



**MODEL 370 - AES  
SEMITRAILER  
OWNER'S MANUAL**

**PURCHASED FROM:** \_\_\_\_\_ **DATE** \_\_\_ / \_\_\_ / \_\_\_

**ADDRESS:** \_\_\_\_\_

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**PHONE NO.:** \_\_\_\_\_ **SERIAL NO.:** \_\_\_\_\_

# WARRANTY

## MANUFACTURER'S GUARANTEE POLICY

### LANDOLL CORPORATION WARRANTY

LANDOLL warrants each new and unused LANDOLL machine, when properly assembled, adjusted, and operated, to be free of defects in material and workmanship, in normal use and when properly serviced, for a period of twelve (12) months after date of delivery by the Dealer to the original retail purchaser. LANDOLL shall repair or replace, at its option, freight on board (f.o.b.) at its factory or designated DEALER location, any part or parts of such new and unused machine which shall have been reported in writing to LANDOLL within thirty (30) days from date of failure thereof and which LANDOLL inspection shall disclose to have been defective. Defective parts must be returned to the LANDOLL factory, freight prepaid. LANDOLL will not be liable for labor, transportation, or any other charges resulting from replacement of a defective part. This warranty is void if any part not supplied by LANDOLL is used in assembly or repair, or if the machine has been altered, abused, or neglected. LANDOLL repair parts are warranted for ninety (90) days from date of replacement or for the unexpired warranty period of the applicable LANDOLL machine, whichever period is longer. LANDOLL makes no warranty, whatsoever, as to purchased component parts and other trade accessories, except to the extent that such items are warranted by the manufacturer thereof. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED, IMPLIED, OR STATUTORY (INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE), AND LANDOLL SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ON ACCOUNT OF ANY LANDOLL PRODUCT.

NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY, VERBALLY OR IN WRITING, OR GRANT ANY OTHER WARRANTY.

LANDOLL CORPORATION, WHOSE POLICY IS ONE OF CONTINUOUS IMPROVEMENT, RESERVES THE RIGHT TO MAKE CHANGES WITHOUT OBLIGATION TO MODIFY PREVIOUSLY PRODUCED EQUIPMENT.

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# SAFETY PRECAUTIONS

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THIS IS THE INTERNATIONAL SAFETY ALERT SYMBOL. IT ALERTS THE OPERATOR TO IMPORTANT SAFETY MESSAGES ON THE MACHINE AND IN THIS MANUAL. CAREFULLY READ AND STUDY THESE LABELS AND MESSAGES BEFORE MACHINE ASSEMBLY AND OPERATION. THERE ARE THREE TYPES OF SAFETY ALERT MESSAGES:

**DANGER**

A LIFE THREATENING SITUATION EXISTS. DEATH CAN OCCUR if safety measures or instructions on this label are not properly followed.

**WARNING**

SERIOUS INJURY OR DEATH CAN OCCUR if safety measures or instructions on this label are not properly followed.

**CAUTION**

SERIOUS EQUIPMENT OR OTHER PROPERTY DAMAGE CAN OCCUR if instructions on this label are not properly followed.



# **REPORTING SAFETY DEFECTS**

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If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Landoll Manufacturing.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Landoll Manufacturing.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in Washington, D.C. area) or write to: NHTSA, U.S. Department of Transportation, Washington, D.C. 20590. You can also obtain other information about motor vehicle safety from the Hotline.

In the event of a defect or problem with your LANDOLL equipment, please notify LANDOLL CORPORATION:

**LANDOLL CORPORATION  
SALES AND SERVICE  
1900 NORTH STREET  
MARYSVILLE, KANSAS 66508**

**OR PHONE:  
(785)562-5381  
1-800-HAULLOLL  
(1-800-428- 5655)  
FAX NO.: (785) 562-4893**



# INTRODUCTION

1

This manual provides operating, servicing, and maintenance instructions, with detailed parts lists for Model 370-AES Semitrailer, manufactured by Landoll Corporation, Marysville, Kansas 66508.

- SECTION 1** gives basic instructions on the use of this manual.
- SECTION 2** gives specifications for the semitrailer, 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.
- SECTION 3** gives instructions for the proper operation of the equipment.
- SECTION 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:  
(785) 562-4893

- SECTION 5** is a troubleshooting guide to aid in diagnosing and solving problems with the semitrailer.
- SECTION 6** is an illustrated parts list of the various assemblies, subassemblies, and systems. Refer to this section when ordering Landoll replacement parts. Order parts from your Landoll dealer

**WARRANTY** The Warranty Registration Card is located inside the front cover of the manual. It is postage paid if mailed within the United States. Fill it out and mail it within 15 days of purchase. The Warranty is printed inside the front cover.

**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  
1700 MAY STREET  
MARYSVILLE, KANSAS 66508  
ATTENTION: PUBLISHING - DEPT. 73





# STANDARD SPECIFICATIONS

CAPACITY\* (FRAME DESIGN): . . . . . 153,000 LB. DISTRIBUTED, 40,000 CONCENTRATED IN 10'

OVERALL LENGTH: . . . . . 56'

OVERALL WIDTH . . . . . 102"

WEIGHT . . . . . 24,800 LBS.

GOOSENECK:  
LENGTH: . . . . . 11'-0"  
DROP . . . . . 18-1/2"

DECK:  
LENGTH . . . . . 45'-0"  
HEIGHT . . . . . 41-1/2"

FIFTH WHEEL:  
HEIGHT: . . . . . 49"  
KINGPIN: . . . . . 2" Dia.

TURNING CLEARANCE:  
FROM KINGPIN . . . . . 74"  
FORWARD SWING CLEARANCE FROM KINGPIN . . . . . 57"

## SPECIFIC BOLT TORQUES

WALKING-BEAM SUSPENSION: . . . . . CLEAN-OILED  
1" SCREW, AXLE CLAMP . . . . . 480 FT.-LBS.  
3/4" SCREW, SUSP., TUBE CLAMP . . . . . 280 FT.-LBS.  
1-1/8" SCREW, TIE ROD PIVOT . . . . . 600 FT.-LBS.  
7/16" SCREW, SPRING HANGER . . . . . 45 FT.-LBS.  
5/8" SCREW, ADJ. ROD CLAMP . . . . . 170 FT.-LBS.  
7/8" SCREW, AXLE CLAMP . . . . . 300 FT.-LBS.








WHEEL FASTENERS:  
INNER CAP NUTS . . . . . 450-500 FT.-LBS.  
OUTER CAP NUTS . . . . . 500-550 FT.-LBS.

TIRES . . . . . 275/70R22.5

FRAME JACK SUPPORT CAPACITY . . . . . 20,000 LBS/8 FT.

**GENERAL TORQUE SPECIFICATIONS (REVISED 9-87)**  
**USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES**  
**ARE NOT GIVEN.**

**NOTE:** These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited, or moly-disulphide greases, or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

SAE Grade No.		2				5				8*			
Bolt head identification marks as per grade. <i>NOTE: Manufacturing Marks will vary.</i>						  				  			
		Torque				Torque				Torque			
Bolt Size		Foot Pounds		Newton-Meters		Foot Pounds		Newton-Meters		Foot Pounds		Newton-Meters	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	7	9	9	11	12	15	12	15	16	20
5/16	7.94	10	12	14	16	17	20	23	28	24	29	32	39
3/8	9.53	20	23	27	31	35	42	48	57	45	54	61	73
7/16	11.11	30	35	41	47	54	64	73	87	70	84	95	114
1/2	12.70	45	52	61	70	80	96	108	130	110	132	149	179
9/16	14.29	65	75	88	102	110	132	149	179	160	192	217	260
5/8	15.88	95	105	129	142	150	180	203	204	220	264	298	358
3/4	19.05	150	185	203	250	270	324	366	439	380	456	516	618
7/8	22.23	160	200	217	271	400	480	542	651	600	720	814	976
1	25.40	250	300	339	406	580	696	786	944	900	1080	1220	1464
1-1/8	25.58					800	880	1085	1193	1280	1440	1736	1953
1-1/4	31.75					1120	1240	1519	1681	1820	2000	2468	2712
1-3/8	34.93					1460	1680	1980	2278	2380	2720	3227	3688
1-1/2	38.10					1940	2200	2631	2983	3160	3560	4285	4827

- NOTES:** 1. When hardware is plated, reduce torque values 25%.  
2. When locknuts are used, increase torque value 25%.  
3. When plated hardware is used w/locknuts, use torque value chart.  
4. **BOLT TORQUES SPECIFIED ARE FOR ZINC PLATED NUTS & BOLTS ONLY.** If other types of nut/bolt combinations are required, contact the OEM office for assistance.  
\* Thick nuts must be used with Grade 8 bolts.

Table 2-1 Standard Torque Specifications

## 3-1 GENERAL

This section supplies sufficient information for operation of the semitrailer. It describes and locates controls, and gives general operation procedures. It includes necessary instructions for operation under unusual conditions.



## WARNING

**DO NOT OPERATE THE SEMITRAILER WITH ANY KNOWN FAULT THAT MIGHT ENDANGER THE OCCUPANTS, NEARBY WORKERS, OTHER TRAFFIC, THE LOAD, OR THE EQUIPMENT.**

## 3-2 PRE-COUPLING OF SEMITRAILER AND TRACTOR

**3-2.1** 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.

**3-2.2** Check the semitrailer kingpin plate height. The kingpin plate should be the same height, to slightly lower, than the latch area of the fifth wheel plate of the towing vehicle. If the kingpin plate height needs to be adjusted, manually raise or lower the kingpin plate by cranking the landing gear (parking stands) up or down until the proper height has been obtained. The landing gear gearing (low/high) may be switched by pushing the crank handle in or pulling it out before cranking.

**3-2.3** Connect the service and emergency air hoses of the towing vehicle to their respective gladhand on the front of the semitrailer. The gladhand connectors are fitted with dummy couplings to keep dirt and moisture out of the air lines. Disconnect the dummy couplings by turning them backwards one-quarter turn. They are attached to short chains to prevent loss. The towing vehicle's air hose couplings are then attached and locked to the appropriate gladhands; red emergency line to the gladhand with the "EMERGENCY" tag, and the blue service line to the gladhand with the "SERVICE" tag (see Fig. 3-1). Chock the trailer wheels before activating the semitrailer air supply valve in the towing vehicle. Set the trailer brakes.

**3-2.4** 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 set promptly.
- d. Re-connect the emergency air line to the trailer and activate the trailer air supply valve. The trailer brakes should set.

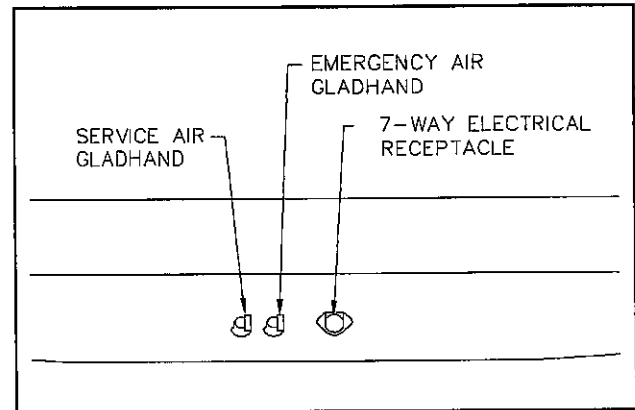


Fig. 3-1 Service Hookups (Front View)

### 3-3 COUPLING OF THE TRACTOR TO THE SEMITRAILER

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#### 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.**

**3-3.1** Verify the trailer wheels are chocked and brakes function properly.

**3-3.2** Make sure the towing vehicle's fifth wheel coupler is open.

**3-3.3** Slowly back the towing vehicle so the fifth wheel contacts the front of the kingpin plate on the

semitrailer and slips under it. Continue backing until the fifth wheel coupler locks onto the semitrailer kingpin.

**3-3.4** Try to pull the tractor forward a few inches to verify the vehicle coupling is secure. If the tractor disconnects from the trailer, locate the source of the coupling failure. Repair before continuing and repeat Steps 3-3.3 and 3-3.4.



#### CAUTION

**PUSHING THE TRAILER BACKWARDS CAN DAMAGE LANDING GEAR.**

**3-3.5** Check that the towing vehicle couples securely to the semitrailer before setting towing vehicle and trailer parking brakes.

**NOTE: Keep brakes engaged for remainder of Hookup, Check-out Procedures, and for parking.**

### 3-4 CONNECTING TRACTOR SERVICES TO THE SEMITRAILER

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**3-4.1** Connect the towing vehicle 7-way electrical plug to the electrical receptacle on the front of the semitrailer (see Fig. 3-1).

**NOTE:**The key on the plug and the keyway in the socket must be properly aligned before inserting the plug into the trailer socket.

### 3-5 TRACTOR AND SEMITRAILER HOOK-UP AND CHECK-OUT

---

**3-5.1** Raise landing gear.

**3-5.2** Check the operation of all lights on the semitrailer for proper response to switch positions and signals (stop, right turn, left turn and clearance).

**3-5.3** Check tire inflation, adjust as needed to maintain pressure listed on each tire.

**3-5.4** Check tractor/trailer rig for air leaks. If air leakage is found, repair the defect before transporting.

**3-5.5** Check the oil in each hub for proper level and freedom from contamination. If hubs contain water, dirt, or other foreign matter, clean them before transporting.

**3-5.6** Check tractor air pressure. Pressure must not fall below the 85 to 95 psi range, after activating the brakes twice. Set emergency brake and try pulling forward. The trailer wheels must not rotate. If trailer brakes

do not apply, do not transport until defect, or defects, are repaired.



#### WARNING

**FAILURE TO PROPERLY SET AND CHECK PARKING BRAKE, AND CHOCK WHEELS WHEN PARKING AND DURING STORAGE, COULD ALLOW MOVEMENT OF THE TRACTOR/TRAILER RIG RESULTING IN SERIOUS PERSONAL INJURY, DEATH, OR DAMAGE TO PROPERTY IN ITS PATH.**

**3-5.7** Set parking brake and carefully remove all wheel chocks. If brakes are not properly set, the tractor/trailer may roll when removing wheel chocks.

### 3-6 TOWING THE SEMITRAILER

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**3-6.1** Driving the towing vehicle with the semitrailer coupled behind requires constant attention to the overall length of the combination. Turning, passing, acceleration, braking, stopping, and back-up require special attention to the "hinged-in-the-middle" configuration of the semitrailer. When executing steep grades or turning tight curves, the semitrailer must not be allowed to push the towing vehicle, or jackknifing the semitrailer with the towing vehicle may result. Application of the semitrailer brakes to keep the trailer in tow will help prevent this pushing. Braking should begin before descending a hill or attempting a curve, to assure control.

**3-6.2** Make a moving test of the semitrailer brakes at low, and medium speeds *before* traveling at highway speed.

**3-6.3** Monitor the air pressure gauge on the dash of the towing vehicle. Pressure should not fall below the 85 to 95 psi range at any time.

**3-6.4** 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.

**3-6.5** To stop, use a gradual and smooth application of brakes. If grabbing occurs, apply less pressure. Grabbing brakes are not efficient.



## DANGER

**ALWAYS CHECK BEHIND AND UNDER THE TRACTOR 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.**

**3-6.6** Backing should be done with care. Tail overhang, trailer length, and allowable space must be taken into consideration.

### 3-7 PARKING THE SEMITRAILER

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**3-7.1** Position tractor/trailer rig on a level, solid surface.

**3-7.2** Set the *PARKING BRAKE*, *not the trailer hand brake*, and check for proper brake holding.

**3-7.3** Chock wheels.

**3-7.4** Check for any air leaks in lines, relay valve, brake air chamber, or any other air system component.

### 3-8 UNCOUPLING TRACTOR FROM SEMITRAILER

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**3-8.1** Park the semitrailer according to instructions in Paragraph 3-7.

**3-8.2** Lower the landing gear to the ground using the manual crank on the side of the semitrailer.

**3-8.3** Disconnect emergency and service air lines and attach them to the tractor gladhand holders.

**3-8.4** Disconnect the 7-way cable from the trailer and store with the tractor.

**3-8.5** Lower the landing gear to the ground, turn handle five to ten rotations, pull the tractor fifth wheel plate latch release lever.

**3-8.6** Attempt to pull the tractor forward. If the tractor uncouples, verify that all service lines are disconnected and trailer wheels are chocked. If tractor does not disconnect, repeat Steps 3-8.5 and 3-8.6.

**3-8.7** Pull the tractor away from the trailer.

## 3-9 TRAILER JACK AND LOAD SUPPORTS

3-9.1 Each jack and load support is limited to 20,000 lbs. per 8 foot of trailer length. The kingpin is to be supported at all times during a jacking procedure and when the trailer is supported by the load supports.

3-9.2 Welding to the main support members.

- a. Welds to the main support members are to be limited.
- b. The weld bead shall end no less than 1/2" from the edge of the structural members or the end of the weld joint.
- c. Contact Landoll Corporation if excess welding to the structural members is required.

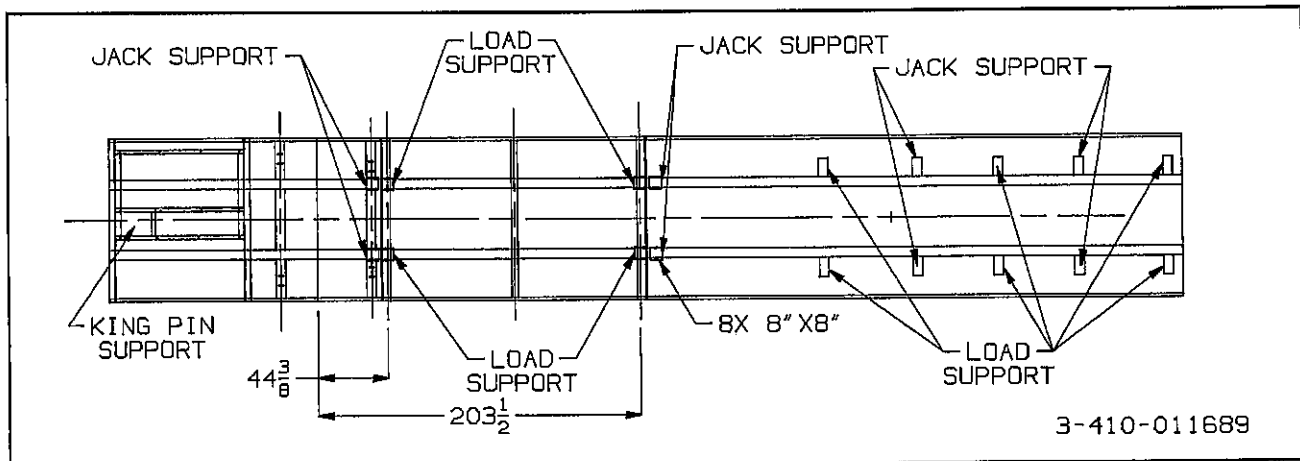


Fig. 3-2 Trailer Jack and Load Supports

## 3-10 COLD WEATHER OPERATION

3-10.1 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 tractor/trailer operator must always be alert for indicators of cold weather malfunctions.

