



# PNEUMATIC TANK TRAILERS

O W N E R ' S M A N U A L



E X P E R I E N C E E X C E L L E N C E

For more information, visit us at  
[www.MACTrailer.com](http://www.MACTrailer.com) or call us **1-800-795-8454**



<b>1.</b>	<b>Introduction And Warranty</b> .....	<b>2</b>
1.1	Introduction.....	2
1.2	Warranty.....	2
<b>2.</b>	<b>Safety</b> .....	<b>3</b>
2.1	Safety.....	3
2.2	Towing Hazards.....	3
2.2.1	Driving Too Fast.....	3
2.2.2	Trailer Not Properly Coupled To Truck.....	4
2.2.3	Overloading.....	4
2.2.4	Improper Load Distribution.....	4
2.2.5	Inappropriate Cargo.....	4
2.2.6	Lift Axles.....	5
2.3	Loading And Unloading.....	5
2.3.1	Tank Pressure.....	5
2.3.2	Manhole Covers.....	5
2.3.3	Handrails.....	5
2.3.4	Wear Personal Protective Equipment.....	6
2.3.5	Properly Couple Hoses.....	6
2.4	Brakes and Lights.....	6
2.5	Clearance.....	6
2.6	Maintenance.....	6
2.7	Hazards From Modifying Your Trailer.....	7
2.8	Safety Warning Labels On Your Trailer.....	7
2.9	Reporting Safety Defects.....	10
<b>3.</b>	<b>Coupling Truck To Trailer</b> .....	<b>11</b>
3.1	Providing An Adequate Truck.....	11
3.2	Trailer Information.....	11
3.3	Kingpin Setting.....	12
3.4	Before Attempting To Couple Truck To Trailer.....	13
3.5	Couple Truck To Trailer.....	14
3.6	Pretrip Inspection.....	16
<b>4.</b>	<b>Towing Trailer</b> .....	<b>18</b>
4.1	Lift Axle(s).....	18
4.2	Wheels And Tires.....	19
4.3	Alignment.....	19
<b>5.</b>	<b>Loading And Unloading The Trailer</b> .....	<b>20</b>
5.1	Load Trailer.....	20
5.1.1	Loading Through Manholes.....	20
5.1.2	Vacuum Loading.....	23
5.2	Unload Trailer.....	25
<b>6.</b>	<b>Uncouple Truck</b> .....	<b>30</b>
6.1	Uncouple Truck From Trailer.....	30
<b>7.</b>	<b>Inspections And Lubrication</b> .....	<b>32</b>
7.1	Every Day.....	32
7.1.1	Inspect Trailer Body, Chassis And Fasteners.....	32
7.1.2	Discharge Air Filter.....	33
7.2	Every Week.....	33
7.2.1	Lubrication.....	33
7.2.2	Trailer Suspension.....	33
7.2.3	Drain Trailer Air Tanks.....	34
7.2.4	Inspect, Measure And Adjust Brakes.....	34
7.3	Every Six Months.....	35
7.3.1	Air In-Line Filter (If Equipped).....	35
7.3.2	Glad Hand Seals And Screens.....	36
<b>8.</b>	<b>Maintenance And Service</b> .....	<b>37</b>
8.1	Tires.....	37
8.2	Wheels.....	37
8.2.1	Spoke Wheels.....	38
8.2.2	Disk Wheels.....	38
8.2.3	Wheel Ends.....	39
8.3	Discharge Air Filter.....	40
8.4	Hoppers.....	41

# **1. INTRODUCTION AND WARRANTY**

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## **1.1 INTRODUCTION**

Read and understand this manual before using your trailer and follow all of the safety instructions. Keep all manuals provided with your trailer in a safe place inside your truck at all times.

Some components on your MAC Trailer have separate instruction manuals. Where this manual indicates that you should read another manual, and you do not have that manual, contact your dealer or MAC Trailer for assistance.

Information provided in this manual was current as of the issue date. MAC Trailer reserves the right to make design changes without further notice or liability.

## **1.2 WARRANTY**


For warranty information, see your warranty manual.

## 2. SAFETY

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### 2.1 SAFETY

This Owner's Manual covers pneumatic trailers produced by MAC Trailer. Before towing, operating or servicing a MAC pneumatic trailer, you must read, understand and follow the instructions and safety warnings in this manual. Your trailer may not be equipped with some of the optional equipment shown in the illustrations in this manual.

The safety information in this manual is denoted by the safety alert symbol: 

The level of risk is indicated by the following signal words.

#### DANGER

**DANGER** – Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

#### WARNING

**WARNING** – Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

#### CAUTION

**CAUTION** – Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

#### *NOTICE*

**NOTICE** – Indicates a situation that could result in damage to the trailer or other property.

### 2.2 TOWING HAZARDS

Loss of control of the truck/trailer combination can result in death or serious injury. The most common causes for loss of control are:

- Driving too fast.
- Incorrect coupling.
- Overloading.
- Improper load distribution.
- Shifting cargo.

#### 2.2.1 DRIVING TOO FAST

If you drive too fast, the trailer is more likely to sway, thus increasing the possibility for loss of control and will also increase stopping distance

#### WARNING

**Collision hazard.**

**Driving too fast for conditions can result in loss of control and may result death or serious injury.**

**Adjust speed down when towing trailer.**

## **Safety**

---

### **2.2.2 TRAILER NOT PROPERLY COUPLED TO TRUCK**

A secure coupling is vital. Uncoupling can result in death or serious injury.



**Collision hazard.**

**An improperly coupled trailer can result in death or serious injury.**

**Before towing trailer, verify that:**

- **The coupler is properly secured and locked.**
- **Trailer landing gear is fully retracted.**
- **Lights and air hoses connected.**
- **Perform pre-trip inspection.**

### **2.2.3 OVERLOADING**

An overloaded trailer can result in loss of control, which may result in death or serious injury. Overloading may also result in tire, wheel, axle or structural failure, and also increased stopping distances.



**Collision hazard.**

**An overloaded trailer can result in death or serious injury.**

**Do not load a trailer so that the Gross Vehicle Weight Rating (GVWR) or Gross Axle Weight Rating (GAWR) is exceeded.**

### **2.2.4 IMPROPER LOAD DISTRIBUTION**

Improper load distribution can result to poor trailer stability and handling. Refer to “Loading The Trailer” for more information.

Uneven load distribution can cause tire, wheel, axle or structural failure, and can result in the trailer rolling over. Be sure your trailer is evenly loaded left-to-right and front-to-rear. Keep the center of gravity as low as possible.



**Collision hazard.**

**An improperly loaded trailer can result in failure or loss of control, leading to death or serious injury.**

**Evenly distribute the load through out the trailer.**

### **2.2.5 INAPPROPRIATE CARGO**

Carry only the cargo that your trailer was designed for. A trailer must not be used to carry certain items, such as people, containers of hazardous substances or containers of flammable substances.

### **WARNING**

Never transport people in a trailer.

Do not transport flammable, explosive or other dangerous materials in your trailer.

#### 2.2.6 LIFT AXLES

### **WARNING**

Collision hazard.

An empty trailer with the lift axle(s) in the down position can be unstable while towing, which can result in loss of control.

Raise the lift axle(s) off the surface on an empty trailer before towing.

## 2.3 **LOADING AND UNLOADING**

#### 2.3.1 TANK PRESSURE

### **WARNING**

Explosion hazard.

Exceeding pressure limit may cause tank to explode.

Never exceed the tank pressure limit, as specified on the VIN plate.

#### 2.3.2 MANHOLE COVERS

### **WARNING**

Risk of death or serious injury from opening manhole cover.

Pressure in tank can cause manhole cover to fly open with force when unlatched.

Verify tank is at zero before opening manhole covers.

Open cam lever on opposite side of manhole cover from hinge last.

#### 2.3.3 HANDRAILS

Raise folding handrails (if equipped) before entering the area on top of the tank.

### **WARNING**

Falling hazard.

Falling from tank may result in death or serious injury.

Do not enter area on top of tank unless handrails are raised, if equipped.

Verify handrails are in the lowered position before moving trailer.

## Safety

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### 2.3.4 WEAR PERSONAL PROTECTIVE EQUIPMENT

#### CAUTION

Risk of injury from product fumes or dust.

Exposure to product fumes and dust during loading can result in minor or moderate injury.

Wear the proper personal protective equipment during loading and unloading.

### 2.3.5 PROPERLY COUPLE HOSES

#### WARNING

Risk of death or serious injury from loose hose under pressure.

Discharge hose under pressure may whip uncontrollably, causing death or serious injury if not properly seated at both ends.

Verify hose quick couplings seat properly and lock at both ends before pressurizing unit.

## 2.4 BRAKES AND LIGHTS

Be sure that the brakes and all of the lights on your trailer are functioning properly before towing your trailer.

#### WARNING

Collision hazard.

Failure to connect the electrical connector and air hoses will result in inoperable trailer lights and brakes, and can lead to collision.

Before each tow, verify that all lights work.

## 2.5 CLEARANCE

#### WARNING

Collision hazard.

Know the height, width and length of the trailer.

Always be aware of clearances.

## 2.6 MAINTENANCE

#### WARNING

Crushing hazard.

Before performing trailer inspections, service or maintenance:

- Park trailer on firm, level surface.
- Set brakes, turn truck engine off and remove ignition key.
- Chock tires if brakes are to be released.
- Support trailer with properly rated and placed stands.



## Safety

### 2.7 HAZARDS FROM MODIFYING YOUR TRAILER

Before making any alteration to your trailer, contact MAC Trailer warranty department and describe the alteration you are contemplating. Altering your trailer may void the manufacturers' warranty. See "Warranty" in Section 1.

