343B / 344
Travel Axle Trailer
Operator's Manual



LANDOLL COMPANY, LLC
1900 North Street
Marysville, Kansas 66508
(785) 562-5381
800-428-5655 ~ WWW.LANDOLL.COM

Instructions for Ordering Parts

**** Repair parts must be ordered through an Authorized Dealer ****

DEALER INSTRUCTIONS FOR ORDERING PARTS FROM LANDOLL PARTS DISTRIBUTION CENTER

Phone #: 800-423-4320 or 785-562-5381 **Fax #: 888-527-3909**
Order online: dealer.landoll.com

DATA PLATE

The Data Plate, which lists the model number and serial number, is located on the front of the frame.

SERIAL NUMBER

The following information will help decode the trailer serial number

AAABBBCDEFGHJJJJJ

AAA	= world manufacturer identifier
BBB	= model
C	= length
D	= axle type
E	= federal check digit

F	= model year
G	= plant of manufacture
H	= model version
JJJJJ	= serial number

MANUFACTURED BY/
FABRIQUE PAR:

Landoll Company,LLC
1900 North Street
Marysville, KS 66508
1-800-428-5655 www.landoll.com

DATE: **TYPE/TYPE DE VEHICULE:** **TRA/REM**

GVWR/PNBV:

AXLE	**TIRE/PNEU**	**RIM/JANTE**	**COLD INFL PRESS/ PRESS DE GONG. À FROID TIRE/PNEU**	**GAWR/PNBE**
FR/AV				
INT				
RR/AR				

SGL/DUAL: **VIN/NIV:**

THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE.
CE VÈHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTU DU RÈGLEMENT SUR LA SÈCURITÈ DES VÈHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION.
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS (FMVSS) IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

Data Plate and Location

Manuals for 343B / 344 Trailers.

Manual Number	Manual Type
F-1177	Operator's Manual
F-1178	Parts Manual



DANGER

DO NOT operate or perform any maintenance tasks on this equipment until you have completed the following:

1. **Receive proper training to operate this equipment safely.**
2. **Read and understand the operator's manual.**
3. **Be thoroughly trained on inspection and repair procedures.**

Failure to comply with this warning will result in serious injury or possibly death.

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Chapter 1

Introduction and Safety Information

Introduction

This manual provides operating, servicing, and maintenance instructions for the most common components and options of the Model 343B and 344 Travel Axle Semitrailer, manufactured by Landoll Company, LLC. If an option is not covered, contact an Authorized Landoll Dealer for assistance. This equipment manual is available online through the Dealer Portal at **dealer.landoll.com**.

IF YOU HAVE ANY QUESTIONS, CONTACT:
LANDOLL COMPANY, LLC.
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
PHONE # (785) 562-5381 or (800) 428-5655

CHAPTER 1	Gives basic instructions on the use of this manual and understanding the safety statements.
CHAPTER 2	Gives product specifications for the equipment, 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 descriptions and instructions for the proper operation of the equipment components.
CHAPTER 4	Gives instructions for the proper operation of the equipment.
CHAPTER 5	Gives general lubrication points, lubrication type, maintenance schedule, and maintenance procedures. Improper maintenance will void your warranty. Additional information may be found in the Manufacturer's References, **See Manufacturer Index on Page 7-1**. It is highly recommended that all service and repair parts are acquired through an authorized Landoll Dealer. Parts are available through an authorized Landoll Dealer, **See Parts Manual on Page 7-1**.
CHAPTER 6	A troubleshooting guide to aid in diagnosing and solving problems with the equipment.
CHAPTER 7	Gives manufacturer references to assist in the troubleshooting, service, and maintenance of the equipment components.The manufacturer references are available online through the Dealer Portal at **dealer.landoll.com**.
PARTS MANUAL	A separate manual showing the various assemblies, sub-assemblies, systems, and diagrams that are useful for both parts identification and during maintenance procedures. Refer to that manual when ordering replacement parts from your authorized Landoll dealer. The equipment parts manual is available online through the Dealer Portal at **dealer.landoll.com**.
WARRANTY	The Warranty Registration form is included with the product documents. Fill it out and mail it within 10 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 COMPANY, LLC.** **1900 NORTH STREET** **MARYSVILLE, KANSAS 66508** **ATTENTION: PUBLICATIONS - DEPT. 55**

DANGER

DO NOT operate or perform any maintenance tasks on this equipment until you have completed the following:

1. **Receive proper training to operate this equipment safely.**
2. **Read and understand the operator's manual.**
3. **Be thoroughly trained on inspection and repair procedures.**

Failure to comply with this warning will result in serious injury or possibly death.

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 will occur if safety measures or instructions on this label are not properly followed.

WARNING

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

CAUTION

Caution means minor or moderate injury could occur if instructions on this label are not properly followed.

NOTICE

Special notices that include helpful hints. Read and understand thoroughly.

IMPORTANT

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

NOTE

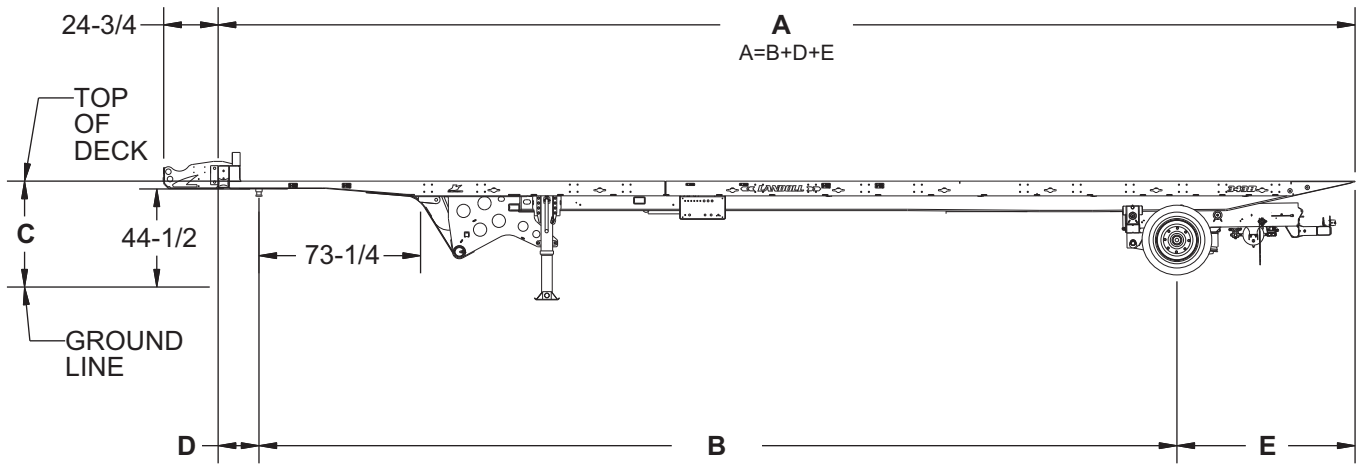
Make sure you read and understand the information contained in this manual and on the machine signs (decals) before you attempt to operate or maintain this vehicle.

The safety statements contained in this manual relate to the operation of the Model 343B and 344 Travel Axle Semitrailer.

