



# ***HELI-PUMP*** **OPERATIONS** **MANUAL**

*2021 VERSION G*

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## **HELI-PUMP OPERATIONS MANUAL - Version G**

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**PLEASE READ BEFORE USING.**

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***We Engineer Solutions***

**2021 Heli-Pump Operations Manual (Version G)**

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## Section 1: Heli-Pump Overview

### Introduction

#### Description of Pump Systems

Designed for military special forces and adapted for civilian helicopter operators, the Heli-Pump is a complete turnkey electric aviation fuel pumping system in a compact package. Designed for rapid deployment, Heli-Pumps can distribute fuel from SEI's collapsible bladder tanks or Fuel-Easy container as well as steel tanks or drums.

With a variety of models to choose from, the Heli-Pump is powered by a helicopter's DC system. Ideal for remote site operations, the Heli-Pump fits inside the cargo area of most helicopters. The Heli-Pump series includes models that use 24VDC, one model that uses 110 or 230 VAC and two models that use 12 VDC (including one that is a marine version). Most models offer single-stage filtration while one model offers dual-stage filtration.



*Slimline pump (not in carrying case).*

#### Features and Options

- Small, lightweight package.
- Transportable and storable.
- Complete aviation refuelling system.
- Optional Fuel-Easy camlock adapter kit.
- Optional Electrical plug connection (customer must provide specs).

#### Available Models

- PSHR Slimline: 15 USGPM (57 LPM) 10 amps 24 VDC (Part # 003530)
- PSHR 1210 Heli-Pump: 11 USGPM (40 LPM) 18 amps 12 VDC (Part # 003595)
- PSHR 2410 Heli-Pump 11 USGPM (40 LPM) 10 amps 24 VDC (Part # 003594)
- PSHR 2420 Heli-Pump: 20 USGPM (75 LPM) 20 amps 24 VDC (Part # 003687)
- PSHR 2420-2 Heli-Pump: 20 USGPM (75 LPM) 20 amps 24 VDC (Part # 009923)
- PSHR 23020 Heli-Pump AC: 20 USGPM (75 LPM) 2.3 amps 230 VAC (Part # 003687A)
- PSHR 11020 Heli-Pump AC: 20 USGPM (75 LPM) 4.9 amps 110 VAC (Part # 003687B)
- PSD 688 Maritime Pump: 10 USGPM (37 LPM) 10 amps 12 VDC (Part # 006647)

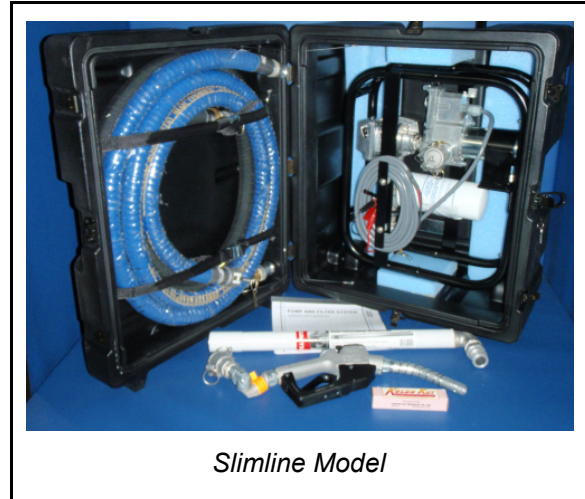


## Model Specifications

### Model Slimline Pump, Part # 003530

#### Standard Equipment List

1. 15 USGPM (57 LPM) 24 VDC, 10 AMP electric pump.
2. Replaceable absorbent cartridge filter
3. Leak-proof hard carrying case with lock.
4. 12 ft. of 1" discharge hose with nozzle.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connect to 24V supply).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.



*Slimline Model*

| Heli-Pump Slimline Dimensions |              |              |
|-------------------------------|--------------|--------------|
| W<br>in (cm)                  | L<br>in (cm) | H<br>in (cm) |
| 18 (46)                       | 21 (53)      | 8 (20)       |

| Dry Weight<br>lb (kg) |
|-----------------------|
| 21 (9)                |

| Voltage |
|---------|
| 24 VDC  |

| Heli-Pump Slimline Carrying Case |              |              |
|----------------------------------|--------------|--------------|
| W<br>in (cm)                     | L<br>in (cm) | H<br>in (cm) |
| 30 (76)                          | 33 (88)      | 16 (41)      |

| Weight<br>lb (kg) |
|-------------------|
| 88 (40)           |

| Amps |
|------|
| 10   |

#### Applications

Aviation Refuelling: Commercial and Military

**Model PSHR 1210 Heli-Pump, Part # 003595****Standard Equipment List**

1. 11 USGPM (40 LPM) 12 VDC, 18 AMP electric pump.
2. Dispensing nozzle.
3. Drum suction tube.
4. 12 ft. of 1" discharge hose, with nozzle.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connection to 12 volt supply).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.

*PSHR 1210 Model***Applications**

Aviation Refuelling: Commercial and Military

| Heli-Pump<br>Dimensions |              |              |
|-------------------------|--------------|--------------|
| W<br>in (cm)            | L<br>in (cm) | H<br>in (cm) |
| 18 (46)                 | 21 (53)      | 8 (20)       |

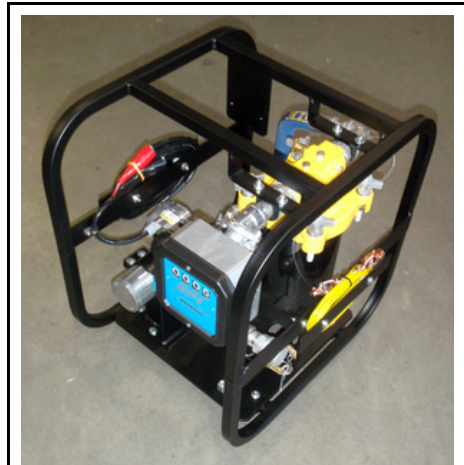
| Dry Weight<br>lb (kg) |
|-----------------------|
| 78 (35)               |

| Voltage |
|---------|
| 12 VDC  |

| Amps |
|------|
| 18   |

**Model PSHR 2410 Heli-Pump, Part # 003594****Standard Equipment List**

1. 11 USGPM (40 LPM) 24 VDC, 10 AMP electric pump.
2. Dispensing nozzle.
3. Drum suction tube.
4. 12 ft. of 1" discharge hose, with nozzle.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connect to 24V supply).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.

*PSHR 2410 Model***Applications**

Aviation Refuelling: Commercial and Military

| Heli-Pump<br>Dimensions |              |              |
|-------------------------|--------------|--------------|
| W<br>in (cm)            | L<br>in (cm) | H<br>in (cm) |
| 19 (48)                 | 23 (58)      | 24 (61)      |

| Dry Weight<br>lb (kg) |
|-----------------------|
| 78 (35)               |

| Voltage |
|---------|
| 24 VDC  |

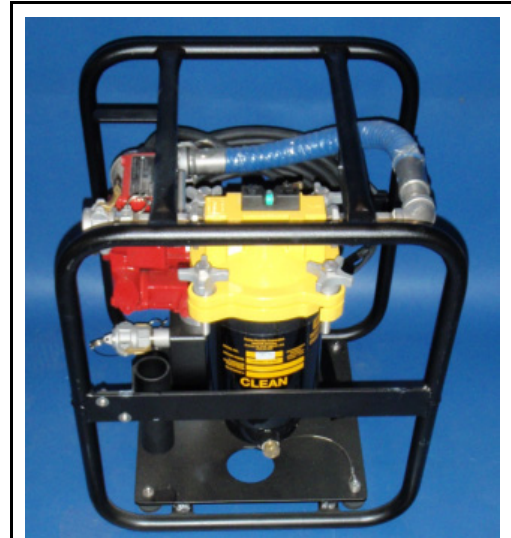
| Amps |
|------|
| 10   |



**Model PSHR 2420 Heli-Pump, Part # 003687**  
 (With single stage filter)

**Standard Equipment List**

1. 20 USGPM (75 LPM) 24 VDC, 20 AMP electric pump.
2. Dispensing nozzles
3. Drum suction tube.
4. 12 ft. of 1" discharge hose, with nozzle.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connect to 24V supply).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.



*PSHR 2420 Model*

**Applications**

Aviation Refuelling: Commercial and Military

| Heli-Pump Dimensions |              |              |
|----------------------|--------------|--------------|
| W<br>in (cm)         | L<br>in (cm) | H<br>in (cm) |
| 18 (46)              | 20 (51)      | 23 (58)      |

| Dry Weight<br>lb (kg) |
|-----------------------|
| 112 (50)              |

| Voltage |
|---------|
| 24 VDC  |

| Amps |
|------|
| 20   |

**Model PSHR 2420-2 Heli-Pump, Part # 009923**  
*(With two stage filtration)*

**Standard Equipment List**

1. 20 USGPM (75 LPM) 24 VDC, 20 AMP electric pump.
2. Dispensing nozzle.
3. Drum suction tube.
4. 12 ft. of 1" discharge hose.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connect to 24V supply).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.



*PSHR 2420-2 Model*

**Applications**

Aviation Refuelling: Commercial and Military.

| Heli-Pump<br>Dimensions |              |              |
|-------------------------|--------------|--------------|
| W<br>in (cm)            | L<br>in (cm) | H<br>in (cm) |
| 19 (48)                 | 32 (81)      | 24 (61)      |

| Dry Weight<br>lb (kg) |
|-----------------------|
| 136 (62)              |

| Voltage |
|---------|
| 24 VDC  |

| Amps |
|------|
| 20   |

**Model PSHR 23020 Heli-Pump AC, Part # 003687A**  
 (With single stage filtration)

**Standard Equipment List**

1. 20 USGPM (75 LPM) 230 VAC, 2.3 AMP electric pump.
2. Dispensing nozzle.
3. Drum suction tube.
4. 12 ft. of 1" discharge hose.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connection to 220 receptacle).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.



