

Zerorez[®] EWS Clutch Drive System 4.8[™] Owner's Manual (Chevy)

HydraMaster
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1 - General Information

The Zerorez® - EWS Clutch Drive System (CDS) 4.8 Truckmounts are custom-engineered carpet cleaning machines developed, designed and manufactured by HydraMaster for Zerorez. The systems utilize the most current technology available in water heating, water recovery systems and cleaning without the use of high-residue soaps, detergents, shampoos or chemicals using Zerorez' Empowered Water™ System.

The Zerorez - EWS CDS 4.8 equipment is shipped from HydraMaster to distributors, and includes the following major components. (See page 9-1 in this Owner's Manual for more information.)

1. Zerorez - EWS CDS 4.8 Tank Assembly, which includes the instrumentation panel
2. Power Pack Assembly with Cowling
3. 125 Gallon Fresh Water Tank with integrated multi-reel system, specially designed to fit Zerorez' specifications
4. Coolant Heat Exchanger Assembly
5. Salsa Heat Exchanger
6. EWS and Water Softener Assemblies
7. Three-Tier Stainless Steel Shelf

It is the purpose of this manual to help you properly understand, maintain and service your cleaning plant. Follow the directions carefully and you will be rewarded with years of profitable, trouble-free operation.

This Owner's Manual contains operation instructions as well as information required for proper maintenance, adjustment and repair of the Zerorez - EWS CDS 4.8. Component troubleshooting guides have also been included for your convenience.

It is imperative that no section be overlooked when preparing for operation of this equipment. Please read this Owner's Manual to familiarize yourself with the operation of the Zerorez - EWS CDS 4.8, paying special attention to all **Warnings and Cautions**.

This section of the manual contains the following helpful information:

- Contact Information
- Warnings, Cautions and Notices
- Machine Specifications
- Responsibilities
- Waste Water Disposal Advisory

CONTACT INFORMATION

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

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

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

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 Zerorez - EWS CDS 4.8 include:

⚠ WARNING

HOT SURFACES: During the operation of this equipment, many surfaces on the machine will become very hot. When near the van for any reason, be careful not to touch any hot surface, such as the engine or the exhaust.

⚠ WARNING

HEARING PROTECTION: The Occupational Safety and Health Administration (OSHA) recommends the use of hearing protection when a technician is exposed to an average of 85 decibels (this is an average of exposure over an eight-hour period). This equipment can produce 85 decibels to a distance of 10 feet. Please check with your local state agencies to see if OSHA standards apply to your application.

⚠ WARNING

NO SMOKING: It is unsafe to smoke in or around the vehicle. Do not allow any open flames in or around the vehicle.

⚠ WARNING

CARBON MONOXIDE: This unit generates toxic fumes. Position the vehicle so that the fumes will be directed away from the job site. Do not park where exhaust fumes can enter a building through open doors, windows, air conditioning units or kitchen fans.

⚠ WARNING

TOXIC FUMES: Do not occupy the vehicle when the cleaning equipment is operating. Toxic fumes may accumulate inside a stationary vehicle.

⚠ WARNING

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

⚠ WARNING

MOVING PARTS: Never touch any part of the machine that is in motion. Severe bodily injury may result.

⚠ WARNING

When operating the EWS equipment, keep safety considerations foremost. Use protective clothing and eye protection when operating the equipment. Follow the instructions in this document and take any additional appropriate safety measures. Be extremely careful in the presence of hazardous substances. The personnel responsible for operation and maintenance of this equipment must be fully familiar with the contents of this document. Any servicing of this equipment must be performed by qualified technicians at the distributor's facility.

Failure to follow these instructions may result in personal injury.

⚠ WARNING

- NO SMOKING ALLOWED WHEN OPERATING THE EWS EQUIPMENT!
- Modifying the EWS configuration in any way may cause bodily injury and will void the warranty.
- Do not allow children to operate the EWS system.
- The EWS configuration must never be operated unless the vehicle engine is running.
- Use caution when operating the equipment.
- Replace components only with those specified by the manufacturer.

Failure to follow any of these warnings may result in personal injury.

⚠ WARNING

If you open the EWS Electrical Box while the power is on, do so with extreme caution. If you touch any of the live wires, you could risk electrical shock which can cause death or injury.

⚠ WARNING

IN ACCORDANCE WITH EPA, STATE AND LOCAL LAWS, DO NOT DISPOSE OF RESIDUAL ('A') 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.

In addition, do not dispose of residual water onto lawns or driveways, especially during freezing weather. Slip-and-fall accidents can occur when water has frozen onto driveways and walkways, causing personal injury to customers as well as cleaning staff.

CAUTION

THROUGH-FLOOR DRILLING: Be cautious when drilling holes through the van floor. Many vans have critical components mounted directly below the van floor that could be damaged by a misplaced drill bit.

CAUTION

LEVEL OPERATION: During operation, the vehicle must be parked on level ground not to exceed + or - 10 degrees. Failure to ensure proper leveling may prevent proper internal lubrication of engine, vacuum and/or high pressure components.

CAUTION

FREEZE PROTECTION: Failure to take appropriate measures to prevent equipment damage due to freezing can result in system failure and loss of warranty on affected parts. Placing an electric heater in the vehicle or parking the vehicle indoors will help ensure against freezing, but should not be the primary method of freeze protection.

MACHINE SPECIFICATIONS

CDS 4.8 Cleaning Unit (including blower and heat exchangers)

Frame	41.5" H x 61.0" L x 23" W	
Weight	900 lbs.	
Construction	Tank	Marine Aluminum with Baked-on Epoxy Finish
Chassis	Powder Coated Steel	
Cowling	Fiberglass	
Power Transfer	Electric Clutch-driven Shaft, Key Activated	
Drive Type	Universal Drive Shaft	
Drive System	PolyChain on Power Pack	
Vacuum Blower	4007 Tri-Lobe; Dual Oil Bath; Tuthill Dominator	
	Blower rpm @ 14"Hg 3,000	
Water Pump	General Pump, 4.0 gpm	
Heating System	Engine Coolant Heat Exchanger (1,200 psi)	
	Blower Exhaust (Salsa) Heat Exchanger (1,200 psi)	

Instruments		
	Main Panel	
		Electronic Tachometer, 0-3,000 rpm
		Water Temperature Gauge, 0-320° F
		Vacuum Gauge, 0-30" Hg
		Hour Meter, Machine Run-Time
		Keyed Ignition, Start/Stop
		Electronic Circuit Protection Breaker, Re-settable
		Machine Status Indicator Lamps
		Water Pressure Gauge, Liquid Filled, 0-1,500 psi
	Side Panel	
		Water Pressure Adjustment
		Blower Lubrication Port
		Water Temperature Adjustment Knob
		High Pressure Outlets

Available Equipment	
Recovery Tank	MaxAirTank (Aluminum) 100-gallon Capacity
Auxiliary Pump Out	Dura-Flow
Cleaning Tool/ Wand	One 2" Evolution Stainless Steel Wand and One Pressure Wash Tool
High Pressure Hose	1/4" High Temperature, Lined, Vinyl Covered - Hose rated to 2,200 psi, 250° F
Two Back Door Bins for Extra Storage	
Wheel Chock Set	
Van Finish Package	
Van Decal Package	
Owner's Manual (on CD)	
Owner's Guide (paper)	

HydraCradle Tank Fresh Water Tank

Tank Capacity	125 gallons	
Tank Construction	Rotomolded LLDPE *	
Mounting Components	Powder coated steel	
Dimensions	47¼" H x 65" L x 34" W	
Dry Weight (without Vacuum Hose)	285 lbs	
38" Diameter Vacuum Hose Reel - Standard - (for 2" Diameter Hose)	Maximum Capacity	250 ft.
	Construction	Rotomolded LLDPE*
	Electrical Operation	Power Retraction - Standard
Vacuum Hose	250 ft; 2" Diameter	
14" Diameter Solution Hose Reel *	Maximum Capacity	250 ft.
	Construction	Rotomolded LLDPE
Solution Hose	250 ft, ¼" Diameter	
Hose Reel Motor Fuse	30 Amp	

* LLDPE = Linear Low Density Polyethylene

Empowered Water System (EWS)

Entire package weighs approximately 350 lbs and includes:

Shelf Assembly, Electrical Cell and Electrical Box
Water Softener/Brine Assembly
Garden Reel with Bracket
120 ft of 3/8" Diameter Garden Hose

RESPONSIBILITIES

Sales Representative'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 fine. 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 present.

Installation Responsibilities

- Ensure proper payload capability. The Zerorez - EWS CDS 4.8 must be installed into a vehicle with a payload capacity of 3,850 lbs or greater.
- Ensure proper placement of the CDS 4.8, fresh water tanks, 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 installation of the electrical wiring and the connections to the vehicle's battery.
- 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

- A thorough review of the Owner's Manual with the purchaser.
- Instruction in and familiarization with:
 1. How to correctly start up and shut down the unit
 2. How to correctly clean with the unit
 3. Where and how often to check and change component oil levels
 4. How the unit's systems work, how to troubleshoot the unit
 5. How to do basic repairs
 6. Safety precautions and their importance
 7. How to avoid freezing damage
 8. How to avoid hard water damage
- A thorough review of the unit warranty and warranty procedures.

Purchaser's Responsibility

If you are the purchaser, it is your responsibility to read the Owner's Manual and to familiarize yourself with the information contained herein, paying special attention to all Warnings and Cautions.

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 recovery tank, contains materials that 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 is to use the Automatic Pump-Out System (APO). This optional system is designed to remove waste water from the extractor’s recovery system and actively pump the water through hoses to a suitable disposal drain.

When properly configured, the APO 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.

⚠ WARNING

IN ACCORDANCE WITH EPA, STATE AND LOCAL LAWS, DO NOT DISPOSE OF RESIDUAL (“A”) 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.

In addition, do not dispose of residual water onto lawns or driveways, especially during freezing weather. Slip-and-fall accidents can occur when water has frozen onto driveways and walkways, causing personal injury to customers as well as cleaning staff.

EWS WATER SOFTENER

Cleaning efficiency and equipment life is increased when the EWS Water Softener is used, especially in areas where water hardness measures more than 3 grains per gallon (see Figure 1-1).

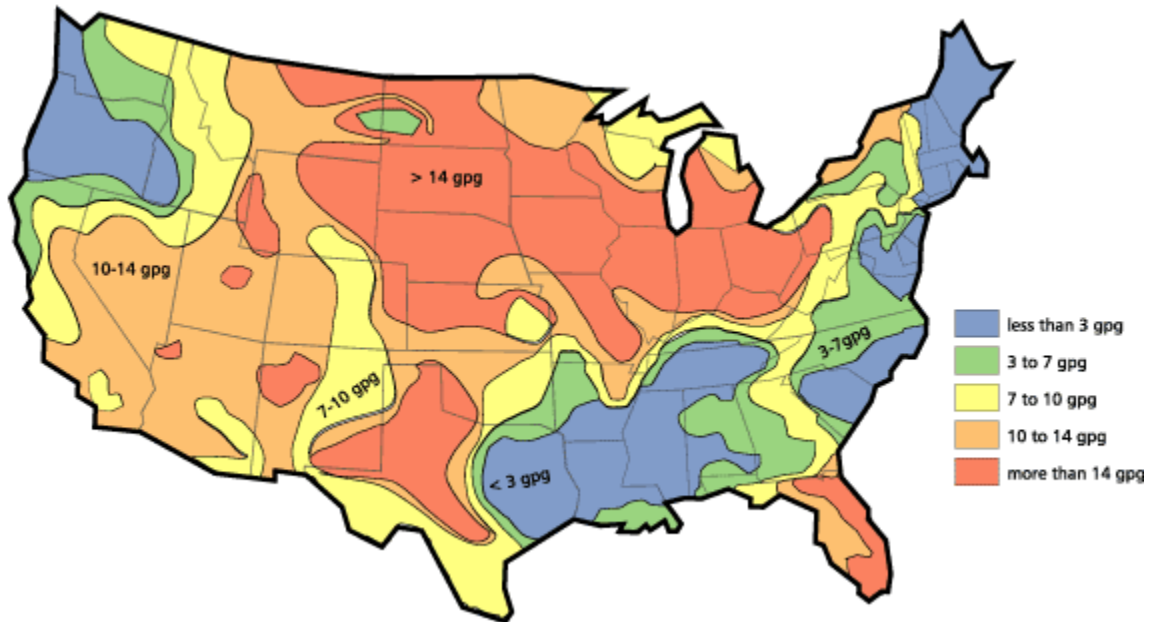


Figure 1-1. Water Hardness Map - Mainland U.S.

Frequency of regeneration depends on the local water hardness. Regenerate as needed to maintain 0 - 1 ppm (parts per million) [0.0584 gpg] water quality. See page 2-8 for regenerating instructions.

2 - Operating Instructions

This section of the manual contains the following instructions:

- Before Operating the Zerorez - EWS CDS
- Zerorez CDS EWS Start Up
- Zerorez EWS Daily Shut Down
- HydraCradle Tank Daily Shut Down
- HydraCradle Tank Shut Down for Extended Storage
- Water Softener Regeneration Instructions

CAUTION

When operating the HydraCradle Tank during the colder months of the year, ensure that you properly freeze guard the system. Failure to take appropriate measures to prevent equipment damage due to freezing can result in system failure and loss of warranty on affected parts.

BEFORE OPERATING THE ZEROREZ - EWS CDS

1. Locate the unit and equipment in a well-ventilated area.

▲ WARNING

The Zerorez CDS unit generates toxic fumes. Position the vehicle so that the fumes will be directed away from the job site. Do not park where exhaust fumes can enter a building through open doors, windows, air conditioning units or kitchen fans. Doing so will cause death or personal injury.

2. Check the fuel tank to be certain there is adequate fuel to complete the job.
3. Position the wheel chocks on one of the rear tires.
4. Make sure all required hoses are correctly connected.
5. When connecting the pressure hose to the pressure outlet connections at the front of the unit, go to the farthest area to be cleaned and connect to the cleaning tool. This ensures that you have the proper length of hose required to perform the cleaning.

ZEROREZ CDS EWS START UP

1. Make sure the vehicle's gear select lever is in the Park position and the emergency brake is set.

NOTICE

Each day, add rock salt to the Salt Feeder first, to the desired level, and then add water as necessary.

Use coarse rock salt in Feeder – not salt pellets.

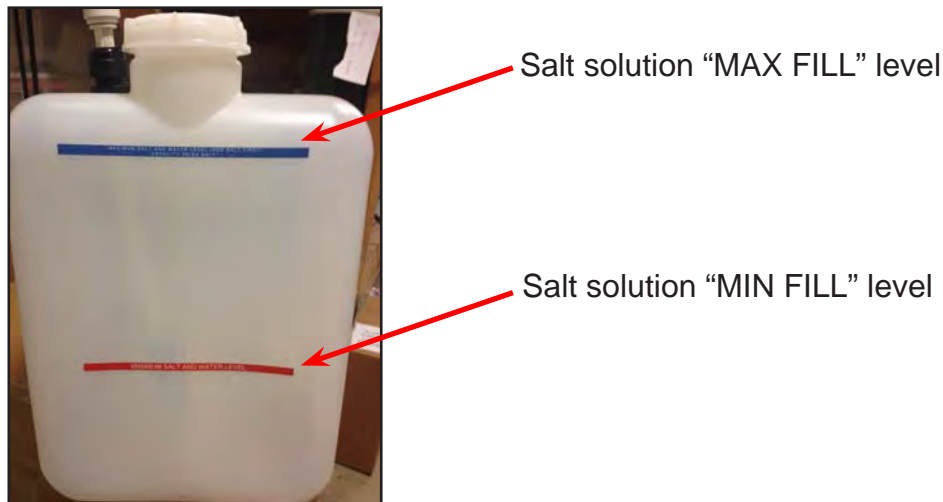


Figure 2-1. Fill Saturated Salt Feeder to Marked Levels

2. Ensure that the saturated salt feeder is filled to the marked levels with salt solution; these levels are marked in black for MAX FILL and red for MIN FILL (see Figure 2-1).
3. Connect the end of the garden hose, located on the 'live' hose reel of the HydraCradle Tank, to the customer's outdoor faucet.
4. Remove the fastening screw on the EWS Electrical Box, unlatch the Box and open the cover.

⚠ WARNING

Be extremely cautious when power is on and the EWS Electrical Box is open. If you touch any of the live wires, you could risk electrical shock which can cause death or injury.

5. Turn on the outside faucet and adjust via the Flow Adjustment Valve located in the EWS Electrical Box. The incoming water flow to the system, as indicated on the flow meter, should read 1.2 gpm (see Figure 2-2).

Open Electrical Box to Find Flow Adjustment Valve and Flow Meter

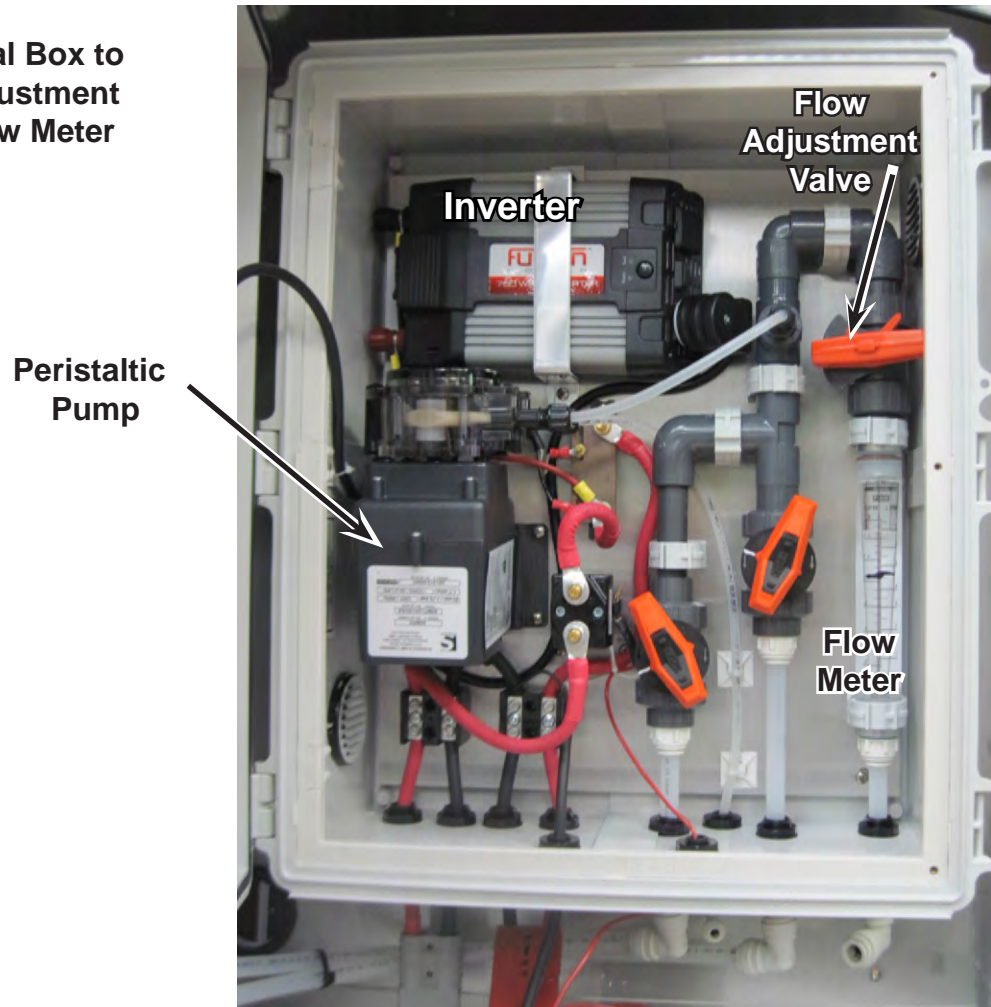


Figure 2-2. Location of Flow Meter in Electrical Box

6. Start the van's engine and turn the CDS fresh water switch to the 'ON' position. This supplies DC power directly from the terminals of the van's battery to the inlet power terminal in the EWS Electrical Box.
7. After the flow of saline solution through the Cell is established via the flow switch assembly which is mounted on top of the HydraCradle Tank, DC current passes between the electrodes of the Cell and will be indicated by the Amp meter (see Figure 2-3).

8. Check that the inverter, located in the EWS Electrical Box (see Figure 2-4), is 'ON' (POWER button showing green) and that the peristaltic pump (see Figure 2-2), also located in the EWS Electrical Box, is operating (test that the 'ON' switch is really 'ON' if the pump is not visibly turning).



Figure 2-3. EWS Electric Box and Amp Meter

NOTICE

If the green light is not on, or an orange light is displayed and you hear a high pitch noise, contact your distributor.

9. Check that the Amp reading on the outside of the Box is above 35 Amps (see Figure 2-3). During normal operation, the Amp meter should read approximately 35-70 Amps.

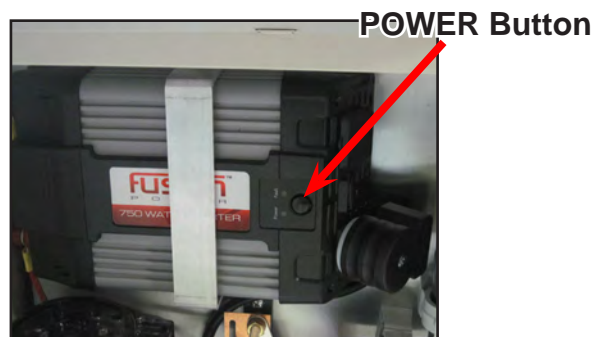


Figure 2-4. Inverter POWER Button

NOTICE

The flows of 'B' water and 'A' water, which are passed vertically through the Cell, are preset and do not need to be adjusted.

10. Close and latch the EWS Electrical Box, re-installing the fastening screw.
11. Manually unwind the vacuum hose a few feet off of the HydraCradle Tank's vacuum reel, and press on the foot switch to test for power retraction of the hose.
12. Select the cleaning speed appropriate for the cleaning job.
13. Turn on the PUMP CLUTCH switch. Adjust cleaning pressure to desired level.
14. Connect the APO to a dump hose (the length of a garden hose), route the hose to an appropriate waste site and turn the APO switch 'ON'.

NOTICE

The APO will not engage until the water level rises inside the recovery tank.

15. Now proceed with the cleaning operation.

NOTICE

The machine will automatically shut down when the Recovery Tank reaches its full capacity due to the float switch located inside the tank. When this occurs, turn the machine off and empty the Recovery Tank. Then, turn the machine back on and continue to clean.

NOTICE

Do not dump waste or residual 'A' water in any area which might violate local, state or federal law. Drain the recovery tank into a sanitary drain system.

ZEROREZ EWS DAILY SHUT DOWN

1. Turn off the CDS fresh water switch.
2. Turn off the outdoor faucet
3. Lay vacuum hoses out in order for all moisture to be removed from the hoses. This prevents spillage of any dirty solution in your vehicle when storing the hoses.
4. Disconnect the hoses and put them away.
5. Allow the unit to run for a few minutes with the vacuum hose disconnected in order to remove all moisture from the vacuum pump.
6. Plug the vacuum inlets.
7. Spray a Hydramaster-recommended lubricant (P/N 000-087-006) into the lube port for about 5 to 10 seconds while the unit is running. This will lubricate the vacuum pump and prevent it from rusting. (The lube port is located on the front panel above the pressure gauge.)
8. Remove the inlet plugs, then turn the ignition 'OFF' before draining the Recovery Tank.
9. Turn the heat control valve to the 'OFF' position. This will help avoid engine overheat problems due to reduced coolant flow through the radiator.
10. Drain the Recovery Tank.

NOTICE

Do not dump waste in any area which might violate local, state or federal law. Drain the Recovery Tank into a sanitary drain system.

11. When the Recovery Tank is drained, lift the Recovery Tank lid and remove the filter basket.
12. Clean out any accumulated debris.
13. Rinse and re-install.
14. Check the corrugated blower filter.
15. Clean out any accumulated debris.
16. Rinse and re-install.

NOTICE

When re-installing the blower filter, ensure that it is fully seated against its mount so that debris cannot pass under it and into the blower.

HYDRACRADLE TANK DAILY SHUT DOWN

To shut down the HydraCradle Tank after daily use:

1. Clean out the vacuum hose and, pressing on the foot switch, rewind the vacuum hose onto its reel.
2. Rewind the other hose.
3. Place cleaning tools/wands in the tank's storage area.

HYDRACRADLE TANK SHUT DOWN FOR EXTENDED STORAGE

If you want to shut down and store the HydraCradle Tank for an extended period of time:

1. Drain the remainder of the water in the tank.
2. Manually unwind the vacuum hose and remove it from the reel, rinse the hose with clean water and allow it to drain before rewinding it on the reel.
3. Unwind the solution hose, detach from the reel and completely drain the hose before rewinding it onto the reel.

CAUTION

Failure to take appropriate measures to prevent equipment damage due to freezing can result in system failure and loss of warranty on affected parts.

WATER SOFTENER REGENERATION INSTRUCTIONS**NOTICE**

Frequency of regeneration depends on the local water hardness. Regenerate as needed to maintain 0 - 1 ppm (parts per million) water quality.



Figure 2-5. Connect Fresh Water Hose to Fresh Water Inlet

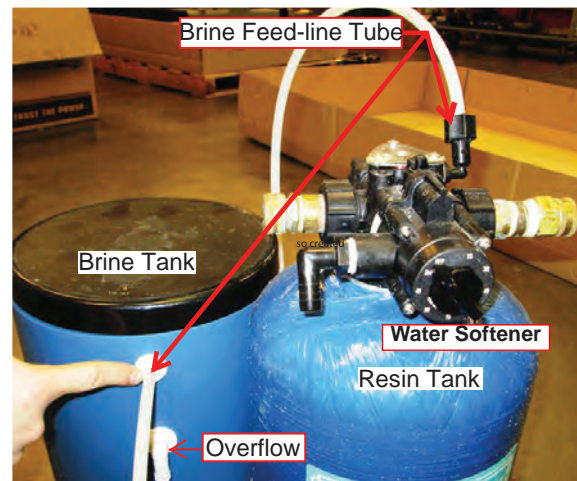


Figure 2-6. Water Softener, Brine Tank, Brine Feed-Line Tube and Overflow

1. Flush the fresh water hose before using it to supply water to the water softener. After the line runs clear, turn off the water and connect the fresh water hose to the inlet side (see Figure 2-5) of the water softener (see Figure 2-6).
2. Slowly turn the fresh water supply on until the supply water valve is completely open.
3. Allow fresh water to flow into the water softener (see Figure 2-5) and from the outlet (see Figure 2-7) of the water softener for a minimum of 2 minutes. This will purge the air and any foreign materials from the water softener.
4. Turn off the fresh water flow to the water softener.
5. Remove the lid from the brine tank, shown in Figure 2-6, and fill the brine tank to the $\frac{1}{4}$ level using only fresh water.

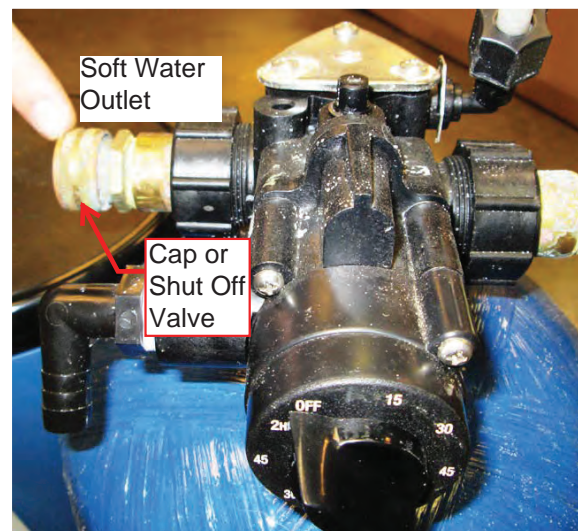


Figure 2-7. Outlet Side of Water Softener

6. Slowly add water softener rock salt (pellets are not recommended) to the water in the brine tank. Add enough salt to reach the top of the water level. Add more fresh water bringing the water level to just below the overflow outlet shown in Figure 2-6. Stir the water-salt combination very gently (15 seconds) and then replace the cover.



Figure 2-8. Drain Elbow

7. Connect the brine solution feed-line, shown in Figure 2-6, to both the brine tank and the water softener.

8. Shut off the outlet side of the water softener, shown in Figure 2-7, using a turn valve or pipe cap.

9. Add a drain tube to the drain outlet elbow (see Figure 2-8). This waste water is a salt water solution and should be disposed of properly.

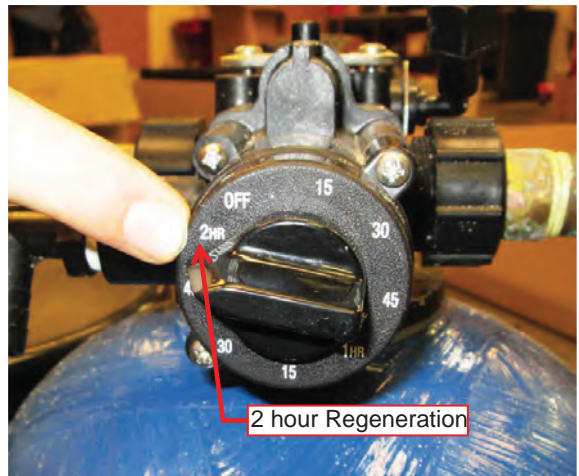


Figure 2-9. Manual Timer

10. Slowly turn on the fresh water valve until the water valve is completely open.

11. Turn the manual timer all the way to the **2- hour position** (see Figure 2-9).

12. Water should begin to flow from the end of the drain elbow or drain tube, shown in Figure 2-8. **The water softener is being regenerated.**

13. After 3 - 5 minutes, the brine solution will begin to be drawn from the brine tank. The flow can be checked by disconnecting the brine feed-line, shown in Figure 2-6 from the brine tank. Once the line is disconnected, listen for a vacuum sound at the end of this tube. If you hear a vacuum sound, the system is working correctly; reconnect the feed-line to the brine tank.

NOTICE

If the brine waste-water is flowing too fast, water is wasted; or too slow, brine solution draw is reduced. The Drain Flow Adjuster shown in Figure 2-10 can be adjusted to vary the brine waste-water flow rates. For most applications, this Drain Flow Adjuster should be left to the FULL OPEN, or WIDE OPEN, position.

When you close the Drain Flow Adjuster, the vacuum and solution draw from the brine tank is reduced.

See page 2-12 for more information on the Drain Flow Adjuster.

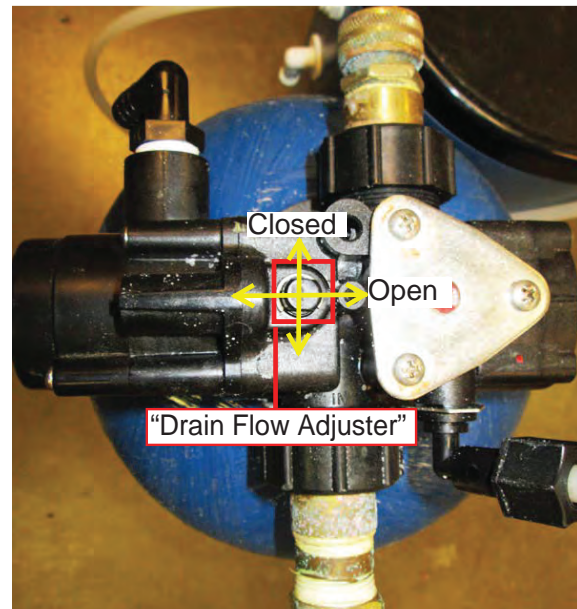


Figure 2-10. Drain Flow Adjuster

14. After the 2 hour regeneration cycle, the manual timer will move to the 'OFF' position (see Figure 2-10). In the 'OFF' position, the following changes occur:
 - The system is fully regenerated.
 - The system is now in service mode (ready to provide soft water).
 - The system allows fresh water to be supplied to the brine tank back through the brine solution feed-line.
 - The brine tank will fill with fresh water and the float will close the water supply once the tank is full.
 - The discharge elbow/waste water line will stop flowing waste water.
15. After the Water Softener has been operated for a period of time, the tank resin will become depleted* again. Repeat the previous steps starting with step 10.

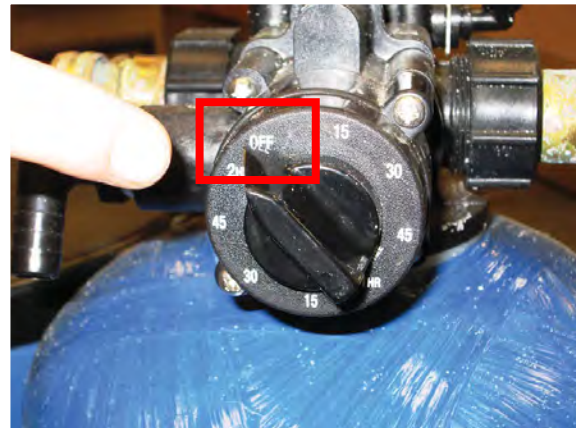


Figure 2-11. Manual Timer in 'OFF' Position

NOTICE

*** Check outlet water conductivity at 150 gallons of use.**

The quality of the soft water being supplied by the water softener can be determined using a conductivity meter or by adding a conductivity light to the outlet side of the water softener.

Drain Flow Adjuster

With the drain flow adjuster (see Figure 2-10), you can adjust the water flow to drain during regeneration.

The counter pressure so created helps to keep the piston of the valve in the regeneration position when the operating pressure is extremely low (< 7.06 psi).

The drain flow adjuster is locked in the wide open position (see Figure 2-12).

By releasing the locking screw of the locking plate, you can still use the drain flow adjuster, but note that the maximum flow to drain is limited by the drain flow control.

To adjust:

1. Place the unit in brine/slow rinse position.
2. Turn the drain flow adjuster either to the right or to the left until the piston remains stable in the regeneration position.

NOTICE

Note that closing the drain flow adjuster too much will result in poor suction from the injector.

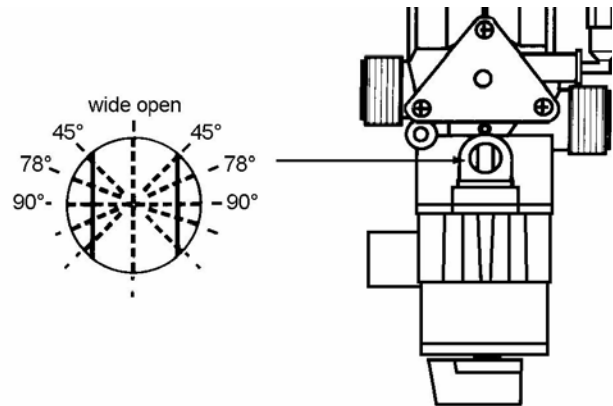


Figure 2-12. Drain Flow Control on Drain Flow Adjuster

3 - Freeze Guarding

When operating the Zerorez EWS CDS 4.8 during the colder months of the year, ensure that you properly freeze guard the system. No part of the Zerorez EWS CDS 4.8 System is covered by warranty if machine damage occurs because of freezing.

CAUTION

BE SURE YOUR MACHINE IS PROTECTED! Freezing will cause component damage.

The following precautions are recommended prior to and during cleaning jobs:

1. Run the machine before leaving for the first job to ensure nothing has frozen the night before, including hoses and tool/wand.
2. Insulate the solution hose from the cold ground by running it through an extra 1½" vacuum hose.
3. Leave vehicle doors closed until you begin cleaning; afterwards, open slightly.

NOTICE

In colder climates, insulating the vehicle walls and floor boards will help protect the unit.

Do not procrastinate during the cleaning operation or the hot water solution line will also freeze on the ground. The solution line should be insulated in extremely cold climates.

Whenever possible, store the van in a heated garage at night or over the weekend. If not possible, place a 1,500 Watt electric heater inside the vehicle, aimed directly at the machine.

⚠ WARNING

Never use a propane heater. It causes excessive moisture on the vehicle ceiling and the possibility of it malfunctioning is therefore higher, which may cause bodily injury. If the machine and vehicle are left outside with a heater, drain water from the machine cleaning tools and hoses because they can be freeze-damaged also

See page 3-2 for the CDS-specific freeze guard procedure.

CDS Freeze Guard Procedure

To drain the CDS, use Kit P/N 000-078-078 (clear freeze guard hose with plug attached) which is shipped with P/N 750-001-003 (or P/N 750-001-006).

NOTICE

The purpose of this part is to facilitate the removal of water from the CDS 4.8 cleaning equipment. The sale and use of the kit is in no way a guarantee against freeze damage but will be sufficient to guard against severe freeze damage for most major components.

1. Connect the black stopper end of the freeze guard hose to the Recovery Tank inlet (see Figure 3-1).
2. Connect the other end of the freeze guard hose to one of the outgoing cleaning solution quick connect fittings (see Figure 3-1).
3. Turn the pump clutch "OFF" at the switch.
4. Turn down the pressure regulator to "0" (counterclockwise).
5. Open the valve and drain the HydraCradle Tank until water no longer flows. This ensures that there is no water at the pump inlet, which could result in freeze damage.
6. Turn on the unit and allow the vacuum to draw the majority of the water from the system.
7. When no water can be seen traveling through the clear hose, turn the unit off.

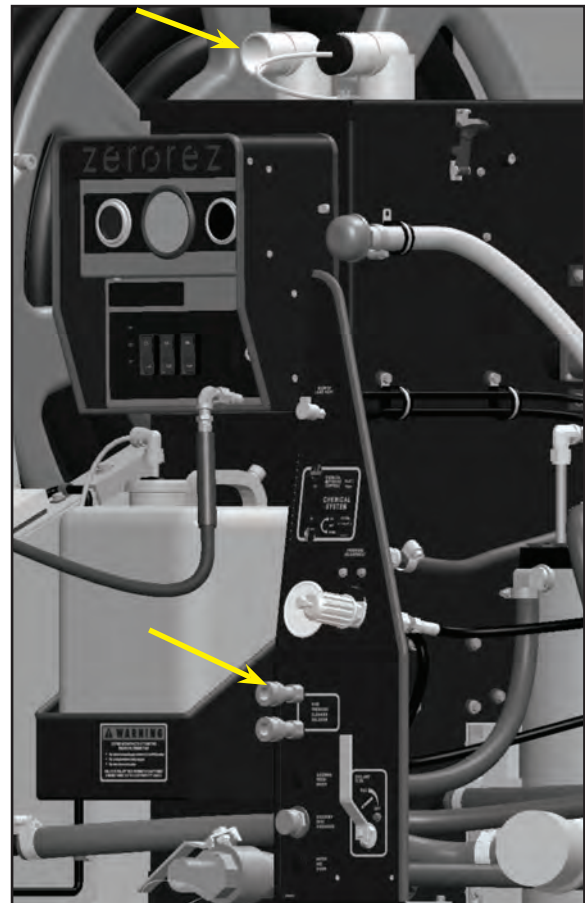


Figure 3-1. Connect Freeze Guard Hose

EWS/Water Softener Freeze Protect Procedure

Because of the way the EWS and the water softener systems are designed, they cannot be completely freeze guarded by draining. The EWS and the Water Softener and its Brine Tank can only be freeze safe if the vehicle is parked in a heated garage overnight or if an electric heater is run inside the vehicle.

4 - Maintenance and Troubleshooting

To avoid costly repairs and down-time, it is imperative to develop and practice good maintenance procedures from the beginning. These procedures fall into daily, weekly, monthly and quarterly increments, and are outlined in this section. All recommended maintenance on the Zerorez CDS must be performed by competent service personnel.

This section is divided into these parts:

- Zerorez CDS 4.8 Maintenance and Troubleshooting
 - Operational Maintenance
 - Appearance Maintenance
 - Drive Shaft Maintenance
 - Troubleshooting

- HydraCradle Maintenance and Troubleshooting
 - Operational Maintenance
 - Appearance Maintenance
 - Troubleshooting

- EWS Maintenance and Troubleshooting
 - The EWS System may need to be cleaned on a routine basis depending on the hardness of the water and the efficiency of your water softener.

Contact your local distributor to arrange for EWS maintenance.

NOTICE

Important: Record the date and machine hours on the maintenance log. Maintenance logs are provided for your convenience in the Owner's Guide. Records of maintenance must be kept and copies may be required to be furnished to HydraMaster before the warranty is honored. It is recommended that you affix a copy of the log on the vehicle door near your unit for convenience and to serve as a maintenance reminder.

ZEROREZ CDS 4.8 MAINTENANCE AND TROUBLESHOOTING

Operational Maintenance

This section contains recommendations for maintenance that will affect the service life of your unit.

NOTICE

HydraMaster recommends that you follow the vehicle maintenance schedule as stated by the manufacturer. All HydraMaster references to vehicle maintenance serve as general vehicle service reminders. If there are any questions regarding servicing of your vehicle, please contact your local vehicle dealership.

Daily

- Clean and inspect pump strainer in saturated salt feeder
- Check engine oil level
- Empty recovery tank inlet filter
- Visually inspect machine for loose wires, oil leaks, water leaks, etc
- Inspect recovery tank stainless steel filter for clogging or damage; clean, repair or replace as needed
- Inspect and clean the vacuum slot on the cleaning wand. Watch for sharp edges that may tear the carpet; remove any sharp edges as required
- Lubricate blower with a HydraMaster-recommended spray lubricant (P/N 000-087-006) through lube port.
- Park the vehicle inside or turn on heater during freezing weather.

Weekly

- Check around vehicle and CDS unit for any evidence of oil/fluid leaks.

⚠ WARNING

Grease, oil, antifreeze, and debris build-up near hot equipment, such as the vehicle engine exhaust system or the CDS blower exhaust system, can present a fire hazard and can cause death or bodily injury.

Vehicle engine exhaust system or the CDS blower exhaust system, can present a fire hazard and can cause death or bodily injury.

- Change pump oil after first 50 hours; every 300 hours thereafter.
- Check pump oil. Add as necessary.
- Check pump drive belts for wear. Check HydraCradle belt also.
- Check pump pulleys for wear.
- Check CDS blower mounting fasteners, drive shaft clamping collar fasteners, and CDS front end component fasteners, tighten as needed.
- Lubricate zerk on HydraCradle swivel every 40 hours with moly grease. Lubricate the 4 zerks located on the Vacuum Hose Reel Assembly (P/N 000-092-025) every 40 hours with moly, as well.
- Check internal machine high pressure water lines for wear or chafing.
- Remove the stainless steel blower inlet filter inside the recovery tank and thoroughly clean, removing all lint build-up. Inspect for damage and re-install.
- Inspect vacuum relief valve. Clean and lubricate as necessary.
- Inspect all external solution hoses, vacuum hoses, and quick connects for wear or damage that may cause premature failure, replace as needed.
- Clean recovery tank thoroughly with high pressure washer.
- Check magnesium anodes in recovery tank and replace as necessary
- Check vehicle engine rpm on CDS tachometer:
 - Speed 1 = 1,500
 - Speed 2 = 1,400
 - Speed 3 = 1,300

Monthly

- Check engine air cleaner filter. Clean as necessary.
- Check blower drive belt
- Clean and inspect battery connections as needed.
- Change blower oil after first 100 hours.

Quarterly

- Change oil in blower.
- Change oil in pump every 300 hours.
- Check the CDS wiring harness for any chafing or wear, especially in the vehicle engine compartment or near any rotating parts.
- Check the vehicle wiring harness for any chafing or wear, especially in the vehicle engine compartment or near any rotating parts.
- Grease the power pack pillow block bearings.

Every 500 Hours

- Grease drive shaft U-joints, splines and zerks.
- Clean and inspect Salsa Heat Exchanger.
- Check magnesium anodes in Salsa Heat Exchanger and replace as necessary

Yearly

- Give van complete vehicle service
- Flush the van's cooling system. Add new anti-freeze
- Change the van's transmission fluid

Change engine oil and filter after every 2,000 miles.

Appearance Maintenance

Maintaining the original appearance of your unit is important for two reasons:

1. It represents a big dollar investment for your cleaning business and its appearance should reflect that fact. A dirty machine does not look professional.
2. Maintenance, troubleshooting and repair is much easier to accomplish on a clean, well-maintained unit. Regular cleaning of the machine offers you an opportunity to visually inspect all parts of the machine and spot potential problems before they occur.

The following maintenance is recommended by the manufacturer at the frequency indicated:

DAILY

- Wipe machine down thoroughly with a damp cloth.
- Flush recovery tank out thoroughly.
- Clean wand to maintain original appearance.
- Wipe down vacuum and high pressure hoses as needed.
- Visually inspect hoses for cuts, etc.

WEEKLY

- Wipe down entire unit as needed.
- Apply good coat of auto wax to all painted surfaces inside and out.
- Thoroughly clean wand and inspect for clogged jet, debris in vacuum slot and leaking fittings at valve.
- Apply light coat of auto wax to wand. Thoroughly clean vacuum and high pressure hose including hose cuffs.

Drive Shaft Maintenance

Every 500 operating hours, apply lubricant to the drive shaft's zerk fittings at clutch and blower flange U-joints (see Figure 4-1).

The drive shaft splines should also be lubricated with a bearing grease with an application temperature range of -4° F to +347° F; the drive shaft manufacturer recommends Mobil Delvac Xtreme Service™ grease as the lubricant.

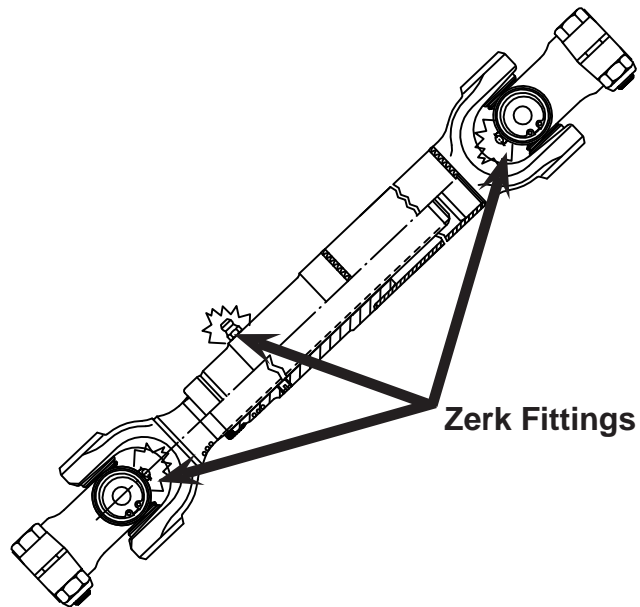


Figure 4-1. Zerk Fittings on Drive Shaft

NOTICE

HydraMaster flexible drive shaft assemblies have two universal joints, one on either end of the drive shaft. The previously mentioned lubrication interval refers to both universal joints.

CDS TROUBLESHOOTING

HEATING SYSTEM

1.0. VEHICLE OVERHEATS AND SHUTS OFF CDS

Refer to vehicle dealer for diagnosis and repair.

2.0. VEHICLE OVERHEATS

	Probable Cause	Solution
2.1.	Faulty thermostat in vehicle.	Refer to dealer
2.2.	Faulty water pump on vehicle	Refer to dealer
2.3.	Faulty radiator (plugged) limited water flow	Refer to dealer
2.4.	Faulty fan clutch, limited air-flow.	Refer to dealer

3.0. UNABLE TO ACHIEVE NORMAL CLEANING TEMPERATURE

	Probable Cause	Solution
3.1.	There is hard water or build-up in the heat exchangers.	This will not allow the heat to transfer properly. Flush as necessary.
3.2.	Flow is too great.	Measure flow at tool.
		The jet in the cleaning tool is too large or worn out. Test the tool for water flow and replace or repair jet as necessary.
		Pressure is too high. Adjust pressure to normal. Inspect pressure gauge for accurate reading.
3.3.	The CDS is being operated at too low rpm or too low vacuum setting.	The system must be at full operating rpm and full vacuum load to achieve full operating temperature. These values must be set per manufacture's specifications. Adjust vacuum or rpm as necessary.