Trailer Specifications

343B Trailer Specifications

Model	343B-39	343B-43	343B-46	343B-50
NOTICE	Capacity Ratings listed below are frame capacities **ONLY**. Some restrictions on load capacities are Tire and Wheel Load Ratings, Brake Size, Gross Axle Weight Rating (GAWR), Gross Vehicle Weight Rating (GVWR), Truck Towing Capacity, and State, Federal, Provincial, Local, and Industrial Regulations.			
Capacity	10,000 lbs (4,535 kg)	10,000 lbs (4,535 kg)	10,000 lbs (4,535 kg)	10,000 lbs (4,535 kg)
Deck Rating Concentrated in	10,000 lbs (4,535 kg) 10 ft (3 m)	10,000 lbs (4,535 kg) 10 ft (3 m)	10,000 lbs (4,535 kg) 10 ft (3 m)	10,000 lbs (4,535 kg) 10 ft (3 m)
Base Weight (+ / - 3%)	14,000 lbs (6,350 kg)	14,900 lbs (6,350 kg)	15,350 lbs (6,350 kg)	16,100 lbs (7,257 kg)
Tires / Load Rating	235/75R 17.5 / (H) 255/70R 22.5 / (H)	235/75R 17.5 / (H) 255/70R 22.5 / (H)	235/75R 17.5 / (H) 255/70R 22.5 / (H)	235/75R 17.5 / (H) 255/70R 22.5 / (H)
Rims	Hub Pilot 17.50 x 6.75 Hub Pilot 22.50 x 8.25	Hub Pilot 17.50 x 6.75 Hub Pilot 22.50 x 8.25	Hub Pilot 17.50 x 6.75 Hub Pilot 22.50 x 8.25	Hub Pilot 17.50 x 6.75 Hub Pilot 22.50 x 8.25
Width	102 in (259 cm)	102 in (259 cm)	102 in (259 cm)	102 in (259 cm)
King Pin Setting	18 in	18 in	18 in	18 in
Swing Clearance	74 in	74 in	74 in	74 in
Load Angle	12 Degrees	12 Degrees	12 Degrees	12 Degrees

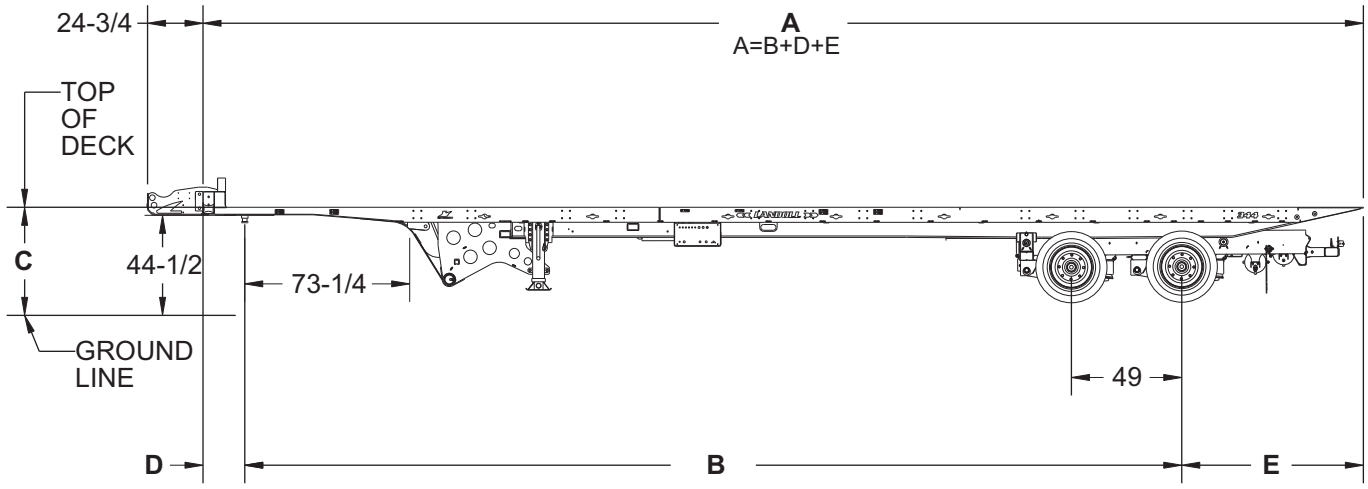


Model	A	B	C	D	E
343B-39	467-1/4 in (38' 11-1/4") (11.87 m)	368 in (30' 8") (9.34 m)	48 in (4' 0") (121.9 cm)	18-1/2 (44.45 cm)	80-3/4" (6' 8-3/4") (2.05 m)
343B-43	515-1/4 in (42' 11-1/4") (13.08 m)	416 in (34' 8") (10.56 m)	48 in (4' 0") (121.9 cm)	18-1/2 (44.45 cm)	80-3/4" (6' 8-3/4") 2.05 m)
343B-46	551-1/4 in (45' 11-1/4") (14 m)	452 in (37' 8") (11.48 m)	48 in (4' 0") (121.9 cm)	18-1/2 (44.45 cm)	80-3/4" (6' 8-3/4") 2.05 m)
343B-50	587-1/4 in (48" 11-1/4") (14.9 m)	488 in (40' 8") (12.40 m)	48 in (4' 0") (121.9 cm)	18-1/2 (44.45 cm)	80-3/4" (6' 8-3/4") 2.05 m)

Figure 2-1: 343B Trailer Specifications

344 Trailer Specifications

Model	344-39	344-43	344-46	344-50
NOTICE	Capacity Ratings listed below are frame capacities **ONLY**. Some restrictions on load capacities are Tire and Wheel Load Ratings, Brake Size, Gross Axle Weight Rating (GAWR), Gross Vehicle Weight Rating (GVWR), Truck Towing Capacity, and State, Federal, Provincial, Local, and Industrial Regulations.			
Capacity	N/A	15,000 lbs (6,803 kg)	15,000 lbs (6,803 kg)	N/A
Deck Rating **Concentrated in**	N/A N/A	15,000 lbs (6,803 kg) 20 ft (6 m)	15,000 lbs (6,803 kg) 20 ft (6 m)	N/A N/A
Base Weight (+ / - 3%)	N/A	17,0000 lbs (7,711 kg)	17,450 lbs (7,915 kg)	N/A
Tires / Load Rating	N/A	235/75R 17.5 / (H) 255/70R 22.5 / (H)	235/75R 17.5 / (H) 255/70R 22.5 / (H)	N/A
Rims	N/A	Hub Pilot 17.50 x 6.75 Hub Pilot 22.50 x 8.25	Hub Pilot 17.50 x 6.75 Hub Pilot 22.50 x 8.25	N/A
Width	N/A	102 in (259 cm)	102 in (259 cm)	N/A
King Pin Setting	N/A	18 in	18 in	N/A
Swing Clearance	N/A	74 in	74 in	N/A
Load Angle	N/A	12 Degrees	12 Degrees	N/A



Model	A	B	C	D	E
344-39	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A
344-43	515-1/4 in (42' 11-1/4") (13.08 m)	416 in (34' 8") (10.56 m)	48 in (4' 0") (121.9 cm)	18-1/2 (44.45 cm)	80-3/4" (6' 8-3/4") 2.05 m)
344-46	551-1/4 in (45' 11-1/4") (14 m)	452 in (37' 8") (11.48 m)	48 in (4' 0") (121.9 cm)	18-1/2 (44.45 cm)	80-3/4" (6' 8-3/4") 2.05 m)
344-50	N/A N/A	N/A N/A	N/A N/A	N/A N/A	N/A N/A

Figure 2-2: 344 Trailer Specifications

General Specifications	
AIR HOOKUP	Front Mounted Color Coded Gladhands
ELECTRICAL HOOKUP	Front Mounted 7-Way Receptacle, 12 VDC System
BRAKES - Air Actuated Spring, Anti-Lock Brakes	12.25” x 7.5” Drum (STD), (OPT) 12.25” Disc 16.5” x 7” Drum (STD), (OPT) 16.5” Disc

Hydraulic Hookup	
NOTICE	The hydraulic power supply must be capable of operating at the flow rate and deadhead pressure listed below.
OPERATING FLOW	20 gpm max (76 Lpm), with a minimum reservoir size of 30 gallons (114 liters), minimum of 3/4 in diameter hoses, with a pressure relief on the hydraulic supply.
MAXIMUM PRESSURE RELIEF VAVLE SETTINGS	**(Hydraulic Supply Pump)** 2,500-2,600 psi (17,237-17926 kPa) **(Trailer Control Valve)** 2,500 psi (17,237 kPa)
QUICK COUPLERS	Flat Face, 3/4 in Body Size

