assembly Parts List
- Frame Assembly Parts List
- Engine Assembly Parts List
- Blower Assembly Parts List
- Pump Assembly Parts List
- Chemical Pump Assembly Parts List
- Heat Exchanger Assembly Parts List
- Silencer Assembly Parts List
- Water Box Assembly Parts List
- Dash Assembly Parts List
- Hi-PSI Manifold Assembly Parts List
- By-Pass Valve Assembly Parts List
- Idler Pulley Assembly Parts List
- Exhaust Assembly Parts List
- Electrical Panel Assembly Parts List
- 50 Gallon Universal Recovery Tank Assembly Parts List
- 70 Gallon Universal Recovery Tank Assembly Parts List
- Cover, Single Vac. - 70 Gallon URT Assembly Parts List
- Vacuum Relief Valve Assembly Parts List
- Dura-Flow APO 90° Assembly Parts List
- APO Connection Kit Assembly Parts List
- Boxxer 318 on 85 RMT w/ 50 URT Assembly Parts List
- 50 Gallon URT for 85 RMT Assembly Parts List
- Boxxer 318 on 85 RMT w/ 70 URT Assembly Parts List
- 70 Gallon URT for 85 RMT Assembly Parts List
- 85 Gallon Rotomolded Tank Assembly Parts List
- Dump and Vacuum Assembly Parts List
- Chemical Jug Tray Assembly Parts List
- Machine Hose Routings

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

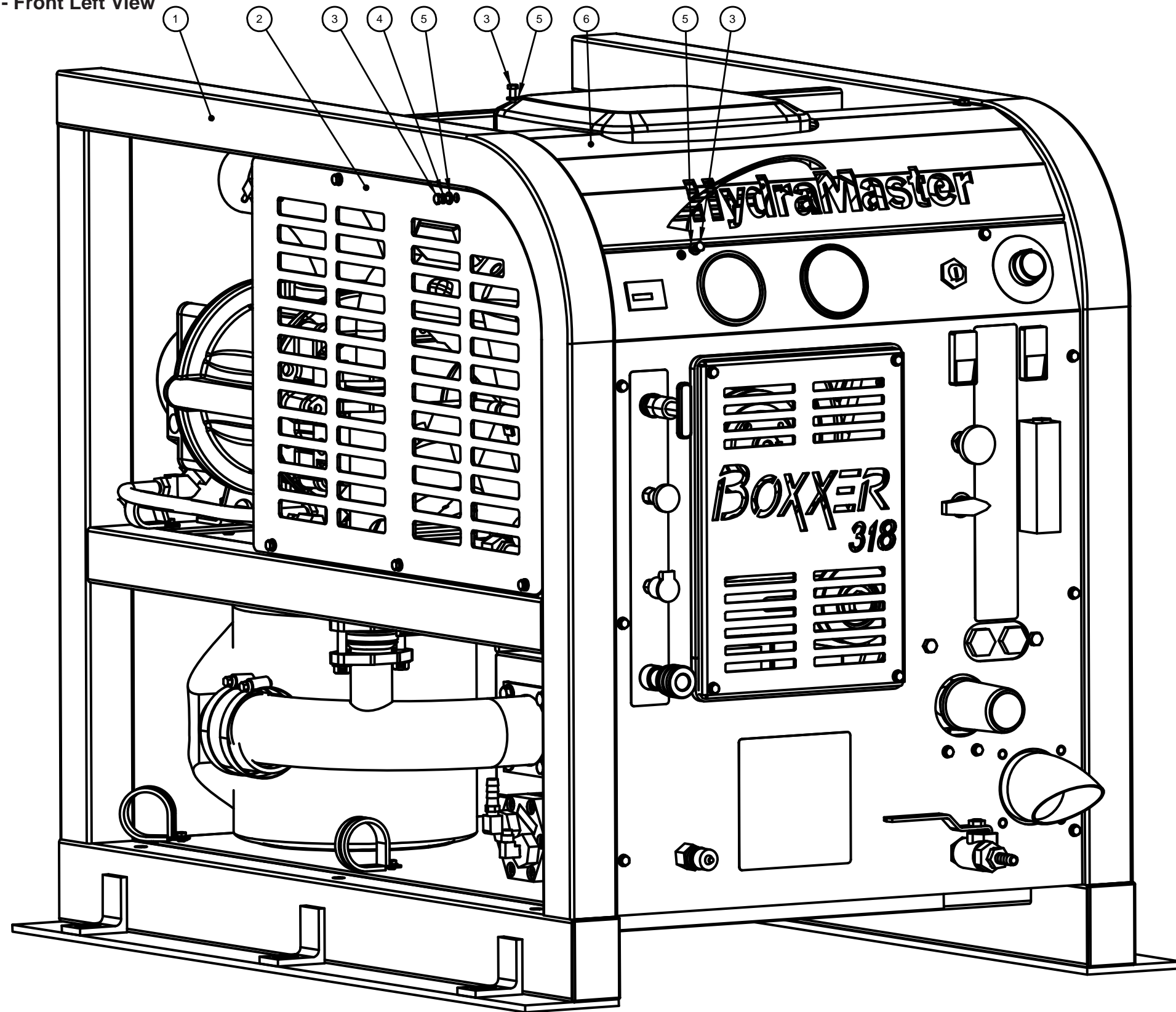
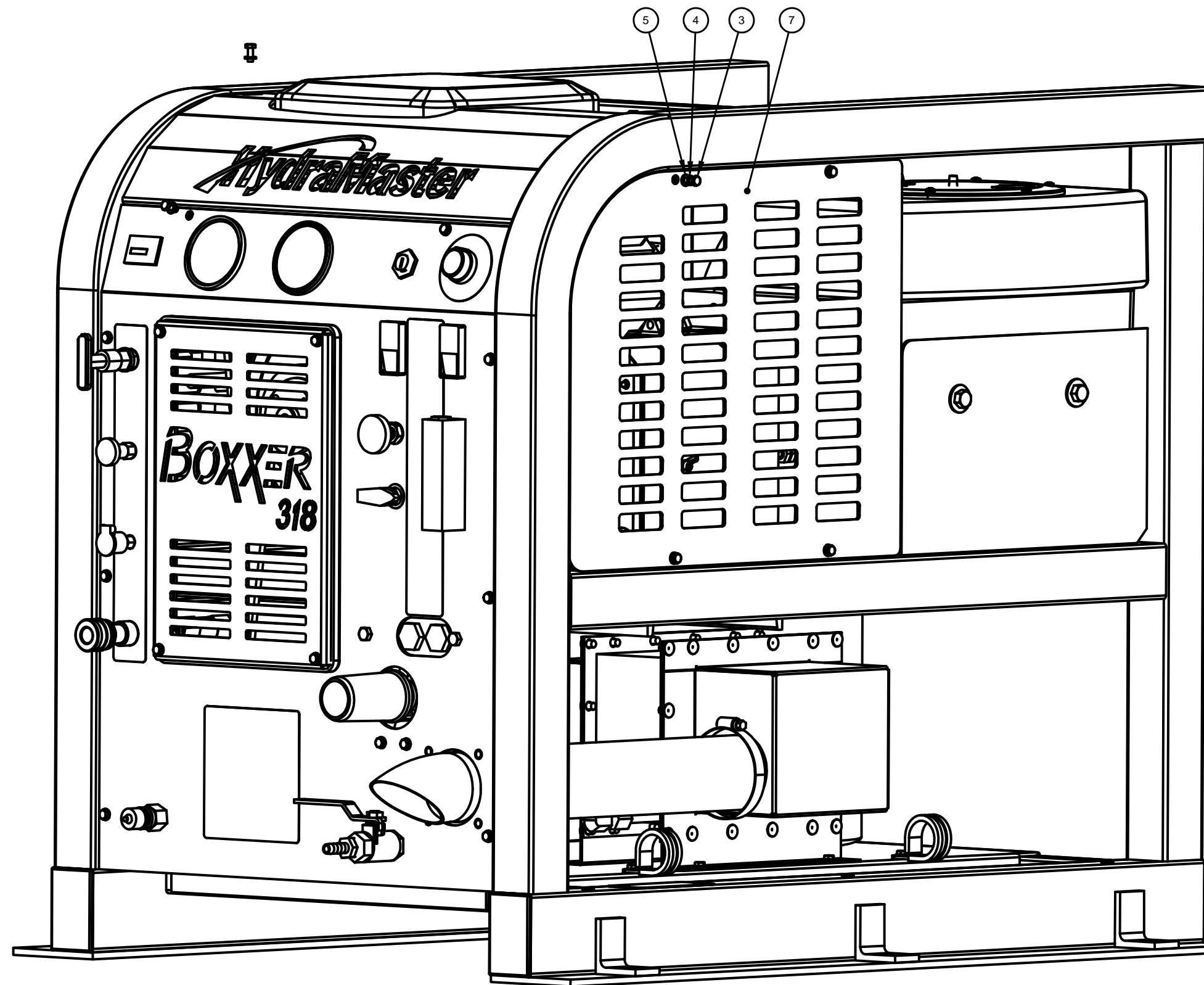


Figure 8-2. Machine Assembly - Front Right View  
7010

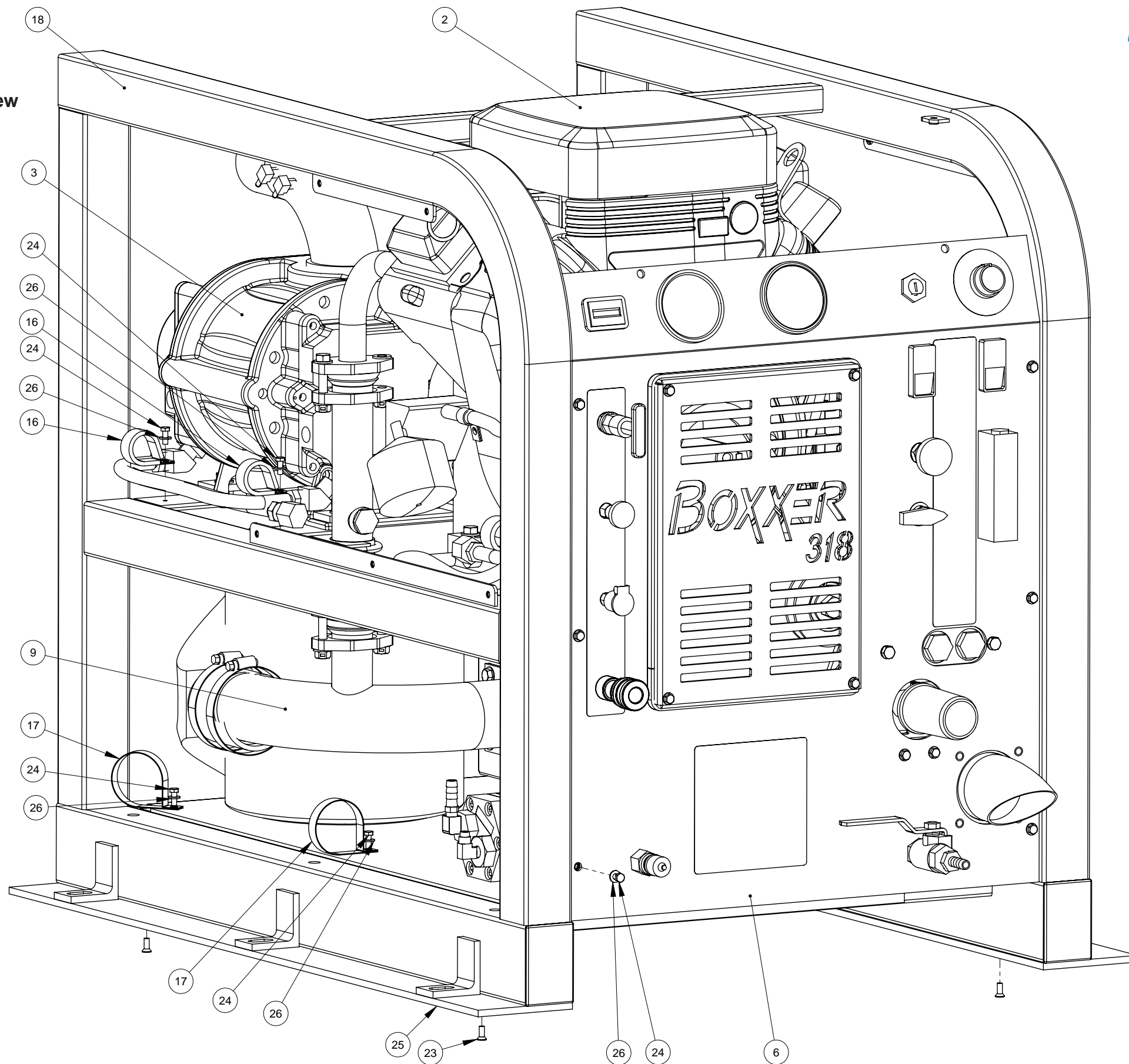


**Machine Assembly Parts List**

Item	Part Number	Description	Qty
1	- - -	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

Item	Part Number	Description	Qty
5	000-174-001	Washer, #10 Flat	13
6	000-041-011	Cover, Top - Machine	1
7	000-041-452	Cover, Side - 17.250" x 14.316"	1

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



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

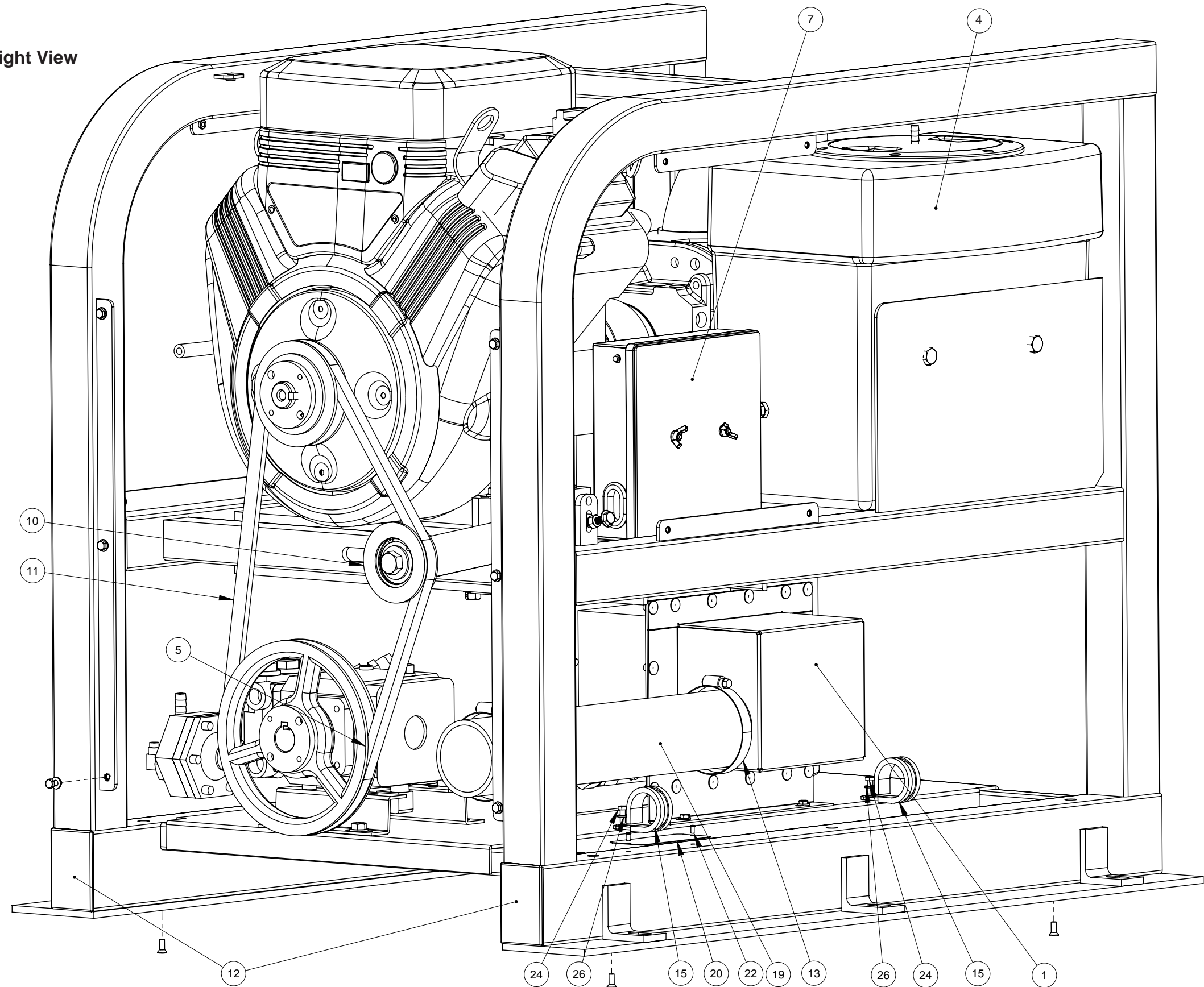
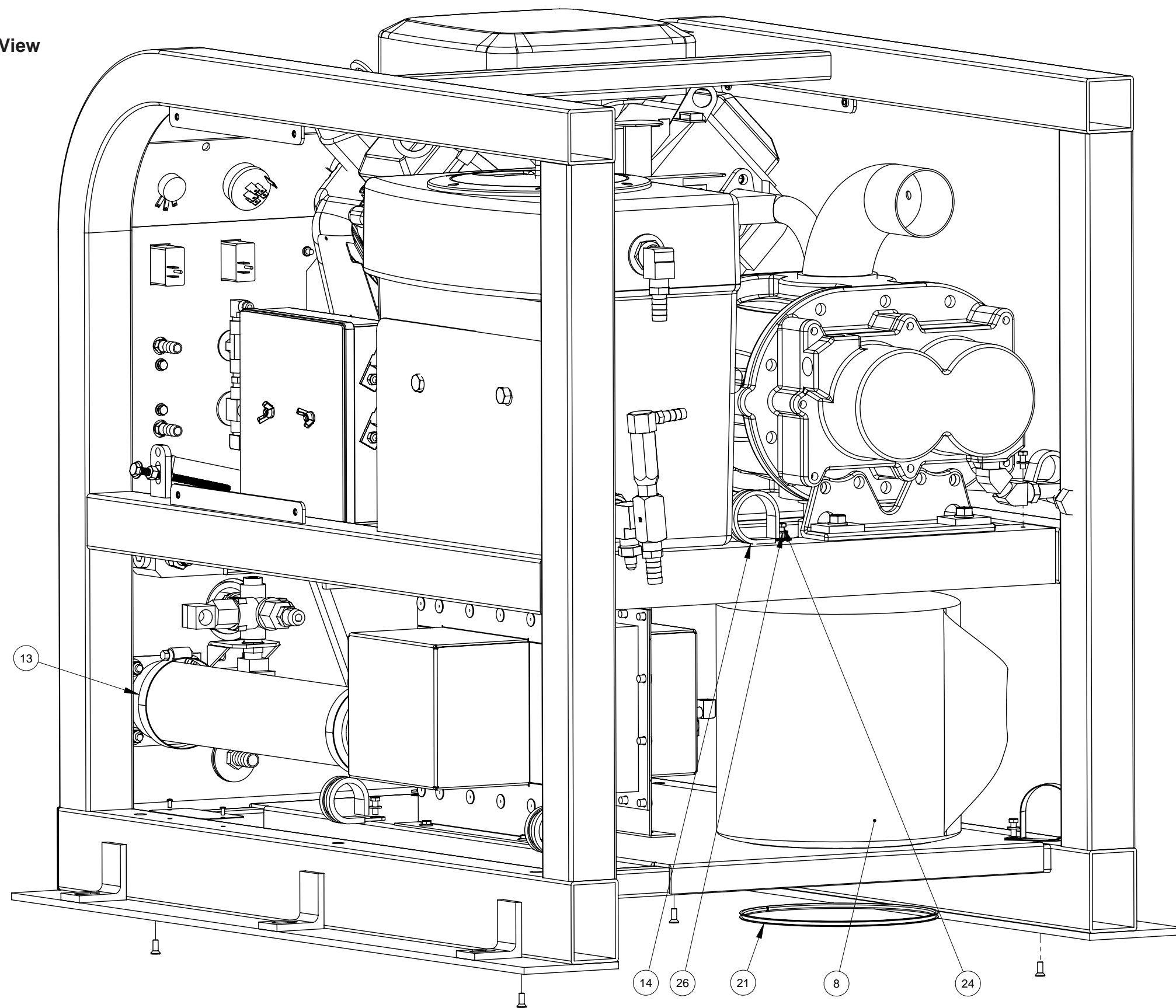


