



DEFENSE CONTRACT MANAGEMENT AGENCY  
DEFENSE CONTRACT MANAGEMENT SEATTLE  
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BELLEVUE, WASHINGTON 98004-8019

DCMDW-GWD

February 14, 2001

Mr. Mike Cossette, Operations Manager  
Spokane Metal Products  
North 3808 Sullivan Rd.  
Spokane Industrial Park, Bldg. 4  
Spokane, WA 99216

Dear Mr. Cossette,

This Statement of Qualification is presented to you to give evidence that the Inspection System of Spokane Metals in Spokane, WA, has successfully met the quality requirements of MIL-I-45208A.

Your qualification to this standard is based upon DCMC Seattle's review of your past quality history, data collected during process/product surveillance activities, the recent DCMC Seattle Quality System Evaluation, and your certification to ASME codes for pressure vessels.

This statement will be shared with your Department of Defense customers. The level of our continued surveillance on your Qualified Inspection System will be based upon periodic reviews of your quality metrics/objectives, customer feedback and DCMC risk assessments.

Congratulations on your qualification to MIL-I-45208A!

Sincerely,

  
VICTORIA H. DIEGO-ALLARD  
LTC, USA  
COMMANDER

Enclosure

"COMMITTED TO CUSTOMERS"

**RECEIVED**

SEP 29 1986

APPENDIX A to Technical Order H2B-1-23  
Management of Recoverable and Waste Liquid  
Petroleum Products

SPOKANE INDUSTRIES, MFG. DIVISION

AVIATION FUEL BOWSER

STANDARD SPECIFICATIONS

A-1. Aviation Fuel Bowsers procured or constructed for aircraft ground support will meet these standard specifications.

A-2. Minimum Standards:

a. Will be constructed so that there is a low point to which contaminants will settle with a drain valve at that lowest point.

b. Depending upon capacity, will have one or more baffles on the inside to control sloshing. Maximum horizontal and longitudinal distance between baffles is 2 ft.

c. All fuel wetted parts of the bowser will be of corrosion resistant material. Any connections or dissimilar metals will have provisions to prevent galvanic corrosion.

d. Must have an access panel/panels on the top to allow for repair and/or inspection to all baffled compartments inside the bowser.

e. Will be desinged so that fuel enters the fuel bowser tanks (free volume) not more than 2 inches from the bottom.

f. Will have a vent at the opposite end from where the fuel enters. The opening of the vent will face downwards, will have mesh screen across the opening which can be removed for periodic maintenance and cleaning.

g. Will have some type of device (either gauge or sight glass) to indicate the amount of fuel in the bowser.

h. Will have a collection box or funnel capable of being raised to within 6 inches of the aircraft drain point. The edges of the box or funnel must be cushioned to prevent damage to the aircraft surface.

i. The collection box or funnel will have a filter screen to catch solid objects. The filter must be made from MIL-S-12875 material or equivalent.

*Sheet, Perforated Metal*

- j. The collection box or funnel will have a lid with a hasp and lock to secure the lid and prevent unauthorized use of the bowser.
- k. The fuel drain/defuel port will be easily accessible and be either an aircraft single point connection or other suitable sure locking connector.
- l. Large clearly visible markings will be on the bowser to indicate its purpose contents (JP-4, JP-5, or JP-8) and any other markings as required by appropriate directives.
- m. Will have at least two grounding reels mounted IAW appropriate directives.
- n. At least two of the four wheels will have an integral braking system to stop the trailer from moving.
- o. Running gear will be sized to safely carry the weight of the bowser with a full load of fuel.
- p. Will not have a pintle hook.
- q. Will have a hand pump mounting capability for fuel transfer.
- r. Large bowser will have forklift points for mobility.
- s. Bowser designs will adhere to established ground fuel handling safety requirements.
- t. Bowser will be constructed of corrosion resistant materials (i.e., stainless steel, ~~aluminum, and/or fiberglass, if compatible.~~)  
*aluminum, or epoxy coated steel.*

*Ed  
H  
d*

FROM: HQ MAC/LGMWF (SMSgt Paul, 63254)

SUBJ: Trip Report, Uniform Fuel Bowser

TO: HQ MAC/LGMWF *Banner Bannock*  
LGMWA *Harvey Givins* *Pickard* *Donny Bann*  
LGMWB *Joe Dieckman*  
LGMW *John Z...*  
LGM *Jim (22) Trip Report!*

IN TURN.

1. ACTIVITY VISITED: SA-ALC/PMDMS, Kelly AFB TX.
2. DATE VISITED: 7-9 May 86.
3. PURPOSE:

To evaluate a proposed uniform fuel bowser and its application for use on MAC aircraft (Ref: SA-ALC/PMDMS 292100Z Apr 86).

4. ATTENDEE: SMSgt Jeffrey J. Paul, HQ MAC/LGMWF.

5. PERSONNEL CONTACTED:

<u>NAME</u>	<u>TITLE/RANK</u>	<u>ORGANIZATION</u>
Fredrick R. Gebhart, Jr	Capt	HQ 8 AF/LGMS (SAC)
James M. Butcher	WS-15	OC-ALC/MAGPFA
Andrew W. Jolly	CMSgt	HQ ATC/LGSE
Benny D. Graham	SMSgt	HQ 12 AF/LGMF (TAC)
Ben L. Hartman	MSgt	67 EMS/MAES (TAC)
Jerry L. Kaiser	TSgt	834 EMS
Lucy Larck	GS-12	SA-ALC/PMDMS
E. M. Fishburn	GS-11	SA-ALC/SPTH
Stephen G. Gieselman	GS-11	SA-ALC/SFSG
Greg Terold	President	Spokane Metal Products
Mike Cassette	General Mgr	Spokane Metal Products
Jim Kuntz	Sales Mgr/Designer	Spokane Metal Products

6. DISCUSSION:

The meeting opened with a brief introduction, followed by Mrs Larck providing a general overview of the reason for the meeting. Each member was to evaluate the proposed fuel bowser from the aspect of suitability for the aircraft in their command.

Historically, there has never been a standardized fuel bowser in the Air Force inventory. Some technical data (i.e., TOs 00-25-172, and 42B-1-23) outline limited criteria for basic construction, marking, and handling. However, no standardized ALC managed item exists. Therefore, units have been forced to locally manufacture various models to meet their own needs. This has caused problems with procurement of replacement parts, technical data, increased demands on structural repair and machine shops to manufacture those parts, and in some cases jeopardizing safety.

Some organizations have even procured an entire bowser locally. We feel an ALC managed fuel bowser is imperative to ensure a safe standardized item exists with supportable spare parts and proper technical data.

Mrs Larck stated that Spokane Metal Products contacted her office with an unsolicited proposal. They sold fuel bowzers to the SAC folks at Fairchild AFB WA. For use on B-52 (Atch 1) aircraft and recommended wider use on other aircraft throughout the Air Force.

After a brief discussion by all representatives (without the representatives from Spokane Metal Products), we established a joint consensus that a need for an ALC managed fuel bowser was essential to meet Air Force requirements and supportability. The meeting then adjourned to the flight line for a demonstration by the manufacturer.

The proposed fuel bowser proved to be extremely versatile. It offered the standard feature of other bowzers, which is the capability to gravity drain fuel into a funnel that telescopes up to 12 feet. However, it also possessed a pneumatically powered motor which gave the bowser the capability to vacuum fuel for tank depuddling. Additionally, the vacuum portion contained four ports allowing the connection of locally manufactured sump drain lines between the aircraft fuel tank sump drains and the bowser. Extracting fuel using the vacuum function instead of relying on the slow gravity process and sponges can virtually cut sump draining and depuddling time at least in half. The fuel bowser has a 400 gallon capacity and an overall height of 52 inches, which enables placement under almost every MAC aircraft. The vacuum port capability allows suction draining of our aircraft it will not fit under, such as helicopters. The vacuum function operates from a maximum of 100 PSI, 60 CFM compressed air from any source (including shop air). This will allow use of the bowser in fuel shops for depuddling external tanks. The bowser was internally baffled in both directions and its low profile and wide tires allows for greater stability in turns and easier maneuverability in soft surfaces. Attachment 2 contains some additional features and specifications. The estimated cost per bowser is \$6,700.

#### 7. FINDINGS/RECOMMENDATIONS:

While the proposed fuel bowser appeared to meet the needs of our aircraft and shop requirements, inspection of the unit revealed numerous deficiencies that must be corrected before pursuing acquisition of this product. Mr Greg Tenold, President of Spokane Metal Products, assured us that his company could incorporate the changes with no problems. The following deficiencies/recommendations were identified/provided to SA-ALC/PMDMS for correction.

a. The entire unit was assembled with non-self-locking nuts. Recommended installing self-locking nuts to reduce potential foreign object damage to aircraft and ground support equipment.

- b. The wheels were not split rims. Recommend installing split rims to prevent procurement of additional shop equipment.
- c. Numerous fittings were installed with teflon tape. Fuel deteriorates teflon tape, therefore, recommend removal.
- d. The wheel lug nut studs were too short and did not allow any threads to extend beyond the nuts. Recommend longer studs to allow a three thread extension.
- e. The ground wires and clips were the wrong type. Ground wires and clips should conform to the requirements contained in TO 00-25-172.
- f. The tow bar and tie rod connections were too loose. The construction consisted of pins, washers, and cotter keys. This type of configuration would not last in a constant use, flight line environment. Recommend the standard sealed bearings and bolt connections.
- g. The brake handles when applied protrude out and pose a safety hazard to personnel walking around the unit. Only one brake handle is needed provided linkage can be connected to the other brake. Therefore, recommend moving the brake handle to the center of the unit to alleviate the safety hazard.
- h. The funnel and tank access lids and closing latches hit the surrounding areas when open. Additionally, the lower adjustment handle for the funnel hits the tank. Recommend installing pads in those areas where they hit.
- i. No grease fittings were incorporated into the brake mechanism. This will cause corrosion and binding. Recommend installing grease fittings.
- j. Although a screen was incorporated into the funnel opening, it will not prevent the entrance of sealants, safety wire, and other contaminants. Those contaminants will make it more difficult to reclaim the fuel and could clog the bowser drain valves. Additionally, there is no screen installed in the vacuum tank to prevent debris from entering the main tank. We recommend installing a reusable filter cartridge into one of the funnel shafts. The filter should be capable of being removed, cleaned, and reinstalled. Additionally, installing a filter screen between the vacuum tank and the main tank is a must to prevent contaminants vacuumed from the aircraft fuel tank from entering the main tank.
- k. The bowser did not have a locking device to stow the tow bar in the up position. Recommend installing such a device to facilitate storage and handling.

1. The tank sight gauge is located in an area subject to damage from the tow bar. We recommend relocating the sight gauge to the other end of the bowser.

m. The latches securing the lid for the vacuum unit had adjustable latches. However, according to the manufacturer there is no adjustment required. Therefore, we recommend installing fixed latches to prevent unnecessary maintenance.

n. The vacuum tank had a capacity of 30 gallons and automatically shut off when full, until it drained into the main tank. The main tank had a capacity of 400 gallons. However, there was no automatic shutoff installed to prevent overflowing. Therefore, if the main tank contained 390 gallons, and the vacuum tank accepted 30 gallons during depuddling, then 20 gallons would overflow from the main tank vent when the vacuum tank opened for draining. We recommend installing the shutoff mechanism in the main tank to prevent accidental spillage.

#### 8. CONCLUSION:

The proposed fuel bowser appears to provide the qualities needed to support all MAC aircraft. We recommend coordination with all aircraft ALC managers to ensure suitability and adaptability of the sump drain vacuum function. We cannot over emphasize the importance of ensuring that technical data is provided with the unit during the acquisition process. Additionally, should this fuel bowser become the standardized item, then we will request a two year warranty accompany the unit. The warranty should not start until the unit is received by the owning organization. Overall, we feel the proposed uniform fuel bowser will meet MAC's needs, and recommend pursuing acquisition. We stand ready to be the lead command for operation and testing.

*Jeffrey J Paul*

JEFFREY J. PAUL, SMSgt, USAF  
Acft Mission Equip & Maint Facilities Mgr

# SPOKANE METAL PRODUCTS

A Division of Spokane Industries, Inc.

Building #4, Spokane Industrial Park  
P.O. Box 3621 • Spokane, WA 99220, USA  
(509) 928-0720 • TELEX 32-8455

The bowser fuel drain tank, being demonstrated here today, is our standard 400 gallon unit complete with the following items:

- . 400 Gallon elliptical T-304 stainless steel
- . (3) Interior baffles
- . Sump type drain 1-1/2" w/locking brass ball valve & quick disconnect plug
- . 2" Vent
- . Sight gauge w/sample port
- . 16" quick opening manhole
- . (2) 7" x 2-1/4" mechanical brakes w/single operator lever
- . Polyurethane paint finish & reflector tape
- . (2) 50' grounding reels 100 amp
- . 5' Tow bar
- . (4) UHI hubs 5-hole 4-1/2" BC
- . (4) 20.5 x 8.0 x 10 tires (split rims available)
- . Spindles, hub axels, and tow bar assemblies carbon steel painted

NOTE: The following options are available for the above tank

- . 12' telescoping funnel w/screen & flip lock cover
- . Vacuum system complete w/suction hose 50' lg installed in bowser
- . Remote drain funnel w/screen & hose
- . 10" fill w/screen & flip lock cover

It is constructed of stainless steel, eliminating rust and other contaminants common to carbon steel tanks. As a cost saving factor, this allows the fuel to be re-used. We also provide eccentric locking brakes for safety and reliability, replacing the chalk blocks that are currently being used.

The telescoping funnel on our 400 gallon bowser will telescope to 12' high from the ground. This was developed to meet the Air Force requirement that fuel can not free fall more than 6 inches. The funnel edge is also cushioned with a nylrol rubber ring to insure that the funnel edge won't damage a wing or whatever it is being used on. The inside of the funnel is provided with a perforated screen.

A vacuum system is provided for depuddling wing tanks, eliminating the need for sponges and 5 gallon buckets. This, along with the telescoping funnel, are some of the features that the Air Force ground support people feel will cut the aircraft defueling turn-around time in half. The vacuum system has 50' of hose that will reach inside any wing tank. On the vacuum unit are (4) 1/2" ports for plugging in drain lines such as pencil drains, allowing you to drain four ports simultaneously. The vacuum system will vacuum up to 30 gallons of fuel per minute with the proper air supply. ~~The vacuum system is virtually maintenance free because it has no moving parts.~~

Additional features that we offer, such as ground reels, the tow bar, sight gauge fittings, sample ports, locking valves, and the polyurethane red paint with yellow stripe, make this unit equipped to handle any aircraft.





DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR TRAINING COMMAND  
RANDOLPH AIR FORCE BASE, TX 78160-5001

DATE TO  
ATTN (X)

LGSF (CMSgt Jolly, 73447)

12 MAY 1986

SUBJECT

Fuel Bowser (Spokane Metal Products)

SA-ALC/PMDMS (Ms L. Larck)

1. The following comments and recommendations regarding the Spokane Metal Products' 400-gallon fuel bowser, demonstrated on 8 May 86 at Kelly AFB (LGSF), is submitted per your verbal request.

a. Without a doubt, this is the best designed and constructed bowser observed to date.

b. There are many applications for this type bowser in fuels management as well as aircraft maintenance operations.

c. Recommended modifications:

(1) Relocate the quantity sight gage from the front to the rear of the tank.

(2) Enhance the tow bar and the tow bar attaching mechanism to meet Air Force standards.

(3) Make split rim wheels standard instead of optional equipment.

(4) Install a low-point trap/sump with a drain valve for the containment of solid objects.

(5) Install channels in the frame for fork lift capability.

(6) Install tie-down eyelets to accommodate air transport.

(7) Modify front axle with tie rods for front wheel alignment adjustment.

d. Correct use of the bowser will negate any problems in maintaining the quality of reclaimed fuel.

e. Safety officials at HQ AFISC should have the opportunity to review the specification portion for safety compliance prior to forwarding a purchase description to contracting.

SPOKANE METAL PRODUCTS  
BLDG. #4 SPOKANE INDUSTRIAL PARK  
P.O. BOX 3303  
SPOKANE WA. 99220  
PHONE 509-928-0720  
FAX 509-827-0826

CERTIFICATION OF TEST

We hereby certify that Spokane Metal Products Co. has performed the Noise Test, requested in contract solicitation No. F41608-92-R-13317 Commerical Item description test requirements, section 2.11

The test results are illustrated per our drawing Named "NOISE TEST 2"

Approved By: \_\_\_\_\_  
Date: 5/12/92

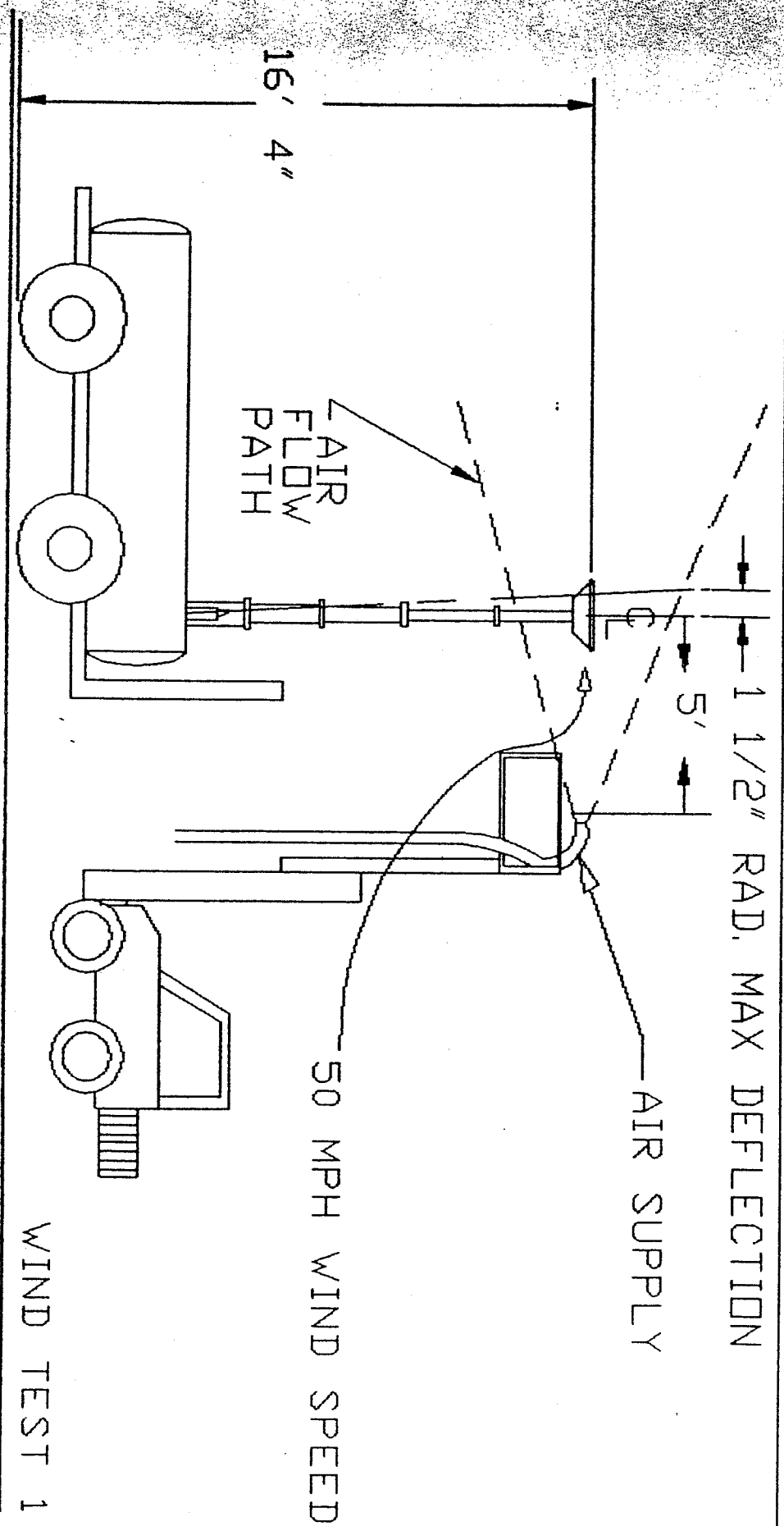
SPOKANE METAL PRODUCTS  
BLDG. #4 SPOKANE INDUSTRIAL PARK  
P.O. BOX 3303  
SPOKANE WA. 99220  
PHONE 509-928-0720  
FAX 509-827-0826

CERTIFICATION OF TEST

We hereby certify that Spokane Metal Products Co. has performed the Funnel Static Load Test, requested in contract solicitation No. F41608-92-R-13317 Commerical Item Description test requirements, section 5.13

With the funnel fully extended a 25# steel weight was placed on the top of the funnel. The test results were good, with no load deflection.

Approved By: \_\_\_\_\_  
Date: \_\_\_\_\_



SPokane METAL PRODUCTS  
 P.O. BOX 3303, SPOKANE, WA 99220 (509) 928-0720

ITEM DESCRIPTION: 600 GALLON FUEL BOWSER TELESCOPING DRAIN FUNNEL WIND TEST.  
 RESULTS: WITH 50 MPH WIND SPEED TEST THE FUNNEL ASSEMBLY DEFLECTED 1 1/2'  
 WHEN FUNNEL WAS EXTENDED TO A HEIGHT OF 16' 4" AND THE WIND SOURCE  
 WAS KEPT AT A DISTANCE OF 5' FROM FUNNEL CENTER.

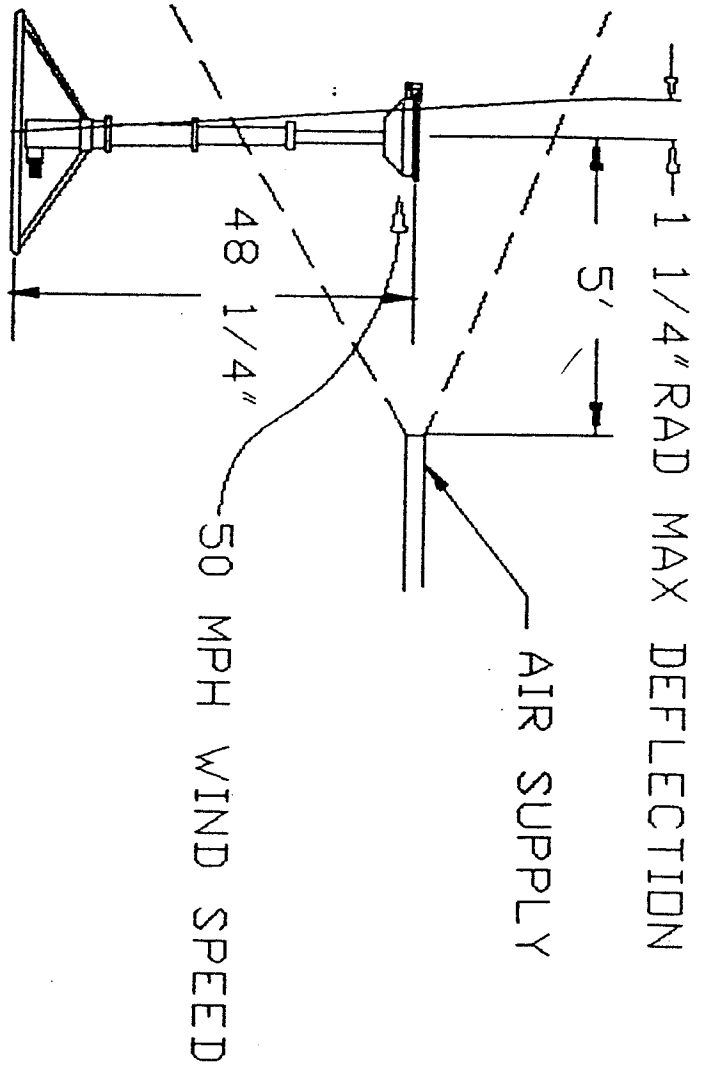
SPOKANE METAL PRODUCTS  
BLDG. #4 SPOKANE INDUSTRIAL PARK  
P.O. BOX 3303  
SPOKANE WA. 99220  
PHONE 509-928-0720  
FAX 509-827-0826

CERTIFICATION OF TEST

We hereby certify that Spokane Metal Products Co. has performed the Stability test, requested in contract Solicitation No. F41608-92-R-13317 Commercial Item Description test requirements, Section 2.12.

The test results are illustrated per our drawing's named "WIND TEST 1" AND "WIND TEST 2" and was performed using a pistol grip wind speedmeter with a range of 5 to 70 M.P.H.

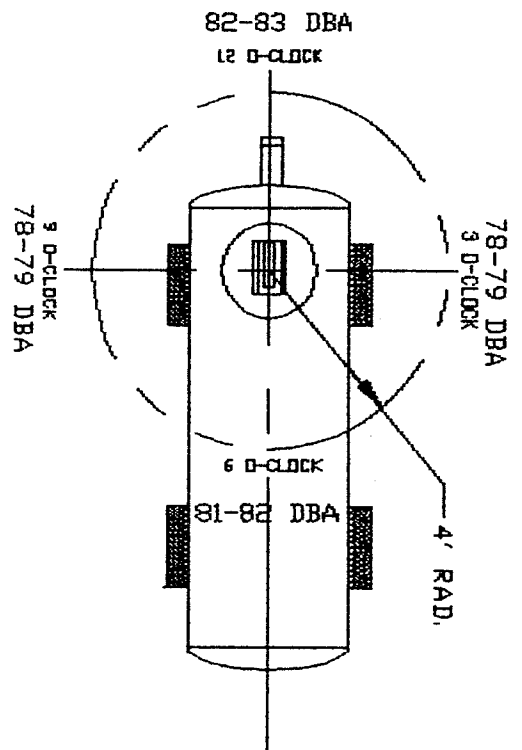
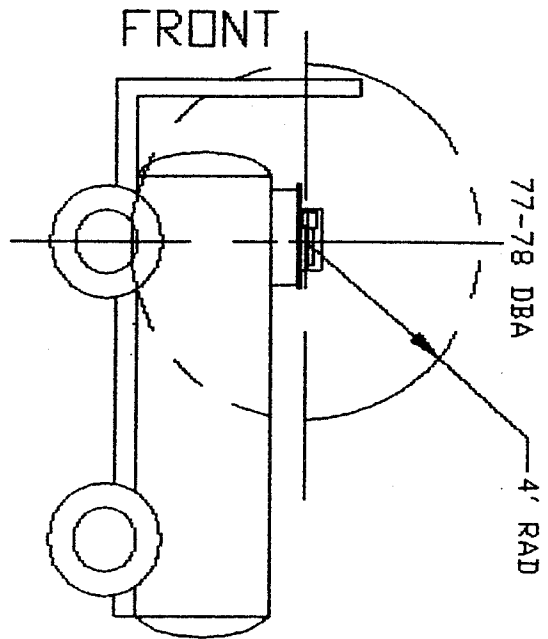
Approved By: \_\_\_\_\_  
Date: \_\_\_\_\_



WIND TEST 2

SPokane Metal Products  
 P.O. BOX 3303, Spokane, WA 99220 (509) 928-0720

ITEM DESCRIPTION: 600 GALLON FUEL BOWSER REMOTE TELESCOPING FUNNEL WIND TEST.  
 RESULTS, WITH 50 MPH WIND SPEED TEST THE FUNNEL ASSEMBLY DEFLECTED 1 1/4"  
 WHEN FUNNEL WAS EXTENDED TO A HEIGHT OF 48 1/4" AND THE WIND SOURCE  
 WAS KEPT AT A DISTANCE OF 5' FROM THE CENTER.  
 NOTE: THERE WAS NO MEASURABLE MOVEMENT OF THE REMOTE TELESCOPING FUNNEL BASE  
 SUPPDRT STRUCTURE.



NOISE TEST 2

SPOKANE METAL PRODUCTS  
 P.O. BOX 3303, SPOKANE, WA 99220 (509) 928-0720

ITEM DESCRIPTION: 600 GALLON FUEL BOWSER NOISE TEST.  
 RESULTS: WITH A DBA METER KEPT AT 4' FROM EXHAUST MANIFOLD AT ANY ANGLE  
 THE NOISE LEVEL NEVER EXCEEDED 83 DBA FROM ANY OF THE TEST POINTS.

**SPOKANE INDUSTRIES, INC.**  
Spokane Metal Products Division  
Spokane, Washington

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Washington is strictly prohibited without written consent.

**FUEL BOWSER  
TECHNICAL MANUAL  
PARTS, OPERATION AND MAINTENANCE**

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## INDEX

Section A	Introduction
Section B	Safety
Section C	Replacement Parts
Section 1	Main Tank
Section 2	Drain Valve/Sump Assembly
Section 3	
Section 4	Sight Gauge/Sample Port
Section 5	Vent Over Flow Assembly
Section 6	Manway Assembly
Section 7	Grounding/Bonding
Section 8	Telescoping Funnel Assembly
Section 9	Vacuum System Assembly
Section 10	Rear Undercarriage Assembly
Section 11	Parking Brake Assembly
Section 12	Rear Wheel Assembly
Section 13	Front Undercarriage Assembly
Section 14	Front Wheel Assembly
Section 15	Tow Bar Assembly
Section 16	Miscellaneous Parts
Section 17	Decal Package
Section 18	Universal Sumping Assembly
Section 19	Remote Drain Funnel Assembly
Section 20	Troubleshooting
Section 21	Warranty Information

Section A INTRODUCTION

- A.1 To obtain optimum benefit from your fuel bowser unit, it is recommended that all operating personnel read and understand this manual prior to operation.
- A.2 Upon receipt of the fuel bowser unit, a visual inspection should be made to determine that it is complete and has not sustained any damage during transportation.
- A.3 Intended Use  
The fuel bowser unit is intended for use in draining and collection of fuel from aircraft or storage area and then transportation to the storage area or disposal site. Any other use is prohibited and may void any and all warranties.

Section B SAFETY

- B.1 Potential Fire and Explosion  
a. Due to the nature of fuel, care should be exercised to eliminate all sparks and open flame in the area of the fuel bowser unit.  
  
b. A 50-foot radius area around the fuel bowser unit for no-smoking, sparks or open flames is usually a good practice. It is strongly recommended by all local or other regulations be consulted for further restrictions.
- B.2 CAUTION: The fuel bowser should never be used inside an enclosed area. Proper ventilation is required.
- B.3 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 as a safety watch for the person inside. It is strongly recommended that all local and/or other regulations be followed.
- B.4 Inspections  
Inspections 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.
- B.5 Grounding  
To eliminate static sparks, the bowser unit is equipped with two grounding reels. Connect prior to draining/filling operations.
- B.6 Insure the manway cover is provided with a "lock out" to prevent accidental closing of the manway while doing internal inspections and can be locked closed to prevent unwanted elements from being introduced to the fuel supply.

**B.7 Towing**

- a. Make sure the tow bar is securely attached to the towing vehicle.
- b. Before moving the bowser unit, check to assure the parking brake is released.
- c. Maximum allowable towing speed is 15 MPH.

**B.8 Parking**

Parking brake must be applied when filling, draining or when left unattended.

**B.9 Air Supply**

**CAUTION:** Check the air pressure of supply lines to the vacuum generator to assure it is not in excess of 100 PSI.

**B.10 Telescoping Funnel**

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

**Section C**

**REPLACEMENT PARTS**

- C.1** This section provides information for identification of parts for ordering. To order, it is important to have the Model/Serial Number, Subassembly Number, Part Number and Description. Parts may be order by calling or writing to:

Spokane Industries, Inc.  
Spokane Metal Products Division  
P.O. Box 3303  
Spokane, WA 99220-3303  
Tel: 509-928-0720, Fax: 509-927-0826  
Email: [dyorke@spokaneindustries.com](mailto:dyorke@spokaneindustries.com)

**Section 1**  
**Main Tank**

- 1.1 See Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 1.2 **Maintenance**  
Internal inspection will be necessary to insure structural integrity and cleanliness. It is recommended that interval inspections be performed at least every six- (6) months.

## **Section 2**

### **Drain Valve / Drain Sump (12 ft. & 16 ft. Telescoping Funnels only)**

- 2.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 2.2 The Telescoping Drain Strainer is located on the bottom of the stainless steel drain housing (400 gallon & larger units only).
- 2.3 Maintenance should consist of inspection and cleaning monthly.
- 2.4 **Drain Screen Removal & Maintenance**  
(Note: Check interior to assure fuel has been thoroughly drained before servicing)
  - 2.4.1 Screen removal is accomplished by loosening the wing nut (Item #5) on the cross arm cover plate.
  - 2.4.2 Swing cross arm assembly out of the way.
  - 2.4.3 After noting screen orientation, use a screwdriver to pry screen out.
  - 2.4.4 Clean or replace as required.
  - 2.4.5 Reshape if needed then re-install and secure cross arm assembly.
  - 2.4.6 Tighten wing nut & check for leaks.

ASSEMBLY NO. 07-1035  
MAJOR ASSEMBLY – DRAIN, SUMP ASSEMBLY  
SECTION 2.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-1035			1	DRAIN SUMP ASSY, 6"	12.4#
	1	04-10581	1	REPAIR KIT, INCLUDES 2,3,4 & 5	6.3
	2	04-125252	1	COVER	2.3
	3	06-1058	1	GASKET, BLACK NUNA N	.4
	4	04-12637	1	GASKET, RETAINER	1.4
	5	04-11162	1	PIVOTING WING NUT ASSEMBLY	2.1
	6	01-8223	1	SUMP STRAINER SCREEN	.1

**Section 4**  
**Sight Gauge/Sample Port**

- 4.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 4.2 Operation/Maintenance
  - 4.2.0 Sight Gauge – This gauge should be inspected monthly for loose connections and weathering of clear tubing.
  - 4.2.1 Sample Port – The bowser is equipped with a ½" NPT valve for use as a sample port (See Item #6).

**Section 5**  
**Vent Overflow**  
**400 gallon & larger units only**

- 5.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 5.2 Operations
  - 5.2.0 The bowser unit is equipped with a float actuated vent to prevent fuel from flowing out the vent in the event the bowser is overfilled.
- 5.3 Maintenance
  - 5.3.0 The vent overflow assembly is located inside the tank directly under the vent.
    - 5.3.1 It consists of a caged float with an elastomer seal.
    - 5.3.2 Inspect float and elastomer seal (gasket) monthly and replace as needed.



ASSEMBLY NO. 08-10011  
 MAJOR ASSEMBLY – VENT, OVERFLOW PREVENTOR  
 SECTION 5.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1022			1	FLOAT ASSY	2.7
	1	04-1047	1	GASKET	1
	2	06-1013	1	FLOAT	.5
	3	02-1100	1	WASHER	.1
	4	02-10001	1	BOLT	.1
08-1023			1	GAUGE ASSY	
	5	07-1032	1	CAGE, WIRE	.9
	6	02-12140	4	NUT	.1

## **Section 6**

### **Manway**

- 6.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 6.2 Operation
  - 6.2.0 The fuel bowser unit is equipped with a 16" quick opening manway assembly for internal inspections.
  - 6.2.1 The manway is equipped with a flip locking cross arm assembly to insure sealing and securing the cover lid in place.
- 6.3 Maintenance
  - 6.3.0 Inspect manway gasket weekly for cuts, cracks or galling. Replace as needed.

## **Section 7**

### **Grounding/Bonding**

- 7.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 7.2 Operation
  - 7.2.1 The bowser unit is supplied with two grounding reels with connectors.
  - 7.2.2 Before filling, draining, or vacuuming, the grounding reels must be attached between the aircraft or object being serviced and appropriate ground.
- 7.3 Maintenance
  - 7.3.1 Grounding reel cables should be pulled out, cleaned and inspected monthly.
  - 7.3.2 Cable clamps and ends should be cleaned and inspected for loose connections monthly.
  - 7.3.3 A Continuity test between the clamp and plug on the grounding reels should be performed monthly (replace as required).

ASSEMBLY NO. 08-1025  
 MAJOR ASSEMBLY – 16” QUICK OPENING MANWAY  
 SECTION 6.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
	1	07-1039S	1	CROSSARM, 19 ½”	2.5
	2	01-8222S	1	CROSSARM, 7”	1
	3	01-86001	1	LID, COVER, MANWAY	6
	4	06-25025	1	GASKET, MANWAY	1.5
	5	01-8700	1	RETAINER, GASKET	1
	6	02-1206	1	NUT, 5/8”-18 UNF, NYLOC	.2
	7	02-10014	1	BOLT, 3/8”-UNC X 3 ½”	.14
	8	02-10013	1	BOLT, 3/8”-UNC X 3”	.12
	9	02-1202	2	NUT, 3/8”-UNC, NYLOC	.2

## **Section 8**

### **Telescoping Funnel**

- 8.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 8.2 Operation
  - 8.2.1 The fuel bowser may be equipped with a telescoping drain assembly. It is capable of being adjusted from 4'-2" to 8'-0", 12'-0", or 16'-0" high depending on model purchased.
  - 8.2.2 To Raise
    - a. Loosen top clamp if necessary.
    - b. Grasp top section with one hand and lift until the top clamp raises approximately 6 inches.
    - c. Tighten clamp securely with the other hand.
    - d. Reposition lifting hand by grasping tube below tightened clamp and lift until next clamp is raised approximately 6 inches.
    - e. Repeat steps 1-4 until desired height is obtained or assembly is fully extended.
  - 8.2.3 To Lower
    - a. Tightly grasp bottom extended tube with one hand and loosen the securing clamp.
    - b. Slowly lower tube, hand over hand, until the following clamp is resting on the loosened clamp.
    - c. Repeat steps 1 and 2 until all sections are lowered.
  - 8.2.4 Funnel is equipped with a nitrile rubber seal around the top edge to allow placement against the underside of a wing.
  - 8.2.5 When not in use, telescope should be collapsed and the cover closed to eliminate contamination.
- 8.3 Maintenance – Drain Assembly
  - 8.3.1 The Telescoping Drain Assembly consists of stainless steel housing permanently attached to the tank and multiple aluminum tube sections.
  - 8.3.2 The stainless tube and largest aluminum tubes are equipped with a clamp assembly.
  - 8.3.3 Each aluminum tube is crimped on the lower end which acts as a stop to prevent the tube from sliding through the clamp.

