

# S P O K A N E M E T A L P R O D U C T S

## 200 GALLON FUEL BOWSER OPERATION AND MAINTENANCE MANUAL MODEL NUMBER BOW 200-03

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# S P O K A N E   M E T A L   P R O D U C T S

## 1.0 INTRODUCTION

- 1.1 To obtain optimum benefit from your fuel Bowser unit, it is recommended that all personnel operating it read and understand this manual prior to operation.
- 1.2 Upon receipt of Bowser unit a visual inspection should be made to determine that it is complete and has not sustained any damage during transportation.

## 2.0 SAFETY

### 2.1.0 Potential Fire or Explosion

- 2.1.1 Due to the nature of fuel, care should be exercised to eliminate all sparks and open flame in the area of the fuel Bowser.
- 2.1.2 A 50 foot radius area around the fuel bowser for no smoking, sparks, or open flames is usually a good practice. It is strongly recommended all local or other regulations be consulted for further restrictions.

### 2.2.0 Telescoping Drain

- 2.2.1 Care should be exercised in using the telescope to prevent crushing fingers between clamps by dropping sections.

### 2.3.0 Grounding

- 2.3.1 To eliminate static sparks the Bowser unit is equipped with two grounding reels which should be connected prior to draining or filling operations

### 2.4.0 Towing

- 2.4.1 Make sure the tow bar is securely attached to the towing vehicle.
- 2.4.2 Before moving the Bowser unit check to assure the parking brake is released.
- 2.4.3 Maximum allowable towing speed is 15 M.P.H.

### 2.5.0 Parking

- 2.5.1 Parking brake must be applied when filling and draining or when left unattended.

### 2.6.0 Air Supply

- 2.6.1 Caution: check the air pressure of supply lines to the vacuum generator to assure it is not in excess of 100 PSI.

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### 2.7.0 Inspections

- 2.7.1 Inspection of tires, under carriage, tow bar, vent, valves, hoses, sight gauge, reflectors, safety labels, etc., should be instituted at regular periodic basis. It is recommended these inspections be performed on a weekly basis.
- 2.7.2 Internal inspection will be necessary to insure structural integrity and cleanliness. It is recommended that interval inspections be performed at least every (6) six months. Caution! when entering confined spaces, such as the interior of the Bowser tank, care should be taken to provide proper breathing equipment and a separate person dedicated solely to a safety watch of the person inside. It is strongly recommended that all local or other regulations be consulted.

### 3.0 OPERATION

#### 3.1.0 Intended use

- 3.1.1 The fuel Bowser unit is intended for use in draining and collection of fuel from aircraft and the transportation to a disposal site. Any other use is prohibited and may void any and all warranties.

#### 3.2.0 Parking Brake

- 3.2.1 The Bowser unit is equipped with a mechanically operated parking brake. The brake should be applied prior to disengaging tow bar. The brake should be applied when filling, or draining tank, or whenever left unattended.

#### 3.3.0 Tow Bar and Undercarriage

- 3.3.1 The Bowser unit is equipped with steerable front wheels controlled by the tow bar.
- 3.3.2 Care should be taken to not jackknife the bowser when backing up.
- 3.3.3 Tire inflation should be checked and maintained as described in the maintenance section.
- 3.3.4 Before towing check to see the brake is disengaged, grounding reel and hoses are disconnected, valves are closed, tow bar is securely attached to the towing vehicle, telescoping drain is collapsed, and all manways and covers are closed and latched.
- 3.3.5 The Bowser unit is equipped with a tow bar latch to hold it in the upright position.

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### 3.4.0   Telescoping Drain Assembly

3.4.1   The fuel Bowser is equipped with a telescoping drain assembly. It is capable of being adjusted from 4'2" to 9'0" high.

#### 3.4.2.0 To Raise

3.4.2.1 Loosen top clamp if necessary.

3.4.2.2 Grasp top section with one hand and lift until the top clamp raises approximately 6 inches.

3.4.2.3 Tighten clamp securely with the other hand.

3.4.2.4 Reposition lifting hand grasping tube below clamp just tightened and lift until the next clamp is raised approximately 6 inches.

3.4.2.5 Repeat operations 3.4.2.2 and 3.4.2.4 until desired height is attained or assembly is fully extended.

#### 3.4.3   To Lower

3.4.3.1 Grasp bottom extended tube securely with one hand and loosen clamp holding it.

3.4.3.2 Slowly lower the extended sections, hand over hand, until the next clamp is resting on the lower clamp.

3.4.3.3 Repeat steps 3.4.3.1 and 3.4.3.2 until all sections are collapsed.

3.4.4   Funnel is equipped with nitrile rubber seal around top edge to allow placement against the under side of a wing.

3.4.5   When not in use telescope should be collapsed and the cover closed to eliminate contamination.

### 3.5.0   Vacuum Assembly

3.5.1   This assembly is equipped with an air powered vacuum generator.

3.5.2   It is intended for vacuum draining or depuddling fuel and condensation. Caution! if other objects such as rock or metallic pieces are vacuumed into the vacuum chamber they may create a hazard due to sparks.

3.5.3   Vacuum is started by attaching a recommended air supply of 60CFM at 100 PSI and turning on the air supply valve.

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- 3.5.5 The vacuum generator is equipped with an automatic overflow protector. When the level of product is full, the valve shuts off and eliminates the vacuum. The vacuum chamber will then automatically drain. The air supply must be shut off to reset the overflow valve. Vacuuming may then continue.
- 3.5.6 The vacuum assembly is supplied with 50 feet of vacuum hose, and ball valve on vacuum suction.
- 3.5.7 The vacuum assembly is equipped with (4) ea 1/2" NPT opening for use with pencil drains. To use the pipe caps must be removed and self-closing quick disconnects attached that match local standards. To operate close vacuum suction valve and turn air supply on and connect drain lines.
- 3.6.0 Grounding Reels
  - 3.6.1 The Bowser unit is supplied with two grounding reels.
  - 3.6.2 Before filling, draining, or vacuuming, the grounding reels must be attached to the aircraft or object being serviced and an appropriate ground.
- 3.7.0 Drain Valves
  - 3.7.1 The Bowser unit is equipped with a 1 1/2" NPT ball valve with a camlock connector.
- 3.8.0 Sample Port
  - 3.8.1 The bowser unit is equipped with an 1/2" NPT valve for use as a sample port.
- 4.0 MAINTENANCE
  - 4.1.0 Parking Brake
    - 4.1.1 The Bowser unit is equipped with a parking brake assembly consisting of a 7" diameter brake drum with 2 1/4" wide brake shoes.
    - 4.1.2 The shoes are activated via a mechanical linkage, eccentric and lever.
    - 4.1.3 Adjustment may be necessary as the shoes wear.

