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# 15-18 GPM (57-68 L/min) 12V & 24V (dc) Fuel Transfer Pump

**Models: M-150S, M-180S, M-240S**

**Thank you for choosing a Great Plains Industries product, and congratulations on your purchase!**

**Headquartered in the heartland of the U.S., GPI strives for integrity, innovation, continuous improvement, and dependability—values you will immediately recognize when using our products.**

**The maintenance policies and procedures outlined in this manual emphasize our commitment to safety and our dedication to you as a customer. By working together, we can ensure years of reliable, quality service.**

*Please save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described.*

*Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage.*

*Please refer to back cover for information regarding this product's warranty and other important information.*

**SAVE FOR YOUR RECORDS**

**Model #:** \_\_\_\_\_

**Serial #:** \_\_\_\_\_

**Purchase Date:** \_\_\_\_\_



## BEFORE YOU BEGIN

### Fueling Requirements:

- This fuel pump is designed, tested and approved for use with gasoline blends (up to E15) diesel fuel blends (up to B20) and kerosene. Pump only models sold without a hose/nozzle are compatible with aviation gasoline AVGAS 100LL and kerosene grade Jet A. Please take all due precautions when handling these flammable liquids.
- Do not use this pump for dispensing any fluids other than those for which it was designed. To do so may damage the pumps components and will void the warranty.



### Power Source Requirements:

- This manual covers 12 and 24 volt DC electric gear pump models M-150S, M-180S, and M-240S.
- Models M-150S and M-180S should be connected to a 12-volt DC power source. Model M-240S should be connected to a 24-volt power source only.
- Do not attempt connection of any pump to a 115-volt AC or 230-volt AC power source.



### Tools Needed:

- Adjustable Wrench, Pipe Wrench, Pliers, Utility Knife, Wire Crimper/Stripper, and Thread Tape

