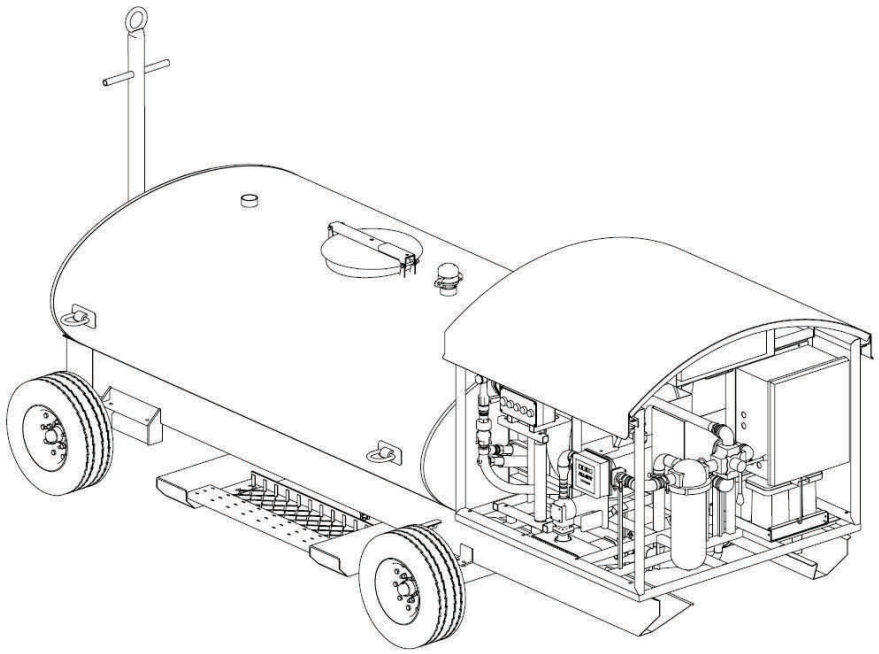
OPERATION MANUAL

Model CNV 600S-12V



SPOKANE INDUSTRIES

HANDIFUELER™

Ground Support Service Cart

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Limited Warranty Agreement Aviation Products

Spokane Industries (SI) of Spokane, Washington hereby Warrants to the purchaser (the Warrantee) that all products explicitly covered by this Warranty Agreement have been thoroughly inspected upon completion and that they and their component parts are free of defects in materials and workmanship. SI further warrants that in the event the product fails due to defects in materials and/or workmanship within a period of twenty-four (24) months from the effective date of this warranty that SI will provide replacement parts free of charge except for those components which are covered by an Original Equipment Manufacturer's (OEM)Warranty, in which case coverage will be provided by that OEM.

Coverage

The SI Sealvac Products Limited Warranty Agreement covers all products manufactured for use as Ground Support, Defueling equipment. Certain components of these products are manufactured by third party Original Equipment Manufacturers (OEMs) and are covered by these manufacturers' Warranties. SI Warranty coverage is contingent upon proper installation, operation, maintenance and repair of the product. Refer to the appropriate manuals and documentation for assistance. In cases of uncertainty, SI must be consulted prior to any service work being performed. Failure to do so may result in the termination of Warranty coverage.

Terms and Conditions

REQUESTS FOR WARRANTY COVERAGE

Requests for Warranty Coverage should be addressed to the SI, Spokane Metal Products Customer Support and Service Department N. 3808 Sullivan Road, Building #4, Spokane, WA, 99216, 800-541-360, Fax: 509-927-0826. Please provide the Model Number, Ship Date, Original Purchaser, and Point of Installation, and, if possible, our original Sales Order number. The Service Department will make a Warranty determination based upon this information and our internal records. If Warranty coverage is in effect replacement parts will be sent provided that credit terms have been established. If Warranty coverage is not in effect, the cost of replacement parts will be quoted.

TRANSFERABILITY

This warranty is extended only to the original purchaser named on this warranty certificate and is not transferable without the express written consent of SI. Transferability is contingent on the product being in warrantable condition. SI reserves the right to verify product warrantability by whatever means is deemed appropriate, and the right to refuse to transfer the warranty with or without cause. Warranty transfer requests must be made in advance of the sale or transfer of the product. SI accepts no responsibility for any costs associated with the transfer of existing warranties includ-

** SI Warranty replacement parts are provided subject to the terms and conditions of the SI Sales and Service Agreement which states that where no other Warranty coverage is in place, Service and Warranty parts are covered by a ninety day limited Warranty.*

LIMITATIONS

The following limitations apply to the SI Limited Warranty Agreement:

** SI shall not be liable under any circumstances for any incidental or consequential damages including, but not limited to, loss of time, inconvenience, expenses incurred by purchaser in order to remedy defects, or liability purchaser may have with respect to any other person for loss or damage arising from the operation of the product or the product's failure to operate in any way, or any other type of consequential damage or economic loss.*

** This warranty is limited to defects in materials and workmanship. SI assumes no liability whatsoever for damages arising from the inability of the product to perform a certain task. Damage arising during shipping and handling, improper installation, use, maintenance, repair, or any unauthorized modifications, whether performed by qualified service personnel or not, neglect, Acts of God, etc., are expressly excluded.* ***In any case, SI's liability shall be limited only to the provision of suitable replacement parts for those which failed due to defects in materials and workmanship. Incidental damage resulting from the failure, and labor costs associated with the repair and/or replacement of the product, its assemblies, and component parts, are excluded.***

** SI reserves the right to limit or terminate warranty coverage in instances where repeated product failures are a result of failure to correct operating conditions which are in any way abnormal or exceed operating condition specifications. It is the purchaser's responsibility to remedy such conditions as may be likely to cause initial and/or repeated failures of the equipment. SI assumes no responsibility whatsoever for any costs incurred for this purpose.*

** The SI Limited Warranty Agreement covers only replacement parts supplied by SI. SI makes every reasonable effort to ensure an adequate supply of replacement parts. However, in cases where the exact replacement part is no longer available, SI reserves the right to provide a suitable substitute.*

Components such as batteries, which are subject to normal wear and tear are pro-rated under the provisions of this Warranty. Warranty coverage shall be pro-rated according to the amount of Warranty coverage remaining.

