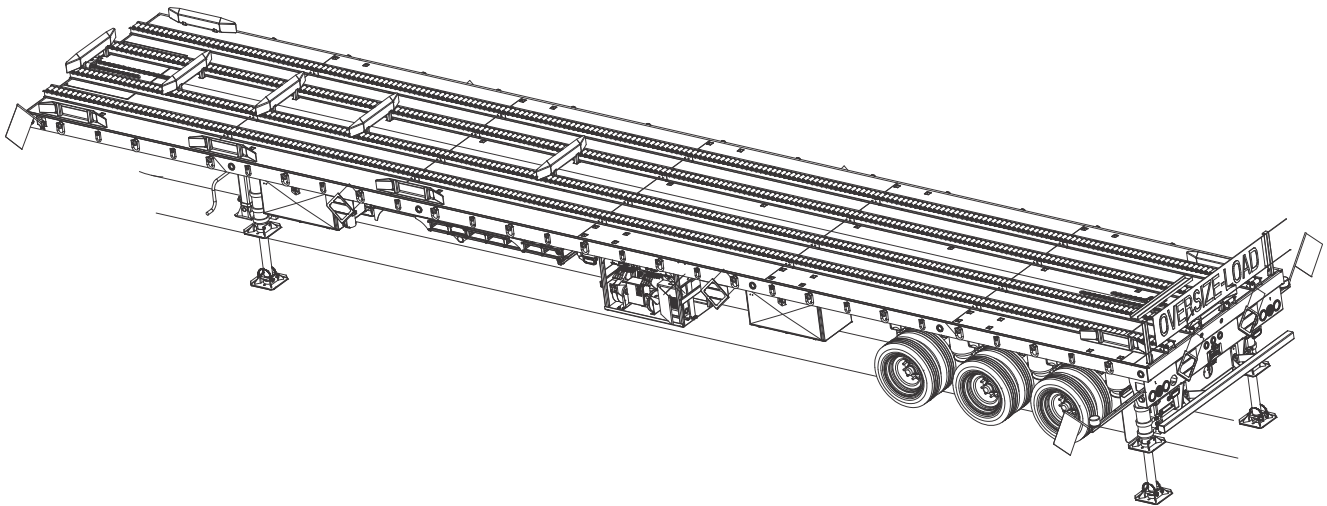




Model 380 Level Load Roller Trailer Operator's Manual



LANDOLL CORPORATION

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Introduction

This manual provides operating, servicing, and maintenance instructions for Model 380 Lockheed semitrailer, manufactured by Landoll Corporation, Marysville, Kansas 66508.

- CHAPTER 1** gives basic instructions on the use of this manual.
- CHAPTER 2** gives product specifications for the trailer, including measurements and component specifications. A Standard Bolt Torque Table is provided to give guidelines for bolt torques to be used when servicing this product.
- CHAPTER 3** gives instructions for the proper operation of the equipment.
- CHAPTER 4** gives general maintenance procedures, a maintenance schedule, and a lubrication schedule. Improper maintenance will void your warranty.

IF YOU HAVE ANY QUESTIONS CONTACT:

**LANDOLL CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508**

**or phone:
(785) 562-5381 or
(800) 428-5655
or FAX:
(888) 527-3909**

- CHAPTER 5** is a troubleshooting guide to aid in diagnosing and solving problems with the trailer.
- PARTS MANUAL** is a separate manual showing the various assemblies, subassemblies, and systems. Refer to that manual when ordering Landoll replacement parts. Order parts from your Landoll dealer.
- WARRANTY** The Warranty Registration form is included with the product documents. Fill it out and mail it within 15 days of purchase.
- NOTE: IMPROPER ASSEMBLY, MODIFICATION, OR MAINTENANCE OF YOUR LANDOLL MACHINE CAN VOID YOUR WARRANTY.**
- COMMENTS** Address comments or questions regarding this publication to:

**LANDOLL CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
ATTENTION: PUBLICATIONS -DEPT. 55**

Understanding Safety Statements

You will find various types of safety information on the following pages and on the machine signs (decals) attached to the vehicle. This section explains their meaning.

The Safety Alert Symbol means ATTENTION! YOUR SAFETY IS INVOLVED!



DANGER

Danger means a life-threatening situation exists. Death can occur if safety measures or instructions on this label are not properly followed.



WARNING

Warning means serious injury or death can occur if safety measures or instructions on this label are not properly followed.



CAUTION

Caution means serious equipment or other property damage can occur if instructions on this label are not properly followed.

NOTE

Means that failure to follow these instructions could cause damage to the equipment or cause it to operate improperly.

NOTE

Make sure you read and understand the information contained in this manual and on the machine signs (decals) before you attempt to operate or maintain this vehicle.

The safety statements contained in this manual relate to the operation of the Model 380 Lockheed semitrailer.

Chapter 2

Standard Specifications

| MODEL 380 | |
|--|--|
| CAPACITY*: | 80,000 LB. GVW 20,000 LB. CONCENTRATED IN 10' 28,000 LB. CONCENTRATED IN 30' |
| KING PIN SETTING: | 30" |
| LOADED GROUND CLEARANCE: | 7" |
| LOADED DECK HEIGHT: | 58-1/2" LESS ROLLERS/62-5/8" TOP OF ROLLERS |
| MAXIMUM LOADED DECK HEIGHT: | 80-3/4" LESS ROLLERS/ 84-7/8" TOP OF ROLLERS |
| SMALL SWIVEL TIEDOWN | 2,500 LB. CAPACITY |
| LARGE SWIVEL TIEDOWN | 10,000 LB. CAPACITY |
| TIRE SIZE: | 255/70R22.5 LRH DOUBLE COIN |
| BRAKE SIZE: | 16-1/2" X 7" |
| ELECTRICAL HOOKUP: | 12 VOLT 7-WAY CONNECTOR/24 VOLT 12-PIN CONNECTOR |
| AIR HOOKUP: | COLOR CODED GLAD HANDS |
| HYDRAULIC RESERVOIR TANK: | 30 GALLON |
| DIESEL ENGINE | 17.2 HP |
| DIESEL ENGINE FUEL TANK | 6.6 GALLON |
| BATTERIES | 12 VOLT SEALED GEL |
| BATTERY CHARGER | 40 AMP 12 VOLT |
| ELECTRIC MOTOR | 7.5 HP 3PH 208-230/460 VOLTS |
| MAXIMUM OPERATING PRESSURE | 2000 PSI |
| OPERATING FLOW | 9.0 GPM ENGINE DRIVE/ 4.7 GPM ELECT. DRIVE |
| <p>* CAPACITY RATINGS ARE FRAME CAPACITIES ONLY. ACTUAL LOAD CAPACITIES MAY BE RESTRICTED BY FACTORS SUCH AS GROSS AXLE WEIGHT RATINGS (GAWR) OR STATE AND FEDERAL REGULATIONS. TIRE, BRAKE, AXLE, OR WHEEL SELECTION MAY ALSO LIMIT CAPACITY.</p> | |

STANDARD SPECIFICATIONS

| SPECIFIC BOLT TORQUES | |
|---|--------------------|
| AIR RIDE SUSPENSION (RL-250-17): | |
| EQUALIZER BEAM PIVOT AND ADAPTER BOLTS | |
| DESIGNATED W/ NEWAY ON BOLT HEAD | 800 FT.-LBS. |
| DESIGNATED W/ HOLLAND NEWAY ON BOLT HEAD | 550 FT.-LBS. |
| SHOCK ABSORBER MOUNTING | 150 FT.-LBS. |
| AIR SPRING MOUNTING: | |
| 1/2" | 35 FT.-LBS. |
| 3/4" | 35 FT.-LBS. |
| WHEEL FASTENERS - ALL MODELS: | |
| OUTER SPINDLE NUTS | 250 - 400 FT.-LBS. |
| PILOT WHEEL NUTS | 450 - 500 FT.-LBS. |

**LANDOLL CORPORATION
GENERAL TORQUE SPECIFICATIONS (REV. 4/97)**

THIS CHART PROVIDES TIGHTENING TORQUES FOR GENERAL PURPOSE APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.

ASSEMBLY TORQUES APPLY TO PLATED NUTS AND CAPSCREWS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.

WHEN FASTENERS ARE DRY (SOLVENT CLEANED), ADD 33% TO AS RECEIVED CONDITION TORQUE.

BOLT HEAD IDENTIFICATION MARKS INDICATE GRADE AND MAY VARY FROM MANUFACTURER TO MANUFACTURER.

THICK NUTS MUST BE USED ON GRADE 8 CAPSCREWS.

USE VALUE IN [] IF USING PREVAILING TORQUE NUTS.

TORQUE IS SPECIFIED IN FOOT POUNDS

| UNC Size | SAE Grade 2 | | SAE Grade 5 | | SAE Grade 8 | | UNF Size | SAE Grade 2 | | SAE Grade 5 | | SAE Grade 8 | |
|----------|-------------|-------|-------------|--------|-------------|--------|----------|-------------|--------|-------------|--------|-------------|--------|
| 1/4-20 | 4 | [5] | 6 | [7] | 9 | [11] | 1/4-28 | 5 | [6] | 7 | [9] | 10 | [12] |
| 5/16-18 | 8 | [10] | 13 | [16] | 18 | [22] | 5/16-24 | 9 | [11] | 14 | [17] | 20 | [25] |
| 3/8-16 | 15 | [19] | 23 | [29] | 35 | [43] | 3/8-24 | 17 | [21] | 25 | [31] | 35 | [44] |
| 7/16-14 | 24 | [30] | 35 | [43] | 55 | [62] | 7/16-20 | 27 | [34] | 40 | [50] | 60 | [75] |
| 1/2-13 | 35 | [43] | 55 | [62] | 80 | [100] | 1/2-20 | 40 | [50] | 65 | [81] | 90 | [112] |
| 9/16-12 | 55 | [62] | 80 | [100] | 110 | [137] | 9/16-18 | 60 | [75] | 90 | [112] | 130 | [162] |
| 5/8-11 | 75 | [94] | 110 | [137] | 170 | [212] | 5/8-18 | 85 | [106] | 130 | [162] | 180 | [225] |
| 3/4-10 | 130 | [162] | 200 | [250] | 280 | [350] | 3/4-16 | 150 | [188] | 220 | [275] | 320 | [400] |
| 7/8-9 | 125 | [156] | 320 | [400] | 460 | [575] | 7/8-14 | 140 | [175] | 360 | [450] | 500 | [625] |
| 1-8 | 190 | [237] | 408 | [506] | 680 | [850] | 1-14 | 210 | [263] | 540 | [675] | 760 | [950] |
| 1-1/8-7 | 270 | [337] | 600 | [750] | 960 | [1200] | 1-1/8-12 | 300 | [375] | 660 | [825] | 1080 | [1350] |
| 1-1/4-7 | 380 | [475] | 840 | [1050] | 1426 | [1782] | 1-1/4-12 | 420 | [525] | 920 | [1150] | 1500 | [1875] |
| 1-3/8-6 | 490 | [612] | 110 | [1375] | 1780 | [2225] | 1-3/8-12 | 560 | [700] | 1260 | [1575] | 2010 | [2512] |
| 1-1/2-6 | 650 | [812] | 1460 | [1825] | 2360 | [2950] | 1-1/2-12 | 730 | [912] | 1640 | [2050] | 2660 | [3325] |
| 1-3/4-5 | 736 | [920] | 1651 | [2063] | 2678 | [3347] | 1-3/4-12 | 920 | [1150] | 2063 | [2579] | 3347 | [4183] |

METRIC

COARSE THREAD METRIC CLASS 10.9 FASTENERS AND CLASS 10.0 NUTS AND THROUGH HARDENED FLAT WASHERS, PHOSPHATE COATED, ROCKWELL "C" 38-45.

USE VALUE IN [] IF USING PREVAILING TORQUE NUTS.

| Nominal Thread Diameter mm | Standard Torque | | Nominal Thread Diameter mm | Standard Torque | |
|----------------------------|-----------------|-------------|----------------------------|-----------------|-------------|
| | Newton-Meters | Foot-Pounds | | Newton-Meters | Foot-Pounds |
| 6 | 10 | [14] | 20 | 385 | [450] |
| 7 | 16 | [22] | 24 | 670 | [775] |
| 8 | 23 | [32] | 27 | 980 | [1105] |
| 10 | 46 | [60] | 30 | 1330 | [1470] |
| 12 | 80 | [101] | 33 | 1790 | [1950] |
| 14 | 125 | [155] | 36 | 2325 | [2515] |
| 16 | 200 | [240] | 39 | 3010 | [3210] |
| 18 | 275 | [330] | | | |

Table 2-1: General Torque Specifications

STANDARD SPECIFICATIONS

LANDOLL CORPORATION HYDRAULIC FITTING TORQUE SPECIFICATIONS 37° JIC, ORS, & ORB (REV. 10/97)

THIS CHART PROVIDES TIGHTENING TORQUES FOR HYDRAULIC FITTING APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.

ASSEMBLY TORQUES APPLY TO PLATED CARBON STEEL AND STAINLESS STEEL FITTINGS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED. BRASS FITTINGS AND ADAPTERS - 65% OF THE TORQUE VALUE FOR STEEL. STAINLESS STEEL, ALUMINUM AND MONEL - THREADS ARE TO BE LUBRICATED.

TORQUE IS SPECIFIED IN FOOT POUNDS

PARKER BRAND FITTINGS

| Dash Size | 37 Degree JIC | O-Ring (ORS) | O-Ring Boss (ORB) |
|-----------|---------------|--------------|-------------------|
| -4 | 11-13 | 15-17 | 13-15 |
| -5 | 14-16 | — | 21-23 |
| -6 | 20-22 | 34-36 | 25-29 |
| -8 | 43-47 | 58-62 | 40-44 |
| -10 | 55-65 | 100-110 | 57.5-62.5 |
| -12 | 80-90 | 134-146 | 75-85 |
| -16 | 115-125 | 202-218 | 109-121 |
| -20 | 160-180 | 248-272 | 213-237 |
| -24 | 185-215 | 303-327 | 238-262 |
| -32 | 250-290 | — | 310-340 |

GATES BRAND FITTINGS

| Dash Size | 37 Degree JIC | O-Ring (ORS) | O-Ring Boss (ORB) |
|-----------|---------------|--------------|-------------------|
| -4 | 10-11 | 10-12 | 14-16 |
| -5 | 13-15 | — | — |
| -6 | 17-19 | 18-20 | 24-26 |
| -8 | 34-38 | 32-40 | 37-44 |
| -10 | 50-56 | 46-56 | 50-60 |
| -12 | 70-78 | 65-80 | 75-83 |
| -14 | — | 65-80 | — |
| -16 | 94-104 | 92-105 | 111-125 |
| -20 | 124-138 | 125-140 | 133-152 |
| -24 | 156-173 | 150-180 | 156-184 |
| -32 | 219-243 | — | — |

AEROQUIP BRAND FITTINGS

| Dash Size | 37 Degree JIC | O-Ring (ORS) | O-Ring Boss (ORB) |
|-----------|---------------|--------------|-------------------|
| -4 | 11-12 | 10-12 | 14-16 |
| -5 | 15-16 | — | 18-20 |
| -6 | 18-20 | 18-20 | 24-26 |
| -8 | 38-42 | 32-35 | 50-60 |
| -10 | 57-62 | 46-50 | 72-80 |
| -12 | 79-87 | 65-70 | 125-135 |
| -14 | — | — | 160-180 |
| -16 | 108-113 | 92-100 | 200-220 |
| -20 | 127-133 | 125-140 | 210-280 |
| -24 | 158-167 | 150-165 | 270-360 |
| -32 | 245-258 | — | — |

Table 2-2: Hydraulic Fitting Torque Specifications

Operating Instructions

General

This section supplies information for operation of the semitrailer. It describes and locates controls and gives general operation procedures. Read all instructions, warnings, cautions, and danger notes before attempting to operate the semitrailer. Operators must have proper training before operating the semitrailer. **(See Figure 3-1 for location of semitrailer parts.)**



WARNING

Do not operate the semitrailer with any known fault that might endanger the occupants, nearby workers, other traffic, the load, or the equipment.



WARNING

Do not operate the semitrailer until you have read the operator's manual and completely understand the proper use and function of all controls. Improper use can cause personal injury, damage to your semitrailer and cargo, and cause time-consuming breakdowns.

Parking Brake

The parking brakes are automatically applied by spring pressure with the air actuators of the braking system when air pressure in the emergency line drops below 50 psi. This may be done within the truck using the trailer parking/emergency valve or by disconnecting the emergency gladhands.

Air Brake System

The air brake system of the semitrailer is operated from the towing vehicle after coupling. The towing vehicle's air system must be coupled to the semitrailer and charged to 90 psi minimum before the brakes can adequately function.

Anti-Lock Brake System (ABS)

The Anti-Lock Brake System of the semitrailer is constant powered by the auxiliary (blue) circuit of the seven way electrical connector, with backup power from the stop lamp (red) circuit, and ground through the white wire. It is necessary that the blue circuit is hot when the tractor key switch is on. The blue circuit on the trailer may not be used to power any additional auxiliary devices while the semitrailer is moving forward. If a fault exists in the ABS, normal braking will occur, but the wheels may lock. Service the ABS as soon as possible.



CAUTION

The auxiliary (blue) circuit is for powering the semitrailer ABS. This circuit must be hot when the tractor key switch is on. No other electrical devices may be powered by this circuit while the semitrailer is moving forward.



CAUTION

If a fault exists in the semitrailer ABS, normal braking will occur, but wheels may lock. Service the ABS as soon as possible.

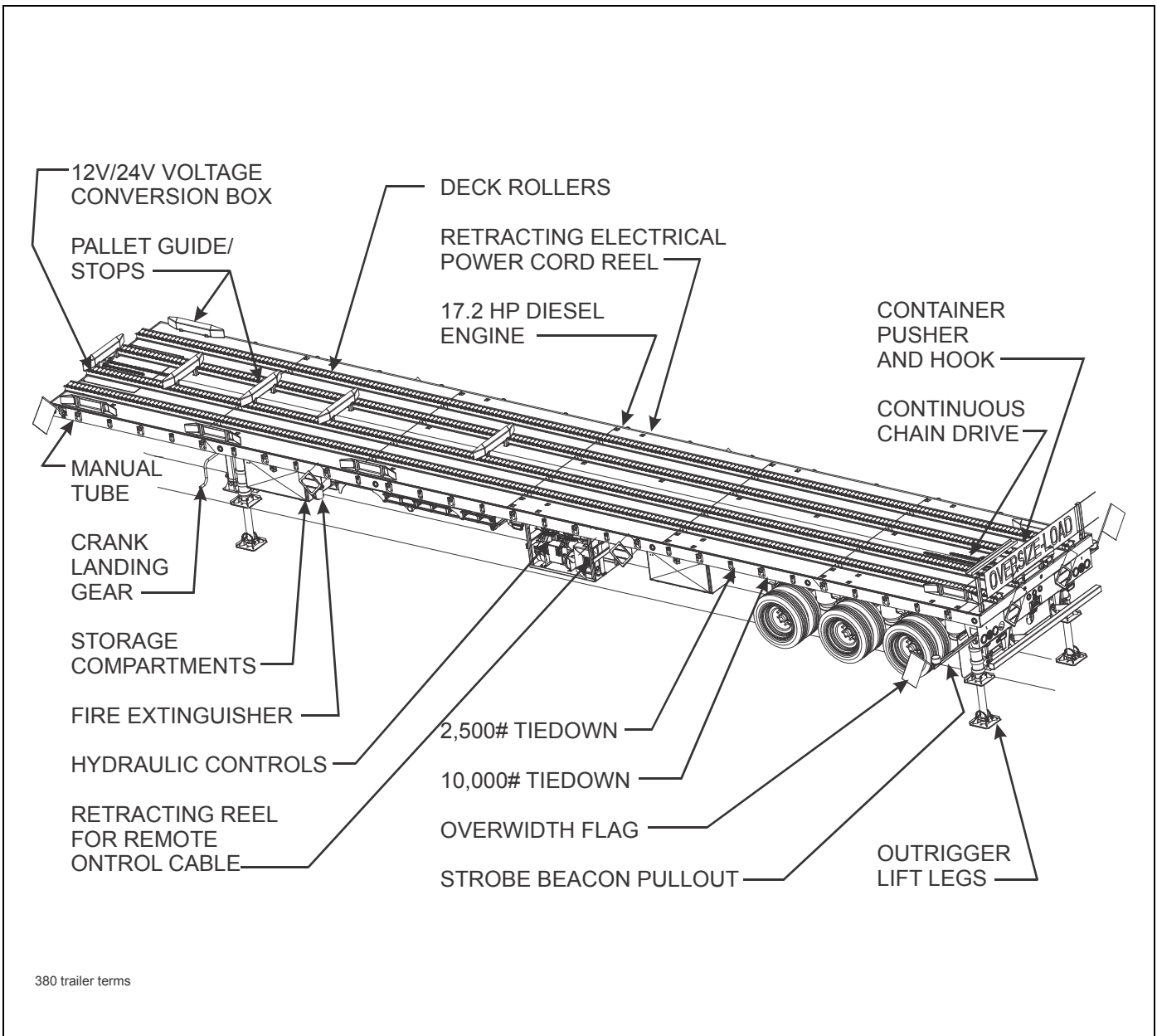


Figure 3-1: Trailer Terminology

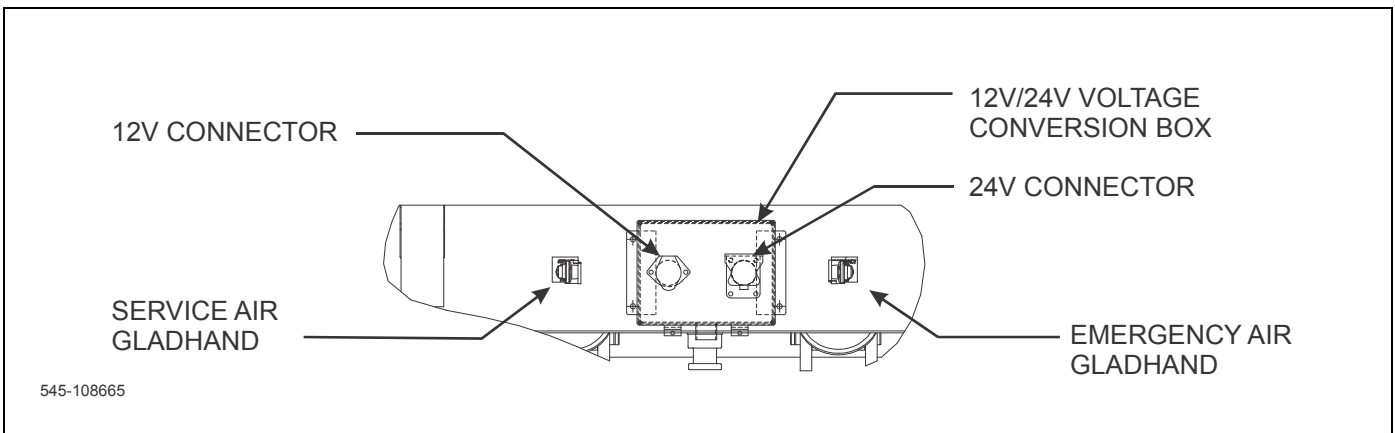


Figure 3-2: Service Hookups

Trailer 12V/24V Electrical System

The operator is required to connect the towing vehicle electrical cable plug with the semitrailer electrical receptacle in order for the lighting system to function.

It is necessary that the tractor blue wire be connected to the appropriate electrical source on the tractor.

Hydraulic

Controls are located on the driver's side of the trailer. The trailer hydraulic power center must be activated before any hydraulic controls can function. The hydraulic system is designed to operate at 2000 psi maximum pressure and approximately 9 gpm flow capacity.

Pre-Coupling of Semitrailer and Tractor

1. Slowly back the tractor/truck (towing vehicle) up to the front end of the semitrailer so the kingpin of the semitrailer is centered between the tractor fifth wheel jaws. Stop the towing vehicle just inches ahead of the semitrailer. Set tractor parking brake.
2. Check the semitrailer king pin plate. It should be in a horizontal position. The king pin plate should be the same height, to slightly lower, than the latch area of the fifth wheel plate of the towing vehicle. If necessary, use the trailer landing gear, or start the semitrailer hydraulic power engine. Use the landing gear **TRAILER LIFT** lever to raise or lower the kingpin plate sufficiently to set proper coupling height **(See "Individual operation of the outriggers can be controlled by each single lever." on page 3-9.)** Drain all air and moisture from the towing vehicle air brake system following towing vehicle manufacturer's instructions.
3. Connect the service and emergency air hoses of the towing vehicle to their respective gladhand on the front of the semitrailer; red emergency line to the gladhand with the "**EMERGENCY**" tag, and the blue service line to the gladhand with the "**SERVICE**" tag **(See Figure 3-2.)** Chock the semitrailer wheels before activating the semitrailer air supply valve in the towing vehicle. Set the parking brakes.



WARNING

Failure to chock semitrailer wheels could allow movement of the semitrailer resulting in serious personal injury, death, or damage to property in its path.

4. Check the air brake operations of the semitrailer as follows:
 - a. Apply brakes and inspect brake action on all wheels for prompt application.
 - b. Release brakes. All brakes should release immediately. Air pressure should discharge quickly from the relay emergency valve.
 - c. Disconnect the emergency air line from the semitrailer gladhand. Trailer brakes should promptly set.
 - d. Re-connect the emergency air line to the semitrailer and activate the semitrailer air supply valve. The semitrailer brakes should set.

Coupling of the Tractor to the Semitrailer



DANGER

Keep all personnel clear of front, rear, and sides of towing vehicle and semitrailer during coupling, component operations, and uncoupling. Failure to stay clear can result in serious personal injury or death.

1. Verify the semitrailer wheels are chocked and brakes function properly.
2. Make certain the coupler of the towing vehicle's fifth wheel is open by pulling the latch handle.
3. Slowly back the towing vehicle so its fifth wheel contacts the front of the king pin plate on the semitrailer and slips under it. Continue backing until the fifth wheel coupler locks onto the semitrailer kingpin.
4. Verify the vehicle coupling is secure by attempting to pull the tractor forward a few inches. If the tractor disconnects from the semitrailer, locate source of coupling failure; repair before continuing; and repeat **steps 3 and 4**.
5. Check that the towing vehicle couples securely to the semitrailer before setting towing vehicle and semitrailer parking brakes.

IMPORTANT

Keep brakes engaged for remainder of hookup, checkout procedures, and parking.

Connecting Tractor Services to the Semitrailer

1. Connect the towing vehicle 12 volt 7-pin or 24 volt 12-pin electrical plug to the electrical receptacle on the front of the semitrailer (See Figure 3-2.)

IMPORTANT

The key on the plug and the keyway in the socket must be properly aligned before inserting the plug into the semitrailer socket.



CAUTION

Hydraulic operating pressures greater than 2500 psi can cause damage to the trailer.

2. Air Lines (See "Pre-Coupling of Semitrailer and Tractor" on page 3-3.)

Tractor and Semitrailer Check-Out



WARNING

Failure to properly set and check parking brake, and chock wheels when parking and during storage, could allow movement of the truck/semitrailer rig resulting in serious personal injury, death, or damage to property in its path.



CAUTION

Failure to support the semitrailer fully on the load blocks during transport, may result in damage to the load, the semitrailer, and possible serious injury or death to individuals near the semitrailer.

1. Check the operation of all lights and signals on the semitrailer for proper response to switch positions (stop, right turn, left turn, and clearance). Check operation of remote function if present.
2. Check tire inflation, adjust as needed to the pressure listed on the semitrailer VIN plate, located on the front of the semitrailer.
3. Check tractor/semitrailer for air leaks. If air leakage is found, repair the defect before transporting.
4. Grease hubs.
5. Check tractor air pressure. Pressure must not fall below 90 psi, even after activating brakes a couple of times. Set parking brake and carefully remove all wheel chocks. Set emergency brake and try pulling forward. The semitrailer wheels must not rotate. If semitrailer brakes do not apply, **DO NOT** transport until defect, or defects, are repaired.

Towing the Semitrailer

Driving the towing vehicle with the semitrailer coupled behind requires constant attention to the overall length of the combination. The “hinged-in-the-middle” configuration of the tractor and semitrailer, load, and weight effect performance. Turning, passing, acceleration, braking, stopping, and backup require special considerations. When executing steep grades or turning tight curves, the semitrailer must not be allowed to push the towing vehicle, or jack knifing the semitrailer with the towing vehicle may result. Application of the semitrailer brakes to keep the semitrailer in tow will help prevent this pushing. Braking should begin before descending a hill or attempting a curve, to assure control.