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- 4.1.3.1 Tightening is accomplished by removing bolt thru one yoke and screwing yoke in to shorten connecting rod.
- 4.1.3.2 Do not over tighten or brakes may drag when released.
- 4.1.4 Replacement of shoes.
  - 4.1.4.1 Remove wheel.
  - 4.1.4.2 Remove nut retaining hub and drum assembly.
  - 4.1.4.3 Disconnect actuating rod.
  - 4.1.4.4 Remove shoe retainers.
  - 4.1.4.5 Install new shoes.
  - 4.1.4.6 Replace shoe retainers.
  - 4.1.4.7 Adjust actuator rod length.
  - 4.1.4.8 Replace wheel.
- 4.2.0 Under Carriage and Tow Bar
  - 4.2.1 The Bowser unit is equipped with steerable front wheels, fixed rear wheels, and a tow bar.
  - 4.2.2 Maintenance should consist of the following.
    - 4.2.2.1 King pin bushings, turning arm bushings and tie rod ends are self lubricating and need no additional maintenance.
    - 4.2.2.2 Pack wheel bearing at intervals not to exceed three (3) months.
    - 4.2.2.3 Check tire pressure weekly. Pressure should be maintained at 28 psi.
  - 4.2.3 Tow bar pivot pin and hook ring should be inspected monthly for excessive wear or cracks.
- 4.3 Telescoping Drain Assembly consists of stainless steel housing 4" in diameter permanently attached to the tank and four (4) aluminum tube sections.
  - 4.3.1 The stainless tube and three largest aluminum tubes are equipped with a clamp assembly.
  - 4.3.2 Each clamp has a nylon clamp sleeve.
  - 4.3.3 Each aluminum tube is equipped with a stop sleeve crimped on the lower end which acts as a stop to prevent the tube from sliding thru the clamp.

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- 4.3.4    Disassembling of the telescope assembly is accomplished by removing the 4 screws holding the clamp sleeve in the clamp. After removal of the clamp sleeve the stop sleeve will slide through the clamp.

### 4.4   Vacuum Assembly

- 4.4.1    The vacuum assembly consists of a vacuum chamber with an air powered vacuum generator mounted on a removable cover. The cover is held in place by three (3) eccentric latches.
- 4.4.3    The vacuum cover is equipped with an overflow valve which should require no maintenance.
- 4.4.4    The vacuum generator is attached to the chamber cover. It is equipped with an exhaust silencer which should be cleaned at six (6) month intervals or more often depending on the amount of use and conditions.
- 4.4.5    The vacuum hose should be inspected monthly for cracks. Any sudden loss of vacuum suction power may indicate a crack in the vacuum hose.
- 4.4.6    The cover gasket should be inspected monthly for deterioration. This gasket should be soft, pliable and free from weather checking.

### 4.5   Grounding Reels

- 4.5.1    Grounding reel cables should be pulled out, cleaned and inspected monthly.
- 4.5.2    Cable clamps and ends should be inspected for loose connections monthly.

### 4.6   Sight Gauge

- 4.6.1    The sight gauge should be inspected monthly for loose connections and weathering of clear tubing.

## 5.0   REPLACEMENT PARTS

This Section provides information for identification of parts for ordering. To order, it is important to have the Model Number, Sub-assembly Number, Part Number and Description. Parts may be ordered by calling or writing to:

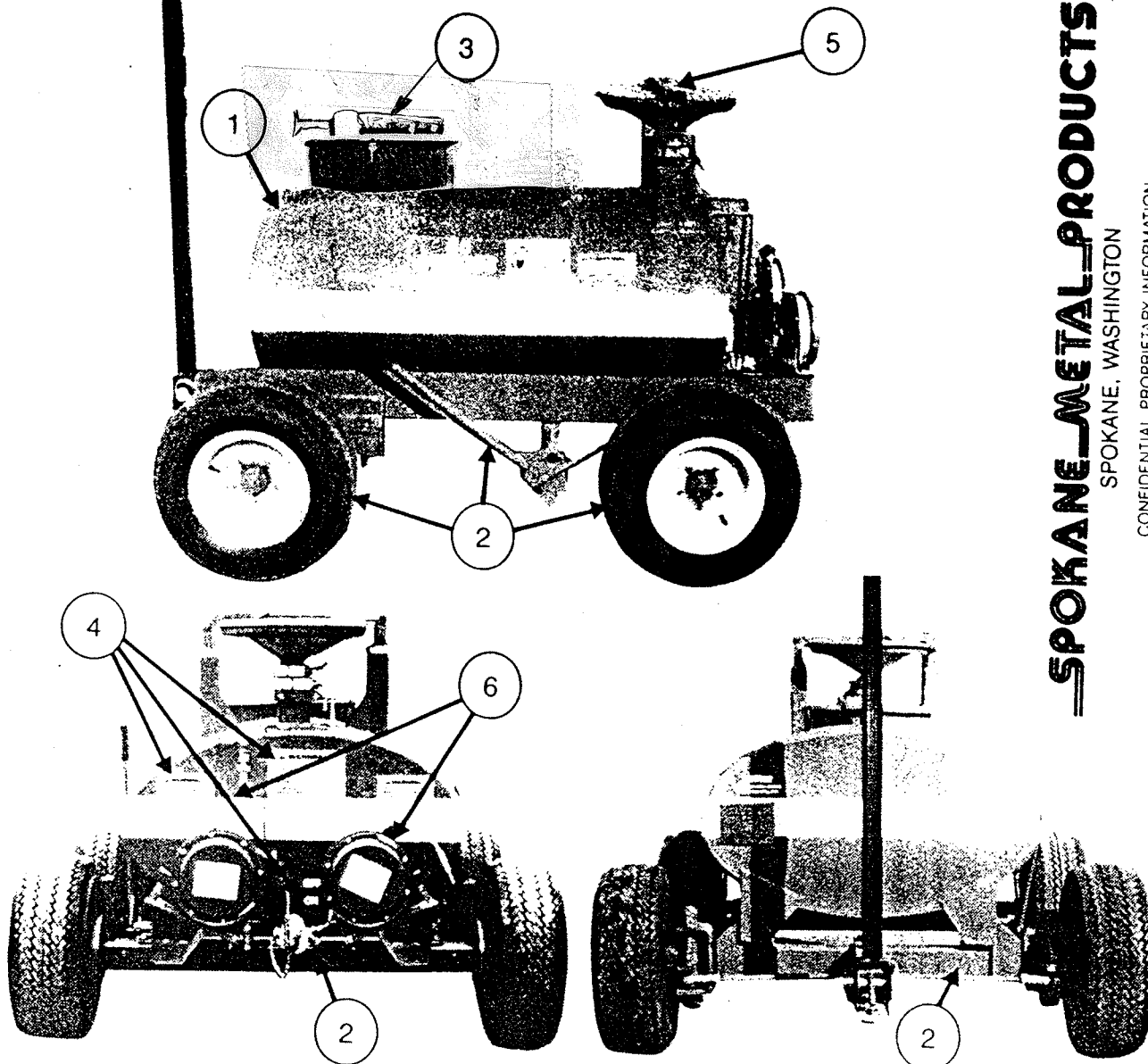
SPOKANE METAL PRODUCTS  
P. O. BOX 3303  
SPOKANE WA 99220-3303

