

# INSTRUCTIONS FOR SAFE OPERATION & MAINTENANCE

**PRO/PORTIONER  
FOAM INJECTION SYSTEM**



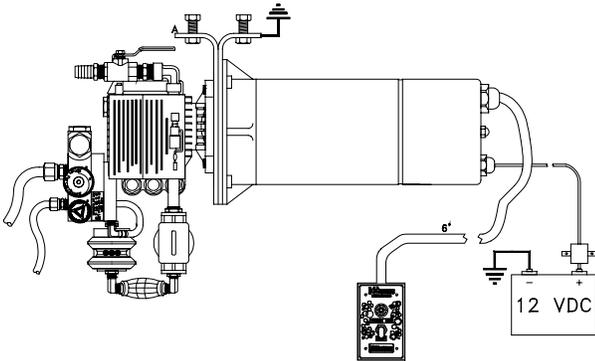
*Read manual before use. Operation of this system without understanding the manual and receiving proper training can be dangerous and is a misuse of this equipment.*



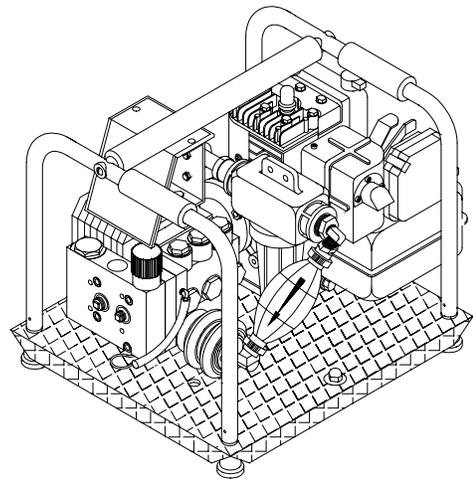
*This manual is intended to familiarize firefighters and maintenance personnel with the installation, operation and servicing procedures associated with KK Product's PRO/portioner foam injection system.*



*This manual should be kept available to all operating and maintenance personnel.*

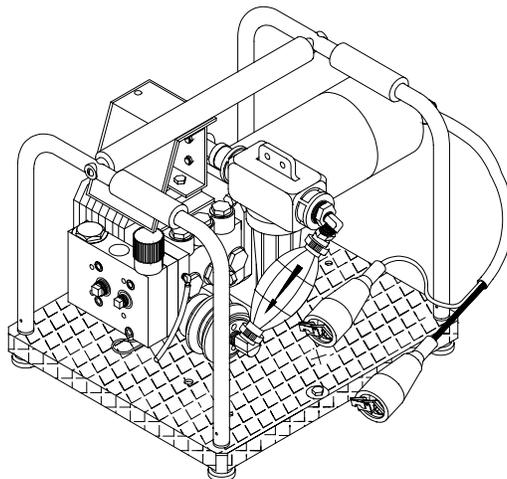


**TRUCK MOUNT**



**4-CYCLE PORTABLE**

**ELECTRIC  
PORTABLE**



KK Products "A Division of Task Force Tips"

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# KK PRODUCTS PRO/portioner Operators Manual

## 1.0 INTRODUCTION

Welcome to the growing number of users of the PRO/portioner injection system. KK Products has been designing and manufacturing quality fire fighting and suppression equipment since 1969. The KK Products line of single, dual, and selectable gallonage fog nozzles, and foam application and injection equipment is represented by over a hundred dealers worldwide. Please take a moment and fill out the enclosed WARRANTY card, and return it within ten days of placing the unit in service. This validates the unit's warranty and will keep you informed of new products and services.

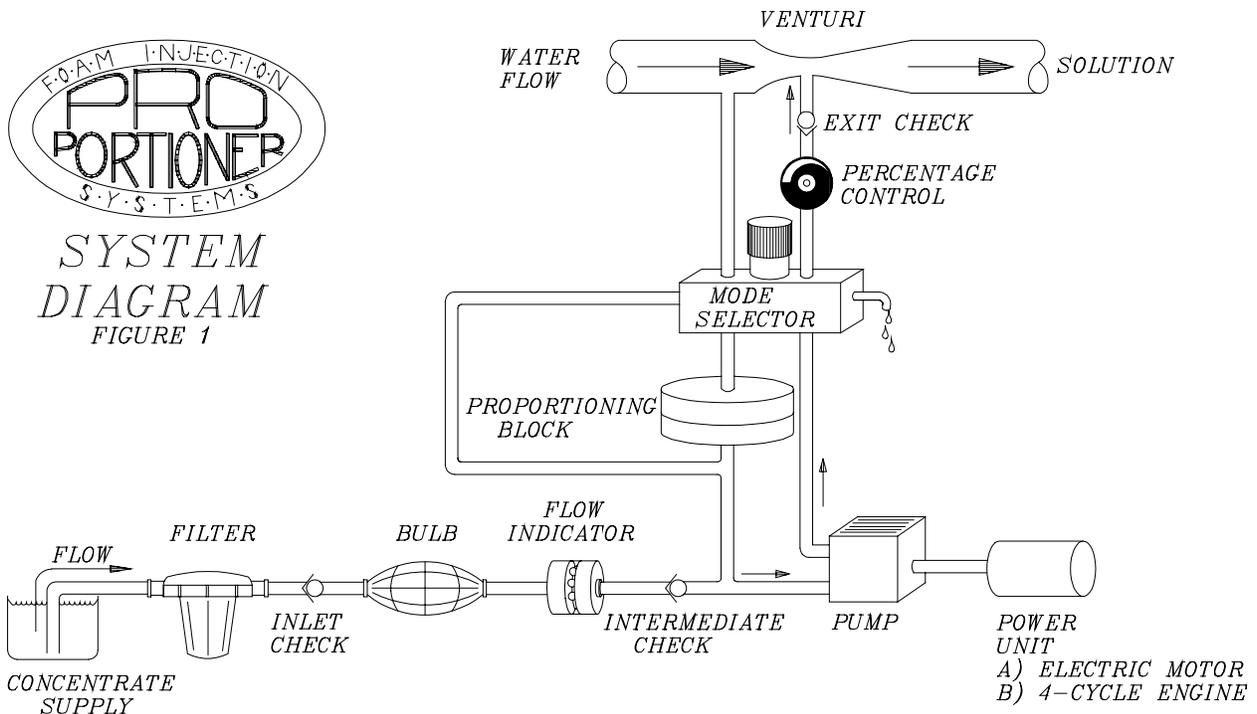
## 1.1 DESCRIPTION

The PRO/portioner is a discharge side, concentrate injection system. Designed to inject liquid concentrates into a water flow at a user selectable concentrate ratio from 0.1% to 1%, this system offers dependability and ease of operation in rugged environments. The desired concentrate ratio is maintained at all flow rates up to the maximum flow capacity of the concentrate pump. Once selected, the concentrate ratio will automatically be injected into the water stream and will not be affected by variations in hose length, pressure, or elevation. With a maximum concentrate flow of 1.25 GPM, the PRO/portioner will operate easily at 1% ratios from 25 to 125 GPM, and at 0.5% ratios up to 250 GPM. Designed especially for use with Class A foaming agents, 1% AFFF and wetting agent concentrates, the PRO/portioner operates on a balanced pressure concept.



**Do not use 3 to 6% class B foams in the PRO/portioner. The use of 3 to 6% Class B foams will result in weak and ineffective foam. Maximum mix ratio, of this PRO/portioner is 1%.**

The PRO/portioner is designed for Class A and Class B AFFF concentrates only. Do not attempt to use any 3 or 6% concentrates in the PRO/portioner, or Class A foams not meeting USDA Forest Service "Interim Requirements for Foam for Wildland Fires, Aircraft or Ground Application" or NFPA 298 "Foam Chemicals for Wildland Fire Control".



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**FIGURE 1 - SYSTEM DIAGRAM**

## 1.2 BALANCED PRESSURE PROPORTIONING

The PRO/portioner is similar in concept to the carburetor on a gasoline engine. In a carburetor the air to fuel ratio remains constant as the amount of air through the carburetor changes. As the engine speeds up, the amount of air passing through the carburetor increases and more gasoline is injected into the air stream to maintain a constant percentage. A carburetor can make the mixture leaner or richer by adjusting the jets. The fuel pump maintains fuel pressure while the carburetor does the proportioning.

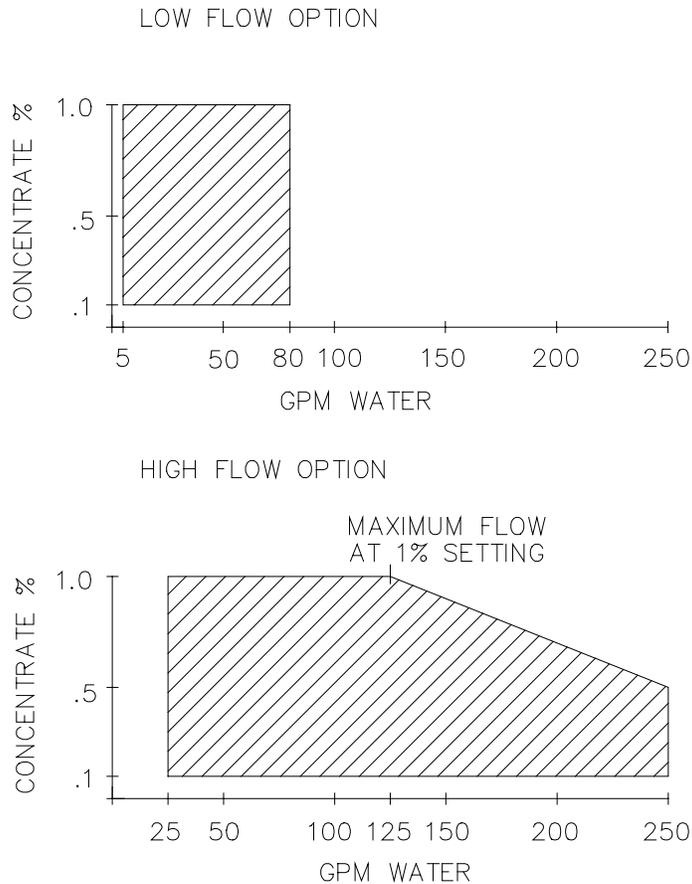
The pump on the PRO/portioner supplies the pressure to inject the concentrate into the water stream. The proportioning block, bolted to the pump, like the carburetor on an engine, maintains proper percentage. The pump is driven by a 12 VDC electric motor, or a four cycle gasoline engine.

## 1.3 FLOW OPTIONS

The PRO/portioner is available in two flow ranges. The **LOW FLOW** option has a flow range of 5 to 80 GPM at any concentration between 0.1% and 1.0%. The **HIGH FLOW** option has a flow range of 25 to 125 GPM at any concentration between 0.1 and 1.0%, and may go to 250 GPM at lower percentages. At flows between 125 and 250 GPM the maximum concentration is limited by the output of the concentrate pump which has a capacity of 1.25 GPM. At any flow below 250 GPM, it is always possible to get at least 0.5% concentration. The maximum concentration possible at any flow is shown in Figure 8. In each case the venturi insert and concentrate adjustment knob are designed to work together. To avoid mix-up, the knobs for the low flow range PRO/portioners are white and the high flow versions are black.



**Maximum operating pressure is 300 psi for electric or 450 psi for 4-cycle. Over pressurizing system may result in loss of foam flow and can damage components.**

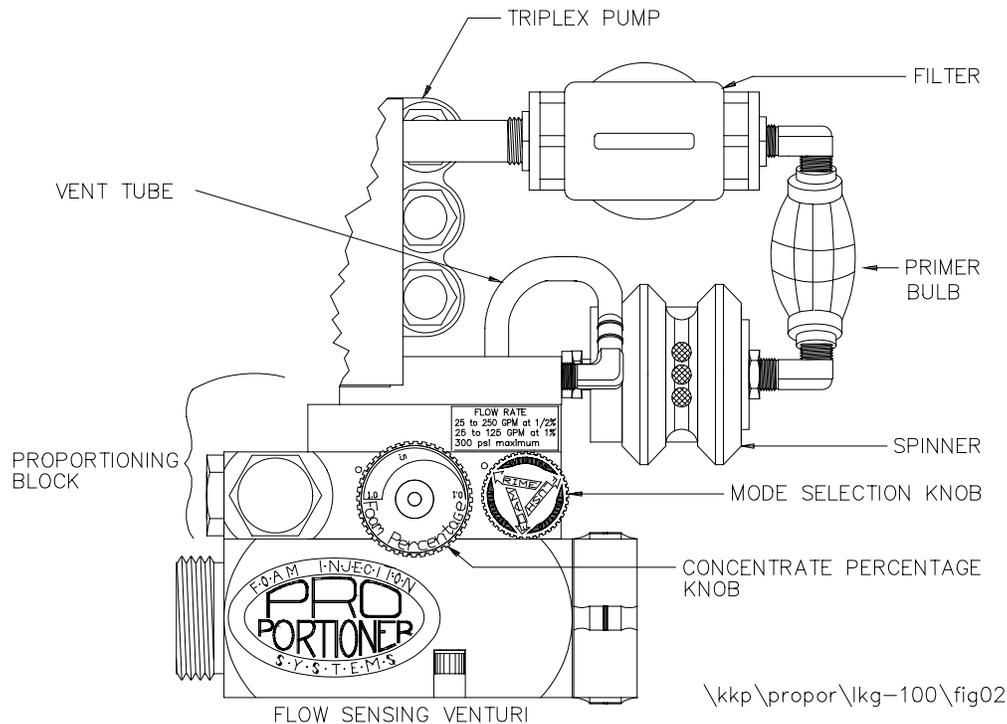


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**FIGURE 2 - PRO/PORTIONER OPERATING RANGE**

## 2.0 SYSTEM COMPONENTS

Figure 3 shows the system components and their relation to each other. Each of the components is described in the following sections.



**FIGURE 3 - PRO/PORTIONER CONTROLS AND COMPONENTS**

### 2.1 PROPORTIONING BLOCK

The entire balanced pressure proportioning system is contained in the rectangular block assembly bolted to the pump. There are two control knobs on the block.

### 2.2 CONCENTRATE PERCENTAGE KNOB

The concentrate percentage knob is located on top of the block and can be set to any desired concentrate ratio from 0.1% to 1%. There are stops limiting rotation at each end of its range. The knob should normally feel tight so that it will stay in position. The red pointer at the 10:00 o'clock position indicates the setting.

### 2.3 MODE SELECTION KNOB

There are three operational modes on the PRO/portioner: FOAM, FLUSH, and PRIME. In the PRIME position the outlet of the pump goes directly to the clear plastic vent tube on the side of the block. Air is expelled from the system and concentrate from the tank or wand fills the system. Keep the knob in the prime position until no more air is visible in the spinner or vent tube. The FOAM position is for normal operation. In this position concentrate is metered into the water stream at the desired concentration. In the FLUSH position water from the venturi connection circulates through the concentrate pump and block, washing concentrate out of the system through the vent tube. With the water line pressurized, run the pump for at least one minute to wash all concentrate from the system.