## UNPACKING

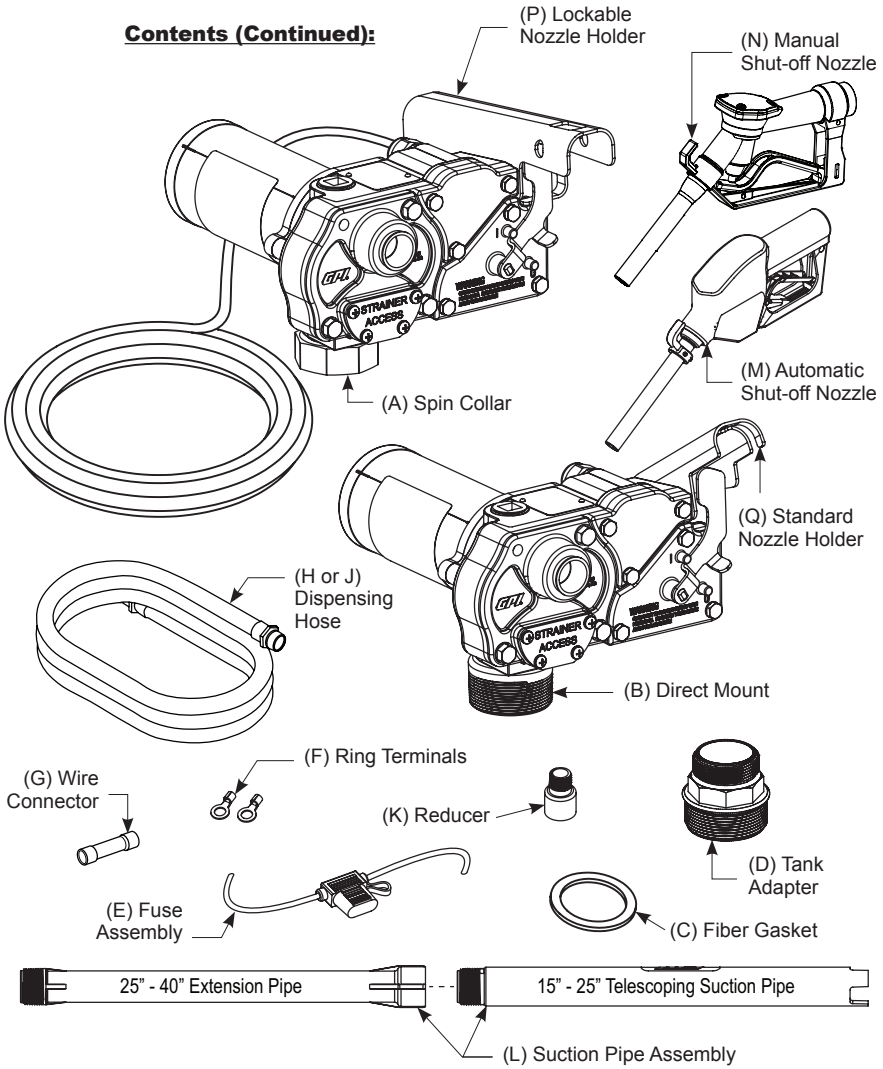


### Contents (See Figure 1):

- (1) 12-volt or 24-volt DC Fuel Transfer Pump with Spin Collar (*Item A*), (1) Fiber Gasket (*Item C*) and (1) Tank Adapter (*Item D*); or 12-volt Fuel Transfer Pump with Direct Mount (*Item B*) (M-150S-EM only)
- (1) 18 foot (5.5 m) Attached Power Cord with (1) Fuse Assembly (*Item E*), (2) Ring Terminals (*Item F*) and (1) Wire Connector (*Item G*)
- (1) 12 foot (3.6 m) Dispensing Hose (*Item H*) (M-150S-AU & -MU, M-180S-AU & -ML, and M-240S-MU) or (1) 10 foot (3.0 m) Dispensing Hose (M-150S-EM only)
- (1) 1 inch Female to 3/4 inch Reducer (*Item K*) - (M-180S-AU & M-180S-ML)
- (1) 15 inch (38 cm) to 40 inch (101 cm) Adjustable Suction Pipe (*Item L*)
- (1) Automatic (*Item M*) - (M-150S-AU and M-180S-AU) or Manual Shut-off Nozzle (*Item N*) - (M-150S-EM & -MU, M-180S-ML and M-240S-MU)
- (1) Lockable Nozzle Holder (*Item P*) - (M-150S-AU & -MU, M-180S-AU & -ML, and M-240S-MU); or (1) Standard Nozzle Holder (*Item Q*) (M-150S-EM only)

# UNPACKING (CONTINUED)

## Contents (Continued):



**Figure 1**



**Inspect:**

- After unpacking the unit, inspect carefully for any damage that may have occurred during transit. Check for loose, missing or damaged parts. Shipping damage claims must be filed with carrier.
- See General Safety Instructions on page 3, and Cautions and Warnings as shown.





## INTERNATIONAL ISO SAFETY SYMBOLS



This symbol indicates a general warning to the user. See additional specific warnings.



This symbol indicates electrical shock hazard. Follow proper installation and maintenance instructions in this manual.



This symbol indicates hot surface. Take care to avoid coming into contact with hot surface.



This symbol indicates automatic restart. Pump contains thermal protection which automatically shuts off motor before overheating. Pump will turn back on automatically after cooling. Turn switch OFF and wait 30 minutes to resume normal pumping. Disconnect power before any inspection or service.



Owner's manual must be read before using, inspecting, or servicing this product.



Disconnect power when product is unattended or in the case of a malfunction. Disconnect power before any inspection, servicing, or maintenance.



Smoking, open flames, fires, and open ignition sources are prohibited in the vicinity of this product.

## AVIATION FUELING

"Pump Only" models sold without a hose or nozzle are approved for ground-based refueling only. Do not use in or on aircraft. User must provide hose, suction pipe, nozzle, and accessories that meet the appropriate [NFPA 407 Standard for Aircraft Fuel Servicing](#). Pumps have no actual or implied compliance with this standard. Please consult NFPA 407 for recommended safety requirements during ground fuel servicing of aircraft using petroleum fuels.

## GENERAL SAFETY INSTRUCTIONS

**IMPORTANT:** It is your responsibility to:

- Know and follow applicable national, state and local safety codes pertaining to installing and operating electrical equipment for use with flammable liquids.
- Know and follow all safety precautions when handling petroleum fuels.
- Ensure that all equipment operators have access to adequate instructions concerning safe operating and maintenance procedures.

Observe all safety precautions concerning safe handling of petroleum fuels.

**⚠ WARNING** *To ensure safe operation, all fuel transfer systems must be properly grounded. Proper grounding means a continuous metal-to-metal contact from one component to the next, including tank, tank mount, pump, meter, filter, hose and nozzle. Care should be taken to ensure proper grounding during initial installation and after any service or repair procedures. For your safety, please take a moment to review the warnings below.*

**⚠ DANGER** *To prevent physical injury or property damage, observe precautions against fire or explosion when dispensing fuel. Do not operate the system in the presence of any source of ignition including running or hot engines, lighted tobacco products, gas or electric heaters, or any type of electronic device. A spark can ignite fuel vapors.*

**⚠ DANGER** *Observe precautions against electrical shock when operating the system. Serious or fatal shock can result from operating electrical equipment in damp or wet locations.*

**⚠ WARNING** *Inspect external pump wiring regularly to make sure it is correctly attached to the battery. To avoid electrical shock, use extra care when connecting the pump to power.*

**⚠ WARNING** *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.*

**⚠ DANGER** *Observe precautions against electrical shock when servicing the pump. Always disconnect power before repairing or servicing. Never apply electrical power to the system when any of the coverplates are removed.*

