



# FUEL HAULER TRAILER OPERATOR'S MANUAL

## FH990XLD MODEL



Read and understand the manual. This manual provides information and procedures to safely operate and maintain the fuel hauler.

(800) 243-2583  
[WWW.DUOLIFT.COM](http://WWW.DUOLIFT.COM)







# DUO LIFT®

## Warranty

This is to certify that we warrant to the original purchaser equipment manufactured by Duo Lift Manufacturing Company, Inc., identified and recorded by serial number, to be free of defects in material and workmanship under normal use and service to replace, free of cost, to the original purchaser any part or parts of said equipment that in our judgement shows evidence of such defects; and provide further that the said part or parts shall be returned to the factory, freight prepaid, within two years of shipping date. Manufacturer agrees to replace or repair during this period of no charge any defective part or parts returned to the factory, and deemed defective by authorized factory inspection. Should it become impractical to return said parts to the factory, the manufacturer shall not be liable for any labor costs, or any other costs encountered, in repairing or replacing any part or parts involved, but will be obligated to supply only the necessary repair and/or replacement items.

Duo Lift Manufacturing Company, Inc., as the manufacturer shall not be liable for any other damage, whether direct or consequential.

No representative or other person is authorized or permitted to make any other warranty or assume for his company any liability not strictly in accordance with the foregoing. This limited warranty is in lieu of all warranties expressed or implied and of all other obligations on the part of the factory.

This limited warranty shall not apply to any item which shall have been operated in a manner not recommended by the Company nor which shall have been repaired, altered, neglected or used in any way which in the Company's opinion adversely affects its performance and results.

This limited warranty shall not apply to any equipment which has been tampered with in any way or which has been subject to misuse, neglect or accident, or which has the serial number altered, defaced, or removed.

This limited warranty does not apply to exterior finishes, tire, bearings, springs, jacks, couplers or any such items not directly manufactured by Duo Lift Manufacturing Company, Inc., except to the extent of their individual manufacturer's guarantee.



**DUO LIFT MANUFACTURING CO., INC.**  
**FUEL HAULER TRAILERS**

**WARRANTY REGISTRATION FORM & INSPECTION REPORT**

**WARRANTY REGISTRATION (please print)**

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Customer's Name _____	Dealer Name _____
Address _____	Address _____
City, State, Zip Code _____	City, State, Zip Code _____
Phone Number ( ____ ) _____	Phone Number ( ____ ) _____
Contact Name _____	Check One:
Serial Number _____	Farm Use <input type="checkbox"/>
Delivery Date _____	Commercial Use <input type="checkbox"/>

**FUEL HAULER TRAILER MODELS:**

FH500D	FH50XLD	FH750D	FH750XLD	FH990D	FH990XLD

I have thoroughly instructed the buyer on the above-described equipment. This review included the Operator's Manual content, equipment care, adjustments, safe operation, and applicable warranty policy.

Refer to the pump and engine Operator's Manuals for maintenance and service of these components.

Date \_\_\_\_\_ Dealer's Rep. Signature \_\_\_\_\_

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation, and applicable warranty policy.

Date \_\_\_\_\_ Owner's Signature \_\_\_\_\_

DUO LIFT MFG.	DEALER	CUSTOMER

(MAKE COPIES AND CHECK APPROPRIATE BOX)

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# DUPLICATE

## DUO LIFT MANUFACTURING CO., INC. FUEL HAULER TRAILERS

### WARRANTY REGISTRATION FORM & INSPECTION REPORT

#### WARRANTY REGISTRATION (please print)

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Customer's Name _____	Dealer Name _____
Address _____	Address _____
City, State, Zip Code _____	City, State, Zip Code _____
Phone Number ( ____ ) _____	Phone Number ( ____ ) _____
Contact Name _____	Check One:
Serial Number _____	Farm Use <input type="checkbox"/>
Delivery Date _____	Commercial Use <input type="checkbox"/>

#### FUEL HAULER TRAILER MODELS:

FH500D	FH50XLD	FH750D	FH750XLD	FH990D	FH990XLD

I have thoroughly instructed the buyer on the above-described equipment. This review included the Operator's Manual content, equipment care, adjustments, safe operation, and applicable warranty policy.

Refer to the pump and engine Operator's Manuals for maintenance and service of these components.

Date \_\_\_\_\_ Dealer's Rep. Signature \_\_\_\_\_

The above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation, and applicable warranty policy.

Date \_\_\_\_\_ Owner's Signature \_\_\_\_\_

DUO LIFT MFG.	DEALER	CUSTOMER

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Dealer / Buyer Inspection Report	
✓ or NA	Task
	<b>Hitch Assembly</b>
	Safety chains are properly attached and have a certification tag. Chains are in good working condition. "6.2.3 Attaching to a Truck" on page 33.
	An OEM drawbar pin and retainer clip must be used for towing and must be in good working condition. <b>Do not use homemade or shop-made drawbar pins when towing this fuel hauler.</b> "6.2.3 Attaching to a Truck" on page 33.
	<b>Wheels and Axles</b>
	Wheel nuts/bolts are tightened to proper torque on all wheels. "9.4.3 Wheel Bolt Torque Requirements" on page 59.
	Tire pressure is correct on all wheels.
	Axle-to-frame bolts are installed and properly tightened.
	<b>Frame</b>
	All grease points are lubricated. "9.6 Service Record Chart" on page 62
	All fasteners are tightened to proper specifications.
	Reflector tape is installed. "4.5 Lights and Reflective Tape for Off-Road Identification" on page 27 and "4.8 Department of Transportation (DOT) Compliant Fuel Haulers" on page 28.
	SMV or SIS sign, if applicable, is installed (not supplied by Duo Lift). "3.3 How to Install Replacement Safety Signs" on page 24.
	All decals are legible and properly installed. "3.3 How to Install Replacement Safety Signs" on page 24.
	All pins are equipped with retainer clips.
	<b>Wiring and Lighting (if equipped)</b>
	Brake lights are in working order.
	Signal lights are in working order.
	Wiring harness plug is in working condition and fits into tow vehicle's receptacle.
	<b>Breakaway Brake System (if equipped)</b>
	Breakaway cable is supplied with fuel hauler. "6.2.3 Attaching to a Truck" on page 33.
	Battery is charged and in good working order. "9.8.2 Charging the Breakaway Battery" on page 63.

✓ or NA	Task
	<b>DOT Models Only</b>
	"4.8 Department of Transportation (DOT) Compliant Fuel Haulers" on page 28.
	Side clearance lights are working.
	Federal Annual Inspection tag is attached to frame and up-to-date.
	Fenders and mud flaps are installed.
	License plate lights are operating.
	Turn signal lights are operating.
	Brake lights are operating.
	<b>Diesel and DEF Tanks</b>
	No visible diesel fuel or DEF leaks.
	All fittings and hose clamps are tightened to proper specifications.
	Fill cap and vent are properly installed.
	Diesel and DEF tank shutoff valves function properly (close for transportation and open for fueling).
	<b>Documentation Review</b>
	All sections of Operator's Manual and Parts Book have been reviewed and understood by the owner.
	All safety and instructional signs have been reviewed and understood by the owner.
	Manual is given to owner.
	<b>Final Checks Prior to Towing</b>
	Tow vehicle is large enough to safely tow the fuel hauler. "6.1 Towing Safety" on page 31.
	OEM drawbar pin and retainer clip are properly installed. "6.2.2 Couplers" on page 33.
	Safety chains are attached to the tow vehicle and crossed under the hitch for added protection. "6.2.1 Trailer Safety Chains" on page 32.
	Wiring harness is connected and all fuel hauler lights are working properly.
	Brakes, if equipped, are working properly.
	Breakaway Brake System is functioning properly.
	Owner is instructed to check wheel bolt/nut torque at 5, 10, 25, and 50 miles; then check annually. "9.4.3 Wheel Bolt Torque Requirements" on page 59.
	1993 Diesel Fuel Placards are installed on all four sides of fuel hauler. "3.4 Installing 1993 Diesel Fuel Placards" on page 25


**XLD D.O.T. COMPLIANT**

FH990XLD, SHOWN

# FUEL HAULER TRAILERS

## Standard Features

<b>FRAME</b>	HEAVY DUTY STRUCTURAL CHANNEL FRAME, FLAT TANK SUPPORT PLATFORM
<b>SUSPENSION</b>	HIGHWAY RATED AXLES, TIRES AND WHEELS. UNDER-SLUNG SLIPPER SPRINGS, STEEL FENDERS
<b>JACK</b>	7,000 LB. TOP-WIND TONGUE JACK
<b>PLATFORM</b>	12" REAR PLATFORM, STEP AND GRAB HANDLE
<b>TANK</b>	BOLT-ON, SPRING CUSHIONED HIP TANK W/ROLL GUARDS, STAINLESS STEEL FUEL GAUGE, 3/16" TANK STEEL THICKNESS, (2) 2" TANK FILL LOCATIONS W/ LOCKABLE PRE-VENT CAPS WITH LOCKABLE PRE-VENT CAPS WITH TANK VENTING, STAINLESS STEEL BOTTOM TANK DRAIN PORT, LOCKING 2" FUEL SHUT OFF VALVE ON LOWER LEFT FRONT CORNER OF TANK
<b>BRAKES</b>	4-WHEEL ELECTRIC BRAKES WITH BREAKAWAY KIT
<b>HITCH</b>	2-5/16" ADJUSTABLE BALL COUPLER WITH (2) 3/8" SAFETY CHAINS AND ID TAGS
<b>FENDERS</b>	HEAVY DUTY FLAT TOP STEEL FENDERS WITH FRONT RUBBER COATING, BLACK SPLASH GUARDS
<b>COLOR</b>	TRAILER: BLACK TANK: WHITE ENCLOSURE: WHITE
<b>LIGHTS</b>	DOT LED LIGHTS CONFORMING TO CFR49. ENCLOSED IN CONDUIT OR LOOM WITH 7-WAY RV CONNECTOR
<b>OTHER</b>	CONSPICUITY TAPE, SAFETY SIGNS, DUO LIFT DECAL, (4) FUEL PLACARDS (NOT INSTALLED), 17 DIGIT VIN, ID PLATE AND MANUFACTURERS STATEMENT OF ORIGIN, MANUAL HOLDER, ANNUAL FEDERAL INSPECTION AND CERTIFICATE

## Optional Features

- IN-LINE DIGITAL D.E.F. METER AND IN-LINE DIESEL FUEL METER
- D.E.F. TRANSFER SYSTEM FOR PUMPING DEF ONTO TRAILER
- D.E.F. FILTER
- SPARE TIRE AND SPARE TIRE CARRIER



FH750XLD, SHOWN

## Technical Data

MODEL	GVWR	AXLES	FRAME	TANK	WHEELS	EMPTY WT.
FH500XLD	7,000 LBS	(2) 3,500 LB CAPACITY TANDEM AXLES	HEAVY DUTY STRUCTURAL CHANNEL FRAME	500 GALLON HIP TANK WITH (1) BAFFLE, 3/16" STEEL, D.O.T. APPROVED	225/75R15D ON 16" X 6" - 8 BOLT ON WHITE SPOKE WHEELS	3,000 LBS
FH750XLD	14,000 LBS	(2) 7,000 LB CAPACITY TANDEM AXLES	HEAVY DUTY STRUCTURAL CHANNEL FRAME	750 GALLON HIP TANK WITH (2) BAFFLES, 3/16" STEEL, D.O.T. APPROVED	(4) 235/80R16E ON 16" X 6" - 8 BOLT WHITE SPOKE WHEELS	3,900 LBS
FH990XLD	14,000 LBS	(2) 7,000 LB CAPACITY TANDEM AXLES	HEAVY DUTY STRUCTURAL CHANNEL FRAME	990 GALLON HIP TANK WITH (3) BAFFLES, 3/16" STEEL, D.O.T. APPROVED	(4) 235/80R16E ON 16" X 6" - 8 ON 6.5" WHITE SPOKE WHEELS	4,500 LBS





## FH500, FH750, FH990 OFF ROAD

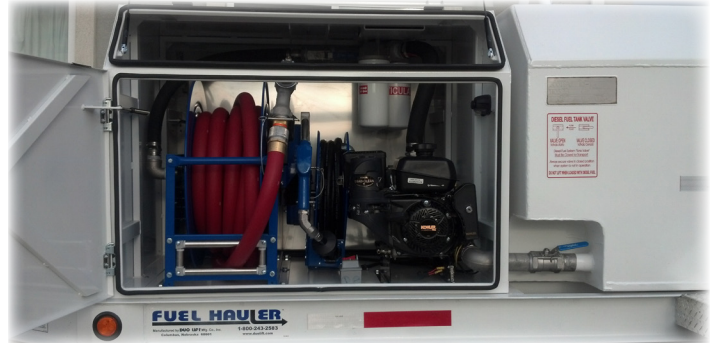
# FUEL HAULER TRAILERS

### Optional Features

- 20 - 25 GPM, 12V DIESEL PUMP W/10 MICRON FILTER, 25' HOSE, SWIVEL WITH AUTO NOZZLE, AND 30' POWER CORD WITH BATTERY CLAMPS
- 30 - 35 GPM, KOHLER GAS ENGINE POWERED DIESEL PUMP W/10 MICRON FILTER, 25' HOSE REEL, SWIVEL AND AUTO NOZZLE
- 40 - 55 GPM, KOHLER GAS ENGINE POWERED DIESEL PUMP, (2) 10 MICRON FILTERS, 50' HOSE REEL, SWIVEL, AUTO NOZZLE AND NOZZLE HOLDER
- 35' DIESEL HOSE REEL WITH NOZZLE HOLDER, SWIVEL & AUTO NOZZLE IN-LINE DIESEL FUEL METERS, 30 GPM OR 50 GPM CAPACITY
- 50, 80 OR 100 GALLON 12V D.E.F. SYSTEM, 120V DEF TANK HEATER BLANKET, DEF FILTER
- D.E.F. TRANSFER SYSTEM FOR PUMPING DEF ONTO TRAILER
- 7,000 LB. SIDE WIND DROP LEG JACK, BOLT-ON
- 25' D.E.F. REEL WITH NOZZLE HOLDER WITH DRIP CONTAINMENT, SWIVEL AND AUTO NOZZLE
- IN-LINE DIGITAL D.E.F. METER
- 50" FRONT OR 50" REAR ENCLOSURE WITH LOCKABLE TOP, SIDE AND REAR DOORS
- ALUMINUM DIAMOND PLATE GRAVEL GUARD FOR FRONT OF ENCLOSURE & FRONT OF FENDERS
- SPARE TIRE, SPARE TIRE CARRIER AND SPARE TIRE COVER
- 12V COVERED POWER SOCKET WITH LED DOME LIGHT AND 12V LED SPOT LIGHT
- LIGHT PACKAGE (FH500-FH750-FH990 OFF ROAD MODELS)
- ALUMINUM 16" - 8 BOLT WHEELS
- BLUE, GREEN, RED OR YELLOW PAINT COLOR FOR TANK OR TRAILER
- AG LIGHT PACKAGE FOR OFF ROAD MODELS



KOHLER POWERED 30-35 GPM DIESEL PUMPING SYSTEM, 12V DEF PUMP AND HOSE REELS



KOHLER POWERED 40-55 GPM DIESEL PUMPING SYSTEM WITH 80 GALLON D.E.F. TANK



OPTIONAL 50, 80 OR 100 GALLON D.E.F. SYSTEMS (100 GALLON SHOWN) OPTIONAL 120V 835 Watt, Auto Temperature Controlled, D.E.F. Tank Heater Blanket (40°F to -10°F Operational Tempera-



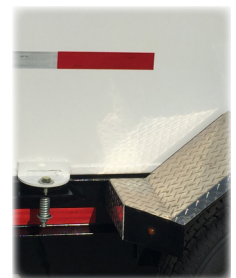
12V, 20-25 GPM DIESEL PUMPING SYSTEM WITH 25' DIESEL HOSE



D.E.F. TRANSFER SYSTEM OPTION



PATENT PENDING DIESEL AND D.E.F. STAINLESS STEEL NOZZLE HOLDERS W/ DRIP CONTAINMENT TUBES



SPRING CUSHIONED, BOLT-ON DIESEL TANK







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# 1 INTRODUCTION

## 1.1 Welcome Statement

### Keep Your Equipment Moving

Congratulations on your choice of a Duo Lift Mfg. Co., Inc. Fuel Hauler™ to complement your harvest operation. This equipment has been designed and manufactured to meet the needs of a discerning agricultural industry.

Operators cannot afford downtime. The Fuel Hauler™ is a heavy-duty fuel hauler designed to transport diesel fuel and diesel exhaust fluid (DEF) to your equipment. Six models are available with 500, 750, and 990 gallon capacities to meet your fueling requirements.

The rugged design and features, such as a heavy-duty frame with tandem axles and highway rated hubs, wheels, and tires, ensure you get to the fueling location quicker and fuel the equipment faster.

Each size of fuel hauler also comes in an Off-Road version or an on-highway DOT compliant version.

Many features incorporated into this fuel hauler are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the fuel hauler safely and how to use it to provide maximum field efficiency. By following the operating instructions, in conjunction with a good maintenance program, your fuel hauler will provide many years of trouble-free service.



FH750D Diesel Fuel Hauler with Open Platform.



FH750 Off-Road Diesel Fuel Hauler with an Optional 50 gallon Diesel Exhaust Fluid (DEF) Tank.



FH750D Fuel Hauler with Front Enclosure.

This manual covers Fuel Hauler models:	
✓	Model
	FH500
	FH500D
	FH750
	FH750D
	FH990
	FH990D

## 1.2 Safe Operation

Safe, efficient, and trouble-free operation of your Duo Lift Mfg. Co., Inc. Fuel Hauler™ requires that you, and anyone else who will be using or maintaining the fuel hauler, read and understand the information contained within the Operator's Manual.

Use this manual for frequent reference and to pass on to new operators or owners.

## **⚠ DANGER**



### **Explosion/Fire Hazard**

*The Fuel Hauler™ is only intended for use with diesel fuel or non-hazardous liquids such as diesel exhaust fluid (DEF). DO NOT use this fuel hauler with any flammable liquid, such as gasoline or kerosene. Transporting any other flammable or combustible liquid could result in a fire and explosion causing serious injury or death.*

## **⚠ WARNING**



### **Read And Understand Manual**

To prevent personal injury or even death, be sure you read and understand all of the instructions in this manual and other related OEM equipment manuals! The Fuel Hauler™, if not used and maintained properly, can be dangerous to users unfamiliar with its operation. Do not allow filling, towing, maintaining, adjusting, or cleaning of this fuel hauler until the user has read this manual and has developed a thorough understanding of the safety precautions and functions of the fuel hauler.

This fuel hauler was designed for a specific application; transporting diesel fuel and diesel exhaust fluid (DEF). DO NOT modify or use this fuel hauler for any application other than which it was designed.

Fuel haulers that are filled or operated improperly or by untrained personnel can be dangerous; exposing themselves and/or bystanders to possible serious injury or death.

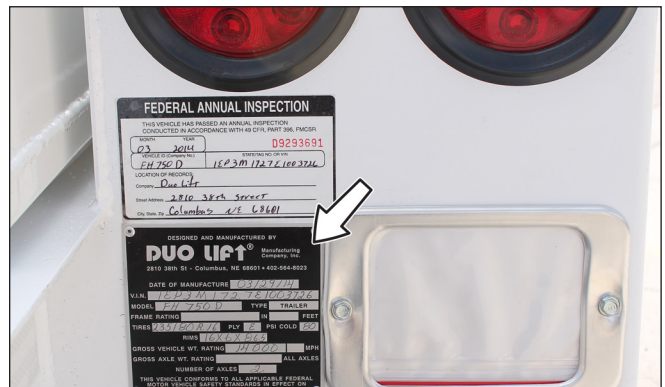
## **1.3 Operator Orientation**

The directions left, right, front, and rear, as mentioned throughout this manual, are as seen from the vehicle driver's seat and facing in the direction of travel.

## **1.4 Serial Number Locations**



Serial Number Stamped on Off-Road Model Fuel Hauler.



VIN (Vehicle Identification Number) Plate on DOT Model Fuel Hauler.

## **1.5 Disposal of Equipment at End of Useful Life**

The Duo Lift Fuel Hauler™ has been designed for the specific purpose of transporting diesel fuel and diesel exhaust fluid (DEF) to your equipment using country roads, local highways, and on agricultural farm land. When this unit is no longer capable of doing its designed purpose, it should be dismantled and scrapped. Do not use any materials or components from this unit for any other purpose.

## **1.6 Unanswered Questions**

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Duo Lift Mfg. Co., Inc., 2810 38th Street, Columbus, Nebraska 68601, Phone: (402) 564-8023, Fax: (402) 564-5385, Toll Free: 1-800-243-2583.



## 2 SAFETY

### 2.1 General Safety Instructions

Safety of the operator and bystanders is one of the main concerns in designing and developing a new piece of equipment. Designers and manufacturers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling the equipment.

Most work-related accidents are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you fill, tow, operate, or maintain the fuel hauler (unit), you must be alert to potential hazards. You should also have the necessary training, skills, and tools to perform any assembly or maintenance procedures.

Improper operation and maintenance of this unit could result in a dangerous situation that could cause injury or death.

If you have any questions not answered in this manual or require additional copies or the manual is damaged, please contact your dealer or Duo Lift Mfg. Co., Inc., 2810 38th Street, Columbus, Nebraska 68601, Phone: (402) 564-8023, Fax: (402) 564-5385, Toll Free: 1-800-243-2583.

#### **WARNING**



**Do not fill or tow the unit until you read and understand the information contained in this manual.**



**Safety precautions and warnings are provided in this manual and on the unit. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.**

Duo Lift Mfg. Co., Inc. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the unit are, therefore, not all-inclusive. If a method of installation or operation not specifically recommended by Duo Lift Mfg. Co., Inc. is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the unit will not be damaged or be made unsafe by the methods that you choose.

The information, specifications, and illustrations in this manual are based on the information that was available at the time this material was written and can change at any time without notice.

### 2.2 Safety Alert Symbols



This is the safety alert symbol (triangle) and will be accompanied with a descriptive pictorial. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

This manual contains DANGERS, SAFETY INSTRUCTIONS, CAUTIONS, IMPORTANT NOTICES, and NOTES which must be followed to prevent the possibility of improper service, damage to the equipment, personal injury, or death. The following key words call the readers' attention to potential hazards.

Hazards are identified by the "Safety Alert Symbol" and followed by a signal word such as "DANGER", "WARNING", or "CAUTION".

#### **DANGER**

**Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.**

#### **WARNING**

**Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

#### **CAUTION**

**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

#### **NOTICE**

*Indicates that equipment or property damage can result if instructions are not followed.*

#### **SAFETY INSTRUCTIONS**




















**Safety instructions (or equivalent) signs indicate specific safety-related instructions or procedures.**

**Note:** Contains additional information important to a procedure.

## 2.3 Safety Icon Nomenclature

Pictorial icons signal a type of hazard and warn of personal protection issues, prohibited actions, and hazard avoidance.

### 2.3.1 Personal Protection/Important Information Icons

-  Read the manual
-  Damaged safety signs
-  Eye protection
-  Fire extinguisher
-  First aid kit
-  Hand protection
-  Head protection
-  Hearing protection
-  Inspect equipment
-  OEM parts only
-  Protective shoes
-  Remove key
-  Set parking brake
-  Stop engine
-  Think safety
-  Transmission in park
-  Use proper support
-  Use proper tools
-  Visibility
-  Weight rating

### 2.3.2 Prohibited Actions Icons

-  Do not alter or modify
-  Do not ride
-  Do not weld
-  No alcohol
-  No drugs
-  No young children

### 2.3.3 Hazard Avoidance Icons

-    Crush hazard
-  Crush hazard (chock wheels)
-  Defective or broken part
-  Entanglement hazard
-  Explosive force hazard
-  Fall hazard
-  Maximum weight limit
-  Projectile hazard
-  Rollover protection
-  Safety alert symbol
-  Safety shields
-  Slipping hazard
-  Tire pressure (maintain)
-  Tripping injury

## 2.4 General Safety Instruction

The owner/operator is responsible for the SAFE use and maintenance of the Duo Lift Manufacturing Co., Inc. (Duo Lift) Fuel Hauler™. Make sure anyone who is towing, filling, maintaining, or working around the Fuel Hauler™ is familiar with the operating and maintenance procedures and related SAFETY information contained in this manual. This manual has step-by-step instructions and alerts you to all good safety practices that should be used while using the Fuel Hauler™.

In addition to the design features of the Fuel Hauler™, including safety signs, accident prevention is dependent upon the awareness, concern, prudence, and proper training of the people involved in the filling, use, towing, maintenance, and storage of the fuel hauler.

In addition to this safety section, refer also to safety messages and instructions in each of the appropriate sections of the fuel hauler manual.

These general safety instructions apply to the overall use and maintenance of the Fuel Hauler™.

More specific instructions on safety are found in the operation, towing, filling, maintenance, and storage sections of this manual. Refer to these sections before performing any of these tasks.

### **WARNING**

Failure to comply with the following safety instructions can and will result in serious injury and possibly even death if they are not understood and followed.



#### **Read And Understand Manual**

To prevent personal injury or even death, be sure you read and understand all of the instructions in this manual and other related OEM equipment manuals! The Fuel Hauler™, if not used and maintained properly, can be dangerous to users unfamiliar with its operation. Do not allow filling, towing, maintaining, adjusting, or cleaning of this fuel hauler until the users have read this manual and have developed a thorough understanding of the safety precautions and functions of the fuel hauler.

This fuel hauler was designed for a specific application; transporting diesel fuel and diesel exhaust fluid (DEF). DO NOT modify or use this fuel hauler for any application other than which it was designed.

Fuel haulers that are filled or operated improperly or by untrained personnel can be dangerous; exposing themselves and/or bystanders to possible serious injury or death.

### **WARNING**



**Provide User with Operator's Manual**  
Fuel Hauler™ owners must provide operating instructions to anyone using the fuel hauler.



#### **Stay Clear**

Under no circumstances should young children be allowed to work with or around the Fuel Hauler™.



#### **Impaired User Hazard**

Do not attempt to fill, tow, or use this fuel hauler under the influence of drugs or alcohol. Consult your doctor before using this fuel hauler while taking prescription medications.

### **CAUTION**

The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.

#### **Personal Protection Equipment**

When using this fuel hauler, wear appropriate personal protective equipment. This list may include, but is not limited to:



- A hard hat.
- Protective shoes with slip resistant soles.
- Protective goggles, glasses, or face shield.
- Protective clothing and gloves.



#### **Hearing Loss**

**Prolonged Exposure To Loud Noise May Cause Permanent Hearing Loss!**

Working environments with noise-producing equipment can cause partial to permanent hearing loss. We recommend using hearing protection any time noise levels exceed 80 decibels (dB). Noise levels over 85 dB, on a long-term basis, can cause severe hearing loss. Noise levels over 90 dB over a period of time can cause permanent and even total hearing loss.

Hearing loss from loud noise is cumulative over a lifetime without hope of natural recovery.

## **SAFETY INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.

---



### **First Aid Kit**

Have a first aid kit available should the need arise and know how to use it.

---



### **Fire Extinguisher**

Have a fire extinguisher available for use should the need arise and know how to use it.

---



### **Think SAFETY!**

**Work SAFELY!**

---

## **2.5 User Training Safety**

Refer to Operation Section 5 for safety recommendations related to using the fuel hauler. All applicable safety recommendations in other sections should also be followed.

## **2.6 Towing Safety**

Refer to Towing Section 6 for safety recommendations related to towing the fuel hauler. All applicable safety recommendations in other sections should also be followed.

## **2.7 Filling Safety**

Refer to Operation Section 7 for safety recommendations related to filling the fuel hauler as well as filling a machine. All applicable safety recommendations in other sections should also be followed.

## **2.8 Storage Safety**

Refer to Storage Section 8 for safety recommendations related to storing the fuel hauler. All applicable safety recommendations in other sections should also be followed.

## **2.9 Maintenance Safety**

Refer to Service and Maintenance Section 9 for safety recommendations related to service and maintenance of the fuel hauler. All applicable safety recommendations in other sections should also be followed.

## **2.10 Tire Safety**

Refer to Maintenance Section 9 for safety recommendations related to tire safety for the fuel hauler. All applicable safety recommendations in other sections should also be followed.

2.11 Sign-Off Form

Duo Lift Mfg. Co., Inc. follows the general Safety Standards specified by the American Society of Agricultural and Biological Engineers (ASABE) and the American National Standards Institute (ANSI). Anyone who will be using and/or maintaining the Fuel Hauler™ must read and clearly understand ALL safety, usage, and maintenance information presented in this manual.

Do not use or allow anyone else to use this fuel hauler until all information has been reviewed. Annually review this manual before the season start-up.

Make periodic reviews of SAFETY and OPERATION of the fuel hauler a standard practice for all of your equipment. An untrained operator is not qualified to use this fuel hauler.

This sign-off sheet is provided for your recordkeeping to show that all personnel who will be working with the equipment have read and understand the information in this Owner’s Manual and Parts Book and have been instructed in the operation of the equipment.

Sign-Off Form		
Date	User’s Signature	Owner’s Signature



## 3 SAFETY SIGNS AND INSTRUCTIONAL LABELS

### 3.1 General Information for Safety Signs

The types of safety signs (hazard labels) and instructional labels are shown in the following illustrations. Good safety practices require that you familiarize yourself with the various safety signs, the type of warning, and the area or particular operation related to that area that requires your SAFETY AWARENESS.



**Think SAFETY!**

**Work SAFELY!**

Pay close attention to the safety and instructional signs attached to the tow vehicle and the fuel hauler. Duplicate safety signs, which are attached to the fuel hauler, can also be found in this section. If the fuel hauler is missing a sign or one is unreadable, replace the sign before using the fuel hauler.

#### SAFETY INSTRUCTIONS





#### Safety and Instructional Signs




1. Keep safety or instructional signs clean and legible at all times.
2. Replace any missing or hard-to-read safety or instructional signs.
3. Use care when washing or cleaning the fuel hauler not to remove or damage the signs.
4. Locations for the signs and replacement part numbers are shown in this section.
5. Replacement parts must have replacement signs attached during installation and/or before the fuel hauler is used.
6. Safety signs are available from your authorized dealer or from Duo Lift at no charge.

### 3.2 Safety Signs

#### 3.2.1 Safety Signs Off-Road Models

<b>⚠ WARNING</b>	
	<b>Wheel Detachment</b> Wheel nuts are prone to loosen after being first assembled due to metal creep between rim and nuts/bolts.  Inadequate wheel nut torque can cause rim to loosen resulting in a wheel separating from trailer.  To prevent serious injury or death: <ul style="list-style-type: none"><li>• Verify wheel nuts are tight before each tow.</li><li>• Check wheel nut torque for tightness on a new trailer, and after re-mounting a wheel after 5, 10, 25, and 50 miles.</li></ul> Tighten: 1/2" to 80 ft.lbs. (110 N·m) 9/16" to 115 ft.lbs. (155 N·m)
	

DE000061

<b>⚠ WARNING</b>	
	<b>Travel Speed</b> <b>Fuel Hauler Trailers are capable of highway speeds.</b> Loss of control, at any speed, can result in serious injury or death.
When filled with fuel, travel speed must be limited per road conditions and also provide reasonable control of tow vehicle and trailer.	
	If travel speed is less than 25 mph (40 kph), an SMV sign must be attached to back of load.
	If travel speed is 25 to 40 mph (40 to 64 kph), an SIS and SMV sign must be attached to back of load.

DE000062

## WARNING

To prevent serious injury or death:

1. Read and understand Owner's Manual and Parts Book before starting.
2. Match capacity of tow vehicle with weight of loaded trailer.
3. Always refer to towing vehicle owner's manual to determine vehicle's towing capacity and ensure compatibility and maximum safety.
4. Attach trailer and tow vehicle using the standard ball hitch or an OEM hardened hitch pin with a retainer. Do not use homemade pins. Attach safety chains to tow vehicle.
5. Before loading trailer, make sure engine of tow vehicle is stopped, transmission is placed in park, key is removed, and parking brake is set.
6. Do not service, adjust, or repair a loaded trailer.
7. Securely tie down load before moving trailer.
8. On Off-Road models, install SMV and/or SIS signs required by highway authorities before transporting. Make sure lights are working correctly.
9. Never exceed a safe travel speed.
10. Shift towing vehicle to a lower gear before going down steep downgrades to use engine as a retarding force. Keep towing vehicle in gear at all times.
11. Inspect all components on trailer for damage. Repair any damage before using trailer.
12. Make sure all hardware is properly tightened to specified torque.
13. Do not drink and drive.
14. Maintain proper trailer brake adjustment, if equipped.
15. Place certified safety stands under frame and chock tires before working on tires or running gear.
16. Do not allow riders on trailer or towing vehicle.
17. Make sure driver is in compliance with all regulations regarding transporting equipment on public roads.
18. Review safety instructions annually.
19. Make sure all pins and reetainer clips are in place before towing.

DE000060

### 3.3 How to Install Replacement Safety Signs

1. Clean and dry the installation area.

**Note:** Do not install the signs if the temperature is below 50°F (10°C).

2. Determine the exact position before you remove the backing paper.
3. Remove the backing paper.
4. Align the sign over the specified area and carefully press the sign to the part/frame.