### 2.4 FILTER

As the concentrate enters the system it passes through a filter-strainer. The filter should be inspected before and after each use, and cleaned as necessary to assure unrestricted flow of concentrate to the pump. Make sure the screen and gasket are in place before the bowl is screwed hand tight onto the filter housing. If the gasket is out of place, it will be difficult to keep the PRO/portioner primed. If the filter is not maintained, or is removed, debris can get stuck in the concentrate percentage valve, or damage the pump, causing the PRO/portioner to malfunction.



**Debris in the foam can cause the system to become inoperative. Clean the filter regularly to avoid blockage.**

## 2.5 PRIMER BULB

The primer bulb is used to assist and speed up the priming of the PRO/portioner. Make sure the MODE SELECTION KNOB is in the PRIME position and squeeze the bulb to help move the concentrate toward the pump. The pump does not need to be running to use the primer bulb.

## 2.6 SPINNER

The concentrate flows from the primer bulb through a sight flow indicator called the spinner. As concentrate flows through the spinner, the three white balls will rotate at a speed proportional to the concentrate flow rate. The user can verify that concentrate is flowing by observing the motion of the balls. When the water flow stops, the balls should stop. There should be no large air bubbles visible during normal operation. If large amounts of air are drawn into the pump, prime will be lost and the balls will stop rotating. Please note, at very low percentages and very low water flows, the concentrate flow is so low that the balls may stop rotating.

## 2.7 TRIPLEX PUMP

The PRO/portioner uses a positive displacement three piston pump to minimize pressure pulsation's. The pump has a capacity of 1.25 GPM at 2000 RPM. The pump is capable of pressures far greater than those encountered on the fireground. No relief valve is necessary because the engine or motors do not have enough power to damage the pump.

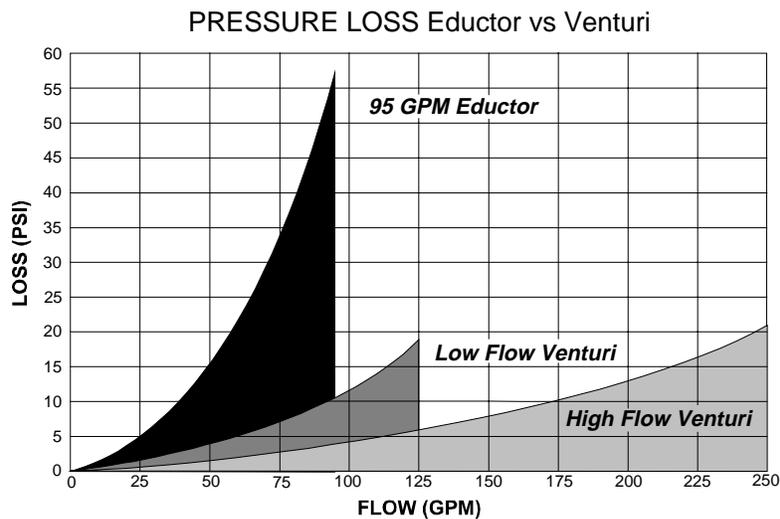
THE PUMP MUST NOT RUN DRY for more than a few moments. A steady supply of concentrate or water is necessary to keep the pistons lubricated while it is running.

The pump crankcase should be kept full to the dot on the oil level window with SAE 30w non-detergent oil. **The red oil cap, used only for shipping, must be replaced with the enclosed yellow vented dipstick before operation. Operation with the red oil cap will cause crankcase pressure buildup and damage the oil seals.** Change the oil after every 50 hours or three months of operation, whichever comes first. An access hole for a 7/8" socket has been cut in the base plate, on portable models, to remove the oil drain plug. Regular lubrication will help insure a long and trouble free service life.

## 2.8 FLOW SENSING VENTURI

The venturi serves two functions. It senses the water flow passing through it and also provides a place for the concentrate to be injected into the water stream. The venturi has less pressure drop across it than an eductor as seen in the graph below. It is the pump and motor that do the actual work of injecting the concentrate into the water. The venturi is available with standard hose threads or grooves for Victaulic® couplings, pipe threads or flanged for permanent installation. See Figures 13 and 14 for the types and sizes available.

**NOTE: A venturi is a restriction in the water flow area. Large increases in venturi inlet pressure are required to increase flow beyond the venturi's rated range.**



**FIGURE 4 - PRESSURE LOSS**

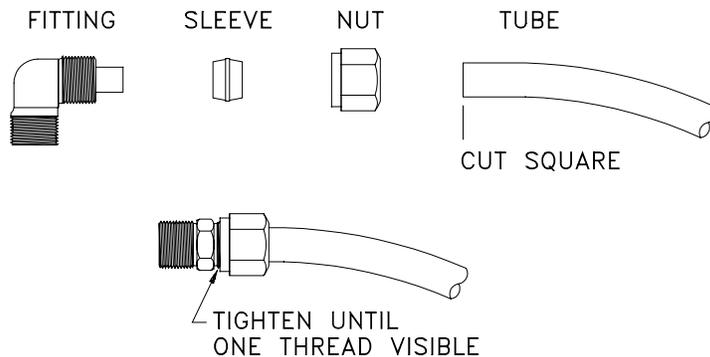
The tapered pipe thread and flange mount venturis are designed for remote mounting. They are available in standard 2.0" and 2.5" sizes. Standard Victaulic couplings, style 75 or 77, clamp into the grooves on the venturi. Victaulic reducing couplings may be used for installation with other pipe sizes. The water **MUST** flow in the direction of the arrow on the venturi.

### 2.8.1 REMOTE VENTURI INSTALLATION

The venturi of any PRO/portioner can be remotely mounted to fit your particular application. The venturi should be installed after the outlet of the water pump to keep concentrates out of the water pump. Valves, elbows and other disruptions immediately in front of the venturi can cause inaccurate proportioning. Install the venturi as far as possible after these disruptions. If a threaded venturi is bolted onto the proportioning block, it should be removed by unscrewing the four screws with a 1/4" allen wrench. There are threaded holes for tapered pipe fittings in the faces of the proportioning block and venturi. The maximum distance between the venturi and the proportioning block is 6 feet. The remote mount kit, available from KK Products, contains all necessary fittings and tubes.

### 2.8.2 REMOTE FITTING ASSEMBLY

The brass fittings have thread sealant applied to them, so "pipe dope" or teflon tape is unnecessary. There are both straight and elbow fittings in the remote kit. The elbow fittings may be used on either the venturi or the proportioning block to suit your installation. Screw the brass fittings into the venturi and proportioning block and tighten. Cut the nylon high pressure tubing to the proper length, making sure the ends are square. Unscrew the nut and sleeve and place them over the end of the tubing and insert the tubing into the fitting **AS FAR AS IT WILL GO**. Tighten the nut until **ONE THREAD** remains visible on the fitting body.



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**FIGURE 5 - REMOTE FITTING ASSEMBLY**

## 3.0 SUPPLY OPTIONS

Concentrate may be delivered to the PRO/portioner through one of these supply options: an 8,12, or 20 gallon tank, a wand, or the user's apparatus foam tank. The 8,12, & 20 gallon tank is made of polyethylene and has a large 5" diameter opening for easy filling. The tank has a 6 foot long transparent hose, shutoff valve, and quick connect fitting to attach it to the PRO/portioner.

The wand option can be used to pick up concentrate from 5, 35, or 55 gallon drums. Care should be taken when moving the wand between containers to avoid sucking air into the PRO/portioner and losing prime. The valve on the inlet to the PRO/portioner should be closed, and the wand quickly moved to the new container and the valve re-opened. If prime is lost, follow the priming instructions on the PRO/portioner label.

If the concentrate tank is higher than the PRO/portioner, a shutoff valve should be installed to prevent the tank from draining through the PRO/portioner.

### 3.1 TRUCK MOUNT OPTION

The truck mount option uses a 12 VDC, 1/3 horsepower electric motor, and is designed for system pressures up to 300 PSI. At 300 PSI system pressure, the motor is at full load and will draw 27 Amps of power. At lower pressures the electric current

will be proportionately less. To turn on the motor, move the toggle switch to the ON position. A green indicator light will be on whenever the motor is running.

The truck mount option is for permanently installing the PRO/portioner in a truck. The PRO/portioner should be located where the two control knobs on the proportioning block can be easily seen and reached. The spinner, and pump crankcase oil level indicator should be visible. Select a location that is not exposed to road debris, or splashing. Mount the unit so the pump crankcase oil fill and drain are easily accessible, and there is adequate clearance for service to the pump head check valves. The motor case may safely reach temperatures of 180 degrees F, but adequate ventilation is required to keep it from overheating. No maintenance is required on the motor, but for long life it should be run in a well ventilated area and be kept as dry as possible.

**The electric motor and other components are ignition sources. The PRO/portioner should be operated only in areas where there is adequate ventilation and no hazard of flammable vapor buildup.**

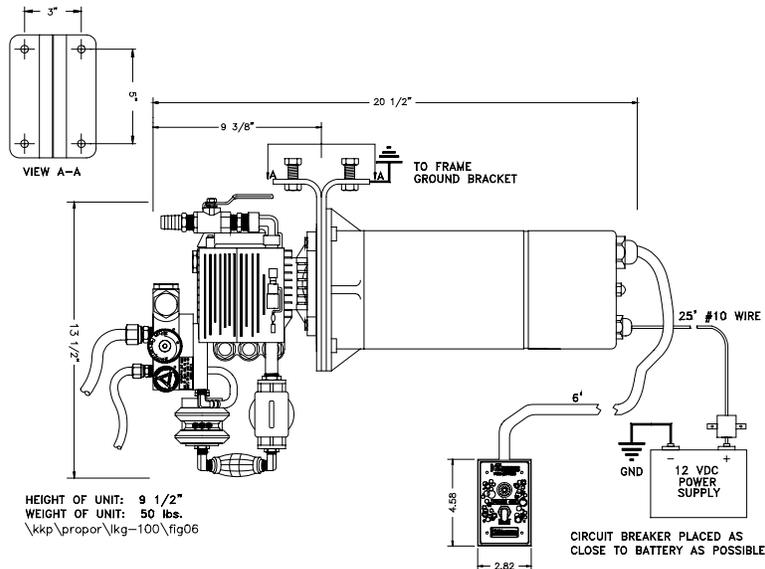
A universal mounting bracket goes between the motor and pump assembly. The bracket has four holes for 3/8" bolts, on a 3 x 5 inch bolt hole patterns as seen in FIGURE 8. The bracket may be bolted to the bottom, side, or top of a truck compartment. It is shipped with the bracket on the left side of the unit, but the bracket can easily be changed to the bottom, top, or right side. The pump must be mounted with the shaft horizontal and the oil filler cap on top for proper lubrication. The electrical switch panel should be secured to the truck in an easily accessible location.

After all wiring has been installed, test system by turning switch on panel from OFF to the on position. If system is working properly, the green light and motor should come on. If not, refer to the trouble-shooting section below.

**PROBLEM**

**CHECK**

- Motor does not run - Toggle switch and white control wire  
- Ground at panel and/or motor
- Circuit breaker trips - For shorts to ground  
- Wires between motor and panel for reversed lead
- Clicking relay - For low voltage at relay (if < 9.5 VDC, check power circuit)  
- For poor electrical contact on control panel
- Motor runs in off position - Toggle switch or white control wire is shorted to ground.



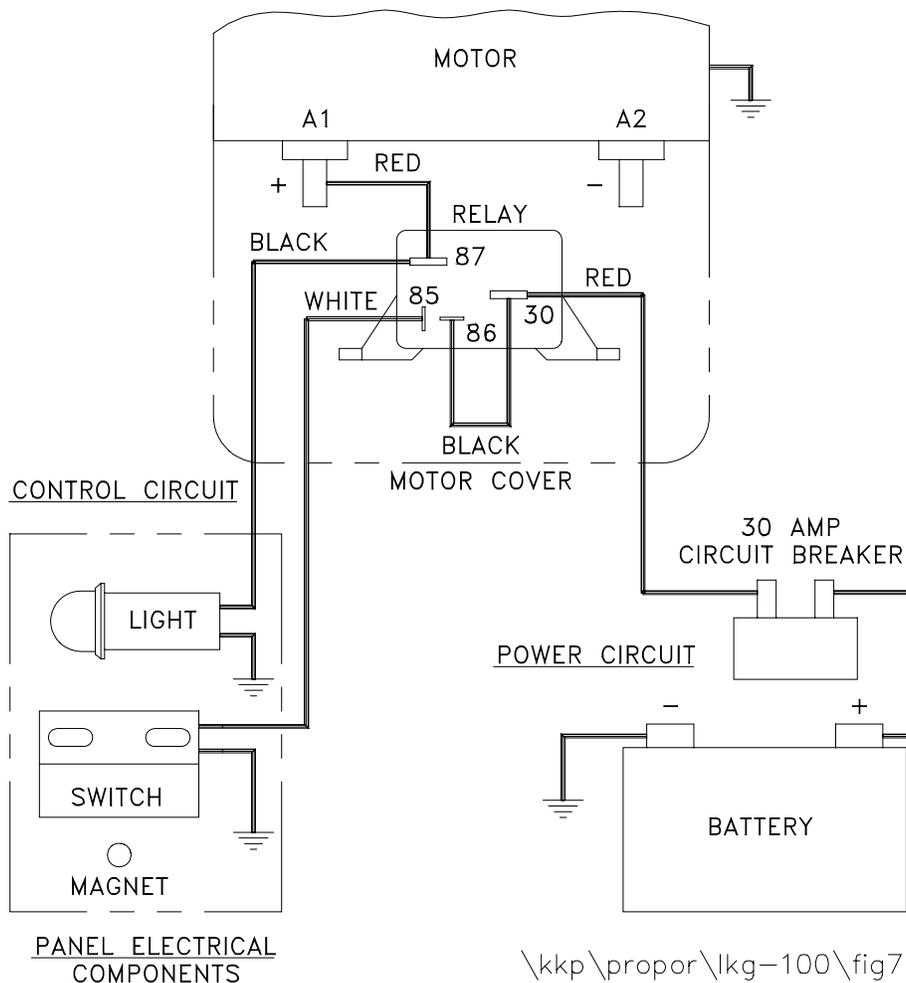
**FIGURE 6 - TRUCK MOUNT OPTION**

### 3.1.1 TRUCK MOUNT OPTION - WIRING

Refer to FIGURE 7 for motor wiring. Good mechanical connections on the wires are absolutely necessary and should be checked periodically. Poor electrical connections can cause power loss to the PRO/portioner and a fire hazard. Use grommets whenever wire passes through holes and secure to prevent damage due to snags, abrasions, etc. Disconnect power before installing or servicing the electrical components. Most of the wiring has been factory installed. The remaining wires needing hookup are:

