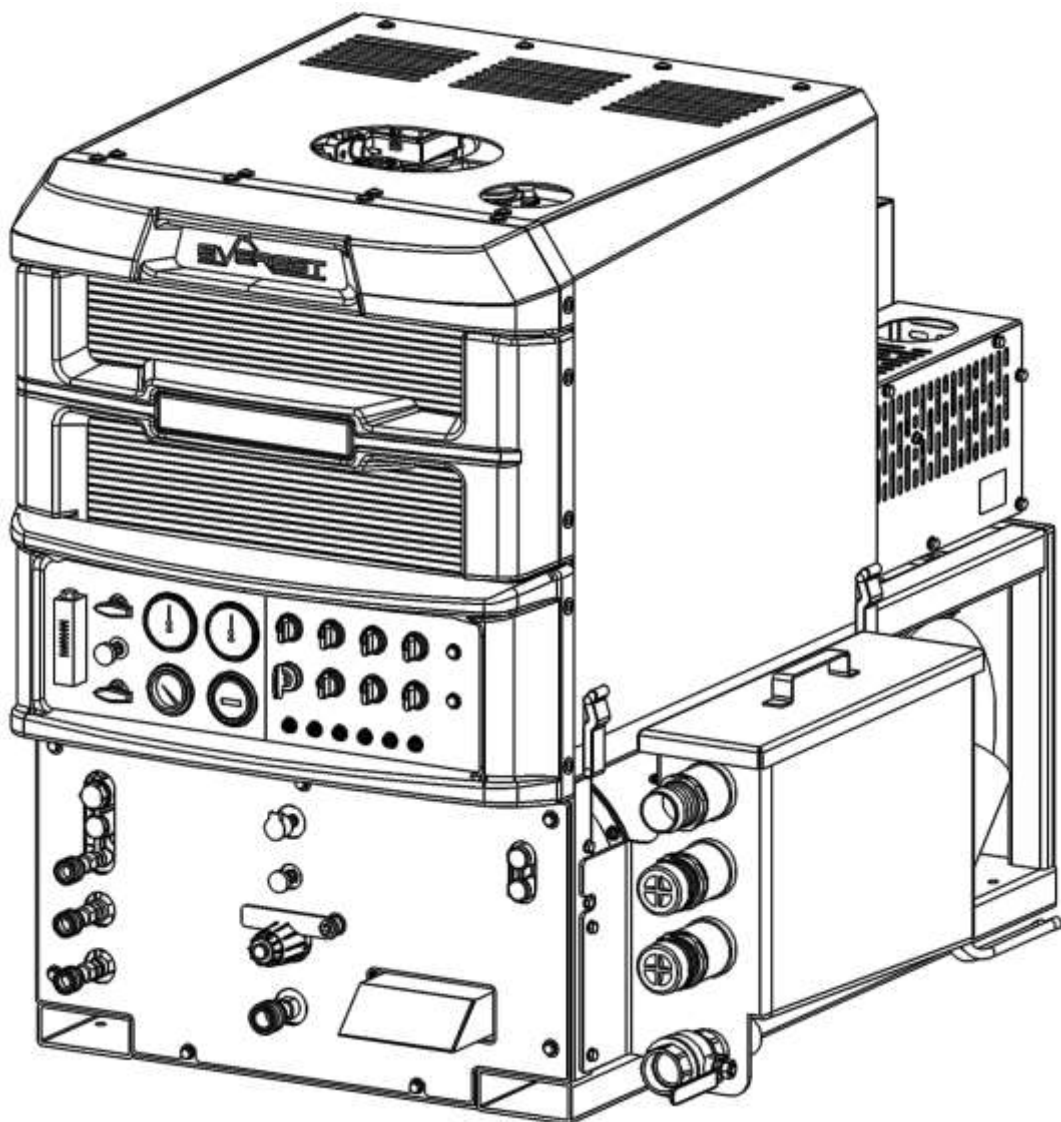


EVEREST 870HP

Operation and Service Manual



Manual P/N 49-174
Revision A, January 2019

UNIT DATA LABEL

Model: _____

Date of Purchase: _____

Serial Number: _____

Dealer: _____

Address: _____

Phone Number: _____

Sales Representative: _____

Congratulations on the purchase of your Mobile Cleaning Unit. This instruction manual is a guide for operating and servicing your equipment. **Read this manual completely before installing or operating this unit.**

Proper operation and service are necessary to ensure the outstanding performance of this unit. When properly maintained, your truck-mount will have a long and trouble-free life.

The service methods outlined in this manual are detailed in a manner that operation and servicing may be performed properly and safely. Because service levels vary due to the skill of the mechanic, tools and parts availability, ensure that prior to attempting any maintenance or repair, you are familiar with the equipment and have all the proper tools to complete the task. Please call a **Legend Brands** service or customer care representative at 866-445-3030 for help with maintenance, repair, warranty and parts related questions.

THIS UNIT MUST BE INSTALLED BY THE DEALER THAT YOU PURCHASED IT FROM IN ACCORDANCE WITH THE PRESCRIBED INSTALLATION PROCEDURES.

Information in this document is subject to change without notice and does not represent a commitment on the part of Legend Brands.

WARRANTY REGISTRATION

Thank you for purchasing a Legend Brands product. Warranty registration is quick and easy. Your registration will allow us to serve you better over the lifetime of the product.

To register your product go to:

<https://www.legendbrandscleaning.com/Warranty>

For customer assistance:

866-445-3030

LEGEND BRANDS LIMITED WARRANTY

Legend Brands Everest Models 870HP

ACTION REQUIRED: Register machine for Warranty.

To be eligible for service under this warranty you MUST do the following:

- Fill out the warranty registration card on-line at <https://www.legendbrandscleaning.com/Warranty> within thirty (30) days of the installation of our product. Product model, serial number, Legend Brands distributor information, and a photo or scanned copy of the original invoice is required.

What Does This Warranty Cover?

This warranty covers the Legend Brands truck mount, model 72-870HP, manufactured in Prescott, Arizona after January 1st, 2019. This warranty is provided to the original purchaser only and is non-transferable. The warranty covers the repair or replacement necessary to correct defects in the materials or workmanship of any parts manufactured by Legend Brands that occur under the normal use during the coverage period.

How Long Does This Warranty Last?

Five (5) years from the date of installation on parts and labor (Excluding consumables / normal maintenance items). Factory installed original belts are covered for 1500 hours or five (5) years, whichever comes first. Water box, recovery tank and frame are covered for five (5) years. All other components including seals, o-rings and electrical components are covered for the entire five (5) year warranty period.

How Do I Get Service?

Contact your authorized Legend Brands service center to schedule an appointment. The authorized service center will inspect your equipment for any defects and if necessary contact Legend Brands for verification of warranty. Proof of proper maintenance may be required before warranty is granted.

What Legend Brands Will Do:

If a defect in materials or workmanship occurs within the warranty period, Legend Brands, at its election, will repair or replace the defective part at no charge. Ground shipping costs will be covered by the manufacturer. Returning defective parts to the manufacturer, Legend Brands, may be required. Parts are to be returned to Legend Brands within 90 days. Upon review of the product, if it is determined there is no defect in the product, or that the defect resulted from causes not within the scope of our warranty, the product can be returned, repaired, or replaced only at your request and at your expense including applicable shipping costs.

What This Warranty Does Not Cover:

This warranty does not cover or apply to defects due directly or indirectly to misuse, abuse, disassembly, alteration, corrosive chemicals, improper voltage, improper fuel, fire, flood, negligence, accident, improperly or incorrectly performed maintenance or repair, failure to perform necessary or recommended maintenance or repair (See Owner's Manual) or if the use of this product is not in compliance with the instructions and specifications for its use. This warranty does not cover consumable/normal wear maintenance items such as air and oil filters, lubricants and tune up parts. Paint is not covered under warranty. Local or distant transportation is not covered under warranty. **Use of Parts Not Approved by Legend Brands Will Void All Warranties.**

OTHER THAN THE WARRANTIES PROVIDED HEREIN, LEGEND BRANDS MAKES NO EXPRESS OR IMPLIED, ORAL OR WRITTEN WARRANTIES WITH RESPECT TO THIS PRODUCT OR WORKMANSHIP AND ALL WARRANTIES IMPLIED BY LAW INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THIS WARRANTY. **Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.** WE SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING FROM USE OF OUR PRODUCTS. **Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.**

How Does State Law Apply?

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Contact us at:

Legend Brands | 2604 Liberator, Prescott, AZ 86301 | Phone: 866-445-3030
www.legendbrandscleaning.com

Legend Brands reserves the right to change its warranty policy without notice.

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SECTION ONE: GENERAL INFORMATION

HOW TO USE THIS MANUAL

This manual contains the following sections:

- How to Use This Manual
- Safety
- Installation
- Operation
- Maintenance & Service
- Parts Listing & Diagrams

The **HOW TO USE THIS MANUAL** section will tell you how to find important information for ordering correct repair parts.

Parts may be ordered from authorized dealers. When placing an order for parts, the machine model and machine serial number are important. Refer to the MACHINE DATA box which is filled out during the installation of your machine. The MACHINE DATA box is located on the inside of the front cover of this manual.

Model: _____
 Date of Purchase: _____
 Serial Number: _____
 Dealer: _____
 Address: _____
 Phone Number: _____
 Sales Representative: _____

The **SAFETY** section contains important information regarding hazardous or unsafe practices for this machine. Levels of hazards are identified that could result in product damage, personal injury, or severe injury resulting in death.

The **INSTALLATION** section contains information on how to properly install the unit in your vehicle.

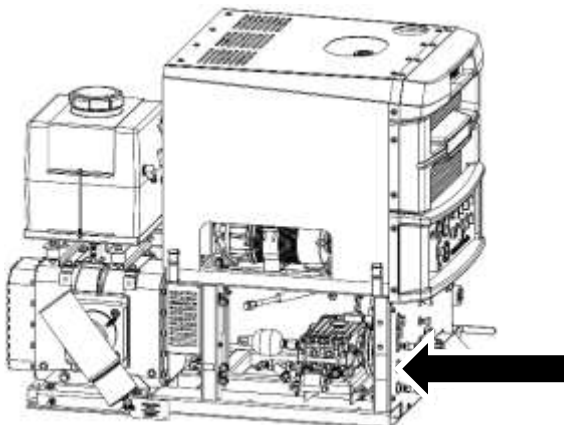
The **OPERATION** section is to familiarize the operator with the operation and function of the machine.

The **MAINTENANCE** section contains preventive maintenance to keep the machine and its components in good working condition.

The **PARTS LISTING & DIAGRAMS** section contains assembled parts illustrations and corresponding parts list. The parts lists include a number of columns of information:

NOTE: *If a service or option kit is installed on your machine, be sure to keep the KIT INSTRUCTIONS which came with the kit. It contains replacement parts numbers needed for ordering future parts.*

The model and serial number of your unit is located on the front left side of the frame as shown here:



SAFETY

The following warning labels are on your mobile cleaning unit. These labels point out important **WARNINGS** and **CAUTIONS**, which must be followed at **ALL** times. Failure to follow these warnings could result in injury or fatality to yourself and/or others or property damage. Please follow these instructions carefully! **DO NOT remove these decals.**



WARNING

Legend Brands uses this WARNING symbol throughout the manual to warn of the possibility of physical injury or fatality. Please read all warnings carefully before operating the equipment.

CAUTION

Legend Brands uses this CAUTION symbol throughout the manual to warn of the possibility of damage to equipment or personal property.

 WARNING

1. Read the operator's manual before starting this unit.

Failure to adhere to instructions could result in severe personal injury or could be fatal.

2. Operate your vehicle and equipment in a well-ventilated area.

Exhaust fumes contain carbon monoxide, which is an odorless and deadly poison that can cause severe injury or death. **DO NOT** run the vehicle in an enclosed area. **DO NOT** operate this unit where the vehicle exhaust may enter a building doorway, window, vent or other opening.

3. This unit must be operated with the vehicle doors open in order to ensure adequate ventilation to the engine.

4. Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well-ventilated, unoccupied buildings and away from sparks or flames. Never carry gasoline or any flammable materials in the vehicle. Fumes could accumulate inside of the vehicle and ignite, causing an explosion.

5. DO NOT operate unit if gasoline is spilled. Do not turn ignition switch until the gasoline has been cleaned up. Never use gasoline for cleaning purposes.

6. DO NOT place hands, feet, hair, clothing or any body parts near rotating or moving parts. Rotating machinery can cause severe injury or death.

7. NEVER operate this unit without belt and safety guards. High speed moving parts, such as belts and pulleys should be avoided while the unit is running. Severe injury, fatality and/or damage may result.

8. NEVER service a unit while it is running. High speed mechanical parts as well as high temperature components and fluids may result in severe injury or fatality.

9. Engine, vacuum pump and heat exchanger components, hoses and fittings will be extremely hot from operation. To prevent severe burns, DO NOT touch these areas while the unit is running, or shortly after the unit is shut off.

10. DO NOT touch any part of the exhaust system while the system is running, or for at least 20 minutes after the unit is shut off. Severe burns could result.

11. Water under pressure can cause severe personal injury or fatality. Shut down unit, allow to cool down, and relieve system of all pressure before removing caps, valves, plugs, fittings, filters or hardware.

12. NEVER leave the vehicle engine running while the unit is in operation.

SECTION ONE: GENERAL INFORMATION

13. Battery acid contains sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries also produce explosive hydrogen gases while charging. To prevent fire or explosion, charge batteries only in a well ventilated area. Keep sparks, open flames, as well as other sources of ignition away from battery at all times. Remove all jewelry prior to servicing batteries. Keep batteries out of the reach of children.

Before disconnecting the negative (–) ground cable, ensure that all switches are in the off position. If on, a spark could occur at the ground connection terminal which could cause an explosion if hydrogen gas or gasoline vapors are present. ALWAYS disconnect the negative (–) terminal first

14. DO NOT smoke around the vehicle. Gas fumes could accumulate and ignite. Battery gasses are extremely flammable. This will prevent possible explosions.

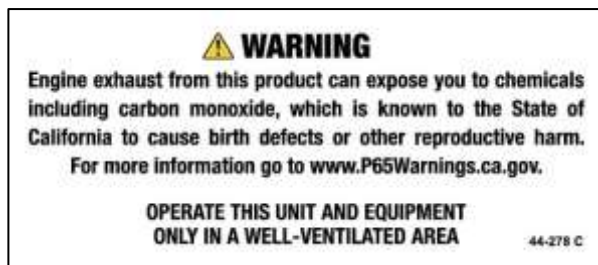
15. NEVER cut or splice any of the vehicle fuel lines during fuel line installation. This could result in fuel leaks and potentially dangerous conditions. Use only the provided fuel hose for fuel lines. When going through the vehicle floor with fuel lines, always utilize bulkhead adaptors. This will prevent fuel leaks and ensure that hoses are not punctured by vehicle vibration abrasion.

16. All high-pressure hoses must be rated to 250° F and 3000 PSI. Severe injuries may result from improper hoses.

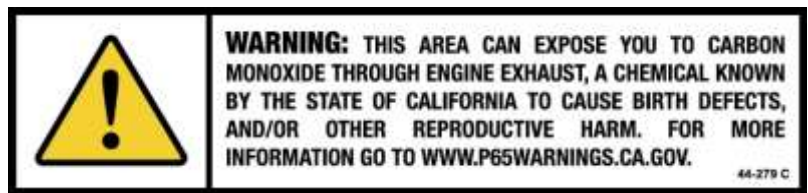
17. The Occupational and Health Administration (OSHA) recommends the use of hearing protection when a technician is exposed to an average of 85 decibels (this is an average of exposure over an 8 hour period). This equipment can produce 85 decibels at a distance of 10 feet. Please check with your local state agencies to see if OSHA standards apply to your application.

18. This unit produces high solution pressure. Improper use could result in injury.

19. California Proposition 65 Warning: Engine exhaust from this product can expose you to chemicals, including carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



44-278



44-279

NOTE: Any unit entering the State of California must properly display Proposition 65 warning labels. Legend Brands label 44-279 has been included and must be installed on the vehicle or enclosure where a unit has been installed in a clearly visible location. Legend Brands label 44-278 must be installed on the unit in a clearly visible location. If you are in California and do not see one or both of these labels installed or need a replacement, contact Legend Brands immediately.



1. **DO NOT** operate this unit at angles exceeding 25 degrees in any direction. Always try to keep the unit as level as possible during operation.
2. **DO NOT** damage the vehicle in any way during the installation. Avoid component or hose contact with moving parts, hot surfaces, brake lines, fuel lines, catalytic converters, exhaust pipes, mufflers, rotating parts or sharp objects.
3. **DO NOT EXCEED THE VEHICLE'S PAYLOAD CAPACITY.** The Everest unit weighs over 2600 lbs. operating with full water capacity. This will prevent unsafe or hazardous driving conditions. Before installing any components into the vehicle, check with the vehicle manufacturer for the Gross Vehicle Weight Rating (GVWR). GVWR is the maximum allowable combined weight of the vehicle, including all passengers, fuel, fluids, tools and cargo.

Example: If the GVWR for a vehicle is 9600 lbs. and the vehicle has a base curb weight of 6400 lbs., this leaves a payload capacity of 3200 lbs. (GVWR - Curb Weight = Payload Capacity).

4. Always keep your vehicle clean and orderly. Tools and accessories must be securely stowed while driving the vehicle.
5. Ensure that you have received proper training and are familiar with the start-up and shut-down procedures prior to operation.
6. **DO NOT** alter or modify your **Everest** in any way. Use only replacement parts authorized by **Legend Brands**. Modifications or use of unapproved parts could create a hazard and will void your warranty. This includes the use of any open ended hoses.
7. Failure to apply preventative measures towards freezing can result in system failure and loss of warranty on affected parts. Water freezes at 32° F and 0° C.

READ AND SAVE THESE INSTRUCTIONS

SPECIFICATIONS

Engine Speed	2400 RPM (High Speed/No Load) 2000 RPM (Med Speed/No Load) 1600 RPM (Low Speed/No Load) 1300 RPM (Idle/No Load)
Water Pump	1500 RPM (High Speed)
Water Pump Flow Rate	5.6 GPM (Maximum)
Water Pump Pressure	2500 PSI (Maximum)
Vacuum Pump	3580 RPM (High Speed)
Vacuum Relief Valve	13 in. Hg
Waste Tank Capacity at Shut-Off	100 gallons
Waste Tank Gross Capacity	120 gallons
Console Weight	1270 lbs. (dry)
Standard Install Package Weight 870HP	1700 lbs. (dry)
Standard Operating Weight 870HP	2635 lbs. (includes water weight, not accessories)

TORQUE VALUES

Engine fan/spacer M6 screws	96 in. lbs. / 8 ft. lbs.
Engine front pulley M6 screws	72 in. lbs. / 6 ft. lbs.
Engine front pulley center M14 bolt	2088-2160 in. lbs. / 174-180 ft. lbs.
Engine rear drive pulley M10 bolts	480 in. lbs. / 40 ft. lbs.
Engine exhaust 8mm nuts	264-300 in. lbs. / 22-25 ft. lbs.
Vacuum pump pulley hub 1/4 screws	180 in. lbs. / 15 ft. lbs.

Refer to manufacturer documentation for more information

BELT TENSIONS (NEW BELTS)

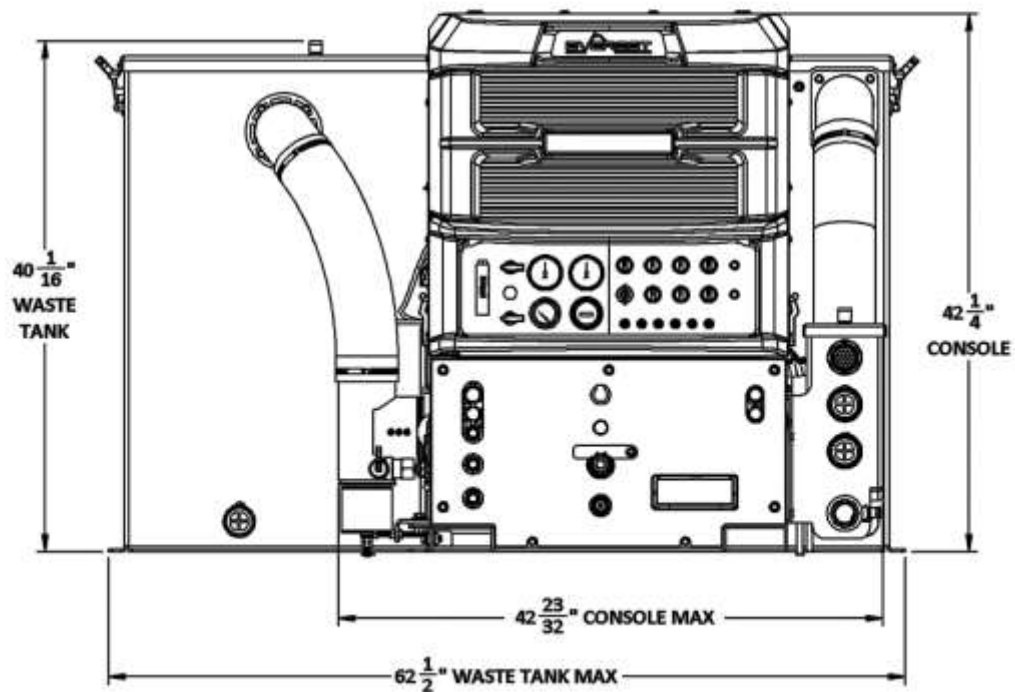
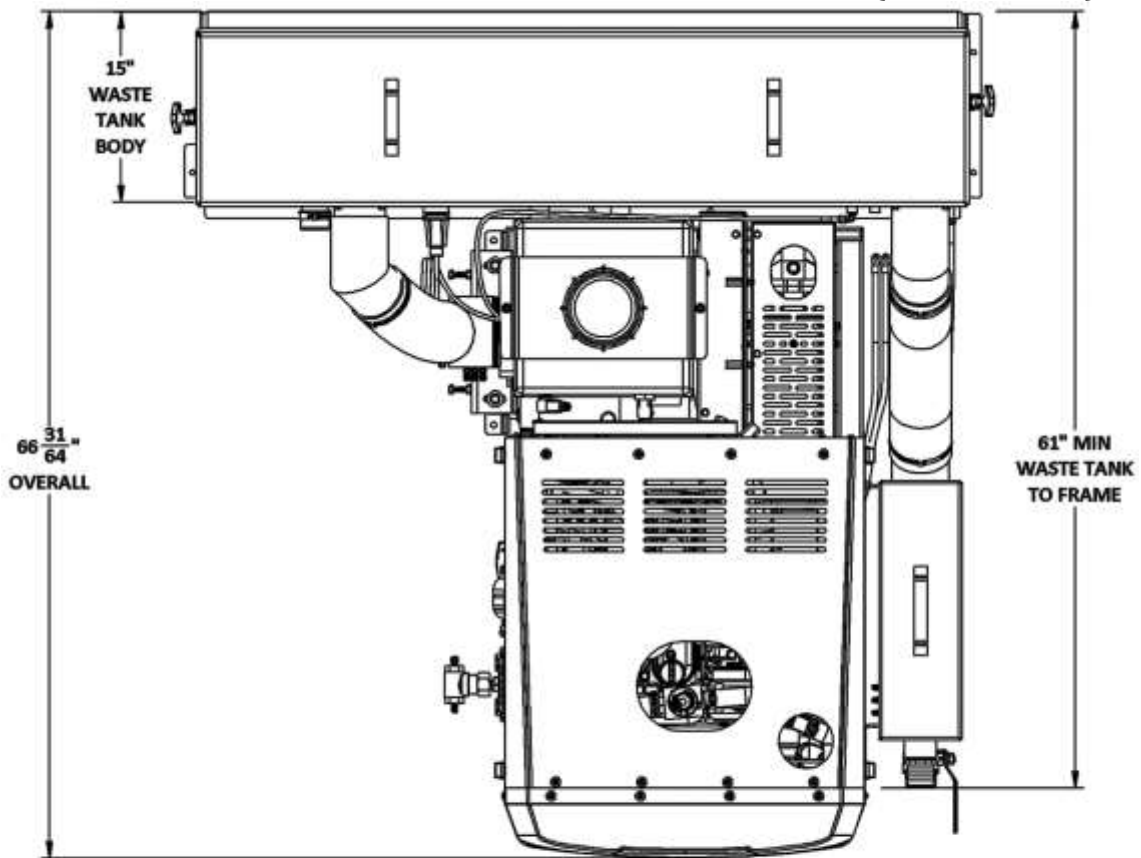
Gates Tri-Power EPDM AX Belts	4 – 6 lbs. @ 1/4" Deflection
Gates Tri-Power EPDM BX Belts	10 – 14 lbs. @ 3/16" Deflection

Refer to manufacturer's recommendations for re-tensioned belts

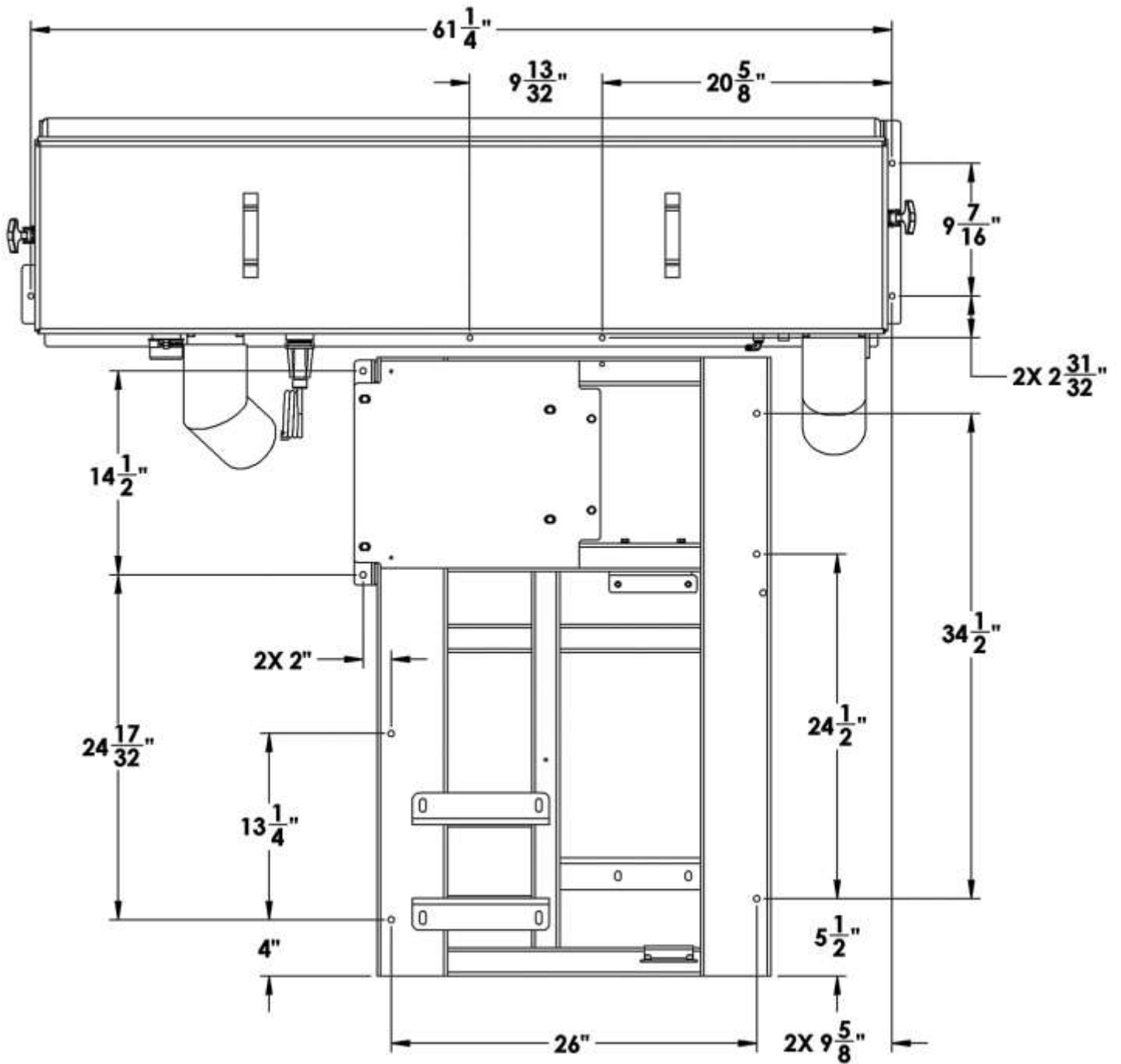
JET SIZING

Legend Brands recommends that the total floor tool tip size be #6

LAYOUT DIMENSIONS WITH WASTE TANK (IN INCHES)



TOP VIEW OF MOUNTING HOLE DIMENSIONS WITH WASTE TANK



INSTALLATION REQUIREMENTS

Prior to beginning the installation, read the **ENTIRE** "Installation" section of this manual. Due to the weight of the Everest, please adhere to the following recommendations prior to installing the unit.

CAUTION!

1. **DO NOT** exceed the vehicle's payload capacity. This will prevent unsafe or hazardous driving conditions. Before installing any components into the vehicle, check with the vehicle manufacturer for the Gross Vehicle Weight Rating (GVWR). GVWR is the maximum allowable combined weight of the vehicle and cargo, including all passengers, fuel, fluids and accessories.

Example: If the GVWR for a vehicle is 9600 lbs. and the vehicle has a base curb weight of 6406 lbs., this leaves a payload capacity of 3194 lbs. (GVWR - Curb Weight = Payload Capacity).
2. If mounting the unit in a trailer, ensure that the trailer is rated for the total weight of the unit and trailer, and that the vehicle towing capacity exceeds the combined weight of the unit, trailer and any payload in the vehicle. Electric or hydraulic brakes must be provided, and strict compliance with all State and Federal laws must be maintained.
3. If mounting in a trailer, the Everest console must be positioned so that it balances properly with respect to the trailer axle. Ten percent (10%) of the unit's total overall weight (w/o accessories or water) should be on the tongue. This unit has an air cooled engine, and adequate ventilation must be provided to prevent overheating.
4. Legend Brands does not recommend using any type of flooring materials that absorb water. This condition will result in rust and corrosion of the vehicle floor.
5. Insulation under rubber mats should be removed prior to installation of the unit.

FUEL REQUIREMENTS

Use unleaded fuel ONLY. Use only fresh, clean unleaded gasoline with a minimum octane rating of 87. **Do Not** use high octane gasoline.

Oxygenated fuels:

- Unleaded gasoline with up to, not exceeding, 10% ethanol by volume is acceptable.
- Unleaded gasoline with up to, not exceeding, 15% MTBE by volume is acceptable.

NOTE: Using other gasoline/alcohol blends including E20 and E85 will cause damage to engine components and will void warranty.

POWER REQUIREMENTS

Group 24 batteries are recommended as a Group U1 battery does not have enough capacity to power the unit if any additional powered accessories are installed. A Group 24 battery box and post battery terminals are provided in the installation kit. To use the post terminals, remove one screw from the terminal and insert the ring terminal of the battery cable. Reinstall screw through the ring terminal.

ENGINE REQUIREMENTS

Use high-quality oil of at least API (American Petroleum Institute) service class SG or higher. **Do not use additives.**

High quality SAE 30 or SAE 10W-30 oil is recommended for all climates. Do not use equipment in freezing temperatures without pre-heating the vehicle or area surrounding the unit. Ambient temperatures increase around the unit during operation. See the maintenance section for recommended schedules.

Engine Oil Capacity	6.0 L / 6.34 US qt.
Radiator/Engine Coolant Capacity	1.5 gal.
Reservoir Bottle	0.5 gal.

CHEMICAL REQUIREMENTS

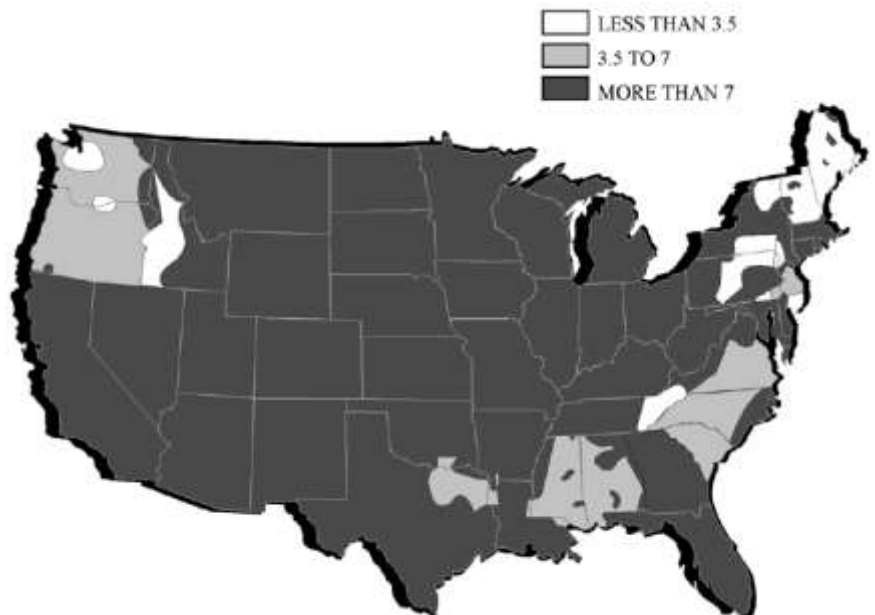
The **EVEREST 870HP** Truck mount unit's unique last step chemical injection system can be used with a wide variety of water diluted chemical compounds, either acidic or alkaline, depending on the work to be performed. We recommend using only **LEGEND BRANDS** brand chemistry.

WATER REQUIREMENTS

Because hard water deposits will damage the plumbing and heat exchange systems on this unit, Legend Brands recommends that a high quality water softener be used in areas where the water hardness exceeds 3½ grains. If a water softener is used, it must have a flow capacity of at least five (5) GPM or greater, without any hose constrictions.

The use of a water softening system will reduce maintenance and reduce down time caused by hard water scaling. It will also enhance the performance of cleaning chemicals, which will result in greater efficiency in lower concentrations.

See the chapter in Section 3 of this manual for instructions on descaling your system.



RECEIVING YOUR TRUCK-MOUNT UNIT

DEALER RESPONSIBILITIES

The Legend Brands authorized dealer that you purchased this unit from is responsible for:

1. Correctly installing and properly securing equipment with proper hardware and underside mounting plates.
2. Checking the components and oil levels prior to starting the unit.
3. Checking that all components are operating at the factory specification.
4. Checking all hoses and accessories for correct operation.
5. Checking all tools/wands for correct operation.
6. Training you in the operation, maintenance and safety precautions of your unit.

It is the purchaser's responsibility to become familiar with the entire Owner's Manual, most importantly all Warnings, Cautions and Notices.

ACCEPTANCE OF SHIPMENT

Your Everest 870HP cleaning unit was thoroughly tested, checked and inspected in its entirety prior to leaving our manufacturing facility. When receiving your unit, please make the following acceptance check:

1. The unit should not show any signs of damage. If there is damage, notify the deliverer immediately.
2. Carefully check your equipment. The Everest should arrive with the following items as well as any additional optional accessories you may have ordered:

EQUIPMENT LISTING

- Legend Brands Everest console
- Recovery tank with shut-off switch and inlet/outlet ports, gaskets and hardware
- Recovery tank vacuum and drain hoses with clamps
- Operation and Service Manual
- Installation mounting plates and hardware
- Prop 65 Label and instructions for units operating in California
- Recovery tank mesh filters and stainless steel strainer basket
- Fuel pump and filter installation kit
- 50 ft. of 1/4-inch high pressure solution hose with shutoff valve and quick connects
- 100 ft. of 1/4-inch high pressure solution hose with quick connects
- 150 ft. of 2-inch vacuum hose
- 50 ft. water supply hose with quick connect
- Two, 2-inch vacuum hose couplers
- Group 24 battery box
- Two universal post battery terminals
- Five gallon chemical jug and holder

OPTIONAL EQUIPMENT

- 50 ft. 2-inch vacuum hose
Part No. 18-003
- 2-inch vacuum hose coupler
Part No. 21-003
- 50 ft. high-pressure solution hose with
qd fittings (no valve)
Part No. 18-000
- 50 ft. high-pressure solution hose w/valve
and qd fittings
Part No. 18-250
- 50 ft. water hose w/qd fitting
Part No. 18-002
- Automatic waste pump kit
Part No. 68-158
- Demand pump system
Part No. 68-190

FUEL HOOK-UP KITS BY VEHICLE

- Chevy 1997 to 2002 FI 69-003FI
- Chevy 2003 FI 69-018FI
- Chevy 2004+ Hook-Up Kit 69-033
- Chevy Box Truck 2004+ 69-081
- Dodge 1997 to 2002 FI 69-004FI
- Ram ProMaster 69-613S
- Ford FI 69-005FI
- Ford 2004 – 2010 69-061
- Ford 2011+ 69-331
- Ford Box Truck 2004+ 68-077
- Ford Transit 2014+ 69-671
- Nissan NV 69-376

SECTION TWO: INSTALLATION



WARNING!!!

This unit must be bolted to the floor of the vehicle by an authorized LEGEND BRANDS DISTRIBUTOR.

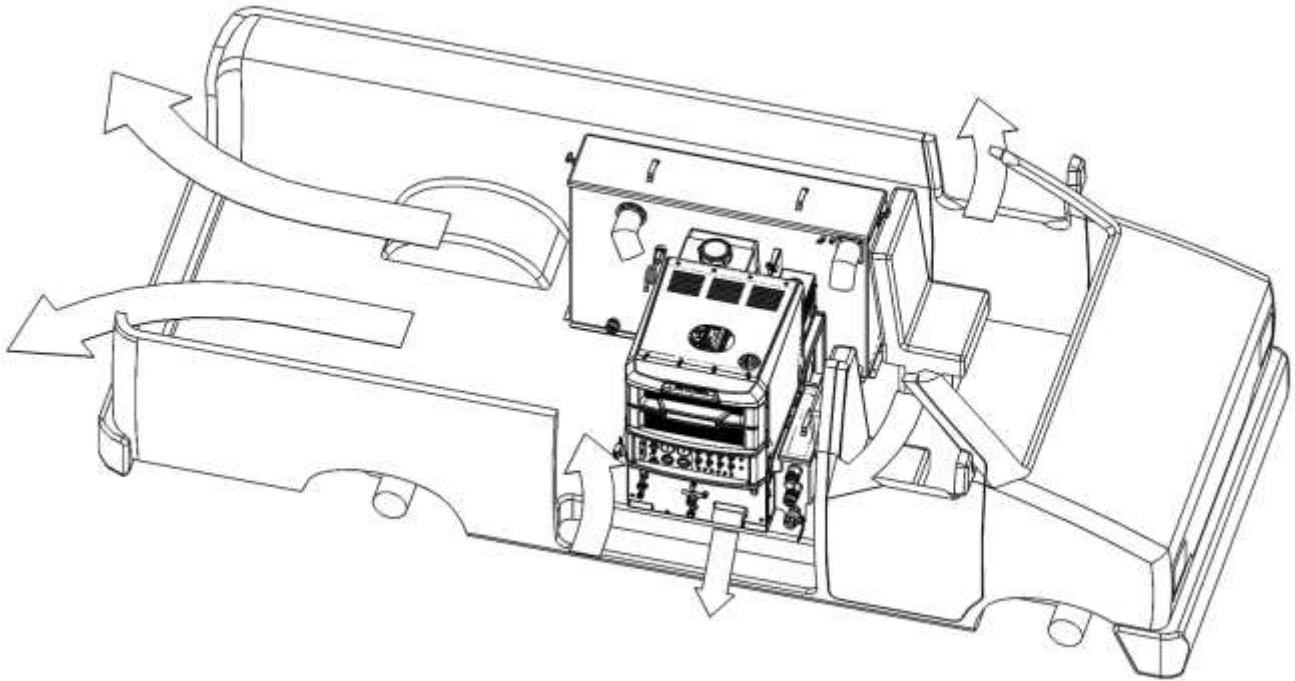
LIFTING THE UNIT INTO THE VEHICLE

Because the console weighs 1270 lbs., a forklift is necessary to place the unit into the vehicle. Position the forks under the unit from the front and make certain that the forks are spread to insert into the frame slots.

POSITIONING THE UNIT INTO THE VEHICLE

Vehicles vary in size and openings. Owners have different preferences on where in the vehicle they want their unit positioned. Legend Brands strongly recommends a side door installation for the Everest. We do NOT recommend a rear door installation.

1. Ensure that enough space is provided to assure adequate engine ventilation as well as room for service and maintenance.



2. Operating weight of the complete installation (which includes water weight) with waste tank and ALL accessories MUST NOT exceed the vehicle's axle weight limit. Please refer to SPECIFICATIONS in Section One for standard unit and waste tank operating weight.

FASTENING DOWN THE UNIT AND WASTE TANK

CAUTION

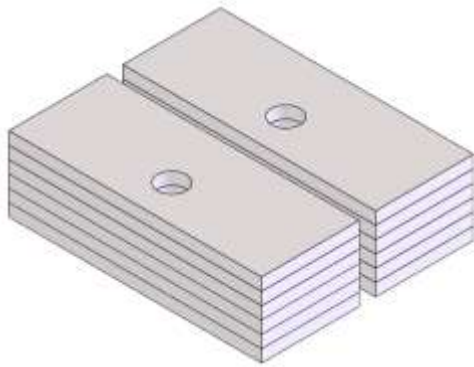
Prior to drilling any holes in the vehicle floor, ensure that while drilling, you will not damage the fuel tank, fuel lines, or any other vital components which could affect the safety or operation of the vehicle.

A. The console mounting rails and waste tank mounting holes will serve as a template. Drill eight (8) to ten (10) $\frac{13}{32}$ in. diameter holes for the console and six (6) to eight (8) $\frac{13}{32}$ in. diameter holes for the waste tank.

B. Using the provided mounting hardware kit:

Insert grade 5, 3/8-16 x 4 in. hex head cap screws with flat washers through the console and waste tank mounting holes. The two 5/16-18 x 6 in. hex head cap screws are provided if the unit is being installed into a Ford Transit. See your Transit installation guide for more information.

Install the provided mounting plates underneath the vehicle floor. Use the larger plates where space is available.



Screw the provided 3/8-16 hex head lock nuts on to the mounting bolts and tighten until the console and waste tank are firmly attached to the vehicle floor.

 **WARNING!** Do not alter or modify your **unit** in any way. Use only replacement parts authorized by **Legend Brands**. Modifications or use of unapproved parts could create a hazard and will void your warranty. Contact your authorized Legend Brands dealer for assistance.

INSTALLATION OF FUEL LINES

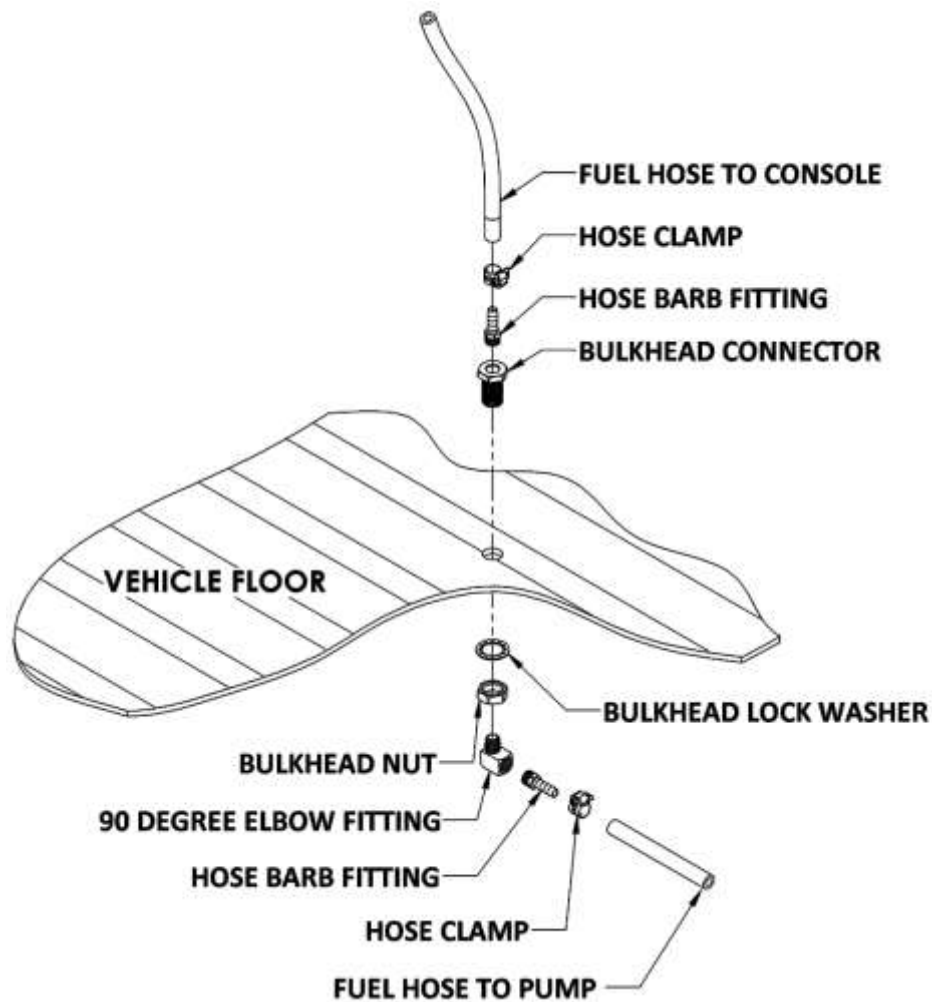


WARNING! The Vehicle fuel lines should **NOT** be spliced under **ANY** circumstances. Severe injury or fatality could result.

- When routing fuel lines, DO NOT configure the hoses in any location where the hoses, or vehicle could be damaged.
- All fuel lines must meet CARB TIER III and EPA PHASE 3 low permeability requirements.
- Avoid contact with moving parts, areas of high temperature, brake lines, fuel lines, catalytic converters, exhaust pipes, mufflers or sharp objects.
- Fuel pump must be mounted in a horizontal position as near as possible to the fuel supply, and not located near any heat sources.
- Excess heat from exhaust or other heat sources may cause the fuel pump to work improperly.

FUEL LINE BULKHEAD INSTALLATION

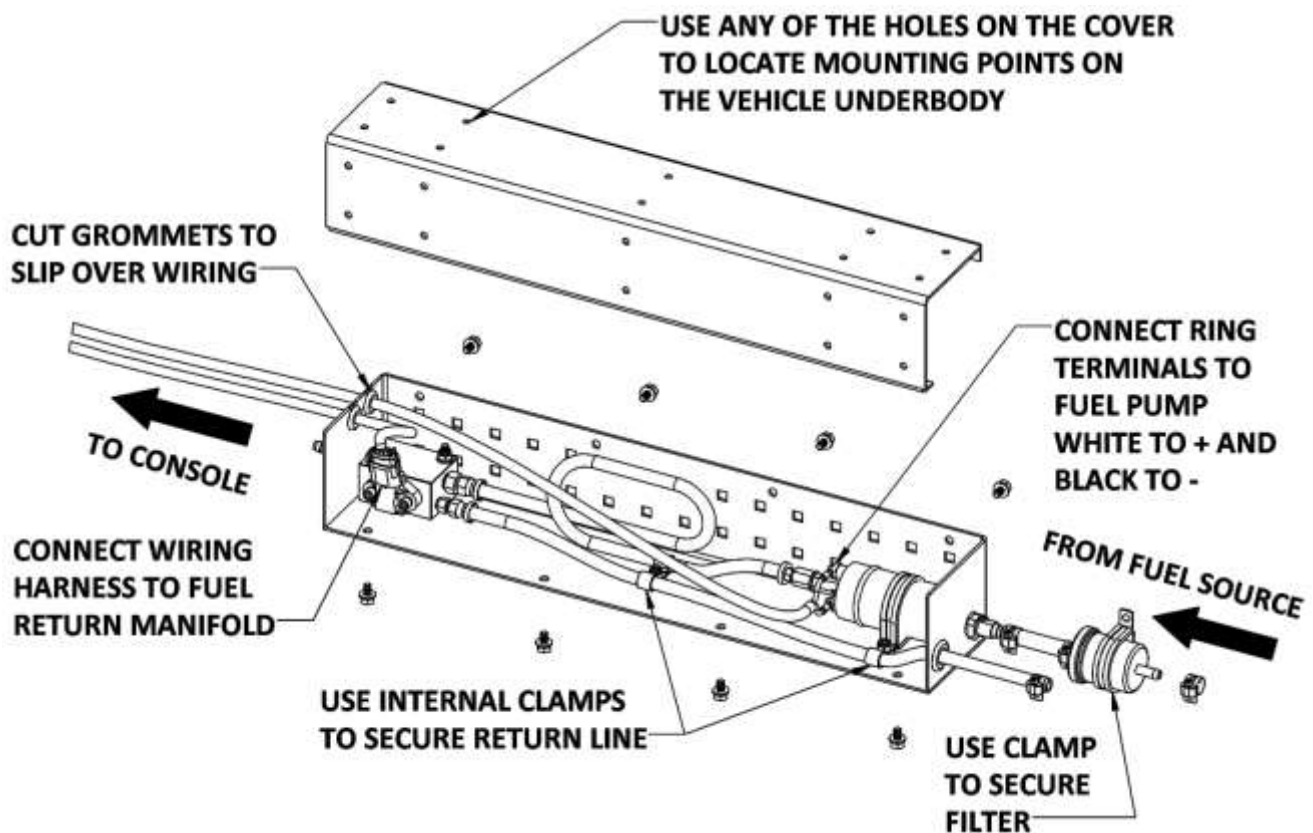
1. Inside the vehicle, select an appropriate location on the vehicle floor away from operator or maintenance traffic and away from contact with any accessories or tools while in use or transit. Make sure your location is within adequate reach of your supply of fuel hose from the fuel manifolds in the finished assembly.
2. Drill one 3/4 inch hole through the vehicle floor at the location chosen for the bulkhead connector.
3. Install the bulkhead connector by inserting the fitting and tightening the nut and lock washer on the opposite side of the vehicle floor.
4. Inside the vehicle, attach the hose barb fitting and connect the fuel line from the engine. Use hose clamps as needed when routing the fuel hose in a safe and clean manner.
5. Drill a hole, two holes or a slot large enough to pass the wiring harness connectors through near the bulkhead.



FUEL PUMP ASSEMBLY INSTALLATION

1. Remove the housing cover from the fuel pump assembly. Attach the ring terminals of the supplied fuel pump extension harness to the fuel pump. Connect the white wire to the positive (+) terminal and the black wire to the negative (-) terminal.
2. Attach the appropriate connector from the wiring harness 47-175 to the fuel return manifold.
3. Cut a slit in the grommets and slip over the wiring harnesses in an appropriate location to route back through the wall of the box.
4. Install the return fuel line onto the fuel return manifold. Use the internal clamps to secure the return line inside the housing. Route the return line through the grommet in the side of the housing. Do not trim the return line until installing the check valve.
5. Locate an appropriate location for the fuel pump assembly housing to mount underneath the vehicle that will not cause damage to the vehicle or compromise the fuel line routing or components. Use the supplied self-drilling screws to install the cover of the fuel pump housing to the vehicle.
6. Attach the main section of the fuel pump assembly to the lid using the eight supplied screws and washers. Blue Loctite is recommended to prevent vibration from loosening the screws.

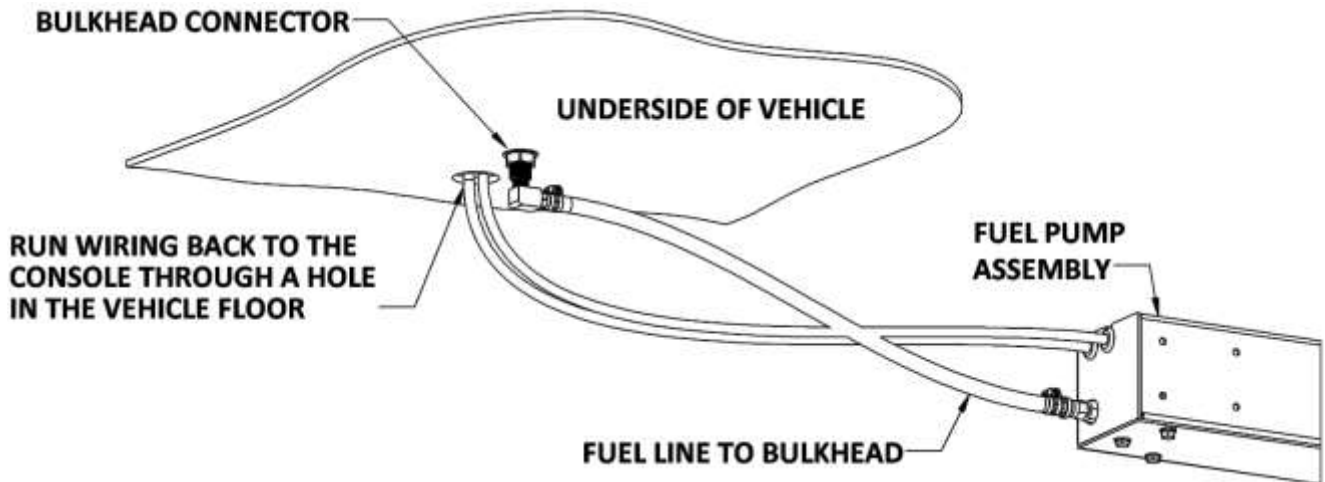
NOTE: Install the fuel pump assembly close to the fuel source.



