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Spokane Washington

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150 GALLON FUEL BOWSER

TECHNICAL MANUAL

PARTS, OPERATION AND MAINTENANCE

MODEL NUMBER BOW 150-02

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150 GALLON FUEL BOWSER

TECHNICAL MANUAL

PARTS, OPERATION AND MAINTENANCE

MODEL NUMBER BOW 150-02

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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.
- 2.2 Telescoping Drain
 - 2.2.1 Care should be exercised in using the telescope to prevent injuring fingers between clamps by dropping sections.
- 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.

3.4 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 To Raise:

- (1) Loosen top clamp if necessary.
- (2) Grasp top section with one hand and lift until the top clamp raises approximately 6 inches.
- (3) Tighten clamp securely with the other hand.
- (4) Reposition lifting hand by grasping tube below tightened clamp and lift until next clamp is raised approximately 6 inches.
- (5) Repeat steps 1-4 until desired height is obtained or assembly is fully extended.

3.4.3 To Lower:

- (1) Tightly grasp bottom extended tube with one hand and loosen the securing clamp.
- (2) Slowly lower tube, hand over hand, until the following clamp is resting on the loosened clamp.
- (3) Repeat steps 1 and 2 until all sections are lowered.

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

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

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. Maintain Pressure as per tire markings.
- 4.2.3 Tow bar pivot pin and hook ring should be inspected monthly for excessive wear or cracks.
- 4.3 Telescoping Drain Assembly
- 4.3.1 The telescoping Drain Assembly consists of stainless steel housing 3-1/2" in diameter permanently attached to the tank and five (4) aluminum tube sections.
- 4.3.2 The stainless tube and four largest aluminum tubes are equipped with a clamp assembly.
- 4.3.4 Each aluminum tube is crimped on the lower end which acts as a stop to prevent the tube from sliding through the clamp.
- 4.3.5 Disassembling of the telescope assembly is accomplished by rotating the four sections 180 degrees from normal position and gently lifting each section so that the crimped edge on the tube is aligned with the slot on the clamp.
- 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

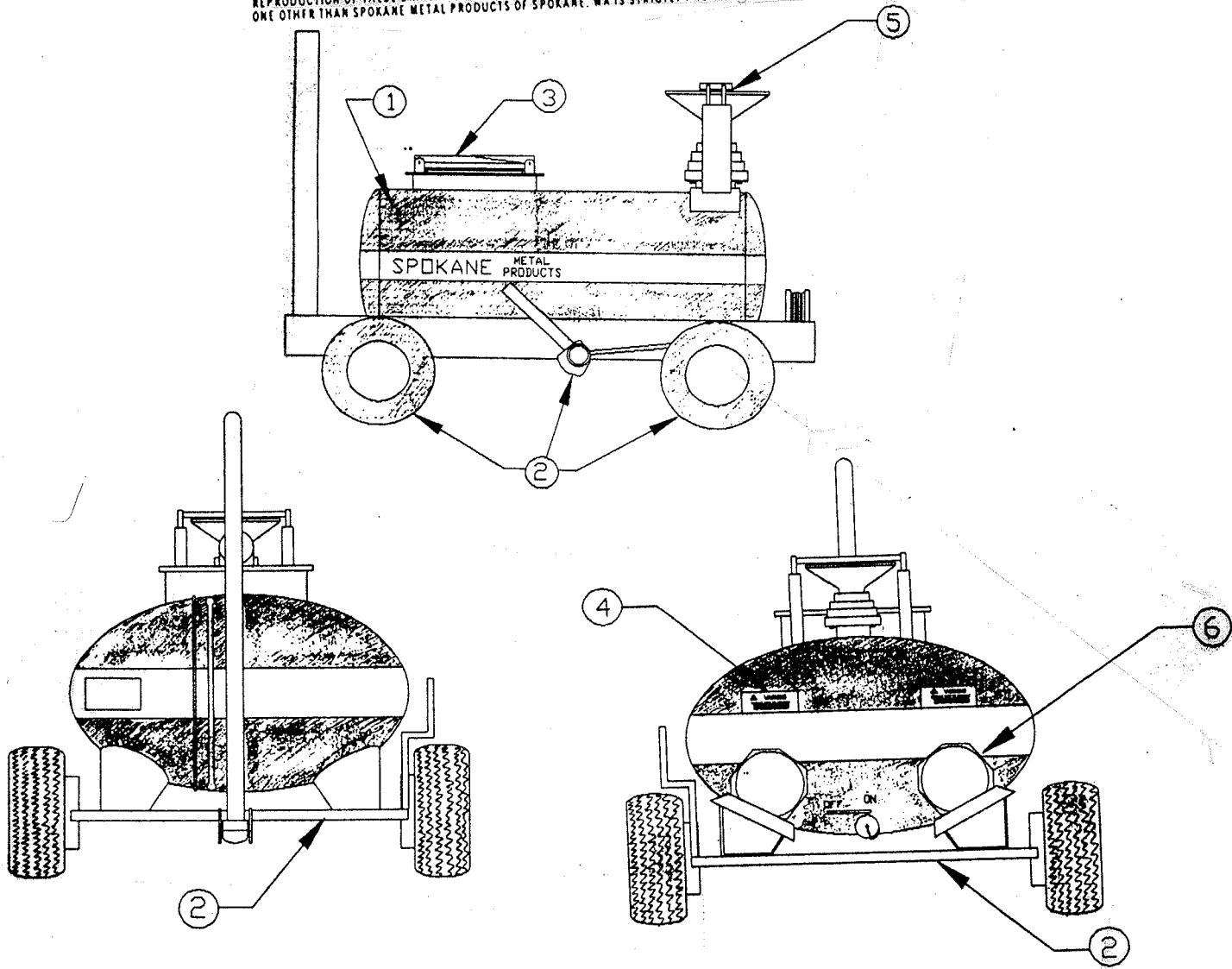
This section provides information for identification of parts for ordering. To order, it is important to have the Model Number, Subassembly Number, Part Number and Description. Parts may be ordered by calling or writing to:

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

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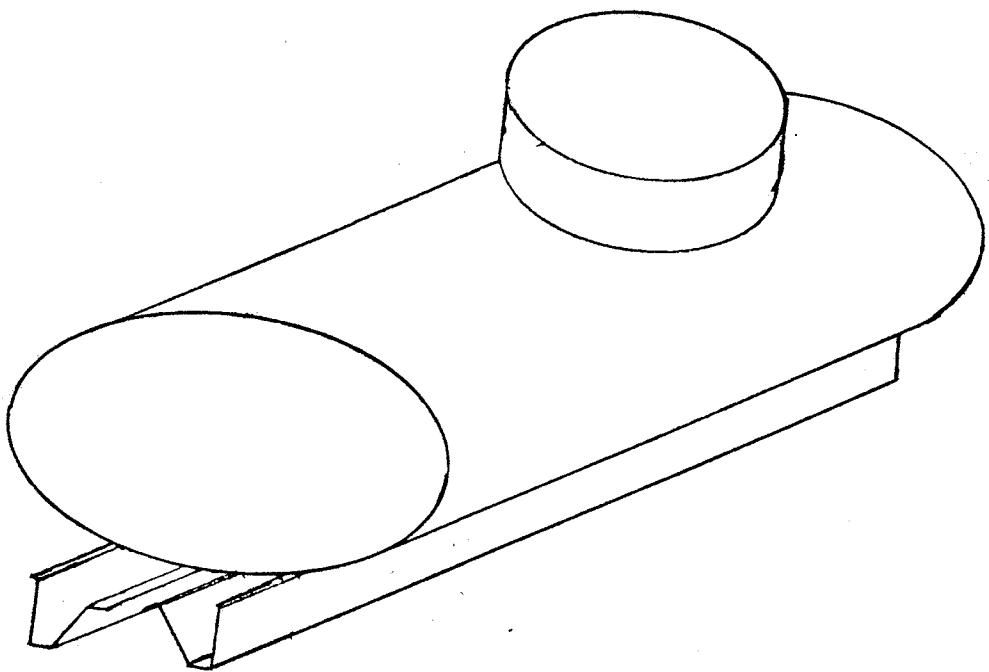
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4	Decal Package	5.4
5	Telescoping Drain	5.5
7	Miscellaneous Fixtures	5.7

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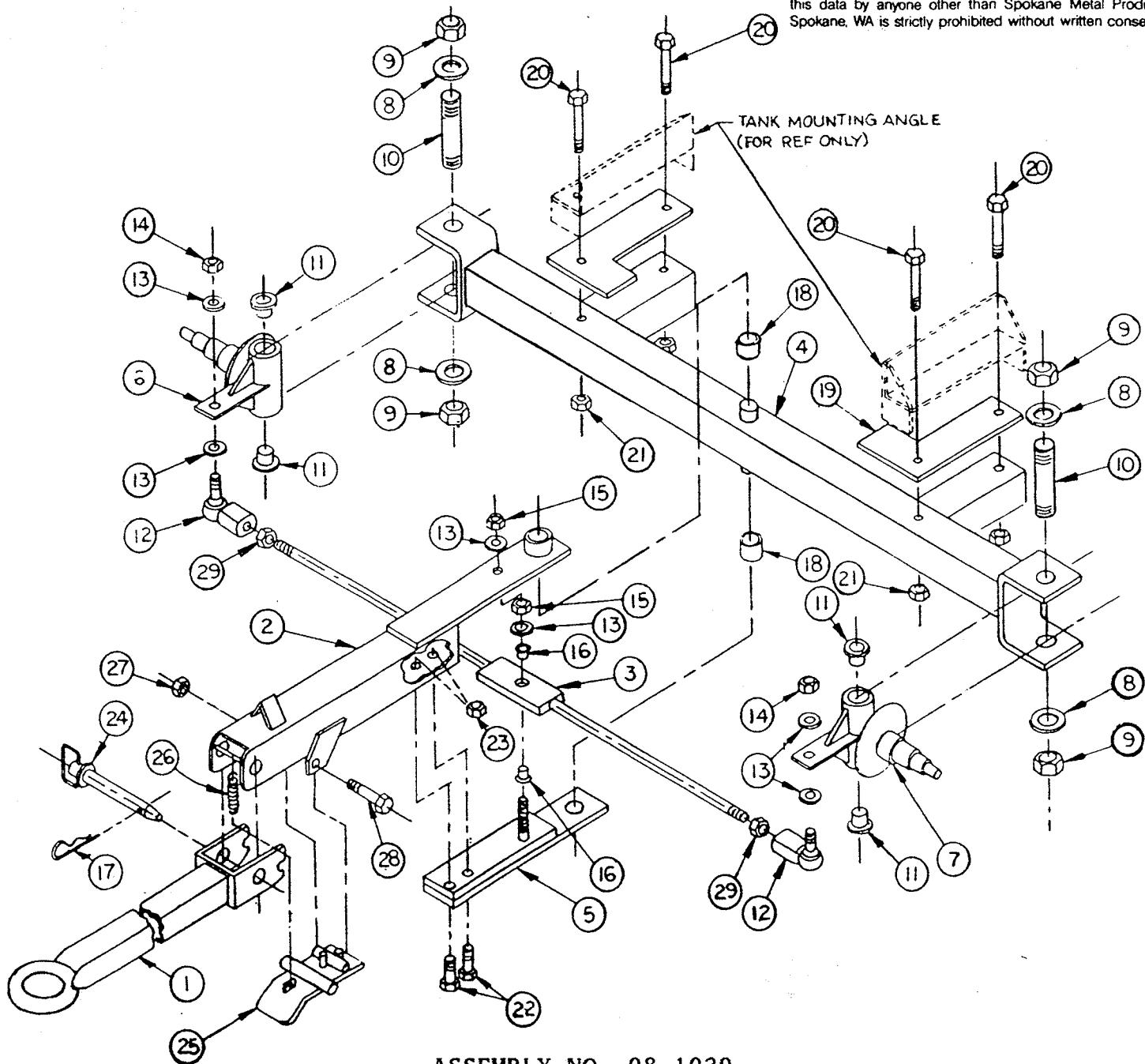
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ASSEMBLY NO. 08-10007