Telephone: 509/928-0720  
FAX No: 509/027-0826

PARTS INDEX  
MODEL: BOW 200-033 Series FUEL BOWSER

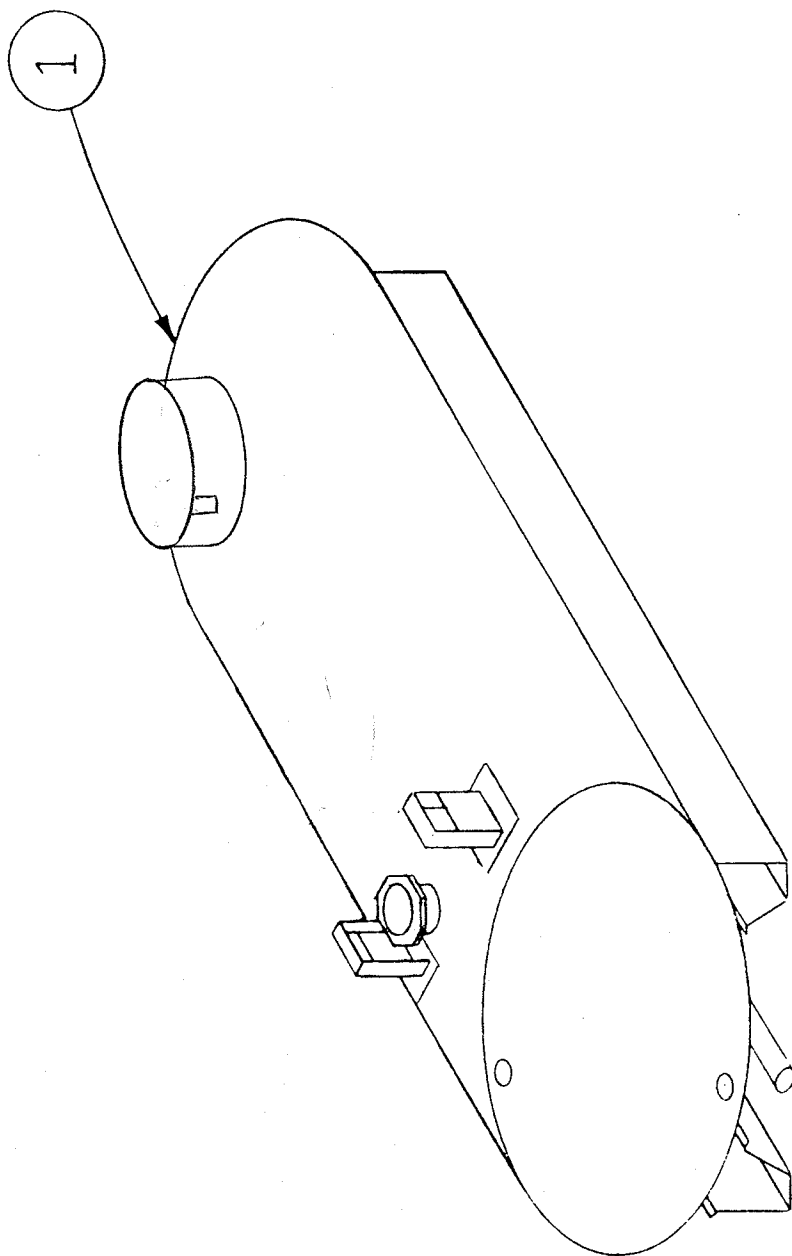
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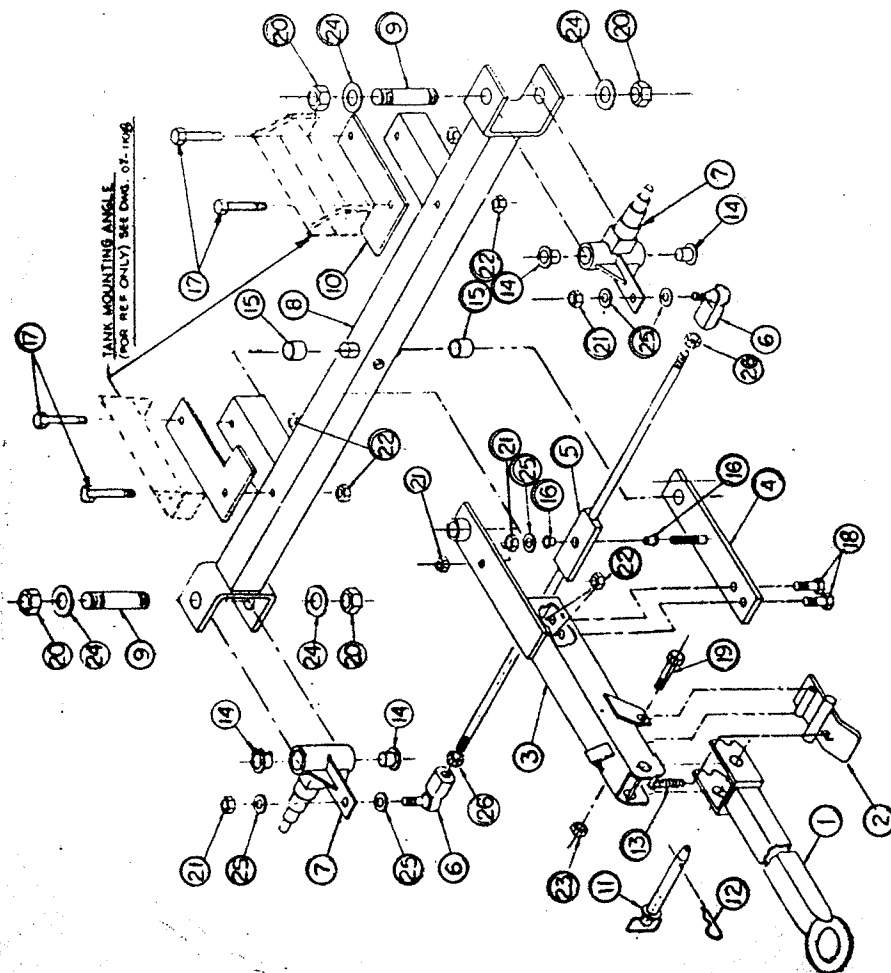
Item No.		Section
1	Main Tank . . . . .	5.1
2	Axle, Front . . . . .	5.2.1
2	Axle, Rear . . . . .	5.2.2
2	Brake, Parking . . . . .	5.2.3
2	Wheel Assembly, Front . . . . .	5.2.5
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6	Miscellaneous Fixtures . . . . .	5.6