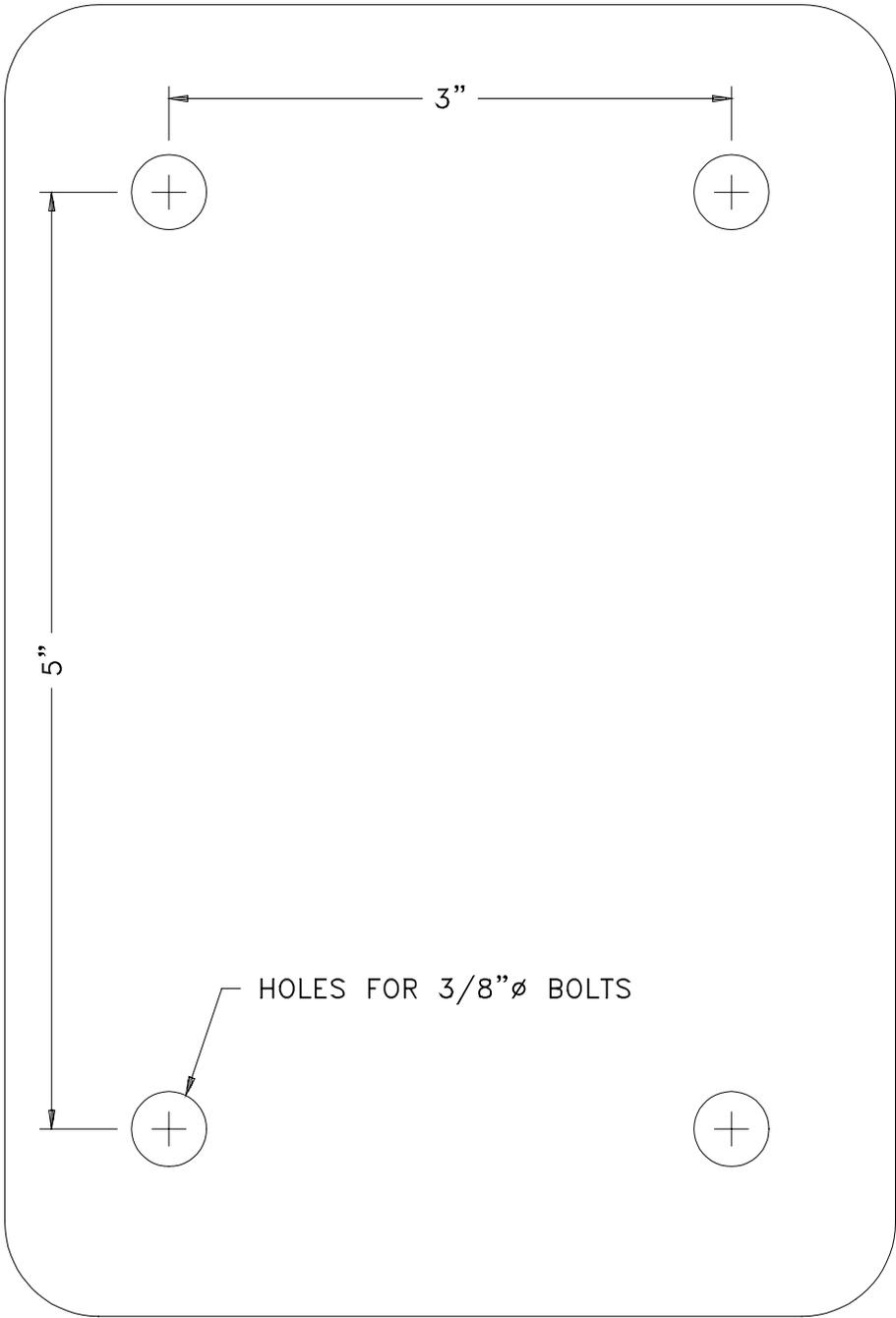
a) CORD BETWEEN PANEL AND MOTOR: The #16-2 cord provided connects the motor to the panel. All connectors are precrimped. Starting at the panel, the white wire goes to the switch and the black wire goes to the light. Remove the motor cover (two acorn nuts) and pass the other end of the cord through the large wire fitting on the motor cover with the white wire attaching at terminal #85 of the relay and the black wire to terminal #87. Tighten the wire retainer. **NOTE: Motor and panel need to be mounted to a conductive grounded surface or a #10 AWG jumper wire must be used between a mounting bracket bolt and a suitable ground.**

b) POWER TO RELAY: The red #10 AWG wire with 30 AMP circuit breaker supplies power to the motor's relay. Pass one end of this red wire through the small wire fitting on motor cover and attach to terminal #30 on the relay. Tighten wire firmly. Reinstall motor cover. For circuit protection a 30 AMP breaker is provided and must be installed as close as possible to the power source. The 30 AMP circuit breaker will trip if the motor is overloaded or overheated. When the circuit breaker trips, the green light will go out. The 30 AMP circuit breaker is internally sealed. It is a type I cycling breaker which continuously resets itself until the overload is corrected. The other end is connected to the positive side of a 12 volt power supply capable of safely maintaining a 30 AMP load. **NOTE: Maximum relay voltage is 15 VDC.**



**FIGURE 7 - TRUCK MOUNT - MOTOR WIRING DIAGRAM**

CUTOUT FOR MOUNTING BRACKET HOLE LOCATION

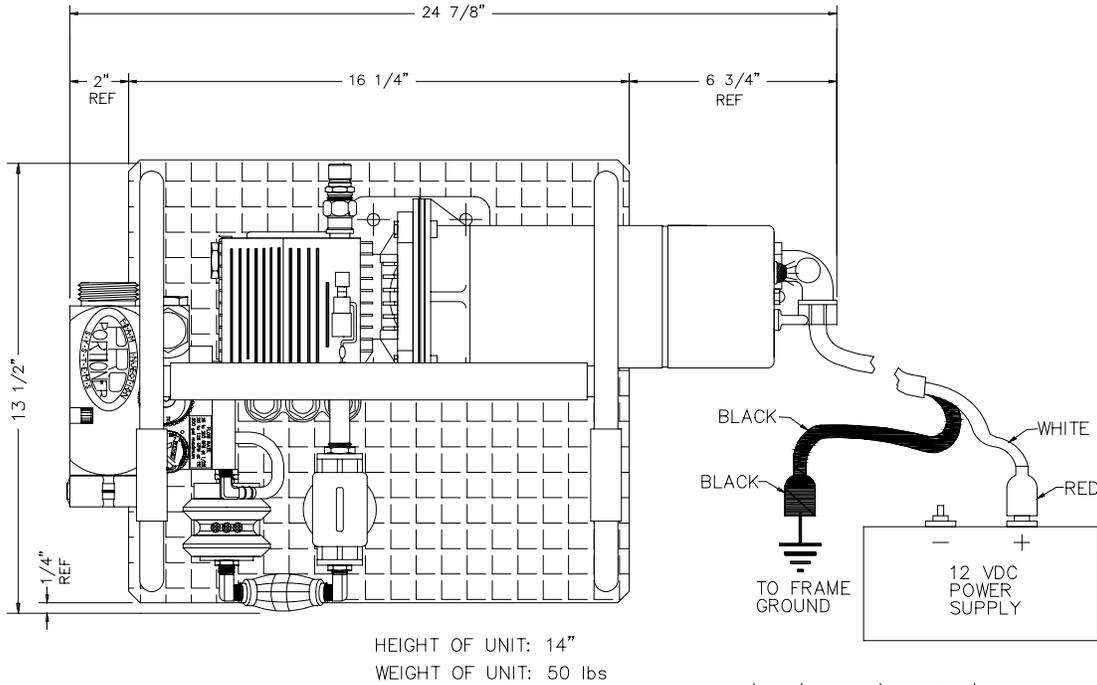


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**FIGURE 8 - TRUCK MOUNT BRACKET**

### 3.2 ELECTRIC PORTABLE OPTION

The Electrical Portable option uses a 12 VDC, 1/3 horsepower electric motor, and is designed for system pressures up to 300 PSI. At 300 PSI system pressure, the motor is at full load and will draw 27 Amps of power. At lower pressures the electric current will be proportionately less. Connect the 50 Amp. Alligator Clips to a 12 VDC battery (See Sect. 3.2.1 for directions). To turn on the motor move the toggle switch to the ON position. A green light will come on whenever the motor is running. The motor case may safely reach temperatures of 80 degrees F, but adequate ventilation is required to keep it from overheating. No maintenance is required on the motor, but for long life it should be run in a well ventilated area and be kept as dry as possible.



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**FIGURE 9 - PORTABLE ELECTRIC OPTION**

#### 3.2.1 PORTABLE ELECTRIC OPTION - WIRING

Good mechanical connections on the wires are absolutely necessary and should be checked periodically. Poor electrical connections can cause power loss to the PRO/portioner and a fire hazard. Disconnect power before servicing any electrical components. See Figure 16 for connection detail.

#### CONNECTION PROCEDURE FOR PORTABLE ELECTRICAL PRO/PORTIONER.



**Batteries contain hydrogen gas, which can ignite and explode if a spark occurs anywhere near the battery. Batteries also contain acid which may be splashed on you if the battery explodes.**

To minimize these risks, use the following procedure:

1. Do not smoke. You should also wear eye protection.
2. Make sure the PRO/portioning unit and vehicle are not touching (contact could provide an unwanted electrical path).
3. **Connect the Positive (Red) alligator clip to the positive (+) post or terminal on battery.**
4. **Connect the Negative (Black) alligator clip to a solid ground. Use an unpainted metal surface like an engine bracket or a frame member. Make sure the ground connection on the vehicle provides a good electrical contact.**
5. Make sure the cables do not touch each other and that the cables are clear of the fan and pulleys.

**NOTE:** Make sure the Positive (Red) alligator clip is connected to the battery before the Negative (Black) alligator clip is connected to ground.

### 3.3 FOUR CYCLE ENGINE OPTION

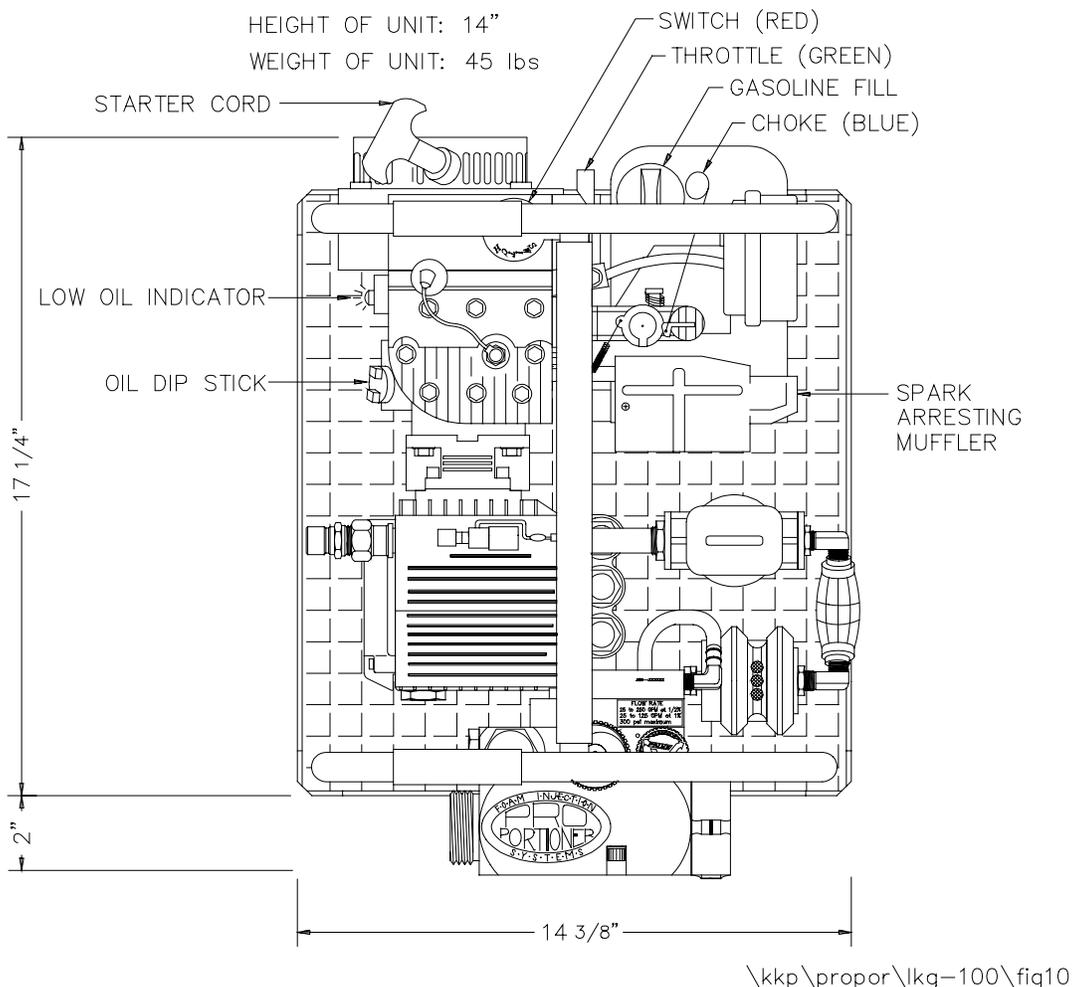
The four cycle Kawasaki engine is rated at 1.6 horse power and has been adjusted to run at 2000 RPM. The four cycle power option is designed for system pressures up to 450 PSI. It is equipped with a low oil shutdown system to protect the engine. If the engine oil level is too low, the engine will stop and a red indicator light near the base of the engine will blink momentarily. The light will also blink when attempting to start the engine with a low oil level. To avoid accidental low oil shutdown, the PRO/portioner should be operated on a fairly level surface. Be sure to check the oil level before starting. See the engine manual and engine placards for type of oil to use.

The engine will operate for about 2 hours on a tank of gasoline at 300 PSI system pressure. Gasoline consumption is proportional to system pressure. To insure an uninterrupted supply of concentrate, make sure the gasoline tank is full before operation.

The engine should be operated only in a well ventilated area to avoid buildup of gasoline and exhaust fumes. The engine is equipped with a spark arresting muffler. The area surrounding the engine should be cleared and wetted down for added safety when operating near flammable ground cover.

For long life proper engine maintenance is essential. Please refer to the engine manual for lubrication, air filter, and spark plug maintenance. Be sure the engine speed is set at 2000 RPM in the high speed position after service work is performed.

The Engine operators Manual is a separate document shipped with this manual. If it is missing or lost, please contact KK Products and we will replace it. The manual should be read and fully understood. It contains important safety information. Do not tamper with or modify the fuel system.



**FIGURE 10 - 4-CYCLE OPERATION**

## 4.0 OPERATIONAL NOTES - ALL MODELS

When running the PRO/portioner unattended, periodically check concentrate and gasoline supplies to make sure neither will run out and interrupt the flow of foam. The user risks pump damage if the pump is allowed to run dry for more than a few moments. The user should evaluate the situation and determine if a low concentrate level cut off switch is needed.