8.3.4 Disassembling the telescoping 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.

ASSEMBLY NO. 08-1034U  
 MAJOR ASSEMBLY – 16 FT TELESCOPING DRAIN ASSEMBLY  
 SECTION 8.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-10541				DRAIN FUNNEL SECTION ASSY	
	1	01-8250	1	DRAIN, TOP (FUNNEL)	5
	2	06-1022T	1	GASKET	.7
	3	01-92402	1	TUBING, 2"O.D.	
	4	04-1039	1	SCREEN	.5
	4A	02-10002	1	BOLT, ¼"	.2
	4B	02-1200	1	NUT, ¼"	.1
08-1017U				DRAIN, TELESCOPING SECT ASSY, 2 ½"O.D.	
	5A	05-10271	1	CLAMP, 2"O.D.	
	5	01-9242	1	TUBING, 2 ½"O.D.	
	6	05-10051	1	WEDGE, 1" X 11/16" X 1 ¼"	.2
	7	05-10181	1	HANDLE, CLAMP	.3
	8	02-1005	1	SCREW, SET	.01
08-1027U				DRAIN, TELESCOPING SECT ASSY, 3"O.D.	
	9A	05-10281	1	CLAMP, 2 ½"O.D.	
	9	01-92452	1	TUBING, 3"O.D.	
	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
08-1028U				DRAIN, TELESCOPING SECT ASSY, 3 ½"O.D.	
	13A	05-10291	1	CLAMP, 3"O.D.	
	13	01-9248	1	TUBING, 3 ½"O.D.	.5
	14	05-10031	1	WEDGE, 1" X 1-1/16" X 1-13/16"	.5
	15	05-10181	1	HANDLE, CLAMP	.3
	16	02-1005	1	SCREW, SET	.01
07-1014U				DRAIN, TELESCOPING SECT ASSY, 4"O.D.	
	17A	05-10301	1	CLAMP, 3 ½"O.D.	
	17	01-9259	1	TUBING, 4"O.D.	
	18	05-10041	1	WEDGE, 1" X 1-7/32" X 2-1/8	.5
	19	05-10181	1	HANDLES, CLAMP	.3
	20	02-1005	1	SCREW, SET	.01
07-1041U				DRAIN, TELESCOPING SECT ASSY, 4 ½"O.D.	
	21A	01-92565S	1	TUBING, 4 ½"O.D.	
	21	05-10302	1	CLAMP, 4"O.D.	4.4

CONTINUED ASSEMBLY NO. 08-1034U  
MAJOR ASSEMBLY – 16 FT TELESCOPING DRAIN ASSEMBLY  
SECTION 8.0

	22	05-10051	1	WEDGE, 1" X 1" X 2 ½"	.6
	22A	04-10561	1	BASE FLANGE	
	23	05-10181	1	HANDLE, CLAMP	.3
	24	02-1005	1	SCREW, SET	.01
	25	02-100121	4	MOUNTING BOLTS, ¼"-16 X ¾"	.2
	26	08-1026	1	COVER ASSEMBLY	5



ASSEMBLY NO. 08-1034W  
 MAJOR ASSEMBLY – 12 FT TELESCOPING DRAIN ASSEMBLY  
 SECTION 8.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-1054W				DRAIN FUNNEL SECTION ASSY	
	1	01-8250	1	DRAIN, TOP (FUNNEL)	5
	2	06-1022T	1	GASKET	.7
	3	01-92402	1	TUBING, 2"O.D.	
	4	04-1039	1	SCREEN	.5
	4A	02-10002	1	BOLT, ¼"	.2
	4B	02-1200	1	NUT, ¼"	.1
08-1012W				DRAIN, TELESCOPING SECT ASSY, 2 ½"O.D.	
	5A	05-10271	1	CLAMP, 2"O.D.	
	5	01-9242	1	TUBING, 2 ½"O.D.	
	6	05-10051	1	WEDGE, 1" X 1 1/16" X 1 ¼"	.2
	7	05-10181	1	HANDLE, CLAMP	.3
	8	02-1005	1	SCREW, SET	.01
08-1013W				DRAIN, TELESCOPING SECT ASSY, 3"O.D.	
	9A	05-10281	1	CLAMP, 2 ½"O.D.	
	9	01-92452	1	TUBING, 3"O.D.	
	10	05-10121	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
08-1014W				DRAIN, TELESCOPING SECT ASSY, 3 ½"O.D.	
	13A	05-10291	1	CLAMP, 3"O.D.	
	13	01-924S	1	TUBING, 3 ½"O.D.	.5
	14	05-10031	1	WEDGE, 1" X 1-1/16" X 1-13/16	.5
	15	05-10181	1	HANDLE, CLAMP	.3
	16	02-1005	1	SCREW, SET	.01
07-1041				DRAIN, TELESCOPING SECT ASSY, 4"O.D.	
	17A	05-10301	1	CLAMP, 3 ½"O.D.	
	17	01-9259	1	TUBING, 4"O.D.	
	18	05-10041	1	WEDGE, 1" X 1-7/32" X 2-1/8	.5
	19	05-10181	1	HANDLES, CLAMP	.3
	20	02-1005	1	SCREW, SET	.01
	22A	04-10562	1	BASE FLANGE	
	25	02-100121	4	MOUNTING BOLTS, ¼"- 16 X ¾"	.2
08-1026	26		1	COVER ASSY	5

ASSEMBLY NO. 08-1034Z  
 MAJOR ASSEMBLY – 8 FT TELESCOPING DRAIN ASSEMBLY  
 SECTION 8.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT #
07-1051				DRAIN FUNNEL SECTION ASSY	
	1	01-8250	1	DRAIN, TOP (FUNNEL)	5
	2	06-1022T	1	GASKET	.7
	3	01-92402	1	TUBING, 2"O.D.	
	4	04-1039	1	SCREEN	.5
	4A	02-10002	1	BOLT, ¼"	.2
	4B	02-1200	1	NUT, ¼"	.1
07-1049				DRAIN, TELESCOPING SECT ASSY, 2 ½"O.D.	
	5A	05-10271	1	CLAMP, 2"	
	5	01-9242	1	TUBING, 2 ½"O.D.	
	6	05-10051	1	WEDGE, 1" X 11/16" X 1 ¼"	.2
	7	05-10181	1	HANDLE, CLAMP	.3
	8	02-1005	1	SCREW, SET	.01
07-1045				DRAIN, TELESCOPING SECT ASSY, 3"O.D.	
	9A	05-10281	1	CLAMP, 2 ½"O.D.	
	9	01-92452	1	TUBING, 3"O.D.	
	10	05-10121	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 SECT ASSY, 3 ½"O.D.	
	13A	05-10291	1	CLAMP, 3" TUBING	
	13	01-9254S	1	TUBING, 3 ½"O.D.	.5
	14	05-10031	1	WEDGE, CLAMP	.5
	15	05-10181	1	HANDLES, CLAMP	.3
	16	02-1005	1	SCREW, SET	.01
	17	04-10560	1	BASE FLANGE	
	18	02-100121	4	MOUNTING BOLTS, ¼"- 16 X ¾"	.2
08-1026	19		1	COVER ASSY	5

## Section 9 Vacuum

- 9.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 9.2 Operation
  - 9.2.1 This assembly is equipped with an air powered vacuum generator.
  - 9.2.2 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.
  - 9.2.3 Vacuum is started by attaching a recommended air supply of 60CFM at 100 PSI and turning on the air supply valve.
  - 9.2.4 The vacuum chamber is equipped with an automatic drain valve that opens when vacuum is eliminated in the chamber. This valve opens directly into the main tank.
  - 9.2.5 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.
  - 9.2.6 The vacuum assembly is supplied with 50 feet of vacuum hose and a ball valve on the vacuum suction.
  - 9.2.7 The vacuum assembly is equipped with (4) four each ½" NPT openings for use with pencil drains. To use, the pipe caps must be removed and self-closing quick disconnects attached. To operate, close vacuum suction valve and turn air supply on and connect drain lines.
- 9.3 Maintenance
  - 9.3.1 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 (3) three tie down latches.
  - 9.3.2 The vacuum chamber is equipped with an automatic drain valve. This valve is pre-adjusted at the factory and should not need further adjustment.
  - 9.3.3 The vacuum cover is equipped with an overflow valve which should require no maintenance.

- 9.3.3 The vacuum cover is equipped with an overflow valve which should require no maintenance.
- 9.3.4 The vacuum generator is attached to the chamber cover. It is equipped with an exhaust silencer which should be cleaned at (6) six month intervals or more often depending on the amount of use and conditions.
- 9.3.5 The vacuum hose should be inspected monthly for cracks. Any sudden loss of vacuum suction power may indicate a crack in the vacuum hose.
- 9.3.6 The cover gasket should be inspected monthly for deterioration. This gasket should be pliable and free from weather checking.

ASSEMBLY NO. 08-0002U  
 MAJOR ASSEMBLY – VACUUM SYSTEM  
 SECTION 9.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-0002U			1	VACUUM SYSTEM ASSY	208.1
08-1000	1	07-1000	1	DRAIN STOP ARM	3.5
	2	04-1000	1	GASKET	.1
	3	02-10016	1	BOLT	.1
	4	02-10002	1	BOLT	.1
	5	02-1100	1	WASHER, FLAT	.1
	6A	02-1201	1	NUT	.1
	6B	02-1200	1	NUT	.1
08-1001				OVERFLOW STOP ASSY	
	7	07-1001	1	FLOAT ASSY	4
	8	04-1001	1	GASKET	.1
	9	02-10003	1	BOLT	.1
	10	02-1200	1	NUT, NYLON LOCK	.1
	11	02-1102	1	WASHER, FLAT	.1
08-1002	12		1	COVER ASSY	29.6
	13	06-1022V	1	GASKET	3.5
08-1003			1	VACUUM GENERATOR ASSY	
	14	04-1004	1	HOUSING, EXHAUST	9.5
	15	04-1005	1	SILENCER	4.7
	16	04-1006	1	VENTURI	2.2
	17A	04-1007	1	JET, AIR	2.7
	17B	03-11135	1	REDUCER, AIR JET	.1
	18	04-1008	1	BOX, VENTURI	2.7
	19A	04-1032	1	VALVE, BALL	5.8
	19B	03-0264S	1	NIPPLE	.2
	20	04-1056	1	COUPLER, AIR TWIST	.7
	21	04-1010	1	GASKET	.1
	22	02-10010	3	BOLT	.1
	23	02-11002	3	WASHER, LOCK	.1
08-1004			1	ACCESORIES	
	24	03-1001	1	ELBOW, 90 DEGREES	2
	25	03-02922S	1	NIPPLE	.5
	26	04-10321	1	VALVE, BALL	3
	27	03-1002	1	BUSHING	.2
	28	06-10162	50'	HOSE, AIRCRAFT DELIVERY	25
	29	--	--	--	--
	30	--	--	--	--

CONTINUED ASSEMBLY NO. 08-0002U  
 MAJOR ASSEMBLY – VACUUM SYSTEM  
 SECTION 9.0

	31	03-1021	3	CAP, PIPE	1
	32	--	--	--	--
	33A	07-1034	1	COVER, VACUUM GENERATOR	11
08-0520	33B		1	WATER SHROUD W/VENT	19.4
	34	02-10010	6	BOLT	.1
	35	06-25123	6	WASHER, FLAT	.1
	36	02-1100	6	WASHER, FLAT	.1
	37	02-1200	6	NUT, NYLON INSERT	.1
	38	04-1057	1	COUPLER, AIR TWIST	.1
	39	02-10004	1	BOLT	.1
	40	02-1200	1	NUT	.1
OPTIONAL	41	02-100115	6	BOLT	1
	42	02-1202	6	NUT	.5
	43	07-1075	2	HANER, HOSE	3
	44	--	3	HOSE, AIRCRAFT DELIVERY	12
	45	04-2507	3	VALVE, BALL	6
	46	--	3	BUSHING	3.1
08-1009			1	VACUUM TANK FABRICATED AND ASSY	
	47	07-1032	1	TANK ASSY	65
	48	04-1062	1	FASTENER, HOOD	1.1
07-10341	49		1	VALVE, VACUUM CHECK ASSY	2.5

## **Section 11**

### **Parking Brakes**

11.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

#### 11.2 Operation

12.1.1 The fuel 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, draining or when left unattended.

#### 11.3 Maintenance

11.3.1 The fuel bowser unit is equipped with a parking brake assembly consisting of a 7" diameter brake drum with 1-3/4" wide brake shoes.

11.3.2 The shoes are activated via a mechanical linkage, eccentric and lever.

11.3.3 Adjustment may be necessary as the shoes wear

- a. Tightening is accomplished by removing the bolt through one yoke and screwing yoke in to shorten connecting rod.
- b. Do not over tighten as brakes may drag when released.

#### 11.3.4 Brake Shoe Replacement

- a. Remove wheel.
- b. Remove nut retaining hub and drum assembly.
- c. Disconnect actuating rod
- d. Remove shoe retainers
- e. Install new shoes.
- f. Replace shoe retainers.
- g. Adjust actuator rod length.
- h. Replace wheel.

ASSEMBLY NO. 10-100052R  
 MAJOR ASSEMBLY – WHEEL ASSEMBLY, REAR  
 SECTION 12.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-10111R		04-1062R		BEARING & HUB ASSY (2 REQUIRED)	
	1	04-1012	1	SEAL, BEARING	1
	2	04-1013	1	BEARING, INNER	3
	3	04-1015	1	CUP, INNER	2
	4	05-1008R	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
	9	02-1017	5	STUDS, HUB	1
08-10061		04-10201		TIRE/WHEEL/TUBE ASSY (2 REQUIRED)	
	10	04-1020	1	WHEEL, SPLIT RIM	9.5
	11	04-1021	5	LUG NUTS, WHEEL	1
	12	04-10221	1	TIRE, 10" E-RANGE FOR 400 & UP B-RANGE FOR 200 & DOWN	4
	13	04-1045	1	TUBE ASSY	11



## **Section 13**

### **Front Undercarriage**

- 13.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.
- 13.2 Operation
- 13.2.1 The Front Undercarriage is intended for use in trailering of fuel from aircraft or storage area to the aircraft, storage area or disposal site. Any other use is prohibited and may void any and all warranties.
- 13.2.2 The fuel bowser unit is equipped with steering front wheels controlled by the tow bar.
- 13.2.3 Care should be taken not to jackknife the fuel bowser when backing up.
- 13.2.4 Before towing, check to see the brake is disengaged, grounding reel and hoses are disconnected, air lines and valves are closed, tow bar is securely attached to the towing vehicle and all manway and covers are closed and latched.
- 13.2.5 The fuel bowser unit is equipped with a tow bar latch to hold it in the upright position.
- 13.3 Maintenance
- 13.3.1 The fuel bowser is equipped with steering front wheels, controlled by the tow bar and fixed rear wheels.
- 13.3.2 Maintenance should consist of the following:
- a. Kingpin bushing, turning bushings and tie rod ends are self-lubricating and need no additional maintenance.
  - b. Inspect wheel bearings at (3) three month intervals. Repack and, or replace as needed.
  - c. Check tire pressure weekly. Maintain pressure as per tire markings.
- 13.3.3 Tow bar pivot pin and hook ring should be inspected monthly for excessive wear or cracks.

ASSEMBLY NO. 08-1029  
 MAJOR ASSEMBLY – FRONT UNDERCARRIAGE  
 SECTION 13.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1029			1	FRONT UNDERCARRIAGE	
	1	07-1103	1	BAR, TOW	20.4
	2	07-1020	1	LATCH, TOE	3.7
	3	07-1052	1	ARM, STEERING	10.4
	4	07-1045	1	PLATE, LOWER	6.7
	5	07-10371	1	ROD, TIE	6.2
	6	03-1016	2	ROD, END	5
	7	07-1009	2	HOUSING, KING PIN MACH.	23.8
	8	07-1053	1	AXLE, FRONT	53.9
	9	05-1010	2	PIN, KING 1-1/2" X 11"LG	5.5
	10	06-1023	2	PAD, MOUNTING, 1/2"THK	.32
	11	02-1304	1	PIN, HITCH	2
	12	02-1300	1	PIN, COTTER	.2
	13	04-1054	1	SPRING, PULL CENTURY #C-187	.5
	14	03-1013	4	BUSHING, OILITE	1
	15	03-1014	2	BUSHING, OILITE	1
	16	03-1015	2	BUSHING, OILITE	.8
	17	02-1503	4	BOLT, 1/2"-13NC X 5"LG	1.3
	18	02-1502	2	BOLT, 1/2"-13NC X 1-3/4"LG	.32
	19	02-1501	1	BOLT, 5/16"-18NC X 4-1/2"	.2
	20	02-12131	4	NUT, 1-1/2"-12NF	2
	21	02-12071	4	NUT, 3/4" – 16NF	1.1
	22	02-12041	4	NUT, 1/2" X 13NC	.8
	23	02-12012	1	NUT, 5/16"-18NC	.6
	24	02-11131	4	WASHER, FLAT 1-1/2"	.7
	25	02-11072	6	WASHER, FLAT 3/4"	.4
	26	02-12141	2	NUT, 3/4"-16NF	.55

ASSEMBLY NO. 08-1018  
 MAJOR ASSEMBLY – AXLE ASSEMBLY  
 SECTION 13.0  
 (FITS 300 GALLON & LARGER UNITS)

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1018			1	AXLE, ASSEMBLY, FRONT	
	1	07-1103	1	BAR, TOW	23
	2	07-1104	1	ARM, TURNING	16
	3	07-1005	1	TIE ROD	7.3
	4	07-11071	1	AXLE, FRONT	53
	5	07-1016	1	STEERING ARM, LOWER PLATE	6.7
	6	05-1009	1	SLEEVE, KING PIN, RIGHT	12
	7	05-1009	1	SLEEVE, KING PIN, LEFT	12
	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, KIN PIN SLEEVE	1
	12	03-1016	2	ENDS, TIE ROD	5
	13	02-11072	5	WASHERS, TIE ROD	.4
	14	02-12071	2	NUT, TIE ROD ENDS	.6
	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	.8
	21	02-12041	4	NUTS, TANK MOUNTING	.5
	22	02-1502	2	BOLTS, TURNING ARM CLAMP	.3
	23	02-12041	2	NUTS, TURNING ARM CLAMP	.4
	24	02-1304	1	HITCH PIN	2
	25	07-1020	1	TOE LATCH	3
	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

ASSEMBLY NO. 10-100042  
MAJOR ASSEMBLY – FRONT WHEEL ASSEMBLY  
SECTION 13.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
10-100042	--	--	2	FRONT WHEEL ASSEMBLY	116
	1	08-1011	1	BEARING AND HUB ASSY, FRONT	23
	2	08-10061	1	TIRE/WHEEL/TUBE ASSY	35

ASSEMBLY NO. 08-10061  
MAJOR ASSEMBLY – FRONT WHEEL ASSEMBLY  
SECTION 13.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-10061			1	TIRE/WHEEL/TUBE ASSY	35
	1	04-1020	1	WHEEL, SPLIT RIM	19
	2	04-1021	5	NUTS, LUG	1
	3	04-10221	1	TIRE, 10" E-RANGE FOR 400 & UP B-RANGE FOR 200 & DOWN	4
	4	04-1045	1	TUBE ASSY	11

ASSEMBLY NO. 08-1011  
 MAJOR ASSEMBLY – FRONT WHEEL ASSEMBLY  
 SECTION 14.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1011		04-1050	1	BEARING AND HUB ASSY, FRONT	23
	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		1
	8	04-1019	1	CAP, DUST	1
	9	02-1017	5	STUDS, HUB	1

ASSEMBLY NO. 10-100110  
 MAJOR ASSEMBLY – MISC. FIXTURES  
 SECTION 16.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
10-100110			1	DRAIN ASSY	
	1	04-10321	1	VALVE, BALL LOCKING	6
	2	04-1033	1	COUPLER, CAMLOCK	1.5
	3	04-10331	1	PLUG, CAMLOCK	.5
	4	04-1034	1	CHAIN	.2
	5	04-1035	1	LINK	.1
	6	04-10351	1	HOOK, S-TYPE	.1
08-1013			1	GROUNDING REEL ASSEMBLIES	
	7	04-1036	1	REEL, GROUNDING CLAMP TYPE	12
	8	04-10361	1	REEL, GROUNDING PLUG TYPE	12
	9	02-10040	4	BOLT	.3
	10	02-100115	4	NUT	.1
08-1014			1	SIGHT GAUGE ASSY	
	11	03-0017S	2	ELBOW	.3
	12	03-1007	1	TEE	.3
	13	03-1008	2	NIPPLE	.3
	14	03-11130	2	HOSE BARB	.3
	15	03-1010	2	HOSE CLAMP	.3
	16	04-1032	1	VALVE, BALL	.3
	17	06-2527	1	TUBING	.3
	18				
	19				
04-1037	20	04-1037	1	VENT, MORRISON	1

ASSEMBLY NO. 10-100070  
 MAJOR ASSEMBLY – DECAL PACKAGE  
 SECTION 17.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
10-100070			1	DECAL PACKAGE	2.7
	1	06-1002	1	CAUTION, VACUUM SYSTEM	.1
	2	06-1003	1	CAUTION – PARK BRAKE	.1
	3	06-1004	2	WARNING,- GROUNDING REELS	.1
	4				
	5	06-1006	2	DANGER – NO SMOKING	.2
	6	06-1007	1	NOTICE – READ MANUAL	.1
	7	06-1008	1	MAXIMUM TOW SPEED	.1
	8	06-1010	1	ON/OFF – PARK BRAKE	.1
	9	06-1010	1	ON/OFF – PARK BRAKE	.1
	10	06-1011	8	ON/OFF DRAIN VALVE	.8
	11		8	REFLECTOR TAPE, 6'LG	.8
	12				



ASSEMBLY NO. 07-0700  
 MAJOR ASSEMBLY – UNIVERSAL SUMPING ASSEMBLY  
 SECTION 18.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-0700			1	UNIVERSAL SUMPING ASSY	
	1	07-0700-1	2	COUPLER, MALE	
	2	07-0700-2	1	COUPLER, FEMALE	
	3	03-11130	4	BARB, HOSE	
	4	03-101005	4	CLAMP	
	5	07-0700-5	1	HOSE, BRAIDED	
	6	07-0700-6	1	HOSE, BRAIDED	
	7	03-10155	1	BUSHING	
	8	08-0100	1	PROBE TIP SET	
	9	08-0100	1	VACUUM PLUG W/ O-RINGS	
	10	08-0200	1	SUMPING CUP	
	11	03-11133	1	HOSE BARB	
	12	07-0700-12	1	VALVE	
	13	03-1010	2	CLAMP	
	14	07-0700-14	1	HOSE, PVC CLEAR	
	15	07-0700-15	1	HOSE BARB	
	16	07-0700-16	1	CHECK VALVE	
	17	03-10821	1	NIPPLE	
	18	07-0700-18	1	COUPLER, FEMALE	

*This is not  
 in this manual  
 Duke Before ??  
 5/29/02*

## **Section 19**

### **Remote Funnel**

19.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

#### **19.2 Operation**

19.2.1 The Remote Funnel is intended for use in draining and collection of fuel from aircraft in conjunction with transportation via the vacuum system of a fuel bowser. Any other use is prohibited and may void any and all warranties.

19.2.2 The Remote Funnel is equipped with a telescoping drain assembly. It is capable of being adjusted from 21-1/2" to 51-1/2" high.

19.2.3 To Raise:

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

19.2.4 To Lower:

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

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

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

#### **19.3 Maintenance**

19.3.1 The Remote Funnel consists of a stainless steel base 3-1/2" in diameter provided with a tripod support and (2) two aluminum tube sections.

19.3.2 The stainless tube and (2) two aluminum tubes are equipped with a clamp assembly.

19.3.3 Each aluminum tube is crimped on the lower end which acts as a stop to prevent the tube from sliding through the clamp.

19.3.4 Disassembling of the telescope assembly is accomplished by rotating the (3) three 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.

ASSEMBLY NO. 07-1110U  
 MAJOR ASSEMBLY – REMOTE FUNNEL  
 SECTION 19.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-11103			1	REMOTE DRAIN FUNNEL, BASE	17
	1	07-1100	1	BASE SECTION FAB S/S	
	2	05-10012	1	CLAMP, BASE	
	3	02-100181	1	SCREW, CLAMP	
	4	05-0037	1	PLASTIC	
	5	04-0093	1	HELICOIL	
	6	03-1003	1	HOSE ADAPTER	
	7	02-10010	3	CLAMP BOLT	
07-11104			1	REMOTE DRAIN FUNNEL, LOWER	2.5
	8	01-92452	1	TUBE, 3" O.D.	
	9	05-10022	1	CLAMP, LOWER	
	10	02-100181	1	SCREW, CLAMP	
	11	05-0037	1	PLASTIC	
	12	04-0093	1	HELICOIL	
07-11105			1	REMOTE DRAIN FUNNEL, MID	1.75
	13	01-9242	1	TUBE, 2-1/2" O.D.	
	14	05-10032	1	CLAMP, MID	
	15	02-10015	1	SCREW, CLAMP	
	16	05-0037	1	PLASTIC	
	17	04-0093	1	HELICOIL	
07-11106			1	REMOTE DRAIN FUNNEL, TOP	13
	18	01-82501	1	FUNNEL, CAST ALUM ASSY	
	19	04-1039	1	DEBRIS SCREEN	
	20	02-1200	1	LOCK NUT	
	21	06-1022	1	NYTRIL GASKET	
	22	04-1053	1	DRAW LATCH	
07-11107		07-1116	1	REMOBE FUNNEL LID ASSY	12
	23	01-9007	1	LID FABRICATION	
	24	01-91984S	1	ROD, THREADED	
	25	02-1200	2	LOCK NUT	
	26	02-1200S	2	WASHER	
	27	01-9233S	1	PIPE	

Section 21.0  
Warranty INFORMATION

## SPOKANE METAL PRODUCTS

Spokane Washington

FUEL BOWSER TANK

ONE YEAR LIMITED WARRANTY

Seller warrants its "Fuel Bowser 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. Our obligation under this Warranty shall be limited to the repair or exchange of equipment and parts which may prove defective within one year 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 manmade, 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 the effect adversely it 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 OF THE UNIT.

Section 20  
Trouble Shooting

*Not Revised yet  
5/29/02  
finish*

**SYMPTOM**

**PROBABLE CAUSE**

**PROBABLE CORRECTIONS**

**Bowser does not track or steer correctly or steer loosely**

Bent King Pin Housing see Section 13.7

Replace King Pin Housing

Defective Tie Rod End see Section 13.8

Replace Tie Rod End

Loose or worn out Bushings see Section 13.7

Replace as Needed <sup>DEFECTIVE BUSHINGS</sup>

**Tow Bar does not stay in the upright position**

Broken or stretched spring see Section 13.0

Replace as Needed

**Parking Brake does not work**

Need adjustment  
*SEE SECTION 11.0*

Adjust as per <sup>NEEDED</sup> instruction in Section

Needs Repairing see Section 11.0

Replace as Needed

**Vacuum System does not have much suction**

Defective lower drain stop gasket, see Section 9.0 *ITEM # 2*

Replace as Needed

Not enough air pressure to operate vacuum generator, see Section 9.0

Increase air pressure and volume *(DO NOT EXCEED 60 CFM @ 100 PSI)*

Plugged outlet ~~Filter~~ *SILENCER* see Section 9.0 *ITEM 15*

Replace or clean as required

**Fuel misting is occurring through vacuum generator**

Bowser tank is to full

Empty main bowser tank

Overflow stop gasket needs replacing or adjusting, see Section 9.0 *ITEM # 8*

Replace or adjust as needed

Float on Vacuum shutoff is bent, see Section 9.0 *ITEM # 7*

Fix or repair as needed

**Section 20  
Trouble Shooting**

**SYMPTOM**

**PROBABLE CAUSE**

**PROBABLE CORRECTIONS**

**Telescoping Drain  
won't stay up**

Loose clamp handles

Tighten handles a  
little tighter

**Telescoping Drain  
is overflowing**

DEFORMED TUBING DUE TO OVER  
TIGHTENING  
CLAMP HANDLE  
Bowser tank is full

RE-SHAPE OR REPLACE AS NEEDED

Empty main bowser tank

Clogged drain screen see  
Section 2.0 ITEM #6

Remove and clean as  
required

**Fuel drains out vent**

Overflow vent preventer  
is stuck in the open condition  
see Section 5.0

Remove and clean as required

VENT OVERFLOW GASKET  
IS CRACKED OR DEFECTIVE  
SEE SECTION 5 ITEM 2

REMOVE AND REPLACE  
AS NEEDED

~~BOWSER TANK IS FULL~~

~~EMPTY MAIN BOWSER TANK~~

**Section 21**  
**Warranty Information**

**SPOKANE METAL PRODUCTS**

Spokane Washington

FUEL BOWSER TANK

ONE YEAR LIMITED WARRANTY

Seller warrants its "Fuel Bowser 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. Our obligation under this Warranty shall be limited to the repair or exchange of equipment and parts which may prove defective within one year 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 manmade, 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 the effect adversely it 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 OF THE UNIT.



1ST DRAFT

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Spokane Metal Products Division  
Spokane, Washington

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**FUEL BOWSER  
TECHNICAL MANUAL  
PARTS, OPERATION AND MAINTENANCE**

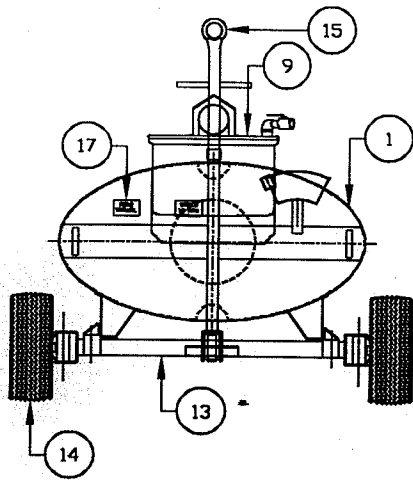
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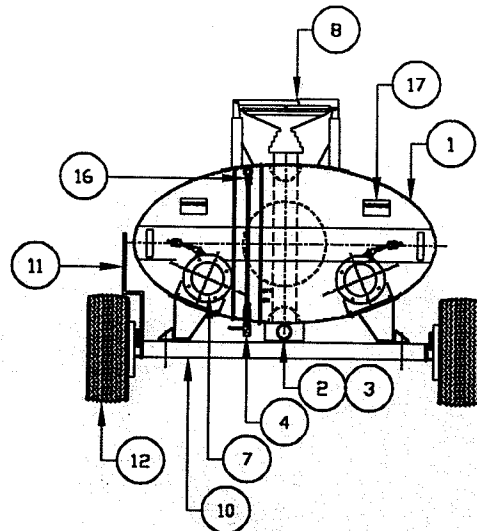
INDEX

SECTION "A" INTRODUCTION  
SECTION "B" SAFETY  
SECTION "C" REPLACEMENT PARTS

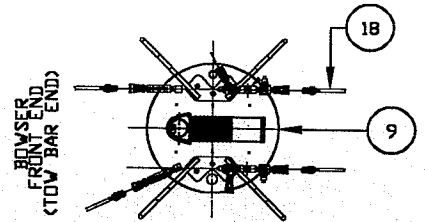
~~Section i~~ Introduction, Safety, and Replacement Parts  
Section 1 Main Tank Assembly  
Section 2 Drain Valve Assembly DRAIN VALVE / SUMP ASSEMBLY  
~~Section 3~~ Drain Screen Assembly RESERVED FOR A LATER DATE  
Section 4 Sight Gauge/Sample Port  
Section 5 Vent Over Flow Assembly  
Section 6 Manway Assembly  
Section 7 Grounding/Bonding  
Section 8 Telescoping Funnel Assembly  
Section 9 Vacuum System Assembly  
Section 10 Rear Undercarriage Assembly  
Section 11 Parking Brake Assembly  
Section 12 Rear Wheel Assembly  
Section 13 Front Undercarriage Assembly  
Section 14 Front Wheel Assembly  
Section 15 Tow Bar Assembly  
Section 16 Miscellaneous Parts  
Section 17 Decal Package  
Section 18 Universal Sumping Cup / Hose Assembly ← THIS SHOULD MATCH TITLE IN TEXT SECTION  
Section 19 Remote Drain Funnel Assembly  
Section 20 Troubleshooting  
Section 21 Warranty INFORMATION



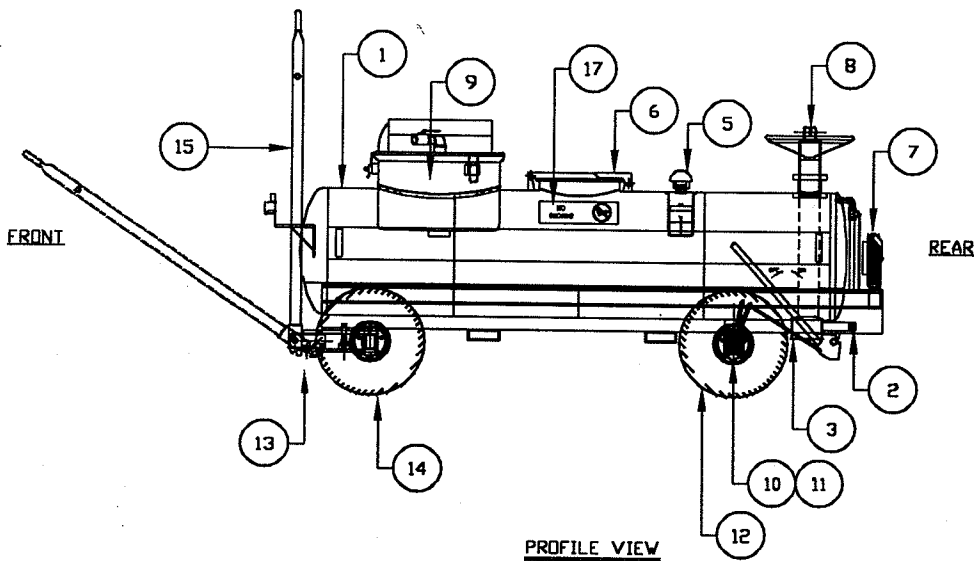
FRONT VIEW



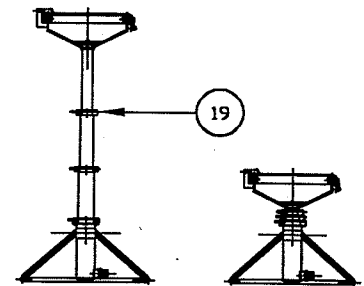
REAR VIEW



UNIVERSAL SUMPING CUP/HOSE ASSEMBLY



PROFILE VIEW



REMOTE DRAIN FUNNEL ASSEMBLY

FUEL BOWSER PARTS LOCATION REFERENCE DWG

1.  
↓  
Section i

A  
INTRODUCTION

- A.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. ↑ OPERATING PERSONNEL
- A.2 Upon receipt of the ~~bowser unit~~ ↑ FUEL, a visual inspection should be made to determine that it is complete and has not sustained any damage during transportation.
- A.3 Intended Use  
The fuel bowser unit is intended for use in draining and collection of fuel from aircraft or storage area and then transportation to the ~~aircraft~~ storage area or disposal site. Any other use is prohibited and may void any and all warranties.

NEXT PAGE → B  
SECTION B  
B  
SAFETY

- B.1 Potential Fire and Explosion  
a. Due to the nature of fuel, care should be exercised to eliminate all sparks and open flame in the area of the fuel bowser unit.  
  
b. A 50-foot radius area around the fuel bowser unit for no-smoking, sparks or open flames is usually a good practice. It is strongly recommended by all local or other regulations be consulted for further restrictions.
- B.2 CAUTION: The fuel bowser should never be used inside ~~of~~ an enclosed area. Proper ventilation is required.
- B.3 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 and/or other regulations be consulted. FOLLOWED. AS FOR
- B.4 Inspections  
Inspections 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.
- B.5 Grounding  
To eliminate static sparks, the bowser unit is equipped with two grounding reels which should be connected prior to draining or filling operations.
- B.6 Insure the manway cover is provided with a "lock out" ~~device~~ to prevent accidental closing of the manway while doing internal inspections and to prevent unwanted elements from being introduced to the fuel supply. CAN BE LOCKED CLOSED

B.7 Towing

- a. Make sure the tow bar is securely attached to the towing vehicle.
- b. Before moving the bowser unit, check to assure the parking brake is released.
- c. Maximum allowable towing speed is 15 MPH.

