

ORIGINALS

150-01 BOWSER

DO NOT DESTROY

SPOKANE METAL PRODUCTS

Spokane, Washington

150 GALLON FUEL BOWSER

TECHNICAL MANUAL

PARTS, OPERATION AND MAINTENANCE

MODEL NUMBER: BOW 150-00

NOTICE:

This manual is for a BOW 150-01 and is identical to a BOW 150-00 except for the vacuum assembly which is not included in a BOW 150-00.

This manual may be used for the BOW 150-00.



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Spokane Washington

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150 GALLON FUEL BOWSER

TECHNICAL MANUAL

PARTS, OPERATION AND MAINTENANCE

MODEL NUMBER BOW 150-01

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150 GALLON FUEL BOWSER

TECHNICAL MANUAL

PARTS, OPERATION AND MAINTENANCE

MODEL NUMBER BOW 150-01

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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 the 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 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.

2.3 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 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 MPH.

2.5 Parking

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

2.6 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.

2.7 Inspections

2.7.1 Inspection of tires, undercarriage, tow bar, vent, valves, hoses, sight gauge, reflectors, safety labels, etc., should be inspected on a periodic basis. It is recommended these inspections be performed weekly.

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 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 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 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 not to 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.

3.5 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.

3.5.4 The vacuum chamber is equipped with an automatic drain valve that opens whenever vacuum is eliminated in the chamber. This valve opens directly into the main tank.

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 a ball valve on the vacuum suction.

3.5.7 The vacuum assembly is equipped with (4) four each 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 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 Drain Valves

3.7.1 The bowser unit is equipped with a 1-1/2" NPT ball valve with a camlock connector.

3.8 Sample Port

3.8.1 The bowser unit is equipped with a 1/2" NPT valve for use as a sample port.

4.0 MAINTENANCE

4.1 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.
 - (1) Tightening is accomplished by removing the bolt through one yoke and screwing yoke in to shorten connecting rod.
 - (2) Do not over tighten or brakes may drag when released.
- 4.1.4** Replacement of shoes.
 - (1) Remove wheel.
 - (2) Remove nut retaining hub and drum assembly.
 - (3) Disconnect actuating rod.
 - (4) Remove shoe retainers.
 - (5) Install new shoes.
 - (6) Replace shoe retainers.
 - (7) Adjust actuator rod length.
 - (8) Replace wheel.

4.2 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:
 - (1) King pin bushing, turning bushings and tie rod ends are self lubricating and need no additional maintenance.
 - (2) Pack wheel bearing at intervals not to exceed three (3) months.
 - (3) Check tire pressure weekly. Pressure should be maintained at 60 PSI.
- 4.2.3** Tow bar pivot pin and hook ring should be inspected monthly for excessive wear or cracks.

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.
- 4.4.2** The vacuum chamber is equipped with an automatic drain valve. This valve is pre-adjusted at the factory and should not need further adjustment.

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 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

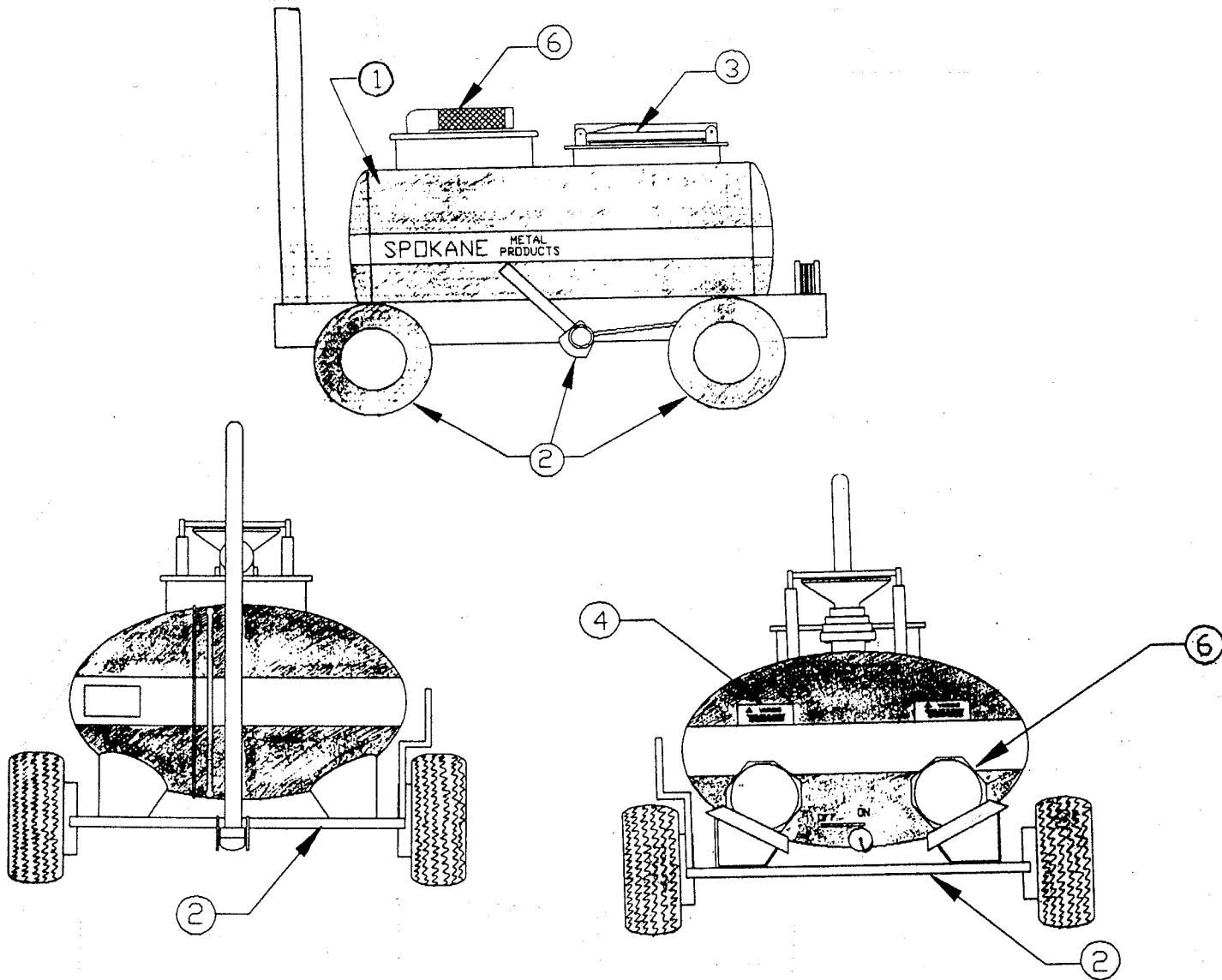
This section provides information for identification of parts for ordering. To order, it is important to have the Model Number, Subassembly Number, Part Number and Description. Parts may be ordered by calling or writing to:

SPOKANE METAL PRODUCTS
P.O. Box 3303
Spokane, WA 99220-3303
Telephone: (509)928-0720
Tele Fax:(509)927-0826

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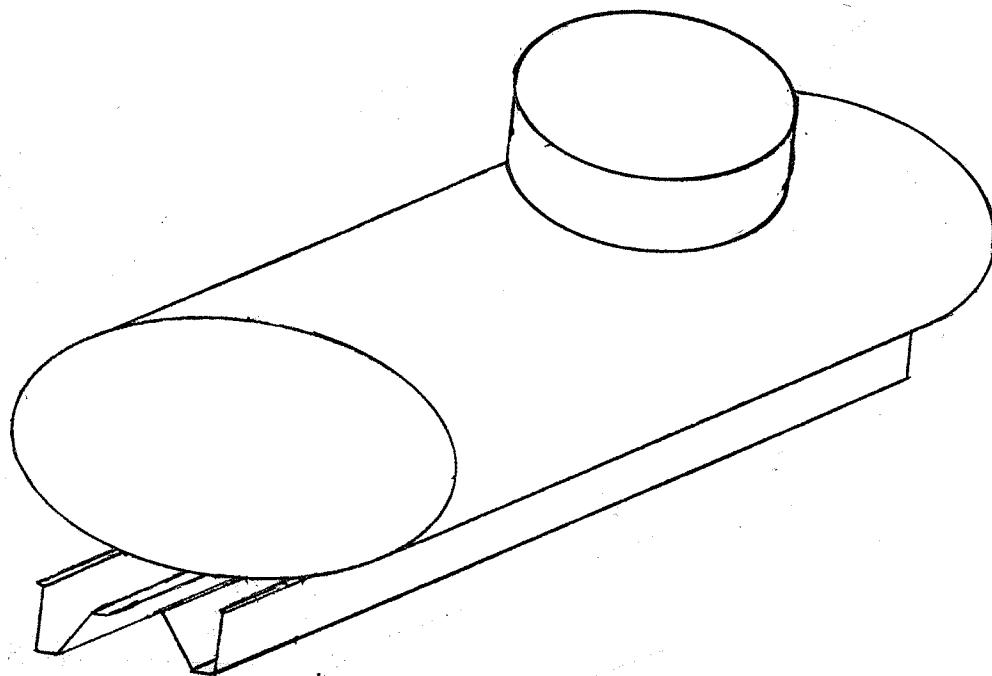
<u>Item No.</u>	<u>Section</u>
1 Main Tank	5.1
2 Axle, Front	5.2.1
2 Axle, Rear	5.2.2
2 Brake, Parking	5.2.3
2 Wheel Assembly, Front	5.2.4
2 Wheel Assembly, Rear	5.2.5
3 Manway Assembly	5.3.1
4 Decal Package	5.4
6 Vacuum Assembly	5.6
7 Miscellaneous Fixtures	5.7

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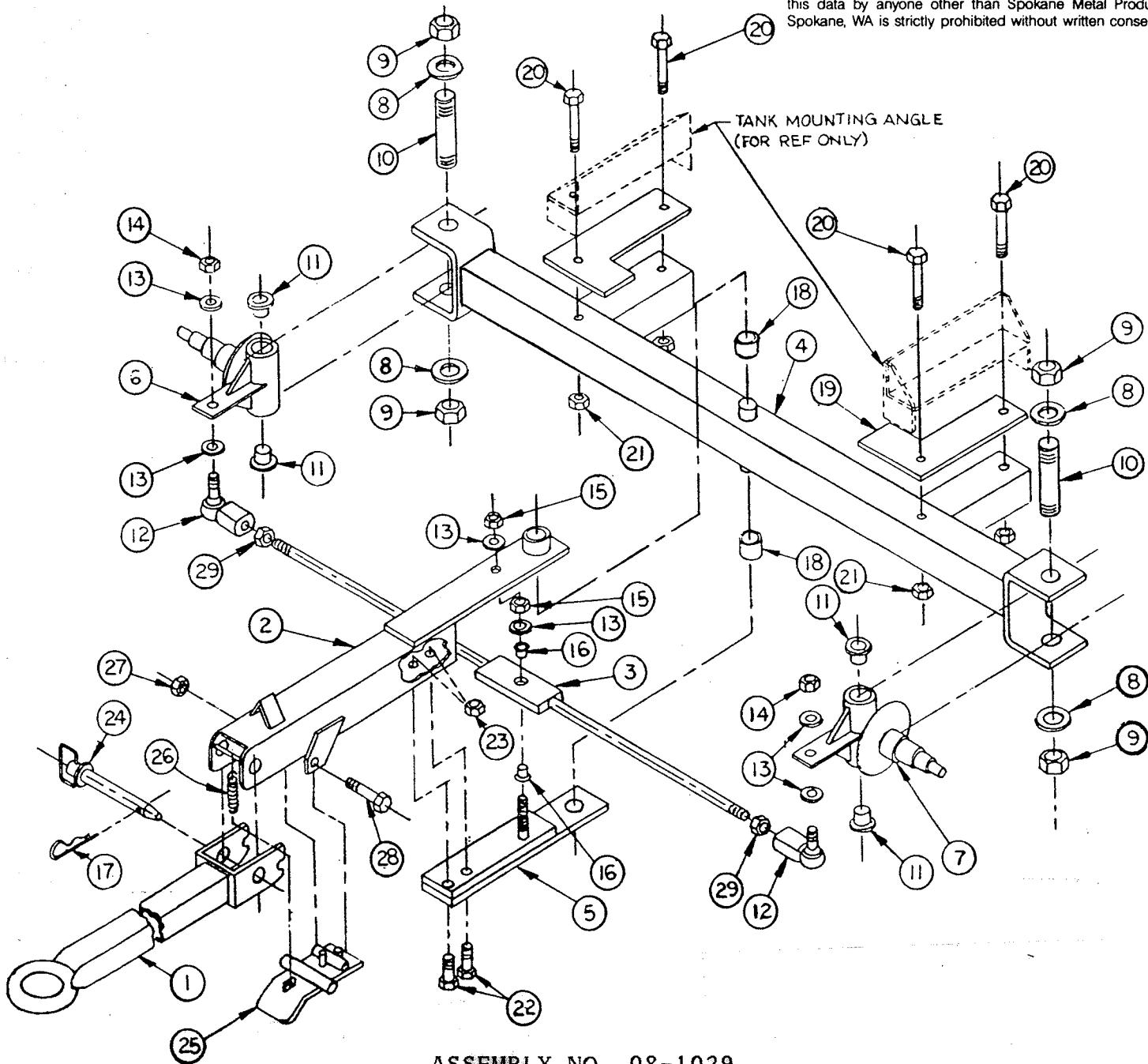
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ASSEMBLY NO. 08-10009