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 150-02	175#



ASSEMBLY NO. 08-1029

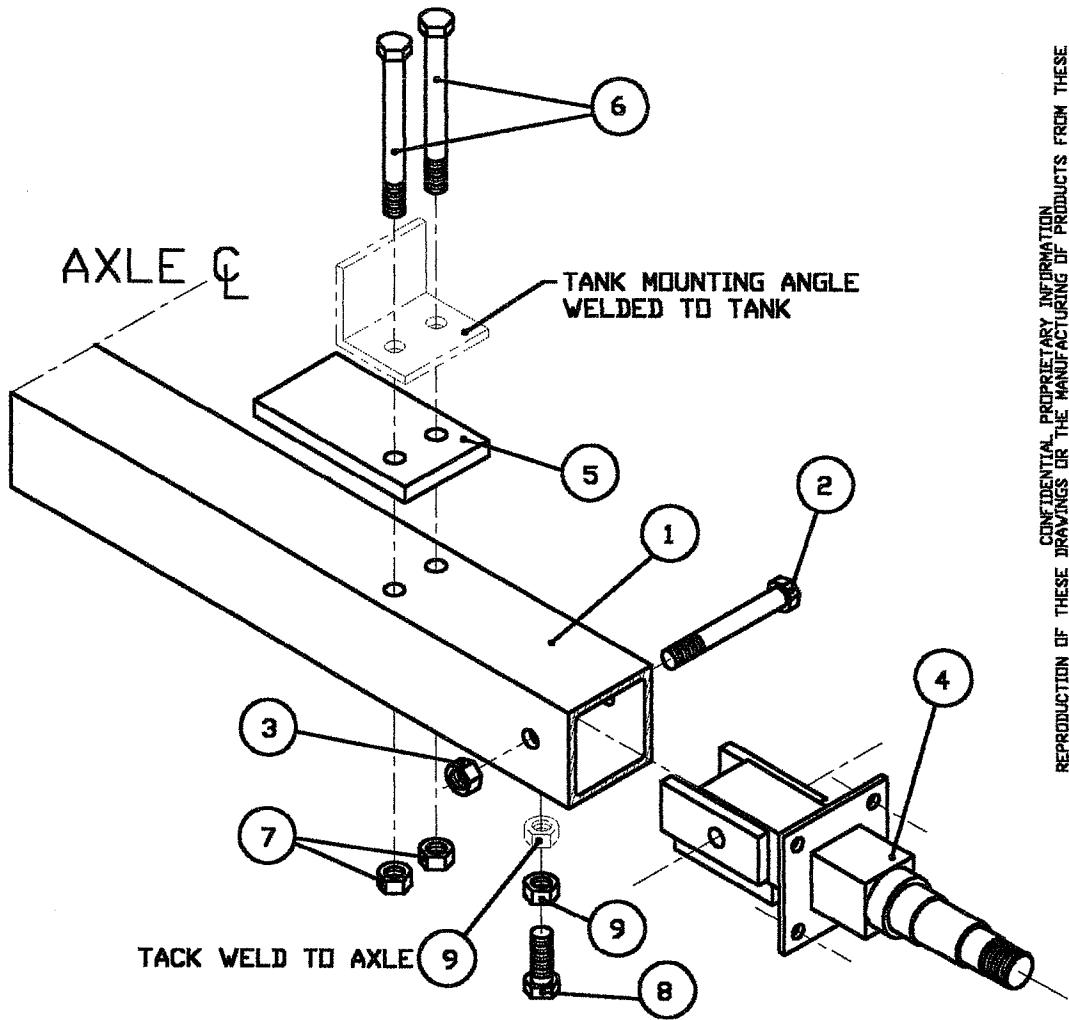
MAJOR ASSEMBLY - AXLE ASSEMBLY

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

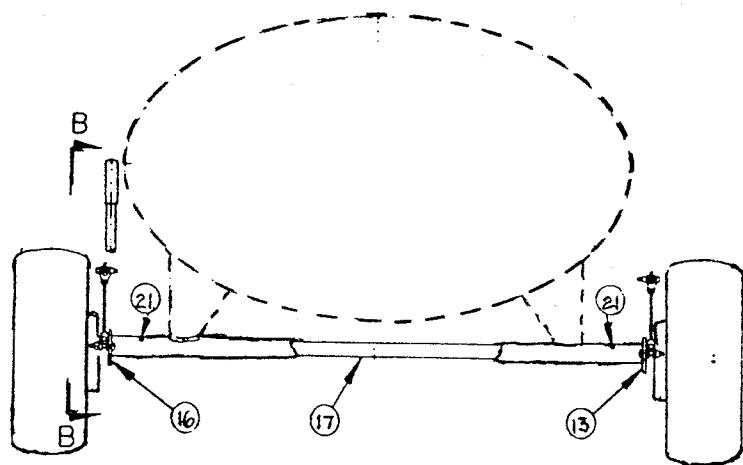
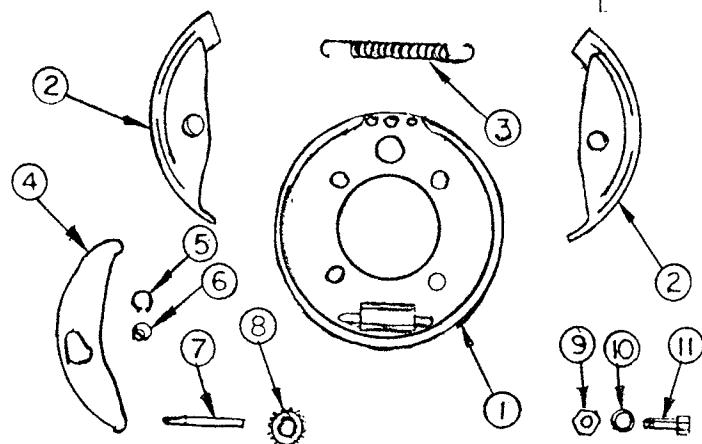


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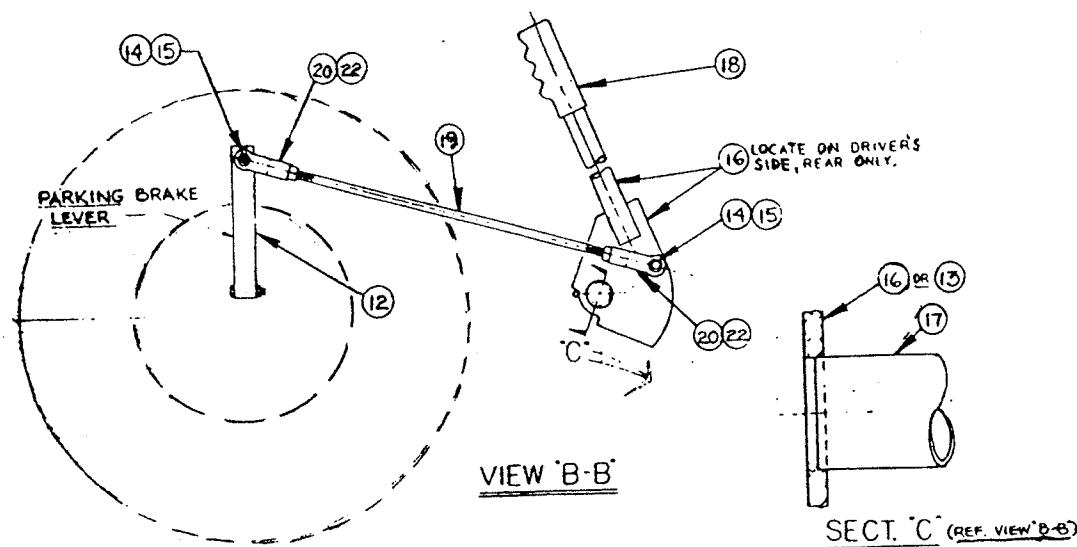
ASSEMBLY NO. 08-1030Z

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
	8	02-10041	2	Bolt, Spindle Stabilizer	.5
	9	02-1203	4	Nuts, Spindle Stabilizer	.5



REAR VIEW
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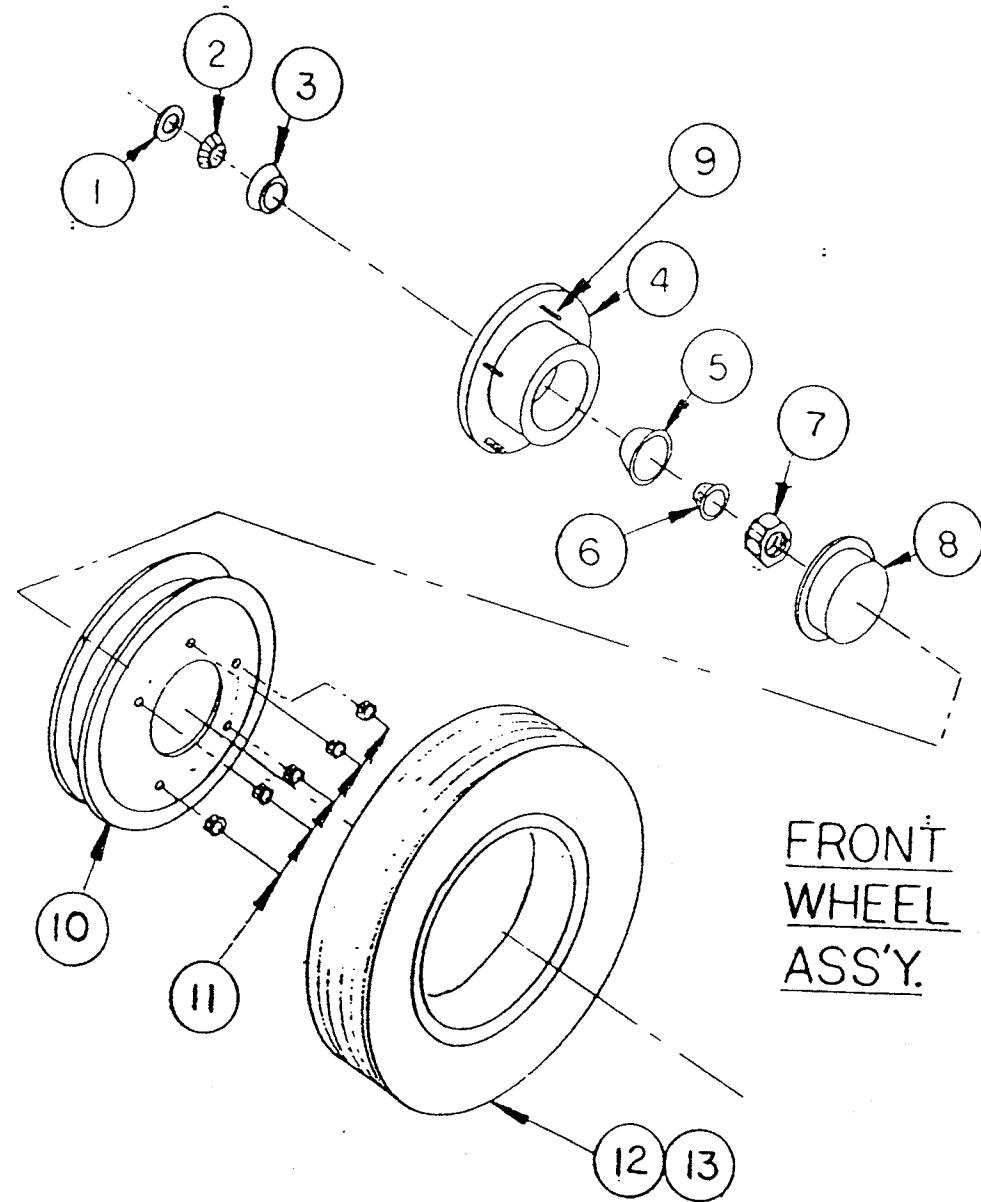
PO BOX 3421 • Spokane, WA 99220 • 509-345-0720 • FAX 509-345-4470