MAJOR ASSEMBLY - TANK WELDMENT, 200 GALLON

Sub Assy.	Item	Part No.	Quantity	Description	Weight
	1	08-10091	1	Stainless Steel Tank Weldment 200 Gallon Capacity Series BOW 200-03	175#

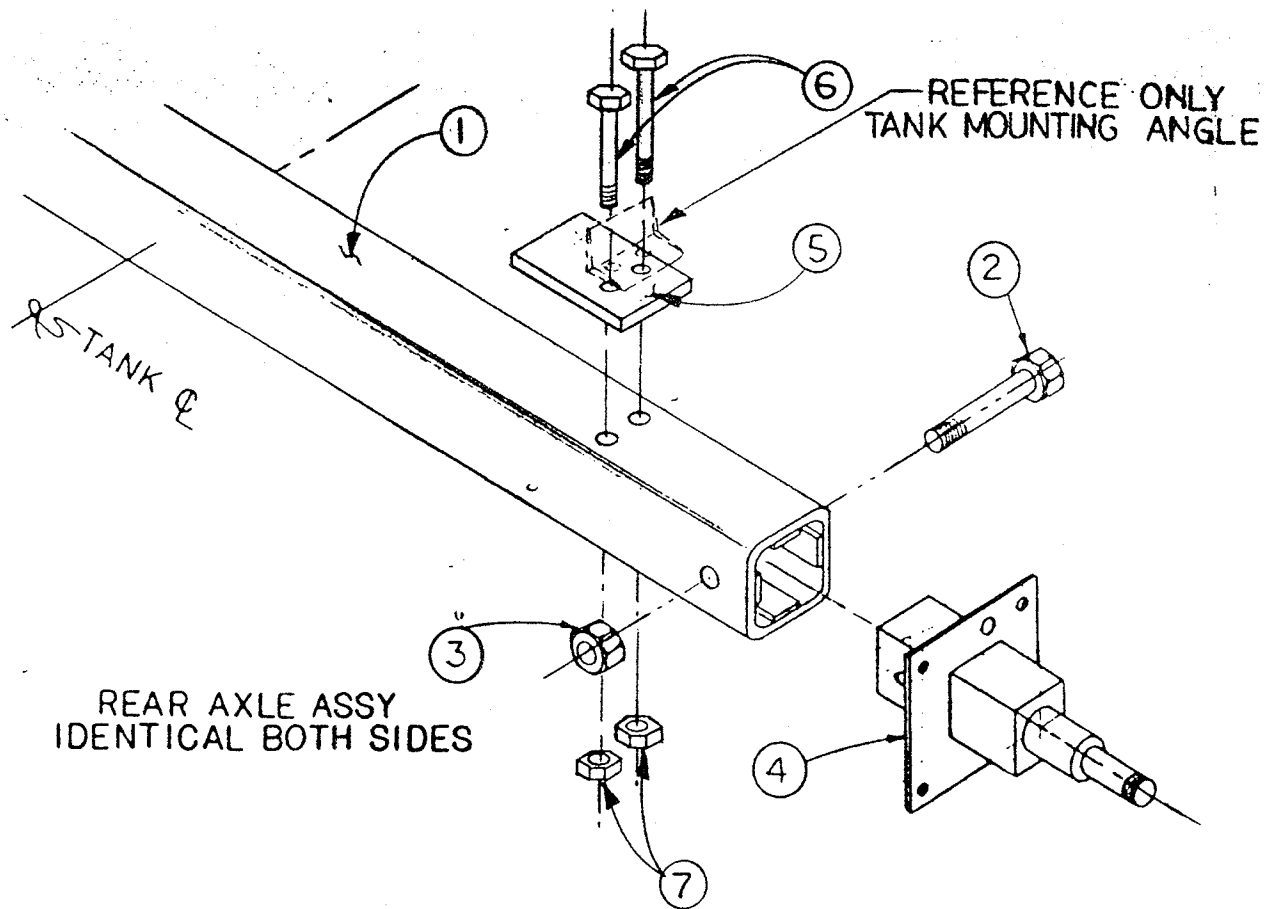


FRONT AXLE ASSEMBLY

MAJOR ASSEMBLY - AXLE ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Weight #
08-1079				AXLE ASSEMBLY, FRONT	
	1	07-1103	1	TOW BAR	23.
	2	07-1020	1	TOE LATCH	3.1
	3	07-1052	1	ARM, STEERING	16.
	4	07-1046	1	STEERING ARM, LOWER PLATE	6.1
	5	07-10371	1	TIE ROD	7.3
	6	03-1016	2	ROD END, BALL JOINT	5.
	7	07-1009	2	HOUSING, KING PIN	24.
	8	07-1053	1	AXLE, FRONT	53.
	9	05-1010	2	KING PIN	11.
	10	06-1023	2	MOUNTING PAD	
	11	02-1304	1	HITCH PIN	2.
	12	02-1300	1	COTTER PIN	.2
	13	04-1054	1	SPRING	.5
	14	03-1013	4	BUSHING	1.
	15	03-1014	2	BUSHING	1.
	16	03-1015	2	BUSHING	.8
	17	02-1503	4	BOLT	1.3
	18	02-1502	2	BOLT	.32
	19	02-1501	1	BOLT	.2
	20	02-12131	4	NUT	2.
	21	02-12071	4	NUT	
	22	02-12041	4	NUT	
	23	02-12012	1	NUT	
	24	02-11131	4	WASHER, FLAT	
	25	02-11072	6	WASHER, FLAT	
	26	02-12141	2	HEX NUT	

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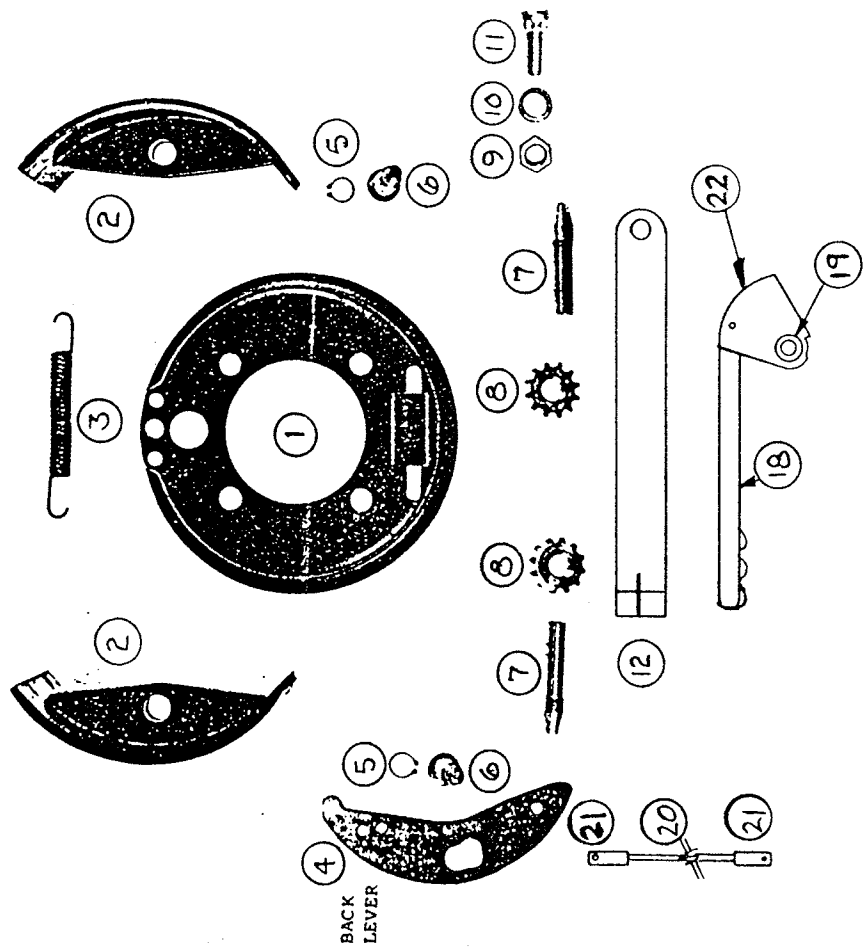
### MAJOR ASSEMBLY - AXLE ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Weight
08-1030				Axle Assembly Rear	
	1	05-1054	1	Axle, Rear Weldment	50#
