HandiFueler™
Pumping system

R600EA

DOD/ACRE

Manual Revision December 2006

HANDIFUELER™

TECHNICAL MANUAL

R600EA

SI AVIATION

Spokane, Washington

600 GALLON HandiFueler™

ONE YEAR LIMITED WARRANTY

Seller warrants its 600 Gallon HandiFueler™ tank to be free from defects in material and workmanship under the normal use and service for which the unit is intended if, but only if the unit has been properly operated, maintained and stored in accordance with printed directions contained in the product manual. Our obligation under this Warranty shall be limited to the repair or exchange of SI manufactured equipment and parts which may prove defective within one year of the date the unit is put into service but shall in no event extend beyond a date three years from the date the unit is shipped from our plant. All transportation charges on parts returned to us for replacement under this warranty must be returned prepaid.

Other manufacturers' components warranties apply as their warranty reads.

This warranty does not extend to damage caused be environmental factors varying from normal design conditions, whether natural or man-made, or to units subjected to misuse, negligence or accident. This warranty likewise does not extend to the unit or any parts thereof which have been repaired or altered improperly or in any way so as to effect adversely its stability or reliability. This warranty does not cover parts or labor required to repair or replace parts whose usefulness is exhausted due to normal operation of the unit.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE NOT SET FORTH IN WRITING SIGNED BY AN AUTHORIZED REPRESENTATIVE OR SELLER. SELLER SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL LOSS OR DAMAGE RESULTING FROM THE USE OR LOSS OF USE OF THE UNIT.

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PARTS BREAKDOWN DRAWINGS

Section 1.0 Introduction

1.1 This operating manual contains information necessary for the operation and maintenance of the HandiFueler™. The HandiFueler™ is designed to provide a portable, safe, self-contained fueling system for the aviation industry.

1.2 Specifications for the HandiFueler™ are shown in Table 1.0.

Table 1.0 Specifications for R600EA

Unit Standards	**NFPA-407**
Overall Unit Dimensions	
Length	148 inches
Width	76 inches
Height	53 inches
Weight—Empty	1500 lbs.
Tank Construction/Capacity	Single wall stainless steel / 600 Gallons
Under Carriage rating	6,000 lbs.
Brakes	Drum Style, manually operated
Pump	Fill-rite12 Volt DC
Fuel Meter	Fill-rite
Fuel Filter, refueling	Facet VF 22 series, Cartridge style, 2 micron
Refueling Hose—Certified to API 1529	35 feet, 1-inch hose and refueling nozzle

Section 2.0 Safety Guidelines for HandiFueler™

2.1 This manual contains guidelines and safety recommendations for use of the HandiFueler™. 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 using this 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 Inc. is not responsible for any modifications performed on this equipment. Modifications performed by user may result in an unsafe condition for equipment or personnel and 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 mental ability to operate this equipment safely.
- Are aware of the potential hazards associated with this equipment, including operating this equipment during adverse weather conditions.
- Do not attempt to move, service or adjust this equipment without another capable person present to provide assistance in the event of injury.

Table 2.0 Other Suggested Safety Resources

ANSI	American National Standards Institute	
OSHA	Occupational Safety & Health Administration	Hazardous Materials, Material Safety Data Sheets (MSDS), Lockout/Tag out, Confined Space, Fire Prevention, Personal Protective Equipment (PPE)
CFR	Certified Federal Regulations	
FAA	Federal Aviation Administration	
FAR	Federal Aviation Regulations	
NFPA	National Fire Protection Association	

2.5 **NFPA Standards**: This HandiFueler™ is designed and built to meet NFPA 407. Safeguards must be in operational condition, if not, discontinue use immediately. No bypass of safety mechanisms is authorized.

Section 3.0 CONTROLS & INDICATORS

3.1 The Controls and Indicators section is designed to provide a description of the various controls and indicators found on the HandiFueler™.

Table 3.0 CONTROLS & INDICATORS FOR R600EA

Parking Brake Handle	Located on 3 Lever operator near pump platform. Used to set park brake during operation and storage.
Emergency shut off levers	Located lower front of tank.. Used to close 3 inch internal valve during an emergency situation.
Liquid level gauge	Located on top of tank. Indicates amount of liquid in tank.
Jet Level Sensor	Located internally. Automatically closes 3 inch internal valve when tank reaches 92% capacity to prevent overfill when bottom filling.
Low Point drain (moisture drain valve)	Located below pump cabinet, aft side. Used to remove moisture from tank. **See Drawing #1**
Loading valve /connection	Located below pump cabinet, aft side. Used to connect fuel source hose during tank filling operations. **Drawing #1**
Source selection Valve. Controlled by T-Handle # 1	Located between battery box and hose real. 3-Way valve selects fuel source to be used; Main Tank or service end of hose on reel.
Destination Valve. Controlled by T-Handle #2	Located between Source selection valve and Fuel filter housing. 3-Way valve selects discharge through the hose reel nozzle or to bottom fill tank.
Fuel Filter Housing	Located inside pump cabinet. Houses 2 micron cartridge filter element, filter housing air bleeder, filter restriction indicator and housing drain petcock. **See drawing #1**
3 lever operator	Located outside pump cabinet. "Valve" lever opens 3 inch internal valve for offloading. "Nozzle" lever sets brake and releases nozzle from holster. "Brake" lever sets park brake. **See Drawing. #1**
Battery Box	Houses two 12 volt batteries, battery selector, 10 Amp charger, charge indicator and two circuit breakers. **See Drawing #1**

Section 4.0 BASIC OPERATION OF HANDIFUELER™

4.1 This section contains information necessary for the operation and maintenance of the HandiFueler™. The HandiFueler™ is designed to provide a portable, clean, safe, self-contained, fueling system for the aviation industry.

4.2 **Pre-Towing the HandiFueler™.** Items in Table 4.0 need to be accomplished before towing the HandiFueler™ .

CAUTION: **Do Not Back up Handifueler™ using 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 "Brake" lever on the 3 Lever operator is released in the forward position.	
Tank		Visually inspect for cracks or leaks. Ensure Manway 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.
Pump cabinet doors		Ensure all cabinet doors are closed and latched. If storage boxes are installed ensure doors are latched.	

4.3 **Operational Definitions.**

Fuel Source	Fuel which is used to fill (load) the HandiFueler™.
Loading	Any action with the intent to put fuel into the HandiFueler™ tank.
Off Loading	Actions requiring fuel discharged through the HandiFueler™ fuel nozzle.
Bottom Loading	Loading fuel by using the Bottom Fill connection located under the pump platform area. Overfill protection provided by Jet Level Sensor.
Top Loading	Loading fuel by using the Manway cover for access to the tank. **WARNING: No overfill protection using this method.**
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 LOADING THE HANDIFUELER™.

4.4.1 BOTTOM LOADING: This method is preferred due to overfill protection provided by the Jet Level Sensor.

4.4.1.1 Bottom Loading using the Loading Valve:

WARNING: Never operate the HandiFueler™ 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 HandiFueler™.

A. Pull Brake lever on 3-Lever operator

CAUTION: Ensure "Valve" lever on 3 lever operator is forward (closed). This ensures Jet Level Sensor can close 3 inch internal valve.

B. Chock tires.

CAUTION: Improper grounding may result in an ignition source.

C. Open cabinet doors.
D. Connect static ground clamps to approved grounding points.
E. Ensure T-Handle #1 is pulled out and T-Handle #2 is pushed in.
F. Connect fuel source hose to Loading Valve connection. **See Drawing # 1**

Continued next page

Bottom Loading/valve method, continued from previous page

G. Open Loading Valve.
H. Begin loading the HandiFueler™ from fuel source
I. The Jet Level Sensor will automatically close the 3 inch internal valve when tank level reaches 92% capacity.
J. Turn off pump at fuel source.
K. Close loading Valve.

CAUTION: Residual fuel pressure may remain in the fuel source hose. Use caution when disconnecting.

L. Disconnect fuel source hose.
M. Disconnect and store static ground clamps.
N. Close and latch cabinet doors.

4.4.1.2 Bottom Loading Using the Servicing Hose:

WARNING: Never operate the HandiFueler™ 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 HandiFueler™.

WARNING: This unit is equipped with a 12Volt Marine battery charger. Do not attempt to charge batteries while using the HandiFueler™ 12 Volt electric fuel pump, damage to charger may occur.

A. Pull Brake lever on 3-Lever operator

CAUTION: Ensure "Valve" lever on 3 lever operator is forward (closed). This ensures Jet Level Sensor can close 3 inch internal valve.

B. Chock tires.

CAUTION: Improper grounding may result in an ignition source.

C. Open cabinet doors.
D. Connect static ground clamps to approved grounding points.
E. Ensure T-Handles #1 and #2 are both pulled out.
F. Pull "Nozzle" Lever on the 3 Lever operator.
G. Remove Nozzle from storage holster and extend hose.
H. Remove Nozzle from hose by releasing 2" cam lock.
I. Use approved grounding cable to attach hose end to fuel reservoir.
J. Insert hose into fuel reservoir.
K. Turn battery selector to 1,2 or Both.
L. Start 12 Volt electric pump by pulling handle located above fuel meter.
M. Fill tank to desired capacity or until Jet Level Sensor terminates fuel flow
N. Turn off 12 Volt electric pump.
O. Turn battery selector to "OFF".

Continued next page

Bottom Loading/Hose method, continued from previous page

CAUTION: Ensure Nozzle is securely seated into storage holster before attempting to move Nozzle or Brake lever forward. Nozzle must be seated to override Brake lock-out device.

P Disconnect ground from hose end to fuel reservoir.
Q. Remove hose and reconnect Nozzle to hose end using 2" cam lock.
R Rewind hose reel and store nozzle in holster.
S. Move Nozzle lever forward to secure Nozzle in holster.
T. Disconnect and store grounding clamps.
U. Close and latch Cabinet doors.

4.4.2 TOP LOADING: WARNING: NO OVERFILL PROTECTION.

A. Set "Brake" Lever on 3 Lever operator.
B. Chock tires.

CAUTION: Improper grounding may result in an ignition source.

C. Connect static ground clamps to approved grounding points.
D. Ensure Loading valve is closed.
E. Open 10 inch Manway cover.
F. Ground Source loading hose to tank.
G. Fill tank to required capacity.
H. Remove hose and ground connection.
I. Close and latch Manway cover.
J. Disconnect and store static ground clamps.

4.5 Moisture Removal: Low Point Drain/ Fuel Filter Housing.

Verify user's local, State and Federal requirements for moisture removal before off loading fuel from the HandiFueler™.

A. Set "Brake" Lever on 3 Lever operator.
B. Procure approved fuel container that will assure containment for amount of liquid to be drained. Place under Low Point Drain Valve.
C. Open Low point Drain Valve located under Pump Platform. **See Drawing #1**
D. Pull handle located near low point drain valve to release fluid.
E. Drain sufficient quantity to remove water or attain sample.
F. Release handle to shut off flow.
G. Close Low Point Drain Valve.
H. **Fuel Filter Housing** - drain using same type of container.

4.6 OFF LOADING FUEL FROM THE HANDIFUELER™

WARNING: Never operate the HandiFueler™ 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 HandiFueler™.