Specific Bolt Torques

Air Spring Assembly	Ft. Lbs	Nm
3/8" - AIR SPRING BOLTS (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP	15 - 20	21 - 27
1/2" - AIR SPRING BOLTS (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP SAF - HOLLAND	 25 - 30 30 - 40	 34 - 40 41 - 54
3/4" - AIR SPRING BOLTS (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP SAF - HOLLAND	 40 - 45 30 - 40	 55 - 61 41 - 54
Bumper Assembly, Rear		
3/4" - BUMPER MOUNT BOLTS (#242 BLUE LOCTITE APPLIED TO THREADS)	280	380
Cam Follower Assembly		
3" - CAM FOLLOWER (JAM NUT ONLY, APPLY #242 BLUE LOCTITE TO BOLT THREADS) 4", 5" - CAM FOLLOWER (APPLY #242 BLUE LOCTITE TO BOLT THREADS)	250 250	339 339
Suspension Assembly - Air Ride		
1-1/8" - PIVOT AND ADAPTER BOLTS (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP SAF - HOLLAND	 750 - 800 550 - 600	 1017 - 1084 746 - 813
7/8" - PIVOT BOLT LOCK NUTS (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP 7/8" - JAM NUT (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP	 500 - 550 150	 678 - 745 204
3/4" - SHOCK ABSORBER MOUNT BOLTS (CLEAN, DRY, NON-LUBRICATED THREADS) DEXTER CORP SAF - HOLLAND	 150 - 175 150 - 175	 204 - 237 204 - 237
1/2" - RIDE HEIGHT AIR VALVE CONTROL ROD & LINKAGE NUTS (CLEAN, DRY, NON-LUBRICATED THREADS)	50	68
1/4" - RIDE HEIGHT AIR VALVE & LINKAGE NUT (CLEAN, DRY, NON-LUBRICATED THREADS)	5	7
Wheel Fasteners		
OUTER SPINDLE NUTS	300 - 400	407 - 542
HUB CAP AND GASKET MOUNT BOLTS	10 - 15	14 - 20
FLANGE NUTS, LUG NUTS, OR PILOT WHEEL NUTS	450 - 500	611 - 677

General Torque Specifications

LANDOLL
FASTENER TORQUE SPECIFICATIONS
(Rev. 23/04)

This chart provides general torque specifications for Standard Nuts and Caps Screws (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Add 33% to the listed torque specification if the fastener is dry (solvent cleaned).

Cap screw grades are indicated by markings on the head, these vary among manufacturers.

Thick Nuts must be used on grade 8 cap screws.

SAE TORQUE SPECIFICATIONS (FOOT-POUNDS)

[ ] Indicates specifications for Prevailing Torque Nuts.

UNC Size	Grade 2	Grade 5	Grade 8
1/4 - 20	4 [5]	6 [7]	9 [11]
5/16 - 18	8 [10]	13 [16]	18 [22]
3/8 - 16	15 [19]	23 [29]	35 [43]
7/16 - 14	24 [30]	35 [43]	55 [62]
1/2 - 13	35 [43]	55 [62]	80 [100]
9/16 - 12	55 [62]	80 [100]	110 [137]
5/8 - 11	75 [94]	110 [137]	170 [212]
3/4 - 10	130 [162]	200 [250]	280 [350]
7/8 - 9	125 [156]	320 [400]	460 [575]
1 - 8	190 [237]	408 [506]	680 [850]
1-1/8 - 7	270 [337]	600 [750]	960 [1200]
1-1/4 - 7	380 [475]	840 [1050]	1426 [1782]
1-3/8 - 6	490 [612]	1100 [1375]	1780 [2225]
1-1/2 - 6	650 [812]	1460 [1825]	2360 [2950]

See back side for SAE UNF and Metric torques.

Form No. F-257-0322

SAE TORQUE SPECIFICATIONS (FOOT POUNDS)

[ ] Indicates specifications for Prevailing Torque Nuts.

UNF Size	Grade 2	Grade 5	Grade 8
1/4 - 28	5 [6]	7 [9]	10 [12]
5/16 - 24	9 [11]	14 [17]	20 [25]
3/8 - 24	17 [21]	25 [31]	35 [44]
7/16 - 20	27 [34]	40 [50]	60 [75]
1/2 - 20	40 [50]	65 [81]	90 [122]
9/16 - 18	60 [75]	90 [112]	130 [162]
5/8 - 18	85 [106]	130 [162]	180 [225]
3/4 - 16	150 [188]	220 [275]	320 [400]
7/8 - 14	140 [175]	360 [450]	500 [625]
1 - 14	210 [263]	540 [675]	760 [950]
1-1/8 - 12	300 [375]	660 [825]	1080 [1350]
1-1/4 - 12	420 [525]	920 [1150]	1500 [1875]
1-3/8 - 12	560 [700]	1260 [1575]	2010 [2512]
1-1/2 - 12	730 [912]	1640 [2050]	2660 [3325]

METRIC TORQUE SPECIFICATIONS

This chart provides torque specification for phosphate coated, Rockwell "C" 38-45 Metric Coarse Thread Class 10.9 Fasteners, Class 10.0 Nuts and Harden Flat Washers.

[ ] Indicates specifications for Prevailing Torque Nuts.

MM Size	Newton - Meters	Foot-Pounds
6	10 [14]	7 [10]
7	16 [22]	12 [16]
8	23 [32]	17 [24]
10	46 [60]	34 [47]
12	80 [101]	60 [75]
14	125 [155]	90 [115]
16	200 [240]	150 [180]
18	275 [330]	205 [245]
20	385 [450]	290 [335]
24	670 [775]	500 [625]
27	980 [1105]	730 [825]
30	1330 [1470]	990 [1090]
33	1790 [1950]	1730 [1870]
36	2325 [2515]	1730 [1870]
39	3010 [3210]	2240 [2380]

See front side for SAE UNC and notes.

Figure 2-3: General Torque Specifications

Hydraulic Fitting Torque Specifications

LANDOLL
HYDRAULIC FITTING TORQUE SPECIFICATIONS
(REV. 23/04)
AEROQUIP BRAND FITTINGS
37° JIC; ORS & ORB

This chart provides torque specifications for Plated Carbon Steel and Stainless Steel Fittings (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Minus 65% from the listed torque specification for Brass Fittings.

TORQUE SPECIFICATIONS
(FOOT-POUNDS)
[ ] Indicates specifications for Prevailing Torque Nuts.

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	240-280
-24	158-167	150-165	270-360
-32	245-258	-----	-----

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LANDOLL
HYDRAULIC FITTING TORQUE SPECIFICATIONS
(REV. 23/04)
GATES BRAND FITTINGS
37° JIC; ORS & ORB

This chart provides torque specifications for Plated Carbon Steel and Stainless Steel Fittings (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Minus 65% from the listed torque specification for Brass Fittings.

TORQUE SPECIFICATIONS
(FOOT-POUNDS)
[ ] Indicates specifications for Prevailing Torque Nuts.

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	-----	-----

FORM NO. F-263-2304 (2 of 3)

LANDOLL
HYDRAULIC FITTING TORQUE SPECIFICATIONS
(REV. 23/04)
PARKER BRAND FITTINGS
37° JIC; ORS & ORB

This chart provides torque specifications for Plated Carbon Steel and Stainless Steel Fittings (as received condition) that are not called out on processes or drawings.

This **DOES NOT** apply if special lubrication such as graphite moly-disulfide or other extreme pressure lubricants are used.

Minus 65% from the listed torque specification for Brass Fittings.

TORQUE SPECIFICATIONS
(FOOT-POUNDS)
[ ] Indicates specifications for Prevailing Torque Nuts.

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	58-62
-12	80-90	134-146	75-85
-14	-----	-----	-----
-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

FORM NO. F-263-2304 (3 of 3)

Figure 2-4: Hydraulic Fitting Torque Specifications

⚠ WARNING

Certain repairs or maintenance may pose a danger while performing the procedures, or during operation if repaired incorrectly. It is highly recommended to contact an authorized Landoll Service Center for service and repair.

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.

Component Descriptions

⚠ WARNING

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product, property or equipment.

- **DO NOT operate the semitrailer until you have read the operator's manual and completely understand the proper use and function of all controls.**
- **DO NOT operate the semitrailer with any known fault that might endanger the occupants, nearby workers, other traffic, the cargo, or the equipment.**

Hitch Assembly

This trailer is equipped with a hydraulic operated pivoting hitch assembly.

Hydraulic power is required from the tractor or an optional front trailer mounted power unit to operate the lift cylinders and other hydraulic options available.

The pivoting hitch assembly is used to tilt the front deck up and down during rear loading and unloading operations.

Frame Assembly

The frame assembly is the load bearing support structure that contains the control station, main deck, undercarriage, and tie down points.

Undercarriage Assembly

The undercarriage assembly is a hydraulic, traveling axle assembly that allows the rear of the trailer to lower reducing the load angle for loading and unloading operations.

The undercarriage is attached to the frame by cam followers. These cam followers allow the undercarriage to move forward and backward to change the tilting pivot point of the deck, allowing for a lower load angle. The undercarriage must be in the transport position (full back) and resting against the rear undercarriage stops.

It also serves as the support structure for the air tanks, axles, suspension, energy pack bumper, and optional tire inflation system.

