



Boxxer XL

Owner's Manual

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**BOXXER
XL**

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1- General Information

The Boxxer XL is a mid-sized truckmount machine designed and manufactured by HydraMaster. It is intended for multitasking in residential and commercial carpet/upholstery cleaning.

The 31 HP Briggs and Stratton engine powers the Boxxer XL's Tuthill 4007 Tri-Lobe vacuum blower and the high pressure water pump, which is rated at 4 gpm (15 litres/minute). The patented heat exchanger system allows for a non-recirculating or "dump-less" subsystem which reduces the need to refill the fresh water tank or empty the recovery tank. *

Purposely designed for quieter operation, the Boxxer XL is rated at approximately 68 dB through the exhaust. (In comparison, a hair dryer or food processor is rated at about 80 - 90 dB.)

Convenient and time-saving maintenance was also a consideration throughout the Boxxer XL's design process. As a result, the following components were specifically positioned to facilitate easy servicing and troubleshooting:

- Heat exchanger core - easy to remove for periodic maintenance and cleaning
- Pump - oil level sight glass, oil fill hole, and belts easy to see and easily accessed
- Electrical box - located at the front of the machine to allow convenient access for troubleshooting, if necessary
- Water box - easy to remove
- Coupler - rubber element can be checked and changed in minutes



* U.S. Patent No. 8,032,976

BOXXER XL

Other features of the Boxxer XL include:

- Dual wand capability
- Aluminum belt guard which also serves as a heat shield
- Dura-Flow Automatic Pump-Out (APO) available as an option
- Exhaust Thru Floor available as an option

You can also select either the HydraMaster 70 gallon (265 litre) recovery tank or a 100 gallon (379 litre) recovery tank.

This Owner's Manual contains installation and operation instructions as well as information required for proper maintenance, adjustment and repair of the Boxxer XL. Component troubleshooting guides have also been included for your convenience.

The intent of this manual is to help you properly understand, maintain and service your Boxxer XL. Follow the directions carefully and you will be rewarded with years of profitable, trouble-free operation.

It is imperative that no section of this manual be overlooked when preparing for operation of the Boxxer XL. Please read the manual to familiarize yourself with the operation of your Boxxer XL, paying special attention to all **Warnings and Cautions**.

This section of the manual contains the following information:

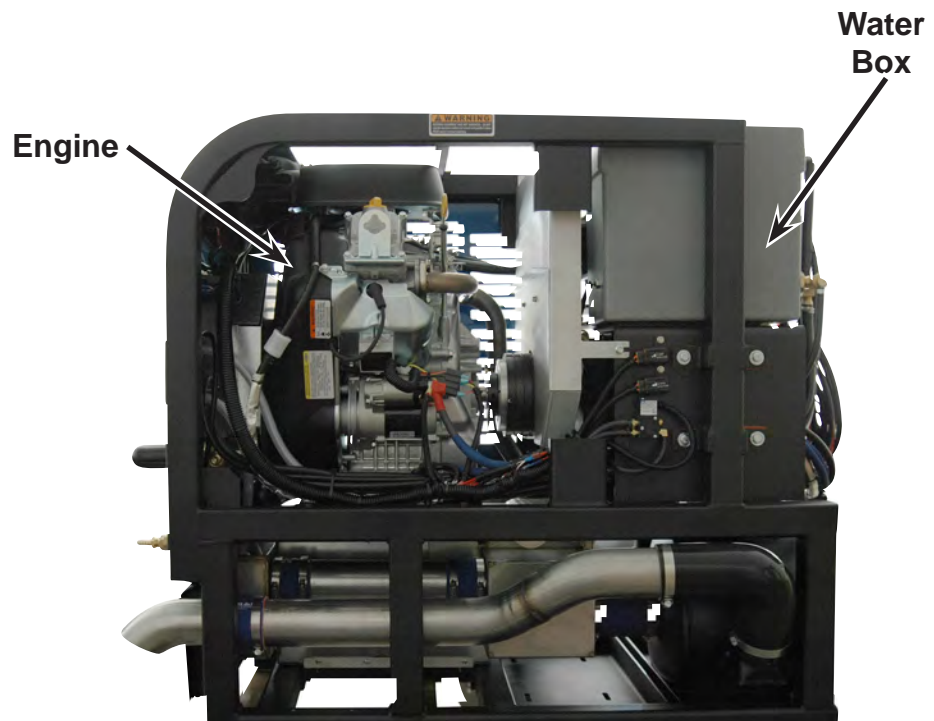
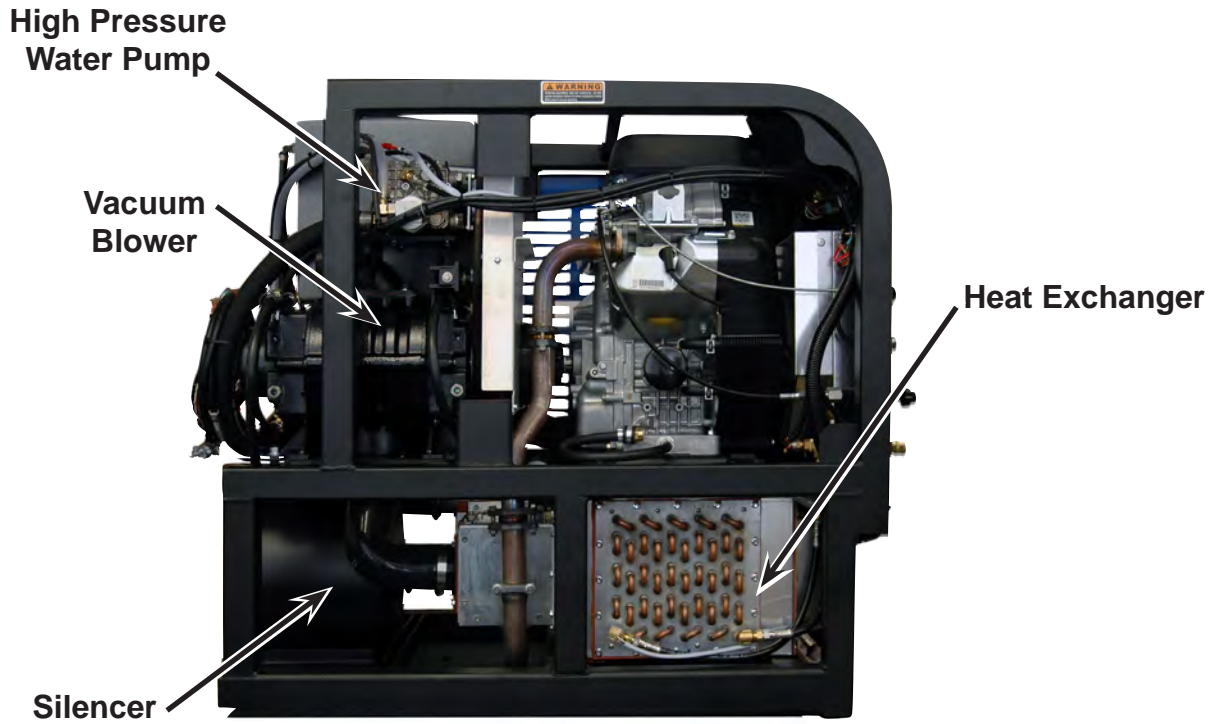
- System Concept
- Contact Information
- Warnings, Cautions and Notices
- Responsibilities
- Machine Specifications
- High Altitude Operation
- Local Water Precautions

NOTICE

Photographs and illustrations included in this document can represent optional equipment as well as standard equipment.

SYSTEM CONCEPT

This Boxxer XL's airflow travels from the vacuum blower, combines with the engine exhaust, streams through the heat exchanger and then through the silencer.





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://hydramaster.com/HowToBuy/DealerLocator.aspx>

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

HOURS	TELEPHONE NUMBERS	E-MAIL ADDRESSES
Monday-Friday 7:00 a.m. to 5:00 p.m. Pacific Time	Technical Support (425) 775-7275 FAX : (800) 426-4225	Technical Support techsupport@hydramaster.com
	Customer Service/Parts (425) 775-7276 FAX: (425) 771-7156	Customer Service/Parts parts@hydramaster.com

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

FOR YOUR REFERENCE:

Serial No. _____

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.

Warnings and Cautions specific to the Boxxer XL include the following:

⚠ 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 ft (3.05 m). 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 8-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.

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.

⚠ WARNING

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 of 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 (3.79 litres) or higher. Using reading than 3.0 grains per gallon (3.79 litres) 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.

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.

CAUTION

Use of the vacuum recovery system when stripping or otherwise removing wax from floors is specifically excluded as an approved use of the truckmount. Failure to follow this exclusion may lead to component failure and will invalidate your warranty.

CAUTION

Use of the vacuum recovery system for "dry cleaning", without corresponding solution application (i.e. duct cleaning), is specifically excluded as an approved use of the truckmount. Failure to follow this exclusion may lead to component failure and will invalidate your warranty.

CAUTION

If concentrated acids or solvents are used to pre-treat surfaces before power washing, do not recover them through the vacuum system. Failure to follow this exclusion may lead to component failure and will invalidate your warranty.

RESPONSIBILITIES

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 and drying equipment. 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 (500+ CC Amps) 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®.

NOTICE

Plywood and carpet are not recommended.

- 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 ***Warnings and Cautions***.
- 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.



Distributor's Responsibility

Acceptance of Shipment

Before accepting the truckmount, check the following:

1. 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 you sign for the shipment.
2. 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.
- Ensure proper placement of the truckmount, recovery tank, fresh water tank, and accessories in the vehicle, and check that they are secured 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 and other accessories 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:

1. How all the truckmount's systems function.
2. All safety precautions and their importance.
3. How to correctly start and shut down the truckmount.
4. How to correctly clean with the truckmount.
5. Where and how often to check and change component oil levels.
6. Freezing damage and how to avoid it. This includes explaining proper freeze guarding procedures.
7. How to do basic troubleshooting of the truckmount.
8. 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.
9. The truckmount's warranty and warranty procedures.



MACHINE SPECIFICATIONS

Frame Dimensions	24" W x 39" H x 41" D (61 cm x 99 cm x 104 cm)	
Weight	800 lbs (363 kg)	
Engine - 31 HP Briggs and Stratton V-Twin Air-cooled	Oil Type	5W-30 Synthetic
	Capacity	2.4 quarts (2.3 litres) - when changing oil and filter
	Engine rpm	3,000 rpm
	Fuel Consumption	1.6 gph (6.1 litres/hour)
Ignition	Electric Key Start	
Vacuum Blower - Tuthill Dominator 4007 (Dual Splash Lubrication)	Oil Type Max. Vac. 12" Hg	PneuLube or other ISO 100 rating
	Gear End Capacity	Approx. 5.8 oz. (171.5 ml)
	Drive End Capacity	Approx. 4.7 oz. (139 ml)
	Blower rpm	3,000 rpm
Water Pump - General Pump	Oil Type	15W-40
	Capacity	14 oz (414 ml)
	Pump Rate	4.0 gpm (15 litres/minute)
Water Box	Rotomolded	4 gallons (15 litres) capacity
Operating Pressure	0 - 1,200 psi (0 - 8,274 kPa)	
Chemical System	Last Step Chemical Injection	
Heating System	Cross Flow Heat Exchanger	Copper Tube and Fin Heat Exchanger

Available Equipment	High Pressure Solution Hose	1/4" High Temperature Lined/Vinyl Cover - 100 ft. (0.635 cm High Temperature Lined/Vinyl Cover -30.5 m)
	Vacuum Hose	2" Vacuum Hose - 100 ft. (5.08 cm Vacuum Hose - 30.5 m)
		1-1/2" Wand Whip Line - 10 ft. (3.81 cm Wand Whip Line - 3.05 m)
	Recovery Hose	10 ft (3.05 m)
	Recovery Tank	70 gallon (265 litre) Universal Tank
		100 gallon (379 litre) Universal Tank
	Cleaning Wand/Tool	Stainless Steel S-bend
		Replaceable Grip
		Rebuildable Solution Valve
	Garden Hose	
	Chemical Jug	5 gallon (19 litres)
	Battery Box	
	Van Decal	
	Van Installation Kit	
	Owner's Manual (on CD) Owner's Guide (printed)	



SPARE PARTS LIST

These parts, which come with the original engine, are also available from HydraMaster:

Part No.	Description
000-049-014	Oil Filter
000-049-049	Fuel Filter
000-049-053	Foam Air Filter
000-049-064	Air Filter
000-057-227	Exhaust Gasket
000-106-016	Spark Plug

HIGH ALTITUDE OPERATION

Elevation plays a key role in how the truckmount will operate. Operation at high altitude (above 5,000 ft [1,524 m]) 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. Find your local Briggs and Stratton dealer at <http://www.vanguardengines.com/where-to-buy/dealer-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 [3.79 litres]) 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.

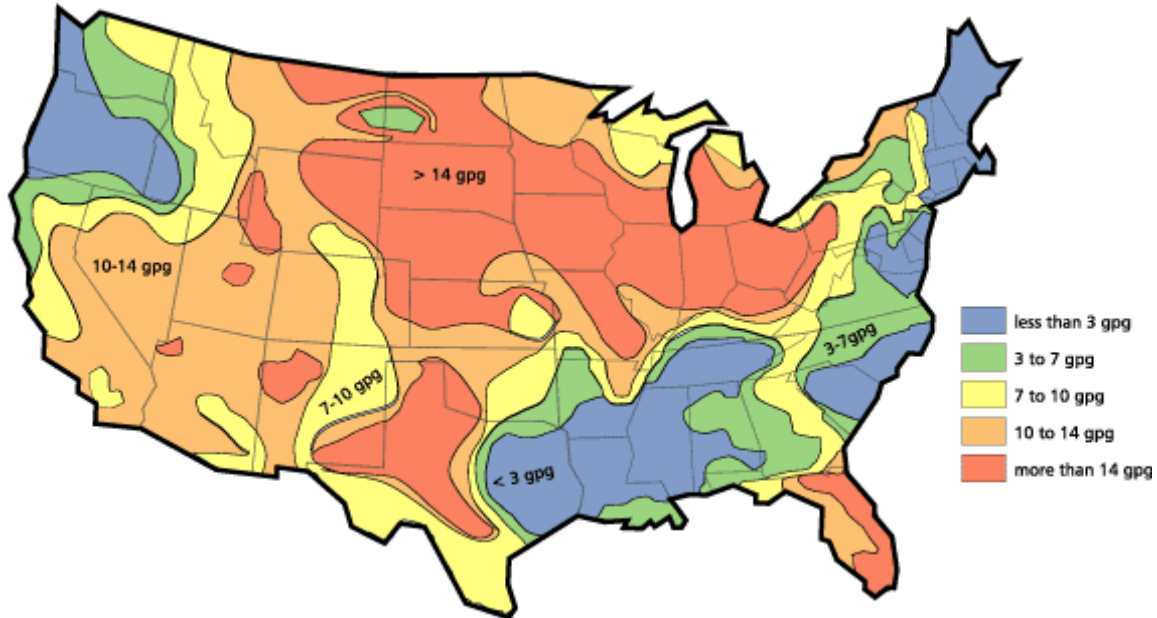


Figure 1-1. Hard Water Map of Mainland United States

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 XL 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.

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 (3,406 litres) of water and the machine uses an average of 30 gallons/hour (113.5 litres/hour), for an average of 5 hours a day, this equals 150 gallons per day (568 litres/day). In 6 days the machine would use 900 gallons (3,406 litres) 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 XL 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 - Installation Information

Although there are many different heavy duty vehicles used for carpet cleaning equipment, the preferable vehicle for a Boxxer XL installation is a cargo van with a heavy-duty suspension package and a 3/4 HD ton capacity. If a fresh water tank is added, a one ton or larger capacity van is required.

Prior to installation of the Boxxer XL, HydraMaster recommends installing a spray-on bed liner in the vehicle. This provides 'metal to cushion' mounting rather than 'metal to metal' and makes for an attractive van interior.

HydraMaster also recommends installing roof vents in vehicles operated in hot weather locations. Roof vent positions are shown in Figure 2-1. Consult your local RV distributor about selection and/or installation of powered roof vents.

For best results, the fan should draw air into the vehicle which will supply cooler air to the air cleaner intake.

CAUTION

HydraMaster requires a powered roof vent above the air cleaner intake. Failure to install a powered roof vent in such a manner may result in serious component or engine damage.

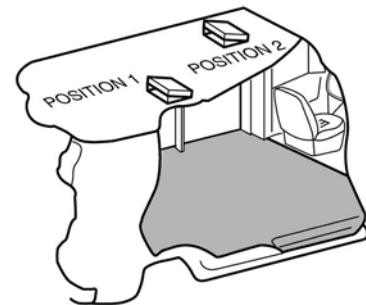


Figure 2-1. Location of Roof Vents in Vehicle



OPERATING THE BOXXER XL IN HOT WEATHER

HydraMaster recommends the following steps when operating the Boxxer XL during periods of hot weather (95° F [35° C] or higher). This will help ensure that your Boxxer XL continues to run at 100% capacity during even the hottest days.

1. A minimum of 9" (22.9 cm) of clearance is required on both sides of the Boxxer XL, when installed. Ensure that additional equipment or other materials are not stored at the sides or on top of the Boxxer XL. Unobstructed airflow around the unit is critical for cooling the engine and other components.
2. For side-door vans with "barn doors", open the doors as wide as their construction will allow. Be sure to open the doors beyond their standard "straight-out" position, if possible, by releasing the stops and putting the doors in their fully extended position.
3. Provide cross-ventilation. When possible, keeping the rear doors open while the Boxxer XL is running will substantially reduce the temperature inside the van and will provide a path for cooling air flow. For rear-mount installations, open up the other doors in the van.
4. Consider adding powered roof vents to the vehicle (if not already installed). These vents can significantly reduce interior temperatures and will result in much cooler operation. A powered roof vent is required when the Boxxer XL is mounted on the optional 85 Gallon Fresh Water Tank.

CAUTION

Use caution when drilling any holes through the van floor. Many vans have critical components mounted directly below the vehicle floor that could be damaged by a misplaced drill bit.

LOCATING THE BOXXER XL IN VEHICLE

There are two recommended entry points on the vehicle for the Boxxer XL installation: the side door or the rear doors.

Most installations are through the side door. This provides rear access for accessories and hoses as well as unobstructed access to the component/working side of the machine, thus making it a bit easier to perform maintenance and/or repair without removing the unit from the truck.

Rear mounting requires the unit to be slid to the right side as far as possible. Although installing the Boxxer XL through the rear door partly limits working access, it does direct the noise away from the cleaning site.

In addition, rear mounting not only provides adequate working space on the component side of the unit but also improves weight distribution inside the van (engine and component weight line up over drive shaft). Some cleaners in colder geographical areas prefer this placement for better traction in ice and snow. Also, it is physically easier to load the unit into the rear door due to the height of the vehicle bed.

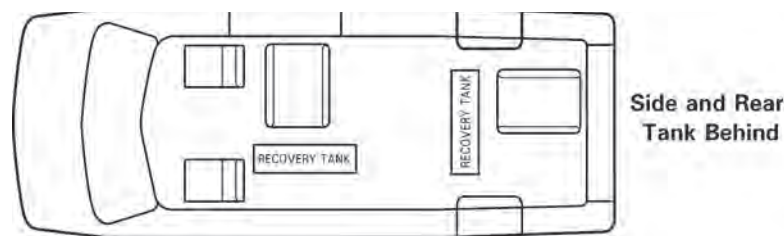


Figure 2-2. Recommended Location of Boxxer XL in Van

Secure Installation

No matter how the unit is installed, check to see if the Boxxer XL is properly secured to the floor of the van with the hardware provided. This safety measure will ensure that the machine will not slide inside the van. See Figure 2-2 for the correct installation.

BOXXER XL

⚠ WARNING

A sudden or crash stop will cause the machine to rocket forward if not properly secured. To prevent serious personal injury, ensure that the Boxxer XL is well secured to the floor of the vehicle with the hardware supplied. Protect yourself and the machine.

⚠ WARNING

HydraMaster strongly recommends that the exhaust from the front of the machine be vented down under the truck to prevent carbon monoxide from entering the job site. **Always park the truck so the exhaust is blowing away from the job site.**

⚠ WARNING

Never operate this machine with a portable gas can inside the truck. Doing so increases the risk of a fire or explosion.

⚠ WARNING

Mount a fire extinguisher just inside the rear or side door for emergencies.

⚠ WARNING

Do not use a portable propane tank inside of the truck or van. It is dangerous and illegal in most states.

⚠ WARNING

Transporting any vented fuel container that presently holds or has ever held a flammable liquid in a vehicle containing the Boxxer XL is strictly forbidden by HydraMaster Corporation and by federal and state regulation.

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

SETTING UP THE BOXXER XL

Prior to operating the Boxxer XL, follow these steps:

1. Adjust the vacuum relief located on the recovery tank by capping all the vacuum inlets. The machine should be set to 12" Hg maximum.

CAUTION

Setting the vacuum level higher than the recommended value can result in an increased risk of serious component damage.

The Boxxer XL is shipped from the factory with antifreeze added to the solution system. Recover this antifreeze and dispose of the recovered antifreeze as stated in the local laws and regulations.

⚠ WARNING

KEEP ANTIFREEZE OUT OF REACH OF CHILDREN AND ANIMALS. Drinking antifreeze can cause death.

If required, dispose of antifreeze at facilities licensed to accept household hazardous waste. If permitted, dispose of antifreeze in sanitary sewer systems. Do not pour antifreeze into storm sewers, septic systems, or onto the ground. Doing so causes health and environmental dangers.

CAUTION

Ensure the antifreeze is completely drained from the solution system. If any antifreeze remains in the system, it could damage machine components and damage fabric.

BOXXER XL

ORIENTATION OF FUEL PUMP

For proper fuel pump operation and fuel flow, the vehicle's fuel pump must be installed in a lower position with respect to the fuel tank and in as vertical a position as possible (outlet side up - see Figure 2-3 and Figure 2-4).

Mount the fuel pump away from sources of heat

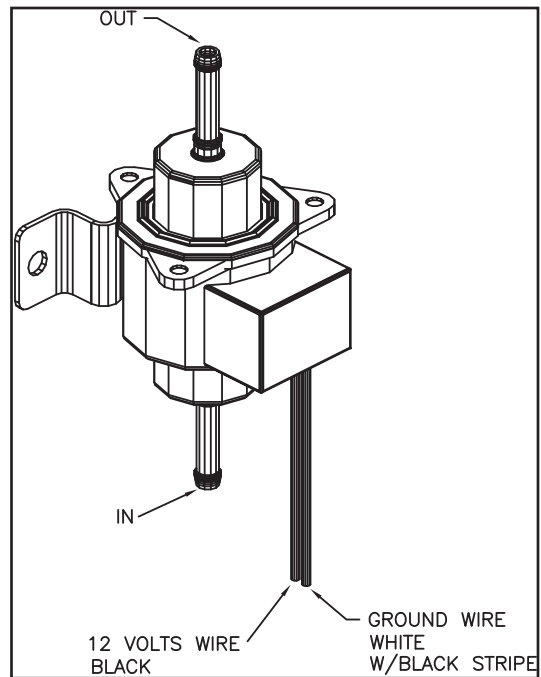


Figure 2-3. Install Fuel Pump, Outlet Side Up

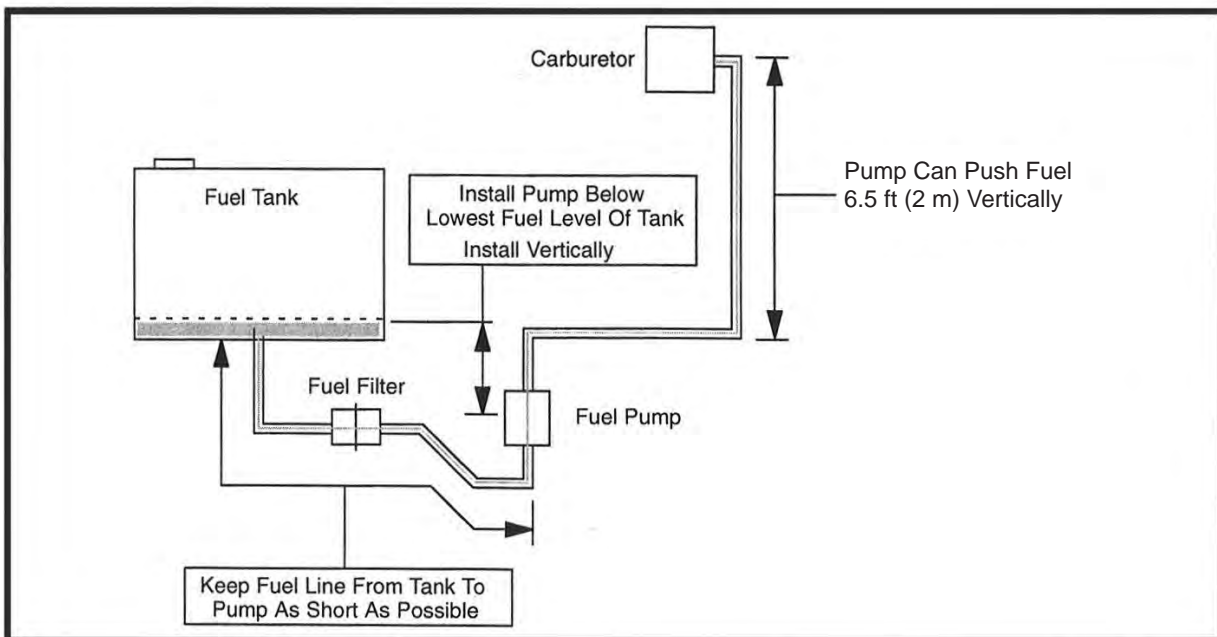


Figure 2-4. Fuel Pump Must Be in Vertical Position

3 - Cleaning Information

The Boxxer XL 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 the IICRC (Institute of Inspection, Cleaning and Restoration Certification) as soon as possible and to always follow the Clean Trust guidelines when cleaning carpets and hard surfaces.

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

- Precautions
- Preparing the Carpet for Extraction
- Rinse and Recover
- Overwetting
- Streaking
- Cleaning Tool Tips
- Severe Cleaning Situations

NOTICE

Contact HydraMaster sales to obtain a copy of HydraMaster's Cleaning Reference Guide for more detailed information about specific processes such as stone, tile, concrete and grout cleaning. Also ask about HydraMaster's Chemical Catalog.



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 system 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.

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 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.

RINSE AND RECOVER

Whether you are using a wand or an RX-20™, you should clean an area approximately 3 ft. x 3 ft. (92 cm x 92 cm) with the solution valve open then immediately go over that area with vacuum only to remove any excess moisture.

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™ 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.

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.

Several factors that will cause over-wetting include:

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 (0.9 m or 1.2 m) 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.



The Evolution Wand is truly the next evolution in wand design and performance. The Aluminum tube and Rotomolded 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.

Available in two sizes: a 12" head with 1-1/2" tube and two jets or a high production 16" head with 2" tube and 6 jets.

Evolution Wands

Half the weight, twice the performance.
The Evolution is not your standard wand.





1½" 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

1½" S-Bend Two Jet Wand

This 12" wide S-Bend wand has two jets. It uses a 1½" 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 (0.9 m or 1.2 m), 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



The five vacuum heads and three spray jets rotate at 130 RPM creating 650 complete cleaning 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 #000-061-144**



**Upholstery Tool
Part #000-163-012**

NOTICE

For more information about HydraMaster accessories, please visit this web page:
<http://hydramaster.com/Products/Accessories.aspx>.

4 - Operating Instructions

This section describes how to operate the Boxxer XL, starting with a description of the dash assembly (see Figure 4-1).

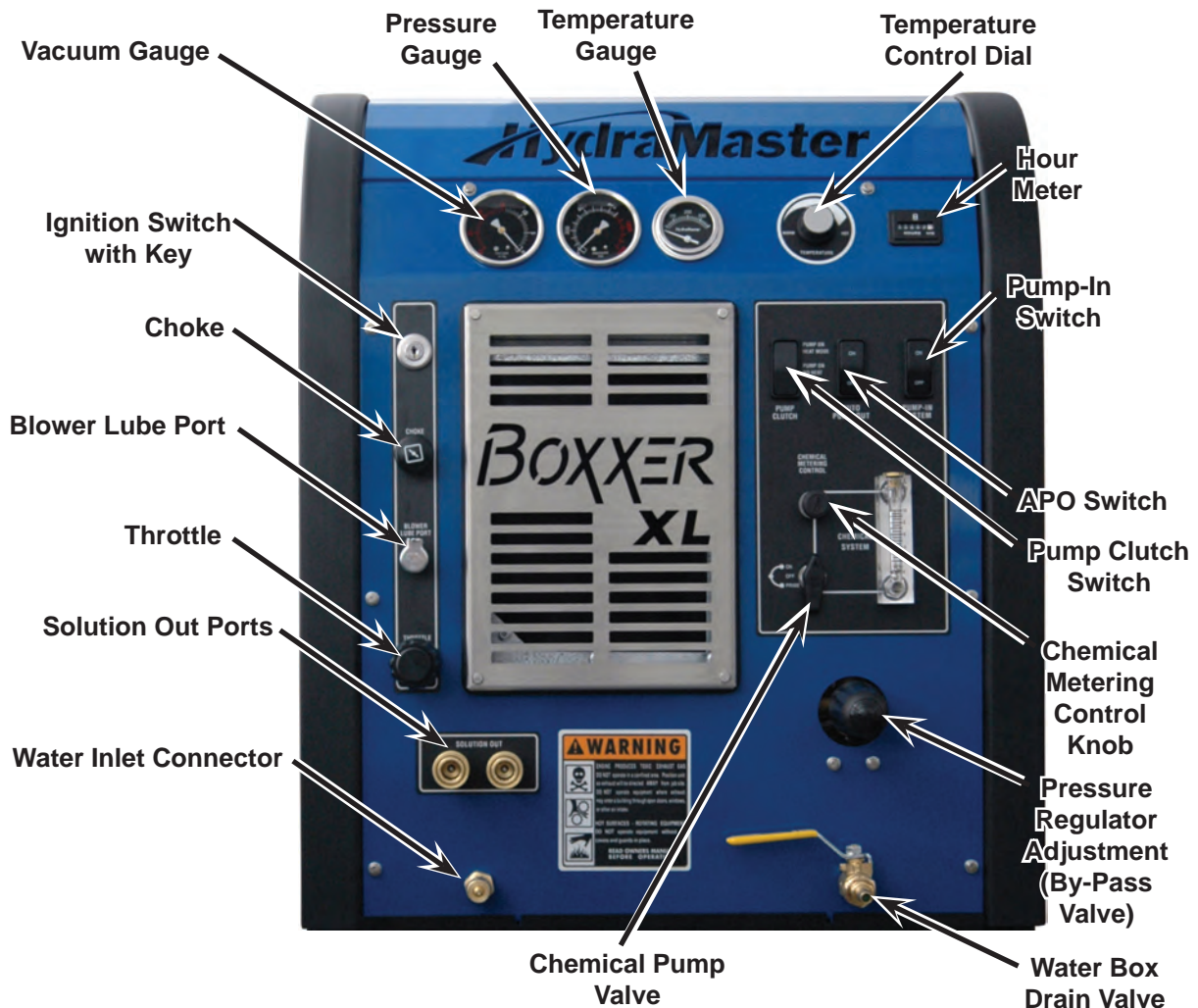


Figure 4-1. Boxxer XL Upper Dash Assembly

The upper dash assembly controls:

- System's power on/off and engine speed
- Pump clutch
- Automatic Pump-Out (APO), if included in the configuration
- Pump-In system, if included in the configuration
- Solution pressure
- Chemical metering
- Water box drain

BOXXER XL

As shown in Figure 4-1, the dash assembly also includes the solution temperature control dial; the temperature, vacuum and pressure gauges; and the hour meter.

The lower dash assembly houses the electrical box and the exhaust outlet as shown in Figure 4-2.

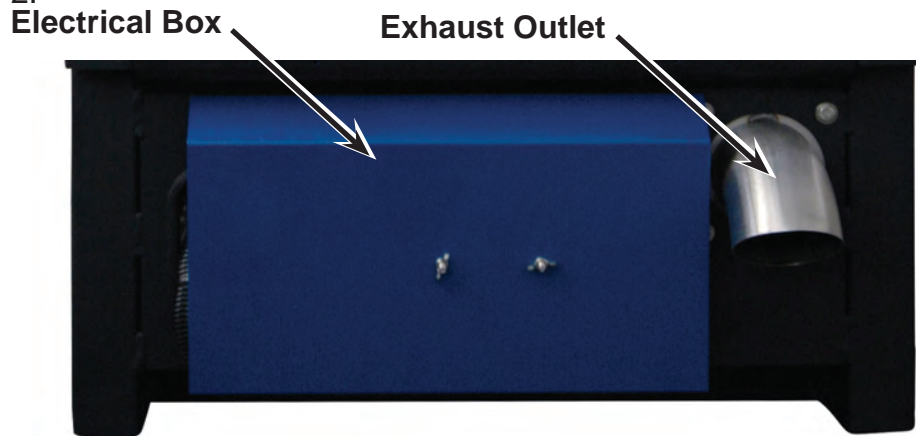


Figure 4-2. Boxxer XL Lower Dash Assembly

NOTICE

Photographs and illustrations included in this document can represent optional equipment as well as standard equipment.

SETTING THE TEMPERATURE

Depending upon the type of cleaning jobs you need to do, there will be times where you will not need the maximum heat and vacuum available. The temperature can be adjusted to allow you to optimize the Boxxer XL to the size of the job.

To adjust the temperature, rotate the dial from the warm setting to hot setting, or anywhere between the two as needed for the cleaning job (see Figure 4-3).

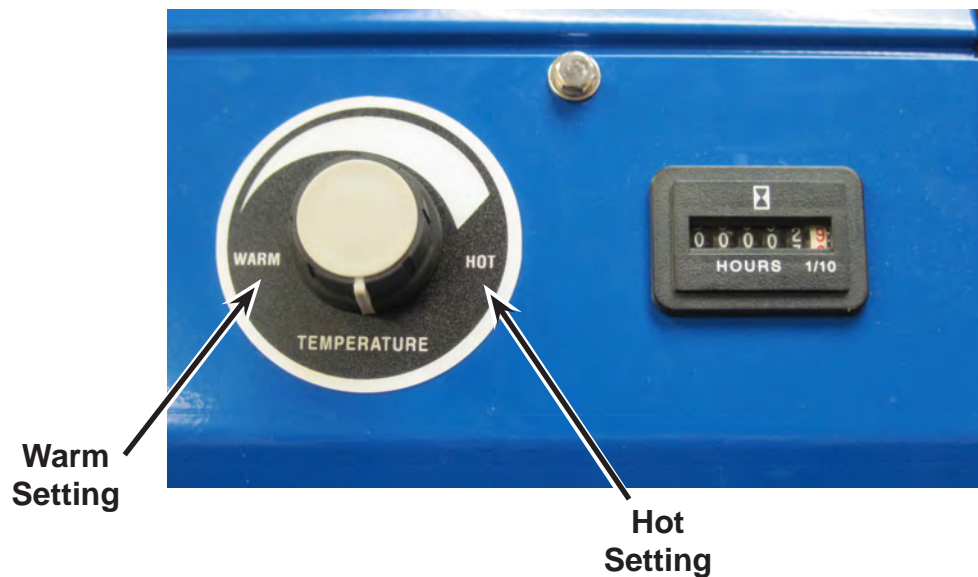


Figure 4-3. Rotate Temperature Dial to Select Temperature

CAUTION

Never perform cleaning operations when the truckmount engine is running in the IDLE throttle position. To do so will increase the risk of serious component or engine damage.

START-UP PROCEDURE

1. Perform all daily periodic maintenance as specified in this Owner's Manual.
2. Connect a garden hose to the water inlet connector to supply water to the truckmount (see Figure 4-1). If the pump-in feature is used on your system, push the Pump-In switch to the "ON" position.
3. Connect the cleaning wand or tool to the length of hose required to perform the cleaning job.
4. Start the truckmount with:
 - a. The throttle cable knob in the "IDLE" position (all the way clockwise).
 - b. Pull the choke cable out if the engine is cold.
 - c. The Pump Clutch switch in the "OFF" position.
5. After the engine starts, allow the truckmount to run in "IDLE" for 2 - 3 minutes to warm up. Gradually push on the choke as the engine warms up.

CAUTION

Never clean when the machine is in the "IDLE" mode. Failure to follow this caution may result in serious component or engine damage.

6. Turn the throttle cable knob counterclockwise; turn the throttle lock knob to secure the throttle in place (see Figure 4-4).
7. Press the Pump Clutch switch to the "PUMP ON HEAT MODE" position for carpet cleaning or upholstery cleaning; for high pressure washing, press "PUMP ON NO HEAT"
8. Adjust the temperature dial to the desired setting.
9. If the Automatic Pump-Out is included in your system's configuration, press the Auto Pump-Out switch to the "ON" position.



Figure 4-4. Turn Throttle Cable Knob Counterclockwise to Increase

SETTING THE PRESSURE FOR CLEANING OPERATIONS

Adjust the cleaning pressure to the desired level using the Pressure Regulator Adjustment Valve (see Figure 4-5).

Typical settings are from 300 to 400 psi for carpet cleaning.