	2	02-1505	2	Bolts, Mounting Spindle	1#
	3	02-1204/	2	Nuts, Mounting Spindle	.5#
	4	05-1022	2	Spindle, Rear	30#
	5	06-1012	2	Mounting Pad, Tank	4#
	6	02-1503	4	Bolt, Tank Mounting	1#
	7	02-1204/	4	Nuts, Tank Mounting	.5#

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BACK  
LEVER

ASSEMBLY NO. 10-100030  
MAJOR ASSEMBLY - BRAKE, PARKING

Sub Assy.	Item	Part No.	Quantity	Description	Wt. lbs
08-1007		04-1023		Brake Assembly (2 req'd per Bowser)	
	1	04-1023	1	Brake, Plate Assembly	7#
	2	04-1024	1	Brake, Shoe Assembly	4#
	3	04-1026	2	Brake, Shoe Lever Spring	1#
	4	04-1025	2	Brake, Shoe Lever	1#
	5	02-1400	2	1/2" Retaining Ring	.2#
	6	02-1303	2	Anchor Pin	.2#
	7/8	04-1027	2	Adjusting Screw Assembly	.7#
	9	02-12031	4	Nut	.2#
	10	02-11031	4	Lockwasher	.1#
	11	02-10031	4	Bolt, 7/16" Shoulder	.5#
	12	04-1030	1	Brake, Control Arm (Camlever - 5-1/4")	3#
08-1008				Brake, Handle Assembly	
	13	04-1028	1	Cam	.5#
	14	04-1029	1	Cam Lever 2"	.7#
	15	04-1031	1	Cam Spacer	.2#
	16	02-10012	1	Bolt	.4#
	17	02-12021	1	Nut	.1#
	18	01-8105	1	Brake, Handle	4#
	19	01-8104	1	Brake, Handle Connector	4#
08-1009				Brake Linkage Assembly (2 req'd p/bowser)	
	20	05-1026	1	Brake Linkage Rod	1#
	21	04-2516	2	Brake Linkage, YOKE-ENDS	.5#
	22	05-1025	2	Brake Linkage Mount	1.4#