MAJOR ASSEMBLY - TANK WELDMENT

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
	1	08-10007	1	Stainless Steel Tank Weldment, 150 Gallon Capacity Series BOW 150-01	175#



ASSEMBLY NO. 08-1029

MAJOR ASSEMBLY - AXLE ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1029				Axle, Assembly, Front	
	1	07-1103	1	Tow Bar	23
	2	07-1052	1	Arm, Turning	16
	3	07-10371	1	Tie Rod	7.3
	4	07-1053	1	Axle, Front	53

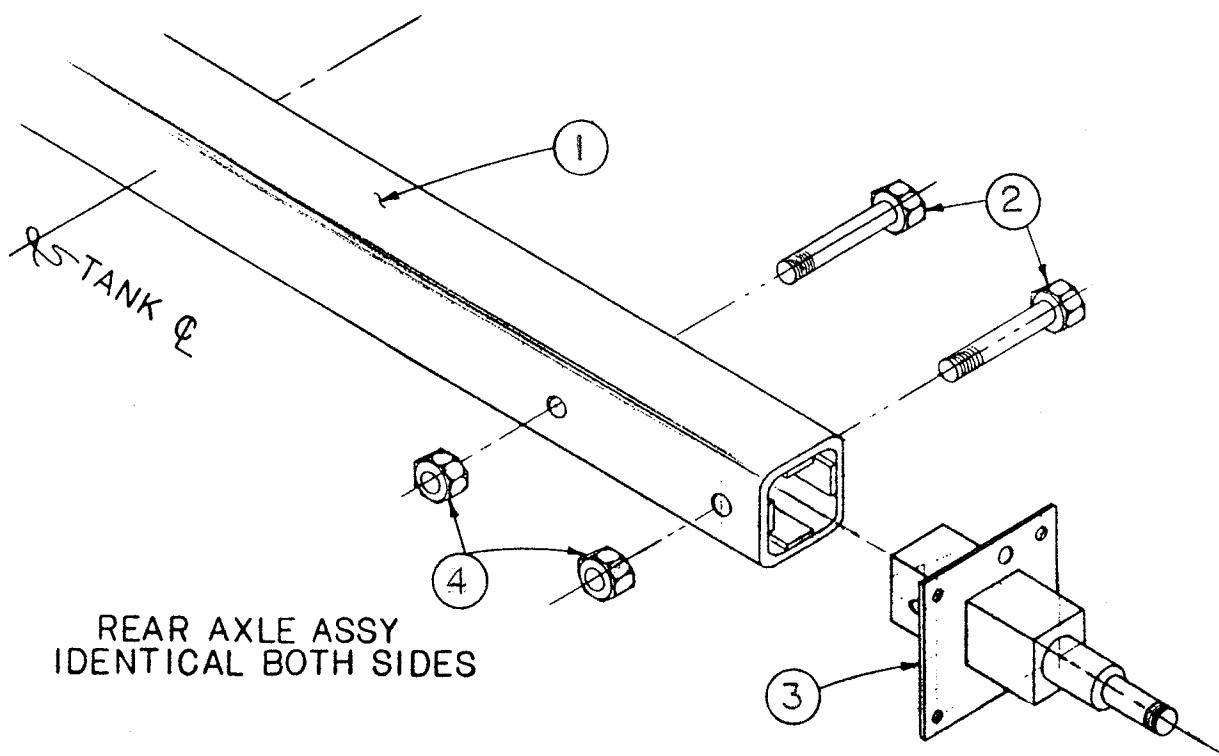
ASSEMBLY NO 08-1029
MAJOR ASSEMBLY - AXLE ASSEMBLY (CONTINUED)

Sub Assy.	Item	Part No.	Quantity	Description	Wt.#
	5	07-1046	1	Steering Arm, Lower Plate	6.1
	6	05-1009	1	Sleeve, King Pin, Right	24
	7	05-1009	1	Sleeve, King Pin, Left	24
	8	02-11131	4	Washer, King Pin	1
	9	02-12131	4	Nut, King Pin	2
	10	05-1010	2	King Pin	11
	11	03-1013	4	Bushing, King Pin Sleeve	1
	12	03-1016	2	Ends, Tie Rod	5
	13	02-11072	5	Washers, Tie Rod	
	14	02-12071	2	Nuts, Tie Rod Ends	1
	15	02-12071	1	Nut, Tie Rod Pivot	.5
	16	03-1015	2	Bushing, Tie Rod Pivot	.8
	17	02-1300	2	Cotter Pin	.2
	18	03-1014	2	Bushing, Axle Pivot	1
	19	06-1023	2	Mounting Pad, Tank	4
	20	02-1503	4	Bolts, Tank Mounting	1.3
	21	02-12041	4	Nuts, Tank Mounting	.5
	22	02-1502	2	Bolts, Turning Arm Clamp	.32
	23	02-12041	2	Nuts, Turning Arm Clamp	.2
	24	02-1304	1	Hitch Pin	2
	25	07-1020	1	Toe Latch	3.1
	26	04-1054	1	Spring, Toe Latch	.5
	27	02-1201	1	Nut, Toe Latch	.1
	28	02-1501	1	Bolt, Toe Latch	.2
	29	02-12141	2	Hex Nut, Tie Rod	.2

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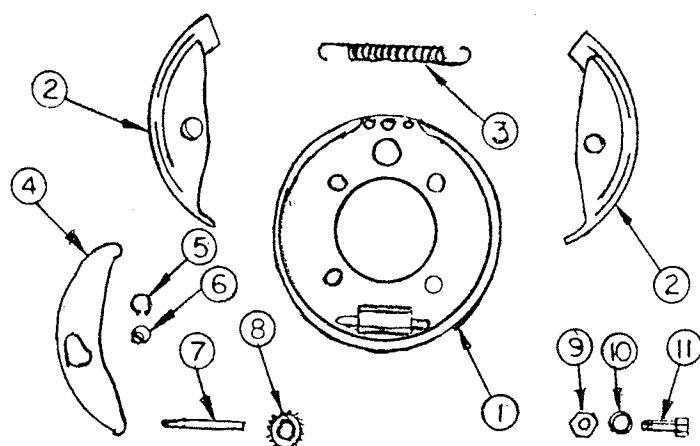
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ASSEMBLY NO. 08-1030Z

MAJOR ASSEMBLY - AXLE ASSEMBLY (CONTINUED)

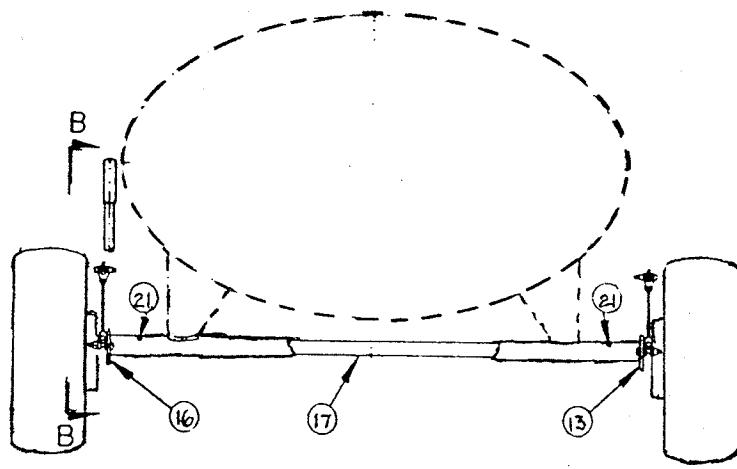
08-1030Z				Axle Assembly, Rear	
1	05-1054	1	Axle, Rear Weldment	40	
2	02-1505	2	Bolts, Mounting Spindle	.6	
3	02-12041	2	Nuts, Mounting Spindle	.5	
4	05-1022	2	Spindle, Rear	17	
5	06-1012	2	Mounting Pad, Tank	1	
6	02-1503	4	Bolt, Tank Mounting	1.3	
7	02-12041	4	Nuts, Tank Mounting	.5	



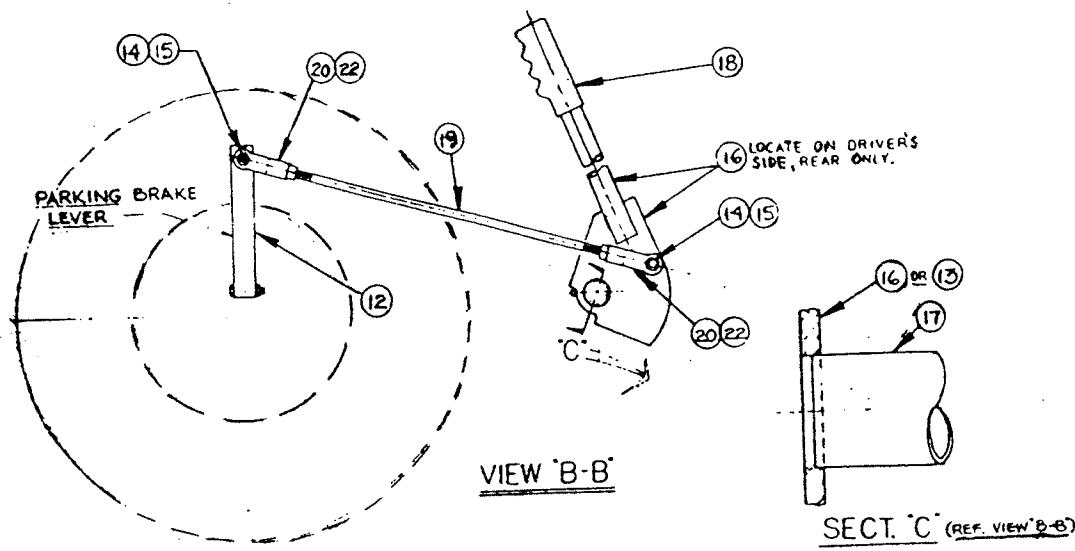
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REAR VIEW
NTS