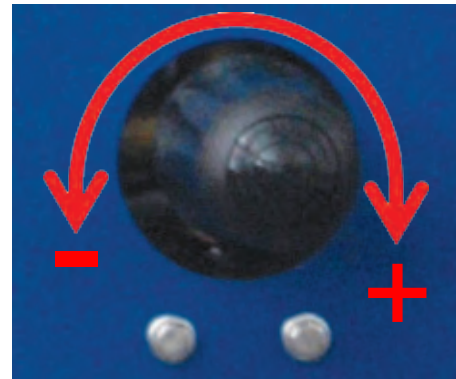


Figure 4-5. Adjust Pressure by Rotating Valve Left (Decrease) or Right (Increase)

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 Pump Clutch switch to "PUMP ON - NO HEAT". Spray the cleaning wand into the vacuum hose for 3-5 minutes. The chemical should now be flushed from the truckmount, hoses and cleaning tool.
3. Press the Pump Clutch switch to "OFF".
4. Remove the vacuum hose.
5. Lubricate the blower to prevent it from rusting internally.
 - a. Allow the unit to run for a few minutes with the vacuum hose disconnected and with the throttle in the high position (counterclockwise) in order to remove moisture from the blower.
 - b. Cap off the inlet(s) to the recovery tank.
 - c. Spray a HydraMaster-recommended spray lubricant into the Blower Lube Port for about 5 to 10 seconds while the unit is running (see Figure 4-6).
 - d. Allow machine to run additional 2 to 5 minutes under load to flush off lubricant.
 - e. Uncap the inlet(s) and run the unit for another minute to allow the blower to cool down.
6. If freeze guarding is necessary, perform the procedure at this time. See the Freeze Guarding section of this Owner's Manual (see page 5-18).
7. Turn the throttle cable knob to the "IDLE" position (all the way clockwise).
8. Turn the ignition switch to "OFF."
9. Drain the water box using the water box drain valve.
10. Drain the recovery tank in an appropriate location.

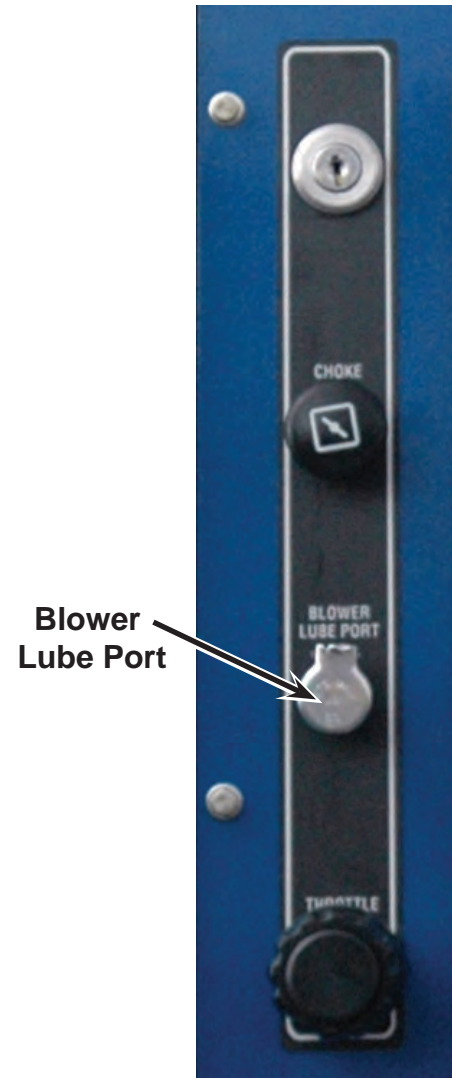


Figure 4-6. Location of Blower Lube Port

NOTICE

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

11. Perform daily maintenance as specified in Section 5 of this Owner's Manual.

5 - Machine Maintenance

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

A maintenance log, provided in the Owner's Guide, must be correctly and completely filled out. HydraMaster may request to inspect the logs 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.
- Check the oil level in the blower. Add oil if needed.
- Inspect and clean the recovery tank 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 a HydraMaster-recommended 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 pump belts for wear and proper tension. Adjust 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 oil change.
- Check the engine valve clearance (intake and exhaust 0.004" - 0.006" [0.101 mm - 0.152 mm]) after first 50 hours and every 250 hours after that.

Monthly Maintenance

- Check the engine air filters. 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" (0.76 mm). Replace if excessive carbon buildup is visible.
- Change the blower oil after first 100 hours of use.

250 Hours

- Check the engine valve clearance (intake and exhaust 0.004" - 0.006" [0.101 mm - 0.152 mm]).

400 Hours

- Change fuel filter.

500 Hours

- Change the blower oil.
- Change the high pressure pump oil.
- Replace spark plugs.

1,000 Hours

- Replace spark plugs.
- Change air filters.
- Check carburetor. Clean or replace as necessary.
- Check coupler element (rubber insert) for cracks or wear. Replace as necessary.
- Clean heat exchanger core.

NOTICE

Refer to the Interval in Hours Maintenance chart in the Owner's Guide for more information.



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.

ENGINE MAINTENANCE

Engine Oil Level Check

The engine oil level should be checked daily. It is recommended that the oil be checked just before the engine is started for the first time for that day. The oil level should be between the 'Add' and the 'Full' marks on the dipstick.

CAUTION

Do not operate the engine with the oil level below the bottom of the 'Add' mark on the dipstick, or above the top of the 'Full' mark.

Adding Engine Oil

It is normal to add some oil in the period of time between oil changes. The amount will vary with the severity of operation. When adding or replacing engine oil, be sure the oil meets or exceeds the recommended specification.

Changing Engine Oil and Filter

The engine oil and filter must be changed every 50 hours or every 6 weeks whichever occurs first. The oil and filter should be changed more often if the engine is operating in dusty or extremely dirty areas, or during cold weather.

Engine Oil Quality

To achieve proper engine performance and durability, it is important that you use only engine lubricating oils of the correct quality in your engine. Proper quality oils also provide maximum efficiency for crankcase ventilation systems, which reduces pollution.

CAUTION

Use only engine oils displaying the American Petroleum Institute (API) "starburst" certification mark 'FOR GASOLINE ENGINES' on the container.

Engine Oil Recommendation

While multi-viscosity oils are generally recommended, 5W-30 synthetic is specifically recommended year round for your Boxxer XL engine.

BOXXER XL

Oil Filter

Briggs and Stratton engines use Briggs and Stratton oil filters. An equivalent or better oil filter must be used when servicing the engine.

To replace the filter, use a proper filter wrench to remove the filter.

Clean the filter mounting base and lightly coat the gasket surface of the new filter with engine oil. Hand tighten the filter until the gasket contacts the base, then tighten another ½ turn. Fill the engine with the correct amount of oil, run the engine and check for oil leaks at the drain plug and oil filter gasket.

Spark Plugs

Always use the recommended spark plugs for your engine. Hotter or colder plugs, or similar plugs that are not exact equivalents to the recommended plugs, can cause permanent engine damage, reduce the engines useful life, and cause many other problems such as hard starting, spark knock and run-on. Installing new spark plugs regularly is one of the best ways to keep your engine at peak performance.

Fuel Filter

The fuel filter is located between the fuel pump and the fuel tank underneath the vehicle.

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 side or 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.

Refer to the Pump Servicing Section in the following page for more information.

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.

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.

Do not run the pump with frozen water in the manifold. If there is a risk of freezing, freeze guard the truckmount. See the Freeze Guarding section on page 5-18 of this manual.

Servicing Valves on the High Pressure Pump

Removing a Valve

1. Remove the valve cap (30 mm) and extract the valve assembly (see Figure 5-1).



Figure 5-1. Remove Valve Cap and Valve Assembly

2. Remove the valve assembly (retainer, spring, valve plate, valve seat) from the valve cavity.
3. Remove the O-ring and support from the valve cavity.
4. Examine the O-ring and replace if there is any evidence of cuts, abrasion, or distortion.
5. Inspect the manifold for wear or damage (see Figure 5-2).
6. Inspect the old valves for wear or damage. Only one valve kit is necessary to repair all the valves in the pump. (The kit includes new supports, O-rings, valve seat, valve poppet, spring and retainer; all are pre-assembled.)



Figure 5-2. Inspect Manifold and Old Valves

7. Replace the center inlet check valve with a modified check valve (Figure 5-3).

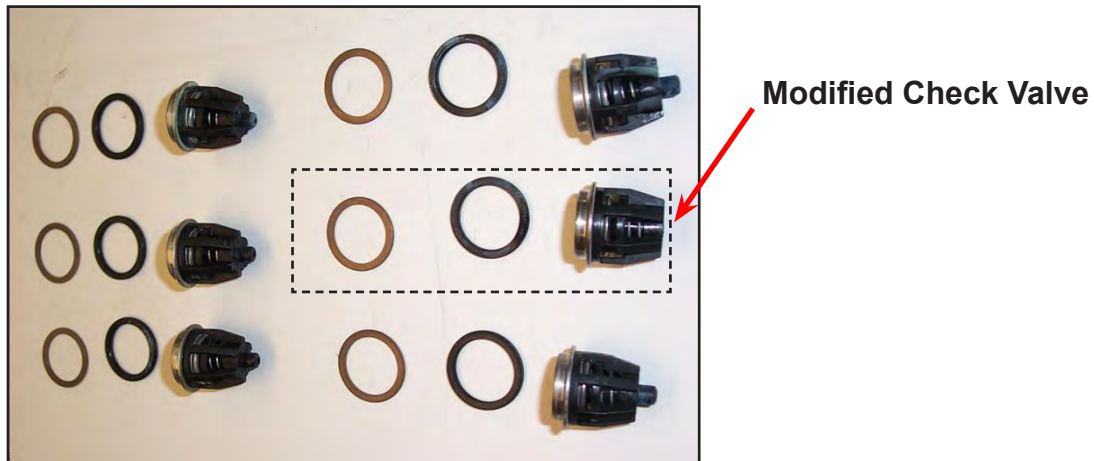


Figure 5-3. Replace Center Inlet Check Valve With Modified Check Valve

8. Apply O-ring grease to O-rings and install valves (Figure 5-4).
9. Replace valve cap and torque to 95 ft. lbs.(13 m kgs) see Figure 5-5).

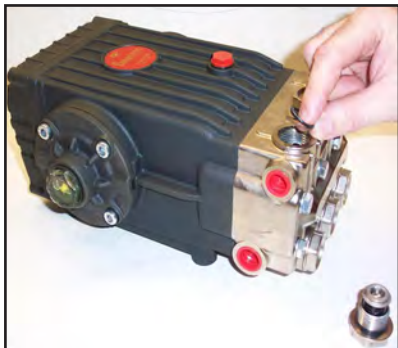


Figure 5-4. Apply Grease and Install Valves



Figure 5-5. Replace Valve Cap and Torque to 95 ft. lbs. (13 m kgs)

10. Remove the fasteners retaining the manifold
11. Separate manifold from crankcase (see Figure 5-6).

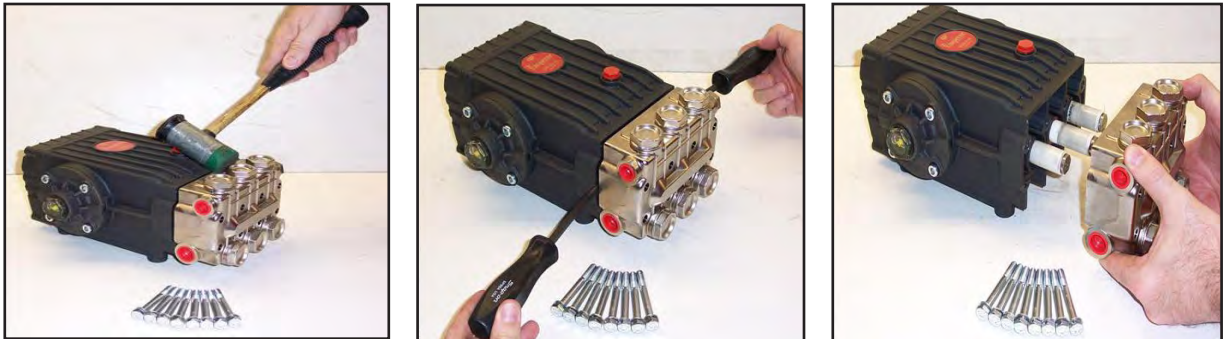


Figure 5-6. Separate Manifold from Crankcase

NOTICE

It may be necessary to rotate crankshaft or tap manifold with rawhide or plastic mallet to loosen.

CAUTION

When sliding manifold from crankcase, use caution not to damage ceramic plungers.

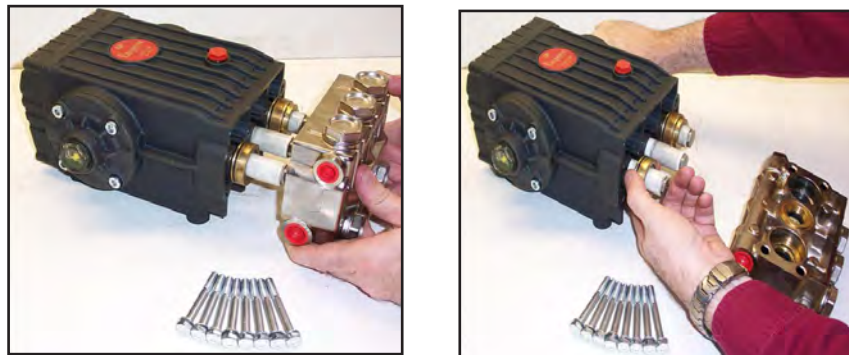


Figure 5-7. Seal Assemblies May Come Off with Manifold

12. The seal assemblies may come off with the manifold (see Figure 5-7)
13. Examine the ceramic plungers. The surface should be smooth and free from scoring, pitting or cracks (see Figure 5-8); if not, replace.



Figure 5-8. Examine Ceramic Plungers

14. Loosen the stainless steel plunger bolt.
15. Remove the stainless steel plunger bolt and ceramic plunger from the plunger guide (see Figure 5-9).
16. If the slinger washer is removed, be certain it is re-installed or replaced.

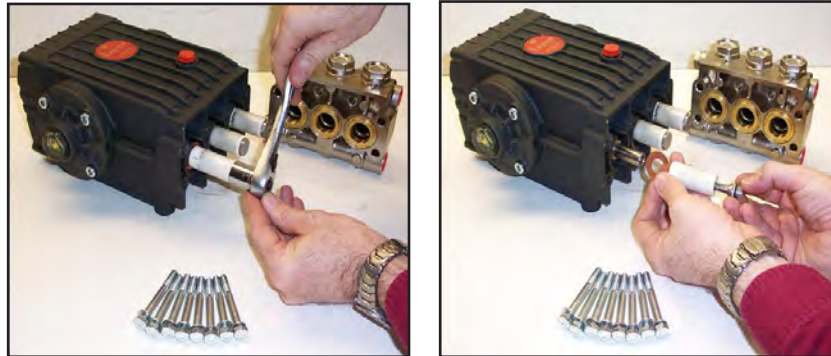


Figure 5-9. Remove Stainless Steel Plunger Bolt and Ceramic Plunger

17. Separate plunger bolt from ceramic plunger (see Figure 5-9).
18. Install new Teflon® back-up ring and O-ring on the plunger bolt. Apply a film of O-ring grease on the outside of the O-ring (see Figure 5-10).
19. Apply removable anaerobic thread sealant (Loctite® 542) to the threads of the plunger bolt, carefully pressing the plunger bolt into ceramic plunger (see Figure 5-10).

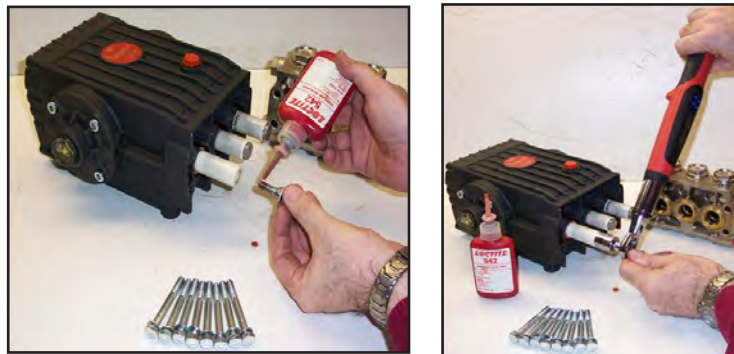


Figure 5-10. Install O-ring, Apply Sealant and Slide Plunger over Plunger Guide

20. Slide new ceramic plunger over the plunger guide (see Figure 5-10).
21. Torque plunger to 14.5 ft. lbs (2 m kgs).

Extracting Seals

With manifold removed from crankcase:

1. Insert proper extractor collet through main seal retainer (see Figure 5-11).
2. Tighten collet and extract retainers and seals.

NOTICE

The Teflon seals of the HT series will be damaged during disassembly so new ones will have to be installed.

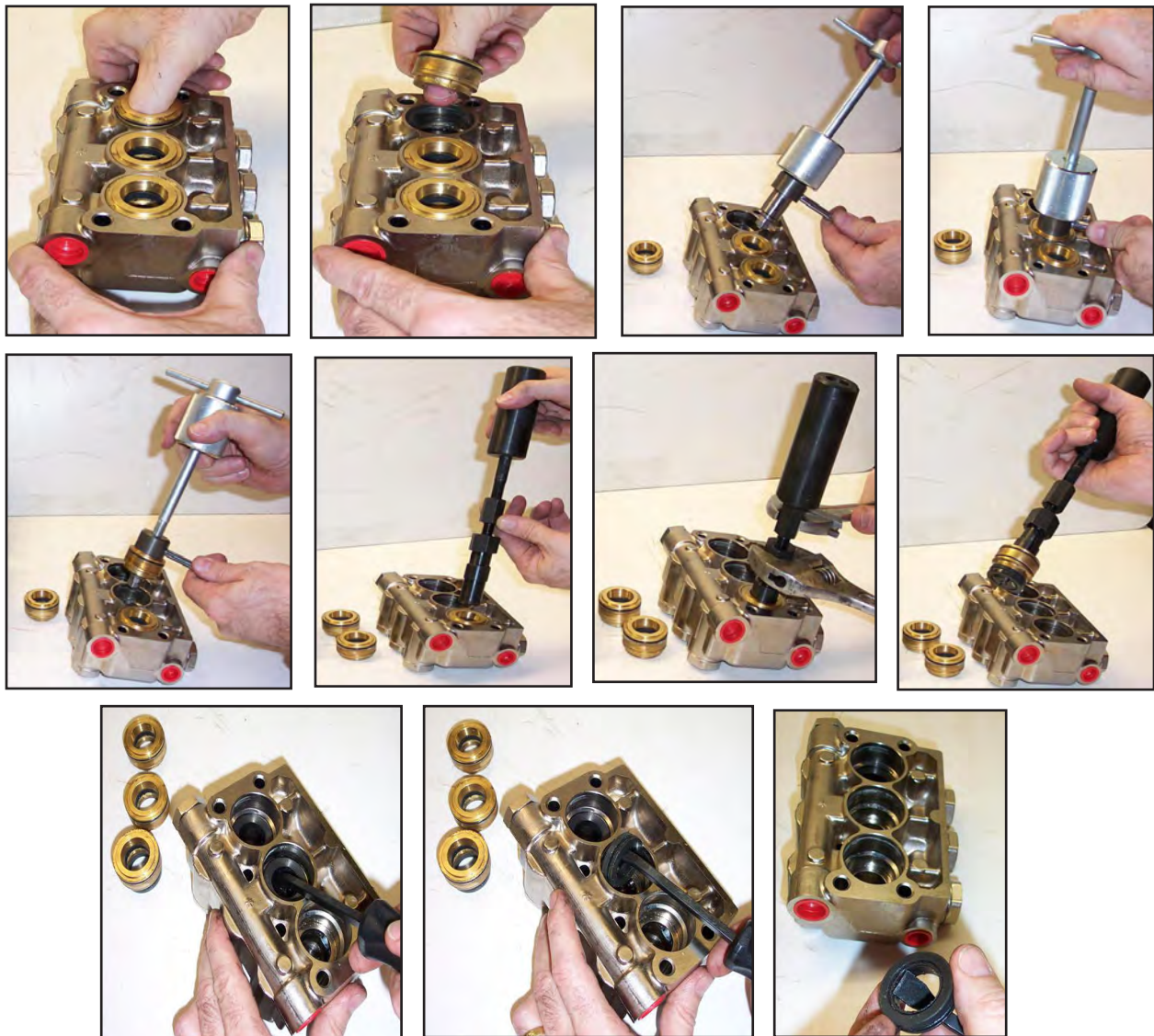


Figure 5-11. Extract Retainers and Seals

Replacing the Seal Assemblies

Only one seal kit is necessary to repair all the seals in the pump (see Figure 5-12). Use an insertion tool for seal installation

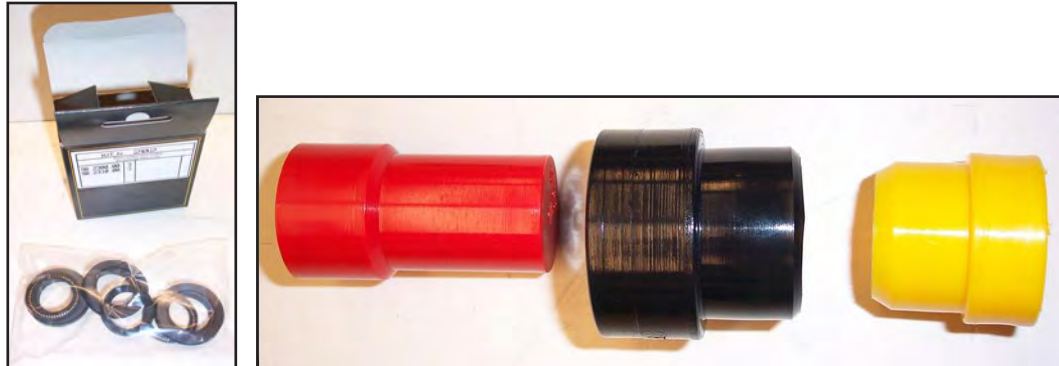


Figure 5-12. Seal Kit and Insertion Tool for Seal Installation

To install a seal assembly:

1. Apply a film of O-ring grease on the O-ring on the outside of the new high pressure seal.
2. Insert the high pressure seal into the cavity with the “U” shape down.
3. Press high pressure seal into place.
4. Apply a film of grease on the O-ring on the brass retainer (see Figure 5-13).

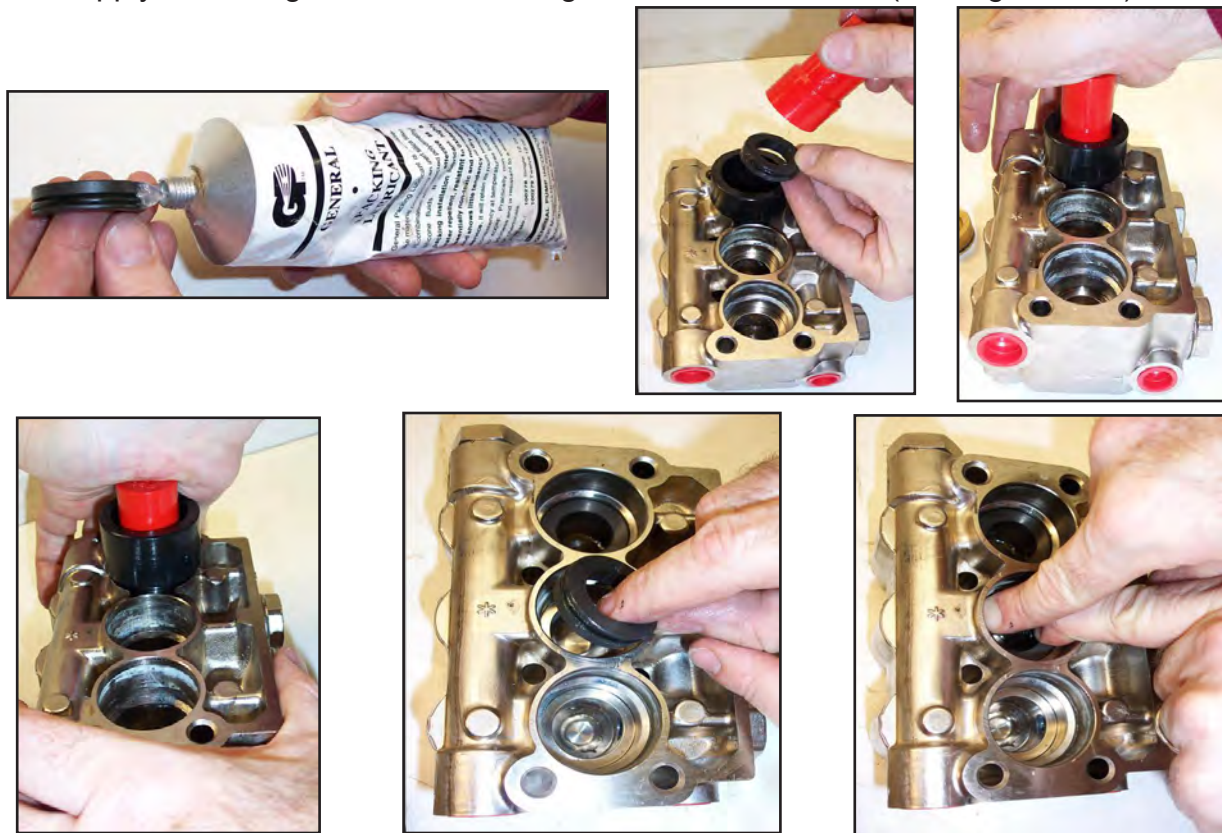


Figure 5-13. Install Seal Assembly Using O-Ring Grease

To install the intermediate retainers and the low pressure seals:

1. Insert the brass intermediate retainer into the cavity.
2. Press the new low pressure seal into the brass low pressure seal retainer and install a new O-ring on the outside (see Figure 5-14).

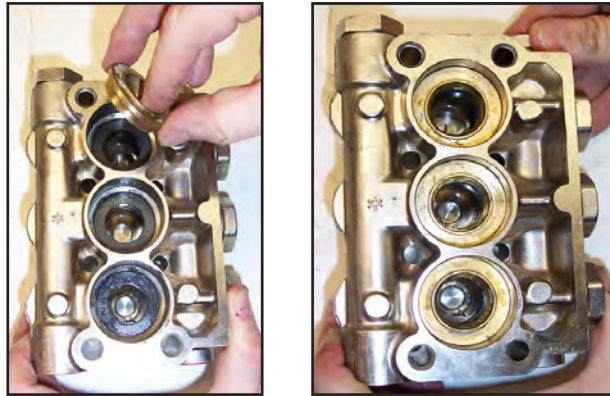


Figure 5-14. Install Retainers into Cavities

3. Press the low pressure seal assembly into the cavity (see Figure 5-15).

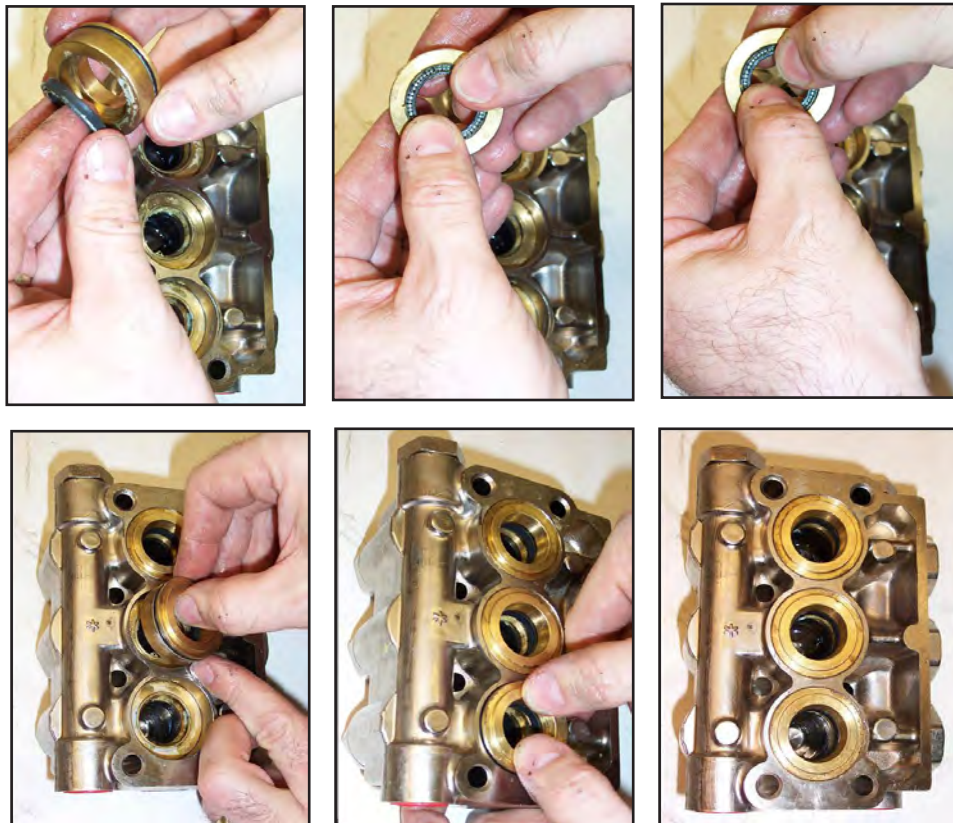


Figure 5-15. Press Low Pressure Seal Assembly into Cavity

Re-Installing Manifold

1. Position the outer plungers at the same position (see Figure 5-16).
2. Re-install manifold and torque the fasteners in an “X” pattern to 50% of specification and then retorque to 100% specification (see Figure 5-17 and Figure 5-18).

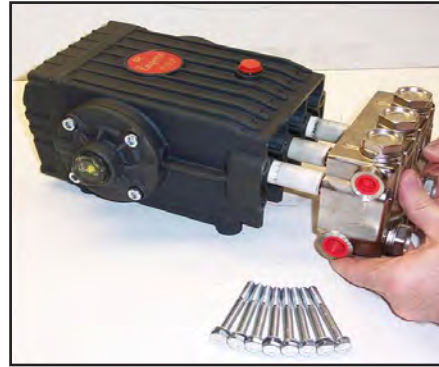
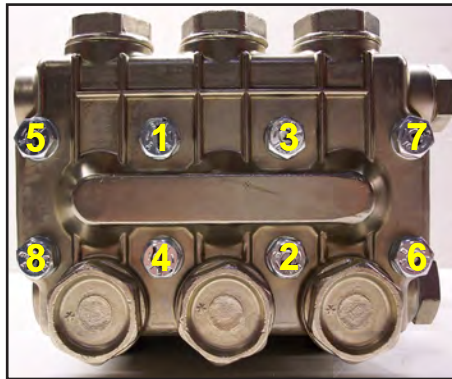
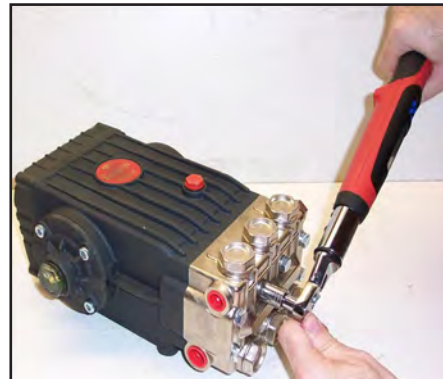


Figure 5-16. Re-install Manifold and Torque Fasteners



**Figure 5-17. Torque Sequence
in “X” Pattern**



**Figure 5-18. Torque Bolts to
22 ft. lbs (3 m kgs)**

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. The manual for the blower has been included. Review the manual for a better understanding of this piece of machinery.

CAUTION

To protect the blower from overloading and damaging itself, there is a vacuum relief system installed on the vacuum tank. When the vacuum tank inlet is completely sealed off a maximum of 12” 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.

To lubricate the blower:

1. Allow the unit to run for a few minutes with the vacuum hose disconnected in order to remove moisture from the blower.
2. Cap off the inlet(s) to the vacuum tank.
3. Spray a HydraMaster-recommended spray lubricant into the Blower Lube Port for about 5 to 10 seconds while the unit is running.
4. Uncap 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. The oil is to be changed 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. 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. Fill a third of the water box with TM DeScaler™. Follow the recommendations on the TM DeScaler™ label for proportions. Verify that the float is not lying horizontal, but floats below.

Attach the recirculation fitting provided in the kit to the garden hose quick connect (see Figure 5-19) and this combination to the front of the truckmount.

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.

Start the truckmount and allow it to run for 3 to 5 minutes. Do not leave the TM DeScaler™ solution in the system. Flush the system with clean water and turn the truckmount "OFF."

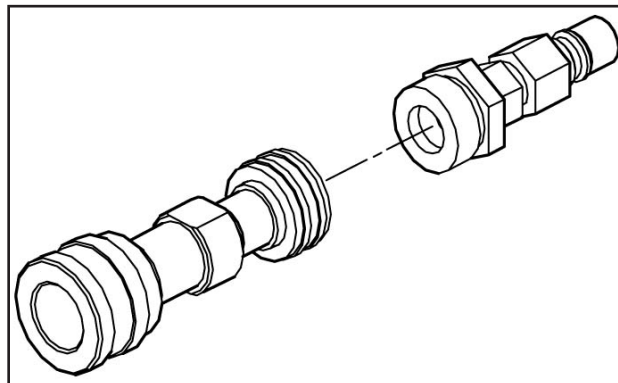


Figure 5-19. Recirculation Fitting

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.

⚠ WARNING

When draining solution from the machine, wear protective eye wear and ensure the solution temperature is cold. Failure to follow this warning can result in personal injury

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. Close the water box drain valve.

NOTICE

In some extreme cold-temperature locations, you may find it necessary to disconnect the pressure gauge hose from the high pressure pump and drain the hose. Reconnect the hose to the pump before proceeding to step 2.

2. Add 2 gallons (7.57 litres) of 50/50 antifreeze and water mix to the water box.
3. Attach a recirculation fitting (See the previous page and Figure 5-19) to the incoming water quick connect on the front of the machine.
4. 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.)
5. Start the truckmount and allow it to run for 2 to 3 minutes.
6. Press the Pump Switch to "PUMP ON HEAT MODE" and allow the machine to run for 2 minutes. This will distribute antifreeze solution throughout the truckmount.

7. Remove the chemical feed line from the chemical jug. Turn the Chemical Selector Valve to "PRIME." This will vacuum the chemical remaining in the lines to the recovery tank.
8. Remove the recirculation fitting from the truckmount.
9. Loosen the fitting at the back of the pressure gauge with a wrench after the antifreeze has been added to the machine to purge the coolant out of the fitting.
10. Re-tighten the fitting.
11. 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 the preceding procedure with the items to be freeze guarded attached.

CAUTION

Always check the freezing level of your reclaimed antifreeze with a glycol tester before reusing. Failure to do so may result in serious component damage.

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.

**BOXER
XL**

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6 - Water and Chemical System

This section describes the Boxxer XL's water and chemical systems, and includes the exhaust subsystem (see Figure 6-1 - Figure 6-3).

1. The process starts when 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.
2. Next, the pressurized water enters the by-pass valve. This valve allows manual adjustment of the pressure level. When the valve at the wand is closed, all the water in the system is recirculated to the water box. When solution is being used at the wand, the necessary amount of high pressure water passes through the by-pass valve and to the heat exchanger.
3. In the tube and fin heat exchanger, the temperature is raised. The heat necessary to do this is provided by the engine. Heated water then travels to the blower heat exchanger. In this heat exchanger, the temperature of the water is raised once again. 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.

NOTICE

The high pressure manifold houses both the temperature sensor for the temperature gauge and the high temperature shutdown switch. This innovative, revolutionary system does not require a recirculation orifice or filter to maintain temperature within the heating system.

When water is not flowing through the cleaning tool, the water within the heat exchange system stops circulating completely.

Water temperature is controlled via a temperature sensor inside the heat exchanger. When the system achieves the maximum operating temperature, the diverter valve will “divert” all heat away from the heat exchanger which allows the system to control its internal temperature without dumping water.

This saves valuable space in the recovery tank, which can be used instead for recovery of dirty water from the cleaning surface.

