

Congratulations on your purchase of the **Big Gulp 4500®** unit. This instruction/parts manual is a guide for operating and servicing your **Sapphire Scientific** unit.

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

The following 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 repair, you are familiar with this equipment and have the proper tools. Any questions regarding the operation, service, or repair of this unit should be directed to your nearest dealer.

The headings **WARNING** and **CAUTION** are utilized to warn you that steps must be taken to prevent personal injury or damage to the equipment. Please make sure that you have read and understand these instructions entirely before proceeding with the operation of this unit.

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

PLEASE ENSURE THAT THE WARRANTY CARD IS FILLED OUT BY THE INSTALLATION SERVICE CENTER THAT INSTALLED THIS UNIT AND IS RETURNED TO **SAPPHIRE SCIENTIFIC**.

Record the serial number of your unit here for future reference or if you should need to contact the factory in the future for any reason.

S/N:

This service and operations manual is written specifically for **Big Gulp 4500®** extraction units manufactured by:

SAPPHIRE SCIENTIFIC

2604 Liberator

Prescott, AZ 86301 USA

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Big Gulp 4500® MANUAL
PART# 49-082

SAPPHIRE SCIENTIFIC LIMITED WARRANTY

SAPPHIRE SCIENTIFIC BIG GULP 4500

What Does This Warranty Cover?

This warranty covers the SAPPHIRE SCIENTIFIC BIG GULP 4500 and is provided to the original purchaser only.

How Long Does This Warranty Last?

This warranty runs for:

- Two (2) years from the date of installation on parts and labor (Excluding normal maintenance items.)
Factory installed original belts are covered for 500 hours. Recovery tank and frame are covered for five years.
All other components including seals, o-rings and electrical components are covered for the entire two year warranty period.

What Sapphire Scientific Will Do:

If a defect in materials or workmanship occurs within the warranty period, Sapphire Scientific at its election will repair or replace the defective part at no charge.

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, or failure to perform necessary or recommended maintenance or repair (See your 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 normal maintenance items such as air and oil filters, lubricants and tune up parts. Paint is not covered. Recovery tank and frame are covered for five years.

All other components including seals, o-rings and electrical components are covered for the entire two year warranty period. We limit all implied warranties to:

- Two (2) years from the installation date on parts and labor.

OTHER THAN THE WARRANTIES PROVIDED HEREIN, SAPPHIRE SCIENTIFIC 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 Do I Get Service?

In order to be eligible for service under this warranty you MUST do the following: (a) fill out the warranty registration card on-line within thirty (30) days of the installation of our product; (b) have your dealer write or call for a return material authorization (RMA); and (c) have the serial number and original proof of installation date available.

Proof of proper maintenance may be required before warranty is granted.

Contact us at:

SAPPHIRE SCIENTIFIC
2604 Liberator, Prescott, AZ 86301
Phone: 928-445-3030

If our dealer uncovers a defect we will repair or replace the product, at our election. Ground shipping and transportation costs will be covered by the manufacturer. Returning defective parts to the manufacturer, if required, shall be the responsibility of the purchaser. Warranty may be denied if defective parts are not returned within the allotted 90 days. If it is determined that there is no defect in the product, or that the defect resulted from causes not within the scope of our warranty, then the product will be repaired or replaced only at your request and at your expense and you must bear all shipping costs.

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.

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SECTION 1: **GENERAL INFORMATION**

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2. RECEIVING YOUR EXTRACTION SYSTEM

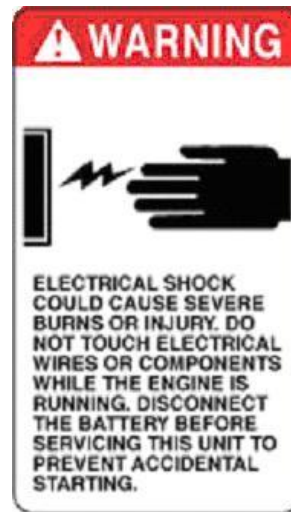
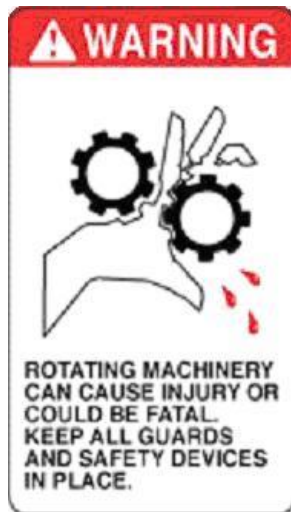
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1. SAFETY

WARNING For Your Safety!

The following **WARNING** labels are on your **SAPPHIRE SCIENTIFIC Big Gulp 4500®** console. These labels point out important **WARNINGS and CAUTIONS**, which must be followed at **all** times. Failure to follow warnings could result in personal injury, fatality, to yourself and/or others or property damage. Please follow these instructions carefully!

DO NOT remove these decals.



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 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 other opening.

3. 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.

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

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 or damage may result.

8. **NEVER** service this unit while it is running. High speed mechanical parts as well as high temperature components may result in injury or severed limbs.

9. Engine components 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 20 minutes after the unit is shut off. Severe burns could result.

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

12. **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.

13. **DO NOT** smoke around the machine. Gas fumes could accumulate and ignite. Battery gases are extremely flammable. This will prevent possible explosions.

SECTION 1

14. **DO NOT** damage the vehicle in any way during the installation. When routing fuel lines **DO NOT** configure the hose in any locations where the hose or vehicle could be damaged. Avoid contact with moving parts, areas of high temperature, brake lines, fuel lines, catalytic converters, exhaust pipes, mufflers or sharp objects.

15. **NEVER** cut or splice any of the vehicle fuel lines during fuel line installation. This will 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. **DO NOT** exceed your vehicles weight limit. The console with waste tank and accessories weighs approximately 900 pounds. Make certain that the vehicle has the correct axle rating. This will prevent unsafe or hazardous driving conditions.

17. High back seats are required for all vehicles that units are to be installed for head and neck protection. Metal partitions between the seats and equipment are strongly recommended.

18. Always keep your vehicle clean and orderly. Wands, tools and accessories must be securely stowed while driving the vehicle.

19. Ensure that you have received proper training from the distributor that you purchased the unit from prior to operation.

20. **DO NOT** modify this unit in any manner. Any modification could result in serious injury or fatality.

**CALIFORNIA PROPOSITION 65
WARNING: ENGINE EXHAUST
FROM THIS PRODUCT CONTAINS
CHEMICALS KNOWN BY THE
STATE OF CALIFORNIA TO CAUSE
CANCER, BIRTH DEFECTS, OR
OTHER REPRODUCTIVE HARM.**

**ALL FUEL LINES MUST MEET
CARB III and EPA PHASE 3 LOW
PERMEABILITY REQUIRMENTS.**

**ALL FUEL STORAGE TANKS MUST
MEET CARB III and EPA PHASE 3
PERMEATION and VENTING
REQUIRMENTS.**

**ALL FUEL ADAPTOR KITS AND
FUEL TANKS USED IN THE STATE
OF CALIFORNIA MUST MEET
CURRENT CALIFORNIA AIR
RESOURCES BOARD (ARB)
REGULATIONS.**

**CARB EXECUTIVE INFORMATION
LABEL(S) MUST BE INSTALLED IN
A VISABLE LOCATION.**

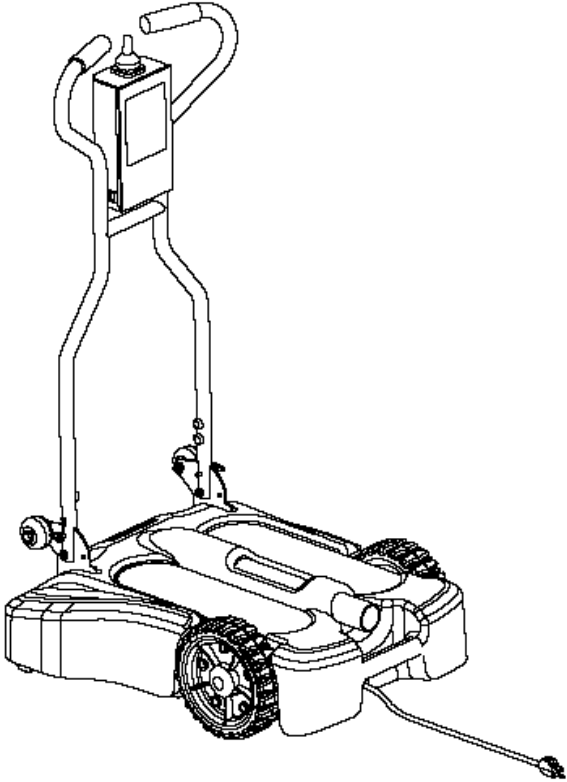
SPECIFICATIONS

Engine Speed	2900 rpm (High Speed No Load) 1500 rpm (Idle No Load)
Vacuum Pump RPM	3265 rpm
Vacuum Relief Valve	14 in. HG
Waste Tank Capacity (at shut-off)	100 gal.
Console Weight	724 lbs.
Console Weight (with waste tank & hoses)	1054 lbs.
Max Operating Weight (full waste tank)	1889 lbs.

TORQUE VALUES

Engine Hub Rear.....	160 inch/lbs.	13.3 ft/lbs.
Engine Hub Front.....	185 inch/lbs.	15.4 ft/lbs.
Vacuum Pump Hub.....	185 inch/lbs.	15.4 ft/lbs.

Use the **Big Gulp** with the **Rover HVE** high volume extractor for maximum water extraction from flooded carpet and pad. The Rover's unsurpassed maneuverability and special features make extraction more efficient than ever. The Rover's joystick precisely controls separate drive wheels to allow easy maneuvering around the sharpest corners. Its patent-pending stainless head with custom polymer glide has a self-healing edge that easily rides over the carpet to maximize extraction on ALL types of carpet. The unit folds flat for easy transport and storage.



SECTION 1

INSTALLATION REQUIREMENTS

Prior to beginning the installation, read the **ENTIRE “Installation”** section of this manual. Since the **SAPPHIRE SCIENTIFIC Big Gulp 4500®** extraction unit weighs approximately 1054 lbs., please adhere to the following recommendations prior to installing the unit.

1. The unit should **NOT** be installed in any motor vehicle of less than 1 ton capacity or on flexible fueled vehicles.

CAUTION!

The console and waste tank with accessories must NOT exceed the vehicle’s axle weight limit.

2. If mounting the unit in a trailer, ensure that the trailer is rated for the total weight of the **unit and trailer**. Electric or hydraulic brakes must be provided, and strict compliance with all State and Federal laws must be maintained.

3. **SAPPHIRE SCIENTIFIC** recommends using only a **dual axle** trailer. If mounting in a trailer, the **SAPPHIRE SCIENTIFIC Big Gulp 4500®** console must be positioned so that it balances properly with respect to the trailer axles. Ten percent (10%) of the unit’s total overall weight (w/o accessories or water) should be on the tongue.

4. Adequate ventilation with either two sets of doors or a roof ventilation system is highly recommended.

5. Tires must have a load rating in excess of the combined unit and vehicle/trailer weight.

6. **SAPPHIRE SCIENTIFIC** does not recommend using any type of flooring materials that absorb water. This condition will result in rust and corrosion of the vehicle floor.

7. 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. Gasoline with up to, not exceeding, 10% ethanol is acceptable.

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

ENGINE OIL REQUIREMENTS

Use high-quality oil of at least API (American Petroleum Institute) service class SF, SG, SH, SJ or higher. **Do not use additives.** A 20W-50 synthetic blend may be used after 50 hours of operation for a new or rebuilt engine to allow the piston rings to properly seat. It is never recommended to extend oil change intervals past 100 hours.

Engine oil capacity	2.8 L 2.9 U.S. qts
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Tightening torque	Drain Plug	32.4 to 37.3 N·m 3.3 to 3.8 kgf·m 23.9 to 27.5 lbf·ft
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NOTE: Using a lower service class oil or extending oil change intervals longer than recommended can cause engine damage.

2. RECEIVING YOUR EXTRACTION SYSTEM

DEALER RESPONSIBILITY

THE DEALER THAT YOU PURCHASED THIS EXTRACTION SYSTEM FROM IS RESPONSIBLE FOR THE PROPER INSTALLATION OF THIS MACHINE.

THE DEALER IS ALSO RESPONSIBLE FOR THE PROPER INITIAL TRAINING OF YOUR OPERATORS AND MAINTENANCE PERSONNEL.

ACCEPTANCE OF SHIPMENT

Your **SAPPHIRE SCIENTIFIC Big Gulp 4500®** 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 common carrier immediately.

2. Carefully check your equipment and packing list. The standard **SAPPHIRE SCIENTIFIC Big Gulp 4500®** unit should arrive with the following items as well as any optional accessories:

EQUIPMENT LISTING

- A. **SAPPHIRE SCIENTIFIC Big Gulp 4500®** console.
- B. Operation and Service manual
- C. Installation mounting plates and bolt down kit
- D. Hose clamps for vacuum and fuel hoses
- E. Waste tank with shutoff switch
- F. Waste tank filter and stainless steel strainer basket.
- G. 50 ft. 2-1/2 in. vacuum hose
- H. 50 ft. 2 in. vacuum hose
- I. Vacuum hose reducer.

OPTIONAL EQUIPMENT

- Additional 50 ft.2 in. vacuum hose
 - Part # 18-003
- Additional 50 ft. 2-1/2 in. vacuum hose
 - Part # 18-333
- Additional vacuum hose connectors
 - Part # 21-003
- Rover HVE

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
- Ford FI..... 69-005FI
- Ford 2004 – 2010..... 69-061
- Ford 2011+..... 69-331
- Ford Box Truck 2004+..... 68-077
- Ford Transit Connect 69-261S
- Nissan NV..... 69-376

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3. INSTALLATION

WARNING!!!

This unit must be bolted to the floor of the vehicle by an **AUTHORIZED DISTRIBUTOR**.

LIFTING THE UNIT INTO THE VEHICLE

The **BIG GULP 4500®** console weighs approximately 724 lbs., a forklift is necessary to place the unit into the vehicle. Make **CERTAIN** that the forks are spread to the maximum width of the unit. Use C clamps to secure the unit to the forks.

POSITIONING THE UNIT INTO THE VEHICLE

Vehicles vary in size and openings. Owners have different preferences on where in the vehicle they want their units positioned. **SAPPHIRE SCIENTIFIC** strongly recommends a side door installation for the **BIG GULP 4500®**. 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. The 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.
3. **NEVER** position the console closer than 12 inches from the bottom rear of the driver and passenger seats.

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 and or operation of the vehicle.