B.8 Parking

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

B.9 Air Supply

**CAUTION:** Check the air pressure of supply lines to the vacuum generator to assure it is not in excess of 100 PSI.

TELESCOPING FUNNEL

- B.10 Care should be exercised in using the telescope to prevent injury <sup>to</sup> TO fingers between clamps by dropping sections.

NEXT PAGE &  
SECTION C

REPLACEMENT PARTS

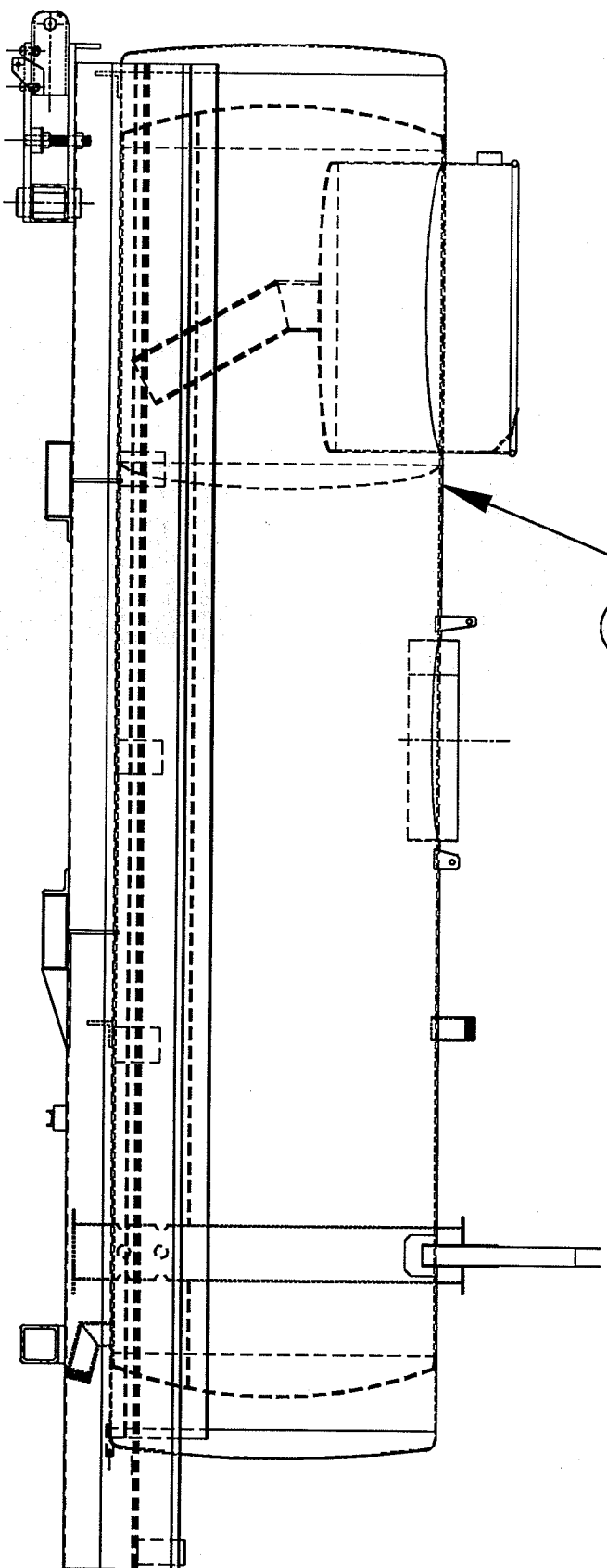
- C.1 This section provides information for identification of parts for ordering. To order, it is important to have the Model Number, Subassembly Number, Part Number and Description. Parts may be order by calling or writing to:

Spokane Industries, Inc.  
Spokane Metal Products Division  
P.O. Box 3303  
Spokane, WA 99220-3303  
Tel: 509-928-0720, Fax: 509-927-0826  
Email: [dyorke@spokaneindustries.com](mailto:dyorke@spokaneindustries.com)

AND SERIAL



DAN



*See*

1

SECTION 1.0  
MAIN TANK



Move to Bottom

Section-3 SECTION 2.0  
Drain Sump DRAIN VALVE / DRAIN SUMP (12 FT & 16 FT TELESCOPING FUNNELS ONLY)  
~~12 ft. & 16 ft. Telescoping Funnel Only~~

2.1  
3.0 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

~~3.1~~ Operation  
The (optional) Drain Sump unit is intended for use in draining of fuel from the fuel bowser to a disposal site. Any other use is prohibited and may void any and all warranties.

2.2  
3.2 The (optional) Telescoping Drain Strainer is located on the bottom of the stainless steel drain housing (400 gallon & larger units only).

2.3  
3.3 Maintenance should consist of inspection and cleaning monthly.

~~3.4~~ Removal  
(1) Removal is accomplished by loosening the wing nut on the clamp holding the base of the sump. NOTE! Check interior to assure fuel has been thoroughly drained before loosening wing nut.  
(2) Remove clamp and sump hose.  
(3) Loosen clamp holding screen to stainless steel drain housing and pull screen down.

→ 2.4 DRAIN SCREEN REMOVAL & MAINTENANCE

(NOTE! CHECK INTERIOR TO ASSURE FUEL HAS BEEN THOROUGHLY DRAINED BEFORE SERVICING)

2.4.1 SCREEN REMOVAL IS ACCOMPLISHED BY LOOSENING THE WING NUT (ITEM #5) ON THE CROSSARM COVERPLATE.

2.4.2 SWING CROSSARM ASSY OUT OF THE WAY

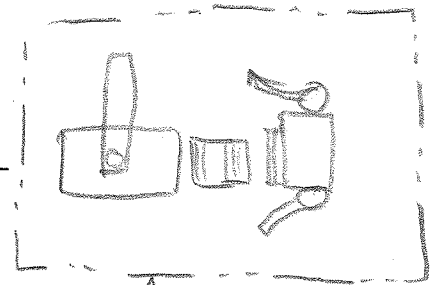
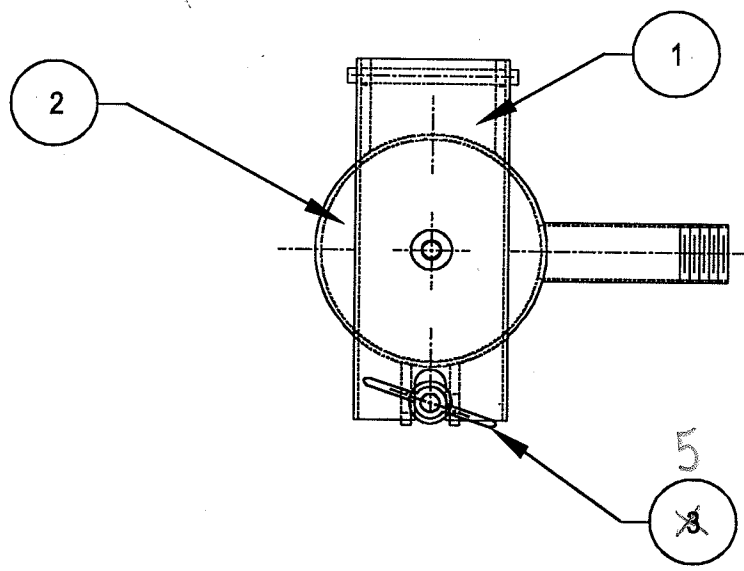
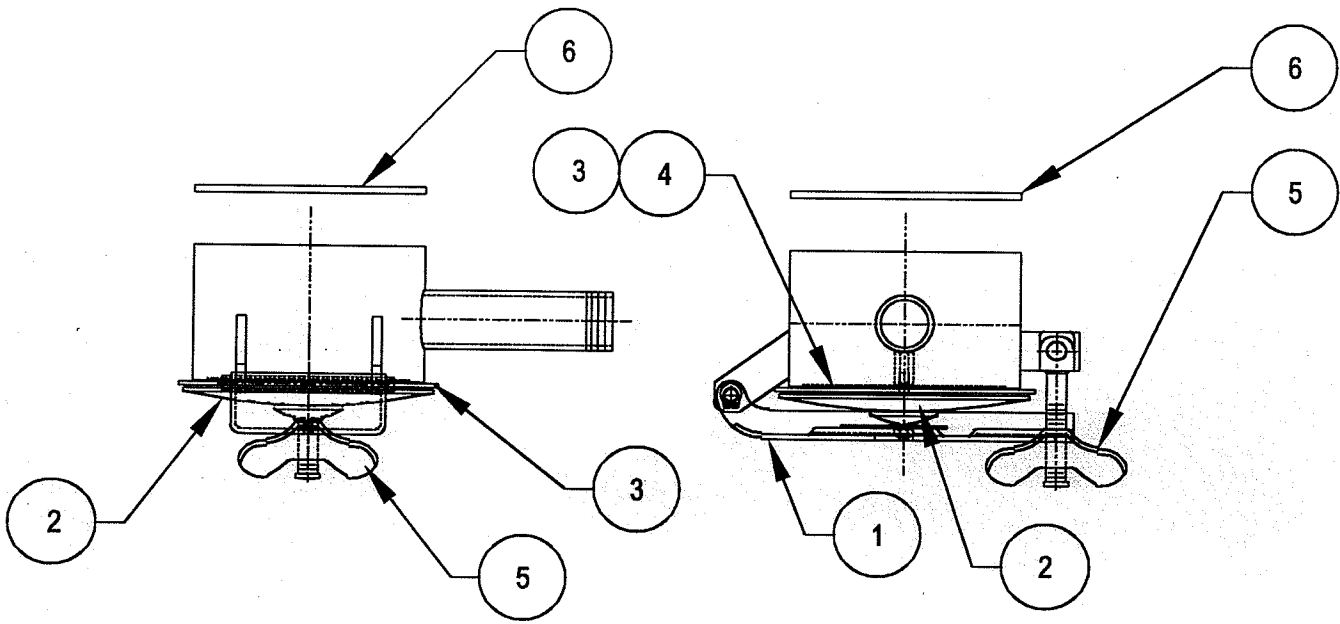
2.4.3 AFTER NOTING SCREEN ORIENTATION USE A SCREWDRIVER TO PRY SCREEN OUT.

2.4.4 CLEAN OR REPLACE AS REQUIRED

2.4.5 RESHAPE IF NEEDED THEN RE-INSTALL AND SECURE CROSSARM ASSEMBLY.

2.4.6 TIGHTEN WING NUT & CHECK FOR LEAKS.





SEE MISCELLANEOUS PARTS  
FOR DRAIN VALVE  
ASSY; BILL OF  
MATERIALS

10-100110  
ITEMS 1 TO 6

SECTION 2.0 & 3.0  
~~DRAIN SUMP ASSEMBLY~~  
DRAIN VALVE/SUMP ASSEMBLY

MOVE UP  
TO  
MARGIN

ASSEMBLY NO. 07-1035  
MAJOR ASSEMBLY - DRAIN, SUMP ASSEMBLY  
SECTION 3-0 2.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-1035			1	DRAIN SUMP ASSY, 6"	12.4#
	1	04-10581	1	REPAIR KIT, INCLUDES 2,3,4 & 5	6.3
	2	04-125252	1	COVER	2.3
	3	06-1058	1	GASKET, BLACK NUNA N	.4
	4	04-12637	1	GASKET, RETAINER	1.4
	5	04-11162	1	PIVOTING WING NUT ASSEMBLY	2.1
	6	01-8223	1	SUMP STRAINER SCREEN	.1

**Section 4**  
**Sight Gauge/Sample Port**

~~4.1~~ ~~4.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

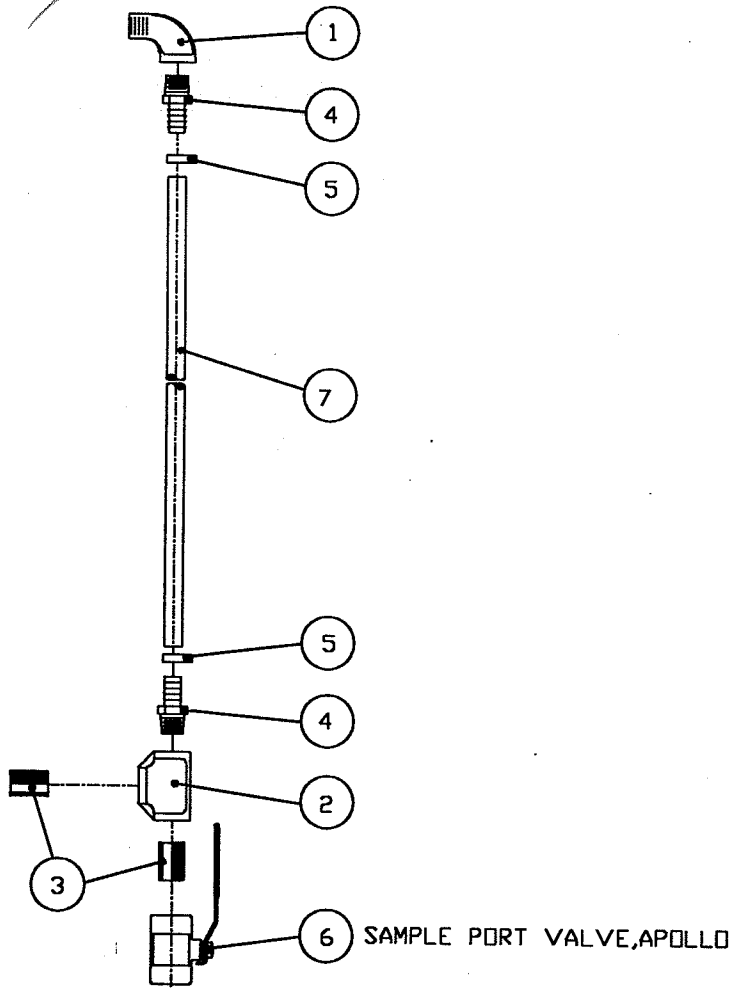
~~4.2~~ ~~4.1~~ Operation/Maintenance

~~4.2.1~~ ~~4.1.0~~ Sight Gauge – This gauge should be inspected monthly for loose connections and weathering of clear tubing.

~~4.2.2~~ ~~4.1.1~~ Sample Port – The bowser is equipped with a 1/2" NPT valve for use as a sample port. (SEE ITEM #6)

SUB ASSY NO.	ITEM NO.	PART NO.	QTY.	DESCRIPTION	WT.#'S
08-1014		<del>06-2527</del>	1	GAUGE, SIGHT, ASSY.	
	7	<del>07-1074</del>	22'	TUBE, 1/2"	.3
	6	04-1032	1	VALVE, BALL, APOLLO	.3
	5	03-1010	2	CLAMP, HOSE, 3/4"	.3
	4	03-11130	2	BARB, HOSE, 1/2"	.3
	3	03-1008	2	NIPPLE, CLOSE, 1/2"	.3
	2	03-1007	1	TEE, 1/2"-NPT	.3
	1	03-0017S	1	ELBOW, STREET, 1/2"	.3

SEPARATE  
 FROM PICTURE  
 ADD TITLE ON  
 TOP  
 THIS BOM IS ALSO  
 LISTED IN SEC. 16.0  
 MISC. FIXTURES



SECTION 4.0  
 SIGHT GAUGE/ SAMPLE PORT

**Section 5**  
**Vent Overflow ~~Assembly~~**  
**400 gallon & larger units only**

~~5.1~~ ~~5.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

~~5.2~~ ~~5.1~~ Operations

~~5.1.0~~ The bowser unit is equipped with a ~~optional~~ float actuated vent to prevent fuel from flowing out the vent in the event the bowser is overfilled.

~~5.3~~ ~~5.2~~ Maintenance

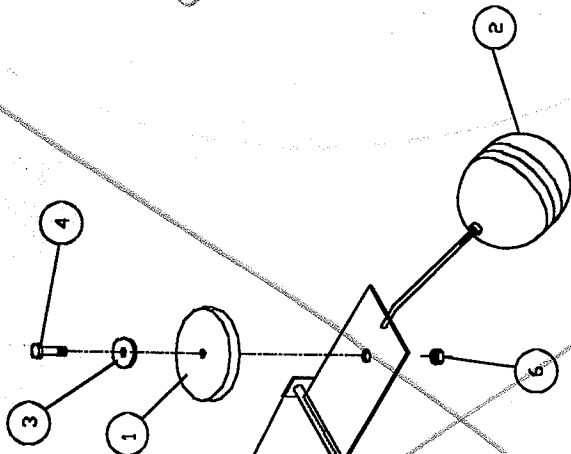
~~5.3.1~~ ~~5.2.0~~ The vent overflow assembly is located inside the tank directly under the vent.

~~5.3.2~~ ~~5.2.1~~ It consists of a caged float with an elastomer seal.

~~5.3.3~~ ~~5.2.2~~ Inspect float and elastomer seal (gasket) monthly and replace as needed.

NOTE: GASKET TO BE BOLTED  
LOOSE AND MUST BE  
CENTERED TO SEAT. SEE

TAB'S WELDED TO  
VACUUM LID SEE



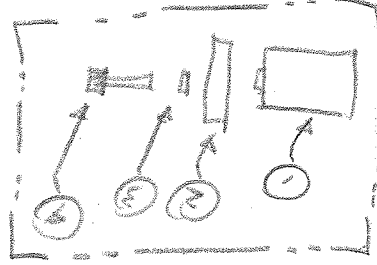
FLOAT ASSEMBLY NO. 08-1022

SECTION 5-0

ROTATE  
ENTIRE  
PICTURE  
90° counter  
clockwise

B.O.M. LOCATED

- 1) VENT DETAIL  
SEE TANK WELDMENT  
SECTION. 16.0
- 2) VENT COVER SEE  
MISC. PARTS SECTION

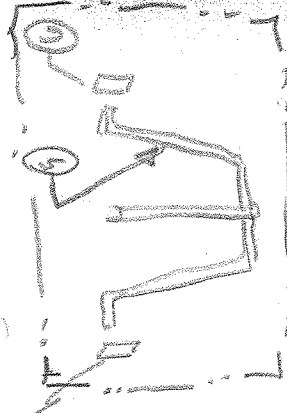


08-1022

SECTION 5.0

08-1023

VENT OVERFLOW PREVENTOR ASSEMBLY NO. 08-1023



MOVE UP TO  
↑ MARGIN

ASSEMBLY NO. 08-10011  
MAJOR ASSEMBLY - VENT, OVERFLOW PREVENTOR  
SECTION 5.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1022			1	FLOAT ASSY	2.7
	1	04-1047	1	GASKET	1
	2	06-1013	1	FLOAT	.5
	3	02-1100	1	WASHER	.1
	4	02-10001	1	BOLT	.1
08-1023			1	GAUGE ASSY	
	5	07-1032	1	CAGE, WIRE	.9
	6	02-12140	4	NUT	.1

**Section 6**  
**Manway**

~~6.0~~  
6.1 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

~~6.1~~  
6.2 Operation

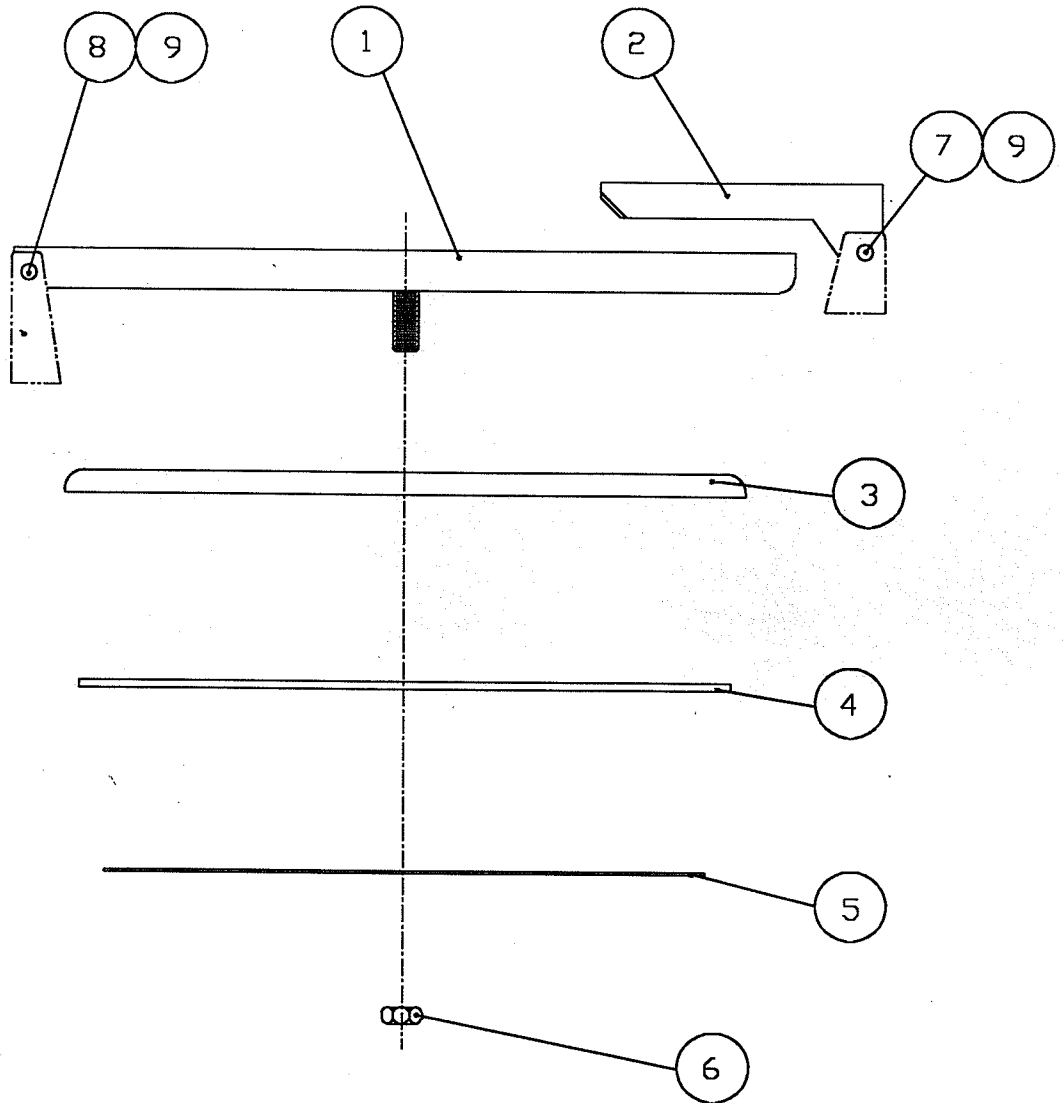
~~6.2.1~~ 6.1.0 The fuel bowser unit is equipped with a 16" quick opening manway assembly for internal inspections.

~~6.2.2~~ 6.1.1 The manway is equipped with a flip locking cross arm assembly to insure sealing and securing the cover lid in place.

~~6.3~~ 6.2 Maintenance

~~6.3.1~~ 6.2.0 Inspect manway gasket weekly for cuts, cracks or galling. Replace as needed.





ASSEMBLY No. 08-1025  
 MAJOR ASSEMBLY- 16" QUICK OPENING MANWAY  
 SECTION 6.0

MOVE UP TO  
MARGIN



ASSEMBLY NO. 08-1025  
MAJOR ASSEMBLY - 16" QUICK OPENING MANWAY  
SECTION 6.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
	1	07-1039S	1	CROSSARM, 19 1/2"	2.5
	2	01-8222S	1	CROSSARM, 7"	1
	3	01-86001	1	LID, COVER, MANWAY	6
	4	06-25025	1	GASKET, MANWAY	1.5
	5	01-8700	1	RETAINER, GASKET	1
	6	02-1206	1	NUT, 5/8"-18 UNF, NYLOC	.2
	7	02-10014	1	BOLT, 3/8"-UNC X 3 1/2"	.14
	8	02-10013	1	BOLT, 3/8"-UNC X 3"	.12
	9	02-1202	2	NUT, 3/8"-UNC, NYLOC	.2

**Section 7**  
**Grounding/Bonding**

~~7.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel  
~~7.1~~ bowser.

~~7.1~~ Operation

~~7.2~~  
~~7.2.1~~ 7.1.0 The bowser unit is supplied with two grounding reels with connectors.

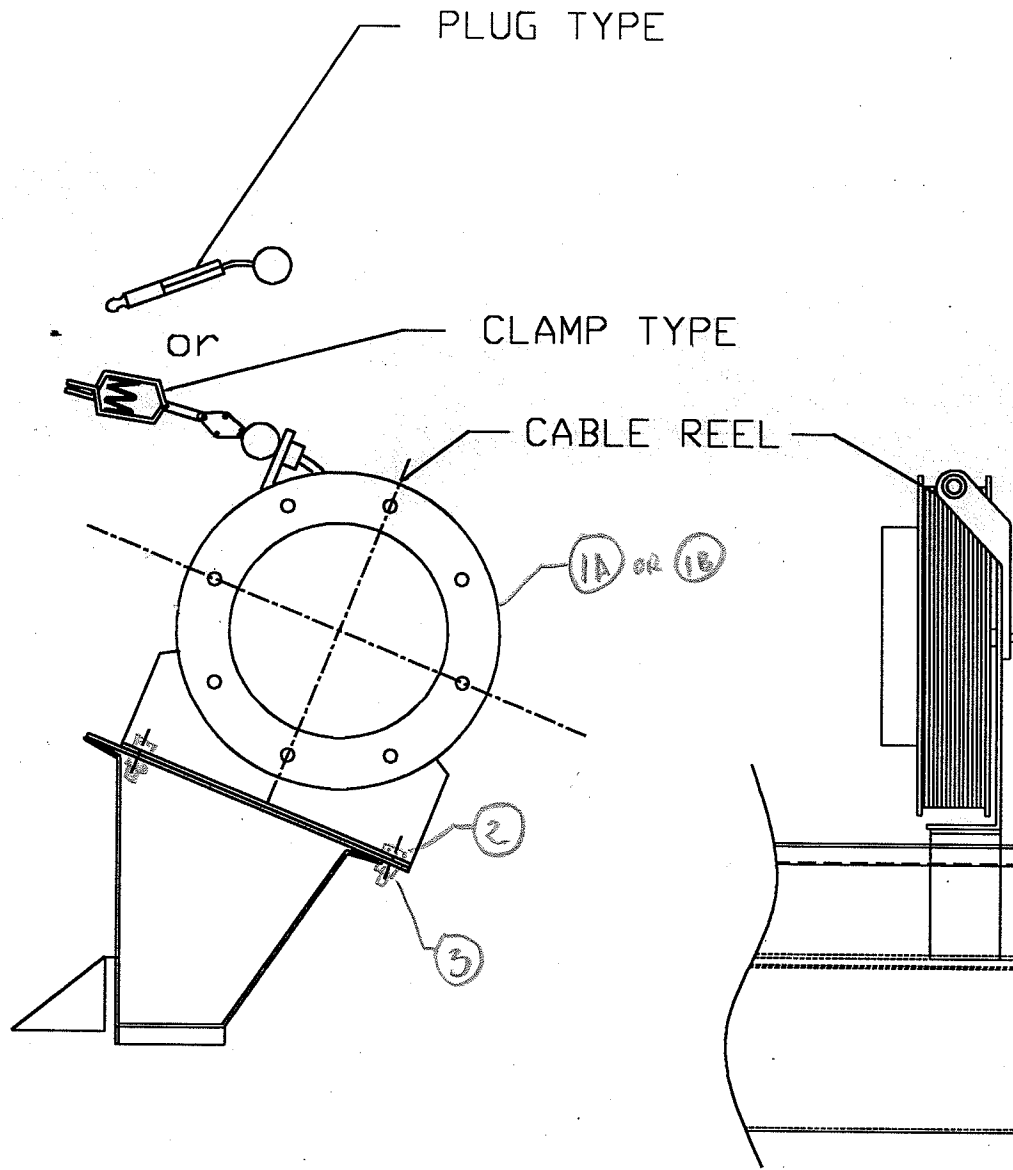
~~7.2.2~~ 7.1.1 Before filling, draining, or vacuuming, the grounding reels must be attached between the aircraft or object being serviced and appropriate ground.

~~7.3.2~~ Maintenance

~~7.3.1~~ ~~7.2.0~~ Grounding reel cables should <sup>BE</sup> pulled out, cleaned and inspected monthly.

~~7.3.2~~ ~~7.2.1~~ Cable clamps and ends should be inspected for loose connections monthly.

~~7.3.3~~ A CONTINUITY <sup>CLEANED AND</sup> TEST BETWEEN THE CLAMP & PLUG ON THE GROUNDING REELS SHOULD BE PERFORMED MONTHLY. (REPLACE AS REQUIRED)



SECTION 7.0  
 08-1013  
 GROUNDING REEL/BONDING

*Original*  
 MISSING BILL OF MATERIALS  
 ADD THIS SECTION 16.0  
 SEE ITEMS 7, 8, 9 & 10

**Section 8**  
**Telescoping Funnel**

8.0 Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

8.1 Operation

8.1.0 The fuel bowser may be equipped with an optional telescoping drain assembly. It is capable of being adjusted from 4'-2" to 8'-0", 12'-0", or 16'-0" high depending on model purchased.

8.1.1 To Raise

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

8.1.2 To Lower

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

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

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

8.2 Maintenance – Drain Assembly

8.2.0 The Telescoping Drain Assembly consists of stainless steel housing permanently attached to the tank and multiple aluminum tube sections.

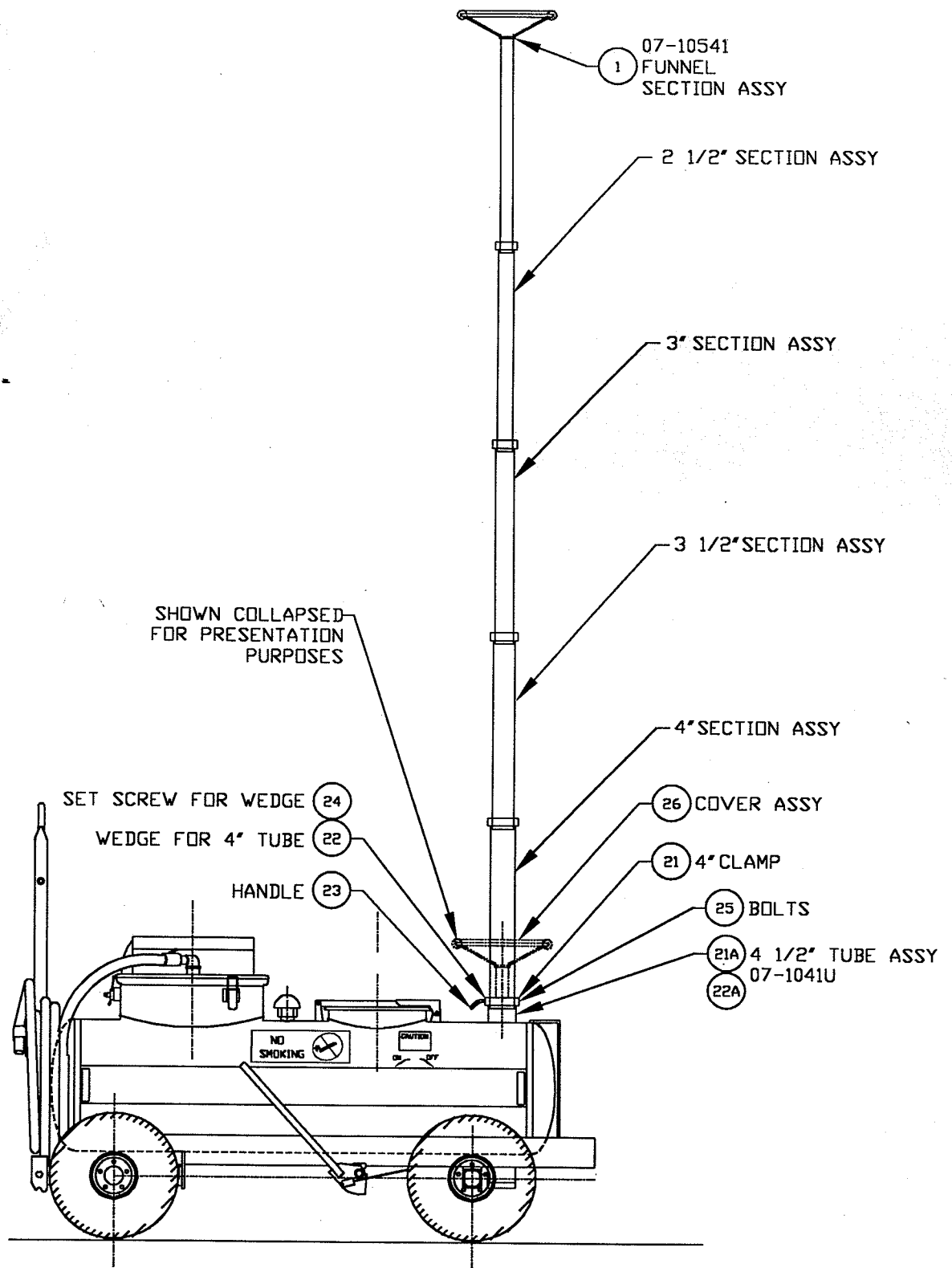
8.2.1 The stainless tube and largest aluminum tubes are equipped with a clamp assembly.

8.2.2 Each aluminum tube is crimped on the lower end which acts as a stop to prevent the tube from sliding through the clamp.

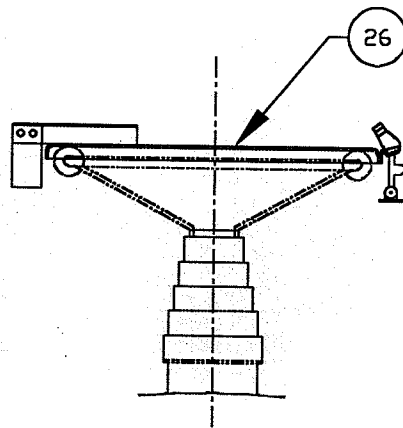
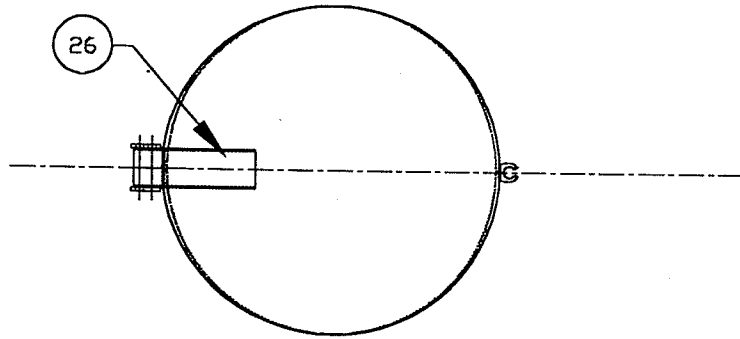
8.2.3  
8.3.4

~~X~~ Disassembling of the telescoping 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.

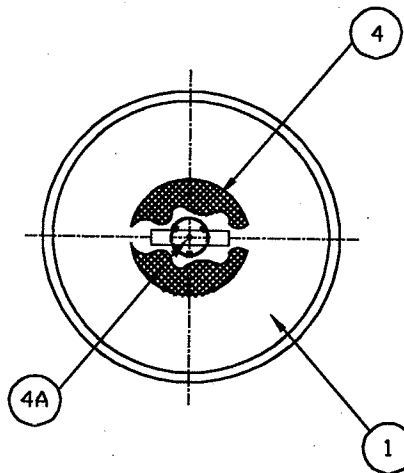
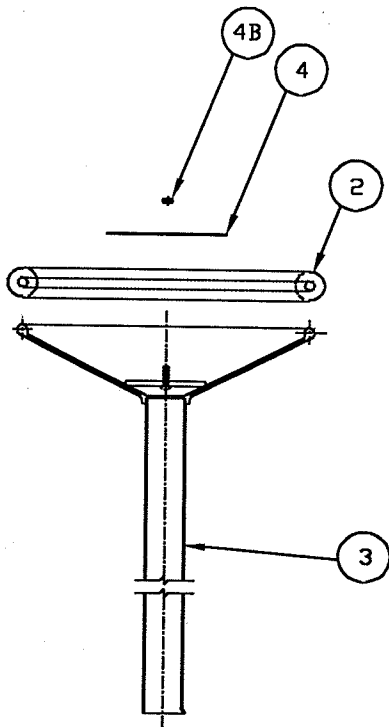
I WONDER IF WE  
CAN MAKE THIS ALL  
FIT ON 1 PAGE ?