BOXER XL

4. Water that is recirculated through the pressure regulator back to the water box travels past a thermostatic valve. This thermostatic valve monitors the water box temperature. When the controller senses the water in the water box has reached its set point, it opens the low pressure thermostatic valve on the side of the water box and closes once the temperature drops back below the set point.
5. The water that is being called for by the wand then exits the manifold and passes through a check valve.
6. Finally, the water joins the chemical where the solution is created.
7. 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 chemical, or soap, jug through the chemical flow meter.
8. 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 6-1. Flow Diagram - View 1 of 3
000-179-043

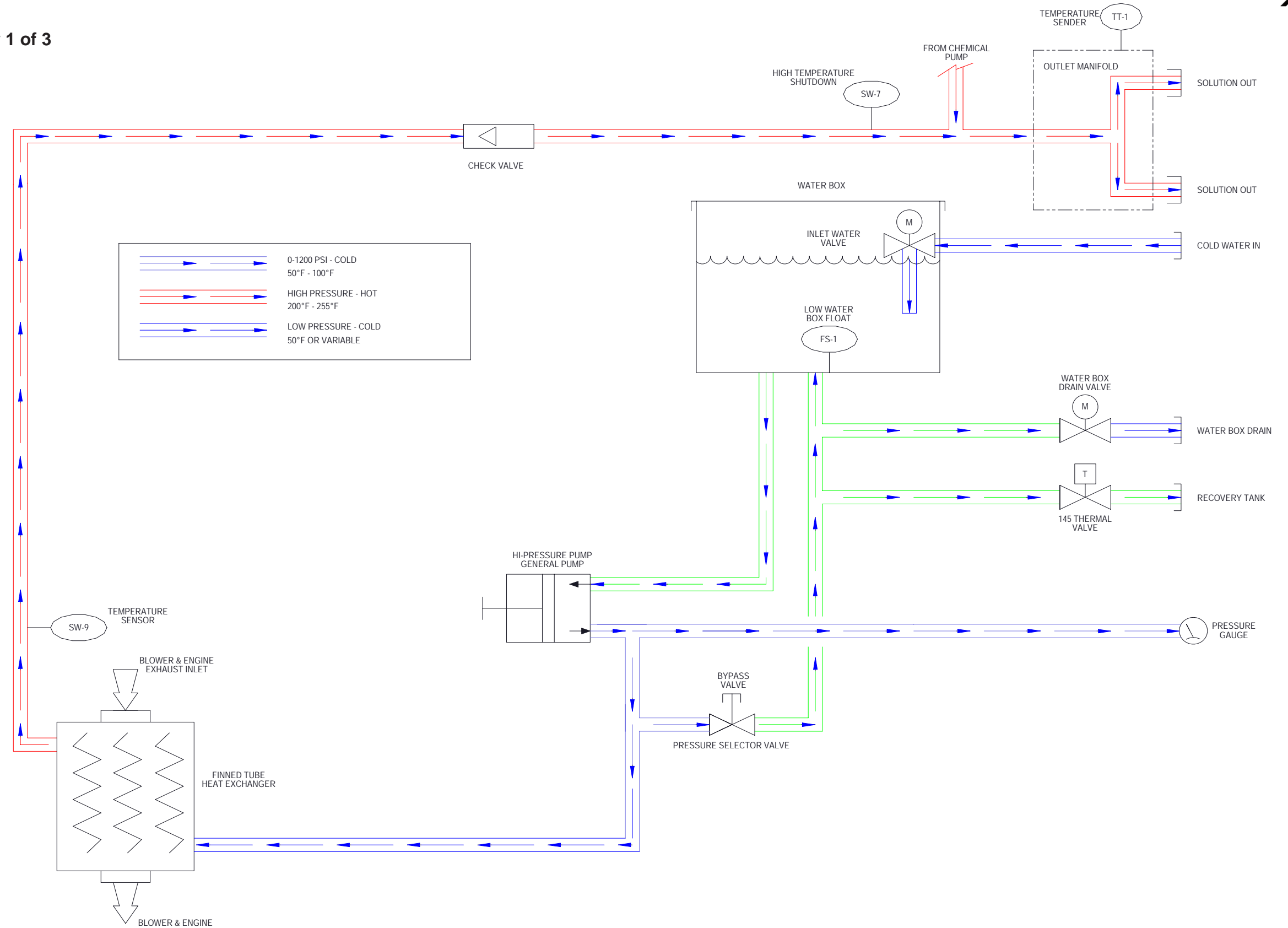


Figure 6-2. Flow Diagram - View 2 of 3
000-179-043

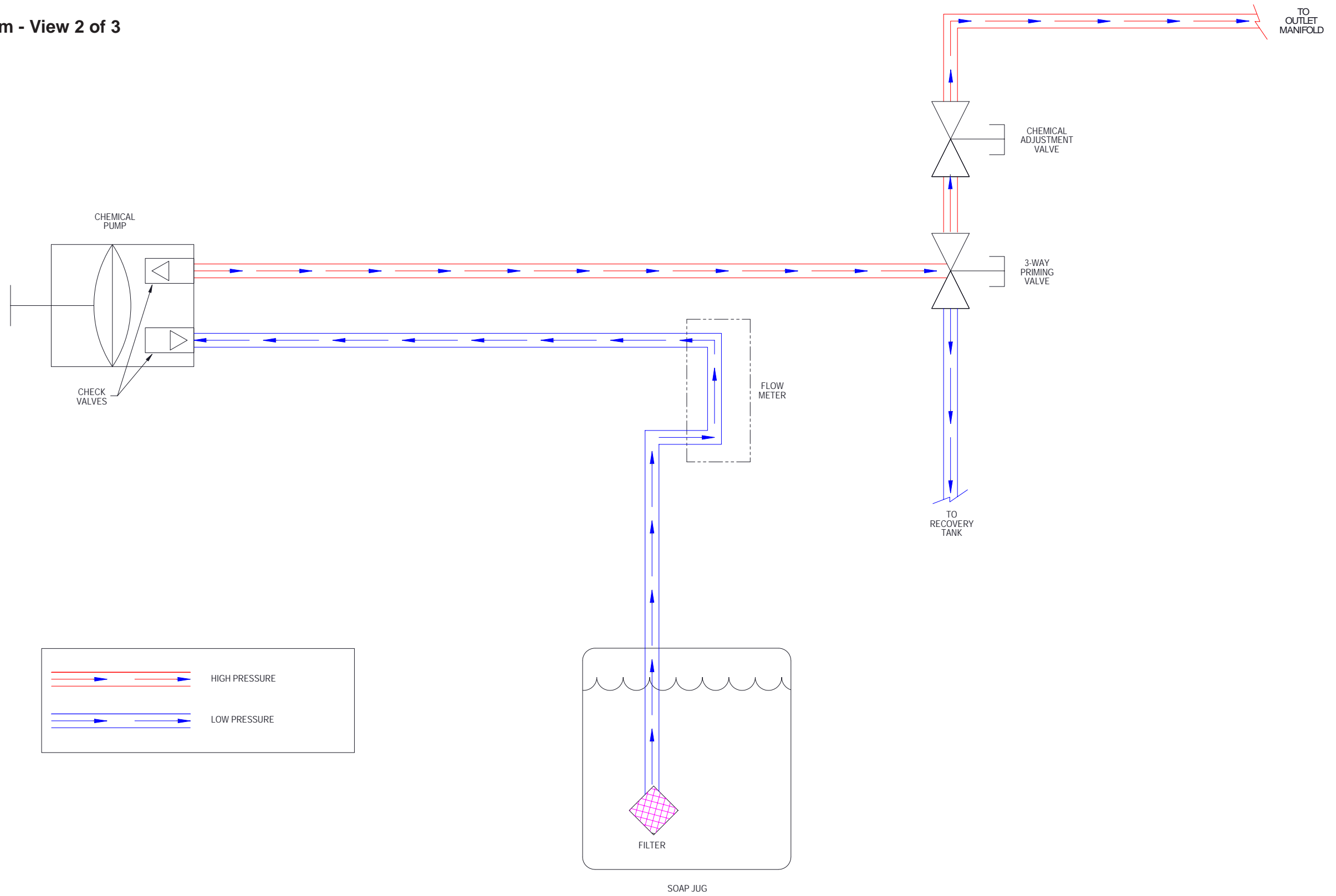
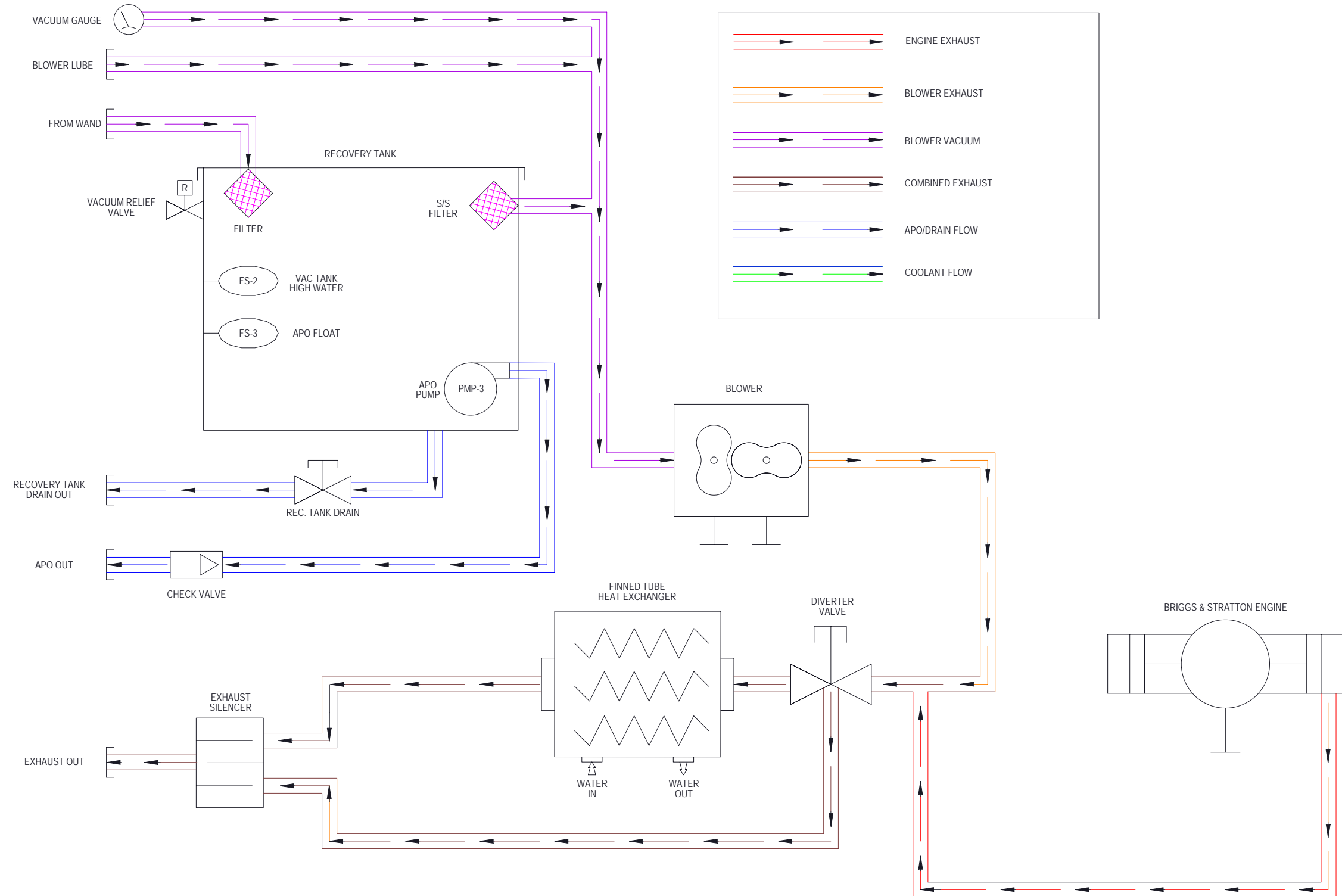


Figure 6-3. Flow Diagram - View 3 of 3
000-179-043



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7 - Electrical System

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

- Electrical System Information
- Electrical Schematic
- Wiring Diagram

ELECTRICAL SYSTEM INFORMATION

The Boxxer XL electrical system operates on 12 - 14 V DC which is provided by the battery. Battery levels are maintained by a 20-Amp alternator mounted on 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 7-1. Electrical Schematic
000-179-042 Rev. B

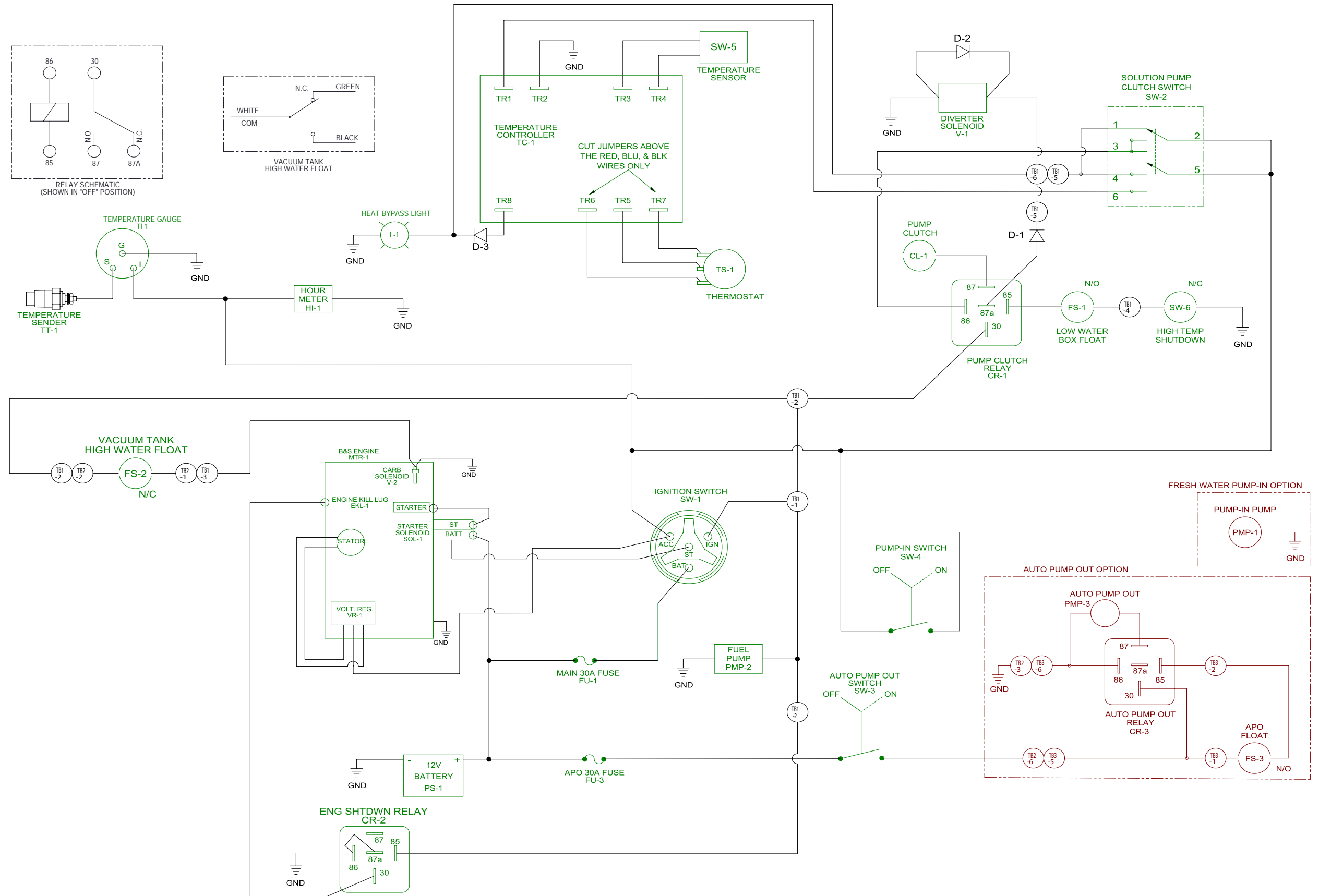


Figure 7-2. Wiring Diagram - View 1 of 3
000-179-041 Rev. C

ALL WIRES ARE 18 GAUGE UNLESS OTHERWISE STATED

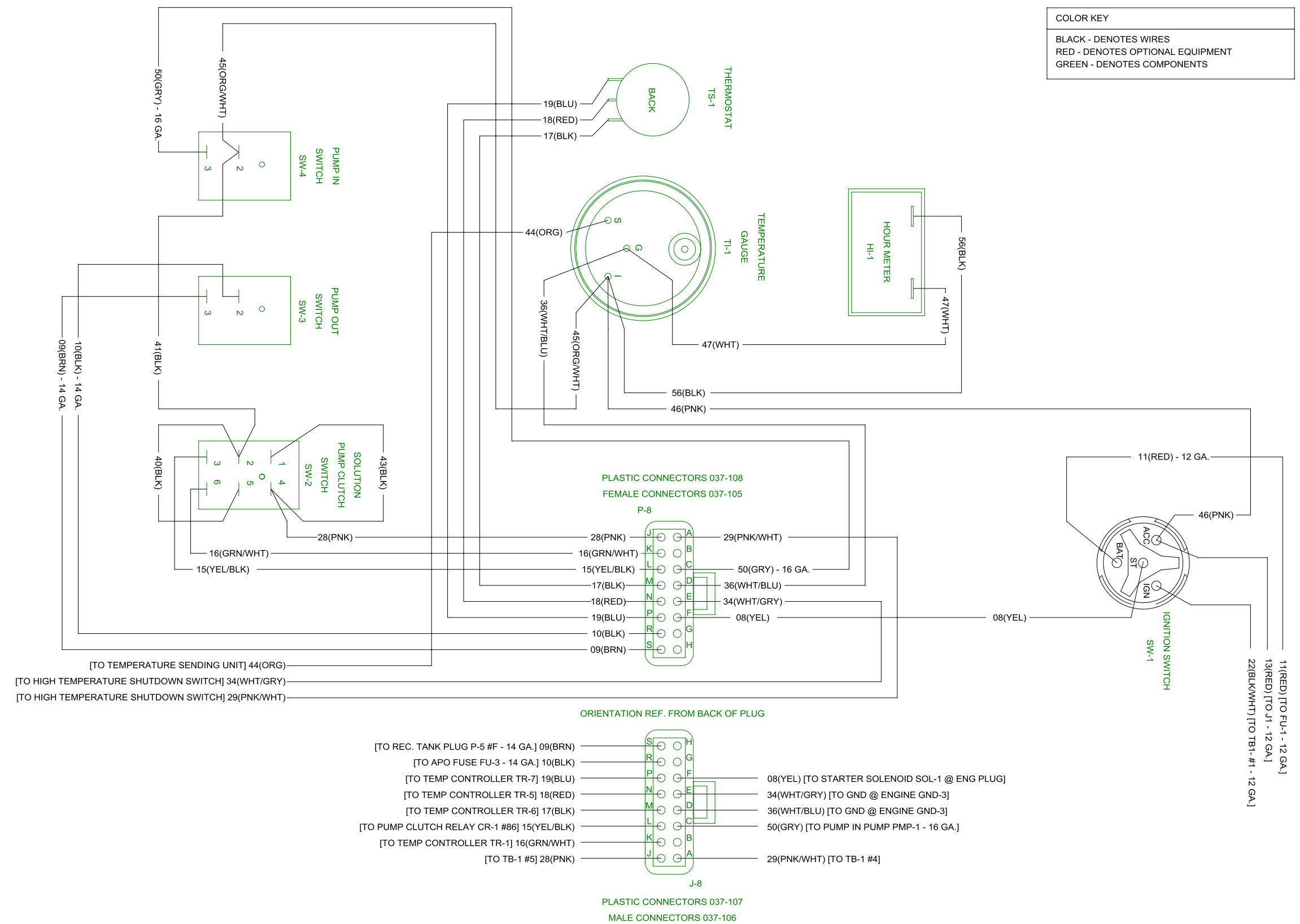


Figure 7-3. Wiring Diagram - View 2 of 3
000-179-041 Rev. C

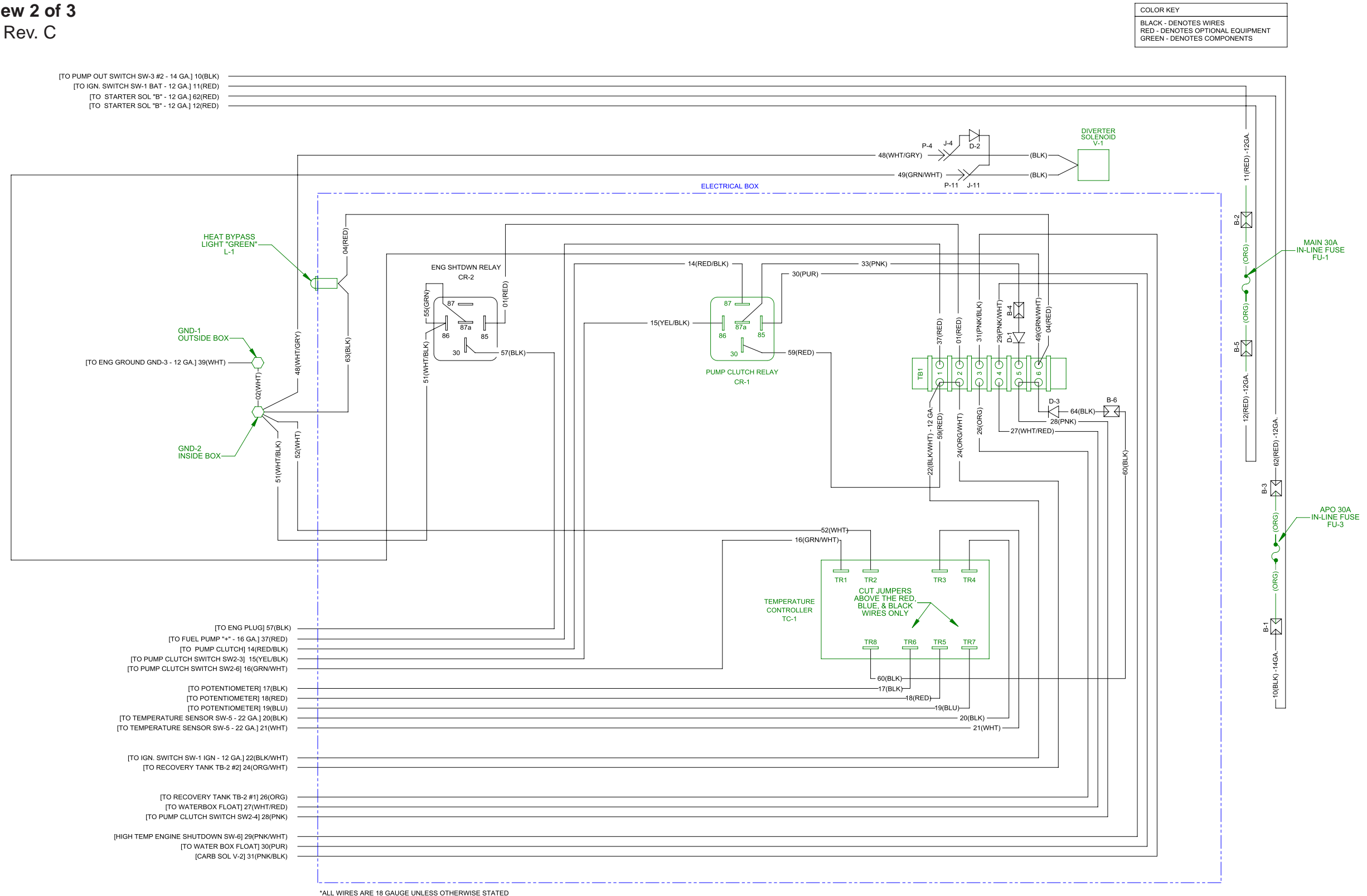
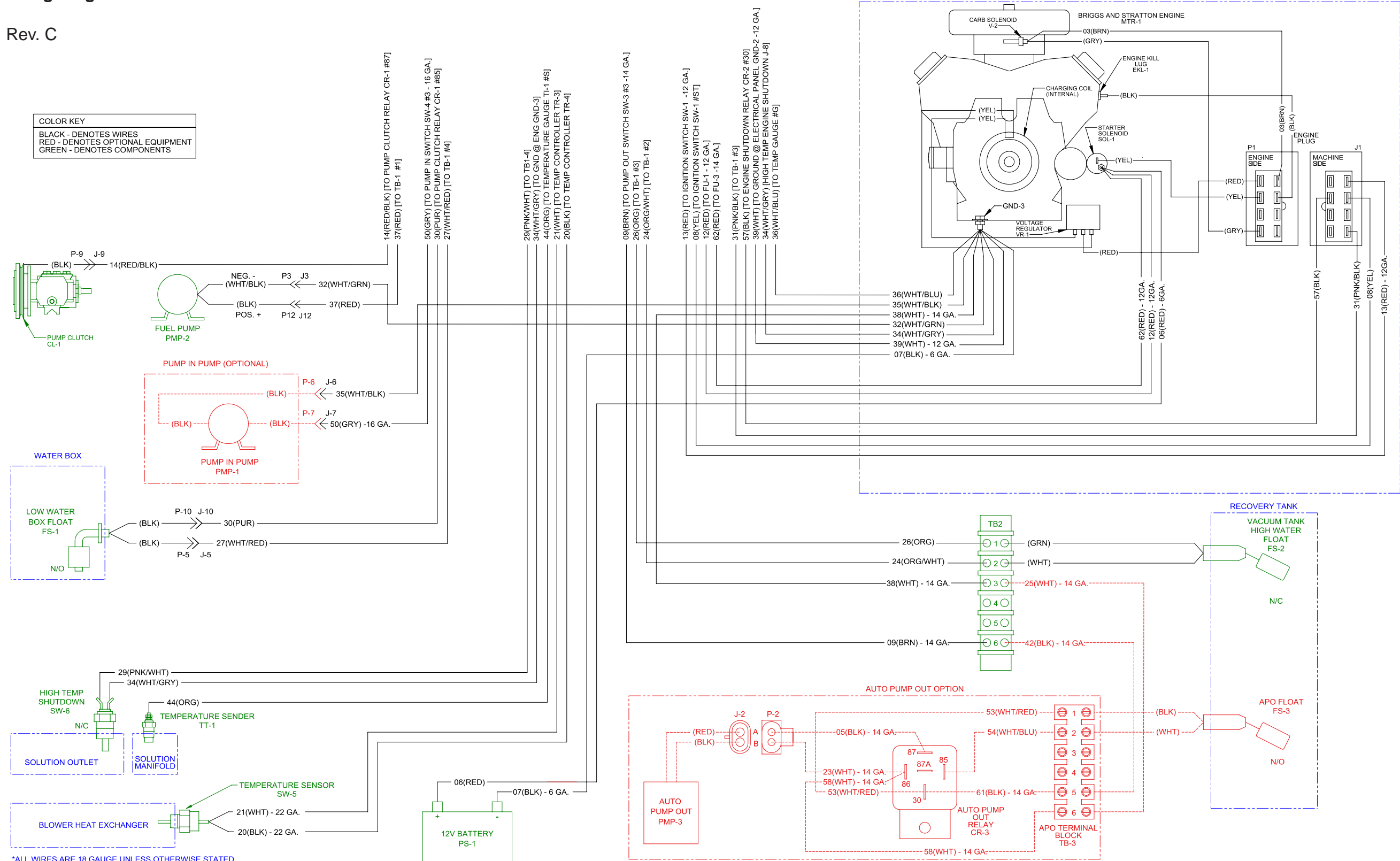


Figure 7-4. Wiring Diagram - View 3 of 3
000-179-041 Rev. C



*ALL WIRES ARE 18 GAUGE UNLESS OTHERWISE STATED

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8 - Systems 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. The truckmount overheats and shuts down

Possible Cause	Solution
1.1. Faulty sensor	Inspect the engine overheat switch and test for functionality.

2. Unable to achieve normal cleaning solution temperature

Possible Cause	Solution
2.1. Temperature control knob is turned down.	Inspect the knob. Adjust if necessary.
2.2. The thermostatic valve is faulty.	Inspect the thermostatic valve and test for functionality.
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 inlet side.	Inspect the interior of heat exchanger. Remove the debris and clean as necessary.

CHEMICAL SYSTEM

1. System will not prime

Possible Cause	Solution
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 to which chemical pump is attached).	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. Chemical flow is unstable or low

Possible Cause	Solution
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. Chemical is present in water box

Possible Cause	Solution
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. The engine will not turn over**

Possible Cause	Solution
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.
	CAUTION 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 Subsection (page 8-9).
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 of this manual (page 7-1).
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 (page 7-1).
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 (page 7-1)..
1.8. None of the above.	Refer to a qualified service technician for further troubleshooting.

2. The engine turns over but will not start.

Possible Cause	Solution
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 is faulty.	Refer to a qualified service technician for further troubleshooting.
2.4. 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.
2.5. The engine is flooded.	Remove spark plug and dry.
2.6. The spark plugs are worn or dirty.	Inspect and replace as necessary.
2.7. None of the above.	Refer to a qualified service technician for further troubleshooting.

NOTICE

Engine should be adjusted to run at 3,000 rpm under a vacuum load of 12" Hg.

3. The Engine will not come up to normal operating rpm

Possible Cause	Solution
3.1. 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.
3.2. Excessive back pressure on the engine exhaust.	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

4. Runs rough at high speed

Possible Cause	Solution
4.1. The spark plug(s) are faulty.	Remove and inspect the plugs. Clean or replace as necessary.
4.2. The spark plug wire(s) are faulty.	Inspect the wires and connectors for damage or loose connections. Repair or replace as necessary.
4.3. Inadequate fuel supply to the carburetor.	Check for blockage in the filter. Repair or replace as necessary.

5. Runs rich (black smoke)

Possible Cause	Solution
5.1. A dirty air filter	Inspect and replace as necessary.
5.2. Excessive back pressure	Inspect for a clogged heat exchanger, dirty air filter or a partially opened choke.

6. Engine overheats

Possible Cause	Solution
6.1. 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.
6.2. Low oil level	Check the level and fill as necessary.
6.3. Excessive back pressure on the engine exhaust	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

HIGH PRESSURE SYSTEM

1. The pump will not come up to normal cleaning pressure

Possible Cause	Solution
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 3,000 rpm under a 12" Hg vacuum load.

2. No pressure reading on gauge

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

3. The psi gauge reads normal (low pressure from wand)

Possible Cause	Solution
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. Pressure pulsation

Possible Cause	Solution
4.1. Chemical pump is not primed.	Prime the chemical pump.
4.2. Air leak between the water box and pump.	Check all the hoses and fittings for cuts, breaks, cracks, etc. Repair as necessary.
4.3. The check valve(s) in the pump are faulty.	Remove each valve and inspect for correct operation. See Machine Maintenance (Section 5).

5. Water box empty or fills slowly

Possible Cause	Solution
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. The water box overflows

Possible Cause	Solution
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.	Replace as necessary.
6.3. The float has come out of adjustment.	Adjust the float as necessary.

VACUUM SYSTEM

1. Weak vacuum at wand. The gauge reads normal.

Possible Cause	Solution
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. Weak vacuum

Possible Cause	Solution
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 3,000 rpm under a 12" Hg. vacuum load.
2.3. The vacuum gauge is defective.	Test the gauge and replace if necessary.

3. The vacuum gauge reads too high with no hoses attached

Possible Cause	Solution
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. Excessive noise produced by the blower

Possible Cause	Solution
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. The vacuum blower is locked and will not turn

Possible Cause	Solution
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 one hour. Then very carefully use pipe wrench on the outer diameter of the pulley on the coupler to attempt to free lobes of the blower. Do not use a wrench directly on the blower shaft. If unable to free up the blower in this manner, refer to a qualified service technician.
5.2. There is internal damage to the blower	Refer to a qualified service technician.

6. Water in truckmount exhaust

Possible Cause	Solution
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.

9 - Assemblies and Parts Lists

Boxxer XL assembly drawings and parts list included in this section are as follows:

- Console Assembly Parts List
- Frame Assembly Parts List
- Side Cover Assembly Parts List
- Blower Assembly Parts List
- Engine Assembly Parts List
- Blower Heat Exchanger Assembly Parts List
- Pump Assembly Parts List
- Exhaust Heat Shield Protector Assembly Parts List
- Electrical Panel Assembly Parts List
- Hi PSI Manifold Assembly Parts List
- By-Pass Valve Assembly Parts List
- Water Box Assembly Parts List
- Exhaust Assembly Parts List
- Diverter Valve Actuator Assembly Parts List
- Diverter Valve Box Assembly Parts List
- Dash Assembly Parts List
- Silencer Assembly Parts List
- 70 Gallon Universal Recovery Tank (URT) Assembly Parts List
- 70 Gallon Universal Recovery Tank (URT) Cover Assembly Parts List
- 100 Gallon Universal Recovery Tank (URT) Assembly Parts List
- 100 Gallon Universal Recovery Tank (URT) Cover Assembly Parts List
- Vacuum Relief Valve Assembly Parts List
- Hose Routings

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Figure 9-1. Console Assembly - View 1 of 5
610-050-727 Rev. A

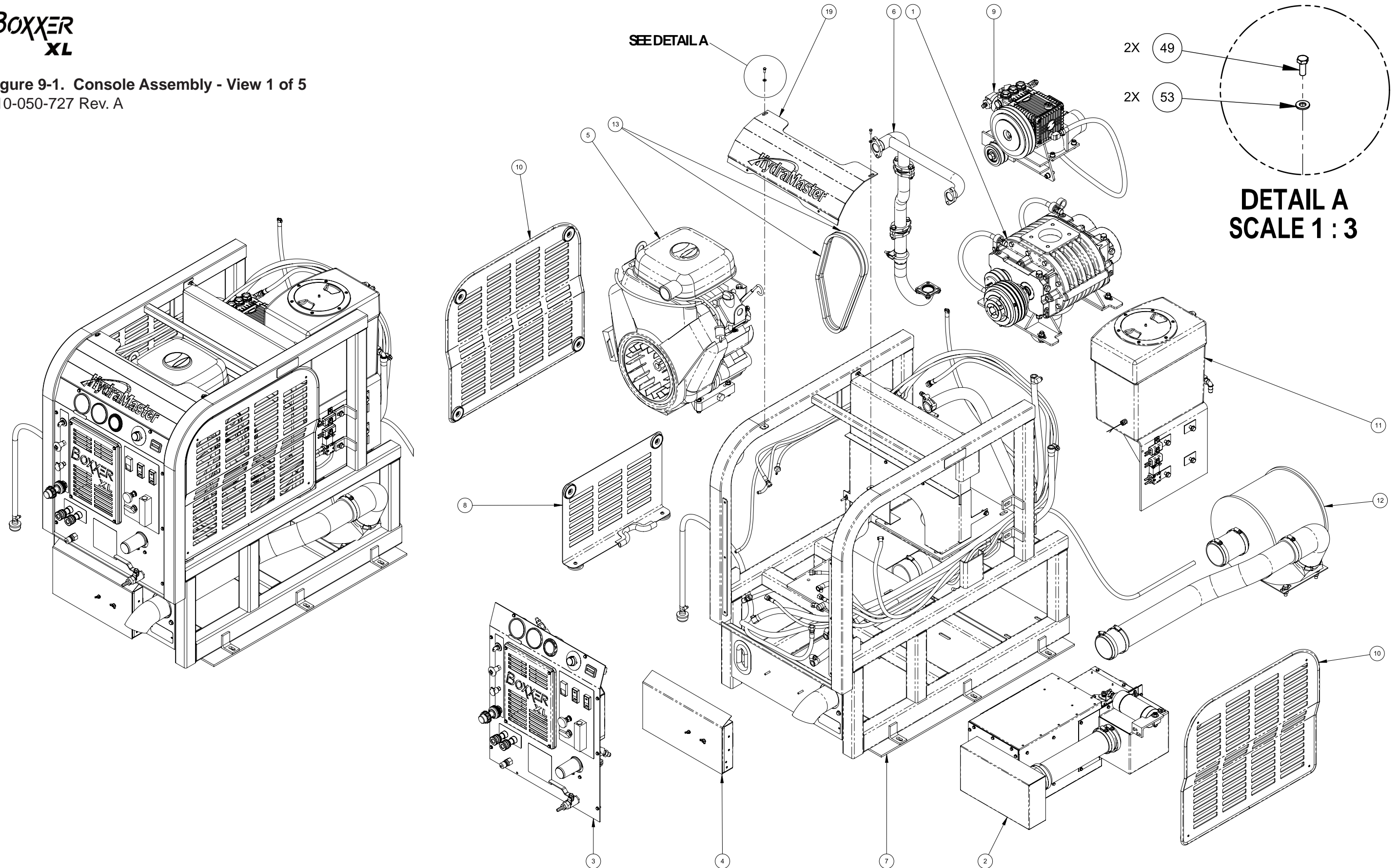
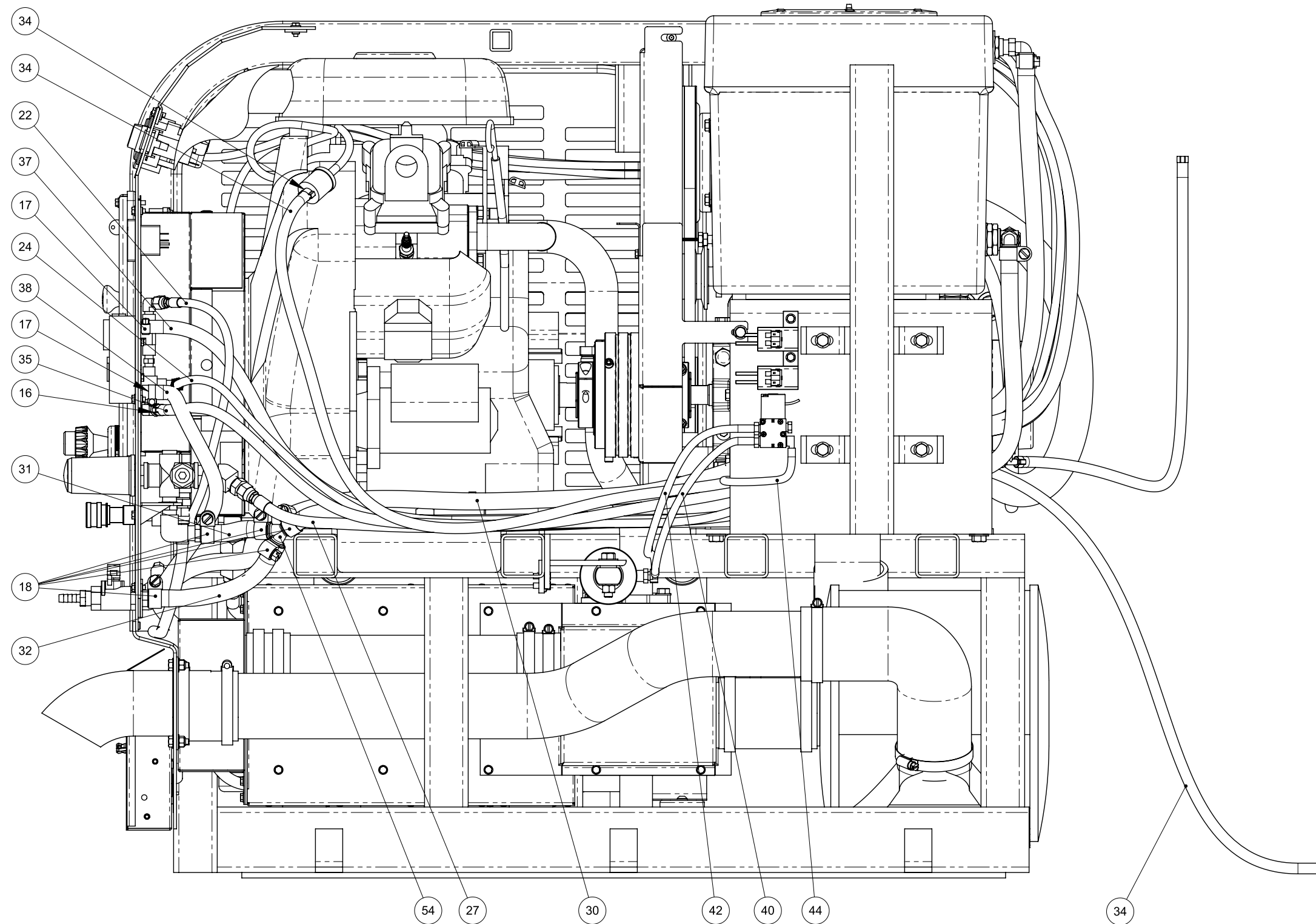