EXCLUSIONS

The following exclusions apply to the SI Limited Warranty Agreement:

** The SI Limited Warranty Agreement applies only to authentic new.*

** The SI Limited Warranty Agreement excludes any and all parts and assemblies which are covered by another manufacturer's Warranty.*

** This Limited Warranty Agreement constitutes the complete and entire SI Warranty statement. Any items and/*

or circumstances not expressly covered by this Warranty Agreement are hereby excluded. This includes, but is not limited to, such additional offerings as SI may make available from time to time. These offerings are independent of this Agreement and, as such, do not in any way extend, modify, or otherwise alter the coverage, terms, conditions, limitations, and exclusions as they are set forth here unless ***explicitly stated.***

** The failure to observe any and all of the terms and conditions of this warranty will render it null and void.*

** Although all reasonable precautions are taken to ensure that shipping damage is avoided, any damage incurred during the shipment and installation of the product is explicitly excluded. Any and all damage during shipment is the sole responsibility of the transportation carrier(s). Product should be thoroughly inspected prior to acceptance from the freight carrier. All SI products are shipped F.O.B. Spokane Washington.*

** This Warranty is in lieu of all other warranties whatsoever, express, implied and statutory, including, without limitation, the implied warranties of merchantability and fitness for a particular purpose, and all such warranties express or implied, shall be excluded from this transaction and shall not apply to the goods sold.*

Product should be thoroughly inspected prior to acceptance from the freight carrier.

All SI products are shipped F.O.B. Spokane Washington.

Warranty inquiries are welcome and should be addressed to:

SI Service Department
Spokane Industries, Spokane Metal Products Division
Spokane Industrial Park Building 4
N3808 Sullivan Rd.
Spokane, Washington 99216
(800) 541-3601

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Section 1.0 Introduction

1.1 This operating manual contains information necessary for the operation and maintenance for the Spokane Industries model number is CNV600S-EG12V.

Table 1.0 Specifications

Dimensions	
Capacity	600 U.S gallons (nominal)
Tank Construction	T304 stainless steel, tight wrap double wall
Under Carriage rating	6,400 lbs.
Tires/ Wheels	195-75/14 mounted on stamp rims
Brakes	Drum Style, manually operated
Batteries -2 each	12 Volt
Battery Charger	120 Volt AC input
Pump	Fill-Rite model 4420
Fuel Meter	Fill-Rite model 901
Fuel Filter housing	Velcon model VF31
Fueling Rate	15 GPM (w/test fluid, and full charge)
Defueling Rate	15 GPM (w/test fluid and full charge)
Fueling Hose	35 feet X 1 inch ID, Goodyear Wingcraft
Fueling Nozzle	1 inch automotive
Defueling	Depuddling hose & Rigid depuddling wand

Section 2.0 Safety Guidelines

2.1 Within this manual are guidelines and safety recommendations for use. It is the responsibility of the end user to completely read this manual and comply with all local, state and federal laws and regulations applicable for fueling and defueling equipment.

2.2 Spokane Industries Inc. is not responsible for industry specific information on safety management, employment safety, health standards, safety codes, etc. Contact your local safety manager or industrial safety representative.

> **NOTE:** Spokane Industries does not allow any field modifications to be performed by the user without written permission from a Spokane Industries representative. Unauthorized field modifications may result in an unsafe condition for either personnel or equipment and will void the manufacturers warranty.

2.3 It is the responsibility of the end user to ensure persons operating this equipment:

- Are trained, authorized and permitted to use the equipment.
- Have physical and the mental ability to operate this equipment safely.
- Are aware of the potential hazards associated with this equipment, i.e. static electricity, electrical shock, fuel spills, pinch points.

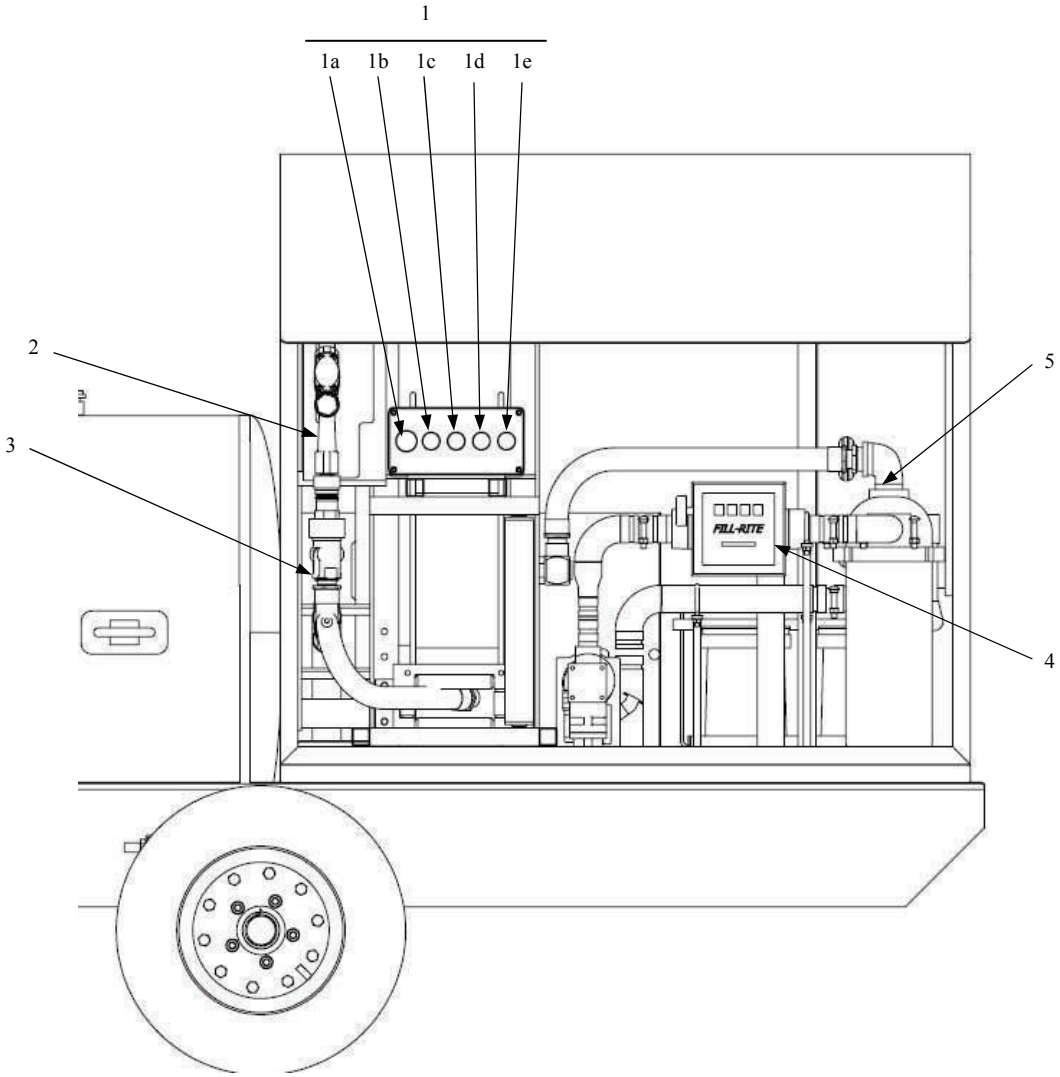
2.4 The unit is not intended to fuel or defuel aircraft.

