Titan 875
Owner's Manual

HydraMaster
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MAN-33180 Rev. 0 March 23, 2012
(182-077-D)

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INSTRUCTIONS

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1- General Information

The Titan 875 truckmount carpet cleaning and restoration machine is powered by the 61 HP GM 4-cylinder, fuel injected engine and the Tuthill Competitor Plus™ 5009 Tri-Lobe dual oil bath blower.

For superior carpet and upholstery cleaning, the Titan 875 provides temperatures up to 270° F at 1,200 psi *. It also provides non-heated pressure washing at 3,000 psi for cleaning hard surfaces.

* Patented Heat Exchanger System - U.S. Patent No. 8,032,976

The Titan 875 also features:

- a simple 3-panel maintenance access
- keyless ignition
- last-step chemical injection which reduces scale buildup

Standard equipment includes:

- 100 Gallon MaxAir™ Recovery Tank
- 5 gallon chemical jug
- 150 ft long, 2” diameter vacuum hose
- 150 ft long, 1/4” diameter solution hose

Optional pieces of equipment available are:

- Dura-Flow™ Automatic Pump Out (APO)
- 2.5” adaptor kit for triple wand capability

It is the purpose of this manual to help you properly understand, maintain and service the Titan 875. By following these guidelines carefully, you can expect years of reliable operation.

Other topics covered in this section of the manual are:

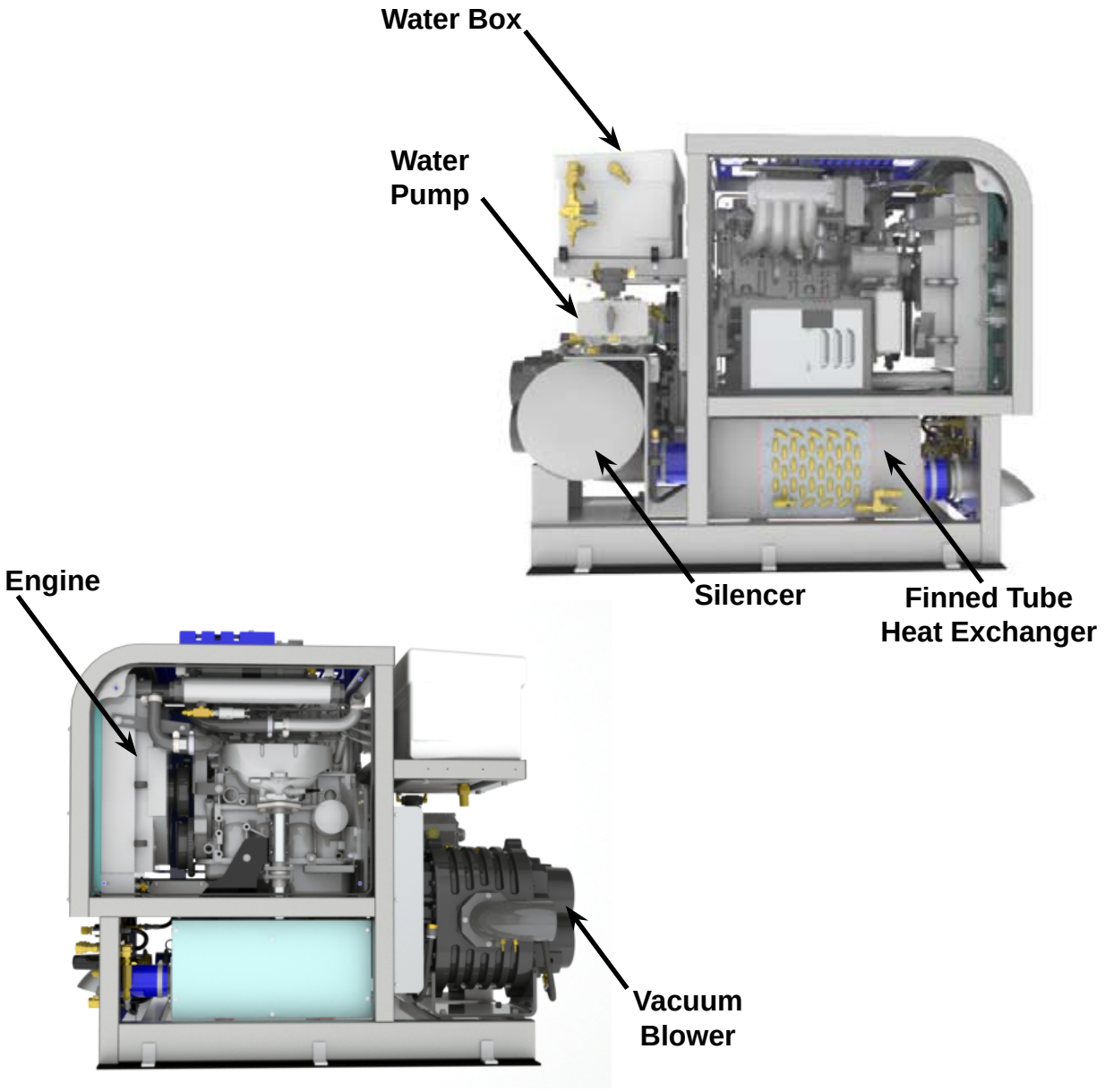
- Contact Information
- Warnings, Cautions and Notices
- Responsibilities
- Machine Specifications
- Spare Parts List
- High Altitude Operation
- Local Water Precautions

SYSTEM CONCEPT

The Titan 875's system utilizes an internal combustion engine to provide the power necessary to turn both the vacuum blower and the high pressure water pump.

The heat from the engine and blower exhausts is transferred to the high pressure water in the finned tube heat exchanger and copper tube and shell of the system. Finally, the chemical is injected into the pressurized water stream and the heated solution is delivered to the cleaning tool.

Solution is recovered by the vacuum generated by the vacuum blower and is collected in the recovery tank for proper disposal.



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 the Owner's 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 Standard 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 Titan 875 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. 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.

⚠WARNING

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

⚠WARNING

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

⚠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 personal injury and property damage may result.

CAUTION

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

CAUTION

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

CAUTION

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

CAUTION

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

CAUTION

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

CAUTION

Never allow water to freeze inside the truckmount. Serious component damage will occur. Perform all freeze guarding procedures as outlined in Section 4 of this 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

Overall Dimensions (Console Only)	22" W x 29" D x 29" H	
Weight	1,187 lbs.	
Engine - GM, 1.6L, 4 Cylinder EFI, 61 HP	Oil Type	10W-30 (Synthetic not recommended)
	Capacity	Approx. 4 quarts (128 oz.) when changing oil and filter
	Engine rpm	High 2,700 rpm
		Mid 2,500 rpm
		Low 2,150 rpm
Vacuum Blower- Tuthill 5009 Competitor Plus SL (Dual Splash Lubrication)	Oil Type	PneuLube™ or other ISO 100 rating
	Gear End Capacity	Approx. 9.6 oz.
	Drive End Capacity	Approx. 7 oz.
	Blower rpm	2,250 rpm
Pump- General Pump	Oil Type	15W-40
	Capacity	Approx. 40 oz.
	Pump Rate	5.5 gallons per minute
	Pump rpm	1,450 rpm
Operating Pressure	0-1,200 psi (heated)	0-3,000 (no heat)
Chemical System	Last Step Chemical Injection	
Heating System	Finned Tube Heat Exchanger	Copper Tube and Shell

Standard Equipment	High Pressure Hose	1/4" High Temperature Lined/ Vinyl Cover - 150 ft.
	Vacuum Hose	2" Vacuum Hose - 150 ft.
		1-1/2" Wand Whip Line - 10 ft.
	Recovery Tank	100 gallon MaxAir Universal Tank
	Cleaning Wand	Stainless Steel S-bend
		Replaceable Grip
		Rebuildable Solution Valve
	Chemical Jug	5 gallon
	Battery Box	
	Van Decal	
	Van Installation Kit	
	Owner's Manual (on CD)	
	Owner's Guide (printed)	
Optional Equipment	Third Wand Adapter for Recovery Tank	2.5 Vacuum Port (P/N 000-078-875)
	Automatic Pump Out (APO)	Dura-Flow APO (P/N 000-079-091)
	Thru Floor Exhaust	4" Thru Floor Exhaust Kit (P/N 000-079-129)
	Pressure Washing	Pressure Wash Kit (P/N 000-079-123)

SPARE PARTS LIST

Part No.	Description	Qty
Engine and Drivetrain Components		
000-106-125	Plug, Spark	4
000-049-097	Filter, Fuel	1
000-049-250	Filter, Oil	1
000-049-251	Filter, Primary Air	1
000-049-252	Filter, Secondary Air	1
000-010-127	Belt, 3VX464 Super HC	4
000-010-128	Belt, HD 9330	2
000-010-129	Belt, Timing	1
000-010-134	Belt, Alternator	1
Electrical Components		
000-056-010	Fuse, 25 Amp	1
000-056-008	Fuse, 15 Amp	1
000-157-040	Switch, 20 Amp Rocker	2
000-157-022	Switch, Relay, 12 V	2
Hydraulic Components		
000-052-050	Quick Connect, 440 Male	2
000-052-051	Quick Connect, 440 Female	2
000-052-052	Quick Connect, 660 Male	1
000-052-053	Quick Connect, 660 Female	1
000-046-011	Diaphragm, Chemical Pump	1
000-169-219	Valve, 80 psi, Last Step Chemical	1
000-180-003	Orifice, 0.046 dia.	1
000-074-167	Gauge, High PSI (0 - 3,000)	1
000-049-023	Screen, Garden Hose	1
000-078-005	Kit, Seal, and Spring High PSI Regulator	1

HIGH ALTITUDE OPERATION

It is not required to change or adjust the fuel system due to altitude differences. The engine electronic control system constantly monitors the barometric pressure and fuel mixture in the exhaust. Using these 2 inputs, the engine can compensate for any elevation. This will be done each time the engine is turned on.

LOCAL WATER PRECAUTIONS

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

Hard Water Advisory

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

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

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

CAUTION

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

Hard Water Area Map

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

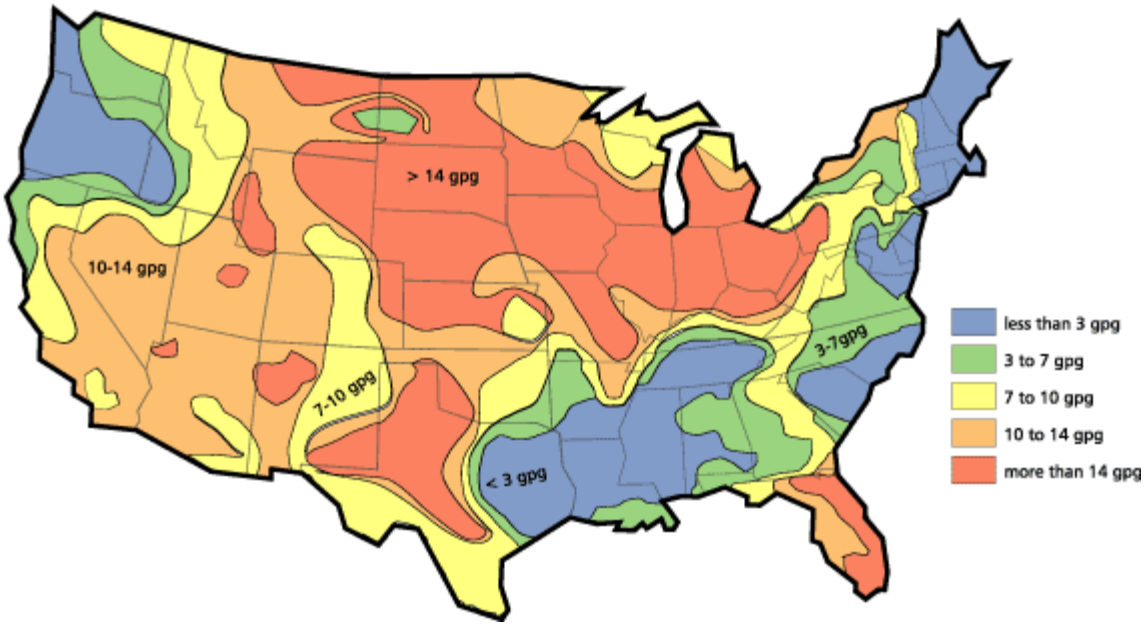


Figure 1-1. Hard Water Map of Continental United States

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 Titan 875 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 of water and the machine uses an average of 30 gallons/hour, for an average of 5 hours a day, this equals 150 gallons per day. In 6 days the machine would use 900 gallons of water. Therefore, the softener would need to be charged every 6 working days for maximum softening.

Waste Water Disposal Advisory

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

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

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

One disposal method which usually complies with the law is to accumulate the waste water and haul it to an appropriate dump site. Another solution to the disposal problem is to equip your Titan 875 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

FUEL PUMP INSTALLATION GUIDELINES

General

The 1.6L GM engine on the Titan 875 is fuel injected. This is a high pressure system and requires approved components and hose to operate within the specifications. The average operating pressure at the fuel rail should be 40 - 50 psi. This pressure is controlled via an pressure manifold that is placed inline with the fuel pump. The fuel system should be hooked up in the following order:

1. Fuel Tank Tap
2. Fuel Pump
3. Fuel Filter
4. Fuel Pressure Manifold
5. Thru Floor Kit
6. Machine

⚠WARNING

Failure to use the specified fuel hose can result in equipment failure or bodily injury. Fuel hose specification: Fuel injection hose carb no. C-4-06-002 SAE 30R9 180 psi.

NOTICE

Failure to use this hose can result in non-compliance fines set forth by the EPA.

CAUTION

The fuel filter must be on the outlet side of the pump, failure to do so may cause the engine to run poorly.

CAUTION

It is important that the order of the fuel supply components are installed correctly, failure to do so may cause the engine or fuel components may not function properly or be damaged.

NOTICE

All components should be replaced with approved OEM parts.

The fuel pump has a “domed” end and an end with the electrical terminations. The “domed” end is the inlet of the pump and the side with the terminations is the output.

The fuel pressure manifold has three ports. The side with the two ports is the return and the inlet, the side with the single port is the output. The dual port side has one connection almost in the center of the block; this is the inlet. The connection that is slightly offset is the return to the fuel tank.

The electrical plug must be positioned at the top when the manifold is installed.

The supplied fuel quick connects are required per the engine certification requirements.

The fuel hose is specific to the Titan 875, this is required by the EPA to maintain the engine certification as well as the pressure requirements.

Locating Components

The Titan 875 is equipped with a fuel pump mounting bracket assembly. This bracket should be located as close to the fuel source as possible. It should be oriented so the fuel pressure manifold plug is oriented upwards (see Figure 2-1).

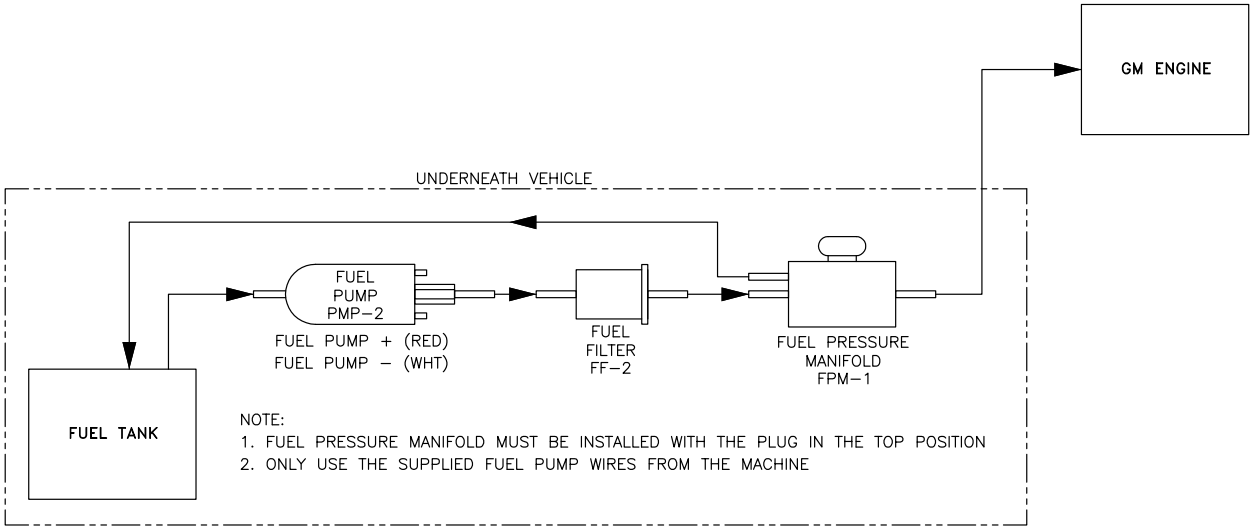


Figure 2-1. Fuel Pump Diagram

Although there are many different heavy duty vehicles used for carpet cleaning equipment, the preferable vehicle for a Titan 875 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 installing the Titan 875, 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 2-2. 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.

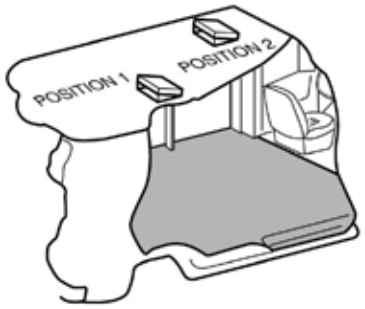


Figure 2-2. Location of Roof Vents in Vehicle

OPERATING THE TITAN 875 IN HOT WEATHER

HydraMaster recommends the following steps when operating the Titan 875 during periods of hot weather (95º F or higher). This will help ensure that your Titan 875 continues to run at 100% capacity during even the hottest days.

1. A minimum of 9" of clearance is required on both sides of the Titan 875, when installed. Ensure that additional equipment or other materials are not stored at the sides or on top of the Titan. Unobstructed airflow around the unit is critical for cooling the engine and other components. The covers must be on the machine at all times to ensure proper cooling.

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 Titan 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.

5. Run the Titan 875 in HOT mode when outdoor temperatures are high. Running the Titan in WARM mode is not "easier" on the machine. In fact, it cuts the coolant heat exchanger out of the cleaning solution loop, in effect reducing the engine-cooling capacity. The Titan was designed to deliver solution at the optimum temperature to clean carpets when in the HOT mode. The WARM mode is intended for delicate materials like upholstery.

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 TITAN 875 IN VEHICLE

There are two recommended entry points on the vehicle for the Titan 875 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 Titan 875 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.

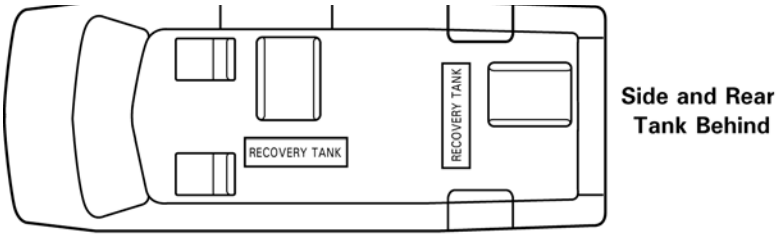


Figure 2-3. Recommended Location of Titan 875 in Van

Secure Installation

No matter how the unit is installed, check to see if the Titan 875 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 2-3 for the correct installation.

⚠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 Titan 875 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 Titan 875 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 TITAN 875

Prior to operating the Titan 875, follow these steps:

1. Adjust the vacuum relief located on the recovery tank by capping all the vacuum inlets (the full throttle condition). The machine should be set to 14” Hg maximum.

CAUTION

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

The Titan 875 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.

3 - Cleaning and Chemicals

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

HydraMaster strongly recommends attending the Clean Trust (formerly known as the Institute of Inspection, Cleaning and Restoration Certification [IICRC]) 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
- Over-Wetting
- Streaking
- Cleaning Tool Tips
- Severe Cleaning Situations

CAUTION

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

CAUTION

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

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

PREPARING THE CARPET FOR EXTRACTION

Pre-vacuum the carpet

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

Pre-treat the carpet

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

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

Remember the solution coming out of your cleaning tool is only in contact with the carpet fiber for a few seconds. Relying on the rinse detergent to do the majority of the cleaning will result in overly long dry times and excess detergent residue left in the carpet.
HydraMaster recommends the use of our pre-sprays: ***Fastbreak™*** for residential carpet and ***Blitz™*** for commercial carpet needs.

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

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.

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

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

There are several factors that will cause over-wetting:

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

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

Possible reasons of streaking may include:

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

CLEANING TOOL TIPS

Wands

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

After pulling the wand for a strip of 3 or 4 ft (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 want 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 Rotomoldeded 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 1-½" 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.

TITAN 875

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

2" S-Bend Wand
This 12" wide wand has two jets. It uses a 1¾" tube for improved airflow and comes with an expanded 2" vacuum hose connection.
Item #163-104

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, 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.

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

Upholstery Tool
Part #000-163-012

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

SEVERE CLEANING SITUATIONS

When your truckmount is used for hard-surface cleaning or pressure washing, some jobs may involve severe cleaning situations. In these cases, certain precautions will need to be taken in order to ensure that the recovery tank and various internal components are not damaged

The following are examples of severe cleaning situations. (This list is not intended to be complete.)

- Concrete cleaning
- Concrete stripping
- Parking lot cleaning
- Extremely greasy floors
- Cleaning that results in the recovery of extensive particulate residue
- Cleaning that results in extensive foam production

When your truckmount is used in severe cleaning situations:

- A pre-filter must be used on the vacuum hose. A fine-mesh filter (i.e. nylon) should be installed into the pre-filter. Contact your distributor for more information.
- The recovery tank should be inspected and cleaned daily.
- The recovery tank inlet filter screen should be rinsed after every job.
- The rectangular blower filter should be rinsed after every job.
- Special care should be taken to clean debris from the recovery tank float switches; they should be inspected daily to ensure that they are fully operational.
- Any cleaning job that induces excessive foam production should be halted until an approved de-foaming agent can be added to the tank.

CAUTION

Failure to follow these recommendations may lead to component failure and warranty invalidation.

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.

4 - Machine Maintenance

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

A maintenance log is provided in the Owner's Guide. **This log must be maintained and may be required to be furnished to HydraMaster before a warranty claim is honored.** It is recommended that the log be affixed to the vehicle door near the 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 (non-synthetic only) if needed.
- Check the high pressure pump oil. Add oil if needed.
- Check the oil level in the blower. Add oil if needed.
- Check coolant overflow bottle level. Add coolant if needed.
- Check the blower drive belt.
- Inspect and clean the recovery tank filters.
- Inspect and clean the orifice and filter.
- 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 spray lubricant.

QR Tag:
Daily Inspection
http://www.youtube.com/user/HydraMasterProducts#p/u/4/qowVchMnrGA

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 drive belt and blower drive belt for wear and proper tension. Tighten as needed.
- Check all the hoses and wiring for wear and chafing. Secure as needed.
- Flush the water and chemical systems with solution of equal parts white vinegar and water.
- Check all the nuts and bolts. Tighten as needed.
- One time change of the high pressure pump oil after 50 hours of operation. (Every 500 hours thereafter.)
- One time change of the engine oil after 25 hours of operation.

QR Tag:
Engine Oil Change Procedure
http://www.youtube.com/user/HydraMasterProducts#p/u/9/dT2p3o80dJs

Monthly Maintenance:

- Change the engine oil every 150 hours. (Every 100 hours if operating in high ambient temperatures.) Change the oil filter every oil change.
- Check the engine primary air filter. Clean or replace as necessary.
- Check the water level in battery. Fill as needed.
- Clean the battery terminals as needed.
- Change the blower oil after first 100 hours of use; change every 500 hours thereafter.

Quarterly Maintenance:

- Check the fuel lines. Repair or replace as needed.
- Clean and gap the spark plugs to 0.031” - 0.035”. Replace if excessive carbon buildup is visible.
- Replace the high pressure pump drive belt.

QR Tag:
Air Filter Maintenance
http://www.youtube.com/user/HydraMasterProducts#p/u/8/waEAGFmpbDE

QR Tag:
Vacuum Blower Maintenance
http://www.youtube.com/user/HydraMasterProducts#p/u/0/pL9rDYHn6JA

QR Tag:
Spark Plug Maintenance
http://www.youtube.com/user/HydraMasterProducts#p/u/7/c_HZiXZehPs

500 Hours:

- Change the blower oil.
- Replace the blower drive belt
- Change the high pressure pump oil.
- Replace spark plugs.
- Change primary fuel filter.
- Check the engine fan belt.

800 Hours:

- Change engine coolant.

1,000 Hours:

- Replace spark plugs.
- Change secondary air filter.
- Clean and inspect the blower heat exchanger.
- Replace the engine fan belt.

NOTICE

Refer to the Interval in Hours Maintenance Chart in the Owner's Guide or on HydraMaster's website for more information.

QR Tag:
Interval Maintenance Schedule

http://hydramaster.com/Portals/0/Manuals/Titan_875/Maint_Schedule_Titan_875.pdf

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

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 150 hours or every three months 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 you 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

Multi-viscosity oils are recommended. SAE 10W-30 is recommended for your engine from 0° F or above. If ambient temperatures are consistently below 0° F, SAE 5W-30 oil should be used. Synthetic oils are not recommended for industrial or stationary engines.

Oil Filter

The GM powertrain engines use a AC Delco oil filter as the original equipment. 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.

Air Cleaner

Air that contains dirt and grit produces an abrasive fuel mixture and can cause severe damage to the cylinder walls and piston rings. Damage to the cylinder walls and piston rings will cause high oil consumption and shorten engine life.

A restricted or dirty air cleaner will also cause a rich fuel mixture. Thus, it is extremely important that the air cleaner be serviced properly at the recommended intervals.

CAUTION

Service the air cleaner more frequently under severe dusty or dirty conditions. Failure to do so can result in machine failure.

1. Remove the primary air cleaner element from the air cleaner assembly and inspect the element for foreign material restrictions or signs of excessive wear or damage.
2. Replace the element if necessary.
3. Remove all dust and foreign matter from the air cleaner housing.
4. Re-install the air cleaner element.
5. Re-install the air cleaner cup, and securely fasten the retaining clips.

Safety Element

If your engine is equipped with an air cleaner which utilizes a safety element, ensure that the element is properly in place before installing the primary element.

Change the safety element annually.

Cooling System

Coolant Level

Check the coolant level of the radiator daily and only when the engine is cool. Generally a good time to do this is just prior to starting the engine for the first time each day.

Maintain the coolant level at 3/4 to 1 1/2” below the filler neck seat of the radiator when the coolant is cold. Whenever coolant level checks are made, inspect the condition of the radiator cap rubber seal. Make sure it is clean and free of any dirt particles which would keep it from seating on the filler neck seat. Rinse off with clean water if necessary. Also make sure that the filler neck seat is free of any dirt particles.

⚠WARNING

Never remove the radiator cap under any conditions while the engine is operating. Failure to follow these instructions could result in damage to the cooling system, engine, or cause personal injury. To avoid having scalding hot coolant or steam blowout of the radiator, use extreme caution when removing the radiator cap from a hot radiator. If possible, wait until the engine has cooled, then wrap a thick cloth around the radiator cap and turn slowly to the first stop. Step back while the pressure is released from the cooling system. When all the pressure has been released, press down on the cap and remove it slowly.

CAUTION

The engine manufacturer recommends the cooling system be filled with a 50/50 mixture of antifreeze and water. The use of DexCool® “Long Life” or equivalent type coolant is required. This antifreeze is typically bright orange in color and should meet requirements issued by the engine supplier. Failure to use this type of antifreeze may result in corrosion of the cooling system.

CAUTION

DO NOT add coolant to any engine that has become overheated until the engine cools. Adding coolant to an extremely hot engine can result in a cracked block or cylinder head.

Bleeding Air from Cooling System

It is necessary to remove all of the air from the engine to prevent overheating. If the coolant has been drained for any reason, it will be necessary to follow the bleed procedure.

1. When the engine is cold, remove the radiator cap.
2. Fill the radiator until it is to the top of the filler neck.
3. Start the engine and run in the low rpm position, pump clutch off, and no vacuum load.
4. Allow the engine coolant to heat up and open the thermostat several times. As all the air is removed from the system, the level of the radiator should lower below the internal tubes. This process should take approximately 5 - 10 minutes.
5. Top off the coolant and install the cap.
6. In the event you experience a coolant shutdown due to overheat, allow the machine to cool down and repeat this procedure.

NOTICE

A kit is available which allows you to add a valve to the radiator to improve bleeding the air. Ask HydraMaster Technical Support for P/N 000-078-891 Titan Coolant Bleed Valve Kit (INS-33141).

Radiator

Inspect the exterior of the radiator for obstructions. Remove all debris with a soft brush or cloth. Use care to avoid damaging the core fins.

Fuel Filter

The fuel filter is located between the fuel pump and the fuel pressure manifold underneath the vehicle. This is a high pressure fuel system and should be replaced with the properly specified filter.

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.

QR Tag:
High Pressure Pump Maintenance
http://www.youtube.com/user/HydraMasterProducts#p/u/6/XoIoEXFU6MM

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.

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

CAUTION

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

CAUTION

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

Service

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

CAUTION

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

NOTICE

The pump service repair kit is P/N 000-078-912; it includes the pump packing lubricant and the insertion tool (see Figure 4-12).

Servicing Valves on the High Pressure Pump

Removing a Valve

To remove the valve cap (30 mm) and extract the valve assembly (see Figure 4-1).

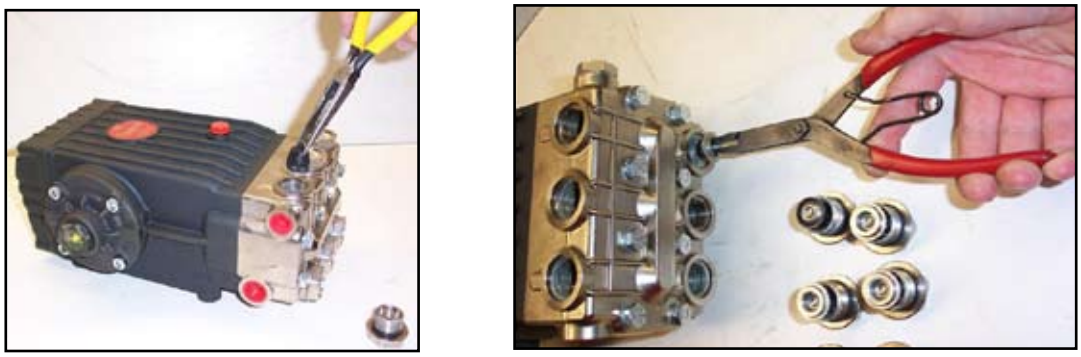


Figure 4-1. Remove Valve Cap and Valve Assembly

1. Remove the valve assembly (retainer, spring, valve plate, valve seat) from the valve cavity.
2. Remove the O-ring and support from the valve cavity.
3. Examine the O-ring and replace if there is any evidence of cuts, abrasion, or distortion.
4. Inspect the manifold for wear or damage (see Figure 4-2).
5. Inspect the old valves for wear or damage. Only one valve kit (P/N 078-519) 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 4-2. Inspect Manifold and Old Valves

6. Replace the center inlet check valve with a modified check valve (P/N 000-169-212 - see Figure 4-3).

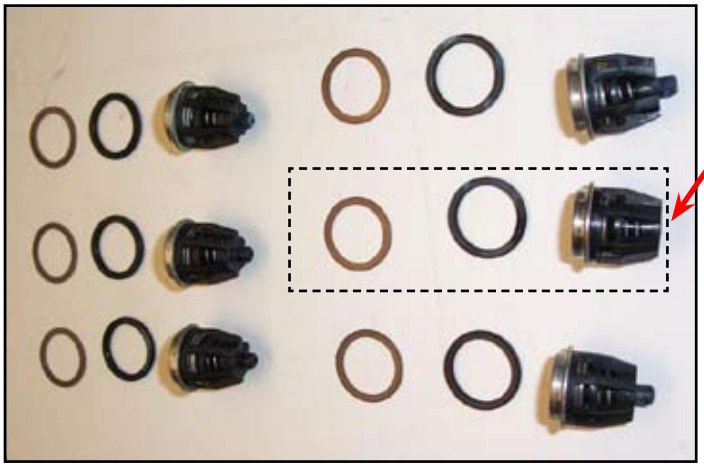


Figure 4-3. Replace Center Inlet Check Valve With Modified Check Valve

7. Apply O-ring grease to O-rings and install valves (see Figure 4-4).

Figure 4-4. Apply Grease and Install Valves

Figure 4-5. Replace Valve Cap and Torque to 95 ft lbs

8. Replace valve cap and torque to 95 ft. lbs. (see Figure 4-5).
9. Remove the fasteners retaining the manifold

10. Separate manifold from crankcase (see Figure 4-6).

Figure 4-6. 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.

11. The seal assemblies may come off with the manifold (see Figure 4-7).
12. Examine the ceramic plungers. The surface should be smooth and free from scoring, pitting or cracks (see Figure 4-8); if not, replace.

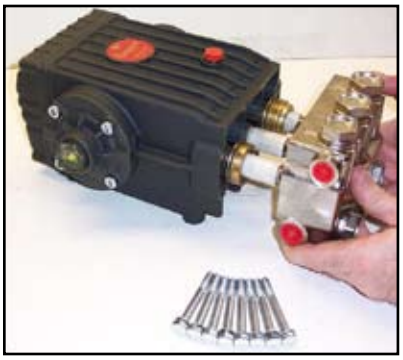


Figure 4-7. Seal Assemblies May Come Off with Manifold

Figure 4-8. Examine Ceramic Plungers

13. Loosen the stainless steel plunger bolt.
14. Remove the stainless steel plunger bolt and ceramic plunger from the plunger guide (see Figure 4-9).
15. If the slinger washer is removed, be certain it is re-installed or replaced.
16. Separate plunger bolt from ceramic plunger (see Figure 4-9).

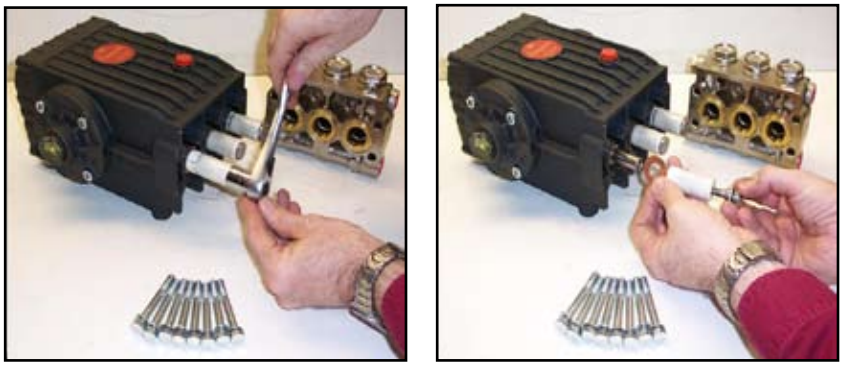


Figure 4-9. Remove Stainless Steel Plunger Bolt and Ceramic Plunger

17. 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 4-10).
18. Apply removable anaerobic thread sealant (Loctite® 542) to the threads of the plunger bolt, carefully pressing the plunger bolt into ceramic plunger.
19. Slide new ceramic plunger over the plunger guide.
20. Torque plunger to 14.5 ft. lbs.

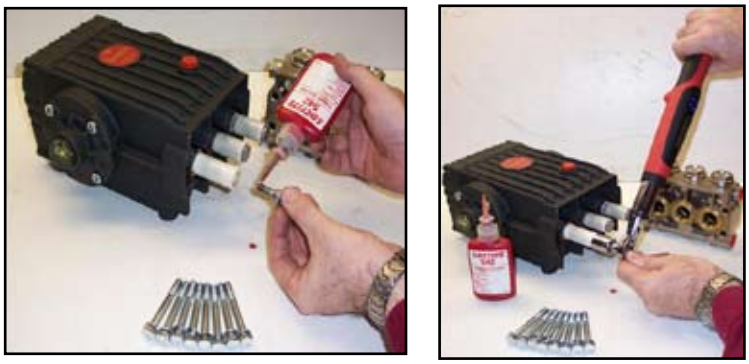


Figure 4-10. Install O-ring, Apply Sealant and Slide Plunger over Plunger Guide

Extracting Seals

With manifold removed from crankcase:

1. Insert proper extractor collet through main seal retainer.
2. Tighten the collet and extract retainers and seals.

NOTICE

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

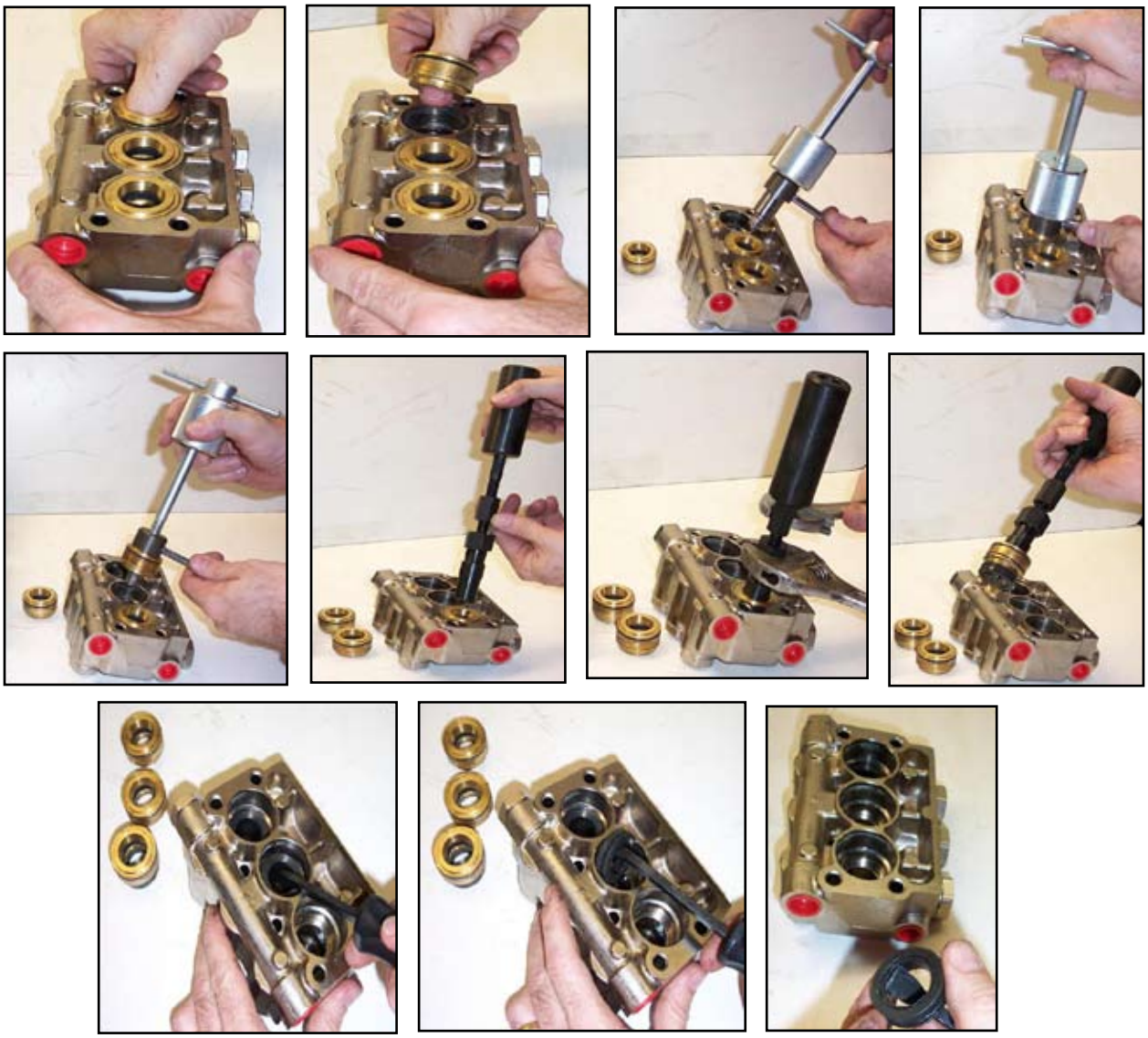


Figure 4-11. Extract Retainers and Seals

Replacing the Seal Assemblies

Only one seal kit (P/N 000-078-518) is necessary to repair all the seals in the pump (see Figure Figure 4-12). Use the insertion tool located in the pump service repair kit for seal installation (see page 4-10).

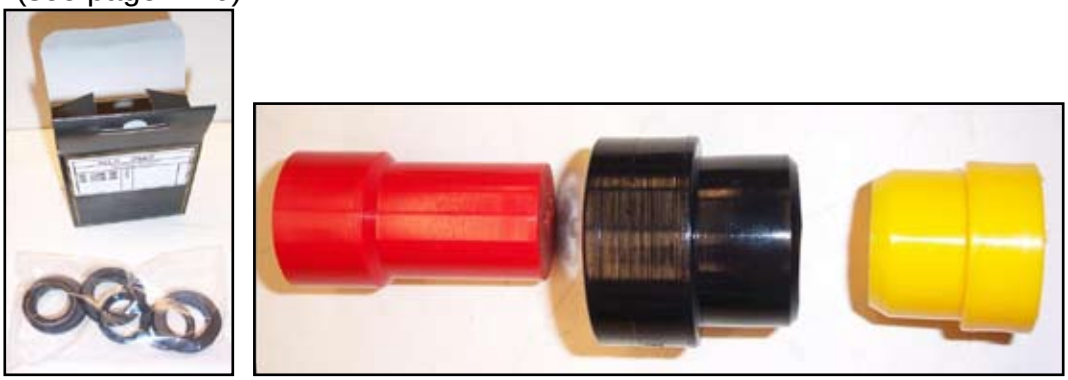


Figure 4-12. Seal Kit and Insertion Tool for Seal Installation

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 4-13).

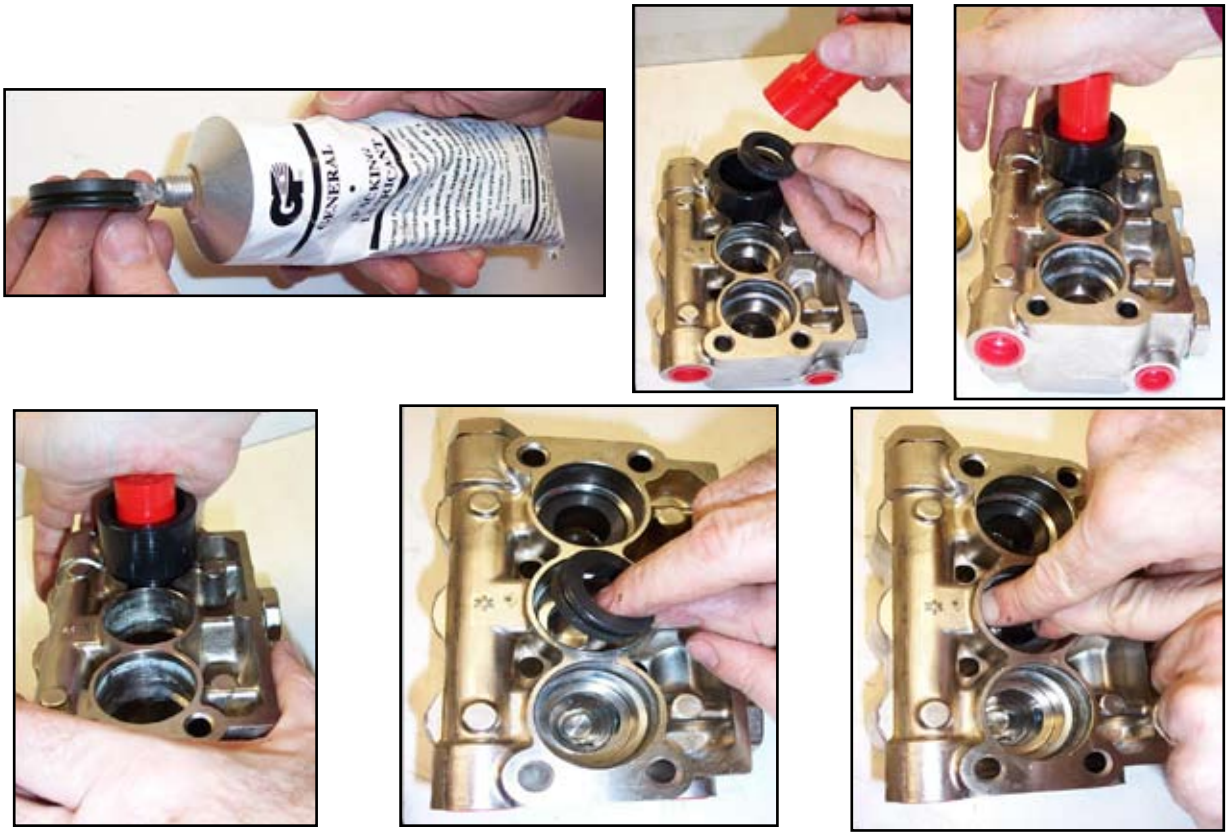


Figure 4-13. Install Seal Assembly Using O-Ring Grease

.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 4-14).