Figure 9-2. Console Assembly - View 2 of 5
610-050-727 Rev. A



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Figure 9-3. Console Assembly - View 3 of 5
610-050-727 Rev. A

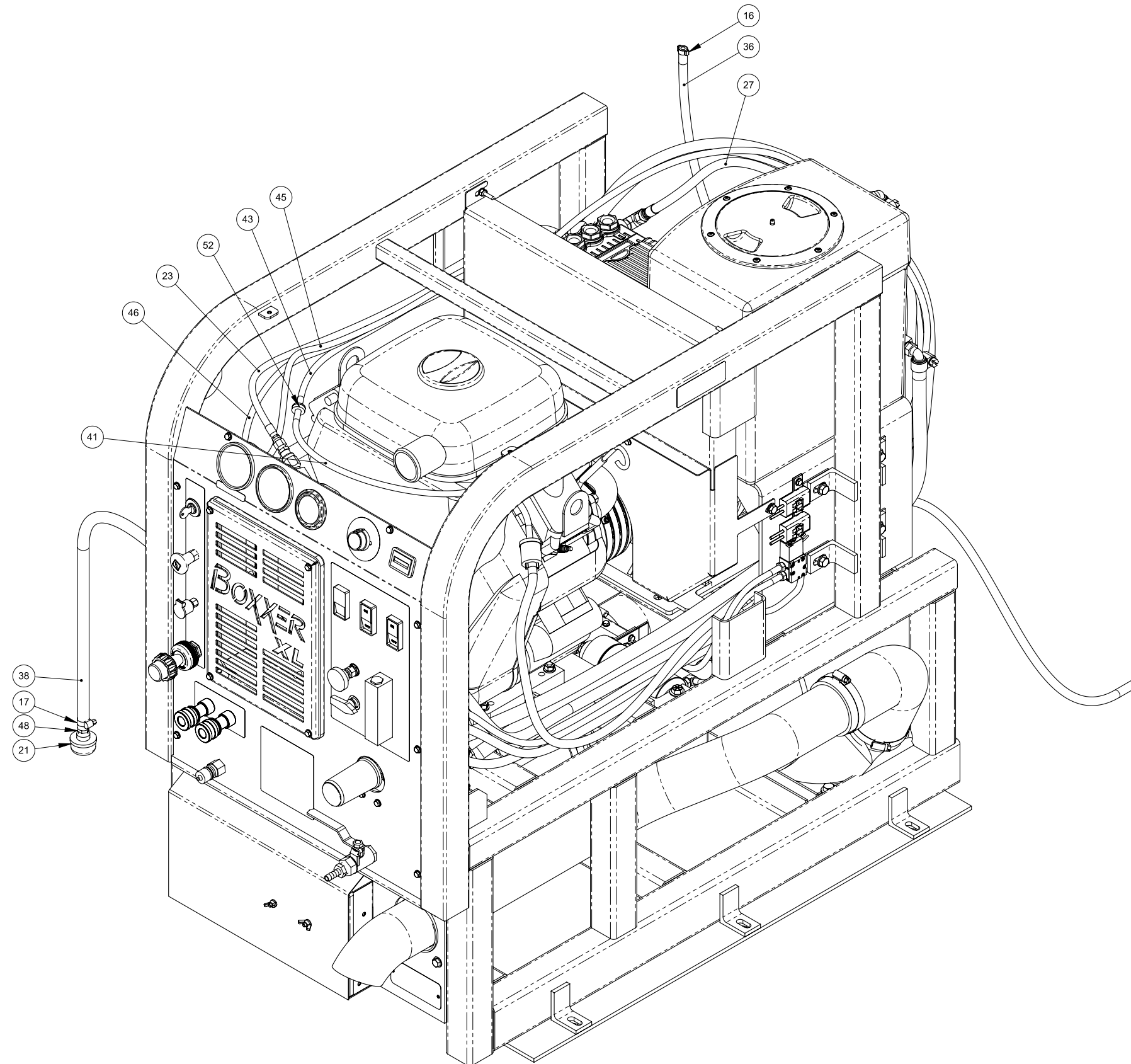
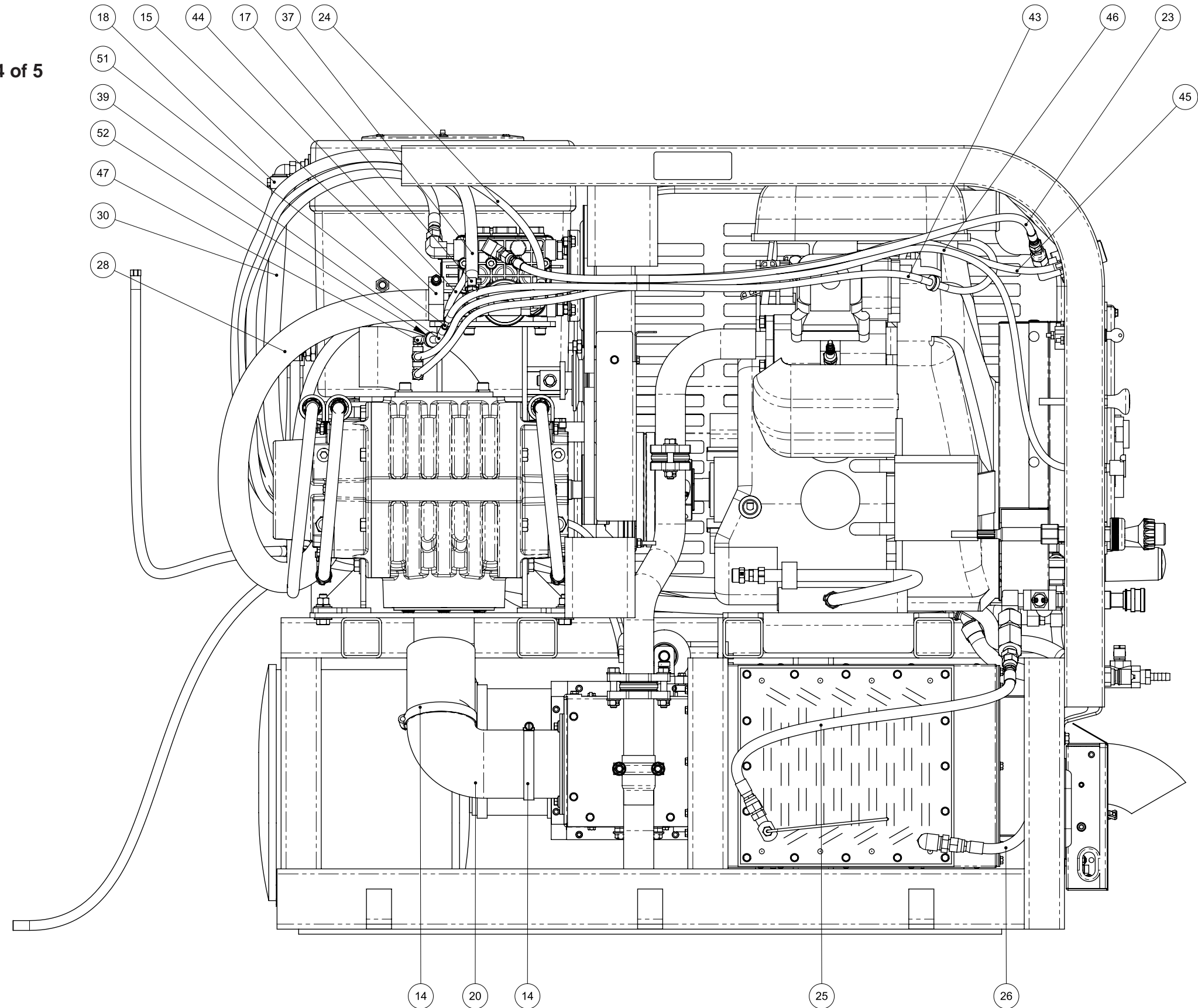
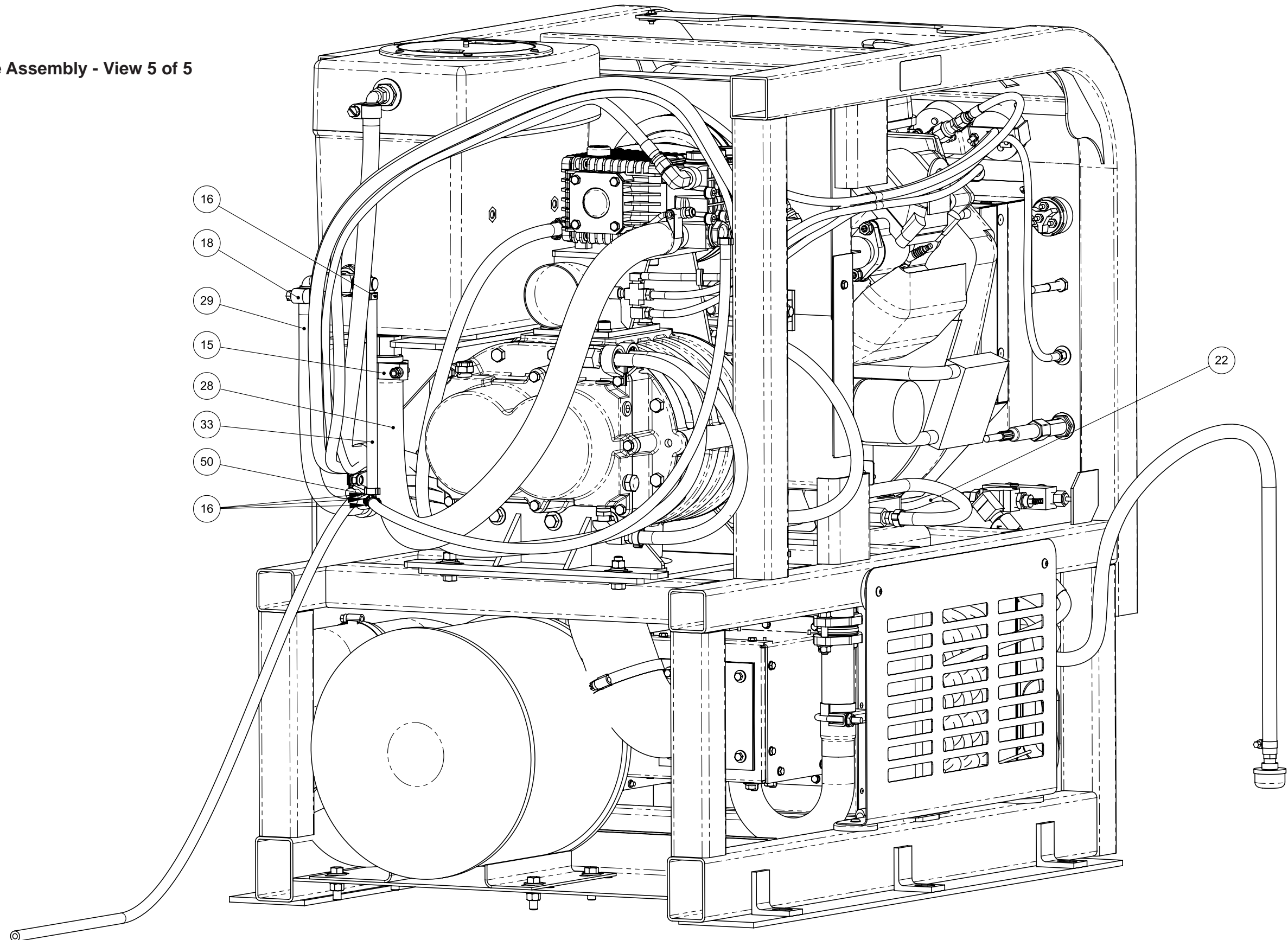


Figure 9-4. Console Assembly - View 4 of 5
610-050-727 Rev. A



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Figure 9-5. Console Assembly - View 5 of 5
610-050-727 Rev. A



Console Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	610-002-727	Assembly, Blower	1	27	000-068-328	Hose Assembly, 5/16" Teflon X 68" Lg. (Hi PSI Pump to By-Pass Valve)	1
2	610-005-727	Assembly, Blower Heat Exchanger	1	28	000-068-529	Hose, 1" I.D. Rubber X 36" Lg. (Water Box to Hi PSI Pump)	1
3	610-018-727	Assembly, Dash	1	29	000-068-991	Hose, 1/2" I.D. Rubber X 42" Lg. (Wye to Water Box)	1
4	610-011-727	Assembly, Electrical Panel	1	30	000-068-325	Hose, 1/2" I.D. Rubber X 68" Lg. (Fresh Water In to Water Box)	1
5	610-004-727	Assembly, Engine	1	31	000-068-992	Hose, 1/2" Rubber X 4" (By-Pass Return to Wye)	1
6	610-013-727	Assembly, Exhaust	1	32	000-068-993	Hose, 1/2" Rubber X 5" Lg. (Drain Valve to Wye)	1
7	610-001-727	Assembly, Frame	1	33	000-068-346	Hose, 1/4" I.D. Fuel X 12" Lg. (Hi Temp Dump Valve to Tee)	1
8	610-024-727	Assembly, Protector - Heat Shield - Exhaust	1	34	000-068-979	Hose, 1/4" I.D. Fuel X 120" Lg. (Fuel Filter to Main Fuel Line)	1
9	610-007-727	Assembly, Pump	1	35	000-068-353	Hose, 1/4" I.D. Fuel X 42" Lg. (Prime Valve to Tee)	1
10	610-023-741	Assembly, Side Cover - Machine	2	36	000-068-345	Hose, 1/4" I.D. Fuel X 66" Lg. (Tee to Recovery Tank)	1
11	610-010-727	Assembly, Water Box	1	37	000-068-971	Hose, 3/8" I.D. Braided - Clear X 60" Lg. (Flow Meter to Chemical Pump)	1
12	610-021-727	Assembly, Silencer	1	38	000-068-971	Hose, 3/8" I.D. Braided - Clear 60" Lg. (Flow Meter to Chemical Jug)	1
13	000-010-136	Belt A37	2	39	000-068-1006	Hose, 5/32" I.D. Vacuum X 1.5" Lg. (Check Valve to Vacuum Tee)	1
14	000-033-013	Clamp, #48 Hose (3")	2	40	000-068-314	Hose, 5/32" I.D. Vacuum X 12.5" Lg. (Diverter Solenoid to Actuator)	1
15	000-033-132	Clamp, 1-1/2" T-Bolt	2	41	000-068-348	Hose, 5/32" I.D. Vacuum X 14" Lg. (Check Valve to Engine)	1
16	000-033-017	Clamp, 1/4" I.D. Hose	7	42	000-068-313	Hose, 5/32" I.D. Vacuum X 17.5" Lg. (Diverter Solenoid to Actuator)	1
17	000-033-003	Clamp, Size #4 Mini Hose	4	43	000-068-1009	Hose, 5/32" I.D. Vacuum X 22" Lg. (Vacuum Tee to Check Valve)	1
18	000-033-004	Clamp, Size #6 Mini Hose	8	44	000-068-347	Hose, 5/32" I.D. Vacuum X 35" Lg. (Vacuum Tee to Diverter Solenoid)	1
19	000-041-874	Cover, Top - Machine - Coated	1				
20	000-052-917	Elbow, Silicone Coupler 3" 90 Degree	1				
21	000-049-118	Filter, Chemical Inlet High Pressure	1				
22	000-068-339	Hose Assembly, 3/16" Teflon X 26" Lg. (Chemical Metering Valve to Solution Out)	1				
23	000-068-338	Hose Assembly, 3/16" Teflon X 32" Lg. (Hi PSI Pump to PSI Gauge)	1				
24	000-068-337	Hose Assembly, 3/16" Teflon X 61" Lg. (Chemical Pump to Prime Valve-Inlet)	1				
25	000-068-330	Hose Assembly, 5/16" Teflon X 16.5" Lg. (Heat Exchanger Out to Hi PSI Manifold)	1				
26	000-068-329	Hose Assembly, 5/16" Teflon X 23" Lg. (By-Pass Valve to Heat Exchanger In)	1				

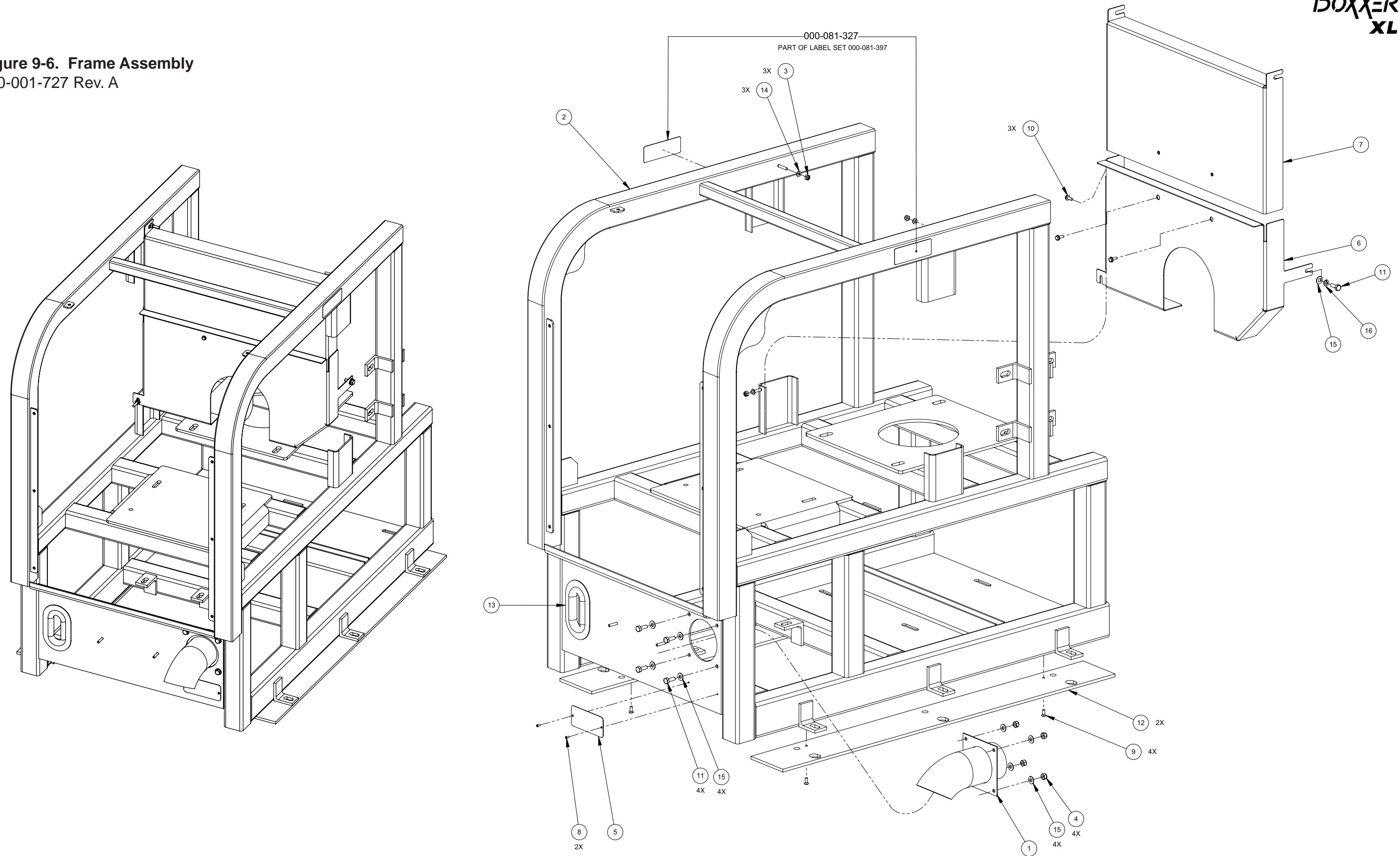


Console Assembly Parts List (continued)

Item	Part Number	Description	Qty
45	000-068-344	Hose, 5/32" I.D. Vacuum X 41.5" Lg. (Blower Inlet to Vacuum Gauge)	1
46	000-068-978	Hose, 5/32" I.D. Vacuum X 52" Lg. (Blower Inlet to Lube Port)	1
47	000-068-1006	Hose, 5/32" I.D. Vacuum X 1.5" Lg. (Blower Inlet to Check Valve)	1
48	000-052-102	Insert, #46 (1/4" NPT X 3/8" Barb)	1

Item	Part Number	Description	Qty
49	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
50	000-052-575	Tee, 1/4" Insert M-M-M GFBN	1
51	000-052-155	Tee, 3/16" Plastic Vacuum Insert	1
52	000-169-156	Valve, Check - Diverter Control	2
53	000-174-001	Washer, #10 Flat	2
54	000-052-407	Wye, 1/2" Plastic Barb	1

Figure 9-6. Frame Assembly
610-001-727 Rev. A



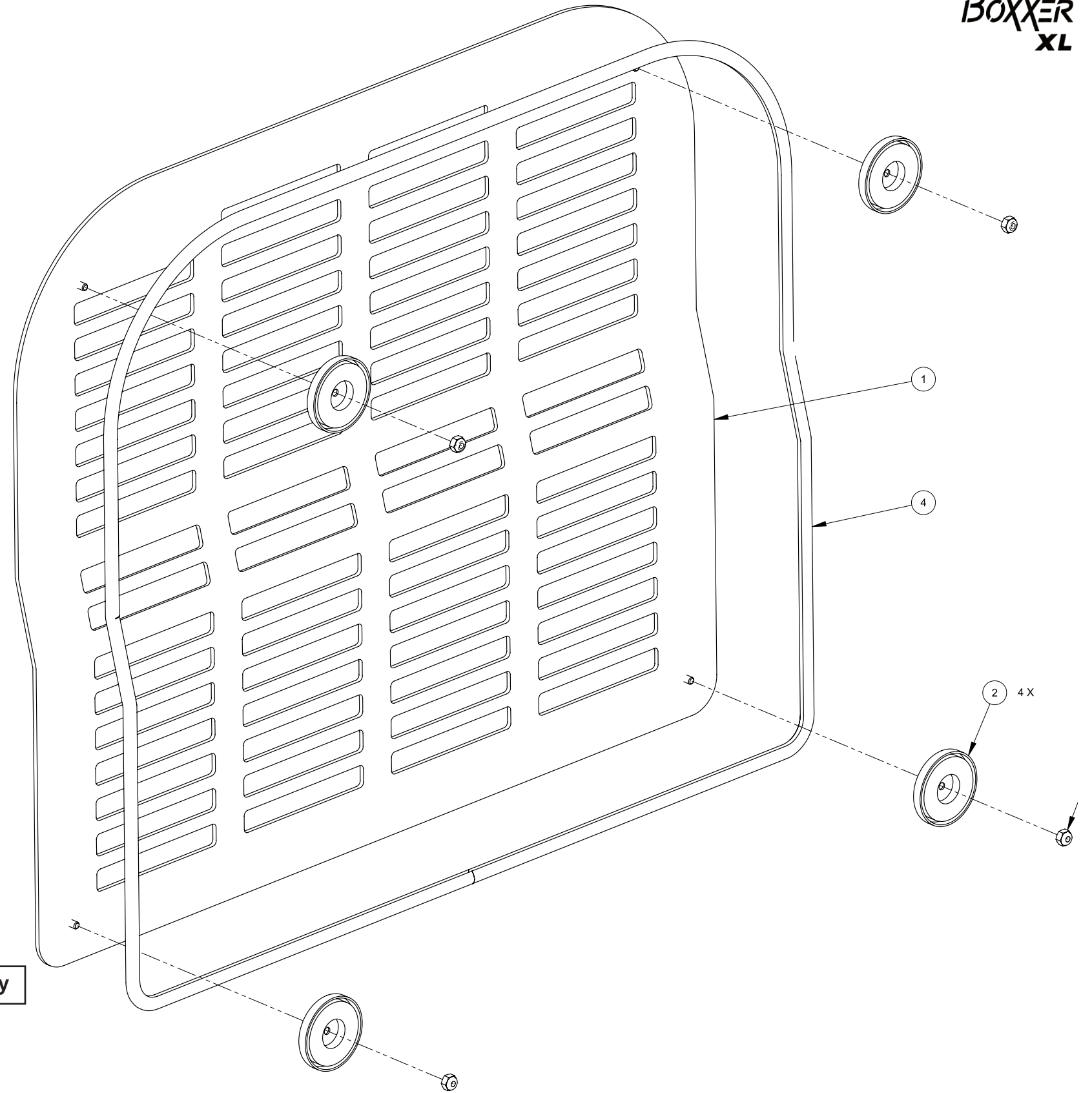
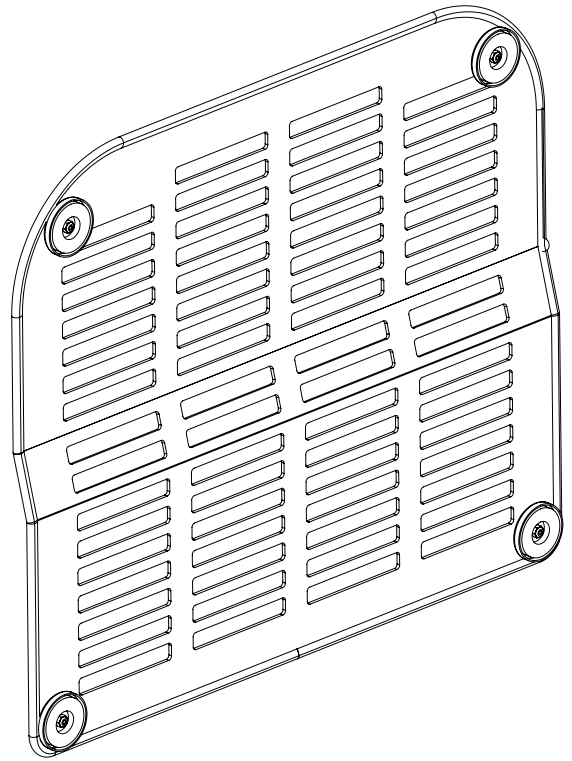


Frame Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-098	Adapter, Exhaust Turndown	1
2	000-055-212	Frame - Coated	1
3	000-094-034	Nut, #10-24UNC Nylock	3
4	000-094-009	Nut, 1/4"-20UNC Nylock	4
5	000-105-012	Plate, Machine Serial I.D.	1
6	000-108-171	Protector, Lower Heat Shield - Fabricated	1
7	000-108-173	Protector, Upper Heat Shield - Fabricated	1
8	000-140-001	Rivet, AB4-3A Aluminum Pop 1/8" X 1/4" Lg.	2

Item	Part Number	Description	Qty
9	000-143-114	Screw, #10-24UNC X 0.50" Lg. Flat Head Phillips	4
10	000-143-583	Screw, #10-24UNC X 0.50" Lg. Hex Head Flange Z/P	3
11	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	5
12	000-154-156	Spacer, Machine Rising 4" X 35"	2
13	000-131-131	Trimlock, 3/8" X 1/8"	1
14	000-174-001	Washer, #10 Flat	3
15	000-174-003	Washer, 1/4" Flat	9
16	000-174-019	Washer, 1/4" Lock	1

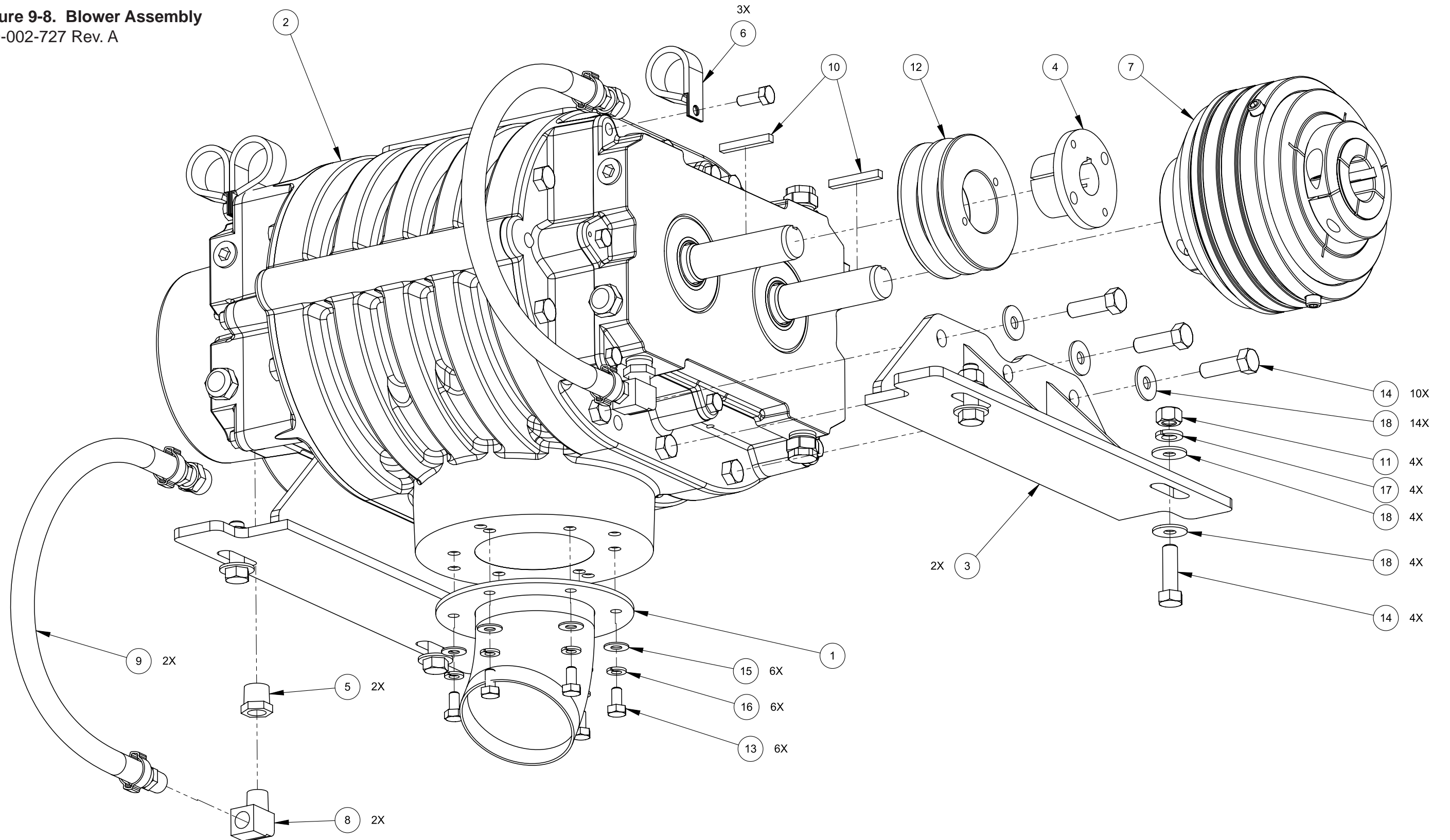
Figure 9-7. Side Cover Assembly
610-023-741 Rev. B



Side Cover Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-469	Cover, Side - Machine - Coated	1
2	000-089-003	Magnet	4
3	000-094-034	Nut, #10-24UNC Nylock	4
4	000-131-131	Trimlock, 3/8 X 1/8 Rubber Edge Trim	1 ft

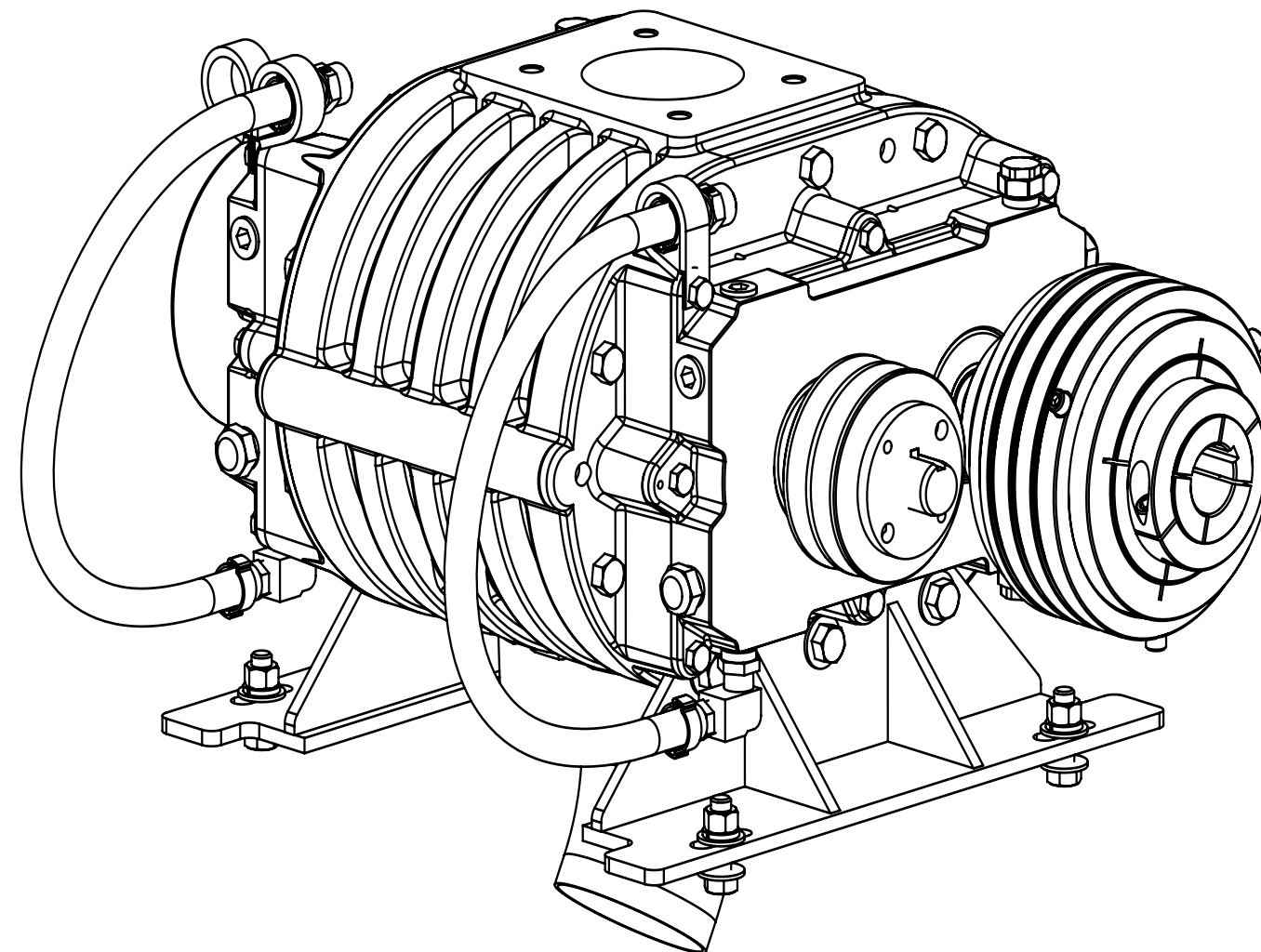
Figure 9-8. Blower Assembly
610-002-727 Rev. A