Retrieval System (Options)

A retrieval system provides the operator with a mechanical advantage to load and unload complex non-powered cargo.

Retrieval System Accessories are additional components used with the retrieval system during the loading, unloading, and securing operations to increase safety and efficiency.

The standard accessories vary depending on the retrieval system drive purchased.

See the drive options below for an inventoried list of accessories that come with that specific drive system.

Options Available:

- Chain Drive - Front Deck Mounted.
- Winch Drive - Front Deck Mounted.

Chain Drive (Options)

The chain drive has been designed for straight line pulling on and pushing off cargo.

This retrieval system provides the operator the ability to safely handle multiple containers on the trailer.

Braden Gearbox:

1. The Braden Gearbox is a front mounted hydraulic motor driven 30:1 gear reduction gearbox. A chain sprocket mounted on the gearbox output shaft rotates and moves the continuous 1/2 inch chain loop around a rear mounted idler pulley to move the cargo.

Chain Drive Standard Retrieval System Accessories:

- (1) Chain Assembly, Container Loading, Front
- (1) Chain Assembly, Container Loading, Rear

- (1) Chain Assembly, Single Hook
- (1) Container, Pusher
- (2) Container, Stop, Front, Slide In, W/ Pins
- (2) Container, Stop, Rear, Slide In, W/ Pins
- (1) Hook Assembly, Chain Connect
- (2) Tie Down, Load Binder, 3/8 Ratchet
- For detailed usage or additional options. ***See Retrieval System Accessories (Options) on Page 3-22.***

Winch Drive (Options)

The winch drive has been designed for straight line pulling on and controlled slide off of the cargo.

This retrieval system provides the operator the ability to safely handle one container on the trailer.

Ramsey Winches:

1. Ramsey 12K, 1-Speed (12,000 lbs / 5443 kg) is an air operated free spool clutch, 5.1:1 gear reduction hydraulic driven winch. It uses a 1/2 in (12.7 mm) by 85 ft (25.9 m) long steel cable.
2. Ramsey 20K, 2-Speed (20,000 lbs / 9072 kg) is an air operated free spool clutch, electrical 12-vdc 2-speed solenoid, 25.53:1 gear reduction, hydraulic driven winch. It uses a 5/8 in (15.785 mm) by 85 ft (25.9 m) long steel cable.

Warn Winches:

1. Warn 12K, 1-Speed (12,000 lbs / 5443 kg) is an air operated free spool clutch, gear reduction hydraulic driven winch. It uses a 1/2 in (12.7 mm) by 85 ft (25.9 m) long steel cable.
2. Warn 20K, 2-Speed (20,000 lbs / 9072 kg) is a manual or air operated free spool clutch, electrical 12-vdc 2-speed solenoid, 36:1 gear reduction, hydraulic driven winches. It uses a 5/8 in (15.785 mm) by 85 ft (25.9 m) long steel cable.

Winch Drive Standard Retrieval System Accessories:

- (1) Chain Assembly, Container Loading, Front
- (1) Chain Assembly, Container Loading, Rear Assist
- (2) Container, Stop, Front, Slide In, W/ Pins
- (2) Tie Down, Load Binder, 3/8 Ratchet
- For detailed usage or additional options. ***See Retrieval System Accessories (Options) on Page 3-22.***

Winch, Free Spool Clutch (Options)

The free spool clutch interlocks the winch drum to the brake assembly, only allowing the hydraulic motor to control the rotation of the drum.

Free Spool Clutches Options:

- Manual Free Spool Clutch.
- Air Free Spool Clutch.

Manual Free Spool Clutch Assembly:

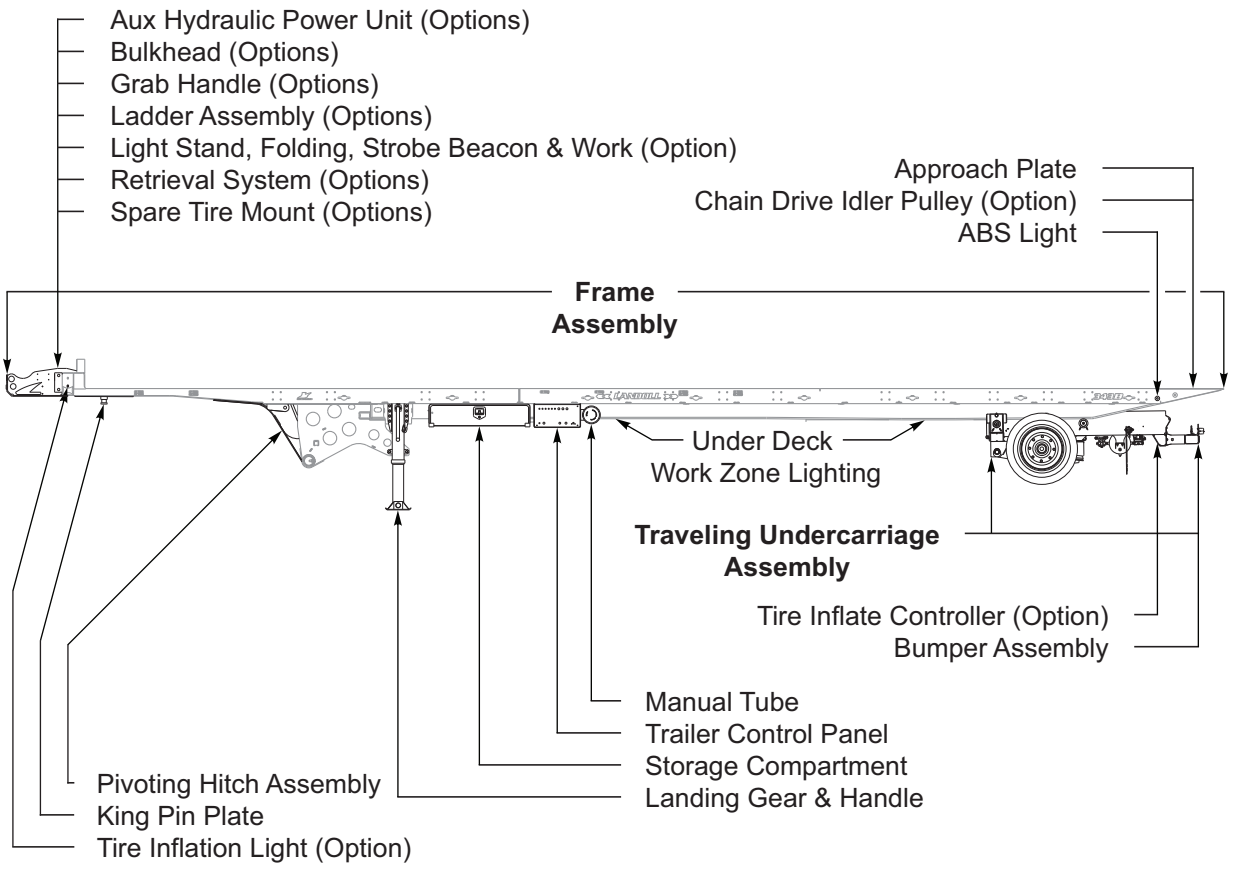
Releasing the free spool clutch, disengages the brake assembly from the winch drum, allowing the winch drum to be manually rotated.