4.0. SYSTEM ATTAINS NORMAL HEAT BUT DROPS OFF SHARPLY

	Probable Cause	Solution
4.1.	Flow at cleaning tool is too high.	Orifice in tool is too large or worn out. Test flow of tool. Repair or replace as necessary.
4.2.	The rpm of machine is set too low.	Adjust as necessary.
4.3.	Pressure is too high.	Adjust pressure to normal. Inspect pressure gauge for accurate reading.

MISCELLANEOUS**1.0. VEHICLE RADIATOR OVERFLOWS INTO COOLANT OVERFLOW CONTAINER WHILE MACHINE IS IN USE**

	Probable Cause	Solution
1.1.	Internal leak in coolant heat exchanger.	Pressure test each heat exchanger separately to determine which heat exchanger is faulty. This process requires heated water and high pressure to simulate the same conditions that are causing the leak. Refer to qualified service technician if necessary.

HYDRACRADLE MAINTENANCE AND TROUBLESHOOTING

This section is divided into the following topics:

- Operational Maintenance
- Appearance Maintenance

Operational Maintenance

This section contains recommendations for maintenance that will affect the service life of your HydraCradle. HydraMaster recommends that you follow maintenance schedules as stated.

Belt Tension

Each month, check the tension on the V belt by:

1. Removing power from the HydraCradle by detaching the HydraCradle's battery cables from the 12 V battery.
2. Removing the screws and washers that secure the belt cover to the HydraCradle frame and then remove the belt cover.
3. Pressing in on the V belt to test the tension. If the belt can be pressed in more than 1" - 1 1/2", it needs to be tightened.
4. After checking and/or adjusting the belt, re-attach the belt cover frame and re-apply power.

Zerk Lubrication

Lubricate the zerk on the swivel after every 40 hours of use with molybdenum disulfide ("moly") grease (see Figure 4-2).

Lubricate 4 zerks (P/N 000-052-505 - see page 9-49), located on the Vacuum Hose Reel Assembly (P/N 000-092-025) every 40 hours with moly, as well.

NOTICE

Do not overgrease.



Figure 4-2. Location of Zerk on Swivel

Appearance Maintenance

Maintaining the original appearance of your HydraCradle is important for two reasons:

1. It represents a big dollar investment for your cleaning business and its appearance should reflect that fact. A dirty machine does not look professional.
2. Maintenance, troubleshooting and repair is much easier to accomplish on a clean, well-maintained unit. Regular cleaning of the tank offers you an opportunity to visually inspect all parts of the tank and spot potential problems before they occur.

The following maintenance is recommended at the frequency indicated:

Daily

- Wipe tank thoroughly with a damp cloth.
- Wipe down hoses as needed.

Weekly

- Visually inspect hoses for cuts and abrasions.
- Thoroughly clean hoses.
- Remove large debris which may have accumulated under the vacuum hose, at the bottom of the tank, and wipe away any remaining smaller debris.

HydraCradle Troubleshooting

1.0. NO VACUUM HOSE RETRACTION - FOOT SWITCH WILL NOT POWER ON

Possible Cause	Solution
1.1 Check foot switch	Connections are not secure; reseal connectors.
	Check continuity on foot switch cables; if defective, replace foot switch.
1.2. Check hose reel motor	30 Amp fuse is bad; replace fuse.
	Drive belt is loose or broken; adjust or replace belt.
1.3. Check battery	Battery is weak or dead; replace battery.
	Battery connections are not tight; reseal connectors
	Check continuity on battery cables; if defective, repair or replace.

2.0. RECOVERY HOSE VACUUM IS WEAK OR THERE IS NO VACUUM

Possible Cause	Solution
2.1. Recovery hose is not securely connected to mount.	Disconnect and reconnect the recovery hose onto the barbed fitting.

3.0. SOLUTION HOSE LOSING PRESSURE OR HAS NO PRESSURE

Possible Cause	Solution
3.1 Quick connects may have come loose.	Tighten or replace as necessary.
3.2 Hoses may be leaking.	Repair or replace as necessary.

4.0. HYDRACRADLE TANK IS EMPTY OR FILLS SLOWLY

Possible Cause	Solution
4.1. No water coming from source.	Check water supply.
4.2 There is a restriction in the water supply system.	Inspect hose connections between fresh water tanks. Tighten if necessary.

5.0. HYDRACRADLE TANK OVERFLOWS OR WILL NOT FILL ALL THE WAY

Possible Cause	Solution
5.1. There is a restriction in the air vent, extending from the HydraCradle Tank.	Inspect and clean, or repair as necessary.

EWS MAINTENANCE AND TROUBLESHOOTING

The EWS System may need to be cleaned on a routine basis depending on the hardness of the water and the efficiency of your water softener.

Contact your local distributor to arrange for EWS maintenance.

EWS Troubleshooting

1. Flow of water to the system cannot be adjusted to the rated flow of 1.2 gpm.

Solution
1. Check that the customer supply water faucet valve is in the fully open position.
2. Check that the 'Inlet water flow control valve' can be adjusted to give a flow of 1.2 gpm.
NOTICE
If step 1 has been confirmed but the required flow rate of 1.2 gpm cannot be adjusted with this valve, there must be a blockage downstream from this valve – this blockage could be due to the build-up of accumulated precipitates in either (or both) the tubing to and from the EWS Cell (also referred to as the Electrode Stack) or in the EWS Cell itself.
3. Check that 'the catholyte flow control valve' and the 'anolyte flow control valve' are positioned at the marked / set values.
4. Check that there is continuous flow of anolyte solution to drain at street level and that this solution has a faint 'chlorine' smell to it when electrical power is applied to the system.
5. Check visually (through the clear saturated salt solution container) that the daily start salt level is $\frac{3}{4}$ full and water level is full in the container.
6. Check that there is continuous flow of saturated brine solution from the saturated brine solution feed container to the EWS Power Cabinet – note that if solution in this line contains air bubbles, the peristaltic pump will lose prime and not pump saturated brine solution. This line then needs to be removed and completely filled with water and replaced to restore prime.
7. Check that solution leaving the EWS Cell is flowing through the flow switch. Check that the flow is visually sufficient to raise the float in the clear plastic chamber to its uppermost position.

If the previous solutions do not remedy the problem, contact your distributor or HydraMaster's Customer Care/Technical Support department.

2. The DC current on the gauge mounted in the door of the DC Power cabinet is less than 35DC Amps.

Solution
1. Check that the value of the DC current on the EWS Power Cabinet is greater than 35 Amps.
2. Check all wires inside the power box for integrity and tighten all electrical wire connections.
3. Check all wires for integrity and tighten all electrical wire connections between the van battery terminals and the EWS Power Cabinet and the EWS Power Cabinet and the EWS Cell.
4. Check that the inverter green light is in the 'on' mode in the power cabinet. If the green light is not on, or an orange light is displayed and you hear a high pitch noise, the inverter is not operating correctly and may need to be replaced.
5. Check that the peristaltic pump on/off switch is in the 'ON' position and is operational (visually rotating) and that the saturated salt feeder has both salt and water mixture.

If you have verified the previous steps and are still not able to achieve at least 35 Amps, contact your distributor or HydraMaster's Customer Care/Technical Support department.

3. Power is turned on but the peristaltic pump will not operate.

Solution
1. Ensure that power from the vehicle is on and that 12VDC is available at the inverter.
2. Ensure that the power switch on the peristaltic pump is 'ON'.

If you have verified the previous steps and the peristaltic pump still will not operate, contact your distributor or HydraMaster's Customer Care/Technical Support department.

5 - Vacuum Blower System

This section of the manual covers the Zerorez CDS' vacuum blower system and includes information on:

- Inlet Filter
- Blower Lubrication
- Blower Troubleshooting

The vacuum blower, featuring tri-lobe rotors, is designed for maximum positive displacement and manufactured using special porting technology to significantly reduce noise.

Lubrication for both the gear end and drive end of the blower is provided by full oil splash. Unlike grease lubrication, oil-splash lubrication provides for longer bearing and seal life through improved heat dissipation.

At the gear end, the timing gear teeth are lubricated by submersion in oil with the gear teeth serving as oil slingers. At the drive end, the bearings are also lubricated by submersion in oil with oil slingers attached on the shafts.

The performance and life of the vacuum blower is greatly dependent on the care and proper maintenance it receives.

Because of the close tolerances between the 3 lobes and housing of the vacuum blower, solid objects entering the inlet will damage the internal lobes, gears, bearings or drive system.

To prevent this from happening, a stainless steel filter screen has been placed at the vacuum blower intake inside the recovery tank. This stainless steel filter system should be removed for cleaning on a daily basis.

▲ WARNING

Use caution when the Zerorez CDS 4.8 is being run for test purposes and the vacuum inlet is open. Unregulated vacuum may cause injury if body parts come in contact with the open vacuum inlet.

CAUTION

To protect the vacuum blower from overloading and damaging itself, there is a vacuum relief system installed on the recovery tank. When the tank inlet is completely sealed off, a maximum of 14" Hg will be attained. At the end of each day, spray an oil-based lubricant into the blower lubrication port before shutting down the machine. If you fail to lubricate the vacuum blower on a daily basis, rust deposits and moisture can form and decrease the life of the vacuum blower.

CAUTION

The recovery tank is protected from excessive water level overflowing by a recovery tank float kill switch. The switch is activated only by liquid.

RECOVERY TANK INLET FILTER

HydraMaster inlet filter screens are designed to trap lint, hair and large objects that would normally collect at the bottom of your recovery tank. Clean the screen at the end of each job to eliminate build-up of debris in the tank.

VACUUM BLOWER LUBRICATION

Read the vacuum blower Owner's Manual, included in the digital (CD) Owner's Manual, for proper oil changing instructions. Because the Zerorez CDS is very demanding of the vacuum blower, the vacuum blower should be maintained as recommended in the vacuum blower Owner's Manual.

Remember to:

1. Remove vented oil fill plug on front or rear oil case.
2. Fill with specified oil until it registers to the top of the sight glass.
3. Use PneuLube or other synthetic ISO 100 rating lubricants (when ambient temperature range from 0° F to 120° F (in applications with extreme variations in ambient temperature, consult blower manufacturer).
4. Add fresh oil as required to maintain proper level.

The oil should be drained, flushed and replaced the first 100 hours and every 500 hours thereafter.

VACUUM BLOWER TROUBLESHOOTING

1.0. Weak vacuum at tool/wand. Gauge reads normal (10" Hg to 14" Hg)

	Probable Cause	Solution
1.1.	Clogged hoses or tool/wand tube.	Disconnect hoses and carefully check for an obstruction.
1.2	Excessive length of hoses connected to machine.	Make sure machine is rated for the conditions under which it is being operated.

2.0. Vacuum gauge will not come up to 14" Hg

	Probable Cause	Solution
2.1	There is an air leak somewhere in the vacuum system.	Check vacuum relief valve for proper adjustment. Check all hoses for cuts and breaks. Check recovery tank lid gasket. Make sure the recovery tank drain valve is fully closed.
2.2	The vacuum gauge is defective.	Test and replace as necessary.
2.3	Vacuum blower is turning too slowly.	Check blower rpm at tachometer on the CDS' dash. Blower rpm should be 2 times the tachometer rpm. See the throttle control kit instructions for further troubleshooting assistance.

3.0. Vacuum gauge reads high with no hoses attached

	Probable Cause	Solution
3.1	Filter in recovery tank is clogged.	Remove and clean or replace as necessary.
3.2	Hose from recovery tank to blower is collapsed internally.	Inspect and replace as necessary.

4.0. Noisy Vacuum Blower

	Probable Cause	Solution
4.1.	Vacuum blower is low on oil.	Inspect oil level and replenish as necessary
<div style="background-color: yellow; padding: 5px;">CAUTION</div> <p>Running the blower when it is low on oil will cause severe internal damage to the blower. If this situation occurs, the blower should be inspected by a qualified service technician.</p>		
4.2.	There is internal damage to blower.	Refer to qualified service technician.

5.0. Vacuum Blower is locked and will not turn

	Probable Cause	Solution
5.1.	The machine has been unused for a period of time and the blower was not properly lubricated when it was shut down, causing rust to build up on internal surfaces.	Spray penetrating oil into blower and let sit for at least 1 hour. Then very carefully use pipe wrench on outer diameter of pulley on blower shaft and attempt to free up blower. Do not use wrench directly on blower shaft. If unable to free up blower in this manner refer to a qualified service technician.
5.2.	There is internal damage to blower.	Refer to qualified service technician.

6 - Water Pump Maintenance

The Zerorez CDS' water pump features a dynamic low-pressure seal retainer, an innovative intermediate ring, and superior low-pressure and high-pressure seals. With its ceramic plungers and nickel-plated forged brass manifold, this high-temperature pump is ideal for use in carpet cleaning.

You must perform daily and periodic maintenance on the pump to maintain maximum performance of seals and valves.

This section of the manual explains:

- Daily Maintenance
- Periodic Maintenance
- Servicing Valves
- Water Pump Troubleshooting



DAILY MAINTENANCE

1. 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 back of the pump.
2. Use a SAE15W40 oil.

CAUTION

If the oil becomes discolored and contaminated, one of the oil seals may be damaged. Refer to the Pump Owner's Manual for more information.

Do not operate the pump if the crankcase has been contaminated with water.

CAUTION

Do not leave contaminated oil in the pump housing or leave the housing empty. Remove contaminated oil as soon as it is discovered and replace it with clean oil.

CAUTION

Do not turn the drive shaft while the oil reservoir is empty.

CAUTION

Protect the pump from freezing.

PERIODIC MAINTENANCE

Change the oil after the first 50 hours of operation, with the pump stopped and the oil still warm, and after every 300 operating hours or 3 months of operation. When changing the oil, remove the drain plug on the oil drain hose so all oil and accumulated sediment will drain out.

The initial oil change is recommended for no other reason than to eliminate impurities that may be in the oil during the running-in phase. If these impurities are not removed, but are allowed to remain in the oil, they may cause premature wear to the moving parts and the oil seals.

NOTICE

If the pump works in conditions with high humidity and with sharp temperature changes, condensation may appear inside the crankcase. Condensation mixing with the oil can change the oil's properties, which is easy to detect because the oil changes to a white, milky color.

If the pump does not have excessive water leaking from the packings, and the oil becomes milky, the oil has to be changed more frequently.

SERVICING VALVES

Removing a Valve

1. Remove the valve cap (30 mm) and extract the valve assembly (see Figure 6-1).

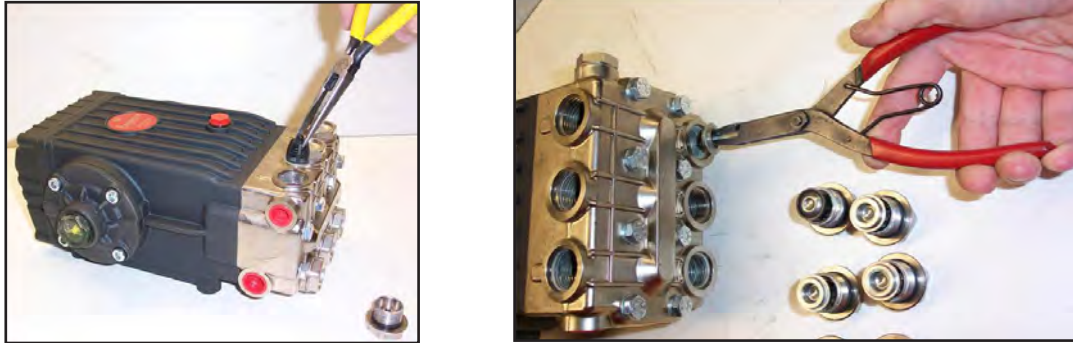


Figure 6-1. Remove Valve Cap and Valve Assembly

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

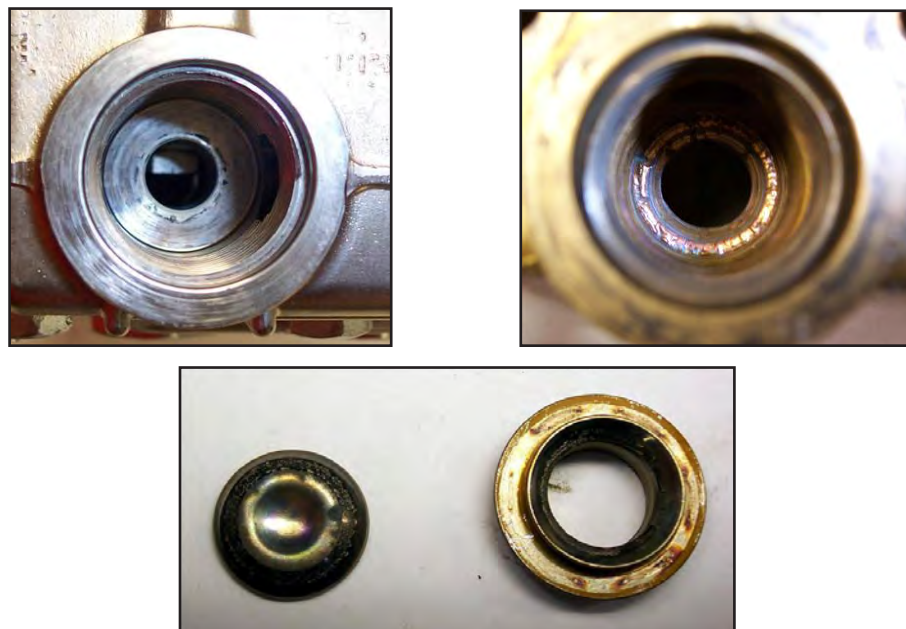


Figure 6-2. Inspect Manifold and Old Valves

7. Replace the center inlet check valve with a modified check valve (see Figure 6-3).

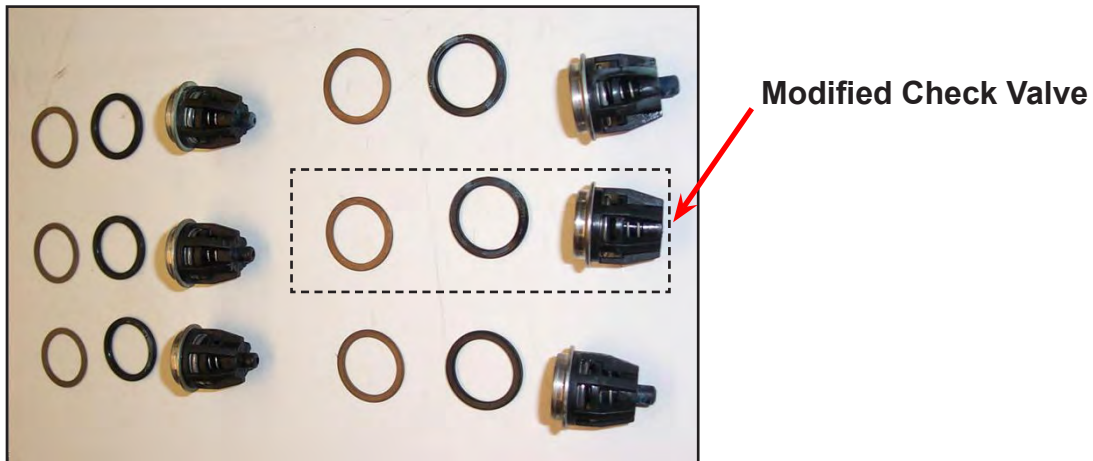


Figure 6-3. Replace Center Inlet Check Valve with Modified Check Valve

8. Apply O-ring grease to O-rings and install valves (Figure 6-4).

NOTICE

HydraMaster recommends O-ring grease, P/N 000-087-028



Figure 6-4. Apply Grease and Install Valves



Figure 6-5. Replace Valve Cap

9. Replace valve cap and torque to 95 ft-lbs.(see Figure 6-5).
10. Remove the fasteners retaining the manifold.

11. Separate manifold from crankcase (see Figure 6-6).

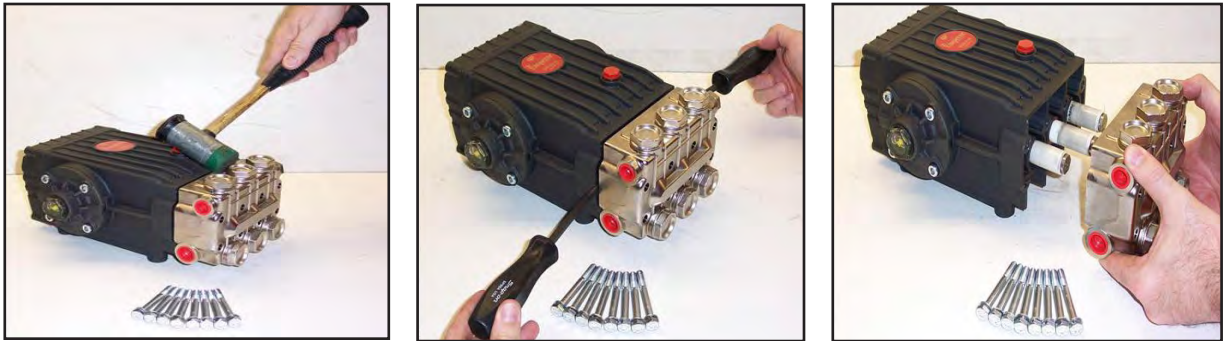


Figure 6-6. Separate Manifold from Crankcase

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.

12. The seal assemblies may come off with the manifold (see Figure 6-7).



Figure 6-7. Seal Assemblies May Come Off with Manifold



Figure 6-8. Examine Ceramic Plungers

13. Examine the ceramic plungers. The surface should be smooth and free from scoring, pitting or cracks (see Figure 6-8); if not, replace.
14. Loosen the stainless steel plunger bolt.

15. Remove the stainless steel plunger bolt and ceramic plunger from the plunger guide (see Figure 6-9).
16. If the slinger washer is removed, be certain it is re-installed or replaced.
17. Separate plunger bolt from ceramic plunger (see Figure 6-9).

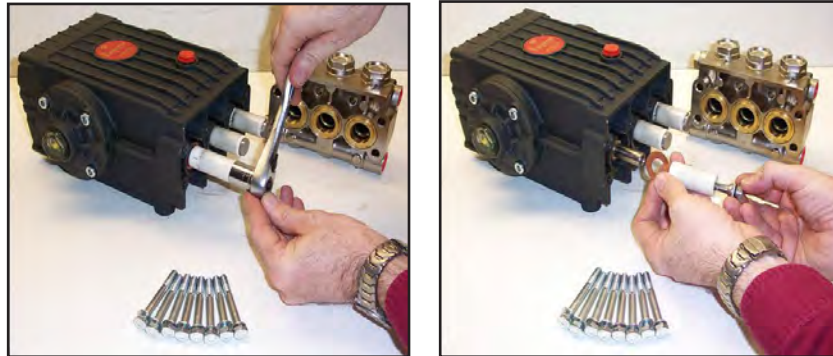


Figure 6-9. Remove Stainless Steel Plunger Bolt and Ceramic Plunger

18. Install new Teflon® back-up ring and O-ring on the plunger bolt. Apply a film of O-ring grease on the outside of the O-ring (see Figure 6-10).
19. Apply removable anaerobic thread sealant (Loctite® 542) to the threads of the plunger bolt, carefully pressing the plunger bolt into ceramic plunger (see Figure 6-10).
20. Slide new ceramic plunger over the plunger guide (see Figure 6-10).

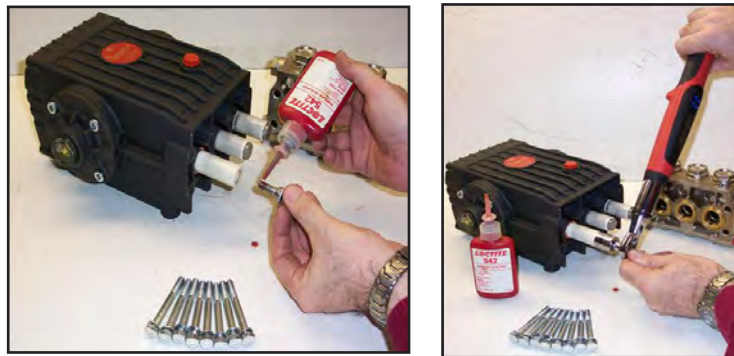


Figure 6-10. Install O-ring, Apply Sealant and Slide Plunger over Plunger Guide

21. Torque plunger to 14.5 ft.-lbs.

Extracting Seals

With manifold removed from crankcase:

1. Insert proper extractor collet through main seal retainer (see Figure 6-11).
2. Tighten collet and extract retainers and seals.

NOTICE

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

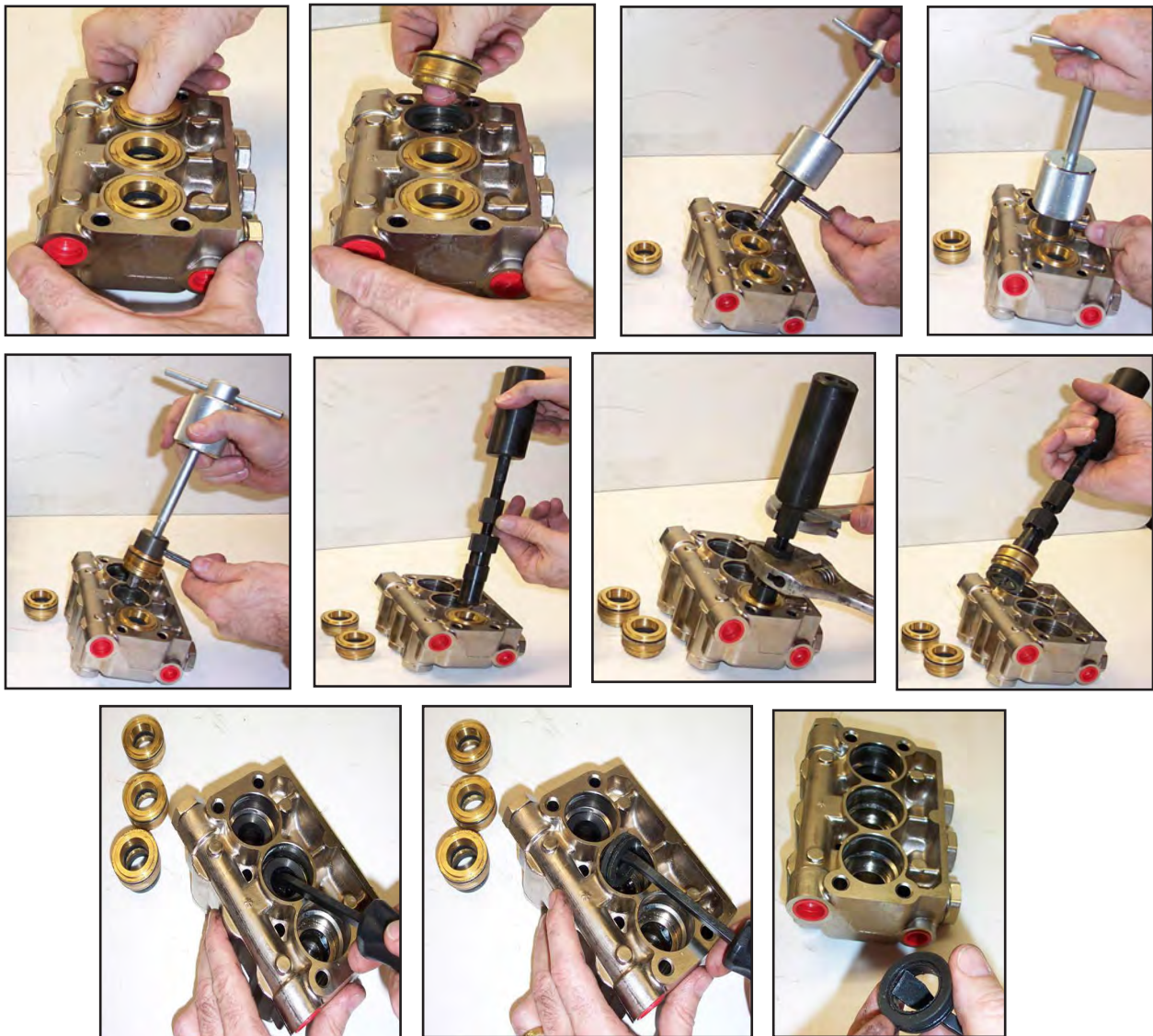


Figure 6-11. Extract Retainers and Seals

Replacing the Seal Assemblies

Only one seal kit is necessary to repair all the seals in the pump (see Figure 6-12). Use an insertion tool for seal installation.

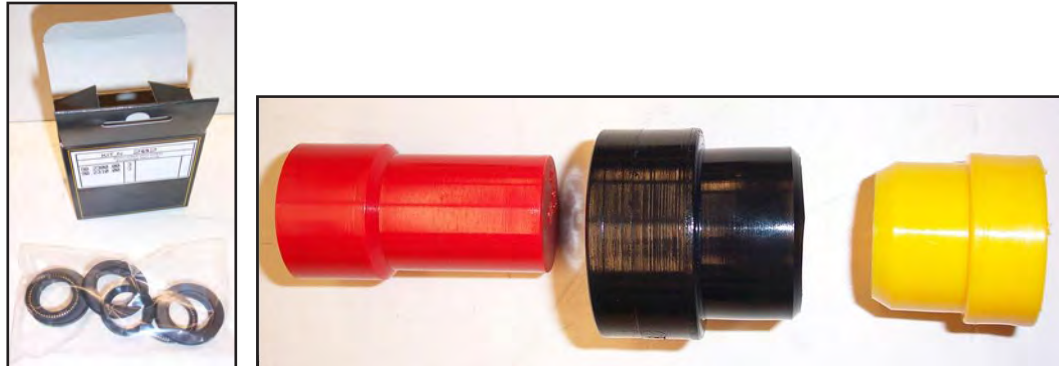


Figure 6-12. Seal Kit and Insertion Tool for Seal Installation

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 6-13).

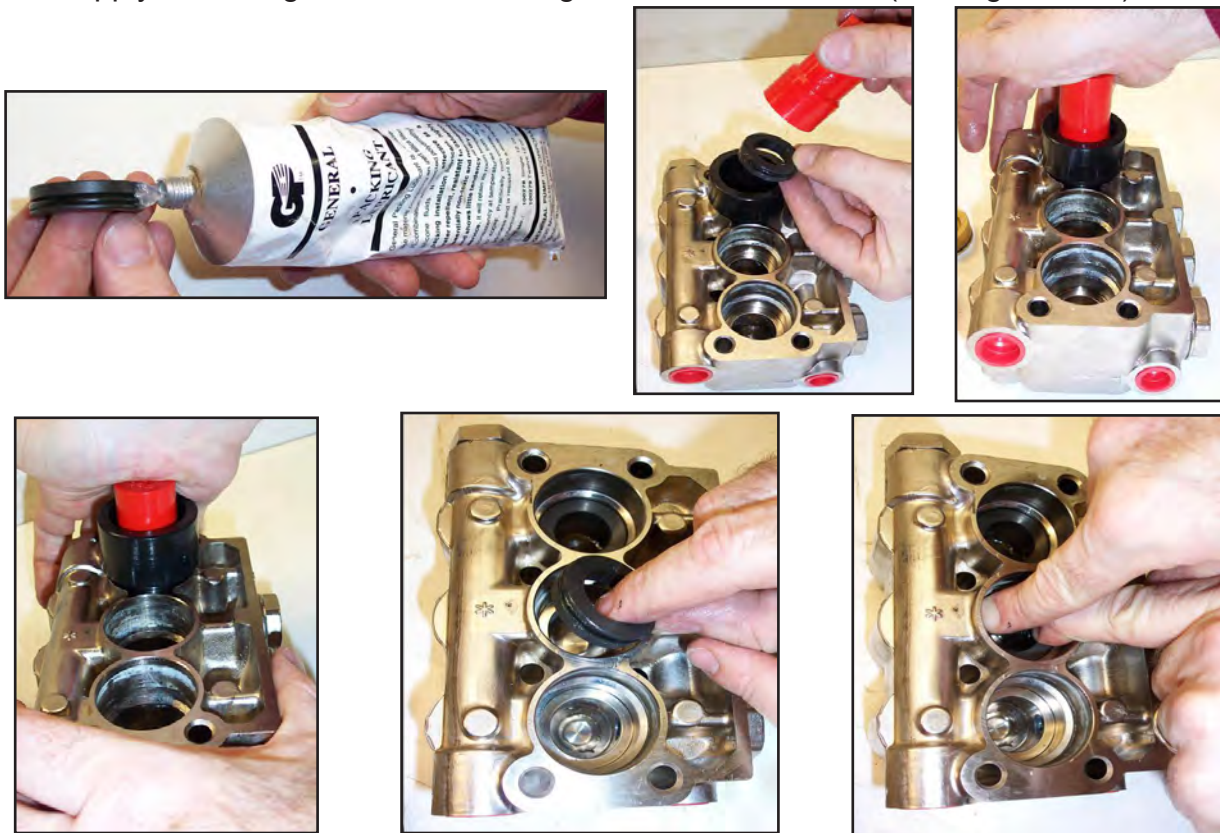


Figure 6-13. Install Seal Assembly Using O-Ring Grease

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 6-14).

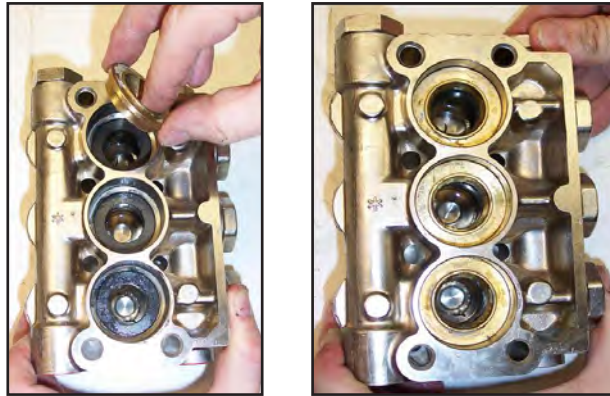


Figure 6-14. Install Retainers into Cavities

3. Press the low pressure seal assembly into the cavity (see Figure 6-15).

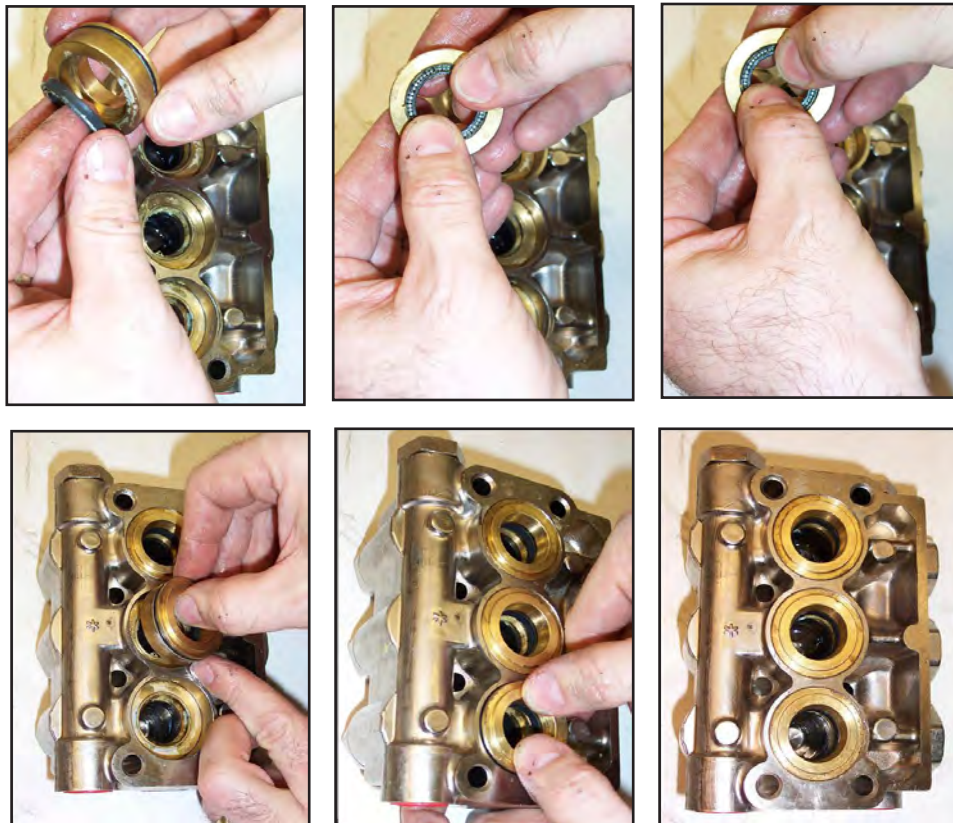


Figure 6-15. Press Low Pressure Seal Assembly into Cavity

Re-Installing Manifold

1. Position the outer plungers at the same position (see Figure 6-16).
2. Re-install manifold and torque the fasteners in an “X” pattern to 50% of specification and then retorque to 100% specification (see Figure 6-17 and Figure 6-18).

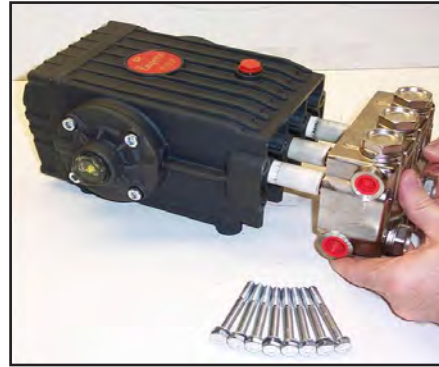


Figure 6-16. Re-install Manifold and Torque Fasteners

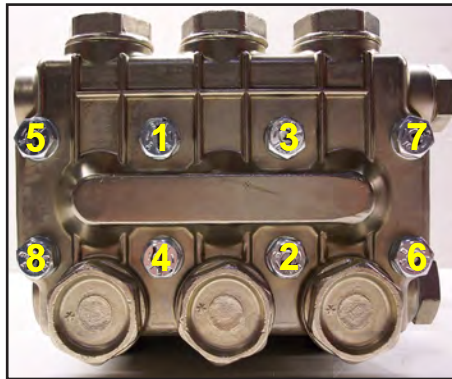


Figure 6-17. Torque Sequence in “X” Pattern

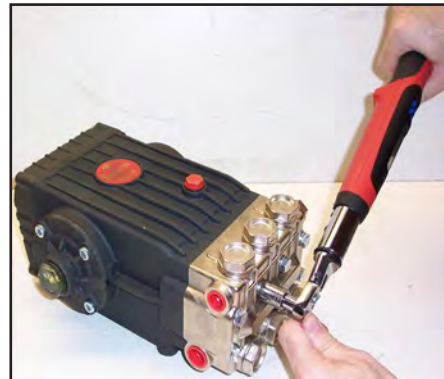


Figure 6-18. Torque Bolts to 22 ft.-lbs

WATER PUMP TROUBLESHOOTING

1.0. Will not come up to normal cleaning pressure

Probable Cause	Solution
1.1. Pressure adjusting valve is defective or dirty.	Disassemble valve. Repair or replace as necessary.
1.2. Worn seals or valves in pump.	Test pump output volume directly from pump at normal operating rpm. If volume is below manufacturer's specifications, replace seals and inspect for defective valves.
1.3. Pump rpm is too low.	Check engine rpm and adjust as necessary. Check for loose pump belt. Adjust tension as necessary.
1.4. Primary system control orifice is missing or loose.	Remove filter and inspect. Tighten or replace as necessary.
1.5. Primary orifice is worn.	Measure orifice size and replace as necessary.

2.0. No pressure reading on PSI gauge

Probable Cause	Solution
2.1. Pump switch is not turned on.	Turn on switch
2.2. Pump belt is broken.	Replace belt.
2.3. Pump clutch is not activated. No water in tanks.	Check system back to source to locate cause of interruption to water flow.
2.4. Pump clutch is not activated.	Check for 12 volts at clutch. If 12 volts is present, replace clutch.
	If 12 volts is not present, check power to the low-water relay. If there is 12 volts at the relay, check low water switch in HydraCradle.
	If low water switch has no continuity when float is up, replace the switch. If switch is good, replace the low water relay.

3.0. PSI gauge reads normal: low pressure from tool/wand

Probable Cause	Solution
3.1. There is a restriction in the cleaning tool/wand.	Inspect tool jet and clean or replace as necessary. Inspect any filters in the cleaning tool and clean or replace as necessary.
3.2. There is a defective quick connect in the system.	Inspect each quick connect and replace as necessary.
3.3. There is a restriction in solution hose.	Remove quick connects and inspect hoses. Clean or replace as necessary.

4.0. Pressure pulsation

Probable Cause	Solution
4.1. Water is too hot and is approaching boiling point.	Check temperature of water.
4.3. One of the intake or outlet valves in the high-pressure pump is defective or is being held open by debris.	Remove each valve and inspect for correct operation.

7 - Electrical System

This section of the manual contains wiring diagrams (see tbd 1, tbd 2) and tbd 3, an electrical schematic (see tbd 4) and troubleshooting guides for the service technician because the most challenging problem to trace in any system is often an electrical failure.

The electrical system (including the HydraCradle Tank and the EWS) operates on 12VDC which is provided by the vehicle's battery. No additional power sources are required.

The HydraCradle's 30 Amp fuse for the foot switch/gear motor, is easily accessible from the front panel of the HydraCradle.

CAUTION

To avoid equipment damage, it is very important to tie up any loose wires or hoses near the drive shaft area. Tie wraps are sufficient for wires and small hoses.

When securing large hoses or wiring harnesses in the area of the drive shaft, tie down the components with a hose clamp, with a clear vinyl hose inserted onto the clamp. On some installations, if the fuel injector wires are not properly secured, the wires could rub against the CDS drive shaft, causing a short in the electrical system of the van.

TROUBLESHOOTING

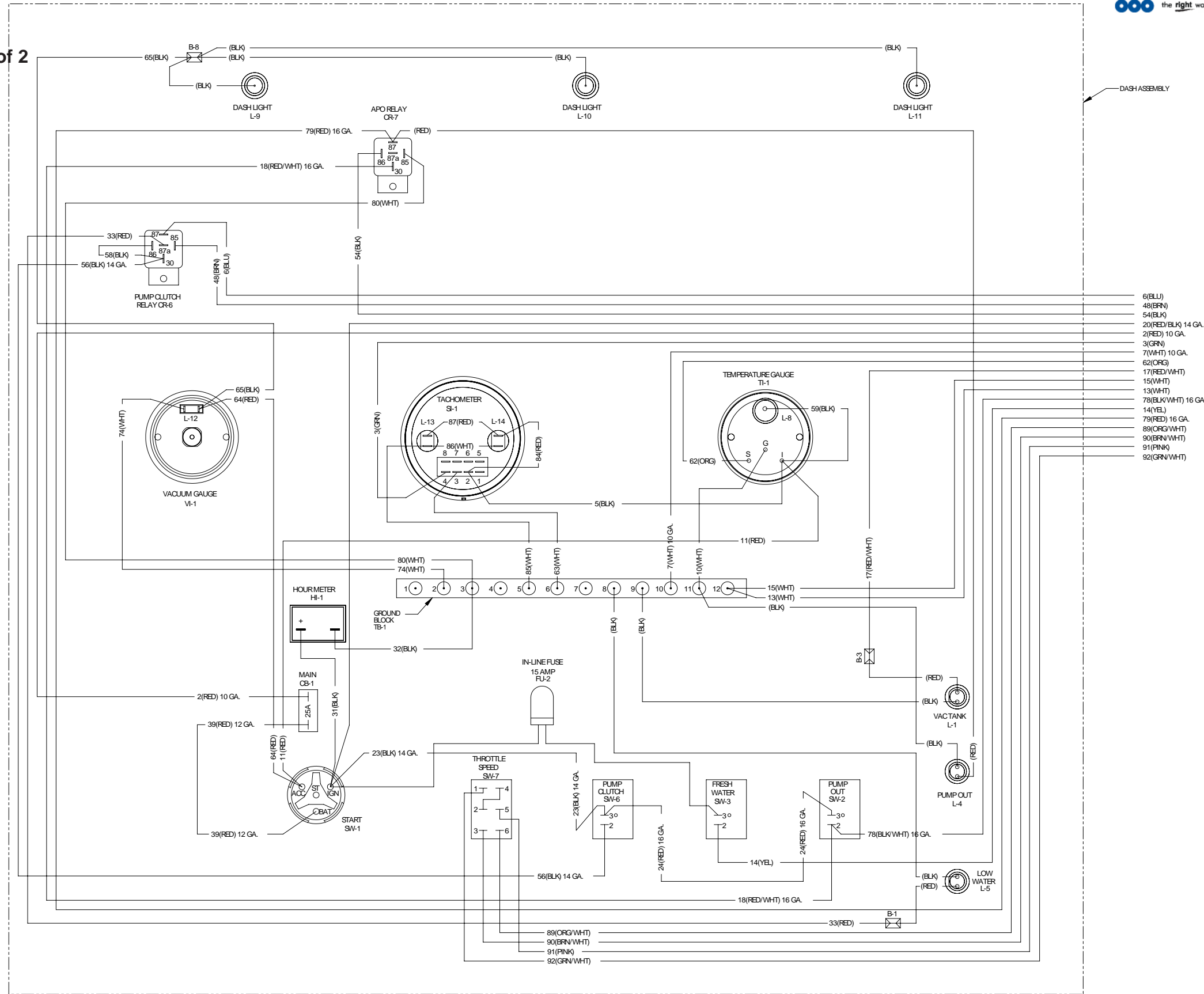
1.0. CDS will not turn on

	Probable Cause	Solution
1.1.	The main power fuse has blown.	Remove CDS cowling and engine cover and check all wiring from the power source back to the CDS console for damage. Replace fuse only after locating the problem that caused the fuse to blow. If unable to locate problem, refer to qualified service technician.
1.2.	The plug-in connection at the base of the recovery tank is corroded.	Clean and seal connection to protect it from moisture.
1.3.	The main circuit breaker has blown on the CDS dash.	Reset breaker and look for loose connections or damaged wires. Check all wires from the control panel forward to the front of the vehicle. If no problem is found but the breaker still trips refer to qualified service technician.

2.0. CDS shuts off while in use

	Probable Cause	Solution
2.1	Recovery tank is full.	Empty tank and restart machine.
2.2.	Recovery tank float switch is dirty or defective.	Inspect float to see if the triangle mark on the float is facing up. If it is, and the float slides freely on the post, replace the float assembly.
2.3.	The vehicle gear selector has moved.	Inspect the gear selector to be sure it is in the proper position. If selector has moved, refer to qualified service technician.
	<div style="background-color: #ff8c00; color: white; padding: 5px; display: inline-block;">⚠ WARNING</div> If vehicle gear selector has moved, refer to qualified service technician. This is a dangerous condition and needs to be repaired immediately.	