CAUTION

When operating semitrailer, do not back over curb. This will cause severe damage to undercarriage.

1. Make a moving test of the semitrailer brakes at low, and medium speeds before traveling at highway speed.
 - a. The Anti-Lock Brake System (ABS) warning lamp mounted at left rear side of the semitrailer should come on when power is supplied to the ABS by turning the tractor keyswitch on. The warning lamp should go off once the semitrailer exceeds 4 mph. If the warning lamp does not go off, a fault exists in the semitrailer ABS. Once the vehicle speed exceeds 4 mph, the light should remain off unless a fault occurs or the keyswitch is turned off, then on again.



CAUTION

If a fault exists in the semitrailer ABS, normal braking will occur, but wheels may lock. Service the ABS as soon as possible.

2. Monitor the air pressure gauge on the dash of the towing vehicle. Pressure should not fall below 90 psi at any time.
3. The semitrailer wheels track to the inside of the towing vehicle during turns. Thus, turning corners requires a wide swing to prevent “curb hopping”, and to allow the semitrailer wheels to clear any obstacle on the inside of the corner.
4. To stop, use a gradual and smooth application of brakes. If grabbing occurs, apply less pressure - grabbing brakes are not efficient.



WARNING

Always check behind and under the truck and semitrailer for persons or objects before moving. Failure to check can lead to serious personal injury or death to others, or damage to property.

5. Backing should be done with care. Tail overhang, semitrailer length, and allowable space must be taken into consideration when backing the semitrailer.

Parking the Trailer

1. Position truck/semitrailer rig on a level, solid surface.
2. Set the **PARKING BRAKE**, **not the semitrailer hand brake**, and check for proper brake holding.
3. Chock wheels of semitrailer.
4. Check for any air leaks in lines, relay valve, brake pods, or any other air system component.

Uncoupling Towing Vehicle from Semitrailer

1. Park the semitrailer according to instructions in **“Parking the Trailer” on page 3-7**.
2. Disconnect the emergency and service air lines and attach them to the tractor gladhand holders. If present, install dummy gladhands on trailer couplings.
3. Disconnect the 12 volt 7-pin or 24 volt 12-pin cable from the semitrailer and store with the tractor.
4. Pull the tractor fifth wheel plate latch release lever.
5. Attempt to pull the tractor forward. If the tractor uncouples, verify all service lines are disconnected and semitrailer wheels are chocked. If tractor does not disconnect, repeat **steps 4 and 5**.
6. Pull the tractor away from the semitrailer.



DANGER

Always check behind and under the truck and semitrailer for persons or objects before moving. Failure to check can lead to serious personal injury or death to others, or damage to property.

OPERATING INSTRUCTIONS

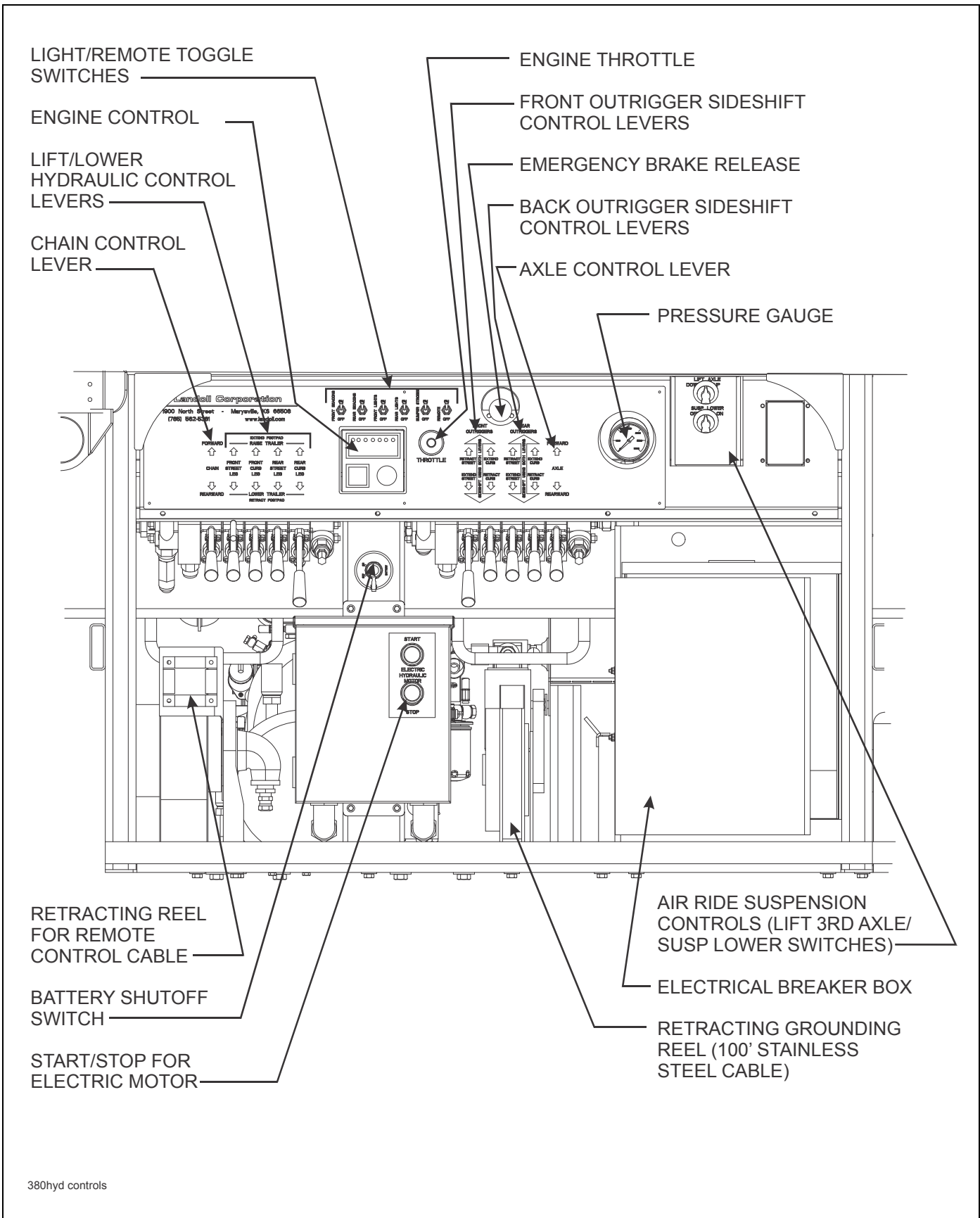


Figure 3-3: Hydraulic Power Center Controls (Streetside)

Hydraulic Control Panel

Light/Remote Switches

The **LIGHT/REMOTE SWITCH** panel is located on the driver's side of the power control center (See Figure 3-3.)

1. The first and second toggle switches nearest the front of the trailer operate the front and rear beacon lights.
2. The third and fourth switches control the front and rear under deck lights.
3. The fifth switch is used to activate the bumper strobe lights.
4. The sixth switch activates the remote.

Backup Alarm and Lights

The **BACKUP ALARM AND LIGHTS** are activated after eight inches of reverse travel and remain on while the trailer is moving in reverse. Backup alarm and lights will shut off five seconds after the trailer has stopped or is moved forward.

Chain Control Lever

The **CHAIN CONTROL lever** (See Figures 3-1 and 3-3) is located on the driver's side of the power control center. The lever has three positions:

| | |
|-----------------|--|
| FORWARD (UP) | In this position, the chain pulls toward the front of the trailer. |
| CENTER | This is the neutral position. The chain stays in its current position. |
| REARWARD (DOWN) | In this position, the chain pulls toward the rear of the trailer. |

Outrigger Sideshift Control Levers

The **OUTRIGGER SIDESHIFT CONTROL levers** (See Figures 3-1 and 3-3) are located on the driver's side of the power control center.


The outrigger valves are positioned to allow for ease of sideshifting the trailer. The front outrigger levers will be pulled up to allow streetside outrigger to retract while the curbside outrigger extends. The front outrigger levers will be pushed down to allow streetside outrigger to extend while the curbside outrigger retracts.

The rear outrigger valves operate in the same manner as the front.

Individual operation of the outriggers can be controlled by each single lever.

Trailer Lift Control Levers

The **TRAILER LIFT CONTROL levers** (See Figures 3-1 and 3-3) are located on the driver's side of the power control center. There are four levers controlling the height of the mechanical outriggers on each side of the semitrailer.

 **DANGER**

When using hydraulic outriggers, the semitrailer must be kept level at all times. Do not lower the parking stands. Loads being placed on the semitrailer must be kept centered on the semitrailer. An unlevel semitrailer may allow a load to slide, causing injury or death to anyone near the load!

Each lever has three positions:

| | |
|--------|---|
| UP | In this position, the corner of the trailer will raise. There is a lever designated for each leg. |
| CENTER | This is the neutral position. The semitrailer stays in its current position. |
| DOWN | In this position, the corner of the trailer will lower. There is a lever designated for each leg. |

Axle Control Lever

The **AXLE CONTROL lever** (See Figures 3-1 and 3-3) is located on the driver's side of the power control center. The lever has three positions:

| | |
|-----------------|--|
| FORWARD (UP) | In this position, the axle moves toward the front of the trailer. |
| CENTER | This is the neutral position. The semitrailer stays in its current position. |
| REARWARD (DOWN) | In this position, the axle moves toward the rear of the trailer. |

Hydraulic Power Supply Diesel Engine Operation

1. The Hydraulic Power Supply Engine system is used to power the hydraulic functions.

IMPORTANT

1. **Check the following fluid levels before starting the engine package: engine oil, fuel supply, hydraulic oil. (Check oil level while semitrailer is not tilted as tilting will change the oil level in the tank.)**
2. **Flip battery shutoff switch to ON position.**
3. **If the engine does not crank, check the following on the battery: charge, fluid, terminals, and cables. take corrective actions as needed.**



CAUTION

If the hydraulic fluid level is low during operation, the semitrailer may not operate correctly, resulting in damage to the semitrailer.

2. The **ENGINE IGNITION SWITCH** is located by the hydraulic controls on the driver's side of the semitrailer. Use the key to start and stop the Hydraulic Power Supply Engine (**See Figure 3-3.**) This switch has three positions:

| | |
|-------|--|
| OFF | In this position, the power package engine does not run. The key can only be inserted or removed from this position. |
| RUN | In this position, the engine runs without using the starter. |
| START | In this position, the starter cranks the power package engine, letting it start. After the engine is started, release the key to the RUN position. |

3. The **HYDRAULIC POWER SUPPLY ENGINE THROTTLE** controls the speed at which the engine operates (**See Figure 3-3.**) It is a variable position control:

| | |
|-----------------|---|
| FULL OUT | In this position, the engine throttle is fully open, letting it run at full speed. |
| FULL IN | In this position, the engine throttle is closed, letting the engine run at a slow idle. |

4. Warm up the engine for about five minutes before using the hydraulic controls.
5. When finished, idle for a couple minutes before turning the engine off.
6. Be sure to turn the battery switch to OFF so as to not run down the battery.

Hydraulic Power Center (Curbside)

1. The curbside of the trailer allows access to the hydraulic tank, fuel tank, diesel engine, and batteries (**See Figure 3-4.**)

Hydraulic Power Supply Electrical Operation

1. The Hydraulic Power Supply Electrical system is also used to power the hydraulic system.

IMPORTANT

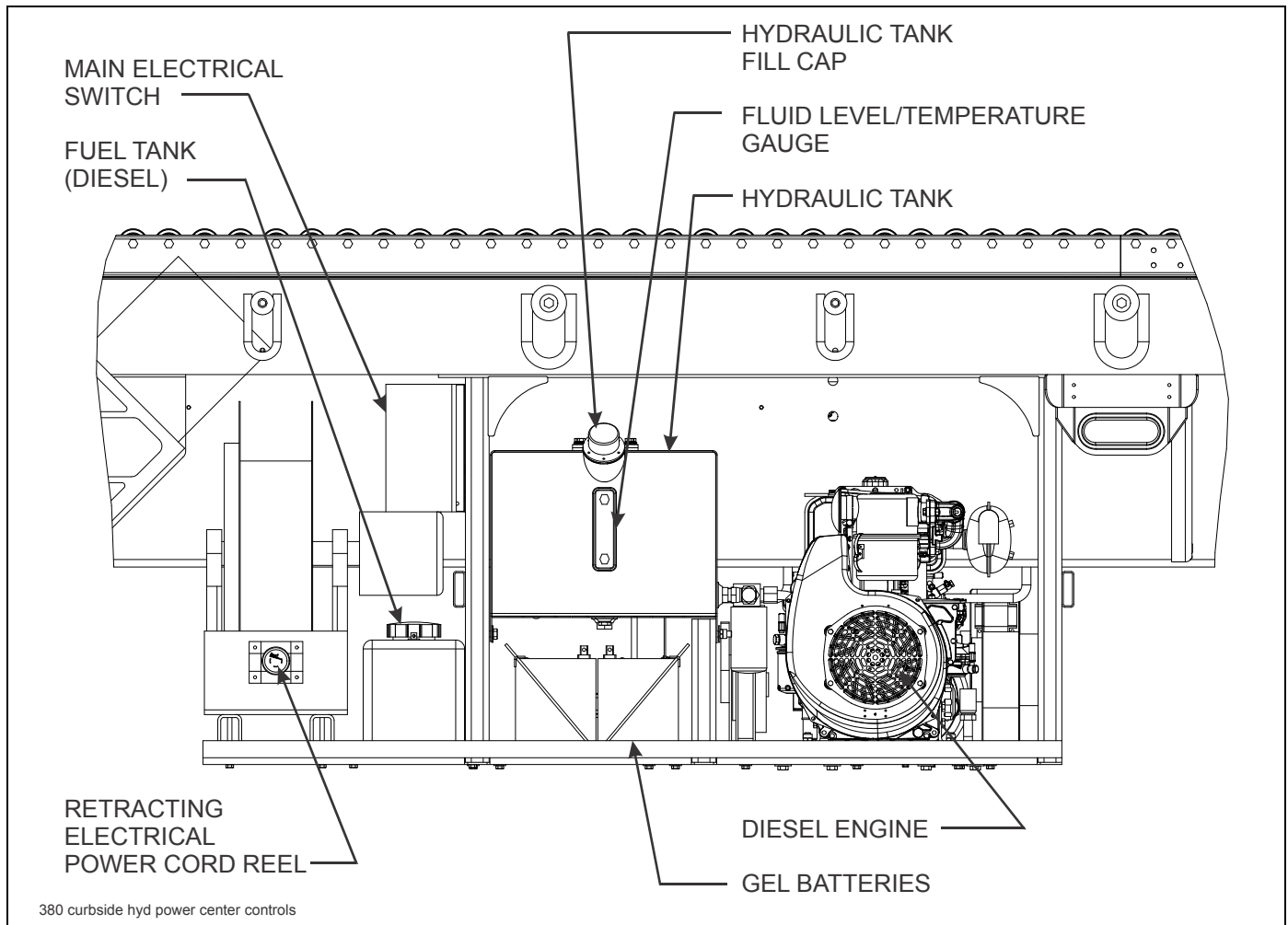
1. Check the hydraulic oil level before starting the hydraulic power supply electrical package. (Check oil level while semitrailer is not tilted as tilting will change the oil level in the tank.)
2. Flip battery shutoff switch to ON position.



CAUTION

If the hydraulic fluid level is low during operation, the semitrailer may not operate correctly, resulting in damage to the semitrailer.

2. The electrical power cord reel is located on the curbside of the trailer (See Figure 3-4.) Extend cord and connect to an appropriate 208-220 volt building power receptacle.
3. Flip the main electrical switch on. It is located on the curbside of the trailer (See Figure 3-4.)
4. To start the electric motor for the hydraulic pump, press the start button on the streetside of the trailer (See Figure 3-3.)
5. Operate all hydraulic functions and controls the same as for the diesel engine operation.
6. When finished, stop the electric motor with the stop button located on the streetside of the trailer (See Figure 3-3.)
7. Flip the main electrical switch **OFF**. It is located on the curbside of the trailer (See Figure 3-4.)
8. Disconnect the power cord from the building receptacle, and retract the cord onto the power cord reel.
9. Be sure to turn the battery switch to **OFF** so as to not run down the battery.



380 curbside hyd power center controls

Figure 3-4: Hydraulic Power Center (Curbside)

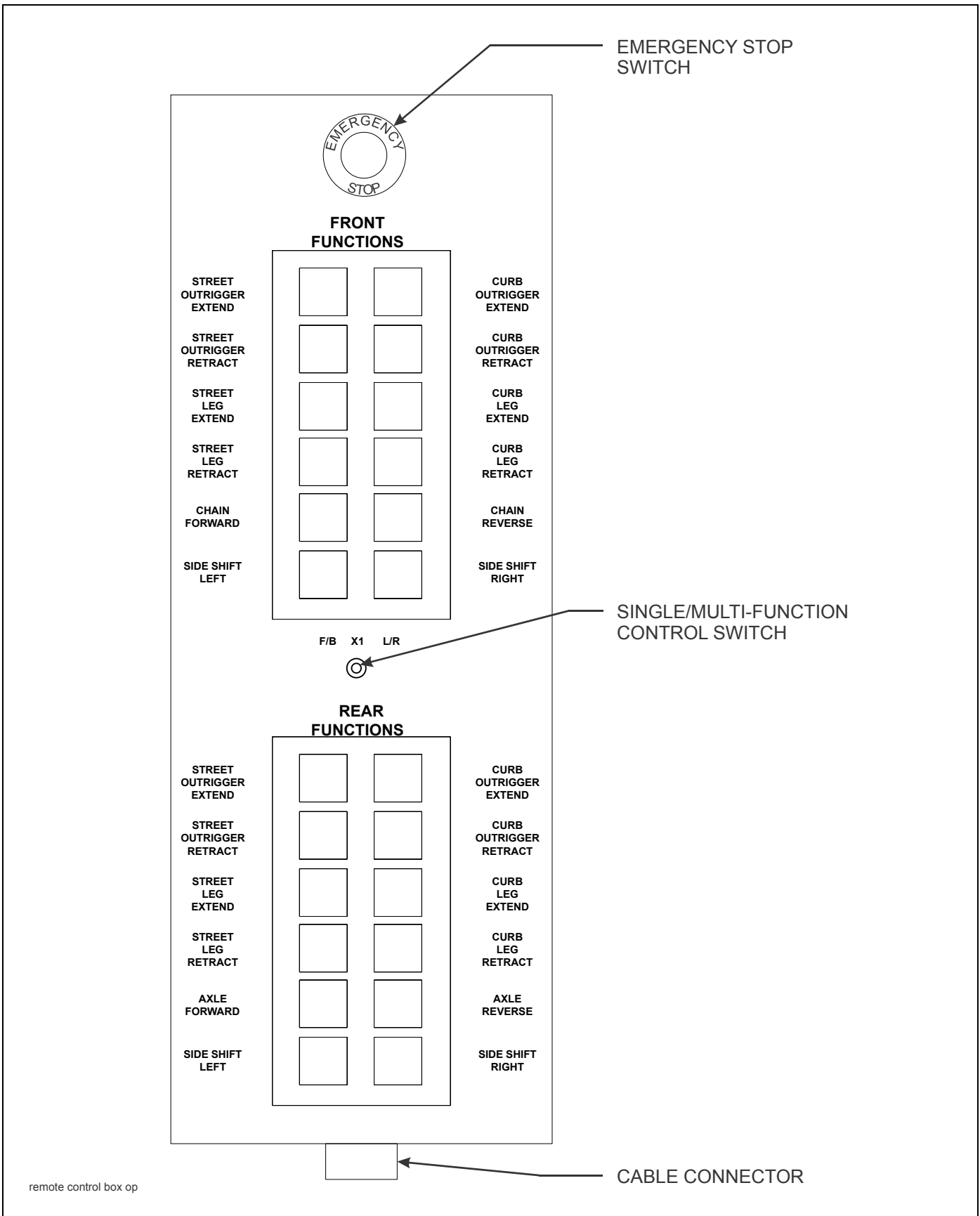


Figure 3-5: Remote Control Operation

Remote Control Operation

A hand-held remote control box (pendant) is stored in the front streetside toolbox on the trailer (See Figure 3-5.)

1. There are two keypads located on the remote control box. The top keypad operates the front functions of the trailer and the lower keypad operates the rear function of the trailer.
2. The remote control functions operate the controls the same way that the hydraulic controls work on the driver's side of the trailer (See "Hydraulic Control Panel" on page 3-9.)
3. An Emergency Stop Switch is located at the top of the remote control box. In the case of an emergency, all functions will cease if the button is pushed in.

NOTE

The Emergency Stop Switch button must be pulled back out before the remote control box will operate.

4. Before the remote control box will work:
 - the remote cable must be plugged into the remote control box at the cable connector.
 - the toggle switch on the hydraulic control panel must be in the UP/ON position (See Figure 3-3.)
 - the emergency stop switch must be pulled out.

5. A single/multi-function control switch is located on the remote control box between the two keypads. There are three functions available through this switch. This switch only affects the lift leg functions of the trailer.

| | |
|---------------------|--|
| F/B (Front/Back) | When switched to F/B, the front or back lift legs will extend or retract together. |
| X1 | When switch is in X1 position, each function works independently. |
| L/R (Left/Right) | When switched to L/R, the left or right lift legs will extend or retract together. |

NOTES

In X1 position, any single front function and single rear function can be operated at the same time.

In X1 position, it is not possible to operate two functions on the same keypad at the same time.

NOTE

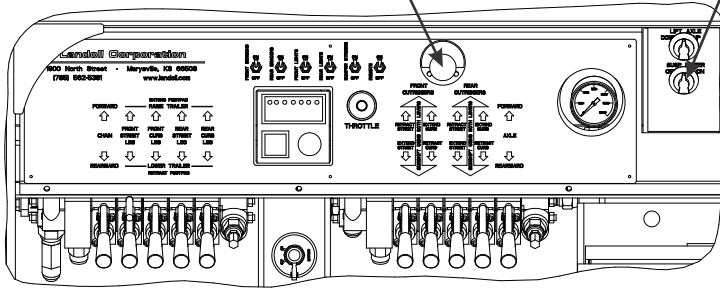
If incompatible buttons are pushed at the same time, functions will not operate. This is a safety feature to prevent damage to the trailer and/or load, or injury to the operator.

6. For troubleshooting and maintenance of the remote control, see "Remote Control ECM Programming and Monitoring" on page 4-31.

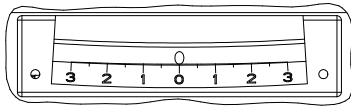
OPERATING INSTRUCTIONS

EMERGENCY BRAKE -
PULL OUT TO RELEASE OR
PUSH IN TO RESET BRAKES

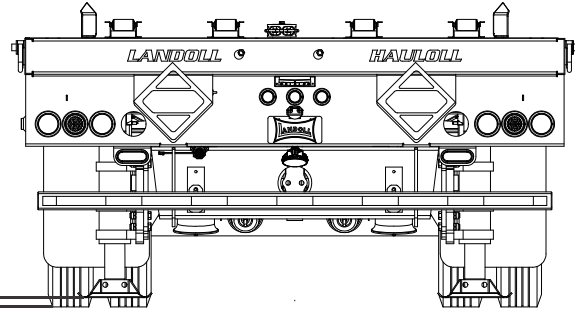
SUSPENSION LOWER - MUST
BE "ON" DURING SIDESHIFTING



HYDRAULIC CONTROL PANEL

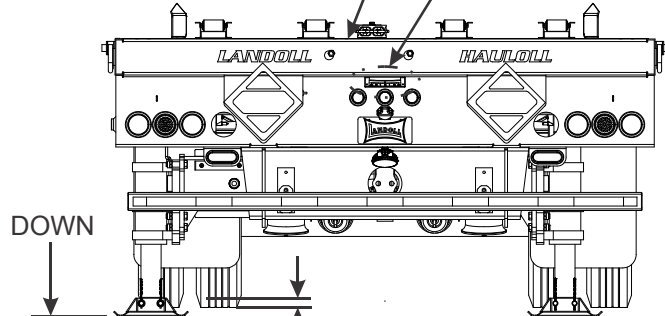


DETAIL A
BUBBLE LEVEL
(LOCATED ON FRONT, REAR,
AND BOTH SIDES)



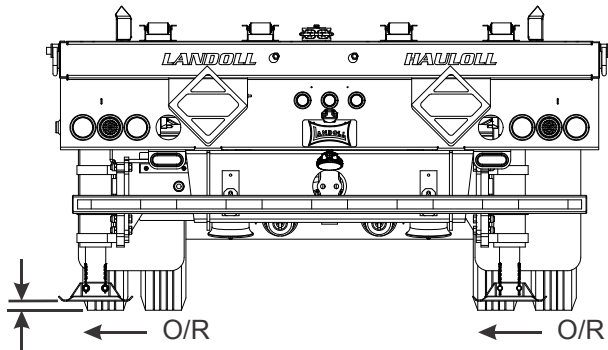
STEP 1

MAINTAIN LEVEL DECK - SEE DETAIL A



CLEARANCE

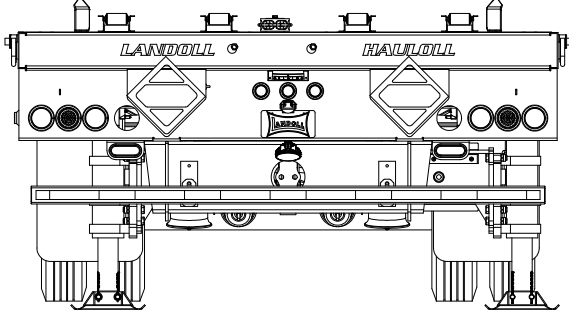
STEP 3



CLEARANCE

STEP 2

← FRAME

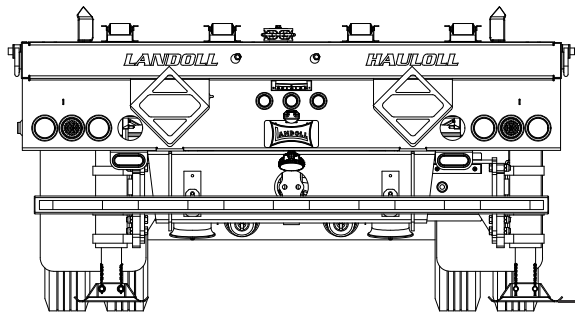


O/R →

BOTH TOGETHER

O/R →

STEP 4



UP

STEPS 5 AND 6

Figure 3-6: Hydraulic Outriggers and Sideshifting (To Streetside)

Hydraulic Outrigger Operation



DANGER

1. When using hydraulic outriggers, the semitrailer must be kept level at all times. Do not lower the parking stands. Loads being placed on the semitrailer must be kept centered on the semitrailer. An unlevel semitrailer may allow a load to slide, causing injury or death to anyone near the load!
2. Do not operate hydraulic outriggers with insufficient space on both sides of the semitrailer. Semitrailer will lean if deck is not kept level. Persons or equipment can be crushed between semitrailer side and rigid objects.

IMPORTANT

1. When using outrigger lift legs, place suspension lower switch to "ON" position.
2. Ladder to be in stowed position for sideshift operation.
3. Release undercarriage brakes before lowering trailer (See Figure 3-3.)
4. Check that the hydraulic outriggers are fully retracted into home position for highway operation of semitrailer.
5. Suspension lower switch must be in "OFF" position for highway operation.
6. Reset undercarriage brakes for highway operation (See Figure 3-3.)



Figure 3-7: Maintain a Level Deck



CAUTION

Be sure to check that the hydraulic outriggers are fully retracted into home position for highway operation of semitrailer (See Figure 3-6.) Failure to retract the hydraulic outriggers before operating can cause severe damage to the semitrailer.

The Hydraulic Outriggers are used to make the trailer ready to load and unload, allows the trailer to be shifted from side to side, and provides stability during the loading and unloading process (See Figure 3-6.)

1. Extend self-stored outrigger arms (out) from frame followed by extending lift leg (up).
2. Place foot pad on ground aligning socket with end of lift leg cylinder and install anchor pin.

IMPORTANT

Front outrigger lift leg foot must be parallel to landing gear foot to prevent interference and/or damage to either piece of equipment.