Air Free Spool Clutch Assembly:

The Air Free Spool Clutch is operated by a Palm Button Valve that supplies/releases air pressure to/from the winch gearbox housing. It requires 50-120 psi (245-827 kpa) of air pressure to release the free spool clutch. The Winch Free Spool Palm Button is located on the control panel. ***See Free Spool Palm Button (Option) on Page 3-15.***

Components Locations

Trailer Components



Model 343B Displayed

Figure 3-1: Trailer Components

Hitch Assembly & Service Connects

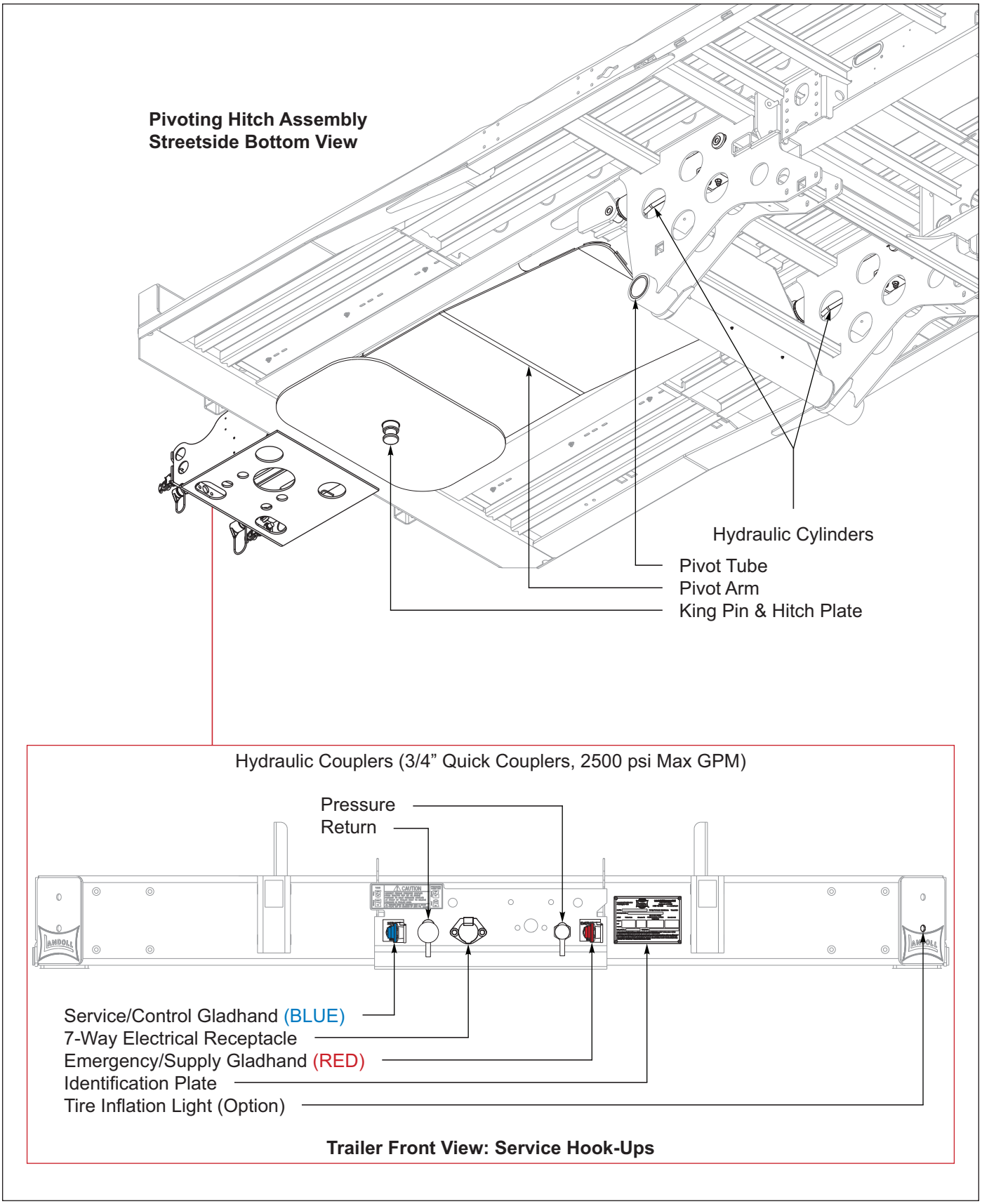
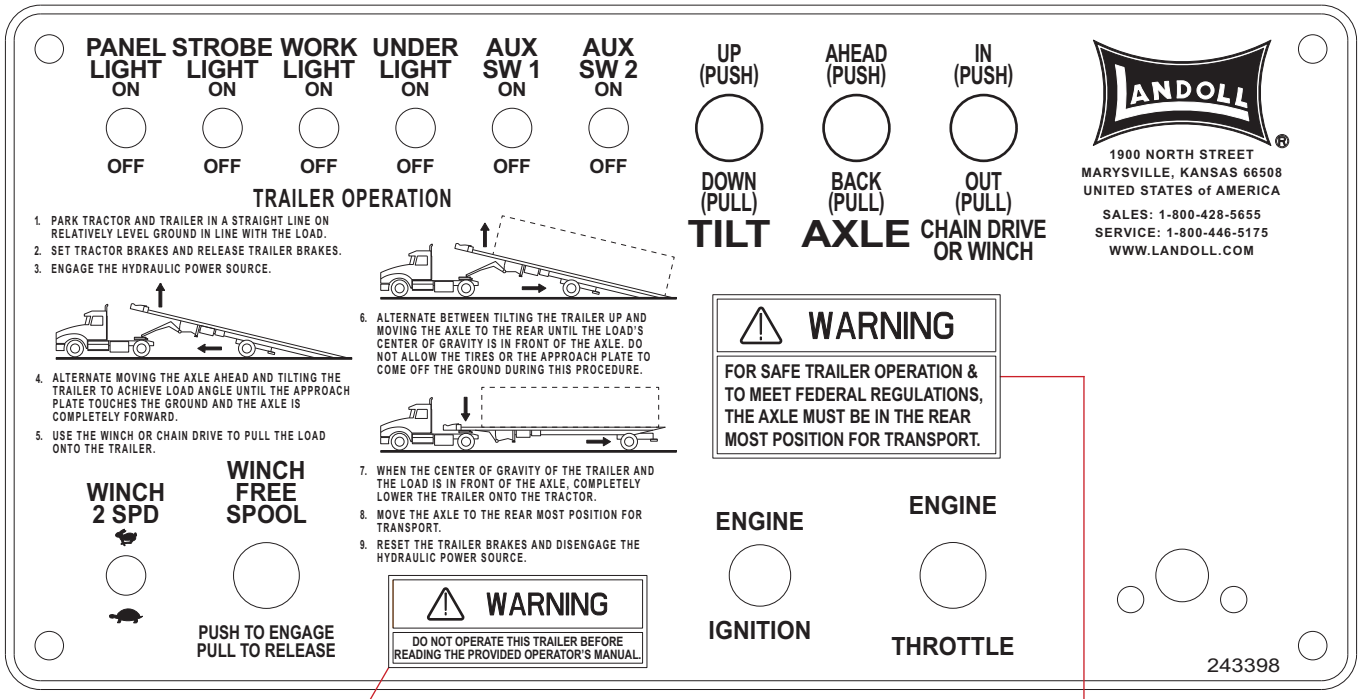


Figure 3-2: Gooseneck Assembly

Control Panel

NOTE: Control functions may depend on the options purchased.
View of Streetside Control Panel.



WARNING

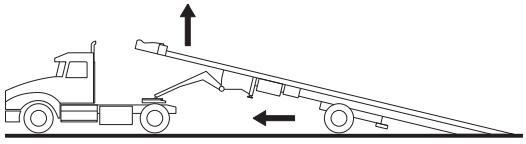
DO NOT OPERATE THIS TRAILER BEFORE READING THE PROVIDED OPERATOR'S MANUAL.

WARNING

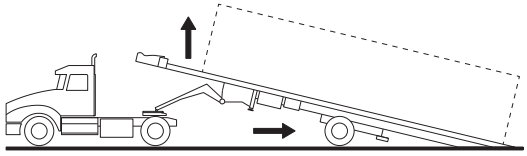
FOR SAFE TRAILER OPERATION & TO MEET FEDERAL REGULATIONS, THE AXLE MUST BE IN THE REAR MOST POSITION FOR TRANSPORT.

TRAILER OPERATION

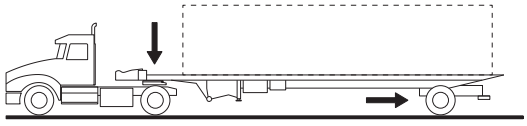
1. PARK TRACTOR AND TRAILER IN A STRAIGHT LINE ON RELATIVELY LEVEL GROUND IN LINE WITH THE LOAD.
2. SET TRACTOR BRAKES AND RELEASE TRAILER BRAKES.
3. ENGAGE THE HYDRAULIC POWER SOURCE.



4. ALTERNATE MOVING THE AXLE AHEAD AND TILTING THE TRAILER TO ACHIEVE LOAD ANGLE UNTIL THE APPROACH PLATE TOUCHES THE GROUND AND THE AXLE IS COMPLETELY FORWARD.
5. USE THE WINCH OR CHAIN DRIVE TO PULL THE LOAD ONTO THE TRAILER.