ASSEMBLY NO. 10-100030

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\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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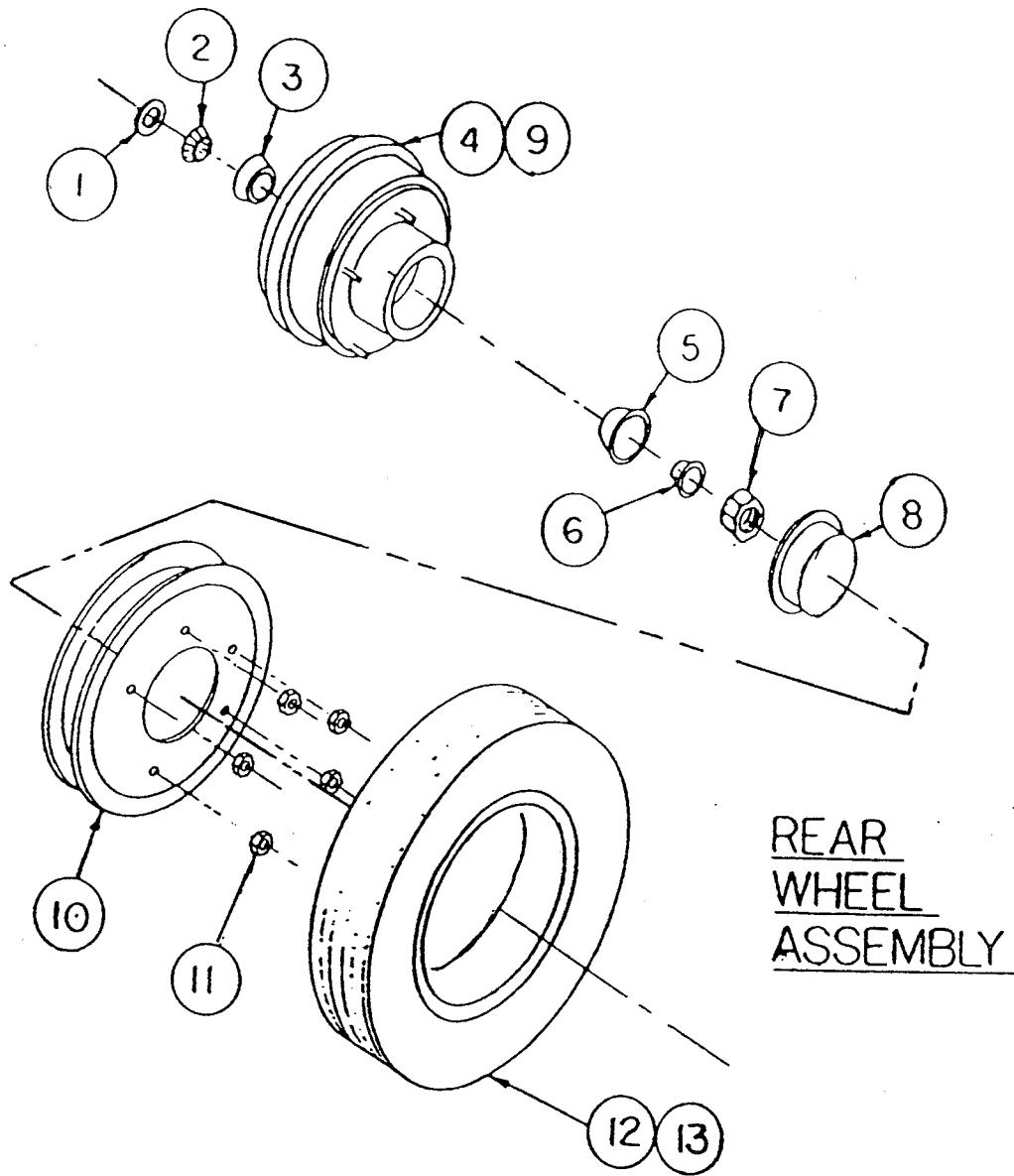
ASSEMBLY NO. 10-100042

MAJOR ASSEMBLY - WHEEL ASSEMBLY, FRONT

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1011		04-1050		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	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
08-10062		04-10201		Tire/Wheel/Tube Assembly (2 Reqd)	
	10	04-1020	1	Wheel, Split Rim, 10"	9.5
	11	04-1021	5	Lug Nuts, Wheel	1
	12	04-10222	1	Tire, 10"	4
	13	04-1045	1	Tube Assembly	11

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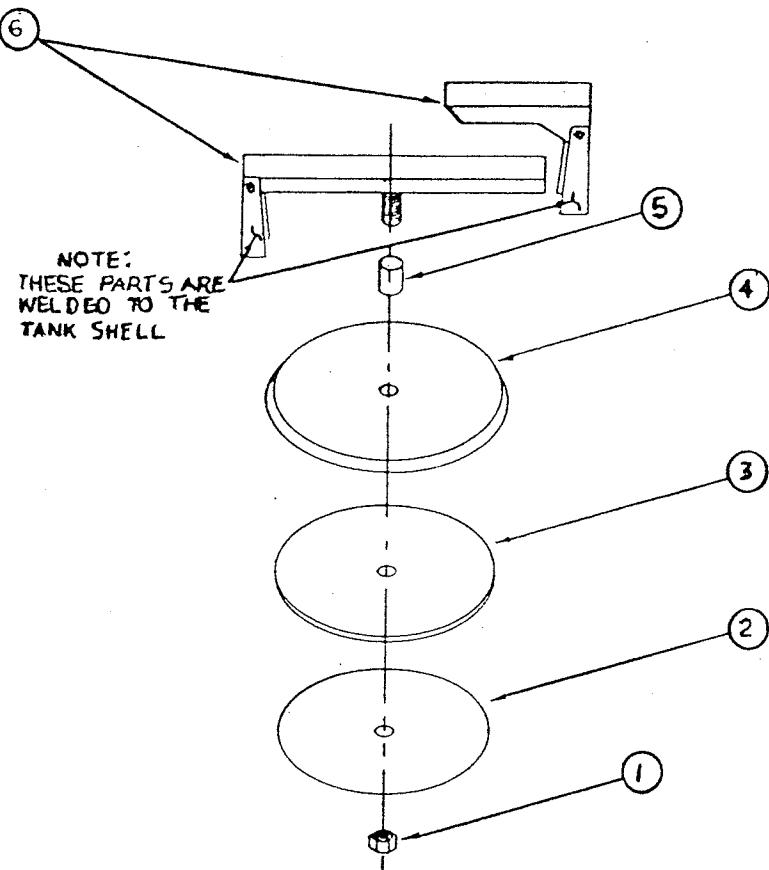
SECTION 5.2.5.



ASSEMBLY NO. 10-100052

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
08-10062		04-10201		Tire/Wheel/Tube Assembly (2 Reqd)	
	10	04-10201	1	Wheel, Split Rim	9.5
	11	04-1021	5	Lug Nuts, Wheel	1
	12	04-10222	1	Tire, 10"	4
	13	04-1045	1	Tube Assembly	11