The PRO/portioner should always be operated and stored with the base in the horizontal position for proper lubrication and to prevent the oil and gasoline on non-electric models, from spilling.

Make sure the PRO/portioner is securely fastened to the truck to prevent damage over rough terrain. The PRO/portioner should be operated only in areas where there is adequate ventilation and no hazard of flammable vapor buildup. The gasoline engines and electric motor are ignition sources and **ARE NOT** explosion or ignition proof.

A bubble may form in the high point of the transparent concentrate hose, such as where the wand exits the concentrate container. At moderate water and concentrate flows this bubble will stay in place and do no harm. At higher flows this bubble may be carried along with the concentrate into the PRO/portioner. If the bubble is small it will pass through the system without notice, but if it is large it may cause loss of prime; re-prime as necessary.



***Improper use of foam can be harmful to personnel and the environment. Follow foam concentrate manufacture's instructions and fire service training to avoid such things as:***

- *Using wrong type of foam on a fire. i.e. Class A foam on a Class B fire.*
- *Mishandling of concentrates, some of which are flammable.*
- *Causing environmental damage.*



***Lack of foam can place the nozzle operator at risk of injury or death. Establish foam flow before advancing into dangerous situations. Assure against running out of foam. Check concentrate level periodically and keep an adequate supply on hand.***



***In compressed air foam systems (CAFS) loss of foam concentrate flow will cause slug flow and high impulsive nozzle reactions. Unit must be closely monitored to avoid this.***

## 5.0 TROUBLE SHOOTING

SYMPTOM	CAUSE	REMEDY
Loss of prime.	Air in line from switching wand.	Re-prime.
	Filter gasket not seated or not tight.	Make sure gasket in place and hand tighten.
	Air vent plugged on concentrate tank.	Unplug or open vent.
Weak foam mix	Debris caught in percentage knob.	Clean concentrate knob.
	Thick concentrate, cold. Internal deposits of old dried concentrate.	Change to thinner brand. Fill concentrate tank with clean water and flush unit thoroughly.
	Clogged check valves on pump.	Clean check valves on pump.
Primer bulb	Valve closed in	Open valve, re-prime.

***Trouble Shooting Continued on next page***

flattens	supply line.	
	Clogged filter or line.	Clear restriction.
Circuit breaker trips	System pressure too high.	Lower engine pressure, use larger hose, or shorten lay.
	Excessive heat.	Improve ventilation.
Gasoline engine problems.	Will not start or runs poorly.	See Engine Manual.

## 6.0 CONCENTRATES



***Improper use of foam is dangerous to personnel and the environment. Follow foam concentrate manufacture’s instructions and fire service training to avoid such things as:***

- ***Using wrong type of foam on a fire. i.e. Class A foam on a Class B fire.***
- ***Mishandling of concentrates, some of which are flammable.***
- ***Causing environmental damage.***



***Do not use 3 to 6% class B foams in the PRO/portioner. The use of 3 to 6% foams will result in weak and ineffective foam. Maximum mix ratio of this PRO/portioner is 1%.***

The PRO/portioner is designed for Class A and Class B AFFF concentrates only. Do not attempt to use any 3 or 6% concentrates in the PRO/portioner, or Class A foams not meeting USDA Forest Service “Interim Requirements for Foam for Wildland Fires, Aircraft or Ground Application” or NFPA 298 “Foam Chemicals for Wildland Fire Control”.

**Do not mix different types of concentrates.** When Class A and Class B foams are mixed, the mixture can become very thick or solidify. We recommend that foam tanks be thoroughly rinsed when switching to a different **type** of foam. In systems with two or more foam tanks that contain different **types** of foam, we recommend that the PRO/portioner be flushed prior to switching to a different foam tank to prevent concentrate mixing in the PRO/portioner. For more information, contact your foam supplier.

The chemical makeup of most fire-fighting concentrates is a trade secret. The user should obtain complete literature and a MATERIAL SAFETY DATA SHEET for each concentrate used. The recommendations and cautions of each manufacturer should be closely followed.

Some concentrates can attack metals, rubber and plastic. KK Products has tried to use materials in the PRO/portioner that resist chemical attack, but cannot predict all the effects of concentrates on the PRO/portioner's components over time and in different environments. Therefore, it is not possible for KK Products to warrant the components of the PRO/portioner against chemical attack. The best way to prolong the life of your PRO/portioner is to limit its long term exposure to concentrates. While the water line is still pressurized, turn the mode selection knob to the **FLUSH** position and run the PRO/portioner for at least one minute to wash the concentrate from the system.

Viscosity is a fluid's resistance to flow. The higher the viscosity, the thicker the fluid. At room temperature most common concentrates have roughly the same viscosity. *However*, at lower temperatures, some become extremely viscous and will resist flowing, and the PRO/portioner will not maintain the correct concentrate percentage. When operating in cold climates, choose a brand of concentrate with a low viscosity, or keep the concentrate in a warm place until it is used. **Maximum concentrate viscosity is 120 CPS (centipoise).**

## 7.0 MAINTENANCE AND STORAGE



***Any alteration to PRO/portioner or its markings constitutes a misuse of this product and could diminish safety.***

Threaded joints have been secured using LOC-TITE® brand thread locking adhesive #271. Disassembly may require considerable torque to break the adhesive. If the fastener cannot be broken loose, heat the threads to 450 degrees F with a propane or oxyacetylene torch to break the bond. The application of excessive heat will damage adjacent seals and components. Threaded parts must be reassembled using LOC-TITE® #271 or equivalent. Small containers of LOC-TITE® are available from KK Products, part number V5010, LOC-TITE® Mini Dispenser.

When ordering parts always specify the serial number found on the PRO/portioner behind the Concentrate Percentage knob. Be sure to use the complete order number and description, as printed in the parts list. The PRO/portioner can be serviced using common hand tools such as allen wrenches, sockets, adjustable or open end wrenches, screwdrivers, and pliers. No special tools are required.

Change the oil in the concentrate pump every 50 hours or 3 months of service. The oil drain plug can be reached through the large hole in the bottom of the PRO/portioner base plate. Refill to the red dot on oil level window with SAE 30 non-detergent oil.

Owners of four cycle gasoline engine powered PRO/portioners should refer to item 12 in the engine operators handbook for a complete list of periodic maintenance intervals and procedures.

If the unit will not be used for more than 60 days, the following procedures are recommended. If the unit uses a tank, drain the tank and rinse with clean water, leaving about 5 gallons of clean water in the tank. If the unit uses a wand, put the wand in a clean 5 gallon bucket of water. Set up the PRO/portioner as you would for fire-fighting and pressurize the water line. Run the unit for a few minutes drawing water, instead of concentrate, into the PRO/portioner. Rotate both control knobs back and forth a few times while the unit is running. Finally, turn the Mode selection knob to FLUSH and run for one minute. After the unit is shut down, perform all other required maintenance listed above and in the engine manuals if appropriate. Clean the PRO/portioner with a damp rag. If the unit must be stored where the temperature will be below freezing, prime the unit, using the primer bulb, with a 50/50 mixture of water and automotive antifreeze (glycol based).

## **8.0 SHIPPING INSTRUCTIONS**

The PRO/portioner may be shipped by United Parcel Service by following these easy steps:

- 1) Be sure to remove the yellow pump dip stick, and replace it with the red shipping cap to prevent the pump oil from leaking out.
- 2) Drain gasoline out of models with engines, and run the engine until all fuel is gone. Ventilate the tank to eliminate all gasoline fumes.
- 3) Drain the oil from the four cycle engines.
- 4) Empty the contents of the filter bowl.
- 5) Select a **VERY** strong box, and pack around the PRO/portioner securely to prevent motion.
- 6) If shipping to KK Products, please include your name, phone, address, and pertinent instructions.
- 7) Shipping insurance may be purchased from UPS for a modest fee.

## **9.0 WARRANTY**

Task Force Tips, Inc., Valparaiso, Indiana 46383-6940 warrants to the original purchaser of its PRO/portioner ("equipment"), and to anyone to whom it is transferred, that the equipment shall be free from defects in material and workmanship during the two (2) year period from the date of purchase.

Task Force Tips' obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by Task Force Tips' examination to be in a defective condition attributable to Task Force Tips. To qualify for this limited warranty, the claimant must return the equipment to Task Force Tips, at 2800 East Evans Avenue, Valparaiso, Indiana 46383-6940, within a reasonable time after discovery of the defect. Task Force Tips' will examine the equipment. If Task Force Tips determines that there is a defect attributable to it, it will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, Task Force Tips will assume the expenses of repair.

If any defect attributable to Task Force Tips under this limited warranty cannot be reasonably cured by repair or replacement, Task Force Tips may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If Task Force Tips makes this election, claimant shall return the equipment to Task Force Tips free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from Task Force Tips any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by Task Force Tips. It is agreed and understood that the price stated for the equipment is in part consideration for limiting Task Force Tips' liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

Task Force Tips shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

**THIS IS A LIMITED EXPRESS WARRANTY ONLY. TASK FORCE TIPS EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY KK PRODUCTS BEYOND THAT STATED IN THE DOCUMENT.**

Excluded from this warranty are abuse, neglect, and chemical attack, as well as damage done by users performing maintenance. In addition, damage or malfunction caused by users adaptation to purposes not approved by Task Force Tips shall not be warranted. If service is necessary, please contact the factory before shipping the unit. Some problems can be solved over the phone. Make sure the PRO/portioner is working properly before attempting to extinguish a fire. *If you have any problems or questions, please call Task Force Tips, toll free, at 1-800-348-2686.*

**FOAM CONCENTRATE FLOW RATE AT VARIOUS FLOWS AND RATIOS**

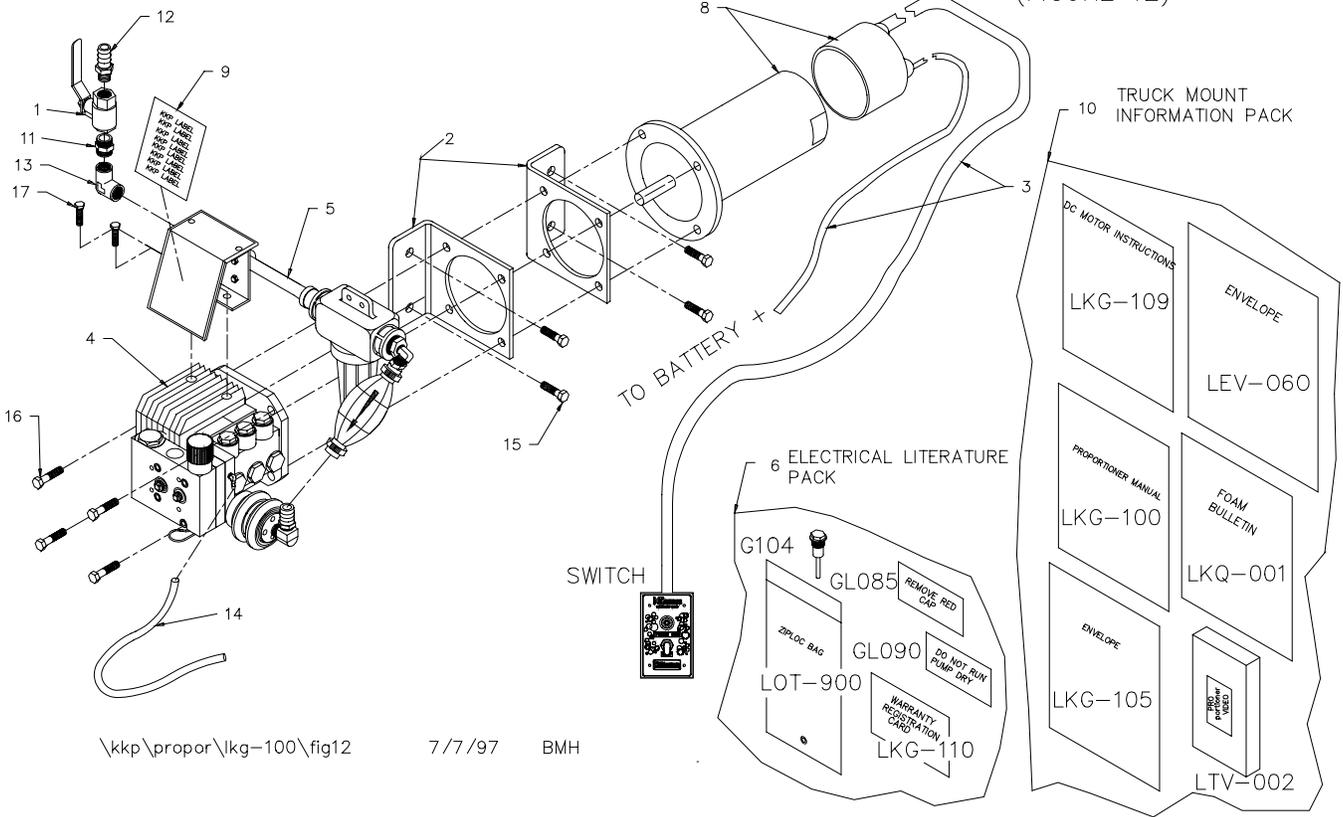
	<b>25</b>	<b>50</b>	<b>75</b>	<b>100</b>	<b>125</b>	<b>150</b>	<b>175</b>	<b>200</b>	<b>225</b>	<b>250</b>
<b>.1%</b>	.02	.05	.07	.10	.12	.15	.17	.20	.22	.25
<b>.2%</b>	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50
<b>.3%</b>	.07	.15	.22	.30	.37	.45	.52	.60	.67	.75
<b>.4%</b>	.10	.20	.30	.40	.50	.60	.70	.80	.90	1.00
<b>.5%</b>	.12	.25	.37	.50	.62	.75	.87	1.00	1.12	1.25
<b>.6%</b>	.15	.30	.45	.60	.75	.90	1.05	1.20	----	----
<b>.7%</b>	.17	.35	.52	.70	.87	1.05	1.20	----	----	----
<b>.8%</b>	.20	.40	.60	.80	1.00	1.20	----	----	----	----
<b>.9%</b>	.22	.45	.67	.90	1.12	----	----	----	----	----
<b>1.0%</b>	.25	.50	.75	1.00	1.25	----	----	----	----	----

**ACTUAL CONCENTRATE FLOW - GPM**

**FIGURE 11- FLOW RATES**

**10.0 EXPLODED VIEWS & PARTS LISTS**

PART # : G9T000 TRUCK MOUNT  
(FIGURE 12)