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

**⚠ CAUTION** *Do not leave pump running unattended.*



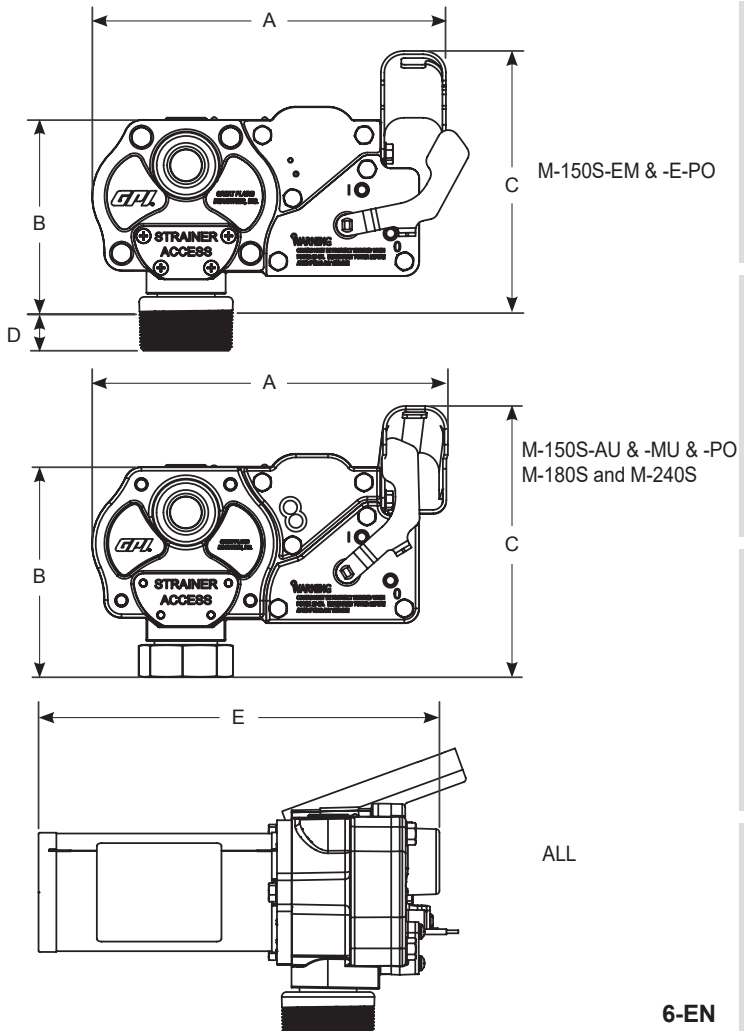
## SPECIFICATIONS

	M-150S-AU M-150S-MU	M-150S-EM	M180S-ML M180S-AU	M240S-MU
Housing Material	Lightweight, corrosion-resistant, cast aluminum body			
Pump Rate	Up to 15 GPM (57 LPM)		Up to 18 GPM (68 LPM)	Up to 15 GPM (57 LPM)
Duty Cycle	30 minute ON, 30 minute OFF			
Suction Lift	Manual Nozzle: Up to 5.5 ft. (1.7 m) Automatic Nozzle: Up to 4.8 ft. (1.5 m)			
Operating Temperature	-20° F to 125° F (-29° C to 52° C)			
Operating Pressure	15 PSI (103.42 kPa)			
Input	12-volt DC			24-volt DC
Current Draw	18 amps		20 amps	9 amps
Motor	1900 RPM, 1/5 hp (150 watts)		2000 RPM, 1/4 hp (187 watts)	1900 RPM, 1/5 hp (150 watts)
Motor Approval	cULus Listed, Class I Div 2, Class I Div 1 (pump-only models)			
Motor Protection	20 amp circuit breaker		25 amp circuit breaker	15 amp fuse
Cord	18 ft. of 12 ga. (5.5 m)			
Fuse	25 amp		30 amp	15 amp
Tank Adapter (Item D)	2 inch NPT	N/A	2 inch NPT	
Inlet	1 inch NPT			
Outlet	3/4 inch NPT		1 inch NPT	3/4 inch NPT
Hose Type	Buna-N Electrically Conductive Discharge Hose			
Hose Size	3/4 in. x 12 ft. (3.6 m)	3/4 in. x 10 ft. (3.0 m)	1 in. x 12 ft. (3.6 m)	3/4 in. x 12 ft. (3.6 m)
Manual Nozzle	3/4 inch Unleaded		1 inch Leaded	3/4 inch Unleaded
Automatic Nozzle	3/4 inch Unleaded			N/A
Weight: Manual Nozzle	23 lbs. (10.5 kg)		26.5 lbs. (12.0 kg)	23 lbs. (10.5 kg)
Weight: Automatic Nozzle	24 lbs. (10.8 kg)		27 lbs. (12.2 kg)	N/A



**SPECIFICATIONS (CONTINUED)**

	M-150S-EM & -E-PO	M-150S-AU & -MU & -PO M-180S and M-240S
<b>Dimensions Inches (cm)</b>		
A. Pump Ass'y Width	9.19 (23.34)	9.13 (23.20)
B. Pump Ass'y Height	5.42 (13.77)	4.95 (12.57)
C. Pump Ass'y Height w/Nozzle Holder	7.00 (17.78)	6.74 (17.12)
D. Direct Mount (NPT Male) Thread Height	1.00 (2.54)	N/A
E. Pump Ass'y Depth	10.45 (26.54)	10.45 (26.54)


**Figure 2**

## INSTALLATION INSTRUCTIONS

**NOTE:** This pump is 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
Automatic Nozzle:	4.8 feet (1.5 m) with diesel 5.8 feet (1.8 m) with gasoline

If you require a greater initial prime height, coat the gears with fluid by removing the plug on the top of the pump and pour a small quantity of motor oil into the gear cavity. Replace the plug and try again. A foot valve with pressure relief may be needed to maintain prime.

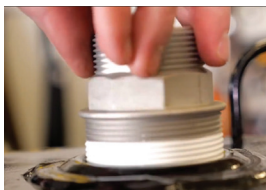
### **Install Tank Adapter and Suction Pipe** **(for all models except M-150S-EM & M-150S-E-PO)**

1. Wrap the 2" threaded end of the tank adapter with three or four turns of thread tape (see Figure 3). Using a pipe wrench, tighten the adapter snugly into the fuel tank.

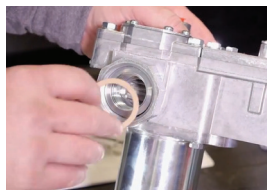
**NOTE:** For Aluminum Tank Installation - To prevent thread galling of aluminum fittings, always prepare the threads for assembly using an anti-seize compound such as Loctite® 567™, Hernon® Dripstop® 940 or equivalent.

2. Using pliers, remove the plastic plug from inlet port on bottom of pump. Place the spin collar gasket into the inlet fitting on the bottom of the pump (see Figure 4).
3. Wrap the threaded end of suction pipe with three or four turns of thread tape (see Figure 5). Thread the suction pipe into the inlet port on the bottom of the pump and hand tighten until snug (see Figure 6).