WARNING: This unit is equipped with a 12Volt Marine battery charger. Do not attempt to charge batteries while using the HandiFueler™ 12 Volt electric fuel pump, damage to charger may occur.

CAUTION: Improper grounding may result in an ignition source.

A. Set "Brake" Lever on 3 Lever operator.
B. Chock tires.
F. Open Cabinet doors and secure.
C. Connect static ground clamps to approved grounding points.
D. Ensure Loading Valve is closed
F. Ensure T-Handles #1 and #2 are both pushed in.
G. Pull Valve, Nozzle levers on the 3 lever operator.
K. Turn battery selector to 1,2 or Both.
H. Start 12 Volt electric pump by pulling handle located above fuel meter
I. Remove Nozzle from storage holster, pulling hose directly out ward to desired length.
J. Connect Nozzle ground clip to receiver fuel filler port.
K. Insert Nozzle into receiver filler port, discharge fuel quantity required.
L. Reel hose and nozzle onto reel assembly.

CAUTION: Ensure Nozzle is securely seated into storage holster before attempting to move Nozzle or Brake lever forward. Nozzle must be seated to override Brake lock-out device.

M. Secure Nozzle into storage holster.
N. Push Nozzle lever forward, do not force lever.
O. Push Valve Lever forward.
P. Turn off 12 Volt electric pump, turn battery selection to "OFF"
M. Turn battery selector to "OFF".
R. Disconnect and store static ground clamps.
T. Close and latch cabinet doors.

SECTION 5.0 INSPECTION AND MAINTENANCE

5.1 This section provides the basic requirements to maintain the HandiFueler™. Many parts of the HandiFueler™ are from different manufacturers and will have different intervals for Inspection and Maintenance requirements. In such cases follow the manufacturer's recommendations dictated in the specific product manual. All available product manuals have been shipped with the HandiFueler™ Users Manual. Take care to store all product manuals for future reference. Some components were received without literature.

5.2 The chassis and tank of the HandiFueler™ 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
Manway seal	6 months	Cuts, tears or wear of material	Replace if seal allows fluid to leak around opening.
3 Lever Operator	6 months	Check freedom of movement	Grease using general purpose grease. Zerks located near pivot point, open side of levers.
Wheel Bearings	2 Years	Grooves, chips, discoloration	Lubricate using approved wheel bearing grease. Replace for irregularities on bearing surfaces.
Hose Reel	Each use, 6 months	Leaks, grease swivel joint	Repair or Replace before using. Grease, see Product Manual for specific guidance.
12 Volt Batteries	6 months	Fluid level, battery terminals for corrosion	Fill battery cells per battery manufacturers recommendations, remove corrosion
Hose Nozzle	Each use	Cracks, leaks	Repair or Replace before using. See Product Manual for specific guidance.
Fuel Meter	Each use	Leaks	Repair or Replace before using. See Product Manual for specific guidance.
Fuel Filter Housing	Each use	Leaks	Repair or Replace before using. See Product Manual for specific guidance.

SECTION 6.0 TROUBLESHOOTING THE HANDIFUELER™

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

Table 6.0

BOTTOM FILLING OPERATION - TROUBLESHOOTING

FAULT	POSSIBLE CAUSE	CORRECTVE ACTION
3 Inch Internal Valve Valve will not open	Insufficient pressure at pilot valve	Ensure source pump pressure is above 10 PSIG
	Pilot valve diaphragm leaking / bad	Replace 3 inch internal valve
	Jammed main piston due to contamination	Drain tank, remove valve, determine repair needs (possible valve replacement due)
Surging Fuel Flow	Insufficient pressure at pilot valve	Ensure source pump pressure is above 20 PSIG
Valve will not close	Jammed main piston due to contamination	Drain tank, remove valve, determine repair needs (possible valve replacement due)
	Main piston seal damaged	Replace 3 inch internal valve
	External tension spring missing	Replace or connect the spring
	Operating cable improperly adjusted	Valve not manually opened during bottom fill operations to ensure overfill protection using Jet Level sensor. Check to ensure Valve lever was not pulled during bottom fill. If pulled it overrides Jet level Sensor ability to close valve.

***OFF LOADING** troubleshooting continued next page*

SECTION 6.0

Table 6.1

OFF LOADING OPERATION - TROUBLESHOOTING

FAULT	POSSIBLE CAUSE	CORRECTVE ACTION
Low discharge pressure at Nozzle	Low Battery charge condition	Charge batteries
	Fuel Filter Clogged	Replace Fuel Filter
	Hose nozzle screen clogged	Remove nozzle tip, clean screen
	Pump not completely primed	Prime pump per Product Manual
3 Inch Internal Valve		
Valve will not open	Operating cable incorrectly adjusted	Tighten the operating cable
	Jammed Main piston due to contamination	Drain tank, remove valve, determine repair needs (possible valve replacement due)
	Main piston seal damaged or deformed	Replace Valve Assembly
Valve will not close	Jammed Main piston due to contamination	Drain tank, remove valve, determine repair needs (possible valve replacement due)
	Main piston seal damaged or deformed	Replace Valve Assembly
	Operating cable incorrectly adjusted	Loosen the operating cable
Fuel Meter has no indication	3 inch valve closed during off loading	Open 3 inch valve
	Off loading source empty, clogged	Refill source to be off loaded, clean inlet
	Fuel Meter broken internally	Replace Fuel Meter
12 Volt Pump Engine will not run	Low Battery charge, corrosion	Check charge state, clean corrosion from terminals

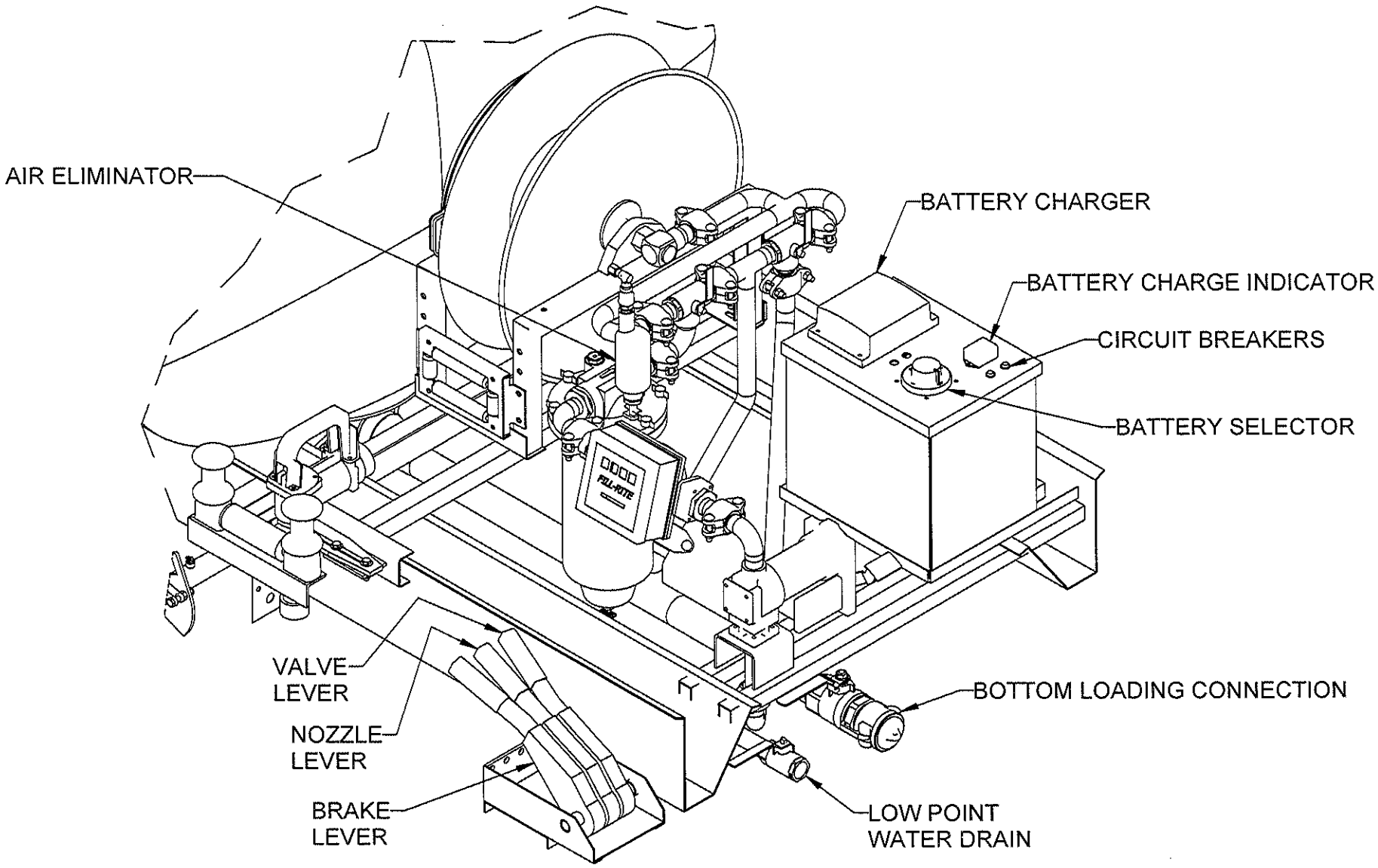
SECTION 7.0 PART BREAKDOWN DRAWINGS

The following drawings are supplied to assist the user in component identification and parts re-ordering.

DRAWING

1	R600EA Overview, Component Identification
2	Front Undercarriage Assembly
3	Wheel Steering Spindle Assembly
4	Tow Bar Pivot Assembly
5	Rear Undercarriage
6	Rear Brake Assembly
7	Rear Hub and Drum Assembly
8	Front Hub Assembly