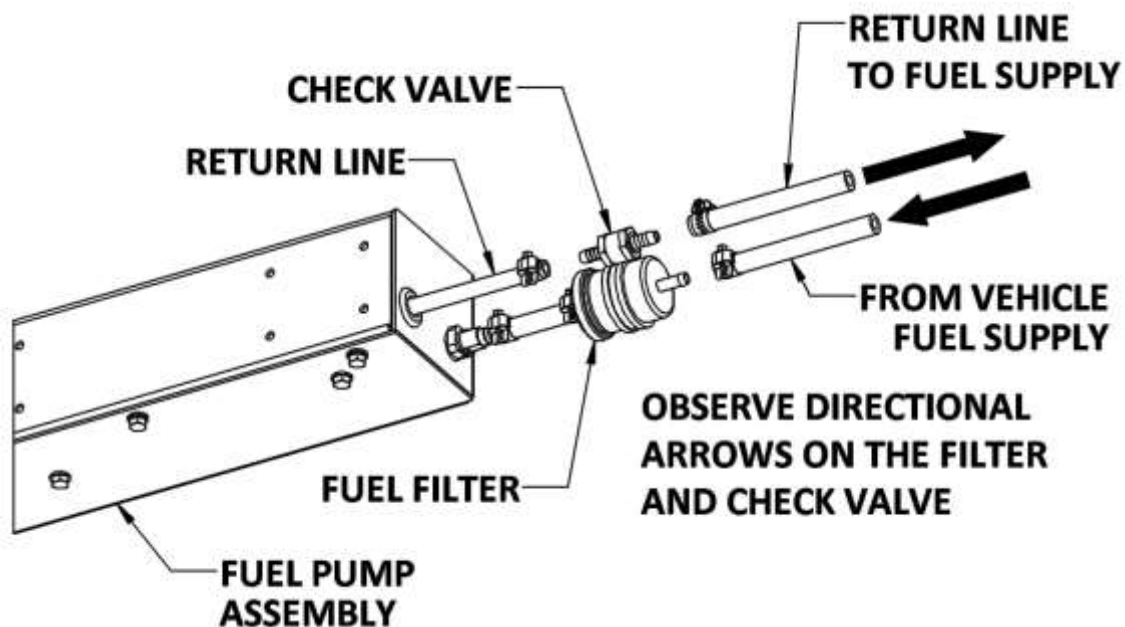
FUEL SUPPLY & RETURN LINE INSTALLATION

Refer to the transfer flow kit instructions found with the appropriate kit for your vehicle.

1. Using the fuel line from the transfer flow kit, connect the outlet fitting on the fuel return manifold to the bulkhead fitting underneath the vehicle.
2. Route both wiring harnesses through the hole, holes or slot you have drilled in the vehicle floor. Apply a grommet and or wire loom at the point of entry to avoid damage from the sharp edge of the vehicle floor.



3. Connect the check valve in line with the return line near the fuel cell with the flow arrow pointed towards the fuel supply.
4. Connect the fuel filter in line with the supply line between the fuel supply and fuel pump with the flow arrow pointed towards the fuel pump.
5. Ensure that all hose clamps are properly tightened.
6. Secure all lines tightly and carefully, avoiding contact with any sharp edges. Use industrial zip ties, protective sleeves and grommets as necessary to shield exposed fuel hoses and wiring.



SECTION TWO: INSTALLATION

NOTE: The return fuel line needs to have enough length to properly cool the fuel temperature. If needed, coil two or three feet of return line under the vehicle in a safe location.

NOTE: Legend Brands recommends using only OEM parts. Using non OEM parts may damage critical components. Contact Legend Brands for OEM replacement parts:

- 36-556, PUMP, FUEL
- 36-097, FILTER, FUEL
- 36-660, CHECK VALVE, TFS-2019

TRAILER FUEL TANK AND FUEL LINE INSTALLATION

The following are recommendations for trailer installations:

- Strict compliance with all federal and state laws must be maintained. **Tanks must meet CARB TIER III and EPA PHASE3 permeation and venting emissions requirements.**
- Use only fuel tanks that are manufactured specifically for gasoline, have proper vented filling caps, and outlet connections that are the same size as the inlet and return connections on the unit.
- **DO NOT** install fuel tanks inside any type of enclosed trailer or vehicle.
- **NEVER** carry gasoline or flammable materials in an enclosed trailer or vehicle.
- **NEVER** store any type of flammable material in an enclosed trailer or vehicle.
- Always mount fuel tanks where they will be protected from any vehicle collision.
- When installing fuel lines from the fuel tank to the unit, use the proper size fuel line.

BATTERY CONNECTION



Explosive gases, Dangerous gases!

Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries also produce explosive hydrogen gases while charging. To prevent fire or explosion, charge batteries in a well-ventilated area only. Keep sparks, open flames, as well as any other sources of ignition away from batteries at all times. Remove all jewelry prior to servicing batteries. Keep batteries out of the reach of children.

- Before disconnecting the negative (-) ground cable, ensure that all switches are in the OFF position. If ON a spark could occur at the ground connection terminal, which could cause an explosion if hydrogen gas or gasoline vapors are present. **ALWAYS** disconnect the negative (-) terminal first.
- Attach the red positive (+) battery cable from the starter solenoid on the console to the positive (+) terminal on the battery and tighten down the nut.
- Attach the black negative (-) battery cable from the ground on the console to the negative (-) terminal on the battery and tighten down the nut.

NOTE: For group 24/post batteries, remove one screw from the provided post battery terminal, insert the ring terminal end of the battery cable into the terminal and install the screw through the ring to secure the battery cable to the terminal.

FIRE EXTINGUISHER

Legend Brands, and many government agencies, recommend that a fire extinguisher rated for A, B, and C type fires be installed into any commercial vehicle.

INITIAL OPERATIONAL SETTINGS

NOTE: Due to temperature and altitude changes, the optimal setting for each truckmount must be adjusted after installation. Failure to make these adjustments may lead to poor unit performance and premature component failure.

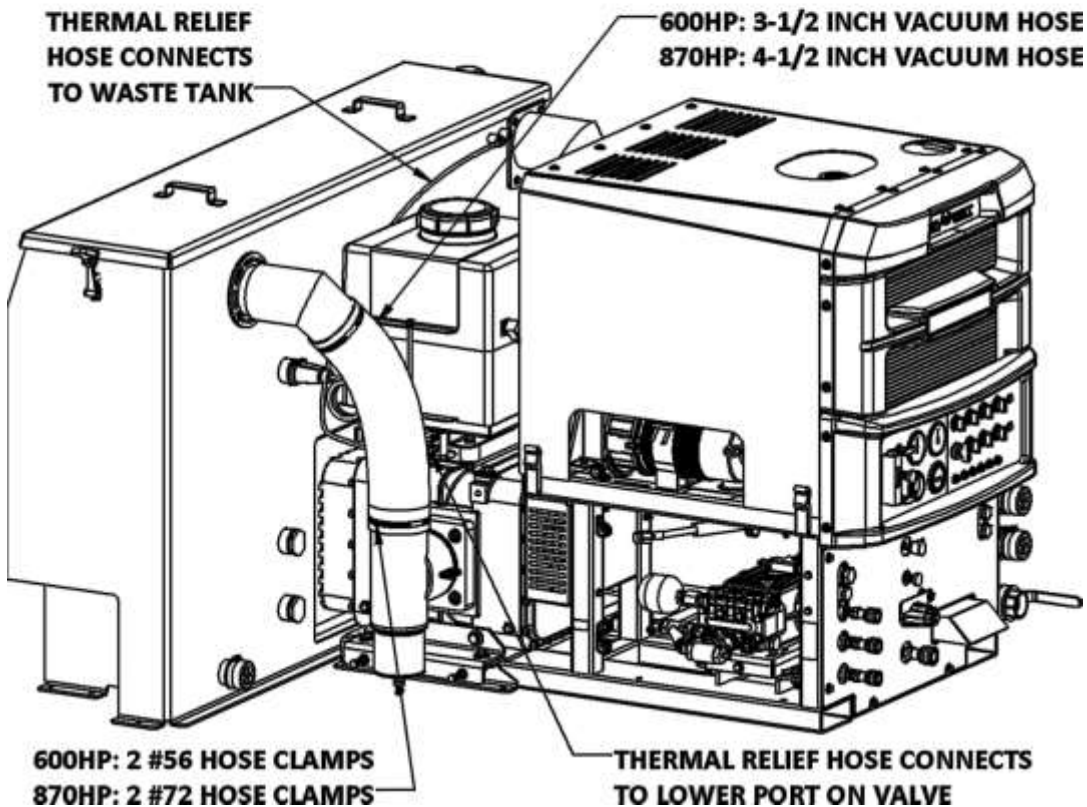
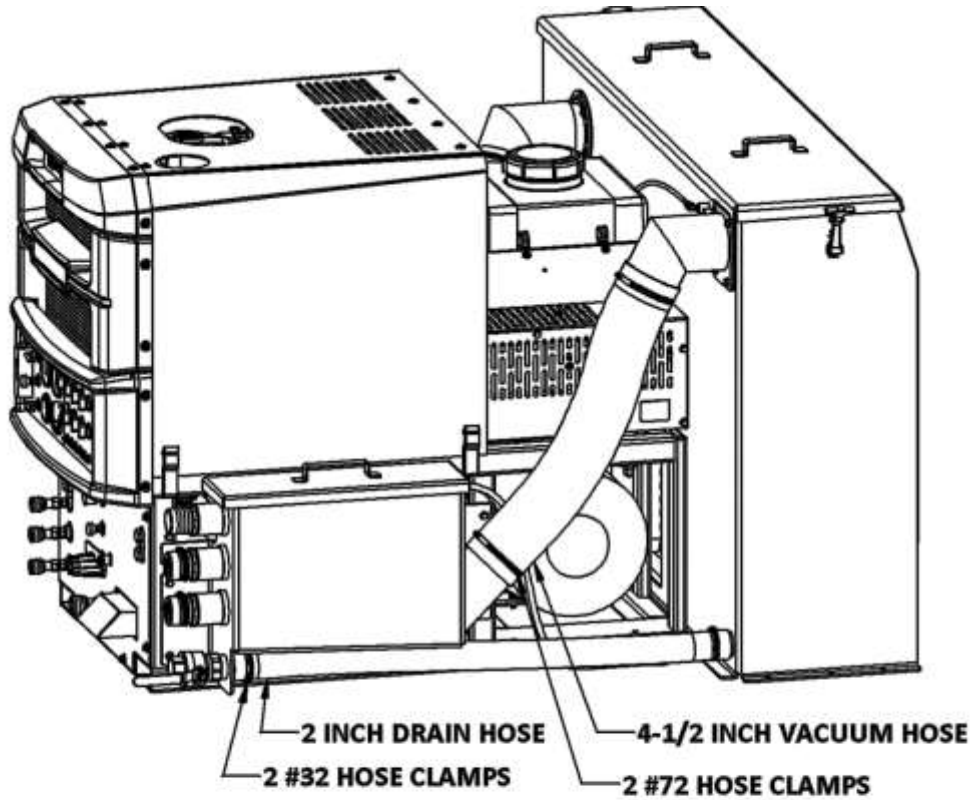
VACUUM PUMP

The maximum vacuum pressure obtainable at full throttle should be 13”Hg. If the unit is drawing a stronger vacuum (at full sealed suction) than 13”Hg, adjust the vacuum relief spring until proper pressure is achieved.

FLUID LEVELS

Verify that oil levels are full on all components of the unit and coolant levels are adequate in the reservoir and radiator before running.

CONSOLE TO WASTE TANK CONNECTIONS



SECTION THREE: USING YOUR CLEANING SYSTEM

UNDERSTANDING THE SYSTEMS

NOTE: Read and understand this section of the manual entirely before proceeding.

This portion of the manual divides the unit up into systems and describes how each system works. Prior to proceeding into the operations and maintenance sections of this manual it is recommended that you acquire a basic understanding of how the unit functions.

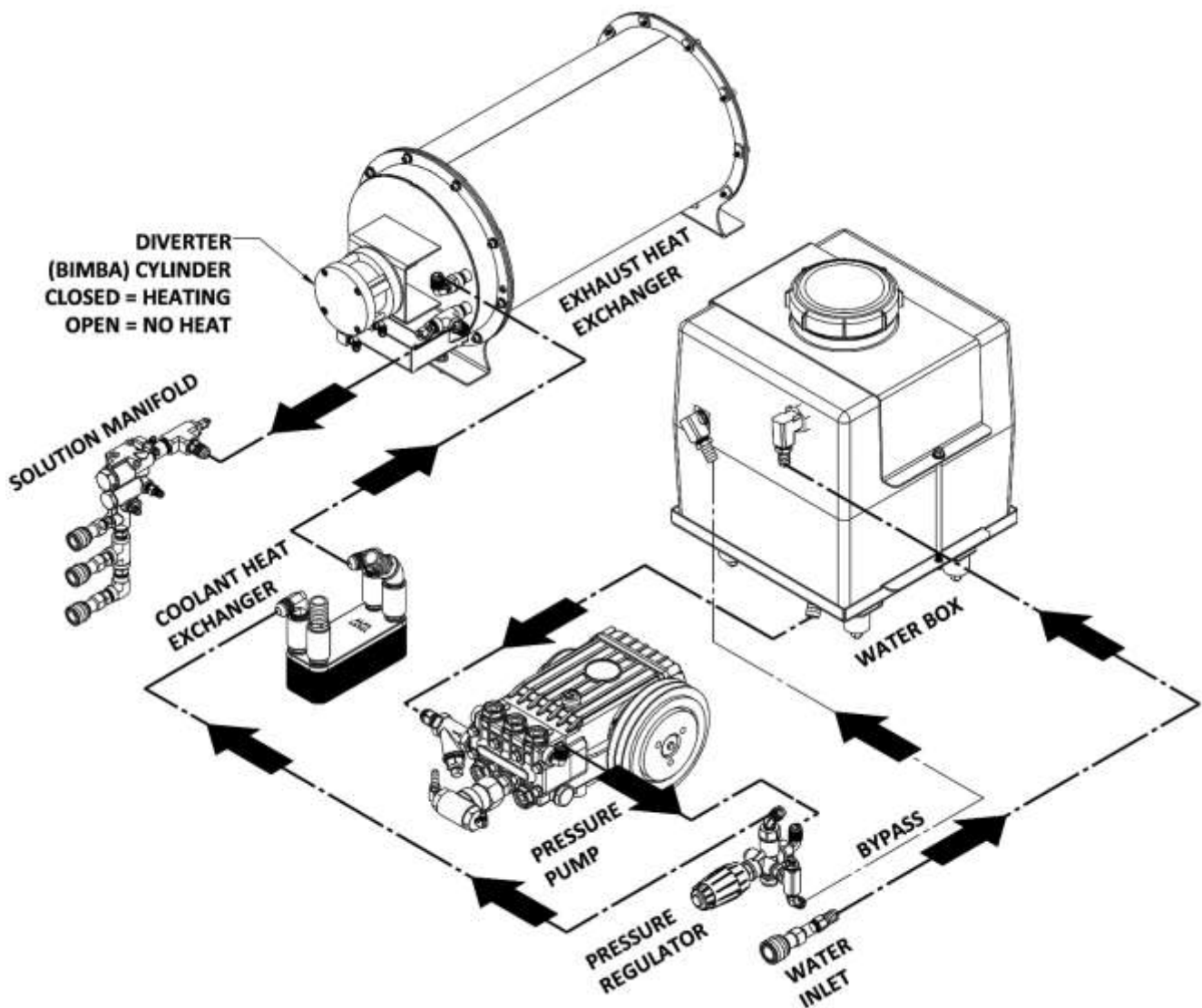
WATER HEATING SYSTEM

Cold water enters the water box through the water inlet connection. When the water box is full, the internal valve will automatically shut off the water flow.

The water then flows to the water pump where it is sent to the pressure regulator which provides and maintains the desired pressure setting. A certain amount of water is bypassed from the regulator due to over pumping capacity of the water pump. The main bulk of water is directed to the engine coolant heat exchanger where the water is pre-heated before being sent to the exhaust heat exchanger. In the exhaust heat exchanger, water travels through a finned tube coil that is heated by the vacuum blower and engine exhaust.

The hot water then flows to the solution outlet manifold that contains a strainer and a check valve. A bypass valve on the control panel can be opened to deplete hot water when rapid cooling of the water temperature is desired.

When the cleaning tool is triggered, chemical is injected into the hot water stream inside the solution outlet manifold creating the hot solution that then flows directly to the cleaning tool.



WATER HEATING SYSTEM (CONTINUED)

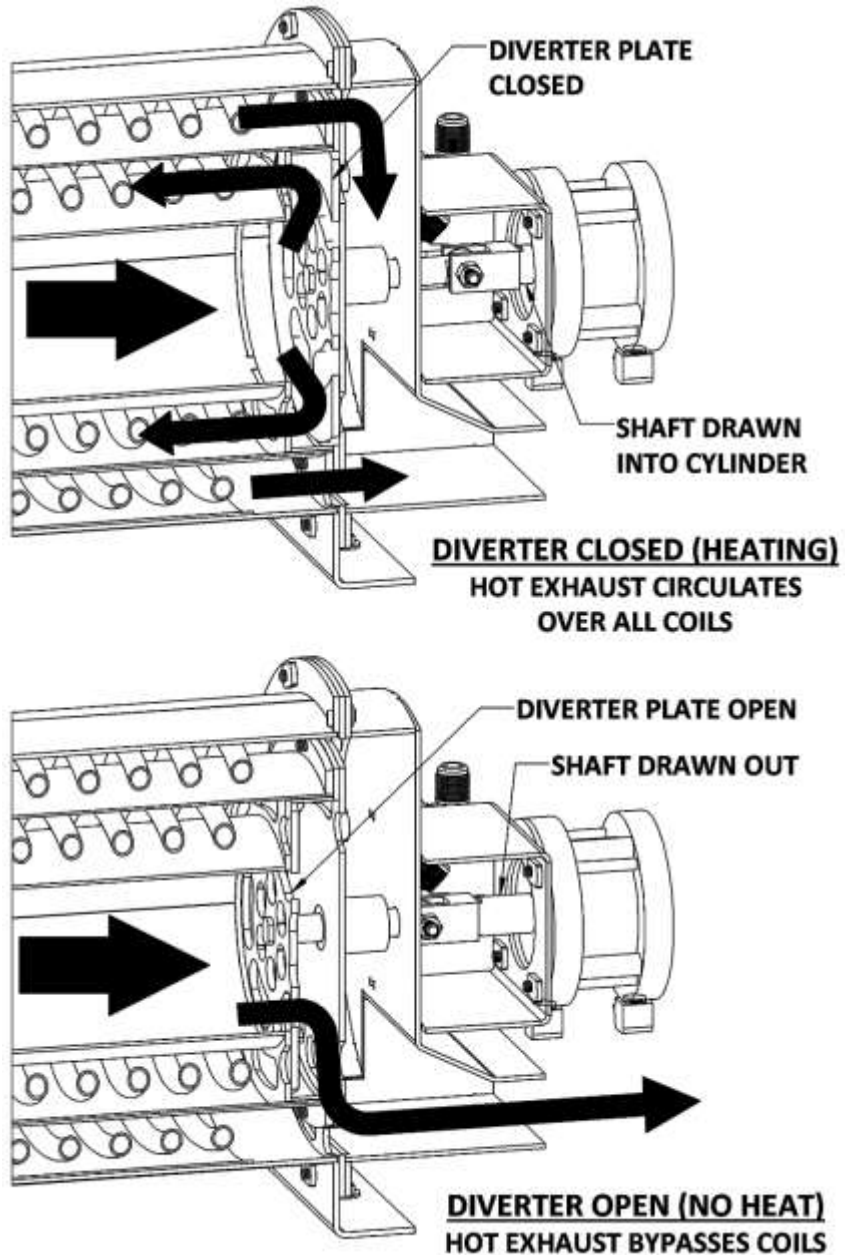
In order to maintain even operating water temperatures, a diverter plate, inside the heat exchanger is used to control the path of hot exhaust air over water-filled finned-tube coils.

When the diverter is closed, the hot exhaust is directed across both sets of coils in an “S” pattern. The coils are specially designed with copper fins to quickly transfer the heat to the water travelling through the tubing.

The desired water temperature is selected on the instrument panel. A temperature sensor communicates with the Thermalogic control system, which in turn triggers the diverter cylinder on the front of the water box through a valve when cooling is needed to maintain the desired water temperature.

When the diverter is open, the hot exhaust is diverted to the exterior exhaust port, bypassing the coils and allowing the water to cool.

This cycle of heating and cooling is the primary method for maintaining a desired water temperature while cleaning.



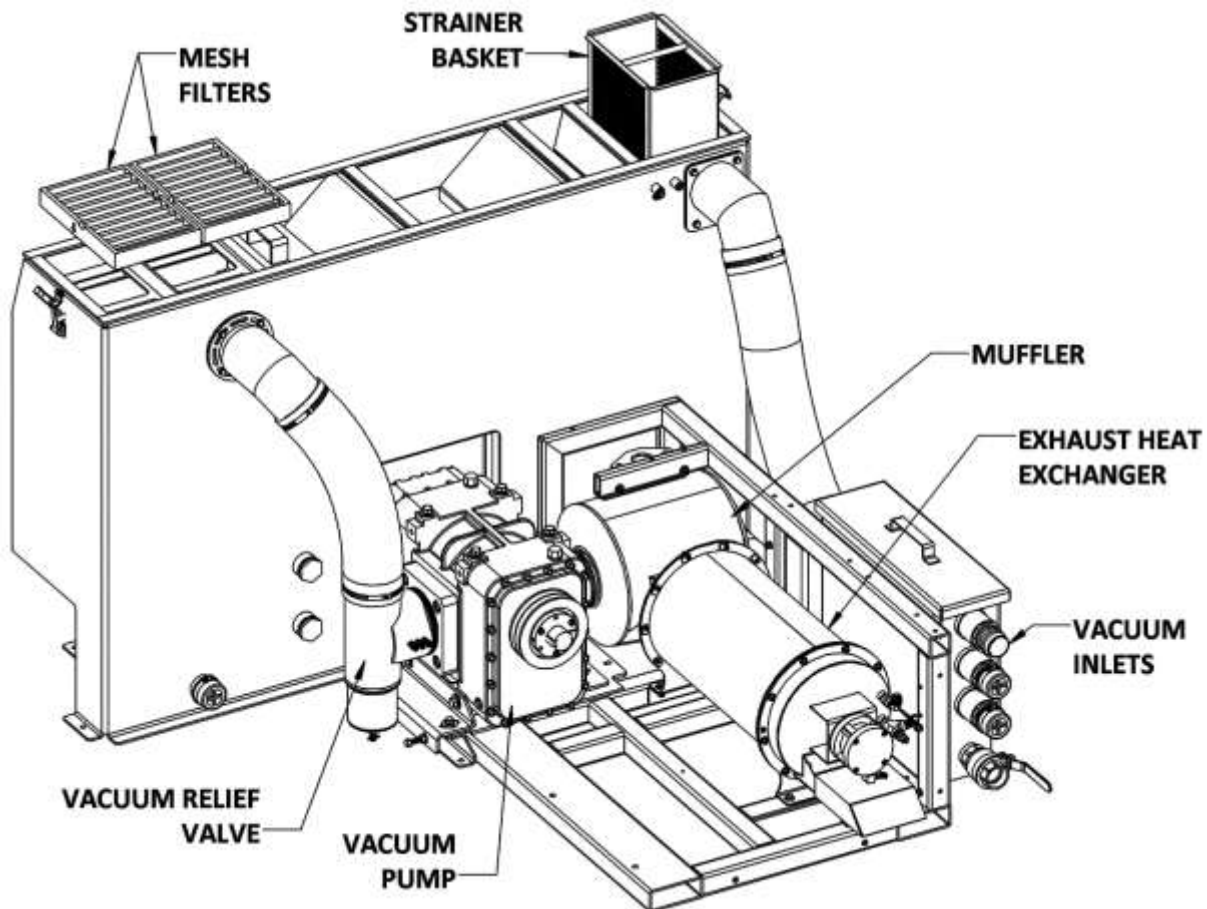
VACUUM SYSTEM

The engine turning a vacuum pump generates the vacuum. The air is channeled in one side of the vacuum pump, compressed and discharged on the opposite side, creating airflow. This airflow is used to do the work necessary for the extraction process. A vacuum nozzle applied to the carpet surface removes moisture, dirt and spent chemicals. These elements are conveyed back to a recovery tank utilizing hoses and the force of air. Particles of moisture and dirt are separated in the recovery tank using a series of changes in direction and velocity. The air is then filtered and rushes into the vacuum pump.

The vacuum pump also heats incoming air as it is compressed. The hot discharged air is forced into a silencer for noise abatement. Exiting the silencer, this hot air is directed through the heat exchanger

The vacuum pump speed is factory set to maximize vacuum pressure and provide sustained system life. Do not alter the vacuum speed outside the recommended range shown in the Specifications section.

A level shut off sensor is located near the top of the waste tank and will shut down the unit before the tank is at full capacity. This protects the vacuum pump from water damage. Note: Waste tank level shut off will not shut the unit off due to high levels of foam. The use of a quality de-foamer is recommended.

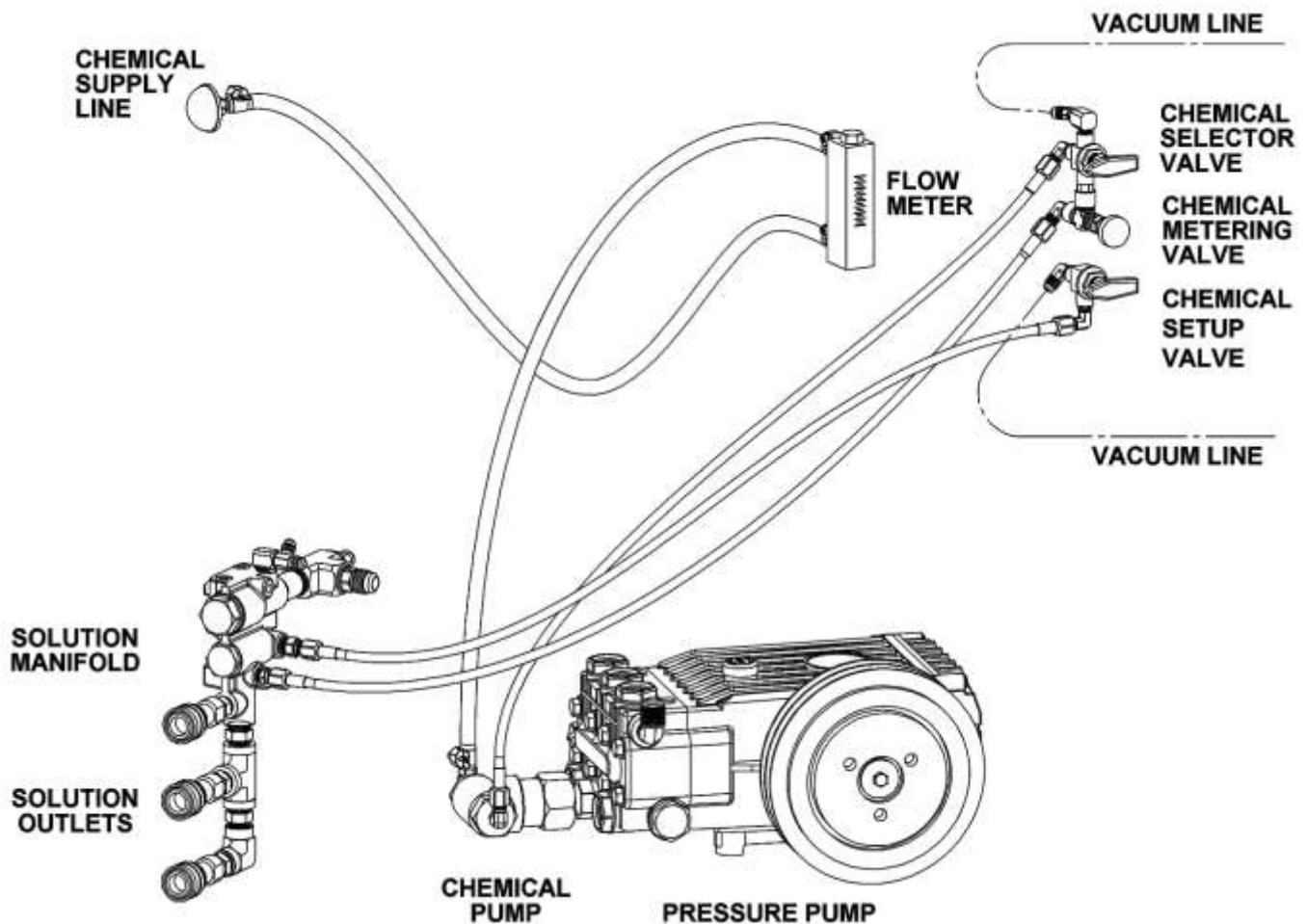


CHEMICAL PUMPING SYSTEM

The chemicals are drawn from the chemical container through a strainer into the flow meter mounted on the control panel. The flow meter indicates the rate of chemical flow.

The chemicals then flow through the stainless steel pulse pump, the chemical is then injected into a three way selector valve located on the front panel. This valve may be used to turn the chemical flow ON, OFF, or to PRIME the chemical pump.

The chemicals then flow through the chemical metering valve to the solution outlet. This valve controls the rate of flow of chemical into the cleaning solution, which is indicated on the flow meter. The chemical setup valve uses vacuum to stimulate the flow to chemical through the system without first connecting tools to the unit.



PREPARATION AND OPERATION

This section of the operator's manual explains how to prepare, start, operate, shut down and maintain your Legend Brands Everest mobile cleaning unit. The Everest unit is easy to operate, however only trained operators should proceed.

 **WARNING** Operate this unit and equipment only in a well-ventilated area. Exhaust fumes contain carbon monoxide, which is an odorless and deadly poison that can cause severe injury or death. DO NOT run this unit in an enclosed area. DO NOT operate this unit where the exhaust may enter a building doorway, window, vent or any other opening.

PREPARATION

ENSURE THERE IS ADEQUATE FUEL

Check the fuel tank to ensure there is adequate fuel to complete the job and transport the vehicle. This unit consumes approximately 1 to 1.75 US gallons of fuel per hour, depending on the speed setting.

REMOVE TOOLS FROM THE VEHICLE

Remove any tools, accessories or hoses from the vehicle that you will require.

WATER SUPPLY CONNECTION

NOTE: Prior to connecting your water inlet hose to any supply faucet, flush out the faucet until the water is free of any debris. Also, flush out any debris from your water inlet hose.

1. Connect the hose to the water supply faucet and flush out any debris from the faucet and hose.
2. Connect the hose to the water inlet fitting on the front of the unit.
3. Turn the water supply faucet on.

NOTE: Never use a waste pump outlet hose as a water inlet hose. Use only clean hoses for water supply.

CHECK YOUR DRAIN VALVES

Make sure the waste tank and pre-filter box drains are closed.

CONNECT HIGH PRESSURE SOLUTION HOSES

Before starting the unit, connect the high pressure solution hose(s) to the solution outlet connection(s) at the front of the unit. Connect the cleaning tool(s) to the opposite end of the pressure hose(s).

CHECK YOUR CHEMICAL LEVELS

Check your chemical container to make sure you have enough chemical mixed to finish the job.

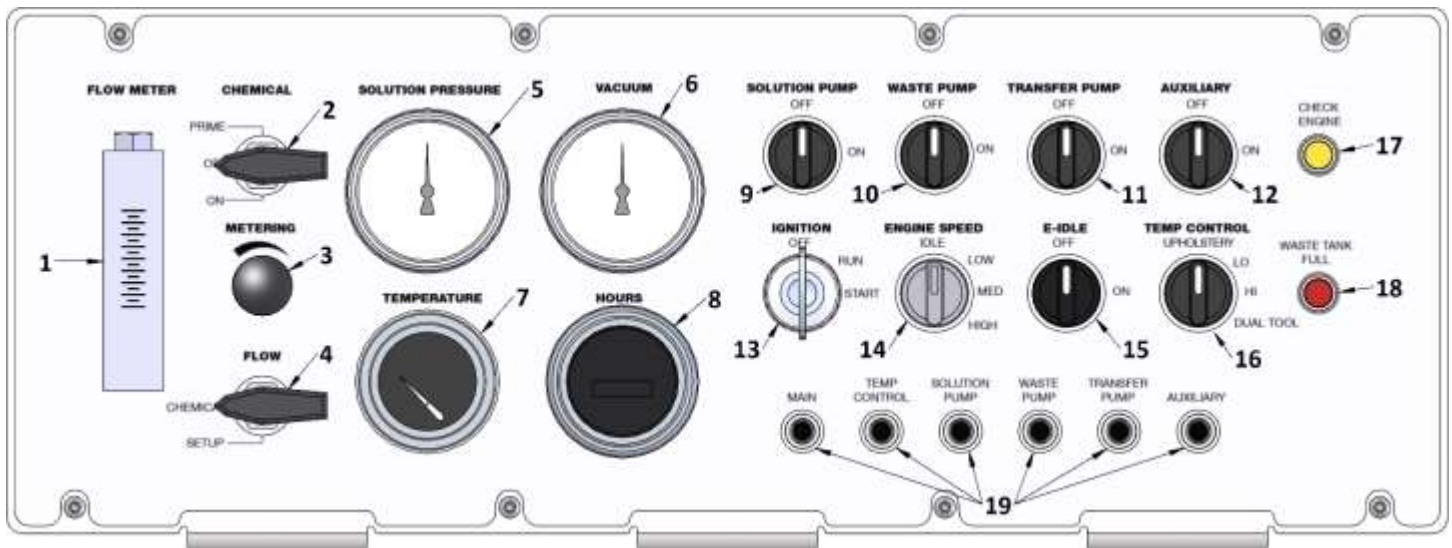
CHECK FILTERS

Inspect the vacuum inlet filter and strainer baskets in the pre-filter box and waste tank. See the Shut Down and Daily Maintenance section below for more information.

 **CAUTION**

NEVER operate the unit with the waste tank air filter removed, damaged or not properly installed.

INSTRUMENT PANEL CONTROLS AND GAUGES



1. CHEMICAL FLOW METER

Visual display of chemical flow through the system.

2. CHEMICAL SELECTION VALVE

The chemical selection valve allows you to start, stop or prime the chemical flow.

3. CHEMICAL METERING VALVE

The chemical metering valve allows you to control the amount of chemical flow being injected into the cleaning solution.

4. CHEMICAL FLOW SETUP VALVE

This valve allows the chemical system to be primed without connecting tools to the unit.

5. SOLUTION PRESSURE GAUGE

This gauge registers the amount of pressure in the water system.

6. VACUUM PRESSURE GAUGE

This gauge indicates, in inches of mercury, how much vacuum the system is producing at any given time

7. WATER TEMPERATURE GAUGE

This gauge measures the temperature of the water at the solution manifold.

8. HOUR METER

The hour meter records the operating time of the unit. This is used to calculate maintenance intervals.

9. SOLUTION PUMP SWITCH

The solution pump switch turns the pressure pump ON or OFF.

10. WASTE PUMP SWITCH

SECTION FOUR – SERVICE AND MAINTENANCE

The waste pump switch is used to turn a waste pump ON or OFF, if an optional automatic waste pump has been installed.

11. TRANSFER PUMP SWITCH

The transfer pump switch is used to turn a waste pump ON or OFF, if an optional transfer pump has been installed.

12. AUXILIARY SWITCH

The auxiliary switch is used to turn an auxiliary item ON or OFF, if an optional accessory item, such as a motorized hose reel, has been installed.

13. IGNITION SWITCH

The engine ignition switch provides ignition to start the engine when the key is inserted and turned.

14. ENGINE SPEED SWITCH

Select between four pre-set engine throttle speeds, IDLE, LOW, MED and HIGH.

15. E-IDLE™ SWITCH

Turn the E-IDLE™ on or off.

16. TEMPERATURE CONTROL SWITCH

The temperature control switch provides multiple pre-set temperature settings of UPHOLSTERY, LO, HI and DUAL TOOL. The UPHOLSTERY setting allows for continual heat diversion, providing no additional heat to the water through the heat exchanger for temperatures appropriate for cleaning sensitive upholstery materials. The LO and HI settings are used for normal cleaning operation with a single cleaning tool. The DUAL TOOL setting allows for normal cleaning operation heat when using two or three tools at once.

17. CHECK ENGINE INDICATOR LIGHT

This light is activated by the engine when a problem is detected by the ECU. When this occurs, troubleshooting is required.

18. WASTE TANK FULL INDICATOR LIGHT

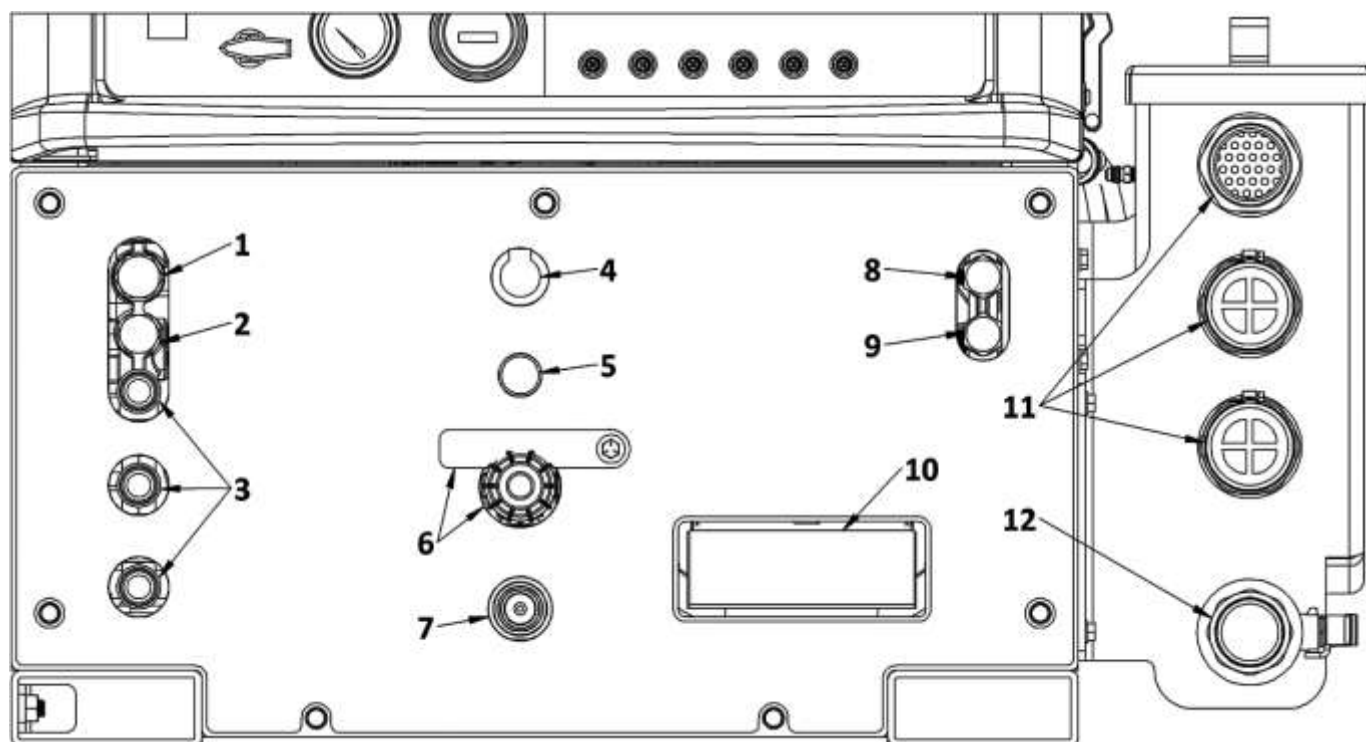
This indicator light is activated when the waste tank has reached full capacity. The unit will shut down to protect the components from damage. The waste tank must be emptied before the unit can be brought back in service.

19. CIRCUIT BREAKERS

Circuit breakers protect system components and wiring from electrical spikes or overloading in the system.

NOTE: For a greater explanation of gauges, see the section “Gauge Readings and Settings” below.

LOWER FRONT PANEL



1. CHEMICAL CHECK VALVE

The chemical check valve allows the chemical injection into the water stream to form the cleaning solution. This is accessible on the front panel for maintenance and service.

2. SOLUTION SCREEN

The solution outlet filter catches debris in the solution stream before it exits the unit for the cleaning tool.

3. SOLUTION OUTLETS

The pressure outlet is where you connect your solution hose. The Everest 870HP has 3 outlets for 3 separate solution hoses.

4. VACUUM LUBRICATION CUP

The vacuum relief valve lubrication cup is used to deliver lubrication to the vacuum pump. This prevents rust from building up inside the pump. See the shut-down and daily maintenance sections for more information.

5. BYPASS VALVE

The bypass valve allows the operator to quickly reduce water temperature by bypassing hot water to the waste tank. Turning the valve counterclockwise opens the valve for cooling. Turning clockwise closes the valve.

6. OUTLET PRESSURE REGULATOR

The pressure regulator sets the pressure of the solution system. This spring loaded valve can be adjusted up or down. The pressure is increased by turning the valve clockwise, or reduced by turning the valve counterclockwise. This valve must be maintained in accordance with the maintenance table in this manual.

The latch over the valve prevents creeping due to vibration while the unit is running.

SECTION FOUR – SERVICE AND MAINTENANCE

7. WATER INLET

The water supply inlet is where you connect your fresh water supply hose.

8. ORIFICE SCREEN

The orifice filter catches debris before it enters the temperature control orifice.

9. TEMPERATURE BALANCE ORIFICE

The orifice in this manifold helps to balance and stabilize the solution temperature within the system.

10. EXHAUST OUTLET

Engine and blower exhaust from the unit. Exhaust fumes contain carbon monoxide which is an odorless and deadly poison that can cause severe injury or fatality. DO NOT run this unit in an enclosed area. DO NOT operate this unit where the exhaust may enter any building doorway, window, vent or opening of any type.

11. VACUUM INLET HOSE PORTS

The vacuum inlets are where you connect your vacuum hoses. The Everest 870HP has three vacuum ports. All three ports will accept 2 or 2-1/2-inch vacuum hoses. Always cap any unused ports to maintain proper vacuum levels.

12. WASTE TANK DRAIN PORT

To drain the waste tank, attach a two-inch hose to the drain port hose barb and turn the valve to open the flow from the tank. Be sure to close the valve after the tank has been drained.

STARTING THE UNIT

NOTE: Read and comply with the preparation section of this manual entirely before starting the unit.

1. Turn on ignition switch (run position) for 2 seconds to build fuel pressure.
2. Turn the ignition switch to the START position temporarily until engine starts.
3. Turn the pressure pump switch to the ON position (must have water supply connected and on).

NOTE: If the unit does not build water pressure after 5 seconds, check for adequate water supply. See “Loss of Water Pump Pressure in the Troubleshooting section of this manual.

VACUUM HOSE

Connect the vacuum hose(s) to the vacuum inlet connection at the front of the unit. Connect the opposite end of the vacuum hose(s) the cleaning tool(s). Let the unit run for a few minutes with the vacuum inlets partially blocked off to warm up the cleaning solution.

Using total jet sizes above #6 on your cleaning tool may reduce cleaning temperatures. Adjust accordingly.

PRIMING AND ADJUSTING THE CHEMICAL FLOW

Legend Brands recommends that the chemical pump be primed whenever the water pump is on. This eliminates possible pressure fluctuations and water pump pulsations related with running the chemical pump dry.

The chemical prime tube and the chemical inlet tube should be inserted into the chemical container before starting the unit. When inserting the chemical tube into the chemical container, ensure that it stays submerged in chemical, as the chemical pump will not function if air is allowed to enter the inlet line.

With the engine running in idle, water supply connected and pressure pump switch in the ON position:

1. Turn the 3-way chemical selector valve located on the control panel to the PRIME position. Allow chemical to circulate. After all air bubbles have been removed from the chemical tube, turn the valve to the ON position.
2. Turn the chemical flow valve to the SETUP position. Use the chemical metering valve to set the desired flow rate. To check actual flow rate for your specific jet size, trigger the cleaning tool while adjusting the flow. Once set, turn the chemical flow valve to the CHEMICAL position.

AUTOMATIC WASTE PUMP

1. If your unit is equipped with an optional automatic waste pump, connect one end of the 5/8 in. or larger garden hose to the pump-out connection and the other end to an acceptable waste disposal.
2. Turn the pump-out switch located on the front console control panel to the ON position. The waste pump will now operate automatically throughout the cleaning period.

DO NOT use an outlet hose that is smaller than 5/8 in. I.D.

NEVER use a waste pump hose as a water inlet hose.



NEVER dispose of waste water in a storm drain, water way or on ground areas. Always dispose of waste in accordance with Local, State and Federal laws.

OPERATION

After you have completed the previous steps, proceed with the cleaning or restoration operation. Place the engine speed control to LO speed and after warm-up, select the appropriate speed for desired cleaning or restoration. A float shut-off switch is located inside of the waste tank. It will automatically shut down the unit if the tank reaches its full capacity. If this occurs, empty the waste tank before continuing. When doing flood extraction, the solution pump should be in the OFF position.

E-IDLE™ OPERATION

When ready to start cleaning, the E-Idle™ switch should be turned on. The controller will automatically idle down the engine within 7 seconds, regardless of the pressure on the water or vacuum sensor. There will be a 2-3 second delay before the water trigger is recognized once the engine has idled down. After this delay, the water switch on the wand can be triggered. This will return the engine to normal speed and cleaning can begin.

The engine can be idled down using the tool trigger, following a wet stroke, with 3-4 pulls of the trigger within a 2 second window. Otherwise, the engine will automatically idle down after 4-5 minutes if there is no change in water or vacuum pressure.

Apply 2-3 pulls of the tool trigger to return the engine to the cleaning speed.

Turn the E-Idle™ switch off when cleaning is complete or if you wish to clean without the use of the E-Idle™ function.

CLEANING

While cleaning, observe the following guidelines:

- Before cleaning, ensure that the wand nozzles are functioning properly.

Hold the wand approximately one foot above the surface to be cleaned and open the wand valve. A full even spray should emit from the cleaning nozzles. If the nozzles are not showing a full even spray pattern, adjust, clean, or replace the nozzles, if required.

- Usually, chemical solution is applied during the push stroke of the wand during cleaning, and extraction is done on the pull stroke. For heavily soiled carpets, the wand may be used in a scrubbing action, with chemical solution applied in both push and pull strokes, provided that the final stroke is a pull stroke with no chemical injection.

UPHOLSTERY CLEANING

Run unit at a low speed. Upholstery tools have a lower flow rate and smaller orifices. Set the temperature control dial to the UPHOLSTERY setting. To maintain proper cleaning temperatures, make certain that the unit has been fully heated up prior to cleaning.

STAIR TOOL CLEANING

Run unit on low speed. Set the temperature control switch to the desired temperature range – HI for single wand operation or DUAL TOOL for dual wand operation.

FLOOD RESTORATION/EXTRACTION

Set the engine speed. Make certain that the solution pump switch is in the OFF position. Proceed into the extraction process.

MULTIPLE WAND OPERATION

Multiple wand operation will alter vacuum and solution rates. The chemical flow rates may be set slightly higher for dual wand operation. Always use the LOWEST flow rate that properly cleans the affected areas. Excessive chemicals can cause damage to the items being cleaned. For standard cleaning operation with two or three tools, run the unit on high speed with the temperature control switch set to DUAL TOOL.

GAUGE READINGS AND SETTINGS

VACUUM PRESSURE GAUGE

With the unit running, the vacuum gauge should read near zero with vacuum hoses disconnected from the vacuum inlets. If the gauge shows a reading, check the filter in the waste tank and the strainer baskets in both the waste tank and pre-filter box for debris. With vacuum ports sealed, and machine running at high speed, the vacuum gauge should read 11 to 14 inches of mercury (in. Hg). This is preset by the factory for the maximum safe operation. Depending on elevation, this may need to be reset at time of installation.



DO NOT exceed 14 in. Hg vacuum pressure. This can cause damage to the vacuum pump.

TEMPERATURE GAUGE

The UPHOLSTERY temperature setting is for upholstery and delicate cleaning. Set the temperature control dial to HI for single wand normal operation. The DUAL TOOL temperature setting is for multiple wand operation or the use of a powered cleaning tool, such as the Legend Brands HOSS. If a lower temperature is desired, open the manual bypass valve on the control panel until the desired temperature is obtained. The highest temperatures will be achieved with the valve closed.

WATER PRESSURE GAUGE

Water pressure is set by adjusting the pressure regulator valve on the lower front panel for the desired water pressure. Normal settings are as follows:

- 200 PSI for upholstery cleaning
- 450 to 600 PSI for standard carpet cleaning (depending on hose lengths and tools used)
- 1000 to 1200 PSI for hard surface tile & grout or painted concrete
- UP TO 2500 PSI maximum for bare concrete

CHEMICAL FLOW METER

The flow meter reads the flow rate from the chemical jug while the chemical is being drawn. The chemical adjustment should normally be set at 1 or 2 GPH for a normal job and at 2 or 3 GPH for an extremely dirty job. Adjust accordingly for alternate recommendations from chemical manufacturers.

NOTE: The setting is also dependent on the type of chemical used and the concentration ratio of chemical to water.

Always use the LOWEST flow rate that properly cleans the affected areas. Excessive chemicals can cause damage to the items being cleaned.

SHUT DOWN AND DAILY MAINTENANCE

1. Flush out the chemical system with fresh water to remove any chemical residue.
2. Remove as much moisture from the vacuum hoses as possible to prevent spillage of wastewater in your vehicle when returning hoses. Disconnect the vacuum hose from the front of the unit.
3. Switch the engine speed to the IDLE position.
4. Switch the temperature control switch to the UPHOLSTERY setting.
5. Allow the unit to run for at least 5 minutes with the manual bypass valve open. This will also help to remove any excess moisture from the vacuum pump and cool the unit down.

NOTE: If shutting down for the day: Plug the vacuum inlet on the front of the unit and set the engine speed to HI. Spray a quality silicone or Teflon/PTFE based lubricant into the lubrication cup for 5 seconds. Let machine run 2 minutes to disperse evenly into the blower.

6. Unplug the vacuum inlet and remove load. Make sure the engine speed is at IDLE, and let idle for 3 to 5 minutes.
7. Turn the ignition switch to the OFF position.
8. If on, turn the E-Idle™ switch to the OFF position.
9. Turn the water supply faucet off. Loosen the water supply hose at the water supply to bleed off any pressure. Unhook the water supply hose and return it to the vehicle.
10. Activate the valves on all cleaning tools. This will relieve any remaining pressure. Disconnect the cleaning tools and solution hoses and return them to the vehicle.
11. Drain the waste tank, disposing of wastewater in a suitable and proper location.
12. Remove the strainer basket from the pre-filter box. Clean out any debris and re-install.
13. Remove the strainer basket from the waste tank. Clean out any debris and re-install. Micro-ban QGC cleaner is the best product for cleaning and sanitizing the waste tanks as well as other parts of the system.
14. Inspect the vacuum inlet filter inside the waste tank daily. Remove and clean the filter if there is any lint or debris present.
15. At the end of the work day, rinse out the waste tank with fresh water. Microban QGC cleaner as the best product for cleaning and sanitizing the waste tanks as well as other parts of the system.
16. Clean the vehicle interior, unit, tools, hoses etc., as needed. Inspect ALL equipment and accessories for any damage, leaks, wear, etc.

FREEZE PROTECTION / DESCALING

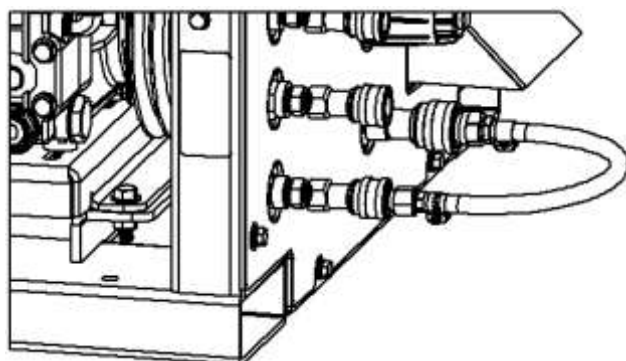
If the unit is exposed to freezing weather conditions, the water inside of the unit may freeze, resulting in **SERIOUS DAMAGE** to the unit. The following is recommended to prevent this from occurring during the cold weather season:

1. Always park the unit in a heated building when not in use.
 2. While out in operation, avoid long periods of shut down as the unit generates heat while running. Keep the unit running just prior to leaving for the next job.
 3. If a heated building is not available, winterize the unit with anti-freeze.
- It is not possible to winterize units that have auxiliary water tanks. If the unit has an auxiliary water tank(s), it must be stored in a heated building.

Hard water deposits will damage the plumbing and heat exchange systems on this unit if not maintained. Legend Brands recommends using a high quality water softener with a minimum flow capacity of 5 GPM in areas where hard water exceeds 3.5 grains. Descaling the unit every three to six months will help prevent calcium deposits or scale build-up in your system. The process for descaling your unit is almost identical to winterizing and are integrated below.

WINTERIZING AND DESCALING YOUR UNIT

1. Disconnect your water supply. If you have an on-board water supply, fully drain it when your unit is down for long periods.
2. Run the unit on low to extract as much water as possible. This can be done through the bypass valve or an open-ended hose connected to the solution outlet. Turn the unit off. If using the bypass valve, ensure that valve is turned off.
3. Add one gallon of a minimum dilution of 50/50 or 100% glycol based anti-freeze or descaler (follow directions on the bottle of descaling agent of your choice for exact amounts) directly into the water box.
4. Turn the pressure regulator all the way down. Start the unit in idle, turn the solution pump switch to the ON position and run coolant/descaler through the system. Allow the unit to run for about 3 minutes to fully circulate the coolant/descaler.
5. Create a loop with a winterizing hose by connecting one end to the water inlet and the other end to a solution outlet on the front of the unit. You can purchase a pre-assembled winterizing hose from Legend Brands, part number 68-423. Alternatively, you can make a short hose with a 1/4" male quick connect to a 3/4" male quick connect.