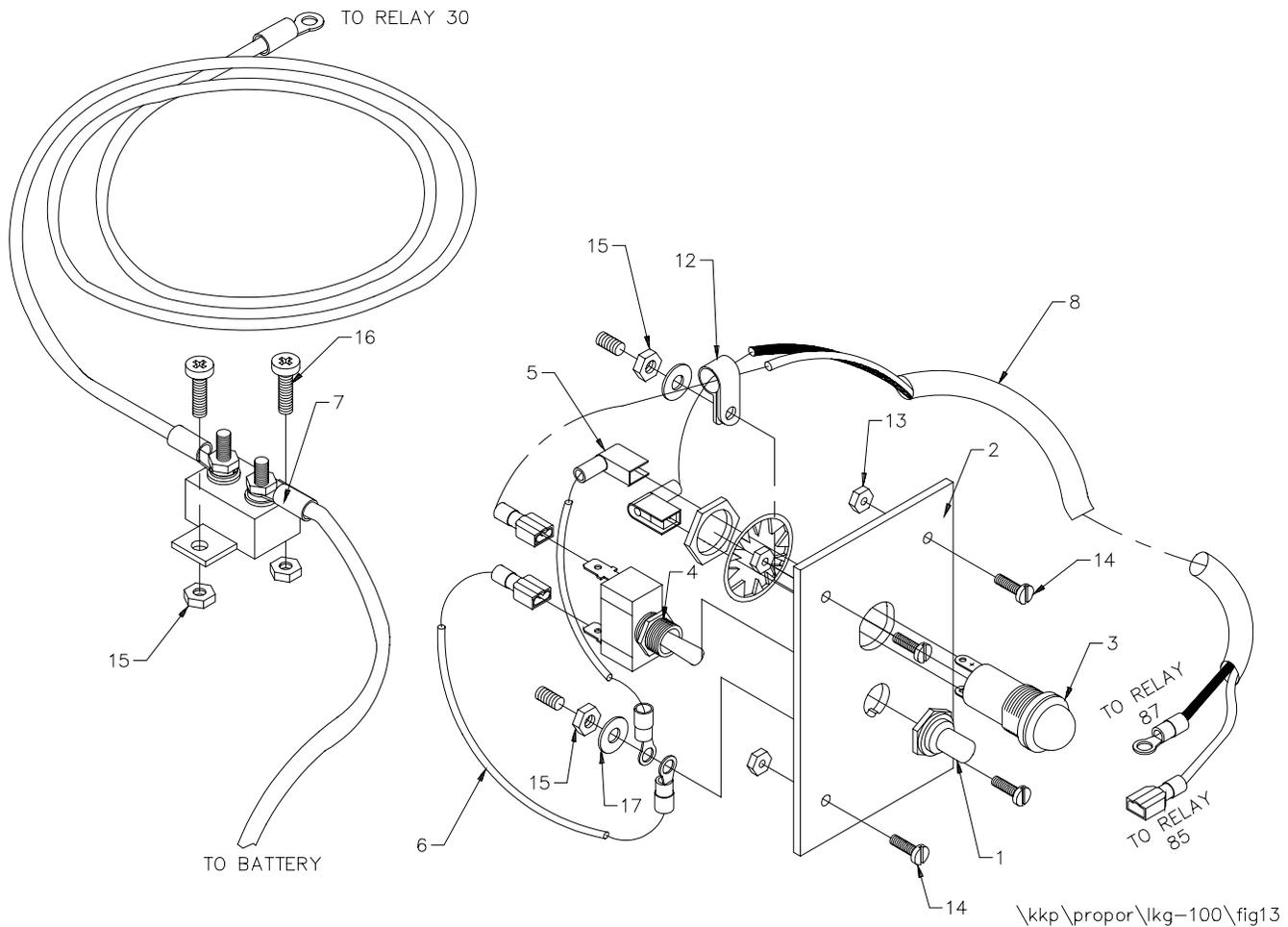
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REF	DESCRIPTION	QTY	ORDER NUMBER
1	1/2 X 1/2 FNPT Valve	1	G253
2	TM Bracket	2	G280
3	Remote Electric Subassembly	1	G417
4	Pump Subassembly	1	G430
5	General Bracket/Inlet Subassembly	1	G460
6	Electric Literature Pack	1	G470
8	Electric Motor Assembly	1	G4TMOTORASSY
9	Electric Instruction Label	1	GL010
10	Truck Mount Information Packet	1	LKG-050
11	1/2" MNPT Hex Nipple	1	VFHN4MX4M
12	3/4" BARB X 1/2" MNPT Nipple	1	VFNN6BX4M
13	1/2" FNPT X 3/8" FNPT EII	1	VFRL4FX3F
14	1/4" ID Clear Vinyl Tube	24 IN	VM4265
15	3/8-16 X 1.5 Hex Bolt	4	VT37-16HX1.5
16	3/8-16 X 1.75 Hex Bolt SS	4	VT37-16HX1.7
17	M8-1.25 X 10 MM Hex Bolt	2	VTM8-HX10

SUBASSEMBLY # - G9T000

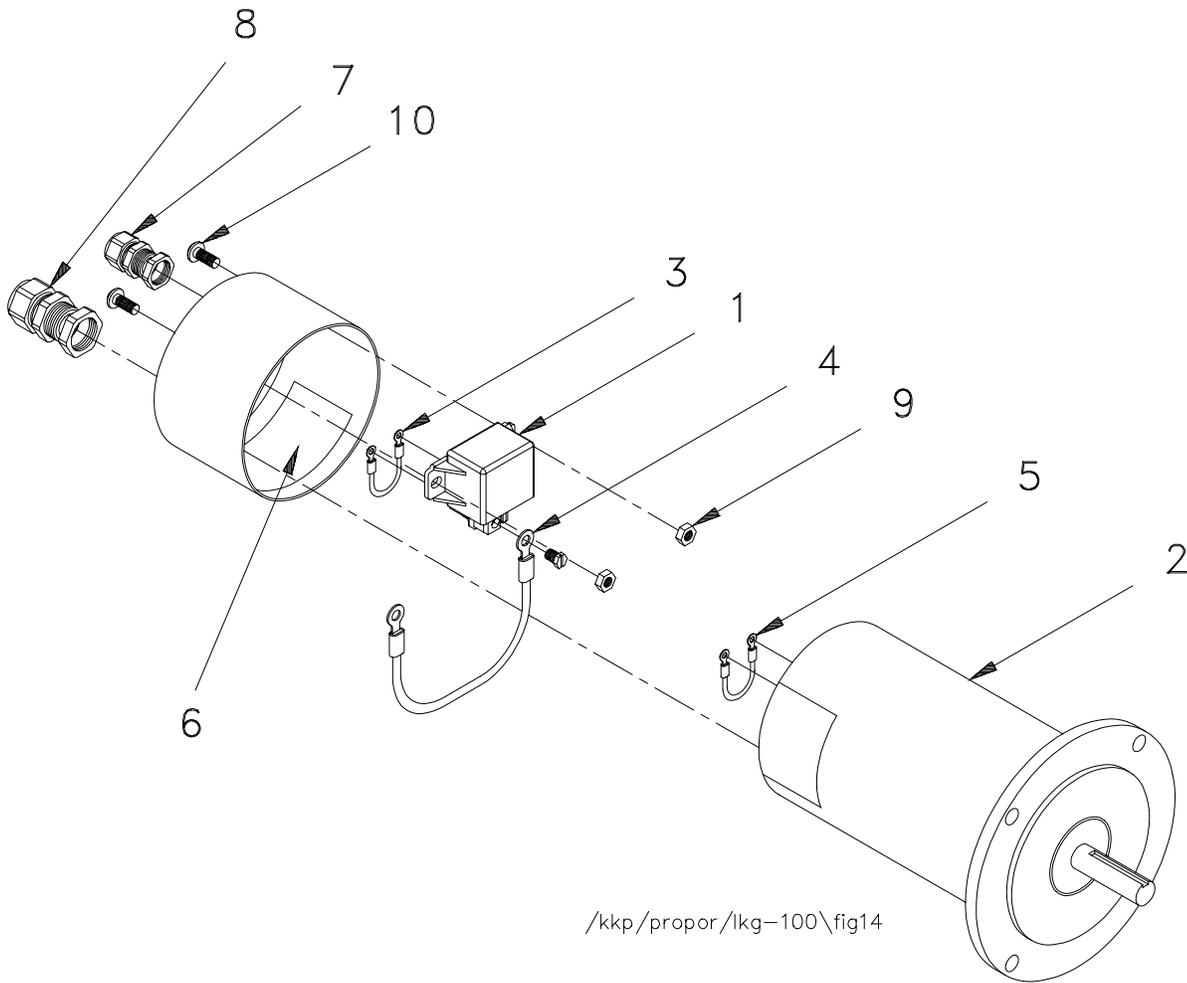
**FIGURE 12 - TRUCK MOUNT PRO/portioner Unit**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	Switch Boot	1	G304
2	Remote Electrical Panel	1	G316-R
3	MC 4583520 Indicator Light	1	G320
4	Toggle Switch #55014-05	1	G325
5	Switch-Light Wire Assembly	1	G418
6	Relay Wire Assembly	1	G419
7	Motor-Power Wire Assembly	1	G424
8	Switch-Motor Wire Assembly	1	G426
9	Switch Plate Mount Card	1	GL092
12	Heyco Cable Clamp #3355	1	VM4105
13	#6-32 Hex Nut 18-8 SS	4	VT06-32NT
14	#6-32 X 1/2 Slotted Pan	4	VT06-32PH500
15	10-24 Hex Brass Nut	4	VT10-24NT
16	10-24 X 3/4 Pan Head	2	VT10-24PH750
17	#10 Nickel Plate Washer	2	VW213X513-40

SUBASSEMBLY # - G417

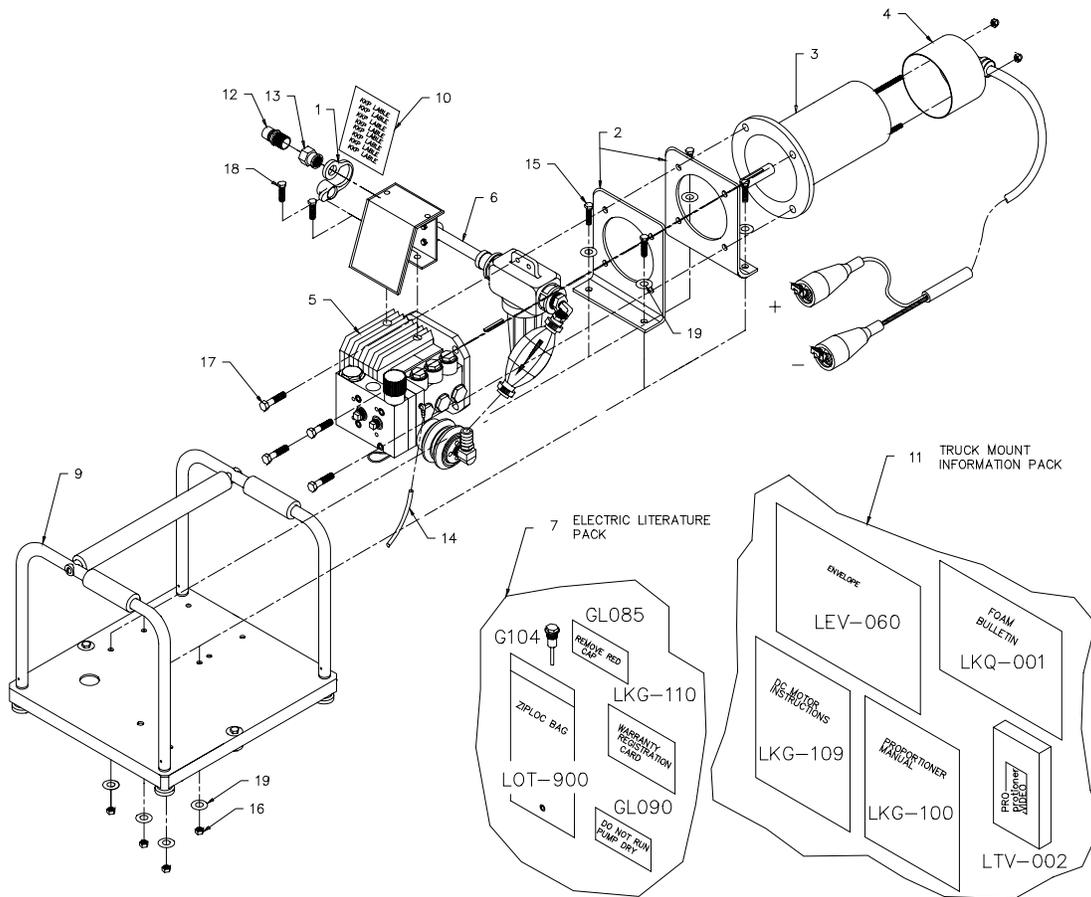
**FIGURE 13 - REMOTE ELECTRIC SUBASSEMBLY**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	12 Volt Power Relay	1	G317
2	12VDC Truck Mount Motor	1	G360
3	Relay Wire Assembly	1	G419
4	Relay-Motor Wire Assembly	1	G420
5	Motor-Ground Wire Assembly	1	G421
6	Remote Wiring Label	1	GL095
7	HEYCO Cord Fitting # 3210	1	VM4095
8	HEYCO Cord Fitting # 3219	1	VM4100
9	¼-20 Stainless Nut	3	VT25-20NT
10	¼-20 X 5/8 Slotted Pan Head	2	VT25-20PH625