Blower Assembly Parts List

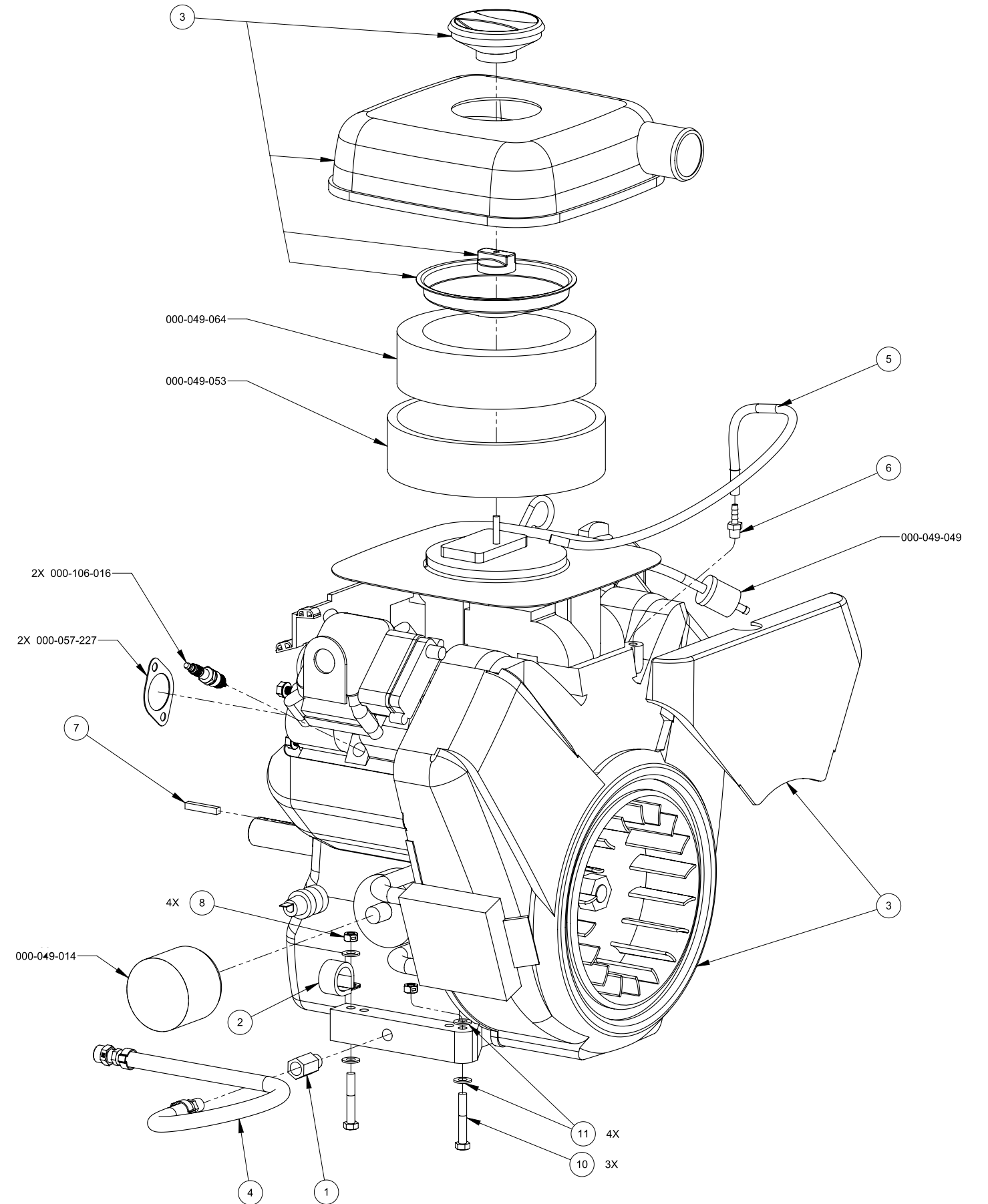
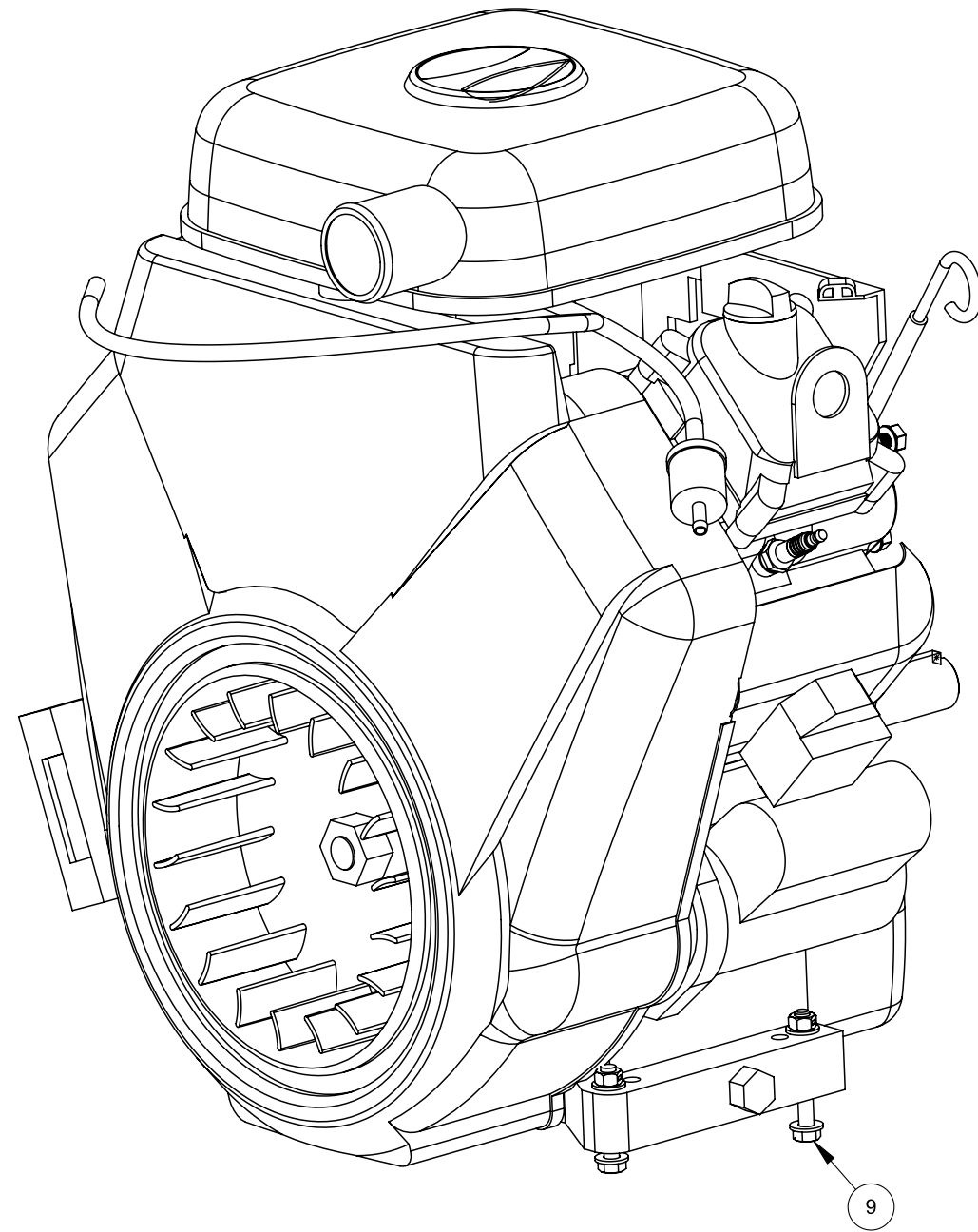
Item	Part Number	Description	Qty
1	000-001-856	Adapter, Blower Outlet - Coated	1
2	000-111-147	Blower, 4007 Dominator	1
3	000-015-1221	Bracket, Blower Foot - Coated	2
4	000-020-019	Bushing, #H X 7/8" Bore	1
5	000-052-061	Bushing, 3/8" NPT X 1/4" FPT	2
6	000-033-057	Clamp, 1" Cushion Loop	3
7	000-039-001	Coupler, 50 Series	1
8	000-052-085	Elbow, 1/4" NPT Street	2
9	000-068-794	Hose Assembly, 3/8" X 17" Lg. Drain	1

Item	Part Number	Description	Qty
10	000-077-011	Key, 3/16" X 1 1/2" Long	2
11	000-094-014	Nut, 3/8-16 Hex Z/P	4
12	000-109-107	Pulley, 2 Groove	1
13	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	6
14	000-143-025	Screw, 3/8"-16 UNC X 1.25" Lg. Hex Head Gr. 8	10
15	000-174-003	Washer, 1/4" Flat	6
16	000-174-019	Washer, 1/4" Lock	6
17	000-174-021	Washer, 3/8" Lock	4
18	000-174-004	Washer, 5/16" Flat, USS	14



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Figure 9-9. Engine Assembly
610-004-727 Rev. A



Engine Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-063	Bushing, 14mm X 1/4" NPT Engine Oil Drain Adapter	1
2	000-033-117	Clamp, 1" Cushion Loop w/ 7/16 Mount Hole	1
3	000-047-041	Engine	1
4	000-068-794	Hose Assembly, 3/8" X 17" Lg. Drain	1
5	000-068-348	Hose, 5/32" (4mm) I.D. Vacuum - Bulk	1
6	000-052-293	Insert, #23 (1/8" NPT X 3/16" Barb)	1

Item	Part Number	Description	Qty
7	000-077-010	Key, 1/4" X 1-1/2" Lg. Class 2 Fit	1
8	000-094-081	Nut, 5/16"-18UNC Hex 2 Way Locking	4
9	000-143-106	Screw, 5/16"-18UNC X 2.5" Lg. Hex Head	1
10	000-143-316	Screw, 5/16-18 X 2" HHCS	3
11	000-174-049	Washer, 5/16" Flat	8

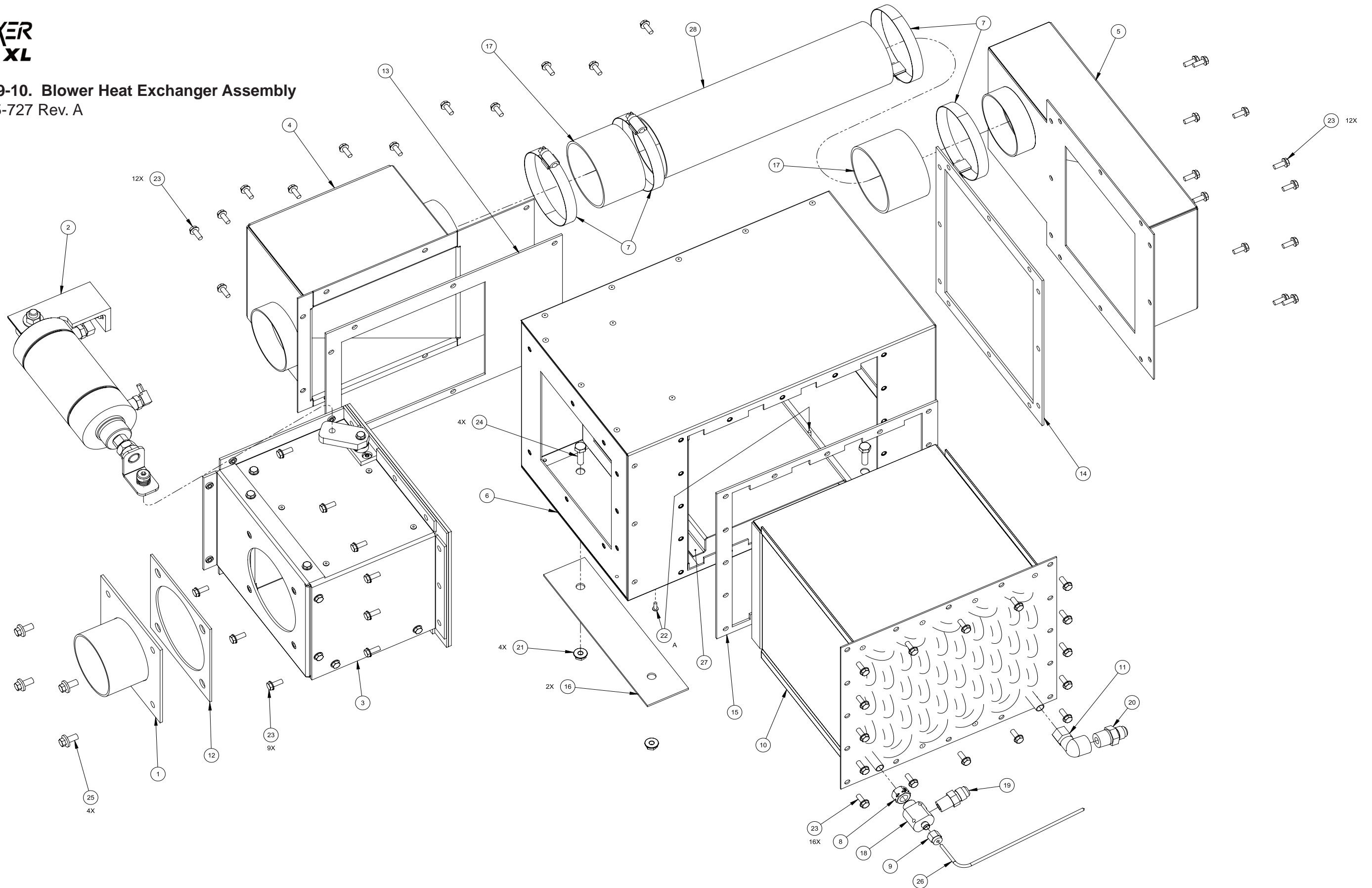
NOTICE

These parts, which come with the original engine, are also available from HydraMaster:

- 000-049-014 Oil Filter
- 000-049-049 Fuel Filter
- 000-049-053 Foam Air Filter
- 000-049-064 Air Filter
- 000-057-227 Exhaust Gasket
- 000-106-016 Spark Plug

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Figure 9-10. Blower Heat Exchanger Assembly
610-005-727 Rev. A



Blower Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-001-598	Adapter, Tank to 3.0" Blower Hose - Welded	1	14	000-057-236	Gasket, Front Plenum	1
2	610-014-727	Assembly, Diverter Valve Actuator	1	15	000-131-015	Gasket, Heat Exchanger Core	1
3	000-169-230	Assembly, Diverter Valve Box	1	16	000-057-215	Gasket, Heat Exchanger Plenum - Silicone	2
4	000-013-119	Box, Divert Plenum - Weldment	1	17	000-068-910	Hose, 3.0" I.D. X 3 Ply Silicone X 2" Lg.	2
5	000-013-121	Box, Front Plenum - Weldment	1	18	000-052-815	Manifold, RTD 1/8" Comp X 3/8" Comp	1
6	000-013-075	Box, Heat Exchanger Inlet and Outlet Plenum	1	19	000-052-533	Nipple, 3/8" JIC X 1/4" NPT	1
7	000-033-013	Clamp, #48 Hose (3")	4	20	000-052-528	Nipple, 3/8" M JIC X 3/8" NPT	1
8	000-052-812	Compression, Fitting 1/4" FPT X 3/8" Tube	1	21	000-094-007	Nut, 1/4-20 UNC, Flange	4
9	000-052-813	Compression, Fitting 1/4" NPT X 1/8" Tube	1	22	000-140-017	Rivet, 1/8" X 3/8" Blind Pop S/S	2
10	000-038-073	Core, Heat Exchanger 8" X 8"	1	23	000-143-583	Screw, #10-24UNC X 0.50" Lg. Hex Head Flange Z/P	49
11	---	Elbow, 3/8" FPT X 3/8" Compression (Comes w/ Heat Exchanger)	1	24	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	4
12	000-057-210	Gasket, 4" Exhaust	1	25	000-143-141	Screw, 1/4"-20UNC X 1/2" Lg. Whiz Lock	4
13	000-057-237	Gasket, Divert Plenum	1	26	000-149-566	Sensor, 6" - 90 Degree RTD	1
				27	000-154-176	Spacer, Heat Exchanger Support - Bottom	1
				28	000-125-936	Tube, 3.00" O.D. X 0.065" Wall X 11.0" Lg.	1

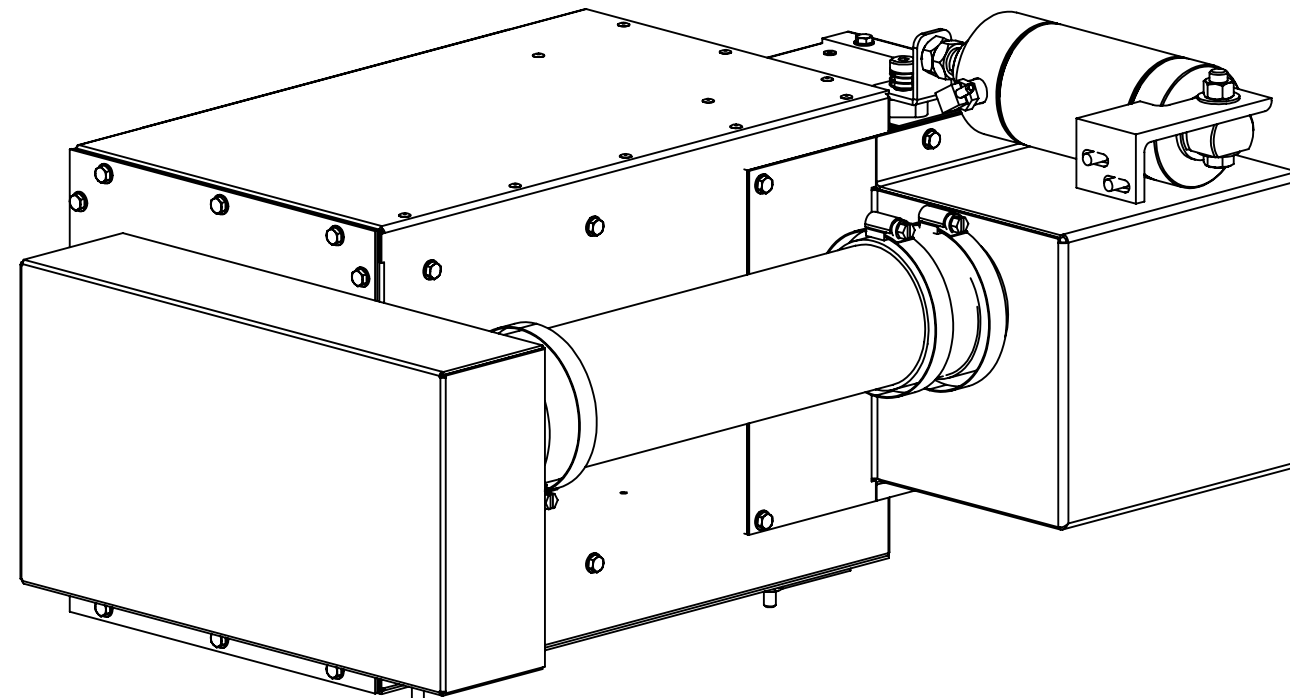


Figure 9-11. Pump Assembly - View 1 of 2
610-007-727 Rev. A

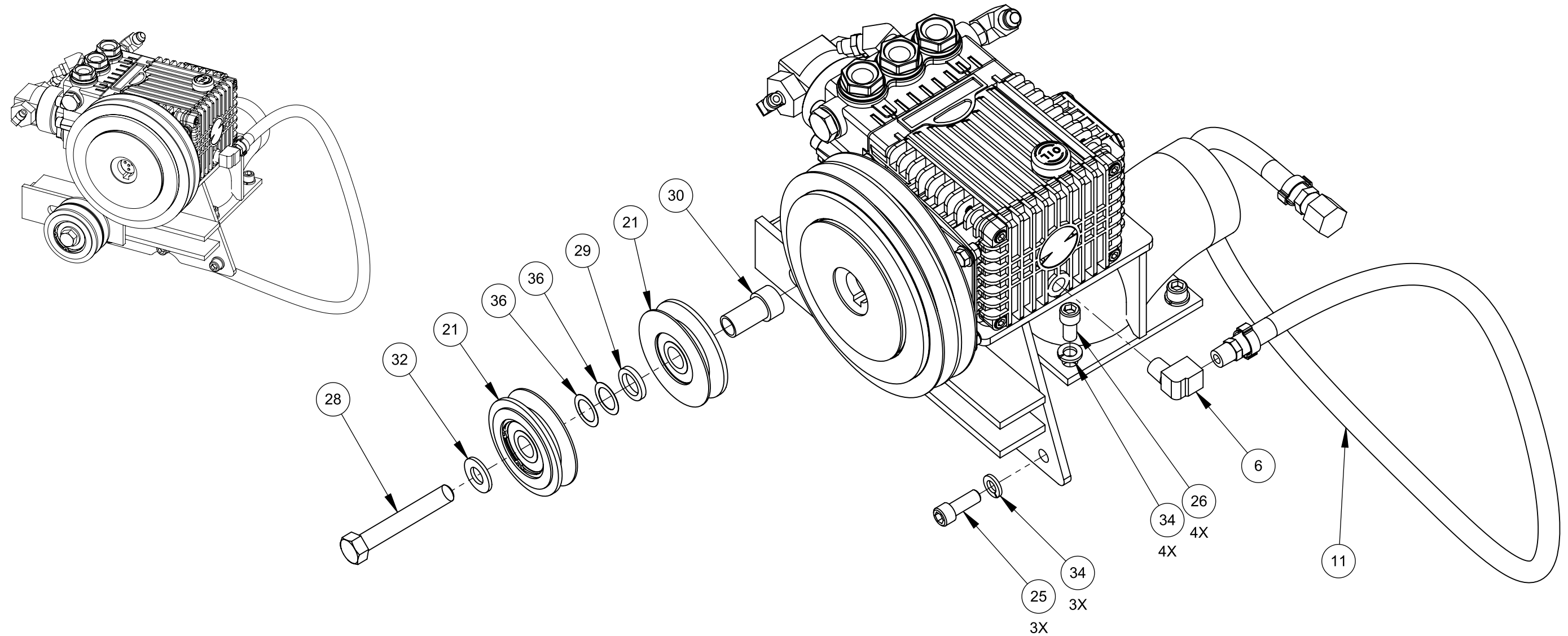
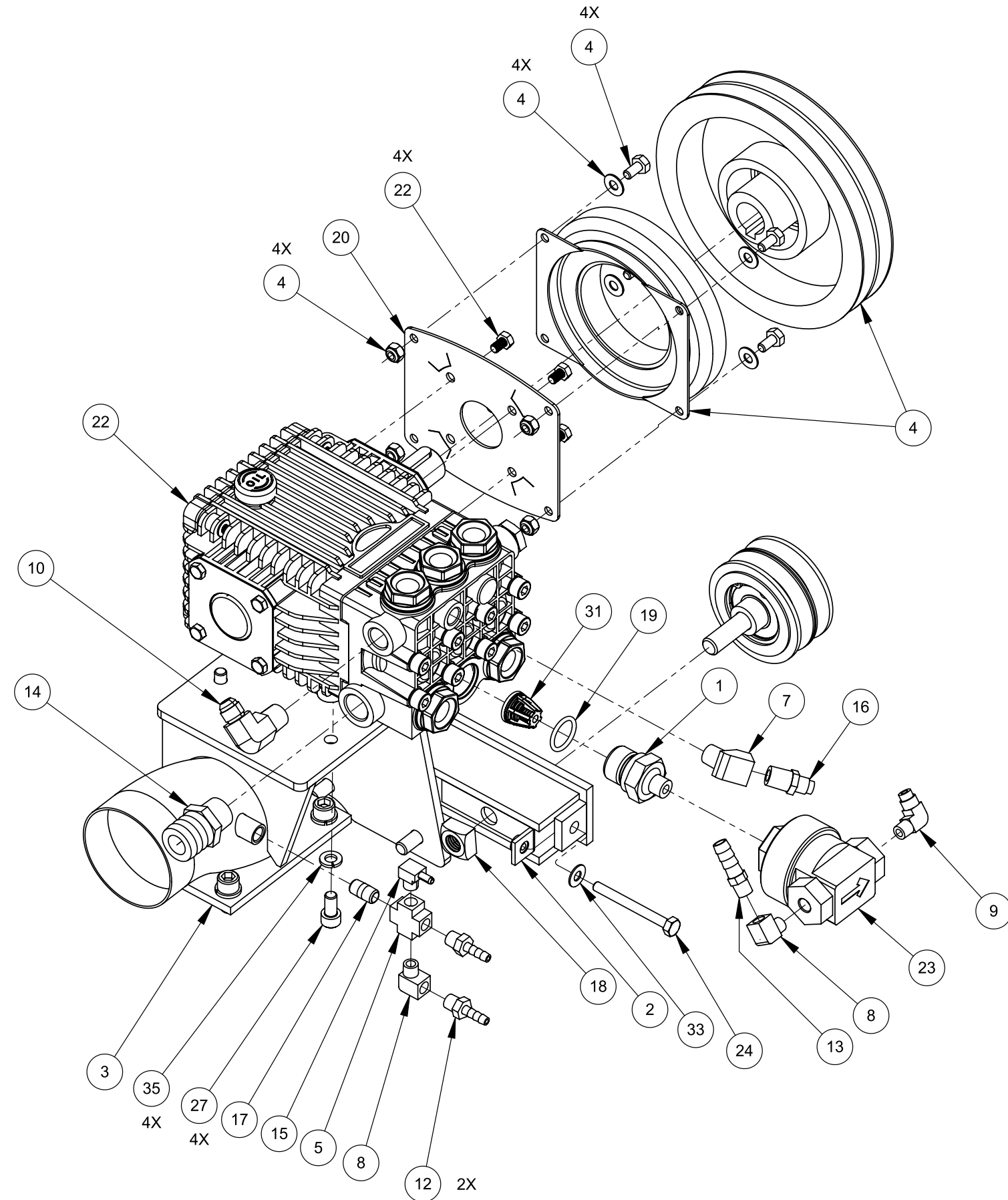


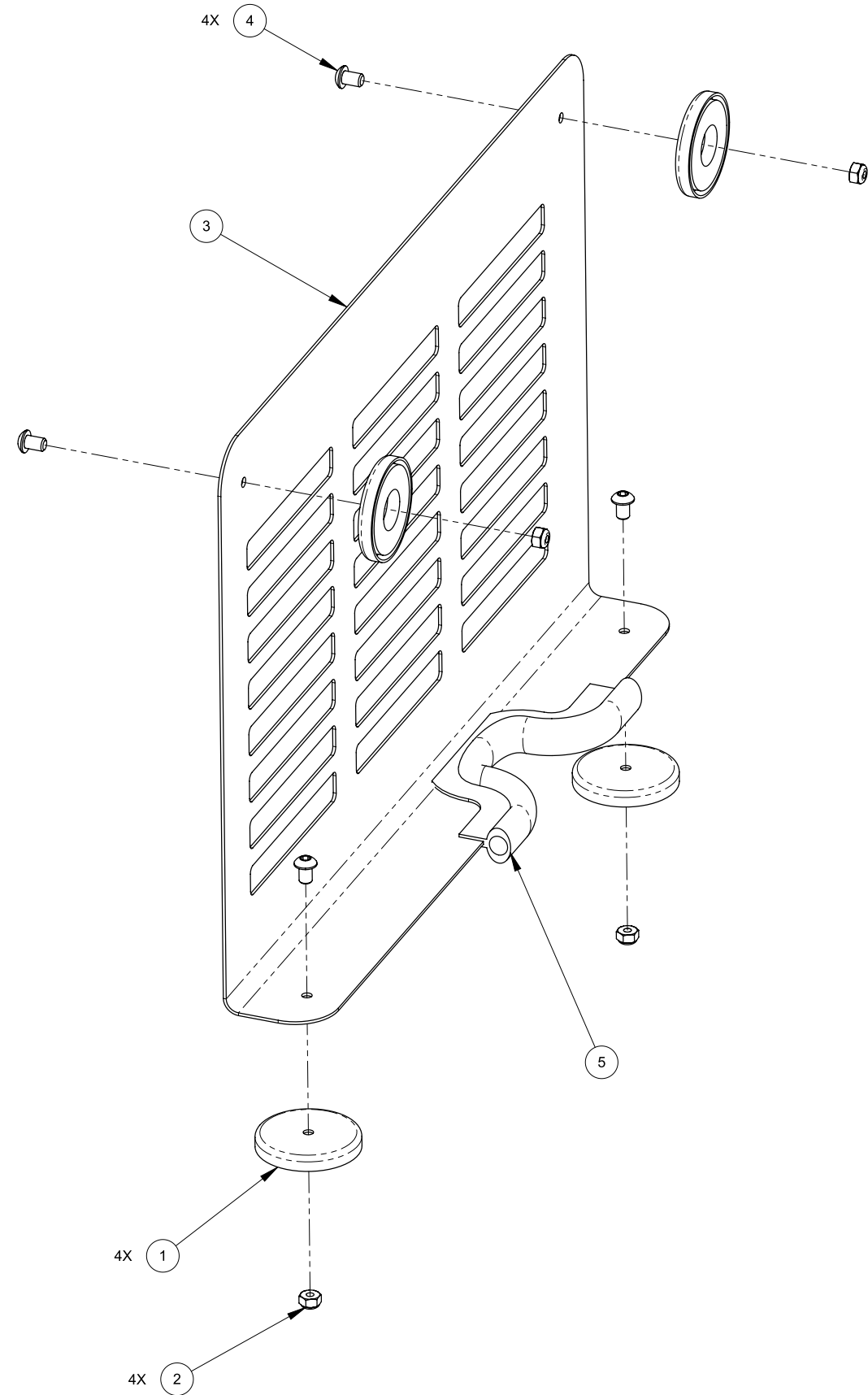
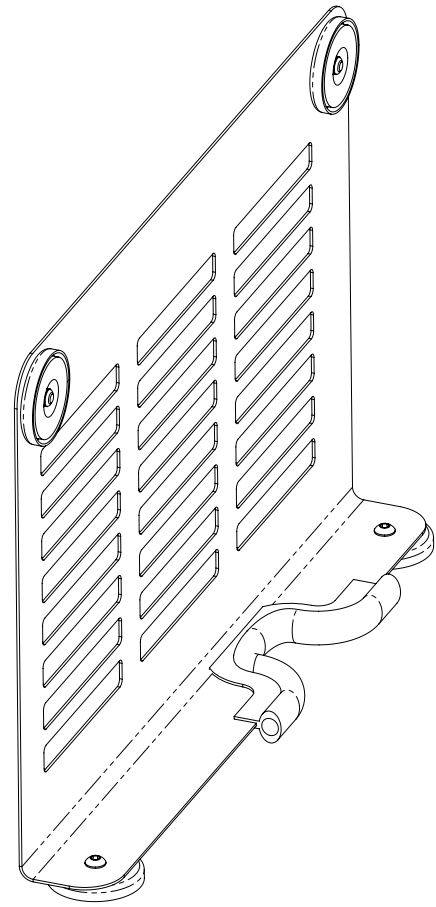
Figure 9-12. Pump Assembly - View 2 of 2
610-007-727 Rev. A



Pump Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-001-154	Adapter, GP to Chemical Pump S/S	1	19	000-097-057	O-Ring, Adapter - Chemical Pump	1
2	000-015-1243	Bracket, Idler Tension - Coated	1	20	000-105-550	Plate, Pump Clutch	1
3	000-015-1223	Bracket, Pump Mount - Coated	1	21	000-109-106	Pulley, Ø3" Offset "A" Section - Assembled	2
4	000-036-009	Clutch, Pump - 24mm Dual Groove	1	22	000-111-188	Pump	1
5	000-052-079	Cross, 1/8" FPT	1	23	000-111-184	Pump, GP Chemical	1
6	000-052-085	Elbow, 1/4" NPT Street	1	24	000-143-594	Screw, 1/4"-20UNC X 2 1/2" Lg. HHCS, Full Threads	1
7	000-052-082	Elbow, 1/4" NPT Street X 45 Degree	1	25	000-143-094-1	Screw, 3/8"-16UNC X 1" Lg. Socket Head	3
8	000-052-084	Elbow, 1/8" NPT Street	2	26	000-143-094-1	Screw, 3/8"-16UNC X 3/4" Lg. Socket Head	4
9	000-052-531	Elbow, 1/8" NPT X 1/4" SAE	1	27	000-143-701	Screw, M8 X 16mm Lg. Socket Head	4
10	000-052-766	Elbow, 3/8 NPT X 3/8 JIC	1	28	000-143-043	Screw, 1/2-13 X 3 1/4" HHC	1
11	000-068-349	Hose Blower Oil	1	29	000-154-199	Spacer, 1.00 O.D. X 0.688 I.D. X 0.150" Thk.	1
12	000-052-293	Insert, #23 (1/8" NPT X 3/16" Barb)	2	30	000-154-198	Spacer, Pump Idler Mounting - Coated	1
13	000-052-099	Insert, #26 (1/8" NPT X 3/8" Barb)	1	31	000-169-221	Valve, GP Pump Check - Mod.	1
14	000-052-753	Insert, #816 (1/2" NPT X 1" Barb)	1	32	000-174-012	Washer, 1/2 SAE H/D	1
15	000-052-106	Insert, 1/8" NPT X 5/32" Barb X 90 Degree	1	33	000-174-003	Washer, 1/4" Flat	1
16	000-052-527	Nipple, 1/4" SAE X 1/4" NPT	1	34	000-174-021	Washer, 3/8" Lock	7
17	000-052-057	Nipple, 1/8" NPT Close	1	35	000-174-018	Washer, 5/16" Lock	4
18	000-094-119	Nut, 1/2-13UNC Zinc Plated Square	1	36	000-174-179	Washer, 1.00 O.D. X 0.688 I.D.	2

Figure 9-13. Exhaust Heat Shield Protector Assembly
610-024-727 Rev. A

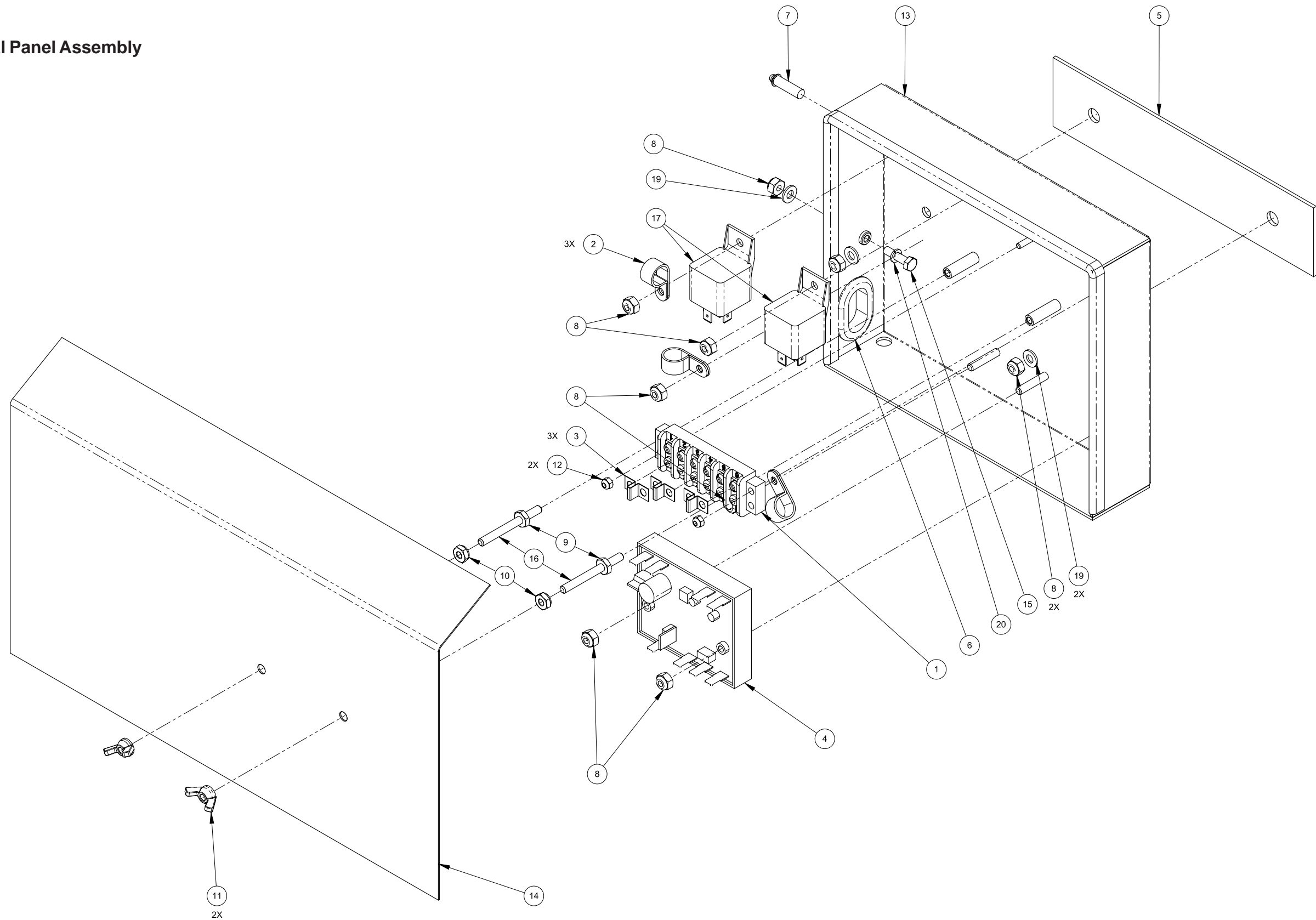


Exhaust Heat Shield Protector Assembly Parts List

Item	Part Number	Description	Qty
1	000-089-003	Magnet	4
2	000-094-034	Nut, #10-24UNC Nylock	4
3	000-108-177	Protector, Heat Shield Exhaust	1
4	000-143-565	Screw, 1/4"20UNC X 0.375" Lg. Button Head Socket	4
5	000-131-021	Trimlock, 5/8" X 1/8" X 12" Lg.	1