SECTION FOUR – SERVICE AND MAINTENANCE

6. (Skip this step if descaling) Prime the chemical injection system with a minimum dilution of 50/50 or 100% glycol based antifreeze. Insert the chemical inlet and prime tube into the anti-freeze container. Turn the chemical valve to PRIME until anti-freeze comes out of the prime hose. Turn the chemical valve to the ON (chemical) position. Ensure that the flow meter indicates flow while the attached tools solution valves are opened. Ensure that all anti-freeze that comes out of the chemical hose goes into an approved container.
7. (Skip if descaling) After 25 seconds, turn the chemical valve to the OFF position.
8. If descaling, run an alkaline through the system. Open the manual bypass valve to recover the rinse cycle.
9. Turn the solution pump switch to the OFF position and turn the ignition switch to the OFF position to turn off your unit.

WINTERIZING THE HOSES AND TOOLS WITH ANTIFREEZE

1. To winterize your hoses and tools, connect all hoses to the solution outlet. Connect a tool to the hoses. Make sure that the tool will drain into an approved container.
2. Make sure the pressure regulator is turned all the way down. Start the unit in idle and turn the water pump on. Open the tool valve until anti-freeze begins to flow from the tool. Repeat this procedure with all hoses and tools as necessary. Disconnect and store the hoses and tools once they have been filled with anti-freeze.

REMOVING ANTI-FREEZE FROM THE UNIT

1. Connect the solution hoses to the unit, with a tool attached to the opposite end. Start the unit. Turn the water pump on. Open the tool valve and ensure that the anti-freeze goes into an approved container. Allow the anti-freeze to flow into the container until all anti-freeze has been drained.
2. Fill the water box with fresh water and repeat step 1.
3. Connect the water inlet hose to the unit and turn the water supply on. Connect all tools and solution hoses that were winterized to the solution outlet connection.
4. Open all tool valves and drain the anti-freeze into an approved container until the water runs clear and all of the anti-freeze is purged from the hoses and tools.
5. Insert the chemical prime hose into the approved container. Submerge the chemical hose into fresh water. Turn the chemical valve to the PRIME position until the water runs clear through the prime hose. Remove the prime hose from the container.
6. Turn the chemical valve to the ON (chemical) position and open attached tools solution valves. This will allow water to flow to the other side of the system.
7. After all of the anti-freeze has been removed, the unit is ready to operate.

The anti-freeze in your approved storage container will eventually become diluted with water. When the anti-freeze level drops below 40% of the total mixture, properly dispose of it and start over with fresh anti-freeze.

SECTION FOUR: SERVICE AND MAINTENANCE

EVEREST 870HP MAINTENANCE CHART

DAILY MAINTENANCE

Engine	Check engine oil level. Fill to proper level.
Engine	Check coolant level in reservoir. Fill to proper level.
Vacuum Pump	Check vacuum pump oil level. Fill to proper level. Do not overfill. (1)
Vacuum Pump	Spray a silicone or Teflon/PTFE based lubricant into the lubrication cup for 5 seconds.
Pressure Pump	Check water pump oil level. Fill to proper level. (2)
Vacuum Inlet Filters	Inspect filters in the waste tank, clean and or replace if required. (1)
Strainer Baskets	Empty and clean stainless steel baskets in the pre-filter box and waste tank.
Vacuum Hoses	Rinse with fresh water.
Waste Pump-Out	(Optional equipment) Inspect and remove any debris or sediment. (1)

WEEKLY MAINTENANCE

Float Switch(es)	Clean and inspect float switch(es) in the waste tank.
Visual Inspection	Check for leaks around the unit, check wires and hoses for wear.

MONTHLY MAINTENANCE

Engine	Check air filter for damaged, dirty or loose parts.
Engine	Inspect drive belts for wear. Replace as needed.
Battery	Check fluid level and battery terminals. (1)
Check Valve Strainer	Clean and remove debris (1, 3)
Check fasteners	Check fastener tightness on all components. Tighten as needed.

YEARLY MAINTENANCE

Check-Valve	Check seat for abnormal wear or debris. Replace as needed.
-------------	--

To maximize the operating life and performance, use only recommended oils, filters and greases.

(1) Or as often as required.

(2) Change water pump crankcase oil after **first 50 hours** of operation.

(3) Inspect after **first week** of operation, and remove any debris present. Inspect again after **2 to 4 weeks**.

EVEREST 870HP SERVICE INTERVAL CHART**SERVICE INTERVALS – EVERY 50 HOURS**

High Pressure Hoses	Inspect hoses for wear, damage or impending rupture. Replace if damaged.
Engine	Tighten bolts and nuts on all exhaust parts.
Engine	Check fuel hoses and clamps.

SERVICE INTERVALS – EVERY 100 HOURS

Engine	Inspect and clean air filter element. Replace if damaged. (6)
Vacuum Relief Valve	Check and adjust vacuum relief valve up to 13” Hg if needed.
Pressure Regulator	Lubricate o-rings. Use only o-ring lubricant. (Legend Brands P/N 13-003)
Belts	Re-tension all belts. (1)
Battery	Clean battery terminals.

SERVICE INTERVALS – EVERY 200 HOURS

Engine	Inspect radiator and hoses. (6)
Engine	Change engine oil and filter. (2)
Engine	Check fan belt condition and tension.

SERVICE INTERVALS – EVERY 250 HOURS

Chemical Metering	Inspect packing nut on selector and metering valves. Adjust as needed.
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SERVICE INTERVALS – EVERY 500 HOURS

Pressure Pump	Change crankcase oil. (3)
Engine	Replace in-line fuel filter. (5) (6)
Engine	Change coolant.
Pulleys and Hubs	Check pulleys and hubs for proper torque. (4)
Chemical Pump	Change diaphragm and check valves. Inspect disc.

SERVICE INTERVALS – EVERY 1000 HOURS

Vacuum Pump	Drain, flush and replace oil. (5)
Engine	Check and adjust valve clearance.
Engine	Replace spark plugs. Use only OEM spark plugs.

SERVICE INTERVALS – EVERY 2000 HOURS

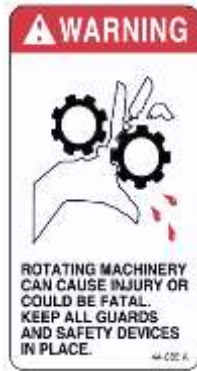
Belts	Replace all belts.
Engine	Replace air filter element. (5)

To maximize the operating life and performance, use only recommended oils, filters and greases.

- (1) Re-tension belts after **first 25 hours**, then every **100 hours** of operation after.
- (2) Change engine oil and oil filter after **first 50 hours** of operation and then **every 200 hours**.
- (3) Change water pump crankcase oil after **first 50 hours** of operation, then **every 500 hours**.
- (4) Check pulley and hub set screws after **first 50 hours** of operation, and again at **100 hours** of operation.
- (5) Or **yearly**, whichever comes first.
- (6) Increase intervals in dusty conditions.

MAINTENANCE AND SERVICE ADJUSTMENTS

This section of the operator's manual contains the service and maintenance information for the Everest. A planned preventative maintenance program will ensure that your Everest has optimum performance, long operating life, and a minimum amount of down time.



WARNING

DO NOT attempt to service this unit while it is running. High speed parts as well as high temperature components may result in severe injury, severed limbs, or fatality.

NOTE: Refer to the hour meter as a guide for coordinating a maintenance schedule.

ENGINE

- **Check engine oil daily.** Ensure that the proper oil level is maintained. Never overfill.
- Change the oil after the **first 50 hours** of operation. Thereafter, change the oil and filter **every 200 hours** of operation. Use only OEM oil filters. Use of any other type of oil filter will void engine warranty.
- Use high-quality oil of at least API (American Petroleum Institute) service class SG or higher. **Do not use additives.** High quality SAE 30 or SAE 10W-30 oil is recommended in extreme hot climates due to ambient temperature increase inside the vehicle during operation. It is never recommended to extend oil change intervals past 200 hours.

NOTE: Using lower service class oil or extending oil change intervals longer than recommended can cause engine damage.

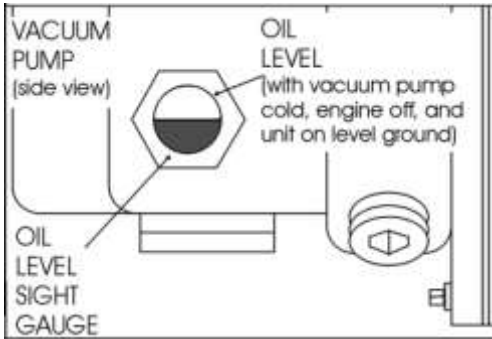
Engine Oil Capacity	6.0 L / 6.34 US qt.
Radiator/Engine Coolant Capacity	5.6L / 1.5 US gallons (6.0 US qt)
Reservoir Bottle	1.89 L / 2.0 US qt.

- Check all hoses and clamps, bolts, nuts and screws **every 50 hours**. Replace/tighten as needed.
- Check the coolant reservoir level **daily**, fill as needed. Change the coolant **every 500 hours**. Inspect the radiator and hoses for leaks **every 200 hours**.
- Inspect and clean the air filter element **every 100 hours**. Replace the element if damaged or **every 2000 hours or yearly**, whichever comes first.
- Check fan belt condition and tension **every 200 hours**.
- Replace the spark plugs **every 1000 hours** or as needed. Use only OEM specified spark plugs.
- Check and adjust valve clearances **every 1000 hours**.
- Change coolant **every 500 hours**.
- Replace the inline fuel filter **every 500 hours or yearly**, whichever comes first.

VACUUM PUMP

NOTE: Refer to the provided vacuum pump Operation and Service Manual for specific instructions.

- Check the oil level on the gear side **daily** to ensure the proper level is maintained. Too little oil will damage and ruin the bearings and gears. Too much oil will result in overheating.



Legend Brands requires that you use only AEON PD-XD Synthetic Blower Lubricant in both sides of the vacuum pump for all operating temperatures. AEON PD-XD is formulated specifically for positive displacement blower service to provide maximum blower protection at any temperature. AEON PD-XD (Legend Brands Part # 13-004) is the only oil that Legend Brands puts in the vacuum pump at the factory. Adding petroleum oil to synthetic oil is NOT recommended.

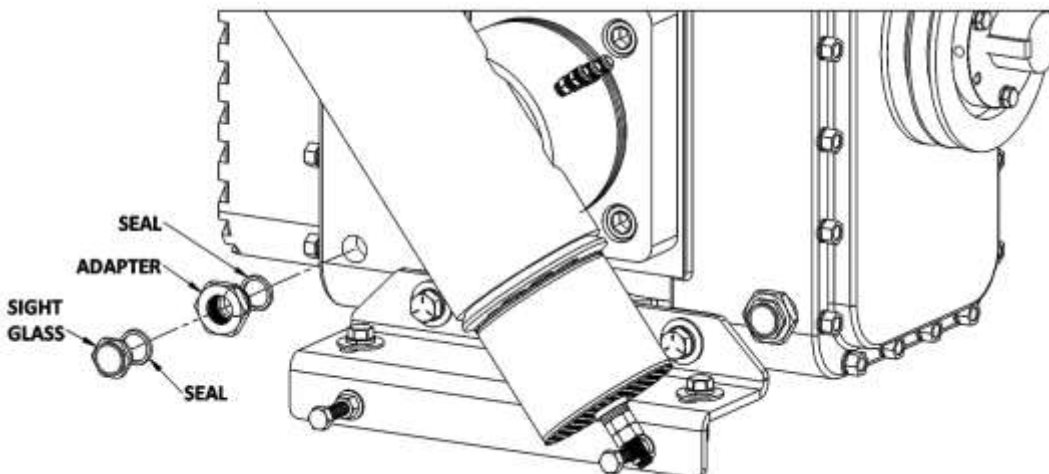
- A lubrication cup has been provided at the front of the console, to prevent rust from building up inside of the vacuum pump. Run the unit for at least 2 minutes to remove any moisture from the vacuum pump. Then, spray a quality silicone or Teflon/PTFE based lubricant into the lubrication cup for 5 seconds while the unit is running and the vacuum inlet port is sealed. This procedure should be done at the **end of every working day**.
- Drain, flush and replace the oil **every 1000 hours or yearly**, whichever comes first.

NOTE: A suction pump is required to remove all the oil from the vacuum pump.

Vacuum Pump Oil Capacity

Shaft End	1.44 pint (23 oz)
Gear End	3 pints (49 oz)

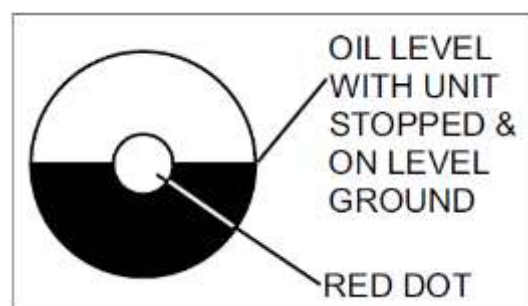
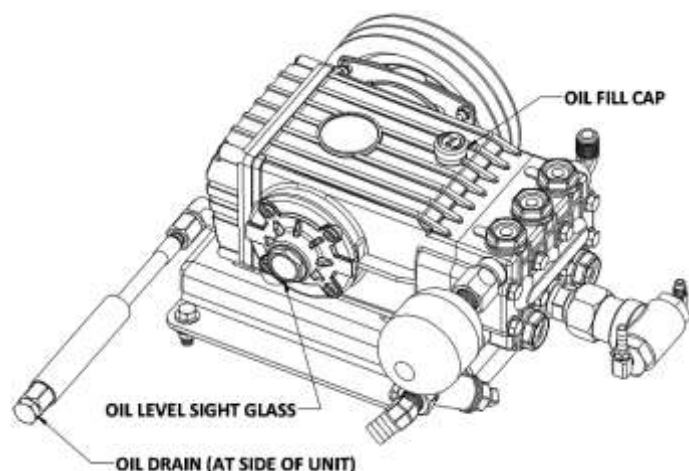
- Place a catch basin beneath the sight glass.
- Carefully remove the sight glass and seal to drain the oil down as much as possible.
- Once the oil has drained, remove the sight glass adapter and seal.
- Using a curved tube or hose as a guide, insert a suction pump hose until it reaches the bottom of the oil reservoir.
- Remove the remaining oil using the suction pump.
- Repeat this process to complete both sides of the vacuum pump.



PRESSURE PUMP

NOTE: Refer to General Pump online documentation for further instructions.

- Check the crankcase oil level **daily** to ensure the proper level. If the level has dropped, check for the source of leakage and repair.



Pressure Pump Oil Capacity	40.6 oz.
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- After the **first 50 hours** of operation, change the crankcase oil Industrial Pump Oil, (Part # 13-030). Change the crankcase oil **every 500 hours** thereafter.

DRIVE BELTS, PULLEYS AND HUBS

Check pulley and hub screws after the **first 50 hours** and again at **100 hours** of operation. Re-torque these bolts with a torque wrench. Follow the torque values on the following table. Check pulley set screws and hub screws **every 500 hours** thereafter.

Ensure belts are properly tensioned after checking the torque values. Use only Gates EPDM belts.

Use a clockwise pattern when re-torquing screws and continue until the proper torque is achieved.

Pulley Hub Torque Values		Notes
Engine lower front pulley M14 retaining bolt	2100 in lb / 175 ft lb	
Engine lower front pulley M6 grade 8.8 screws	72 in lb / 6 ft lb	Apply blue Loctite
Engine cooling fan M6 grade 10.9 screws	96 in lb / 8 ft lb	Apply blue Loctite
Engine rear drive pulley M10 grade 10.9 bolts	480 in lb / 40 ft lb	Apply blue Loctite
Vacuum pump pulley bushing 5/16" screws	180 in lb / 15 ft lb	Apply blue Loctite

Belt Tensions	Deflection	New	Used
Gates Tri-Power EPDM 5VX vacuum pump belts	3/16"	10-14 lbs.	5-8 lbs.
Gates Tri-Power EPDM AX pressure pump belts	1/4"	4-6 lbs.	3-4 lbs.
Kubota 16241-9701-3 (37") cooling fan v-belt	0.28 - 0.35"	22 lbs.	

VACUUM PUMP BELT REPLACEMENT

Only use Gates EPDM belts

1. Disconnect the negative battery cable.
2. Remove belt guard rear cover and lower side belt guard.
3. Loosen the hose clamp on the hose between the blower and silencer.
4. Loosen the four blower mounting bolts*.
5. Loosen the jam nuts on the blower adjustment bolts, then turn the bolts counterclockwise to allow the blower to be pushed towards the center of the unit to loosen the belts.
6. Remove both belts. Install new belts.
7. After belts have been installed, follow the step above in reverse. Check for proper tension and alignment.
8. Check pulleys for alignment using a straight edge. Make sure pulley flange touches on 2 places on each pulley (4 total places).

* To loosen the inside blower belts, use two long extension bars, no less than 36 inches in combined length, one solid and one wobble socket.

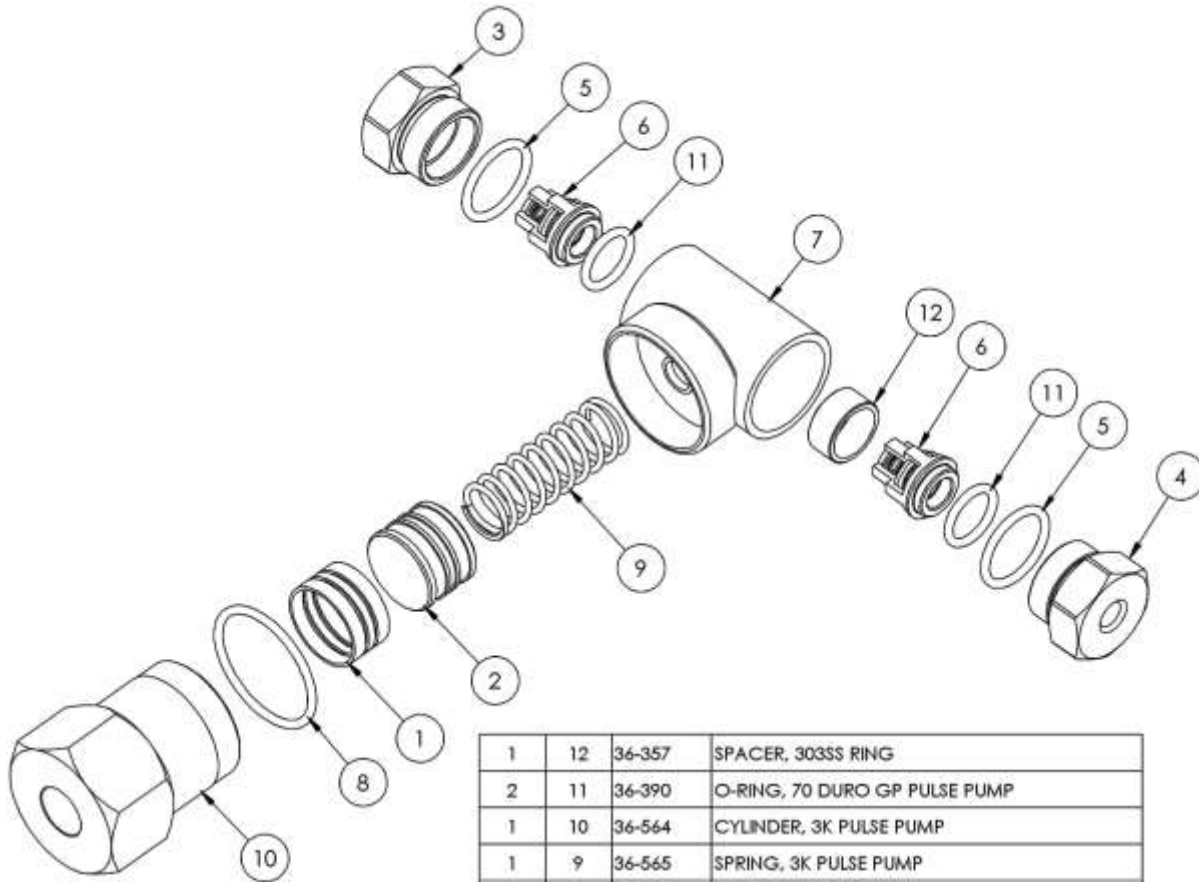
WATER PUMP DRIVE BELT REPLACEMENT

Use only Gates EPDM belts

1. Disconnect the negative battery cable.
2. Remove the left side hood.
3. Remove the lower front panel.
4. Loosen the four nuts that hold the water pump base to the riser plate.
5. Turn the tensioning bolt counterclockwise to push the pump towards the center of the unit to loosen the belt.
6. Remove the belt. Install new belt.
7. After the belt has been installed, follow the above steps in reverses. Check for proper tension and alignment.
8. Check pulleys for alignment using a straight edge. Make sure pulley flange touches on 2 places on each pulley (4 total places).

CHEMICAL PUMP

The chemical pump should be rebuilt **every 500 hours**. This involves changing the check valves, replacing the o-rings, and inspecting the piston. **DO NOT** attempt to reuse o-rings after the check valves have been removed. Replace all o-rings when servicing check valves.



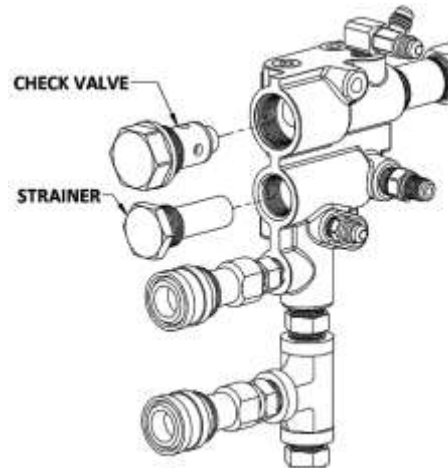
1	12	36-357	SPACER, 303SS RING
2	11	36-390	O-RING, 70 DURO GP PULSE PUMP
1	10	36-564	CYLINDER, 3K PULSE PUMP
1	9	36-565	SPRING, 3K PULSE PUMP
1	8	36-566	O-RING, BUNA -126
1	7	36-567	BODY, 3K PULSE PUMP
2	6	36-568	ASSY, VALVE 3K PULSE PUMP
2	5	36-569	O-RING, 1.051 ID X .070 CS
1	4	36-570	VALVE CAP, INLET 3K PULSE PUMP
1	3	36-571	VALVE CAP, OULET 3K PULSE PUMP
1	2	36-572	PISTON, 3K PULSE PUMP
1	1	36-573	SEAL KIT, PISTON 3K PULSE PUMP
QTY	ITEM	PART NO.	DESCRIPTION

SOLUTION MANIFOLD CHECK VALVE AND STRAINER

Unscrew the screen and inspect the strainer after **the first week** of operation. Remove any debris present. Inspect again **after 2 and 4 weeks**. Thereafter, inspect the strainer and screen at least **monthly**. If a frequent build-up of debris is noticed, inspect and clean more frequently.

Always inspect the check valve and solution manifold strainer whenever performing service on the chemical pump or if flow problems are occurring in the chemical system.

1. Shut down Unit.
2. Remove and clean strainer mesh.
3. Remove the check valve, ensuring that the small o-ring on the seat comes out with it.
4. Next, remove the seat using a 5/16 in. Allen wrench.
5. Check the seat for wear or debris. Clean and replace the seat if necessary.
6. Inspect the poppet and the spring for wear or damage. Clean and replace as necessary.
7. Re-assemble the check valve. Thread the seat by hand until snug. Then tighten with a 5/16 in Allen wrench. **DO NOT** over-tighten.
8. Lubricate the new o-rings with o-ring lubricant (Part # 13-003) and re-install.



NOTE: New o-rings must be installed **anytime** the check valve is removed.

NOTE: Improper seating of the check valve seat, poppet, damaged spring or o-rings will result in poor performance of the chemical system.



23-063 ASSEMBLY, CHECK VALVE MANIFOLD

Item #	P/N	Qty.	Description
1	27-009	1	CAP, CHECK VALVE ASSY. SS
2	41-007	1	ORING, 7/8 ID X 1-1/16 OD
3	15-007	1	SPRING, CHECK VALVE ASSY.
4	27-010	1	POPPET, CHECK VALVE ASSY
5	27-004	1	INSERT, SEAT-CHK VLV ASSY TM
6	27-011	1	SEAT, CHECK VALVE ASSY.
7	41-008	1	ORING, ½ ID 5/8 OD

PRESSURE REGULATOR

The pressure regulator holds water pressure at a preset point and bypasses the excess water.

To adjust:

With the unit running, with the cleaning tool valve closed, the pressure gauge should read 0. With the tool valve open, adjust the pressure by turning the adjusting knob so that the pressure gauge reads between 0 - 2500 PSI.



WARNING

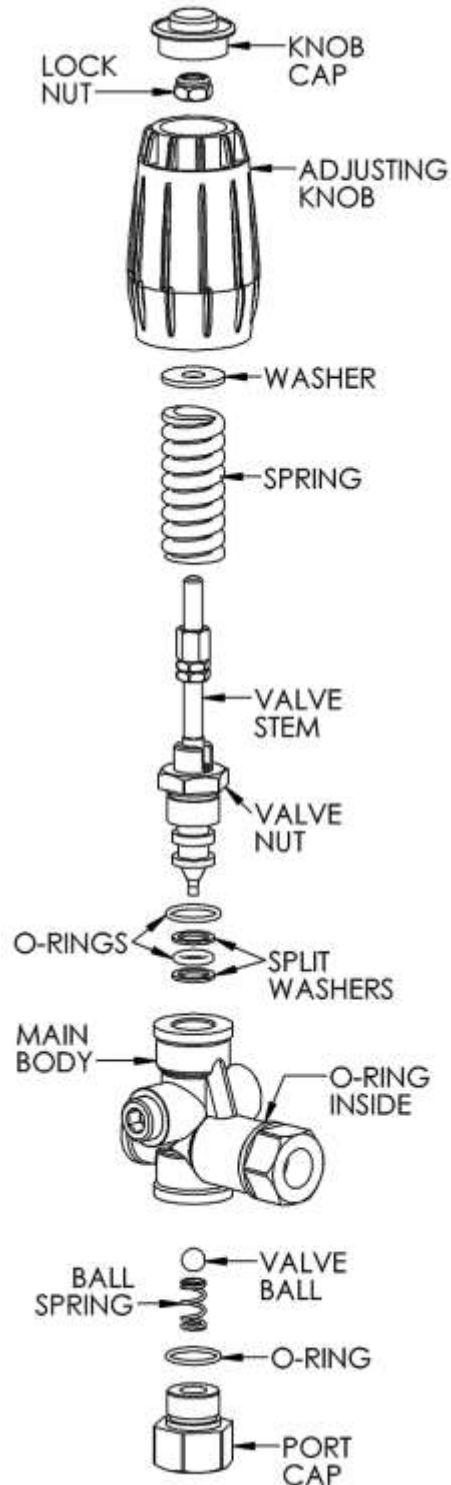
DO NOT loosen the adjusting body (cap) all the way (counterclockwise) or remove it while the unit is running.

Lubricate the o-rings in the pressure regulator **every 100 hours**.

Use only o-ring lubricant (Part #13-003).

If you do not, the stem may become seized due to inadequate lubrication. If this occurs:

1. Shut down the unit.
2. Relieve all pressure from the water system.
3. Loosen the valve nut and remove the valve stem with long nose pliers.
4. Clean and lubricate stem.
5. Reassemble pressure regulator.
6. Check the port cap o-rings for proper lubrication as well.

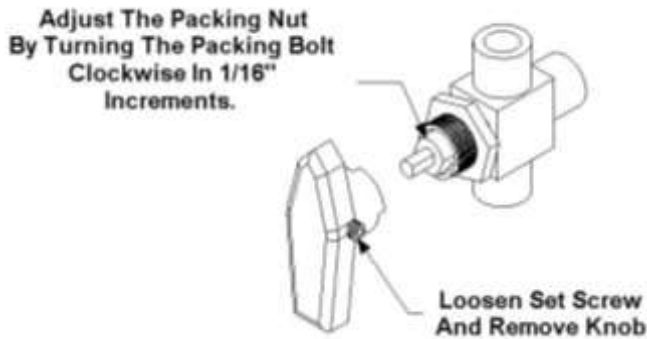


CHEMICAL METERING SYSTEM

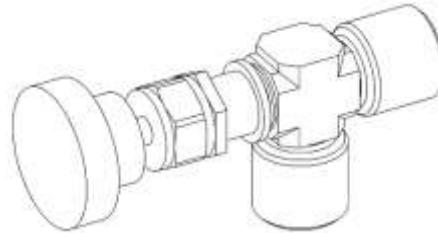
Check and inspect the packing nut on the chemical selector and metering valves **every 250 hours**. Keeping the valve packing's properly adjusted will prevent leaks and add to the overall life of the valves.

When turning the knob, there should be some resistance. If not, slightly tighten the packing nut. DO NOT over tighten. Keeping the packing properly adjusted will eliminate possible leaks and will add to the overall life of the valves.

23-027, CHEMICAL SELECTOR VALVE

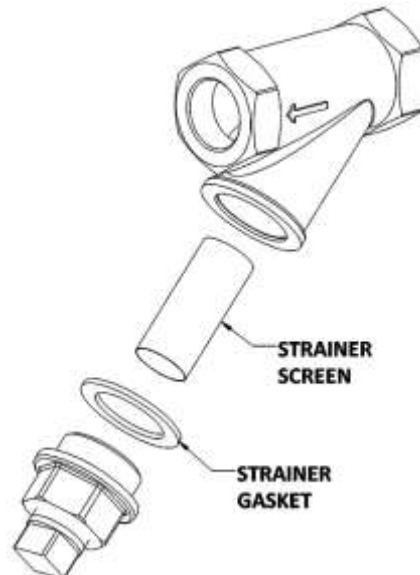


23-028, CHEMICAL METERING VALVE



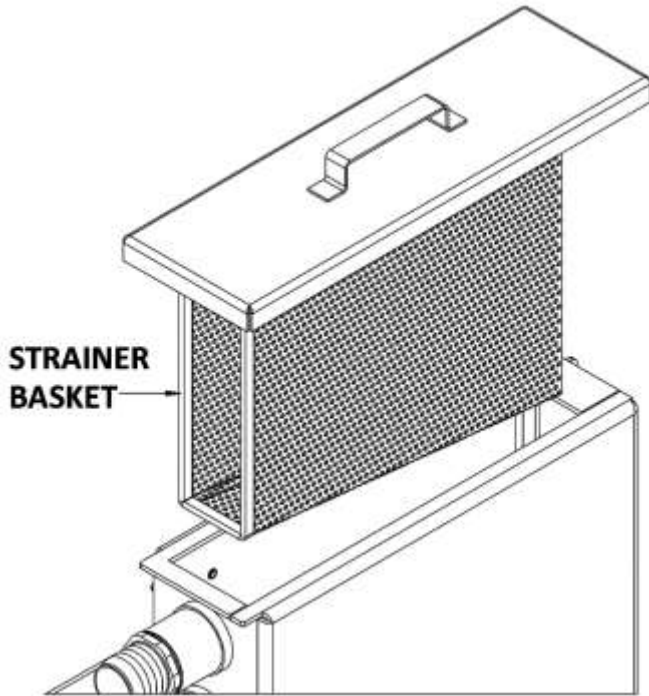
WYE STRAINER

Water heading to the pressure pump from the heat exchanger passes through a wye strainer stainless steel mesh screen. The wye strainer captures incoming debris and will restrict water flow when clogged. Inspect and clean at least once a month or as needed. Hard water deposits can build and reduce water flow.



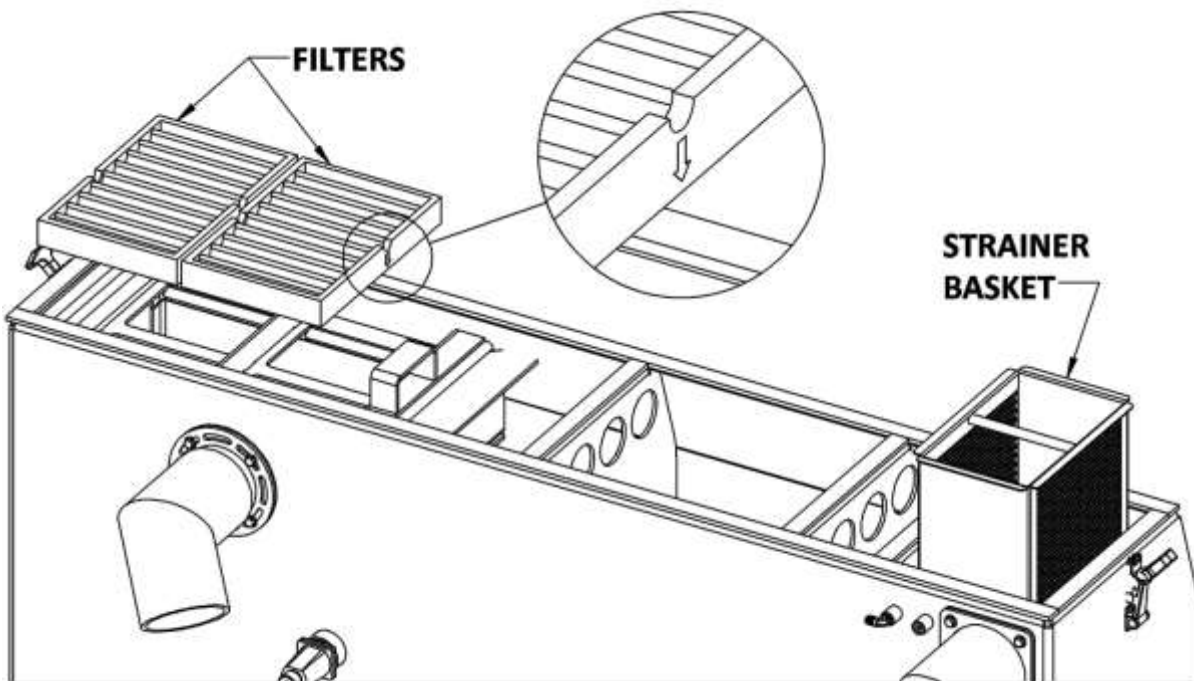
PRE-FILTER BOX STRAINER BASKET

The pre-filter box strainer basket should be removed, inspected and cleaned **daily**.



WASTE TANK FILTERS AND STRAINER BASKET

The waste tank filters and strainer basket should be removed, inspected and cleaned **daily**. When replacing the filters, ensure that the flow indicating arrow is pointing down.



BATTERY



Explosive gases, Dangerous acid!

Batteries contain sulfuric acid. To prevent acid burns, avoid contact with skin, eyes and clothing. Batteries also produce explosive hydrogen gases while charging. To prevent fire or explosion, charge batteries only in a well ventilated area. Keep sparks, open flames, as well as any other sources of ignition away from batteries at all times. Remove all jewelry prior to servicing batteries.

Before disconnecting the negative (–) ground cable, ensure that all switches are in the OFF position. If ON a spark could occur at the ground connection terminal, which could cause an explosion if hydrogen gas or gasoline vapors are present. ALWAYS disconnect the negative (–) terminal first.

- If you do not have a maintenance free sealed battery, check the fluid level in the battery at least once a week. If low, fill to the recommended level **ONLY** with distilled water. **DO NOT** overfill the battery. Early failure or poor performance will result due to loss of electrolyte.
- Keep cables, terminals and external surfaces of the battery clean and dry. A buildup of corrosive acid or grime on the external surfaces could cause the battery to self-discharge.
- Battery terminals should be cleaned every 100 hours to prevent corrosion buildup. Wash the cables, terminals and external surfaces with a mild baking soda and water solution. Rinse thoroughly with fresh water. **DO NOT** allow baking soda to enter the battery cells, as this will destroy the electrolyte, resulting in battery failure.

VACUUM HOSES

To ensure maximum hose life, Legend Brands recommends that you wash out the hoses with fresh water **daily**. Micro-ban QGC cleaner as the best product for cleaning and sanitizing the wands and hoses as well as other parts of the system.

HIGH PRESSURE SOLUTION HOSES

Inspect your high-pressure solution hoses for wear after the **first 100 hours**. Thereafter, inspect **every 50** hours. If the hoses show any signs of damage or impending rupture, replace the hoses.



NEVER attempt to repair high-pressure solution hoses. Repairing high-pressure solution hoses may result in severe burns and serious injury.

All high-pressure solution hoses must be rated for 3000 PSI at 250 deg. F. Thermoplastic hoses do not meet this requirement and should not be used. Severe burns and injury may result if the hoses do not meet these requirements.

INSTRUMENT PANEL ACCESS

To access the rear of the instrument panel for maintenance:

1. Remove the lower front-end bezel by removing the four (4) mounting screws (shown in Figure 1). Carefully set the bezel aside.
2. To access the right-side electrical panel, remove the four screws holding the panel to the front of the unit (shown in Figure 2). If more access is required for the gauge/chemical side, remove all eight screws holding both sides of the panel in place.
3. You can now fold down the electrical right-side of the panel to access the wiring harness, Thermallogic control box and E-Idle™ control box (shown in Figure 3). Do not fold down the left gauge/chemical side of the panel without first folding down the right electrical side.
4. Follow these instructions in reverse to close up the unit.

NOTE: Do not over tighten the screws holding on the upper and lower front bezel, doing so may damage these components.

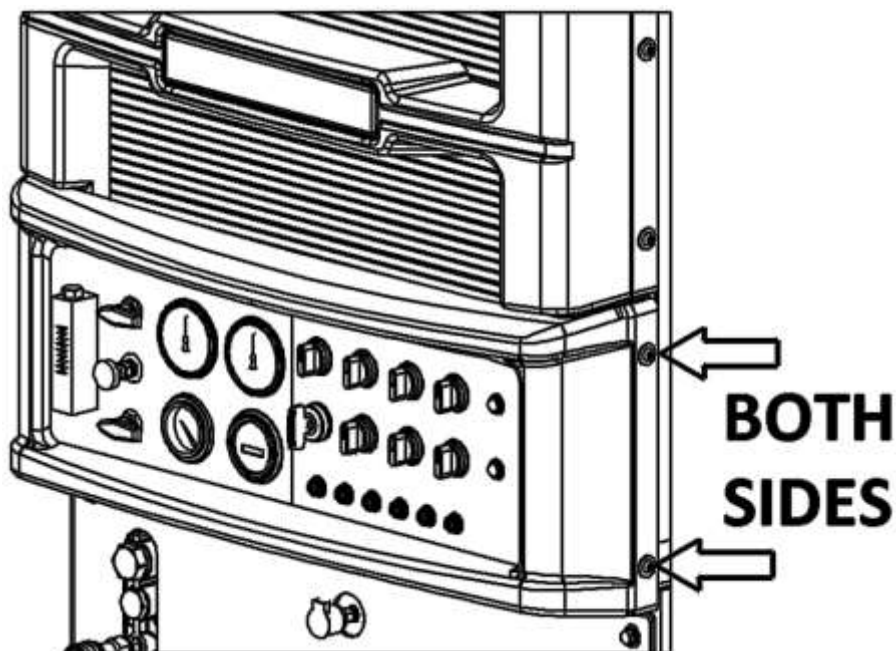


Figure 1 – Remove lower bezel screws

INSTRUMENT PANEL ACCESS

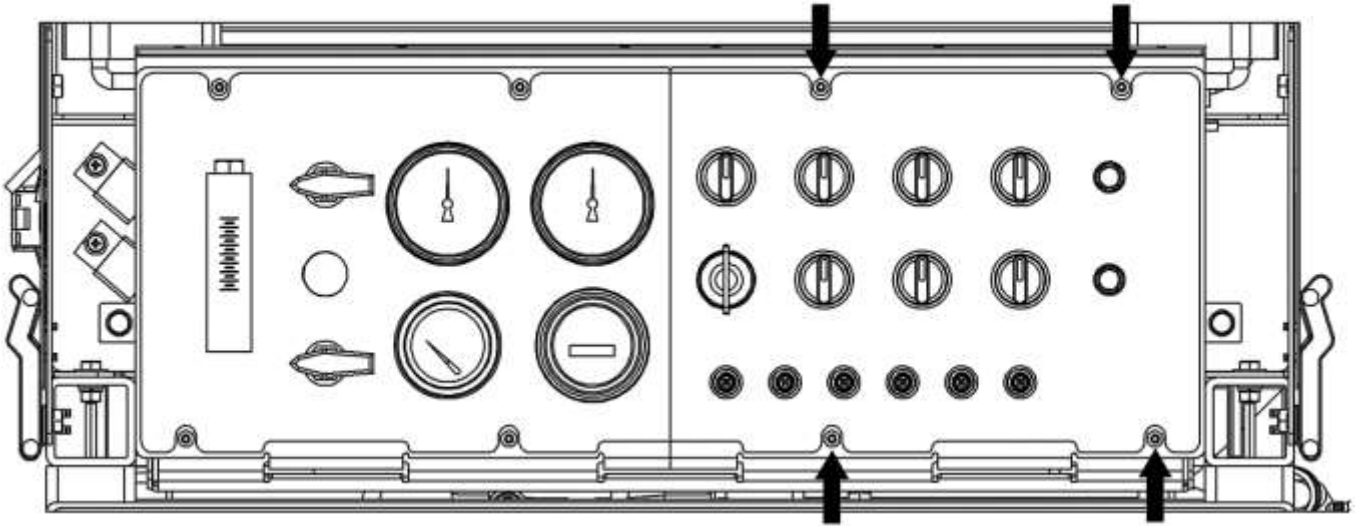


Figure 2 – Remove electrical side panel mounting screws

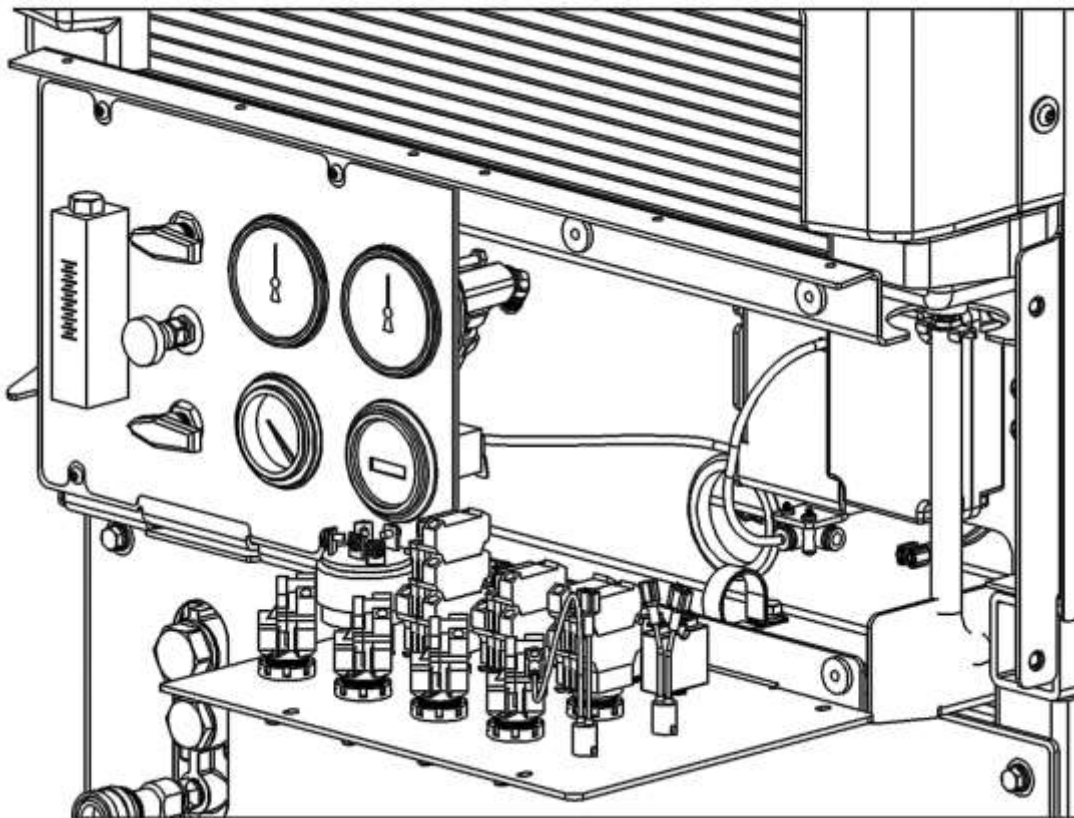


Figure 3 – Electrical side instrument panel access

TROUBLESHOOTING



DO NOT attempt to service this unit while it is running. High-speed parts as well as high temperature components may result in severe injury, severed limbs or fatality.

This section of the operator's manual describes how to look for and repair malfunctions, which may occur.

Accurate troubleshooting is based on a thorough and complete understanding of the WATER, CHEMICAL, VACCUM, HEAT TRANSFER, SAFETY and WIRING systems featured in this unit.

If there are malfunctions occurring on this unit which you do not understand, refer back to the OPERATION section of this manual and review SYSTEM.



Do not alter or modify your Everest in any way. Use only replacement parts authorized by Legend Brands. Modifications or use of unapproved parts could create a hazard and will void your warranty. Contact your authorized Legend Brands dealer for assistance.

ENGINE TROUBLESHOOTING

ENGINE WILL NOT START (STARTER DOES NOT TURN OVER)

PROBABLE CAUSE	SOLUTION
Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped breaker, press the reset button.
Loose or corroded battery connections.	Clean, tighten or replace the battery terminals.
Dead battery.	Recharge or replace battery
Defective ignition switch.	Test ignition switch for power going into the switch. If there is power going in, but none coming out, replace the switch.
Defective starter motor.	Test the starter motor. Replace if necessary.
Vacuum pump seized.	Refer to the vacuum pump manufacturer service and repair manual.

STARTER TURNS OVER BUT ENGINE WILL NOT START

PROBABLE CAUSE	SOLUTION
Recovery tank is full.	Empty the recovery tank.
Defective fuel pump.	Replace the fuel pump.
Loose or broken wires leading to the recovery tank float switch.	Repair or replace any broken electrical connections.
Defective float switch inside recovery tank.	Check switch for proper operation. Replace if necessary.
Shut-down relay is defective.	Replace relay.
Engine is malfunctioning.	Refer to the engine owner's manual.

ENGINE STOPS RUNNING DURING NORMAL OPERATION

PROBABLE CAUSE	SOLUTION
Engine is out of gasoline.	Check the fuel tank.
Recovery tank is full.	Empty recovery tank.
Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped breaker, press the reset button.
Defective fuel pump.	Replace fuel pump.
Defective float switch inside recovery tank.	Check switch for proper operation. Replace if necessary.
No ignition in the engine or the engine is malfunctioning.	Refer to the engine owner's manual.

ENGINE REMAINS IN LOW IDLE EVEN WITH E-IDLE™ SWITCH OFF

PROBABLE CAUSE	SOLUTION
Loose/poor wiring connection on E-Idle™ PCB terminal block.	Reconnect any loose wires on the terminal block.

E-IDLE™ DOES NOT FUNCTION (EITHER WILL NOT IDLE DOWN OR RESUME NORMAL SPEED)

PROBABLE CAUSE	SOLUTION
Loose/poor wiring connection on E-Idle™ PCB terminal block.	Reconnect any loose wires on the terminal block.
Loose connection of vacuum line.	Check/reconnect the vacuum hose connections between the E-Idle™ box and the rear of the pressure gauge on the instrument panel.
Tear in vacuum hose.	Replace vacuum hose.
Bad or faulty PCB.	Replace PCB.

VACUUM PUMP TROUBLESHOOTING**LOSS OF VACUUM** (while cleaning, engine RPM is normal but vacuum is lower than expected)

PROBABLE CAUSE	SOLUTION
Vacuum gauge is giving an improper reading.	Examine the tubing between the vacuum relief valve and the vacuum gauge and remove any blockage.
Vacuum hose(s) damaged, causing a suction leak.	Inspect hose(s), repair or replace.
Waste tank gaskets not sealing properly, not positioned properly.	Inspect the gasket. Repair seal or replace Re-position lid(s).
Plugged vacuum hose or vacuum plumbing between vacuum inlet and strainer basket.	Unplug vacuum hose or inlet plumbing.
Waste tank filter or strainer basket is plugged.	Clean or replace filter. Clean strainer basket.
Loose vacuum pump drive belts.	Tighten the drive belts.
Waste tank drain valve is damaged or left open, causing a vacuum leak.	Drain the waste tank. Close drain valve, if open. Replace valve if defective.
Vacuum relief valve requires adjustment or has a vacuum leak due to damaged diaphragm.	Re-adjust the vacuum relief valve. If the vacuum does not increase, remove and inspect the relief valve diaphragm. If damaged, replace.
Vacuum exhaust heat exchanger plugged.	Remove and clean.
Vacuum pump is worn out.	Replace the vacuum pump.

EXCESSIVE VACUUM (while cleaning, engine RPM is normal but vacuum is higher than expected)

PROBABLE CAUSE	SOLUTION
Vacuum relief valve requires adjustment.	Readjust vacuum relief valve to 13" Hg.
Improper throttle adjustment.	Adjust throttle to set desired vacuum pressure.

PRESSURE PUMP TROUBLESHOOTING**LOSS OF SOLUTION PRESSURE (CLEANING TOOL OPEN, SOLUTION GAUGE READS LOW)**

PROBABLE CAUSE	SOLUTION
Water supply is turned off or the float valve is stuck.	Turn the water supply on or up. Check for kinks in the water supply hose. Examine the float or replace.
Solution pump inlet supply line is plugged or drawing air.	Examine filter screen inside the water box. Remove accumulated debris and replace if required. Check for suction leaks and loose clamps or fittings. Tighten any loose fittings or clamps. Replace any ruptured hose(s).
Improper engine speed.	Using a tachometer, check the engine speed.
Pressure regulator o-rings are dry and/or worn. See instructions on regulator.	Check o-rings. Lubricate and/or replace as needed, using o-ring lubricant.
Pressure regulator is dirty, stuck open, or improperly adjusted. See instructions on regulator.	Clean or repair regulator. Adjust to working pressure. Lubricate o-rings, using o-ring lubricant.
Low pump volume. (Measure the amount of water being returned to the water box from the pressure regulator. It should fill a gallon container about every 17.6 seconds).	Examine the check valves, plunger cups, and cylinder head on the water pump. Repair, whenever required (refer to the water pump service manual).
Defective water pressure gauge.	Replace gauge.
Orifice (spray nozzle) in the cleaning tool is worn, defective or wrong size.	Replace Nozzle or change nozzle size.
Debris clogging water lines or water inlet disconnect.	Clean or replace as needed.
Belts loose or broken.	Re-tension or replace as needed.
Loss of pump prime.	Manually prime water pump.
Temperature Balance Orifice missing.	Replace Orifice.

LOSS OF SOLUTION VOLUME AT TOOL (PRESSURE GAUGE READS NORMAL)

PROBABLE CAUSE	SOLUTION
Plugged orifice and/or screen in the cleaning tool.	Unplug or replace orifice and/or screen.
Internal block between the inlet pressure regulator and the solution outlet manifold, or the solution screen is clogged.	Inspect all lines, remove accumulated debris which is blocking flow. Replace any defective hoses. Remove, inspect, and clean the solution screen. De-scale unit and install a water softener, if necessary.
Outlet check valve is plugged.	Examine the check valve, remove any debris.
Defective quick-connect on one or more of the high pressure hoses.	Replace defective quick-connects(s) on high pressure hoses(s).
Cleaning tool valve is malfunctioning.	Repair or replace valve.
Hose inner lining is constricted.	Remove restriction or replace hose.
Air leak in chemical supply line, priming valve or metering valve.	Check for air leaks. Replace faulty parts.

SECTION FOUR – SERVICE AND MAINTENANCE

PRESSURE PUMP DOES NOT ENGAGE

PROBABLE CAUSE	SOLUTION
Pressure pump circuit breaker has been tripped.	Check the pressure pump circuit breaker on the control panel. Press the circuit breaker reset button.
Defective electrical connection in the console wiring or defective switch.	Examine switch, electrical connections, and wiring. Repair any defective connections. If there is power going to the switch but not going out, replace the defective switch.
Pressure pump has not been activated.	Turn pressure pump switch to on.
Defective pressure pump clutch.	If there is power in the switch, but not power at the clutch, replace the defective wire. If there is power at the clutch, replace the defective switch.
Loose or broken pressure pump belts.	Tighten or replace belts.

CHEMICAL SYSTEM TROUBLESHOOTING

CHEMICAL FLOW METER INDICATES FLOW WITH TOOL VALVE CLOSED

PROBABLE CAUSE	SOLUTION
External leak in chemical piping.	Tighten or replace fittings. Re-apply thread sealant where required.
Outlet check valve is full of debris or damaged, not allowing it to close properly.	Close the chemical valve on the instrument panel. If the flow meter does not indicate flow, remove debris or replace check valve, if necessary.
Internal leak in chemical valve causing continual flow through prime tube returning to container.	Tighten valve packing nut (see “General Service Adjustments”). Replace valve, if necessary.
Chemical flow valve is defective.	Replace valve.