**Applications**

Aviation Refuelling: Commercial and Military

| Heli-Pump AC<br>Dimensions |              |              | Dry Weight<br>lb (kg) |
|----------------------------|--------------|--------------|-----------------------|
| W<br>in (cm)               | L<br>in (cm) | H<br>in (cm) | 116 (52)              |
| 18 (46)                    | 20 (51)      | 23 (58)      |                       |
|                            |              |              | Voltage               |
|                            |              |              | 230 VAC               |
|                            |              |              | Amps                  |
|                            |              |              | 2.3                   |

**Model PSHR 11020 Heli-Pump AC, Part # 003687B**  
 (With single stage filtration)

**Standard Equipment List**

1. 20 USGPM (75 LPM) 110 VAC, 4.9 AMP electric pump.
2. Dispensing nozzle.
3. Drum suction tube.
4. 12 ft. of 1" discharge hose.
5. 12 ft. of 1" suction hose with camlocks.
6. Totalizing flow meter.
7. Camlock connection drum stub.
8. 20 ft. grounding wire.
9. 20 ft. of electric cable (connection to 110 receptacle).
10. Powder-coated aluminium roll cage.
11. Water detection paste.
12. Run time: 30 minutes on and 30 minutes off.



**Applications**

Aviation Refuelling: Commercial and Military

| Heli-Pump AC<br>Dimensions |              |              |
|----------------------------|--------------|--------------|
| W<br>in (cm)               | L<br>in (cm) | H<br>in (cm) |
| 18 (46)                    | 20 (51)      | 23 (58)      |

| Dry Weight<br>lb (kg) |
|-----------------------|
| 116 (52)              |

| Voltage |
|---------|
| 110 VAC |

| Amps |
|------|
| 4.9  |

**Model PSD 688 Maritime Pump, Part # 006647****Standard Equipment List**

1. 10 USGPM (37 LPM) 12 VDC, 12 AMP electric pump.
2. Replaceable absorbent cartridge filter
3. Leak-proof hard carrying case.
4. 8 ft. of 1" suction hose with camlocks.
5. Totalizing flow meter.
6. 20 ft. grounding wire.
7. 20 ft. of electric cable.
8. Powder-coated aluminium mounting plate.
9. Run time: 30 minutes on and 30 minutes off.

*PSD 688 Model***Applications**

Marine re-fuelling: Commercial and Military

| Heli-Pump<br>Dimensions |              |              |
|-------------------------|--------------|--------------|
| W<br>in (cm)            | L<br>in (cm) | H<br>in (cm) |
| 19 (48)                 | 32 (81)      | 24 (61)      |

| Dry Weight<br>lb (kg) |
|-----------------------|
| 136 (62)              |

| Voltage |
|---------|
| 12 VDC  |

| Amps |
|------|
| 12   |



## Section 2: Pump Safety

### Safety Procedures

#### *Installation*

- Provide adequate ventilation. Do not operate in an explosive atmosphere.
- Prohibit smoking and open flames.
- Keep fire extinguishers and/or other fire fighting equipment close by.
- Ground the pump to eliminate electrostatic build-up by the liquid being pumped.
- Ensure all pipes and hoses are securely connected and free of leaks. The arms of cam-lock fittings should be secured to prevent loosening.
- Inspect external pump wiring regularly to make sure it is correctly attached to the power source. To avoid electrical shock or sparks, use extra care when connecting the pump to power.

#### *Operation*

- Shut the motor off if the pump fails to prime within two minutes and check the suction lines for leaks. Check that all discharge valves are open.
- Do not operate the pump against a closed discharge valve for long periods.
- Do not attempt to pump water or corrosive materials. The Heli-Pump was designed to handle petroleum products only.
- Shut down an overheated pump immediately.
- Observe precautions against electrical shock or sparks when operating the system. Serious or fatal shock can result from operating electrical equipment in damp or wet locations.
- Avoid prolonged skin contact with petroleum fuels. Use protective goggles, gloves, and aprons in case of splashing or spills. Change saturated clothing and wash skin promptly with soap and water.
- Do not pump the tank completely dry as contaminants from the bottom of the tank may enter the pump.
- To avoid pump damage, do not run the pump for more than 10 minutes with the nozzle closed.

**Service**

- Familiarize yourself with the applicable manuals before servicing.
- Always allow the pump to cool before servicing. Do not remove fittings from an overheated pump as vapor pressure within the pump may cause parts being removed to be ejected with great force.
- Drain the pump before servicing. Do not drain fuel on to the ground. Drain into a container which can be closed.
- Use non-sparking tools.
- Observe precautions against electrical shock or sparks when servicing the pump. Always disconnect power before repairing or servicing. Never apply electrical power to the system when any of the cover plates are removed.

## Section 3: Pump Operations

### 12/24 VDC and 110/230 VAC Operations

Before refuelling, the pump skid and the aircraft must be properly grounded. Proper grounding means continuous metal to metal contact between the pump skid and the aircraft or power supply.

To turn the pump on, use the switch at the top of the pump motor.

The pump will self-prime dry to a height of 150 cm. Once the pump is primed, it should lift up to a maximum suction height of five meters, depending on pump specifications. If the pump fails to prime, refer to *Section 4* of this manual for priming procedure.

#### Important Note

**Do not run the pump dry.** If the pump does not begin to deliver fuel within two minutes after turning the pump on and opening the nozzle, turn the pump off and check for air leaks in the suction line.

#### Caution

**The duty cycle of the pump is 30 minutes on and 30 minutes off.** After pumping for a maximum of 30 minutes, turn the pump off and allow it to cool for 30 minutes before pumping again.

When starting a new unit or one that has been idle for a long time, pump fuel back in to the storage tank for several minutes. This will purge all the hoses of air and rinse out any contamination which may have entered the system during storage or transport.

**Dispensing Fuel**

1. Turn the pump on.
2. Insert the nozzle into the receiving tank or container. Squeeze the handle to start fuel flow.
3. This pump is designed to self-prime. If it does not begin to deliver fuel within two minutes after turning the pump on and opening the nozzle, turn it off. Refer to instructions in *Section 4* of this manual for priming procedure.
4. After dispensing fuel, release the nozzle handle, turn the pump off and return the nozzle to its holder.
5. An automatic bypass valve prevents pressure buildup when the pump is on with the nozzle closed.

**Caution**

To avoid pump damage, do not run the pump for more than ten minutes with the nozzle closed.

**Filter Instructions**

There are two types of filter systems available on Heli-Pump models. One type is an absorptive cartridge and the second type utilizes a filter/separator cartridge.

Filter housings may be fitted with differential pressure gauges. As the filter cartridge becomes contaminated, the pressure on the inlet side of the filter will differ from the outlet side. This is referred to as differential pressure.

For models equipped with differential pressure gauges, replace the filter cartridge when the indicator reaches the "red" area (15 psi).



*Filter Separator*

Both styles of cartridges may also need to be replaced when there is a significant reduction in flow or after one year of service – whichever occurs first. The filter housing should also be frequently checked for any water accumulating in the bottom of the housing.

**Caution**

Do not use absorptive cartridges with pre-mixed fuels containing anti-icing additives.

On canister-type filters, check the bottom of the housings frequently when using fuel containing anti-icing additives. Stagnant water in the bottom of the filter housing can absorb large amounts of anti-icing additives and must be periodically drained off.

**Filter Safety Precautions**

- Do not drain fuel on to the ground. Drain into a container which can be closed.
- Have trays and absorbent materials available in case of a spill.
- Wear rubber gloves when replacing cartridges as some fuel additives are toxic.
- Fire extinguishers and other fire fighting equipment must be kept close by.
- If tools are required, use only non-sparking tools.
- Rules prohibiting smoking and open flames in the area must be established and strictly enforced.

**Important Note**

Used filter cartridges are a fire hazard. They must be enclosed in a metal or approved fuel container.



## Models Slimline, PSHR 2410 and 1210 Pumps

Slimline, PSHR 2410 and PSHR 1210 pumping systems use pumps with the following specifications:

### *PSHR Slimline*

- 24 VDC, 10 AMPS, 10 USGPM (37 LPM)
- Duty cycle: 30 minutes ON and 30 minutes OFF.
- Motor: 1900 RPM UL Listed, CSA certified.
- Inlet 1"
- Outlet 3/4"

### *PSHR 2410 Heli-Pump*

- 24 VDC, 10 AMPS, 11 USGPM (40 LPM)
- Duty cycle: 30 minutes ON and 30 minutes OFF.
- Motor: 1900 RPM UL Listed, CSA certified.
- Inlet 1"
- Outlet 3/4"

### *PSHR 1210 Heli-Pump*

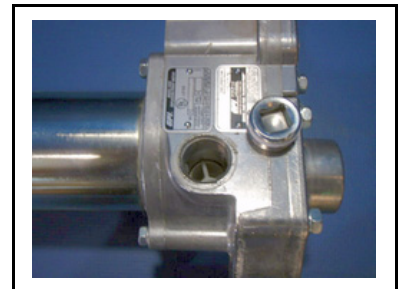
- 12 VDC, 18 AMPS, 11 USGPM (40 LPM)
- Duty cycle: 30 minutes ON and 30 minutes OFF.
- Motor: 1900 RPM UL Listed, CSA certified.
- Inlet 1"
- Outlet 3/4"

## **Priming**

These pumps are designed to self-prime with dry gears. Expect suction lift as follows:

### *Manual Nozzle:*

- 5.5 feet (1.7 m) with diesel
- 6.7 feet (2.1 m) with gasoline



If your installation requires a greater distance from the lowest fuel level to the pump, this pump may not prime until the gears are coated with fluid. To coat the gears, remove the plug on the top of the pump and pour a small quantity of motor oil into the gear cavity. Replace the plug, turn the pump on and open the nozzle.