PUMPING SYSTEM OVERVIEW



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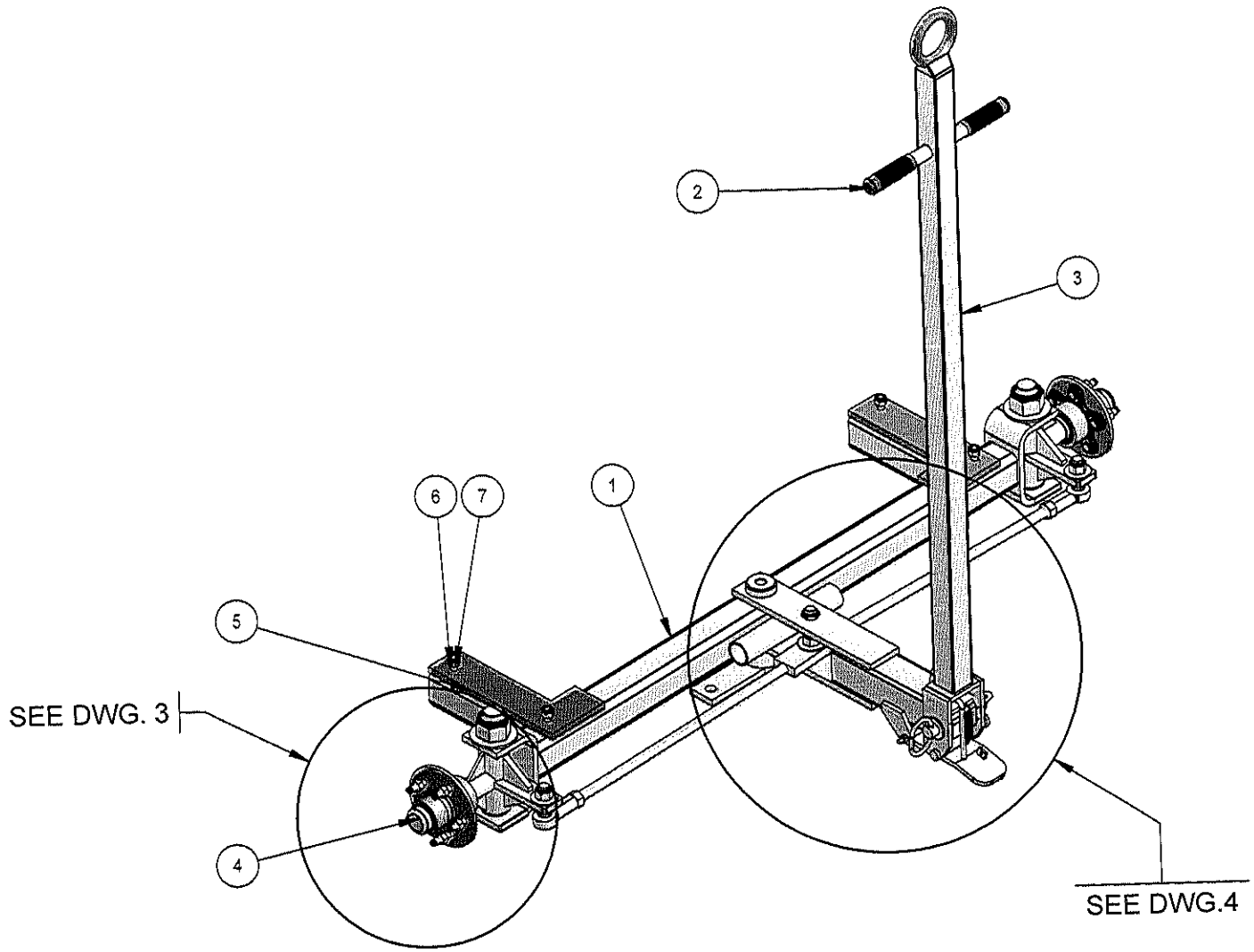

Parts List					
ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WT.
1	1	07-11071	FRONT AXLE	Steel, Mild	67.95
2	2	04-1055	HAND GRIP	Rubber	.05
3	1	07-1103	TOW BAR	VARIOUS	21.65
4	2	08-1011	FRONT HUB ASSEMBLY	VARIOUS	8.62
5	2	06-1023	PAD, MOUNTING	Rubber	.75
6	1	02-1501	HEX BOLT, 5/16-18 x 4 1/2" LG.	Steel, Mild	.11
7	6	02-12041	NUT, NYLON INSERT, 1/2" UNC	Steel, Mild	.05

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Tolerance:except as noted
x/x=± 1/8"
.xx=± .03"
.xxx=± .005"
ANG=± 1°

Drawn: AL

FRONT UNDERCARRIAGE ASSEMBLY
R600EA

PN: 08-1018A | DWG. #2

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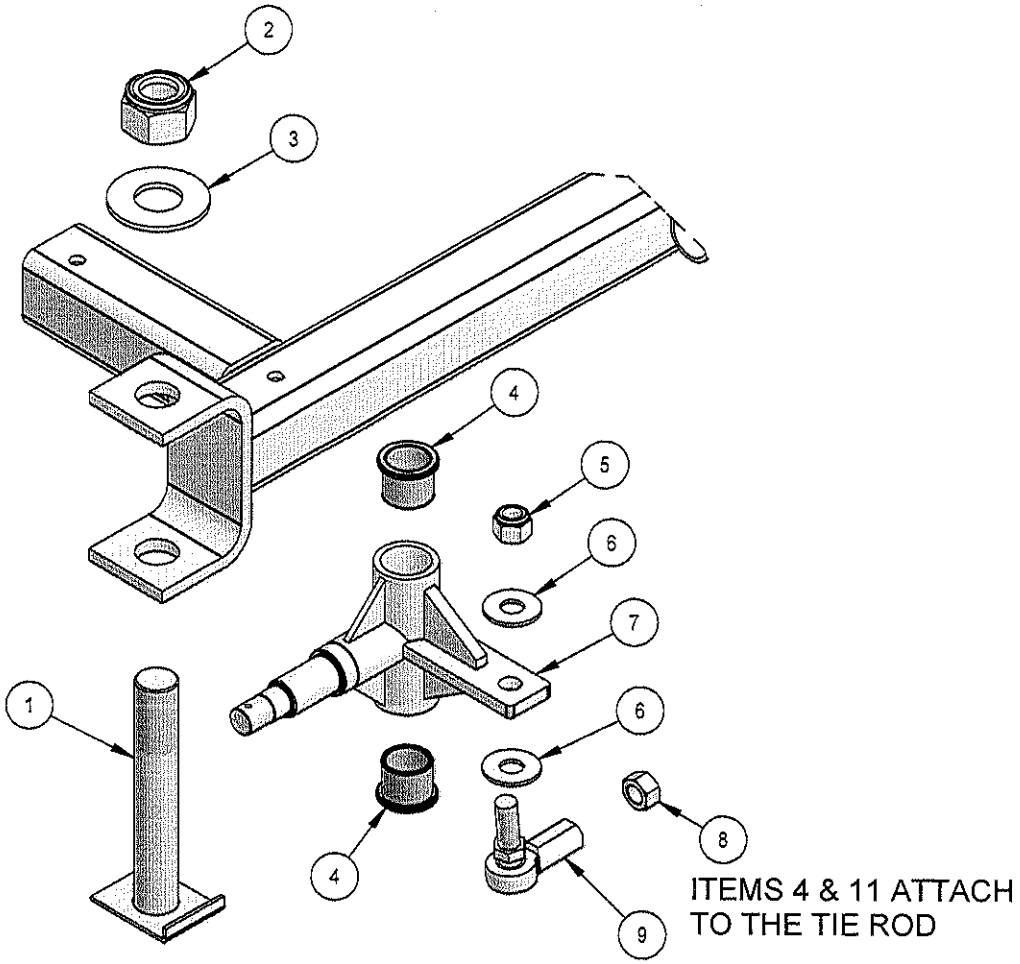

Parts List					
ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WT.
7	1	07-1009	HOUSING, KING PIN		8.17
1	1	07-10105	KING PIN		5.24
9	1	03-1016	ROD END, BALL JOINT		1.32
3	1	02-11131	WASHER, FLAT	Steel, Mild	.43
2	1	02-12131	NUT, NYLON INSERT	Steel, Mild	1.21
6	2	02-11072	FLATWASHER, 3/4"	Steel, Mild	.10
4	2	03-1013	BUSHING, KING PIN	Bronze	.36
5	1	02-12071	NUT, NYLON INSERT, 3/4-16 UNF	Steel, Mild	.17
8	1	02-12141	NUT, 3/4-16 UNF	Steel, Mild	.13

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ANG=± 1°

WHEEL STEERING SPINDLE ASSEMBLY R600EA

DWG. #3

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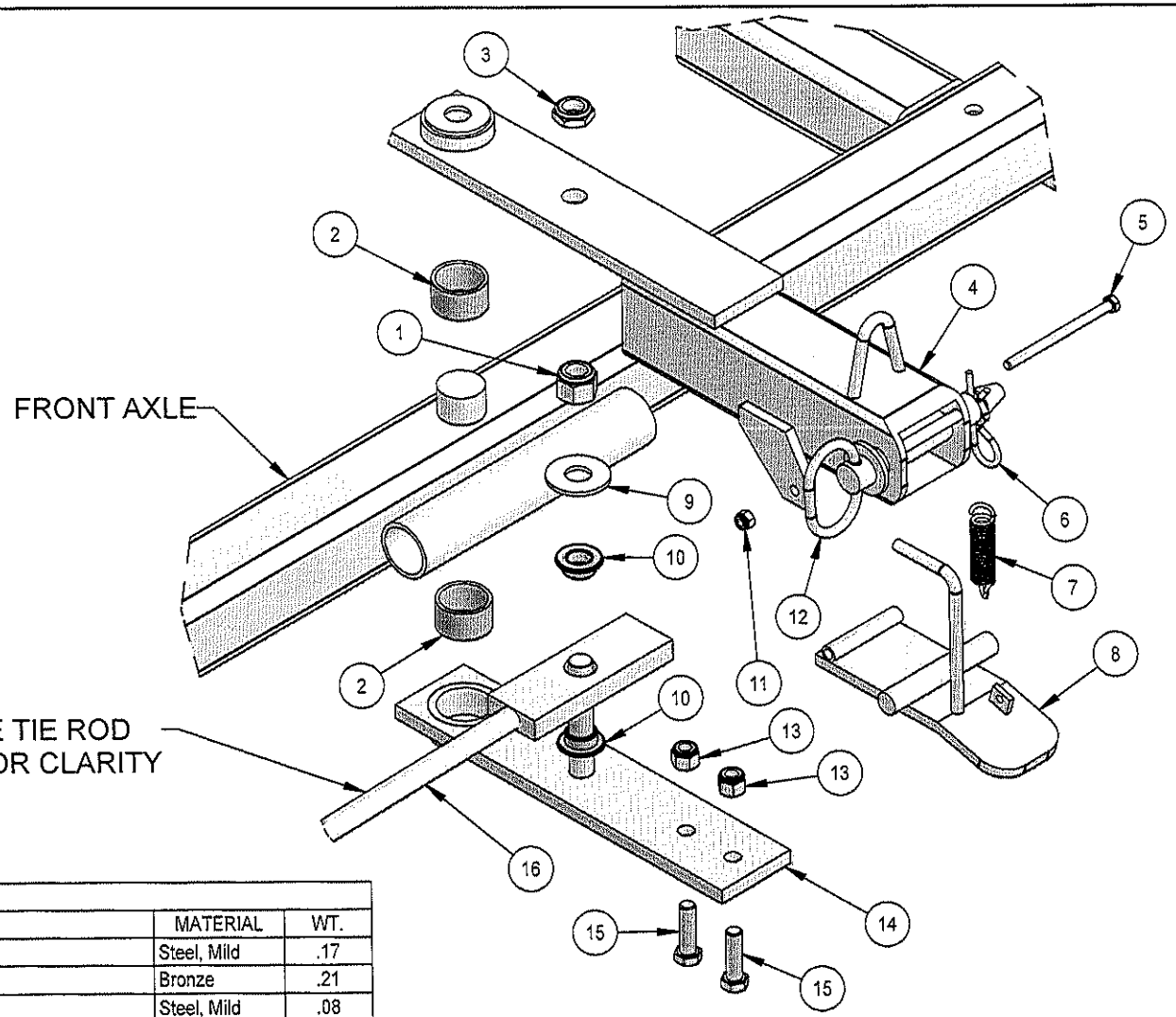