Section 3.0 Controls and Indicators

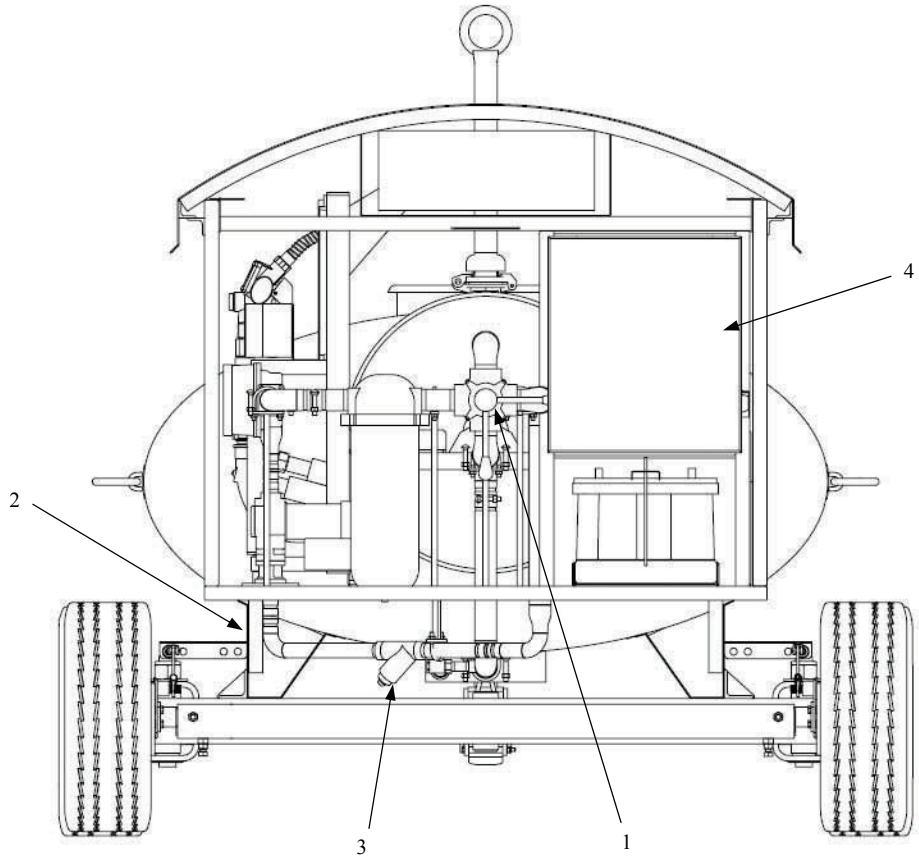
3.1 The Controls and Indicators section is designed to provide a description of the various controls and indicators. All physical references are made from the rear looking forward towards the tow bar.

Table 3.0 Controls and Indicators

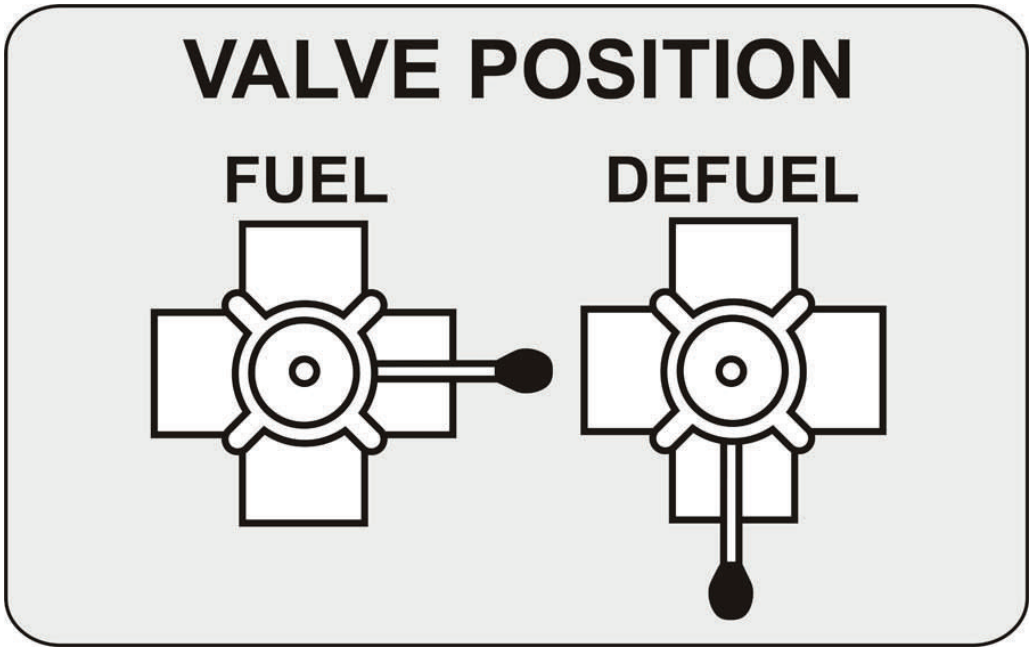
Liquid level gauge	Located on top of tank. Indicates level of fuel in 1/4 tank increments .
Parking Brake Handle	Located on front / left . Used to set park brake during operation and storage. Not intended to STOP the unit underway, this is a parking brake system only.
Low Point drain (moisture drain valve)	Located left lower side, in front of rear tire. Used to remove moisture from tank or take samples.
Emergency Stop	Located left side, at control panel.
Push Buttons	Left PB—"Start" - starts pump. Right PB—"Stop" - stops pump.
Dispensing Meter	Located left side pump cabinet.
Filter Housing GO/NO-GO indicator	Indicates when filter element needs to be changed.
Tank-to-Pump Valve	Master valve allowing fuel into or out of main tank.