Figure 8-5. Frame Assembly - Rear View  
7011 Rev. B



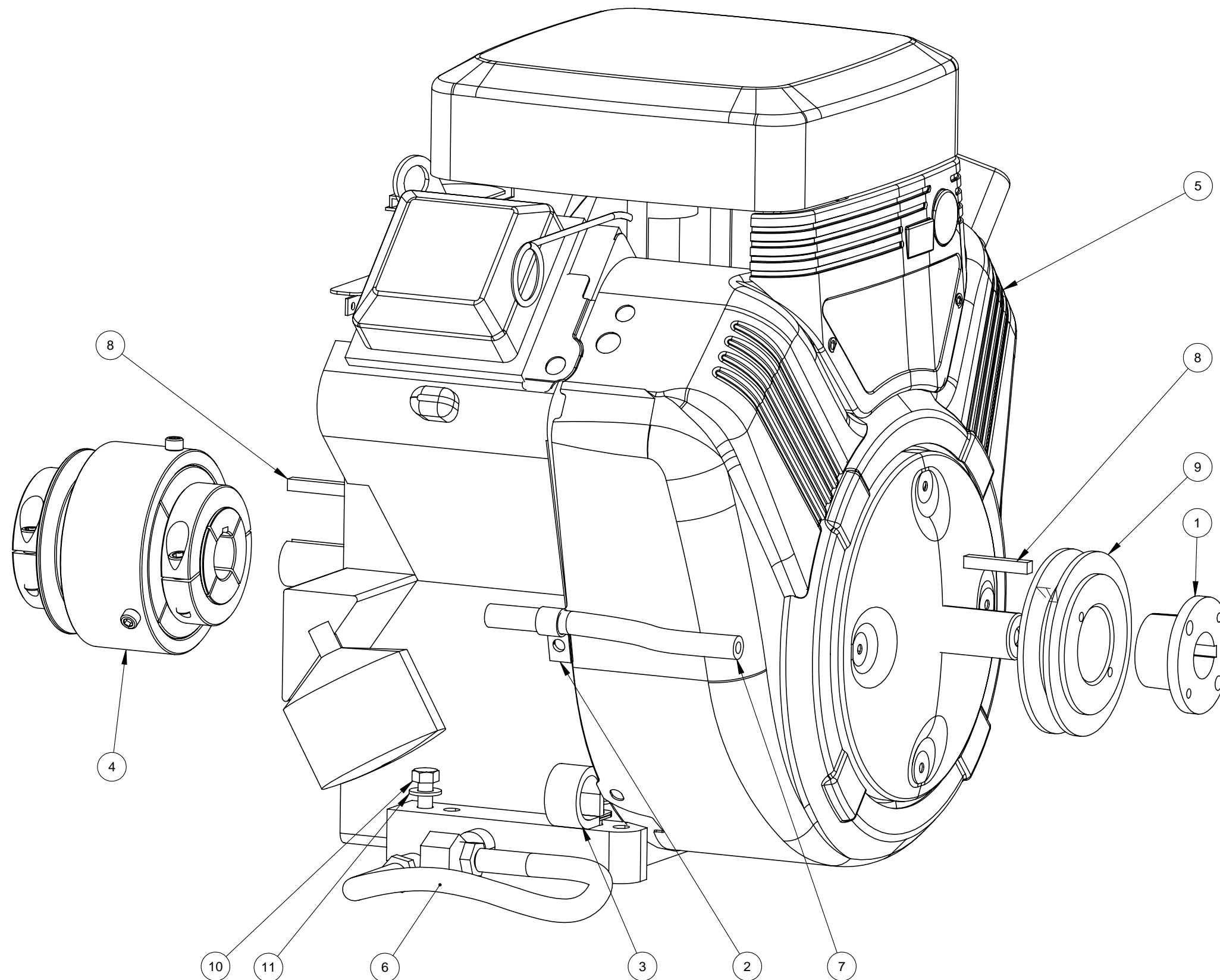
## Frame Assembly Parts List

Item	Part Number	Description	Qty
1	---	Assembly, Heat Exchanger	1
2	---	Assembly, Engine	1
3	---	Assembly, Blower	1
4	---	Assembly, Water Box	1
5	---	Assembly, Pump	1
6	---	Assembly, Dash	1
7	---	Assembly, Electrical Panel	1
8	---	Assembly, Silencer	1
9	---	Assembly, Exhaust	1
10	---	Assembly, Idler Pulley	1
11	000-010-124	Belt, #9430hd	1
12	000-027-110	Cap, 2" X 3" Frame End	2
13	000-033-012	Clamp, Size #44 Hose	2

Item	Part Number	Description	Qty
14	000-033-050	Clamp, 1-3/4" Cushion Loop	1
15	000-033-052	Clamp, 1-1/4" S/S EDPM	2
16	000-033-057	Clamp, 1" Cushion Loop	2
17	000-033-067	Clamp, 2" Cushion Loop	2
18	000-055-188	Frame Weldment- Boxxer 318	1
19	000-068-122	Hose, Ø 2.5" I.D. Silicone X 14.5" Lg.	1
20	000-105-012	Plate, Machine Serial I.D.	1
21	000-131-131	Trimlok, 3/8" X 1/8" Rubber	1
22	000-140-001	Rivet, Ab4-3a Aluminum Pop (1/8" X 1/4")	2
23	000-143-114	Screw, #10-24UNC X 0.50" Lg. Flat Head Phillips	4
24	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	13
25	000-154-156	Spacer, Machine Rising 4" X 35"	2
26	000-174-001	Washer, #10 S/S Flat	13



Figure 8-6. Engine Assembly  
7013 Rev. A

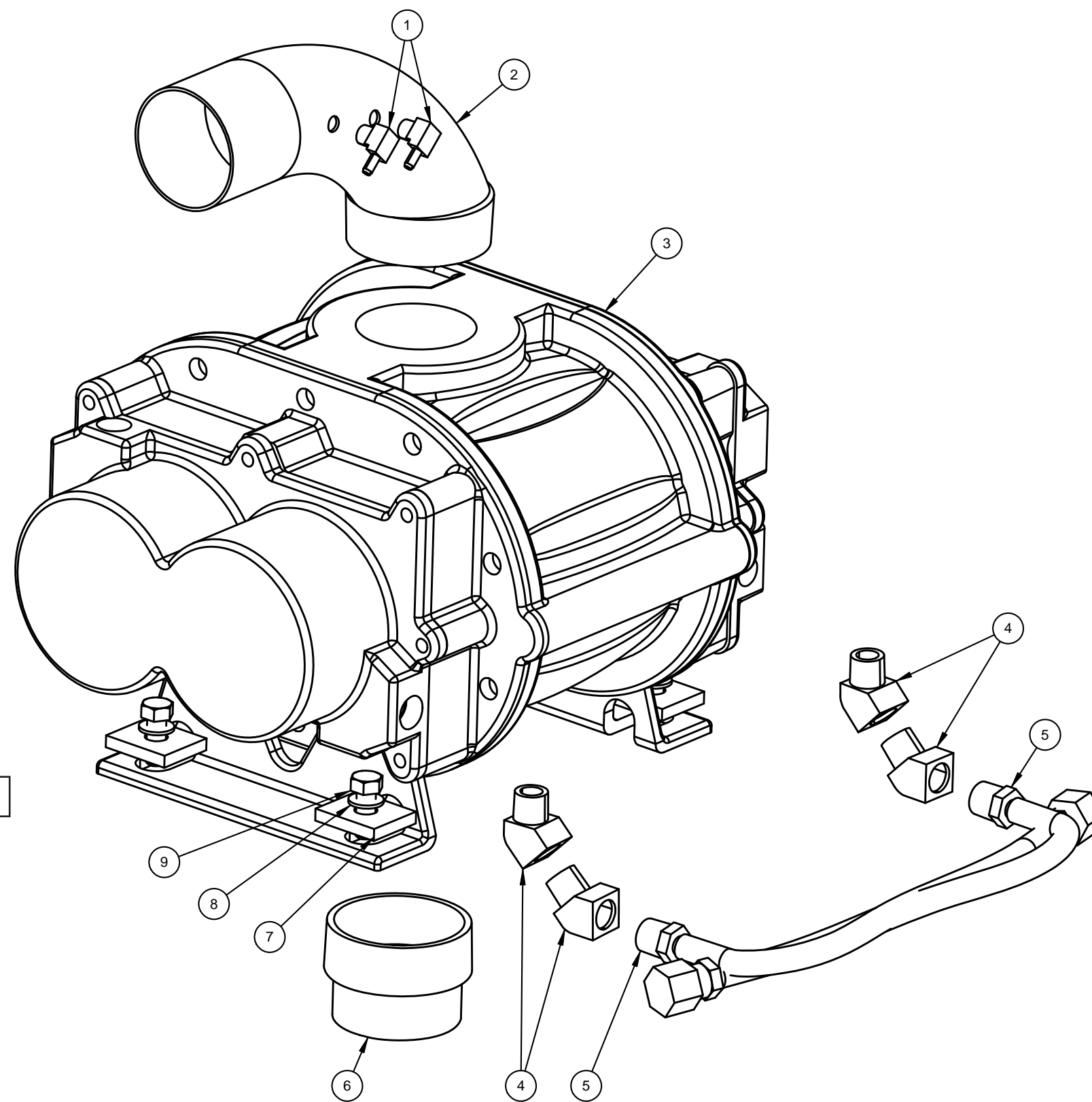


## Engine Assembly Parts List

Item	Part Number	Description	Qty
1	000-020-025	Bushing, H X 1"	1
2	000-033-046	Clamp, 1/2 Wide X 1/2 Tube	1
3	000-033-117	Clamp, 1" Cushion Loop w/ 7/16 Mount Hole	1
4	000-039-054	Coupler, 40 Series	1
5	000-047-028	Engine, B&S 18hp	1
6	000-068-219	Hose, Drain	1

Item	Part Number	Description	Qty
7	000-068-660	Hose, 1/4" Fuel	1
8	000-077-010	Key, 1/4" X 1-1/2" Lg.	2
9	000-109-040	Pulley, Ak47-H	1
10	000-143-375	Screw, 5/16"-18UNC X 1.75" Lg. Hex Head Grd. 8 Z/P	4
11	000-174-049	Washer, 5/16" Flat	4

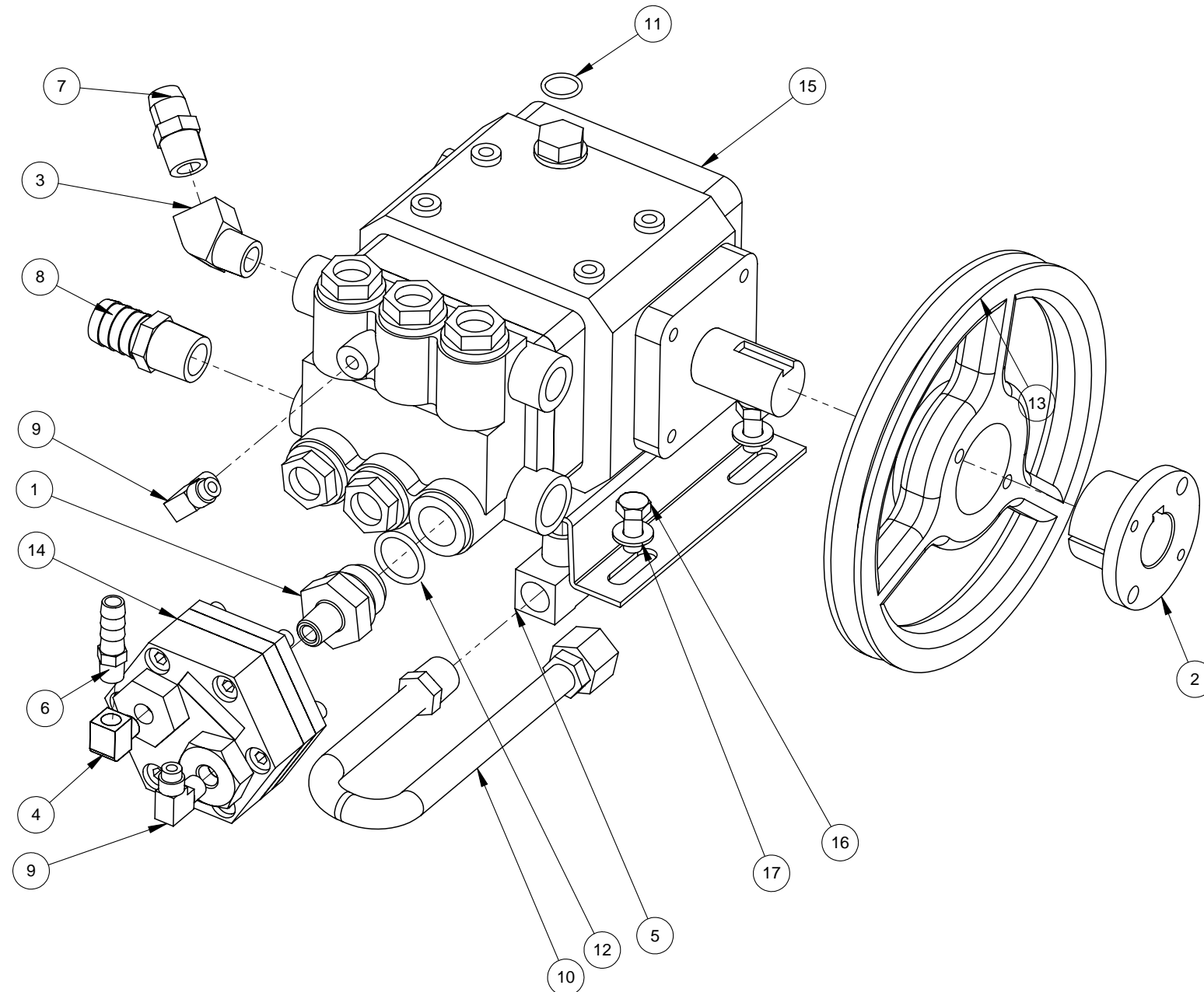
Figure 8-7. Blower Assembly  
7014



**Blower Assembly Parts List**

Item	Part Number	Description	Qty
1	000-052-106	Insert, 1/8" NPT X 5/32" Barb X 90°	2
2	000-001-141	Adapter, 2.5" NPT X 2.5" O.D.Tube - Elbow	1
3	000-111-134	Blower, 3006 Competitor	1
4	000-052-083	Elbow, 3/8" NPT Street X 45°	4
5	000-068-219	Hose, Drain	2
6	000-001-140	Adapter, 2.5" NPT To 2.5" O.D.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

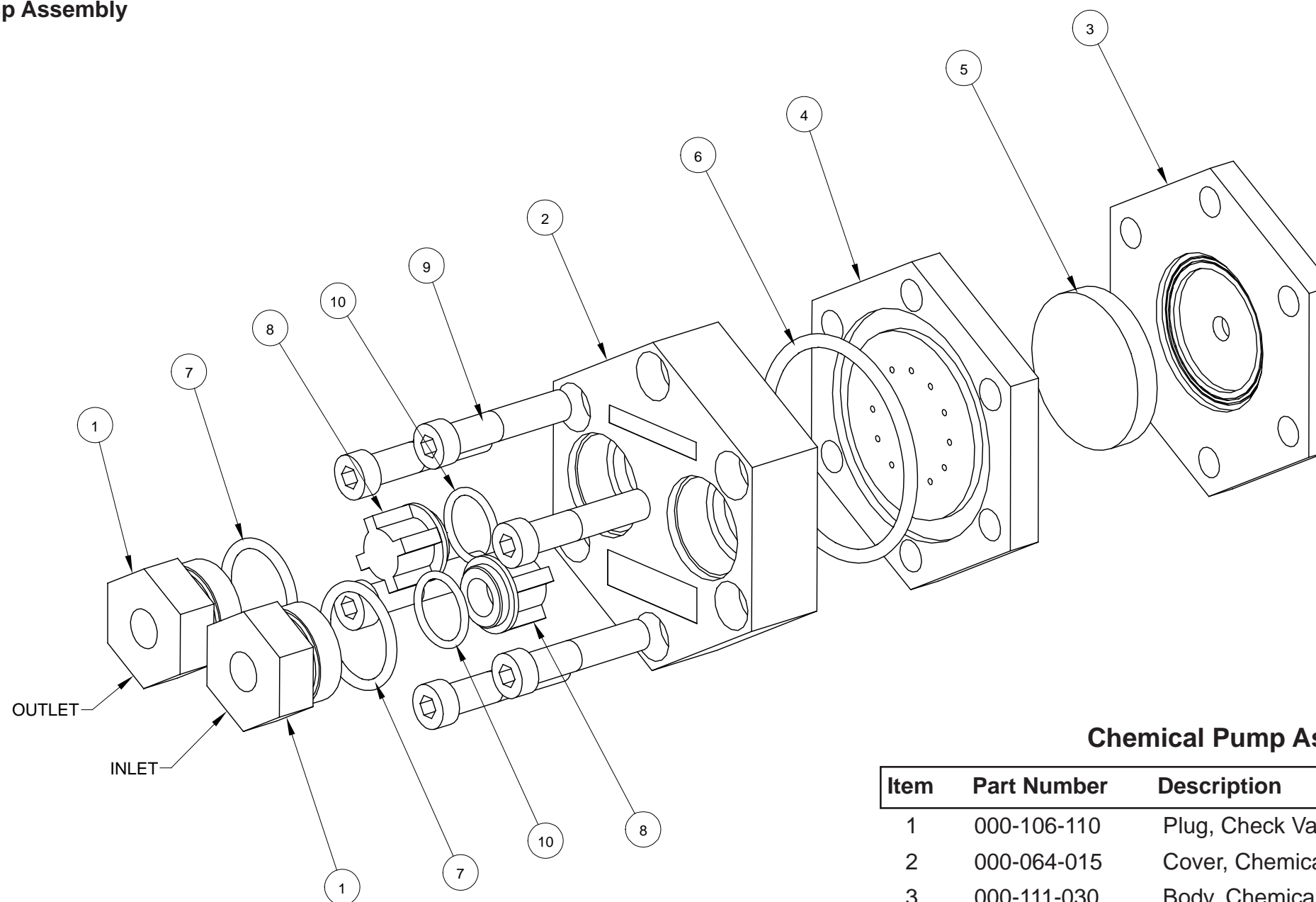
**Figure 8-8. Pump Assembly**  
7016 Rev. B



## Pump Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-096	Adapter, Chem. Pump To Comet	1
2	000-020-013	Bushing, H X 24mm	1
3	000-052-083	Elbow, 3/8" NPT Street X 45°	1
4	000-052-084	Elbow, 1/8" NPT Street	1
5	000-052-086	Elbow, 3/8" NPT Street	1
6	000-052-099	Insert, #26 (1/8" NPT X 3/8" Barb)	1
7	000-052-128	Nipple, 3/8 MPT X 3/8 SAE Flare	1
8	000-052-129	Insert #812, 1/2 NPT X 3/4 Hose	1
9	000-052-531	Elbow, 1/8" NPT X 1/4" SAE	2
10	000-068-219	Hose, Drain	1
11	000-097-002	O-Ring, Ø0.551 I.D. X Ø0.070 Wall	1
12	000-097-057	O-Ring, Adapter - Chemical Pump	1
13	000-109-116	Pulley, Ak74	1
14	000-111-035	Assembly - Pump, Chemical	1
15	000-111-042	Pump, Hydrapump li	1
16	000-143-012	Screw, 5/16"-18UNC X 3/4" Lg.	4
17	000-174-004	Washer, 5/16" Flat	4

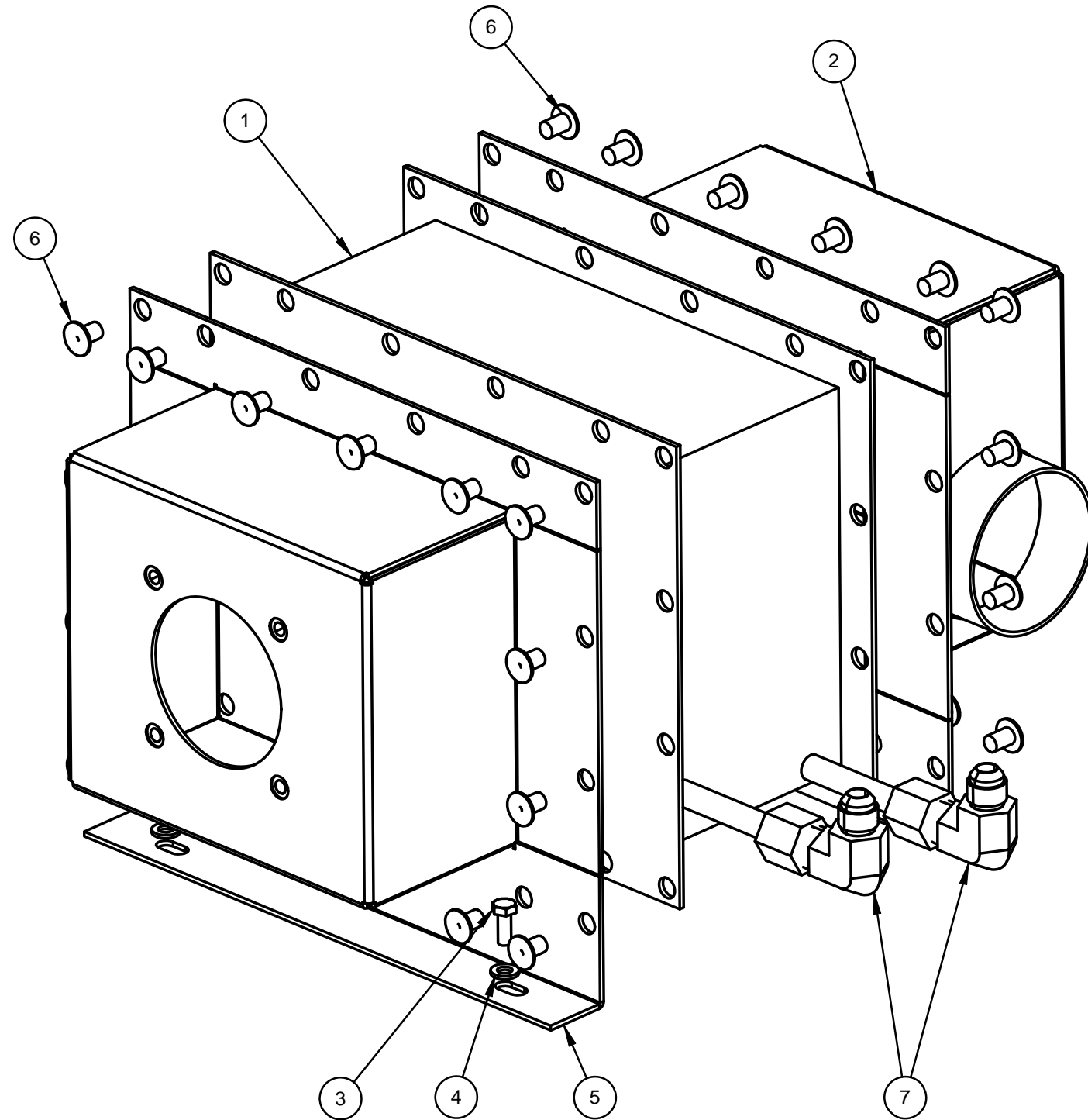
Figure 8-9. Chemical Pump Assembly  
4416 Rev. B