### 2.8 SAFETY WARNING LABELS ON YOUR TRAILER

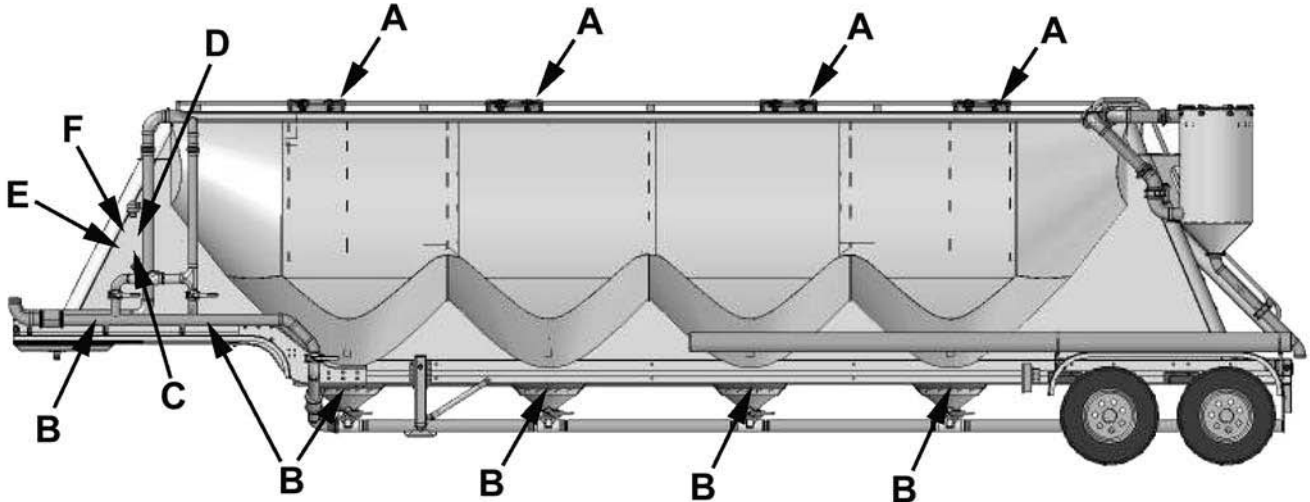


Figure 2-1 – Street Side Safety Decal Locations

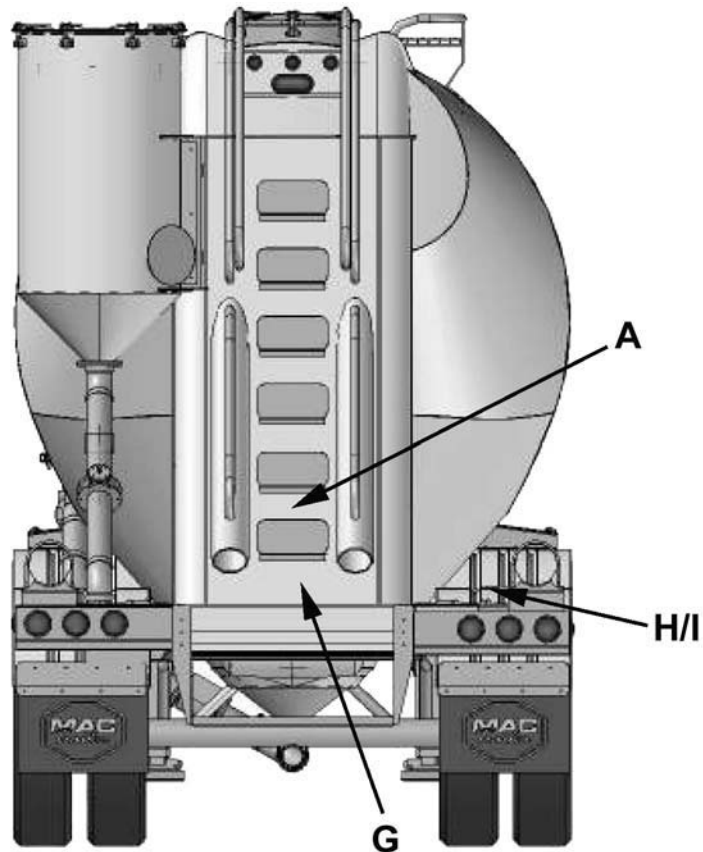


Figure 2-2 – Rear Safety Decal Locations



Figure 2-3 – Decal A



Figure 2-4 – Decal B



Figure 2-5 – Decal C

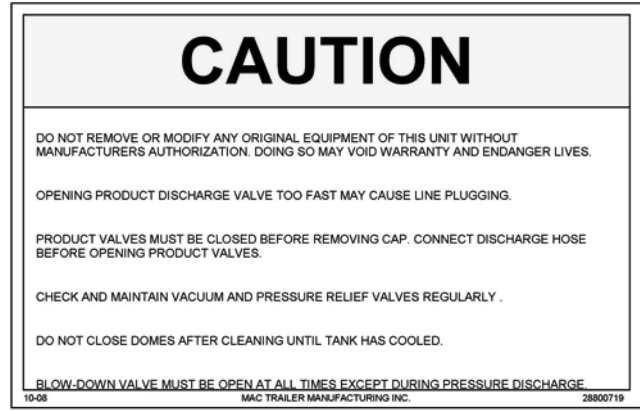


Figure 2-6– Decal D

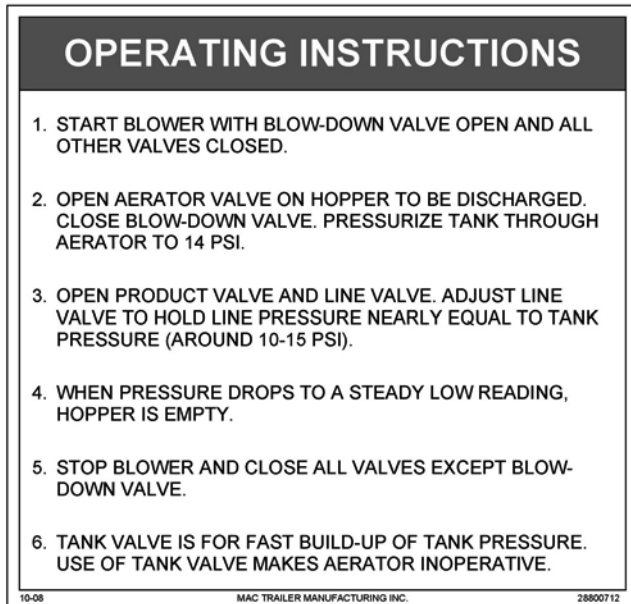


Figure 2-7 – Decal E



Figure 2-8 – Decal F

<b>INSTRUCTIONS FOR LADDER AND PLATFORM</b>
<b>WARNING</b>
<p>Failure to read and follow instructions on the use of the ladder and platform may result in injury or death.</p> <ol style="list-style-type: none"> <li>1. Always face the ladder when climbing or descending.</li> <li>2. Always hold the ladder with both hands. Do not use hands on perforated metal treads.</li> <li>3. Do not carry loads that might make you lose your balance.</li> </ol>
<b>INSPECT BEFORE EACH USE</b>
<ol style="list-style-type: none"> <li>1. Inspect thoroughly for missing or damaged parts or loose fasteners. Never use a damaged ladder.</li> <li>2. Clean all foreign material (snow, grease, mud, wet paint, oil, etc.) prior to use.</li> </ol>
<b>CONSIDER BEFORE EACH USE</b>
<ol style="list-style-type: none"> <li>1. Ladders and platforms are designed for one person only. Do not overload.</li> <li>2. Do not use in high winds and during storms.</li> <li>3. Do not use if in poor health, if taking drugs or alcoholic beverages, or if physically handicapped.</li> <li>4. Keep shoes clean. Worn shoes should not be used.</li> <li>5. Pay close attention to what you are doing.</li> <li>6. Use ladder and platform at your own risk.</li> </ol>
<b>PROPER CARE</b>
<ol style="list-style-type: none"> <li>1. Never store materials on ladder or platform.</li> <li>2. Never drop or apply impact loads to the ladder or platform.</li> </ol>
<p>04-08      MAC TRAILER MANUFACTURING INC.      28800708</p>

Figure 2-9 – Decal G


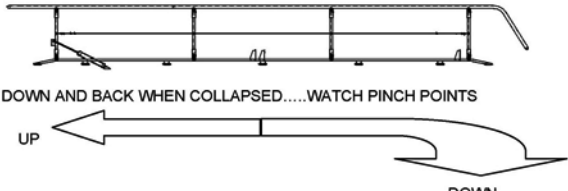
	<b>CAUTION</b>
<b>COLLAPSIBLE HANDRAIL</b>	
	
<p>DOWN AND BACK WHEN COLLAPSED.....WATCH PINCH POINTS</p> <p>UP</p> <p>DOWN</p>	
<p>TRAILER WILL BE OVER HEIGHT WITH HANDRAIL IN THE UP POSITION</p>	
<p>6/26/2009</p>	<p>MAC TRAILER MANUFACTURING      28800723</p>

Figure 2-10 – Decal H


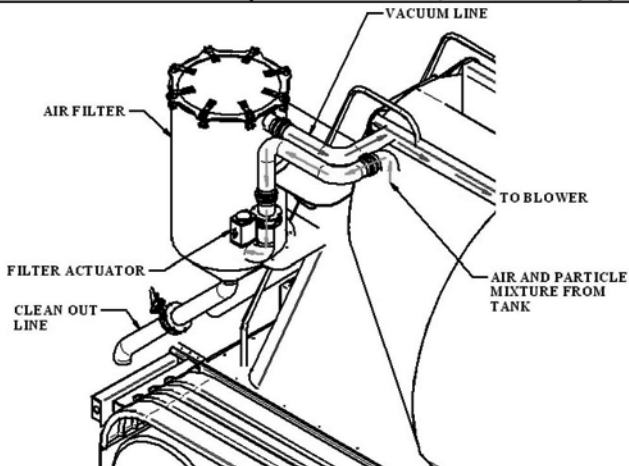
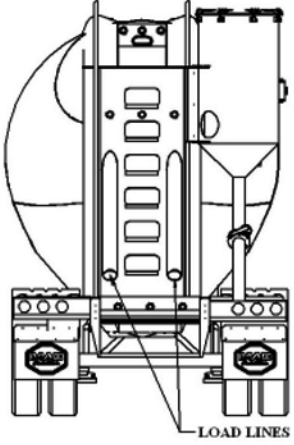
<b>VACUUM OPERATING INSTRUCTIONS - DRY BULK</b>	
 <b>CAUTION</b>	<p><b>MAXIMUM TANK VACUUM: 13 INCHES OF MERCURY (13" HG)</b></p> <p>The blow down valve must be opened to reduce tank vacuum to zero before disconnecting hoses or opening manholes.</p> <p>The filter actuator must be closed when pressure unloading to prevent damage to the filter assembly.</p> <p>Clean the filter assembly after each loading to prevent damage.</p>
	
<p style="text-align: center;"><b>BEFORE LOADING</b></p> <ol style="list-style-type: none"> <li>1. Verify manholes are properly latched, hosing and piping are secure and that the relief valves function.</li> <li>2. Open filter actuator and close all other valves.</li> <li>3. Verify filter assembly is clean and in good working order.</li> <li>4. Verify top hatch of rail car is open, if applicable.</li> </ol>	<p style="text-align: center;"><b>LOADING</b></p> <ol style="list-style-type: none"> <li>1. Initiate blower and adjust to recommended rpm.</li> <li>2. Adjust hose probe or open container discharge nozzle to attain 8" to 10" HG in tank.</li> <li>3. When the tank is loaded, remove the probe or close the the container nozzle to empty the fill line.</li> <li>4. Turn off blower.</li> <li>5. Open blow down line.</li> <li>6. Close filter actuator.</li> </ol>
<p>10/09</p>	<p style="text-align: right;">For unloading instructions see pneumatic operations decal.</p> <p>MAC MANUFACTURING INC.      28800732</p>

Figure 2-11 – Decal I

### WARNING

To protect against death or serious injury, all labels must be on the trailer and must be legible.

If any of these labels are missing or cannot be read, call MAC Trailer at 1-800-795-8454 for replacement labels.

## 2.9 REPORTING SAFETY DEFECTS

If you believe that your vehicle has a defect that could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying MAC Trailer. If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or MAC Trailer.

To contact NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to <http://www.safercar.gov>; or write to: Administrator, NHTSA, 1200 New Jersey Avenue, SE., Washington, DC 20590. You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

To contact MAC trailer, call or write to:

MAC Trailer  
14599 Commerce Street  
Alliance, Ohio 44601  
800-795-8454

## 3. COUPLING TRUCK TO TRAILER

### 3.1 PROVIDING AN ADEQUATE TRUCK

The truck must be matched to the Gross Vehicle Weight Rating (GVWR) of your trailer. If you already have a truck, know your trucks tow rating and make certain the trailer's rated capacity is less than or equal to the tow vehicle's rated towing capacity.



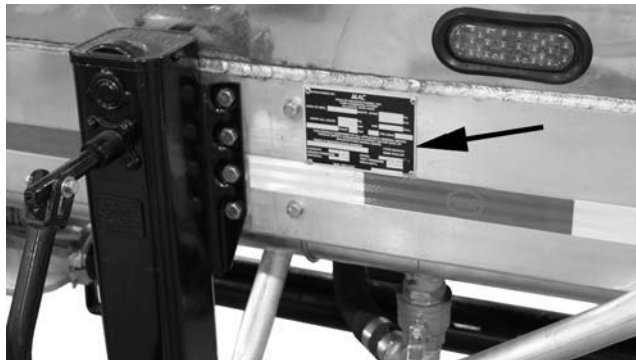
**Collision hazard.**

**Use of an under-rated truck could result in loss of control, and can lead to death or serious injury.**

**Be sure your truck is rated for the Gross Vehicle Weight Rating (GVWR) of your trailer.**

### 3.2 TRAILER INFORMATION

The Certification / VIN tag is located on the left side of the trailer, near the landing gear. See Figure 3-1.