3-10.2 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.

3-10.3 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.

3-10.4 Check tire inflation. Tire inflation decreases when the temperature decreases.

3-10.5 Periodically check drain holes in the bottom of the relay valve and storage compartments. They must be open at all times to avoid moisture entrapment.

## 3-11 HOT WEATHER OPERATION

3-11.1 Hot weather operation can cause expansion of parts, resulting in tightening of bearings, fasteners, and moving parts. Failure of gaskets or seals can occur.

3-11.2 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.

3-11.3 Check tire pressure early in the day before beginning operations while the tire is cool. Put all valve stem caps back on after checking.

3-11.4 If the area is extremely humid, protect electrical terminals with ignition insulation spray. Coat paint and bare metal surfaces with an appropriate protective sealer.

3-11.5 The use of a filter-lubricator in the towing vehicle's air delivery system is recommended.

## 4-1 GENERAL

This section contains instructions necessary for proper maintenance of the semitrailer. The 370 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.

## 4-2 MAINTENANCE SCHEDULE.

Semitrailer maintenance includes periodic inspection and lubrication. Table 4-3, **Maintenance Schedule**, lists the recommended maintenance and lubrication tasks by time interval and by accumulated mileage (use whichever occurs first).

### 4-2.1 Inspection



### 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.**

Inspect the towing vehicle, 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 semitrailer.

**4-2.2 Lubrication.** Table 4-2 details lubrication points and intervals, method of application, and lubricant required, and illustrates the location of each part to be lubricated. During inspections of the semitrailer, 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 THE EYES, THE SKIN, AND THE RESPIRATORY TRACT. AVOID SKIN AND EYE CONTACT. GOOD GENERAL VENTILATION IS NORMALLY ADEQUATE. KEEP AWAY FROM OPEN FLAMES OR OTHER COMBUSTIBLE ITEMS.**

## 4-3 MAINTENANCE PROCEDURES.

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**4-3.1 Repair Parts.** Repair parts are illustrated and listed in Section 6 Illustrated Parts List. Replacement of parts due to wear is determined by examination and measurement in the Maintenance Procedures of this section.

**4-3.2 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.

**4-3.3 Standard Torque Values.** Table 2-1 lists torque values for standard hardware and is 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. Table 2-1 illustrates the markings on the heads of steel bolts and screws that indicate their ASTM and SAE grades.

### 4-3.4 Cleaning

a. Wash semitrailer to remove all accumulated dirt and grime.

b. 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.

c. Inspect semitrailer for cause of any reported troubles.

d. Scrape, sand, prime, and repaint areas where finish is missing or where there is evidence of corrosion.

e. Replace any missing or illegible decals. Replace any missing or damaged reflective tape. See page 6-13 for a list of required decals and reflective tape.

f. Use the Troubleshooting Guide to check for "SYMPTOMS" and "PROBLEMS" of any semitrailer system not functioning correctly. Administer "REMEDY" according to the right-hand column of the Troubleshooting guide.

g. 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.

h. Inspect seals, seal wiping surfaces, any bearing caps, and bearing cones for wear, pitting, chipping, or other damage.

## 4-4 FRAME AND DECKS

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The trailer should be thoroughly checked daily for cracks or material fatigue. Cracks will normally show best under loaded conditions. If any cracks or breaks are

found, return the trailer immediately to the Landoll factory for repair. Any defective parts must be replaced immediately.

## 4-5 ELECTRICAL SYSTEM

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**4-5.1** 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 Figure 4-1 for a wiring diagram.

**4-5.2** 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.

**4-5.3** Corroded terminals must have the corrosion removed, source of corrosion neutralized and the terminals resealed, protected and insulated.

**4-5.4** 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.

**4-5.5** Lights with a repeated lamp burn-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.



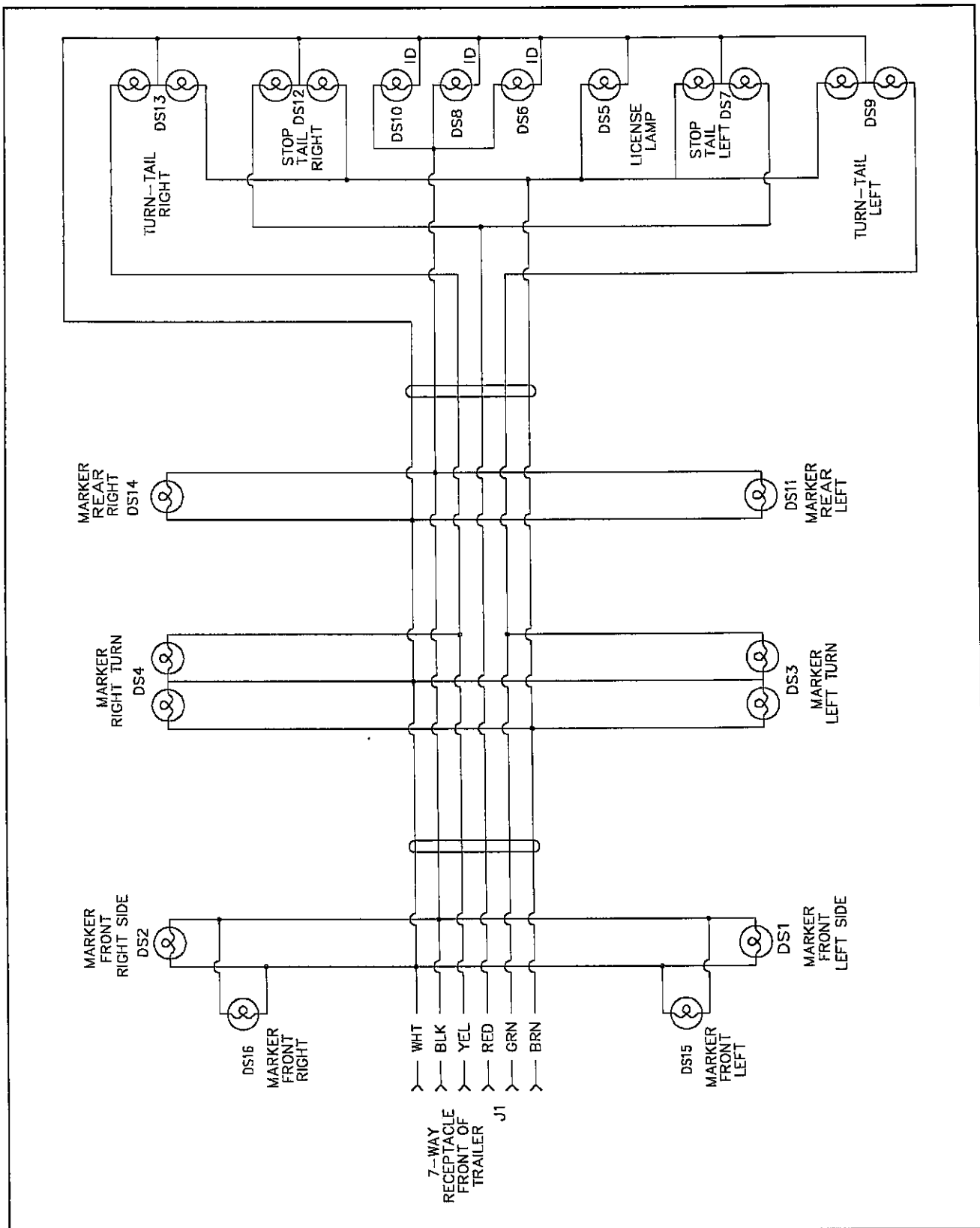


Figure 4-1 Electrical Schematic

<b>WIRING PARTS LIST</b>			
<b>REF. DES.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>FUNCTION</b>
DS1	10205Y	REFLECTOR LAMP, YELLOW	FRONT LEFT SIDE MARKER
DS2	10205Y	REFLECTOR LAMP, YELLOW	FRONT RIGHT SIDE MARKER
DS3	60015Y	LIGHT, TURN AND CLEARANCE	LEFT SIDE MARKER/TURN
DS4	60015Y	LIGHT, TURN AND CLEARANCE	RIGHT SIDE MARKER/TURN
DS5	15009	LICENSE LAMP	LICENSE PLATE LIGHT
DS6	10205R	REFLECTOR LAMP, RED	IDENTIFICATION LEFT
DS7	40015R	4" TAIL LAMP	LEFT STOP/TAIL
DS8	10205R	REFLECTOR LAMP, RED	IDENTIFICATION CENTER
DS9	40015R	4" TAIL LAMP	LEFT TURN/TAIL
DS10	10205R	REFLECTOR LAMP, RED	IDENTIFICATION RIGHT
DS11	10205R	REFLECTOR LAMP, RED	REAR LEFT SIDE MARKER
DS12	40015R	4" TAIL LAMP	RIGHT STOP/TAIL
DS13	40015R	4" TAIL LAMP	RIGHT TURN/TAIL
DS14	10205R	REFLECTOR LAMP, RED	REAR RIGHT SIDE MARKER
DS15	10205Y	REFLECTOR LAMP, YELLOW	LEFT FRONT MARKER
DS16	10205Y	REFLECTOR LAMP, YELLOW	RIGHT FRONT MARKER
J1	59S-7	RECEPTACLE, 7 PIN	FRONT CONNECTOR

**Table 4-1 Electrical Wiring Parts List**

## 4-6 BRAKE SYSTEM MAINTENANCE

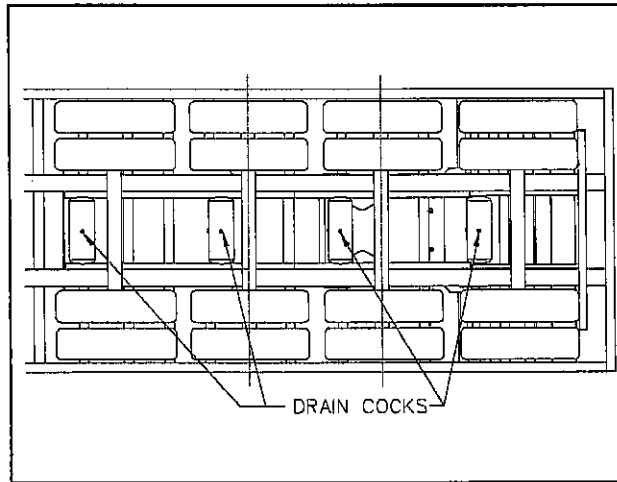


Fig. 4-2 Drain Cock Locations



### WARNING

USE GREAT CARE IF WHEELS OR BRAKE DRUMS MUST BE TOUCHED OR HANDLED, THEY MAY BE VERY HOT AND CAN CAUSE SERIOUS INJURY.

#### 4-6.1 General.

- a. Check air hoses for chafing, bends, kinks, or damaged fittings. Replace defective hoses.
- b. Check the brake system for loose, missing, deformed, or corroded fasteners. Replace and tighten defective hardware.
- c. Check brake linings for excessive wear or distortion.
- d. 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 4-2).

#### 4-6.2 Air Brake Chamber Maintenance

Repair or replace faulty units. Check the condensation holes on the underside of the brake chambers to make sure they are open. The front brake chambers have only service chambers. The rear brake chambers have 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. The spring chamber should not be serviced. Replace entire unit if spring chamber becomes faulty. 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.



### DANGER

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 CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

COMPLETELY DRAINING THE AIR RESERVOIR WILL RELEASE THE TRAILER BRAKES. ALWAYS CHOCK WHEELS BEFORE RELEASING BRAKES TO PREVENT SERIOUS PERSONAL INJURY OR DEATH.

THE SPRING BRAKE CHAMBER EMPLOYS A SPRING WITH HIGH FORCES. SERVICE SHOULD NOT BE ATTEMPTED. SERIOUS INJURY OR DEATH MAY RESULT.

- a. **Caging the Power Spring**
  1. Chock the trailer wheels.
  2. Remove dust cap from spring brake chamber.
  3. Remove the release bolt from it's 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 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.

**b. 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 Paragraphs 4-6.2 a.
4. Disconnect the slack adjuster from the connecting rod by removing the clevis pin (See Figure 4-5).
5. Mark all air service lines for proper re-installation and disconnect from the brake chamber.
6. Remove the brake chamber from the axle brackets.

**c. Installation**

1. CAGE THE POWER SPRING following the steps outlined in Paragraphs 4-6.2 a.
2. Position the inlet ports by loosening the service chamber clamp bands and rotating the center housing so the ports align with marks made during disassembly. Then re-tighten 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 hole faces downward. Re-tighten 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 4-5).

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

d. Check for leakage by charging the air system to a minimum of 90 psi and apply 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.

e. Insure that the clamp band is properly seated and tight before uncaging the power spring.

**4-6.3 Relay Emergency Valve**



**WARNING**

**REPAIR OR REPLACEMENT OF THE RELAY EMERGENCY VALVE IS A COMPLEX OPERATION AND SHOULD BE PERFORMED BY TRAINED SERVICE PERSONNEL. IF THE RELAY OR EMERGENCY VALVE NEEDS REPAIR, CONTACT A LANDOLL AUTHORIZED SERVICE CENTER OR THE LANDOLL FACTORY FOR SERVICING.**

Every 3600 operating hours, 100,000 miles (161,000 km), or yearly, depending upon operating conditions and experience, the Relay Emergency Valve should be disassembled, cleaned, and lubricated. Rubber parts and parts subject to wear should be replaced if worn or damaged.

**4-6.4 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 4-3).

**a. Brake Adjustment** This trailer 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 (see page 4-9).

**b. Disassembly for 16-1/2"X7" Brakes (see Figure 4-4)**

1. Release brakes and back off slack adjuster.
2. Remove slack adjuster lock ring and slack adjuster.
3. Remove drum assembly (see page 4-10).
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.

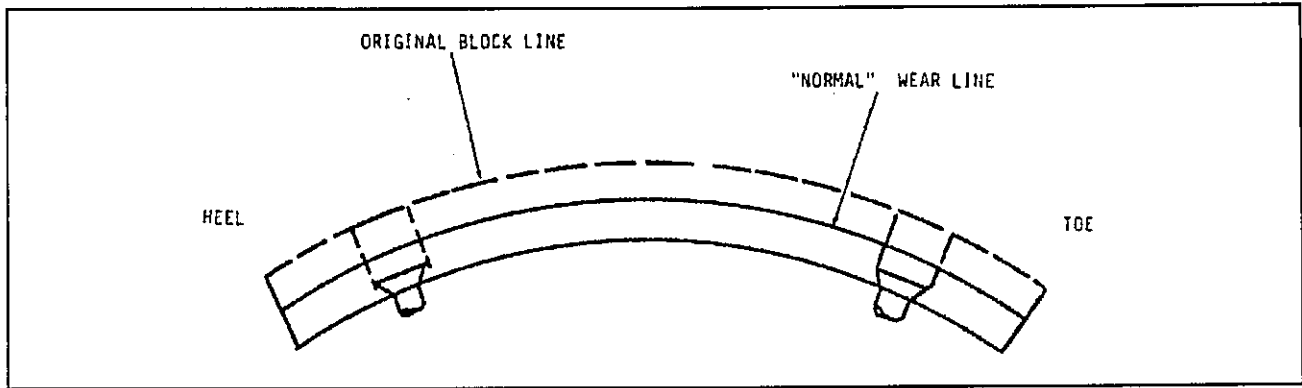


Fig. 4-3 Brake Lining Wear

8. Remove camshaft lock ring, spacer washer(s) and camshaft.
  9. After removing the shoes, completely inspect all brake components, servicing as necessary.
- c. Reassembly for 16-1/2" X 7" Brakes (see Figure 4-4)
1. Install new anchor pin bushings, camshaft bushing and camshaft seals into the spider.

**NOTE: 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 brake shoes.
3. Install 1/8" thick camshaft washer onto the camshaft.
4. Install the cam shaft into the spider. Install spacer washer and lock ring on camshaft before sliding the camshaft through the camshaft support bracket. Install the slack adjuster, washer and lock ring.
5. Install the brake keeper springs 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 on page 4-9.