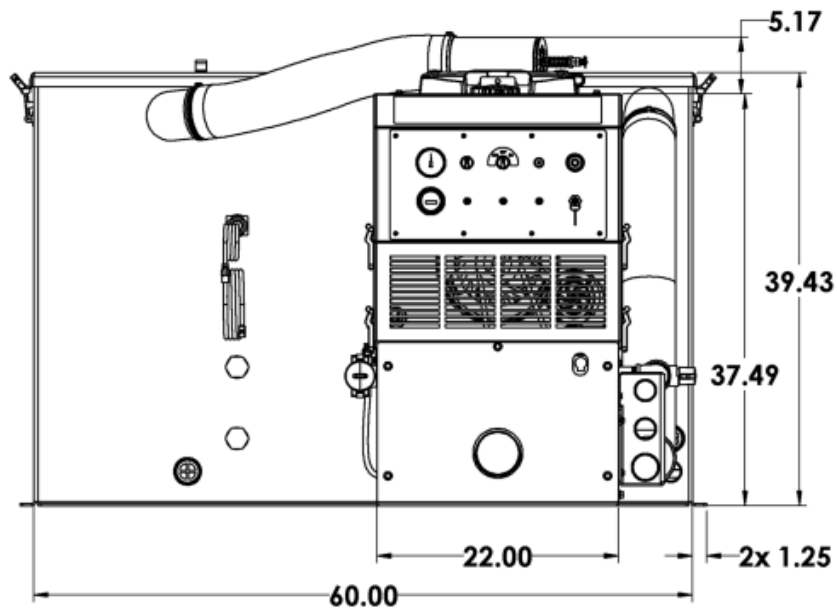
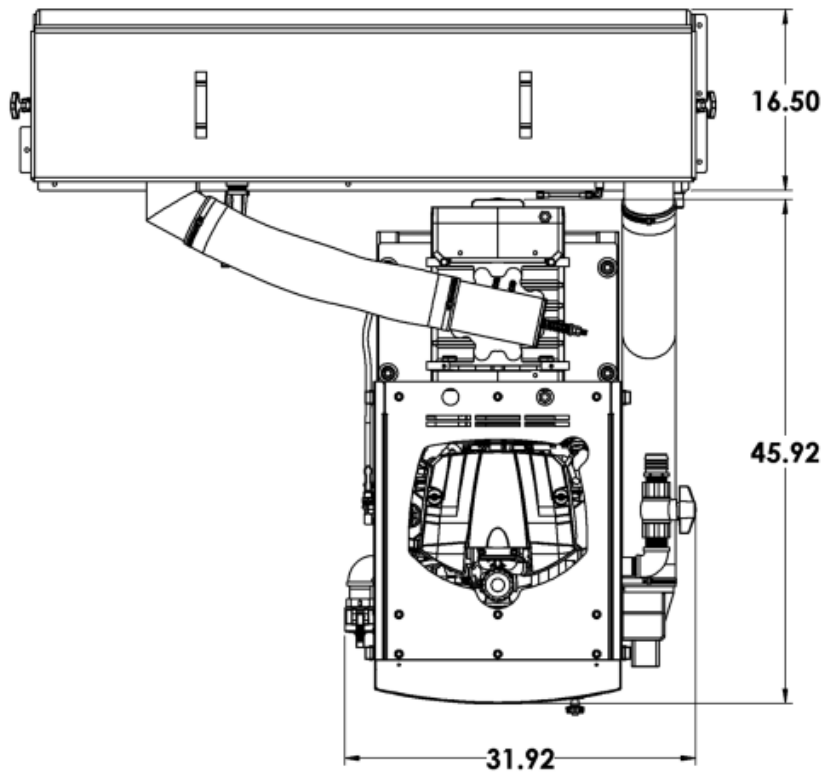
A. The waste tank mounting holes will serve as a template. Drill ten (10) 13/32 in. diameter holes for the waste tank.

B. Using the provided mounting hardware kit:

1. Insert six (6) 3/8-16 × 4 in. hex head cap screws with flat washers through the **BIG GULP®** console mounting holes, and four (4) 3/8-16 × 4 in. hex head cap screws with flat washers through the waste tank mounting holes.
2. Install the provided mounting plates underneath the vehicle floor.
3. 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.

SECTION 2

4500 Big Gulp Overall Dimensions



INSTALLATION OF FUEL LINES



READ THESE INSTRUCTIONS IN THEIR ENTIRETY PRIOR TO PROCEEDING.



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

DO NOT damage the vehicle in any way during the installation. When routing fuel lines, **DO NOT** configure the hoses in any location where the hoses or vehicle could be damaged. Avoid contact with moving parts, areas of high temperature, brake lines, fuel lines, catalytic converters, exhaust pipes, mufflers or sharp objects. Excess heat from exhaust or other heat sources may cause the fuel pump to work improperly.

TRAILER FUEL TANK AND FUEL LINE INSTALLATION

The following are recommendations for trailer installations:

- A. Strict compliance with all federal and state laws must be maintained.
- B. 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.
- C. **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.

D. Always mount fuel tanks where they will be protected from any vehicle collision.

E. 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 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. 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.

A. 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.

B. Attach the black negative (-) battery cable from the ground on the console to the negative (-) terminal on the battery and tighten down the nut.

FIRE EXTINGUISHER

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

SECTION 3: **OPERATION**

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4. SYSTEMS

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

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.

VACUUM SYSTEM

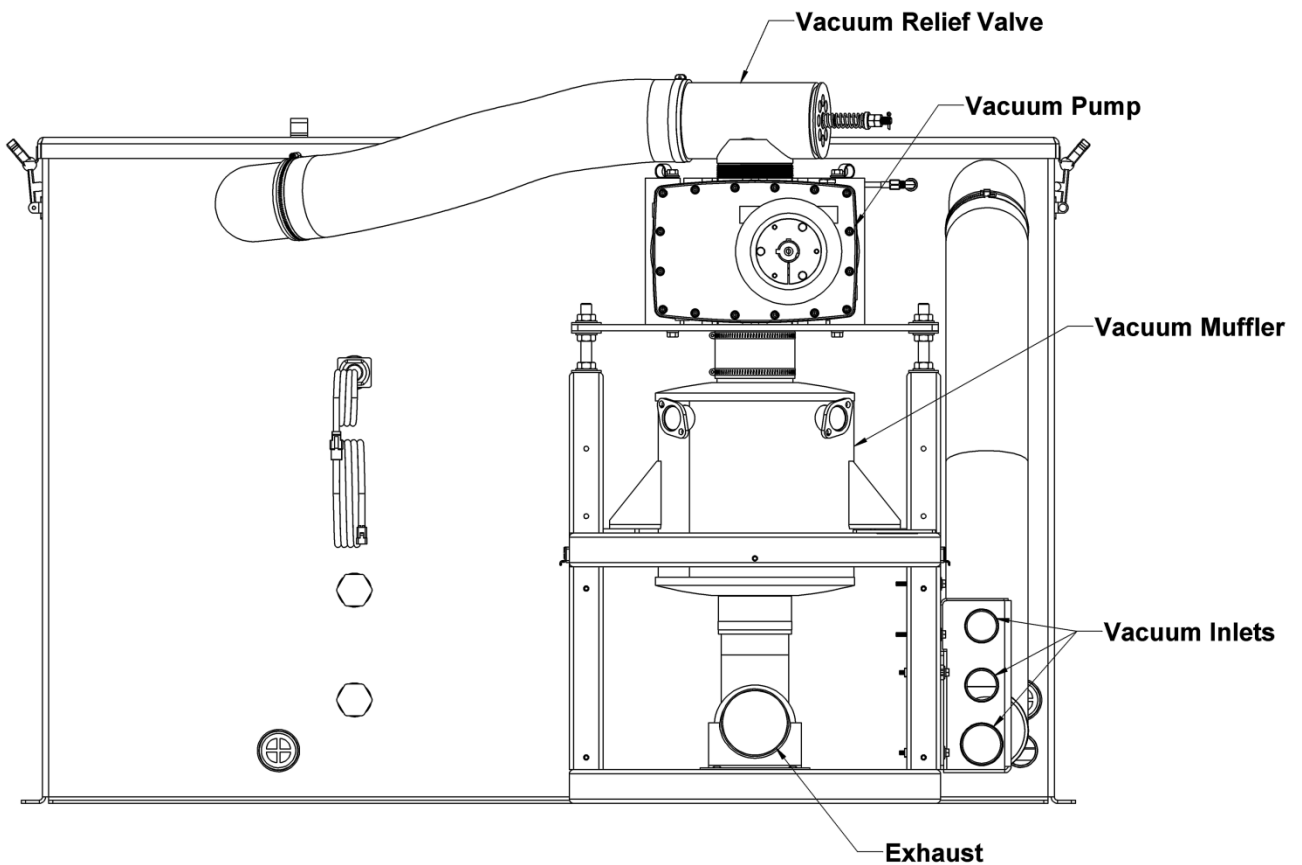
The vacuum flow is initiated by the vacuum pump, or blower. An air and water mixture is drawn into the vacuum inlet on the front of the console. The

mixture flows through a strainer basket in the waste tank. The air exits the waste tank through a 100 mesh filtration system, into the vacuum pump. A vacuum pump relief valve is installed for vacuum pump protection.

The air is discharged from the vacuum pump through a spiral silencer.

A high level shut off sensor is located on the front 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 high level shut off will not shut the unit off due to high levels of foam.



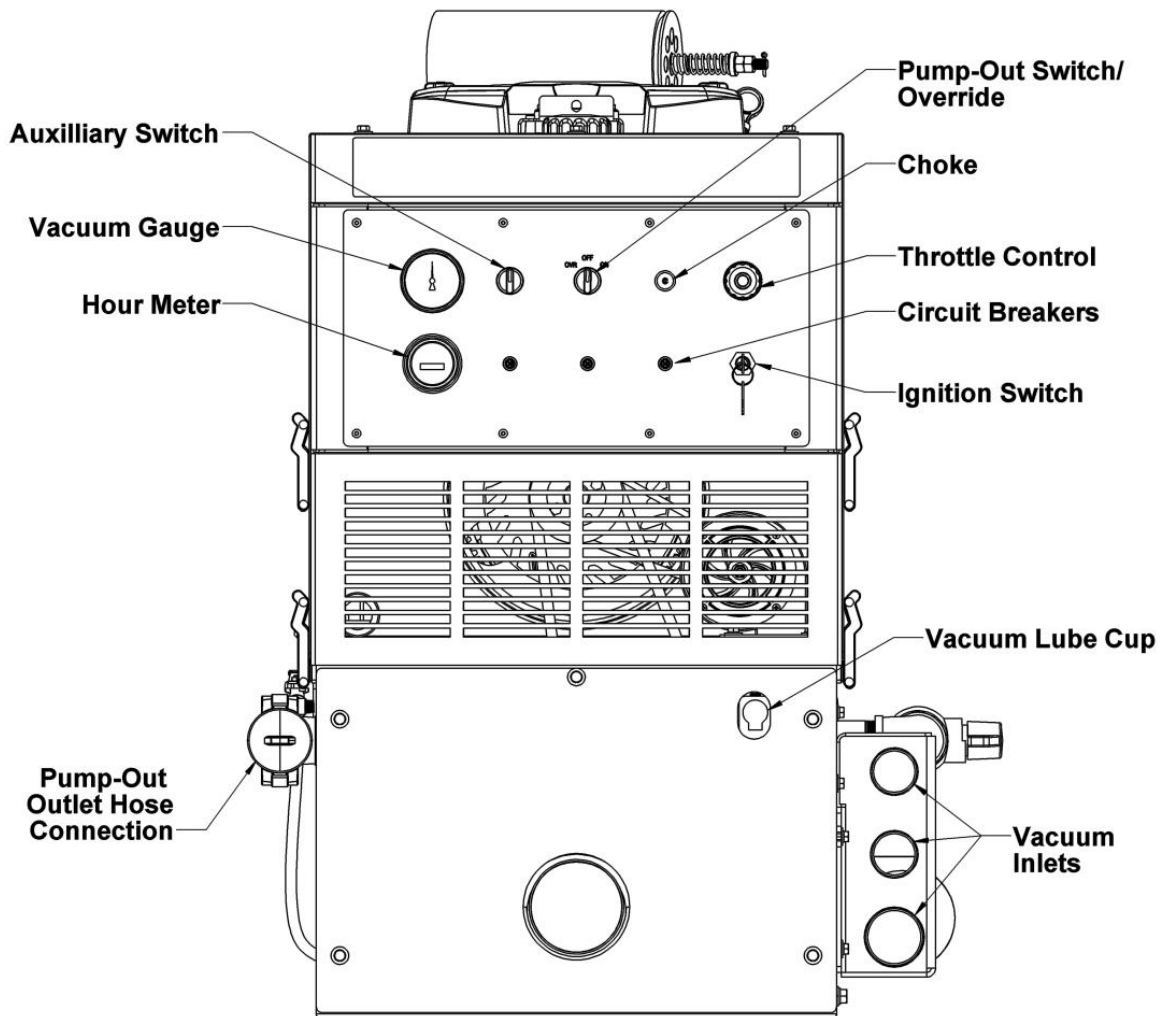
5. OPERATION

PREPARATION

This section of the operator's manual explains how to prepare, start, operate, shut down and maintain your **SAPPHIRE SCIENTIFIC Big Gulp 4500®** extraction unit. The **SAPPHIRE SCIENTIFIC Big Gulp 4500®** extraction 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.



ENSURE THERE IS ADEQUATE FUEL

Check the fuel tank to ensure there is adequate fuel to complete the job and transport the vehicle.

REMOVE TOOLS FROM THE VEHICLE

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

STARTING THE UNIT

1. Set throttle control in, pull out engine choke, turn pump out switch to override (OVR) and turn ignition key to start.
2. Push in engine choke after engine has started.
3. Set throttle control to desired speed.

Note: Do not operate the unit with throttle control set below 50% of maximum throttle setting.

VACUUM HOSE

Connect the vacuum hose to the vacuum inlet connection at the front of the console. Connect the opposite end of the vacuum hose to the extraction tool.

AUTOMATIC WASTE PUMP

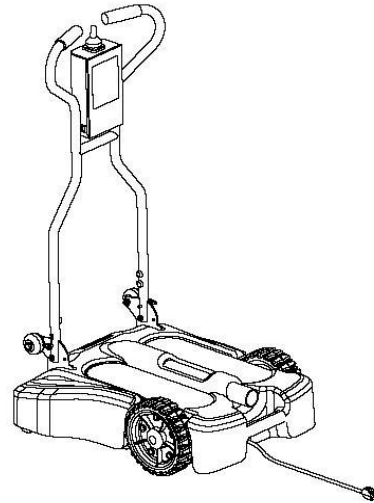
1. Turn the auxiliary power switch on. The waste pump will now operate automatically throughout the extraction process.

WARNING!

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.

EXTRACTION PROCESS

After you have completed the previous steps, proceed with the extraction process. Place the throttle control lever to the desired speed for extraction. 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.



Use the **Big Gulp** with the **Rover HVE** high volume extractor for maximum water extraction from flooded carpet and pad. The Rover's unsurpassed maneuverability and special features make extraction more efficient than ever. The Rover's joystick precisely controls separate drive wheels to allow easy maneuvering around the sharpest corners. Its patent-pending stainless head with custom polymer glide has a self-healing edge that easily rides over the carpet to maximize extraction on ALL types of carpet. The unit folds flat for easy transport and storage.

SECTION 3

SHUT DOWN AND DAILY MAINTENANCE

1. Remove as much moisture from the vacuum hoses as possible. This will prevent spillage of wastewater in your vehicle when returning hoses.
2. Disconnect the vacuum hose from the front of the console.
3. Push the throttle control lever to the slow position.
4. Allow the unit to run for at least **2 minutes**. This will help remove any moisture from the vacuum pump.

NOTE: If shutting down for the day: Plug the vacuum inlets, and set the throttle control to 50% of maximum throttle. Spray WD-40 (or equivalent) into the **blower lubrication cup**, located on the front of the console for **5 seconds**. Continue to run the unit for 1 to 2 minutes. This will lubricate the vacuum pump. Unplug the vacuum inlets, and return the throttle control lever to the slow position, and continue.

5. Turn the ignition switch to the **OFF** position.
6. Drain the waste tank, disposing of wastewater in a suitable and proper location.

WARNING!

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

7. Remove the strainer basket from the waste tank. Clean out any debris and re-install.

NOTE: Damage may occur to the vacuum pump. Replacement and maintenance of the filters will prevent rust and corrosion from entering the vacuum pump.

8. Inspect the vacuum inlet filters inside the waste tank **daily**. Remove and clean the filters if there is any lint or debris present.

NOTE: To remove the vacuum inlet filter, grip the plastic hexagon section of the filter. Gripping the filter by the screen will collapse or destroy the filter. After cleaning, grease the threads on the filter and replace the filter. Tighten the filter until hand tight and then loosen ¼ turn. This will make the filter easier to remove when cleaning or replacement is required.

NEVER operate this unit with the filter removed, damaged or improperly installed.

9. At the end of the work day, rinse out the waste tank with fresh water. Microban QGC cleaner is the best product for cleaning and sanitizing the waste tank as well as other parts of the system to prevent bacterial growth.
10. Clean the vehicle interior, unit, tools, hoses etc., as needed. Inspect **ALL** equipment and accessories for any damage, leaks, wear, etc.

CAUTION!