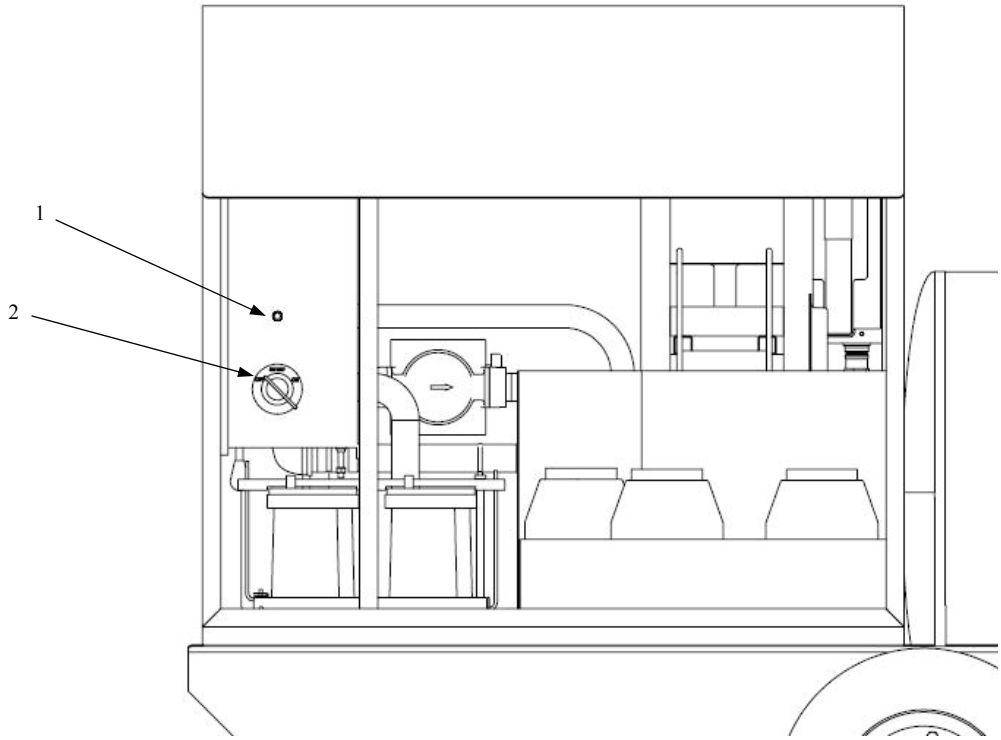


1. Control Panel
   1a. E-stop (lite when powered)
   1b. Work light ON/OFF
   1c. Pump ON
   1d. Pump OFF
   1e. Pump Running Light
2. Fuel Nozzle
3. Hose QD Valve
4. Meter
5. Filter dP Gauge



1. Fuel / Defuel Selector Valve
2. Water Drain
3. Y-strainer
4. Power Box (Charger Inside)





1. Pump thermal circuit breaker 2. Battery ON/OFF (must be ON to charge)

Section 4.0 Basic Operation

4.1 This section contains information necessary for the safe operation and maintenance. The unit is designed to provide a portable, safe, self-contained, fueling/ defueling system for AGE equipment.

4.2 Pre-Towing requirements. Items in Table 4.0 need to be accomplished before towing.

CAUTION: DO NOT back up the unit using a tow vehicle. Damage to under carriage, steering assembly or tow bar may occur.

Table 4.0 Pre-towing Safety Checklist

ITEM DESCRIPTION	PRE-TOWING CHECK	VISUAL INSPECTION	CORRECTIVE ACTION
Tires, Tire Pressure		Check for damage and proper tire inflation.	Replace tire if damaged. Inflate to manufacturers specifications on tire sidewall
Brakes		Ensure brakes lever is released	Release brake.
Tank		Visually inspect for cracks or leaks. Ensure Man way cover is closed and latched. Ensure tank is securely fastened to the rolling undercarriage.	Repair cracks or leaks before use. Tighten fasteners if loose.
Hoses, Nozzle, Grounding Clamps and wires		Ensure all hoses and ground wires clamps are secured for transportation. Inspect hoses, clamps and wires for serviceability.	Replace hoses, grounding clamps or wires before use if found to be beyond repair.
Valves		Visually inspect to ensure all valves are in the closed position. Check for leaks.	If leaks are found, repair or replace item before using.

4.3 Operational Definitions

Top Loading	Loading fuel by using the 2-inch fill/vent port on top of the tank.
Fueling	Actions requiring fuel to be discharged through the fuel nozzle.
Defueling	Actions that involve removing fuel from an item other than the tank.
CAUTION	Indicates an operation or condition that, if not observed, could result in equipment or property damage.
WARNING	Indicates an operation or condition that, if not observed, could result in possible injury or death.

4.4 Top Loading

WARNING: No overfill protection, visually monitor tank fluid level during Top loading operations.

A. Set Brake Lever forward
B. Chock tires if chocks are available

CAUTION: Improper grounding may result in an ignition source.

C. Connect static ground clamp to approved grounding point.
D. Open 2-inch fill/vent cover.
E. Ground Source loading hose to tank opening
F. Fill tank to required capacity.
G. Remove hose and ground connection.
H. Disconnect and store static ground clamps.

4.5 Fueling the Equipment

WARNING: Never operate the unit in an enclosed area. Proper ventilation must be maintained at all times. All fuels are flammable, do not allow sources of ignition within 50 feet of the unit.

A. Set brakes.
B. Chock tires if chocks are available.

CAUTION: Improper grounding may result in an ignition source.

C. Connect static ground wire with clamp to earth grounding point.

D. Extend hose from reel. Hose reel locks on detent.
E. Remove Nozzle from stowed position and attach to hose end.
F. Reset meter.
G. Place fueling mode selector valve in “Fuel” mode.
H. On battery box turn main power switch ON.
I. Turn on pump by pushing the “START” pushbutton.
J. Turn off pump by pushing the “STOP” pushbutton.

4.6 Defueling the Equipment

WARNING: Never operate the unit in an enclosed area. Proper ventilation must be maintained at all times. All fuels are flammable, do not allow sources of ignition within 50 feet of the unit.

WARNING: No overfill protection during defueling operations. Ensure there is sufficient tank capacity to receive the amount of fuel being removed from the aircraft.

A. Set brakes
B. Chock tires if chocks are available.

CAUTION: Improper grounding may result in an ignition source.

C. Connect static ground wire.
D. Extend hose from reel. Hose reel locks on detent.
E. Attach defuel attachment to end of hose.

CAUTION: Ensure proper venting of the fuel cell is accomplished prior to beginning defuel operations.

F. Reset fuel meter.
G. Place fueling mode selector valve in “Defuel” mode.
H. On battery box turn main power switch ON.
I. Turn on pump by pushing the “START” pushbutton.
J. Turn off pump by pushing the “STOP” pushbutton.

4.7 Fuel Moisture Removal

Low Point Drain/ Fuel Filter Housings. The low point drain is located left side / lower. A brass valve with lever manually discharges a fuel/water sample or to drain the tank. The lever is spring loaded in the CLOSED position.

A. Set brakes.
B. Chock tires if chocks are available.
C. Procure approved fuel container that will assure containment for amount of liquid to be drained. Place under Low Point Drain Valve.
D. Open low point drain valve by pushing lever downward.
E. Drain sufficient quantity to remove water or attain sample.
F. Release handle to shut off flow.

Fuel Filter Housing - drain using same type of container

A. Open air vent on top of housing. (turn counter clockwise).
B. Place container under housing and open drain. (turn clockwise as viewed from the top).
C. Drain sufficient quantity to remove water from housing.
D. Close drain.

SECTION 5.0 Inspection and Maintenance

5.1 This section provides the basic requirements to maintain the unit. The chassis and tank of the unit requires minimal preventive maintenance. The tow bar and steering spindles use Oil-Lite bronze bushings which require NO lubrication.