\* Denotes Items Not Shown

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This diagram shows an exploded perspective view of a mechanical assembly. The components are numbered 1 through 13. A dashed line indicates the assembly path. The assembly consists of a base (1) with a central hole, a flange (2) with a central hole, a flange (3) with a central hole, a flange (4) with a central hole, a flange (5) with a central hole, a flange (6) with a central hole, a flange (7) with a central hole, a flange (8) with a central hole, a flange (9) with a central hole, a flange (10) with a central hole, a flange (11) with a central hole, a flange (12) with a central hole, and a flange (13) with a central hole. The flanges are stacked on top of each other, with the base at the bottom and flange 13 at the top. The flanges have different diameters and thicknesses. The base and flanges are connected by a central shaft or pin, which is not explicitly shown but implied by the alignment of the holes. The dashed line indicates the assembly path from the base up to the top flange.

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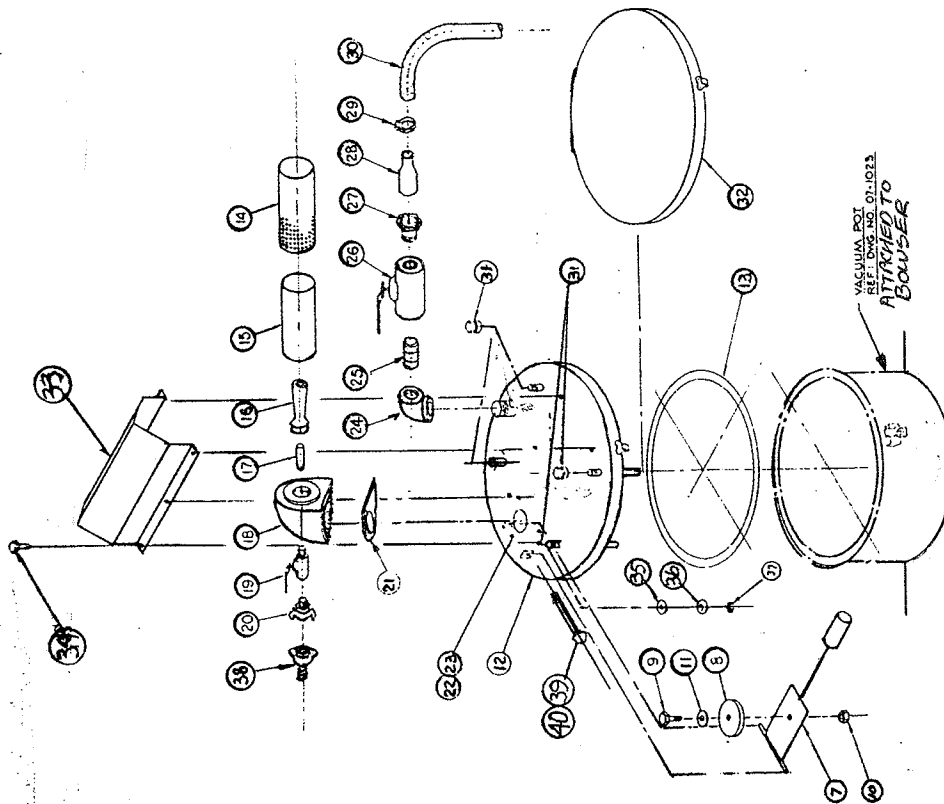
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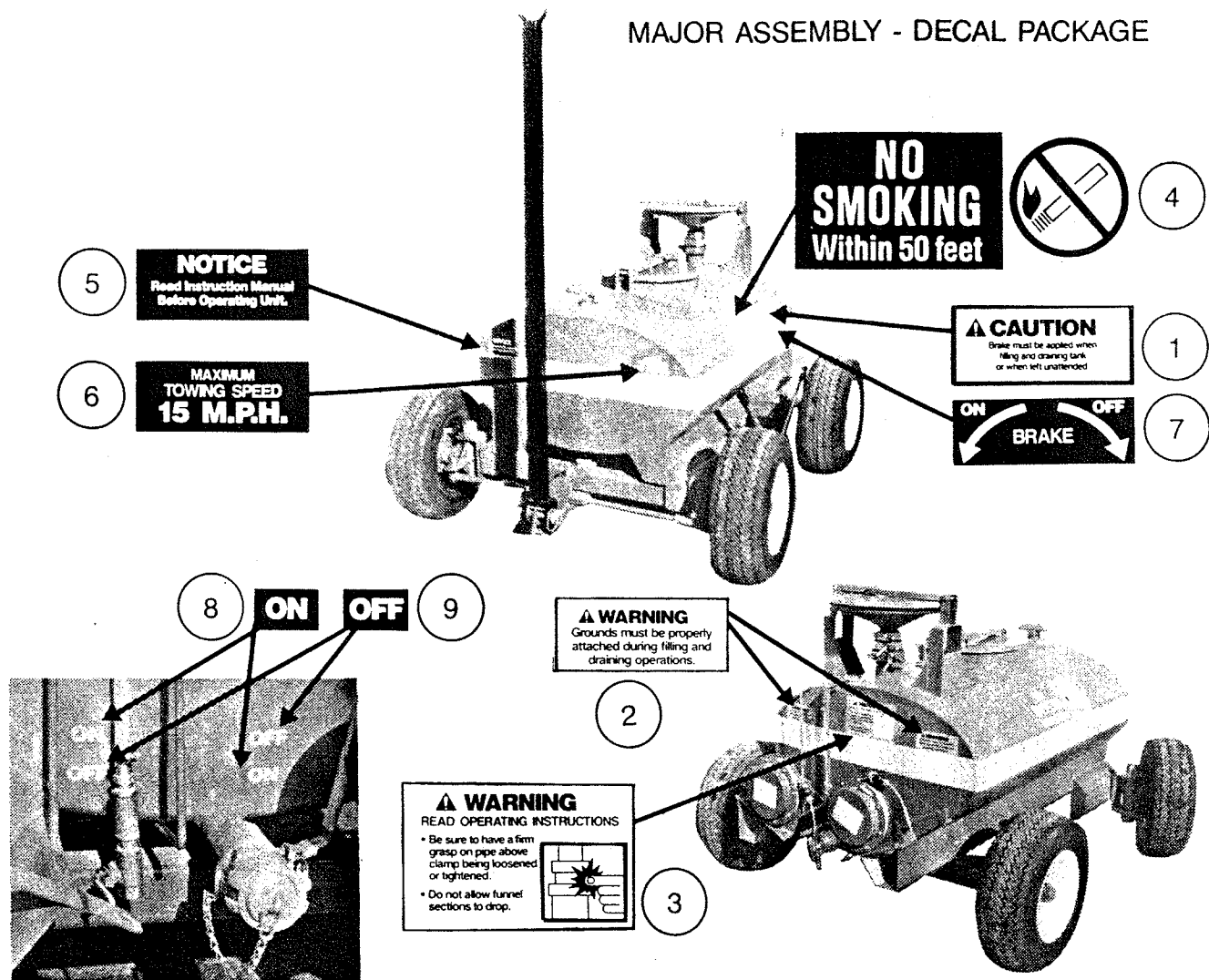
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# MAJOR ASSEMBLY - DECAL PACKAGE