Figure 7-1. CDS Wiring Diagram - View 1 of 2
7660 Rev. A



*ALL WIRES ARE 18 GAUGE UNLESS OTHERWISE STATED

Figure 7-2. CDS Wiring Diagram - View 2 of 2
7660 Rev. A

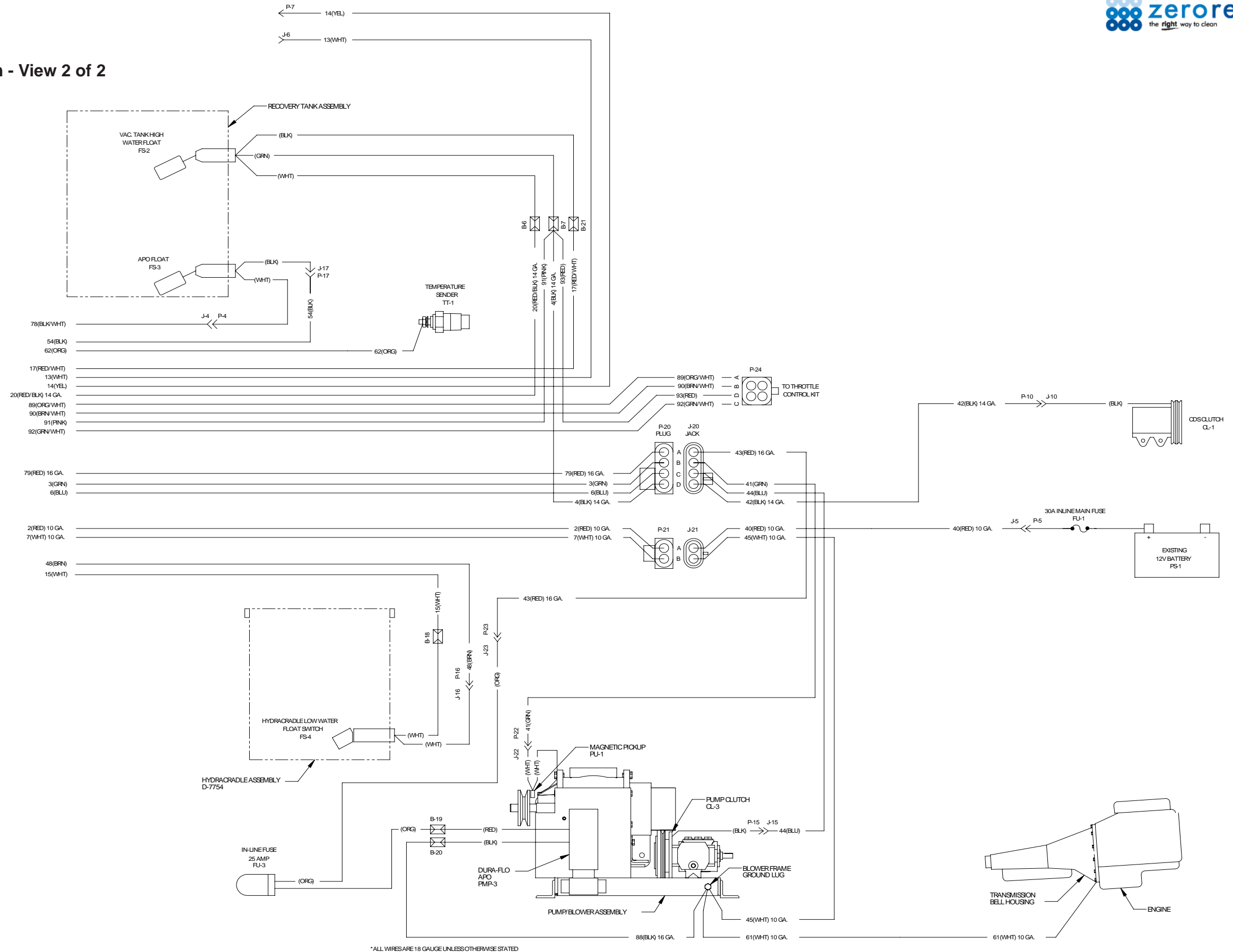


Figure 7-3. CDS Electrical Schematic
7661 Rev. A

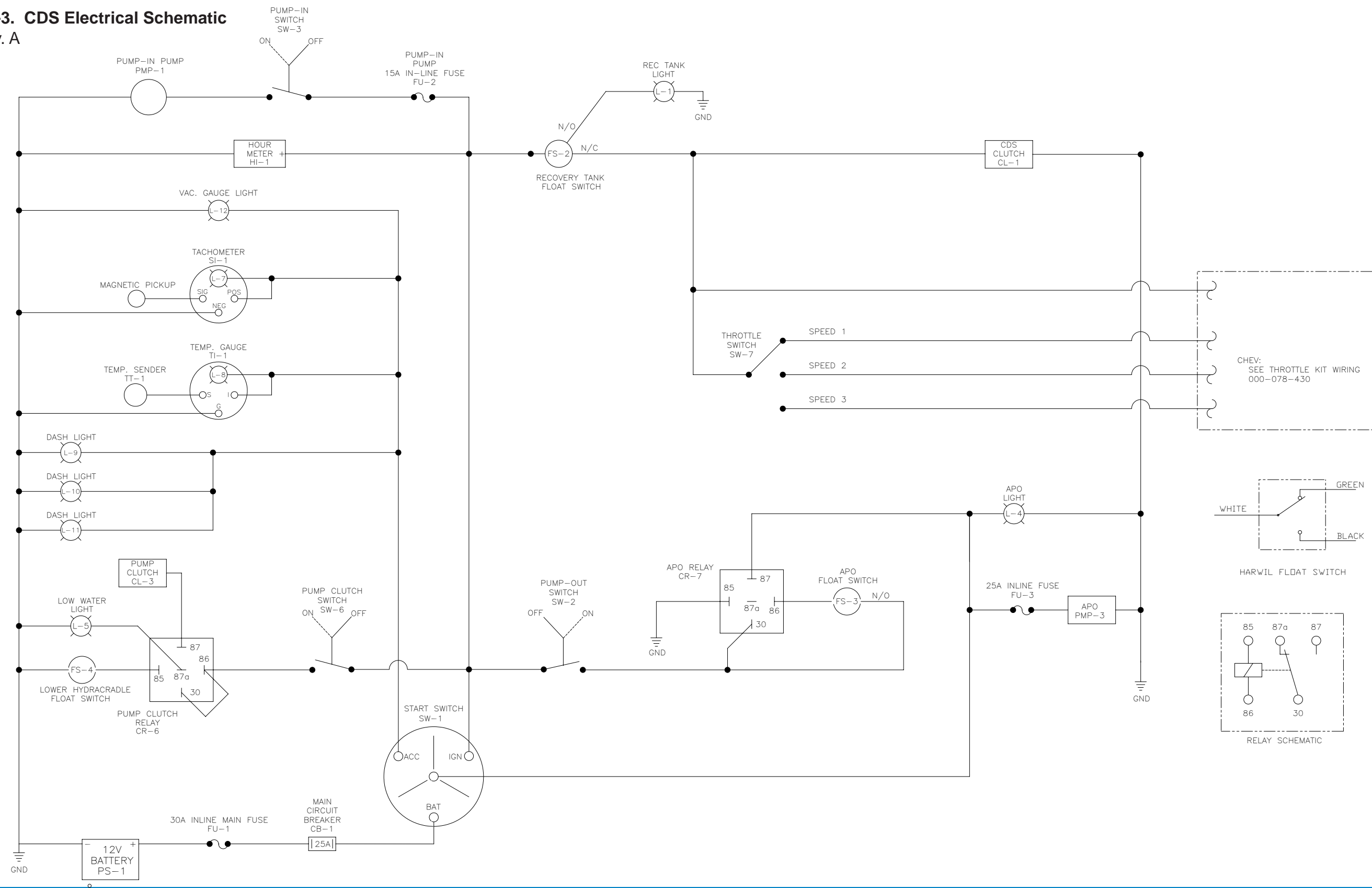
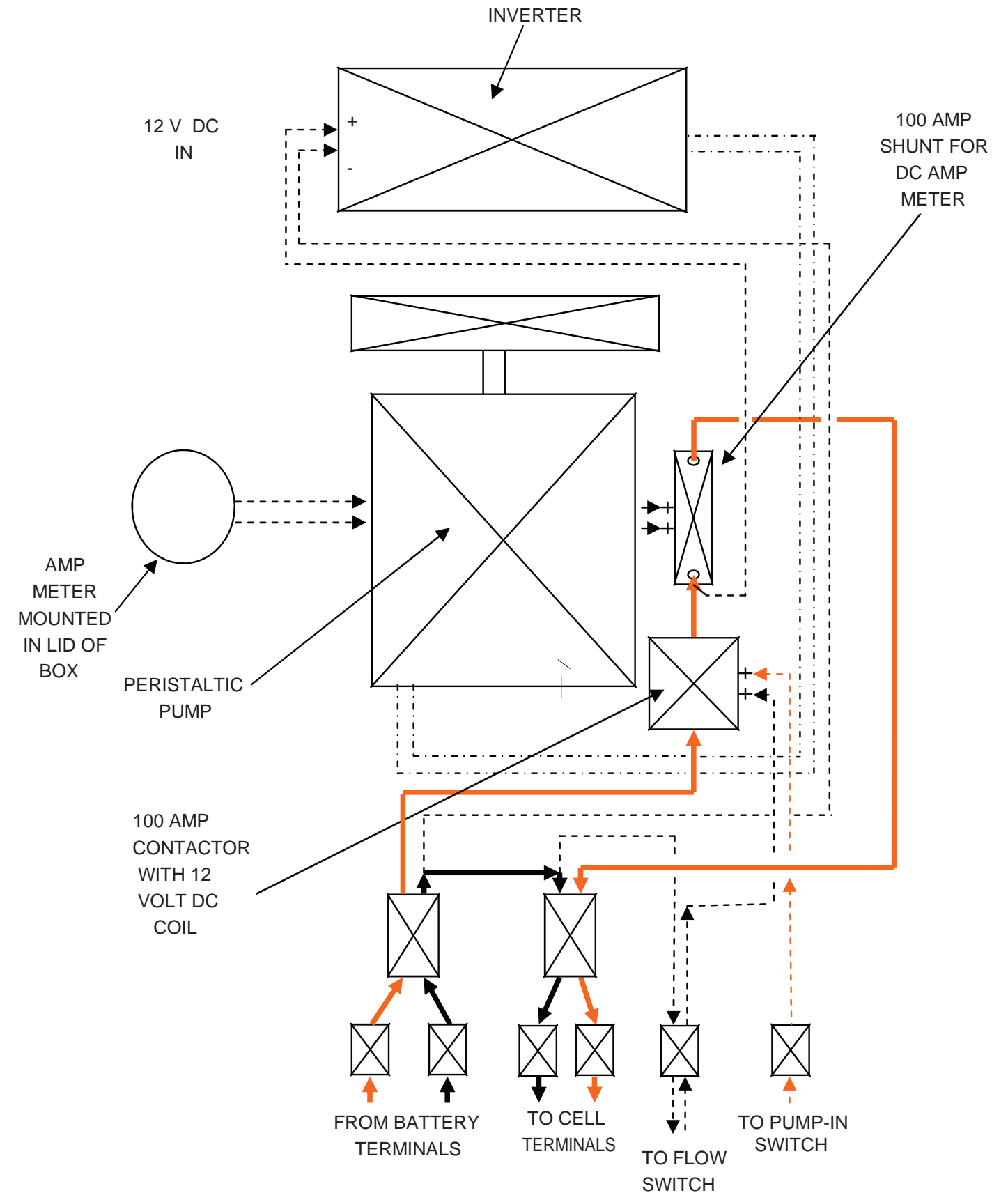
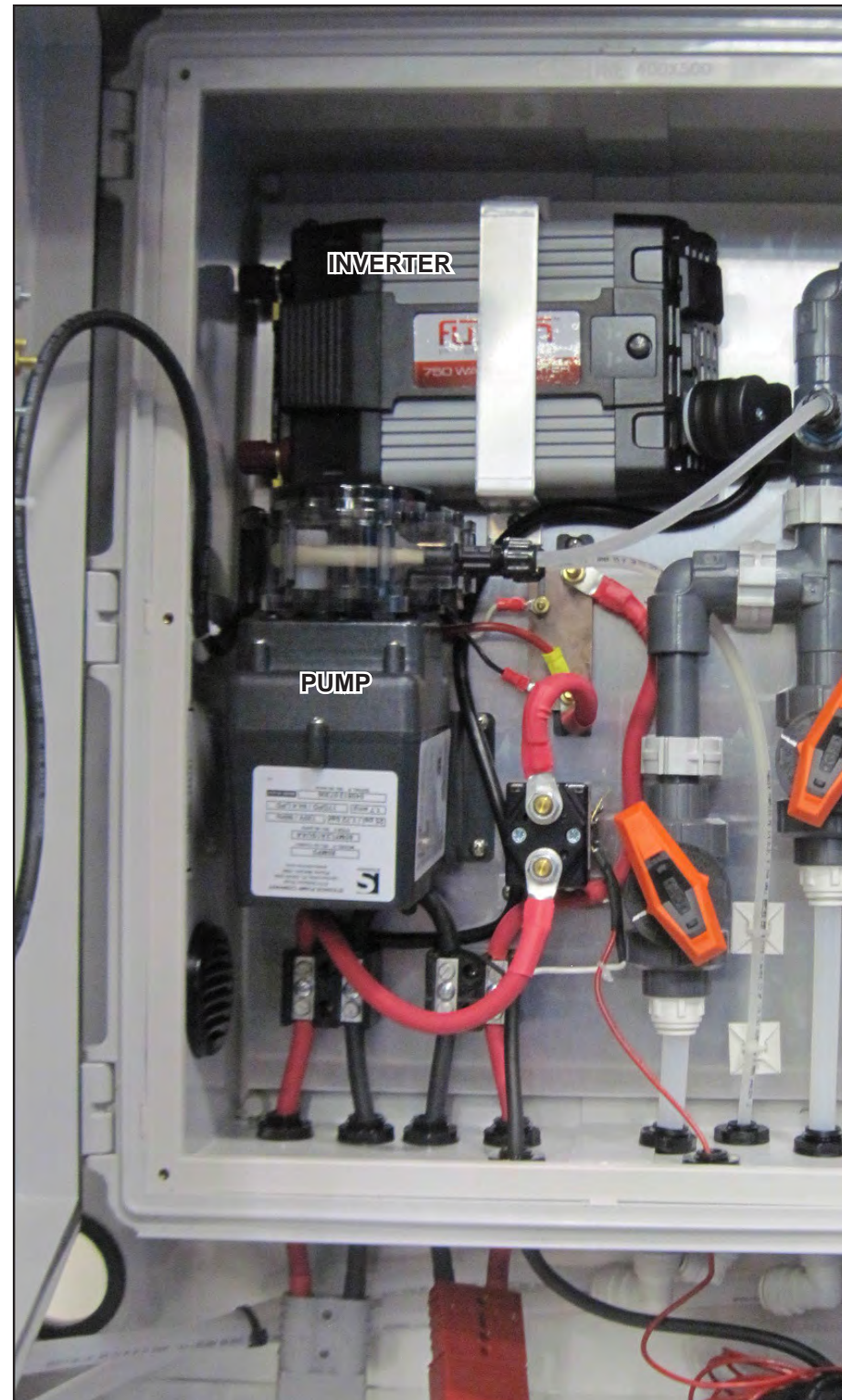


Figure 7-4. EWS Electrical Box Wiring Diagram



8 - Flow System

The general concept of the ZR EWS flow system as shown in Figure 8-1 is as follows:

Water, supplied from an outdoor faucet at the job's location, combines with a saturated salt solution which is stored in the van.

After the flow of the combined saline solution is established via the EWS Cabinet (EWS Electrical Box), the solution flows into the EWS Cell where DC power, provided from the alternator / battery of the vehicle, is applied to the solution to continuously generate catholyte ('B' water) and anolyte ('A' water) solutions.

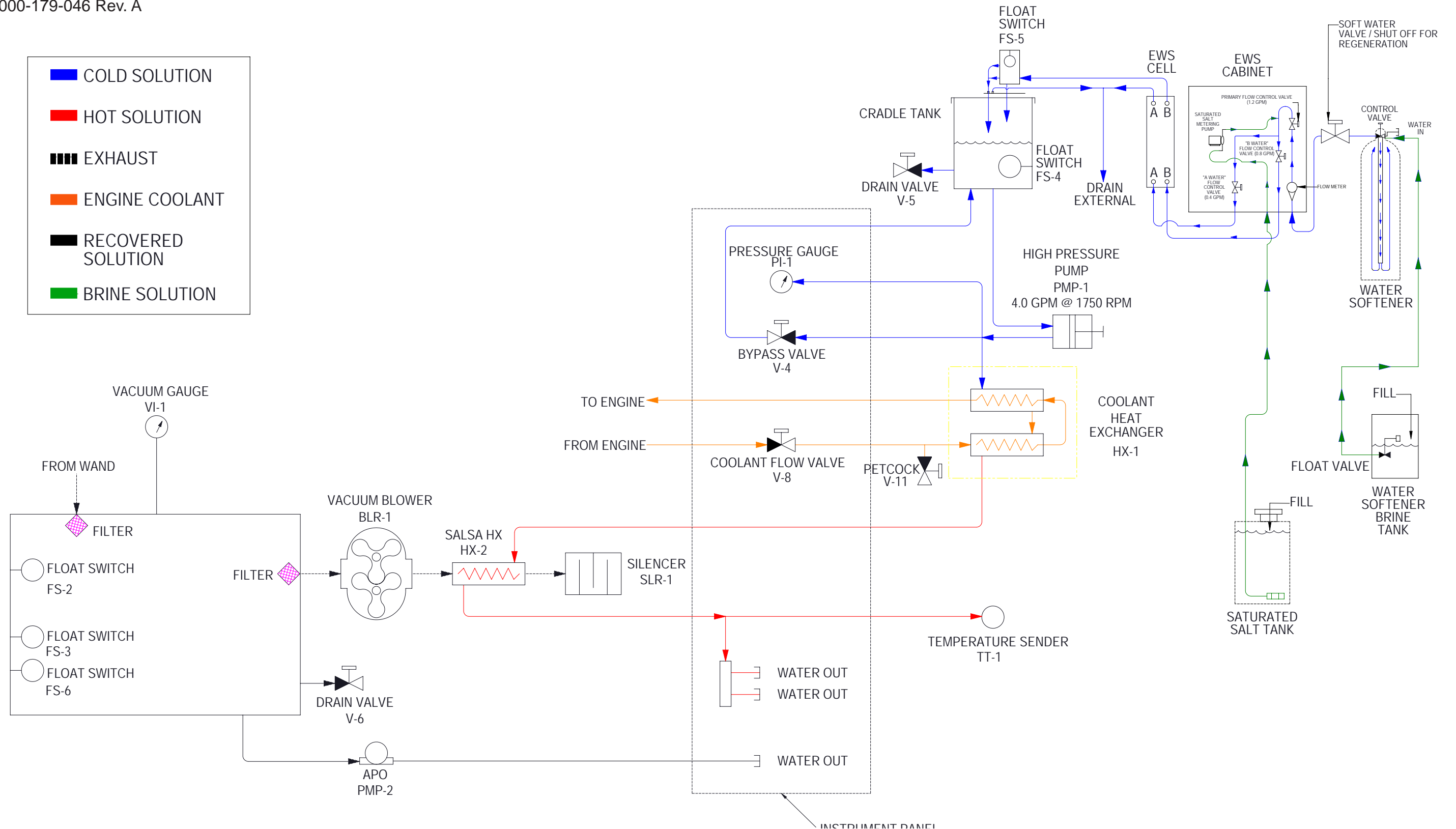
The catholyte ('B' water), intended for cleaning, is stored in the HydraCradle Tank. The co-produced anolyte ('A' water) must be discharged into a receptacle and then into an approved disposal site.

⚠ WARNING

IN ACCORDANCE WITH EPA, STATE AND LOCAL LAWS, DO NOT DISPOSE OF RESIDUAL ('A') 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.

In addition, do not dispose of residual water onto lawns or driveways, especially during freezing weather. Slip-and-fall accidents can occur when water has frozen onto driveways and walkways, causing personal injury to customers as well as cleaning staff.

Figure 8-1. Flow Diagram
000-179-046 Rev. A



9 - Assemblies and Parts Lists

This section of the manual provides detailed illustrations and parts lists for the following assemblies:

- Recovery Tank Assembly Parts List
- Dash Box Assembly Parts List
- Dash Panel Assembly Parts List
- Instrument Panel Assembly Parts List
- By-Pass Valve Assembly Parts List
- Hi-PSI Manifold Assembly Parts List
- Recovery Tank Cover Assembly Parts List
- Vacuum Inlet Stopper Kit Parts List
- Vacuum Relief Valve Assembly Parts List
- CDS Front End Assembly Parts List
- Power Pack Assembly Parts List
- Blower Assembly Parts List
- Pump Assembly Parts List
- Frame Assembly Parts List
- Coolant Heat Exchanger Assembly Parts List
- Salsa Heat Exchanger Assembly Parts List
- Pass Thru Assembly Parts List
- Yaw Sensor Cooling Kit Parts List
- Automatic Pump Out (APO) Kit Assembly Parts List
- ZR-EWS Retrofit Kit Assembly Parts List
- EWS Rack Assembly Parts List
- 32K Water Softener Brine Tank Assembly Parts List
- Water Softener Kit Assembly Parts List
- Frame Base Kit Assembly Parts List
- EWS Hardware Kit Parts List
- 125 Gallon HydraCradle Tank Assembly Parts List
- HydraCradle Tank Assembly Parts List
- 14" Solution Hose Reel Assembly Parts List
- EWS HydraCradle Tank Hose and Fittings Assembly Parts List
- Vacuum Hose Reel Assembly Parts List
- Garden Reel, 2nd Reel Option - Live Assembly Parts List
- Live Garden Fittings Assembly Parts List
- Vacuum Hose Reel Hub Assembly Parts List
- Three Tier Stainless Steel Shelf Assembly Parts List
- Panel Set Rear Door Assembly Parts List
- Back Door Shelf Assembly Parts List
- Furniture Pad Holder Assembly Parts List
- Chevy Cowling Assembly Parts List

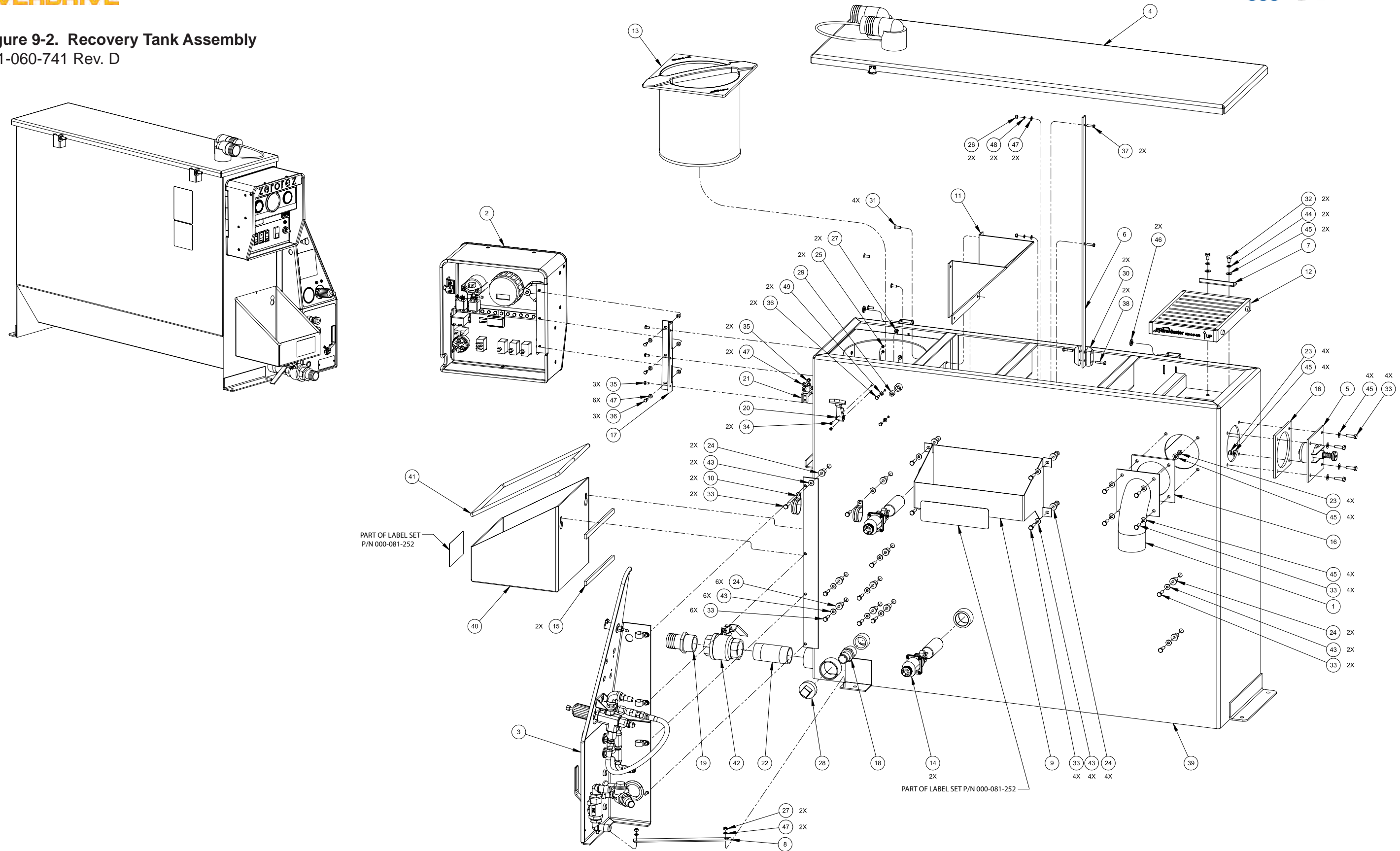
Some of the illustrations in this section reference sealants, thread lockers, adhesive, primer, anti-seize and lubricant specifications that are used in the construction of HydraMaster equipment.

Refer to Figure 9-1 to identify those substances such as A1, A2 and so forth. Equivalent products are acceptable if they meet or exceed current specifications and are approved by HydraMaster.

Adhesive Material Production Line Reference Card from ENG-45975 Rev. 0					
<p>A1 Silicone RTV</p> 	<p>A2 Loctite 567</p> 	<p>A3 Loctite 545</p> 	<p>A4 Teflon Tape</p> 	<p>E1 Loctite 51252 Grease</p> 	
<p>B1 Loctite 242</p> 	<p>B2 Loctite 262</p> 	<p>B3 Loctite 266</p> 	<p>C1 Gapper</p> 	<p>D1 Loctite 7649</p> 	<p>E2 Molykote Anti-Seize</p> 
<p>B4 Loctite 222MS</p> 	<p>B5 Loctite 425</p> 	<p>E4 Super Lube</p> 	<p>E5 SKF Anti-Fret</p> 		

Figure 9-1. Adhesive and Sealant Material Reference

Figure 9-2. Recovery Tank Assembly
601-060-741 Rev. D



Recovery Tank Assembly Parts List

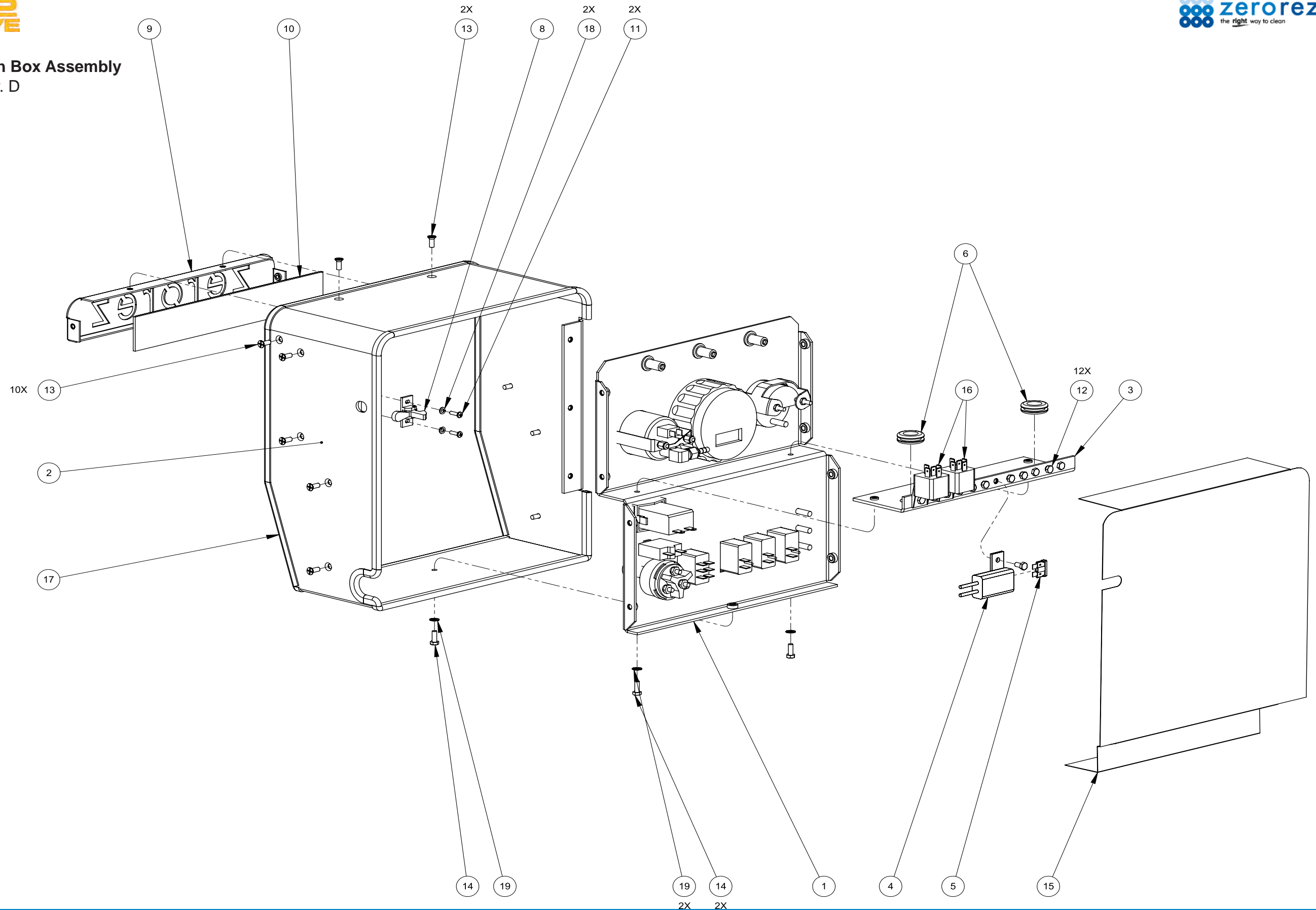
Item	Part Number	Description	Qty
1	000-001-135	Adapter, Ø3.0 Tank to X 90 Degree Blower Hose - Coated	1
2	601-018-741	Assembly, Dash Box	1
3	601-019-741	Assembly, Instrument Panel	1
4	601-029-701	Assembly, Recovery Tank Cover	1
5	601-026-701	Assembly, Vacuum Relief Valve - URT	1
6	000-015-423	Bracket, Anode - Fabricated	1
7	000-015-932	Bracket, Flat Filter Securing -Uncoated	1
8	000-015-1208	Bracket, Instrument Panel to Vacuum Tank Stabilizer	1
9	000-015-422	Bracket, Tray - Coated	1
10	000-033-053	Clamp, 1-1/2" Cushion Loop	2
11	000-049-154	Filter, Air Deflector, URT - Fabricated	1
12	000-049-153	Filter, Flat - Universal Recovery Tank	1
13	000-049-152	Filter, Recovery Tank Basket	1
14	000-157-091	Float, Lever Switch	2
15	000-057-026	Gasket, 1/2" X 1/4" X 18-1/8" Lg.	2
16	000-057-206	Gasket, Adapter - URT	2
17	000-067-031	Hinge, Dash Box	1
18	000-052-758	Insert, 1" NPT X 1" Barb	1
19	000-052-226	Insert, 1-1/2" NPT X 1-1/2" Barb (Gray)	1
20	000-086-008	Latch, Bungee	1
21	000-086-032	Latch, Dash Strike	1
22	000-052-921	Nipple, 1-1/2" NPT X 4" Lg. S/S	1
23	000-094-009	Nut, 1/4"-20UNC Nylock	8
24	000-094-113	Nut, 1/4"-20UNC Neoprene Wellnut	14
25	000-094-063	Nut, #6-32UNC Nylock	2

Item	Part Number	Description	Qty
26	000-094-004	Nut, #10-24UNC Hex	2
27	000-094-034	Nut, #10-24UNC Nylock	4
28	000-106-019	Plug, 1-1/2" NPT	1
29	000-106-007	Plug, 1/4" NPT Allen Head	1
30	000-108-022	Protector, Magnesium Anode *	2
31	000-140-023	Rivet, Ab8-6A Aluminum Pop	4
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	22
34	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
35	000-143-166	Screw, #10-24UNC X 0.375" Lg. Hex Head	5
36	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	5
37	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	2
38	000-143-134	Screw, #10-24UNC X 1" Lg. Hex Head S/S	2
39	000-159-130	Tank, 100 Gallon Universal Recovery - Coated	1
40	000-166-002	Tray, Soap Jug - Coated	1
41	000-131-131	Trimlok, 3/8 X 1/8 Rubber	1
42	000-169-022	Valve, 1-1/2" Full Port Ball	1
43	000-174-060	Washer, 1/4" Rubber Backed	14
44	000-174-019	Washer, 1/4" Lock	2
45	000-174-003	Washer, 1/4" Flat	18
46	000-174-029	Washer, 3/8" Rubber Backed	2
47	000-174-001	Washer, #10 Flat	12
48	000-174-014	Washer, #10 Lock	2
49	000-174-036	Washer, #10 Flat Rubber Backed	2

NOTICE

* Check anodes every 50 hours and replace as necessary..

Figure 9-3. Dash Box Assembly
601-018-741 Rev. D



Dash Box Assembly Parts List

Item	Part Number	Description	Qty
1	601-020-701	Assembly, Dash Panel	1
2	000-013-025	Box, Dash - Coated	1
3	000-015-183	Bracket, Grounding Bus - Fabricated	1
4	000-056-006	Fuse Holder, In-Line - Weatherproof	1
5	000-056-003	Fuse, 15 Amp Plug In	1
6	000-060-002	Grommet, Large Wiring	2
7	000-084-007	Kit, Light - New Style Temp Gauge (not shown in figure)	1
8	000-086-104	Latch, Dash Securing	1
9	000-105-053-10	Plate, Dash Name - Coated - Zerorez	1
10	000-084-016	Reflector, 1.625" X 11"	1
11	000-143-046	Screw, #6-32 X .500" Lg. PHP	2
12	000-143-166	Screw, #10-24UNC X 0.375" Lg. Hex Head	12
13	000-143-114	Screw, #10-24UNC X 0.50" Lg. Flat Head Phillips	12
14	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	3
15	000-108-013	Shield, Drip - Dash	1
16	000-157-022	Switch, Relay	2
17	000-131-027	Trimlok, 1/8" I.D. X 3/8" X 105" Lg	1
18	000-174-043	Washer, #6 Lock	2
19	000-174-015	Washer, #10 Outside Star	3

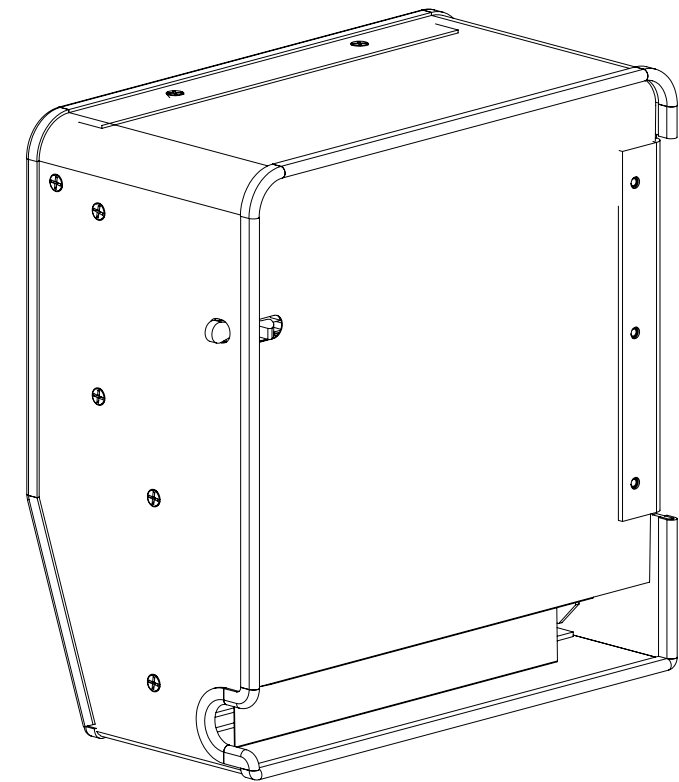
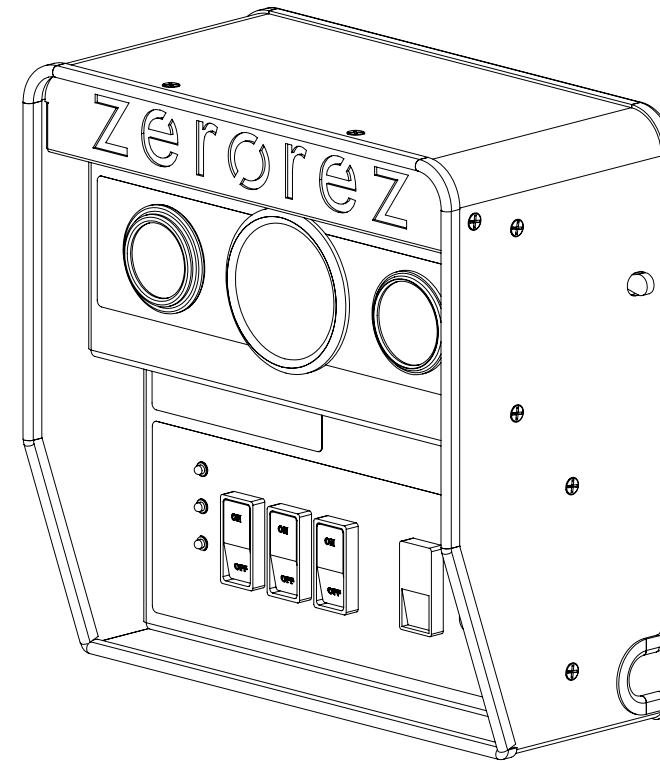
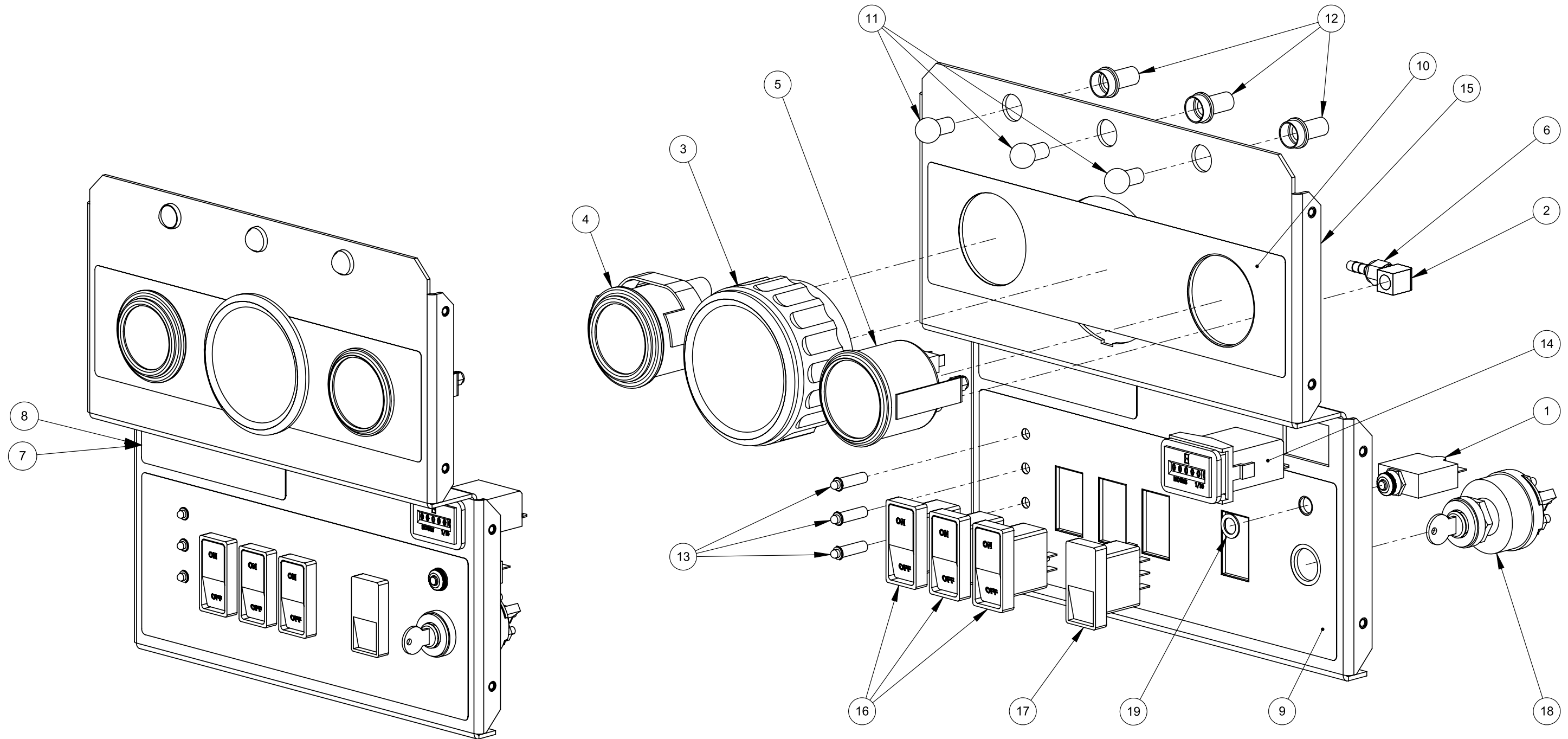


Figure 9-4. Dash Panel Assembly
601-020-701 Rev. D



Dash Panel Assembly Parts List

Item	Part Number	Description	Qty
1	000-018-004	Breaker, 25 Amp Circuit	1
2	000-052-084	Elbow, 1/8" NPT Street	1
3	000-074-034	Gauge, Tach. Mag Pick Up 3-3/8" Dial	1
4	000-074-016	Gauge, Temperature	1
5	000-074-006	Gauge, Vacuum	1
6	000-052-096	Insert, #F23 (1/8" FPT X 3/16" Barb)	1
7	000-081-355	Label, Dash Name - 1	1
8	000-081-356	Label, Dash Name - 2	1
9	000-081-353	Label, Lower Dash	1
10	000-081-354	Label, Upper Dash	1
11	000-084-004	Lamp, Replacement Gauge	3
12	000-084-009	Lamp, Socket - Dashboard	3
13	000-084-011	Light, Red LED Indicator Mini	3
14	000-074-170	Meter, Rectangular w/o Bezel	1
15	000-100-071	Panel, Dash - Coated	1
16	000-157-040	Switch, 20 Amp Rocker	3
17	000-157-131	Switch, 3-Way Speed Control	1
18	000-157-008	Switch, Ignition	1
19	000-174-052	Washer, 3/8" Flat	1

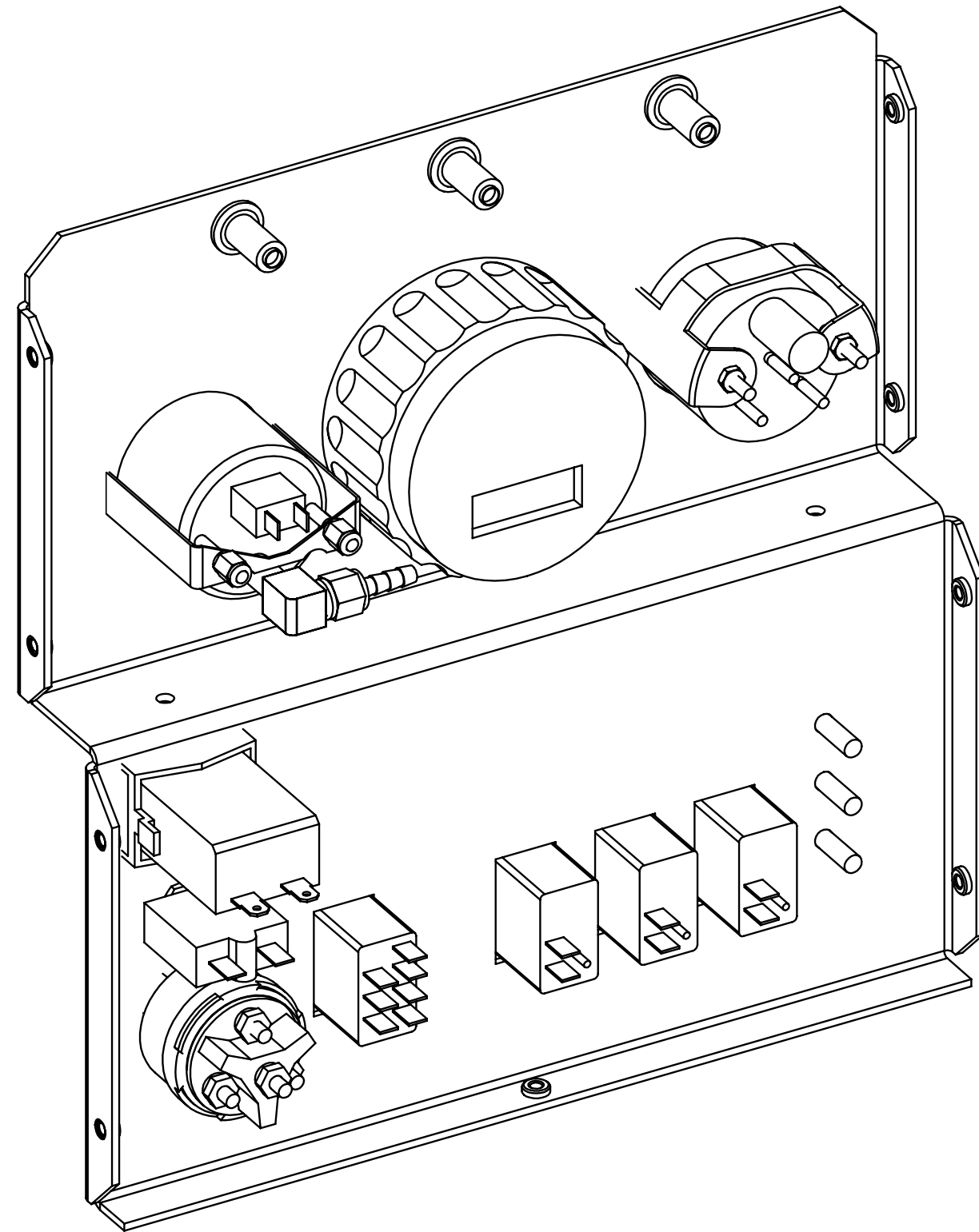
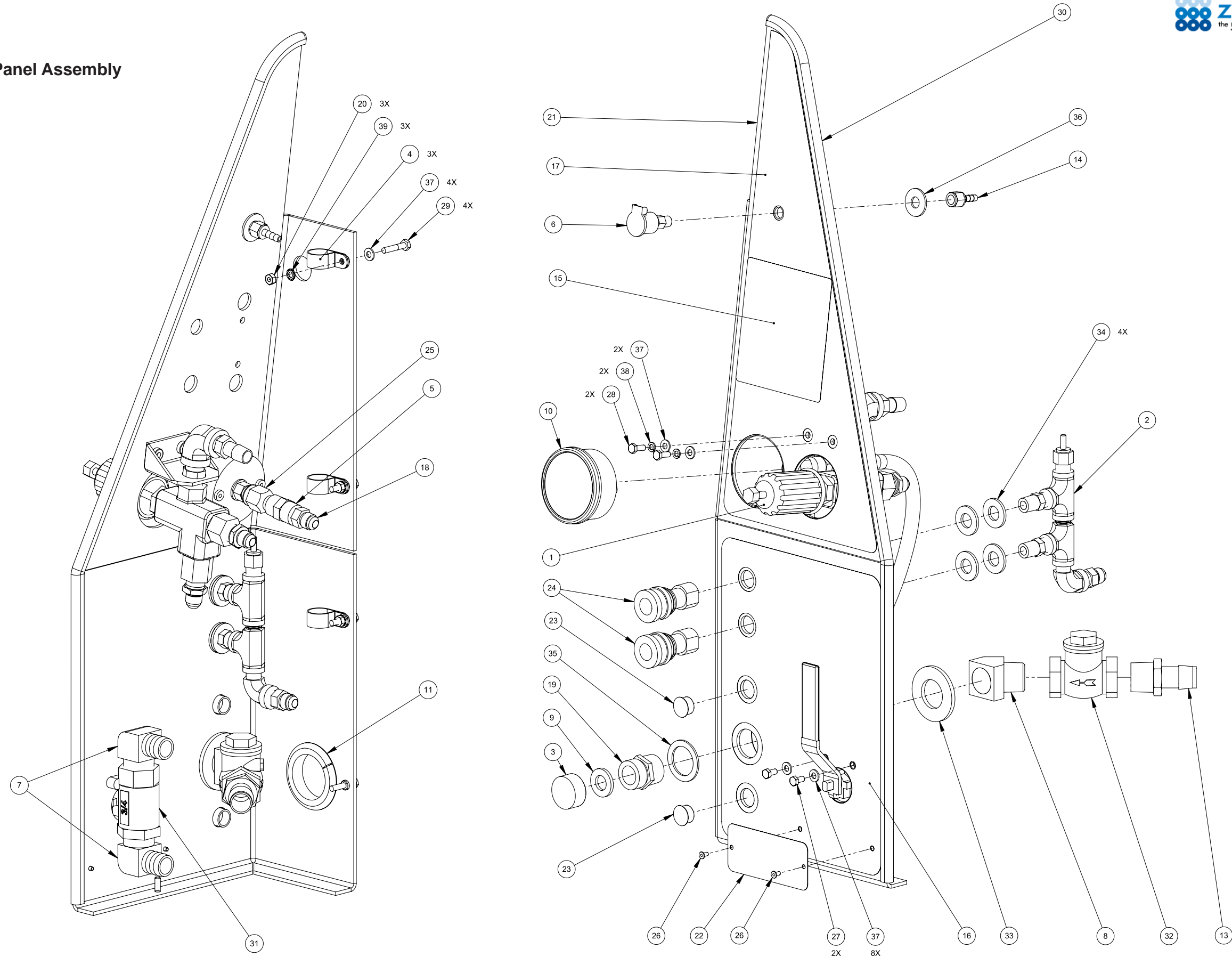