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

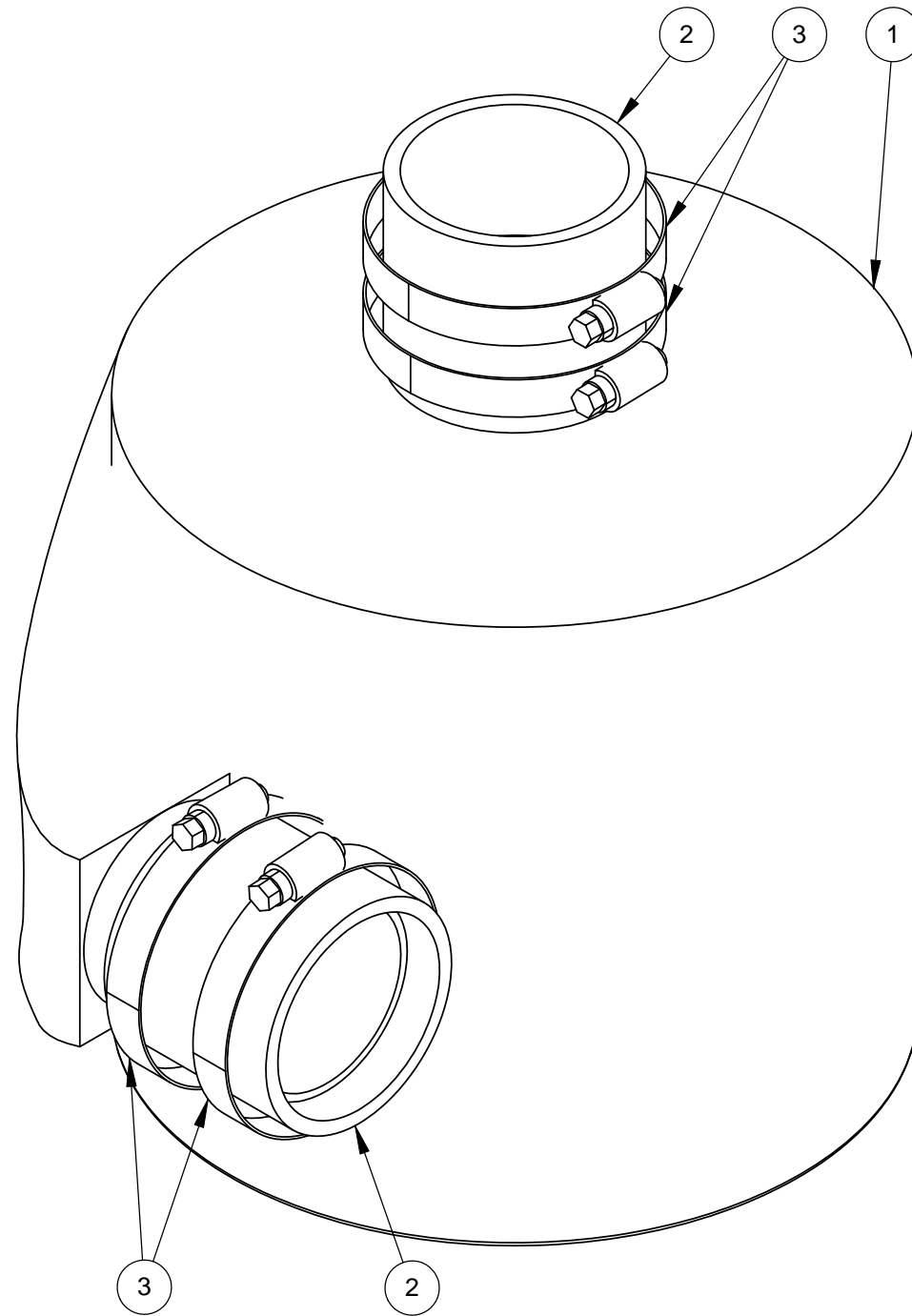
**Figure 8-10. Heat Exchanger Assembly**  
7012



**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 Hex Head	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 MNPT x 3/8 JIC	2

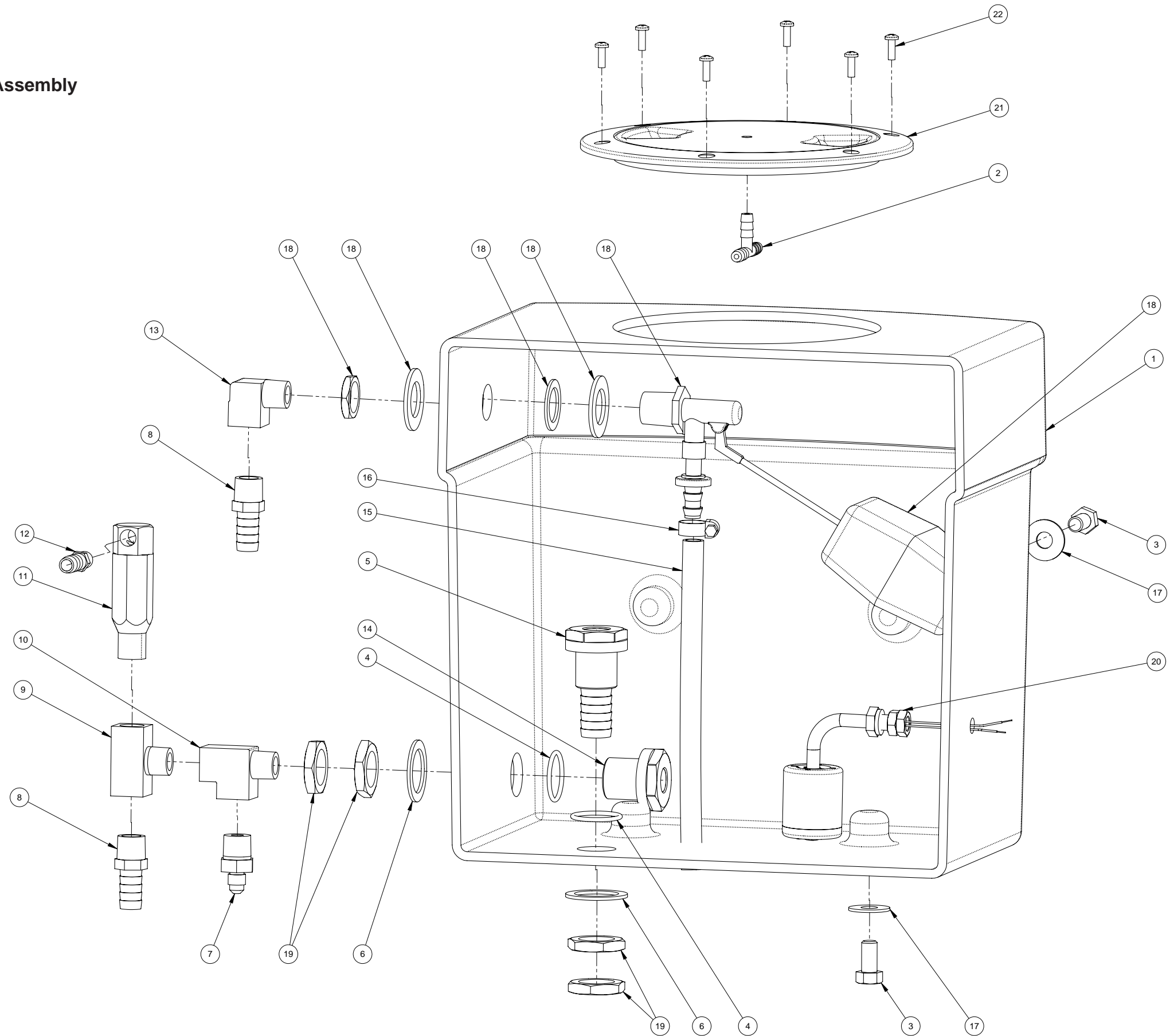
**Figure 8-11. Silencer Assembly**  
7075 Rev. A



**Silencer Assembly Parts List**

Item	Part Number	Description	Qty
1	000-093-108	Silencer, Ø2.5" O.D. Inlet/Outlet	1
2	000-068-104	Hose, Ø 2.5" I.D. Silicone x 2.5" Lg.	2
3	000-033-012	Clamp, Size #44 Hose	4

**Figure 8-12. Water Box Assembly**  
7015 Rev. B





**Water Box Assembly Parts List**

Item	Part Number	Description	Qty
1	000-159-001	Tank, Poly Water Box - Modified	1
2	000-052-156	Tee, 1/4" Plastic	1
3	000-143-017-1	Screw, 3/8"-16UNC X 3/4" Lg. Hex Head	3
4	000-097-041	O-Ring, 1/2" Bulk Head	2
5	000-052-661	Insert, 3/4" Barb X Straight	1
6	000-174-063	Washer, 1.5" O.D. X 1.073" I.D. X 0.075" Thk.	2
7	000-052-662	Nipple, 3/8" NPT X 1/4" M SAE	1
8	000-052-099	Insert, #26 (1/8" NPT X 3/8" Barb)	1
9	000-052-447	Tee, 3/8" NPT Male Branch	1
10	000-052-023	Tee, 3/8" NPT Male Street	1
11	000-169-027	Valve, 165 F Thermal	1

Item	Part Number	Description	Qty
12	000-052-105	Insert, #68 (3/8" NPT X 1/2" Barb)	2
13	000-052-086	Elbow, 3/8" NPT Street	1
14	000-052-660	Bulkhead, 3/8" FPT X 3/8" FPT	1
15	000-068-326	Hose, 3/8"Clr w/Braid	1
16	000-033-003	Clamp, Size 4 Mini Hose	1
17	000-174-032	Washer, 3/8" Flat	3
18	000-169-218	Valve, Float, Water Box	1
19	000-094-097	Nut, 1"-14UNS Brass	4
20	000-157-0801	Switch, with Protector	1
21	000-041-005	Cover, 6"	1
22	000-143-314	Screw, #8 X 1/2" Lg. Pan Head	6

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

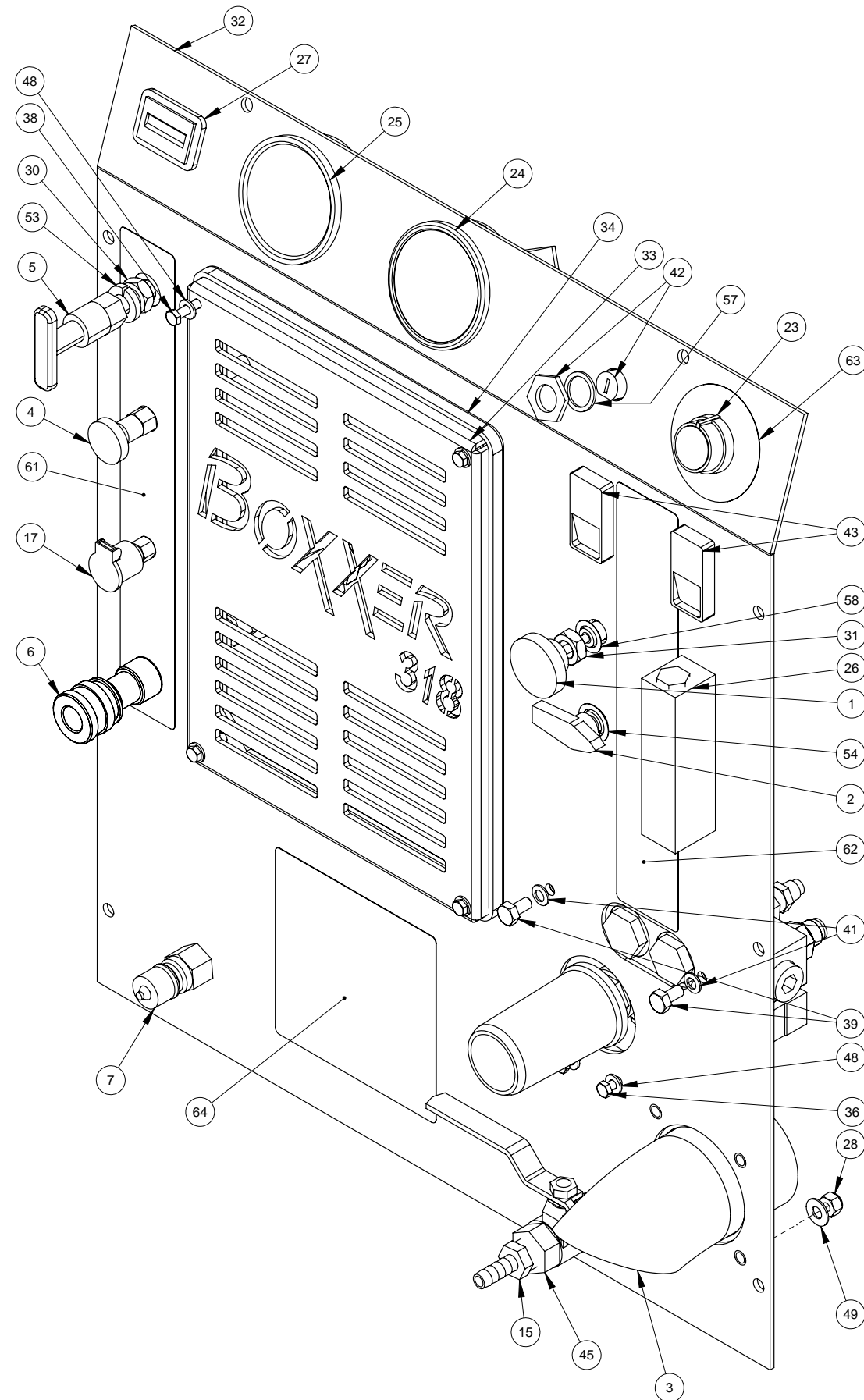
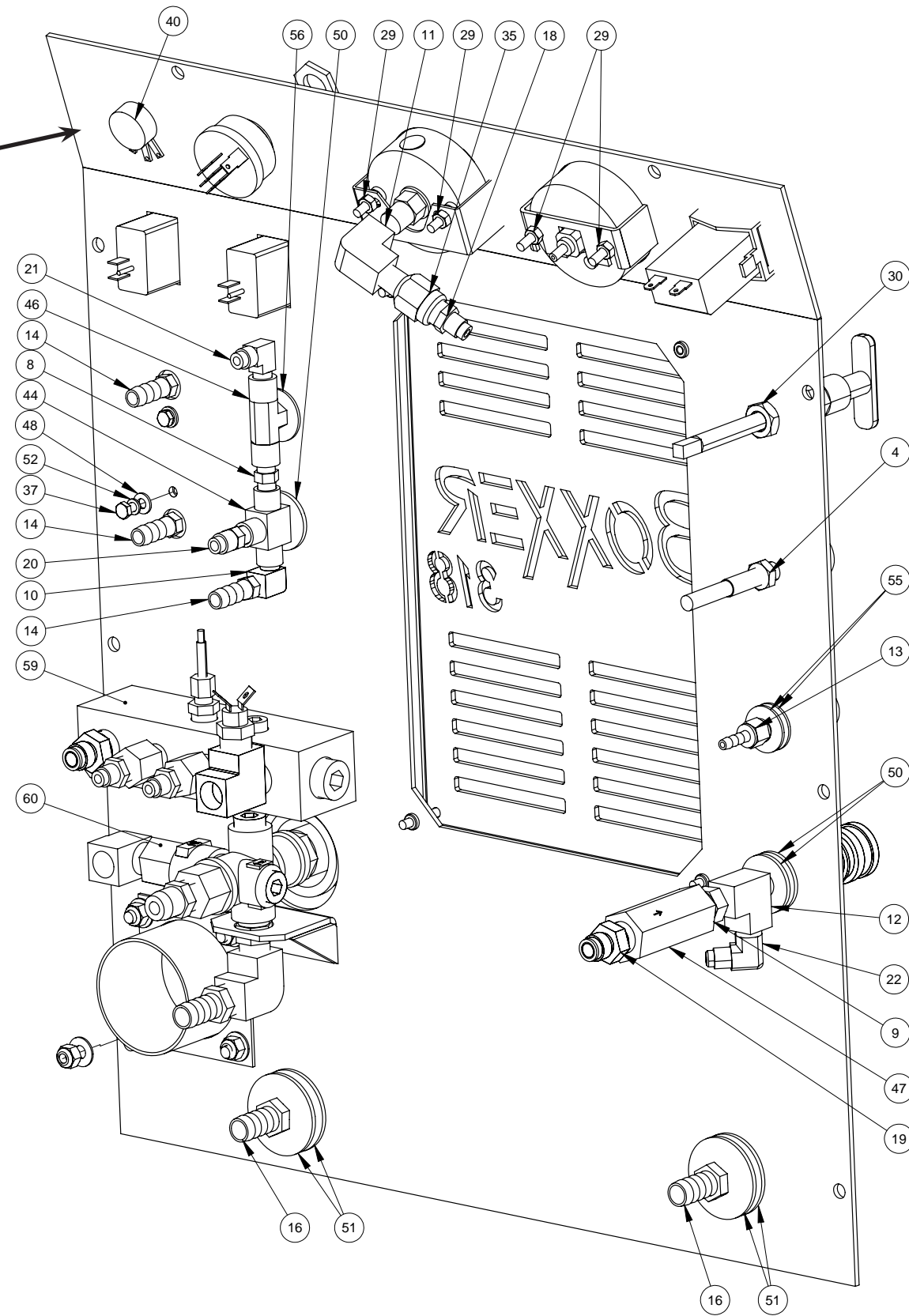


Figure 8-14. Dash Assembly - Back  
7018 Rev. C

**NOTICE**

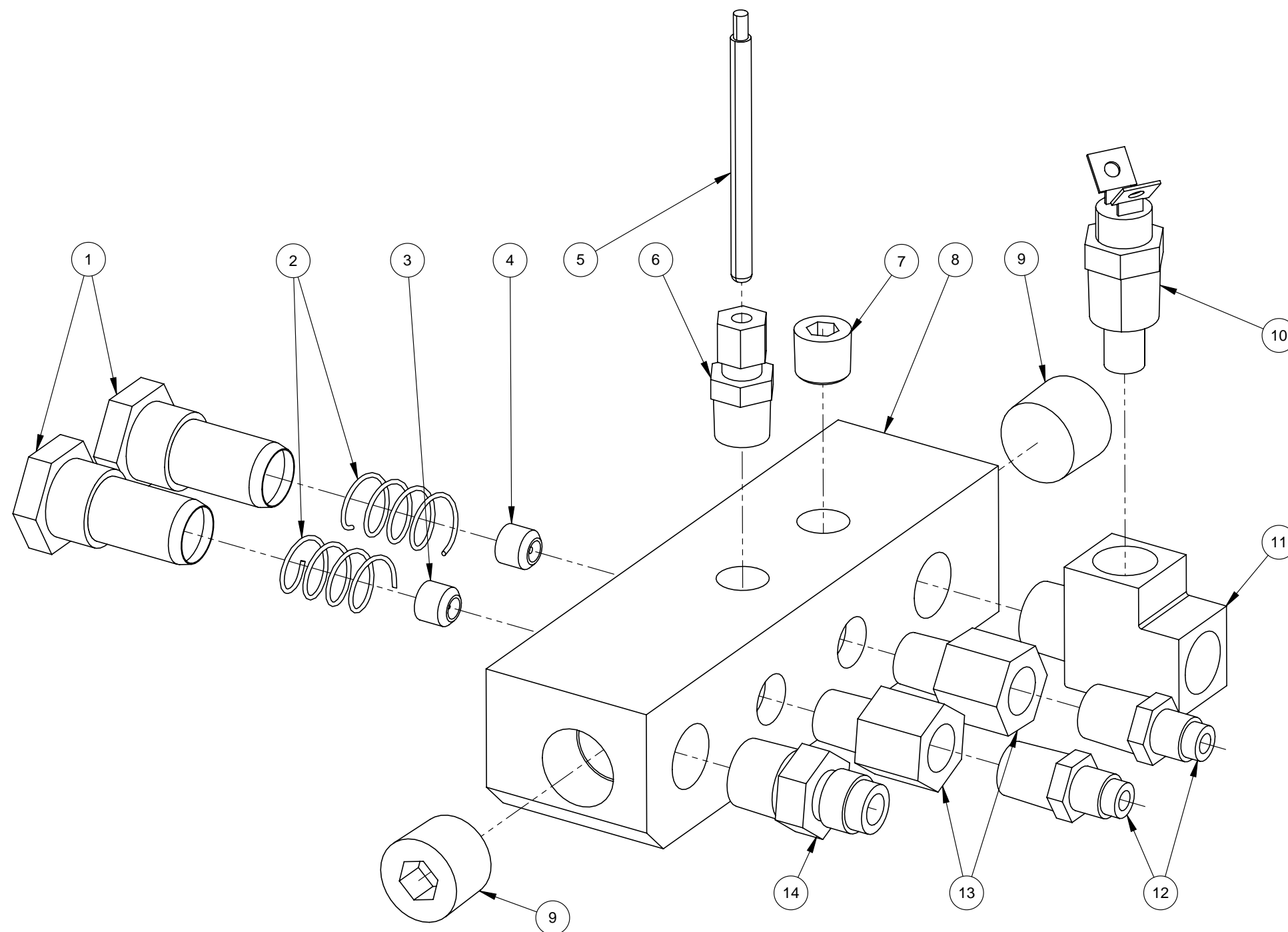
To order a spare thermostat (P/N 000-149-560), specify P/N 000-149-561.