Parts List

ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WT.
1	1	02-12071	NUT, NYLON INSERT, 3/4-16 UNF	Steel, Mild	.17
2	2	03-1014	BUSHING, STEERING ARM	Bronze	.21
3	1	02-1207	JAM NUT, NYLON INSERT, 3/4-16 UNF	Steel, Mild	.08
4	1	07-1104	STEERING ARM		15.94
5	1	02-1501	HEX BOLT, 5/16-18 x 4 1/2" LG.	Steel, Mild	.11
6	1	02-1300	PIN, COTTER	Steel, Mild	.06
7	1	04-1054	SPRING	Steel, Mild	.12
8	1	07-1020	TOE LATCH		3.46
9	1	02-11072	FLATWASHER, 3/4"	Steel, Mild	.10
10	2	03-1015	BUSHING, TIE ROD	Bronze	.09
11	1	02-1201	NUT, NYLON INSERT, 5/16-18	Steel, Mild	.02
12	1	02-1304	HITCH PIN	Steel, Mild	1.59
13	2	02-12041	NUT, NYLON INSERT, 1/2" UNC	Steel, Mild	.06
14	1	07-1016	STEERING ARM, LOWER PLATE		6.57
15	2	02-1502	BOLT, 1/2-13 x 1 3/4" LG.	Steel, Mild	.14
16	1	07-1005	TIE ROD	Steel, Mild	

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Tolerance:except as noted
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TOW BAR PIVOT ASSEMBLY
R600EA

DWG. #4

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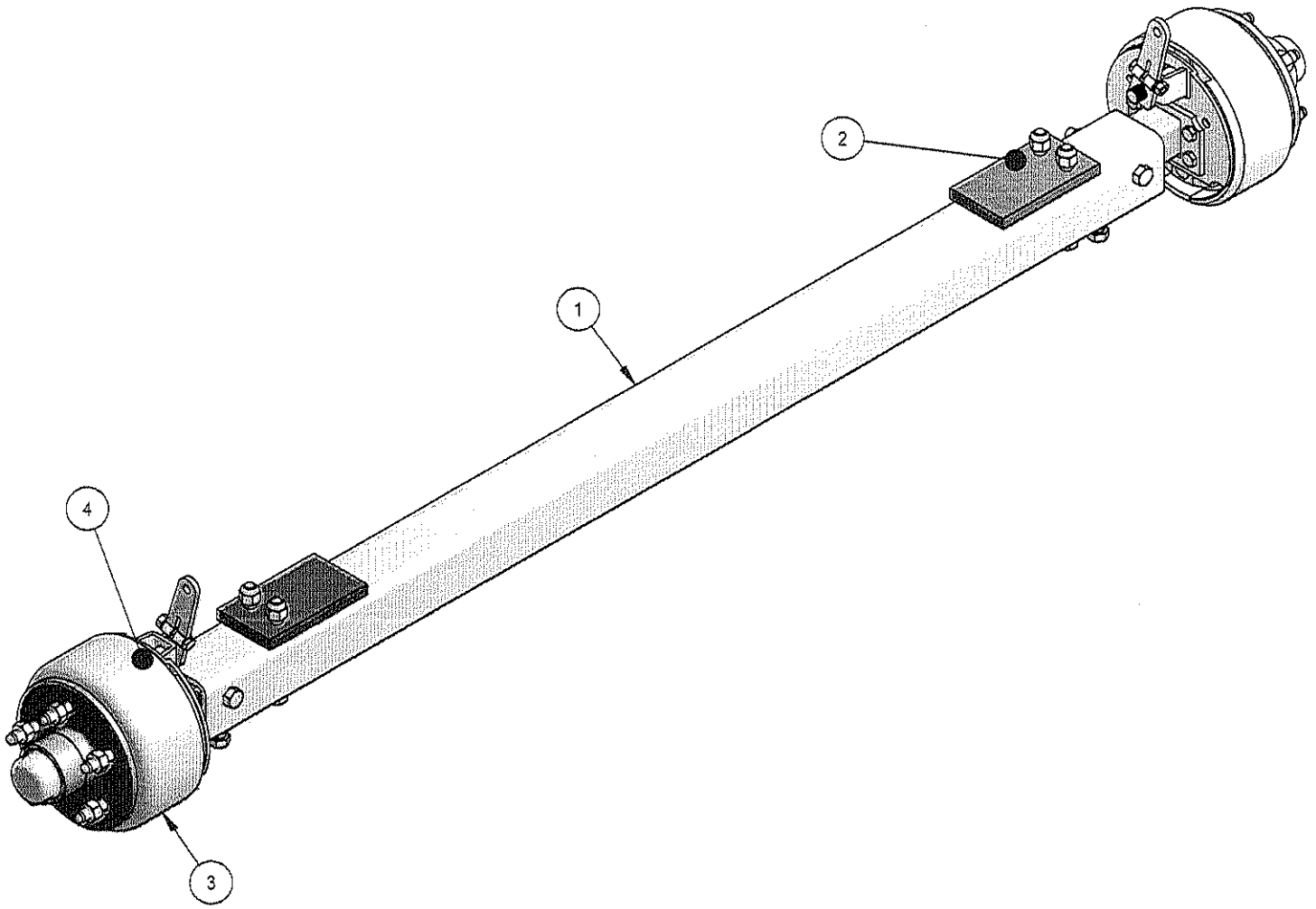

Parts List

ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WT.
1	1	08-10301	REAR AXLE ASSEMBLY		61.67
2	2	08-1007R	BRAKE ASSEMBLY SEE DWG. #6		5.23
3	2	08-10111	REAR HUB & DRUM ASSEMBLY SEE DWG. #7		15.09
4	2	06-1012	REAR MOUNT PAD	Rubber	.27

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Tolerance:except as noted
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ANG=± 1°

REAR UNDERCARRIAGE

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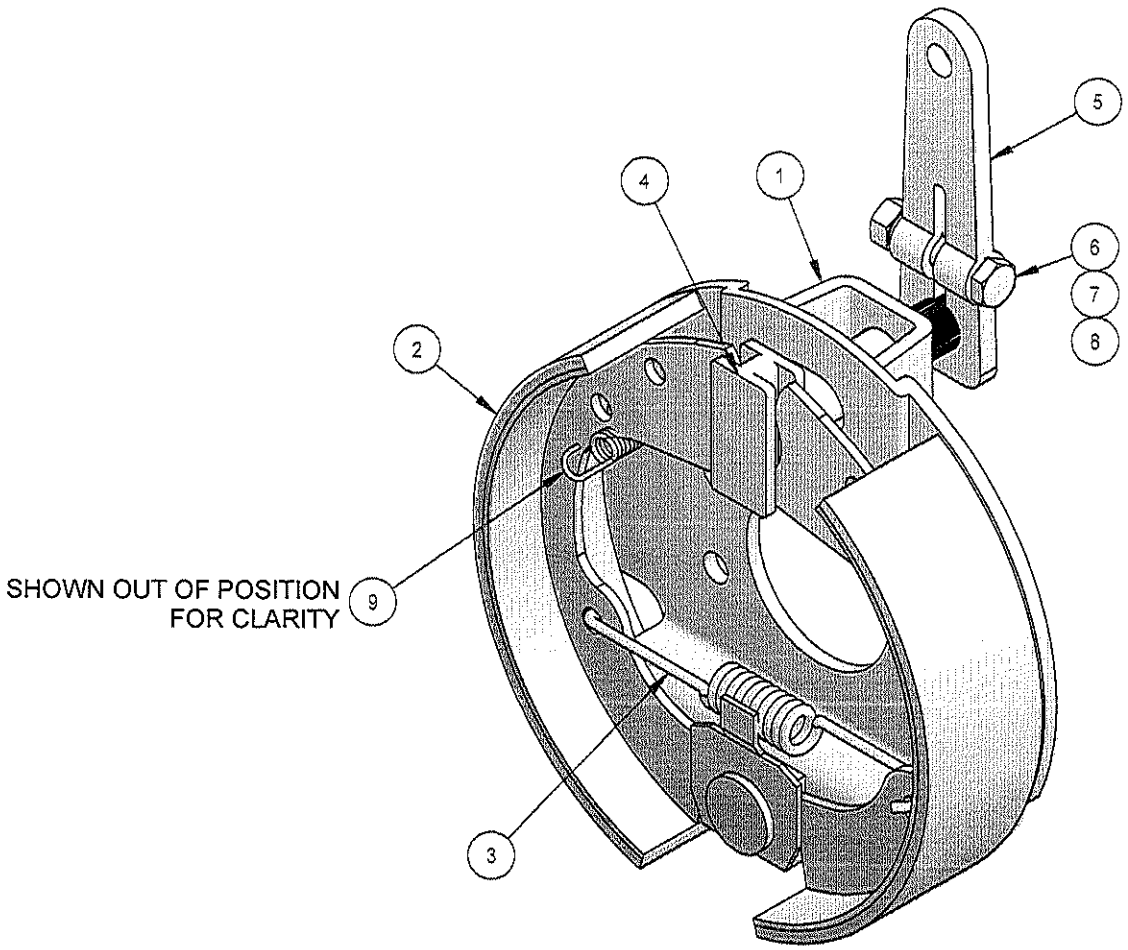

Parts List					
ITEM	QT	P.N.	DESCRIPTION	MATERIAL	WT.
1	1	04-1064R	BACK PLATE	Steel, Mild	2.11
2	2	04-1065R	BRAKE SHOE	Steel, Mild	1.12
3	1	04-10265R	RETURN SPRING	Steel, Mild	.06
4	1	04-1028R	CAM	Steel, Mild	.43
5	1	04-1030R	CAM LEVER	Steel, Mild	.32
6	1	02-10017R	HEX HEAD CAP SCREW, 5/16"-UNF 1 1/2" LG.	Steel, Mild	.05
7	1	02-12011	NUT, 5/16"-UNF GRADE 8	Steel, Mild	.01
8	1	02-11011	LOCK WASHER, 5/16"	Steel, Mild	.00
9	2	04-1026R	BRAKE SHOE HOLD DOWN SPRING	Steel, Mild	.01

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Tolerance:except as noted
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.xx=± .03"
.xxx=± .005"
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BRAKE ASSEMBLY