**Note:** Small air pockets can be pierced with a pin and smoothed out using the piece of backing paper.

### 3.4 Installing 1993 Diesel Fuel Placards

#### SAFETY INSTRUCTIONS



Before transporting fuel, make sure the diesel fuel placards are displayed on all four sides of the fuel hauler. It is the responsibility of the owner to properly install and display these placards.

Fuel haulers are shipped with four diesel fuel placards that are not installed. Federal regulations require that the placards be installed before filling the tank with diesel fuel.

Install one placard on each of the four sides.

**Note:** Install the placards prior to filling the fuel tank with diesel fuel. Fuel haulers that have never been filled with fuel do not require the placards in order to be towed.



Diesel Fuel Placard.



Typical Fuel Placard Placement Locations.

## 4 MACHINE APPLICATIONS AND COMPONENTS

### 4.1 Fuel Hauler Applications

The Duo Lift Mfg. Co., Inc. Fuel Hauler™ is designed to carry and transport diesel fuel and diesel exhaust fluid (DEF) if equipped with the optional DEF tank. On-Road and Off-Road versions of the three sizes are available. All fuel hauler models, whether On-Road or Off-Road, are capable of transporting fuel into the field or construction site where it's needed.



On-Road Diesel Fuel Hauler™ (DOT compliant).



Off-Road Diesel Fuel Hauler™ with an Optional Diesel Exhaust Fluid (DEF) Tank.



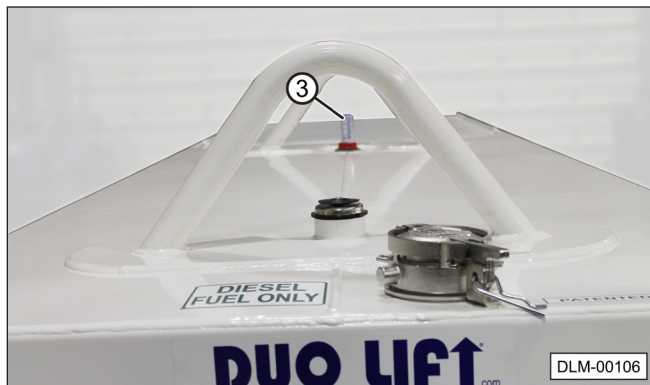
DOT Compliant On-Road Fuel Hauler™.

### 4.2 Diesel Fuel Tank

There are three sizes of diesel fuel tanks, depending on the requirements of the user; 500, 750, or 990 gallons (1890, 2840, or 3745 liters).

Each tank is equipped with an All-in-1 vent/fill cap (1), breather port (2), and fuel level gauge (3).

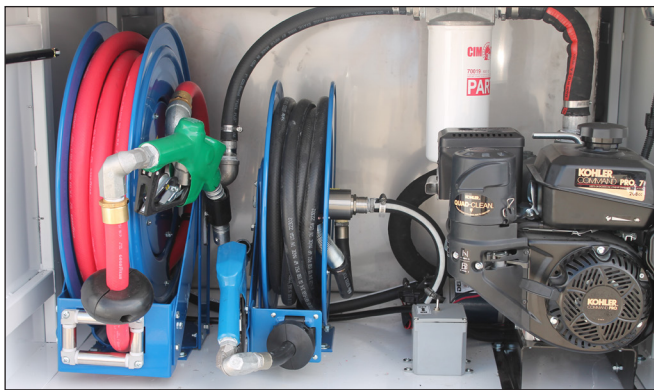
The cap provides a fill point, pressure relief, vacuum relief, a fusible vent, and rollover protection.



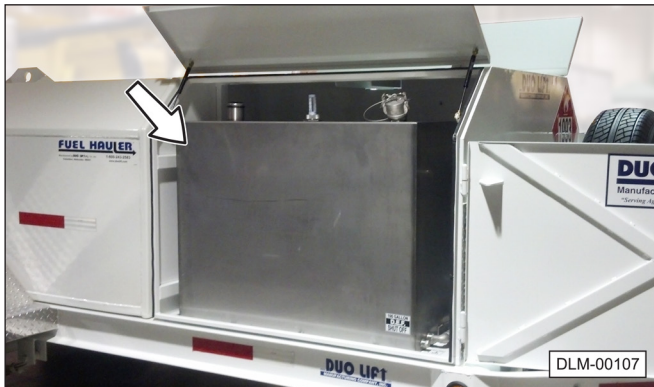


### 4.3 Fuel Pump; Gasoline or Electric

Each fuel hauler is equipped with either a direct-drive, gasoline engine and pump, or a 12 Volt electric pump.



### 4.4 Diesel Exhaust Fluid (DEF) Tank



All fuel hauler models can be equipped with the optional 50 gallon or 100 gallon Diesel Exhaust Fluid (DEF) tank. DEF is a solution used with all newer diesel engine ag equipment to meet emission standards. It is a highly purified solution of urea in water which allows SCR (Selective Catalytic Reduction) engines to meet clean air standards. DEF is a clear liquid similar in appearance to water.

DEF is safe to handle and use; it is not explosive, flammable, toxic, or subject to any hazardous product regulations.

### 4.5 Lights and Reflective Tape for Off-Road Identification

Off-Road Fuel Haulers™ have red and orange reflective tape on the back bumper and amber tape on the sides. To meet the standards for road transportation, an optional light package can be added.

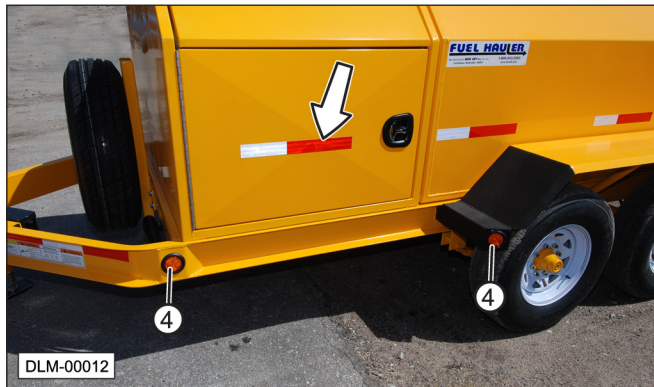


DOT style Fuel Haulers™ are equipped with DOT compliant running lights (1), brake lights and turn signals (2) for use on public roads. A bank of three red lights (3) is also installed in the middle of the back bumper. Red and white reflective tape is also installed.





Yellow side lights (4) are installed at the front of the fuel hauler frame and on the fenders. DOT compliant fuel haulers are also equipped with red and white reflective tape on all sides of the fuel hauler.



The left-side fender is also equipped with a license plate light.



## 4.6 Axles and Springs

The FH500 model has a single 6000 pound axle and the FH500D model has tandem 3500 pound axles. The FH750(D) and FH990(D) models are equipped with 7,000 pound axles and underslung slipper springs for suspension to improve handling performance when towing.



## 4.7 Breakaway Brake System

The breakaway brake system is standard on all DOT models and optional on Off-Road models. This system will apply the brakes automatically and immediately 1) if the breakaway cable is properly attached to the tow vehicle; and 2) if the fuel hauler separates from the tow vehicle.

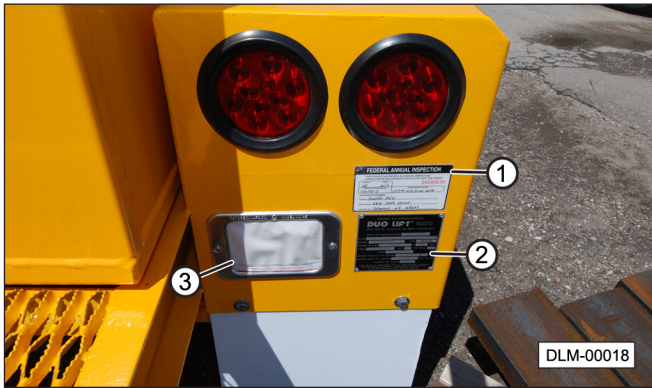


## 4.8 Department of Transportation (DOT) Compliant Fuel Haulers

The DOT Compliant Package includes: four wheel electric brakes, flat top fenders with rubberized coating on the front of each fender, splash guards, red/white reflective tape, highway lighting package, rear fuel hauler bumper, fusible vent, and a vacuum and fill cap rollover guard on the diesel tank.



#### 4.8.1 DOT Compliant Items



1. Federal Annual Inspection Tag.
2. VIN (Vehicle Identification Number) Plate.
3. Holder for Registration and Insurance Information.

#### 4.9.2 Power Port and Dome Light (Optional)



Operator's Manual Canister.

### 4.9 Optional Equipment

These items are available as options from Duo Lift Mfg. Co., Inc.

#### 4.9.1 Vinyl Spare Tire Cover (Optional)



## 5 SPECIFICATIONS

### 5.1 Fuel Hauler Specifications

MODEL DIMENSIONS	FH500 Off Road*/FH500D**	FH750 Off Road*/FH750D**	FH990 Off Road*/FH990D**
Overall Length in Longest Configuration	14' 9"	16' 11"	19' 9"
Overall Width	8'6"	8'6"	8'6"
Capacity in Gallons	500	750	990
GVWR	7,000	12,000	14,000
Empty Weight	1700/3100	2960/3780	3480/4300
Tires Size	225/75R15	235/80R16	235/80R16
Tire Pressure	65 psi	80 psi	80 psi
Load Range	D	E	E
Hubs	6 Bolt	8 Bolt	8 Bolt
Number of Axles	1 or 2	2	2
Wheel Nut Torque	1/2" - 80 ft. lbs. (110 N·m)	9/16" - 115 ft. lbs. (155 N·m)	
DEF Tank			

Specifications subject to change without notice.

\* OFF ROAD Models are Equipped with Open Front Platform, 12 Volt Powered Diesel Pump System and Hose Stand

\*\* D.O.T. Complaint Models are Equipped with Front Enclosure, 50 or 100 Gallon D.E.F. System, Gas Engine Powered Diesel Pump System, Diesel Hose Reel, D.E.F. Hose Reel, Spare Tire and Spare Tire Carrier

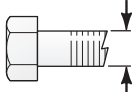
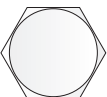


### 5.2 Bolt Torque

#### 5.2.1 Checking Bolt Torque

Torque figures indicated in the charts are used for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in the charts unless otherwise noted. Check tightness of bolts periodically, using the bolt torque chart as a guide. Always replace hardware with the same strength bolt.

#### 5.2.2 English Torque Values

 Bolt Diameter	English Bolt Torque Specifications*					
	Grade 2  No Marking		Grade 5  3 Radial Lines		Grade 8  6 Radial Lines	
	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
1/4"	8	6	12	9	17	12
5/16"	13	10	25	19	36	27
3/8"	27	20	45	33	63	45
7/16"	41	30	72	53	100	75
1/2"	61	45	110	80**	155	115
9/16"	95	60	155	115**	220	165
5/8"	128	95	215	160	305	220
3/4"	225	165	390	290	540	400
7/8"	230	170	570	420	880	650
1"	345	225	850	630	1320	970



## 6 TOWING

### 6.1 Towing Safety

#### **WARNING**

Failure to comply with the following safety instructions can and will result in serious injury and possibly even death if they are not understood and followed.



#### **Vehicle Owner/Operator Manual**

Always refer to the towing vehicle owner's manual fuel hauler towing section to determine the vehicle's towing capacity and to ensure compatibility and maximum safety.



#### **Operating the Tow Vehicle**

Before attaching the fuel hauler to the tow vehicle, be familiar with its controls and how to stop it quickly in the event of an emergency. Read and understand this manual and the one provided with your tow vehicle before towing the fuel hauler.



#### **Hitch and Retainer Pins (Off-Road Models)**

Attach the fuel hauler and tow vehicle using a ball coupler, eye hitch, or hardened hitch pin with a retainer and safety chains. Do not use homemade pins.



#### **Hitch and Retainer Pins (On-Road Models)**

Attach the fuel hauler and tow vehicle using a standard ball coupling and hitch, and safety chains.



#### **Crush Hazard**

Under no circumstances should young children be allowed to work with or around the Fuel Hauler™. When moving the fuel hauler, make sure all bystanders, especially small children, stay clear of the working area.



#### **Fall and Crush Hazard**

Do not allow riders on the fuel hauler or tow vehicle.



#### **Maximum Towing Speed**

Do not exceed a maximum safe travel speed, which may be lower than the recommended or posted speed. Slow down for corners and rough terrain.



#### **Descending Hills**

Shift towing vehicle to a lower gear before going down steep downgrades to use engine as a retarding force. Keep towing vehicle in gear at all times.

#### **WARNING**



#### **Visibility**

Clean reflectors, SMV or SIS sign, and lights before towing. Make sure all the lights and reflectors required by highway and transport authorities are in place and can be seen clearly by all overtaking and oncoming traffic.



#### **Close all Shutoff Valves**

Before towing, close shutoff valves on diesel tank and DEF tank.



#### **Regulations**

Make sure all local, state, and federal regulations, regarding the transport of equipment on public roads and highways, are met. Check with the local authorities regarding fuel hauler transport on public roads. Obey all applicable laws and regulations.

### 6.1.1 Towing Preparation (Inspection)

#### **SAFETY INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.



#### **Hitch Rating (Off-Road Models)**

Make sure the hitch and hitch pin on the towing vehicle are rated greater than the fuel hauler's "gross vehicle weight rating" (GVWR). Inspect the hitch and hitch pin for wear or damage. DO NOT use a home made pin.



#### **Inspect Hitch and Coupling (On-Road Models)**

Make sure the hitch and coupling device are compatible. DO NOT tow the fuel hauler using a defective hitch or coupling.



#### **Hitch Attachment**

Be sure the fuel hauler is securely attached to the tow vehicle and in good operating condition before using.



#### **Crisscross Safety Chains**

Connect and crisscross the chains under the hitch to support the hitch should an unplanned separation occur.



#### **Breakaway Brake System**

If equipped, attach the breakaway cable to the rear of the towing vehicle. Do not attach the cable to the fuel hauler hitch.

**SAFETY  
INSTRUCTIONS**



**Tire Pressure**

Check the tires for high/low pressure, cuts, bubbles, damaged rims, or missing lug nuts. Do not use the fuel hauler if any damage is found.



**Working Taillights and Signal Lights**

Make sure the directional and brake lights on the fuel hauler are connected and working properly.



**Highway Safety Devices**

On Department of Transportation (DOT) models, make sure all highway safety devices, such as fenders, mud flaps, and lighting, are properly installed and in working condition before using the fuel hauler.



**Additional Lighting**

Install additional lights on the rear of the fuel hauler to safeguard against rear-end collisions. Daybreak and dusk are particularly dangerous and pilot vehicles are recommended.

**6.1.2 Towing Vehicle Specifications**

**SAFETY  
INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.

**6.1.2.1 Truck**



**Truck Capacity**

A 3/4 ton or larger capacity truck should be used for towing.

**6.1.2.2 Tractor**



**Rollover Protection**

If the tow vehicle is a tractor, it should be equipped with a Rollover Protective Structure (ROPS) and a seat belt.



**Hazard Flashers**

Use hazard flashers on the combine when towing unless prohibited by law.



**Right-of-Way**

Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.

**6.2 Attaching/Unhooking Trailer**

Follow this procedure when attaching the Fuel Hauler™ to a tow vehicle.

**WARNING**



**Crush Hazard**

Under no circumstances should young children be allowed to work with or around the Fuel Hauler™. When moving the fuel hauler, make sure all bystanders, especially small children, stay clear of the working area.

**6.2.1 Trailer Safety Chains**

Safety chains connecting the tow vehicle to the fuel hauler are a vital part of highway towing safety. Fuel Hauler™ are equipped with certified safety chains from the factory. Each chain has a certification tag attached to it.



**WARNING**



**Unexpected Separation Hazard**

If the safety chains do not have a current certification tag, do not use the fuel hauler until properly certified chains are installed. Substandard safety chains could allow the fuel hauler to separate from the tow vehicle, resulting in equipment damage, personal injury, or death.



## 6.2.2 Couplers

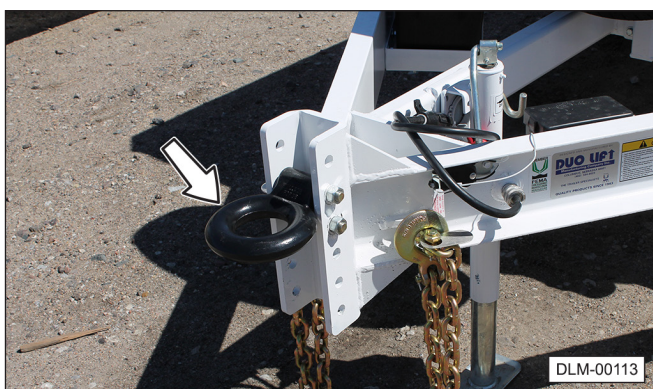
The Off-Road Fuel Hauler™ may be equipped with a clevis for a hardened hitch pin with retainer, a standard ball hitch, or a lunette eye hitch. The On-Road Fuel Hauler™ is equipped with a 2-5/16" ball coupler.



Hardened Hitch Pin with Retainer.



2-5/16" Ball coupler.



Lunette Eye Hitch.

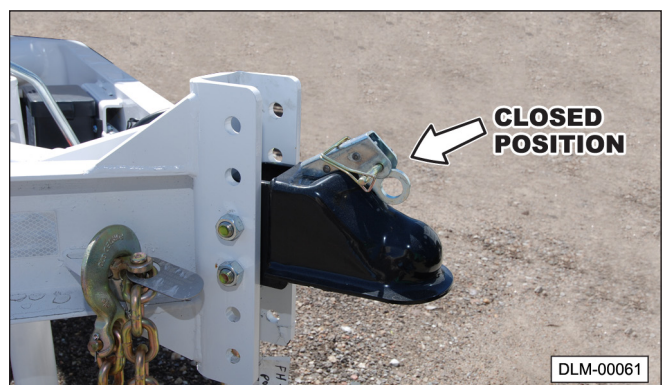
## 6.2.3 Attaching to a Truck

For fuel haulers equipped with brakes, the tow vehicle must have a functional brake controller.

1. Slowly back the tow vehicle up to the fuel hauler until the clevis or ball coupler and hitch are aligned.



2. Install the hardened drawbar pin and retainer or connect the ball coupler, depending on the style of hitch assembly.



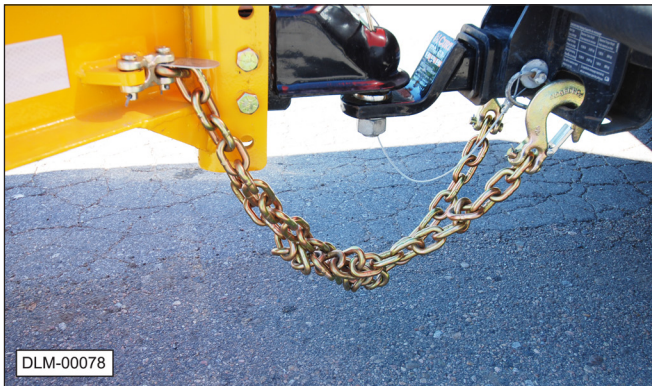


## NOTICE

If towing the fuel hauler with a drawbar, use only a certified, hardened drawbar pin with a retainer clip. Do not use homemade pins, bolts, or any other type of retaining device. Always install the retainer clip, making sure the hitch and fuel hauler are securely fastened to the tow vehicle.

Using a pin not intended for this type of towing can result in unexpected separation of the fuel hauler from the tow vehicle, resulting in equipment damage and personal injury.

3. Attach the safety chains to the tow vehicle to prevent unexpected separation. Be sure to crisscross the chains under the hitch.

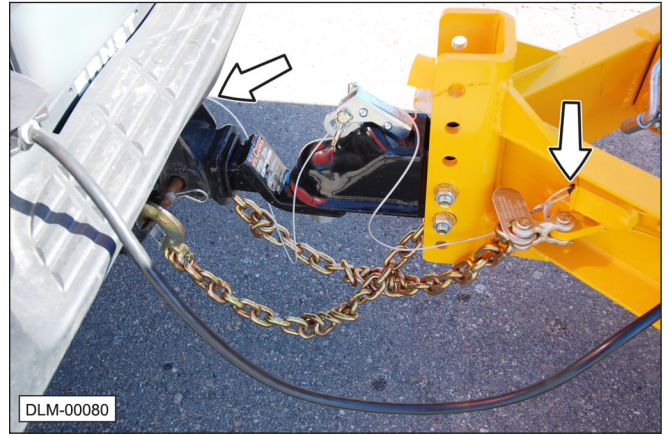


**Note:** The safety chains can be twisted in order to shorten their length and prevent them from dragging on the ground.



4. If equipped, attach the breakaway brake cable to the frame of the tow vehicle.

**Note:** The breakaway key must be inserted into the socket and the cable hooked to the tow vehicle.



5. Raise the jack. Pull the retaining pin, rotate the jack 90° into the storage position, and reinsert the retaining pin.



6. If equipped, connect the seven pin wiring harness to the truck. Provide sufficient slack for turning.



7. Before towing, follow these Safety Instructions.

***SAFETY  
INSTRUCTIONS***

1. Make sure the fuel hauler lights and brakes, if equipped, are working properly. If the fuel hauler's electrical equipment is not functioning properly, it may be due to incompatible or crossed wiring from the tow vehicle to the fuel hauler.

---
2. Make sure the fuel hauler brakes apply when the brake pedal is depressed.

---
3. If equipped with a breakaway brake system, make sure it activates and applies brakes when cable key is pulled from its socket.

---
4. Always verify the diesel fuel tank shutoff valve is in the CLOSED position before towing. Some shutoff valves on the diesel fuel tank may be in the OPEN position when the handle is perpendicular to the valve body, which is typically the CLOSED position.

---

## 7 OPERATION

### 7.1 Operating Safety

#### 7.1.1 Operator Safety Training

##### **WARNING**



##### **Read And Understand Manual**

To prevent personal injury or even death, be sure you read and understand all of the instructions in this manual and other related OEM equipment manuals before using the Fuel Hauler™. The Fuel Hauler™ Fuel hauler, if not used properly, can be dangerous to users unfamiliar with its operation. Do not allow filling, towing, or adjusting of this fuel hauler until the users have read this manual and have developed a thorough understanding of the safety precautions and functions of the fuel hauler.

This fuel hauler was designed for a specific application; transporting diesel fuel and diesel exhaust fluid (DEF). DO NOT modify or use this fuel hauler for any application other than which it was designed.

Fuel haulers that are filled or operated improperly or by untrained personnel can be dangerous; exposing the operators and/or bystanders to possible serious injury or death.

##### **SAFETY INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.



##### **Train Unfamiliar Users**

It is the fuel hauler owner's responsibility to make sure any person using the fuel hauler, especially if it is loaned or rented, has been thoroughly trained in its proper and safe use.

Train all new users and review instructions frequently with existing users.

Be certain only physically able persons will use the fuel hauler.

Users who have not read and understood all operating and safety instructions are not qualified to use the fuel hauler. Untrained users expose themselves and bystanders to possible serious injury or death.

If the elderly are assisting with the work, their physical limitations need to be recognized and accommodated.

#### 7.1.2 General Operating Safety

##### **WARNING**

Failure to comply with the following safety instructions can and will result in serious injury and possibly even death if they are not understood and followed.



##### **Read and Understand Manual**

Never fill the fuel hauler without reading and completely understanding this manual and the OEM instructions from the manuals and on the combine and/or header.



##### **Follow All Applicable Safety Codes**

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 based 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.



##### **Crush Hazard (Bystander)**

When filling the fuel hauler, make sure all bystanders, especially small children, stay clear of the working area.



##### **Crush Hazard (Chock Wheels)**

Always block (chock) the front and rear of the fuel hauler wheels when filling the fuel hauler. Make sure the fuel hauler is securely attached to the tow vehicle before filling.



##### **Tow Vehicle**

Before filling the fuel hauler, make sure the engine of the tow vehicle is stopped, transmission is placed in park, the key is removed, and the parking brake is set.



## ⚠ CAUTION

The following safety instructions are provided to help prevent potential injury. Not following these instructions may lead to injury.



### Fall Hazard

Serious injury or even death could result from falling. Do not climb onto the fuel hauler or use it for a platform.



### Personal Protection Equipment

Wear personal protection equipment (PPE), which may include hard hat, safety glasses, safety shoes, gloves, etc. appropriate for the work site and working conditions.



### Entanglement Hazard

Do not fuel equipment when parts are rotating. Make sure any rotating parts are completely stopped before adding fuel.

## SAFETY INSTRUCTIONS

The following safety instructions are provided to help prevent injury or limit equipment damage.



### Maximum Weight Limit

Never exceed the weight limits of this fuel hauler. Refer to the Specifications section in this manual for maximum load ratings.

## NOTICE

*To prevent pump damage, always open the diesel tank shutoff valve prior to starting the gasoline engine pump. Make sure the shutoff valve is closed once fueling is complete.*

### 7.1.3 Gasoline Engine Pump Safety (if equipped)

Know how to stop the engine quickly and understand the operation of all controls. Never permit anyone to operate the engine without proper instructions.



## ⚠ DANGER



### Read and Understand the OEM Manual(s)

Internal combustion engines present special hazards during operation and fueling. Failure to follow the safety guidelines described in this section could result in severe injury or death. Read and follow all safety warnings described in this and the engine operator's manual. A copy of the engine manual was supplied with the unit when it was shipped from the factory.



### Fire Hazard

Gasoline is a highly combustible fuel. The improper use, handling, or storage of gasoline can be dangerous. Burns or other serious injuries can result from improper handling of fuel. Never touch or fill a hot engine. **DO NOT** fill the engine's fuel tank near an open flame while smoking, or while engine is running. **DO NOT** fill a tank in an enclosed area with poor ventilation. Clean up fuel spills immediately.



### Static Electricity Hazard

An ignition source is always a concern in refueling. Gasoline for the gas powered engine is very explosive, especially the fumes. A flame or spark can easily ignite gasoline vapors. The most common source of electrostatic discharge (spark) is from the operator. The person refueling the equipment should always make a point of touching something nearby to ground and discharge themselves before refueling the gas engine. This is especially important in winter months.



## **DANGER**



### **Explosive Fuel Hazard**

Always store gasoline in an approved container. If any fuel is spilled, make sure the area is dry before starting the engine.



### **Chemical Skin Burn Hazard**

Avoid prolonged skin contact with gasoline. Use protective goggles, gloves, and aprons in case of splashing or spills. Change saturated clothing and wash skin promptly with soap and water.



### **Burn Hazard**

Hot surface. The engine gets very hot during operation. Do not touch engine surfaces. Keep children away. Allow the engine to cool before moving it indoors.



### **Hot Surface Burn Hazard**

DO NOT touch or lean against hot exhaust pipes or engine cylinders. The muffler becomes very hot during operation and remains hot even after stopping the engine. Be careful not to touch the muffler while it is hot. Let the engine cool before storing it indoors.



### **Equipment Malfunction Hazard**

Improperly maintaining the gas engine, or failure to correct a problem before operation, can cause a malfunction in which you can be seriously hurt or killed.

## **WARNING**



### **No Child Operators**

To prevent serious injury to the operator, as well as bystanders, do not allow children to operate the engine.



### **Carbon Monoxide Hazard**

DO NOT operate the engine indoors or in an area with poor ventilation unless exhaust hoses are used. Engine exhaust contains carbon monoxide, a deadly, odorless and colorless gas which, if inhaled, can cause nausea, fainting, or death. Make sure engine exhaust cannot seep into closed rooms or ventilation equipment.

## **SAFETY INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.



Make sure the engine is off before you begin any maintenance or repairs.



DO NOT operate the engine with the fuel tank cap loose or missing.



DO NOT clean engine air filter with gasoline or other types of low flash point solvents.



DO NOT operate the unit without a functional exhaust system. Prolonged exposure to sound levels in excess of 85 dBA can cause permanent hearing loss. Wear hearing protection when working around a running engine.



Keep hands, feet, and loose clothing away from moving parts on the engine.



Keep area around exhaust free of debris to reduce the chance of an accidental fire.



Do not operate the gas engine if any of the following conditions exist during operation:

1. Noticeable change in engine speed.
2. Sparking occurs.
3. Engine misfires or there is excessive engine vibration.

## **NOTICE**

Open the diesel fuel tank shut off valve prior to starting the gasoline engine to prevent damage to the pump.

Always close the shut off valve after fueling is complete.

### 7.1.4 Electric Pump (12 Volt) Safety

Use the following safety instructions if the trailer is equipped with a 12 Volt pump.



## NOTICE

*The duty cycle of the 12 Volt pump is 30 minutes ON and 30 minutes OFF. Allow the pump to cool for 30 minutes before using again.*

### SAFETY INSTRUCTIONS



The 12 Volt electric pumps are designed for use only with diesel fuel. Do not use the pumps for dispensing any fluids other than those for which it was designed. Misuse may damage the pump components and will void the warranty.

## NOTICE

*Open the diesel fuel tank shut off valve prior to starting the 12 Volt electric pump to prevent damage to the pump.*

*Always close the shut off valve after fueling is complete.*

## 7.2 Diesel Fuel Safety

### 7.2.1 Inhalation Hazard (Diesel Fuel)

## ! DANGER



#### Fumes and Inhalation Hazard

Always avoid breathing fuel vapors or mists which may cause dizziness, drowsiness, moderate eye irritation, and/or skin irritation (rash). Excessive exposure may cause irritations to the nose, throat, lungs, and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

In case of inhalation, remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

### 7.2.2 Fire and Explosion Hazards (Diesel Fuel)

## ! WARNING



Diesel fuel presents a moderate fire hazard. Vapors may be ignited rapidly when exposed to heat, spark, open flame, or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### 7.2.3 Ingestion (Diesel Fuel)

#### **WARNING**



The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure, and even death. Ingestion will cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

In case of ingestion **DO NOT INDUCE VOMITING**. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties.

Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### 7.2.4 Eye Protection (Diesel Fuel)

#### **WARNING**



Safety glasses or goggles are recommended where there is a possibility of splashing or spraying. Contact with liquid or vapor may cause mild irritation.

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 minutes. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### 7.2.5 Skin Protection (Diesel Fuel)

#### **CAUTION**



Contact with diesel fuel may cause skin irritation with prolonged or repeated contact. Wearing gloves constructed of nitrile, neoprene, or PVC are recommended when in close contact with diesel fuel. Chemical protective clothing should also be worn. Long-term, repeated exposure to diesel fuel may cause skin cancer.

In case of contact with skin, remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

### 7.2.6 Storage Precautions (Diesel Fuel)

#### **CAUTION**



Keep away from flame, sparks, excessive temperatures, and open flame. Keep fuel hauler fill port closed because an empty tank may contain explosive vapors. Do not pressurize, cut, heat, weld, or expose tanks to sources of ignition.



Store the fuel hauler in a well-ventilated area. Avoid storage near incompatible materials.

### 7.2.7 U.S. Federal, State, and Local Regulatory Information (Diesel Fuel)

#### **SAFETY INSTRUCTIONS**



Diesel fuel is on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product may also be subject to other regulations at the state and/or local level. Always consult the regulations applicable to your area prior to operation.

### 7.3 Battery Safety

#### 7.3.1 General Hazards for Batteries

#### **SAFETY INSTRUCTIONS**



Wear protective eye wear and gloves.

**DO NOT** attempt to recharge a frozen battery. Remove the battery from the vehicle/equipment, bring it into a warm room and let it thaw before charging or testing.

Inspect the battery cables to make sure they are free of rust and corrosion and have no exposed wires. Never use electrical tape to cover exposed wires.

Automotive lead-acid batteries contain sulfuric acid in the electrolyte. The acid inside the battery is highly corrosive and can burn your skin if it leaks out of the battery and gets on your skin. Acid may leak out of the battery if the case is cracked or damaged.

**SAFETY  
INSTRUCTIONS**



Maintenance-free batteries should always remain in an upright position (do not turn it sideways or upside down).

On equipment with a battery designed into the fuel hauler, it is usually a good idea to disconnect the battery before doing electrical repairs. Disconnect the negative battery cable from the battery to prevent accidental damage to onboard electronics or wiring to prevent a short circuit.

### 7.3.2 Ventilation Hazard for Batteries

**SAFETY  
INSTRUCTIONS**



Whenever servicing a battery, work in a well ventilated area to prevent gas buildup.

### 7.3.3 Shock Hazards for Batteries

**SAFETY  
INSTRUCTIONS**



Batteries only produce 12 Volts so there is NO danger of being shocked. However, 12 Volt batteries can generate several hundred amps of current, which is roughly the amount of current used by a welding arc. Do not short the battery by touching the positive or negative terminals with a metal tool. This current is capable of damaging tools, equipment, and causing personal injury. It can also cause the battery to explode.

Before working around a battery, remove all jewelry, particularly rings and necklaces. The electrical charge from a battery can be transmitted through a metal tool and into a metal ring or watch.

NEVER disconnect a battery when the ignition is ON in the tow vehicle, or while the engine is idling or running, as this can damage electrical and/or electronic components in the tow vehicle.

### 7.3.4 Explosion Hazards for Batteries

**SAFETY  
INSTRUCTIONS**



Always remove the battery's ground cable (black) before removing the positive (red). If the negative cable is removed first, it will not be possible to inadvertently complete a circuit, thus causing electrical shock.

A short circuit can occur if the positive terminal is connected to the battery and the person working with the battery comes into contact with a grounded object. Always remove the ground cable first.

Do not smoke around a battery, or use anything that produces an open flame or spark.