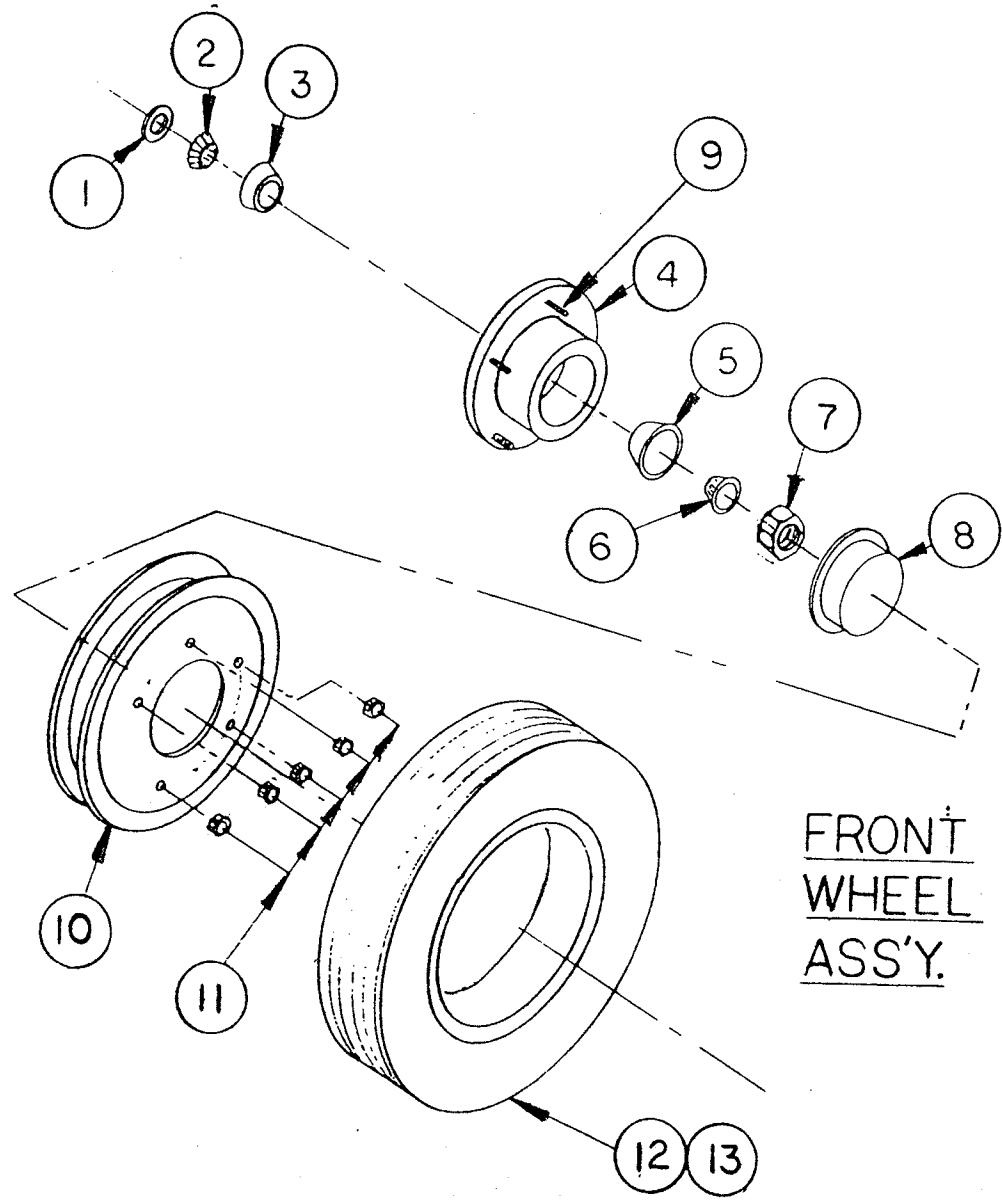


MAJOR ASSEMBLY - BRAKE, PARKING

Sub Assy.	Item	Part No.	Quantity	Description	Wt.#
08-1007		04-1063		Brake Assembly (2 Req'd)	
	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 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	.3
08-1008				Brake Linkage Assembly	
	13	05-1025	1	Cam, Brake Linkage	1.4
	14	02-10012	1	Bolt	.4
	15	02-12021	1	Nut	.1
	16	07-1033	1	Brake Handle, Fabd Sub-Ass	5.4
	17	01-8104	1	Brake Handle, Connector	4
	18	04-1055	1	Grip, Vinyl	1
	19	05-1026	1	Rod, Brake Linkage	1
	20	04-2516	4	Yoke Ends	.5
	21	03-1020	2	Grease Fitting	.5
	22	02-100231	4	Jam Nut, 3/8"	.5

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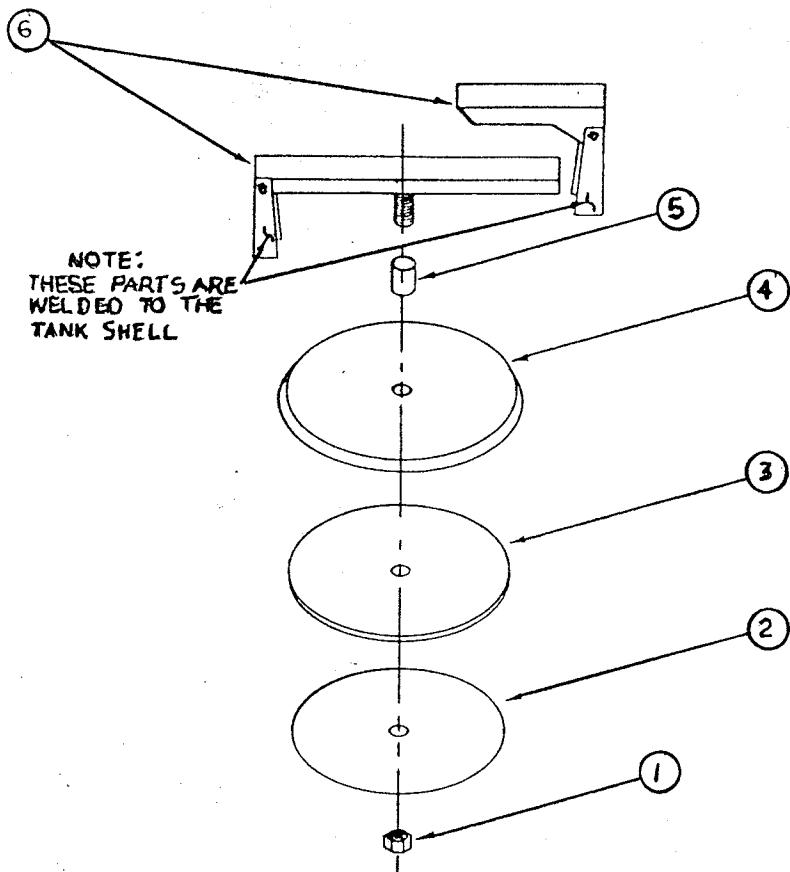


MAJOR ASSEMBLY - WHEEL ASSEMBLY, FRONT

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1011	04-1050			Bearing & Hub Assembly (2 Req'd)	
	1	04-1012	1	Seal, Bearing	1
	2	04-1013	1	Bearing, Inner	3
	3	04-1015	1	Cup, Inner	2
	4	04-1017	1	Hub, Wheel	7
	5	04-1016	1	Cup, Outer	4
	6	04-1014	1	Bearing, Outer	3
	7	02-1205	1	Spindle Nut	1
	8	04-1019	1	Dust Cap	1
	9	02-1017	5	Studs, Hub	1
08-10061	04-10201			Tire/Wheel/Tube Assembly (2 Req'd)	
	10	04-1020	1	Wheel, Split Rim, 10"	9.5
	11	04-1021	5	Lug Nuts, Wheel	1
	12	04-10221	1	Tire, 10"	4
	13	04-1045	1	Tube Assembly	11

MAJOR ASSEMBLY - WHEEL ASSEMBLY, REAR

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-10111		04-1062		Bearing & Hub Assembly (2 Reqd)	
	1	04-1012	1	Seal, Bearing	1
	2	04-1013	1	Bearing, Inner	3
	3	04-1015	1	Cup, Inner	2
	4	05-1008	1	Hub/Brake Drum Sub-Assy	16
	5	04-1016	1	Cup, Outer	4
	6	04-1014	1	Bearing, Outer	3
	7	02-1205	1	Nut, Spindle	1
	8	04-1019	1	Dust Cap	1
08-10061		04-1020		Tire/Wheel/Tube Assembly (2 Reqd)	
	10	04-10201	1	Wheel, Split Rim	9.5
	11	04-1021	5	Lug Nuts, Wheel	1
	12	04-10221	1	Tire, 10"	4
	13	04-1045	1	Tube Assembly	11



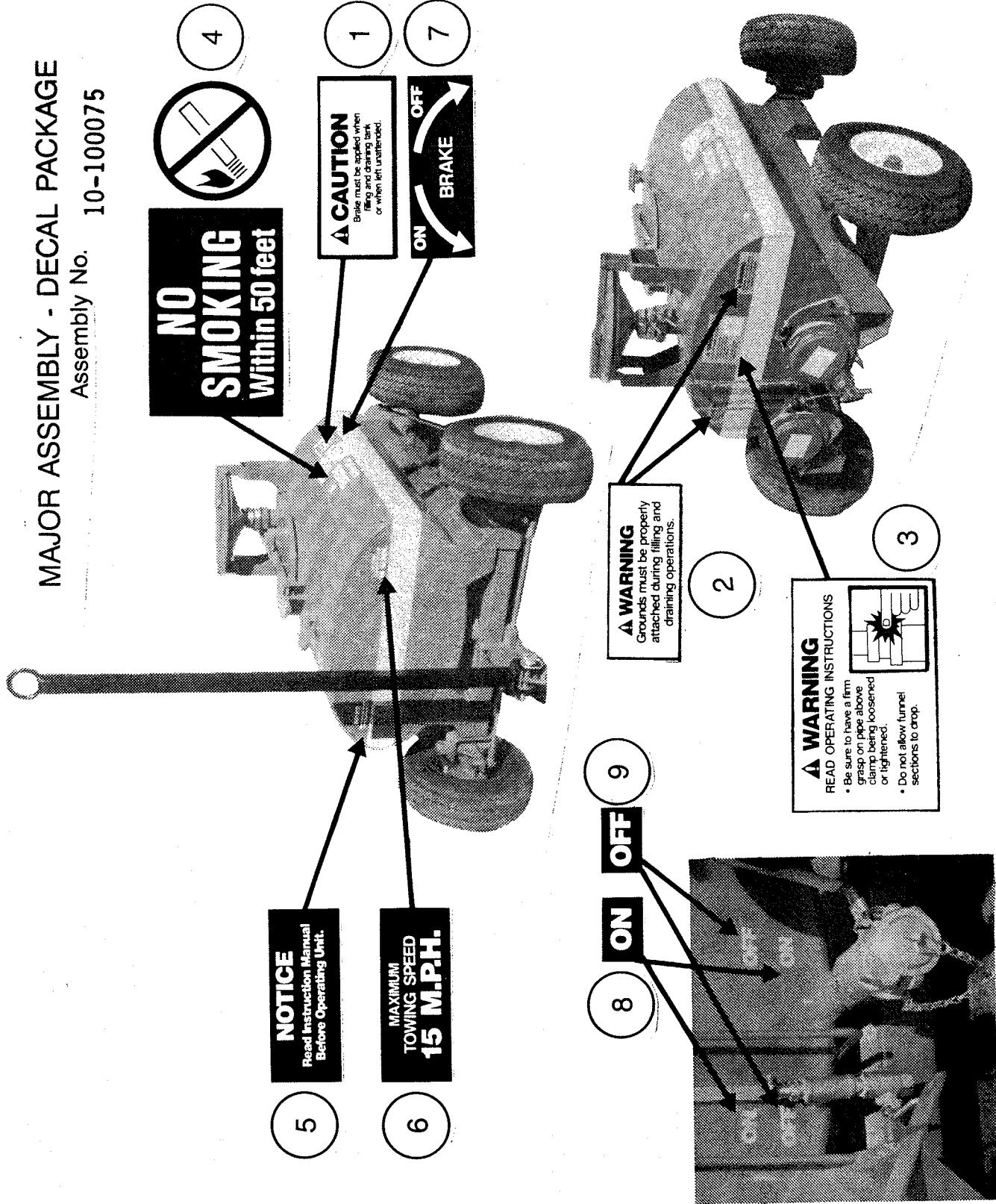
ASSEMBLY NO. 10-100060

MAJOR ASSEMBLY - MANWAY ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1025				Manway Cover Assembly	
1	07-2102	1	1	16" Cross Arm Sub-Assy	2.5
2	01-8222S	1	1	7" Cross Arm	.4
3	01-93455S	1	1	Spacer	.5
4	01-86001	1	1	Cover	5
5	06-25025	1	1	Gasket	1
6	07-2303	1	1	Gasket Retainer	2
7	02-1206	1	1	Nut	.5
8	02-10013	1	1	Bolt	1
9	02-10014	1	1	Bolt	1
10	02-1202	2	2	Nut	.5