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Figure 9-14. Electrical Panel Assembly
610-011-727 Rev. C



Electrical Panel Assembly Parts List

Item	Part Number	Description	Qty
1	000-012-002	Block, 6 Post Terminal	1
2	000-033-022	Clamp, 1/2" Nylon Hose	3
3	000-037-011	Connector, Jumper Terminal Block	3
4	000-074-125	Controller, Temp Single Analog Input - RTD	1
5	000-057-215	Gasket, Heat Exchanger Plenum - Silicone	1
6	000-060-014	Grommet, 1.00" I.D. X 1.50" O.D.	1
7	000-084-010	Light, Green LED Indicator Mini	1
8	000-094-034	Nut, #10-24UNC Nylock	9
9	000-094-003	Nut, #10-32UNF Hex	2
10	000-094-058	Nut, #10-32UNF Nylock	2

Item	Part Number	Description	Qty
11	000-094-108	Nut, #10-32UNF Wing	2
12	000-094-063	Nut, #6-32UNC Nylock	2
13	000-100-314	Panel, Electrical - Coated	1
14	000-100-253	Panel, Electrical Box Cover - Coated	1
15	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	1
16	000-156-040	Stud, #10-32UNF X 2" Lg. S/S	2
17	000-157-022	Switch, Relay	2
18	000-131-131	Trimlock, 3/8" X 1/8"	1
19	000-174-001	Washer, #10 Flat	3
20	000-174-014	Washer, #10 Lock	1

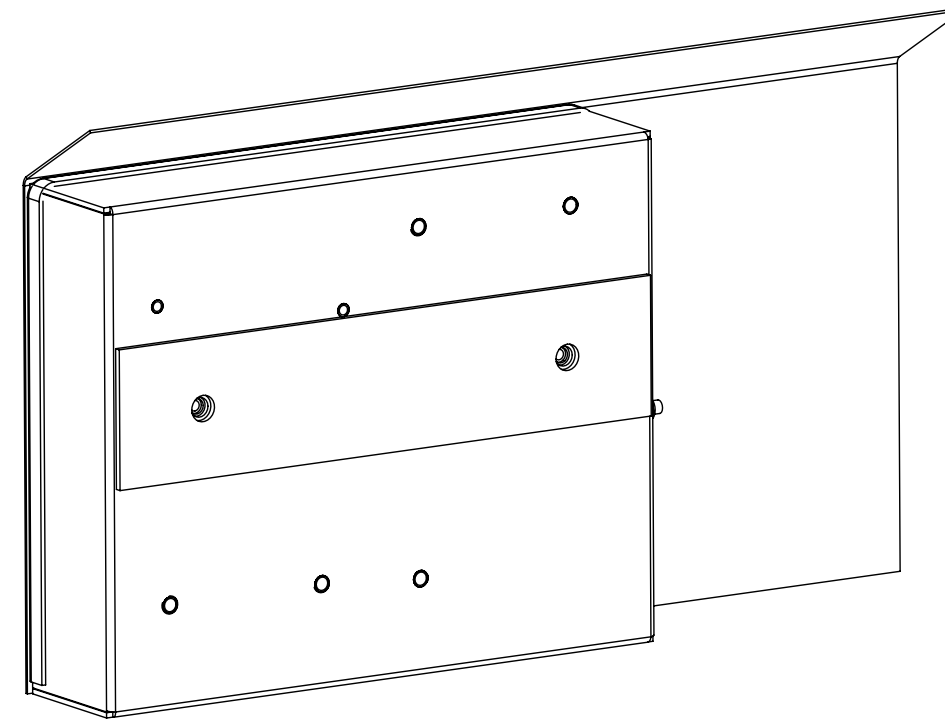
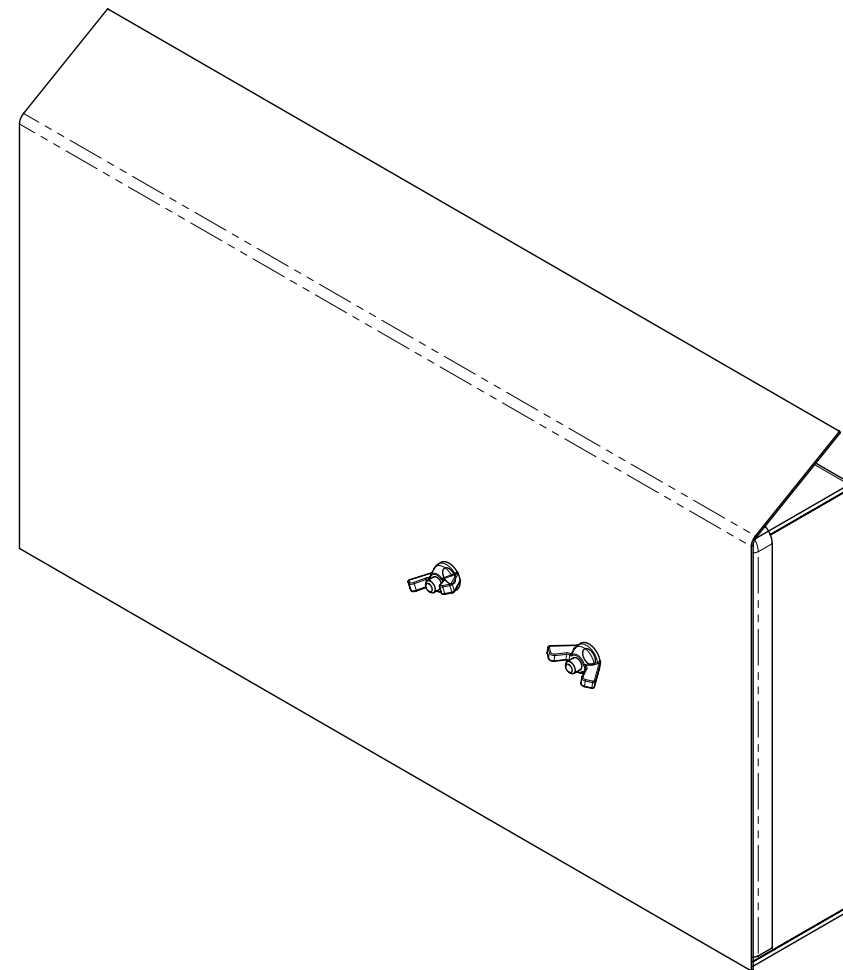
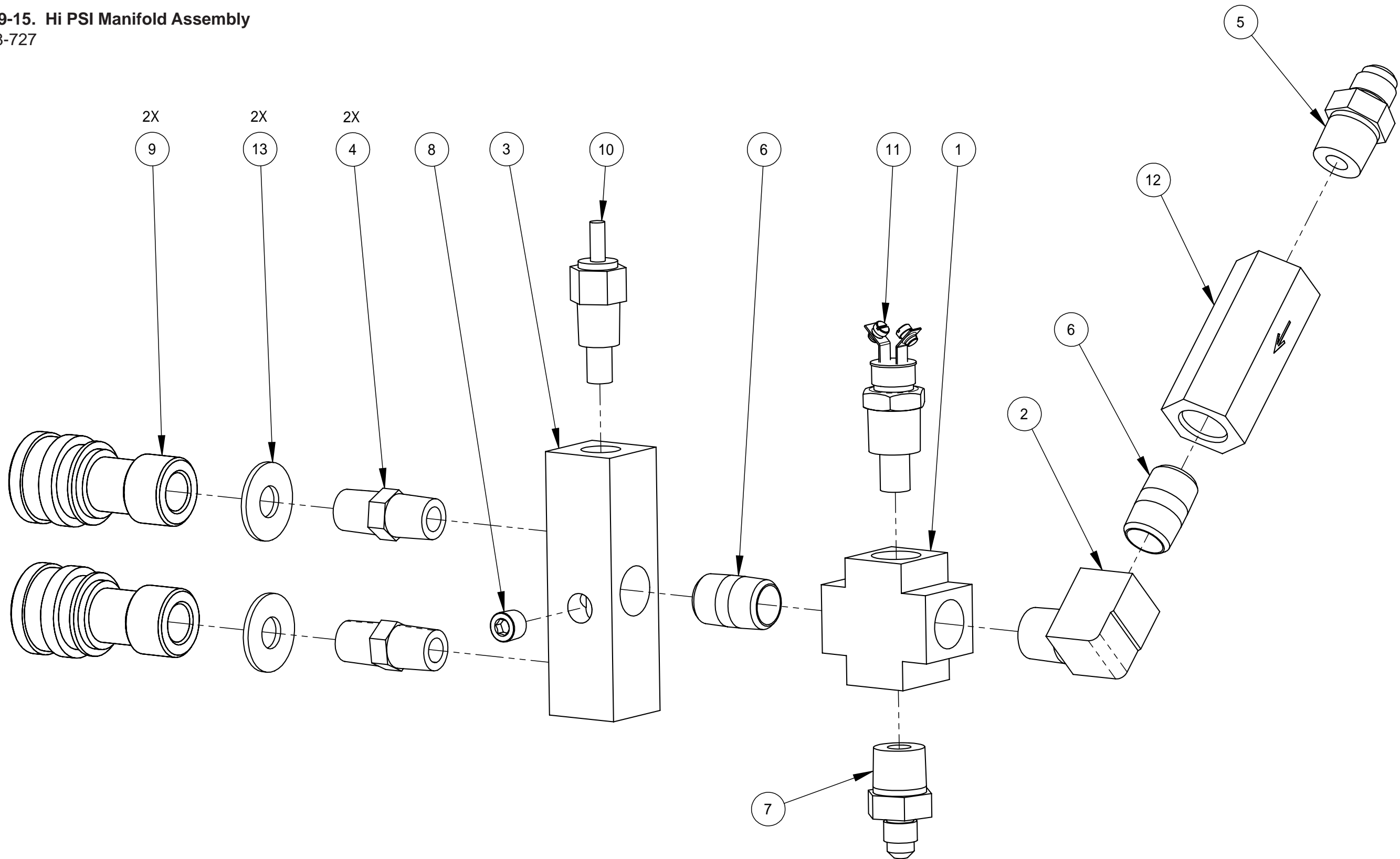


Figure 9-15. Hi PSI Manifold Assembly
610-008-727



Hi PSI Manifold Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-113	Cross, 3/8" FPT	1
2	000-052-086	Elbow, 3/8" NPT Street	1
3	000-090-008	Manifold, High Pressure	1
4	000-052-071	Nipple, 1/4" NPT Hex	2
5	000-052-528	Nipple, 3/8" M JIC X 3/8" NPT	1
6	000-052-077	Nipple, 3/8" NPT Close	2
7	000-052-662	Nipple, 3/8" NPT X 1/4" M SAE	1

Item	Part Number	Description	Qty
8	000-106-009	Plug, 1/8" NPT Allen Head	1
9	000-052-051	Quick Connect, 440 Female w/ EPDM O-Ring	2
10	000-149-039	Sender, Temperature	1
11	000-149-555	Sensor, 295 Degree F N/C High Temp Shutdown	1
12	000-169-219	Valve, Check 80 psi - Last Step Chemical	1
13	000-174-005	Washer, 3/8" Flat	2

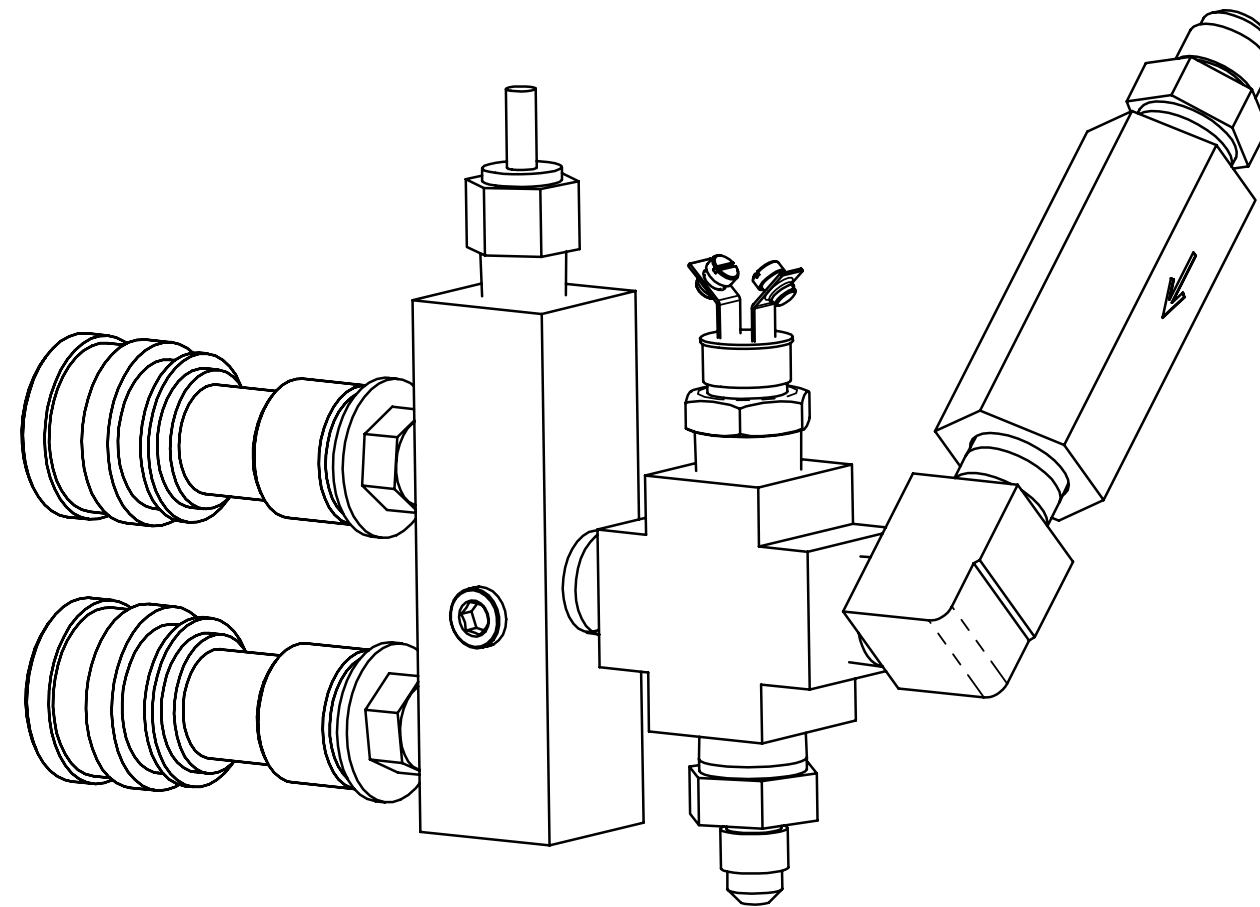
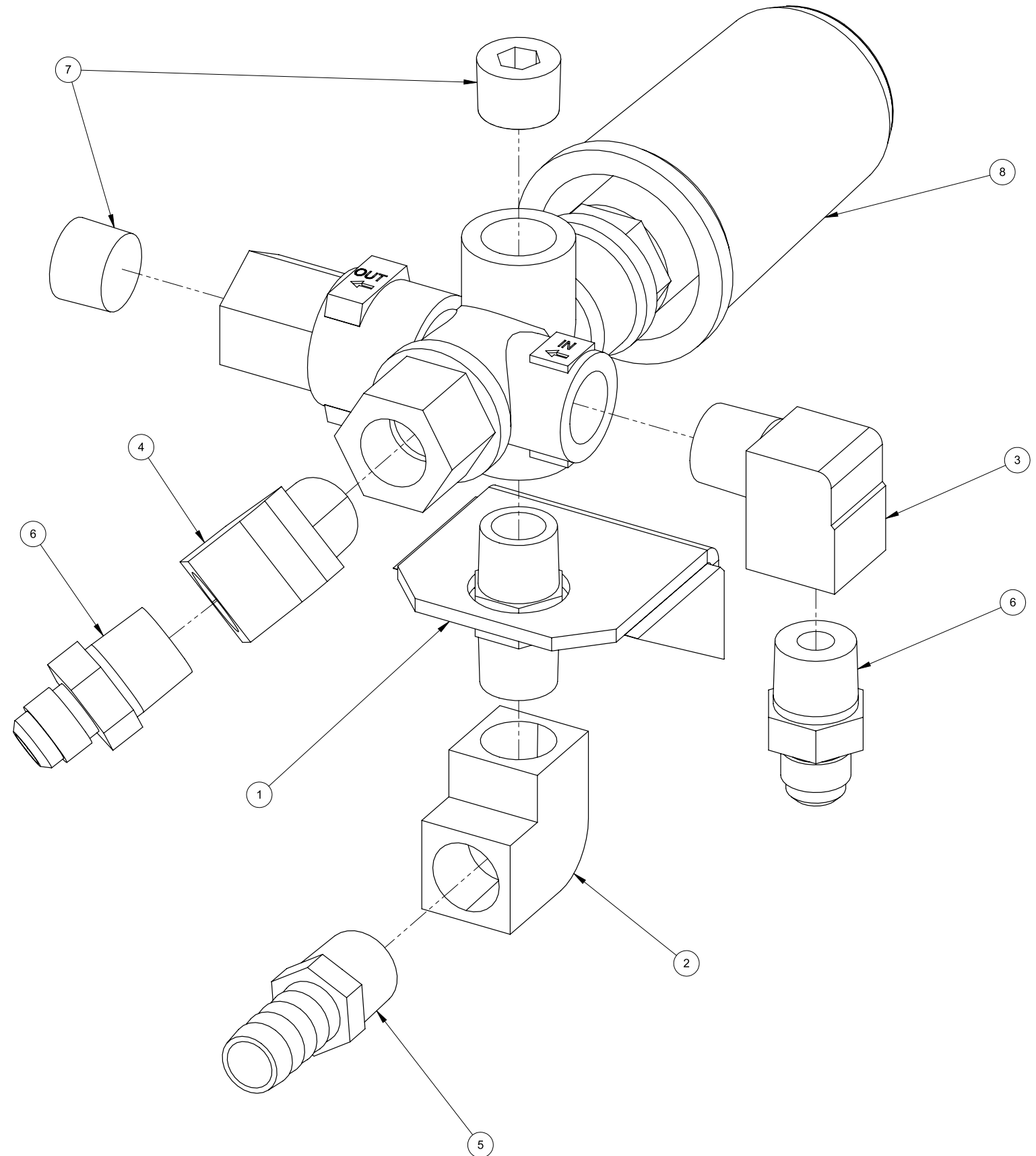
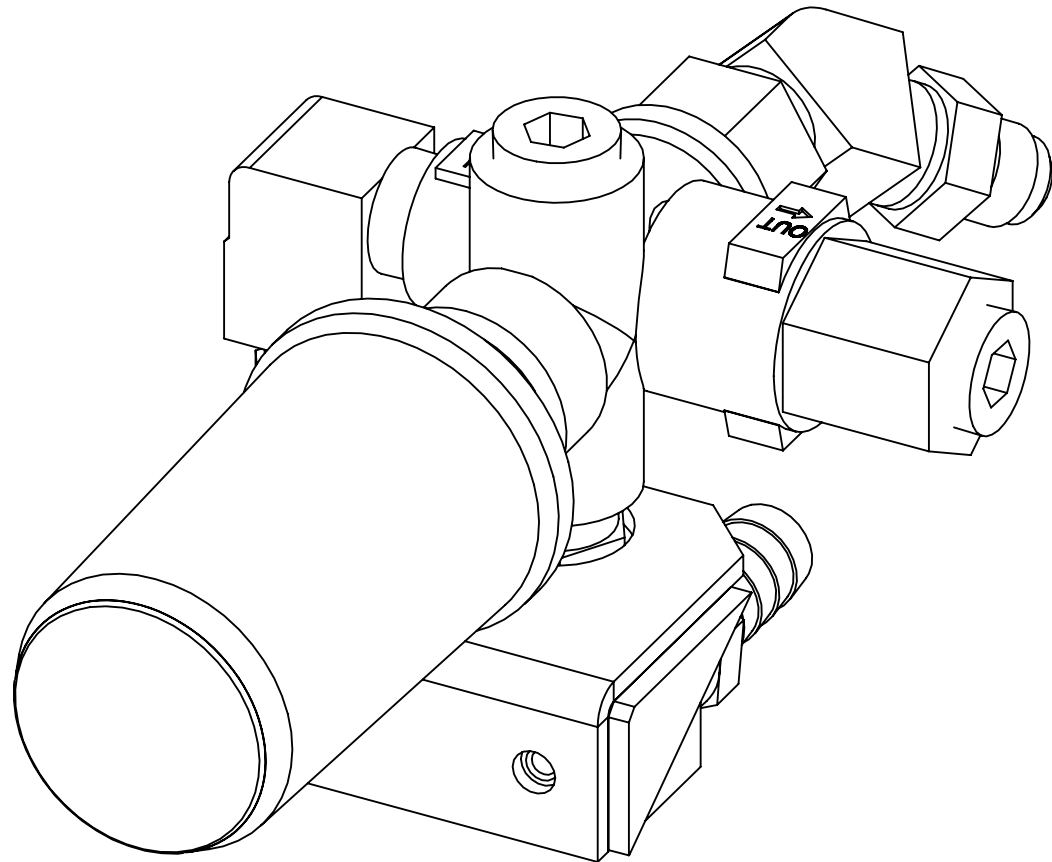


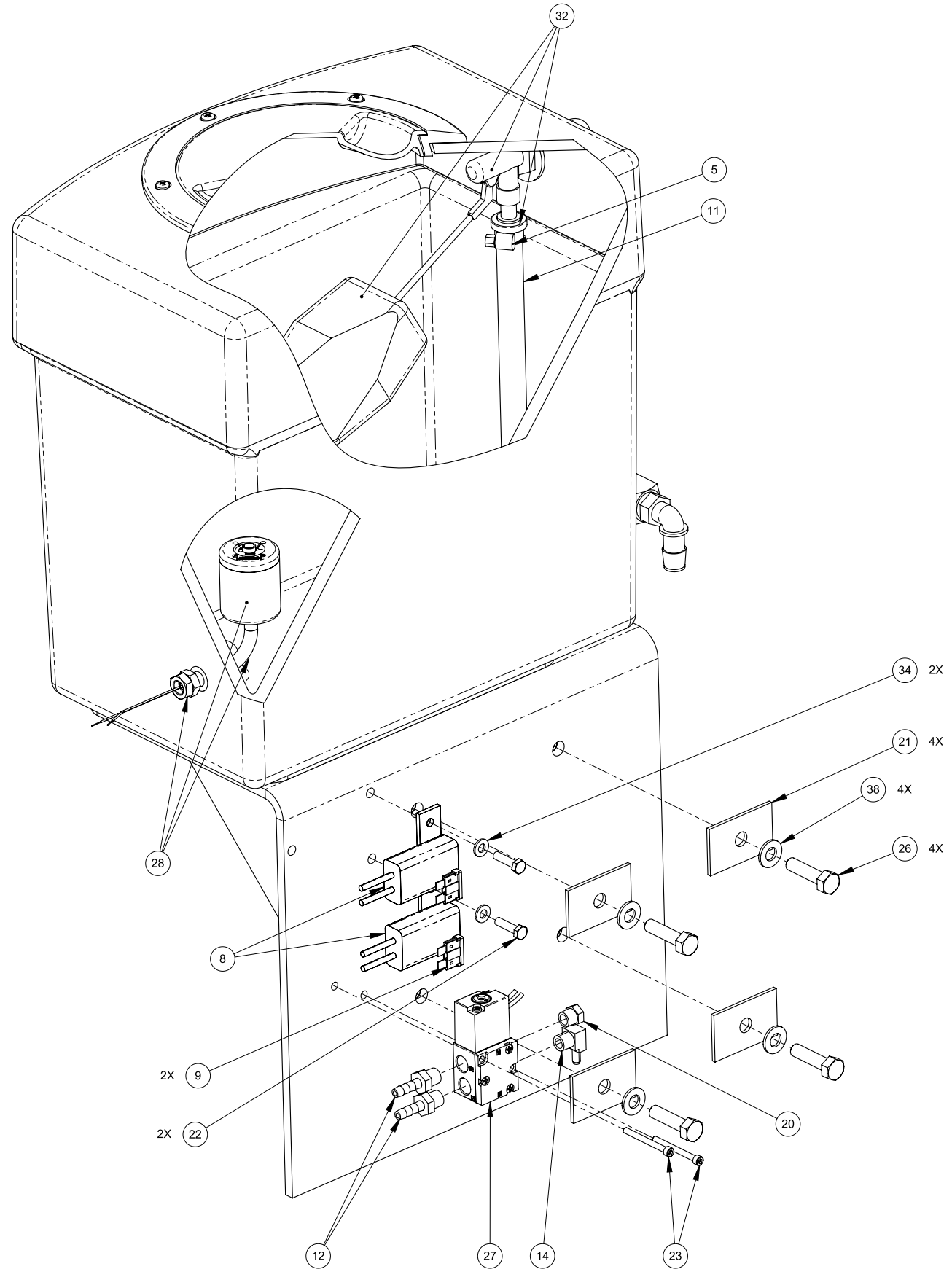
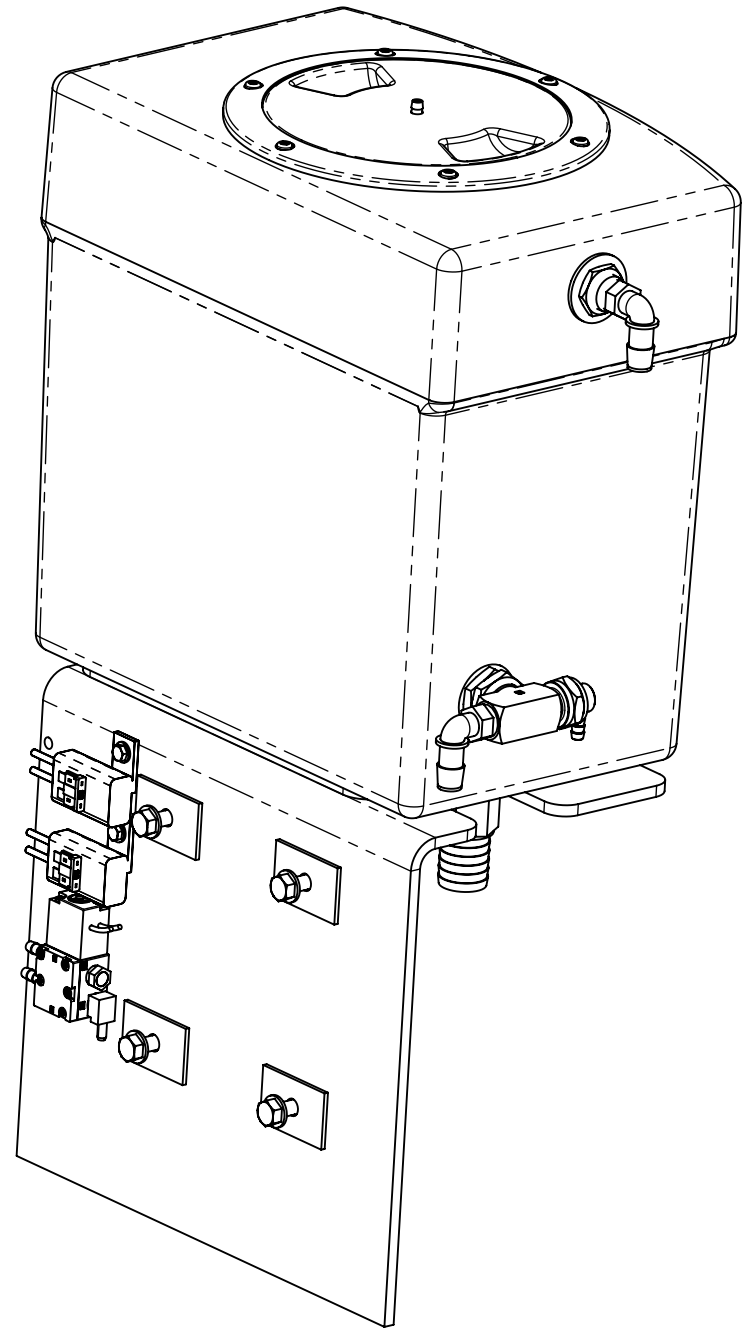
Figure 9-16. By-Pass Valve Assembly
610-009-727 Rev. A



By-Pass Valve Assembly Parts List

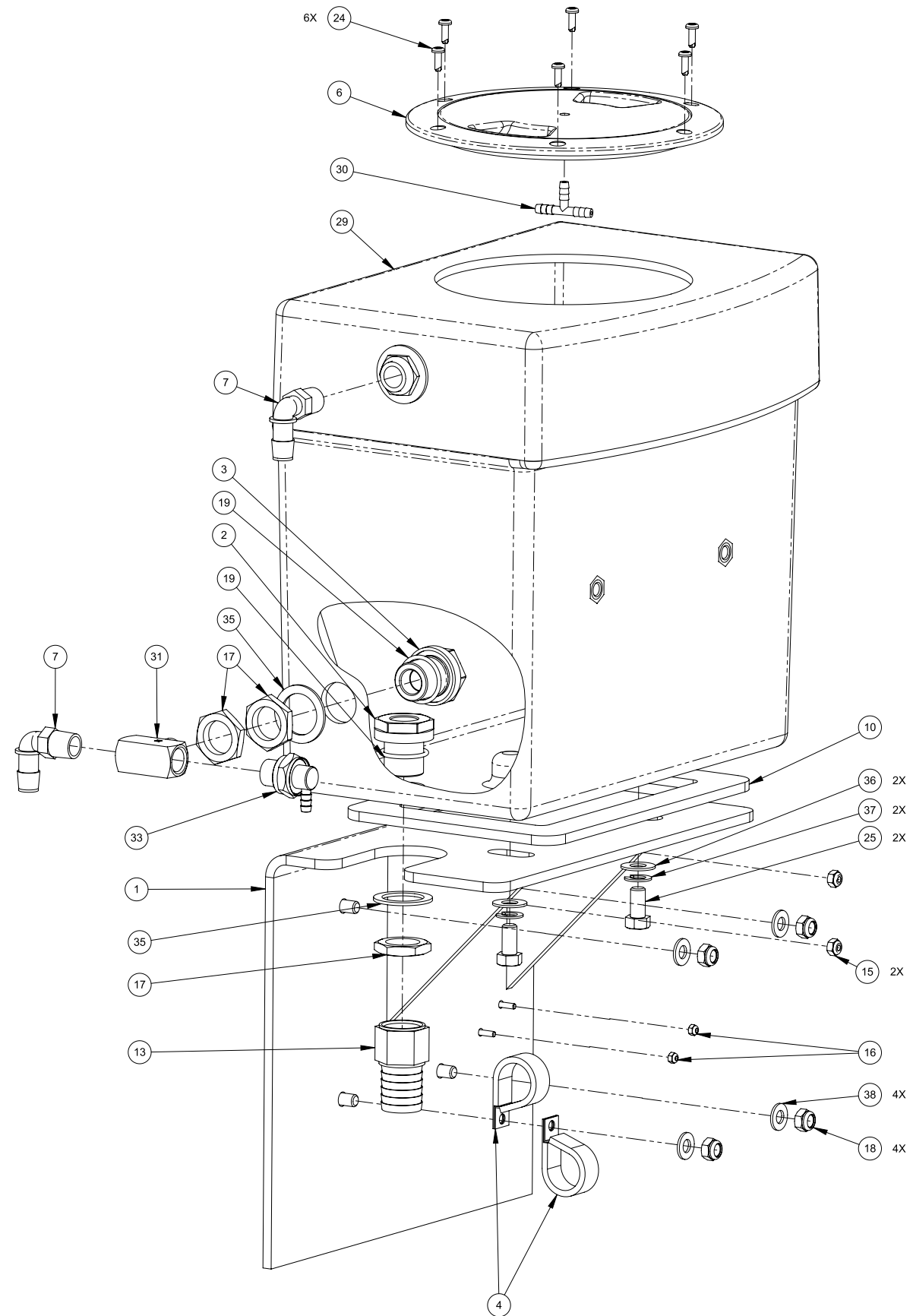
Item	Part Number	Description	Qty
1	000-015-515	Bracket, By-Pass Valve Mount - Weldment	1
2	000-052-142	Elbow, 3/8" F X F Brass	1
3	000-052-086	Elbow, 3/8" NPT Street	1
4	000-052-083	Elbow, 3/8" NPT Street X 45 Degree	1
5	000-052-105	Insert, #68 (3/8" NPT X 1/2" Barb)	1
6	000-052-528	Nipple, 3/8" M JIC X 3/8" NPT	2
7	000-106-008	Plug, 3/8" NPT Allen Head	2
8	000-169-188	Valve, Pressure Regulator-Modified	1

Figure 9-17. Water Box Assembly - View 1 of 2
610-010-727 Rev. A



BOXER
XL

Figure 9-18. Water Box Assembly - View 2 of 2
610-010-727 Rev. A

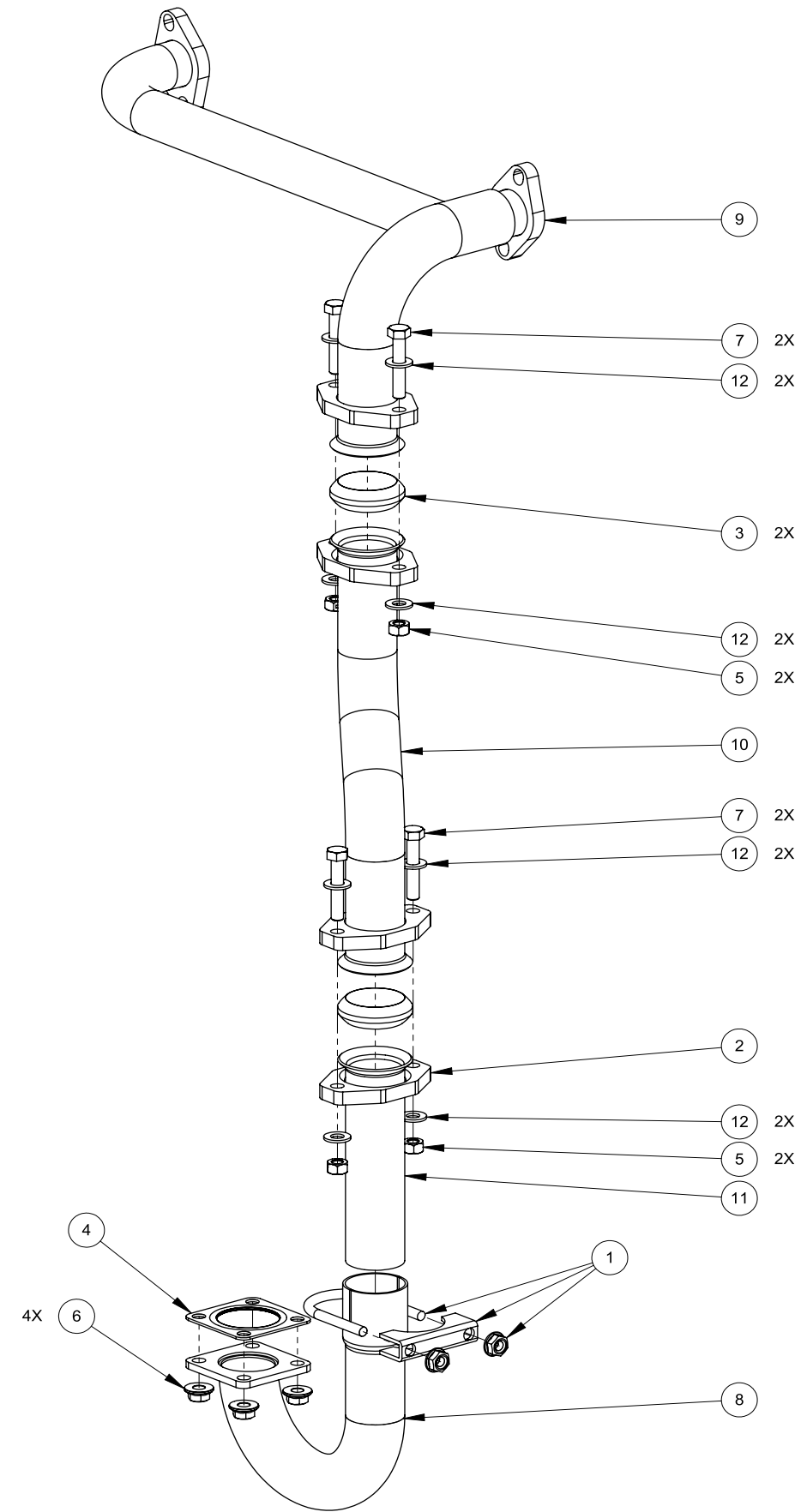
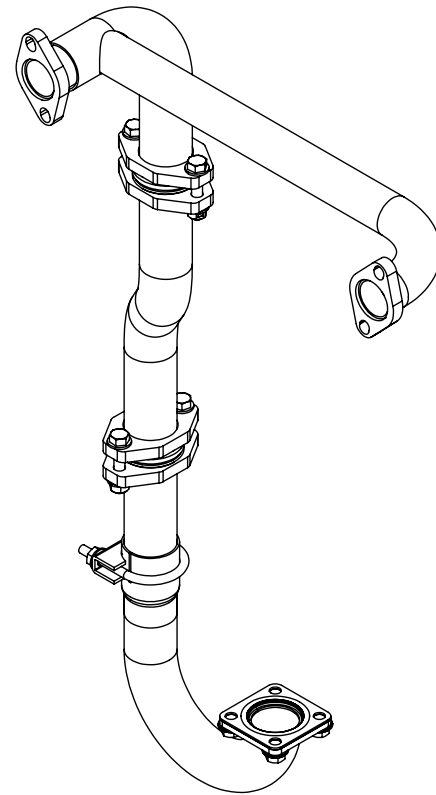