Table 5.0 Inspection Intervals and Component Maintenance Guide

COMPONENT	INTERVAL	CRITERIA	MAINTENANCE
Fueling Nozzle	Each use	- Cracks, Leaks	- Replace before using
Fuel Meter	Each use	- Leaks	- Repair or replace before using
Fuel Hose	Each Use	- Cuts, leaks	- Replace before using
Fuel Filter Housing	Each use	- Cracks, leaks	- Replace if cracked, determine cause of leaks and repair if possible, if leaks can not be repaired replace housing.
Pump cabinet plumbing	Each use	- Inspect all plumbing lines, tubes and clamps for cracks and leaks	- Cracks are unserviceable and item shall be replaced. Leaks should be repaired if possible, if item can not be repaired then replacement is due.
Wheel bearings	2 years	- Grooves, chips, discoloration	- Lubricate using approved wheel bearing grease. Slight discoloration is allowed. Severe discoloration, chips or grooves in bearing surfaces is cause for replacement.
Brakes	Each use	- Proper engagement	- Adjust as needed

SECTION 6.0 Trouble Shooting

6.1 The following troubleshooting guidelines are designed to cover most common types of problems with probable solutions to repair the condition.

TABLE 6.1 Trouble Shooting For Fuel Service Operations

FAULT	POSSIBLE CAUSE	CORRECTIVE ACTION
Low/ No discharge pressure at fuel nozzle	- Low battery charge - Fuel filter(s) restricted - Fuel mode valve not correctly positioned - Y-Strainer screen restricted	- Charge batteries - Inspect and replace if needed - Move valve to desired mode. - Remove/ clean Y-Strainer screen
Low/ No Defueling Capability	- Low battery charge - Fuel filter(s) restricted - Fuel mode valve not correctly positioned - Y-Strainer screen restricted	- Charge batteries - Inspect and replace if needed - Move valve to desired mode. - Remove/ clean Y-Strainer screen
12 Volt pump – weak or will not work	- Low/ No battery charge - Battery terminals/ cables corroded - Battery Cell(s) fluid low - Main Power switch in OFF position - Pump has internal damage - Pump has reached duty cycle - Circuit breaker has tripped	- Fully charge batteries - Inspect & clean, replace if necessary - Service cell(s) with distilled water - Turn Main Power switch ON - Replace pump - Wait 30 minutes and retry - Wait 30 minutes and retry
Fuel Meter has no indication of flow	- Main pump not turned ON - Main tank empty - Fuel Meter internally broken	- Turn ON pump - Load fuel into tank - Replace fuel meter