SECTION 80  
16FT TELESCOPING FUNNEL ASSEMBLY



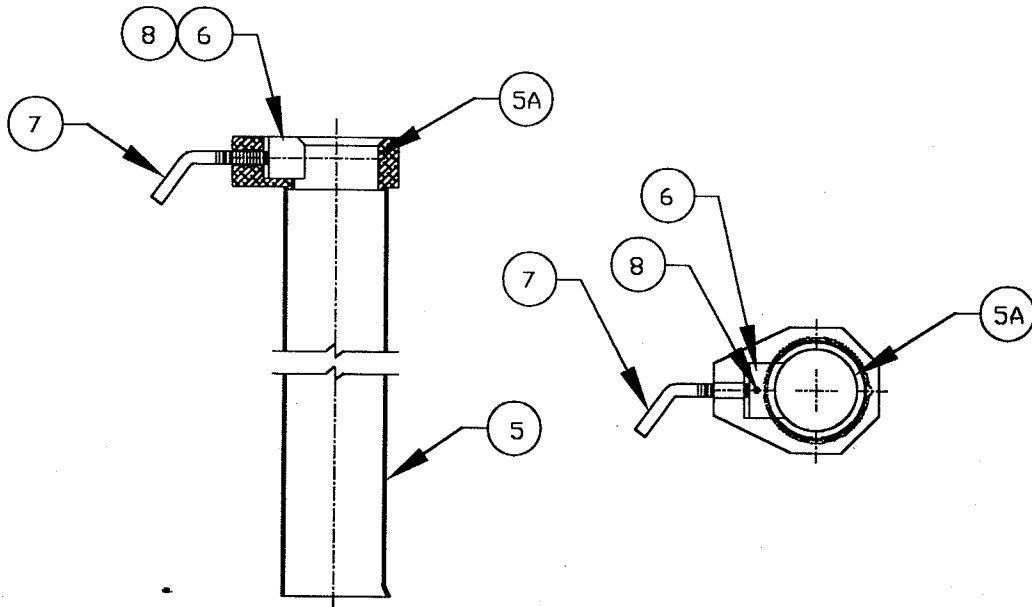
08-1026  
COVER ASSY



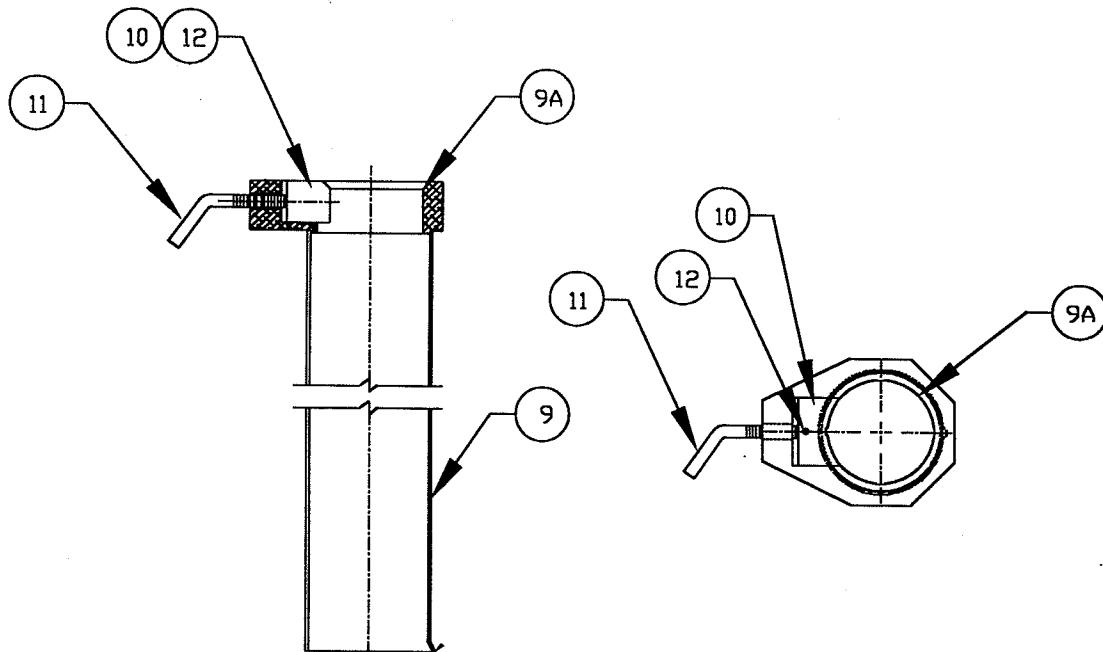
TOP VIEW

07-10541  
DRAIN FUNNEL  
SECTION ASSY

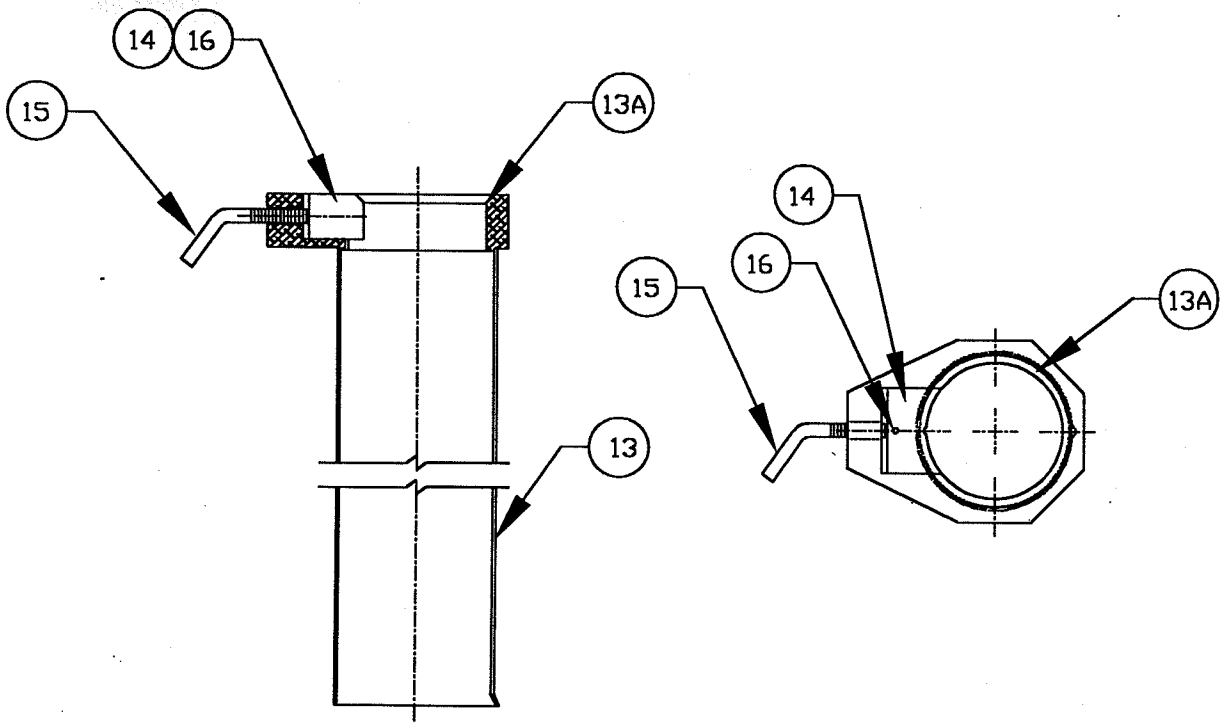




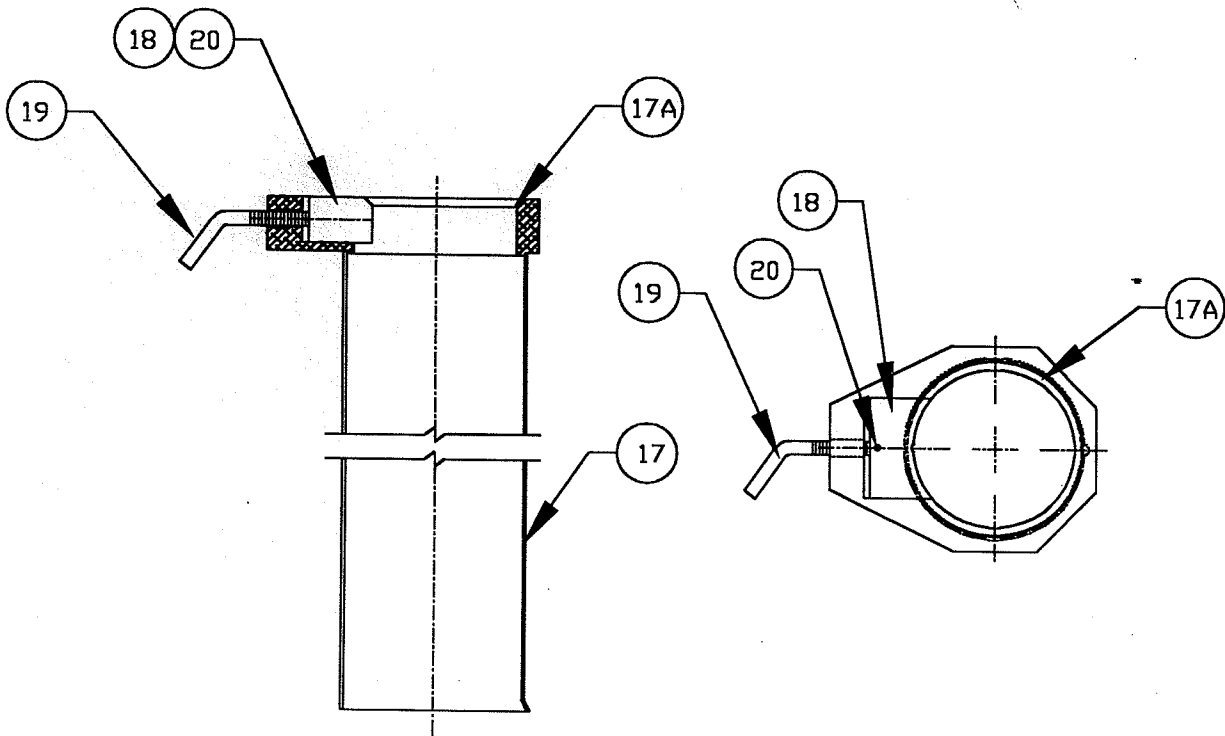
08-1017U  
 2 1/2" SECTION ASSY  
 16FT TELESCOPING DRAIN



08-1027U  
 3" SECTION ASSY  
 16FT TELESCOPING DRAIN



08-1028U  
 3 1/2" SECTION ASSY  
 16FT TELESCOPING DRAIN



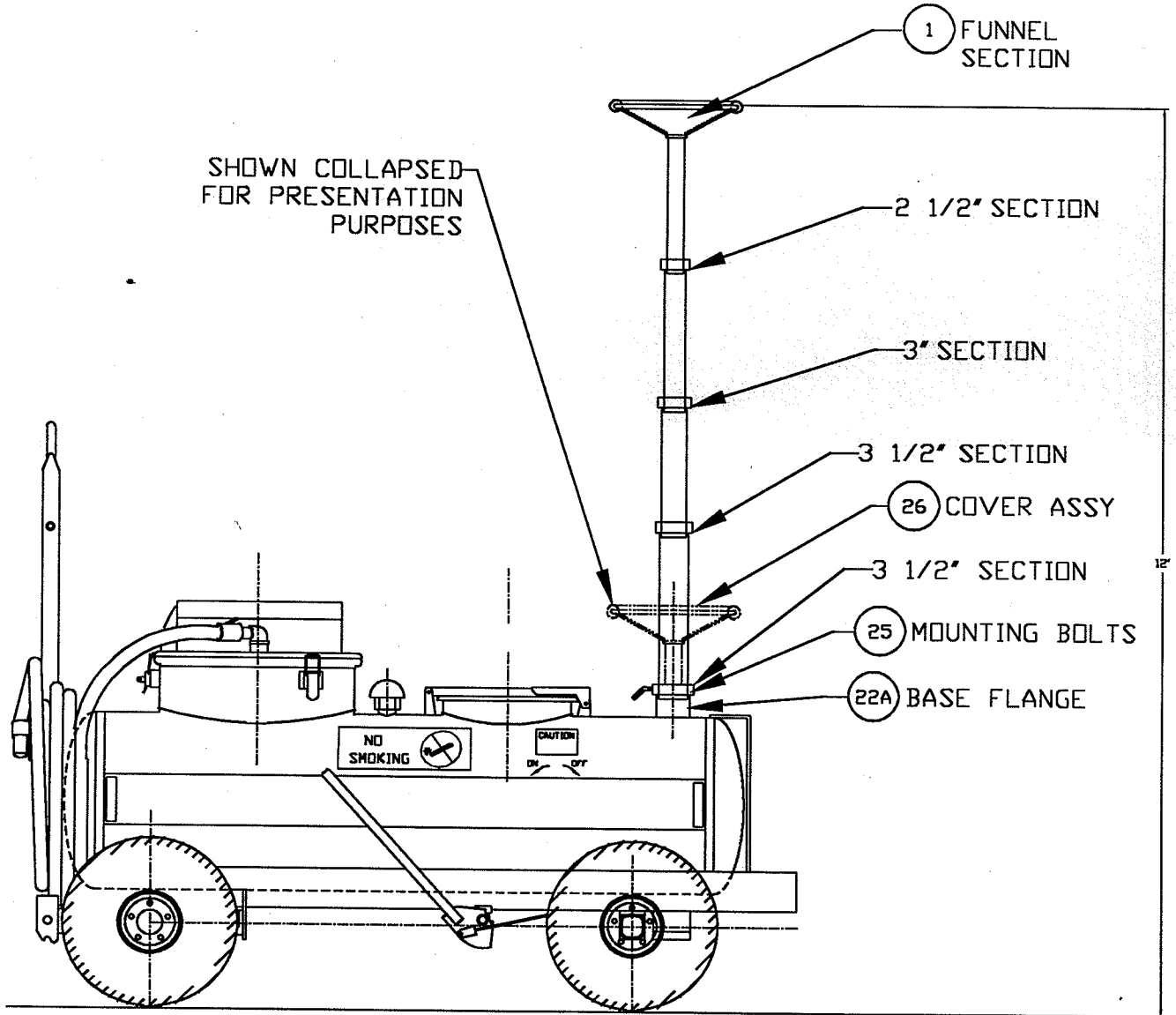
07-1014U  
 4" SECTION ASSY  
 16FT TELESCOPING DRAIN

ASSEMBLY NO. 08-1034Z 1034u  
 MAJOR ASSEMBLY - 16 FT TELESCOPING DRAIN ASSEMBLY  
 SECTION 8.0

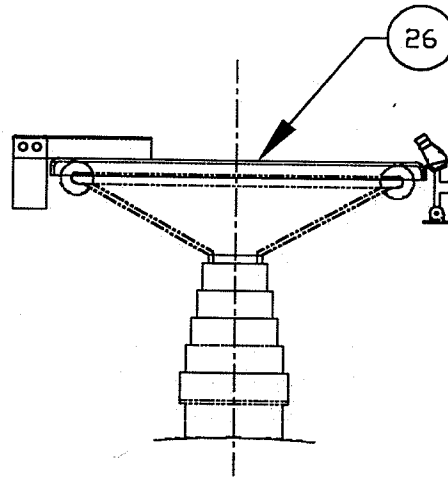
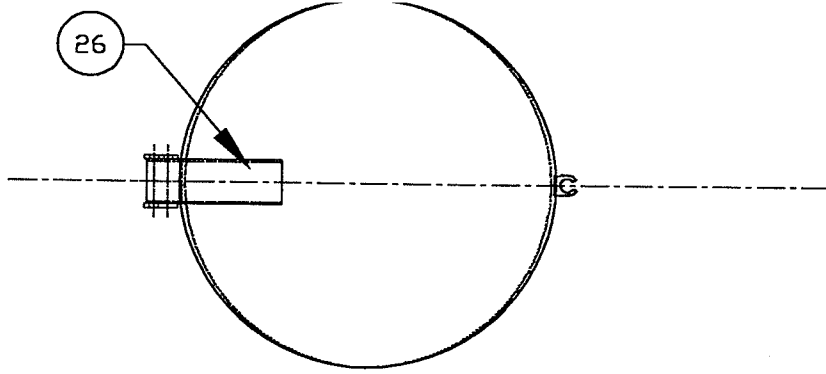
SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-10541				DRAIN FUNNEL SECTION ASSY	
	1	01-8250	1	DRAIN, TOP (FUNNEL)	5
	2	06-1022T	1	GASKET	.7
	3	01-92402	1	TUBING, 2"O.D.	
	4	04-1039	1	SCREEN	.5
	4A	02-10002	1	BOLT, 1/4"	.2
	4B	02-1200	1	NUT, 1/4"	.1
08-1017U				DRAIN, TELESCOPING SECT ASSY, 2 1/2"O.D.	
	5A	05-10271	1	CLAMP, 2"O.D.	
	5	01-9242	1	TUBING, 2 1/2"O.D.	
	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
08-1027U				DRAIN, TELESCOPING SECT ASSY, 3"O.D.	
	9A	05-10281	1	CLAMP, 2 1/2"O.D.	
	9	01-92452	1	TUBING, 3"O.D.	
	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
08-1028U				DRAIN, TELESCOPING SECT ASSY, 3 1/2"O.D.	
	13A	05-10291	1	CLAMP, 3"O.D.	
	13	01-9248	1	TUBING, 3 1/2"O.D.	.5
	14	05-10031	1	WEDGE, 1" X 1-1/16" X 1-13/16"	.5
	15	05-10181	1	HANDLE, CLAMP	.3
	16	02-1005	1	SCREW, SET	.01
07-1014U				DRAIN, TELESCOPING SECT ASSY, 4"O.D.	
	17A	05-10301	1	CLAMP, 3 1/2"O.D.	
	17	01-9259	1	TUBING, 4"O.D.	
	18	05-10041	1	WEDGE, 1" X 1-7/32" X 2-1/8"	.5
	19	05-10181	1	HANDLES, CLAMP	.3
	20	02-1005	1	SCREW, SET	.01
07-1041U				DRAIN, TELESCOPING SECT ASSY, 4 1/2"O.D.	
	21A	01-92565S	1	TUBING, 4 1/2"O.D.	
	21	05-10302	1	CLAMP, 4"O.D.	4.4

CONTINUED ASSEMBLY NO. 08-1034Z 1034U  
MAJOR ASSEMBLY - 16 FT TELESCOPING DRAIN ASSEMBLY  
SECTION 8.0

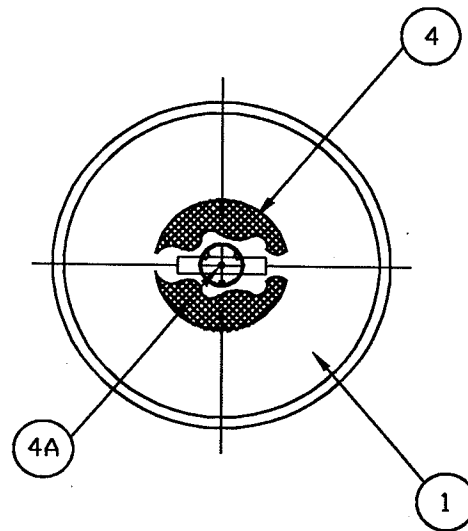
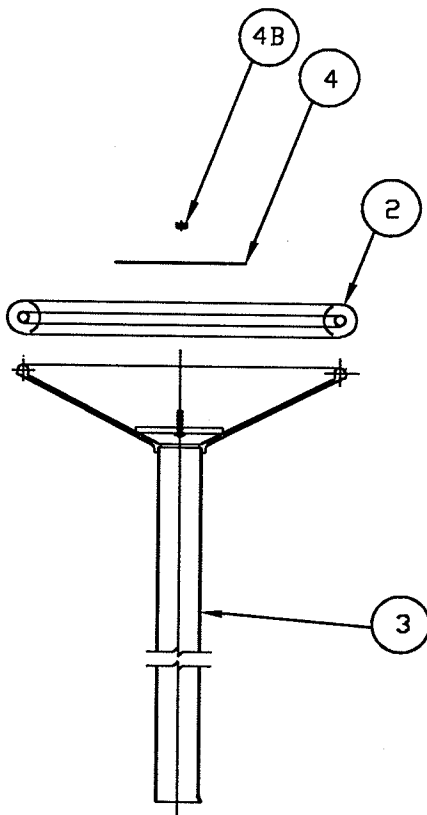
	22	05-10051	1	WEDGE, 1" X 1" X 2 1/2"	.6
	22A	04-10561	1	BASE FLANGE	
	23	05-10181	1	HANDLE, CLAMP	.3
	24	02-1005	1	SCREW, SET	.01
	25	02-100121	4	MOUNTING BOLTS, 1/4"-16 X 3/4"	.2
	26	08-1026	1	COVER ASSEMBLY	5



SECTION 8.0  
 12FT TELESCOPING FUNNEL ASSY

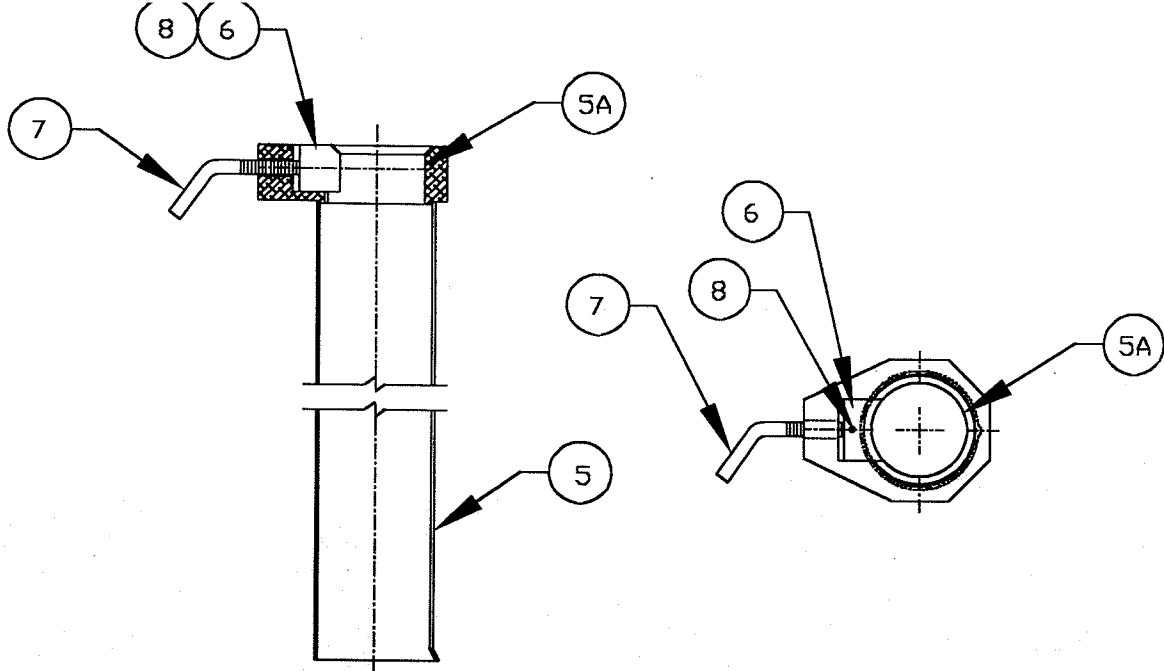


08-1026  
COVER ASSY

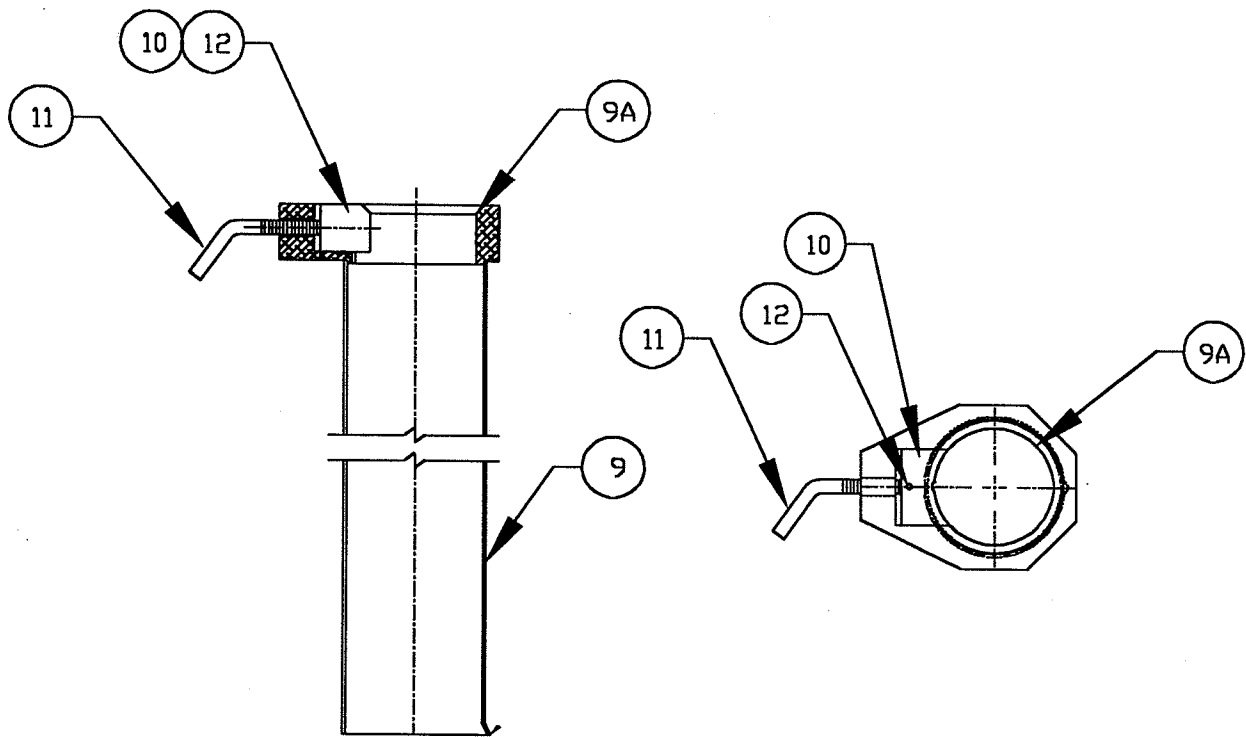


TOP VIEW

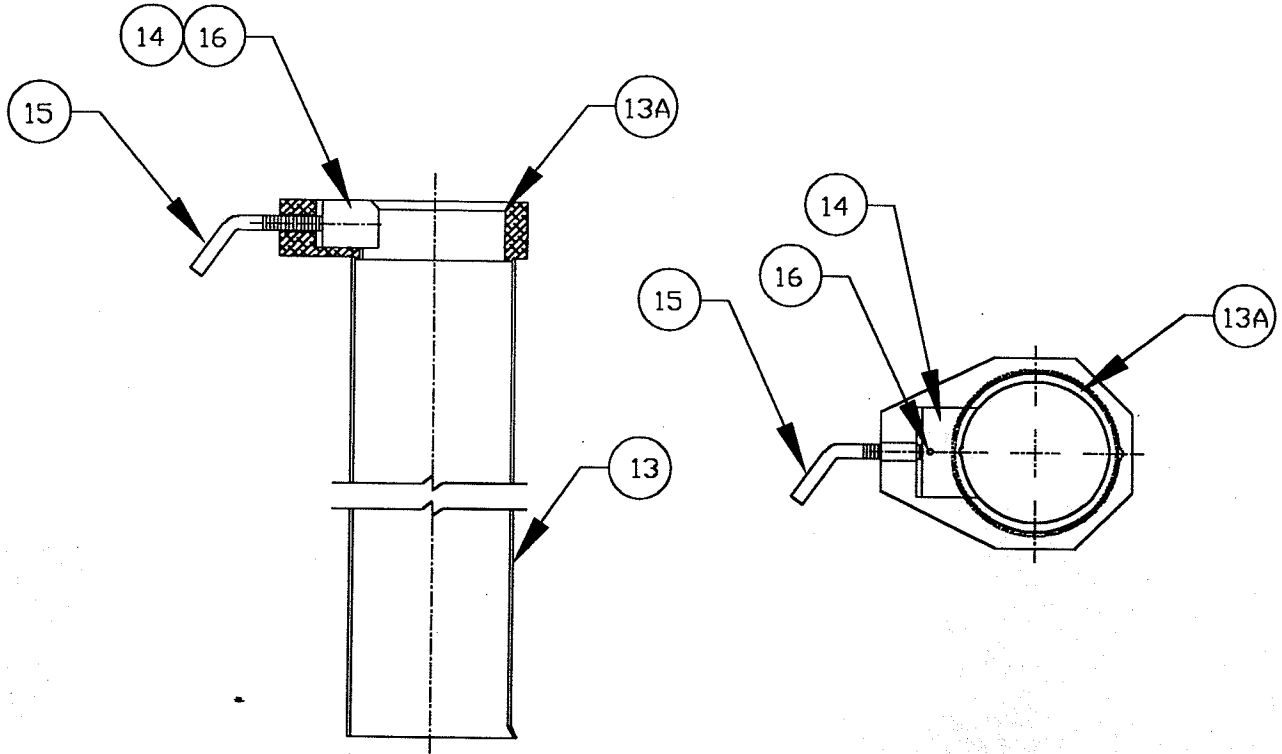
07-1054W  
DRAIN FUNNEL  
SECTION ASSY



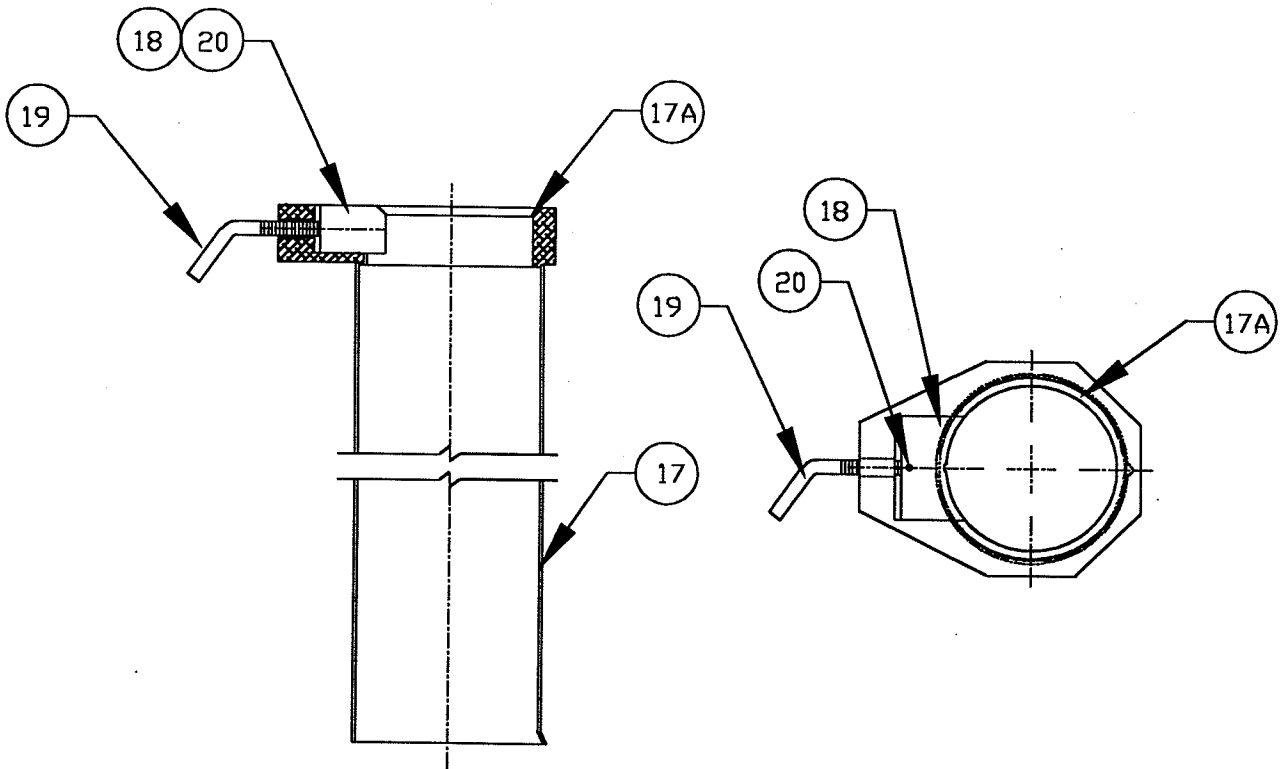
08-1012W  
 2 1/2" SECTION ASSY  
 12FT TELESCOPING DRAIN



08-1013W  
 3" SECTION ASSY  
 12FT TELESCOPING DRAIN



08-1014W  
 3 1/2" SECTION ASSY  
 12FT TELESCOPING DRAIN

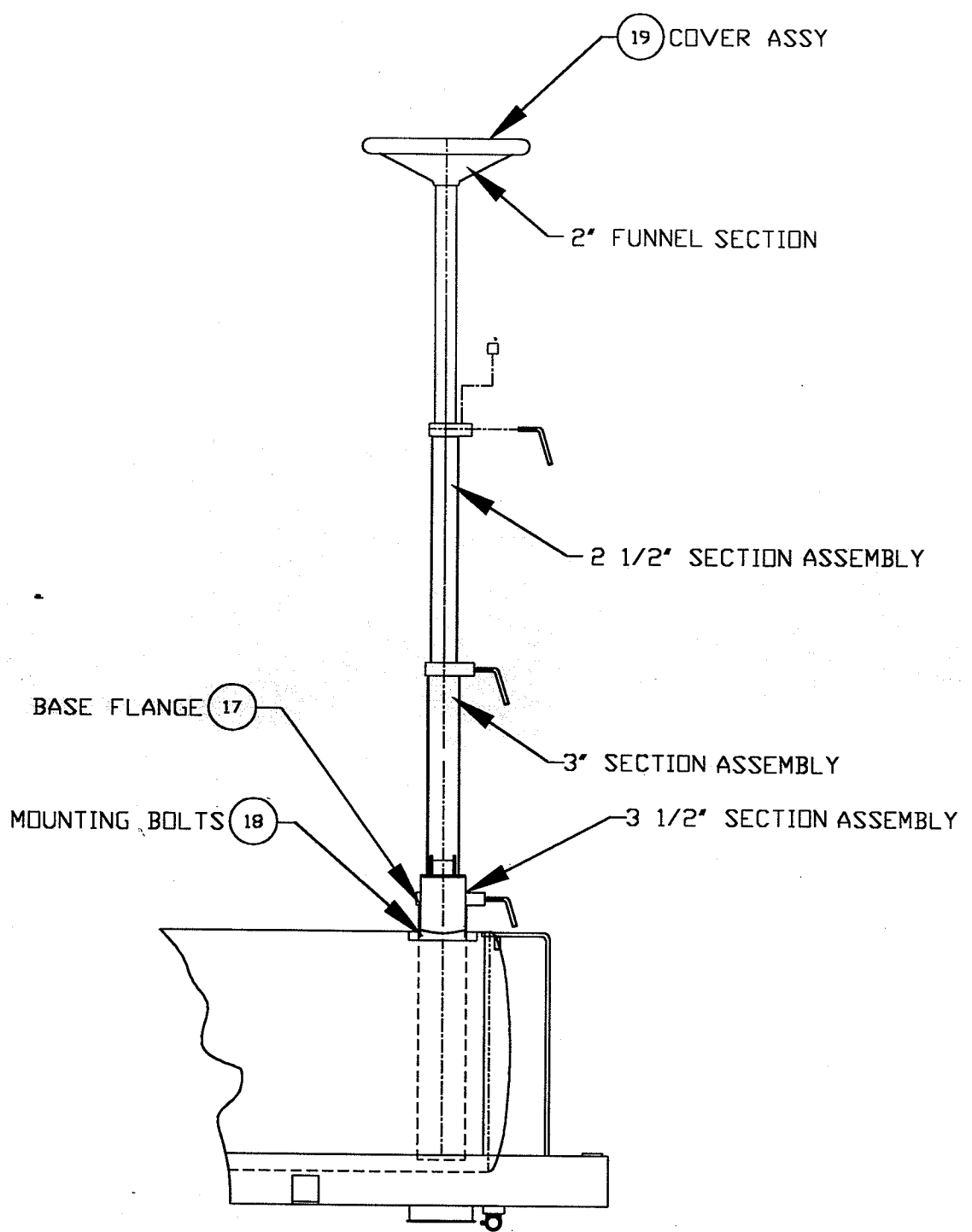


07-1041  
 4" SECTION ASSY  
 12FT TELESCOPING DRAIN

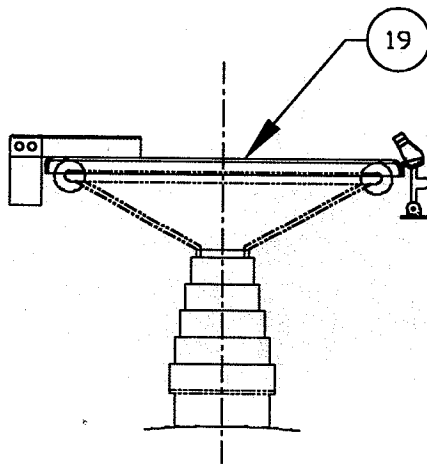
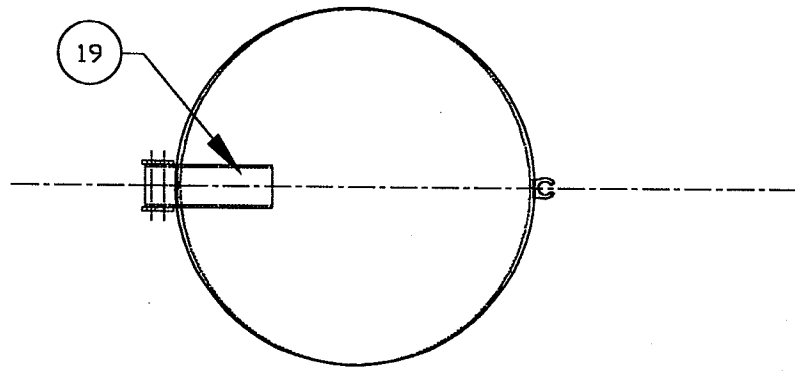