6. ALTERNATE BETWEEN TILTING THE TRAILER UP AND MOVING THE AXLE TO THE REAR UNTIL THE LOAD'S CENTER OF GRAVITY IS IN FRONT OF THE AXLE. DO NOT ALLOW THE TIRES OR THE APPROACH PLATE TO COME OFF THE GROUND DURING THIS PROCEDURE.



7. WHEN THE CENTER OF GRAVITY OF THE TRAILER AND THE LOAD IS IN FRONT OF THE AXLE, COMPLETELY LOWER THE TRAILER ONTO THE TRACTOR.
8. MOVE THE AXLE TO THE REAR MOST POSITION FOR TRANSPORT.
9. RESET THE TRAILER BRAKES AND DISENGAGE THE HYDRAULIC POWER SOURCE.

Figure 3-3: Control Panel

Bumper & Centralized Grease Points

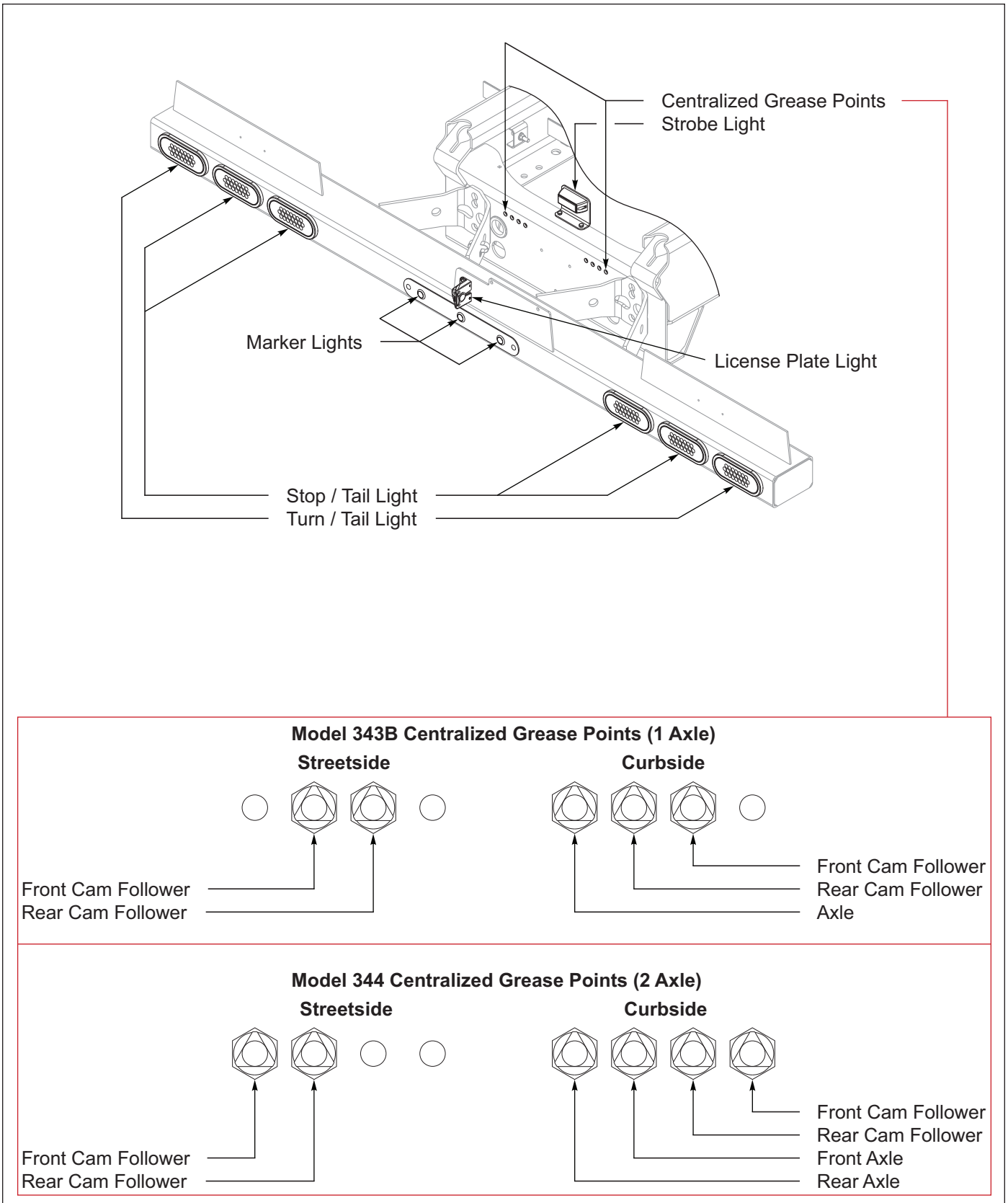


Figure 3-4: Bumper & Centralized Grease Points

Container Stop / Hold & Tie Downs

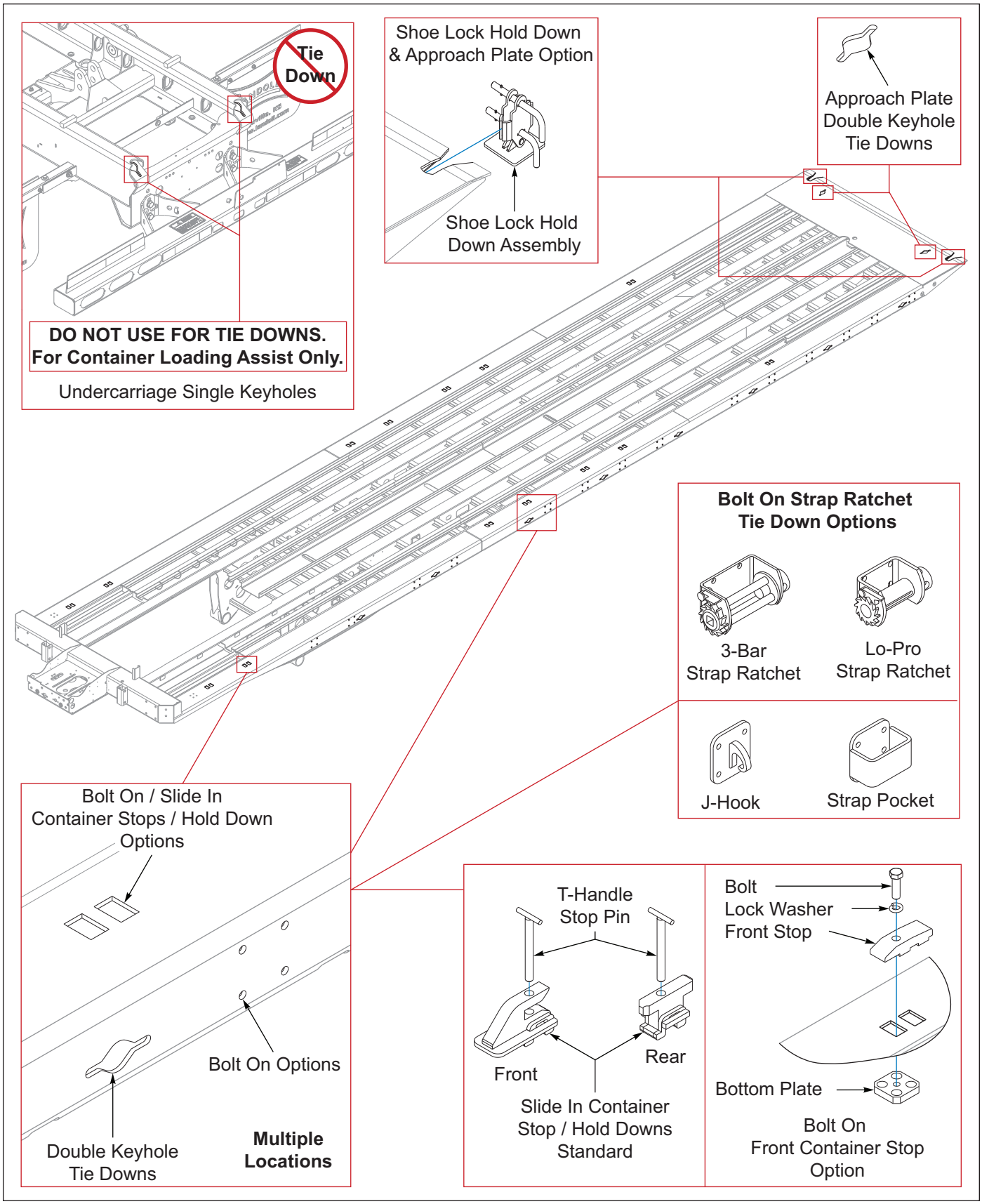


Figure 3-5: Container Stop / Lock & Tie Downs (1 of 3)