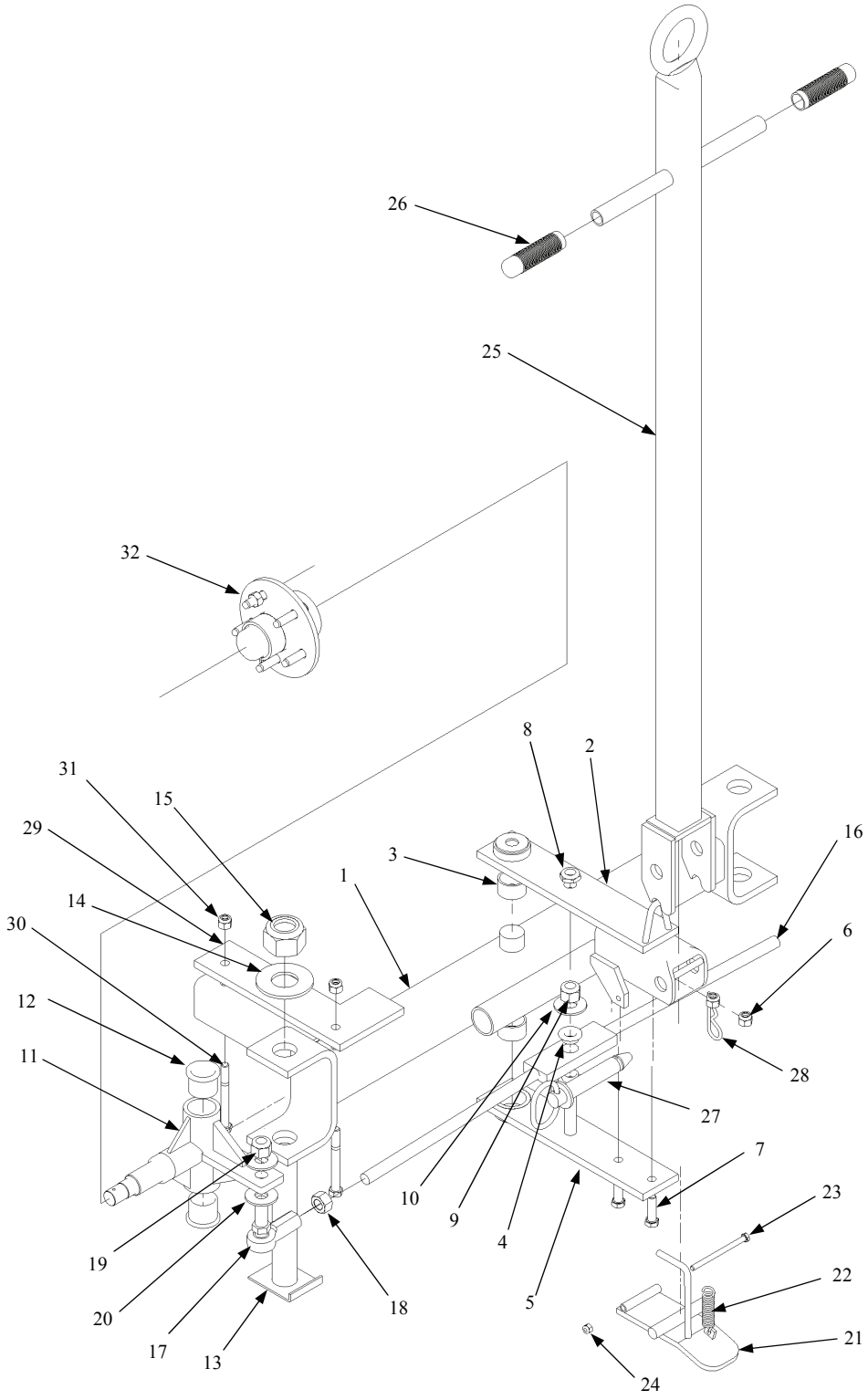


Figure 7-1. Front Undercarriage Assembly

FIGURE & INDEX / SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
7-1			FRONT UNDERCARRIAGE ASSEMBLY	
	08-1029R1	66144	FRONT UNDERCARRIAGE, 200 GALLON	1
	08-1018	66144	FRONT UNDERCARRIAGE, 400/600 GALLON	1
- 1	07-1053	66144	. WELDMENT, FRONT AXLE, 200 GALLON	1
1	07-11071	66144	. WELDMENT, FRONT AXLE, 400/600 GALLON	1
- 2	07-1052	66144	. STEERING ARM, UPPER, 200 GALLON	1
2	07-1104	66144	. STEERING ARM, UPPER, 400/600 GALLON	1
3	03-1014	66144	. . BUSHING, Steering Arm	2
4	03-1015	66144	. . BUSHING, Tie Rod	2
5	07-5002	66144	. STEERING ARM, LOWER PLATE	1
6	02-3087	66144	. . NUT, Nylon Insert, 1/2-13 (AP)	2
7	02-3022	66144	. . BOLT, 1/2-13 by 1-3/4 Lg. (AP)	2
8	02-3081	66144	. . JAM NUT, Nylon Insert, 3/4-16 (AP)	1
9	02-3095	66144	. . NUT, Nylon Insert, 3/4-16 (AP)	1
10	02-3131	66144	. . WASHER FLAT, 3/4-Inch (AP)	1
11	07-1009	66144	. HOUSING, KING PIN	2
12	03-1013	66144	. . BUSHING, King Pin	4
13	07-10105	66144	. . KING Pin	2
14	02-3127	66144	. . . Washer, Flat, 1-1/2-Inch (AP)	2
15	02-3093	66144	. . . Nut, Nylon Insert, 1-1/2-12 (AP)	2
- 16	07-10371	66144	. TIE ROD ASSEMBLY, 200 GALLON	1
16	07-1005	66144	. TIE ROD ASSEMBLY, 400/600 GALLON	1
17	03-1016	66144	. . ROD END, Ball Joint	2
18	02-3081	66144	. . JAM NUT, Nylon Insert, 3/4-16	2
19	02-3095	66144	. . . Nut, Nylon Insert, 3/4-16 (AP)	2
20	02-3131	66144	. . . Washer, Flat, 3/4-Inch (AP)	4
21	07-1020	66144	. TOE LATCH	1
22	04-1054	1P384	. SPRING, TOE LATCH	1
23	02-3055	66144	. . BOLT, 5/16-18 by 4-1/2 Lg. (AP)	1
24	02-3090	66144	. . NUT, Nylon Insert, 5/16-18 (AP)	1
25	07-1103	66144	. TOW BAR	1
26	04-1055	66144	. . HAND GRIP	2
27	02-3063	66144	. . . Hitch Pin (AP)	1
28	02-3016	66144	. . . Pin, Cotter (AP)	1
29	06-1023	66144	. PAD, MOUNTING	2
30	02-3025	66144	. . BOLT, 1/2-13 by 4-1/2 Lg (AP)	4
31	02-3087	66144	. . NUT, Nylon Insert, 1/2-13 (AP)	4
32	08-1011	66144	. FRONT HUB ASSEMBLY (See Fig. 7-12)	2
- 33	07-10201	66144	. WHEEL ASSEMBLY (See Figure 7-11)	2

- Not Illustrated

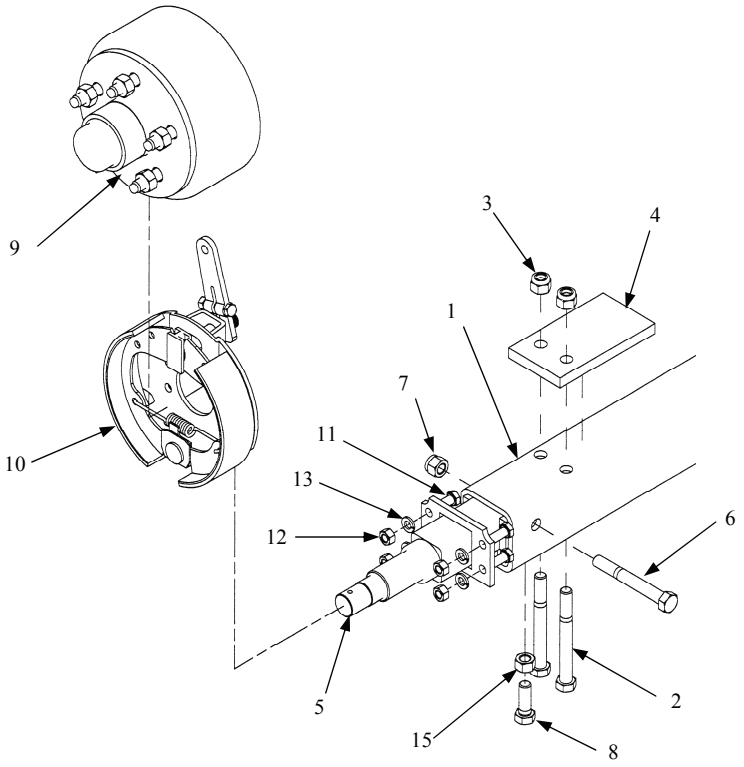


Figure 7-2. Rear Undercarriage Assembly

FIGURE & INDEX / SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
7-2			REAR UNDERCARRIAGE ASSEMBLY	
	08-10101	66144	ASSEMBLY, REAR UNDERCARRIAGE, 200 GALLON	1
	08-10301	66144	ASSEMBLY, REAR UNDERCARRIAGE,	
-1			400/600 GALLON	1
1	05-1054	66144	. REAR AXLE TUBE, 200 GALLON	1
2	05-1023	66144	. REAR AXLE TUBE, 400/600 GALLON	1
3	02-3025	66144	. BOLT, 1/2-13 by 4/1/2-INCH (AP)	4
4	02-3087	66144	. NUT, NYLON INSERT, 1/2-13 (AP)	4
5	06-1012	66144	. MOUNT PAD, REAR	2
6	07-1010	66144	. . WELDMENT, Rear Spindle	2
7	02-3024	66144	. . BOLT, 1/2-13 by 4-Inch Lg (AP)	2
8	02-3087	66144	. . NUT, Nylon Insert, 1/2-13 (AP)	2
9	02-3026	66144	. . BOLT, 1/2-13 by 1-1/2-Inch Lg (AP)	2
10	08-10111	66144	. REAR HUB AND DRUM ASSY (SEE FIG. 7-13)	2
11	825155	ORG94	. BRAKE ASSEMBLY	2
12	02-3050	66144	. . BOLT, 3/8-16 by 1-Inch Long (AP)	8
13	02-3072	66144	. . NUT, 3/8-16 (AP)	8
- 14	02-3143	66144	. . LOCK WASHER, 3/8 (AP)	8
15	07-10201	66144	. WHEEL ASSEMBLY (SEE FIG. 7-11)	2
	02-3068	66144	. NUT, 1/2-13, PLATED	2