*Figure 3-1 – Certification / VIN Tag Location*

The trailer Certification / VIN tag contains the following information:

**MANUFACTURER:** MAC Trailer Manufacturing, Inc.

**DATE OF MANUFACTURE:** Month and year the trailer was manufactured.

**GVWR WITH \_\_\_\_\_ RIMS:** The Gross Vehicle Weight Rating is the maximum allowable gross weight of the trailer and its contents with the listed wheel rims.

**GAWR ALL AXLES:** The Gross Axle(s) Weight Rating is the maximum gross weight that the axle(s) can support.

**TIRE SIZE:** The tire size recommended for your trailer and load range.

**PSI COLD:** The “pounds per square inch” is the tire pressure (Kilopascals / Pounds per Square Inch) measured when cold.

**VEHICLE IDENTIFICATION NUMBER:**

**VEHICLE TYPE:** Semi Trailer.

**CERTIFICATION STATEMENT:** “This vehicle conforms to all the applicable Federal Motor Vehicle Safety Standards in effect on the date of manufacture shown above”.

## Coupling Trailer To Truck

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**CAPACITY:** The absolute full capacity of the tank.

**PRESSURE DESIGN:** Maximum allowable operating pressure.

**MATERIAL SHELL:** Material composition of tank shell.

**MODEL:** MAC model number.

**TEST PRESSURE:** The pressure to which the tank was subjected to verify structural integrity.

**WELD:** Material used to weld the tank.

**MAX. PAYLOAD:** (Lbs) The maximum weight of cargo that can be carried by the tank.

**MAX TEMPERATURE:** The maximum allowable operating temperature of the tank.

**VAC TANK:**

**VACUUM DESIGN:** The maximum allowable vacuum pressure in the tank.

### 3.3 KINGPIN SETTING

Kingpin plate is adjustable and can be moved forward or back, or can be rotated 180 degrees to provide various kingpin settings of 18 to 34 inches.



**WARNING**

**Crushing hazard.**

**The weight of the kingpin plate is up to 350 lbs.**

**Support and lift the kingpin plate with an adequate lifting device.**

**To adjust kingpin setting:**

1. Properly support kingpin plate with an adequate lifting device.
2. Remove all kingpin plate bolts (A) and locknuts.
3. Replace all bolts and locknuts.
4. Rotate kingpin plate, or move plate forward or aft using additional adjustment holes (B), to obtain desired kingpin setting.

## Coupling Trailer To Truck

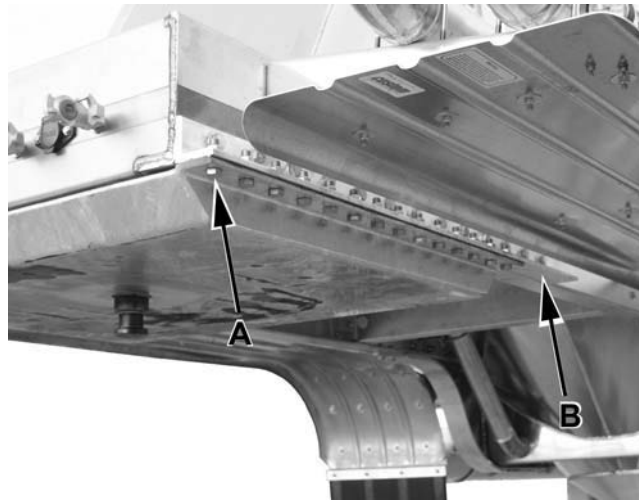


Figure 3-2 – Kingpin Plate Adjustment

### **⚠ WARNING**

**Uncoupling hazard.**

**Kingpin plate can separate from trailer if all bolts are not used, not properly tightened and/or damaged, which can result in death or serious injury.**

**When adjusting kingpin plate, all hardware must be replaced and bolts must be installed through trailer mounting rail and kingpin plate mounting holes.**

**Tighten to 155 lb-ft of torque.**

5. All bolt holes in kingpin plate **MUST** have a bolt and locknut. Install all kingpin plate bolts and locknuts.
6. Tighten to 155 lb-ft of torque.

### **3.4 BEFORE ATTEMPTING TO COUPLE TRUCK TO TRAILER**

1. Check the condition of the kingpin and mounting plate. Wipe the kingpin clean and inspect it for flat spots, cracks and pits.

### **⚠ WARNING**

**Uncoupling hazard.**

**A worn, bent or damaged kingpin can fail while towing, which can result in death or serious injury.**

**Inspect the kingpin and kingpin plate for wear and damage. Replace a worn or damaged kingpin or kingpin plate before towing trailer.**

2. Verify that the kingpin plate and fifth wheel fasteners are tight and welds are sound.

## Coupling Trailer To Truck

### **⚠ WARNING**

**Uncoupling hazard.**

**A loose kingpin or fifth wheel can result in the trailer uncoupling, which can result in death or serious injury.**

**Verify the kingpin and fifth wheel are tight.**

3. Lubricate the fifth wheel lock mechanism and verify it will move freely.
4. Clear all hoses and electrical cables from the coupling area.
5. Verify the fifth wheel locks are open.

### **WARNING**

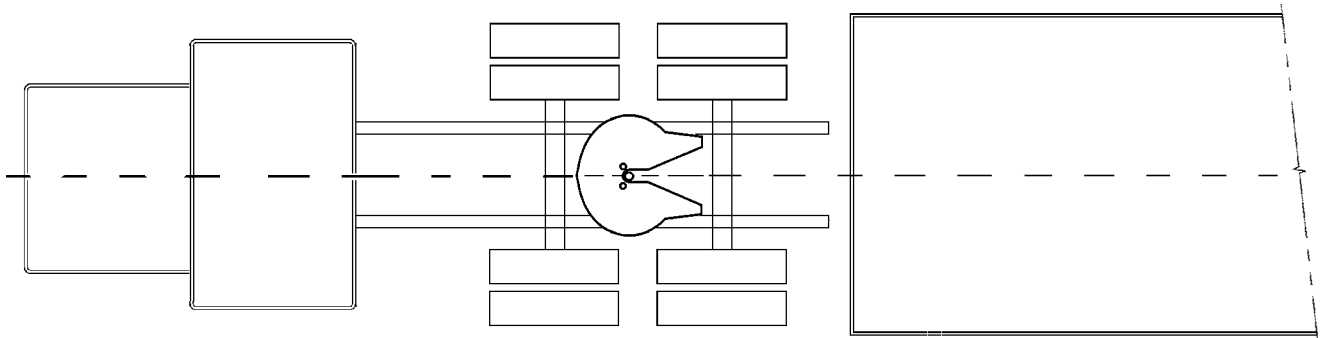
**Crushing hazard.**

**Death or serious injury may occur if the trailer drops.**

**Keep bystanders away from trailer while coupling.**

## **3.5 COUPLE TRUCK TO TRAILER**

1. Place wheel chocks behind the trailer tires.
2. Place the truck directly in front of the trailer. See Figure 3-3. NEVER back under the trailer at an angle.



*Figure 3-3 – Align Truck with Trailer For Coupling*

3. Back the truck until close to the trailer.
4. Apply the truck parking brakes and place transmission in neutral.
5. Release air from truck suspension (if equipped).
6. Inspect the height of the trailer vs the fifth wheel. The kingpin plate on the front of the trailer should first contact the fifth wheel 4-6 inches rearward of the fifth wheel centerline. See Figure 3-4. The trailer should raise slightly when the truck is backed under it. If the trailer is too low, the truck may strike and damage the front of the trailer. If the trailer is too high, it will not couple correctly. Adjust the landing gear as needed to achieve the correct trailer height.



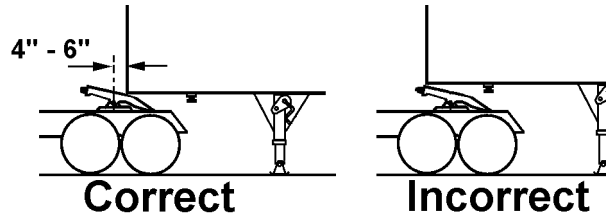
## Coupling Trailer To Truck

### **⚠ WARNING**

**Uncoupling Hazard.**

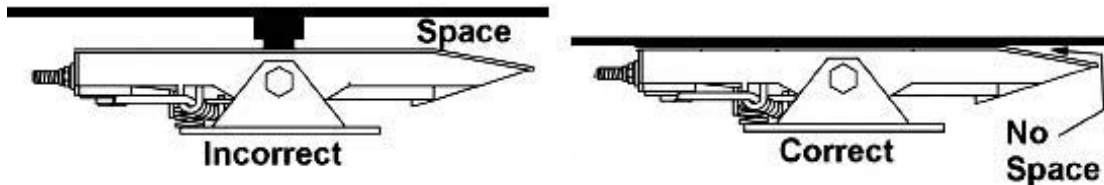
**Trailer must be at the correct height to couple to truck.**

**Verify trailer is at the proper height before coupling.**



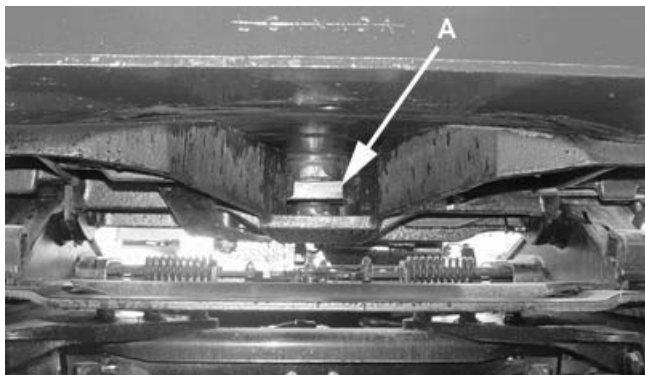
*Figure 3-4 – Coupling Truck to Trailer*

7. Verify that the kingpin and fifth wheel are aligned.
8. Slowly back the truck keeping the kingpin aligned with the fifth wheel. Continue backing until the fifth wheel locks firmly on the kingpin. Attempt to pull forward as a test to verify the fifth wheel is locked. Do not attempt to move the truck and trailer at this time. Apply the truck parking brake and place transmission in neutral.
9. Inspect the coupling. See Figure 3-5. Verify there is no space between the kingpin plate and the fifth wheel. If there is space, the kingpin may be on top of the fifth wheel jaws. Raise the trailer with the landing gear, pull the fifth wheel release lever and pull the truck ahead. Repeat steps 6-9 again to couple the trailer correctly.

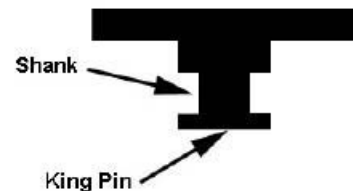


*Figure 3-5 – Fifth Wheel Checks*

10. Verify the fifth wheel jaws (A) have closed around the shank of the kingpin and the fifth wheel lock lever is in the locked position. See Figure 3-6.



*Figure 3-6 – Fifth Wheel Jaws Closed Around Kingpin Shank*



11. Inflate the truck suspension (if equipped).

## Coupling Trailer To Truck

12. Connect the supply hose to glad hand (A), service hose to glad hand (B), electrical cable to connector, and if equipped, connect hoses to the lift axle glad hands. See Figure 3-7.