## Dash Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	---	Chemical Metering Valve - Knob Only	1	33	000-100-170	Panel, Grill	1
2	---	Knob, 3-Way Ball Valve (Part Of 000-169-0171)	1	34	000-131-131	Trimlok, 3/8" X 1/8" Rubber	1
3	000-001-148	Adapter, 2.5" Exhaust Turndown	1	35	000-135-052	Regulator, Hi PSI Snubber	1
4	000-025-003	Cable, Choke With Detent	1	36	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
5	000-025-020	Cable, Throttle Locking	1	37	000-143-166	Screw, #10-24UNC X 3/8" Lg. Hex Head	2
6	000-052-051	Quick Connect, 440 Female w/ EPDM O-Ring	1	38	000-143-171	Screw, #10-24UNC X 1.25" Hex Head	4
7	000-052-052	Quick Connect, 660 3/8" Brass w/ EPDM O-Ring	1	39	000-143-542	Screw, 1/4"-28UNF X 0.50" Lg. Hex Head	2
8	000-052-069	Nipple, 1/8" NPT Hex	1	40	000-149-560	Thermostat, Potentiometer (see note on page 8-19)	1
9	000-052-073	Nipple, 3/8" NPT X 1/4" NPT Hex	1	41	000-155-053	Spring, 1/4" Belleville Washer	2
10	000-052-084	Elbow, 1/8" NPT Street	1	42	000-157-017	Switch, Ignition - B & S	1
11	000-052-088	Elbow, 1/4" FPT X FPT	1	43	000-157-040	Switch, 20 Amp Rocker	2
12	000-052-090	Tee, 1/4" NPT Branch M-F-F	1	44	000-169-0171	Valve, 3-Way Ball O-Ring Style	1
13	000-052-096	Insert, #F23 (1/8" FPT X 3/16" Barb)	1	45	000-169-064	Valve, 3/8" NPT Full Port Ball	1
14	000-052-099	Insert, #26 (1/8" NPT X 3/8" Barb)	3	46	000-169-160	Valve, Chemical Metering	1
15	000-052-104	Insert, #66 (3/8" NPT X 3/8" Barb)	1	47	000-169-219	Valve, Check 80 psi - Last Step Chemical	1
16	000-052-105	Insert, #68 (3/8" NPT X 1/2" Barb)	2	48	000-174-001	Washer, #10 S/S Flat	8
17	000-052-272	Cup, Gravity Feed Oil Blower Lube Port	1	49	000-174-003	Washer, 1/4" Flat	4
18	000-052-527	Nipple, 1/4" SAE X 1/4" NPT	1	50	000-174-007	Washer, 1/2" Flat	3
19	000-052-528	Nipple, 3/8" M Jic X 3/8" NPT	1	51	000-174-008	Washer, 5/8" Flat	4
20	000-052-530	Nipple, 1/4" SAE X 1/8" NPT	1	52	000-174-014	Washer, #10 Lock	2
21	000-052-531	Elbow, 1/8" NPT X 1/4" SAE	1	53	000-174-022	Washer, 7/16" Lock	1
22	000-052-532	Elbow, 1/4" SAE X 1/4" NPT	1	54	000-174-030	Washer, 5/8" I.D. X 7/8" O.D. X 0.010" Thk	1
23	000-061-056	Knob, Temperature Adjustment	1	55	000-174-032	Washer, 3/8" Flat	2
24	000-074-007	Gauge, Pressure 0 -1,500 psi	1	56	000-174-038	Washer, 7/16" SAE Flat	1
25	000-074-017	Gauge, 30" Hg. Vacuum - HydraMaster	1	57	000-174-058	Washer, 21/32" I.D. X 27/32" O.D. Nylon	1
26	000-074-030	Meter, Chemical Flow Raw	1	58	000-174-062	Washer, 1/2" I.D. X 3/4" O.D. X 0.010" Thk	1
27	000-074-170	Meter, Rectangular Hour w/O Bezel	1	59	---	Assembly, Hi PSI Manifold	1
28	000-094-009	Nut, 1/4"-20UNC Nylock	4	60	---	Assembly, By-pass Valve	1
29	000-094-070	Nut, 5mm Nylock	4	61	---	Label, Left Dash	1
30	000-094-092	Nut, 7/16"-20UNF Hex Jam	2	62	---	Label, Right Dash	1
31	000-094-098	Nut, 7/16"-24UNF - 2 Way Metering Valve	1	63	---	Label, Temperature	1
32	000-100-169	Panel, Dash	1	64	---	Label, Dash Warning	1

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

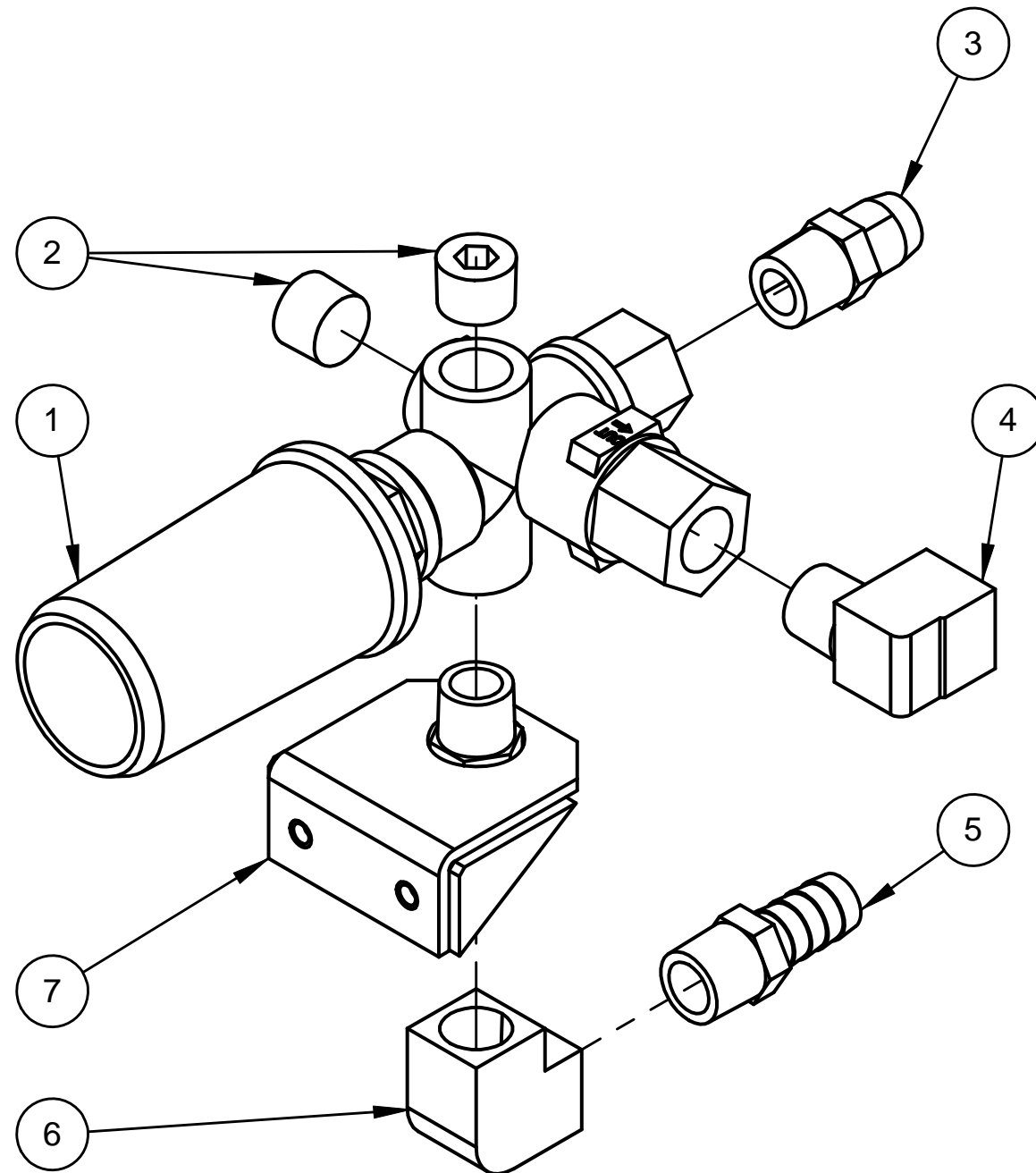


**Hi-PSI Manifold Assembly Parts List**

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

Item	Part Number	Description	Qty
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

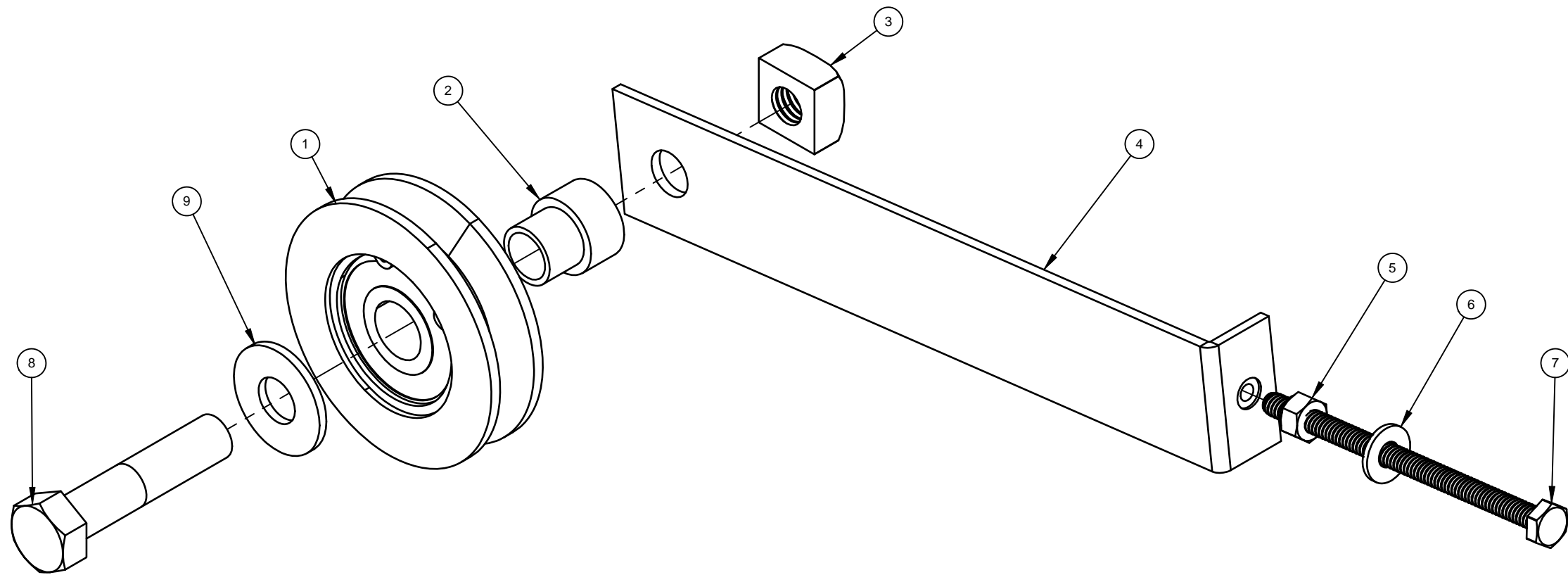
Figure 8-16. By-Pass Valve Assembly  
7078



By-Pass 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, By-pass Valve Mounting	1

**Figure 8-17. Idler Pulley Assembly**  
7080

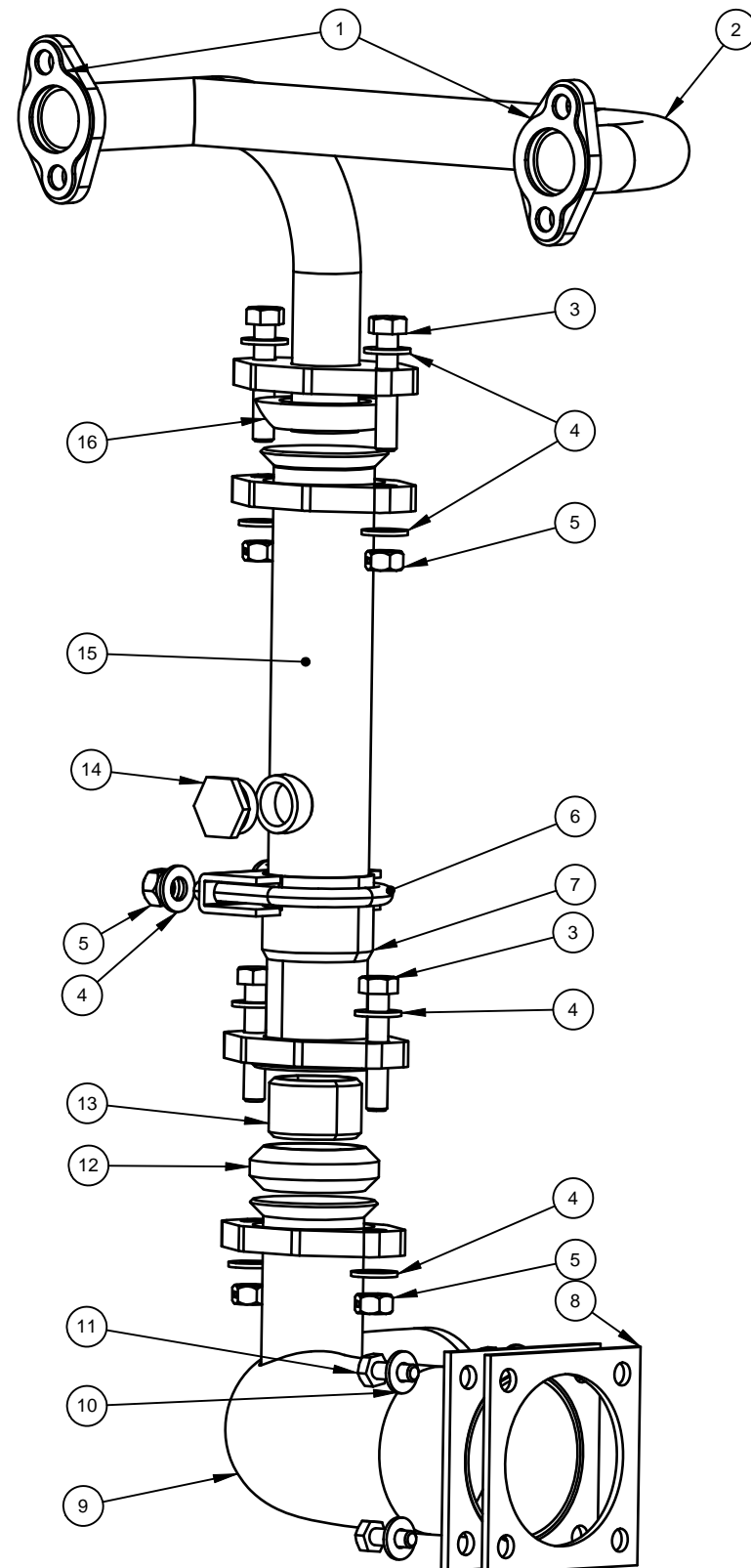


### Idler Pulley Assembly Parts List

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



Figure 8-18. Exhaust Assembly  
7079

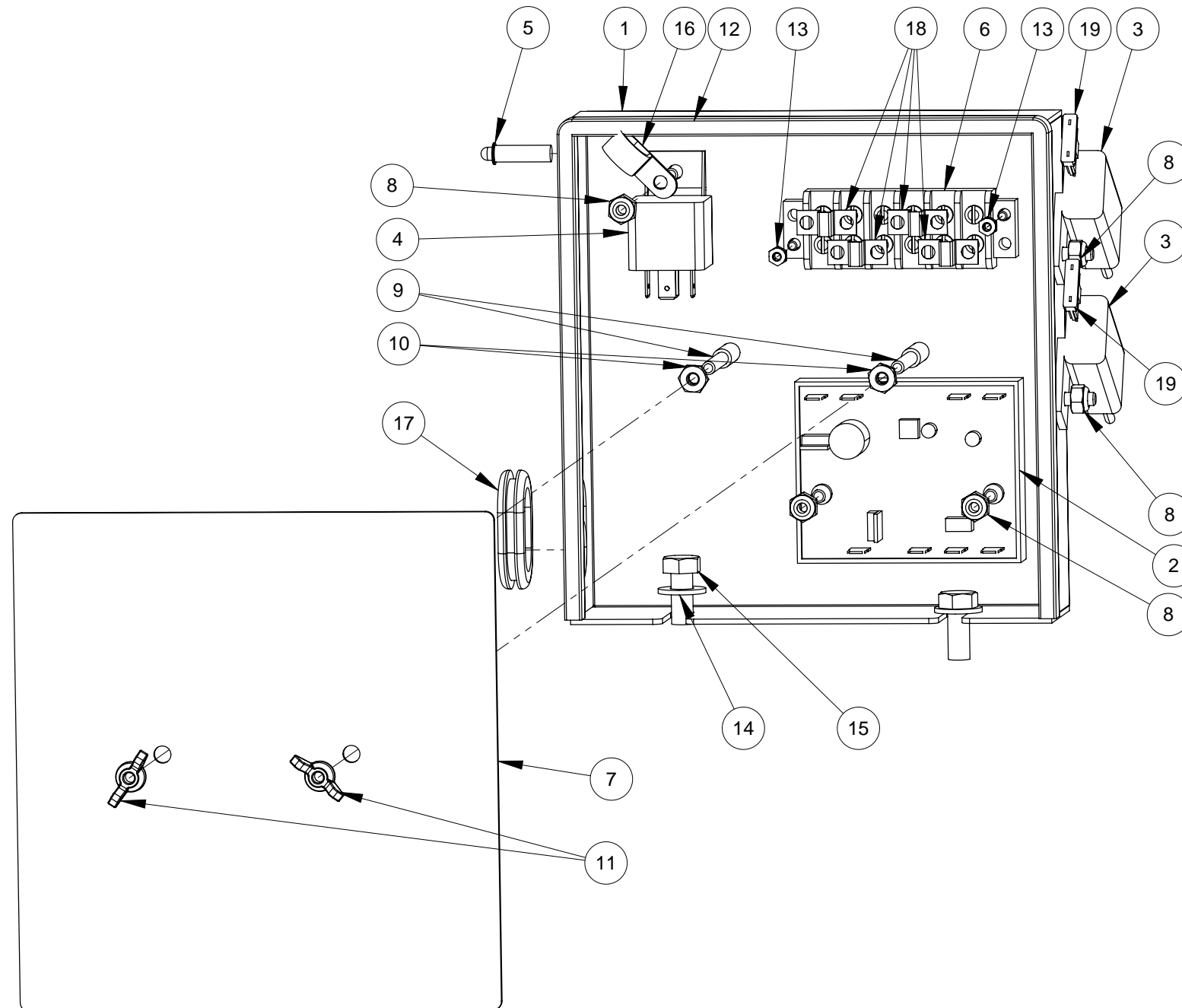


Exhaust Assembly Parts List

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" O.D. 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" O.D. Exhaust w/ Port	1
16	000-057-212	Gasket, Half Donut	1

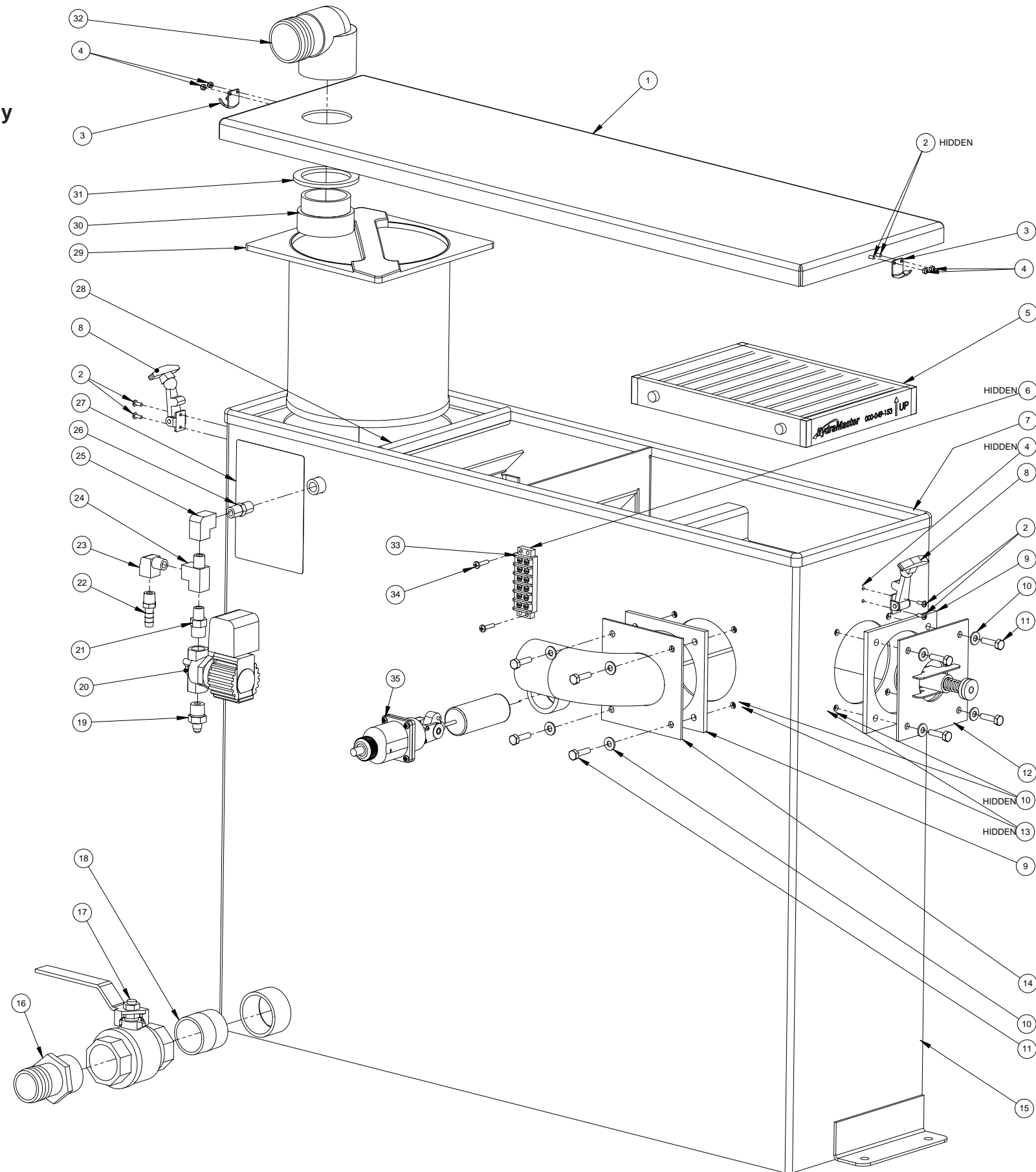
**Figure 8-19. Electrical Panel Assembly**  
7020 Rev. C