- Not Illustrated

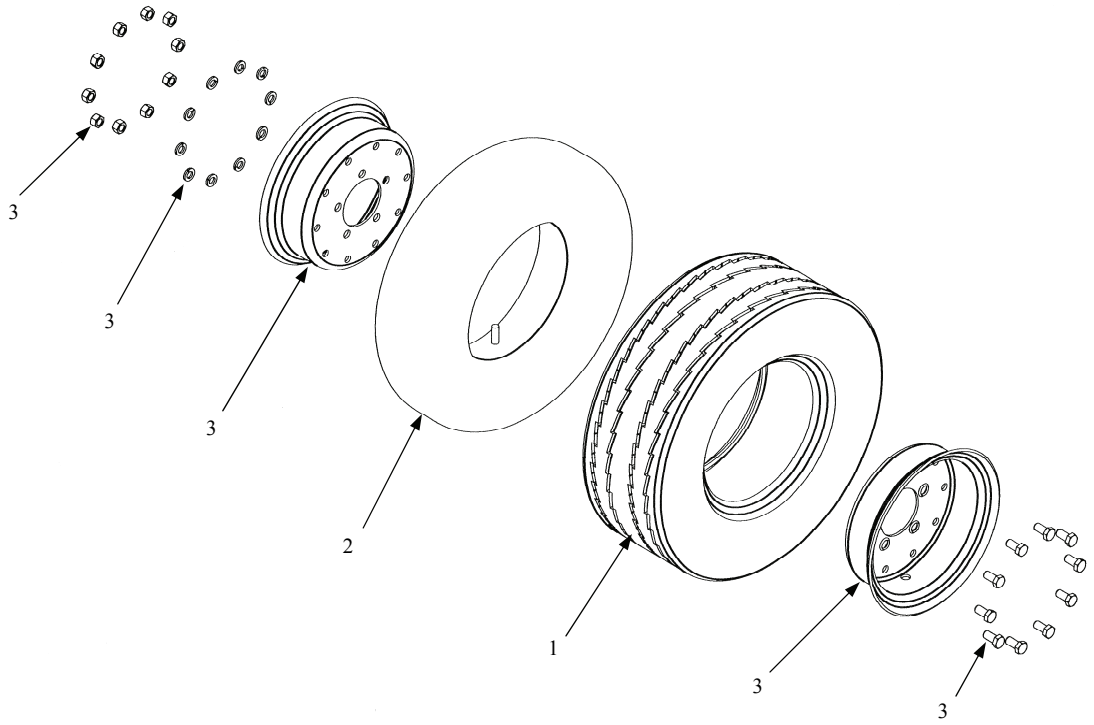


Figure 7-3. Wheel Assembly

FIGURE & INDEX / SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
7-3	07-10201	66144	WHEEL ASSEMBLY	4
1	04-10221	66144	. TIRE, 20.5 x 8.0-10, E-RANGE	1
2	04-1045	66144	. TUBE, INNER	1
3	04-1020	66144	. SPLIT RIM WHEEL ASSEMBLY	1

- Not Illustrated

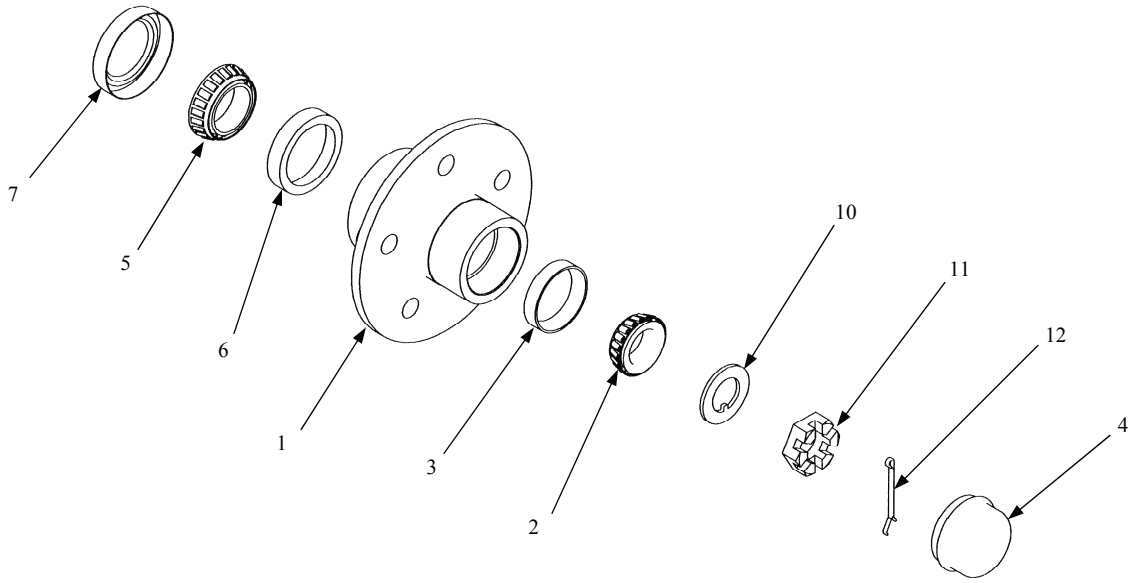


Figure 7-4. Front Hub Assembly

FIGURE & INDEX / SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
7-4	08-1011	66144	FRONT HUB ASSEMBLY	2
1	04-1017	66144	. HUB, FRONT AXLE	1
2	L44649	60038	. . BEARING, Outer	1
3	04-1016	66144	. . RACE, Outer Bearing	1
4	04-1019	66144	. . CAP, Dust	1
5	L68149	60038	. . BEARING, Inner	1
6	L6811	60038	. . RACE, Inner Bearing	1
7	CR17146	80201	. . SEAL, Bearing	1
- 8	02-1017	66144	. . STUD, Wheel	5
- 9	02-3065	66144	. . . NUT, Lug (AP)	5
10	02-12055	66144	. . . WASHER, Spindle (AP)	1
11	02-1205	66144	. . . NUT, Castle (AP)	1
12	02-3018	66144	. . . PIN, Cotter (AP)	1