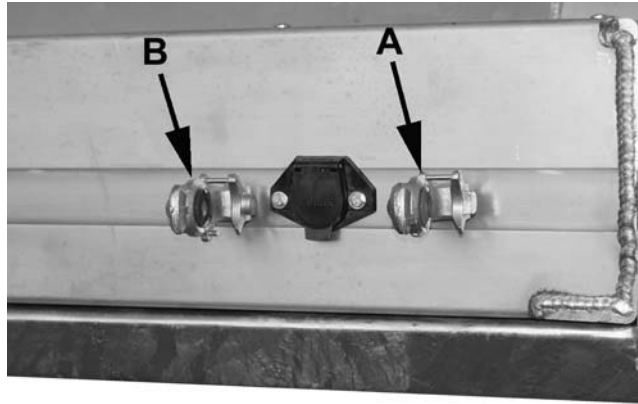


Figure 3-7 – Connect Hoses and Electrical Connector

13. Raise the landing gear. MAC Trailer uses a two speed landing gear from several different manufacturers. High speed may be “in” on some models and “out” on others. Engage the crank handle (A) to the shaft and turn to retract the landing gear. Return the two speed landing gear crank handle to the storage position. See Figure 3-8.

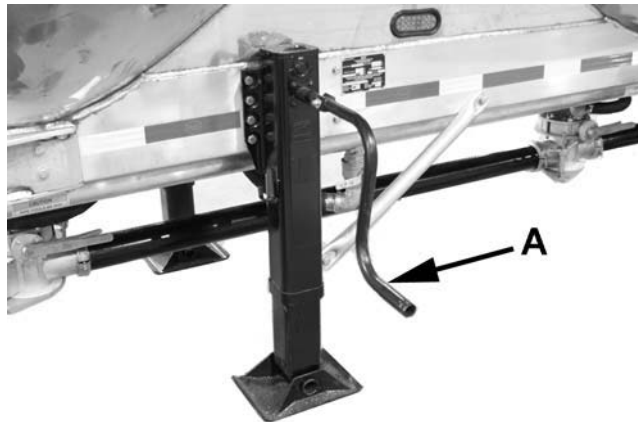


Figure 3-8 – Two Speed Landing Gear

14. Press the trailer air supply valve in the truck to fill the trailer air tanks. Do not release truck parking brakes.
15. Perform pretrip inspection. See Section 3.6.

### 3.6 PRETRIP INSPECTION

Perform the inspections and checks before towing trailer:

- Check all lights for operation.
- Check that ABS light on street side rear corner of the trailer is not illuminated.
- Check that all safety decals are in place and in good, readable condition.
- Check that all reflectors are in place and in good condition.
- Check air pressure on all tires. Air pressure is listed on the Certification/VIN tag.
- Check and inspect all tires. If a tire has a bald spot, bulge, cut or cords showing, replace the tire(s) before towing trailer.
- Check wheel lug torque. See the Maintenance Section of this manual.
- Check the wheel hubs for signs of lubricant leakage.
- Verify that air suspension springs are inflated.
- Check electrical harness and air hoses from truck for damage.

## **Coupling Trailer To Truck**

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- Listen for air leaks in hoses and air suspension.
- Check brakes for wear and adjustment, and verify the brakes function properly.
- Verify manholes are closed and safety latches fastened.
- Verify all valves, except blow down valve, are closed.

Repair or replace any worn, damaged, leaking, broken or non-functioning items before towing the trailer. Do not load a damaged trailer.

## 4. TOWING TRAILER

### 4.1 LIFT AXLE(S)

Your trailer can be equipped with one or more lift axles and may be equipped with a regulator valve. With trailer loaded, the axle(s) are lowered to help carry and distribute the load forces on the trailer. Turn the valve (A) to set the air pressure to the desired level. See Figure 4-1.

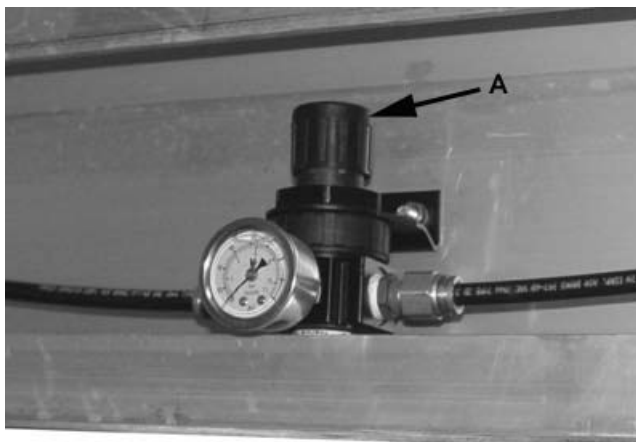


Figure 4-1 – Lift Axle Regulator Valve

Use the correct chart below for the axle(s) on your trailer to set the air pressure.

AAL,AAT & AANT C-20901,C-23611, C-23612, C-23721, C-23748

<b>SUSPENSION LOAD SCALE INTRAAX 250</b>			
GAUGE PRESSURE		LOAD PER AXLE	
<b>24 PSI</b>	<b>165 KPA</b>	<b>7000 LB</b>	<b>3175 KG</b>
<b>32 PSI</b>	<b>221 KPA</b>	<b>9000 LB</b>	<b>4082 KG</b>
<b>40 PSI</b>	<b>276 KPA</b>	<b>11000 LB</b>	<b>4990 KG</b>
<b>48 PSI</b>	<b>331 KPA</b>	<b>13000 LB</b>	<b>5897 KG</b>
<b>56 PSI</b>	<b>386 KPA</b>	<b>15000 LB</b>	<b>6804 KG</b>
<b>65 PSI</b>	<b>448 KPA</b>	<b>17000 LB</b>	<b>7711 KG</b>
<b>72 PSI</b>	<b>496 KPA</b>	<b>19000 LB</b>	<b>8618 KG</b>
<b>80 PSI</b>	<b>552 KPA</b>	<b>21000 LB</b>	<b>9526 KG</b>
<b>88 PSI</b>	<b>607 KPA</b>	<b>23000 LB</b>	<b>10433 KG</b>
<b>96 PSI</b>	<b>662 KPA</b>	<b>25000 LB</b>	<b>11340 KG</b>

5-5 MAC TRAILER MANUFACTURING INC.

AAL,AAT C-25871,C-23611, C-25872 & C-25873

<b>SUSPENSION LOAD SCALE INTRAAX 300</b>			
GAUGE PRESSURE		LOAD PER AXLE	
<b>30 PSI</b>	<b>207 KPA</b>	<b>10000 LB</b>	<b>4536 KG</b>
<b>37 PSI</b>	<b>255 KPA</b>	<b>12000 LB</b>	<b>5443 KG</b>
<b>44 PSI</b>	<b>303 KPA</b>	<b>14000 LB</b>	<b>6350 KG</b>
<b>51 PSI</b>	<b>352 KPA</b>	<b>16000 LB</b>	<b>7258 KG</b>
<b>58 PSI</b>	<b>400 KPA</b>	<b>18000 LB</b>	<b>8165 KG</b>
<b>64 PSI</b>	<b>441 KPA</b>	<b>20000 LB</b>	<b>9072 KG</b>
<b>71 PSI</b>	<b>490 KPA</b>	<b>22000 LB</b>	<b>9979 KG</b>
<b>78 PSI</b>	<b>538 KPA</b>	<b>24000 LB</b>	<b>10886 KG</b>
<b>85 PSI</b>	<b>586 KPA</b>	<b>26000 LB</b>	<b>11794 KG</b>
<b>92 PSI</b>	<b>634 KPA</b>	<b>28000 LB</b>	<b>12701 KG</b>
<b>99 PSI</b>	<b>683 KPA</b>	<b>30000 LB</b>	<b>13608 KG</b>

5-5 MAC TRAILER MANUFACTURING INC.

With the trailer empty, raise the axle(s) off the surface by relieving the air pressure on the lift axles.

⚠ **WARNING**

**Collision hazard.**

**An empty trailer with the lift axle(s) in the down position can be unstable while towing, which can result in loss of control.**

**Raise the lift axle(s) off the surface on an empty trailer before towing.**

## 4.2 WHEELS AND TIRES

Uneven tread wear can be caused by tire imbalance, axle misalignment or improper inflation. If you observe uneven tread wear, take the trailer to an authorized truck/trailer service center for diagnosis. Trailer wheels and lugs are subjected to high side loads. This can cause the wheel lugs to become loose. Check to be certain wheel lugs are tightened to 450-500 lb ft of torque. Refer to the maintenance section for the proper tightening procedure. Failure to perform this check may result in a wheel parting from the trailer, and a crash leading to death or serious injury. You must use a torque wrench to obtain the proper tightening of the lug nuts.

## 4.3 ALIGNMENT

Properly aligned trailer axles optimize fuel economy and driveability, and help prevent excessive tire wear. A perfect alignment scenario has all trailer wheels parallel to one another and perpendicular to the centerline of the trailer. However due to uncontrollable factors, this perfect scenario is often an unreasonable expectation. A more likely alignment scenario has the trailer wheels parallel within a very small tolerance range to one another and perpendicular within a very small tolerance range to the centerline of the trailer. There are two important trailer axle angles that must be kept within recommended tolerance ranges: thrust angle and scrub angle. These angles, when out of tolerance, can lead to increased rolling resistance, excessive tire wear and can contribute to trailer "dog tracking". "Dog tracking" is a condition where the trailer does not follow or track directly behind the truck as the vehicle is being operated in a straight line and is influenced by body rail alignment, king pin location, axle side-to-side location, and other things. If realignment is necessary, take the trailer to your dealer or an authorized trailer service center.

## 5. LOADING AND UNLOADING THE TRAILER

Improper trailer loading causes many accidents and deaths. To safely load a trailer, you must consider the overall load weight and load distribution.

The load distribution must be such that no component part of the trailer is loaded beyond its rating. You must be sure that the load distribution does not exceed the rating of the tires, wheels and axles.

### **⚠ WARNING**

**Collision hazard.**

**An overloaded trailer can result in death or serious injury.**

**Do not load a trailer so that the Gross Vehicle Weight Rating (GVWR) or Gross Axle Weight Rating (GAWR) is exceeded.**

## 5.1 LOAD TRAILER

### 5.1.1 LOADING THROUGH MANHOLES

1. Park the truck and trailer on a firm surface and set the parking brakes.
2. Verify **all** discharge valves (A) are closed. See Figure 5-1.



*Figure 5-1 – Discharge Valve Closed*

### **NOTICE**

**Risk of trailer damage.**

**Ambient temperature changes can result in pressure changes inside the hopper. If the blow down valve is not open, damage to the hopper may result.**

**The blow down valve must remain open at all times except when the hopper is being pressurized for unloading or the trailer is being vacuum loaded.**

## Loading And Unloading The Trailer

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3. Verify blow down valve (B) is open. See Figure 5-2.