MAJOR ASSEMBLY - DECAL PACKAGE

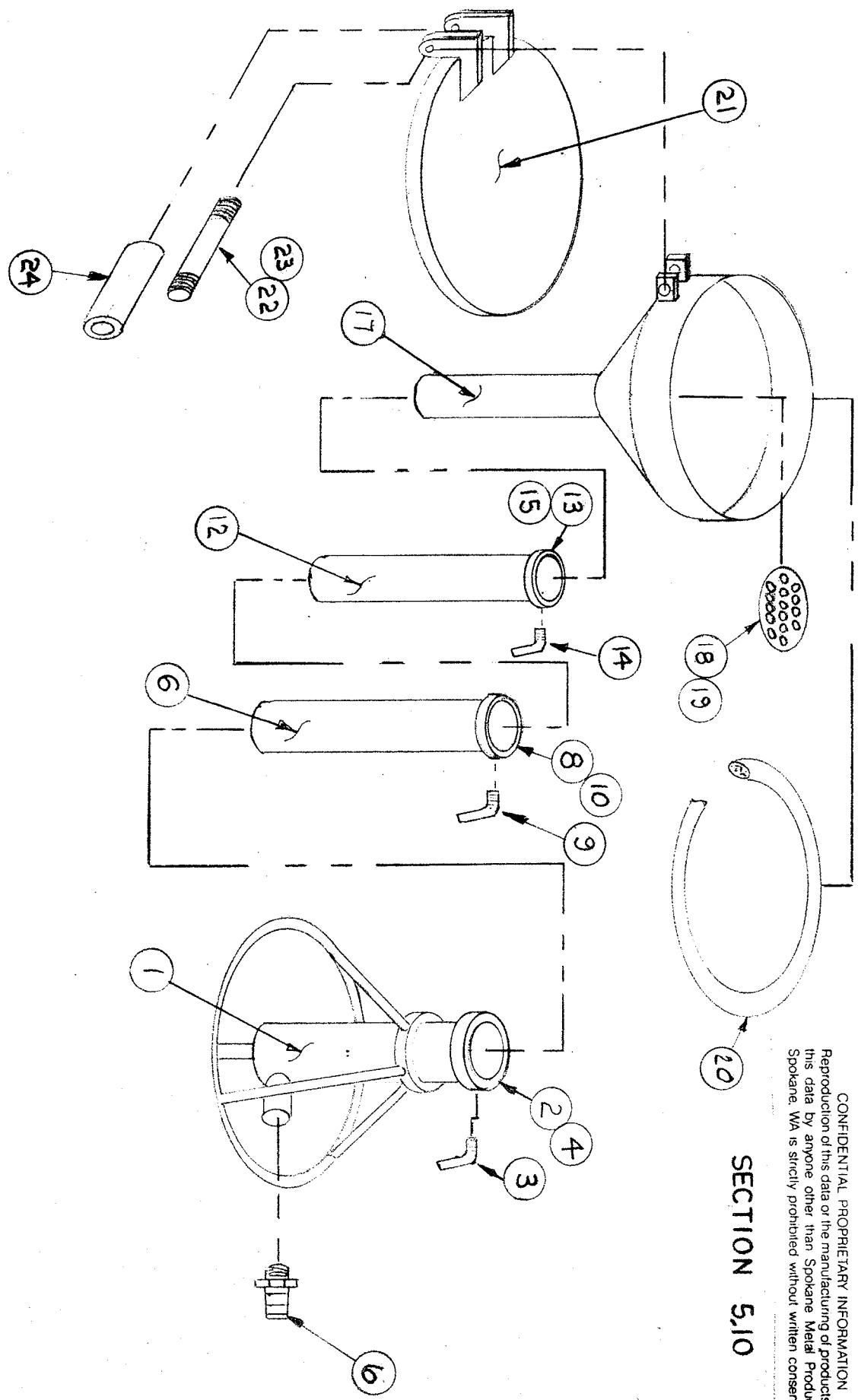
Assembly No. 10-100075



MAJOR ASSEMBLY - DECAL PACKAGE

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
10-100070				Decal Assembly	.1
	1	06-1002	1	Caution, Vacuum System	.1
	2	06-1003	1	Caution, Parking Brake	.1
	3	06-1004	2	Warning, Grounding Reels	.1
	4	06-1005	1	Warning, Telescoping Drain	.1
	5	06-1006	2	Danger, No Smoking	.2
	6	06-1007	1	Notice, Read Manual	.1
	7	06-1008	1	Maximum Towing Speed 15MPH	.1
	8	06-1010	1	Off/On, Parking Brake	.1
	9	06-1011	8	Off/On, Drain Valve	.8
*	11		8	Reflector Tape	.8

* = ITEMS NOT SHOWN



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SECTION 5,10

SECTION 5.10

MAJOR ASSEMBLY - REMOTE DRAIN FUNNEL
ASSEMBLY 07-1110U

Sub Assy.	Item	Part No.	Quantity	Description	Wt.#
07-11103				REMOTE DRAIN FUNNEL, BASE	17
	1	07-1100	1	BASE SECTION FAB S/S	
	2	05-10012	1	CLAMP, BASE	
	3	02-10181	1	SCREW, CLAMP	
	4	05-0037	1	PLASTIC	
07-11104				REMOTE DRAIN FUNNEL, LOWER	2.5
	7	01-92452	1	TUBE, 3" O.D.	
	8	05-10022	1	BASE CLAMP	
	9	02-10181	1	SCREW, CLAMP	
	10	05-0037	1	PLASTIC	
07-11105				REMOTE DRAIN FUNNEL, UPPER	1.75
	12	01-9242	1	TUBE, 2-1/2" O.D.	
	13	05-10032	1	CLAMP, BASE	
	14	02-10015	1	SCREW, CLAMP	
	15	05-0037	1	PLASTIC	
07-11106				REMOTE DRAIN FUNNEL, TOP, FAB	13
	17	01-8250	1	FUNNEL, CAST ALUM	
	18	04-1039	1	DEBRIS SCREEN	
	19	02-1200	1	LOCK NUT	
	20	06-1022	1	NITRILE GASKET	

SECTION 5.10 (CONTINUED)

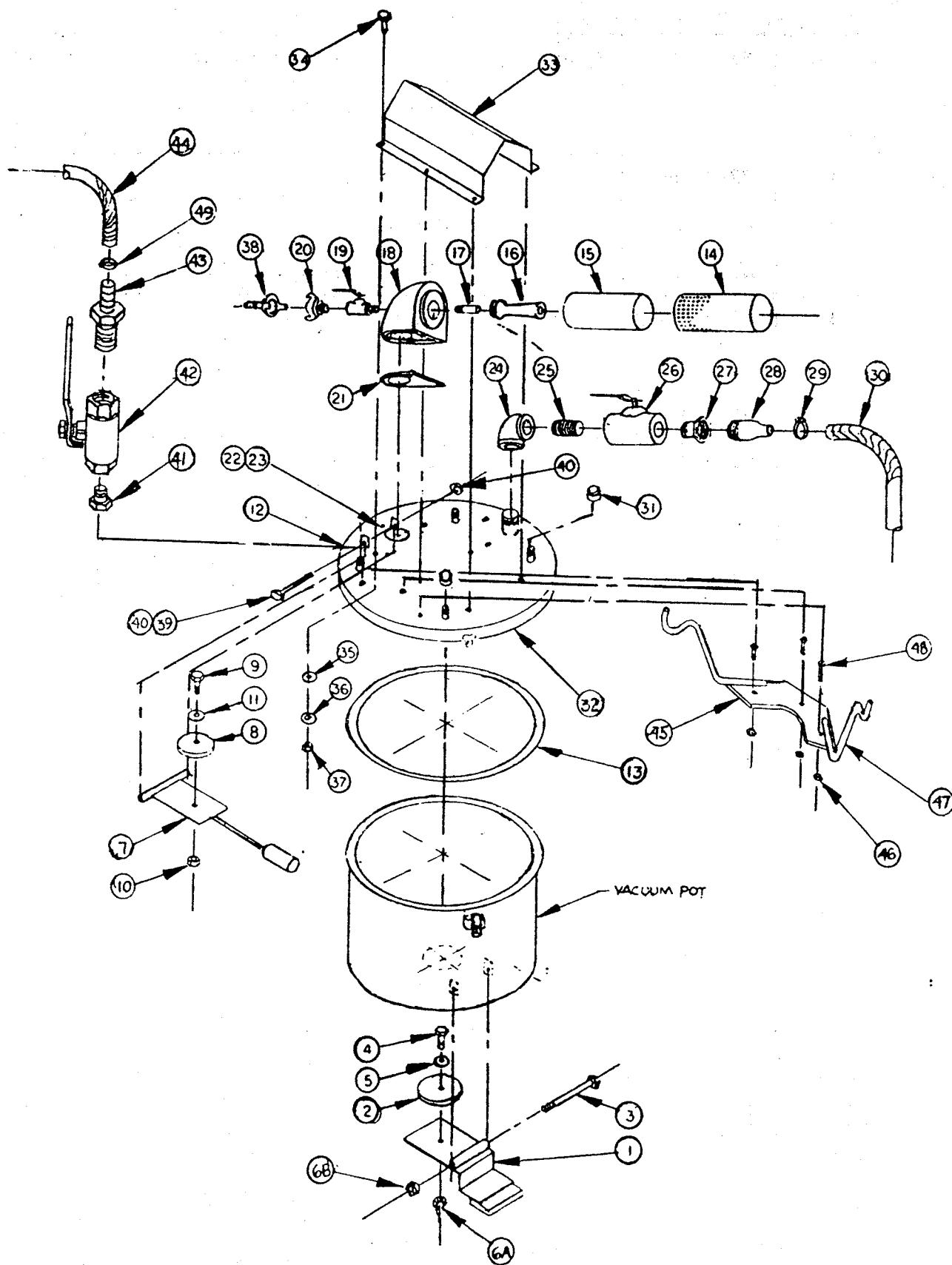
MAJOR ASSEMBLY - REMOTE DRAIN FUNNEL

ASSEMBLY 07-1110U

07-11107		07-1116		REMOTE FUNNEL LID ASSY	12
	21	01-9007	1	LID FABRICATION	
	22	01-91984S	1	ROD, THREADED	
	23	02-1200	2	LOCK NUTS	
	24	01-9233S	1	PIPE	

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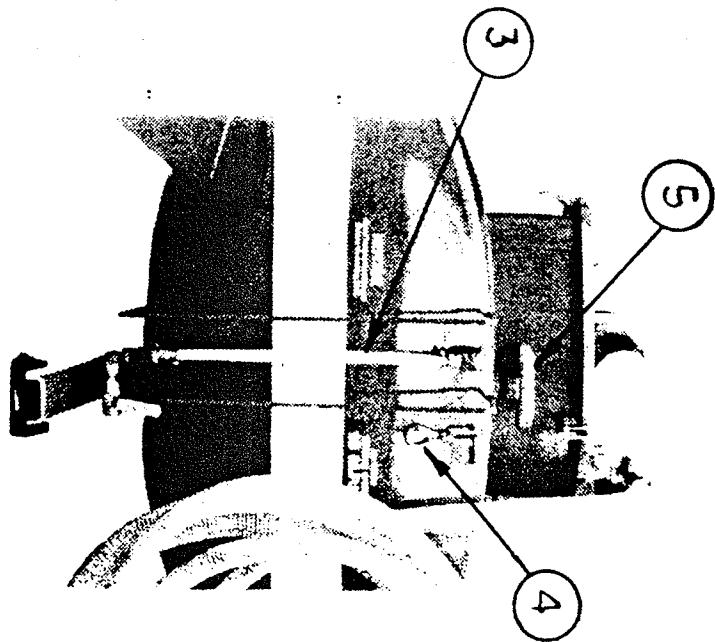
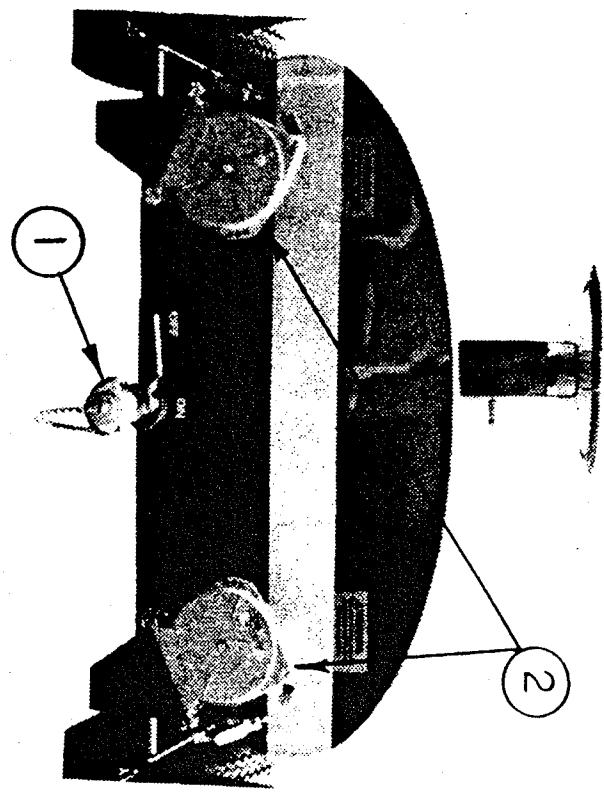