**NOTE:** If your tank is 15" - 24" deep, do not use the included suction pipe extension; if your tank is 24" - 40" deep, attach the suction pipe extension (see Figure 7).



**Figure 3**



**Figure 4**



**Figure 5**



**Figure 6**

## INSTALLATION INSTRUCTIONS (CONTINUED)

### **Install Suction Pipe (for model M-150S-EM & M-150S-E-PO)**

1. Wrap the threaded mount of the fuel pump with three or four turns of thread tape.

**NOTE:** For Aluminum Tank Installation - To prevent thread galling of aluminum fittings, always prepare the threads for assembly using an anti-seize compound such as Loctite® 567™, Herson® Dripstop® 940 or equivalent.

2. Using pliers, remove the plastic plug from inlet port on bottom of pump.
3. Wrap the threaded end of suction pipe with three or four turns of thread tape (see Figure 5). Thread the suction pipe into the inlet port on the bottom of the pump and hand tighten until snug (see Figure 6).

**NOTE:** If your tank is 15 - 24 inches deep, do not use the included suction pipe extension; if your tank is 24 - 40 inches deep, attach the suction pipe extension (see Figure 7).



**Figure 7**

### **Install Pump on Tank**

#### **(for all models except M-150S-EM & M-150S-E-PO)**

1. Clean the tank interior of all dirt and foreign material.
2. Carefully lift pump / suction pipe assembly and insert suction pipe into the tank opening.

While holding the spin collar gasket in place, position the pump spin collar onto the tank adapter and tighten using a pipe wrench, making sure the spin collar is not cross-threaded (see Figure 8). The spin collar measures 2.26 inches (5.74 cm) across flats.

**NOTE:** To prevent pressure buildup and possible fuel leaks through the nozzle, make sure the fuel tank is properly vented. A vent cap rated at 3 psi (6.90 kPa) or less is recommended.



**Figure 8**

## INSTALLATION INSTRUCTIONS (CONTINUED)

### Install Pump on Tank (model M-150S-EM & M-150S-E-PO)

1. Clean the tank interior of all dirt and foreign material.
2. Carefully lift pump / suction pipe assembly and insert suction pipe into the tank opening.

Position the pump mount and tighten securely, making sure the threads are not cross-threaded; the pump mount exterior threads are 2 inches NPT.

**NOTE:** To prevent pressure buildup and possible fuel leaks through the nozzle, make sure the fuel tank is properly vented. A vent cap rated at 3 psi (6.90 kPa) or less is recommended.

### Install Hose and Nozzle

1. Using pliers, remove the plastic plug from outlet port on front of pump. Wrap one end of the dispensing hose with three to four turns of thread tape and thread into outlet port (see Figure 9). Tighten securely using an adjustable wrench.
2. Wrap opposite end of hose with three or four turns of thread tape and thread into nozzle. Tighten securely using an adjustable wrench (see Figure 10).
3. Place the nozzle into the nozzle holder on the end of the pump motor housing. Note that the nozzle cannot be placed in the holder unless the pump switch is OFF (see Figure 11).



**Figure 9**



**Figure 10**



**Figure 11**



**Figure 12**

## INSTALLATION INSTRUCTIONS (CONTINUED)

### **Connect to a Power Source**

**NOTE:** Please consult the Owner's Manual for your vehicle before proceeding.

**IMPORTANT:** The pump is designed for use with a 12 Volt (M-150S and M-180S) or 24-Volt (M-240S) DC power source. Do not attempt installation on a 115 or 230 Volt AC system.

**⚠ WARNING** *Do not attempt to power the pump from vehicle wiring smaller than 12 gauge, such as the cigarette lighter wire, as these thin wires could overheat and cause a fire.*

**NOTE:** Pumps pre-wired are for installation in CLASS I, DIVISION 2 locations such as portable fuel tanks, trailers, etc. Connection to a battery will depend upon the application.

**⚠ WARNING** *"Pump only" models (-PO) may be installed in a CLASS I DIVISION I location with approved wiring.*

**IMPORTANT:** Verify switch is in OFF position, then route the electrical wires to the source of the vehicle power system. Be sure to support the wires as necessary and protect them from sharp edges, heat or anything that could damage the wires.

1. If the power cord provided is too long, disconnect from power and cut to desired length. Using a utility knife, carefully strip 3 to 4 inches (7.62 to 10.16 cm) of outer insulation from end of power cord. **DO NOT CUT INNER WIRES.** Next, using wire strippers, remove 1/4 inch (6.35 mm) of insulation from the black and red power cord wires.
2. For a negative ground system, first disconnect the vehicle's ground wire, and then connect as follows: Using a wire stripper, carefully strip 1/4 inch (6.35 mm) of insulation from both ends of the fuse assembly wire.
3. Insert one end of the fuse assembly wire into the wire connector and crimp. Insert the red power cord wire into the other end of the wire connector and crimp. Make sure the fuse assembly is positioned outside of hazardous areas and as close to the battery as possible (see Figure 12).
4. Using wire crimper, attach one ring terminal to the other end of the fuse assembly and one ring terminal to the end of the black power cord wire.
5. Connect the red wire/fuse assembly to the positive side of the battery (see Figure 12).
6. Connect the black power cord wire to the negative side of the battery.