Batteries can explode. Batteries give off hydrogen gas, which is flammable and can explode if a spark occurs near the battery (as when connecting a jumper cable).

### 7.4 Fire Extinguisher

A fire extinguisher is provided with the Fuel Hauler™.

The extinguisher bracket should be mounted in an accessible location on the fuel hauler. Do not install the fire extinguisher onto the diesel fuel tank.

Follow the manufacturer's instructions to periodically check and maintain the fire extinguisher.

### 7.5 Pre-Operation Checklist





Efficient and safe operation of the Duo Lift Mfg. Co., Inc. Fuel Hauler™ requires that every user read and understand the operational instructions and all related safety instructions outlined in this manual.




This pre-operation checklist is provided for the user/owner. It is important for both personal safety and to maintain the mechanical condition of the fuel hauler that this checklist is followed.



To prevent personal injury or even death, be sure you read and understand all of the instructions in this manual and other related OEM equipment manuals before using or towing the diesel fuel hauler.



Initial Setup Checklist (prior to using for the first time)	
Item	Task
	Make sure the hitch assembly will positively attach to the tow vehicle. A retainer pin or clip must be installed to prevent accidental release of the hitch from the tow vehicle. "6.2 Attaching/Unhooking Trailer" on page 32.  The height of the hitch is adjustable, make sure the fuel hauler is level.
	Make sure the safety chains are securely attached to the fuel hauler frame and are without wear or damage. If the certification tag is missing, do not use the fuel hauler until the certified chains have been replaced and installed. "6.2 Attaching/Unhooking Trailer" on page 32.
	Make sure the wiring harness is connected to the tow vehicle and that all the lights and the electric brakes are functioning correctly. "6.2 Attaching/Unhooking Trailer" on page 32.
	If equipped, make sure the breakaway brake system is functioning properly by pulling the breakaway cable pin and making sure the brakes apply. Re-install the pin. "9.8 Breakaway Brake Systems" on page 63.
	Check the tire pressure.  Check wheel nut torque on all wheels. Check again at 5, 10, 25, and 50 miles.
	Make sure splash guards are installed on DOT models.

	Make sure the Diesel Tank Shutoff Valve is in the closed position before towing.
	Make sure the DEF Tank Shutoff Valve is in the closed position before towing.
	Final check before towing: 1. Safety chains are attached to tow vehicle. 2. Breakaway brake system cable is attached to tow vehicle. 3. Hitch is securely attached and retainer pin or clip is installed. 4. Make sure the jack is in the raised (stored) position. 5. Diesel Fuel Safety Placards are installed.



## 7.6 Trailer Break-In

Although there are no operational restrictions on the Fuel Hauler™ when used for the first time, it is recommended that the following mechanical items be checked:

1. After 1/2 hour or 5 miles (8 km) of operation:
  - a. Re-torque all wheel bolts.
  - b. Re-torque all fasteners.
  - c. Inspect all electrical cables and hoses.
2. After 1 hour or 10 miles (16 km) of operation, re-torque all wheel bolts.
3. After 2-1/2 hours or 25 miles (40 km) of operation, re-torque all wheel bolts.
4. After 5 hours or 50 miles (80 km) of operation:
  - a. Re-torque all wheel bolts, fasteners, and tie-down hardware.
  - b. Inspect all electrical cables and hoses.
5. After 10 hours or 200 miles (320 km) of operation:
  - a. Re-torque all wheel bolts, fasteners, and tie-down hardware.
  - b. Inspect all electrical cables and hoses.
  - c. Start the normal servicing and maintenance schedule, as defined in the Service and Maintenance Section 9.

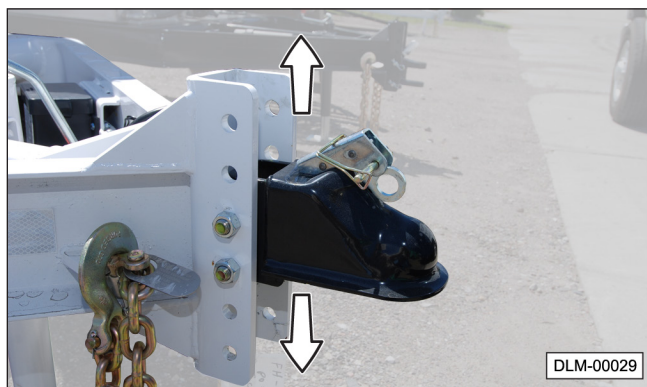
## 7.7 Checklist Prior to Each Use

Before each use of the Fuel Hauler™, the following areas should be checked.

Checklist Before Each Use	
✓	Task
	Use only a truck or tractor of adequate power and weight to pull the fuel hauler.
	Make sure the fuel hauler is positively hitched to the towing vehicle.
	Attach safety chains from the fuel hauler to the tow vehicle. Cross chains under the hitch to support it should an unplanned separation occur.
	Inspect wiring harness and plug for damage. Do not use fuel hauler if damage is found.
	Check inflation pressure on all tires. Correct under-inflation or over-inflation pressures. The specified inflation pressure is on the tires.
	Make sure the wheels are securely tightened to the hubs.
	On Off-Road models, make sure lights, reflectors, and SMV/SIS emblem required by local highway authorities are installed.
	Clean and make sure taillights and signal lights are working properly. Also check all side lights on DOT models.
	Inspect all diesel fuel and DEF solution fittings, hoses and valves for proper operation and leakage. Correct any problems prior to towing.

## 7.8 Initial Setup Procedure

If necessary, adjust the height of the hitch assembly so the fuel hauler rides level with the tow vehicle. Refer to "5.2.2 English Torque Values" on page 30 for the proper tightening torque.



6. Attach the fuel hauler to the tow vehicle.
7. If not already installed, attach the diesel fuel placards.

8. Connect the breakaway brake cable to the tow vehicle, and make sure the plug is completely pushed into the socket.



**Note:** A gasoline engine or a 12 Volt power source is used to power the diesel fuel pump. Depending on the power source, follow the appropriate steps.

## **WARNING**



### **Flammable Fuel Hazard**

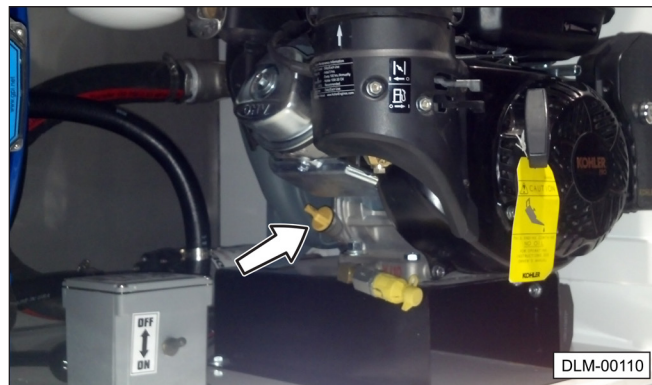
Gasoline is a highly flammable fuel. The improper use, handling, or storage of gasoline can be dangerous. Never fill a hot engine. **DO NOT** fill the engine's fuel tank near an open flame while smoking, or while engine is running. **DO NOT** fill tank in an enclosed area with poor ventilation. Clean up any gasoline spills immediately.

9. For gasoline engine models:

- a. To comply with Federal Transportation Regulations, the gasoline engines are shipped without gasoline or oil in the engine.
- b. Fill the engine's gas tank with clean, fresh unleaded gasoline. Replace and securely tighten the gas cap after filling.



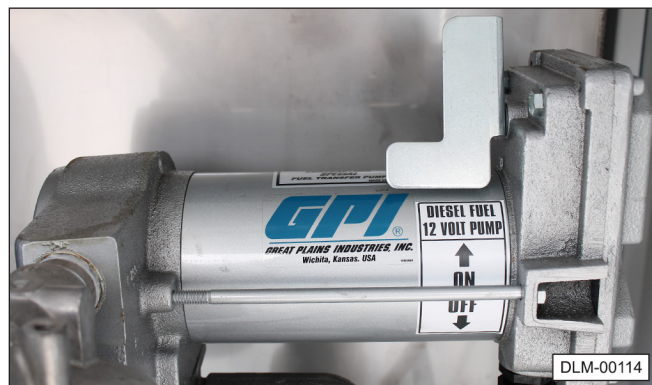
- c. Fill the engine with SAE 10W-30 oil to the proper level.



**Note:** Before checking or refilling with engine oil, make sure the engine is stopped and the fuel hauler is on a level surface.

10. For a 12 Volt external power source:

- a. Make sure the pump switch is in the OFF position.

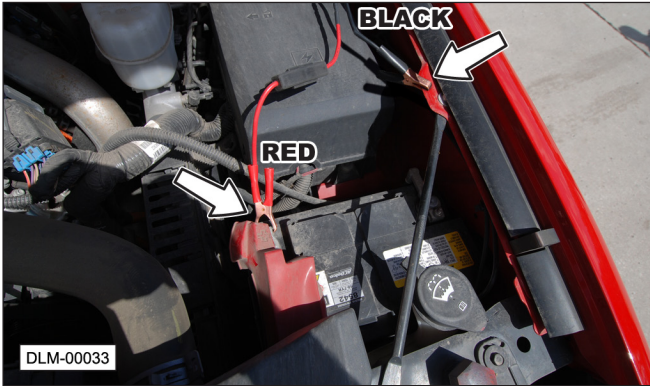


- b. Connect the battery cables to the towing vehicle or a stand alone battery.

## **NOTICE**

*Make sure the external electrical source is 12 Volts. Some farm or construction machines may use a 24 Volt system, which will damage the pump.*

- c. Connect the red cable to the positive terminal of the supply battery.
- d. Connect the black cable to the negative terminal of the battery or a heavy metal ground on the frame of the tow vehicle.

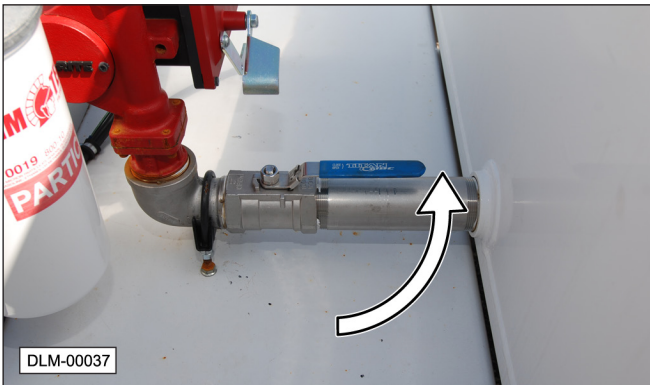


- e. There will now be power to the pump switch.
  - f. Place the pump switch in the ON position.
11. Fill the fuel hauler with diesel fuel. Refer to "7.9.1 Filling the Fuel Hauler™ with Diesel Fuel" on page 46.
  12. Prime the fuel pump.

## NOTICE

*Follow these instructions before the initial use or after whenever the tank has been completely emptied to ensure the pump is primed. If the pump runs without diesel fuel in it, seal and pump damage will occur and void the warranty.*

- a. Open the fuel tank valve.



- b. Place the nozzle of the fuel hose into the fill port of the equipment being filled.
- c. Start the gasoline or electric pump. Operate the gas engine at low idle.
- d. Open the fuel nozzle to allow the air to purge from the pump and hose.
- e. Operate the pump for no more the 30 seconds. The air should be purged from the lines and diesel fuel should begin to flow.
- f. If diesel fuel does not flow within 20 to 30 seconds, quickly shut off the pump. Make sure all the equipment is working properly. Check the pump for possible damage.



## 7.9 Diesel Fuel Tank Break-In

### 7.9.1 Filling the Fuel Hauler™ with Diesel Fuel

1. Follow all the safety recommendation, such as attaching the fuel hauler to the tow vehicle, placing the fuel hauler on a level surface, block both sides of the wheels to prevent unexpected movement, etc.

#### **DANGER**

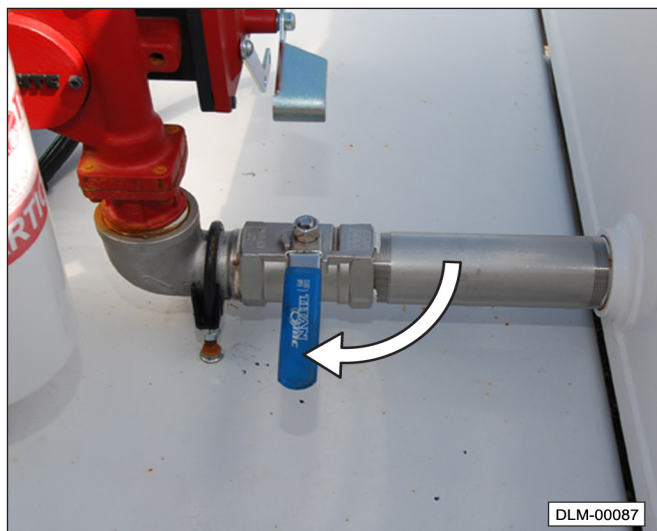


#### **Explosive Fuel Hazard**

Never use the fuel hauler for transporting gasoline which is highly explosive. This fuel hauler is only intended to transport diesel fuel.



2. Make sure the fuel shutoff valve is closed.



3. Fill the Fuel Hauler™ no more than 1/4 full of diesel fuel and check for tank and fitting leaks. After the tank, all fittings, and hoses have been checked for leaks, fill the tank to the desired level.



**Note:** To fill the fuel hauler to maximum capacity, make sure it is on level ground.

4. Replace and securely tighten the fuel hauler fuel cap.

### 7.9.2 Filling Equipment with Diesel Fuel

#### **WARNING**

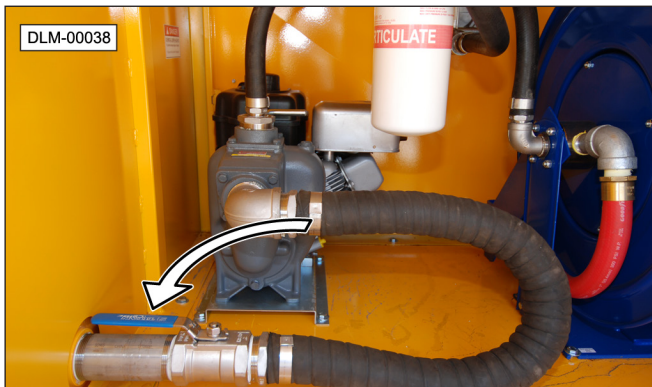
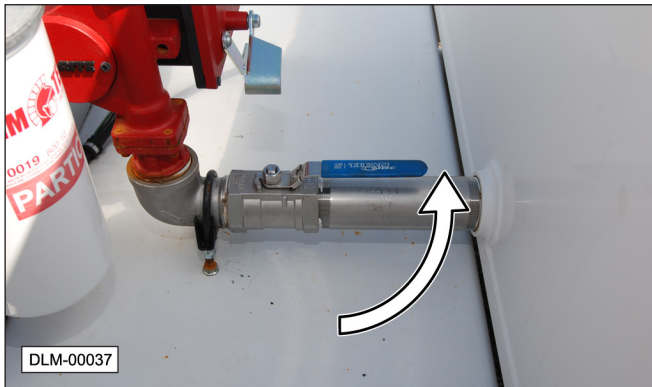


#### **Fall Hazard**

Do not use the fuel tank as a work platform. Do not stand on the fenders. Do not ride on the fuel hauler or allow others to ride on the fuel hauler.



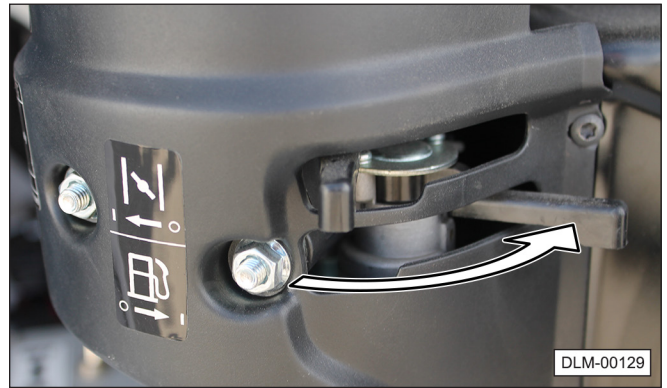
1. Position the fuel hauler near the equipment being serviced. Open the shut off valve on the tank, as shown.



2. Start the pump. For gasoline engine powered pumps, proceed with Step 3 For 12 Volt electric pumps, proceed to Step 4.
3. Start the gasoline engine.



- a. Turn the engine fuel lever to the ON position.



- b. To start a cold engine, move the choke lever to the ON position. In warm weather, start the engine with the choke in the middle. To restart a hot engine, move the choke lever to the OFF position.



- c. Move the throttle lever away from the SLOW position, about midway to the FAST position.



- d. Turn the key switch to the START position.  
When the engine starts, release the switch.



- e. If the choke lever is in the CHOKE position, gradually move it to the OPEN position as the engine starts to warm up.



- f. Operate the engine at idle speed before moving the throttle lever to the desired position.

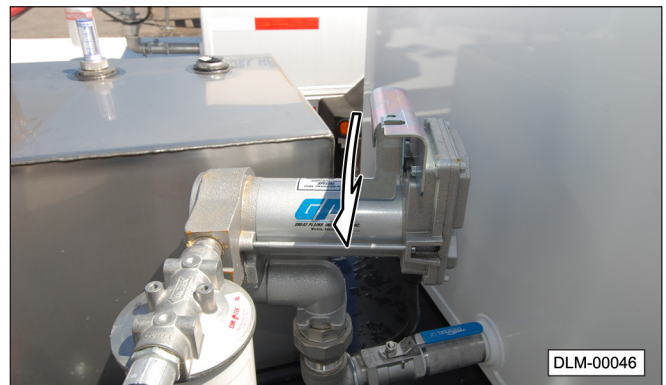


4. Start the 12 Volt pump:

## NOTICE

*Make sure the external electrical system you are using is a 12 Volt system. Some equipment may use a 24 Volt system which would cause damage to the pump, if connected.*

- Connect the red cable to the positive terminal of the supply battery.
- Connect the black cable to the negative terminal of the supply battery or a heavy metal ground on the tow vehicle.
- Move the lever to the ON position.





5. Remove the fuel nozzle from its holder



## NOTICE

*To avoid fuel contamination and possible nozzle malfunction, keep the fuel nozzle clean. Always store the nozzle in the nozzle holder when not it use.*

6. Extend enough hose to easily reach the fill opening of the equipment being serviced.



**Note:** When the pump is running, the fuel hose is pressurized and squeezing the handle on the fuel nozzle will begin pumping diesel fuel.

7. If using the optional electronic fuel meter, press the DISPLAY button on the face of the meter. With TTL1 showing on the display screen, hold the DISPLAY button down for three seconds to zero the batch total.

**Note:** The fuel meter will turn on automatically when it senses fuel flow. It can be manually turned on by pressing the DISPLAY button ("DISPLAY"). The meter will show the total from its last use. The meter turns off automatically if not used for approximately one minute.

**Note:** Briefly pressing the DISPLAY button switches the display screen between TTL1 (batch total) and TTL2 (cumulative total).

**Note:** Refer to the OEM manual for further information.



## NOTICE

*To avoid overfilling the receiving tank, always keep the fuel nozzle clean, and do not leave the fuel nozzle unattended during fueling. Be prepared to manually shut off fuel flow at the nozzle, if necessary.*

8. Place the fuel nozzle into the receiving tank and squeeze the handle to start fuel flow. When the tank is full, the nozzle will automatically shut off the flow. If an electronic fuel meter is attached to the hose, a specific amount of fuel can be added.
9. Turn off the power supply.  
Turn the pump OFF.  
To turn OFF a gas engine pump, refer to Step 10.  
To turn OFF an electric pump, refer to Step 11.

**Note:** When filling equipment from the Fuel Hauler™, never allow the pump to run dry.

10. To turn OFF the gasoline engine pump:

**Note:** To stop the engine in an emergency, simply turn the key switch to the OFF position.

- a. Under normal conditions, move the throttle lever to the SLOW position. Allow the engine to run at idle for 30-60 seconds.



- b. Turn the key switch to the OFF position.

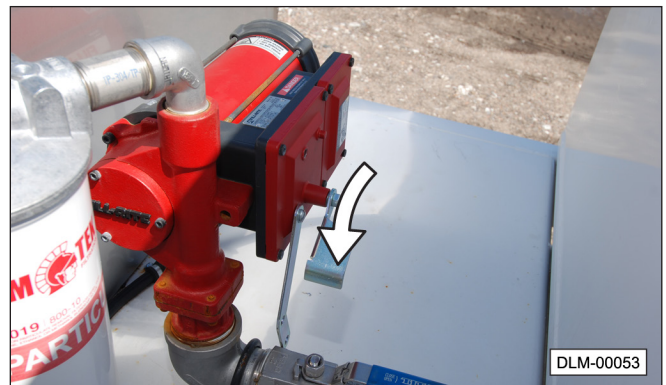


- c. Turn the fuel valve lever to the OFF position.

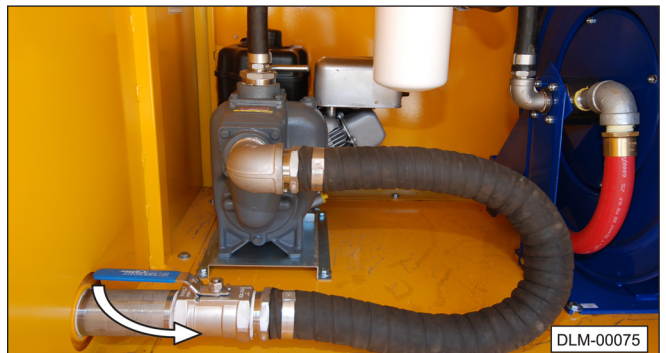
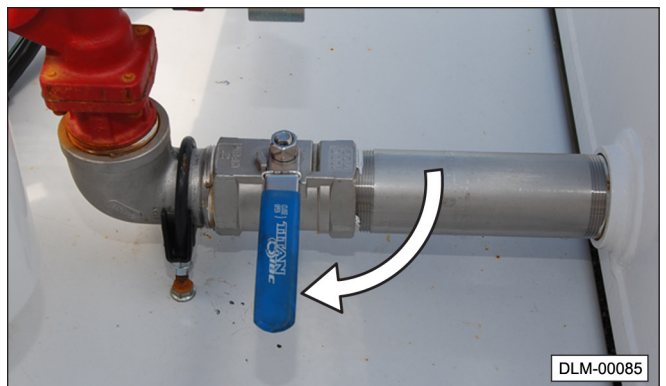


11. To turn OFF the electric pump:

- a. Place the ON/OFF lever in the OFF position.
- b. Remove the black battery cable first, and then remove the red cable.



12. Close the fuel shutoff valve on the tank (vertical to the pipe).





13. When fueling is complete, rewind the fuel hose on the hose reel or hose stand.

**Note:** Refer to the OEM manual for hose reel operation and maintenance.

14. Place the nozzle back into the nozzle holder.

15. Close and latch the doors, if equipped.

## 7.10 DEF Solution

The information concerning DEF provided in this manual has been obtained from sources considered technically accurate and reliable. Review the safety information concerning potential product hazards. Since the actual product use is beyond our control, it is assumed that the user has been fully trained to meet any local, state, or federal regulations.

### 7.10.1 DEF Solution Safety Practices

#### SAFETY INSTRUCTIONS



**Respiratory protection is not usually required. If significant spray or mist occurs, wear a NIOSH approved or equivalent dust respirator.**



**The use of gloves impermeable to the specific material handled is advised to prevent skin contact, possible irritation, or absorption.**



**Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on the conditions of use, a face shield may be necessary.**



**A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn, as needed.**

### 7.10.2 DEF Solution First Aid Measures

**Eye:** If irritation or redness develops, move away from exposure and into fresh air. Flush eyes with clean water immediately for at least 15 minutes. If symptoms persist, seek medical attention.

**Skin:** Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.

**Inhalation (Breathing):** If respiratory conditions develop, move away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

**Ingestion (Swallowing):** First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

### 7.10.3 DEF Solution General Information

1. DEF has not been shown to be harmful to humans or animals.
2. DEF is not explosive, does not burn, and will not aid in combustion.
3. DEF is non-toxic. If you get it on your skin or clothes, rinse with plenty of water.
4. DEF is a colorless liquid. However, it is best to avoid spilling on clothing or vehicle upholstery as it may leave a stain.

#### IMPORTANT NOTICE

*DEF is very corrosive to certain types of material. Care should be taken when filling the fuel hauler or the equipment.*

### 7.10.4 DEF Solution Storage

1. Keep DEF containers tightly closed.
2. To avoid solidification, do not store DEF at temperatures below 23°F (-5°C). Solidified DEF, which has been warmed up carefully at temperatures not exceeding 86°F (30°C), will not be impaired in quality and can be used as soon as the warmed up solution is free from solids. Frozen DEF can be thawed and used without concerns of product degradation; however, damage to the container or equipment will likely occur.
3. To avoid freezing, a DEF heating system is available as an option from Duo Lift Mfg. Co., Inc.
4. Store only in approved containers.
5. Protect containers against physical damage.

- In order to prevent decomposition of the urea, as well as the evaporation of water in the case of vented containers, prolonged transportation or storing above 77°F should be avoided. (See Table Below).

Constant Ambient Storage Temperature (°F)	Minimum Shelf Life (Months)
≤50	36
≤77*	18
≤86	12
≤95	6
>95	**
*To prevent decomposition of DEF, prolonged transportation or storage above 77 °F should be avoided	
**Significant loss of shelf life: check every batch before use	

Source: ISO 22241-3:2008(E)

### 7.10.5 Using DEF

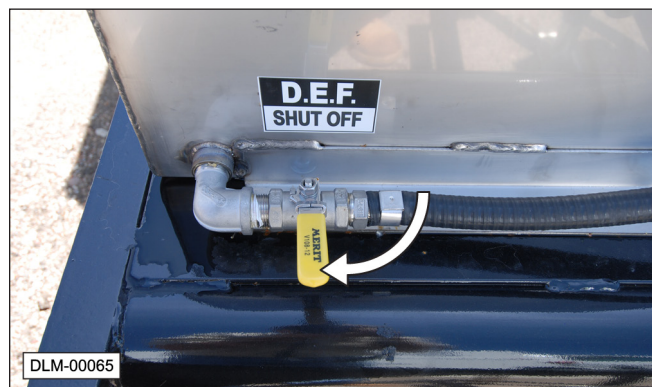
- Only fill the DEF tank with ISO certified DEF that has been delivered in dedicated, sealed DEF packages.
- Wear appropriate protective clothing and equipment, such as safety glasses, gloves, etc. while pumping DEF.
- Wash thoroughly after handling DEF.
- Never add DEF into the diesel fuel tank.
- Never add diesel fuel into the DEF tank.
- Avoid contact with DEF on eyes, skin, and clothing.
- If spilled, rinse the area with water.
- Do not use DEF that has been diluted with water or other substances.

### 7.10.6 DEF Disposal

For proper disposal of waste DEF, as a non-hazardous liquid waste, it should be solidified with stabilizing agents such as sand, fly ash, or clay absorbent, so that no free liquid remains before disposal in an industrial waste landfill.

### 7.10.7 Filling Fuel Hauler's DEF Tank

- Make sure the DEF tank shut off valve is in the OFF position.



- Fill the DEF tank using the filler spout. Use the fluid level indicator to determine when the tank is full.

**Note:** To prevent contamination of the DEF fluid, keep the DEF nozzle and the fill port on the tank clean and free of dust and dirt.



## NOTICE

*Do not overfill tank.*

### 7.10.8 Filling the DEF Tank on Machinery

1. Connect the electrical cables for the DEF pump to a 12 Volt power source.
  - a. Connect the end of the RED jumper cable to the POSITIVE (+) post on the battery (power source). Make sure the NEGATIVE (-) cable is not touching a grounded surface.

**Note:** In many cases the POSITIVE battery post is slightly larger than the NEGATIVE post and will be marked with a PLUS (+) sign. There may also be a RED plastic protective cover over the positive battery post.

- b. Connect the end of the BLACK jumper cable NEGATIVE (-) to a heavy metal ground on the frame of the tow vehicle.

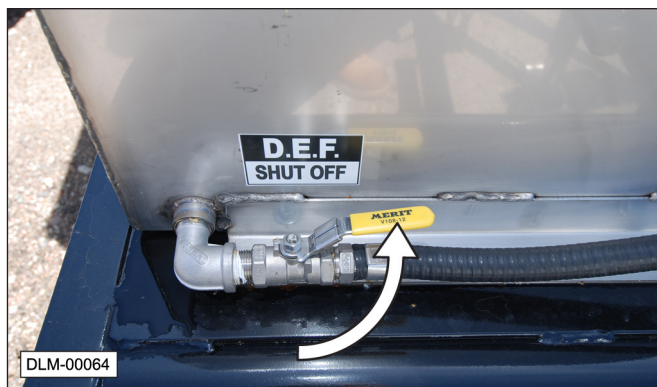
#### SAFETY INSTRUCTIONS

*If the cable must be connected to the NEGATIVE (-) post on the battery itself, be extremely careful to prevent any sparks that can ignite hydrogen fumes around or on top of the dead battery, causing it to explode.*

#### IMPORTANT NOTICE

*To avoid contaminating the DEF and possible nozzle malfunction, keep the nozzle clean. Always store the nozzle in the nozzle holder when not in use.*

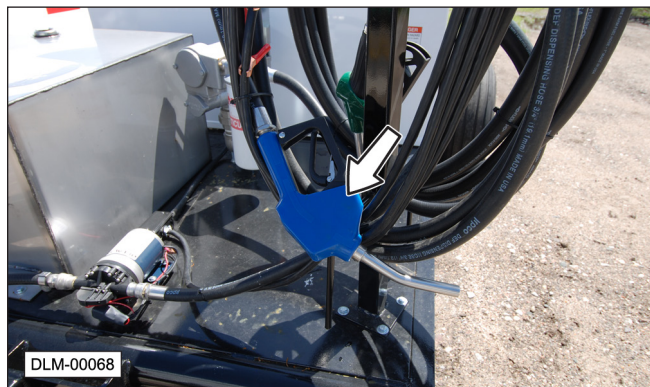
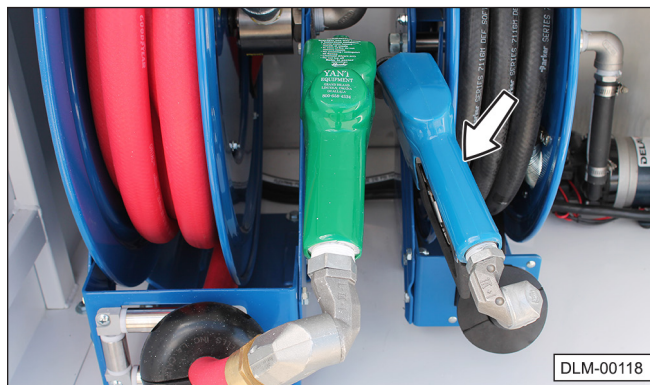
2. Open the DEF tank shutoff valve.



3. Turn the DEF power switch to ON to energize the DEF pump.



4. Use the blue handled nozzle to fill the DEF tank on the equipment.



#### NOTICE

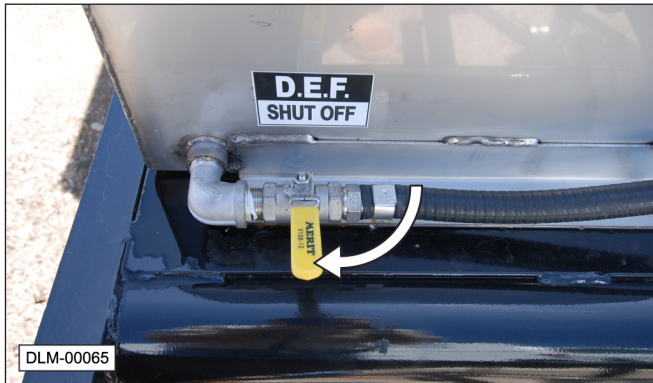
*To avoid overfilling the DEF receiving tank, do not leave the nozzle unattended during filling. Be prepared to manually shut off flow at the nozzle, if necessary.*

5. Fill the equipment's DEF tank.

**Note:** When the pump is running, the DEF hose is pressurized and squeezing the handle on the nozzle will begin pumping DEF fluid.



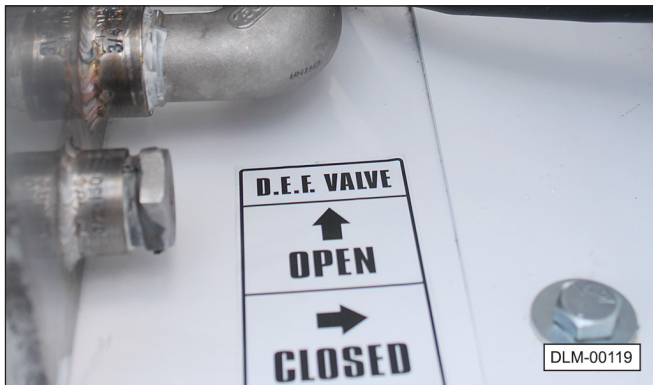
6. Turn off the DEF pump switch and replace the nozzle in its holder.
7. Place the shut off valve for the DEF tank in the closed position.



8. Remove the battery cables..
  - a. Remove the BLACK cable NEGATIVE (–) from the metal ground on the frame of the tow vehicle.
  - b. Remove the RED jumper cable from the POSITIVE (+) post on the battery (power source). Make sure the NEGATIVE (–) cable is not touching a grounded surface.