ASSEMBLY NO. 08-1034Z-1034W  
 MAJOR ASSEMBLY - 12 FT TELESCOPING DRAIN ASSEMBLY  
 SECTION 8.0

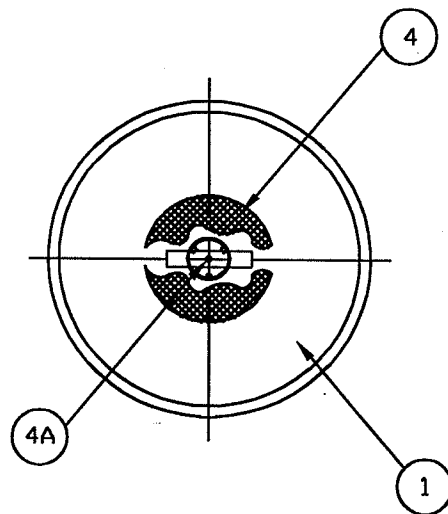
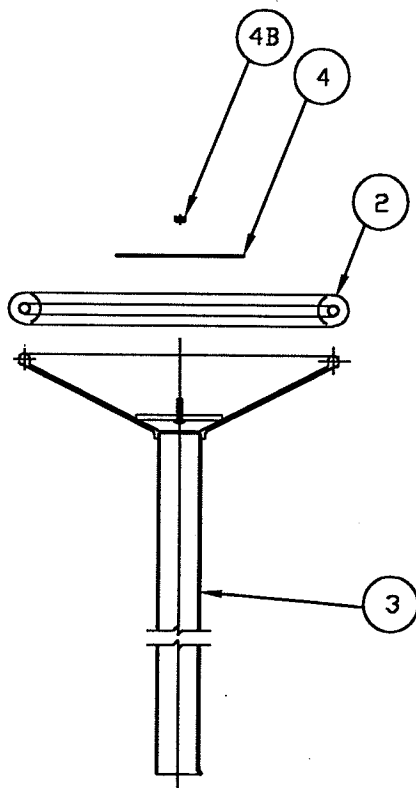
SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-1054W				DRAIN FUNNEL SECTION ASSY	
	1	01-8250	1	DRAIN, TOP (FUNNEL)	5
	2	06-1022T	1	GASKET	.7
	3	01-92402	1	TUBING, 2"O.D.	
	4	04-1039	1	SCREEN	.5
	4A	02-10002	1	BOLT, 1/4"	.2
	4B	02-1200	1	NUT, 1/4"	.1
08-1012W				DRAIN, TELESCOPING SECT ASSY, 2 1/2"O.D.	
	5A	05-10271	1	CLAMP, 2"O.D.	
	5	01-9242	1	TUBING, 2 1/2"O.D.	
	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
08-1013W				DRAIN, TELESCOPING SECT ASSY, 3"O.D.	
	9A	05-10281	1	CLAMP, 2 1/2"O.D.	
	9	01-92452	1	TUBING, 3"O.D.	
	10	05-10121	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
08-1014W				DRAIN, TELESCOPING SECT ASSY, 3 1/2"O.D.	
	13A	05-10291	1	CLAMP, 3"O.D.	
	13	01-924S	1	TUBING, 3 1/2"O.D.	.5
	14	05-10031	1	WEDGE, 1" X 1-1/16" X 1-13/16	.5
	15	05-10181	1	HANDLE, CLAMP	.3
	16	02-1005	1	SCREW, SET	.01
07-1041				DRAIN, TELESCOPING SECT ASSY, 4"O.D.	
	17A	05-10301	1	CLAMP, 3 1/2"O.D.	
	17	01-9259	1	TUBING, 4"O.D.	
	18	05-10041	1	WEDGE, 1" X 1-7/32" X 2-1/8	.5
	19	05-10181	1	HANDLES, CLAMP	.3
	20	02-1005	1	SCREW, SET	.01
	22A	04-10562	1	BASE FLANGE	
	25	02-100121	4	MOUNTING BOLTS, 1/4"- 16 X 3/4"	.2
08-1026	26		1	COVER ASSY	5



SECTION 8.0  
8FT TELESCOPING FUNNEL ASSY

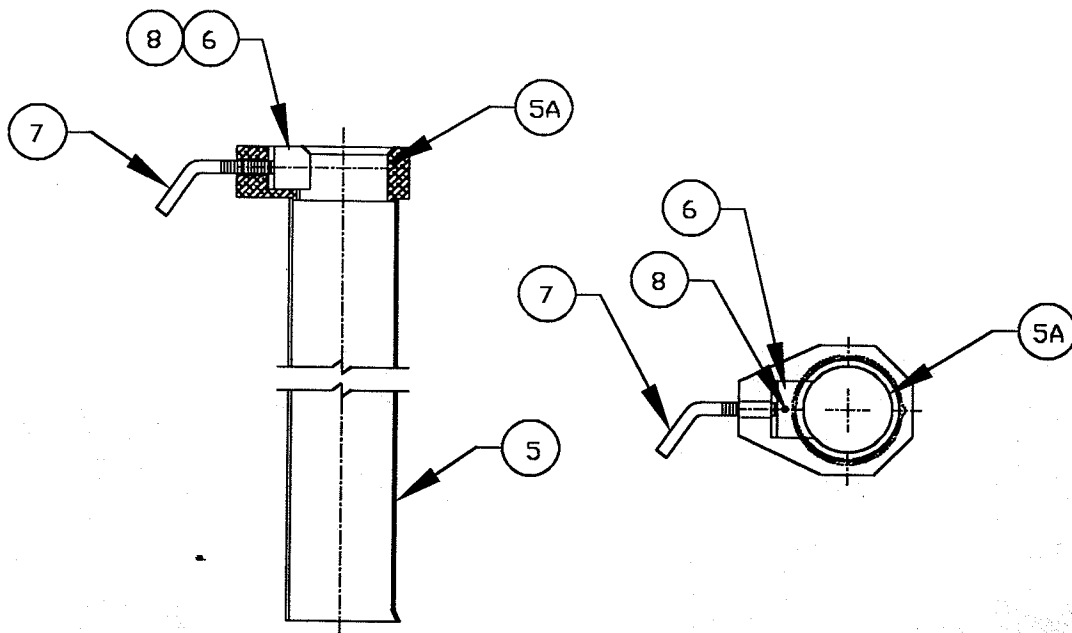


08-1026  
COVER ASSY

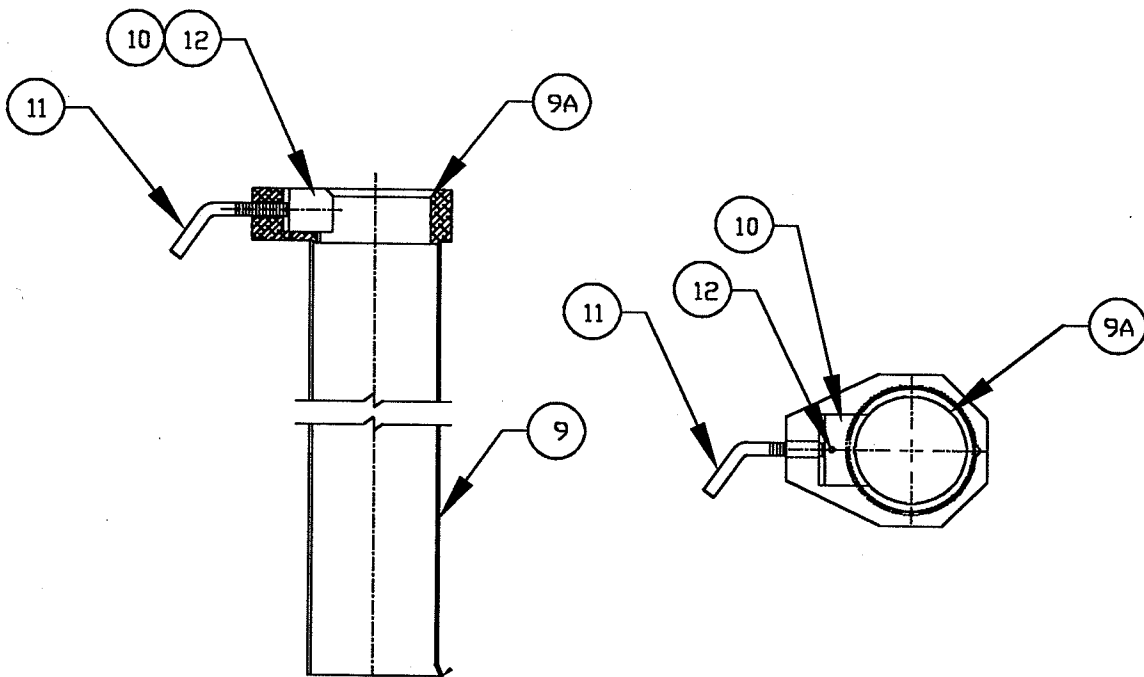


TOP VIEW

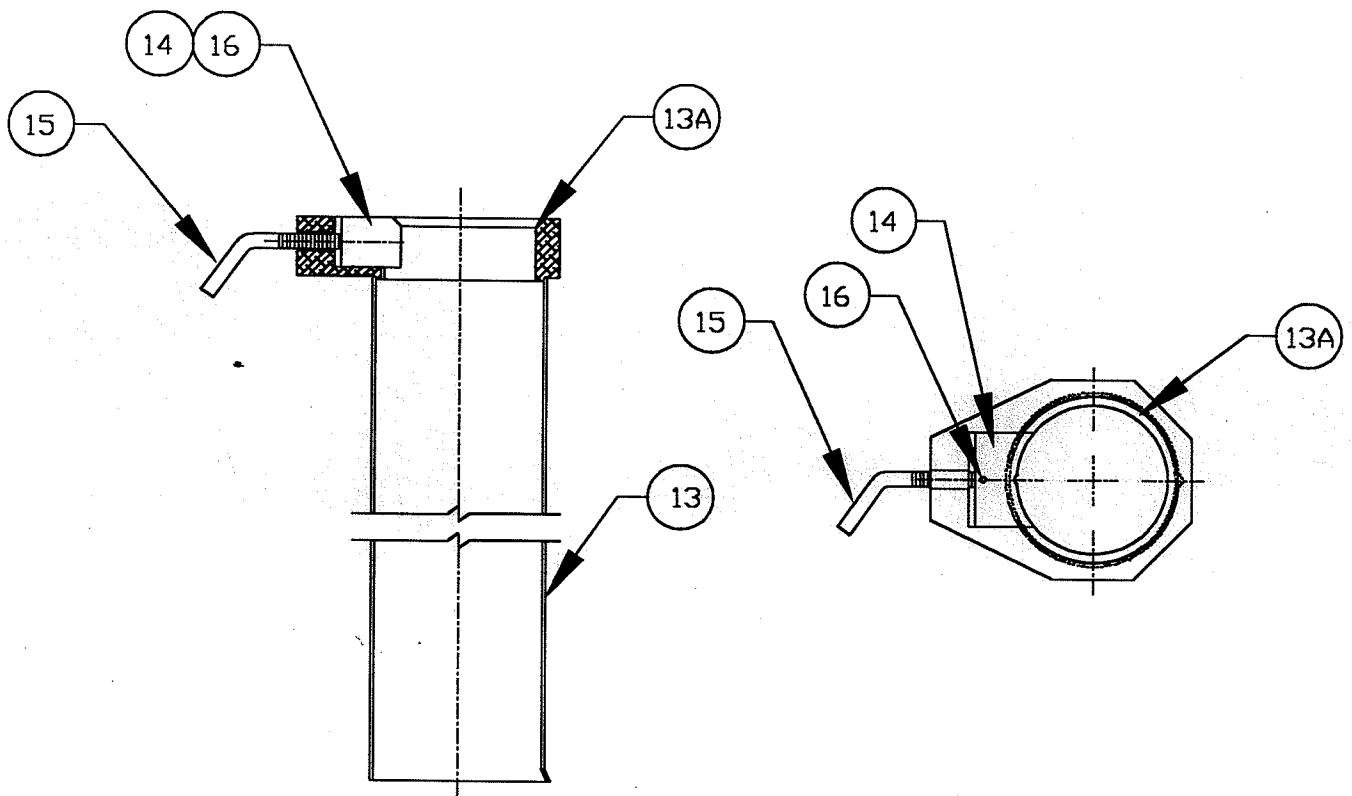
07-1051  
DRAIN FUNNEL  
SECTION ASSY



07-1049  
 2 1/2" SECTION ASSY  
 8FT TELESCOPING DRAIN

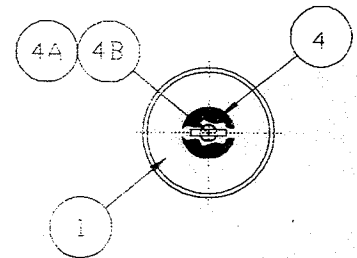
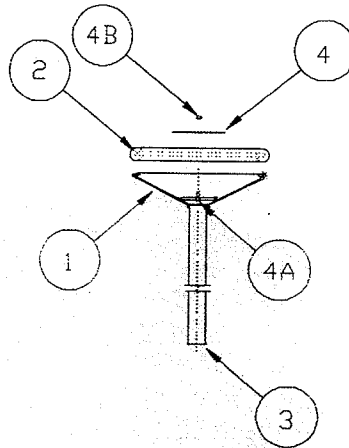
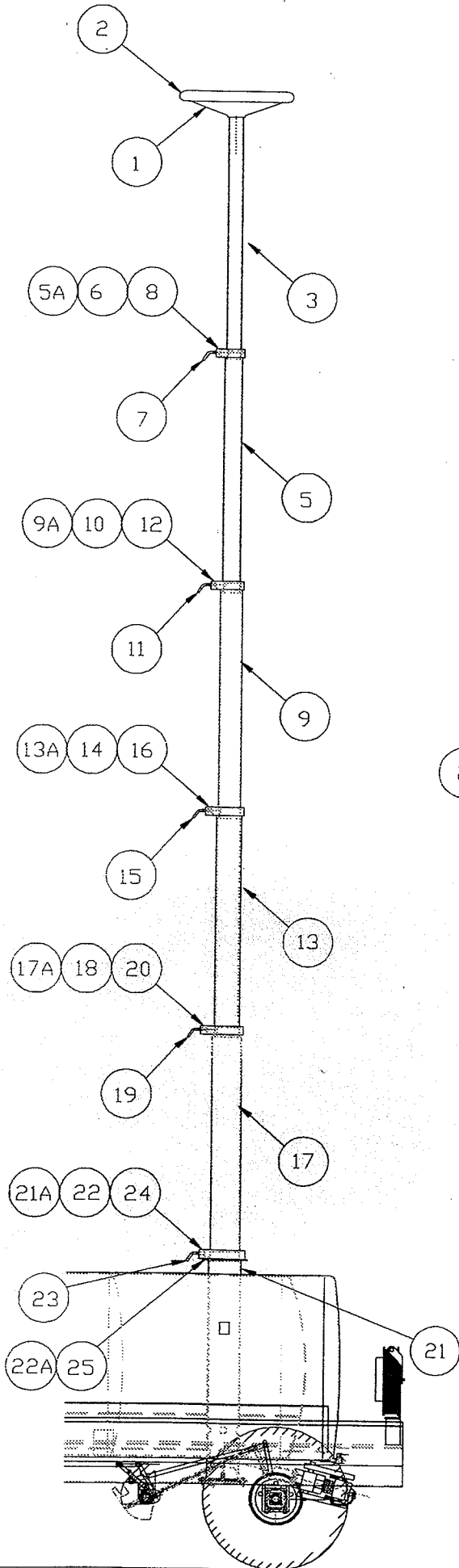


07-1045  
 3" SECTION ASSY  
 8FT TELESCOPING DRAIN



07-1043  
3 1/2" SECTION ASSY  
8FT TELESCOPING DRAIN

CONFIDENTIAL-PROPRIETARY INFORMATION  
REPRODUCTION OF THESE DRAWINGS OR THE  
MANUFACTURING OF PRODUCTS FROM THESE  
DRAWINGS FOR USE BY ANYONE OTHER THAN  
SPOKANE INDUSTRIES INC. OF SPOKANE, WA  
IS STRICTLY PROHIBITED WITHOUT WRITTEN  
CONSENT



REAR

ASSEMBLY NO. 08-1034Z  
 MAJOR ASSEMBLY – 8 FT TELESCOPING DRAIN ASSEMBLY  
 SECTION 8.0

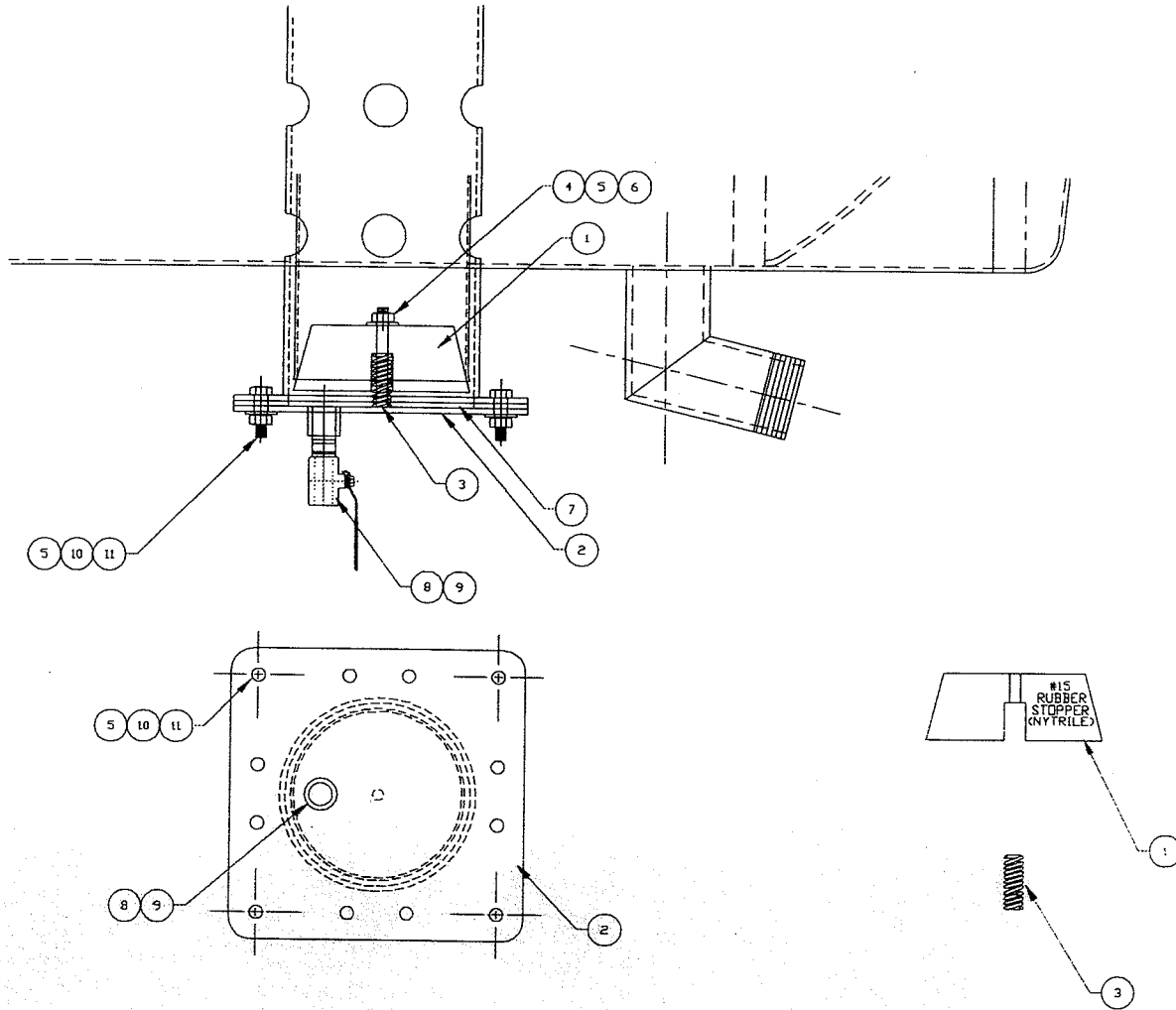
SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT #
07-1051				DRAIN FUNNEL SECTION ASSY	
	1	01-8250	1	DRAIN, TOP (FUNNEL)	5
	2	06-1022T	1	GASKET	.7
	3	01-92402	1	TUBING, 2"O.D.	
	4	04-1039	1	SCREEN	.5
	4A	02-10002	1	BOLT, ¼"	.2
	4B	02-1200	1	NUT, ¼"	.1
07-1049				DRAIN, TELESCOPING SECT ASSY, 2 ½"O.D.	
	5A	05-10271	1	CLAMP, 2"	
	5	01-9242	1	TUBING, 2 ½"O.D.	
	6	05-10051	1	WEDGE, 1" X 11/16" X 1 ¼"	.2
	7	05-10181	1	HANDLE, CLAMP	.3
	8	02-1005	1	SCREW, SET	.01
07-1045				DRAIN, TELESCOPING SECT ASSY, 3"O.D.	
	9A	05-10281	1	CLAMP, 2 ½"O.D.	
	9	01-92452	1	TUBING, 3"O.D.	
	10	05-10121	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 SECT ASSY, 3 ½"O.D.	
	13A	05-10291	1	CLAMP, 3" TUBING	
	13	01-9254S	1	TUBING, 3 ½"O.D.	.5
	14	05-10031	1	WEDGE, CLAMP	.5
	15	05-10181	1	HANDLES, CLAMP	.3
	16	02-1005	1	SCREW, SET	.01
	17	04-10560	1	BASE FLANGE	
	18	02-100121	4	MOUNTING BOLTS, ¼"- 16 X ¾"	.2
08-1026	19		1	COVER ASSY	5

ASSEMBLY No. 08-1034USP  
MAJOR ASSEMBLY- TELESCOPING DRAIN

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #'s
08-1034U			1	TELESCOPING DRAIN ASSEMBLY	30#
08-1016U		07-10541	1	Funnel Section Assembly	
	1	01-8250	1	Funnel, Cast	2.4
	2	06-1022T	1	Gasket	.2
	3	01-92402	1	Tubing, 2"OD	3.5
	4	04-1039	1	Screen	.1
	4A	02-10002	1	Bolt, Carriage	.2
	4B	02-1200	1	Nut, Nylon Lock	.1
08-1017U			1	2 1/2" Section Assembly	
	5A	05-10271	1	Clamp(Clamps 08-1016U Assy)	2.1
	5	01-9242	1	Tubing, 2 1/2"OD	1.1
	6	05-10051	1	Wedge For 05-10271 Clamp	.3
	7	05-10181	1	Handle, Clamp	.3
	8	02-1005	1	Screw, Set ( For Wedge )	.1
08-1027U			1	3" Section Assembly	
	9A	05-10281	1	Clamp(Clamps 08-1017U Assy)	2.3
	9	01-92452	1	Tubing, 3"OD	1.4
	10	05-10021	1	Wedge for 05-10281 Clamp	.3
	11	05-10181	1	Handle, Clamp	.3
	12	02-1005	1	Screw, Set ( For Wedge )	.1
08-1028U			1	3 1/2" Section Assembly	
	13A	05-10291	1	Clamp(Clamps 08-1027U Assy)	2.6
	13	01-9248	1	Tubing, 3 1/2"OD	1.6
	14	05-10031	1	Wedge For 05-10291 Clamp	.3
	15	05-10181	1	Handle, Clamp	.3
	16	02-1005	1	Screw, Set ( For Wedge )	.1
07-1014USP			1	4" Section Assembly	
	17A	05-10301	1	Clamp(Clamps 08-1028U Assy)	2.7
	17	01-9259	1	Tubing, 4"OD	1.1
	18	05-10041	1	Wedge For 05-10301 Clamp	.3
	19	05-10181	1	Handle, Clamp	.3
	20	02-1005	1	Screw, Set ( For Wedge )	.1
07-1041USP			1	4 1/2" Section Assembly	
	21A	05-10302	1	Base Clamp(Clamps 07-1014USP Assy)	6.5
	21	01-92565S	1	Tubing, 4 1/2"OD	3.7
	22A	04-10561	1	Flange, Base	.5
	22	05-10051	1	Wedge For 05-10301 Clamp	.3
	23	05-10181	1	Handle, Clamp	.3
	24	02-1005	1	Screw, Set ( For Wedge )	.1
	25	02-100121	4	Bolts, Mounting	.1



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MATING FLANGE AND ASSEMBLY DETAILS

STOPPER AND SPRING DETAILS

ASSEMBLY No. SMP-15575SP  
 MAJOR ASSEMBLY- TELESCOPING DRAIN SUMP W/ STOPPER

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #'s
SMP-15575SP			1	Telescoping Drain Sump W/ Stopper Assembly	6.6
	1	15575SP1	1	#15 Stopper	1.0
	2	01-9005S	1	Flange, Mating	2.0
	3	15575SP2	1	Spring, S-810	.1
	4	02-10004	1	Bolt, 1/4'-unc x 2 1/2'lg	.2
	5	02-12140	13	Nut, 1/4'-unc Hex	.1
	6	02-1102	1	Washer, 1/4' Flat	.1
	7	06-2506	1	Gasket	.2
	8	03-0170S	1	Nipple, 1/4' Close	.2
	9	04-2506	1	Valve, 1/4' Ball	.3
	10	02-1100	12	Bolt, 1/4'-unc x 1' Lg	2.1
	11	02-11001	12	Washer, Lock	.2

## Section 9 Vacuum Assembly

9.1 ~~9.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

### 9.2 ~~9.1~~ Operation

9.2.1 ~~9.1.0~~ This assembly is equipped with an air powered vacuum generator.

9.2.2 9.1.1 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.

9.2.3 9.1.2 Vacuum is started by attaching a recommended air supply of 60CFM at 100 PSI and turning on the air supply valve.

9.2.4 9.1.3 The vacuum chamber is equipped with an automatic drain valve that opens when ~~vacuum~~ vacuum is eliminated in the chamber. This valve opens directly into the main tank. DELETE

9.2.5 9.1.4 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.

9.2.6 9.1.5 The vacuum assembly is supplied with 50 feet of vacuum hose and a ball valve on the vacuum suction.

9.2.7 9.1.6 The vacuum assembly is equipped with (4) four each ½" 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. S

### 9.3 ~~9.2~~ Maintenance

9.3.1 9.2.0 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 (3) three tie down latches.

9.3.2 9.2.1 The vacuum chamber is equipped with an automatic drain valve. This valve is pre-adjusted at the factory and should not need further adjustment.

~~9.2.2~~ 9.3.3 The vacuum cover is equipped with an overflow valve which should require no maintenance.

~~9.2.3~~ 9.3.4 The vacuum generator is attached to the chamber cover. It is equipped with an exhaust silencer which should be cleaned at (6) six month intervals or more often depending on the amount of use and conditions.

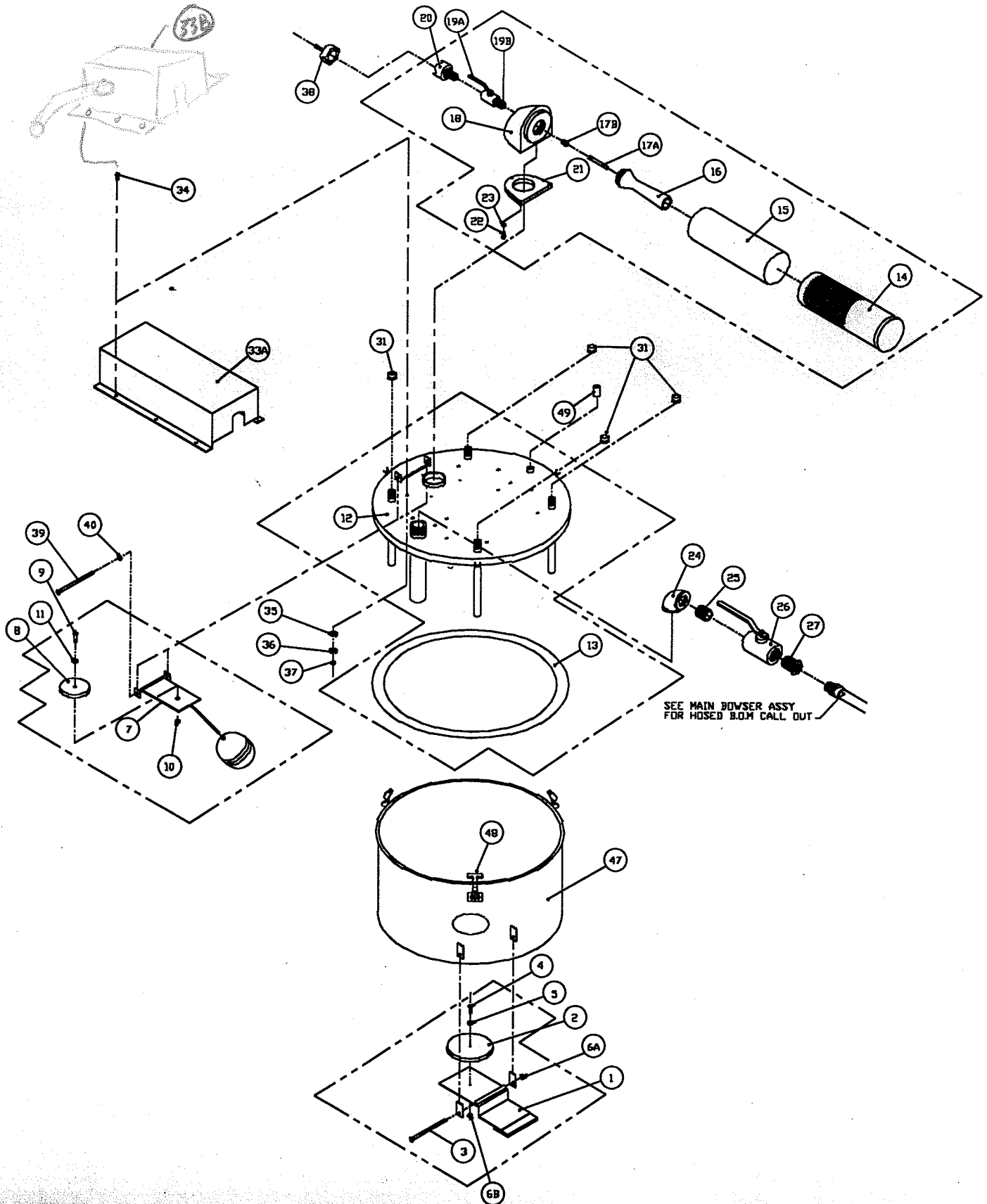
~~9.2.4~~ 9.3.5 The vacuum hose should be inspected monthly for cracks. Any sudden loss of vacuum suction power may indicate a crack in the vacuum hose.

~~9.2.5~~ 9.3.6 The cover gasket should be inspected monthly for deterioration. This gasket should be pliable and free from weather checking.

SECTION 9 *9.0*

~~LID SHROUD WATER PROTECTION AND VENT~~  
~~WITH POT ASSEMBLY~~

*VALVUM SYSTEM ASSEMBLY*



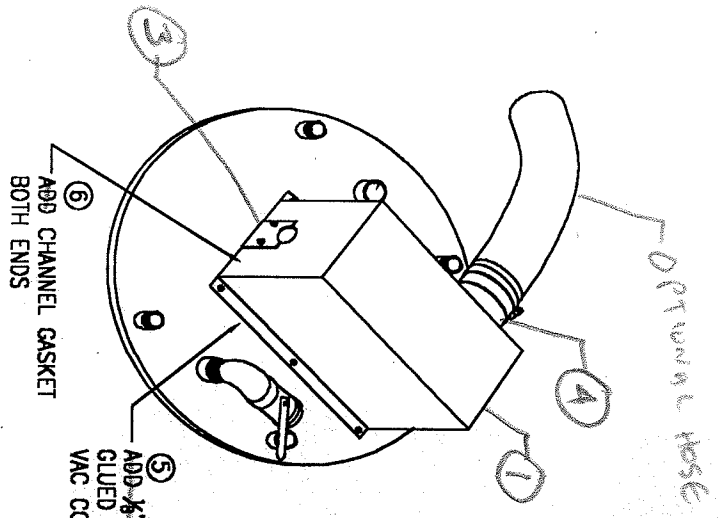
ASSEMBLY NO. 08-0002U  
 MAJOR ASSEMBLY - VACUUM SYSTEM  
 SECTION 9.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-0002U			1	VACUUM SYSTEM ASSY	208.1
08-1000	1	07-1000	1	DRAIN STOP ARM <del>(OPTIONAL)</del>	3.5
	2	04-1000	1	GASKET <del>(OPTIONAL)</del>	.1
	3	02-10016	1	BOLT <del>(OPTIONAL)</del>	.1
	4	02-10002	1	BOLT <del>(OPTIONAL)</del>	.1
	5	02-1100	1	WASHER, FLAT <del>(OPTIONAL)</del>	.1
	6A	02-1201	1	NUT <del>(OPTIONAL)</del>	.1
	6B	02-1200	1	NUT <del>(OPTIONAL)</del>	.1
08-1001				OVERFLOW STOP ASSY	
	7	07-1001	1	FLOAT ASSY	4
	8	04-1001	1	GASKET	.1
	9	02-10003	1	BOLT	.1
	10	02-1200	1	NUT, NYLON LOCK	.1
	11	02-1102	1	WASHER, FLAT	.1
08-1002	12		1	COVER ASSY	29.6
	13	06-1022V	1	GASKET	3.5
08-1003			1	VACUUM GENERATOR ASSY	
	14	04-1004	1	HOUSING, EXHAUST	9.5
	15	04-1005	1	SILENCER	4.7
	16	04-1006	1	VENTURI	2.2
	17A	04-1007	1	JET, AIR	2.7
	17B	03-11135	1	REDUCER, AIR JET	.1
	18	04-1008	1	BOX, VENTURI	2.7
	19A	04-1032	1	VALVE, BALL	5.8
	19B	03-0264S	1	NIPPLE	.2
	20	04-1056	1	COUPLER, AIR TWIST	.7
	21	04-1010	1	GASKET	.1
	22	02-10010	3	BOLT	.1
	23	02-11002	3	WASHER, LOCK	.1
08-1004			1	ACCESORIES	
	24	03-1001	1	ELBOW, 90 DEGREES	2
	25	03-02922S	1	NIPPLE	.5
	26	04-10321	1	VALVE, BALL	3
	27	03-1002	1	BUSHING	.2
	28	06-10162	50'	HOSE, JET FUEL BONDED AND CERTIFIED AIRCRAFT DELIVERY	25
	29	--	--	--	--
	30	--	--	--	--

CONTINUED ASSEMBLY NO. 08-0002U  
 MAJOR ASSEMBLY - VACUUM SYSTEM  
 SECTION 9.0

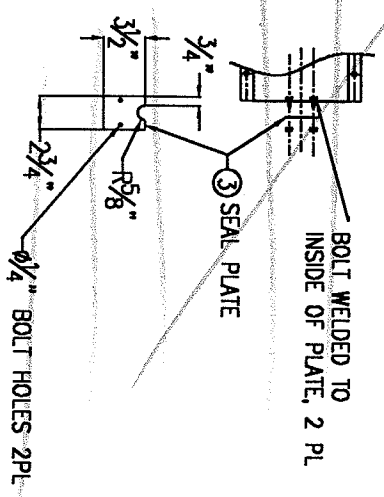
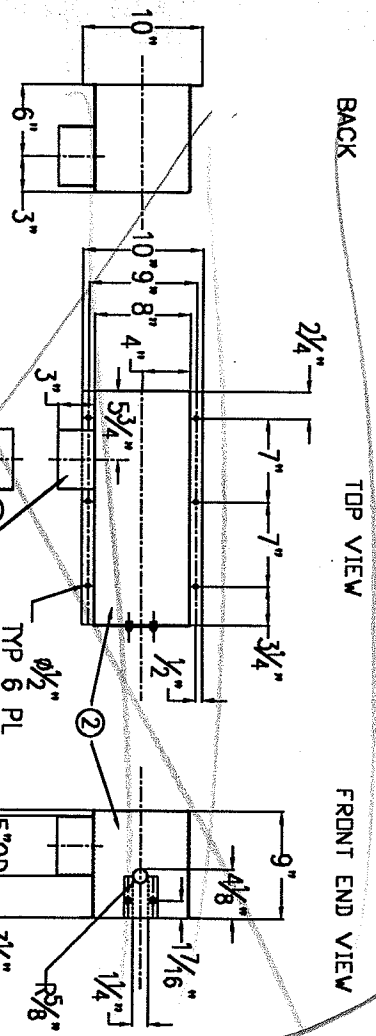
	31	03-1021	3	CAP, PIPE	1
	32	--	--	--	--
	33A	07-1034	1	COVER, VACUUM GENERATOR	11
08-0520	33B		1	<del>ACCESSORY VENT W/VAC.</del> <i>WATER SHROUD W/VENT</i>	<del>19.4</del> <i>16.1</i>
	34	02-10010	6	BOLT	.1
	35	06-25123	6	WASHER, FLAT	.1
	36	02-1100	6	WASHER, FLAT	.1
	37	02-1200	6	NUT, NYLON INSERT	.1
	38	04-1057	1	COUPLER, AIR TWIST	.1
	39	02-10004	1	BOLT	.1
	40	02-1200	1	NUT	.1
OPTIONAL	41	02-100115	6	BOLT	1
	42	02-1202	6	NUT	.5
	43	07-1075	2	HANER, HOSE	3
	44	--	3	HOSE, JET FUEL BONDED AND CERTIFIED	12
	45	04-2507	3	VALVE, BALL	6
	46	--	3	BUSHING	3.1
08-1009			1	VACUUM TANK FABRICATED AND ASSY	
	47	07-1032	1	TANK ASSY	65
	48	04-1062	1	FASTENER, HOOD	1.1
07-10341	49		1	VALVE, VACUUM CHECK ASSY	2.5