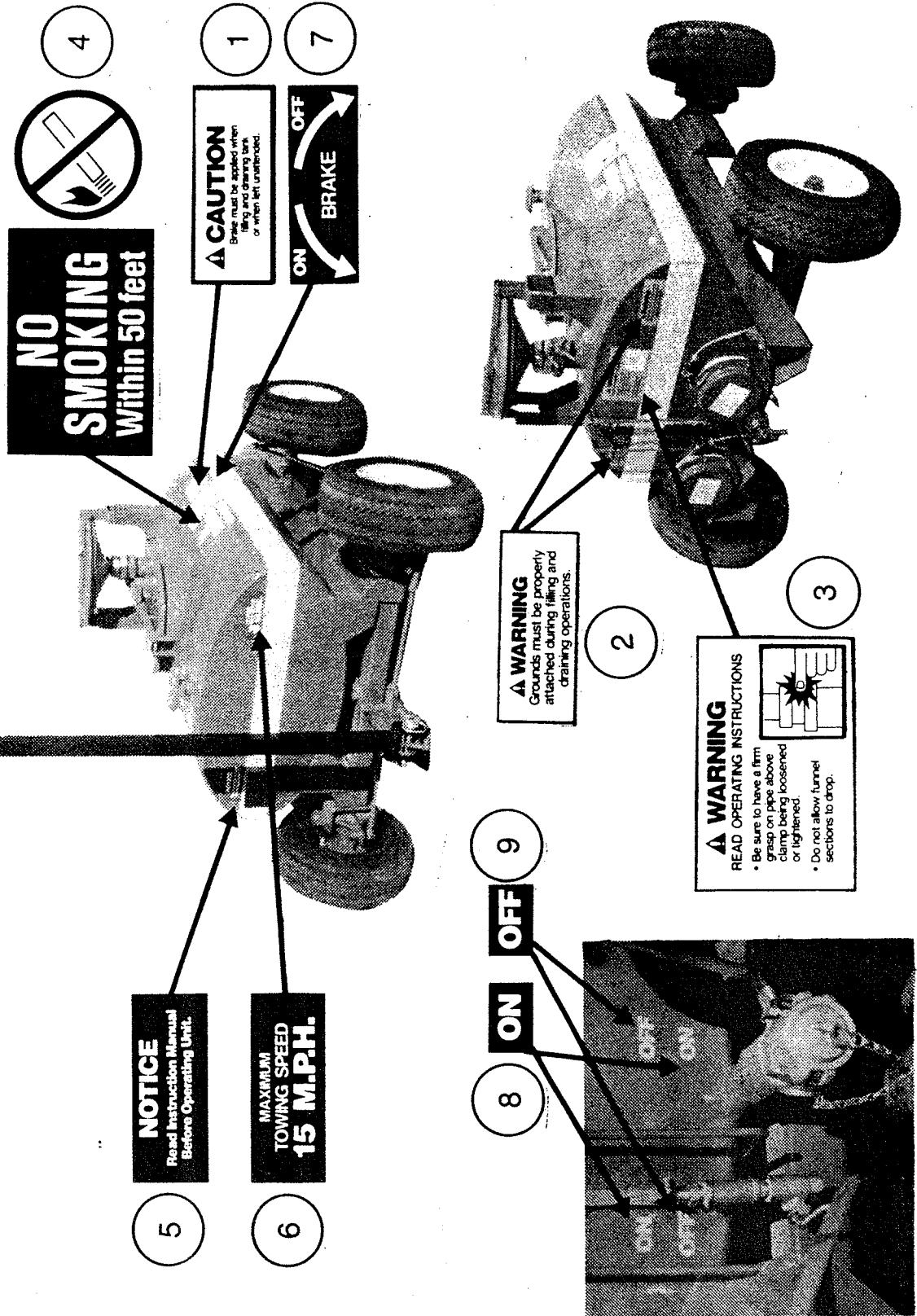


ASSEMBLY NO. 10-100060

MAJOR ASSEMBLY - MANWAY ASSEMBLY

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

MAJOR ASSEMBLY - DECAL PACKAGE
Assembly No. 10-100075



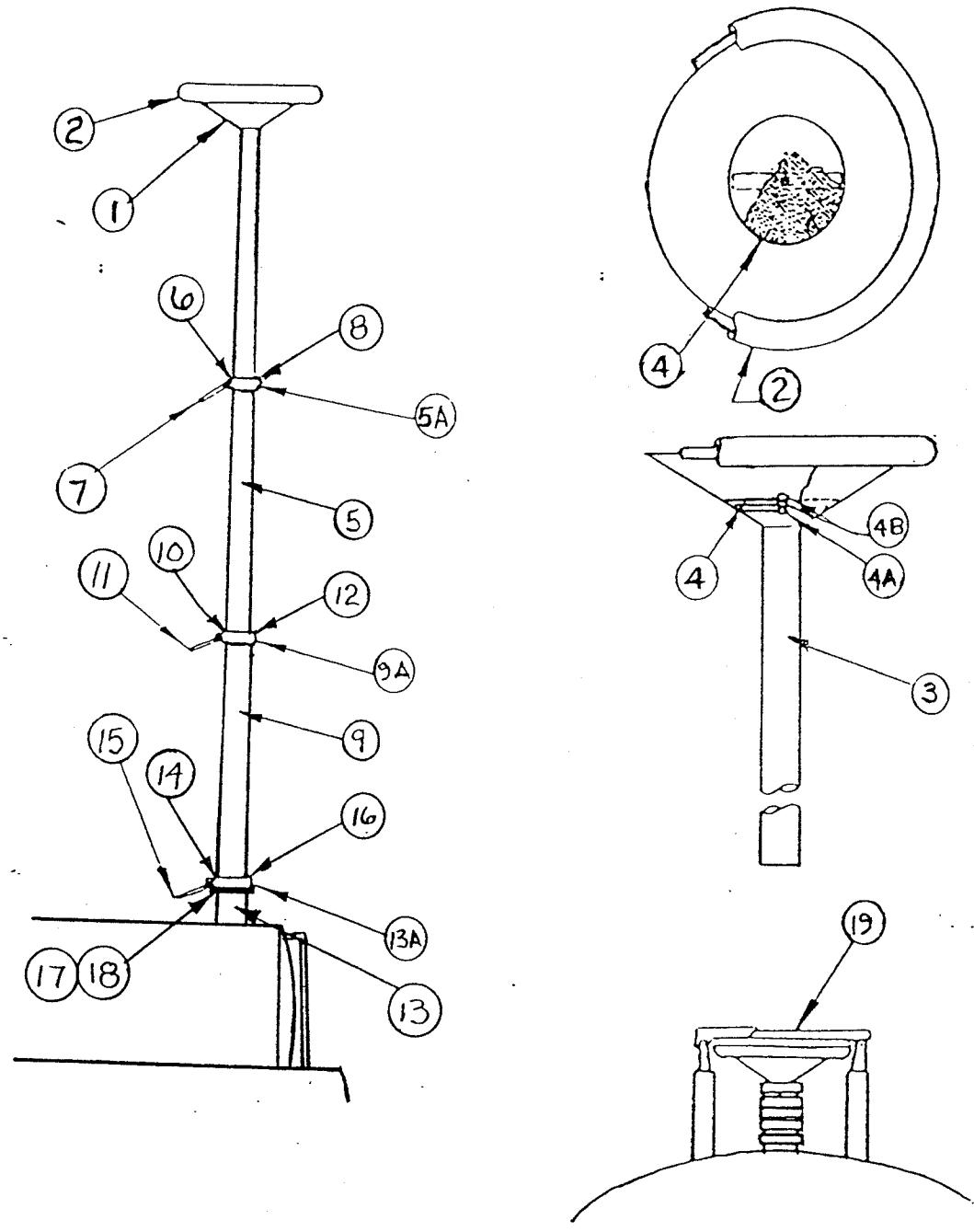
ASSEMBLY NO 10-100070

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

SECTION 5.5



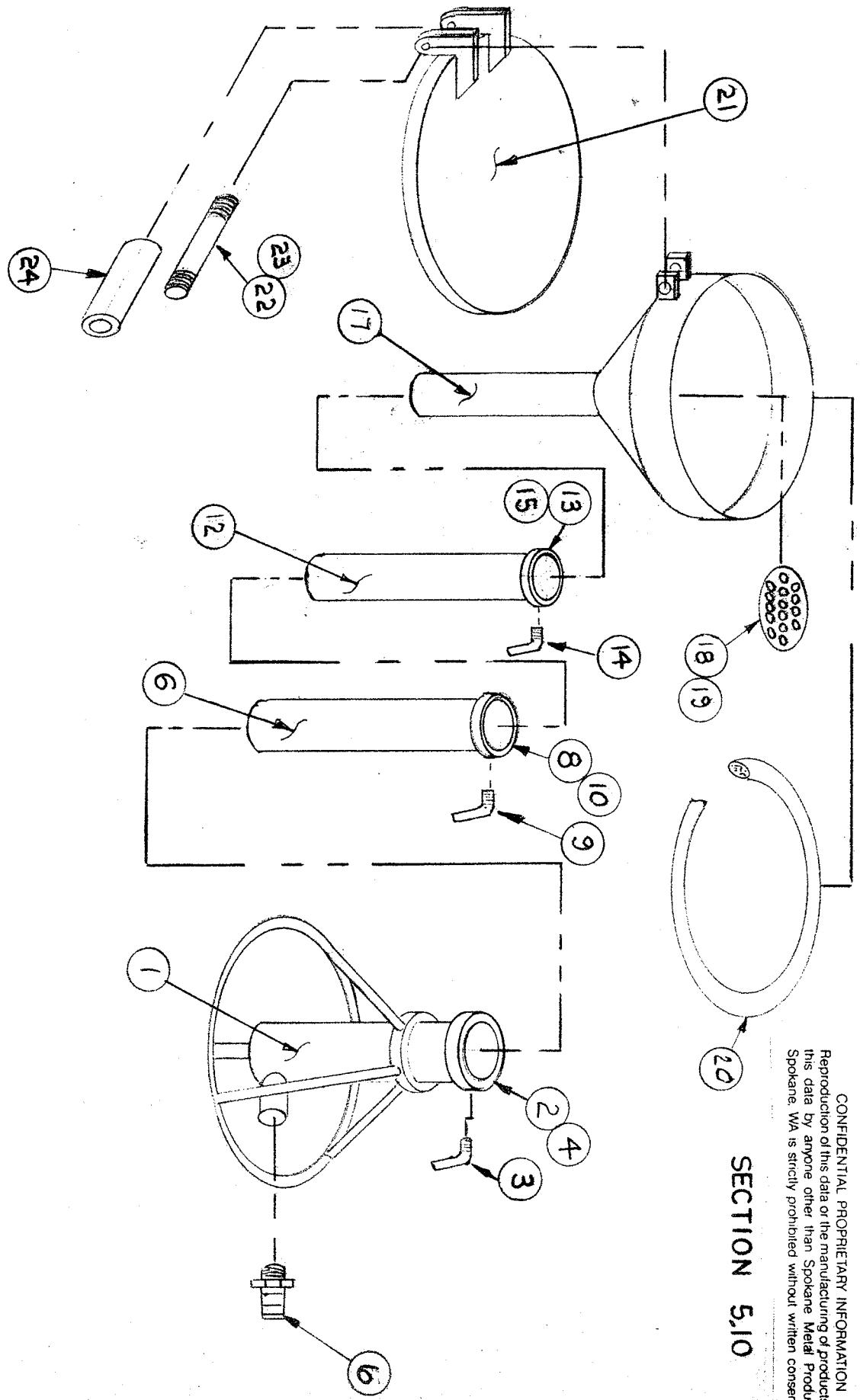
ASSEMBLY 08-1034Z
MAJOR ASSEMBLY - TELESCOPING DRAIN ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
07-1051				Drain Funnel Section Assembly	
	1	01-8250	1	Drain, Top (funnel)	.5
	2	06-1022	1	Gasket	.7
	3	01-92402	1	Tubing, 2" OD	
	4	04-1039	1	Screen	.5
	4A	02-10002	1	Bolt, 1/4"	.2
	4B	02-1200	1	Nut, 1/4"	.1
07-1049				Drain, Telescoping Sect. Assembly, 2-1/2" OD	
	5A	05-10271	1	Clamp, 2"	
	5	01-9242	1	Tubing, 2-1/2" OD	
	6	05-10051	1	WEDGE, 1" x 11/16" x 1 1/4"	.2
	7	05-10181	1	HANDLE, CLAMP	.3
	8	02-1005	1	SCREW, SET	.01
07-1045				Drain, Telescoping Sect. Assembly, 3" OD	
	9A	05-10281	1	Clamp, 2-1/2" OD	
	9	01-92452	1	Tubing, 3" OD	
	10	05-10021	1	WEDGE, 1" x 7/8" x 1 9/16"	.3
	11	05-10181	1	HANDLE, CLAMP	.3
	12	02-1005	1	SCREW, SET	.01
07-1043				Drain, Telescoping Section Assembly, 3-1/2" O.D.	
	13A	05-10291	1	Clamp, 3" TUBING	
	13	01-92548	1	Tubing, 3-1/2" O.D.	
	14	05-10031	1	WEDGE, CLAMP	.5
	15	05-10181	1	Handles, Clamp	.3
	16	02-1005	1	SCREW, SET	.01

ASSEMBLY 08-1034Z (CONTINUED)

MAJOR ASSEMBLY - TELESCOPING DRAIN ASSEMBLY

	17	04-10560	1	Base Flange	
	18	02-100121	4	MOUNTING BOLTS, 1/4-16x3/4"	.2
08-1026	19		1	COVER ASSEMBLY	5



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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)

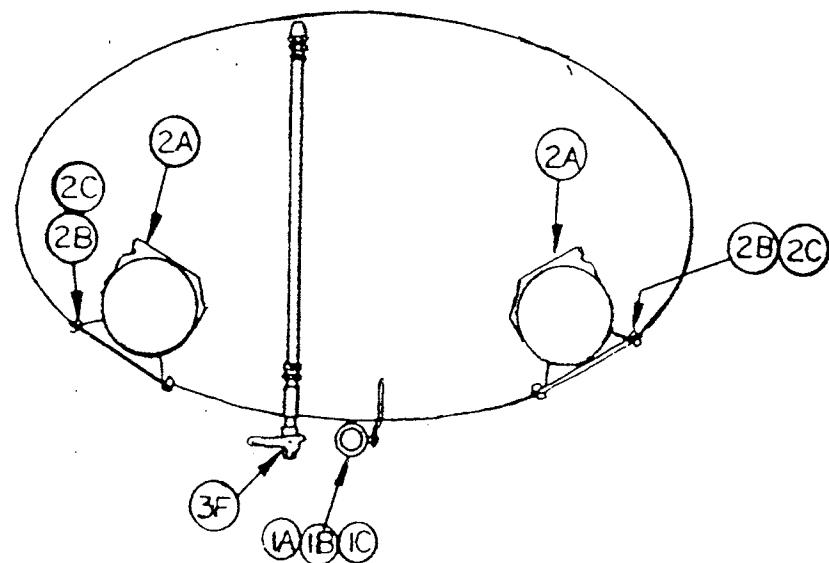
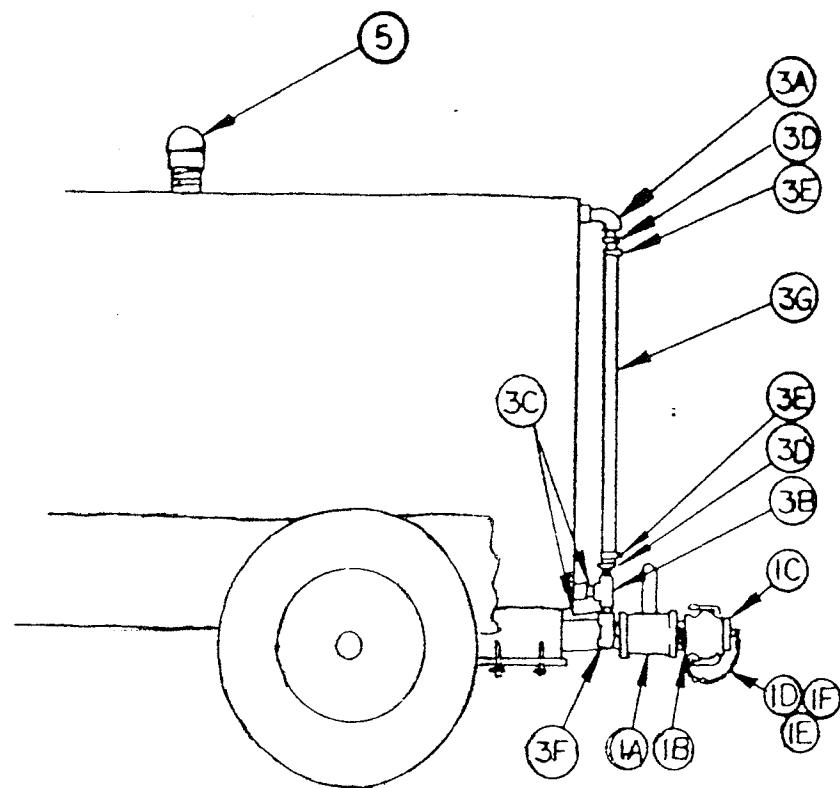
MAJOR ASSEMBLY - REMOTE DRAIN FUNNEL

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	

SECTION 5.7

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REAR VIEW

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.