SUBASSEMBLY # - G4TMOTORASSY

**FIGURE 14 - TRUCK MOUNT MOTOR ASSEMBLY**



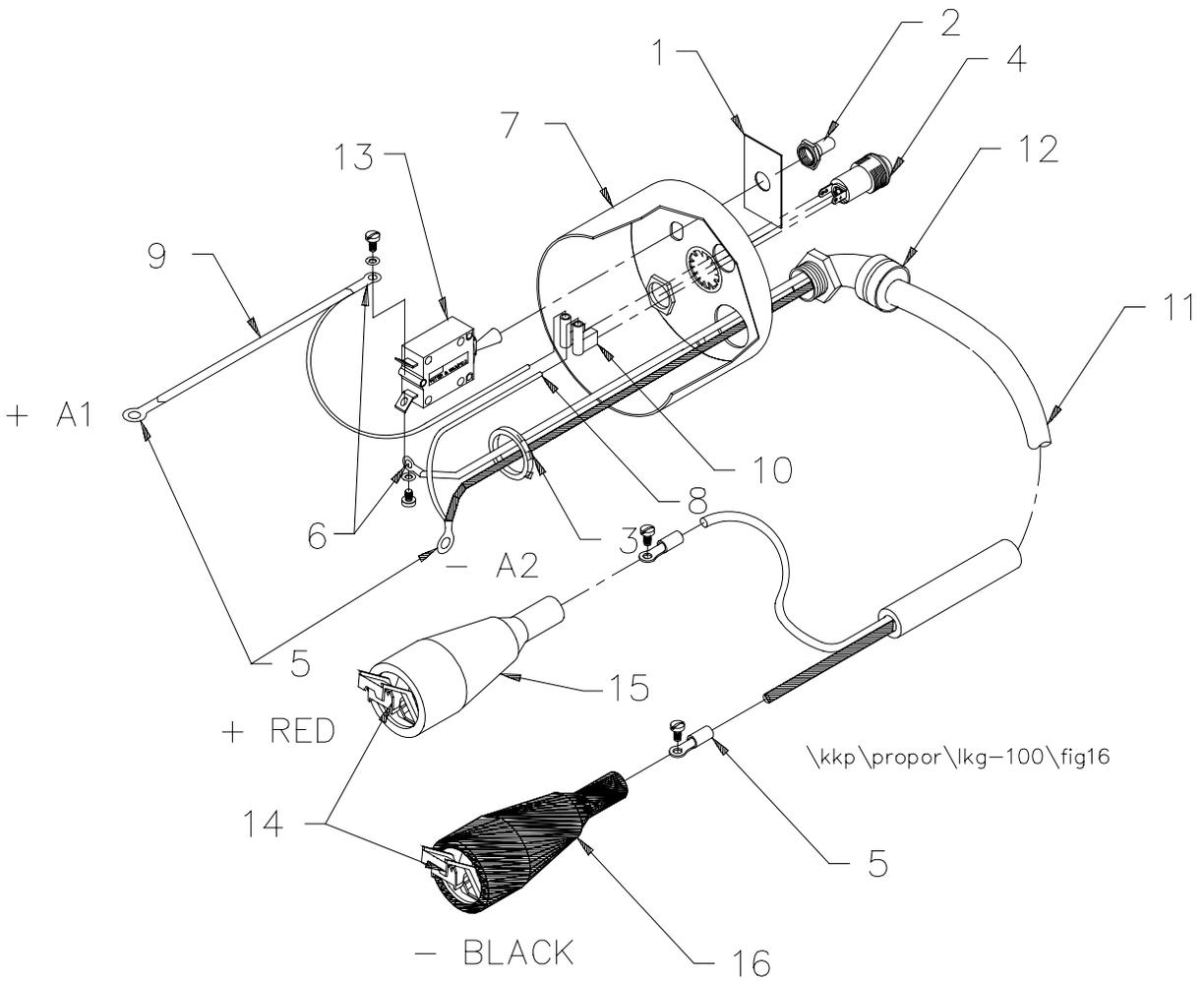
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REF	DESCRIPTION	QTY	ORDER NUMBER
1	QC Cap	1	G264
2	TM Bracket	1	G280
3	12 VDC Truck Mount Motor	1	G360
4	G9E000 Cord Assembly	1	G415
5	Pump Subassembly	1	G430
6	General Bracket/Inlet Subassembly	1	G460
7	Electric Literature Pack	1	G470
9	Portable Base Plate Kit	1	G490
10	Electric Instruction Label	1	GL010
11	Truck Mount Information Pack	1	LKG-050
12	1/2" QC X 1/2" MNPT Nipple	1	VFNN4QX4M
13	1/2" FNPT X 3/8" FNPT Coupling	1	VFRC4FX3F
14	1/4" ID Clear Vinyl Tube	6	VM4265
15	5/16-18 X 1 1/4 Hex Bolt	4	VT31-18HX1.2
16	5/16-18 Stainless Steel Nut	4	VT31-18NT
17	3/8-16 X 1.75 Hex Bolt SS	4	VT37-16HX1.7
18	M8-1.25 X 10 MM Hex Bolt	2	VTM8-HX10
19	5/16" SS Washer	8	VW31SS

SUBASSEMBLY # - G9E000

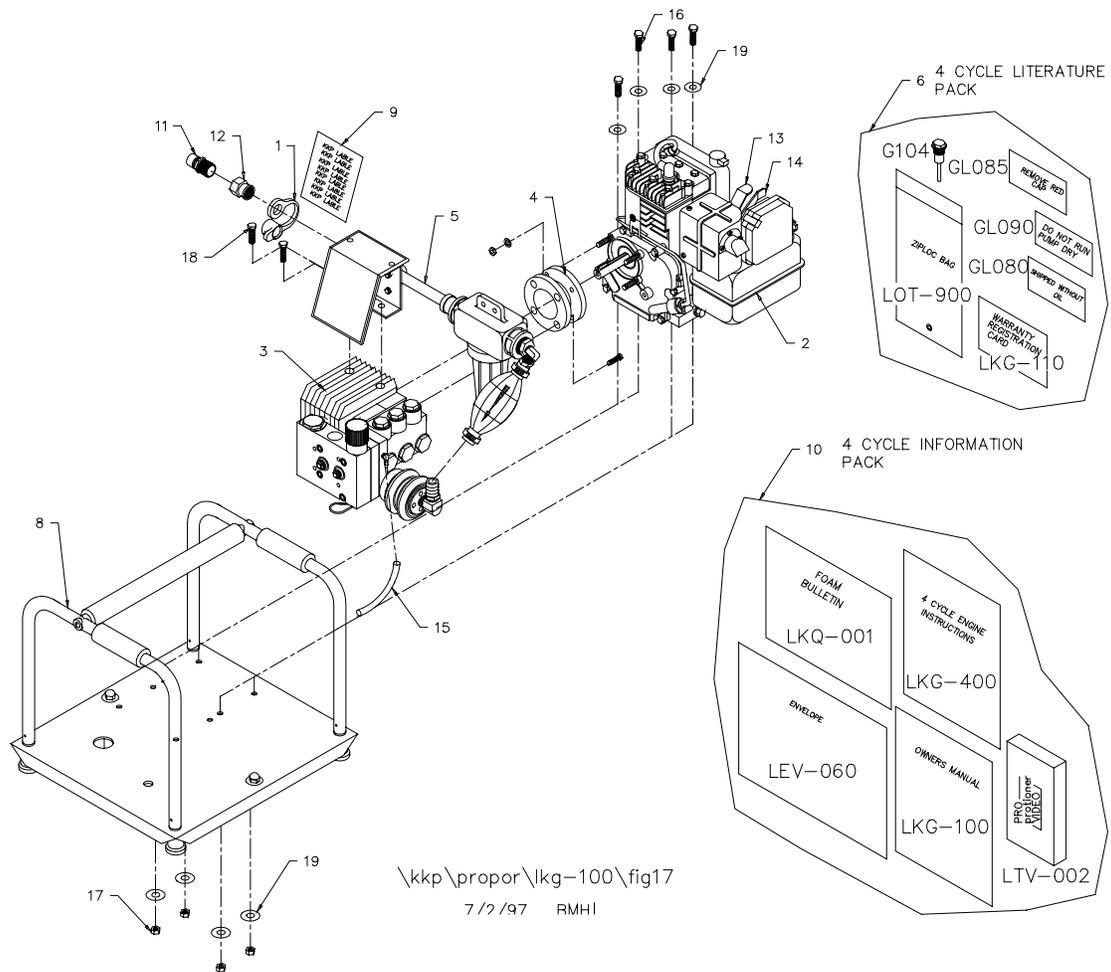
**FIGURE 15 - PORTABLE ELECTRIC OPTION**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	ON-OFF Plate	1	G302
2	Switch Boot	1	G304
3	Conduit Locknut 3/4"	1	G311
4	MC4583520 Indicator Light	1	G320
5	1/4 Yellow Ring Terminal	4	G355
6	1/4 Yellow Ring Terminal	2	G356
7	Portable Motor Cover	1	G363
8	#16 AWG MTW TFFN Wire	12	V4065
9	#10 RED UL 1015 TEW Wire	.5 FT	V4068
10	3/16 Flag Spade Connector	2	V4099
11	#10-2 TYPE SO	15 FT	VM4085
12	90 Deg. Strain Relief	1	VM4090
13	30 Amp Breaker/Switch	1	VM4155
14	50 Amp. Alligator Clip	2	VM4157
15	Positive Alligator Clip Cover (Red)	1	VM4158
16	Negative Alligator Clip Cover (Black)	1	VM4159

SUBASSEMBLY # - G415

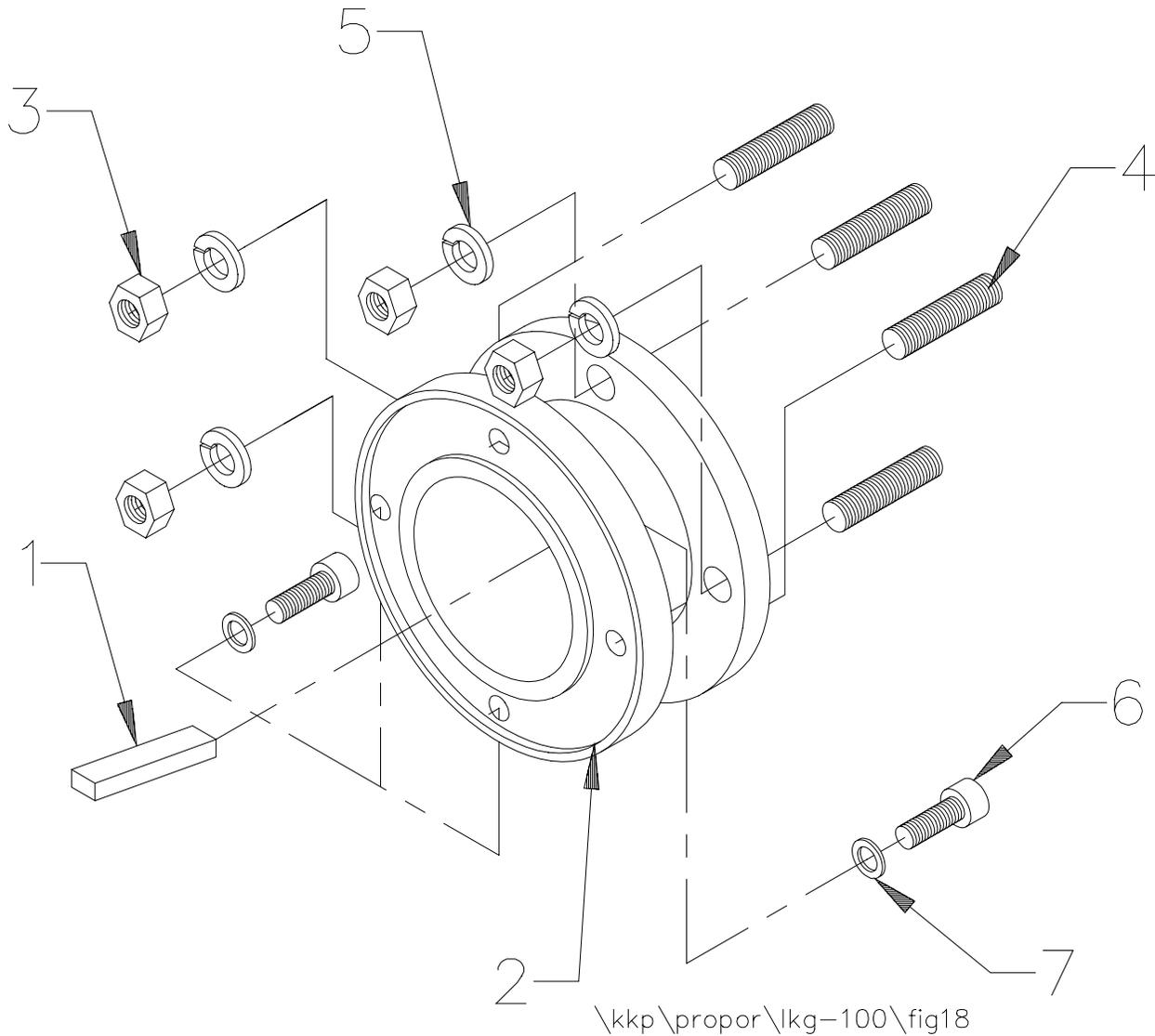
**FIGURE 16 - PORTABLE ELECTRIC OPTION - CORD ASSEMBLY**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	QC Cap	1	G264
2	4 Cycle Kawasaki Engine	1	G364
3	Pump Subassembly	1	G430
4	4-Cycle/Pump Connection Kit	1	G441
5	General Bracket/Inlet Subassembly	1	G460
6	4-Cycle Literature Pack	1	G474
8	Portable Base Plate Kit	1	G490
9	4-Cycle Instruction Label	1	GL014
10	4-Cycle Information Pack	11	LKG-450
11	1/2" QC X 1/2" MNPT Nipple	1	VFNN4QX4M
12	1/2" FNPT X 3/8" FNPT Coupling	1	VFRC4FX3F
13	.172-8 Green Vinyl Tip	1	VM1040
14	.375-14 Blue Vinyl Tip	1	VM1060
15	1/4" ID Clear Vinyl Tube	6	VM4265
16	5/16-18 X 1 1/4 Hex Bolt	4	VT31-18HX1.2
17	5/16-18 SS Nut	4	VT31-18NT
18	M8-1.25 X 10 MM Hex Bolt	2	VTM8-HX10
19	5/16" SS Washer	8	VW31SS

SUBASSEMBLY # - G94000

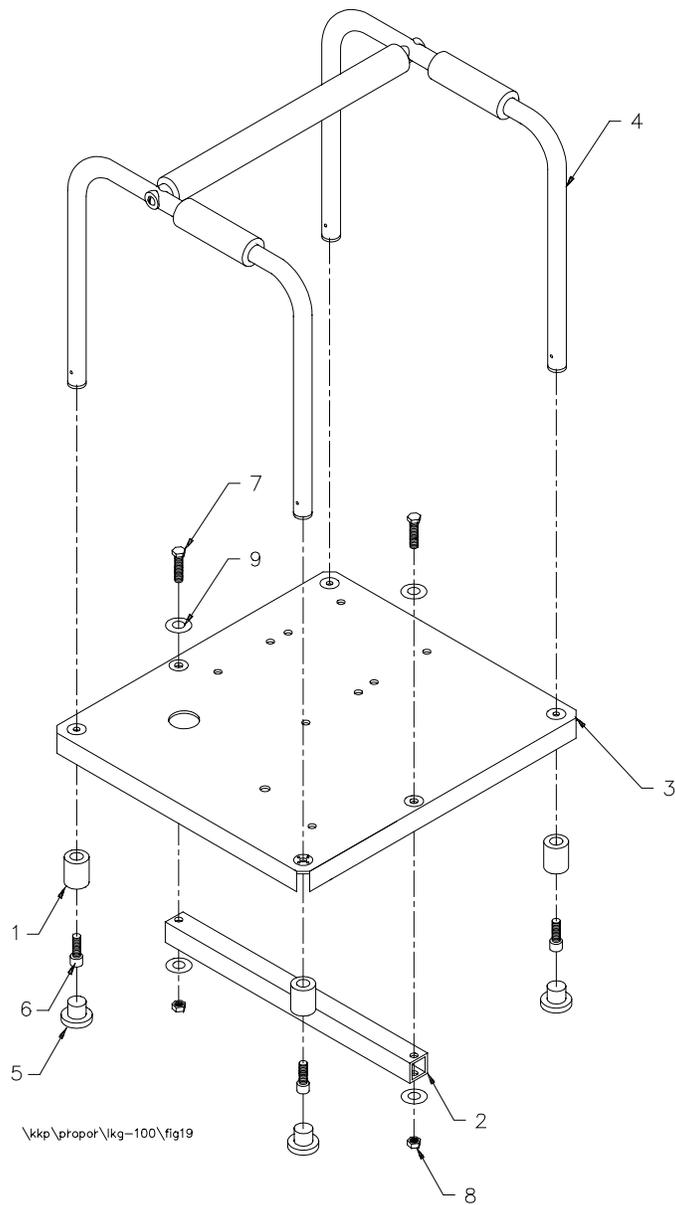
**FIGURE 17 - 4-CYCLE OPTION**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	Key	1	G367
2	Motor Flange ZFWWS	1	G372
3	5/16-24 Stainless Steel Nut	4	VT31-24NT
4	5/16-24 X 1 1/4 SS Stud	4	VT31-24SD1.2
5	5/16 Stainless Lock Washer	4	VW31SSLOCK
6	M6X18 SS Socket Head Bolt	4	-
7	M6 Stainless Lock Washer	4	-