ASSEMBLY NO. 08-0001U
VACUUM SYSTEM ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1000				Drain Stop Assembly	
	1	07-1000	1	Drain Stop Arm	3.5
	2	04-1000	1	Gasket	1.5
	3	02-10016	1	Bolt	.1
	4	02-10002	1	Bolt	.1
	5	02-1100	1	Flatwasher	.1
	6A	02-1201	1	Nut	.1
	6B	02-1200	1	Nut	.1
08-1001				Overflow Stop Assembly	
	7	07-1109	1	Float Sub. Assembly	4
	8	04-1001	1	Gasket	.1
	9	02-10003	1	Bolt	.1
	10	02-1200	1	Nut	.1
	11	02-1100	1	Flatwasher	.1
08-10022				Cover Assembly	
	12	07-1002	1	Lid	5
	13	06-1022	1	Gasket	2.7
08-1003				Nortech Vacuum Head Assy.	
	14	04-1004	1	Exhaust Housing	9.5
	15	04-1005	1	Exhaust Silencer	4.7
	16	04-1006	1	Venturi	2.2
	17	04-1007	1	Air Jet	2.7
	18	04-1008	1	Venturi Box	2.7
	19	04-1032	1	Valve	5.8
	20	04-1056	1	Coupler	1.7
	21	04-1010	1	Gasket	.1
	22	02-10010	3	Bolt	.1

ASSEMBLY NO. 08-0001U (CONTINUED)
VACUUM SYSTEM ASSEMBLY

	23	02-11001	3	Washer	.1
08-1004				Accessories	
	24	03-1001	1	Elbow	2
	25	03-02922S	1	Nipple	.5
	26	04-10321	1	Valve	3
	27	03-1002	1	Hex Bushing	.2
	28	03-1003	1	Nipple	.1
	29	03-10101	1	Hose Clamp	.1
	30	06-10161	1	Hose	15
	31	03-1021	4	Pipe Cap (Optional)	1
	32	07-1019	1	Lid	24
	33	07-1034	1	Cover, Vacuum Generator	8
	34	02-10010	6	Bolt	.1
	35	06-1021	6	Washer	.1
	36	02-1100	6	Washer	.1
	37	02-1200	6	Nuts	.1
	38	04-1057	1	Coupler	.5
	39	02-10016	1	Bolt	.5
	40	02-1201	1	Nut	.1
	41	03-10155	4	Bushing (Optional)	.5
	42	04-10320	4	Ball Valve (Optional)	4
	43	03-10091	4	Hose Barb (Optional)	2
	44	06-10185	4	Tubing (Optional)	4
	45	01-9026S	2	Hanger Plate (Optional)	3
	46	02-12014	6	Hex Nuts (Optional)	.5
	47	01-9172S	4	Tubing Hangers (Optional)	2.5
	48	02-100115	6	Bolt (Optional)	1
	49	03-101005	4	Hose Clamp (Optional)	.5



ASSEMBLY NO. 10-100110
MAJOR ASSEMBLY - MISC. FIXTURES

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1012				Drain Assembly	
	1A	04-10321	1	Ball Valve	6
	1B	04-1033	1	Camlock Adaptor	1.5
	1C	04-10331	1	Camlock Plug	.5
	1D	04-1034	1	Safety Chain	.2
	1E	04-1034	1	S-Hook, Safety Link	.1
	1F	04-1035	1	S-Hook, Safety Link	.1
08-1013				Grounding Reel Assembly	
	2	04-10361	1	Grounding Reel	12
	2A	04-1036	1	Grounding Reel	12
	2B	02-10040	4	Bolts	.3
	2C	02-12041	4	Nuts	.1
08-1014	3			Sight Gauge Assembly	
	3A	03-0017S	2	Elbow	.5
	3B	03-1007	1	Tee	.5
	3C	03-1008	2	Nipple	.5
	3D	03-11130	2	Hose Barb	1
	3E	03-1010	2	Hose Clamp	.1
	3F	04-1032	1	Ball Valve	2.7
	3G	06-2527	1	Tubing	.1
	5	04-1037	1	Vent	3

SPOKANE METAL PRODUCTS

Spokane Washington

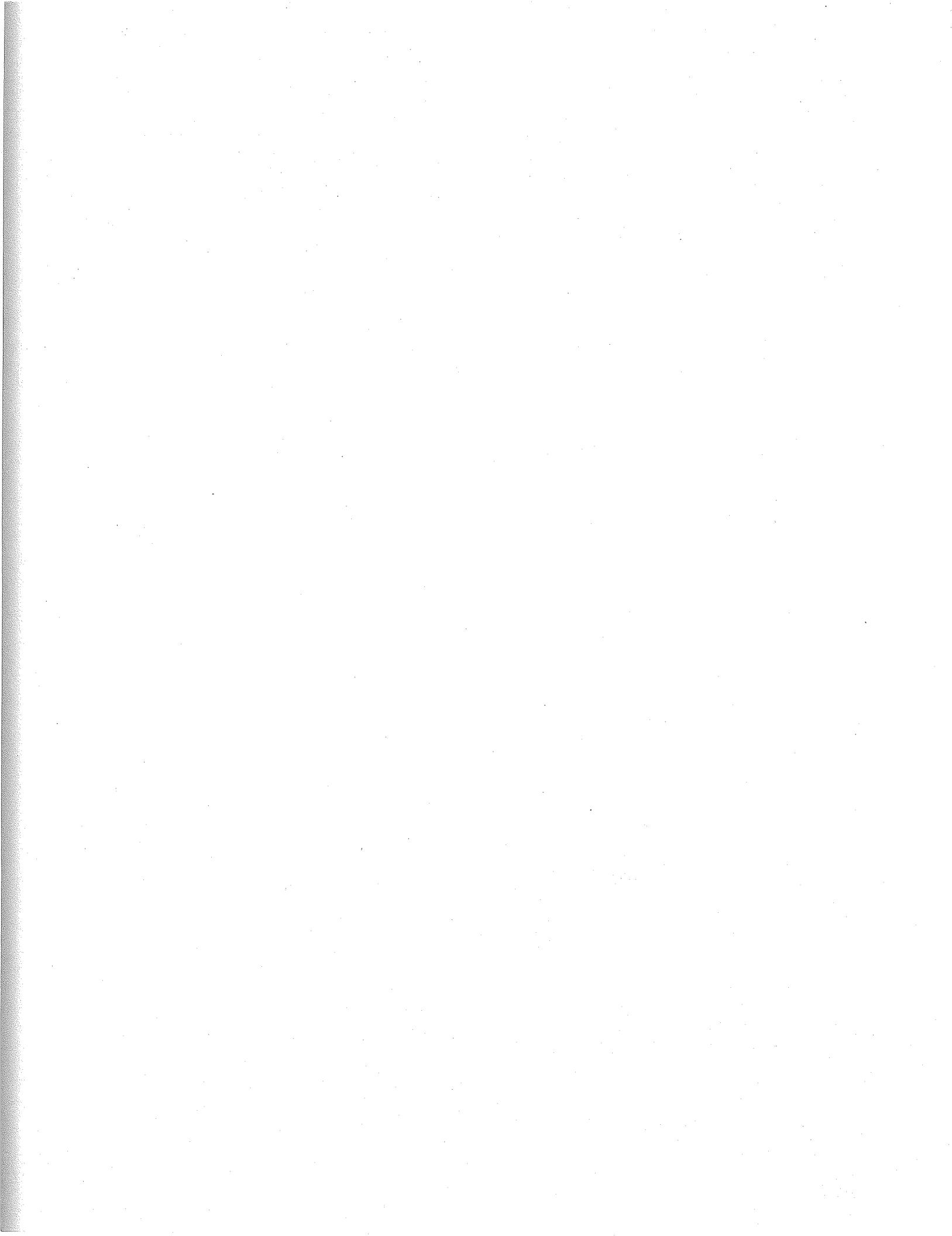
150 GALLON BOWSER FUEL DRAIN TANK

ONE YEAR LIMITED WARRANTY

Seller warrants its 150 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 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 pre-paid.

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 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.



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

150 GALLON FUEL BOWSER

OPERATION AND MAINTENANCE MANUAL

MODEL NUMBER BOW 150-0/

OBSOLETE

11-19-92

SPOKANE METAL PRODUCTS

150 GALLON FUEL BOWSER OPERATION AND MAINTENANCE MANUAL MODEL NUMBER BOW 150-01

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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

2.2.1

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

2.6.1

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

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, ~~and all manways and covers are closed and latched.~~ 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.

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

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 60 CFM at 100 PSI and turning on the air supply valve.

3.5.4

- 3.5.5 The vacuum generator is equipped with an automatic overflow protector. When the level of products is full, the valve shuts off and eliminates the vacuum. The air supply must be shut off to reset the overflow valve and the tank must be drained. Vacuuming may then continue.

- 3.5.6 The vacuum assembly is supplied with 35 feet of vacuum hose.

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 a 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.

- 4.1.3.1 Tightening is accomplished by removing bolt through one yoke and screwing yoke in to shorten connecting rod.

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

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

4.3.1 The carriage should have a regular maintenance program of inspection and repair.

4.3.2 Inspect sleep bar, supports, fenders, etc.

4.3.3 Check operating valves to determine that pressure does not fluctuate and valves operate correctly to prevent unauthorized vehicles entering the unit.