### 7.10.9 Winterizing DEF System

Since the majority of the DEF solution is water, freezing of this solution can cause damage to the components of the DEF system. It is recommended that the solution be removed from the DEF tank and stored in a DEF compatible container.



## NOTICE

*Do not allow DEF fluid to freeze in the tank. Warranty is void if freezing occurs.*

If the fuel hauler will be in a location where temperatures go below freezing, remove the DEF solution from the tank, pump, and hose.



## 8 STORAGE

### 8.1 Storage Safety

After use or when the Fuel Hauler™ will not be used for a period of time, completely inspect the fuel hauler frame, tires, and axles. Replace or repair any worn or damaged components to prevent unnecessary downtime at the beginning of the next season.

#### CAUTION



##### **Personal Injury Hazard**

Store the fuel hauler in an area away from human activity. To prevent the possibility of serious injury, do not permit children to play on or around the stored fuel hauler.



##### **Crush Hazard**

Block the wheels to prevent the machine from rolling, causing personal injury.

#### NOTICE

*To prevent damage to the fuel hauler, store it in a dry, level area. Place planks under the tires for support, if desired.*

### 8.2 Placing Trailer In Storage

After use, the fuel hauler should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary downtime at the beginning of the next season.

Follow this procedure before storing:

1. Remove any entangled vegetation.
2. Thoroughly wash the fuel hauler with a pressure washer or water hose to remove all dirt, mud, or debris.
3. Touch up all paint nicks and scratches to prevent rusting.
4. Move the fuel hauler to its storage area (inside a building is ideal).
5. Select an area that is dry, level, and free of debris.
6. Winterize the DEF system if the fuel hauler is stored in an area where temperatures go below freezing.
7. Close the fuel tank shutoff valve.

8. If the gasoline engine will not be used for two months or more, the fuel system must be completely emptied, or the gasoline treated with a stabilizer.
9. It is not required to drain the diesel fuel tank for storage. Should it become necessary to drain the diesel fuel tank, a port is provided for this purpose.



10. Place chocks in front of and behind a rear tire.
11. Do not leave the tow vehicle attached to the fuel hauler.

### 8.3 Removing Trailer From Storage

When removing this fuel hauler from storage, follow this procedure:

1. Attach the fuel hauler to the tow vehicle.
2. Check:
  - a. Electrical wiring harness connections and components.
  - b. All hardware. Tighten as required.
  - c. Tire pressure.
  - d. Wheel nuts/bolts.
3. Replace any worn or defective parts.
4. Fill the diesel tank and prime the diesel pump, if necessary.
5. Fill the DEF tank and prime the DEF pump, if necessary.
6. Follow the pre-operation checklist before using the fuel hauler.

## 9 SERVICE AND MAINTENANCE

### 9.1 Maintenance Safety

#### **WARNING**

Failure to comply with the following safety instructions can and will result in serious injury and possibly even death if they are not understood and followed.



#### **Personal Protection Equipment**

Wear personal protection equipment (PPE), which may include hard hat, safety glasses, safety shoes, gloves, etc. appropriate for the work site and working conditions.



#### **Damaged Parts Hazard**

Do not use the fuel hauler if any parts are damaged. If the fuel hauler is believed to have a defect which could cause it to work improperly, immediately stop using it and remedy the problem before continuing.



#### **No Unauthorized Modifications**

Do not modify the fuel hauler or safety devices. Do not weld on the unit. Unauthorized modifications may impair its function and safety.

If the fuel hauler has been altered in any way from the original design, Duo Lift does not accept any liability for injury or warranty.



#### **Crush Hazard (Chock Wheels)**

Always block the fuel hauler wheels when performing maintenance.



#### **Good Working Condition**

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts.



#### **Replacement Parts**

If replacement parts are necessary, genuine factory replacement parts must be used to restore the unit to its original specifications. Duo Lift will not accept responsibility for damages as a result of the use of unapproved parts.



#### **Safety Shields**

When completing a maintenance or service function, make sure all safety shields and devices are reinstalled before placing the fuel hauler in service.

#### **SAFETY INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.



#### **Safety Equipment**

A fire extinguisher and first aid kit should be readily accessible while performing maintenance on this equipment.



#### **Clean Work Area**

Do not leave used tools lying around the work area. Follow good shop practices. Keep service area clean and dry. Be sure electrical outlets and tools are properly grounded. Use adequate light.



#### **Use the Right Tools**

Use the correct tools, jacks, hoists or other tools that have the capacity for the job.



#### **Proper Support**

Use support blocks or safety stands rated to support the load when changing tires, working beneath the fuel hauler, or performing maintenance.

## 9.2 Tire Safety

### **WARNING**

Failure to comply with the following safety instructions can and will result in serious injury and possibly even death if they are not understood and followed.



#### **Explosive Force Hazard**

Explosive separation of a tire from the rim can cause serious injury or death.

Tire replacement, repair, and/or maintenance should be done by a qualified tire dealer or qualified repair service.

Failure to follow proper procedures when installing a tire on a wheel or rim or adding air to the tire can produce an explosive force that will result in serious injury or death.

Do not attempt to install a tire without proper equipment and experience to perform the job.

Do not substitute tires with a lesser road rating and/or capacity for the original equipment tires.



#### **Stand to Side of Tire When Inflating**

Inflated tires can explode. When inflating tires, use a clip-on chuck and extension hose.

Always stand to the side of the tire when inflating and NOT in front of or over the tire assembly.



#### **Maintain Correct Tire Pressure**

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.



#### **No Welding**

Never weld or heat a wheel and tire assembly.

The heat can cause an increase in air pressure, resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

### **SAFETY INSTRUCTIONS**

The following safety instructions are provided to help prevent injury or limit equipment damage.



#### **Explosive Force Hazard**

To prevent injury due to possible dangerous separation of the wheels from the axle, the wheel nuts must be maintained at the proper torque levels. Properly tightened wheel nuts prevent loose wheels and broken studs.

## 9.3 Lubricants

Use an SAE multipurpose high-temperature grease with extreme pressure (EP) performance. Also acceptable is an SAE multipurpose lithium base grease.

Use the Service Record checklist provided to keep a record of all scheduled maintenance.

1. Use a handheld grease gun for all greasing.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace and repair broken fittings immediately.
4. If fittings will not take grease, remove and clean it thoroughly. Also clean the lubricant passageway. Replace fittings if necessary.
5. To repack the wheel bearings, wash and completely flush out the old grease in between the rollers using proper solvents.
6. Use a bearing packer to ensure proper placement of grease inside the bearing.
7. Wheel bearing grease seals should be replaced each time the bearing is repacked using OEM seals.
8. If the fuel hauler is equipped with a grease fitting in the hub, apply grease until new grease can be seen coming out of the hub.

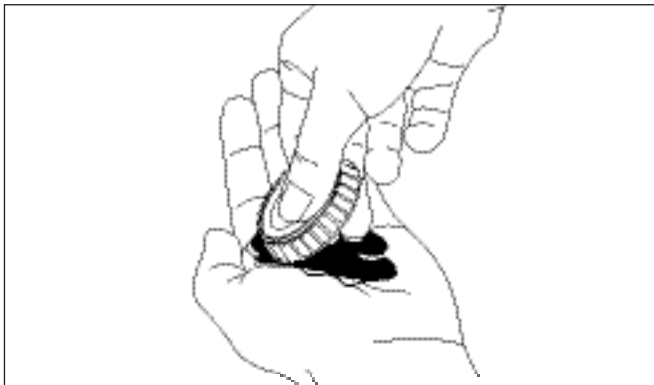
## 9.4 Wheel Hub Bearing Repacking Instructions

### NOTICE

*Do not mix Lithium, calcium, sodium or barium complex greases due to possible compatibility problems. When changing from one type of grease to another, it is necessary to ensure all the old grease has been removed.*

Along with bearing adjustment, proper lubrication is essential to the proper function and reliability of your fuel hauler axle. Bearings should be lubricated every 12 months or 12,000 miles. The method to repack bearing cones is as follows:

1. The use of a bearing packer to repack the bearings is strongly recommended. Follow the OEM instructions for the proper use of the bearing packer.
2. If a bearing packer is not available, place a quantity of grease into the palm of your hand.

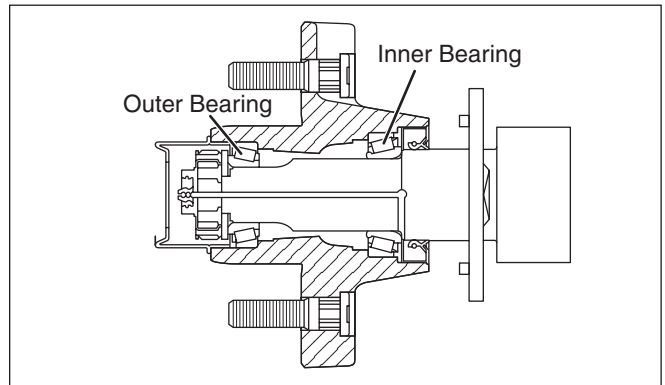


3. Press or pull a section of the bearing rollers and cage through the grease, forcing grease into the interior of the bearing.
4. Rotate the bearing and repeat the process from roller-to-roller.
5. Continue this process until the entire bearing is completely filled with grease.
6. Before reinstalling the bearing cone, apply a light coat of grease on the bearing cup.

### 9.4.1 Hub and Bearing Installation

1. Press the cup of the inner and outer bearings into the hub assembly.
2. Install the cone of the inner bearing. Coat the inner surface of the cup with a thin coat of grease before installing the cone.

3. Install the double lip seal in the hub assembly.
4. Clean the spindle with a clean cloth.



5. Slide the hub onto the spindle. Use care not to damage the lip of the seal when installing the hub assembly.

**Note:** The inside surface of the bearing cones and the spindle shaft are machined to a very close tolerance. If either the bearing cone or spindle is damaged or dirty, the hub will not slide easily onto the spindle. Also, if the rear bearing cup is not seated squarely in the hub, it may not slide on the spindle.

6. Once the hub is seated against the back of the spindle, install the outer bearing cone. Make sure the taper of the cone is seated in the bearing cup (do not install the bearing cone backwards).
7. Install the spindle washer and castle nut. Hand tighten the castle nut.
8. Follow the procedure in the Wheel Bearing Preload Adjustment section.

### 9.4.2 Wheel Bearing Preload Adjustment

Whenever new hubs or new bearings are installed, the bearings must be preloaded.

Preloading the bearings ensures the bearing cups are completely seated in the hub. Improperly installed bearings will cause the hub to wobble.

1. Tighten the wheel nut using a wrench until the hub barely turns. Do not overtighten the nut.
2. Turn the hub five to ten revolutions to fully seat the bearings.
3. Loosen the castle nut.
4. Hand-tighten the castle nut.



5. Tighten the castle nut additionally until the next castle nut slot is aligned with the cotter pin hole in the spindle.
6. Install the cotter pin and bend the tabs around the castle nut.

## NOTICE

*Do not tow the fuel hauler when the spindle nut is too tight; this will cause the bearings to overheat. Never tow the fuel hauler with bearings too loose. A very slightly loose spindle nut will run adequately, but too loose and the rollers may come apart inside the bearings, causing the hub to fracture.*

### 9.4.3 Wheel Bolt Torque Requirements

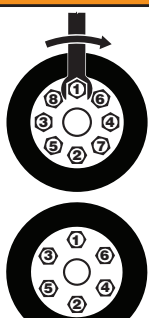
It is extremely important to apply and maintain proper wheel mounting torque on your fuel hauler axle. Use a torque wrench to assure the proper amount of torque is being applied to the fastener.

**Note:** Wheel nuts and bolts must be installed and maintained at the proper torque levels to prevent loose wheels, broken studs, and possible dangerous separation of wheels from your axle.

Be sure to use the fasteners matched to the cone angle of your wheel.

- a. Start all bolts or nuts by hand to prevent cross threading.
- b. Tighten bolts or nuts in the following sequence.
- c. The tightening of the fasteners should be done in stages. Following the recommended sequence, tighten the fasteners per the wheel torque requirements diagram.

⚠ WARNING



**Wheel Detachment**

Wheel nuts are prone to loosen after being first assembled due to metal creep between rim and nuts/bolts.

Inadequate wheel nut torque can cause rim to loosen resulting in a wheel separating from trailer.

To prevent serious injury or death:

- Verify wheel nuts are tight before each tow.
- Check wheel nut torque for tightness on a new trailer, and after re-mounting a wheel after 5, 10, 25, and 50 miles.

Tighten:  
1/2" to 80 ft.lbs. (110 N·m)  
9/16" to 115 ft.lbs. (155 N·m)

DE000061

- d. Wheel nut/bolts should be torqued before first road use and after each wheel removal. Check and re-torque at 5, 10, 25, 50, and 100 miles. Check annually thereafter.

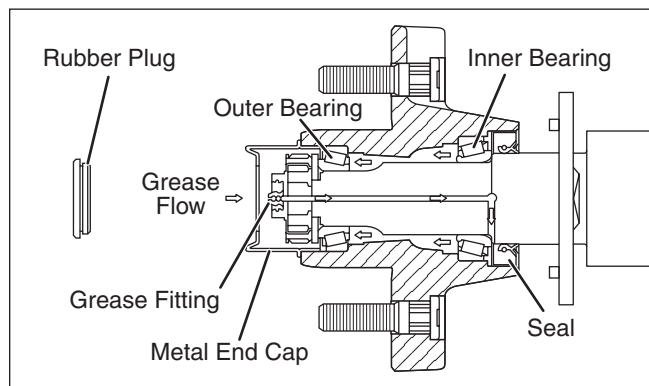
### 9.4.4 E-Z Lube® Lubrication

The procedure is as follows:

1. Remove the rubber plug from the end of the grease cap.
2. Place a standard manual grease gun onto the grease fitting located on the end of the spindle. Make sure the grease gun nozzle is fully engaged on the fitting.
3. While rotating the hub, pump grease slowly into the fitting. The old, displaced grease will begin to flow back out the cap around the grease gun nozzle.
4. When the new, clean grease is observed, remove the grease gun, wipe off any excess, and replace the rubber plug in the cap.
5. Rotate hub or drum while adding grease.

**Note:** If hubs are removed from an axle with the E-Z Lube® feature, it is imperative that the seals be replaced BEFORE bearing lubrication. Otherwise, the chance of grease getting on the brake linings is greatly increased.

**Note:** It is strongly recommended not to use pneumatic powered grease guns as these can inject grease too fast and force grease past the seal, or in rare cases dislodge the seal.



### 9.5 Servicing Intervals

The period recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent lubrication.

### 9.5.1 Diesel Fuel Filter Replacement

1. Replace the diesel fuel filter after the first 2000 gallons are pumped or after 6 months, whichever comes first.



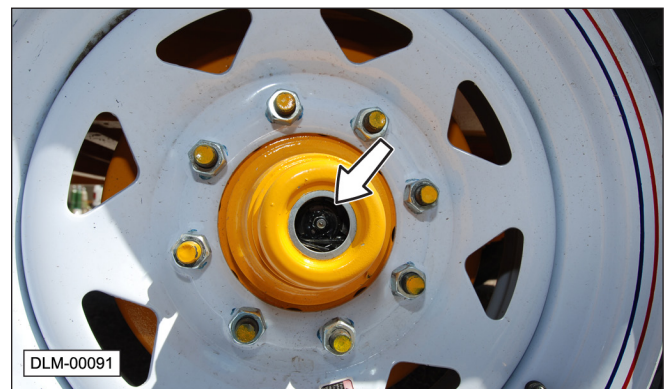
2. Thereafter, replace the diesel fuel filter after every 10,000 gallons are pumped or every 6 months, whichever comes first.

### 9.5.2 25 Hours or Weekly Inspection

1. Check the hitch assembly and make sure it will securely attach the fuel hauler to the tow vehicle.
2. Check the tire pressure on all the wheels.
3. Make sure the wheel nuts/bolts are tightened to the proper torque on all the wheels.
4. If equipped, make sure the battery for the breakaway brake system is fully charged and that the system functions correctly.

### 9.5.3 Annual Inspection

1. Repack the standard wheel bearings or lubricate the EZ Lube bearings. Standard wheel bearing axles have a metal cap on the hub, while the EZ lube axle has a rubber cap which is removed to access the grease fitting.



2. If equipped, service the gasoline engine, following the instructions in the OEM manual.
3. Make sure the axle-to-frame bolts are properly tightened.



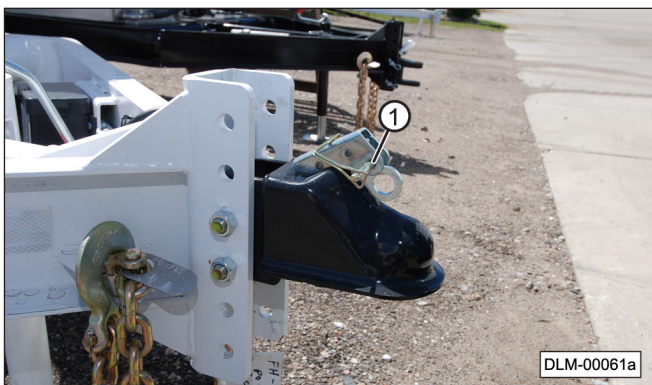
4. Make sure the safety chains are properly attached and have a certification tag. Make sure the chains are not worn or damaged in any way that would hinder their function.



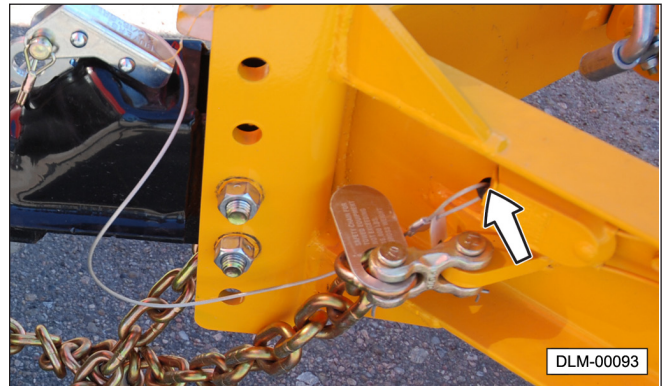
5. Depending on the style of hitch, make sure an OEM drawbar pin and retainer clip are being used for towing and are in good condition. **Do not use homemade or shop-made drawbar pins when towing this fuel hauler.**



6. If equipped with a ball and coupling style hitch, make sure it is functioning correctly. Also make sure retainer pin (1) is installed before towing the fuel hauler.



7. Make sure the wiring harness and seven-pin connector are not damaged and working properly.
8. Make sure the breakaway cable and key are connected to the fuel hauler. Make sure the battery is charged and in good working order.



9. Make sure all lights are working and that all safety signs and reflective tape are legible and properly installed.
10. Wash the fuel hauler to prevent possible contamination of the diesel fuel and/or DEF solution.

## 9.6 Service Record Chart

See this section for details of service. Copy this page to continue record.

Hours and Serviced By														
<b>Maintenance</b>														
<b>25 Hours of Operation</b>														
Check the hitch assembly and make sure it will securely attach the fuel hauler to the tow vehicle.														
Check the tire pressure on all the wheels.														
Make sure the wheel nuts/bolts are tightened to the proper torque on all the wheels.														
If equipped, make sure the battery for the breakaway brake system is fully charged and that the system functions correctly.														
Make sure all pins are equipped with hair pin retainer clips.														
<b>Every 6 Months</b>														
Replace the diesel fuel filter.														
<b>Annually</b>														
Repack the standard wheel bearings or lubricate the EZ Lube bearings.														
Make sure the axle-to-frame bolts are properly tightened.														
Make sure the safety chains are properly attached and have a certification tag. Make sure the chains are not worn or damaged in any way that would hinder their function.														
If equipped, make sure an OEM drawbar pin and retainer clip are being used for towing and are in good condition. Do not use homemade or shop-made drawbar pins when towing this fuel hauler.														
If equipped with a ball and coupling style hitch, make sure it is functioning correctly.														
Make sure the wiring harness and seven-pin connector are not damaged and working properly.														
Make sure the breakaway cable and key are connected to the fuel hauler. Make sure the battery is charged and in good working order.														
Make sure all lights are working and that all safety signs and reflective tape are legible and properly installed.														
Wash the fuel hauler.														
If equipped with a 12 Volt battery for the DEF pump, inspect the battery for cracks or corrosion. If any damage is found, replace the battery immediately to avoid serious injury or additional equipment damage.														
If equipped with an electric pump, clean or replace the pump screen.														



## 9.7 Welding Repairs



Repair welding must be done with care and with procedures that may be beyond the capabilities of the ordinary welder. Before performing any type of welding repair, contact Duo Lift Mfg. for approval.

### **WARNING**



#### Personal Injury Hazard

Repairs or modifications to the fuel hauler, fuel hauler tongue, or fuel hauler hitch can result in serious injury or death should these repairs fail.

### **NOTICE**

Anyone performing a welding repair should be certified in accordance to the American Welding Society (AWS) standards.

## 9.8 Breakaway Brake Systems



### 9.8.1 Testing the Breakaway Battery

1. Disconnect the wiring harness plug from the tow vehicle; otherwise, you are testing the tow vehicle's battery.

### **NOTICE**

If the battery is weak or dead (even after charging), the battery must be replaced.

2. Test the system by pulling the pin out of the breakaway switch. The battery should activate the brakes. (**Note:** Do not use this kit as a parking brake). The battery should be charged and tested prior to each use of the fuel hauler.

### 9.8.2 Charging the Breakaway Battery

The battery in the breakaway system is rechargeable. If the battery will not hold a charge, replace the battery.

### 9.8.3 Replacing the Breakaway Battery

Refer to the Parts section in this manual for a replacement battery.

### **NOTICE**

Make sure the battery is replaced with the same type or compatible battery. Also make sure the wiring leads are correctly connected to the battery.



## 10 TROUBLESHOOTING

The Duo Lift Mfg. Co., Inc. Fuel Hauler™ is a fuel hauler that is used to transport diesel fuel and diesel exhaust fluid (DEF) to your equipment.

In this section, we have listed many of the problems, causes, and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this troubleshooting guide, please call your local distributor or dealer. Before you call, please have this Owner's Manual and the serial number from your fuel hauler.

### WARNING



#### EQUIPMENT FAILURE

The torque value for bolts and capscrews are identified by their head markings. Replacing higher "Grade" bolts (Grade 8 or 10.9) with lower Grade bolts (Grade 5 or 8.8) will lead to equipment failure and can result in injury or death. Always use replacement bolts with the same Grade markings as the removed bolt.

PROBLEM	CAUSE	SOLUTION
Fuel hauler sways when being pulled down the road.	Low tire pressure.	Inflate tire to correct pressure. Check all tires.
	Axle is bent or out of alignment.	Repair or replace axle.
Fuel hauler pulls to one side when being towed.	One tire has low pressure.	Inflate tire to correct pressure.
	Axle(s) out of alignment.	Realign, repair, or replace axle(s).
The tow vehicle has difficulty stopping.	Travelling too fast.	Slow to appropriate speed.
	Towing vehicle too light-weight.	Use appropriate tow vehicle.
	Bad road conditions.	Slow to appropriate speed for conditions.
Tires are experiencing excessive wear.	Axle bent or out of alignment.	Repair or replace axle.
	Bent spindle.	Replace.
	Travelling too fast.	Slow to appropriate speed.
	Bad road conditions.	Slow to appropriate speed for conditions.
Brakes are not operational.	Broken or damaged wire.	Inspect wiring and replace.
	Brakes out of adjustment.	Brake pads are too far away from the drum. Adjust pads so they do not touch drum when disengaged but provide adequate braking when engaged.
	Excessive wear on brakes.	Brakes worn out. Brakes adjusted too close.
Lights do not work.	Wiring harness is damaged.	Inspect wiring and replace if necessary.
	Wiring harness plug is incorrectly wired or incompatible with tow vehicle.	Rewire.
	Lights are burned out.	Replace lights.
Gasoline engine is not working.	Refer to the OEM service manual.	Refer to the OEM service manual.
Electric motor/pump for DEF system is not working.	DEF tank shutoff valve is closed.	Open the valve.
	Pump was not winterized and has been damaged due to freezing.	Winterize the system prior to winter or store the fuel hauler in a climate controlled building.
Fuel is not being pumped from the tank.	Fuel tank shutoff valve is closed.	Open the valve.
	Fuel filter is dirty.	Change the filter.
	Electric fuel pump inlet strainer is dirty.	Clean or replace the strainer.
	Fuel pump is not working properly.	Repair or replace the pump.

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## 11 THIRD-PARTY DOCUMENTS

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### INCLUDED:

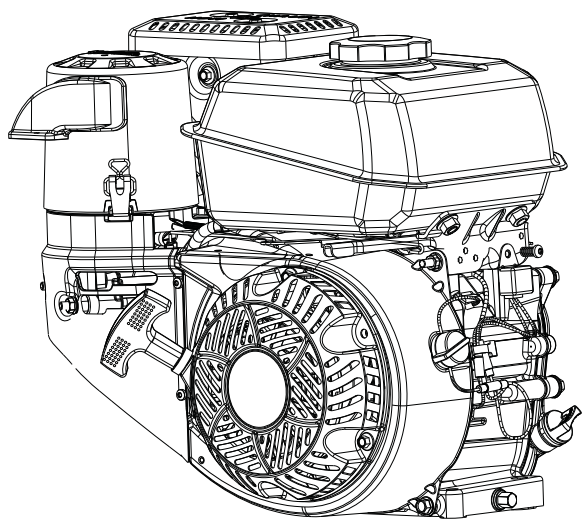
- KOHLER CH270 7-HP OPERATORS MANUAL
- KOHLER CH270 7HP GAS ENGINE - ELECTRICAL PARTS LIST
- FUEL HAULER TRAILER PUMPING SYSTEMS WIRING SCHEMATICS
- FH000093 HOPKINS 12V POWER SOCKET AND LED DOME LIGHT PRODUCT INFORMATION
- MP PUMPS DIESEL PUMP MANUAL
- COX DIESEL FUEL HOSE REEL MANUAL
- M1000147 VENT FILL CAP PARTS AND PRODUCT INFORMATION
- FH000133 DIESEL FUEL FILTER INSTALLATION INFORMATION
- HUSKY HIGHT FLOW HEAVY DUTY DIESEL FUEL NOZZLES (INSTALLATION, MAINTENANCE, INSPECTION INSTRUCTIONS)
- DEF HANDLING AND STORAGE INFORMATION
- DELVAN DEF PUMP MANUAL
- WT000102 235-80R16LRE ON 16-IN 8-BOLT WHITE SPOKE WHEEL

# KOHLER® Command PRO

CH245, CH255, CH260, CH270, CH395,  
CH395DF, CH395TF, CH440, CH440DF

## Owner's Manual

EN  
ESS  
FRC  
ID  
KO  
ZH



### IMPORTANT:

Read all safety precautions and instructions carefully before operating equipment. Refer to operating instruction of equipment that this engine powers. Ensure engine is stopped and level before performing any maintenance or service.

Warranty coverage as outlined in the warranty card and on KohlerEngines.com. Please review carefully as it provides your specific rights and obligations.

To maintain compliance with applicable emission regulations, exhaust system backpressure may not exceed limits which can be found on KohlerEngines.com. Search by Model No., then select Specs tab.

Kohler Engines has published CO2 values on KohlerEngines.com website.

Record engine information to reference when ordering parts or obtaining warranty coverage.


Engine Model \_\_\_\_\_  
Specification \_\_\_\_\_  
Serial Number \_\_\_\_\_  
Purchase Date \_\_\_\_\_


## Safety Precautions


**▲ WARNING:** A hazard that could result in death, serious injury, or substantial property damage.

**▲ CAUTION:** A hazard that could result in minor personal injury or property damage.


NOTE: is used to notify people of important installation, operation, or maintenance information.

	<p><b>▲ WARNING</b></p> <p>Explosive Fuel can cause fires and severe burns.</p> <p>Do not fill fuel tank while engine is hot or running.</p>
<p>Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent.</p>	

	<p><b>▲ WARNING</b></p> <p>Carbon Monoxide can cause severe nausea, fainting or death.</p> <p>Avoid inhaling exhaust fumes. Never run engine indoors or in enclosed spaces.</p>
<p>Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, and can cause death if inhaled.</p>	

	<p><b>▲ WARNING</b></p> <p>Accidental Starts can cause severe injury or death.</p> <p>Disconnect and ground spark plug lead(s) before servicing.</p>
<p>Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (-) battery cable from battery.</p>	





	<p><b>▲ WARNING</b></p> <p>Rotating Parts can cause severe injury.</p> <p>Stay away while engine is in operation.</p>
<p>Keep hands, feet, hair, and clothing away from all moving parts to prevent injury. Never operate engine with covers, shrouds, or guards removed.</p>	

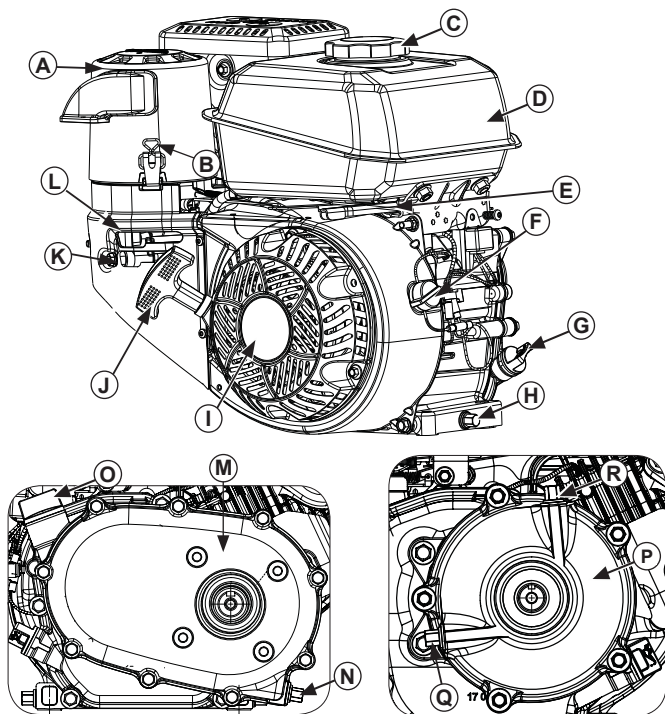
	<p><b>▲ CAUTION</b></p> <p>Electrical Shock can cause injury.</p> <p>Do not touch wires while engine is running.</p>
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	<p><b>▲ WARNING</b></p> <p>Hot Parts can cause severe burns.</p> <p>Do not touch engine while operating or just after stopping.</p>
<p>Never operate engine with heat shields or guards removed.</p>	

<p><b>▲ WARNING:</b> This product can expose you to chemicals including carbon monoxide and benzene, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>.</p>
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## Symbols

					
Fuel	Off	On	Choke	Fast	Slow

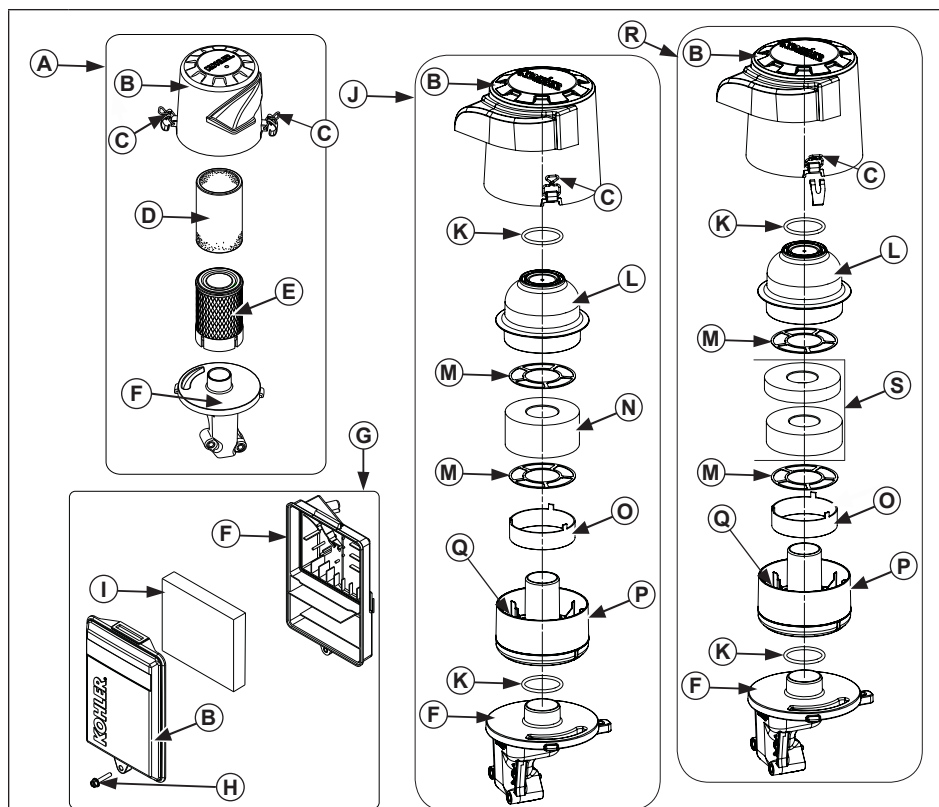


<b>A</b>	Air Cleaner Cover	<b>B</b>	Bail	<b>C</b>	Fuel Cap	<b>D</b>	Fuel Tank
<b>E</b>	Throttle Lever	<b>F</b>	On/Off Switch (if equipped)	<b>G</b>	Dipstick/Oil Fill Plug	<b>H</b>	Oil Drain Plug
<b>I</b>	Retractable Starter	<b>J</b>	Starter Handle	<b>K</b>	Fuel Shut-Off (and Ignition, if equipped)	<b>L</b>	Choke Lever
<b>M</b>	2:1 with Clutch Reduction System (CH245, CH255, CH270, CH395, CH440)	<b>N</b>	Drain Plug	<b>O</b>	Gear Box Dipstick	<b>P</b>	6:1 Reduction System (CH245, CH255, CH270)
<b>Q</b>	Oil Level/Drain Plug	<b>R</b>	Oil Fill Plug				

See next page for exploded view of air cleaner systems.