SECTION 9-9.0  
 LFB SHROUD WATER PROTECTION AND VENT W/VACUUM WATER PROTECTION SHROUD W/ VENT  
 (ACCESSORY TO ITEM #34A)  
 (OPTIONAL ITEM #33B)  
 (SR-921)



SHROUD, 10" x  
 19 1/2" x 6" x 9"  
 TALL

REMOVE EXISTING FASTNER BOLTS  
 PLACE GASKET WASHERS BETWEEN  
 SHROUD AND LID THEN RE-INSTALL  
 FASTNER BOLTS.  
 END PLATES COVER ENTIRE END

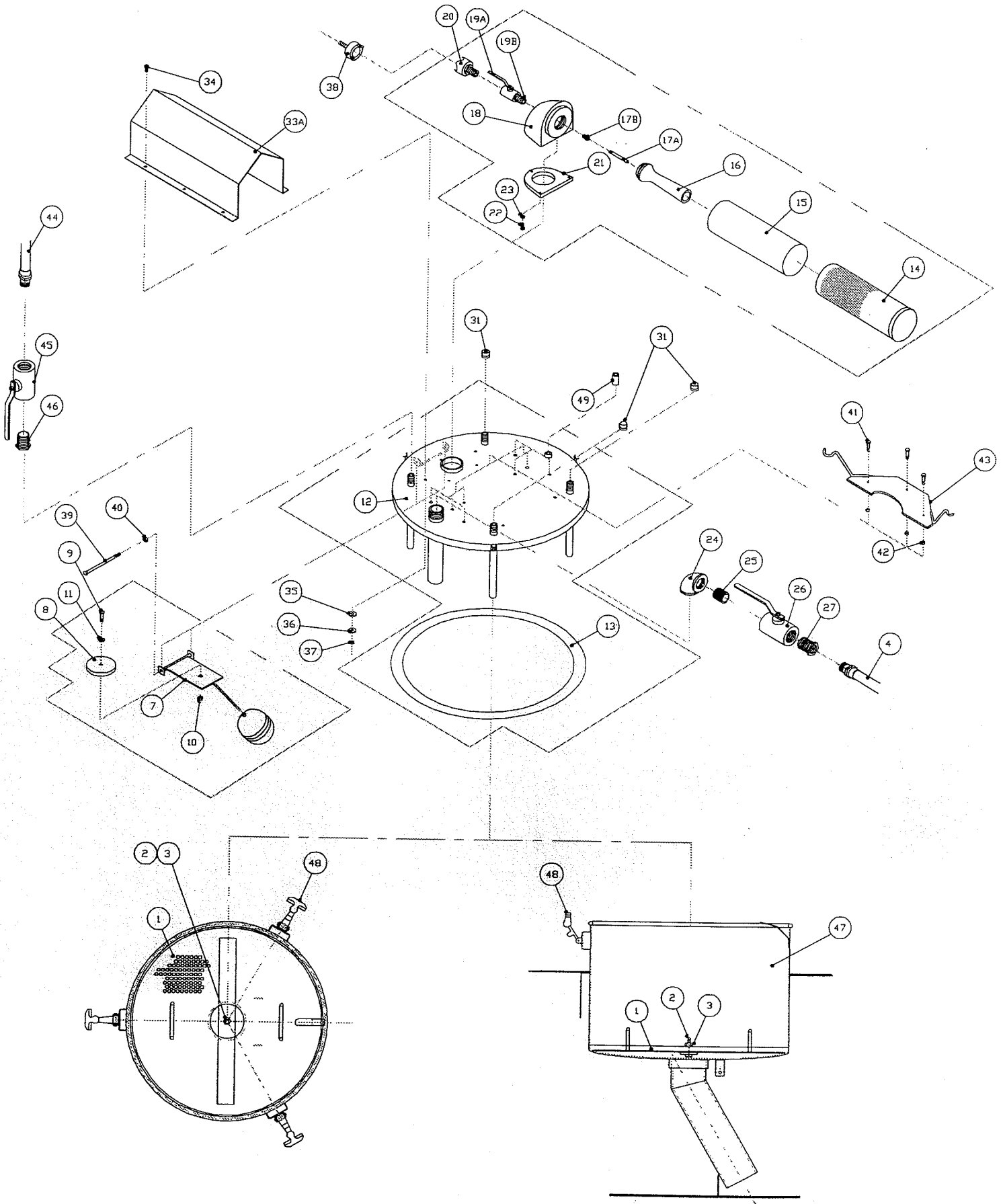


ITEM	QTY	PART No.	DESCRIPTION	ITEM	QTY	PART No.	DESCRIPTION
1	2	01-901S	PLATE, 14 GA, 9 1/2" x 8 1/2" LG	5	1	PD	BUNAN SEAL
2	1	01-901S	PLATE, 14 GA, 19 1/2" x 26" LG	6	2	06-3000	CHANNEL GASKET
3	1	01-901S	SEAL PLATE, 14 GA, 2 7/8" x 2 3/4"				
4	1	01-901S	VAC. PIPE ATTACHMNT, 1 1/4 GA, 3 1/2" LG * 5" OD, 1.0#				

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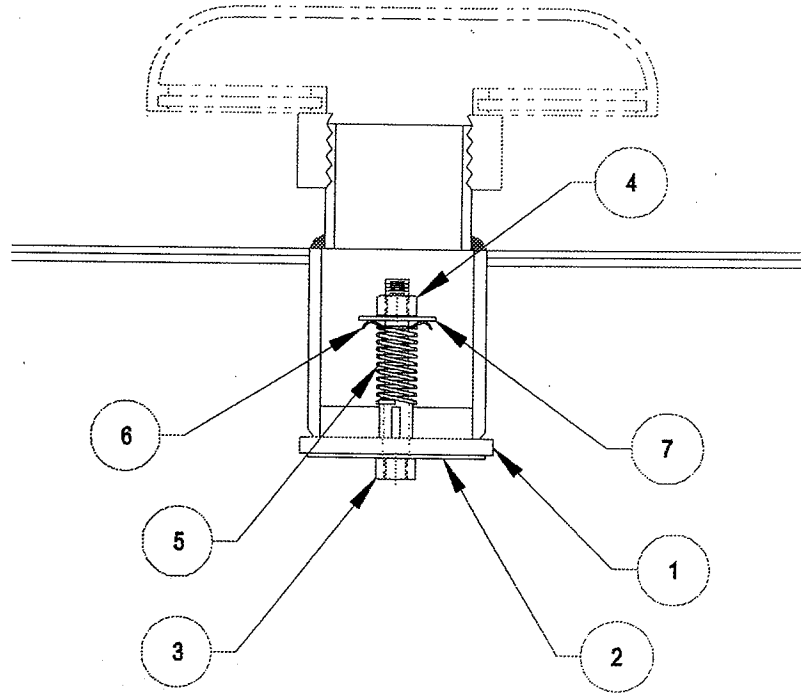
ASSEMBLY No. 08-0002USP  
MAJOR ASSEMBLY- VACUUM SYSTEM

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #'s
08-0002USP			1	VACUUM SYSTEM ASSEMBLY	170#
-	1	08-0002USP-1	1	Screen, Welded Assembly	13
-	2	08-0002USP-2	1	Bolt, Shoulder	.1
-	3	08-0002USP-3	1	Nut, Washered Wing	.1
	4	06-10162	50ft	Hose, Jet Fuel Bonded and Certified	25
	5	-	-	-	-
	6A	-	-	-	-
	6B	-	-	-	-
08-1001			1	Overflow Stop Assembly	
	7	07-1001	1	Float Assembly	4
	8	04-1001	1	Gasket	.1
	9	02-10003	1	Bolt	.1
	10	02-1200	1	Nut, Nylon Lock	.1
	11	02-1102	1	Washer, Flat	.1
08-1002	12		1	Cover Assembly	29.6
06-1022V	13		1	Gasket	3.5
08-1003			1	Vacuum Generator Assembly	
	14	04-1004	1	Housing, Exhaust	9.5
	15	04-1005	1	Silencer	4.7
	16	04-1006	1	Venturi	2.2
	17A	04-1007	1	Jet, Air	2.7
	17B	03-11135	1	Reducer, Air Jet	.1
	18	04-1008	1	Box, Venturi	2.7
	19A	04-1032	1	Valve, Ball	5.8
	19B	03-0264S	1	Nipple	.2
	20	04-1056	1	Coupler, Air Twist	.7
	21	04-1010	1	Gasket	.1
	22	02-10010	3	Bolt	.1
	23	02-11002	3	Washer, Lock	.1
08-1004			1	Assessories	
	24	03-1001	1	Elbow, 90°	2
	25	03-02922S	1	Nipple	.5
	26	04-10321	1	Valve, Ball	3
	27	03-1002	1	Bushing	.2
	28	-	-	-	-
	29	-	-	-	-
	30	-	-	-	-

ASSEMBLY No. 08-0002USP  
 MAJOR ASSEMBLY- VACUUM SYSTEM

	31	03-1021	3	Cap, Pipe	1
	32	-	-	-	-
	33A	07-1034W	1	Cover, Vacuum Generator	11
	33B	-	-	-	-
	34	02-10010	6	Bolt	.1
	35	06-25123	6	Washer, Flat	.1
	36	02-1100	6	Washer, Flat	.1
	37	02-1200	6	Nut, Nylon Insert	.1
	38	04-1057	1	Coupler, Air Twist	.1
	39	02-10004	1	Bolt	.1
	40	02-1200	1	Nut	.1
	41	02-100115	6	Bolt	1
	42	02-1202	6	Nut	.5
	43	07-1075	2	Hanger, Hose	3
	44	08-0002USP-44	3	Hose, Jet Fuel Bonded And Certified	12
	45	04-2507	3	Valve, Ball	6
	46	08-0002USP-46	3	Bushing	3.1
08-1009			1	Vacuum Tank Fabricated Assembly	
	47	07-1032	1	Tank Assembly	65
	48	04-1062	1	Fastener, Hood	1.1
07-10341	49		1	Valve, Vacuum Check Assembly	2.5

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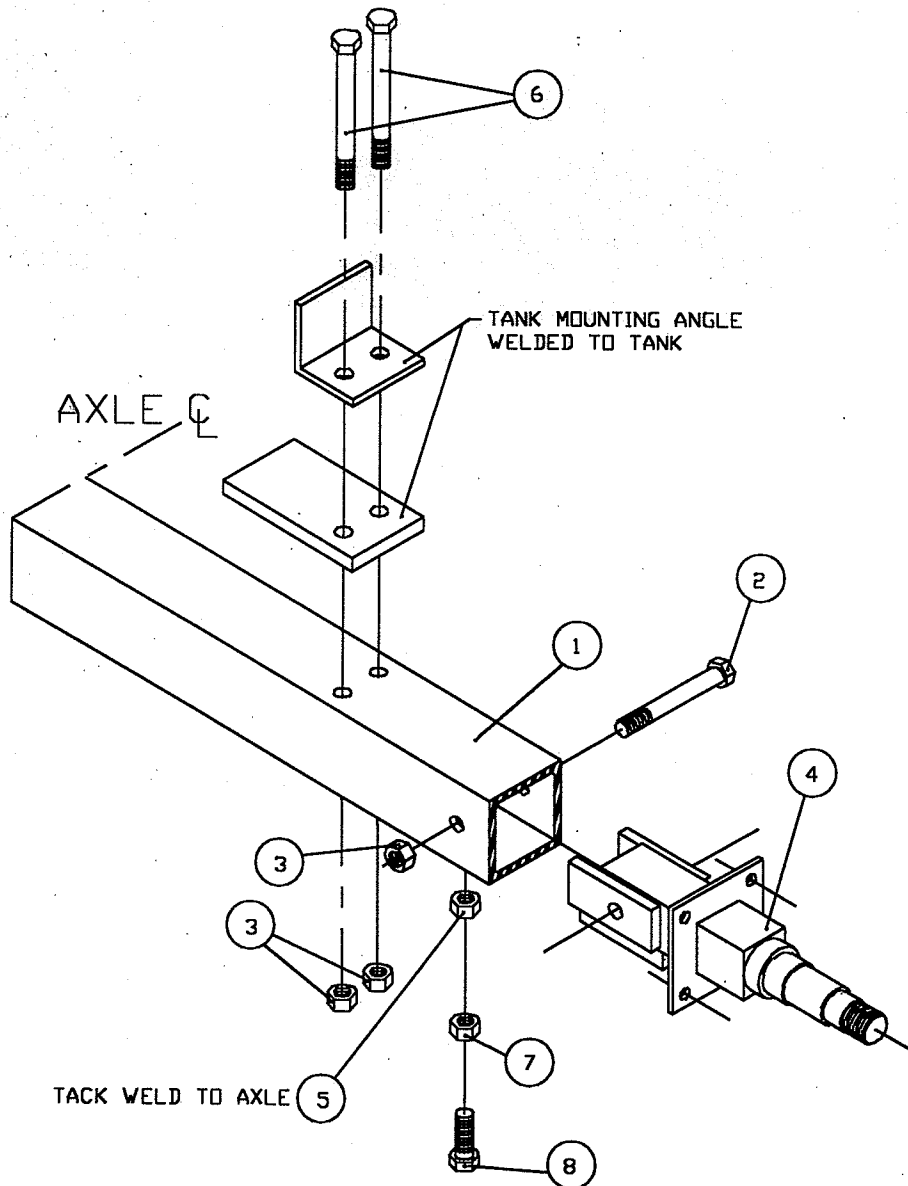
ASSEMBLY No. SMP15575GOV  
 MAJOR ASSEMBLY- VACUUM GOVERNOR

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #'s
SMP15575GOV			1	Vacuum Governor Assembly	
	1	15575GOV-1	1	Gasket	.3
	2	01-903S	1	Washer, Flat	.1
	3	02-10013	1	Bolt	.2
	4	02-12014	1	Nut	.1
	5	15575GOV-5	1	Spring, Century J-38	.1
	6	15575GOV-6	1	Washer, Cup 92922A036	.1
	7	15575GOV-7	1	Washer, Flat 91090A121	.1

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~~SECTION 10;~~  
~~FITS 200 GAL. & SMALLER UNITS~~

Shouldn't there be a  
TEXT SECTION FOR  
THIS  
(SECTION 10.0  
REAR UNDERCARRIAGE ASSEMBLY)



SECTION 10.0  
ASSEMBLY No. 08-1030ZR2  
MAJOR ASSEMBLY- AXLE ASSEMBLY  
REAR UNDERCARRIAGE ASSY  
(FITS 200 GAL. & SMALLER UNITS)

Move up To margin



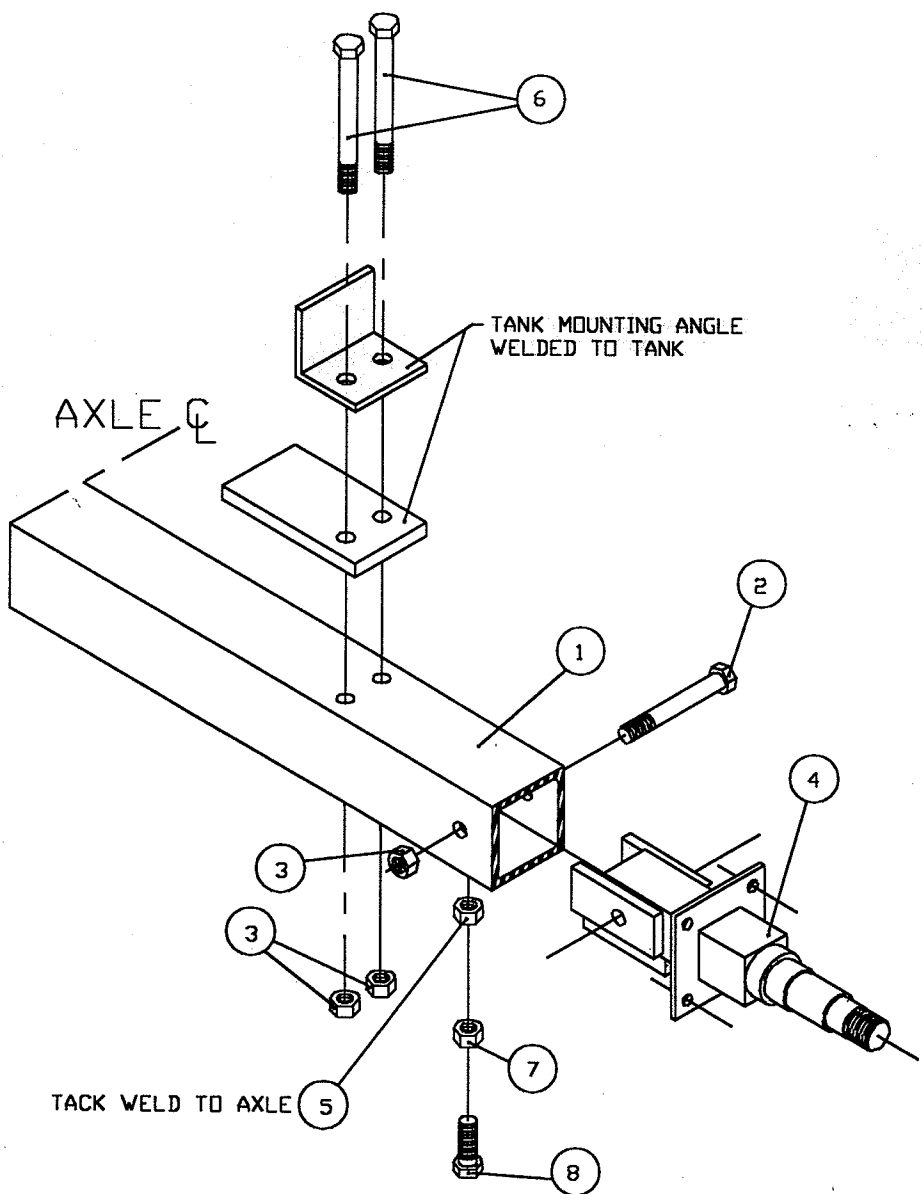
ASSEMBLY NO. 08-1030ZR2  
MAJOR ASSEMBLY - AXLE ASSEMBLY  
SECTION 10.0  
(FITS 200 GALLON & SMALLER UNITS)

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1030ZR				AXLE ASSY, 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	07-1010R	2	SPINDLE, REAR	17
	5	02-12035	1	NUT, JAM	.1
	6	02-1503	4	BOLT, TANK MOUNTING	1.3
	7	02-1203	4	NUTS, TANK MOUNTING	.5
	8	02-10041	2	BOLT, SPINDLE STABILIZER	.5

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~~SECTION 10;~~

~~FITS 300 GAL. & LARGER UNITS~~



SECTION 10.0

ASSEMBLY No. 08-10102R

MAJOR ASSEMBLY- AXLE ASSEMBLY

REAR WHEEL CARRIAGE ASSY.

(FITS 300 GAL. & LARGER UNITS)

Move up to  
margin

ASSEMBLY NO. 08-10102R  
MAJOR ASSEMBLY - AXLE ASSEMBLY  
SECTION 10.0  
(FITS 300 GALLON & LARGER UNITS)

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-10102R				AXLE ASSY, REAR	
	1	05-1023	1	AXLE, REAR WELDMENT	40
	2	02-1505	2	BOLTS, MOUNTING SPINDLE	.6
	3	02-12041	2	NUTS, MOUNTING SPINDLE	.5
	4	07-1010R	2	SPINDLE, REAR	17
	5	02-12035	1	NUT, JAM	.1
	6	02-1503	4	BOLT, TANK MOUNTING	1.3
	7	02-1203	4	NUTS, TANK MOUNTING	.5
	8	02-10041	2	BOLT, SPINDLE STABILIZER	.5

**Section 11**  
**Parking Brakes**

11.1 ~~11.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

11.2 ~~11.1~~ Operation

11.2.1 ~~11.1.0~~ The fuel <sup>BOWSER</sup> ~~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, draining ~~tank~~ or when ~~ever~~ left unattended.

11.3 ~~11.2~~ Maintenance

11.3.1 11.2.0 The fuel bowser unit is equipped with a parking brake assembly consisting of a 7" diameter brake drum with 1-3/4" wide brake shoes.

11.3.2 11.2.1 The shoes are activated via a mechanical linkage, eccentric and lever.

11.3.3 11.2.2 Adjustment may be necessary as the shoes wear

- 1) ~~a~~. Tightening is accomplished by removing the bolt through one yoke and screwing yoke in to shorten connecting rod.
- 2) ~~b~~. Do not over tighten <sup>AS</sup> or brakes may drag when released.

11.3.4 11.2.3 Brake Shoe Replacement

- 1) ~~a~~ Remove wheel.
- 2) ~~b~~ Remove nut retaining <sup>HUB</sup> ~~hub~~ and drum assembly.
- 3) ~~c~~ Disconnect actuating rod
- 4) ~~d~~ Remove shoe retainers
- 5) ~~e~~ Install new shoes.
- 6) ~~f~~ Replace shoe retainers.
- 7) ~~g~~ Adjust actuator rod length.
- 8) ~~h~~ Replace wheel.



MAKE ON ITS OWN PAGE

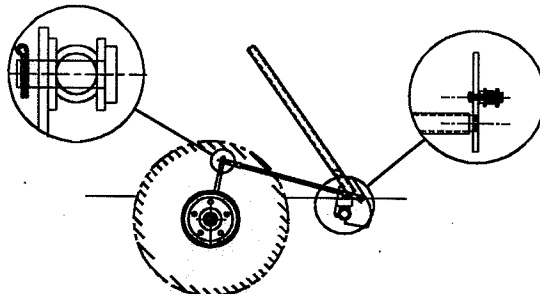
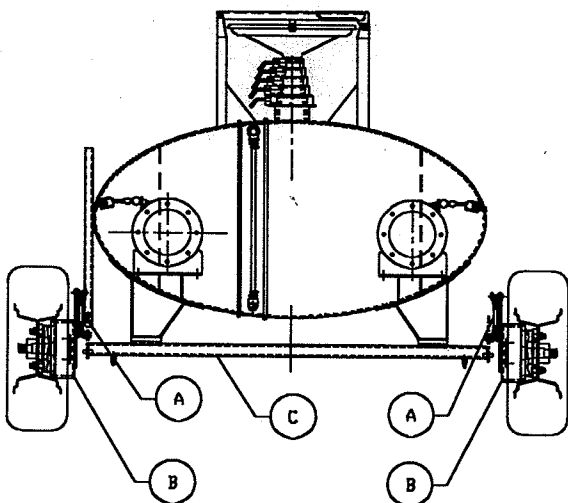
MOVE TO UNDER PICTURE

SECTION 11.0  
 ASSEMBLY No. 10-100030  
 MAJOR ASSEMBLY - PARKING BRAKE

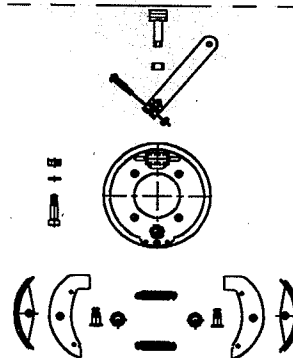
SECTION 11.0  
 PARKING BRAKE

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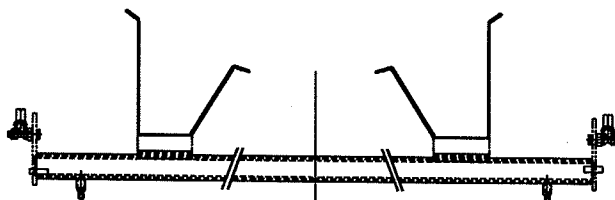
SECTION 5.2.3



A BRAKE LINKAGE ASSEMBLY  
 SECTION 5.2.3-A



B BRAKE ASSEMBLY  
 SECTION 5.2.3-B



C BRAKE SLEEVE ASSEMBLY  
 SECTION 5.2.3-C

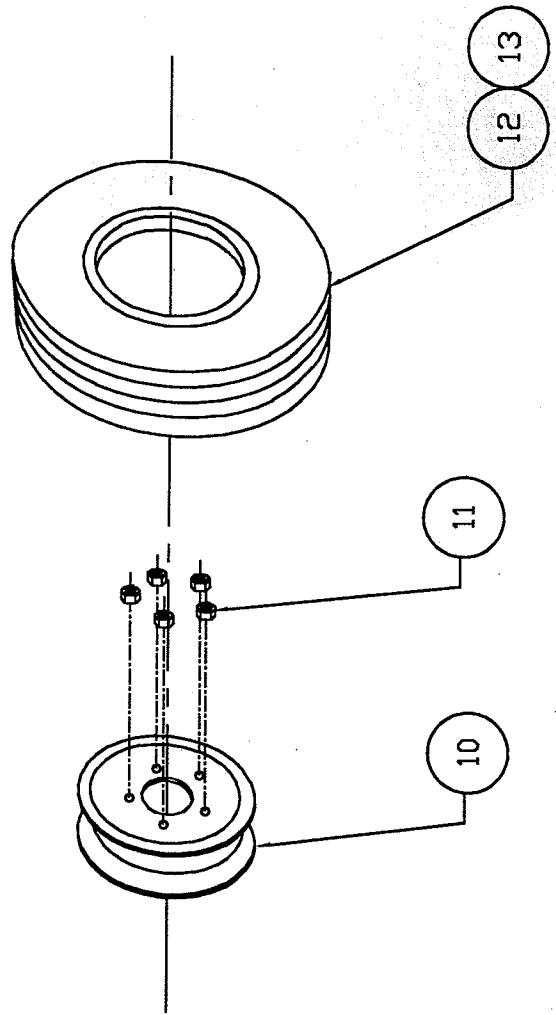
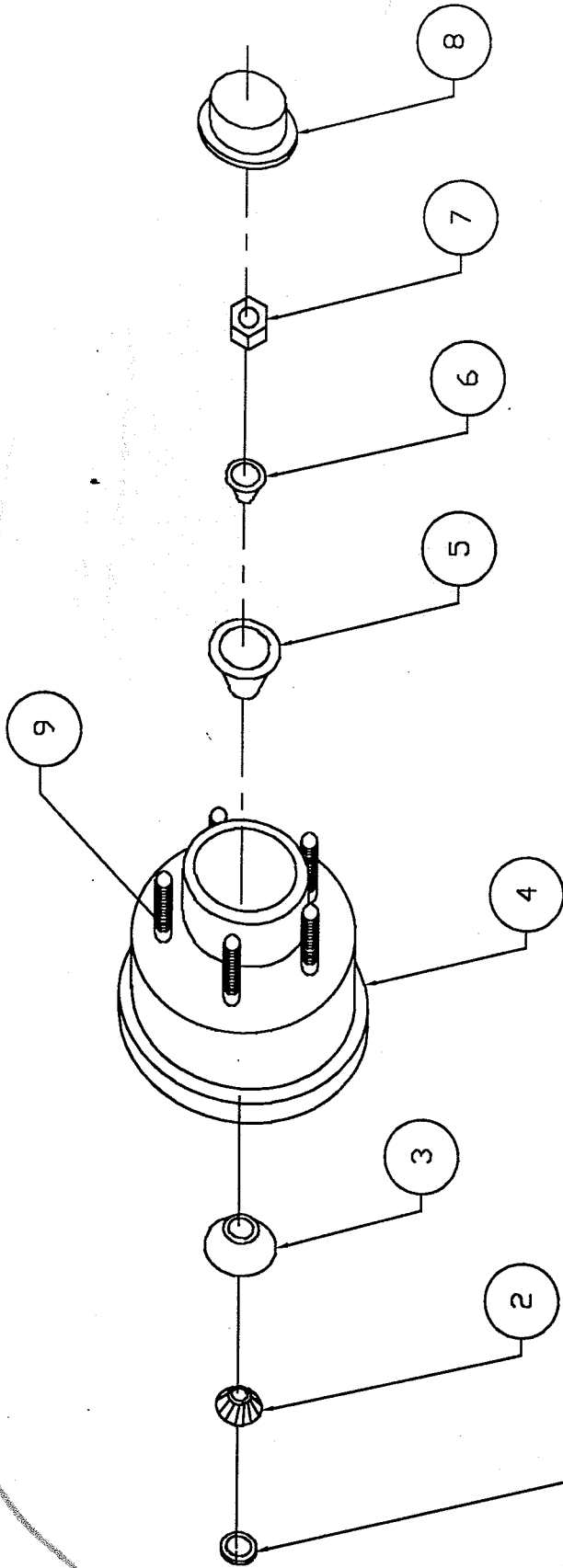
SECTION 11.0

ASSEMBLY No. 10-100030  
 MAJOR ASSEMBLY - TOW BAR ACTUATED PARKING BRAKE

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #'s
10-100030	-	-	1	Brake Assembly	45#
-	A	08-1031X	1	Brake Linkage Assembly	14.3
-	B	08-1007	1	Brake Assembly	17.9
-	C	07-1038	1	Brake Sleeve Assembly	8.6

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SECTION 12.0  
REAR WHEEL ASSEMBLY  
BEARING, HUB & BRAKE ASSY., REAR



SHOULDN'T THERE  
BE A TEXT SECTION  
FOR THIS  
(SECTION 12.0  
REAR WHEEL ASSEMBLY)

ROTATE  
ALL BALLONS  
TO VERTICAL

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OF PAGE

ASSEMBLY NO. 10-100052R  
 MAJOR ASSEMBLY – WHEEL ASSEMBLY, REAR  
 SECTION 12.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-10111R		04-1062R		BEARING & HUB ASSY (2 REQUIRED)	
	1	04-1012	1	SEAL, BEARING	1
	2	04-1013	1	BEARING, INNER	3
	3	04-1015	1	CUP, INNER	2
	4	05-1008R	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
	9	02-1017	5	STUDS, HUB	1
08-10061		04-10201		TIRE/WHEEL/TUBE ASSY (2 REQUIRED)	
	10	04-1020	1	WHEEL, SPLIT RIM	9.5
	11	04-1021	5	LUG NUTS, WHEEL	1
	12	04-10221	1	TIRE, 10" E-RANGE FOR 400 & UP B-RANGE FOR 200 & DOWN	4
	13	04-1045	1	TUBE ASSY	11

**Section 13.0**  
**Front Undercarriage**

13.1 ~~13.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

13.2 ~~13.1~~ Operation

13.2.1 13.1.0 The Front Undercarriage is intended for use in tailoring of fuel from aircraft or storage area to the aircraft, storage area or disposal site. Any other use is prohibited and may void any and all warranties.

13.2.2 13.1.1 The fuel bowser unit is equipped with steering front wheels controlled by the tow bar.

13.2.3 13.1.2 Care should be taken not to jackknife the fuel bowser when backing up.

13.2.4 13.1.3 Before towing, check to see the brake is disengaged, grounding reel and hoses are disconnected, air lines and valves are closed, tow bar is securely attached to the towing vehicle and all manway and covers are closed and latched.

13.2.5 13.1.4 The fuel bowser unit is equipped with a tow bar latch to hold it in the upright position.

13.3 ~~13.2~~ Maintenance

13.3.1 13.2.0 The fuel bowser is equipped with steering front wheels, controlled by the tow bar and fixed rear wheels.

13.3.2 13.2.1 Maintenance should consist of the following:

1) a Kingpin bushing, turning bushings and tie rod ends are self-lubricating and need no additional maintenance.

2) b Inspect wheel bearings at (3) three month intervals. Repack and, or replace as needed.

3) c Check tire pressure weekly. Maintain pressure as per tire markings.

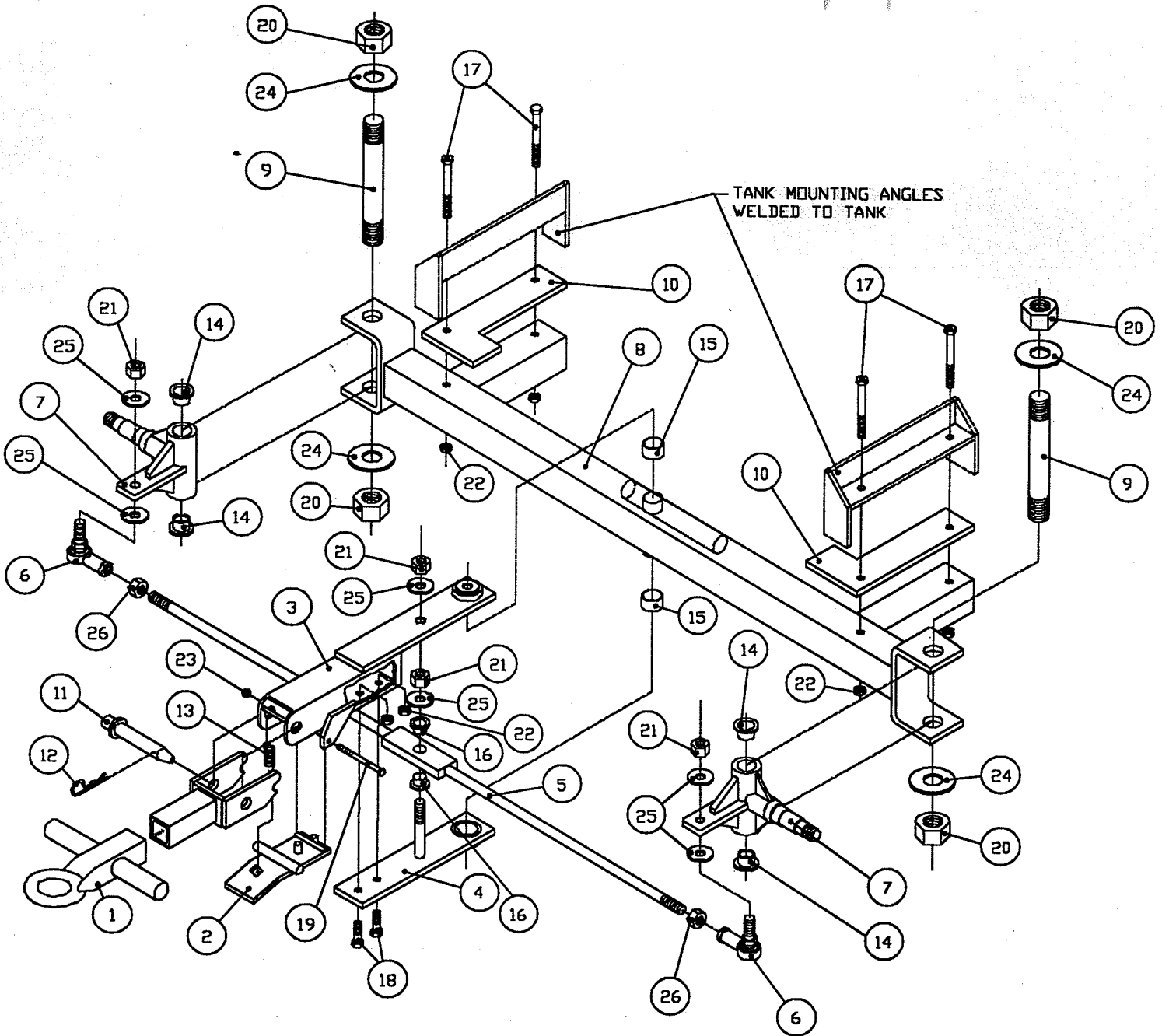
13.3.3 13.2.2 Tow bar pivot pin and hook ring should be inspected monthly for excessive wear or cracks.