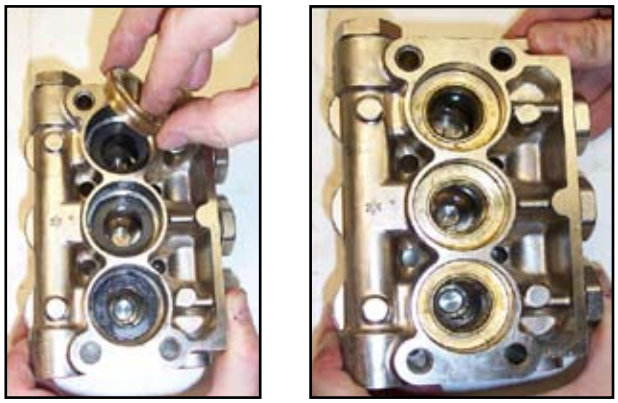


Figure 4-14. Install Retainers into Cavities

3. Press the low pressure seal assembly into the cavity (see Figure 4-15).

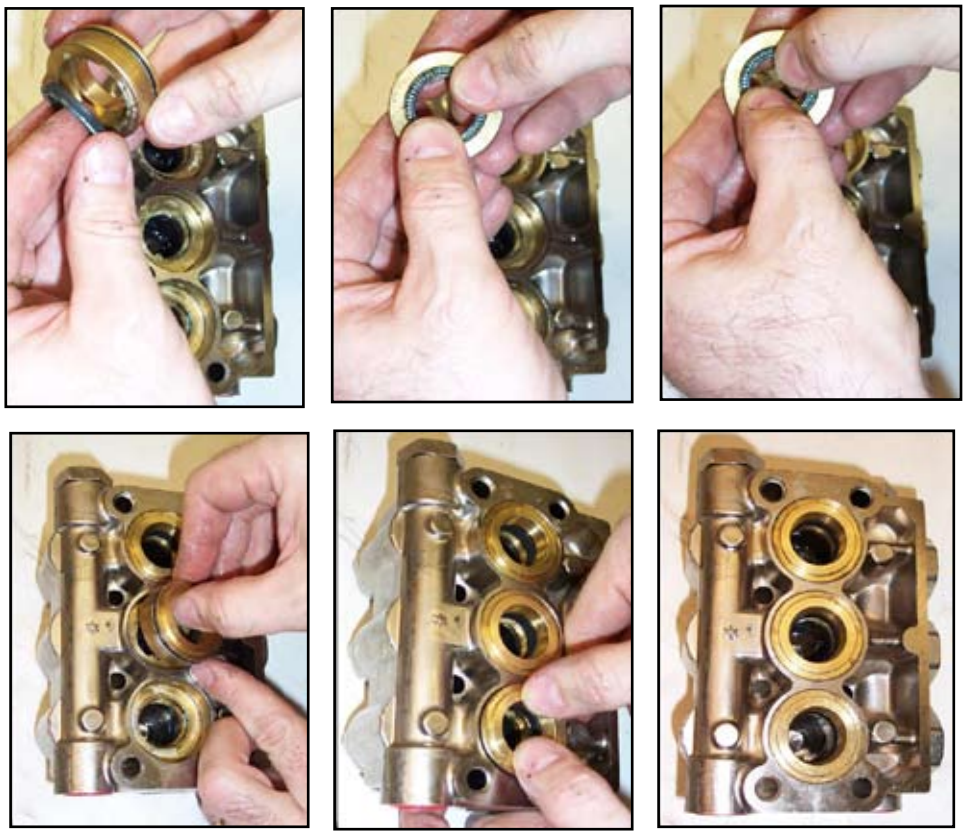


Figure 4-15. Press Low Pressure Seal Assembly into Cavity

Re-Installing Manifold

1. Position the outer plungers at the same position (see Figure 4-16).
2. Re-install manifold and torque the fasteners in an “X” pattern to 50% of specification and then retorque to 100% specification (see Figure 4-17 and Figure 4-18)

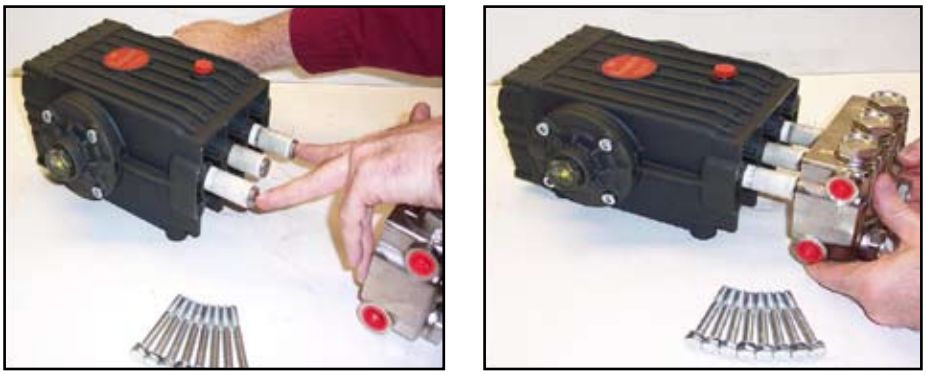


Figure 4-16. Re-install Manifold and Torque Fasteners

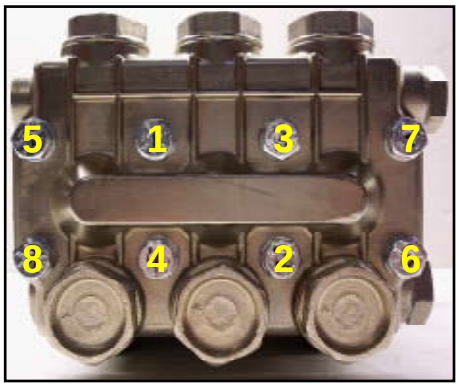


Figure 4-17. Torque Sequence in “X” Pattern

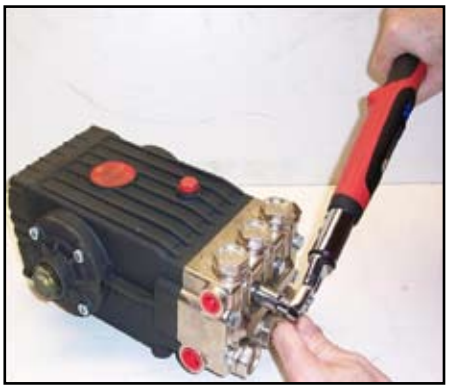


Figure 4-18. Torque Bolts to 22 ft lbs

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.

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

CAUTION

Solid objects entering the blower will cause serious damage to the internal components of the blower. Extreme caution should be used when the 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. Allow machine to run additional 2 to 5 minutes under load to flush off lubricant.
5. 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 deposits. The frequency with which descaling procedures are required will vary. If the area has particularly hard water, you may have to de-scale often.

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

NOTICE

If using TM DeScaler™ through the flow meter, make sure to run clean water through the flowmeter 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 4-19) 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 three to five minutes. Do not leave the TM DeScaler™ solution in the system. Flush the system with clean water and turn the truckmount OFF.

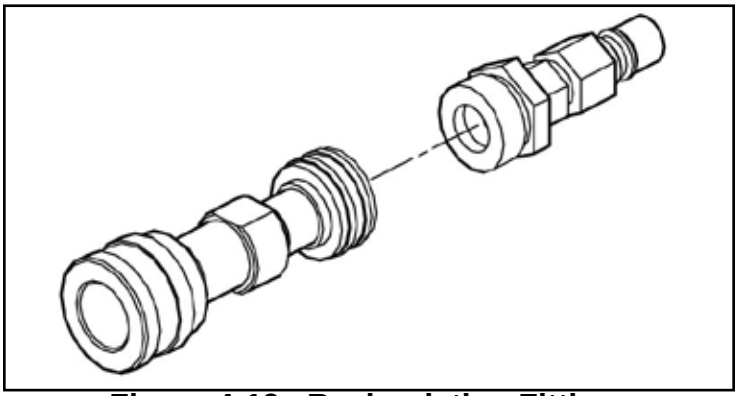


Figure 4-19. Recirculation Fitting

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 caution 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.

QR Tag:
Freeze Guarding
Procedure
http://www.youtube.com/user/HydraMasterProducts#p/u/1/C0cSvaqmudQ

2. Add 2 gallons of 50/50 antifreeze and water mix to the water box.
3. Attach a section of solution hose to the outgoing solution fitting on the front of the machine. Attach the opposite end to the recirculation fitting. (If more sections of hose are to be freeze guarded attach those inline.)
4. Start the truckmount and allow it to run for 2 to 3 minutes. This will distribute antifreeze solution throughout the truckmount.
5. Remove the chemical feed line from the chemical jug. Turn the selector valve to “PRIME.” This will vacuum the chemical remaining in the lines to the recovery tank.

When using the recirculation kit, skip ahead to Step 7.

6. Remove the quick connect fitting from the garden hose. Attach the quick connect to the machine. Using a vacuum hose attached to the recovery tank, vacuum the water out of the quick connect. This will freeze guard the feed line to the water box.
7. Remove the quick connect from the truckmount.
8. 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.
9. Re-tighten the fitting.
10. Spray the antifreeze and water mix out of the truckmount and into a container to reclaim the solution. Run the truckmount until it stops.
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 Step 7 with the items to be freeze guarded, attached.

Recovering Antifreeze for Re-Use

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

Freeze Protection of the Pump-In System

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

NOTICE

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

5 - Operating Instructions

This section describes how to operate the Titan 875, starting with a description of the dash assembly (see Figure 5-1).

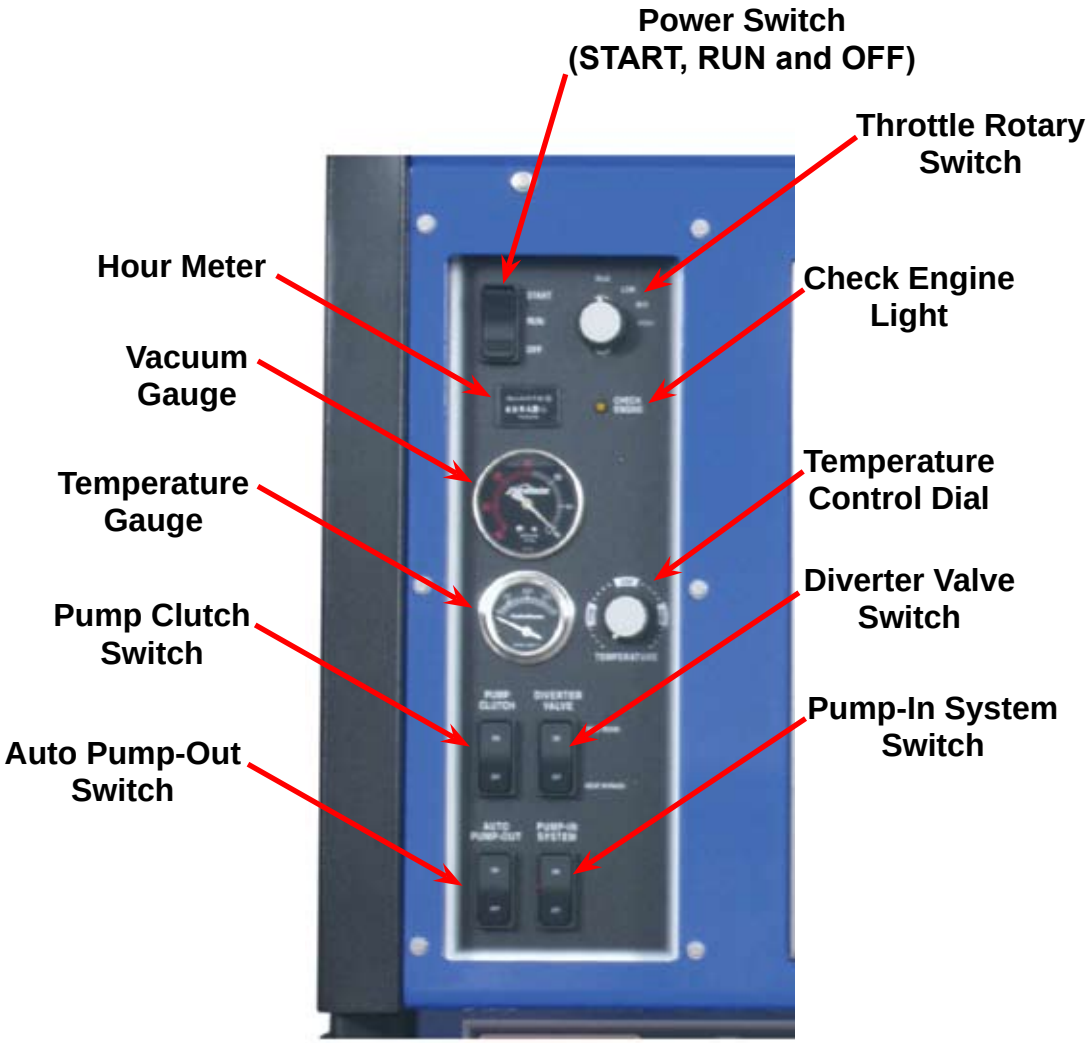


Figure 5-1. Titan 875 Upper Dash Assembly

The front dash assembly controls the:

- 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

The front dash assembly also includes the solution temperature control dial; the temperature, vacuum and pressure gauges; and the hour meter.

The lower dash assembly controls the:

- Water pressure
- Chemical metering
- Water box drain
- Heat selection for carpet cleaning (HOT) or upholstery cleaning (WARM) - see Figure 5-2

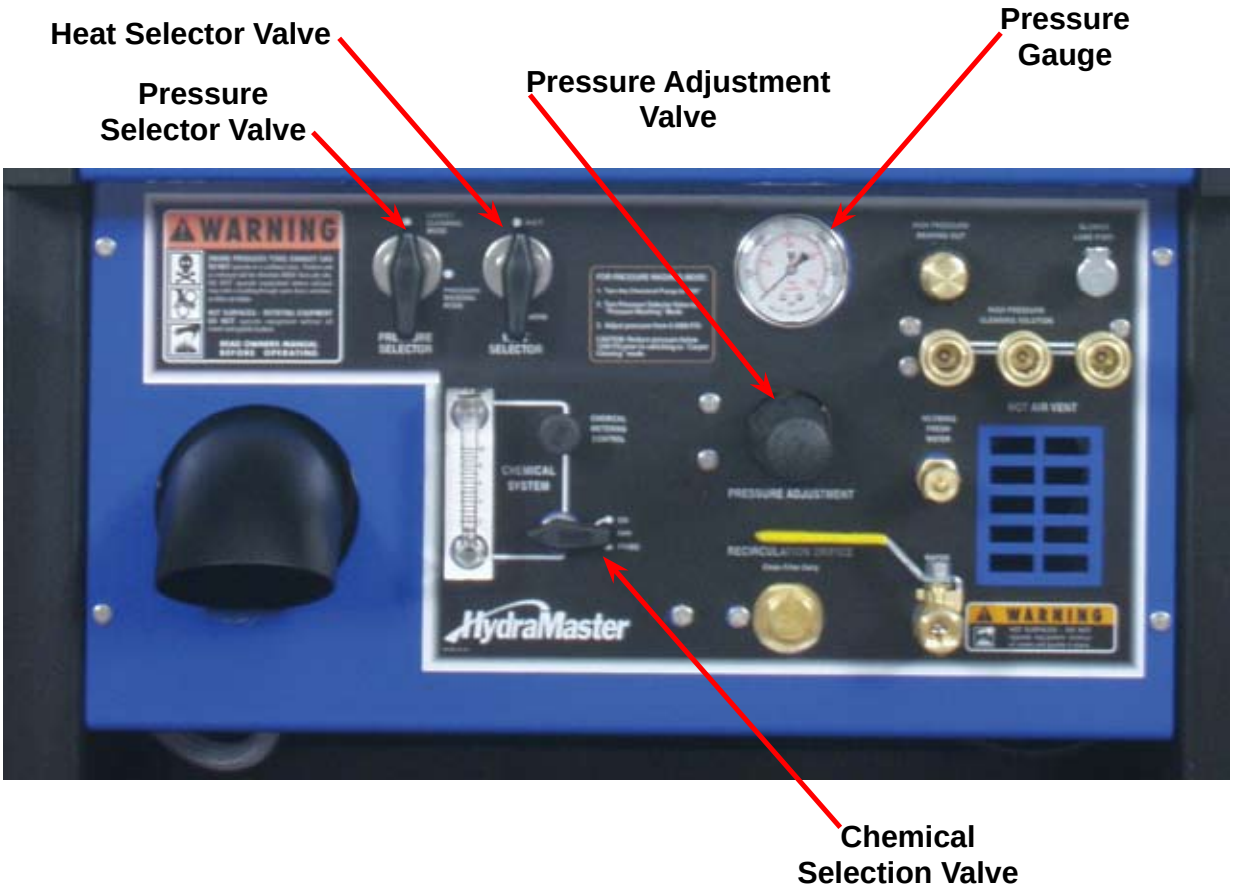


Figure 5-2. Titan 875 Lower Dash Assembly

The lower dash assembly also houses the blower lube port and three high pressure cleaning solution ports where the wand/tools connect to the Titan 875.

NOTICE

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

START-UP PROCEDURE

1. Perform all daily and periodic maintenance as specified in Section 4 of this manual.
2. Connect a garden hose to supply water to the truckmount. If used, turn the “PUMP-IN” switch to the “ON” position.
3. Connect the cleaning tool to the length of hose required to perform the cleaning job.
4. Start the truckmount with;
   a. The throttle rotary switch in “IDLE”.
   b. The “PUMP CLUTCH” switch in the “OFF” position.
   c. The “DIVERTER VALVE” switch in the “HEAT BYPASS” position.
5. After the engine starts allow the truckmount to run in “IDLE” for 1-2 minutes to warm up.
6. Rotate the throttle switch clockwise to “LOW”, “MID”, or “HIGH”.
7. Turn the “PUMP CLUTCH” switch to the “ON” position.
8. Turn the “DIVERTER VALVE” switch to the “HEAT MODE” position.
9. Set the “HEAT SELECTOR” valve to the desired position.
   a. Set to the “COOL” position for upholstery or single wand cleaning.
   b. Set to the “HOT” position for dual or triple wand cleaning.
10. Set “PRESSURE SELECTOR” valve to the desired position.
    a. “Pressure Washing Mode” for 1,200-3,000 psi (Non-Heat).
    b. “Carpet Cleaning Mode” for 0-1,200 psi (Heated).
11. If used, turn the “AUTO PUMP-OUT” switch to the “ON” position.
12. Set the cleaning pressure to the desired level.
    a. Suggested settings:
       Carpet Cleaning: 300 - 400 psi.
       Hard Surface Cleaning: 1,000 psi or as indicated on the tool.
       High Pressure Cleaning: 3,000 psi or as indicated on the tool.

QR Tag:
Start-up Procedure
http://www.youtube.com/user/HydraMasterProducts#p/u/2/75C_d6EX604

13. Turn the “CHEMICAL SYSTEM” switch to the “PRIME” position to purge any air from the system (see Figure 5-2).
    a. With the truckmount running at “MID” or “HIGH”, block off the vacuum intake to the recovery tank. The vacuum gauge should read 12” Hg. This will assist in priming the chemical system.
    b. Allow the chemical to flow through the chemical meter at full flow for 30 seconds.
    c. Turn the “CHEMICAL SYSTEM” switch to “ON.” The restriction can now be removed from the vacuum inlet.
    d. While spraying solution from the cleaning tool, adjust the chemical flow by turning the “CHEMICAL METERING CONTROL” knob.
14. Begin cleaning.
    a. While spraying solution from the cleaning tool, adjust the chemical flow by turning the “CHEMICAL METERING CONTROL” knob.

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 “DIVERTER VALVE” switch to “HEAT BYPASS”. Spray the cleaning wand into the vacuum hose for 3 - 5 minutes. The chemical is now flushed from the truckmount, hoses and cleaning tool.
3. Remove the vacuum hose.
4. Lubricate the blower to prevent it from rusting internally.
   a. Allow the unit to run for a few minutes with the vacuum hose disconnected in order to remove moisture from the blower.
   b. Cap off the inlet(s) to the vacuum tank.
   c. Spray a HydraMaster-recommended spray lubricant into the “BLOWER LUBE PORT” for about 5 to 10 seconds while the unit is running (see Figure 5-3).
   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.

QR Tag:
Shut-down Procedure
http://www.youtube.com/user/HydraMasterProducts#p/u/3/GX7xZEIFySE

Figure 5-3. Blower Port Located on Lower Dash Assembly

5. If freeze guarding is necessary perform the procedure at this time. See Freeze Guarding section of this Owner's Manual.
6. Rotate the engine throttle to the "IDLE" position.

CAUTION

Never perform cleaning operations when the truckmount engine is running at the IDLE throttle position. Failure to heed this caution will increase the risk of serious component or engine damage.

7. Turn the ignition switch to "OFF."
8. Drain the water box using the valve.
9. Drain the vacuum tank in an appropriate location.

NOTICE

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

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

SETTING THE TEMPERATURE

Due to the high performance designed into the Titan 875, there will be times where you will not need the maximum heat and vacuum available. There are a few different ways you can optimize the Titan 875 to the size of the job.

The different scenarios can be defined as follows:

1. **Maximum** – Triple wands or rotary machine usage. This means that all available power is required.
2. **High Heat/Reduced Vacuum** – Dual wand with short hose runs or single wand at longer hose runs to the job site.
3. **Reduced Heat/Full Vacuum** – Single wand with short hose runs to the job site.
4. **Low Heat/Reduced Vacuum** – Upholstery or any reduced solution flow cleaning.

Figure 5-4. Set Heat Selector Valve

1. **Maximum**
   a. Set the Heat Selector valve to “Hot” (see Figure 5-4).
   a. Rotate the thermostat dial to “260” (see Figure 5-5).
   b. Increase engine rpm to “High”.

2. **High Heat/ Reduced Vacuum**
   a. Set the Heat Selector valve to “Hot”.
   b. Rotate the thermostat dial to “260”.
   c. Increase engine rpm to “Low” or “Mid”.

3. **Reduced Heat/ Full Vacuum**
   a. Set the Heat Selector valve to “Warm”.
   b. Rotate the thermostat dial to “Desired Level”.
   c. Increase engine rpm to “High”.

4. **Low Heat/ Reduced Vacuum**
   a. Set the Heat Selector valve to “Warm”.
   b. Rotate the thermostat dial to “Desired Level”.
   c. Increase engine rpm to “Low”.

Figure 5-5. Rotate Thermostat Dial and Select Engine rpm

MACHINE SAFETIES

This machine is equipped with four safeties that shut down the clutch and three safeties that shut down the machine.

1. **Pump Protection Safeties** – When these safeties are activated, they will latch the pump clutch relay. This will prevent the clutch from re-engaging after the condition is below the set point of the safety. To reset the circuit, you must first turn the pump clutch switch off and they back on again.
   a. Low Water Box
   b. Pressure Switch
   c. Low Pressure Solution Overheat Protection
   d. High Pressure Solution Overheat Protection

2. **Machine Protection Safeties** When these safeties activate, they will shut the machine down.
   a. Oil Pressure Switch
   b. Coolant Temperature Switch
   c. Recovery Tank High Water Float

NOTICE

The Recovery Tank High Water Float circuit has a 10-second delay.

6 - Water and Chemical System

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

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

WATER AND CHEMICAL FLOW OPERATION

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

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

In the tube and shell heat exchanger the temperature is raised. The heat necessary to do this is provided by the engine coolant. The heated water then travels to the blower heat exchanger. In this finned tube 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.

The high pressure manifold houses both the temperature sensor for the heat control system that also acts as a high temperature shutdown switch. There is one orifice located in the manifold. This is referred to as a recirculation orifice and allows a small amount of high pressure, high temperature water to pass back to the water box. This prevents excessive pressure building up in the heat exchanger when the wand valve is closed and no solution is exiting the truckmount.

Water that is recirculated through the pressure regulator back to the water box travels past a low pressure temperature sensor. This sensor 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 solenoid on the side of the water box and closes once the temperature drops back below the set point.

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

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

Figure 6-1. Flow Diagram - View 1 of 3
6701 Rev. A

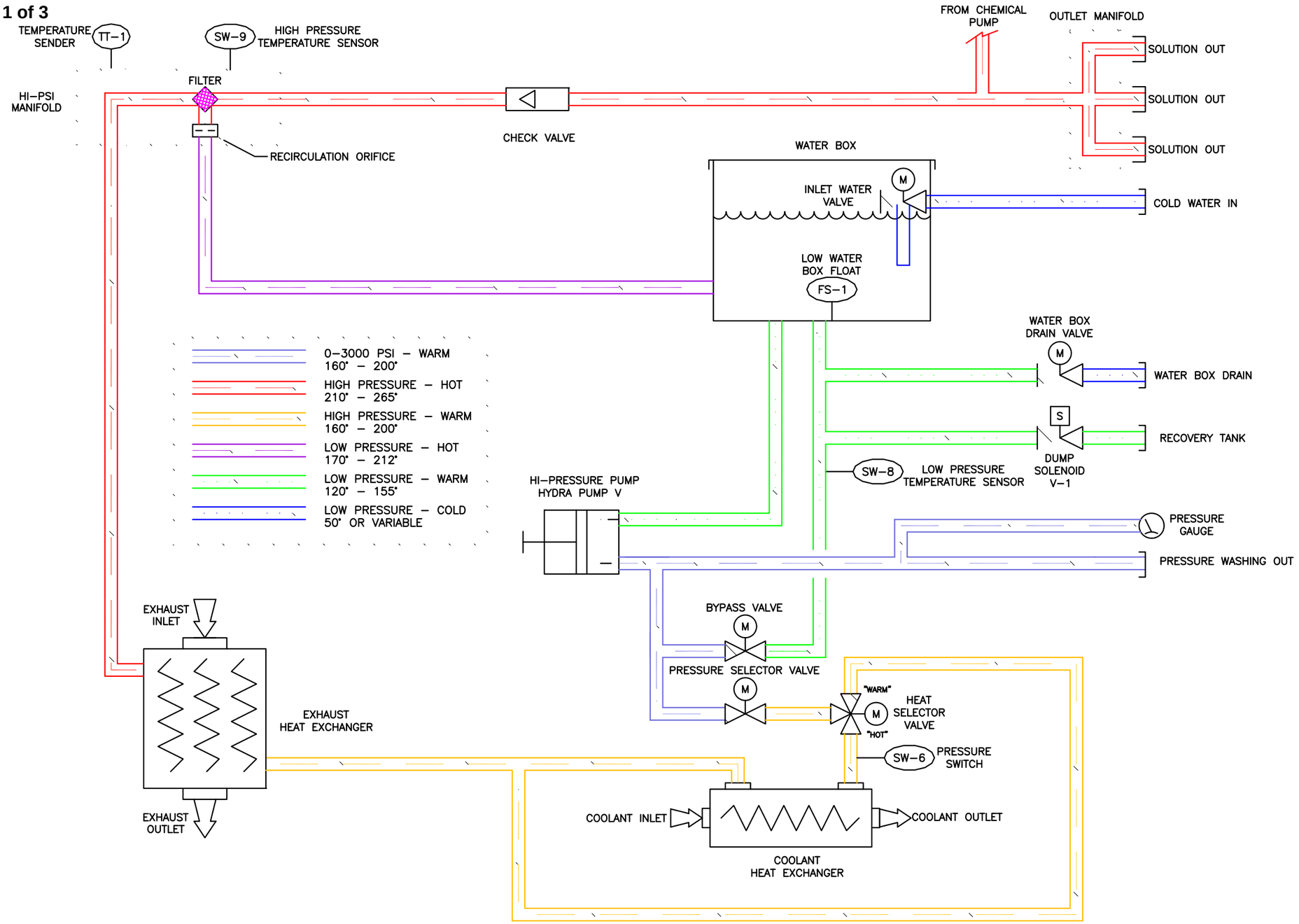


Figure 6-2. Flow Diagram - View 2 of 3
6701 Rev. A

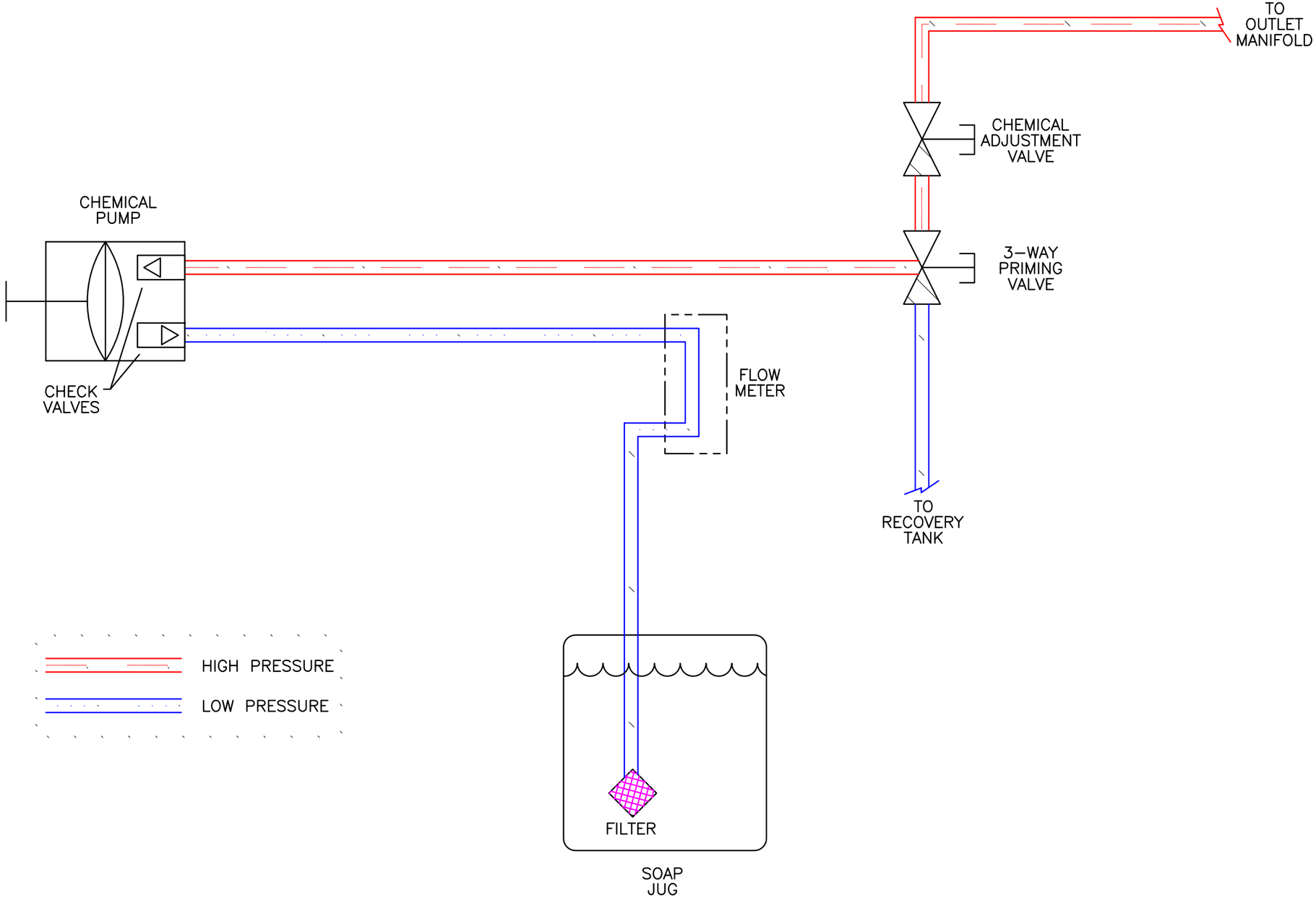
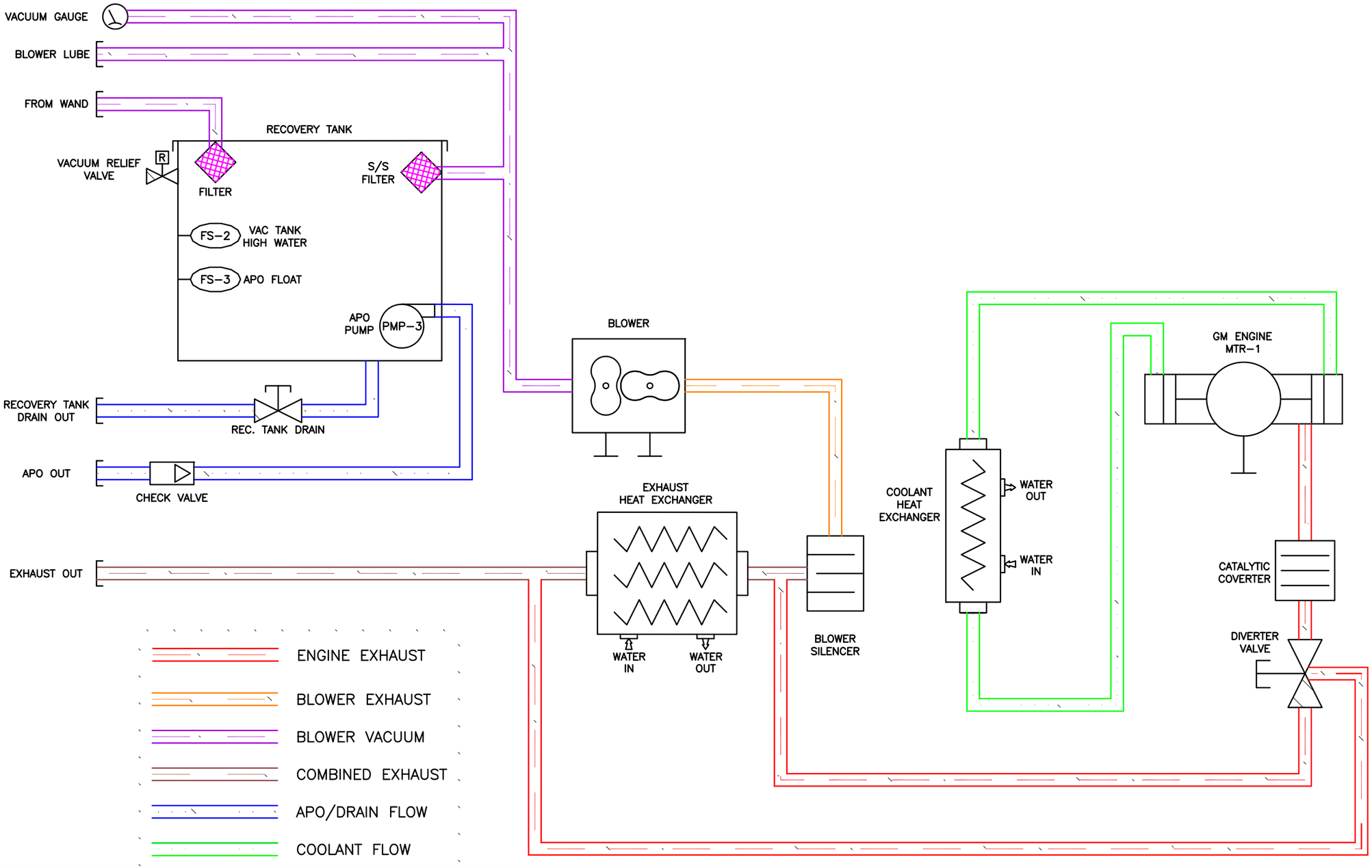


Figure 6-3. Flow Diagram - View 3 of 3
6701 Rev. A



7 - Electrical System

This section describes the following:

- Electrical System Information
- Electrical Schematic
- Wiring Diagram

The Titan 875 electrical system operates on 12 V DC which is provided by the battery. Battery levels are maintained by a 70 Amp generator mounted on the engine.

CAUTION

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

Figure 7-1. Electrical Schematic
6700 Rev. D

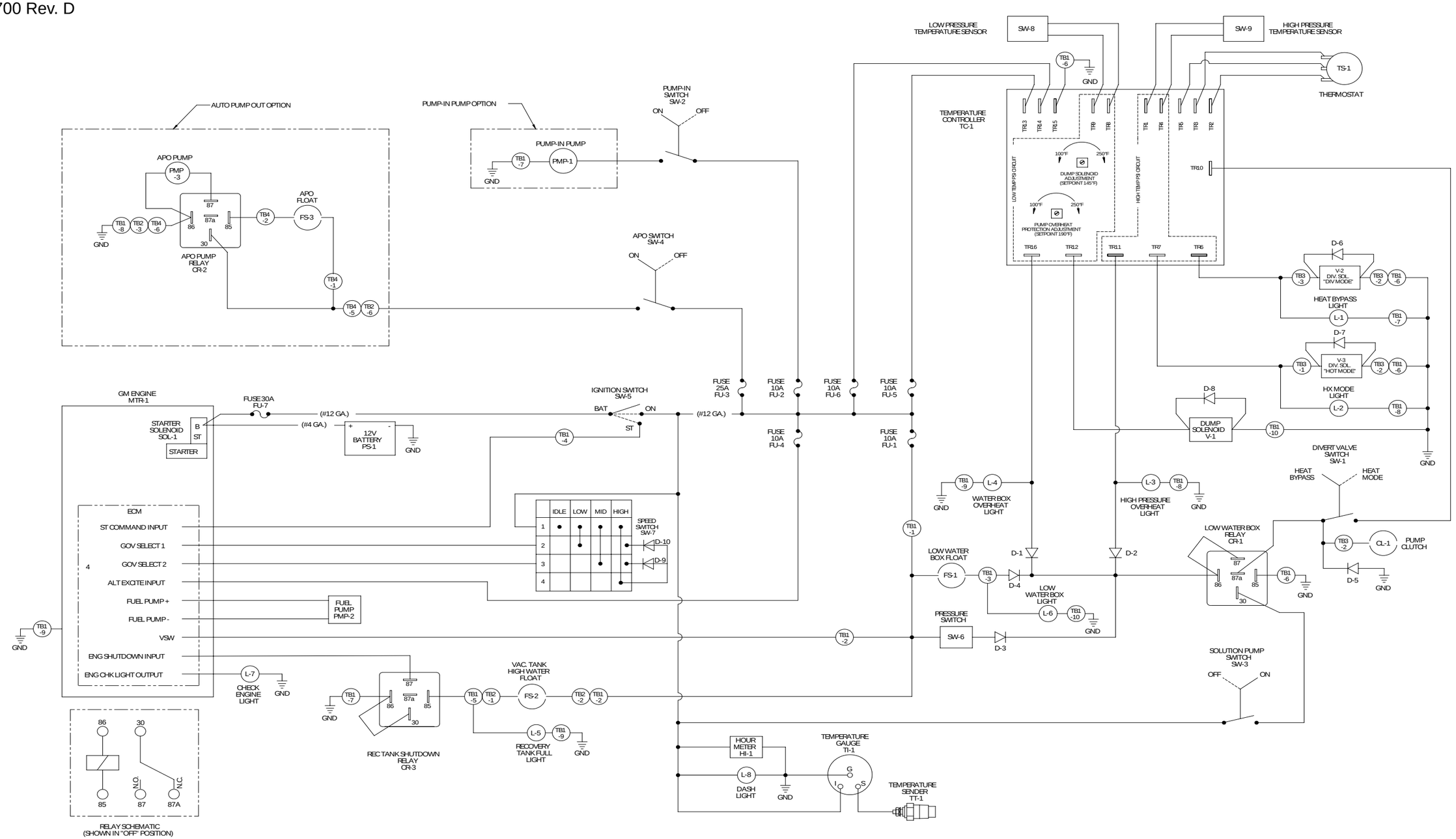
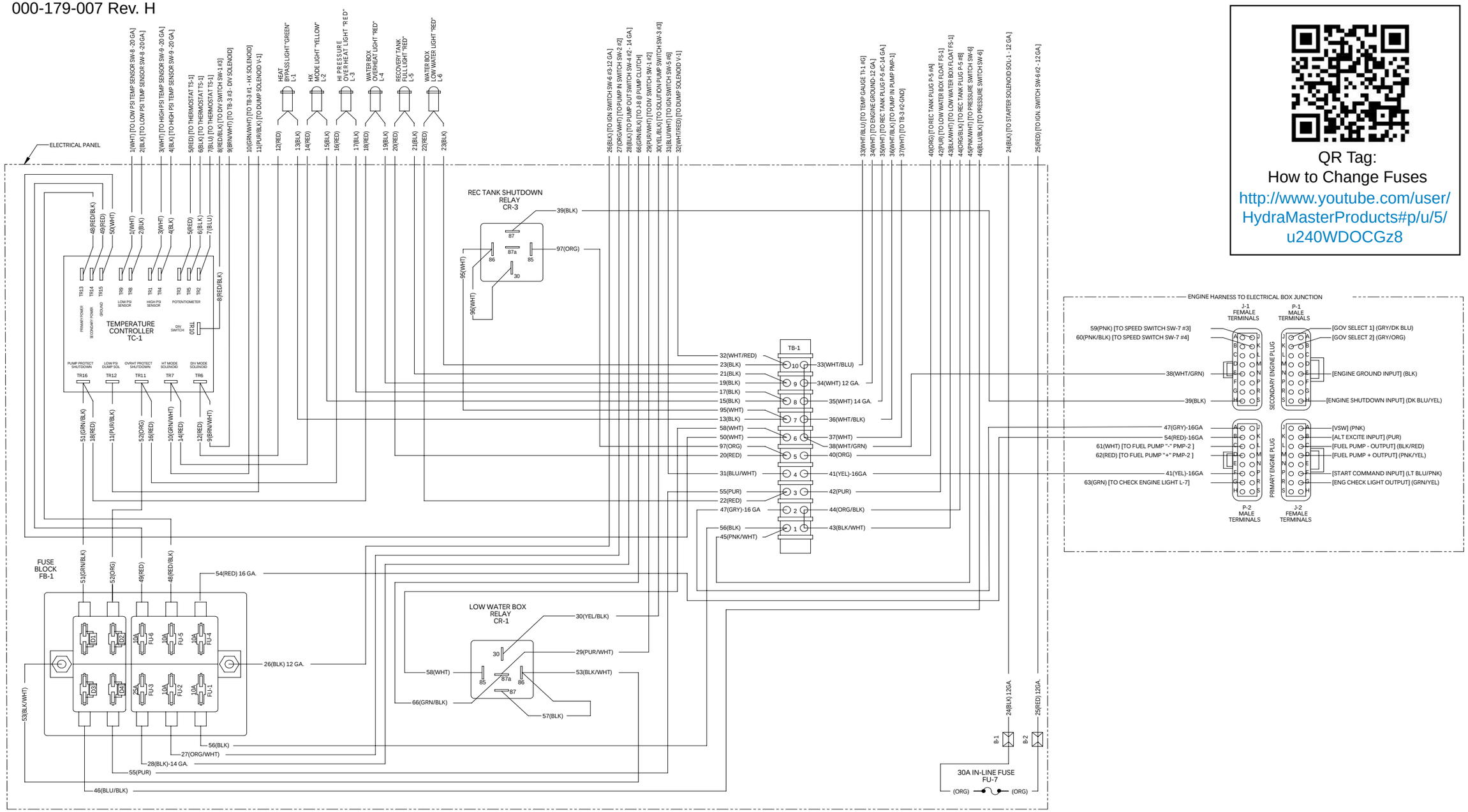