**Motor Protector***PSHR Slimline*

An inline fuse provides overload protection on the 24-volt models. Follow the instructions in this manual's repair section to replace the fuse.

*PSHR 2410 Heli-Pump*

An inline fuse provides overload protection on the 24-volt models. Follow the instructions in this manual's repair section to replace the fuse.

*PSHR 1210 Heli-Pump*

The motor protector trips automatically. This feature provides added protection against motor damage and must be reset manually.

When the motor protector trips, reset by turning the switch to off. Let the pump cool then turn on again. If the motor protector trips again, see the troubleshooting section of this manual.

**Pump Maintenance**

This pump is designed for minimum maintenance. Motor bearings are sealed and require no lubrication. Inspect the pump and components regularly for fuel leaks and make sure that the hose and power cord are in good condition. Keep the pump exterior clean to help identify leaks. Perform a regular visual inspection of the system (refer to *Section 2* of this manual).

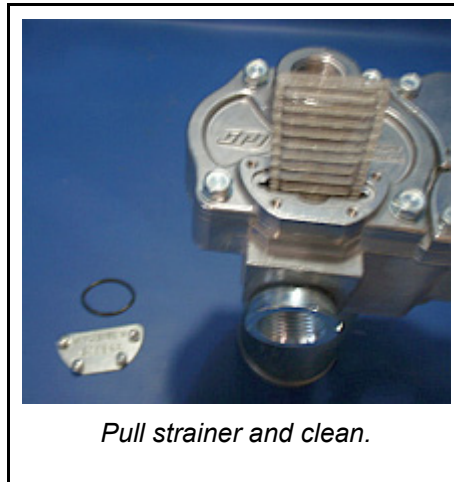
Do not use this pump to pump water, chemicals, or herbicides. Dispensing any fluid other than gasoline, diesel or kerosene fuel will damage the pump. Use of the pump with unauthorized fluids will void the warranty.

Remove and clean the fuel strainer after every 40 hours of operation or if low flow is noticed. To do this, follow the steps outlined below.

1. Turn the pump off and disconnect from its power source.
2. Remove the four Phillips screws from the strainer access coverplate.
3. Remove the inlet strainer and inspect for damage or debris.
4. Clean the strainer with a soft-bristled brush and solvent. If the strainer is very dirty, compressed air may be used. If damaged, replace the strainer.



*Remove four screws and cover.*

**Important Note**

A very dirty strainer can indicate a contaminated fuel tank. Clean the tank, if necessary.

**Warning**

If using solvent to clean pump components or tank, observe the solvent manufacturer's recommendations for safe use and disposal.

5. Clean the cover plate and O-ring. Coat the O-ring lightly with grease.
6. Place the strainer in the cavity.
7. Ensure the cover plate O-ring is properly seated and tighten the strainer access cover plate.



## Models PSHR 2420, 2420-2, 11020 and 23020 Pumps

PSHR 2420, PSHR 2420-2, PSHR 11020 and PSHR 23020 pumping systems use pumps with the following specifications.

### *PSHR 2420 and PSHR 2420-2 Heli-Pumps*

- 24 VDC, 20 AMPS, 20 USGPM (75 LPM)
- Duty cycle: 30 minutes ON and 30 minutes OFF.
- Motor: 2500 RPM UL Listed, 20 amp inline fuse to protect the motor
- Inlet 1"
- Outlet 1"

### *PSHR 11020 Heli-Pump*

- 110 AC, 4.9 AMPS, 20 USGPM (75 LPM)
- Duty cycle: 30 minutes ON and 30 minutes OFF.
- Motor: 1750 RPM UL Listed, CSA certified
- Inlet 1"
- Outlet 1"

### *PSHR 23020 Heli-Pump*

- 230 VDC, 2.3 AMPS, 20 USGPM (75 LPM)
- Duty cycle: 30 minutes ON and 30 minutes OFF.
- Motor: 1750 RPM UL Listed, CSA certified
- Inlet 1"
- Outlet 1"

#### **Important Note**

For more pump information, please refer to the manufacturer's manual in the appendix.

## Model PSD 688 Pump

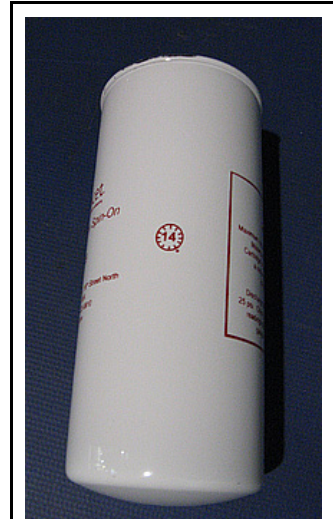
### PSD 688 Maintenance

The filter system uses a spin-on absorptive cartridge. The cartridge absorbs water and provides particulate filtration. As the filter cartridge becomes contaminated, the differential pressure across it will increase and a reduction in flow will occur, indicating that the cartridge must be replaced.

1. Clean inlet strainer after every 50 hours of operation.
2. Remove the pump assembly from its case by removing nuts.

#### Caution

Do not use spin-on absorptive cartridges with pre-mixed fuels containing anti-icing additives.

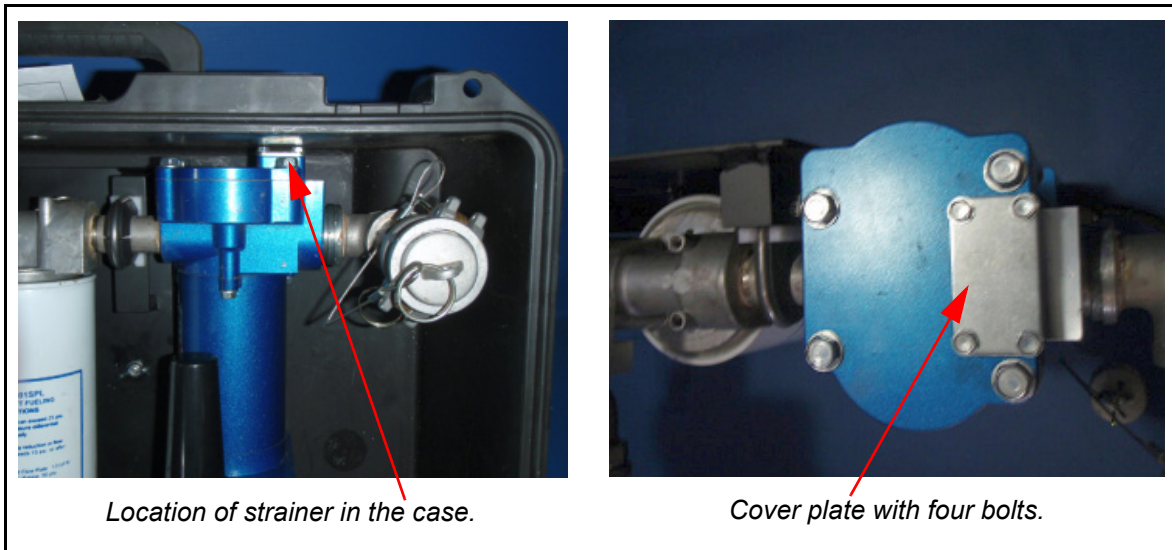


Spin-On Filter

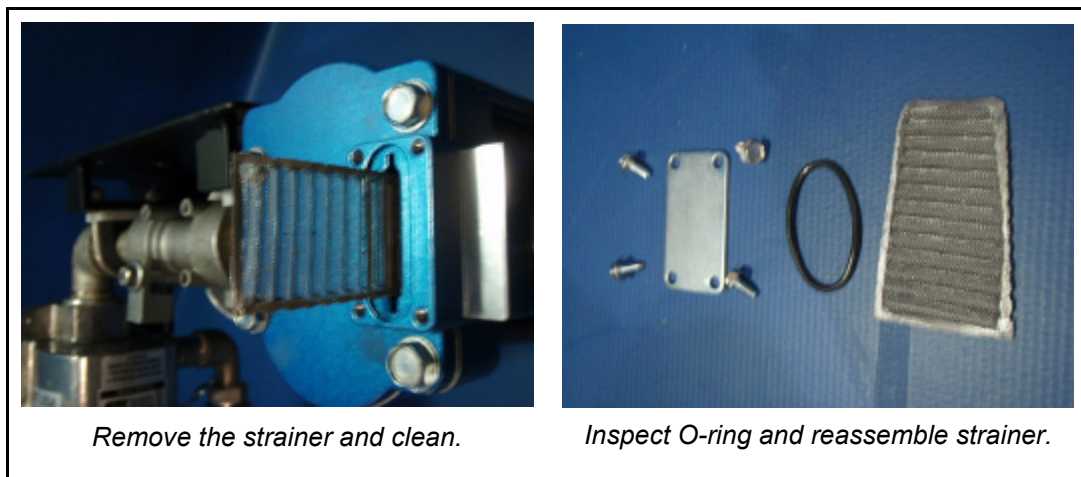




3. To remove the inlet strainer, remove four screws and the strainer cover.



4. Remove and clean the strainer.



5. If strainer is excessively dirty, clean tank to protect the pump and the equipment being fuelled.
6. After cleaning the strainer, replace the strainer and cover. Make sure the cover seal is in place.