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

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.
- 4.4.2 ~~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

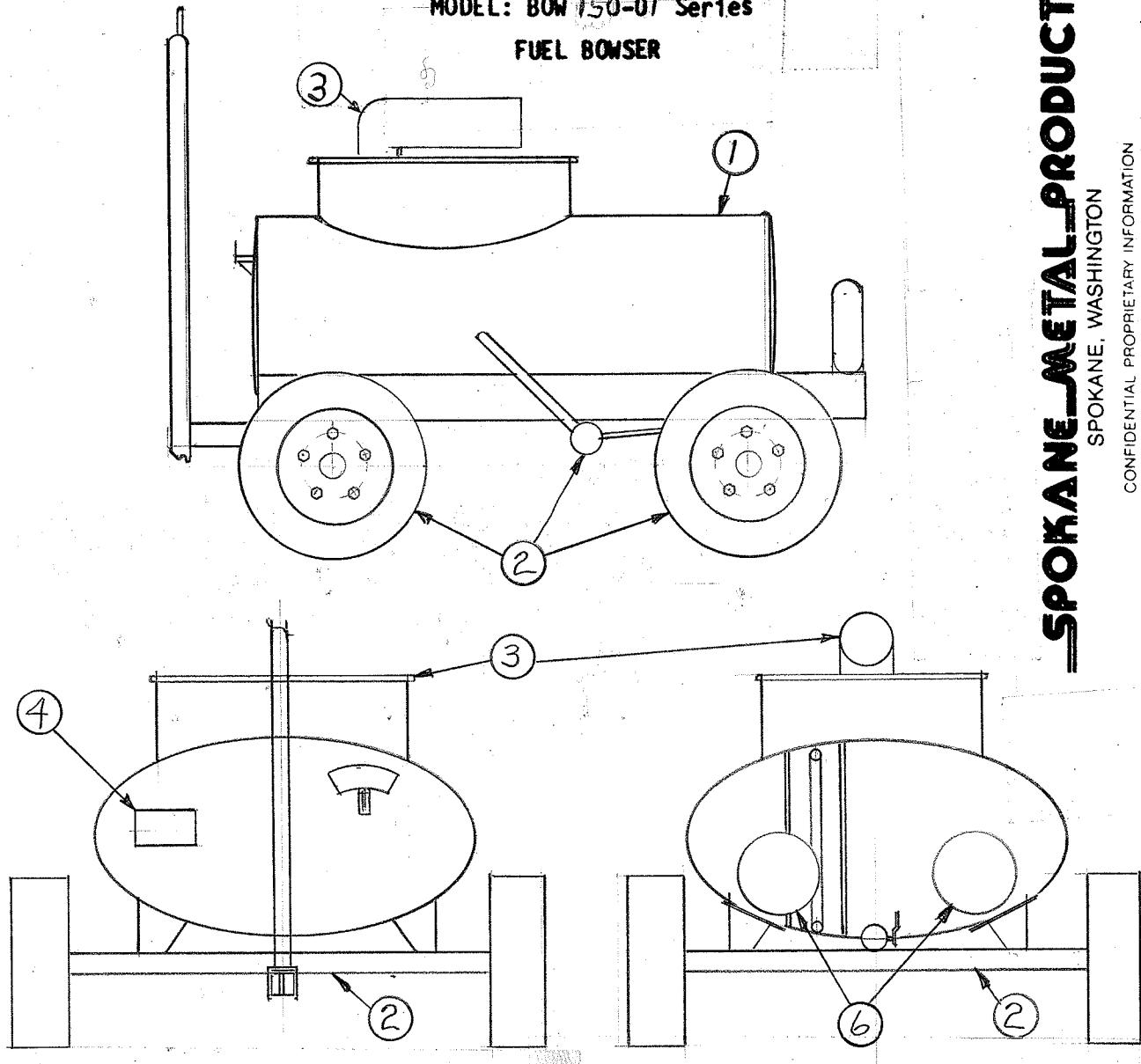
This section provides information for identification of parts for ordering. To order it is important to have the Model Number, Subassembly Number, Part Number and Description. Parts may be ordered by calling or writing to:

SPOKANE METAL PRODUCTS
P.O. Box 3621
Spokane, WA 99220
Telephone: Area Code 509-928-0720

PARTS INDEX

MODEL: BOW 150-01 Series

FUEL BOWSER

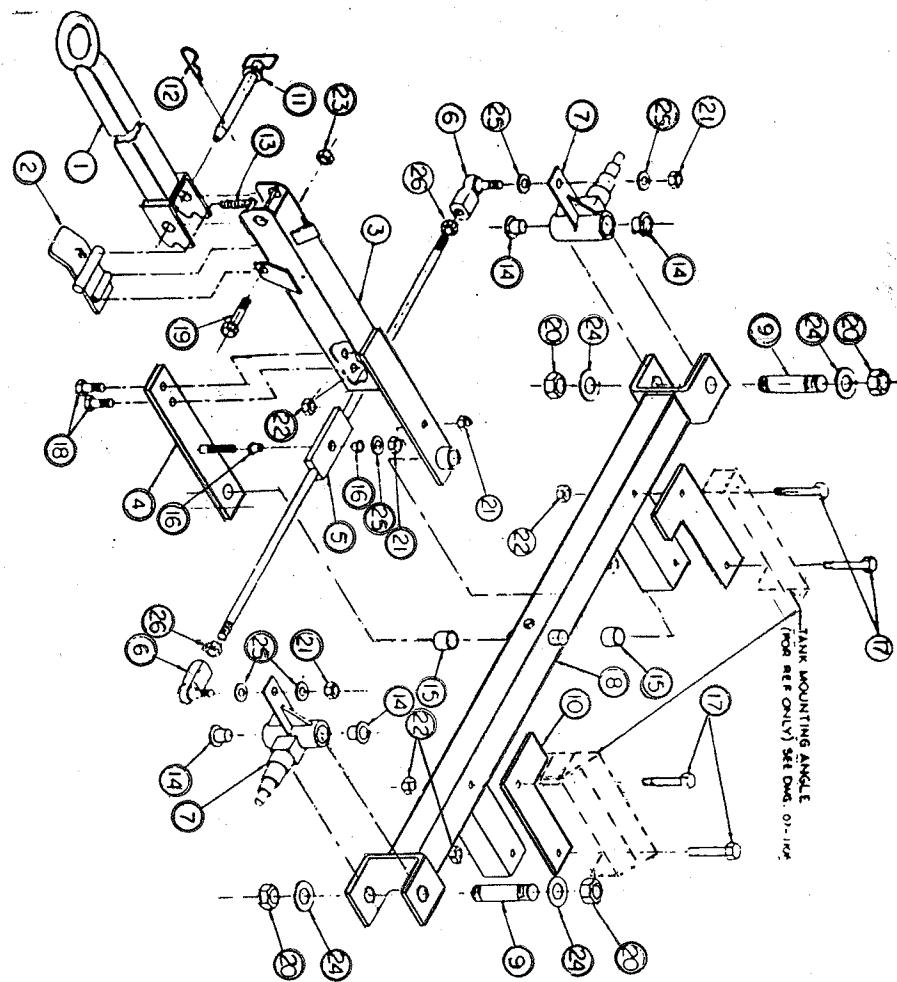


<u>Item No.</u>		<u>Section</u>
1	Main Tank	5.1
2	Axle, Front	5.2.1
2	Axle, Rear	5.2.2
2	Brake, Parking	5.2.3
2	Wheel Assembly, Front	5.2.5
2	Wheel Assembly, Rear	5.2.6
3	VACUM ASSEMBLY.	5.3
4	Decal Package	5.4
5		
6	Miscellaneous Fixtures	5.6

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MAJOR ASSEMBLY - AXLE ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Weight
08-1029	1	07-1103	1	AXLE ASSEMBLY, FRONT	.23
	2	07-1020	1	TOE LATCH	.3.1
	3	07-1052	1	ARM, STEERING	1b.
	4	07-1046	1	STEERING ARM, LOWER PLATE	.6.1
	5	07-10377	1	TIKE ROD	.7.3
	6	03-1016	2	ROD END, BALL JOINT	.5.
	7	05-1009	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	02-1104	1	HITCH PIN	.2.
	12	02-1300	1	COTTER PIN	.?
	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	
	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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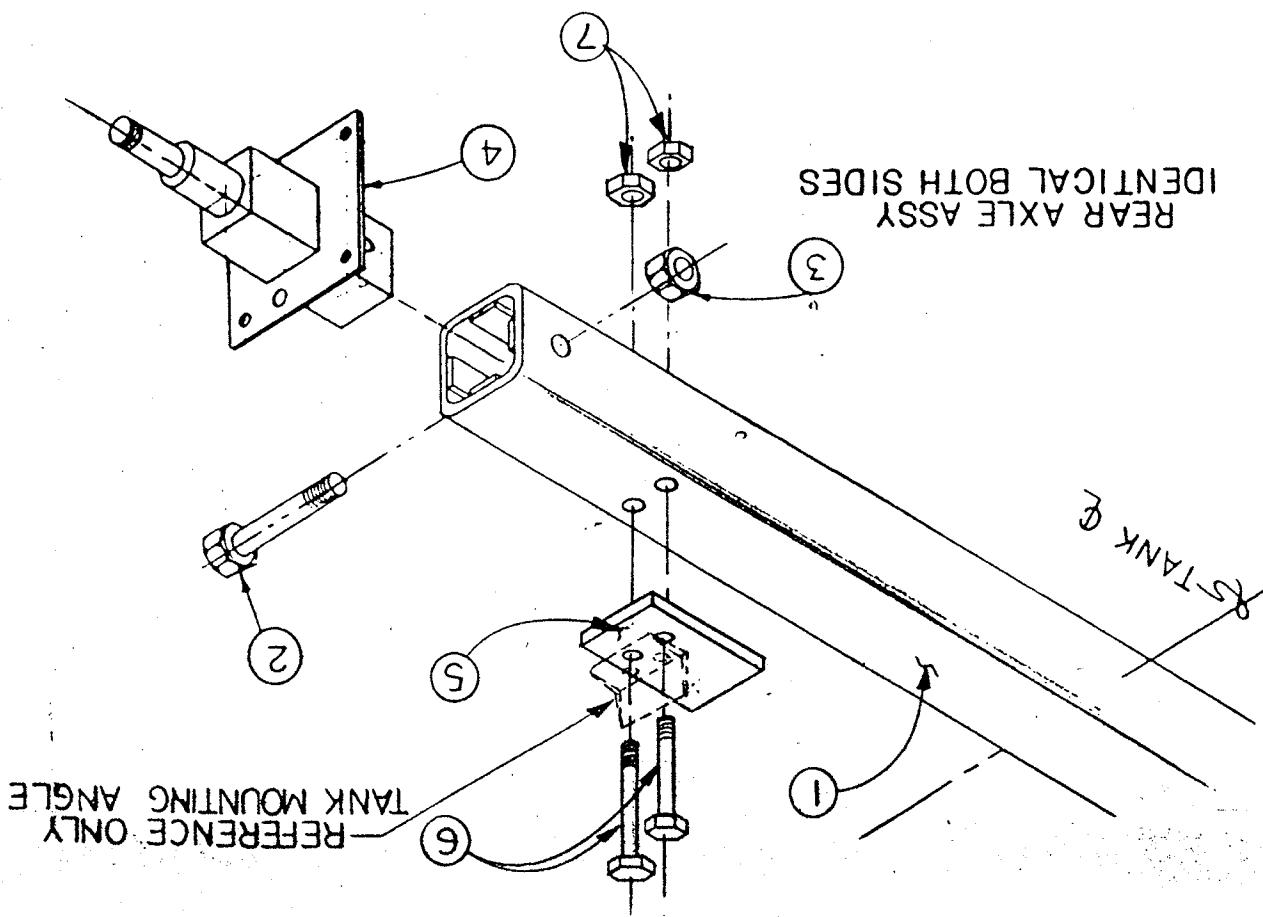
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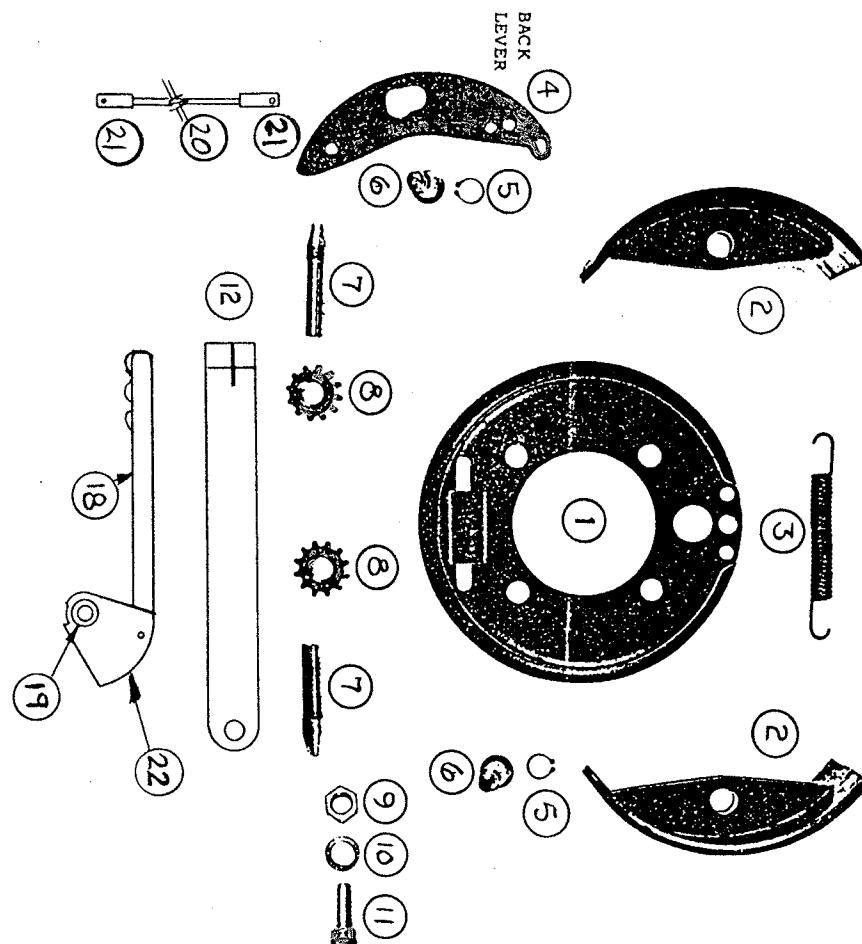
Sub Assy.	Item	Part No.	Quantity	Description	Weight
	1	05-1054	1	Axle, Rear Wheel	50#
	2	02-1505	2	Bolts, Mounting Spindle	1#
	3	02-12041	2	Nuts, Mounting Spindle	.5#
	4	05-1022	2	Spindle, Rear	30#
	5	06-1012	2	Mounting Pad, Tank	4#
	6	02-1503	4	Bolt, Tank Mounting	1#
	7	02-12041	4	Nuts, Tank Mounting	.5#