Figure 7-2. Wiring Diagram - View 1 of 3
000-179-007 Rev. H



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How to Change Fuses
http://www.youtube.com/user/HydraMasterProducts#p/u/5/u240WDOCGz8

*ALL WIRES ARE 18 GAUGE UNLESS OTHERWISE STATED

Figure 7-3. Wiring Diagram - View 2 of 3
000-179-007 Rev. H

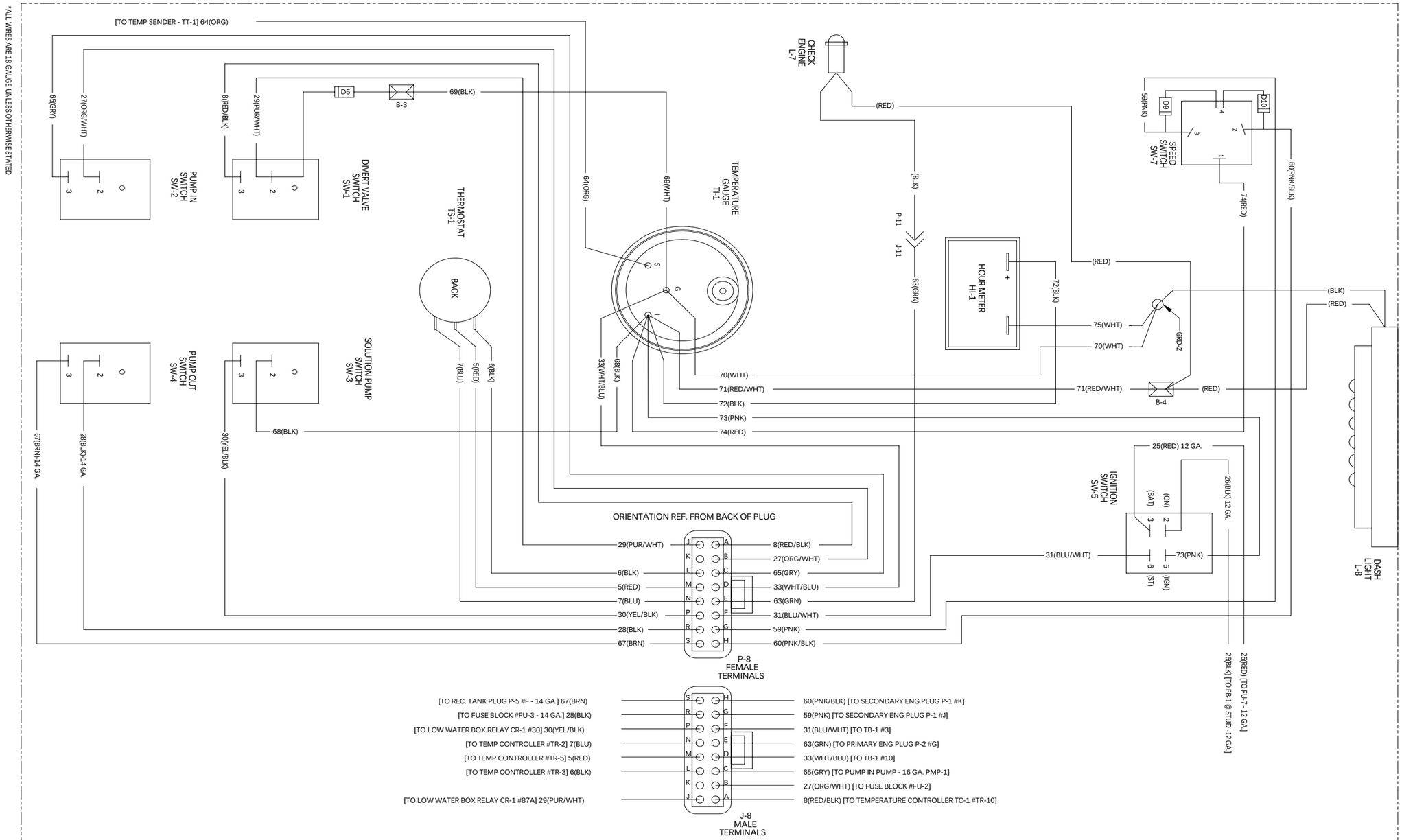


Figure 7-4. Wiring Diagram - View 3 of 3
000-179-007 Rev. H

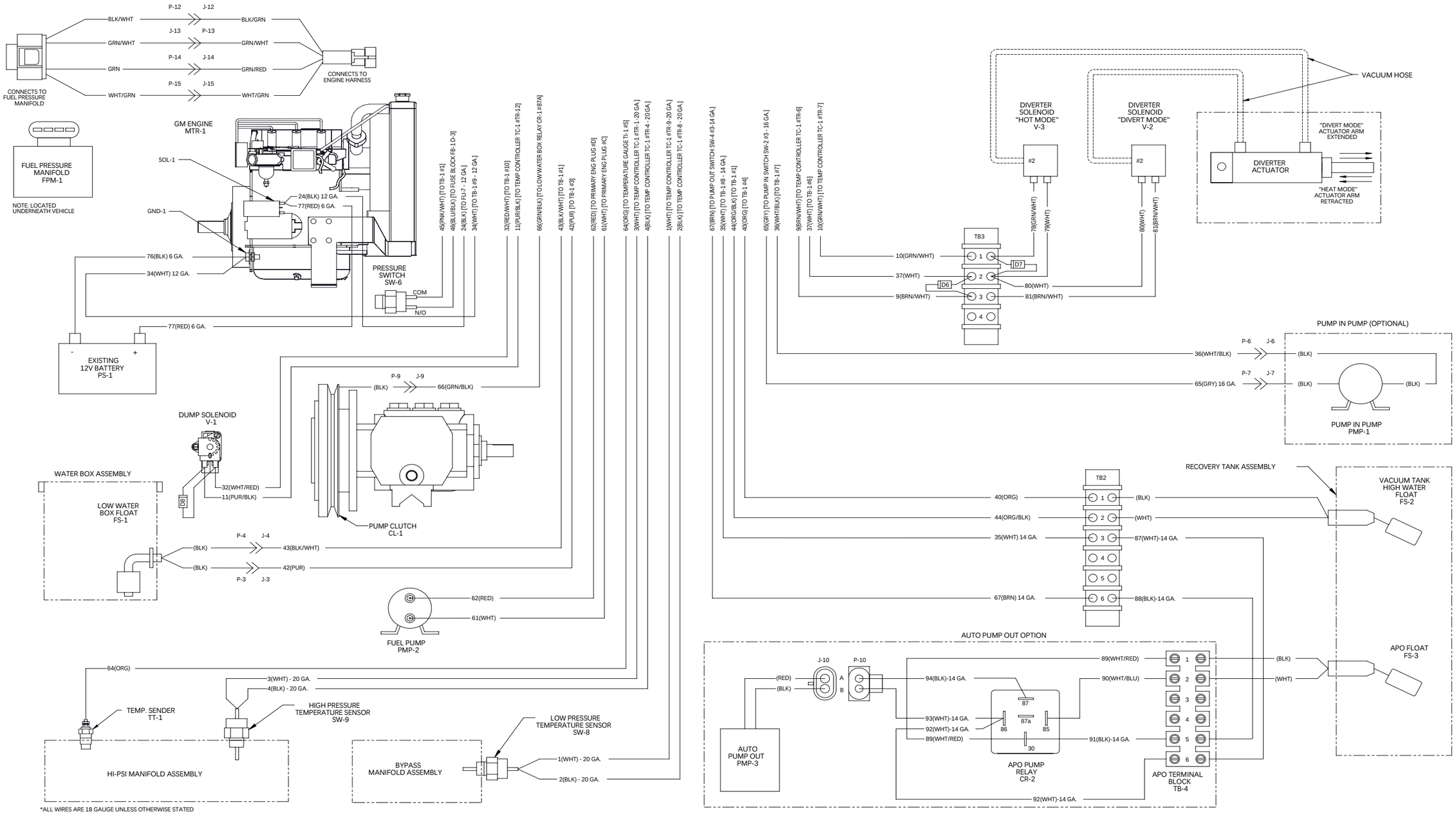


Figure 7-5. Schematic of Wire Harness - Fuel Pump Manifold to Machine - View 1 of 2
7799

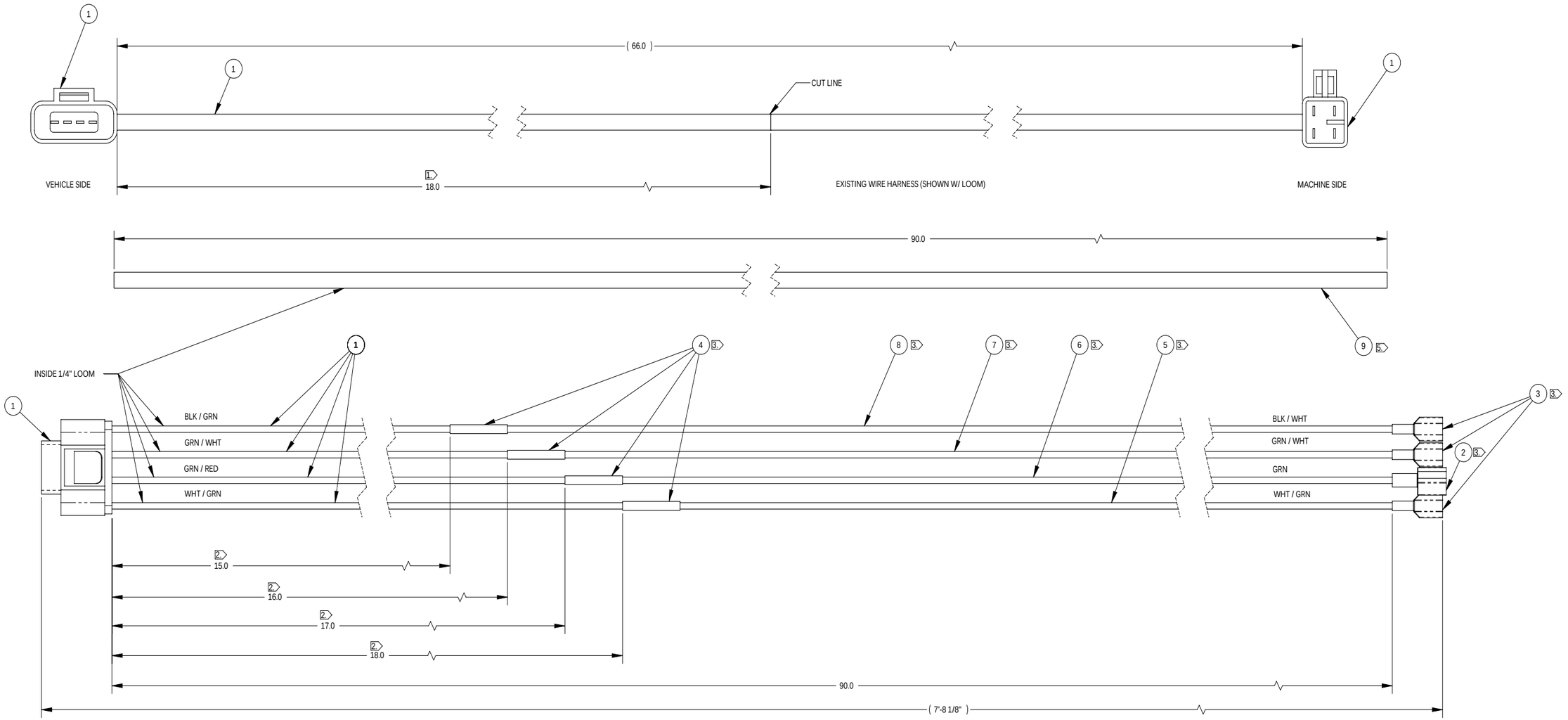
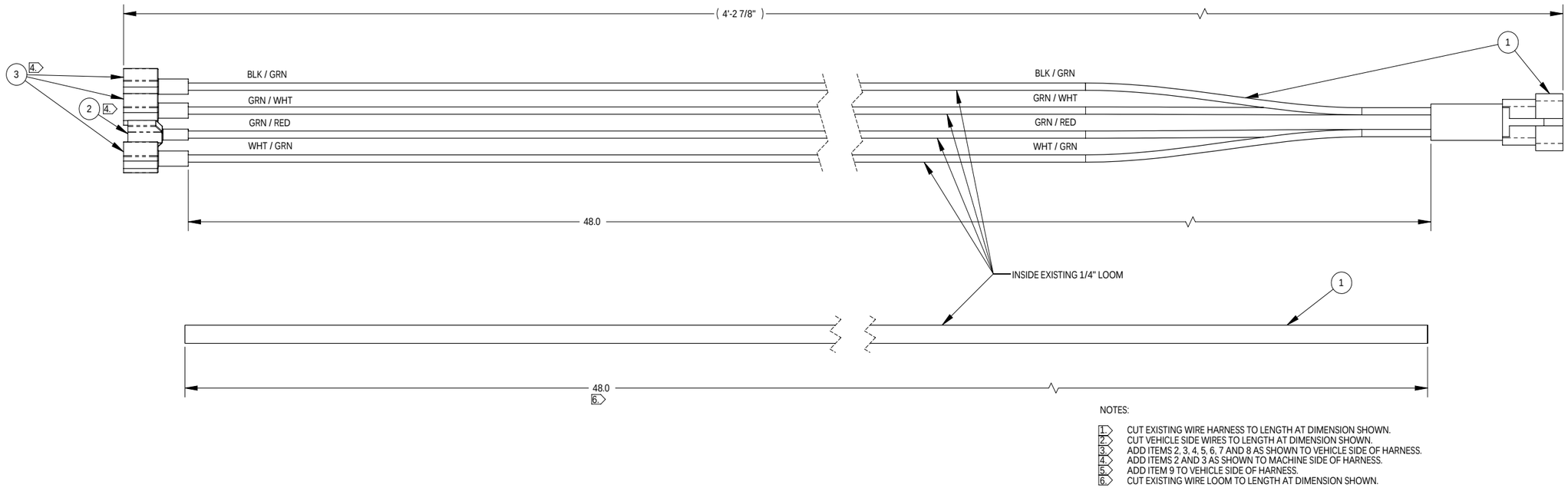


Figure 7-6. Schematic of Wire Harness - Fuel Pump Manifold to Machine - View 2 of 2
7799



Harness Assembly Parts List

Item	Part Number	Description	Qty
1	- - -	Wire Harness	1
2	000-037-072	Terminal, Fully Insulated Male, 22-16ga	2
3	000-037-071	Terminal, Fully Insulated Female, 22-16ga	6
4	000-037-033	Connector, #22 Pink Butt	4
5	000-178-092	Wire, Awg, 18 Ga Green / White Stripe	71”
6	000-178-097	Wire, GXL, 18 Ga, Green	72”
7	000-178-114	Wire, GXL, 18 Ga, White / Green Stripe	73”
8	000-178-066	Wire, GXL, 18 Ga, Black / White Stripe	74”
9	000-063-021	Harness Wrap, 1/4 Split	90”

8 - Troubleshooting

This section describes the standard troubleshooting procedures for:

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

HEATING SYSTEM

1.0. The truckmount overheats and shuts down.

	Possible Cause	Solution
1.1.	The orifice or filter screen are restricted.	Remove and inspect. Clean as necessary.
1.2.	The low pressure dump solenoid is restricted.	Inspect the solenoid and the hose that delivers water to it. Clean or replace as necessary.
1.3.	The dump solenoid is faulty.	Check the main fuse. If the fuse is blown, inspect electrical system for worn or shorted wires. Repair or replace as necessary. Inspect dump the solenoid and test for functionality. If the solenoid is operable, refer to a qualified service technician to test the temperature controller and sensor.

2.0. 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 dumb solenoid is faulty.	Inspect the solenoid and test for functionality. If the solenoid is operable, refer to a qualified service technician to test the temperature controller and sensor.
2.3.	Excessive solution flow at tool.	The cleaning tool jet is too large or worn. Inspect the jet. Replace if necessary.
2.4.	The heat exchanger has hard water scale buildup.	Descale the system.
2.5.	The heat exchanger has blockage on the exhaust side.	Inspect the interior of heat exchanger. Remove the debris and clean as necessary.
2.6.	The heat selector valve is in the wrong position.	Move the heat selector valve to the “HOT” position.

CHEMICAL SYSTEM

3.0. System will not prime

	Possible Cause	Solution
3.1.	The check valves in chemical pump are faulty	Remove the valves and inspect. Clean or replace as necessary.
3.2.	The chemical pump diaphragm is faulty	Remove and inspect. Replace as necessary.
3.3.	The check valve in high pressure pump is faulty (piston which chemical pump is attached to)	Remove the valve and inspect. Clean or replace as necessary.
3.4.	The filter on feed line in chemical jug is clogged	Inspect and clean.
3.5.	The feed line from chemical jug is loose, pinched or damaged	Inspect and repair.
3.6.	The chemical selector valve is faulty	Inspect the valve for leaks between ports. Replace as necessary.

4.0. Chemical flow is unstable or low

	Possible Cause	Solution
4.1.	Air is in the lines	Check that all fittings and connections are tight and in good condition. Repair or replace as necessary.
4.2.	The filter screen in the chemical jug is partially obstructed	Inspect and clean.
4.3.	The chemical selector valve is faulty	Inspect the valve for leaks between ports. Replace as necessary.
4.4.	The chemical metering valve is faulty	Remove and inspect the valve. Clean or replace as necessary.
4.5.	The high pressure check valve is faulty	Remove and inspect the valve. Clean or replace as necessary.

5.0. Chemical is present in water box\

	Possible Cause	Solution
5.1.	The chemical pump diaphragm is faulty.	Remove and inspect the chemical pump diaphragm. Replace as necessary.
5.2.	The high pressure check valve is faulty.	Remove and inspect the valve. Clean or replace as necessary.

ENGINE

1.0. 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. **⚠WARNING** Do not attempt to jump start the truckmount from a running vehicle. The amperage output from an automobile will damage the charging system of the truckmount.
1.3.	The main fuse is blown	Check the main fuse.
		If the fuse is blown, inspect the electrical system for worn or shorted wires. Repair or replace as necessary.
1.4.	The vacuum blower has seized	Attempt to turn the coupler by hand. If it will not turn refer to the Vacuum System Troubleshooting Section, 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 Section 7.
1.6.	The starter solenoid is faulty	Test to see if there is power to solenoid with ignition in “Start” position. Refer to Section 7.
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 Section 7.
1.8.	None of the above	Refer to a qualified service technician for further troubleshooting.

2.0. The engine turns over but will not start. There is NO SPARK.

	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.

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

	Possible Cause	Solution
3.1.	Fuel is not reaching the injector rail.	Test for power to the fuel pump. Refer to Section 7.
		If power is present, inspect the fuel pump. Replace if necessary.
		Inspect the fuel lines between the source and the carburetor. Repair or replace as necessary.
3.2.	The engine is flooded	Remove spark plug and dry.
3.3.	The spark plugs are worn or dirty	Inspect and replace as necessary.
3.4.	None of the above	Refer to a qualified service technician for further troubleshooting.

4.0. The engine will not come up to normal operating rpm Note: Engine should be adjusted to run at 3,150 rpm under a vacuum load of 14” Hg.

	Possible Cause	Solution
4.1.	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.
4.2.	Excessive back pressure on the engine exhaust.	Inspect for blockage in the heat exchanger. Clean or replace as necessary.

5.0. Runs rough at high speed.

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

6.0. Runs rich (black smoke).

	Possible Cause	Solution
6.1.	A dirty air filter.	Inspect and replace as necessary.
6.2.	Excessive fuel to the fuel rail.	Refer to a qualified service technician for further troubleshooting

7.0. Engine overheats.

	Possible Cause	Solution
7.1.	Poor ventilation in the van	Open all the van doors. Install a roof vent in the van. Remove any dividers or other objects impeding airflow around the truckmount.
7.2.	Low oil level	Check the level and fill as necessary.
7.3.	Excessive back pressure on the engine exhaust	Inspect for blockage in the heat exchanger. Clean or replace as necessary.
7.4.	Low coolant	Check radiator level. Check overflow bottle level. **NOTICE** Use phosphate-free antifreeze.
7.5.	Poor coolant mixture	Check the coolant with a test to determine mixture; adjust as necessary.

HIGH PRESSURE SYSTEM

1.0. 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 3,150 rpm under a 14" Hg vacuum load.
1.4.	The primary orifice is missing or loose	Remove and inspect. Tighten or replace as necessary.
1.5.	The primary and secondary orifices have been installed incorrectly	Inspect and reverse if necessary. Refer to Section 9.
1.6.	The primary orifice is worn	Measure the orifice size and replace as necessary. Correct size is 0.033"

2.0. 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.

3.0. 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	De-scale the truckmount.

4.0. Pressure pulsation.

	Possible Cause	Solution
4.1.	Air leak between the water box and pump	Check all the hoses and fittings for cuts, breaks, cracks, etc. Repair as necessary.
4.2.	The check valve(s) in the pump are faulty	Remove each valve and inspect for correct operation. See the Section 4.

5.0. 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.

6.0. 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.	Detach the float and check to see if it will float to the surface. Replace as necessary.
6.3.	The float has come out of adjustment.	Adjust the float as necessary.

VACUUM SYSTEM

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

	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.

2.0. A 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 3,150 rpm under a 14” Hg vacuum load.
2.3.	The vacuum gauge is defective	Test the gauge and replace if necessary.

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

	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.

4.0. 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. **NOTICE** Running the blower with low oil levels can cause severe damage. If this situation occurs the blower should be inspected by a qualified service technician.
4.2.	The vacuum blower has internal damage	Refer to a qualified service technician.

5.0. The vacuum blower is locked and will not turn.

	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 HydraMaster-recommended oil into the blower and let sit for at least 1 hour. Then very carefully use pipe wrench on the outer diameter of the pulley on the coupler to attempt to free lobes of the blower. Do not use a wrench directly on the blower shaft. If unable to free up the blower in this manner, refer to a qualified service technician.
5.2.	There is internal damage to the blower	Refer to a qualified service technician.

6.0. Water in truckmount exhaust.

	Possible Cause	Solution
6.1.	The recovery tank has been filled with foam or over filled with water	Inspect the recovery tank. If full, drain the tank. Inspect the high level shutoff switch for proper operation. Clean or replace the switch as necessary. If foam is in recovery tank, use defoamer on the carpet being cleaned.
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 - Machine Assemblies and Parts Lists

This section contains all the assemblies and parts lists associated with the Titan 875.

Figure 9-1. Machine Assembly - View 1 of 4
610-050-740 Rev. C

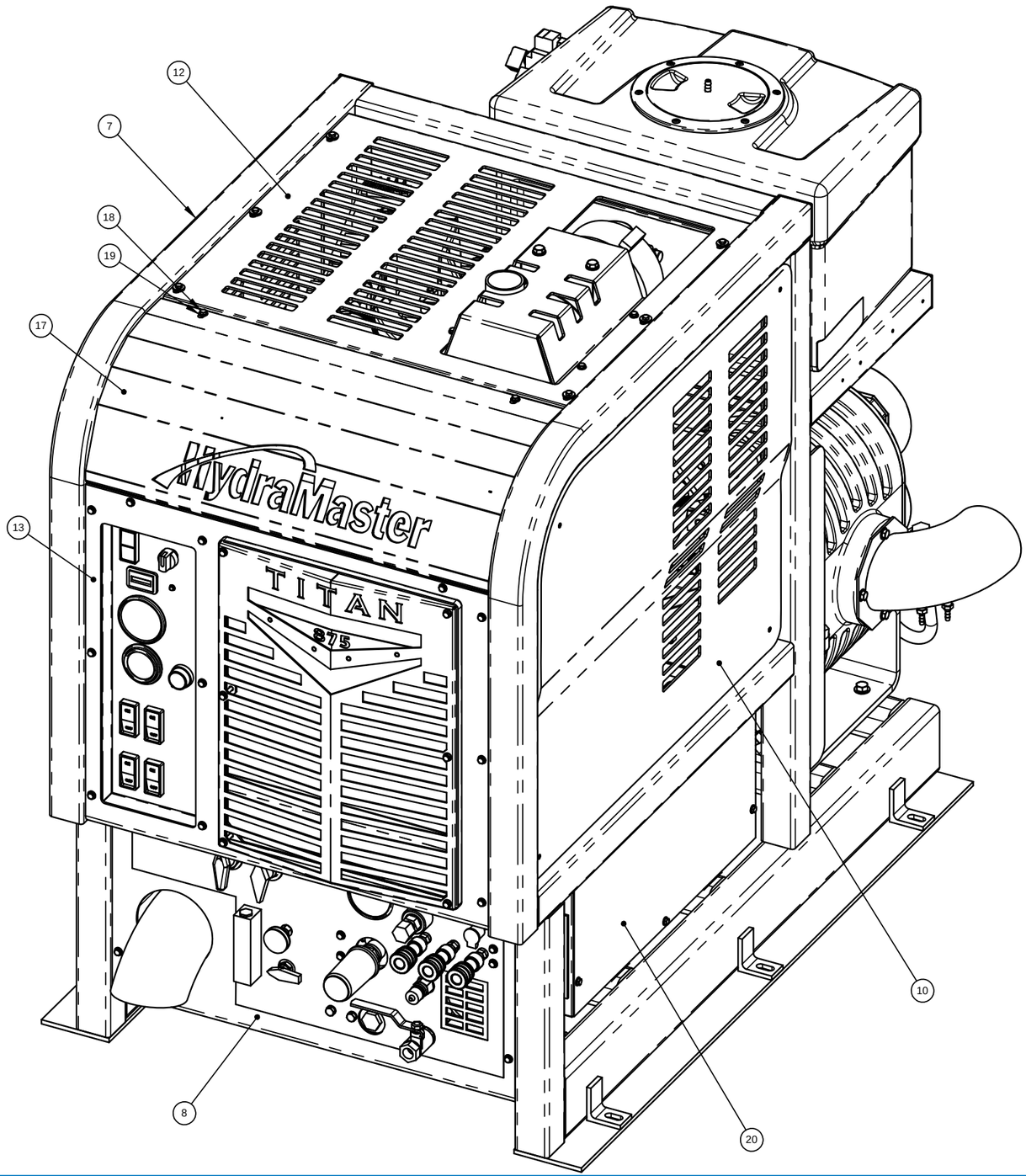


Figure 9-2. Machine Assembly -View 2 of 4
610-050-740 Rev. C

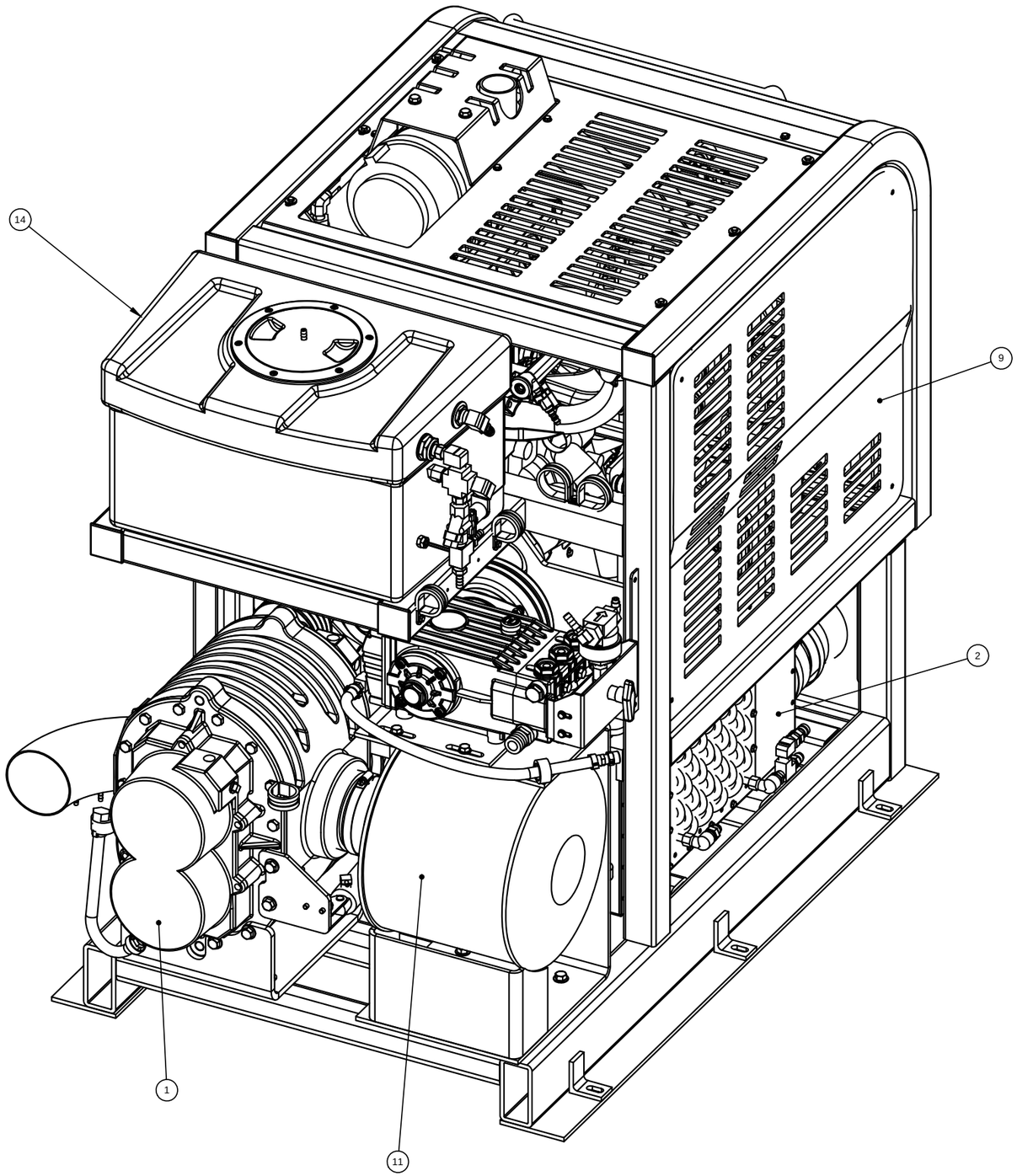
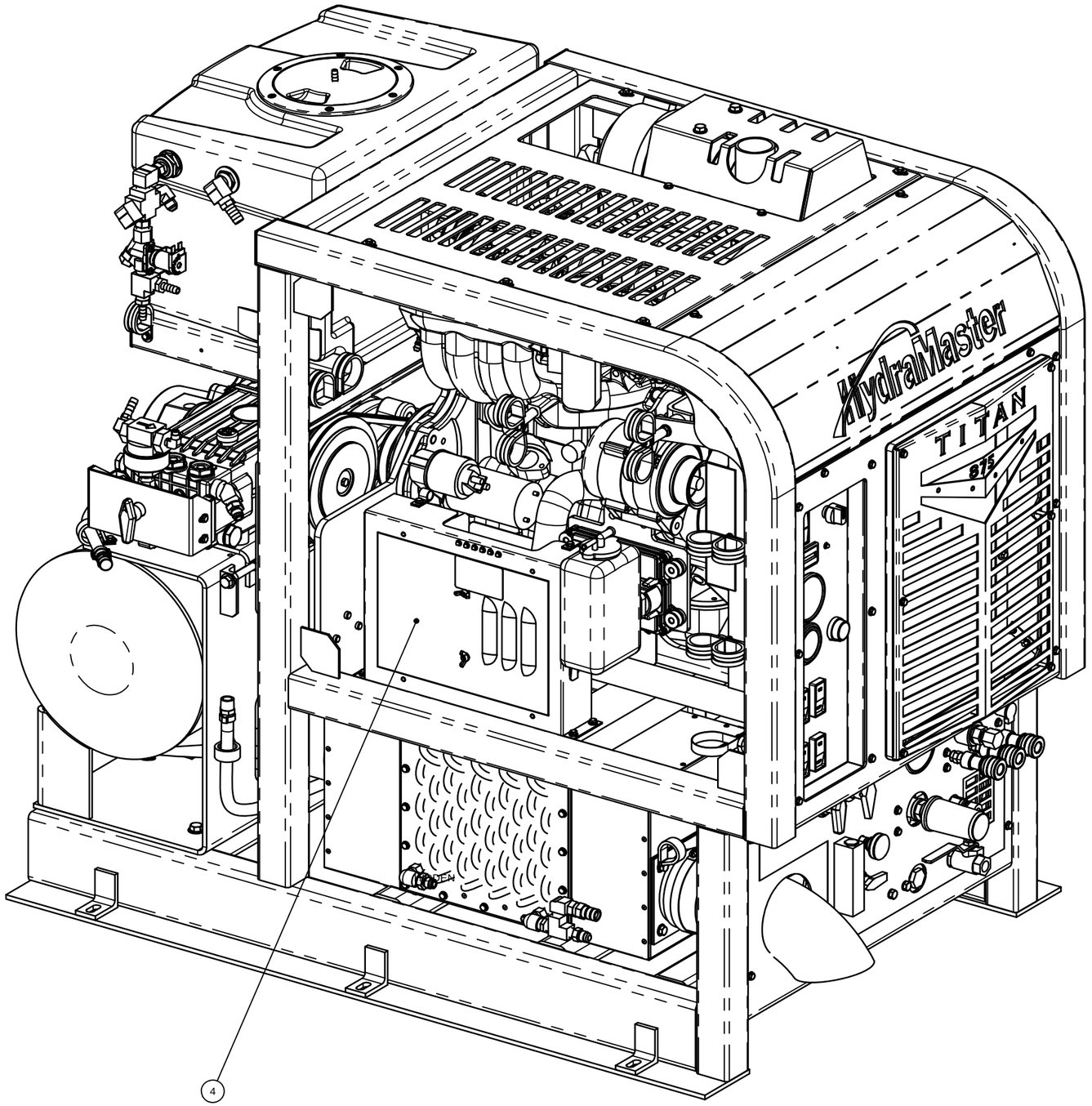
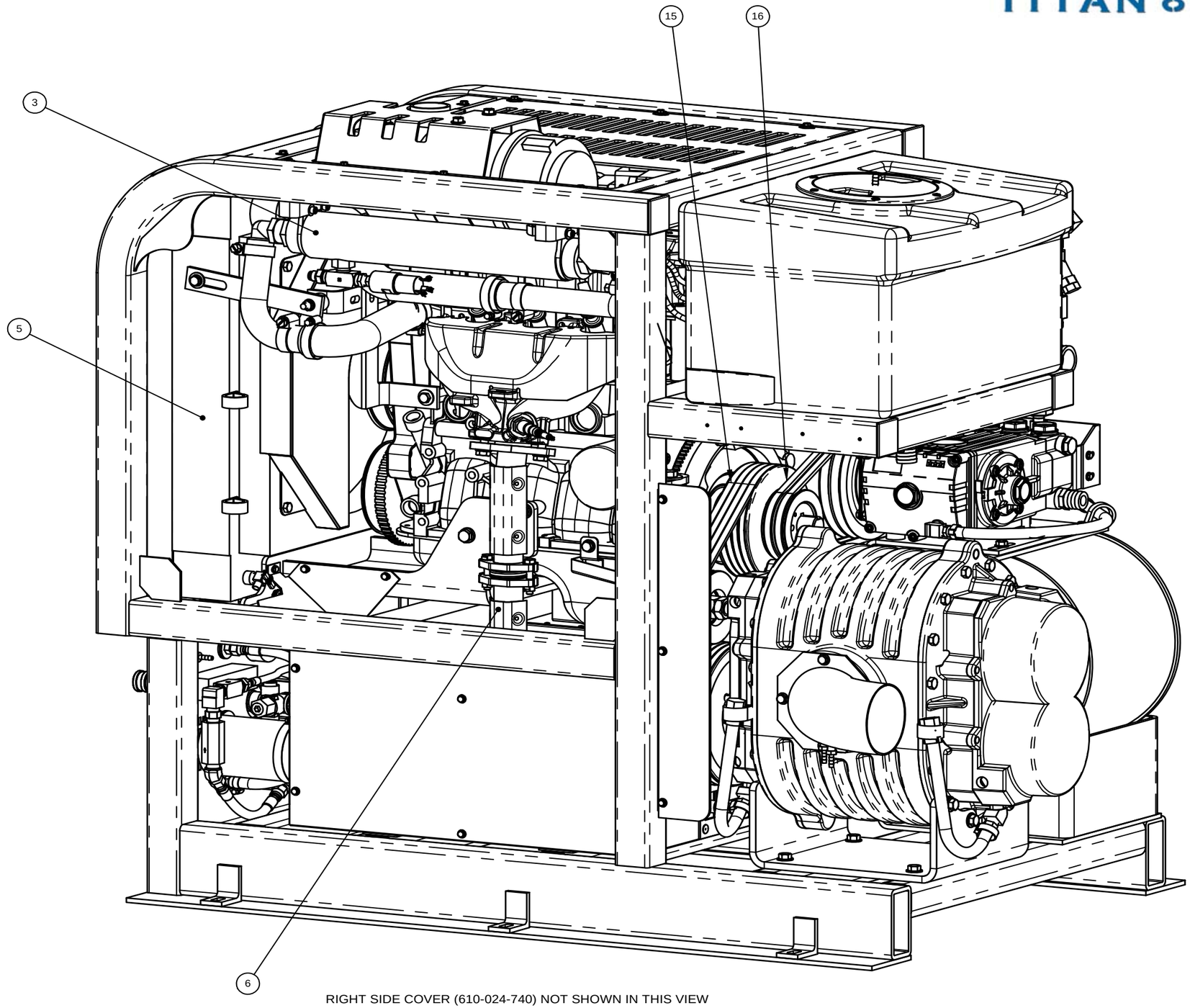


Figure 9-3. Machine Assembly - View 3 of 4
610-050-740 Rev. C



LEFT SIDE COVER (P/N 610-023-740) NOT SHOWN IN THIS VIEW.