#### Important Note

For more pump information, please refer to the manufacturer's manual in the appendix.

## Priming All Pump Systems

All pump models should prime within two minutes after the pump is turned on up to a height of 36 in. (91 mm). Pumps installed at height up to 5 ft. (1.52 m) may have difficulty priming. Follow the procedure below to initiate prime. Pumps installed at suction height above 5 ft. (1.52 m) will have difficulty in holding the prime. It is recommended that a check valve be added to the bottom of the suction tube to help maintain the prime.

If the prime is not achieved in two minutes after turning the pump on, use the following procedure to initiate:

1. Disconnect inlet/supply hose from the pump inlet port.
2. Lay the pump assembly onto its back.
3. Pour fuel to be dispensed into the pump inlet port until completely filled.
4. Re-attach the inlet/supply hose to the inlet port on the pump.
5. Turn on the pump and try to dispense the fuel.
6. If the pump still does not prime, check all connections and hoses for any major restrictions or leaks.
7. If no restrictions or leaks are detected, inspect the pump filter screen and/or filter to ensure that they are not clogged with debris and need to be serviced.
8. If the procedures above have been followed and the pump still fails to prime or dispense fuel, the pump motor may be defective and should be reported to an SEI representative for disposition.



## Section 4: Fuel Meters

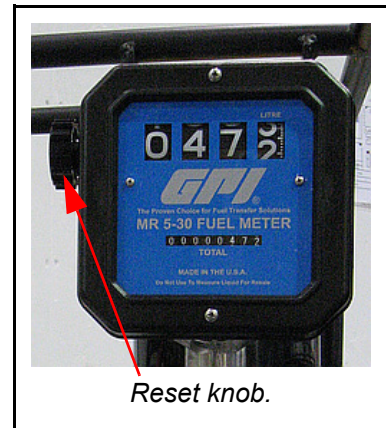
### Operations and Maintenance

PSHR 2410, PSHR 1210 and PSD 688 use a GPI FM 200L series mechanical meter. Measuring in litres is standard but an optional USG PM meter is available.

1. Your meter is designed for use only with thin viscosity petroleum fuels such as diesel fuel, kerosene and gasoline (up to 15% alcohol blends such as E15, M15).
2. Do not use this equipment for dispensing any fluids other than those for which it was designed.

#### Warning

Any components added to your meter, such as the hose, nozzle or pump, must be statically grounded and approved for use with petroleum fuels.



#### Meter Accuracy

The meter has been accurately calibrated at the factory for use with diesel fuel. Due to differences in viscosities and flow rates, calibration may need to be adjusted if other fuels are to be dispensed.

#### Daily Operations

1. Before use, visually check the meter to ensure it is securely fitted to other system components and there is no leakage at connections. If leakage is present, tighten the connection. If the connection is already tight, remove the connection and apply appropriate sealer and re-tighten.
2. Follow safety precautions, wiping any spilled fuel from the exterior of the meter and other system components.
3. The large meter display represents the batch total for each fuel delivery. Before dispensing fuel, reset the batch total to zero by turning the reset knob on the side of the meter counter clockwise.

#### Important Note

The small number display on the bottom of the meter represents the cumulative total of all pump deliveries and cannot be reset.

## Section 5: Filters

### Filter Safety

#### *Safety Precautions*

- Do not drain fuel on to the ground. Drain into an open top container and transfer to a container that can be closed.
- Have trays and absorbent materials available in case of a spill.
- Wear rubber gloves when replacing cartridges as some fuel additives are toxic.
- Be sure that the filter is connected to a suitable ground.
- Fire extinguishers and other fire fighting equipment must be kept close by.
- If tools are required, use only non-sparking tools.
- Rules prohibiting smoking and open flames in the area must be established and strictly enforced.

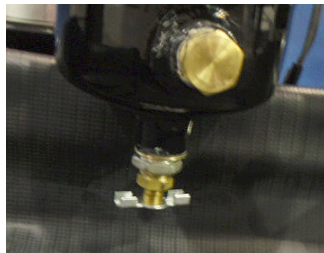
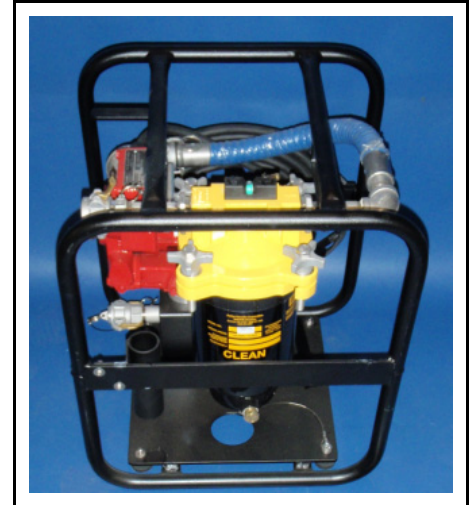
#### **Important Note**

Used filter cartridges are a fire hazard. They must be enclosed in a metal or plastic fuel container.

## Models PSHR 1210, 2420, 11020 and 23020 Filters

PSHR 1210, PSHR 2420, PSHR 11020 and PSHR 23020 pumps are equipped with a single stage Racor filter assembly. The filter housing (with the gauge) contains a filter/separator cartridge. The filter/separator cartridge provides mechanical filtration and separates water from the fuel.

The filter housing should be periodically checked for water accumulating in the bottom of the housing. With the pump turned off, place a container underneath the filter housing and open the drain valve at the bottom of the housing. Drain off any water, and close the valve.

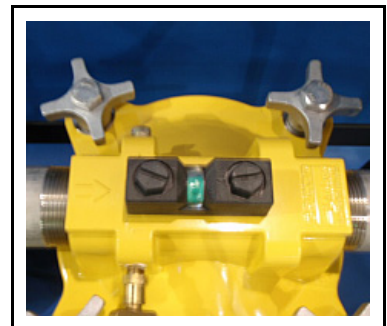


*Drain Valve*

### Important Note

Check the bottom of the housing frequently when using fuel containing anti-icing additives. Stagnant water in the bottom of the filter housing can absorb large amounts of anti-icing additives. This water/anti-icing solution can disarm water-absorbing elements allowing water to pass downstream

Replace the filter cartridges when the indicator on the differential pressure gauge mounted on the top of the filter housing changes from green to red (15 psi), or when there is a significant reduction in flow, or after one year of service – whichever occurs first.





## Model PSHR 2420-2 Filter

PSHR 2420-2 pump is equipped with Racor 2 filtration system.

Both filter housings have a differential pressure gauge. The first filter housing contains a filter/separator cartridge. This filter/separator cartridge provides mechanical filtration and separates water from the fuel.

The second housing contains an absorptive cartridge. This cartridge will absorb any remaining water and will shut off the flow once it becomes saturated with water.



### Important Note

The cartridges for the two filter housing are different from each other.

The filter housing should be periodically checked for water accumulating in the bottom of the housing. With the pump turned off, place a container underneath the filter housing and open the drain valve at the bottom of the housing. Drain off any water, and close the valve.

### Important Note

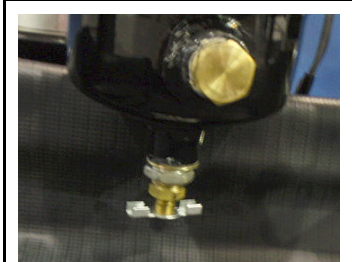
Check the bottom of the housing frequently when using fuel containing anti-icing additives. Stagnant water in the bottom of the filter housing can absorb large amounts of anti-icing additives. This water/anti-icing solution can disarm water-absorbing elements allowing water to pass downstream

Replace the filter cartridges when the indicator on the differential pressure gauge mounted on the top of the second filter housing changes from green to red (15 psi) or when there is a significant reduction in flow, or after one year of service – whichever occurs first. Repeat for second filter if gauge shows red. Refer to the *Cartridge Replacement* procedures in *Section 6*.

## Filter Maintenance

It is recommended that the vent and drain valves be opened once each day to permit the escape of entrapped air and accumulated water. Make sure to place a container under the drain valve.

Since there are no moving parts, maintenance is limited to an occasional cartridge replacement, requiring only a 2 inch (51 mm) base clearance.



*Drain Valve*

### Caution

Use only non-sparking tools when performing any maintenance or service work on this

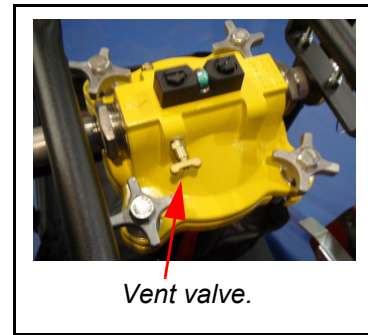
### Cartridge Replacement

When any of the above noted conditions indicate that cartridge replacement is necessary, observe the following procedures.

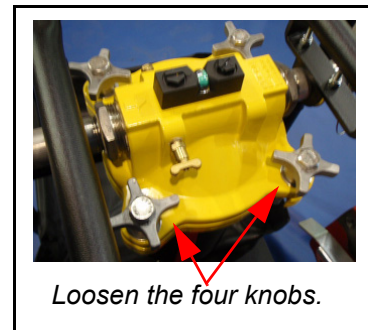
1. Place a container under the filter and open the drain valve on the housing bottom and allow all the fluid to drain from the unit.