<u>Sub-Assy</u>	<u>Item</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>	<u>Wt.#</u>
08-10251	1	06-1003	1	Decal, Caution, Parking Brake	.1
	2	06-1004	2	Decal, Warning, Grounding Reels	.1
	3	06-1005	1	Decal, Warning, Telescoping Drain	.1
	4	06-1006	2	Decal, Danger, No Smoking	.2
	5	06-1007	1	Decal, Notice, Read Manual	.1
	6	06-1008	1	Decal, Maximum Towing Speed-15 mph	.1
	7	06-1009	1	Decal, Parking Brake- Off/On	.1
	8	06-1011	2	Decal, On, Drain Valve	.1
	9	06-1011	2	Decal, Off, Drain Valve	.1
	10	06-1002	1	Decal, Caution - Vacuum System	.1

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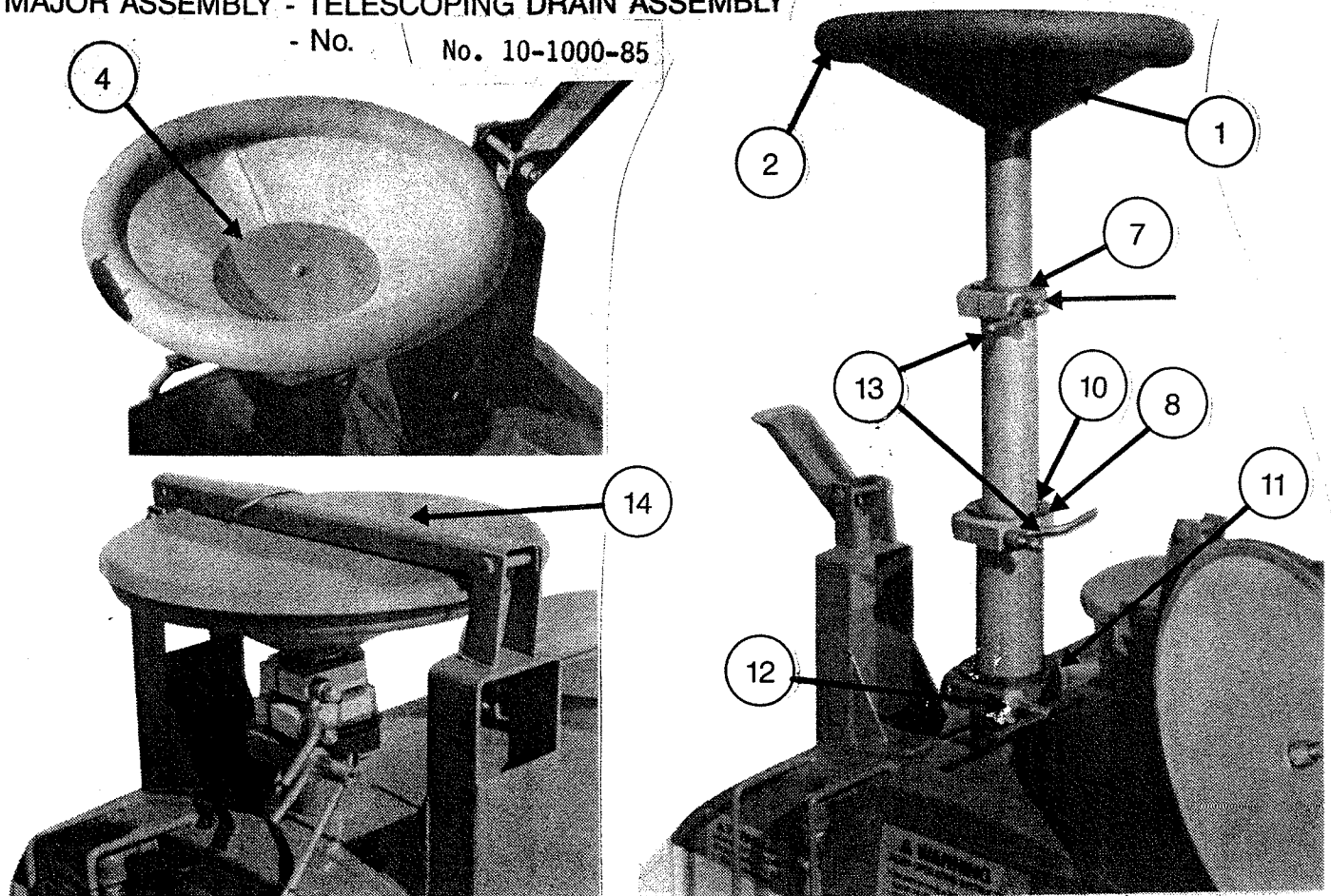
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# MAJOR ASSEMBLY - TELESCOPING DRAIN ASSEMBLY

- No.