Figure 9-4. Machine Assembly -View 4 of 4
610-050-740 Rev. C



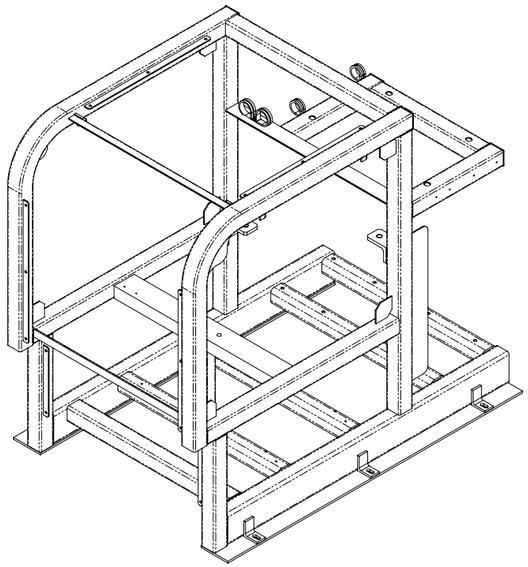
RIGHT SIDE COVER (610-024-740) NOT SHOWN IN THIS VIEW

Machine Assembly Parts List

Item	Part Number	Description	Qty
1	610-002-740	Assembly, Blower	1
2	610-005-740	Assembly, Blower Heat Exchanger	1
3	610-006-740	Assembly, Coolant Heat Exchanger	1
4	610-011-740	Assembly, Electrical Panel	1
5	610-004-740	Assembly, Engine	1
6	610-013-740	Assembly, Exhaust	1
7	610-001-740	Assembly, Frame	1
8	610-019-740	Assembly, Lower Dash	1
9	610-023-740	Assembly, Machine Left Side Cover	1
10	610-024-740	Assembly, Machine Right Side Cover	1

Item	Part Number	Description	Qty
11	610-021-740	Assembly, Pump and Silencer	1
12	610-022-740	Assembly, Top Cover - Machine	1
13	610-020-740	Assembly, Upper Dash	1
14	610-010-740	Assembly, Water Box 8 Gallon	1
15	000-010-127	Belt, 3VX475 Super HC V	4
16	000-010-128	Belt, HD9330 Gates - Green Back	2
17	000-041-454	Cover, Brow, Machine - Coated	1
18	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	2
19	000-155-053	Spring, 1/4” Belleville Washer	2
20	610-021-005	Assembly, Cover - Catalytic	1

Figure 9-5. Frame Assembly - View 1 of 2
610-001-740 Rev. E



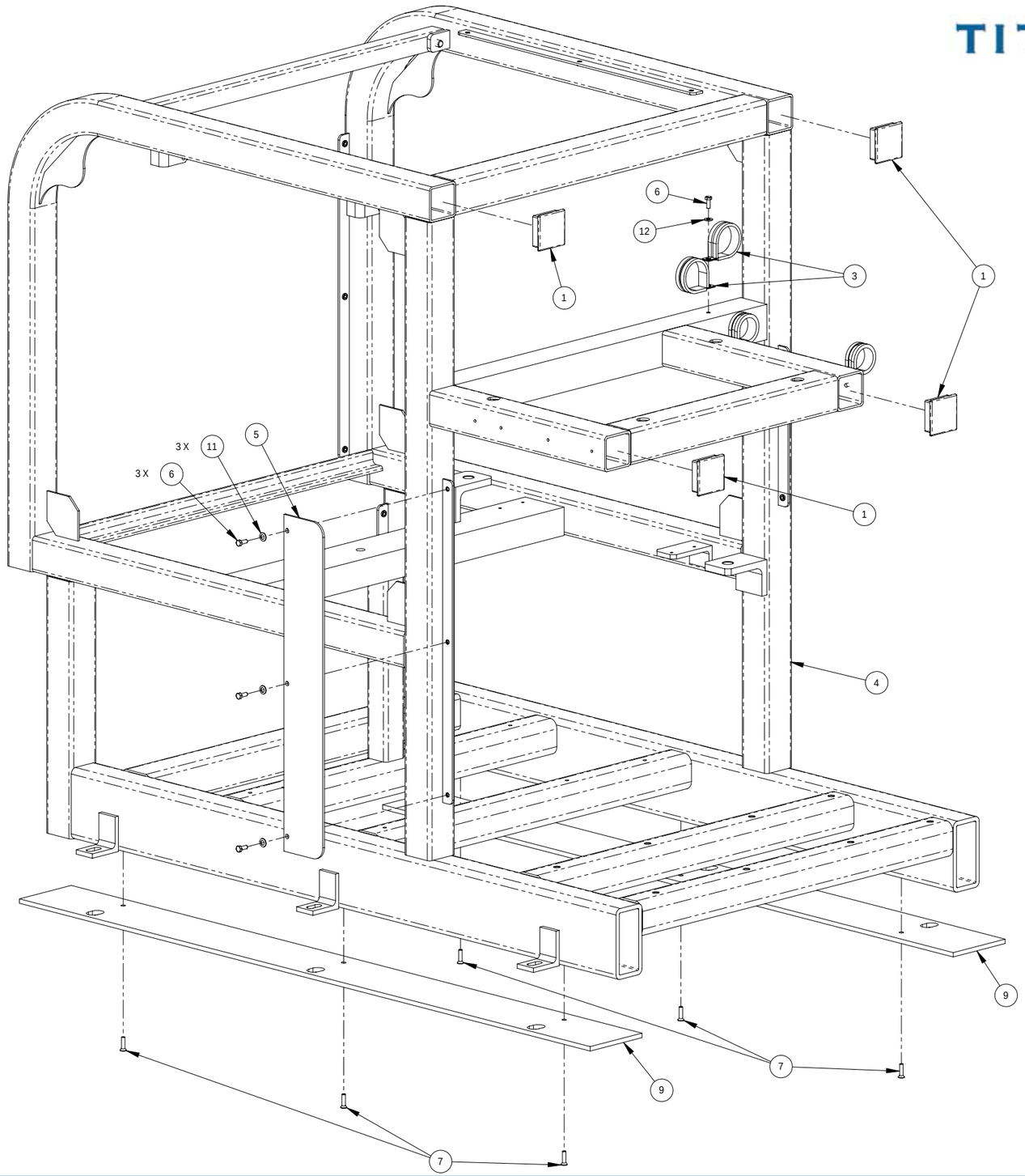
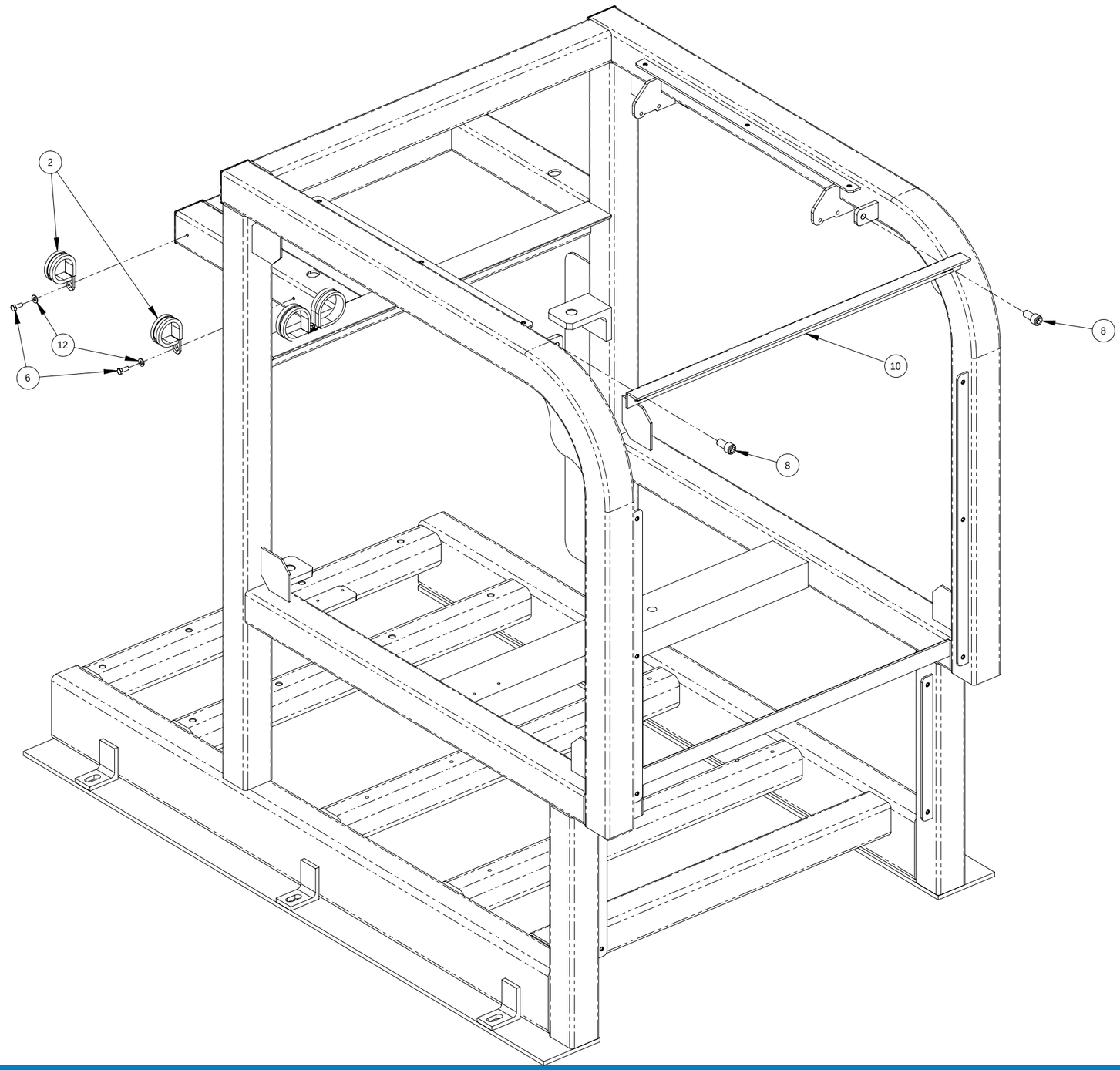


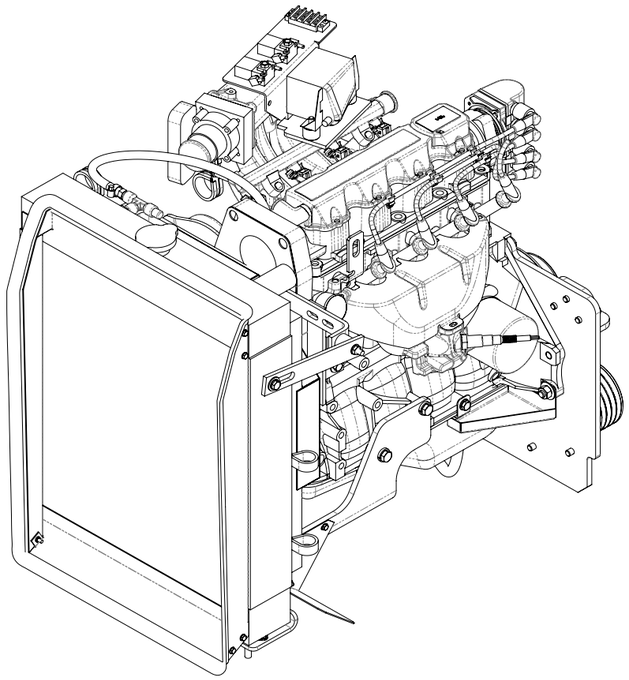
Figure 9-6. Frame Assembly - View 2 of 2
610-001-740 Rev. E



Frame Assembly Parts List

Item	Part Number	Description	Qty
1	000-027-109	Cap, 2” X 2” Black	4
2	000-033-052	Clamp, 1-1/4” S/S EDPM	2
3	000-033-050	Clamp, 1-3/4” Cushion Loop	2
4	000-055-187	Frame - Coated	1
5	000-108-150	Protector, Belt Guard - Coated	1
6	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	6
7	000-143-063	Screw, #10-24UNC X 0.75” Lg. FH Phillips	6
8	000-143-094-1	Screw, 3/8”-16UNC X 3/4” Lg. Socket Head	2
9	000-154-157	Spacer, Machine Raising - 4” X 44”	2
10	000-154-155	Spacer, Removable Side Rail Support - Coated	1
11	000-155-053	Spring, 1/4” Belleville Washer	3
12	000-174-001	Washer, #10 Flat	3

Figure 9-7. Engine Assembly - View 1 of 3
610-004-740 Rev. K



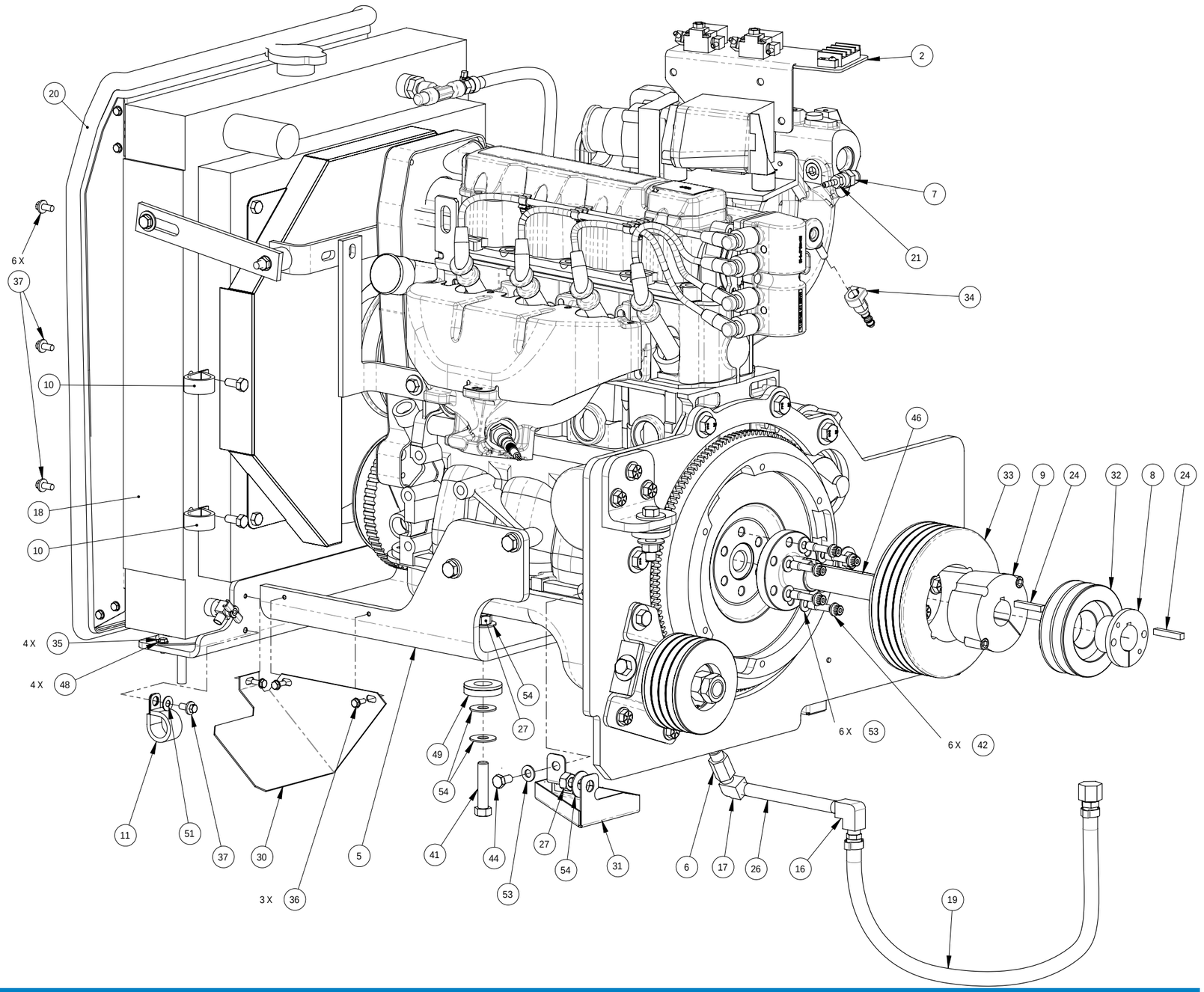


Figure 9-8. Engine Assembly - View 2 of 3
610-004-740 Rev. K

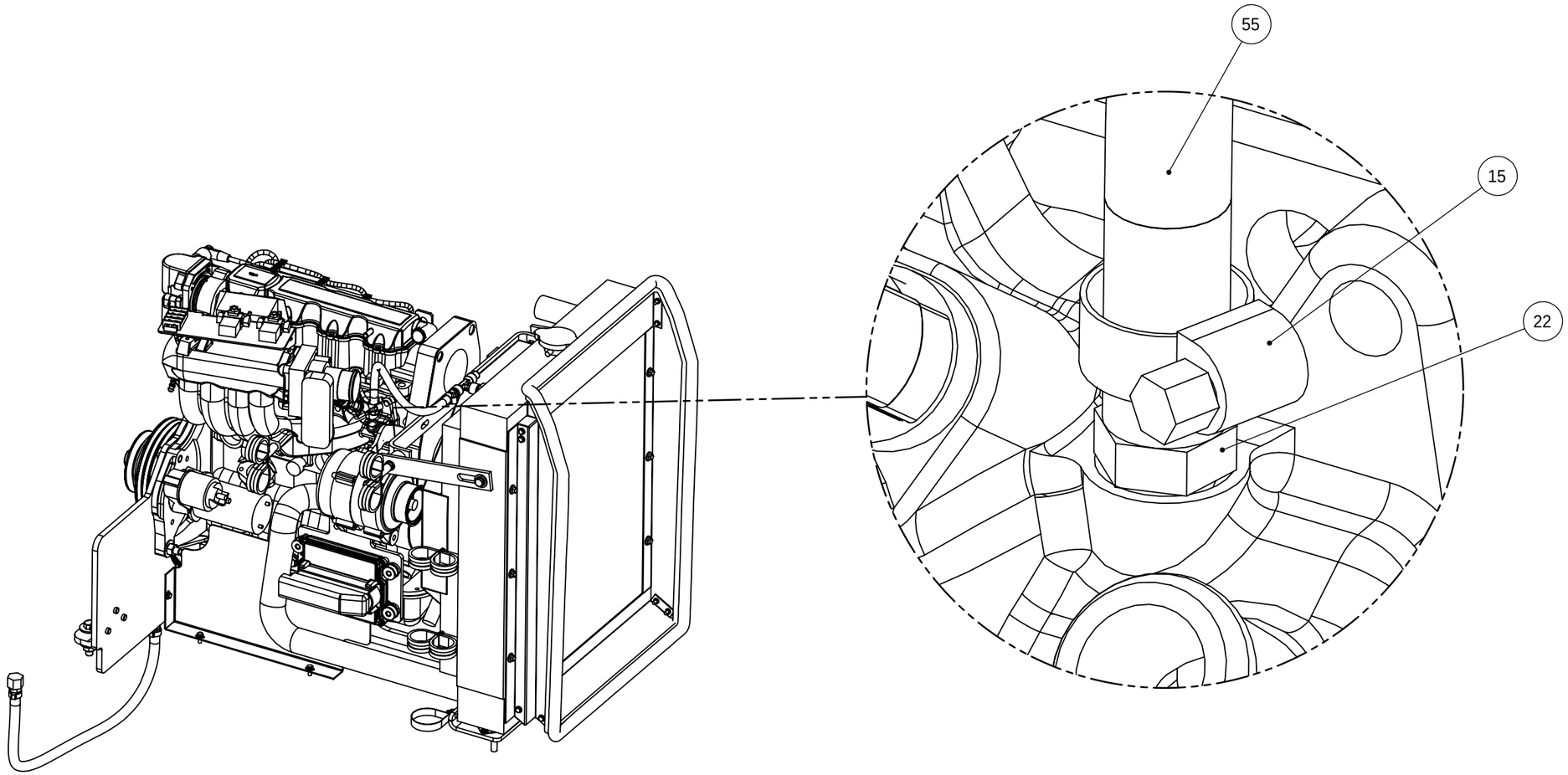
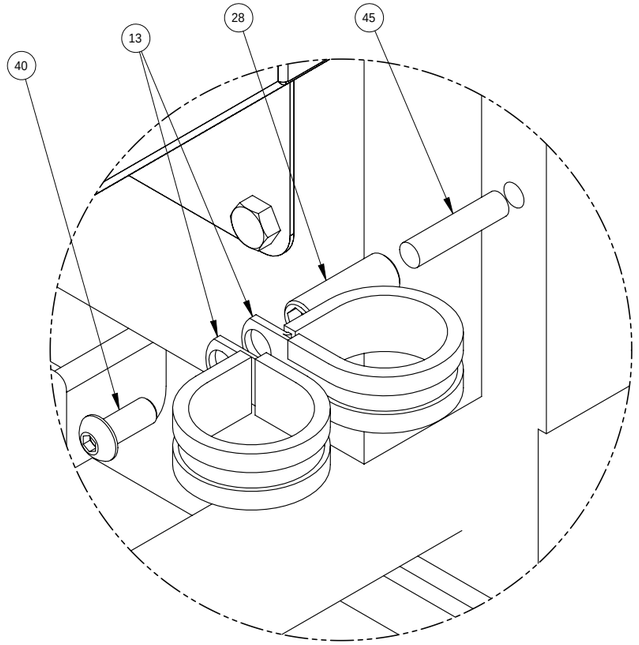
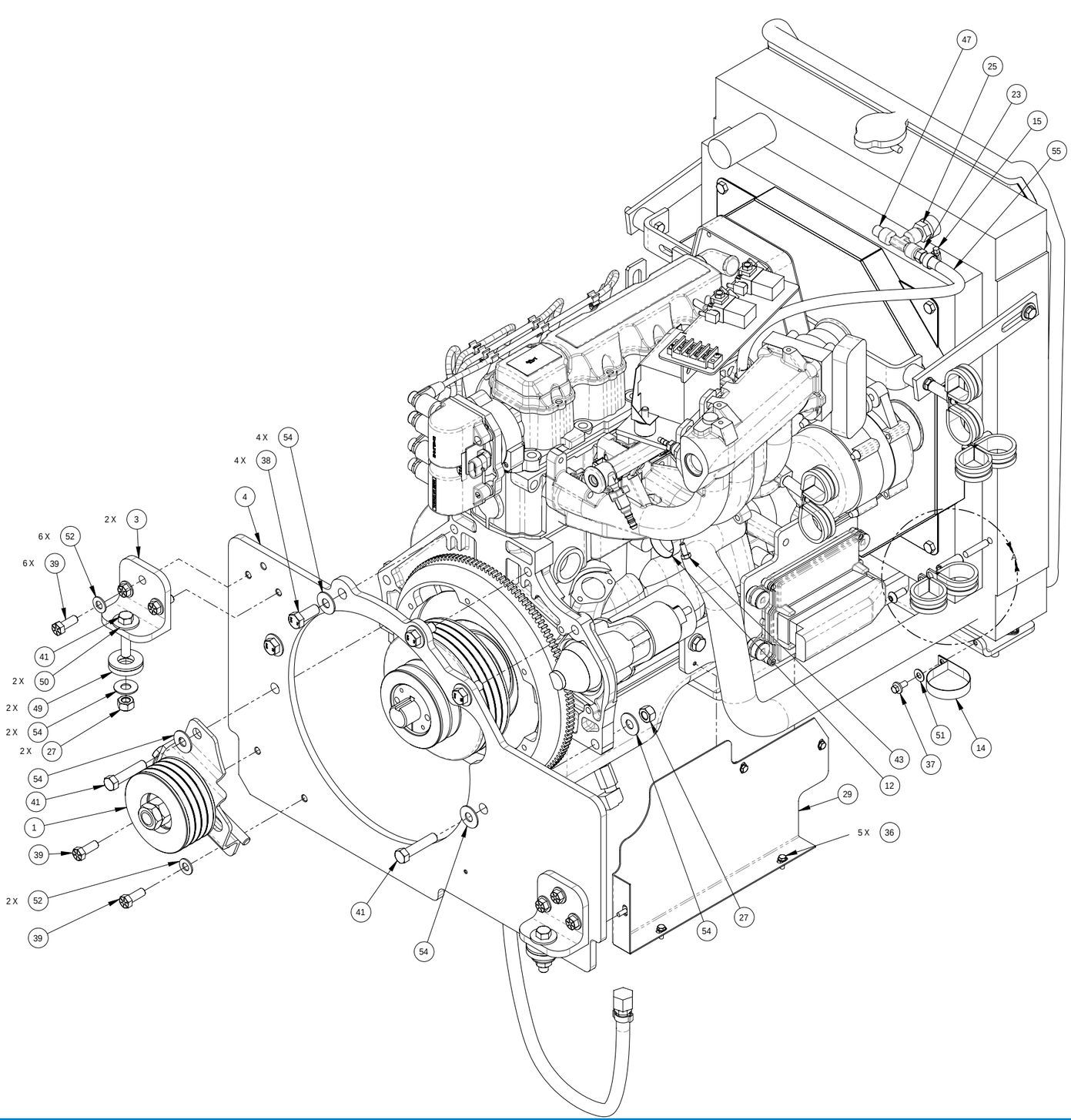


Figure 9-9. Engine Assembly - View 3 of 3
610-004-740 Rev. K



DETAIL A
SCALE 1 : 1



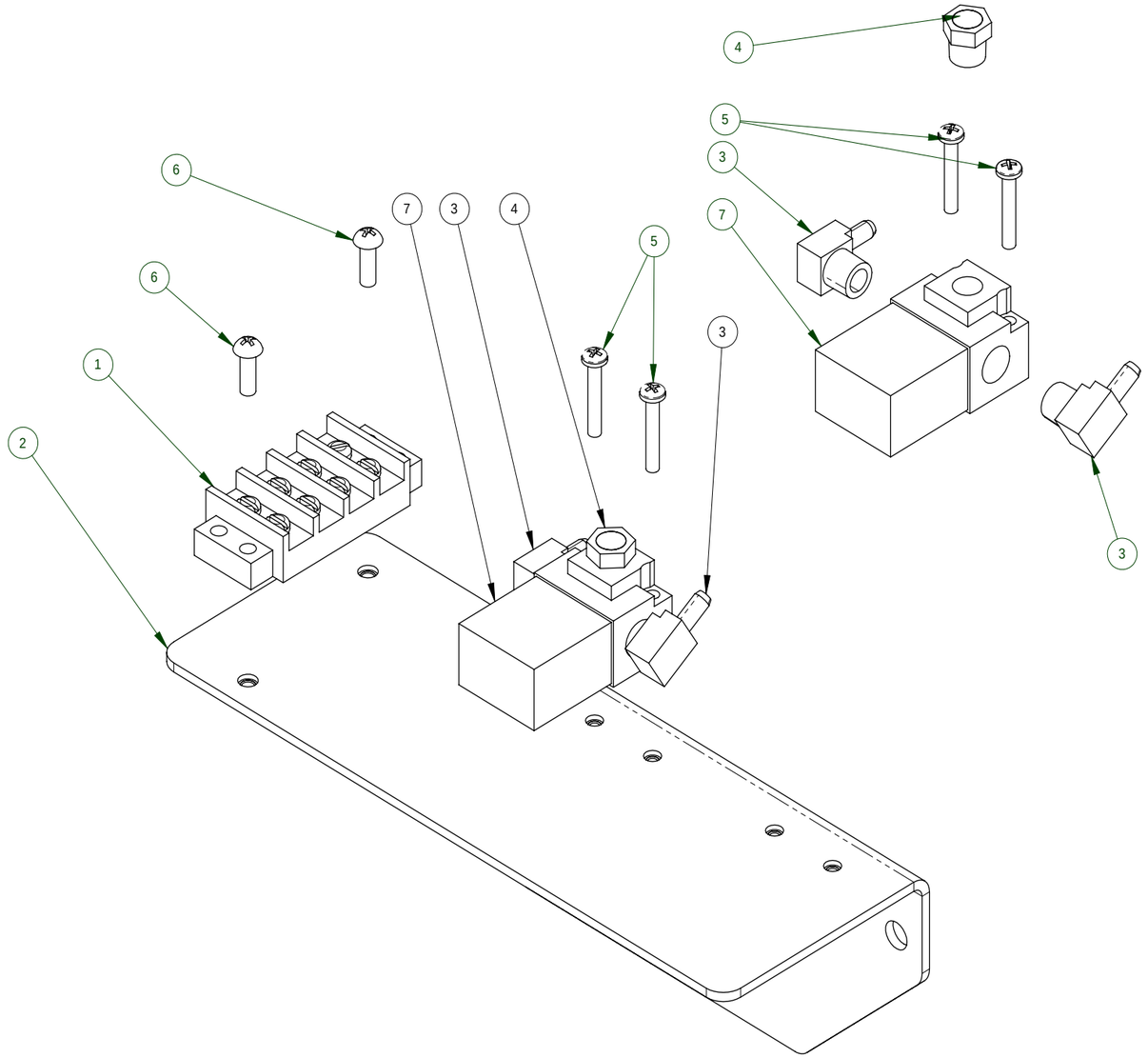
Engine Assembly Parts List

Item	Part Number	Description	Qty
1	610-021-006	Assembly, Idler Pulley Tensioner	1
2	610-026-003	Assembly, Solenoid	1
3	000.015-949	Bracket, Angle - Rear Engine Mount - Coated	2
4	000-015-935	Bracket, Engine - Rear Mount - Coated	1
5	000-015-936	Bracket, Front Engine and Radiator Mount - Coated	1
6	000-052-063	Bushing, 14mm X 1/4” NPT Engine Oil Drain Adapter	1
7	000-052-778	Bushing, 3/8” SAE X 1/8” FPT	1
8	000-020-055	Bushing, HQ 1-1/8	1
9	000-020-065	Bushing, Taper Lok Ø1-1/8” Bore	1
10	000-033-057	Clamp, 1” Cushion Loop	2
11	000-033-117	Clamp, 1” Cushion Loop w/ 7/16” Mount Hole	1
12	000-033-053	Clamp, 1-1/2” Cushion Loop	1
13	000-033-116	Clamp, 1-1/2” Cushion Loop w/ 7/16” Mounting Hole	8
14	000-033-067	Clamp, 2” Cushion Loop	1
15	000-033-003	Clamp, Size #4 Mini Hose	2
16	000-052-088	Elbow, 1/4” FPT X FPT	1
17	000-052-085	Elbow, 1/4” NPT Street	1
18	000-047-036	Engine, 1.6l GM PSI MOR *	1
19	000-068-221	Hose Assembly, Pump Drain	1
20	000-042-073	Housing, Radiator Shroud - Assembled	1
21	000-052-293	Insert, #23 (1/8” NPT X 3/16” Barb)	1
22	000-052-097	Insert, #24	1
23	000-052-100	Insert, #44	1
24	000-077-010	Key, 1/4” X 1-1/2” Lg. Class 2 Fit	2
25	000-052-729	Nipple, 1/2” X 1/4”	1
26	000-052-767	Nipple, Extension 6”	1
27	000-094-018	Nut, 7/16”-14UNC Hex Z/P	5
28	000-094-104	Nut, Stacking, N-10 Clamping Unit	4
29	000-108-147	Protector, Electrical Panel	1
30	000-108-148	Protector, Lower Panel	1
31	000-108-149	Protector, Oil Catch - Coated	1
32	000-109-120	Pulley, 4” Dual Groove Ax	1
33	000-109-118	Pulley, 6-1/2” Quad Groove 3vx	1
34	000-052-770	Quick Connect, Fuel Straight Female	1
35	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	4
36	000-143-583	Screw, #10-24UNC X 0.50” Lg. Hex Head Flange Z/P	8
37	000-143-141	Screw, 1/4”-20UNC X 1/2” Lg. Whiz Lock	8
38	000-143-582	Screw, 12mm X 30mm Hex Head 8.8	4
39	000-143-018	Screw, 3/8”-16UNC X 1” Lg. Hex Head - Grade 8	8
40	000-143-142	Screw, 5/16”-18UNC X 0.75” Lg. BHCS	4
41	000-143-587	Screw, 7/16”-14UNC X 2” Lg. Hex Head	5
42	000-143-581	Screw, 9mm X 1.0 X 35mm (10.9)	6
43	000-143-221	Screw, M6-1 X 14mm Lg. Hex Head	1
44	000-143-337	Screw, M8 X 1.25 X 16mm Lg. Hex Head S/S	1
45	000-143-199	Screw, Thread Adapter T-10, Clamping Unit	3
46	000-150-161	Shaft, Stub	1
47	000-169-223	Valve, Push Button 1/4”	1
48	000-174-001	Washer, #10 Flat	4
49	000-174-105	Washer, 1-1/16” I.D. Self Aligning Spherical 2 Pc Set	3
50	000-174-007	Washer, 1/2” Flat	2
51	000-174-003	Washer, 1/4” Flat	2
52	000-174-005	Washer, 3/8” Flat	8
53	000-174-004	Washer, 5/16” Flat	7
54	000-174-006	Washer, 7/16” Flat	13
55	000-068-015	Hose, 1/4” Rubber-Bulk	1

NOTICE

* Earlier units include the 1.6L GM IMPCO MOR Engine (P/N 000-047-027).

Figure 9-10. Solenoid Assembly
610-026-003 Rev. D



Solenoid Assembly Parts List

Item	Part Number	Description	Qty
1	000-012-001	Block, 4 Lead Electrical Terminal	1
2	000-015-004	Bracket, Solenoid Mount	1
3	000-052-106	Insert, 1/8” NPT X 5/32” Barb X 90°	4
4	000-106-014	Plug, Vent	2
5	000-143-047	Screw, #6-32 UNC X .875” Lg. PH Phillips	4
6	000-143-050	Screw, #8-32 UNC. X 0.50” Lg. PH Phillips	2
7	000-169-070	Valve, Primary Vac. Solenoid	2

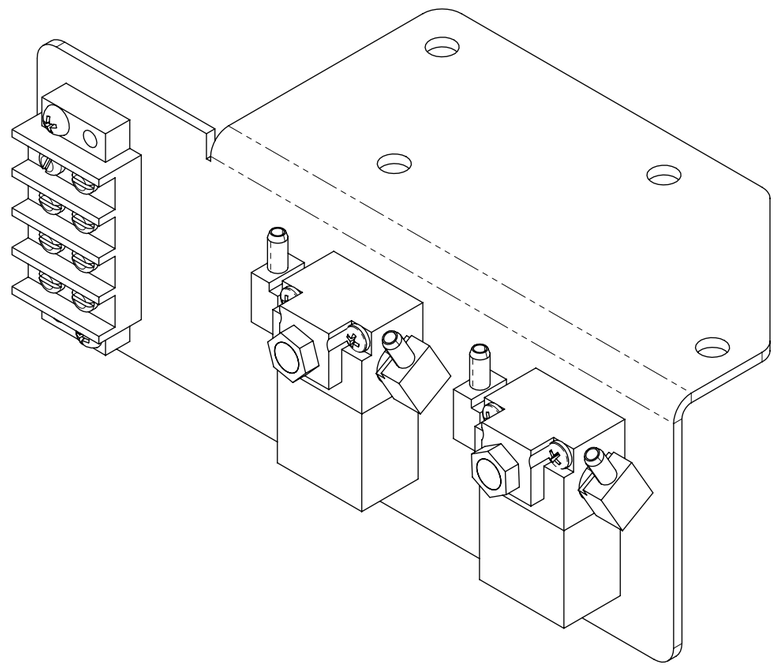
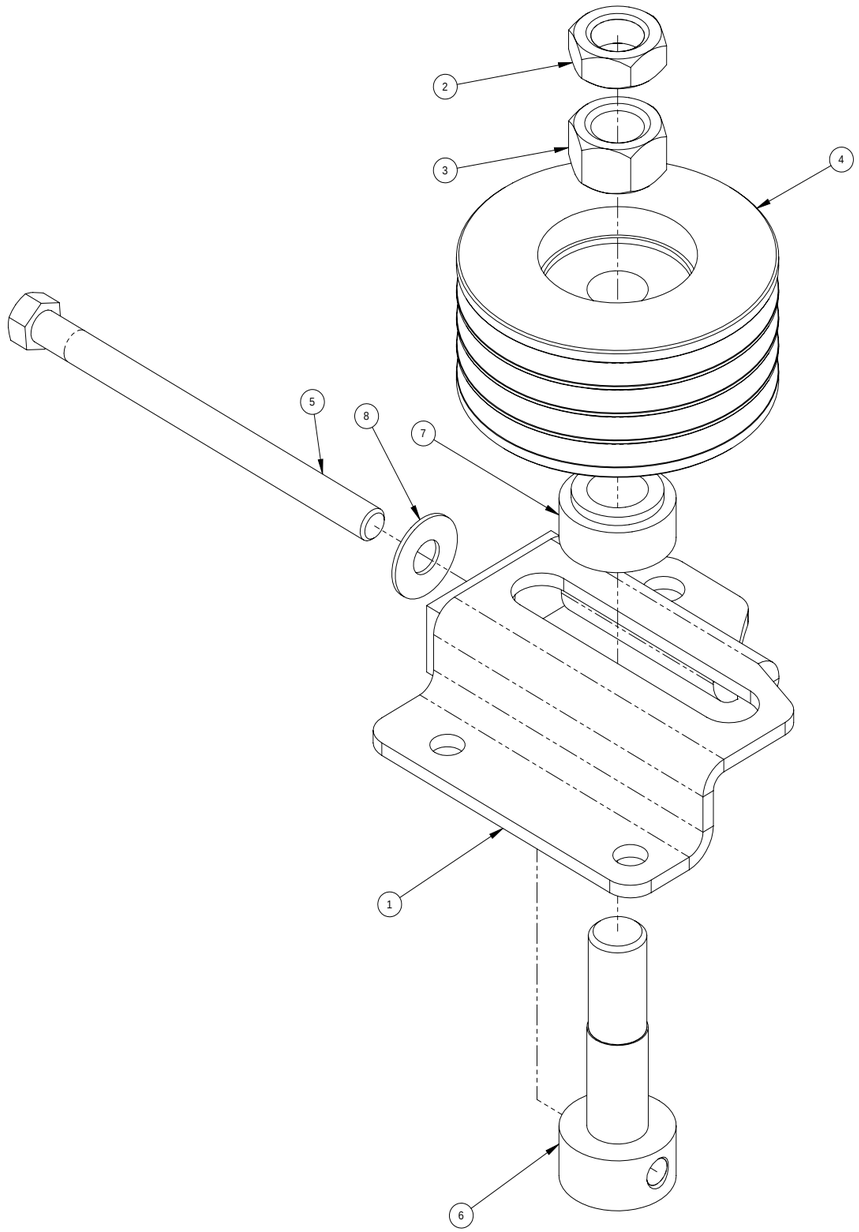


Figure 9-11. Idler Pulley Tensioner Assembly
610-021-006 Rev. A



Idler Pulley Tensioner Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-941	Bracket, Idler Pulley Tensioner - Coated	1
2	000-094-106	Nut, 3/4”-16UNF Hex Jam - Zinc Plated	1
3	000-094-105	Nut, 3/4”-16UNF Hex Zinc Plated	1
4	000-109-117	Pulley, Quad Groove 3VX Idler	1
5	000-143-554	Screw, 7/16-14 UNC. X 6.5” Lg. Ft Gr. 5	1
6	000-150-011	Shaft, Idler Pulley	1
7	000-154-015	Spacer, Idler Pulley Offset	1
8	000-174-006	Washer, 7/16” Flat	1

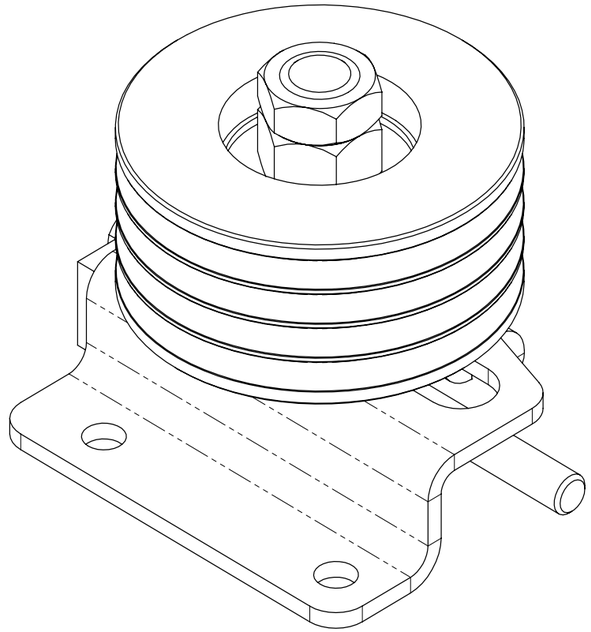


Figure 9-12. Blower Assembly - View 1 of 2
610-002-740 Rev. C

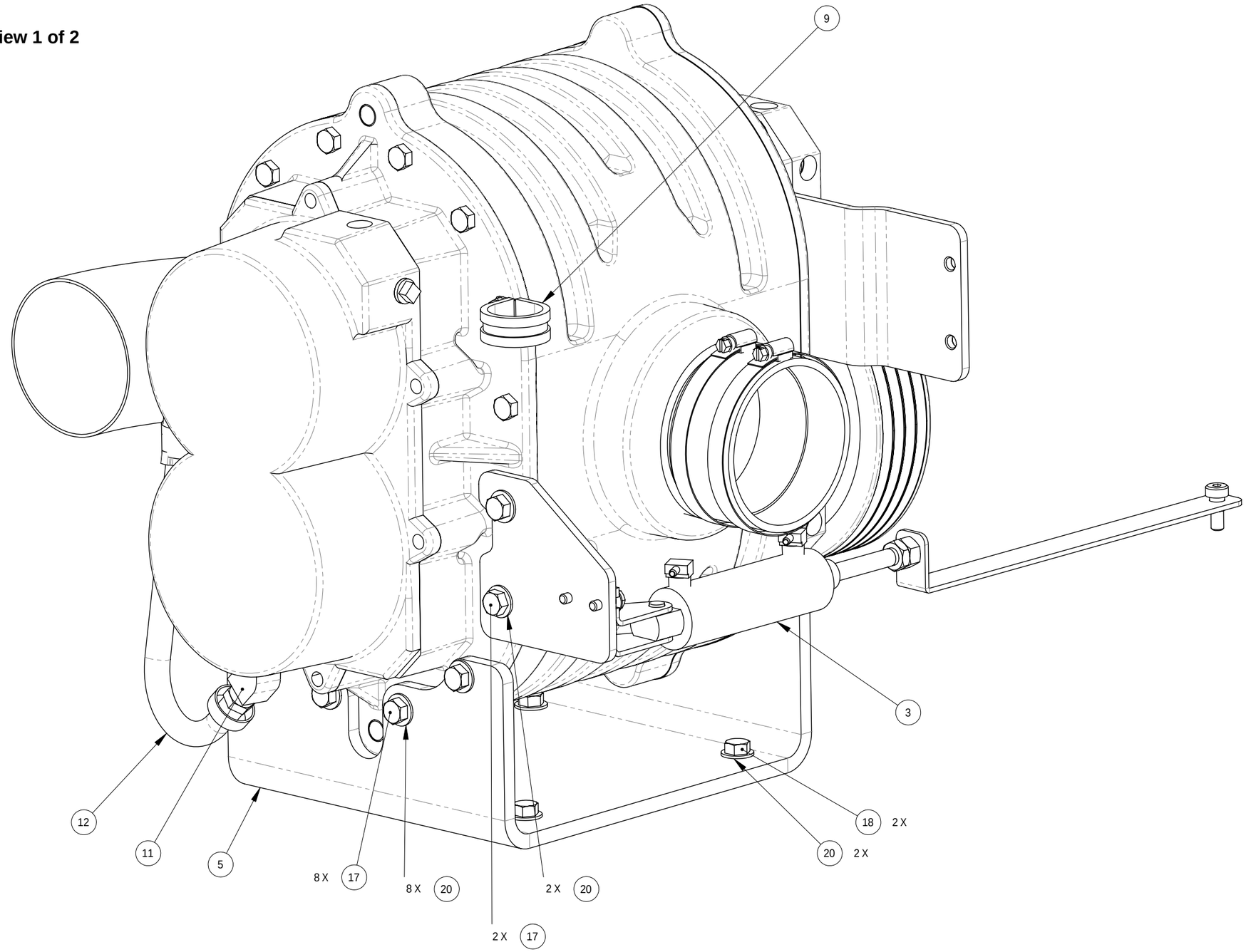
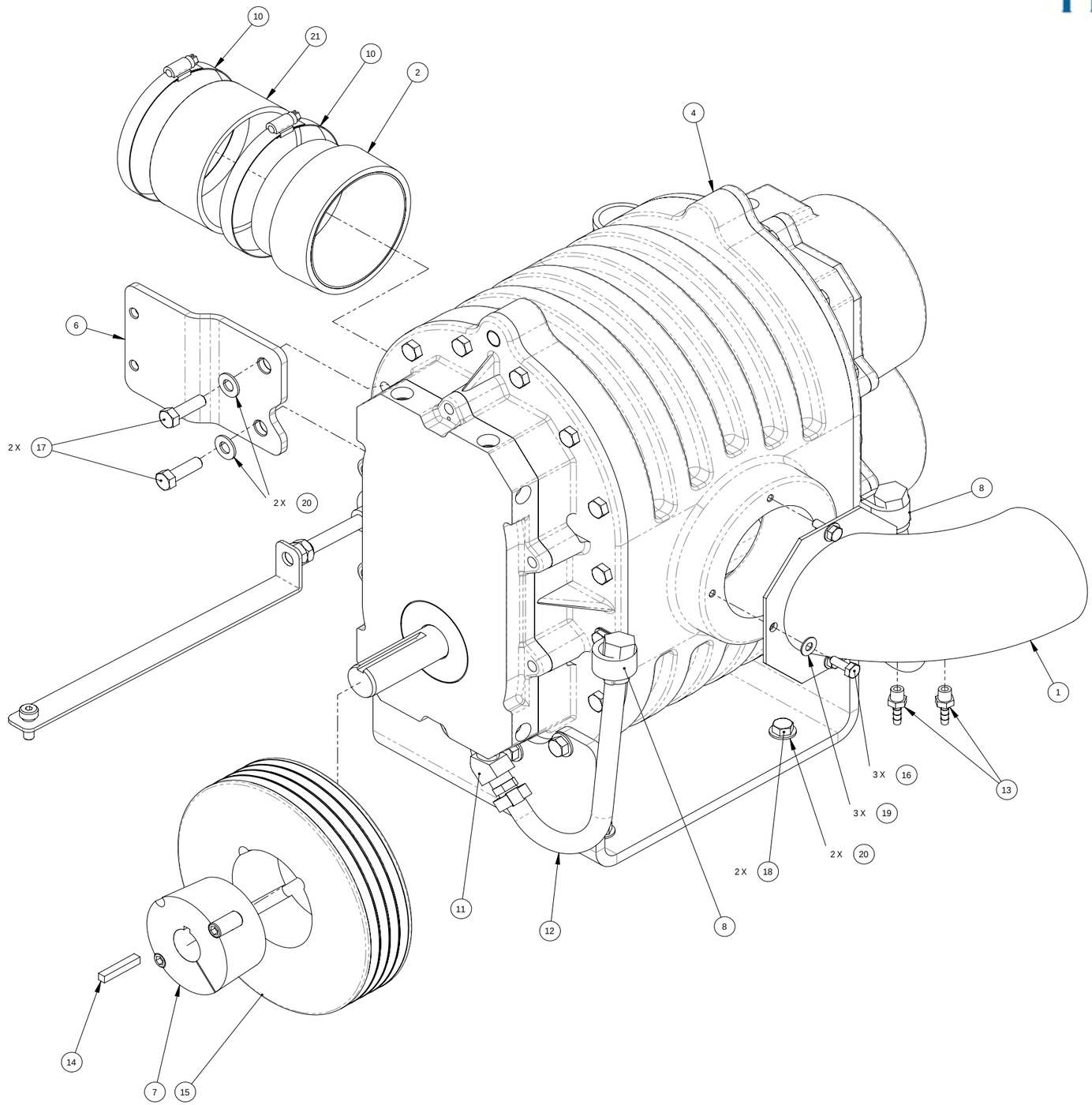