LOSS OF CHEMICAL (CLEANING TOOL OPEN, NO CHEMICAL)

PROBABLE CAUSE	SOLUTION
Chemical pump is improperly primed.	Refer to chemical pump priming instructions.
The strainer at the inlet end of the chemical inlet line is clogged.	Unclog the strainer. If damaged, replace.
Suction leak in the inlet line leading into the chemical pump.	Inspect inlet lines and flow meter for air leaks or damage.
Chemical pump check valve(s) clogged.	Remove any debris from the chemical check valve(s). Replace chemical check valve(s) or seals, if necessary.
Chemical prime/on-off valve or chemical metering valve is defective.	Replace valve(s).
Defective cylinder in the pressure pump.	Measure the pump volume. If the pump volume is less than normal, refer to “Loss of Solution Volume” in this section.

HEAT EXCHANGER/TEMPERATURE RELATED TROUBLESHOOTING**EXCESSIVE HEATING**

PROBABLE CAUSE	SOLUTION
Flow restriction caused by hard water scaling.	Descale unit, repair or replace damaged plumbing components as necessary. Install a water softener.
Thermal relief valve stuck.	Check thermal relief valve for scaling or debris.
Not enough water flowing during normal operation.	Check jet size of tool. Do not let cleaning tool sit for long periods with unit running. Trigger tool more often.
Bypass manifold orifice clogged.	Clean orifice.
Diverter valve not functioning properly.	Check operation of diverter valve with unit in operation. Piston behind cylinder will move towards the rear of the unit when heating and towards the front when cooling.

LOSS OF TEMPERATURE

PROBABLE CAUSE	SOLUTION
No vacuum hose is connected.	Connect vacuum hose to vacuum inlet port.
Temperature relief valve on water box is stuck open.	Clean temperature relief valve and test. Replace if necessary.
Engine RPM is low.	Reset engine RPM.
Defective temperature gauge.	Test gauge and sensor. Replace failed component.
Temperature balance orifice missing.	Replace orifice.
Manual inlet bypass valve open.	Close valve, check for leaks. Replace if leaking.
Diverter valve not functioning properly.	Check the operation of diverter valve (see table above).

HEAT EXCHANGER LEAKING

PROBABLE CAUSE	SOLUTION
Water is dripping from the exhaust port due to condensation build-up.	NOTE: The heat exchanger may produce water condensation discharge at times during normal operation. Do not confuse this with a leak.
Heat exchanger is damaged from frozen water.	Inspect heat exchanger for leaks. Visually inspect for damage. Pressure check after removing the unit (maximum test pressure – 1500 PSI).

WASTE PUMP (IF INSTALLED) TROUBLESHOOTING**WASTE PUMP NOT OPERATING NORMALLY**

PROBABLE CAUSE	SOLUTION
Defective waste pump float switch.	Replace float switch.
Inspect check valve for debris or damage.	Clean or replace if necessary. Ensure that check valves are seated correctly by extending the spring.
Broken diaphragm(s).	Replace diaphragm(s).
Weak battery.	Charge or replace battery if needed. Check charging station.
Pump-out circuit breaker on control panel has been tripped.	After inspecting waste pump to determine the cause of the tripped circuit breaker, press the reset button.

SECTION FOUR – SERVICE AND MAINTENANCE

KUBOTA WG1605-G DTC LIST

DTC		16	87	88
Name		Cam/Crank Sensors	FP	FP
DTC Name		Crank and/or Cam Could Not Synchronize During Start	Fuel pressure low	Fuel pressure high
J1939	SPN	636	94	94
	FMI	8	1	0
MIL		ON	ON	ON
Detected Item		Mechanical misalignment between cam and crank	Fuel pressure abnormality (Low side)	Fuel pressure abnormality (High side)
DTC Set Preconditions		Engine Cranking or Running	Engine Running	Engine Running
DTC Set Conditions		- Cranking revs without sysnc > 4.0 revs - and RPM > 90 min⁻¹ (rpm)	- FP fault mode Gasoline only - run time wait for fuel pressure low faults 5.0 sec - FP pressure < 345 kPa [abs] (3.52 kgf/cm², 50.0 psia)	- FP fault mode Gasoline only - run time wait for fuel pressure high faults 5.0 sec - FP pressure > 448 kPa [abs] (4.57 kgf/cm², 65.0 psia)
Period for Judgment or Number of Occurrence for Judgment		2 sec	2 sec	2 sec
System Action		None	- AL Disable KC - Low Rev Limit	- AL Disable KC - Low Rev Limit
Engine Warning Light		ON	ON	ON

DTC		91	92	107
Name		FP	FP	MAP
DTC Name		FP Low Voltage	FP High Voltage	MAP Low Voltage
J1939	SPN	94	94	106
	FMI	4	3	4
MIL		ON	ON	ON
Detected Item		- Sensor/wiring harness open/short to ground - Sensor malfunction	- Sensor/wiring harness short to power - Sensor malfunction	- Sensor/wiring harness open/short to ground - Sensor malfunction
DTC Set Preconditions		Key ON	Key ON	Engine Cranking or Running
DTC Set Conditions		FP voltage < 0.100 V	FP voltage > 4.90 V	- MAP voltage < 0.050 V - and TPS > 5.0 % - and RPM < 4000 min⁻¹ (rpm)
Period for Judgment or Number of Occurrence for Judgment		1 sec	5 sec	1 sec
System Action		- AL Disable KC - Low Rev Limit	- AL Disable KC - Low Rev Limit	- AL Disable KC - Power derate 1
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		108	111	112
Name		MAP	IAT	IAT
DTC Name		MAP high pressure	IAT Higher Than Expected Stage 1	IAT Low Voltage
J1939	SPN	106	105	105
	FMI	16	15	4
MIL		ON	OFF	OFF
Detected Item		• Sensor/wiring harness short to power • Sensor malfunction	• Intake air temperature abnormality (High side stage 1)	• Sensor/wiring harness short to ground • Sensor malfunction
DTC Set Preconditions		• Engine Cranking or Running	• Engine Running	• Engine Running
DTC Set Conditions		• MAP pressure > 110.3 kPa [abs] (1.125 kgf/cm², 16.00 psia) • and TPS < 3.0 % • and RPM > 1000 min⁻¹ (rpm)	• run-time wait for all IAT HiExp faults 0.0 sec • IAT > 71 degC (160 degF) • and RPM > 1000 min⁻¹ (rpm)	• IAT voltage < 0.100 V
Period for Judgment or Number of Occurrence for Judgment		• 2 sec	• 60 sec	• 1 sec
System Action		• AL Disable KC • Power derate 1	• AL Disable • Power derate 1	• AL Disable • Power derate 1
Engine Warning Light		ON	ON	ON

DTC		113	116	117
Name		IAT	ECT/CHT	ECT/CHT
DTC Name		IAT High Voltage	ECT Higher Than Expected Stage 1	ECT/CHT Low Voltage
J1939	SPN	105	110	110
	FMI	3	15	4
MIL		OFF	OFF	OFF
Detected Item		• Sensor/wiring harness open/short to power • Sensor malfunction	• Engine coolant temperature abnormality (High side stage 1)	• Sensor/wiring harness short to ground • Sensor malfunction
DTC Set Preconditions		• Engine Running	• Engine Running	• Engine Running
DTC Set Conditions		• IAT voltage > 4.90 V	• run time wait for ECT HiExp faults 30.0 sec • ECT > 110 degC (230 degF) • and RPM > 600 min⁻¹ (rpm)	• ECT voltage < 0.100 V
Period for Judgment or Number of Occurrence for Judgment		• 1 sec	• 20 sec	• 1 sec
System Action		• AL Disable • Power derate 1	• AL Disable • Power derate 1	• AL Disable • Power derate 1
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		118	121	122
Name		ECT/CHT	TPS	TPS
DTC Name		ECT/CHT High Voltage	TPS1 % Lower Than TPS2 %	TPS1 Signal Voltage Low
J1939	SPN	110	51	51
	FMI	3	1	4
MIL		OFF	ON	ON
Detected Item		- Sensor/wiring harness open/short to power - Sensor malfunction	TPS malfunction	- TPS circuit in the harness short to ground - TPS malfunction
DTC Set Preconditions		Engine Running	Key-On, Engine Cranking, or Running	Key-On, Engine Cranking, or Running
DTC Set Conditions		ECT voltage > 4.90 V	(TPS1 % – TPS2 %) < –20.0 %	TPS1 voltage < 0.200 V
Period for Judgment or Number of Occurrence for Judgment		1 sec	1 sec	0.5 sec
System Action		- AL Disable - Power derate 1	Shutdown	Shutdown
Engine Warning Light		ON	ON	ON

DTC		123	127	129
Name		TPS	IAT	IAT
DTC Name		TPS1 Signal Voltage High	IAT Higher Than Expected Stage 2	BP Low Pressure
J1939	SPN	51	105	108
	FMI	3	0	1
MIL		ON	OFF	ON
Detected Item		- TPS circuit in the harness short to power - TPS malfunction	Intake air temperature abnormality (High side stage 2)	- Sensor out of calibration - Loss for 5V reference feed (5V_ext1) to MAP - Signal wire open or shorted to ground
DTC Set Preconditions		Key-On, Engine Cranking, or Running	Engine Running	Engine Running
DTC Set Conditions		TPS1 voltage > 4.80 V	- run-time wait for all IAT HiExp faults 0.0 sec - IAT > 93 degC (200 degF) - and RPM > 1000 min⁻¹ (rpm)	BP < 57.2 kPa [abs] (0.584 kgf/cm², 8.30 psia)
Period for Judgment or Number of Occurrence for Judgment		0.5 sec	120 sec	1 sec
System Action		Shutdown	- AL Disable - Force idle	AL Disable KC
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		134	154	171
Name		EGO Sensors	EGO Sensors	Adaptive Learn
DTC Name		EGO1 Open/Lazy (HO2S1)	EGO2 Open/Lazy (HO2S2)	Adaptive Learn Bank 1 High (Gasoline)
J1939	SPN	3217	3227	4237
	FMI	5	5	0
MIL		ON	ON	ON
Detected Item		- Open feed circuit to O₂ heater - Open heater ground circuit - Open or shorted to ground O₂ signal wire - open sensor ground (5Vrtn1) - inoperative sensor	- Open feed circuit to O₂ heater - Open heater ground circuit - Open or shorted to ground O₂ signal wire - open sensor ground (5Vrtn1) - inoperative sensor	- exhaust leaks upstream or near the HEGO sensor - reduced fuel supply pressure to the fuel injection system - a inoperative sensor - an injector that is stuck closed or dirty - weak spark or lack of spark to a cylinder - a MAP sensor that indicates pressure that is lower than ture pressure
DTC Set Preconditions		Engine Running	Engine Running	Engine Running, Adaptive Mode
DTC Set Conditions		EGO cold persistently > 120.0 sec	EGO cold persistently > 120.0 sec	- AL_BM > 30 % - and RPM >= 0 min⁻¹ (rpm) - and RPM <= 9999 min⁻¹ (rpm) - and MAP >= 0.0 kPa [abs] (0.0 kgf/cm², 0.0 psia) - and MAP <= 682 kPa [abs] (6.96 kgf/cm², 99.0 psia)
Period for Judgment or Number of Occurrence for Judgment		5 sec	5 sec	3 updates
System Action		- CL Disable - AL Disable KC	- CL Disable - AL Disable KC	- CL Disable - AL Disable KC
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		172	182	183
Name		Adaptive Learn	FT	FT
DTC Name		Adaptive Learn Bank1 Low (Gasoline)	FT gasoline low	FT gasoline high
J1939	SPN	4237	174	174
	FMI	1	4	3
MIL		ON	ON	ON
Detected Item		- an inoperative O₂ sensor - high fuel supply pressure or temperature - internal mechanical engine damage - an injector that is stuck open or leaking	- Operating in a frigid atmosphere - Sensor out of calibration	- Operating in a hot environment - Sensor out of calibration
DTC Set Preconditions		Engine Running, Adaptive Mode	Engine Running	Engine Running
DTC Set Conditions		- AL_BM < -30 % - and RPM ≥ 0 min⁻¹ (rpm) - and RPM ≤ 9999 min⁻¹ (rpm) - and MAP ≥ 0.0 kPa [abs] (0.0 kgf/cm², 0.0 psia) - and MAP ≤ 682 kPa [abs] (6.96 kgf/cm², 99.0 psia)	- FT fault mode Temp only - fuel temp < -37.0 degC (-35.0 degF)	- FT fault mode Temp only - fuel temp > 60.0 degC (140.0 degF)
Period for Judgment or Number of Occurrence for Judgment		3 updates	1 sec	1 sec
System Action		- CL Disable - AL Disable KC	None	Power derate 2
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		187	217	219
Name		FT	ECT/CHT	Engine Speed
DTC Name		FT Gaseous Fuel Extremery Low	ECT Higher Than Expected 2	RPM Higher Than Max Allowed Governed Speed
J1939	SPN	3468	110	515
	FMI	1	0	15
MIL		ON	OFF	OFF
Detected Item		Not vaporized completely	Engine coolant temperature abnormality (High side stage 2)	Engine over speed condition, stuck throttle, large vacuum leak into intake manifold after throttle blade
DTC Set Preconditions		Engine Running	Engine Running	Engine Running
DTC Set Conditions		Fuel temp < -40 °C (-40 °F)	- run time wait for ECT HiExp faults 30.0 sec - ECT > 116 degC (240 degF) - and RPM > 600 min⁻¹ (rpm)	RPM > 3800 min⁻¹ (rpm)
Period for Judgment or Number of Occurrence for Judgment		1 sec	30 sec	1 sec
System Action		None	Power derate 2	reduce throttle to limit speed
Engine Warning Light		ON	ON	ON

DTC		221	222	223
Name		TPS	TPS	TPS
DTC Name		TPS1 % Higher Than TPS2 %	TPS2 Signal Voltage Low	TPS2 Signal Voltage High
J1939	SPN	51	3673	3673
	FMI	0	4	3
MIL		ON	ON	ON
Detected Item		TPS malfunction	- TPS circuit in the harness short to ground - TPS malfunction	- TPS circuit in the harness short to power - TPS malfunction
DTC Set Preconditions		Key-On, Engine Cranking, or Running	Key-On, Engine Cranking, or Running	Key-On, Engine Cranking, or Running
DTC Set Conditions		(TPS1 % – TPS2 %) > 20.0 %	TPS2 voltage < 0.200 V	TPS2 voltage > 4.80 V
Period for Judgment or Number of Occurrence for Judgment		1 sec	0.5 sec	0.5 sec
System Action		Shutdown	Shutdown	Shutdown
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		261	262	264
Name		Injectors	Injectors	Injectors
DTC Name		Injector Driver #1 Open/Short-To-Ground	Injector Driver #1 Short-To-Power	Injector Driver #2 Open/Short-To-Ground
J1939	SPN	651	651	652
	FMI	5	6	5
MIL		ON	ON	ON
Detected Item		- Loss of 12.0 V feed to injector - open injector coil - open or shorted to ground injector driver circuit in engine harness	- Injector coil shorted internally - Injector driver circuit shorted to voltage between injector and ECM	- Loss of 12.0 V feed to injector - open injector coil - open or shorted to ground injector driver circuit in engine harness
DTC Set Preconditions		Key-On, Engine Running	Key-On, Engine Running	Key-On, Engine Running
DTC Set Conditions		- Injector1 off-state low-side < 4.00 V - and battery voltage > 9.00 V	- Injector1 on-state low-side > 4.00 V - and battery voltage < 16.0 V	- Injector2 off-state low-side < 4.00 V - and battery voltage > 9.00 V
Period for Judgment or Number of Occurrence for Judgment		10 samples	10 samples	10 samples
System Action		- CL Disable - AL Disable KC - Low Rev Limit	- CL Disable - AL Disable KC - Low Rev Limit	- CL Disable - AL Disable KC - Low Rev Limit
Engine Warning Light		ON	ON	ON

DTC		265	267	268
Name		Injectors	Injectors	Injectors
DTC Name		Injector Driver #2 Short-To-Power	Injector Driver #3 Open/Short-To-Ground	Injector Driver #3 Short-To-Power
J1939	SPN	652	653	653
	FMI	6	5	6
MIL		ON	ON	ON
Detected Item		- Injector coil shorted internally - Injector driver circuit shorted to voltage between injector and ECM	- Loss of 12.0 V feed to injector - open injector coil - open or shorted to ground injector driver circuit in engine harness	- Injector coil shorted internally - Injector driver circuit shorted to voltage between injector and ECM
DTC Set Preconditions		Key-On, Engine Running	Key-On, Engine Running	Key-On, Engine Running
DTC Set Conditions		- Injector2 on-state low-side > 4.00 V - and battery voltage < 16.0 V	- Injector3 off-state low-side < 4.00 V - and battery voltage > 9.00 V	- Injector3 on-state low-side > 4.00 V - and battery voltage < 16.0 V
Period for Judgment or Number of Occurrence for Judgment		10 samples	10 samples	10 samples
System Action		- CL Disable - AL Disable KC - Low Rev Limit	- CL Disable - AL Disable KC - Low Rev Limit	- CL Disable - AL Disable KC - Low Rev Limit
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		270	271	326
Name		Injectors	Injectors	Knock
DTC Name		Injector Driver #4 Open/Short-To-Ground	Injector Driver #4 Short-To-Power	Knock 1 Excessive or Erratic Signal
J1939	SPN	654	654	731
	FMI	5	6	2
MIL		ON	ON	ON
Detected Item		- Loss of 12.0 V feed to injector - open injector coil - open or shorted to ground injector driver circuit in engine harness	- Injector coil shorted internally - Injector driver circuit shorted to voltage between injector and ECM	- Knock signal abnormality (High side) - Sensor malfunction
DTC Set Preconditions		Key-On, Engine Running	Key-On, Engine Running	Key On, Engine On
DTC Set Conditions		- Injector4 off-state low-side < 4.00 V - and battery voltage > 9.00 V	- Injector4 on-state low-side > 4.00 V - and battery voltage < 16.0 V	- KNK1 sensor input > 0.500 V - MAP < 55.2 kPa [abs] (0.562 kgf/cm², 8.00 psia)
Period for Judgment or Number of Occurrence for Judgment		10 samples	10 samples	3 sec
System Action		- CL Disable - AL Disable KC - Low Rev Limit	- CL Disable - AL Disable KC - Low Rev Limit	- Power derate 1 - Retard Fault KNK
Engine Warning Light		ON	ON	ON

DTC		327	336	337
Name		Knock	Cam/Crank Sensors	Cam/Crank Sensors
DTC Name		Knock 1 Sensor Open or Not Present	Crank Input Signal Noise	Loss of Crankshaft Input Signal
J1939	SPN	731	636	636
	FMI	4	2	4
MIL		ON	ON	ON
Detected Item		- Sensor/wiring harness open/short to power - Sensor malfunction	Crank+ or Crank- circuits in wrong connector terminal slot	- Loss of sensor feed - open sensor ground - open or shorted to ground signal wire
DTC Set Preconditions		Key On, Engine On	Key On, Engine On	Key On, Engine On
DTC Set Conditions		- KNK1 sensor input < 0.005 V - and RPM > 2000 min⁻¹ (rpm) - and MAP > 82.7 kPa [abs] (0.844 kgf/cm², 12.00 psia)	- Number of invalid cam re-syncs 3 re-syncs - within a time window of <= 800 ms	Cam pulsed without crank activity > 3 cam pulses
Period for Judgment or Number of Occurrence for Judgment		10 sec	1 sec	1 sec
System Action		- Power derate 1 - Retard Fault KNK	AL Disable KC	None
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		341	342	359
Name		Cam/Crank Sensors	Cam/Crank Sensors	Lockoff/Fuel Diagnostics
DTC Name		Camshaft Input Signal Noise	Loss of Camshaft Input Signal	Fuel run-out longer than expected
J1939	SPN	723	723	632
	FMI	2	4	31
MIL		ON	ON	ON
Detected Item		Cam+ or Cam- circuits in wrong connector terminal slot	- Loss of feed voltage to Cam sensor - loss of signal or ground circuits - faulty sensor	
DTC Set Preconditions		Key On, Engine On	Key On, Engine On	Key Off, Engine On
DTC Set Conditions		- Number of invalid cam re-syncs 3 re-syncs - within a time window of ≤ 700 ms	- No cam pulse in 2.0 cycles - and RPM $> 150 \text{ min}^{-1}$ (rpm)	Fuel run-out engine run time > 20000 ms
Period for Judgment or Number of Occurrence for Judgment		1 sec	1 sec	N/A
System Action		AL Disable KC	AL Disable KC	Shutdown
Engine Warning Light		ON	ON	OFF

DTC		420	524	562
Name		Catalyst	Oil Pressure	Battery Voltage
DTC Name		Catalyst Monitor	Oil Pressure Low	Battery Voltage (VBAT) Low
J1939	SPN	3050	100	168
	FMI	11	1	17
MIL		OFF	ON	ON
Detected Item			Low Oil Pressure	- Wiring harness open/short/damage - Battery abnormality
DTC Set Preconditions		Engine Running	Key On, Engine On	Key On, Engine On
DTC Set Conditions		- EGO3/4 RMS > 0.008 phi - and EGO3/4 RMS $> \text{EGO1/2 RMS } 50 \%$ - and EGO3/4 RMS $> \text{CL waveform RMS } 50 \%$ - and mass flow at ports ≥ 10.0 g/sec and $\leq \text{CBT} - \text{CBT}_{ss} \pm 50.0$ degF	- run time wait for oil pressure low faults 4.0 sec - RPM lower limit for oil pressure low faults 300 min^{-1} (rpm) - Oil pressure pulled-up input less than a threshold voltage of 2.50 V	- Voltage < 9.00 V - and RPM $> 1000 \text{ min}^{-1}$ (rpm)
Period for Judgment or Number of Occurrence for Judgment		100 updates	1 sec	5 sec
System Action		- Shutdown - CL Disable - AL Disable - Hard Warning	Shutdown	- AL Disable KC - Power derate 2
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		563	601	604
Name		Battery Voltage	Internal Processor Diagnostics	Internal Processor Diagnostics
DTC Name		Battery Voltage (VBAT) High	Microprocessor Failure-FLASH	Microprocessor Failure-RAM
J1939	SPN	168	628	630
	FMI	15	13	12
MIL		ON	ON	ON
Detected Item		System voltage abnormality (High side)	Faulty ECU	Faulty ECU
DTC Set Preconditions		Key-On, Engine Cranking, or Running	Key on	Key on
DTC Set Conditions		Voltage > 16.00 V	Internal microprocessor error	Internal ECM microprocessor memory access failure
Period for Judgment or Number of Occurrence for Judgment		3 sec	N/A	N/A
System Action		- AL Disable KC - Low Rev Limit	- Never Forget - AL Disable KC - Power derate 2	- Never Forget - AL Disable KC - Power derate 2
Engine Warning Light		ON	OFF	OFF

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		606	627	628	
Name		Internal Processor Diagnostics	Fuel Pump Relay Control/Coil	Fuel Pump Relay Control/Coil	Fuel Pump Motor Feedback
DTC Name		Microprocessor Failure-COP	Fuel Pump Relay Coil Open	Fuel Pump Relay Ground Short	
J1939	SPN	629	1348	1348	1347
	FMI	31	5	4	5
MIL		ON	ON	ON	ON
Detected Item		Faulty ECU	- Open coil in relay - Open in relay driver circuit in engine harness	- Relay pull in coil shorted internally - relay driver circuit shorted to ground in wire harness	
DTC Set Preconditions		Key on	Key On, Engine Off	Engine Running	
DTC Set Conditions		Internal microprocessor error	Fuel Pump relay coil output open circuit	Fuel Pump relay coil output shorted to ground	- Fuel pump motor high-side on-state < 4.0 volts - battery voltage > 8.0 volts
Period for Judgment or Number of Occurrence for Judgment		N/A	10 samples	10 samples	2 sec
System Action		- Never Forget - AL Disable KC - Power derate 2	None	None	None
Engine Warning Light		OFF	ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		629		642	643
Name		Fuel Pump Relay Control/Coil	Fuel Pump Motor Feedback	5 V External	5 V External
DTC Name		Fuel Pump Relay Coil Short-To-Power		Sensor Supply Voltage 1 Low (5Vext1)	Sensor Supply Voltage 1 High (5Vext1)
J1939	SPN	1348	1347	1079	1079
	FMI	3	6	4	3
MIL		ON	ON	ON	ON
Detected Item		- Shorted relay pull in coil - relay driver circuit shorted to voltage in wire harness		- Wiring harness short to ground - ECM malfunction	- Wiring harness short to 12.0 V power - ECM malfunction
DTC Set Preconditions		• Engine Running		• Key-On, Engine OFF, or Running	• Key-On, Engine OFF, or Running
DTC Set Conditions		Fuel Pump relay coil output short to power/voltage	- Fuel pump motor high-side off-state < 4.0 volts - battery voltage < 16.0 volts	• 5VE1 < 4.60 V	• 5VE1 > 5.40 V
Period for Judgment or Number of Occurrence for Judgment		• 10 samples	• 2 sec	• 1 sec	• 1 sec
System Action		• None	• None	- AL Disable - Power derate 1	- AL Disable - Power derate 1
Engine Warning Light		ON	ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		652	653	686
Name		5 V External	5 V External	Power Relay Control/Coil
DTC Name		Sensor Supply Voltage 2 Low (5Vext2)	Sensor Supply Voltage 2 High (5Vext2)	Power Relay Ground Short
J1939	SPN	1080	1080	1485
	FMI	4	3	4
MIL		ON	ON	ON
Detected Item		- Wiring harness short to ground - ECM malfunction	- Wiring harness short to 12.0 V power - ECM malfunction	- Short to ground in relay pull in coil - short to ground in relay driver circuit in wire harness
DTC Set Preconditions		• Key-On, Engine OFF, or Running	• Key-On, Engine OFF, or Running	• Key On, Engine Off
DTC Set Conditions		• 5VE2 < 4.60 V	• 5VE2 > 5.40 V	• Power relay coil output shorted to ground
Period for Judgment or Number of Occurrence for Judgment		• 1 sec	• 1 sec	• 10 samples
System Action		- AL Disable - Power derate 1	- AL Disable - Power derate 1	• None
Engine Warning Light		ON	ON	OFF

DTC		687	1111	1112
Name		Power Relay Control/Coil	Engine Speed	Engine Speed
DTC Name		Power Relay Coil Short-To-Power	RPM Above Fuel Rev Limit Level	RPM Above Spark Rev Limit Level
J1939	SPN	1485	515	515
	FMI	3	16	0
MIL		ON	ON	ON
Detected Item		- Shorted relay pull in coil - relay driver circuit shorted to voltage in wire harness	Engine overspeed condition, faulty Crank sensor or input	Engine overspeed condition, faulty Crank sensor or input
DTC Set Preconditions		• Key On, Engine Off	• Engine Running	• Engine Running
DTC Set Conditions		• Power relay coil output short to power/voltage	• RPM > 4200 min ⁻¹ (rpm)	• RPM > 4300 min ⁻¹ (rpm)
Period for Judgment or Number of Occurrence for Judgment		• 10 samples	• 1 sec	• 1 sec
System Action		• None	disable fuel injectors or gaseous fuel control actuator	disable ignition coils
Engine Warning Light		OFF	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		1121	1151	1152
Name		FPP	Closed Loop	Closed Loop
DTC Name		FPP1/2 Simultaneous Voltages Out-of-Range	Closed Loop High (LPG)	Closed Loop Low (LPG)
J1939	SPN	91	4236	4236
	FMI	31	0	1
MIL		ON	ON	ON
Detected Item		- Wiring harness open/short/damage - FPP malfunction	- exhaust leaks upstream or near the HEGO sensor - reduced fuel supply pressure to the gaseous fuel control system - a fuel supply or manifold leak - a non-responsive HEGO sensor	- high fuel supply pressure to the gaseous fuel control or faulty pressure regulator - a non-responsive HEGO sensor
DTC Set Preconditions		Key on, Engine Off	Engine Running, Closed Loop Mode	Engine Running, Closed Loop Mode
DTC Set Conditions		User same parameter as individual FPP 1/2 voltage fault detection above	- CL_BM > 35 % - and RPM $\geq 0 \text{ min}^{-1}$ (rpm) - and RPM $\leq 9999 \text{ min}^{-1}$ (rpm) - and MAP $\geq 0.0 \text{ kPa [abs]}$ (0.0 kgf/cm², 0.0 psia) - and MAP $\leq 682 \text{ kPa [abs]}$ (6.96 kgf/cm², 99.0 psia)	- CL_BM < -35 % - and RPM $\geq 0 \text{ min}^{-1}$ (rpm) - and RPM $\leq 9999 \text{ min}^{-1}$ (rpm) - and MAP $\geq 0.0 \text{ kPa [abs]}$ (0.0 kgf/cm², 0.0 psia) - and MAP $\leq 682 \text{ kPa [abs]}$ (6.96 kgf/cm², 99.0 psia)
Period for Judgment or Number of Occurrence for Judgment		0.5 sec	- Power Derate2 5 updates	5 updates
System Action		- Power Derate 2 - Low Rev Limit - Force Idle	- CL Disable - AL Disable KC	- CL Disable - AL Disable KC
Engine Warning Light		OFF	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		1153	1154	1155
Name		Closed Loop	Closed Loop	Closed Loop
DTC Name		Closed Loop High (NG)	Closed Loop Low (NG)	Closed Loop Bank 1 High (Gasoline)
J1939	SPN	4236	4236	4236
	FMI	0	1	0
MIL		ON	ON	ON
Detected Item		- exhaust leaks upstream or near the HEGO sensor - reduced fuel supply pressure to the gaseous fuel control system - a fuel supply or manifold leak - a non-responsive HEGO sensor	- high fuel supply pressure to the gaseous fuel control or faulty pressure regulator - a non-responsive HEGO sensor	- exhaust leaks upstream or near the HEGO sensor - reduced fuel supply pressure - an injector that is stuck closed
DTC Set Preconditions		Engine Running, Closed Loop Mode	Engine Running, Closed Loop Mode	Engine Running, Closed Loop Mode
DTC Set Conditions		- CL_BM > 35 % - and RPM ≤ 0 min⁻¹ (rpm) - and RPM ≤ 9999 min⁻¹ (rpm) - and MAP ≥ 0.0 kPa [abs] (0.0 kgf/cm², 0.0 psia) - and MAP ≤ 682 kPa [abs] (6.96 kgf/cm², 99.0 psia)	- CL_BM < -35 % - and RPM ≥ 0 min⁻¹ (rpm) - and RPM ≤ 9999 min⁻¹ (rpm) - and MAP ≥ 0.0 kPa [abs] (0.0 kgf/cm², 0.0 psia) - and MAP ≤ 682 kPa [abs] (6.96 kgf/cm², 99.0 psia)	- CL_BM > 35 % - and RPM ≥ 0 min⁻¹ (rpm) - and RPM ≤ 9999 min⁻¹ (rpm) - and MAP ≥ 0.0 kPa [abs] (0.0 kgf/cm², 0.0 psia) - and MAP ≤ 682 kPa [abs] (6.96 kgf/cm², 99.0 psia)
Period for Judgment or Number of Occurrence for Judgment		5 updates	5 updates	5 updates
System Action		- CL Disable - AL Disable KC	- CL Disable - AL Disable KC	- CL Disable - AL Disable KC
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		1156	1161	1162
Name		Closed Loop	Adaptive Learn	Adaptive Learn
DTC Name		Closed Loop Bank 1 Low (Gasoline)	Adaptive Learn High (LPG)	Adaptive Learn Low (LPG)
J1939	SPN	4236	4237	4237
	FMI	1	0	1
MIL		ON	ON	ON
Detected Item		- high fuel supply pressure to the fuel injection system - a non-responsive HEGO sensor - an injector that is stuck open	- exhaust leaks upstream or near the HEGO sensor - reduced fuel supply pressure to the gaseous fuel control system - a fuel supply or manifold leak - a non-responsive HEGO sensor	- high fuel supply pressure to the gaseous fuel control or faulty pressure regulator - a non-responsive HEGO sensor
DTC Set Preconditions		Engine Running, Closed Loop Mode	Engine Running, Adaptive Mode	Engine Running, Adaptive Mode
DTC Set Conditions		- CL_BM < -35 % - and RPM $\geq 0 \text{ min}^{-1}$ (rpm) - and RPM $\leq 9999 \text{ min}^{-1}$ (rpm) - and MAP $\geq 0.0 \text{ kPa [abs]}$ (0.0 kgf/cm², 0.0 psia) - and MAP $\leq 682 \text{ kPa [abs]}$ (6.96 kgf/cm², 99.0 psia)	- AL_BM > 30 % - and RPM $\geq 0 \text{ min}^{-1}$ (rpm) - and RPM $\leq 9999 \text{ min}^{-1}$ (rpm) - and MAP $\geq 0.0 \text{ kPa [abs]}$ (0.0 kgf/cm², 0.0 psia) - and MAP $\leq 682 \text{ kPa [abs]}$ (6.96 kgf/cm², 99.0 psia)	- AL_BM < -30 % - and RPM $\geq 0 \text{ min}^{-1}$ (rpm) - and RPM $\leq 9999 \text{ min}^{-1}$ (rpm) - and MAP $\geq 0.0 \text{ kPa [abs]}$ (0.0 kgf/cm², 0.0 psia) - and MAP $\leq 682 \text{ kPa [abs]}$ (6.96 kgf/cm², 99.0 psia)
Period for Judgment or Number of Occurrence for Judgment		5 updates	3 updates	3 updates
System Action		- CL Disable - AL Disable KC	- CL Disable - AL Disable KC	- CL Disable - AL Disable KC
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		1166	1171	1172
Name		Catalyst	EPR Diagnostics	EPR Diagnostics
DTC Name		Catalyst inactive on NG	EPR/CFV Regulation Pressure Higher than Expected	EPR/CFV Regulation Pressure Lower than Expected
J1939	SPN	3050	520260	520260
	FMI	11	0	1
MIL		OFF	ON	ON
Detected Item			Inlet pressure to DEPR is too high.	- Inlet pressure to DEPR is too low. - Malfunctioning lock off valve, plugged fuel filter, closed manual valve or fuel tank out of fuel
DTC Set Preconditions		Engine Running	Engine Running	Engine Running
DTC Set Conditions		- EGO3/4 RMS > 0.008 phi - and EGO3/4 RMS > EGO1/2 RMS 50 % - and EGO3/4 RMS > CL waveform RMS 50 % - and mass flow at ports >= 10.0 g/sec and <= CBT –CBT_ss +/- 50.0 degF	EPR actual-commanded pressure > 2.50 in H₂O	EPR actual-commanded pressure < -2.50 in H₂O
Period for Judgment or Number of Occurrence for Judgment		100 updates	5 sec	5 sec
System Action		- CL Disable - AL Disable KC	AL Disable	AL Disable
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		1173	1174	1175
Name		EPR Diagnostics	EPR Diagnostics	EPR Diagnostics
DTC Name		EPR/CFV comm lost	EPR/CFV Voltage Supply High	EPR/CFV Voltage Supply Low
J1939	SPN	520620	520260	520260
	FMI	31	3	4
MIL		OFF	ON	ON
Detected Item		- Faulty CAN cinnection - CAN terminal incorrect	Supply voltage to the EPR/CFV is too high	Supply voltage to the EPR/CFV is too low
DTC Set Preconditions		Engine Running	Engine Running	Engine Running
DTC Set Conditions		No EPR packets recieved within 500 ms	Voltage supply to EPR/CFV is > 33.0 VDC	Voltage supply to EPR/CFV is < 18.0 VDC
Period for Judgment or Number of Occurrence for Judgment		0.5 sec	5 sec	5 sec
System Action		- CL Disable - AL Disable KC	- AL Disable - AL Disable KC - Power Derate 2 - Low Rev Limit	- AL Disable - AL Disable KC - Power Derate 2 - Low Rev Limit
Engine Warning Light		ON	ON	ON

DTC		1176	1177	1611
Name		EPR Diagnostics	EPR Diagnostics	5V External
DTC Name		EPR/CFV Internal Actuator Fault Detection	EPR/CFV Internal Circuitry Fault Detection	Sensor Supply Voltage (5Vext 1/2) Simultaneous Out-of-Range
J1939	SPN	520260	520260	1079
	FMI	12	12	31
MIL		ON	ON	ON
Detected Item		- Short or open circuit in actuator coil - Associated wiring - Overheating of actuator drive electronics	DEPR internal microprocessor or memory failure, fuel temperature sensor failure.	- Wiring harness short to 12V power or ground - ECM malfunction
DTC Set Preconditions		Engine Running	Engine Running	Engine On
DTC Set Conditions		the DEPR electronics detect a fault condition associated with its internal actuator.	the DEPR electronics detect a fault condition associated with its internal circuitry.	5Vext1> 5.40 V or 5Vext1< 4.60 V, and 5Vext2 > 5.40 V or 5Vext2 < 4.60 V
Period for Judgment or Number of Occurrence for Judgment		0.25 sec	0.25 sec	1 sec
System Action		AL Disable	AL Disable	- Power Derate 2 - Low Rev Limit - Force Idle
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		1612	1613	1614
Name		Internal Processor Diagnostics	Internal Processor Diagnostics	Internal Processor Diagnostics
DTC Name		Microprocessor Failure-RTI 1	Microprocessor Failure-RTI 2	Microprocessor Failure-RTI 3
J1939	SPN	629	629	629
	FMI	31	31	31
MIL		ON	ON	ON
Detected Item		Faulty ECU	Faulty ECU	Faulty ECU
DTC Set Preconditions		Key on	Key on	Key on
DTC Set Conditions		Internal microprocessor error	Internal microprocessor error	Internal microprocessor error
Period for Judgment or Number of Occurrence for Judgment		N/A	N/A	N/A
System Action		- Shutdown - CL Disable - AL Disable - Hard Warning	- Never Forget - AL Disable KC - Power derate 2	- Never Forget - AL Disable KC - Power derate 2
Engine Warning Light		ON	OFF	OFF

DTC		1615	1616	1673
Name		Internal Processor Diagnostics	Internal Processor Diagnostics	General System Diagnostics
DTC Name		Microprocessor Failure-A/D	Microprocessor Failure-Interrupt	Calibration Configuration Error
J1939	SPN	629	629	1634
	FMI	31	31	13
MIL		ON	ON	ON
Detected Item		Faulty ECU	Faulty ECU	ECM malfunction
DTC Set Preconditions		Key on	Key on	Key ON
DTC Set Conditions		Internal microprocessor error	Internal microprocessor error	Specific calibration variable checks do not return expected results
Period for Judgment or Number of Occurrence for Judgment		N/A	N/A	N/A
System Action		- Never Forget - AL Disable KC - Power derate 2	- Never Forget - AL Disable KC - Power derate 2	- Never Forget - AL Disable KC - Power derate 2
Engine Warning Light		OFF	OFF	OFF

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		2111	2112	2121
Name		TPS	TPS	FPP
DTC Name		Unable to Reach Lower TPS	Unable to Reach Higher TPS	FPP1 Lower Than FPP2
J1939	SPN	51	51	91
	FMI	7	7	18
MIL		ON	ON	ON
Detected Item		TPS malfunction	TPS malfunction	- Wiring harness open/short/damage - FPP malfunction
DTC Set Preconditions		Cranking or Running	Cranking or Running	Key On, Engine Off
DTC Set Conditions		- target TPS-actual TPS < -20.0 % - persistently longer than 200 ms while battery voltage > 9.00 V and battery voltage < 16.0 V	- target TPS-actual TPS > 20.0 % - persistently longer than 200 ms while battery voltage > 9.00 V and battery voltage < 16.0 V	(FPP 1 % - FPP 2 %) < 20.0 %
Period for Judgment or Number of Occurrence for Judgment		1 sec	1 sec	1.5 sec
System Action		Shutdown	Shutdown	- Power derate 2 - Low Rev Limit
Engine Warning Light		ON	ON	ON

DTC		2122	2123	2126
Name		FPP	FPP	FPP
DTC Name		FPP1 Voltage High	FPP1 Voltage Low	FPP1 Higher Than FPP2
J1939	SPN	91	91	91
	FMI	3	4	16
MIL		ON 2Hz	ON 2Hz	ON
Detected Item		- Wiring harness open/short/damage - FPP malfunction	- Wiring harness open/short/damage - FPP malfunction	- Wiring harness open/short/damage - FPP malfunction
DTC Set Preconditions		Key On	Key On, Engine Off	Key On, Engine Off
DTC Set Conditions		FPP1 voltage > 4.80 V	FPP1 voltage < 0.200 V	(FPP 1 % - FPP 2 %) > 20.0 %
Period for Judgment or Number of Occurrence for Judgment		0.5 sec	0.5 sec	1.5 sec
System Action		- Power derate 1 - Low Rev Limit	- Power derate 1 - Low Rev Limit	- Power derate 2 - Low Rev Limit
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

DTC		2127	2128	2135
Name		FPP	FPP	TPS
DTC Name		FPP2 voltage low	FPP2 voltage high	TPS1/2 Simultaneous Voltages out of range
J1939	SPN	29	29	51
	FMI	4	3	31
MIL		ON 2Hz	ON 2Hz	ON
Detected Item		- Wiring harness open/short/damage - FPP malfunction	- Wiring harness open/short/damage - FPP malfunction	TPS malfunction
DTC Set Preconditions		Key On	Key On	Key On, Engine On
DTC Set Conditions		FPP1 voltage < 0.200 V	FPP1 voltage > 4.80 V	User same parameter as individual TPS1/2 voltage fault detection above
Period for Judgment or Number of Occurrence for Judgment		0.5 sec	0.5 sec	0.5 sec
System Action		- Power derate 1 - Low Rev Limit	- Power derate 1 - Low Rev Limit	Shutdown
Engine Warning Light		ON	ON	ON

DTC		2300	2301	2303
Name		Spark Coil Primary	Spark Coil Primary	Spark Coil Primary
DTC Name		Spark Coil #1 Primary Open/Short-to-Ground	Spark Coil #1 Primary Short-to-Power	Spark Coil #2 Primary Open/Short-to-Ground
J1939	SPN	1268	1268	1269
	FMI	5	6	5
MIL		ON	ON	ON
Detected Item		- a short to ground or open circuit in the harness - an open internal to the primary coil	- a short to power in the harness - a short internal to the primary coil	- a short to ground or open circuit in the harness - an open internal to the primary coil
DTC Set Preconditions		Key On, Engine On	Key On, Engine On	Key On, Engine On
DTC Set Conditions		- Adaptive dwell adjustment >= 2.0 ms - or total dwell >= 14.0 ms - and battery voltage > 11.0 V	- Adaptive dwell adjustment <= -2.0 ms - or total dwell <= 4.0 ms - and battery voltage < 16.0 V	- Adaptive dwell adjustment >= 2.0 ms - or total dwell >= 14.0 ms - and battery voltage > 11.0 V
Period for Judgment or Number of Occurrence for Judgment		10 sparks	10 sparks	10 sparks
System Action		- CL Disable - AL Disable - Low Rev Limit	- CL Disable - AL Disable - Low Rev Limit	- CL Disable - AL Disable - Low Rev Limit
Engine Warning Light		ON	ON	ON

SECTION FOUR – SERVICE AND MAINTENANCE

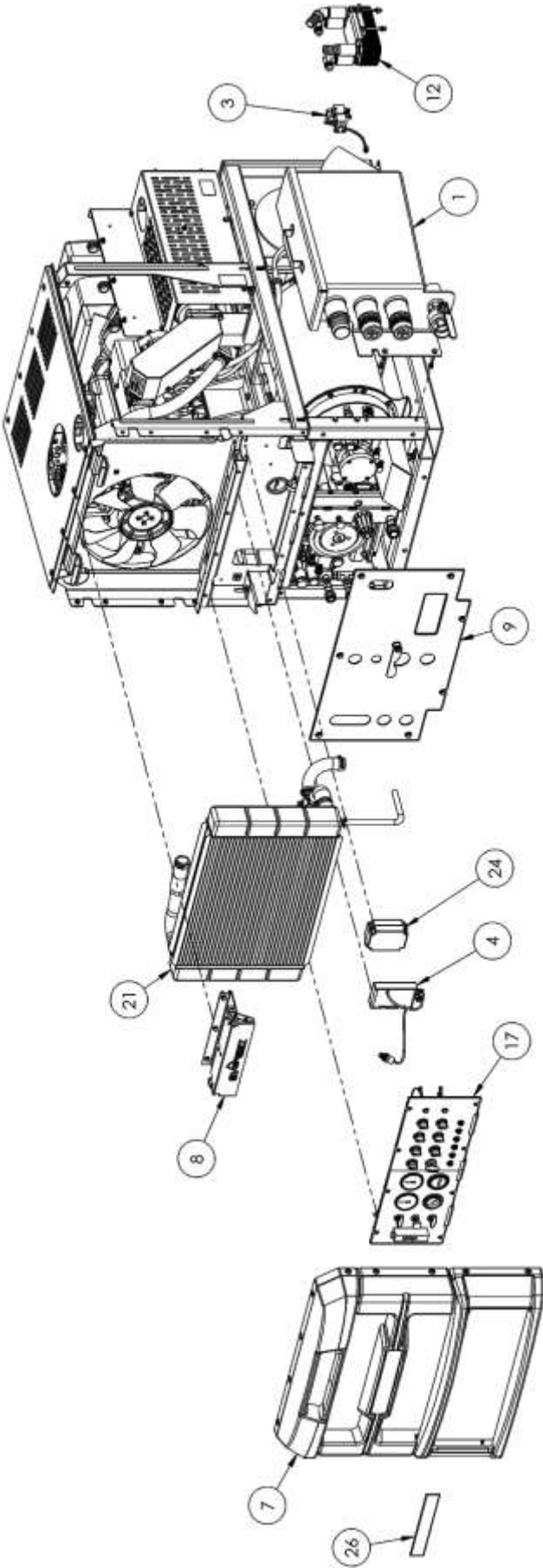
DTC		2304	2306	2307
Name		Spark Coil Primary	Spark Coil Primary	Spark Coil Primary
DTC Name		Spark Coil #2Primary Short-to-Power	Spark Coil #3 Primary Open/Short-to-Ground	Spark Coil #3 Primary Short-to-Power
J1939	SPN	1269	1270	1270
	FMI	6	5	6
MIL		ON	ON	ON
Detected Item		• a short to power in the harness • a short internal to the primary coil	• a short to ground or open circuit in the harness • an open internal to the primary coil	• a short to power in the harness • a short internal to the primary coil
DTC Set Preconditions		• Key On, Engine On	• Key On, Engine On	• Key On, Engine On
DTC Set Conditions		• Adaptive dwell adjustment ≤ -2.0 ms • or total dwell ≤ 4.0 ms • and battery voltage < 16.0 V	• Adaptive dwell adjustment ≥ 2.0 ms • or total dwell ≥ 14.0 ms • and battery voltage > 11.0 V	• Adaptive dwell adjustment ≤ -2.0 ms • or total dwell ≤ 4.0 ms • and battery voltage < 16.0 V
Period for Judgment or Number of Occurrence for Judgment		• 10 sparks	• 10 sparks	• 10 sparks
System Action		• CL Disable • AL Disable • Low Rev Limit	• CL Disable • AL Disable • Low Rev Limit	• CL Disable • AL Disable • Low Rev Limit
Engine Warning Light		ON	ON	ON

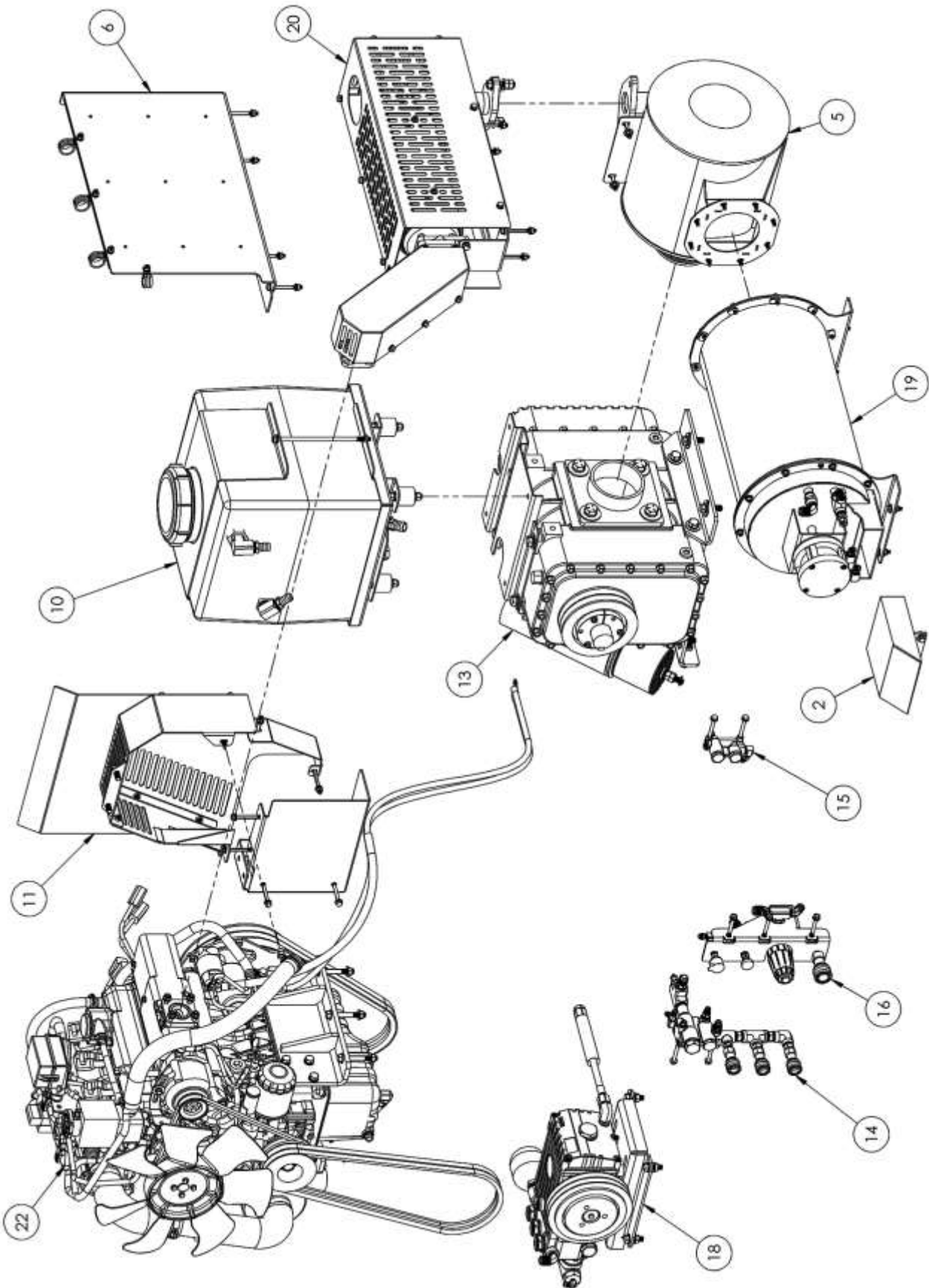
SECTION FOUR – SERVICE AND MAINTENANCE

DTC		2309	2310
Name		Spark Coil Primary	Spark Coil Primary
DTC Name		Spark Coil #4 Primary Open/Short-to-Ground	Spark Coil #4 Primary Short-to-Power
J1939	SPN	1271	1271
	FMI	5	6
MIL		ON	ON
Detected Item		- a short to ground or open circuit in the harness - an open internal to the primary coil	- a short to power in the harness - a short internal to the primary coil
DTC Set Preconditions		Key On, Engine On	Key On, Engine On
DTC Set Conditions		- Adaptive dwell adjustment $\geq$ 2.0 ms - or total dwell $\geq$ 14.0 ms - and battery voltage $>$ 11.0 V	- Adaptive dwell adjustment $\leq$ -2.0 ms - or total dwell $\leq$ 4.0 ms - and battery voltage $<$ 16.0 V
Period for Judgment or Number of Occurrence for Judgment		10 sparks	10 sparks
System Action		- CL Disable - AL Disable - Low Rev Limit	- CL Disable - AL Disable - Low Rev Limit
Engine Warning Light		ON	ON

SECTION FIVE: PARTS LISTING AND REFERENCE

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SECTION FIVE: PARTS LISTING AND REFERENCE
70-870HP, CONSOLE, EVEREST 870HP BOM TABLE

1	24	69-634	ASSY, TEMP CONTROL MODULE
1	23	69-875	ASSY, FRAME & ENCLOSURES
1	22	69-876	ASSY, ENGINE
1	21	69-877	ASSY, RADIATOR
1	20	69-878	ASSY, EXHASUT & CATALYST
1	19	69-879	ASSY, THERMAL WELL
1	18	69-881	ASSY, PRESSURE PUMP
1	17	69-882	ASSY, INSTUMENT PANEL
1	16	69-884	ASSY, PRESSURE REGULATOR
1	15	69-885	ASSY, BYPASS MANIFOLD
1	14	69-886	ASSY, MANIFOLD BLOCK EV870
1	13	69-888	ASSY, BLOWER EURUS ZG100
1	12	69-889	ASSY, COOLANT HEAT EXCHANGER
1	11	69-890	ASSY, BELT GUARDS
1	10	69-979	ASSY, WATER BOX
1	9	69-988	ASSY, LOWER PANEL 870HP
1	8	69-991	ASSY, NAMEPLATE
1	7	69-992	ASSY, THERMOFORMED BEZEL
1	6	69-994	ASSY, HEAT SHEILD
1	5	69-996	ASSY, SILENCER
1	4	69-997	ASSY, E-IDLE
1	3	69-999	ASSY, DIVERTER LOCKOUT
1	2	69-1003	ASSY, EXHAUST EXTENSION
1	1	69-1007	ASSY, FILTER BOX 870HP
QTY	ITEM	PART NO.	DESCRIPTION