11. Completely drain the waste tank.

SECTION 4: **SERVICE and MAINTENANCE**

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MAINTENANCE CHART

Engine	Daily	Check engine oil level.** Fill to proper level. DO NOT OVERFILL
Vacuum Pump	Daily	Spray WD-40 (or Equivalent) into the lubrication cup for 5 seconds.
Vacuum Inlet Filter	Daily*	Inspect filter, clean daily, and or replace if required.
Strainer Basket (if equipped)	Daily	Empty and clean stainless steel basket.
Vacuum Hoses	Daily	Rinse with fresh water.
Waste Pump-Out	Daily*	Inspect and remove any debris or sediment.
Waste Tank	Daily	Rinse tank and clean.
Vacuum Pump	Daily*	Check vacuum pump oil level. Fill to proper level. DO NOT OVERFILL.
Engine	Monthly	Check air cleaner for damaged, dirty, or loose parts.
Engine	Monthly	Inspect air intake and cooling areas. Clean if required.
Battery	Monthly*	Check fluid level. Fill with distilled water only. DO NOT OVERFILL.
Engine	100 Hours	Change engine oil and filter. **
Battery	100 Hours	Clean battery terminals.
Engine	200 Hours	Clean engine air filter.
Engine	500 Hours	Replace in-line fuel filter. ****
Pulleys and Hubs	500 Hours	Check pulley and hub set screws for proper torque. ***
Engine	1000 Hours	Replace spark plugs. *****
Engine	1000 Hours	Replace air filter element.
Vacuum Pump	1000 Hours	Drain, flush, and replace oil. *****

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

*Or as often as required.

Change engine oil and oil filter after **first 5 to 8 hours of operation.

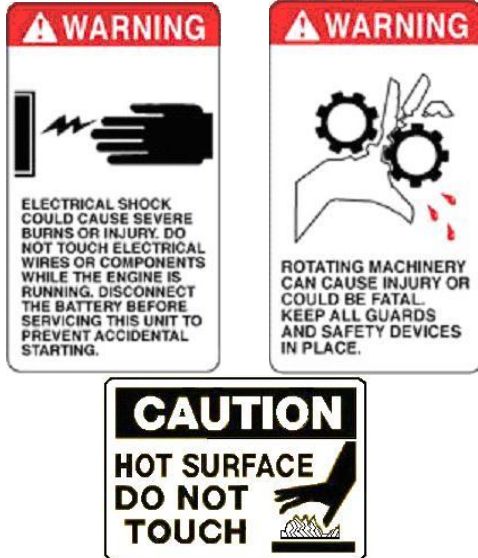
***Check pulley and hub set screws after **first 50 hours** of operation, and again at **100 hours** of operation.

****Or every **6 Months**. Whichever comes first.

*****Or **Yearly**. Whichever comes first.

6. MAINTENANCE

This section of the operator's manual contains the service and maintenance information for the **Sapphire Scientific Big Gulp 4500®**. A planned preventative maintenance program will ensure that your **Sapphire Scientific Big Gulp 4500®** 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.

ENGINE

1. Check the engine oil level daily. Ensure that the proper oil level is maintained. **NEVER** overfill.
2. Change the oil after the first **5 to 8 hours** of operation. Thereafter, change oil and oil filter every **100 hours** of operation.
USE ONLY KOHLER BRAND 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 SF, SG, SH, SJ or higher. **Do not use additives.** A 20W-50 synthetic blend may be used after 50 hours of operation for a new or rebuilt engine to allow the piston rings to properly seat. It is never recommended to extend oil change intervals past 100 hours.

Engine oil capacity	2.8 L 2.9 U.S. qts
---------------------	-----------------------

Tightening torque	Drain Plug	32.4 to 37.3 N·m
		3.3 to 3.8 kgf·m
		23.9 to 27.5 lbf·ft

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

3. Replace spark plugs every **1000 hours**.
4. Clean the engine air filter element every **200 hours**. Replace the element every **1000 hours or yearly**.
5. Replace the in-line fuel filter **yearly**.

NOTE: Additional engine service information can be obtained from the provided Kohler Operation and Maintenance manual. If service or repair is required, contact an authorized Kohler Service Center. They will require the serial number of the engine.

SECTION 4

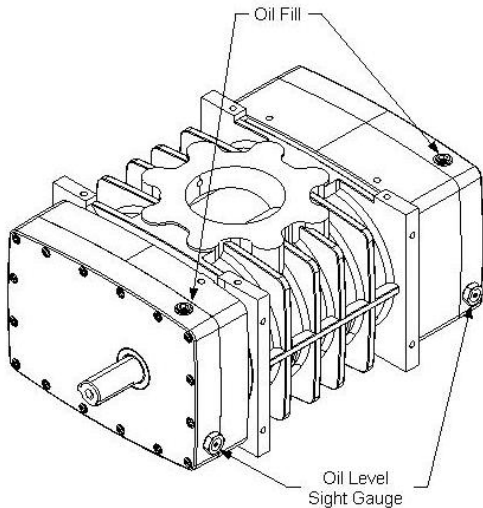
VACUUM PUMP

NOTE: Refer to the provided Vacuum Pump Operation and Service Manual for specific instructions.

Lubrication: **SAPPHIRE SCIENTIFIC** *requires* that you use only AEON PD-XD Synthetic Blower Lubricant on both ends 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. One filling of AEON PD-XD will last a minimum of twice as long as a premium mineral oil.

NOTE: AEON PD-XD (Part # 13-004) is the only oil that SAPPHIRE SCIENTIFIC puts in the vacuum pump at the factory. Adding petroleum oil to synthetic oil is **NOT** recommended.

1. Check the oil level **weekly** to ensure the proper level. Too little oil will damage and ruin the bearings and gears. Too much oil will result in overheating.



2. 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 WD-40 (or Equivalent) into the lubrication cup for **5 seconds** while the unit is running and the vacuum inlet ports are sealed. This procedure should be done at the end of **every working day**.

3. Drain, flush and replace the oil every **1000 hours or yearly, whichever comes first**.

NOTE: Two drains are on your vacuum pump. Ensure that both sides of the vacuum pump are filled to their proper level when servicing.

7. GENERAL SERVICE **ADJUSTMENTS**

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.

ENGINE SPEED

1. To adjust the engine RPM, refer to the Kohler Engine Operation and Service Manual for specific instructions.

WARNING!

DO NOT attempt to adjust without a tachometer and NEVER adjust the engine above 3000 RPM.

VACUUM RELIEF VALVE

With the unit running at full RPM, block off the airflow at the vacuum inlet ports and read the vacuum gauge. If adjustment is required, shut the unit down and adjust the locking nut tension on the vacuum relief valve. Re-start the unit and read the vacuum gauge. Repeat this process until the vacuum relief valve opens at 14" Hg.

TROUBLE SHOOTING

VACUUM PUMP

PROBLEM	CAUSE	SOLUTION
Loss of vacuum : While cleaning, the vacuum is not up to specification..	Improper throttle adjustment.	Adjust throttle to set desired vacuum pressure.
	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) is 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 waste tank.	Unplug vacuum hose or inlet plumbing.
	Waste tank filter or strainer basket (if equipped) is plugged.	Clean or replace filter. Clean strainer basket.
	Waste tank drain valve is damaged or left open, causing a vacuum leak.	Drain the waste tank. Close drain valve, if open. Remove the dump valve and, after inspecting, replace the defective components.
	Vacuum relief valve diaphragm is damaged.	Re-adjust the vacuum relief valve. If the vacuum does not increase, remove and inspect the relief valve diaphragm. If damaged replace.
	Vacuum pump is worn out.	Replace the vacuum pump.
Excessive Vacuum:	Vacuum relief valve requires adjustment.	Readjust the vacuum relief valve.

ENGINE

PROBLEM	CAUSE	SOLUTION
Engine stops running: While doing normal extraction, the engine stops running	Engine is out of gasoline	Add gasoline to the fuel tank.
	Waste tank is full	Empty waste tank.
	Main circuit breaker on the control panel has been tripped.	After inspecting the unit to determine the cause of the tripped circuit breaker, reset button the circuit breaker.
	Defective fuel pump.	Replace fuel pump.
	Defective float switch on the waste tank.	Check switch for proper operation. Replace as necessary.
	Oil pressure switch on engine has shut down due to insufficient oil pressure.	Refer to the Kohler Engine Operation and Maintenance Manual. DO NOT restart the engine until the cause is determined and corrected.
	No ignition in the engine or engine is malfunctioning.	Refer to the Kohler Engine Operation and Maintenance Manual.
Automatic waste pump is malfunctioning or not operating normally.	Defective waste pump float switch.	Replace float switch.
	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.

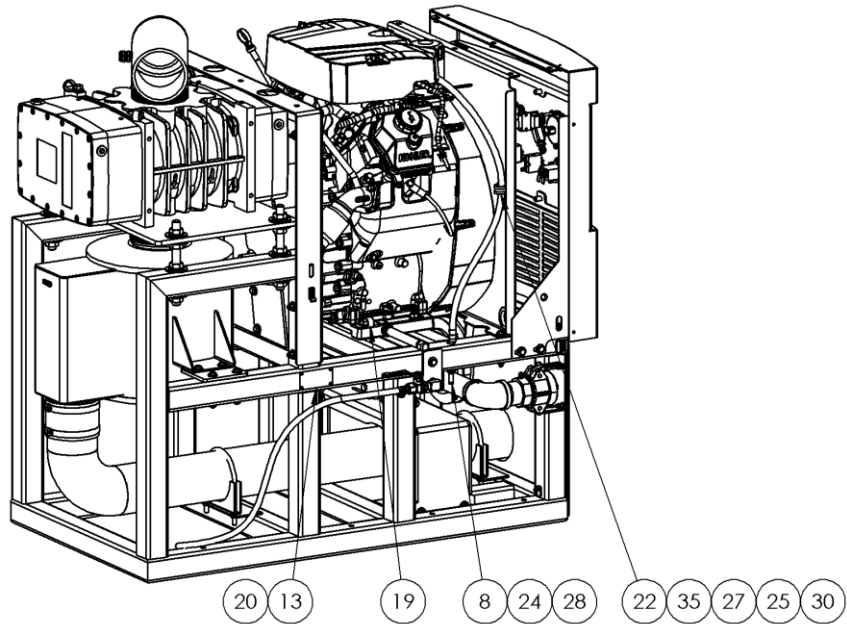
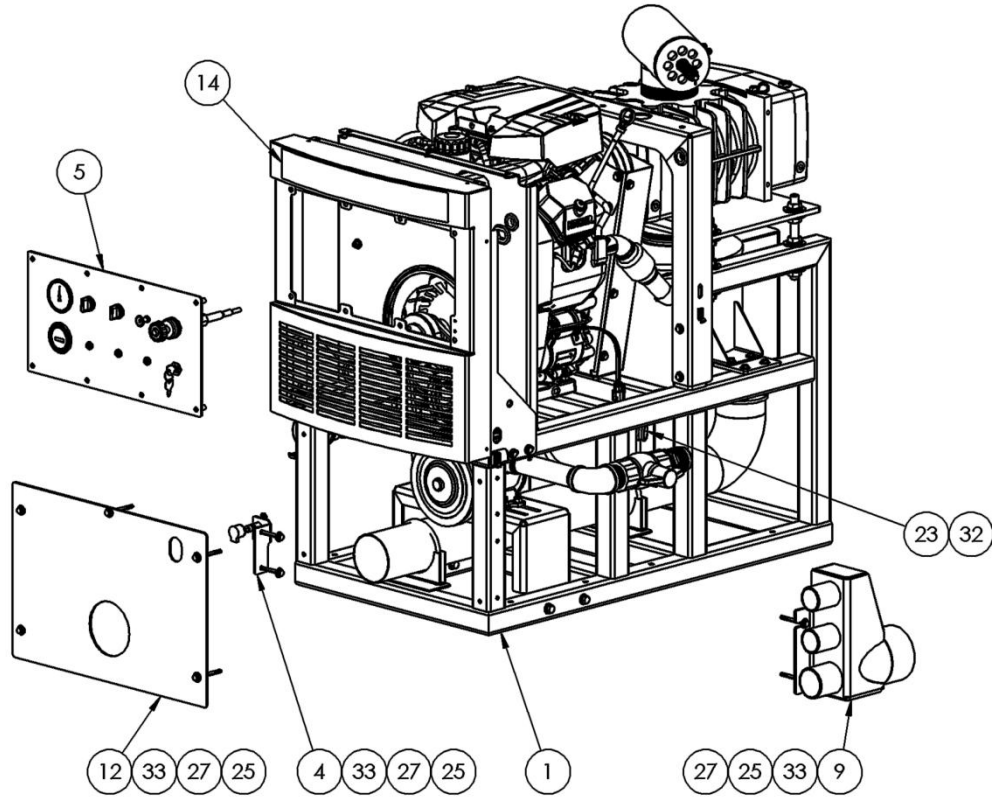
SECTION 5: **PARTS and ACCESSORIES**

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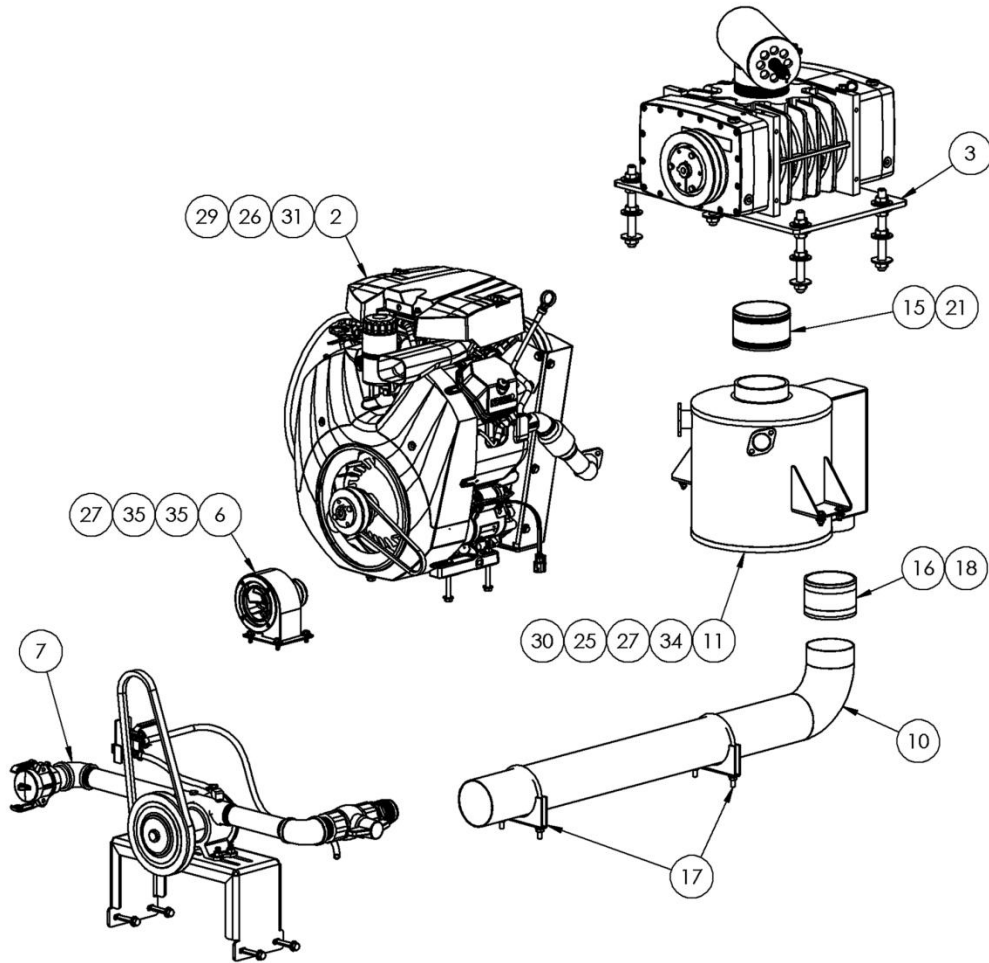
10. ACCESSORIES