Visit [KohlerEngines.com](http://KohlerEngines.com) for service parts information and purchasing options.







<b>A</b>	Quad-Clean™ Air Cleaner	<b>B</b>	Air Cleaner Cover	<b>C</b>	Bail	<b>D</b>	Precleaner
<b>E</b>	Paper Element	<b>F</b>	Air Cleaner Base	<b>G</b>	Low-Profile Air Cleaner	<b>H</b>	Screw
<b>I</b>	Foam Element	<b>J</b>	CH270 Oil Bath Air Cleaner	<b>K</b>	O-Ring	<b>L</b>	Foam Filter Cover
<b>M</b>	Foam Filter Support Plate	<b>N</b>	Foam Filter	<b>O</b>	Oil Retainer Ring	<b>P</b>	Oil Reservoir Cup
<b>Q</b>	Oil Level Mark	<b>R</b>	CH395/CH440 Oil Bath Air Cleaner	<b>S</b>	Foam Element Kit		

### Pre-Start Checklist

1. Check oil level. Add oil if low. Do not overfill.
2. Check fuel level. Add fuel if low. Check fuel system components and lines for leaks.
3. Check and clean cooling areas, air intake areas and external surfaces of engine (particularly after storage).
4. Check that air cleaner components and all shrouds, equipment covers, and guards are in place and securely fastened.
5. Check spark arrestor (if equipped).
6. If equipped with oil bath air cleaner, check oil level in oil reservoir cup; add oil if below oil level mark; do not overfill; inspect for leaks. See Oil Bath Air Cleaner.

## Starting

	<p><b>⚠ WARNING</b></p> <p>Carbon Monoxide can cause severe nausea, fainting or death.</p> <p>Avoid inhaling exhaust fumes. Never run engine indoors or in enclosed spaces.</p>
<p>Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, and can cause death if inhaled.</p>	

	<p><b>⚠ WARNING</b></p> <p>Rotating Parts can cause severe injury.</p> <p>Stay away while engine is in operation.</p>
<p>Keep hands, feet, hair, and clothing away from all moving parts to prevent injury. Never operate engine with covers, shrouds, or guards removed.</p>	

**NOTE:** Choke position for starting may vary depending upon temperature and other factors. Once engine is running and warm, turn choke to OFF position.

**NOTE:** Extend starter cord periodically to check its condition. If cord is frayed have it replaced immediately by a Kohler authorized dealer.

**NOTE:** Do not crank engine continuously for more than 10 seconds. Allow a 60 second cool down period between starting attempts. Failure to follow these guidelines can burn out starter motor.

**NOTE:** If engine develops sufficient speed to disengage starter but does not keep running (a false start), engine rotation must be allowed to come to a complete stop before attempting to restart engine. If starter is engaged while flywheel is rotating, starter pinion and flywheel ring gear may clash, resulting in damage to starter.

1. Turn fuel shut-off valve to ON position (if equipped).
2. Turn engine on/off switch to ON position (if equipped).
3. Start engine as follows:

**Cold engine:** Place throttle control midway between SLOW and FAST positions. Place choke control into ON position.

**Warm engine:** Place throttle control midway between SLOW and FAST positions. Return choke to OFF position as soon as engine starts. A warm engine usually does not require choke on.

4. Retractable Start: Slowly pull starter handle until just past compression-STOP! Return starter handle; firmly pull straight out to avoid excessive rope wear from starter rope guide.

**Electric Start:** Activate starter switch. Release switch as soon as engine starts. If starter does not turn engine over, shut off starter immediately. Do not make further attempts to start engine until condition is corrected. Do not jump start. See your Kohler authorized dealer for trouble analysis.

5. Gradually return choke control to OFF position after engine starts and warms up. Engine/equipment may be operated during warm up period, but it may be necessary to leave choke partially on until engine warms up.

## Cold Weather Starting Hints

1. Use proper oil for temperature expected.
2. Disengage all possible external loads.
3. Use fresh winter grade fuel. Winter grade fuel has higher volatility to improve starting.

## Stopping

1. If possible, remove load by disengaging all PTO driven attachments.
2. If equipped, move throttle control to slow or idle position; stop engine.
3. If equipped, close fuel shut-off valve.

## Angle of Operation

Refer to operating instructions of equipment this engine powers. Do not operate this engine exceeding maximum angle of operation; see specification table. Engine damage could result from insufficient lubrication.

## Engine Speed

**NOTE:** Do not tamper with governor setting to increase maximum engine speed. Overspeed is hazardous and will void warranty.

## High Altitude Operation

If this engine is operated at an altitude of 4000 ft. (1219 meters) or above, a high altitude carburetor kit is required. To obtain high altitude carburetor kit information or to find a Kohler authorized dealer, visit [KohlerEngines.com](http://KohlerEngines.com) or call 1-800-544-2444 (U.S. and Canada).

This engine should be operated in its original configuration below 4000 ft. (1219 meters).

Operating this engine with the wrong engine configuration at a given altitude may increase its emissions, decrease fuel efficiency and performance, and result in damage to the engine.

## Carburetor Icing


**NOTE:** Running engine with cover positioned for cold weather operation in normal conditions can damage engine.

Carburetor icing can take place when certain combinations of temperature and humidity exist. Result of carburetor icing is rough running at idle or low speed as well as black or white smoke.

To reduce likelihood of carburetor icing, air cleaner cover can be rotated to draw warmer air from muffler side. For cold weather operation, position air cleaner cover with snowflake decal out.

For normal operation, position air cleaner cover with sun decal out.

## Maintenance Instructions

	<p><b>⚠ WARNING</b></p> <p>Accidental Starts can cause severe injury or death.</p> <p>Disconnect and ground spark plug lead(s) before servicing.</p>	<p>Before working on engine or equipment, disable engine as follows: 1) Disconnect spark plug lead(s). 2) Disconnect negative (–) battery cable from battery.</p>
---	--	---

Normal maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual; however, warranty repairs must be performed by a Kohler authorized dealer found at KohlerEngines.com or 1-800-544-2444 (U.S. and Canada).

## Maintenance Schedule

### After first 5 Hours

- Change engine oil (NOT required if using KOHLER PRO 10W-50 full-synthetic oil).

### Every 8 Hours

- Check oil bath air cleaner oil level in oil reservoir cup (if equipped).

### Every 50 Hours

- Change oil in 2:1 with Clutch Reduction System (CH245, CH255, CH270, CH395, CH440).

### Every 50 Hours<sup>1</sup>

- Service/replace oil bath air cleaner foam filter or foam elements (if equipped).

### Every 50 Hours or Annually (whichever comes first)

- Service/replace Quad-Clean<sup>™</sup> precleaner.

### Every 100 Hours or Annually<sup>1</sup> (whichever comes first)

- Clean low-profile air cleaner element.
- Change engine oil.
- Clean cooling areas.

### Every 200 Hours

- Replace Quad-Clean<sup>™</sup> air cleaner element.

### Every 300 Hours

- Replace low-profile air cleaner element.
- Check fuel filters (tank outlet filter and in-line filter) and clean or replace if needed (if equipped).
- Change oil in 6:1 Reduction System (CH245, CH255, CH270).

### Every 300 Hours<sup>2</sup>

- Check and adjust valve clearance when engine is cold.

### Every 300 Hours<sup>3</sup>

- Change engine oil (KOHLER PRO 10W-50 oil only).

### Every 500 Hours or Annually<sup>1</sup> (whichever comes first)

- Replace spark plug and set gap.

<sup>1</sup> Perform these procedures more frequently under severe, dusty, dirty conditions.

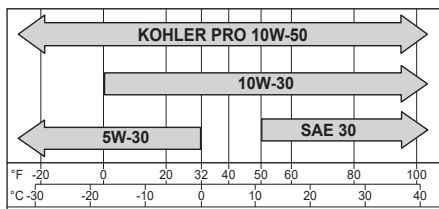
<sup>2</sup> Have a Kohler authorized dealer perform this service.

<sup>3</sup> Option only if using KOHLER<sup>®</sup> PRO oil.

## Oil Recommendations

All-season KOHLER<sup>®</sup> PRO 10W-50 Synthetic Oil is the ideal oil for KOHLER engines. It is specifically formulated to extend the oil change interval to 300 Hours. Contact your Kohler authorized dealer for availability.

300-Hour oil change intervals are exclusive to and only authorized on KOHLER engines that utilize the KOHLER PRO 10W-50 Synthetic Oil. Alternative engine oils may be used with KOHLER engines but require 100-Hour oil change intervals for proper maintenance. Oil must be API (American Petroleum Institute) service class SJ or higher. Select viscosity based on air temperature at time of operation as shown below.



## Check Oil Level

**NOTE:** To prevent extensive engine wear or damage, never run engine with oil level below or above operating range indicator on dipstick.

Ensure engine is cool and level. Clean oil fill/dipstick areas of any debris.

1. Remove dipstick; wipe oil off.
2. Reinsert dipstick into tube; rest on oil fill neck; turn counterclockwise until cap drops down to lowest point of thread leads; do not thread cap onto tube.
  - a. Remove dipstick; check oil level.
 

**For CH260/CH270 engines**, oil level should be at middle of indicator on dipstick.

**For all other models**, oil level should be at top of indicator on dipstick.

or

  - b. Remove oil fill plug.
 

**For CH260/CH270 engines**, oil level should be to middle of filler neck threads.

**For all other models**, oil level should be up to point of overflowing filler neck.
3. If oil is low, add oil to specified level on dipstick or filler neck threads for engine being serviced. See step 2.
4. Reinstall dipstick or oil fill plug and tighten securely.

## Change Oil

Change oil while engine is warm.

1. Clean area around oil fill cap/dipstick and drain plug.
2. Remove drain plug and oil fill cap/dipstick. Drain oil completely.
3. Reinstall drain plug. Torque to 13 ft. lb. (17.6 N·m).
4. Fill crankcase with new oil to specified level on dipstick or filler neck threads for engine being serviced. See Check Oil Level.
5. Reinstall oil fill cap/dipstick and tighten securely.
6. Dispose of used oil in accordance with local ordinances.

## Oil Sentry™ (if equipped)

This switch is designed to prevent engine from starting in a low oil or no oil condition. Oil Sentry™ may not shut down a running engine before damage occurs. In some applications this switch may activate a warning signal. Read your equipment manuals for more information.

## Reduction Systems (if equipped)

Some engines are equipped with a gear reduction system. Follow maintenance and oil change information specified in this section and maintenance schedule.

### 2:1 Reduction System (CH270)

This reduction system is lubricated by engine crankcase oil. No special maintenance or service is necessary. Check and maintain engine oil level as outlined in Check Oil Level.

### 2:1 with Clutch Reduction System (CH245, CH255, CH270, CH395, CH440)

**NOTE:** Engines with this reduction system must be operated at 2400 RPM or higher under load, when full gear box engagement occurs. Operating engine under heavy loads below 2400 RPM, could result in clutch/gear box failure from disc slippage/overheating and insufficient engine cooling, not covered under normal warranty.

This reduction system uses a clutch assembly and chain and sprocket drive system, independent of, and separated from main crankcase lubrication. Check and maintain oil level using dipstick in gear box case. Change reduction system oil at interval in maintenance schedule. Use 20W-40 or 20W-50 oil in this gear box case. Oil capacity of this gear box is 0.5 L (0.52 U.S. qt.).

1. Drain old oil out through oil drain plug of gear box cover, tip engine as required. Reinstall drain plug and tighten securely.



2. Engine must be level. Add new 20W-40 or 20W-50 oil through oil dipstick hole on top of gear box case until oil level is up to bottom of the mark on the oil dipstick in gear box case. Reinstall dipstick securely into gear box cover.

### 6:1 Reduction System (CH245, CH255, CH270)


This reduction system uses an internal pinion and ring gear system, independent of, and separated from main crankcase lubrication. Check and maintain oil level using oil level/drain plug hole in gear box case. Change reduction system oil at interval in maintenance schedule. Oil capacity of this gear box is 0.12 L (0.13 U.S. qt.).

1. Drain old oil out through oil level/drain plug, tip engine as required.
2. Engine must be level. Add new oil through oil fill plug hole on top until oil level is up to bottom of oil level/drain plug hole. Reinstall both plugs and tighten securely.

### 6:1 Reduction System (CH395, CH440)

This reduction system is lubricated by engine crankcase oil. No special maintenance or service is necessary. Check and maintain engine oil level as outlined in Check Oil Level.

## Fuel Recommendations

	<p><b>! WARNING</b></p> <p>Explosive Fuel can cause fires and severe burns.</p> <p>Do not fill fuel tank while engine is hot or running.</p>
<p>Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent.</p>	


**NOTE:** E15, E20 and E85 are NOT approved and should NOT be used; effects of old, stale or contaminated fuel are not warrantable.

Fuel must meet these requirements:

- Clean, fresh, unleaded gasoline.
- Octane rating of 87 (R+M)/2 or higher.
- Research Octane Number (RON) 90 octane minimum.
- Gasoline up to 10% ethyl alcohol, 90% unleaded is acceptable.
- Methyl Tertiary Butyl Ether (MTBE) and unleaded gasoline blend (max 15% MTBE by volume) are approved.
- Do not add oil to gasoline.
- Do not overfill fuel tank.

- Do not use gasoline older than 30 days.

## Add Fuel

	<p><b>! WARNING</b></p> <p>Explosive Fuel can cause fires and severe burns.</p> <p>Do not fill fuel tank while engine is hot or running.</p>
<p>Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in well ventilated, unoccupied buildings, away from sparks or flames. Spilled fuel could ignite if it comes in contact with hot parts or sparks from ignition. Never use gasoline as a cleaning agent.</p>	

## Nominal Fuel Tank Volume

CH245, CH255	2.75 qt. (2.6 L)
CH260, CH270	4.02 qt. (3.8 L)
CH395, CH440	7.19 qt. (6.8 L)

Ensure engine is cool.

1. Clean area around fuel cap.
2. Remove fuel cap. Fill to base of filler neck. Do not overfill fuel tank. Leave room for fuel to expand.
3. Reinstall fuel cap and tighten securely.

## Fuel Line

Low permeation fuel line must be installed on carbureted Kohler Co. engines to maintain EPA and CARB regulatory compliance.

## Fuel Valve

Engines are equipped with a fuel valve and integral screen filter located at inlet of carburetor. It controls and filters fuel flow from tank to carburetor. Clean fuel valve cup of debris.

1. Remove two nuts, two screws, and carburetor cover panel.
2. Turn fuel valve lever to OFF position.
3. Remove fuel valve cup. Remove O-ring and filter screen.
4. Clean screen and fuel valve cup with solvent and wipe it off.
5. Check screen and O-ring, replace if damaged.
6. Reinstall O-ring followed by fuel valve cup. Rotate fuel valve cup until it is finger tight. Turn with a wrench 1/2 to 3/4 full turn.
7. Turn fuel valve to ON position and check for leaks. If fuel valve leaks repeat steps 5 & 6.
8. Tighten fuel cap securely.

9. Reinstall carburetor cover panel securing with hardware removed in step 1.

## Spark Plugs



### CAUTION

Electrical Shock can cause injury.  
Do not touch wires while engine is running.

Clean out spark plug recess. Remove plug and replace.

1. Check gap using wire feeler gauge. Adjust gap, see specification table for adjustment.
2. Install plug into cylinder head.
3. Torque plug to 20 ft. lb. (27 N·m).

## Air Cleaner

**NOTE:** Running engine with cover positioned for cold weather operation in normal conditions can damage engine.

**NOTE:** Operating engine with loose or damaged air cleaner components could cause premature wear and failure. Replace all bent or damaged components.

**NOTE:** Paper element cannot be blown out with compressed air.

### Quad-Clean™

Move bails on air cleaner cover down; remove latches from under tabs on base; remove cover.

or

Turn air cleaner cover (counterclockwise) to release tabs inside cover from base; remove cover.

Precleaner:

1. Remove precleaner from paper element.
2. Replace or wash precleaner in warm water with detergent. Rinse and allow to air dry.
3. Lightly oil precleaner with new engine oil; squeeze out excess oil.
4. Reinstall precleaner over paper element.

Paper Element:

1. Separate precleaner from element; service precleaner and replace paper element.
2. Install new paper element on base; install precleaner over paper element.

Position air cleaner cover for normal operation (sun decal out) or cold weather operation (snowflake decal out).

Place latches under tabs on base; lift up bails to secure cover.

or

Turn air cleaner cover (clockwise) to secure tabs inside cover in base.

## Low-Profile

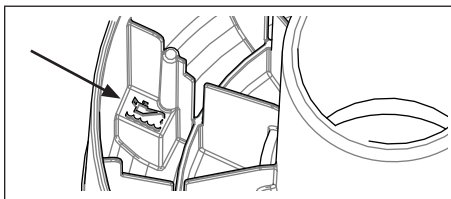
1. Remove screw and air cleaner cover.
2. Remove foam element from base.
3. Wash foam element in warm water with detergent. Rinse and allow to air dry.
4. Lightly oil foam element with new engine oil; squeeze out excess oil.
5. Reinstall foam element into base.
6. Reinstall cover and secure with screw.

## Oil Bath

Some engines are equipped with an oil bath air cleaner. Follow maintenance and oil change information specified in this section and in Maintenance Schedule.

Move bails on air cleaner cover down; remove latches from under tabs on base; remove cover.

1. Remove foam filter cover from oil reservoir cup. Remove foam filter support plate and foam filter or foam elements.
2. CH270 engines: Replace or wash foam filter in warm water with detergent. Rinse and allow to air dry.  
CH395/CH440 engines: Replace or wash foam elements in warm water with detergent. Rinse and allow to air dry.
3. Lightly oil foam filter or foam elements with new engine oil; squeeze out excess oil.
4. Remove foam filter support plate and oil retainer ring from oil reservoir cup.
5. Remove oil reservoir cup from base. Empty oil from cup and wash cup in warm water with detergent. Rinse and dry cup.
6. Make sure O-ring is in place on air cleaner base. Set oil reservoir cup on base.
7. Fill oil reservoir cup up to oil level mark with same grade of oil as in crankcase. See Oil Recommendations.



8. Reinstall oil retainer ring and foam filter support plate in oil reservoir cup.

9. CH270 engines: Reinstall foam filter on oil reservoir cup. Place foam filter support plate on filter. Reinstall foam filter cover. Make sure O-ring is in place on top of filter cover.



CH395/CH440 engines: Reinstall taller foam element first, then shorter foam element on oil reservoir cup. Place foam filter support plate on elements. Reinstall foam filter cover. Make sure O-ring is in place on top of filter cover.

Position air cleaner cover for normal operation (sun decal out) or cold weather operation (snowflake decal out). Place latches under tabs on base; lift up bails to secure cover.

### Breather Tube

Ensure both ends of breather tube are properly connected.

### Air Cooling

	<div data-bbox="271 560 436 600"> <b>WARNING</b></div> <div data-bbox="191 609 457 657">Hot Parts can cause severe burns.</div> <div data-bbox="191 662 489 714">Do not touch engine while operating or just after stopping.</div>
Never operate engine with heat shields or guards removed.	

Proper cooling is essential. To prevent over heating, clean screens, cooling fins, and other external surfaces of engine. Avoid spraying water at wiring harness or any electrical components. See Maintenance Schedule.

### Repairs/Service Parts

We recommend that you use a Kohler authorized dealer for all maintenance, service, and replacement parts for engine. To find a Kohler authorized dealer visit [KohlerEngines.com](http://KohlerEngines.com) or call 1-800-544-2444 (U.S. and Canada).

### Storage

If engine will be out of service for 2 months or more follow procedure below.

1. Add Kohler PRO Series fuel treatment or equivalent to fuel tank. Run engine 2-3 minutes to get stabilized fuel into fuel system (failures due to untreated fuel are not warrantable).
2. Change oil while engine is still warm from operation (NOT required if using KOHLER PRO 10W-50 full-synthetic oil). Remove spark plug(s) and pour about 1 oz. of engine oil into cylinder(s). Replace spark plug(s) and crank engine slowly to distribute oil.
3. If engine is equipped with oil bath air cleaner, clean and oil foam filter or foam elements and replace oil in oil reservoir cup. See Oil Bath Air Cleaner.
4. Disconnect negative (-) battery cable.
5. Store engine in a clean, dry place.

## Troubleshooting

Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. This work should be performed by a Kohler authorized dealer.

Problem	Possible Cause							
	No Fuel	Improper Fuel	Dirt In Fuel Line	Dirty Debris Screen	Incorrect Oil Level	Engine Overloaded	Dirty Air Cleaner	Faulty Spark Plug
Will Not Start	•	•	•		•	•	•	•
Hard Starting		•	•		•	•	•	•
Stops Suddenly	•		•	•	•	•	•	•
Lacks Power		•	•	•	•	•	•	•
Operates Erratically		•	•	•		•	•	•
Knocks or Pings		•		•		•		•
Skips or Misfires		•	•	•			•	•
Backfires		•	•			•	•	•
Overheats		•	•	•	•	•	•	
High Fuel Consumption						•	•	•

## Engine Specifications

Model	Bore	Stroke	Displacement	Oil Capacity (Refill)	Spark Plug Gap	Maximum Angle of Operation (@ full oil level)*
CH245	2.7 in. (68 mm)	1.9 in. (49 mm)	10.8 cu. in. (177 cc)	0.63 U.S. qt. (0.60 L)	0.030 in. (0.76 mm)	25°
CH255						
CH260	2.8 in. (70 mm)	2.1 in. (54 mm)	12.7 cu. in. (208 cc)	1.16 U.S. qt. (1.1 L)		
CH270						
CH395, CH395DF, CH395TF	3.1 in. (78 mm)	2.3 in. (58 mm)	16.9 cu. in. (277 cc)			
CH440, CH440DF	3.5 in. (89 mm)	2.7 in. (69 mm)	26.2 cu. in. (429 cc)			

\*Exceeding maximum angle of operation may cause engine damage from insufficient lubrication.

Additional specification information can be found in service manual at [KohlerEngines.com](http://KohlerEngines.com).

Any and all horsepower (hp) references by Kohler are Certified Power Ratings and per SAE J1940 & J1995 hp standards. Details on Certified Power Ratings can be found at [KohlerEngines.com](http://KohlerEngines.com).

## Emission Control System

Exhaust Emission Control System for models CH245, CH255, CH260, CH270, CH395, CH395DF, CH395TF, CH440, CH440DF is EM for U.S. EPA, California, and Europe. This engine is certified to operate on gasoline.

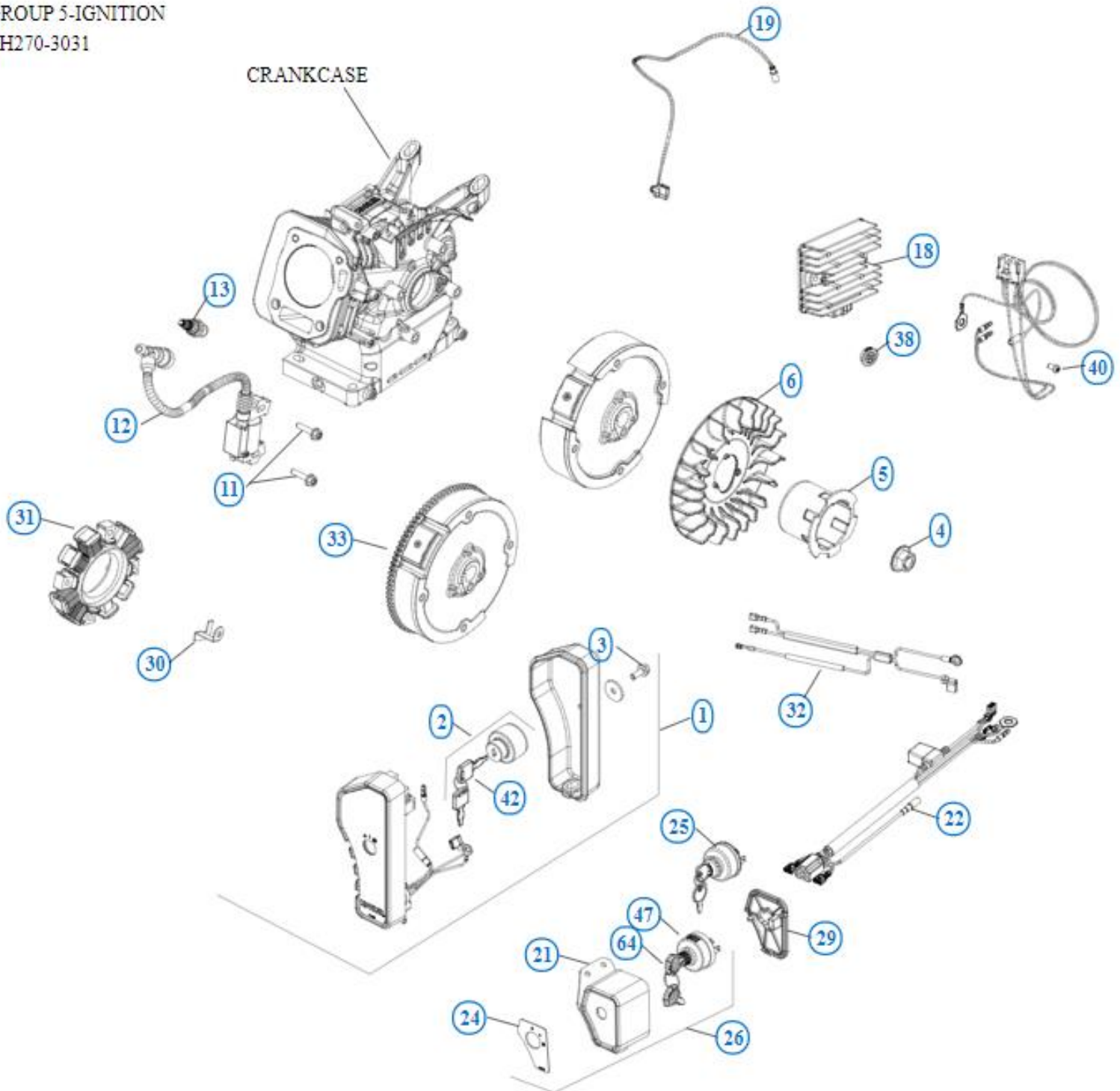
NOTE: Tampering with the engine and its emission control system voids the EPA Certificate of Conformity, ARB Executive Order, and EU type-approval.



# Kohler CH270 7HP Gas Engine – Electric Start with 10 AMP Charging System



















Spec No: CH270-3031, Buid Date: 08/22/2012, S/N: 4223520678














GROUP 5-IGNITION  
CH270-3031



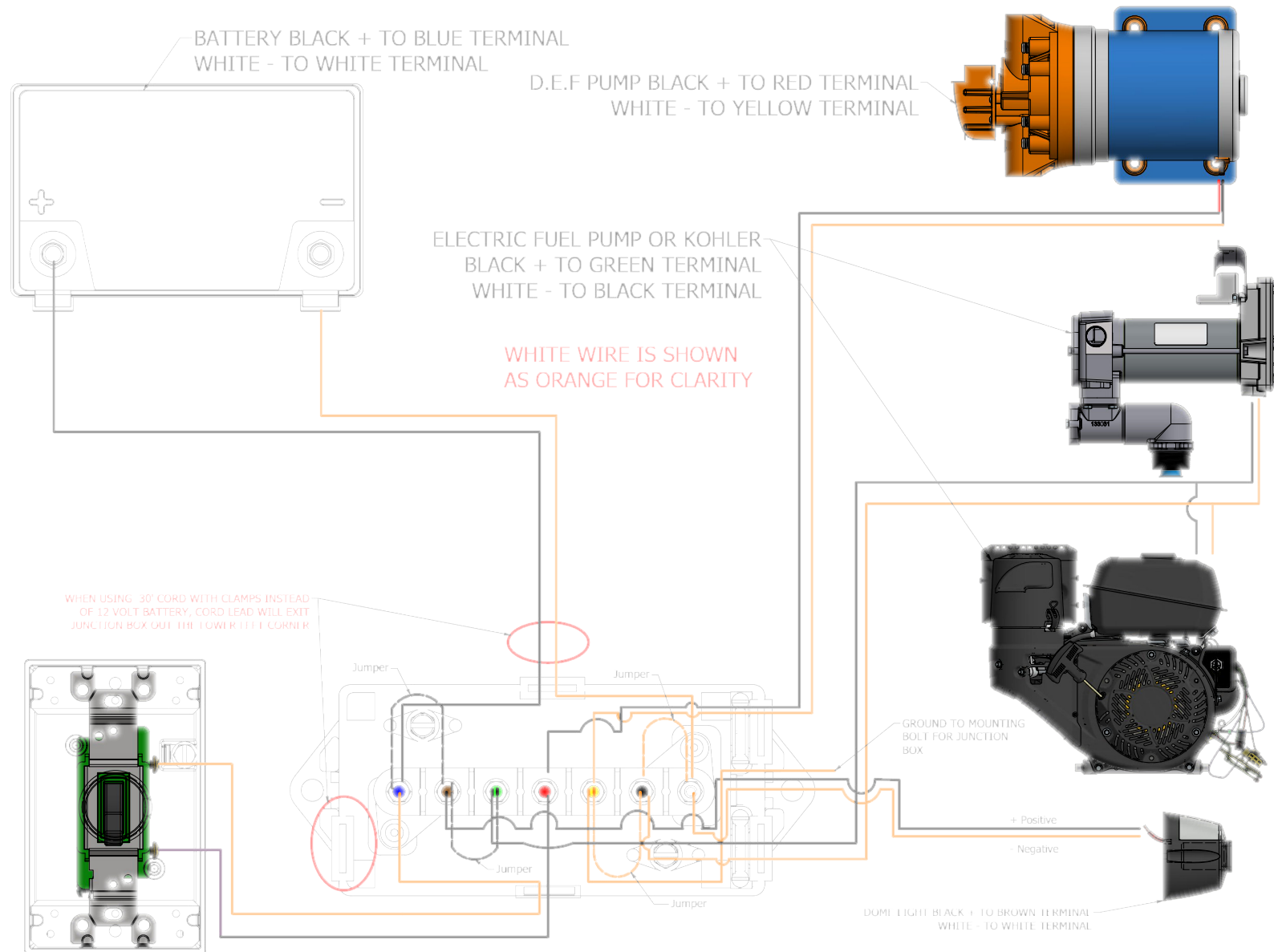
ILLUSTRATIONS ARE REPRESENTATIVE - NOT INTENDED TO SHOW ALL DETAILS

## Ignition/Charging - Group: 05

Pos	Kit	Included in	Part #	Substitution	Description	Note	QTY	Tech info	
1			17 081 45-S 	<u>replaced by</u>	VOID HOUSING, KEY BOX ASSY-DISCONTINUED		1		<a href="#">ADD</a>
2			17 099 07-S 	<u>replaced by</u>	SWITCH, KEY ASSEMBLY - (#DSC)		1		<a href="#">ADD</a>
3			25 086 159-S 	<u>replaced by</u>	SCREW, HEX FLANGE (M6)-USE 25 086 433-S		1		<a href="#">ADD</a>
4			17 100 48-S 		NUT, FLYWHEEL		1		<a href="#">ADD</a>
5			17 109 01-S 		CUP, STARTER DRIVE		1		<a href="#">ADD</a>
6			17 157 06-S 	<u>replaces</u>	FAN, FLYWHEEL		1		<a href="#">ADD</a>
11			25 086 186-S 	<u>replaced by</u>	SCREW, M6 X 25-(#25086436S)		6		<a href="#">ADD</a>
12			17 584 01-S 		MODULE, IGNITION		1		<a href="#">ADD</a>
13			25 132 19-S		SPARK PLUG		1		<a href="#">ADD</a>
18			17 403 08-S		REGULATOR, 10 AMP		1		<a href="#">ADD</a>
19			17 518 04-S		LEAD, GROUND TO KILL		1		<a href="#">ADD</a>
21			17 081 110-S 		KIT, KEYBOX HOUSING ASSEMBLY		1		<a href="#">ADD</a>
22			17 176 18-S		HARNESS, WIRING ASSEMBLY (10 AMP)		1		<a href="#">ADD</a>
24			17 113 76-S 		LABEL, KEY BOX		1		<a href="#">ADD</a>

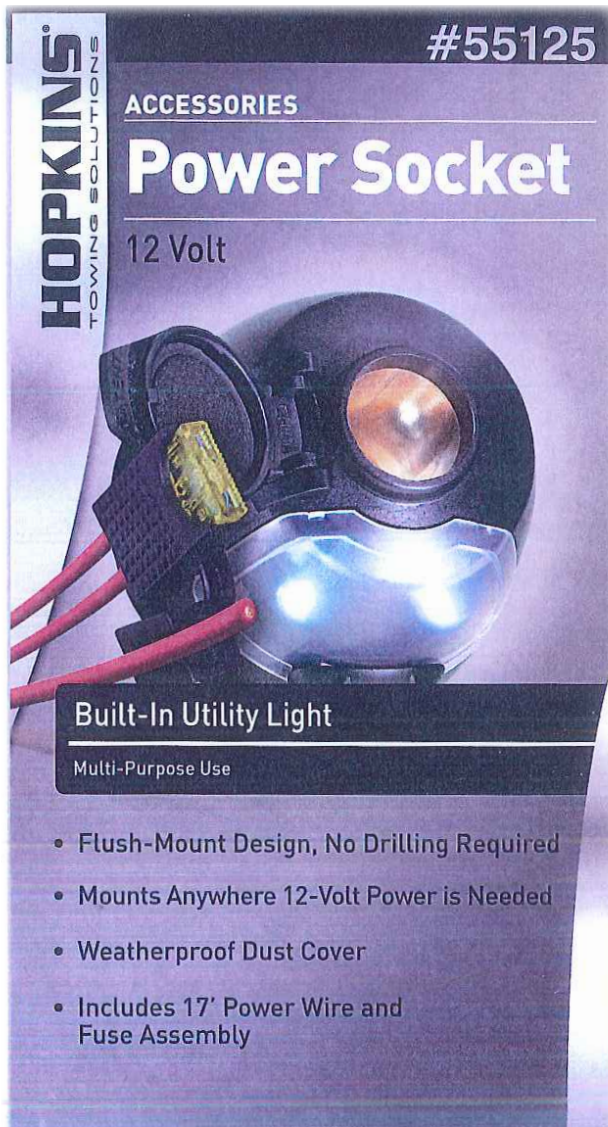
25	25 099 32-S 	<u>replaces</u> <u>replaced by.</u>	KEY ASSEMBLY SWITCH-USE 25 099 37-S	1		<div>ADD</div>
26	17 081 111-S 		KIT, KEY BOX ASSEMBLY	 1 	<div>ADD</div>	
29	17 096 92-S 		COVER, KEY BOX	1	<div>ADD</div>	
30	17 126 216-S		BRACKET, FIXED STATOR WIRE	1	<div>ADD</div>	
31	17 085 25-S		STATOR ASSEMBLY, 12 POLE, (10 AMP)	1	<div>ADD</div>	
32	17 176 03-S 		HARNESS, REGULATOR WIRING ASSY	1	<div>ADD</div>	
33	17 025 39-S 		FLYWHEEL ASSY, ELECTRIC START 10-AMP	1	<div>ADD</div>	
38	25 158 20-S		BUSHING, WIRE MANAGEMENT	1	<div>ADD</div>	
40	25 086 220-S		SCREW, M5 X 8	1	<div>ADD</div>	
42	17 340 11-S 		KEYS FOR SWITCH	 1	<div>ADD</div>	
47	25 099 38-S		SWITCH, KEY ASSEMBLY	 1	<div>ADD</div>	
64	17 340 18-S		KIT, KEY PLASTIC HANDLE (2 PC)	 1 	<div>ADD</div>	

# FUEL HAULER TRAILER PUMPING SYSTEMS WIRING SCHEMATIC





## P/N: FH000093 POWER SOCKET 20-AMP FUSE INSTRUCTIONS



# #55125

### Wiring Identification

White wire..... Attach to ground

Red wire..... Battery

1. Find a suitable location for the socket to be mounted.
2. Clean the mounting surface to ensure good adhesion.
3. **OPTIONAL:** If you wish to drill a hole behind the location of the socket for the wires to pass through, do so with a 1/2" drill bit. If drilling through metal, a rubber grommet may be desirable to protect the wire from being cut.
4. Peel the backing from the adhesive tape and press the socket to the mounting surface. If you do not drill the hole in step 3, make sure the wires from the socket pass along the channel in the tape.
5. **OPTIONAL:** If you wish to use screws for permanent mounting, insert them now.
6. Ground the white wire to a clean, rust-free spot on the vehicle frame.
7. Splice a 14-gauge red wire onto the red wire coming from the socket. Be sure this wire is long enough to reach the battery.
8. Run the wire from the socket to the battery. Avoid the exhaust system, fuel tank and drive train. **Important:** Use fuse to attach the wire to the positive (+) battery terminal.