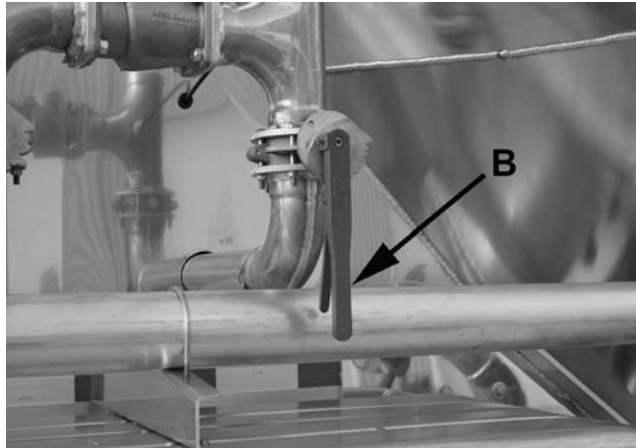


Figure 5-2 – Blow Down Valve Open

### **⚠ WARNING**

**Risk of death or serious injury from falling.**

**Failure to use restraining devices may result in falling from top of tank, which can result in serious injury or death.**

**Use handrails at rear ladder.**

**Raise folding handrails at top of tank, if equipped.**

**Use tie-off protection.**

4. Verify tank pressure gauge (C) reads zero pressure. See Figure 5-3.

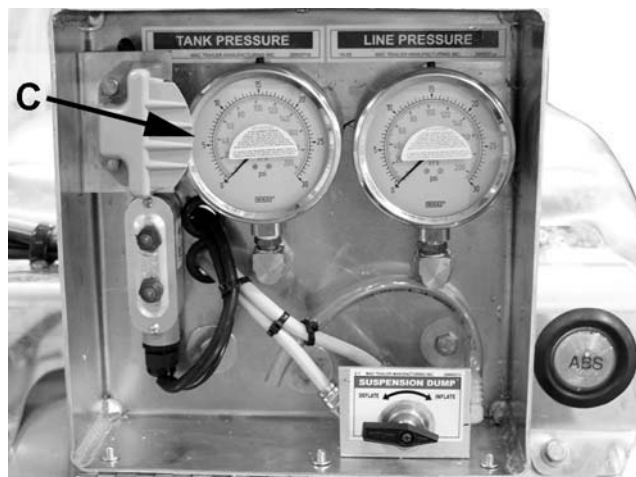


Figure 5-3 – Tank Pressure Gauge Reading Zero

## Loading And Unloading The Trailer

- Turn control valve to raise folding handrails, if equipped. See Figure 5-4. Use tie-off protection when on top of tank.

### **⚠ WARNING**

**Falling hazard.**

**Falling from tank may result in death or serious injury.**

**Do not enter area on top of tank unless handrails are raised, if equipped.**



*Figure 5-4 – Folding Handrails (Optional)*

### **⚠ WARNING**

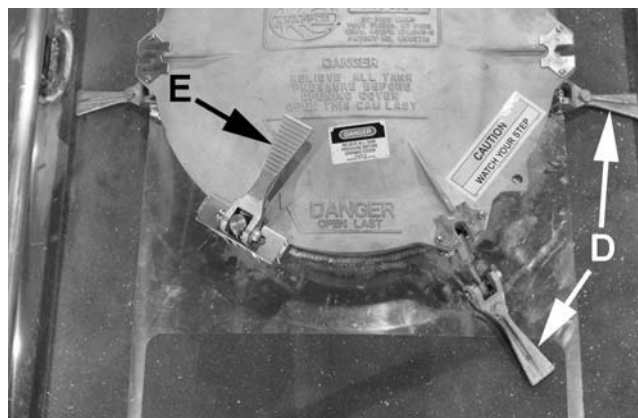
**Risk of death or serious injury from opening manhole cover.**

**Pressure in tank can cause manhole cover to open with force when unlatched.**

**Verify tank pressure is at zero before opening manhole covers.**

**Open cam lever on opposite side of manhole cover from hinge last.**

- Enter the top of the trailer using the rear steps.
- Use tie off protection to prevent falling from trailer.
- Carefully open appropriate manholes. Open cam levers (D), starting with levers closest to manhole cover hinge. Open cam lever (E) (on opposite side of cover from hinge) last, as indicated on manhole cover. See Figure 5-5.



*Figure 5-5 – Manhole Cam Levers*



## Loading And Unloading The Trailer

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### **⚠ CAUTION**

**Risk of injury from product fumes or dust.**

**Exposure to product fumes and dust can result in minor or moderate injury.**

**Wear the proper personal protective equipment during loading and unloading.**

9. Load material into tank(s) distributing the material evenly throughout the trailer.
10. Weigh the trailer to be sure weight capacity of trailer, tires, axles and wheels have not been exceeded.
11. Close manhole covers and engage the latches.

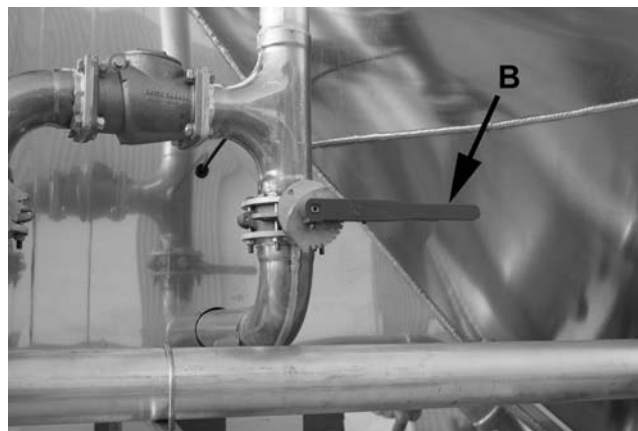
### **5.1.2 VACUUM LOADING**

1. Park the truck and trailer on a firm surface and set the parking brakes.
2. Verify **all** discharge valves (A) are closed. See Figure 5-1.



*Figure 5-6 – Discharge Valve Closed*

3. Verify manhole covers are closed and blow down valve (B) is closed.



*Figure 5-7 – Blow Down Valve Closed*

## Loading And Unloading The Trailer

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4. Connect truck blower to vacuum coupler (C) and set blower for vacuum operation.

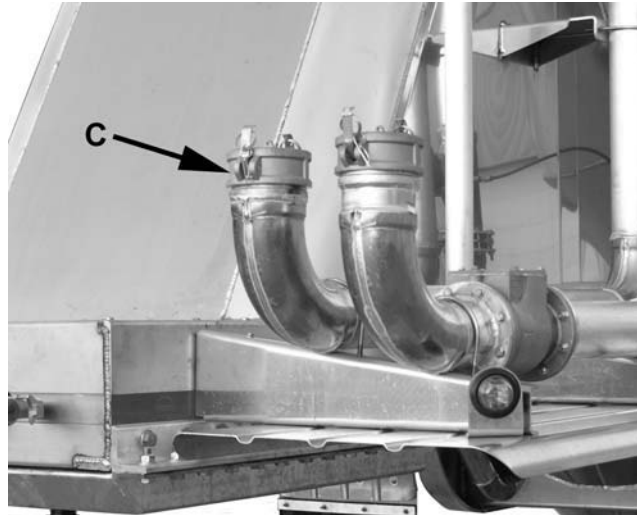


Figure 5-8 – Vacuum Coupler

5. Remove dust cap from vacuum tube (D) and connect supply hose to tube (D). See Figure 5-9.
6. Turn control (E) to open filter actuator valve. See Figure 5-10.

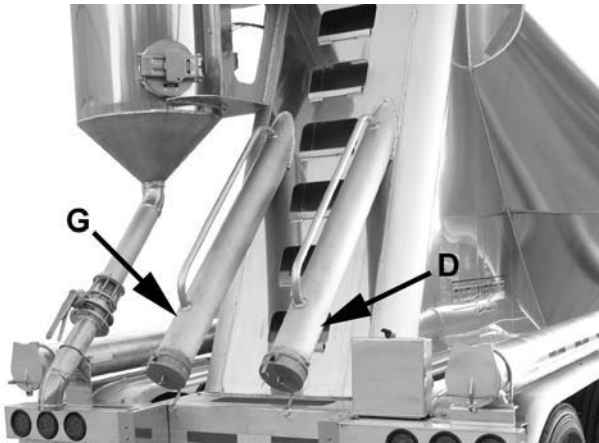


Figure 5-9 – Vacuum Tubes

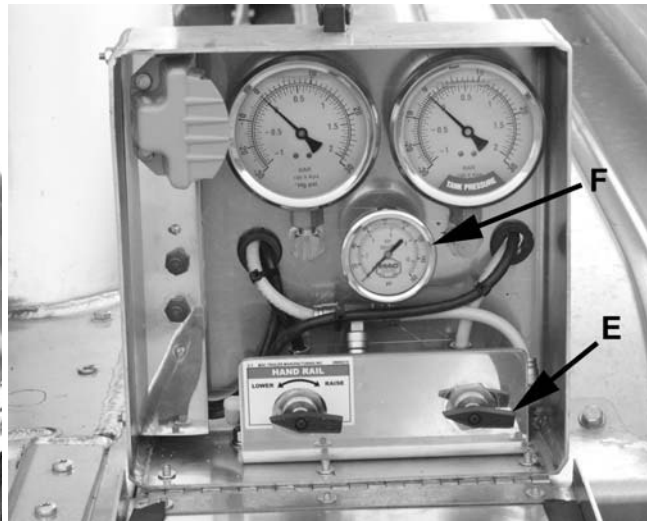


Figure 5-10 – Control Box

7. Engage the blower/vacuum.
8. Monitor load gauge (F) on the control panel. See Figure 5-10. When load gauge indicates the desired pressure for forward hopper loading, disengage blower and move supply hose to vacuum tube (G). Install dust cap on vacuum tube (D). See Figure 5-9.
9. Restart blower and monitor the load gauge. When load gauge indicates the desired pressure for rearward hopper loading, disengage blower. Remove supply tube from vacuum tube.
10. Install dust cap on both vacuum tube (G).
11. Close filter actuator valve (E).

## Loading And Unloading The Trailer

12. After loading is complete, check filter tank discharge tube sight glass (H) for material accumulation. If accumulation is visible in the sight glass, open discharge tube valve (I) and drain material into supply source or a suitable container.

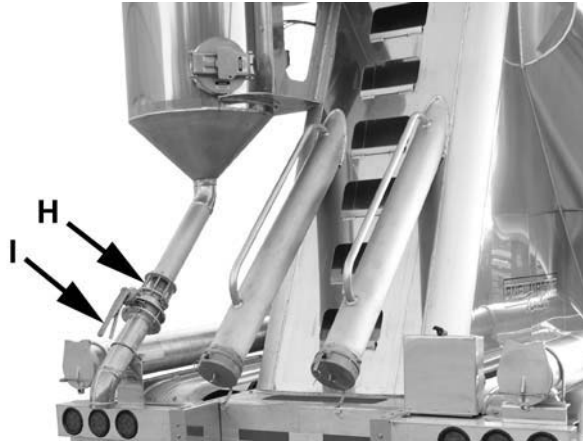


Figure 5-11 – Filter Tank Discharge Tube

13. Weigh the trailer to be sure weight capacity of trailer, tires, axles and wheels have not been exceeded.

### 5.2 UNLOAD TRAILER

1. Park the truck and trailer on a firm surface and set the parking brakes.
2. Remove cap (A) on discharge line. See Figure 5-6.

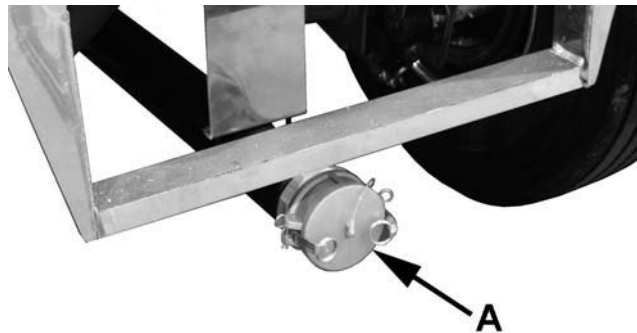


Figure 5-6 – Cap

#### **⚠ WARNING**

**Risk of death or serious injury from loose hose under pressure.**

**Discharge hose under pressure may whip uncontrollably, causing death or serious injury if not properly seated at both ends.**

**Verify hose quick couplings seat properly and lock at both ends before pressurizing unit.**

#### **⚠ CAUTION**

**Risk of injury from product fumes or dust.**

**Exposure to product fumes and dust can result in minor or moderate injury.**

**Wear the proper personal protective equipment during loading and unloading.**

## Loading And Unloading The Trailer

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### **NOTICE**

Risk of contaminated material.

Check contents of unloading site before discharging load contents into it.

### **NOTICE**

Risk of damage to equipment.