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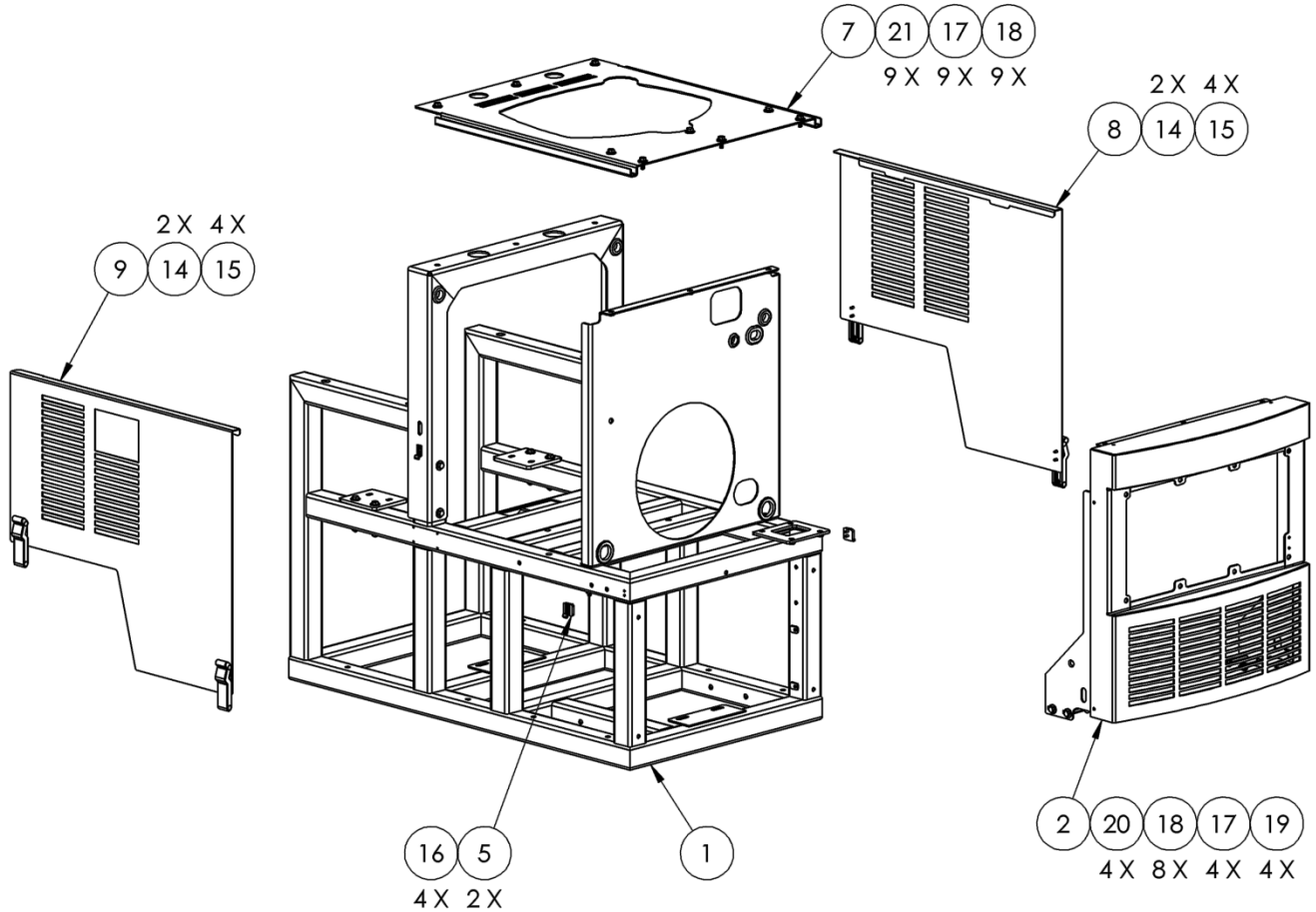
**BIG GULP 4500 CONSOLE ASSEMBLY DETAILS 1 AND 2
(BOM TABLE ON FOLLOWING SHEET)**

SECTION 4



				5	35	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
2	17	14-064	CLAMP, MUFFLER 4 IN	4	34	10-026	SCREW, MACH 1/4-20 X 1 HXHD
1	16	16-109	HOSE, 4.0 IN ID X 3FT SILICONE 550F	9	33	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
1	15	16-110	HOSE, 4.5 ID X 3 FT SILICONE 550F	1	32	10-035	SCREW, 1/4 X 1 HWH TEKS 3
1	14	44-127	DECAL, PRODUCT BIG GULP 4500	4	31	10-139	BOLT, 3/8-16 X 4 GRADE 5 HEX
1	13	44-129	PLATE, SERIAL BIG GULP 4500BB	5	30	11-004	NUT, 1/4-20 ZINC
1	12	58-702	PANEL, LOWER FRONT	4	29	11-019	NUT, 3/8-16 NYLOK
1	11	61-1095	WELDMENT, SILENCER	1	28	11-088	NUT, 7/16-20 THIN NYLOK ZPS
1	10	61-788	WELDMENT, EXHAUST TUBE	23	27	12-012	WASHER, FLAT 1/4 USS
1	9	61-796	WELDMENT, 4.5 IN VAC INLET	8	26	12-013	WASHER, FLAT 3/8 SAE
1	8	66-359	FITTING, 1/4 X 5/16 FUEL LINE MANIFOLD	18	25	12-015	LKWSR, 1/4 ZINC
1	7	68-174	KIT, JABSCO PUMP	1	24	12-021	WASHER, FLAT, 7/16 ZINC
1	6	69-184	ASSY, BELT GUARD BLOWER	1	23	14-003	CLAMP, WIRE CUSHION 1.00 ID X 1/4 BOLT
1	5	69-195	ASSY, CONTROL PANEL	1	22	14-004	CLAMP, WIRE CUSHION 3/4 ID X 1/4 BOLT
1	4	69-389	ASSY, OIL CUP BRACKET	2	21	14-008	CLAMP, HOSE #72
1	3	69-600	ASSY, VACUUM BLOWER	4	20	14-019	RIVET, ALUM NAMEPLATE
1	2	69-601	ASSY, ENGINE	1	19	14-023	CLAMP, 3/4 ID VINYL COVERED
1	1	69-602	ASSY, FRAME & ENCLOSURES	2	18	14-050	CLAMP, HOSE 4 1/2 TO 2 1/2 HD SS
QTY	ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION

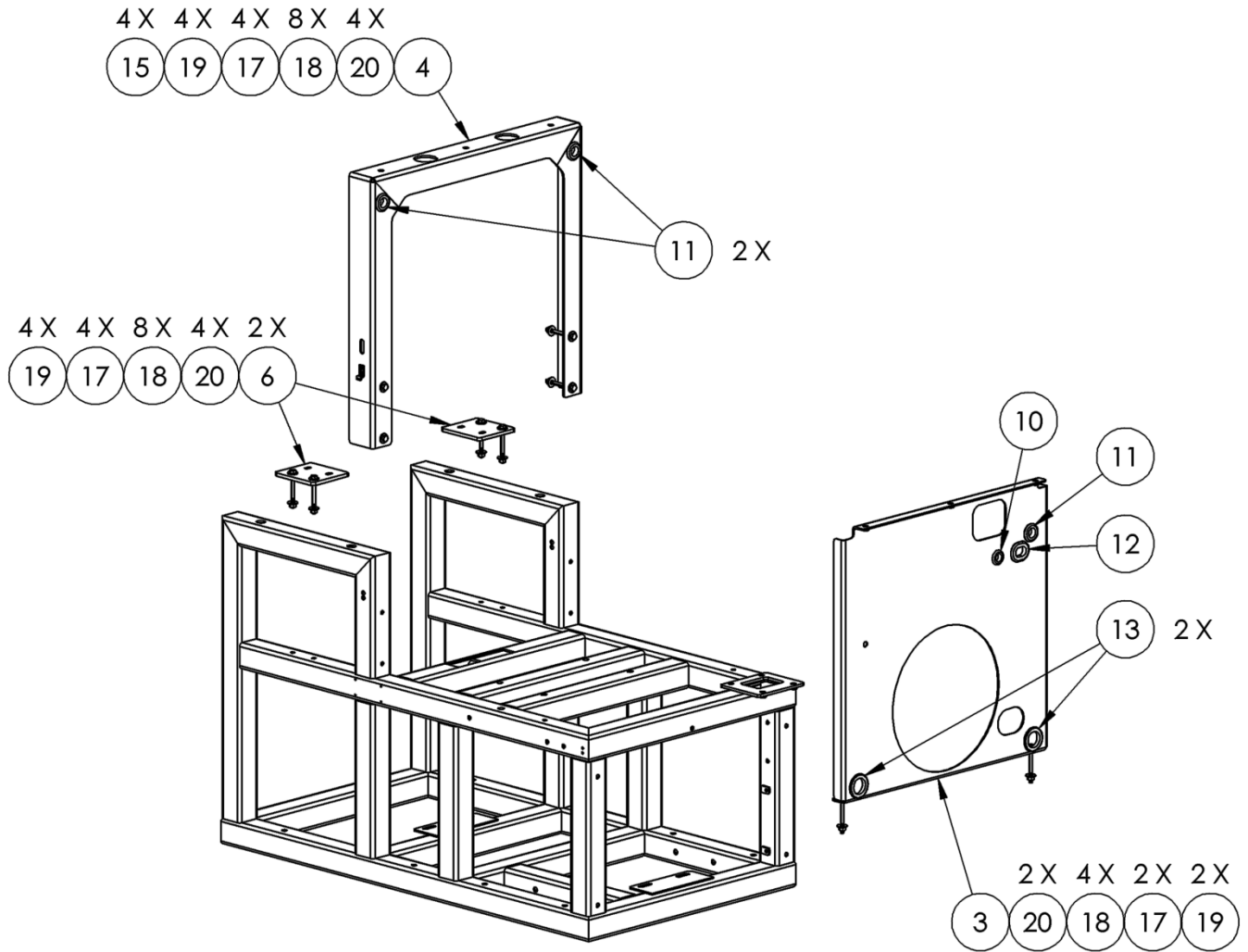
BIG GULP 4500 CONSOLE ASSEMBLY DETAIL 3 AND BOM TABLE



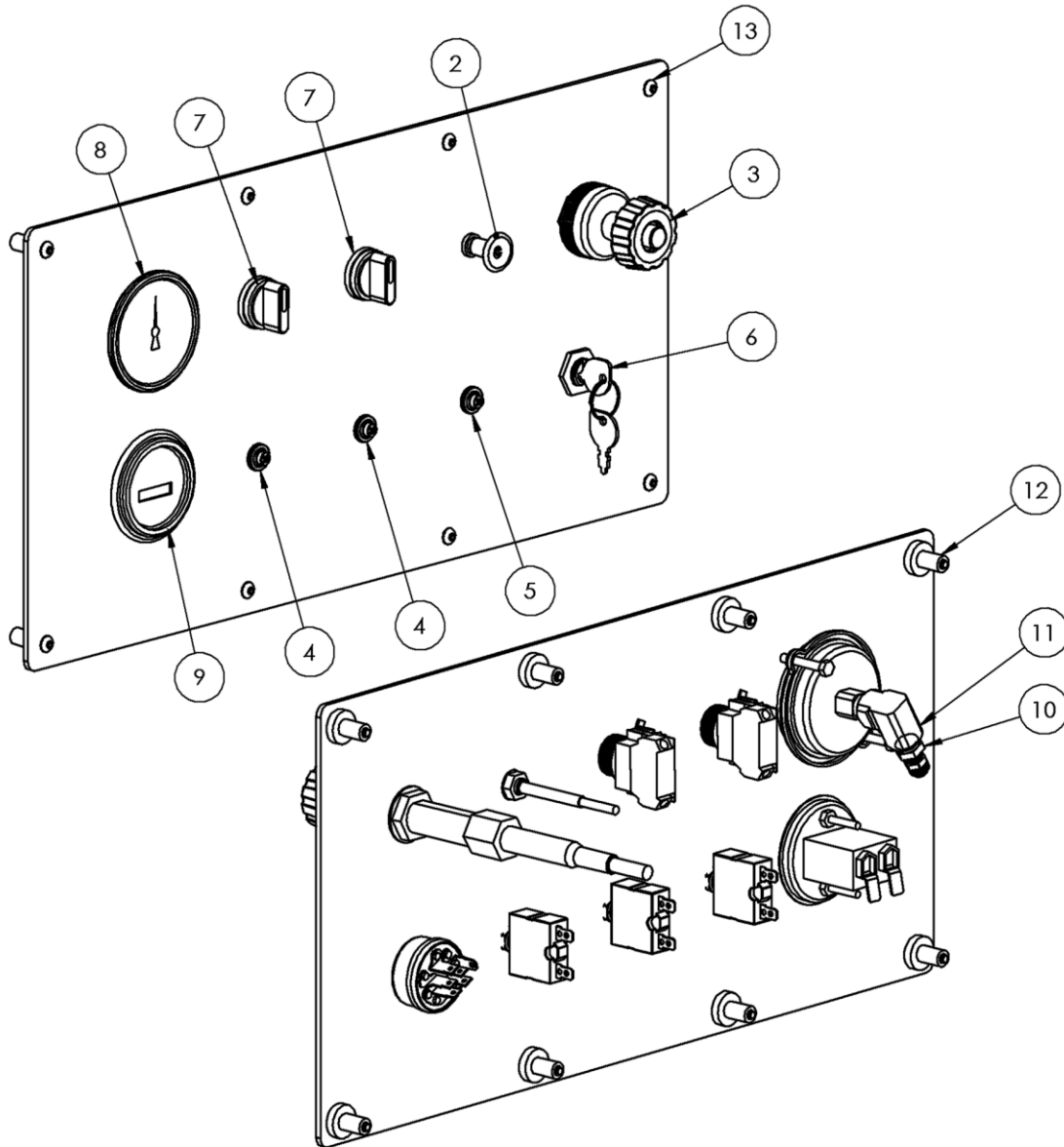
				9	21	10-025	SCREW, MACH 1/4-20 X 3/4 HXHD GRD5
1	10	41-096	GROMMET, 1-1/8 OD X 5/8 ID X 1/8 PANEL	14	20	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
1	9	58-662	PNL, LEFT SIDE	14	19	11-004	NUT, 1/4-20 ZINC
1	8	58-663	PNL, RIGHT SIDE	37	18	12-012	WASHER, FLAT 1/4 USS
1	7	58-681	PANEL, TOP 22IN	23	17	12-015	LKWSR, 1/4 ZINC
2	6	58-685	PLATE, SILENCER SUPPORT	4	16	14-085	RIVET, 5/32 X .312 HD .251-.375 GRIP SS
2	5	58-699	PLATE, LATCH SPACER	12	15	14-086	RIVET, 5/32 X .312 HD .062-.125 GRIP SS
1	4	61-1045	WELDMENT, REAR BRACE 22IN	4	14	40-034	LATCH, DRAW SS CONCEALED MOUNT
1	3	61-1047	WELDMENT, AIR DAM 22IN	2	13	41-020	GROMMET, 1-7/8 OD X 1-1/4 ID
1	2	61-1057	WELDMENT, FRONT BEZEL	1	12	41-033	GROMMET, 1 ID X 1-3/4OD
1	1	61-1098	WELDMENT, FRAME	3	11	41-071	GROMMET, 1-3/8" OD X 3/4" ID X 1/8" PANEL
QTY	ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION

69-602, FRAME AND ENCLOSURES DETAIL 1

SECTION 4



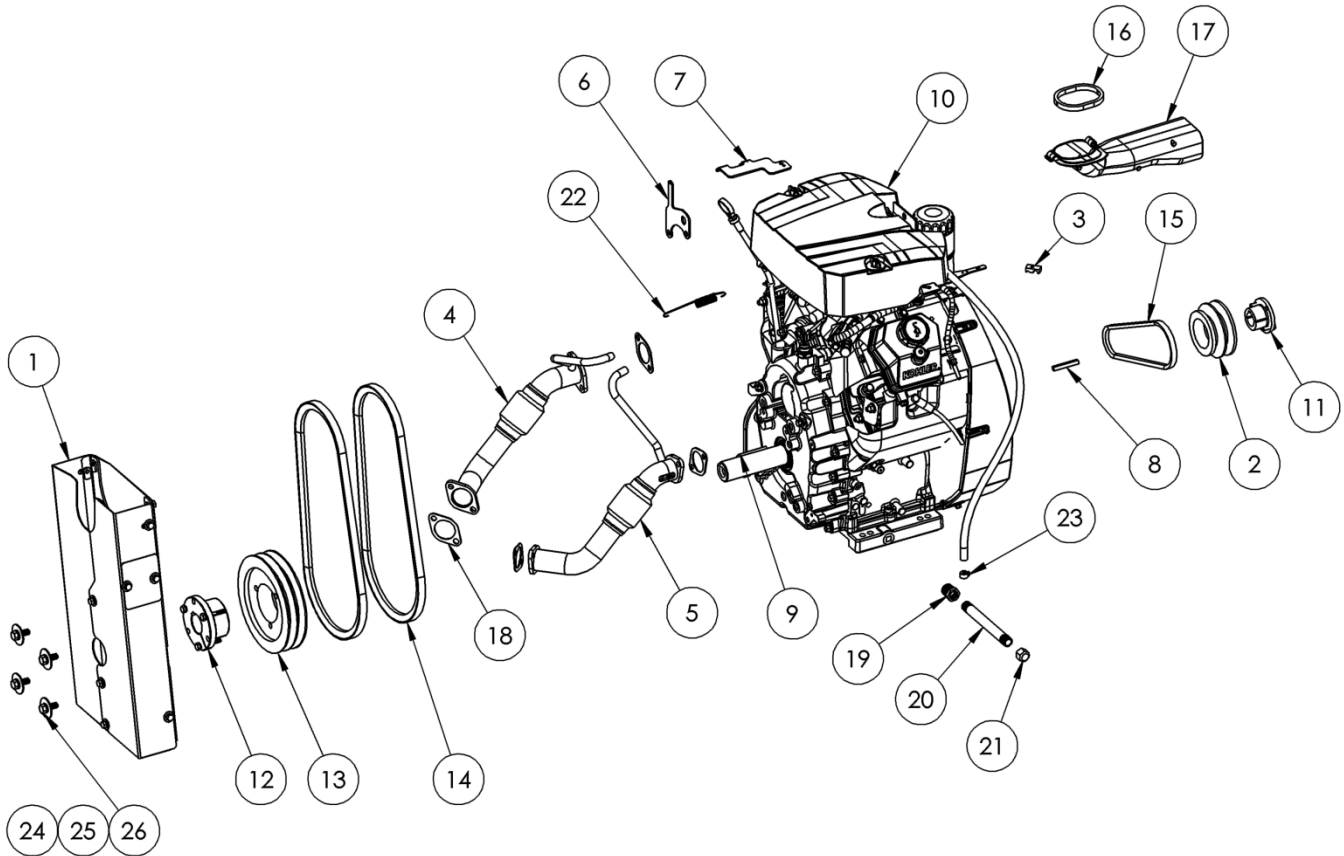
69-602, FRAME AND ENCLOSURES DETAIL 2



8	13	10-016	SCREW, MACHINE 10-32 X 1 SOCHD SS
8	12	11-002	NUT, WELL G 10-32
1	11	21-037	ELL, 1/4 IN. BRASS
1	10	21-433	CONN, 1/4 P X 1/4 POLY
1	9	26-033	HOURMETER, HOBBS CHROME BEZEL
1	8	26-044	GAUGE, VACUUM 2.5 IN 0-30 IN/HG
2	7	29-016	SWITCH, ROTARY NON-ILLUMINATED
1	6	29-047	SWITCH, ENGINE STARTER
1	5	30-007	BREAKER, 30 AMP
2	4	30-008	BREAKER, 20 AMP
1	3	40-031	CABLE, THROTTLE
1	2	40-032	CABLE, CHOKE
1	1	58-386	PANEL, INSTRUMENT, BIG GULP 4500
QTY	ITEM	PART NO.	DESCRIPTION

69-195 ASSY, INSTRUMENT PANEL

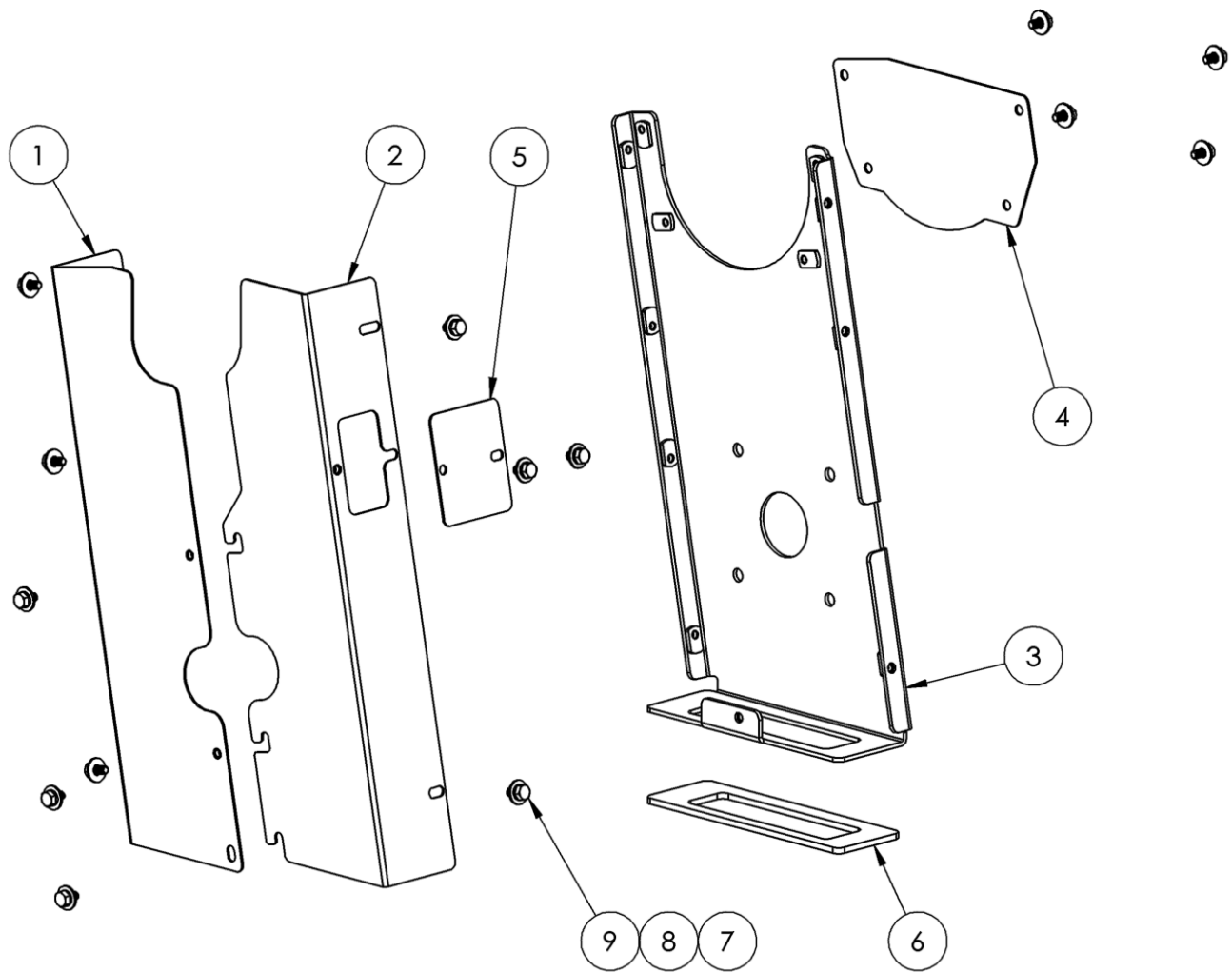
SECTION 4



1	13	38-028	PULLEY, 5V710SK 2G
1	12	38-034	HUB, 1-7/16 4JTU56
1	11	38-052	BUSHING, BROWNING H X 1.125
1	10	45-041	ENGINE, KOHLER
2.25 IN	9	55-008	KEYSTOCK, SS 304 3/8 SQUARE x 12 FT
2.00 IN	8	55-031	KEYSTOCK, HR 1/4 SQUARE X 12 FT
1	7	58-678	BRACKET, CHOKE CABLE MOUNT
1	6	58-686	PLATE, CHOKE SPRING MOUNT
1	5	61-1096	WELDMENT, ENGINE EXHAUST LS
1	4	61-1097	WELDMENT, ENGINE EXHAUST RS
1	3	66-122	RETAINER, CABLE
1	2	66-367	PULLEY, ENGINE FRONT
1	1	69-588	ASSY, BELT GUARD
QTY	ITEM	PART NO.	DESCRIPTION

4	26	10-029	SCREW, MACH 3/8-16 X 1 HXHD
4	25	12-014	LKWSR, 3/8 ZINC
4	24	12-049	WASHER, 3/8 X 1-1/2 FENDER ZINC
1	23	14-067	CLAMP, HOSE 1/4 IN
1	22	15-054	SPRING, CHOKE RETURN
1	21	21-326	CAP, 3/8 NPT BRASS
1	20	21-329	NIPPLE, 3-8 NPT X 6 SS
1	19	21-371	BUSHING, 1/2 NPT X 3/8 NPT HEX BRASS
4	18	36-485	GASKET, ENGINE EXHAUST SLOTTED
1	17	36-486	TUBE, AIR INTAKE KOHLER
1	16	36-487	INSERT, FOAM KOHLER
1	15	37-067	BELT, 3L240
2	14	37-098	BELT, 5VX422 GATES EPDM
QTY	ITEM	PART NO.	DESCRIPTION

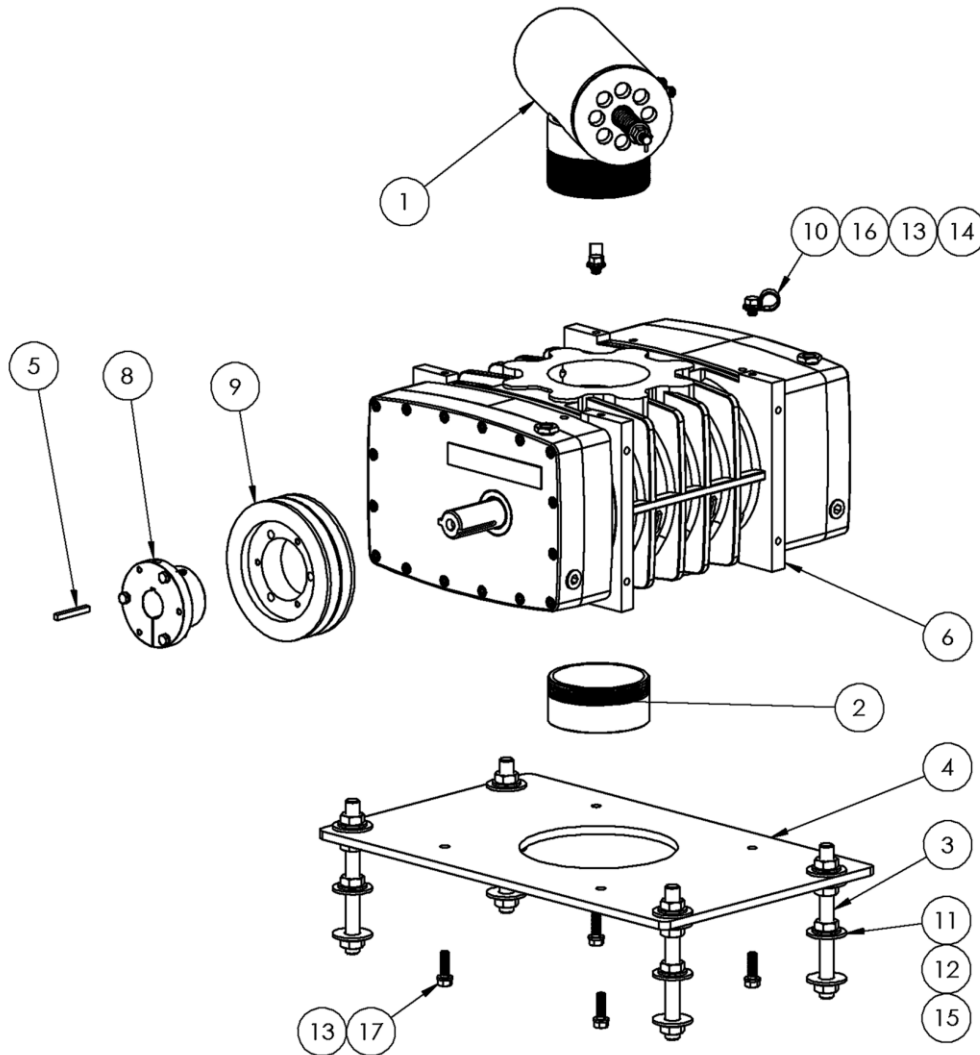
69-601, ENGINE ASSEMBLY



14	9	10-006	SCREW, MACH 1/4-20 X 1/2 HEXHD
14	8	12-012	WASHER, FLAT 1/4 USS
14	7	12-015	LKWSR, 1/4 ZINC
1	6	41-155	GASKET, BELT GUARD
1	5	58-403	PLATE, BELT GUARD INSPECTION COVER
1	4	58-673	PLATE, PULLEY COVER
1	3	61-1012	WELDMENT, BELT GUARD MOUNT
1	2	61-1013	WELDMENT, BELT GUARD LS
1	1	61-1014	WELDMENT, BELT GUARD RS
QTY	ITEM	PART NO.	DESCRIPTION

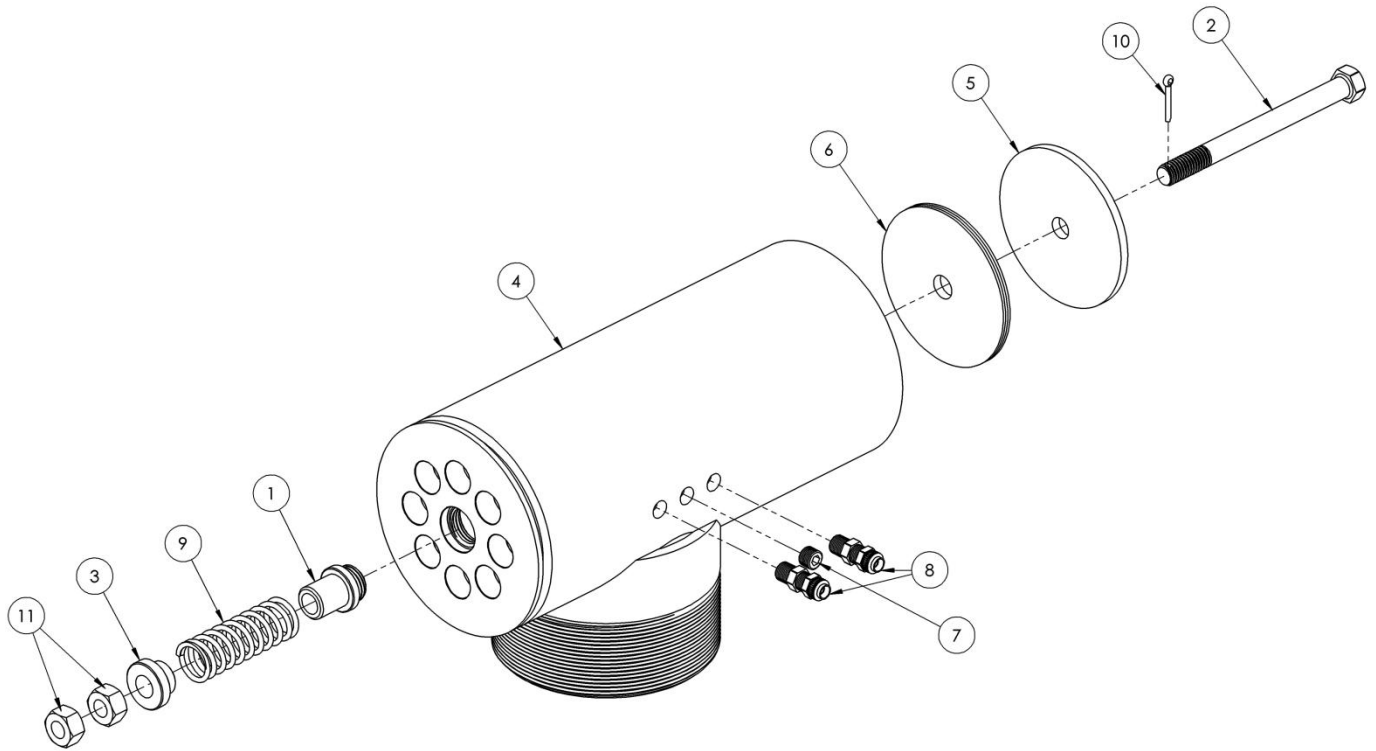
69-547 ASSEMBLY, BELT GUARD

SECTION 4



1	9	38-027	PULLEY, 5V630SK				
1	8	38-032	HUB, SK 1.25	4	17	10-004	SCREW, MACH 3/8-16 X 1-1/4 HEXHD
1	7	41-156	GASKET, .062 SILICONE W/PSA	2	16	10-157	SCREW, MACH 3/8-16 X 1/2 HH ZP
1	6	46-059	VACUUM PUMP, TI 410 HORZ RH CW	16	15	11-062	NUT, 5/8-18 JAM
2.00 IN	5	55-031	KEYSTOCK, HR 1/4 SQUARE X 12 FT	2	14	12-013	WASHER, FLAT 3/8 SAE
1	4	58-703	PLATE, BLOWER MOUNT	6	13	12-014	LKWSR, 3/8 ZINC
4	3	66-227-04	THREADED ROD, .625-18 UNF 2A X 7.0 IN	16	12	12-039	WASHER, LOCK, .625
1	2	66-459	NIPPLE, BLOWER OUTLET	16	11	12-040	WASHER, FLAT .625 USS
1	1	69-468	ASSY, VAC BREAK	2	10	14-023	CLAMP, 3/4 ID VINYL COVERED
QTY	ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION

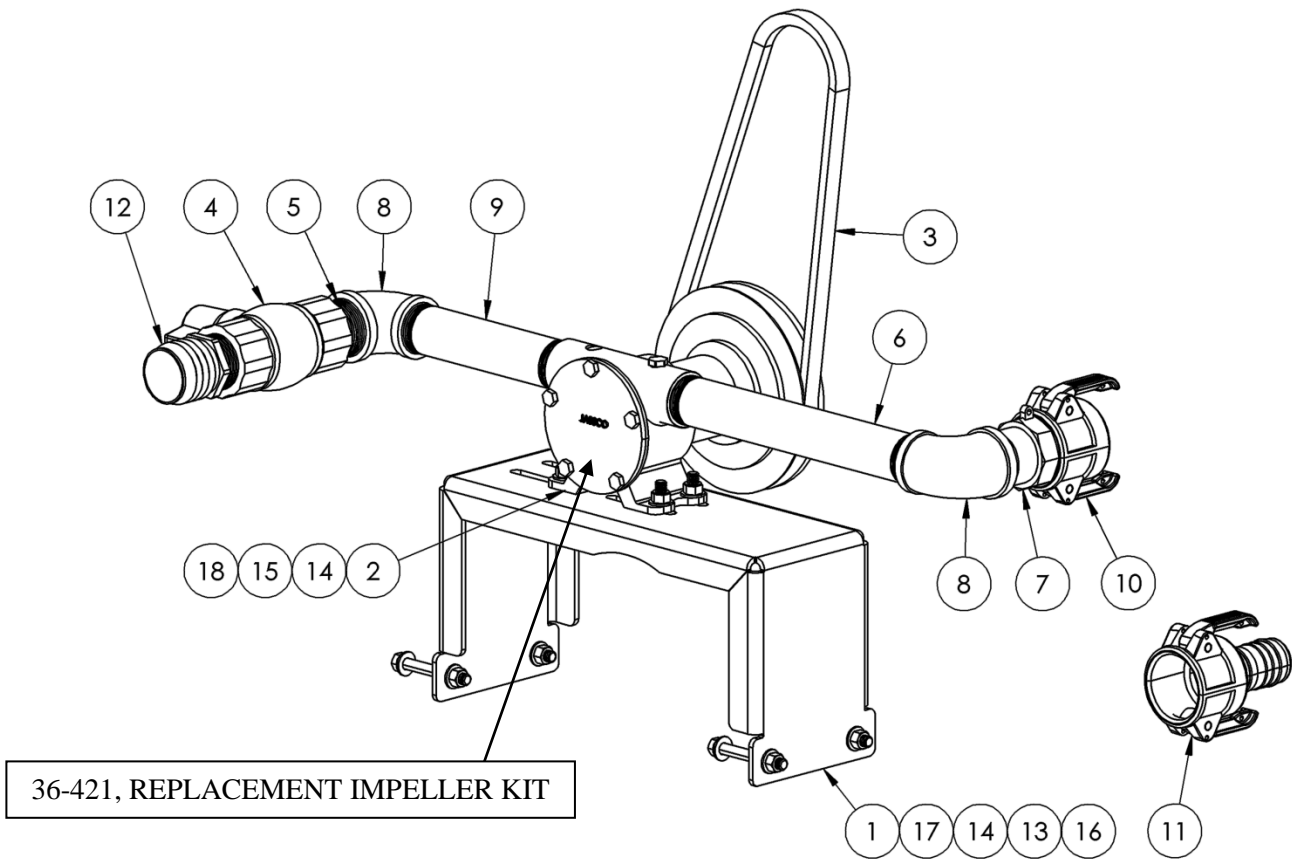
69-600 ASSEMBLY, VACUUM BLOWER



2	11	11-012	NUT, 7/16-14 ZP
1	10	14-032	PIN, COTTER 7/64 X 3/4 SS
1	9	15-033	SPRING, VAC RELIEF VALVE
2	8	21-028	CONN, 1/8 P X 1/4 POLY
1	7	21-029	PLUG, 1/8 NPT SOCKET HD BRASS
1	6	41-113	DIAPHRAGM, VAC RELIEF
1	5	60-1313	PANEL, VAC RELIEF
1	4	61-1094	WELDMENT, VAC BRAKE
1	3	66-289	BUSHING, VAC RELIEF SPRING
1	2	66-290	STEM, VAC RELIEF
1	1	66-431	PILOT, VAC BRAKE SHAFT
QTY	ITEM	PART NO.	DESCRIPTION

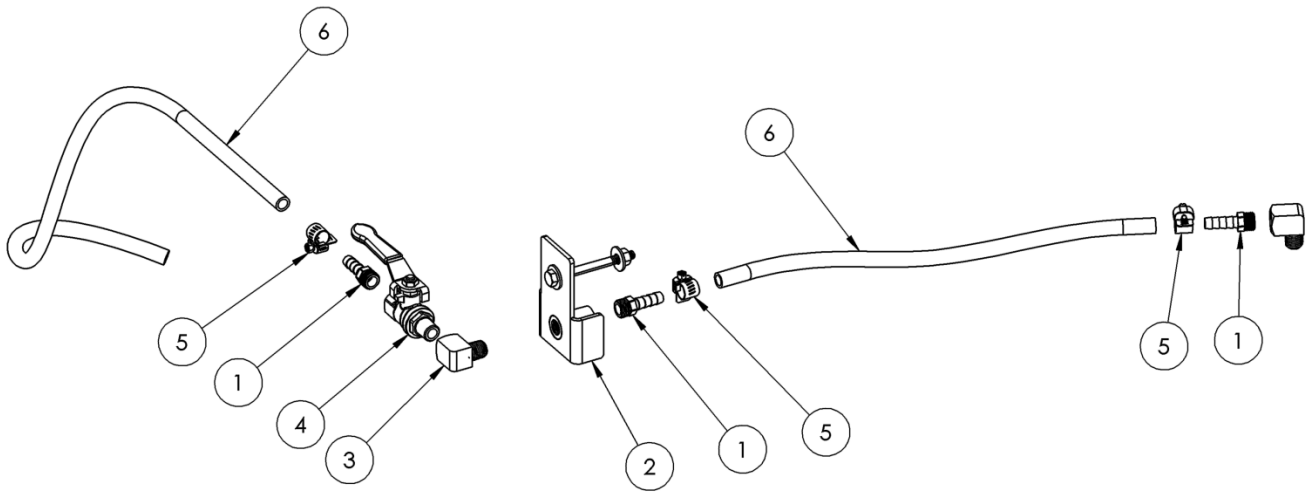
69-468 ASSY, VACUUM BRAKE

SECTION 4



4	18	10-004	SCREW, MACH 3/8-16 X 1-1/4 HEXHD
4	17	10-030	SCREW, MACH 3/8-16 X 3 HXHD
4	16	11-006	NUT, 3/8-16 ZINC
4	15	11-019	NUT, 3/8-16 NYLOK
16	14	12-013	WASHER, FLAT 3/8 SAE
4	13	12-014	LKWSR, 3/8 ZINC
1	12	21-094	FTTG, 1-1/2 P X 2H DRAIN
1	11	21-307	COUPLING, ALUM LL 1 1/2 X 2 1/8X
1	10	21-308	COUPLING, AL CAP 1 1/2 X 2 1/8X
1	9	21-496	NIPPLE, 1-1/4 NPT X 8 BRASS
2	8	21-339	ELBOW, FEMALE 1.50 NPT REDUCE TO 1.25 NPT BRASS
1	7	21-356	ADAPTER, 1-1/2 NPT X 1-1/2 CAM & GROOVE
1	6	21-386	NIPPLE, 1.25 NPT X 12 BRASS NIPPLE
1	5	21-392	NIPPLE, 1-1/2 NPT CLOSE BRASS
1	4	23-022	VLV, BALL 1-1/2 FP PVC DUMP
1	3	37-086	BELT, BX38 GATES COG V
1	2	46-054	PUMP, JABSCO 1187-0005 12-2A
1	1	60-1328	BRACKET, PUMP MOUNT
QTY	ITEM	PART NO.	DESCRIPTION

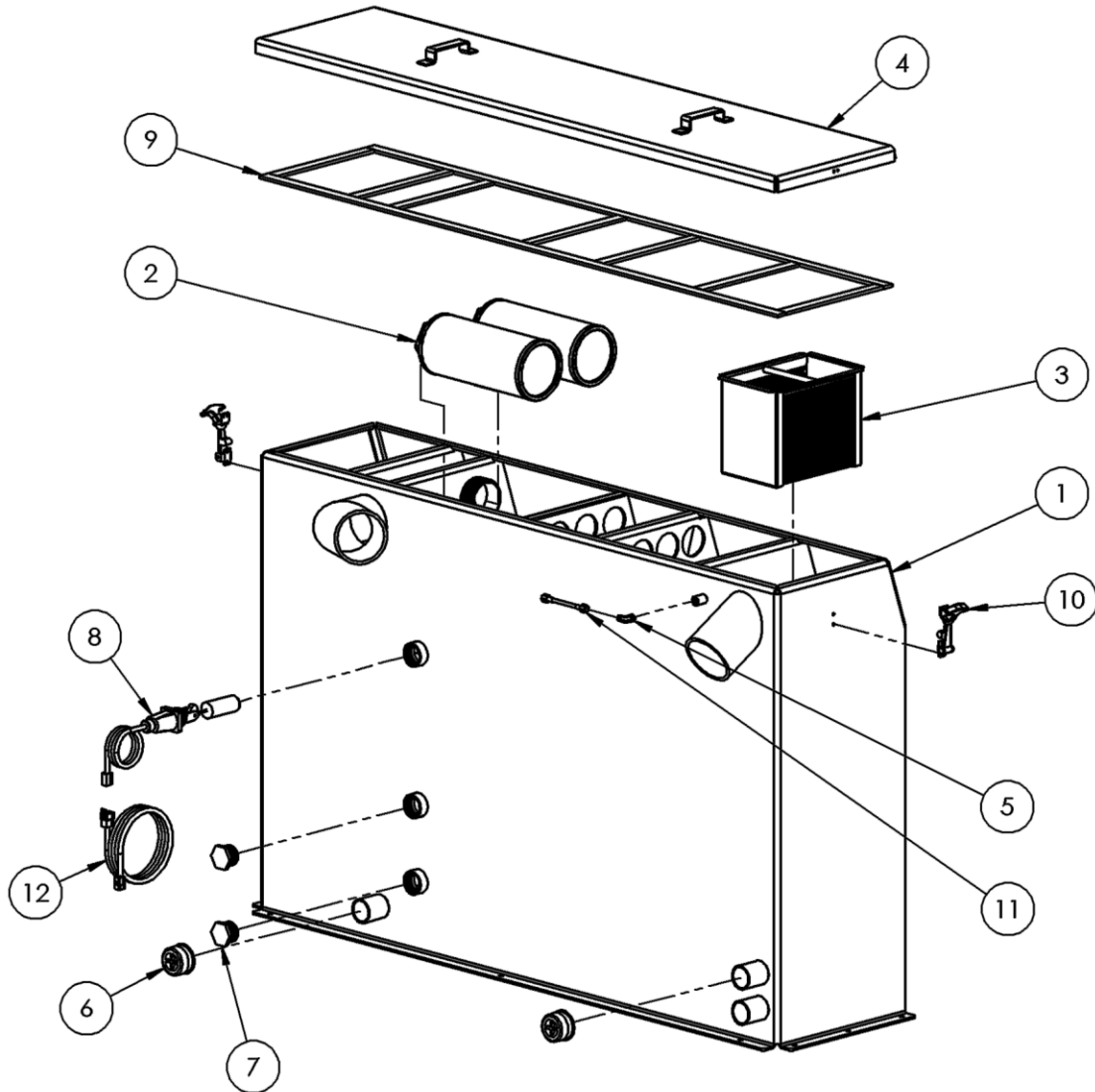
69-388 AUTOMATIC PUMP-OUT



1	10	10-028	SCREW, MACH 1/4-20 X 2-3/4 HXHD
2	9	12-012	WASHER, FLAT 1/4 USS
1	8	12-015	LKWSR, 1/4 ZINC
1	7	11-004	NUT, 1/4-20 ZINC
3.00 FT	6	16-006	HOSE, BRAIDED 5/16 ID 300 FT BULK
3	5	14-007	CLAMP, HOSE #4 SS
1	4	23-071	VALVE, BALL 1/4 NPT F X M
2	3	21-039	ELL, 1/4 IN STREET BRASS
1	2	61-489	WELDMENT, GAS LINE BRACKET
3	1	21-006	FTTG, BRB 1/4 PX5/16 H BRASS
QTY	ITEM	PART NO.	DESCRIPTION

69-333 ASSY, PUMP-OUT ANTIFREEZE KIT

SECTION 4



1	12	47-095	HARNES, LEVEL SENSOR EXTENSION
1	11	18-215-16	HOSE ASSEMBLY, 3-16 ID X 38 OL
2	10	40-003	LATCH, PRE-FILTER BOX
199 IN	9	41-018	GASKET, SPONGE 1 IN X 45 FT
1	8	69-000	FLOAT SWITCH
2	7	21-097	PLUG, 1-1/4 IN PVC
2	6	19-009	CAP, 2 IN RUBBER
1	5	21-064	ELL, 1/4 P X 1/4 T BRASS
1	4	61-672	WELDMENT, LID LARGE RECOVERY TANK
1	3	61-002	WELDMENT, STRAINER BASKET
2	2	20-021	STRAINER, FILTER 3" 100 MESH
1	1	61-794	WELDMENT, 4500 RECOVERY TANK
QTY	ITEM	PART NO.	DESCRIPTION