**NOTE:** Connecting directly to the battery terminal or the end of the battery cable is recommended.



## OPERATION

**IMPORTANT:** Always follow safety precautions when operating this equipment. Review the Safety Instructions.

**⚠ DANGER** *To prevent physical injury or property damage, observe precautions against fire or explosion when dispensing fuel. Do not operate the system in the presence of any source of ignition including running or hot engines, lighted tobacco products, gas or electric heaters, or any type of electronic device. A spark can ignite fuel vapors.*

**⚠ CAUTION** *Before each use, repair leaks around seals or connections. Make sure hoses are in good condition and connections are tight.*

NOTE: Make sure the work area is dry.

**⚠ WARNING** *Make sure the pump is properly grounded. Repair any corroded or damaged wiring before use.*

NOTE: Ensure the tank contains enough fuel.

**IMPORTANT:** Make sure the fuel is not contaminated with debris. Tighten loose tank lids regularly.

### **Dispensing Fuel**

1. Turn on the pump by removing the nozzle from the holder and pushing up the switch lever. Insert the nozzle into the receiving tank and squeeze the handle to start fuel flow. When done, release the nozzle handle, turn the pump off and return the nozzle to its holder.

**IMPORTANT:** This pump is designed to be self-priming. If fuel is not delivered within 15 to 20 seconds, turn the pump off and refer to priming information in the Troubleshooting Section.

**⚠ CAUTION** *An automatic bypass valve prevents pressure build up when the pump is on with the nozzle closed. To avoid pump damage, do not run the pump more than 10 minutes with the nozzle closed.*

**IMPORTANT:** After running the pump for a maximum of 30 minutes, allow it to cool for 30 minutes.

### **Motor Protector**

NOTE: The M-150S and M-180S pumps have a motor protector that provides added protection against motor damage. It must be reset manually.

1. If the motor protector trips, reset by turning the switch OFF. Let the pump cool then turn ON again. If the motor protector trips again, see the Troubleshooting Section of this manual.
2. An inline fuse provides motor protection on the 24-volt M-240S model. Replace fuse as needed.

## TROUBLESHOOTING GUIDE

Symptom	Possible Cause(s)	Corrective Action
Motor does not run	1. Fuse blown	1. Inspect fuse in fuse holder on power cord. If blown, replace
	2. Switch defective	2. Remove switch coverplate and inspect switch. Replace, if necessary
	3. Switch or electrical connections are faulty (models M-150S and M-180S)	3. Inspect for damaged motor protector, defective wiring or switch, or improper electrical connections. Replace as needed and reinstall
	4. Circuit breaker tripped	4. Turn power off at source. Inspect the pump thoroughly; clean or repair. Reset circuit breaker by turning the power switch off then back on
	5. Motor burned out	5. Replace motor (see Maintenance / Repair section)
Motor runs but doesn't pump	1. Gear coverplate or O-ring damaged	1. Remove and inspect the coverplate and O-ring. Replace, as necessary. (see Maintenance / Repair section)
	2. Strainer clogged or defective	2. Remove strainer coverplate. Remove and clean strainer. Install again
	3. Suction pipe clogged, damaged or missing	3. Remove pump from tank. Inspect suction pipe. Clean or replace, as necessary
	4. Bypass poppet O-ring worn or missing	4. Inspect O-ring (see Maintenance / Repair section). Replace, if necessary
	5. Bypass poppet O-ring dirty	5. Remove poppet assembly and clean poppet and cavity
	6. Bypass poppet binding or damaged	6. Remove the bypass poppet, spring, and O-ring. Clean cavity. Inspect and replace components, if needed

**TROUBLESHOOTING GUIDE (CONTINUED)**

Symptom	Possible Cause(s)	Corrective Action
Motor runs but does pump (continued)	7. System air leak	7. Tighten all pump fittings and connections. Inspect suction pipe for leaks or damage
	8. System air lock	8. Occurs if external filter, meters or an off-the-shelf automatic nozzle is used. To correct, remove the pipe plug in the top outlet port and fill the gear cavity with fuel. Use of a factory-supplied automatic nozzle is recommended
	9. Poor connections or low voltage	9. Make sure electrical connections are secure. Check battery voltage
	10. Fuel level low	10. Fill tank
	11. Motor running backwards due to incorrect polarity	11. Connect red wire to positive (+) ungrounded side of battery. Gear with key should turn counterclockwise
Low flowrate	1. Strainer partially clogged	1. Remove the strainer coverplate. Remove and clean the strainer. Install again
	2. Poor connections or low voltage	2. Make sure electrical connections are secure. Also check battery voltage
	3. Suction pipe clogged or damaged	3. Remove pump from tank. Inspect suction pipe. Clean or replace, as necessary
	4. Fuel tank empty	4. Fill tank
	5. Using off-the-shelf automatic nozzle	5. Factory-supplied automatic nozzle is recommended
	6. System air leak	6. Tighten all pump fittings and connections. Inspect suction pipe for leaks or damage. Replace, as necessary
	7. Bypass poppet spring weak	7. Remove the bypass poppet and inspect spring (see Maintenance / Repair section. Replace, if necessary