## Electrical Panel Assembly Parts List



Item	Part Number	Description	Qty
1	000-100-171	Panel, Electrical - 7" X 7.25"	1
2	000-074-125	Controller, Temp Single Analog Input - RTD	1
3	000-056-006	Fuse Holder, In-Line - Weatherproof	2
4	000-157-022	Switch, Relay	1
5	000-084-010	Light, Green Led Indicator Mini	1
6	000-012-002	Block, 6 Post Terminal	1
7	000-041-460	Cover, Electrical Panel	1
8	000-094-034	Nut, #10-24UNC Nylock	5
9	000-156-030	Stud, #10-32UNF X 2" Lg. S/S	2
10	000-094-058	Nut, #10-32UNF - Nylock	2
11	000-094-108	Nut, #10-32UNF Wing	2
12	000-131-131	Trimlok, 3/8" X 1/8"	1
13	000-094-063	Nut, #6-32UNC Nylock	2
14	000-174-049	Washer, 5/16" Flat	2
15	000-143-012	Screw, 5/16"-18UNC X 3/4" Lg.	2
16	000-033-022	Clamp, 1/2" Nylon Hose	1
17	000-060-014	Grommet, 1.00" I.D. X 1.50" O.D.	1
18	000-037-011	Connector, "Jumper" Terminal Block	4
19	000-056-010	Fuse, 25 Amp	2

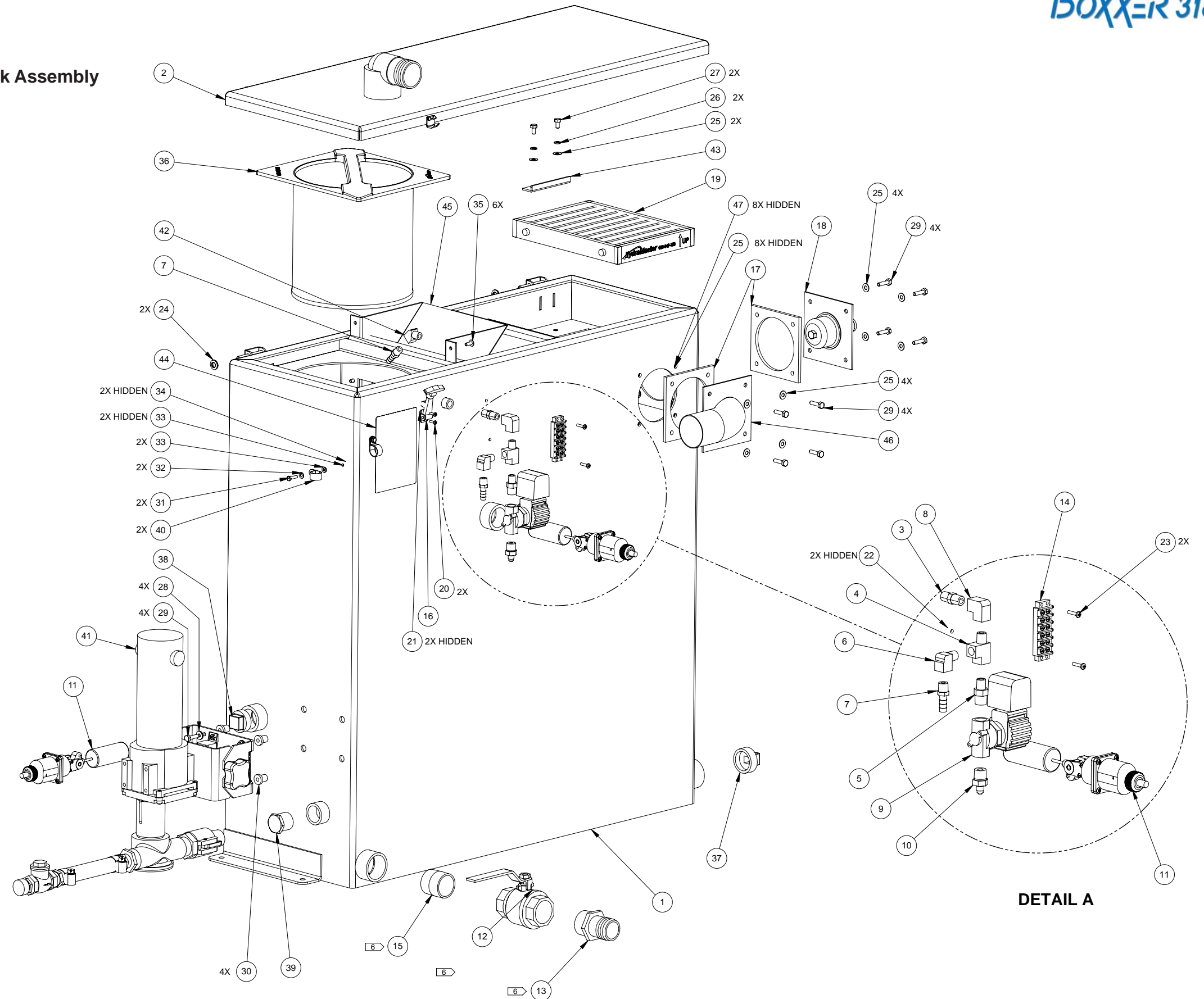
Figure 8-20. 50 Gallon Universal Recovery Tank Assembly  
7230 Rev. B



**50 Gallon Universal Recovery Tank Assembly Parts List**

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-041-459	Cover, Recovery Tank - Weldment	1	19	000-052-662	Nipple, 3/8" NPT x 1/4" M SAE	1
2	000-143-165	Screw, #6-32UNC x 3/8" Lg. Button Head	8	20	000-169-082	Valve, 12 Volt Solenoid 1200 PSI	1
3	000-086-008	Latch, Bungee - Catch	2	21	000-052-073	Nipple, 3/8" NPT x 1/4" NPT Hex	1
4	000-094-063	Nut, #6-32UNC Nylock S/S	8	22	000-052-102	Insert, #46 (1/4" NPT x 3/8" Barb)	1
5	000-049-153	Filter, Flat - Universal Recovery Tank	1	23	000-052-085	Elbow, 1/4" NPT Street	1
6	000-094-059	Nut, #8-32UNC Nylock	2	24	000-052-090	Tee, 1/4" NPT Branch M-F-F	1
7	000-131-021	Trimlok, 5/8" x 1/8"	1	25	000-052-088	Elbow, 1/4" FPT x FPT	1
8	000-086-008	Latch, Bungee - Strike	2	26	000-052-071	Nipple, 1/4" NPT Hex	1
9	000-057-206	Gasket, Adapter - URT	2	27	000-081-039	Label, Maintenance and Lube Schedule	1
10	000-174-003	Washer, 1/4" Flat	16	28	000-131-021	Trimlok, 5/8" x 1/8"	1
11	000-143-002	Screw, 1/4"-20UNC x 1.00" Lg. Hex Head	8	29	000-049-155	Basket, Filter - Small	1
12	- - -	Assembly, Vacuum Relief Valve - URT	1	30	000-052-219	Adapter, 2" NPT x 2" F Slip	1
13	000-094-009	Nut, 1/4"-20UNC Nylock	8	31	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	1
14	000-001-134	Adapter, Tank To Ø2.5" x 90° Blower Hose	1	32	000-052-222	Elbow, 2" Barb x 2" FPT	1
15	000-159-132	Tank, 50 Gallon Universal Recovery	1	33	000-012-002	Block, 6 Post Terminal	1
16	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	1	34	000-143-051	Screw, #8-32UNC x 3/4" Lg. Binder Head	2
17	000-169-022	Valve, 1-1/2" Full Port Ball	1	35	000-157-090	Float, Lever Switch	1
18	000-052-763	Nipple, 1-1/2" IPS Close S/S	1				

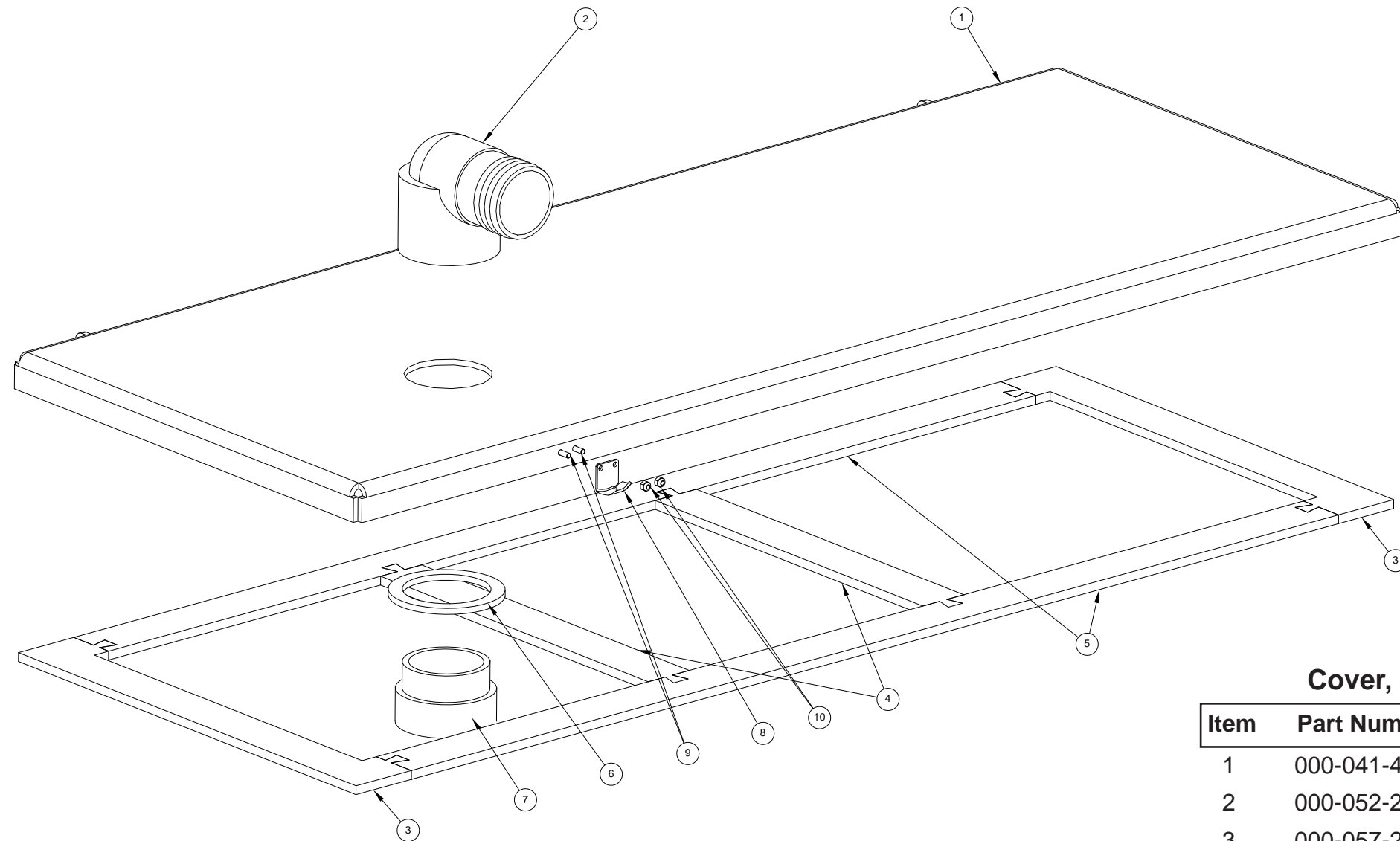
**Figure 8-21. 70 Gallon Universal Recovery Tank Assembly**  
7067 Rev. C



**70 Gallon Universal Recovery Tank Assembly Parts List**

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-159-128	Tank, 70 Gallon URT - Weldment	1	25	000-174-003	Washer, 1/4" Flat	18
2	- - -	Assembly, Cover - Single Vacuum	1	26	000-174-019	Washer, 1/4" Lock	2
3	000-052-071	Nipple, 1/4" NPT Hex	1	27	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	2
4	000-052-090	Tee, 1/4" NPT Branch M-F-F	1	28	000-174-060	Washer, 1/4" Rubber Backed	4
5	000-052-073	Nipple, 3/8" NPT X 1/4" NPT Hex	1	29	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	12
6	000-052-085	Elbow, 1/4" NPT Street	1	30	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	4
7	000-052-102	Insert, #46 (1/4" NPT X 3/8" Barb)	2	31	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	2
8	000-052-088	Elbow, 1/4" FPT X FPT	1	32	000-174-001	Washer, #10 S/S Flat	2
9	000-169-082	Valve, 12 Volt Solenoid 1200 psi	1	33	000-174-036	Washer, #10 Flat Rubber Backed	4
10	000-052-662	Nipple, 3/8" NPT X 1/4" M SAE	1	34	000-094-034	Nut, #10-24UNC Nylock	2
11	000-157-091	Float, Lever Switch	1	35	000-140-023	Rivet, Ab8-6a Aluminum Pop	6
12	000-169-022	Valve, 1-1/2" Full Port Ball	1	36	000-049-152	Filter, Recovery Tank Basket	1
13	000-052-226	Insert, 1-1/2" NPT X 1-1/2" Barb (Grey)	1	37	000-106-019	Plug, 1-1/2" NPT	1
14	000-012-002	Block, 6 Post Terminal	1	38	000-106-046	Plug, 1-1/4" NPT	1
15	000-052-763	Nipple, 1-1/2" Ips Close S/S	1	39	000-106-049	Plug, 1" NPT Black Nylon	1
16	000-086-008	Latch, Bungee - Strike	1	40	000-033-023	Clamp, 3/4" Nylon Hose	2
17	000-057-206	Gasket, Adapter - URT	2	41	000-079-091	Assembly, Dura-Flow APO - Production	1
18	601-050-001	Assembly, Vacuum Relief Valve - URT	1	42	000-052-082	Elbow, 1/4" NPT Street X 45°	1
19	000-049-153	Filter, Flat - Universal Recovery Tank	1	43	000-015-932	Bracket, Flat Filter Securing	1
20	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2	44	- - -	Label, Maintenance & Lube Schedule	1
21	000-094-063	Nut, #6-32UNC Nylock	2	45	000-049-154	Deflector, Air - Universal Recovery Tank	1
22	000-094-059	Nut, #8-32UNC Nylock	2	46	000-001-134	Adapter, Tank To Ø2.5" X 90° Blower Hose	1
23	000-143-051	Screw, #8-32UNC X 3/4" Lg. Binder Head	2	47	000-094-009	Nut, 1/4"-20UNC Nylock	8
24	000-174-029	Washer, 3/8" Rubber Backed	2				

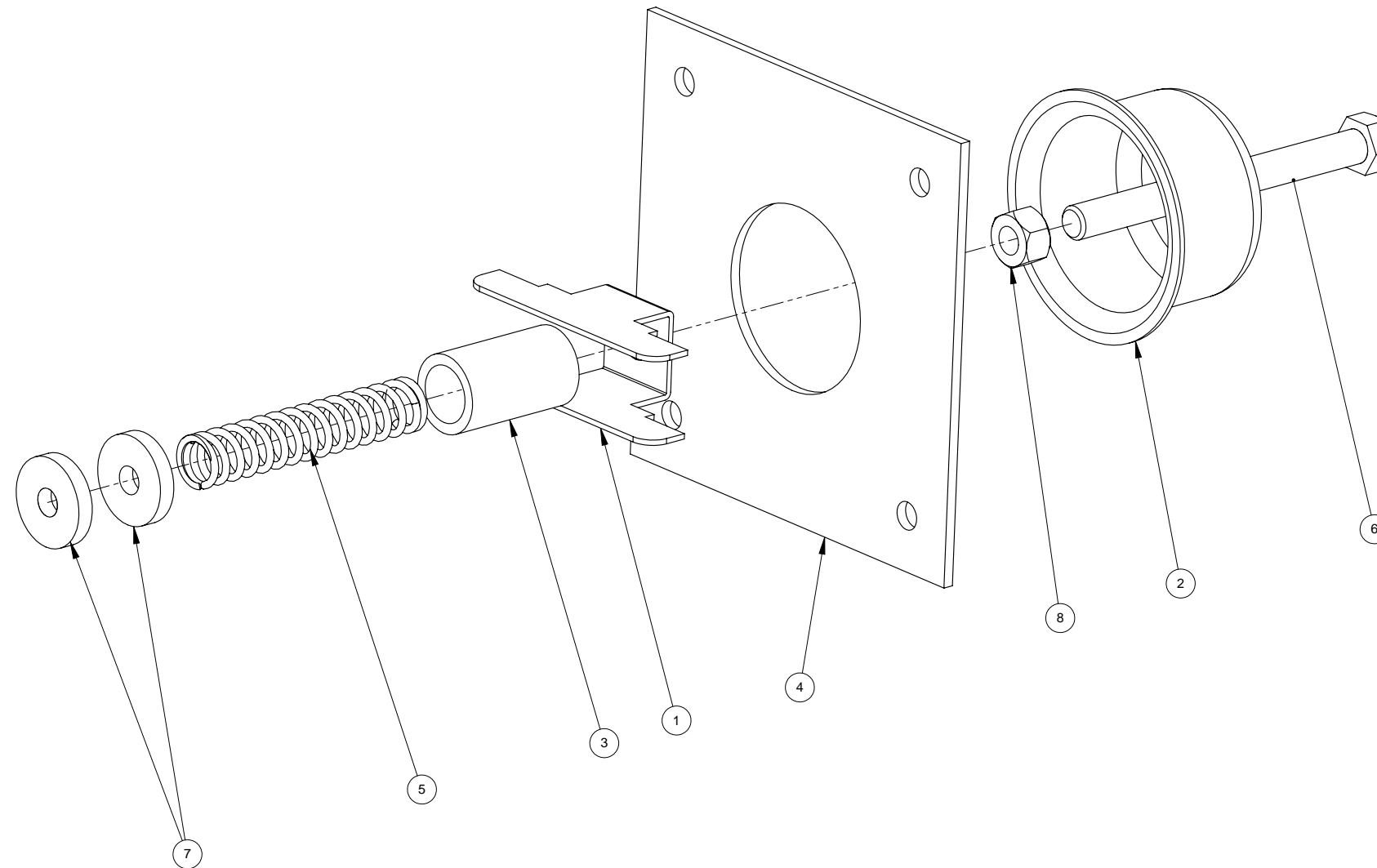
Figure 8-22. Cover, Single Vac. - 70 Gallon URT Assembly  
6891 Rev. A



Cover, Single Vac. - 70 Gallon URT Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-443	Cover, Single Vac. 70 Gallon URT	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	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, Bungee - 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**  
6894 Rev. A



**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, Spun Vacuum Relief Valve	1
3	000-125-111	Tube, Vacuum Relief Spring Guide	1
4	000-105-332	Plate, Vacuum Relief Valve Mounting - URT	1

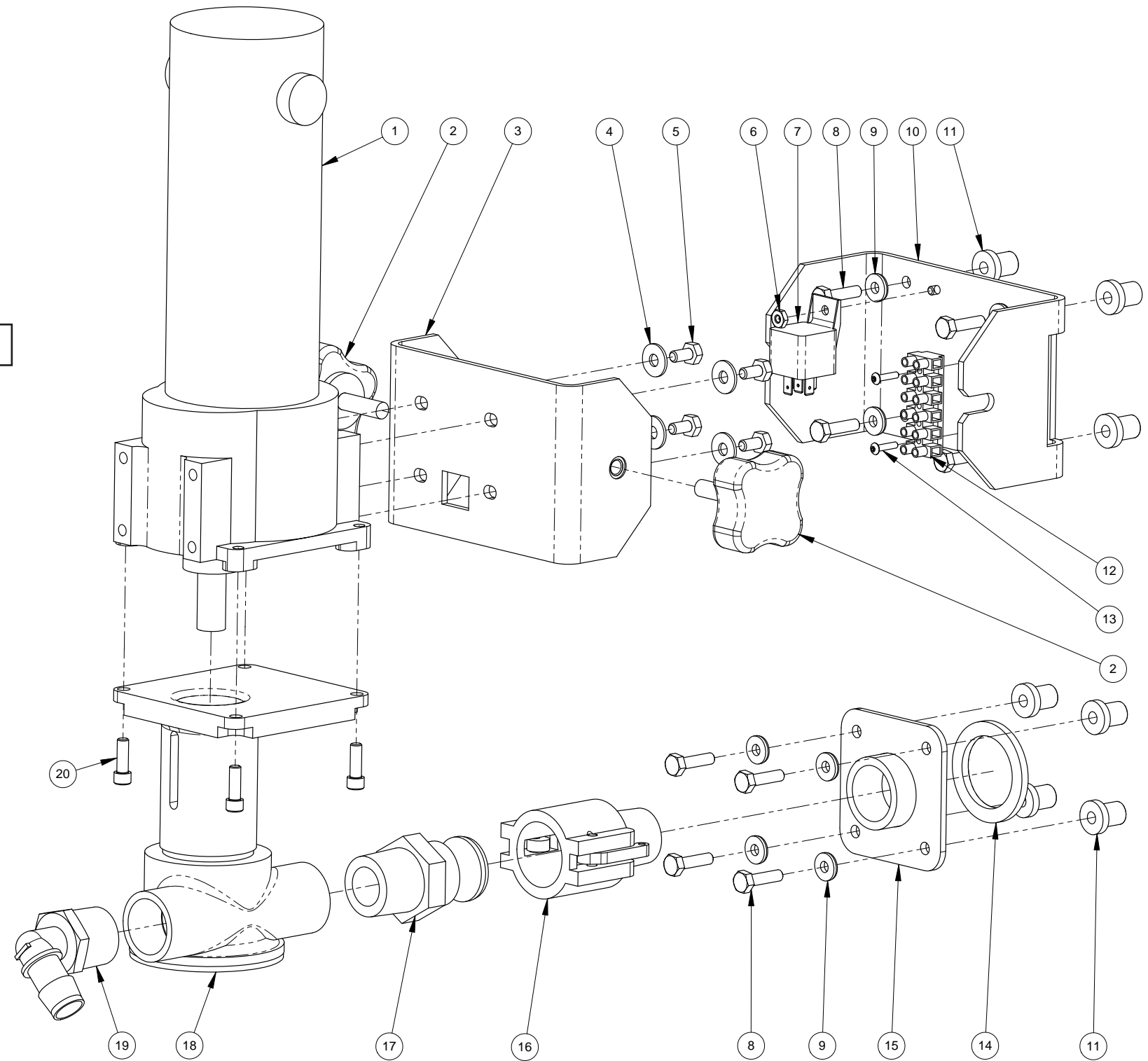
Item	Part Number	Description	Qty
5	000-155-026	Spring, Vacuum Relief Valve	1
6	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	1
7	000-094-077	Nut, 3/8"-16UNC X 1.00" O.D. Knurled	2
8	000-094-101	Nut, 3/8"-16UNC Hex Jam	1