Figure 9-5. Instrument Panel Assembly
601-019-741 Rev. E



Instrument Panel Assembly Parts List

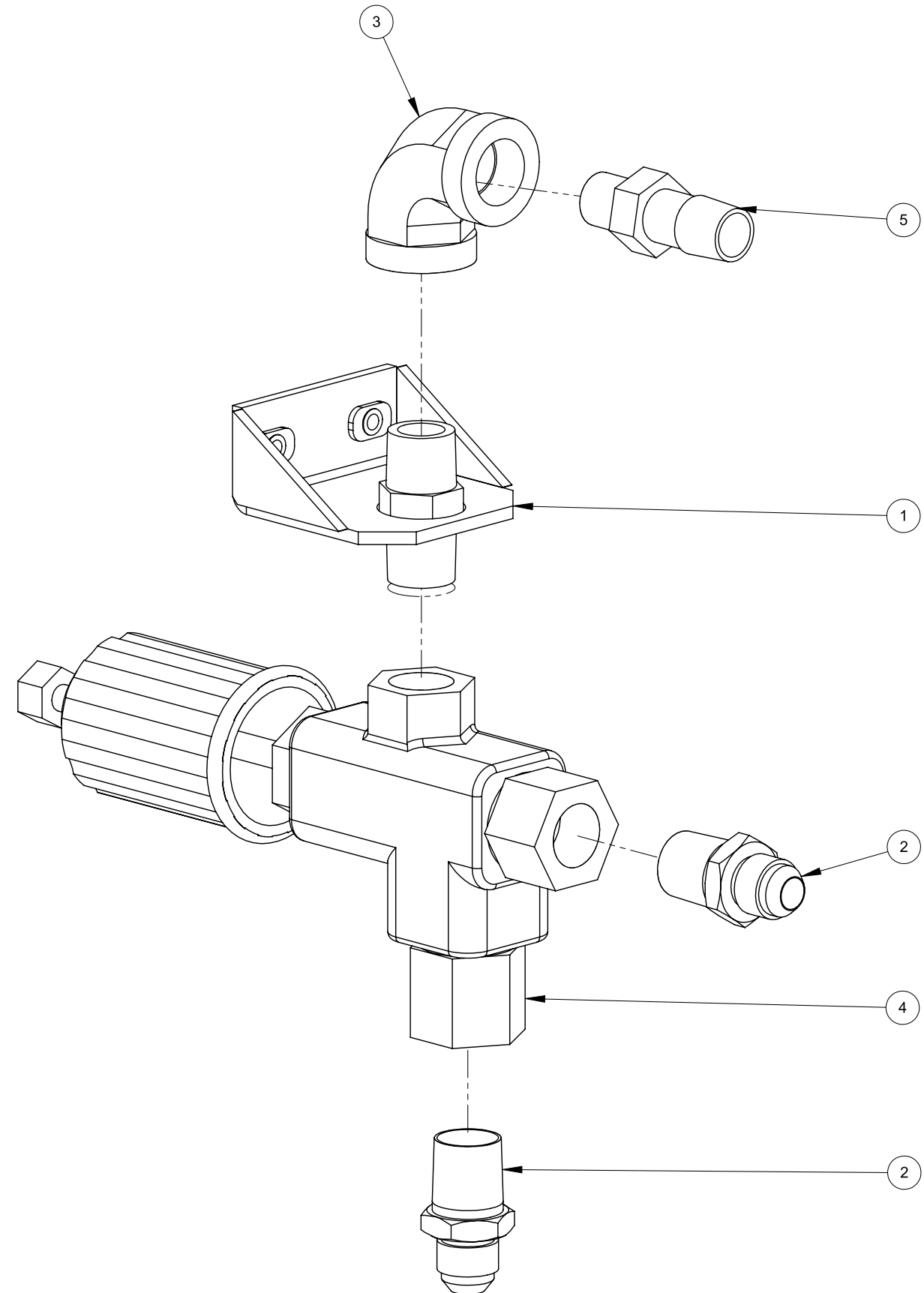
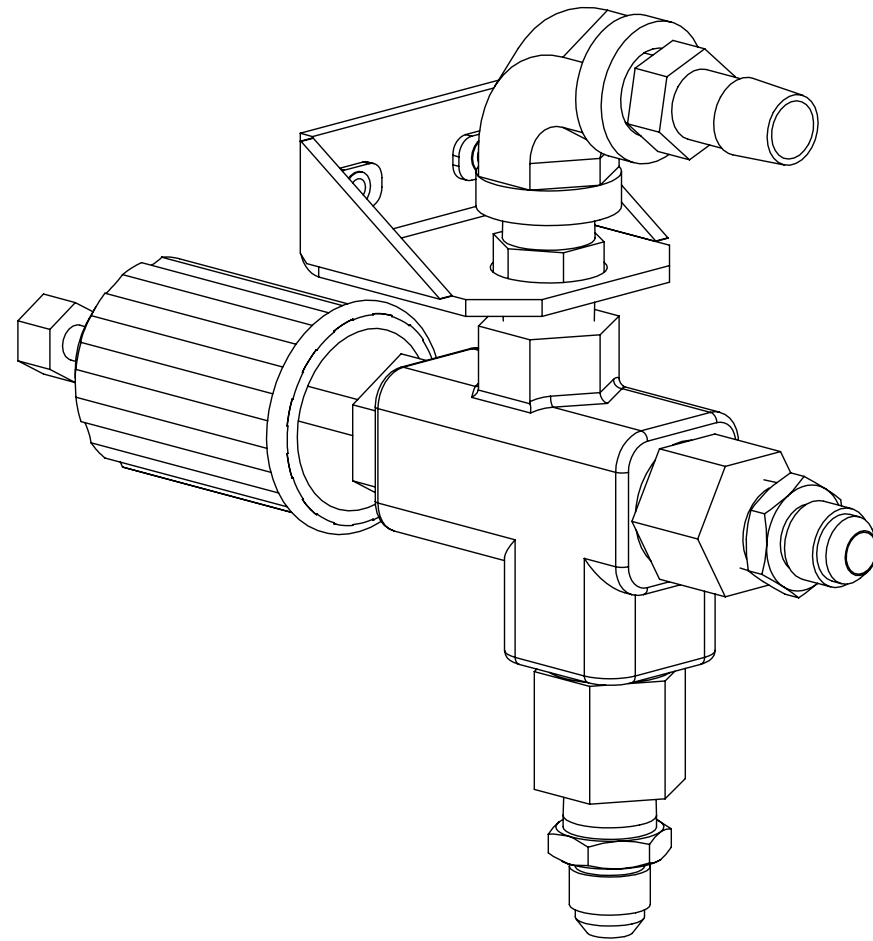
Item	Part Number	Description	Qty
1	601-009-741	Assembly, By-Pass Valve	1
2	601-008-741	Assembly, Hi-PSI	1
3	000-027-014	Cap, Garden Hose	1
4	000-033-023	Clamp, 3/4" Nylon Hose	3
5	000-052-610	Coupler, 1/4 FPT S/S	1
6	000-052-272	Cup, Gravity Feed Oil Blower Lube Port	1
7	000-052-589	Elbow, 3/4" NPT X 3/4" Barb	2
8	000-052-384	Elbow, 3/4" NPT X 45 Degree	1
9	000-057-055	Gasket, Garden Hose	1
10	000-074-155	Gauge, Pressure 0 -2,000 psi	1
11	000-060-015	Grommet, 2.5" - Modified	1
12	000-068-737	Hose Assembly, 3/8"X14.5" w/JIC Ends	1
13	000-052-338	Insert, #1212 (3/4" NPT X 3/4" Barb)	1
14	000-052-096	Insert, #F23 (1/8" FPT X 3/16" Barb)	1
15	000-081-328	Label, ANSI Warning - Large	1
16	000-081-376	Label, Lower Instrument Panel	1
17	000-081-375	Label, Upper Instrument Panel	1
18	000-052-506	Nipple, 1/4" MPT X 9/16"	1
19	000-052-281	Nipple, 3/4" NPT X 3/4" Male Garden Hose	1
20	000-094-004	Nut, #10-24UNC Hex	3

Item	Part Number	Description	Qty
21	000-100-168	Panel, Instrument - Coated	1
22	000-105-012	Plate, Machine Serial I.D.	1
23	000-106-024	Plug, 5/8" Black Dome	2
24	000-052-690	Quick Connect, 1/4" Female S/S	2
25	000-135-053	Regulator, Hi Psi Snubber	1
26	000-140-015	Rivet, 1/8" X 1/4" Lg. Pop	2
27	000-143-166	Screw, #10-24UNC X 0.375" Lg. Hex Head	2
28	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
29	000-143-134	Screw, #10-24UNC X 1" Lg. Hex Head S/S	4
30	000-131-027	Trimlok, 1/8" X 3/16" Lg.	1
31	000-169-201	Valve, 3/4" Heater Panel Mount	1
32	000-169-009	Valve, 3/4" FPT Swing Check	1
33	000-174-050	Washer, 1" Flat	1
34	000-174-012	Washer, 1/2 SAE H/D	4
35	000-174-063	Washer, 1.5" O.D. X 1.073" I.D.X 0.075" Thk.	1
36	000-174-005	Washer, 3/8" Flat	1
37	000-174-001	Washer, #10 Flat	8
38	000-174-014	Washer, #10 Lock	2
39	000-174-015	Washer, #10 Outside Star	3

NOTICE

Items 15 - 17 are part of label set P/N 000-081-252

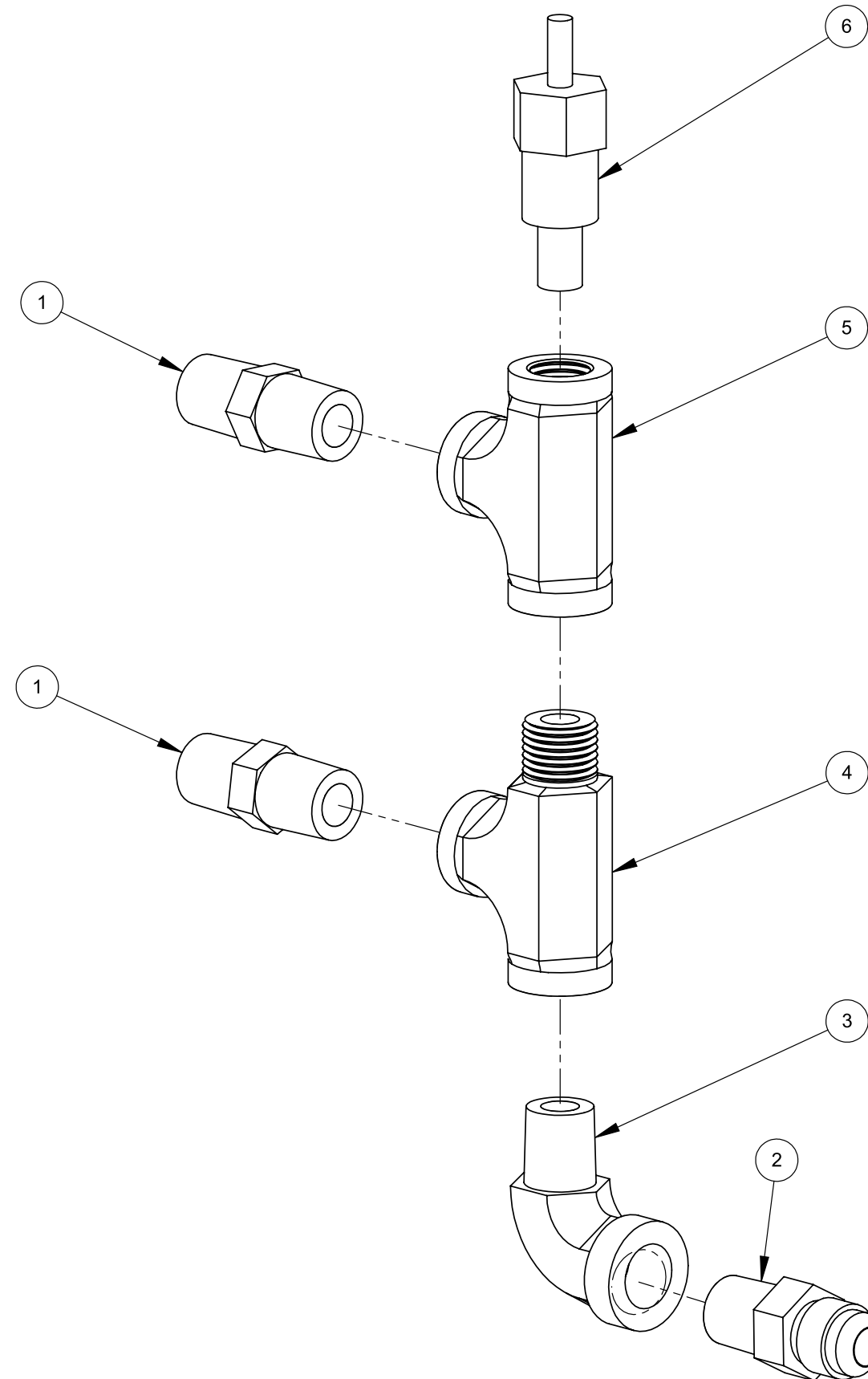
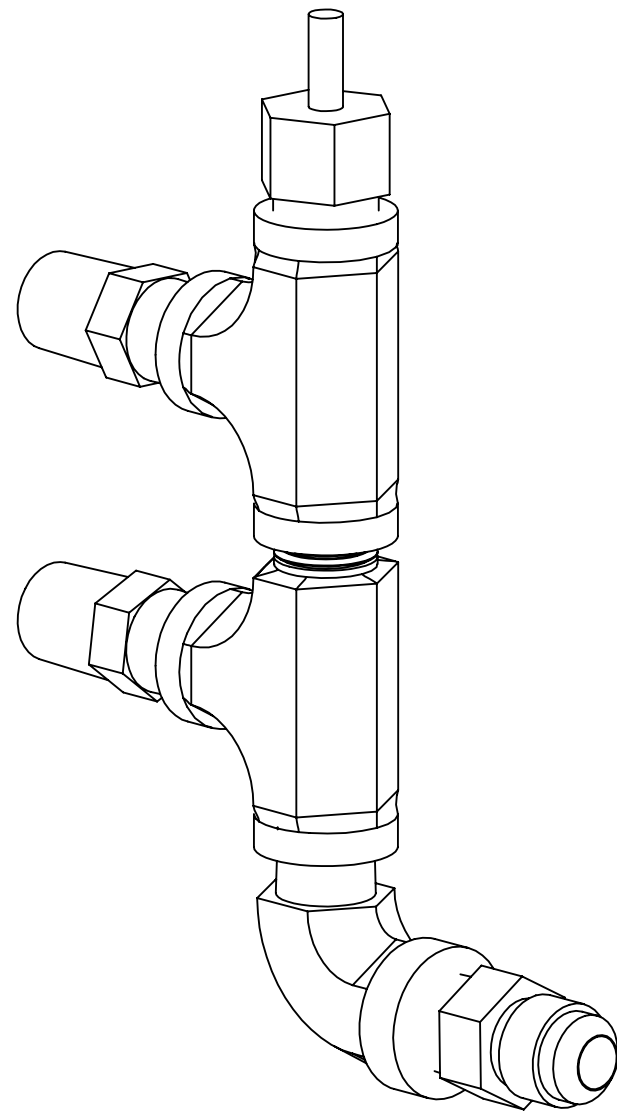
Figure 9-6. By-Pass Valve Assembly
601-009-741 Rev. D



By-Pass Valve Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-515	Bracket, By-Pass Valve Mount - Weldment	1
2	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
3	000-052-188	Elbow, 3/8" S/S Female	1
4	000-169-178	Valve, S/S Press Reg	1
5	000-052-056	Insert, #68 GFBN	1

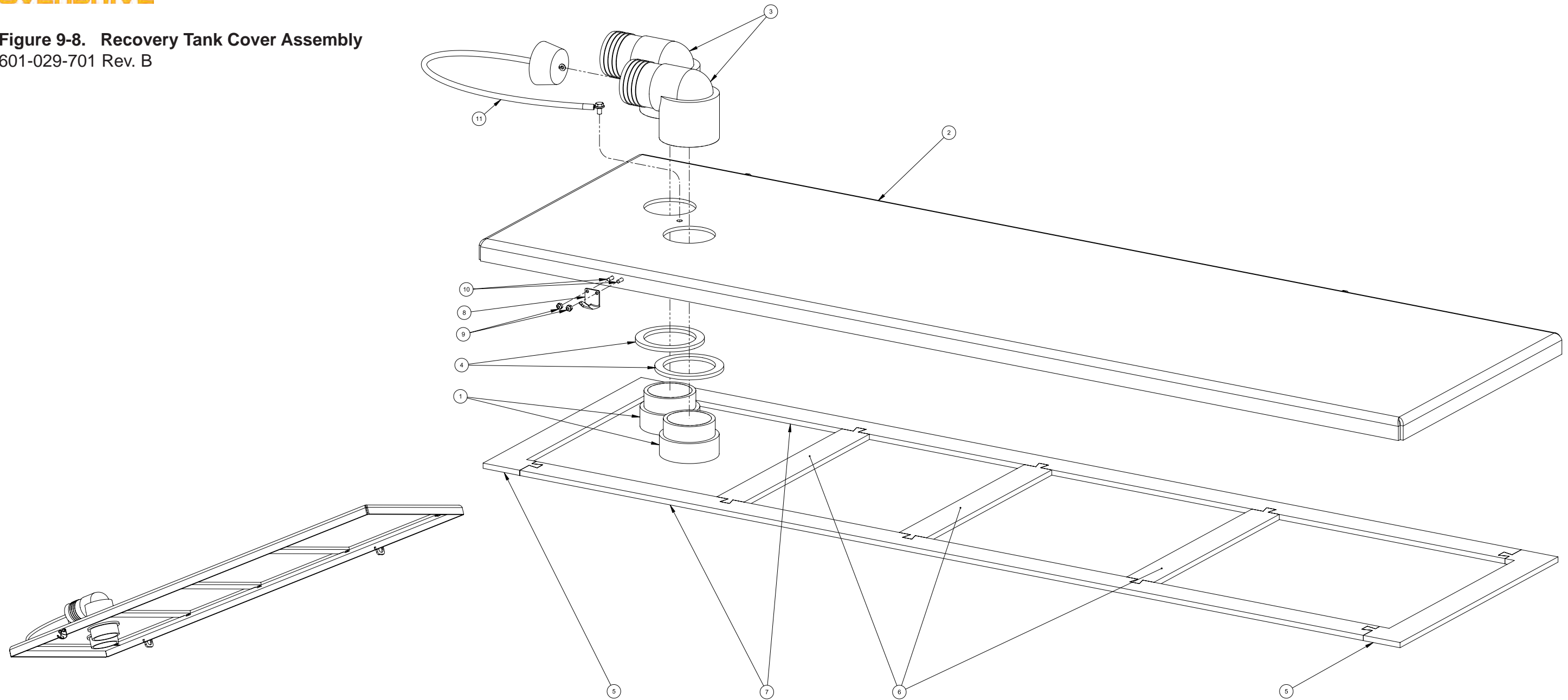
Figure 9-7. Hi-PSI Manifold Assembly
601-008-741 Rev. C



Hi-PSI Manifold Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-095	Nipple, 1/4" S/S Hex	2
2	000-052-506	Nipple, 1/4" MPT X 9/16"	1
3	000-052-691	Elbow, 1/4" Street S/S	1
4	000-052-190	Tee, 1/4" Branch S/S	1
5	000-052-189	Tee, 1/4" Female S/S	1
6	000-149-035	Sender, Temperature - Coated	1

Figure 9-8. Recovery Tank Cover Assembly
601-029-701 Rev. B

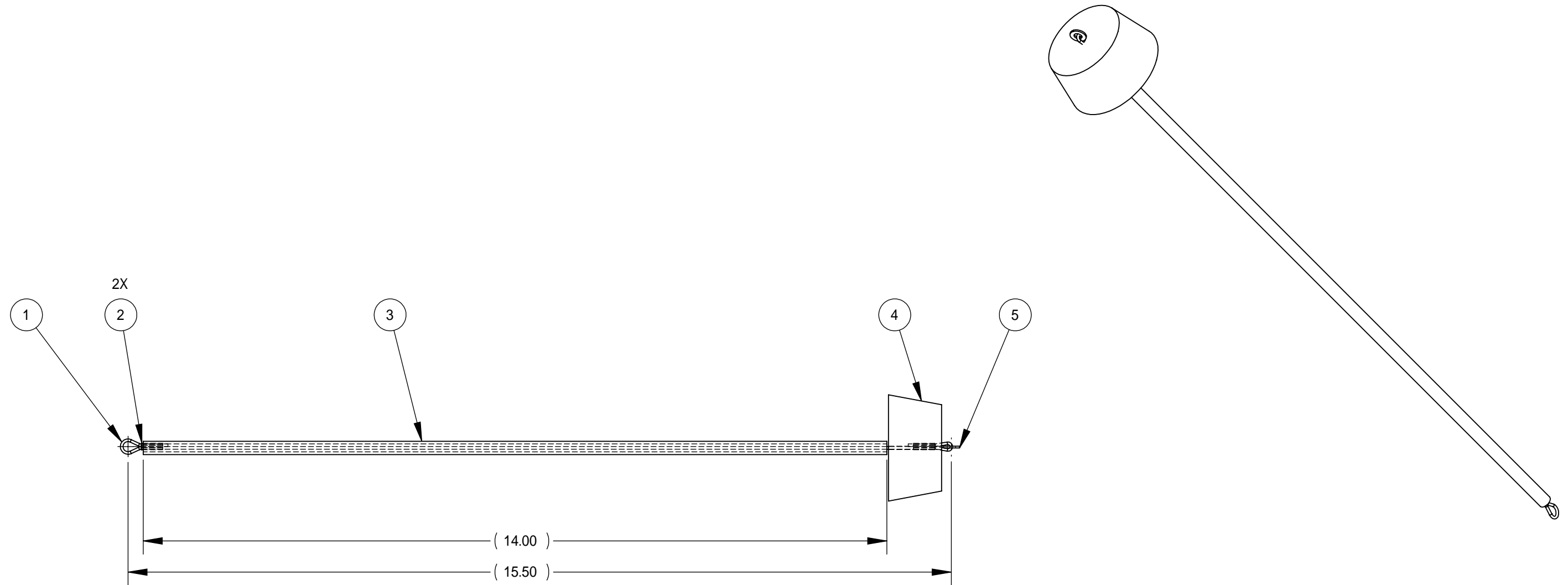


Recovery Tank Cover Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-219	Adapter, 2" NPT X 2" F Slip	2
2	000-041-447	Cover, Recovery Tank - 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

Item	Part Number	Description	Qty
7	000-057-205	Gasket, Side - Rec. Tank Cover	2
8	000-086-008	Latch, Bungee - Strike (Part of 000-086-008)	1
9	000-094-063	Nut, #6-32UNC Nylock	2
10	000-143-539	Screw, #6-32UNC X 0.50" Lg. Button Head	2
11	000-078-039	Vacuum Inlet Stopper	1

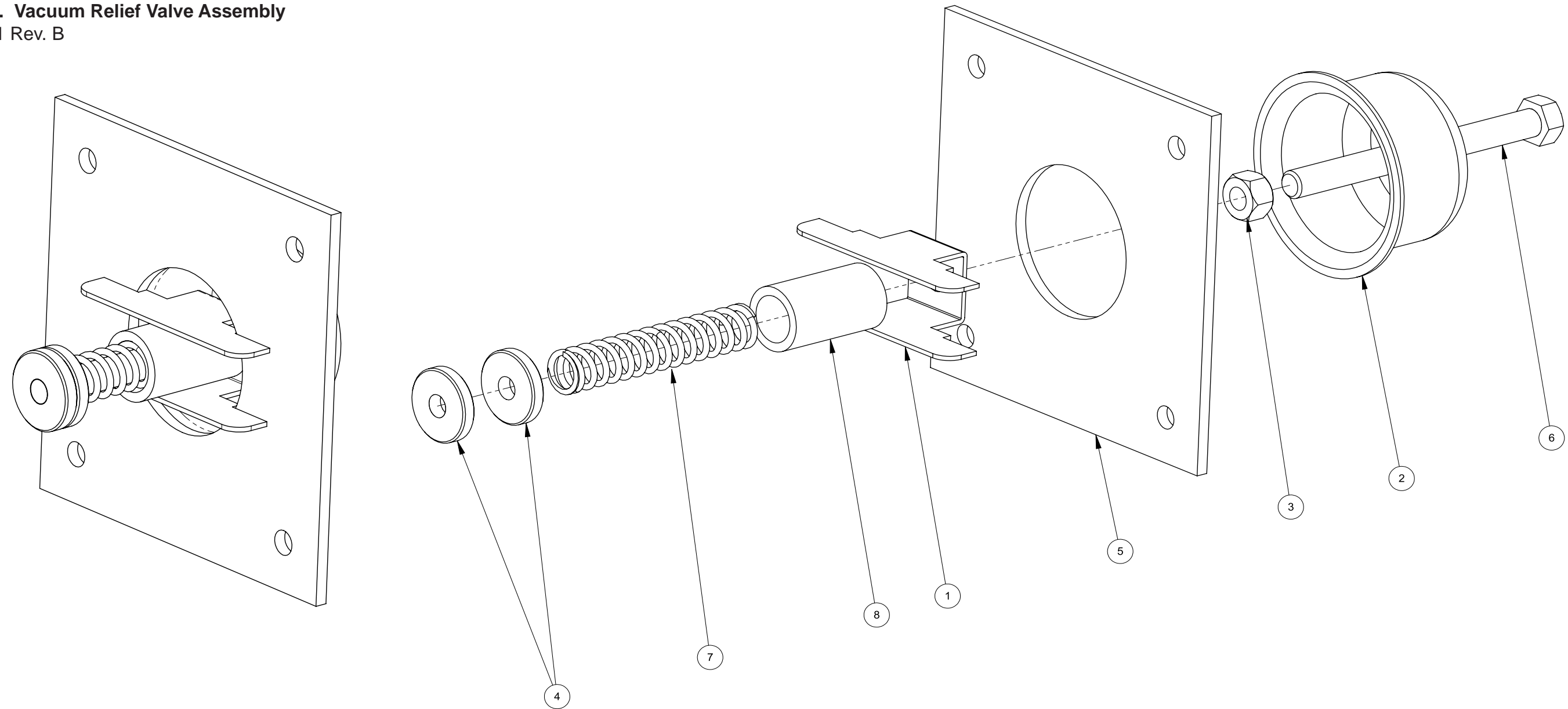
Figure 9-9. Vacuum Inlet Stopper Kit Assembly
000-078-039 Rev. B



Vacuum Inlet Stopper Kit Parts List

Item	Part Number	Description	Qty
1	000-025-008	Cable, 150 lb. Test 17.00 Lg.	1
2	000-033-032	Clamp, Throttle Cable	2
3	000-068-025	Hose, Ø1/4" X 14.00 Lg. Clear	1
4	000-106-028	Stopper, Vacuum Inlet	1
5	000-174-045	Washer, #6 S/S Flat	1

Figure 9-10. Vacuum Relief Valve Assembly
601-026-701 Rev. B

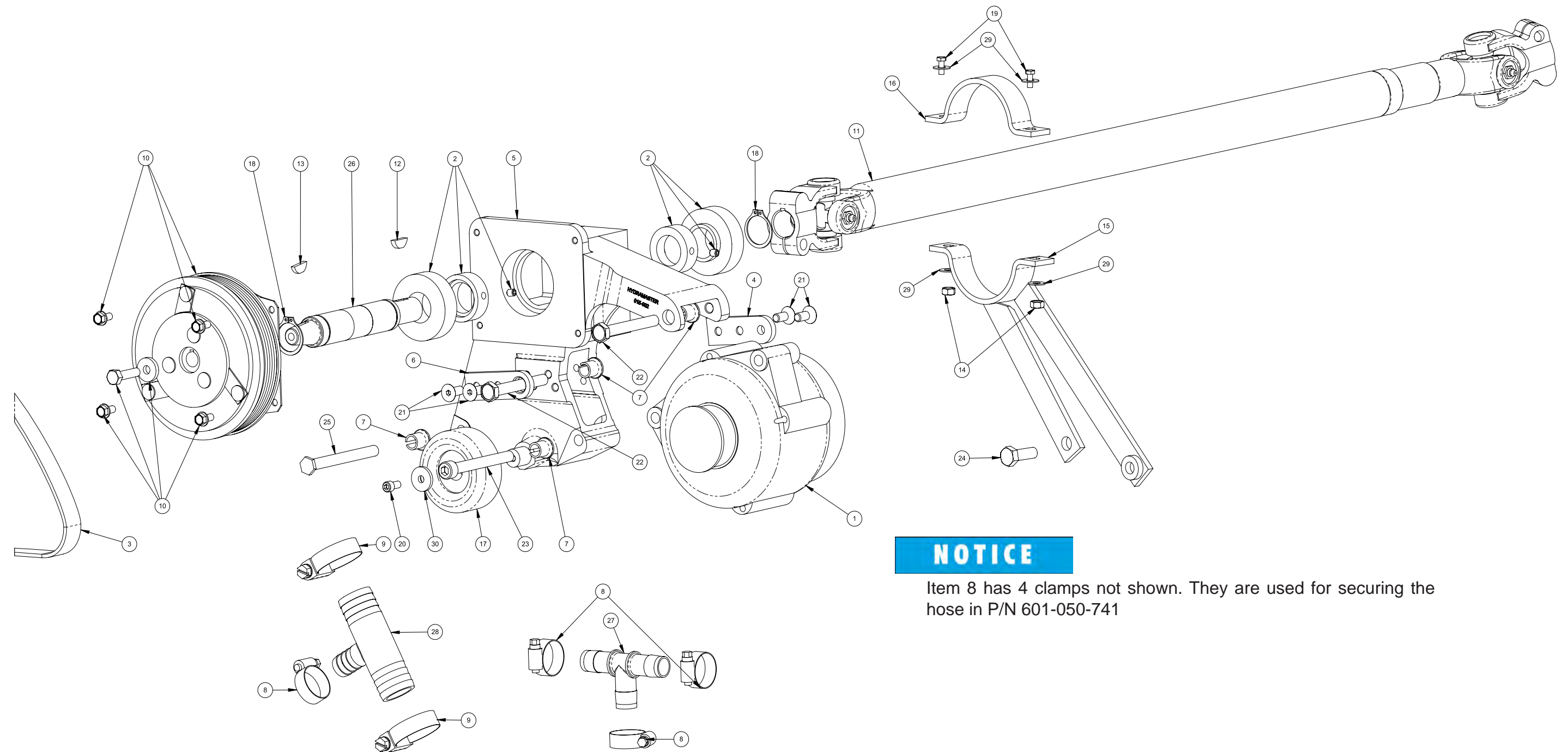


Vacuum Relief Valve Assembly Parts List

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

Item	Part Number	Description	Qty
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

Figure 9-11. CDS Front End Assembly
601-021-132 Rev. D



CDS Front End Assembly Parts List

Item	Part Number	Description	Qty	Item	Part Number	Description	Qty
1	- - -	Alternator, GMC (Part of Van)	1	16	000-108-009	Protector, Fly Strap - Top Clamp - Coated	1
2	000-008-011	Bearing, CDS Clutch	2	17	000-109-095	Pulley, 76mm CDS Idler	1
3	000-010-118	Belt, + Ch-8 Poly	1	18	000-139-005	Ring,CDS Clutch Shaft	2
4	000-015-880	Bracket, Chevy Idler Casting - Rear	1	19	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
5	000-015-002	Bracket, CDS Front End Idler Casting	1	20	000-143-079	Screw, 1/4"-20UNC X 0.5" Lg. Socket Head	1
6	000-015-879	Bracket, Idler Casting - Front	1	21	000-143-562	Screw, 5/16-18UNC X 0.75" Lg. Flat Head Allen	4
7	000-054-141	Bushing, CDS Idler Casting - Alternator Motor	4	22	000-143-564	Screw, M10 X 1.5 X 80mm Lg. Hex Head	2
8	000-033-029	Clamp, Size #12 Hose	8	23	000-143-563	Screw, M10 X 1.5 X 90mm Lg. Socket Hd	1
9	000-033-008	Clamp, Size #20 Hose	2	24	000-143-078	Screw, M10 X 30mm Lg.	1
10	000-036-003	Clutch Assembly, 6" CDS Poly Groove	1	25	000-143-558	Screw, M10x1.5 X 90mm Lg. Mod. Thin Head - Machined	1
11	000-150-174	Drive Line Axle	1	26	000-150-009	Shaft, Electric Clutch	1
12	000-077-009	Key,3/16" X 3/4" Woodruff	1	27	000-052-717	Tee, 3/4" Barb X 3/4" Barb	1
13	000-077-008	Key,5/32 X 3/4" Woodruff	1	28	000-052-716	Tee, Upper Coolant - GMC	1
14	000-094-010	Nut, 1/4"-20UNC Hex	2	29	000-174-003	Washer, 1/4" Flat	4
15	000-108-127	Protector, Fly Strap - Coated	1	30	000-174-104	Washer, Chevy CDS Idler Casting	1

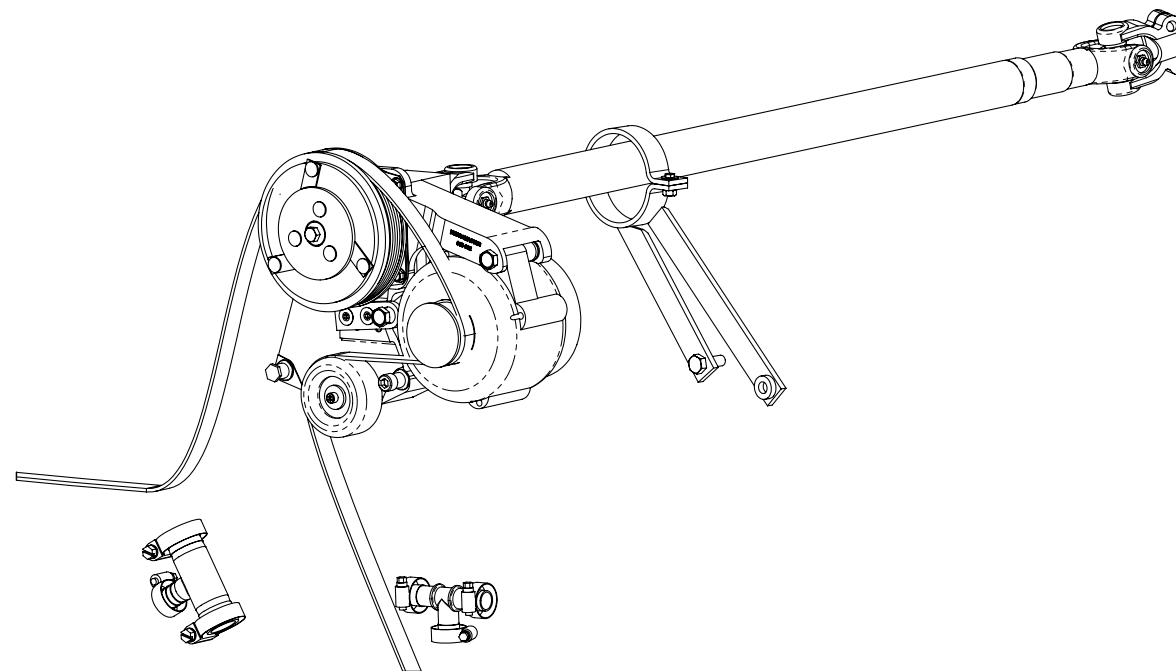


Figure 9-12. Power Pack Assembly - View 1 of 2
601-004-741 Rev. E

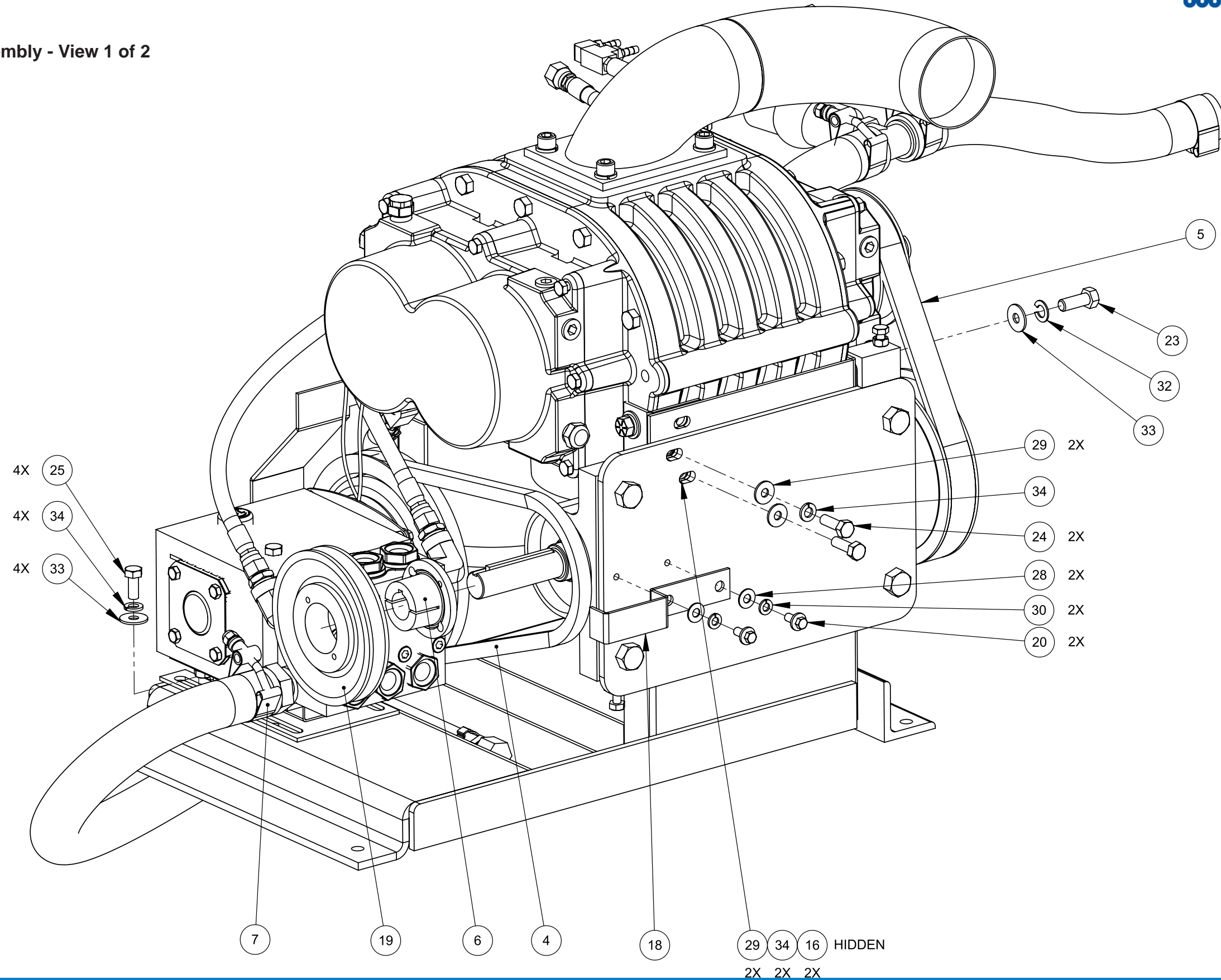
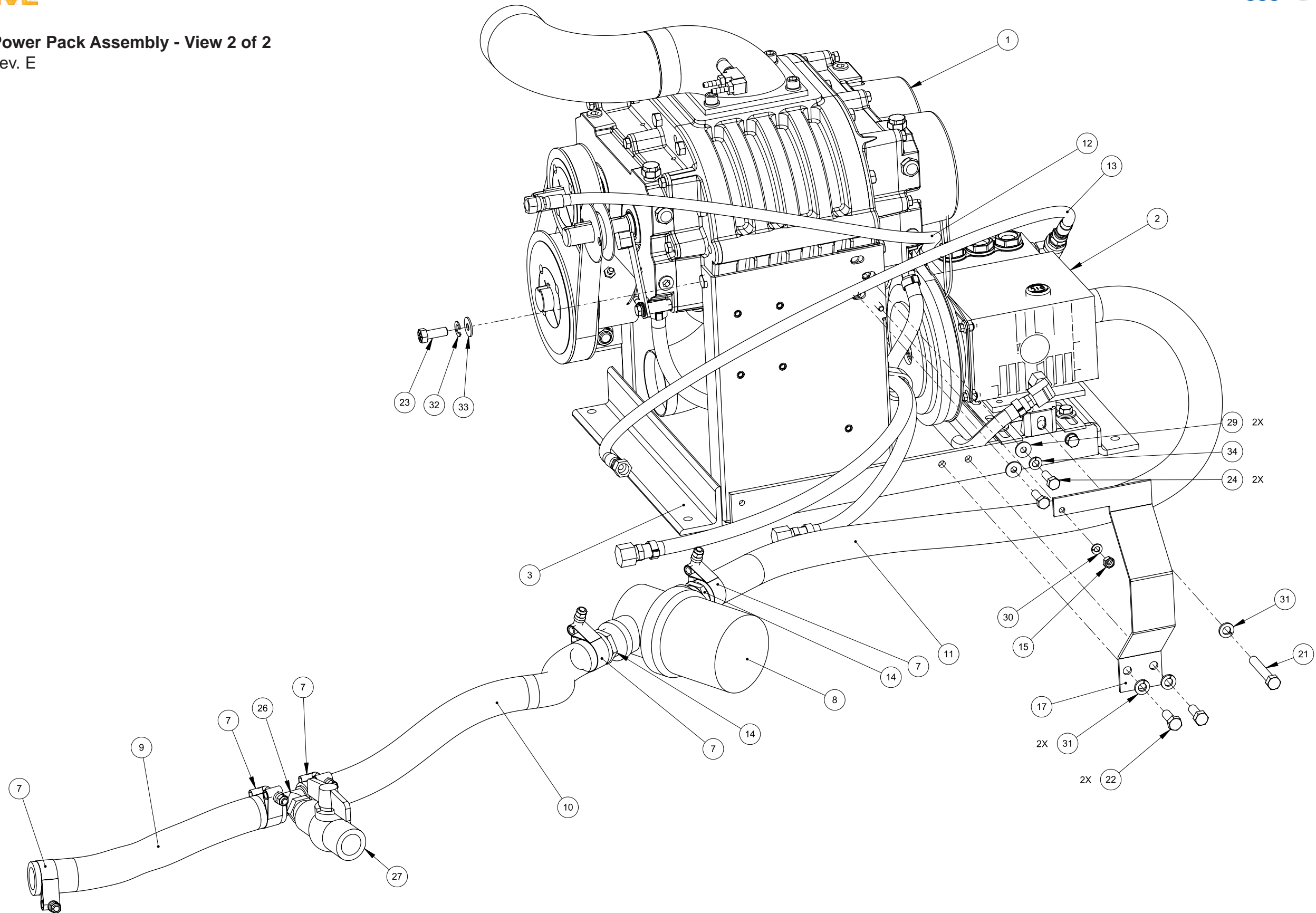


Figure 9-13. Power Pack Assembly - View 2 of 2
601-004-741 Rev. E



Power Pack Assembly Parts List

Item	Part Number	Description	Qty
1	601-002-701	Assembly, Blower	1
2	601-007-741	Assembly, Pump - Zerorez	1
3	601-001-701	Assembly, Universal CDS Frame	1
4	000-010-065	Belt, #9345 Pump Drive	1
5	000-010-052	Belt, Polychain GT	1
6	000-020-019	Bushing, #H X 7/8" Bore	1
7	000-033-132	Clamp, 1-1/2" T-Bolt	6
8	000-049-200	Filter, 1" In-Line Strainer	1
9	000-068-1042	Hose, 1" I.D. Suction X 12" Lg.	1
10	000-068-1043	Hose, 1" I.D. Suction X 24" Lg.	1
11	000-068-1044	Hose, 1" I.D. Suction X 41" Lg.	1
12	000-068-644	Hose Assembly, 5/16" PTFE (Teflon) X 49.5" Lg.	1
13	000-068-644	Hose Assembly, 5/16" PTFE (Teflon) X 49.5" Lg.	1
14	000-052-758	Insert, 1" NPT X 1" Barb	2
15	000-094-010	Nut, 1/4"-20UNC Hex	1
16	000-094-012	Nut, 5/16-18"UNC Hex	2
17	000-108-065	Protector, Pump Belt Shield - Coated	1

Item	Part Number	Description	Qty
18	000-108-109	Protector, Pump Drive Belt - Coated	1
19	000-109-043	Pulley, AK51H	1
20	000-143-141	Screw, 1/4"-20UNC X 1/2" Lg. Whiz Lock	2
21	000-143-098	Screw, 3/8-16 X 2 1/2" Hex Head	1
22	000-143-096	Screw, 3/8"-16UNC X 1.00" Lg. Hex Head	2
23	000-143-018	Screw, 3/8"-16UNC X 1" Lg. Hex Head - Grade 8	2
24	000-143-013	Screw, 5/16"-18UNC X 1.00" Lg. Hex Head Grade 8	4
25	000-143-012	Screw, 5/16"-18UNC X 3/4" Lg.	4
26	000-052-510	Tee, 1" Hose X 3/4" NPT	1
27	000-169-202	Valve, 3/4" FPT Ball Valve	1
28	000-174-003	Washer, 1/4" Flat	2
29	000-174-002	Washer, 1/4" Flat	6
30	000-174-019	Washer, 1/4" Lock	3
31	000-174-021	Washer, 3/8" Lock	3
32	000-174-057	Washer, 3/8" Lock	2
33	000-174-004	Washer, 5/16" Flat, USS	6
34	000-174-018	Washer, 5/16" Lock	8