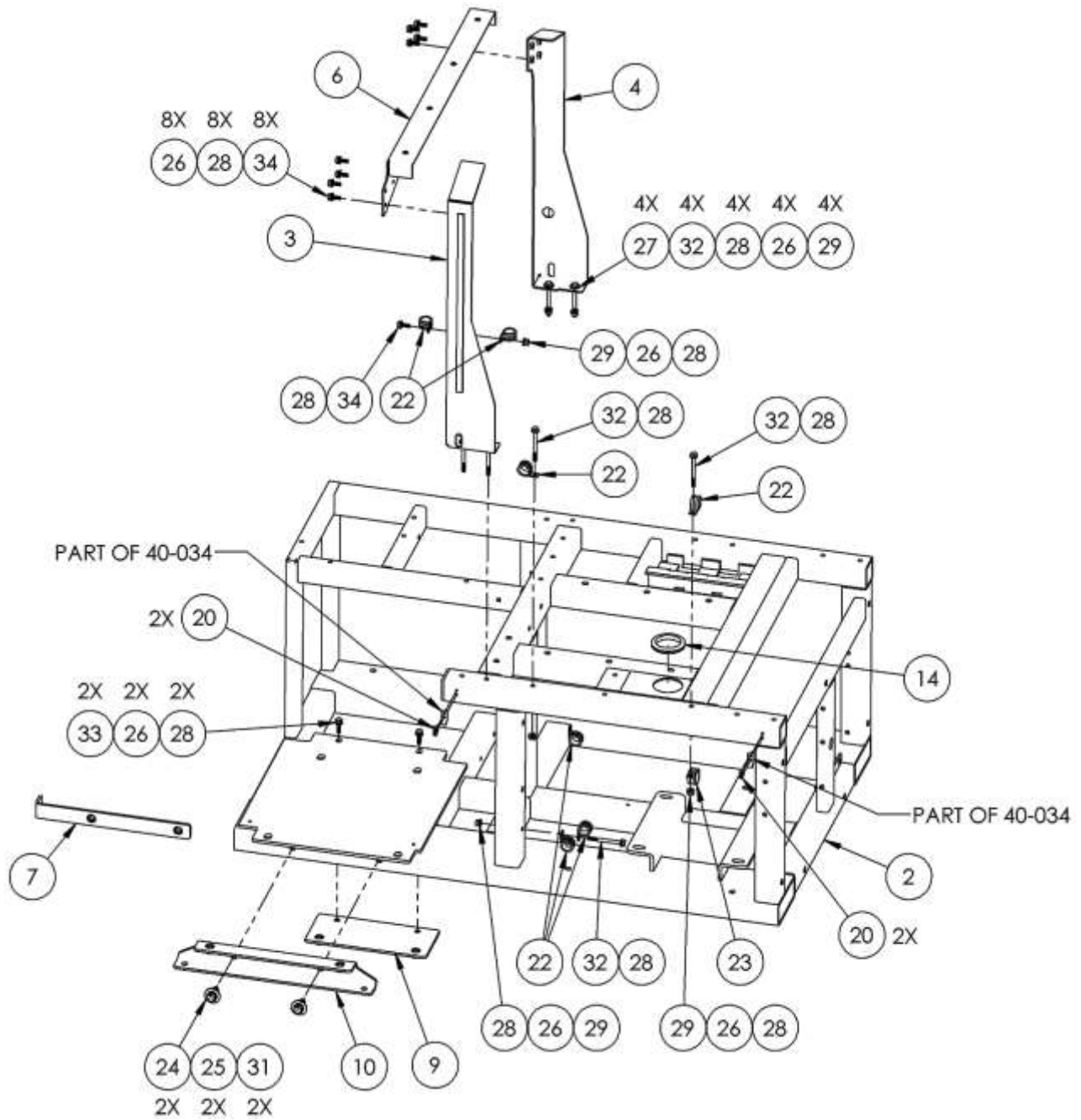
1	EA	47-167	HARNESS, MAIN EVEREST
1	EA	47-174	HARNESS, TEMP CONTROL EVEREST FINAL
1	EA	48-169	KIT, CONSOLE HOSES EVEREST
1	EA	49-175	MANUAL, EVEREST 870HP
1	EA	69-000	ASSY, LEVEL SENSOR SHTOFF
QTY	U/M	PART NO.	DESCRIPTION
ITEMS NOT SHOWN IN DRAWING VIEWS			

69-875, FRAME AND ENCLOSURES, DETAIL 1 OF 2



SECTION FIVE: PARTS LISTING AND REFERENCE

69-875, FRAME AND ENCLOSURES, DETAIL 2 OF 2

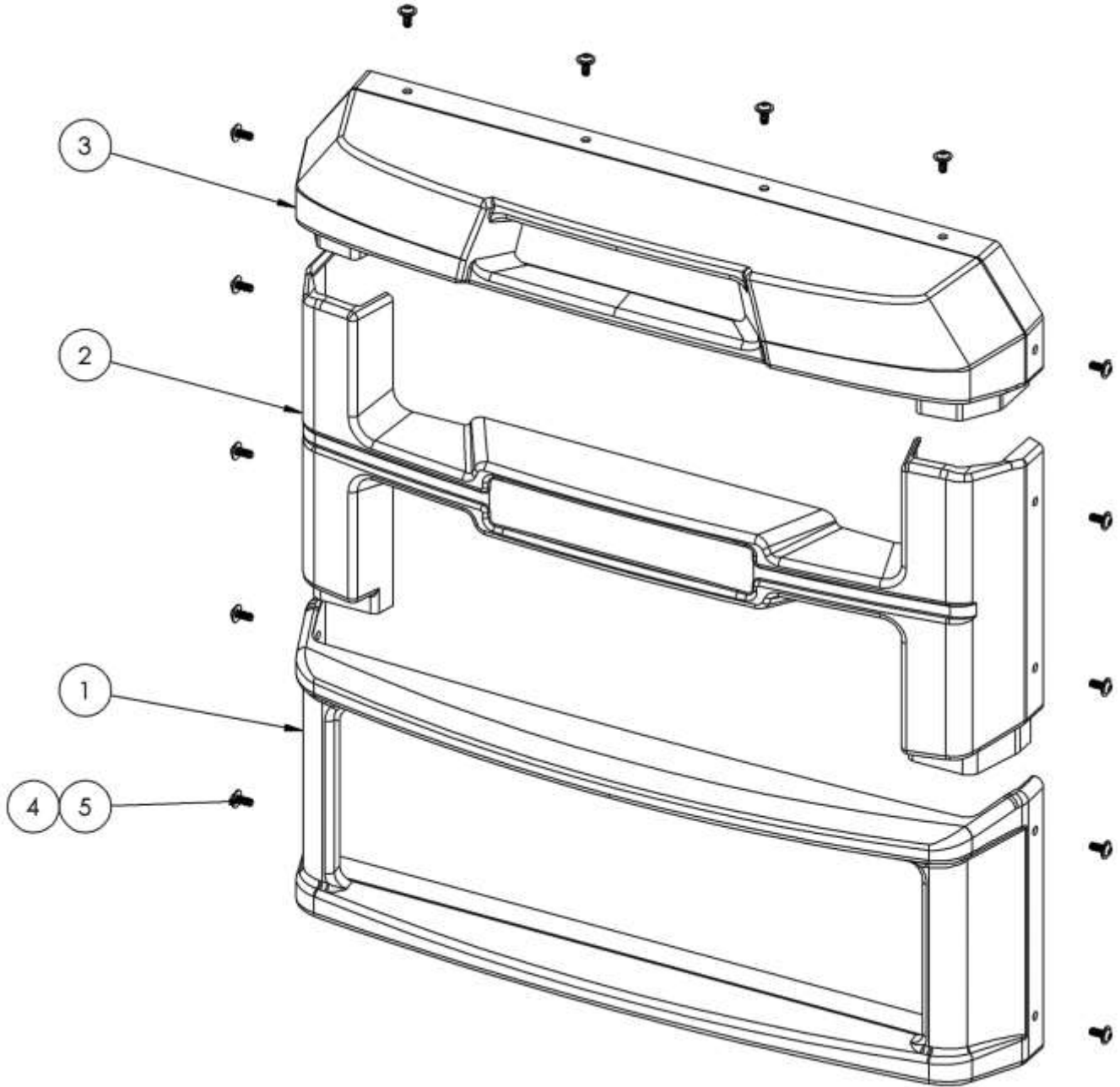


SECTION FIVE: PARTS LISTING AND REFERENCE

69-875, FRAME AND ENCLOSURES BOM TABLE

12	34	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
4	33	10-026	SCREW, MACH 1/4-20 X 1 HXHD
11	32	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
2	31	10-041	SCREW, MACH 7/16-14 X 1-1/4 HXHD ZP
8	30	10-420	SCREW, MACH 1/4-20 X 5/8 BHSCS ZP
10	29	11-004	NUT, 1/4-20 ZINC
29	28	12-011	WASHER, FLAT #12 SAE
16	27	12-012	WASHER, FLAT 1/4 USS
27	26	12-015	LKWSR, 1/4 ZINC
2	25	12-020	LKWSR, 7/16 ZINC
2	24	12-021	WASHER, FLAT, 7/16 ZINC
2	23	14-003	CLAMP,WIRE CUSHION 1.00 ID X 1/4 BOLT
7	22	14-004	CLAMP,WIRE CUSHION 3/4 ID X 1/4 BOLT
1	21	14-022	CLAMP, 1-1/4 ID VINYL COVERED
8	20	14-085	RIVET, 5/32 X .312 HD .251-.375 GRIP SS
8	19	14-086	RIVET, 5/32 X .312 HD .062-.125 GRIP SS
4	18	40-034	LATCH, DRAW SS CONCEALED MOUNT
1	17	41-070	GROMMET, 7/8" OD X 3/8" ID X 1/8" PANEL
0.2	16	41-091	PAD, 1/4 SILICONE SPONGE 1-1/2W X 16-1/2L
5.33 FT	15	41-112	GASKET, VINYL SPONGE W/PSA
2	14	41-204	GROMMET, 2.0 ID X 2-5/8 OD X 1/8 PANEL
1	10	58-1031	PNL, LEFT SIDE HOOD
1	12	58-1032	PNL, RIGHT SIDE HOOD
1	8	58-970	PNL, CENTER HOOD
1	10	61-1453	WELDMENT, BLOWER BOLT BAR LS
1	9	61-1454	WELDMENT, BLOWER BOLT BAR RS
1	8	61-1455	WELDMENT, THERMAL WELL MOUNT
1	7	61-1456	WELDMENT, BLOWER MNT BOLT BAR
1	6	61-1496	WELDMENT, REAR BRACE
1	5	61-1597	WMT, FRONT SUPPORT
1	4	61-1606	WMT, REAR BRACE LEG RS
1	3	61-1607	WMT, REAR BRACE LEG LS
1	2	62-013	ASSY, FRAME EVEREST
2	1	69-982	ASSY, RADIATOR TOP CLAMP
QTY	ITEM	PART NO.	DESCRIPTION

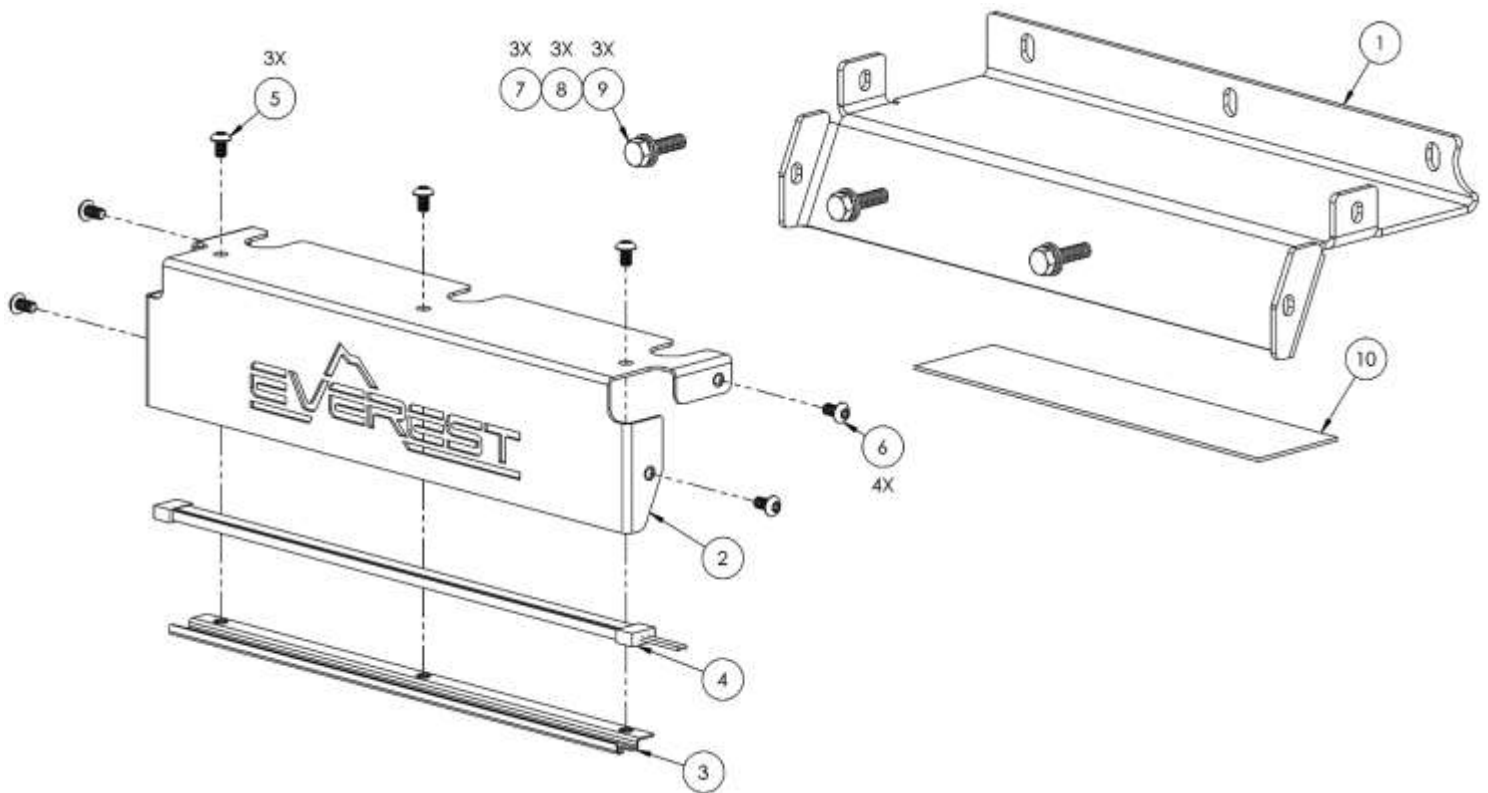
SECTION FIVE: PARTS LISTING AND REFERENCE
69-992, FRONT BEZEL ASSEMBLY



14	5	10-420	SCREW, MACH 1/4-20 X 5/8 BHSCS ZP
14	4	12-002	WASHER, FLAT 1/4 SS ANC
1	3	51-124	THERMOFORM, UPPER PANEL
1	2	51-125	THERMOFORM, CENTER PANEL
1	1	51-126	THERMOFORM, LOWER PANEL
QTY	ITEM	PART NO.	DESCRIPTION

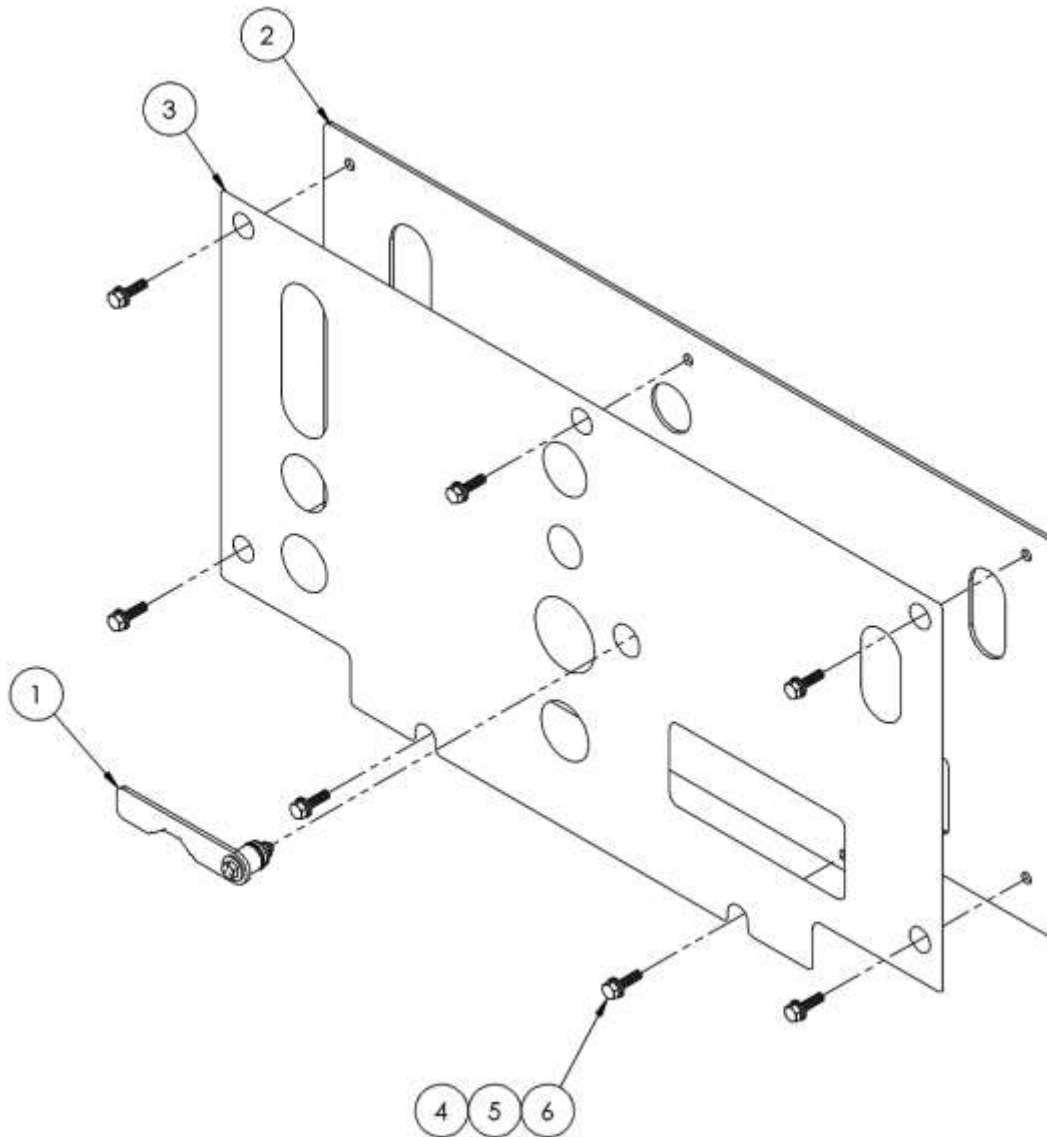
SECTION FIVE: PARTS LISTING AND REFERENCE

69-991, NAMEPLATE ASSEMBLY



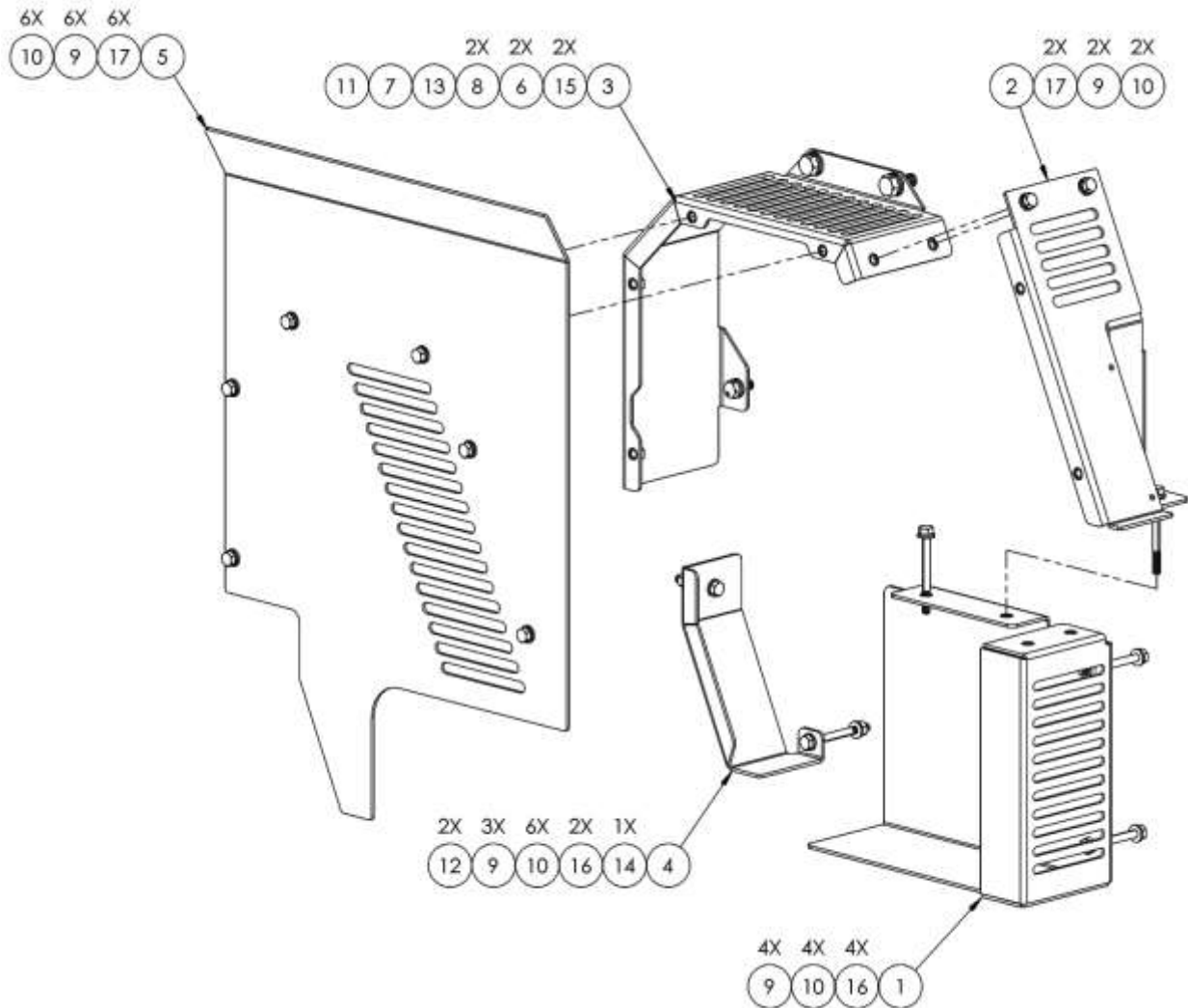
1	10	41-092-01	GASKET, 1-15/16 X 8-1/2 X 1/16 SILICONE PSA
3	9	10-026	SCREW, MACH 1/4-20 X 1 HXHD
3	8	12-015	LKWSR, 1/4 ZINC
3	7	12-011	WASHER, FLAT #12 SAE
4	6	10P-419	SCREW, 10-32 X 5/16 BHSCS W-NYLON PATCH
3	5	10P-419	SCREW, 10-32 X 5/16 BHSCS W-NYLON PATCH
1	4	47-166	LIGHT ASSY, BLUE LED STRIP
1	3	61-1499	WELDMENT, LED STRIP MOUNT
1	2	61-1612	WMT, NAMEPLATE
1	1	58-1042	PNL, NAMEPLATE MNT
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-988, LOWER FRONT PANEL ASSEMBLY, 870HP



7	6	10-026	SCREW, MACH 1/4-20 X 1 HXHD
7	5	12-011	WASHER, FLAT #12 SAE
7	4	12-015	LKWSR, 1/4 ZINC
1	3	44-334	DECAL, LOWER PANEL 870HP
1	2	58-1041	PLT, LOWER PANEL THREE WAND
1	1	69-986	ASSY, PRESSURE REGULATOR STOP
QTY	ITEM	PART NO.	DESCRIPTION

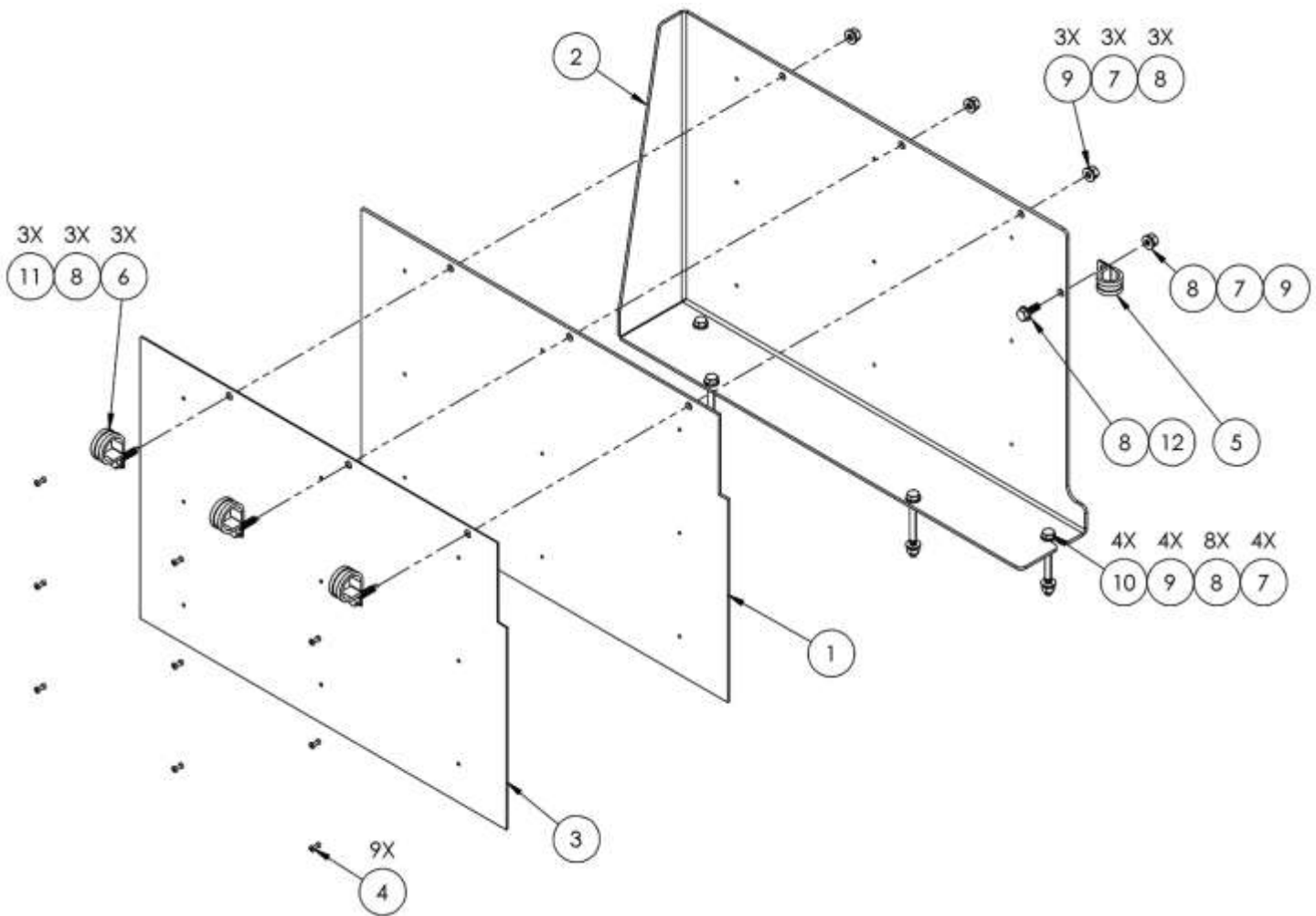
SECTION FIVE: PARTS LISTING AND REFERENCE
69-890, BELT GUARD ASSEMBLY



8	17	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
5	16	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
2	15	10-086	SCREW, M10-1.25 X 25MM G8.8 ZP
1	14	10-170	SCREW, MACH, 1/4-20 X 1-3/4 HH G5
1	13	10-425	SCREW, M8-1.25 X 20MM HXHD G8.8 ZP
2	12	11-004	NUT, 1/4-20 ZINC
1	11	12-004	WASHER, M8 ZINC
16	10	12-011	WASHER, FLAT #12 SAE
14	9	12-015	LKWSR, 1/4 ZINC
2	8	12-025	WASHER, FLAT M10
1	7	12-078	WASHER - M8 LOCK ZINC
2	6	12-093	LKWSR, M10 ZP
1	5	58-973	PLT, BELT GUARD REAR COVER
1	4	58-976	PNL, BELT GUARD HEAT SHIELD
1	3	61-1497	WELDMENT, BELT GUARD ENGINE
1	2	61-1501	WELDMENT, BELT GUARD TOP COVER
1	1	61-1504	WELDMENT, BELT GUARD SIDE
QTY	ITEM	PART NO.	DESCRIPTION

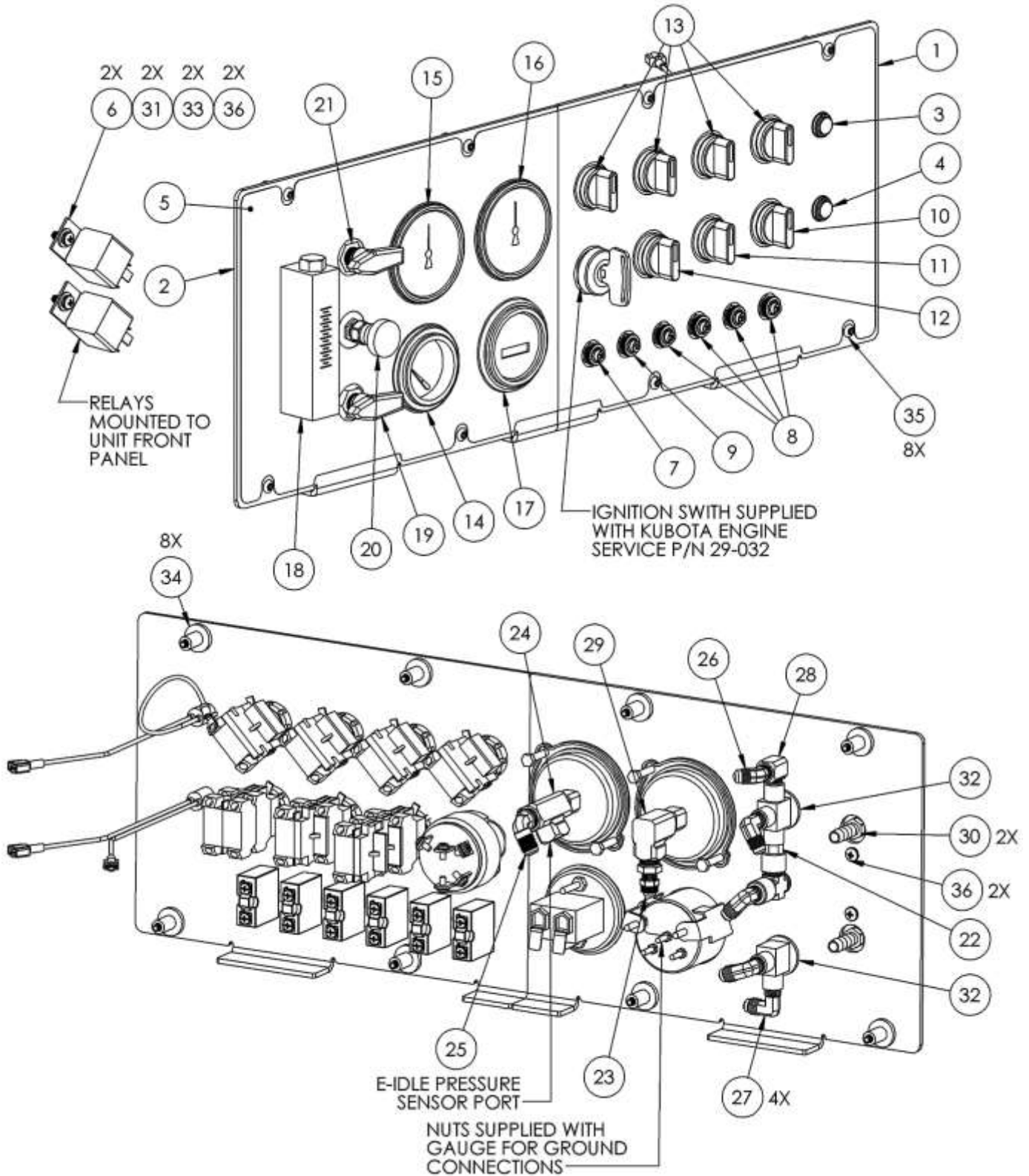
SECTION FIVE: PARTS LISTING AND REFERENCE

69-994, HEAT SHIELD ASSEMBLY



1	12	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
3	11	10-026	SCREW, MACH 1/4-20 X 1 HXHD
4	10	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
8	9	11-004	NUT, 1/4-20 ZINC
16	8	12-011	WASHER, FLAT #12 SAE
8	7	12-015	LKWSR, 1/4 ZINC
3	6	14-003	CLAMP,WIRE CUSHION 1.00 ID X 1/4 BOLT
1	5	14-004	CLAMP,WIRE CUSHION 3/4 ID X 1/4 BOLT
9	4	14-071	RIVET, 1/8 X .313 - .375 GRIP SS
1	3	58-1043	HEAT SHIELD INSULATOR COVER
1	2	61-1615	WMT, HEAT SHIELD
1	1	64-076	INSULATOR, HEAT SHIELD
QTY	ITEM	PART NO.	DESCRIPTION

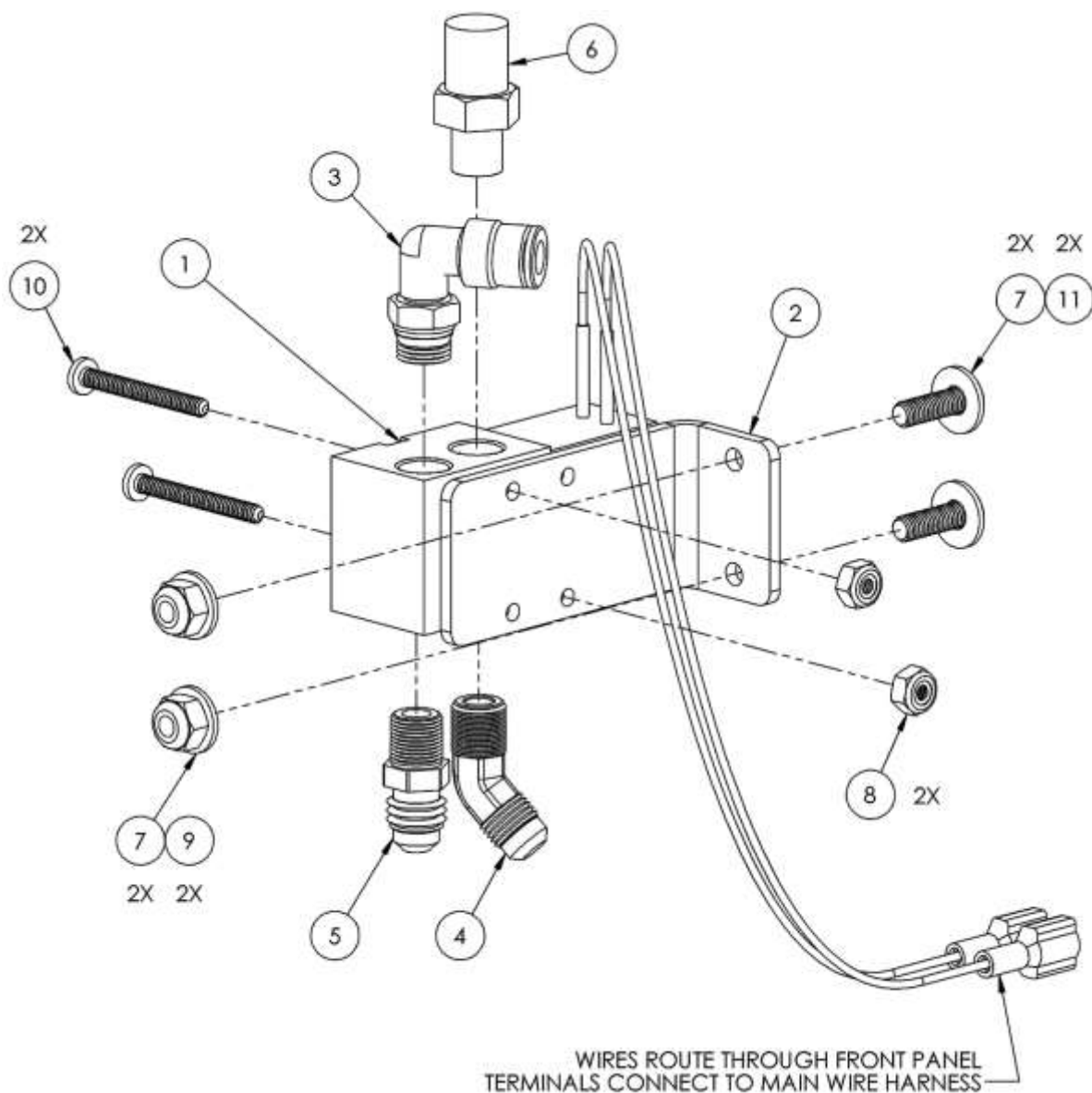
SECTION FIVE: PARTS LISTING AND REFERENCE
69-882, INSTRUMENT PANEL ASSEMBLY



SECTION FIVE: PARTS LISTING AND REFERENCE
69-882, INSTRUMENT PANEL ASSEMBLY BOM TABLE

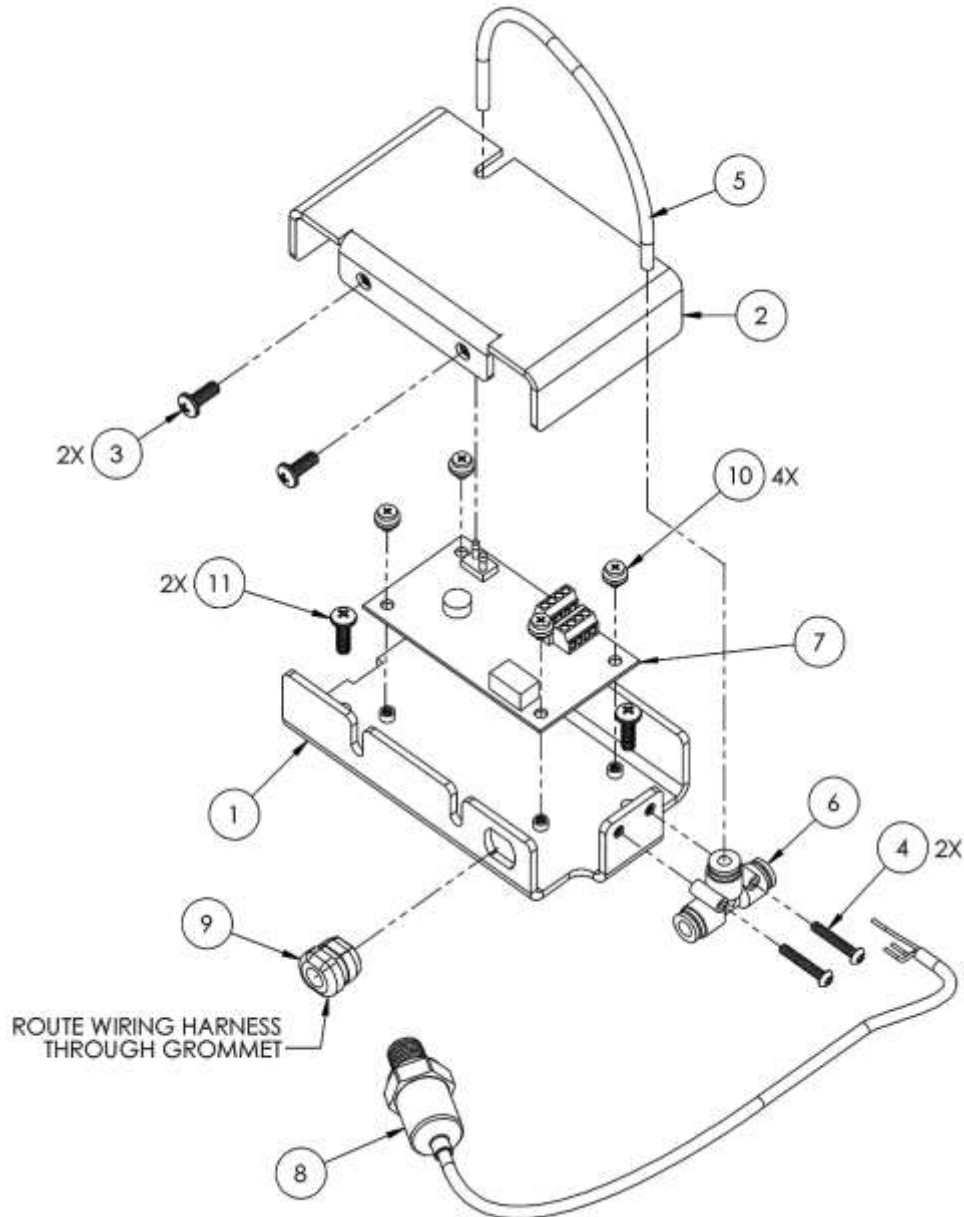
4	36	10-150	SCREW, 10-32 X .50 PHP ZP
8	35	10-181	SCREW, MACH 10-32 X 1 BHSCS SS
8	34	11-002	NUT, WELL G 10-32
2	33	12-050	LKWSR, #10 SPLIT ZINC
2	32	12-090	WASHER, FLAT 1/2 SAE ZP
2	31	12-091	WASHER, FLAT #10 SAE ZP
2	30	21-007	FTTG, BRB 1/8 P X 5/16 H BR
1	29	21-037	ELL, 1/4 IN. BRASS
1	28	21-038	ELL, STREET 1/8 IN BRASS
4	27	21-054	ELL, 1-8P X 1/4 T BRASS
1	26	21-055	ELL, 1-8 P X 1/4 T 45 DEG BRASS
1	25	21-064	ELL, 1/4 P X 1/4 T BRASS
1	24	21-122	TEE, 1/4 IN BRASS
1	23	21-433	CONN, 1/4 P X 1/4 POLY
1	22	21-589	NIPPLE, 1/8 NPT X 1.06 IN HEX BRASS
1	21	23-027	VALVE, 3-WAY BALL 1/8 FP SS
1	20	23-028	VLV, MET 1/8 FP (CHEM) RT ANG SS
1	19	23-138	VALVE, 2-WAY BALL 1/8 FP SS
1	18	26-003	FLOWMETER, 1/8 FP
1	17	26-033	HOURLMETER, HOBBS CHROME BEZEL
1	16	26-044	GAUGE, VACUUM 2.5 IN 0-30 IN/HG
1	15	26-046	GAUGE, PRESSURE 2.5 IN 0-5000 PSI
1	14	26-049	GAUGE, WTR TEMP CHROME 280 DEG.
4	13	29-016	SWITCH, ROTARY NON-ILLUMINATED
1	12	29-058	SWITCH, 870 THROTTLE CONTROL
1	11	29-063	SWITCH, ROTARY, 3 NO
1	10	29-072	SWITCH, ROTARY, 4POS 2NO 2NC
1	9	30-148	BREAKER, 10A SCREW TERM
4	8	30-149	BREAKER, 20A SCREW TERM
1	7	30-150	BREAKER, 30A SCREW TERM
2	6	34-010	RELAY, ENG.SHTDWN 12V 40/60AMP
1	5	44-293	DECAL, INSTRUMENT PANEL
1	4	47-172	LIGHT ASSY, RED INDICATOR
1	3	47-173	LIGHT ASSY, AMBER INDICATOR
1	2	58-1025	PNL, INSTRUMENT PANEL LS
1	1	58-1045	PNL, INSTRUMENT PANEL RS
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-999, DIVERTER LOCKOUT ASSEMBLY



2	11	10-062	SCREW, MACH 10-32 X 5/8 PPHZ
2	10	10-255	SCREW, MACH 6-32 X 1-1/4 PPH ZP
2	9	11-018	NUT, 10-32 NYLOK
2	8	11-021	NUT, 6-32 NYLOK
4	7	12-091	WASHER, FLAT #10 SAE ZP
1	6	20-030	1/8 IN AIR MUFFLER
1	5	21-001	CONN, 1/8 P X 1/4 T BR
1	4	21-055	ELL, 1-8 P X 1/4 T 45 DEG BRASS
1	3	21-331	CONNECTOR, 1-8 MNPT X 1-4 HOSE 90 DEG. SWIVEL
1	2	58-364	BRACKET, DIVERTER LOCKOUT VALVE
1	1	69-998	ASSY, MAC VALVE
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-997, E-IDLE™ ASSEMBLY

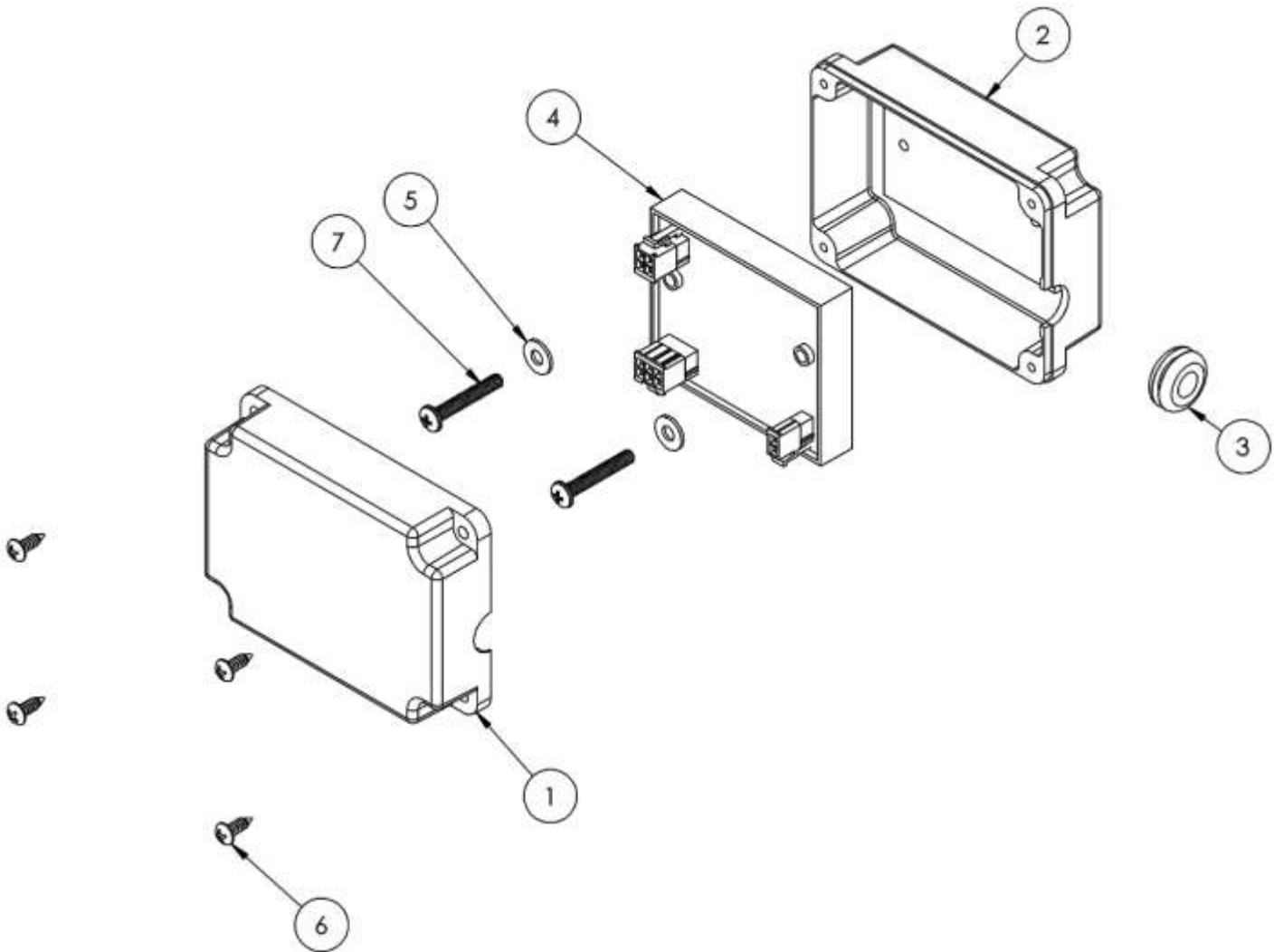


2	11	10-062	SCREW, MACH 10-32 X 5/8 PPHZ
4	10	41-220	GROMMET, ANTI-VIBRATION
1	9	31-284	STRAIN RELIEF, HEYCO #1210
1	8	30-154	TRANSDUCER, PRESSURE 1/4-18 NPT
1	7	30-153	PCB, AUTO IDLE
1	6	21-609	TEE, UNEQUAL UNION 3/16 X 1/4 X 1/4
1	5	16-152	TUBING, TYGON LP1100 3/32 ID X 3/16 OD
2	4	10-436	SCREW, MACH 6-32 X 7/8 BHSCS SS
2	3	10-150	SCREW, 10-32 X .50 PHP ZP
1	2	62-015	ASSY, E-IDLE COVER
1	1	62-014	ASSY, E-IDLE BASE
QTY	ITEM	PART NO.	DESCRIPTION

NOT SHOWN: 47-170, HARNESS E-IDLE EVEREST

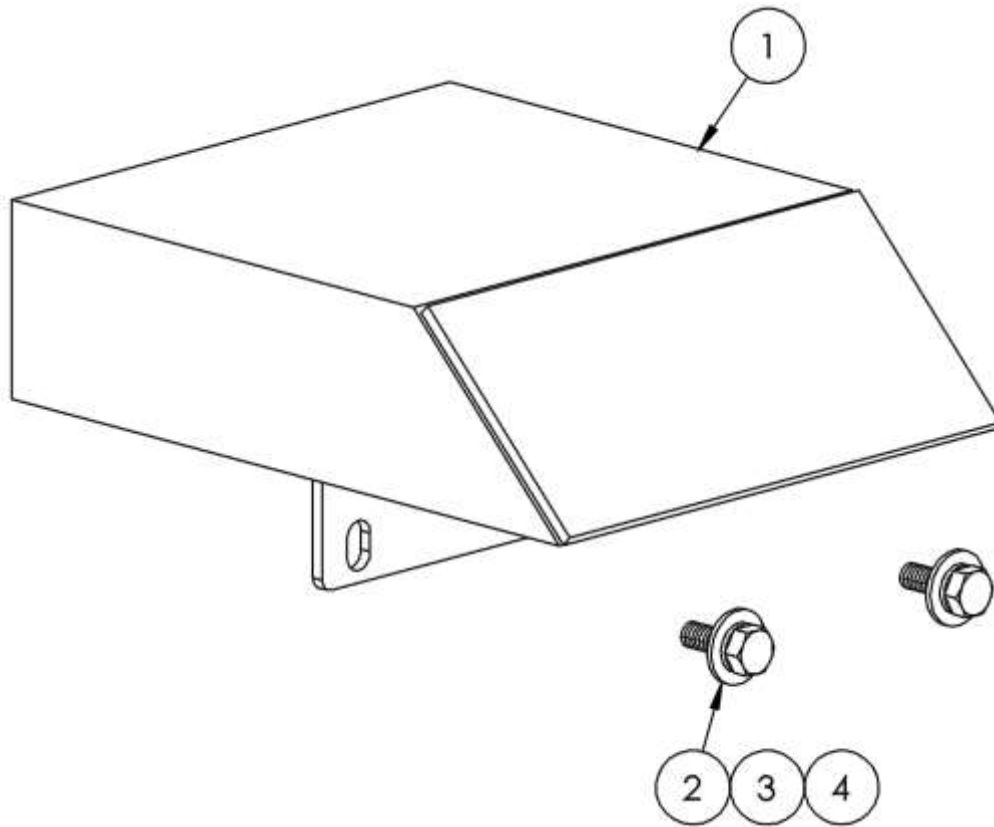
SECTION FIVE: PARTS LISTING AND REFERENCE

69-634, TEMPERATURE CONTROL ASSEMBLY



2	7	10-252	SCREW, MACH 10-32 X 1-1/4 PPH ZP
4	6	10-310	SCREW, SHEET METAL #8-15 X 1/2 PPH ZP
2	5	12-028	WASHER, FLAT #10 SS
1	4	34-045	MODULE, TEMP CONTROL
1	3	41-070	GROMMET, 7/8" OD X 3/8" ID X 1/8" PANEL
1	2	51-086	MOLDING, TEMP CNTL BOX BOTTOM
1	1	51-087	MOLDING, TEMP CNTL BOX LID
QTY	ITEM	PART NO.	DESCRIPTION