Sideshift Procedures

NOTES

- Operate (both front handles together or rear handles together manually or via the remote (switch in F/B position) to maintain level deck.
- Operate individual leg controls manually or via the remote (switch in X1 position) to fine tune level deck.

Total Sideshifting to Streetside

NOTE

See Figure 3-6 for step drawings of what the trailer will look like when shifting the entire trailer to the streetside.

1. Lower landing gear, uncouple truck from trailer, and lift foot pads to clear ground.

NOTE

Suspension lower switch should be in "ON" position.

2. Fully extend front and rear streetside outriggers and fully retract front and rear curbside outriggers.
3. Set all foot pads on ground and continue lifting trailer until undercarriage tires clear the ground (approximately 1").
4. The trailer can now be sideshifted to the streetside. Insure that the trailer deck is level using bubble levels located on the front, rear, and both sides of trailer.

NOTE

The ladder must be in stowed position.

- a. Slowly raise the two front outrigger control levers, and the two rear outrigger control levers (**See Figure 3-3.**) Feather the control levers to allow the trailer to smoothly sideshift toward the streetside.
 - b. For remote operation, push the side shift left function on both the front section and rear section of the remote control panel (**See Figure 3-5.**) Feather the buttons to allow the trailer to smoothly sideshift toward the streetside.
5. Before lowering trailer, release undercarriage brakes (**See Figure 3-3.**) This allows the axles to roll back under the trailer. Failure to release brakes will push trailer forward when tires contact the ground.
 6. After the trailer is on the ground, reset undercarriage brakes (**See Figure 3-3.**)
 7. For additional streetside sideshift movement, fully retract front and rear streetside outriggers and fully extend front and rear curbside outriggers. Repeat **steps 3 through 6.**

Total Sideshifting to Curbside

NOTE

See Figure 3-6 for step drawings of what the trailer will look like when shifting the entire trailer to the streetside. The outriggers will need to be shifted in the opposite direction from the drawing to sideshift the entire trailer toward the curbside.

1. Lower landing gear, uncouple truck from trailer, and lift foot pads to clear ground.

NOTE

Suspension lower switch should be in "ON" position.

2. Fully retract front and rear streetside outriggers and fully extend front and rear curbside outriggers.
3. Set all foot pads on ground and continue lifting trailer until undercarriage tires clear the ground (approximately 1").
4. The trailer can now be sideshifted to the curbside. Insure that the trailer deck is level using bubble levels located on the front, rear, and both sides of trailer.

NOTE

The ladder must be in stowed position.

- a. Slowly lower the two front outrigger control levers, and the two rear outrigger control levers (**See Figure 3-3.**) Feather the control levers to allow the trailer to smoothly sideshift toward the curbside.
 - b. For remote operation, push the side shift right function on both the front section and rear section of the remote control panel (**See Figure 3-5.**) Feather the buttons to allow the trailer to smoothly sideshift toward the curbside.
5. Before lowering trailer, release undercarriage brakes (**See Figure 3-3.**) This allows the axles to roll back under the trailer. Failure to release brakes will push trailer forward when tires contact the ground.
 6. After the trailer is on the ground, reset undercarriage brakes (**See Figure 3-3.**)
 7. For additional curbside sideshift movement, fully extend front and rear streetside outriggers and fully retract front and rear curbside outriggers. Repeat **steps 3 through 6.**

Sideshifting Rear Only (Toward Streetside)

NOTE

See Figure 3-6 for step drawings of what the trailer will look like when shifting the entire trailer to the streetside. Note that in this procedure only the rear will be sideshifted.

1. The truck must be coupled to the trailer (trailer pivots about kingpin), landing gear up, lift foot pads to clear ground.

NOTE

Suspension lower switch should be in "ON" position.

2. Fully extend rear streetside outriggers and fully retract rear curbside outriggers.
3. Set rear foot pads on ground and continue lifting rear of trailer until undercarriage tires clear the ground (approximately 1").
4. The rear of trailer can now be sideshifted to the streetside. Insure that the trailer deck is level from side to side.

NOTE

The ladder must be in stowed position.

- a. Slowly raise the two rear outrigger control levers (**See Figure 3-3.**) Feather the control levers to allow the trailer to smoothly sideshift toward the streetside.
 - b. For remote operation, push the side shift left function on the rear section of the remote control panel (**See Figure 3-5.**) Feather the buttons to allow the trailer to smoothly sideshift toward the streetside.
5. Before lowering trailer, release undercarriage brakes (**See Figure 3-3.**) This allows the axles to roll back under the trailer. Failure to release brakes will push trailer forward when tires contact the ground.
 6. After the trailer is on the ground, reset undercarriage brakes (**See Figure 3-3.**)
 7. For additional streetside sideshift movement, fully retract rear streetside outriggers and fully extend rear curbside outriggers. Repeat **steps 3 through 6.**

Sideshifting Rear Only (Toward Curbside)

NOTE

See Figure 3-6 for step drawings of what the trailer will look like when shifting the entire trailer to the streetside. Note that in this procedure only the rear will be sideshifted and the outriggers will be moved in the opposite direction from the drawing.

1. The truck must be coupled to the trailer (trailer pivots about kingpin), landing gear up, lift foot pads to clear ground.

NOTE

Suspension lower switch should be in "ON" position.

2. Fully retract rear streetside outriggers and fully extend rear curbside outriggers.
3. Set rear foot pads on ground and continue lifting rear of trailer until undercarriage tires clear the ground (approximately 1").
4. The rear of trailer can now be sideshifted to the curbside. Insure that the trailer deck is level from side to side.

NOTE

The ladder must be in stowed position.

- a. Slowly lower the two rear outrigger control levers (**See Figure 3-3.**) Feather the control levers to allow the trailer to smoothly sideshift toward the curbside.
 - b. For remote operation, push the side shift right function on the rear section of the remote control panel (**See Figure 3-5.**) Feather the buttons to allow the trailer to smoothly sideshift toward the curbside.
5. Before lowering trailer, release undercarriage brakes (**See Figure 3-3.**) This allows the axles to roll back under the trailer. Failure to release brakes will push trailer forward when tires contact the ground.
 6. After the trailer is on the ground, reset undercarriage brakes (**See Figure 3-3.**)
 7. For additional curbside sideshift movement, fully extend front and rear streetside outriggers and fully retract front and rear curbside outriggers. Repeat **steps 3 through 6.**

Sideshifting Front Only (Toward Streetside)

NOTE

See Figure 3-6 for step drawings of what the trailer will look like when shifting the entire trailer to the streetside. Note that in this procedure only the front will be sideshifted.

1. Lower landing gear, uncouple truck from trailer, and lift foot pads to clear ground.

NOTE

Suspension lower switch should be in "ON" position.

2. Fully extend front streetside outriggers and fully retract front curbside outriggers.
3. Set front foot pads on ground and continue lifting front of trailer until landing gear clears the ground (approximately 1").
4. Release undercarriage brakes (trailer pivots about undercarriage tires) (**See Figure 3-3.**)
5. The front of trailer can now be sideshifted to the streetside. Insure that the trailer deck is level from side to side.

NOTE

The ladder must be in stowed position.

- a. Slowly raise the two front outrigger control levers (**See Figure 3-3.**) Feather the control levers to allow the trailer to smoothly sideshift toward the streetside.
 - b. For remote operation, push the side shift left function on the front section of the remote control panel (**See Figure 3-5.**) Feather the buttons to allow the trailer to smoothly sideshift toward the streetside.
6. Before lowering trailer, reset undercarriage brakes (**See Figure 3-3.**)
 7. For additional front streetside sideshift movement, fully retract front streetside outriggers and fully extend front curbside outriggers. Repeat **steps 3 through 6.**

Sideshifting Front Only (Toward Curbside)

NOTE

See Figure 3-6 for step drawings of what the trailer will look like when shifting the entire trailer to the streetside. Note that in this procedure only the front will be sideshifted and the outriggers will be moved in the opposite direction from the drawing.

1. Lower landing gear, uncouple truck from trailer, and lift foot pads to clear ground.

NOTE

Suspension lower switch should be in "ON" position.

2. Fully retract front streetside outriggers and fully extend front curbside outriggers.
3. Set front foot pads on ground and continue lifting front of trailer until landing gear clears the ground (approximately 1").
4. Release undercarriage brakes (trailer pivots about undercarriage tires) (**See Figure 3-3.**)
5. The front of trailer can now be sideshifted to the curbside. Insure that the trailer deck is level from side to side.

NOTE

The ladder must be in stowed position.

- a. Slowly lower the two front outrigger control levers (**See Figure 3-3.**) Feather the control levers to allow the trailer to smoothly sideshift toward the curbside.
 - b. For remote operation, push the side shift right function on the front section of the remote control panel (**See Figure 3-5.**) Feather the buttons to allow the front of the trailer to smoothly sideshift toward the curbside.
6. Before lowering trailer, reset undercarriage brakes (**See Figure 3-3.**)
 7. For additional front curbside sideshift movement, fully extend front streetside outriggers and fully retract front curbside outriggers. Repeat **steps 3 through 6.**

Shifting Trailer Forward or Rearward

1. With truck coupled to trailer and undercarriage (fully rearward) in transport position, set trailer brakes and release tractor brakes. Landing gear and lift leg footpads to be up to clear ground.
2. Operate the axle control lever or remote button **“FORWARD”** to pull the tractor and trailer backward within short distance of loading dock or aircraft.
3. Lower landing gear, uncouple truck from trailer, set all foot pads on ground, and continue lifting trailer to match dock height.
4. After loading or unloading the trailer, lower the trailer to the ground, and raise the lift leg footpads to be clear of the ground.
5. Recouple the truck to the trailer and raise the landing gear. Set trailer brakes and release tractor brakes.
6. Operate the axle control lever or remote button **“REARWARD”** to push the tractor and trailer fully forward to increase the distance to the loading dock or aircraft. This will also put the undercarriage into transport position.

Pullout Strobe Beacon

1. Pullout strobe beacons are located on the front and rear of the trailer.
2. The pullout locks are released and the pullout slid the designated distance and locked into place (**See Figure 3-8.**)
3. Each pullout has six width options. Strobe beacon lights and flag holders are located on the end of each pullout.

NOTE

The pullout beacons should always be pulled out wider than the load being transported.

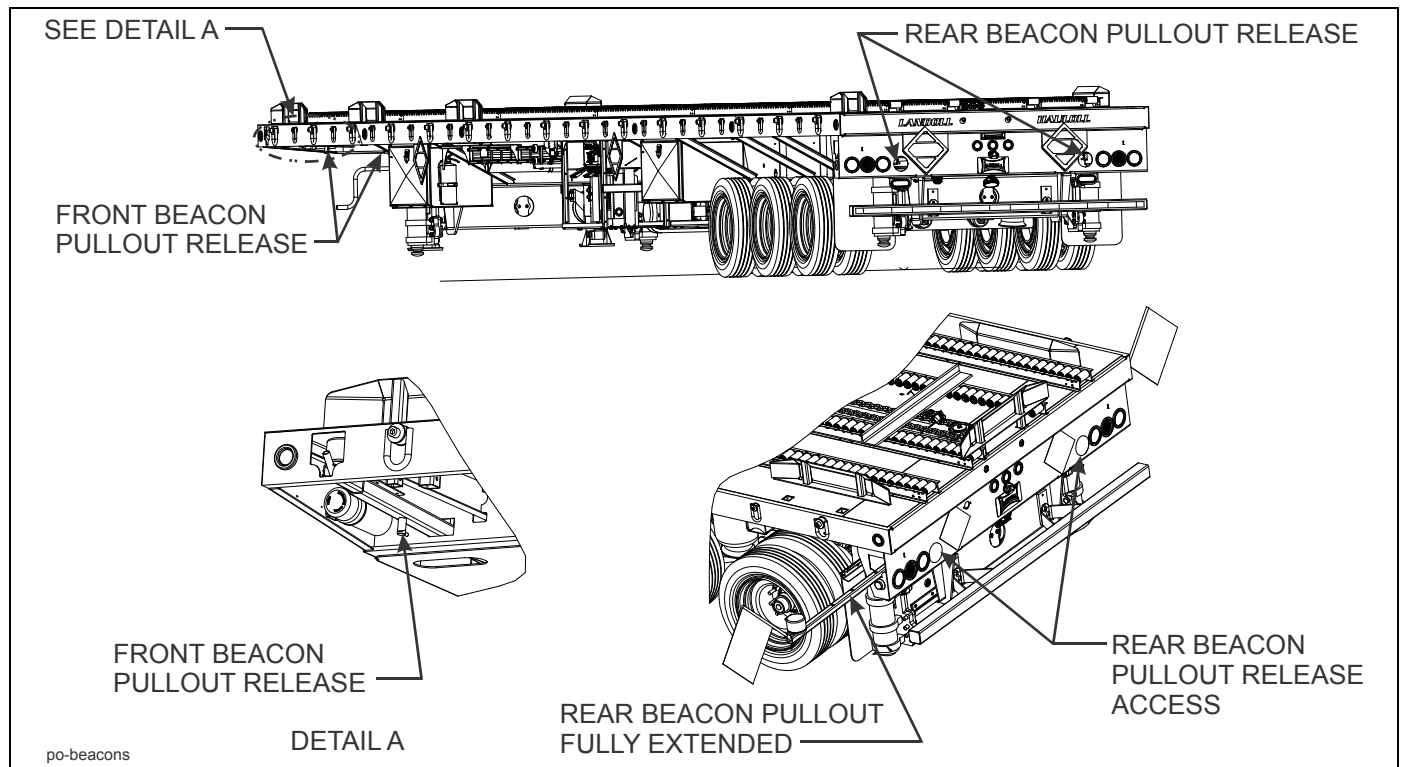


Figure 3-8: Pullout Beacon Stored and Transport Position

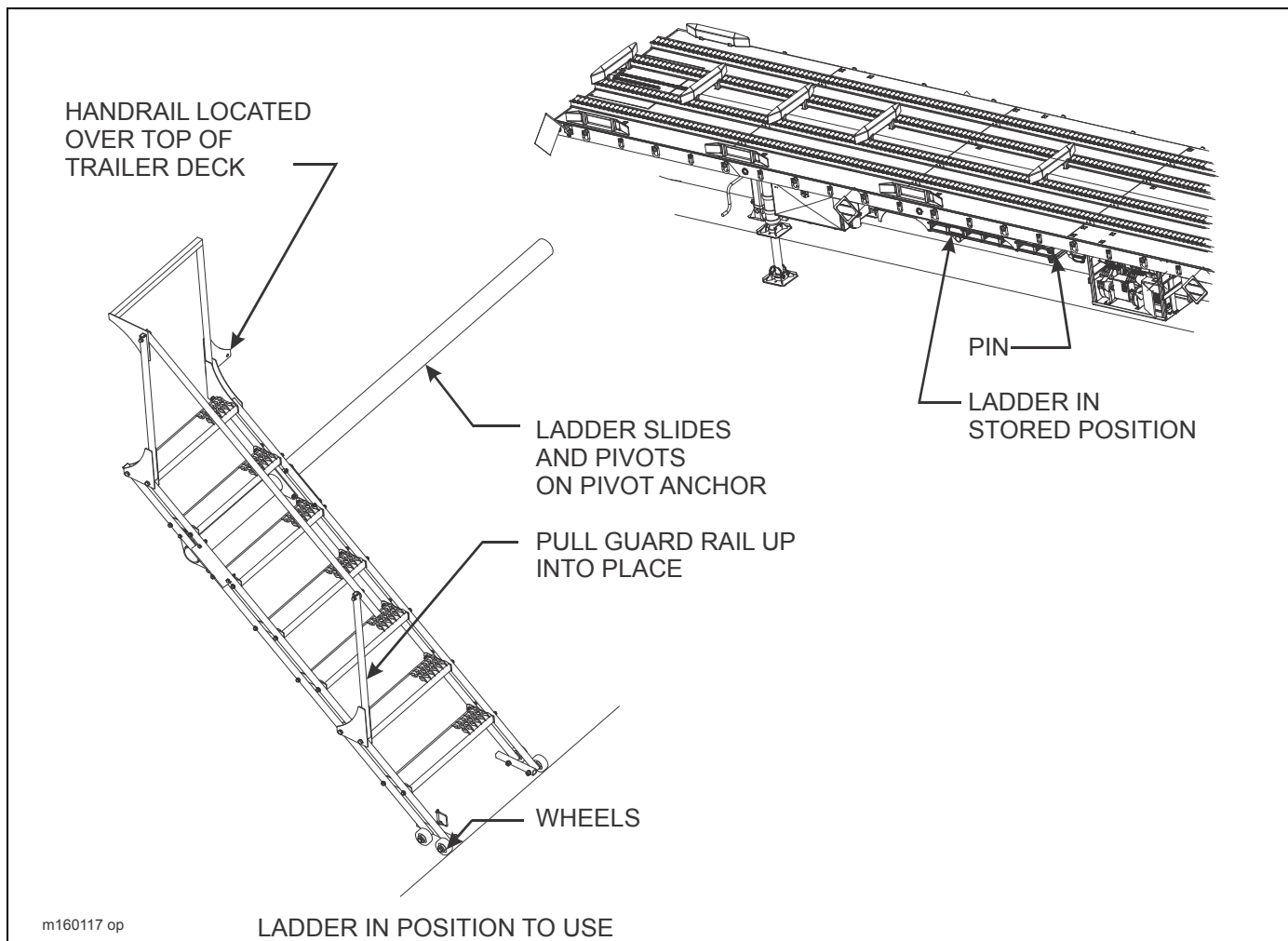


Figure 3-9: Steps for Ladder Usage and Storage

Preparing to Use the Ladder

1. Unpin ladder assembly and store pin back in hole after ladder assembly is put in place for usage.
2. Pull ladder out from stored position. The top of the ladder (closest to the front of trailer) will tilt up until wheels touch the ground (closest to the rear of trailer) **(See Figure 3-9.)**
3. Pull up on handrail until it is in position.
4. Push the ladder back toward the trailer until handrail stop is located over trailer deck leaving 3" between ladder and siderail of trailer for pivot movement.



WARNING

The ladder must be 3" from siderail of trailer and stop over trailer deck before it is used. Failure to do so may cause the ladder to fold up on the user and may lead to serious personal injury.

IMPORTANT

The ladder must be in stowed position during sideshift operations.

Storing the Ladder

1. Pull ladder back out releasing the handrail stop from above the trailer deck **(See Figure 3-9.)**
2. Fold hand rail down into stored position against the ladder.



WARNING

Be careful not to pinch fingers when folding handrail.

3. Pivot the ladder assembly to horizontal position.
4. Push ladder assembly under trailer deck and pin into place.

Preparation for Loading and Unloading



CAUTION

Model 380 semitrailer maximum concentrated load within a 10 ft. area is 20,000 lbs. and within a 30 ft. area is 28,000 lbs.



WARNING

Before operating:

Do not exceed the gross axle weight ratings for any axle on your vehicle. The combined weight of the semitrailer and cargo must not exceed the gross vehicle weight rating (GVWR) of the trailer.



DANGER

Be sure to keep feet and all other parts of your body clear of the bottom of the semitrailer during lowering operation. Failure to keep your feet or body clear may result in serious personal injury or death.

1. Practice all standard industrial safety standards. Do not load any payload that will overload any component of the trailer or cause an unsafe condition.
2. Park the tractor/semitrailer in a straight line on level even surface. Set the tractor brakes.
3. Start operation of hydraulic power system. Start hydraulic engine package and warm engine following engine operating instructions in “**Hydraulic Power Supply Diesel Engine Operation**” on page 3-10 (Read engine operator’s manual.)
4. Become familiar with the hydraulic controls on the hydraulic control panel as described in “**Hydraulic Control Panel**” on page 3-9, the remote control box as described in “**Remote Control Operation**” on page 3-13, and the hydraulic outriggers as described in “**Hydraulic Outrigger Operation**” on page 3-15 prior to loading or unloading the semitrailer.
5. Pallet guide/stops are available and should be used to help guide loads onto the trailer and as barriers to stop a load and to aid in keeping it in position.



WARNING

Pallet guide stops are NOT intended to prevent a load from shifting during transport. All loads must be properly secured as described in “**Securing the Load**” on page 3-22. Failure to secure a load properly may result in loss of load, injury, or death.

Loading the Semitrailer

1. Set the semitrailer up for loading as outlined in “**Preparation for Loading and Unloading**” on page 3-21.
2. Pull the load onto the semitrailer using the chain drive. Insure that the load is guided straight onto the semitrailer and does not maneuver off the side of the semitrailer. Pallet guides/stops are provided to help guide loads (**See Figure 3-1.**) Load a stationary load by means of a forklift, crane, or other means satisfactory to the constitution of the load. Position the load accordingly for proper weight distribution.
3. Chain the load down in accordance with instructions in “**Securing the Load**” on page 3-22.

Securing the Load



WARNING

Do not allow slack in tiedowns. A shifting load may create enough momentum to break hi-test chains or strap ties. Slack in tiedowns may result in damage to the load, and death or serious injury to persons near the load.

1. All items of the semitrailer load must be securely tied to the deck, front and rear, using the 2,500 lb. and 10,000 lb. tie-downs on the semitrailer frame. The load must be tied with chain or ratchet straps sufficient to withstand the weight of the load using standard approved tiedown methods.
2. No slack is allowed in the tie down chains or straps. Use binders with chains or a ratchet type buckle on straps to eliminate any slack in the tiedowns.

IMPORTANT

More information about cargo securement may be found at

<http://www.fmcsa.dot.gov/cargosecurement.pdf>.

Remember that regulations vary from state to state. for state regulations, see

<http://www.fhwa.dot.gov/webstate.htm>.

Preparation for Transport

1. After securing the load, following the steps as outlined in **“Securing the Load” on page 3-22**, move the trailer back to transport position. This may include any of the following dependent upon how the trailer was loaded:
 - Lifting the outrigger legs to transport position.
 - Shifting the outriggers back to a centered home position
2. Once the wheels are on the ground and the axles are in transport position, the load is ready for transport.



CAUTION

Before lowering the semitrailer to transport position, insure that undercarriage brakes are released. Failure to release brakes before lowering will push trailer forward when tires contact the ground.

3. See **“Towing the Semitrailer” on page 3-6** for further transport instructions.

Unloading the Semitrailer

1. Prepare to unload the semitrailer by following the steps outlined in **“Preparation for Loading and Unloading” on page 3-21**.
2. Remove the chains and binder or the tie-straps from the load.
3. Remove the load off the semitrailer with the chain drive or remove a stationary load by means of a forklift, crane, or other means satisfactory to the constitution of the load.



WARNING

When removing load, insure that the load is guided straight so it does not maneuver off the side of the semitrailer. Failure to do so could result in damage to equipment, injury, or death.

4. Use the power center for chain drive operation.
 - a. To start, pull throttle out halfway.
 - b. Turn the ignition key to the START position. The engine should crank and then start.



CAUTION

Do not crank engine for more than 10 seconds at a time. If engine does not start, consult the owner’s manual supplied with the engine.

- c. When the engine starts, release the key.
- d. To adjust the speed, turn the throttle control in or out, as needed, until the engine runs smoothly at a speed capable of withstanding use of the hydraulic controls. The hydraulic controls should now be functional.
- e. Before shutting it off, allow the engine to cool down by running at a slow idle for a few minutes. Then turn the ignition switch to the off position.
- f. Once the engine is cool, turn or push the throttle control completely in and turn the key to the OFF position.

NOTES

- Refer to engine manufacturer’s owner manual for additional information regarding operation, service, specifications, and troubleshooting.
- During first 50 hours, DO NOT exceed 70% of maximum rated power.
- DO NOT stop engine when operating a full load or at high speed.

Air Ride Operation

1. Trailer air pressure must be maintained above 90 PSI before operating. **PROTECTION VALVES** are used to maintain 65 PSI air brake pressure during suspension or remote system air loss.
2. The semitrailer is equipped with a single ride height control valve located on center axle.



CAUTION

If suspension air loss should occur, completely deflate suspension and temporarily operate on the air springs internal rubber bumpers. Carefully proceed to the nearest semitrailer service facility. To deflate the air suspension, disconnect the lower connection on the linkage of the automatic air valves. Rotate the valve control arms down about 45° to exhaust the air. To restore to normal operation, simply reverse the procedure.

Suspension Lower Operation

The Suspension Lower switch allows straight down lowering of trailer deck by exhausting air from suspension air springs (See Figure 3-3.)

This also relieves air from suspension air springs during trailer outrigger lift operations.

1. To lower trailer, place switch in "ON" position.

NOTE

When trailer is in motion, switch must be in "OFF" position for normal height control valve automatic operation.

Third Axle Lift Operation

The manual ON/OFF valve, when activated, sends a pneumatic signal to the pilot valves. These valves exhaust the air suspension air springs and inflate the air lift air springs causing the axle to lift.

Suspension Operation (Axle Down)

1. With the manual ON/OFF valve in the **OFF** position, the air suspension system is in operating position.

Axle Lift Operation (Axle Up)

2. With the manual ON/OFF valve in the **ON** position, the axle lift is in operating position and raises the axle.



CAUTION

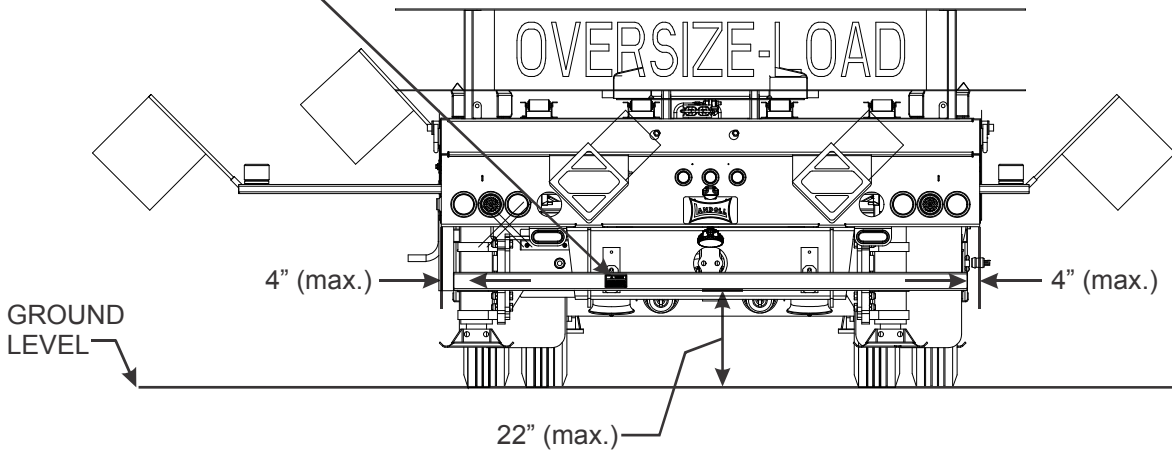
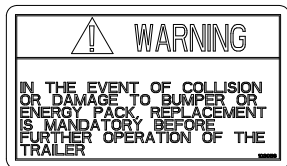
Do not overload axle.

The lift axle may be operated in the raised position as follows:

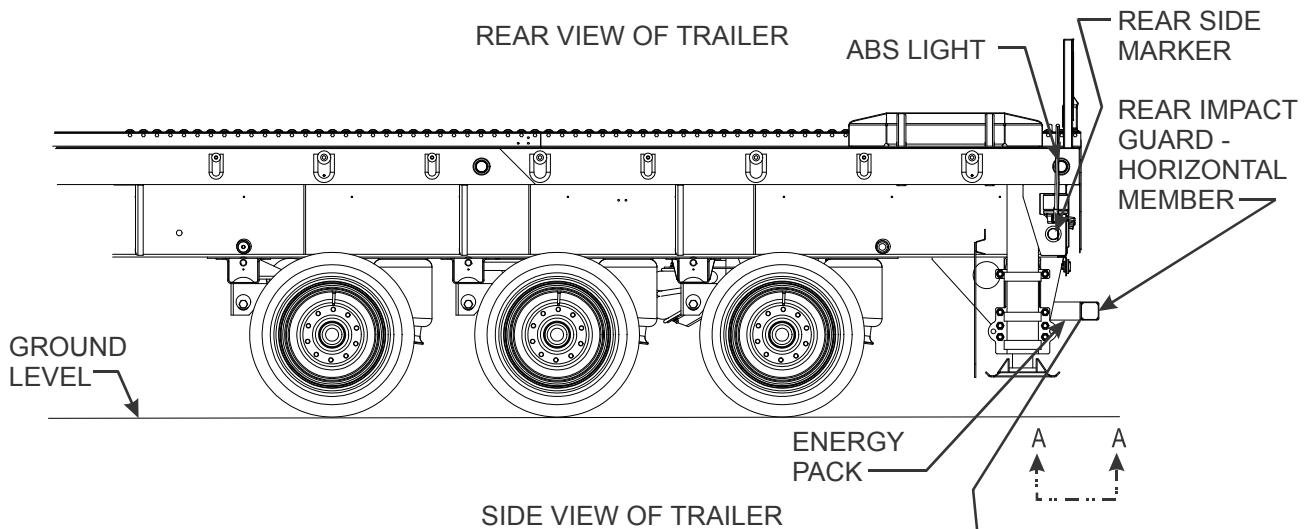
1. **When vehicle is unloaded or partially loaded as long as adjacent axles are not overloaded.**
2. **When vehicle is loaded and off highway, but at a reduced and safe speed.**
3. **When vehicle is loaded and on highway, but as a government law allows for turning purposes and then at reduced and safe speed.**
4. **Whenever it is necessary for reasons of safety to maintain traction or sufficient load on other vehicle driving, steering, braking, or cornering axles.**

Failure to adhere to these directions could result in overload fines, premature equipment failure and/or vehicle accident.