2. Open the vent valve on the cover of the housing and allow the unit to thoroughly drain before opening the cover.



3. Loosen the four knobs attaching the head to the housing flange.



4. Lower housing until you can pull the cartridge free and lower it into the filter cannister.



5. Remove the canister and the filter from the pump frame.

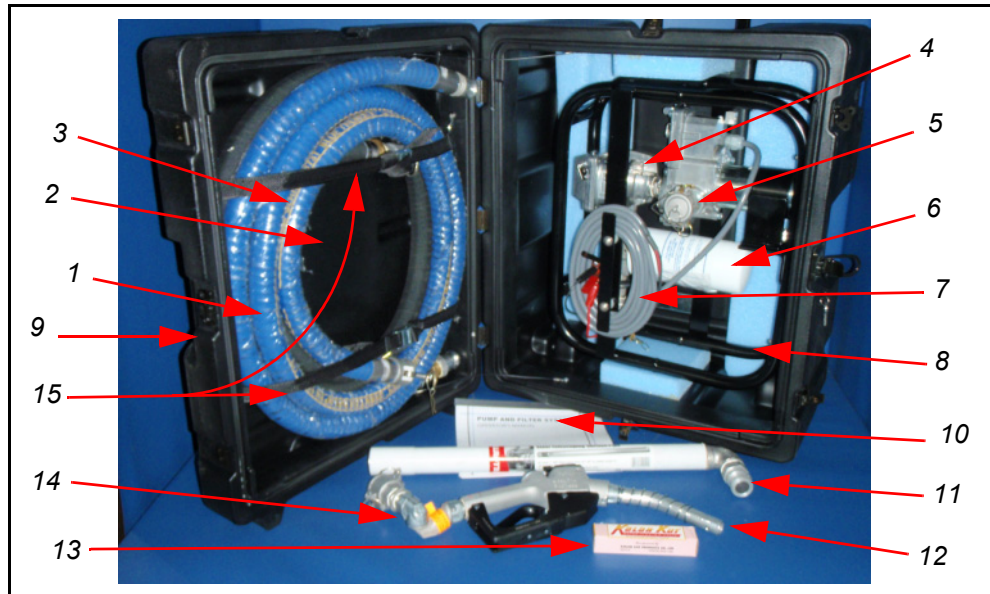


6. Remove the head gasket and discard.
7. Remove and discard the expended cartridge in a fire-safe place, in accordance with local and national regulations.
8. Flush the interior of the housing with clean, processes, filtered product or suitable solvent. A non-metallic bristle brush will help to remove caked-on debris. Rinse the housing and unit cover with a clean solvent and dry with soft lint-free wiping cloths.
9. Lightly lubricate new head gasket with Vaseline or petroleum jelly and position it on the head. If Vaseline is not available, lubricate the gasket with the fuel or oil.
10. Insert a new cartridge into the housing. Position housing (with cartridge) underneath filter head. Push/twist cartridge onto head spigot. The head conical spring will seat/seal the cartridge in the housing.
11. Rotate housing onto the collar bolts. Hand tighten knobs until head is snug to housing.
12. Close the drain plug or valve on the bottom of the housing.
13. Leave the vent valve on top of the unit open to allow entrapped air to escape while filling.
14. When a small amount of fluid flows from the vent valve, close it tightly.
15. During the initial filling and, after the above maintenance, and while the unit is in operation, examine the housing and all connections for leaks, including the head/flange junction.
16. Ensure any and all leaks are identified and repaired before allowing fuel to flow through housing.

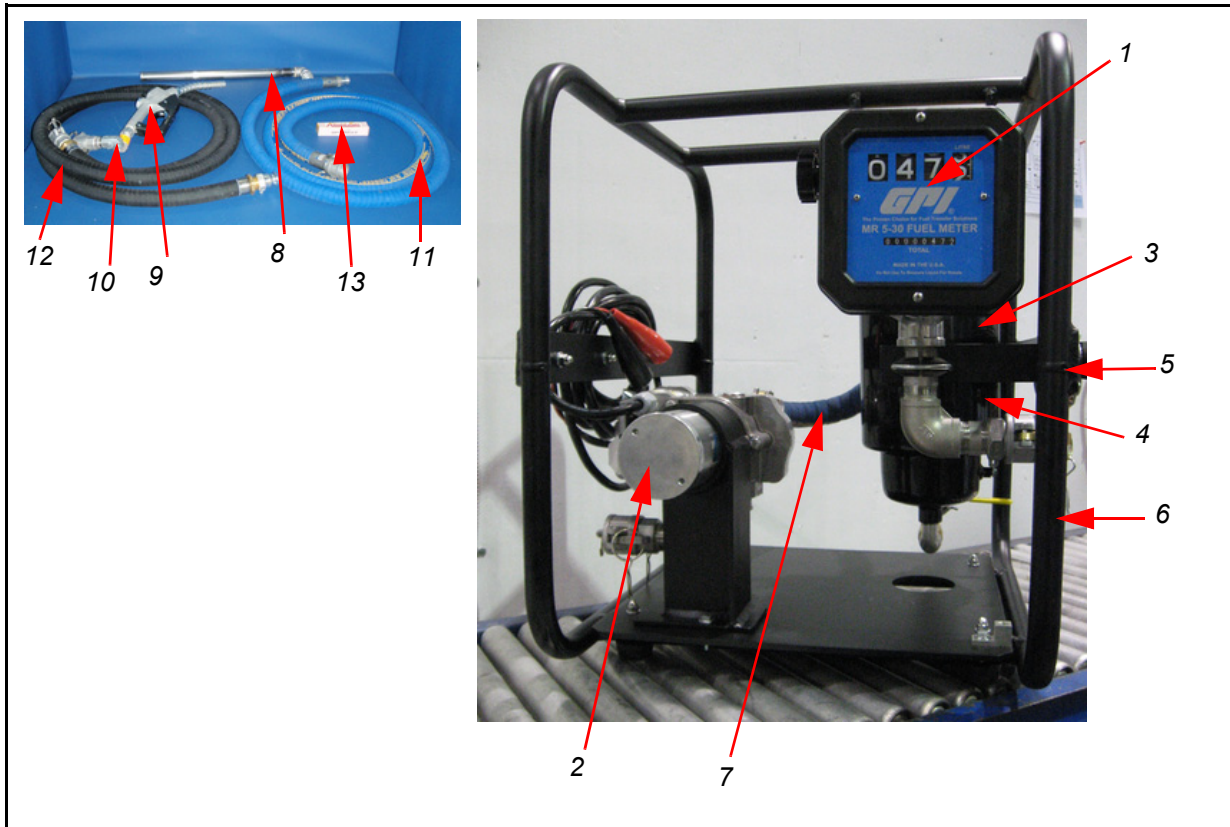
## Section 6: Parts

### Part Lists

#### Model Slimline, Part # 003530

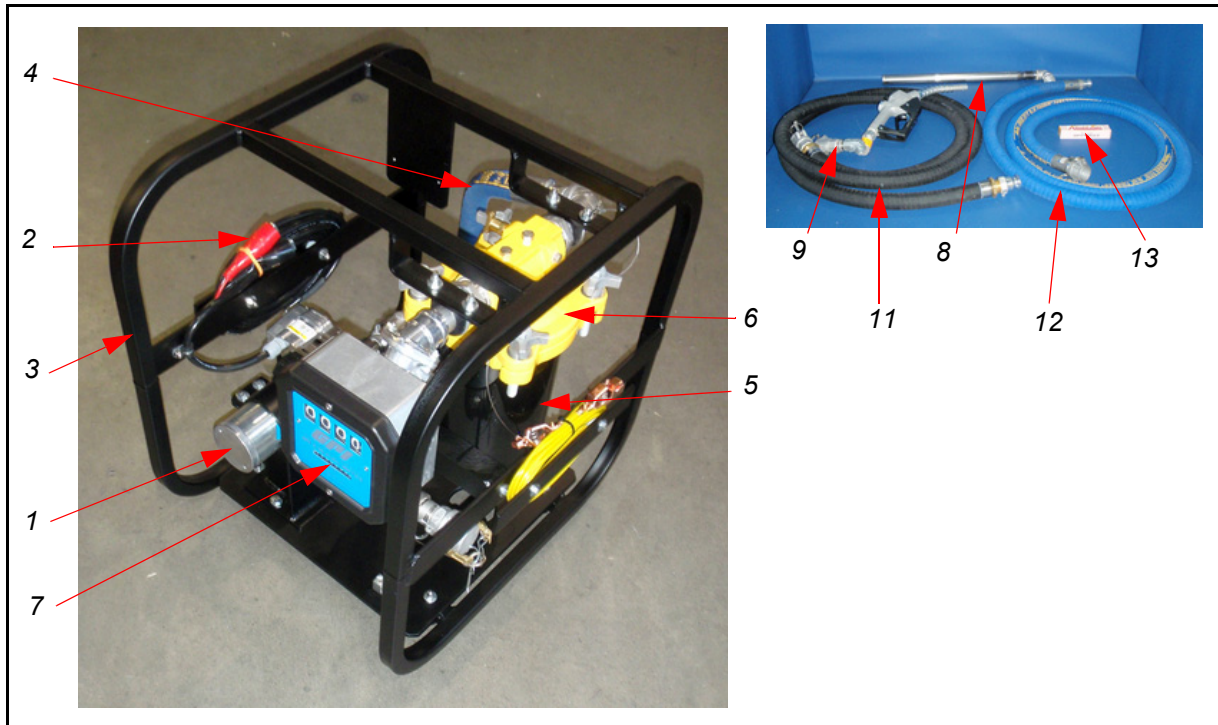


| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 2    | 010955 | GROUND, ASSEMBLY, 20' W/CLIPS       | 1   |
| 3    | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 4    | 017001 | FLOWMETER, LITRES,                  | 1   |
| 5    | 003327 | PUMP, FUEL, 15GPM, 24VDC            | 1   |
| 6    | 003236 | HEAD, FILTER, 1"NPT                 | 1   |
| 7    | 003238 | FILTER, ELEMENT                     | 1   |
| 8    | 003532 | FRAME, SLIMLINE PUMP                | 1   |
| 9    | 003531 | ENCLOSURE, 24" X 20" X 14"          | 1   |
| 10   | 010726 | MANUAL, HELI-PUMP                   | 1   |
| 11   | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 12   | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 13   | 008733 | PASTE, WATER, FINDING, KOLOR KUT    | 1   |
| 14   | 002931 | SWIVEL, 3/4" MNPT X 3/4" FNPT, AL   | 1   |
| 15   | 011066 | STRAPS, HELI, SLIMLINE              | 2   |