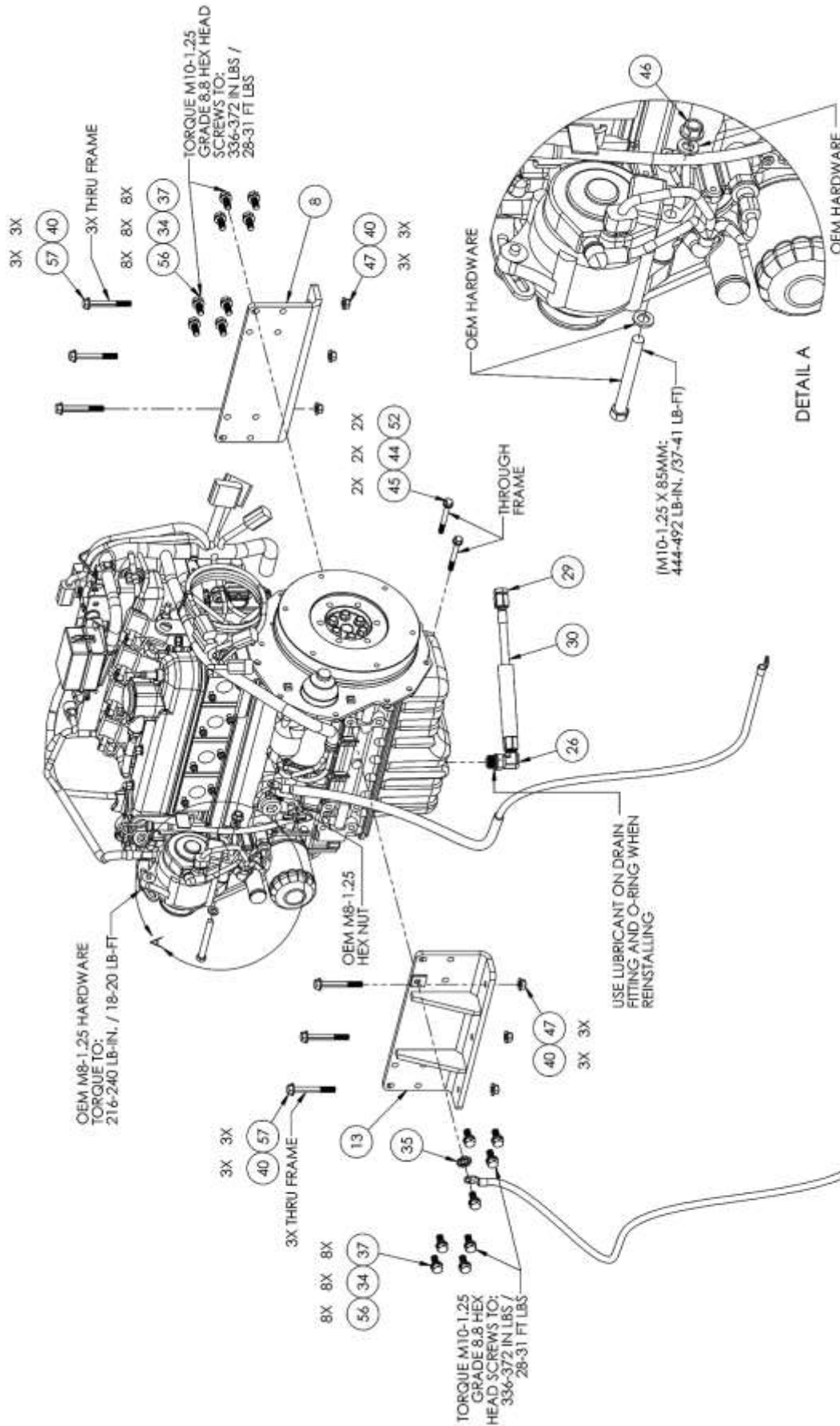
SECTION FIVE: PARTS LISTING AND REFERENCE
69-1003, EXHAUST EXTENSION

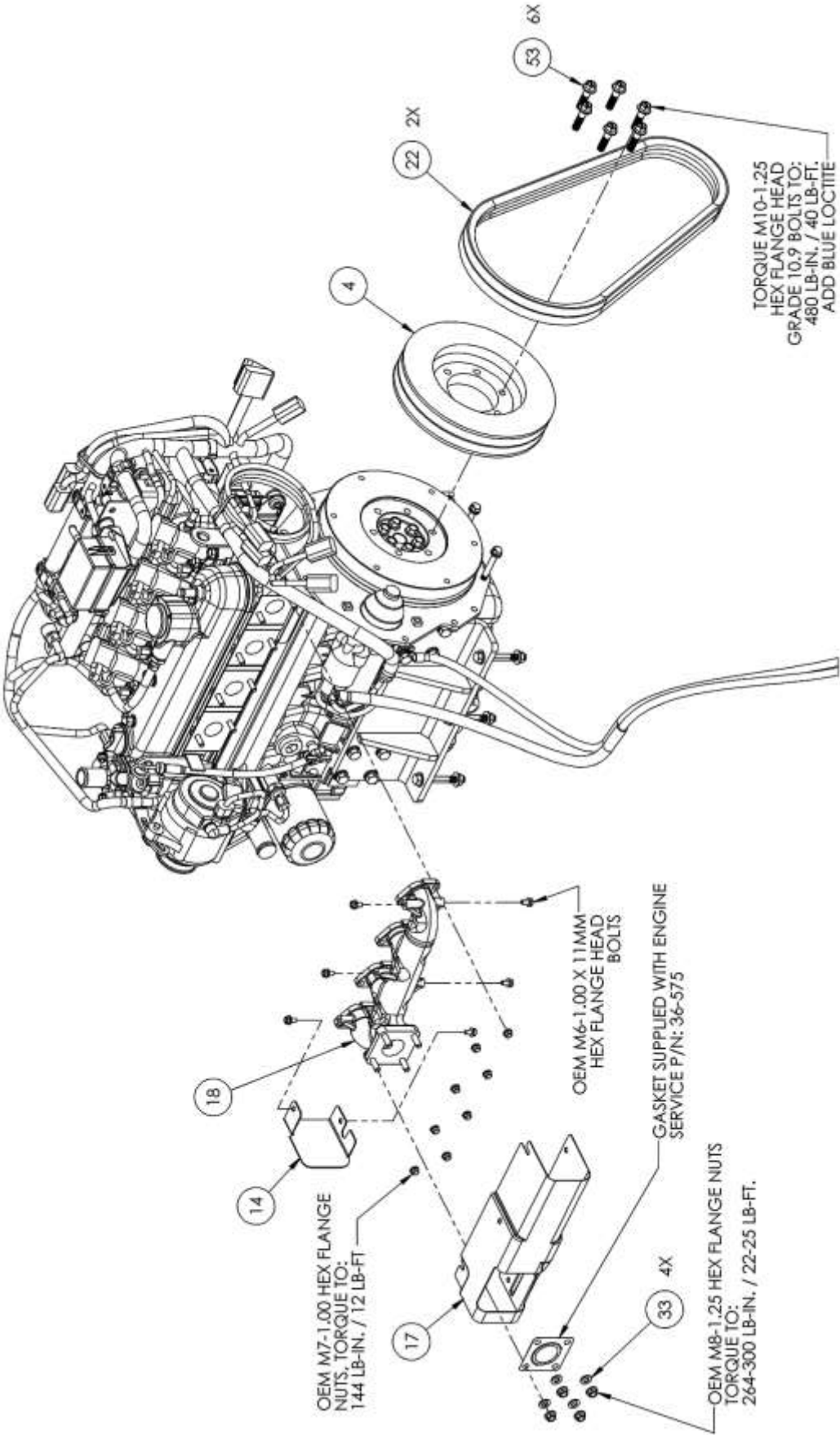


2	4	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
2	3	12-015	LKWSR, 1/4 ZINC
2	2	12-012	WASHER, FLAT 1/4 USS
1	1	61-1598	WMT, EXHAUST EXTENSION
QTY	ITEM	PART NO.	DESCRIPTION

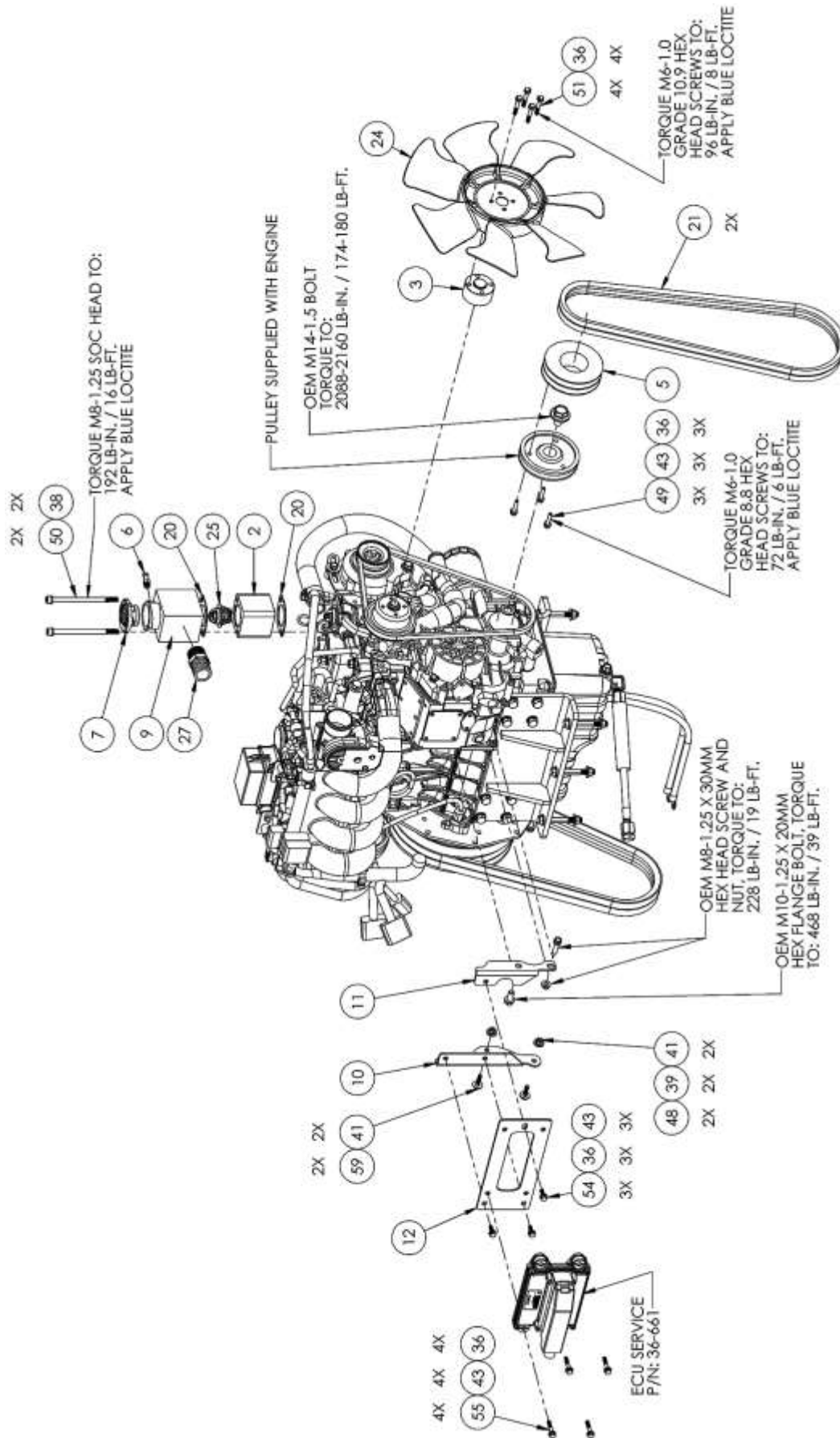
SECTION FIVE: PARTS LISTING AND REFERENCE

69-876, ENGINE ASSEMBLY, DETAIL 1 OF 4



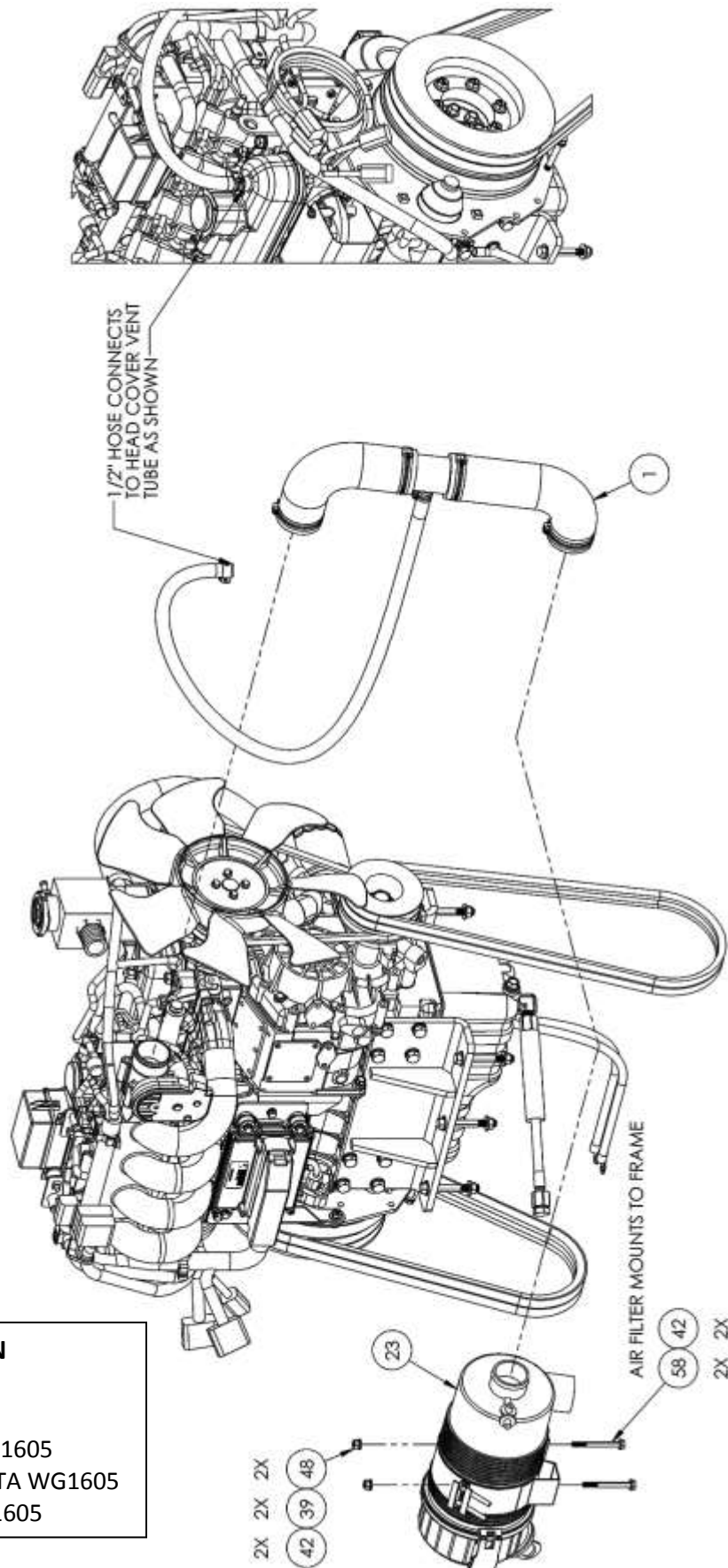


SECTION FIVE: PARTS LISTING AND REFERENCE



SECTION FIVE: PARTS LISTING AND REFERENCE

69-876, ENGINE ASSEMBLY, DETAIL 4 OF 4



SERVICE PARTS NOT SHOWN IN DRAWING VIEWS:

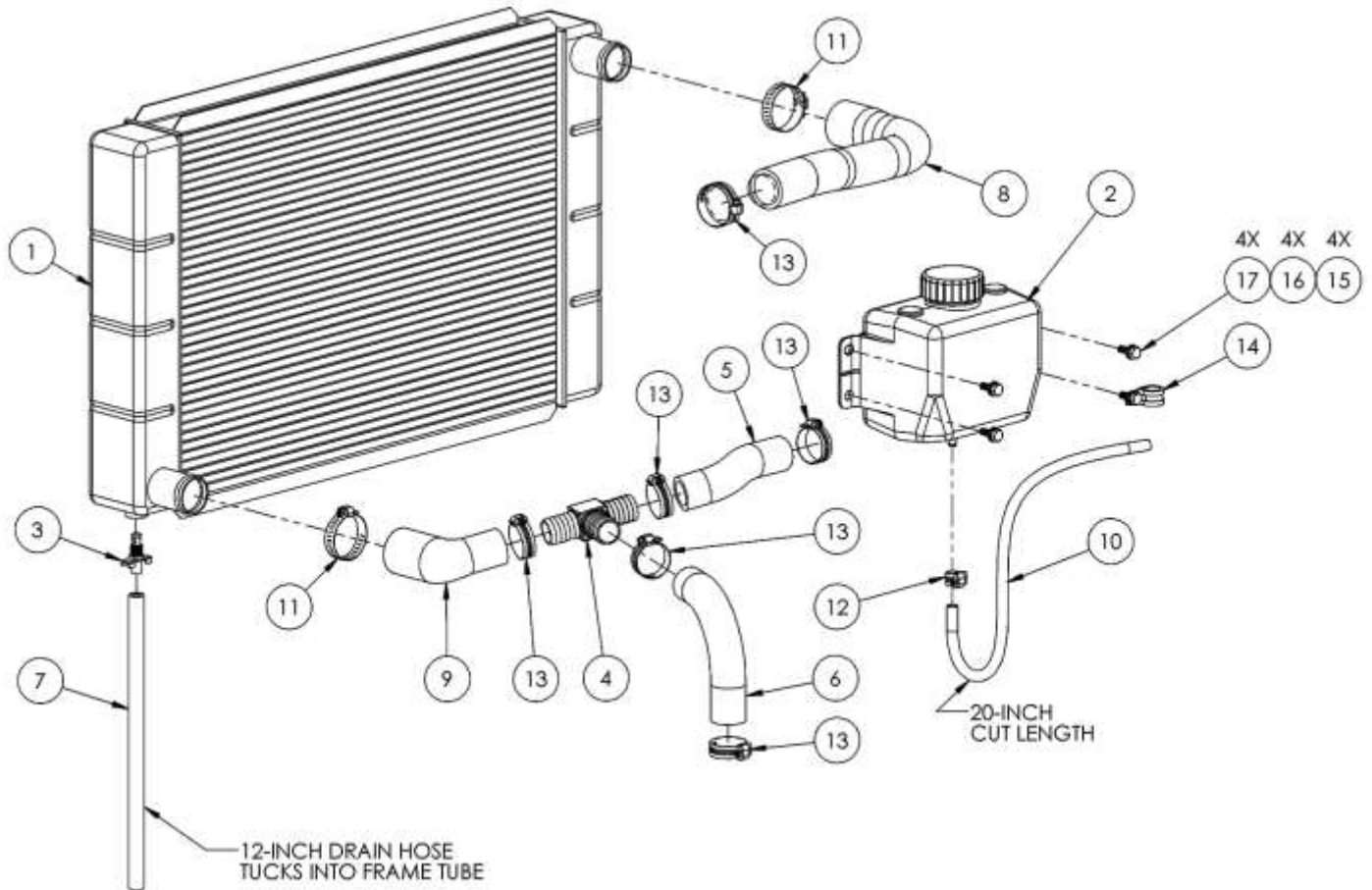
- 36-648, FILTER, OIL
- 36-665, SPARK PLUG, KUBOTA WG1605
- 36-664, BELT, ALTERNATOR KUBOTA WG1605
- 36-668, SENSOR, O2 KUBOTA WG1605

69-876, ENGINE ASSEMBLY, BOM TABLE

SECTION FIVE: PARTS LISTING AND REFERENCE

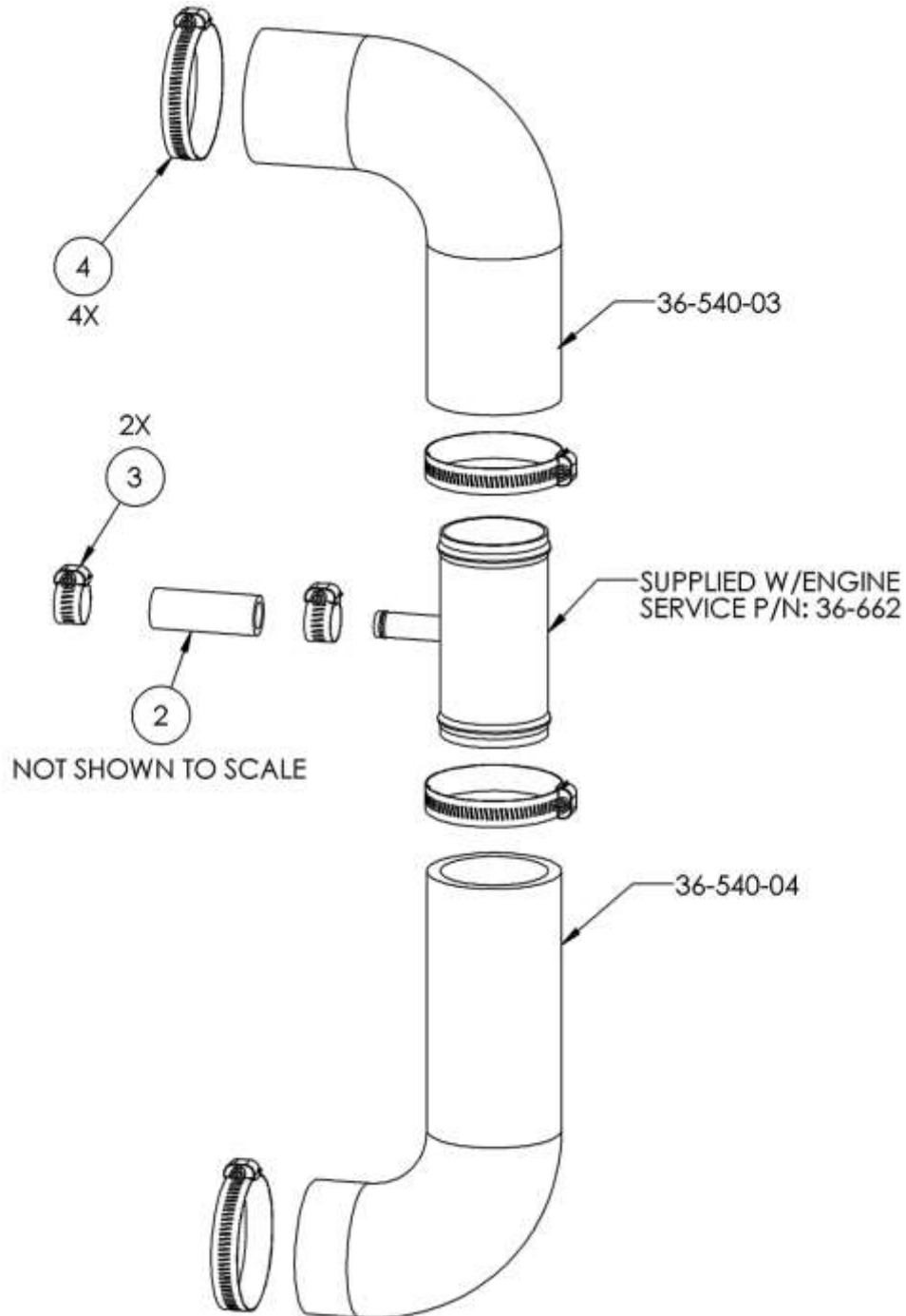
1	30	18-21-4-05	HOSE, 7/16 ID X 08 FJIC X 08 FJIC W / SS & SLEEVE
1	29	21-027	PLUG, 1/2 T BR
1	28	21-381	FTTG, 3/4P X 1H BRASS
1	27	21-583	FTTG, BARB 1 NPT X 1-1/4 H BRASS
1	26	21-595	ADAPTER, 08 MJIC X 22MM ORB 90 DEG
1	25	34-014	THERMOSTAT, KUBOTA 195 DEG
1	24	35-053	FAN BLADE, KUBOTA 15 IN 7 BLADE
1	23	36-423	ASSY, AIR CLEANER
2	22	37-081	BELT, 5VX330 GATES EPDM
2	21	37-102	BELT, AX45 GATES EPDM
2	20	41-026	GASKET, THERMOSTAT KUBOTA
1	19	45-061	ENGINE, KUBOTA 1.6L GAS
1	18	45-061-1	MANIFOLD, EXHAUST WG1605-G-E3
1	17	45-061-2	SHIELD, EXHAUST MANIFOLD
1	16	47-001	ASSY, BATTERY CABLE RED THERMAL
1	15	47-002	ASSY, BATTERY CABLE BLK THERMAL
1	14	58-995	PNL, ALTERNATOR HEAT SHIELD
1	13	61-1440	WMT, ENGINE MOUNT RS
1	12	61-1443	WELDMENT, ECU BRACKET
1	11	61-1444	WELDMENT, ECU-AIR CLNR BRKT
1	10	61-1445	WELDMENT, ECU SUPPORT BRKT
1	9	61-1603	WMT, UPPER RAD HOSE & CAP ADAPTER
1	8	61-1614	WMT, ENGINE MOUNT LS
1	7	63-263	CAP, RADIATOR 13 LB
1	6	63-265	TUBE, FILLER NECK OVERFLOW
1	5	66-581	PULLEY, ENGINE FRONT
1	4	66-582	PULLEY, ENGINE REAR
1	3	66-586	SPACER, FAN
1	2	66-614	HOUSING, DUAL THERMOSTAT
1	1	69-987	ASSY, CRANK VENT ADAPTER
QTY	ITEM	PART NO.	DESCRIPTION
2	59	10-026	SCREW, MACH 1/4-20 X 1 HXHD
2	58	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
6	57	10-030	SCREW, MACH 3/8-16 X 3 HXHD
16	56	10-086	SCREW, M10-1.25 X 25MM G8.8 ZP
4	55	10-247	SCREW, M8-1.0 X 35MM HXHD G8.8 ZP
3	54	10-325	SCREW, M6-1.0 X 20MM 8.8 HXHD ZP
6	53	10-405	SCREW, M10-1.25 X 40MM CLASS 10.9 FHCS ZP
2	52	10-406	SCREW, M8-1.25 X 70MM CLASS 8.8 HXHD ZP
4	51	10-410	SCREW, M6-1.0 X 45MM HXHD G10.9 ZP
2	50	10-444	SCREW, M8-1.25 X 130MM G12.9 SOCHD ZP
3	49	10-437	SCREW, MACH M6-1.00 X 30MM HXHD ZP
4	48	11-004	NUT, 1/4-20 ZINC
6	47	11-019	NUT, 3/8-16 NYLOK
1	46	11-151	NUT, M10-1.25 FLANGE ZP
2	45	12-004	WASHER, M8 ZINC
2	44	12-005	LKWSR, M8 HARD
10	43	12-010	WASHER, FLAT M6 ZP
4	42	12-011	WASHER, FLAT #12 SAE
4	41	12-012	WASHER, FLAT 1/4 USS
12	40	12-013	WASHER, FLAT 3/8 USS
4	39	12-015	LKWSR, 1/4 ZINC
2	38	12-016	LKWSR, 5/16 ZINC
16	37	12-025	WASHER, FLAT M10
14	36	12-063	WASHER, LOCK M6 ZP
1	35	12-070	WASHER, LOCK 3/8 INT/EXT TOOTH ZPS
16	34	12-093	LKWSR, M10 ZP
4	33	12-114	WASHER, NORDLOCK 5/16"/M8 LARGE OD SS
2	32	14-006	CLAMP, HOSE #20 SS
1	31	16-155-01	HOSE, TSTAT TO HE 7623 CUT
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-877, RADIATOR ASSEMBLY



4	17	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
4	16	12-011	WASHER, FLAT #12 SAE
4	15	12-015	LKWSR, 1/4 ZINC
1	14	14-005	CLAMP,WIRE CUSHION 5/8 ID X 1/4 BOLT
6	13	14-006	CLAMP, HOSE #20 SS
1	12	14-007	CLAMP, HOSE #4
2	11	14-042	CLAMP, HOSE #24 SS
1.66 FT	10	16-129	HOSE, 5/16 VACUUM
1	9	16-153	HOSE, LOWER RADIATOR 8937
1	8	16-154-01	HOSE, UPPER RADIATOR 9763
1 FT	7	16-156	HOSE, VACUUM 3/8 ID
1	6	16-157-01	HOSE, 1.0 ID X 14L 90 DEG CUT 01
1	5	16-157-02	HOSE, 1.0 ID X 14L 90 DEG CUT 02
1	4	21-611	TEE, 1 IN HOSE BARB BRASS
1	3	23-146	COCK, DRN 1/4 P X 1/4 H BRASS
1	2	36-595	BOTTLE, COOLANT OVERFLOW
1	1	63-258	RADIATOR, EVEREST
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-987, CRANK VENT ADAPTER ASSEMBLY



4	4	14-010	CLAMP, HOSE #32
2	3	14-011	CLAMP, HOSE #6 SS
3 FT	2	16-003	HOSE, WTR 1/2 IN HRZ 500 FT BULK
1	1	36-540	HOSE, ENGINE AIR 2.0 ID NAPA 8290
QTY	ITEM	PART NO.	DESCRIPTION

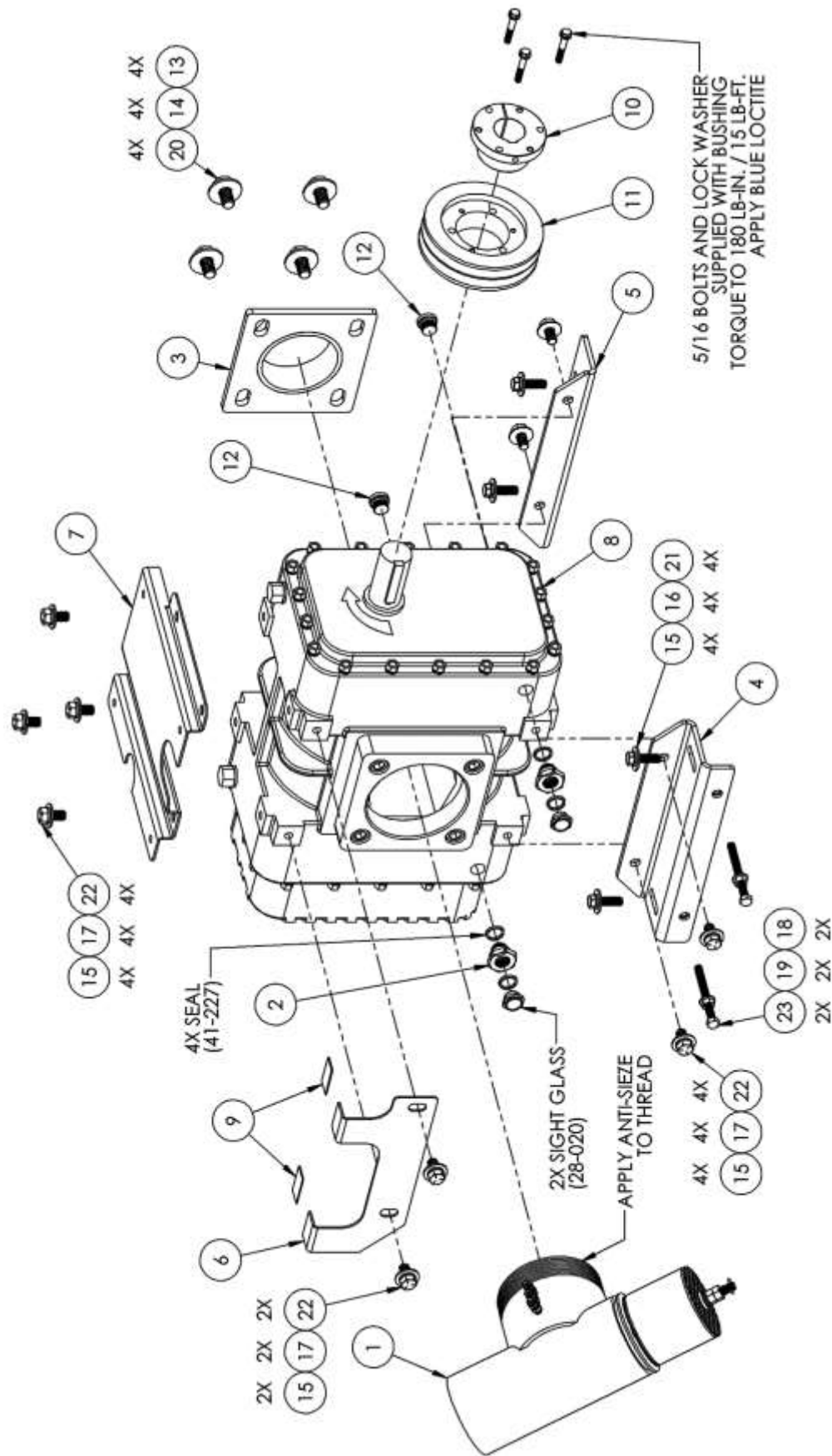


SECTION FIVE: PARTS LISTING AND REFERENCE

69-878, EXHAUST AND CATALYST ASSEMBLY BOM TABLE

21	26	10-006	SCREW, MACH 1/4-20 X 1/2 HEXHD
4	25	10-020	SCREW, MACH 1/4-20 X 3/4 HXHD SS
4	24	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
4	23	10-425	SCREW, M8-1.25 X 20MM HXHD G8.8 ZP
4	22	10-434	SCREW, MACH 7/16-14 X 2 HXHD G8
4	21	10-442	SCREW, MACH 5/16-18 X 1-1/2 HXHD G8 BO
4	20	11-004	NUT, 1/4-20 ZINC
4	19	11-148	NUT, 7/16-14 TOP LOCK ZP
4	18	11-152	NUT, 5/16-18 G8 YZ
4	17	11-153	NUT, 7/16-14G8 YZ
4	16	12-001	LKWSR, 5/16 HARD YZ
4	15	12-004	WASHER, M8 ZINC
4	14	12-005	LKWSR, M8 HARD
34	13	12-011	WASHER, FLAT #12 SAE
29	12	12-015	LKWSR, 1/4 ZINC
8	11	12-017	WASHER, FLAT 5/16 SAE ZINC
8	10	12-115	WASHER, FLAT 7/16 HARD YZ
1	9	36-577	GASKET , MUFFLER OUTLET 1.6L KUBOTA
1	8	58-1048	PLT, CATALYST HEAT SHIELD END
1	7	61-1442	WELDMENT, EXHAUST TUBE ENGINE
1	6	61-1461	WMT, EXHAUST TUBE CAT TO SILENCER
1	5	61-1465	WMT, CATALYST HEAT SHIELD
1	4	61-1618	WMT, EXHAUST HEAT SHIELD
1	3	61-1619	WMT, EXHAUST HEAT SHIELD COVER
1	2	61-1626	WMT, CATALYST MOUNT
1	1	61-1627	WMT, CATALYST HEAT SHIELD COVER
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE

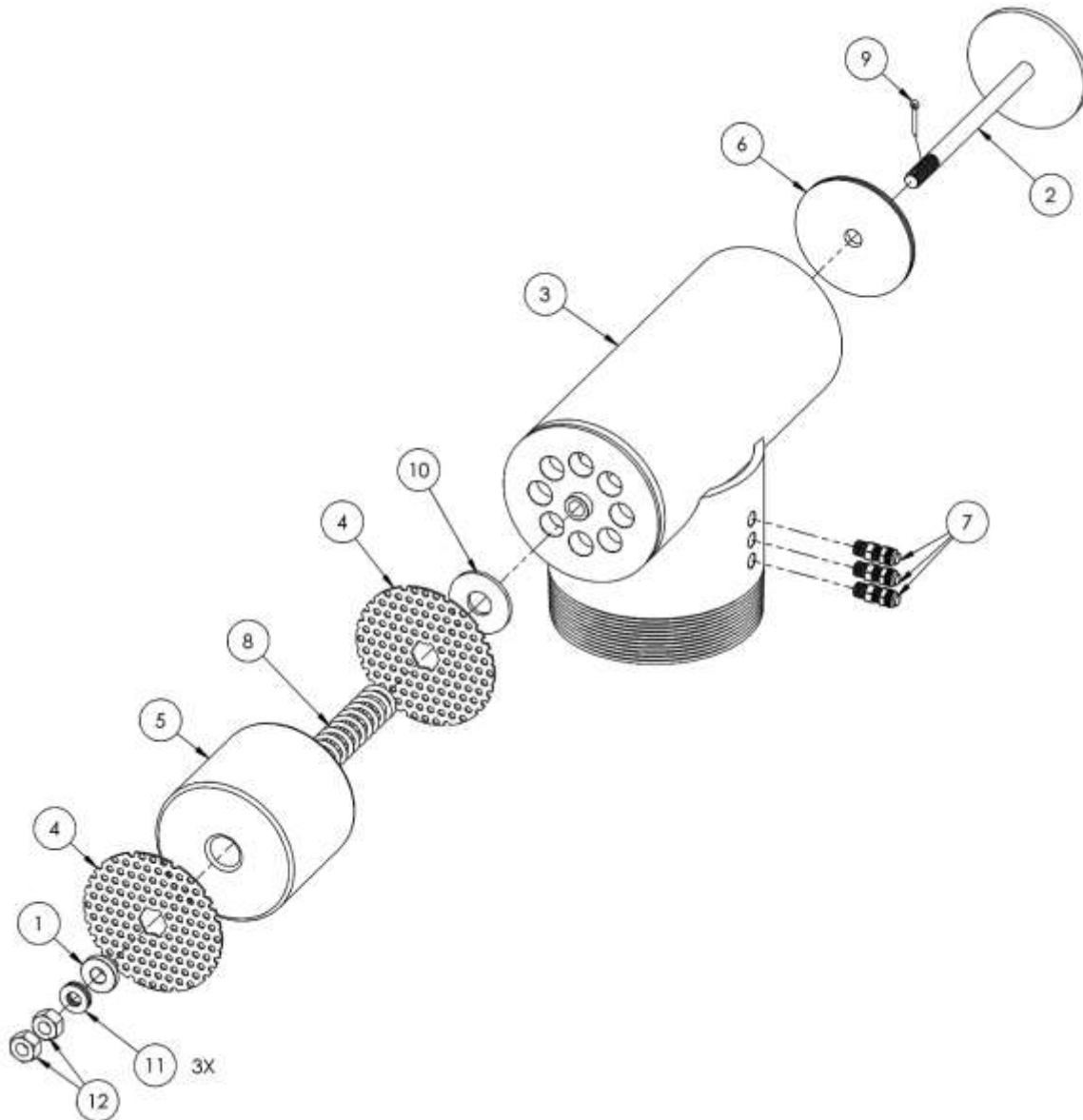


SECTION FIVE: PARTS LISTING AND REFERENCE
69-888, VACUUM PUMP ASSEMBLY BOM TABLE

2	23	10-010	BOLT, TAP 3/8-16 X 4 GR 5
10	22	10-038	SCREW, MACH 1/2-13 X 1 HXHD
4	21	10-039	SCREW, MACH 7/16-14 X 1-1/2 HXHD
4	20	10-432	SCREW, MACH .625-11 X 1.25 HXHD ZP
2	19	11-006	NUT, 3/8-16 ZINC
2	18	12-013	WASHER, FLAT 3/8 USS
10	17	12-019	LKWSR, 1/2 ZINC
4	16	12-020	LKWSR, 7/16 ZINC
14	15	12-021	WASHER, FLAT, 7/16 ZINC
4	14	12-039	WASHER, LOCK, 5/8
4	13	12-040	WASHER, FLAT 5/8 USS
2	12	21-520	PLUG, HEX M20-1.5 STEEL
1	11	38-027	PULLEY, 5V630SK
1	10	38-112	HUB, SK X 42MM
2	9	41-228	GASKET, 1.0 X 1.75 X .062 SILICONE SHT W-PSA
1	8	46-076	VACUUM PUMP, EURUS ZG-100 MOD
1	7	58-1026	PNL, WATER BOX SUPPORT
1	6	58-1053	PNL, WATER BOX STOP PLATE
1	5	58-946	PNL, BLOWER MOUNT RS
1	4	61-1451	WELDMENT, BLOWER MOUNT LS
1	3	61-972	WELDMENT, BLOWER OUTLET
2	2	66-623	ADAPTER, EURUS SIGHT GLASS EXT
1	1	69-356	ASSY, VAC BREAK
QTY	ITEM	PART NO.	DESCRIPTION

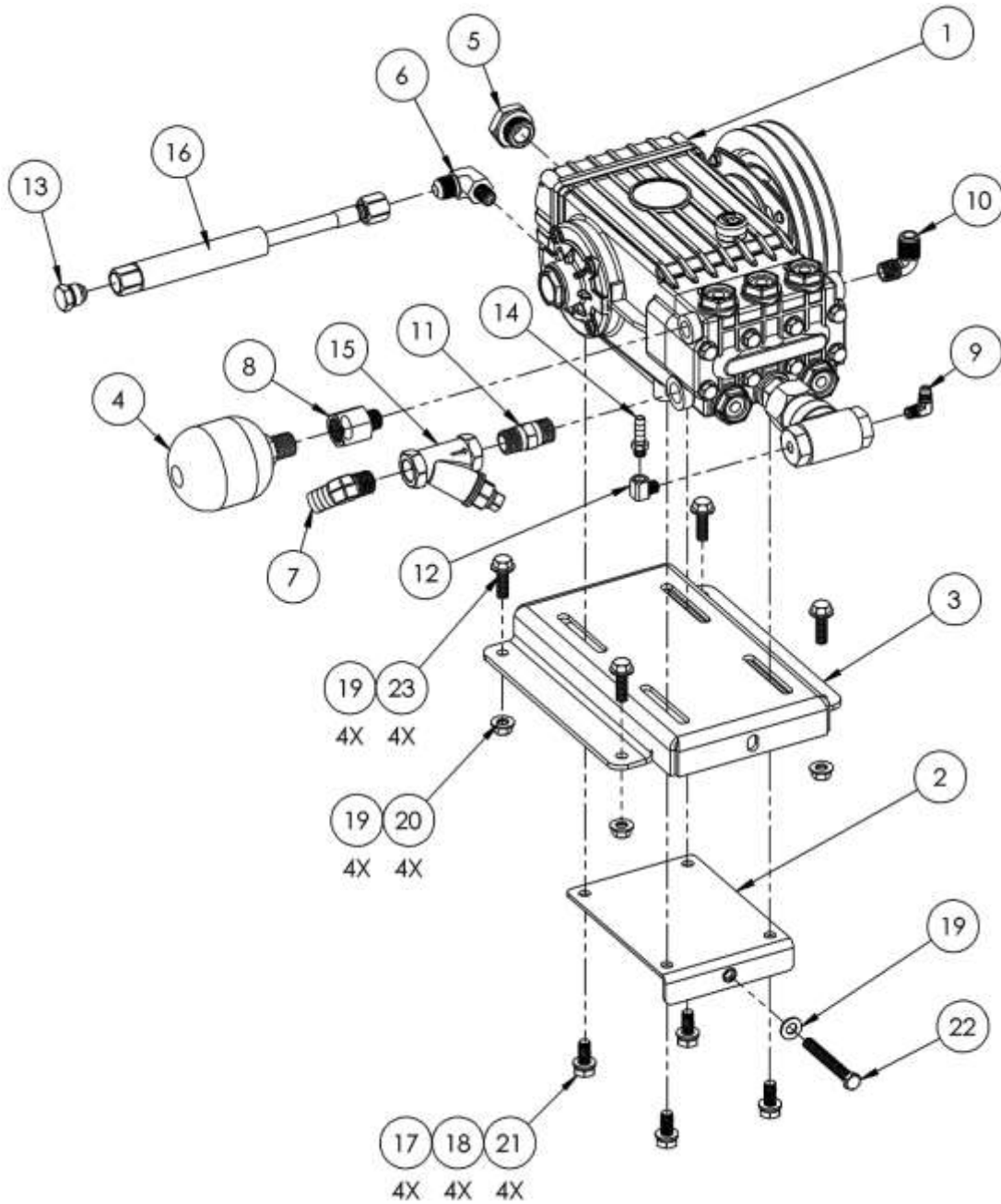
SECTION FIVE: PARTS LISTING AND REFERENCE

69-356, VACUUM RELIEF VALVE ASSEMBLY



2	12	11-012	NUT, 7/16-14 ZP
3	11	12-013	WASHER, FLAT 3/8 USS
1	10	12-040	WASHER, FLAT 5/8 USS
1	9	14-032	PIN, COTTER 7/64 X 3/4 SS
1	8	15-033	SPRING, VAC RELIEF VALVE
3	7	21-028	CONN, 1/8 P X 1/4 POLY
1	6	41-113	DIAPHRAGM, VAC RELIEF
1	5	50-019	FOAM, VAC BREAK
2	4	60-1865	WASHER, VAC BRAKE SILENCER
1	3	61-763	WELDMENT, VAC BREAK
1	2	61-768	WELDMENT, VAC RELIEF STEM
1	1	66-502	BUSHING, LARGE SPRING RETAINER
QTY	ITEM	PART NO.	DESCRIPTION

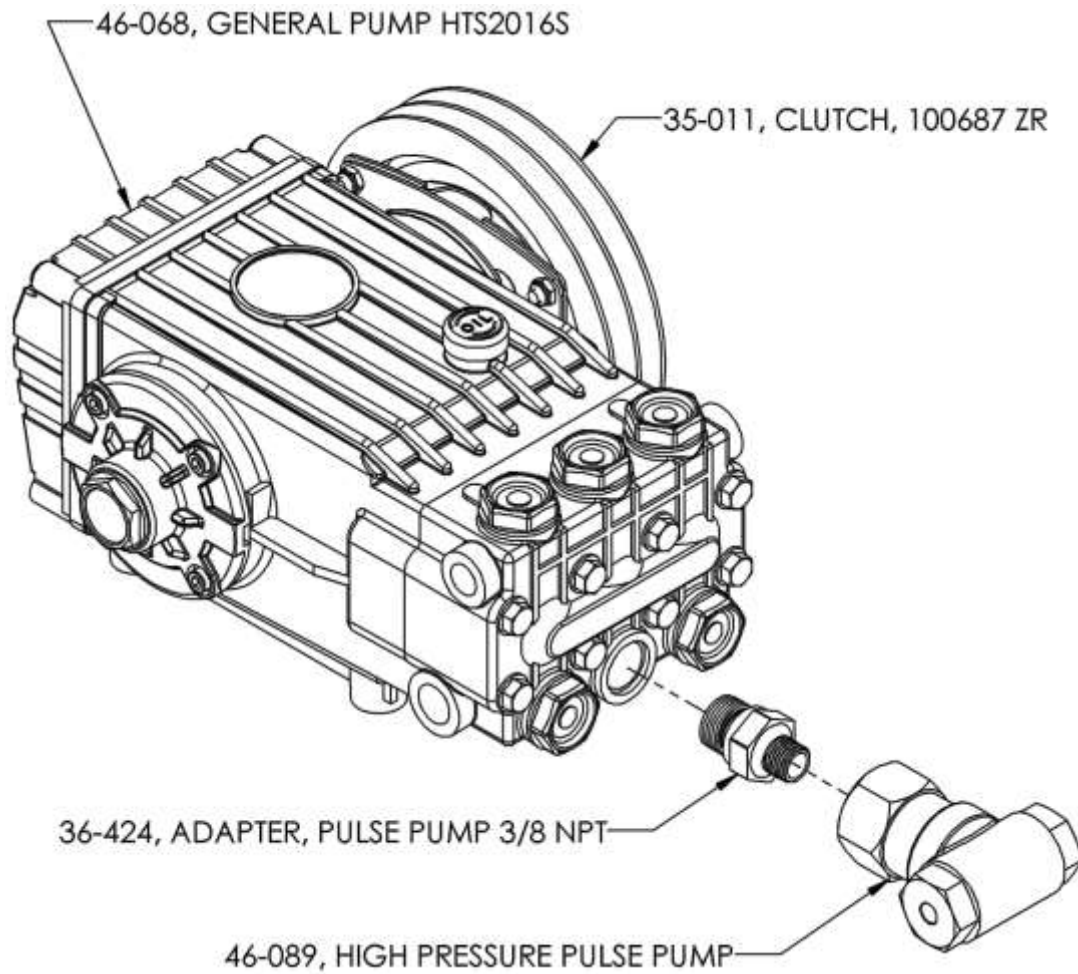
SECTION FIVE: PARTS LISTING AND REFERENCE
69-881, PRESSURE PUMP ASSEMBLY



SECTION FIVE: PARTS LISTING AND REFERENCE
69-881, PRESSURE PUMP ASSEMBLY BOM TABLE

4	23	10-004	SCREW, MACH 3/8-16 X 1-1/4 HEXHD
1	22	10-057	BOLT, TAP 3/8-16 X 3 GR 5
4	21	10-129	SCREW, M10-1.5 X 30MM HCS Z GR8.8
4	20	11-019	NUT, 3/8-16 NYLOK
9	19	12-013	WASHER, FLAT 3/8 USS
4	18	12-024	LKWSR, 10MM ZINC
4	17	12-025	WASHER, FLAT M10
1	16	18-214-05	HOSE, 7/16 ID X 08 FJIC X 08 FJIC W / SS & SLEEVE
1	15	20-056	STRAINER, 1/2 WYE BRASS
1	14	21-007	FTTG, BRB 1/8 P X 5/16 H BR
1	13	21-027	PLUG, 1/2 T BR
1	12	21-038	ELL, STREET 1/8 IN BRASS
1	11	21-047	NIP, 1/2 IN HEX BRASS
1	10	21-061	ELL, 3/8 P X 1/2 T BRASS
1	9	21-066	ELL, 1/8 NPT X 1/4 JIC SS
1	8	21-424	ADAPTER, REDUCING 1/2 FNPT X 3/8 MNPT
1	7	21-431	ELL, 1/2P X 3/4H 45 DEG BRASS
1	6	21-444	ELL, 1/4 BSPP X 1/2 JIC STEEL
1	5	36-501	PLUG, GP OIL LEVEL
1	4	46-045	ACCUMULATOR, CAT 6028
1	3	61-1462	WELDMENT, PUMP BRACKET
1	2	61-733	WELDMENT, PUMP BOLT PLATE
1	1	68-181	KIT, PRESSURE PUMP
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
68-181, PRESSURE PUMP BREAKDOWN

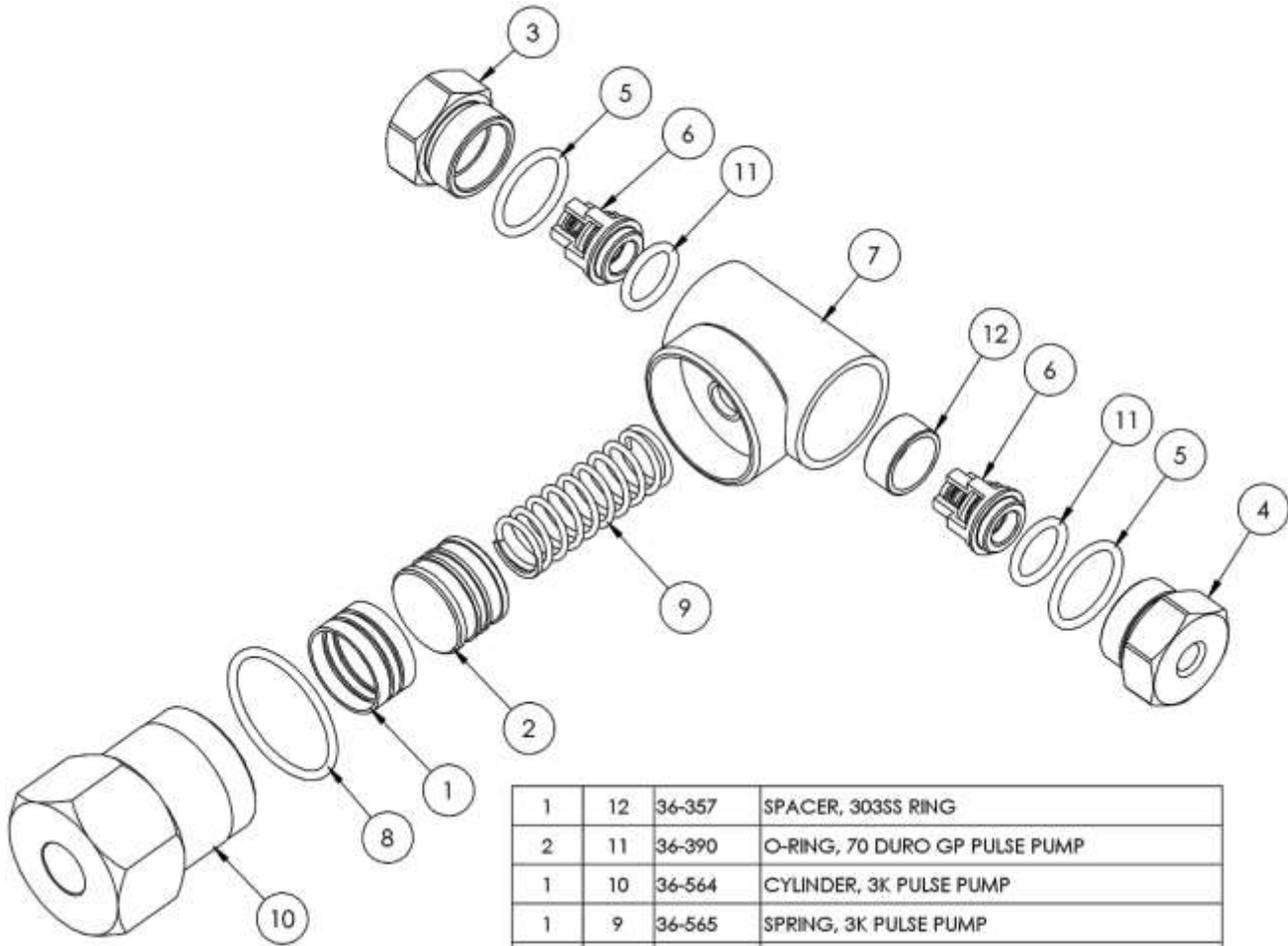


AVAILABLE FOR SERVICE:

36-463, SEAL KIT, HTS PUMP SERIES (20MM PLUNGER SEAL REPLACEMENT KIT)

36-467, VALVE KIT, HTS PUMP SERIES (HIGH TEMPERATURE VALVE REPLACEMENT KIT)