#### 4-6.5 Automatic Slack Adjusters.

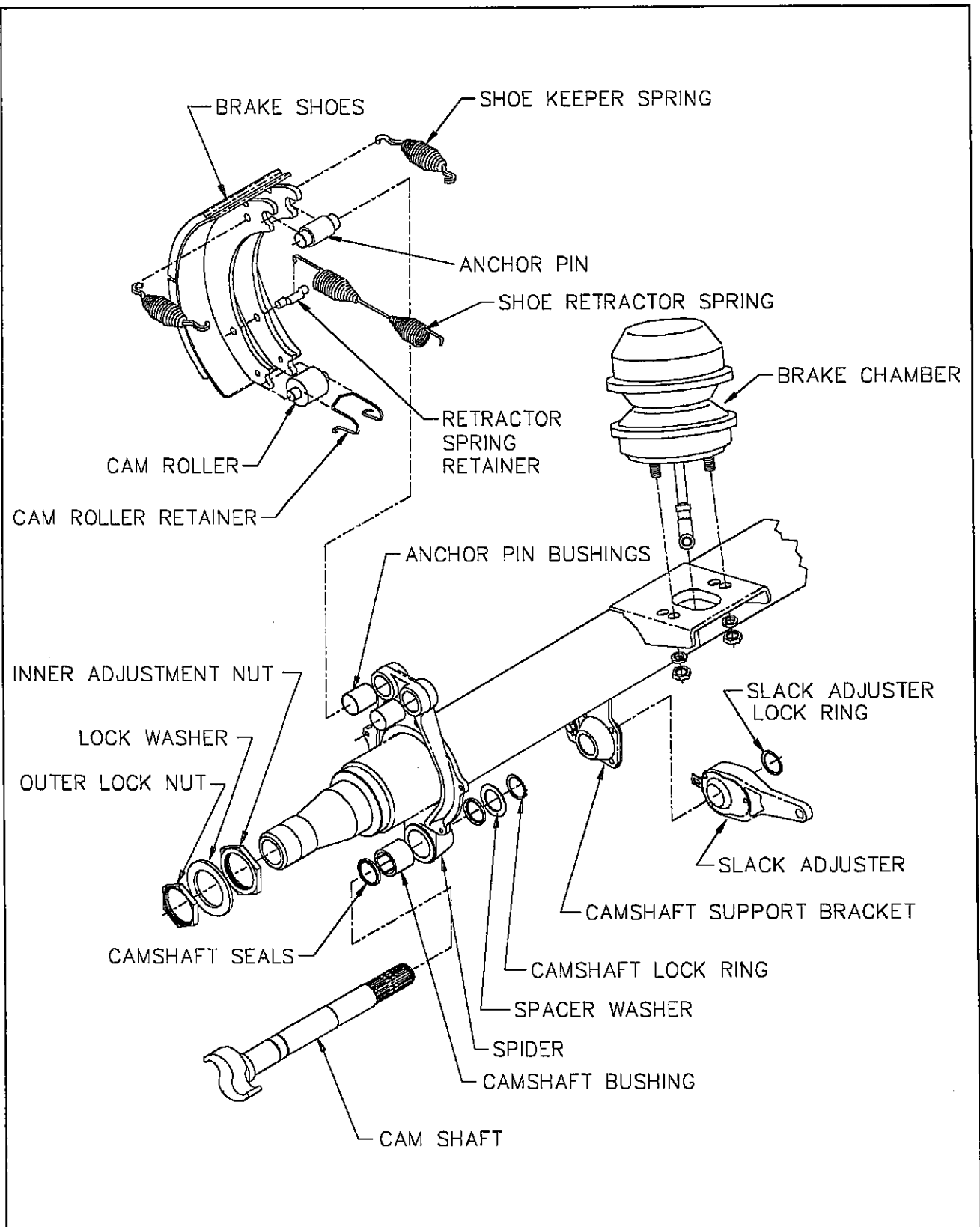
The semitrailers automatic slack adjusters provide the means for routine brake adjustment to compensate for lining wear. Inspect slack adjusters every 2,000 miles to assure correct operation.

- a. Operational Check (see Figure 4-5)
  1. Block wheels to prevent vehicle from rolling.
  2. Check that the push rod is fully retracted, apply air to release spring brake.

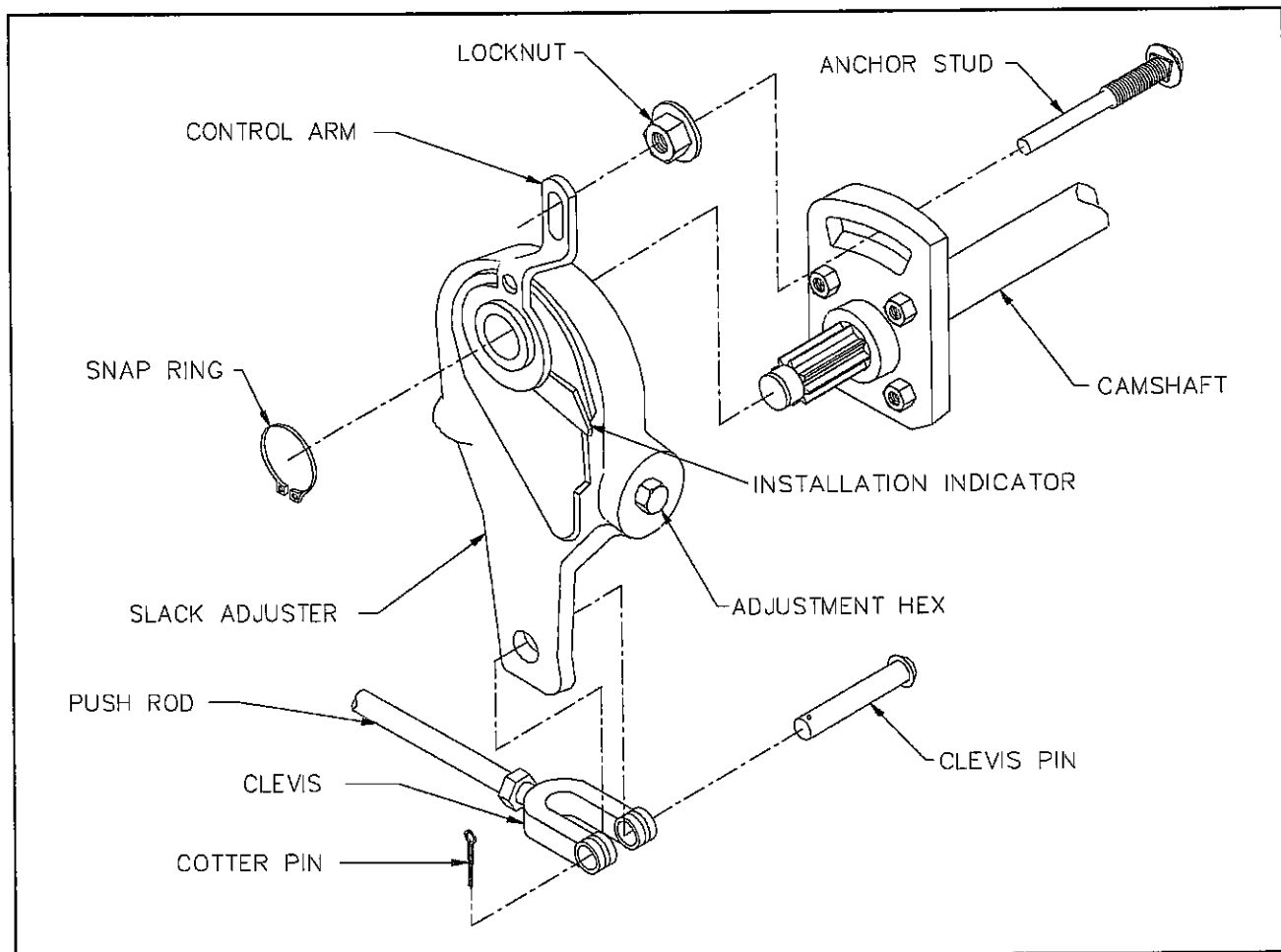
3. Turn adjustment hex counterclockwise to create an excessive clearance condition. (A ratcheting sound will occur.)
4. Make a full service brake application. On release, allow sufficient time for brake to fully retract. During the brake release, observe rotation of the adjustment hex (attach a wrench 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 80 to 90 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 FOUNDATION BRAKE 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.**



**Fig. 4-4 Axle and Brake Assembly**



**Fig. 4-5 Slack Adjuster**

**b. Replacing Slack Adjuster (See Figure 4-5)**

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 80 psi reservoir pressure must be maintained. If air pressure is not available the spring brake must be manually caged.
3. Remove cotter pin and clevis pin, snap ring and anchor stud. Slide old adjuster off cam shaft.
4. Apply "Anti-Seize" type lubricant to spline of cam shaft.
5. Install the new slack adjuster onto the cam shaft with the adjusting hex pointing away from the brake chamber. Rotate adjustment hex clockwise until adjuster arm enters clevis and holes line up.
6. Install clevis pin. Do not install cotter pin at this time.
7. Secure adjuster to cam shaft with snap ring.
8. Rotate control arm away from adjustment hex, towards the air chamber until it comes to an internal stop. Proceed with adjustment.

**c. Adjusting Slack Adjuster**

1. The Installation Indicator must fall within the slotted area with the brake released.
2. Place anchor stud through slotted plate, lock nut and control arm bushing.
3. Tighten lock nut (40 to 50 ft.-lbs.). Be sure control arm does not move out of position, and the Installation Indicator remains within the slotted area.
4. Manually adjust by rotating adjuster hex clockwise until lining contacts the drum, then counterclockwise 1/2 of a turn. A minimum of 13 ft.lbs. is necessary to overcome the clutch. Ratcheting sound will occur.
5. To check adjustment, release spring and service brake, with full air pressure. Installation Indicator should be within the slotted area. Remove clevis pin and check that the clevis hole and adjuster hole remain aligned. If not repeat steps 1 through 5.
6. When adjustment is correct install cotter pin into clevis pin.

## 4-7 HUB AND DRUM MAINTENANCE

4-7.1 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.**

4-7.2 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.**

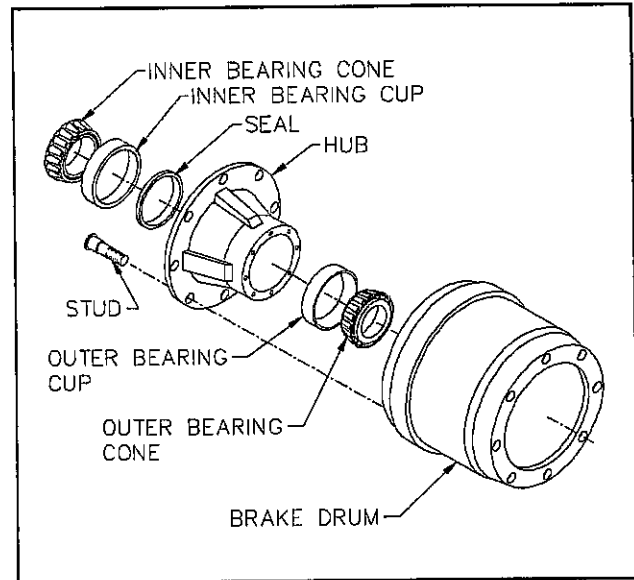


Fig. 4-6 Hub and Drum Assembly

4-7.3 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 rebores 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.

4-7.4 Replace the hub and drum as follows (see Figure 4-6):

- a. Remove the brake drum. It may be necessary to release the slack adjuster.



 **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.**

- 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.
- g. If hub is to be reused, clean it thoroughly.
- h. Insert bearing cups into hub.
- i. 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.
- j. 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.
- k. Install inner bearing, cone, and seal.

**NOTE: Do not mix new cups with old cones or new cones with old cups.**

l. Right hand (R) hubs should be installed on the curbside of the vehicle. Left hand (L) hubs should be installed on the driver side.

 **CAUTION**

**FAILURE TO USE THE CORRECT STUD ON THE CORRECT SIDE MAY CAUSE LOOSENING OF THE HUB STUDS DURING OPERATION, RESULTING IN LOSS OF A WHEEL.**

- m. Place the hub 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.
- n. 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.
- o. Install and adjust bearings (see **Wheel Bearing Lubrication and Adjustment**).
- p. Install the hub cap with proper gasket. Tighten the cap screws of the hub cap to 15 to 20 ft-lb of torque.
- q. Remove the filler plug and fill the hub cavity to the recommended level with a gear type oil.
- r. 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.

## 4-8 WHEEL BEARING

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With trailer sitting level, the oil level must be checked daily and maintained between the "ADD" and "FULL" lines on the hub cap window. Check for cracked windows, missing filler plugs and oil leaks. Add hub oil through the "POP-IN" filler plug located in the center of the hub windows. Re-install the "POP-IN" plugs after filling each hub.

### 4-8.1 Adjustment

- a. With a drain pan under the hub cap, remove the hub cap assembly allowing oil to drain.
- b. Lift the wheel off of the ground.
- c. Adjust slack adjuster to eliminate brake drag during tire/wheel rotation (see page 4-9).

- d. Remove the outer spindle nut and locking washer (see Figure 4-4).

- e. Rotate the tire by hand and tighten the inner nut until there is a slight bind. Back off the inner spindle nut 1/4 turn (3/8 turn max.) to allow free rotation of wheel.

- f. Install lock ring. Lock ring must engage pin on inner adjusting nut. Nut must engage nearest pin hole.

- g. Install tab washer and outer spindle nut. Torque outer spindle nut to 250 (min.) - 300 (max.) ft-lb. Bend 3 tabs over outer nut flats to secure.

- h. Install hub cap with new gasket and fill with oil to the full mark. Use 90 weight gear oil.

- i. Check hub oil level after the wheel has set level in one position for a few minutes to allow the oil to work into the bearings.

## 4-9 SUSPENSION MAINTENANCE

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### 4-9.1 Spring Suspension

- a. Make certain that all springs are properly located on the wear pads. Twisted springs or cocked hangers will cause uneven spring contact with wear pad and will result in excessive wear on the spring suspension. Check the shocks for excessive wear.

- b. After an initial break in period, approximately 3000 miles, all bolts and nuts should be checked to insure that recommended torque values are being maintained.

- c. Every 25,000 miles or 6 months, whichever is first, inspect all suspension parts. Replace cracked, failed,

damaged or excessively worn parts. All nuts and bolts must be retightened to torques given on page 2-1. To obtain proper torque, it is recommended to back off nuts, clean threads, oil threads with SAE 20 oil then tighten.

- d. Replacing the equalizer bushings and the torque arm bushings on the spring suspension is a complex operation and should be left to trained service personnel. If the bushings need to be replaced contact a Landoll authorized service center or the Landoll factory for servicing.

## 4-10 ALIGNMENT

### 4-10.1 Wheel Alignment



**TO PREVENT A POTENTIALLY LIFE THREATENING ACCIDENT:**

- 1. SUPPORT THE TRAILER SO THE TIRES ARE OFF THE GROUND.**
- 2. SUPPORT THE TRAILER 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, feathering or uneven wear, examine the semitrailer 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:

- Remove wheel, hub and bearing assemblies.
- 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 4-7).

c. 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 4-7).

d. Follow the same procedures as in Paragraph 4-10.1 b and c, except place the axle gauge above and below the axle. If gauge point gap is found, the axle has positive or negative camber. The semitrailer axle has no camber from the factory, thus if it is found to have positive or negative camber, axle replacement is necessary (see Figure 4-8 for examples of camber).

### 4-10.2 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 trailer alignment machine. In either case, a thorough inspection of the complete suspension must be performed and all defects corrected before aligning.

#### a. Manual Alignment Procedure

- Position trailer 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.
- Detach tractor from the trailer and jack the trailer up sufficiently to permit measuring from the underside of the trailer.
- Suspend a plumb bob at axle height from the center of the king pin.
- Measure (D) from the plumb bob to the center point on one end of the axle. Record this measurement (See Figure 4-9).

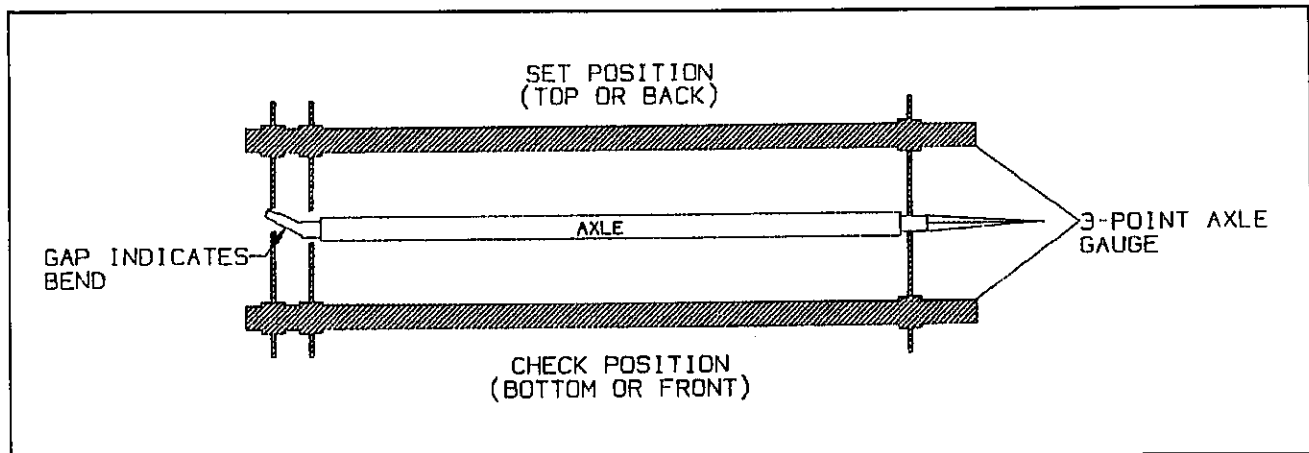


Fig. 4-7 Checking Axle for Bend

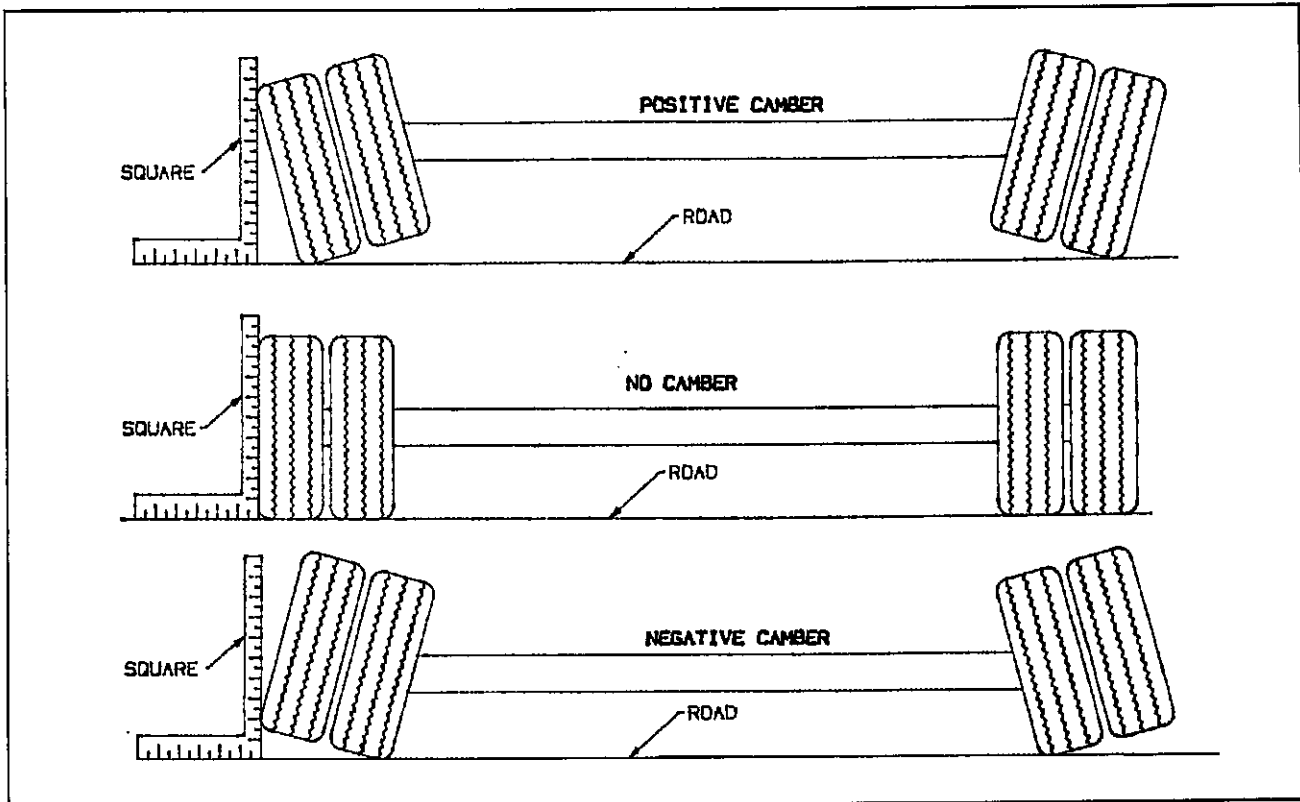


Fig. 4-8 Examples of Camber

5. Measure (D1) to the other end of the axle in the same manner as in Step 4. Record this measurement (See Figure 4-9).
6. It is usually necessary to set D about 1/8" shorter than D1 to insure proper trailer tracking on slope of road.
7. Loosen the radius rod clamp bolts on the adjustable radius rods.
8. Turn the adjustable radius rod on the front axle until the proper alignment has been achieved.
9. Tighten the radius rod clamp bolts to 45-55 ft-lb torque to lock in the alignment of the front axle.
10. Align the rear axle to the front axle in the same manner, using the radius rod for adjusting. The rear axle should be parallel with the front axle, with the dimensions Y and Y1 being the same.
11. Tighten the rear axle radius rod clamp bolts to 45 to 55 ft-lb.
12. In all cases, all suspensions must be in good repair with no binding or other restrictions before the alignment process can be undertaken properly. All defective parts of the suspension or axles must be replaced immediately.