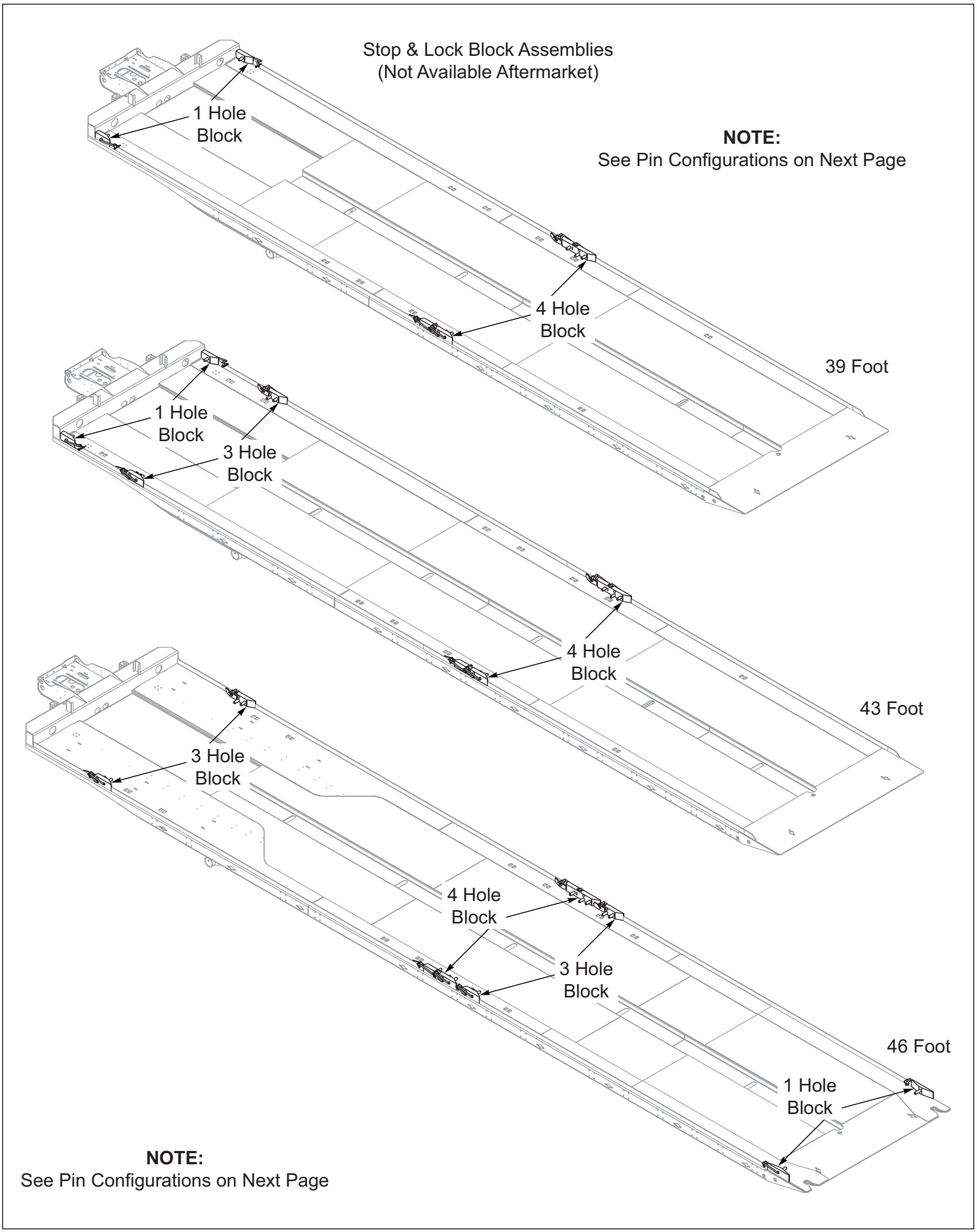


Figure 3-6: Container Stop / Lock & Tie Downs (2 of 3)

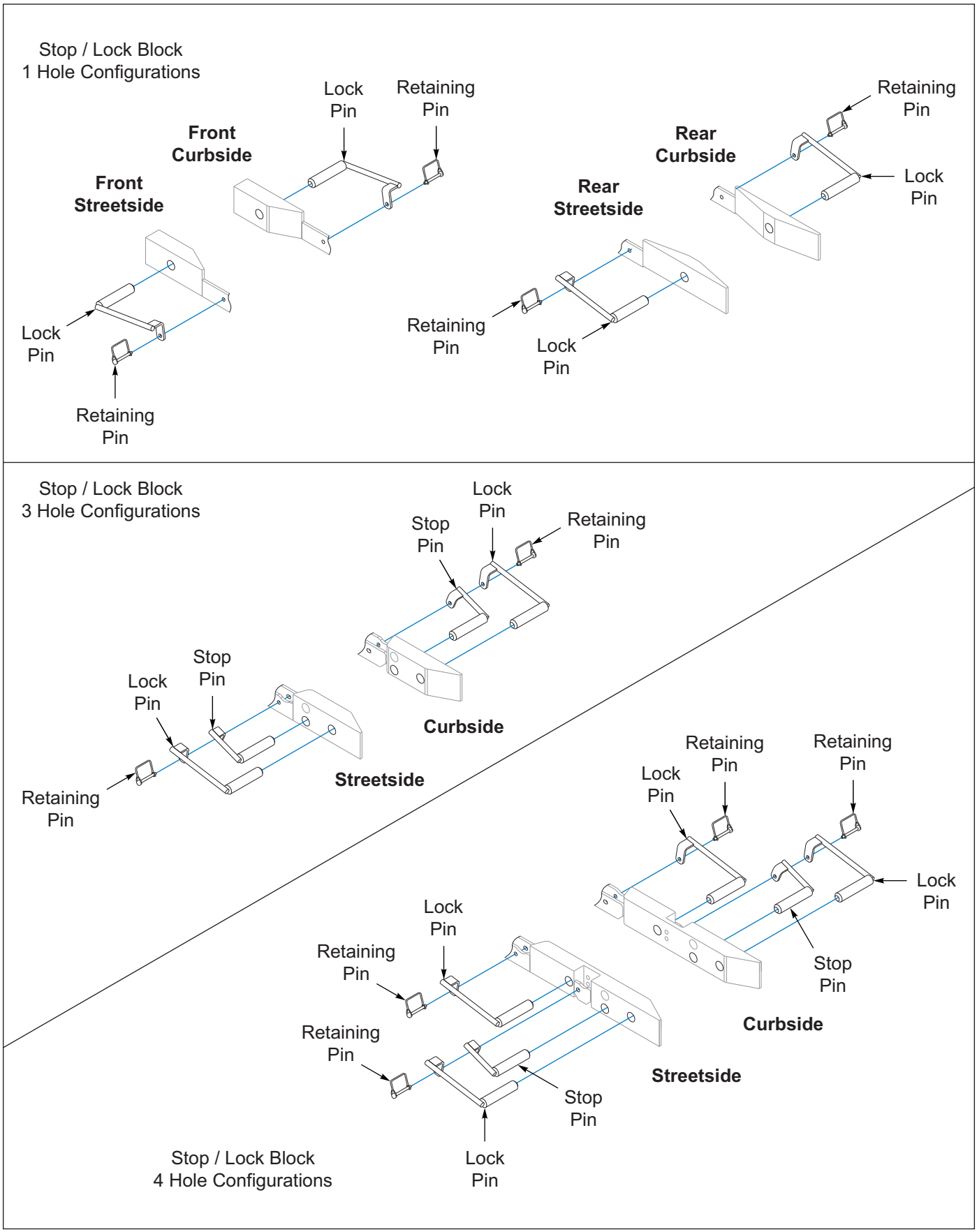
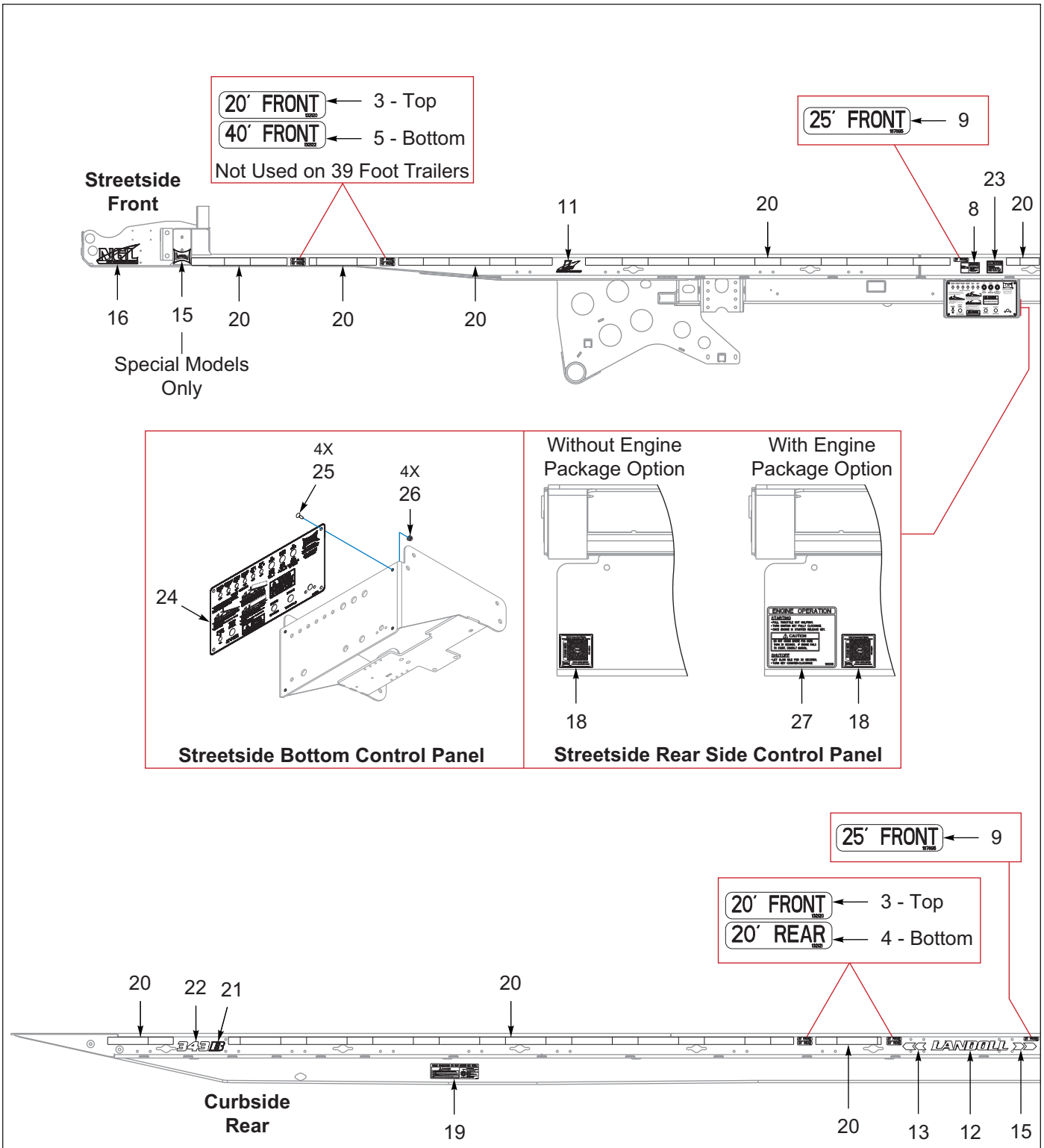