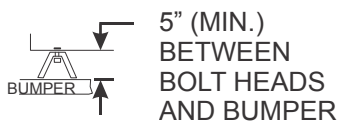
CAUTION DECAL TO BE LOCATED ON REARWARD CURBSIDE OR REAR IMPACT GUARD AS SHOWN.



REAR VIEW OF TRAILER

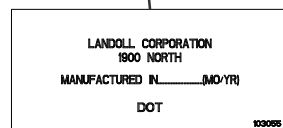


SIDE VIEW OF TRAILER



VIEW A-A

380rear guard and abs



CERTIFICATION DECAL TO BE LOCATED ON FORWARD FACING SURFACE, 12 INCHES FROM CURB END OF GUARD.

Figure 3-10: Rear Impact Guard and Anti-Lock Brake System

Anti-Lock Brake System (ABS)

Vehicle standards FMVSS No. 121, anti-lock brake system requires all trailers manufactured after March 1, 1998 with air brake systems to have ABS. Each trailer (including a trailer converter dolly) shall be equipped with an anti-lock brake system that controls the wheels of at least one axle of the trailer. Wheels on other axles of the trailer may be indirectly controlled by the anti-lock brake system.

NHTSA Docket 92-29; notice 11 published September 23, 1996 specifies the ABS warning light be mounted near the rear of the left side of the trailer (**See Figure 3-10.**)

Decal or lens marking with ABS to identify the lamp.

The lamp must illuminate one time whenever power is supplied to the ABS. At any time the light remains on when power is supplied there is a malfunction to the system.

The ABS used on the semitrailer is a commercial unit. Single axle trailers use a two sensor, one modulator system. Tandem axle semitrailers use a four sensor, two modulator system. Sensors are located at each hub of the front and rear axles, and each modulator controls one side of the trailer.

The ABS is constant powered by the auxiliary (blue) circuit, center pin on the semitrailer seven way electrical connector. This circuit must be hot whenever the tractor keyswitch is on. This circuit must also not be used to power any additional electrical devices while the semitrailer is moving forward. However, additional devices such as remote controls may be powered from the auxiliary circuit while the semitrailer is stationary. Back up power to the ABS is supplied through the stop lamp (red) circuit, No. 4 pin on the seven way connector, and ground is supplied by the white wire, No. 1 pin.



CAUTION

The auxiliary (blue) circuit is for powering the semitrailer ABS. This circuit must be hot when the tractor key switch is on. No other electrical devices may be powered by this circuit while the semitrailer is moving forward.

Malfunction in the ABS is signaled by illumination of the ABS warning lamp located at the left rear side of the semitrailer. The warning lamp will come on and stay on while power is supplied to the ABS on a moving vehicle, if there is a fault. If a fault in the ABS exists, normal braking will still occur, but wheels may lock. The semitrailer is still operable, but the system should be serviced as soon as possible.



CAUTION

If a fault exists in the semitrailer ABS, normal braking will occur, but wheels may lock. Service the ABS as soon as possible.

Refer to ABS maintenance manual supplied with semitrailer to answer basic questions for the anti-lock brake system, obtain outline procedures on how to adjust, test, remove, and install ABS components, as well as how to test for faults in the system by using "Blink Code Diagnostics"; and illustrates ABS components, wiring, and plumbing installation diagrams.

Cold Weather Operation

1. Cold weather causes lubricants to congeal, insulation and rubber parts to become hard, which may lead to problems found in bearings, electrical systems, and air systems. Moisture attracted by warm parts can condense, collect and freeze to immobilize equipment. The truck/semitrailer operator must always be alert for indicators of cold weather malfunctions.
2. During any extended stop period, neither the service nor parking brake should be used as they can freeze up. Use wheel chocks to secure the vehicle from moving.
3. Check all structural fasteners, air system fittings, gaskets, seals and bearings for looseness that can develop due to contraction with cold. Do not over-tighten.
4. Check tire inflation. Tire inflation decreases when the temperature decreases.
5. Periodically check drain holes in the bottom of the relay valve (for trailers with air brakes) and storage compartments. They must be open at all times to avoid moisture entrapment.

Hot Weather Operation

1. Hot weather operation can create certain problems which must be checked. Expansion of parts result in tightening of bearings, fasteners, and moving parts. Failure of gaskets or seals can occur.
2. The semitrailer should be parked in the shade if possible. Long exposure to the sun will shorten service life of rubber components (i.e., tires, light and hose grommets, hoses, etc.) and paint life.
3. Check tire pressure early in the day before beginning operations while the tire is cool. Replace all valve stem caps after checking.
4. If the area is extremely humid, protect electrical terminals with ignition insulation spray. Coat paint and bare metal surfaces with an appropriate protective sealer.
5. The use of a filter-lubricator in the towing vehicle's air delivery system is recommended.

Maintenance and Lubrication

This section contains instructions necessary for proper maintenance of the semitrailer. The 380 semitrailer is designed for years of service with minimal maintenance. However, proper maintenance is important for durability and safe operation and is an owner/user responsibility.

Maintenance Schedule

Trailer maintenance includes periodic inspection and lubrication. **Table 4-2, Maintenance Schedule**, lists the recommended maintenance and lubrication tasks by time interval and by accumulated mileage (use whichever occurs first).



DANGER

Operating the tractor or trailer with defective, broken or missing parts may result in serious injury or death, damage to the tractor/trailer, its cargo, or property in its path.

Inspection

1. Inspect the tractor, the trailer, and trailer parts periodically for damage or signs of pending failure. Damaged or broken parts must be repaired or replaced at once. Determine the cause of any binding or hydraulic leakage at once. Correct the problem before using the tractor or trailer.
2. Use the “**Troubleshooting Guide**” on page 5-1 to check for “SYMPTOMS” and “PROBLEMS” of any trailer system not functioning correctly, or where wear, distortion, or breakage are found. Administer “REMEDY” according to the right-hand column of the troubleshooting section.

Lubrication

Figure 4-1 and Table 4-1 detail lubrication points and intervals, method of application, and lubricant required, and illustrate the location of each part to be lubricated. During inspections of the trailer, if lubricants are found to be fouled with dirt or sand, those parts should be cleaned with paint thinner, dried, and relubricated immediately. Dirt in a lubricant forms an abrasive compound that will wear parts rapidly.



WARNING

Paint thinner and other solvents are flammable and toxic to eyes, the skin, and respiratory tract. Avoid skin and eye contact. Good general ventilation is normally adequate. Keep away from open flames or other combustible items.

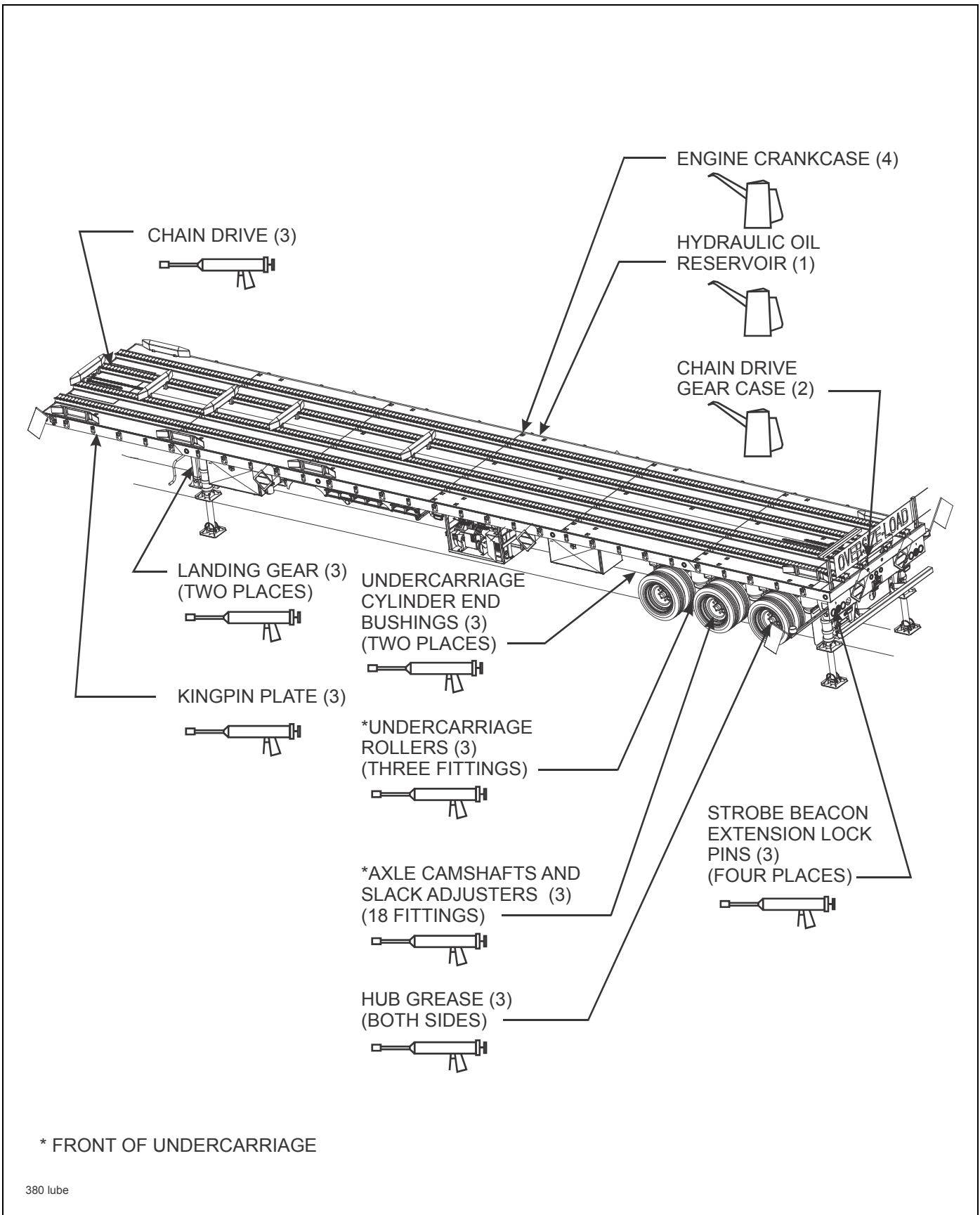


Figure 4-1: Lubrication Points

| LUBE | SEASON | BRAND AND PRODUCT (WEIGHT AND/OR TYPE) | | | |
|------|----------|---|--------------------------------|--------------------------|--------------------|
| | | AMOCO | EXXON | PHILLIPS | TEXACO |
| 1 | ALL YEAR | Rycon MV | HDX Plus 10W | Magnus Oil A KV 5W-20 | Rando HD-AZ |
| 2 | ALL YEAR | Mobil Lube HD Plus 85W-140 | | | |
| 3 | ALL YEAR | Lit-Multi-purpose Grease | Rondex Multi-purpose Grease | Phil Lube M.W. Grease | MarFax All Purpose |
| 4 | ALL YEAR | Mobil Delvac 1300 Super SAE 15W-40 | | | |

Table 4-1: Lubrication Specifications

Maintenance Procedures

Repair Parts

Repair parts are illustrated and listed in a separate parts manual. Replacement of parts due to wear is determined by examination and measurement in the Maintenance Procedures of this section.

Tools and Equipment

Tools, equipment, and personnel normally found in a facility capable of making truck repairs will be adequate for maintenance of the semitrailer. No other special tools or equipment should be necessary.

Torque Values

Table 2-1 and Table 2-2 list torque values for standard hardware and hydraulic fittings. They are intended as a guide for average applications involving typical stresses and mechanical surfaces. Values are based on the physical limitations of clean, plated, and lubricated hardware. In all cases, when an individual torque value is specified, it takes priority over values given in this table. Replace original fasteners with hardware of equal grade.

Cleaning

1. Wash semitrailer to remove all accumulated dirt and grime.
2. Use any mineral spirits paint thinner (or its equivalent) to remove grease and oil from all parts of the trailer. Rinse degreasing solution off with cold water.
3. Inspect semitrailer for cause of any reported troubles.



WARNING

Paint thinner and other solvents are flammable and toxic to eyes, skin, and respiratory tract. Avoid skin and eye contact. Good general ventilation is normally adequate. Keep away from open flames or other combustible items.

4. Scrape, sand, prime, and repaint areas where finish is missing or where there is evidence of corrosion.
5. Replace any missing or illegible decals. Replace any missing or damaged reflective tape.
6. Use Troubleshooting Guide to check for "SYMPTOMS" AND "PROBLEMS" of any semitrailer system not functioning correctly, or where wear, distortion, or breakage can be found. Administer "REMEDY" according to right-hand column of Troubleshooting guide.
7. After disassembling any components, thoroughly clean dirt and old lubricant from all parts. Do not use a wire brush on any bearing parts or surfaces — use a stiff bristle brush. Do not use compressed air, or spin bearing parts when cleaning. These practices can throw solvents, dirt, or metal particles into your eyes. Dry clean parts with lint free, clean, soft, absorbent, cloth or paper. Wash and dry hands.
8. Inspect seals, seal wiping surfaces, bearing caps, and bearing cones for wear, pitting, chipping, or other damage.

| NORMAL OPERATING SERVICE INTERVALS ^a | | | | | | | | |
|--|--------------|--------------------|---------------|----------------|-----------------|---------------|---------------|--------------|
| SERVICE INTERVAL: ITEM | TIMES | 1ST 5 HOURS | WEEKLY | MONTHLY | 6 MONTHS | YEARLY | LUBE # | NOTES |
| | MILES | 50 | 500 | 2,000 | 12,000 | 25,000 | | |
| LIGHTS | | I | I | | | | | |
| WIRING AND CONNECTIONS | | I | | I | | | | |
| FASTENERS | | I,T | | I | | | | b |
| KING PIN AND PLATE | | I | | C,I,L | | | 3 | c |
| BRAKE AIR SYSTEM | | I | I | I | | | | |
| RELAY VALVES | | | | | | I,C | | |
| BRAKE ADJ & WEAR | | I | | I,T | | | | d |
| SLACK ADJUSTERS | | I | I | | L | | 3 | c |
| CAMSHAFT ASSEMBLIES | | I | I | | | L | 3 | c |
| HUB OIL | | I | I,L | | | R | 6 | c |
| WHEEL BEARINGS | | I | | I,T | | | | b |
| TIRE INFLATION & WEAR | | I | I | | | | | f |
| WHEEL LUG NUTS | | I,T | I | I,T | | | | b |
| SUSPENSION ALIGNMENT | | I | | I | | | | |
| UNDERCARRIAGE ROLLERS | | | | L | | | 3 | c |
| HYDRAULIC GREASE | | I | I | | | R | 1 | c |
| HYDRAULIC FILTER | | R | | | R | | | |
| HOSES (<i>Inspect & Replace as needed</i>) | | I | | I | | I,R | | |
| CHAIN GEAR CASE | | I | | I | | | 2 | c |
| | | | | | | | | |
| I - Inspect, R - Replace, T - Tighten/Adjust Torque, L - Lubricate, C - Clean | | | | | | | | |
| NOTES: | | | | | | | | |
| <ul style="list-style-type: none"> a. Perform at the time shown. Shorten service intervals when operating in severe or dirty conditions. b. See Table 2-1 and Table 2-2 for correct torque specifications. c. See Table 4-1 for recommended lubricant. d. See “Brake System Maintenance” on page 4-19 for procedures. e. See “Wheel Bearing Lubrication and Adjustment” on page 4-27 for procedures. f. See Serial Number Plate on the front of the semitrailer for proper inflation requirements. | | | | | | | | |

Table 4-2: Maintenance Schedule

Gooseneck, Frame, And Deck

Repairing Structural Defects

If any structural defect is found, the fault must be corrected before further use of the vehicle. To continue usage could endanger the trailer, its load, personnel, traffic, and properties. If any cracks or breaks are found, contact the Landoll factory for repairs. Inspect the deck daily for broken or missing planks or missing attachments. Replace any defective parts promptly.

Hydraulic System

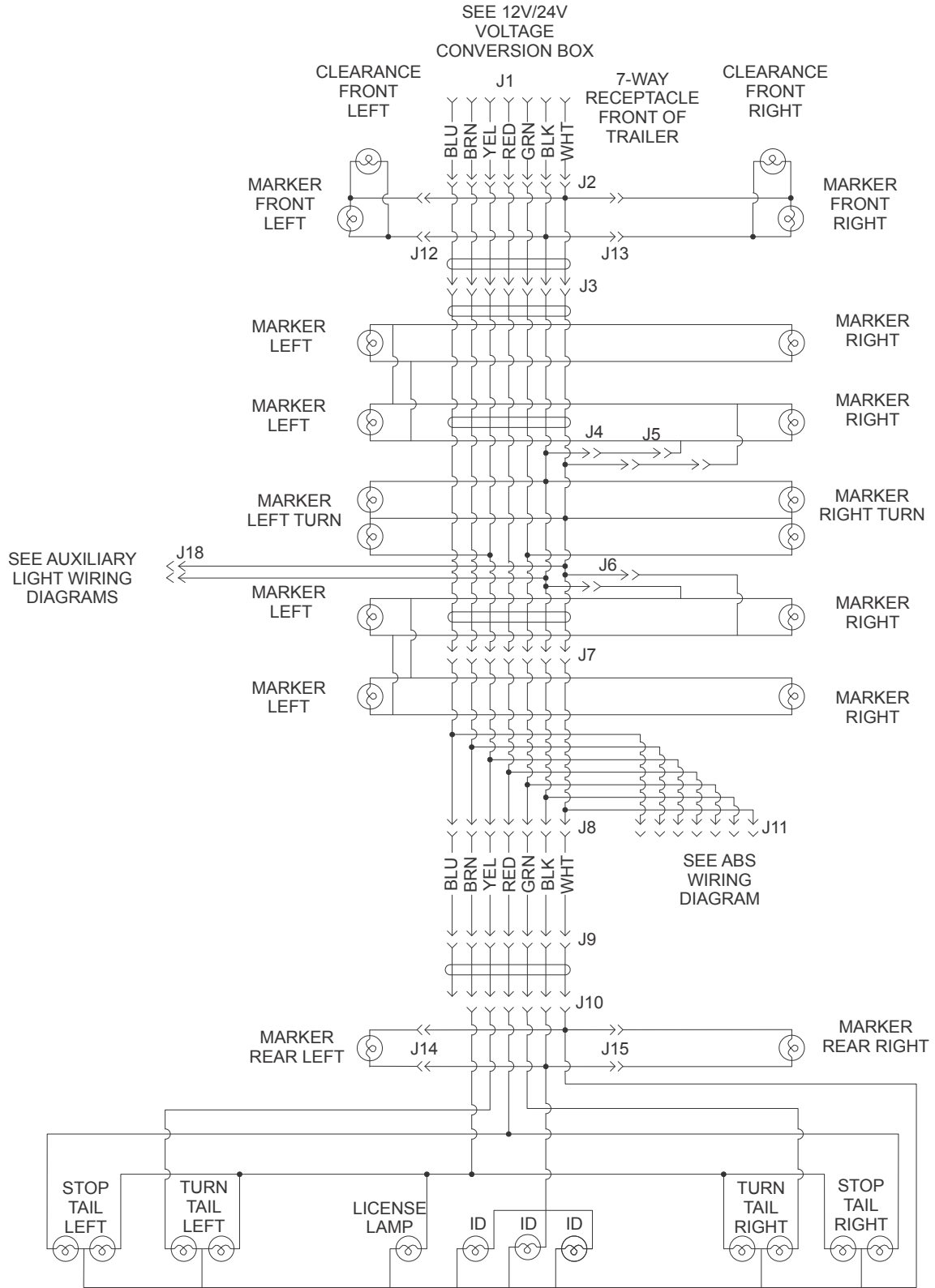
General

1. Check the oil level of the hydraulic power center weekly, or after any leakage. **See Table 4-1** for proper hydraulic oil. Check the hydraulic oil level with hydraulic cylinders in the retracted position and the hydraulic pump disengaged. Enough volume in tank (approximately 15 gallons) above hydraulic oil level must be available to accept extra oil from cylinders when retracted.
2. Overfilling can cause hydraulic fluid overflow during operation.
3. Hydraulic system pressure relief valves should be set at 2500 psi.
4. Check hoses weekly for cracks or leaks. If a valve or line leaks, it should be replaced immediately.

Hydraulic Engine Package

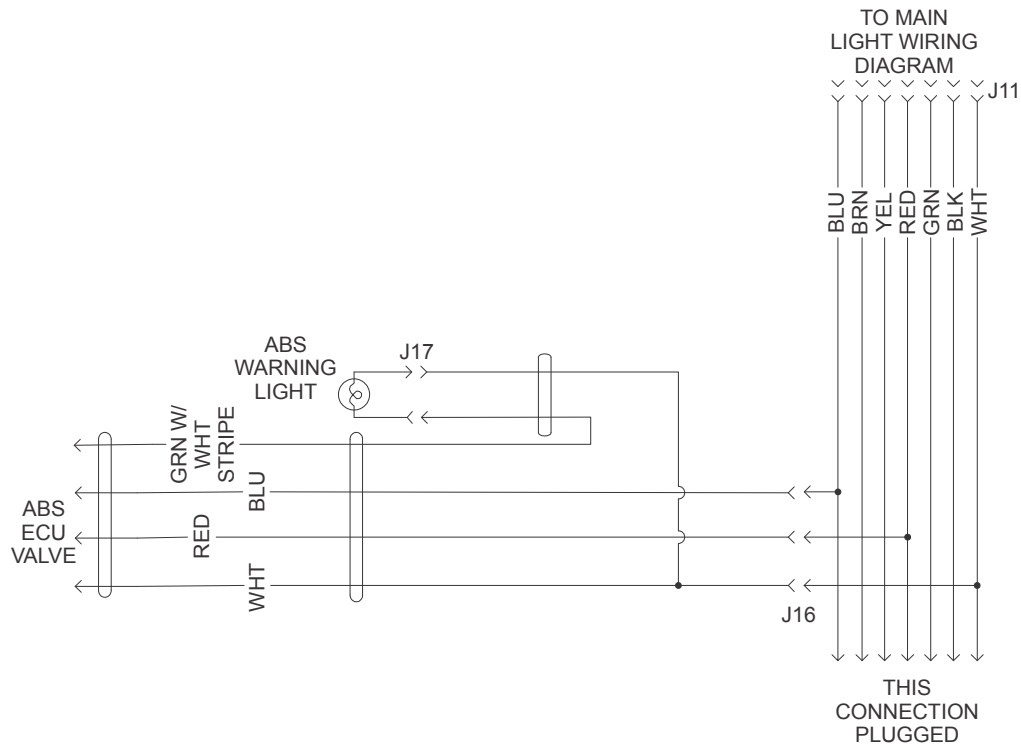
The hydraulic engine package should be inspected weekly to insure continued proper operation. The inspection should include:

1. Check the hydraulic oil level weekly, or after any leakage. **See Table 4-1** for proper hydraulic oil. With all hydraulic cylinders in the retracted position and with the engine stopped, check the hydraulic oil level.
2. Check hoses weekly for cracks or leaks. If a valve or line leaks, it should be replaced immediately.
3. Check the engine oil each time before using. Oil level should be maintained between the "ADD" and "FULL" marks on the oil dip stick. For further maintenance procedures and proper lubrication specifications, please refer to the engine owner's manual that was supplied with the hydraulic engine package.
4. Replace hydraulic filter with new filter at least every 6 months or more often under adverse conditions.
5. Use the fuel recommended for the engine package installed on you trailer.