SUBASSEMBLY # - G441

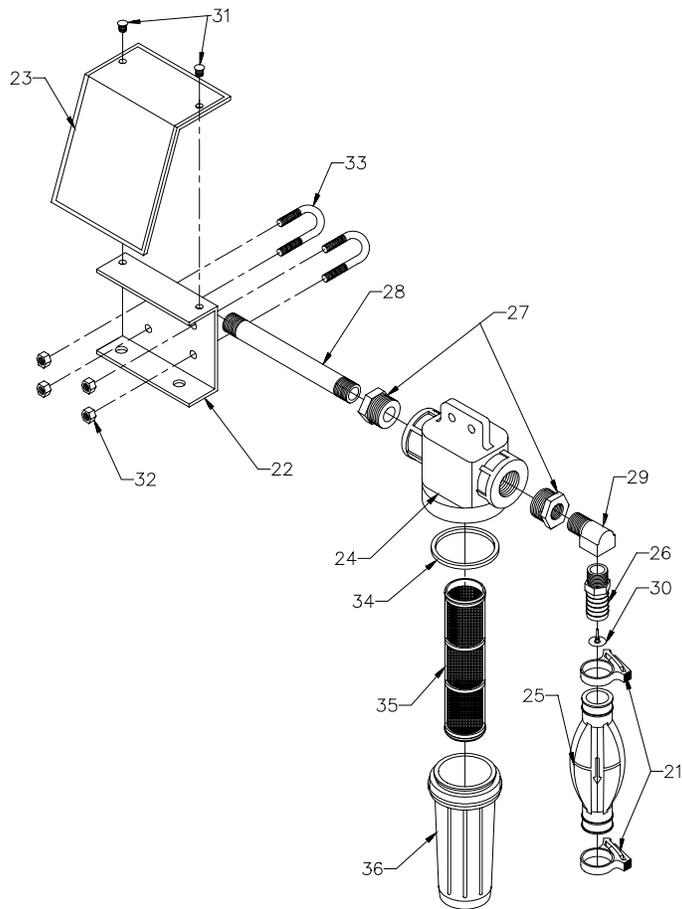
**FIGURE 18 - 4-CYCLE/PUMP CONNECTION KIT**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	Base Feet	4	G227
2	Stiffener	1	G230
3	Portable Base Plate	1	G354
4	Handle Subassembly	1	G435
5	Rubber Base Feet	4	VM4285
6	1/4-20 X 7/8 SHCS, SS	4	VT25-20SH875
7	5/16-18 X 1 1/2 Hex Bolt	2	VT31-18HX1.5
8	5/16-18 SS Nut	2	VT31-18NT
9	5/16\" SS Washer	4	VW31SS

SUBASSEMBLY # - G490

**FIGURE 19 - PORTABLE BASE ASSEMBLY**

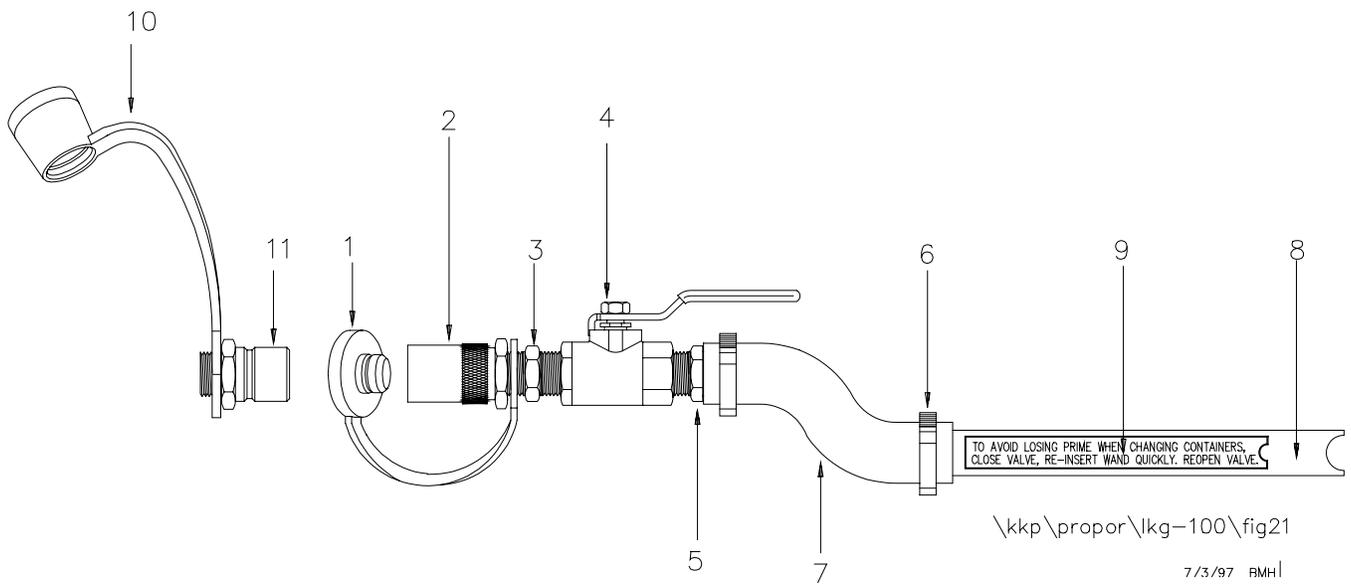


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REF	DESCRIPTION	QTY	ORDER NUMBER
21	M62 Plastic Hose Clamp	2	G247
22	Bracket	1	G273
23	Sign Plate	1	G274
24	3/4" Filter Head	1	G275
25	Primer Bulb	1	G295
26	Bulb End	1	G296
27	3/4" MNPT X 3/8 FNPT Hex Bushing	2	VFHB6MX3F
28	3/8" NPT X 6" Nipple	1	VFLN3MX6.0
29	3/8" FNPT X 3/8" MNPT Ell	1	VFSL3FX3M
30	Valve Umbrella	1	VM4290
31	6-32 X 1/4" Button Head	2	VT06E32BH250
32	1/4-20 Stainless Steel Nuts	4	VT25-20NT
33	1/4-20 U-Bolt 3/4" Between Legs	2	VT25-20UB750
34	2" ID X 1/8 C/S	1	VO-226
35	CP16903-4-SSPP Filter Screen	1	G277
36	CP15403-PP Filter Bowl	1	G276

SUBASSEMBLY # - G460

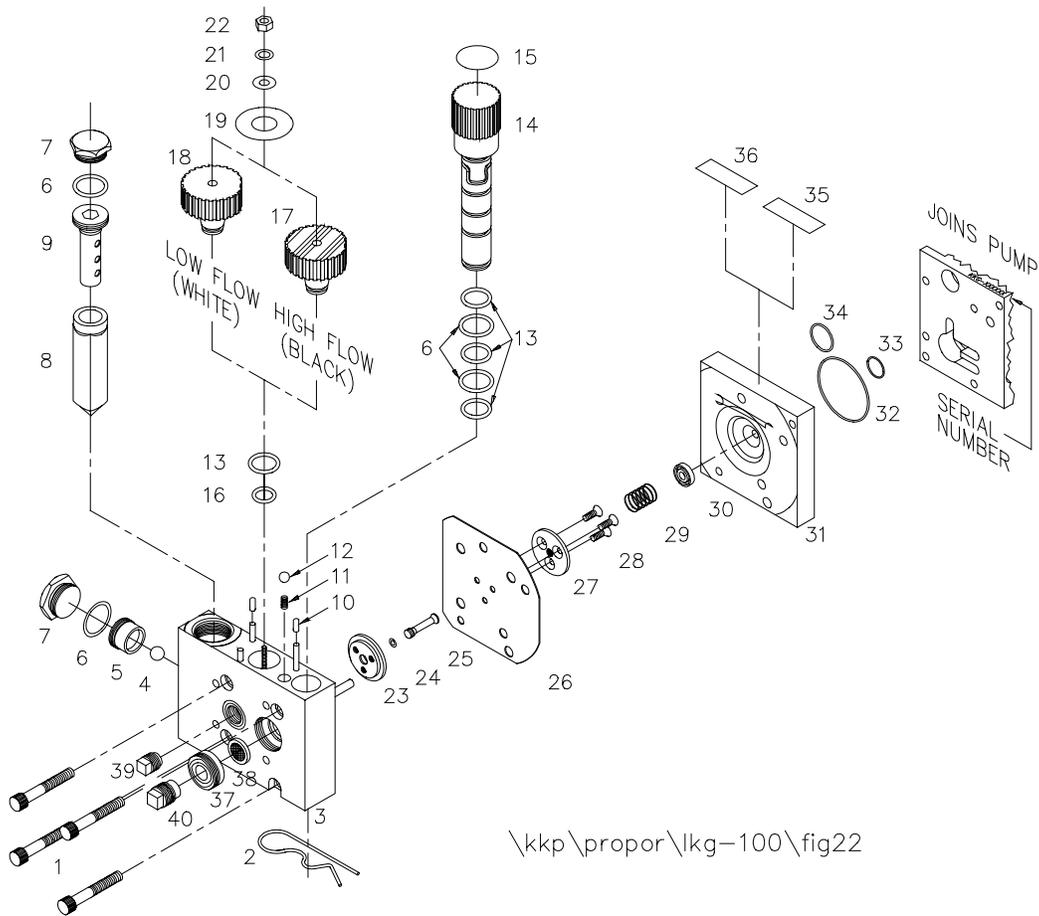
**FIGURE 20 - GENERAL BRACKET/INLET SUBASSEMBLY**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	QC Plug	1	G263
2	½ QC Socket X ½ FNPT	1	VFAA4QX4F
3	½" X ½" MNPT Hex Nipple	1	VFHN4MX4M
4	½" X ½" FNPT Valve	1	G253
5	¾" Barb X ½" MNPT Nipple	1	VFNN6BX4M
6	63012 #12 Hose Clamp	2	G246
7	¾" ID Vardex Tubing	84	G292
8	Wand Label	1	GL070
9	PRO/portioner Wand	1	G205
10	QC Cap	1	G264
11	½" QC X ½" MNPT Nipple	1	VFNN4QX4M

SUBASSEMBLY # - G9000W

## FIGURE 21- WAND SUPPLY SYSTEM

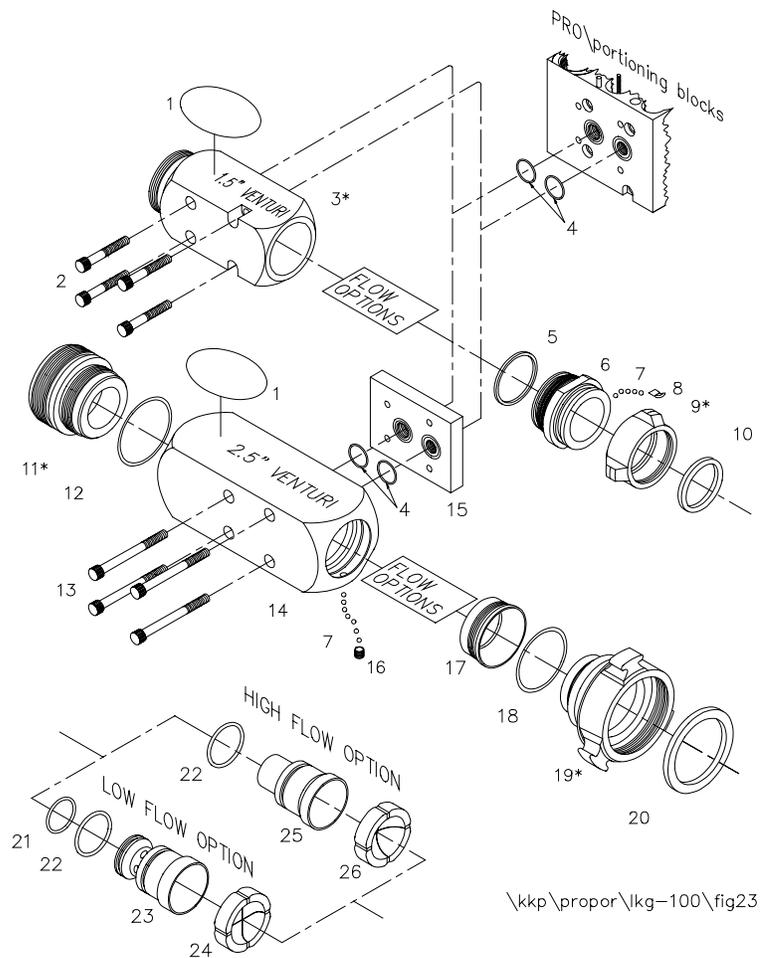


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REF	DESCRIPTION	QTY	ORDER NUMBER
1	5/16-18X2 SHCS	4	VT31-18SH2.0
2	Bridge Pin	1	VM4255
3	Thick Block	1	G110
4	½" Polypropylene Ball	1	VB500PE
5	Check Ring	1	G198
6	O-Ring-119	4	VO-119
7	Top Cap	2	G190
8	Pulsation Prism	1	G196
9	Distributor Rod	1	G194
10	.125-8 Red Vinyl Tip	2	VM1030
11	Spring #C0180-032-0310-S	1	VM4195
12	3/16" Ball 302 SS	1	V2120
13	O-Ring-115	4	VO-115
14	Flush Stem	1	G145
15	Foam,Flush,Prime Label	1	GL025
16	O-Ring-111	1	VO-111
17	High Flow Valve Stem (Black)	1	G151
18	Low Flow Valve Stem (White)	1	G152
19	Percentage Label	1	GL020
20	¼" Flat Washer	1	VW687X281-50