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079-1551-255  
Rev. B 5-12  
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Patented in U.S.





# PETROLEUM 8

## 2" x 2" Self Priming Centrifugal Pump

Petroleum 8 self-priming centrifugal pumps are capable of creating vacuum sufficient to lift liquids from heights up to 25 feet above the source. To handle many different fuels, the Petroleum 8 is available in three distinct models: PO, PG and PE 8.

A Petroleum 8 PumPAK® is a fully assembled and run tested pump end that can be easily coupled to a number of drivers such as hydraulic motors, 56C and 145TC frame motors and gas engines. A bearing pedestal is also available for T-frame motor or belt drive.

Standard features include SS drive sleeve, SS fasteners, renewable wear plate, and a semi-open dynamically balanced impeller.

The Petroleum 8 Pump is available in three distinct models: PG, PO and PE

Model PG Pumps - Compatible For Gasoline, Kerosene, Avgas & Jet Fuel

Model PO Pumps - Compatible For BioDiesel, Fuel Oil & Diesel

Model PE Pumps - Compatible For Ethanol & E 85

### SPECIFICATIONS:

Suction and Discharge . . . 2" x 2" NPT

Flow . . . . . Up to 150 GPM

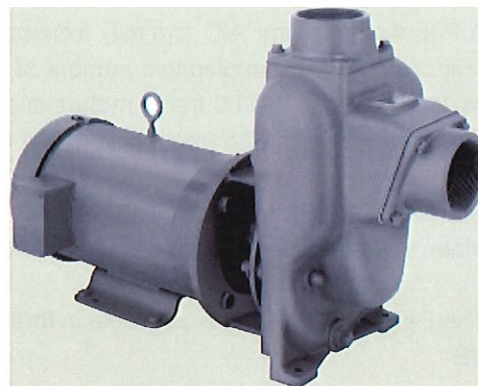
Head Feet . . . . . Up to 100'

Impeller . . . . . PE 8 - semi-open cast iron, 316 SS (optional)  
PG 8 - semi-open cast iron, aluminum (optional)  
PO 8 - semi-open cast iron

Motor . . . . . Up to 3 HP

Drive Options . . . . . Close coupled 145TC  
Close coupled 56C  
Engine mount 5.5 HP  
Engine mount 6.5 HP  
Hydraulic motor .22 cu. in.  
Hydraulic motor .37 cu. in.  
Hydraulic motor .45 cu. in.  
Pedestal  
PumPAK® (without motor)

Seal . . . . . PE 8 - carbon / silicon carbide / Viton  
PG 8 - carbon / silicon carbide / Viton  
PO 8 - carbon / Ni-Resist / Viton



#### Application:

- Agricultural
- Industrial
- Marine
- OEM

#### Compatible For:

- PE 8 - ethanol, E 85
- PG 8 - gasoline, avgas, kerosene, jet A/8
- PO 8 - biodiesel, fuel oil, diesel

#### Features:

- Gas engine for diesel fuel transfer
- Non-spark clamp (on some models)
- Renewable wear plate
- Stainless steel drive sleeve
- Stainless steel fasteners
- Up to a 25' suction lift

#### Mounting Options:

- PE 8 - explosion proof, class 1, group D
- PG 8 - explosion proof, class 1, group D
- PO 8 - TEFC

#### Options:

- 5 blade impeller available for higher flows



## PETROLEUM 8

Petroleum 8 self-priming centrifugal pumps are capable of creating vacuum sufficient to lift liquids from heights up to 25 feet above the source. To handle many different fuels, the Petroleum 8 is available in three distinct models: PO, PG and PE 8.

A Petroleum 8 PumPAK® is a fully assembled and run tested pump end that can be easily coupled to a number of drivers such as hydraulic motors, 56C and 145TC frame motors and gas engines. A bearing pedestal is also available for T-frame motor or belt drive.

Standard features include SS drive sleeve, SS fasteners, renewable wear plate, and a semi-open dynamically balanced impeller.

The Petroleum 8 Pump is available in three distinct models: PG, PO and PE

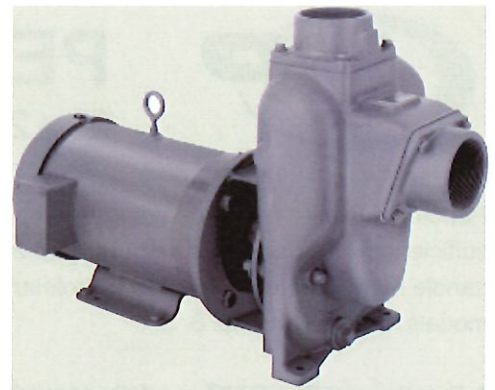
Model PG Pumps - Compatible For Gasoline, Kerosene, Avgas & Jet Fuel

Model PO Pumps - Compatible For BioDiesel, Fuel Oil & Diesel

Model PE Pumps - Compatible For Ethanol & E 85

## SPECIFICATIONS:

Suction and Discharge	.. 2" x 2" NPT
Flow	..... Up to 150 GPM
Head Feet	..... Up to 100'
Impeller	..... PE 8 - semi-open cast iron, 316 SS (optional) PG 8 - semi-open cast iron, aluminum (optional) PO 8 - semi-open cast iron
Motor	..... Up to 3 HP
Drive Options	..... Close coupled 145TC Close coupled 56C Engine mount 5.5 HP Engine mount 6.5 HP Hydraulic motor .22 cu. in. Hydraulic motor .37 cu. in. Hydraulic motor .45 cu. in. Pedestal PumPAK® (without motor)
Seal	..... PE 8 - carbon / silicon carbide / Viton PG 8 - carbon / silicon carbide / Viton PO 8 - carbon / Ni-Resist / Viton



### Application:

- Agricultural
- Industrial
- Marine
- OEM

### Compatible For:

- PE 8 - ethanol, E 85
- PG 8 - gasoline, avgas, kerosene, jet A/V8
- PO 8 - biodiesel, fuel oil, diesel

### Features:

- Gas engine for diesel fuel transfer
- Non-spark clamp (on some models)
- Renewable wear plate
- Stainless steel drive sleeve
- Stainless steel fasteners
- Up to a 25' suction lift

### Mounting Options:

- PE 8 - explosion proof, class 1, group D
- PG 8 - explosion proof, class 1, group D
- PO 8 - TEFC

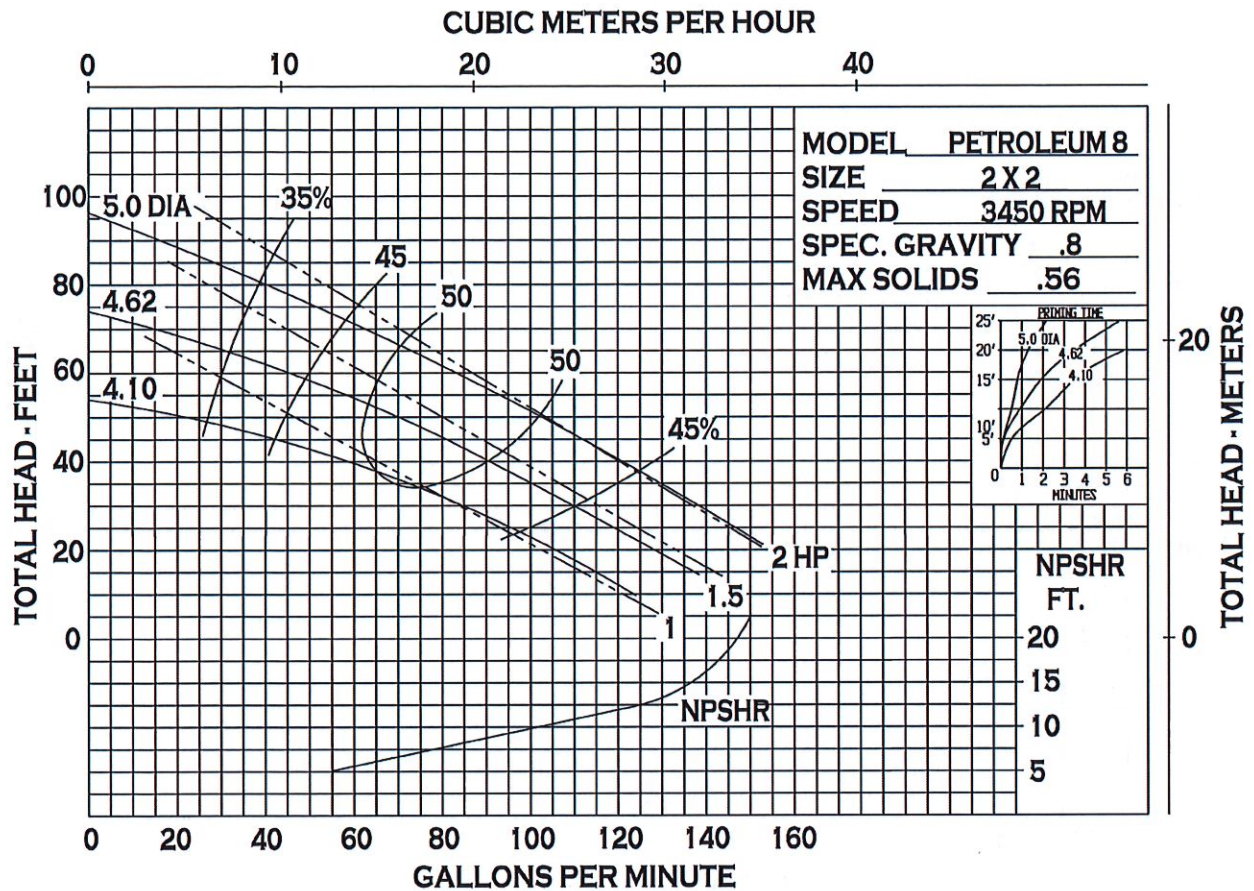
### Options:

- 5 blade impeller available for higher flows



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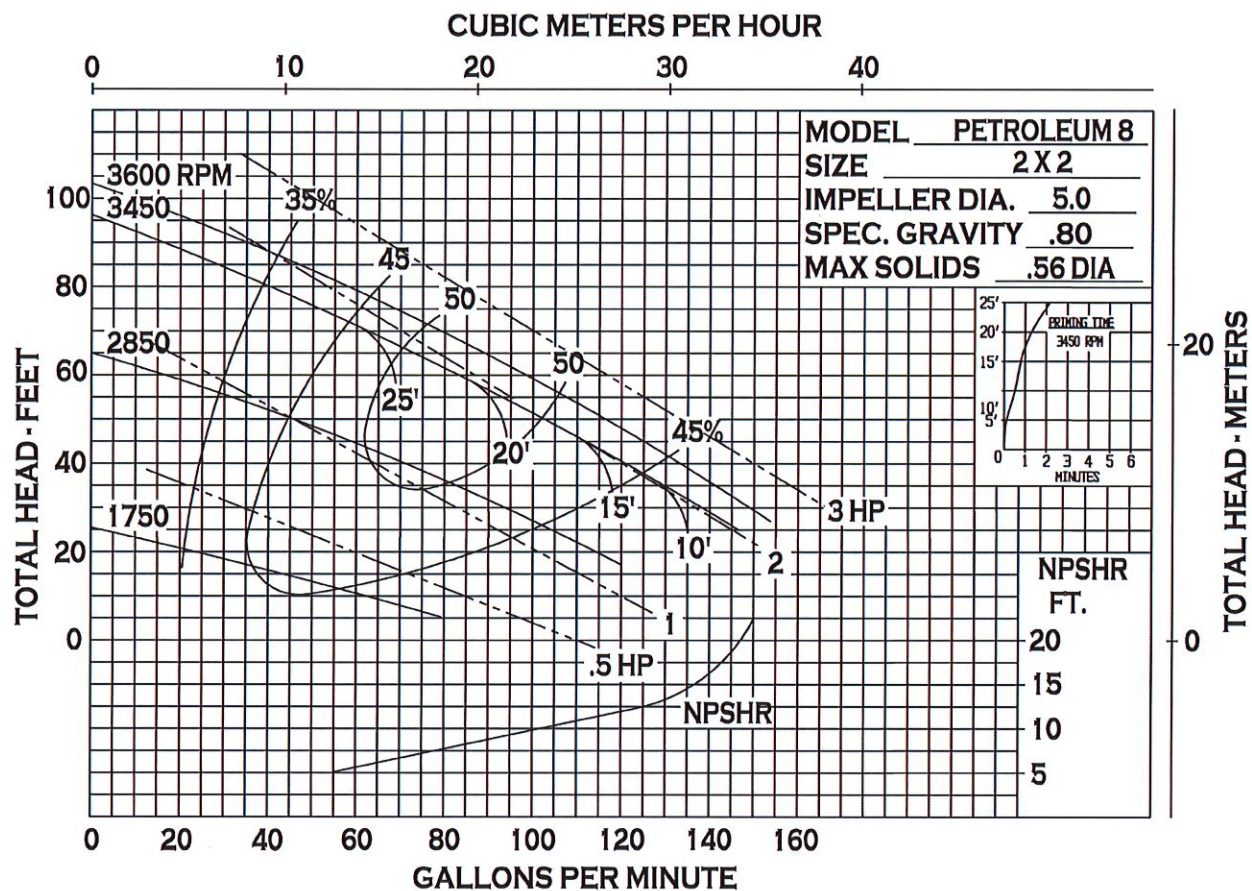
# PETROLEUM 8



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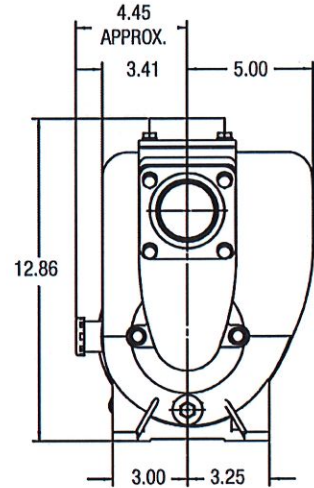
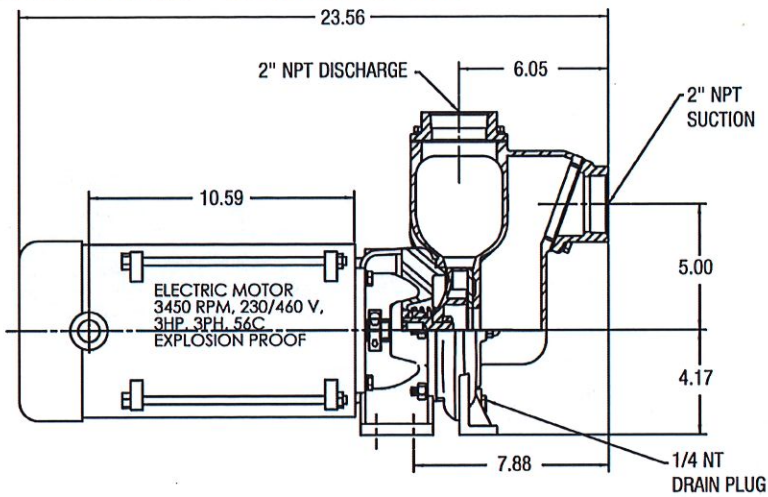
# PETROLEUM 8



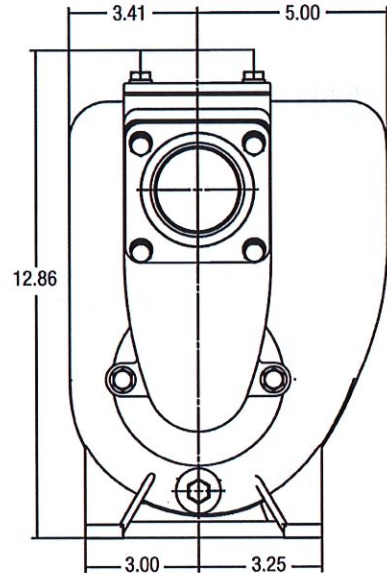
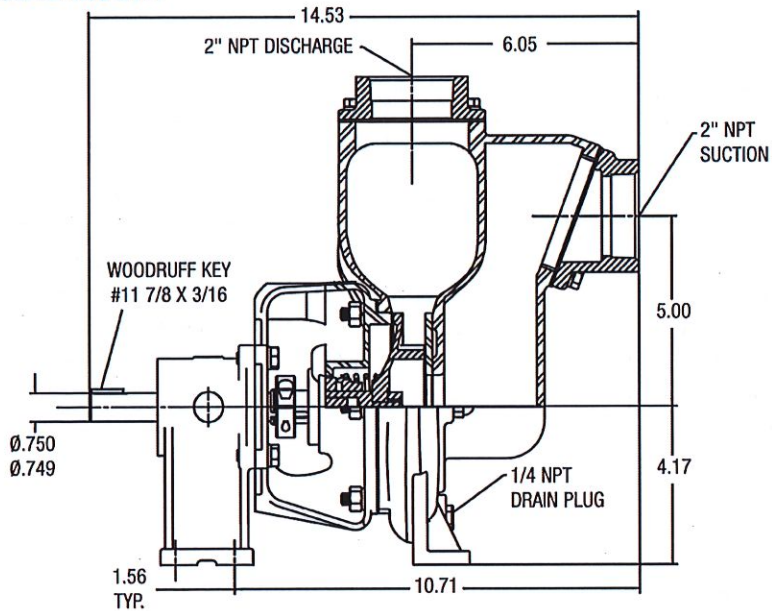
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# PETROLEUM 8

## CLOSE COUPLED - ELECTRIC MOTOR

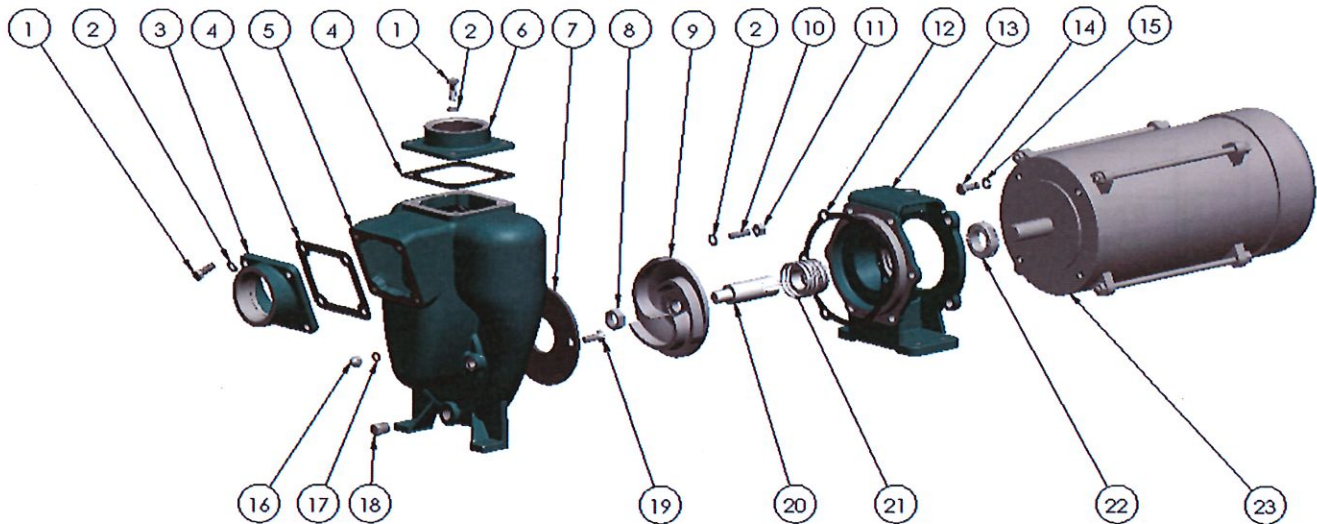


## PEDESTAL-MOUNT



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35639



PART NO.	ITEM NO.	DESCRIPTION	QTY.		PART NO.	ITEM NO.	DESCRIPTION	QTY.
21242	1	CAPSCREW - 5/16"-18 X 7/8"	8		21266	15	LOCKWASHER SS: 3/8	4
21238	2	LOCKWASHER 5/16	14		21237	16	ACORN NUT - 5/16"-18	2
35614	3	SUCTION FLANGE D - 2" NPT	1	*	21248	17	GASKET - 1/2 X 5/16 X 1/16	2
* 35609	4	GASKET CORK/BUNA	2		21267	18	PIPE PLUG SS 1/4 NPT	1
35604	5	HOUSING DUCTILE	1		21249	19	SCREW SS 5/16-18X1	2
35615	6	DISCHARGE FLANGE D - 2" NPT	1		25664	20	DRIVE SLEEVE SS: 7/8 SL	1
* 22258	7	WEAR PLATE ALUMINUM	1	*	35610	21	SEAL 1" T-2 CAR/SIC/VIT	1
22655	8	JAM NUT - 5/8"-18	1		35613	22	CLAMP B: 7/8 SL	1
22293	9	IMPELLER C 5" DIA.	1		26027	23	EL MTR: 3-3 145TC 3450 230/460	1
30321	10	STUD - 5/16"-18 X 1.13"	6				EXPLOSION PROOF	
21284	11	HEXNUT - 5/16"-18	6					
* 35722	12	GASKET C-4433	1					
35608	13	ADAPTOR DUCTILE	1					
21251	14	CAPSCREW 3/8-16 X 7/8	4					

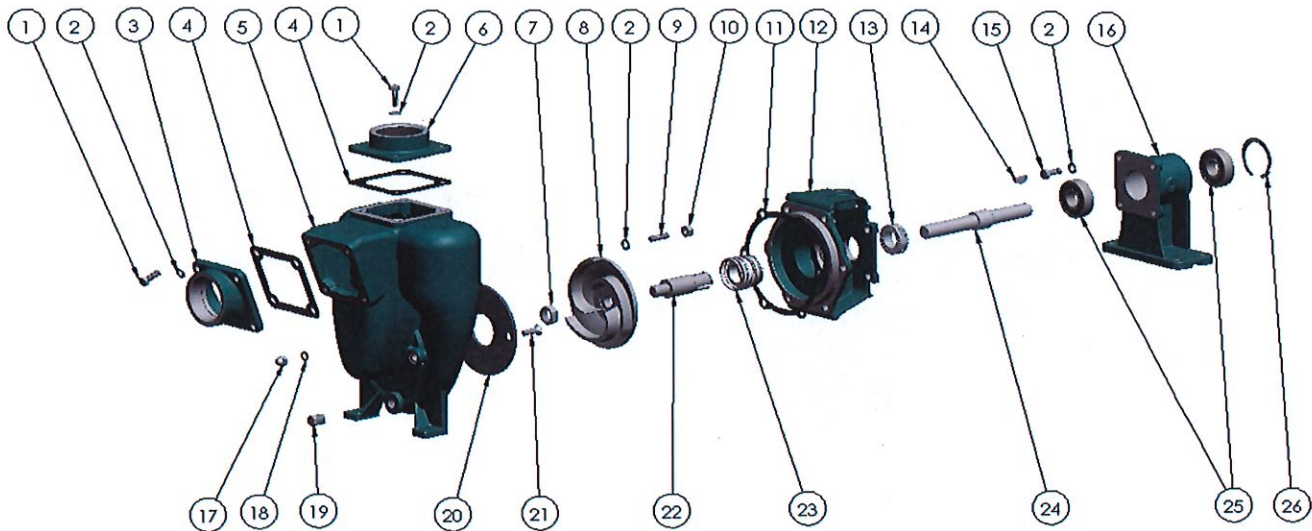
\* SUGGESTED REPLACEMENT PARTS

\*\* COMPATIBLE FOR KEROSENE, JET A/8 & GASOLINE



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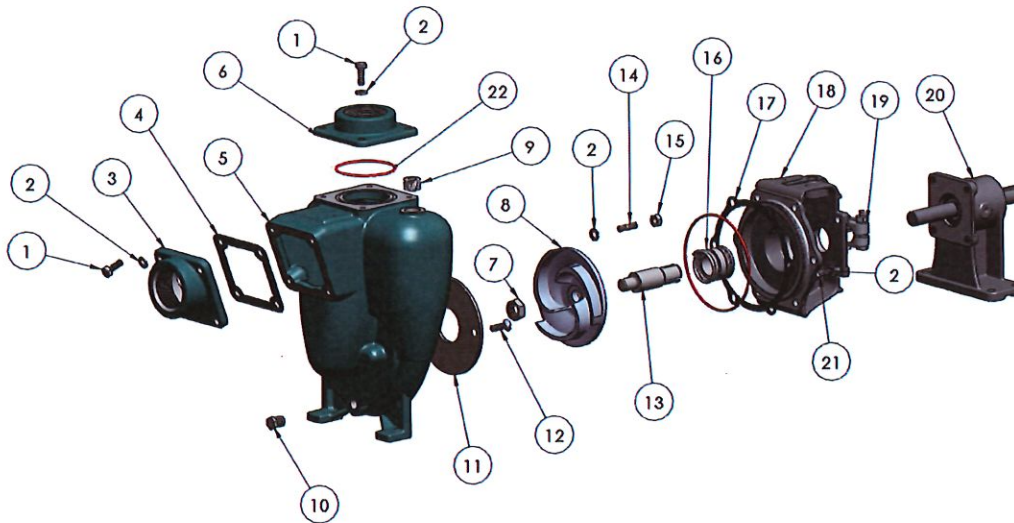


PART NO.	ITEM NO.	DESCRIPTION	QTY.		PART NO.	ITEM NO.	DESCRIPTION	QTY.
21242	1	CAPSCREW - 5/16"-18 X 7/8"	8		21278	15	CAPSCREW - 5/16"-24 X .88	4
21238	2	LOCKWASHER 5/16	18		26140	16	PEDESTAL C	1
35614	3	SUCTION FLANGE D - 2" NPT	1		21237	17	ACORN NUT - 5/16"-18	2
* 35609	4	GASKET CORK/BUNA	2	*	21248	18	GASKET - 1/2 X 5/16 X 1/16	2
35604	5	HOUSING DUCTILE	1		21267	19	PIPE PLUG SS 1/4 NPT	1
35615	6	DISCHARGE FLANGE D - 2" NPT	1	*	22258	20	WEAR PLATE ALUMINUM	1
22655	7	JAM NUT - 5/8"-18	1		21249	21	SCREW SS 5/16-18X1	2
22293	8	IMPELLER C 5" DIA.	1		22286	22	DRIVE SLEEVE SS - 3/4	1
30321	9	STUD - 5/16"-18 X 1.13"	6	*	35610	23	SEAL 1" T-2 CAR/SIC/VIT	1
21284	10	HEXNUT - 5/16"-18	6		26085	24	SHAFT STL	1
* 35722	11	GASKET C-4433	1		22300	25	BALL BEARING	2
35606	12	ADAPTOR DUCTILE	1		21695	26	SNAP RING	1
35612	13	CLAMP B: 3/4 SL.	1					
22321	14	WOODRUFF KEY STL	1					

\* SUGGESTED REPLACEMENT PARTS

\*\* COMPATIBLE FOR KEROSENE, JET A/8 & GASOLINE

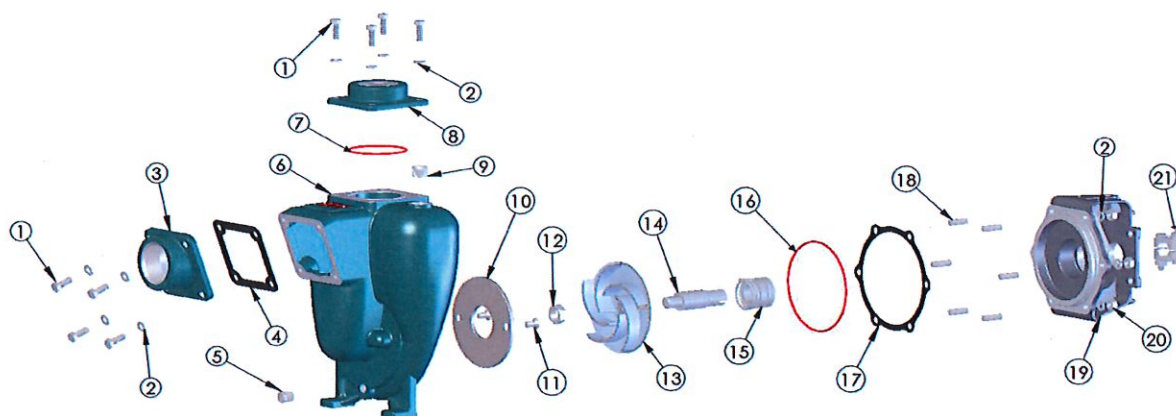




PART NO.	ITEM NO.	DESCRIPTION	QTY.		PART NO.	ITEM NO.	DESCRIPTION	QTY.
21242	1	CAPSCREW - 5/16"-18 X 7/8"	8		22286	13	DRIVE SLEEVE SS - 3/4	1
21238	2	LOCKWASHER 5/16	20		30321	14	STUD S.S. - 5/16"-18 X 1.13"	6
22387	3	SUCTION FLANGE C - 2" NPT	1		21284	15	HEXNUT S.S. - 5/16"-18	8
* 35609	4	GASKET CORK/BUNA	2	*	25460	16	SEAL 1" T-21 NRS	1
22251	5	HOUSING CAST	1	*	35722	17	GASKET C-4433	1
22311	6	DISCHARGE FLANGE C - 2" NPT	1		22247	18	ADAPTOR CAST	1
22655	7	JAM NUT - 5/8"-18	1		23002	19	CLAMP ASSY. S.S.: 3/4 SL.	2
22293	8	IMPELLER C 5" DIA.	1		26141	20	PEDESTAL ASSY. C	1
37140	9	1/2" NPT PIPE PLUG ZPS	1		21278	21	CAPSCREW - 5/16"-24 X .88	4
21267	10	PIPE PLUG SS 1/4 NPT	1	*	37141	22	O RING VITON - AS-568-149	1
* 22260	11	WEAR PLATE STEEL	1					
37137	12	FHS SCREW S.S. - 5/16-18 X .62	2					

\* SUGGESTED REPLACEMENT PARTS

\*\* COMPATIBLE FOR DIESEL, BIO-DIESEL & FUEL OIL



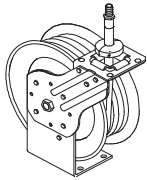
ITEM NO.	PART NO.	DESCRIPTION	QTY.		ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	21242	CAPSCREW - SS - 5/16-18 X 7/8	8	*	12	22655	JAM NUT - SS - 5/8-18	1
2	21238	LOCKWASHER - SS - 5/16	16		13	36408	IMPELLER - C - Ø5.00	1
3	22387	FLANGE - C - DISCHARGE 2" NPT	1		14	22286	DRIVE SLEEVE - SS - 3/4"	1
4	35609	GASKET - CORK/BUNA	1		15	25460	SEAL ASSY - T-21 - VITON	1
5	21267	PIPE PLUG - SS - 1/4 NPT	1		16	34555	O-RING - VITON - AS-568-158	1
6	22251	HOUSING - C	1	*	17	35722	GASKET - KINGERSIL	1
7	37141	O-RING - VITON - AS-568-149	1	*	18	30321	STUD - STL - 5/15-18 X 1.13	6
8	22311	FLANGE - C - SUCTION 2" NPT	1		19	22247	ADAPTER - C	1
*	9	37140	PIPE PLUG - ZPS - 1/2 NPT	1	20	21284	HEXNUT - SS - 5/16-18	6
	10	22260	WEAR PLATE - STL	1	21	23002	CLAMP ASSY - 22 3/4"	1
*	11	37137	FH SCREW - SS - 5/6-18 X 58	2				

\* SUGGESTED REPLACEMENT PARTS

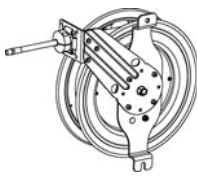




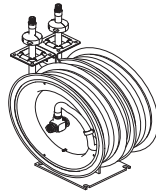
SPRING RETRACTABLE HOSE REELS:  
SERIES P, SG, SH, MP, HP, C, E, EN, T, TDMP, SHW, P-W  
(ADD "EZ" PREFIX FOR EZ-COIL™ MODELS IN EACH SERIES)



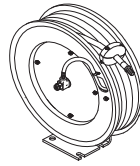
SERIES: P, SH,  
MP, HP



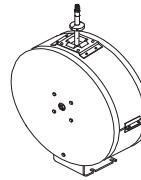
SERIES SG



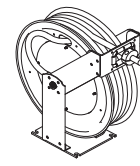
SERIES: C



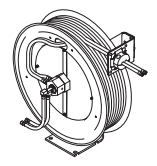
SERIES: E



SERIES: EN



SERIES: T, TDMP



SERIES: SHW,  
P-W

## COXREELS

The technical data and images which appear in this manual are for informational purposes only. **NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE CREATED BY THE DESCRIPTIONS AND DEPICTIONS OF THE PRODUCTS SHOWN IN THIS MANUAL.** COXREELS makes no warranty (and assumes no liability) as to function of equipment or operation of systems built according to customer design or of the ability of any of its products to interface, operate or function with any portions of customer systems not provided by COXREELS.