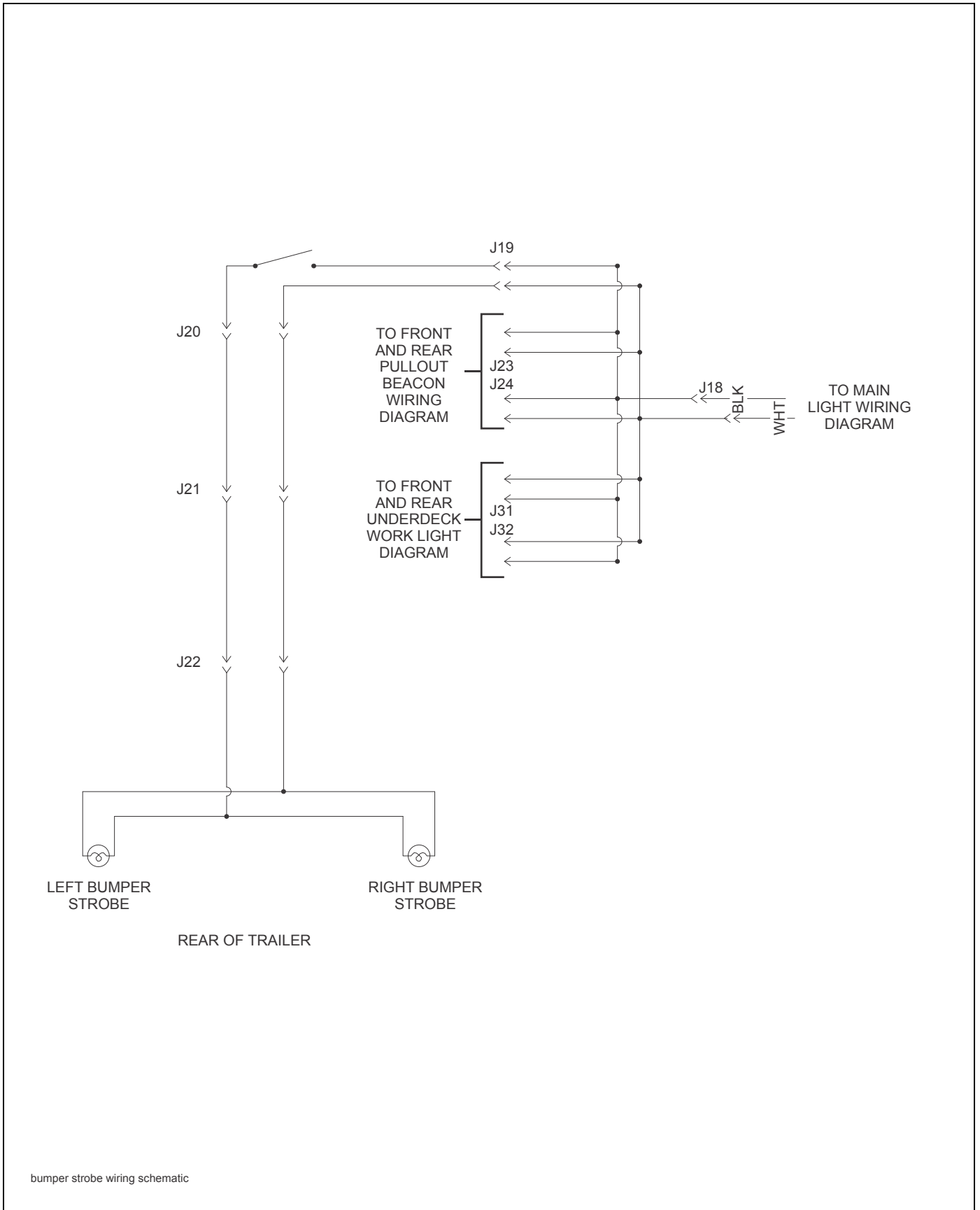
380 main light wiring elect op

Figure 4-2: Model 380 Main Light Wiring Diagram



wiring for abs system

Figure 4-3: Model 380 ABS Wiring Diagram



bumper strobe wiring schematic

Figure 4-4: Bumper Strobe Wiring Diagram

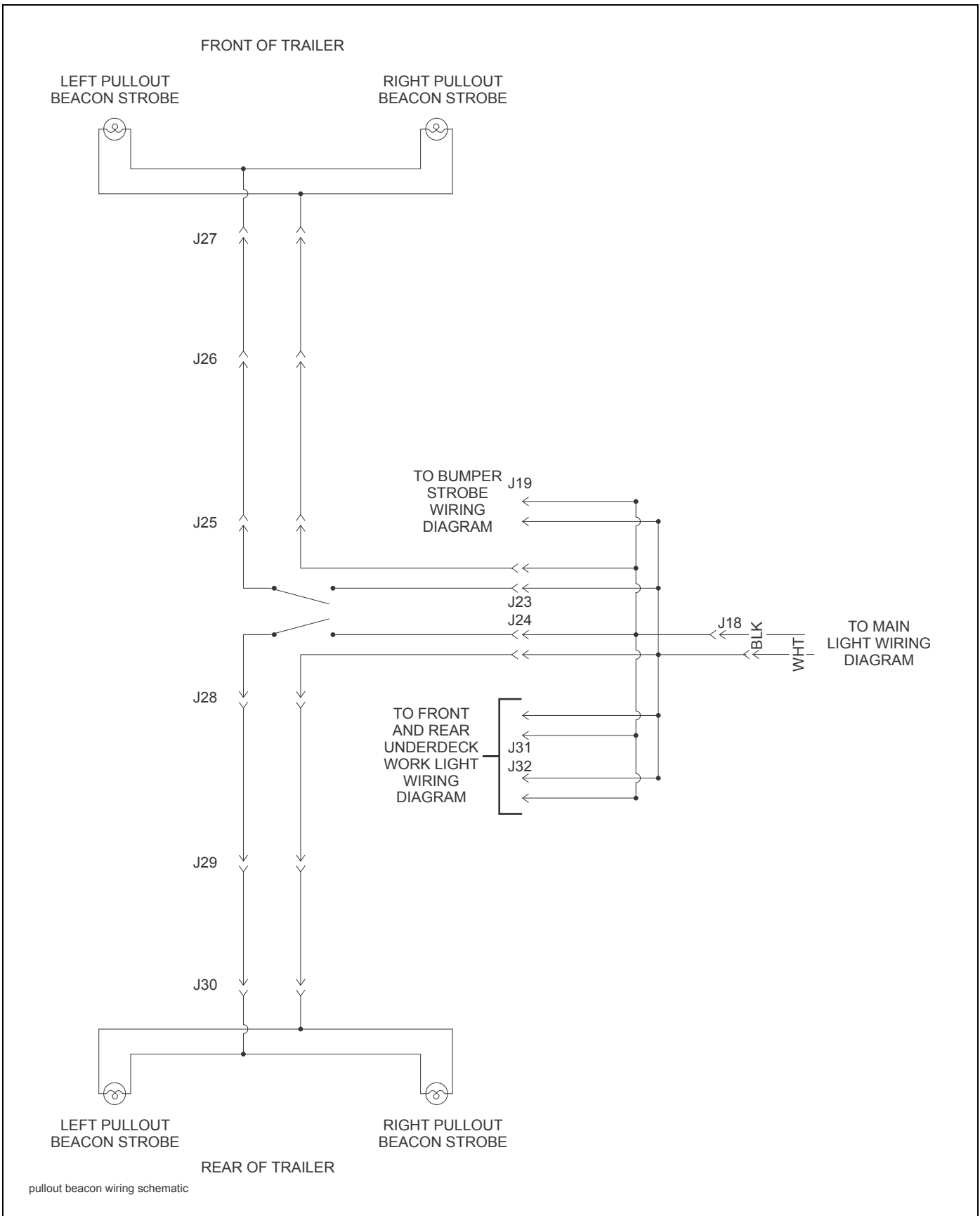


Figure 4-5: Front and Rear Pullout Beacon Wiring Diagram

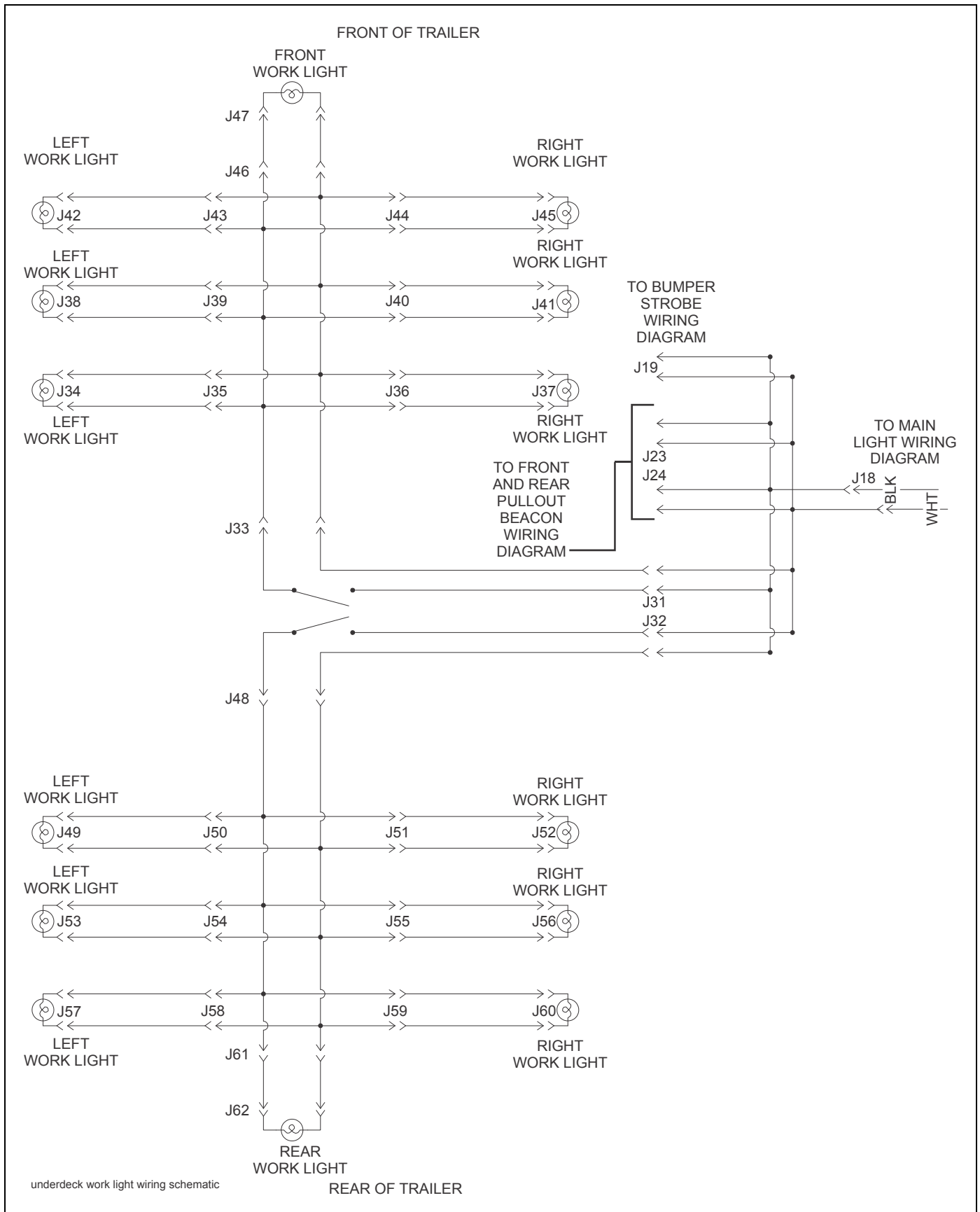


Figure 4-6: Front and Rear Underdeck Wiring Diagram

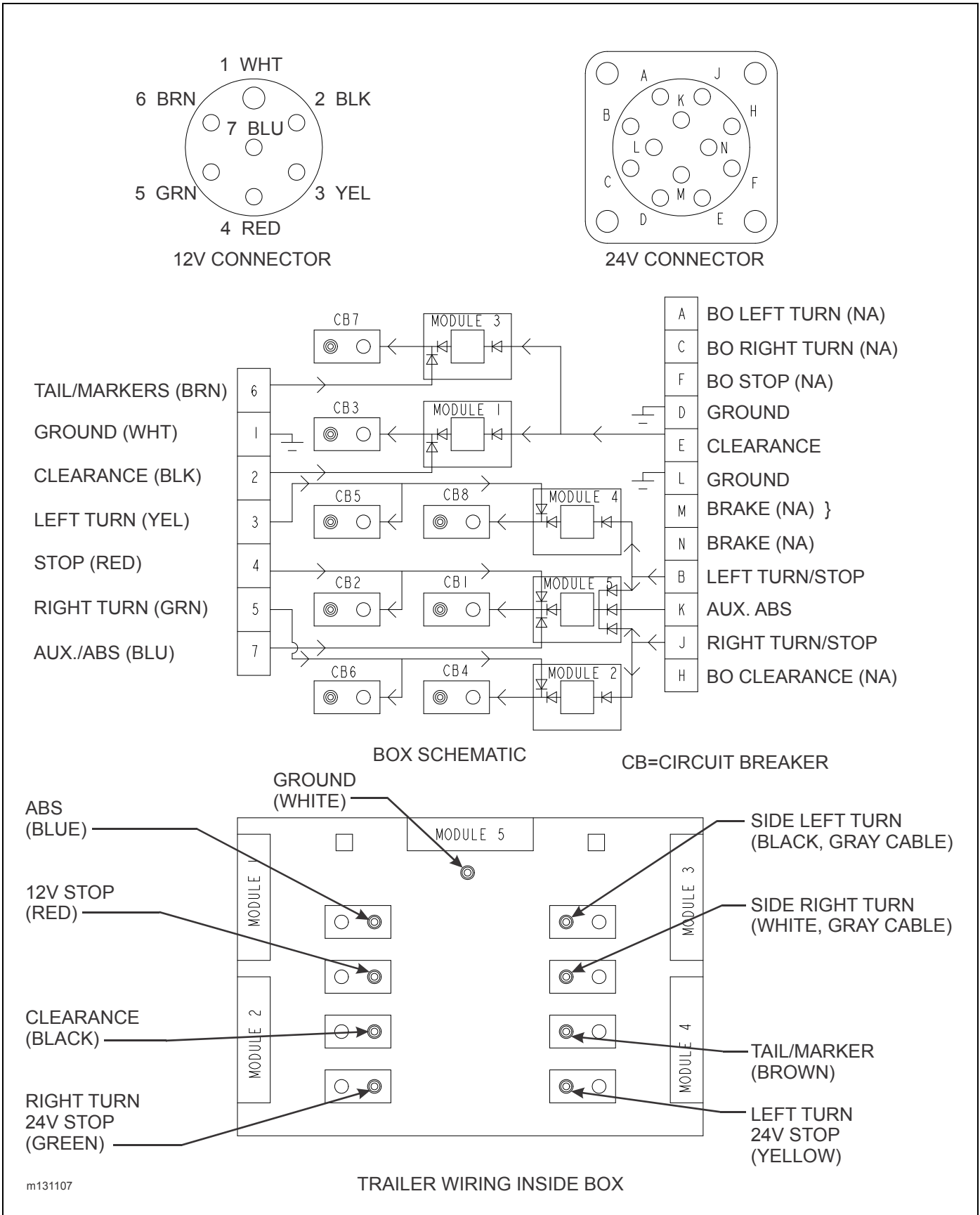


Figure 4-7: 12V/24V Voltage Conversion Box

Electrical System

1. Maintenance of the electrical system consists of inspection and minor servicing. Any wire, connection or electrical component showing signs of corrosion, wear, breakage or unraveling must be repaired or replaced. **(See Figures 4-2 thru 4-7 for electrical wiring diagram. Note that all harness junctions are designated as J1, J2, etc.)**
2. Frayed or unraveling wire must have the defective section removed and replaced with wire of the same color and gauge. Seal all connections and insulate.
3. Corroded terminals must have the corrosion removed, source of corrosion neutralized and the terminals resealed, protected, and insulated.
4. Fuse or circuit breaker burn-out or blow-out usually indicates an electrical short-circuit, although a fuse can occasionally fail from vibration. Insert a second fuse or reset the breaker. If this fuse immediately burns out or the breaker trips, locate the cause of the electrical short and repair.
5. A light that repeatedly burns-out usually indicates a loose connection, poor system ground, or a malfunctioning voltage regulator. Locate the source of the problem and repair. System grounds must be grounded to bare metal surfaces. Paint, grease, wax, and other coatings act as insulators. Replacement lamps must be equivalent to the factory installed lamp.

Suspension Maintenance

See Figure 4-8 for Triple Air Ride Suspension drawings.

1. Physically check all nuts, bolts, and air line fittings for proper torque (see torque chart below).

| Air Suspension Torque Chart | | | | |
|-----------------------------|--------------|---------|----------|---------|
| Size | 1-1/8"-7 | 1/2"-13 | *3/4"-16 | 3/4"-10 |
| Torque in Ft. Lbs. | **800 or 550 | 35 | 35 | 150 |

* Air Spring Connections Only.

** First number listed is torque required if bolt head designated with Neway; Second number listed is torque required if bolt head designated with Holland Neway.

2. Check all other suspension components for any sign of damage, looseness, wear or cracks.
3. With trailer on level surface and air pressure in excess of 65 psi, all air springs should be of equal firmness.
4. The height control valve on left side of center axle controls ride height for all air springs on triple axle suspension.

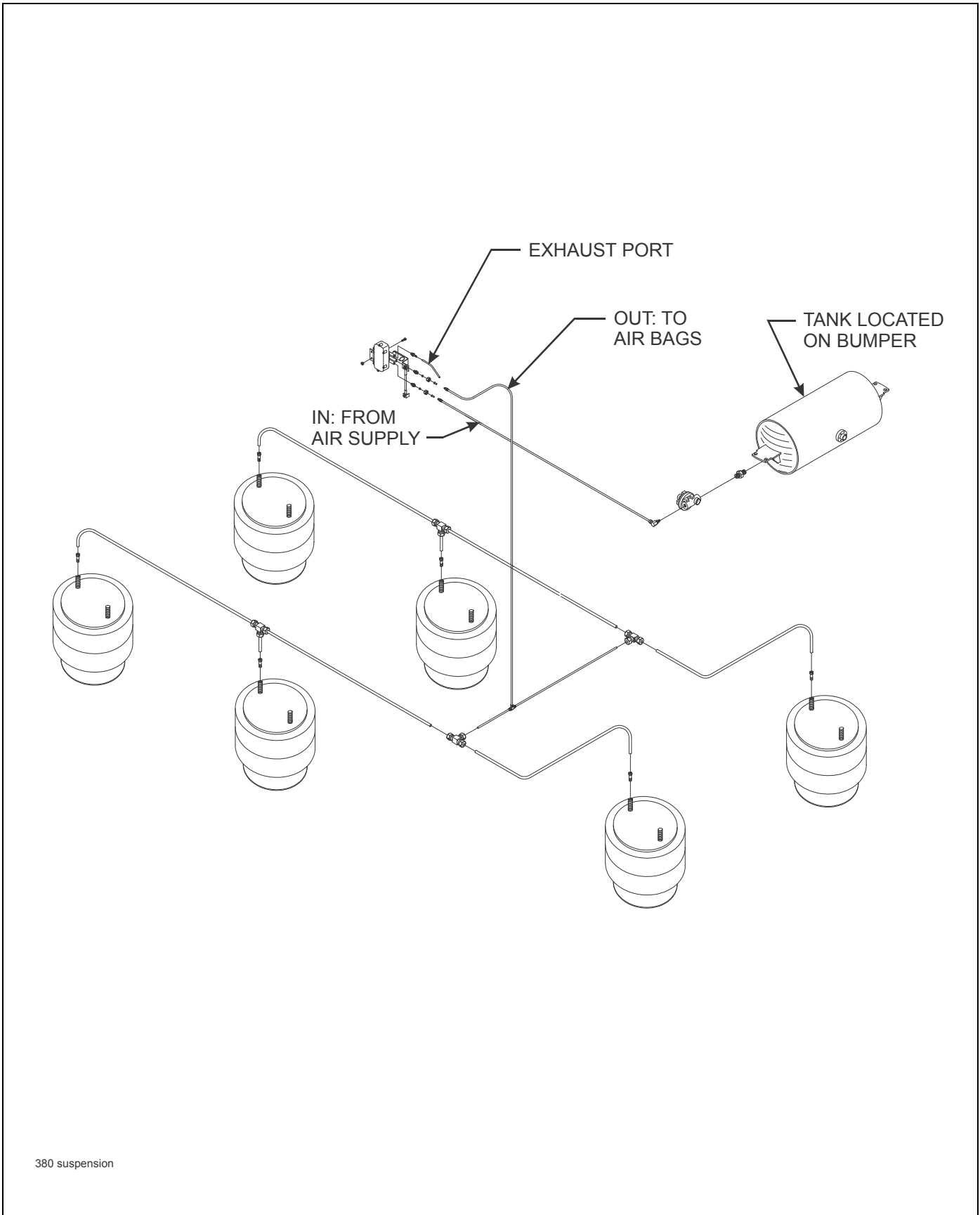


Figure 4-8: Triple Axle Air Ride Suspension System

Air Ride Height Adjustment

(See Figure 4-9 for parts identification.)

1. Before adjusting, the vehicle must be empty with the kingpin at operating height and have air supplied to the trailer.
2. Disconnect linkage at the control arm and raise control arm to the "up" position, raising the trailer until a block can be placed between axle tube and undercarriage frame (See Figure 4-9.)
3. Position the wood block between the axle tube and frame according to table below. Block height is dependent upon suspension ride height.

| Air Suspension Ride Height and Block | | |
|--------------------------------------|-------------|--------------|
| Brake Size | Ride Height | Block Height |
| 16-1/2" Dia. | 17" | 15-1/2" |

4. Lower the trailer by exhausting air from the air springs by moving the control arm to the "down" position (about 45°) until the axle tube is resting on the block.

5. Check the ride height to make sure it is correct. Consult Landoll Service Center if correct height cannot be obtained.
6. Loosen the 1/4" adjusting lock nut located on the adjusting block, allowing the control arm to move approximately 1 inch. Move the adjusting block until holes align, then insert locating pin. (See Figure 4-9.)
7. Align the control arm linkage to the control arm lower bracket and re-tighten the 1/4" adjusting lock nut to 2-4 ft.lbs. The ride height valve should now be correctly adjusted.
8. Remove the locating pin.
9. The block can now be removed by using the height control valve as an improvised jack by disconnecting the control arm at the lower bracket and pushing the control arm to an "up" position.
10. Remove the block and reconnect the linkage. This allows the Automatic Height Control Valve to resume normal operation.
11. Check the air ride height. If necessary, go through the adjustment procedure again until the proper air ride height is achieved.
12. Check the air ride height periodically and adjust as needed.

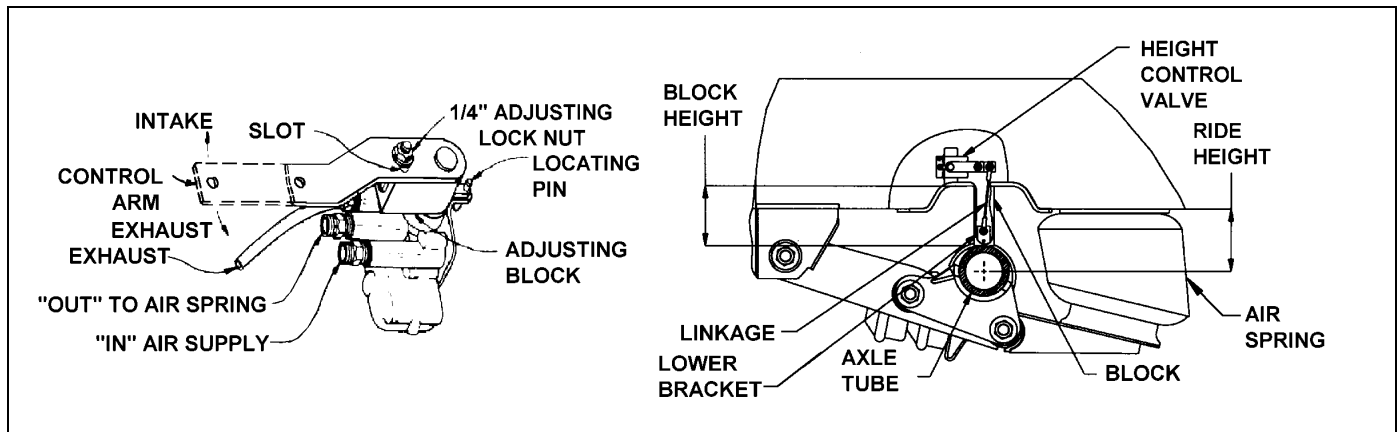


Figure 4-9: Air Ride Height Adjustment

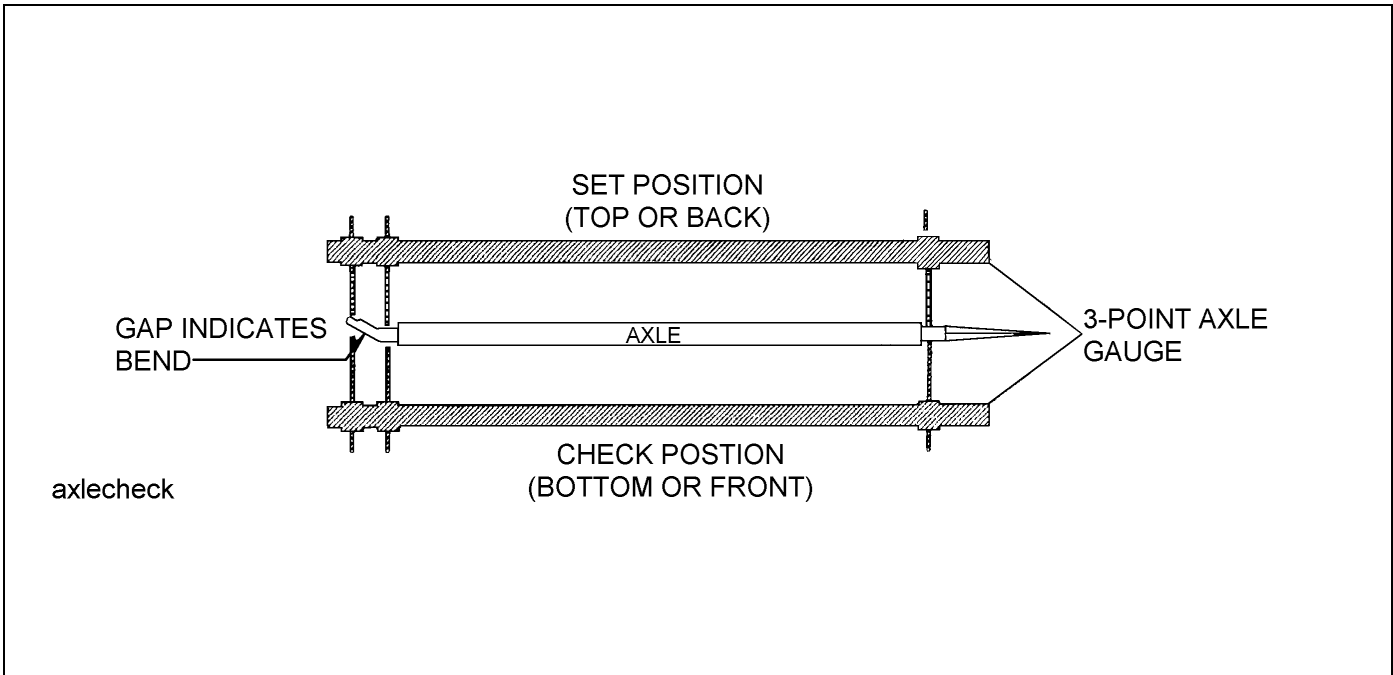


Figure 4-10: Checking Axle for Bend

Alignment

Wheel Alignment



DANGER

To prevent a life threatening accident:

1. Support trailer and undercarriage so tires are off the ground.
2. Support the trailer and undercarriage on jack stands with sufficient capacity to support the total weight of the trailer and any load which it may be carrying.

When trailer tires show signs of scuffing, feather-edging or uneven wear, examine the trailer for damaged suspension (frame, shocks, linkage, etc.), axle, wheel bearings and wheels. Proper wheel alignment and wheel bearing adjustment is essential for proper tire wear. The simplest form of checking wheel alignment “toe” is by running the trailer over a “SCUFF GAUGE”. A scuff gauge reading of 16 feet or less per mile is considered satisfactory. If a scuff gauge is not readily available, or edge wear on one side of a tire is occurring signifying positive or negative camber, alignment can be checked as follows:

1. Remove wheel, hub and bearing assemblies.
2. Place a 3-point axle gauge against the front side of the axle, and adjust each axle gauge point to the axle. (Double point end against the inner and outer wheel bearing surfaces of the spindle being checked and the other point on the inner bearing surface on the other spindle.)(See Figure 4-10.)
3. Move the axle gauge and place against the back side of the axle. If either of the points of double point end fails to touch the axle surface, a bent spindle is evident. A point gap of .015" or more is considered excessive tire “toe” and the axle must be replaced (See Figure 4-10.)
4. Follow the same procedures as in steps 2 and 3, except place the axle gauge above and below the axle. If gauge point gap is found, the axle has positive or negative camber. The trailer axle has no camber from the factory. If it is found to have positive or negative camber, axle replacement is necessary (See Figure 4-11 for examples of camber).