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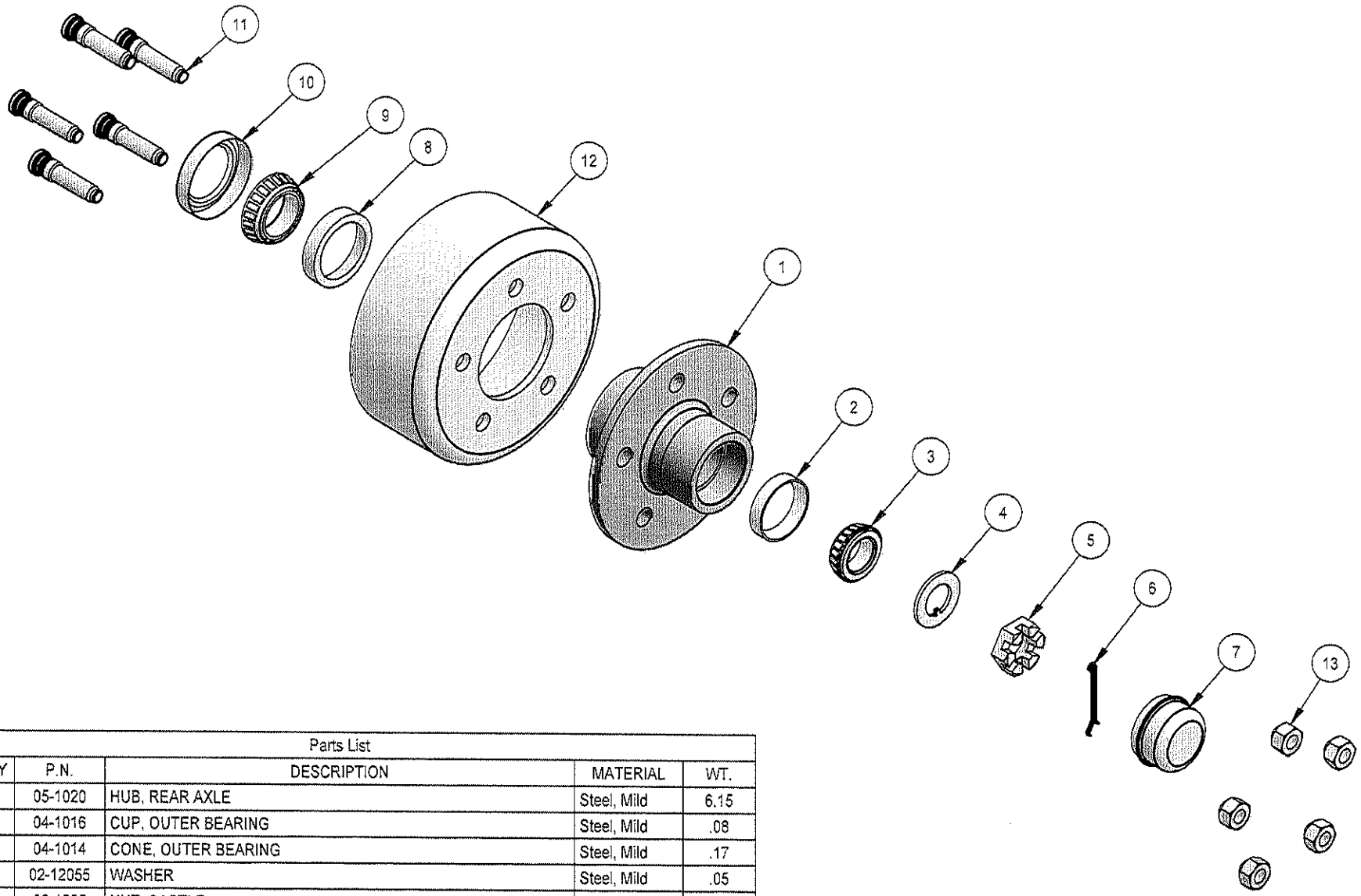


Parts List					
ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WT.
1	1	05-1020	HUB, REAR AXLE	Steel, Mild	6.15
2	1	04-1016	CUP, OUTER BEARING	Steel, Mild	.08
3	1	04-1014	CONE, OUTER BEARING	Steel, Mild	.17
4	1	02-12055	WASHER	Steel, Mild	.05
5	1	02-1205	NUT, CASTLE	Steel, Mild	.16
6	1	02-1303	PIN, COTTER	Steel, Mild	.01
7	1	04-1019	CAP, HUB	Steel, Mild	.10
8	1	04-1015	CUP, INNER BEARING	Steel, Mild	.18
9	1	04-1013	CONE, INNER BEARING	Steel, Mild	.24
10	1	04-1012	SEAL, BEARING	Steel, Mild	.04
11	5	02-1017	STUD	Steel, Mild	.16
12	1	05-1021	DRUM, BRAKE	Steel, Mild	6.80
13	5	04-1021	NUT, LUG	Steel, Mild	.06

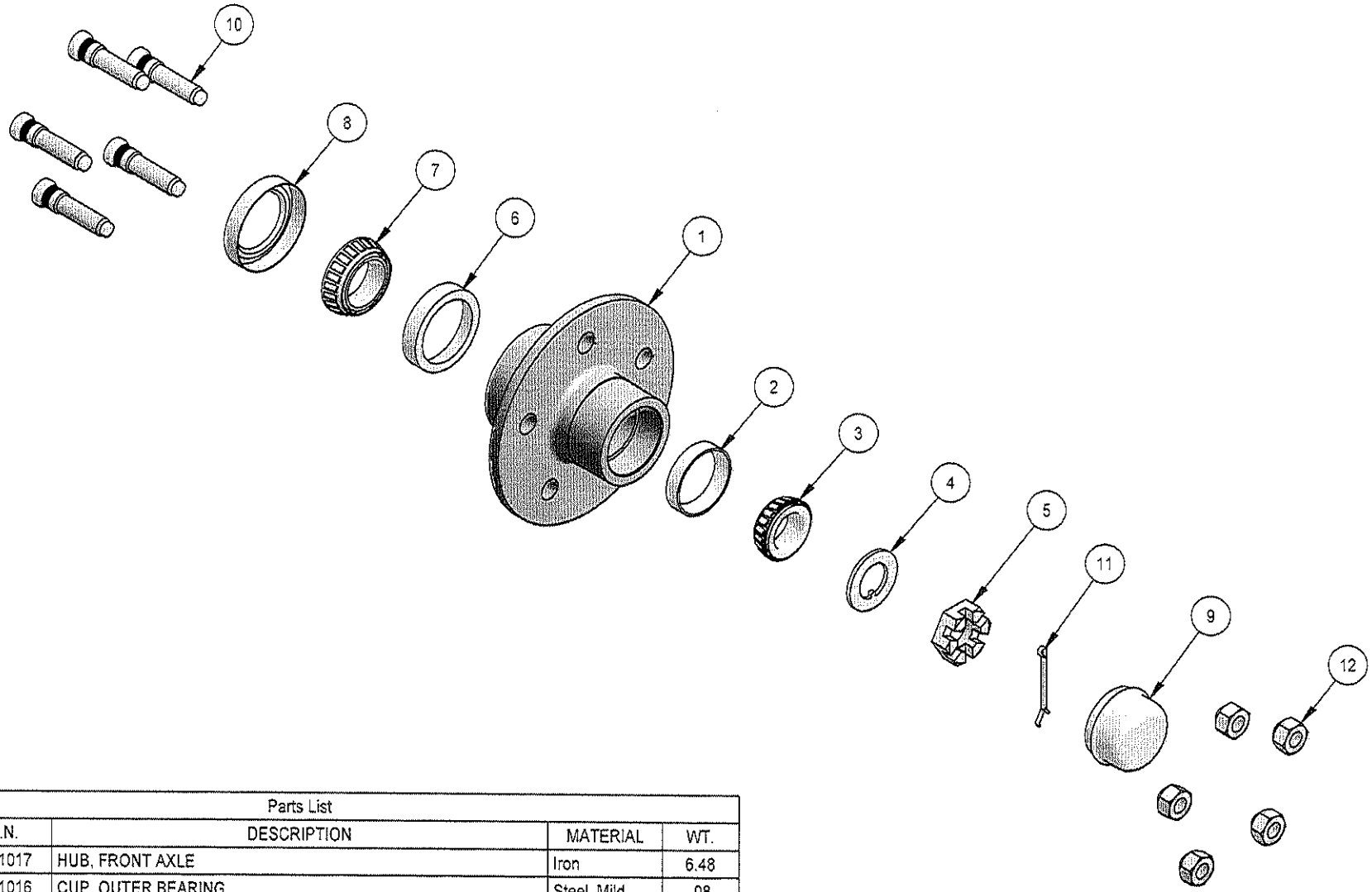
SPOKANE INDUSTRIES
PO Box 3303 Spokane, WA. 99220 800-541-3601

Tolerance:except as noted
x/x=± 1/8"
.xx=± .03"
.xxx=± .005"
ANG=± 1°

REAR HUB & DRUM ASSEMBLY

PN: 08-10111 | DWG.# 7

Drawn: jay | Date:11/30/2005 | Size: A | Scale: NTS | Sheet 1 of 1



Parts List					
ITEM	QTY	P.N.	DESCRIPTION	MATERIAL	WT.
1	1	04-1017	HUB, FRONT AXLE	Iron	6.48
2	1	04-1016	CUP, OUTER BEARING	Steel, Mild	.08
3	1	04-1014	CONE, OUTER BEARING	Steel, Mild	.17
4	1	02-12055	WASHER	Steel, Mild	.05
5	1	02-1205	NUT, CASTLE	Steel, Mild	.16
6	1	04-1015	CUP, INNER BEARING	Steel, Mild	.18
7	1	04-1013	CONE, INNER BEARING	Steel, Mild	.24
8	1	04-1012	SEAL, BEARING	Steel, Mild	.04
9	1	04-1019	CAP, HUB	Steel, Mild	.10
10	5	02-1017	STUD	Steel, Mild	.16
11	1	02-1303	PIN, COTTER	Steel, Mild	.01
12	5	04-1021	NUT, LUG	Steel, Mild	.06

SPOKANE INDUSTRIES
PO Box 3303 Spokane, WA. 99220 800-541-3601

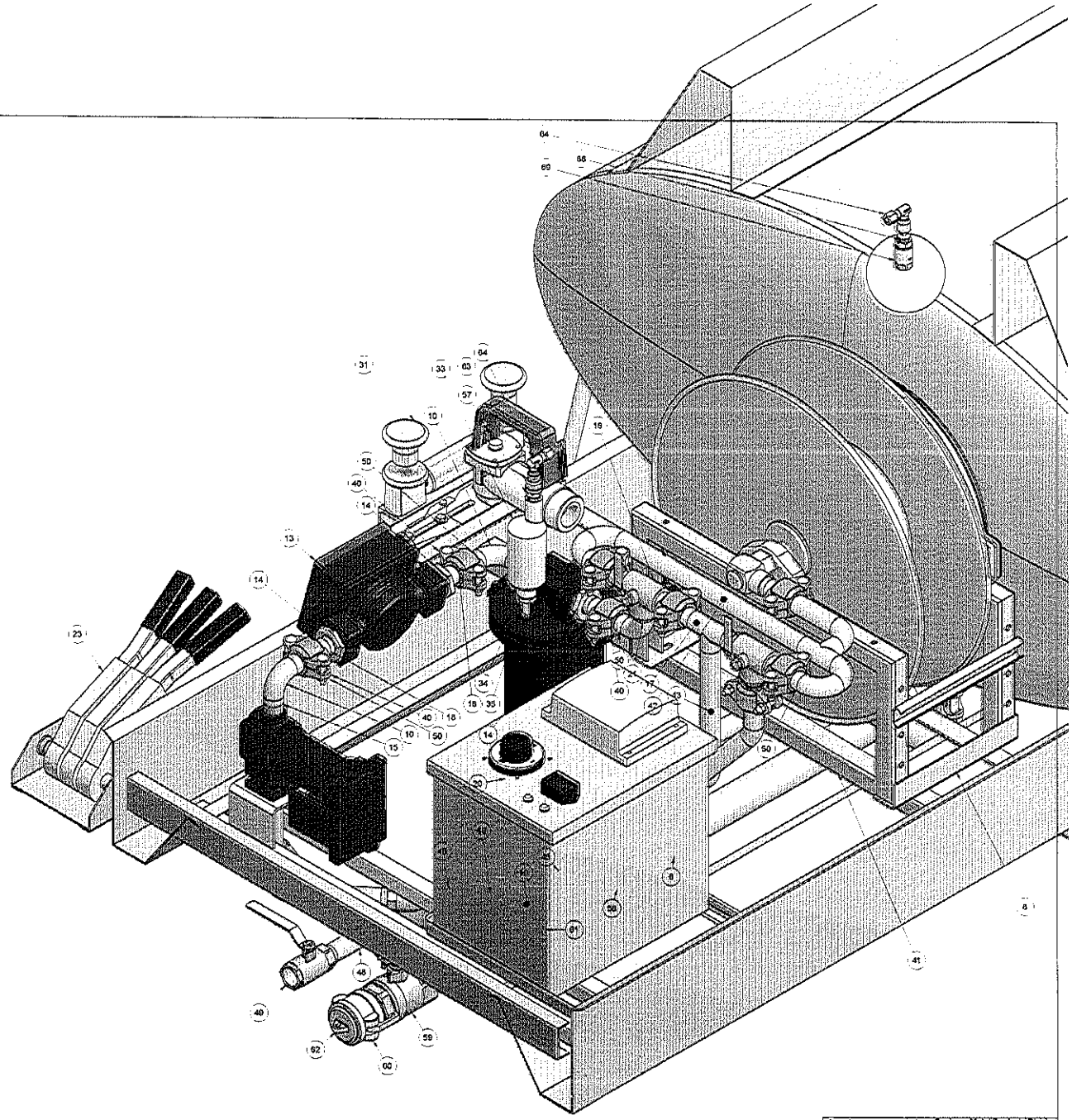
Tolerance:except as noted
x/x=± 1/8"
.xx=± .03"
.xxx=± .005"
ANG=± 1°