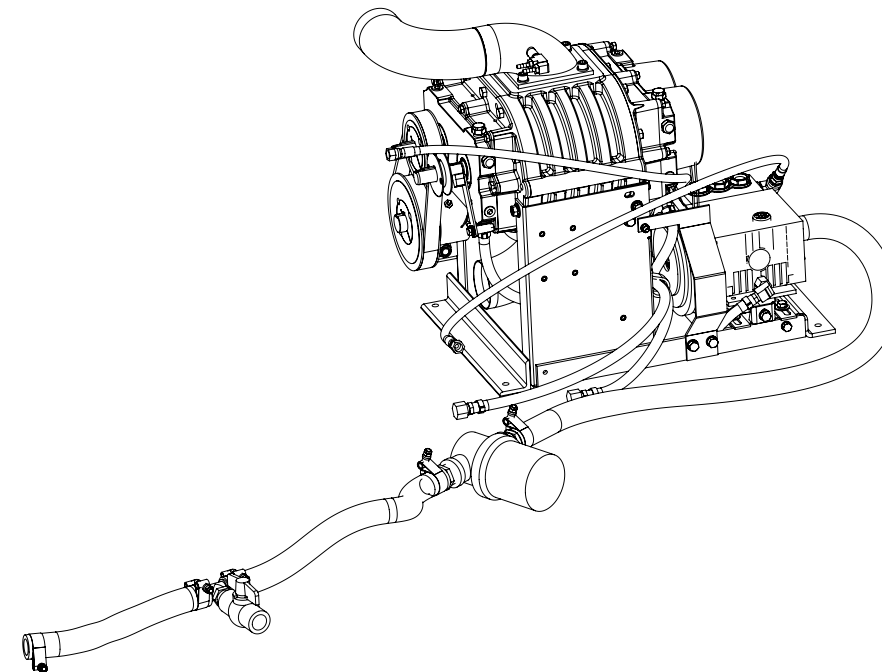
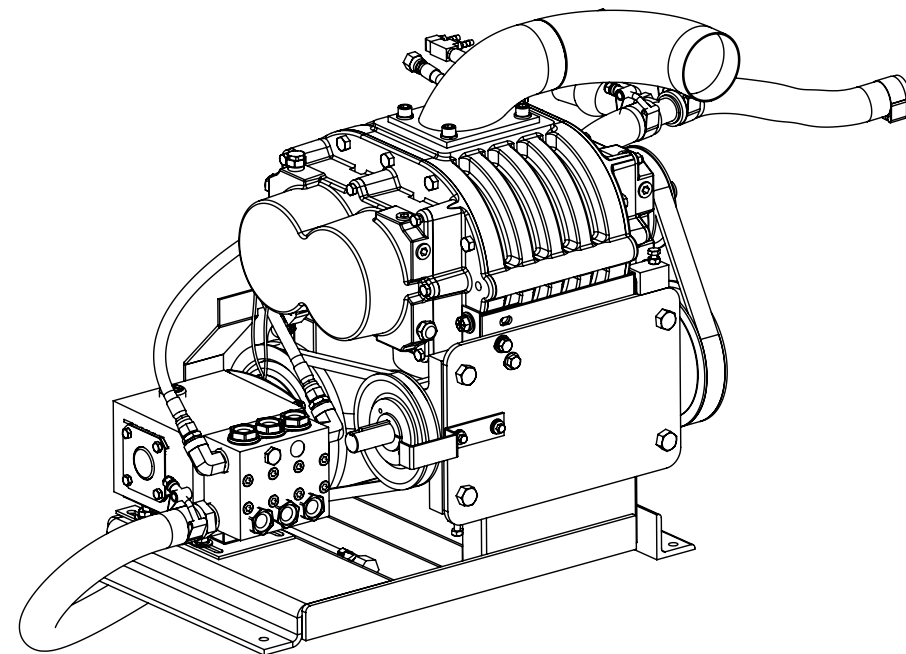
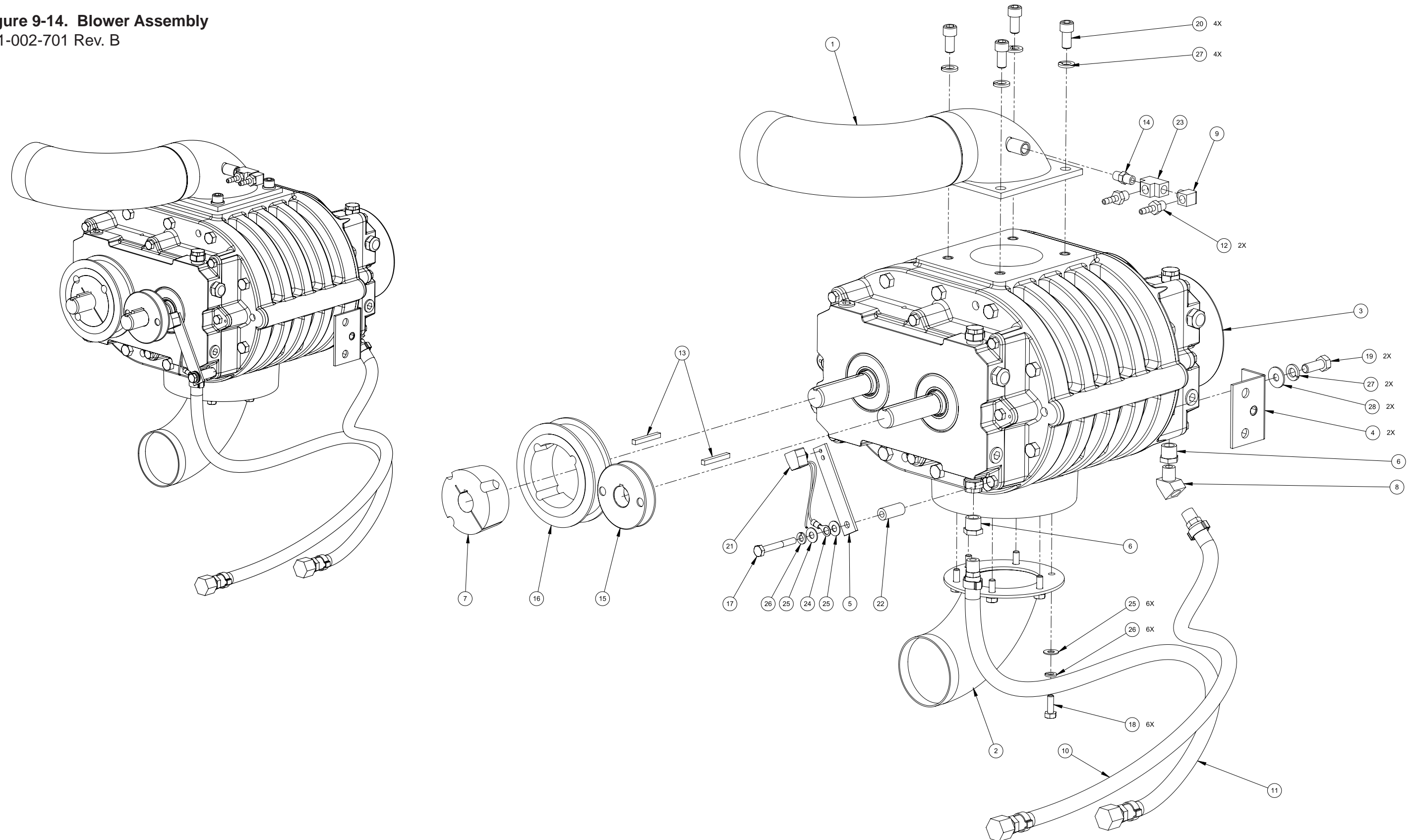


Figure 9-14. Blower Assembly
601-002-701 Rev. B

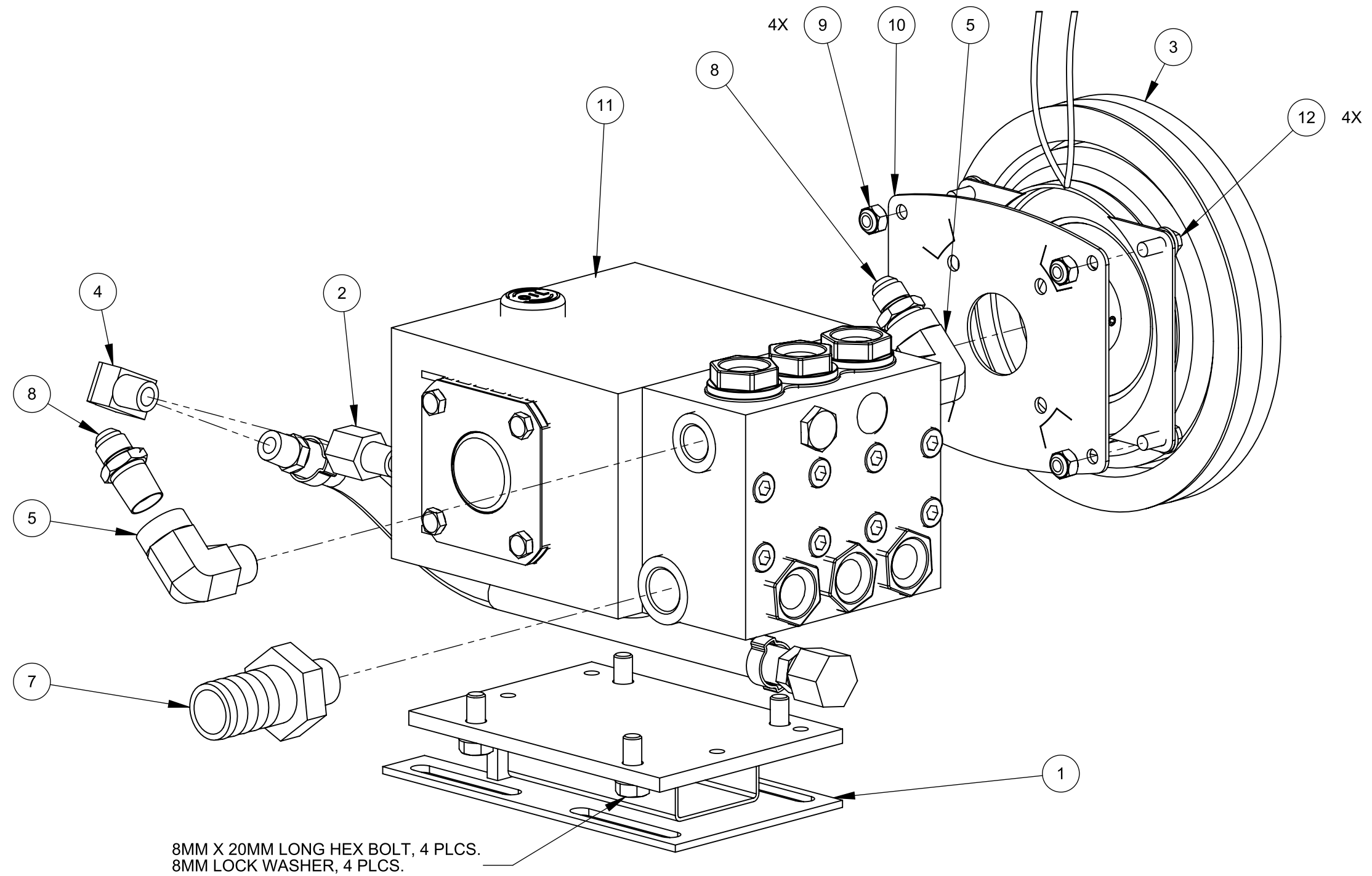


Blower Assembly Parts List

Item	Part Number	Description	Qty
1	000-001-090	Adapter, Blower Inlet - Coated	1
2	000-001-042	Adapter, Blower Outlet - Coated	1
3	000-111-147	Blower, 4007 Dominator	1
4	000-015-801	Bracket, Blower Mounting - Coated	2
5	000-015-930	Bracket, Tach. Magnetic Extension - Coated	1
6	000-052-061	Bushing, 3/8" NPT X 1/4" FPT	2
7	000-020-020	Bushing, 7/8" Taper-Lock	1
8	000-052-082	Elbow, 1/4" NPT Street X 45 Degree	1
9	000-052-084	Elbow, 1/8" NPT Street	1
10	000-068-149	Hose, CDS Blower Oil Drain	1
11	000-068-149	Hose, CDS Blower Oil Drain	1
12	000-052-293	Insert, #23 (1/8" NPT X 3/16" Barb)	2
13	000-077-011	Key, 3/16" X 1 1/2" Long	2
14	000-052-069	Nipple, 1/8" NPT Hex	1

Item	Part Number	Description	Qty
15	000-109-009	Pulley, 2 3/4" X 7/8" Pump Drive - Machined	1
16	000-109-057	Pulley, 40 Tooth	1
17	000-143-373	Screw, 1/4"-20UNC X 2" Lg. Hex Head Grade 5	1
18	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	6
19	000-143-018	Screw, 3/8"-16UNC X 1" Lg. Hex Head - Grade 8	2
20	000-143-094-1	Screw, 3/8"-16UNC X 3/4" Lg. Socket Head	4
21	000-149-010	Sensor, CDS Magnetic Tach	1
22	000-154-153	Spacer, Tach, Sensor	1
23	000-052-092	Tee, 1/8" FPT	1
24	000-037-015	Terminal, 5/16 Ring-16 AWG	1
25	000-174-003	Washer, 1/4" Flat	8
26	000-174-019	Washer, 1/4" Lock	7
27	000-174-021	Washer, 3/8" Lock	6
28	000-174-004	Washer, 5/16" Flat, USS	2

Figure 9-15. Pump Assembly
601-007-741 Rev. F



Pump Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-927	Bracket, Compressor Mount - Coated	1
2	000-052-062	Bushing, 1/4" NPT Male X 1/4" NPT Female	1
3	000-036-008	Clutch, 7" O.D. 24mm Single Groove	1
4	000-052-085	Elbow, 1/4" NPT Street	1
5	000-052-747	Elbow, 3/8 S/S Street 90	2
6	000-068-149	Hose, CDS Blower Oil Drain	1

Item	Part Number	Description	Qty
7	000-052-922	Insert, 1/2" MNPT X 1" Hose Barb	1
8	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37° Jic S/S	2
9	000-094-071	Nut, 1/4"-20UNC Nylock Half	4
10	000-105-550	Plate, Pump Clutch - GP 4.0 Gpm	1
11	000-111-159	Pump, 4.0 gmp GP S/S	1
12	000-143-141	Screw, 1/4"-20UNC X 1/2" Lg. Whiz Lock	4

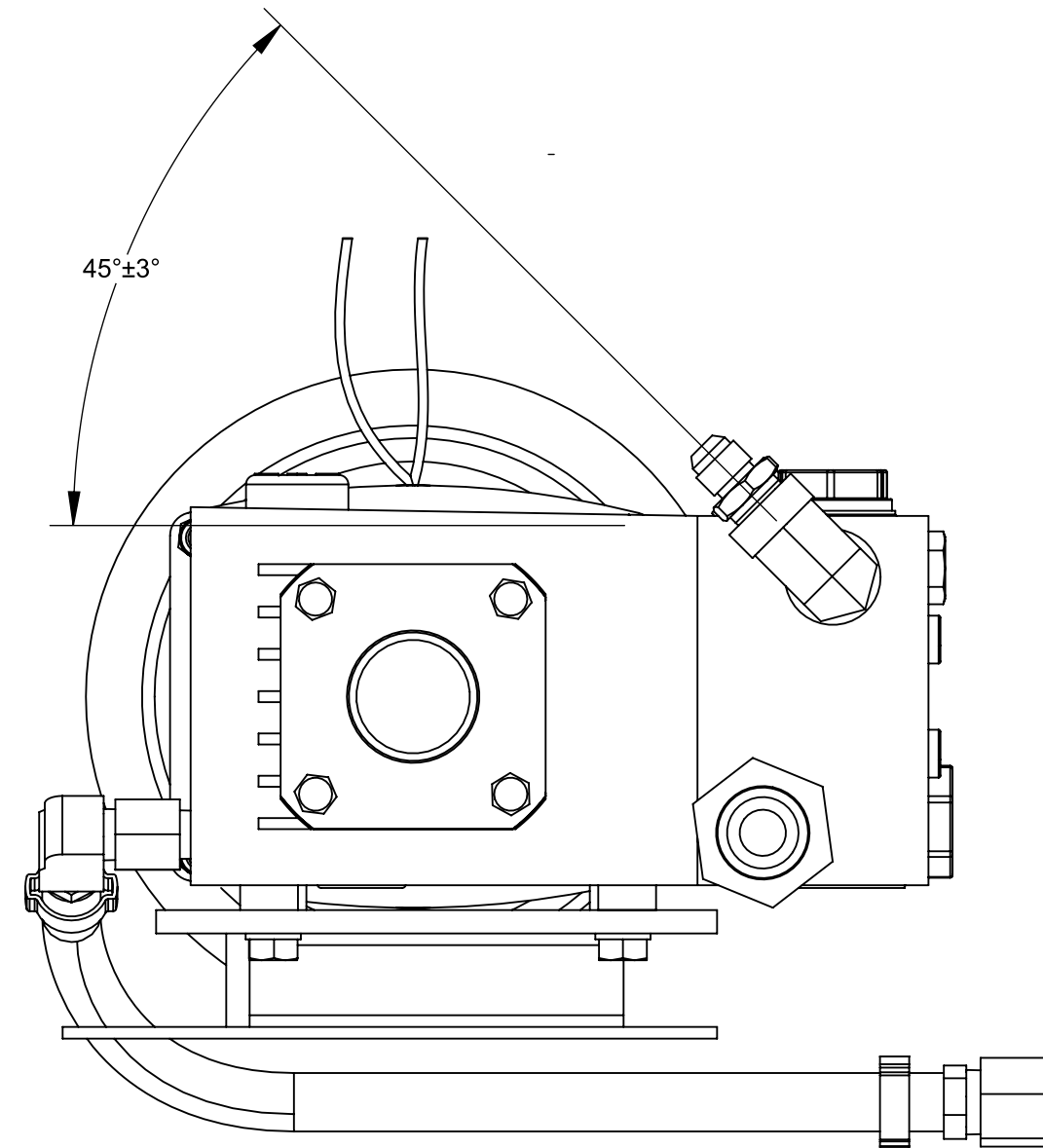
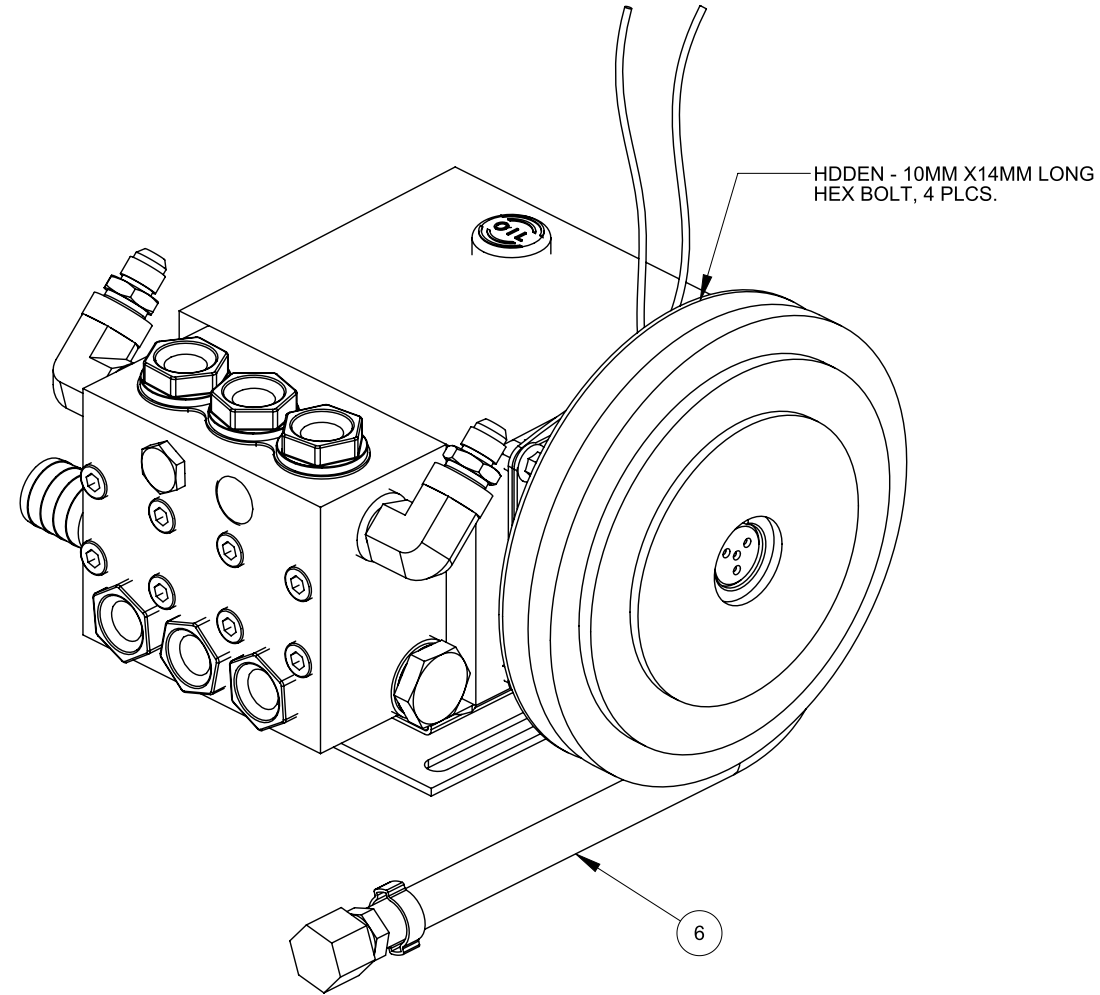
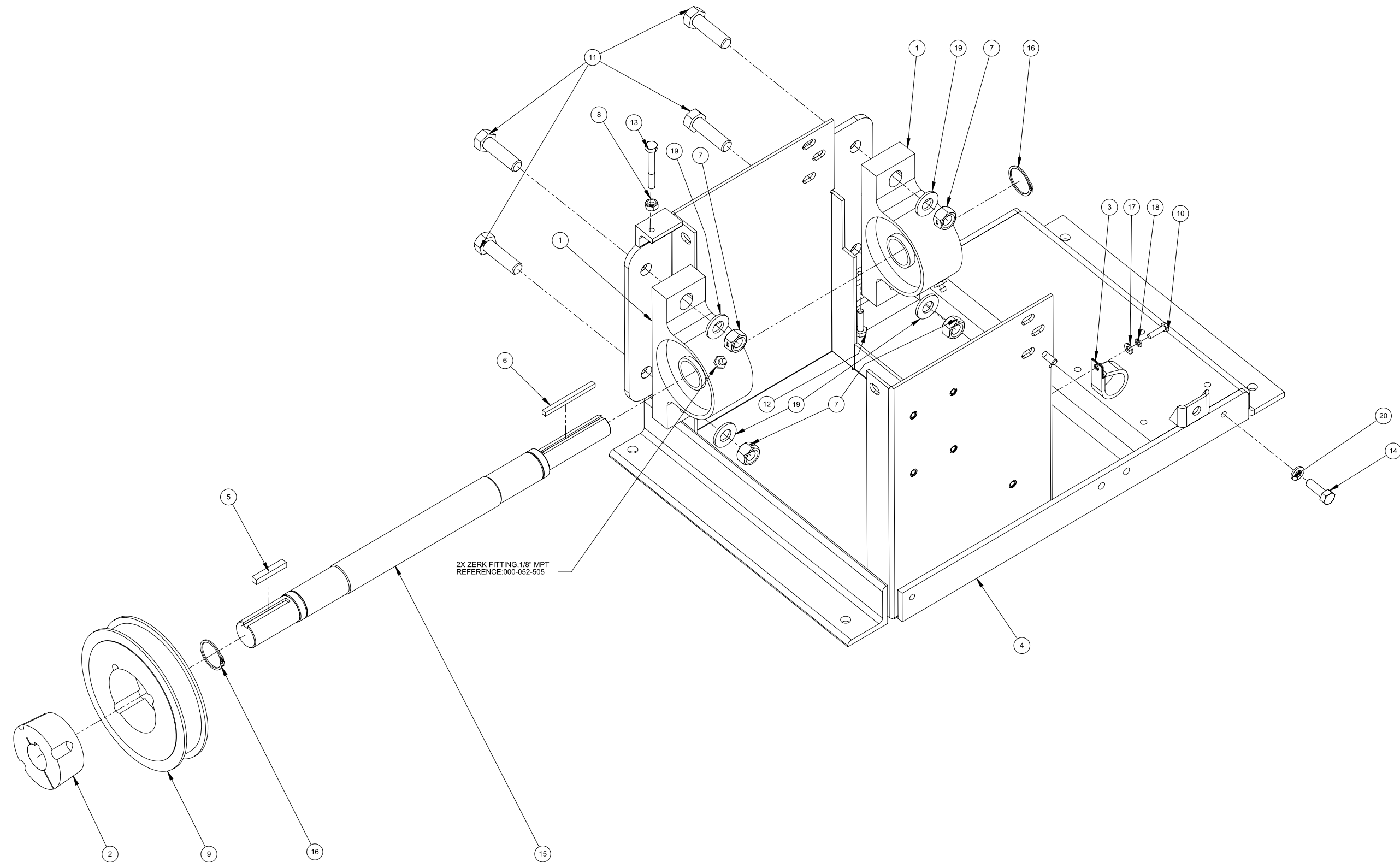


Figure 9-16. Frame Assembly
601-001-701 Rev. B

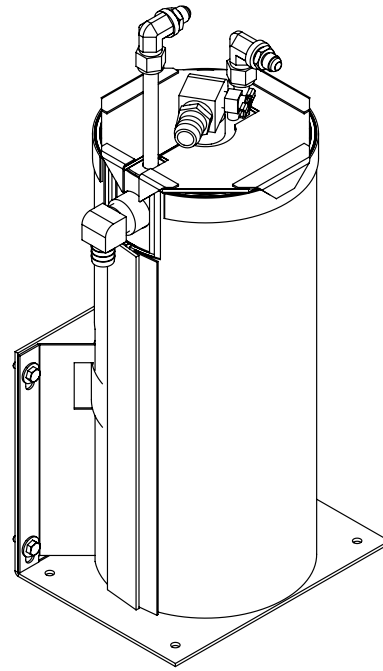
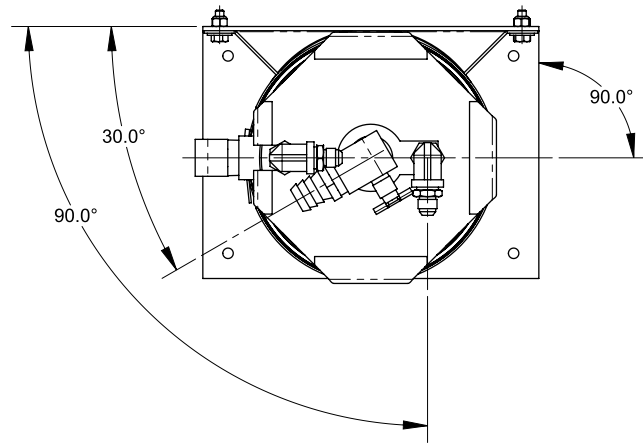


Frame Assembly Parts List

Item	Part Number	Description	Qty
1	000-008-020	Bearing, Pillow Block - 1-3/16" Bore	2
2	000-020-026	Bushing, 1-1/8" Taper-Lock	1
3	000-033-057	Clamp, 1" Cushion Loop	1
4	000-055-028	Frame, Pump and Blower - Coated	1
5	000-077-010	Key, 1/4" X 1-1/2" Lg. Class 2 Fit	1
6	000-077-012	Key, 3/16" X 2.5" Lg. Class 2 Fit	1
7	000-094-037	Nut, 1/2-13UNC 2-Way Locking	4
8	000-094-010	Nut, 1/4"-20UNC Hex	1
9	000-109-058	Pulley, Engine and Blower	1
10	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	1

Item	Part Number	Description	Qty
11	000-143-240	Screw, 1/2"-13UNC X 1.75" Lg. Hex Head - Grade 5	4
12	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	1
13	000-143-548	Screw, 1/4"-20UNC X 2.00" Lg. Hex Head	1
14	000-143-013	Screw, 5/16"-18UNC X 1.00" Lg. Hex Head Grade 8	1
15	000-150-040	Shaft, Drive Sprocket	1
16	000-139-021	Snap Ring, 1-3/16" Shaft	2
17	000-174-001	Washer, #10 Flat	1
18	000-174-014	Washer, #10 Lock	1
19	000-174-012	Washer, 1/2 SAE H/D	4
20	000-174-018	Washer, 5/16" Lock	1

Figure 9-17. Coolant Heat Exchanger Assembly
601-006-741 Rev. C



Coolant Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-745	Bracket, After Burner Mounting Saddle - Fabricated	1
2	000-015-971	Bracket, Coolant Heat Exchanger -Uncoated	1
3	000-033-123	Clamp, After Burner Mount - 21.125" Lg.	1
4	000-052-589	Elbow, 3/4" NPT X 3/4" Barb	1
5	000-052-733	Fitting, 3/4" NPT Street Elbow - Modified	1
6	000-038-065	Heat Exchanger, Coolant - Weldment	1
7	000-052-602	Insert, #1212 Brass	1
8	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37 Degree JIC S/S	2
9	000-094-009	Nut, 1/4"-20UNC Nylock	4
10	000-094-038	Nut, 5/16"-18UNC Nylock	1
11	000-108-102	Protector, Coolant Heat Exchanger	1
12	000-108-131	Protector, Heat Exchanger Pad Ø6.625	1
13	000-141-033	Rod, Heat Exchanger Strap Retainer - Fabricated	2
14	000-143-001	Screw, 1/4"-20UNC X 3/4" Lg. Hex Head	4
15	000-143-316	Screw, 5/16-18 X 2" HHCS	1
16	000-169-205	Valve, Petcock 90 Degree	1
17	000-174-002	Washer, 1/4" Flat	4
18	000-174-049	Washer, 5/16" Flat	2

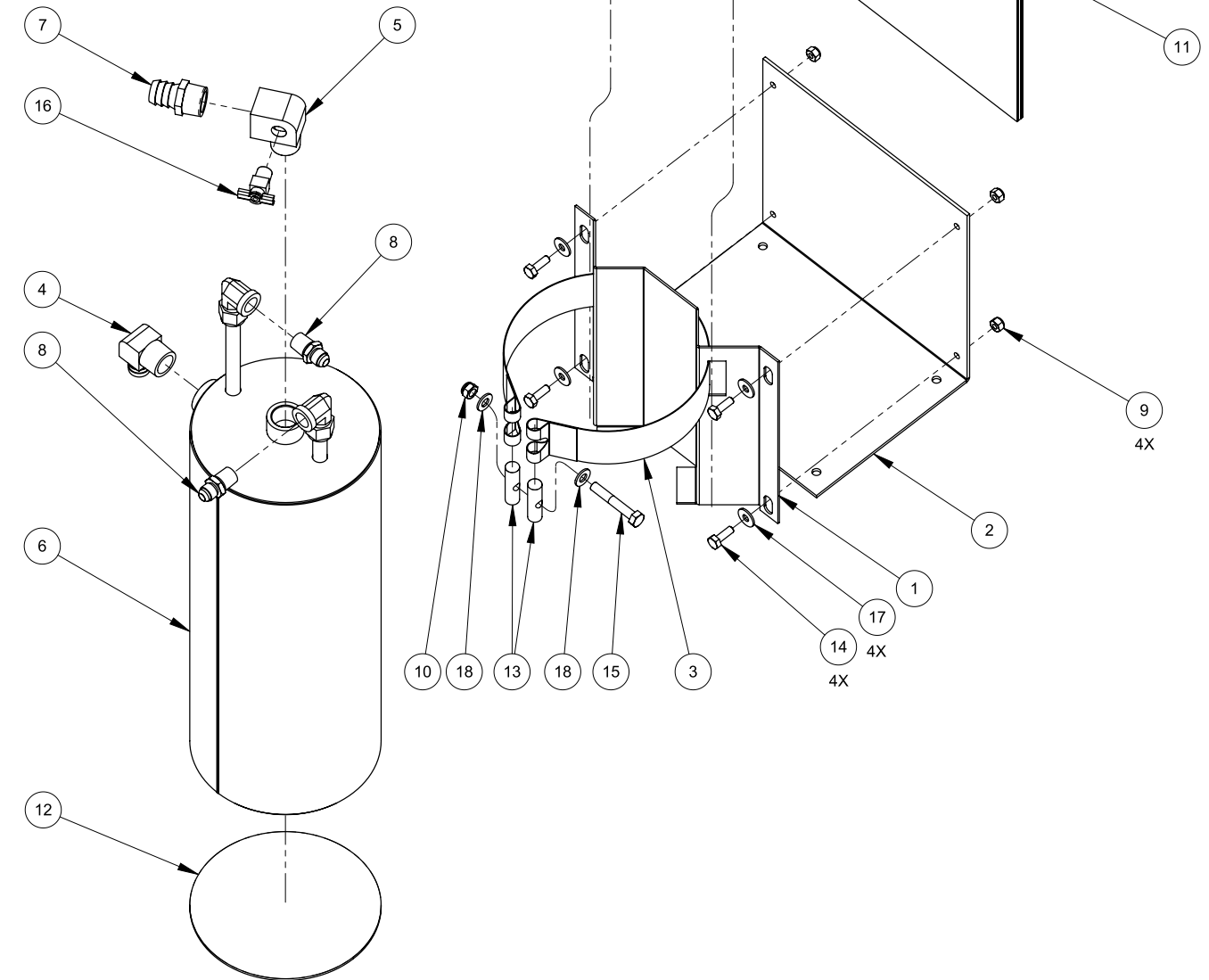
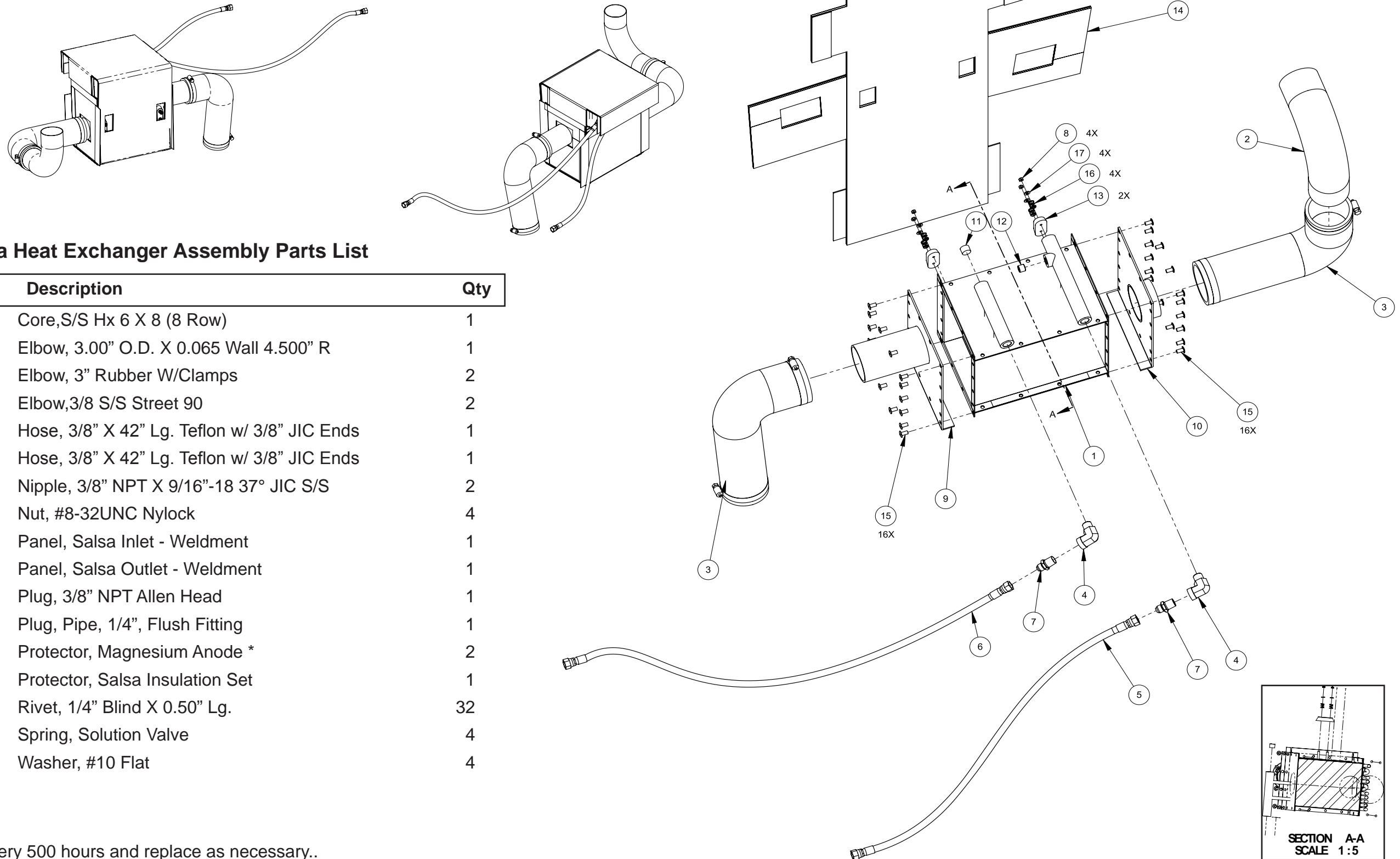


Figure 9-18. Salsa Heat Exchanger Assembly
601-005-741 Rev. F



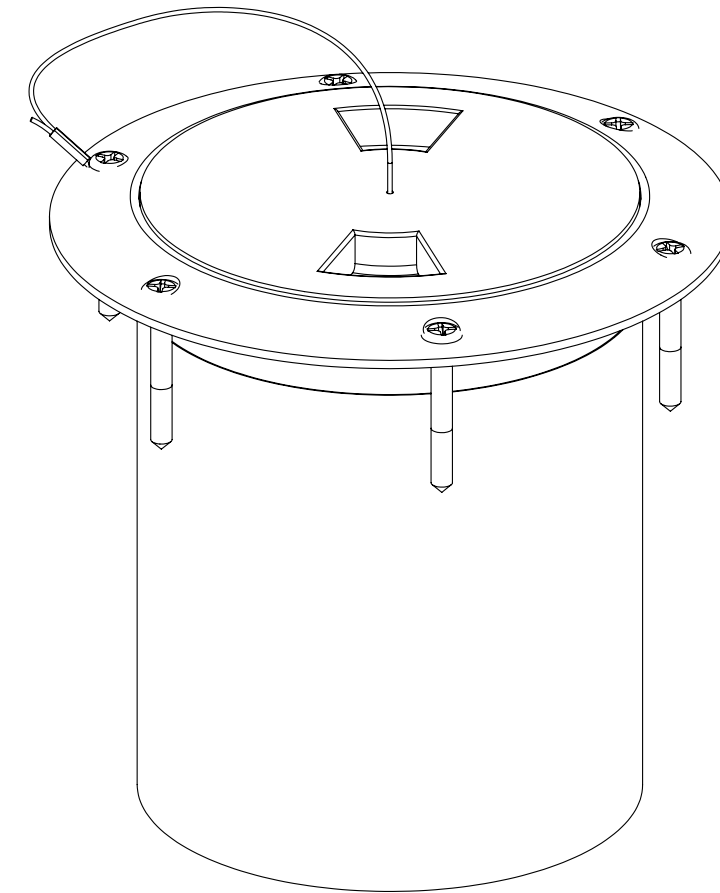
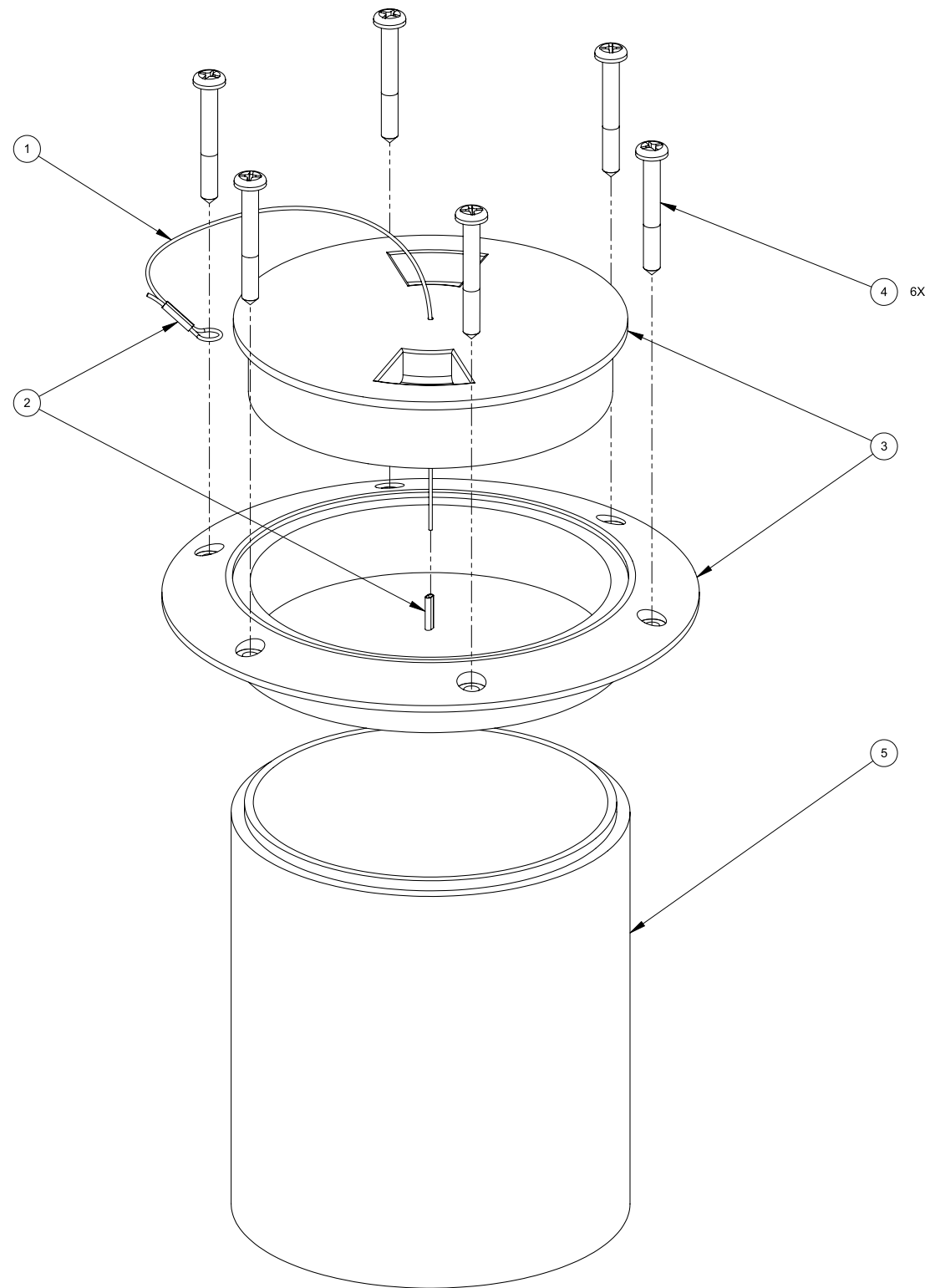
Salsa Heat Exchanger Assembly Parts List

Item	Part Number	Description	Qty
1	000-038-071	Core,S/S Hx 6 X 8 (8 Row)	1
2	000-052-649	Elbow, 3.00" O.D. X 0.065 Wall 4.500" R	1
3	000-052-674	Elbow, 3" Rubber W/Clamps	2
4	000-052-747	Elbow,3/8 S/S Street 90	2
5	000-068-802	Hose, 3/8" X 42" Lg. Teflon w/ 3/8" JIC Ends	1
6	000-068-802	Hose, 3/8" X 42" Lg. Teflon w/ 3/8" JIC Ends	1
7	000-052-507	Nipple, 3/8" NPT X 9/16"-18 37° JIC S/S	2
8	000-094-059	Nut, #8-32UNC Nylock	4
9	000-100-154	Panel, Salsa Inlet - Weldment	1
10	000-100-155	Panel, Salsa Outlet - Weldment	1
11	000-106-173	Plug, 3/8" NPT Allen Head	1
12	000-106-124	Plug, Pipe, 1/4", Flush Fitting	1
13	000-108-022	Protector, Magnesium Anode *	2
14	000-108-140	Protector, Salsa Insulation Set	1
15	000-140-021	Rivet, 1/4" Blind X 0.50" Lg.	32
16	000-155-003	Spring, Solution Valve	4
17	000-174-001	Washer, #10 Flat	4

NOTICE

* Check anodes every 500 hours and replace as necessary..