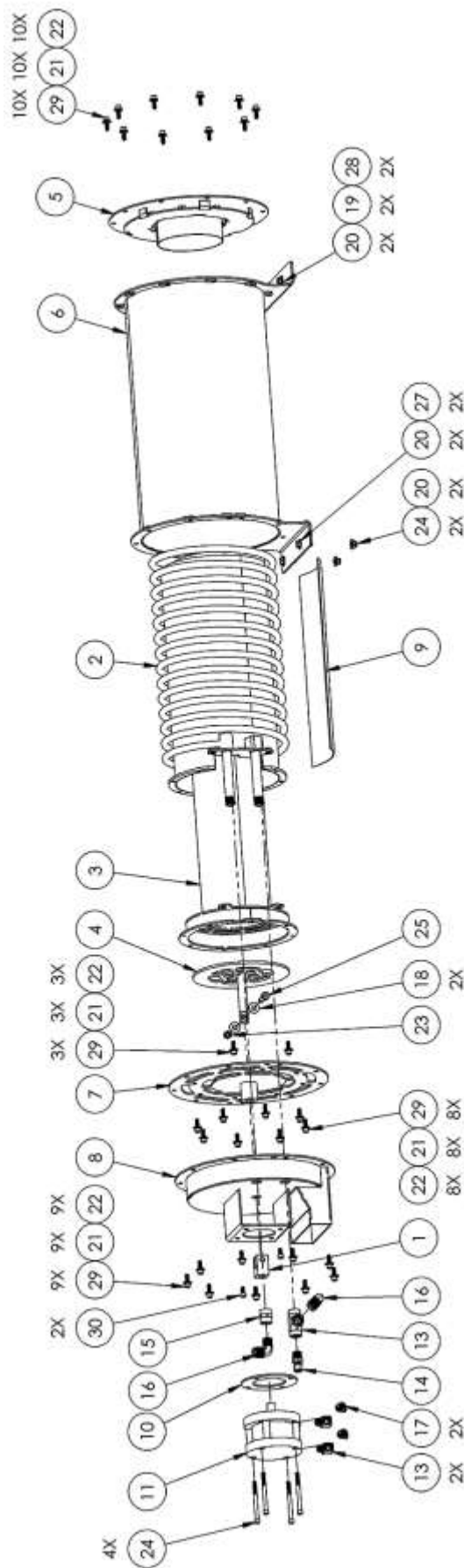
SECTION FIVE: PARTS LISTING AND REFERENCE
46-089, PUMP, PULSE GENERAL 101067



1	12	36-357	SPACER, 303SS RING
2	11	36-390	O-RING, 70 DURO GP PULSE PUMP
1	10	36-564	CYLINDER, 3K PULSE PUMP
1	9	36-565	SPRING, 3K PULSE PUMP
1	8	36-566	O-RING, BUNA -126
1	7	36-567	BODY, 3K PULSE PUMP
2	6	36-568	ASSY, VALVE 3K PULSE PUMP
2	5	36-569	O-RING, 1.051 ID X .070 CS
1	4	36-570	VALVE CAP, INLET 3K PULSE PUMP
1	3	36-571	VALVE CAP, OULET 3K PULSE PUMP
1	2	36-572	PISTON, 3K PULSE PUMP
1	1	36-573	SEAL KIT, PISTON 3K PULSE PUMP
QTY	ITEM	PART NO.	DESCRIPTION

69-879, HEAT EXCHANGER ASSEMBLY

SECTION FIVE: PARTS LISTING AND REFERENCE

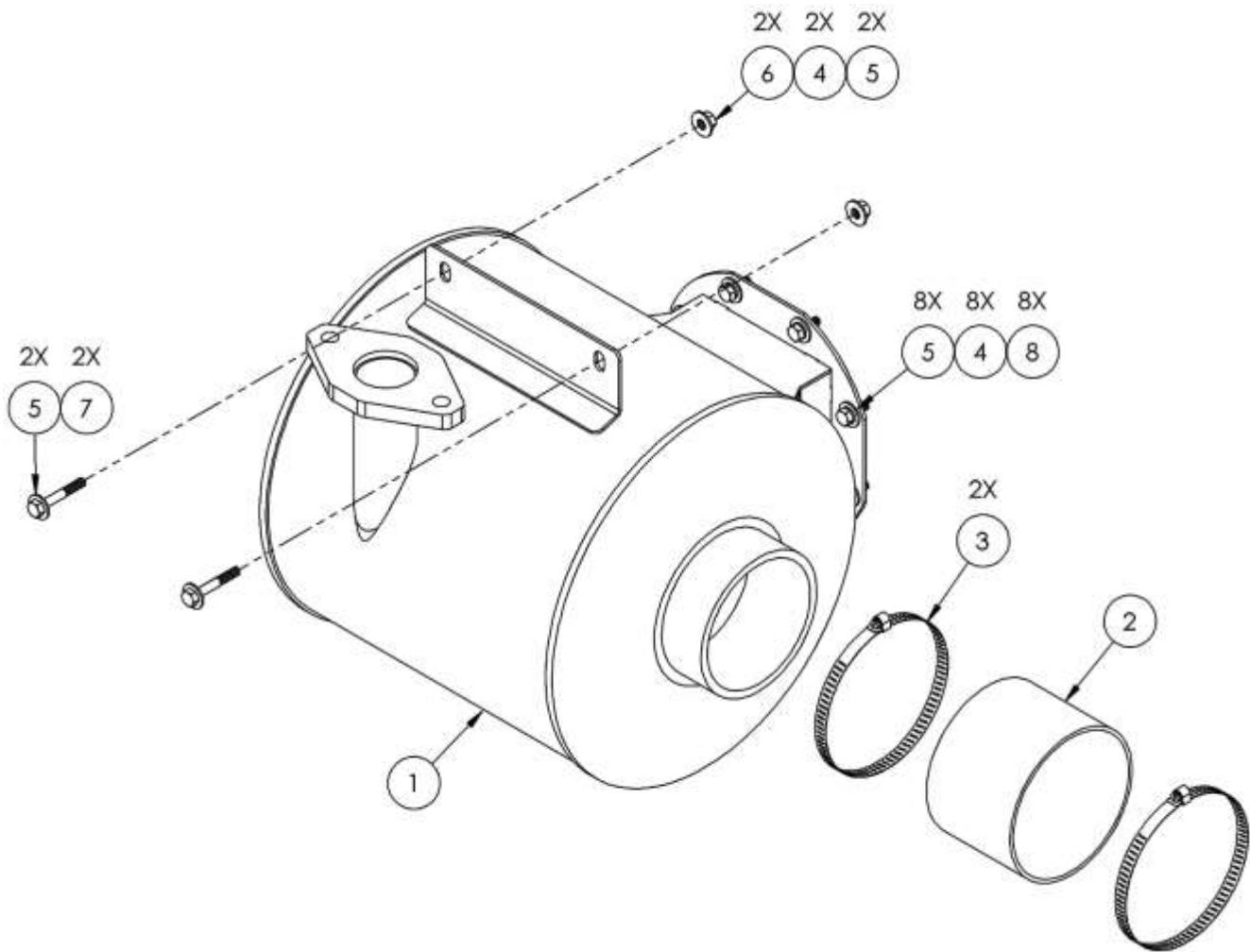


SECTION FIVE: PARTS LISTING AND REFERENCE
69-879, HEAT EXCHANGER ASSEMBLY BOM TABLE

2	30	10-007	SCREW, MACH 1/4-20 X 1/2 SOCHD SS
29	29	10-021	SCREW, MACH 1/4-20 X 3/4 SOCHD SS
2	28	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
2	27	10-026	SCREW, MACH 1/4-20 X 1 HXHD
4	24	10-143	BOLT, 1/4-20 X 3 SHCS ZP
1	25	10-234	BOLT, 3/8 X 7/8 SHOULDER 5/16-18 THD
2	24	11-013	NUT, 1/4-20 NYLOK SS
1	23	11-090	NUT, 5/16-18 TOPLOCK GRC Z
29	22	12-002	WASHER, FLAT 1/4 SS ANC
29	21	12-003	LKWSR, 1/4 IN SS
6	20	12-012	WASHER, FLAT 1/4 USS
2	19	12-015	LKWSR, 1/4 ZINC
2	18	12-044	WASHER, FLAT, .38 X .812 X .03 PTFE (95630A245)
2	17	21-051	ELL, 1/4P X 1/4T 45 DEG BRASS
2	16	21-061	ELL, 3/8 P X 1/2 T BRASS
1	15	21-073	COUPLING, 3/8 NPT BRASS
1	14	21-500	FITG, 3/8 NPT X 1/4 COMPRESSION SS
1	13	21-501	TEE, 3/8 NPT HI PRESSURE BRASS
2	13	21-608	ELL, 1/4 IN SHORT STREET BRASS
1	11	23-067	CYLINDER, AIR, BIMBA FO-701.5-CMTV
1	10	41-069	GASKET, DIVERter CYLINDER
1	9	41-092	GASKET, 5-13/16 X 17 X .062 SILICONE SHT W/PSA
1	8	61-1356	WELDMENT, DIVERter COVER
1	7	61-1375	WELDMENT, DIVERter HOUSING PLATE
1	6	61-1439	WELDMENT, THERMAL WELL
1	5	61-1616	WMT, INLET ADAPTER
1	4	61-530	WELDMENT, DIVERter PLATE
1	3	61-531	WELDMENT, DIVERter CHAMBER
1	2	61-532	WELDMENT, FINNED TUBE COIL
1	1	66-211	.875 SQ CLEVIS WITH 5E-11 THREAD
QTY	ITEM	PART NO.	DESCRIPTION

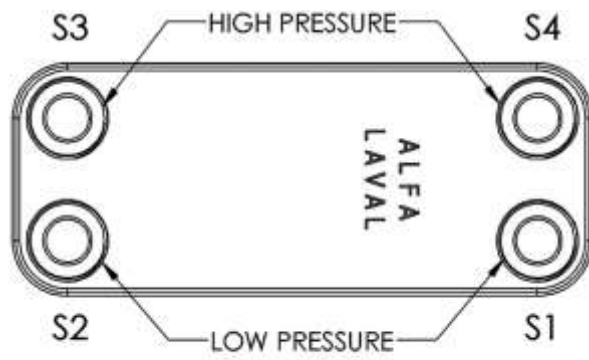
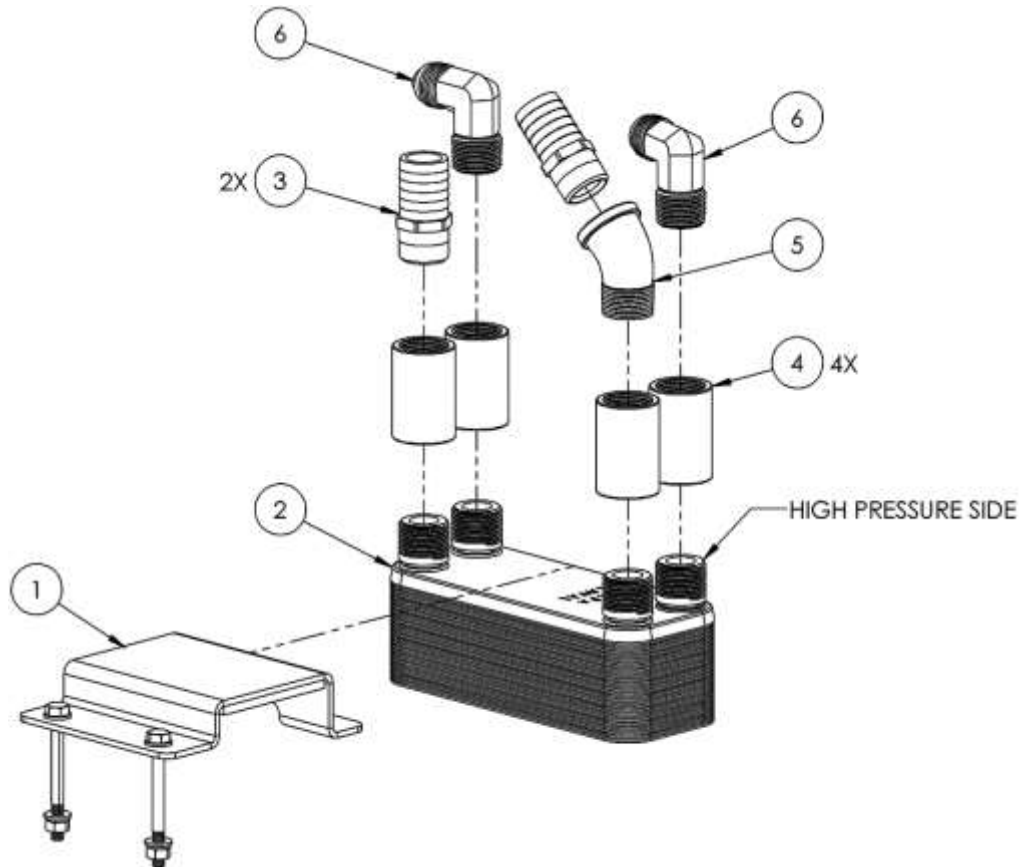
SECTION FIVE: PARTS LISTING AND REFERENCE

69-996, EXHAUST SILENCER ASSEMBLY



8	8	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
2	7	10-170	SCREW, MACH, 1/4-20 X 1-3/4 HH G5
2	6	11-004	NUT, 1/4-20 ZINC
12	5	12-012	WASHER, FLAT 1/4 USS
10	4	12-015	LKWSR, 1/4 ZINC
2	3	14-008	CLAMP, HOSE #72
3.25 IN	2	16-110	HOSE, 4.5 ID X 3 FT SILICONE 550F
1	1	61-1441	WMT, SILENCER
QTY	ITEM	PART NO.	DESCRIPTION

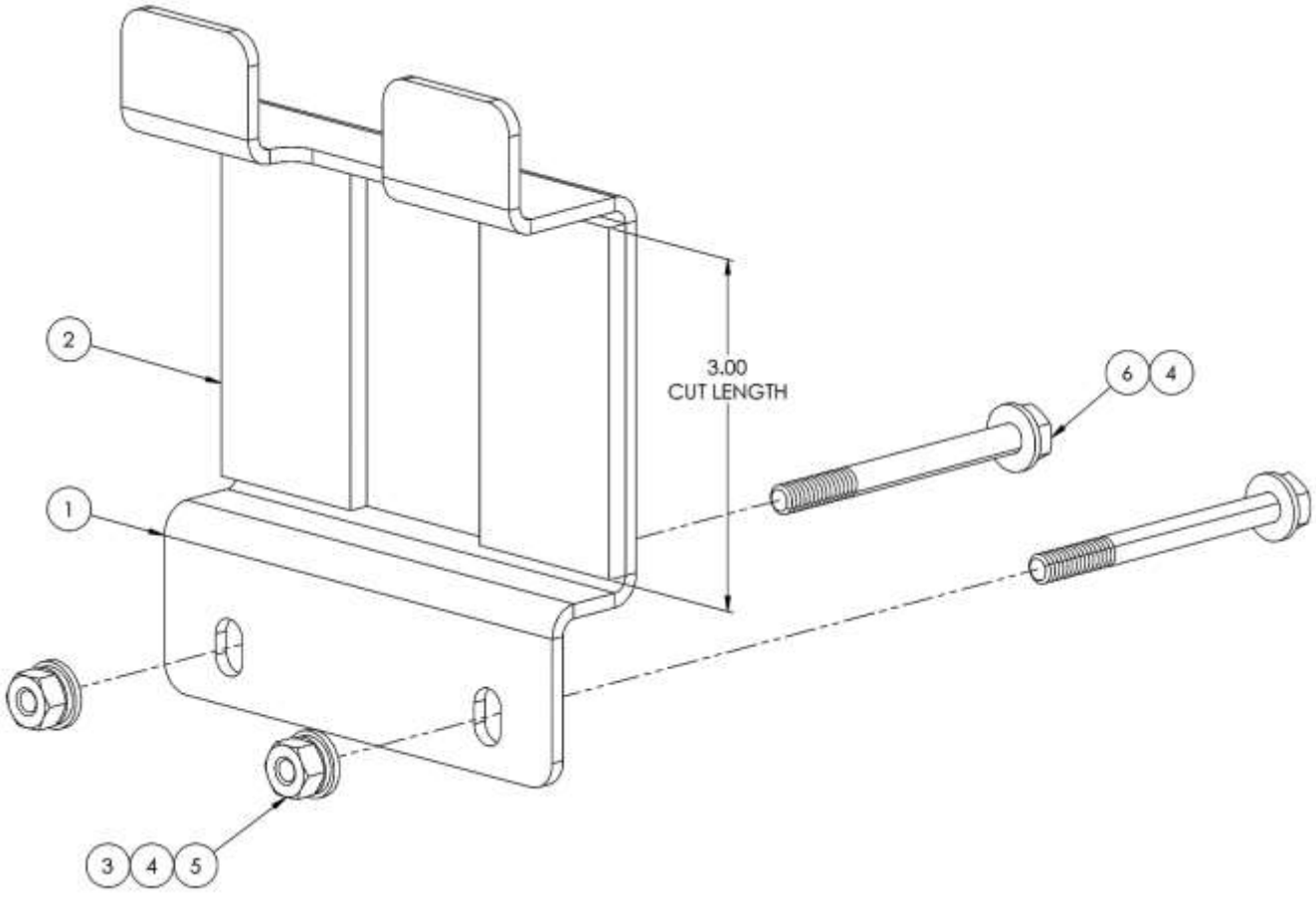
SECTION FIVE: PARTS LISTING AND REFERENCE
69-889, COOLANT HEAT EXCHANGER



63-257 TOP VIEW

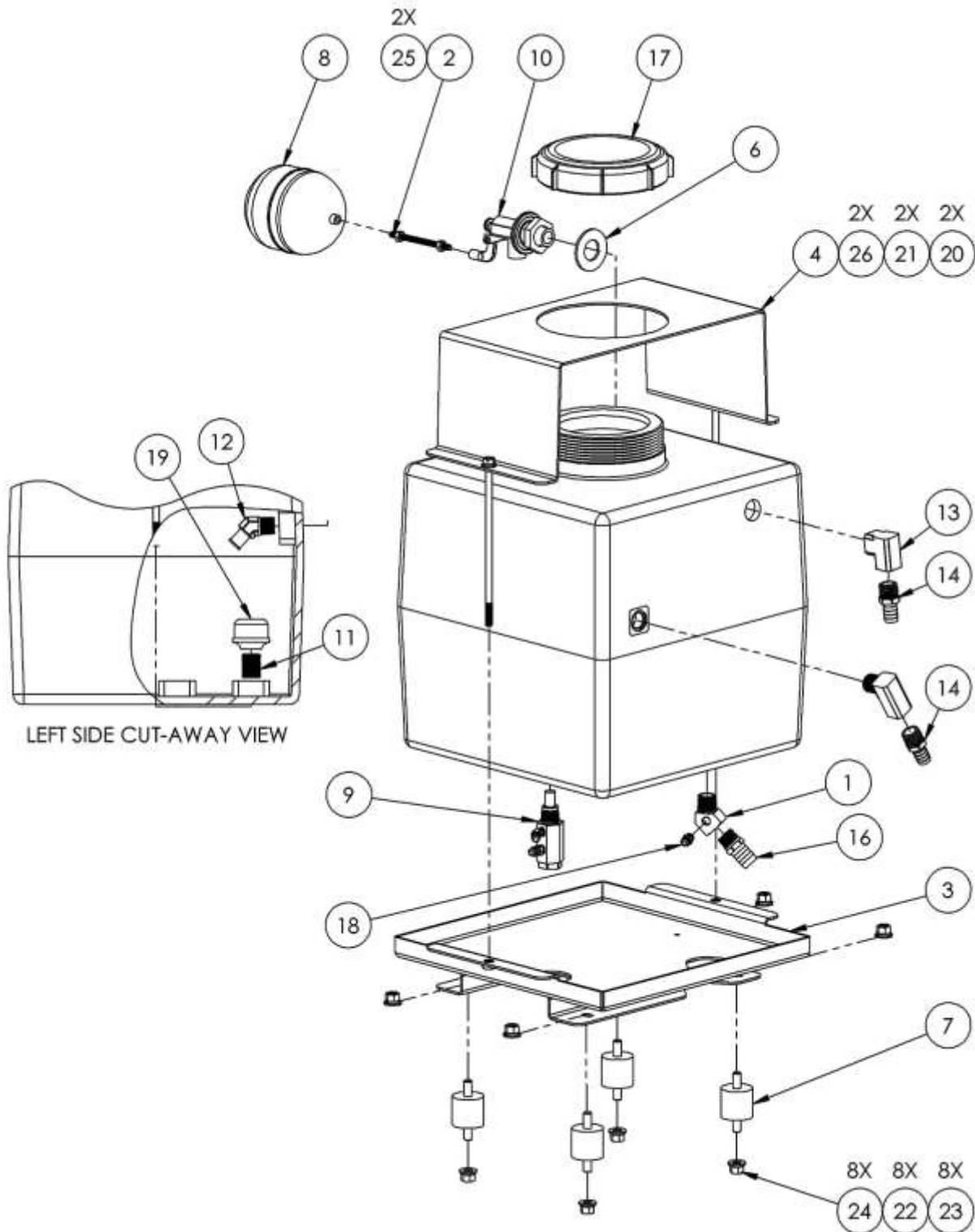
2	6	21-074	ELL, 3/4 P X 1/2 T BRASS
1	5	21-078	ELL, STREET PIPE 3/4 45 DEG
4	4	21-285	COUPLING, 3/4 NPT FULL 3000 PSI SS
2	3	21-381	FTG, 3/4P X 1H BRASS
1	2	63-257	HEAT EXCHANGER, AXP14-48H
1	1	69-984	ASSY, HE CLAMP
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-984, HEAT EXCHANGER CLAMP ASSEMBLY



2	6	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
2	5	11-004	NUT, 1/4-20 ZINC
4	4	12-011	WASHER, FLAT #12 SAE
2	3	12-015	LKWSR, 1/4 ZINC
0.4	2	41-091	PAD, 1/4 SILICONE SPONGE 1-1/2W X 16-1/2L
1	1	58-1035	PNL, HE CLAMP
QTY	ITEM	PART NO.	DESCRIPTION

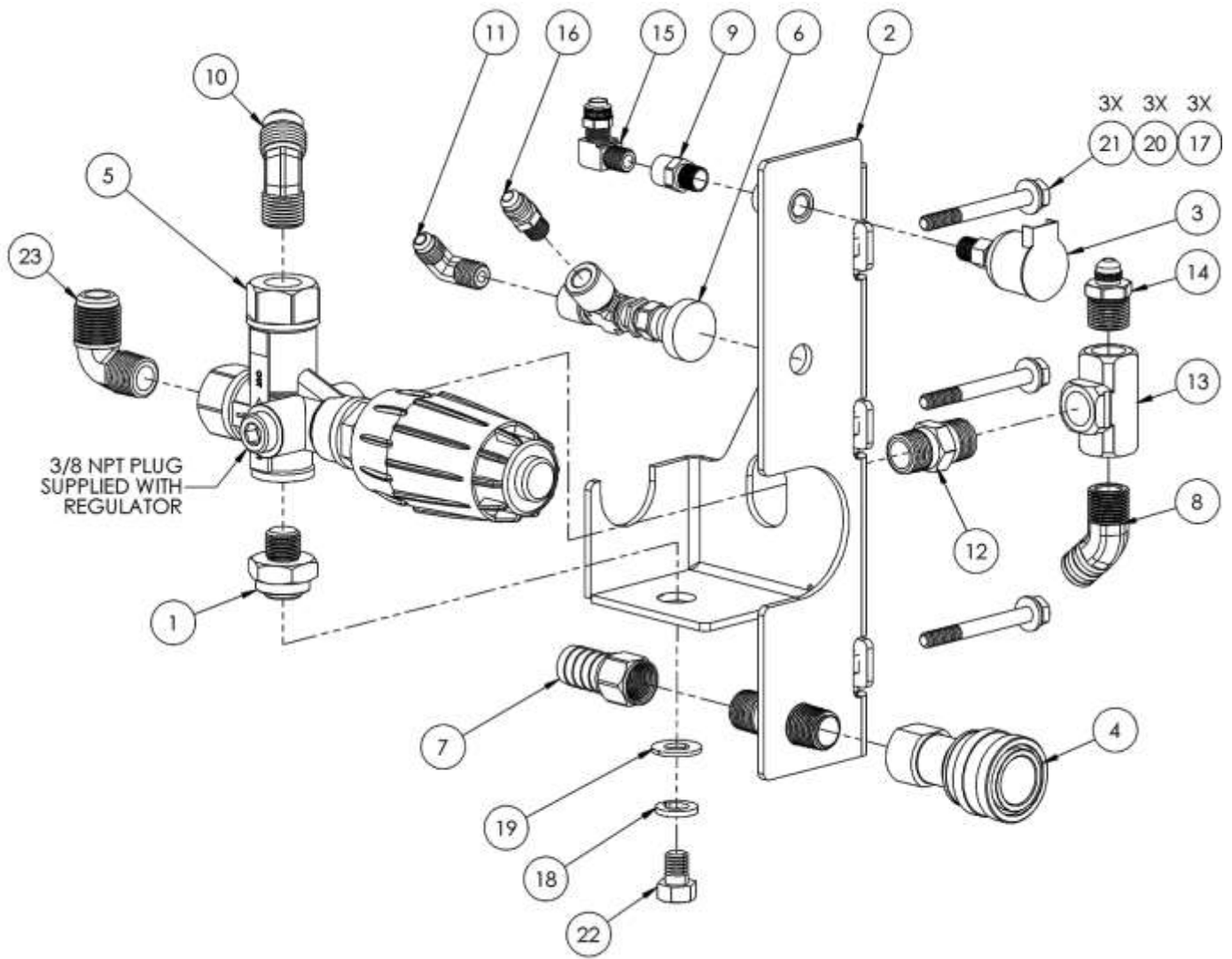
SECTION FIVE: PARTS LISTING AND REFERENCE
69-979, WATER BOX ASSEMBLY



SECTION FIVE: PARTS LISTING AND REFERENCE
69-980, WATER BOX ASSEMBLY

2	26	10-430	SCREW, MACH 5/16-18 X 8 HXHD ZP
2	25	11-001	NUT, 1/4-20 SS
8	24	11-006	NUT, 3/8-16 ZINC
8	23	12-013	WASHER, FLAT 3/8 USS
8	22	12-014	LKWSR, 3/8 ZINC
2	21	12-016	LKWSR, 5/16 ZINC
2	20	12-017	WASHER, FLAT 5/16 SAE ZINC
1	19	20-014	STRAINER, SUC END1/2FP 40 MESH
1	18	21-001	CONN, 1/8 P X 1/4 T BR
1	17	21-025	CAP, 5 IN, BLACK
1	16	21-032	FTTG, BRB 1/2 P X 3/4 H BRASS
1	15	21-034	ELL, STREET 1-2 NPT BRASS
2	14	21-109	FTTG, 1/2 NPT X 5/8 BARB BRASS
1	13	21-127	ELL, 1/2 NPT BRASS
1	12	21-324	ELL, 1/2P X 5/8H 45 DEG BRASS
1	11	21-515	NIPPLE, 1/2 NPT CLOSE BRASS
1	10	23-134	VALVE, FLOAT 1/2 NPT LEGEND
1	9	23-149	VALVE, 165 DEG THERMAL RELIEF EVEREST
1	8	28-001	BALL, FLOAT
4	7	41-095	ISOLATOR, 1.5 OD X 1.5 TALL 50 DURO
1	6	41-214	GASKET, 1.0 ID X 2.0 OD X 3MM NEOPRENE
1	5	51-123	MOLDING, WATER BOX
1	4	58-1027	PNL, WATER BOX HOLD DOWN
1	3	61-1596	WMT, WATER BOX MOUNT
1	2	64-077	ROD, FLOAT 1/4-20 X 4 IN LG 18-8 SS
1	1	66-617	ELL, STREET 1/2 NPT 45 DEG W/TAP
QTY	ITEM	PART NO.	DESCRIPTION

69-884, PRESSURE REGULATOR ASSEMBLY

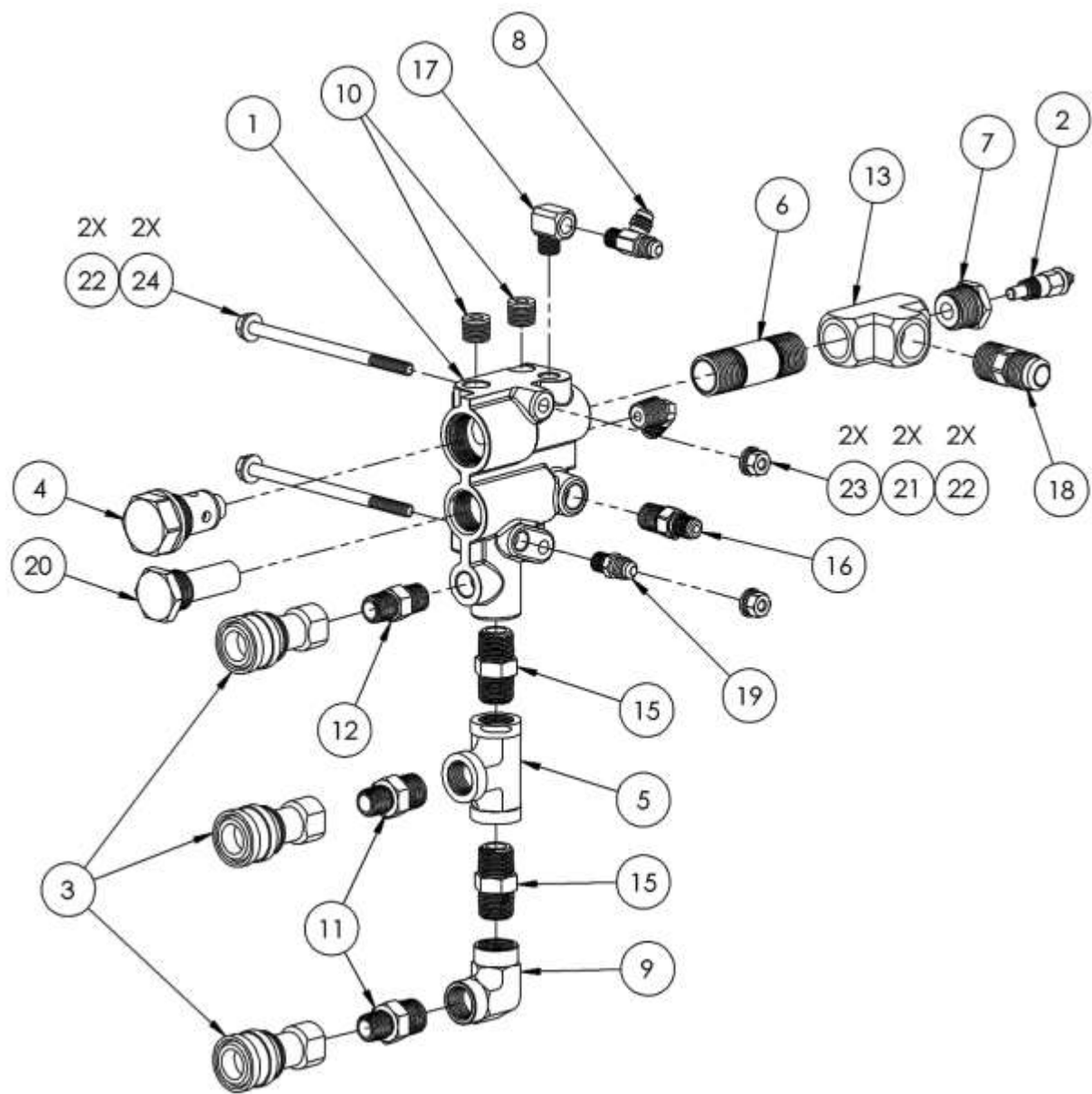


SECTION FIVE: PARTS LISTING AND REFERENCE

69-884, PRESSURE REGULATOR ASSEMBLY BOM TABLE

1	23	21-061	ELL, 3/8 P X 1/2 T BRASS
1	22	10-157	SCREW, MACH 3/8-16 X 1/2 HH ZP
3	21	10-423	SCREW, MACH 1/4-20 X 2-1/2 HXHD ZP
3	20	12-011	WASHER, FLAT #12 SAE
1	19	12-013	WASHER, FLAT 3/8 USS
1	18	12-014	LKWSR, 3/8 ZINC
3	17	12-015	LKWSR, 1/4 ZINC
1	16	21-001	CONN, 1/8 P X 1/4 T BR
1	15	21-011	ELL, 1/8 NPT X 1/4 POLY BRASS
1	14	21-017	CONN, 3/8 P X 1/4 T
1	13	21-041	TEE, 3/8 NPT BRASS
1	12	21-046	NIP, 3/8 IN HEX BRASS
1	11	21-054	ELL, 1-8P X 1/4 T BRASS
1	10	21-059	ELL, 3/8 NPT X 1/2 JIC 45 DEG BRASS
1	9	21-333	COUPLING, 1/8 FNPT X 1/8 MNPT BRASS
1	8	21-413	FTTG, BARB 45 DEG 3/8P X 5/8H
1	7	21-434	FTTG, 3/8 FP X 5/8 BARB BRASS
1	6	23-028	VLV, MET 1/8 FP (CHEM) RT ANG SS
1	5	23-144	REGULATOR, VRT3 2300 PSI
1	4	25-005	QUICK COUPLING, 3/8 F X 3/8 FNPT BRASS
1	3	28-000	CUP, OILFILL, 1/8 NPT
1	2	61-1475	WMT, OIL, BYPASS, REG & QD BRKT
1	1	66-340	FITTING, 3/8 NPT M X 3/8-16 F STANDOFF
QTY	ITEM	PART NO.	DESCRIPTION

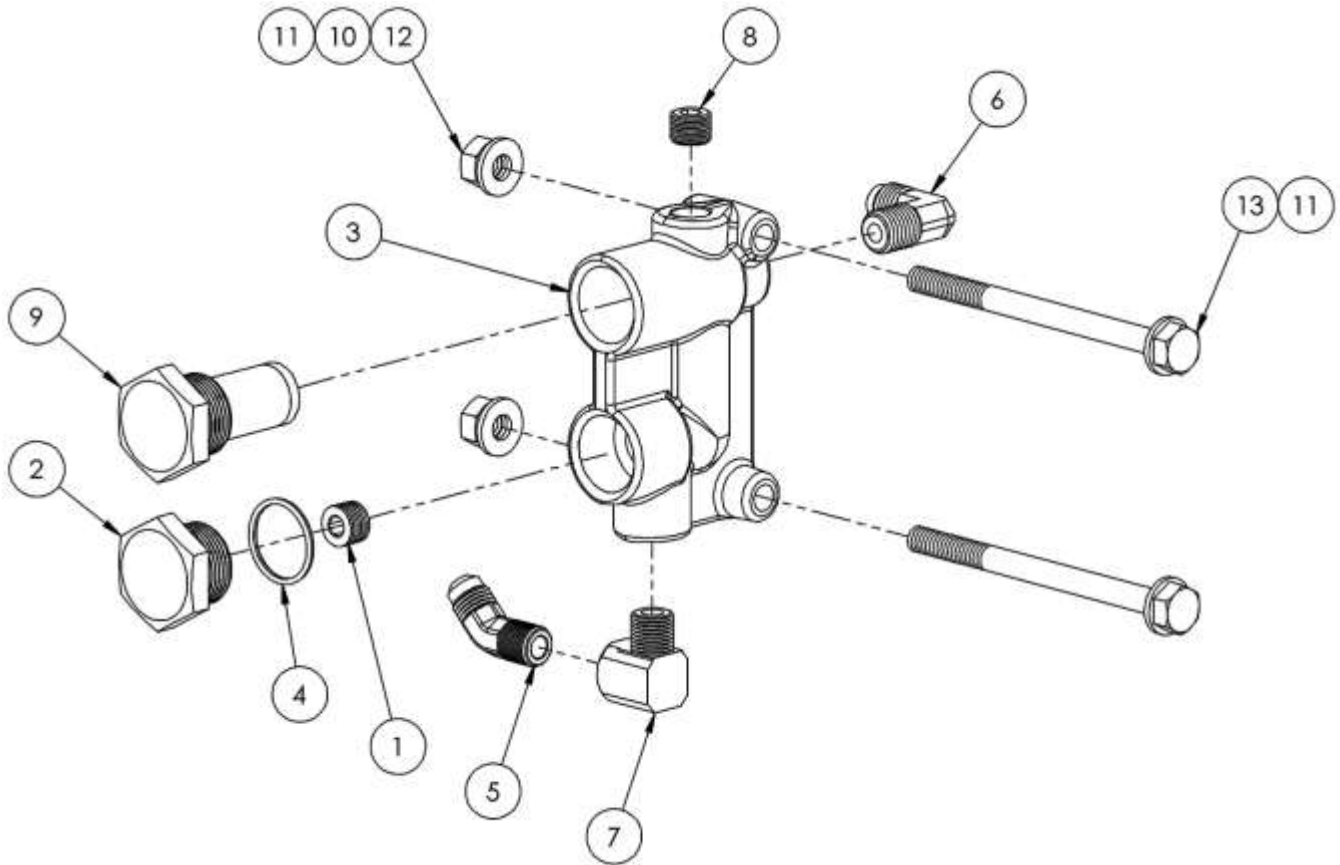
SECTION FIVE: PARTS LISTING AND REFERENCE
69-886, SOLUTION MANIFOLD ASSEMBLY



SECTION FIVE: PARTS LISTING AND REFERENCE
69-971, SOLUTION MANIFOLD ASSEMBLY BOM TABLE

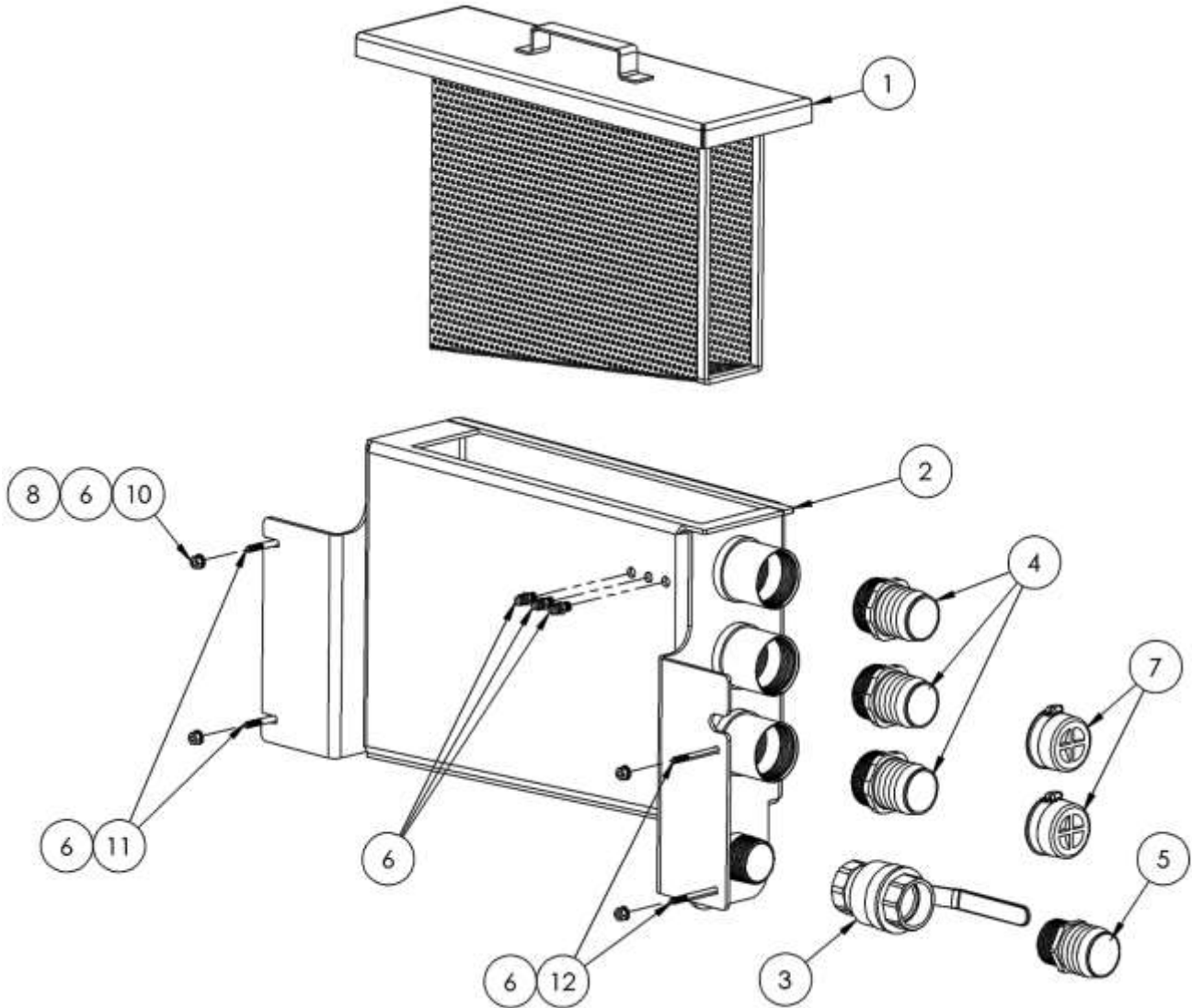
2	24	10-160	BOLT, 1/4-20 X 4 1/2 HH ZP
2	23	11-004	NUT, 1/4-20 ZINC
4	22	12-011	WASHER, FLAT #12 SAE
2	21	12-015	LKWSR, 1/4 ZINC
1	20	20-018	SCREEN, CHECK VALVE MANIFOLD
1	19	21-001	CONN, 1/8 P X 1/4 T BR
1	18	21-012	CONN, 1/2 NPT X 1/2 T BRASS
1	17	21-038	ELL, STREET 1/8 IN BRASS
1	16	21-050	CONN, 1/4 NPT X 1/4 JIC BRASS
2	15	21-053	NIPPLE, HEX 3-8 NPT SS
1	14	21-064	ELL, 1/4 P X 1/4 T BRASS
1	13	21-110	TEE, 1/2 NPT BRASS
1	12	21-128	NIPPLE, HEX 1/4 NTP SS
2	11	21-231	NIPPLE, 1/4 X 3/8 SS NPT
2	10	21-264	PLUG, 1/4 NPT BRASS
1	9	21-294	ELL, 3/8 NPT SS
1	8	21-336	TEE, RUN 1/8 NPT X 1/4 JIC X 1/4 JIC BRASS
1	7	21-373	BUSHING, 1/2 NPT X 1/8 FNPT BRASS
1	6	21-374	NIPPLE, 1/2 NPT X 2-1/2L 304SS
1	5	21-412	TEE, 3-8 NTP SS
1	4	23-063	ASSY, CHECK VALVE
3	3	25-013	DSC, 1/4 X 1/4 FP STAINLESS
1	2	34-000	SENSOR, TEMP, 140-320 DEGREE
1	1	66-205	MANIFOLD BLOCK
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-885, BYPASS MANIFOLD ASSEMBLY



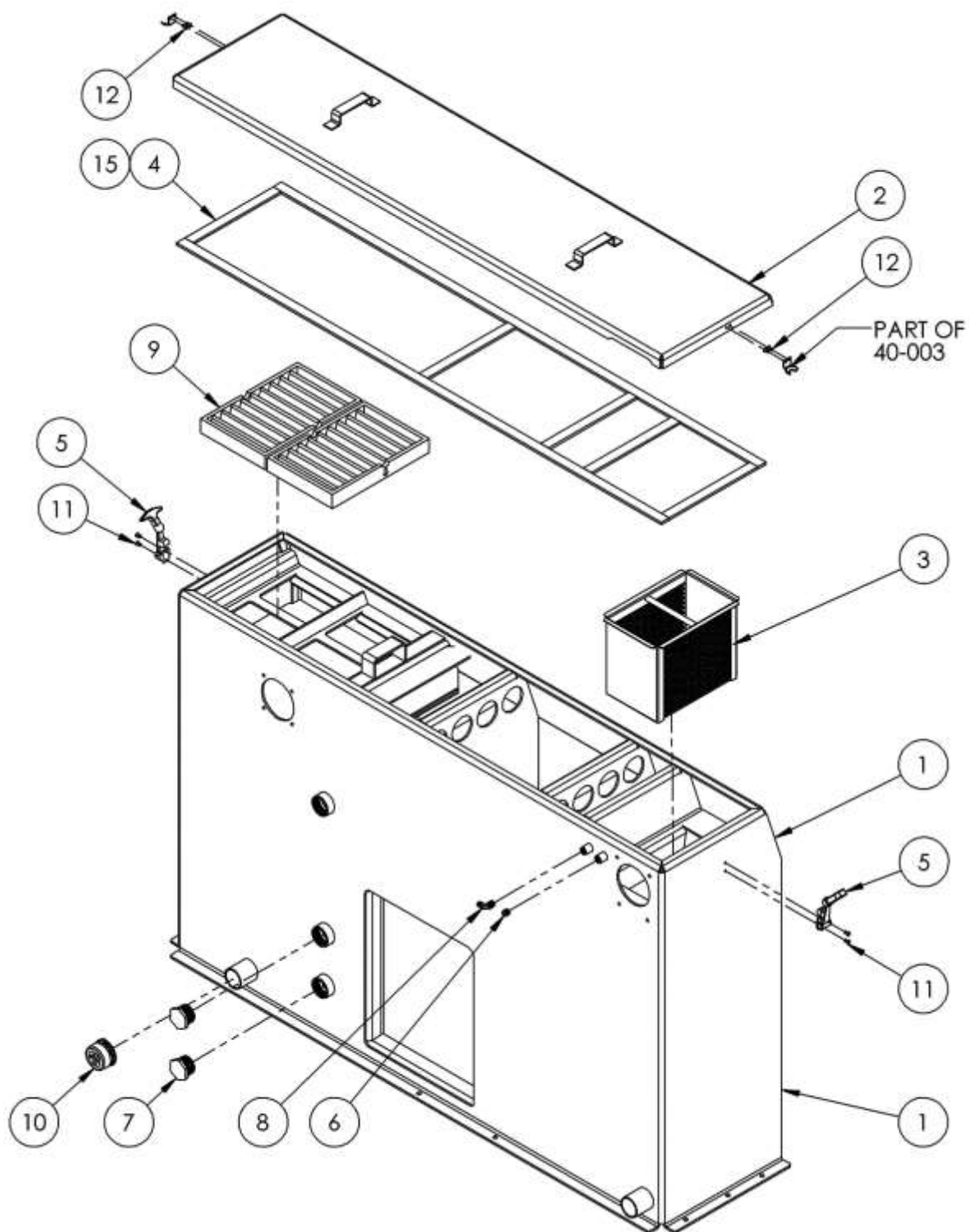
2	13	10-003	BOLT, 1/4-20 X 3 1/2 HH ZP
2	12	11-004	NUT, 1/4-20 ZINC
4	11	12-011	WASHER, FLAT #12 SAE
2	10	12-015	LKWSR, 1/4 ZINC
1	9	20-015	SCREEN, BYPASS MANIFOLD
1	8	21-029	PLUG, 1/8 NPT SOCKET HD BRASS
1	7	21-038	ELL, STREET 1/8 IN BRASS
1	6	21-054	ELL, 1-8P X 1/4 T BRASS
1	5	21-055	ELL, 1-8 P X 1/4 T 45 DEG BRASS
1	4	41-003	ORING, .676 ID .816 OD
1	3	66-011	MANIFOLD, BYPASS
1	2	66-017	CAP, CHECK VALVE
1	1	66-020	ORFICE, BYPASS MANIFOLD, .037 GREEN
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-956, VACUUM INLET AND PREFILTER BOX ASSEMBLY



2	12	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
2	11	10-170	SCREW, MACH, 1/4-20 X 1-3/4 HH G5
4	10	11-004	NUT, 1/4-20 ZINC
8	6	12-011	WASHER, FLAT #12 SAE
4	8	12-015	LKWSR, 1/4 ZINC
2	7	19-009	CAP, PLUG 2IN RUBBER
3	6	21-001	CONN, 1/8 P X 1/4 T BR
1	5	21-094	FTTG, 1-1/2 P X 2H DRAIN
3	4	21-616	FTTG, 2 NPT X 2 H BARB PVC
1	3	23-050	VLV, 1-1/2 IN BRASS BALL
1	2	61-1625	WMT, FILTER BOX 870HP
1	1	69-1005	ASSY, FILTER BOX LID
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
69-933, 120 GALLON WASTE TANK ASSEMBLY



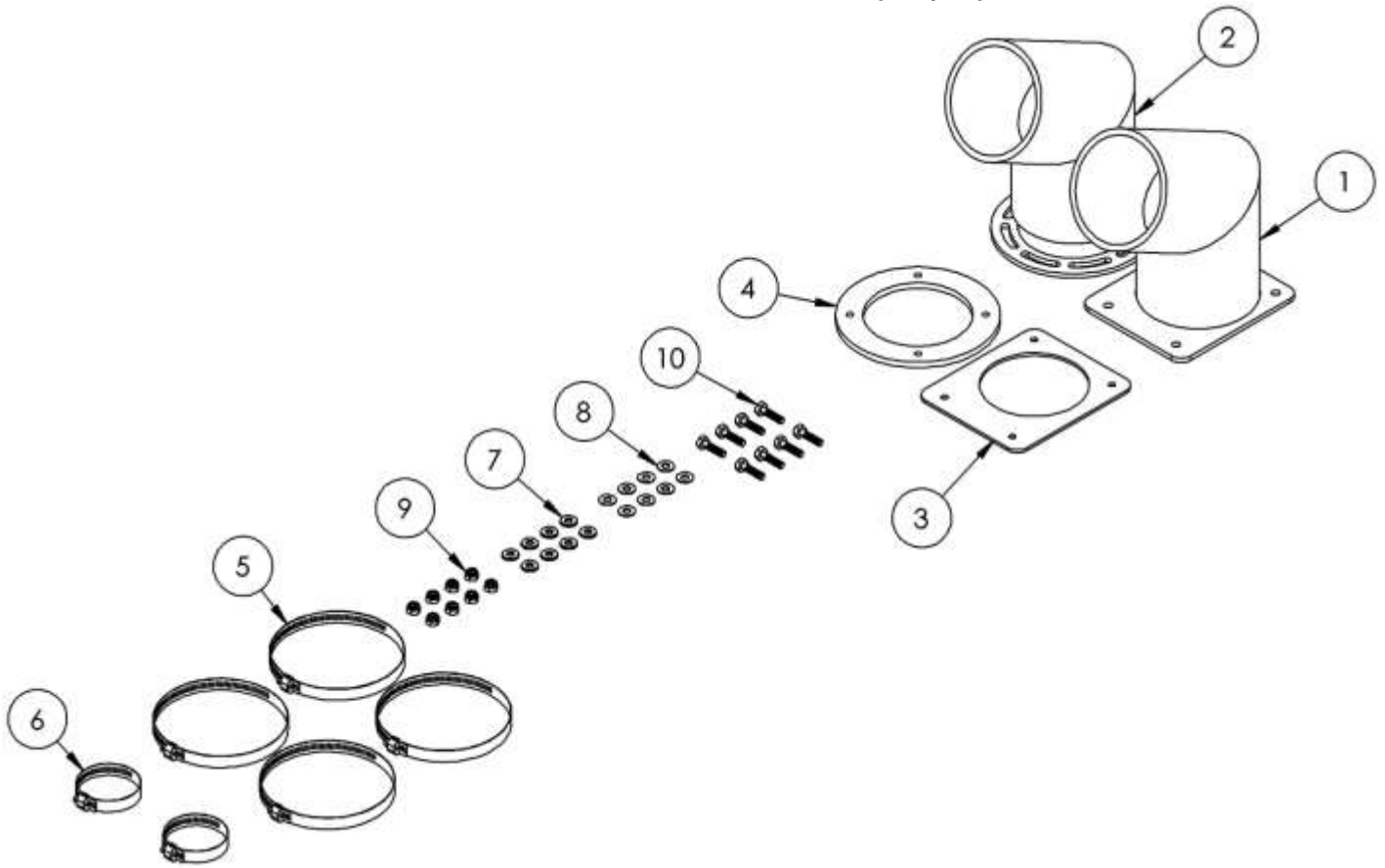
SECTION FIVE: PARTS LISTING AND REFERENCE

69-933, 120 GALLON WASTE TANK ASSEMBLY BOM TABLE

4	14	10-022	SCREW, MACH 5/16-X 2 LAG BOLT
1	13	13-005	ADHESIVE, GASKET BOSTIK 1100 10.1 OZ TUBE
4	12	14-018	RIVET, SS 3/16 LONG
4	11	14-031	RIVET, SS 3/16 X 1/2 SHORT
1	10	19-009	CAP, PLUG 2IN RUBBER
2	9	20-071	STRAINER, WASTE TANK RECT
1	8	21-064	ELL, 1/4 P X 1/4 T BRASS
2	7	21-097	PLUG, 1-1/4 IN PVC
1	6	21-264	PLUG, 1/4 NPT BRASS
2	5	40-003	LATCH, PRE-FILTER BOX
7	4	41-018	GASKET, SPONGE 1 IN X 45 FT
1	3	61-002	WELDMENT, STRAINER BASKET
1	2	61-1520	WELDMENT, WASTE TANK LID 120 GAL
1	1	61-1522	WELDMENT, WASTE TANK 870
QTY	ITEM	PART NO.	DESCRIPTION