FRONT HUB ASSEMBLY

PN: 08-1011 | DWG. #8

Drawn: jay | Date:10/18/2005 | Size: A | Scale: NTS | Sheet 1 of 1

Manufacturers Product manuals sent with User's Manual	DATE	Initials
DOD/ACRE R600EA		
Spokane House of Hose, Refueling Hose, Test Certificate	15-Dec-06	DMS
Hannay Hose Reel "Guarantee" (Copy)	15-Dec-06	DMS
Hannay Hose Reel Safety Guidelines (Copy)	15-Dec-06	DMS
Hannay Hose Reel Parts Breakdown, Series 800 (Copy)	15-Dec-06	DMS
Fill-Rite Manual, Series 900	15-Dec-06	DMS
Static Grounding Reel, Installation & Operation, P/N 922-30-028, Original	15-Dec-06	DMS
OPW 295 Series Hose Nozzle (Copy)	15-Dec-06	DMS
GUEST, 10 Amp, Marine Battery Charger Owners Manual	15-Dec-06	DMS
GUEST, 10 Amp, Marine Battery Charger Installation Manual	15-Dec-06	DMS
Static Cable Reel Manual sheet	15-Dec-06	DMS

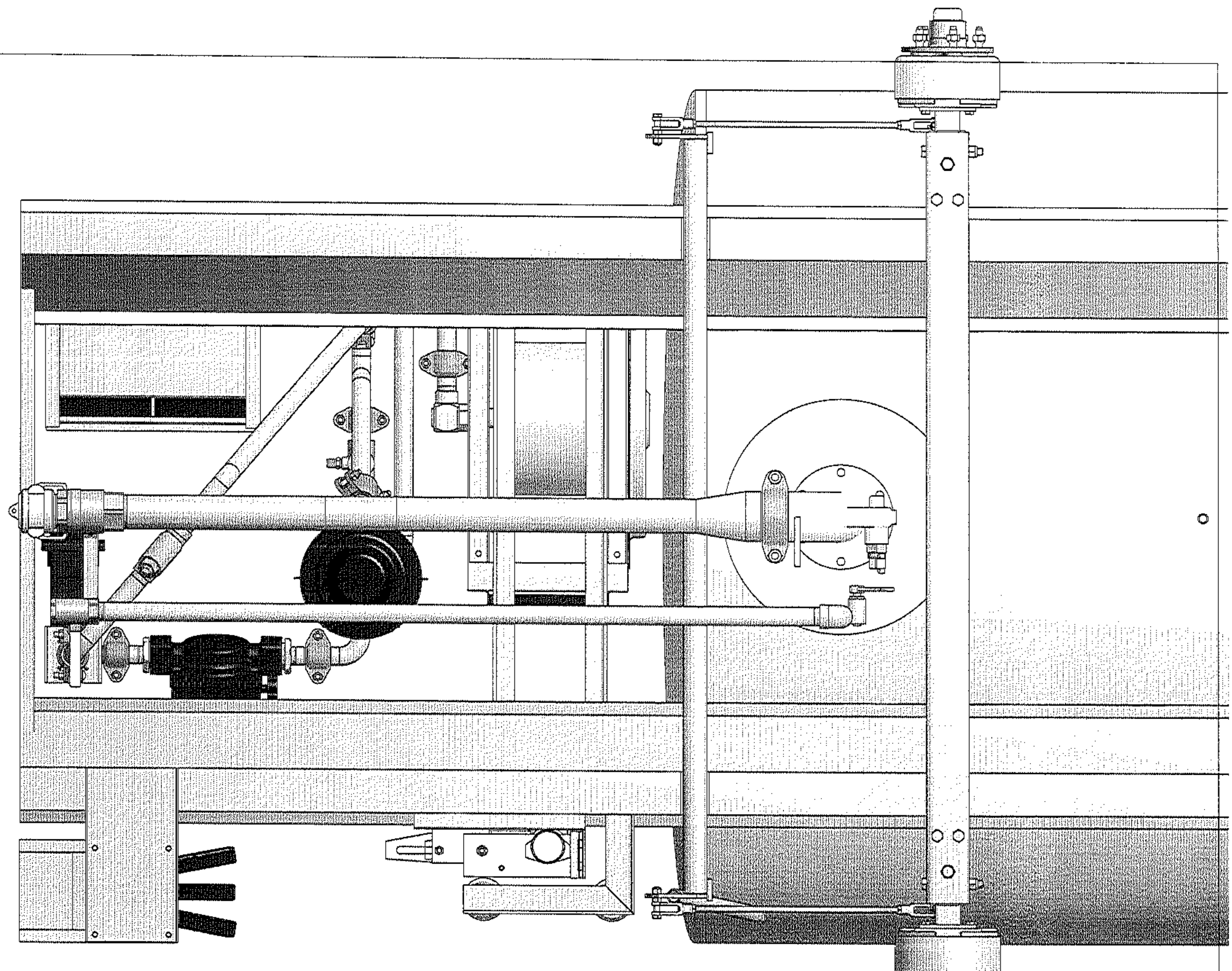


ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	MASS
			Parts List		
74	1	roller mount mount		Stainless Steel	1.33
73	1	roller mount angle		Stainless Steel	2.36
72	3	belt mount angle		Stainless Steel	1.93
71	1	operator mount	OPERATOR MOUNT, .105" THK x 12" LG.	Stainless Steel	3.04
70	1	03-21301	3" VICTAULIC #75 CLAMP W/BUNA SEAL		3.11
69	1	P.D.	CHECK VALVE, 3/8"	Stainless Steel	.36
68	1	P.D.	CLOSE NIPPLE, 3/8"	Stainless Steel	.04
67	1	pump box			114.65
66	1	01-93018	HALF-NIPPLE, 1" x 4 1/2" LG.	Stainless Steel	.63
65	1	01-933118	1" SCH-10 PIPE 4 1/2" LG. GROOVE ONE END	Stainless Steel	.61
64	2	P.D.	ELBOW, 3/8" MNPT x 3/8" COMPRESSION	Stainless Steel	.16
63	1	P.D.	BELL REDUCER, 1/2" x 3/8"	Stainless Steel	.12
62	1	04-10334	CAMLOCK PLUG, 2"	Aluminum	.47
61	1	01-924075	PIPE, 2" SCH-40 x 15" LG. TOE	Stainless Steel	4.69
60	1	04-10333	CAMLOCK, 2" MNPT x 2" FCL	Aluminum	.86
59	1	04-10318	2" LOCKING HANDLE BALL VALVE		6.57
58	1	03-100765	TEE, 2" x 1" SCH-10	Stainless Steel	1.28
57	1	Check valve 1_2	CHECK VALVE, 1/2"	Stainless Steel	.24
56	2	3_8 x 1.5 HHCS	HHCS, 3/8" x 1 1/2" lg.	Stainless Steel	.07
55	2	02-1202	NUT, NYLON INSERT 3/8" UNC	Stainless Steel	.03
54	2	STOCK	WASHER, 3/8"	Stainless Steel	.01
53	1	STOCK	BOLT, 1/4" x 1" LG.	Stainless Steel	.02
52	2	LOCK STOP	LOCK STOP, 18 GA. 3" x 6" LG.	Stainless Steel	.33
51	1	bearing mount	BEARING MOUNT, 1/4" THK. 2 3/8" x 4" LG.	Stainless Steel	.68
50	8	01-933115	1" SCH-10 PIPE 1 1/2" LG. GROOVE ONE END	Stainless Steel	.19
49	1	P.D.	1" LOCKING HANDLE BALL VALVE		1.30
48	1	water drain pipe	PIPE, 1" SCH-40 x 52" LG. TBE	Stainless Steel	7.47
47	1	04-2523	1" LOW POINT DRAIN VALVE		3.75
46	1	04-4200	STRAINER, Y, 1"	Brass	3.08
45	1	1 pipe 19.241	PIPE, 1" SCH-40 x APPROPRIATE LENGTH	Stainless Steel	2.32
44	1	01-933115	1" SCH-10 PIPE 2 1/2" LG GROOVE ONE END	Stainless Steel	.30
43	1	1 pipe 9.307	PIPE, 1" SCH-10 x APPROPRIATE LENGTH	Stainless Steel	1.13
42	1	manifold rear cross	1" SCH-10 x	Stainless Steel	2.09
41	2	01-94305	ANGLE, 1 1/2" x 1/4" x 41 3/4" LG.	Stainless Steel	8.44
40	10	03-21101	1" VICTAULIC #75 CLAMP W/BUNA SEAL		.22
39	1	03-900015	HALF-COUPLING, 1"	Stainless Steel	.14
38	1	pump bracket		Stainless Steel	1.97
37	2	1.25 sq tube 36 lg		Default	.58
36	1	battery box			75.02
35	1	P.D.	FULL NIPPLE, 1/4" x 2" LG.	Stainless Steel	.07
34	1	03-101415	BUSHING, 3/4" x 1/4"	Stainless Steel	.17
33	1	P.D.	AIR ELIMINATOR, 11 AV	Default	.14
32	1	P.D.	HINGE, SPRING LOADED		.00
31	1	04-2230	CHROME ROLLER HOSE GUIDE		9.66
30	2	P.D.	NYLON WASHER,	UHMW, White	.00
29	2	P.D.	FLANGE BEARING, 3/8"	Nylon-6/6	.00
27	2	01-94106	ANGLE, 1" x 1/8" x 3 3/8" LG.	Stainless Steel	.23
26	2	lock block	NOZZLE LOCKING BLOCK	Aluminum	.40
25	1	base	MOUNTING BASE, .105" THK.	Stainless Steel	1.73
24	1	04-1260	NOZZLE, OPW 295		3.54
23	1	04-25225	3-HANDLE OPERATOR		9.45
22	3	01-93016	1" HALF-NIPPLE 2" LG. GROOVE ONE END	Stainless Steel	.24
21	1	01-93015	1" HALF-NIPPLE, 1" LG.	Stainless Steel	.12
20	1	04-0240	FILTER HOUSING, FACET VF-22-PU15		31.00
19	4	03-100535	ELBOW, 1" SCH-10 45 DEGREE	Stainless Steel	.14
18	5	01-93318	1" HALF-NIPPLE x 2 1/2" LG. GROOVE ONE END	Stainless Steel	.31
17	2	03-100720	TEE, 1" SCH-10 BW	Stainless Steel	.45
16	2	04-10311	1" 3-WAY BALL VALVE		1.75
15	3	03-025213	HALF-NIPPLE, 1" x 1 1/2" LG.	Stainless Steel	.19
14	4	03-10145	BUSHING, 1 1/2" x 1"	Stainless Steel	.59
13	1	8011.5 rotated	FILL-RITE 901 METER		6.07
12	1	01-93313	1" HALF-NIPPLE, 5" LG. GROOVE ONE END	Stainless Steel	.65
11	1	01-933118	1" SCH-10 PIPE x APPROPRIATE LENGTH GROOVE ONE END	Stainless Steel	1.47
10	9	03-100528	ELBOW, 1" SCH-10 90 DEGREE BW	Stainless Steel	.27
9	1	01-93316	1" HALF-NIPPLE 6 1/2" LG.	Stainless Steel	.86
8	1	04-2224	900 SERIES HOSE REEL, 618-25-295		71.45
7	1	04-0174	PUMP, 12 VOLT FILL-RITE		43.49
6	1	01-924075	PIPE, 2" SCH-10 x 21 1/16" LG.	Stainless Steel	4.77
5	1	03-11135	REDUCER, ECCENTRIC, 3" x 2"	Stainless Steel	.99
4	1	01-924595	3" SCH-10 2" LG. GROOVE ONE END	Stainless Steel	.68
3	1	04-2524	3" EMERGENCY VALVE		7.72
2	1	08-10102	REAR UNDERCARRIAGE		126.01
1	1	tank weldment			660.06