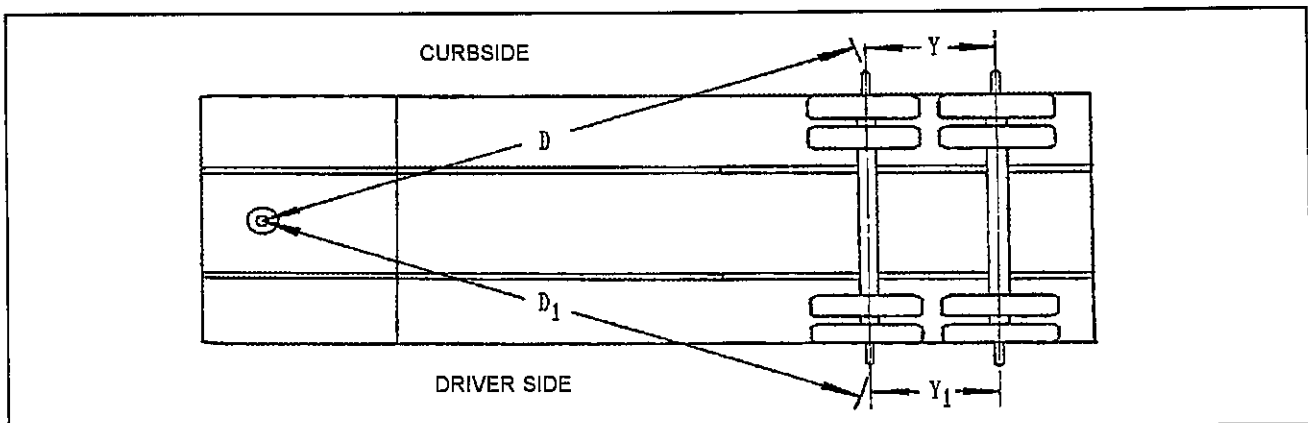


Fig. 4-9 Checking Axle Alignment

## 4-11 TIRES AND WHEELS.

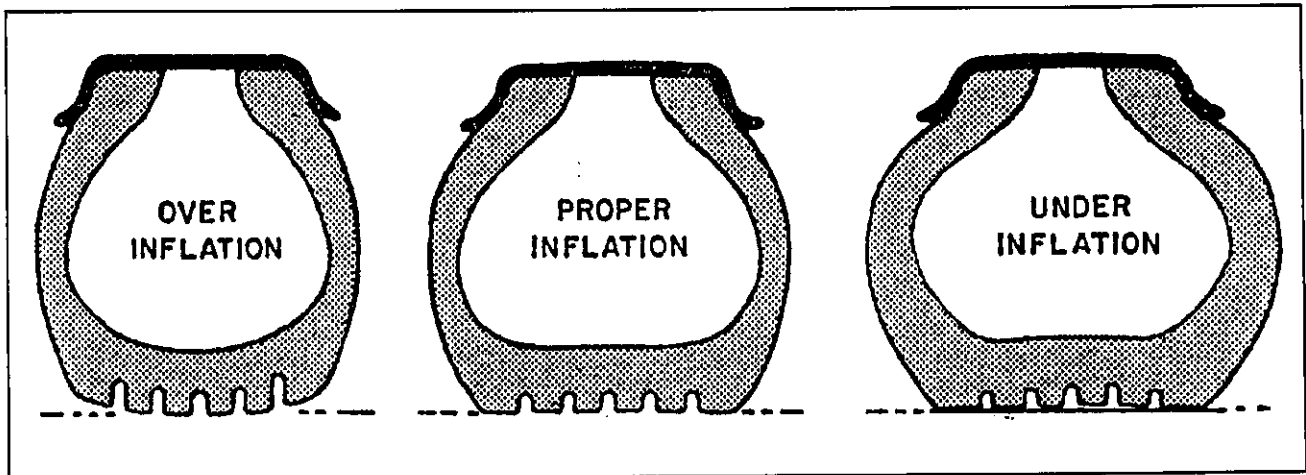


Fig. 4-10 Tire Inflation Examples

**4-11.1 Tire Inflation.** Tire inflation will cause tire to ground contact characteristics as shown in Figure 4-10. 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 trailer VIN plate located on the front of the semitrailer. 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.

**4-11.2 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.

a. **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 4-11).

b. **Straight Edge or String Method:** (This method can not 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 4-12).

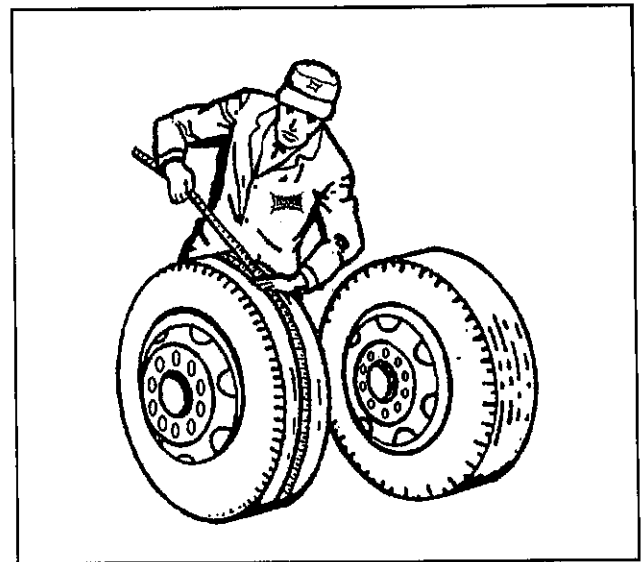
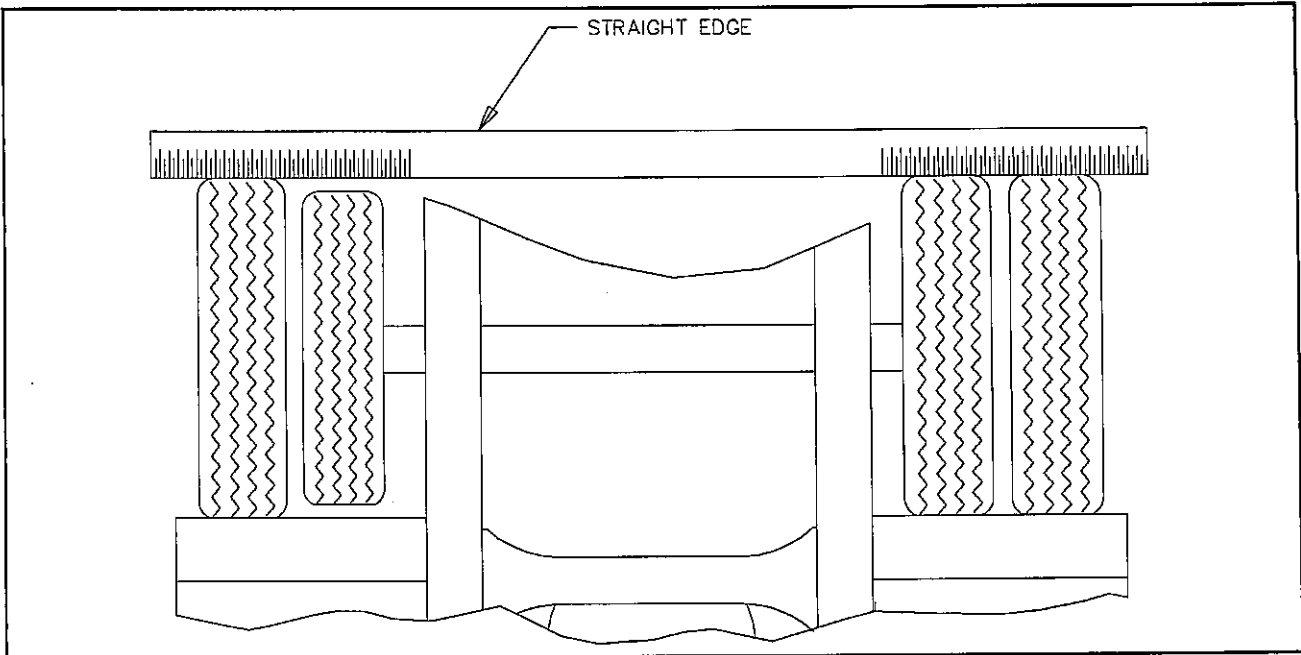
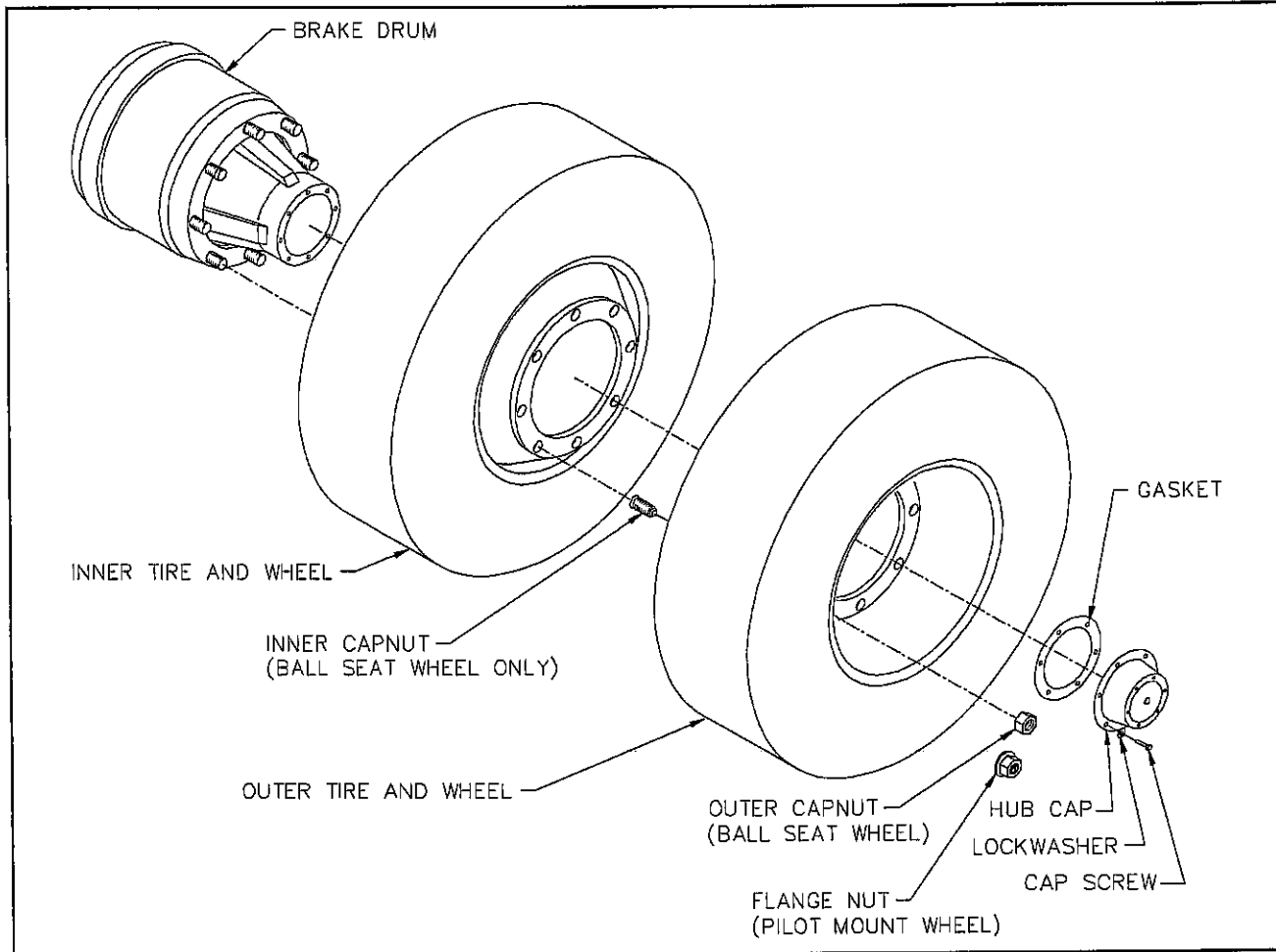


Figure 4-11 Measuring Method



**Figure 4-12 Straight Edge Method**



**Figure 4-13 Mounting Tires and Wheels**

### 4-11.3 Mounting Tire and Wheel (Hub Type)

a. 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 4-13).

b. 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.

c. For **ball seat mounted wheels** only, install the inner capnuts on the studs and tighten to fifty foot-pounds using the sequence illustrated in Figure 4-14. Make certain that the left-handed threads are installed on the driver side of the vehicle and the right-handed threads are installed on the curbside of the vehicle.

d. Tighten the inner capnuts to full torque of 450 to 500 foot-pounds using the same sequence in Figure 4-14.

e. For **pilot mounted wheels** skip steps c and d.

f. Position the outer disc wheel over the capnuts being careful not to damage the inner capnut threads. Be sure the valve stems for both the inner and outer tire are accessible.

g. Install the outer capnuts (ball seat) or flange nut (pilot mount) and tighten to 50 foot-pounds using the sequence in Figure 4-14. Then tighten to full torque of 450 to 500 foot-pounds for ball seat and 500 to 550 foot-pounds for pilot mount, using the same sequence.

h. Torque will drop after the first 50 to 100 miles of operation. Check the capnuts or flange nuts for proper torque after this interval and retighten them. Loosen the outer capnuts and retighten the inner and outer capnuts per steps d to g.

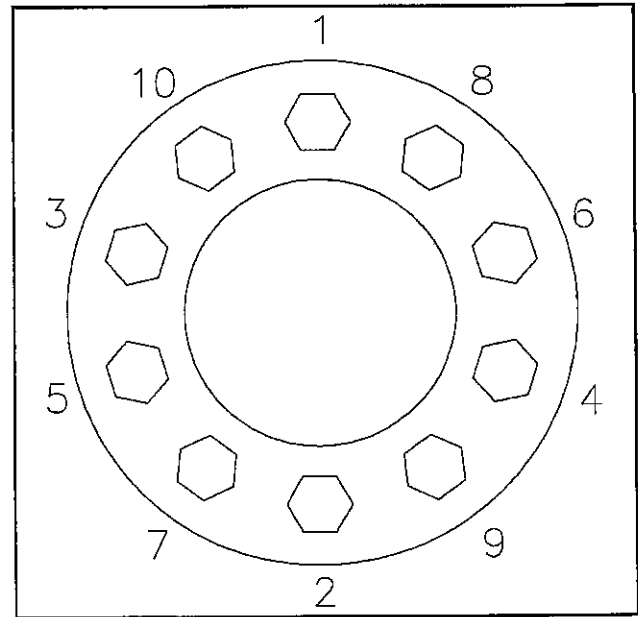


Figure 4-14 Stud Tightening Sequence



## 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.

## 4-12 CRANK LANDING GEAR

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**4-12.1** It may be necessary to periodically lubricate to maintain satisfactory performance.

a. Lube both legs, through grease fittings provided in the legs, two times a year or as required.

b. Lube two-speed gears, through the grease fitting in the gearbox, two times a year or as required.

### 4-12.2 Gearbox Dismantling (see Figure 4-15)

a. Remove all rust from shafts (1) and (2) and lubricate for easier removal of gearbox cover (3).

b. Remove gearbox cover (3) by removing bolts and nuts (5).

c. To remove shaft (1), shaft must be free of rust. Lubricate and tap out from mounting bracket side. Remove shifter gear (14) by removing spiral pin (12) and pin (15). Also remove shifter spring (13) after shaft (1) has been removed.

d. Remove shaft (8) and step gear (9). Remove all worn, bent or broken parts.

### 4-12.3 Leg Dismantling

a. Disconnect cross shaft (36) by removing nuts and bolts (37) and remove the landing gear from the trailer.

b. Remove all rust from projecting end of shaft (1,2 or 35) and lubricate for easy removal.

c. Remove screws (16), leg cover (17) and gasket (18).

d. Tap out groove pin (6) from bevel pinion gear (19).

e. Remove shaft (2 or 35) from landing gear making sure not to lose shims (51) or location of shims (51).

f. Next, remove nut (20) from top of elevating screw and inner leg assembly (24).

g. Remove bevel gear (21) from screw in inner leg assembly (24).

h. Tap end of screw with wood block or brass hammer until screw and inner leg assembly (24) drop out. (Be careful not to damage screw threads).

i. Lift out polyethylene bushing (22).

j. Remove thrust bearing (31), thrust washer (32) and woodruff key (50) from screw in assembly (24).

k. Replace all worn, bent or broken parts.