REF	DESCRIPTION	QTY	ORDER NUMBER
21	¼ X .500 X .002 SS Spring	1	VW250BELVIL
22	¼-28 Stop Nut	1	VT25-28NTAN
23	Diaphragm Disc	1	G162
24	O-Ring-007	1	VO-007
25	Knuckle	1	G163
26	Diaphragm	1	G125
27	Control Valve	1	G160
28	10-24 X 3/8 Flat Socket	3	VT10-24FH375
29	Diaphragm Spring	1	VM5015
30	Valve Seat	1	G161
31	Thin Block	1	G115
32	O-Ring-031	1	VO-031
33	O-Ring-019	1	VO-019
34	O-Ring-025	1	VO-025
35	5-80 GPM Label	1	GL041
36	25-250 GPM Label	1	GL042
37	Filter Nut	1	G192
38	Filter Washer	1	MS730
39	Plastic Caplug #P-28	1	VM1016
40	Plastic Caplug #P-38	1	VM1017

**FIGURE 22 - PORPORTIONING BLOCKS**

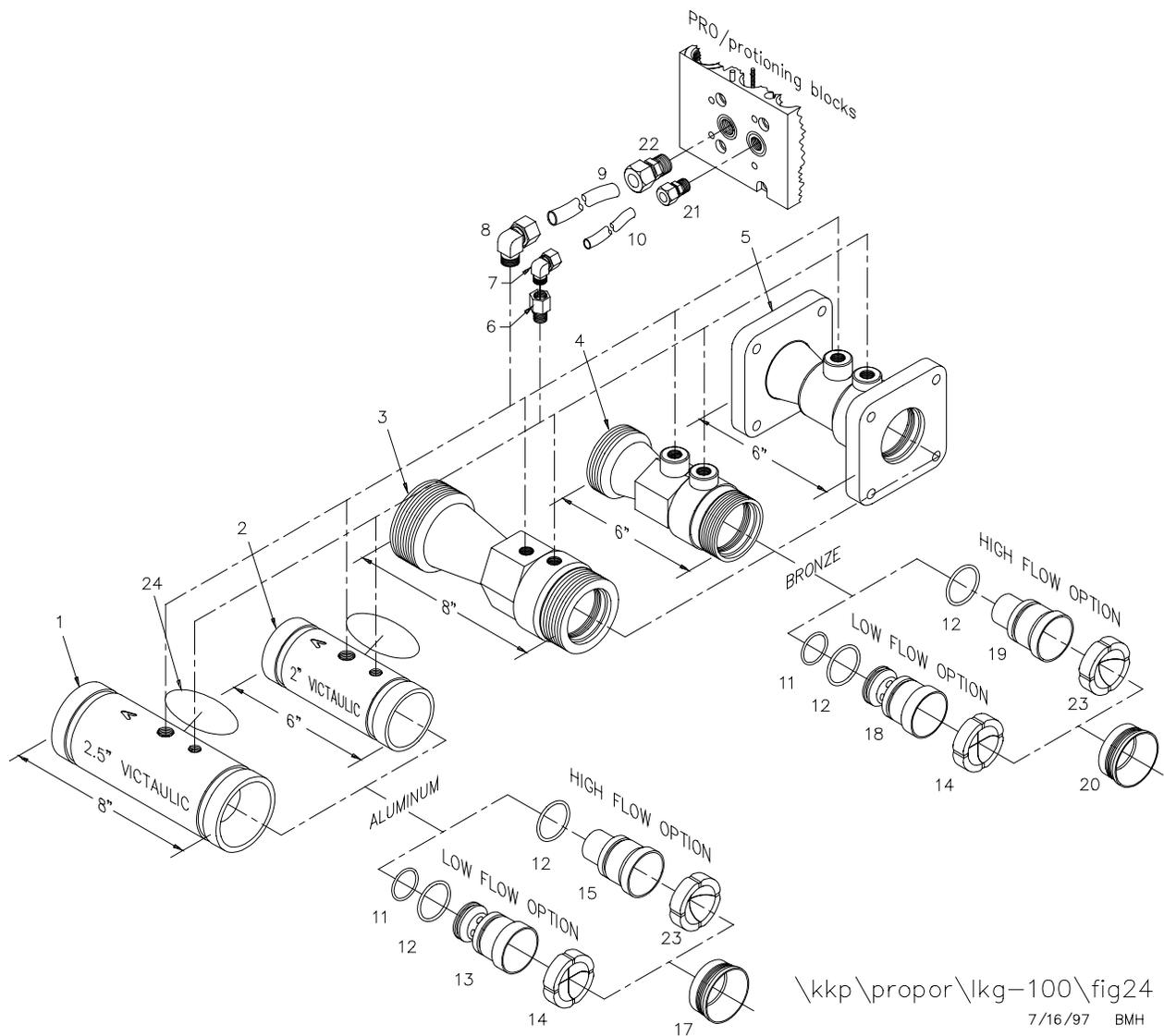


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REF	DESCRIPTION	QTY	ORDER NUMBER
	<b>1.5 VENTURI</b>		
1	Oval PRO/portioner Logo	1	GL050
2	5/16-18 x 29 SHCS	4	VT31-18SH2.0
3	1.5 Venturi*	1	G130*
4	O-Ring-019	2	VO-019
5	O-Ring-132	1	VO-132
6	Tail Piece	1	G133
7	3/16" SS Ball	34/36	VB187SS
8	Port Plug	1	B770
9	1.5 Rocker Coupling *	1	F10097*
10	1.5 Hose Gasket	1	V3130
	<b>2.5 VENTURI</b>		
11	2.5 Front Ring*	1	G127*
12	O-Ring-143	1	VO-143
13	5/16-18 X 3.5" SACS	4	VT31-18SH3.5

REF	DESCRIPTION	QTY	ORDER NUMBER
14	2.5 Venturi	1	G126
15	3/4" Spacer Block	1	G124
16	1/4-28 X 1/4 Socket Set	1	VT25-28SS250
17	Back Ring	1	G123
18	O-Ring-140	1	VO-140
19	2.5 Rocker Coupling *	1	J14097
20	2.5 Coupling Gasket	1	V3190
	<b>FLOW OPTIONS</b>		
21	O-Ring-124	1	VO-124
22	O-Ring-126	1	VO-126
23	Low Flow Venturi Insert	1	G131
24	Low Flow Heart Valve	1	G141
25	High Flow Venturi Insert	1	G132
26	High Flow Heart Valve	1	G142

**FIGURE 23 - DIRECT CONNECTION AND FLOW OPTION**

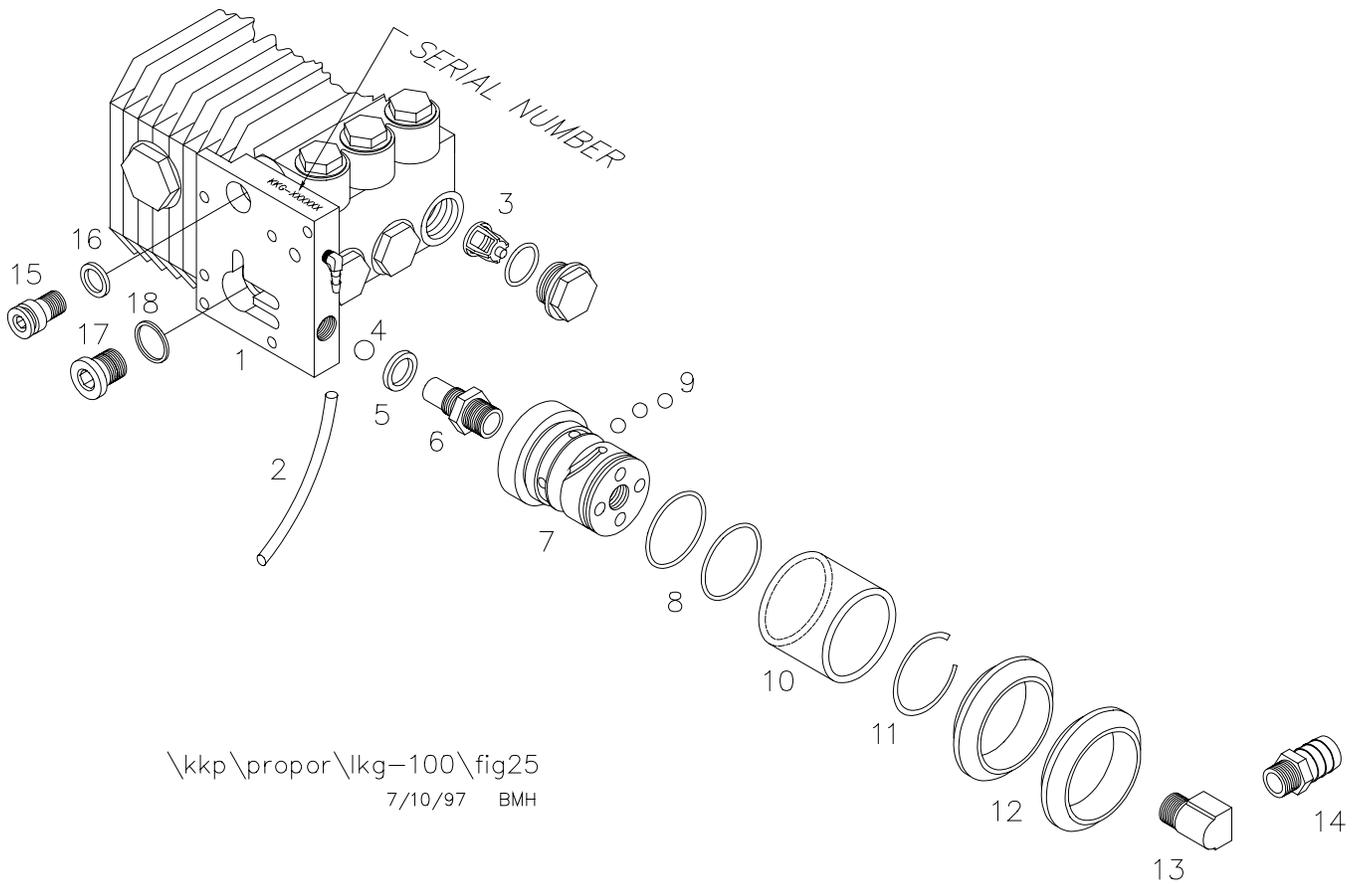


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REF	DESCRIPTION	QTY	ORDER NUMBER	REF	DESCRIPTION	QTY	ORDER NUMBER
1	2.5 Victaulic Venturi (Aluminum)	1	G128	11	O-Ring-124	1	VO-124
2	2.0 Victaulic Venturi (Aluminum)	1	G129	12	O-Ring-126	1	VO-126
3	2.5 Venturi (Bronze)	1	G585	13	Low Flow Venturi Insert (Aluminum)	1	G131
4	2" NPT Venturi	1	G580	14	Heart Valve - Low Flow	1	G141
5	Flanged Venturi (Bronze)	1	G588	15	High Flow Venturi Insert (Aluminum)	1	G132
6	1/4" FNPT X 1/4" MNPT Adapter	1	VFAA2FX2M	17	Back Ring	1	G123
7	3/8" Tube X 1/4" MNPT Elbow	1	VFLL3PX2M	18	Low Flow Venturi Insert (Bronze)	1	G131-642
	3/8" Tube X 1/4" MNPT Adapter	1	VFAA3PX2M	19	High Flow Venturi Insert (Bronze)	1	G132-642
8	1/2" Tube X 3/8" MNPT Elbow	1	VFLL4PX3M	20	Back Ring (Bronze)	1	G123-642
	1/2" Tube X 3/8" MNPT Adapter	1	VFAA4PX3M	21	1/4" Straight Fitting	1	VFLL3PX2M
9	NNR-8-062 Natural Nylon	72 in.	VM4325	22	3/8" Straight Fitting	1	VFAA4PX3M
10	NNR-6-048 Natural Nylon	72 in.	VM4330	23	Heart Valve - High Flow	1	G142
				24	Pro/portioner Logo Label	1	GL050

**FIGURE 24 - REMOTE CONNECTION AND FLOW OPTIONS**



REF	DESCRIPTION	QTY	ORDER NUMBER
1	Tee Block	1	G120
2	¼" I.D. Tube (Inches)	6	VM4265
3	Pump Check Kit (6 Pcs.)	1	G106
4	½" Polypropylene	1	VB500PE
5	Check Cap Seal	1	G170
6	Ball Seat	1	G185
7	Spinner	1	G240
8	O-Ring-130	2	VO-130
9	3/8" Polyethylene Ball	1	VB375PE
10	Spinner Window	1	G261
11	Smalley Ring	1	VR4235
12	Glass Bumper	2	G262
13	3/8" FNPT X 3/8" MNPT EII	1	VFSL3FX3M
14	¾" Barb X 3/8" MNPT	1	VFNN6BX3M
15	Small Bolt	1	G140
16	O-Ring-019	1	VO-019
17	Big Bolt	1	G135
18	O-Ring-025	1	VO-025

PARTS 7-14 SUBASSEMBLY # G450 - SPINNER

**FIGURE 25 - SPINNER AND RELATED PARTS**

**Task Force Tips**  
(800) 348-2686

**PRO/portioner**  
Foam Injection System

		WATER FLOW, GPM											
		5	10	25	50	75	100	125	150	175	200	225	250
DESIRED RATIO	.1%	1000	500	250	100	72	50	42	34	30	25	22	20
	.2%	500	250	100	50	34	25	20	16	15	12	11	10
	.3%	330	170	72	34	22	16	14	11	9.5	8.5	7.5	6.5
	.4%	250	130	50	25	16	12	10	8.5	7	6.5	5.5	5
	.5%	200	100	42	20	14	10	8	6.5	5.5	5	4.5	4
	.6%	170	83	34	16	11	8.5	6.5	5.5	5	4		
	.7%	140	70	30	15	9.5	7	5.5	5	4			
	.8%	120	62	25	12	8.5	6.5	5	4				
	.9%	110	56	22	11	7.5	5.5	4.5					
	1.0%	100	50	20	10	6.5	5	4					

TIME TO EMPTY 5 GALLON SUPPLY, MINUTES

		WATER FLOW, GPM											
		5	10	25	50	75	100	125	150	175	200	225	250
DESIRED RATIO	.1%	1600	800	400	160	110	80	67	53	47	40	36	32
	.2%	800	400	160	80	53	40	32	27	23	20	18	16
	.3%	530	270	110	53	36	27	22	18	15	13	12	11
	.4%	400	200	80	40	27	20	16	13	12	10	9	8
	.5%	320	160	67	32	22	16	13	11	9	8	7	6.5
	.6%	270	130	53	27	18	13	11	9	7.5	7		
	.7%	230	110	47	23	15	12	9	7.5	6.5			
	.8%	200	100	40	20	13	10	8	6.5				
	.9%	180	90	36	18	12	9	7					
	1.0%	160	80	32	16	11	8	6.5					

TIME TO EMPTY 8 GALLON SUPPLY, MINUTES

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**FIGURE 26 - CONCENTRATE USAGE CHART**

LKG-100  
December 11, 1998 Rev 7