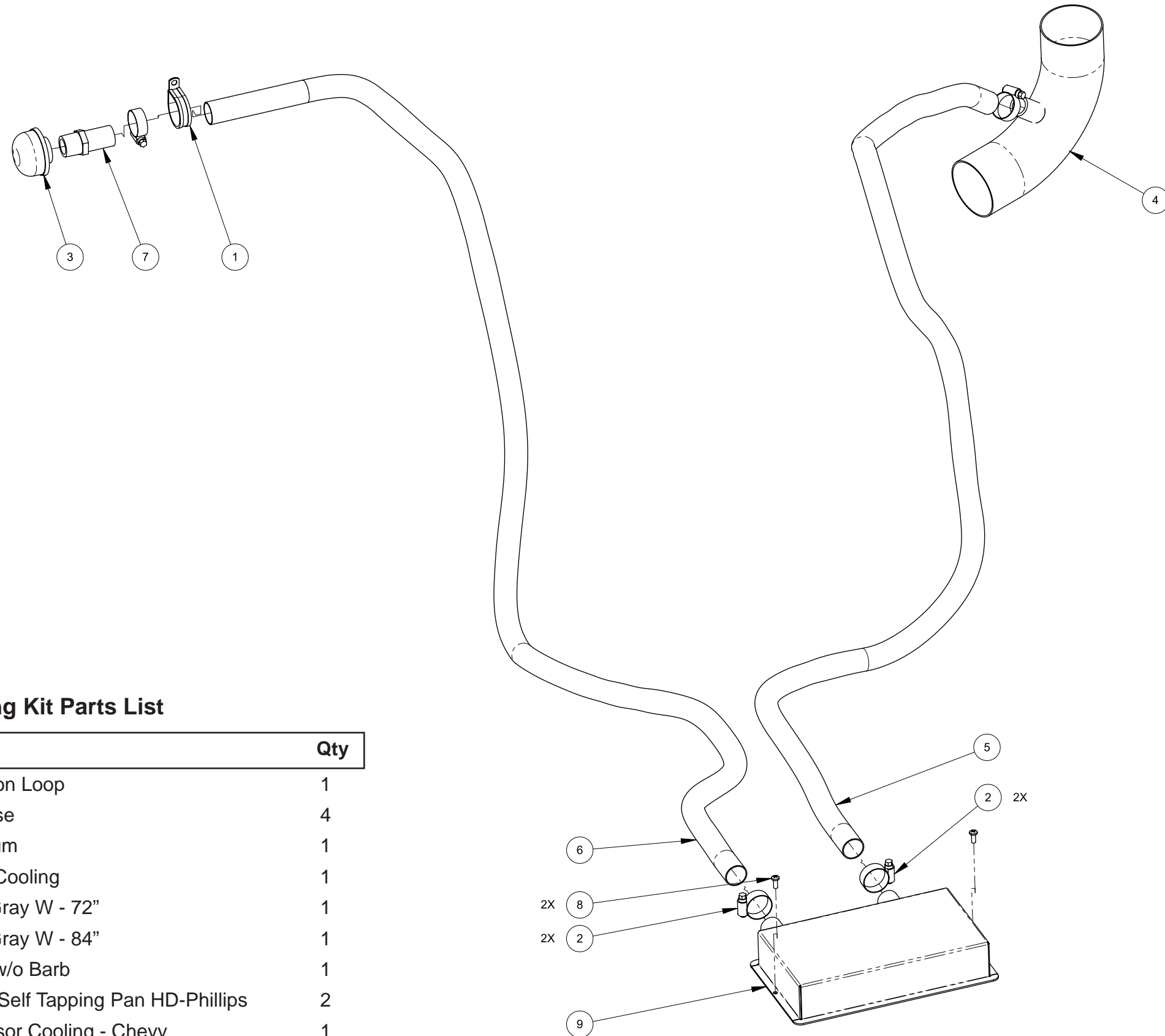
Figure 9-19. Pass Thru Assembly
000-078-381 Rev. C



Pass Thru Assembly Parts List

Item	Part Number	Description	Qty
1	000-025-008	Cable, 150 lb Test S/S	1
2	000-033-032	Clamp, CDS Throttle Cable	2
3	000-041-200	Cover, 4" Round ABS-Mod. -Pass Thru	1
4	000-143-537	Screw, #10 X 1.5" Lg. Pan Head Sheet Metal	6
5	000-125-182	Tube, Pass Thru	1

Figure 9-20. Yaw Sensor Cooling Kit
000-079-130



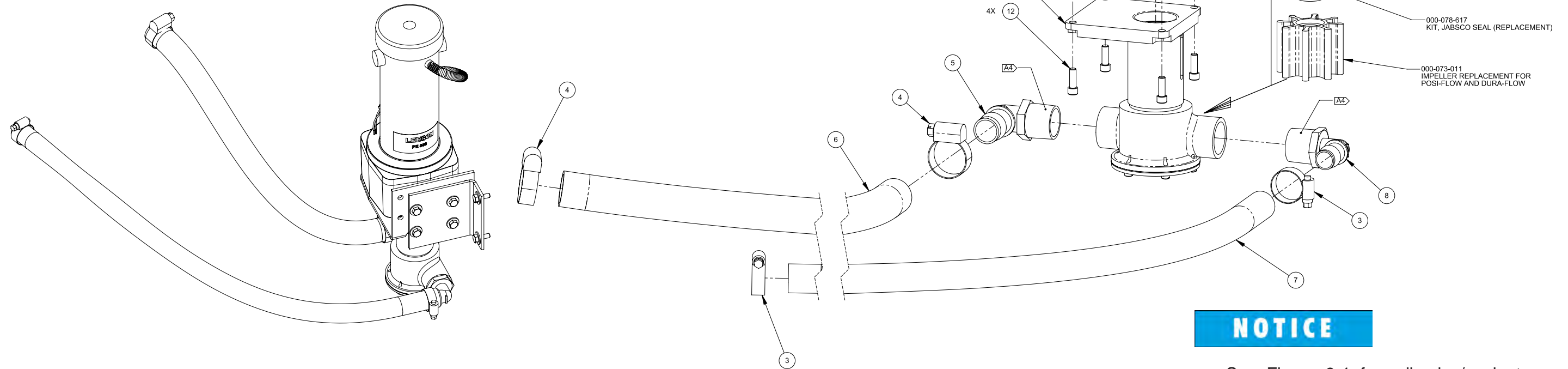
Yaw Sensor Cooling Kit Parts List

Item	Part Number	Description	Qty
1	000-033-053	Clamp, 1-1/2" Cushion Loop	1
2	000-033-029	Clamp, Size #12 Hose	4
3	000-049-020	Filter Screen - Medium	1
4	000-052-034	Fitting, Yaw Sensor Cooling	1
5	000-068-829	Hose, 1" Vacuum - Gray W - 72"	1
6	000-068-828	Hose, 1" Vacuum - Gray W - 84"	1
7	000-052-908	Insert 3/4 X 1 Hose w/o Barb	1
8	000-143-112	Screw, 10-24 X 1/2" Self Tapping Pan HD-Phillips	2
9	000-041-312	Weldment, Yaw Sensor Cooling - Chevy	1

Figure 9-21. Automatic Pump Out (APO) Kit Assembly
000-079-001 Rev. E

Automatic Pump Out (APO) Kit Assembly Parts List

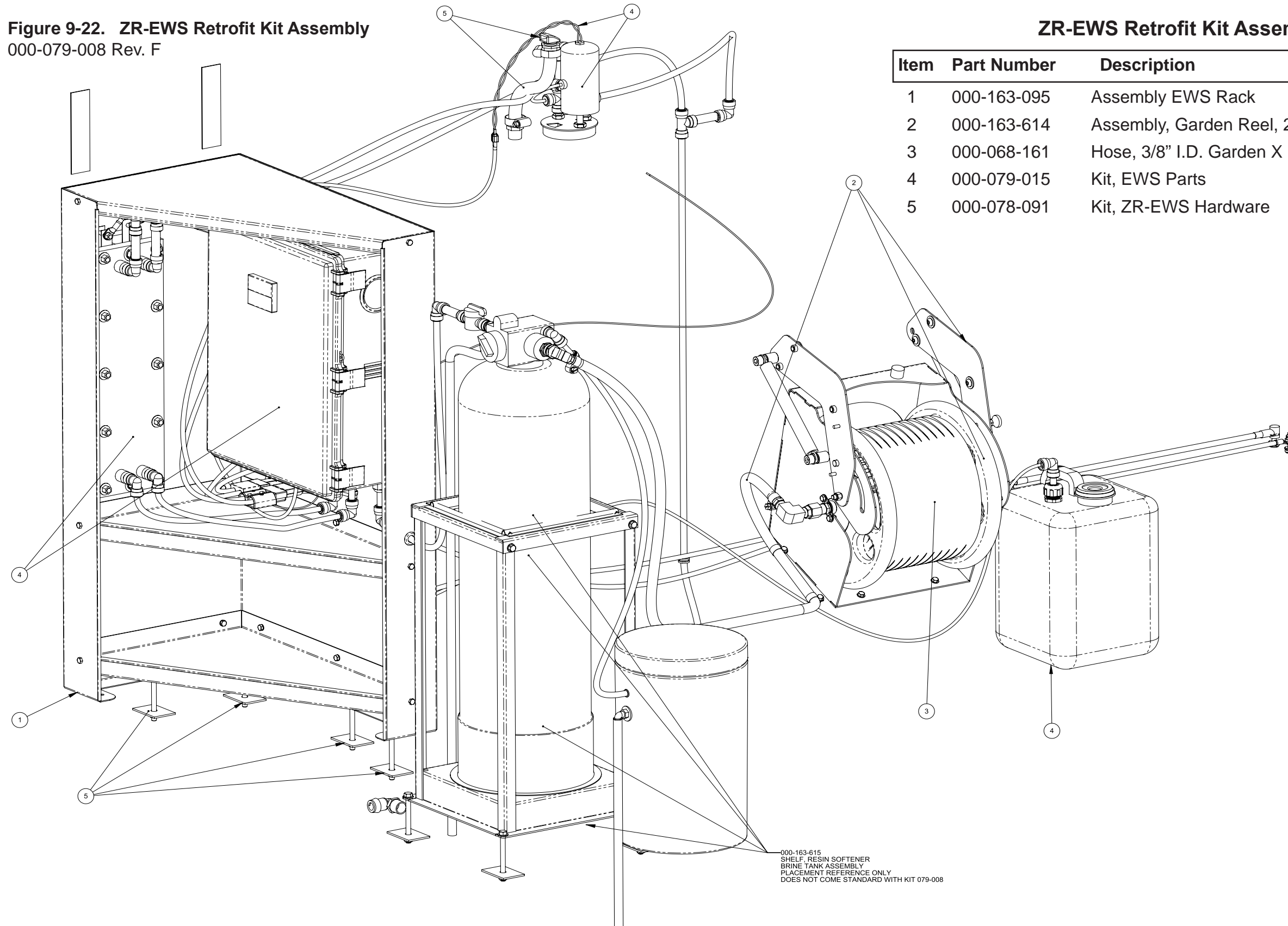
Item	Part Number	Description	Qty
1	000-111-169	Assembly, APO Pump	1
2	000-015-908	Bracket, Dura-Flow Support - Fabricated	1
3	000-033-029	Clamp, Size #12 Hose	2
4	000-033-020	Clamp, Size #16 Hose	2
5	000-052-131	Elbow, 1" NPT X 1" Barb (Glass Filled Black Nylon)	1
6	000-068-1029	Hose, 1" I.D. Rubber X 24" Lg. - Red	1
7	000-068-974	Hose, 3/4" I.D. Rubber X 30" Lg. - Red	1
8	000-052-757	Insert, 1" NPT X 3/4" Elbow	1
9	000-091-043	Motor Assembly - APO	1
10	000-143-074	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head Self-Tapping	4
11	000-143-001	Screw, 1/4"-20UNC X 0.75" Lg. Hex Head	2
12	000-143-566	Screw, 1/4"-28UNF X 0.75" Lg. Socket Head	4
13	000-174-002	Washer, 1/4" Flat	6



NOTICE

See Figure 9-1 for adhesive/sealant information.

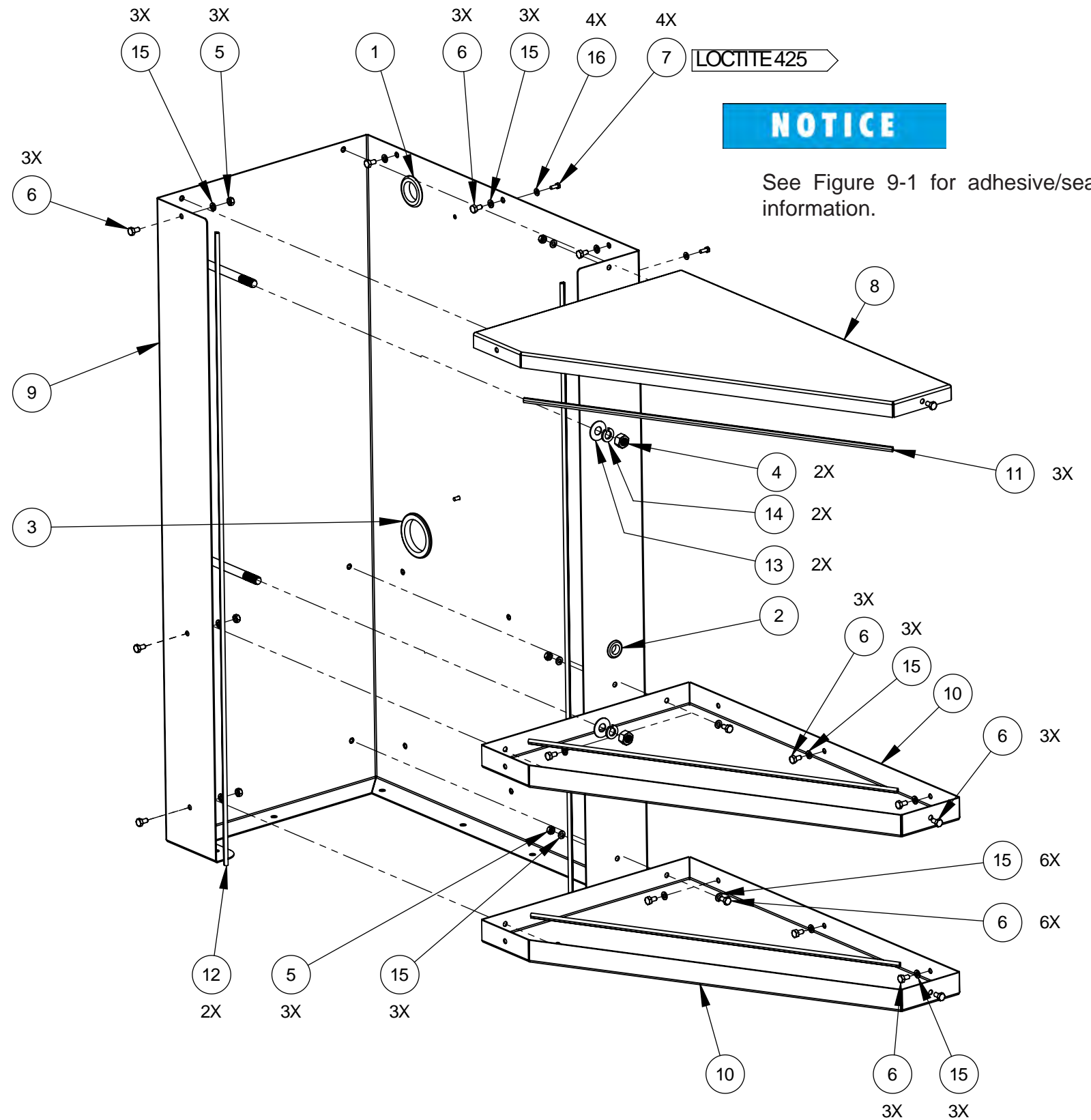
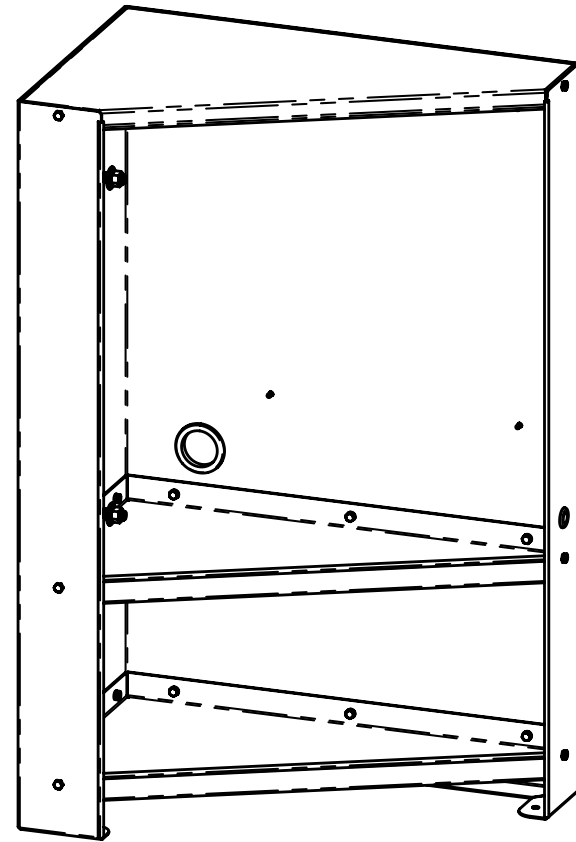
Figure 9-22. ZR-EWS Retrofit Kit Assembly
000-079-008 Rev. F



ZR-EWS Retrofit Kit Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-095	Assembly EWS Rack	1
2	000-163-614	Assembly, Garden Reel, 2nd Reel Option - Live	1
3	000-068-161	Hose, 3/8" I.D. Garden X 120 ft	1
4	000-079-015	Kit, EWS Parts	1
5	000-078-091	Kit, ZR-EWS Hardware	1

Figure 9-23. EWS Rack Assembly
000-163-095 Rev. E



NOTICE

Order P/N 000-079-008 for the ZR EWS retro fit kit which includes:

- 000-163-095 Assembly EWS Rack
- 000-163-614 Assembly, Garden Reel, 2nd Reel - Live
- 000-068-161 Hose, 3/8" I.D. Garden X 120 ft
- 000-078-091 Kit, ZR-EWS Hardware
- 000-079-015 Kit, EWS

EWS Rack Assembly Parts List

Item	Part Number	Description	Qty
1	000-060-010	Grommet, 1-5/16" I.D.	1
2	000-060-002	Grommet, Large Wiring	1
3	000-060-003	Grommet, Ø2.50	1
4	000-094-126	Nut, 1/2"-13UNC S/S Hex	2
5	000-094-010	Nut, 1/4"-20UNC Hex	6
6	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	21
7	000-143-327	Screw, #10-32UNF X 0.50" Lg. Hex Head	4
8	000-166-177	Tray, EWS Top Shelf - Welded	1

Item	Part Number	Description	Qty
9	000-166-175	Tray, EWS Back Panel - Welded	1
10	000-166-176	Tray, EWS MI.D. Shelf - Welded	2
11	000-131-030	Trimlok, 1/4" X 5/16" X 24-7/8" Long	3
12	000-131-030	Trimlok, 1/4" X 5/16" X 42-1/4" Long	2
13	000-174-181	Washer, 1/2" S/S Flat	2
14	000-174-180	Washer, 1/2" S/S Lock	2
15	000-174-019	Washer, 1/4" Lock	21
16	000-174-001	Washer, #10 Flat	4

Figure 9-24. 32K Water Softener Brine Tank Assembly
000-163-615 Rev. B

32K Water Softener Brine Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-027-119	Cap, 3/8 - Push Connect	1
2	000-163-619	Frame, Base Kit - EWS	1
3	000-079-136	Kit, Water Softener - EWS	1
4	000-159-185	Tank, Water Softener and Brine	1
5	000-131-021	Trimlok 3/8" X 1/8" X 10.750"	4

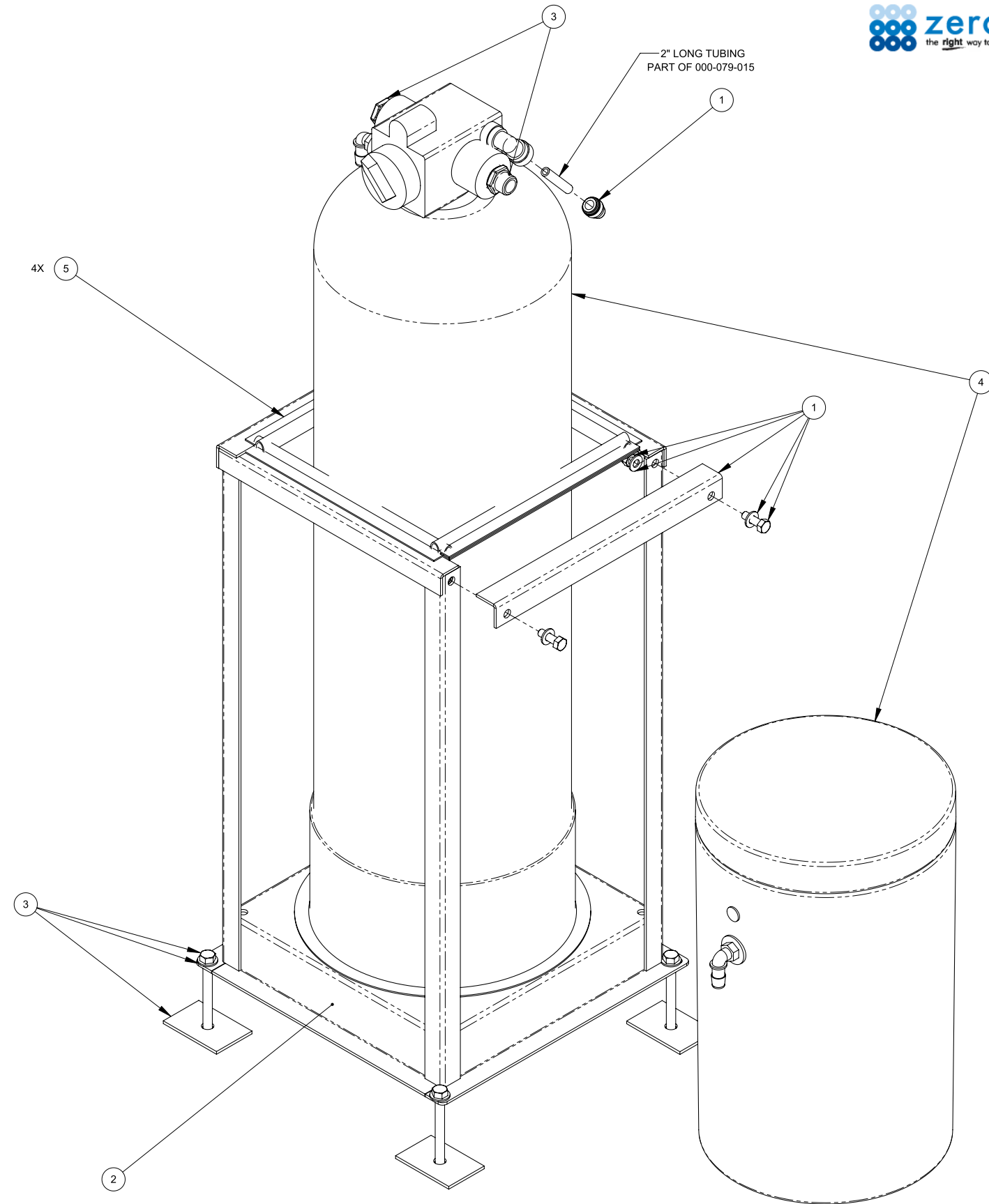


Figure 9-25. Water Softener Kit Assembly
000-079-136 Rev. A

Water Softener Kit Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-411	Bushing, 3/4" MPT X 1/2" FPT	1
2	000-052-823	Nipple, 3/4" X 1/2"	1
3	000-094-014	Nut, 3/8-16 Hex Z/P	4
4	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	4
5	600-011-003	Tie Down Cleat Washer - Fabricated	4
6	000-174-005	Washer, 3/8" Flat	8
7	000-174-021	Washer, 3/8" Lock	4

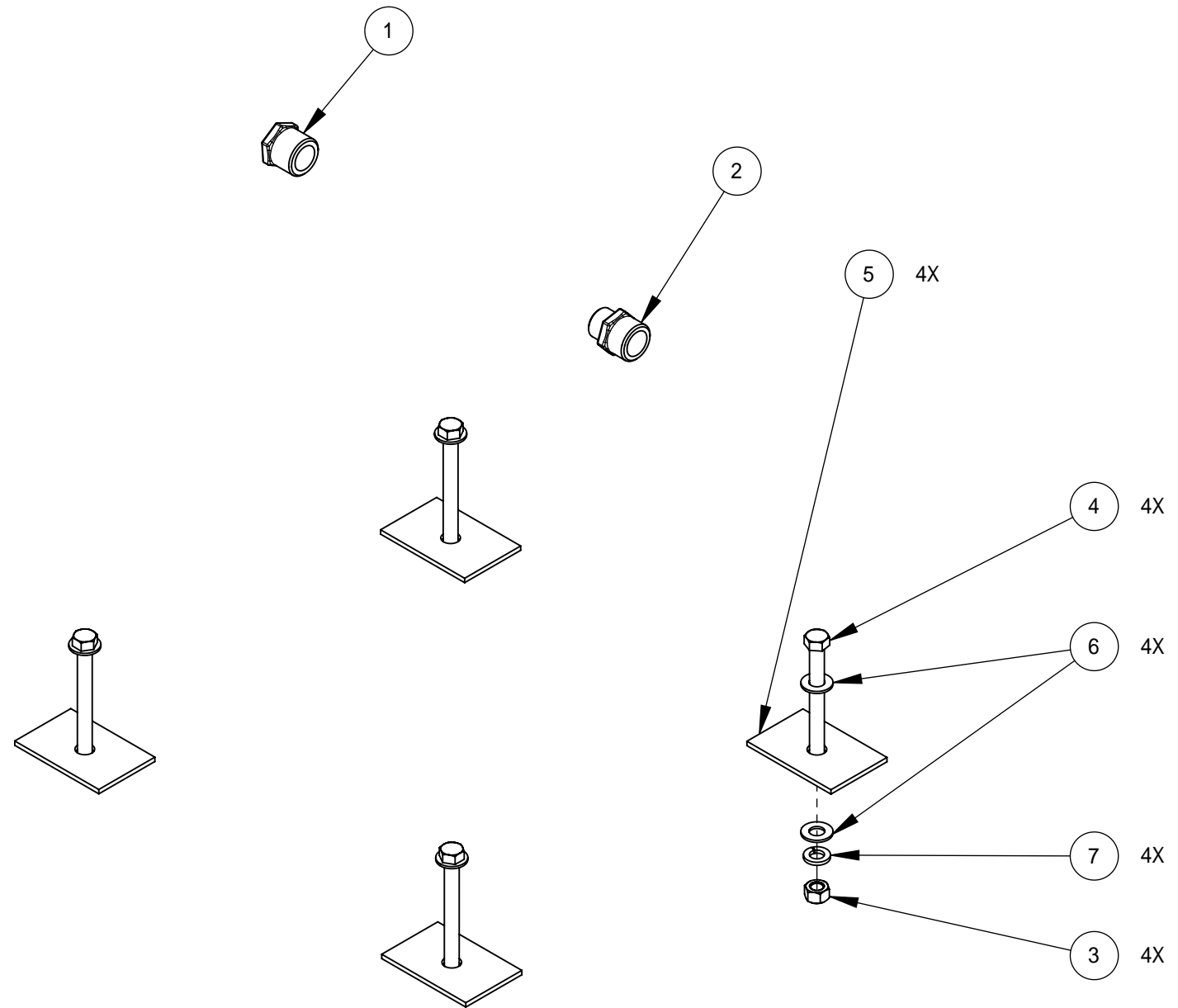
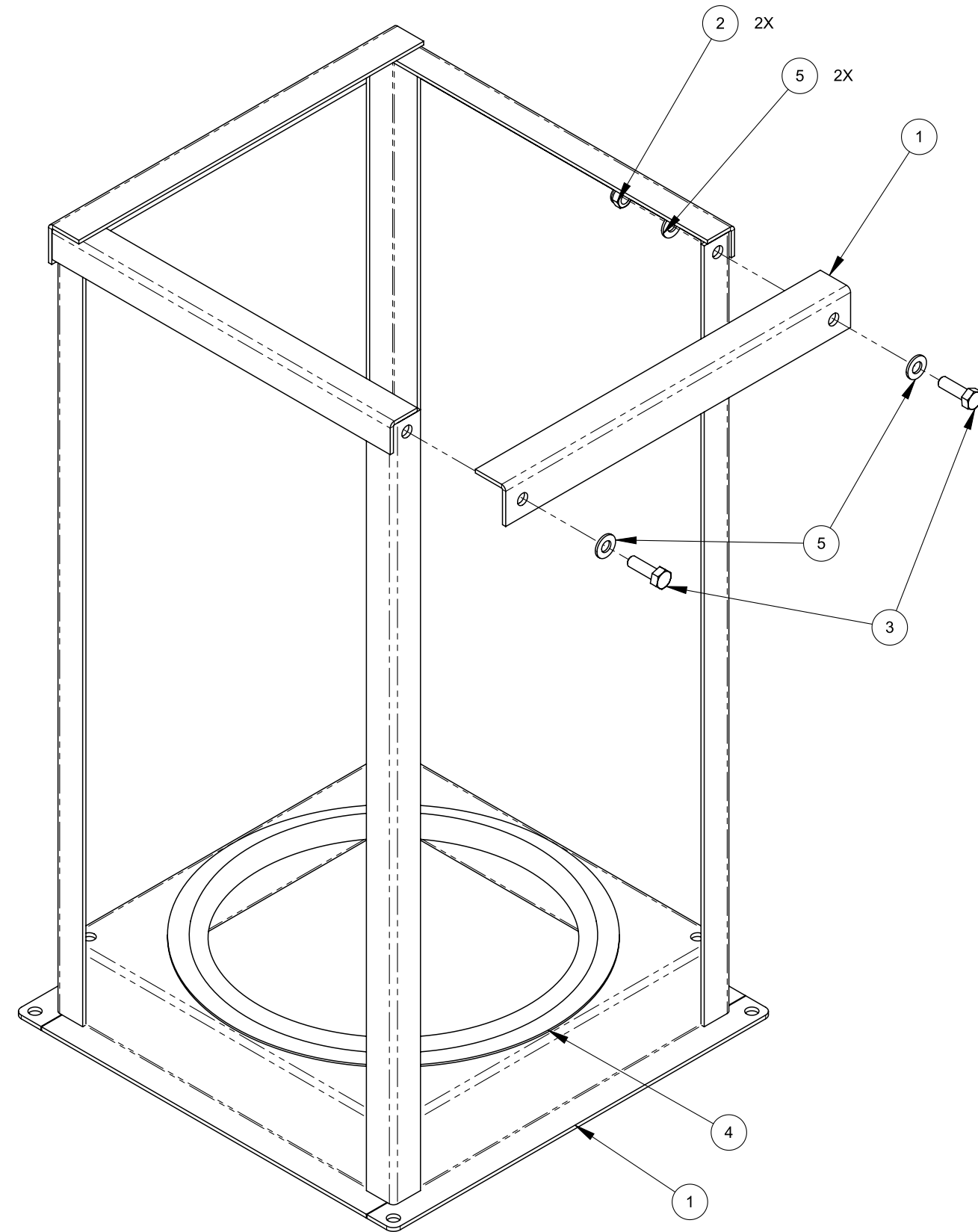
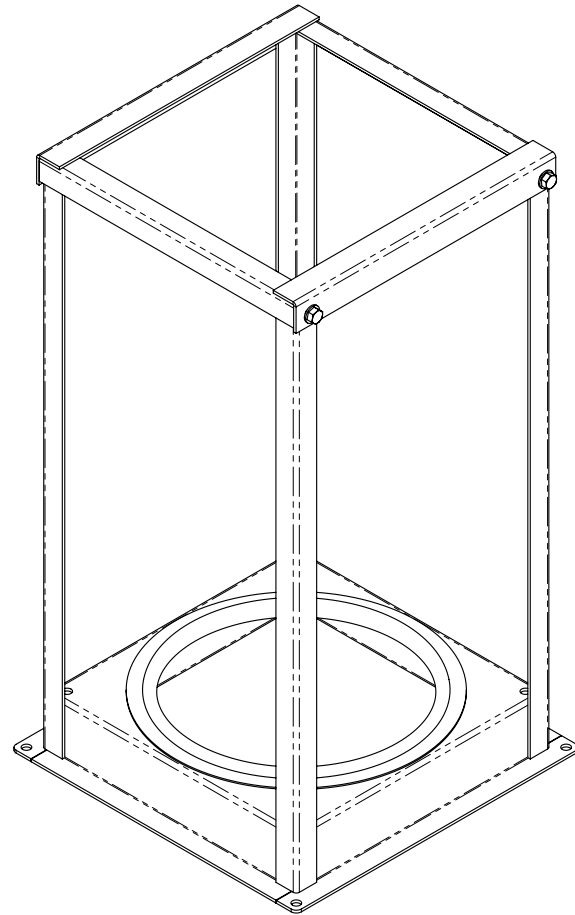


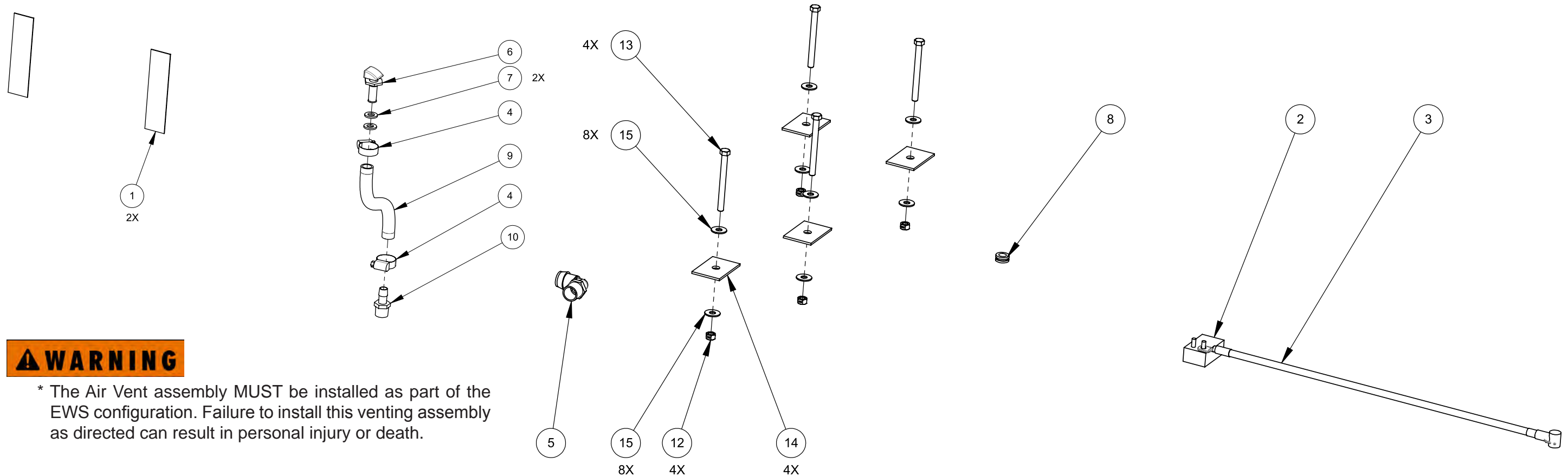
Figure 9-26. Frame Base Kit Assembly
000-163-619 Rev. A



Frame Base Kit Assembly Parts List

Item	Part Number	Description	Qty
1	000-055-062	Frame, Water Softener- Set	1
2	000-094-038	Nut, 5/16"-18UNC Nylock	2
3	000-143-143	Screw, 5/16"-18UNC X 1.00" Lg. Hex Head	2
4	000-131-021	Trimlok 5/8" X 1/8" X 37"	1
5	000-174-049	Washer, 5/16" Flat	4

Figure 9-27. EWS Hardware Kit
000-078-091 Rev B



⚠ WARNING

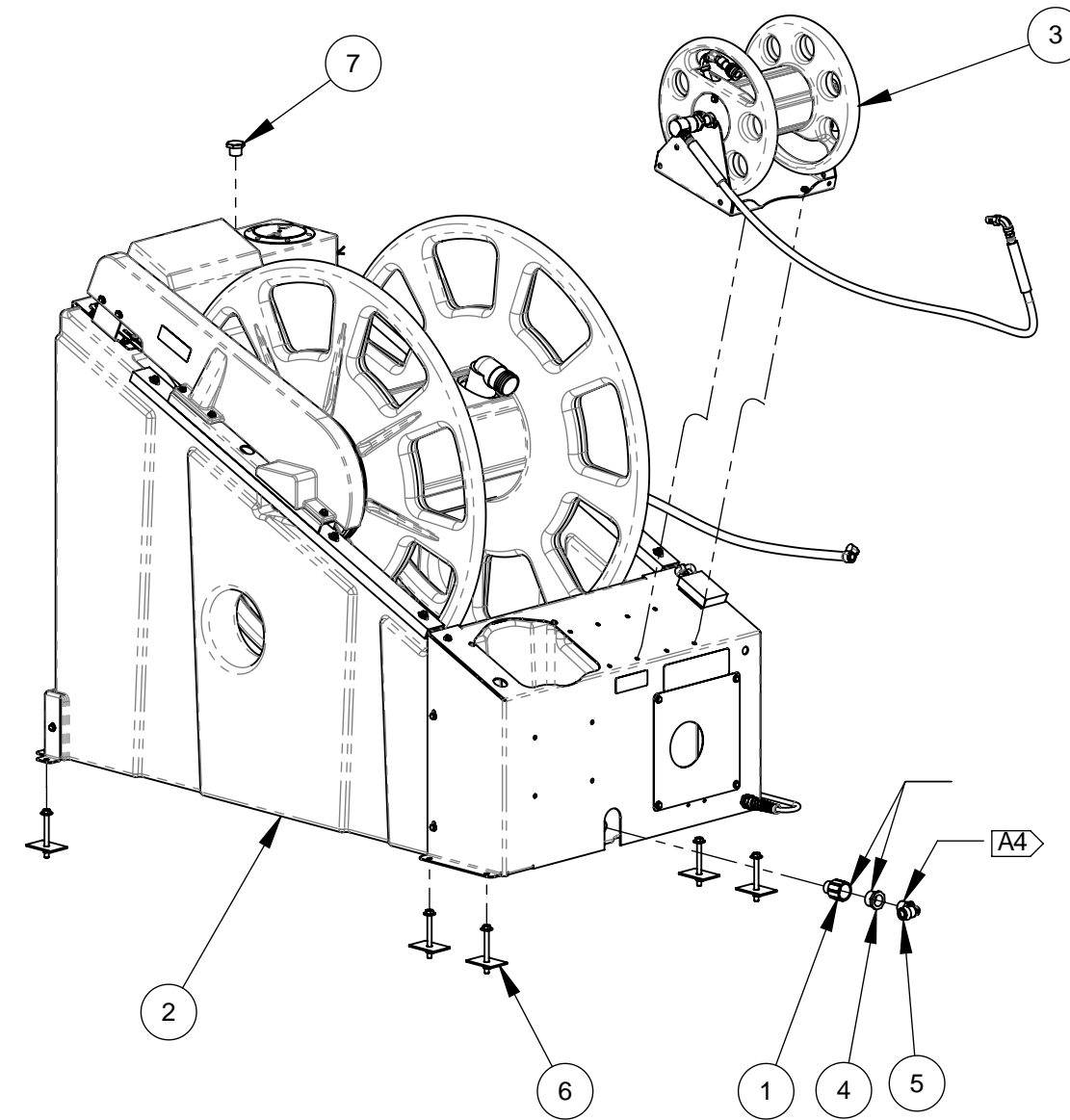
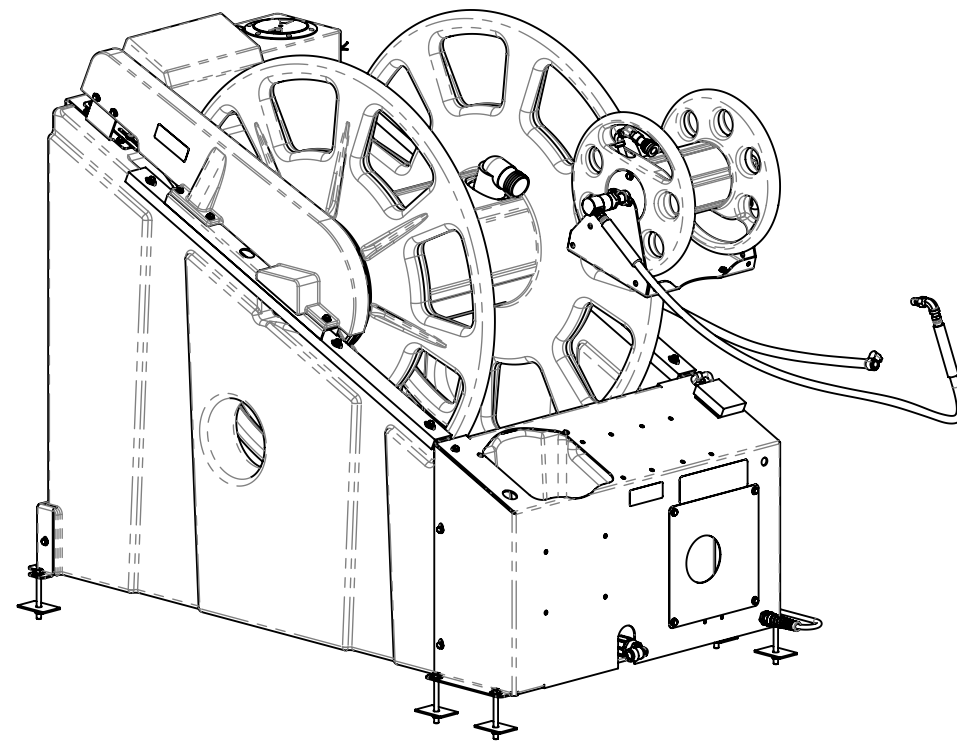
* The Air Vent assembly MUST be installed as part of the EWS configuration. Failure to install this venting assembly as directed can result in personal injury or death.

EWS Hardware Kit Parts List

Item	Part Number	Description	Qty
1	000-015-024	Bracket, Shelf Mounting	2
2	000-018-001	Breaker 100 Amp	1
3	000-063-051	Cable, Power	1
4	000-033-020	Clamp, Size #16 Hose *	2
5	000-052-348	Elbow, 3/4" NPT X 1" Hose	1
6	000-052-009	Filter Vent *	1
7	000-057-055	Gasket, Garden Hose *	2
8	000-060-009	Grommet, Large Wiring	1

Item	Part Number	Description	Qty
9	000-068-296	Hose 5/8" I.D.Green Stripe - 14" Long *	1
10	000-052-012	Insert, 3/4" X 1" Hose Barb *	1
11	000-037-010	Lug, Copper Cable, Ring Terminal 3/8"	2
12	000-094-015	Nut, 3/8"-16UNC Hex 2-Way Locking	4
13	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	4
14	600-011-003	Tie Down Cleat Washer - Fabricated	4
15	000-174-005	Washer, 3/8" Flat	8

Figure 9-28. 125 Gallon HydraCradle Tank Assembly
000-163-082 Rev. D



125 Gallon HydraCradle Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-236	Adapter, 3/4" Mpt X 1" Female	1
2	000-163-609	Assembly, Tank Cradle - Zerorez	1
3	000-163-611	Assembly, Zerorez 14" Hose Reel, Solution	1
4	000-052-235	Bushing, 3/4" FPT X 1" Male	1
5	000-052-348	Elbow, 3/4" NPT X 1" Hose	1
6	000-078-200	Kit, Tie Down Cradle Tank	1
7	000-052-816	Plug, 3/4" NPT, PVC	1

NOTICE

See Figure 9-1 for adhesive/sealant information.