### 4-12.4 Leg Assembly

a. Place thrust washer (32) on top of elevating screw. Thrust bearing (31) follows and must be assembled with cup of bearing up.

b. Place outer leg (33 or 34) over screw and nut portion of inner leg assembly (24). Press down until threaded part of elevating screw is clearly visible through hole in top of the outer leg (33 or 34).

c. Fit polyethylene bushing (22) into place around screw in leg assembly (24) and push all the way down into bearing block.

d. Install woodruff key (50) in slot of elevating screw (24) and install bevel gear (21) in place.

e. Secure bevel gear (21). Use Loc-tite on threads of screw and install jam lock nut (20). Make sure bevel gear (21) turns freely.

f. Place bevel pinion gear (19) on top of bevel gear (21) on the opposite side from mounting bracket of single speed outer leg (34), or mounting bracket side of 2-speed outer leg (33).

g. Install shaft (2 or 35) through outer leg (33 or 34). Install shims (51) removed previously and slide shaft (2 or 35) through shims (51) and bevel pinion gear (19).

h. Align holes in bevel pinion gear (19) with hole in shaft (2 or 35), insert groove pin (6) so that shafts turn freely and the two gears are engaged properly.

i. Check for proper shimming. Proper shimming is achieved when the shafts turn freely and there is no more than 1/16" gap between the shims and the outer leg when shaft (2 or 35) is pushed toward the bevel gear.

j. Make sure this assembly is well lubricated with a permanent type lubricant (1/2 pound, minimum).

k. Replace gasket (18), metal cover (17) and self tapping screws (16).

l. Install landing gear back on trailer. Adjust both legs to the same length and install cross shaft (36) and bolts and nuts (37). When installing cross shaft make sure there is enough end play and gears crank freely.

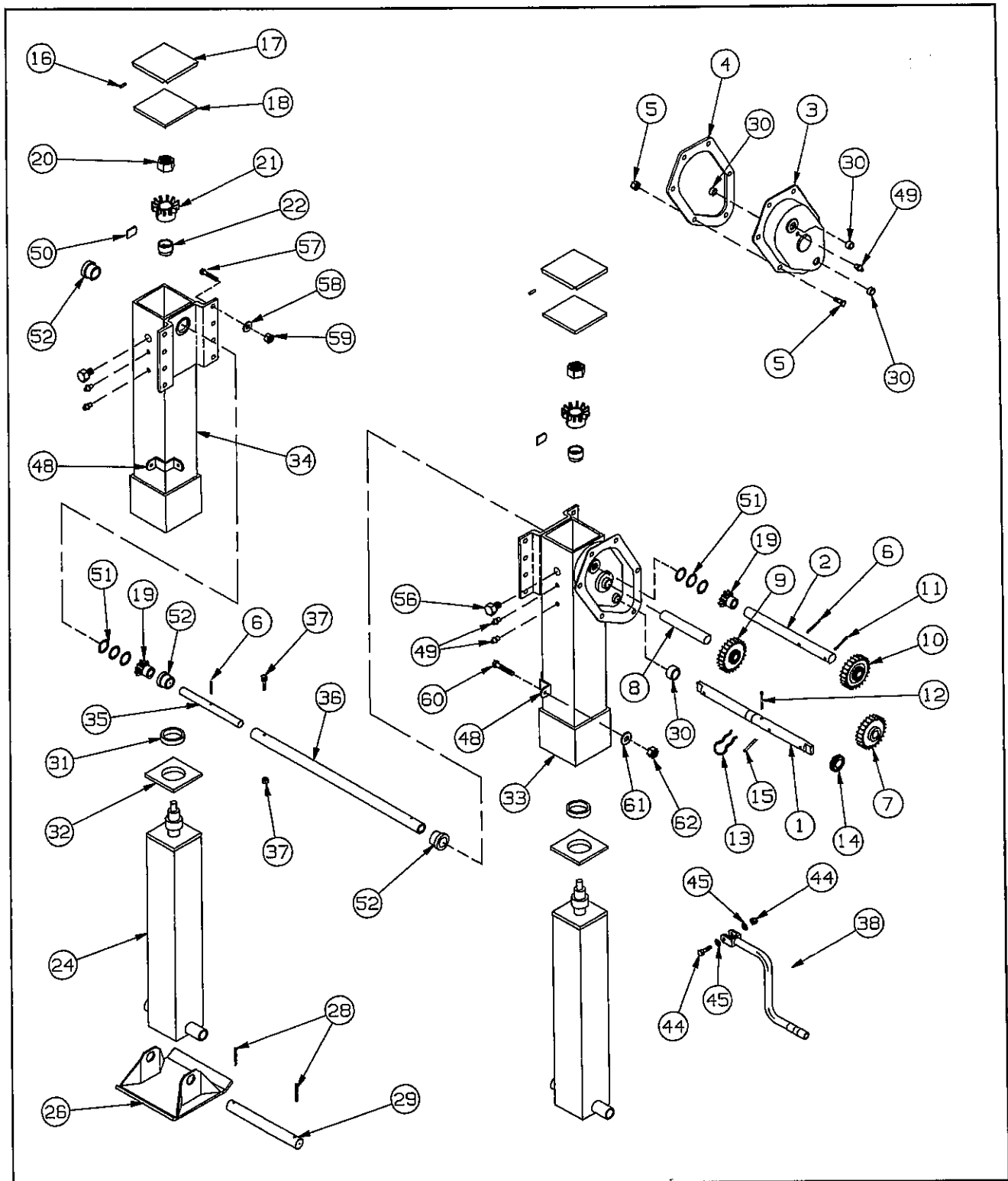
### 4-12.5 Gearbox Assembly

a. To replace shifter gear (14), install pin (15) in shaft (1). Then slide shifter gear on shaft so that recess in shifter gear fits over pin (15). Install spiral pin (12).

b. Insert shaft (1) with gear (14) in lower hole of gearbox and install shifter spring (13) in place.

c. Slide gear (9) on shaft (8) and insert shaft in middle hole of gear box.





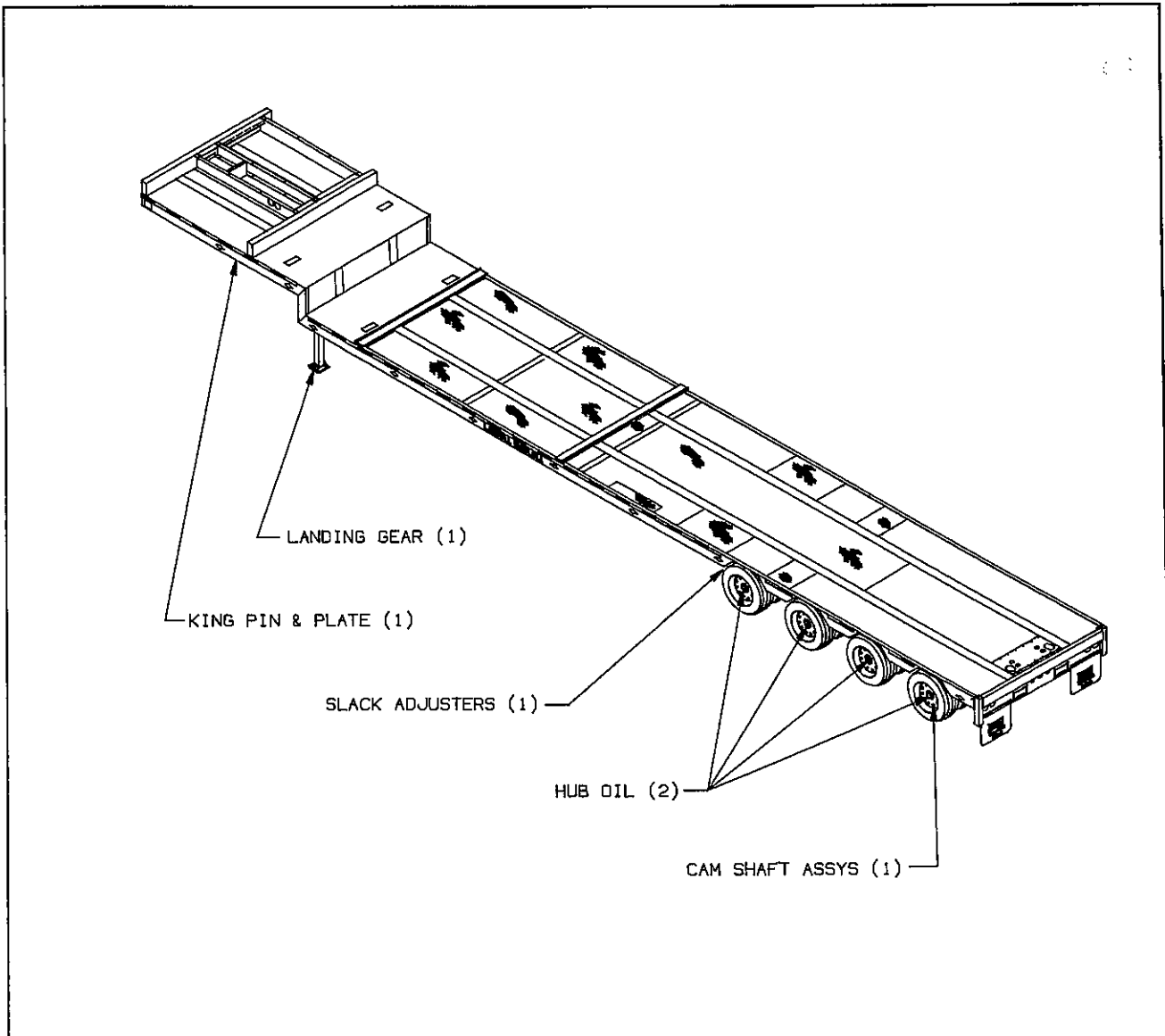
**Fig. 4-15 Crank Landing Gear Assembly**

d. Install step gear (10) on shaft (2) and secure with spiral pin (11).

e. Place idler gear (7) on shaft (8) with shoulder of gear to inside.

f. Gears must be coated with permanent type grease in order to obtain successful operation.

g. Replace gasket (4) and gearbox cover (3) and assemble with bolts and nuts (5).



**Fig. 4-16 Lubrication Points**

LUBE	BRAND AND PRODUCT (WEIGHT AND/OR TYPE)			
	AMOCO	EXXON	PHILLIPS	TEXACO
1	Lit-Multi-purpose Grease	Rondex Multi-purpose Grease	Phil Lube M.W. Grease	MarFax All Purpose
2	Multi-purpose 90	Gear Oil GTX 85-140	Phil Lube All-purpose Gear SAE 90 #90501	Multi-gear EP 80W90

**Table 4-2 Lubrication Specifications**

MAINTENANCE SCHEDULE							
SERVICE INTERVAL <sup>a</sup> :	1st 5 Hrs	Weekly	Monthly	6 Months	Yearly	LUBE #	NOTES
ITEM							
	50	500	2,000	12,000	25,000		
LIGHTS	I	I					
WIRING & CONNECTIONS	I		I				
FASTENERS	I, T		I				b
KING PIN & PLATE	I		C, I, L			1	c
BRAKE AIR SYSTEM	I	I	I				
RELAY VALVES					I, C		
BRAKE ADJ & WEAR	I		I, T				d
SLACK ADJUSTERS	I	I			L	1	c
CAMSHAFT ASSYS	I	I			L	1	c
HUB OIL	I	I, L			R	2	c
WHEEL BEARINGS	I			I, T		2	c
TIRE INFLATION & WEAR	I	I					e
WHEEL LUG NUTS	I, T	I	I, T				b
SUSPENSION			T		I, T		
SUSPENSION ALIGNMENT	I		I				
SUSPENSION ASSEMBLY			I, T	I, T			f
I – Inspect, R – Replace, T– Tighten/ Adjust Torque, L – Lubricate, C – Clean							
<b>NOTES:</b>							
a. Perform at the time shown. Shorten service intervals when operating in severe or dirty conditions.							
b. See Table 2-1 (Bolt Torque Chart) for correct torque.							
c. See Table 4-2 (Lube Specification Chart) for recommended lubricant.							
d. Call Landoll Customer Services for procedures to replace.							
e. See Serial Number Plate on the front of the semitrailer for proper inflation requirements.							
f. See page 2-1 (Standard Specifications) for correct torque.							

Table 4-3 Maintenance Schedule

**NOTES:**

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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 or contact the Landoll factory for servicing.

## 5-1 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 Page 4-2.

SYMPTOM	PROBLEM: REMEDY
NO LIGHTS	<b>Fuse blown on tractor:</b> Replace fuse. <b>Loose connection at plug-in:</b> Tighten connection. <b>Broken or corroded wires:</b> Replace wire. <b>Ground wire loose:</b> Clean and tighten ground.
LIGHTS FLICKERING	<b>Wires shorted or loose:</b> Locate, insulate, replace, or tighten.
LIGHTS DIM	<b>Voltage difference between trailer and tractor:</b> Tractor supply wire or circuit components too low capacity - enlarge wire or component, match bulbs with tractor voltage.
LIGHTS BRIGHT AND BURN OUT	<b>Ground wire disconnected:</b> Connect ground wire. <b>Voltage difference between trailer and tractor:</b> Tractor supply wire or circuit components too low capacity - enlarge wire or component, match bulbs with tractor voltage.
FUSE BLOW-OUT OR CIRCUIT BREAKER TRIPPING	<b>Vibration:</b> Locate source of vibration and repair. <b>Short circuit:</b> Replace fuse and try all accessories. If fuse blows right away, locate short and repair.
LAMP BULB BURN OUT	<b>Vibration:</b> Locate source of vibration and repair. <b>Short circuit:</b> Replace fuse and try all accessories. If fuse blows right away, locate short and repair. <b>Loose connection:</b> Check lamp sockets and ground connections. <b>Intermittent short:</b> Locate short and repair. <b>Improper voltage:</b> Check voltage regulator output.

## TABLE 3-4 TROUBLESHOOTING, Continued

### 5-2 Tires - Wheels - Suspension

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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 see **Pages 4-12 through 4-15**.

<b>SYMPTOM</b>	<b>PROBLEM: REMEDY</b>
VIBRATIONS WHILE DRIVING	<b>Improper tire inflation:</b> Inflate to proper pressure. <b>Tires cupped or have flat spots:</b> Replace tires. <b>Wheels bent or loose:</b> Replace or tighten. <b>Tires incorrectly mounted:</b> Remount. <b>Mud in wheels:</b> Clean wheels. <b>Tire(s) out of balance:</b> Balance tires. <b>Brakes dragging:</b> Locate cause and repair. <b>Object(s) stuck between duals:</b> Remove object(s).
<b>RAPID TIRE WEAR/DETERIORATION:</b>	
CENTER TREAD WEAR	<b>Over inflation:</b> Deflate to correct inflation.
SHOULDER TREAD WEAR - BOTH SHOULDERS	<b>Under inflation:</b> Increase inflation to correct psi. Check axle alignment. <b>Overload:</b> Loads are above rated tire capacity. <i>Do not load above rated tire capacity.</i>
SHOULDER TREAD WEAR - ONE SHOULDER	<b>Axle damage:</b> Straighten or replace axle. <b>Axles not parallel:</b> Check axle alignment.
OVERALL TREAD WEAR	<b>Overloading:</b> Check tire load rating. <b>High speeds:</b> Adjust speed according to road and load conditions. <b>Incorrect dual matching:</b> Properly match dual tires
TIRE FLAT SPOTS	<b>Quick stops:</b> Adjust braking practices. <b>Grabbing brakes:</b> Adjust brakes properly. <b>Worn or loose wheel bearings:</b> Adjust or replace as needed. <b>Out of balance wheels and tire:</b> Balance wheels and tires.
UNEVEN WEAR	<b>Suspension bushings worn:</b> Replace bushings. <b>Worn or loose wheel bearings:</b> Adjust or replace as needed. <b>Out of balance wheels and tires:</b> Balance wheels and tires.
<b>RIM FAILURE*:</b>	
CRACKING	<b>Overinflated tires:</b> Deflate tire to proper psi. <b>High speeds:</b> Adjust speed according to road and load conditions. <b>High speed cornering:</b> Adjust cornering practices. <b>Over loading:</b> Check rim load rating.

**\*In all instances of rim failure, replace the rim immediately!**

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**TABLE 3-4 TROUBLESHOOTING, Continued**

<b>SYMPTOM</b>	<b>PROBLEM: REMEDY</b>
BENDING OR WARPING	<b>Curb-hopping or potholes:</b> Adjust turning practices and adjust speed accordingly with road conditions. <b>Improper tightening sequence:</b> Follow proper tightening sequence.
BROKEN STUDS*	<b>Over-tightening:</b> Use correct torque and tightening sequence when mounting.
<b>*Replace broken studs before using the semitrailer!</b>	
<b>TRAILER TRACKING PROBLEMS:</b>	
TRACKS TO ONE SIDE	<b>Axle alignment:</b> Re-align axle.
TRACKS TO EITHER SIDE	<b>Broken or bent springs or equalizer bushings:</b> Replace worn parts. <b>Axles not parallel:</b> Adjust axle spacing to be parallel.

**5-3 Brakes**

For maintenance procedures see Page 4-5.

<b>SYMPTOM</b>	<b>PROBLEM: REMEDY</b>
NO BRAKES OR BRAKES ARE INTERMITTENT	<b>Brake air system improperly connected:</b> Reconnect gladhands properly. <b>Relay/Emergency valve plugged:</b> Clean valve. <b>Defective tractor protection valve:</b> Repair or replace. <b>Restricted tubing or hose line:</b> Locate and eliminate restriction. <b>Broken line:</b> Locate break and repair. <b>Tractor air system failure:</b> Troubleshoot tractor air system and repair.
SINGLE BRAKE DRAGGING OR LOCKED	<b>Broken internal brake component:</b> Locate and replace broken part. <b>Flat spot on cam roller or cam shaft:</b> Replace and lubricate. <b>Improper adjustment:</b> Adjust slack adjusters. <b>Spider bushing or cam bracket bushing binding:</b> Lubricate or replace bushing. <b>Improper lubrication:</b> Lubricate per Figure 4-16. <b>Worn brake shoe bushing:</b> Replace bushing. <b>Brake drum distortion:</b> Replace drum. <b>Brake chamber pushrod binding:</b> Realign brake chamber bracket. <b>Air brake line loose or broken:</b> Tighten or repair.