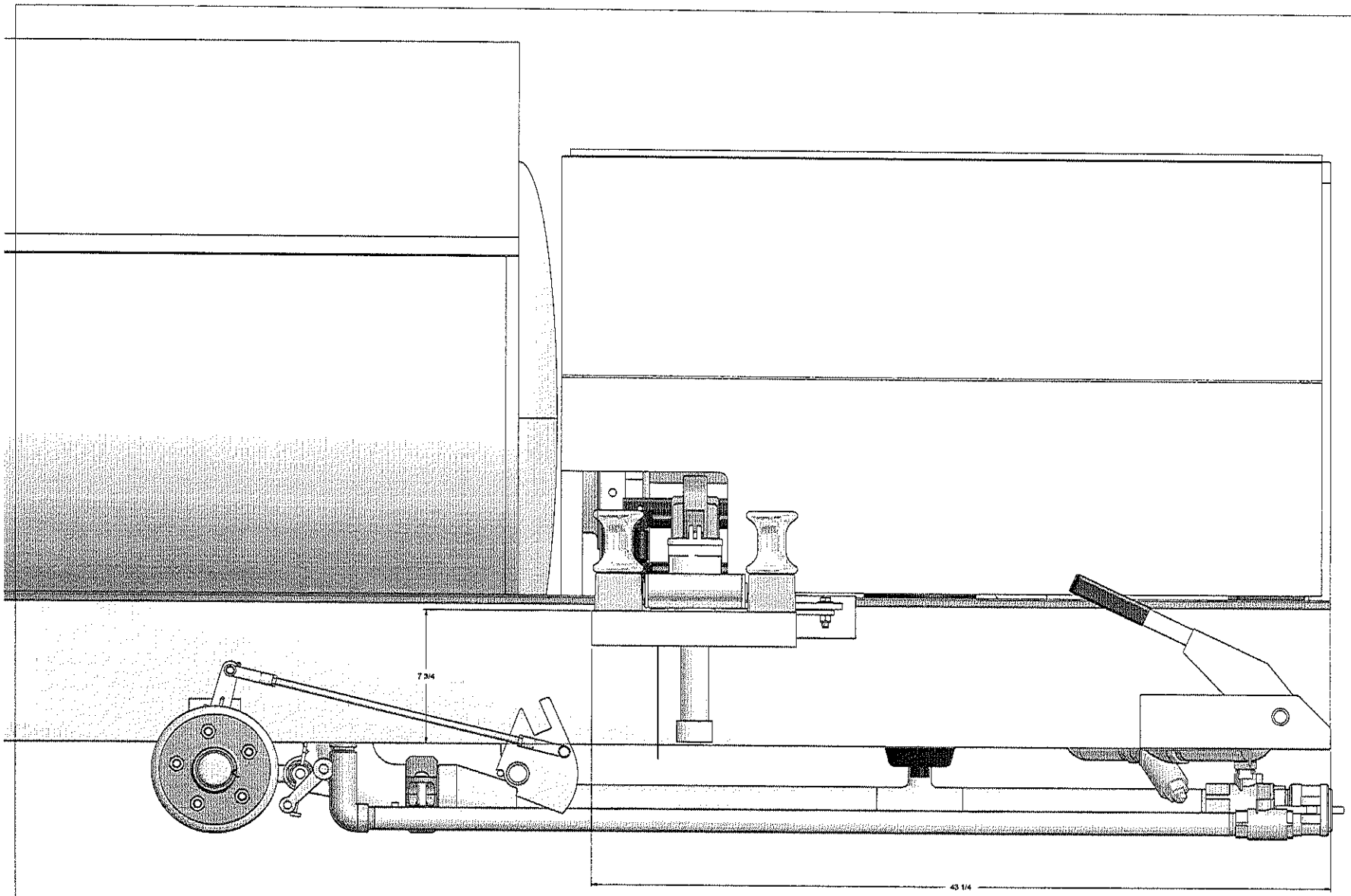
Spokane Industries — Spokane Metal Products Division

PN: 0776 Rev:

Drawn: Jay Size: A Scale: NTS Sheet: 1 of 1



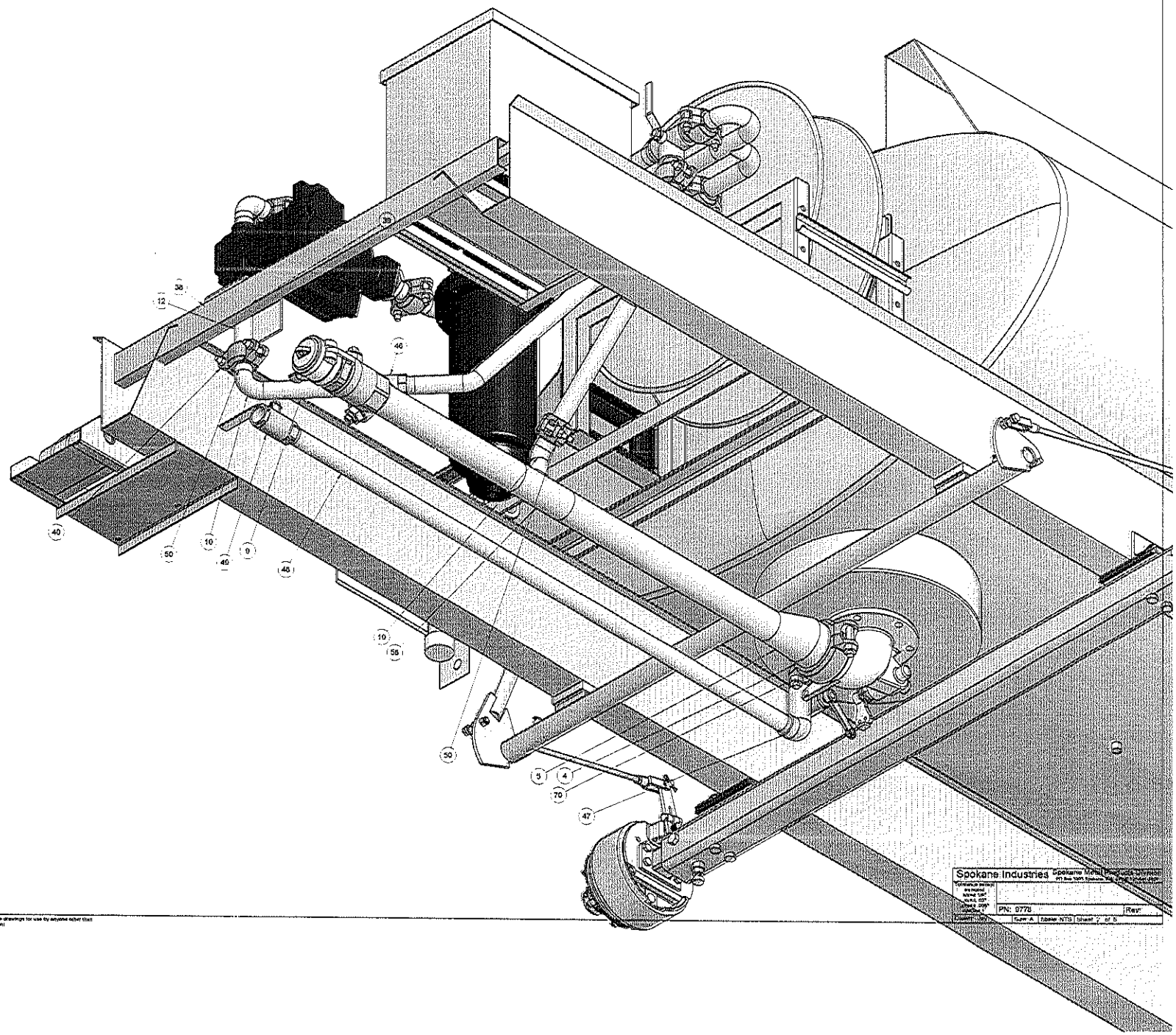
Spokane Industries	Spokane Metal Products Division	
	PN: 9778	Rev:
Drawn: Jay	Size A Scale NTS	Sheet 4 of 5



Spokane Industries Spokane Metal Products Division
PO Box 1103 Spokane, WA 99210-1103

PN: 9775 Rev:

Drawn: Jay | Size: A | Scale: NTS | Sheet: 1 of 1



Spokane Industries — Spokane Metal Products Division

PN: 9778 — Rev:

Size: A | Scale: NTS | Sheet 1 of 5

SPOKANE HOUSE OF HOSE, INC.

Aircraft Refueling Hose

TEST CERTIFICATION

This AIRCRAFT REFUELING hose meets API Bulletin 1529 - 5th edition, and 1998 and N.F.P.A. Bulletin 407

CUSTOMER:	Spokane Metal Products	
ASSEMBLY SERIAL NO.	HH-062306-A / #87755	
HOSE SPECIFICATION:	Goodyear Wingcraft	
HOSE I.D.	1"	
WORKING PRESSURE:	300 psi	
TEST PRESSURE:	600 psi	
TYPE OF COUPLING:	H521-2 w/1BSCO b/e	
MEGA OHM READING (M.R.)	.060 (Mega Ohms)	Reading in Mega Ohms
ASSEMBLY LENGTH:	35'	Length in Feet
COVER RESISTANCE	.005623 (Mega Ohms per Meter)	(Reading/Length) x 3.28
ASSEMBLED DATE:	6/23/2006	
DATE OF TEST:	6/23/2006	

THIS HOSE ASSEMBLY WAS HYDROSTATICALLY TESTED TO 200% OF RECOMMENDED WORKING PRESSURE FOR 10 MINUTES AFTER COUPLINGS WERE ATTACHED.