## TROUBLESHOOTING GUIDE (CONTINUED)

Symptom	Possible Cause(s)	Corrective Action
Motor stalls when operating in bypass mode	1. Motor protector activated	1. Turn off switch. Allow motor to cool, then turn on switch
	2. Gears locked	2. Remove gear coverplate and inspect gears and drive key. Make sure gears turn freely with the key removed. Replace, if worn
	3. Wiring defective	3. Use Wiring instructions in the Installation Section to ensure proper connections
	4. Bypass poppet binding or damaged	4. Using instructions in the Repair Section, remove the bypass poppet, spring and O-ring. Clean cavity. Inspect components and replace, as necessary
	5. Motor defective	5. Replace motor as described in the Repair Section
Switch fails to operate motor	1. Switch or electrical connections faulty (model M-240S)	1. Inspect for a blown fuse, defective wiring or switch, or improper electrical connections. Replace or install again, as necessary. Refer to Switch Replacement instructions in the Repair Section
	2. Motor burned out	2. Replace motor as described in the Repair Section
	3. Motor protector activated	3. Turn off switch. Allow motor to cool, then turn on switch
	4. Switch or electrical connections faulty (models M-150S and M-180S)	4. Inspect for damaged motor protector, blown fuse, defective wiring or switch, or improper electrical connections. Replace as needed and re-install

**TROUBLESHOOTING GUIDE (CONTINUED)**

Symptom	Possible Cause(s)	Corrective Action
Rapid overheating of motor	<ol style="list-style-type: none"><li>1. Duty cycle too long</li><li>2. Strainer clogged</li><li>3. Suction pipe clogged or damaged</li><li>4. Gears worn</li><li>5. Fuel level low</li><li>6. Running too long in bypass mode</li></ol>	<ol style="list-style-type: none"><li>1. Pump operation should not exceed the standard duty cycle of 30 minutes ON, and 30 minutes OFF. Allow the pump to cool for 30 minutes</li><li>2. Remove strainer coverplate. Remove and clean strainer. Install again</li><li>3. Remove pump from tank. Inspect suction pipe. Clean or replace, as necessary</li><li>4. Remove gear coverplate and inspect gears and drive key. Make sure gears turn freely with key removed. Replace, if necessary</li><li>5. Fill tank</li><li>6. Limit bypass operation to 10 minutes</li></ol>

## MAINTENANCE

**NOTE:** This pump is designed for minimum maintenance. The motor bearings are sealed and require no lubrication. Inspect the pump and components regularly for fuel leaks and make sure the hose and power cord are in good condition. Keep the pump exterior clean to help identify leaks.

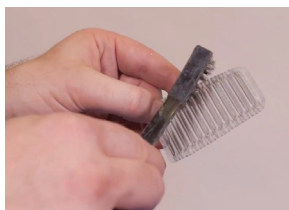
**IMPORTANT:** Do not use this pump for water, chemicals or herbicides. Dispensing any fluid other than those listed in this manual will damage the pump. Use of the pump with unauthorized fluids will void the warranty.

### **Clean or Replace Strainer**

1. Turn the pump off and disconnect from power. Remove the strainer coverplate. Remove the inlet strainer and inspect for damage or clogs (see Figure 13). Clean the strainer with a soft-bristled brush and solvent (see Figure 14). If the strainer is very dirty, compressed air may be used. If damaged, replace the strainer.
2. Place the strainer in the cavity. Clean the coverplate and O-ring. Coat the O-ring lightly with grease. Ensure the coverplate O-ring is properly seated (see Figure 15) and tighten the strainer coverplate.



**Figure 13**



**Figure 14**



**Figure 15**

**IMPORTANT:** Carefully inspect all parts for wear or damage. Replace components, as necessary. The Illustrated Parts List gives information on replacement parts and kits. Review the Safety Instructions before proceeding.

**⚠ DANGER** *Observe precautions against electrical shock when servicing the pump. Always disconnect power before repairing or servicing. Never apply electrical power to the system when any of the coverplates are removed.*

**⚠ WARNING** *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.*

### **Remove Pump From Tank**

1. Turn the pump OFF and disconnect from power.
2. Turn the spin collar counterclockwise to release the inlet fitting.
3. Lift the pump and suction pipe straight up from the tank adapter.
4. Elevate the nozzle and hose to allow excess fuel to drain into the tank.
5. Wipe the entire system with a clean cloth.

### **Service O-rings**

**NOTE:** A Wet Seal Kit contains all seals for your pump and should be on hand when performing repairs. Old seals may then be replaced with new seals.

1. In general, when inspecting O-rings, look for breaks, wear and signs of deterioration, such as swelling.
2. Replace, as necessary.
3. Before seating, coat O-rings with light grease.

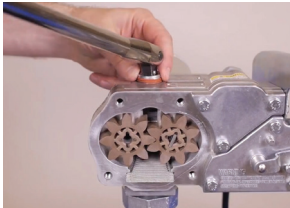
### **Replace Gears and Drive Key**

1. Turn the pump OFF and disconnect from power.
2. Remove the gear coverplate and O-ring from the pump housing
3. Inspect the gears and key for wear and damage. Replace, as necessary.
4. Wipe the gear cavity with a clean cloth.
5. Replace the gears. Make sure they turn freely.
6. Replace the drive key.
7. Make sure the gear coverplate O-ring is securely in place. Tighten the coverplate to the housing.

## REPAIR (CONTINUED)

### **Clean Bypass Poppet**

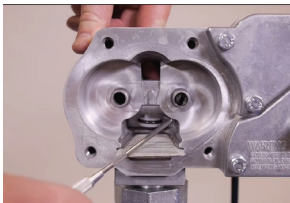
1. Turn the pump OFF and disconnect from power.
2. Using a 1/2" drive socket wrench, remove the pipe plug from the top outlet port (see Figure 16).
3. Remove the gear coverplate and O-ring from the pump housing.
4. Pull the drive key and two gears from the pump (see Figure 17).
5. To clean the bypass poppet:
  - a. With a clean cloth, wipe the poppet cavity through the top outlet port.
  - b. Push down on the poppet until the poppet O-ring is exposed inside the housing (see Figure 18).
  - c. Using a clean cloth, rotate the poppet and clean it thoroughly.