Obsolete

PRIOR TO 1991
MODEL'S ONLY

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

125/150 GALLON FUEL BOWSER

OPERATION AND MAINTENANCE MANUAL

MODEL NUMBER BOW 150

Bow 125

SPOKANE METAL PRODUCTS

125 / 150 GALLON FUEL BOWSER

OPERATION AND MAINTENANCE MANUAL

MODEL NUMBER BOW150

BOW 125

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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

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, 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.

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

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.

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

- 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.

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

- 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 3-1/2" in diameter permanently attached to the tank and three (3) aluminum tube sections.
 - 4.3.1 The stainless tube and two 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.

SPOKANE METAL PRODUCTS

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.

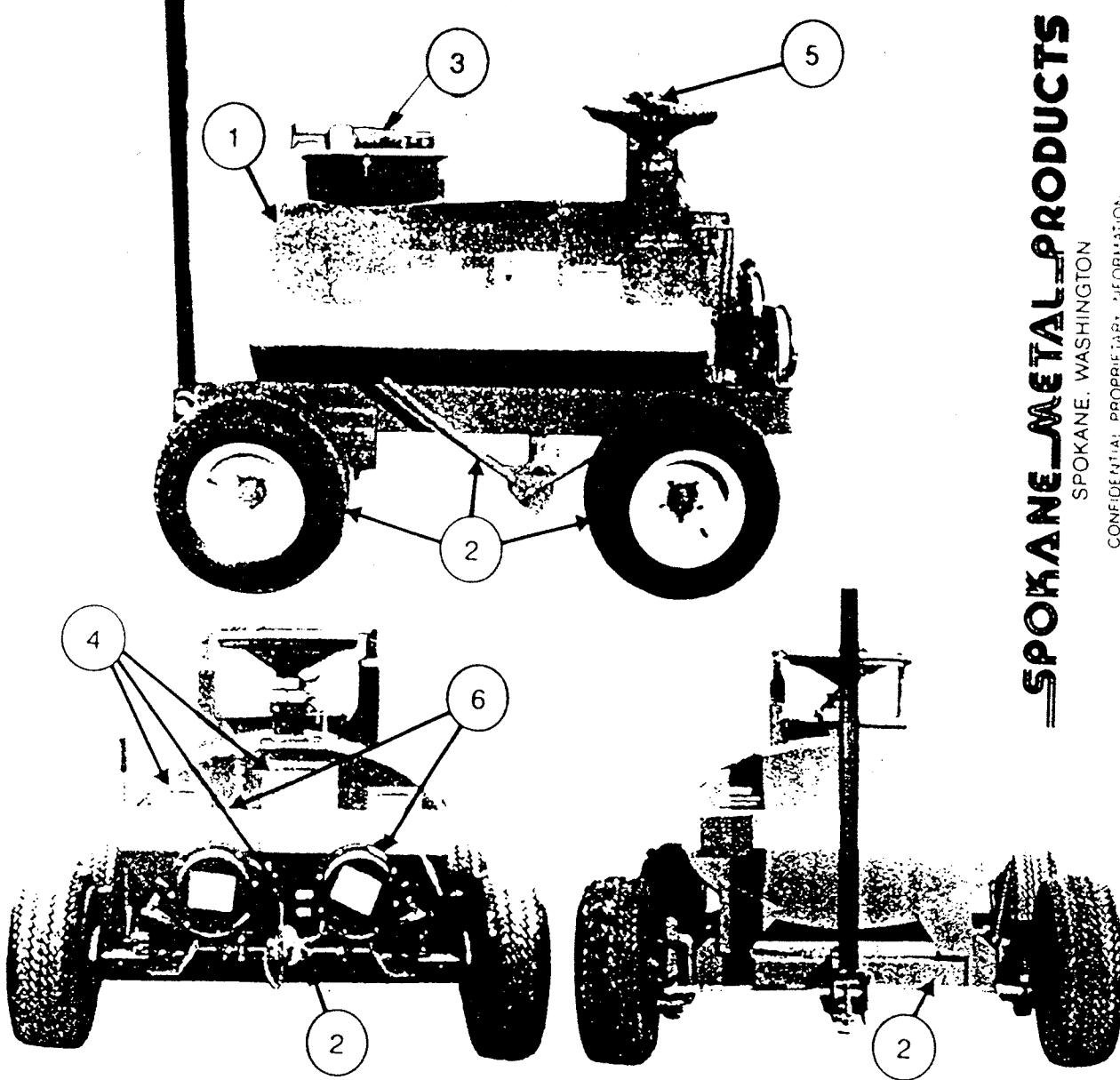
5.0 REPLACEMENT PARTS

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 3621
SPOKANE WA 99220-3621

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

PARTS INDEX
MODEL: BOW150-03 Series FUEL BOWSER



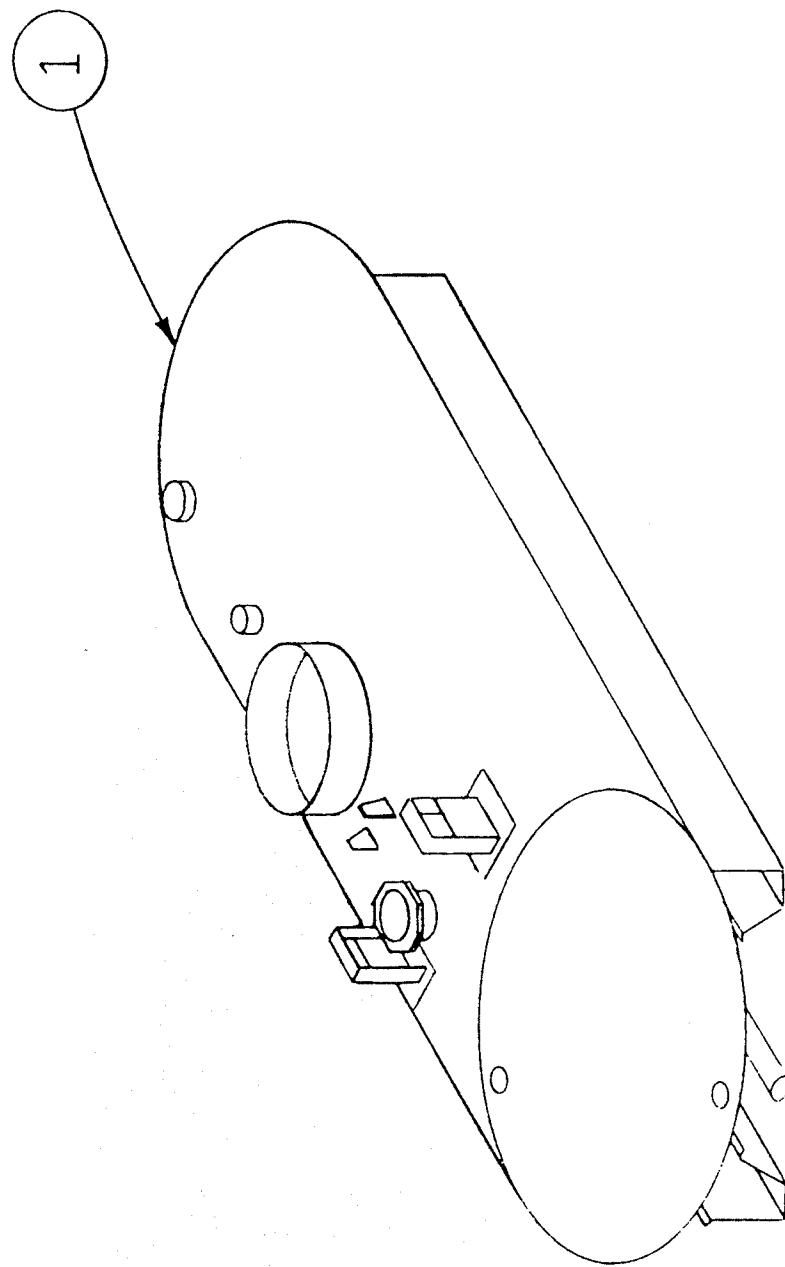
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Item No.

		<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	Vacuum Assembly	5.3
4	Decal Package	5.4
5	Telescoping Drain	5.5
6	Miscellaneous Fixtures	5.6



MAJOR ASSEMBLY - TANK WELDMENT, 150 GALLON

Sub Assy.	Item	Part No.	Quantity	Description	Weight
1	08-10091	1	1	Stainless Steel Tank Weldment 150 Gallon Capacity Series BOW 150-0 3	175#