MAJOR ASSEMBLY - AXLE ASSEMBLY



SECTION 5.2.3

WHEEL ASSEMBLY

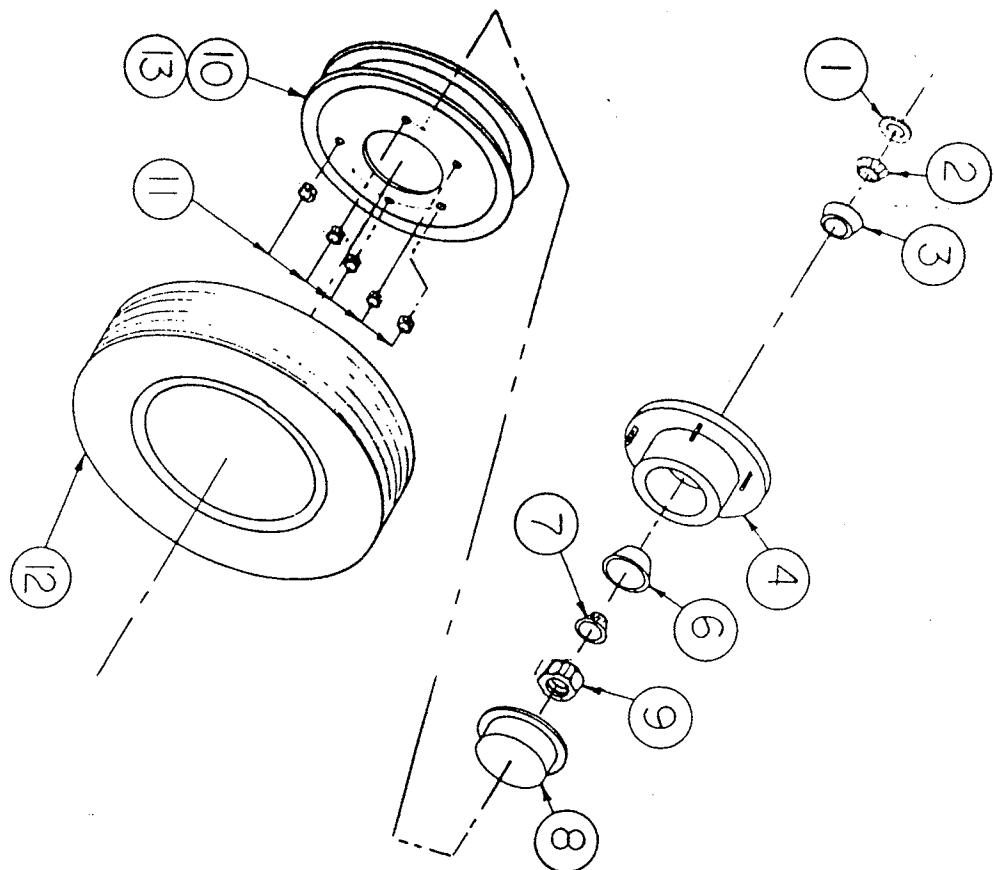


MAJOR ASSEMBLY - BRAKE, PARKING

Sub Assy.	Item	Part No.	Quantity	Description	Net Wt.
08-1007		04-1063		Brake Assembly (2 req'd per Bowser)	
	1	04-1023	1	Brake, Plate Assembly	.74
	2	04-1024	1	Brake, Shoe Assembly	.44
	3	04-1026	2	Brake, Shoe Lever Spring	.14
	4	04-1025	2	Brake, Shoe Lever	.14
	5	02-1400	2	1/2" Retaining Ring	.24
	6	02-1303	2	Anchor Pin	.24
	7/8	04-1027	2	Adjusting Screw Assembly	.74
	9	02-12031	4	Nut,	.24
	10	02-11031	4	Lockwasher,	.14
	11	02-10031	4	Bolt, 7/16" Shoulder	.54
	12	04-1030	1	Brake, Control Arm (Cam lever - 5-1/4")	.34
08-1008				Brake, Handle Assembly	
	13	04-1028	1	Cam	.54
	14	04-1029	1	Cam Lever 2" *	.74
	15	04-1031	1	Cam Spacer *	.24
	16	02-10012	1	Bolt	.44
	17	02-12021	1	Nut *	.14
	18	01-8105	1	Brake Handle	.44
	19	01-8104	1	Brake Handle Connector	.44
08-1009				Brake Linkage Assembly (2 req'd per bowser)	
	20	05-1026	1	Brake Linkage Rod	.14
	21	04-2516	2	Brake Linkage, YOKE-ENDS	.54
	22	05-1025	2	Brake Linkage Mount	.14

* Denotes Items Not Shown

SECTION 5.2.4



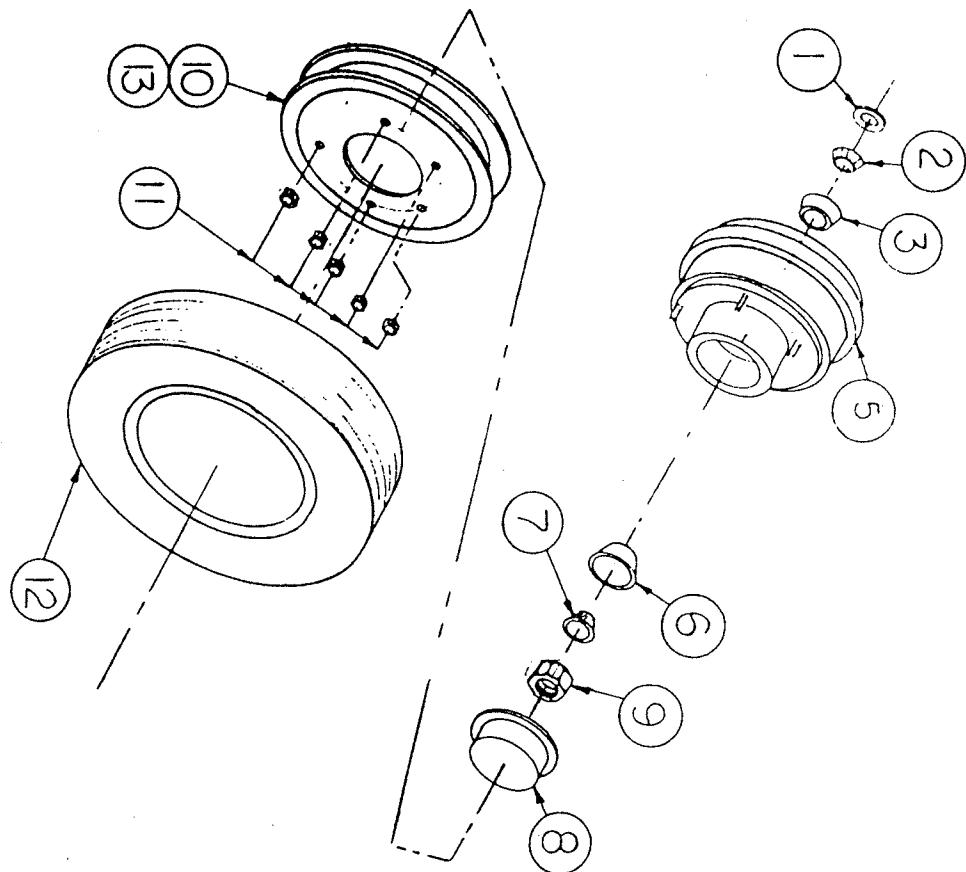
MAJOR ASSEMBLY - WHEEL ASSEMBLY, FRONT

Sub Assy.	Item	Part No.	Quantity	Description	Weight
08-1011				Bearing Assembly (2 req'd per Bowser)	
	1	04-1012	1	Seal, Bearing	1#
	2	04-1013	1	Bearing, Cone, Inner	3#
	3	04-1015	1	Bearing, Cup, Inner	2#
	4	04-1017	1	Hub, Wheel	7#
	5	04-1016	1	Outer Bearing Cup	4#
	6	04-1014	1	Outer Bearing Cone	3#
	7	04-1019	1	Dust Cap	1#
	8	02-1205	1	Spindle Nut	1#
08-10061				Wheel Assembly (2 req'd per Bowser)	
	10	04-1020	1	Wheel 10", Split Rim	10#
	11	04-1021	5	Wheel, Lugnuts	1#
	12	04-10221	1	Tires, 10"	4#
	13	04-1045	1	Tube Assembly	1#

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SECTION 5.2.5



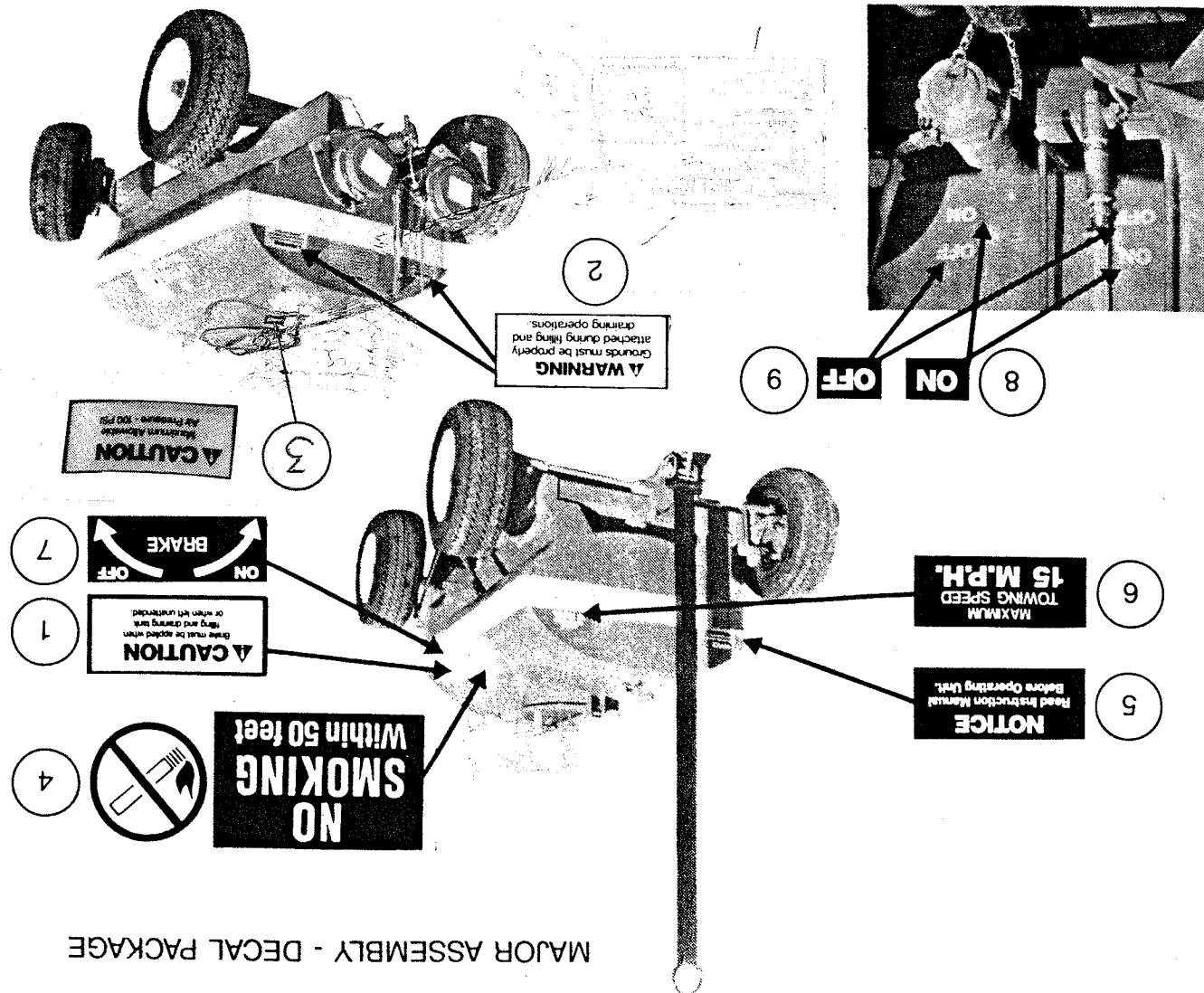
Sub Assy.	Item	Part No.	Quantity	Description	Weight
8-10111				Bearing Assembly (2 req'd per Bowser)	
	1	04-1012	1	Seal, Bearing	1#
	2	04-1013	1	Bearing, Cone, Inner	3#
	3	04-1015	1	Bearing, Cup, Inner	2#
	5	05-1008	1	Hub, Drum Assembly	16#
	6	04-1016	1	Outer Bearing Cup	4#
	7	04-1014	1	Outer Bearing Cone	3#
	8	04-1019	1	Dust Cap	1#
	9	02-1205	1	Spindle Nut	1#
8-10061				Wheel Assembly (2 req'd per Bowser)	
	10	04-1020	1	Wheel 10" - Split Rim	10#
	11	04-1021	5	Wheel, Lugnuts	1#
	12	04-10221	1	Tires, 10"	4#
	13	04-1045	1	Tube Assembly	.1#