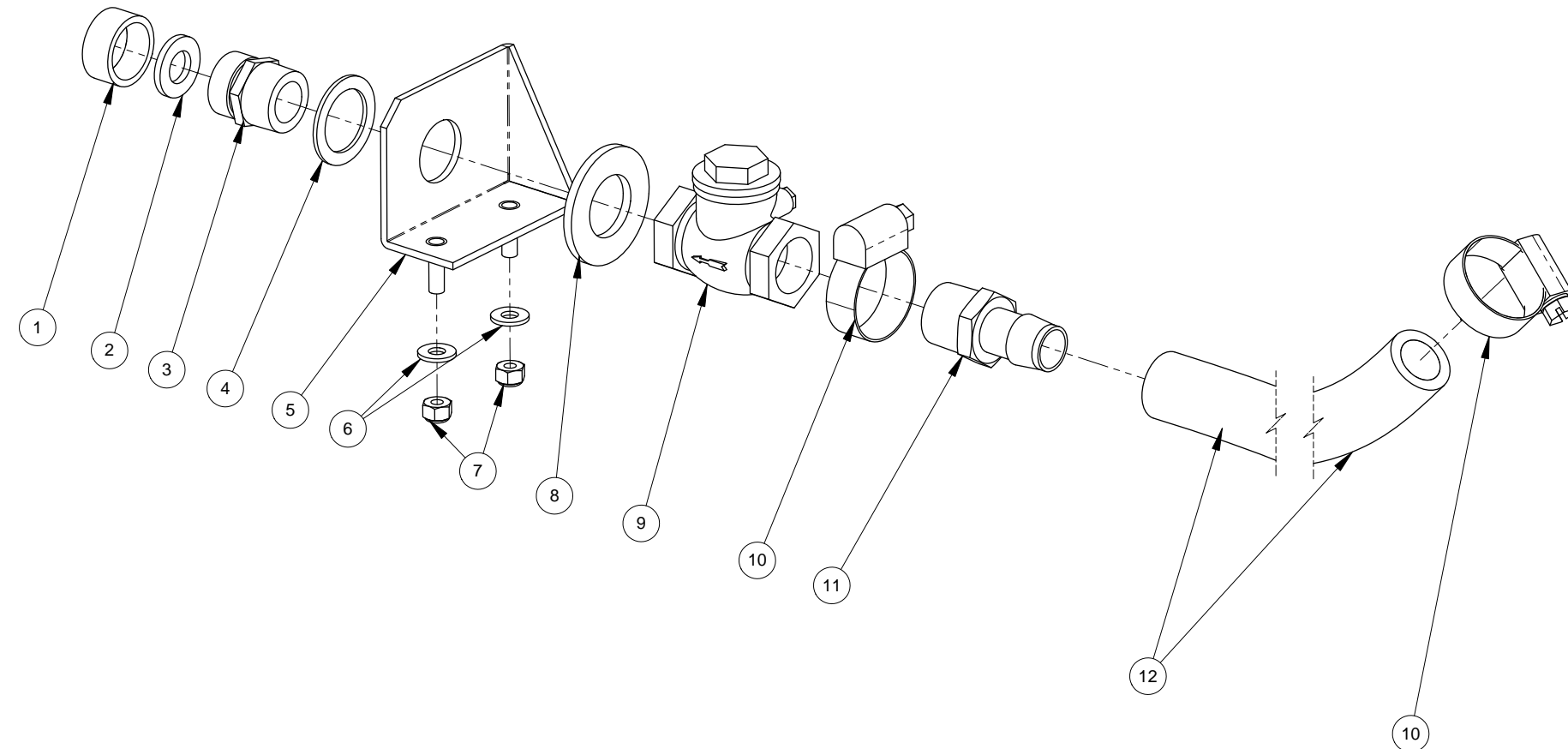
**Figure 8-24. Dura-Flow APO 90° Assembly**  
6313 Rev. A

**Dura-Flow APO 90° Assembly Parts List**

Item	Part Number	Description	Qty
1	000-091-042	Motor, Bison 438 Series	1
2	000-061-131	Knob, Handle	2
3	000-015-891	Bracket, APO Clamp	1
4	000-174-002	Washer, 1/4" Flat	4
5	000-143-074	Screw, 1/4"-20UNC x 0.50" Lg. Hex Head Self-Tapping	4
6	000-094-027	Nut, #10-24UNC Hex	1
7	000-157-022	Switch, Relay	1
8	000-143-002	Screw, 1/4"-20UNC x 1.00" Lg. Hex Head	8
9	000-174-060	Washer, 1/4" Rubber Backed	8
10	000-015-890	Bracket, Tank Mounted on APO Support	1
11	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	8
12	000-012-011	Block, 6 Post Terminal	1
13	000-143-532	Screw, #6-32UNC x 5/8" Lg. Socket Head	2
14	000-057-192	Gasket, APO Bulkhead	1
15	000-052-725	Fitting, APO Bulkhead	1
16	000-052-724	Fitting, 1" NPT Cam Lock - Banjo 100B	1
17	000-052-723	Fitting, 1" NPT Cam Lock - Banjo 100F	1
18	000-111-169	Assembly, APO Pump - Jabsco	1
19	000-052-757	Insert, 1" NPT x 3/4" Elbow	1
20	000-143-566	Screw, 1/4"-28UNF x 0.75" Lg. Socket Head	4



**Figure 8-25. APO Connection Kit Assembly**  
7243

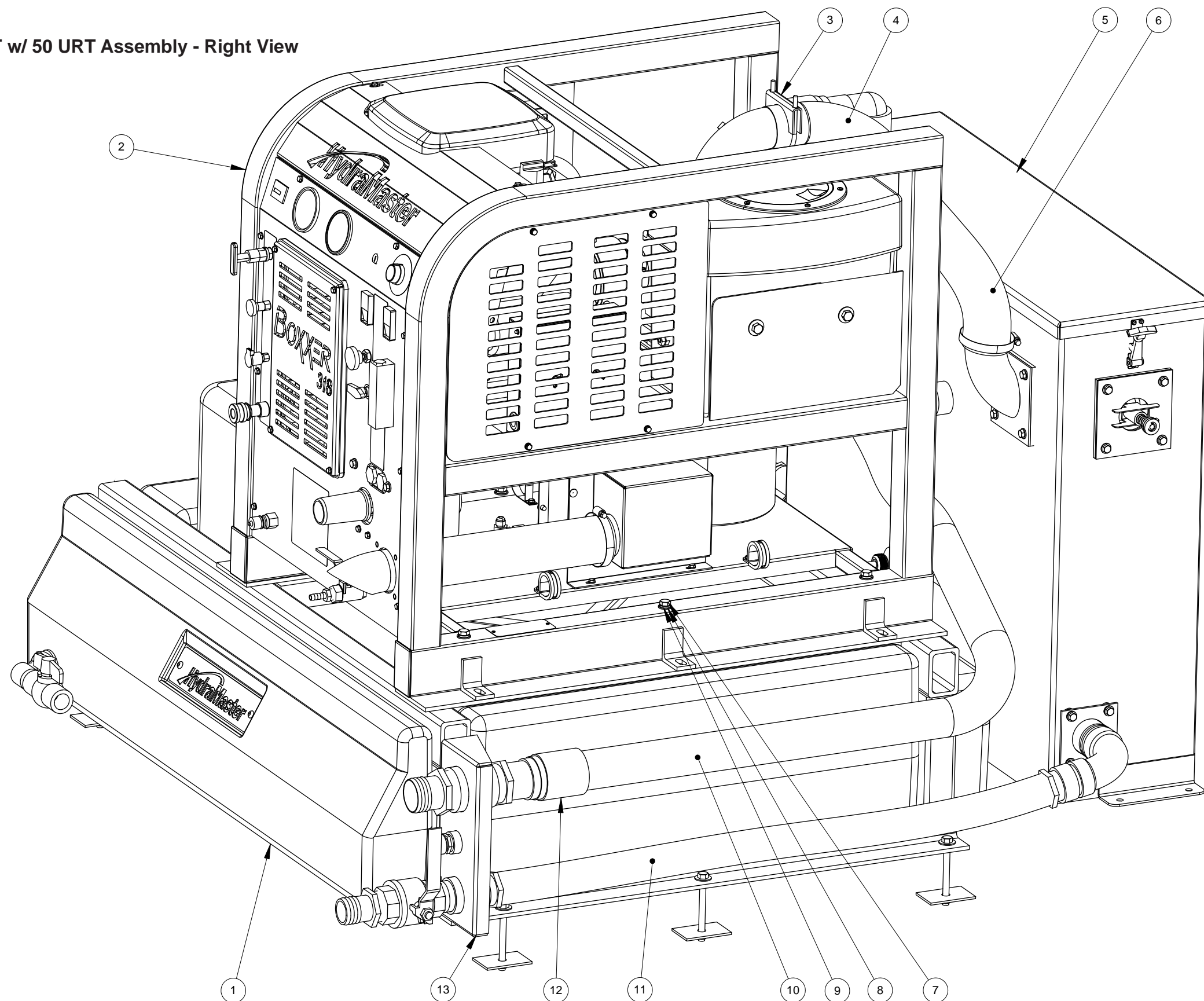


### APO Connection Kit Assembly Parts List

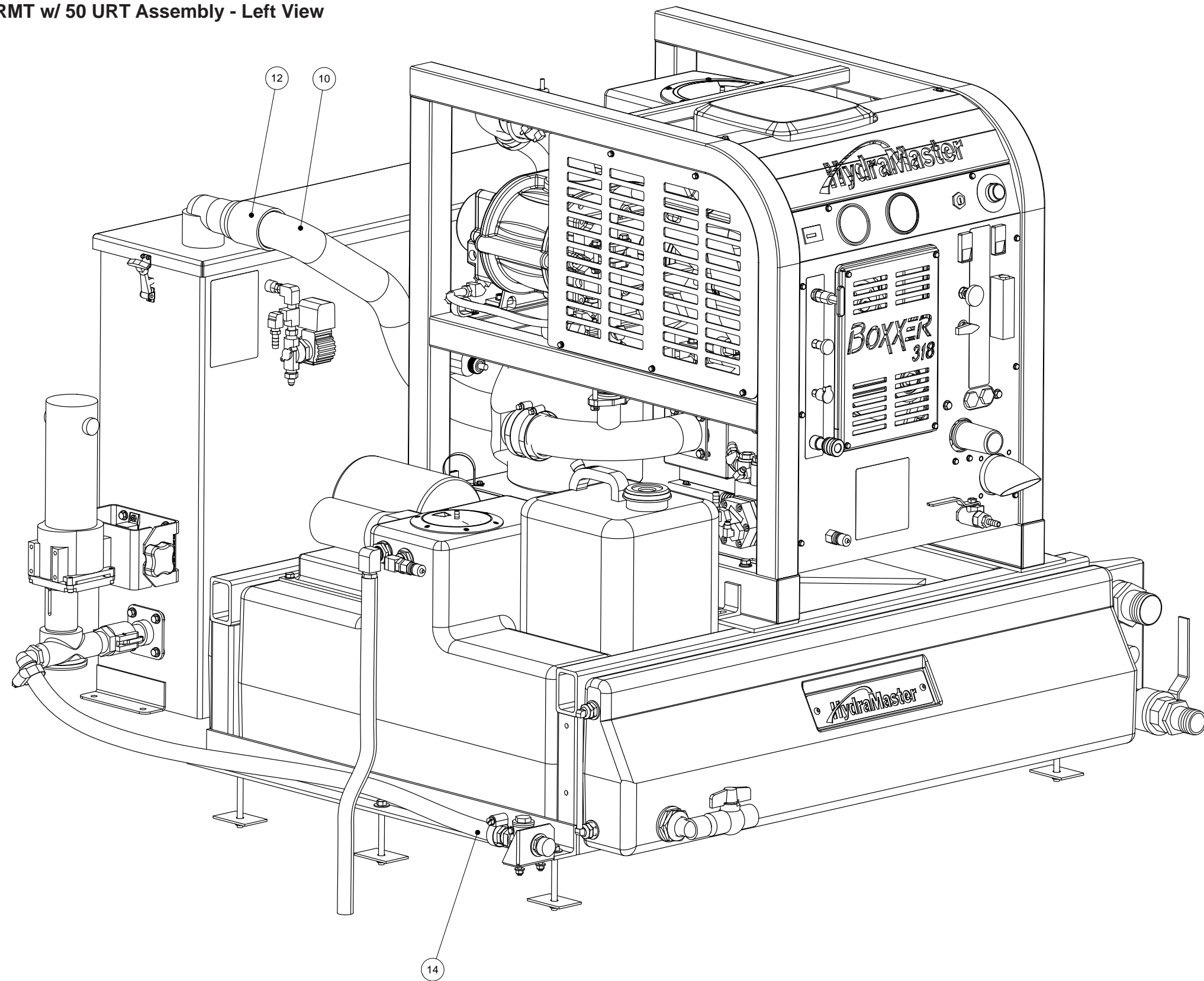
Item	Part Number	Description	Qty
1	000-027-014	Cap, Garden Hose	1
2	000-057-055	Gasket, Garden Hose	1
3	000-052-281	Nipple, 3/4" NPT X 3/4" Male Garden Hose	1
4	000-174-063	Washer, 1.5" O.D. X 1.073" I.D. X 0.075" Thk.	1
5	000-015-719	Bracket, APO Outlet Mounting - Weldment	1
6	000-174-003	Washer, 1/4" Flat	2

Item	Part Number	Description	Qty
7	000-094-009	Nut, 1/4"-20UNC Nylock	2
8	000-174-050	Washer, 1" Flat	1
9	000-169-009	Valve, 3/4" FPT Swing Check	1
10	000-033-020	Clamp, Size #16 Hose	2
11	000-052-338	Insert, #1212 (3/4" NPT X 3/4" Barb)	1
12	000-068-069	Hose, 3/4" I.D. Parker Gst li - Bulk	1

Figure 8-26. Boxxer 318 on 85 RMT w/ 50 URT Assembly - Right View  
7087



**Figure 8-27. Boxxer 318 on 85 RMT w/ 50 URT Assembly - Left View**  
7087

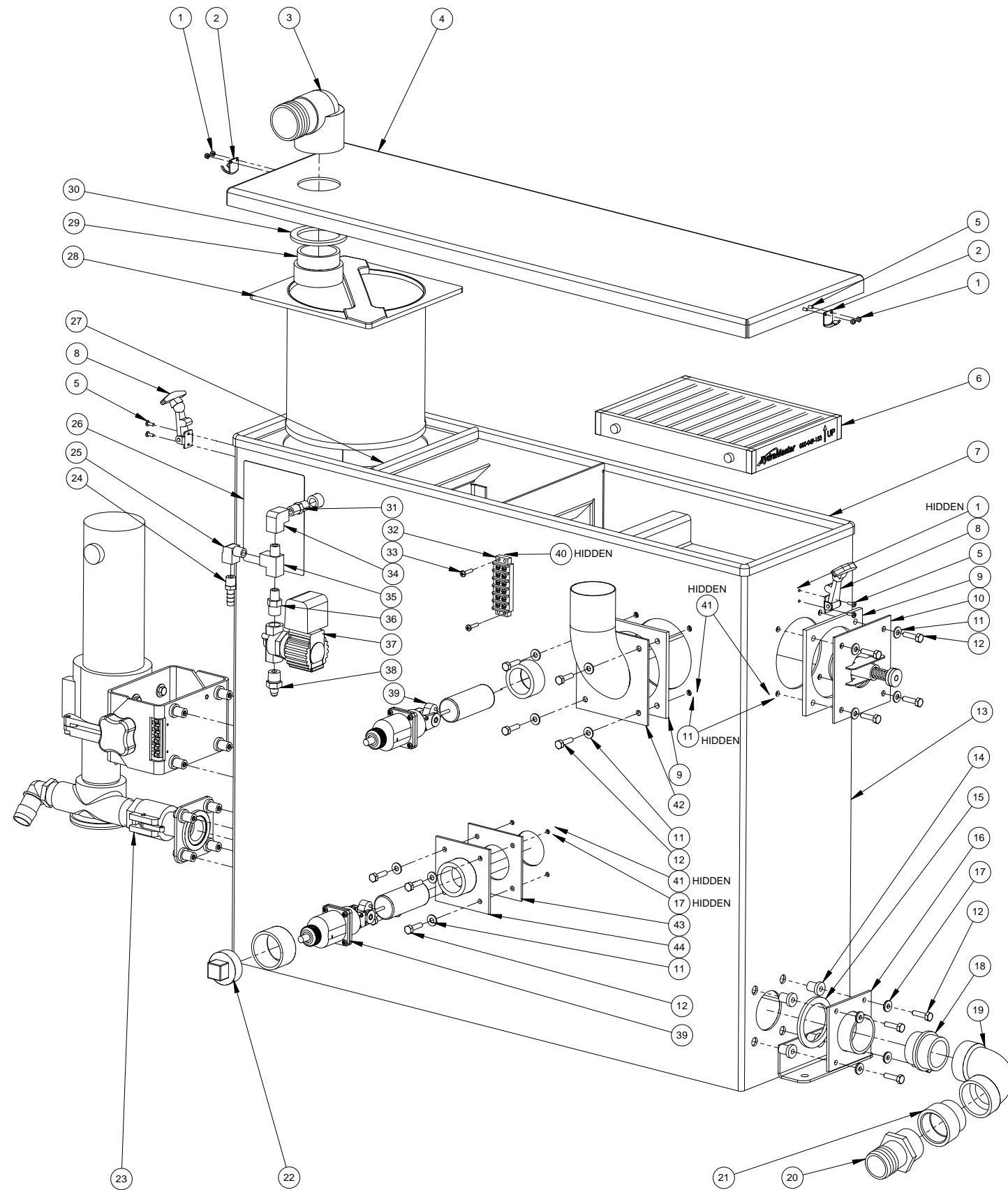


**Boxxer 318 on 85 RMT w/ 50 URT Assembly Parts List**

Item	Part Number	Description	Qty
1	---	Assembly, 85 Gallon Rotomolded Tank	1
2	---	Assembly, Machine	1
3	000-033-058	Clamp, Ø2.5" Muffler	1
4	000-001-107	Adapter, Silencer Exhaust	1
5	---	Assembly, 50 Gallon URT for 85 RMT	1
6	000-068-776	Hose, Ø2.50" I.D. x 30" Lg. Flexible Wire Reinforced	1
7	000-143-150	Screw, 3/8"-16UNC x 4" Lg. Hex Head (Full Thread)	6

Item	Part Number	Description	Qty
8	000-174-005	Washer, 3/8" Flat	6
9	000-174-021	Washer, 3/8" Lock	6
10	000-068-042	Hose, Ø2" Vacuum - Black	1
11	000-068-135	Hose, Ø1.5" Red Stripe Type 55 - Bulk	1
12	000-052-169	Cuff, Ø2" Vacuum Hose	2
13	---	Assembly, Dump and Vacuum Bracket	1
14	---	Assembly, APO Connection Kit	1

Figure 8-28. 50 Gallon URT for 85 RMT Assembly  
6526



### 50 Gallon URT for 85 RMT Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-094-063	Nut, #6-32UNC Nylock S/S	8	23	- - -	Assembly, Dura-Flow APO 90°	1
2	000-086-008	Latch, Bungee - Catch	2	24	000-052-102	Insert, #46 (1/4" NPT x 3/8" Barb)	1
3	000-052-222	Elbow, 2" Barb x 2" FPT	1	25	000-052-085	Elbow, 1/4" NPT Street	1
4	000-041-459	Cover, Recovery Tank - Weldment	1	26	000-081-039	Label, Maintenance and Lube Schedule	1
5	000-143-165	Screw, #6-32UNC x 3/8" Lg. Button Head	8	27	000-131-021	Trimlok, 5/8" x 1/8"	1
6	000-049-153	Filter, Flat - Universal Recovery Tank	1	28	000-049-155	Basket, Filter - Small	1
7	000-131-021	Trimlok, 5/8" x 1/8"	1	29	000-052-219	Adapter, 2" NPT x 2" F Slip	1
8	000-086-008	Latch, Bungee - Strike	2	30	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	1
9	000-057-206	Gasket, Adapter - URT	2	31	000-052-071	Nipple, 1/4" NPT Hex	1
10	- - -	Assembly, Vacuum Relief Valve - URT	1	32	000-012-002	Block, 6 Post Terminal	1
11	000-174-003	Washer, 1/4" Flat	20	33	000-143-051	Screw, #8-32UNC x 3/4" Lg. Binder Head	2
12	000-143-002	Screw, 1/4"-20UNC x 1.00" Lg. Hex Head	16	34	000-052-088	Elbow, 1/4" FPT x FPT	1
13	000-159-132	Tank, 50 Gallon Universal Recovery	1	35	000-052-090	Tee, 1/4" NPT Branch M-F-F	1
14	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	4	36	000-052-073	Nipple, 3/8" NPT x 1/4" NPT Hex	1
15	000-057-216	Gasket, Ø2.200" I.D. x Ø2.875" O.D.	1	37	000-169-082	Valve, 12 Volt Solenoid 1200 PSI	1
16	000-001-153	Adapter, 1-1/2" FPT x 4 Bolt Flange	1	38	000-052-662	Nipple, 3/8" NPT x 1/4" M SAE	1
17	000-174-060	Washer, 1/4" Rubber Backed	8	39	000-157-090	Float, Lever Switch	2
18	000-052-316	Adapter, 1-1/2" NPT x 1-1/2" M Slip	1	40	000-094-059	Nut, #8-32UNC Nylock	2
19	000-052-246	Elbow, 1-1/2" F Slip x F Slip Sweep	1	41	000-094-009	Nut, 1/4"-20UNC Nylock	12
20	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	1	42	000-001-134	Adapter, Tank To Ø2.5" x 90° Blower Hose	1
21	000-052-243	Adapter, 1-1/2" FPT x 1-1/2" M Slip	1	43	000-057-175	Gasket, Harwil Float	1
22	000-106-019	Plug, 1-1/2" NPT	1	44	000-052-750	Fitting, Bulkhead - Harwil Float	1