No. 10-1000-85



Sub-Assy	Item	Part No.	Qty.	Description	Wt.#
07-1051				Drain Funnel, Section Assy	
	1	07-1047	1	Drain, Funnel, Section	5.
	2	06-1022	1	Gasket, Funnel Section	.7
	3	05-1000	1	Stop Sleeve COLLAR *	.1
	4	04-1039	1	Screen, Funnel Section	.5
07-1049				Drain, Telescoping Section-2 1/2"	
	5	07-1048	1	Telescoping Section Weldment	3.
	6	05-1001	1	Stop Sleeve COLLAR *	.1
	7	05-1002	1	Sleeve, Clamp LINER LINER	.1
07-1045				Drain, Telescoping Section- 3"	
	8	07-1044	1	Telescoping Section Weldment-3"	3.5
	9	05-1003	1	Stop Sleeve COLLAR *	.1
	10	05-1004	1	Sleeve, Clamp LINER	.3
	11	05-1006	1	Sleeve, Clamp LINER	.4
	12	07-1015	1	Handle, Clamp Lower	1.
	13A	04-1040	2	Handles, Clamps	.5
	13B	02-10021	2	Handles, Bolts	.7
	14	08-1026	1	Cover Assembly	5.
	15	02-1500	12	Screws, Stainless *	.2
	16	06-1060	3	"O" Ring Set *	.3

\*Denotes Items Not Shown

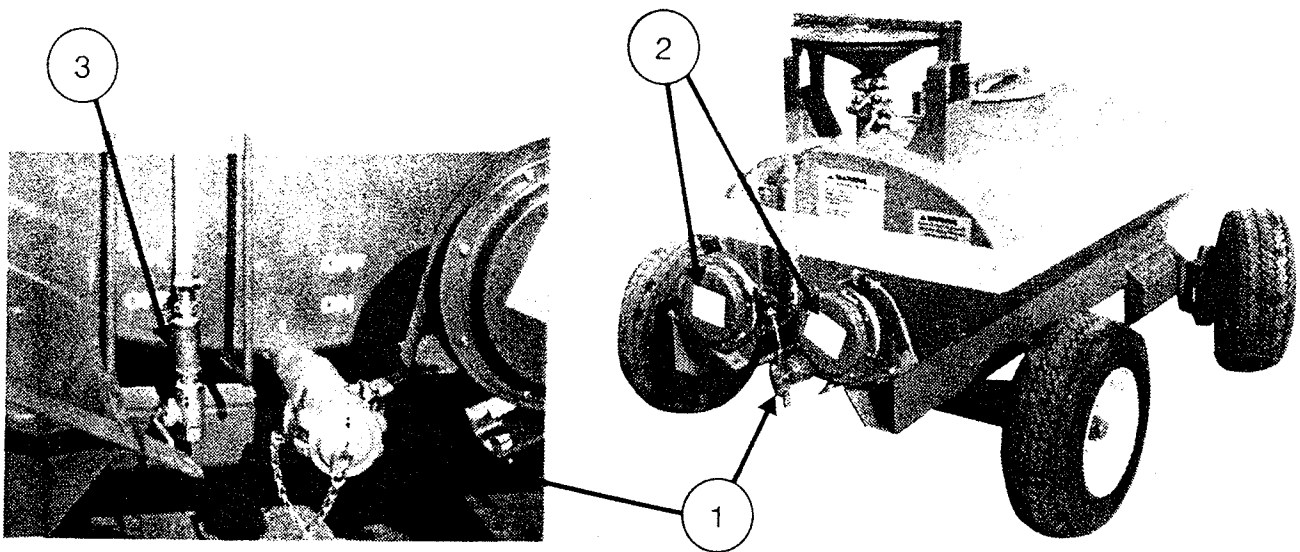
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# MAJOR ASSEMBLY - MISC. FIXTURES

Assembly No.

10-100115



<u>Sub-Assy</u>	<u>Item</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>	<u>Wt.#</u>
08-1012	1			Drain Assembly	
	1A	04-10321	1	Valve, 1 1/2" Ball w/Locking Handle	6.
	1B	04-1033	1	Adaptor, Camlock 1 1/2"	1.5
	1C	04-10331	1	Plug, Camlock 1 1/2"	.5
	1D	04-1034	1	Chain, Safety X 12" lg.	.2
	1E	04-1035	1	S Link	.1
	1F	04-10351	1	S Link	.1
08-1013	2			Grounding Reel Assembly	
	2A	04-1036	1	Grounding Reel	12.
	2B	04-10361	1	Grounding Reel	12.
	2C	02-10040	4	Bolts	.3
	2D	02-12041	4	Nuts, Hex, Nylon Locking	.1
08-1014	3			Sight Gage Assembly	
	3A	03-1017S	1	Elbow, 1/2"	.5
	3B	03-1007	1	Tee, 1/2"	.5
	3C	03-1008	2	Nipple, 1/2"	.5
	3D	03-11130	2	Hose Barb, 1/2"	.5
	3E	03-1010	2	Hose Clamp, 1/2"	.1
	3F	04-1032	1	Valve, 1/2", Ball w/Locking Handle	3.
	3G	06-2527	1	Tube, 1/2" I.D.	.2

Section 5.6

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SPOKANE METAL PRODUCTS  
200 GALLON BOWSER FUEL DRAIN TANK  
ONE YEAR LIMITED WARRANTY

Seller warrants its 200 Gallon Bowser Fuel Drain 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 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 two 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.

This Warranty does not extend to damage caused by 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,  
EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF  
MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE NOT SET FORTH  
IN A WRITING SIGNED BY AN AUTHORIZED REPRESENTATIVE OF 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.