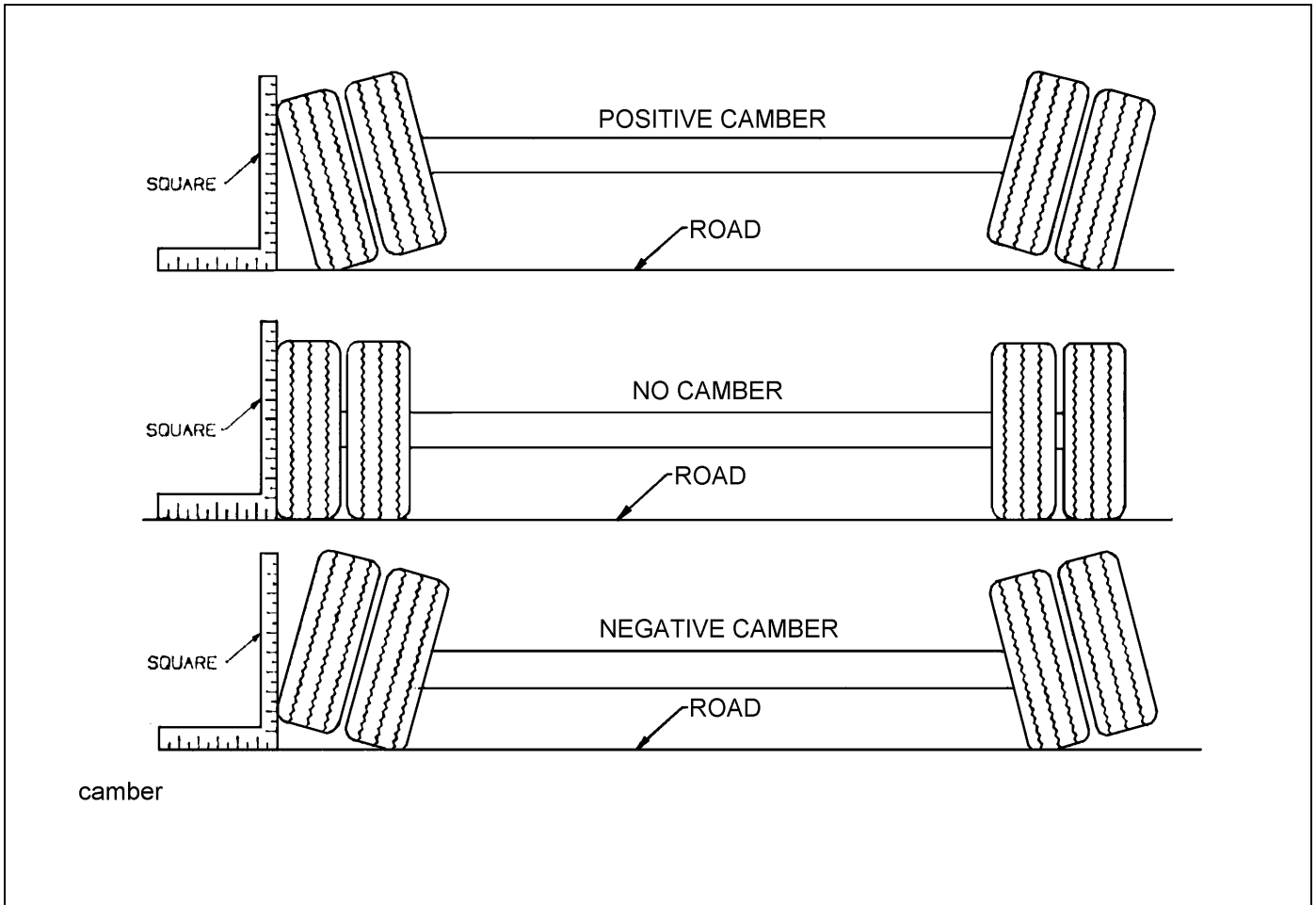


Figure 4-11: Examples of Camber

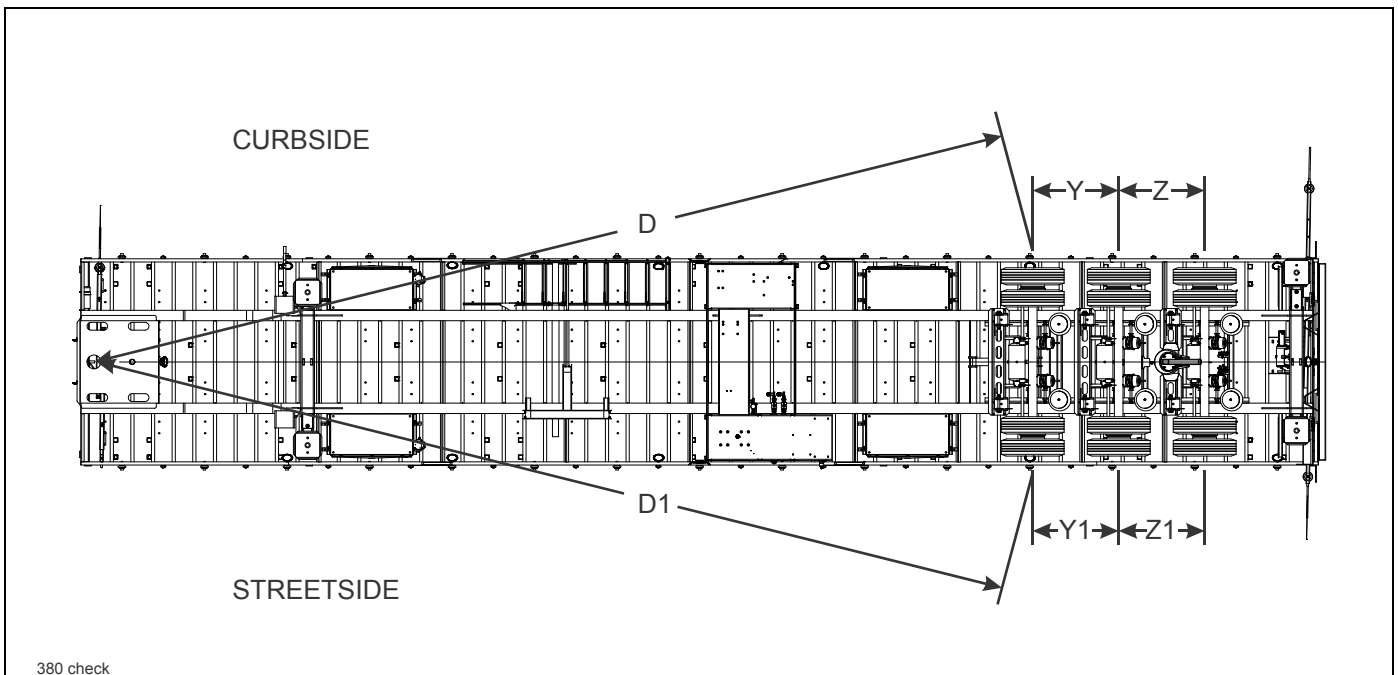


Figure 4-12: Checking Axle Alignment

Axle Alignment

Proper axle to king pin alignment is necessary to obtain straight tracking. If axle alignment is off, “dog-tracking” occurs. Check alignment manually or by using a semitrailer alignment machine. In either case, a thorough inspection of the complete suspension must be performed and all defects corrected before aligning.

Manual Alignment Procedure

1. Position semitrailer on a firm and level surface. Insure that the undercarriage is in the rear most position. Eliminate any suspension binding due to sharp turns or unusual maneuvers.
2. Detach tractor from the semitrailer and jack the trailer up sufficiently to permit measuring from the underside of the trailer.
3. Suspend a plumb bob at axle height from the center of the king pin.
4. Measure (D) from the plumb bob to the center point on one end of the axle. Record this measurement **(See Figure 4-12.)**
5. Measure (D1) to the other end of the axle in the same manner as in **step 4**. Record this measurement **(See Figure 4-12.)**
6. Set D about 1/8” shorter than D1 to insure proper trailer tracking on slope of road.
7. The suspensions must be in good repair with no binding or other restrictions before aligning. All defective parts of the suspension or axles must be replaced immediately.

Air Ride Suspension Axles

The air ride suspension is aligned and adjusted at the factory and it should not be necessary to align the axles. If, however it does become necessary to align the axles, the procedure is as follows:

1. To align air ride suspension axles, locate the front axle equalizer beam pivot bolt in front hanger at front end of lock nut. Loosen the suspension pivot bolt lock nut. Rotate the head of the pivot bolt. For axle alignment forward, rotate bolt head clockwise. For axle alignment rearward, rotate the bolt head counter-clockwise. Both sides of axle need to be adjusted to prevent axle rise or fall.
2. Align the front axle using the method outlined in **“Manual Alignment Procedure” on page 4-18.**
3. After proper alignment has been obtained, tighten the suspension pivot bolt nut to the torque listed in the table on **page 4-13.**
4. Align the center axle to the front axle. Locate the rear axle equalizer beam pivot bolt in hanger at front end of driver’s side rear axle equalizer beam. Loosen the suspension pivot bolt lock nut. Rotate the head of the pivot bolt. For axle alignment forward, rotate bolt head clockwise. For axle alignment rearward, rotate the bolt head counter-clockwise. The center axle should be parallel with the front axle, with the dimensions Y and Y1 being the same.
5. Align the rear axle to the center axle in the same manner, as **step 4**, with dimensions Z and Z1 being the same. The rear axle should also be parallel with the front axle, with dimensions Y plus Z equal to Y1 plus Z1.
6. Tighten the suspension pivot bolt nut to the torque listed in the table on **page 4-13.**

Brake System Maintenance

! WARNING

1. **When crawling under the semitrailer is necessary, chock all wheels of the trailer and tractor. When jacking is necessary, chock all wheels and support the semitrailer undercarriage with jack stands sufficient to withstand the weight of the semitrailer and load. Failure to take adequate safety measures may result in serious personal injury or death.**
2. **Use great care if wheels or brake drums must be handled. They may be very hot and can cause serious burns.**

General

A daily general inspection will reveal the most common problems found in the spring brake system. This inspection should include the following:

1. Check air hoses for chafing, bends, kinks, or damaged fittings. Replace defective hoses.
2. Check the brake system for loose, missing, deformed, or corroded fasteners. Replace and tighten defective hardware.
3. Check brake linings for excessive wear or distortion.
4. Drain air reservoir daily. A drain cock on the bottom of each air reservoir vents the tank to drain collected water and oil. If held open, air pressure in the tanks is relieved, causing the emergency or parking brakes to be applied (**See Figure 4-13.**)

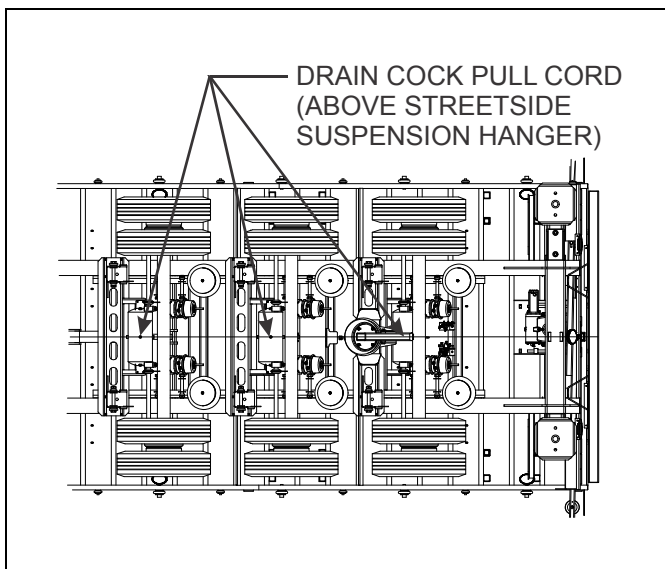


Figure 4-13: Drain Cock Locations

Spring Air Brake Chambers

Check for faulty units. Check the condensation holes on the underside of the brake chambers to make sure they are open. The spring brake has two brake chambers, a service chamber and an emergency chamber or spring chamber. Service brake chambers should be disassembled and cleaned at 50,000 miles or yearly. The diaphragm and any marginal parts should be replaced. When replacing the service diaphragm, replace the corresponding parts for the other chamber on the same axle (to aid in even brake application and release). Examine yoke pin for wear and replace as necessary. The spring chamber should not be serviced. Replace entire unit (both service and spring chamber) if spring chamber becomes faulty.

! WARNING

The spring brake chamber employs a spring with high forces. service should not be attempted. Serious injury or death may result.

Caging the Power Spring

1. Chock the trailer wheels.
2. Remove dust cap from spring brake chamber.
3. Remove the release bolt from its holding brackets and insert it into the spring brake chamber. **DO NOT USE AN IMPACT WRENCH TO CAGE THE SPRING BRAKE.**
4. Turn the bolt until the spring brake is caged. This should be 2-1/4 to 2-1/2 inches of release bolt extension.
5. The brakes should now be totally released. Do not operate loaded trailer with brake manually released.
6. To reset the spring brake, turn the release bolt until the spring is released. Remove the release bolt and store it in its brackets.
7. Snap the dust cap back in place on the chamber.

Removal

1. Chock all tractor and trailer wheels and drain the air system.
2. Mark the brake chamber for proper air line port alignment for reassembly.
3. CAGE THE POWER SPRING following the steps outlined in “Caging the Power Spring” on **page 4-20.**
4. Disconnect the slack adjuster from the connecting rod by removing the clevis pin (**See Figure 4-16.**)
5. Mark all air service lines for proper reinstallation and disconnect from the brake chamber.
6. Remove the brake chamber from the axle brackets.

Installation

1. CAGE THE POWER SPRING following the steps outlined in “Caging the Power Spring” on **page 4-20.**
2. Position the inlet ports by loosening the service chamber clamp bands and rotating center housing such that ports are located according to alignment marks made during disassembly, then retighten the clamp bands.
3. Position the breather hole in the downward facing position by loosening the clamp bands on the spring brake chamber and rotating the chamber housing until the breather hold faces downward. Retighten the clamp bands.
4. Remount the brake chamber on the axle brackets and reconnect the air service hoses and the slack adjuster connecting rod (**See Figure 4-16.**)

IMPORTANT

Be sure the service line is on the service chamber port and the emergency line is on the spring brake port.

5. Check for leakage by charging the air system to a minimum of 90 psi and applying soap suds to the brake chamber and connections. If a growing bubble is detected or bubbles are blown away, locate the source of the leak and repair.
6. Insure that the clamp band is properly seated and tight **before** uncaging the power spring.

Emergency Relay Valve Maintenance

Every 3600 operating hours, 100,000 miles, or yearly, the Emergency Relay Valve should be disassembled, cleaned, and lubricated by a trained technician.



WARNING

Repair or replacement of the relay/emergency valve is a complex operation and should be performed by trained service personnel. Contact a landoll authorized service center or the landoll factory for servicing.

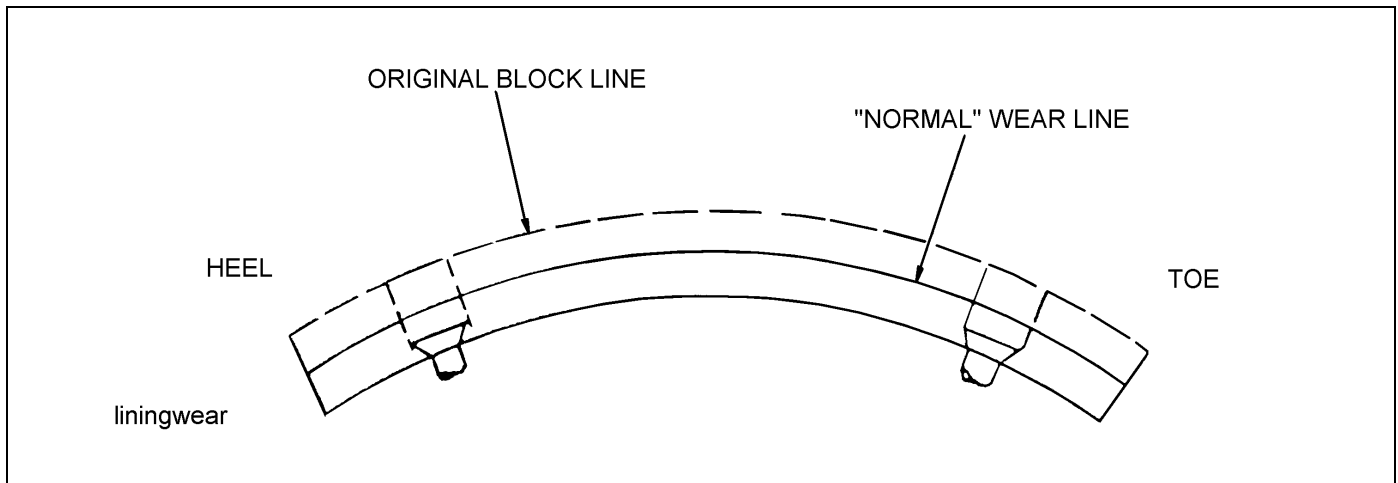


Figure 4-14: Brake Lining Wear

Brake Assembly Maintenance

The brake assemblies should be inspected and adjusted every 2,000 miles or monthly. Examine the brake linings visually to locate the lining showing the greatest amount of wear. The wheel and drum should be removed and the linings replaced if the thinnest portion of the lining is 3/8 in. (9.5 mm) or less. Do not allow the linings to wear thin enough that the lining rivet contacts the drum (See Figure 4-14.) Lubricate brake assembly per Figure 4-1 and Table 4-2.



WARNING

Do not allow grease to contact brake linings as this could result in reduced braking performance.

Brake Adjustment

This semitrailer is equipped with automatic slack adjusters which compensate for brake lining wear and keep brakes adjusted. Brakes should not be adjusted manually except when relining brakes.

Disassembly for 16-1/2" x 7" Brakes

1. Release brakes and back off slack adjuster (See Figure 4-15.)
2. Remove slack adjuster lock ring and slack adjuster.
3. Remove drum assembly.
4. Disengage the roller retainers from the rollers.
5. Press down on the bottom brake shoe and remove the lower cam roller. Lift the top shoe and take out the top cam roller.
6. Lift out the shoe retractor spring, which is now free of tension.

7. Swing the lower shoe back approximately 180° to relieve the tension on the shoe keeper springs. Remove the springs and slip the shoes off the anchor pins.
8. Remove camshaft lock ring, spacer washer(s) and camshaft.
9. After removing the shoes, completely inspect all brake components, servicing as necessary.

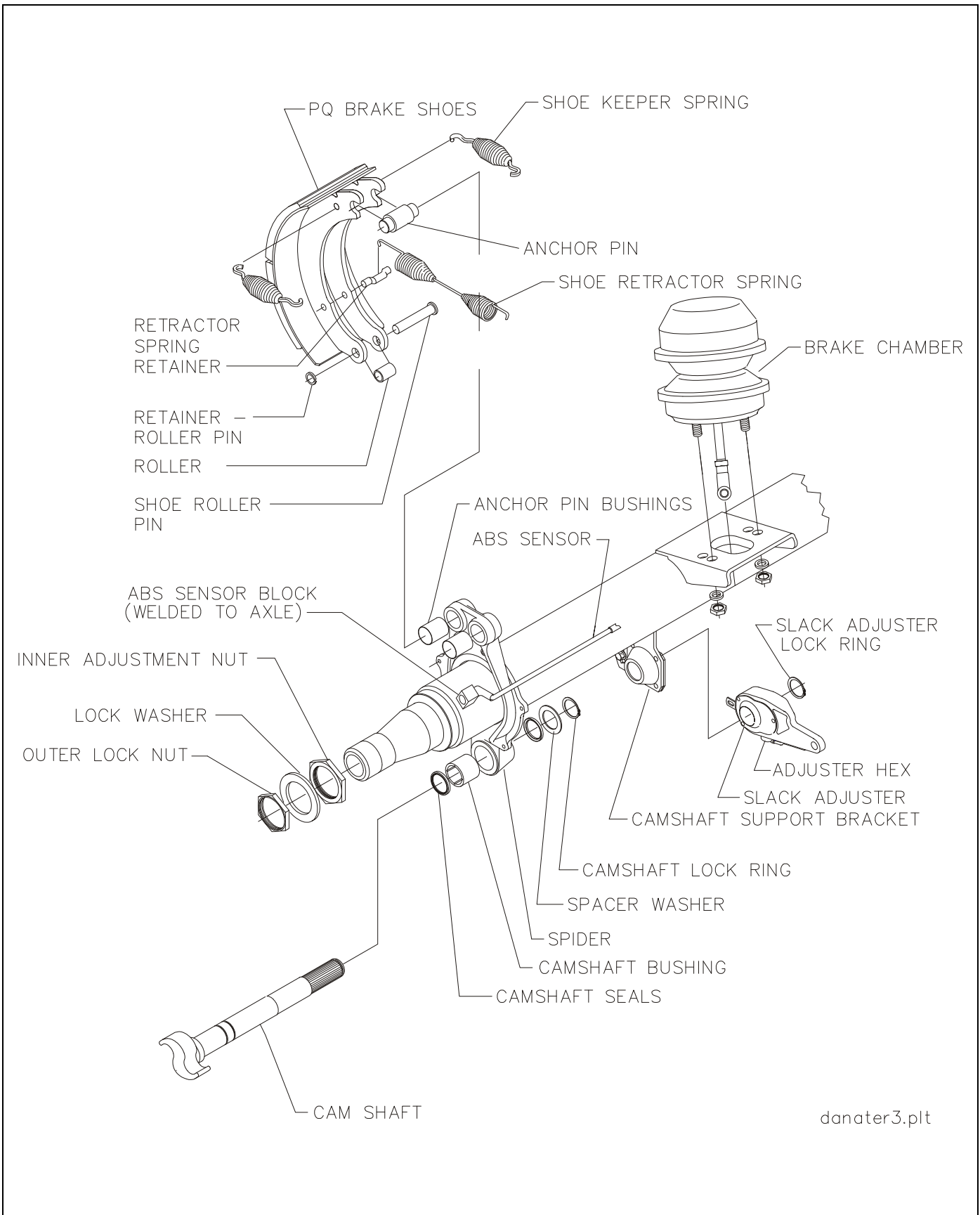
Reassembly for 16-1/2 x 7" Brakes

1. Install new anchor pin bushings, camshaft bushing and camshaft seals into the spider (See Figure 4-15.)

IMPORTANT

When installing camshaft seals, the seal on the slack adjuster side is installed facing into spider. This allows grease to purge outside the brake assembly when greasing the camshaft bushing.

2. Install cam roller, retainer clip and retractor spring retainers onto the camshaft.
3. Install 1/8" thick camshaft washer onto the camshaft.
4. Install the camshaft into the spider. Install spacer washer and lock ring retainer on camshaft before sliding the camshaft through the camshaft support bracket. Install the slack adjuster, washer and lock ring retainer.
5. Install the brake keeper onto the shoes. Install shoes onto the spider by placing shoes in place on the anchor pins, then "wrap" the two shoes into place about the spider.
6. Install the shoe retractor spring onto the shoes.
7. Connect slack adjuster to brake chamber pushrod.
8. Adjust automatic slack adjuster as outlined in "Adjusting Slack Adjuster" on page 4-24.



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Figure 4-15: Axle and Brake Assembly

Automatic Slack Adjuster

The semitrailer automatic slack adjusters provide the means for routine brake adjustment to compensate for lining wear. Inspect slack adjusters every 2,000 miles to assure correct operation.



CAUTION

The installation guide must be used when installing or reinstalling automatic slack adjuster. Failure to do so may result in improperly adjusted brakes which may cause brake damage or lead to brake failure.

Operational Check

1. Block wheels to prevent vehicle from rolling.
2. Check that the push rod is fully retracted, apply air to release spring brake **(See Figure 4-16.)**
3. Turn adjustment hex counterclockwise to create an excessive clearance condition. (A ratcheting sound will occur.)
4. Make a full service brake application. On release, allow sufficient time for brake to fully retract. During the brake release, observe rotation of the adjustment hex (attach a wrench on the hex to make this movement easier to see). This rotation indicates that an excessive clearance condition has been determined by the slack adjuster, and it is making an adjustment to compensate. On each subsequent brake release the amount of adjustment and push rod travel will be reduced until the desired clearance is achieved.
5. The push rod stroke should be 1 1/2" to 2" with an 100 to 105 PSI service brake application.
6. Measure the movement of the push rod from the completely released position to the applied position by marking the push rod where it exits the air chamber before and after application.
7. If the brakes have been running tight, the control arm location should be checked.



WARNING

If the adjuster appears not to be operating, check the other brake components for proper function and eliminate any binding. Recheck the automatic slack adjuster. If the adjuster is not functioning, the unit must be replaced because failure of proper adjustment function will result in loss of brakes.

Replacing Slack Adjuster

1. Chock wheels to prevent vehicle from rolling. Release spring and service brake. Air chamber push rod must be **fully released**.
2. To maintain a fully released parking brake, a minimum of 105 psi reservoir pressure must be maintained. If air pressure is not available the spring brake must be manually caged.
3. Remove the existing slack adjuster and clevis - **DO NOT REMOVE EXISTING JAM NUT (See Figure 4-16.)**
4. Install the new clevis (with 1/2" pin) onto the pushrod up to the jam nut -**DO NOT TIGHTEN JAM NUT**.

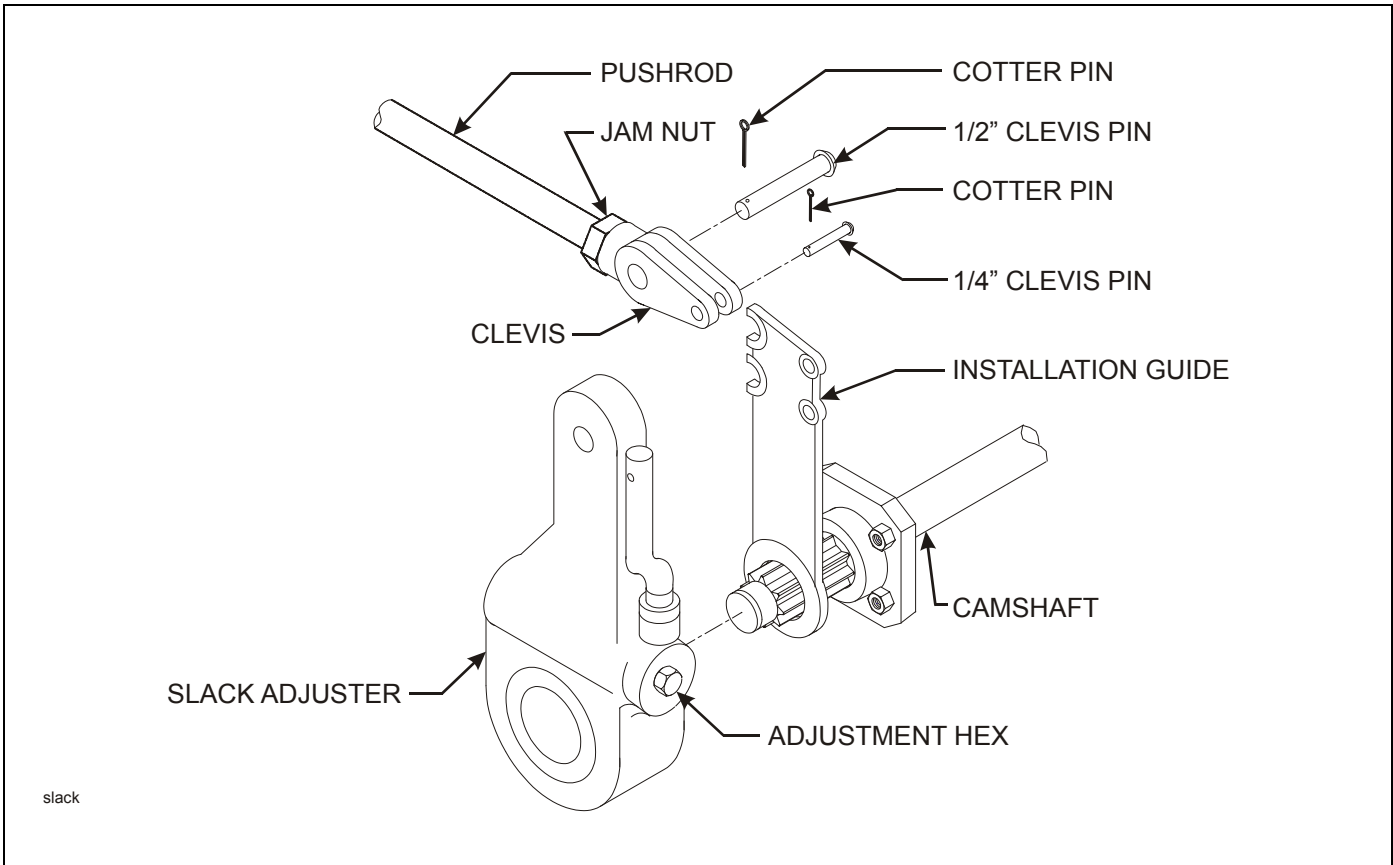


Figure 4-16: Slack Adjuster

5. Fit the installation guide over the cam splines so the 1/2" pin slots face the air chamber.
6. Swing the guide into the clevis until the appropriate slot totally engages 1/2" pin.
7. Observe the guide pointer arrow:
If the guide pointer is above the clevis pointer, adjust clevis CCW for alignment.
If the guide pointer is below the clevis pointer, adjust clevis CW for alignment.
8. Reposition clevis until the guide pointer aligns with the clevis pointer.
9. Verify by engaging 1/4" pin through the clevis and guide.
10. Tighten jam nut to 50 ft.-lbs. torque min.
11. Remove the guide from cam shaft.
12. If the push rod threads extend through the clevis more than 1/16", remove clevis and cut rod to length.
13. If the push rod is not fully engaged in clevis body, install a new push rod - cut to length.
14. Install the slack adjuster on the cam shaft.
15. Rotate the manual adjuster shaft CW until the slack adjuster arm holes align with the clevis. Install 1/2" and 1/4" pins and cotter pins.

Adjusting Slack Adjuster

1. Rotate the manual adjuster clockwise until brake shoes contact drum.
2. Back off manual adjuster 1/2 turn. (counterclockwise)
3. Manually uncage the spring brake.
4. Build up vehicle air pressure.
5. Fully apply and release the brakes several times to check for adequate clearance to all adjacent components.
6. Measure the distance from air chamber to 1/2" pin. Apply brakes with 100-105 psi air pressure and remeasure distance to 1/2" pins.
7. The stroke (difference of these two measurements) must be less than 2 inches.

Hub and Drum Maintenance

1. Clean and inspect the brake drums whenever relining the brakes. To be suitable for further service, the brake drum should pass the following checks.
 - a. The brake surface should be free of scoring, excessive heat checks and cracks.
 - b. The brake surface diameter should be within the maximum diameter cast or stamped on the drum.
 - c. The mounting holes and pilot must be round and true.
 - d. The mounting surface must be clean and flat.