**TABLE 3-4 TROUBLESHOOTING, Continued**

<b>SYMPTOM</b>	<b>PROBLEM: REMEDY</b>
UNEVEN BRAKES	<p><i>See "SINGLE BRAKE DRAGGING OR LOCKED"</i></p> <p><b>Restriction in hose:</b> Locate restriction and remove.</p> <p><b>Worn brake linings:</b> Reline brakes.</p> <p><b>Grease on linings:</b> Reline brakes.</p> <p><b>Broken slack adjuster:</b> Replace slack adjuster.</p> <p><b>Call Factory or see qualified Trailer/Brake Technician.</b></p> <p><b>Leaking brake chamber diaphragm:</b> Replace diaphragm.</p>
BRAKES APPLY TOO SLOWLY	<p><b>Brakes need adjusting or lubrication:</b> Adjust or lubricate as needed.</p> <p><b>Low air pressure in brake system (below 90 psi):</b> Check tractor air system.</p> <p><b>Restricted tubing or hose:</b> Locate restriction and remove.</p> <p><b>Worn or broken relay valve:</b> Replace.</p> <p><b>Call Factory or see qualified Trailer/Brake Technician.</b></p>
BRAKES RELEASE TOO SLOWLY	<p><b>Brakes need adjusting or lubrication:</b> Adjust or lubricate as needed.</p> <p><b>Brake rigging binding:</b> Align brakes or replace bent parts.</p> <p><b>Exhaust port of relay valve restricted or plugged:</b> Replace valve.</p>
ALL BRAKES DO NOT RELEASE	<p><b>Air system improperly connected to tractor:</b> Tighten or adjust connections.</p> <p><b>Brake valve on tractor is applied:</b> Release brake.</p> <p><b>Relay emergency valve in emergency position:</b> Check line pressure and check valve.</p> <p><b>Restricted tubing or line:</b> Locate restriction and remove.</p> <p><b>Tractor protection valve failure:</b> Troubleshoot tractor air system.</p> <p><b>Parking brakes locked:</b> Troubleshoot air system.</p> <p><b>Moisture in air system:</b> Check air system.</p>
INSUFFICIENT BRAKES	<p><b>Brakes need adjusting:</b> Adjust brakes.</p> <p><b>Cams need lubricating:</b> Lubricate cams.</p> <p><b>Brakes need relining:</b> Reline brakes.</p> <p><b>Low air pressure:</b> Troubleshoot air system.</p> <p><b>Relay emergency valve failure:</b> Replace.</p> <p><b>Brakes overheated:</b> Stop and allow brakes to cool, locate cause of overheating.</p>
BRAKES GRABBING	<p><b>Grease on brake linings:</b> Reline brakes.</p> <p><b>Brake rigging binds:</b> Align brakes or replace bent parts.</p> <p><b>Brake valve on tractor failed or worn:</b> Replace valve.</p> <p><b>Relay emergency valve failed or worn:</b> Replace valve.</p>



**TABLE 3-4 TROUBLESHOOTING, Continued**

<b>SYMPTOM</b>	<b>PROBLEM: REMEDY</b>
EXCESSIVE LEAKAGE WITH BRAKES RELEASED	<b>Relay emergency valve leaking:</b> Replace valve. <b>Leaking tube or hose:</b> Replace part(s).
EXCESSIVE LEAKAGE WITH BRAKES APPLIED	<b>Relay emergency valve leaking:</b> Replace valve. <b>Leaking brake chamber diaphragm:</b> Replace brake chamber. <b>Call Factory or see qualified Trailer/Brake Technician</b> <b>Leaking tubing or hose:</b> Replace part(s).
EXCESSIVE LEAKAGE WITH EMERGENCY SYSTEM ONLY APPLIED - NO LEAKAGE WITH NORMAL BRAKING	<b>Relay emergency valve failure:</b> Replace valve.
EXCESSIVE WATER PRESENT IN BRAKE SYSTEM	<b>Reservoir not drained often enough:</b> Drain reservoir daily.
EXCESSIVE OIL PRESENT IN BRAKE SYSTEM	<b>Compressor on tractor passing excessive oil:</b> Refer to <i>Tractor Repair manual</i> .
BRAKE WILL NOT APPLY PROPERLY	<b>Flat spot on cam roller or camshaft:</b> Replace and lubricate.
BRAKES WILL NOT APPLY WHEN EMERGENCY LINE IS DISCONNECTED	<b>Initial air pressure too low:</b> Allow air system to build up to minimum 90 psi and stabilize. <b>Relay valve failure:</b> Replace valve. <b>Air line leak:</b> Locate leak and repair. <b>Brake chamber leak:</b> Replace brake chamber.

#### **5-4 Brake Drums**

For maintenance procedures see See Page 4-10.

<b>SYMPTOM</b>	<b>PROBLEM: REMEDY</b>
EXCESSIVE LOSS OF BRAKES OR FADING	<b>Overheated brake drums:</b> 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	<b>Drums of different diameters:</b> Replace with drums of same diameter. <b>Foreign matter in drums:</b> Clean drums out.
ROUGH OR NOISY BRAKING ACTION	<b>Worn drums:</b> 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 and replace worn part(s).
VIBRATION IN RIDE	<b>Worn or out-of-round drums:</b> Replace drums. <b>Out-of-balance drums:</b> Balance drums.

## 5-5 Two-Speed Crank Landing Gear

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For maintenance procedures see See Page 4-18.

SYMPTOM	PROBLEM: REMEDY
LANDING GEAR TURNS HARD	<b>Binding cross shaft:</b> Loosen bolts in the cross shaft to allow lateral movement. (To determine which leg turns hard, remove the cross shaft and operate each leg individually.) <b>Misalignment:</b> Check that legs are parallel and extend and retract evenly. Check that crankshaft and crankshaft extension are aligned. <b>Lack of lubrication:</b> Legs and gearbox may need additional lubrication.
CRANKSHAFT IS JAMMED	<b>Axle is binding where it goes through legs:</b>
CRANKSHAFT JAMS OR SKIPS WHILE TURNING	<b>Damage to nut and screw assembly caused by dropping of trailer:</b> Repair or replace damaged parts.
WILL NOT STAY IN GEAR WHILE CRANKING	<b>Damage to nut and screw assembly caused by dropping of trailer:</b> Repair or replace damaged parts. <b>Worn, broken or missing teeth on gears:</b> Examine all gears. Replace damaged gears.
	<b>Damaged or worn shifter spring or crankshaft:</b> Examine shifter spring and grooves in crankshaft. Repair or replace damaged parts.

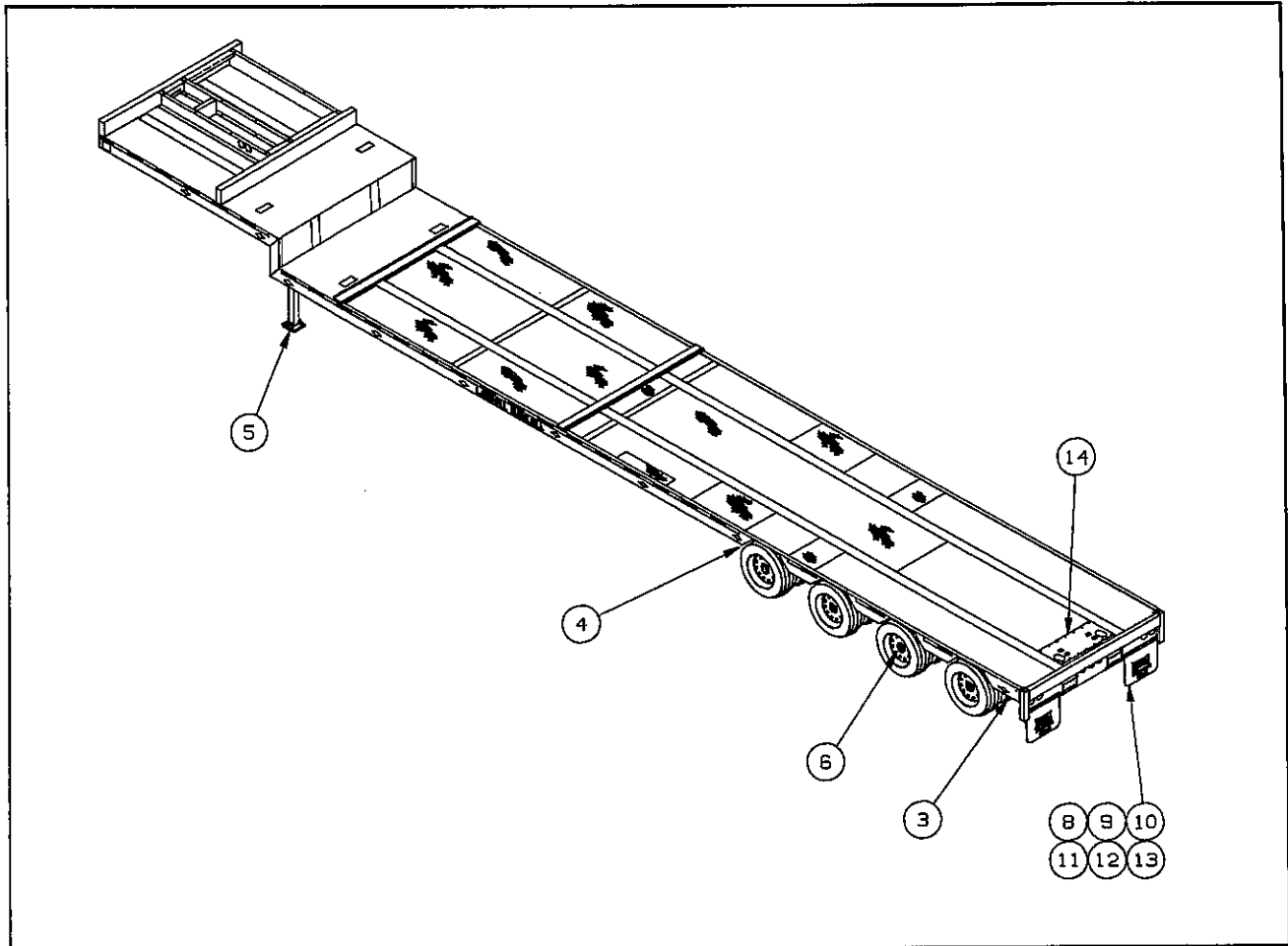


Figure 6-1 General Assembly

## GENERAL ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
1	REFERENCE	ELECTRICAL SYSTEM (SEE FIGURE 6-2)	1
2	REFERENCE	AIR BRAKE SYSTEM (SEE FIGURE 6-3)	1
3	REFERENCE	SUSPENSION SYSTEM (SEE FIGURE 6-4)	1
4	3-042-010039	AXLE ASSEMBLY (SEE FIGURE 6-5)	2
5	3-725-010066	LANDING GEAR ASSEMBLY (SEE FIGURE 6-6)	1
6	3-406-010061	HUB AND DRUM ASSEMBLY (SEE FIGURE 6-7)	4
7	REFERENCE	DECAL PLACEMENT (SEE FIGURE 6-8)	1
8	3-485-010001	FLAP, MUD 21 IN.	2
9	3-762-010017	CLAMP, MUD FLAP	2
10	1-654-010051-07	SCREW HEX CAP 3/8-16UNCX1-1/2	8
11	1-861-010032-11	WASHER, FLAT 3/8 W ZP/CD	16
12	3/8-16HFN	NUT ZP GR2	8
13	3/8SLW	WASHER, LOCK	8
14	3-303-010062	FLOOR, RR PLATE W/MT HOLES	1

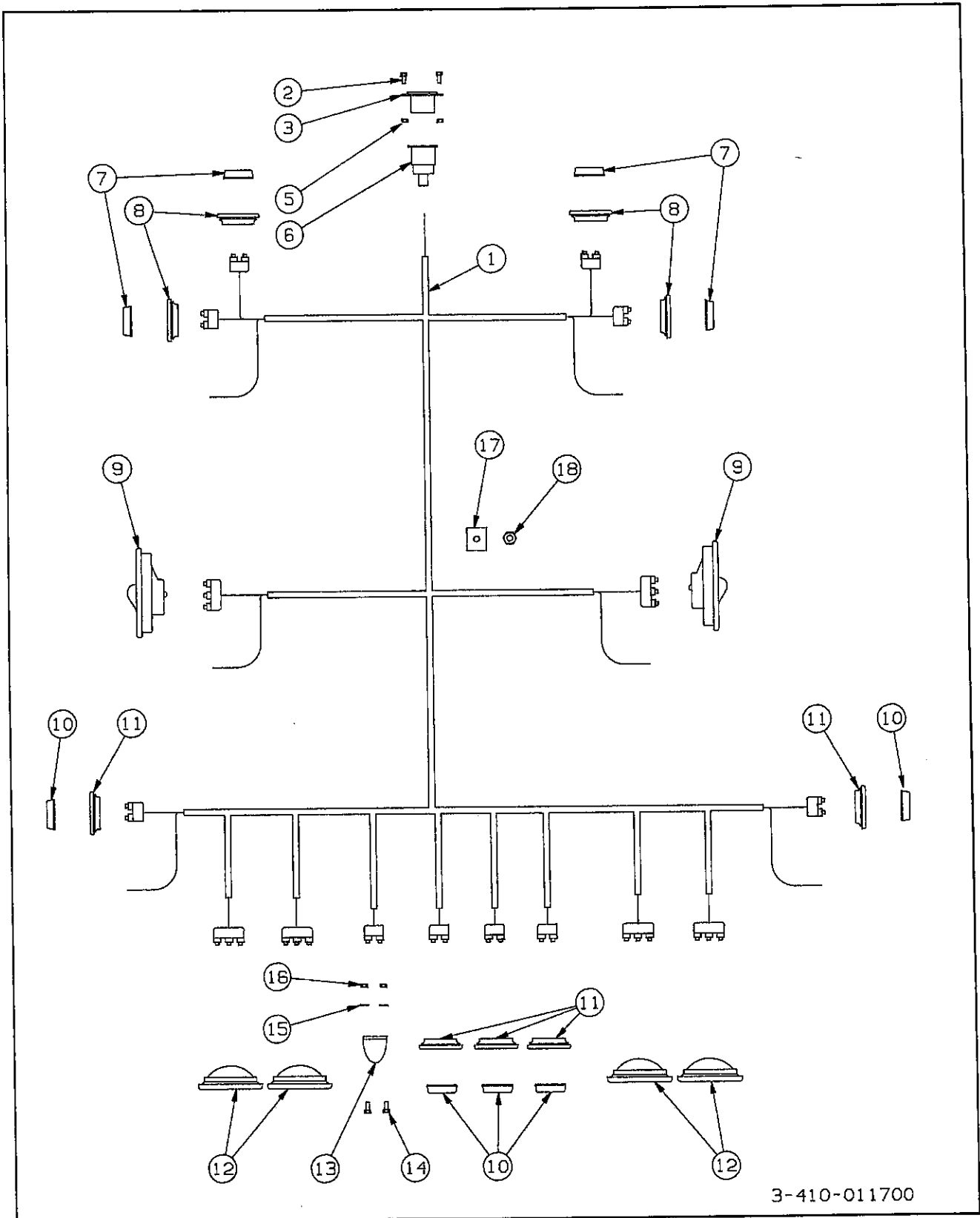


Figure 6-2 Electrical System

## ELECTRICAL SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
1	3-368-010203	HARNESS, ELECTRICAL 370 AES	1
2	5/16-18X1-1/4CS	CAPSCREW HEX GR2	2
3	59S-7	RECEPTACLE, 7 PIN	1
4	5/16SLW	WASHER SPLIT LOCK ZP	2
5	5/16-18HFLN	NUT HEX LOCK GRB CAD W/WAX	2
6	59W-2-3	RUBBER BOOT	1
7	10205Y	REFLECTOR LAMP YELLOW	4
8	10403	GROMMET MOUNT	6
9	60015Y	LIGHT TURN AND CLEARANCE	2
10	10205R	REFLECTOR LAMP RED	5
11	10404	GROMMET MOUNT 3 IN	3
12	40002R	LIGHT 4 IN STOP TURN TAIL	4
13	15009	LICENSE LAMP	1
14	3/16X3/4RHDSTV	BOLT, STOVE ROUND HEAD	2
15	3/16SLW	WASHER, SPLIT LOCK	2
16	3/16-24HFN	NUT ZP GR2	2
17	2-181-010001	HOSE CLAMP	40
18	1-510-010001	NUT, 3/8-16 FLANGE LOCK	40