**Figure 8-29. Boxxer 318 on 85 RMT w/ 70 URT Assembly - Right View**  
7247

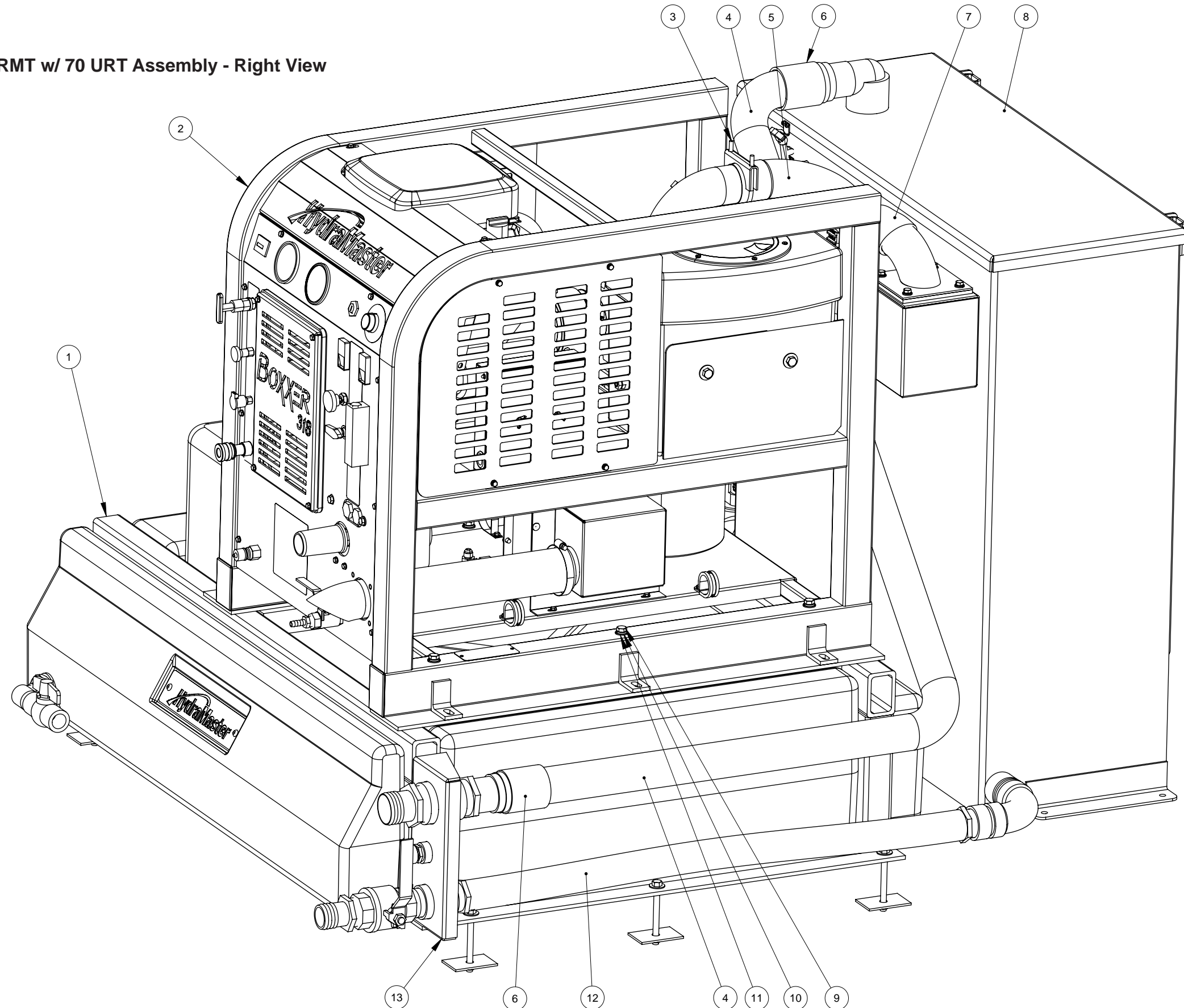
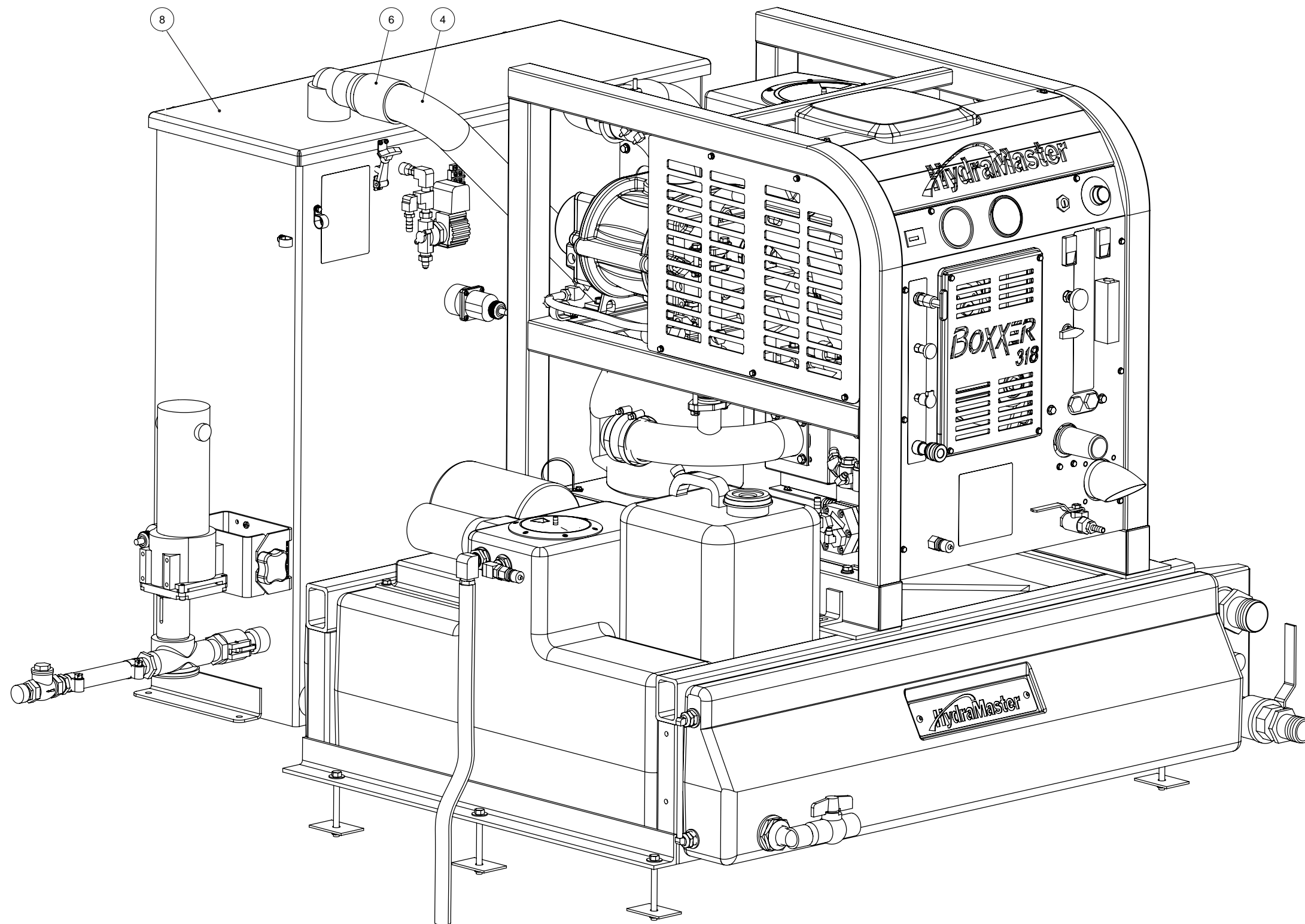




Figure 8-30. Boxxer 318 on 85 RMT w/ 70 URT Assembly - Left View  
7247

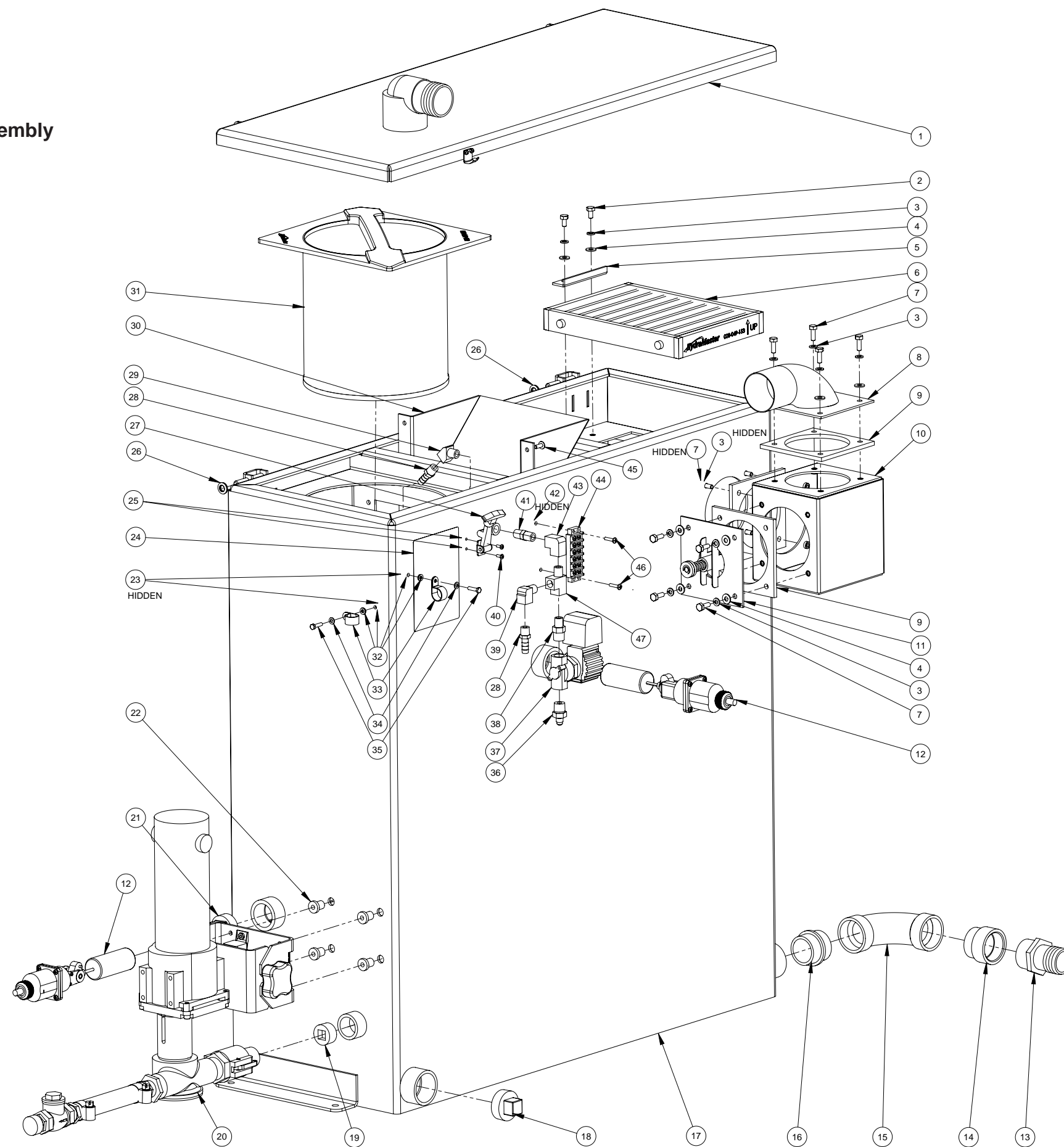


**Boxxer 318 on 85 RMT w/ 70 URT Assembly Parts List**

Item	Part Number	Description	Qty
1	---	Assembly, 85 Gallon Rotomolded Tank	1
2	---	Assembly, Machine	1
3	000-033-058	Clamp, Ø2.5" Muffler	1
4	000-068-042	Hose, Ø2" Vacuum - Black	1
5	000-001-107	Adapter, Silencer Exhaust	1
6	000-052-169	Cuff, Ø2" Vacuum Hose	2
7	000-068-776	Hose, Ø2.50" I.D. x 30" Lg. Flexible Wire Reinforced	1

Item	Part Number	Description	Qty
8	---	Assembly, 70 Gallon URT for 85 RMT	1
9	000-143-150	Screw, 3/8"-16UNC x 4" Lg. Hex Head (Full Thread)	6
10	000-174-021	Washer, 3/8" Lock	6
11	000-174-005	Washer, 3/8" Flat	6
12	000-068-135	Hose, Ø1.5" Red Stripe Type 55 - Bulk	1
13	---	Assembly, Dump and Vacuum Bracket	1

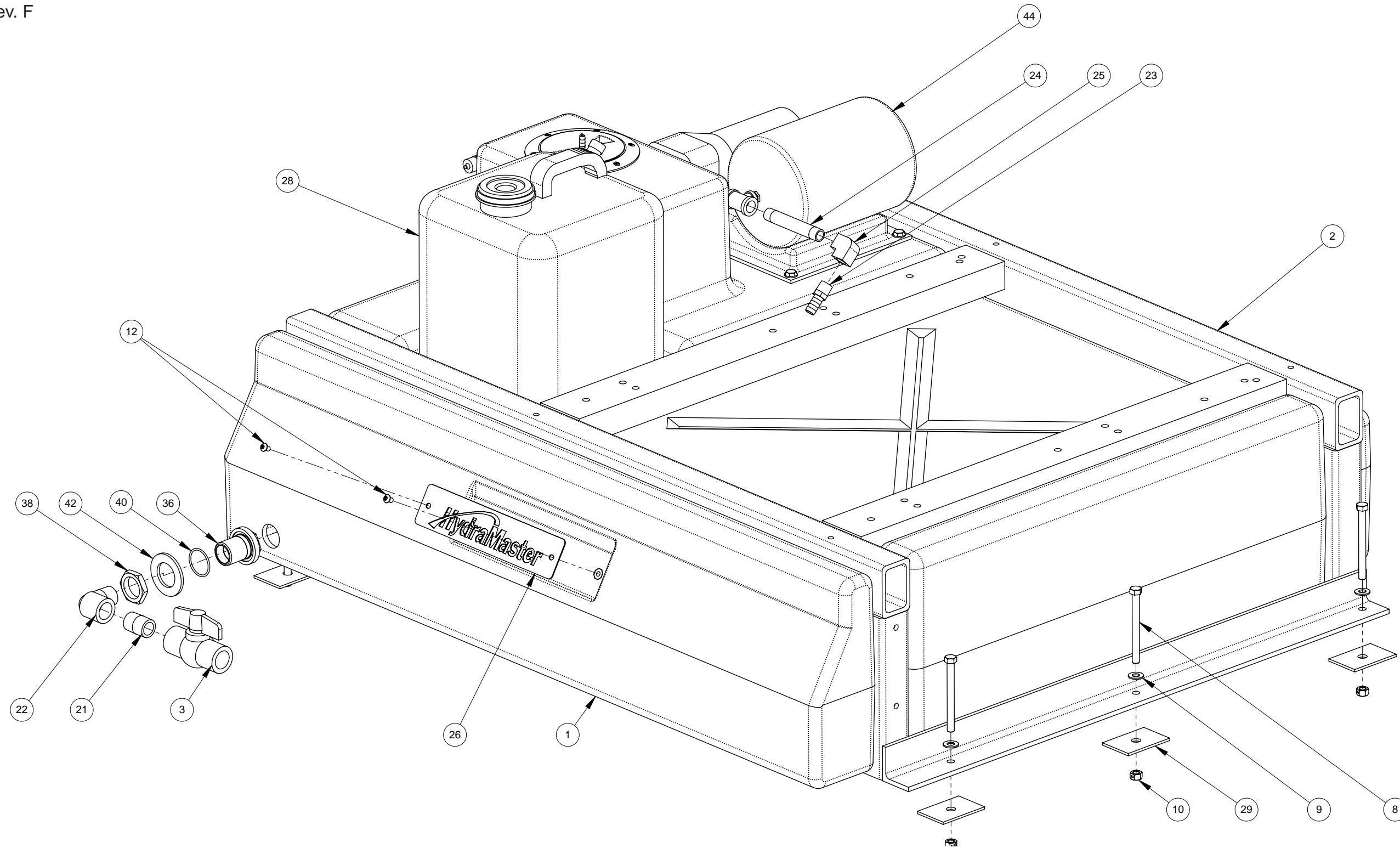
Figure 8-31. 70 Gallon URT for 85 RMT Assembly  
7246



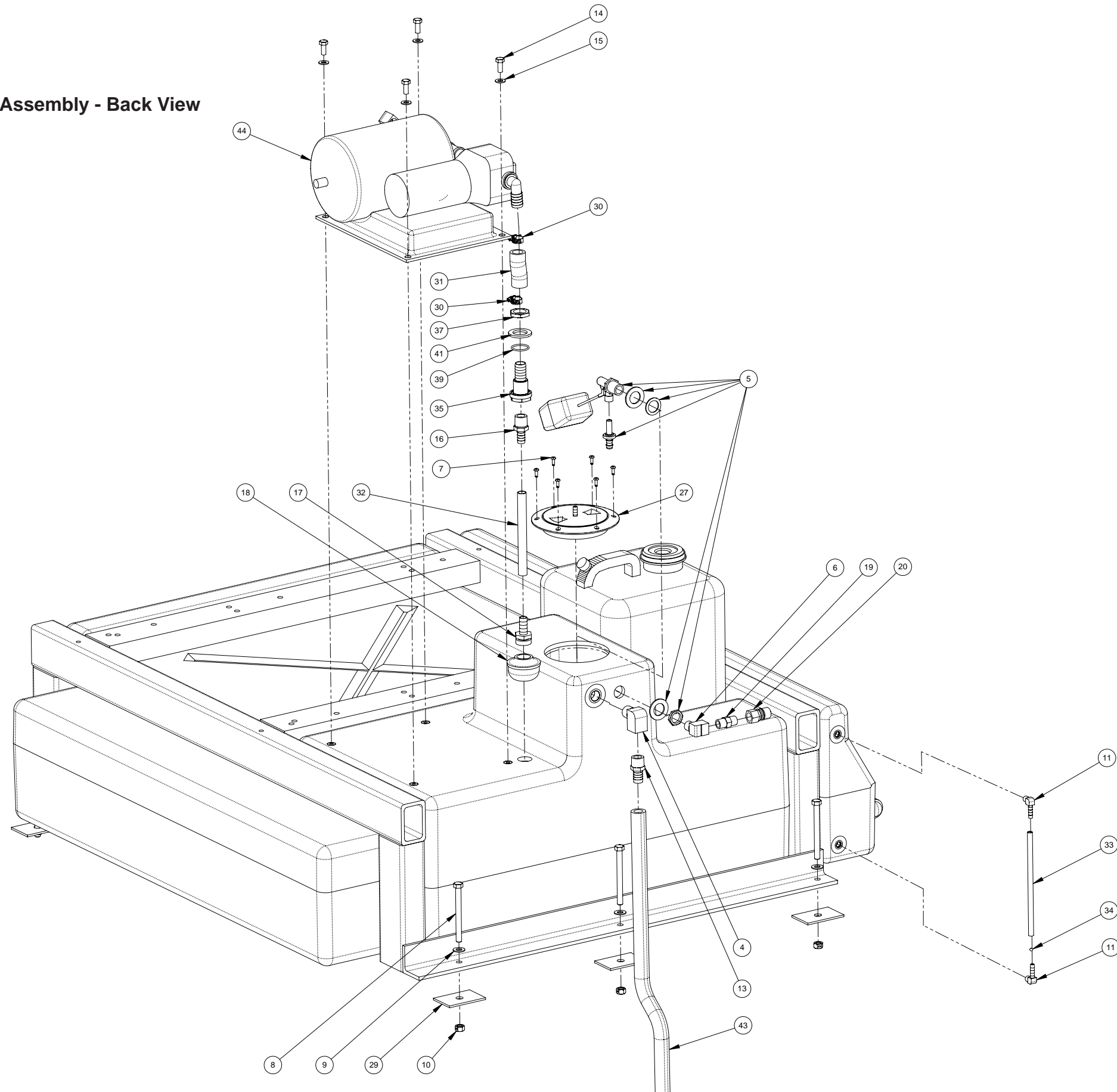
**70 Gallon URT for 85 RMT Assembly Parts List**