COXREELS agrees to repair or exchange the goods sold hereunder necessitated by reason of defective workmanship and material discovered and reported COXREELS within two years after shipment of such goods to Buyer.

Except where the nature of the defect is such that it is appropriate, in COXREELS' judgment, to effect repairs on site, COXREELS' obligation hereunder to remedy defects shall be limited to repairing or replacing (at COXREELS' option) FOB point of original shipment, any part returned to COXREELS at the risk and cost of Buyer. Defective parts replaced shall become the property of COXREELS.

COXREELS shall only be obligated to make such repair or replacement if the goods have been used by Buyer only in service recommended. COXREELS is not responsible for defects which arise from improper installation, neglect, improper use of or from normal wear and tear.

COXREELS obligation shall be limited by the manufacturer's warranty (and is not further warranted by COXREELS) for all parts procured from others according to published data, specifications or performance information not designed by COXREELS.

COXREELS further agrees to replace or at COXREELS' option to provide a refund of the sales price of any goods that do not conform to applicable specifications or which differ from that agreed to be supplied which non-conformity is discovered and forthwith reported to COXREELS within 30 days after shipment to the Buyer. COXREELS' obligation to replace or refund the purchase price for non-conforming goods shall arise once Buyer returns such goods FOB point of original shipment by COXREELS at the risk and cost of Buyer. Goods replaced by COXREELS shall become property of COXREELS.

COXREELS liability on any claim, whether in contract, tort (including negligence), or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair, replacement or use of any products or services shall in no case exceed the price paid for the product or services or any part thereof which give rise to the claim. In no event shall COXREELS be liable for consequential, special, incidental or other damages, nor shall COXREELS be liable in respect of personal injury or damage to property not the subject matter hereof unless attributable to gross misconduct of COXREELS, which shall mean an act or omission by COXREELS demonstrating reckless disregard of the foreseeable consequences thereof.

COXREELS is not responsible for incorrect choice of models or where products are used in excess of their rated and recommended capacities and design functions or under abnormal conditions. COXREELS assumes no liability for loss of time, damage or injuries to property or persons resulting from the use of COXREELS products. Buyer shall hold COXREELS harmless from all liability, claims, suits and expenses in connection with loss or damage resulting from operation of products or utilization of services, respectively, of COXREELS and shall defend any suit or action which might arise there from in Buyer's name – provided that COXREELS shall have the right to elect to defend any such suit or action for the account of Buyer. The foregoing shall be the exclusive remedies of the Buyer and all persons and entities claiming through the Buyer.

**NOTE: All designs, specifications, and dimensional data contained in this publication are subject to change without notice.**



### WARNING – APPLICATION

❖ THE PRODUCTS IN THIS INSTALLATION AND MAINTENANCE MANUAL HAVE BEEN TESTED UNDER CONTROLLED LABORATORY CONDITIONS TO MEET SPECIFIC TEST CRITERIA. THESE TESTS ARE NOT INTENDED TO REFLECT THE PERFORMANCE OF THE PRODUCTS OR ANY OTHER MATERIAL IN ANY SPECIFIC APPLICATION, BUT ARE INTENDED TO PROVIDE THE USER WITH APPLICATION GUIDELINES. THE PRODUCTS ARE INTENDED FOR USE BY KNOWLEDGEABLE PERSONS HAVING THE TECHNICAL SKILL NECESSARY TO EVALUATE THEIR SUITABILITY FOR SPECIFIC APPLICATIONS.



### WARNING – USER RESPONSIBILITY

❖ THE USER, THROUGH ITS OWN ANALYSIS AND TESTING, IS SOLELY RESPONSIBLE FOR MAKING THE FINAL SELECTION OF THE SYSTEM AND COMPONENTS AND ASSURING THAT ALL PERFORMANCE, ENDURANCE, MAINTENANCE, SAFETY AND WARNING REQUIREMENTS OF THE APPLICATION ARE MET.

❖ TO THE EXTENT THAT COXREELS PROVIDE COMPONENT OR SYSTEM OPTIONS BASED UPON DATA OR SPECIFICATIONS PROVIDED BY THE USER, THE USER IS RESPONSIBLE FOR DETERMINING THAT SUCH DATA AND SPECIFICATIONS ARE SUITABLE AND SUFFICIENT FOR ALL APPLICATIONS AND REASONABLY FORESEEABLE USES OF THE COMPONENTS OR SYSTEM.



### WARNING – SAFETY

❖ READ ALL SAFETY INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE, OR MAINTAIN THIS PRODUCT. ONLY QUALIFIED PERSONNEL SHOULD UNDERTAKE THE INSTALLATION AND COMMISSIONING OF THIS PRODUCT. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

❖ FAILURE TO FOLLOW RECOMMENDED APPLICATION INFORMATION AND RECOMMENDED PROCEDURES FOR SELECTION, INSTALLATION, CARE, MAINTENANCE AND STORAGE OF REEL ASSEMBLY, SWIVEL, HOSE, COUPLINGS OR HOSE ASSEMBLIES MAY RESULT IN FAILURE TO PERFORM PROPERLY AND MAY RESULT IN DAMAGE TO PROPERTY AND SERIOUS BODILY INJURY.

❖ FOLLOW GOOD MAINTENANCE PRACTICES – ESTABLISH A PROGRAM OF INSPECTION, TESTING AND REPLACEMENT OF REEL COMPONENTS FROM FACTORS INCLUDING:  
○ SEVERITY OF APPLICATION, FREQUENCY OF EQUIPMENT USE, AND PAST PERFORMANCE OF REEL COMPONENTS

❖ ONLY PROPERLY TRAINED PERSONS SHOULD INSPECT, TEST OR SERVICE REEL AND HOSE/CABLE ASSEMBLIES. PERIODIC UPDATING OF TRAINING IS RECOMMENDED. DOCUMENT MAINTENANCE, INSPECTIONS AND TESTING.

❖ **PROP 65 WARNING:** Handling of brass material on this product exposes you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm.  
"WASH HANDS AFTER USE"





## SAFETY



### PRESSURE WARNINGS

- This equipment should be properly installed before use in accordance with local codes and ordinances.
- The pressure from the hose reel should be disconnected from the hose reel before any service functions are performed.
- This hose reel must not be used for pressure greater than the rating listed in the COXREELS catalog / website [www.coxreels.com](http://www.coxreels.com).



### OPERATIONAL WARNINGS

- Exercise care when handling the hose reel during normal operation. Some hose reels have a rotating drum powered by a spring under tension.
- Do not use hose different from that for which the reel is intended. Changes in diameter, weight per foot, length of hose or flexibility (Minimum Bend Radius) will affect the operation of the reel.
- Mounting hardware and fasteners should be installed to maintain tightness under vibration and checked periodically to ensure tightness.
- Overhead installation mountings should be such that the reel is not supported by bolts in tension. A safety chain, cable, enclosure or netting is strongly recommended to minimize damage and/or possible injury in the event of a mounting failure.



### MAINTENANCE WARNINGS

- Modification of the equipment may cause excessive wear and will void the warranty. Contact COXREELS regarding changes or modifications of equipment which could affect reliability or safety.
- **DO NOT DISASSEMBLE A SPRING MOTOR FOR ANY REASON!** Serious personal injury could result. Some hose reels are equipped with a spring under tension. Contact COXREELS for assistance.



### SPECIFICATIONS & LISTINGS

- The identified Series of Hose Reel products within this manual are not certified or listed by any independent certifying or regulatory body.
- This series of hose reels is intended for industrial use and are provided with permanent mounting means.



### PRESSURE & TEMPERATURE RATING

- All reels covered in this manual with or without hose have specific P.S.I. ratings. (Please refer to the COXREELS catalog, website or contact Customer Service for Reel specific data). Reels should not be used at pressures greater than the rating of the hose.



### LABELS & MARKINGS

#### Hose Reels with and without hose

- The marking of the hose reel provide with or without hose includes the following
  - The label on the frame includes the COXREELS name and Logo, the product catalog number, the individual product serial number, PSI rating and what type and length of hose intended for use on the reel.
  - The maximum pressure rating for every hose reel supplied without hose is marked on the COXREELS Identification Label. In absence of this information, refer to website, catalog, or customer service. Actual rating is determined by the installed hose and is not to exceed the indicated maximum operational rating. The pressure rating of the hose installed on reels provided without hose must be marked on the label upon installation.



### PERSONAL SAFETY

- Ensure reel has been properly installed before connecting supply line.
- Before connecting to reel, be certain supply line does not exceed rated pressure of the hose reel or amperage rating on cable reel.
- Thoroughly review the "Hose Installation" instructions to properly install hose.
- Perform "Operational Check" per instructions to ensure reel is operating properly.
- If a leak should occur after applying pressure to the reel, immediately discontinue supply line pressure.

**WARNING:** Prevent static sparking. When working around flammables, ensure that the hose reel, hose, and equipment are properly grounded.

## INSTALLATION



**WARNING:** READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE, OR MAINTAIN THIS PRODUCT. ONLY QUALIFIED PERSONNEL SHOULD UNDERTAKE THE INSTALLATION AND COMMISSIONING OF THIS PRODUCT. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE. REEL SHOULD NOT BE INSTALLED ABOVE 15 FEET MAXIMUM FROM THE FLOOR.

### MOUNTING OF REEL

- Reel is supplied with guide arm in standard positions depending on model. Note: Series E does not include a guide arm and Series EN is enclosed reel as shown.
  - Guide arm may be adjusted to desired location as shown in figure 1.0. Refer to figure 2.0 for Series EN models.
  - Pull out hose until reel latches.
  - Remove four bolts holding guide arm to support base.
  - Reposition guide arm and securely fasten four bolts.
  - Reposition inside hose clamp to alternate position as needed.
- To mount reel to a solid structure use four 7/16" or M12 bolts, washers, and nuts. Four masonry bolts may be used depending on mounting application. Mounting hardware is NOT provided. The mounting base of the reel has two 1/2" slots and two 1/2" holes. Mounting patterns will vary depending on model. On SG Series reels, use 1/2" bolts.
- Loosely fit two pieces of mounting hardware to ceiling/floor/or wall so that reel can be slid into position. Fit reel. Install two pieces of hardware in other end of reel. Securely fasten all bolts and nuts.
- Overhead installation mountings should be such that the reel is not supported by bolts in tension. A safety chain, cable, enclosure or netting is strongly recommended to minimize damage and/or possible injury in the event of a mounting failure.

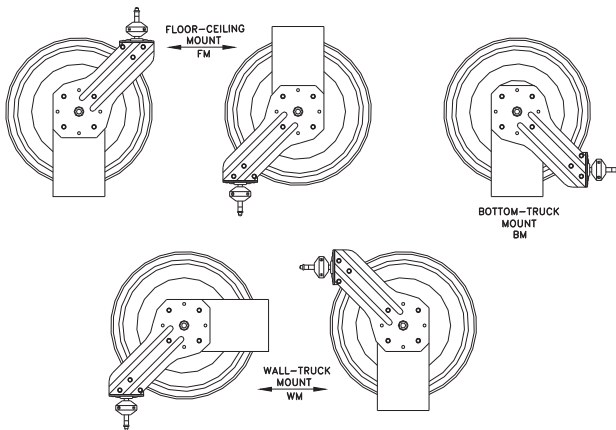


FIGURE 1.0

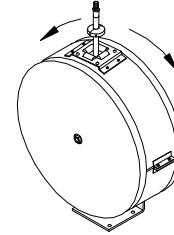


FIGURE 2.0

## INSTALLATION OF INLET HOSE

- Apply thread sealant to inlet hose and connect to the swivel joint on reel.



**CAUTION: IT IS IMPORTANT TO USE A “FLEXIBLE” INLET HOSE. DO NOT USE SOLID PIPING OR RESTRAIN INLET HOSE AS TO CAUSE ANY SIDE FORCE ON SWIVEL JOINT. THE WARRANTY IS VOID IF NOT PROPERLY INSTALLED.**

- Flush some product through the system before connecting inlet hose to the source.
- If reel includes hose (**Otherwise, See Installation of Hose**), flush some product through system before connecting end fitting, nozzle, or tool.
- (Reel supplied less hose) Apply thread sealant to outlet hose fitting. Connect end, nozzle, or tool as desired.
- If a hose stopper adjustment is required to allow easy reach of end fitting or tool; latch reel at approximate desired location, loosen (two) ball stop bolts. Move ball stop and tighten bolts. Unlatch reel.
- Connect Inlet hose to supply source.

## INSTALLATION OF OUTLET HOSE

**NOTE:** Before proceeding, ensure that you are installing the proper size, length and type of hose per the reel rating. Consult factory if unsure of rating. Damage may occur if wrong hose is installed.

- Securely stabilize the reel.
- Wind the reel drum clockwise (facing the swivel) until the spring is tight.



### Use Extreme Caution!

- Back off approximately two turns and lock the reel drum to keep from rotating.
- Insert the MALE fitted end of the hose through the roller guide arm and through the cutout in the side of the drum flange.
- The MALE hose fitting should now be on the outside of the drum. Apply thread sealant, connect hose fitting to the swivel joint and secure the hose rigid with the (two) hose clamps.

**NOTE:** The hose clamps restrain the hose when fully extended, preventing strain between the fittings and swivel joint.

- **CAREFULLY** release the locking ratchet and **SLOWLY** allow the hose to retract onto the reel.

## SPRING TENSION ADJUSTMENT

- Release line pressure prior to making spring adjustments.
- Disconnect inlet hose.
- Pull out approximately 6 feet (2m) of hose and latch the drum.
- Add or subtract one wrap of hose as desired to acquire the proper tension on the reel.

**NOTE:** Spring tension adjustment is accomplished by adding wraps of hose around the drum (to increase tension) or subtracting wraps of hose (to decrease tension).



**CAUTION:** Improper tensioning of spring or adding too many pre-wraps may cause damage to spring mechanism. Only authorized personnel should make adjustments.

- Unlatch drum and check for proper tension.
- Connect Inlet hose.

## SWIVEL SEAL REPLACEMENT

- Remove inlet hose from swivel.
- Remove swivel from reel by unscrewing swivel from the axle shaft. Disconnect hose from swivel.
- Remove retaining ring on swivel; pull out shaft from body.
- Replace the seals, lubricate and reassemble swivel.
- Fit hose to swivel then fit swivel to reel. **Do not over-tighten.**
- Reconnect inlet hose and test for leakage.

## SPRING CANISTER REPLACEMENT

- Pull out approximately 3 feet (1m) of hose and latch the reel.
- Remove outlet nozzle, gun or tool and hose stopper.
- Carefully unlatch the reel and **firmly hold the drum**. Allow the drum to **slowly** unwind until it stops.
- Remove the retaining ring, spacer and swivel unit. Note: on T-Series reels, the outboard support arm must first be removed.
- Remove the two or four nuts located on the support post side inside the drum cavity. **Do not** attempt to remove the spring canister nuts.
- Pull spring canister off drum and axle shaft.
- Reverse above procedure to re-assemble.
- Re-tension the reel by turning the drum three complete turns clockwise (from swivel side) and latch the drum.
- Feed the hose through the hose guide. Fit hose stopper, then unlatch the drum. Hose stopper should sit snugly against the hose guide.



**CAUTION:** Release line pressure prior to making any repairs or adjustments to the reel.

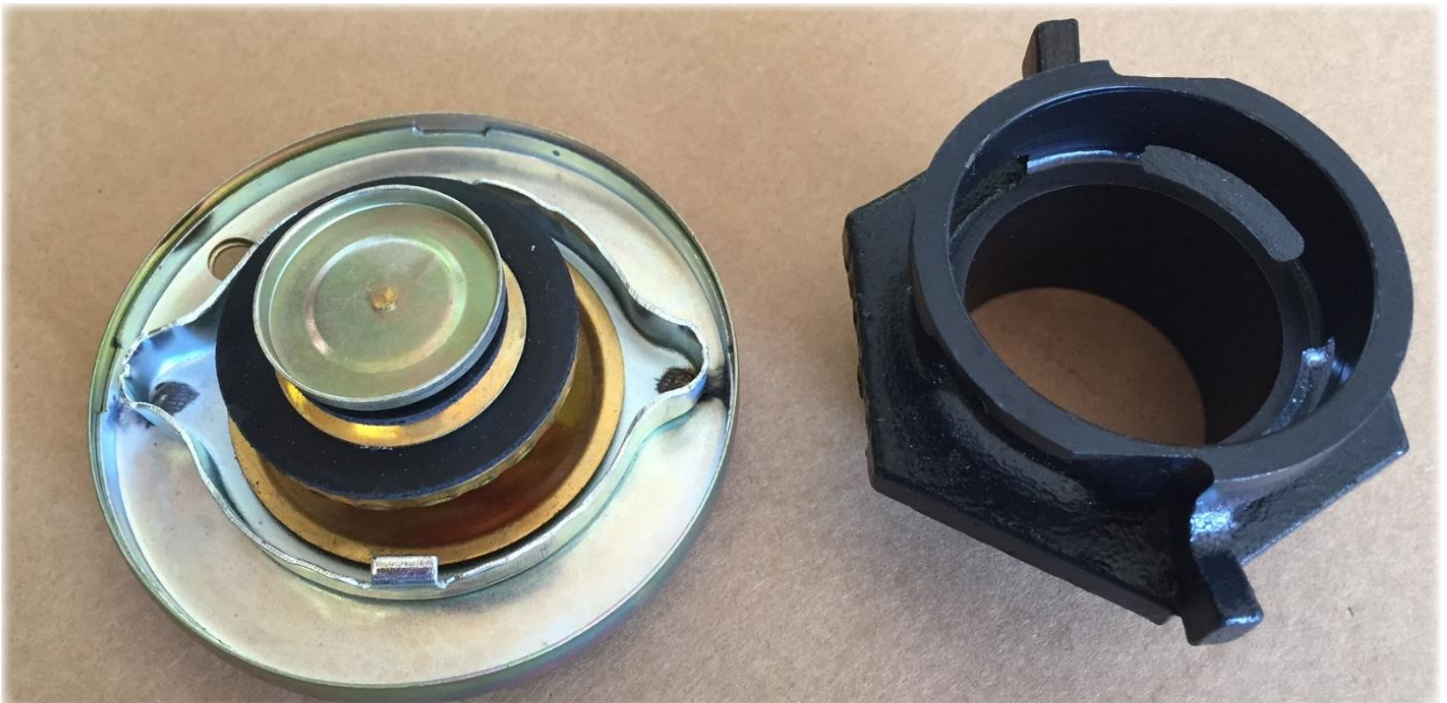


## TROUBLE SHOOTING GUIDE

TROUBLE	CAUSE	REMEDY
HOSE WILL NOT FULLY RETRACT	a) Outlet nozzle, gun or tool is too heavy. b) Spring is fatigued. c) Field installed hose is too long.	a) Add spring tension. See "Spring Tension Adjustment". b) Add spring tension. See "Spring Tension Adjustment". Replace Spring Canister if required. c) Call local Distributor for correct specified hose length.
HOSE WILL NOT RETRACT AT ALL	Spring has lost all tension or has possibly broken.	a) Reinstall Spring Tension b) Replace Spring Canister. See "Spring Canister Replacement".
REEL WILL NOT LATCH	a) Incorrect operation. b) Dog spring or locking cam is broken or worn.	a) Reel latches on first, second, third or fourth "click". After forth "click" it automatically rewinds. b) Replace dog spring or locking cam.
FLUID LEAKS FROM SWIVEL	Swivel seals are damaged or worn.	Replace swivel seals. See "Swivel Seal Replacement". <b>Caution:</b> Be sure leak is not at Hose Fitting!
REEL RETRACTS TOO FAST (EZ-COIL™ MODELS ONLY)	EZ-Coil unit is defective	Replace EZ-Coil unit. <b>Note:</b> When weather is extremely hot, reel will operate slightly faster than under normal conditions. This function is normal.
HOSE LOCKS UP WHEN FULLY EXTENDED	Hose clamp is in the incorrect position.	Relocate hose clamp to optional location.

**P/N M1000147 VENT/FILL CAP**

**PROVIDES 2 FILL LOCATIONS, VENTS AT 2.5 LBS OF PRESSURE, OPENS AT 1.5 OZ OF VACUUM**





DL P/N: FH000133

# Diesel Fuel Filter Information



Central Illinois  
Manufacturing Co.  
201 N. Champaign St.  
Bement, IL 61813  
www.cim-tek.com  
888.898.7187

## Service Bulletin 103 800 Series Particulate Filters

Not for use with Aviation Fuels



**FLAMMABLE!!**

No Smoking!

No Power Tools!

*Personal Protection Equipment Required.*

Read and follow all instructions.

Failure to do so could result in fire, serious bodily injury or death.

### Safety Instructions

- ▶ The filter unit should only be installed or changed by authorized trained personnel only.
- ▶ The pumping unit used *must not exceed* the recommended flow rate of the filter unit used.
- ▶ The working pressure of the pumping unit *must not exceed* the maximum working pressure of filter unit used.
- ▶ No smoking or power tools!
- ▶ Use only non-sparking hand tools, goggles, static control wrist strap and fire extinguisher required for personal safety!
- ▶ Surge Accumulators or Relief Valves should be installed on systems equipped with check valves, long hoses, hose reels, and/or excessive piping. Thermal expansion and water hammer can cause filters to leak and even rupture.
- ▶ Surge Accumulators or a relief valve should be installed around the filter if the system utilizes a hose reel. Excessive pressure of trapped fuel can develop during the winding of the hose if the system is equipped with a check valve or a closed valve.

### LIMITED WARRANTY

Central Illinois Manufacturing Co. products are guaranteed to be free from defects of workmanship or materials during the recommended service life. If a Central Illinois Manufacturing Co. product is found to be defective in material or workmanship during the recommended service life of the product, it will be replaced or a credit issued. All warranty claims must be made within twelve (12) months from the date produced. Our liability hereunder is limited to the purchase price of any merchandise proven defective or, at our option, to the replacement of such merchandise upon its authorized return to us. This warranty is in lieu of and excludes all other warranties, expressed, implied, statutory, or otherwise created under applicable law including, but not limited to, the warranty of merchantability and the warranty of fitness for a particular purpose. In no event shall Central Illinois Manufacturing Co. be liable for special, incidental, consequential damages, or loss of product or profits.

Manufactured by: Central Illinois Manufacturing Co. Bement, Illinois 217.678.2511 SB 103 Rev H 5/11  
www.cim-tek.com Customer Service 888.898.7187 PN #119501

#### Installation Instructions

1. **DANGER! FLAMMABLE!** Read and follow all safety instructions. Failure to do so could result in fire, serious bodily injury, or death.
2. Turn off power supply to pumping unit.
3. Clear area of pedestrians and vehicles prior to installation.
4. Tag pumping unit out of service for filter change.
5. **Pump Unit Located In the Pedestal**
  - A) Turn pump on, in order to make sure that the power supply has been disabled.
  - B) Operate the nozzle until no flow occurs to relieve any stored system pressure. Then return the dispenser to the off position.
6. **Remote Pump Location**
  - A) Close the impact valve (emergency valve).
  - B) Turn dispenser on while operating the nozzle until no flow occurs. Then return the dispenser to the off position.
7. Remove the old filter, while collecting all spilled fuel. Dispose of the old filter in accordance with local, state, or federal regulations.
8. Apply a thin film of LUBRICATING OIL to the gasket of the new filter.
9. Screw new filter on the flow adapter or manifold until the gasket makes contact. Tighten according to filter label.
10. Turn on fuel supply
11. Pressurize the system and check for leaks.

#### Operation Instructions

1. Filter unit must be installed using a suitable mounting device or rigid piping.
2. Filter unit must be installed with flow in proper direction.
3. Filter should be inspected every six months, and changed annually, when slow flow occurs, or when differential pressure reaches 20-25psid.
4. These filters should not be used on systems capable of more than 20psid across the filter without pressure differential gauges installed.

**Product - Operating pressure not to exceed 50 PSI.**

**Product - Flow rate not to exceed 30 GPM. W/805 series adapter**

**Flow rate not to exceed 40 GPM. W/ 810 series adapter**

**Flow rate not to exceed 40 GPM. W/820 series adapter**

**Note: It is not recommended to  
install these units for use with  
suction side applications.**



## SPOUT REPLACEMENT INSTRUCTIONS

**Model 005215 Spout Assembly**

1. Remove spout lock nut and spout.
2. Remove and discard spout seal.
3. Place new spout seal in groove.

5. While holding the spout in proper alignment, tighten the spout lock nut firmly, approximately 35 - 60 lb•ft. / 47 - 81 N•m. Do not overtighten.

- Model 005215 Spout Assembly**
1. Remove spout lock nut and spout.
  2. Remove and discard spout seal.
  3. Place new spout seal in groove.
5. While holding the spout in proper alignment, tighten the spout lock nut firmly, approximately 35 - 60 lb•ft. / 47 - 81 N•m. Do not overtighten.

1. Insert new spout into body making sure the vent tube is in the port (slight twisting motion to seat vent tube is required).

## GUARD REPLACEMENT INSTRUCTIONS

Model 000554  
Turn off dispenser and relieve

- Turn off dispenser and relieve line pressure.
- Remove nozzle from hose.
- Remove old guard.
- Install new guard over spout and pull back to cover nozzle body.
- Re-install nozzle to hose.
- Test nozzle for automatic shut off.

Model 001811

1. Cut old guard at nozzle inlet and remove from nozzle.
2. Install new guard over spout and pull back to cover nozzle body.
3. Pull tie through the eyelets and loop under nozzle inlet.
4. Pull tightly and trim off excess tie.
5. Install waffle splash guard over spout lock nut.

Model 007210

1. Remove waffle splash guard (if applicable).
2. Cut old guard at nozzle inlet and remove from nozzle.
3. Install new POPD® reguard over spout and pull back to cover nozzle body.
4. Pull zip tie through the eyelets and loop under nozzle inlet.
5. Pull tightly and trim off excess tie.
6. Re-install waffle splash guard (if applicable).
7. Install desired advertisement and clear cover (model 006828).

Model 001804  
Cut old guard at nozzle inlet

- Cut old guard at nozzle inlet and remove from nozzle. Install new guard over spout and pull back to cover nozzle body. Pull tie through the eyelets and loop under nozzle inlet. Pull tightly and trim off excess tie.

**Model 005494**

1. Remove old lever cover

1. Remove old lever cover.
2. Snap new lever cover into place.

Model 001808

1. Remove old waffle splash guard.
2. Install new waffle splash guard over spout lock nut.

Model 006628  
Trim advertisement to 375.20

- Trim advertisement to 3.75 in / 95.25 mm x 3.75 in / 95.25 mm. Notch corners of advertisement approximately .375 in / 9.5 mm x .375 in / 9.5 mm.
- Turn clear cover "inside out". Center advertisement on POPD® guard, using the notched corners as guides, and fold over the edges.
- Lay clear cover over advertisement, making sure the advertisement stays centered, and turn it "right side out".
- Confirm the cover is securely in place.

Model 000099  
Turn off dispenser and relieve

- Turn off dispenser and relieve line pressure.
- Remove nozzle from hose.
- Remove old guard.
- Install new guard over spout and pull back to cover nozzle body.
- Install waffle splash guard over spout lock nut.
- Re-install nozzle to hose.
- Test nozzle for automatic shut off.

**Model 006655**  
**. Turn off dispenser and relieve**

- Turn off dispenser and relieve line pressure.
- Remove nozzle from hose.
- Remove old guard.
- Install new guard over spout and pull back to cover nozzle body.
- Re-install nozzle to hose.
- Test nozzle for automatic shut off.

POPD® guard, using the notched corners as guides and

- notched corners as guides, and fold over the edges. Lay clear cover over advertisement, making sure the advertisement stays centered, and turn it "right side out". Confirm the cover is securely in place.

**TESTING / MAINTENANCE / INSPECTION**



- Check for leaks / stains.
- Check for loose spouts.
- Check for damage.
- Check for bent lever.
- Check for broken clip / tr spring.



- Check nozzle automatic shut off - minimum of 5 gpm / 18.9 Lpm.
- Check "remove after" date.

①


- Check for electrical conductivity.
- Lubricate main valve stem.

Annually

Monthly

- Check nozzle automatic shut off - minimum of 5 gpm / 18.9 Lpm.

ANY TEST / INSPECTION FAILURE  
REQUIRES IMMEDIATE EQUIPMENT  
REPLACEMENT OR REMOVAL  
FROM SERVICE.

 **Daily**

- Check for leaks / stains.
- Check for loose spouts.
- Check for damage.

- Check for broken clip / trigger spring.
- Apply city, state, or federal testing regulations as appropriate.

**IF DRIVE OFF OCCURS**

- Turn off dispenser and relieve line pressure.
- Visually check for fractured spout shear groove.
- Check for leaks.
- Check spout tip - should be round and sensing pressure.
- Perform flow test - check automatic shut off - measure flow rate.
- Check for electrical conductivity.

**DO NOT OVERTIGHTEN. USE WRENCH ON HOSE NUT ONLY.**

1. Turn off dispenser and relieve line pressure.
2. Use pipe thread sealant (not Teflon® tape) approved for gasoline on the male threads of hose section.
3. Tighten approximately 1 to 2 turns past hand tight - do not overtighten.