Figure 9-29. HydraCradle Tank Assembly - View 1 of 4
000-163-609 Rev. D

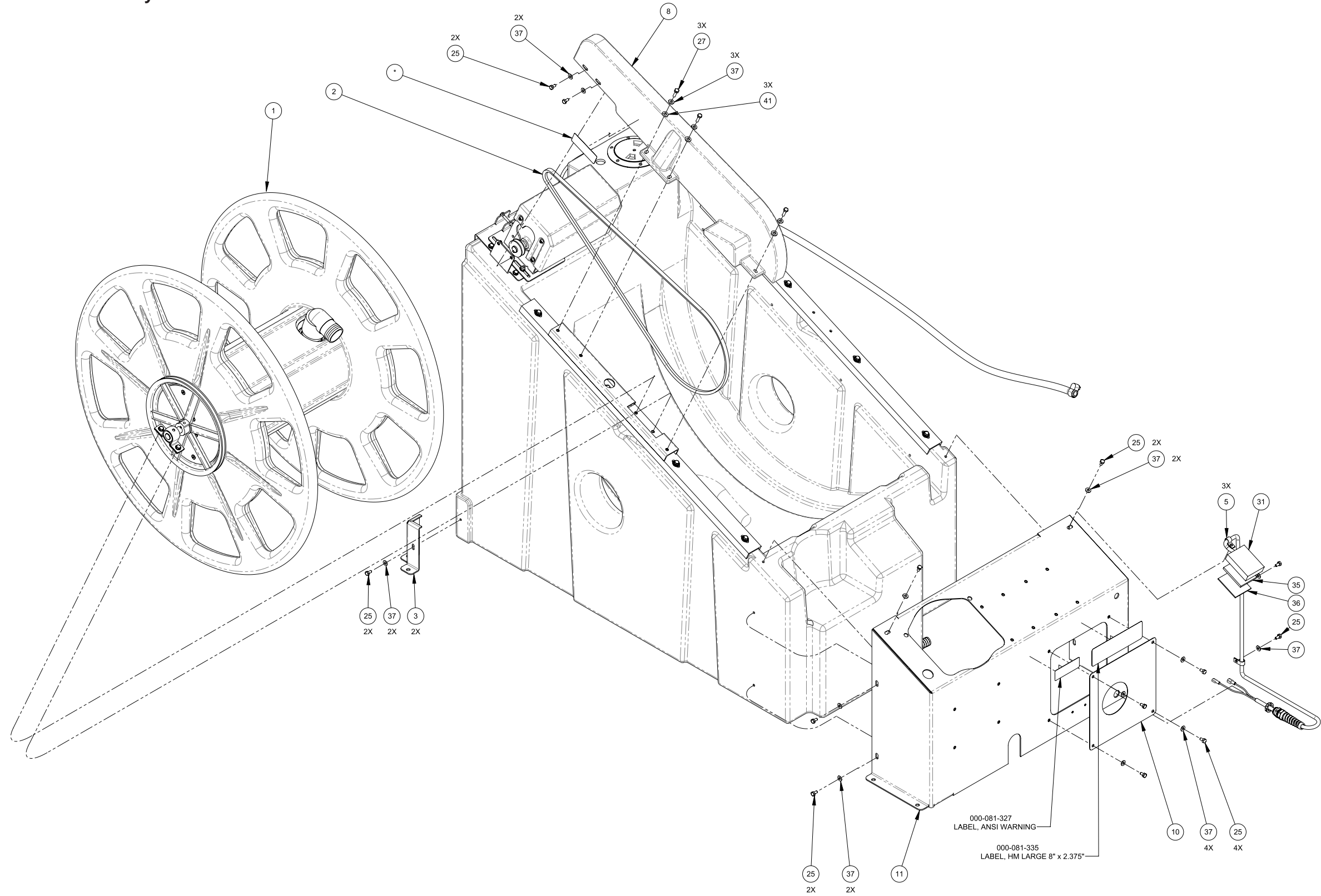
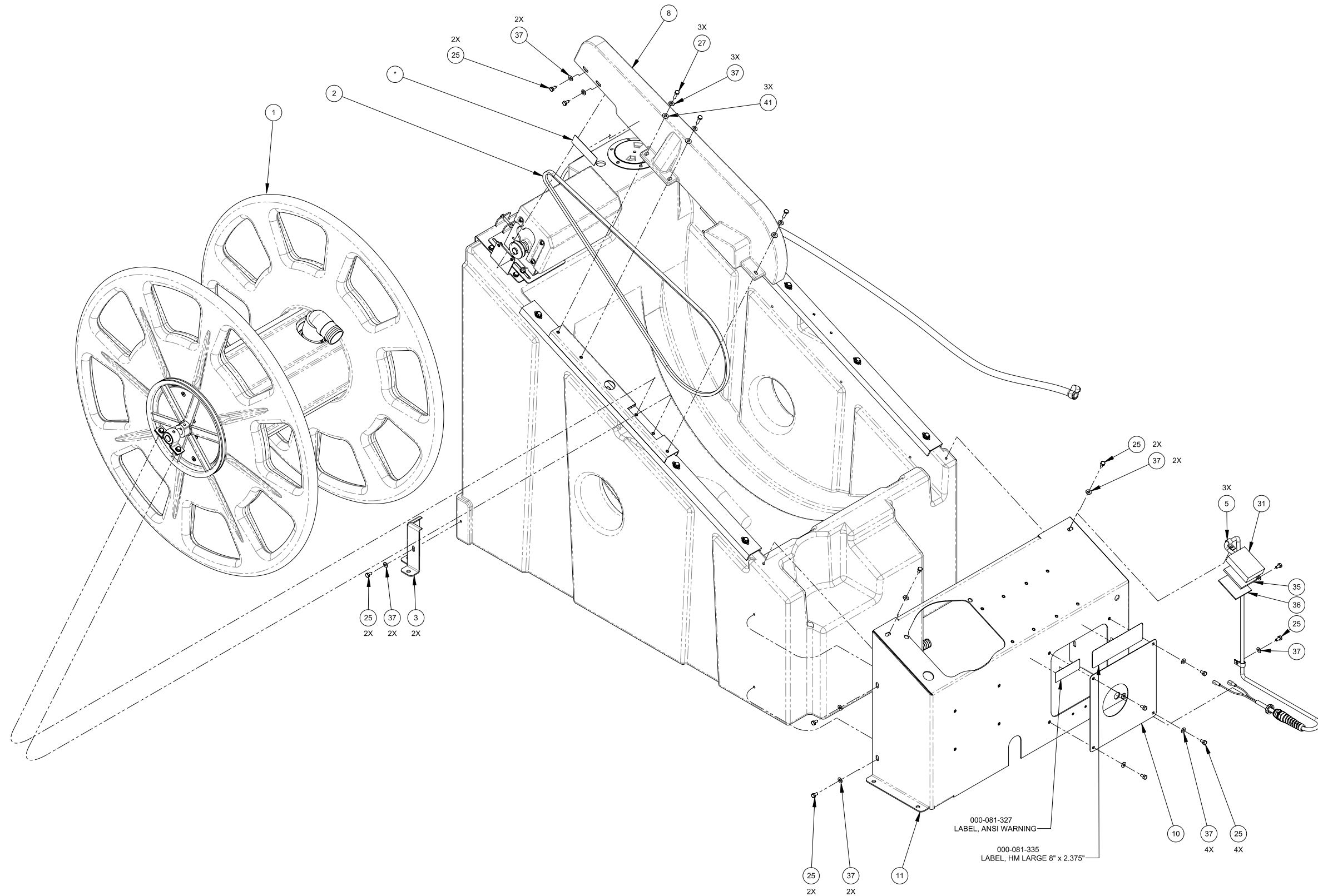


Figure 9-30. HydraCradle Tank Assembly - View 2 of 4
000-163-609 Rev. D



**Figure 9-31. HydraCradle
Tank Assembly- View 3 of 4**
000-163-609 Rev. D

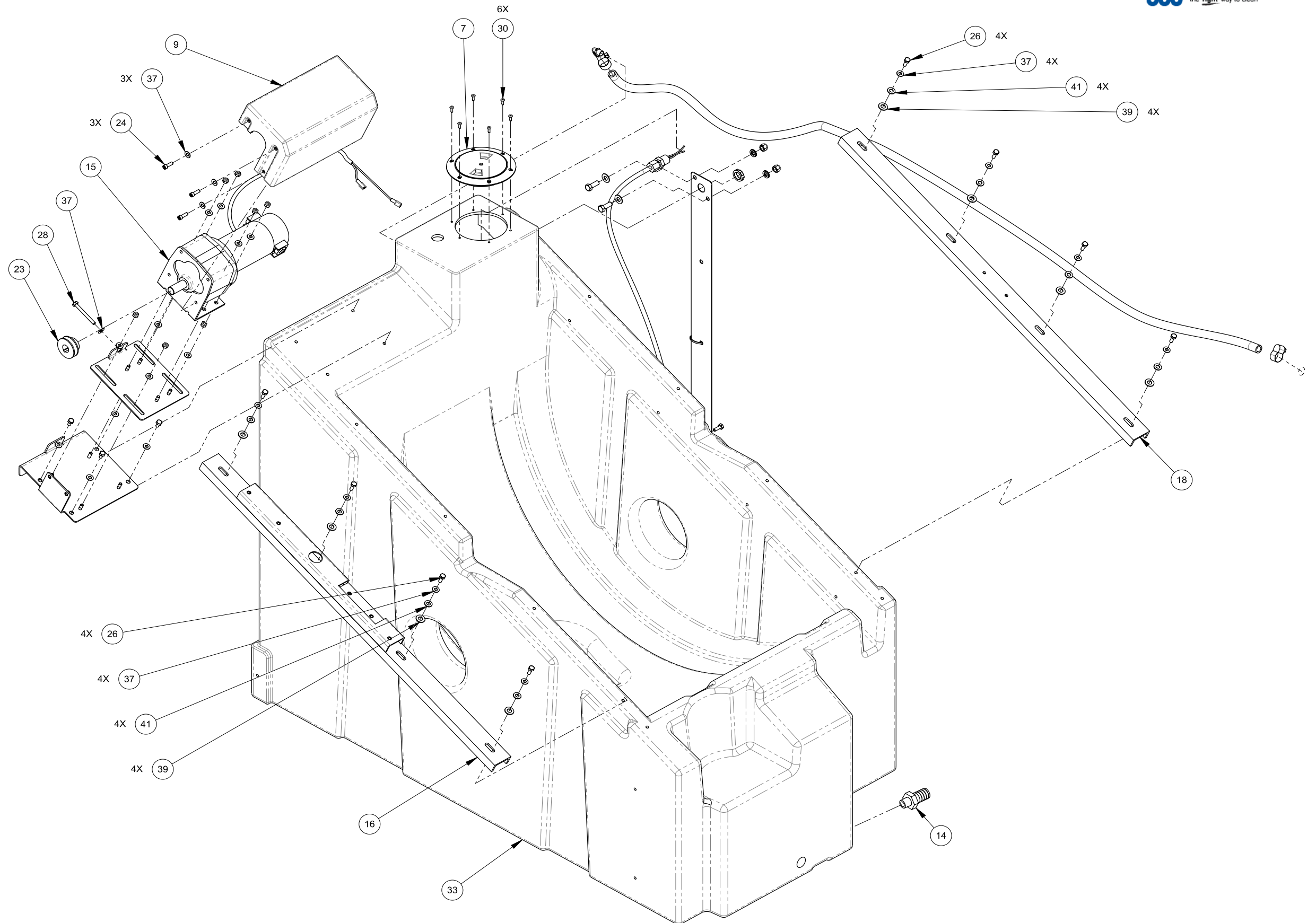
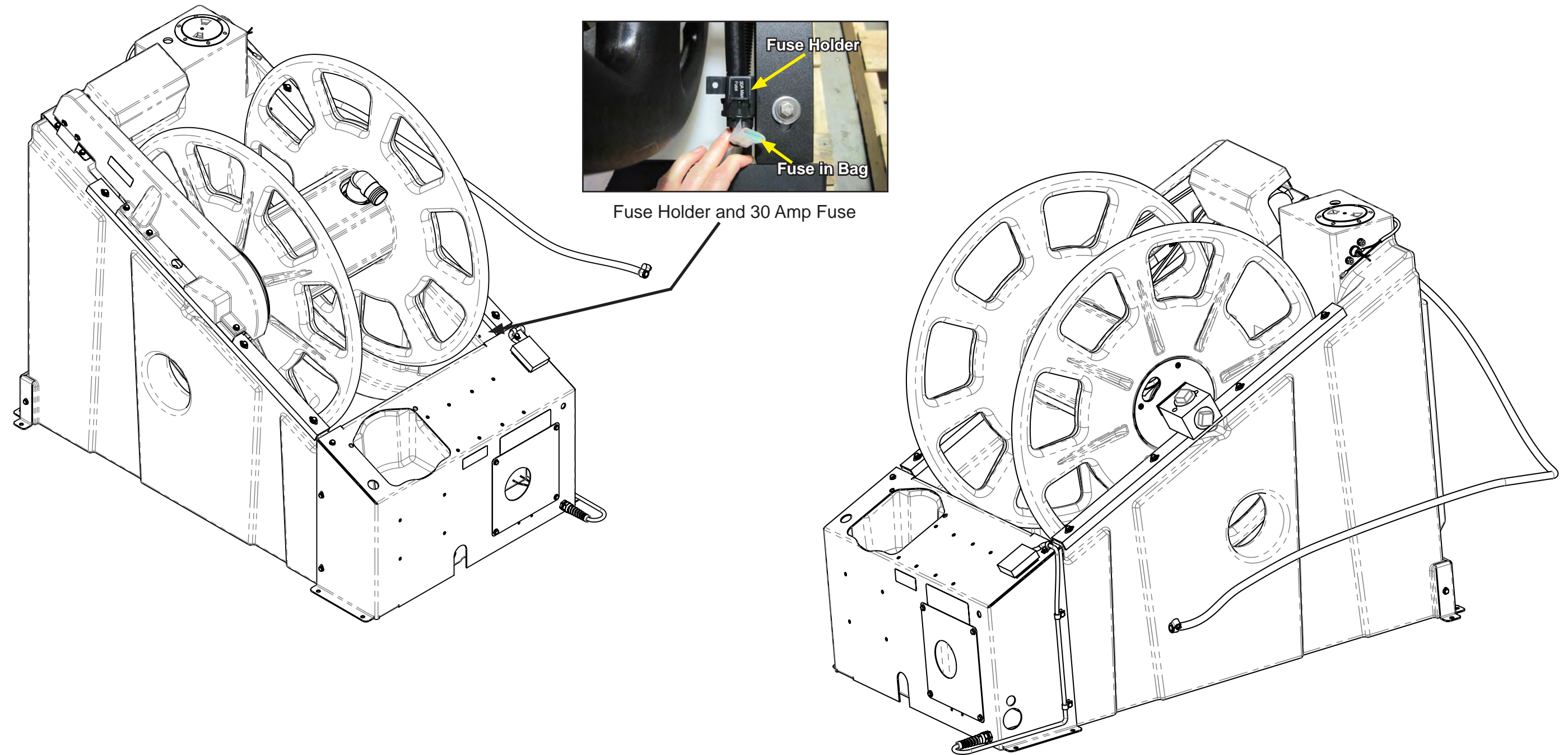


Figure 9-32. HydraCradle Tank Assembly - View 4 of 4
000-163-609 Rev. D



HydraCradle Tank Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-612	Assembly, Zerorez Vacuum Hose Reel	1
2	000-010-030	Belt, 4L, 73" Long	1
3	000-015-977	Bracket, Rear Base - Coated	2
4	000-015-012	Bracket, Submersible Float Switch - Fabricated	1
5	000-033-046	Clamp, 1/2" Wide X 1/2" Tube	3
6	000-033-006	Clamp, Size #8	2
7	000-041-365	Cover, 4" Round	1
8	000-041-475	Cover, Belt - Cradle Tank	1
9	000-041-474	Cover, Motor, Cradle Tank	1
10	000-041-477	Cover, Pump Access - Coated	1
11	000-041-476	Cover, Tank Front - Coated	1
12	000-052-484	Elbow, 1/2" NPT X 1/2 Hose	1
13	000-068-878	Hose, 1/2" Rubber - 8 ft Long	1
14	000-052-922	Insert, 1/2" MNPT X 1" Hose Barb	1
15	000-091-046	Motor Assembly, 1/6 Hp, 12VDC, Modification	1
16	000-092-033	Mount, Bearing - Coated	1
17	000-092-027	Mount, Drive Motor - Coated	1
18	000-092-034	Mount, Live Center - Coated	1
19	000-092-026	Mount, Motor Adjustment - Coated	1
20	000-094-036	Nut, 1/2" NPT Pipe Plastic	1
21	000-094-009	Nut, 1/4"-20UNC Nylock	10

Item	Part Number	Description	Qty
22	000-094-100	Nut, 3/8"-16UNC Nylock	2
23	000-109-122	Pulley, 2" O.D. X 3/4 Bore	1
24	000-143-566	Screw, 1/4"-28UNF X 0.75" Lg. Socket Head	3
25	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	18
26	000-143-001	Screw, 1/4"-20UNC X 0.75" Lg. Hex Head	10
27	000-143-002	Screw, 1/4"-20UNC X 1.00" Lg. Hex Head	3
28	000-143-594	Screw, 1/4"-20UNC X 2 1/2" Lg. HHCS, Full Threads	1
29	000-143-096	Screw, 3/8"-16UNC X 1.00" Lg. Hex Head	2
30	000-143-314	Screw, #8 X 1/2" Lg. Pan Head	6
31	000-157-156	Switch, Foot - Modified	1
32	000-157-039	Switch, Modified Liquid Level	1
33	000-159-134	Tank, 125 Gallon, Cradle	1
34	000-162-002	Tie Wrap, 6" Nylon	2
35	000-131-132	Velcro, Hook 2" Wide	3"
36	000-131-133	Velcro, Latch 2" Wide	3"
37	000-174-003	Washer, 1/4" Flat	45
38	000-174-032	Washer, 3/8" Flat	2
39	000-174-005	Washer, 3/8" Flat	8
40	000-174-029	Washer, 3/8" Rubber Backed	2
41	000-174-049	Washer, 5/16" Flat	11

Figure 9-33. 14" Solution Hose Reel Assembly
000-163-611 Rev. D

14" Solution Hose Reel Assembly Parts List

Item	Part Number	Description	Qty
1	000-008-054	Bearing, Face Flange, 3/4 I.D	1
2	000-008-055	Bearing Tensioner	1
3	000-015-979	Bracket, Reel Mount - Coated	1
4	000-052-007	Bushing, 3/8" M X 1/4 F	1
5	000-052-691	Elbow, 1/4" Street S/S	2
6	000-052-745	Elbow, 1/4", 45 Deg Street S/S	1
7	000-061-152	Handle, Crank - Modified	1
8	000-068-251	Hose Assembly, 1/4" Solution X 96" Lg.	1
9	000-092-028	Mount, 14" Reel Crank - Coated	1
10	000-092-029	Mount, 14" Reel, Live Center - Coated	1
11	000-052-678	Nipple, 1/4 NPT X 4", Sch 80	1
12	000-052-690	Quick Connect, Female S/S	1
13	000-163-598	Reel, 14" Rotomold	2
14	000-163-599	Reel Center Core, Rotomold	1
15	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	8
16	000-143-599	Screw, 1/4"-20UNC X 3/4" Lg. SHCS, S/S	2
17	000-143-610	Screw, 1/4"-20UNC X 4.50" Lg. Hex Head	4
18	000-154-179	Spacer, 0.82" I.D. X 1.05" O.D. X 0.5" Lg	1
19	000-163-575	Swivel, 3/8 Live Solution, S/S w/Viton Seals	1
20	000-143-589	Thumb Screw, 1/4-20 X 1-1/2 Lg, w/ Rosette Hd	1
21	000-174-003	Washer, 1/4" Flat	13

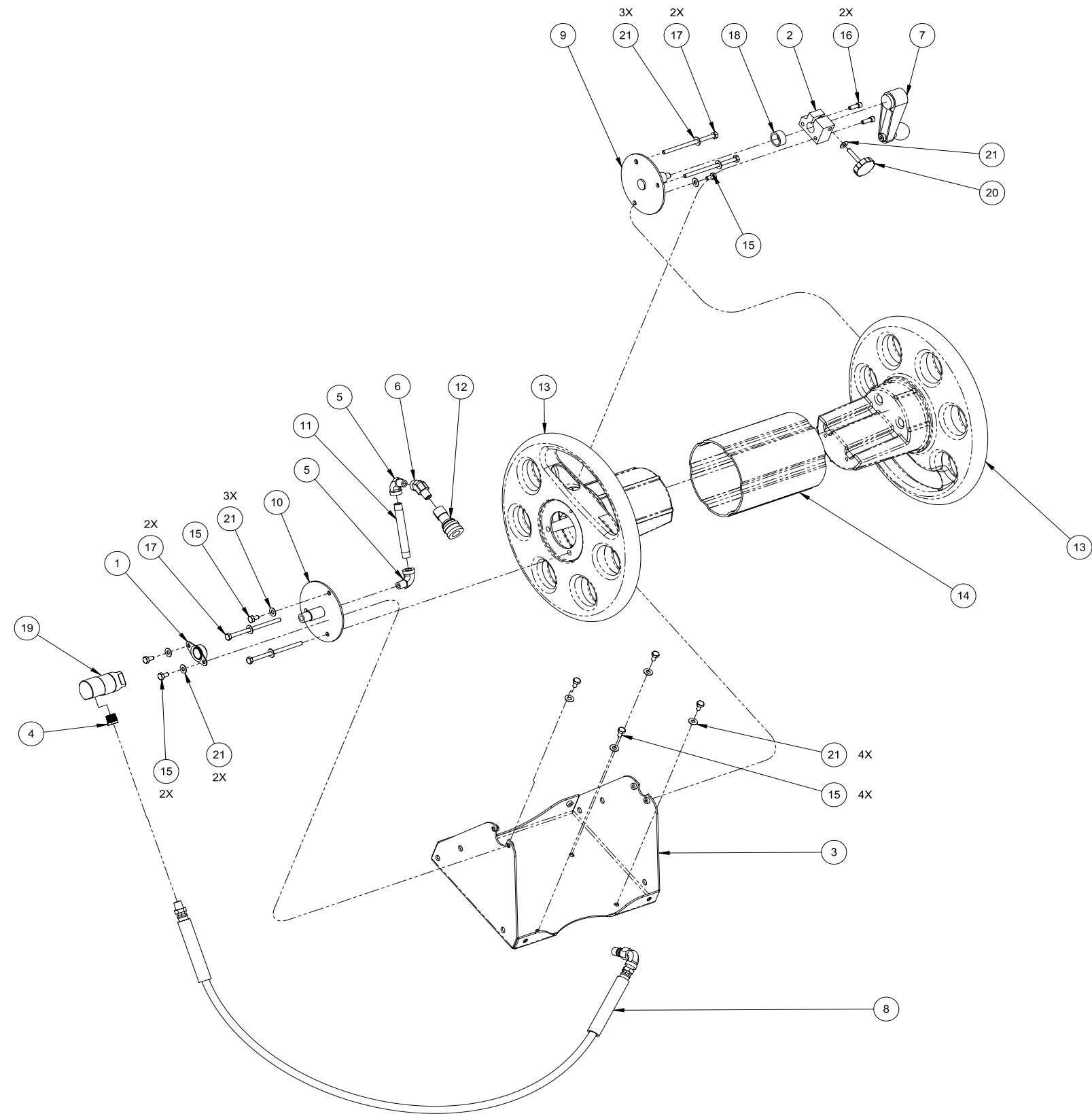
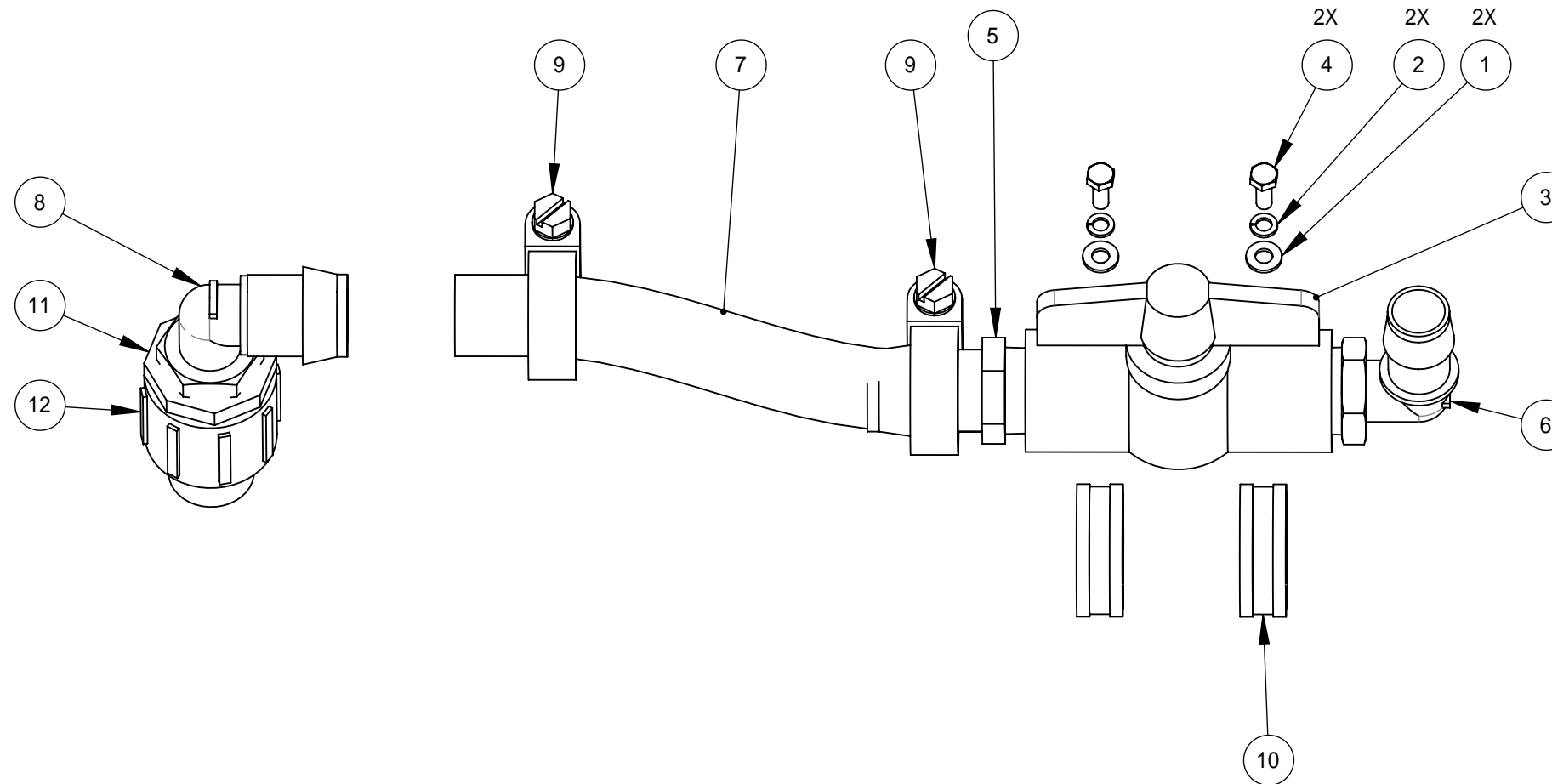


Figure 9-34. EWS HydraCradle Tank Hose and Fittings Assembly
000-078-103 Rev. A

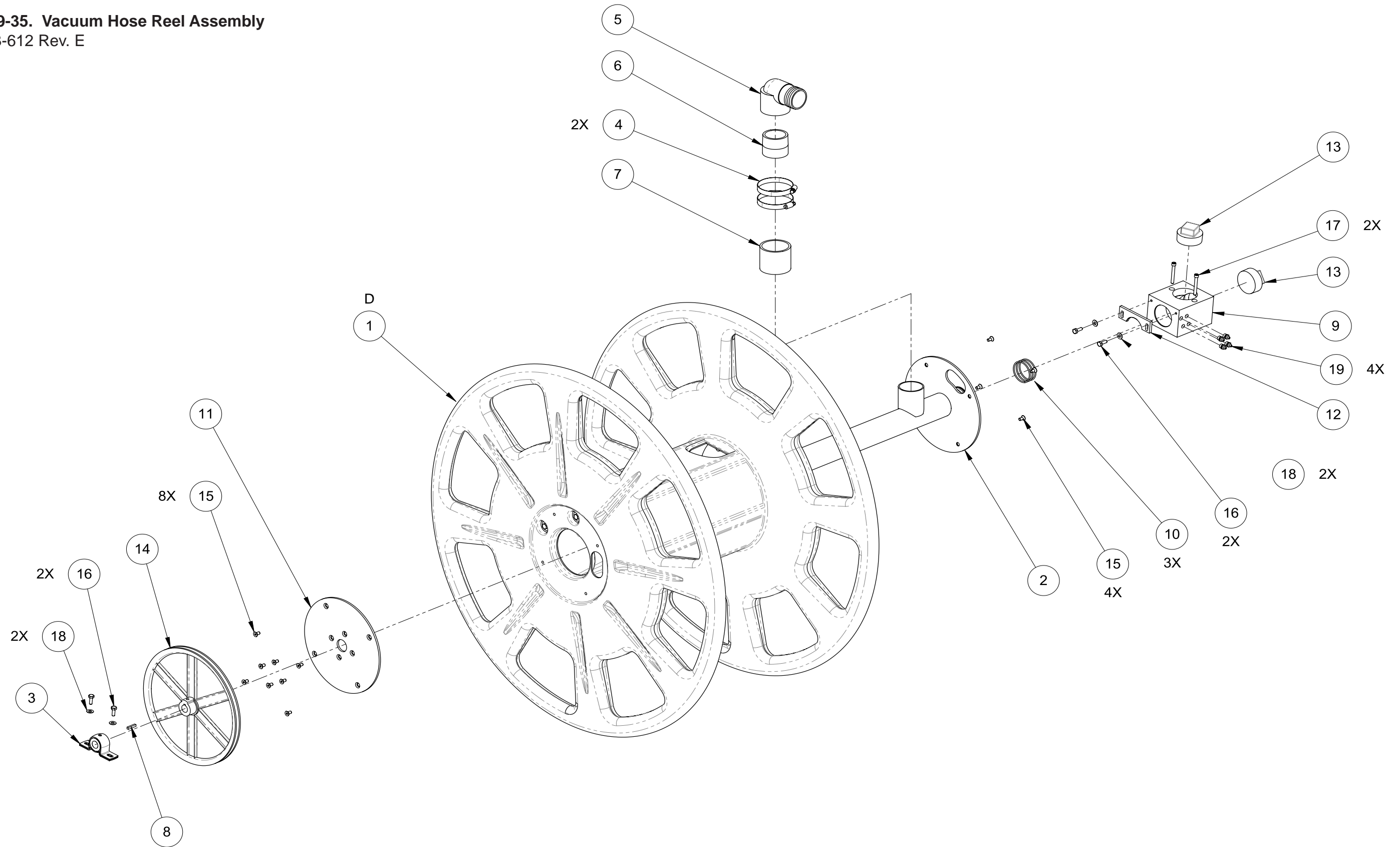


EWS HydraCradle Tank Hose and Fittings Assembly Parts List

Item	Part Number	Description	Qty
1	000-174-001	Washer, #10 Flat	2
2	000-174-014	Washer, #10 Lock	2
3	000-169-202	Valve, 3/4" FPT Ball Valve	1
4	000-143-126	Screw, #10-24UNC X 0.50" Lg. Hex Head	2
5	000-052-125	Insert, 3/4" X 1" Hose Barb	1
6	000-052-756	Insert, 3/4" NPT X 3/4" Elbow	1

Item	Part Number	Description	Qty
7	000-068-877	Hose, 1" Green Stripe - 7" Lg	1
8	000-052-348	Elbow, 3/4" NPT X 1" Hose	1
9	000-033-020	Clamp, Size #16 Hose	2
10	000-033-053	Clamp, 1-1/2" Cushion Loop	2
11	000-052-235	Bushing, 3/4" FPT X 1" Male	1
12	000-052-236	Adapter, 3/4" MPT X 1" Female	1

Figure 9-35. Vacuum Hose Reel Assembly
000-163-612 Rev. E



Vacuum Hose Reel Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-597	Assembly, Hub - Vacuum Hose Reel	1
2	000-141-044	Axle, Main Shaft, Welded	1
3	000-008-053	Bearing, Pillow Block, 3/4	1
4	000-033-012	Clamp, Size #44 Hose	2
5	000-052-222	Elbow, 2" Barb X 2" FPT	1
6	000-052-820	Half Nipple, 2" NPT X 2" Lg	1
7	000-068-887	Hose, 2-1/2" Red Stripe X 2-3/8" Lg.	1
8	000-077-016	Key, 3/16 X 3/16 X 1.0" Lg	1
9	000-092-025	Mount, Live Center	1
10	000-097-071	O-Ring, AS568A-136, Buna-N, 2" Nom I.D. X 0.103	3

Item	Part Number	Description	Qty
11	000-105-661	Plate Reel Mtg Brg Side Coated	1
12	000-105-560	Plate, Locking, Vac Hose Reel	1
13	000-106-018	Plug, 2" NPT, Square Head	2
14	000-109-128	Pulley, 12" O.D. X 3/4 Bore	1
15	000-143-596	Screw, 1/4"-20UNC X 0.50" Lg, Flat Head	12
16	000-143-001	Screw, 1/4"-20UNC X 0.75" Lg. Hex Head	4
17	000-143-606	Screw, 1/4"-20UNC X 2" Lg. Socket Head	2
18	000-174-003	Washer, 1/4" Flat	4
19	000-052-505	Zerk Fitting, 1/8" MNPT Grease Fitting - Straight Z/P	4

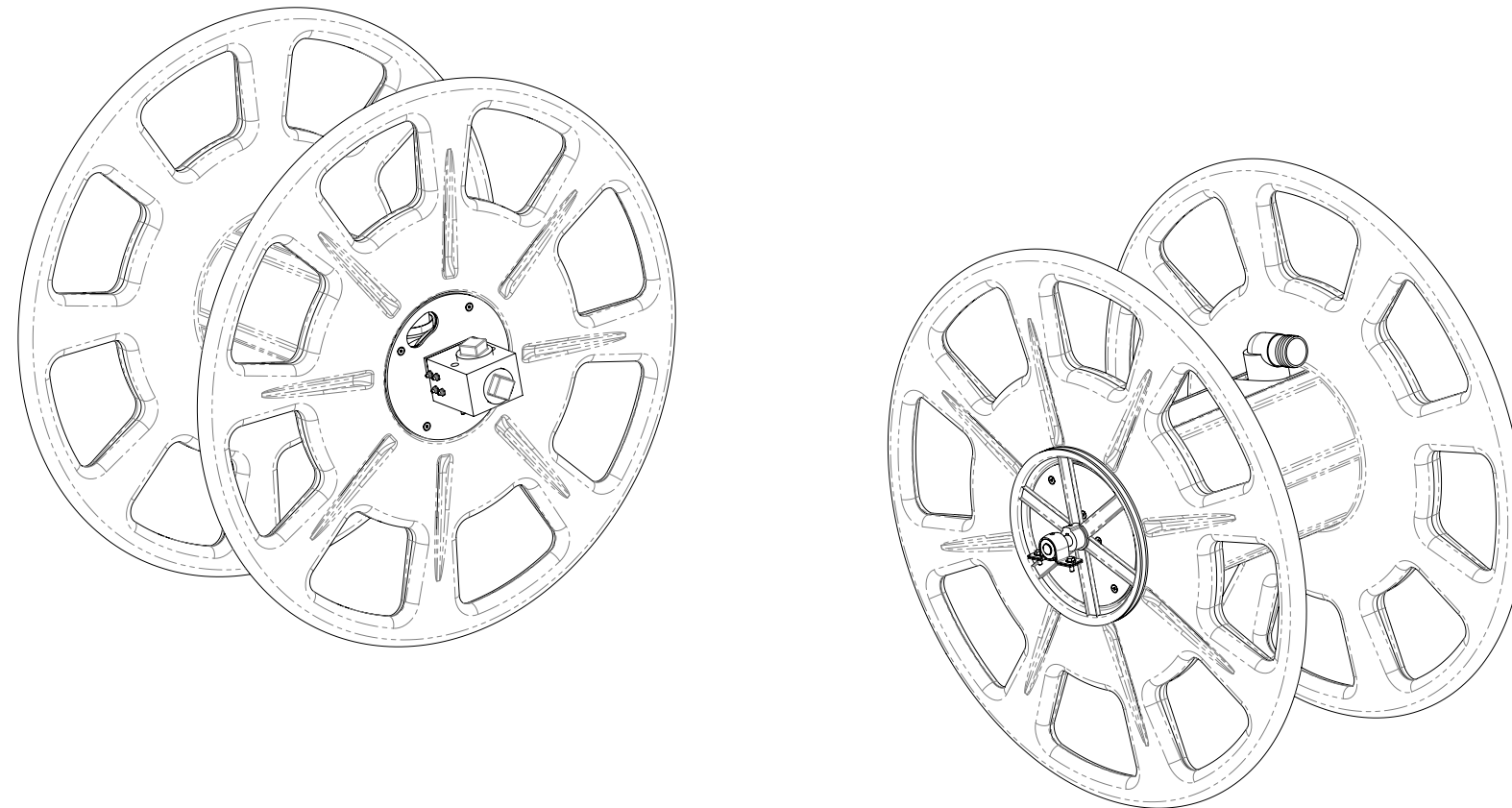
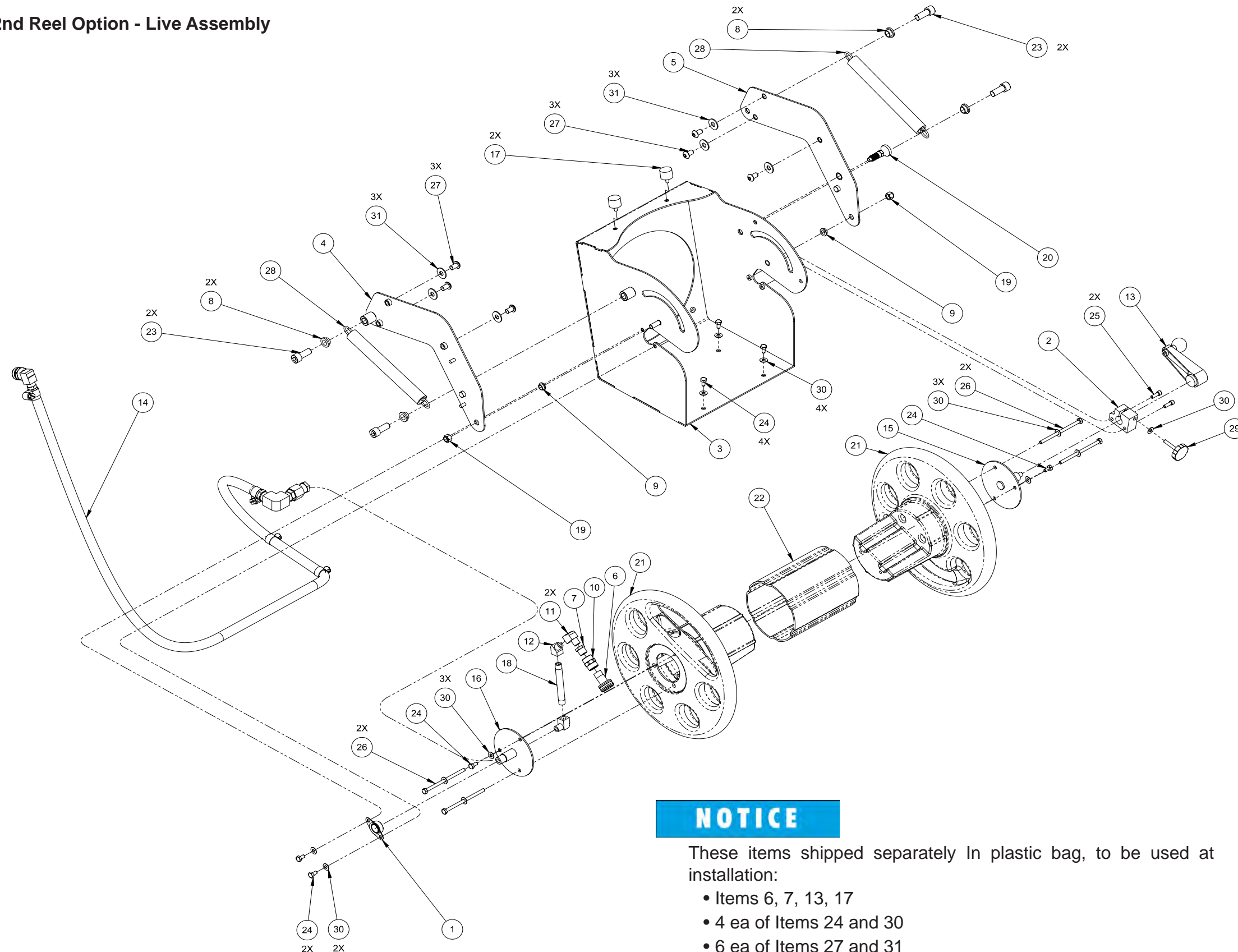


Figure 9-36. Garden Reel, 2nd Reel Option - Live Assembly
000-163-614 Rev. B



NOTICE

These items shipped separately In plastic bag, to be used at installation:

- Items 6, 7, 13, 17
- 4 ea of Items 24 and 30
- 6 ea of Items 27 and 31

Garden Reel, 2nd Reel Option - Live Assembly Parts List

Item	Part Number	Description	Qty
1	000-008-054	Bearing, Face Flange, 3/4 I.D.	1
2	000-008-055	Bearing, Tensioner	1
3	000-015-992	Bracket, 2nd Reel - Coated	1
4	000-015-994	Bracket, 2nd Reel, LH Pivot - Coated	1
5	000-015-993	Bracket, 2nd Reel, RH Pivot - Coated	1
6	000-052-158	Bushing, 3/4" Female Garden X 3/8" NPT	1
7	000-052-061	Bushing, 3/8" NPT X 1/4" FPT	1
8	000-020-068	Bushing, Flanged Bronze, 1/2 I.D. X 5/8 O.D. X 3/8 Lg	4
9	000-020-072	Bushing, Flanged, Bronze, 3/8 I.D. X 1/2 O.D. X 1/4 Lg	2
10	000-052-414	Coupler, 3/8" FPT Brass	1
11	000-052-085	Elbow, 1/4" NPT Street	2
12	000-052-082	Elbow, 1/4" NPT Street X 45 Degree	1
13	000-061-152	Handle, Crank - Modified	1
14	000-078-606	Kit, Live Garden Fittings	1
15	000-092-028	Mount, 14" Reel Crank - Coated	1
16	000-092-029	Mount, 14" Reel, Live Center - Coated	1

Item	Part Number	Description	Qty
17	000-092-031	Mount, Rubber Bumper, w/1/4-20 X 1/2Lg Mtg Stud	2
18	000-052-678	Nipple, 1/4 NPT X 4", Sch 80	1
19	000-094-100	Nut, 3/8-16, Nylock	2
20	000-103-057	Pin, Retractable, 1/2-13 Threads	1
21	000-163-598	Reel, 14" Rotomold	2
22	000-163-599	Reel Center Core, Rotomold	1
23	000-143-603	Screw, 1/2-13UNC X 1-1/4" Lg. Socket Head	4
24	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	8
25	000-143-599	Screw, 1/4"-20UNC X 3/4" Lg. SHCS, S/S	2
26	000-143-610	Screw, 1/4"-20UNC X 4.50" Lg. Hex Head	4
27	000-143-602	Screw, 3/8-16 X 5/8 Lg, Button Head	6
28	000-155-104	Spring, Extension, 1" O.D. X 9" Lg X .135 Wire Dia	2
29	000-143-589	Thumb Screw, 1/4-20 X 1-1/2 Lg, w/ Rosette Hd	1
30	000-174-003	Washer, 1/4" Flat	13
31	000-174-005	Washer, 3/8" Flat	6

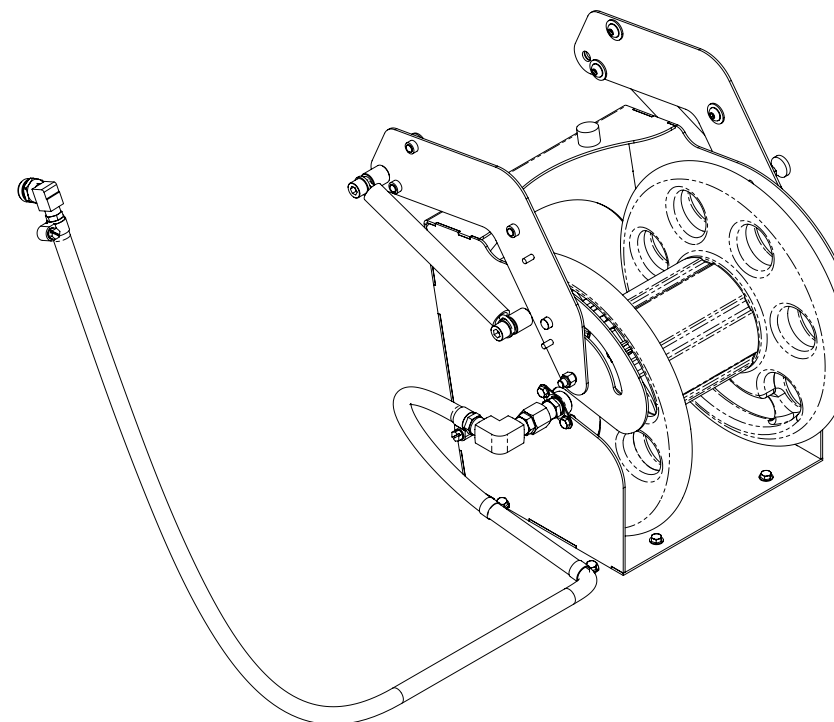
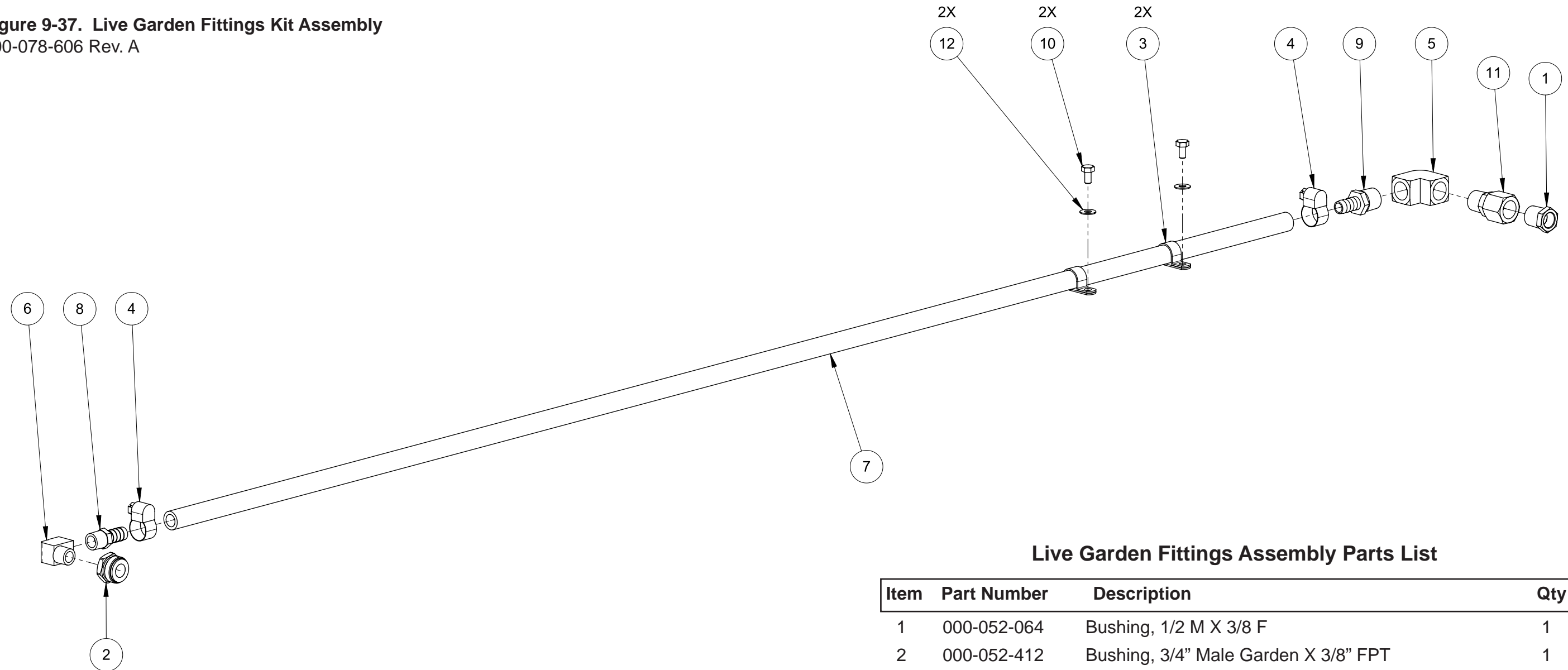


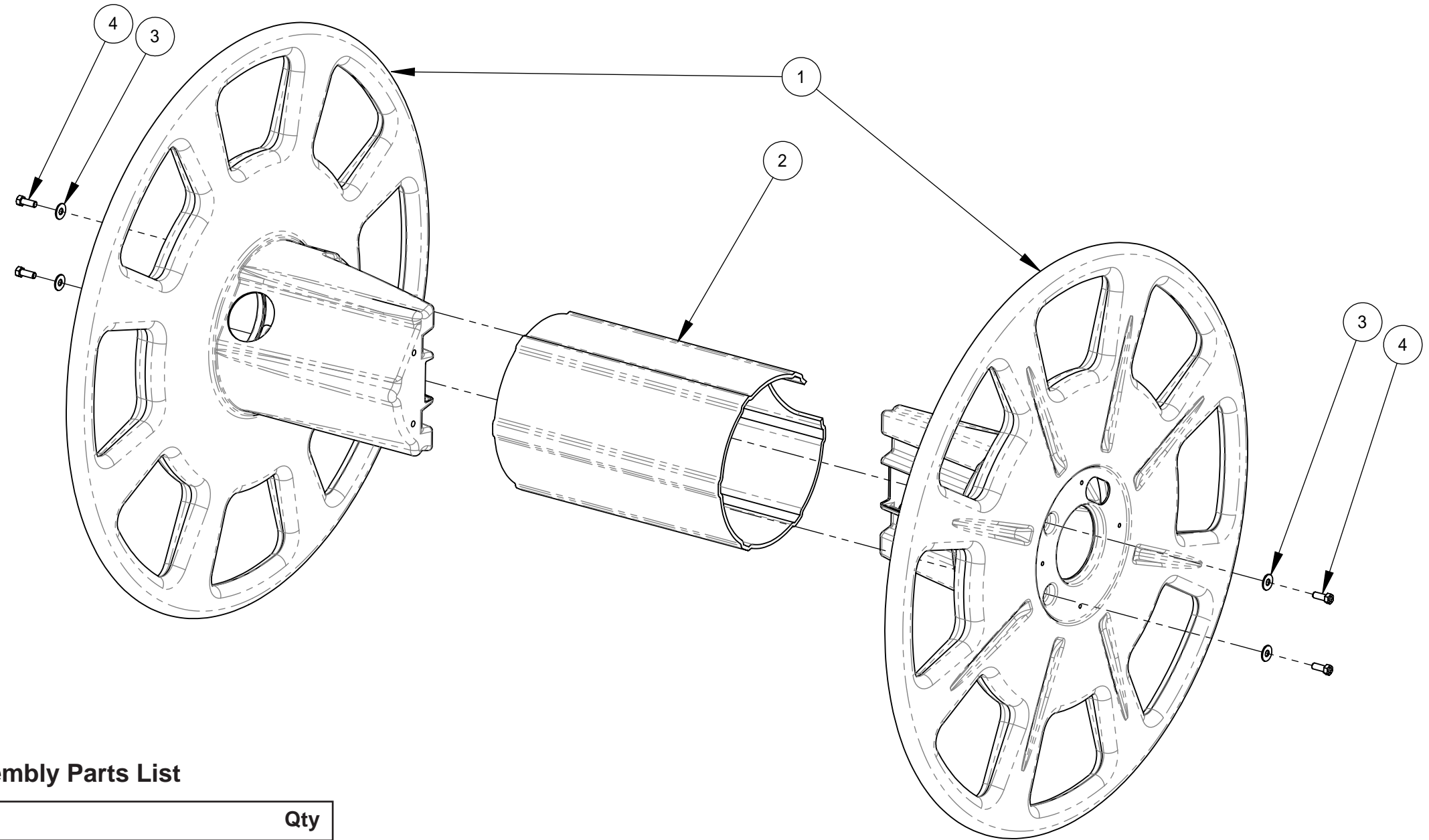
Figure 9-37. Live Garden Fittings Kit Assembly
000-078-606 Rev. A



Live Garden Fittings Assembly Parts List

Item	Part Number	Description	Qty
1	000-052-064	Bushing, 1/2 M X 3/8 F	1
2	000-052-412	Bushing, 3/4" Male Garden X 3/8" FPT	1
3	000-033-134	Clamp, 3/4 I.D., Cushion	2
4	000-033-004	Clamp, Size #6 Mini Hose	2
5	000-052-143	Elbow, 1/2 FPT, Brass	1
6	000-052-086	Elbow, 3/8" NPT Street	1
7	000-068-994	Hose, 1/2" Rubber X 62" Lg	1
8	000-052-105	Insert, #68 (3/8" NPT X 1/2" Barb)	1
9	000-052-107	Insert, #88 (1/2" NPT X 1/2" Barb)	1
10	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	2
11	000-052-290	Swivel, Garden, 1/2 NPT	1
12	000-174-003	Washer, 1/4" Flat	2

Figure 9-38. Vacuum Hose Reel Hub Assembly
000-163-597 Rev. A



Vacuum Hose Reel Hub Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-595	Reel, 38" O.D., Vacuum Hose, Rotomold	2
2	000-163-596	Reel, Center Core, Vacuum Hose, Rotomold	1
3	000-174-005	Washer, 3/8" Flat	4
4	000-143-018	Screw, 3/8"-16UNC X 1" Lg. Hex Head - Grade 8	4

Figure 9-39. 3 Tier Stainless Steel Shelf Assembly

000-163-038 Rev. C

Three Tier Stainless Steel Shelf Assembly Parts List

Item	Part Number	Description	Qty
1	000-015-024	Bracket, Shelf Mounting	2
2	000-081-173	Label	1
3	000-083-020	Leg, Three Tier Shelf	2
4	000-094-010	Nut, 1/4"-20UNC Hex	24
5	000-094-015	Nut, 3/8"-16UNC Hex 2-Way Locking	4
6	000-143-333	Screw, 1/4"-20UNC X 0.50" Lg. Hex Head	24
7	000-143-198	Screw, 3/8"-16UNC X 4" Lg. Hex Head - Full Thread	4
8	600-011-003	Tie Down Cleat Washer - Fabricated	4
9	000-166-057	Tray, Three Tier - 47"	3
10	000-174-019	Washer, 1/4" Lock	24