**Model PSHR 1210 Heli-Pump, Part # 003595**

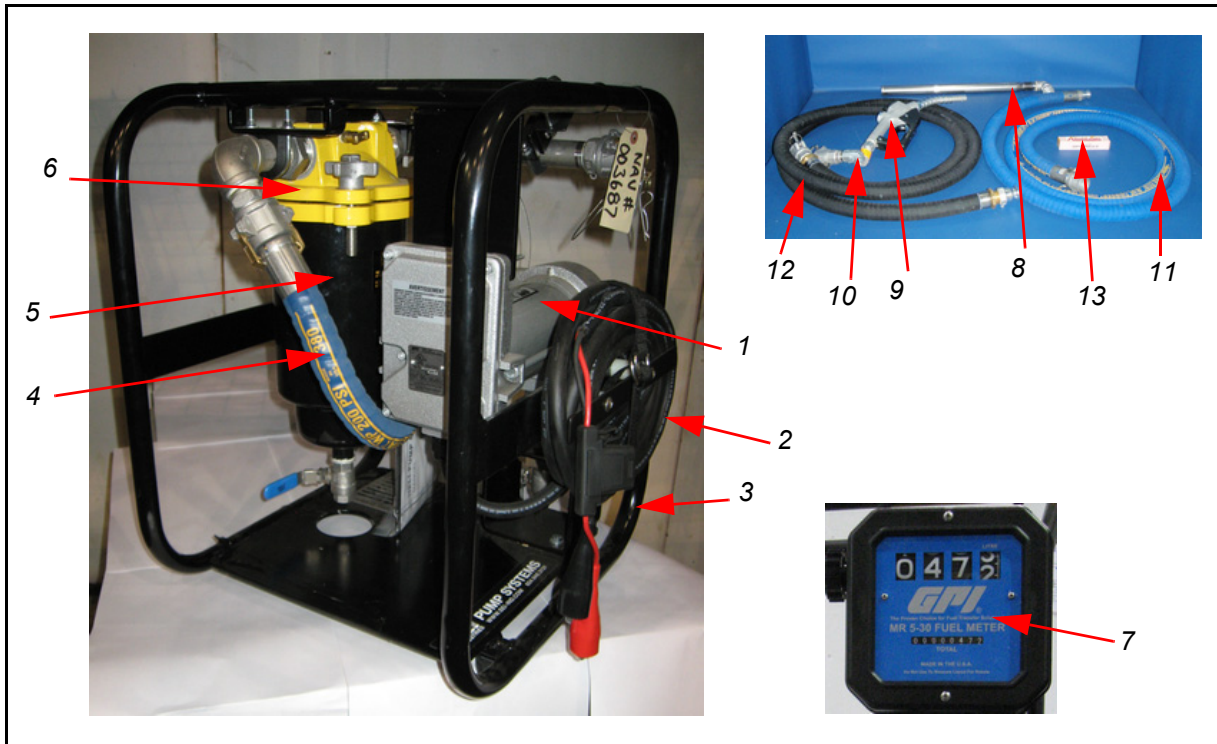
| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 003253 | METER, FLOW, LITERS                 | 1   |
| 2    | 003326 | PUMP, FUEL, 10GPM, 12VDC            | 1   |
| 3    | 003245 | HOUSING, FILTER                     | 1   |
| 4    | 009504 | FILTER, ELEMENT, 1 MICRON           | 1   |
| 5    | 010955 | GROUND, ASSEMBLY, 20'               | 1   |
| 6    | 004849 | FRAME, HELI, PUMP                   | 1   |
| 7    | 007831 | HOSE, ASSEMBLY, 1" X 23"            | 1   |
| 8    | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 9    | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 10   | 002931 | SWIVEL, 3/4" MNPT X 3/4", FNPT, AL  | 1   |
| 11   | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 12   | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 13   | 008733 | PASTE, WATER, FINDING, KOLOR CUT.   | 1   |



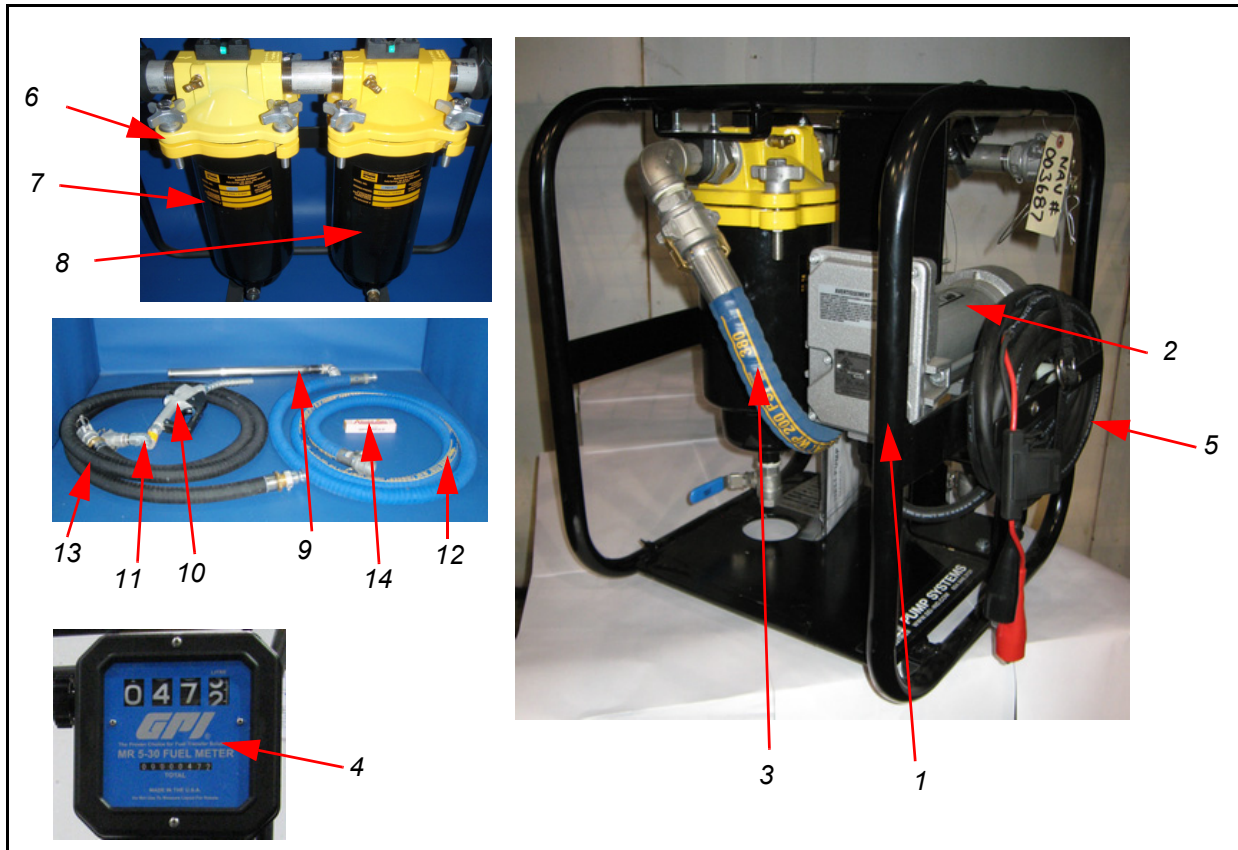
**Model PSHR 2410 Heli-Pump, Part # 003594**

| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 003327 | PUMP, FUEL, 10 USGPM, 24VDC         | 1   |
| 2    | 003229 | CORD, POWER                         | 1   |
| 3    | 010868 | FRAME, HELI, PUMP                   | 1   |
| 4    | 007831 | HOSE, ASSEMBLY, AVI. 1" X 23"       | 1   |
| 5    | 009504 | FILTER, ELEMENT, 1 MICRON           | 1   |
| 6    | 003245 | FILTER, HOUSING                     | 1   |
| 7    | 003253 | METER, FLOW, LITERS                 | 1   |
| 8    | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 9    | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 10   | 002931 | SWIVEL, 3/4" MNPT X 3/4", FNPT, AL  | 1   |
| 11   | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 12   | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 13   | 003293 | PASTE, WATER, FINDING, 3 OZ.        | 1   |