SPOKANE HOUSE OF HOSE COUPLER

SPOKANE HOUSE OF HOSE, E.5520 SPRAGUE, SPOKANE, WA 99212

PH# 1-800-541-6351, LOCAL 535-3638, FAX# 1-800-541-4673

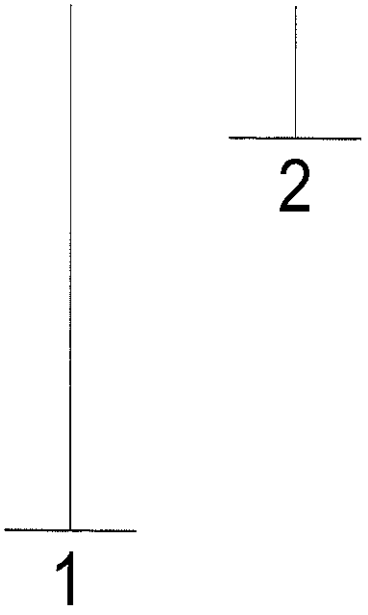
Manufacturers Product manuals sent with User's Manual	DATE	Initials
DOD/ACRE R600EA		
Spokane House of Hose, Refueling Hose, Test Certificate	15-Dec-06	DMS
Hannay Hose Reel "Guarantee" (Copy)	15-Dec-06	DMS
Hannay Hose Reel Safety Guidelines (Copy)	15-Dec-06	DMS
Hannay Hose Reel Parts Breakdown, Series 800 (Copy)	15-Dec-06	DMS
Fill-Rite Manual, Series 900	15-Dec-06	DMS
Static Grounding Reel, Installation & Operation, P/N 922-30-028, Original	15-Dec-06	DMS
OPW 295 Series Hose Nozzle (Copy)	15-Dec-06	DMS
GUEST, 10 Amp, Marine Battery Charger Owners Manual	15-Dec-06	DMS
GUEST, 10 Amp, Marine Battery Charger Installation Manual	15-Dec-06	DMS
Static Cable Reel Manual sheet	15-Dec-06	DMS

T-HANDLE POSITIONS FOR OPERATION

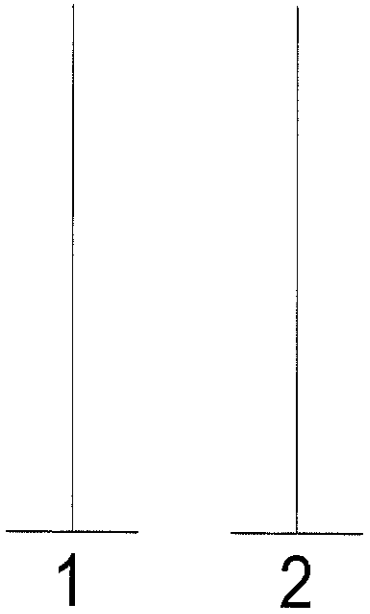
#1 SOURCE SELECTION VALVE
#2 DESTINATION VALVE

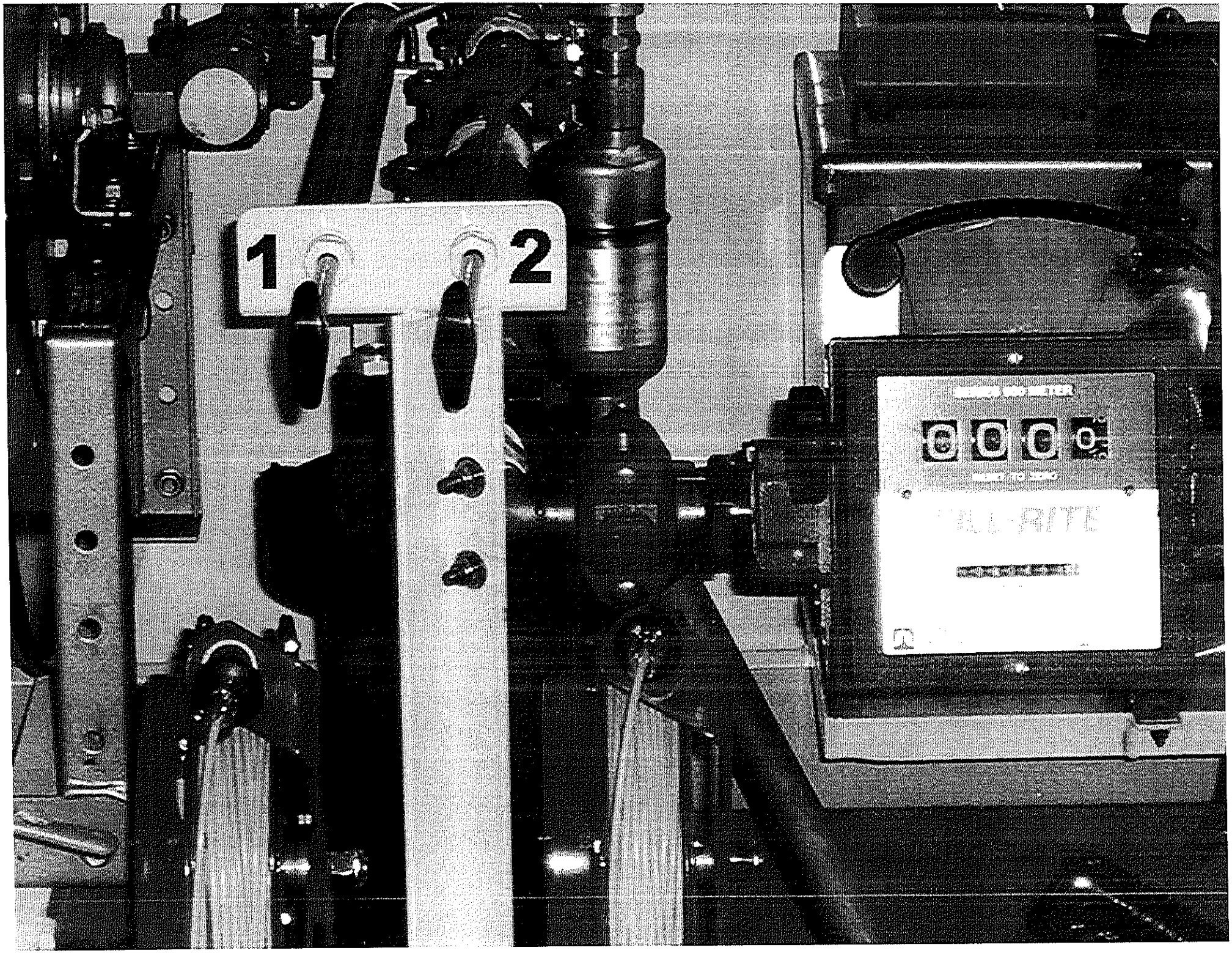
FROM TANK
TO HOSE REEL

BOTTOM FILL

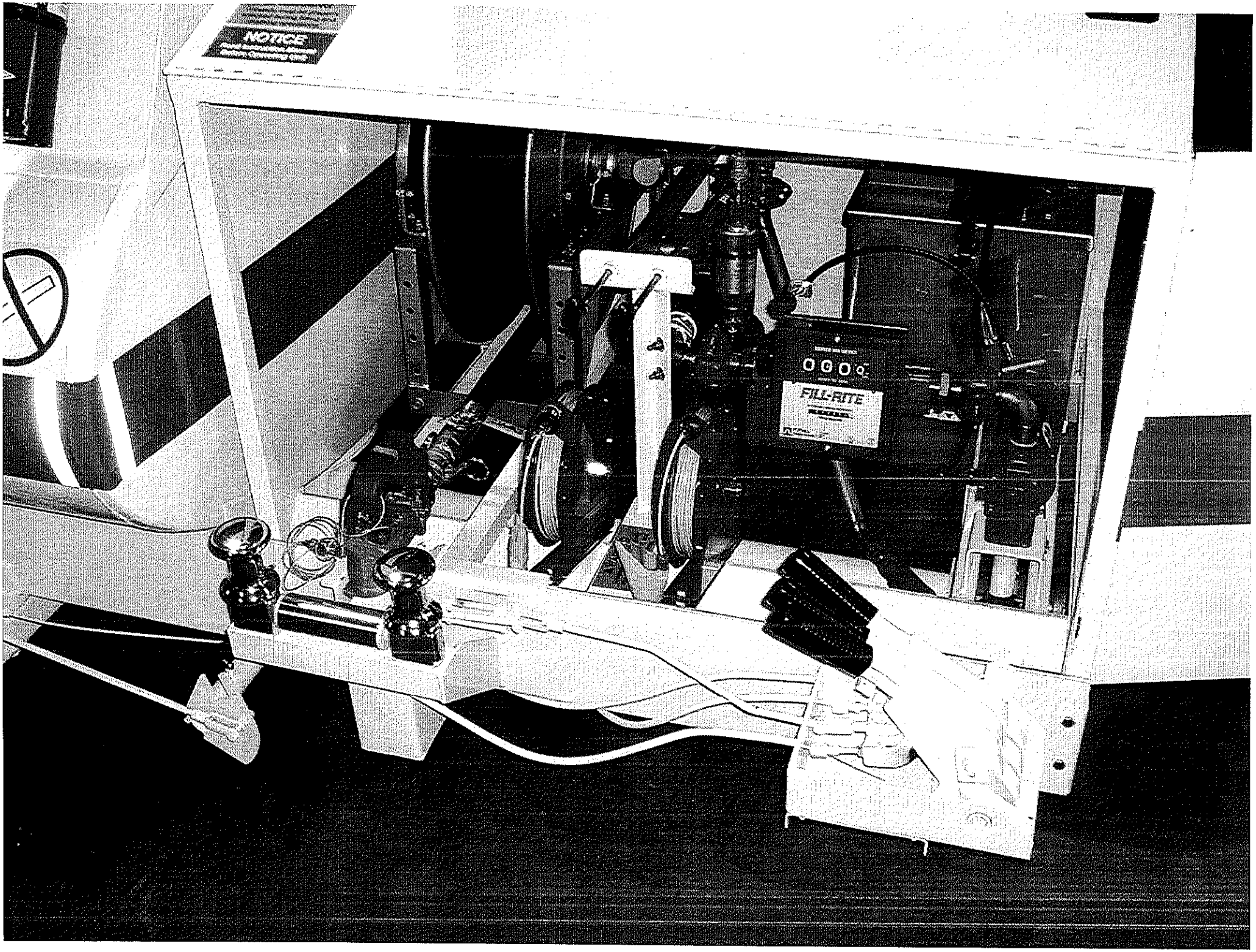


FROM HOSE REEL
TO TANK




1
2

20
12 Volt DC Pump


NOTICE
FILL-RITE