**Figure 16**



**Figure 17**



**Figure 18**

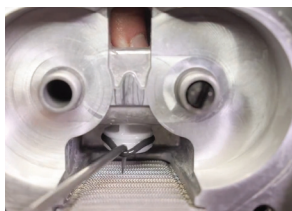
## REPAIR (CONTINUED)

### Replace Bypass Poppet O-ring

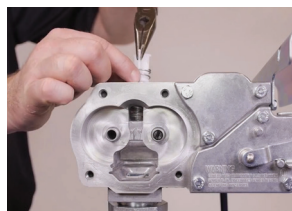
1. To remove or replace the bypass poppet:
  - a. As with cleaning, push down on the poppet until the O-ring is exposed.
  - b. Remove the O-ring with a small screwdriver or similar tool. Take care not to damage the poppet or O-ring (see Figure 19).
  - c. From inside the housing, push the poppet and spring upward and pull through the top outlet port (see Figure 20).
  - d. Wipe the poppet and gear cavities with a clean cloth.
  - e. Inspect the O-ring and replace as necessary (see Figure 21).

**NOTE:** Replace O-ring if damaged, swollen or loose-fitting (see Wet Seal Kit).

2. To assemble, place the spring and poppet into the poppet cavity through the top outlet port. Compress the poppet into the housing until the poppet appears in the lower chamber. Coat the O-ring lightly with grease and slip over the poppet head. Make sure the O-ring is well-seated.
3. Push on the poppet through the top outlet port to make sure it moves freely.
4. Install the pipe plug again, using thread tape as necessary.
5. Replace the gears and drive key. Make sure gears turn freely with the key removed.
6. Make sure the gear coverplate O-ring is in place. Tighten the coverplate to the pump housing.



**Figure 19**



**Figure 20**

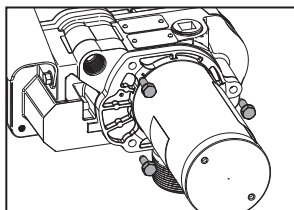


**Figure 21**

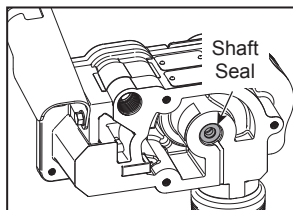
## REPAIR (CONTINUED)

### **Replace Motor Shaft Seal**

1. Turn the pump OFF and disconnect from power.
2. Remove the gear coverplate, gears and drive key as described in Gear Replacement instructions.
3. Remove the (3) 1/4-20 x 3/4 inch SEMS screws and motor from the pump housing (see Figure 22).
4. Remove the motor shaft seal by prying out with a small screwdriver (see Figure 23).
5. Lubricate the gear shaft with WD-40® or a similar penetrating oil.
6. Press a new motor shaft seal evenly in the pump housing until seated. Lubricate the seal with a lightweight motor oil.
7. Gently slide the shaft through the seal until the motor is flush against the pump housing.
8. Tighten the motor to the pump housing. Check for proper installation by working a .0015 inch feeler gauge around the motor flange. The gauge should not fit between the flange and the housing.
9. Re-install the gears and drive key as described in Gear Replacement instructions.



**Figure 22**



**Figure 23**

### **Replace Motor**

In order to preserve the UL Listing or CSA Certification for pump safety, return the entire pump to the factory for motor repair or replacement. For products serviced outside the factory, the UL and CSA nameplates must be defaced to indicate the equipment may no longer meet the requirements for UL Listing or CSA Certification. This does not apply to products serviced outside the factory under the UL program for Rebuilt Motors for Use in Hazardous Locations and the CSA rebuild program.

## REPAIR (CONTINUED)

### Replace Power Switch

1. Turn the pump OFF and disconnect from power.
2. Remove the switch coverplate from the pump housing (see Figure 24).
3. Remove the torx head screw, then remove the switch assembly (see Figure 25).
4. Unscrew both blade terminals and remove red pump wires from the back of the switch (see Figure 26).
5. Install a new switch by reversing the above procedure. Insert the switch assembly into the pump cavity. Place the red wire between the circuit breaker and the wall of the pump. Make sure the O-ring is seated properly before tightening the switch coverplate.

**NOTE:** For the proper operation of the switch lever and cam, attach the mounting plate to the switch with a clearance of 0.175 inch or about 3/16 inch (see Figure 27).