- Not Illustrated

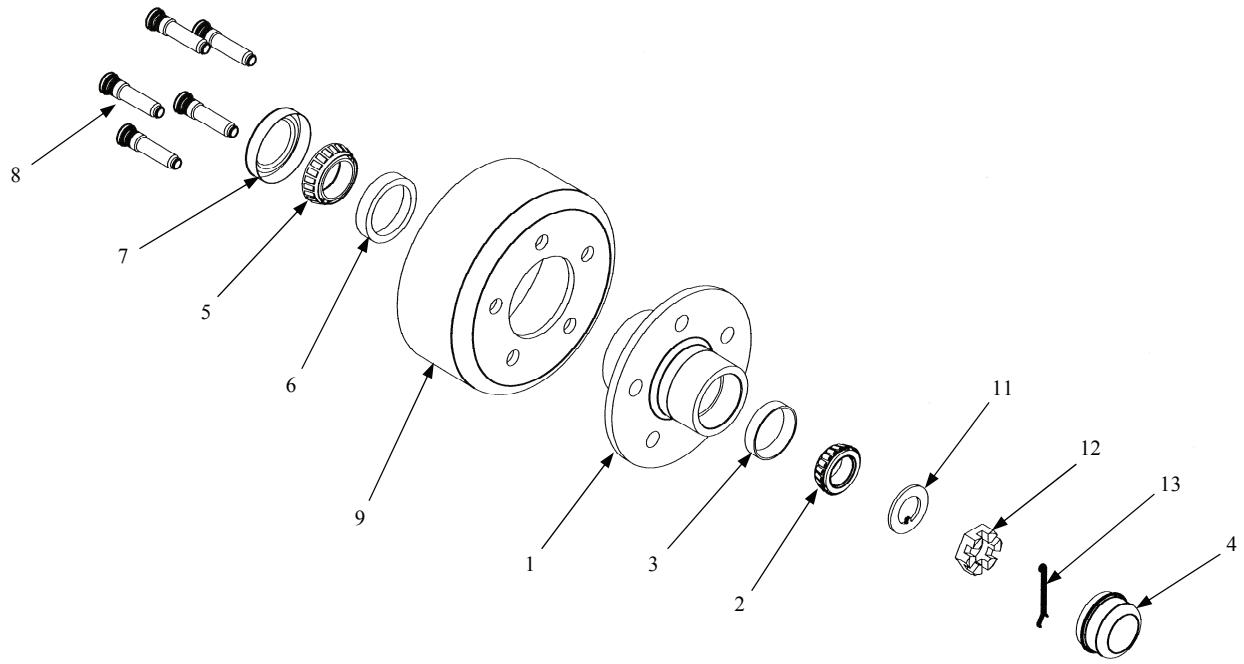


Figure 7-5. Rear Hub Assembly

FIGURE & INDEX / SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY
7-5	08-10111	66144	REAR HUB ASSEMBLY	2
1	05-1020	66144	. HUB, REAR AXLE	1
2	L44649	60038	. . BEARING, Outer	1
3	04-1016	66144	. . RACE, Outer Bearing	1
4	04-1019	66144	. . CAP, Dust	1
5	L68149	60038	. . BEARING, Inner	1
6	L6811	60038	. . RACE, Inner Bearing	1
7	CR17146	80201	. . SEAL, Bearing	1
8	02-1017	66144	. . STUD, Wheel	5
9	05-1021	66144	. . DRUM, Brake	1
- 10	02-3065	66144	. . . NUT, Lug (AP)	5
11	02-12055	66144	. . . WASHER, Spindle (AP)	1
12	02-1205	66144	. . . NUT, Castle (AP)	1
13	02-3018	66144	. . . PIN, Cotter (AP)	1

- Not Illustrated

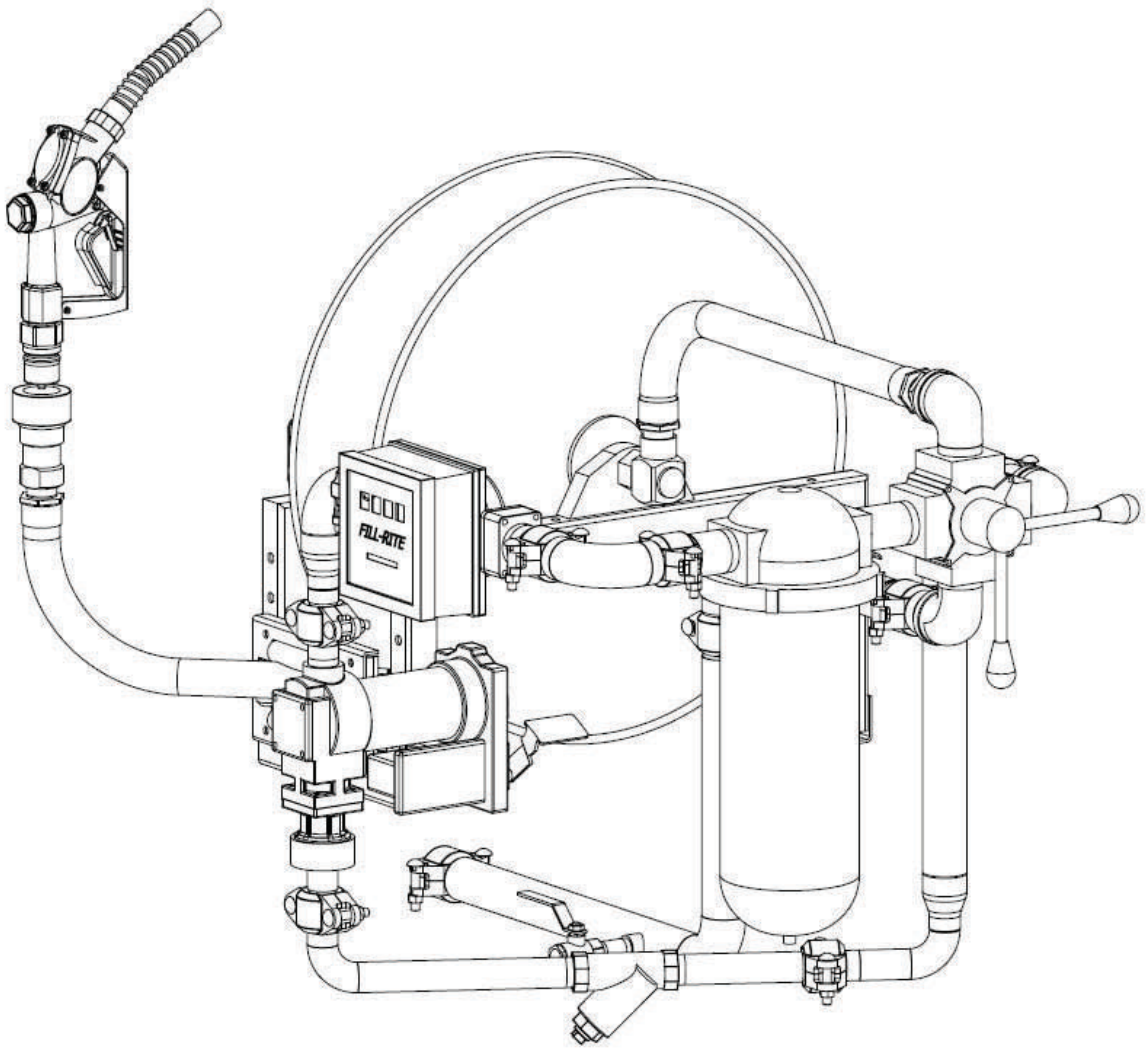

FILL-RITE

FIGURE & INDEX / SHEET NO.	PART NUMBER	CAGE	1 2 3 4 5 6 7 DESCRIPTION	UNITS PER ASSY

- Not Illustrated