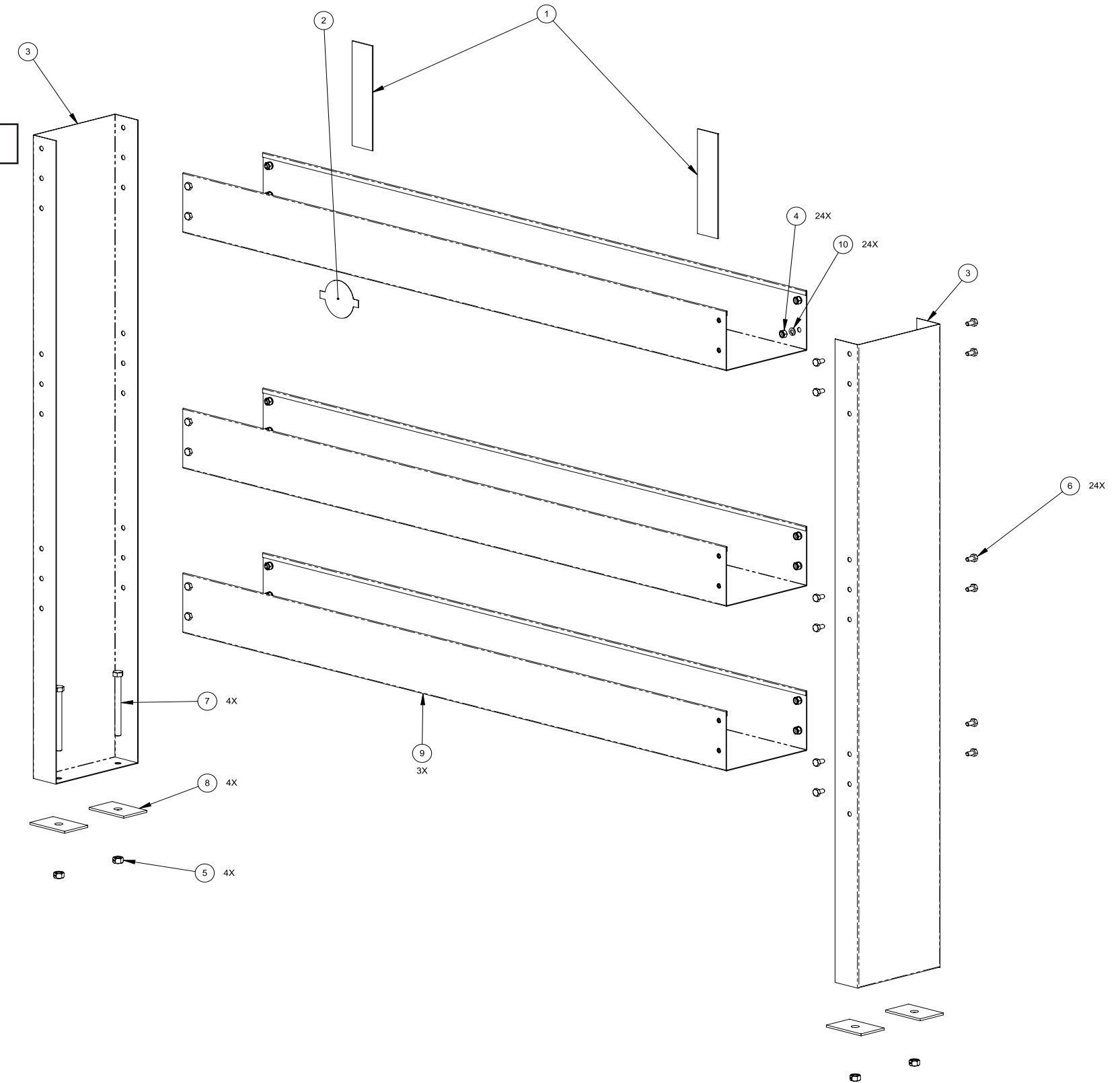


Figure 9-40. Panel Set Rear Door Assembly
000-100-021 Rev. A

Panel Set Rear Door Assembly Parts List

Item	Part Number	Description	Qty
1	000-100-020	Panel Set, Left and Right Rear Door - Chevy	1
2	000-131-060	Trimlok Seal, 3/4" X 3 ft	1

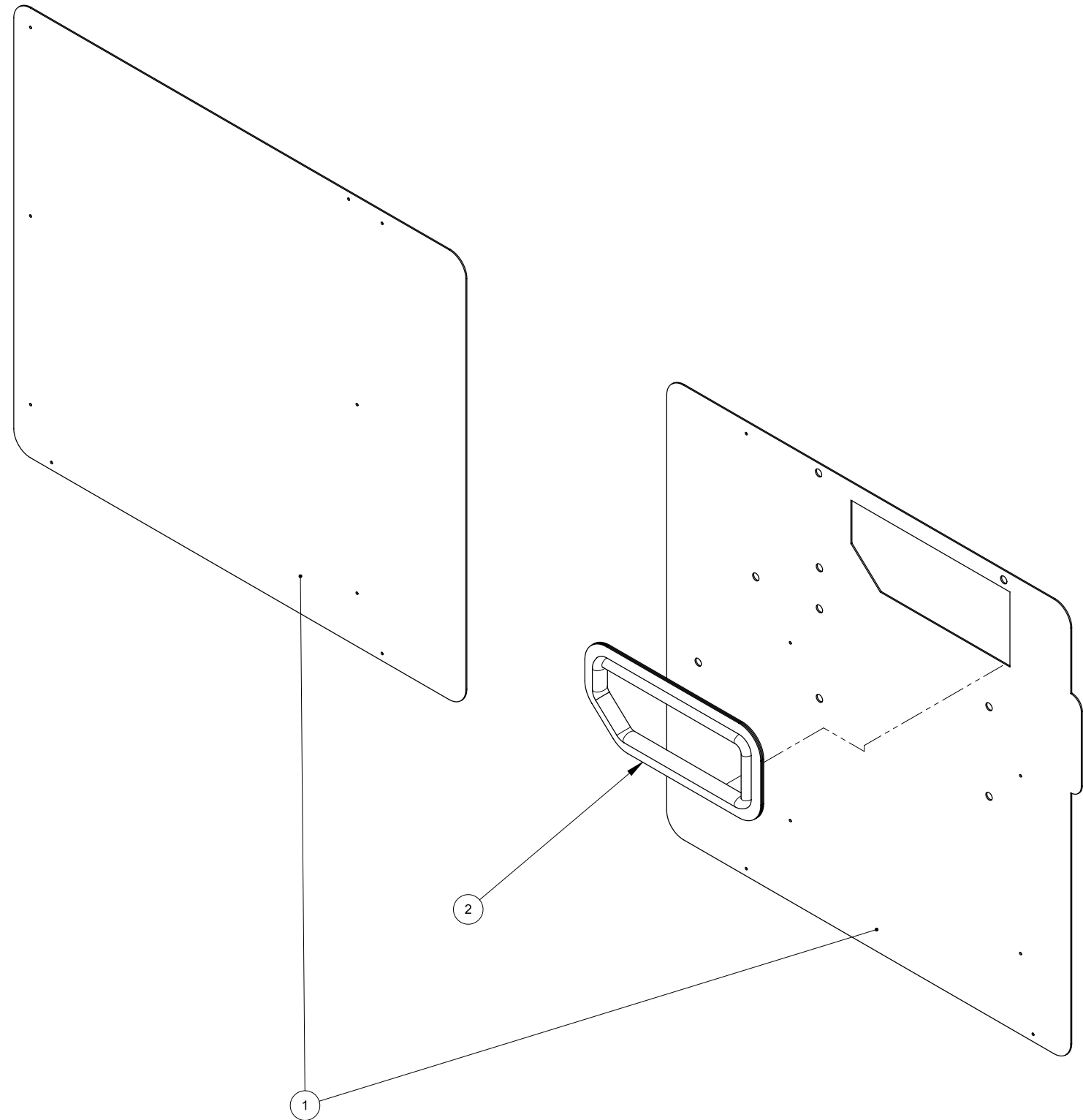


Figure 9-41. Back Door Shelf Assembly
000-163-050

Back Door Shelf Assembly Parts List

Item	Part Number	Description	Qty
1	000-081-173	Label	1
2	000-094-004	Nut, #10-24UNC Hex	12
3	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	6
4	000-163-049	Shelf, Back Door - Coated	1
5	000-131-003	Trimlok, 1/8" X 3/4" - Bulk	2 ft
6	000-174-001	Washer, #10 Flat	18
7	000-174-014	Washer, #10 Lock	12

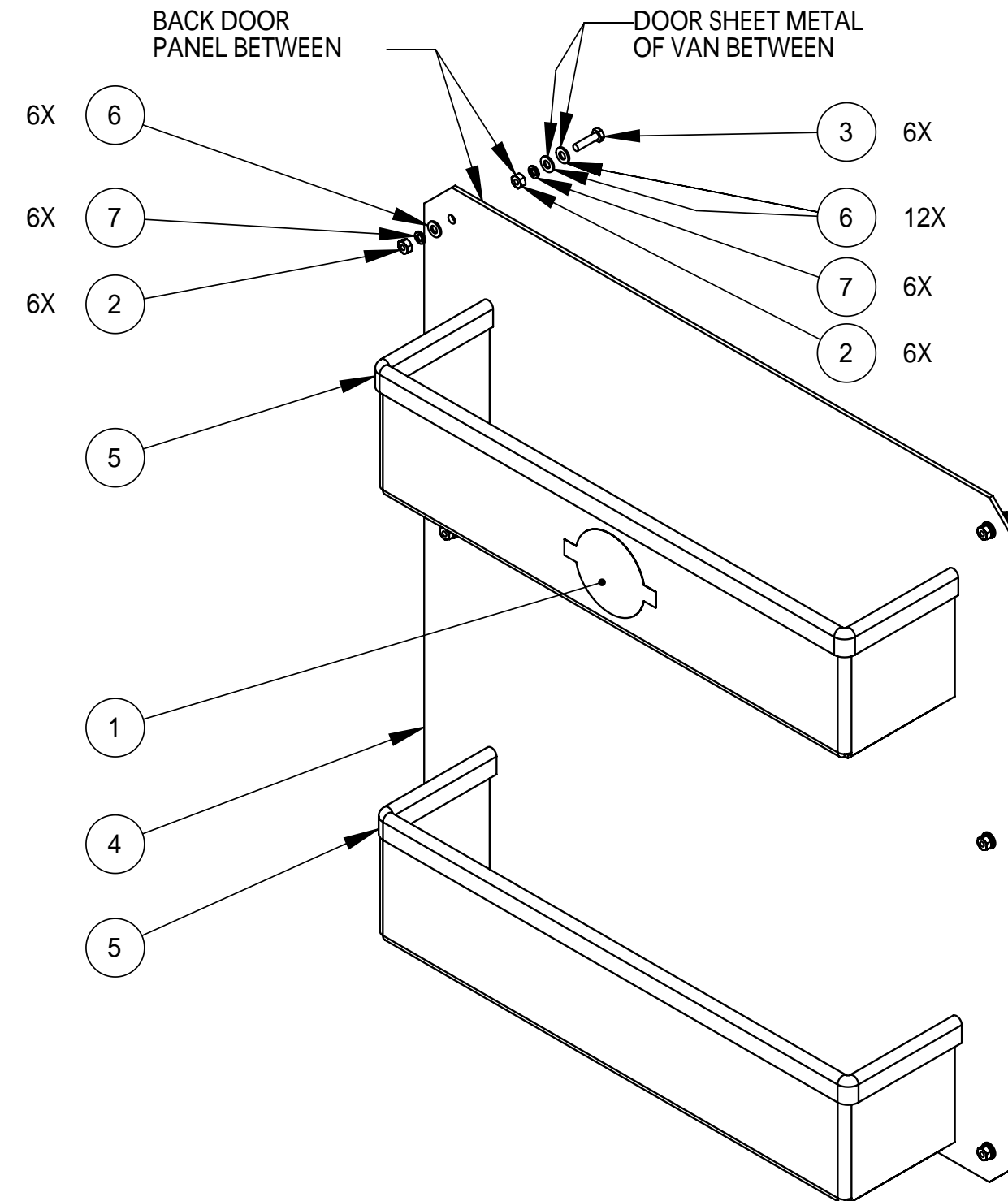


Figure 9-42. Furniture Pad Holder Assembly
000-163-015 Rev. B

Furniture Pad Holder Assembly Parts List

Item	Part Number	Description	Qty
1	000-163-024	Holder, Furniture Pad - Coated	1
2	000-081-173	Label	1
3	000-094-004	Nut, #10-24UNC Hex	8
4	000-143-132	Screw, #10-24UNC X 0.75" Lg. Hex Head	4
5	000-174-001	Washer, #10 Flat	12
6	000-174-014	Washer, #10 Lock	8

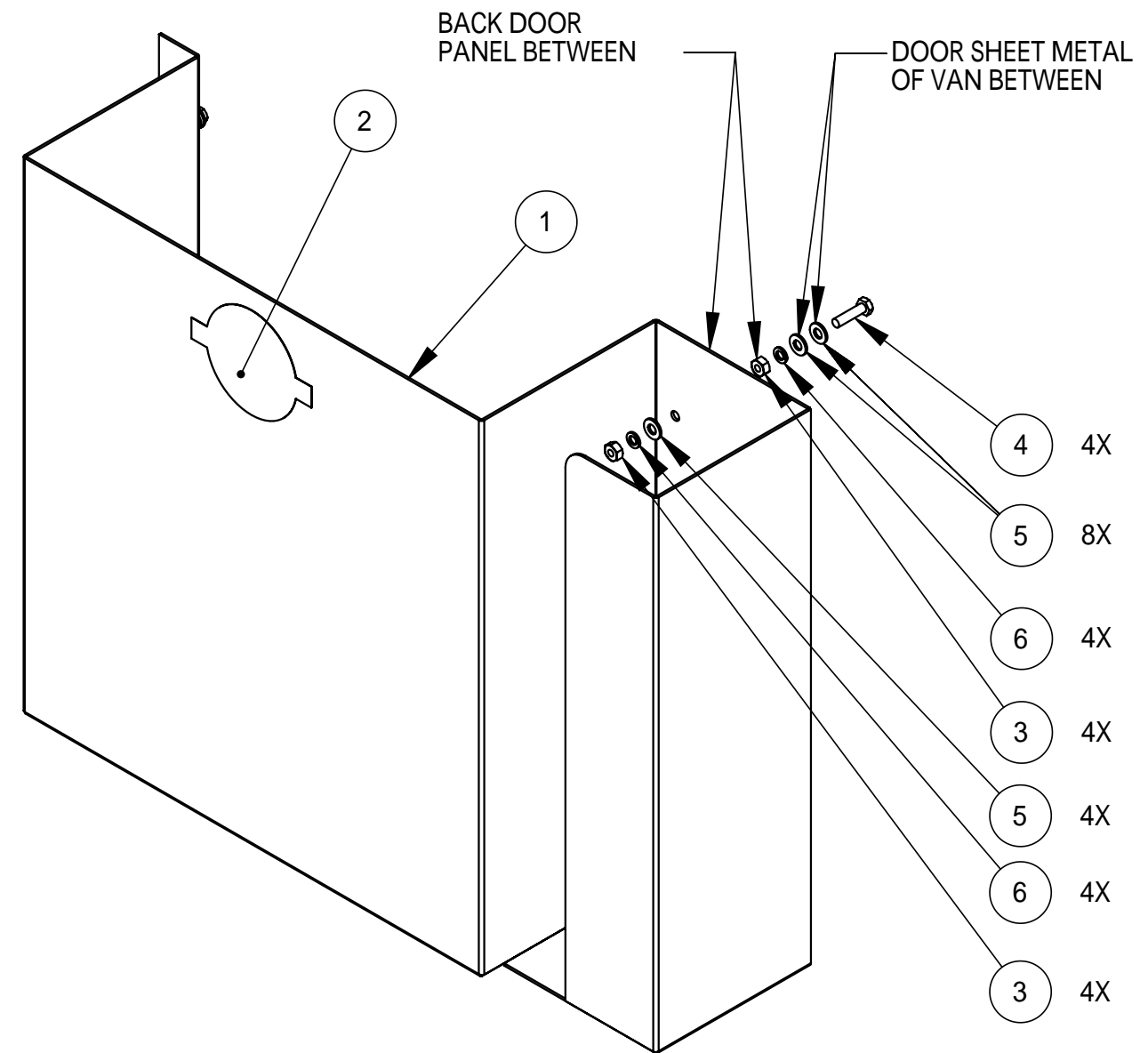
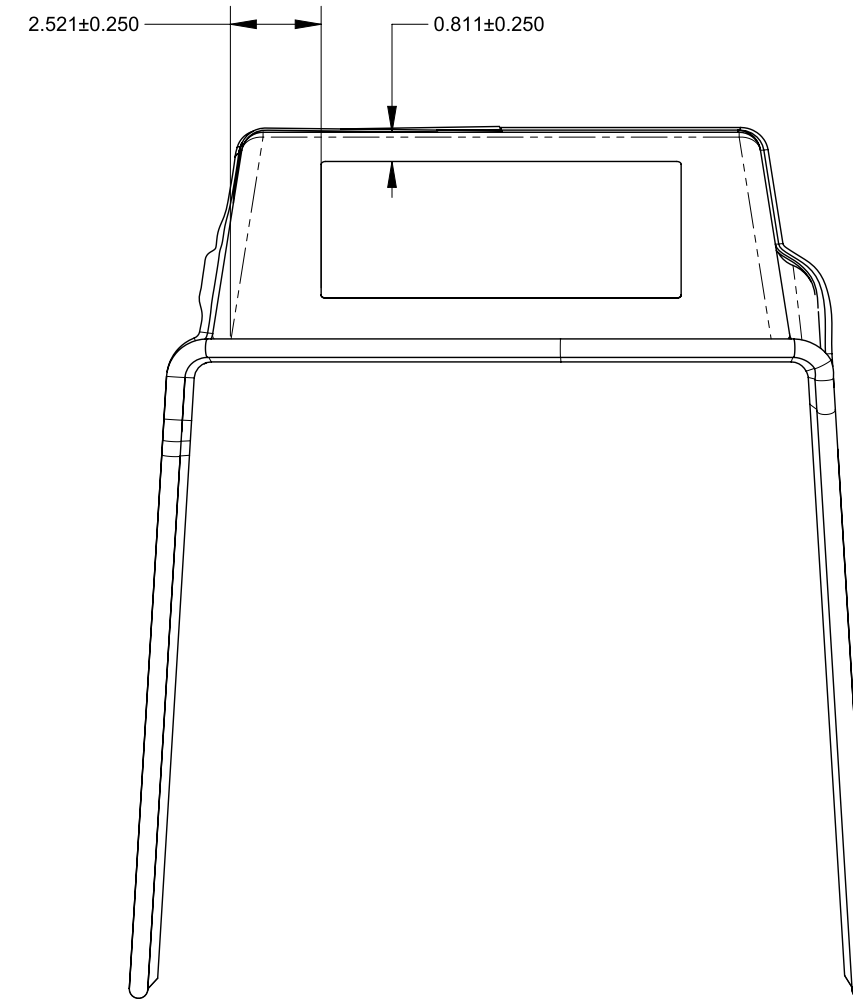
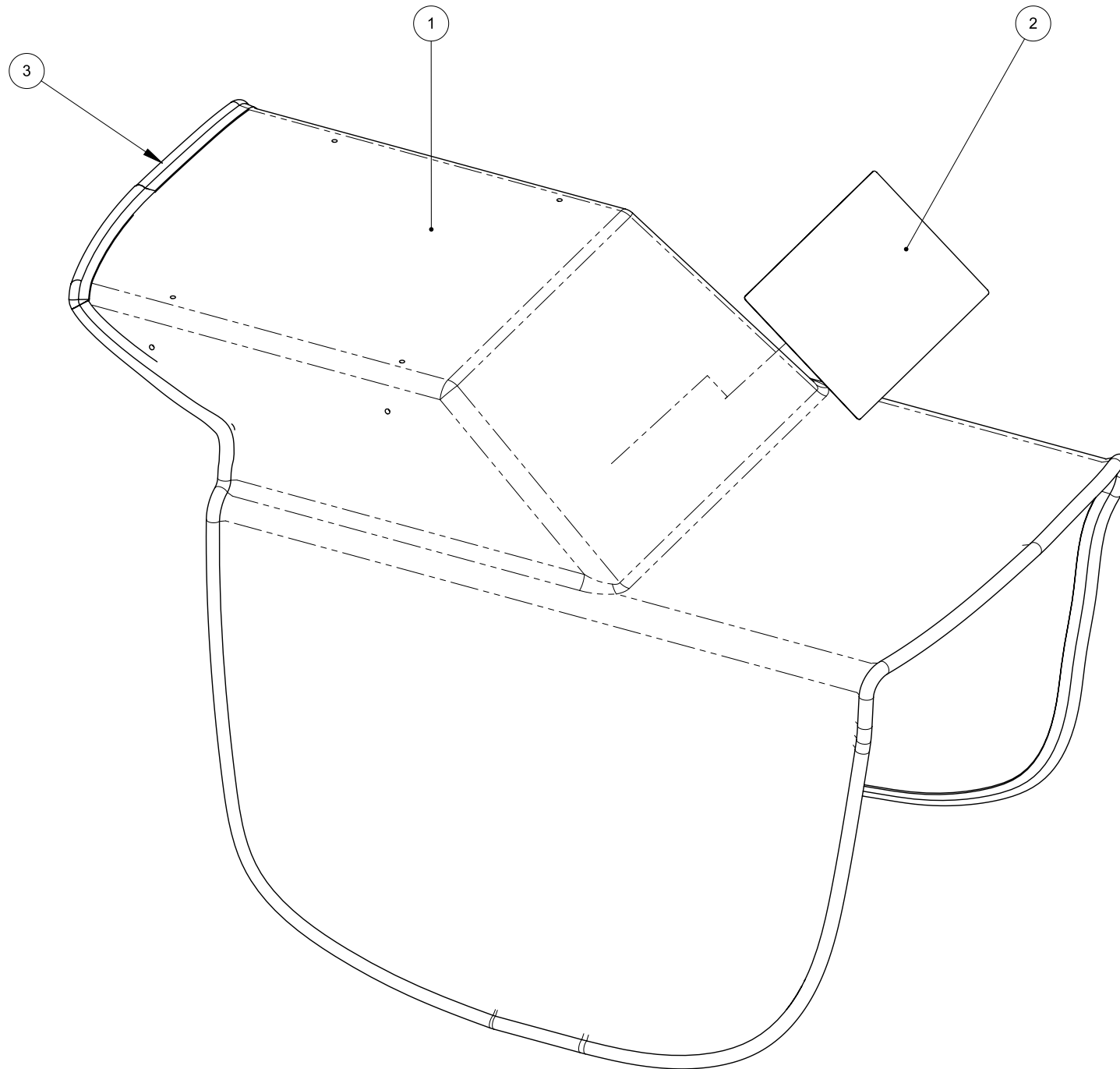


Figure 9-43. Chevy Cowling Assembly (Unmodified)
601-020-008



NOTICE

If the cowling is modified (cut to fit), it may be necessary to move the Driveline Lubrication Procedure and Specification Label to the side of the cowling (driver's side). Replacement labels are available by ordering this part number: 000-081-403.

Chevy Cowling Assembly Parts List

Item	Part Number	Description	Qty
1	000-041-139	Cowling, Chevy	1
2	000-081-403	Label, Driveline Lubrication Procedure and Specification	1
3	000-131-060	Trimlok, 3/4" Bulb	1 ft

Figure 9-44. ZR-EWS Hose and Tube Routings - Part 1 of 3

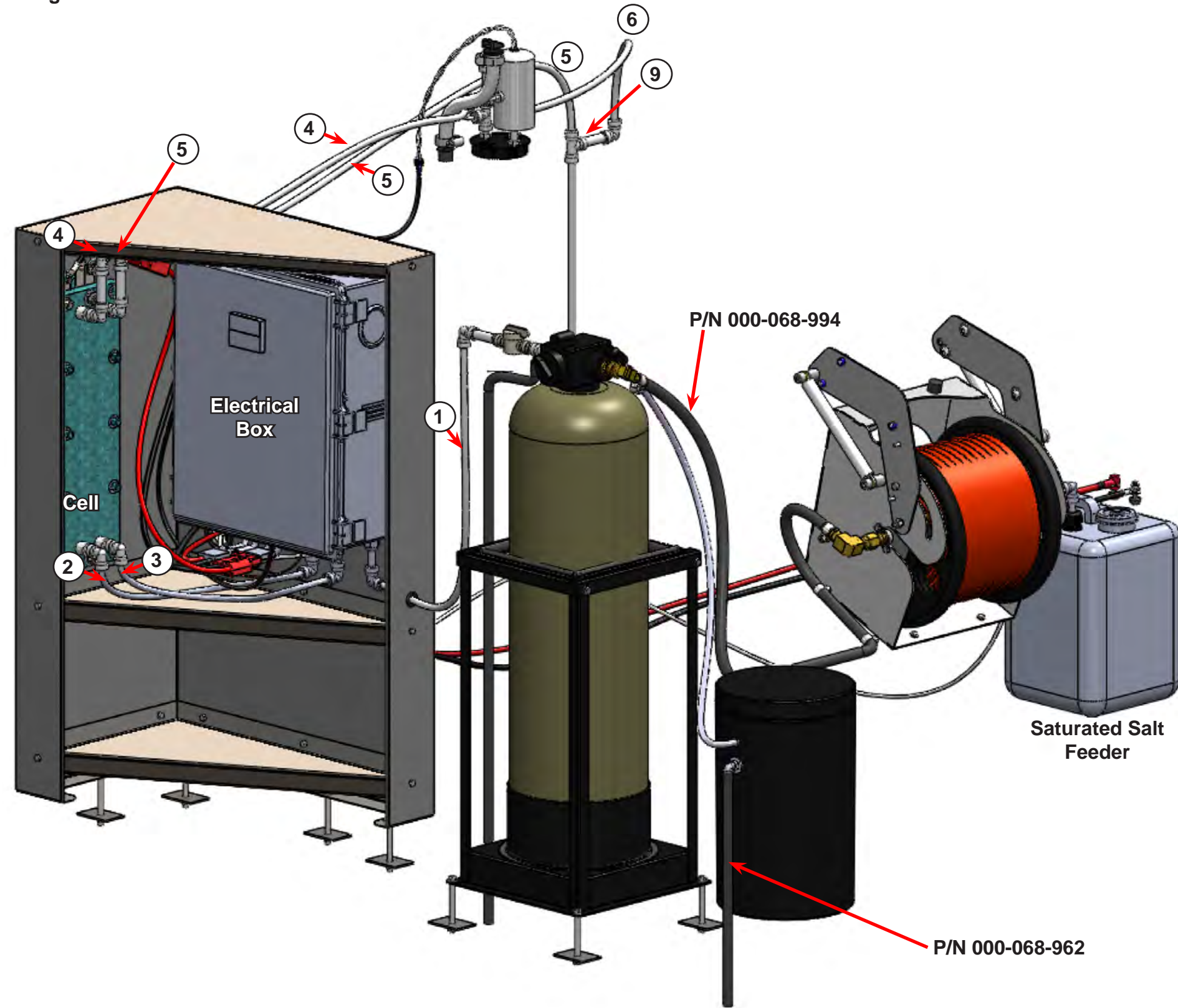


Figure 9-45. ZR-EWS Hose and Tube Routings - Part 2 of 3

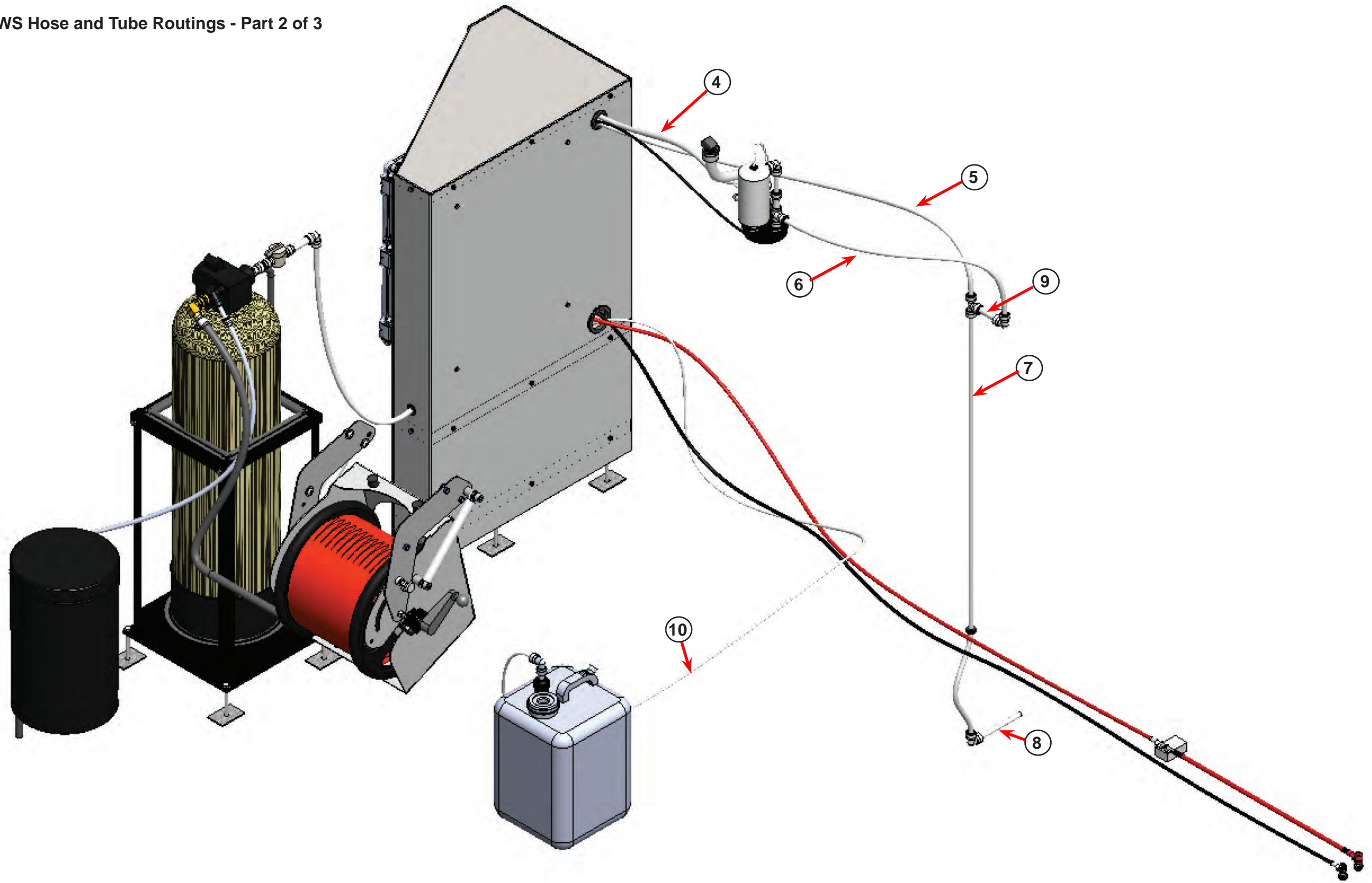
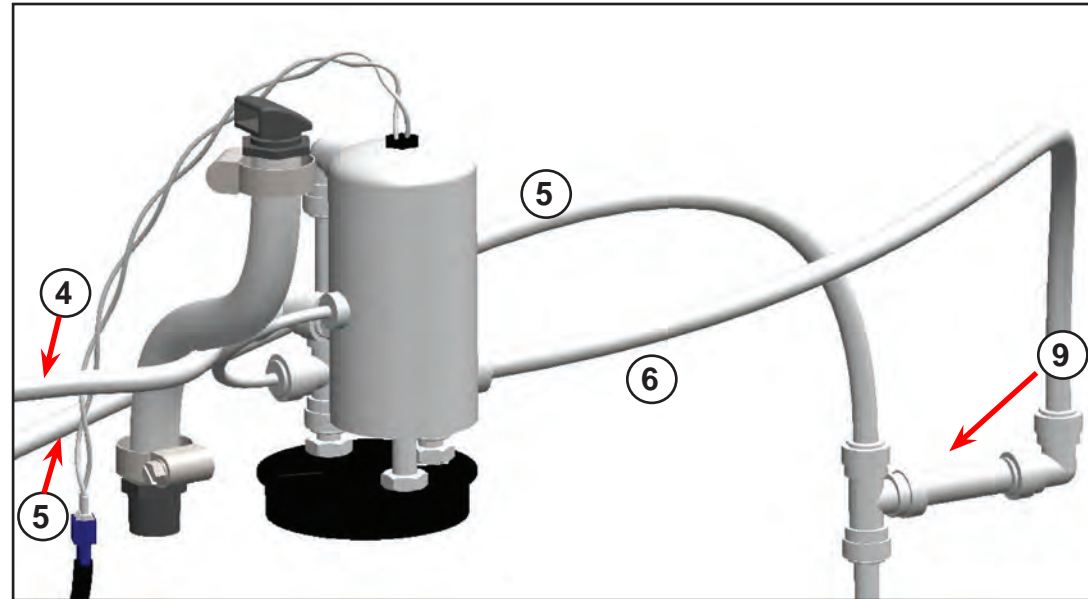


Figure 9-46. ZR-EWS Hose and Tube Routings - Part 3 of 3



Closeup of EWS Safety Shutoff Cover and Hose Routings

NOTICE

Please note that the tube lengths are recommended; your configuration may require slightly different lengths. Always measure twice and cut once.

Table 9-1. ZR-EWS Tube Routings List

Drawing Item Number	Part Number	From	To	Hose Diameter
1	000-068-956	Water Softener	Power Cabinet	1/2"
2	000-068-957	Power Cabinet	Electrode Stack	1/2"
3	000-068-957	Power Cabinet	Electrode Stack	1/2"
4	000-068-958	Electrode Stack	Safety Float	1/2"
5	000-068-956	Electrode Stack	Drain Tee	1/2"
6	000-068-956	Safety Float	Drain Tee	1/2"
7	000-068-956	Drain Tee	Drain Elbow	1/2"
8	000-068-959	Drain Elbow	Atmosphere	1/2"
9	000-068-960	Tee	Tee	1/2"
10	000-068-961	Salt Feeder	Power Cabinet	1/4"

Table 9-2. CDS Hose Routings

Part Number	Description	From	To
000-068-878	Hose, 1/2" I.D. Rubber - 8 ft Long	Back of HydraCradle	Pressure Regulator
000-068-644	Hose, 3/8" X 49 1/2" Teflon w/JIC Ends	Water Pump	Coolant Heat Exchanger
000-068-385	Hose, 3/4" I.D. Green Stripe Bulk	Coolant Heat Exchanger	Engine Water Pump Hose
000-068-802	Hose, 3/8" X 42" Teflon w/JIC Ends	Pressure Regulator	Salsa Heat Exchanger
000-068-802	Hose, 3/8" X 42" Teflon w/JIC Ends	Coolant Heat Exchanger	Salsa Heat Exchanger
000-068-884	Hose, Blower-Recovery Tank 4.8 - 3" I.D. Reinforced	Blower	Yaw Sensor Elbow
000-068-200	Hose 3" I.D. EPDM	Yaw Sensor Elbow	Recovery Tank
000-068-828	Hose, 1" I.D. Vac	Yaw Sensor	Filter, Front of CDS
000-068-828	Hose, 1" I.D. Vac	Yaw Sensor	Yaw Sensor Fitting on Elbow
000-068-528	Hose, 1" I.D. Red 200 psi	APO	Recovery Tank
000-068-069	Hose, 3/4" I.D. Parker GST II	APO	Bottom of Instrument Panel
000-068-1044	Hose, 1" X 41" Lg Suction	Water Pump	Inline Strainer
000-068-1043	Hose, 1" X 24" Lg Suction	Inline Strainer	Front of HydraCradle
000-068-385	Hose, 3/4" I.D. Green Stripe Bulk	Bottom of Instrument Panel	Radiator
000-068-644	Hose, 3/8" X 49 1/2" Teflon w/JIC Ends	Water Pump	Pressure Regulator
000-068-254	Hose, 1/4" X 8 ft Blue with 1/4" Inserts Each	HydraCradle	Front of Instrument Panel
000-068-385	Hose, 3/4" I.D. Green Stripe Bulk	Coolant Heat Exchanger	Bottom of Instrument Panel

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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

HYDRAMASTER WARRANTY PARTS ORDERS

1. Call the local distributor where you purchased your equipment and ask for the Service Department.
2. Have the following information ready:
 - a. Equipment Model
 - b. Date of Purchase
 - c. Hours on the Unit
 - d. Unit Serial Number, if applicable
 - e. 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 (Pacific Time).

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 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 HydraMaster and arrange for expedited shipping.

HydraMaster sells parts only through authorized distributors and service centers.

EWS PARTS ORDERS

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

Major EWS Components

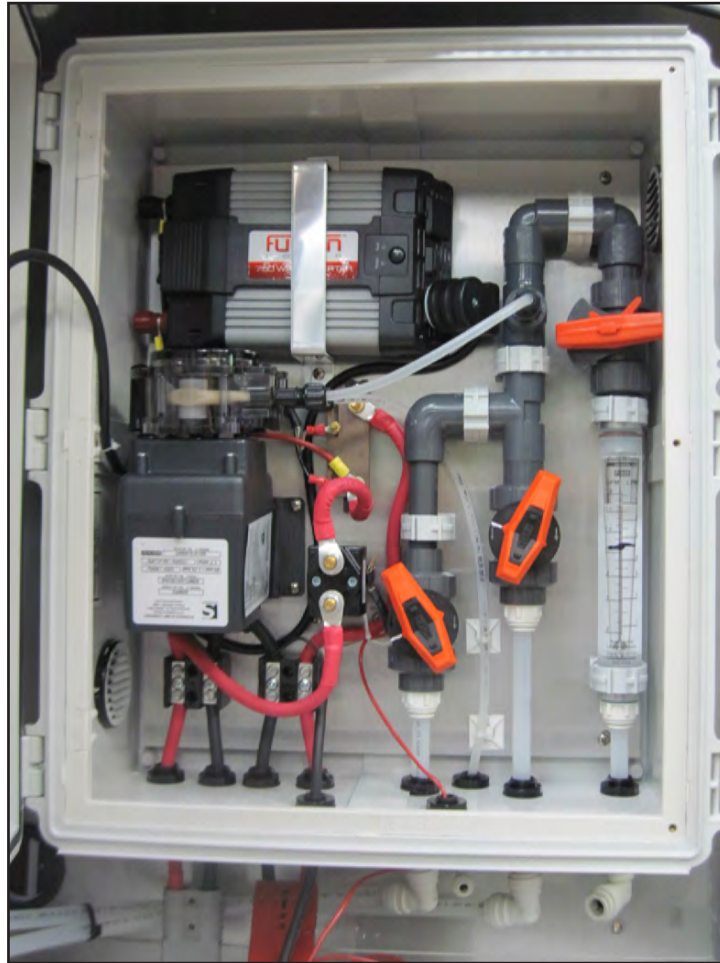
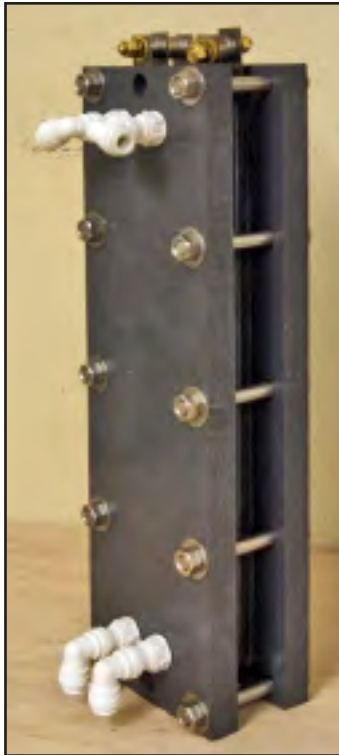


Figure 10-1. Electrical Box or Power Cabinet P/N 000-163-070



**Figure 10-2. Cell or
Electrode Stack P/N 000-
163-041**



**Figure 10-3. Safety
Shutoff Cover
P/N 000-041-077**



**Figure 10-4. Salt Feeder
Assembly P/N 000-163-210**

Additional EWS Components

Hoses

Hose	P/N	Diameter	From	To	Length
1	000-068-956	½"	Water Softener	Electrical Box	48"
2	000-068-957	½"	Electrical Box	Cell	28"
3	000-068-957	½"	Electrical Box	Cell	28"
4	000-068-958	½"	Cell	Safety Shutoff Cover	60"
5	000-068-956	½"	Cell	Drain Tee	48"
6	000-068-956	½"	Safety Shutoff Cover	Drain Tee	48"
7	000-068-956	½"	Drain Tee	Drain Elbow	48"
8	000-068-959	½"	Drain Elbow	Atmosphere	6"
9	000-068-960	½"	Tee	Tee	2"
10	000-068-961	¼"	Salt Feeder	Electrical Box	336"

Harnesses

Harness	P/N	From	To
1	000-063-043	Power Cabinet	Van Battery
2	000-063-044	Power Cabinet	Cell

11 - Warranty Information

HYDRAMASTER SPECIAL LIMITED WARRANTY

HydraMaster warrants to the original end user, each new machine, new accessories and genuine replacement parts against defects in material and workmanship under normal use and service. Our obligation under this warranty is limited to repair or replacement of the defective item at our factory or by an Authorized Service Center. Warranty coverage shall begin on the date of purchase by the original end user (as evidenced by your invoice from the factory or Authorized Dealer) or six (6) months from the date the machine was shipped from the factory, whichever is earlier. The warranty registration card must be completed and returned within 30 days of purchase. The warranty coverage period is specified below.

GROUP	Parts ^{1,2}	Labor ²
Frame	1 Year	1 Year
Covers	1 Year	1 Year
Vacuum Recovery Tank (Structural only)	1 Year	1 Year
Vacuum Pump	1 Year	1 Year
Chemical Systems	1 Year	1 Year
Hoses, Internal Machine	1 Year	1 Year
Hoses, External Machine	1 Year	1 Year
Valve, High pressure bypass	1 Year	1 Year
Water Heating System	1 Year	1 Year
Pump, High pressure water	See Note 3	1 Year
Belts	1 Year	1 Year
Fittings, internal machine	1 Year	1 Year
Engine	See Note 3	1 Year
Accessories and Fresh Water Tanks	1 Year	1 Year
Replacement Parts ⁴	90 days	NA
NOTES:		
1-Parts repaired or replaced are guaranteed for the remainder of the original machine warranty period.		
2-Coverage only applicable to products sold and used in the United States and Canada.		
3-As provided by the original Manufacturer.		
4-Applies to replacement parts only after machine warranty coverage has expired.		

This warranty shall not apply to repairs resulting from accidents or misuse, damage in transit, overloading the capacity of the machine, failure due to lack of proper maintenance or care as described in the operating and maintenance instructions. Freezing of any water or chemical related component will VOID all warranties on water or chemical related components, internal or external. Corrosion, deposits and/or build-up in the water, chemical, recovery or heating systems due to hardness in the water used or chemicals which result in deposits, will VOID all warranties on affected components. The use or application of any chemical, including but not limited to acids or solvents, which results in damage to metal, rubber, plastic, or painted parts will VOID all warranties on those parts. Minor adjustments, such as tightening of screws or bolts not connected with the replacement of parts, are not covered. Replacement of expendable wear items including, but not limited to paint, labels and other cosmetic parts are also not covered. Repairs or alterations by an organization other than the factory or an Authorized Service Center are not covered and will void any HydraMaster warranty as to the parts or systems repaired or altered by a non-authorized organization.

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION OF THE LIMITED WARRANTIES STATED WITHIN. NO OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS MADE EXCEPT AS EXPRESSLY STATED HEREIN. ANY STATUTORY IMPLIED WARRANTIES, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, THAT ARE IMPOSED BY LAW DESPITE THE EXPRESS LIMITATION OR WARRANTIES ABOVE, ARE EXPRESSLY LIMITED TO THE DURATION OF THE WRITTEN WARRANTY. BUYER UNDERSTANDS, ACKNOWLEDGES AND AGREES THAT THE REMEDIES PROVIDED UNDER THIS LIMITED WARRANTY ARE THE SOLE AND EXCLUSIVE REMEDIES AVAILABLE TO THE BUYER. HYDRAMASTER WILL NOT BE LIABLE FOR ANY OTHER OR ADDITIONAL DAMAGES, INCLUDING BUT NOT LIMITED TO INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE FURNISHING, PERFORMANCE, USE OF OR INABILITY TO USE THE MACHINE. ANY EXTENSIONS OF OR MODIFICATIONS MADE TO THIS WARRANTY BY A DEALER/DISTRIBUTOR OF HYDRAMASTER ARE THE SOLE RESPONSIBILITY OF THE DEALER/DISTRIBUTOR.

HydraMaster will pay all freight and transportation charges within the United States, via normal ground shipping means, for replacement of parts covered under this warranty. All material must be properly authorized by HydraMaster prior to being returned. When returning, please provide an explanation of the problem and include the serial number of the machine as well as the name of the selling organization. All defective material must be returned to HydraMaster within 60 days of authorization. The Technical Service department of the authorized Dealer Service Center or the factory will investigate and then contact you.

Transportation of hazardous waste or contaminated equipment is subject to various laws and regulations. In returning machines, parts, or accessories under this limited warranty, the end user must certify in writing that the machines, parts or accessories being returned have not been used for handling, clean up, or disposal of hazardous waste or hazardous materials including but not limited to such things as asbestos, anthrax etc. or if the machines, parts or accessories being returned have been used for handling, clean up, or disposal of hazardous waste or hazardous materials, then the end user must have the machines, parts or accessories decontaminated by licensed and qualified decontamination professionals and provide written certification of this decontamination signed by the decontamination professionals. These machines, parts or accessories are to be returned only to the local HydraMaster Authorized Service Center for Warranty service along with decontamination certification.

NILFISK-ADVANCE, INC. Reserves the right to change its warranty policy without notice.

HydraMaster is a division of NILFISK-ADVANCE, INC.

Warranty Procedure

Contact your distributor for warranty-related issues.

For Your Reference:

Serial No. _____

Date of Purchase: _____

Purchased From (Distributor): _____

EWS SYSTEM WARRANTY

The EWS System carries a limited 1 year warranty. The EWS Cell, or Electrode Stack, has a pro-rated 24 month warranty.

During the warranty period, the customer shall return the component in question, freight prepaid, to the original manufacturer for consideration. The component must be accompanied by the original invoice or proof of purchase. The original manufacturer shall, at its sole discretion, elect to repair or replace the defective component and return it to the customer, freight pre-paid.

The original manufacturer accepts no responsibility other than to repair or replace a defective component, and this warranty specifically excludes product failure due to accidental damage, abuse, misuse, and negligence, damage due to non-compliance of the operating manual or unauthorized alterations or modifications to the system.

The original manufacturer accepts no responsibility and is not liable for any extended warranties or variations to this warranty offered by re-sellers of the manufacturer's systems.

Warranty Procedure

Contact your distributor for warranty-related issues.

For Your Reference:

Date of Purchase: _____

Purchased From (Distributor): _____

WATER SOFTENER/BRINE TANK SYSTEM WARRANTY

The manufacturer's warranty for the fiberglass tank part is 1 year. The manufacturer's warranty for all other parts is 90 days from date of purchase.

Warranty labor is paid for 90 days from date of purchase.

Warranty Procedure

Contact your distributor for warranty-related issues.

For Your Reference:

Date of Purchase: _____

Purchased From (Distributor): _____