WARNING

Failure to replace faulty brake drums will result in an unreliable braking system, and may lead to an accident.

2. It may be necessary to turn or resurface the braking surface to remove small heat checks or other surface defects resulting from normal use.
 - a. The maximum diameter cast into the back plate portion of the brake drum is the maximum diameter or discard diameter to which the brake drum may be turned or worn and still be usable. If any portion of the brake surface exceeds the maximum diameter it must be discarded. The maximum is .120 over the nominal new diameter unless stated otherwise on the casting. The maximum diameter cast into the brake drum supersedes all published information.
 - b. When resurfacing a drum, allow at least 0.040 inches under the maximum diameter for additional wear.



WARNING

Turning a brake drum beyond 0.040 inches under the maximum diameter will result in a weaker brake drum and may result in an accident.

3. Replacement of the brake drum is required if any of the following conditions exist:
 - a. The brake drum is cracked.
 - b. The brake surface is heat checked, grooved or worn beyond the rebore limit or the maximum diameter.
 - c. The back plate is cracked.
 - d. The bolt holes are elongated.
 - e. The brake drum has been severely overheated.
 - f. The brake drum is out-of-round.



CAUTION

Replace brake drums in pairs to achieve the same braking power on both wheels and maintain an even braking load on the axle. Failure to do this may significantly reduce the performance, service life, and/or safety of your vehicle.

4. Replace the hub and drum as follows (See Figure 4-17.)
 - a. Remove the brake drum (See Figure 4-17.) It may be necessary to release the slack adjuster.
 - b. Remove hub cap and catch lubricant in a pan.
 - c. Remove outer spindle nut, spindle locking washer, inner spindle nut, and bearing. Remove hub from axle.
 - d. Using an appropriate driver, remove inner bearing cone, and seal.
 - e. Using an appropriate driver, remove bearing cups from hub.
 - f. Check that the hub cavity is clean. If the hub is to be reused, clean it thoroughly.
 - g. Insert bearing cups into the hub.
 - h. Clean the mounting surfaces with a good grade commercial cleaner and soft rag. Dry all component parts with a clean, absorbent cloth or paper. Lubricant will not adhere to surfaces wet with solvent.
 - i. Install inner bearing, cone, and seal.

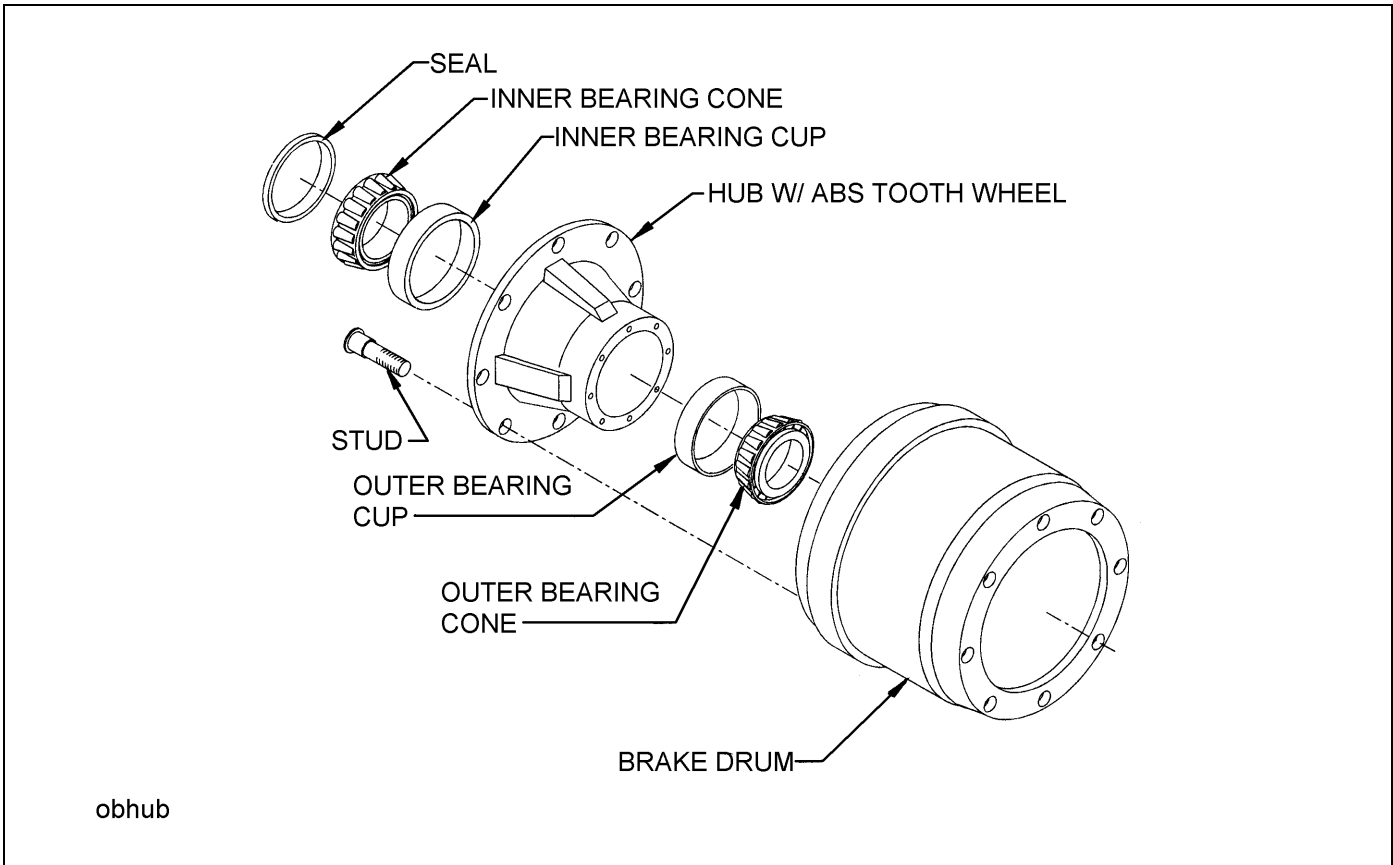


Figure 4-17: Outboard Hub and Drum

IMPORTANT

Do not mix new cups with old cones or new cones with old cups.

- j. Place the hub or wheel over the axle spindle being careful to align the hub bore with the axle. Do not damage the seal. Support the hub assembly until the outer bearing cone and spindle nut are installed, to avoid damaging the seal.
- k. Install the outer bearing cone and inner spindle nut, tightening the nut until it is snug against the outer bearing cone. Remove the hub support allowing the hub to rest on the bearings.
- l. Install and adjust bearings (**See “Wheel Bearing Lubrication and Adjustment” on page 4-27.**)
- m. Install the hub cap with the proper gasket. Tighten the cap screws of the hub cap to 15 to 20 ft.-lbs. of torque.
- n. Place the drum over the hub and brake shoes being careful not to damage the threads on the studs. Make sure the drum seats flat against the hub flange and mates properly with the hub pilot. There should be no interference between the brake drum pilot chamfer and the corner radius on the hub. If interference exists, the hub will not be able to function properly.

Wheel Bearing Lubrication and Adjustment

Adjust wheel bearings and change grease every 50,000 miles or with each brake lining replacement, whichever occurs first.

Adjustment

1. Remove the hub cap assembly.
2. Lift the wheel off of the ground.
3. Adjust slack adjuster to eliminate brake drag during tire/wheel rotation.
4. Remove outer lock nut and inner nut and lock washer.
5. Tighten the inner adjustment nut to a minimum of 75 ft.-lbs., while rotating wheel to insure proper seating of the bearings and cups in the wheel hub.
6. Loosen the inner adjustment nut so that the wheel will turn freely.
7. Retighten the inner adjustment nut to 50 ft.-lbs. while rotating the wheel, to properly position the bearings for the final adjustment.
8. Loosen the inner adjustment nut 1/3 turn.
9. Install the spindle nut lock washer so that the dowel on the inner nut will align with a hole in the lock washer and the washer tang fits in the spindle keyway.
10. Install the outer lock nut and tighten to 250-300 ft.-lbs. End-play of .001" to .010" must be present in the adjusted wheel bearing assembly.



DANGER

Failure to torque the outer lock nut properly could cause the wheel to come off during vehicle operation resulting in property damage or loss of life.

11. Install the hub cap with a new gasket (**See Table 4-1.**)
12. Adjust brakes according to "**Brake Adjustment**" on **page 4-21.**

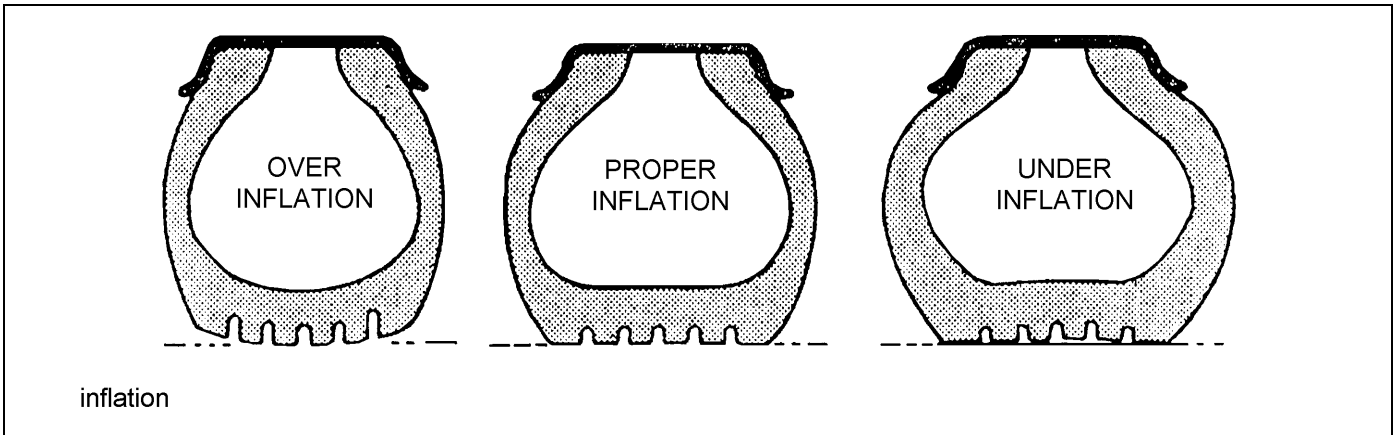


Figure 4-18: Tire Inflation Examples

Tire Maintenance

Tire Inflation

Tire inflation will cause tire to ground contact characteristics as shown in **Figure 4-18**. Tire inflation should be checked daily while the tire is cold, and during road stops. Checking the tire pressures while tires are hot will give a faulty increased pressure reading. Adjusting tire air pressure to the specified amount while tires are hot will produce improper tire to road contact and thus abnormal wear. Do not exceed cold inflation pressure listed on the semitrailer VIN plate located on the front of the trailer. Exceeding cold inflation pressure will result in damaged tire bodies, rims, and wheels. Replace all valve stem caps when pressure checking/adjusting has been completed. Remove any foreign objects from between duals.

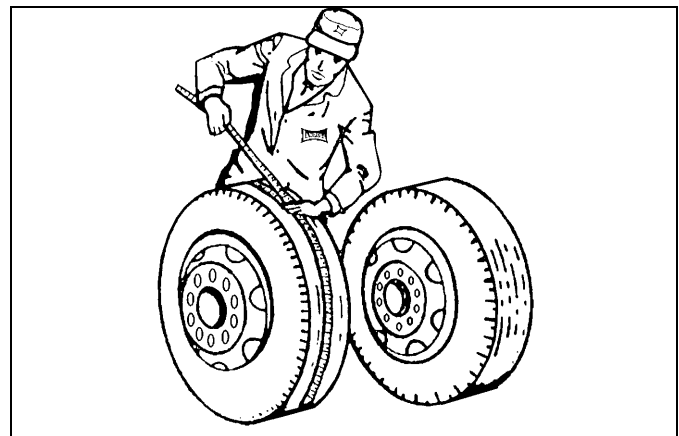


Figure 4-19: Measuring Tape Method

Tire Matching

Both tires on the same spindle must be the same size in order to properly distribute the load and braking forces between them. The tire must be mounted on a rim and properly inflated before measuring. If there is an allowable difference in size the smaller tire should be mounted to the inside position of the duals.

Tape Measuring Method

Measure around each tire on the tread surface. A maximum difference of 3/4" is allowed between the two mating tires of a dual (**See Figure 4-19.**)

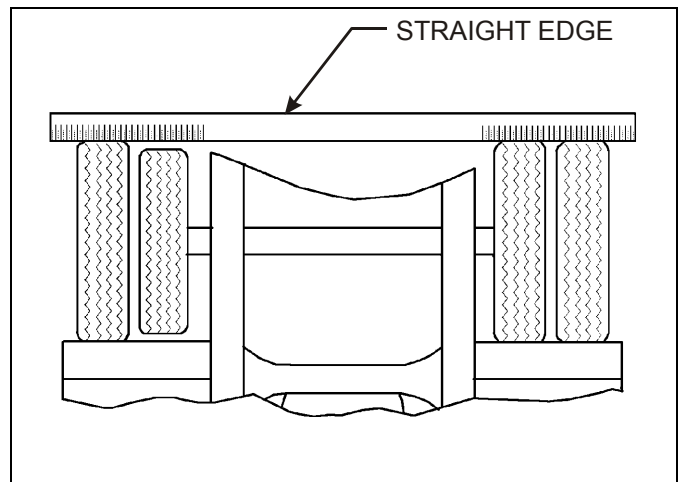


Figure 4-20: Straight Edge Method

Straight Edge or String Method

(This method cannot be used if tire and wheel assemblies are not mounted on the axle.) Jack trailer up until the wheels are off of the ground. Hold a straight edge against the tires of both ends of an axle. A gap at one tire indicates a smaller tire. A maximum of 1/8" gap is allowed (**See Figure 4-20.**)

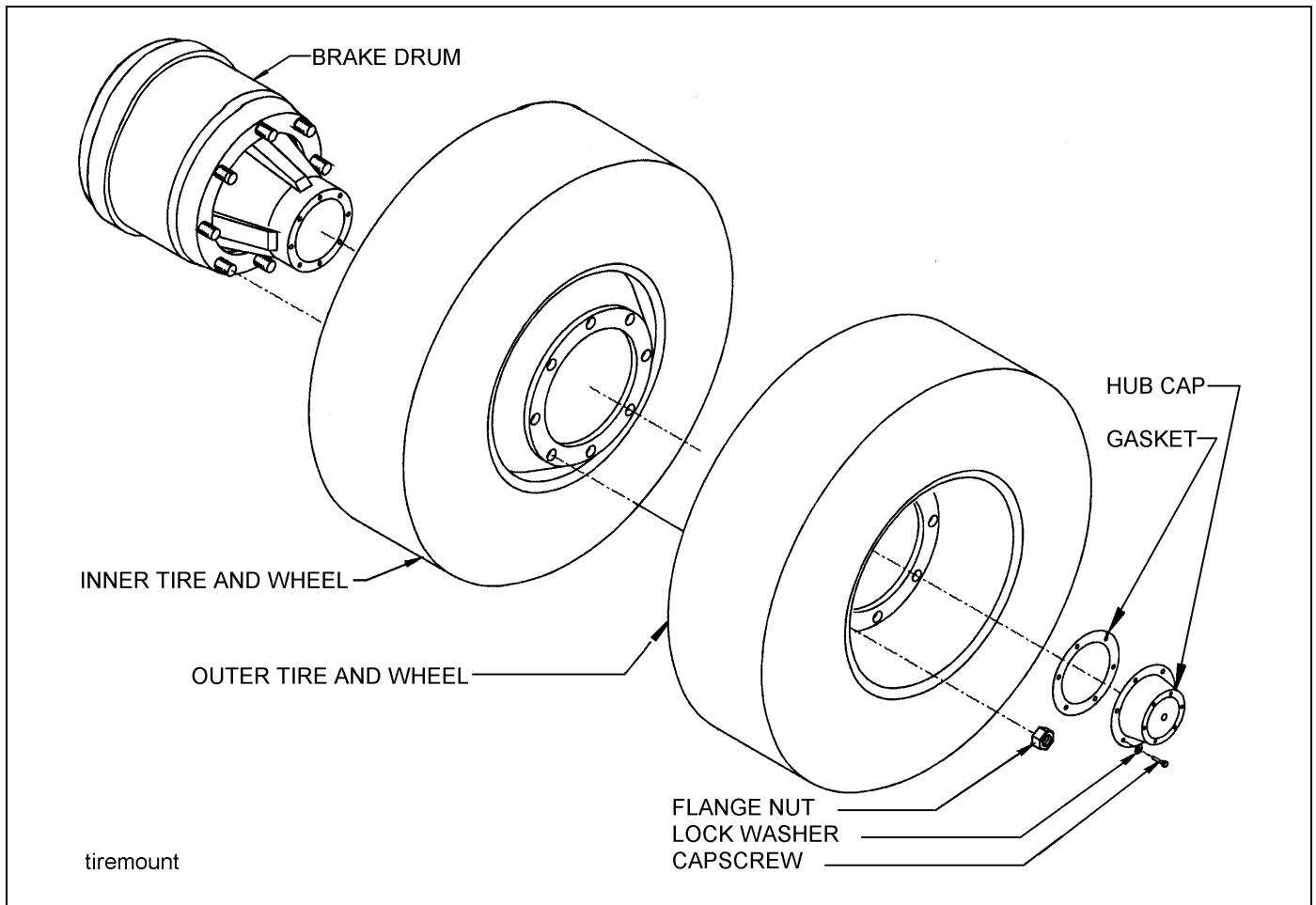


Figure 4-21: Mounting Tires and Wheels

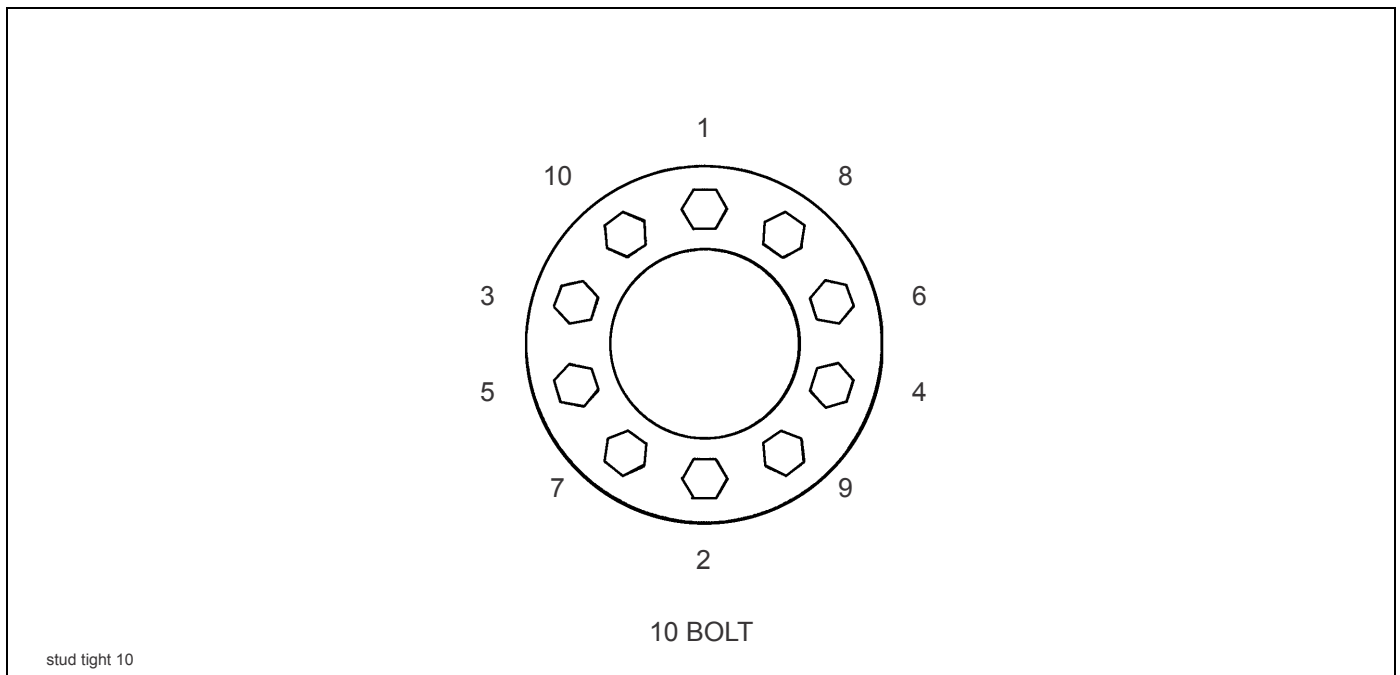


Figure 4-22: Stud Tightening Sequence

Mounting Tire and Wheel (Hub Type)

1. Make sure that all mounting surfaces are clean and free of rust, dirt or paint. A wire brush may be used to clean these surfaces (**See Figure 4-21.**)
2. Position the inner disc wheel over the studs, being careful not to damage the stud threads. Make sure that the disc wheel is flat against the mounting surface and that there is clearance between the disc wheel taper and brake drum.
3. Position the outer disc wheel being careful not to damage the stud threads. Be sure the valve stems for both the inner and outer tire are accessible.
4. Install the flange nut (pilot mount) and tighten to 50 foot-pounds using the sequence in **Figure 4-22.** Then tighten to full torque of 500 to 550 foot-pounds.
5. Torque will drop after the first 50 to 100 miles of operation. Check the nuts for proper torque after this interval and retighten them.



WARNING

Use a torque wrench to assure proper torque. Insufficient torque can cause stud breakage and damage wheel pilots. Overtorque can overstress the studs and strip the threads.

Chain Drive

Inspect the chain drive before and after **every** usage. If nicks, kinks, worn spots, breaks or any other sign of deterioration or damage is found, immediate replacement is mandatory before further usage. If the semitrailer is going to be out in the weather for any length of time, it is advisable to oil the chain drive to prevent untimely rusting and deterioration of the chain. **See Table 4-1** for lubrication specifications.

Inspect the chain drive mechanism thoroughly each week to insure safe, efficient operation.



WARNING

Do not handle the chain drive when the chain drive is in the engage position. Hands or clothing could get caught in the chain and be pulled into the spool causing serious personal injury.

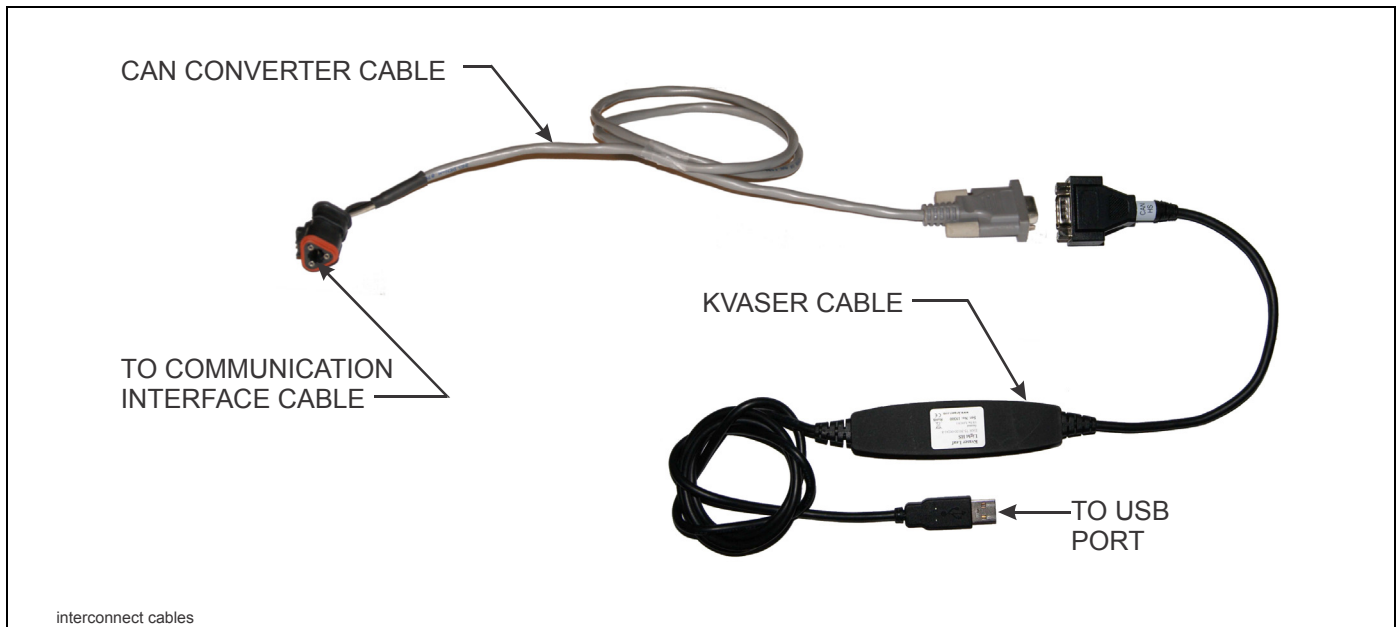


Figure 4-23: Interconnect Cables

Remote Control ECM Programming and Monitoring

The remote control functions can be checked using Plus 1 software monitoring package.

NOTE

Not all computer rear panel orientations are the same, but the pin connections used are the same.

Getting Started Using Plus 1 Software

1. Install the Plus 1 programs from the CD provided (p/n 166909) in the order designated below:
 - a. PLUS 1 GUIDE 5.0.8 Service Tool setup_Latest_1_C022245.exe
 - b. PLUS 1 GUIDE Service Tool 5.0.8 to 5.0.9 setup_Latest_1_C022482.exe
2. Install Kvaser and drivers:
 - a. kvaser_drivers_w2k_xp.exe
3. Once these files are installed, copy the following file to your PC and double click to run. This will open the Plus1 service tool with the application for your trailer.
 - a. A18475 Level Load Roller Trailer Diagnostic.P1D
4. The file listed below is a backup of the application installed into the controller at the factory. This will only be used in the event that the existing controller must be replaced.
 - a. A18475 LEVEL LOAD ROLLER TRAILER.lhx

5. Attach Kvaser Cable/CAN Converter Cable combination to the available USB port on your computer and to the trailer near the controller (See **Figure 4-23.**)
6. Start Plus 1 software only.
7. You are now ready to begin monitoring the remote control system.
8. Follow the screens shots provided below to navigate through the Plus 1 capabilities.

IMPORTANT

It is important to remember that before operating the Plus 1 software, you must connect the software “EACH TIME” by clicking on the “Connect” icon (See Figure 4-24.)

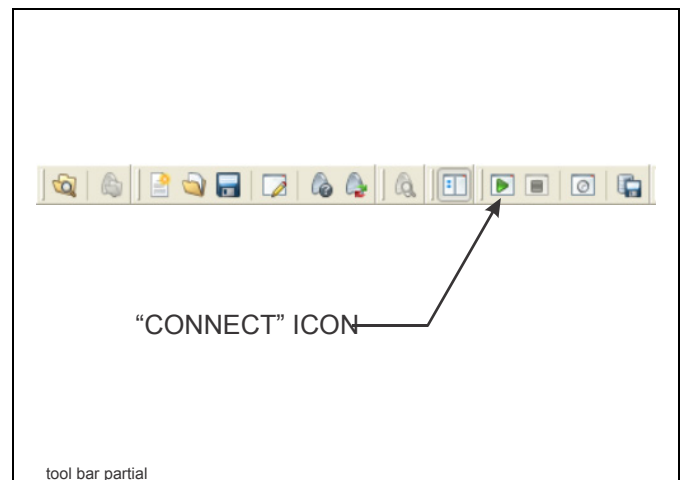


Figure 4-24: Connect Icon on Toolbar

9. The status is provided at the bottom of the computer screen (See Figure 4-25.)

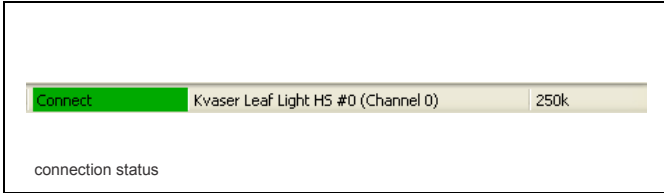


Figure 4-25: Plus 1 Software Activation Status

ECU Downloading and Type

ECU screens used to check the revisions of software and application along with downloading the appropriate software (See Figures 4-26 and 4-27.)

This section of the software is a monitoring or "Log Function", which allows the user to monitor vital performance settings of the electrically controlled hydraulic control system.