Water Box Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-1226	Bracket, Water Box Mounting - Coated	1
2	000-052-728	Bulkhead, 1/2" FPT	1
3	000-052-660	Bulkhead, 3/8" FPT X 3/8" FPT	1
4	000-033-057	Clamp, 1" Cushion Loop	2
5	000-033-003	Clamp, Size #4 Mini Hose	1
6	000-041-005	Cover, 6" Access	1
7	000-052-355	Elbow, 3/8" NPT X 1/2" Hose, GFBN	2
8	000-056-006	Fuse Holder, In-Line - Weatherproof	2
9	000-056-011	Fuse, 30 Amp	2
10	000-057-001	Gasket, Pumptec Lid	1
11	000-068-827	Hose, 3/8" I.D. X 39" Lg., Clr w/Braid	1
12	000-052-293	Insert, #23 (1/8" NPT X 3/16" Barb)	2
13	000-052-754	Insert, #F816 (1/2" FPT X 1" Barb)	1
14	000-052-106	Insert, 1/8" NPT X 5/32" Barb X 90 Degree	1
15	000-094-034	Nut, #10-24UNC Nylock	2
16	000-094-063	Nut, #6-32UNC Nylock	2
17	000-094-097	Nut, 1"-14UNS Brass	3
18	000-094-038	Nut, 5/16"-18UNC Nylock	4
19	000-097-041	O-Ring, 1/2" Bulk Head	2

Item	Part Number	Description	Qty
20	000-106-014	Plug, Vent	1
21	000-108-186	Protector, Silicone Spacer 2" X 1 1/4" Lg.	4
22	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	2
23	000-143-340	Screw, #6-32 X 1 1/2" Socket Cap	2
24	000-143-314	Screw, #8 X 1/2" Lg. Pan Head	6
25	000-143-017	Screw, 3/8"-16UNC X 0.75" Lg. Hex Head Grd. 8	2
26	000-143-014	Screw, 5/16"-18UNC X 1.25" Lg. Hex Head - Grade 5	4
27	000-169-226	Solenoid, Air Actuator 4- Way Valve	1
28	000-157-0801	Switch, w/Protector, Polypropylene Barrel	1
29	000-159-183	Tank, Poly Water Box - 4 Gallon	1
30	000-052-155	Tee, 3/16" Plastic Vacuum Insert	1
31	000-052-447	Tee, 3/8" NPT Male Branch	1
32	000-169-218	Valve, Float, Water Box	1
33	000-169-224	Valve, Mechanical 145 Degree	1
34	000-174-001	Washer, #10 Flat	2
35	000-174-063	Washer, 1.5" O.D. X 1.073" I.D. X 0.075" Thk.	2
36	000-174-032	Washer, 3/8" Flat	2
37	000-174-057	Washer, 3/8" Lock	2
38	000-174-049	Washer, 5/16" Flat	8

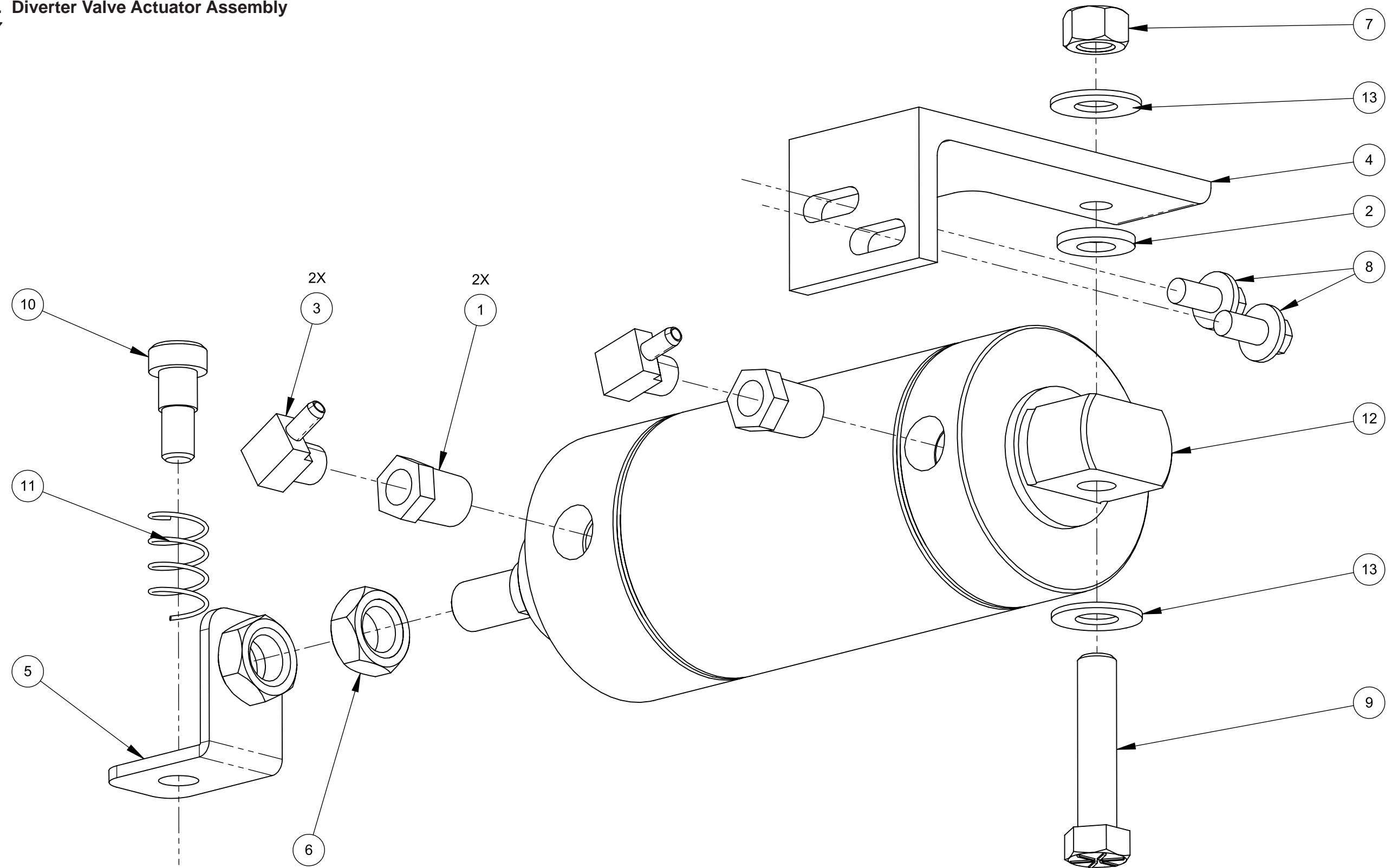
Figure 9-19. Exhaust Assembly
610-013-727



Exhaust Assembly Parts List

Item	Part Number	Description	Qty
1	000-033-068	Clamp, 1-1/2" Exhaust	1
2	000-105-181	Flange, Ø1.50" Exhaust Donut - Coated	1
3	000-057-199	Gasket, Exhaust Donut	2
4	000-057-146	Gasket, Four Hole Exhaust	1
5	000-094-081	Nut, 5/16"-18UNC Hex 2 Way Locking	4
6	000-094-078	Nut, 5/16-18UNC Hex Flange	4
7	000-143-124	Screw, 5/16"-18UNC X 1.75" Lg. Hex Head	4
8	000-125-932	Tube, Exhaust Entry - Weldment	1
9	000-090-093	Tube, Exhaust Manifold - Weldment	1
10	000-125-930	Tube, Exhaust Mid - Fabricated	1
11	000-125-931	Tube, Flange Donut End 5.75" Lg - Fabricated	1
12	000-174-049	Washer, 5/16" Flat	8

Figure 9-20. Diverter Valve Actuator Assembly
610-014-727



Diverter Valve Actuator Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-059	Bushing, 1/4" MPT X 1/8" FPT	2
2	000-057-224	Gasket, Actuator	1
3	000-052-106	Insert, 1/8" NPT X 5/32" Barb X 90 Degree	2
4	000-042-069	Mount Air Cylinder - Coated	1
5	000-042-070	Mount, Air Cylinder Extension - Coated	1
6	000-094-122	Nut, 1/2"-20UNF Hex Jam	1
7	000-094-014	Nut, 3/8-16 Hex Z/P	1

Item	Part Number	Description	Qty
8	000-143-141	Screw, 1/4"-20UNC X 1/2" Lg. Whiz Lock	2
9	000-143-022	Screw, 3/8-16UNC X 1.75" Hex Head - Grade 8	1
10	000-143-573	Screw, 5/16"-18UNC X 7/8" Lg. w/ 3/8" X 1/2"	1
11	000-155-020	Spring, 0.540 O.D. X 0.041 Wire X 1.00 Lg.	1
12	000-169-225	Valve, Ø2.5" Air Cylinder	1
13	000-174-032	Washer, 3/8" Flat	2

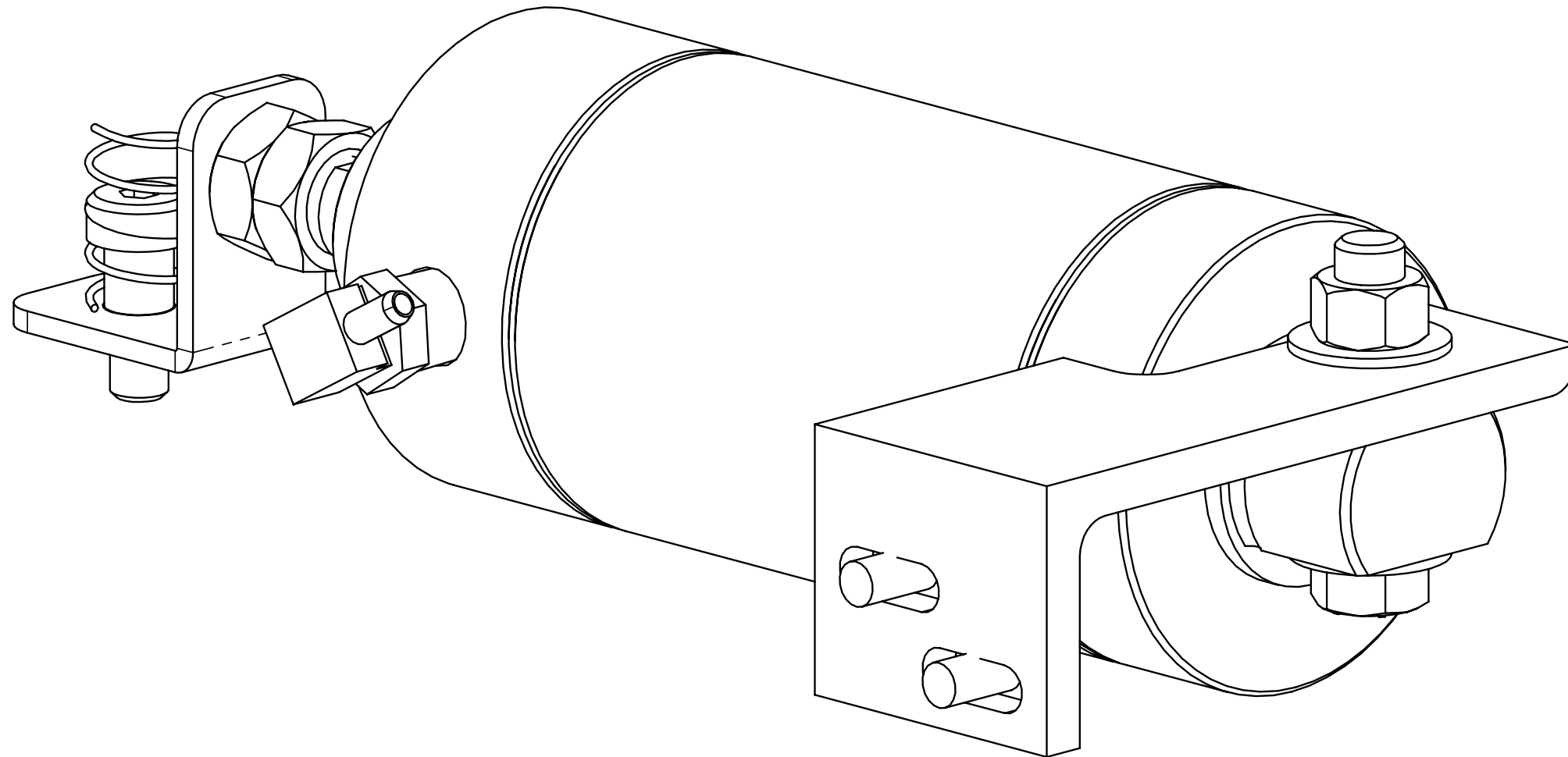
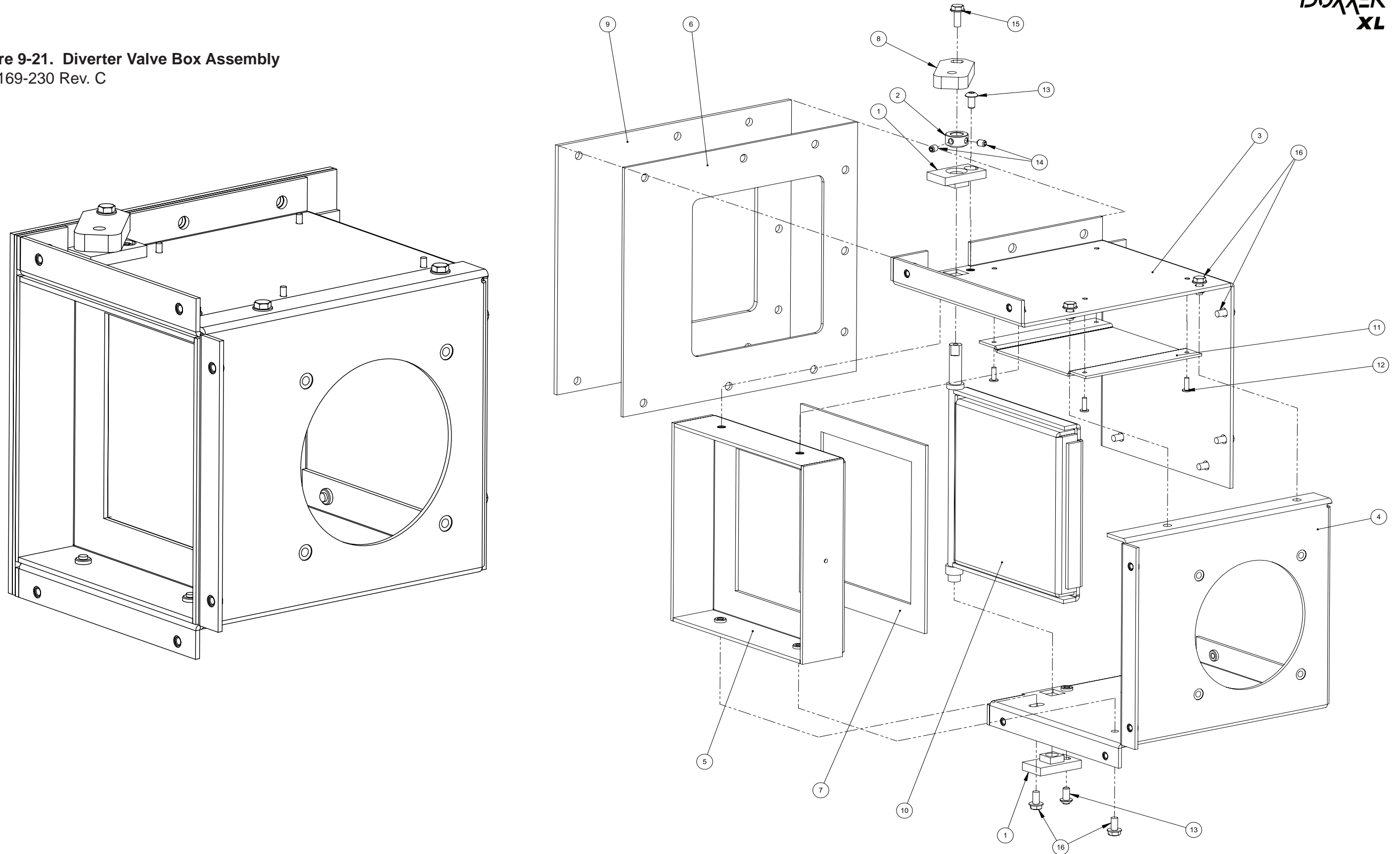


Figure 9-21. Diverter Valve Box Assembly
000-169-230 Rev. C





Diverter Valve Box Assembly Parts List

Item	Part Number	Description	Qty
1	000-020-069	Bushing, Flapper - Diverter - Machined	2
2	000-020-073	Collar, Diverter Alignment	1
3	000-042-065	Housing, Top and Side - Diverter - Fabricated	1
4	000-042-066	Housing, Bottom and Side - Diverter - Fabricated	1
5	000-042-067	Housing, Baffle - Diverter - Fabricated	1
6	000-057-219	Gasket, Diverter to Heat Exchanger Box	1
7	000-057-220	Gasket, Diverter Baffle	1
8	000-085-031	Linkage, Diverter Actuation - Coated	1

Item	Part Number	Description	Qty
9	000-105-551	Plate, Sealing - Diverter - Fabricated	1
10	000-105-552	Plate Flapper Diverter- Coated	1
11	000-108-151	Protector, Exhaust Diverter - Fabricated	1
12	000-140-017	Rivet, 1/8" X 3/8" Blind Pop S/S	4
13	000-143-107	Screw, #10-24UNC X 3/8" Lg. Button Head Socket	2
14	000-143-111	Set Screw, #10-24UNC X 0.25" Lg.	2
15	000-143-583	Screw, #10-24UNC X 0.50" Lg. Hex Head Flange Z/P	1
16	000-143-705	Screw, #10-24UNC X 3/8" Lg. Whiz Head	10

Figure 9-22. Dash Assembly - Part 1 of 2
610-018-727 Rev. B

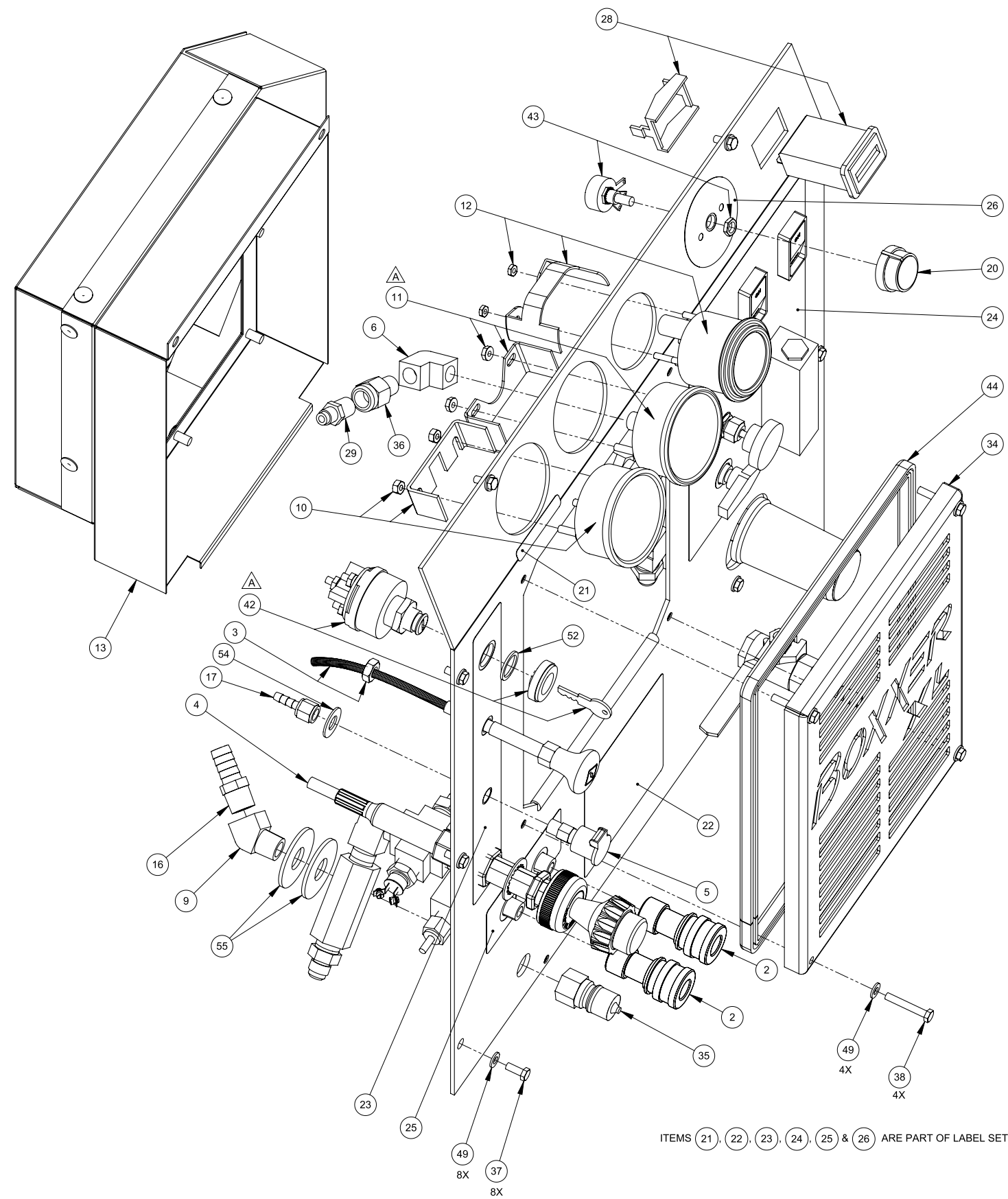
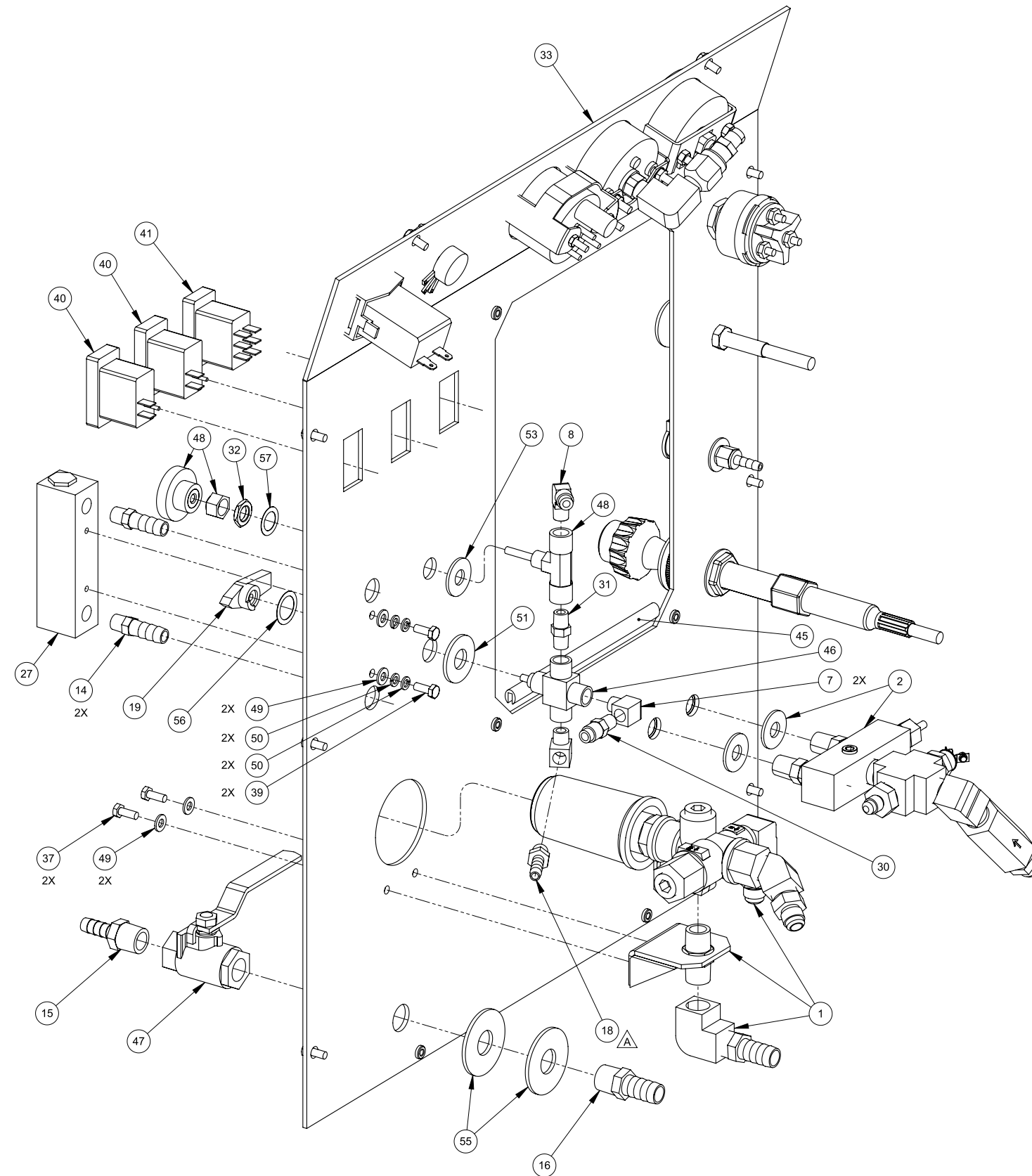


Figure 9-23. Dash Assembly - Part 2 of 2
610-018-727 Rev. B

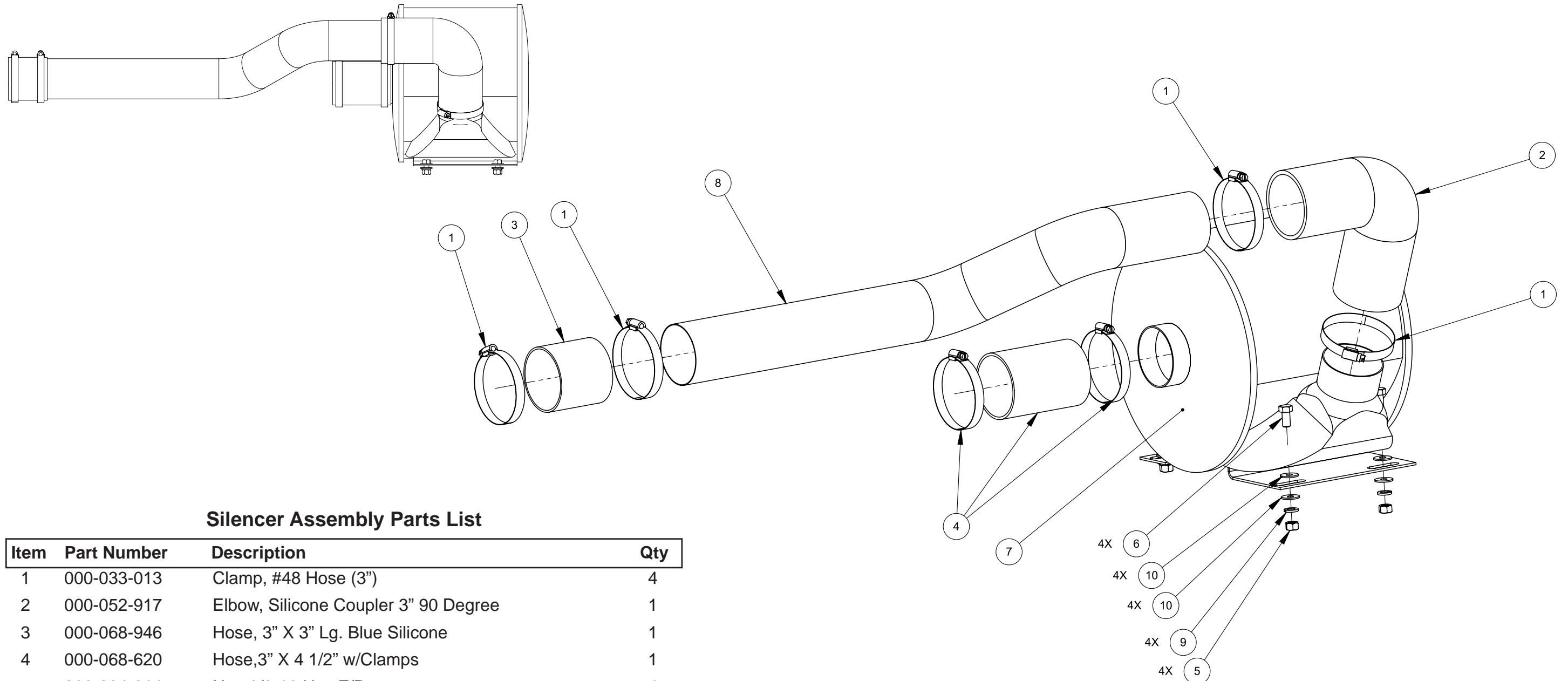


ITEMS 13, 34, 44 AND 4 EACH 49 & 38 ARE NOT SHOWN IN THIS VIEW.

Dash Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	610-009-727	Assembly, By-Pass Valve	1	30	000-052-530	Nipple, 1/4" SAE X 1/8" NPT	1
2	610-008-727	Assembly, Hi PSI Manifold	1	31	000-052-069	Nipple, 1/8" NPT Hex	1
3	000-025-003	Cable, Choke With Detent	1	32	000-094-098	Nut, 7/16"-24UNF - 2 Way Metering Valve	1
4	000-025-029	Cable, Throttle - Modified	1	33	000-100-251	Panel, Dash, Steel - Coated	1
5	000-052-272	Cup, Gravity Feed Oil Blower Lube Port	1	34	000-100-232	Panel, Grill	1
6	000-052-088	Elbow, 1/4" FPT X FPT	1	35	000-052-052	Quick Connect, 660 3/8" Brass w/ EPDM O-Ring	1
7	000-052-084	Elbow, 1/8" NPT Street	2	36	000-135-052	Regulator, Hi PSI Snubber	1
8	000-052-531	Elbow, 1/8" NPT X 1/4" SAE	1	37	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	10
9	000-052-083	Elbow, 3/8" NPT Street X 45 Degree	1	38	000-143-171	Screw, #10-24UNC X 1.25" Lg. Hex Head	4
10	000-074-017	Gauge, 30" Hg. Vacuum	1	39	000-143-327	Screw, #10-32UNFX 0.50" Lg. Hex Head	2
11	000-074-007	Gauge, Pressure 0 -1,500 psi	1	40	000-157-040	Switch, 20 Amp Rocker	2
12	000-074-016	Gauge, Temperature	1	41	000-157-131	Switch, 3-Way Speed Control	1
13	000-042-090	Housing, Cooling Shroud - Assembled	1	42	000-157-008	Switch, Ignition	1
14	000-052-099	Insert, #26 (1/8" NPT X 3/8" Barb)	2	43	000-149-560	Thermostat, Potentiometer	1
15	000-052-104	Insert, #66 (3/8" NPT X 3/8" Barb)	1	44	000-131-131	Trimlock, 3/8" X 1/8" Rubber	1 ft
16	000-052-105	Insert, #68 (3/8" NPT X 1/2" Barb)	2	45	000-131-131	Trimlock, 3/8" X 1/8" Rubber	1 ft
17	000-052-096	Insert, #F23 (1/8" FPT X 3/16" Barb)	1	46	000-169-0171	Valve, 3-Way Ball O-Ring Style	1
18	000-052-097	Insert, #24	1	47	000-169-064	Valve, 3/8" NPT Full Port Ball	1
19	---	Knob, 3-Way Ball Valve (Part of 000-169-0171)	1	48	000-169-160	Valve, Chemical Metering	1
20	000-061-056	Knob, Temperature Adjustment	1	49	000-174-001	Washer, #10 Flat	16
21	000-081-307	Label, 12' Hg Max Vacuum	1	50	000-174-014	Washer, #10 Lock	4
22	000-081-328	Label, ANSI Warning	1	51	000-174-007	Washer, 1/2" Flat	1
23	000-081-399	Label, Dash Left	1	52	000-174-058	Washer, 21/32" I.D. X 27/32" O.D. Nylon	1
24	000-081-398	Label, Dash Right	1	53	000-174-005	Washer, 3/8" Flat	1
25	000-081-400	Label, Solution Out	1	54	000-174-032	Washer, 3/8" Flat	1
26	000-081-331	Label, Temperature	1	55	000-174-008	Washer, 5/8" Flat	4
27	000-074-030	Meter, Chemical Flow Raw	1	56	000-174-030	Washer, 5/8" I.D. X 7/8" O.D. X 0.010" Thk	1
28	000-074-170	Meter, Rectangular Hour w/o Bezel	1	57	000-174-062	Washer, 1/2" I.D. X 3/4" O.D. X 0.010" Thk	1
29	000-052-527	Nipple, 1/4" SAE X 1/4" NPT	1				

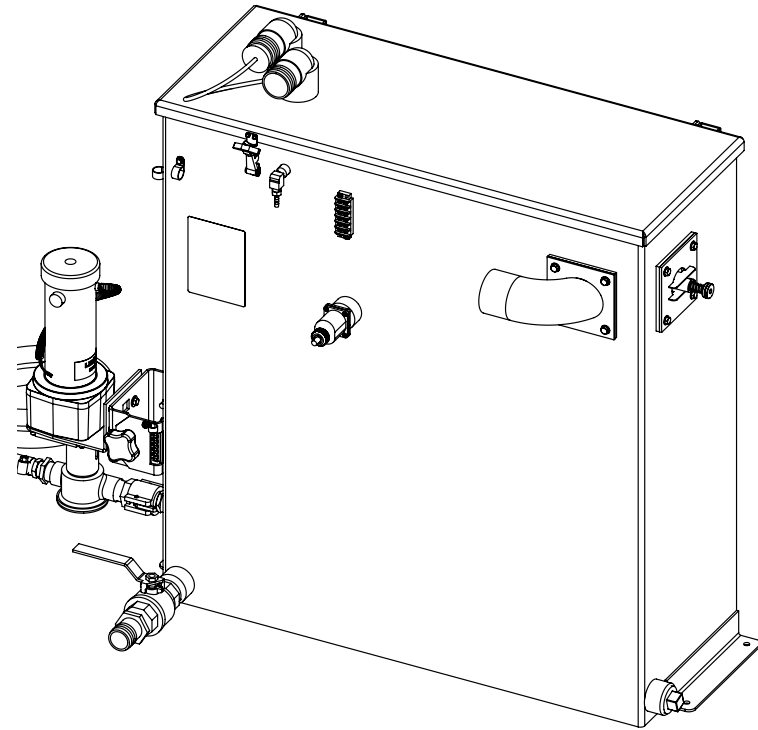
Figure 9-24. Silencer Assembly
610-021-727 Rev. B



Silencer Assembly Parts List

Item	Part Number	Description	Qty
1	000-033-013	Clamp, #48 Hose (3")	4
2	000-052-917	Elbow, Silicone Coupler 3" 90 Degree	1
3	000-068-946	Hose, 3" X 3" Lg. Blue Silicone	1
4	000-068-620	Hose, 3" X 4 1/2" w/Clamps	1
5	000-094-014	Nut, 3/8-16 Hex Z/P	4
6	000-143-017	Screw, 3/8"-16UNC X 0.75" Lg. Hex Head Grd. 8	4
7	000-093-087	Silencer 3" Cowl Coated	1
8	000-125-934	Tube, Final Exhaust	1
9	000-174-021	Washer, 3/8" Lock	4
10	000-174-004	Washer, 5/16" Flat, USS	8

Figure 9-25. 70 Gallon Universal Recovery Tank (URT) Assembly
610-003-577 Rev. A

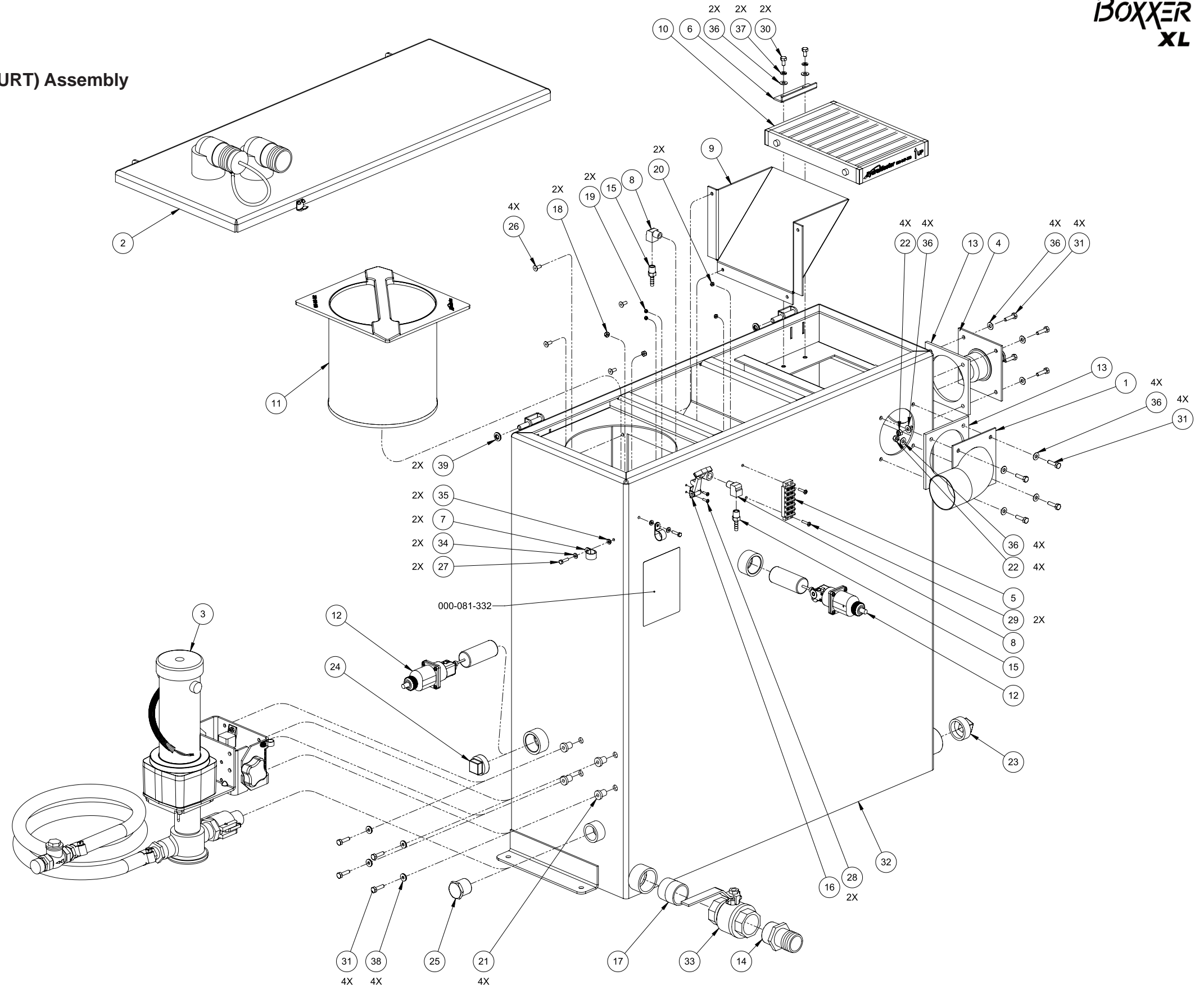


NOTICE

Item 3 is optional; lower float switch item 12 is only used when APO is installed.