*trailer*  
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*this does not just fit the bowser, the front under carriage*

SECTION 13.0  
UNDERCARRIAGE, FRONT  
200, 150 AND 100 GALLON BOWSERS  
FRONT AXLE ASSEMBLY

*UNDERCARRIAGE*

*↓  
Move this  
to Bottom*



08-1029

SECTION 13.0  
~~UNDERCARRIAGE, FRONT~~  
 200, 150 AND 100 GALLON BOWSERS  
FRONT AXLE ASSEMBLY  
 UNDERCARRIAGE

BOM SHOULD  
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~~TYPE~~ ✓  
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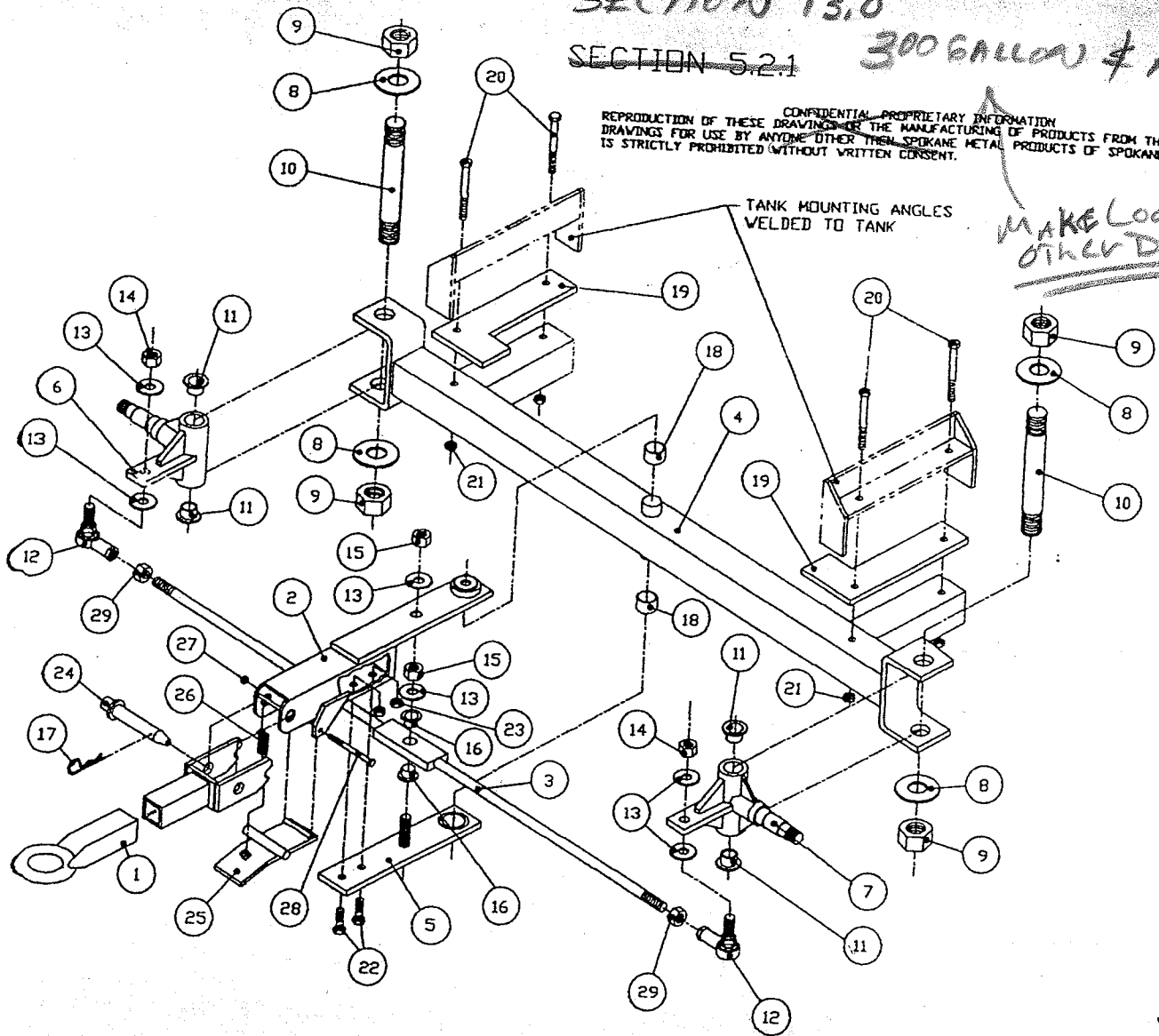
26	2	02-12141	NUT,3/4"-16NF	C/S	.55	
25	6	02-11072	WASHER,FLAT, 3/4"	C/S	.4	
24	4	02-11131	WASHER,FLAT, 1 1/2"	C/S	.7	
23	1	02-12012	NUT,5/16"-18NC W/ NYLON INS.	C/S	.6	
22	4	02-12041	NUT,1/2"-13NC W/ NYLON INS.	C/S	.8	
21	4	02-12071	NUT,3/4"-16NF W/ NYLON INS.	C/S	1.1	
20	4	02-12131	NUT,1 1/2"-12NF W/ NYLON INS.	C/S	2	
19	1	02-1501	BOLT,5/16"-18NC x 4 1/2"LG.	C/S	.2	
18	2	02-1502	BOLT,1/2"-13NC x 1 3/4"LG.	C/S	.32	
17	4	02-1503	BOLT,1/2"-13NC x 5"LG	C/S	1.3	
16	2	03-1015	BUSHING, DILITE# FF-1011-2 BRONZE	BRONZE	.8	
15	2	03-1014	BUSHING, DILITE #AA-1704-15 BRONZE	BRONZE	1	
14	4	03-1013	BUSHING, DILITE #FFB-2428-12 BRONZE	BRONZE	1	
13	1	04-1054	SPRING, PULL CENTURY#C-187	STEEL	.5	
12	1	02-1300	PIN,COTTER,3/16" x 1 1/2"	C/S	.2	
11	1	02-1304	PIN,HITCH,1"Ø x 4 1/2" EFF. LGTH.	STEEL	2	
10	2	06-1023	PAD,MOUNTING, TANK, 1/2"THK	NEOPR	.32	
9	2	05-1010	PIN,KING, 1 1/2"Ø x 11"LG.	C/S	5.5	
8	1	07-1053	AXLE,FRONT		53.9	
7	2	07-1009	HOUSING,KING PIN MACHINED		23.8	
6	2	03-1016	ROD END,B.J.,3/4"-16 FEMALE THREAD Mc#6072K78	C/S	5	
5	1	07-10371	ROD,TIE		6.2	
4	1	07-1046	PLATE,LOWER		6.7	
3	1	07-1052	ARM,STEERING		10.4	
2	1	07-1020	LATCH,TOE		3.7	
1	1	07-1103	BAR,TOW		20.4	
08-1029			UNDERCARRIAGE,FRONT			
SUB ASSY.	NO.	QTY.	PART NO.	DESCRIPTION	MAT'L	WHT.

SECTION 13.0

SECTION 5.2.1

300 GALLON & ABOVE

CONFIDENTIAL PROPRIETARY INFORMATION  
REPRODUCTION OF THESE DRAWINGS FOR THE MANUFACTURING OF PRODUCTS FROM THESE  
DRAWINGS FOR USE BY ANYONE OTHER THAN SPOKANE METAL PRODUCTS OF SPOKANE, WA  
IS STRICTLY PROHIBITED WITHOUT WRITTEN CONSENT.



SEPARATE FROM PICTURE

SECTION 13.0  
ASSEMBLY NO. 08-1018

MAJOR ASSEMBLY - AXLE ASSEMBLY

Type done 5/29 ✓

Sub Assy.	Item	Part No.	Quantity	Description	Wt. #
08-1018				Axle, Assembly, Front	
	1	07-1103	1	Tow Bar	23
	2	07-1104	1	Arm, Turning	16
	3	07-1005	1	Tie Rod	7.3
	4	07-11071	1	Axle, Front	53

✱

MOVE UP TO  
MARGIN



ASSEMBLY NO. 10-100042  
MAJOR ASSEMBLY - FRONT WHEEL ASSEMBLY  
SECTION 14.0 13.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
10-100042	--	--	2	FRONT WHEEL ASSEMBLY	116
	1	08-1011	1	BEARING AND HUB ASSY, FRONT	23
	2	08-10061	1	TIRE/WHEEL/TUBE ASSY	35

ADD AN ASSEMBLY  
PICTURE FOR THIS B.O.M.



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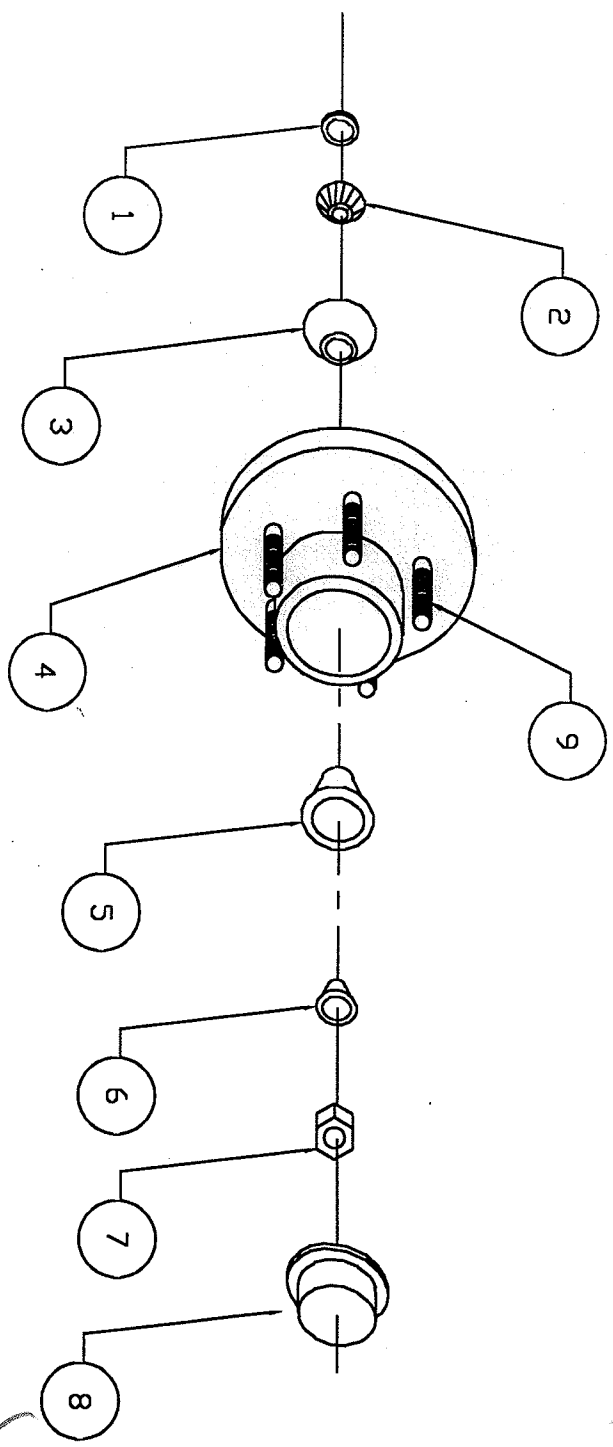


ASSEMBLY NO. 08-10061  
MAJOR ASSEMBLY - FRONT WHEEL ASSEMBLY  
SECTION 14.0 13.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-10061			1	TIRE/WHEEL/TUBE ASSY	35
	1	04-1020	1	WHEEL, SPLIT RIM	19
	2	04-1021	5	NUTS, LUG	1
	3	04-10221	1	TIRE, 10" E-RANGE FOR 400 & UP B-RANGE FOR 200 & DOWN	4
	4	04-1045	1	TUBE ASSY	11

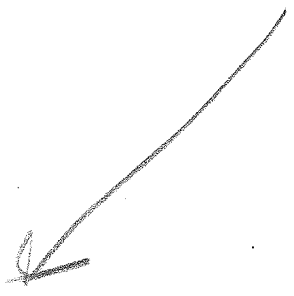
SECTION 14.0  
FRONT WHEEL ASSEMBLY  
BEARING AND HUB ASSY., FRONT

08-1011



ROTATE  
ALL BALLS

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MOVE UP TO MARGIN



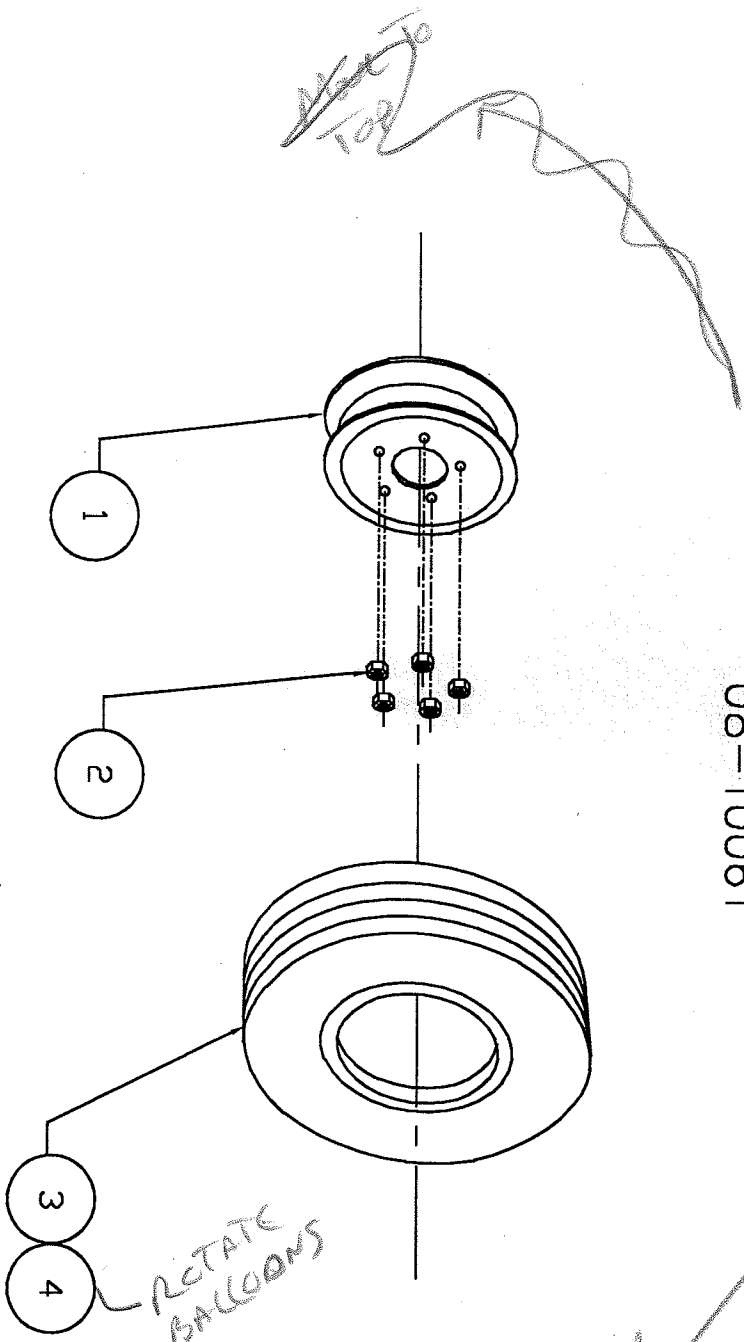
ASSEMBLY NO. 08-1011  
MAJOR ASSEMBLY - FRONT WHEEL ASSEMBLY  
SECTION 14.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
08-1011		04-1050	1	BEARING AND HUB ASSY, FRONT	23
	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	MIT. S[OMD;E	1
	8	04-1019	1	CAP, DUST	1
	9	02-1017	5	STUDS, HUB	1

SECTION 14.0

WHEEL ASSEMBLY FRONT

08-10061



Move To Top

1

2

3

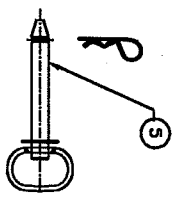
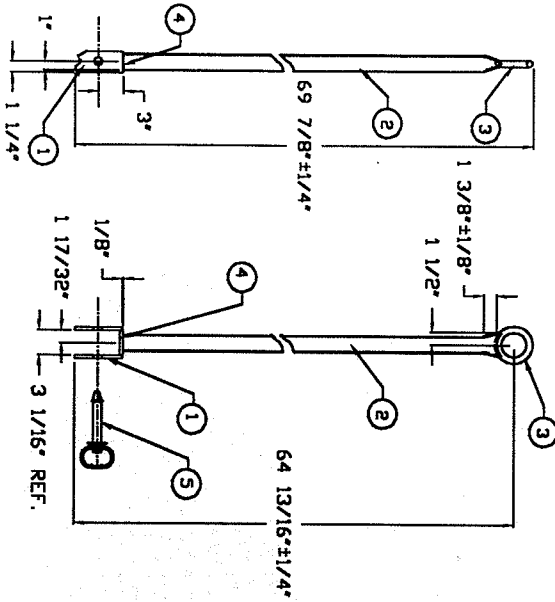
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ROTATE  
BALLOONS

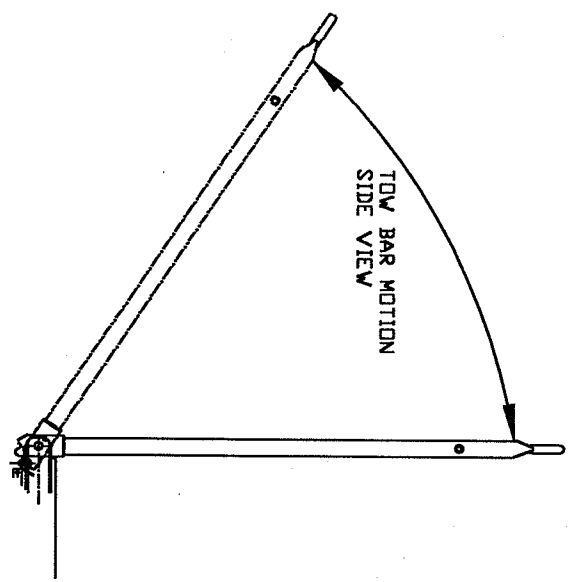
Move to  
Bottom

SECTION 15.0  
 TOW BAR  
 FABRICATED SUB-ASSEMBLY  
 07-1103

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HITCH PIN, W/ COTTER PIN  
 DETAIL

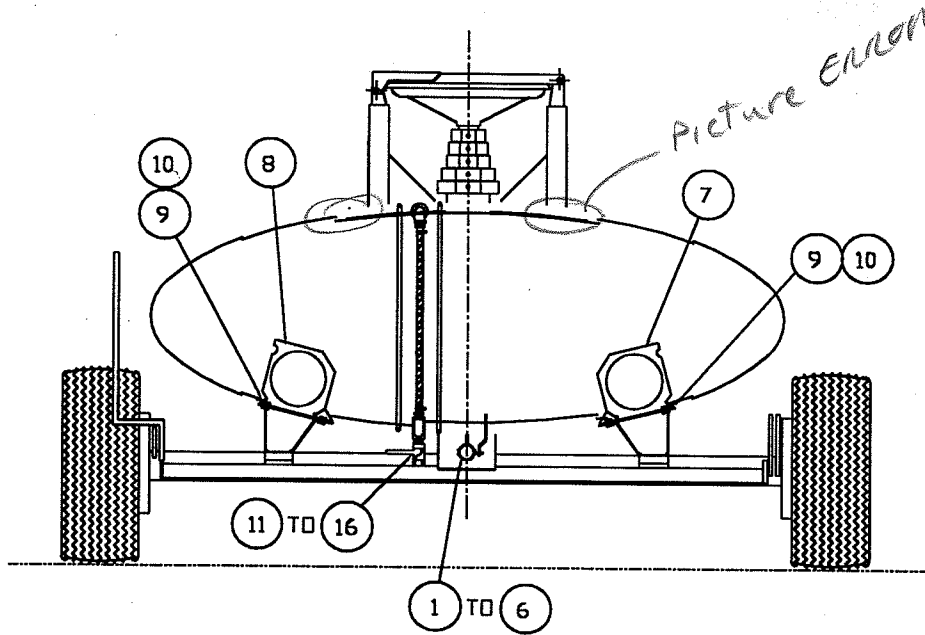
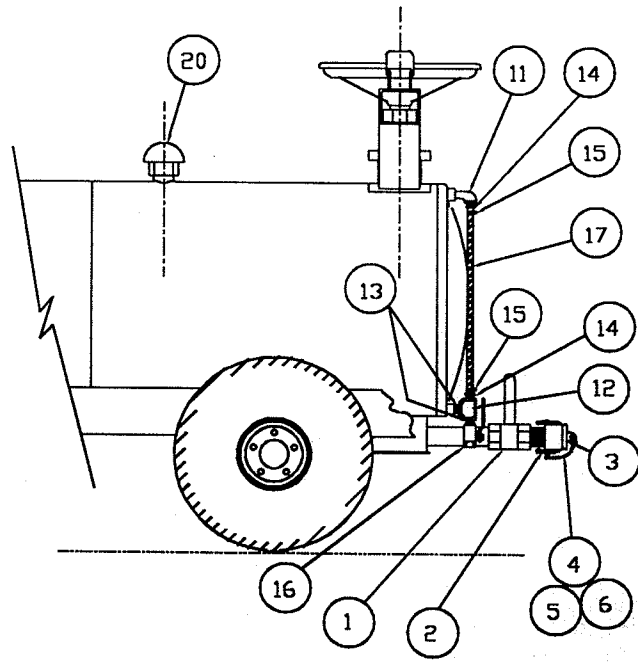


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ITEM	QNT.	PART NO.	DESCRIPTION
5	1	02-1304	HITCH PIN, W/ COTTER PIN
4	1	01-9682	FLAT BAR, 3/8"x2 1/2", 3'LG.
3	1	04-1052	HOOK RING, PINTEL, 4 1/2"ODx3"ID
2	1	01-80051	TUBING, FORMED, 2"O x 1/8"WALL
1	2	01-8305	TOE LATCH

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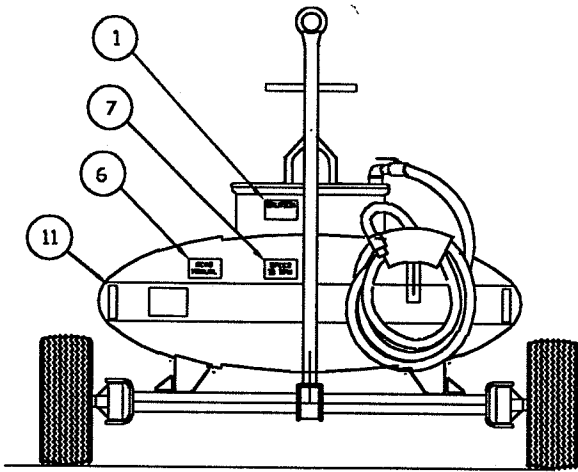
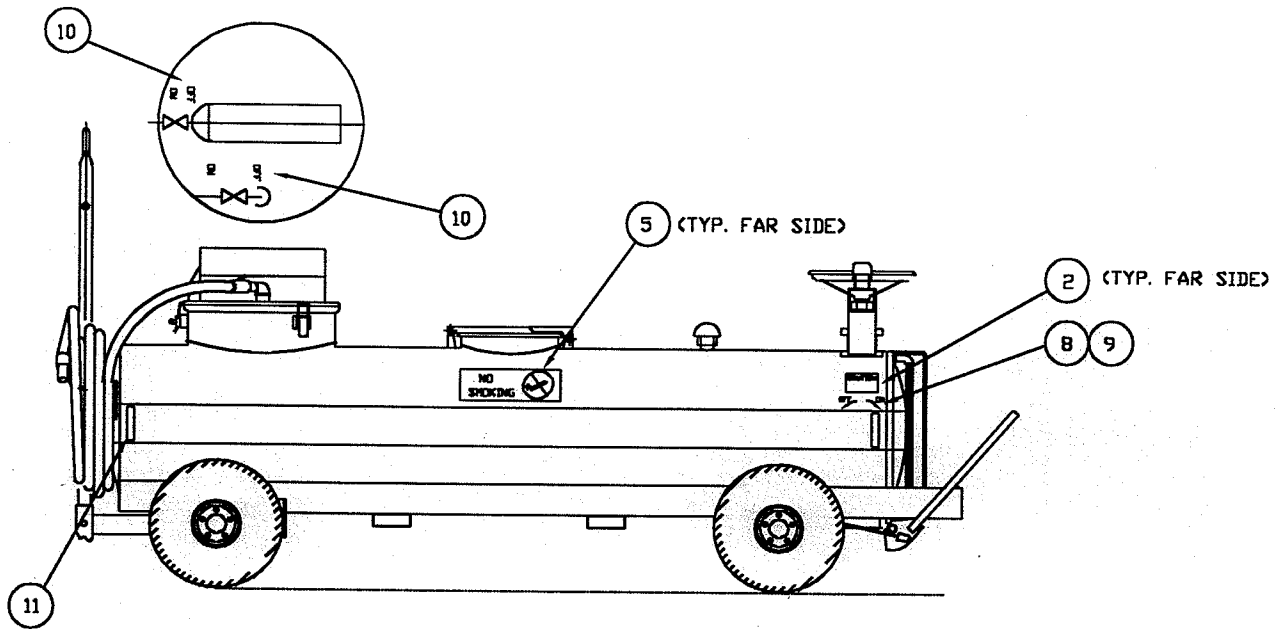


REAR VIEW

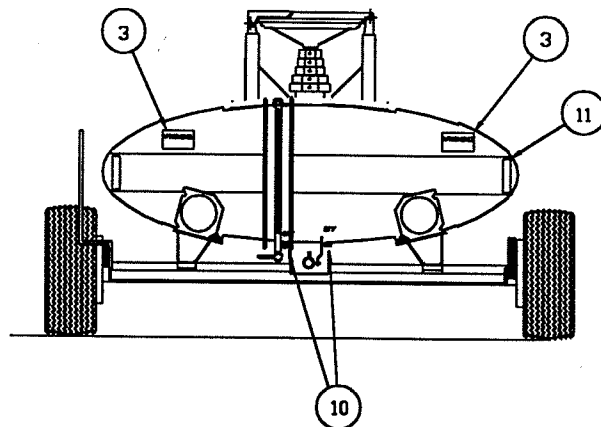
SECTION 16.0  
 MISCELLANEOUS FIXTURES  
 #10-100110

ASSEMBLY NO. 10-100110  
 MAJOR ASSEMBLY – MISC. FIXTURES  
 SECTION 16.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
10-100110			1	DRAIN ASSY	
	1	04-10321	1	VALVE, BALL LOCKING	6
	2	04-1033	1	COUPLER, CAMLOCK	1.5
	3	04-10331	1	PLUG, CAMLOCK	.5
	4	04-1034	1	CHAIN	.2
	5	04-1035	1	LINK	.1
	6	04-10351	1	HOOK, S-TYPE	.1
08-1013			1	GROUNDING REEL ASSEMBLIES	
	7	04-1036	1	REEL, GROUNDING CLAMP TYPE	12
	8	04-10361	1	REEL, GROUNDING PLUG TYPE	12
	9	02-10040	4	BOLT	.3
	10	02-100115	4	NUT	.1
08-1014			1	SIGHT GAUGE ASSY	
	11	03-0017S	2	ELBOW	.3
	12	03-1007	1	TEE	.3
	13	03-1008	2	NIPPLE	.3
	14	03-11130	2	HOSE BARB	.3
	15	03-1010	2	HOSE CLAMP	.3
	16	04-1032	1	VALVE, BALL	.3
	17	06-2527	1	TUBING	.3
	18				
	19				
04-1037	20	04-1037	1	VENT, MORRISON	1



FRONT VIEW



REAR VIEW

SECTION 17.0  
 DECAL PACKAGE  
 #10-100070

← MAKE THIS LOOK LIKE ALL OTHER DWG SHEETS



Move up to  
margin



ASSEMBLY NO. 10-100070  
MAJOR ASSEMBLY - DECAL PACKAGE  
SECTION 17.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
10-100070			1	DECAL PACKAGE	2.7
	1	06-1002	1	CAUTION, VACUUM SYSTEM	.1
	2	06-1003	1	CAUTION - PARK BRAKE	.1
	3	06-1004	2	WARNING,- GROUNDING REELS	.1
	4				
	5	06-1006	2	DANGER - NO SMOKING	.2
	6	06-1007	1	NOTICE - READ MANUAL	.1
	7	06-1008	1	MAXIMUM TOW SPEED	.1
	8	06-1010	1	ON/OFF - PARK BRAKE	.1
	9	06-1010	1	ON/OFF - PARK BRAKE	.1
	10	06-1011	8	ON/OFF DRAIN VALVE	.8
	11		8	REFLECTOR TAPE, 6"LG	.8
	12				

Shouldnt there be  
some kind of text  
section for this as well,  
(this would make it look  
like all the rest)

## SECTION 18

### UNIVERSAL DRAIN ASSEMBLY (UDA)

#### INTRODUCTION:

#### VACUUM GENERATOR AND UNIVERSAL DRAIN ASSEMBLY (UDA)

The use of a vacuum generator for the primary delivery of fuel into the bowser unit was based upon many optimal benefits. The generator is economical to operate, compact in size, low cost, minimal maintenance as well as built to lightweight construction with no moving parts.

To obtain optimum benefit from your vacuum system it is recommended that all personnel operating it read and understand this section prior to operating.

Upon receipt of the unit, a visual inspection should be made to determine that it is complete and has not sustained any damage during transportation.

When compressed air is forced through a double conical nozzle its velocity increases and the pressure decreases. Vacuum generators operate on this principle, which creates vacuum without a single moving part.

If the aircraft is equipped with a "POP-IT", also known as a "PENCIL" type low point drain then the fuel bowser should be able to hook up and function properly.

The vacuum lid assembly is provided with quick connects for attaching the suction fuel delivery lines.

There are (4) four ½" inch suction fuel delivery lines provided on the lid of the vacuum assembly.

If the vacuum probes do not work, you will have to find a Sumping tool adapter to enable hook up.

## SECTION 18

### UNIVERSAL DRAIN ASSEMBLY (UDA)

#### OPERATIONS

18.0 Safety Note: Review Safety Section prior to operating or maintaining (UDA).

#### 18.1 Operation

18.1.0 Setting up the Universal Drain Assembly (UDA) with the suction fuel delivery lines to the aircraft low point pencil drains:

- 1) (Item #C4) on the drawing shows a set of probe tips with the same diameters and different lengths. The service technician will have to determine which length works best for the type of pencil drain provided with the aircraft. Thread the selected probe tip into the probe (Item # C1)  
(NOTE: If you choose a tip length too short no or little flow occurs. If you choose a tip length too long, proper sealing between (Item #B1) and the aircraft will not be achieved and the unit could fall and be damaged.)
- 2) A good clean sealing surface is required around the pencil drain for the sumping cup, (Item #B1), to vacuum seal. If the aircraft has seams or uneven surfaces an artificial mating surface may need to be considered.
- 3) There is a check valve provided, (Item #A5), on the ¼ inch clear tube line. Insure this check valve is installed, and that the direction of flow goes from (Item #B1) toward (Item #A9). This line is required for providing a vacuum area between the inner and the outer gasket seals (Items # B2 & B3) provided with the sumping cup.
- 4) Connect the female quick coupler (Item # A9) on each of the ¼ inch clear lines to the male quick couplers (Item #H2) and manifolds (Item # H1) located on the vacuum generator cover.
- 4) Connect the opposite end of the ¼ inch clear line assembly (Item #A4) to the sumping cup (Item #B1) 1/8 inch NPT port that is provided.
- 6) Connect the male quick coupler (Item E1) on each black ½ inch line x 25 Feet long, to the female quick couplers (Item # F4) located on the vacuum lid assembly.

- 7) Connect the male quick coupler (Item #D3) on each black ½ inch line x 3 feet long to the female quick coupler (Item # E2) on the black ½ inch line x 25 feet long.
- 8) Install the vacuum probe (Item #C1) into the sumping cup center (Item # B1) by inserting probe and turning 90 degrees to lock into place.
- 9) Cover the inner and outer gasket seals (Items #B2 & B3) with a light coat of petroleum jelly.
- 10) Close each of the 1/8 inch slider valves (Item #A3) located on the sumping cups where the ¼ inch clear lines attach to the sumping cups by sliding the knurled valve ring away from the sumping cup.
- 11) Connect 1/2 inch minimum air supply line to the vacuum generator inlet twist coupler making sure that both vacuum generator ball valves are in the off position. (Note: the air supply recommended is 40 to 60 CFM at 80 to 100PSI) (Note: make sure that all aircraft fuel tank or fuel cell vents are open prior to any defueling or damage to the aircraft will occur.)
- 12) Turn on the small vacuum generator (Item #J1) by opening the ¼ inch ball valve (Item #J6) located on the left side of the centered main vacuum generator on the top of the vacuum lid.
- 13) Align the vacuum probe (Item #C1) with the proper tip (Item #C4) installed to the aircraft "POP-IT" (pencil) low point drain on the wing and the fuselage low point drains.
- 14) Open the 1/8 inch slide valve (Item #A3) on the selected cup (Item #B1) to attach to aircraft by moving the knurled ring toward the sumping cup and attaching the cup/probe (Items #B1 & C3) into the low point drain making sure probe tip is centered on the low point drain.
- 15) Observe the clear ¼ inch line (Item #A4) for fuel leaking past inner seal (Item #B3). If any fuel is present in the ¼" inch line (Item #A4) remove sumping cup assembly (Item #B1) by reversing the previous directions. Re-seal or replace the seals (Items #B2 & B3) as required.
- 16) Turn on the large vacuum generator by opening the ½ inch ball valve located on the centered main vacuum generator on the top of the vacuum lid.
- 17) Slowly open up the 1/2 inch quick coupler ball valves (Item #F2) located on the vacuum lid for only the black ½ inch lines to be used, watching for leaks and seepage past the seals. Repair as required to stop any leaks.

- 18) Reinstall sumping cup if required.
- 19) Commence with defueling operation only when all observations prove a proper seal tight operation.
- 20) Once the operation has started the fuel is delivered from the aircraft to the vacuum.
- 21) **For the intermittent vacuum type units only:**  
the vacuum chamber is equipped with an automatic drain valve that opens when vacuum is eliminated in the chamber. This valve opens directly into the main tank.
- 22) The vacuum generator is equipped with a float actuated automatic overflow shutoff. When the vacuum chamber or the tank is full the float valve shuts off and eliminates the vacuum. (On the intermittent type units the vacuum chamber will then automatically drain and the air supply must be shut off to reset the overflow valve before defueling can continue.)