69-402 ASSEMBLY, 4500 RECOVERY TANK



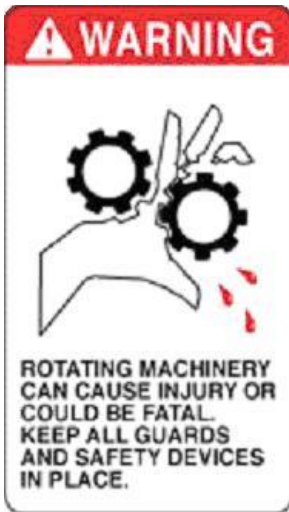
44-084 DECAL,
CAUTION, HOT SURFACE



44-124
DECAL, VAC LUBE



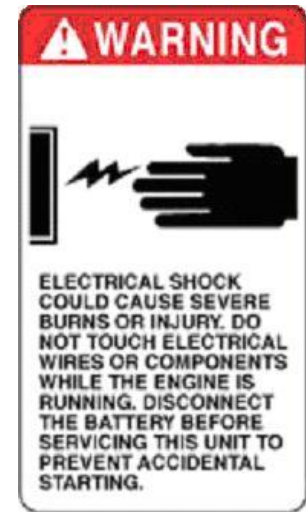
44-080 DECAL,
WARNING, VENTILATED AREA



44-085 DECAL,
WARNING, ROTATING MACHINERY



44-067 DECAL,
WARNING READ MANUAL



44-066, DECAL
WARNING ELECTRICAL SHOCK



44-081 DECAL, ENGINE
COVER WARRANTY

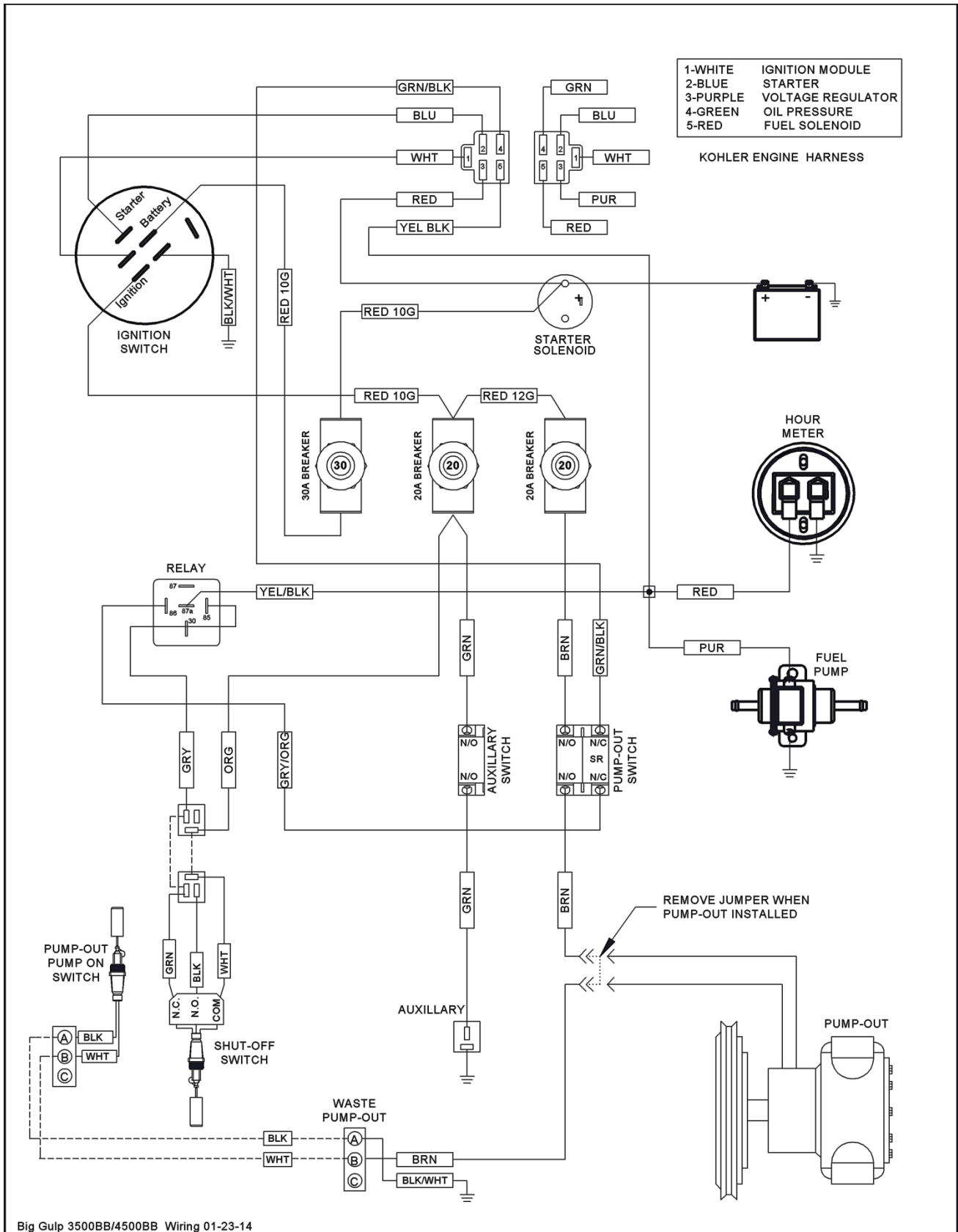


44-079 DECAL, UNLEADED FUEL ONLY

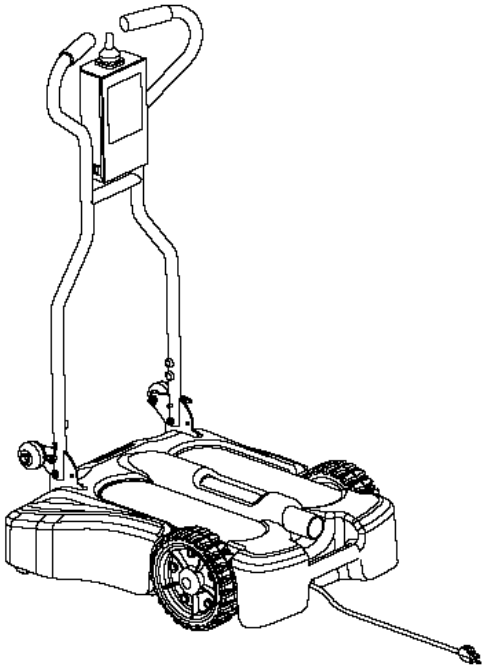


44-075 DECAL, BIG GULP 4500®

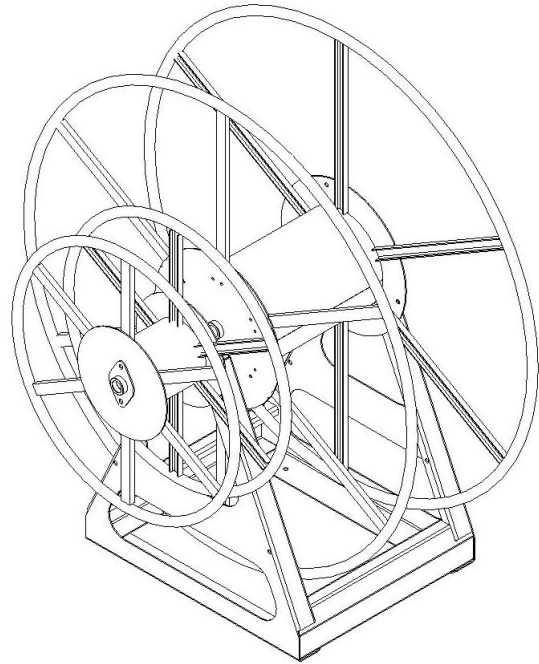
ELECTRICAL DIAGRAM



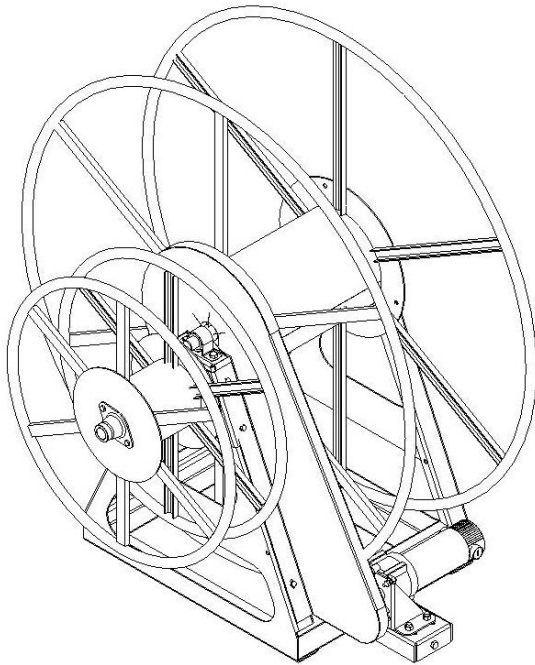
10. ACCESSORIES



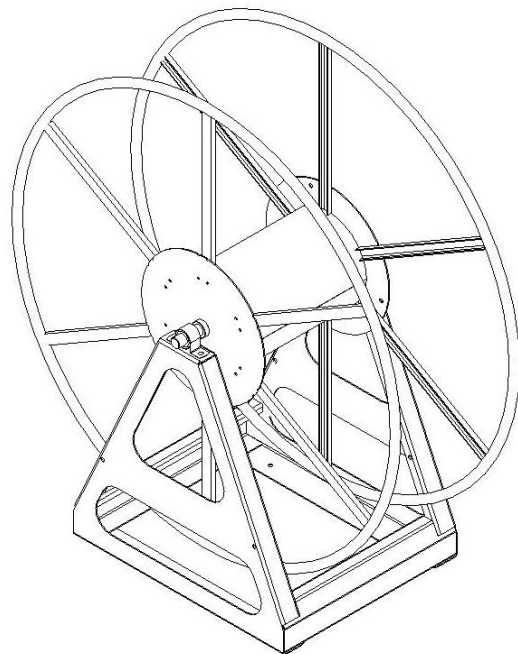
Rover HVE



68-025 ASSY, HOSE REEL HIGH PROFILE

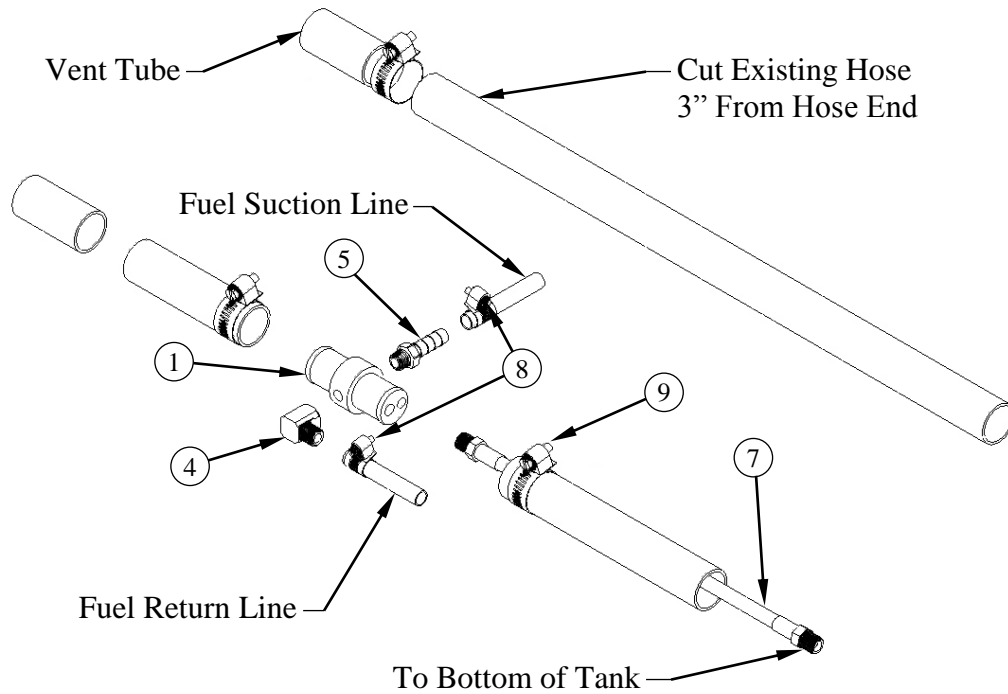


68-033 ASSY, HOSE REEL H. PROFILE W/MTR



68-037 ASSY, HOSE REEL VAC ONLY

1992 TO 2002 FORD FUEL LINE INSTALLATION

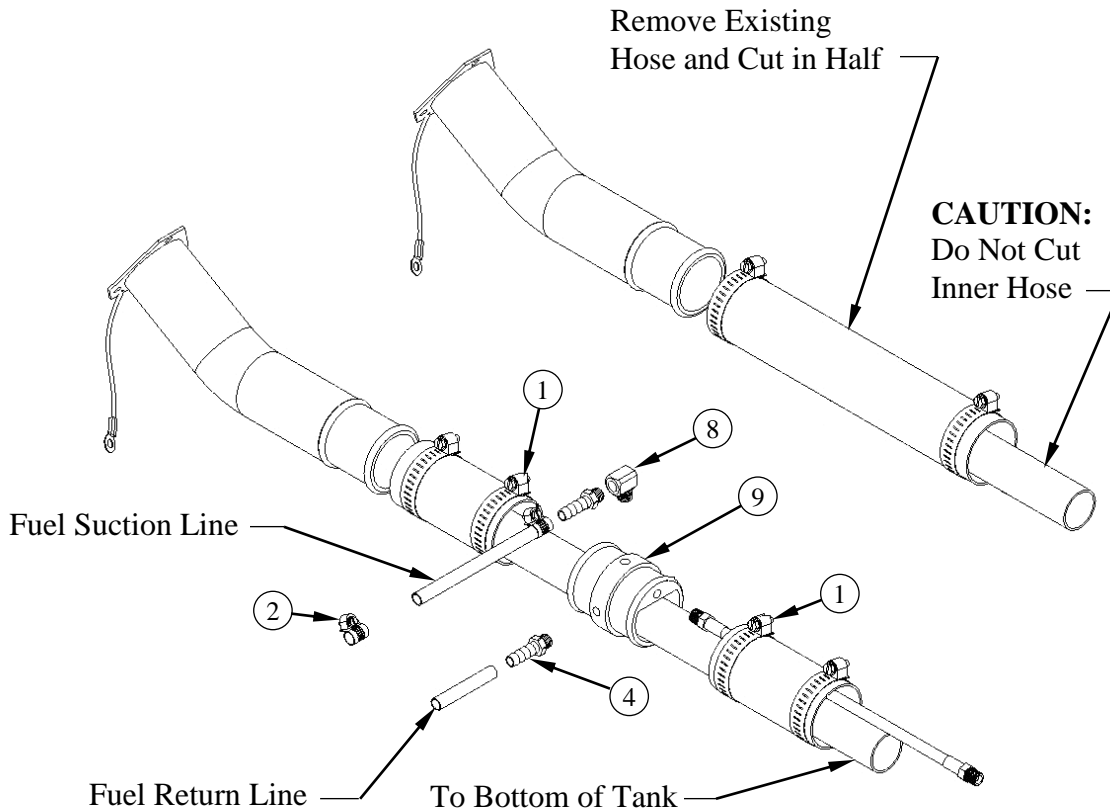


69-005FI KIT, FUEL HOOKUP FORD FI

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 5

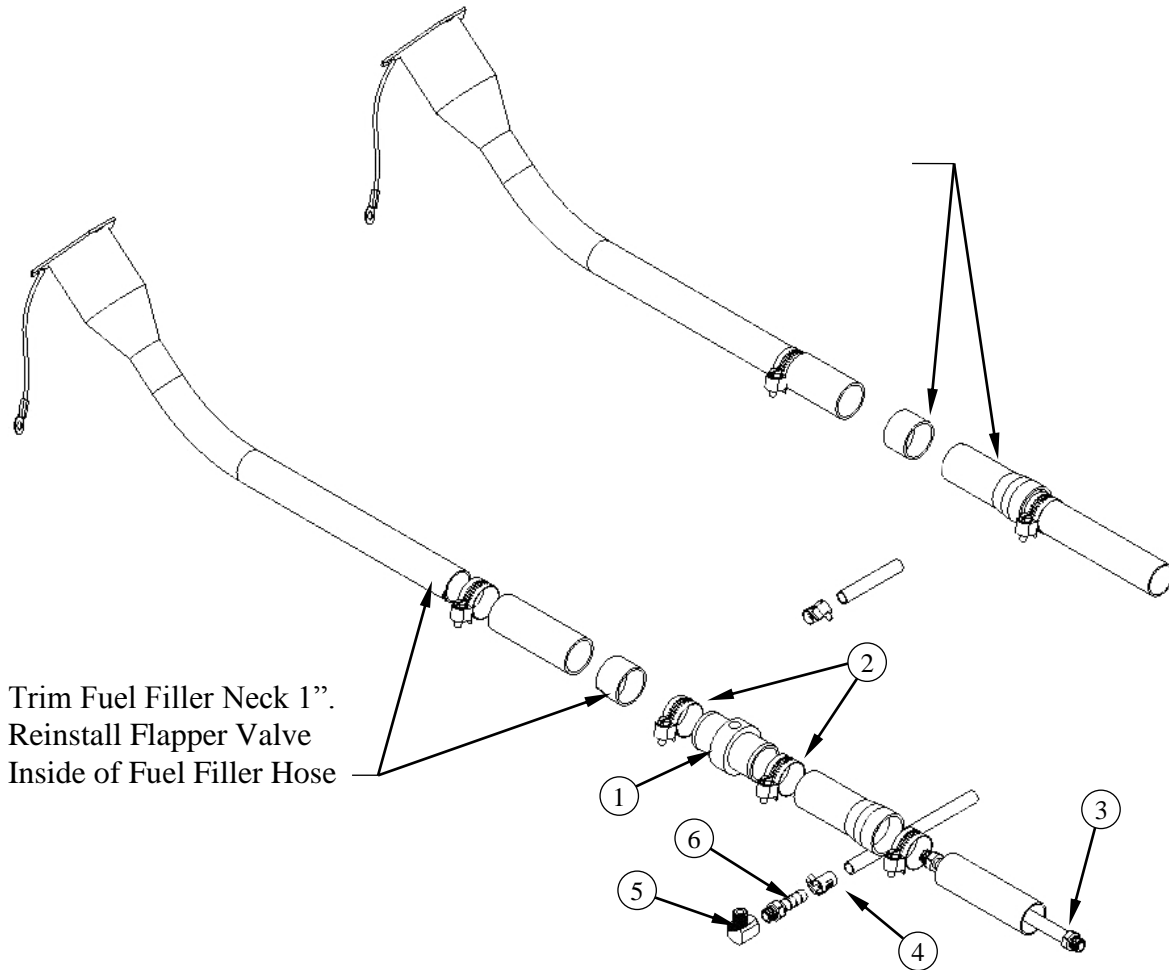
CHEVY AND GMC FULL SIZE VAN FUEL LINE INSTALLATION



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)