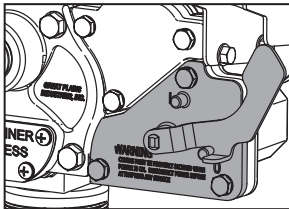


Figure 24

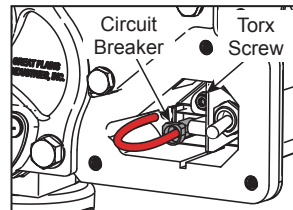


Figure 25

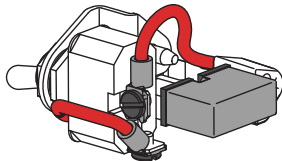


Figure 26

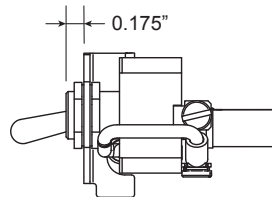
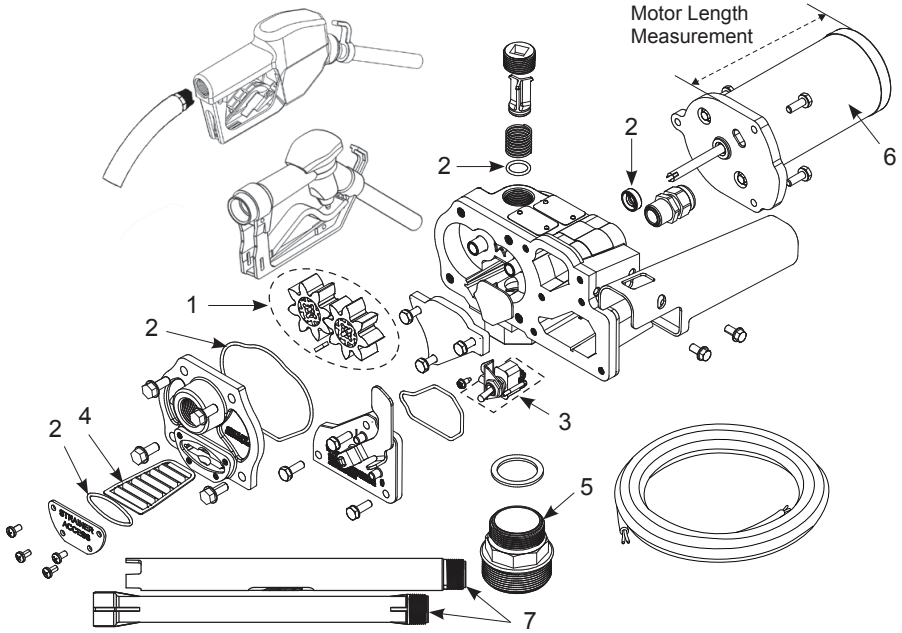


Figure 27





## REPAIR PARTS ILLUSTRATION FOR M-150S-AU, M150S-MU, M180S-ML, M180S-AU, and M-240S-MU

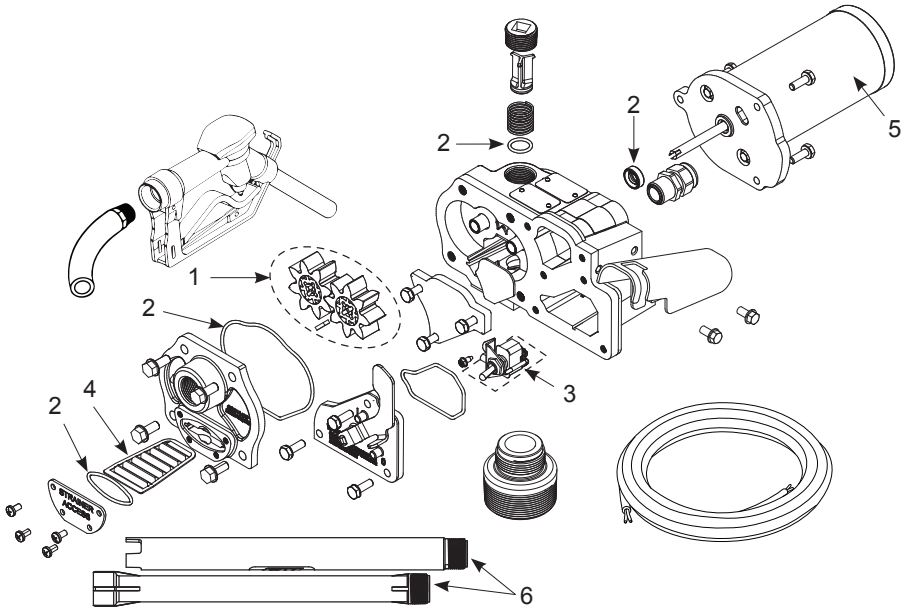


### REPAIR PARTS LIST FOR FOR M-150S-AU, M-150S-MU, M-180S AND M-240S

Ref. No.	Description	Part Number:	Qty.
1	Gear Kit - Includes 2 Gears & Drive Key	110906-1	1
2	<b>Wet Seal Kit</b>	<b>110907-1</b>	
	Gear Coverplate O-ring	▲	1
	Strainer Coverplate O-ring	▲	1
	Bypass Poppet O-ring	▲	1
	Motor Shaft Seal	▲	1
3	M-150S-MU & -AU Switch Assembly	110277-05	1
3	M-240S Switch Assembly	110277-06	1
3	M-180S Switch Assembly	110277-07	1
4	Inlet Strainer	110009-1	1
5	Tank Adapter	110909-1	1
6	12-volt Motor (UL) (M-150S-MU & -AU)	119200-551	1
6	12-volt Motor (UL) (M-180S)	119201-551	1
6	24-volt Motor (UL) (M-240S)	119200-552	1
7	Suction Pipe Assembly	110241-01	1

(▲) Available as part of kit only.

## REPAIR PARTS ILLUSTRATION FOR M-150S-EM



## REPAIR PARTS LIST FOR M-150S-EM

Ref. No.	Description	Part Number:	Qty.
1	Gear Kit - Includes 2 Gears & Drive Key	110906-1	1
2	<b>Wet Seal Kit</b>	<b>110907-1</b>	
	Gear Coverplate O-ring	▲	1
	Strainer Coverplate O-ring	▲	1
	Bypass Poppet O-ring	▲	1
	Motor Shaft Seal	▲	1
3	Switch Assembly	110277-05	1
4	Inlet Strainer	110009-1	1
5	12-volt Motor (UL)	119200-551	1
6	Suction Pipe Assembly	110241-01	1

(▲) Available as part of kit only.