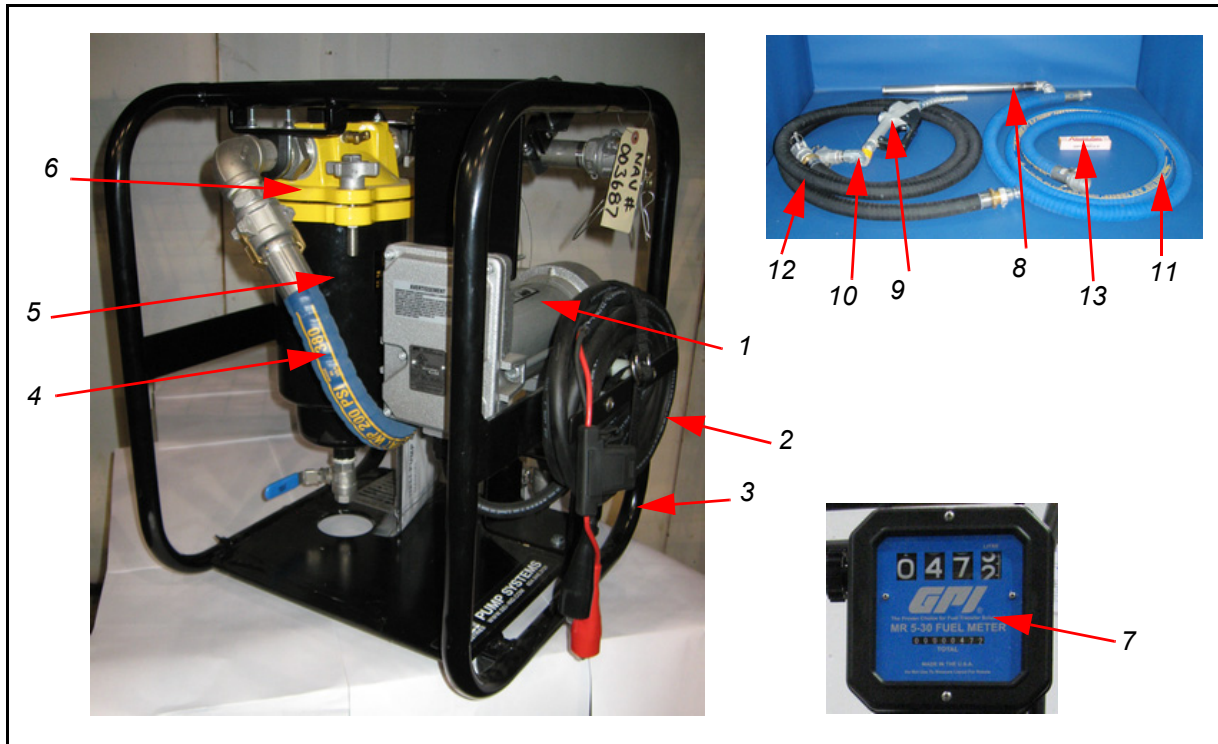


**Model PSHR 2420 Heli-Pump, Part # 003687**

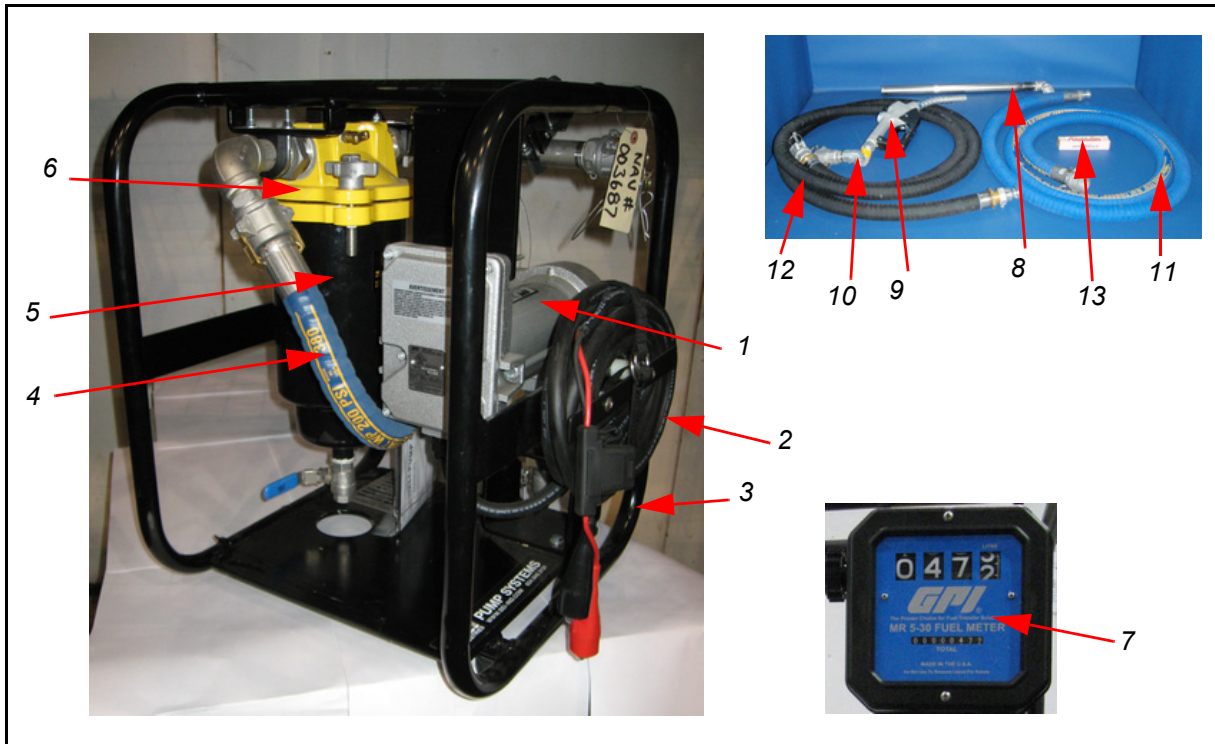
| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 003329 | PUMP, FUEL, 20 USGPM, 24VDC         | 1   |
| 2    | 003229 | CORD, POWER                         | 1   |
| 3    | 010868 | FRAME, HELI, PUMP                   | 1   |
| 4    | 007831 | HOSE, ASSEMBLY, AVI. 1" X 23"       | 1   |
| 5    | 009504 | FILTER, ELEMENT, 1 MICRON           | 1   |
| 6    | 003245 | FILTER, HOUSING                     | 1   |
| 7    | 003253 | METER, FLOW, LITERS                 | 1   |
| 8    | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 9    | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 10   | 002931 | SWIVEL, 3/4" MNPT X 3/4", FNPT, AL  | 1   |
| 11   | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 12   | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 13   | 008733 | PASTE, WATER, FINDING, KOLOR CUT    | 1   |

**Model PSHR 2420-2 Heli-Pump, Part # 009923**

| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 006698 | FRAME, PUMP, AL                     | 1   |
| 2    | 003329 | PUMP, FUEL, 20USGPM, 24VDC          | 1   |
| 3    | 003391 | HOSE ASSEMBLY, AVI.                 | 1   |
| 4    | 003253 | METER, FLOW, LITERS                 | 1   |
| 5    | 010955 | GROUND ASSEMBLY, 20'                | 1   |
| 6    | 003245 | HOUSING, FILTER                     | 2   |
| 7    | 003246 | FILTER, ELEMENT, 1 MICRON           | 1   |
| 8    | 003262 | FILTER, ELEMENT                     | 1   |
| 9    | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 10   | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 11   | 002931 | SWIVEL, 3/4" MNPT X 3/4", FNPT, AL  | 1   |
| 12   | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 13   | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 14   | 008733 | PASTE, WATER, FINDING, KOLOR CUT    | 1   |

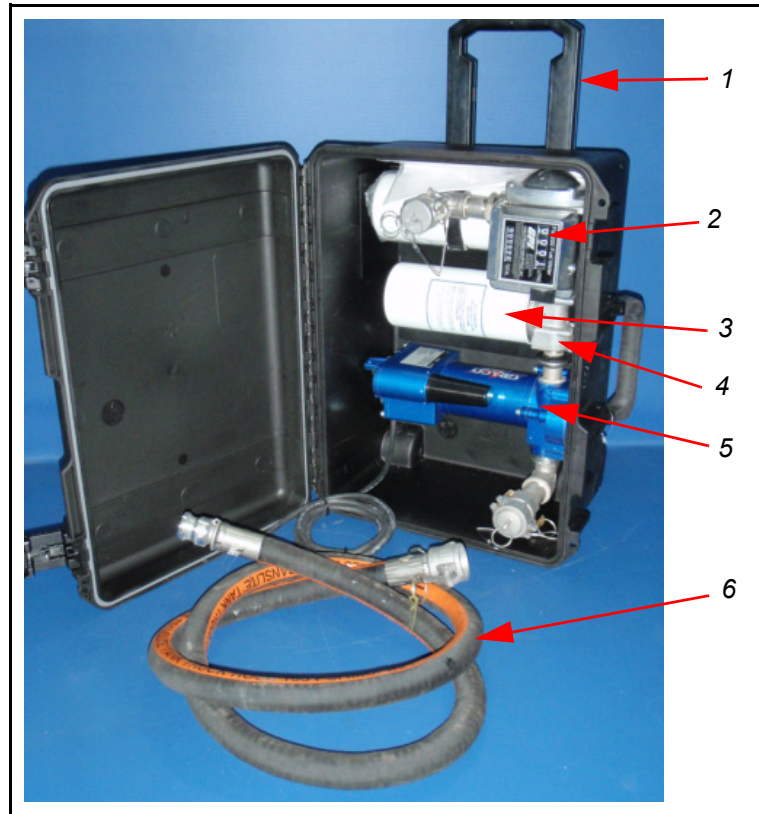
**Model PSHR 23020 Heli-Pump, Part # 003687A**

| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 011618 | PUMP, FUEL, 20 USGPM, 230V          | 1   |
| 2    | 003229 | CORD, POWER                         | 1   |
| 3    | 010868 | FRAME, HELI, PUMP                   | 1   |
| 4    | 007831 | HOSE, ASSEMBLY, AVI. 1" X 23"       | 1   |
| 5    | 009504 | FILTER, ELEMENT, 1 MICRON           | 1   |
| 6    | 003245 | FILTER, HOUSING                     | 1   |
| 7    | 003253 | METER, FLOW, LITERS                 | 1   |
| 8    | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 9    | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 10   | 002931 | SWIVEL, 3/4" MNPT X 3/4", FNPT, AL  | 1   |
| 11   | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 12   | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 13   | 008733 | PASTE, WATER, FINDING, KOLOR CUT    | 1   |