2003 CHEVY AND GMC FULL SIZE VAN FUEL LINE INSTALLATION

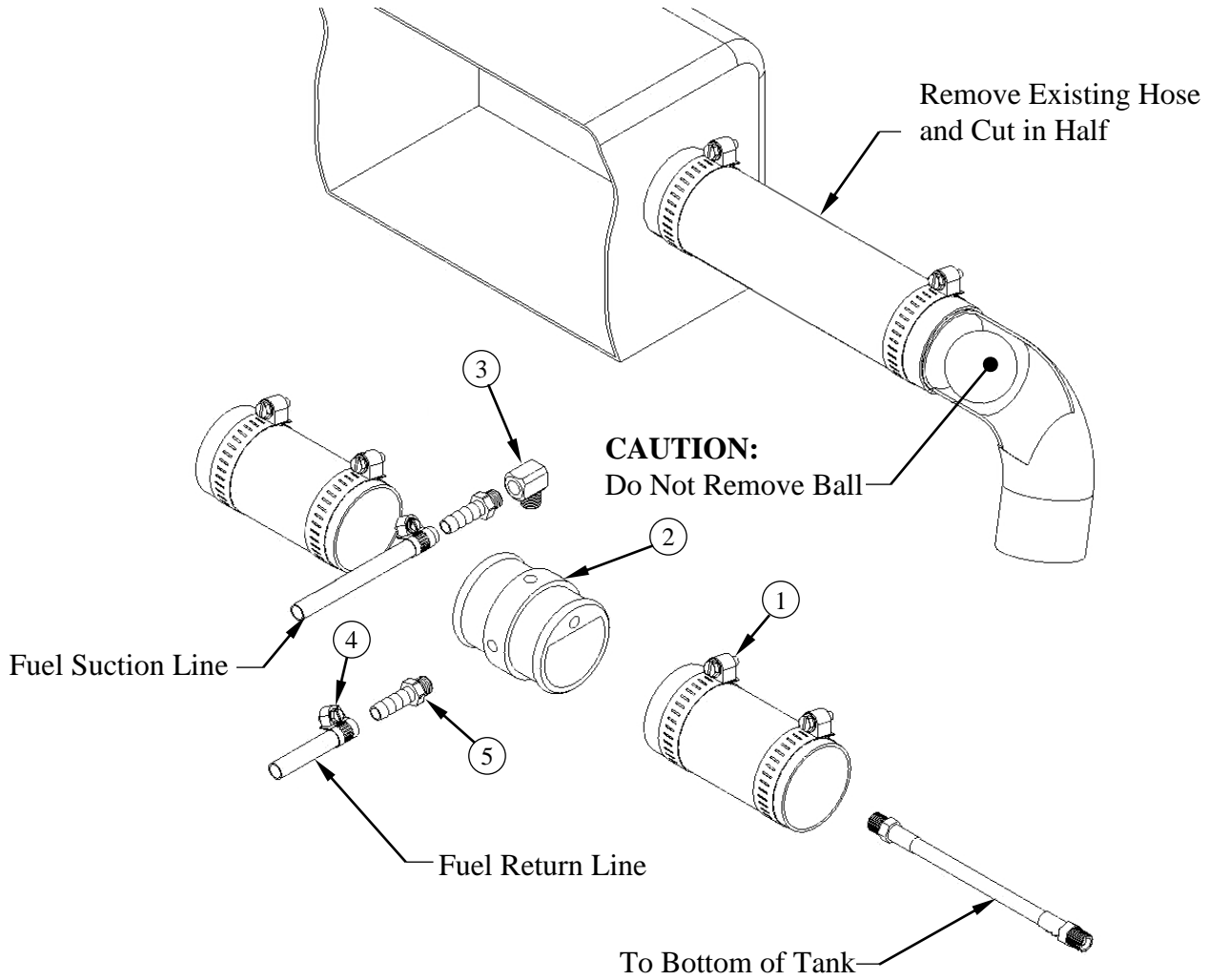


69-018FI KIT, FUEL HOOKUP 2003 CHEVY FI

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 5

1997-2002 DODGE FULL SIZE VAN FUEL LINE INSTALLATION



69-004FI KIT, FUEL HOOKUP CHEVY/DODGE

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

Fuel Line Bulkhead Installation (Inside Vehicle)

1. 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 hole is within adequate reach of the supplied hose in the finished assembly.
2. Drill a 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 console.
5. Drill a 1/2 inch hole nearby the bulkhead fitting for the fuel pump electrical extension harness to pass through.

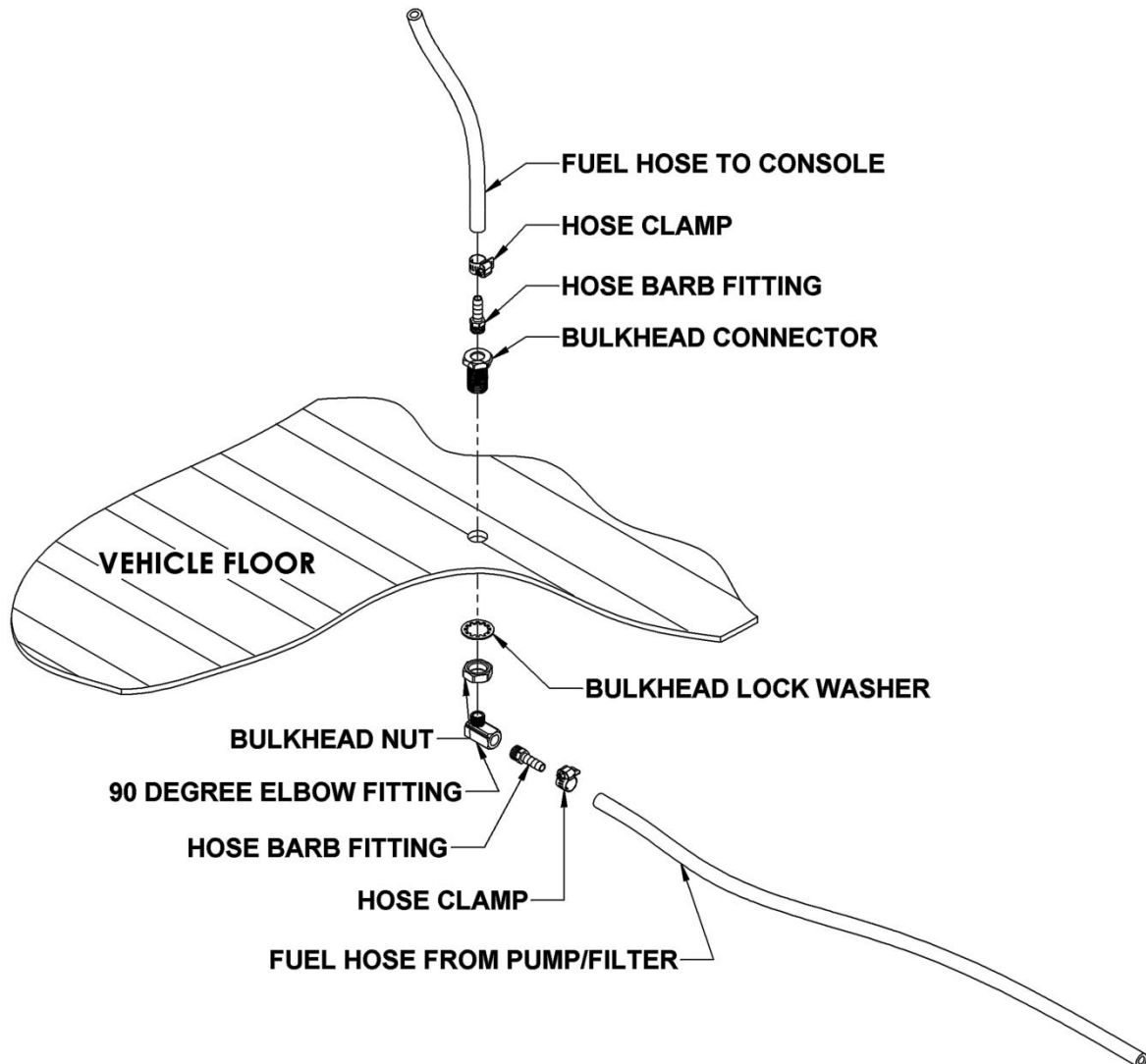


Figure 1. Fuel Line Bulkhead Assembly

Fuel Pump Assembly Installation (Underneath the Vehicle Floor)

1. 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.
2. Remove the housing lid from the fuel pump assembly.
3. Use the supplied Tek screws to install the lid of the fuel pump housing to the vehicle.

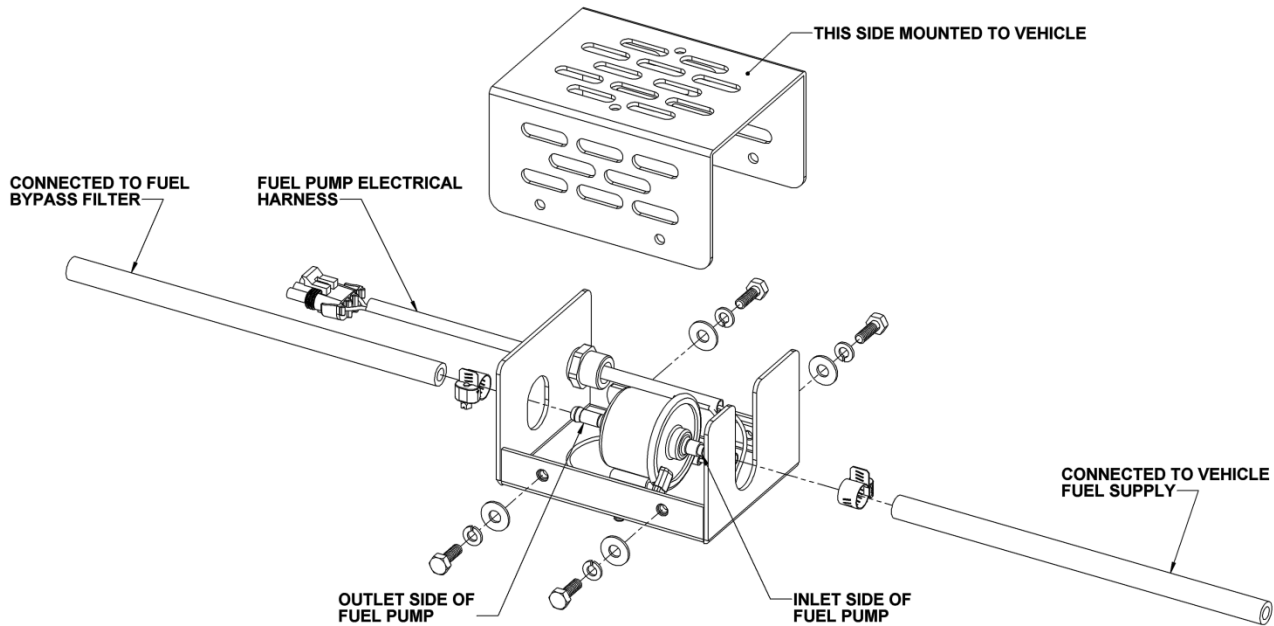


Figure 2. Fuel Pump Assembly Detail

Fuel Supply & Return Line Installation (Underneath the Vehicle Floor)

1. Refer to the transfer flow kit instructions found with the appropriate kit for your vehicle.
2. Connect the fuel line from the transfer flow kit to the inlet side of the fuel pump.
3. Connect the outlet side of the fuel pump to the inlet side of the fuel bypass filter.
4. Connect the return line from the bypass filter return port back to the vehicle fuel supply.

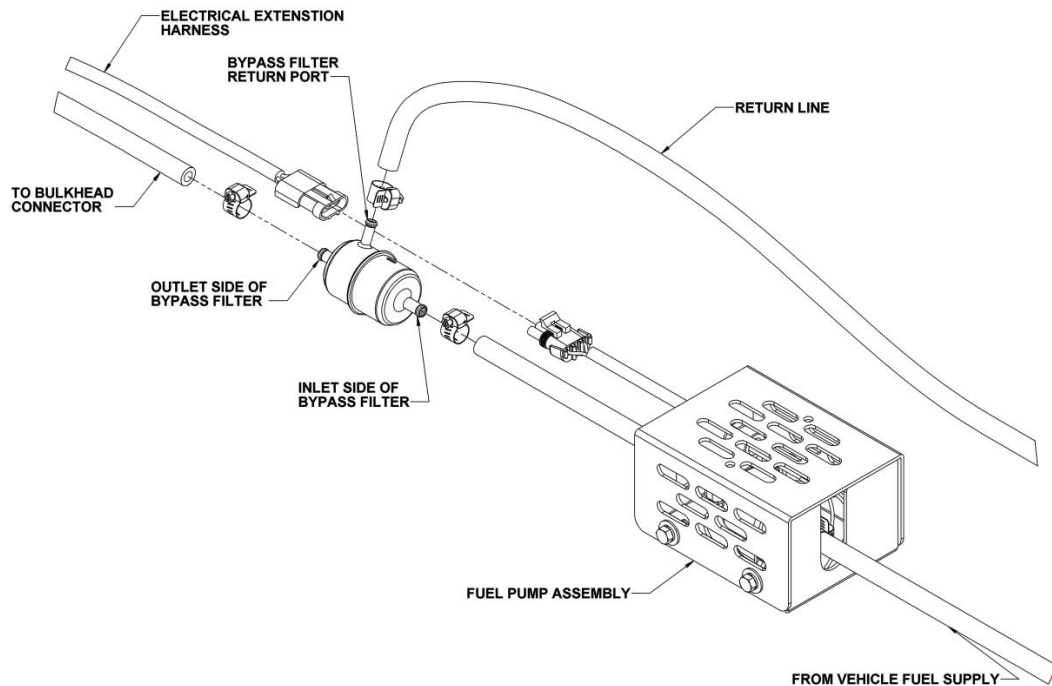


Figure 3. Fuel Pump and Filter Detail

5. Attach the 90 degree elbow and hose barb fittings to the bulkhead connector underneath the vehicle.
6. Connect a segment of hose between the outlet side of the fuel bypass filter to the hose barb fitting.
7. Ensure that all hose clamps are properly tightened.
8. Connect the electrical extension harness to the fuel pump harness, running the other end up through a hole in the floor of the vehicle, connecting to the console harness.

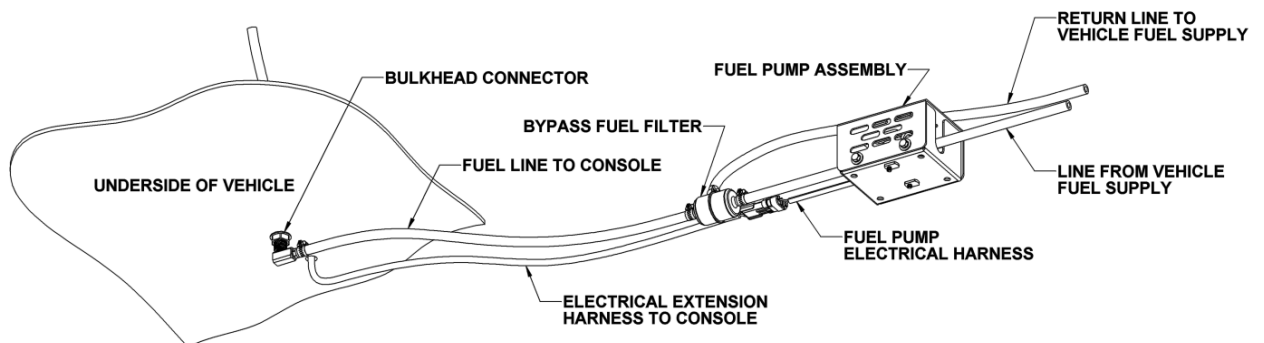


Figure 4. Vehicle Underside Fuel Line Installation