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	- - -	Assembly, Cover - Single Vacuum	1	25	000-094-063	Nut, #6-32UNC Nylock S/S	2
2	000-143-333	Screw, 1/4"-20UNC x 0.50" Lg. Hex Head	2	26	000-174-029	Washer, 3/8" Rubber Backed	2
3	000-174-019	Washer, 1/4" Lock	14	27	000-086-008	Latch, Bungee - Strike	1
4	000-174-003	Washer, 1/4" Flat	14	28	000-052-102	Insert, #46 (1/4" NPT x 3/8" Barb)	2
5	000-015-932	Bracket, Flat Filter Securing	1	29	000-052-082	Elbow, 1/4" NPT Street x 45°	1
6	000-049-153	Filter, Flat - Universal Recovery Tank	1	30	000-049-154	Deflector, Air - Universal Recovery Tank	1
7	000-143-001	Screw, 1/4"-20UNC x 0.75" Lg. Hex Head	12	31	000-049-152	Filter, Recovery Tank Basket	1
8	000-001-134	Adapter, Tank To Ø2.5" x 90° Blower Hose	1	32	000-174-036	Washer, #10 Flat Rubber Backed	4
9	000-057-206	Gasket, Adapter - URT	3	33	000-033-023	Clamp, 3/4" Nylon Hose	2
10	000-013-070	Box, Vacuum Relief Valve Box - URT	1	34	000-174-001	Washer, #10 Flat	2
11	- - -	Assembly, Vacuum Relief Valve - URT	1	35	000-143-132	Screw, #10-24UNC x 0.75" Lg. Hex Head	2
12	000-157-090	Float, Lever Switch	2	36	000-052-662	Nipple, 3/8" NPT x 1/4" M SAE	1
13	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	1	37	000-169-082	Valve, 12 Volt Solenoid 1200 PSI	1
14	000-052-243	Adapter, 1-1/2" FPT x 1-1/2" M Slip	1	38	000-052-073	Nipple, 3/8" NPT x 1/4" NPT Hex	1
15	000-052-246	Elbow, 1-1/2" F Slip x F Slip Sweep	1	39	000-052-085	Elbow, 1/4" NPT Street	1
16	000-052-316	Adapter, 1-1/2" NPT x 1-1/2" M Slip	1	40	000-143-165	Screw, #6-32UNC x 3/8" Lg. Button Head	2
17	000-159-128	Tank, 70 Gallon URT - Weldment	1	41	000-052-071	Nipple, 1/4" NPT Hex	1
18	000-106-019	Plug, 1-1/2" NPT	1	42	000-094-059	Nut, #8-32UNC Nylock	2
19	000-106-049	Plug, 1" NPT Allen Head	1	43	000-052-088	Elbow, 1/4" FPT x FPT	1
20	- - -	Assembly, Dura-Flow APO - Production	1	44	000-012-002	Block, 6 Post Terminal	1
21	000-106-046	Plug, 1-1/4" NPT	1	45	000-140-023	Rivet, AB8-6A Aluminum Pop	6
22	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	4	46	000-143-051	Screw, #8-32UNC x 3/4" Lg. Binder Head	2
23	000-094-034	Nut, #10-24UNC Nylock S/S	2	47	000-052-090	Tee, 1/4" NPT Branch M-F-F	1
24	000-081-039	Label, Maintenance and Lube Schedule	1				

Figure 8-32. 85 Gallon Rotomolded Tank Assembly - Front View  
5566 Rev. F



**Figure 8-33. 85 Gallon Rotomolded Tank Assembly - Back View**  
5566 Rev. F

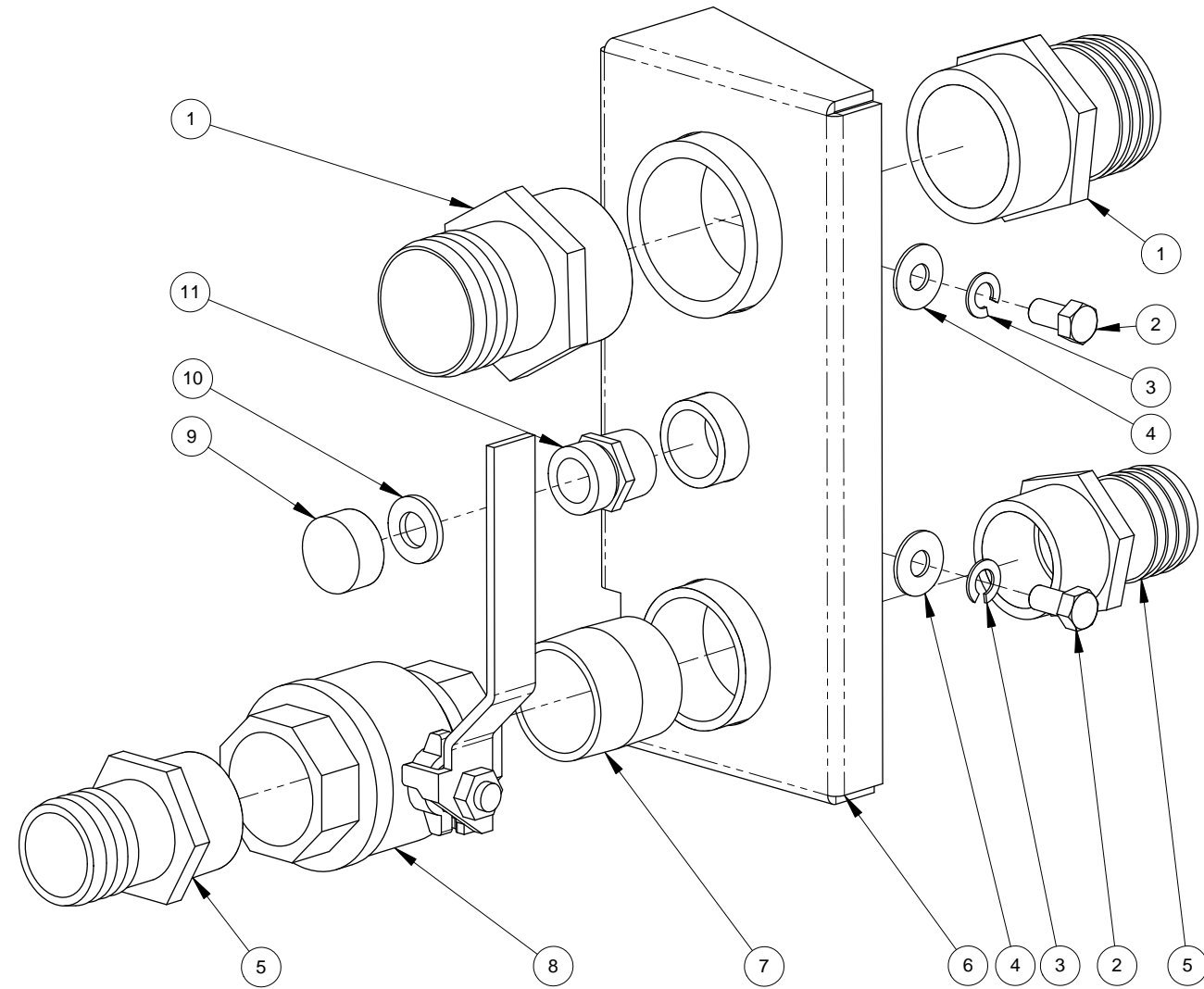


### 85 Gallon Rotomolded Tank Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-159-116	Tank, 85 Gallon Rotomolded Fresh Water	1	23	000-052-105	Insert, #68 (3/8" NPT X 1/2" Barb)	1
2	000-055-169	Frame, Rotomolded Fresh Water Tank	1	24	000-052-408	Nipple, 3/8" NPT X 4" Lg.	1
3	000-169-202	Valve, 3/4" FPT Ball Valve	1	25	000-052-142	Elbow, 3/8" F X F Brass	1
4	000-052-087	Elbow, 1/2" NPT Street	1	26	000-105-313	Plate, HydraMaster Name - Roto Tank	1
5	000-169-218	Valve, Float, Water Box	1	27	000-041-004	Cover, Poly Water Box Mod, W/Vent	1
6	000-052-086	Elbow, 3/8" NPT Street	1	28	000-159-016	Jug, 5 Gallon Plastic Chemical - Standard	1
7	000-143-314	Screw, #8 X 1/2" Lg. Pan Head	6	29	600-011-003	Tie Down Cleat, Washer	6
8	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	6	30	000-033-029	Clamp, Hose, Size 12	2
9	000-174-005	Washer, 3/8" Flat	6	31	000-068-069	Hose, 3/4" I.D. Weatherhead Blue - Bulk	1
10	000-094-015	Nut, 3/8"-16UNC Hex 2-Way Locking	6	32	000-068-018	Hose, 1/2" I.D. Bulk	1
11	000-052-253	Elbow, 1/8" NPT X 1/4" Barb	2	33	000-068-025	Hose, 1/4" I.D. Clear	1
12	000-143-565	Screw, 1/4"-20UNC X 0.375" Lg. Button Head Socket	2	34	000-005-008	Sight Float Bead, 5mm Red Wally Whale	1
13	000-052-130	Insert, #810 (1/2" NPT X 5/8" Barb)	1	35	000-052-785	Bulkhead, 1/2" FPT X 3/4" Barb	1
14	000-143-012	Screw, 5/16"-18UNC X 3/4" Lg.	4	36	000-052-786	Bulkhead, 3/4" FPT	1
15	000-174-049	Washer, 5/16" Flat	4	37	000-094-097	Nut, 1"-14uns Brass	1
16	000-052-107	Insert, #88 (1/2" NPT X 1/2" Barb)	1	38	000-094-121	Nut, 1-5/16"-12un Brass	1
17	000-052-160	Insert, 3/4" M Garden X 1/2" Barb	1	39	000-097-072	O-Ring, 1.06" I.D. X 3/32" Width	1
18	000-049-020	Filter Screen - Medium	1	40	000-097-073	O-Ring, 1.375 I.D. X 3/32" Width	1
19	000-052-074	Nipple, 3/8" NPT Hex	1	41	000-174-173	Washer, 1" I.D. X 1.60 O.D. X 0.135" Thk.	1
20	000-052-052	Quick Connect, 660 3/8" Brass w/ EPDM O-Ring	1	42	000-174-174	Washer, 1.375" I.D.	1
21	000-052-326	Nipple, 3/4" NPT Close	1	43	000-068-020	Hose, .625" I.D. - Green Stripe	1
22	000-052-726	Elbow, 3/4" Street (Grey)	1	44	000-111-170	Pump, Flojet w/ Bladder 40 psi Fresh Water	1

**Figure 8-34. Dump and Vacuum Bracket Assembly**  
7088

**Dump and Vacuum Assembly Parts List**



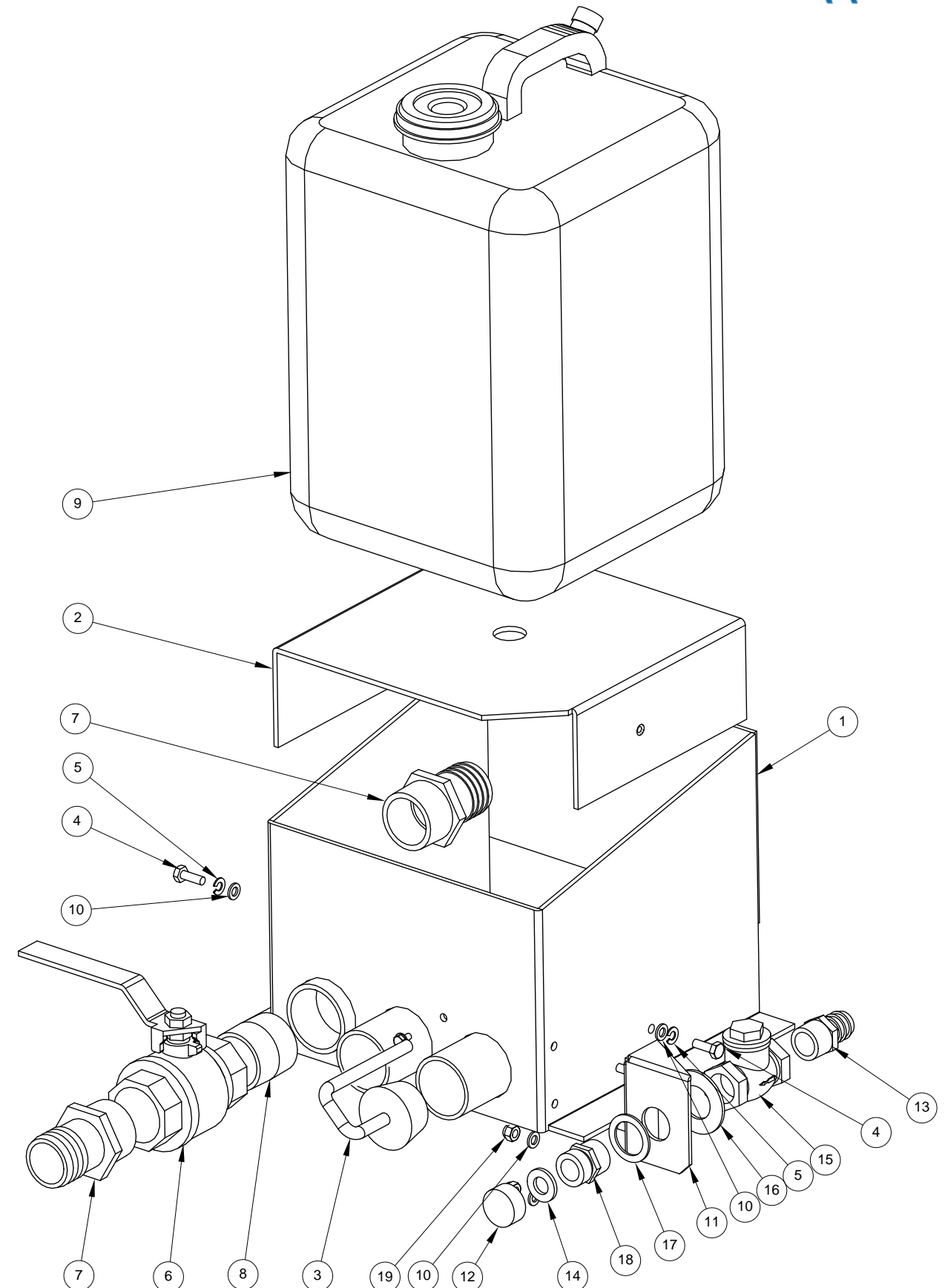
Item	Part Number	Description	Qty
1	000-052-221	Insert, 2" NPT x 2" Barb (Grey)	2
2	000-143-017-1	Screw, 3/8"-16UNC x 3/4" Lg. Hex Head	2
3	000-174-057	Washer, 3/8" Lock	2
4	000-174-032	Washer, 3/8" Flat	2
5	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	2
6	000-015-884	Bracket, Dump and Vacuum Mounting	1
7	000-052-182	Nipple, 1-1/2" NPT Close	1
8	000-169-022	Valve, 1-1/2" Full Port Ball	1
9	000-027-014	Cap, Garden Hose	1
10	000-057-055	Gasket, Garden Hose	1
11	000-052-281	Nipple, 3/4" NPT x 3/4" Male Garden Hose	1



Figure 8-35. Chemical Jug Tray Assembly  
4945 Rev. C

Chemical Jug Tray Assembly Parts List

Item	Part Number	Description	Qty
1	000-166-021	Tray, Chemical Jug - Outer - Weldment	1
2	000-166-025	Tray, Chemical Jug - Inner	1
3	000-078-039	Vacuum Inlet Stopper	1
4	000-143-001	Screw, 1/4"-20UNC x 0.75" Lg. Hex Head	2
5	000-174-019	Washer, 1/4" Lock	2
6	000-169-022	Valve, 1-1/2" Full Port Ball	1
7	000-052-226	Insert, 1-1/2" NPT x 1-1/2" Barb (Grey)	2
8	000-052-182	Nipple, 1-1/2" NPT Close Galvanized	1
9	000-159-016	Jug, 5 Gallon Plastic Chemical - Standard	1
10	000-174-003	Washer, 1/4" Flat	4
11	000-015-720	Bracket, APO Outlet Mounting - Weldment	1
12	000-027-014	Cap, Garden Hose	1
13	000-052-338	Insert, #1212 (3/4" NPT x 3/4" Barb)	1
14	000-057-055	Gasket, Garden Hose	1
15	000-169-009	Valve, 3/4" FPT Swing Check	1
16	000-174-050	Washer, 1" Flat	1
17	000-174-063	Washer, 1.5" O.D. x 1.073" I.D. x 0.075" Thk.	1
18	000-052-281	Nipple, 3/4" NPT x 3/4" Male Garden Hose	1
19	000-094-009	Nut, 1/4"-20UNC Hex Nylock	2



**Machine Hose Routings**

<b>Manufactured Hoses (Crimped Ends)</b>			
<b>Part No.</b>	<b>Description</b>	<b>Hose Routing</b>	
		<b>From</b>	<b>To</b>
000-068-587	3/8" X 17.5" Lg. - Throb	High Pressure Pump	By-pass Valve
000-068-518	3/16" X 18.25" Lg. Teflon (JIC Ends)	High Pressure Pump	Pressure Gauge
000-068-070	3/8" X 12" Lg. Teflon (JIC & MNPT Ends)	By-pass Valve	Heat Ex. Inlet
000-068-070	3/8" X 12" Lg. Teflon (JIC & MNPT Ends)	Heat Ex. Outlet	Manifold
000-068-517	3/16" X 23" Lg. Teflon (JIC Ends)	Chemical Pump	Chem. Selector Valve
000-068-517	3/16" X 23" Lg. Teflon (JIC Ends)	Chem. Selector Valve	Solution Out Elbow
000-068-723	3/16" X 75" Lg. Teflon (JIC Ends)	Secondary Orifice	Dump Solenoid
000-068-626	3/8" x 28.5" Lg. Teflon (JIC Ends)	Manifold	Solution Out Check Valve
000-068-627	3/16" X 44" Lg. Teflon (JIC Ends)	Primary Orifice	Water Box
<b>Cut-to-Length Hoses (Clamps on Ends)</b>			
<b>Part No.</b>	<b>Description</b>	<b>Hose Routing</b>	
		<b>From</b>	<b>To</b>
000-068-018	1/2" Rubber - 67" Lg.	Inlet on Dash	Water Box
000-068-069	3/4" Parker GST II - 50" Lg.	Water Box	High Pressure Pump
000-068-086	1/2" Hi-Temp Rubber - 7" Lg.	Plastic Wye	Drain Valve
000-068-086	1/2" Hi-Temp Rubber - 6" Lg.	By-pass Valve	Plastic Wye
000-068-086	1/2" Hi-Temp Rubber - 37" Lg.	Plastic Wye	Water Box
000-068-085	3/8" Hi-Temp Rubber - 33" Lg.	Chem. Selector Valve	Brass Tee
000-068-085	3/8" Hi-Temp Rubber - 8.5" Lg.	Water Box	Brass Tee
000-068-085	3/8" Hi-Temp Rubber - 72" Lg.	Brass Tee	Insert on Recovery Tank
000-068-326	3/8" Clear w/ Braid - 28.5" Lg.	Chemical Meter	Chemical Pump
000-068-326	3/8" Clear w/ Braid - 60" Lg.	Chemical Jug	Chemical Meter
000-068-030	5/32" Rubber Vacuum - 54" Lg.	Vacuum Gauge	Elbow on Blower
000-068-030	5/32" Rubber Vacuum - 45" Lg.	Blower Lube Port	Elbow on Blower
000-068-104	2-1/2" Silicone - 2.5" Lg.	Blower	Silencer
000-068-104	2-1/2" Silicone - 2.5" Lg.	Silencer	Lower Exhaust Manifold
000-068-122	2-1/2" Silicone - 14.5" Lg.	Heat Exchanger Exit	Exhaust Turn Down

# 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 truckmount, make arrangements with your distributor to either perform the repairs or ship the parts to you.

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.**

## 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.

# 10 - Warranty Information

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

The following topics 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 truckmount 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 descaler, whichever might be necessary, with truckmount'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. Please refer to the Golden Guarantee© Limited Warranty document shipped to you with the Owner's Guide.

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) 775-7272 or email us at: [custsvc@hydramaster.com](mailto:custsvc@hydramaster.com).

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

# 11 - Accessories and Chemical Solutions

HydraMaster's machine accessories are the most innovative collection available in the cleaning industry. For example, our RX-20 Rotary Extractors have changed the shape of carpet cleaning. In addition, our hoses, reels and tanks are of the finest quality construction.

Our carpet care and hard floor care chemical solutions have been specially prepared, not only to give you exceptional cleaning, but also to optimize your truckmount's operation and reliability. HydraMaster's chemical solutions will help maintain your machine's water pump and water heating systems at peak efficiency and also help ensure fewer breakdowns.

HydraMaster's full line of machine accessories and chemicals can enhance cleaning performance while reducing your labor costs, and include:

- Upholstery Tools
- Wands
- Vacuum Hoses
- Tanks
- Van Accessories
- Hose Reels
- Carpet Care Detergents
- Rinse Agents
- Pre-Sprays
- Hard Floor Care Detergents
- Defoamers and Descalers
- Deodorizers and Disinfectants
- Spotting Agents

For more information about our full line of accessories and chemical solutions, refer to the HydraMaster website at <http://www.hydramaster.com>.

To order genuine HydraMaster accessories and chemical solutions, call your nearest authorized HydraMaster Distributor.

## **WARRANTY PROCEDURE**

Warranty coverage is available to you through your local distributor. Please refer to the Golden Guarantee© Limited Warranty document shipped to you with the Owner's Guide.

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) 775-7272 or email us at: [custsvc@hydramaster.com](mailto:custsvc@hydramaster.com).

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



# 11 - Accessories and Chemical Solutions

HydraMaster's machine accessories are the most innovative collection available in the cleaning industry. For example, our RX-20 Rotary Extractors have changed the shape of carpet cleaning. In addition, our hoses, reels and tanks are of the finest quality construction.

Our carpet care and hard floor care chemical solutions have been specially prepared, not only to give you exceptional cleaning, but also to optimize your truckmount's operation and reliability. HydraMaster's chemical solutions will help maintain your machine's water pump and water heating systems at peak efficiency and also help ensure fewer breakdowns.

HydraMaster's full line of machine accessories and chemicals can enhance cleaning performance while reducing your labor costs, and include:

- Upholstery Tools
- Wands
- Vacuum Hoses
- Tanks
- Van Accessories
- Hose Reels
- Carpet Care Detergents
- Rinse Agents
- Pre-Sprays
- Hard Floor Care Detergents
- Defoamers and Descalers
- Deodorizers and Disinfectants
- Spotting Agents

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