**Model PSHR 11020 Heli-Pump, Part # 03687B**

| ITEM | PART # | DESCRIPTION                         | QTY |
|------|--------|-------------------------------------|-----|
| 1    | 004933 | PUMP, FUEL, 20 USGPM, 120V          | 1   |
| 2    | 003229 | CORD, POWER                         | 1   |
| 3    | 010868 | FRAME, HELI, PUMP                   | 1   |
| 4    | 007831 | HOSE, ASSEMBLY, AVI. 1" X 23"       | 1   |
| 5    | 009504 | FILTER, ELEMENT, 1 MICRON           | 1   |
| 6    | 003245 | FILTER, HOUSING                     | 1   |
| 7    | 003253 | METER, FLOW, LITERS                 | 1   |
| 8    | 003235 | STUB, DRUM, 1" MNPT, STL            | 1   |
| 9    | 002933 | NOZZLE, DISPENSING, 3/4"            | 1   |
| 10   | 002931 | SWIVEL, 3/4" MNPT X 3/4", FNPT, AL  | 1   |
| 11   | 003390 | HOSE, SUCTION, 1" X 12'6", ASSEMBLY | 1   |
| 12   | 003389 | HOSE, 1" X 12'6" ASSEMBLY           | 1   |
| 13   | 008733 | PASTE, WATER, FINDING, KOLOR CUT    | 1   |

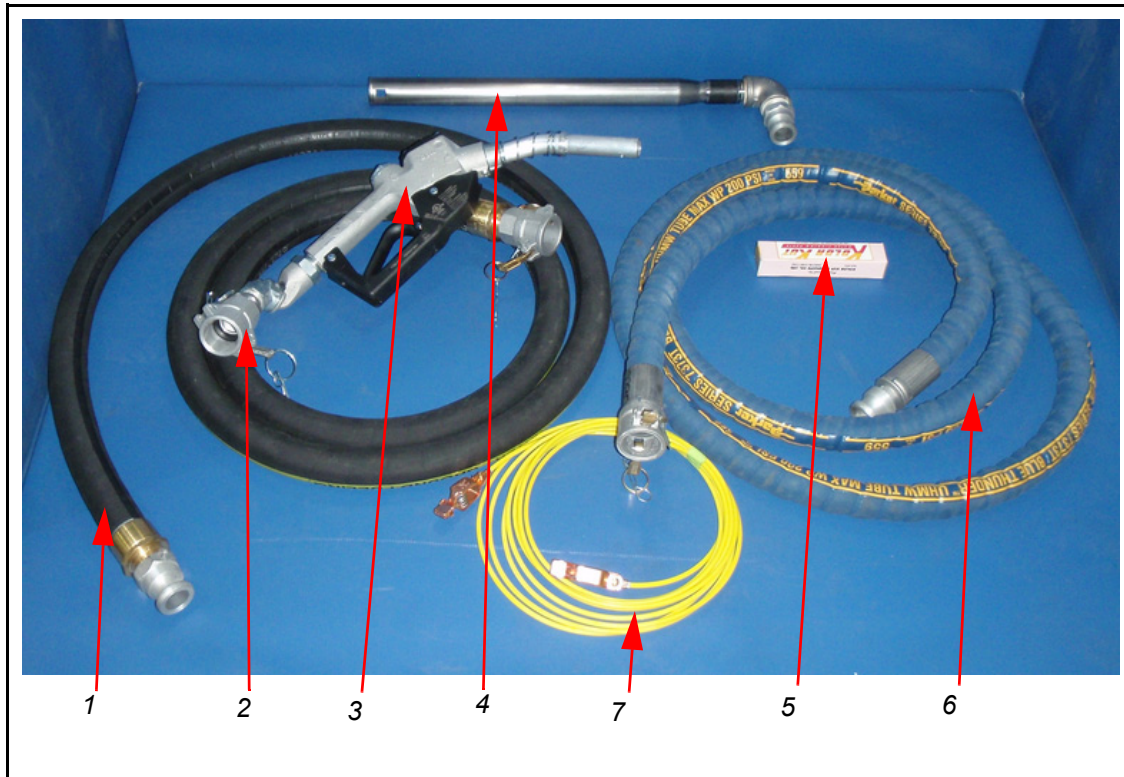


**Model PSD 688 Maritime Pump, Part # 006647**

| ITEM | PART # | DESCRIPTION                      | QTY |
|------|--------|----------------------------------|-----|
| 1    | 011021 | CASE, 20" x 14" x 10" BLACK      | 1   |
| 2    | 003292 | METER, FLOW, LITRES              | 1   |
| 3    | 003248 | FILTER, ELEMENT, SPIN ON         | 2   |
| 4    | 003247 | HEAD, FILTER, SPIN ON            | 1   |
| 5    | 003326 | PUMP, FUEL, 12GPM, 12VDC         | 1   |
| 6    | 011022 | HOSE, 1' x 12'6" ASSEMBLY        | 1   |
| 7    | 011018 | FRAME, MARITIME, PUMP            | 1   |
|      | 008733 | PASTE, WATER, FINDING, KOLOR CUT | 1   |

A 12VDC model is also available. Use Pump #003327 instead of Pump #003326 (all other parts are identical).

## Accessories



| ITEM | PART # | DESCRIPTION                      | QTY |
|------|--------|----------------------------------|-----|
| 1    | 003389 | HOSE, ASSEMBLY, DELIVERY         | 1   |
| 2    | 002931 | SWIVEL, 3/4" MNPT X 3/4" FNPT AL | 1   |
| 3    | 002933 | NOZZLE, 3/4"                     | 1   |
| 4    | 003235 | STUB, DRUM, 1" MNPT, STL         | 1   |
| 5    | 003293 | PASTE, WATER, FINDING, 3OZ       | 1   |
| 6    | 003390 | HOSE, ASSEMBLY, SUCTION          | 1   |
| 7    | 010955 | GROUNDING, ASSEMBLY WITH CLIPS   | 1   |

***Slimline and Maritime Pump Filters***

| PART # | DESCRIPTION               | QTY | WHERE USED    |
|--------|---------------------------|-----|---------------|
| 003248 | FILTER, ELEMENT, SPIN, ON | 1   | MARITIME PUMP |
| 003238 | FILTER ELEMENT, ABSORBING | 1   | SLIMLINE      |
| 003531 | ENCLOSURE, 24 X 20 X 14"  | 1   | SLIMLINE      |
| 011021 | ENCLOSURE, 20 X 15 X 10"  | 1   | MARITIME PUMP |

***PSHR 2410, 2420, 1210, 11020 and 23020 Pump Filters***

| PART # | DESCRIPTION                  | QTY | FILTER TYPE       |
|--------|------------------------------|-----|-------------------|
| 009504 | FILTER, ELEMENT, 1 MICRON F3 | 1   | FILTER, SEPARATOR |
| 013421 | FILTER, ELEMENT COALESCER    | 1   | FILTER, SEPARATOR |

***PSHR 2420-2 Pump Filter***

| PART # | DESCRIPTION                  | QTY | FILTER TYPE       |
|--------|------------------------------|-----|-------------------|
| 009504 | FILTER, ELEMENT, 1 MICRON F3 | 1   | FILTER, SEPARATOR |
| 013421 | FILTER, ELEMENT, ABSORBING   | 1   | MONITOR           |



# Section 7: Warranty

- a) Warranty is limited to repairing or replacing, at the company's sole discretion, any product approved to be defective.
- b) The company's products are not guaranteed for any specific length of time or measure of service, but are warranted only to be free from defects in workmanship and material for a period of one year to the original purchaser.
- c) To the extent allowable under applicable law, the company's liability for consequential, incidental and environmental damages is expressly disclaimed. **The company's liability in all events is limited to and shall not exceed, the purchase price paid.**
- d) This warranty is granted to the original purchaser and does not extend to a subsequent purchaser or assignee.
- e) The company must receive notification in writing of any claims of warranty from the original purchaser which must give details of the claimed defect in the product.
- f) Where the original purchaser is claiming under warranty, the product must be returned to the company for inspection with all transportation and duty charges prepaid.
- g) The warranty does not extend to any product that has been accidentally damaged, abraded, altered, punctured, abused, misused or used for a purpose which has not been approved by the company.
- h) This warranty does not apply to any accessories used with the product such as pumps, filters, hoses, etc., that are not supplied by the company, and any warranty on such accessories must be requested from the manufacturer or dealer of the accessories.
- i) In the event the original purchaser does not give notice of a warranty claim within one year of the original purchase of the product, it is understood that the purchaser has waived the claim for warranty and the purchaser and/or any subsequent purchaser must accept the condition of the product as it may be, without warranty.
- j) Any technical information supplied by the company regarding the product is not a condition of warranty but rather is information provided by the company to the best of its knowledge.
- k) There are no implied warranties nor is there any warranty that can be assumed from any representation of any person, except the company itself.

### Exclusions

This warranty is void if the product is not assembled, used and/or maintained in accordance with the operator's manual supplied by SEI.

# Appendix

### ***Contents***

- Kolor Kut Water Finding Paste and Other Products Info Sheet
- Kolor Kut MSDS
- Facet Spin-On Filters
- Mechanical Fuel Meter
- Filter Notes
- Pump Manufacturer Manuals

### ***Need an appendix?***

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