Items 24 and 25 are not used when APO is installed.

Label P/N 000-081-332 is part of label set P/N 000-081-397 and cannot be sold separately.

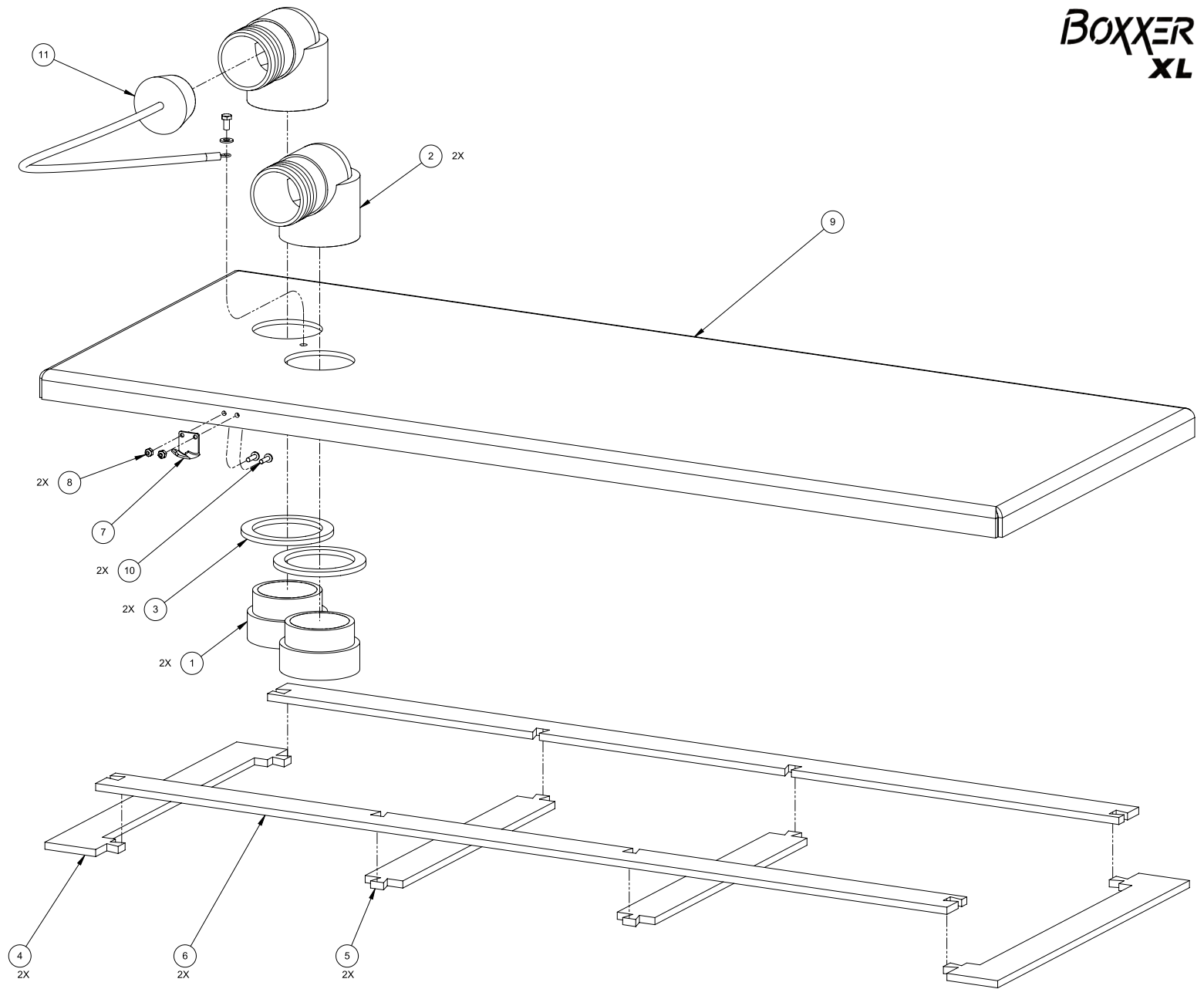
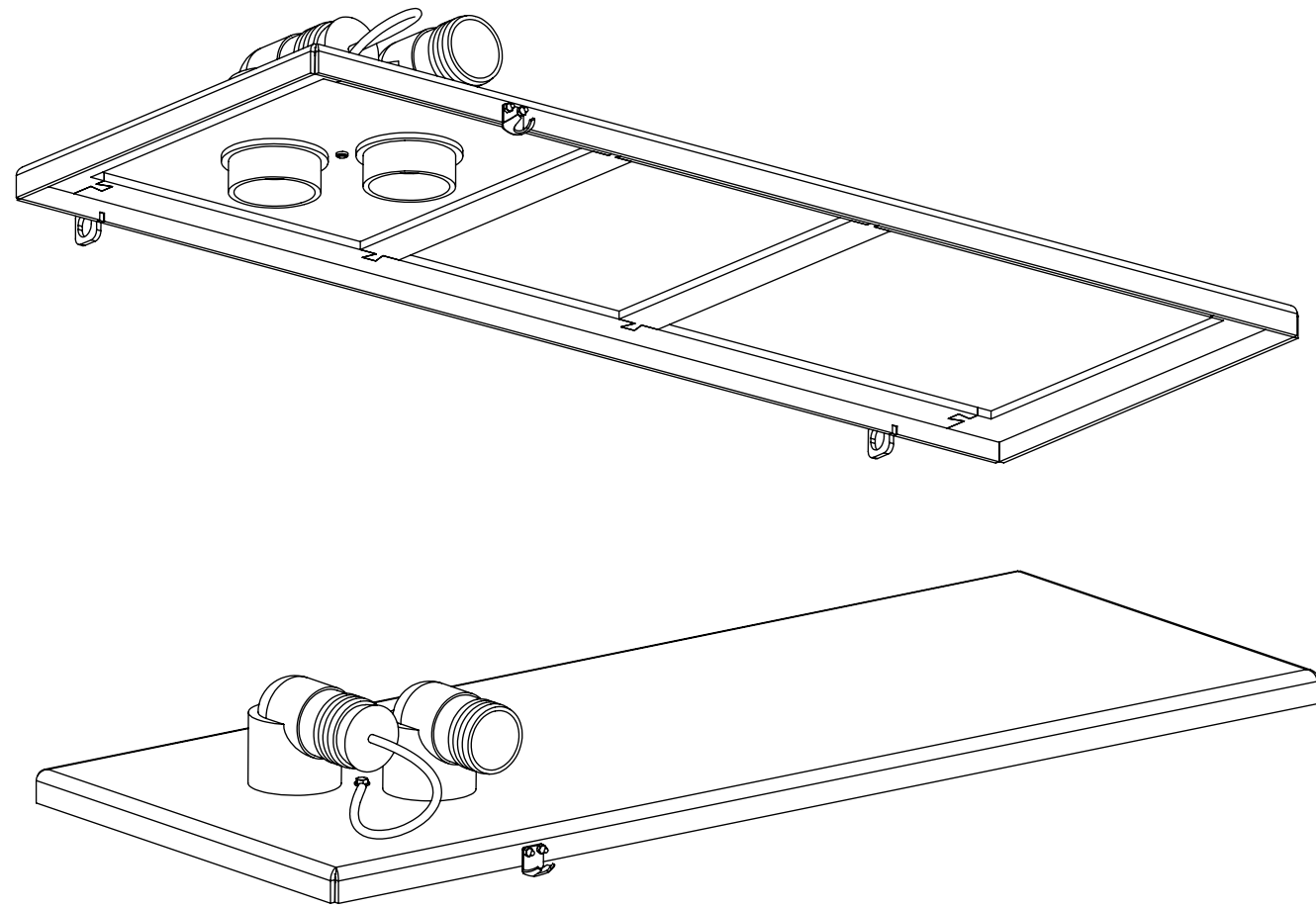




70 Gallon Universal Recovery Tank (URT) Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	000-001-135	Adapter, Ø3.0 Tank to X 90 Degree Blower Hose	1	21	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	4
2	610-029-010	Assembly, Cover, 70 Gal, Dual Vac, URT	1	22	000-094-009	Nut, 1/4"-20UNC Nylock	8
3	000-079-091	Assembly, Dura-Flow APO - Production	1	23	000-106-019	Plug, 1-1/2" NPT	1
4	610-026-724	Assembly, Vacuum Relief Valve - URT	1	24	000-106-046	Plug, 1-1/4" NPT	1
5	000-012-002	Block, 6 Post Terminal	1	25	000-106-049	Plug, 1" NPT Black Nylon	1
6	000-015-932	Bracket, Flat Filter Securing - Uncoated	1	26	000-140-023	Rivet, AB8-6A Aluminum Pop	4
7	000-033-023	Clamp, 3/4" Nylon Hose	2	27	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	2
8	000-052-085	Elbow, 1/4" NPT Street	2	28	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
9	000-049-154	Filter, Air Deflector, URT - Fabricated	1	29	000-143-051	Screw, #8-32UNC X 3/4" Lg. Binder Head	2
10	000-049-153	Filter, Flat - URT	1	30	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	2
11	000-049-152	Filter, Recovery Tank Basket	1	31	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	12
12	000-157-091	Float, Lever Switch	2	32	000-159-128	Tank, 70 Gallon URT - Coated	1
13	000-057-206	Gasket, Adapter - URT	2	33	000-169-022	Valve, 1-1/2" Full Port Ball	1
14	000-052-226	Insert, 1-1/2" NPT X 1-1/2" Barb (Gray)	1	34	000-174-001	Washer, #10 Flat	2
15	000-052-100	Insert, #44	2	35	000-174-036	Washer, #10 Flat Rubber Backed	2
16	000-086-008	Latch, Bungee	1	36	000-174-003	Washer, 1/4" Flat	18
17	000-052-763	Nipple, 1-1/2" IPS Close S/S	1	37	000-174-019	Washer, 1/4" Lock	2
18	000-094-034	Nut, #10-24UNC Nylock	2	38	000-174-060	Washer, 1/4" Rubber Backed	4
19	000-094-063	Nut, #6-32UNC Nylock	2	39	000-174-029	Washer, 3/8" Rubber Backed	2
20	000-094-059	Nut, #8-32UNC Nylock	2				

Figure 9-26. 70 Gallon Universal Recovery Tank (URT) Cover Assembly
610-029-010 Rev. A

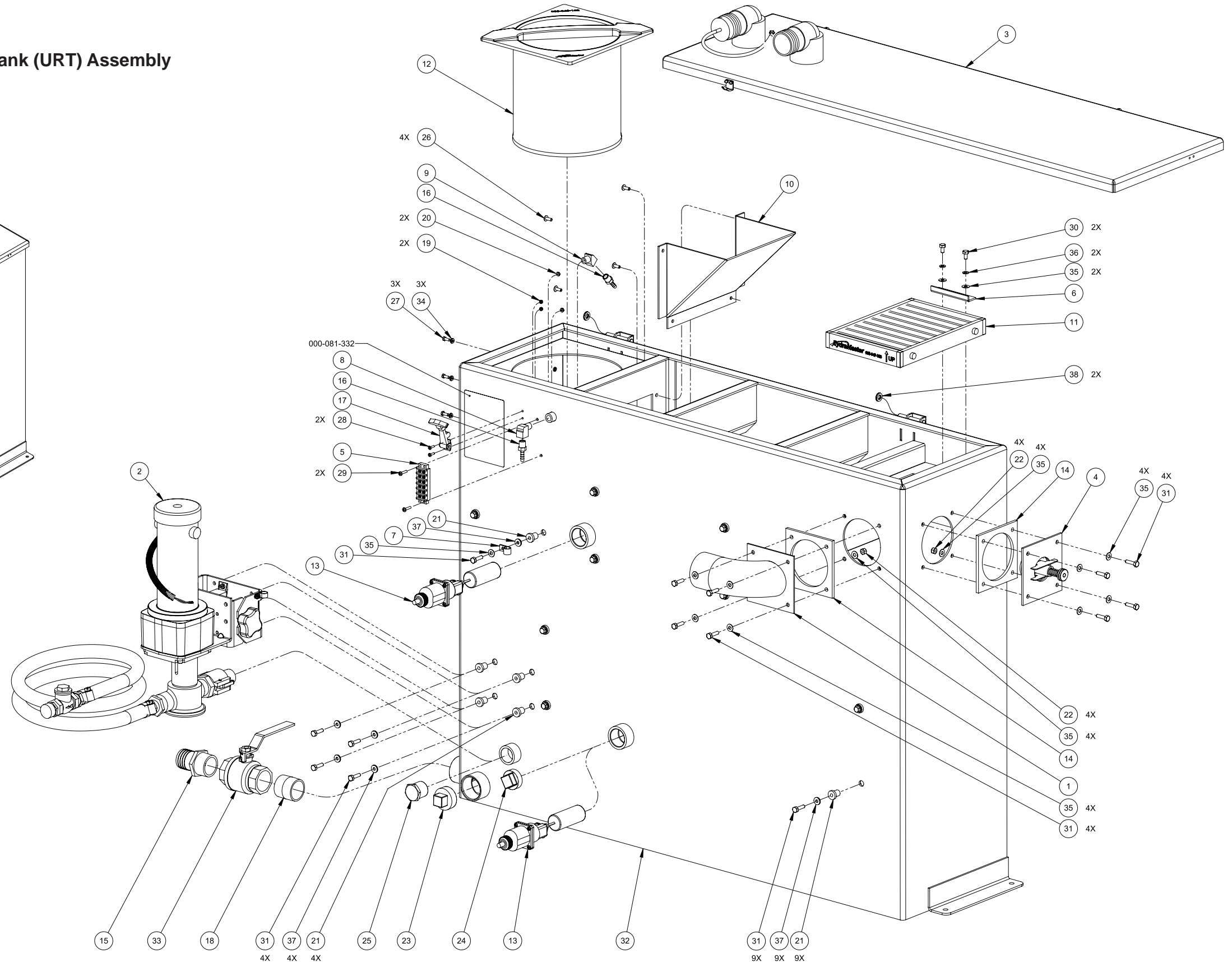
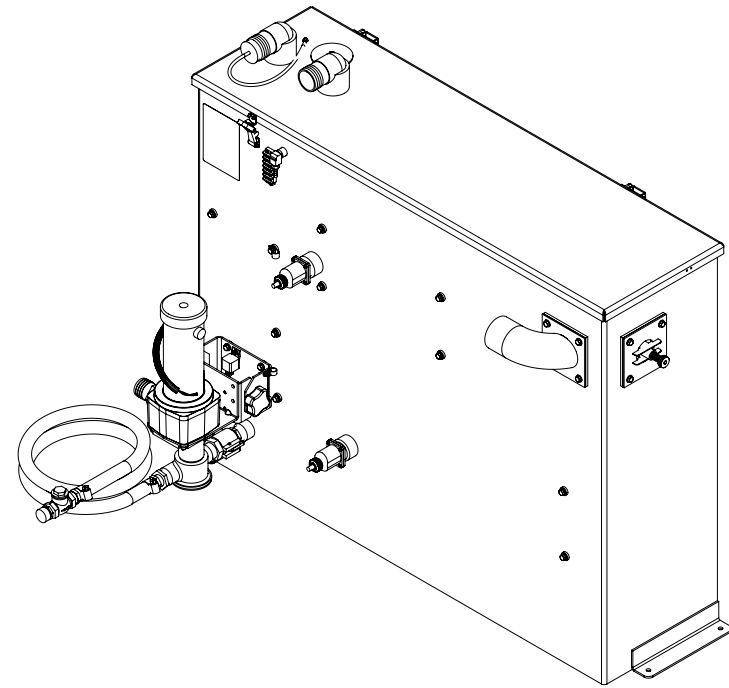


70 Gallon Universal Recovery Tank (URT) Cover Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-219	Adapter, 2" NPT X 2" F Slip	2
2	000-052-222	Elbow, 2" Barb X 2" FPT	2
3	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	2
4	000-057-202	Gasket, End - Rec. Tank Cover	2
5	000-057-203	Gasket, Middle - Rec. Tank Cover	2
6	000-057-204	Gasket, Side - Recovery Tank	2

Item	Part Number	Description	Qty
7	- - -	Latch, Bungee - Strike (Part of 000-086-008)	1
8	000-094-063	Nut, #6-32UNC Nylock	2
9	000-041-444	Recovery Tank, Cover Dual Vac, Weldment - Coated	1
10	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
11	000-078-039	Vacuum Inlet Stopper	1

Figure 9-27. 100 Gallon Universal Recovery Tank (URT) Assembly
610-003-727 Rev. A



NOTICE

Item 2 is optional; lower float switch item 13 is only used when APO is installed.

Items 24 and 25 are not used when APO is installed.

Label P/N 000-081-332 is part of label set P/N 000-081-397 and cannot be sold separately.

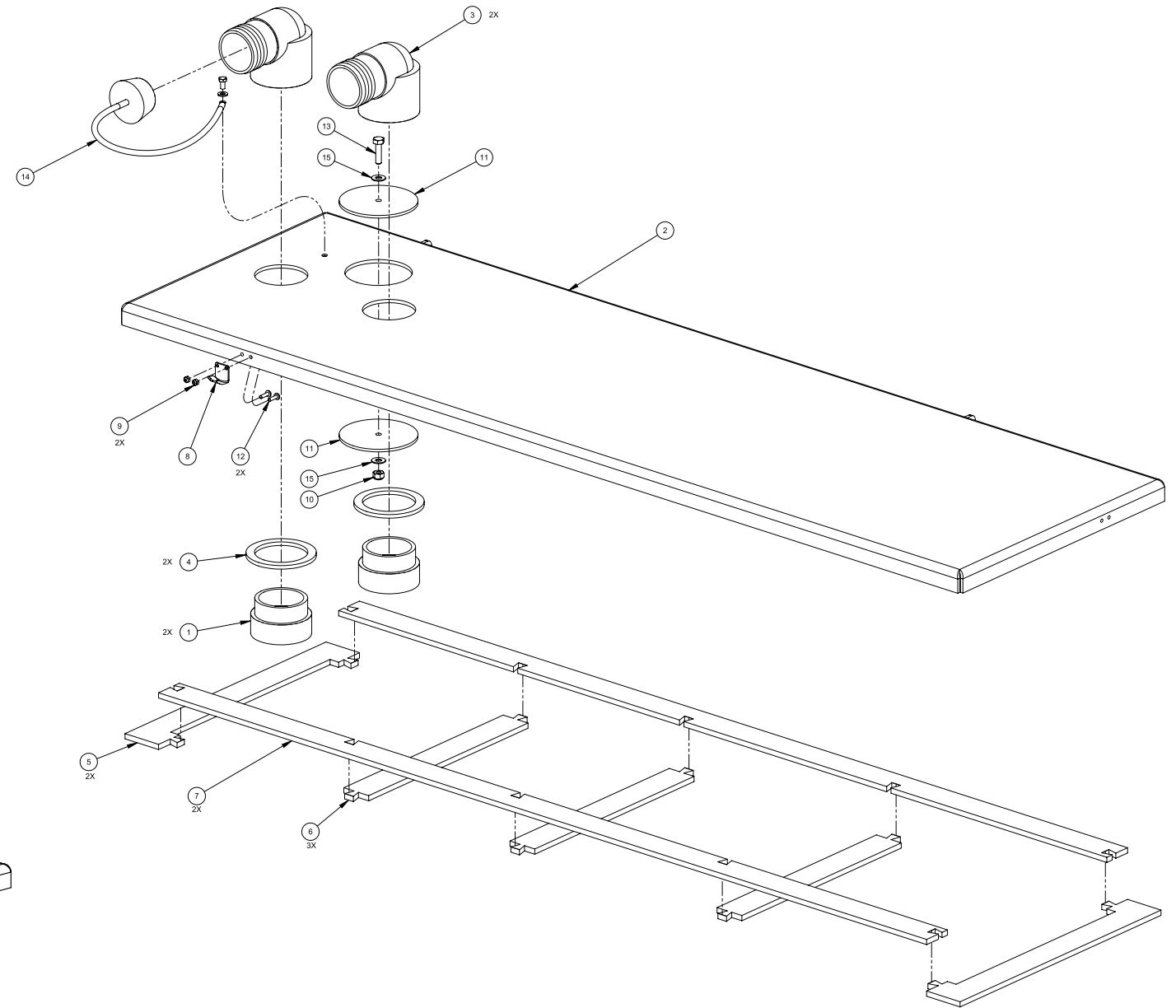
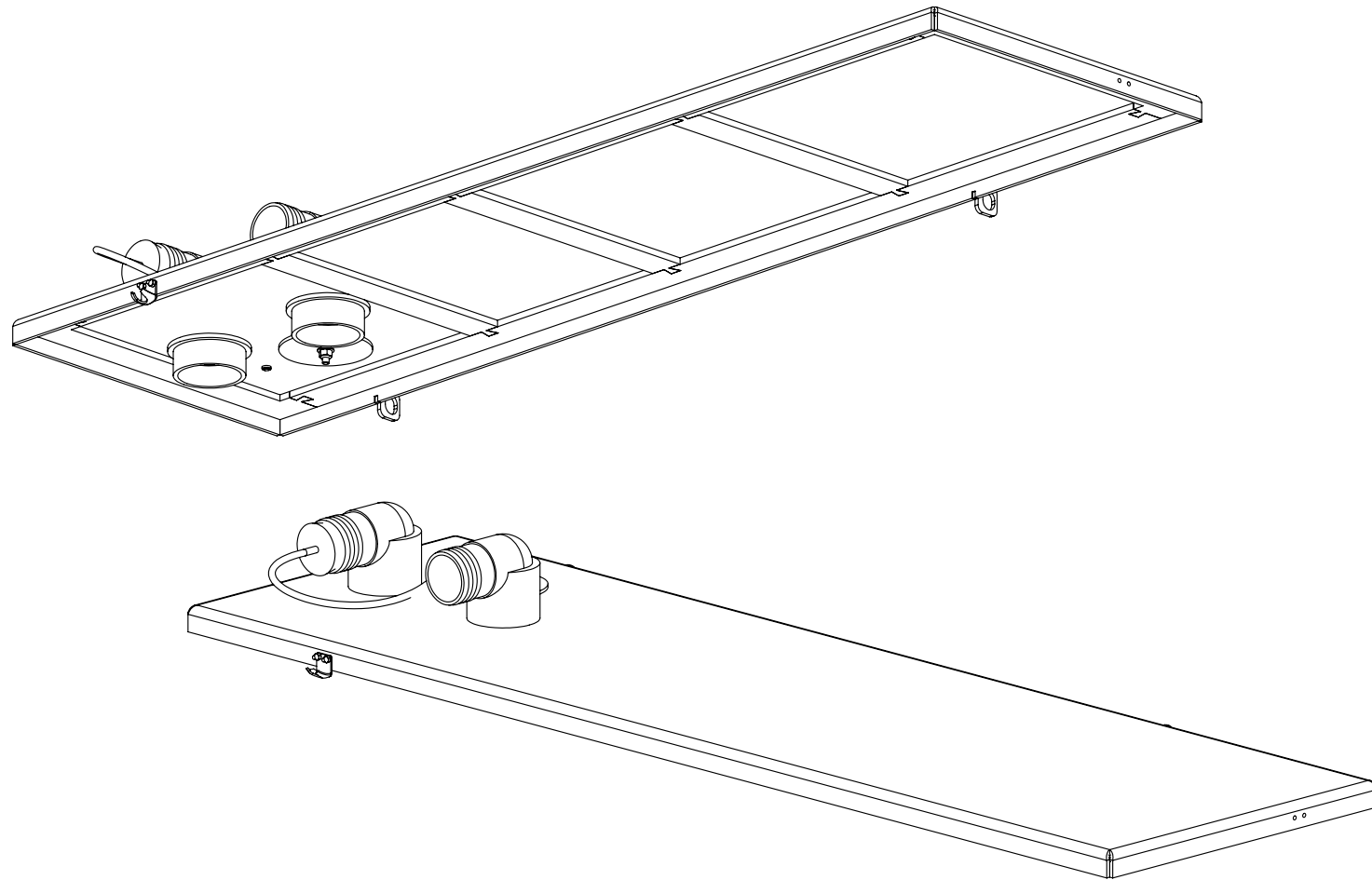
100 Gallon Universal Recovery Tank (URT) Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-135	Adapter, Ø3.0 Tank to X 90 Degree Blower Hose	1
2	000-079-091	Assembly, Dura-Flow APO - Production	1
3	610-029-001	Assembly, Recovery Tank Cover w/ 2.5" Port	1
4	610-026-724	Assembly, Vacuum Relief Valve - URT	1
5	000-012-002	Block, 6 Post Terminal	1
6	000-015-932	Bracket, Flat Filter Securing - Uncoated	1
7	000-033-046	Clamp, 1/2" Wide X 1/2" Tube	1
8	000-052-085	Elbow, 1/4" NPT Street	1
9	000-052-082	Elbow, 1/4" NPT Street X 45 Degree	1
10	000-049-154	Filter, Air Deflector, URT - Fabricated	1
11	000-049-153	Filter, Flat - Universal Recovery Tank	1
12	000-049-152	Filter, Recovery Tank Basket	1
13	000-157-091	Float, Lever Switch	2
14	000-057-206	Gasket, Adapter - URT	2
15	000-052-226	Insert, 1-1/2" NPT X 1-1/2" Barb (Gray)	1
16	000-052-100	Insert,#44	2
17	000-086-008	Latch, Bungee	1
18	000-052-763	Nipple, 1-1/2" IPS Close S/S	1
19	000-094-063	Nut, #6-32UNC Nylock	2

Item	Part Number	Description	Qty
20	000-094-059	Nut, #8-32UNC Nylock	2
21	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	14
22	000-094-009	Nut, 1/4"-20UNC Nylock	8
23	000-106-019	Plug, 1-1/2" NPT	1
24	000-106-046	Plug, 1-1/4" NPT	1
25	000-106-049	Plug,1" NPT Black Nylon	1
26	000-140-023	Rivet, AB8-6A Aluminum Pop	4
27	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	3
28	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
29	000-143-051	Screw, #8-32UNC X 3/4" Lg. Binder Head	2
30	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	2
31	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	22
32	000-159-129	Tank, 100 Gal. Universal Recovery - Coated	1
33	000-169-022	Valve, 1-1/2" Full Port Ball	1
34	000-174-036	Washer, #10 Flat Rubber Backed	3
35	000-174-003	Washer, 1/4" Flat	19
36	000-174-019	Washer, 1/4" Lock	2
37	000-174-060	Washer, 1/4" Rubber Backed	14
38	000-174-029	Washer, 3/8" Rubber Backed	2

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Figure 9-28. 100 Gallon Universal Recovery Tank (URT) Cover Assembly
610-029-001

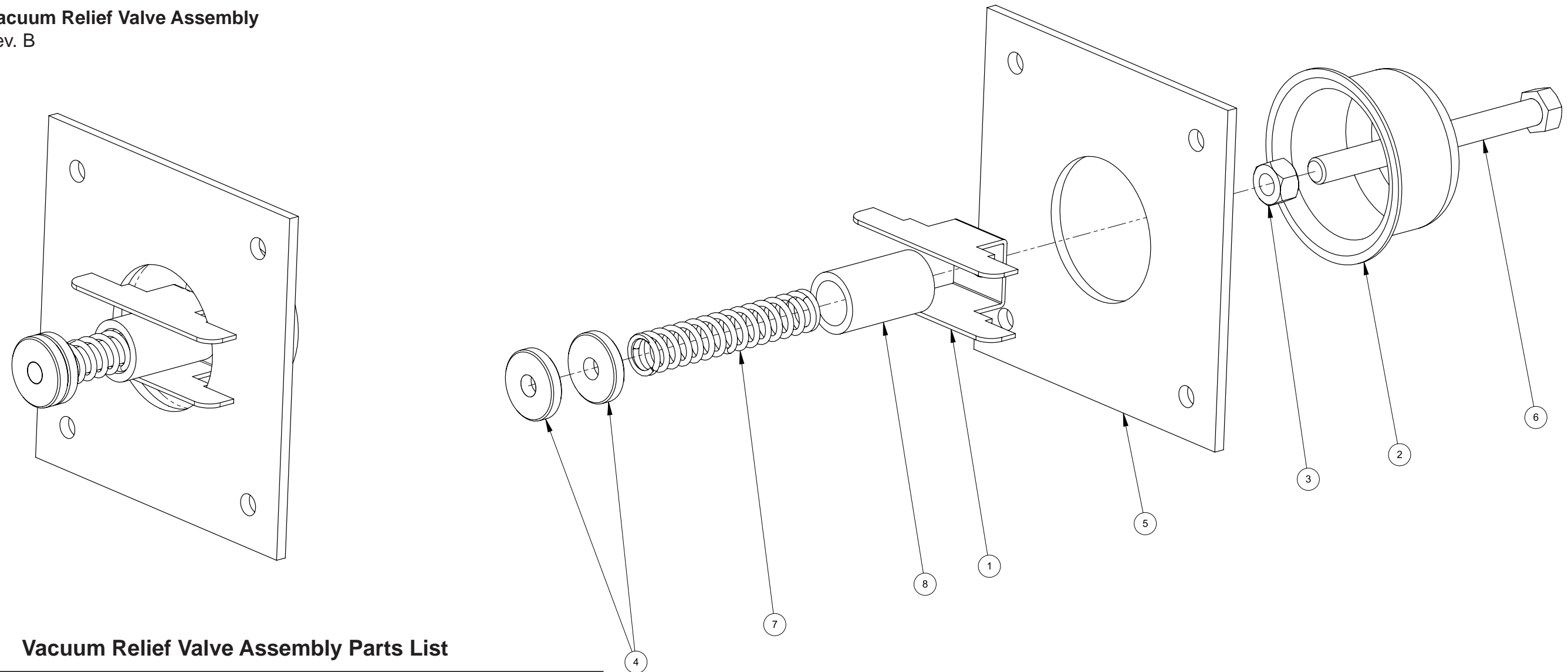


100 Gallon Universal Recovery Tank (URT) Cover Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-219	Adapter, 2" NPT X 2" F Slip	2
2	000-041-465	Cover 100 URT - Coated	1
3	000-052-222	Elbow, 2" Barb X 2" FPT	2
4	000-057-015	Gasket, 1-1/2" Bulkhead Fitting	2
5	000-057-202	Gasket, End - Rec. Tank Cover	2
6	000-057-203	Gasket, Middle - Rec. Tank Cover	3
7	000-057-205	Gasket, Side - Rec. Tank Cover	2
8	- - -	Latch, Bungee - Strike (Part of 000-086-008)	1

Item	Part Number	Description	Qty
9	000-094-063	Nut, #6-32UNC Nylock	2
10	000-094-009	Nut, 1/4"-20UNC Nylock	1
11	000-105-546	Plate, Port Cover - Coated	2
12	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
13	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	1
14	000-078-039	Vacuum Inlet Stopper	1
15	000-174-003	Washer, 1/4" Flat	2

Figure 9-29. Vacuum Relief Valve Assembly
610-026-724 Rev. B



Vacuum Relief Valve Assembly Parts List

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

Hose Routings

Manufactured Hoses (Crimped Ends)			
Part No.	Description	Hose Routing	
		From	To
000-068-328	3/8" Teflon - 66"	Pump	By-Pass
000-068-329	3/8" Teflon - 21"	By-Pass	Heat Exchanger In
000-068-330	3/8" Teflon - 14.5"	Heat Exchanger Out	Solution Out
000-068-337	3/16" Teflon - 58"	Chemical Pump	Prime Valve-Inlet
000-068-338	3/16" Teflon - 30"	Pump	Pressure Gauge
000-068-339	3/16" Teflon --24"	Metering Valve	Solution. Outlet
Cut to Length Hoses (Clamp On Ends)			
Part No.	Description	Hose Routing	
		From	To
000-068-344	5/32" Vacuum - 41.5"	Blower Inlet	Vacuum Gauge
000-068-345	5/32" Vacuum - 53"	Blower Inlet	Lube Port
000-068-346	5/32" Vacuum - 11"	Blower Inlet	Vacuum Tee
000-068-347	5/32" Vacuum - 35"	Vacuum Tee	Divert Solenoid
000-068-348	5/32" Vacuum - 36"	Engine Vacuum	Vacuum Tee
000-068-313	5/32" Vacuum - 17.5"	Diverter Solenoid	Actuator
000-068-314	5/32" Vacuum - 12.5"	Diverter Solenoid	Actuator
000-068-158	1/4" Fuel Hose - 24"	Hi Pressure Valve	Atmosphere
000-068-355	3/8" Clear Braided Hose - 62"	Flower Meter	Chemical Pump
000-068-356	3/8" Clear Braided Hose - 60"	Chemical Jug	Flow Meter
000-068-333	1/2" Hose - 42"	Wye	Water Box
000-068-334	1/2" Hose - 6"	Drain	Wye
000-068-335	1/2" Hose - 3"	By-Pass	Wye
000-068-325	1/2" Hose - 68"	Water Inlet	Water Box
000-068-695	4" Flex Hose - 21"	Blower	Diverter Inlet
000-068-388	1/4" Fuel Hose - 72"	Hi Temperature Dump Valve	Recovery Tank
000-068-388	1/4" Fuel Hose - 108"	Prime Valve-Prime	Recovery Tank
000-068-349	3/8" Hi Temp - 39"	Pump Drain	Atmosphere Plug
000-068-529	1" Black Suction Hose - 35"	Water Box	Pump

10 - How to Order Parts

To order warranty replacement parts or repairs, it is important that you read this section which includes:

- Warranty Parts Orders
- Parts Orders
- Emergencies

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. Unit Serial Number
 - d. Description of Malfunction
3. Once it has been determined which parts are needed to correct the problem with your machine, make arrangements with your distributor to either perform the repairs or ship the parts to you.

Any questions you have regarding the warranty program should be directed to the Customer Service Department at (425) 775-7275, 7 a.m. to 5 p.m. Monday through Friday (PT).

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. 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.

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11 - Warranty Information

To avoid misunderstandings which might occur between machine owners and the manufacturer, we are listing causes of component failure that specifically voids warranty coverage. Such causes listed in this section shall constitute abuse or neglect.

BLOWER

- Failure to lubricate impellers daily with a HydraMaster-recommended lubricant, to lubricate bearings, to maintain proper oil levels, or to use the correct oil grade and viscosity as recommended in 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 blower.

HIGH PRESSURE WATER PUMP

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

VACUUM TANK

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

CHEMICAL SYSTEM

- Use of improper chemical.
- Failure to use water softener in hard water area.
- Operating machine without 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 hoses against freezing.
- Failure to protect hoses against burns from engine and blower exhaust.
- Damage to hoses from being run over by vehicles.
- Kinking or cracking from failure to store or unroll hoses correctly.
- Normal wear and tear from everyday use.

CLEANING WAND AND TOOL

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

WATER HEATING SYSTEM

- Over-pressurization of the system (recommended maximum working pressure - 1,200 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 machines 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.

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

12 - 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 steam 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
- De-Foamers 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.

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