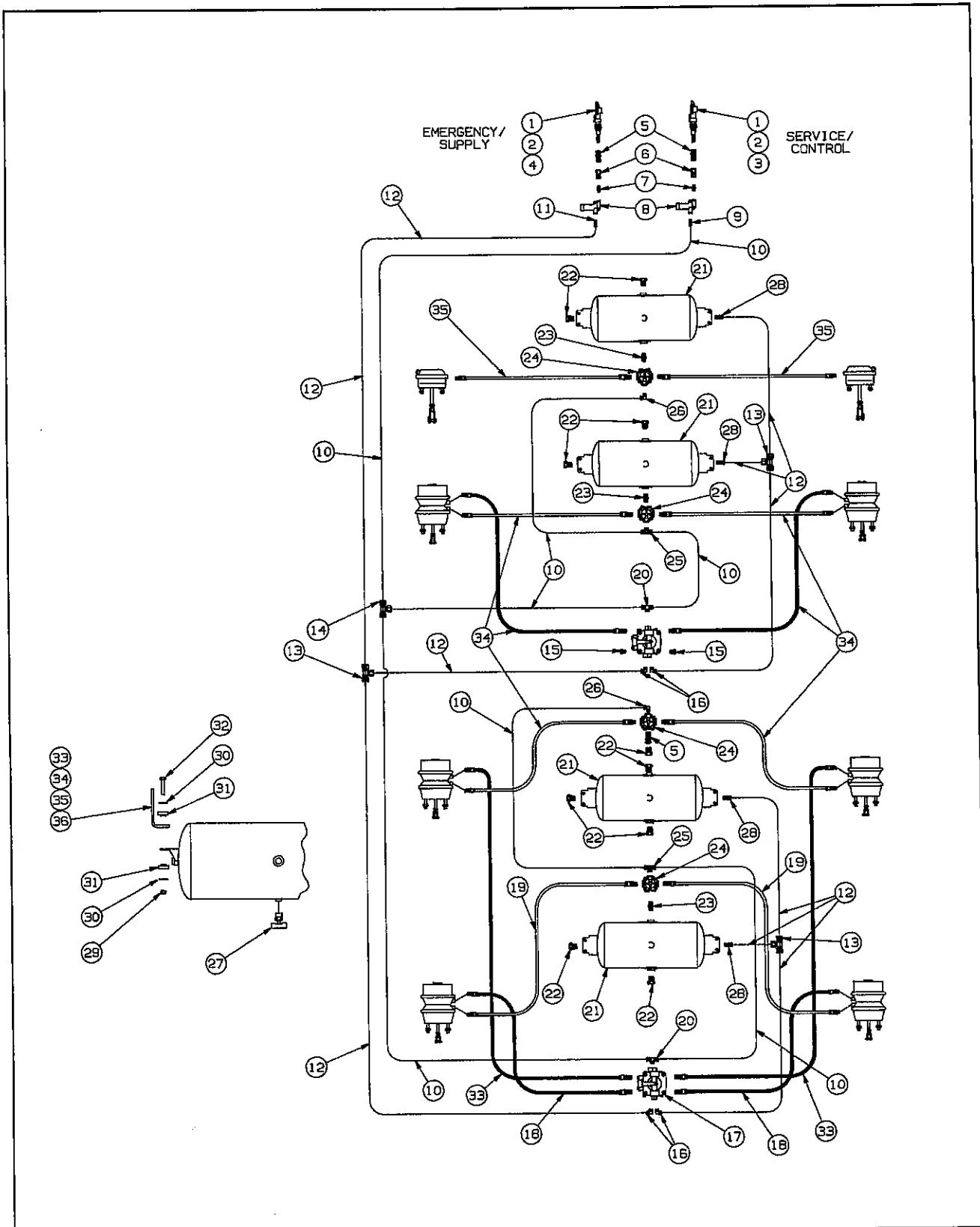


Figure 6-3 Air Brake System

## AIR BRAKE SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
	3-011-010013	AIR SYS. 370 AES	
1	55B11	GLAD HAND	2
2	36407	GLADHAND DUMMY	2
3	55B61-7	TAG SERVICE LINE VELVAC 035026	1
4	55B61-6	TAG EMER. LINE VELVAC 035025	1
5	55B61	FRAME UNION	3
6	1-297-010021-05	FITTING, BRASS PIPE, REDUCER COUPLING	2
7	1-297-010019-06	FITTING, 3/8, BRASS PIPE, HEX NIPPLE	2
8	3-295-010006	FILTER, AIR LINE	2
9	1-297-010007-12	FITTING, AIR 3/8TUBE X 3/8 NPT	1
10	62P6	TUBING, NYLON 3/8 OD	AR
11	1-297-010007-15	FITTING AIR 1/2 TUBE X 3/8NPT	1
12	62P8	TUBING, NYLON 1/2 OD	AR
13	1-297-010010-06	FITTING, AIR UNION TEE 1/2	3
14	1-297-010010-03	FITTING, AIR, UNION TEE 3/8	1
15	1-297-010033-03	PLUG, PIPE, BLACK 3/8 NPTF	2
16	1-297-010008-23	FITTING, AIR 90 1/2TUBE X 3/8NPT	4
17	758-181	VALVE TASK 4 PORT	2
18	1-384-010038018	HOSE, AIR 3/8 W/3/8 ENDS, 18"	2
19	1-384-010038042	HOSE, AIR 3/8 W/3/8 ENDS, 42"	2
20	1-297-010015-07	FITTING, AIR, BR TEE 3/8T-3/8P	2
21	3-780-010002	TANK AIR 9.5X22.5 .5NPT PORTS	4
22	1-297-010033-04	FITTING, 1/2, BRASS PLUG-HEX PIPE	11
23	1-297-010019-08	FITTING, 1/2, BRASS PIPE, HEX NIPPLE	3
24	3-843-010005	VALVE, RELAY 2 PORT THIRD AXLE	4
25	1-297-010015-06	FITTING, AIR, BR TEE 3/8T-1/4P	2
26	1-297-010008-18	FITTING, AIR 90 3/8TUBE X 1/4NPT	2
27	56D4	COCK, DRAIN AIR TANK VEL036019	4
28	1-297-010007-16	FITTING, AIR, 1/2TUBE X 1/2 NPT	4
29	3/8-16HFLN	NUT HEX LOCK GRB CAD W/WAX	16
30	3/8FW	WASHER FLAT ZP	32
31	805-2	BUSHINGS, STEP	32
32	3/8-16X1-1/2CS	SCREW HEX HEAD CAP GR5	16
33	1-384-010038054	HOSE, AIR 3/8 W/3/8 ENDS, 54"	2
34	1-384-010038024	HOSE, AIR 3/8 W/3/8 ENDS, 24"	6
35	1-384-010038032	HOSE, AIR 3/8 W/3/8 ENDS, 32"	2
36	105-0211	TYWRAP 3/16-3-1/2DIA TY-527MX	AR

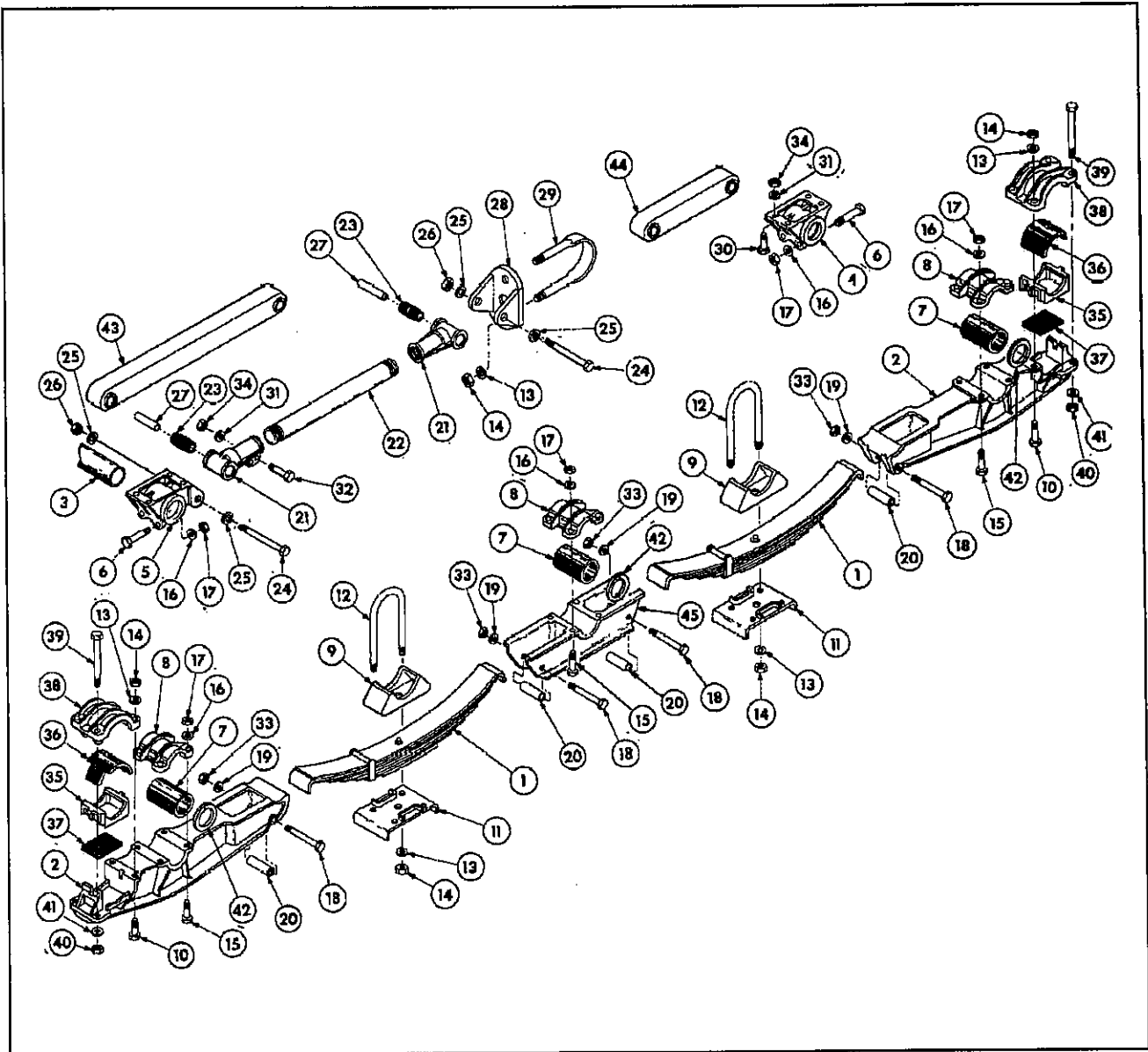


Figure 6-4 Spring Suspension

## SPRING SUSPENSION

ITEM	PART NO.	DESCRIPTION	QTY.
	3-762-010672	SUSPENSION, 4AX S/R (NEWAY #TR-4100-B)	
1	915-57-288	SPRING ASSEMBLY	4
2	910-15-015	EQUALIZING BEAM FOR 5" RD. AXLES	4
3	910-38-290	TRUNNION TUBE 3-1/2" O.D. X 1/2" W. X 44-1/4" LG. H.T.	3
4	915-01-011	TRUNNION CLAMP REAR	2
5	915-18-040	TRUNNION CLAMP - FRONT & CENTER TRUNNION LH	2
	915-18-041	TRUNNION CLAMP - FRONT & CENTER TRUNNION RH	2
6	930-03-635	CAP SCREW 3/4" - 10 X 5"	12
7	900-08-011	TRUNNION RUBBER BUSHING	6
8	910-10-157	TRUNNION RUBBER CAP	6



## SPRING SUSPENSION (CONTINUED)

ITEM	PART NO.	DESCRIPTION	QTY.
9	910-01-075	AXLE SPRING SEAT FOR 5" RD. AXLES	4
10	930-04-241	CAP SCREW FOR 5" RD. AXLES 1" - 8 X 3-1/2"	8
11	910-10-108	SPRING CLAMP PLATE FOR 5" RD. AXLES	4
12	900-41-324	U-BOLT 1- 8 X 10-1/2 GR8 5" RD. AXLES	8
13	936-00-168	FLAT WASHER 1"	32
14	934-00-502	LOCK NUT 1" - 8	32
15	930-03-585	CAP SCREW 3/4" - 10 X 3"	24
16	936-00-156	FLAT WASHER 3/4"	36
17	934-00-494	LOCK NUT 3/4" - 10	36
18	930-02-799	CAP SCREW 7/16" - 14 X 6"	8
19	936-00-130	FLAT WASHER 7/16"	8
20	910-36-128	PIPE SPACER	8
21	915-44-138	RADIUS ROD END R.H. (INCLUDES ITEM 23)	1
	915-44-137	RADIUS ROD END L.H. (INCLUDES ITEM 23)	1
22	910-38-475	RADIUS ROD SCREW	1
23	900-08-002	RUBBER BUSHING	8
24	932-00-945	ROD BOLT 1-1/8" - 7 X 8-1/8"	8
25	936-00-174	FLAT WASHER 1-1/8"	16
26	934-00-506	LOCK NUT 1-1/8" - 7	8
27	900-38-083	DELTRIN LINER 1-1/8"	8
28	910-18-039	RADIUS ROD AXLE BRACKET	4
29	900-41-807	U-BOLT FOR 5" RD. AXLES 1" - 8	4
30	930-03-347	CAP SCREW 5/8" - 11 X 2	24
31	939-00-025	FLAT WASHER 5/8"	28
32	930-03-383	CAP SCREW 5/8" - 11 X 3-1/2"	4
33	934-00-476	LOCK NUT 7/16" - 14	8
34	934-00-490	CROWN LOCK NUT 5/8" - 11	28
35	910-01-089	AXLE ADAPTER FOR 5" ROUND AXLES	4
36	910-28-051	RUBBER WRAPPER FOR 5" RD. AXLES	4
37	910-28-089	RUBBER PAD LOWER	4
38	910-10-060	AXLE CAP FOR 5" RD. AXLES	4
39	930-03-941	CAP SCREW 7/8" - 9 X 9	8
40	934-00-498	LOCK NUT 7/8" - 9	8
41	936-00-162	FLAT WASHER 7/8"	8
42	936-00-035	WASHER	6
43	915-44-147	RADIUS ROD- FIXED (INCLUDES 2 OF ITEM 23) (2ND AXLE)	1
44	915-44-167	RADIUS ROD- FIXED (INCLUDES 2 OF ITEM 23) (3RD AXLE)	2
45	915-15-123	TR EQUALIZER BEAM ASSEMBLY	2
	SRK-98	RADIUS ROD SERVICE KIT(INCLUDES ITEMS 23,25,27 & 31)	
	SRK-97	TRUNNION AND END AXLE SERVICE KIT (INCLUDES ITEMS 7,14,36,37,39,40, & 41)	

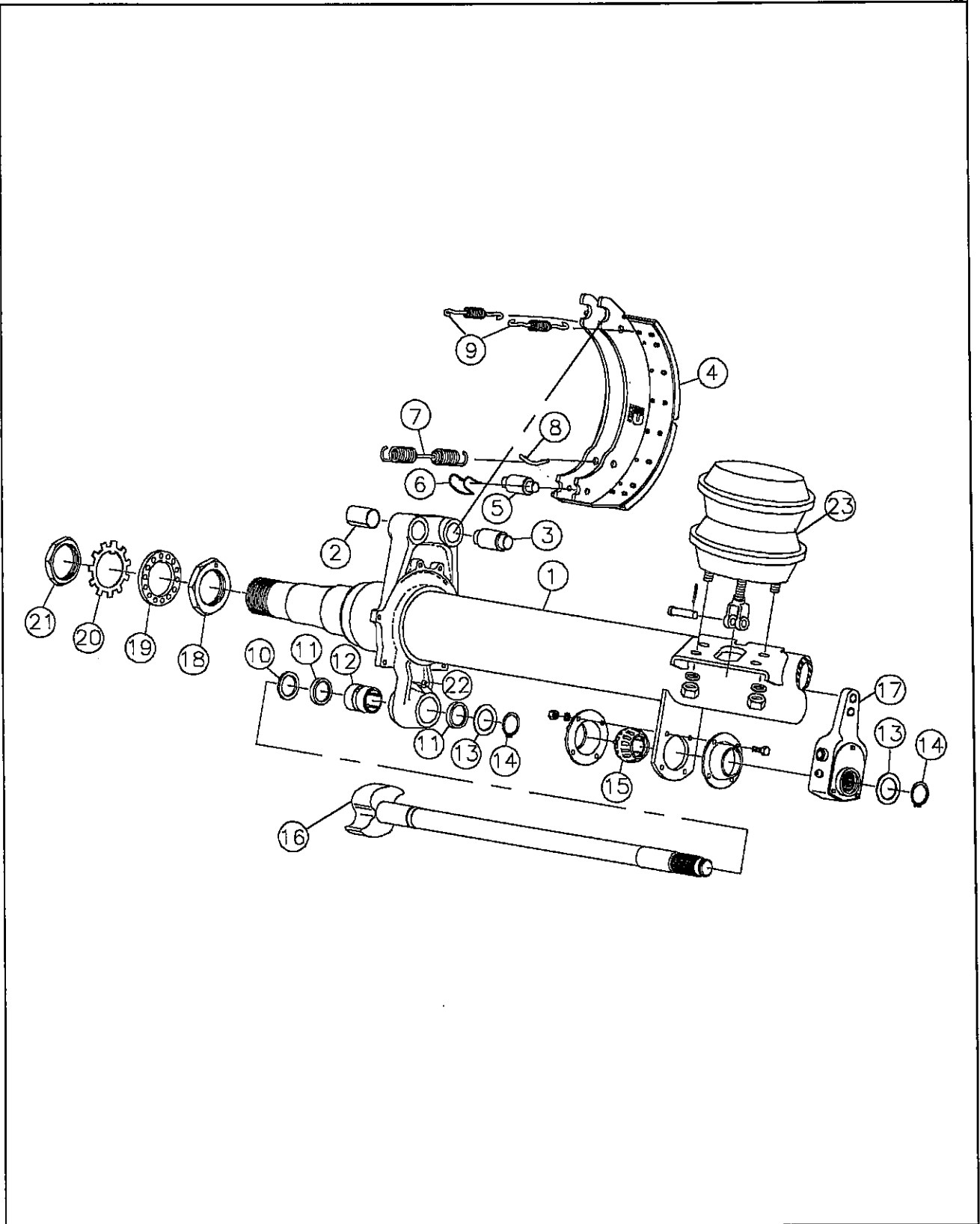


Figure 6-5 Axle Assembly

## AXLE ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
	3-042-010104	AXLE, 77-1/2" TRACK, 16-1/2X7 BK ASA	2
	3-042-010105	AXLE, 77-1/2" TRACK, 16-1/2X7 BK SPG.	2
1	D-2516*	BEAM W/ BRACKETS	1
	K71-136-00	BRAKE SHOE HARDWARE KIT (ITEMS 2,3,5,6,7,8, AND 9)	
2	014-068-00**	BUSHING - SPIDER ANCHOR PIN	4
3	056-017-00	ANCHOR PIN	4
4	040-180-00	SHOE AND LINING ASSEMBLY	4
	040-180-01	BRAKE SHOE, LINING, ROLLER AND RETAINER	4
	K71-138-00	BRAKE BLOCK KIT - LINING AND RIVETS	4
5	014-065-00	ROLLER, KNURLED	4
6	071-122-00	RETAINER, ROLLER	4
7	046-096-00	SPRING, SHOE	2
8	056-018-00	RETAINER, RETRACTOR SPRING	4
9	046-097-00	SPRING, SHOE KEEPER	4
	K71-135-00	CAMSHAFT REPAIR KIT (ITEMS 10-15, AND 22)	
10	005-096-00	WASHER, CAMSHAFT	2
11	010-052-00	SEAL, GREASE	4
12	014-056-00	BUSHING, CAMSHAFT SPIDER	2
13	005-097-00	WASHER, CAMSHAFT	4
14	069-020-00	RETAINER, CAMSHAFT	2
15	014-058-00	BUSHING, CAMSHAFT SUPPORT	2
16	034-065-00	CAMSHAFT, 26-1/2" LH	1
	034-064-00	CAMSHAFT, 26-1/2" RH	1
17	055-011-06	AUTO SLACK ADJUSTER	2
18	006-114-00	NUT, INNER SPINDLE	2
19	005-098-00	WASHER, SPINDLE LOCK	2
20	005-099-00	WASHER, TABBED SPINDLE LOCK	2
21	006-115-00	NUT, OUTER SPINDLE	2
22	061-006-00	FITTING, GREASE, 45°	2
23	034-057-01	CHAMBER, AIR BRAKE (3-042-010105)	2
	034-058-01	CHAMBER, SPRING BRAKE (3-042-010104)	2

\* WHEN ORDERING THE BEAM WITH SPINDLE, SPIDER AND BRACKETS ATTACHED, YOU WILL NEED THE BEAM NUMBER, TRACK LENGTH, BRAKE SIZE, AND CAMSHAFT LENGTH.