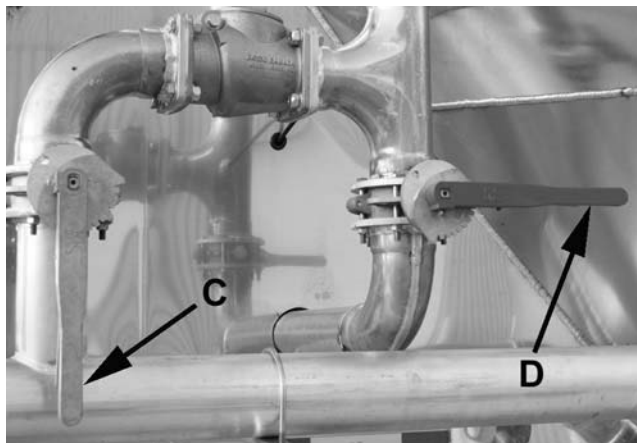
**Verify unloading site has the capacity and structural integrity required before discharging load contents into it.**

3. Remove discharge hose from storage tube and connect hose to discharge line and to unloading site.
4. Verify storage facility has adequate capacity for load.
5. If equipped, verify filter actuator is closed.
6. Connect air supply to air inlet coupler (B). See Figure 5-7



*Figure 5-7 – Air Inlet Coupler*

7. Open proportioning valve
8. Engage blower.
9. Open main aeration valve (C) and close blow down valve (D). See Figure 5-8.



*Figure 5-8 – Main Aeration Valve Open*

## Loading And Unloading The Trailer

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10. If equipped, open top air valve.
11. Close proportioning valve (E). See Figure 5-9.



Figure 5-9 – Proportioning Valve Closed

12. Pressurize tank to pressure specified for material. Do not exceed pressure specified on VIN plate.
13. When tank has reached specified operating pressure, open proportioning valve (E) to the half-open position.
14. Slowly open discharge valve (F) on front hopper to the half-open position. When material begins to flow, fully open discharge valve. See Figure 5-10 & 5-11.

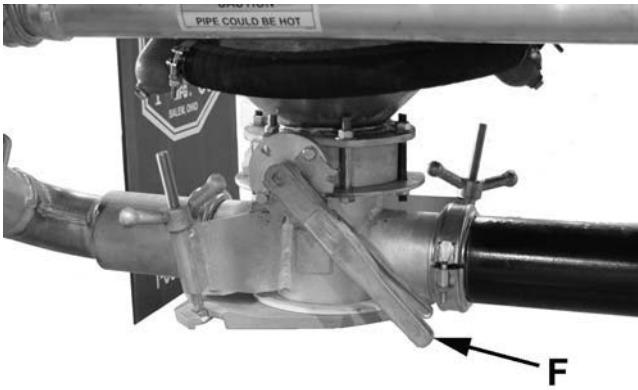


Figure 5-10 – Front Discharge Valve Half Open

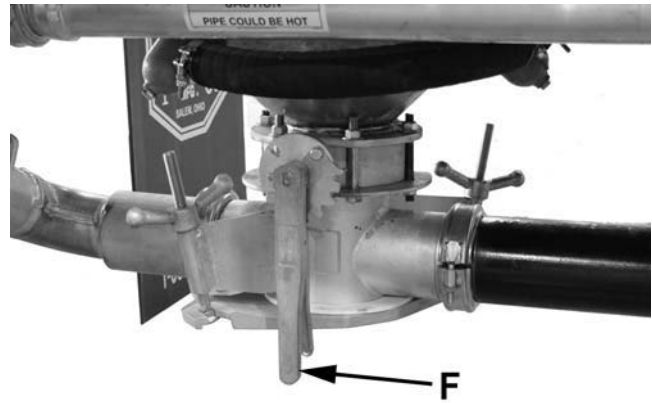
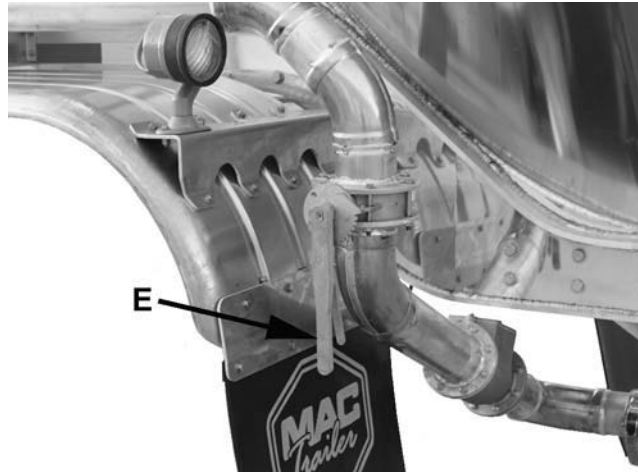


Figure 5-11 – Front Discharge Valve Full Open

## Loading And Unloading The Trailer

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15. Open proportioning valve (E) to full-open position. See Figure 5-12.



*Figure 5-12 – Proportioning Valve Open*

16. When tank pressure drops, close front discharge valve (F).

17. Slowly open discharge valve on next hopper (working front to rear of trailer) to unload that hopper.

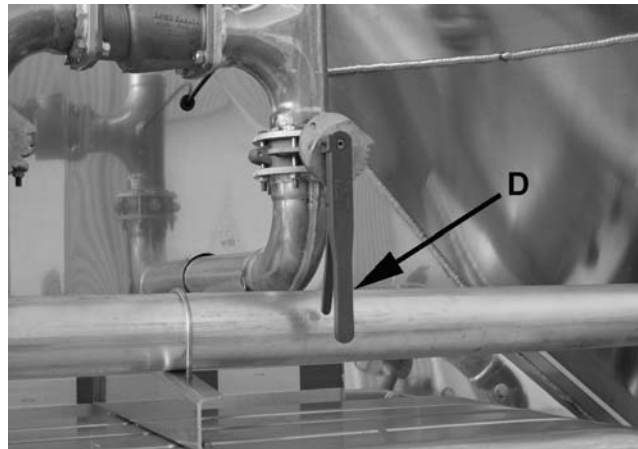
18. When tank pressure begins to drop rapidly, close discharge valve.

19. Repeat Steps 13 - 15 for remaining hoppers.

20. Purge hopper by slowly opening and closing each discharge valve, working front to rear of trailer.

21. Disengage blower.

22. Open blow down valve (D) to relieve tank pressure. See Figure 5-13.



*Figure 5-13 – Blow Down Valve Open*

23. Disconnect and stow discharge hose.

## Loading And Unloading The Trailer

---

### **NOTICE**

Risk of trailer damage.

Ambient temperature changes can result in pressure changes inside the hopper. If the blow down valve is not open, damage to the hopper may result.

The blow down valve must remain open at all times except when the hopper is being pressurized for unloading.

24. Verify all valves, except blow down valve, are closed. Blow down valve must remain open.

25. Install cap (A) on discharge line. See Figure 5-14.

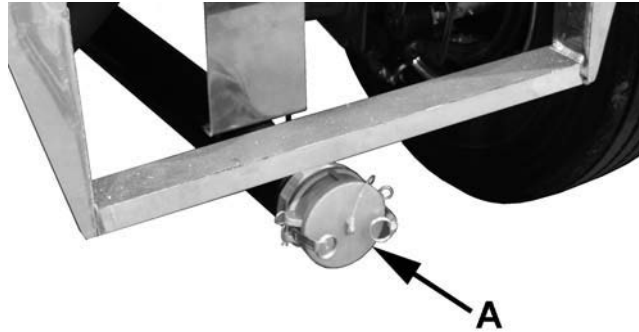


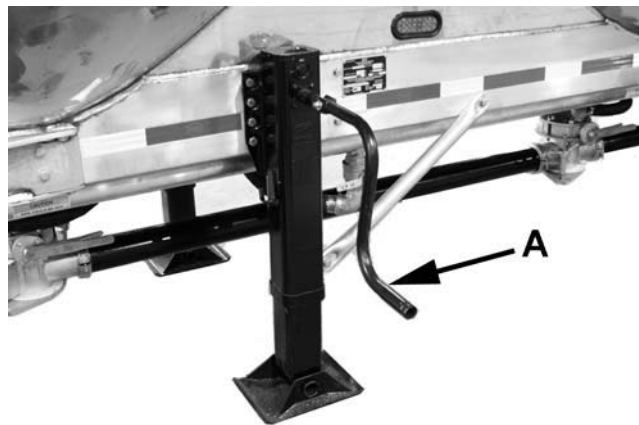
Figure 5-14 – Cap

## 6. UNCOUPLE TRUCK

### 6.1 UNCOUPLE TRUCK FROM TRAILER

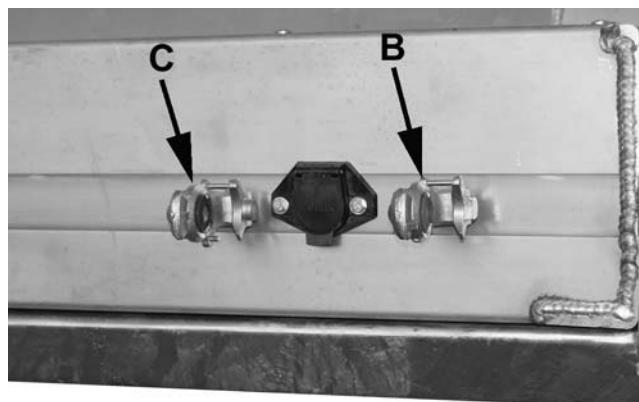
Follow these steps to uncouple your truck from the trailer:

1. Park the trailer on a firm level surface.
2. Set the parking brakes.
3. If trailer is loaded, place blocks or pads under landing gear legs to prevent settling.
4. MAC Trailer uses a two speed landing gear from several different manufacturers. High speed may be in on some models and out on others. High speed is used only when landing gear is off the ground. Engage the crank handle (A) and lower the landing gear until it makes firm contact with the ground, blocks or pads. Switch to low gear and crank an additional 4-8 turns. See Figure 6-1.



*Figure 6-1 – Two Speed Landing Gear*

5. Disconnect the supply hose from glad hand (B), service hose from glad hand (C) and electrical connector. See Figure 6-2.



*Figure 6-2 – Disconnect Hoses and Electrical Connector*

6. Pull the fifth wheel release lever.
7. Release air in truck suspension (if equipped) and pull truck forward until fifth wheel comes out from under the trailer.



## **Uncouple Truck**

---

8. Stop with truck frame under trailer. This will prevent the trailer from falling to the ground if the landing gear should collapse or sink.
9. Apply parking brake and place transmission in neutral.
10. Make sure ground is supporting trailer. Make sure landing gear is not damaged.
- 11 Check the area and drive truck forward until clear of trailer.

## 7. INSPECTIONS AND LUBRICATION

---

Routine inspections, maintenance and service must be performed on your trailer on a regular basis to insure safe and reliable operation. Inspections can be performed by a person trained in spotting potential problems. Service and repairs must be performed by a trained, qualified technician.

*Note: In addition to this manual, also check the relevant component manufacturer's manual.*



**Crushing hazard.**

**Before performing trailer inspections, service or maintenance:**

- **Park trailer on firm, level surface.**
- **Set parking brakes, turn truck engine off and remove ignition key.**
- **Chock tires if brakes are to be released.**
- **Support trailer with properly rated and placed stands.**

### 7.1 EVERY DAY

Perform the inspections and checks before towing trailer. This list is also covered in the pre-trip inspection:

- Check all lights for proper operation.
- Check that ABS light on street side rear corner of the trailer is not illuminated.
- Check that all safety decals are in place and in good, readable condition.
- Check that all reflectors are in place and in good condition.
- Check air pressure on all tires. Air pressure is listed on the Certification/VIN tag.
- Check and inspect all tires. If a tire has a bald spot, bulge, cut or cords showing, replace the tire(s) before towing trailer.
- Check wheel lug torque. See the Maintenance Section of this manual.
- Check the wheel hubs for signs of lubricant leakage.
- Check for broken or missing leaf springs or verify that air suspension springs are inflated.
- Check electrical harness and air hoses from truck for damage.
- Listen for air leaks in hoses and air suspension (if equipped).
- Check brakes for wear and verify the brakes function properly.
- Verify manholes are closed and safety latches fastened.
- Verify all valves, except blow down valve, are closed.
- Check relief valve for obstructions or damage.