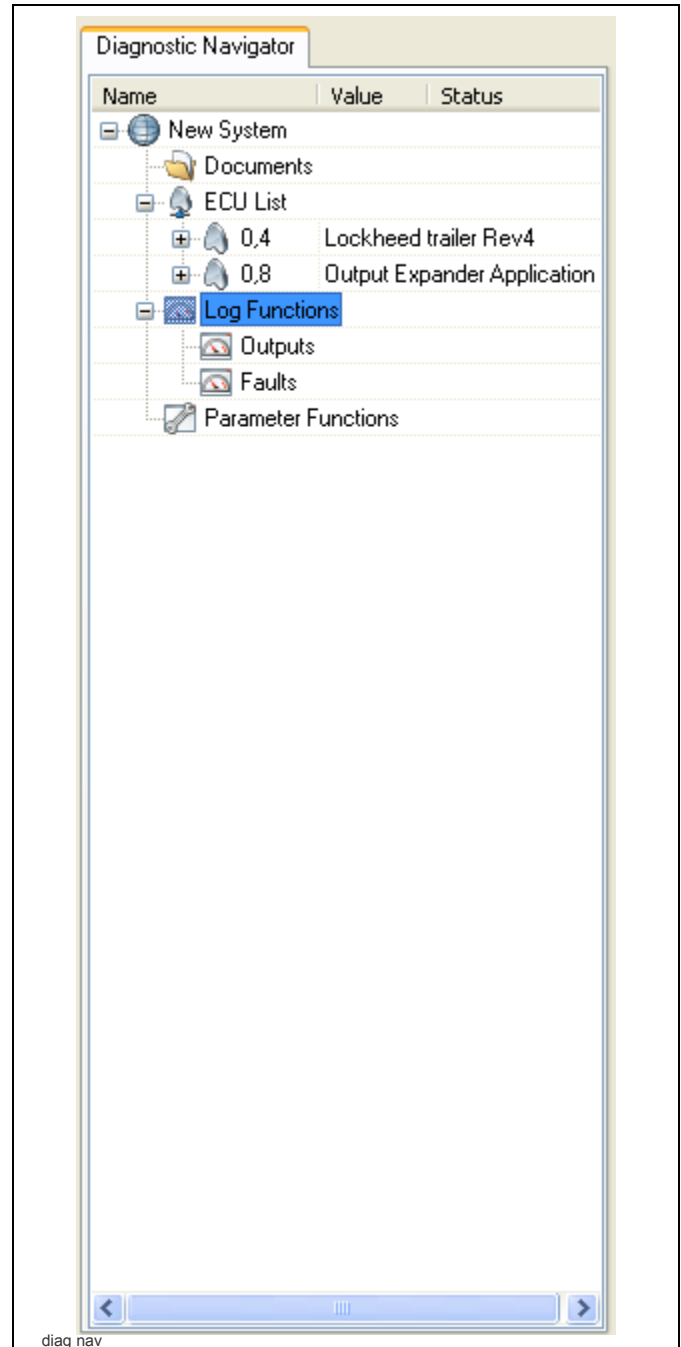


Figure 4-26: Diagnostic Navigator Screen

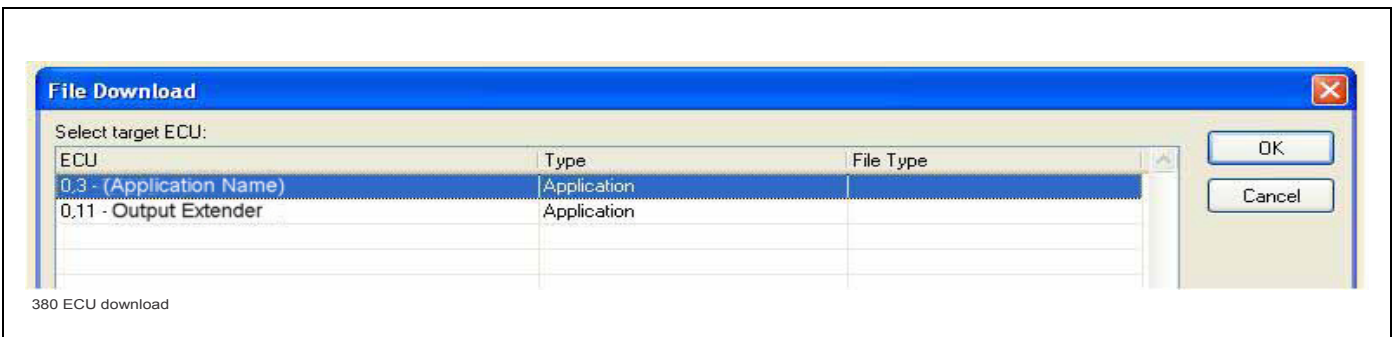


Figure 4-27: File Download Screen

Output Status Screen

The output status screen allows you to check the functions on the remote control (See Figure 4-28.)

NOTE

The front and rear sideshift functions are a combination of extend/retract and street/curb outrigger functions; therefore, multiple functions will be working in conjunction and will be reflected on your computer screen.

1. The left column shows the CAN messaging from the remote control keypads.
2. The two center columns show the output status. The top half of the columns are for the front functions of the remote and the bottom columns are for the rear functions of the remote. As each function is manipulated, the status will toggle between “ON” and “OFF”.
3. The right column indicated voltage status and should be between 11 and 14 volts (ex. 12644 x .001 = 12.64 volts).

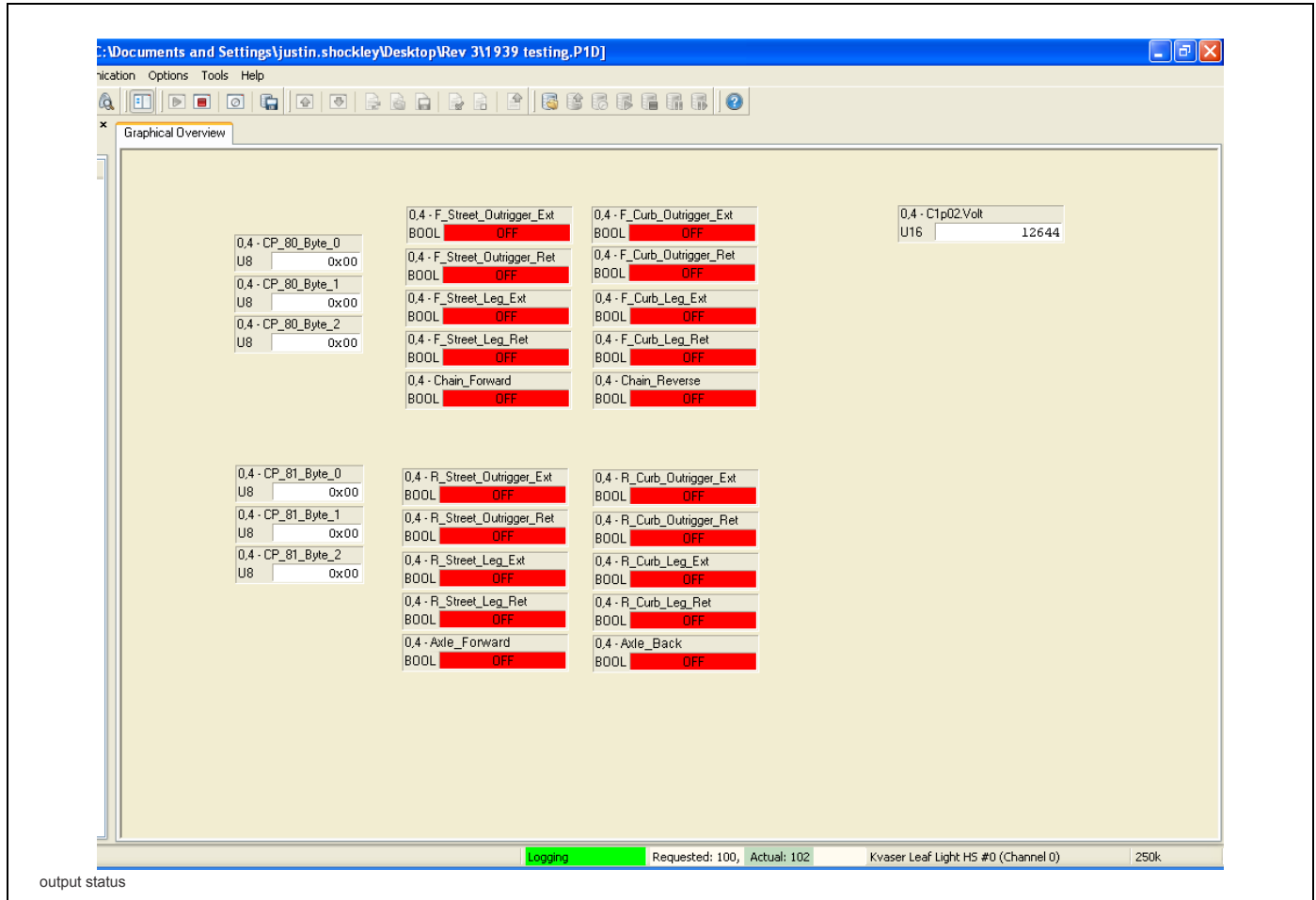


Figure 4-28: Output Status

Troubleshooting Guide

Troubleshooting should be performed by a trained and competent technician. Landoll Corporation is not responsible for equipment that is improperly maintained. Contact an authorized Landoll Service center for servicing.

Electrical

Most electrical system problems show up as a burned out light or fuse, or inoperative electrical component. Wiring, grounds, or components may be at fault. Locate the symptom in this section that best identifies your electrical problem. Check out each possible problem under that symptom. If the problem cannot be located, see an automotive electrical specialist. For maintenance procedures see **“Electrical System” on page 4-13.**

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|--|---|
| NO LIGHTS | Fuse blown | Replace fuse |
| | Connection at plug-in | Tighten connection |
| | Broken or corroded wires | Replace wire |
| | Ground wire loose | Clean and tighten ground |
| LIGHTS FLICKERING | Wires shorted or loose | Locate, insulate, replace, or tighten |
| | Grounding through fifth wheel | Locate broken ground wire (tractor or semitrailer) |
| LIGHTS DIM | Voltage difference between semitrailer and tractor | Match bulbs with tractor voltage |
| | Grounding through fifth wheel | Locate broken ground wire (tractor or semitrailer) |
| LIGHTS BRIGHT AND BURN OUT | Voltage difference between semitrailer and tractor | Match bulbs with tractor voltage |
| FUSE BLOW-OUT OR CIRCUIT BREAKER TRIPPING | Vibration | Locate source of vibration and repair |
| | Short circuit | Replace fuse and try all accessories. If fuse blows right away, locate short and repair |
| LAMP BULB BURN OUT | Vibration | Locate source of vibration and repair |
| | Short circuit | Replace fuse and try all accessories. If fuse blows right away, locate short and repair |
| | Loose connection | Check lamp sockets and ground connections |
| | Intermittent short | Locate short and repair |
| | Improper voltage | Check voltage regulator output |

Tires - Wheels - Suspension

Most tire, wheel, and suspension related problems are due to excessive loads, extreme conditions, and improper maintenance. Tire, wheel, and suspension problems can be easily detected and solved by checking the following guide. For maintenance procedures, refer to the following sections:

- “Hydraulic System” on page 5-7
- “Alignment” on page 4-16
- “Hub and Drum Maintenance” on page 4-25
- “Wheel Bearing Lubrication and Adjustment” on page 4-27
- “Tire Maintenance” on page 4-28

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|--|---------------------------------|--|
| VIBRATIONS WHILE DRIVING | Improper tire inflation | Inflate to proper pressure (See “Tire Inflation” on page 4-28.) |
| | Tires cupped or have flat spots | Replace tires. |
| | Wheels bent or loose | Replace or tighten. |
| | Tires incorrectly mounted | Remount (See “Mounting Tire and Wheel (Hub Type)” on page 4-30.) |
| | Mud in wheels | Clean wheels. |
| | Tire(s) out of balance | Balance tires. |
| | Brakes dragging | Locate cause and repair. |
| Object(s) stuck between duals | Remove object(s). | |
| RAPID TIRE WEAR/DETERIORATION: | | |
| CENTER TREAD WEAR | Over inflation | Deflate to correct inflation (See “Tire Inflation” on page 4-28.) |
| SHOULDER TREAD WEAR - BOTH SHOULDERS | Under inflation | Increase inflation to correct PSI. Check axle alignment (See “Tire Inflation” on page 4-28.) |
| | Overload | Loads are above rated tire capacity. DO NOT load above rated tire capacity. |
| SHOULDER TREAD WEAR - ONE SHOULDER | Axle damage | Straighten or replace axle (See “Axle Alignment” on page 4-18.) |
| | Axles not parallel | Check axle alignment. |
| OVERALL TREAD WEAR | Overloading | Check tire load rating. |
| | High speeds | Adjust speed according to road and load conditions. |
| | Incorrect dual matching | Properly match dual tires (See “Tire Matching” on page 4-28.) |
| TIRE FLAT SPOTS | Quick stops | Adjust braking practices. |
| | Grabbing brakes | Adjust brakes properly (See “Brake Adjustment” on page 4-21.) |
| | Worn or loose wheel bearings | Adjust or replace as needed (See “Hub and Drum Maintenance” on page 4-25.) |
| | Out of balance wheels and tire | Balance wheels and tires. Check ABS system function. |
| UNEVEN WEAR | Suspension bushings worn | Replace bushings (See “Hub and Drum Maintenance” on page 4-25.) |
| | Worn or loose wheel bearings | Adjust or replace as needed. |
| | Out of balance wheels and tires | Balance wheels and tires. |
| RIM FAILURE*: | | |
| CRACKING | Overinflated tires | Deflate tire to proper PSI. |
| | High speeds | Adjust speed according to road and load conditions. |
| | High speed cornering | Adjust cornering practices. |
| | Over loading | Check rim load rating. |
| *IN ALL INSTANCES OF RIM FAILURE, REPLACE THE RIM IMMEDIATELY! | | |

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|--|---|---|
| BENDING OR WARPING | Curb-hopping or potholes | Adjust turning practices and adjust speed accordingly with road conditions. |
| | Improper tightening sequence | Follow proper tightening sequence (See Figure 4-22.) |
| BROKEN STUDS* | Over tightening | Use correct torque when mounting (See Table 2-1) |
| *REPLACE BROKEN STUDS BEFORE USING THE SEMITRAILER! | | |
| SEMITRAILER TRACKING PROBLEMS: | | |
| TRACKS TO ONE SIDE | Axle alignment | Re-align axle (See “Axle Alignment” on page 4-18.) |
| TRACKS TO EITHER SIDE | Broken or bent springs or equalizers | Replace defective parts. |
| | Axles not parallel | Re-align axles |
| AIR RIDE HEIGHT PROBLEMS: | | |
| TOO HIGH | Axle to control valve linkage | Readjust linkage. |
| | Height Control Valve internal leak | Repair or replace valve. |
| TOO LOW | Axle to control valve linkage | Readjust linkage. |
| | Height Control Valve filter plugged | Clean or replace valve. |
| | Pressure Protection Valve filter plugged | Clean or replace valve. |
| | System air pressure low (65 PSI minimum required) | Troubleshoot air supply. |
| UNEVEN FROM SIDE TO SIDE | Linkage adjustment | Readjust linkage |
| | Exhaust port plugged | Clean or replace valve(s). |
| | Height control valve internal leak | Repair or replace valve. |
| | Supply line to one height control valve pinched, restricted, or plugged | Repair or replace line. |

Brakes

For maintenance procedures, see “**Brake System Maintenance**” on page 4-19.

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|--------------------------------------|---|--|
| NO BRAKES OR BRAKES ARE INTERMITTENT | Brake air system improperly connected | Reconnect hand valves properly. |
| | Relay/Emergency valve plugged | Clean valve. |
| | Defective tractor protection valve | Repair or replace. |
| | Restricted tubing or hose line | Locate and eliminate restriction. |
| | Broken line | Locate break and repair. |
| | Tractor air system failure | Troubleshoot tractor air system and repair. Check ABS system function. |
| SINGLE BRAKE DRAGGING OR LOCKED | Broken internal brake component | Locate and replace broken part (See “ Brake Assembly Maintenance ” on page 4-21.) |
| | Flat spot on cam roller or cam shaft | Replace and lubricate. |
| | Improper adjustment | Adjust slack adjusters (See “ Automatic Slack Adjuster ” on page 4-23.) |
| | Spider bushing or cam bracket bushing binding | Lubricate or replace bushing. |
| | Improper lubrication | Lubricate per Figure 4-1 . |
| | Worn brake shoe bushing | Replace bushing. |
| | Brake drum distortion | Replace drum. |
| | Broken brake chamber spring | Replace spring. |
| | Brake chamber pushrod binding | Re-align brake chamber bracket. |
| | Air brake line loose or broken | Tighten or repair. |
| UNEVEN BRAKES | See “SINGLE BRAKE DRAGGING OR LOCKED” | |
| | Restriction in hose | Locate restriction and remove |
| | Worn brake linings | Reline brakes. |
| | Grease on linings | Reline brakes. |
| | Broken slack adjuster | Replace slack adjuster (See “ Replacing Slack Adjuster ” on page 4-23.) |
| | Leaking brake chamber diaphragm | Replace diaphragm. |
| BRAKES APPLY TOO SLOWLY | Brakes need adjusting or lubrication | Adjust or lubricate as needed. |
| | Low air pressure in brake system (below 105 PSI) | Check tractor air system. |
| | Restricted tubing or hose | Locate restriction and remove. |
| | Defective relay valve | Clean or replace. |
| | Call Factory or see qualified Trailer/Brake Technician | |
| BRAKES RELEASE TOO SLOWLY | Brakes need adjusting or lubrication | Adjust or lubricate as needed. |
| | Brake rigging binding | Align brakes or replace bent parts. |
| | Exhaust port of relay valve restricted or plugged | Clean valve. |
| | Tractor pressure too low | Adjust to provide 105 psi min. |

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|--|---|
| ALL BRAKES DO NOT RELEASE | Air system improperly connected to tractor | Tighten or adjust connections. |
| | Brake valve on tractor is applied | Release brake |
| | Relay emergency valve in emergency position | Check line pressure and check valve position |
| | Restricted tubing or line | Locate restriction and remove |
| | Defective tractor protection valve | Troubleshoot tractor air system. |
| | Parking brakes locked | Troubleshoot air system |
| | Moisture in air system | Check air system |
| | Tractor pressure too low | Adjust to provide 105 psi min. |
| INSUFFICIENT BRAKES | Brakes need adjusting | Adjust brakes (See “Brake Adjustment” on page 4-21.) |
| | Brakes need lubricating | Lubricate brakes |
| | Brakes need relining | Reline brakes |
| | Low air pressure | Troubleshoot air system. |
| | Defective relay emergency valve | Repair or replace. |
| | Brakes overheated | Stop and allow brakes to cool, locate cause of overheating. |
| BRAKES GRABBING | Grease on brake linings | Reline brakes |
| | Brake rigging binding | Align brakes or replace bent parts. |
| | Defective brake valve on tractor | Repair or replace valve. |
| | Defective relay emergency valve | Repair or replace valve. |
| EXCESSIVE LEAKAGE WITH BRAKES RELEASED | Relay emergency valve leaking | Repair or replace valve |
| | Leaking tubing or hose | Replace defective part. |
| EXCESSIVE LEAKAGE WITH BRAKES APPLIED | Relay emergency valve leaking | Repair or replace valve. |
| | Leaking brake chamber diaphragm | Replace diaphragm. |
| | Call Factory or see qualified Trailer/Brake Technician | |
| | Leaking tubing or hose | Replace defective part. |
| EXCESSIVE LEAKAGE WITH EMERGENCY SYSTEM ONLY APPLIED - NO LEAKAGE WITH NORMAL BRAKING | Defective relay emergency valve | Repair or replace valve. |
| EXCESSIVE WATER PRESENT IN BRAKE SYSTEM | Reservoir not drained often enough | Drain reservoir daily. |
| EXCESSIVE OIL PRESENT IN BRAKE SYSTEM | Compressor on tractor passing excessive oil | Repair compressor. |
| BRAKE WILL NOT APPLY PROPERLY | Flat spot on cam roller or camshaft | Replace and lubricate. |
| BRAKES WILL NOT APPLY WHEN EMERGENCY LINE IS DISCONNECTED | Initial air pressure too low | Allow air system to build up to minimum 90 PSI and stabilize. |
| | Defective relay valve | Repair or replace valve. |
| | Air line leak | Locate leak and repair. |
| | Brake chamber leak | Locate leak and repair or replace. |
| ABS WARNING LIGHT STAYS ON | Refer to Rockwell WABCO ABS maintenance manual supplied with semitrailer, for system function and use of blink code diagnostics. | |

Brake Drums

For maintenance procedures, refer the following sections:

- “Suspension Maintenance” on page 4-13
- “Alignment” on page 4-16
- “Brake System Maintenance” on page 4-19
- “Hub and Drum Maintenance” on page 4-25
- “Wheel Bearing Lubrication and Adjustment” on page 4-27

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|------------------------------------|---------------------------------|---|
| EXCESSIVE LOSS OF BRAKES OR FADING | Overheated brake drums | Check for defective or misadjusted brake linings, distorted or over-machined drums. Also check for operating conditions or loads that create severe or excessive brake applications. |
| BRAKES PULL TO EITHER SIDE | Drums of different diameters | Replace with drums of same diameter. |
| | Foreign matter in drums | Clean drums out. |
| ROUGH OR NOISY BRAKING ACTION | Defective drums | Pull drums and inspect for any of the following; Heat spotted drums, grease spotting, blue drums, scored drums, excessive wear at rivet holes or edges, polished drums, out of round drums, unbalanced drums, worn/damaged brake components, foreign matter in drums. Correct situation or replace defective part(s). |
| VIBRATION IN RIDE | Defective drums or out-of-round | Replace drums. |
| | Out-of-balance drums | Balance drums. |

Hydraulic System

Most hydraulic system failures follow the same pattern: a gradual or sudden loss of pressure or flow with a resulting loss of cylinder or motor power. Any one of the system's components may be at fault. By following step-by-step procedures, the trouble can be located in a short time.

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---------------------------------------|---|--|
| SEMITRAILER LOCKED IN TILTED POSITION | Velocity fuse activated | Raise the trailer slightly (to reset the velocity fuse), then lower the trailer slowly. |
| SYSTEM INOPERATIVE | Not enough oil in system | Fill, check for leaks. |
| | Wrong oil in system | Change oil, see specifications (See Table 4-1). |
| | Filter dirty or clogged | Drain oil and replace filter. |
| | Hydraulic lines dirty or collapsed | Clean or replace as necessary. |
| | Air leaks in pump suction line | Repair or replace as necessary. |
| | Worn or dirty pump | Clean, repair or replace. Check for contaminated oil. Drain and flush. |
| | Badly worn components | Examine for internal leakage. Replace faulty components. Check for cause of wear. |
| | Leakage | Check all components, and relief valve for proper settings. |
| | Excessive load | Check unit specifications for load limit (See "Standard Specifications" on page 2-1). |
| | Slipping or broken pump drive | Repair or replace couplings. Check for alignment |
| SYSTEM OPERATES ERRATICALLY | Air in the system | Check suction side of system for leaks. Repair leaks. |
| | Cold oil | Allow ample warm-up time. Use proper weight oil for operating temperature. |
| | Dirty or damaged components | Clean or repair as needed. |
| | Restriction in filters or lines | Clean and/or replace filter or lines. |
| | Not enough oil in system | Fill and check for leaks. |
| SYSTEM OPERATES SLOWLY | Oil viscosity too high, or "cold oil" | Allow oil to warm up before operating. |
| | Low pump drive speed | Increase engine speed (check pump owners manual for specifications). |
| | Low oil level | Check reservoir and add oil as necessary. |
| | Air in system | Check suction side for leaks. Repair leaks. |
| | Badly worn pump, valves, cylinders, etc. | Repair or replace faulty component(s) as necessary. |
| | Restrictions in lines or filter | Clean and/or replace filter or lines. |
| | Improper adjustments | Check orifices, relief valves, etc. Adjust as necessary. |
| | Oil leaks | Tighten fittings. Replace seals, gaskets and damaged lines. |
| SYSTEM OPERATES TOO FAST | Wrong size or incorrectly adjusted restrictor | Replace or adjust as necessary. |
| | Engine running too fast | Reduce engine speed |

TROUBLESHOOTING GUIDE

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---|---|--|
| OVER HEATING OF OIL IN SYSTEM | Oil passing through relief valve for excessive time | Return control valve to neutral when not in use |
| | Incorrect, low, dirty oil | Use recommended oil (See Table 4-1). Fill reservoir with clean oil. Replace filter. |
| | Engine running too fast | Reduce engine speed. |
| | Excessive component internal leakage | Repair or replace component as necessary. |
| | Restriction in filters or lines | Clean and/or replace filter or lines. |
| | Insufficient heat radiation | Clean dirt and mud from reservoir and components. |
| | Malfunctioning component | Repair or replace |
| | Excess oil going to dock level circuit | Adjust flow divider for 2.5 to 3.1 GPM flow. |
| FOAMING OF OIL | Incorrect, low, or dirty oil | Replace, clean or add oil as needed. |
| | Water in oil | Replace oil |
| | Air leaks | Check suction line and component seals for suction leaks. Replace defective parts. |
| NOISY PUMP | Low, incorrect, foamy oil | Replace, clean, or add oil as needed. |
| | Suction line plugged | Clean out obstruction or replace line. Flush system, replace filter. |
| | Pump damaged | Repair or place |
| LEAKY PUMP | Damaged or worn shaft seal | Replace seal and/or shaft and check for misalignment. |
| | Loose or broken parts | Tighten or replace |
| CYLINDERS MOVE WITH CONTROL VALVE IN NEUTRAL POSITION | Leaking cylinder seals or fittings | Replace worn seals or fittings. |
| | Control valve not centering when released | Check linkage for binding and repair |
| | Valve damaged | Repair or replace. |
| CONTROL VALVE LEAKS | Seals damaged or worn | Replace. |
| CYLINDER LEAKS | Seals worn or damaged | Replace. |
| | Rod damaged | Replace. |
| | Barrel damaged | Replace. |
| CYLINDERS DO NOT FUNCTION, OR CREEP WITH PTO DISENGAGED | Leaking fittings or cylinder seals | Tighten loose fittings. Replace worn seals or fittings. |
| | Piloted check valve or O-ring leak | Replace defective component. |

Hydraulic Power Supply Engine Package

To troubleshoot the engine in the hydraulic engine package, please refer to the owner's manual that was provided with the engine package.

Remote Control

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|----------------------------------|---|--------------------------------|
| NO FUNCTIONS WORK | Check that transmitter power is on. | Self-explanatory |
| | Check that transmitter power is on | Self-explanatory |
| | Check system wiring for power into the system. | Tighten loose connections |
| | Check LED status display for system status. | Self-explanatory |
| | Check for proper grounding of system's electrical circuit. | Self-explanatory |
| | Check system's hydraulic system. | Clean or replace as necessary. |
| CERTAIN FUNCTIONS DO NOT WORK | Check the wiring connection from the system to the valve coil for the output function that does not work. | Tighten loose connections |
| | Check LED status display for possible fault or error indication. | Self-explanatory |
| | Check hydraulic system | Clean or replace as necessary. |
| | Check electrical system | Tighten loose connections |
| FUNCTIONS OPERATE INTERMITTENTLY | Loose connector at the valve coil | Tighten loose connections |
| | Check LED status display for system status | Self-explanatory |
| | Check receiver antenna for any damage and proper connection. | Service or replace. |
| | Check hydraulic system. | Clean or replace as necessary. |

Gearbox

| PROBLEM | PROBABLE CAUSE | SOLUTION |
|---------------------|-------------------------|--|
| CHAIN SLIPS ON GEAR | Incorrect chain tension | Tighten chain. Do not torque 7/8-9 threads more than 90 ft.-lbs. when pulling gearbox forward because no more than 6,000 pounds shall be on each bolt. |
| | Gearbox gear worn out | Replace gearbox gear |
| | Chain worn out | Replace drive chain |

Notes:



Intertek

Equipment from Landoll Corporation is built to exacting standards ensured by ISO 9001:2008 registration at all Landoll manufacturing facilities.

Model 380
Level Load Roller Trailer
Operator's Manual

Re-Order Part Number F-618-0911

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