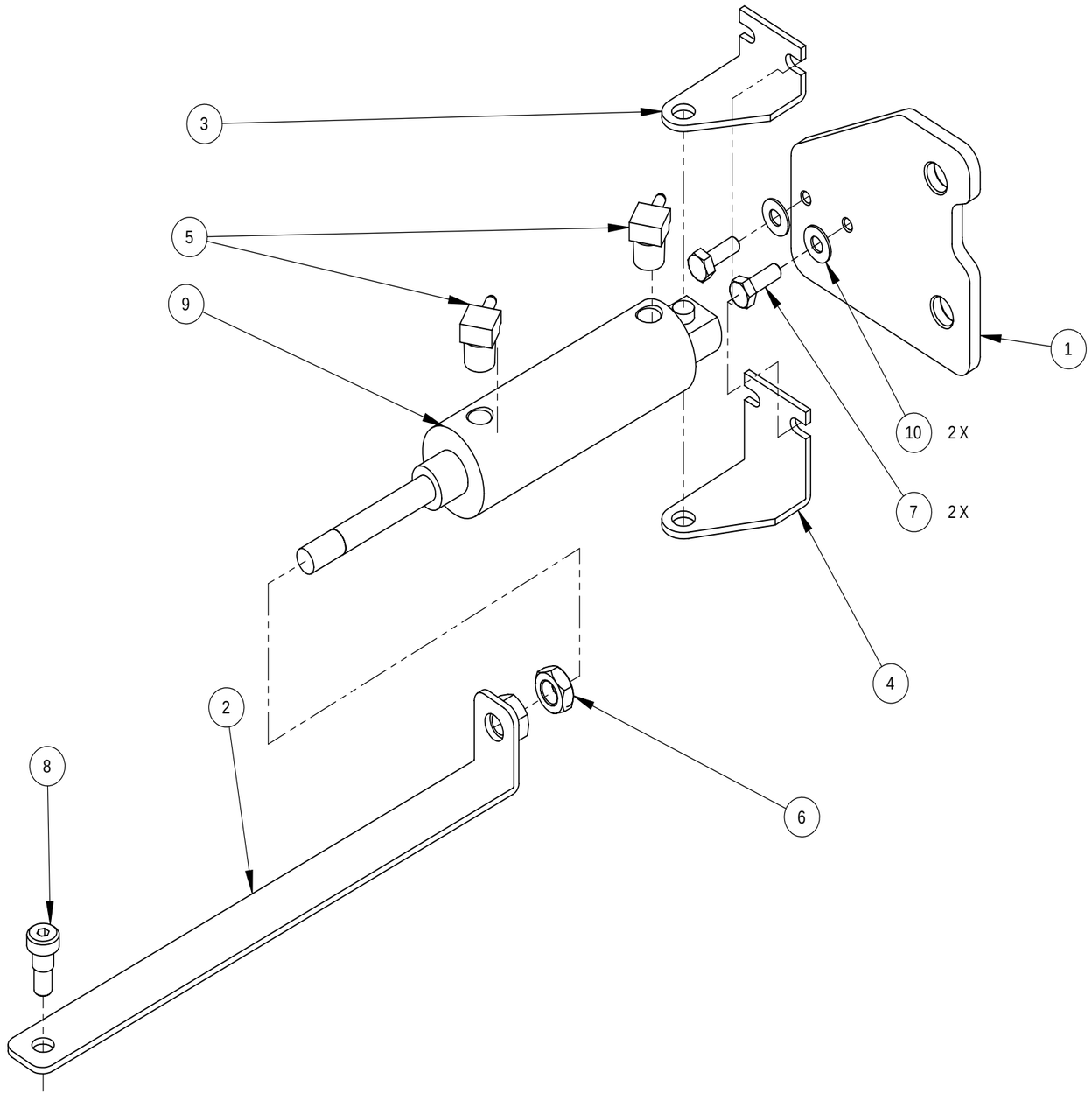
Figure 9-13. Blower Assembly - View 2 of 2
610-002-740 Rev. C



Blower Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-182	Adapter, 4” Blower - Coated	1
2	000-001-139	Adapter, 4” NPT to Slip Connection - Coated	1
3	610-014-740	Assembly, Actuator Valve	1
4	000-111-181	Blower, 5009	1
5	000-015-937	Bracket, Blower Mount - Coated	1
6	000-015-958	Bracket, Blower To Silencer - Coated	1
7	000-020-065	Bushing, Taper Lok Ø1-1/8” Bore	1
8	000-033-117	Clamp, 1” Cushion Loop w/ 7/16 Mount Hole	2
9	000-033-116	Clamp, 1-1/2” Cushion Loop w/ 7/16” Mounting Hole	1
10	000-033-015	Clamp, 4” Hose	2
11	000-052-083	Elbow, 3/8” NPT Street X 45°	2
12	000-068-219	Hose Assembly, Pump Drain	2
13	000-052-293	Insert, #23 (1/8” NPT X 3/16” Barb)	2
14	000-077-010	Key, 1/4” X 1-1/2” Lg. Class 2 Fit	1
15	000-109-119	Pulley, 8” Quad Grove 3VX	1
16	000-143-001	Screw, 1/4”-20UNC X 0.75” Lg. Hex Head	3
17	000-143-025	Screw, 3/8”-16 UNC X 1.25” Lg. Hex Head Gr. 8	12
18	000-143-017	Screw, 3/8”-16UNC X 0.75” Lg. Hex Head Gr. 8	4
19	000-174-003	Washer, 1/4” Flat	3
20	000-174-005	Washer, 3/8” Flat	16
21	000-068-944	Hose, 4” I.D. X 3 Ply Silicone X 2.0” Lg	1

Figure 9-14. Air Actuator Assembly
610-014-740 Rev. A



Air Actuator Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-953	Bracket , Actuator Mount - Coated	1
2	000-015-954	Bracket, Actuator Extension - Coated	1
3	000-015-750	Bracket, Air Cylinder Mount - Inner- Coated	1
4	000-015-748	Bracket, Air Cylinder Mount - Outer - Coated	1
5	000-052-550	Elbow, 1/8” NPT X 3/16” Barb	2
6	000-094-092	Nut, 7/16”-20UNF Hex Jam	1
7	000-143-001	Screw, 1/4”-20UNC X 0.75” Lg. Hex Head	2
8	000-143-573	Screw, 5/16”-18UNC X 7/8” Lg. w/ 3/8” X 1/2”	1
9	000-169-169	Valve, Air Cylinder	1
10	000-174-003	Washer, 1/4” Flat	2

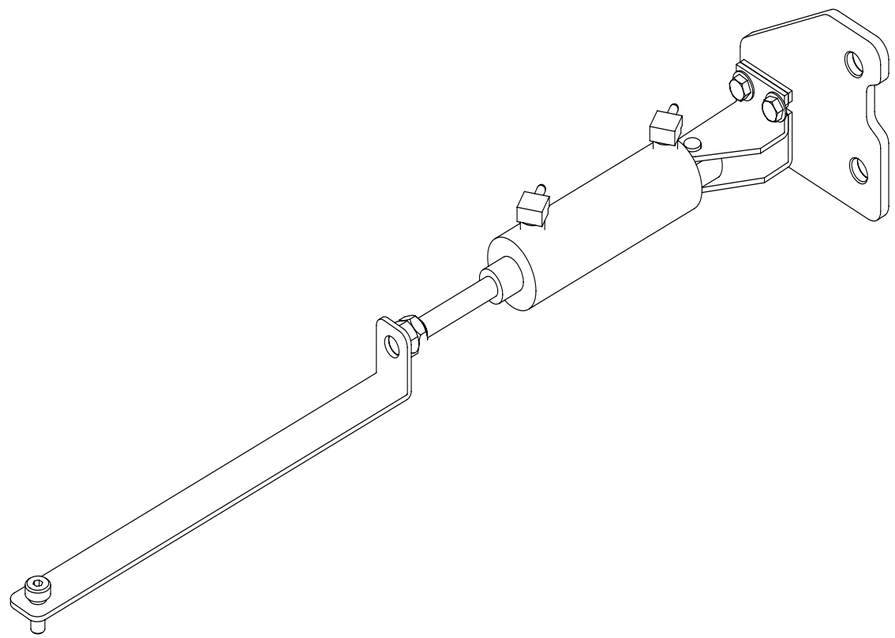
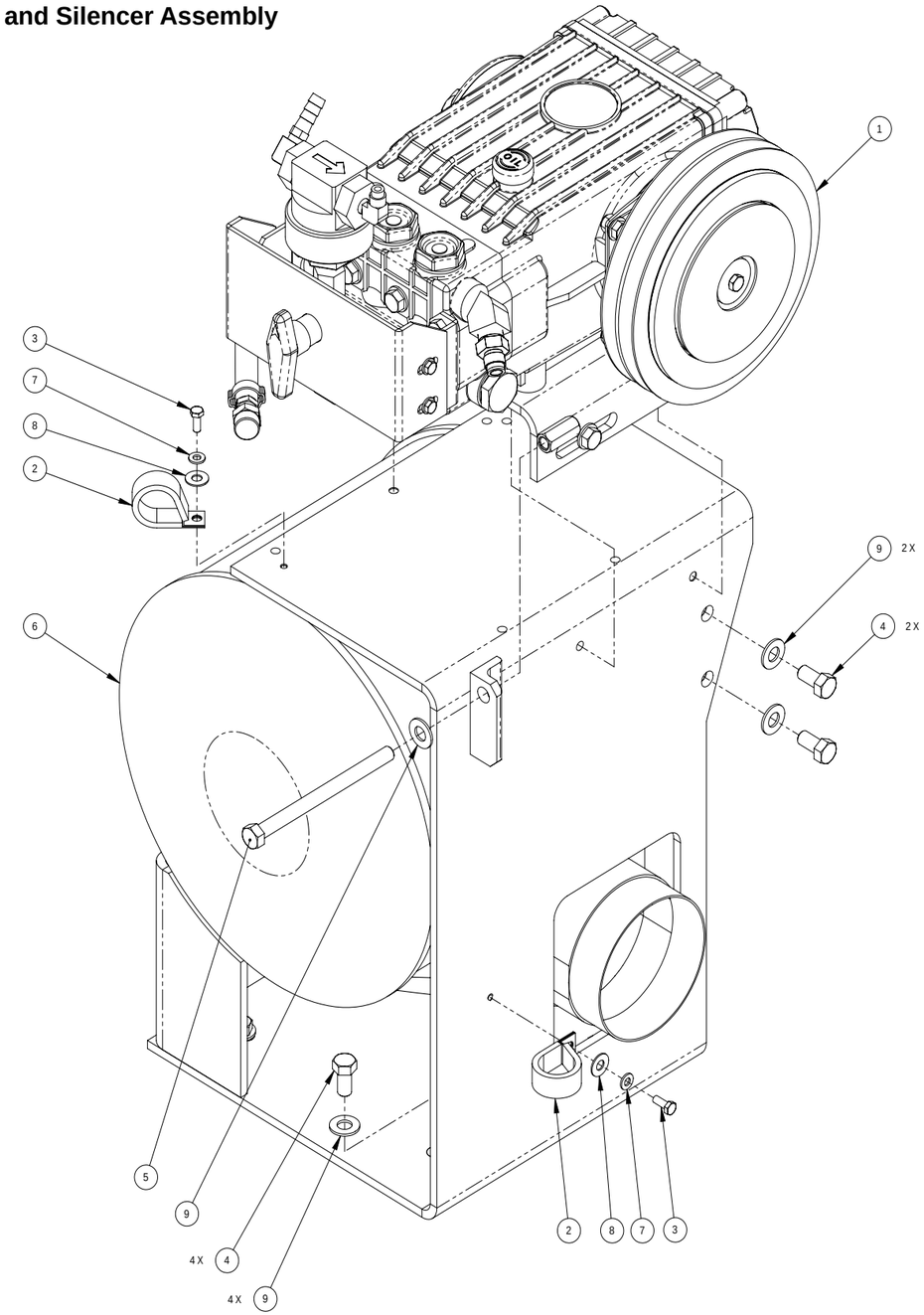


Figure 9-15. Pump and Silencer Assembly
610-021-740 Rev. B



Pump and Silencer Assembly Parts List

Item	Part Number	Description	Qty
1	610-007-740	Assembly, Pump	1
2	000-033-057	Clamp, 1” Cushion Loop	2
3	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	2
4	000-143-017	Screw, 3/8”-16UNC X 0.75” Lg. Hex Head Grd. 8	6
5	000-143-024	Screw, 3/8”-16UNC X 5” Lg. Hex Head Tap	1
6	000-093-105	Silencer, 4” Slip Connection - Coated	1
7	000-174-001	Washer, #10 Flat	2
8	000-174-003	Washer, 1/4” Flat	2
9	000-174-005	Washer, 3/8” Flat	7

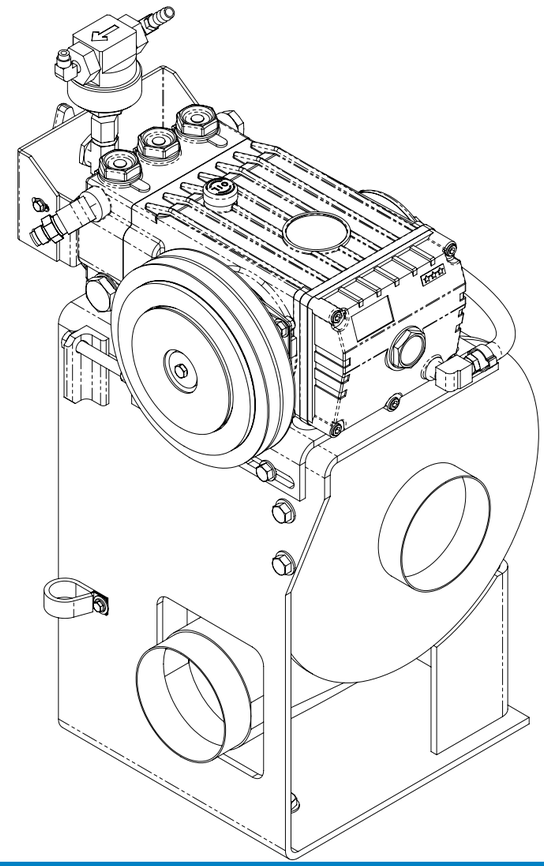


Figure 9-16. Pump Assembly - View 1 of 2
610-007-740 Rev. E

NOTICE

The pump service repair kit, which is P/N 000-078-912, includes the pump packing lubricant and the insertion tool.

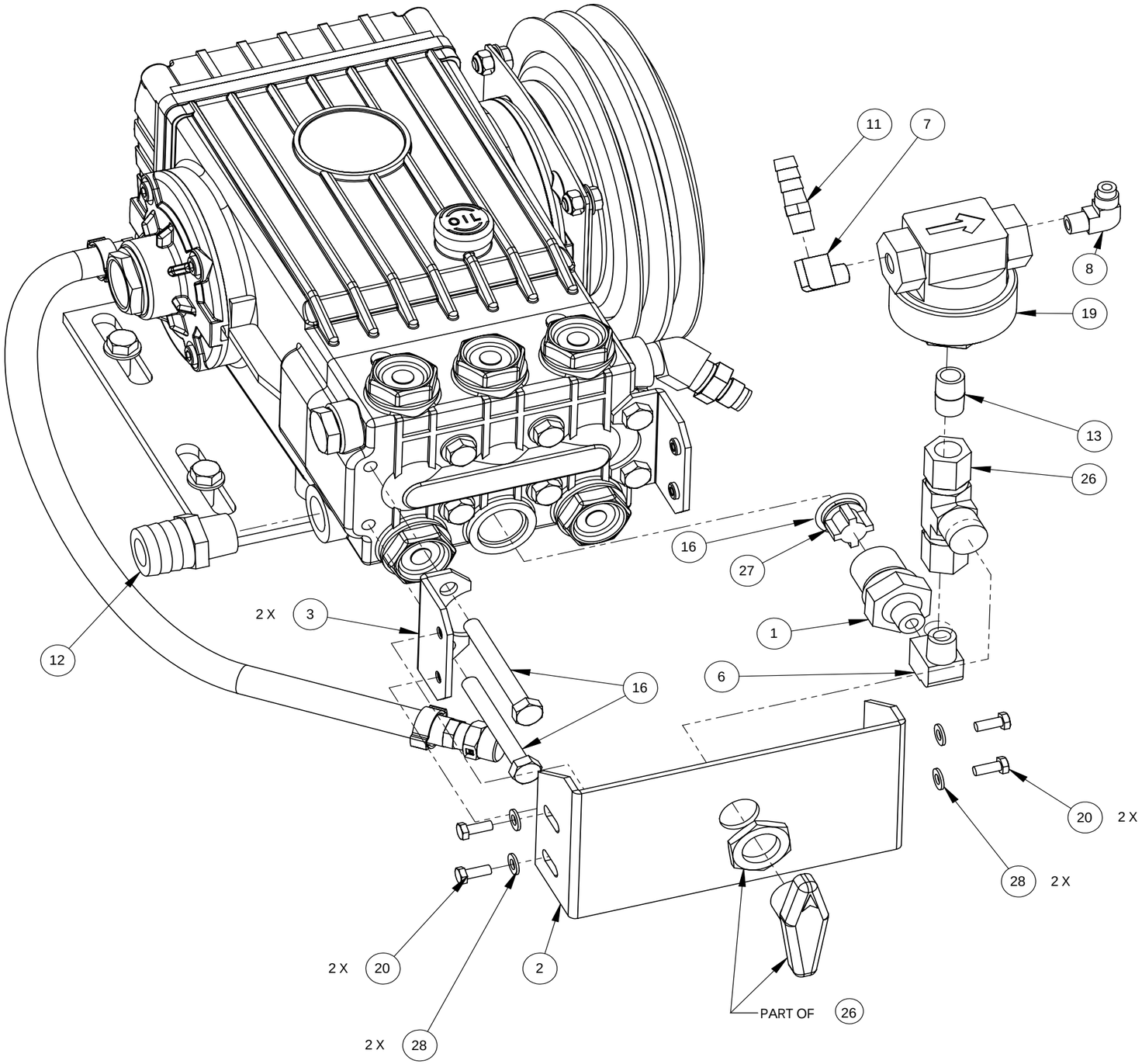
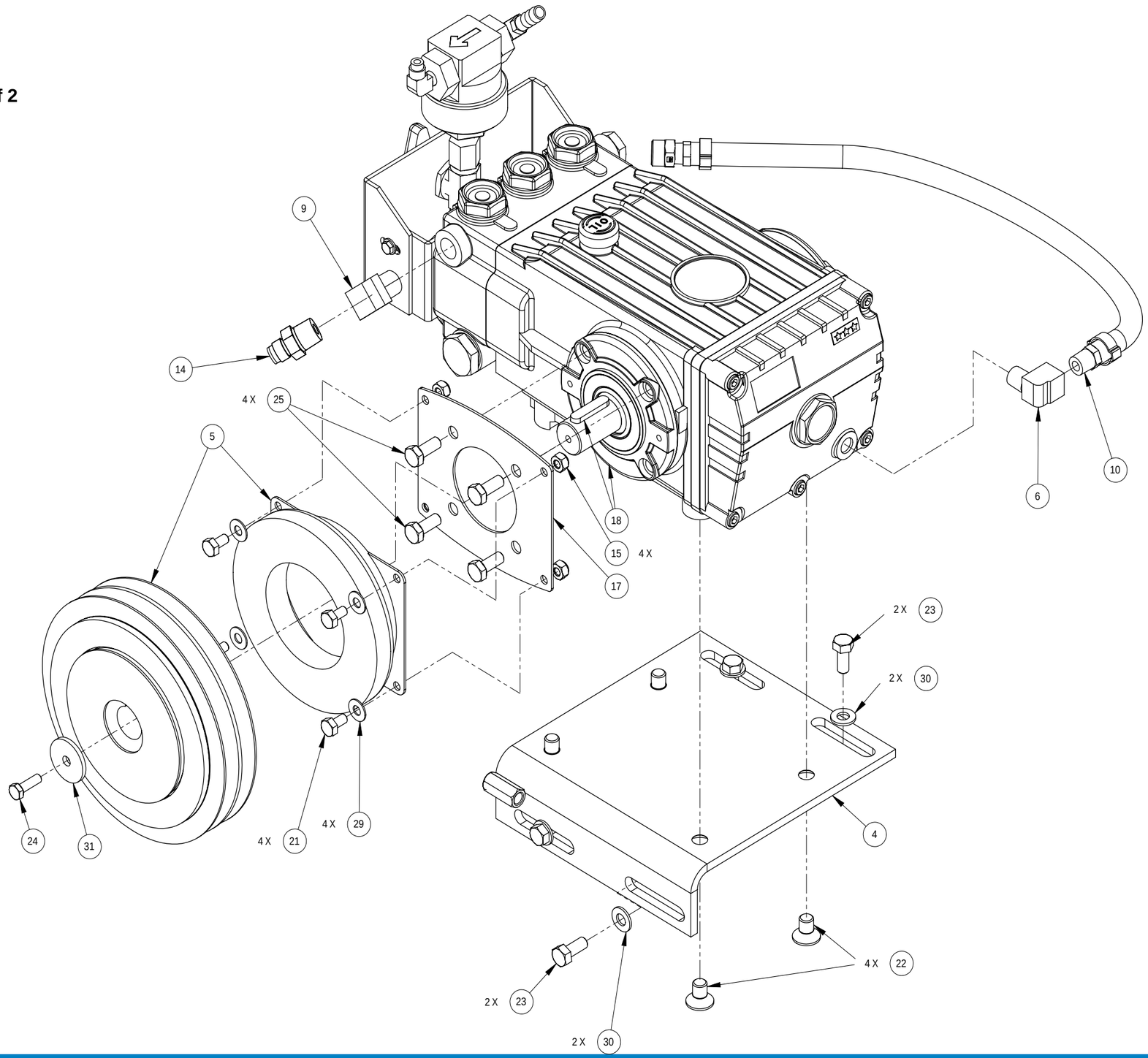
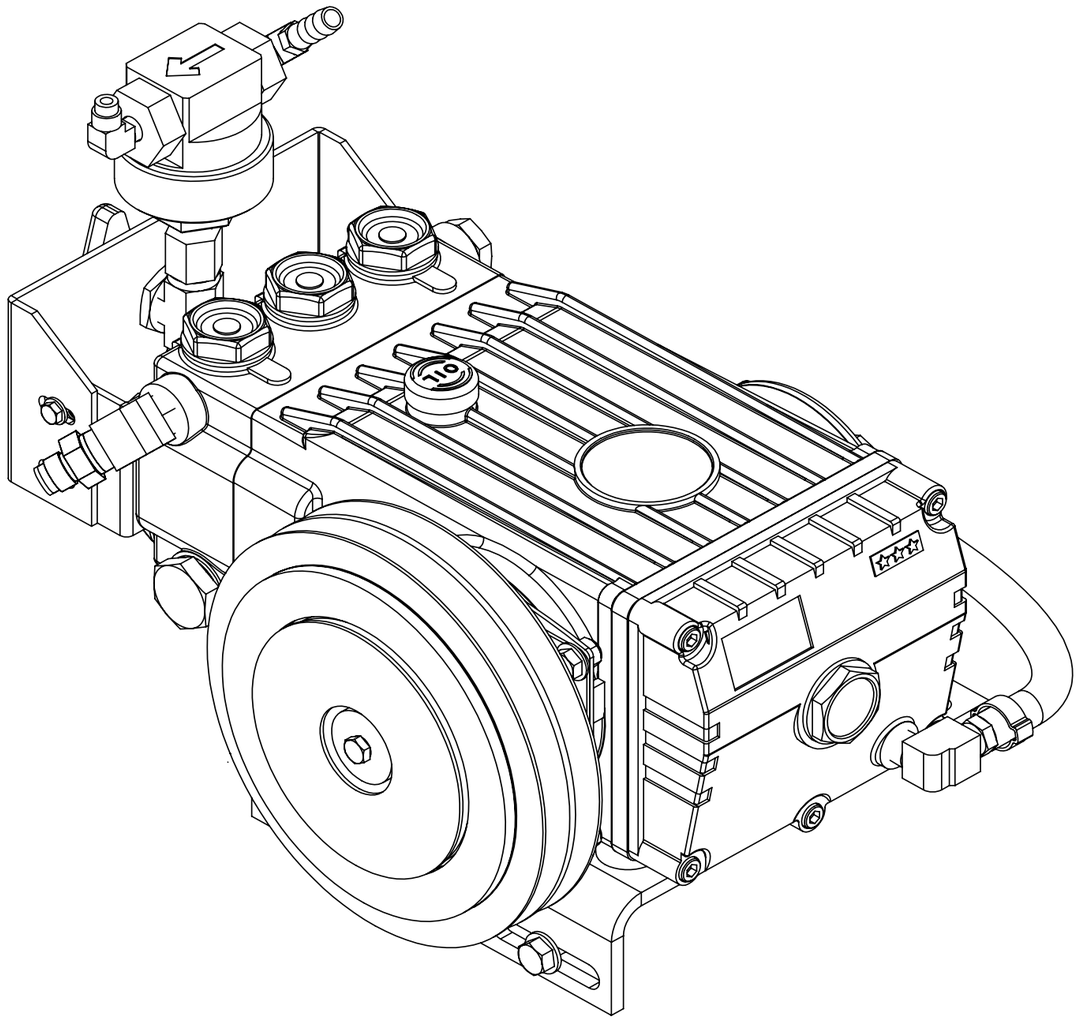


Figure 9-17. Pump Assembly - View 2 of 2
610-007-740 Rev. E

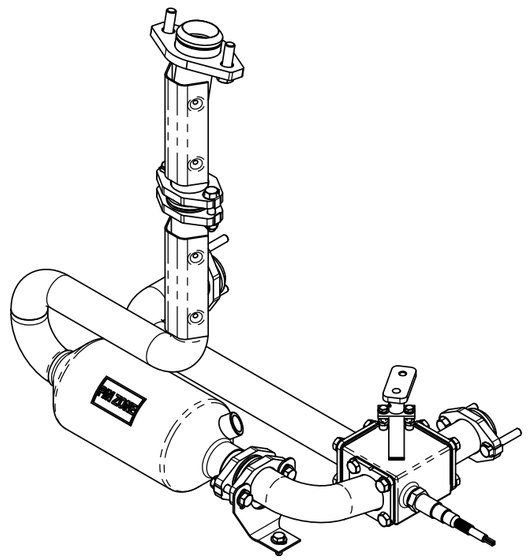


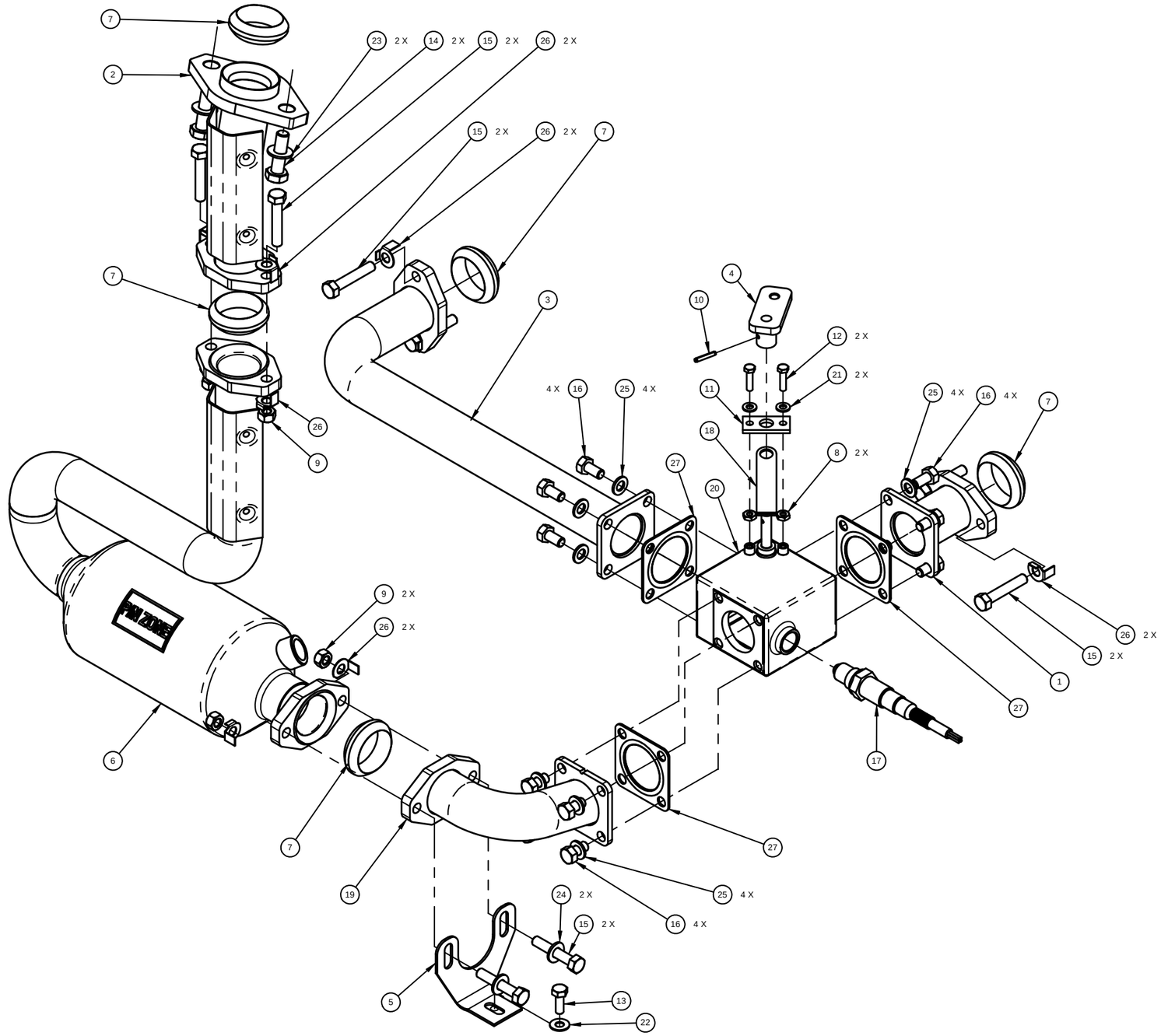


Pump Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-151	Adapter, GP to Chem Pump S/S	1
2	000-015-957	Bracket, Chem Pump Main Support - Coated	1
3	000-015-956	Bracket, Chem Pump Mount - Coated	2
4	000-015-955	Bracket, Pump Mount - Coated	1
5	000-036-009	Clutch, Pump - 24mm Dual Groove	1
6	000-052-085	Elbow, 1/4” NPT Street	2
7	000-052-084	Elbow, 1/8” NPT Street	1
8	000-052-531	Elbow, 1/8” NPT X 1/4” SAE	1
9	000-052-083	Elbow, 3/8” NPT Street X 45°	1
10	000-068-794	Hose Assembly, 3/8” X 17” Lg. Drain	1
11	000-052-099	Insert, #26 (1/8” NPT X 3/8” Barb)	1
12	000-052-753	Insert, #816 (1/2” NPT X 1” Barb)	1
13	000-052-517	Nipple, 1/4” NPT Close	1
14	000-052-528	Nipple, 3/8” M JIC X 3/8” NPT	1
15	000-094-071	Nut, 1/4”-20UNC Nylock	4
16	000-097-057	O-Ring, Adapter - Chemical Pump	1
17	000-105-541	Plate, GP Clutch Mount	1
18	000-111-183	Pump, General	1
19	000-111-184	Pump, GP Chemical	1
20	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	4
21	000-143-333	Screw, 1/4”-20UNC X 0.50” Lg. Hex Head	4
22	000-143-586	Screw, 10mm X 1.5 X 16mm Socket Flat Head	4
23	000-143-242	Screw, 5/16”-18UNC X 0.75” Lg. Hex Head Grade 5	4
24	000-143-588	Screw, 6mm X 20mm X 0.75 Hex Head	1
25	000-143-185	Screw, 8mm X 20mm Gr. 8.8 Hex Head	4
26	000-169-176	Valve, 2-Way Chem Pump	1
27	000-169-212	Valve, GP Pump Check - Modified	1
28	000-174-001	Washer, #10 Flat	4
29	000-174-003	Washer, 1/4” Flat	4
30	000-174-004	Washer, 5/16” Flat	4
31	000-174-171	Washer, Ø1.25” X Ø0.285” I.D. X 0.125” Thk.	1

Figure 9-18. Exhaust Assembly
610-013-740 Rev. C





Exhaust Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-142	Adapter, Exhaust 2-1/2” w/ Fixed Flange	1
2	000-001-143	Adapter, Exhaust 7.5” w/ Custom Fixed Flange	1
3	000-001-144	Adapter, Exhaust 90° Elbow w/ Fixed Flange	1
4	000-015-642	Bracket, Air Cylinder Actuation - Coated	1
5	000-015-725	Bracket, Exhaust Support - Fabricated	1
6	000-093-115	Catalytic Converter, PSI MOR - Weldment	1
7	000-057-199	Gasket, Exhaust Donut	5
8	000-094-027	Nut, #10-24UNC Hex	2
9	000-094-012	Nut, 5/16-18” UNC Hex	4
10	000-103-014	Pin, 1/8” X 3/4” Long - Spring	1
11	000-138-010	Retainer, Leaf Spring	1
12	000-143-132	Screw, #10-24UNC X 0.75” Lg. Hex Head	2
13	000-143-001	Screw, 1/4”-20UNC X 0.75” Lg. Hex Head	1
14	000-143-584	Screw, 10mm X 35mm Hex Head	2

Item	Part Number	Description	Qty
15	000-143-124	Screw, 5/16”-18UNC X 1.75” Lg. Hex Head	8
16	000-143-572	Screw, 5/16-18UNC X 5/8” Lg. Grd. 5 Hex Head	12
17	----	Sensor, O2 - GM 1.6L Engine	1
18	000-155-030	Spring, Leaf - Weldment	1
19	000-125-208	Tube, Diverter Inlet - Welded	1
20	000-169-045	Valve, Cast Exhaust Diverter	1
21	000-174-001	Washer, #10 Flat	2
22	000-174-003	Washer, 1/4” Flat	1
23	000-174-005	Washer, 3/8” Flat	2
24	000-174-049	Washer, 5/16” Flat	2
25	000-174-069	Washer, 5/16” Inconel Belleville	12
26	000-174-166	Washer, 5/16” Tab	10
27	000-057-146	Gasket, Four Hole Exhaust	3

Figure 9-19. Blower Heat Exchanger Assembly - View 1 of 2
610-005-740 Rev. F

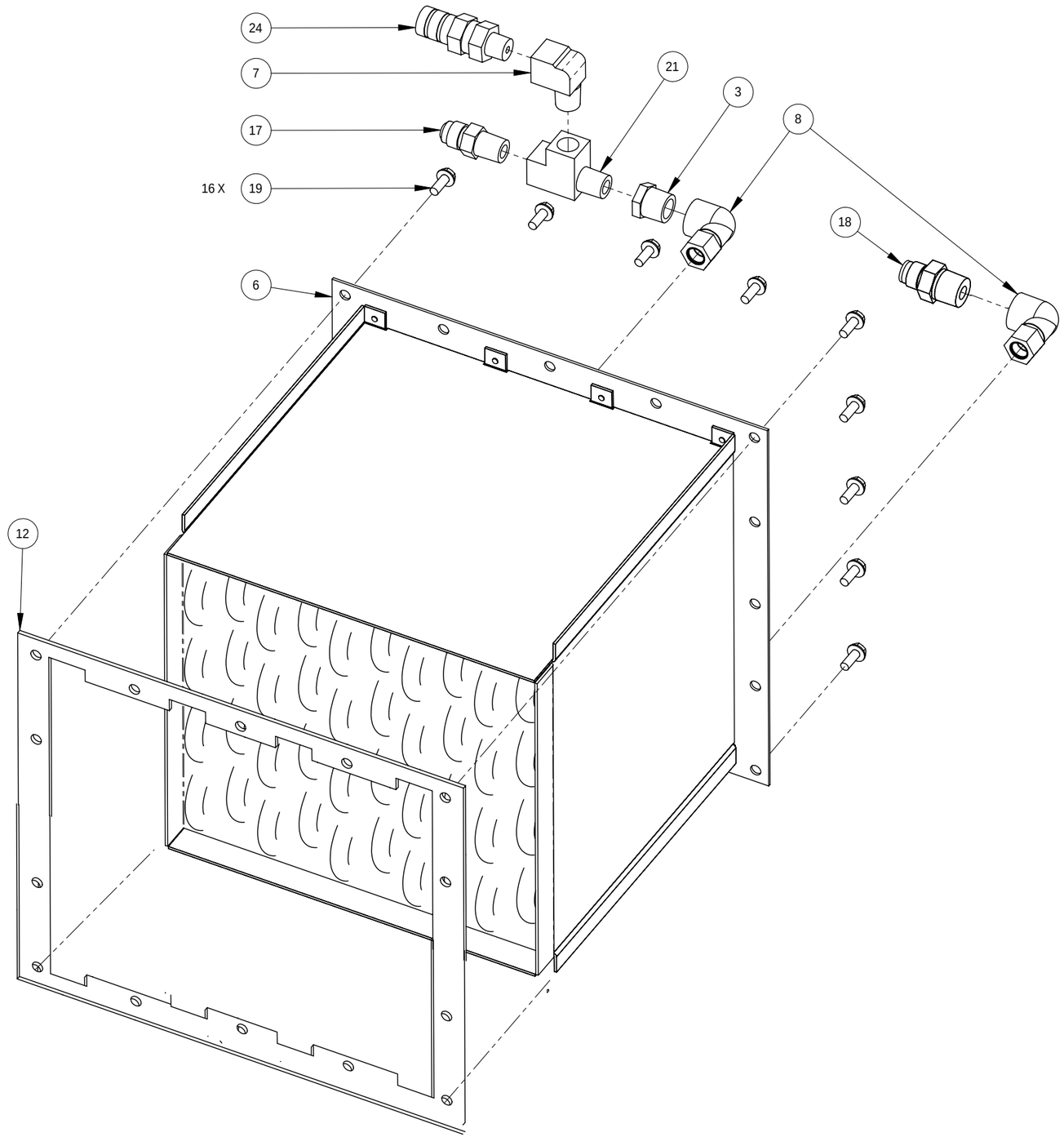
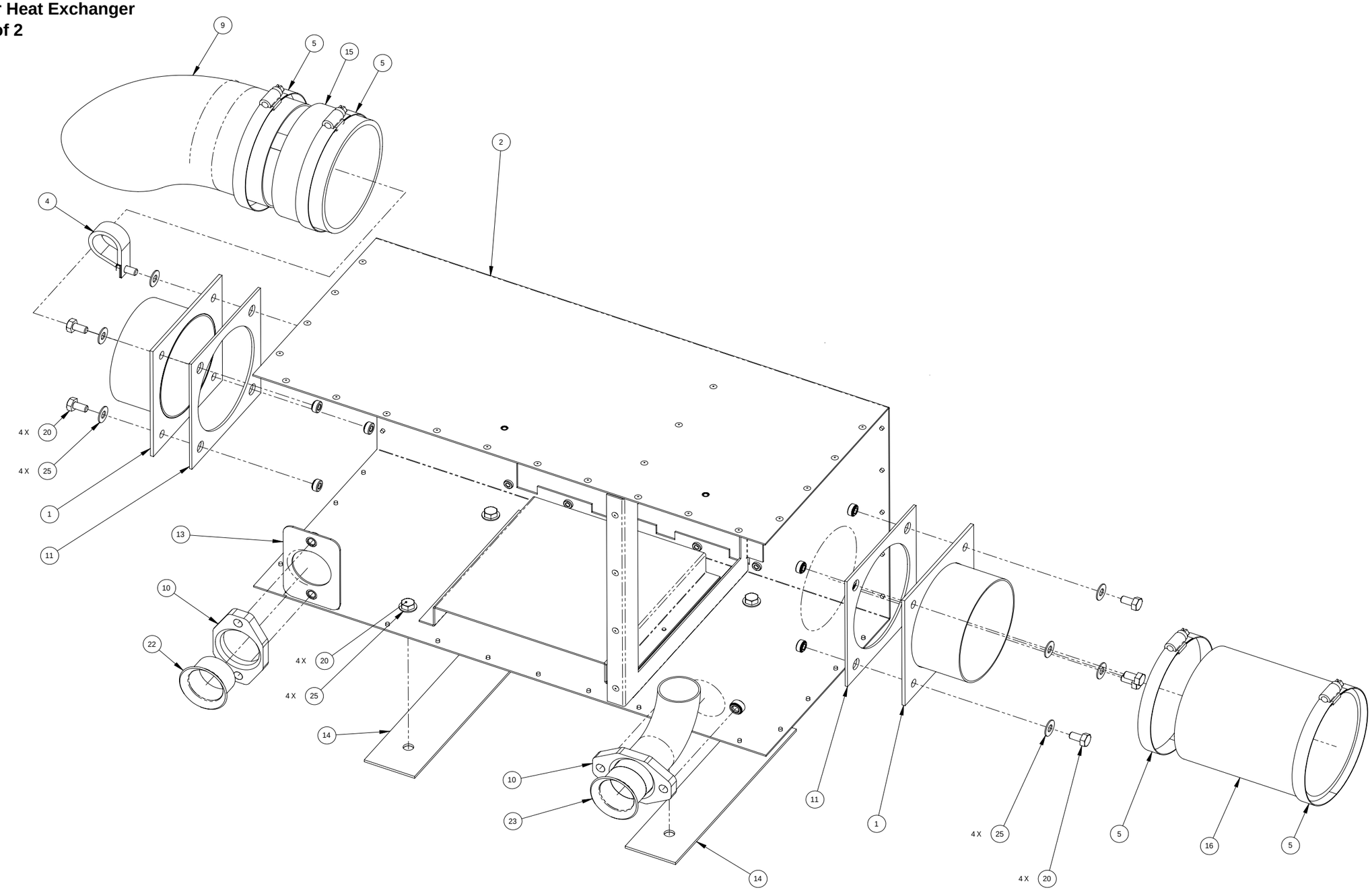
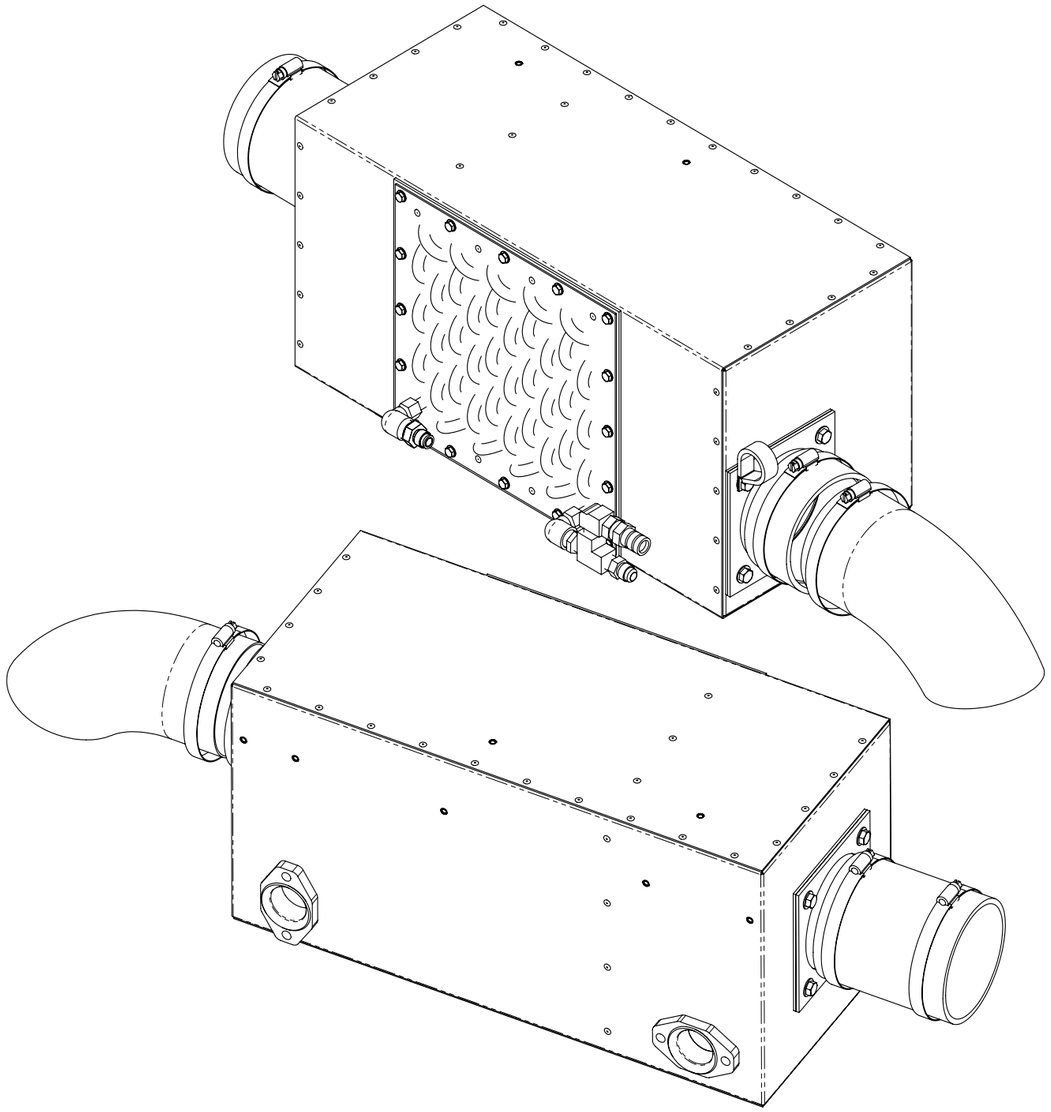