Repair or replace any worn, damaged, leaking, broken or non-functioning items before towing the trailer. Do not load a damaged trailer.

#### 7.1.1 INSPECT TRAILER BODY, CHASSIS AND FASTENERS

1. Inspect the trailer body and chassis for damage daily.
2. Inspect all of the fasteners, welds and structural frame members for bending and other damage, cracks, or failure. Repair or replace any damaged fastener and repair the frame member. If you have any questions about the condition or method of repair of fasteners or frame members, get the recommendation of, or have the repair done by MAC Trailer. Contact MAC Trailer warranty department for a list of authorized repair facilities. Welds must be repaired by a qualified technician.

## Inspections And Lubrication

### **⚠ WARNING**

Broken or damaged fasteners or welds can cause injury or damage to trailer and contents.

Inspect for and repair all damaged parts.

### **7.1.2 DISCHARGE AIR FILTER**

Your trailer may be equipped with a discharge air filter located at the rear of the trailer. Inspect discharge air filter daily. Open filter tank door (A) and inspect tubes for wear. See Figure 7-1.



Figure 7-1 – Filter Tank Door

## **7.2 EVERY WEEK**

### **7.2.1 LUBRICATION**

Lubricate the trailer brake shaft grease fittings at least once per week. See Figure 7-2.

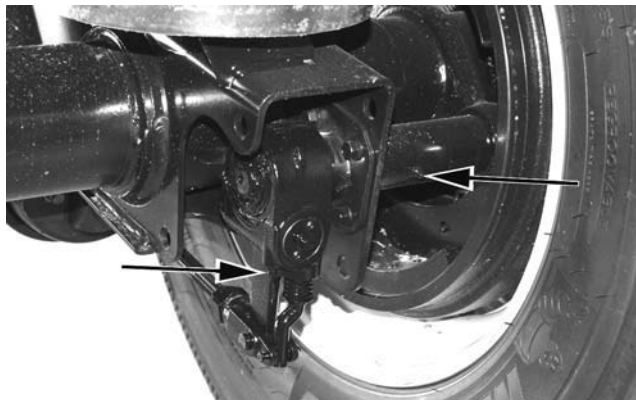


Figure 7-2 – Brake Shaft Grease Fittings

### **7.2.2 TRAILER SUSPENSION**

Inspect suspension components and fasteners.

# Inspections And Lubrication

## 7.2.3 DRAIN TRAILER AIR TANKS

Drain moisture from trailer air tanks by opening petcock (A) on the bottom of each air tank. See Figure 7-3. Close petcocks after draining.

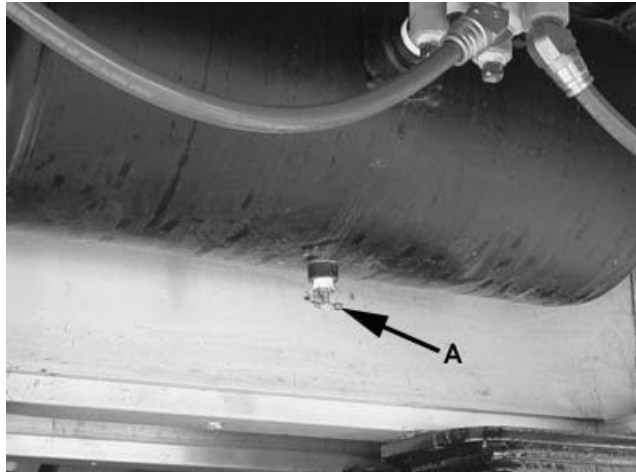


Figure 7-3 – Drain Trailer Air Tanks

## 7.2.4 INSPECT, MEASURE AND ADJUST BRAKES

Inspect and measure the brake linings. Replace with a quality shoe and lining if contaminated, cracked or if the lining is worn to less than ¼ inch thickness at any point. See Figure 7-4.

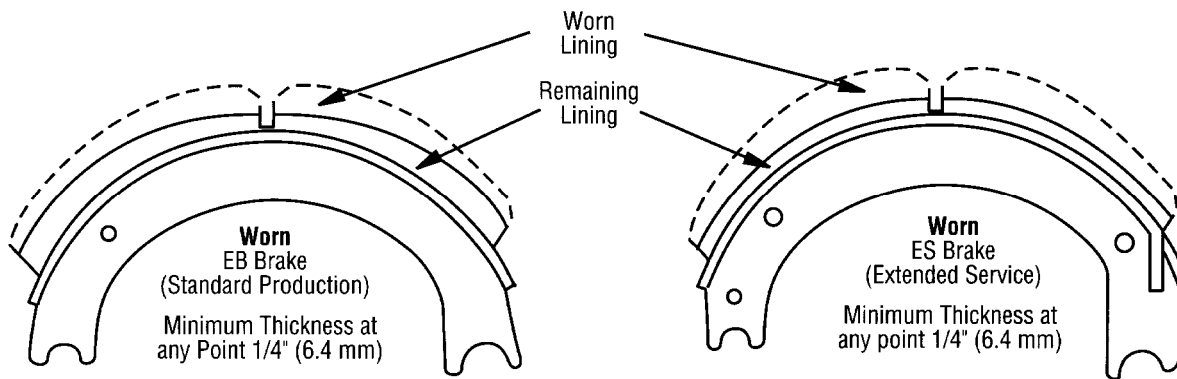


Figure 7 -4 – Measure Brake Lining

## Inspections And Lubrication

Chock tires and release brakes. Measure the distance (A) with brakes released. See Figure 7-5. Use a lever to move slack adjuster until brakes contact the drum and measure the distance (B). Subtract distance A from distance B. The result is the free stroke. Adjust slack adjuster so the free stroke is 3/8 – 5/8 inch on each slack adjuster.

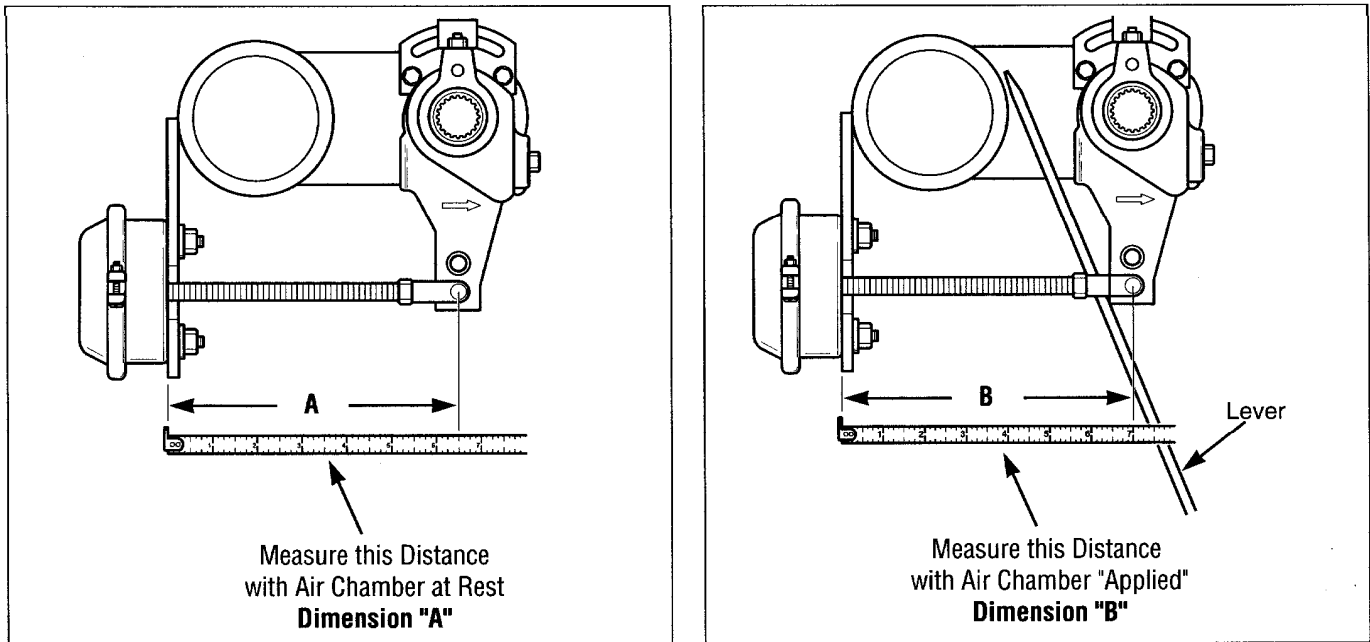


Figure 7-5 – Adjust Slack Adjusters

### 7.3 EVERY SIX MONTHS

#### 7.3.1 AIR IN-LINE FILTER (IF EQUIPPED)

Your trailer may be equipped with air inline filters. Filters are mounted on the inside of the frame rail. Every six months, relieve the air press in the trailer air tanks and remove the cap (A) and filter screen (B). See Figure 7-6 on page 36. Clean and install filter screen and cap.

#### **⚠ WARNING**

**Trailer air system is under pressure.**

**Cap and screen can shoot out with force.**

**Relieve air in the trailer air system before removing cap and screen.**

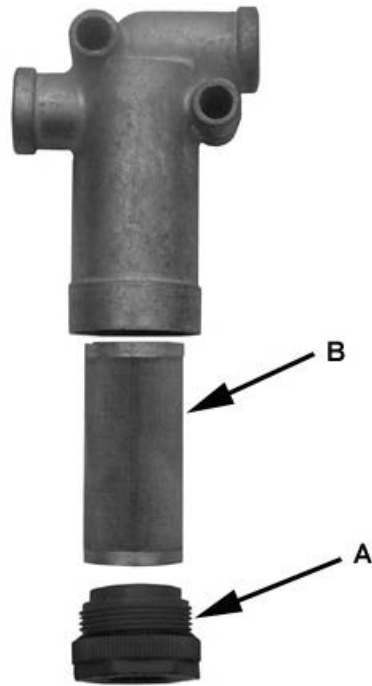


Figure 7-6 – Air In-Line Filter

### 7.3.2 GLAD HAND SEALS AND SCREENS

Inspect all glad hand seals (A) and screens (B) (if equipped) for damage and wear. Replace if damaged or worn. See Figure 7-7.

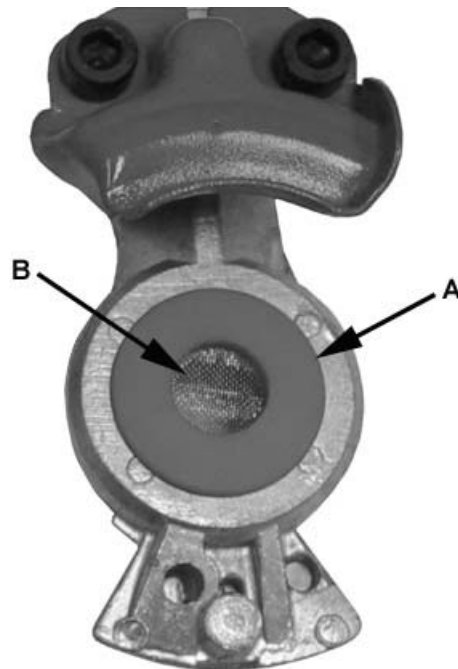


Figure 7-7 – Glad Hand Seals And Screens

## 8. MAINTENANCE AND SERVICE

MAC Trailer uses components on their trailers such as landing gear, axle assemblies, tires and rims, hydraulic and air cylinders, which are produced by other manufacturers. Refer to the OEM manufacturer's information for specific maintenance instructions. If you do not have the manufacturers' information, contact your dealer or MAC Trailer for assistance.