## 18.2 Maintenance

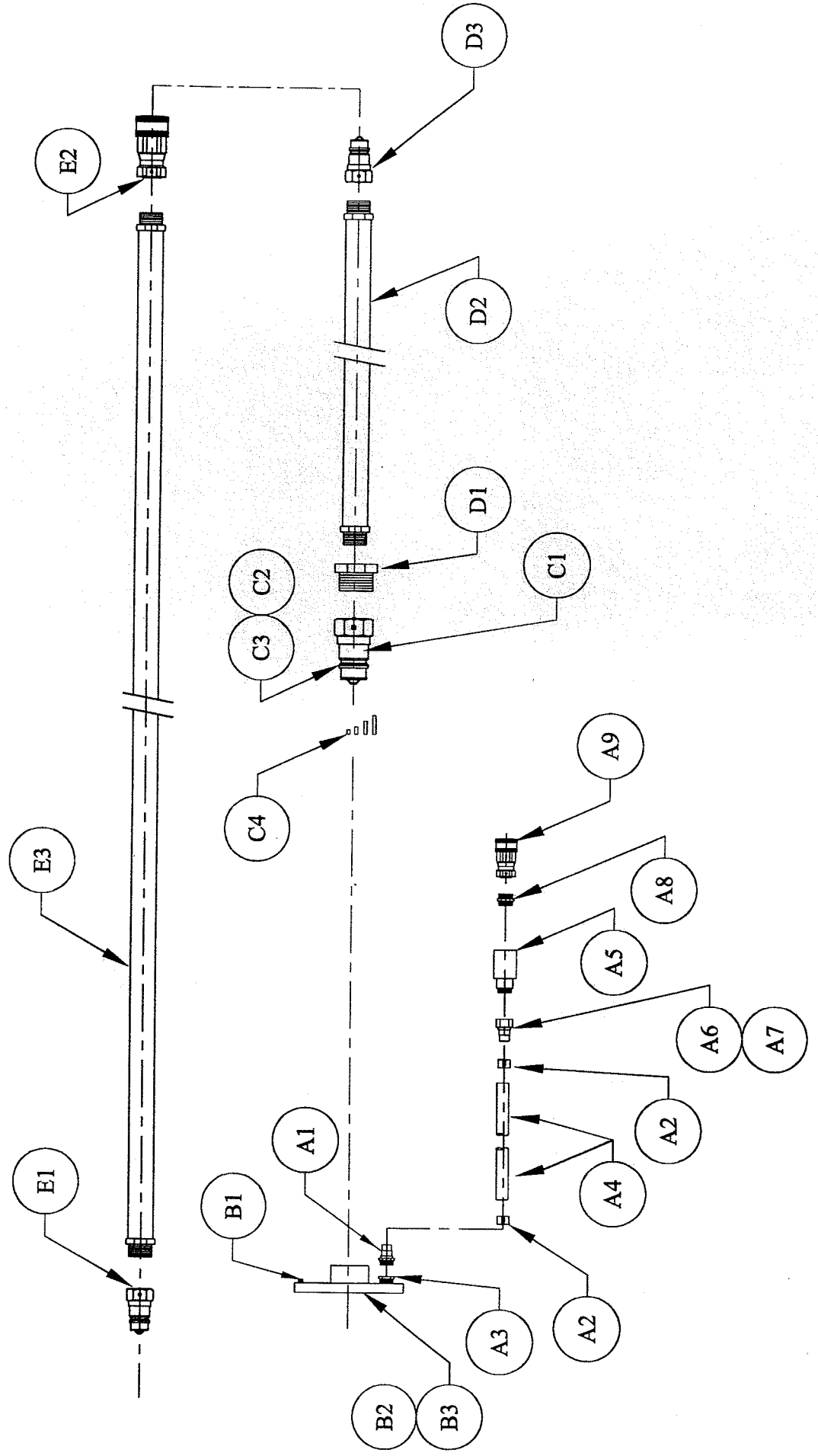
- 1) The vacuum generator is supplied with a filtered exhaust silencer. Remove and wash this with soap and water. Thoroughly dry and reinstall as needed.
- 2) All vacuum hoses should be inspected regularly for cracking. Any sudden loss of vacuum suction power may indicate a crack in the hose lines, replace if any cracks, deformation or any leakage is visible.
- 3) Check both inner and outer sumping cup seals prior to each usage, Replace if any cracks or deformation is visible.
- 4) Check the "O-Ring" Seal on the probe prior to each usage replace if any cracks or deformation is visible.
- 5) Check probe tips to ensure that they are not bent or damaged, replace as required.
- 6) Check all components regularly

Section 18.0

Assembly Part No. 08-14000

Universal Drain Assembly (UDA)

Item No.	PART #	QTY.	DESCRIPTION
<b>08-14001</b>	<b>Assembly</b>	<b>4</b>	<b>Sumping Cup assembly, consisting of :</b>
A1	03-111334	1	HOSE BARB, BRASS 1/8 NPT x 1/4" Barb #29-42
A2	03-10105	2	CLAMP, OITKER 1/2 #11/13
A3	04-10325	1	Slider valve, 1/8" Brass, #250
A4	06-2526	1	TUBING, 1/4 X 1/2 OD PVC X 25'-0" #510
A5	04-10099	1	CHECK VALVE, BRASS, LINDE #639110
A6	03-111336	1	HOSE BARB ADAPTOR, BRASS, LINDE #17
A7	03-111337	1	NUT, BRASS, LINDE #7
A8	03-111338	1	BUSHING, BRASS, LINDE #32
A9	03-111398	1	QUICK DISCONNECT 1/4 FEMALE #BH2-60
<b>08-0200</b>	<b>Sub-Assembl</b>	<b>1</b>	<b>Sumping cup sub-assembly consisting of:</b>
B1	05-1040	1	SUMPING CUP, MACHINED ALUMINUM
B2	06-0075	1	Seal, 4.75" OD, Viton (40 Dur), 3/16 X 1/2 (R/S 06-0072)
B3	06-0074	1	Seal, 2" ID, Viton (40 Dur), 3/16 X 1/2 (R/S 06-0072)
<b>08-14006</b>	<b>Assembly</b>	<b>4</b>	<b>3foot pigtail/probe, consisting of :</b>
<b>08-0100</b>	<b>Sub-Assembl</b>	<b>1</b>	<b>Vacuum fuel probe sub-assembly , consisting of:</b>
C1	05-1037	1	PROBE, MACHINED ALUMINUM
C2	02-1350	2	Roll Pin, .3/32" OD x 1/4" LG. #92373A139 18-8 SS
C3	06-00684	1	O-RING PART NO. 2- 214
C4	01-9187S	5	Probe pins, 8-32 thread /.204/.366/.616/.866/1.25 Lg SS
<b>08-0150</b>	<b>Sub-Assembl</b>	<b>1</b>	<b>Hose,probe pigtail sub-assembly, consisting of:</b>
D1	03-10155	1	BUSHING, BRASS, 3/4 TO 1/2 #3220 X 12 X 8
D2	06-10166	1	Aircraft Defueling hose, 1/2" x 3'Lg w/ 1/2" M-NPT ends
D3	03-111395	1	QUICK DISCONNECT, 1/2 MALE, #BH4-61
<b>08-14003</b>	<b>Assembly</b>	<b>4</b>	<b>25 foot hose assembly, consisting of :</b>
E1	03-111395	1	QUICK DISCONNECT 1/2 MALE, #BH4-61
E2	03-111394	1	QUICK DISCONNECT 1/2 FEMALE, #BH4-60
E3	06-10166	1	Aircraft Defueling hose, 1/2" x 25'Lg w/ 1/2" M-NPT ends





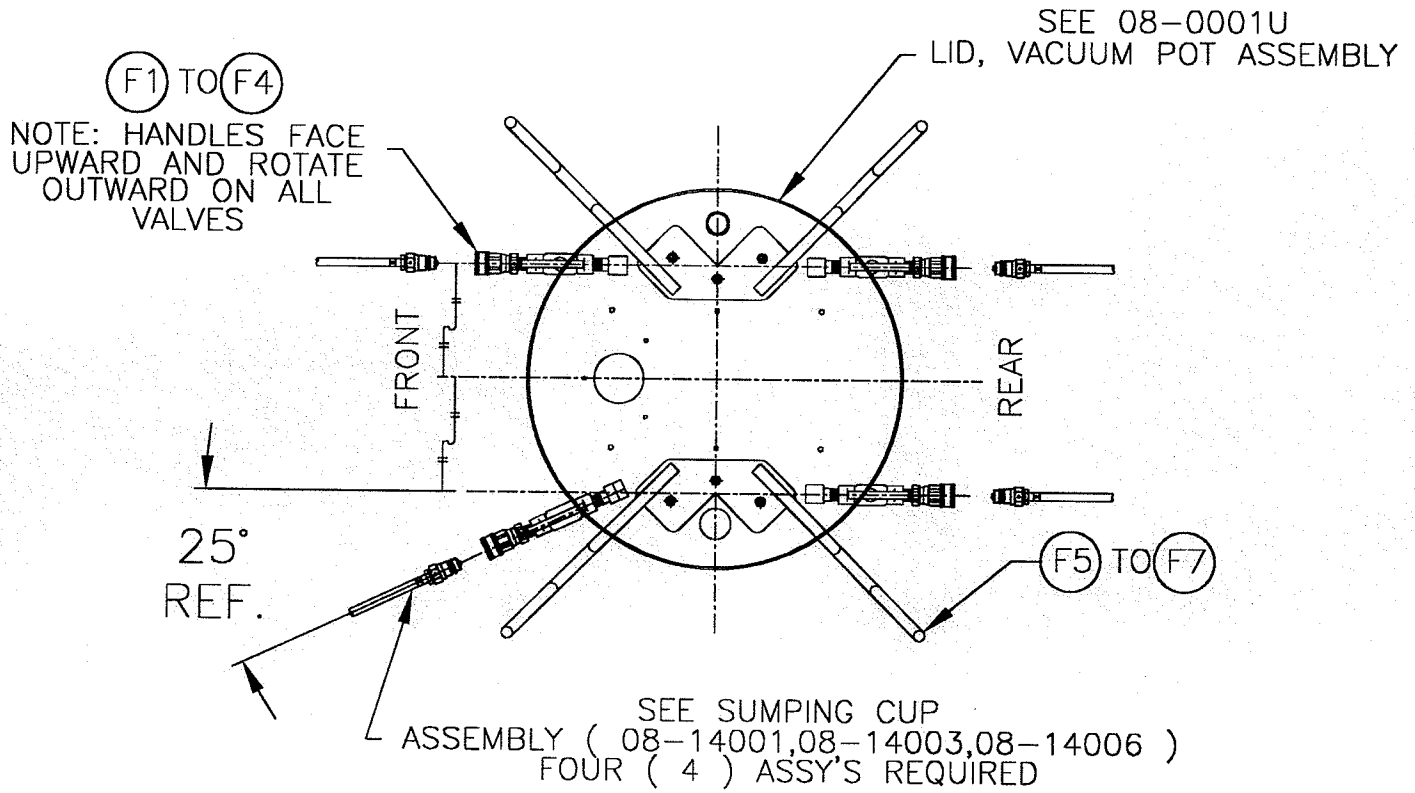
Continued

## Section 18.0

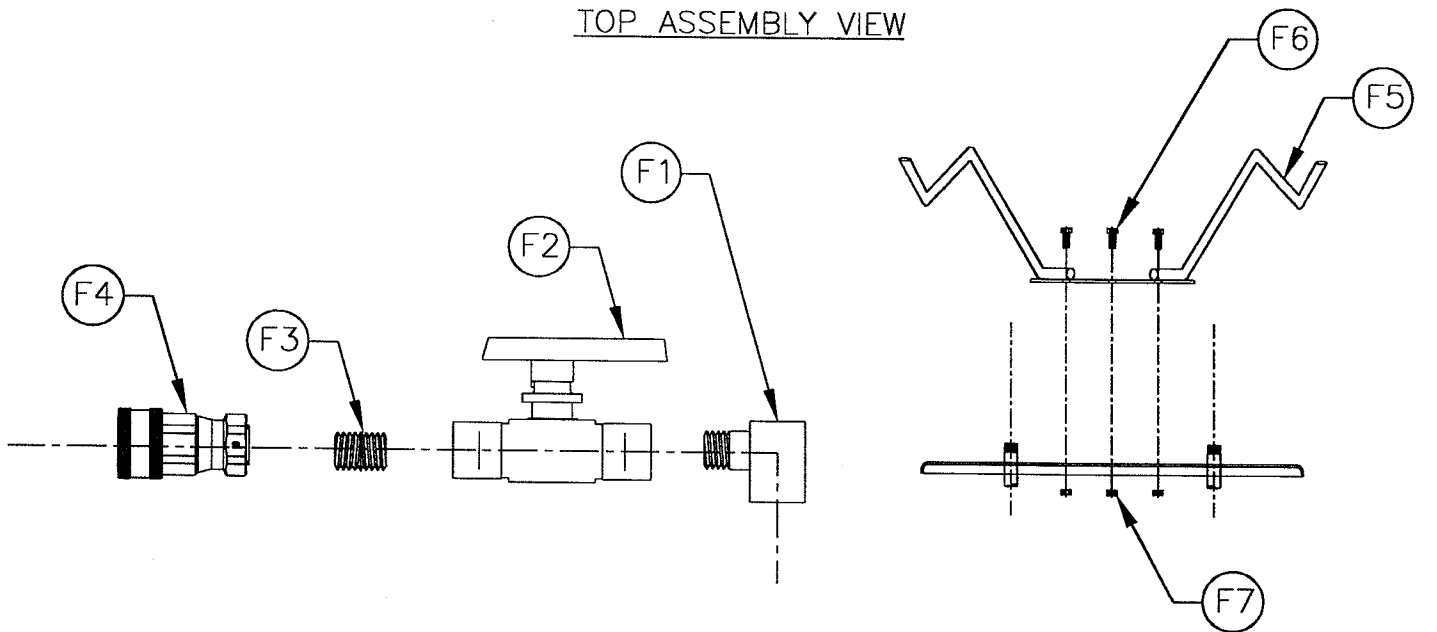
Assembly Part No. 08-14000

Universal Drain Assembly (UDA)

Item No.	PART #	QTY.	DESCRIPTION
<b>08-14004</b>	<b>Assembly</b>	<b>1</b>	<b>Sumping probe adaptors, consisting of :</b>
F1	03-1006	4	Elbow, Brass street, 1/2 #3400-8
F2	04-2507	4	VALVE,BRASS, 1/2 APOLLO BALL #70-103-01
F3	03-10081	4	CLOSE NIPPLE,BRASS, 1/2 #3326-8
F4	03-111394	4	QUICK DISCONNECT, 1/2 FEMALE, #BH4-60
F5	07-1075	2	SUMPING HOSE SUPPORT BRACKET
F6	02-100115	6	BOLTS, 3/8" NC 1" LG.T-304SS
F7	02-1202	6	NUTS. 3/8" NC NYLOC, T-304SS
<b>08-14002</b>	<b>Assembly</b>	<b>1</b>	<b>Vacuum Mainfold Assembly, consisting of:</b>
H1	05-1046	2	Vacuum manifold blocks, Machined Aluminum
H2	03-111397	4	QUICK DISCONNECT, 1/4 MALE #BH2-61
H3	03-10252	2	PLUG, BRASS, 1/4 NPT #3151-4
H4	03-10015	2	PLUG, BRASS, 1/8 NPT #3151-2
H5	02-10015	4	BOLT, HEX, 5/16 X 1-3/4 LG. T-304 SS
H6	02-12012	4	NUT, 5/16 T-304 SS
<b>08-14005</b>	<b>Assembly</b>	<b>1</b>	<b>Vacuum pump Assembly, consisting of:</b>
J1	04-100035	1	Vacuum Pump, 1/8" Intake/1/4" Outlet, #41605K14
J2	03-10058	2	Tee, 1/2" Brass #3700-8
J3	03-11135	2	Bushing, 1/2" x 1/4" Brass #3220-8-4
J4	03-10692	1	Nipple, 1/4" x 1.5" lg Brass # 3327-4
J5	03-11136	1	Street El, 1/4" x 90 #3400-4
J6	04-2506	1	Valve, Ball, 1/4" Brass #70-101-01
J7	03-11133	1	HOSE BARB, BRASS 1/4 NPT x 1/4" Barb #29-44
J8	06-2526	1	TUBING, 1/4 X 1/2 OD PVC X 12" #510
J9	03-10105	2	CLAMP, OITKER 1/2 #11/13
J10	03-111334	1	HOSE BARB, BRASS 1/8 NPT x 1/4" Barb #29-42
J11	03-10690	1	CLOSE NIPPLE,BRASS,1/4 #3325-4
J12	06-10166	1	Aircraft Defueling hose,1/2" x 22" Lg w/ 1/2"M-NPT ends
J13	06-10166	1	Aircraft Defueling hose,1/2" x 24" Lg w/ 1/2"M-NPT ends
J14	01-8425	1	Shim Block, 1/2" x 1-1/4" x 3" Aluminum
J15	02-1510	2	Slotted Head Capscrew, #10-32 x 1-3/4" SS
J16	01-1210	2	Hex Nut, #10-32 SS
J17	03-10081	1	CLOSE NIPPLE,BRASS, 1/2 #3326-8

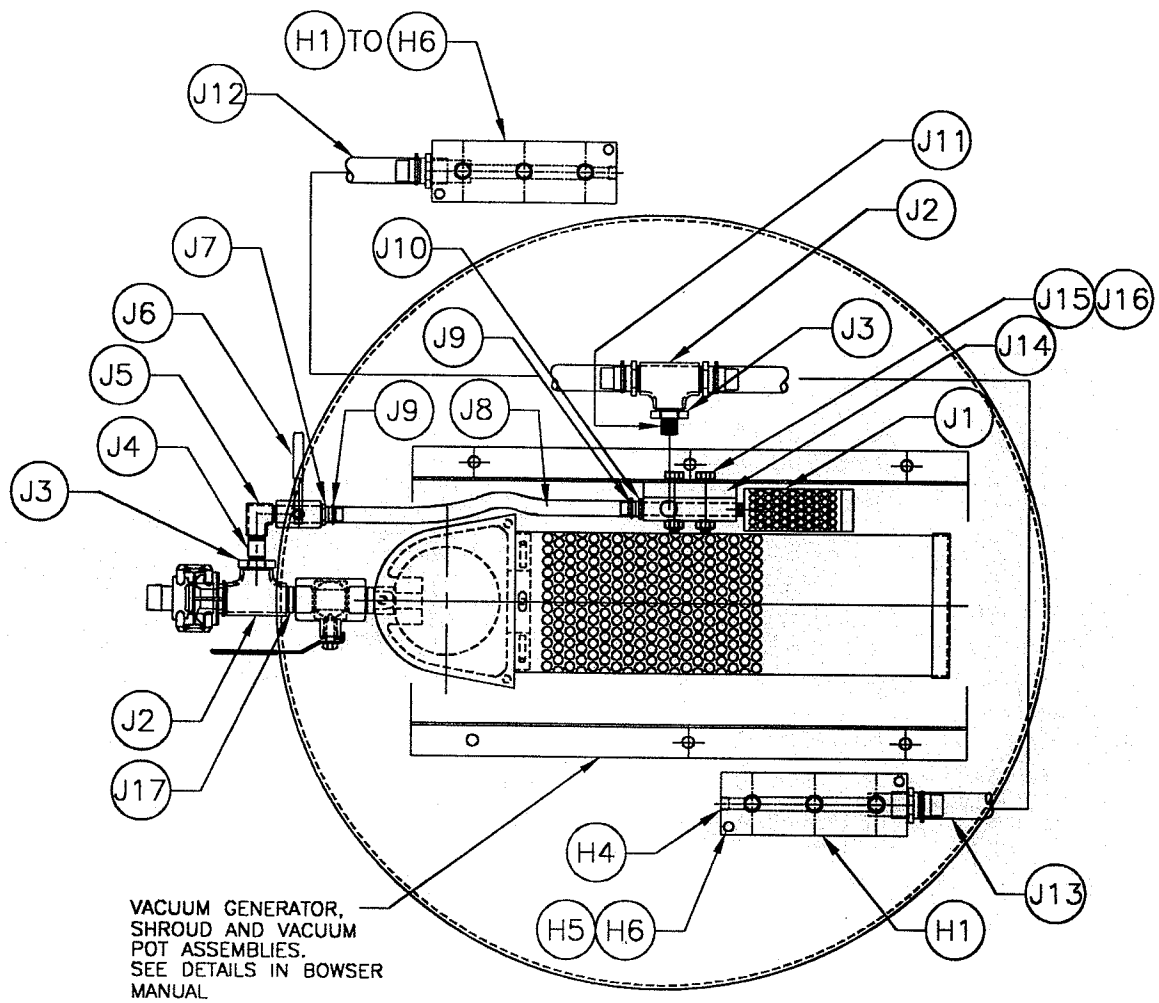


TOP ASSEMBLY VIEW

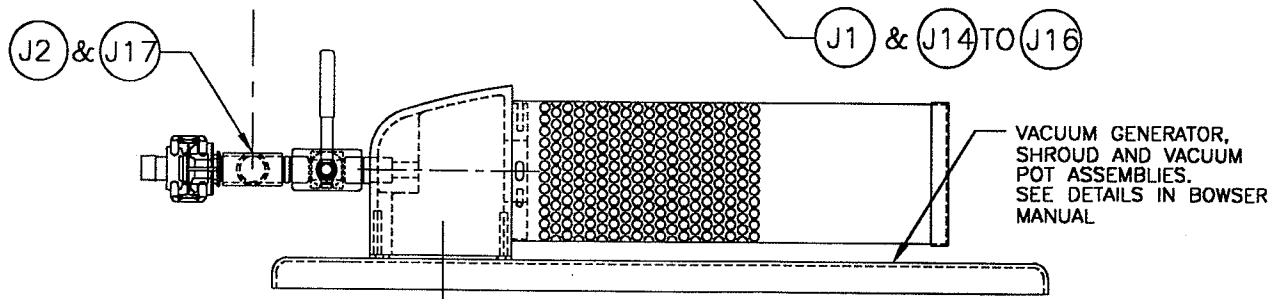
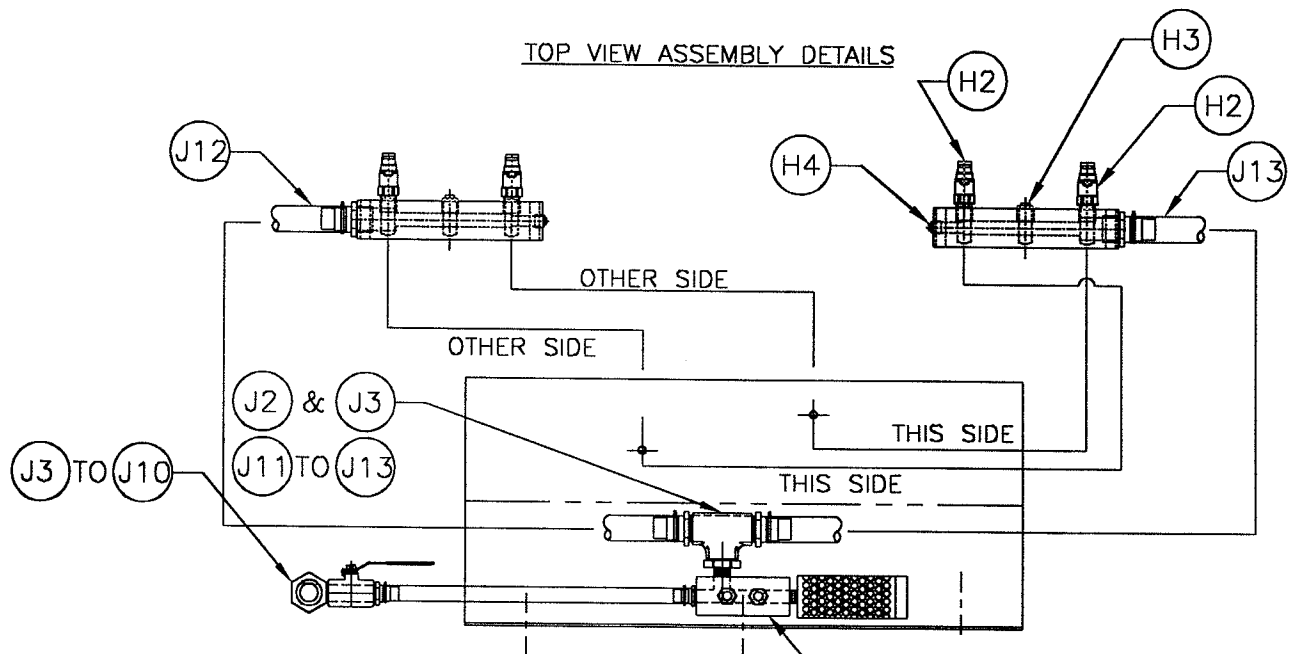


VALVE ASSEMBLY

HOSE HANGER SUPPORT BRACKET



TOP VIEW ASSEMBLY DETAILS



SIDE VIEW ASSEMBLY DETAILS

**Section 19**  
**Remote Funnel**

~~19-1~~ ~~19.0~~ Safety Note: Review Safety Section "B" prior to operating or maintaining fuel bowser.

~~19-2~~ ~~19.1~~ Operation

~~19.1.0~~ The Remote Funnel is intended for use in draining and collection of fuel  
~~19.2.1~~ from aircraft in conjunction with transportation via the vacuum system of a fuel bowser. Any other use is prohibited and may void any and all warranties.

~~19.1.1~~ The Remote Funnel is equipped with a telescoping drain assembly. It is  
~~19.2.2~~ capable of being adjusted from 21-1/2" to 51-1/2" high.

~~19.1.2~~ To Raise:

- ~~19.2.3~~ 1) ~~a~~ Loosen top clamp if necessary.
- 2) ~~b~~ Grasp top section with one hand and lift until the top clamp raises approximately (6) six inches.
- 3) ~~c~~ Tighten clamp securely with the other hand.
- 4) ~~d~~ Reposition lifting hand by grasping tube below tightened clamp and lift until next clamp is raised approximately (6) six inches.
- 5) ~~e~~ Repeat steps 1-4 until desired height is obtained or assembly is fully extended.

~~19.1.3~~ To Lower:

- ~~19.2.4~~ 1) ~~a~~ Tightly grasp bottom extended tube with one hand and loosen the securing clamp.
- 2) ~~b~~ Slowly lower tube, hand over hand, until the following clamp is resting on the loosened clamp.
- 3) ~~c~~ Repeat steps 1 and 2 until all sections are lowered.

~~19.1.4~~ Funnel is equipped with nitrile rubber seal around the top edge to allow  
~~19.2.5~~ placement against the underside of a wing.

~~19.1.5~~ When not in use, ~~telescope~~ <sup>ALL TELESCOPING SECTIONS</sup> should be collapsed and the cover closed to  
~~19.2.6~~ eliminate contamination.

~~19.2~~ Maintenance

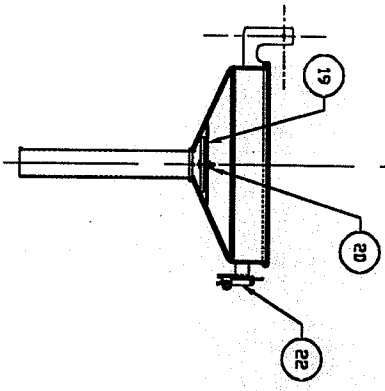
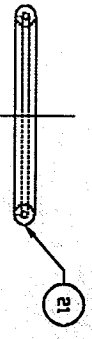
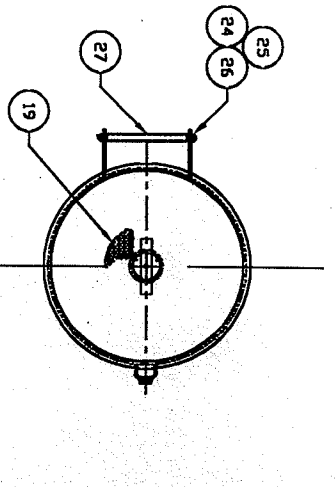
~~19.3~~

~~19.2.0~~ The Remote Funnel consists of a stainless steel base 3-1/2" in diameter  
~~19.3.1~~ provided with a tripod support and (2) two aluminum tube sections.

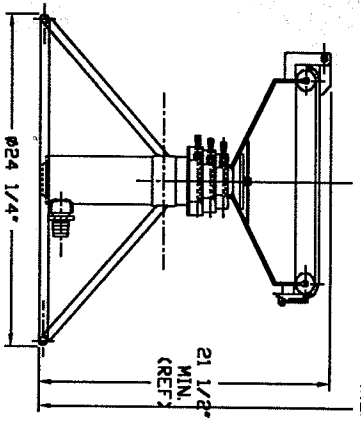
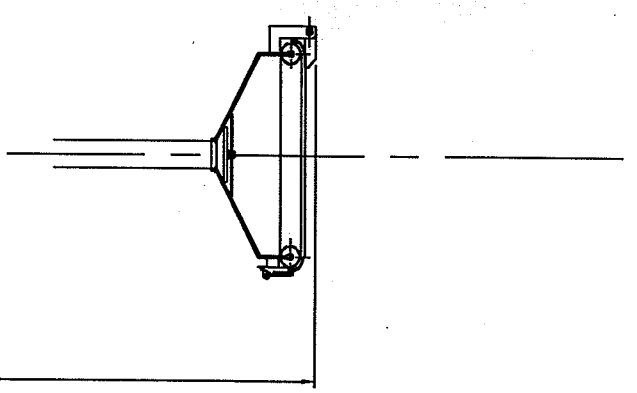
19.3.2 19.2.1 The stainless tube and (2) two aluminum tubes are equipped with a clamp assembly.

19.3.3 19.2.2 Each aluminum tube is crimped on the lower end which acts as a stop to prevent the tube from sliding through the clamp.

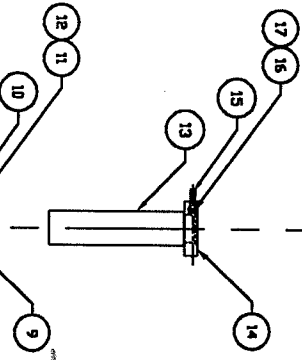
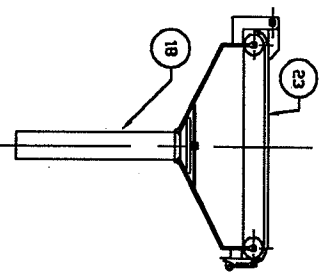
19.3.4 19.2.3 Disassembling of the telescope assembly is accomplished by rotating the (3) three sections 180 degrees from normal position and gently lifting each section so that the crimped edge on the tube is aligned with the slot on the clamp.



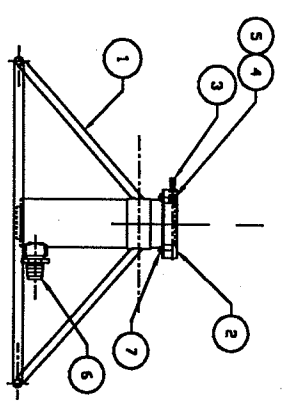
FUNNEL SECTION ASSEMBLY



FUNNEL ASSEMBLED DETAIL



ROTATE ALL BALLONS



EXPLODED ASSEMBLY DETAILS

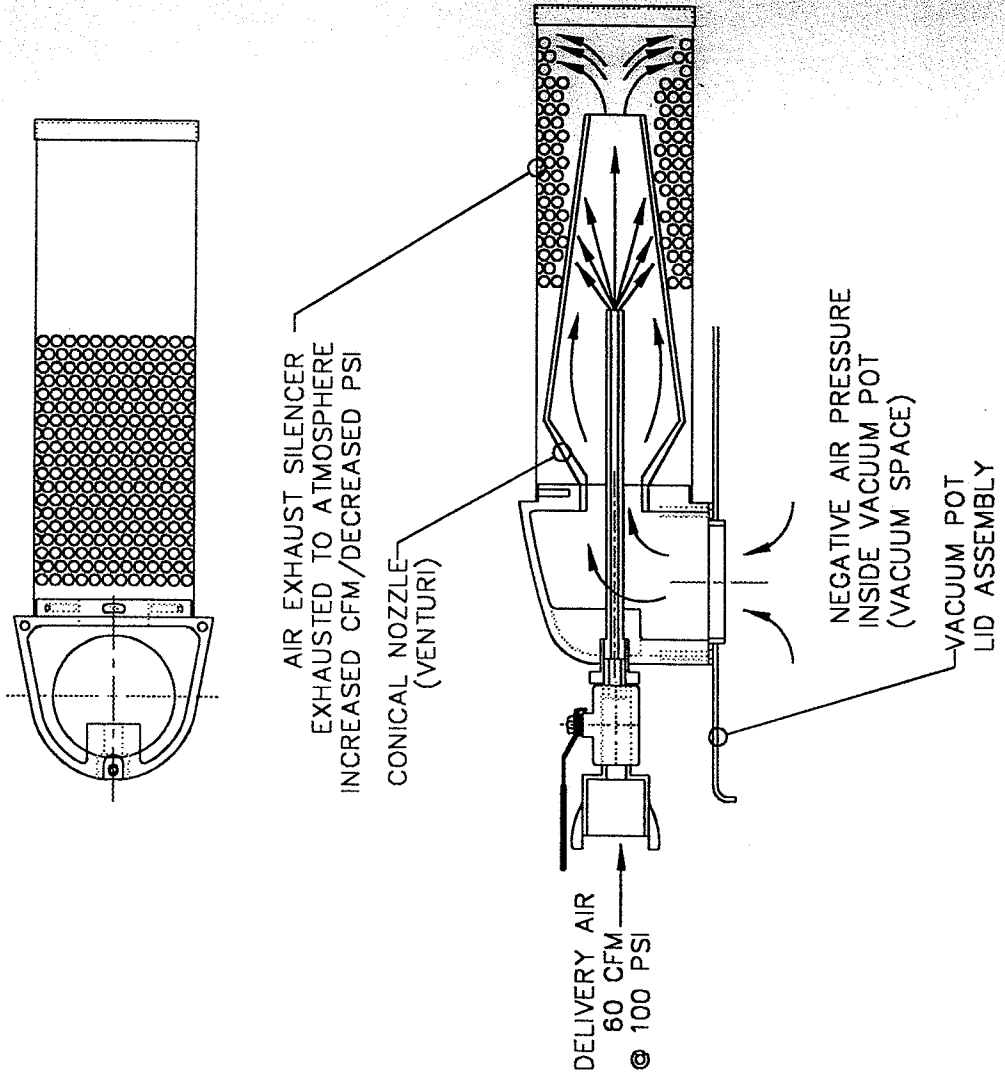
SECTION 19.0  
 REMOTE DRAIN FUNNEL ASSEMBLY  
 #07-1110U

→ MOVE TO THIS END

ASSEMBLY NO. 07-1110U  
 MAJOR ASSEMBLY - UNIVERSAL SUMPING ASSEMBLY *REMOTE FUNNEL*  
 SECTION 19.0

SUB ASSY	ITEM	PART NO.	QTY	DESCRIPTION	WT. #'S
07-11103			1	REMOTE DRAIN FUNNEL, BASE	17
	1	07-1100	1	BASE SECTION FAB S/S	
	2	05-10012	1	CLAMP, BASE	
	3	02-100181	1	SCREW, CLAMP	
	4	05-0037	1	PLASTIC	
	5	04-0093	1	HELICOIL	
	6	03-1003	1	HOSE ADAPTER	
	7	02-10010	3	CLAMP BOLT	
07-11104			1	REMOTE DRAIN FUNNEL, LOWER	2.5
	8	01-92452	1	TUBE, 3" O.D.	
	9	05-10022	1	CLAMP, LOWER	
	10	02-100181	1	SCREW, CLAMP	
	11	05-0037	1	PLASTIC	
	12	04-0093	1	HELICOIL	
07-11105			1	REMOTE DRAIN FUNNEL, MID	1.75
	13	01-9242	1	TUBE, 2-1/2" O.D.	
	14	05-10032	1	CLAMP, MID	
	15	02-10015	1	SCREW, CLAMP	
	16	05-0037	1	PLASTIC	
	17	04-0093	1	HELICOIL	
07-11106			1	REMOTE DRAIN FUNNEL, TOP	13
	18	01-82501	1	FUNNEL, CAST ALUM ASSY	
	19	04-1039	1	DEBRIS SCREEN	
	20	02-1200	1	LOCK NUT	
	21	06-1022	1	NYTRIL GASKET	
	22	04-1053	1	DRAW LATCH	
07-11107		07-1116	1	REMOBE FUNNEL LID ASSY	12
	23	01-9007	1	LID FABRICATION	
	24	01-91984S	1	ROD, THREADED	
	25	02-1200	2	LOCK NUT	
	26	02-1200S	2	WASHER	
	27	01-9233S	1	PIPE	

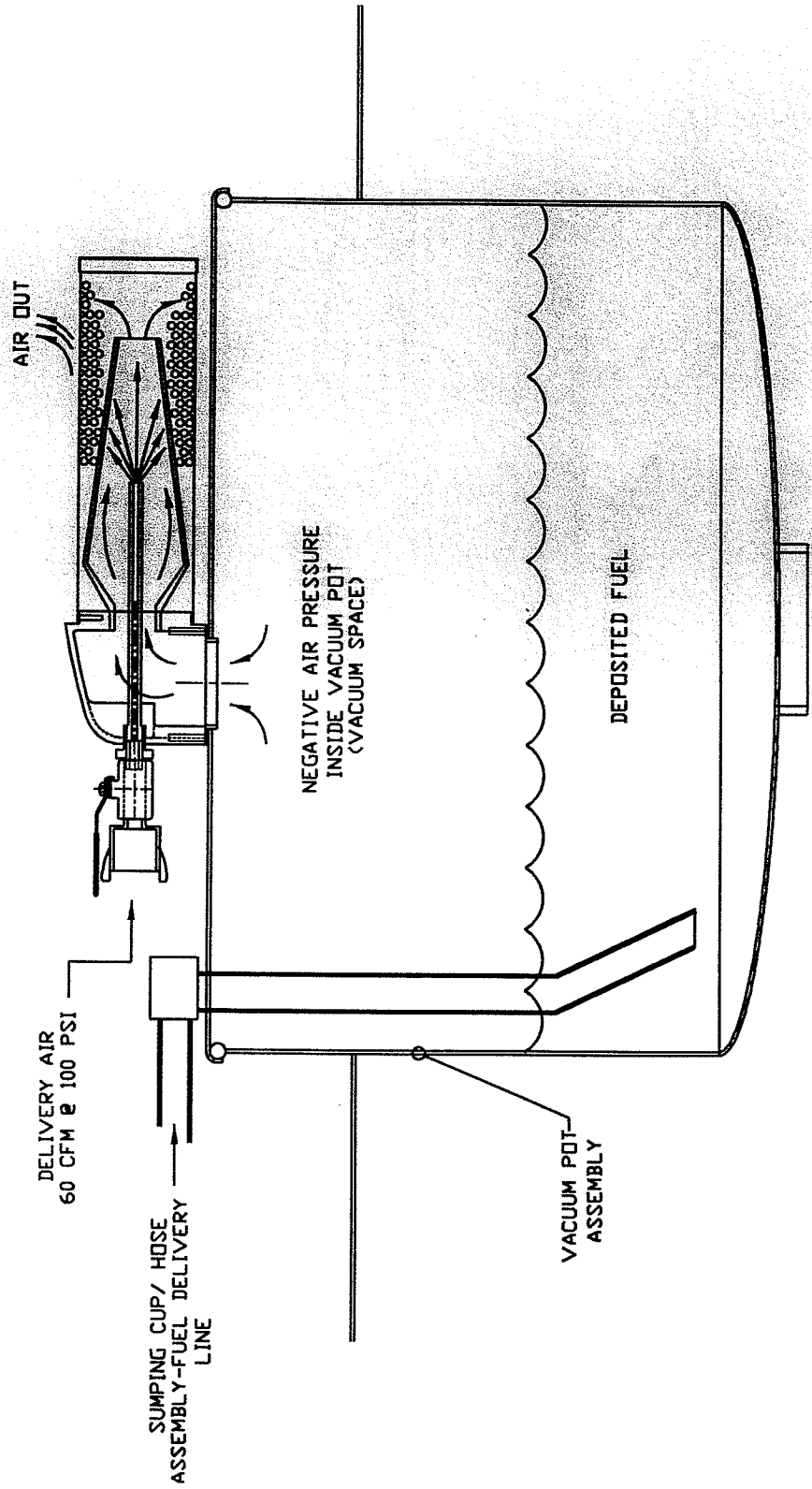
SECTION 18  
UNIVERSAL SUMPING ASSEMBLY



HIGH SPEED AIR PRESSURE CREATES  
A NEGATIVE PRESSURE INSIDE THE  
VACUUM POT THERE BY EVACUATING  
THE AIR OUT OF THE VACUUM POT  
AND CREATING SUCTION IN THE SUMP--  
ING CUP/ HOSE ASSEMBLY, SUCKING  
FUEL INTO THE VACUUM POT REPLAC--  
ING THE NEGATIVE VOID.



SECTION 18  
UNIVERSAL SUMPING ASSEMBLY



## SECTION 18

### UNIVERSAL DRAIN ASSEMBLY (UDA)

#### SAFETY

The vacuum generator is an air-operated generator. An air supply of 40 to 60 CFM @ 80 to 100 PSI is recommended to operate this system. Smaller capacity air supply will result in decreased performance.

Check the air pressure of supply lines to the vacuum generator to assure it is not in excess of 100 PSI.

Parking brake must be applied when operating the vacuum system.

The vacuum system should never be used inside of an enclosed area. Proper ventilation is required at all times.

Due to the nature of fuel, care should be exercised to eliminate all sparks and open flames in the area of the vacuum system.

To eliminate static sparks, prior to operating the vacuum system connect the grounding reels to the proper ground and to the Aircraft to be defueled.

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.

If other objects such as rock or metallic pieces are vacuumed into the vacuum system they may create a hazard due to sparks.

Prior to any defueling to the aircraft you must insure proper venting to the aircraft fuel tanks or fuel cells or damage to the aircraft will occur.