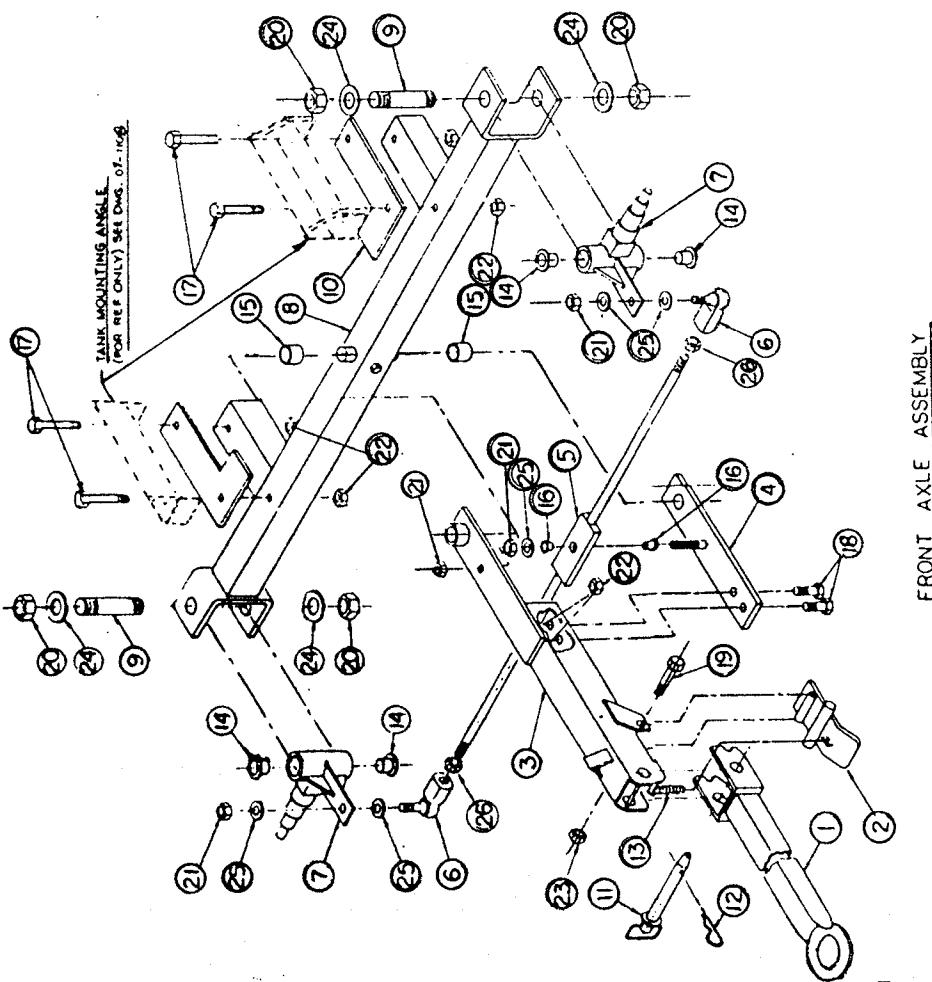
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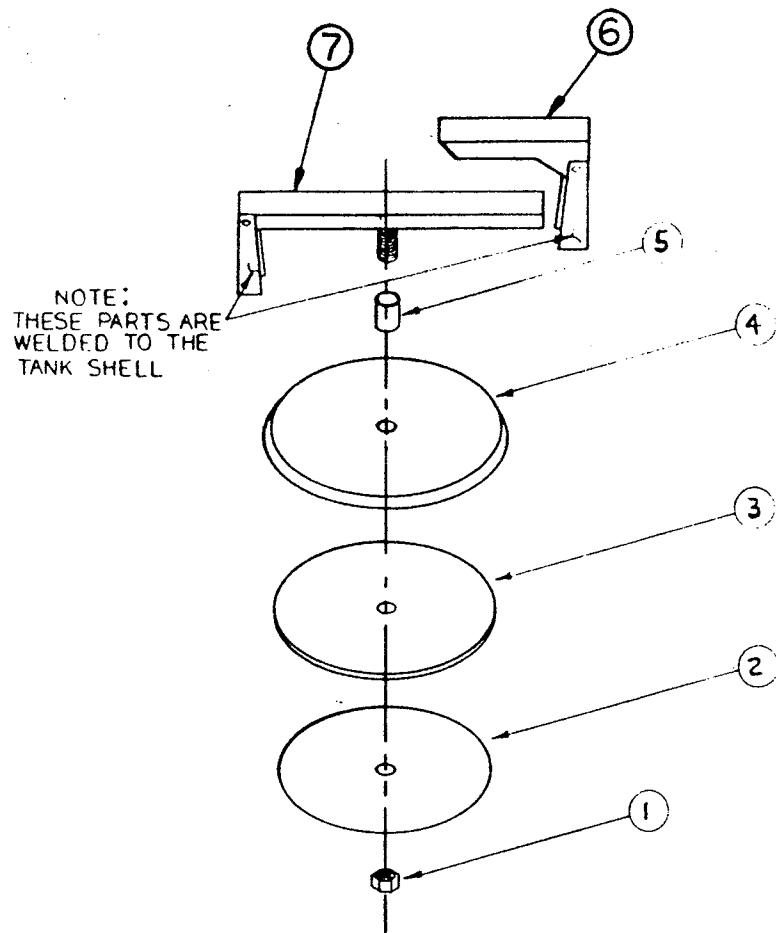
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MAJOR ASSEMBLY - AXLE ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Weight
08-1029				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	.6
	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	02-12011	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	





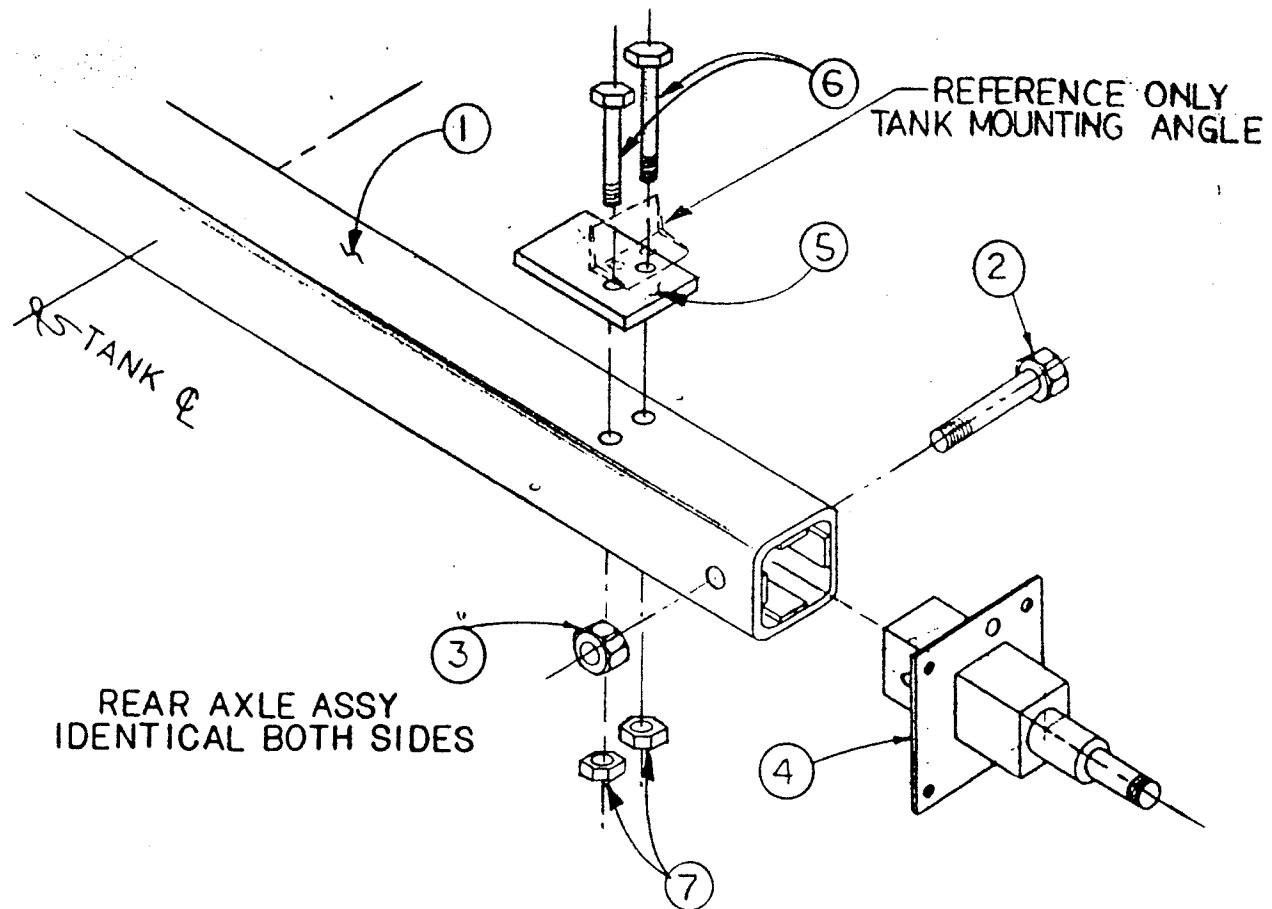
MAJOR ASSEMBLY - MANWAY ASSEMBLY

Sub Assy.	Item	Part No.	Quantity	Description	Weight
08-1032				16" Flip-Lock Manway	
	1	02-1206	1	Nut, Lock Retainer	.5#
	2	07-2303	1	Gasket, Retainer	2#
	3	06-25025	1	Gasket, Manway	1#
	4	01-86001	1	Cover, Manway	5#
	5	01-93455S	1	Spacer, Manway	.5#
	6	01-8222S	1	Cross Arm, 7", Manway	4#
	7	07-1039S	1	Cross Arm, 19-1/2" Weldment	2.5#

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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	02-12041	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#

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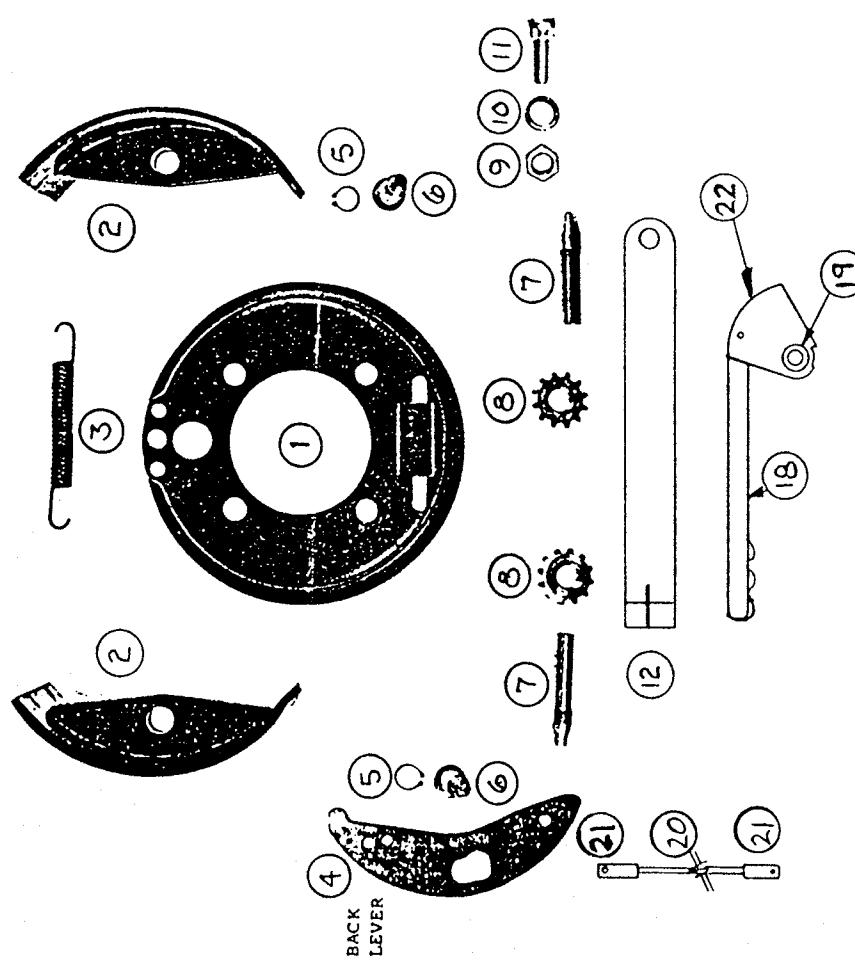
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SPOKANE, WA

ASSEMBLY NO. 10-100030

MAJOR ASSEMBLY - BRAKE, PARKING

Sub Assy.	Item	Part No.	Quantity	Description	Ref.
08-1007		04-1063	1	Brake Assembly (2 req'd per Bonsen)	
	1	04-1023	1	Brake, Plate Assembly	78
	2	04-1024	1	Brake, Shoe Assembly	48
	3	04-1026	2	Brake, Shoe Lever Spring	18
	4	04-1025	2	Brake, Shoe Lever	18
	5	02-1400	2	1/2" Retaining Ring	28
	6	02-1203	2	Anchor Pin	28
	7/8	04-1027	2	Adjusting Screw Assembly	78
	9	02-12031	4	Nut,	28
	10	02-11031	4	Lockwasher,	18
	11	02-10031	4	Bolt, 7/16" Shoulder	58
	12	04-1030	1	Brake, Control Arm (Camlever - 5-1/4")	38
08-1008				Brake, Handle Assembly	
	13	04-1028	1	Cam	.58
	14	04-1029	1	Cam Lever - 2" ↗	.78
	15	04-1031	1	Cam Spacer *	28
	16	02-10012	1	Bolt	.48
	17	02-12021	1	Nut *	.18
	18	01-8105	1	Brake, Handle	48
	19	01-8104	1	Brake, Handle Connector	48
08-1009				Brake Linkage Assembly (2 req'd per Bonsen)	
	20	05-1026	1	Brake Linkage Rod	18
	21	04-2516	2	Brake Linkage, YOKE-ENDS	.58
	22	05-1025	2	Brake Linkage Mount	1.48