Figure 9-20. Blower Heat Exchanger Assembly - View 2 of 2
610-005-740 Rev. F

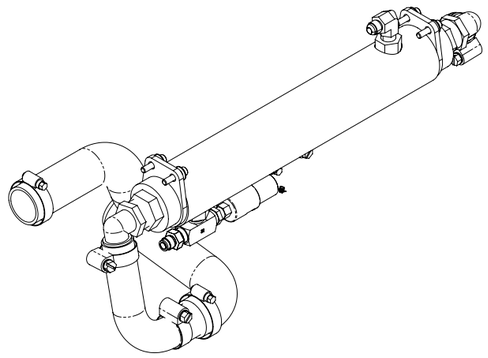


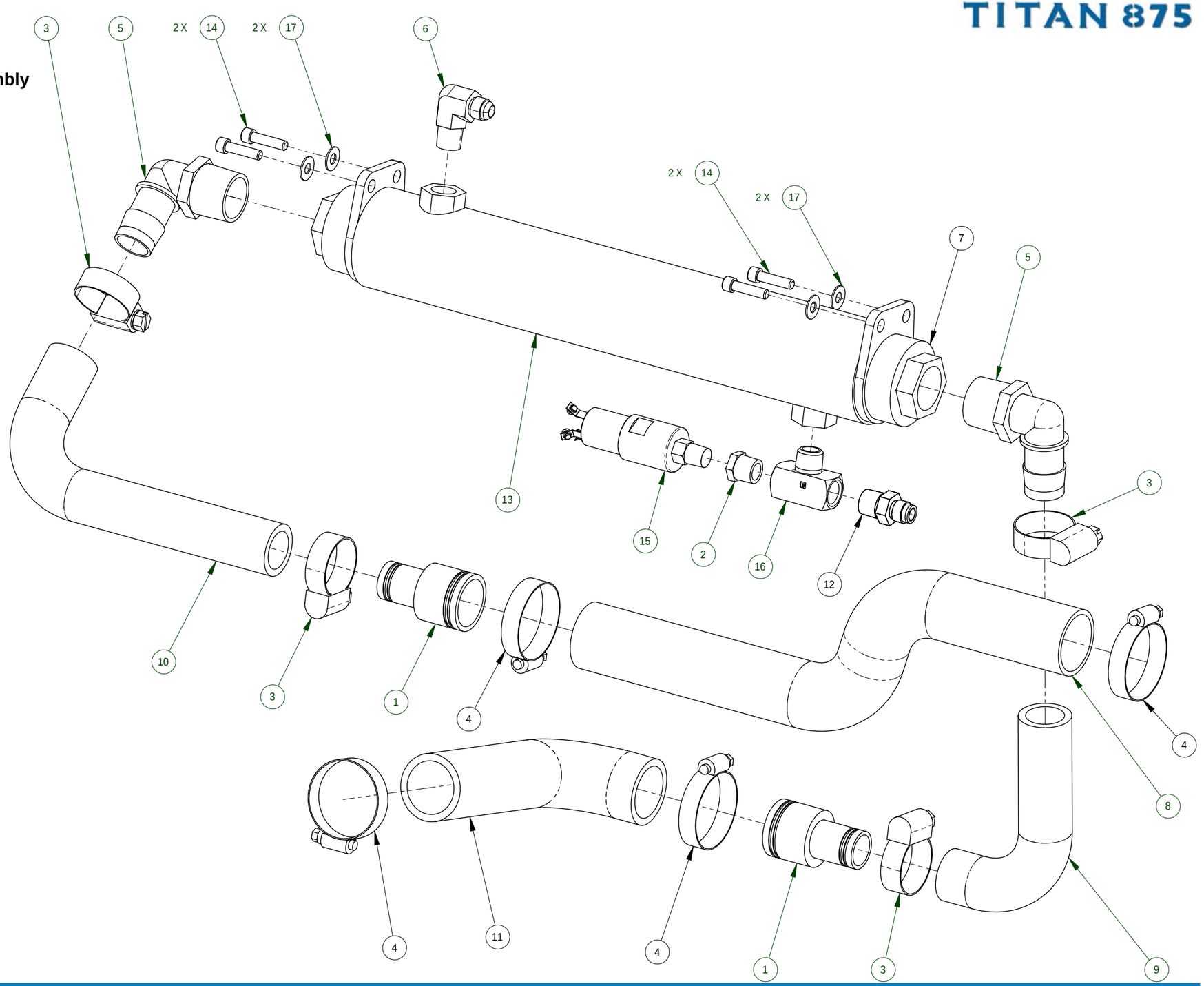


Blower Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-133	Adapter, Tank to N4.0” Blower Hose	2
2	000-013-071	Box, Heat Exchanger Inlet and Outlet Plenum	1
3	000-052-061	Bushing, 3/8” NPT X 1/4” FPT	1
4	000-033-057	Clamp, 1” Cushion Loop	1
5	000-033-015	Clamp, 4” Hose	4
6	000-038-073	Core, Heat Exchanger 8” X 8”	1
7	000-052-085	Elbow, 1/4” NPT Street	1
8	- - -	Elbow, 3/8” FPT X 3/8” Compression (Comes w/ Hx)	2
9	000-125-240	Elbow, 4” O.D. w/ 2” Tangents X 75~ - Coated	1
10	000-105-181	Flange, Ø1.50” Exhaust Donut - Coated	2
11	000-057-210	Gasket, 4” Exhaust	2
12	000-131-015	Gasket, Heat Exchanger Core	1
13	000-057-211	Gasket, Heat Exchanger Plenum	1
14	000-057-215	Gasket, Heat Exchanger Plenum - Silicone	2
15	000-068-944	Hose, 4” I.D. X 3 Ply Silicone X 2.0” Lg	1
16	000-068-945	Hose, 4” I.D. X 3 Ply Silicone X 5.0” Lg	1
17	000-052-533	Nipple, 3/8” JIC X 1/4” NPT	1
18	000-052-528	Nipple, 3/8” M JIC X 3/8” NPT	1
19	000-143-583	Screw, #10-24UNC X 0.50” Lg. Hex Head Flange Z/P	16
20	000-143-333	Screw, 1/4”-20UNC X 0.50” Lg. Hex Head	12
21	000-052-090	Tee, 1/4” NPT Branch M-F-F	1
22	000-125-120	Tube, Flange Donut End 1.00” Lg.	1
23	000-125-234	Tube, Inlet Plenum - Weldment	1
24	000-169-050	Valve, High Pressure Safety (2,200)	1
25	000-174-003	Washer, 1/4” Flat	12

Figure 9-21. Coolant Heat Exchanger Assembly
610-006-740 Rev D.





Coolant Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-150	Adapter, Ø1” X Ø1.5”	2
2	000-052-061	Bushing, 3/8” NPT X 1/4” FPT	1
3	000-033-020	Clamp, Size #16 Hose	4
4	000-033-009	Clamp, Size #24 Hose	4
5	000-052-131	Elbow, 1”NPT X 1” Barb (Glass Filled Black Nylon)	2
6	000-052-766	Elbow, 3/8 NPT X 3/8 JIC	1
7	000-038-043	Heat Exchanger, Water to Water	1
8	000-068-783	Hose, ‘S’ 1-1/2” I.D.	1
9	000-068-792	Hose, 1” I.D. Coolant - Modified Both Ends	1
10	000-068-792	Hose, 1” I.D. Coolant - Modified One End	1
11	000-068-798	Hose, Coolant - Engine Modified	1
12	000-052-528	Nipple, 3/8” M JIC X 3/8” NPT	1
13	000-108-134	Protector, Coolant Hx Gray Silicone Blanket	1
14	000-143-080	Screw, 1/4”-20UNC X 1.00” Lg. Socket Head	4
15	000-157-157	Switch, Nason 1,350 psi Shutoff	1
16	000-052-447	Tee, 3/8” NPT Male Branch	1
17	000-174-003	Washer, 1/4” Flat	4

Figure 9-22. Lower Instrument Panel Assembly - View 1 of 3
610-019-740 Rev. D

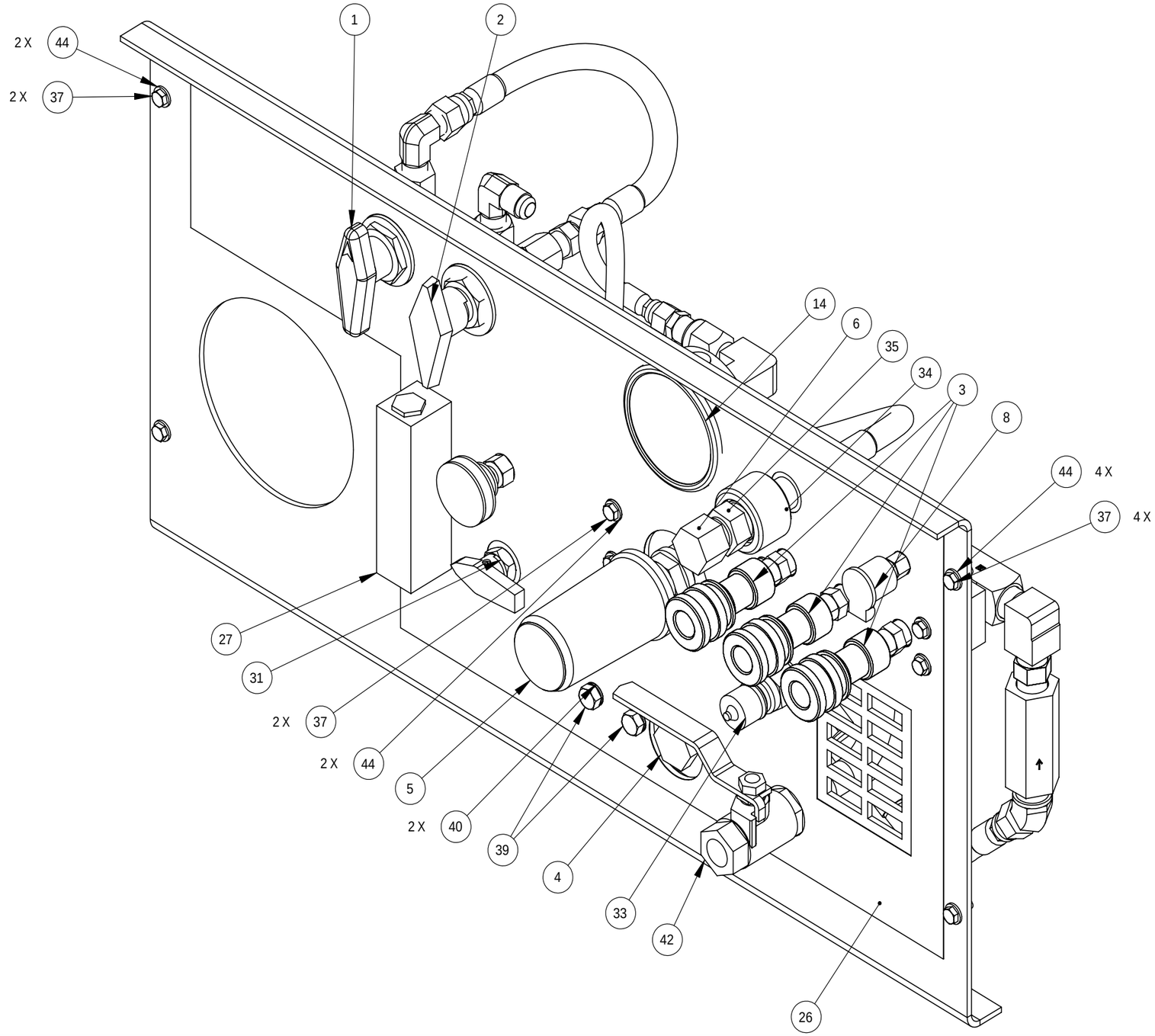


Figure 9-23. Lower Instrument Panel Assembly - View 2 of 3
610-019-740 Rev. D

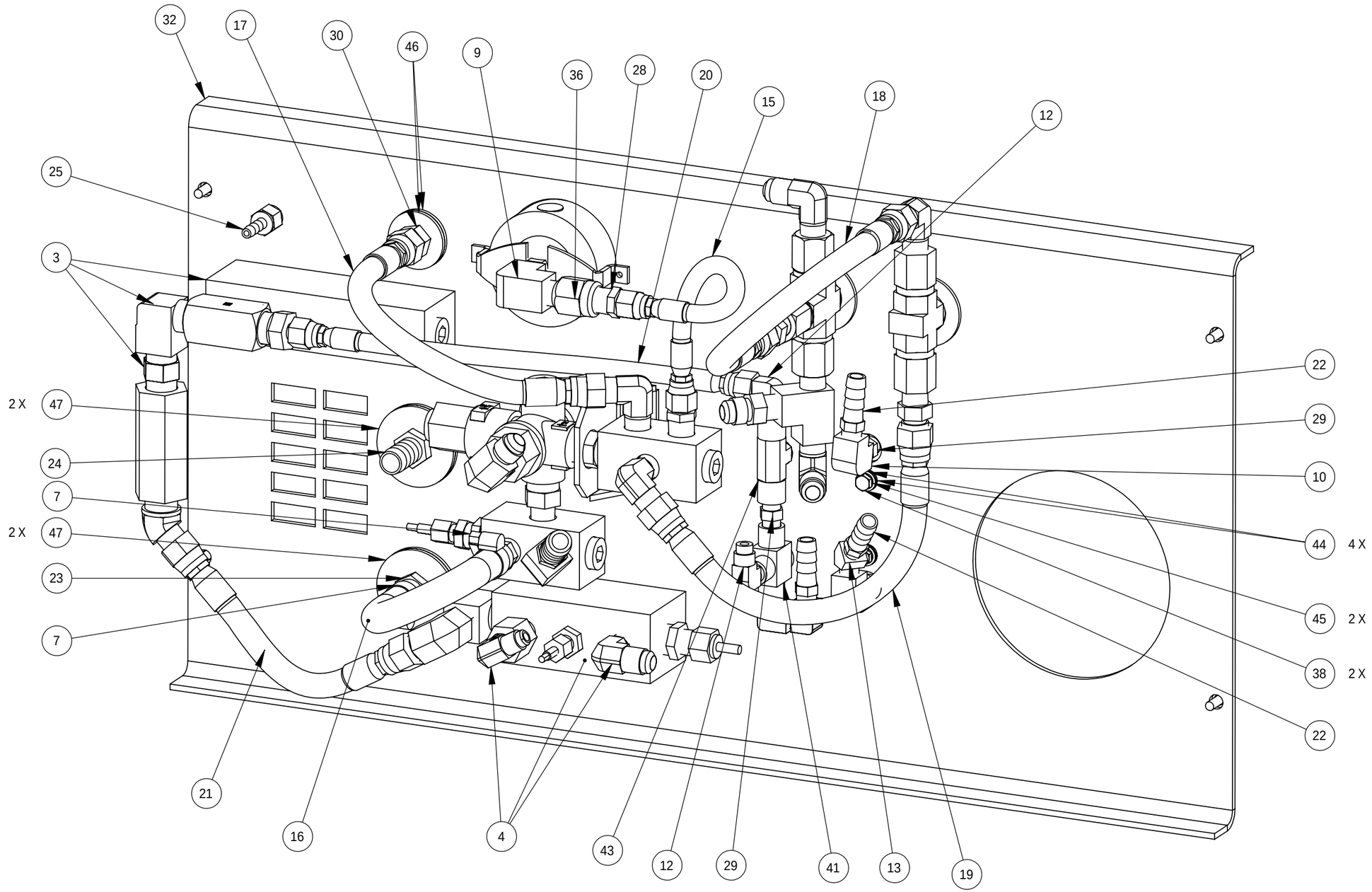
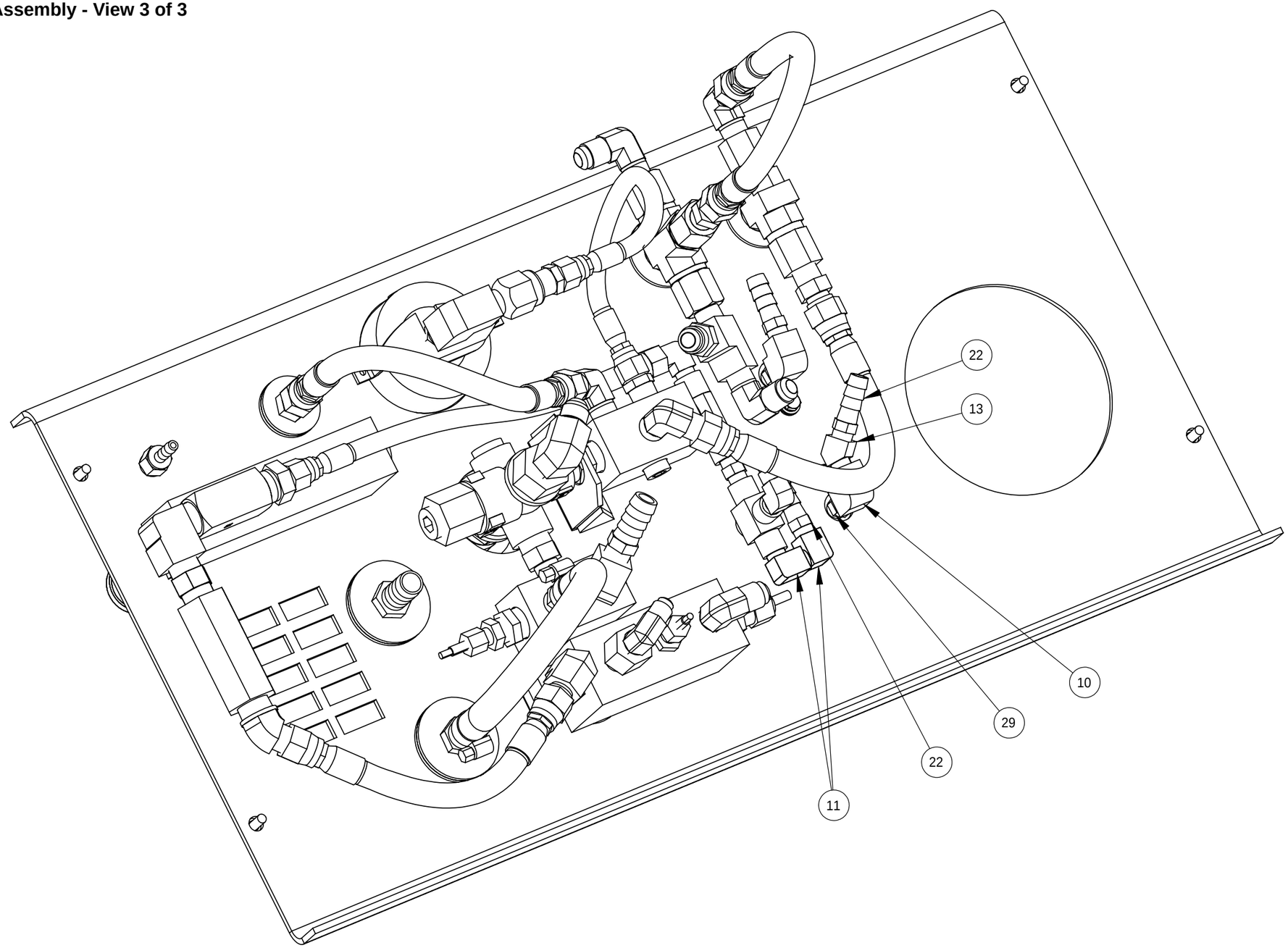


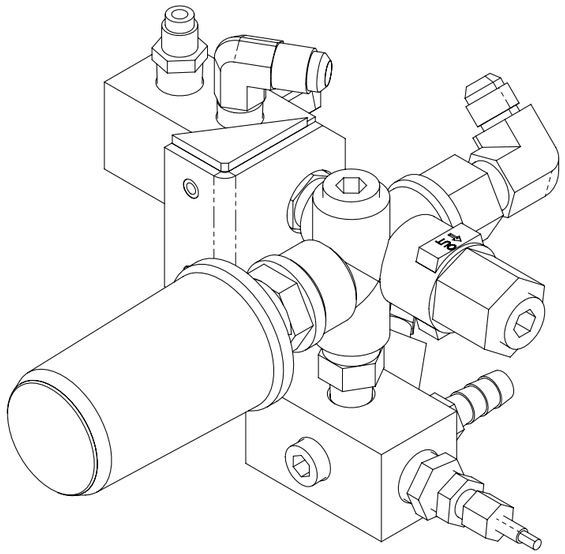
Figure 9-24. Lower Instrument Panel Assembly - View 3 of 3
610-019-740 Rev. D

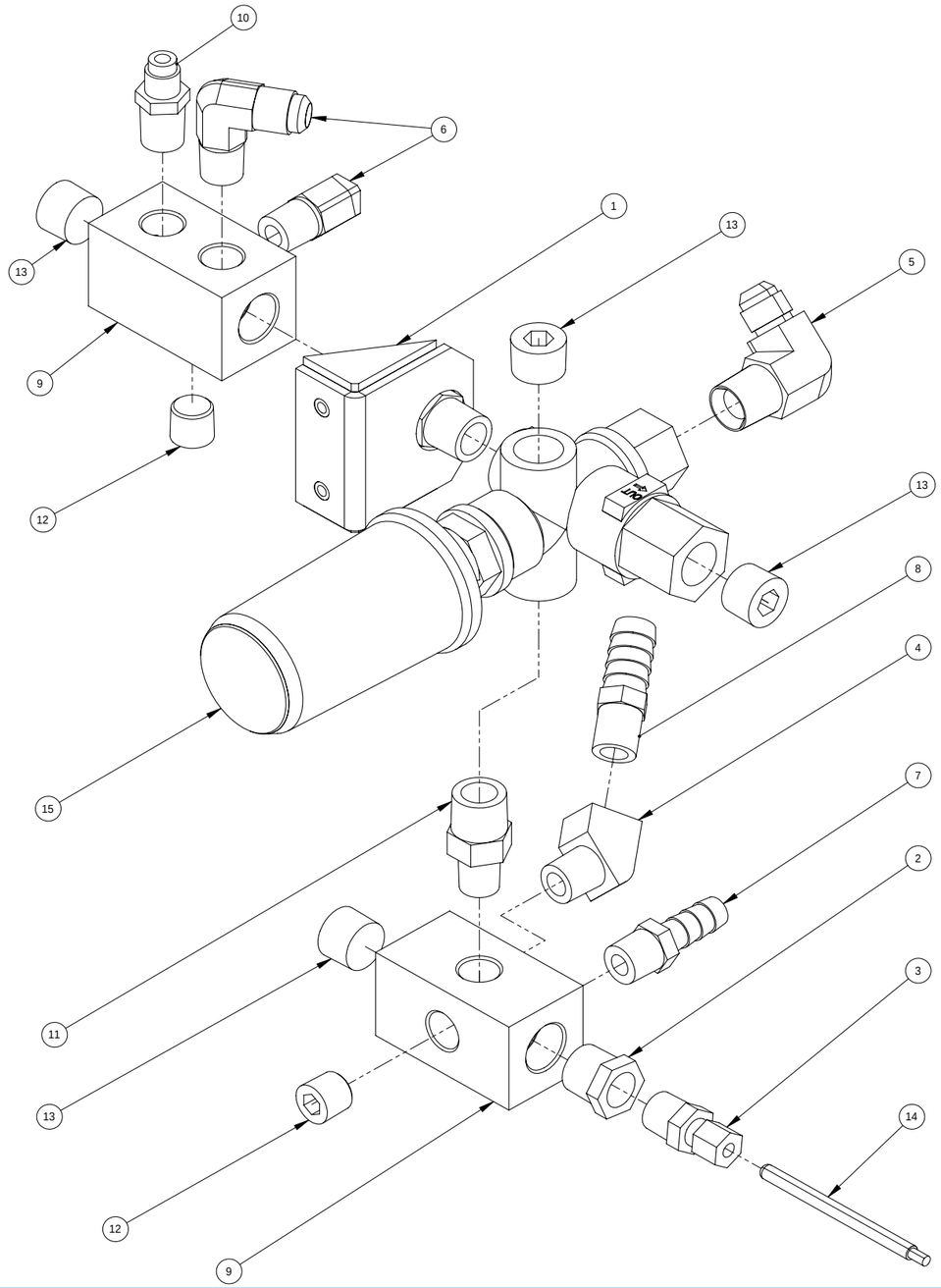


Lower Instrument Panel Assembly Parts List

Item	Part Number	Description	Qty
1	610-026-002	Assembly, 2-Way Valve	1
2	610-026-001	Assembly, 3-Way Valve	1
3	610-008-740	Assembly, Hi Pressure Out Manifold	1
4	610-027-740	Assembly, Orifice Manifold	1
5	610-026-740	Assembly, Psi Regulator Valve 0 - 3,200 psi	1
6	000-027-008	Cap, 3/8” Brass Pipe	1
7	000-033-003	Clamp, Size #4 Mini Hose	2
8	000-052-272	Cup, Gravity Feed Oil Blower Lube Port	1
9	000-052-088	Elbow, 1/4” FPT X FPT	1
10	000-052-089	Elbow, 1/8” NPT Female	2
11	000-052-084	Elbow, 1/8” NPT Street	2
12	000-052-531	Elbow, 1/8” NPT X 1/4” SAE	2
13	000-052-078	Elbow, 1/8” NPT X 45° Street	1
14	000-074-167	Gauge, Pressure (0 - 3,000 psi)	1
15	000-068-789	Hose, 3/16” X 10.5” Lg. Teflon w/ JIC Ends	1
16	000-068-017	Hose, 3/8” I.D. - Bulk	1
17	000-068-512	Hose, 3/8” X 10.25” Lg. Teflon w/ JIC Ends	1
18	000-068-512	Hose, 3/8” X 10.25” Lg. Teflon w/ JIC Ends	1
19	000-068-512	Hose, 3/8” X 10.25” Lg. Teflon w/ JIC Ends	1
20	000-068-512	Hose, 3/8” X 10.25” Lg. Teflon w/ JIC Ends	1
21	000-068-806	Hose, 3/8” X 6” Lg. Teflon w/ JIC Ends	1
22	000-052-099	Insert, #26 (1/8” NPT X 3/8” Barb)	3
23	000-052-104	Insert, #66 (3/8” NPT X 3/8” Barb)	1
24	000-052-105	Insert, #68 (3/8” NPT X 1/2” Barb)	1
25	000-052-096	Insert, #F23 (1/8” FPT X 3/16” Barb)	1
26	000-081-361	Label, Lower Instrument Panel	1
27	000-074-030	Meter, Chemical Flow Raw	1
28	000-052-527	Nipple, 1/4” SAE X 1/4” NPT	1
29	000-052-069	Nipple, 1/8” NPT Hex	3
30	000-052-533	Nipple, 3/8” JIC X 1/4” NPT	1
31	000-094-098	Nut, 7/16”-24UNF - 2-Way Metering Valve	1
32	000-100-166	Panel, Lower Instrument - Coated	1
33	000-052-052	Quick Connect, 660 3/8” Brass w/ EPDM O-Ring	1
34	000-052-769	Quick Connect, High PSI Female 1/4” NPT	1
35	000-052-768	Quick Connect, High PSI Male 1/4” NPT	1
36	000-135-052	Regulator, High PSI Snubber	1
37	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	10
38	000-143-327	Screw, #10-32UNF X 0.50” Lg. Hex Head	2
39	000-143-542	Screw, 1/4”-28UNF X 0.50” Lg. Hex Head	2
40	000-155-053	Spring, 1/4” Belleville Washer	2
41	000-169-0171	Valve, 3-Way Ball O-Ring Style	1
42	000-169-064	Valve, 3/8” NPT Full Port Ball	1
43	000-169-160	Valve, Chemical Metering	1
44	000-174-001	Washer, #10 Flat	14
45	000-174-014	Washer, #10 Lock	2
46	000-174-007	Washer, 1/2” Flat	2
47	000-174-008	Washer, 5/8” Flat	4

Figure 9-25. PSI Regulator Valve (0 - 3,200 psi) Assembly
610-026-740 Rev D.

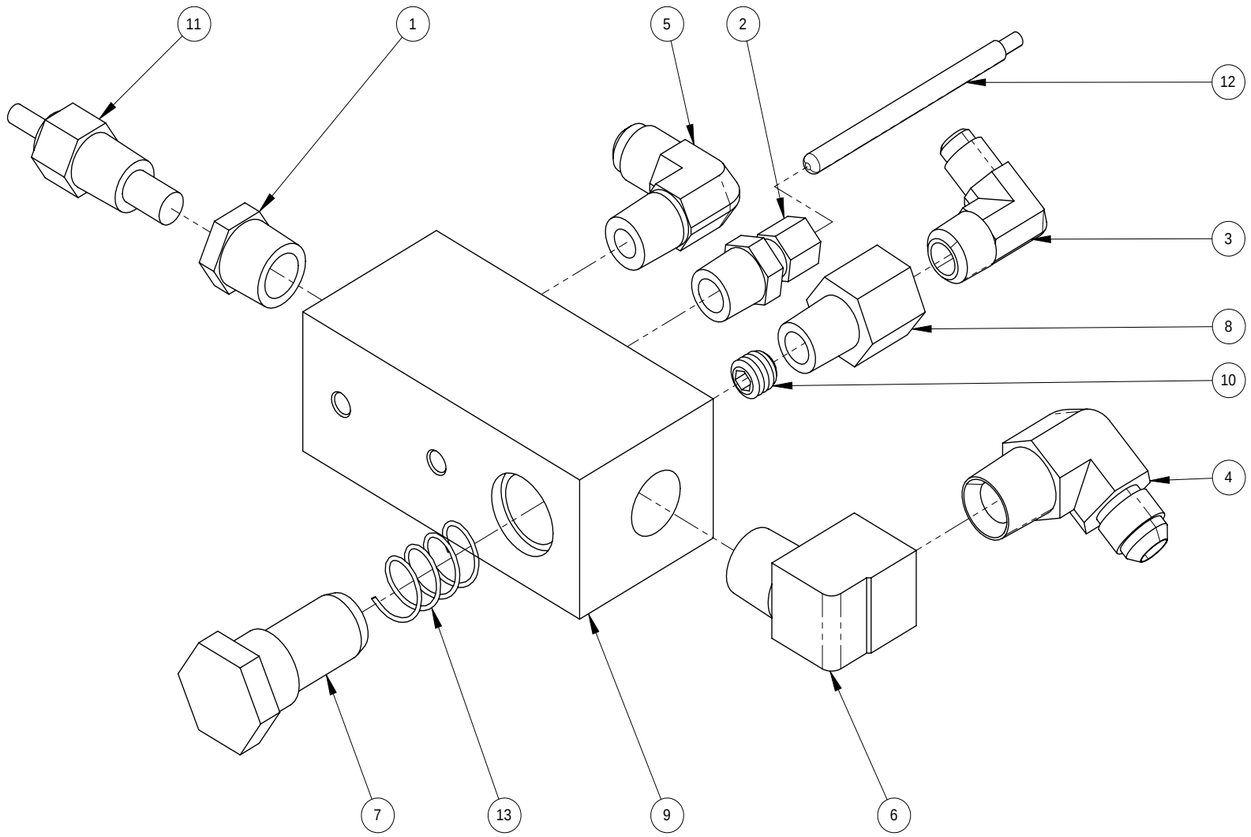




PSI Regulator Valve (0 - 3,200 psi) Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-515	Bracket, Cat By-Pass Valve Mount - Weldment	1
2	000-052-061	Bushing, 3/8” NPT X 1/4” FPT	1
3	000-052-587	Compression, 3/16” X 1/4” NPT Thermocouple	1
4	000-052-082	Elbow, 1/4” NPT Street X 45°	1
5	000-052-766	Elbow, 3/8 NPT X 3/8 JIC	1
6	000-052-751	Elbow, 3/8” JIC X 1/4” NPT	2
7	000-052-102	Insert, #46 (1/4” NPT X 3/8” Barb)	1
8	000-052-117	Insert, #48 (1/4” NPT X 1/2” Barb)	1
9	000-090-068	Manifold, Multi Port	2
10	000-052-527	Nipple, 1/4” SAE X 1/4” NPT	1
11	000-052-073	Nipple, 3/8” NPT X 1/4” NPT Hex	1
12	000-106-007	Plug, 1/4” NPT Allen Head	2
13	000-106-008	Plug, 3/8” NPT Allen Head	4
14	000-149-540	Sensor, RTD Compression Fitting Style	1
15	000-169-197	Valve, PSI Regulator 0 - 3,200 psi - Modified	1

Figure 9-26. Orifice Manifold Assembly
610-027-740 Rev. D



Orifice Manifold Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-061	Bushing, 3/8” NPT X 1/4” FPT	1
2	000-052-587	Compression, 3/16” X 1/4” NPT Thermocouple	1
3	000-052-532	Elbow, 1/4” SAE X 1/4” NPT	1
4	000-052-766	Elbow, 3/8 NPT X 3/8 JIC	1
5	000-052-751	Elbow, 3/8” JIC X 1/4” NPT	1
6	000-052-086	Elbow, 3/8” NPT Street	1
7	000-049-016	Filter, 1/4” NPT Replacement “Y”	1
8	000-052-423	Fitting, Bushing Modified Orifice Housing	1
9	000-090-069	Manifold, Orifice	1
10	000-180-003	Orifice, Set Screw - Ø0.046”	1
11	000-149-039	Sender, Temperature	1
12	000-149-540	Sensor, RTD Compression Fitting Style	1
13	000-155-020	Spring, 0.540 O.D. X 0.041 Wire X 1.00 Lg.	1

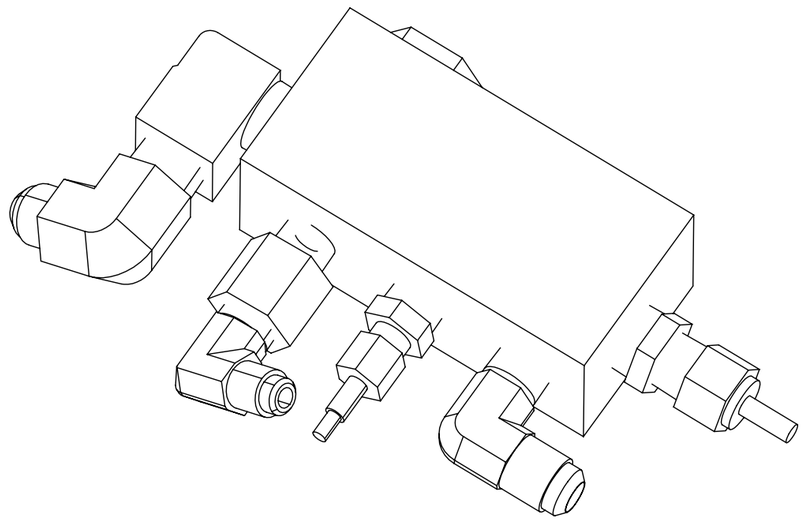
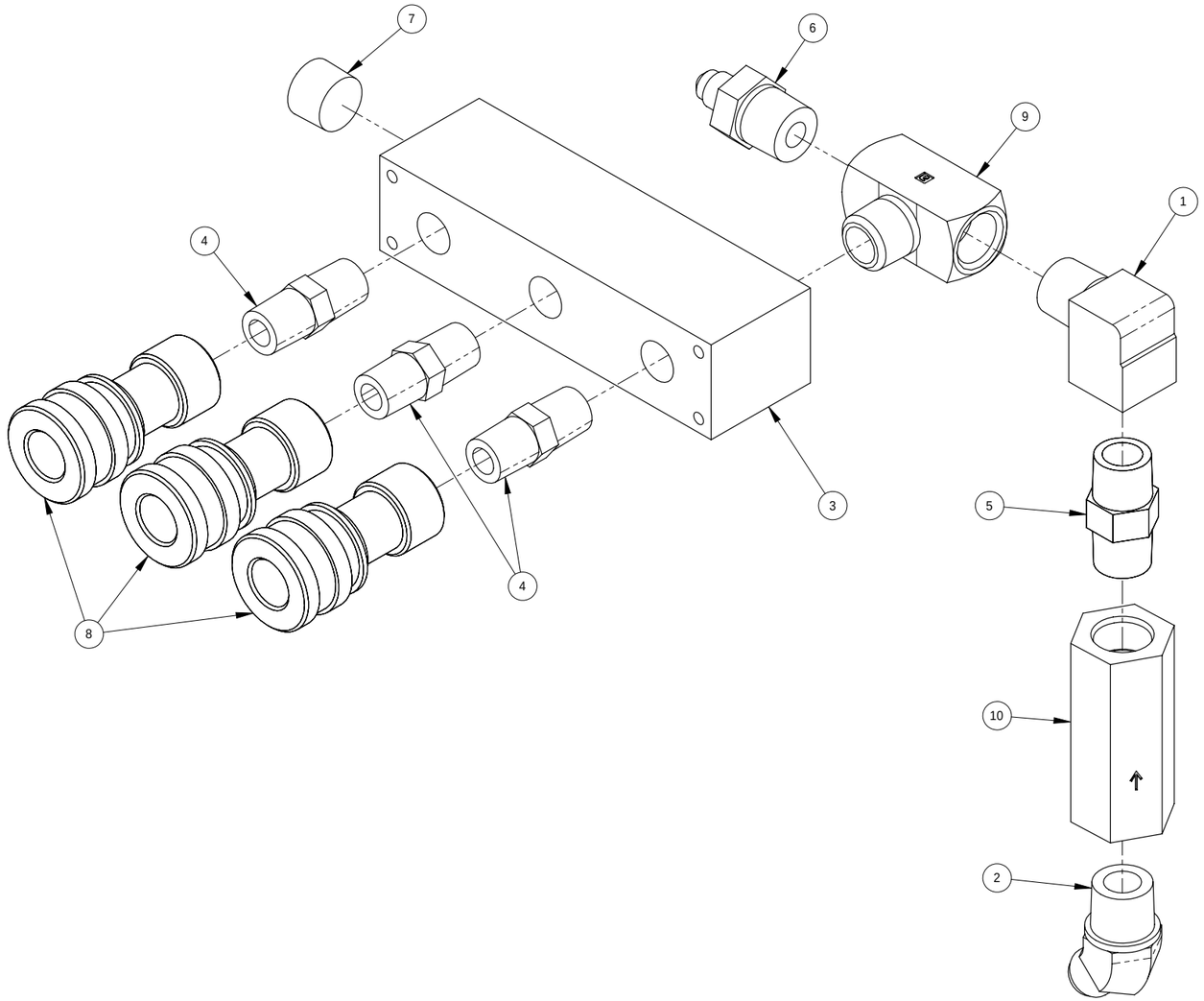


Figure 9-27. Hi Pressure Out Manifold Assembly
610-008-740 Rev. D



Hi Pressure Out Manifold Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-086	Elbow, 3/8” NPT Street	1
2	000-052-779	Elbow, 3/8” NPT X 3/8” M JIC X 45°	1
3	000-090-070	Manifold, Hi Pressure Out	1
4	000-052-071	Nipple, 1/4” NPT Hex	3
5	000-052-074	Nipple, 3/8” NPT Hex	1
6	000-052-662	Nipple, 3/8” NPT X 1/4” M SAE	1
7	000-106-008	Plug, 3/8” NPT Allen Head	1
8	000-052-051	Quick Connect, 440 Female w/ EPDM O-Ring	3
9	000-052-447	Tee, 3/8” NPT Male Branch	1
10	000-169-219	Valve, Check 80 psi - Last Step Chemical	1

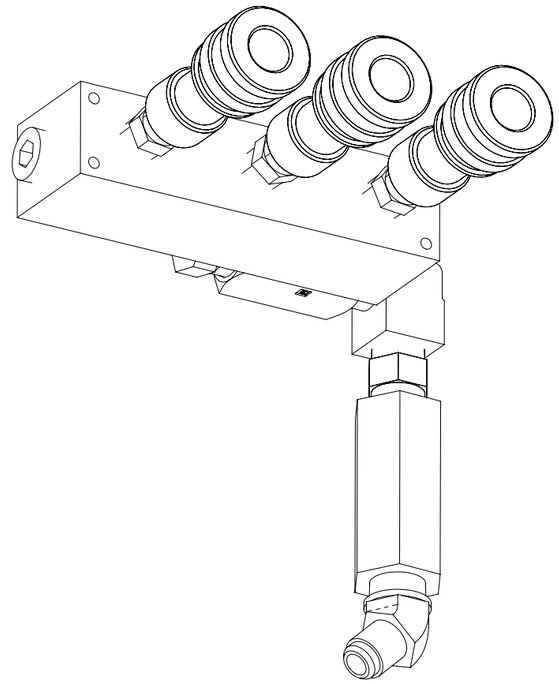
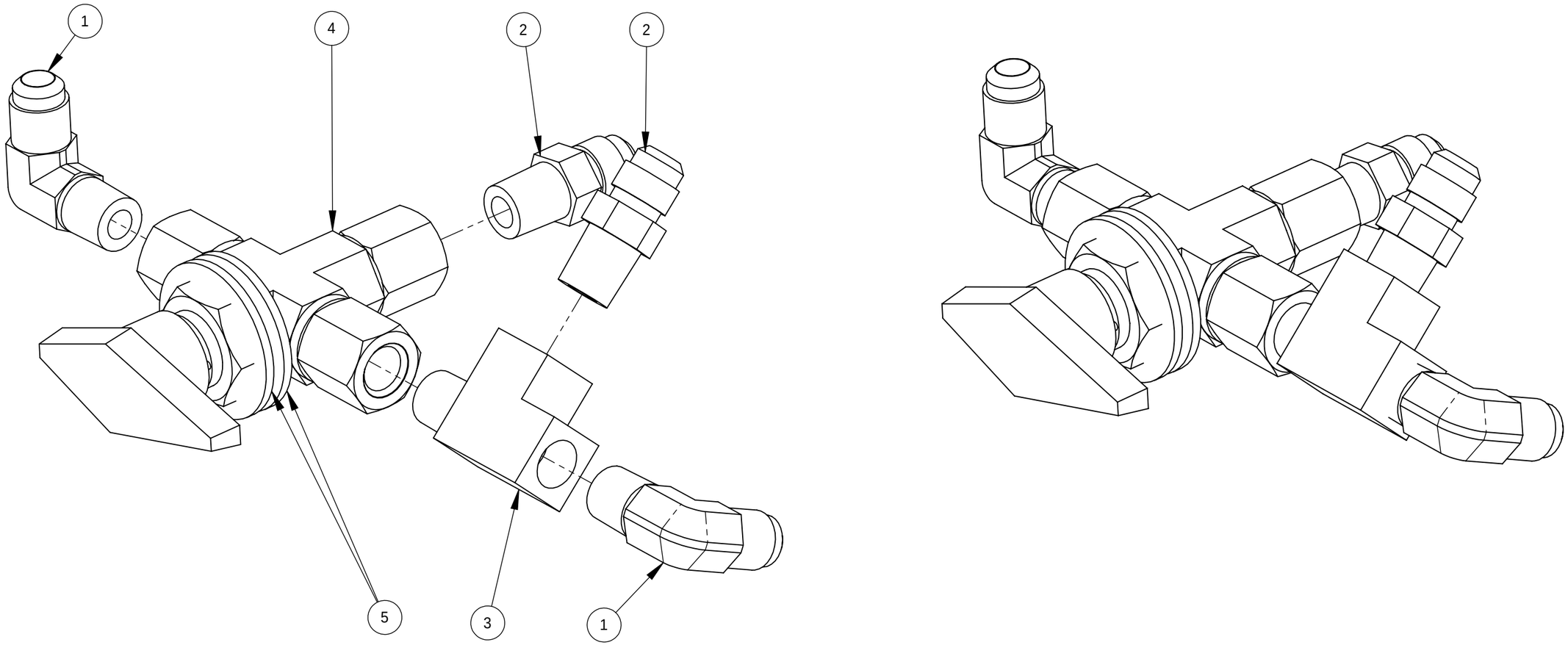