Routine inspections, maintenance and service must be performed on your trailer on a regular basis to insure safe and reliable operation. Inspections can be performed by a person trained in spotting potential problems. Service and repairs must be performed by a trained, qualified technician.

*Note: In addition to this manual, also check the relevant component manufacturer's manual.*

### **WARNING**

**Crushing hazard.**

**Before performing trailer inspections, service or maintenance:**

- **Park trailer on firm, level surface.**
- **Set parking brakes, turn truck engine off and remove ignition key.**
- **Chock tires if brakes are to be released.**
- **Support trailer with properly rated and placed stands.**

### 8.1 TIRES

Before each tow, be sure the tire pressure is at the value indicated on the Certification / VIN label. Tire pressure must be checked while the tire is cold. Do not check the tire pressure immediately after towing the trailer. Allow at least three hours for a tire to cool, if the trailer has been towed for as much as one mile. Replace tires that have the wear bands showing before towing trailer.

A bubble, cut or bulge in a side wall can result in a tire blowout. Inspect both side walls of each tire for any bubble, cut or bulge, and replace a damaged tire before towing the trailer.

### **WARNING**

**Collision hazard.**

**Worn, damaged or under-inflated tires can cause loss of control, injury and damage.**

**Check tires before towing trailer.**

### 8.2 WHEELS

Whenever tires/wheels are removed, check the condition of the wheel, wheel lugs, hubs and studs. Replace any damaged, corroded or worn parts. Use the correct wheel lugs and wedges (if equipped) for your trailer.

### **WARNING**

**Wheel failure hazard.**

- **Never weld on wheel or hub for any reason**
- **Never install aluminum wheels on an axle designed for steel wheels. The stud length is greater for aluminum wheels than steel wheels.**
- **Always use the correct lugs and wedges (if equipped).**

## Maintenance And Service

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### 8.2.1 SPOKE WHEELS

Lug nuts are prone to loosen right after a wheel is mounted to a hub. When driving on a remounted wheel, check to see if the lug nuts are tight after the first 50-100 miles of driving and weekly thereafter.

When removing a wheel from a trailer equipped with spoke wheels, care must be taken to avoid injury.

#### **⚠ WARNING**

**Flying projectile hazard.**

**Wedges can fly out with force when removing wheel.**

**Partially loosen wheel lugs and relieve tension on wedges before removing wheel lugs.**

Loosen the wheel lugs but do not remove at this time. With the wheel lugs loose, strike the wedges with a hammer to free tension on wedges. Now the wheel lugs and wedges can be removed.

Install wheel, wedges and lugs. Rotate the wheel and set runout to a maximum of 1/8 inch. Evenly tighten lugs to 200-250 lb/ft of torque.

#### **⚠ WARNING**

**Wheel failure hazard.**

**Lug nuts are prone to loosen after being first assembled. Death or serious injury can result.**

**Check lug nuts for tightness on a new trailer, and after re-mounting a wheel after the first 50-100 miles and weekly thereafter.**

#### **NOTICE**

**Risk of trailer damage.**

**Studs, lugs and wheels can be damaged by over tightening.**

**Do not over tighten wheel lugs.**

### 8.2.2 DISK WHEELS

Lug nuts are prone to loosen right after a wheel is mounted to a hub. When driving on a remounted wheel, check to see if the lug nuts are tight after the first 50-100 miles of driving and weekly thereafter.

#### **⚠ WARNING**

**Lug nuts are prone to loosen after being first assembled. Death or serious injury can result.**

**Check lug nuts for tightness on a new trailer, and after re-mounting a wheel after the first 50-100 miles and weekly thereafter.**

1. Place two drops of oil to a point between the nut and flange and two drops to the two or three threads at the end of each wheel stud.
2. Tighten to 50 lb/ft of torque in the sequence shown in Figure 8-1.



3. Tighten to 450-500 lb/ft of torque in the sequence shown in Figure 8-1.

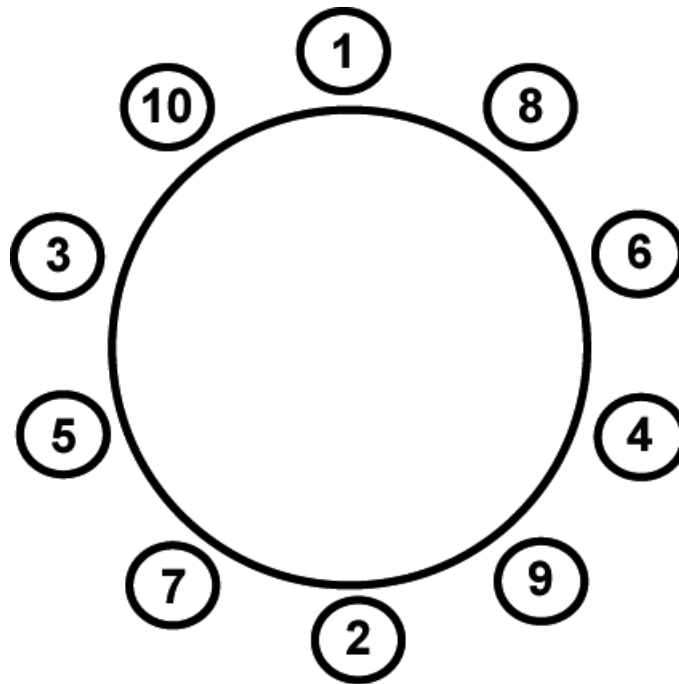


Figure 8-1 – Wheel Lug Torque Sequence

### 8.2.3 WHEEL ENDS

Your trailer may be equipped with oil bath (A), grease packed (B) or Hendrickson Long-Lift System™ (HLS™) (C) wheel ends. See Figure 8-2.

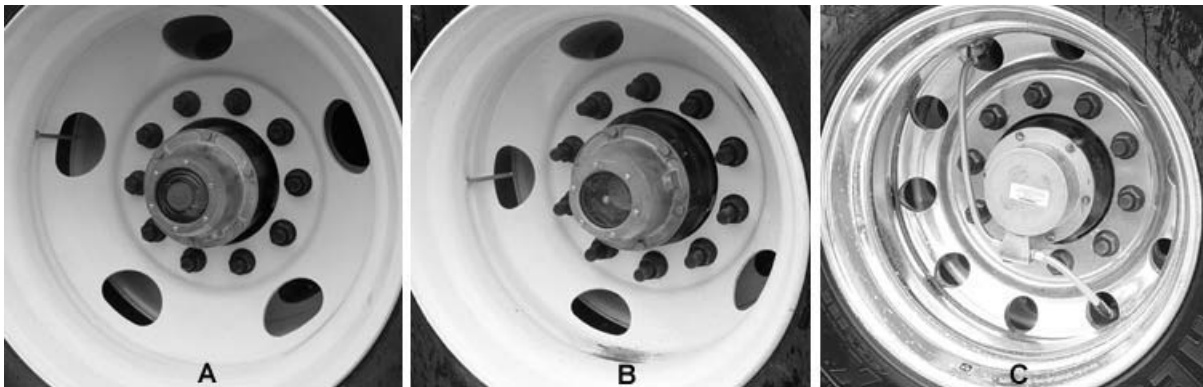


Figure 8-2 – Wheel End Options

Oil bath style wheel ends (A) use an approved drive axle lubricant gear oil for lubrication. Remove the rubber plug. Use a lubricant meeting MIL-L-2105D specifications. Either 80W-90 mineral based or 75W-90 synthetic lubricant is acceptable. Do not mix lubricants. Add lubricant to the bottom full line on hub cap. Install rubber plug.

Grease packed wheel ends (B) use wheel bearing grease for lubrication. Check the axle manufacturers' information regarding service and maintenance intervals.

Hendrickson Long-Life System™ (HLS™) wheel ends (C) are factory lubricated with a synthetic grease. Do not add lubricant, wheel end is factory lubricated. Do not attempt to adjust bearings; they are preset at the factory. Hub removal will void the warranty. Do not remove the (HLS™) hub cap without first contacting Hendrickson.

### 8.3 DISCHARGE AIR FILTER

If tubes in discharge air filter show excessive wear or clogging, the filter needs to be replaced using the following procedure.

1. Turn control valve to raise folding handrails, if equipped. See Figure 5-4. Use tie-off protection when on top of tank.

**⚠ WARNING**

**Falling hazard.**

**Falling from tank may result in death or serious injury.**

**Do not enter area on top of tank unless handrails, if equipped are raised.**



*Figure 8-3 – Folding Handrails (Optional)*

2. Enter the top of the trailer using the rear steps.
3. Use tie off protection to prevent falling from trailer.

**⚠ WARNING**

**Crushing hazard.**

**Discharge air filter is heavy. Use appropriate lifting device to remove filter from filter housing.**

4. Release filter assembly latches on top of filter housing.
5. Attach an appropriate lifting device to filter assembly handle.
6. Slowly remove filter assembly from housing, and replace filter tubes.



Figure 8-4 – Discharge Air Filter Removal

### 8.4 HOPPERS

Depending on the cargo, it may be necessary to thoroughly clean the hoppers, discharge valves and discharge lines.

1. Verify hopper is completely empty.
2. Verify the blow down valve is open and that the tank and line pressure are at zero.
3. Open and remove clamps (A). See Figure 8-5. Slide seals (D) completely off the discharge valve and onto the discharge lines. See Figure 8-6.
4. Remove safety pin (B) from flange.
5. Insert a pipe into bracket (C) and pull on pipe to release discharge valve.
6. Clean hopper, valve and discharge lines with pressurized air.
7. Repeat procedure for other hoppers.

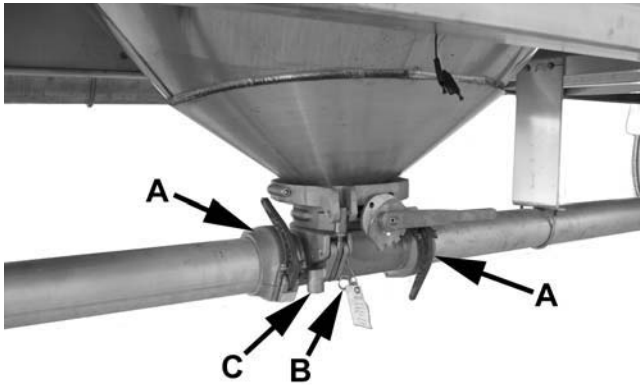


Figure 8-5 – Remove Discharge Valve

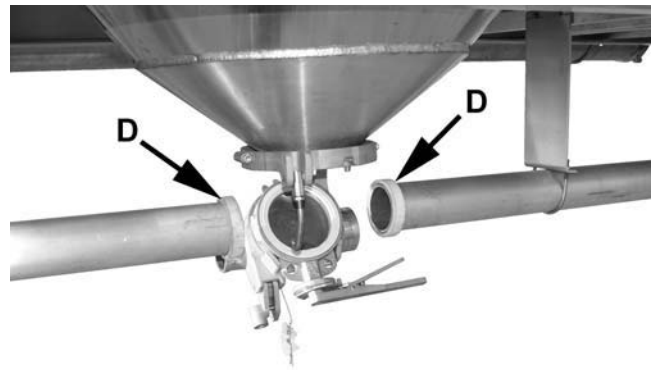


Figure 8-6 – Discharge Valve Seals



## NOTES

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