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SPOKANE METAL PRODUCTS

Sub-Assy	Item	Part No.	Qty.	Description	Wt. #
08-10251	1	06-1003	1	Decal, Caution, Parking Brake	.1
	2	06-1004	2	Decal, Warning, Grounding Reels	.1
	3	06-1002	1	DECAL, CAUTION, VACUUM SYSTEM	.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



SPOKANE METAL PRODUCTS

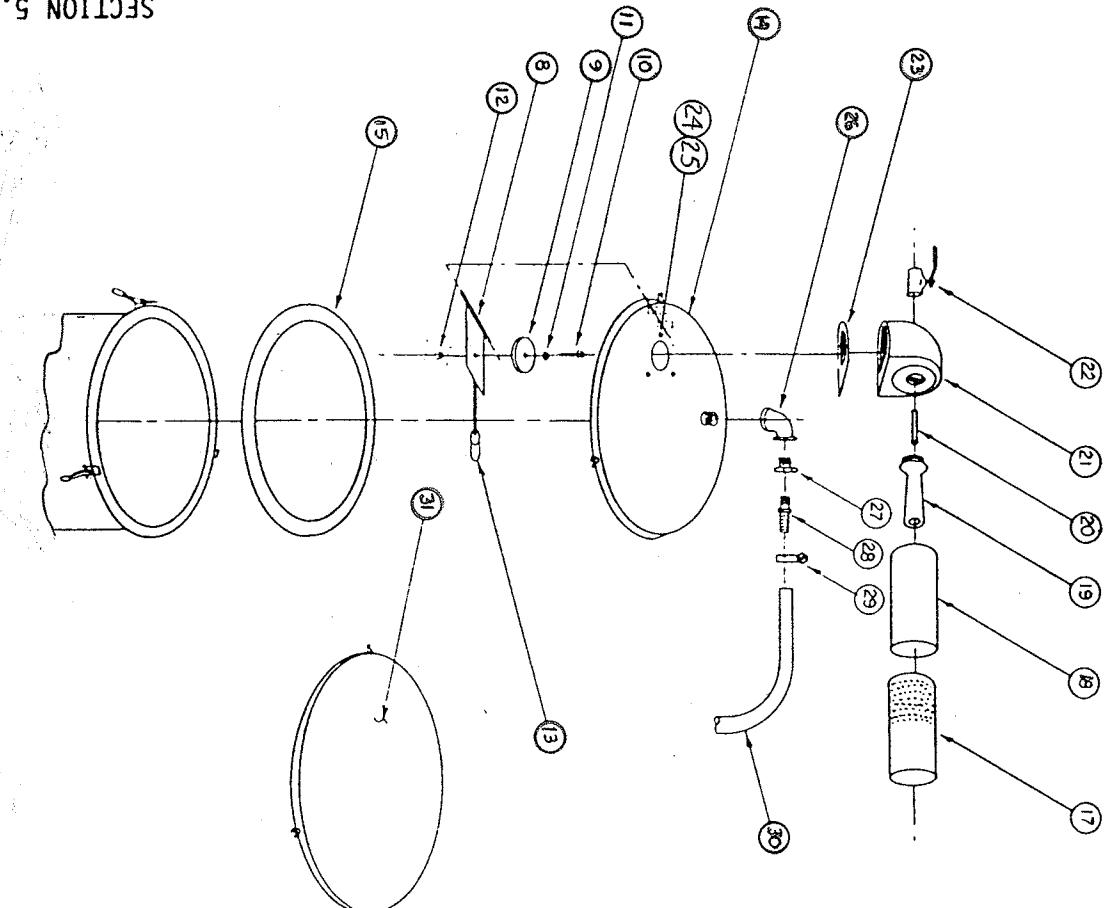
SPOKANE, WA

ASSEMBLY NO. 10-100090

MAJOR ASSEMBLY - VACUUM SYSTEM ASSEMBLY

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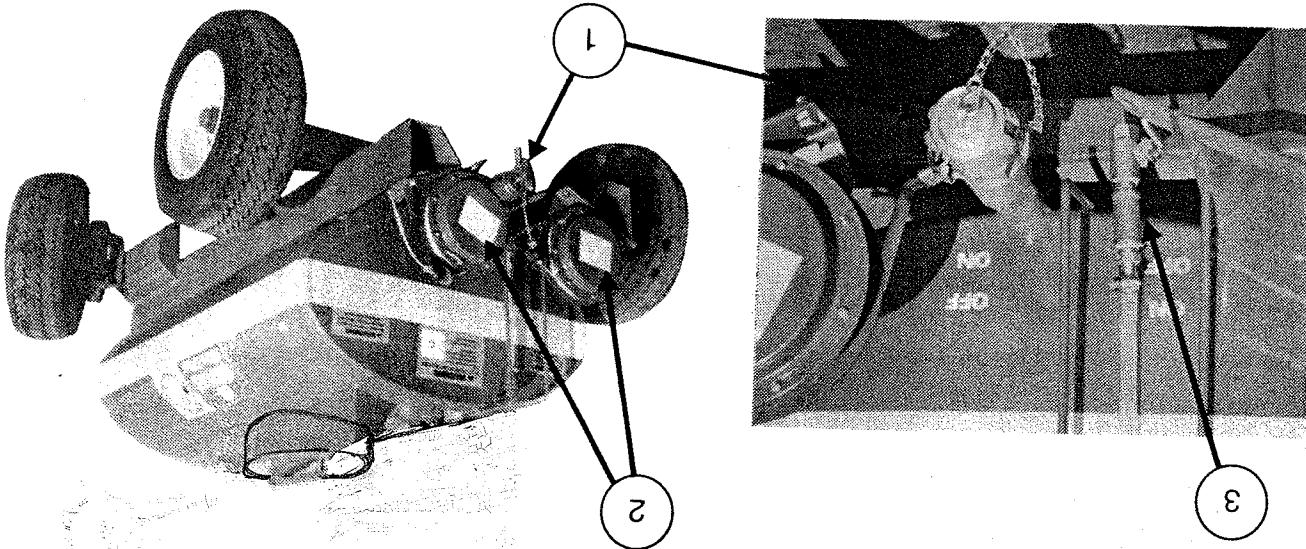
SECTION 5.6



Sub Assy.	Item	Part No.	Quantity	Description	Wt.
08-1001	1	07-1109	1	Over-flow Stop Assembly	.44
	8	04-1001	1	Over-flow Stop	.44
	9	04-1003	1	Gasket, Over-flow Stop	.21
	10	02-1003	1	Bolt, Over-flow Stop Gasket	.21
	11	02-1100	1	Washer, Over-flow Stop Gasket	.11
	12	02-1200	1	Nut, Lock Over-flow Stop Gasket	.11
	13	04-1019	1	Float, Over-flow	.21
08-1002				Cover Assembly	
	14	07-1002	1	Cover Plate	.24
	15	06-1022	1	Gasket, Cover	.31
08-1003				Vacuum Head Assembly	.27
	17	04-1004	1	Exhaust Housing	.91
	18	04-1005	1	Exhaust Silencer	.47
	19	04-1006	1	Venturi	.21
	20	04-1007	1	Air Jet	.21
	21	04-1008	1	Venturi Box	.51
	22	04-1032	1	Valve, Shut Off	.11
	23	04-1010	1	Gasket, Vacuum Head	.11
	24	02-10010	3	Bolt, Vacuum Head	.24
	25	02-11100/	3	Washer, Vacuum Head	.11
08-1004				Accessories	
	26	03-1001	1	Elbow, Vacuum Outlet	.21
	27	03-1002	1	Bushing, Outlet	.11
	28	03-1003	1	Adapter, Hose	.54
	29	03-1004	1	Clamp, Hose	.24
	30	06-1001	1	Hose, Vacuum	.15
	31	07-1019	1	Cover, Blank	.24

Section 5.7

Sub-Assy	Item	Part No.	Qty.	Description	Wt. #
08-1012	1	04-10321	1	Drain Assembly	
	1A	04-10321	1	Valve, 1/2" Ball W/Locking Handle	6.
	1B	04-1033	1	Adaptor, Camlock 1 1/2"	
	1C	04-10331	1	Plug, Camlock 1 1/2"	1.5
	1D	04-1034	1	Chain, Safety X 12" 1g.	.5
	1E	04-1035	1	S Link	.2
	1F	04-10351	1	S Link	.1
08-1013	2	04-1036	1	Grounding Reel Assembly	.1
	2A	04-10361	1	Grounding Reel	12.
	2B	02-10042	1	Grounding Reel	12.
	2C	02-12041	4	Bolts	12.
	2D	02-12041	4	Nuts, Hex, Nylon Locking	12.
	3A	03-10175	1	Sight Gauge Assembly	.1
	3B	03-1007	1	Elbow, 1/2"	.5
	3C	03-1008	1	Te, 1/2"	.5
	3D	03-11130	2	Hose Barb, 1/2"	.5
	3E	03-1010	2	Hose Clamp, 1/2"	.5
	3F	04-1032	2	Valve, 1/2", Ball W/Locking Handle	.1
	3G	06-2527	1	Tube, 1/2" I.D.	.2



MAJOR ASSEMBLY - MIS.C. FIXTURES
Assembly No. 10-100115

SELLER WARRANTS ITS 450 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 TWO YEARS OF THE DATE THE UNIT IS PUT INTO SERVICE BUT SHALL IN NO EVENT EXCEED 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 PRE-PAID.

THIS WARRANTY DOES NOT EXTEND TO DAMAGE CAUSED BY ENVIRONMENTAL FACTORS VARYING FROM NORMAL DESIGN CONDITIONS, WHETHER NATURAL OR MAN-MADE, OR TO UNITS SUBJECT 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.

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TWO YEAR LIMITED WARRANTY

450 GALLON BOWSER FUEL DRAIN TANK

SPOKANE METAL PRODUCTS