## INSTALLATION INSTRUCTIONS

**WARNING** Designed for use at motor fuel dispensing facilities only.

**IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS IN A READILY ACCESSIBLE LOCATION.**

026812	026865N	052412	052410N	052465N	696312	696310N	696365N	6963159	*1489910N
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**Husky**
Recommended Installation, Maintenance and Inspection Instructions

Recommended Installation, Maintenance  
and Inspection Instructions



**ALWAYS ADHERE TO INSTALLATION / USAGE INSTRUCTIONS AND WARNINGS.**

**GENERAL WARNINGS / INSTRUCTIONS PERTAINING TO A RISK OF FIRE/ELECTRIC SHOCK OR INJURY TO PERSONS:**

- Use of equipment is at individuals' own risk.
- Always abide and adhere to city, state, and federal regulations regarding use and installation of dispensing equipment.
- Always follow the product manufacturer's installation and maintenance instructions.
- Always turn off all power to dispenser during maintenance and inspection activities.
- Always close the shear valves during maintenance and inspection activities.
- Always relieve pressure from system prior to performing maintenance activities.
- Always check continuity after installation using a megohmmeter (Refer to PEI RP 400 for details).
- Always replace or remove from service damaged or leaking dispensing equipment immediately.
- Always report leaks / spills / accidents to appropriate authorities.
- Always wear appropriate safety equipment during maintenance activities.
- Always have appropriate fire extinguishing equipment within 5 ft / 1.5 m of dispensers.
- Always use pipe sealant approved for gasoline service.
- Always place containers on the ground before filling.
- Always discharge static electricity before using or servicing equipment by touching a metal part of the dispenser nozzle and after fueling vehicle.
- Never smoke within 20 ft / 6.1 m of dispensers.
- Never keep in service past recommended life.
- Never leave the nozzle unattended while dispensing fuel.
- Never use sparking or flaming devices within 20 ft / 6.1 m of dispensers.
- Never use power tools near dispensers or to aid in the installation process.
- Never use cell phone within 20 ft / 6.1 m of dispensers.
- Never reenter car when fueling vehicle.
- Never allow gasoline to touch eyes or skin.
- Never use at flow rates in excess of regulatory guidelines.
- Never use at flow rates less than 5 gpm / 18.9 Lpm.
- Never dispense flammable material into unapproved containers.
- Never dispense fuel without a valid driver's license.

**CAUTION: DO NOT TOP OFF!**

Topping off can lead to spills and splashes.

**IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS IN A READILY ACCESSIBLE LOCATION.**

**WARRANTY**

**VAPOR PRODUCTS** - Husky Corporation will, at its option, repair, replace, or credit the purchase price of any Husky® manufactured product which proves upon examination by Husky, to be defective in material and/or workmanship for a period of one (1) year of installation or fifteen (15) months from the manufacture date of shipment by Husky, whichever occurs first. The warranty period on repaired or replacement vapor recovery products is only for the remainder of the warranty period of the defective product.

**CONVENTIONAL PRODUCTS** - Husky Corporation will, at its option, repair, replace, or credit the purchase price of any Husky manufactured product which proves upon examination by Husky, to be defective in material and/or workmanship for a period of one (1) year from the manufacture date of shipment by Husky.

Buyer must return the products to Husky, transportation charges prepaid. This Warranty excludes the replaceable bellows, bellows spring assembly, spout assembly and scuff guard, unless (i) damage is obvious when the product is removed from shipping carton and (ii) the defective product is returned to Husky prior to use. This warranty does not apply to equipment or parts which have been installed improperly, damaged by misuse, improper operation or maintenance, or which are altered or repaired in any way.

The warranty provisions contained herein apply only to original purchasers who use the equipment for commercial or industrial purposes. There are no other warranties of merchantability, fitness for a particular purpose, or otherwise, and any other such warranties are hereby specifically disclaimed.

Husky assumes no liability for labor charges or other costs incurred by Buyer incidental to the service, adjustment, repair, return, removal or replacement of products. Husky assumes no liability for any incidental, consequential, or other damages under any warranty, express or implied, and all such liability is hereby expressly excluded.

Husky reserves the right to change or improve the design of any Husky fuel dispensing equipment without assuming any obligations to modify any fuel dispensing equipment previously manufactured.

Husky Corporation • 2325 Husky Way • Pacific, MO 63069 • Phone: (800) 325-3558 • Fax: (636) 825-7300 • www.husky.com  
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**OPERATION INSTRUCTIONS**

1. Activate dispenser.
2. Insert spout into fill pipe opening.
3. Lower hose end of nozzle so the spout spring catches the inside of the fill pipe.
4. Raise the lever and begin fueling.
5. Nozzle will shut off automatically when the tank is full.
6. Wait 15 seconds to allow any fuel remaining in the spout to drain.
7. Remove nozzles from fill pipe by raising hose end of the nozzle.
8. Return nozzle to nozzle boot.

NOTE: Nozzle is equipped with a unique Flo-Stop® device that shuts off the nozzle fill rate from the fill pipe or raises above horizontal.

**HOLD OPEN CLIP INSTALLATION / REMOVAL INSTRUCTIONS**

Model 003593: Hold Open Clip Kit

**INSTALLATION**

1. Remove nozzle from hose and drain.
2. Position latch spring under latch clip and hold them in place. The latch clip should straddle the mating holes in the trigger lever.
3. Insert latch rivet through latch clip and lever, making sure latch spring is secured in position by the rivet.
4. Install push nut on rivet - DO NOT hammer in place.
5. Squeeze lever several times to check operation.
6. Verify clip and lever are parallel.

NOTE: Nozzles can be ordered without clips.

NOTE: Field installation of the hold open clip is NOT UL approved because improper installation may cause the nozzle to fail.

**REMOVAL**

1. Remove nozzle from hose and drain.
2. Place nozzle on a flat surface in safe location.
3. Hold up on the latch clip to prevent rivet from rotating.
4. Drill off the riveted end using a 1/2" / 6.4 mm bit.
5. Do not remove latch plate.

**TROUBLESHOOTING GUIDE**

Nozzle keeps shutting off or won't dispense...

1. Make sure dispenser is on and activated.
2. Slow down flow rate - use lower notch on clip.
3. Clean spout tip end.
4. Clean or replace filter.
5. Inspect Safe-T-Break®
6. Replace spout assembly.
7. Check dispenser pressure - 19 psi / 1.31 bar is required to activate nozzle.

Nozzle won't shut off...

1. Check flow rate - minimum of 3 gpm / 11.4 Lpm required.
2. Remove nozzle and drain hose.

Nozzle leaks...

1. Check for loose spout.
2. Check hose connection.
3. Check for cracks in nozzle and hose threads.

Low flow rate...

1. Verify dispenser is not in slow flow rate mode.
2. Check for system leak.

**GENERAL TECHNICAL DATA**

Fuel Type Test and warranty for gasoline and diesel fuel

Flow Rate 25 gpm / 94.6 Lpm

Body Die cast aluminum

Disc Fluorocarbon

Packing Double O-ring seal protected by fiber reinforced Teflon®

Lever One piece contoured steel with hard plastic cover

Shipping Weight 3.4 lbs / 1.5 kg

Thread 1" / 25.4 mm NPT

Spout 1 1/8" / 28.6 mm O.D.

Case Quantity 15

Listings Default

A NOT LISTED

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## STORING DIESEL EXHAUST FLUID (DEF)



**CAUTION: AVOID CONTACT WITH EYES. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR A MINIMUM OF 15 MINUTES. REFERENCE THE MATERIALS SAFETY DATA SHEET (MSDS) FOR ADDITIONAL INFORMATION.**

Do not ingest DEF. In the event DEF is ingested, contact a physician immediately. Reference the Materials Safety Data Sheet (MSDS) for additional information.

**IMPORTANT:** It is unlawful to tamper with or remove any component of the after treatment system. Do not use DEF that does not meet the required specifications or operate the engine with no DEF.

Never attempt to create DEF by mixing agricultural grade urea with water. Agricultural grade urea does not meet the necessary specifications and can damage the after treatment system.

Do not add any chemicals or additives to DEF in an effort to prevent freezing. Any chemicals or additives added to DEF can damage the after treatment system. Never add water or any other fluid in place of, or in addition to DEF. Operating with a modified DEF or using an unapproved DEF can damage the after treatment system.

The following storage information is provided for reference and is to be used as a guideline only.

It is preferred to store DEF out of extreme ambient temperatures. DEF freezes at -11 °C (12 °F). Exposure to temperatures greater than 30 °C (86 °F) can degrade DEF over time. Dedicated DEF storage containers must be sealed between uses to prevent evaporation and contamination. Containers made of polyethylene, polypropylene, or stainless steel are recommended to transport and store DEF.

Ideal conditions for storage of DEF are:

- Store at temperatures between -5 °C and 30 °C (23 °F and 86 °F)
- Store in dedicated containers sealed to avoid contamination and evaporation

Under these conditions, DEF is expected to remain usable for a minimum of 18 months. Storing DEF at higher temperatures can reduce its useful life by approximately 6 months for every 5 °C (9 °F) temperature above 30 °C (86 °F).

If unsure how long or under what conditions DEF has been stored, test DEF. See Testing Diesel Exhaust Fluid (DEF).

Long-term storage in the DEF tank (over 12 months) is not recommended. If long-term storage is necessary, test DEF prior to operating engine. See Testing Diesel Exhaust Fluid (DEF).

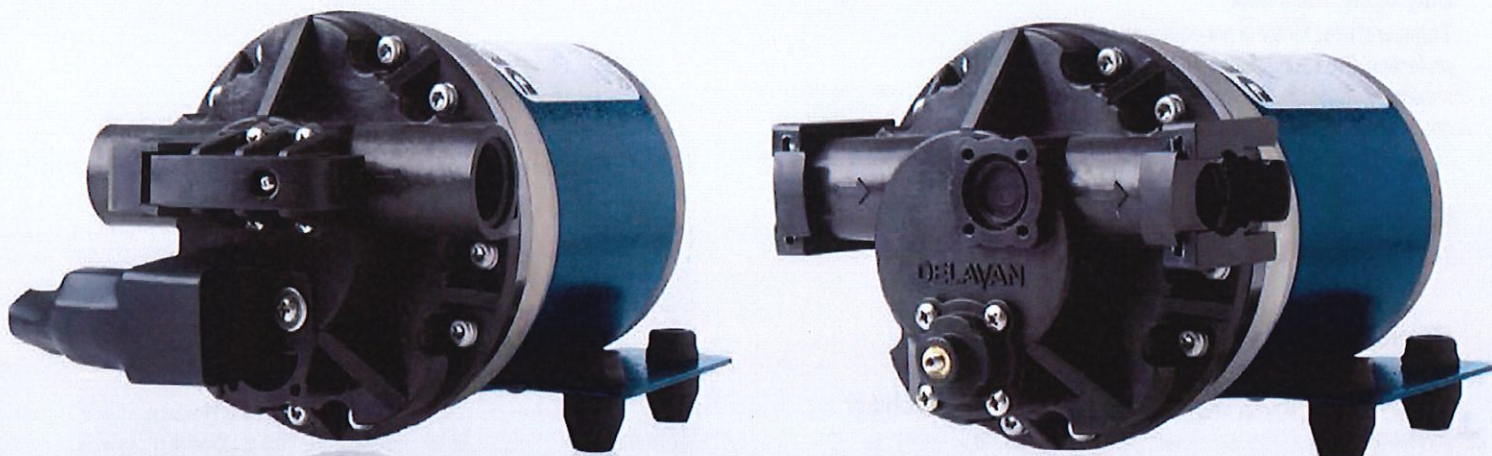
It is recommended to purchase DEF in quantities that will be consumed within 12 months.



# DELA~~V~~AN<sup>TM</sup>

PUMPS, INC.

*Power***FLO**  
Diaphragm Pumps



## FB-2 Diaphragm Pump

7870 / 7970 Series

Installation, Operation, Repair, & Parts Manual

DELA~~V~~AN AG PUMPS INC  
1228 Chestnut Avenue  
Minneapolis, MN 55403  
Phone: 866-335-2826  
Fax: 888-726-5906  
[www.delavanagpumps.com](http://www.delavanagpumps.com)



## Specifications

### Motor

**Type:** 12 VDC, permanent magnet, totally enclosed, non-ventilated

**Leads:** 12 AWG, 12" long

**Duty Cycle:** Intermittent

**Temperature:** Motor is not equipped with thermal protection. For user safety, optimal performance, and maximum motor life, the motor surface temperature should not exceed 180 ° F (82° C)

### Weight:

7870/7970: 8LBS (3.6 kg)

### Pump

**Type:** 5 chamber positive displacement diaphragm pumps, self priming, capable of being run dry, demand or bypass mode

**Liquid Temperature:** 140°F (60°C) Max.

**Priming Capabilities:** 14 Feet (4m)

**Max Pressure:** 100 PSI (6.7 Bar)

### Inlet/Outlet Ports:

7870: 1/2" FNPT

7970: Quick Attach

### Materials of Construction:

Housing: Polypropylene Glass Filled

Diaphragm: Santoprene

Valves: Viton

Fasteners: Stainless Steel

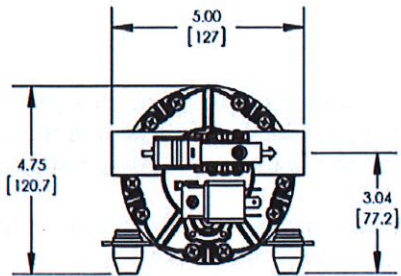
Motor Shell: Coated Steel

### Quick Attach Nylon Inlet/Outlet Port Fittings (minimum 1/2" HB Recommended for Inlet Use)

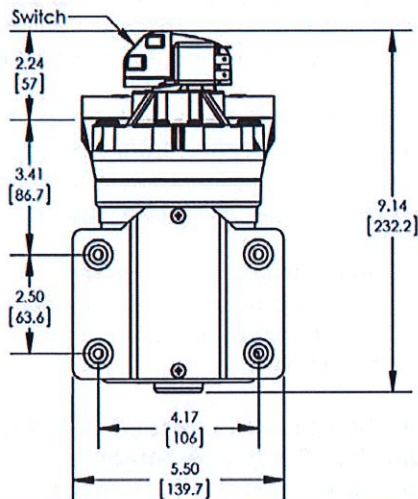
Item #	Description
5DFA38	3/4" QA X 3/8" HB Straight Fitting w/ O-Ring, Nylon
5DFA12	3/4" QA X 1/2" HB Straight Fitting w/ O-Ring, Nylon
5DFA34	3/4" QA X 3/4" HB Straight Fitting w/ O-Ring, Nylon
5DFE38	3/4" QA X 3/8" HB Elbow Fitting w/ O-Ring, Nylon
5DFE12	3/4" QA X 1/2" HB Elbow Fitting w/ O-Ring, Nylon
5DFE34	3/4" QA X 3/4" HB Elbow Fitting w/ O-Ring, Nylon



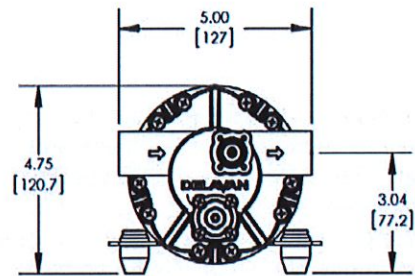
## Demand Models



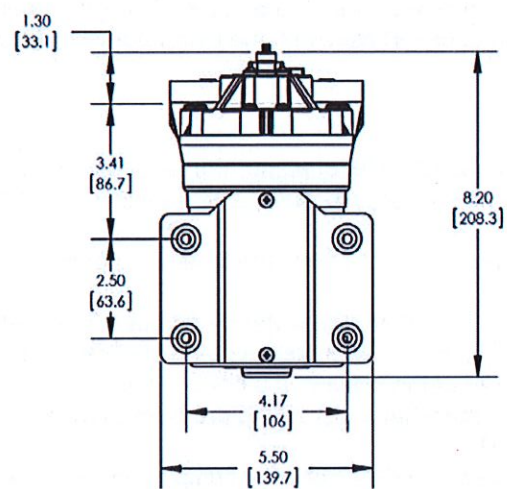
1/2" FNPT  
Threaded



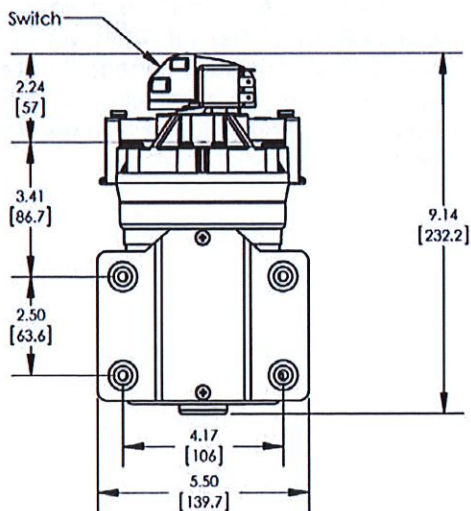
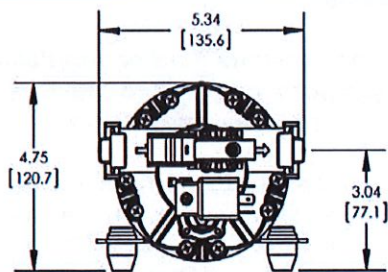
## Bypass Models



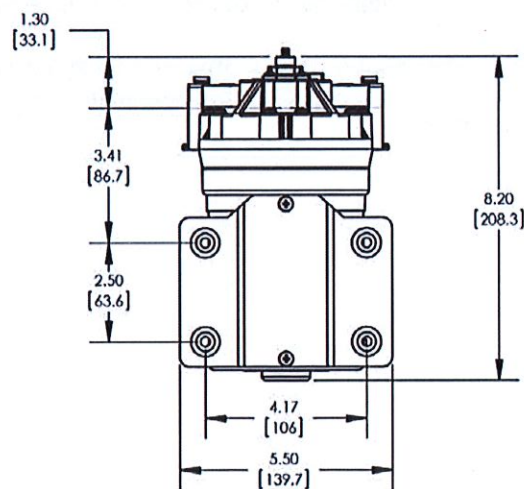
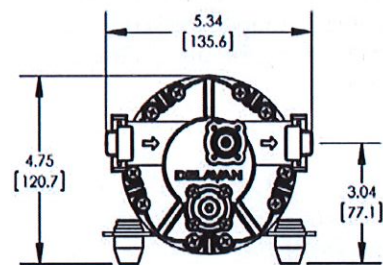
1/2" FNPT  
Threaded



Quick Attach



Quick Attach





## Installation Recommendations

### Mounting:

Determine the optimum location for your pump.

1. The pump should be mounted in a dry place and away from any source of heat. If an enclosure is used, special instructions for cooling the motor may be necessary. Consult the factory.
2. Do not subject the pump to extreme high or low (freezing) temperatures while in operation. (Operating ambient temperature range is 32° F to 115° F).
3. The pump may be mounted horizontally with the outlet port on the right when viewed from the pump end or with the pump above the mount, or vertically with the pump above or below the motor.

### Plumbing:

1. Use suction hose on inlet of pump. We recommend use of flexible tubing with proper pressure rating. (Minimum of 1/2" I.D.)
2. Pump will prime only if all pressure is relieved from outlet port.
3. It is recommended that pure water be pumped or an in-line sediment filter (50 mesh) be installed at the inlet side to keep foreign debris out of the system. If a check valve is installed in the plumbing, it must have a cracking pressure of no more than 2 PSI (0.14 bar).
4. Avoid any sharp bends which may crimp tubing and restrict flow. Use 90° elbow fittings if necessary.
5. The pump should always be mounted prior to any components which could introduce particles to the water; thus, preventing them from entering the pump chambers and possibly causing clogging.

### Electrical:

1. The FB-2 series pumps are designed for intermittent duty. Make sure that "OFF" periods are sufficient. Consult the factory for particular data and design criteria.
2. Be sure power supply used is adequate for the application.
3. Pump and motor specifications are based on an alternator charged battery (13.7 VDC).
4. Use sufficient battery supply power. Smaller ATV and lawn tractor batteries may affect pump performance due to low voltage and amp ratings.

## Installation and Operation Precautions

1. The pump is equipped with a pressure sensing demand switch that controls the maximum operating pressure. (Demand series only)
2. In addition, never subject the pump to pressures above 125 PSI (8.5 bars)
3. As long as there is inlet water pressure, the pump will not stop forward flow of water even if the motor is turned off. Be sure the system has positive means of shutting off water supply.
4. Do not operate pump in an explosive environment. Arcing from the motor brushes, switch or excessive heat from an improperly cycled motor may cause an explosion.
5. Do not locate the pump motor near low temperature plastics or combustible material. The surface temperature of the motor may exceed 250° F (120° C).
6. **Do not pump gasoline or other flammable liquids. Pump head materials are designed for use with water only. Do not use with petroleum products.**
7. **Do not assume fluid compatibility. If the fluid is improperly matched to the pumps' elastomers, a leak may occur.**
8. To prevent electrical shock, disconnect power before initiating any work. In the case of pump failure, the motor housing and/or pump fluid may carry high voltage to components normally considered safe. Therefore, always consider electrical shock hazard when working with and handling electrical equipment. If uncertain, consult an electrician. Electrical wiring should only be done by a qualified electrician per local and state electrical codes.





## Motor-Driven Diaphragm Pumps

### Installation & Operation

1. Turn off water supply
2. Cut flexible tubing in sufficient length to avoid any stress on the tubing where it connects to the pump or the fitting on any accessory.
3. Insert tubing into pump ports. If fittings are John Guest type, be sure tubing is inserted past the resistance point until it bottoms out against the port stop. If compression fittings with threaded nuts are used, insert tubing until it bottoms out in the port and hand tighten the compression nut until the connection is tight. Then use a wrench to tighten the nut 1/2 turn clockwise or follow the wrench tightening instructions provided by the fitting manufacturer.
4. The pump is now ready for operation. Turn on water supply to allow water to flow to the pump.
5. If the power source is a transformer, plug the appropriate supplied/approved transformer into the receptacle and connect the pump to the transformer. If the power source is not a transformer, connect the pump to the appropriate power source. Open the discharge or dispensing valve. Allow water to circulate, purging any entrapped air.
6. The pump will now start building pressure. Operating pressure will vary with flow rate, flow valve, feed-water pressure and line voltage. Check for fitting leaks.
7. If compression fittings with threaded nuts are used, observe any leaks after pump has run for approximately 15 minutes. Further tighten compression nuts approximately 1/8 to 1/4 of a turn on all fittings in the system. Wait 15 minutes and repeat the leak check. Note: further adjustments should not be necessary although it may take several days of operation before all the air has been purged and the system is stabilized.
8. Adjusting the Pressure Switch. Should the pressure switch OFF setting vary with use and time to an unsuitable value, it may be adjusted for optimum performance. Turn the setscrew clockwise to increase the OFF pressure setting and counter clockwise to decrease. The screw should not be adjusted more than one half turn without consulting the factory. Excessive adjustment of the pressure switch could cause low system pressure, rapid cycling ON/OFF operation, and reduced pump and motor life. Damage may occur. The warranty does not cover improper adjustment of the pressure switch.

### Troubleshooting Guide

#### 1. Pump will not start

Check:

- Correct voltage (+/- 10%) and electrical connections
- Fuse or breaker
- Pressure switch operation & correct voltage at switch
- Rectifier or motor for open or grounded circuit
- Locked drive assembly

#### 2. Pump will not prime (no discharge with motor running)

Check:

- Debris in strainer
- Restriction (kinks) in inlet/outlet tubes
- Debris or swelling in inlet/outlet valves

#### 3. Pump will not shut off

Check:

- Air trapped in outlet line or pump head
- Correct voltage to pump
- Debris in pump inlet/outlet valves
- Loose drive assembly or pump head screws
- Pressure switch operation/adjustments

#### 4. Leaks from pump head or switch

Check:

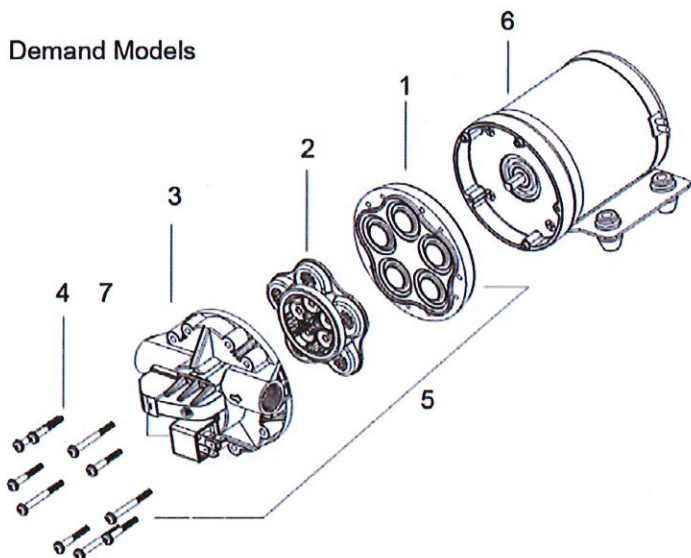
- Loose screws at switch
- Switch diaphragm ruptured or pinched
- Punctured diaphragm if fluid is present
- 

#### Servicing:

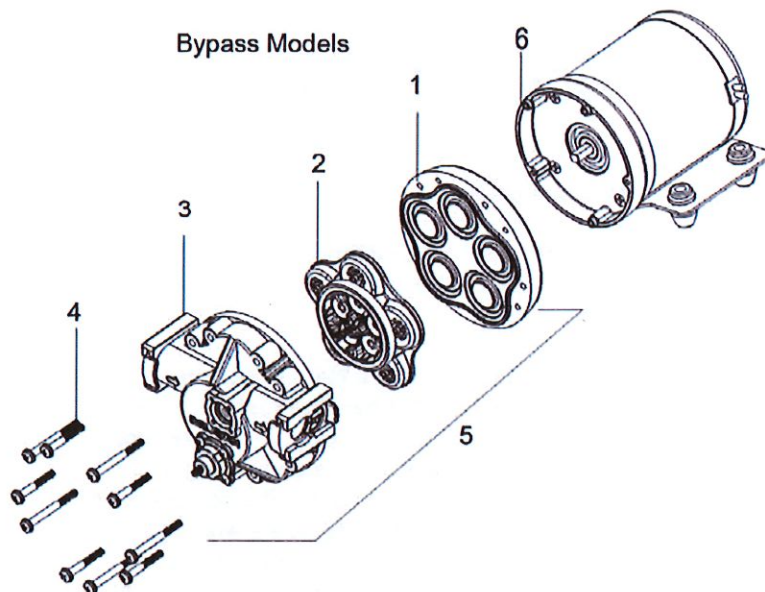
- Every year: Check system against operating standards
- Every 2-3 years: We recommend replacing the diaphragm and checking against operating standards



Demand Models



Bypass Models

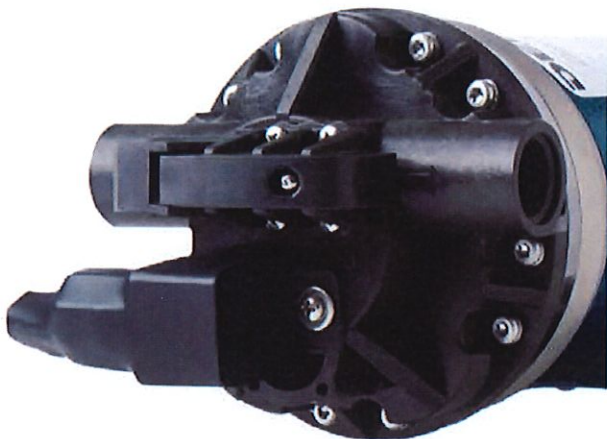


## Replacement Parts

Item	Description	Part Number	Qty
1	Lower Housing.....		1
	7870/7970 Series.....	LHA-7870	
2	Valve Assembly Housing.....		1
	7870/7970 Series.....	VHA-7870	
3	Upper Housing.....		1
	7800 w/ Pressure Switch.....	UHA-7800-PS	
	7800 w/ Bypass.....	UHA-7800-B	
	7900 w/ Pressure Switch.....	UHA-7900-PS	
	7900 w/ Bypass.....	UHA-7900-B	
4	Mounting Bolts.....	J58-053	5
5	Complete Pump Head.....		1
	7800 w/ Pressure Switch.....	PHA-7870-PS	
	7800 w/ Bypass.....	PHA-7870-B	
	7900 w/ Pressure Switch.....	PHA-7970-PS	
	7900 w/ Bypass.....	PHA-7970-B	
6	Motor.....		1
	7870/7970 Series.....	M12-7870A	
7	Switches.....		1
	Relay Switch.....	FBR-102	
	Pressure Switch.....	7800-PSW-100	



### Pressure Sensing Demand Switch



The PowerFLO Series pump is controlled by a built-in pressure sensing demand switch. When a faucet or valve is opened down stream of the pump, line pressure drops thus starting the pump automatically. Conversely, when the valve shuts, the line pressure increases turning the pump off automatically. The pressure switch actuates in response to the pump outlet pressure at a predetermined and preset pressure. The pump label indicates the predetermined shut OFF pressure. Typically, the OFF pressure is accurately set at the Factory and the ON pressure is within an allowable range below that value. In response to the characteristics of the system in which the pump is installed, the flexibility and length of the tubing, the faucet or valves and the duration that they are open; these pressure settings may vary. Therefore, variations in pressure setting is expected with use or over time.

### Standard Warranty

Delavan warrants PowerFLO Series pumps for a period of TWO YEARS from date of purchase.

All products sold by Delavan are warranted only to purchasers from Delavan for resale or for use in purchasers' own business or original equipment manufacture, against defects in workmanship or materials under normal use, maintenance and service (rental use excluded).

The sole and exclusive obligation of Delavan under this or any implied warranty shall be to replace or, at its option, to repair, without charge, any product which is determined by Delavan to be defective in workmanship or materials after the product is returned to the Delavan Factory", shipping costs prepaid.

In no event shall Delavan be liable to any person for indirect or consequential damages or for injury or commercial loss resulting from any use or inability to use a Delavan product. Delavan expressly negates any other warranty, express or implied, including any warranty of merchantability or fitness for a particular purpose, or arising from any course of dealing or custom or usage of trade.

No person, including any dealer or representative of Delavan, is authorized to make any representative or warranty on behalf of Delavan in addition to or inconsistent with these provisions. Purchasers to whom these provisions apply agree to hold Delavan harmless from claims by their customers in excess of obligations of Delavan expressly set forth herein.

### \*Important return safety instructions:

When you return your pump for warranty or repair, you must always do the following:

1. Flush chemical residue from the pump (best done in the field).
  2. Tag pump with type of chemicals having been sprayed.
  3. Include complete description of operation problem, such as how pump was used, symptoms of malfunction, etc.
- Since pumps can contain residues of toxic chemical these steps are necessary to protect all the people who handle return shipments, and to help pinpoint the reason for the breakdown.

Please call the Delavan Factory before returning any goods at 866-335-2826 to obtain a RMA # necessary for tracking purposes.

# DELA\AN™

PUMPS, INC.



## P/N: WT000102 235/80R16 LRE, 10-PLY RADIAL TIRES ON 16” 8-BOLT WHITE SPOKE WHEELS



### MASTERTRACK

UN203 ST Radial

**ST235/80R16 10PR**

Load Range E 124/120L

**HF-ST45**



Made in China

#### SAFETY PRECAUTIONS FOR MOUNTING TIRES

These are safety precautions, not instructions on how to mount tires. The mounting procedures and safety precautions on the RMA Tire Demounting and Mounting Wall Chart\* must be followed. Only trained and experienced tire service personnel should undertake this hazardous work.

#### FOR TIRES MOUNTED ON ONE PIECE DROP CENTER RIMS

1. NEVER mount tires on rims which are damaged or not smooth and clean.
2. ALWAYS be sure that rim diameter and tire diameter are the same.
3. ALWAYS lubricate both beads and rim flanges with an approved mounting lubricant.
4. NEVER force the bead(s) over the rim flange or use sharp edged or improper tools which could damage the bead(s) or other parts of the tire.
5. ALWAYS inflate tires in a safety cage or with another restraint device, except 16.5 and smaller on mounting machine use wheel hold-down.
6. ALWAYS use clip-on chuck and extension gauge on air hose when inflating and/or seating beads.
7. NEVER stand next to or lean over tire and rim when inflating.
8. NEVER exceed 40 PSI to seat beads.
9. ALWAYS after beads have seated, adjust to recommended inflation pressure.

#### FOR TIRES MOUNTED ON MULTI-PIECE RIMS

1. ALWAYS deflate tires completely before removing lock ring or side ring.
2. NEVER use rim parts which are damaged or not smooth and clean.
3. NEVER mix different size parts or rim parts made by different manufactures (unless approved by the manufacture).
4. ALWAYS be sure that rim diameter and tire diameter are the same.
5. ALWAYS lubricate the base of the tube, the flap and beads as directed. Use only an approved mounting lubricant.
6. ALWAYS install tube and flap in accordance with RMA Tire Demounting and Mounting wall Chart.
7. ALWAYS remove valve core before inflating to seat beads.
8. NEVER inflate until you are certain that the side ring or lock ring is properly seated.
9. ALWAYS inflate tires in a safety cage or with another restraint device.
10. ALWAYS use clip-on chuck and extension gauge on air hose when inflating and/or seating beads.
11. NEVER exceed 40 PSI to seat beads.
12. ALWAYS after beads are seated, install valve core and inflate to recommended inflation pressure.

**WARNING: MOUNTING TIRES IS DANGEROUS, FAILURE TO FOLLOW THESE AND THE RMA'S MOUNTING PROCEDURES AND SAFETY PRECAUTIONS, CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.**

\* Available from RMA, 1400 K Street N.W., Washington, DC 20005



# FUEL HAULER TRAILER

## OPERATOR'S MANUAL AND PARTS BOOK

FH990XLD MODEL

Member of



2810 38TH ST • COLUMBUS, NEBRASKA 68601

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