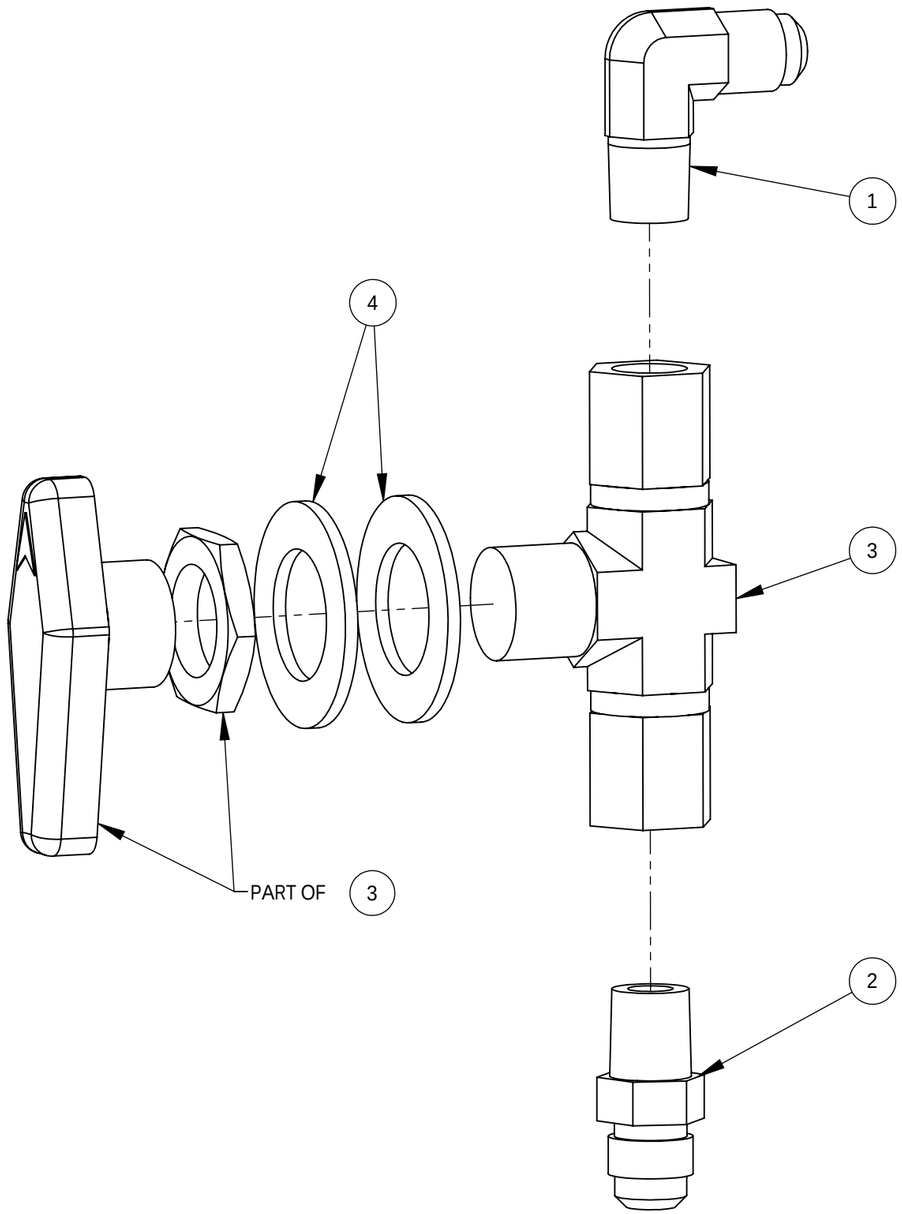
Figure 9-28. 3-Way Valve Assembly
610-026-001 Rev. C



3-Way Valve Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-751	Elbow, 3/8” JIC X 1/4” NPT	2
2	000-052-533	Nipple, 3/8” JIC X 1/4” NPT	2
3	000-052-090	Tee, 1/4” NPT Branch M-F-F	1
4	000-169-213	Valve, 3-Way 1/4” FPT	1
5	000-174-028	Washer, 7/8” I.D. X 1.50” O.D. X 0.090” Thk.	2

Figure 9-29. 2-Way Valve Assembly
610-026-002 Rev. C



2-Way Valve Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-751	Elbow, 3/8” JIC X 1/4” NPT	1
2	000-052-533	Nipple, 3/8” JIC X 1/4” NPT	1
3	000-169-214	Valve, 2-Way Chem Pump - 1/4” FPT S/S	1
4	000-174-028	Washer, 7/8” I.D. X 1.50” O.D. X 0.090” Thk.	2

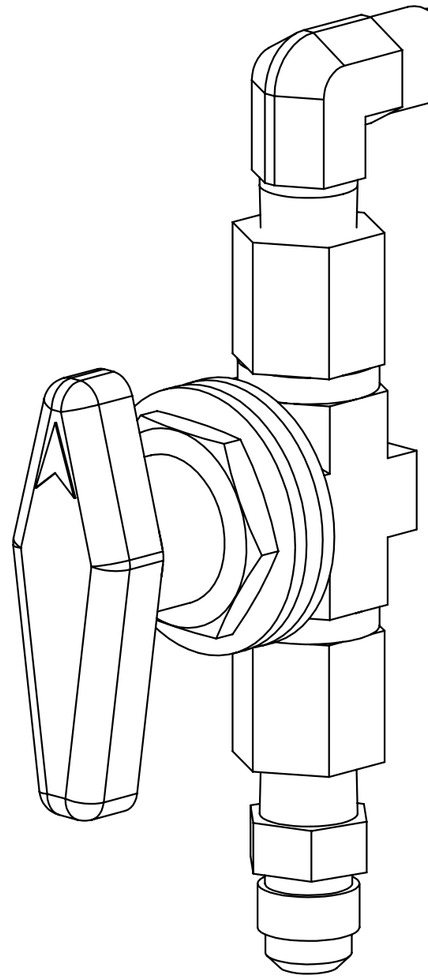
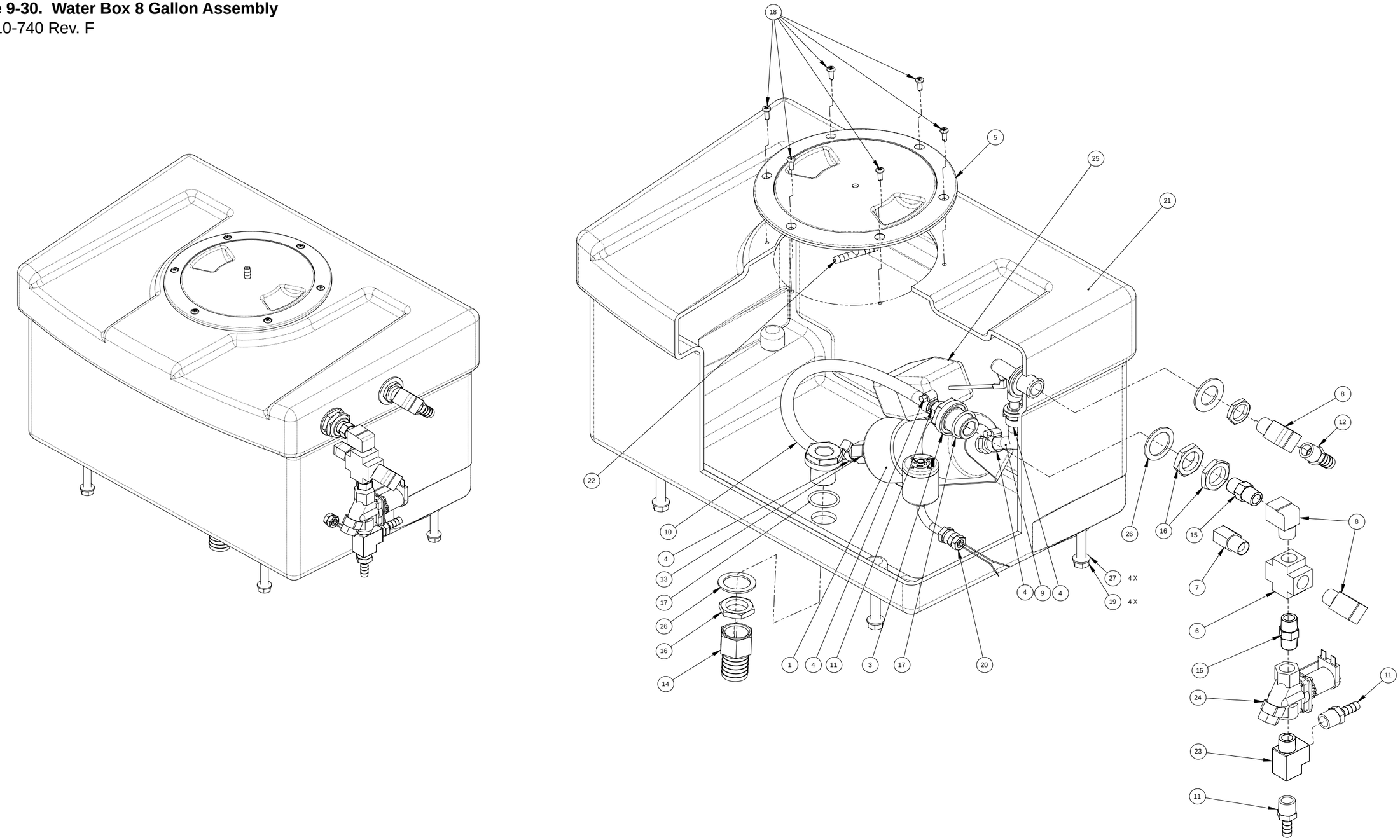


Figure 9-30. Water Box 8 Gallon Assembly
610-010-740 Rev. F

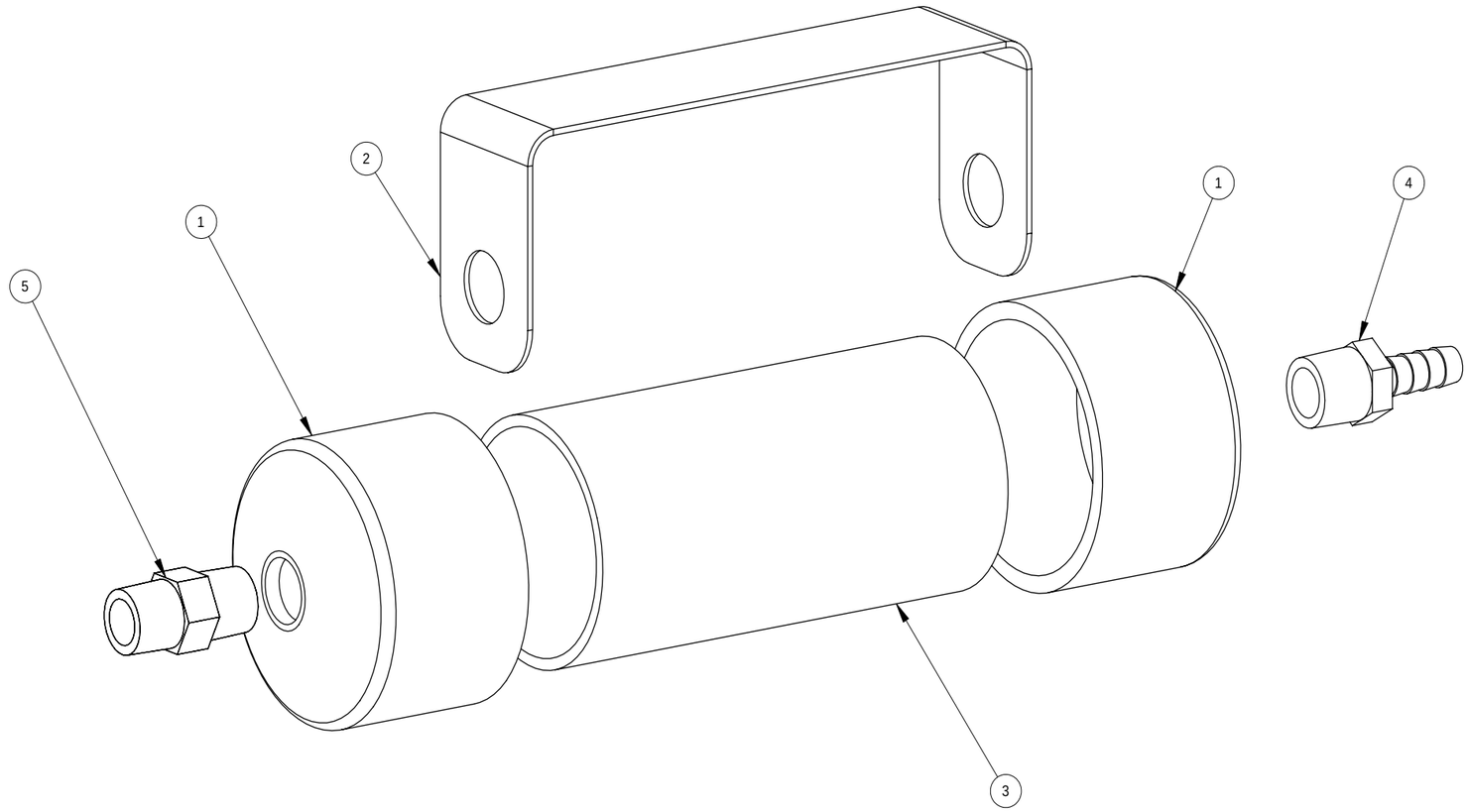


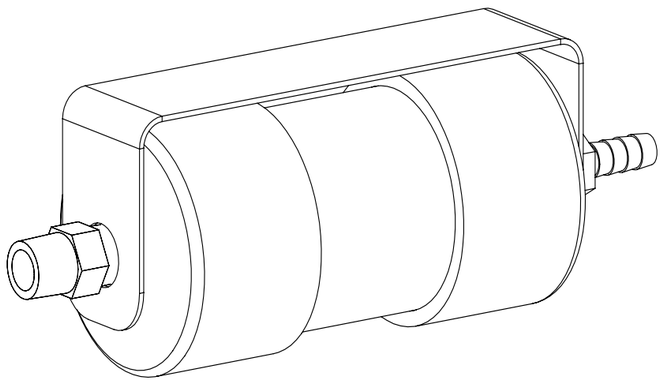
Water Box 8 Gallon Assembly Parts List

Item	Part Number	Description	Qty
1	000-049-151	Assembly, Diffuser Filter	1
2	000-052-728	Bulkhead, 1/2” FPT	1
3	000-052-660	Bulkhead, 3/8” FPT X 3/8” FPT	1
4	000-033-003	Clamp, Size #4 Mini Hose	4
5	000-041-005	Cover, 6” Access	1
6	000-052-113	Cross, 3/8” FPT	1
7	000-052-766	Elbow, 3/8 NPT X 3/8 JIC	1
8	000-052-086	Elbow, 3/8” NPT Street	3
9	000-068-326	Hose, 3/8” I.D. Clear Braid	1
10	000-068-326	Hose, 3/8” I.D. Clear w/ Braid	1
11	000-052-104	Insert, #66 (3/8” NPT X 3/8” Barb)	3
12	000-052-105	Insert, #68 (3/8” NPT X 1/2” Barb)	1
13	000-052-488	Insert, #F66 (3/8” NPT X 3/8” Hose Barb)	1
14	000-052-754	Insert, #F816 (1/2” FPT X 1” Barb)	1

Item	Part Number	Description	Qty
15	000-052-074	Nipple, 3/8” NPT Hex	2
16	000-094-097	Nut, 1”-14UNS Brass	3
17	000-097-041	O-Ring, 1/2” Bulk Head	2
18	000-143-314	Screw, #8 X 1/2” Lg. Pan Head	6
19	000-143-097	Screw, 3/8”-16UNC X 2.50” Lg. Hex Head Grade 5	4
20	000-157-0801	Switch, w/Protector, Polypropylene Barrel	1
21	000-159-135	Tank, Poly Water Box 8g	1
22	000-052-156	Tee, 1/4” Plastic	1
23	000-052-023	Tee, 3/8” NPT Male Street	1
24	000-169-120	Valve, Chemical and Hi-Temp Solenoid - 12 V	1
25	000-169-218	Valve, Float, Water Box	1
26	000-174-063	Washer, 1.5” O.D. X 1.073” I.D. X 0.075” Thk.	2
27	000-174-004	Washer, 5/16” Flat	4

Figure 9-31. Diffuser Assembly
000-049-151 Rev. A

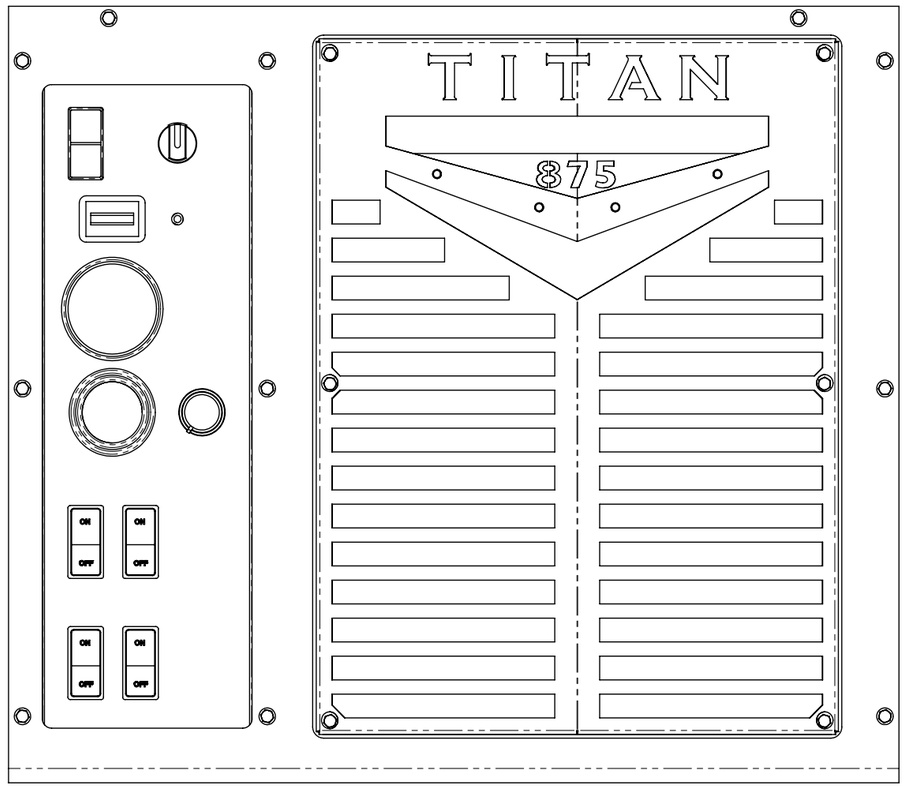


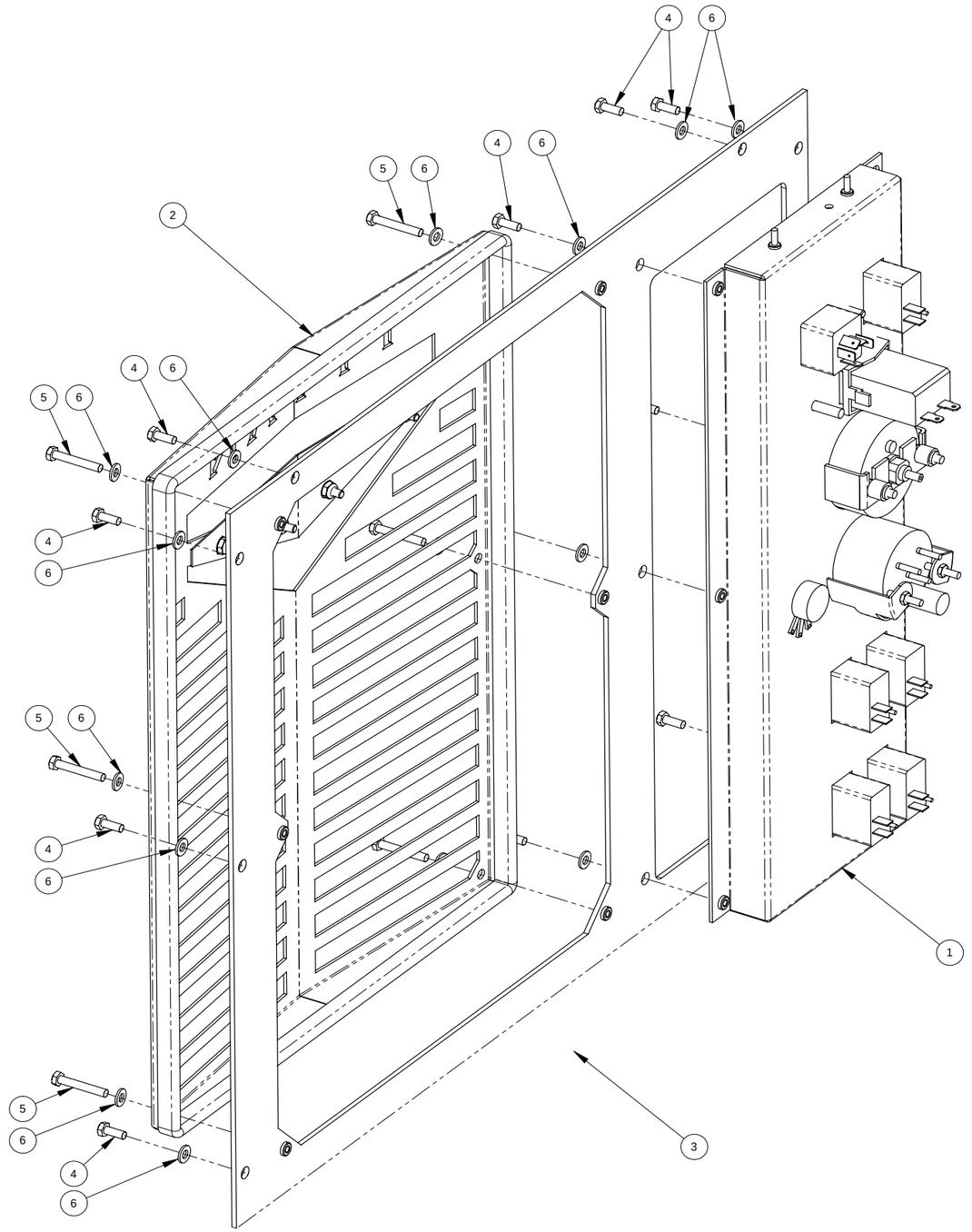


Diffuser Assembly Parts List

Item	Part Number	Description	Qty
1	000-027-115	Cap, 2” PVC Modified for Diffuser	2
2	000-033-131	Clamp, Diffuser	1
3	000-125-222	Tube, Diffuser	1
4	000-052-104	Insert, #66 (3/8” NPT X 3/8” Barb)	1
5	000-052-074	Nipple, 3/8” NPT Hex	1

Figure 9-32. Upper Dash Assembly
610-020-740 Rev. D

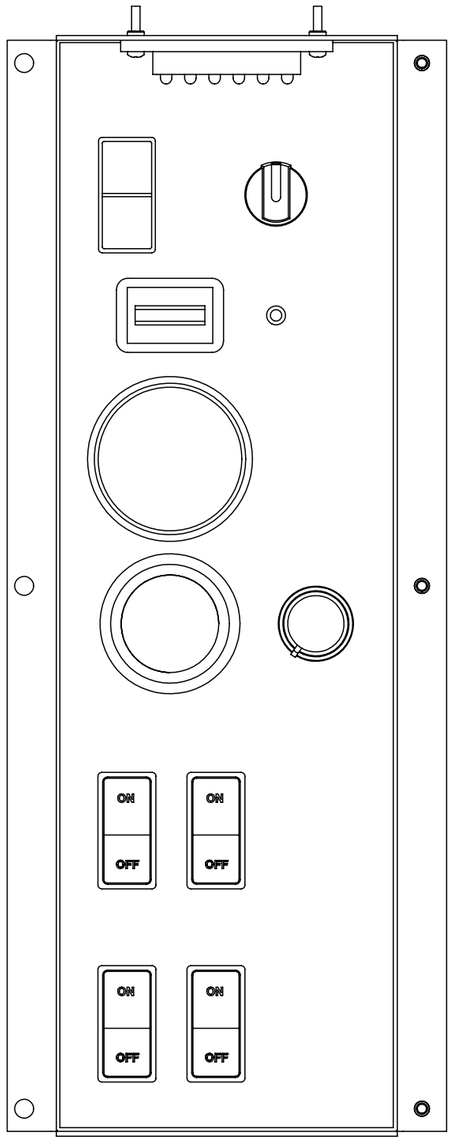


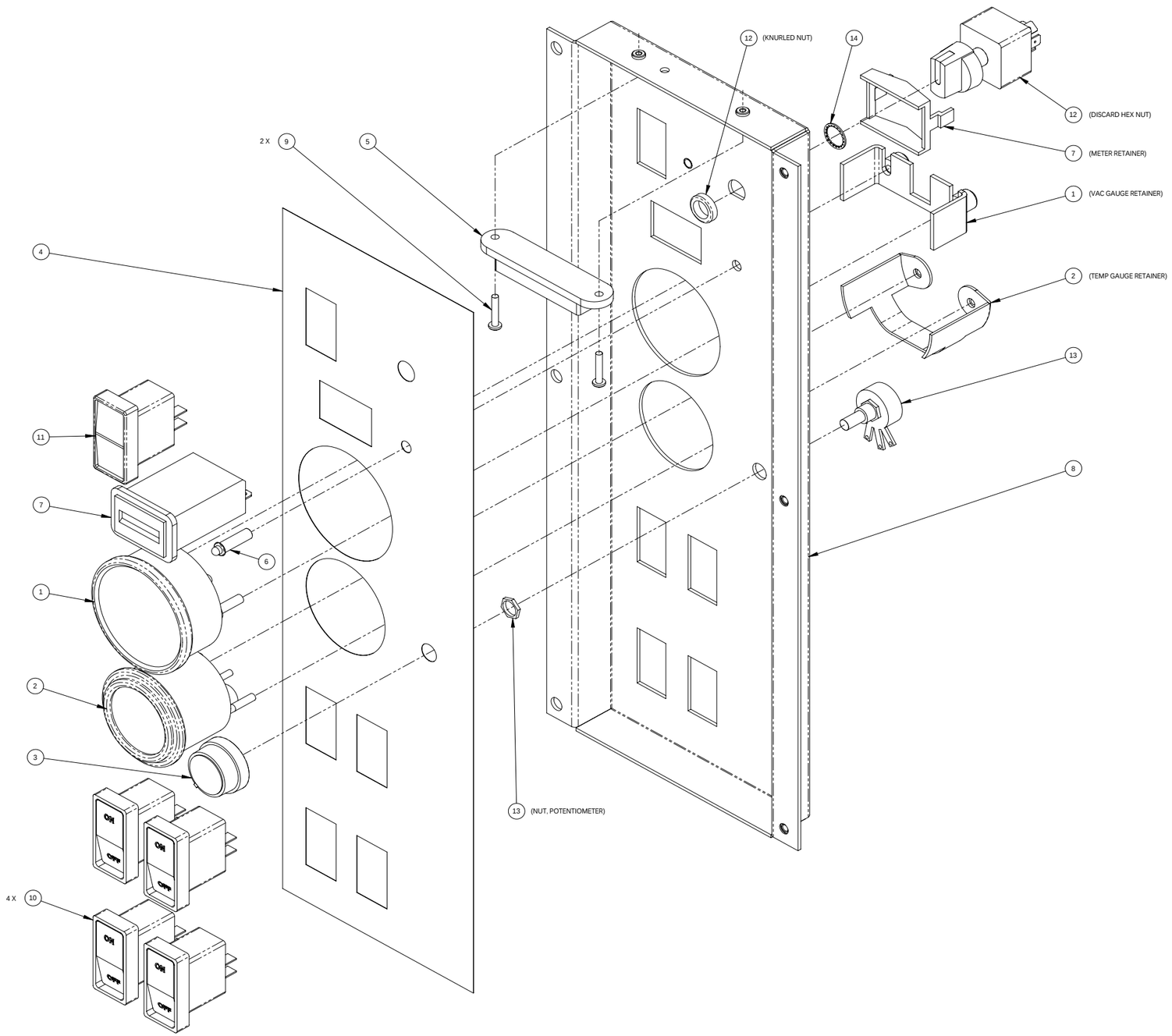


Upper Dash Assembly Parts List

Item	Part Number	Description	Qty
1	610-025-740	Assembly, Dash Gauge Panel,	1
2	610-028-740	Assembly, Grill	1
3	000-100-164	Panel, Dash - Coated	1
4	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	11
5	000-143-171	Screw, #10-24UNC X 1.25” Lg. Hex Head	6
6	000-174-001	Washer, #10 Flat	17

Figure 9-33. Dash Gauge Panel Assembly
610-025-740 Rev. D





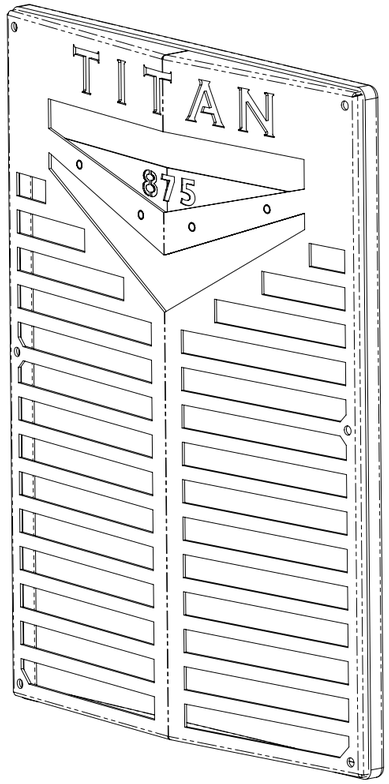
Dash Gauge Panel Assembly Parts List

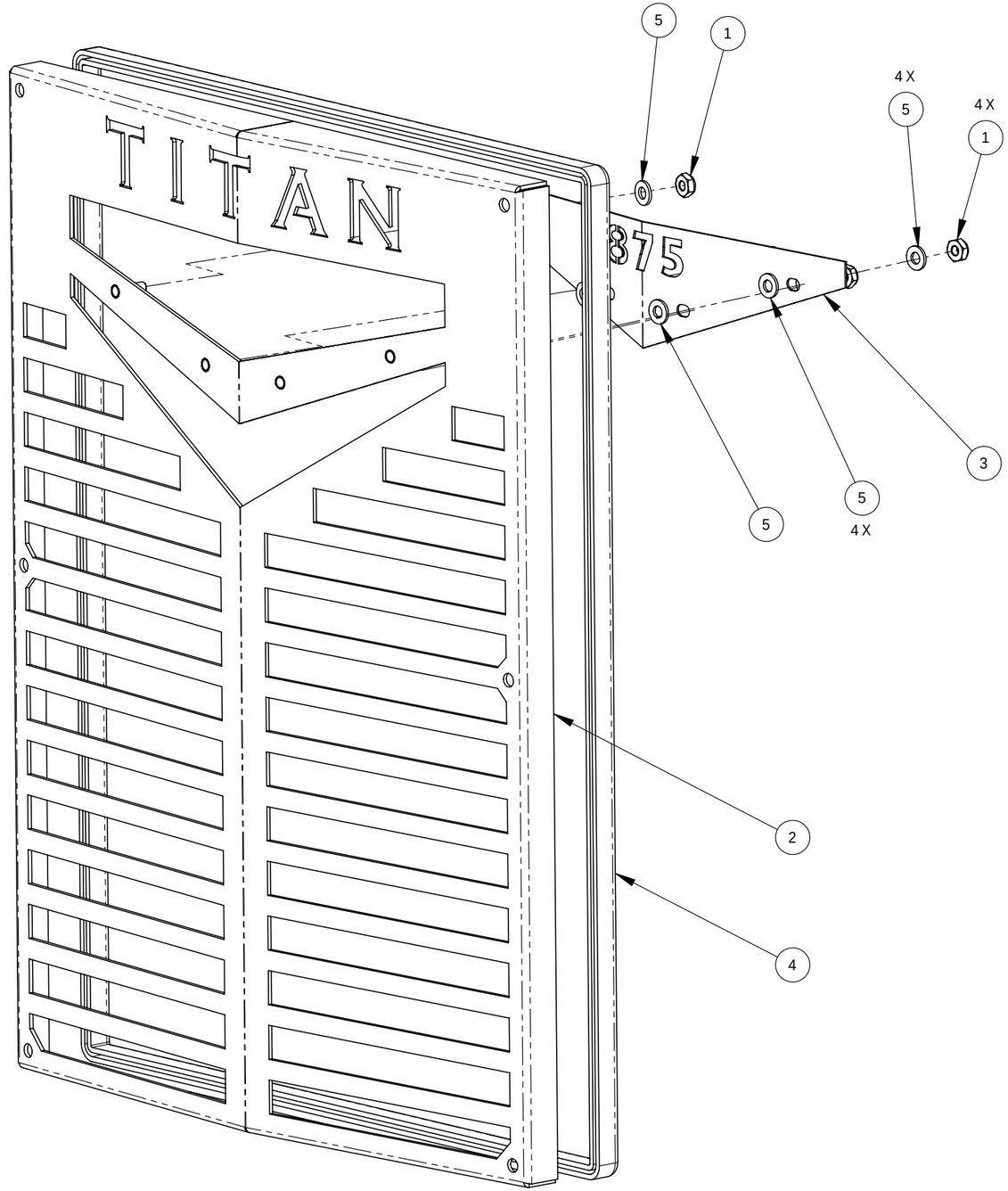
Item	Part Number	Description	Qty
1	000-074-017	Gauge, 0-30” Hg Vac. 2 1/2” Face	1
2	000-074-016	Gauge, Temperature	1
3	000-061-056	Knob, Temperature Adjustment	1
4	000-081-360	Label, Inset Dash Panel	1
5	000-084-019	Light, Blue LED Strip	1
6	000-084-012	Light, Yellow LED Indicator Mini	1
7	000-074-170	Meter, Rectangular Hour w/o Bezel	1
8	000-100-165	Panel, Inset, Dash - Coated	1
9	000-143-326	Screw, #6-32 X .750” Lg. PHP	2
10	000-157-040	Switch, 20 Amp Rocker	4
11	000-157-152	Switch, Ignition	1
12	000-157-060	Switch, Rotary, 4-Position	1
13	000-149-551*	Thermostat, Potentiometer Dual Controller *	1
14	000-174-046	Washer, Switch Lock	1

NOTICE

* To order spare thermostat (P/N 000-149-551), specify P/N 000-149-552.

Figure 9-34. Grill Assembly
610-028-740 Rev. C

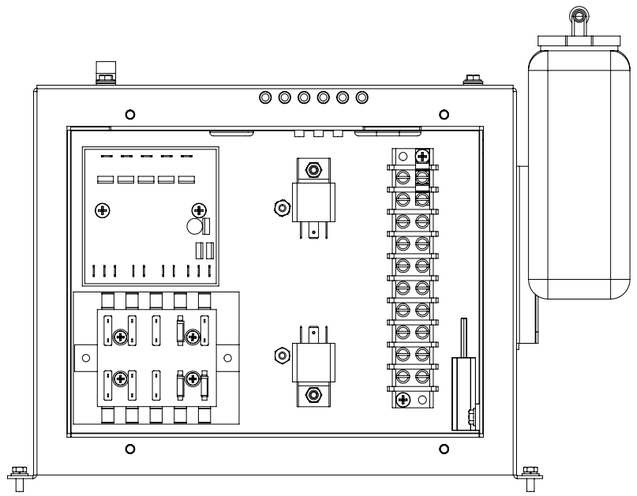


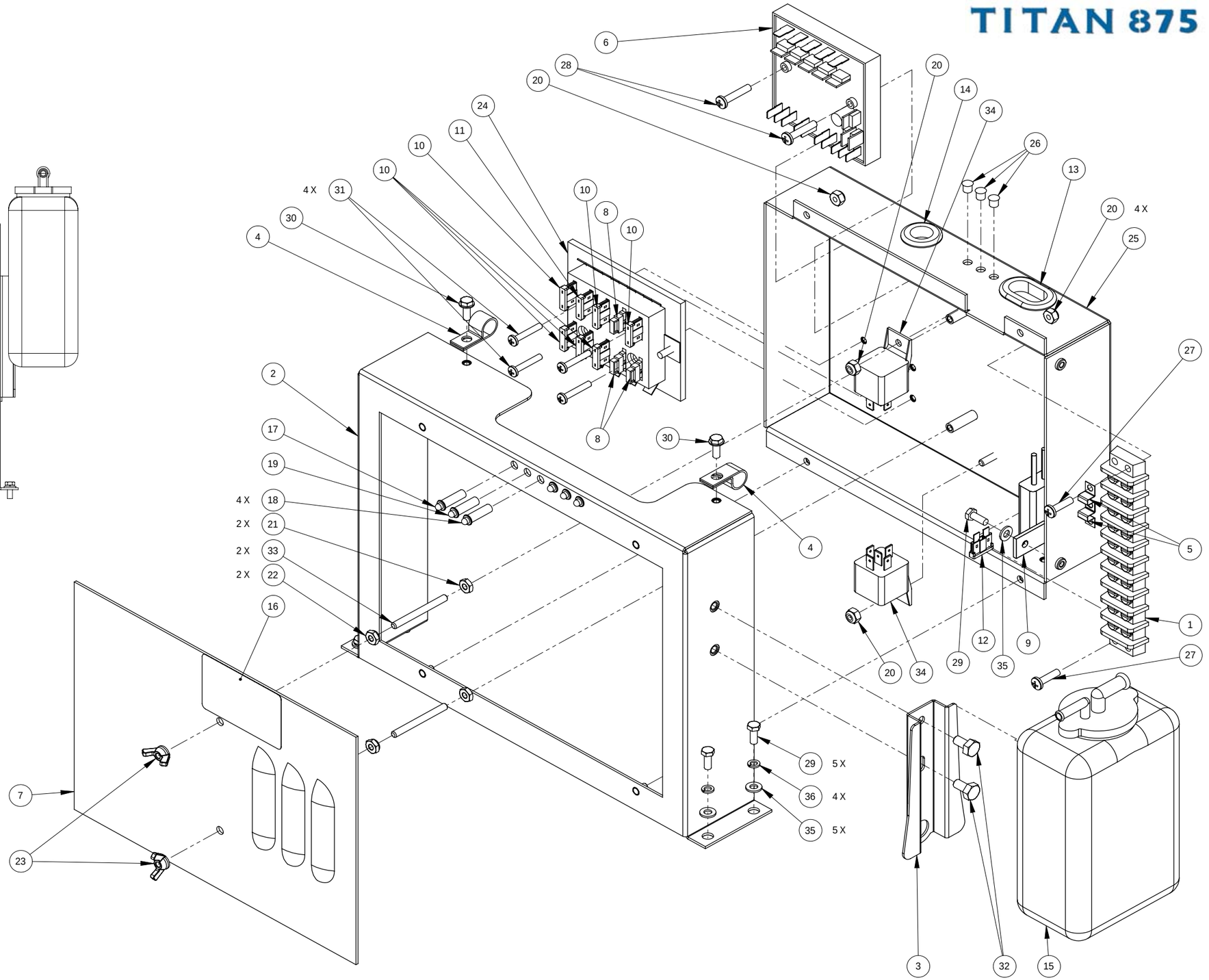


Grill Assembly Parts List

Item	Part Number	Description	Qty
1	000-094-058	Nut, #10-32UNF Nylock	4
2	000-100-172	Panel, Grill	1
3	000-100-178	Panel, Logo Grill - Coated	1
4	000-131-131	Trimlok, 3/8” X 1/8” Groove	1 ft
5	000-174-001	Washer, #10 Flat	8

Figure 9-35. Electrical Panel Assembly
610-011-740 Rev. F

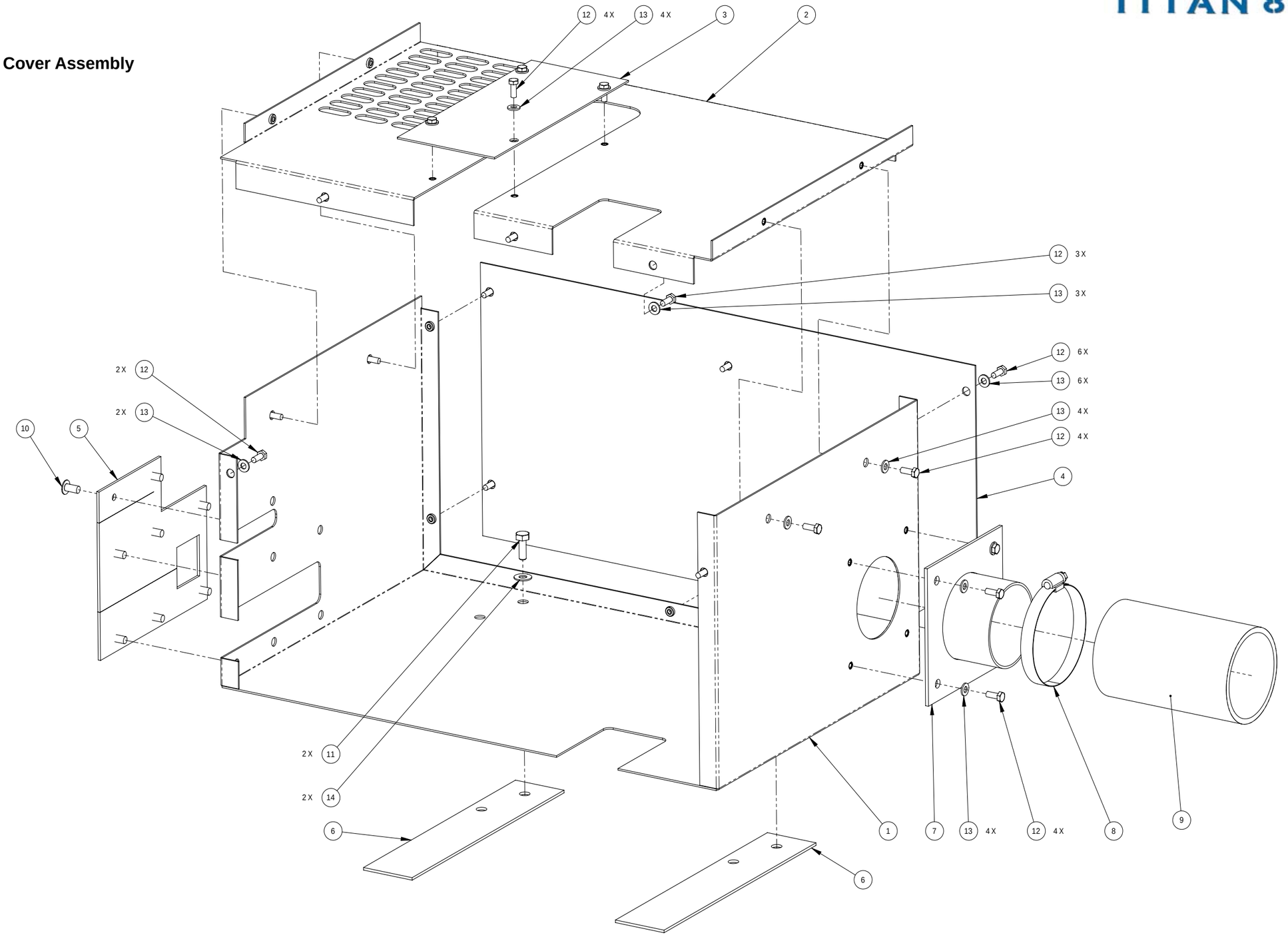




Electrical Panel Assembly Parts List

Item	Part Number	Description	Qty
1	000-012-010	Block, Terminal 10 Post	1
2	000-015-944	Bracket, Electrical Panel Mount - Coated	1
3	000-015-1010	Bracket, Overflow Jug (Comes w/ Engine)	1
4	000-033-046	Clamp, 1/2 Wide X 1/2 Tube	2
5	000-037-011	Connector, “Jumper” Terminal Block	2
6	000-074-130	Controller, Temp. Dual Independent	1
7	000-041-418	Cover, Electrical Control Panel - Coated	1
8	000-135-004	Diode, Plug In	3
9	000-056-006	Fuse Holder, In-Line - Weatherproof	1
10	000-056-007	Fuse, 10 Amp Plug In	6
11	000-056-010	Fuse, 25 Amp	1
12	000-056-011	Fuse, 30 Amp	1
13	000-060-014	Grommet, 1.00” I.D. X 1.50” O.D.	1
14	000-060-002	Grommet, Large Wiring	1
15	000-078-815	Jug, Overflow (Comes w/ Engine)	1
16	000-081-362	Label, Electrical Panel	1
17	000-084-010	Light, Green LED Indicator Mini	1
18	000-084-011	Light, Red LED Indicator Mini	4
19	000-084-012	Light, Yellow LED Indicator Mini	1
20	000-094-034	Nut, #10-24UNC Nylock	6
21	000-094-003	Nut, #10-32UNF Hex	2
22	000-094-058	Nut, #10-32UNF Nylock	2
23	000-094-108	Nut, #10-32UNF Wing	2
24	000-056-030	Panel, Diode	1
25	000-100-137	Panel, Electrical Control - Coated	1
26	000-106-172	Plug,1 /4” Plastic	3
27	000-143-062	Screw, #10-24 UNC. X 0.75” Lg. PPH	2
28	000-143-534	Screw, #10-24 UNC. X 1” Lg. PPH	2
29	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	5
30	000-143-583	Screw, #10-24UNC X 0.50” Lg. Hex Head Flange Z/P	2
31	000-143-545	Screw, #8-32 UNC. X 1” Lg. PPH	4
32	000-143-333	Screw, 1/4”-20UNC X 0.50” Lg. Hex Head	2
33	000-156-030	Stud, #10-32UNF X 2” Lg. S/S	2
34	000-157-022	Switch, Relay	2
35	000-174-001	Washer, #10 Flat	5
36	000-174-014	Washer, #10 Lock	4