* Denotes Items Not Shown

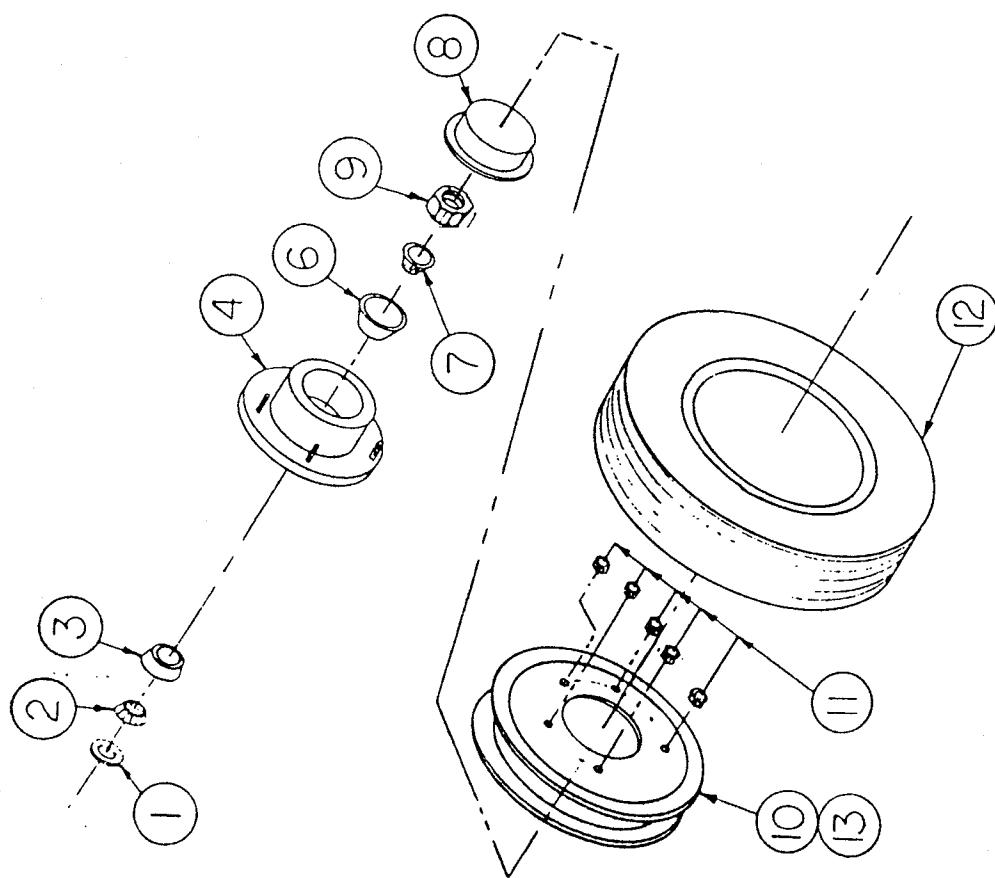


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MAJOR ASSEMBLY - WHEEL ASSEMBLY. FRONT

Sub Assy.	Item	Part No.	Quantity	Description	Weight
08-1011					
				Bearing Assembly (2 req'd per Bowser)	
1	04-1012	1	1	Seal, Bearing	14
2	04-1013	1	1	Bearing, Cone, Inner	39
3	04-1015	1	1	Bearing, Cup, Inner	29
4	04-1017	1	1	Hub, Wheel	79
6	04-1016	1	1	Outer Rearing Cup	49
7	04-1014	1	1	Outer Bearing Cone	34
8	04-1019	1	1	Dust Cap	19
9	02-1214	1	1	Spindle Nut	14
08-10061					
				Wheel Assembly (2 req'd per Bowser)	
10	04-10201	1	1	Wheel 10", Split Rim	109
11	04-1021	5	5	Wheel, Lugnuts	16
12	04-10221	1	1	Tires, 10"	46
13	04-1045	1	1	Tube Assembly	10

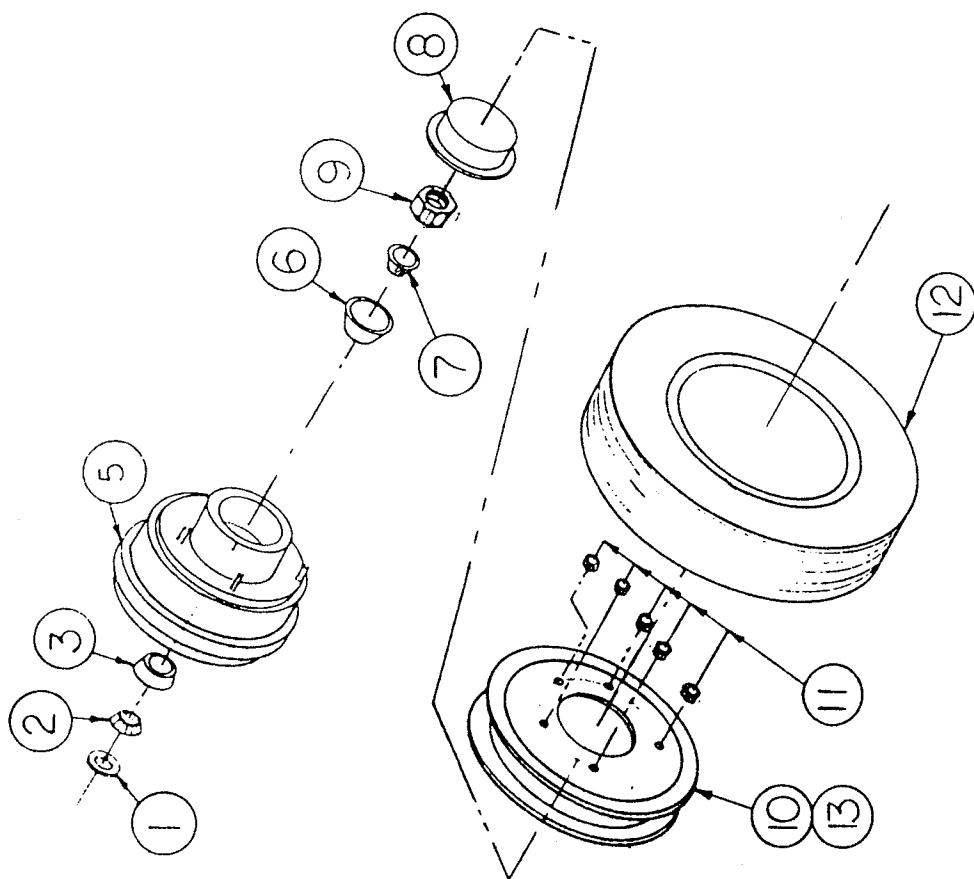


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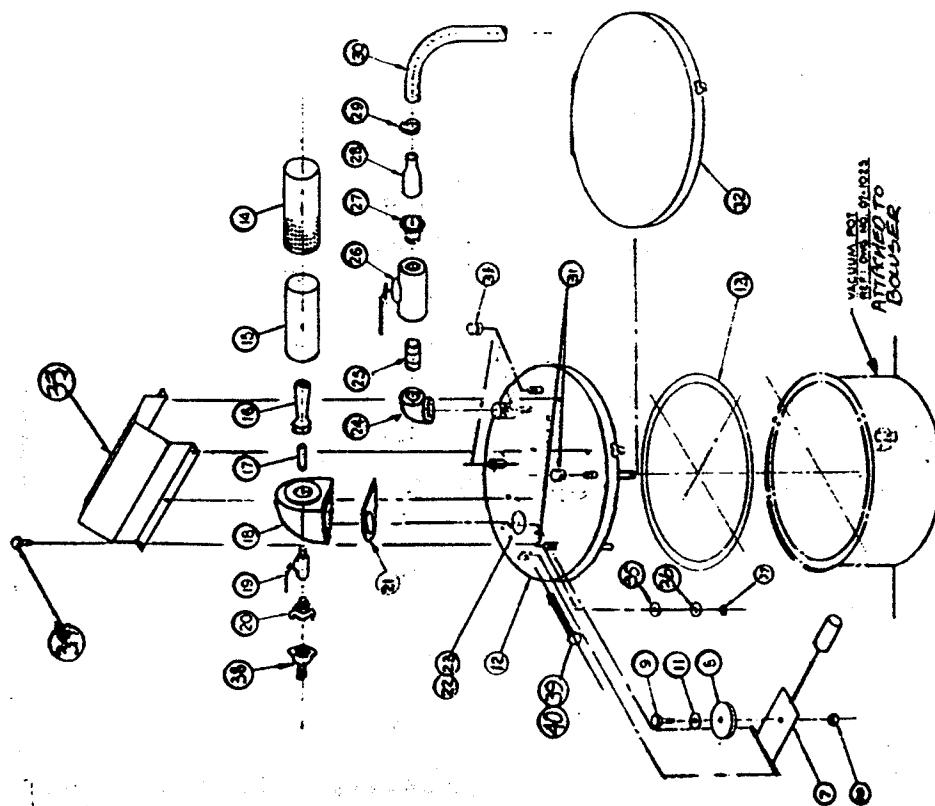
Sub Assy.	Item	Part No.	Quantity	Description	Weight
8-10111				Rearing Assembly (2 req'd per Bowser)	
	1	04-1012	1	Seal, Bearing	1#
	2	04-1013	1	Bearing, Cone, Inner	3#
	3	04-1015	1	Bearing, Cup, Inner	2#
	5	05-1008	1	Hub, Drum Assembly	16#
	6	04-1016	1	Outer Bearing Cup	4#
	7	04-1014	1	Outer Bearing Cone	3#
	8	04-1019	1	Dust Cap	1#
	9	02-1214	1	Spindle Nut	1#
8-10061				Wheel Assembly (2 req'd per Bowser)	
	10	04-10201	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
SPOKANE, WA

Sub Assy.	Item	Part No.	Quantity	Notes
08-1001	1	07-11100	1	Overline Seal Assembly
	8	04-1001	1	Float Stop Assembly
	9	02-10003	1	Bolt
	10	02-1000	1	Nut
	11	02-1100	1	Flat Washers
08-1002				Cover Assembly
	12	07-1002	1	Lid
	13	06-1022	1	Gasket
08-1003				Horitech Vacuum Head Assembly
	14	04-1004	1	Exhaust Housing
	15	04-1005	1	Exhaust Signer
	16	04-1006	1	Venturi
	17	04-1007	1	Air Jet
	18	04-1008	1	Venturi Box
	19	04-1010	1	Valve
	20	04-1036	1	Coupler
	21	04-1010	1	Gasket
	22	02-10010	3	Bolt
	23	02-10001	3	Nut
08-1004				Accessories
	24	03-1001	1	Flange
	25	03-020225	1	Nipple
	26	04-1021	1	Valve
	27	03-1002	1	Nut Bushing
	28	03-1003	1	Nipple
	29	03-100100	1	Wedge Clamp
	30	06-1016	1	Nut
	31	03-1021	4	Pipe Cap
	32	07-1019	1	Lid, Right
	33	07-1034	1	Cover, Vac. Jan
	34	02-10010	6	Bolt
	35	06-1021	6	Nut
	36	02-1100	6	Washer
	37	02-1200	6	Nuts
	38	04-1057	1	Coupler
	39	02-10016	1	BOLT
	40	02-1201	1	NUT