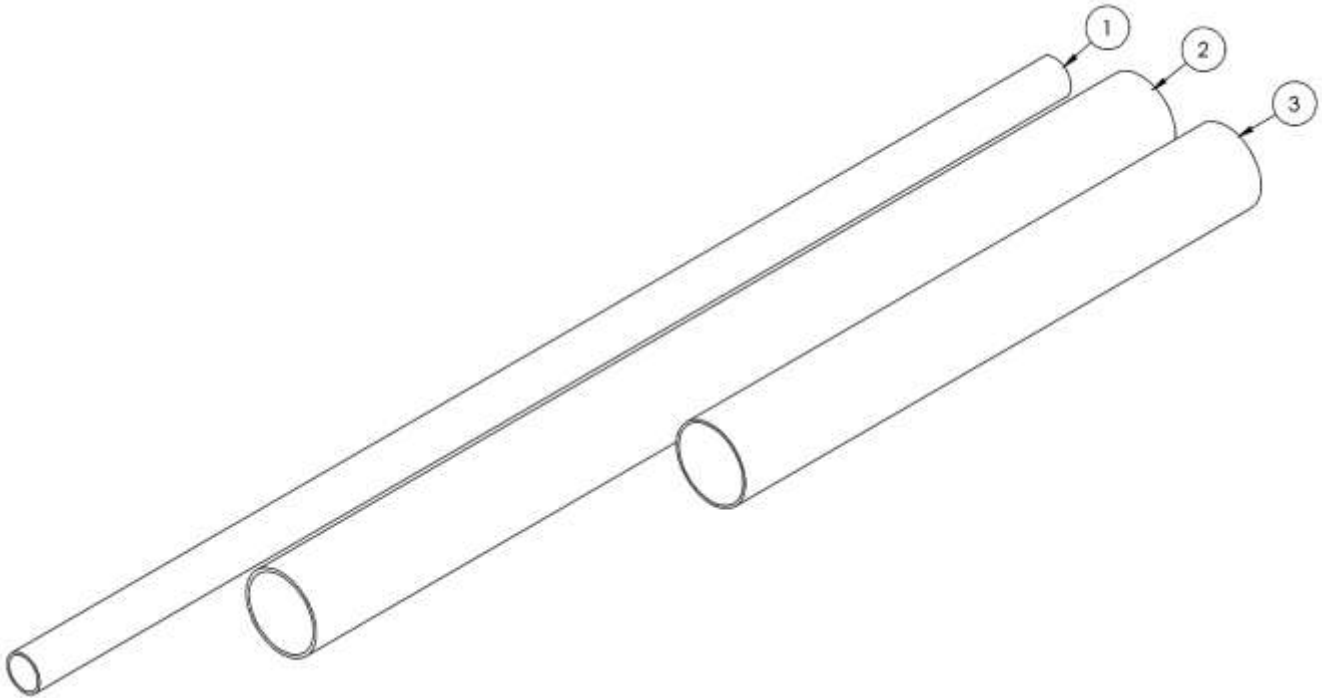
SECTION FIVE: PARTS LISTING AND REFERENCE

48-143 WASTE TANK PORTS KIT (4-1/2")



8	10	10-011	SCREW, MACH 1/4-20 X 1 HXHD SS
8	9	11-139	LKNUT, 1/4-20 NYLOK SS
8	8	12-002	WASHER, FLAT 1/4 SS ANC
8	7	12-071	WASHER, SEALING .27 ID X .625 OD
2	6	14-010	CLAMP, HOSE #32
4	5	14-026	CLAMP, HOSE #80 SS
1	4	41-207	GASKET, VAC OUTLET
1	3	41-211	GASKET, VAC INLET LG
1	2	61-1523	WELDMENT, 4.50 VAC OUTLET
1	1	61-1524	WELDMENT, 4.50 VAC INLET
QTY	ITEM	PART NO.	DESCRIPTION

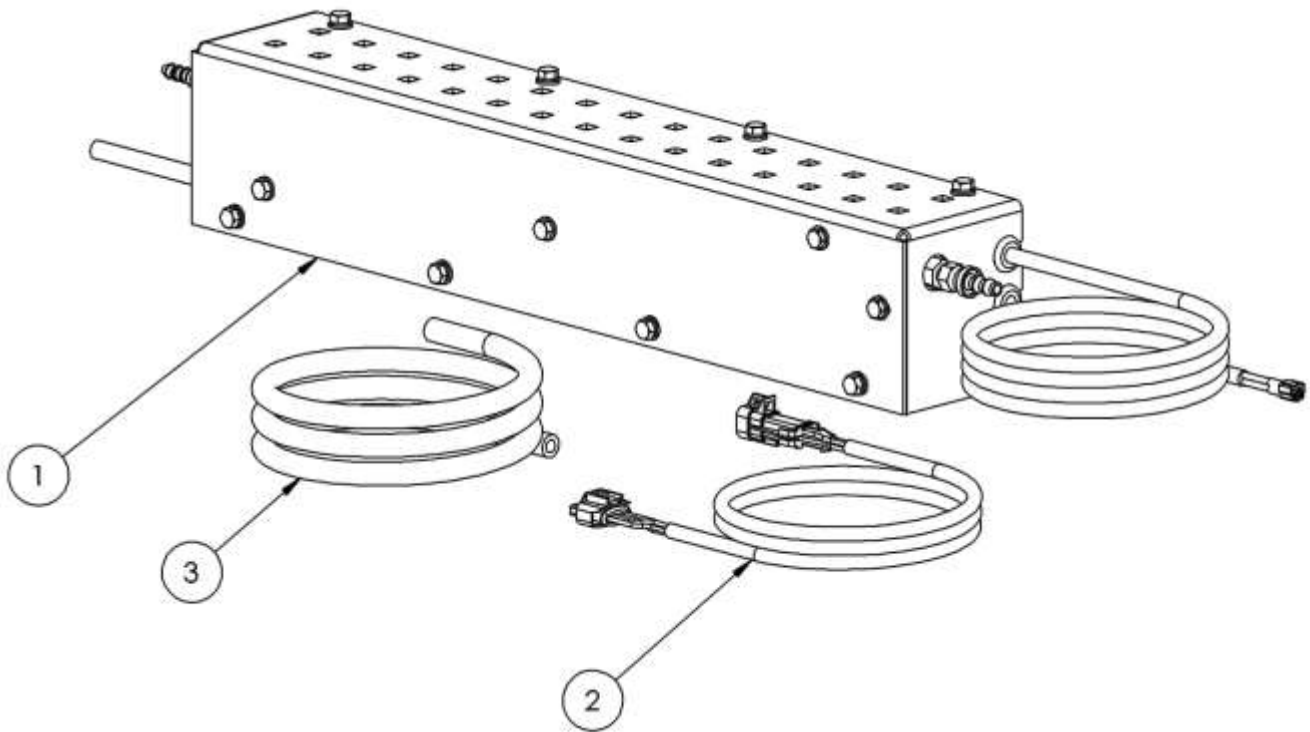
SECTION FIVE: PARTS LISTING AND REFERENCE
48-135 WASTE TANK HOSES KIT



1	3	17-724	HOSE, INT. VACUUM 4-1/2 X 3FT
1	2	17-722	HOSE, INT VACUUM 4-1/2 X 5FT
1	1	17-421	HOSE, INT VACUUM 2 IN X 6 FT
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE

48-170 FUEL KIT



6 FT	3	16-103	HOSE, FUEL 5/16 30R9 FUEL INJECTION
1	2	47-175	HARNESS, FUEL PUMP EVEREST
1	1	68-426	ASSY, FUEL PUMP
QTY	ITEM	PART NO.	DESCRIPTION

68-426 FUEL PUMP AND HOUSING ASSEMBLY

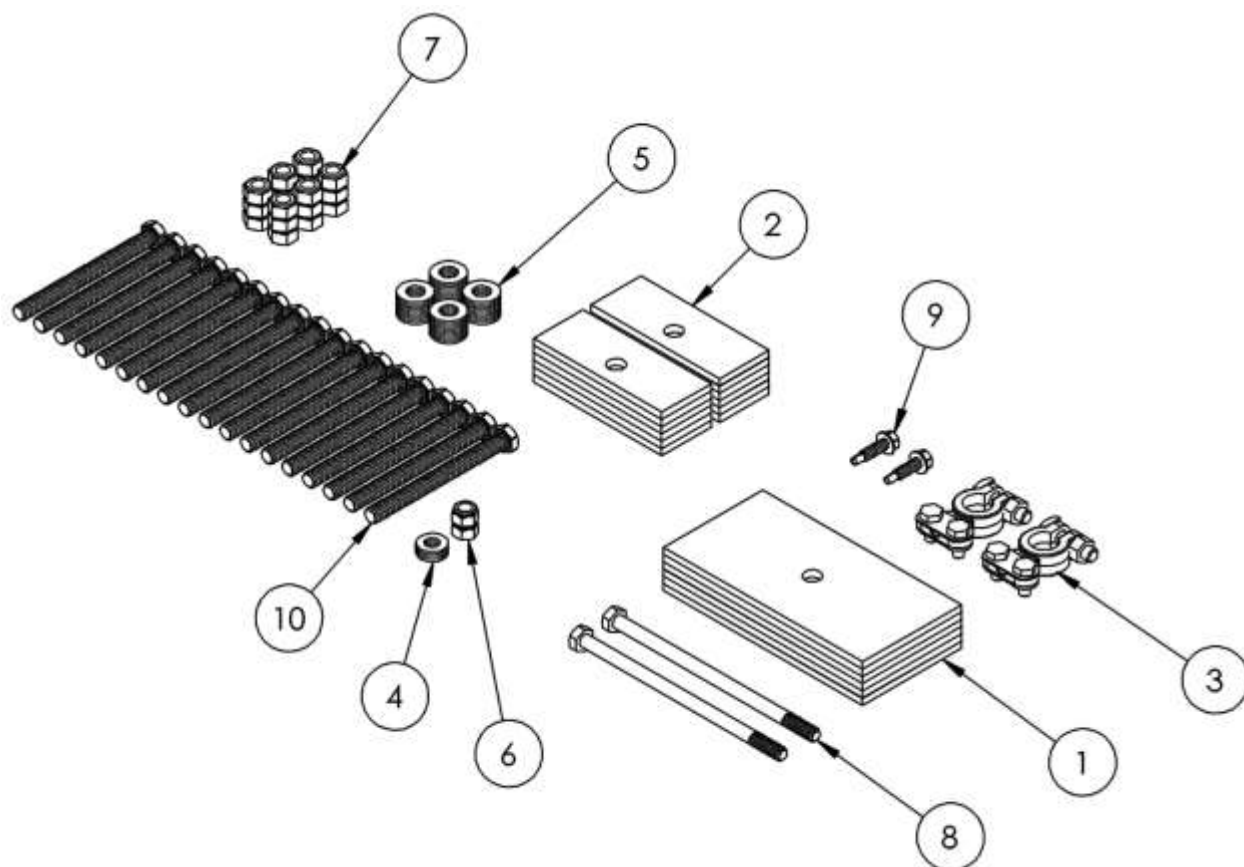


SECTION FIVE: PARTS LISTING AND REFERENCE

68-426 FUEL PUMP AND HOUSING ASSEMBLY BOM TABLE

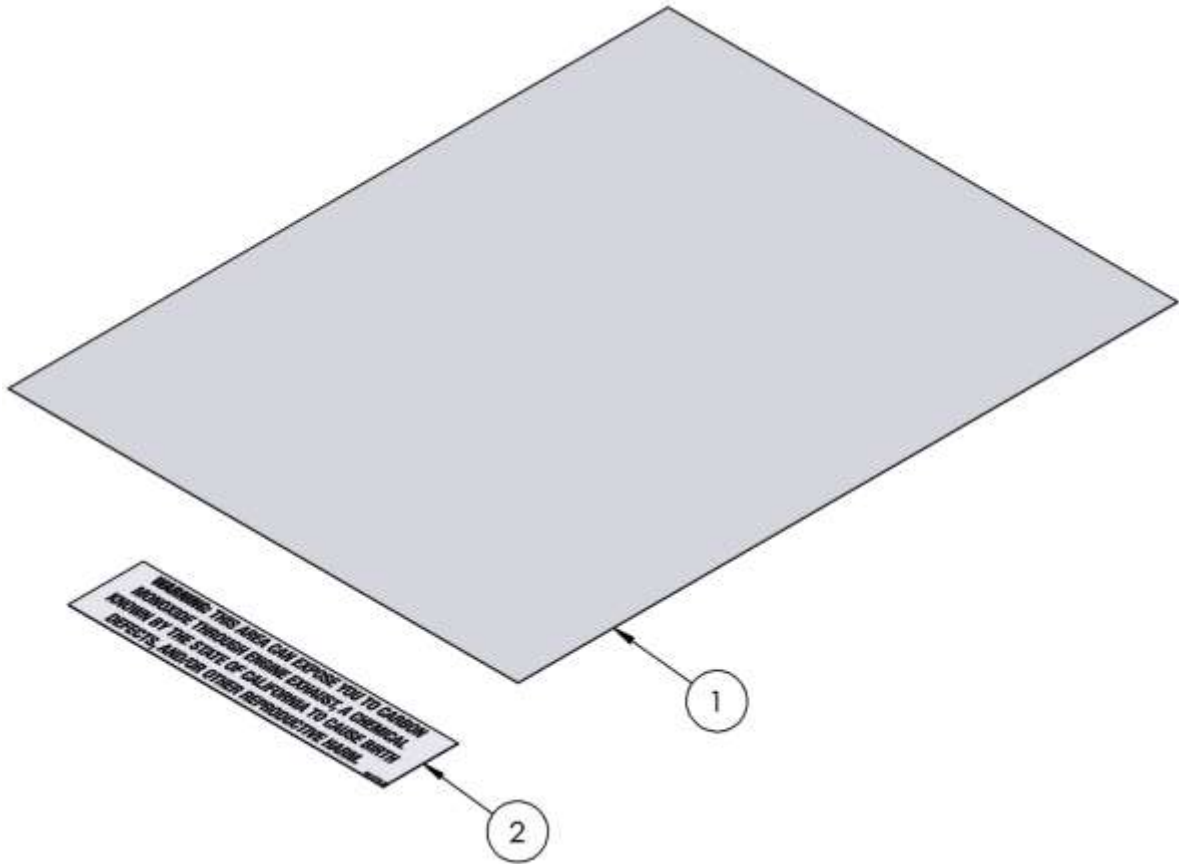
2	22	10-005	SCREW, MACH, 1/4-20 X 2 HXHD
8	21	10-006	SCREW, MACH 1/4-20 X 1/2 HEXHD
2	20	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
4	19	11-013	NUT, 1/4-20 NYLOK SS
1	18	11-149	NUT, HEX M4-0.7 ZP
1	17	11-150	NUT, HEX M5-0.8 ZP
14	16	12-011	WASHER, FLAT #12 SAE
8	15	12-063	WASHER, LOCK M6 ZP
4	14	14-007	CLAMP, HOSE #4
3	13	14-029	CLAMP, 1/2 ID VINYL COVERED
1	12	14-115	CLAMP, WIRE CUSHION 1.75 ID X 1/4 BOLT
1	11	14-116	CLAMP, WIRE CUSHION 2.0 ID X 1/4 BOLT
2 FT	10	16-103	HOSE, FUEL 5/16 30R9 FUEL INJECTION
1	9	21-132	FUEL CONNECTOR, CHEVY
2	8	31-030	TERM, RING 14-16 GA. #10 BLUE
1	7	31-041	TERM, INS PSH ON 14-16 GA. BLUE MALE
1	6	31-042	TERM, INS PSH ON 14-16 GA. BLUE FEMALE
144 IN	5	32-032	CABLE, SJ CORD 14/2 250FT
2	4	41-070	GROMMET, 7/8" OD X 3/8" ID X 1/8" PANEL
1	3	41-096	GROMMET, 1-1/8 OD X 5/8 ID X 1/8 PANEL
1	2	58-519	PNL, FUEL PUMP HOUSING
1	1	59-941	PNL, FUEL PUMP COVER
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
48-157 INSTALLATION HARDWARE KIT



18	10	10-010	BOLT, TAP 3/8-16 X 4 GR 5
2	9	10-035	SCREW, 1/4 X 1 HWH TEKS 3
2	8	10-363	SCREW, MACH 5/16-18 X 6 HXHD ZPS
18	7	11-019	NUT, 3/8-16 NYLOK
2	6	11-029	NUT, 5/16-18 NYLOCK
36	5	12-013	WASHER, FLAT 3/8 USS
4	4	12-017	WASHER, FLAT 5/16 SAE ZINC
2	3	31-164	TERMINAL, HD BATTERY 6G TO 2/0
12	2	58-055	PLATE, MACHINE MOUNTING
6	1	58-803	PLATE, LARGE CONSOLE MOUNTING
QTY	ITEM	PART NO.	DESCRIPTION

SECTION FIVE: PARTS LISTING AND REFERENCE
48-155 CALIFORNIA PROP 65 LABEL KIT



1	2	44-279	DECAL, WARNING CA PROP 65 EXTERNAL
1	1	49-156	INSTRUCTIONS, CA PROP 65 DECAL
QTY	ITEM	PART NO.	DESCRIPTION

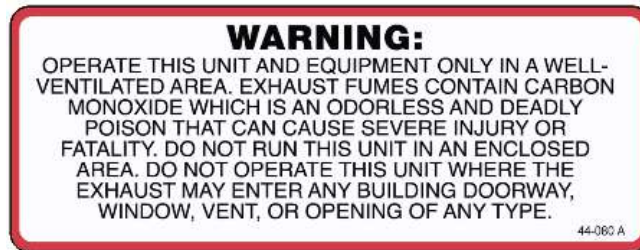
FOR USE IN THE STATE OF CALIFORNIA ONLY

SECTION FIVE: PARTS LISTING AND REFERENCE

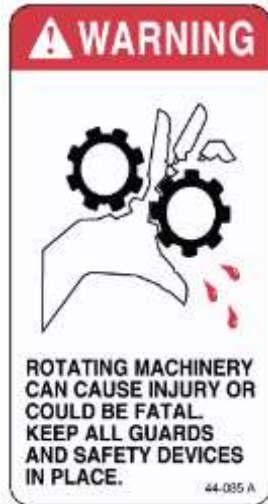
DECALS



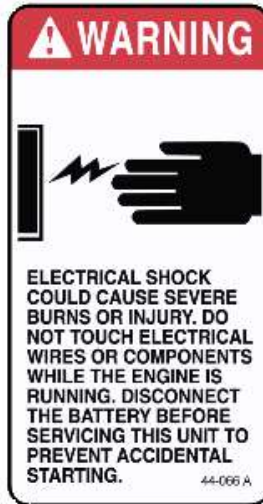
44-084, DECAL, CAUTION HOT SURFACE



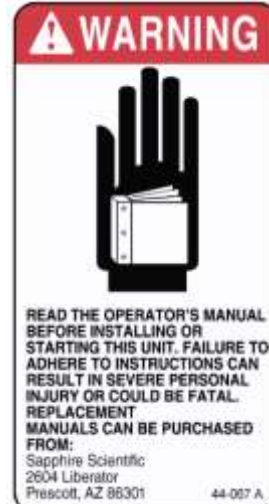
44-080, DECAL, WARNING USE IN WELL VENTILATED AREA



44-085, DECAL, WARNING ROTATING MACHINERY



44-066, DECAL, WARNING ELECTRIC SHOCK



44-067, DECAL, WARNING READ MANUAL



44-090, DECAL, WARNING MANIFOLD MAINTENANCE

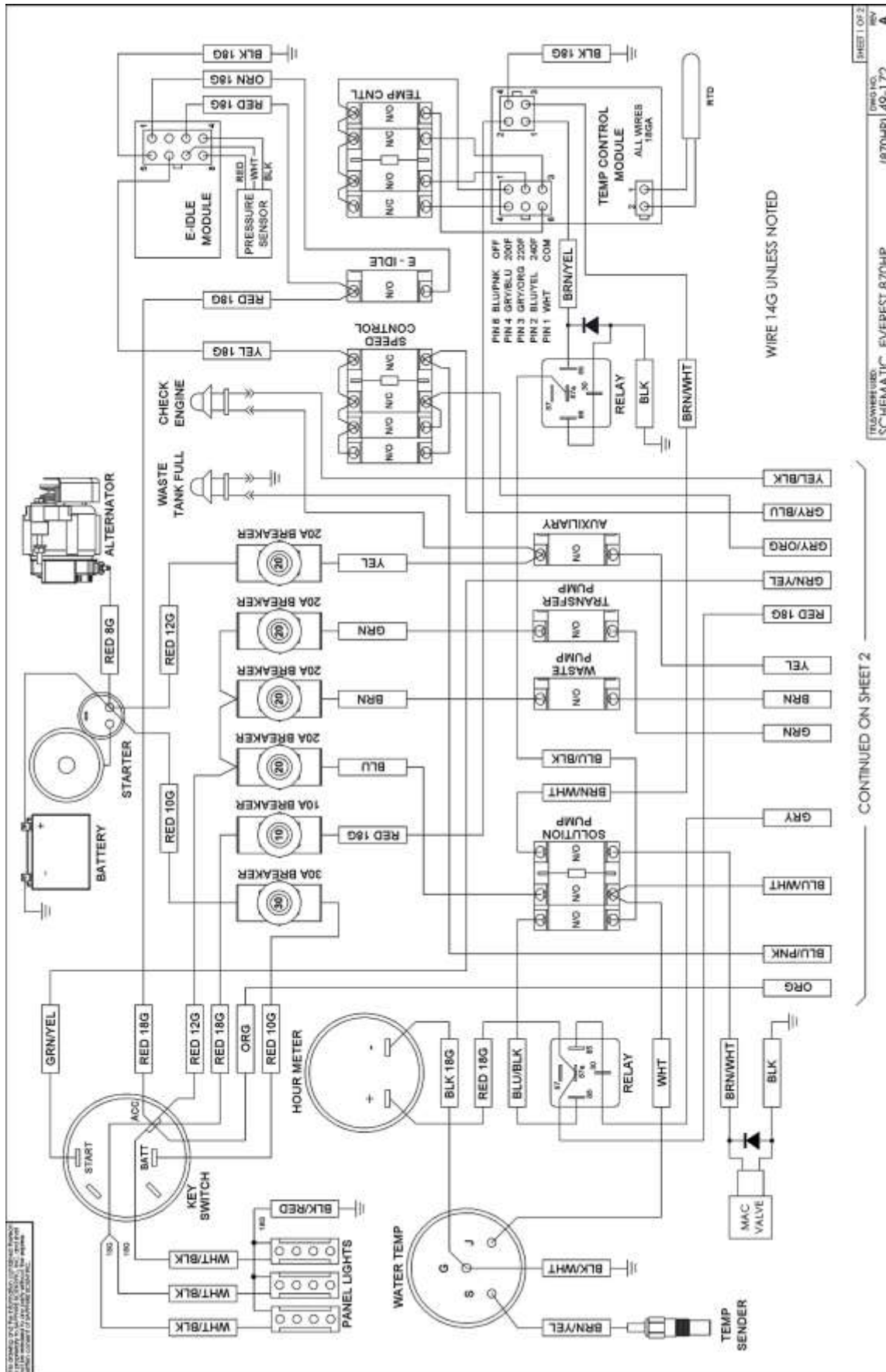


44-079, DECAL, UNLEADED FUEL ONLY



44-336, DECAL, 870HP EMBLEM

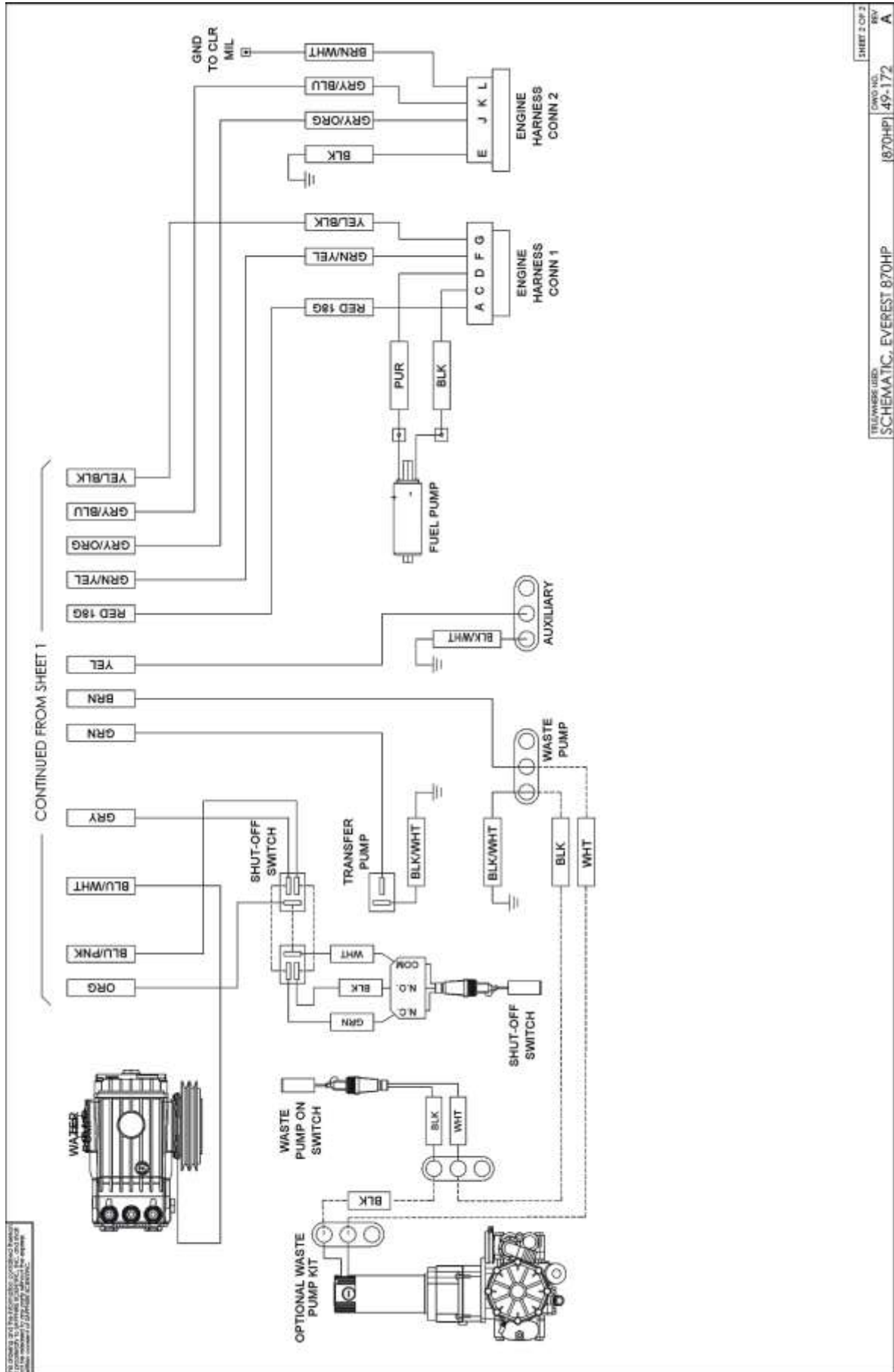
SECTION FIVE: PARTS LISTING AND REFERENCE
EVEREST 870HP WIRING DIAGRAM



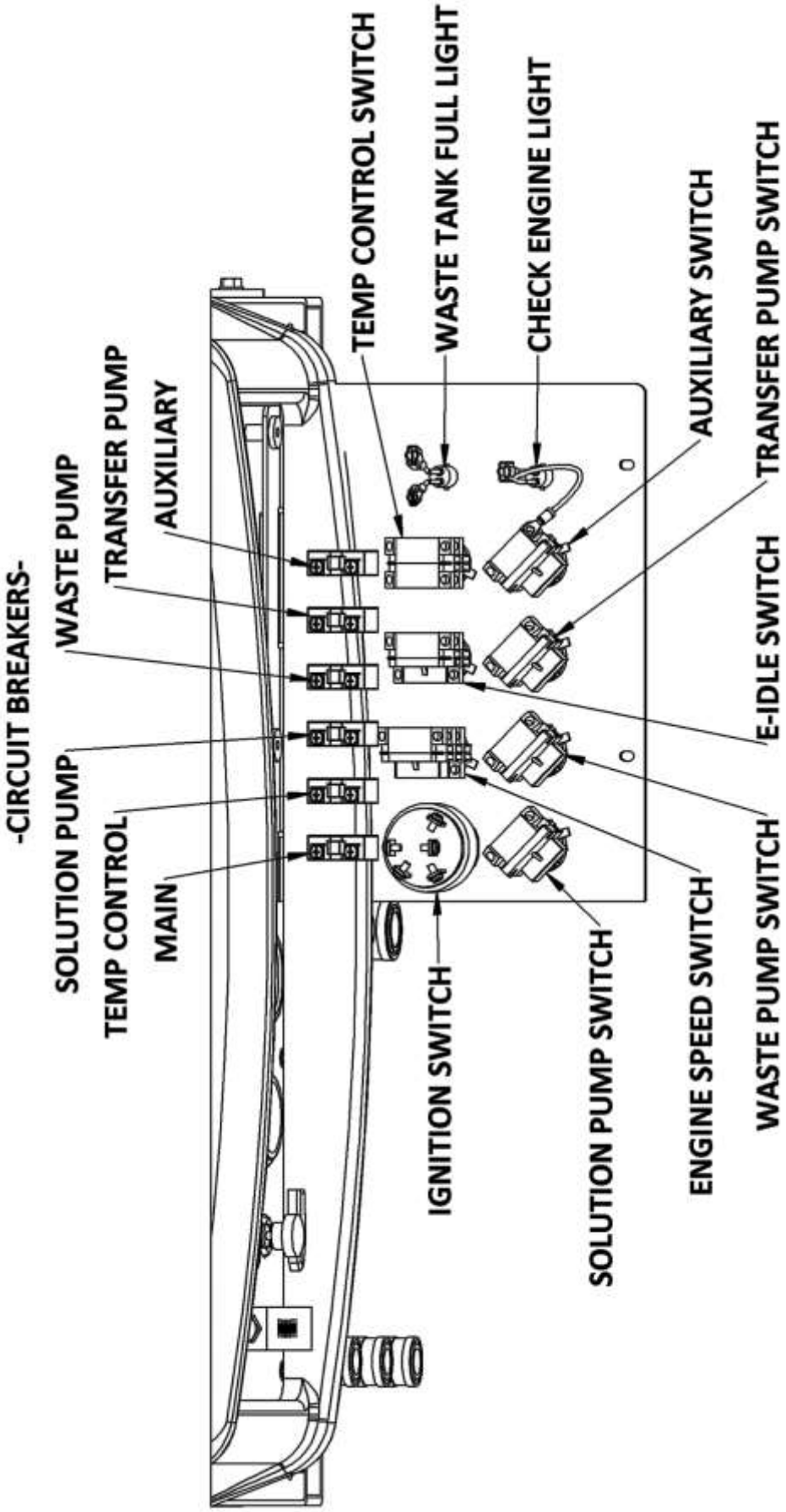
SHEET 1 OF 2
 EVEREST 870HP
 SCHEMATIC, EVEREST 870HP

CONTINUED ON SHEET 2

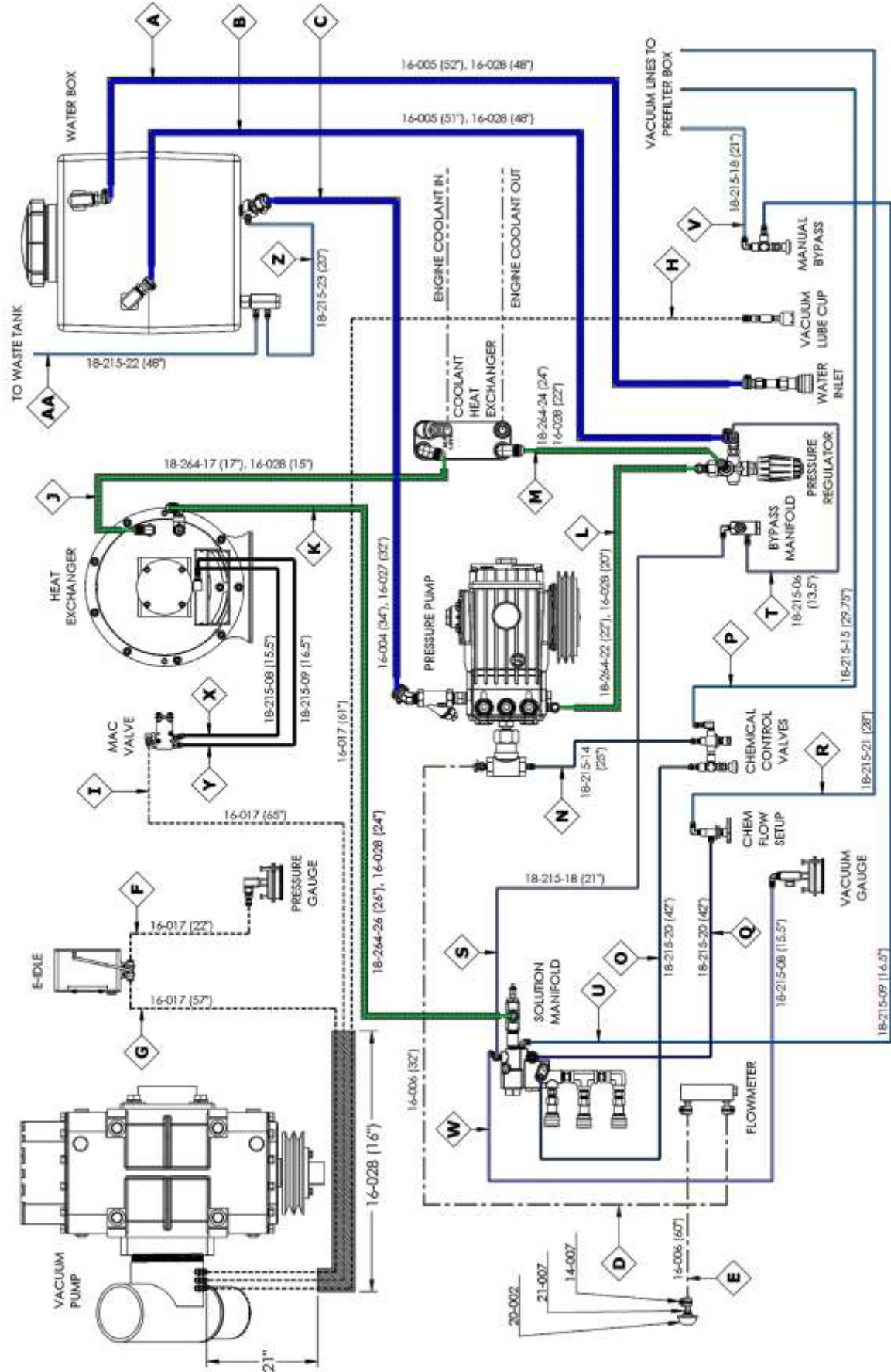
SECTION FIVE: PARTS LISTING AND REFERENCE



EVEREST 870HP INSTRUMENT PANEL LAYOUT FROM MAINTENANCE VIEW

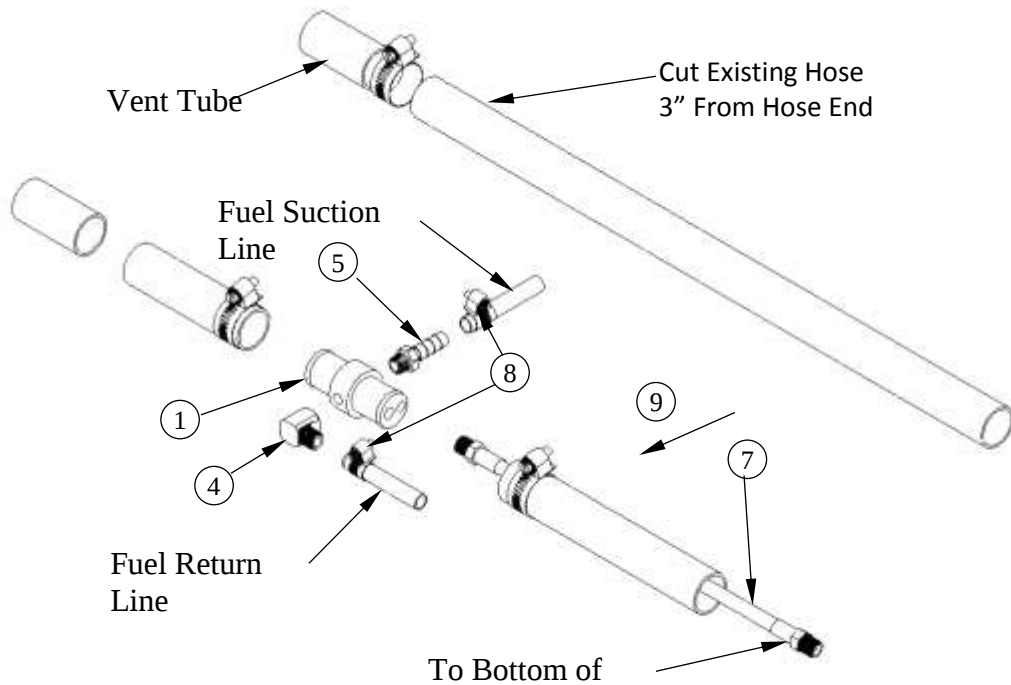


SECTION FIVE: PARTS LISTING AND REFERENCE
EVEREST 870HP HOSE ROUTING AND IDENTIFICATION



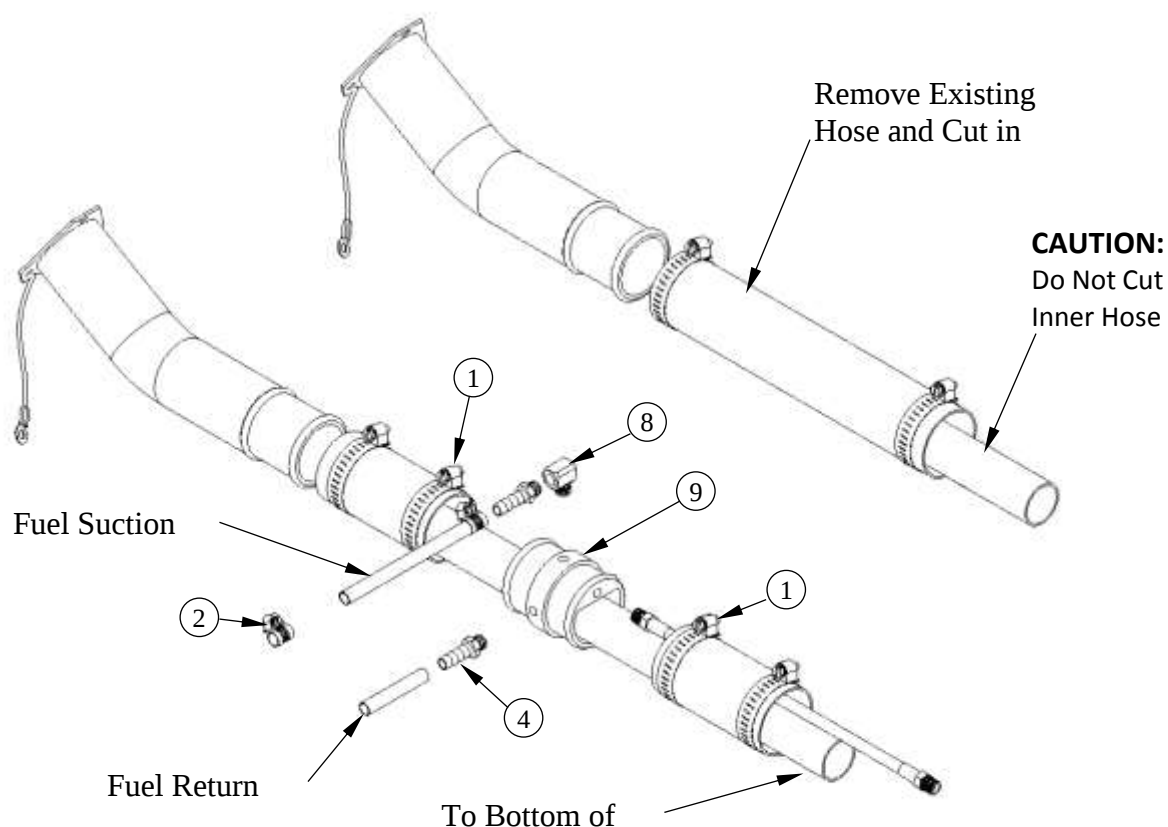
SECTION FIVE: PARTS LISTING AND REFERENCE
HOSE IDENTIFICATION CHART (SEE HOSE ROUTING DIAGRAM)

HOSE/SLEEVE LENGTHS, CLAMP LOCATIONS (SEE DIAGRAM)					
ID	HOSE PART NO.	HOSE LENGTH (IN)	SLEEVE	SLEEVE LENGTH	CLAMPS
A	16-005 (5/8)	52	16-028	48	14-012 X2
B	16-005 (5/8)	51	16-028	48	14-012 X2
C	16-004 (3/4)	34	16-027	32	14-000 X2
D	16-006 (5/16)	32	N/A	N/A	14-007 X2
E	16-006 (5/16)	60	N/A	N/A	14-007 X2
F	16-017 (1/4)	22	N/A	N/A	N/A
G	16-017 (1/4)	57	16-028	16	N/A
H	16-017 (1/4)	61			N/A
I	16-017 (1/4)	65			N/A
J	18-264-17 (08 JIC)	17	16-028	15	N/A
K	18-264-26 (08 JIC)	26	16-028	24	N/A
L	18-264-22 (08 JIC)	22	16-028	20	N/A
M	18-264-24 (08 JIC)	24	16-028	22	N/A
N	18-215-14 (04 JIC)	25	N/A	N/A	N/A
O	18-215-20 (04 JIC)	42	N/A	N/A	N/A
P	18-215-15 (04 JIC)	29.75	N/A	N/A	N/A
Q	18-215-20 (04 JIC)	42	N/A	N/A	N/A
R	18-215-21 (04 JIC)	28	N/A	N/A	N/A
S	18-215-18 (04 JIC)	21	N/A	N/A	N/A
T	18-215-06 (04 JIC)	13.5	N/A	N/A	N/A
U	18-215-09 (04 JIC)	16.5	N/A	N/A	N/A
V	18-215-18 (04 JIC)	21	N/A	N/A	N/A
W	18-215-08 (04 JIC)	15.5	N/A	N/A	N/A
X	18-215-08 (04 JIC)	15.5	N/A	N/A	N/A
Y	18-215-09 (04 JIC)	16.5	N/A	N/A	N/A
Z	18-215-23 (04 JIC)	20	N/A	N/A	N/A
AA	18-215-22 (04 JIC)	48	N/A	N/A	N/A

1992 TO 2002 FORD FUEL LINE INSTALLATION**69-005FI KIT, FUEL HOOKUP FORD FI**

Item No.	Part Number	Qty	Description
1	66-031	1	ADAPTOR, VENT TUBE(FORD)
2	21-086	2	FTTG, BULKHEAD 1/4 IN BRASS
3	21-039	2	ELL, 1/4 IN LG STREET BRASS
4	21-038	1	ELL, STREET 1/8 IN BRASS
5	21-007	2	FTTG, BRB 1/8P X 5/16 H BR
6	21-006	4	FTTG, BRB 1/4P X 5//16H BR
7	18-028	1	HOSE, 3/16 X 25 (1/8P X 1/8P NO COVER)
8	14-011	6	CLAMP, HOSE FUEL # 6
9	14-000	2	CLAMP, HOSE #12

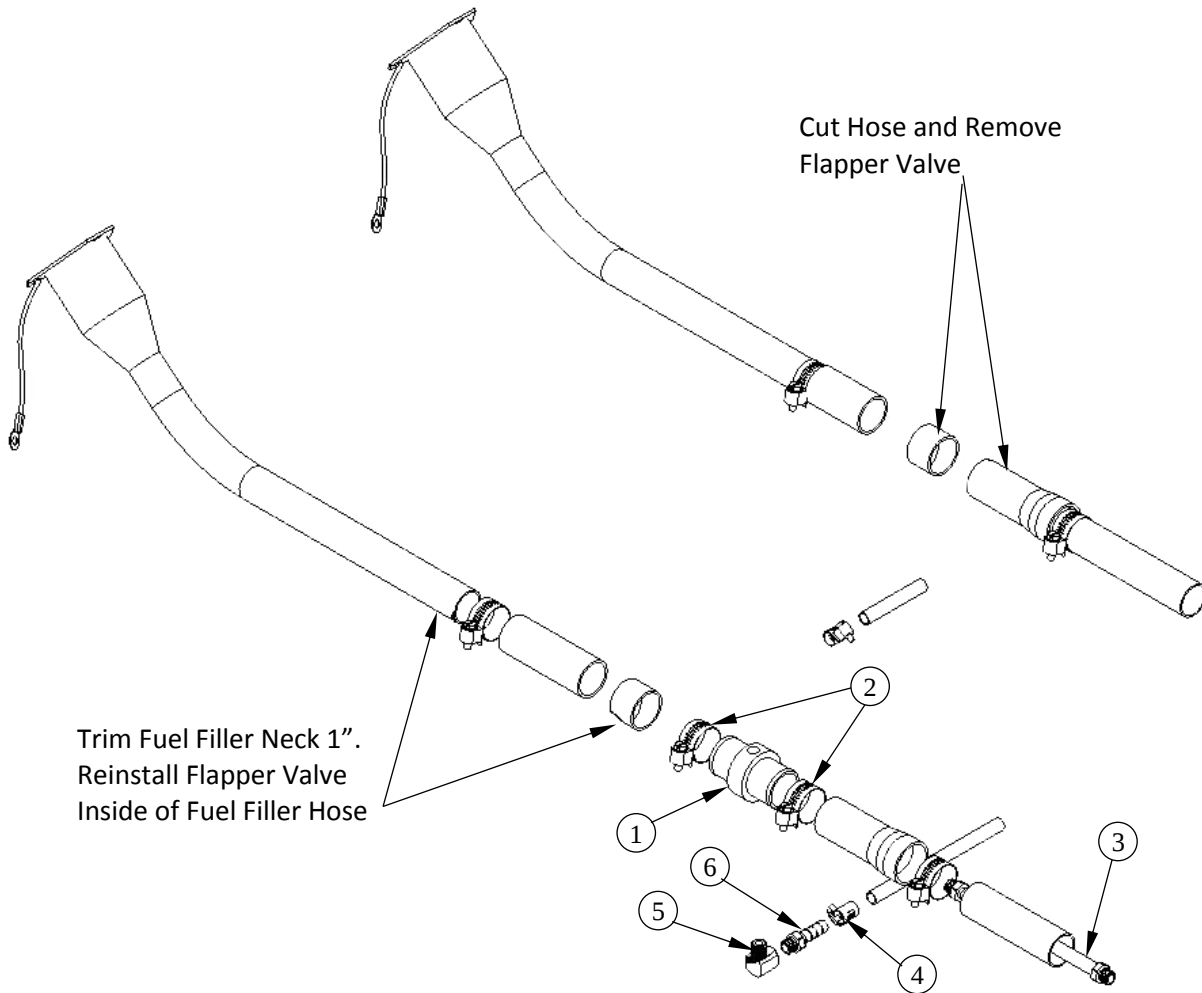
SECTION FIVE: PARTS LISTING AND REFERENCE
CHEVY AND GMC FULL SIZE VAN FUEL LINE INSTALLATION



69-003FI KIT, FUEL HOOKUP 97 & 2002 FI

Item No.	Part Number	Qty	Description
1	14-010	2	CLAMP, HOSE # 32
2	14-011	6	CLAMP, HOSE FUEL # 6
3	21-006	4	FTTG, BRB 1/4P X 5//16H BR
4	21-007	2	FTTG, BRB 1/8P X 5/16 H BR
5	21-038	1	ELL, STREET 1/8 IN BRASS
6	21-039	2	ELL,1/4 IN LG STREET BRASS
7	21-086	2	FTTG, BULKHEAD 1/4 IN BRASS
8	21-116	1	ELL, 1/8 FP X 1/8 FP BRONZE
9	66-030	1	ADAPTOR,FUEL NECK(CHEVY)
10	18-027	2	HOSE, 3/16 X 5 (1/8P X 1/8P NO CVR)

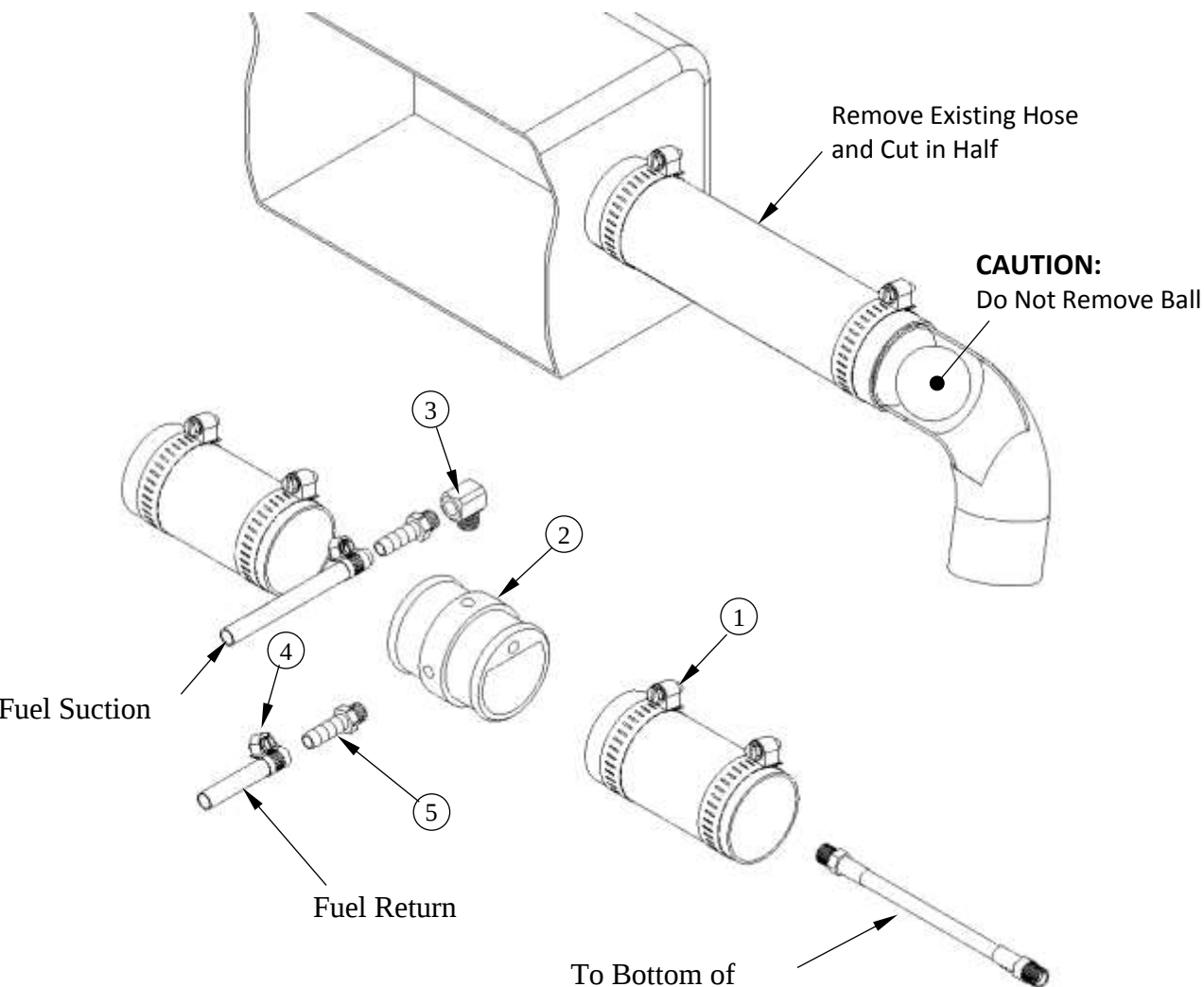
SECTION FIVE: PARTS LISTING AND REFERENCE
2003 CHEVY AND GMC FULL SIZE VAN FUEL LINE INSTALLATION



69-018FI KIT, FUEL HOOKUP 2003 CHEVY FI

Item No.	Part Number	Qty	Description
1	66-034	1	ADAPTOR, FUEL FLR CHVY 2003
2	14-006	2	CLAMP, HOSE # 20
3	18-028	1	HOSE, 3/16 X 25 (1/8P X 1/8P NO COVER)
4	14-011	6	CLAMP, HOSE FUEL # 6
5	21-038	1	ELL, STREET 1/8 IN BRASS
6	21-007	2	FTTG, BRB 1/8P X 5/16 H BR
7	21-039	2	ELL, 1/4 IN LG STREET BRASS
8	21-006	4	FTTG, BRB 1/4P X 5/16H BR
9	21-086	2	FTTG, BULKHEAD 1/4 IN BRASS

SECTION FIVE: PARTS LISTING AND REFERENCE
1997-2002 DODGE FULL SIZE VAN FUEL LINE INSTALLATION



69-004FI KIT, FUEL HOOKUP CHEVY/DODGE FI

Item No.	Part Number	Qty	Description
1	14-010	2	CLAMP, HOSE # 32
2	66-030	1	ADAPTOR,FUEL NECK(CHEVY)
3	21-038	1	ELL, STREET 1/8 IN BRASS
4	14-011	6	CLAMP, HOSE FUEL # 6
5	21-007	2	FTTG, BRB 1/8P X 5/16 H BR
6	18-028	1	HOSE, 3/16 X 25 (1/8P X 1/8P NO COVER)
7	21-086	2	FTTG, BULKHEAD 1/4 IN BRASS
8	21-006	4	FTTG, BRB 1/4P X 5//16H BR
9	21-039	2	ELL,1/4 IN LG STREET BRASS