Figure 9-36. Catalytic Cover Assembly
610-021-005 Rev. A



Catalytic Cover Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-455	Cover, Bottom and Ends Catalytic	1
2	000-041-456	Cover, Top - Catalytic	1
3	000-041-457	Cover, Removable - Catalytic	1
4	000-041-458	Cover, Side - Catalytic	1
5	000-108-146	Protector, Cat Cover	1
6	000-057-214	Gasket, Cat Heat Shield	2
7	000-001-132	Adapter, 3.0” Tank to Blower Hose - Coated	1
8	000-033-013	Clamp, #48 Hose (3”)	1
9	000-068-943	Hose, 3” I.D. 3 Ply Sil.	1
10	000-140-021	Rivet, 1/4” Blind X 0.50” Lg.	8
11	000-143-001	Screw, 1/4”-20UNC X 0.75” Lg. Hex Head	2
12	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	23
13	000-174-001	Washer, #10 Flat	23
14	000-174-003	Washer, 1/4” Flat	2

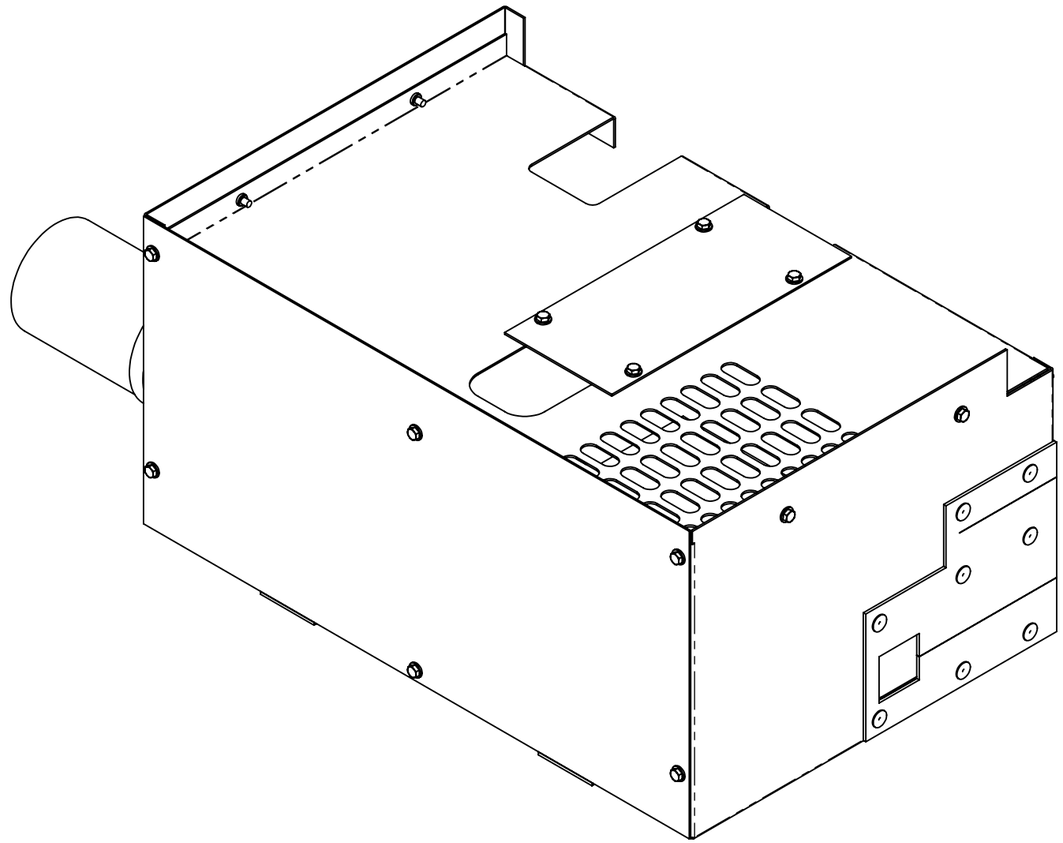
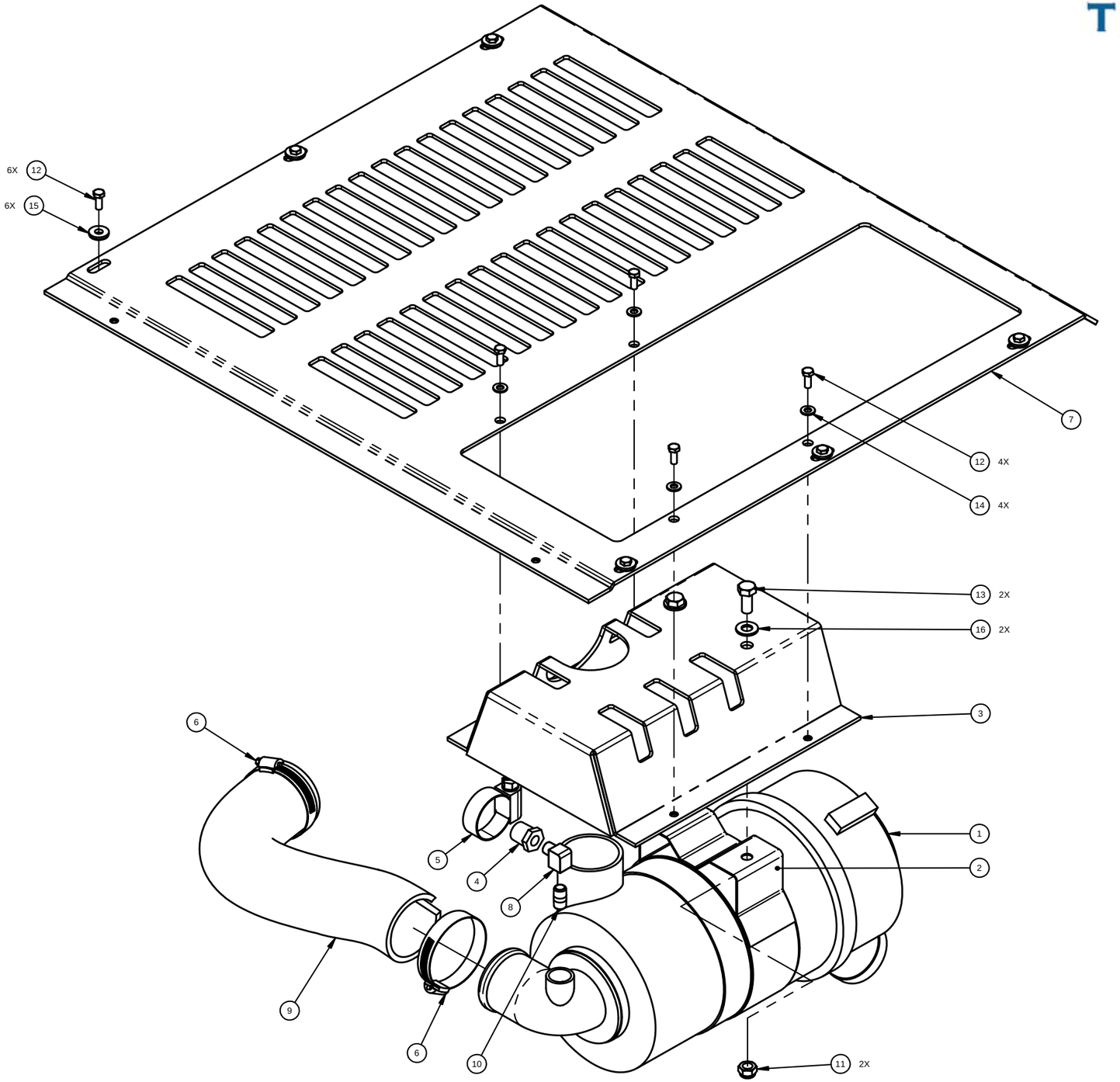


Figure 9-37. Top Cover - Machine Assembly
610-022-740 Rev. C



Top Cover - Machine Assembly Parts List

Item	Part Number	Description	Qty
1	000-049-251	Air Cleaner, Engine - Primary (Comes w/ Engine)	1
2	000-015-943	Bracket, Air Cleaner	1
3	000-015-943	Bracket, Air Cleaner Mount - Coated	1
4	000-052-060	Bushing, 3/8” NPT X 1/8” FPT	1
5	000-033-020	Clamp, Size #16 Hose	1
6	000-033-010	Clamp, Size #32 Hose	2
7	000-041-448	Cover, Top - Machine - Coated	1
8	000-052-084	Elbow, 1/8” NPT Street	1

Item	Part Number	Description	Qty
9	000-068-795	Hose, ‘L’ 2” I.D. Modified	1
10	000-052-057	Nipple, 1/8” NPT Close	1
11	000-094-038	Nut, 5/16”-18UNC Nylock	2
12	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	10
13	000-143-012	Screw, 5/16”-18UNC X 3/4” Lg.	2
14	000-174-001	Washer, #10 Flat	4
15	000-174-060	Washer, 1/4” Rubber Backed	6
16	000-174-049	Washer, 5/16” Flat	2

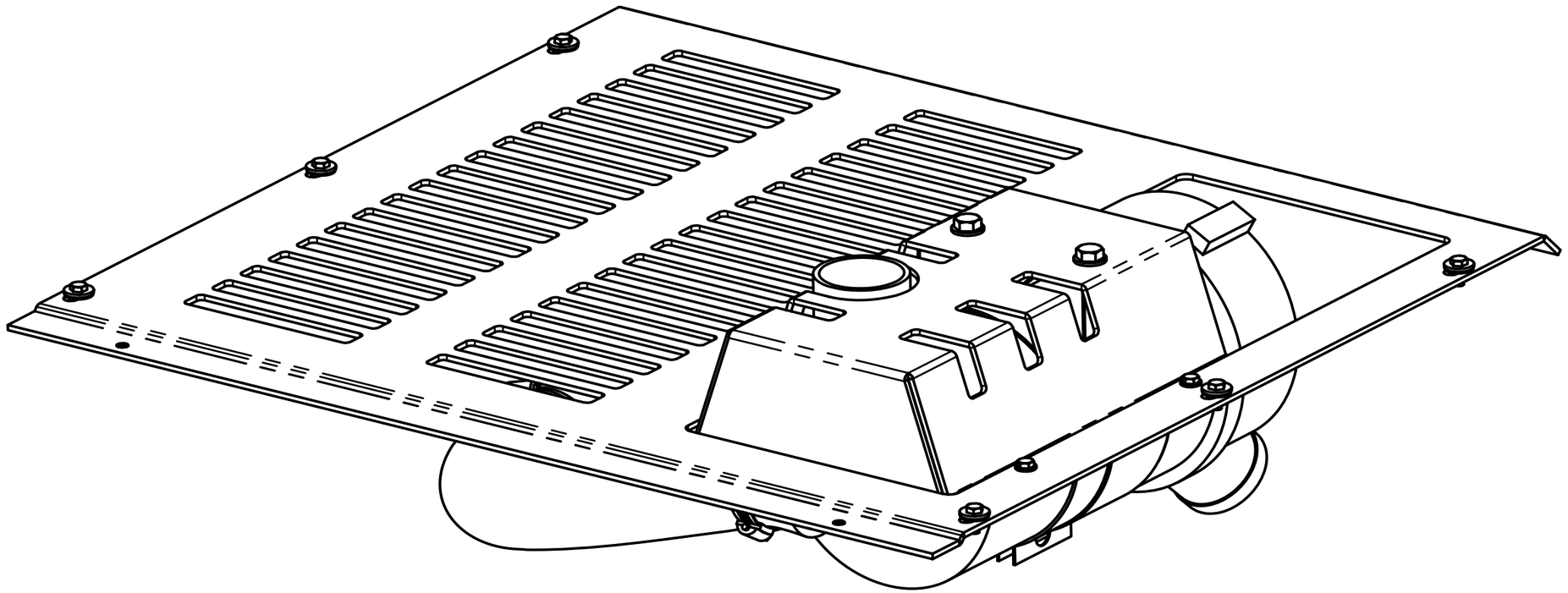


Figure 9-38. Left Side Cover - Machine Assembly
610-023-740 Rev. A

Left Side Cover - Machine Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-449	Cover, Left Side, Machine - Coated	1
2	000-089-003	Magnet	4
3	000-094-034	Nut, #10-24UNC Nylock	4
4	000-131-131	Trimlok, 3/8” X 1/8” Rubber	1 ft

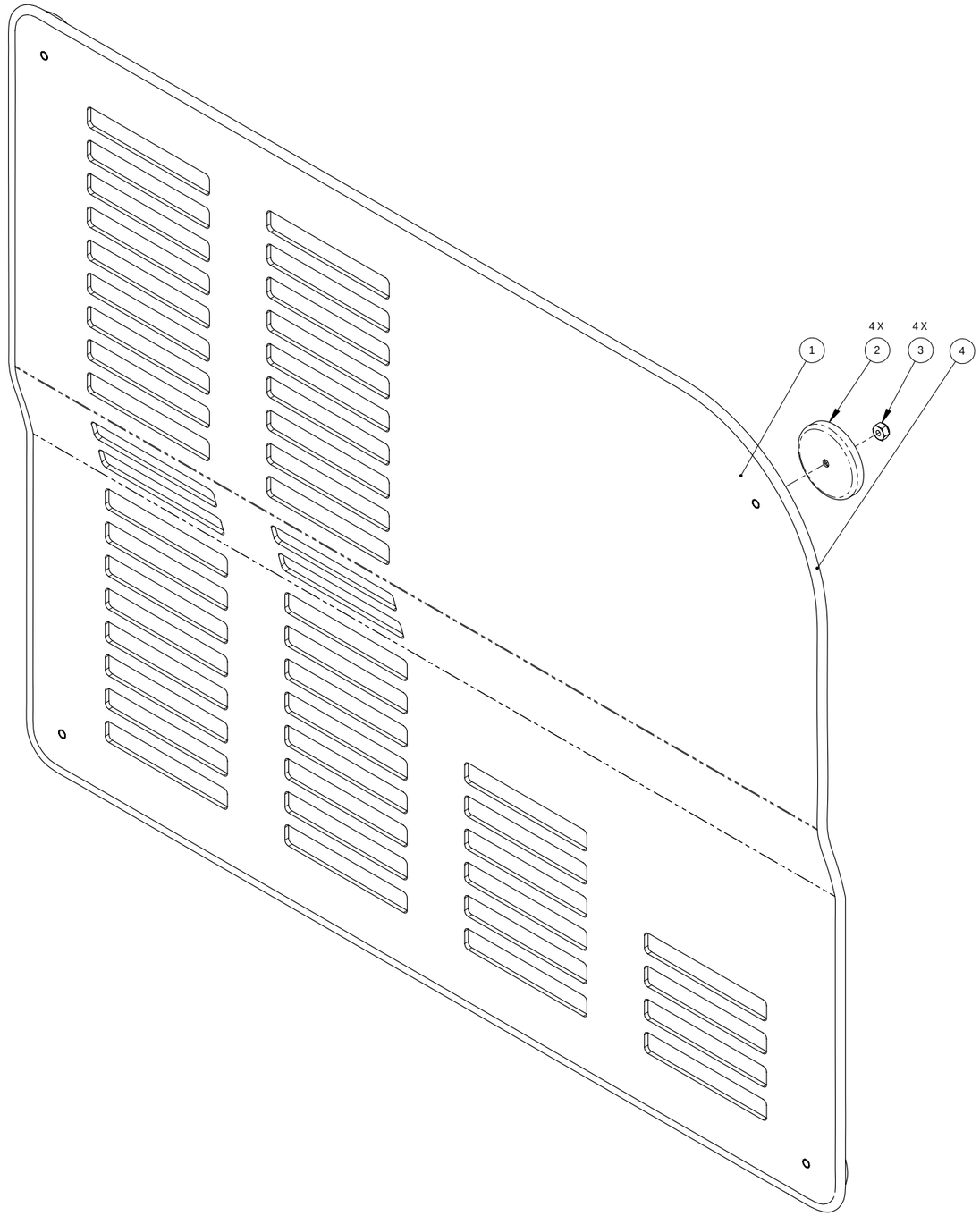


Figure 9-39. Right Side Cover - Machine Assembly
610-024-740 Rev. A

Right Side Cover - Machine Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-450	Cover, Right Side, Machine - Coated	1
2	000-089-003	Magnet	4
3	000-094-034	Nut, #10-24UNC Nylock	4
4	000-131-131	Trimlok, 3/8” X 1/8” Rubber	1 ft

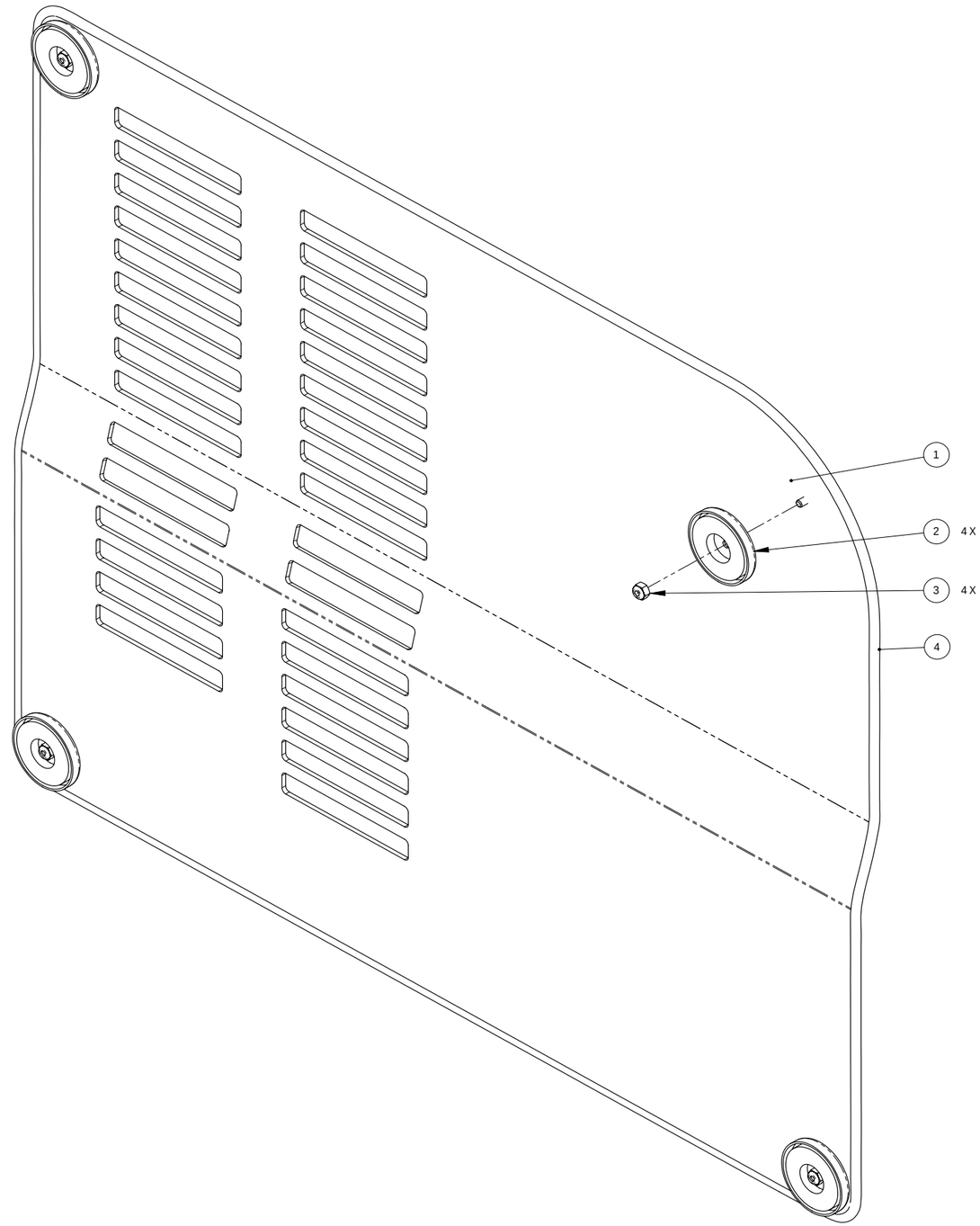
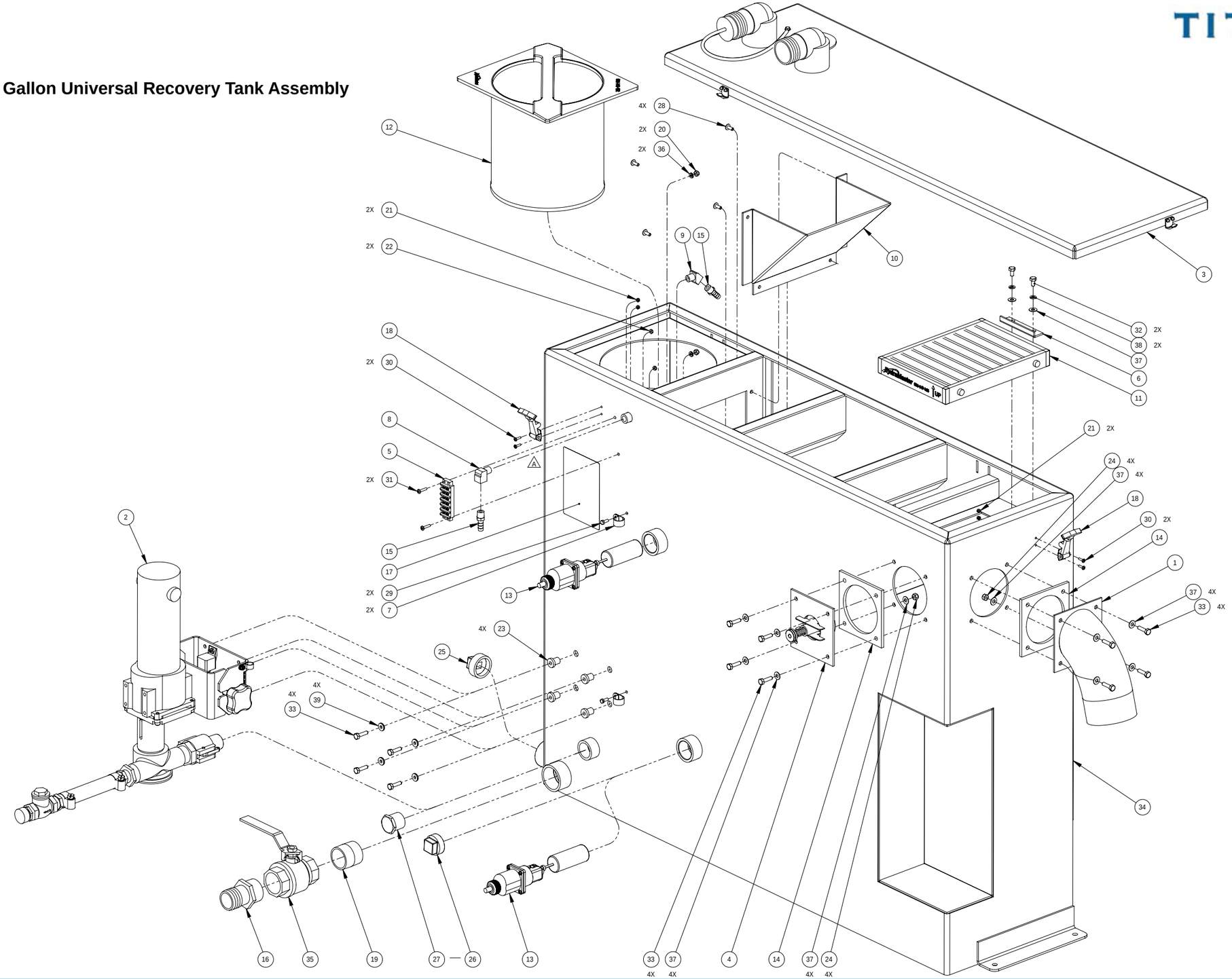


Figure 9-40. 100 Gallon Universal Recovery Tank Assembly
610-003-740



100 Gallon Universal Recovery Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-184	Adapter, 4” O.D. Elbow X 15 Degree - Coated	1
2	000-079-091	Assembly, Dura-Flow APO - Production	1
3	610-029-020	Assembly, 100 URT 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	000-033-023	Clamp, 3/4” Nylon Hose	2
8	000-052-085	Elbow, 1/4” NPT Street	1
9	000-052-082	Elbow, 1/4” NPT Street X 45°	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	000-052-102	Insert, #46 (1/4” NPT X 3/8” Barb)	2
16	000-052-226	Insert, 1-1/2” NPT X 1-1/2” Barb (Gray)	1
17	000-081-332	Label, Maintenance and Lube Schedule	1
18	000-086-008	Latch, Bungie	2
19	000-052-763	Nipple, 1-1/2” Ips Close S/S	1
20	000-094-034	Nut, #10-24UNC Nylock	2

Item	Part Number	Description	Qty
21	000-094-063	Nut, #6-32UNC Nylock	4
22	000-094-059	Nut, #8-32UNC Nylock	2
23	000-094-113	Nut, 1/4”-20UNC Neoprene Wellnut	4
24	000-094-009	Nut, 1/4”-20UNC Nylock	8
25	000-106-019	Plug, 1-1/2” NPT	1
26	000-106-046	Plug, 1-1/4” NPT	1
27	000-106-049	Plug,1” NPT Black Nylon	1
28	000-140-023	Rivet, AB8-6A Aluminum Pop	4
29	000-143-126	Screw, #10-24UNC X 0.50” Lg. Hex Head	2
30	000-143-539	Screw, #6-32UNC X 0.50” Lg. Button Head	4
31	000-143-051	Screw, #8-32UNC X 3/4” Lg. Binder Head	2
32	000-143-333	Screw, 1/4”-20UNC X 0.50” Lg. Hex Head	2
33	000-143-002	Screw, 1/4”-20UNC X 1.00” Lg. Hex Head	12
34	000-159-133	Tank, Recovery - 100 Gallon - Coated	1
35	000-169-022	Valve, 1-1/2” Full Port Ball	1
36	000-174-036	Washer, #10 Flat Rubber Backed	2
37	000-174-003	Washer, 1/4” Flat	18
38	000-174-019	Washer, 1/4” Lock	2
39	000-174-060	Washer, 1/4” Rubber Backed	4

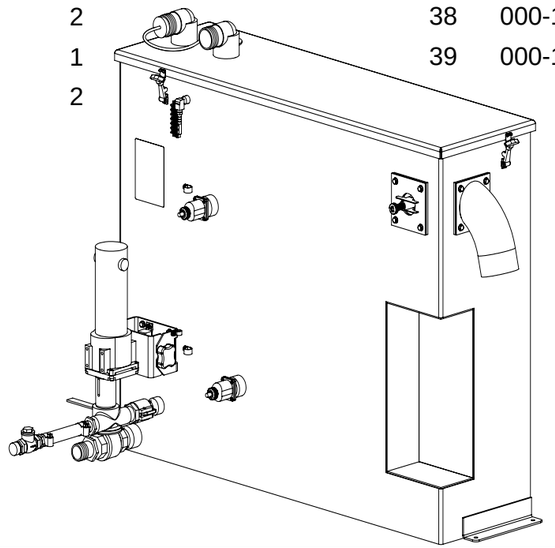
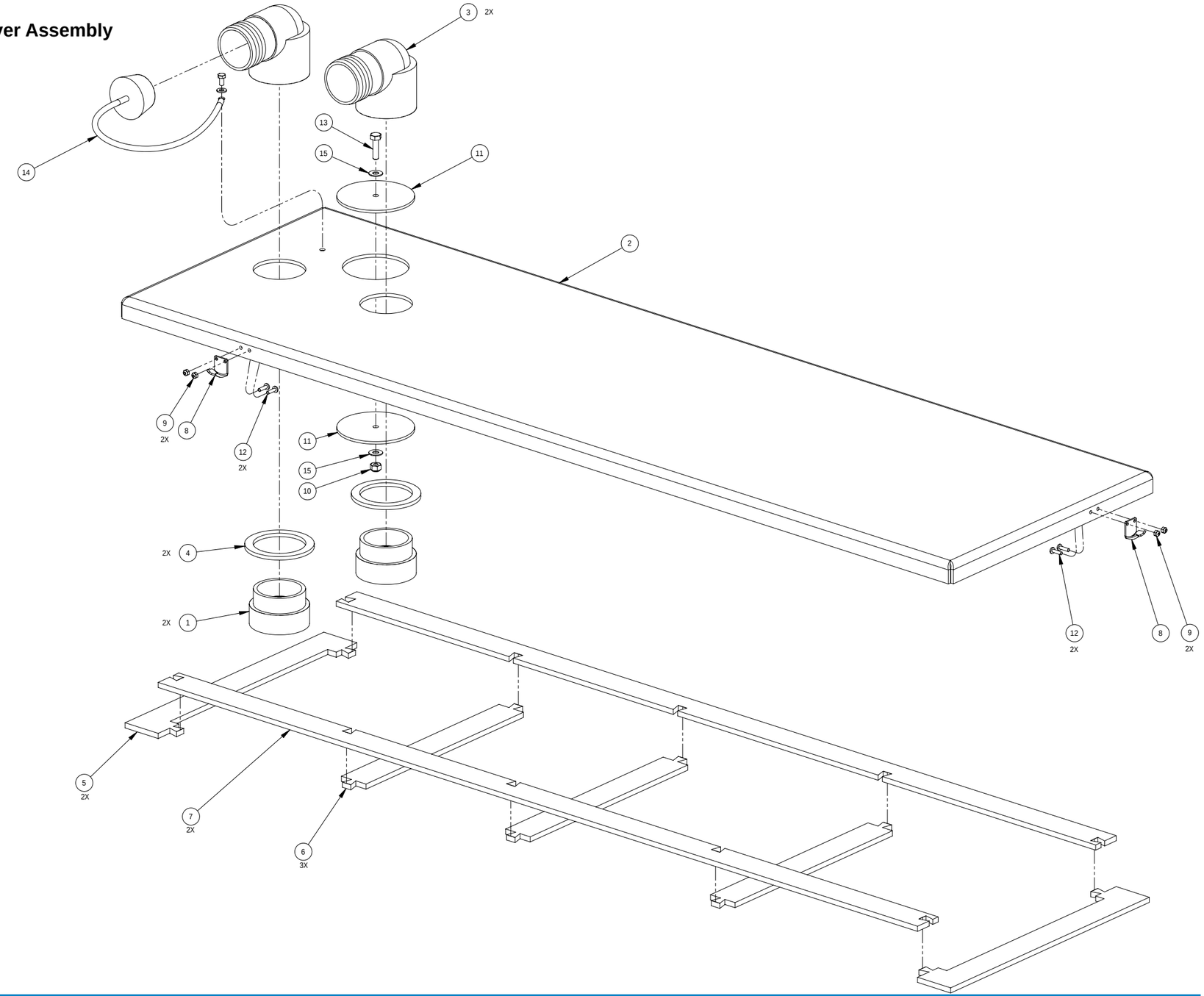


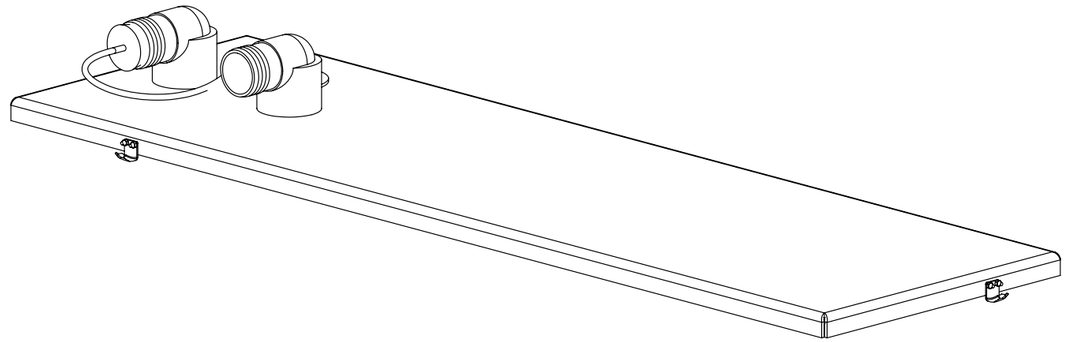
Figure 9-41. 100 Gallon Universal Recovery Tank Cover Assembly
610-029-020



100 Gallon Universal Recovery Cover Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-219	Adapter, 2” NPT X 2” F Slip	2
2	000-041-462	Cover, Recovery Tank - 100 Gal. 2.5” Vac Hose - 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	000-086-008	Latch, Bungee - Strike	2

Item	Part Number	Description	Qty
9	000-094-063	Nut, #6-32UNC Nylock	4
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	4
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



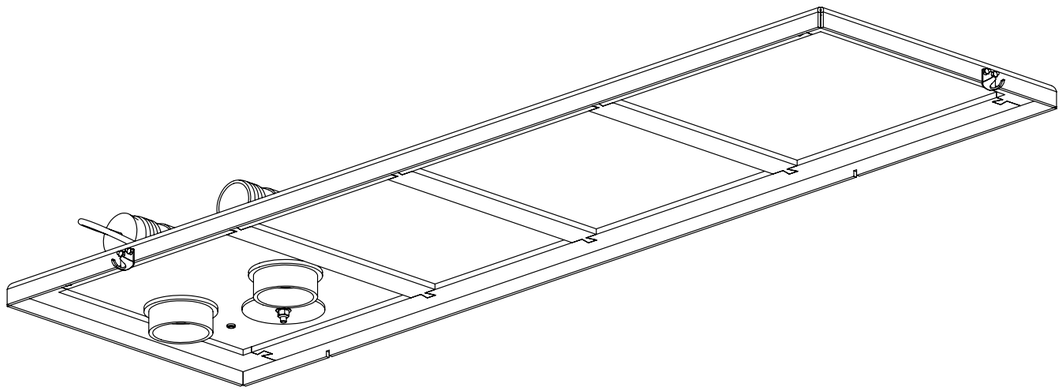
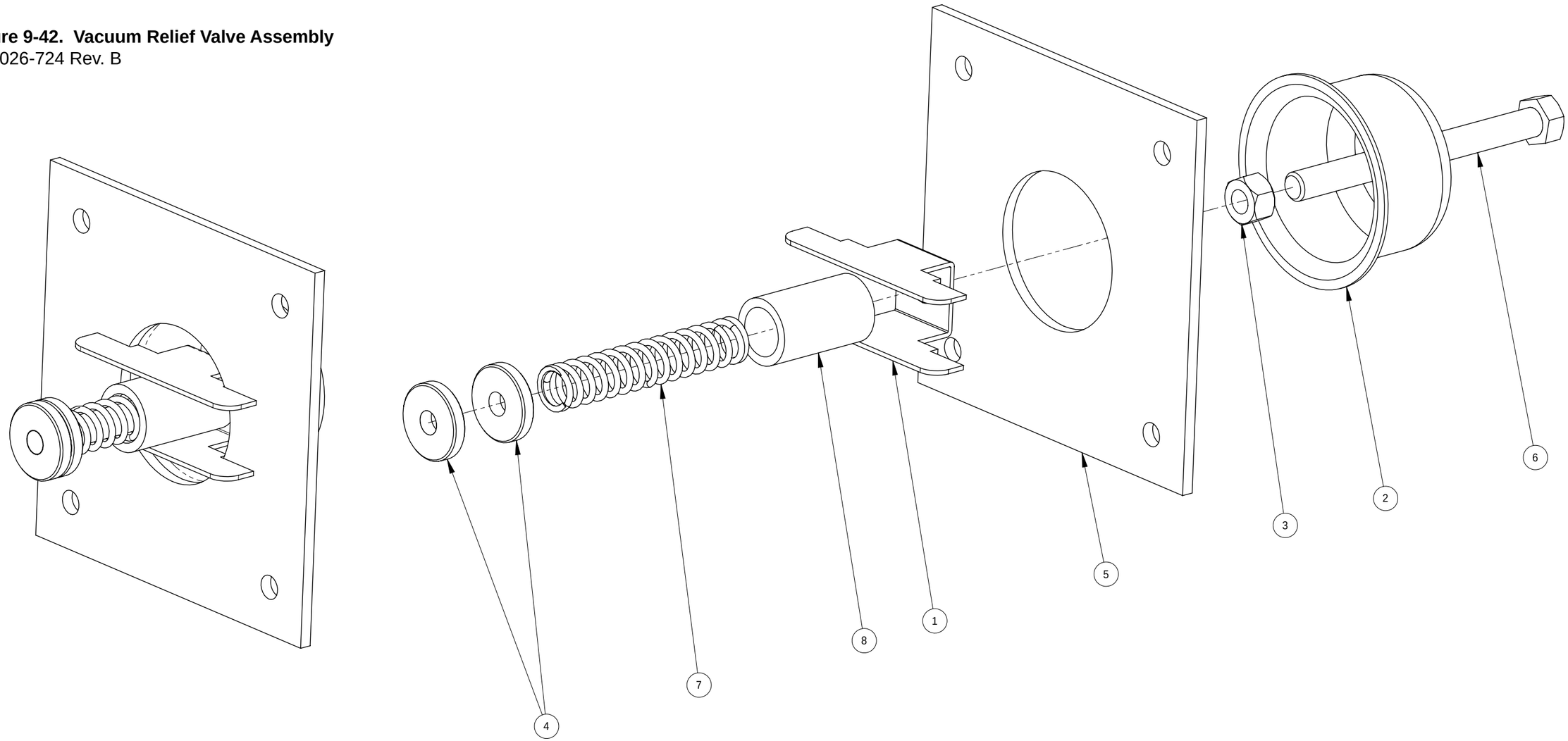


Figure 9-42. Vacuum Relief Valve Assembly
610-026-724 Rev. B



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”-16UNC 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

Machine Hose Routings

P/N	Length - Inches	Description	From	To
000-068-018	72	1/2" Low Temp Rubber	Fresh Water-Dash	Water Tank [Inlet]
000-068-086	70	1/2" Hi-Temp Rubber	By-Pass Valve	Water Tank [Return]
000-068-085	67	3/8" Hi-Temp Rubber	Chemical Prime	Water Tank [Solenoid]
000-068-326	62	3/8" Clear Braid	Flow Meter [Out/Top]	Chemical Pump
000-068-648	62	3/16" Teflon	Chemical Pump	Chemical Metering Valve
000-068-802	42	3/8" Teflon	By-Pass Valve	Hi Pressure Pump
000-068-791	24	1" Rubber Low Temp	Hi Pressure Pump	Water Tank
000-068-801	37	3/8" Teflon	Coolant Heat Exchanger [Front]	3-Way Valve [Return/Bottom]
000-068-786	52	3/8" Teflon	3-Way Valve [Top/Out]	Coolant Heat Exchanger [Back]
000-068-787	18	3/8" Teflon	3-Way Valve [Out/Bottom]	Blower Heat Exchanger [Front]
000-068-788	27.5	3/8" Teflon	Orifice Manifold	Blower Heat Exchanger [Back]
000-068-326	52	3/8" Clear Braid	Chemical Jug	Flow Meter [In/Bottom]
000-068-806	6	3/8" Teflon	Check Valve [Solution Manifold]	Orifice Manifold [Solution. Out]
000-068-512	10.25	3/8" Teflon	By-Pass Valve Side Manifold [Top]	Hi Pressure Washing Outlet
000-068-512	10.25	3/8" Teflon	2-Way Valve [In/ Bottom]	By-Pass Valve Side Manifold [Back]
000-068-512	10.25	3/8" Teflon	2-Way Valve [Out/Top]	3-Way Valve [Inlet/Middle]
000-068-790	10.25	3/16" Teflon	Chemical Metering Valve [Top]	Solution Manifold
000-068-789	7	3/16" Teflon	By-Pass Bottom Manifold	Orifice Manifold [Orifice]
000-068-790	10.5	3/16" Teflon	Pressure Gauge	By-Pass Valve Side Manifold [Top]
000-068-017	9.5	3/8" Hi-Temp Rubber	Water Box Drain Valve	Lower By-Pass Manifold
000-068-086	60	3/8" Hi-Temp Rubber	Dump Solenoid	Recovery Tank

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.

11 - Warranty Information

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

The following topics are covered in this section

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

BLOWER

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

HIGH PRESSURE WATER PUMP

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

VACUUM TANK

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

CHEMICAL SYSTEM

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

CONTROL PANEL

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

VACUUM AND SOLUTION HOSES

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

CLEANING WAND

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

WATER HEATING SYSTEM

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

HARD WATER DEPOSITS

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

WARRANTY PROCEDURE

Warranty coverage is available to you through your local distributor. Please refer to the Golden Guarantee© Limited Warranty document shipped to you with the Owner's Guide. You can also find a copy of the Golden Guarantee on the HydraMaster website at http //hydramaster.com/KnowledgeCenter/Warranty.aspx .

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 CSOrders@HydraMaster.com

When calling your distributor, be sure to have the machine's information ready for the service representative (see page 1-4 of this Owner's Manual).

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, refer to the following pages or visit our website at www.hydramaster.com.

To order genuine HydraMaster accessories and chemical solutions, call your nearest authorized HydraMaster Distributor. To find a local distributor, please visit our website at http://hydramaster.com/HowToBuy/DealerLocator.aspx.