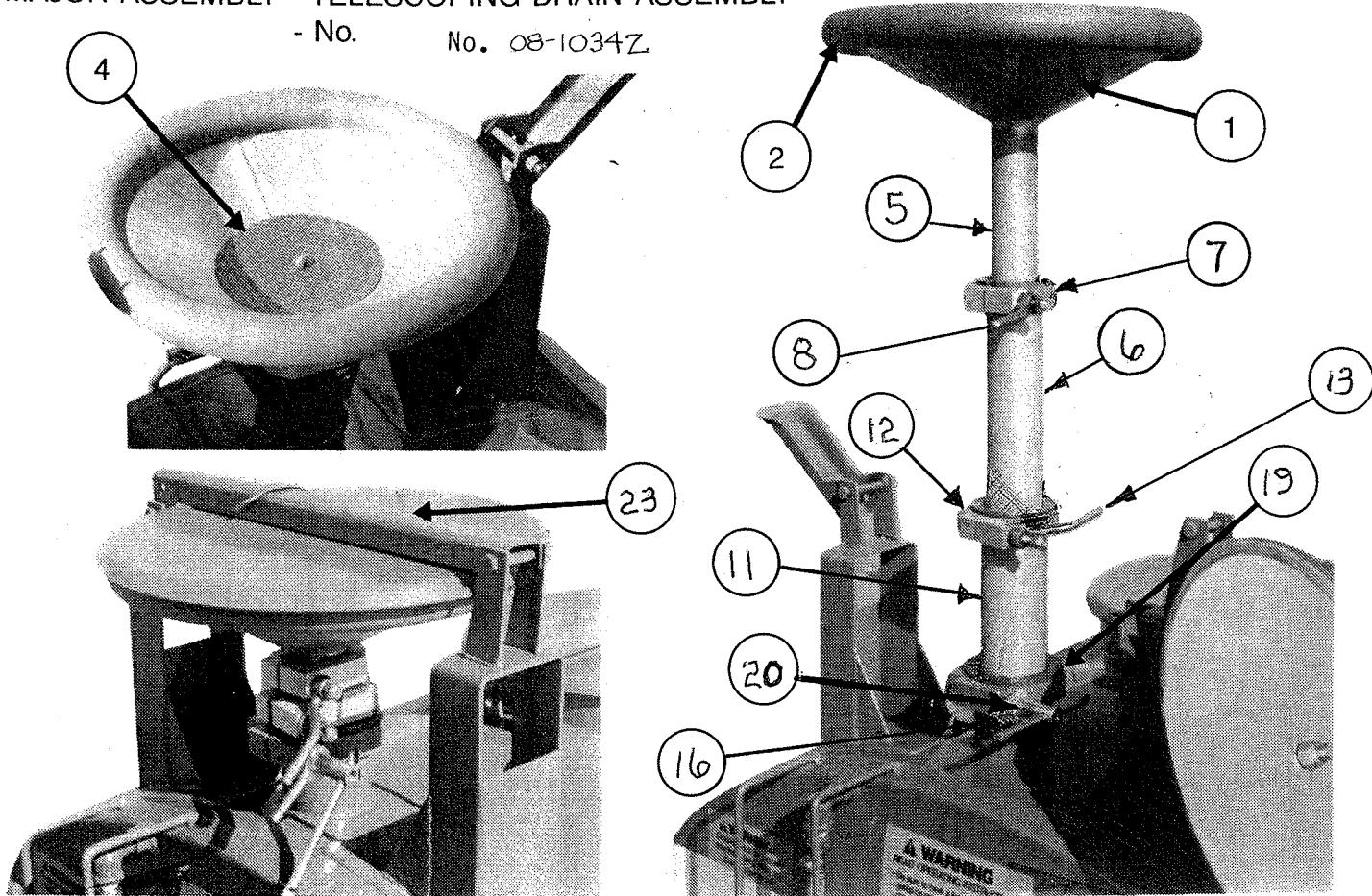
SECTION 5.3

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SPOKANE METAL PRODUCTS

MAJOR ASSEMBLY - TELESCOPING DRAIN ASSEMBLY

- No. No. 08-1034Z



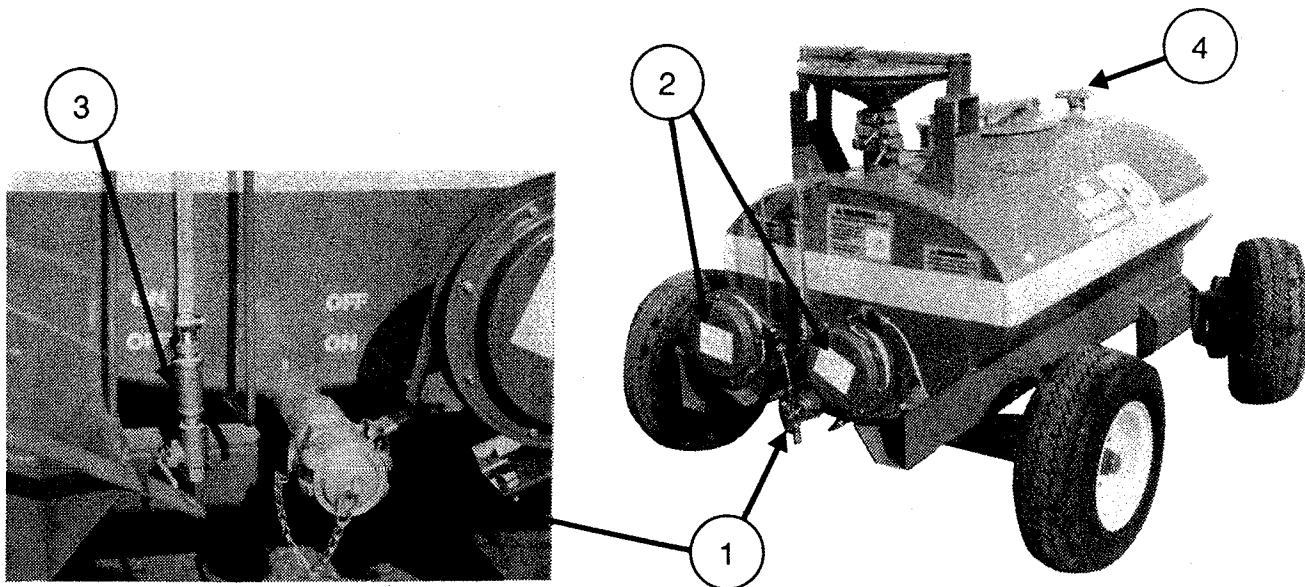
<u>Sub-Assy</u>	<u>Item</u>	<u>Part No.</u>	<u>Qty.</u>	<u>Description</u>
07-1051	1	01-8250	1	Drain Funnel Section Assy.
	2	06-1022	1	Drain funnel
	3	02-10002	1	Gasket
	4	04-1039	1	Carriage Bolt *
	5	01-92402	1	Screen, Funnel Section
	6	01-9242	1	2" O.D. Tubing
07-1049	7	05-10271	1	Drain, Telescoping Section 2-1/2"
	8	05-10181	1	2-1/2" O.D. Tubing
	9	05-1011	1	Clamp, 2"
	10	02-1005	1	Clamp Handle
07-1045	11	01-92452	1	Wedge, Clamp *
	12	05-10281	1	Set Screw *
	13	05-10181	1	Drain, Telescoping Section 3"
	14	05-10021	1	3" O.D. Tubing
	15	02-1005	1	Clamp, 3"
07-1043	16	01-9254	1	Clamp Handle
	17	04-10560	1	Wedge, Clamp *
	18	02-100121	4	Set Screw *
	19	05-10291	1	Drain, Tank Section 3-1/2"
	20	05-10181	1	3-1/2" O.D. Tubing
	21	05-10031	1	Face Ring *
	22	02-1005	1	Flange Bolts *
08-1026	23		1	Base Clamp
				Clamp Handle
				Wedge, Clamp *
				Set Screw *
				Funnel Cover Assy.

* DENOTES ITEMS NOT SHOWN

MAJOR ASSEMBLY - MISC. FIXTURES

Assembly No.

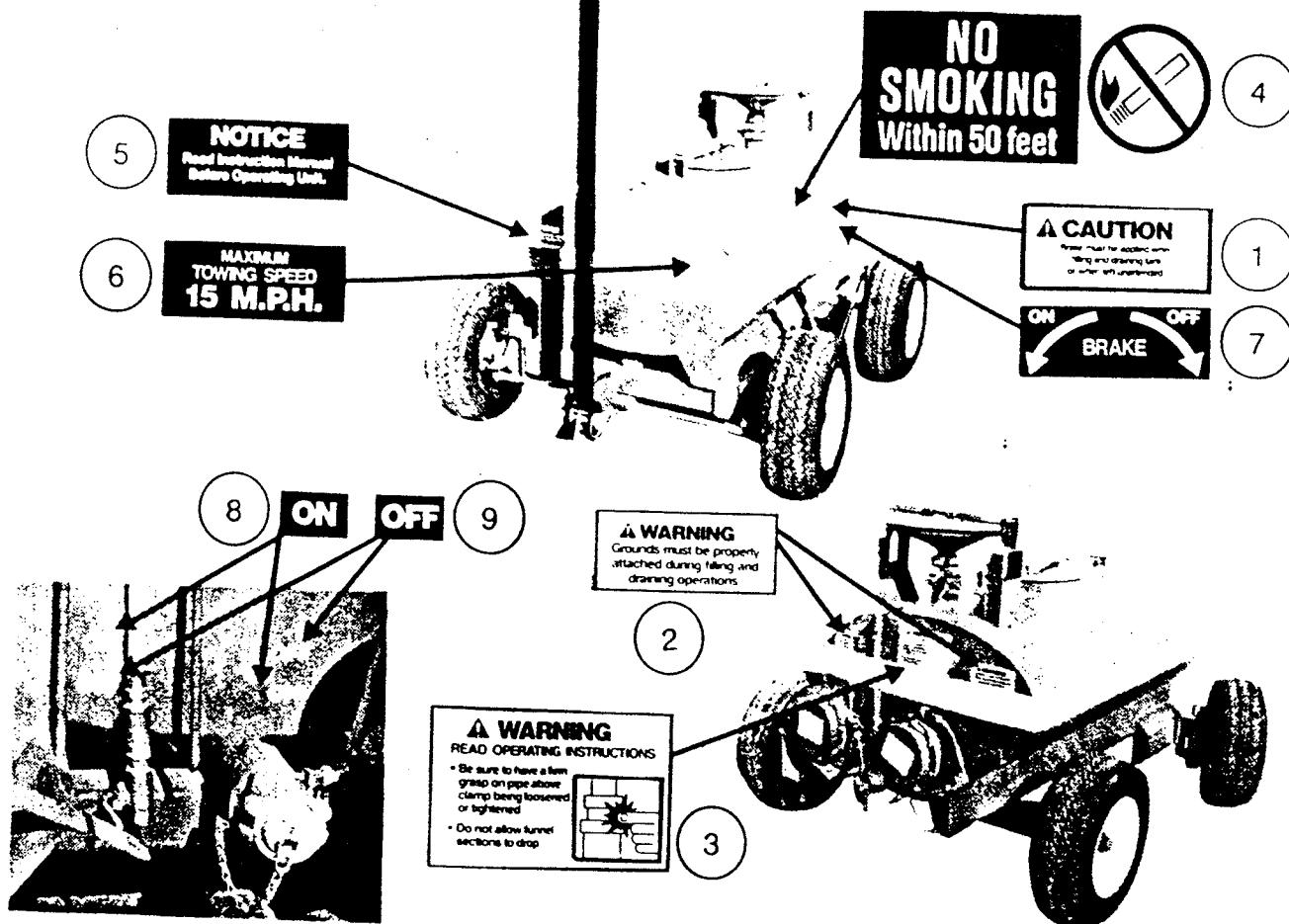
10-100115



<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
08-1014	2D	02-12041	4	Nuts, Hex, Nylon Locking	.1
	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
	4	04-1037	1	Vent, 1 1/2"	.3.

Section 5.6

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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SPOKANE, WASHINGTON

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SPOKANE METAL PRODUCTS
BOWSER FUEL DRAIN TANK
ONE YEAR LIMITED WARRANTY

Seller warrants its 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.

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