\*\* THESE PARTS ARE AVAILABLE AS PART OF THE REPAIR KIT LISTED.

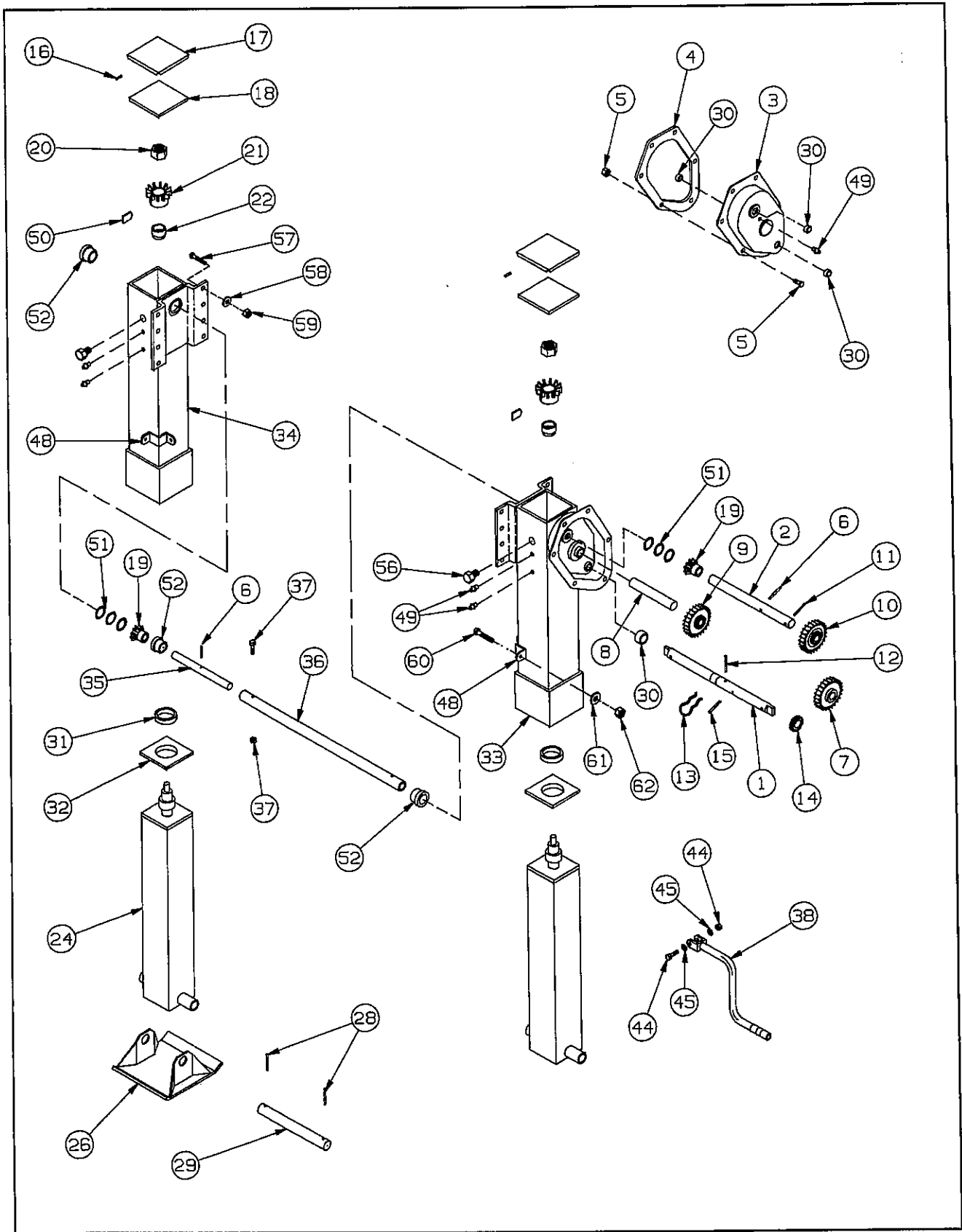


Figure 6-6 Landing Gear Assembly

## LANDING GEAR ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
	3-725-010063	LAND GEAR 120,000 (ITEMS 1- 56) (HOLLAND#LG75-3A105)	
1	XA-V-05159-A	DRIVE AND GEAR SHAFT	1
2	XA-V-05123-A	DRIVE GEAR SHAFT	1
3	XA-V-1920	GEARBOX COVER	1
4	XB-V-1926	GASKET	1
5	XB-3103	LOCKNUT 1/4"-28	6
	XB-CX-14-28-F-58	HEX HEAD CAP SCREW 1/4"-28X5/8"	6
6	XB-02065	GROOVE PIN	2
7	XA-V-1927	IDLER GEAR	1
8	XA-V-1957	IDLER GEAR SHAFT	1
9	XA-V-1928-1	STEP GEAR (UNDRILLED)	1
10	XA-V-1928	STEP GEAR (DRILLED)	1
11	XB-21-S-375-1500	SPIRAL PIN 3/8" X 1-1/2"	1
12	XB-21-S-187-1250	SPIRAL PIN 3/16" X 1-1/4"	1
13	XB-V-1949	SHIFTER SPRING	1
14	XA-V-1929	SHIFTER GEAR	1
15	XA-CRP-V-1917	PIN 3/8" X 1-7/16"	1
16	XB-04112	SELF TAPPING SCREW	4
17	XA-V-03824	UPPER LEG COVER	2
18	XB-V-1966	GASKET	2
19	XA-V-04204-1	BEVEL PINION	2
20	XB-FW-25	JAM NUT 1"-14	2
21	XA-V-04205-1	BEVEL GEAR	2
22	XB-V-643-A2	BUSHING	2
24	XA-V-05356-0 - 5	INNER LEG AND SCREW ASSY.	2
26	XA-V-796-B-1	SKID FOOT 12" X 11-1/2"	2
28	XB-21-S-375-3000	ROLL PIN 3/8" X 3"	4
29	XA-V-1901-1	AXLE	2
30	XB-V-851	BUSHING	4
31	XB-V-647	THRUST BEARING	2
32	XA-V-1913	THRUST WASHER	2
33	XA-V-03876-0 - 5	OUTER LEG ASSY (2 SPEED)	1
34	XA-V-03875-0 - 5	OUTER LEG ASSY. (SINGLE SPEED)	1
35	XA-V-05122-A	DRIVE GEAR SHAFT	1
36	XA-V-1910	CROSS SHAFT	1
37	XB-V-444-1	HEX HEAD CAP SCREW 3/8"-16 X 1-3/4"	2
	XB-338	LOCKNUT 3/8"-16	2
38	3-360-010016	TUBULAR HAND CRANK (MODIFIED)	1
40	XA-V-1914	CRANK HANGER	1
44	XB-C-38-C-214	HEX HEAD CAP SCREW 3/8"- 16 X 2-1/4"	1
	XB-338	LOCKNUT 3/8"-16	1
45	XB-1108	SAE 3/8" WASHER	2
48	XA-V-1938	BRACE	2
49	XB-767	LUBE FITTING	5
50	XB-H-32-2	WOODRUFF KEY	2
51	XB-03816	SHIM	AR
52	XB-0307	BEARING	3
56	XB-01789	LUBE PLUG	2
57	1/2-13X2HHCS	SCREW, HEX CAP GR5	18
58	1/2SLW	WASHER SPLIT LOCK ZP	18
59	1/2-13HFN	NUT, ZP GR2	18
60	5/8-11X3-1/4CS	SCREW, HEX CAP GR5	4
61	5/8SLW	WASHER SPLIT LOCK ZP	4
62	5/8-11HFN	NUT, ZP GR2	4

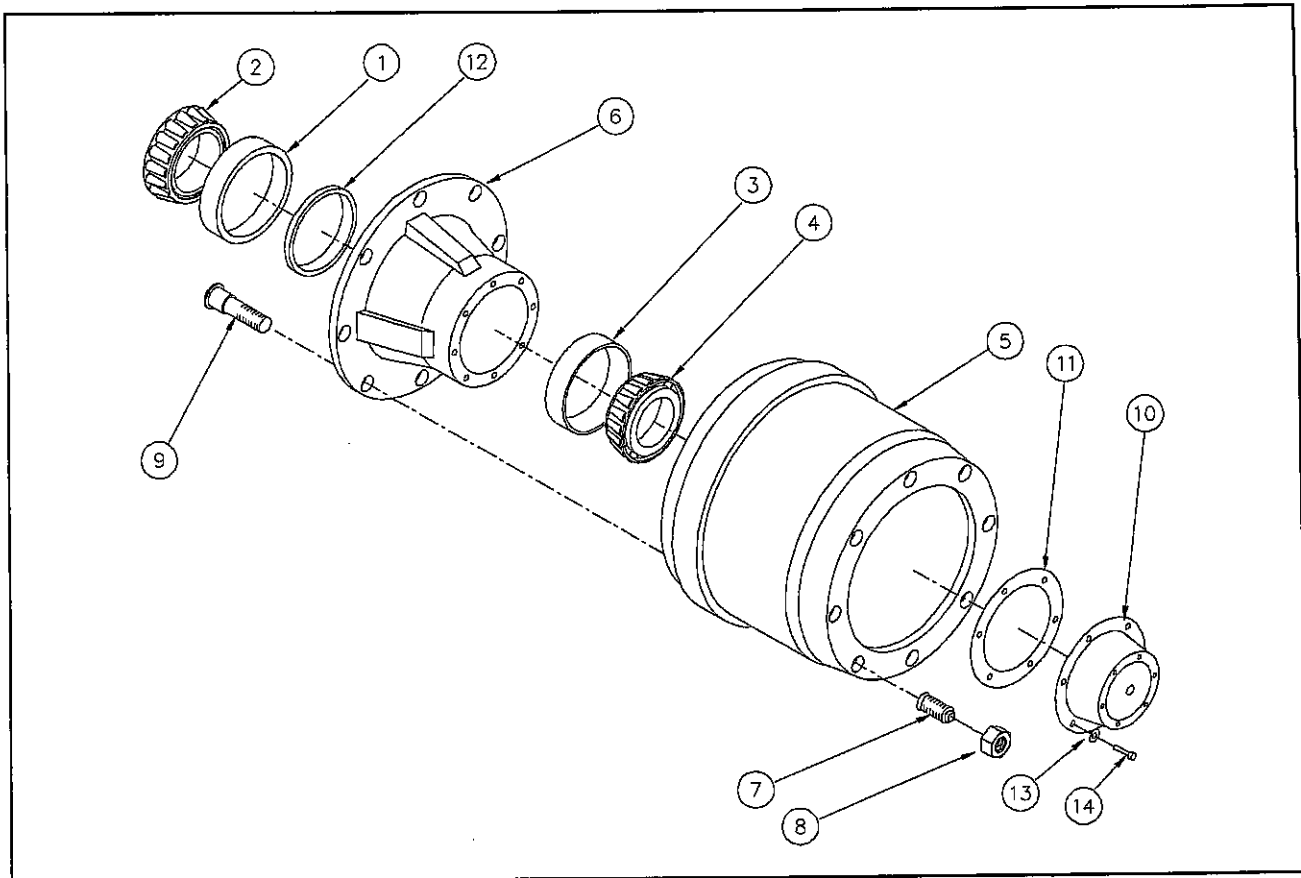


Figure 6-7 Hub and Drum Assembly

### HUB AND DRUM ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
	3-406-010052	HUB/DRUM ASSY. L.H.	4
	3-406-010053	HUB/DRUM ASSY. R.H.	4
1	HM218210	INNER BEARING CUP	1
2	HM218248	INNER BEARING CONE	1
3	HM212011	OUTER BEARING CUP	1
4	HM212049	OUTER BEARING CONE	1
5	67101	OUTBOARD MOUNTED BRAKE DRUM	1
6	1020	HUB, IRON	1
7	107083	CAPNUT, INNER, L.H.	10
	107082	CAPNUT, INNER, R.H.	10
8	178921	CAPNUT, OUTER, L.H.	10
	178910	CAPNUT, OUTER, R.H.	10
9	198521	STUD, L.H.	10
	198510	STUD, R.H.	10
10	021-038-01 (4009)	CAP, HUB	1
11	071-124-00 (3067)	GASKET, OIL CAP	1
12	010-055-01	SEAL	1
13	5/16SLW	LOCKWASHER	6
14	5/16-18X3/4HHCS	CAP SCREW	6
15	3-870-010035	WHEEL, DISC, 8.25 X 22.5 (NOT SHOWN)	1
16	TR573	VALVE STEM (NOT SHOWN)	1

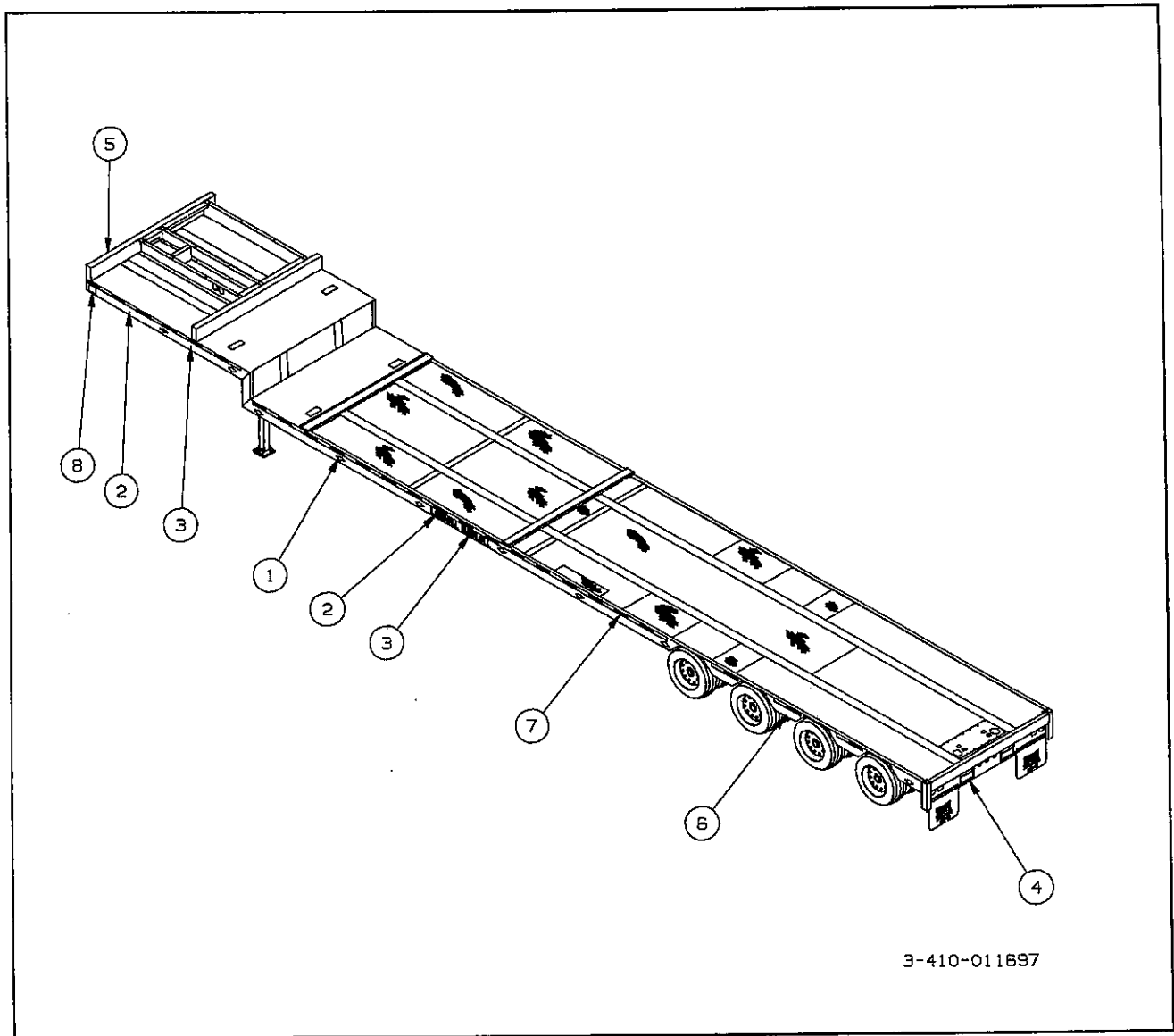


Figure 6-8 Decal Placement

## DECAL PLACEMENT

ITEM	PART NO.	DESCRIPTION	QTY.
1	1-573-010002	DECAL L WHITE	8
2	1-573-010003	DECAL LANDOLL WHITE	4
3	1-573-010004	DECAL HAULLOLL WHITE	4
4	1-573-010007	DECAL LANDOLL WHITE	2
5	3-573-010020	PLATE, IDENTIFICATION	1
6	3-573-010210	DECAL, TORQUE SPEC 8-10 STUD HUB	1
7	3-573-010377	DECAL 2" REFLEXITE RD/WHT	680"
8	3-573-010035	DECAL, 40,000 LBS. CONC. LOAD IN 10' FOOT	1

**NOTES:**

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