Figure 3-7: Container Stop / Lock & Tie Downs (3 of 3)

Decal Locations



NOTE:
Decals must be ordered individually.

Figure 3-8: Decal Locations (1 of 3)

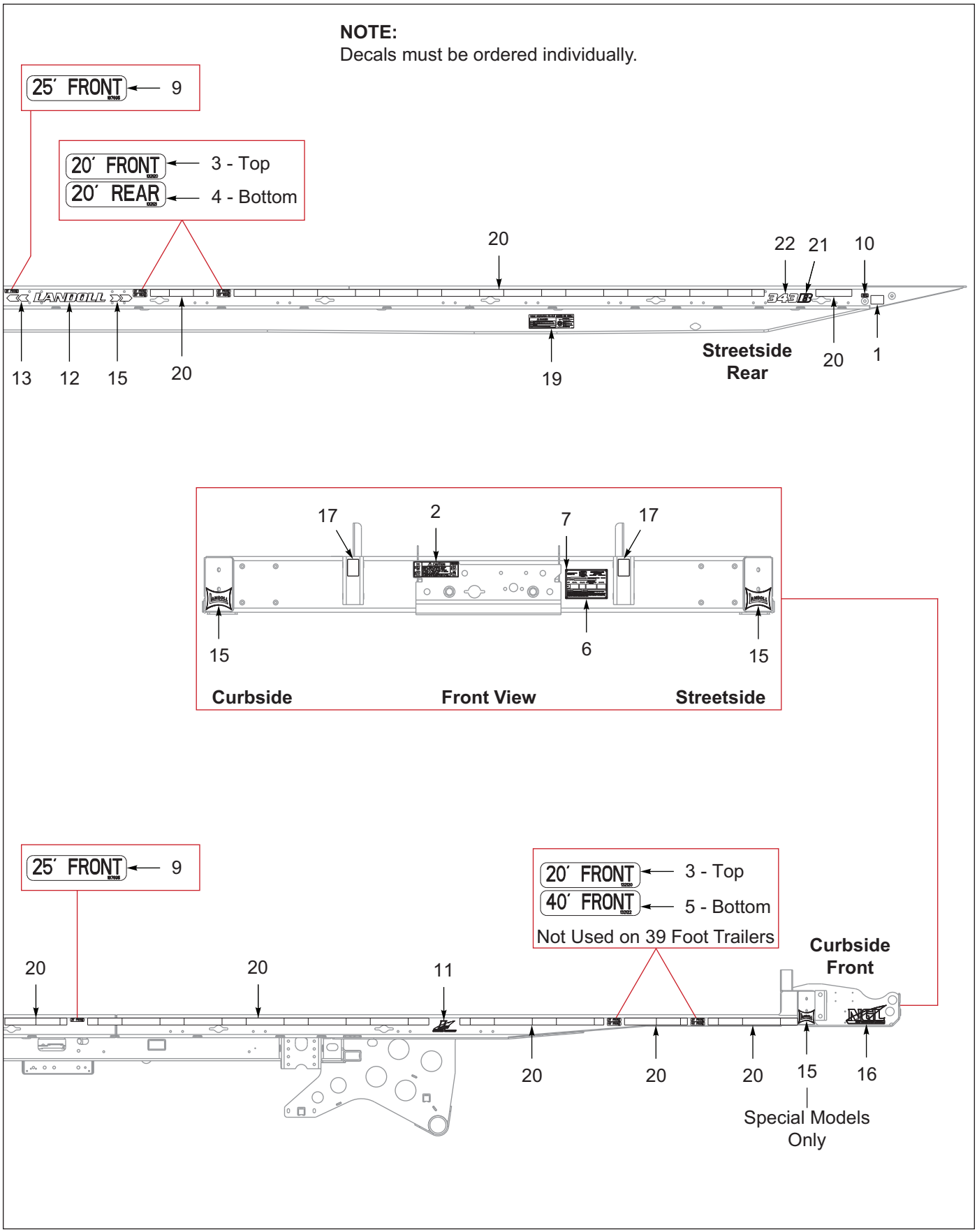
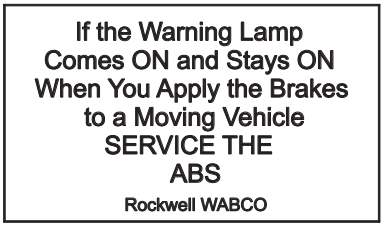


Figure 3-9: Decal Locations (2 of 3)



1



2



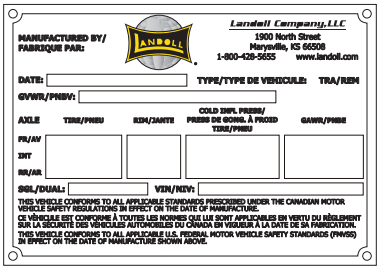
3



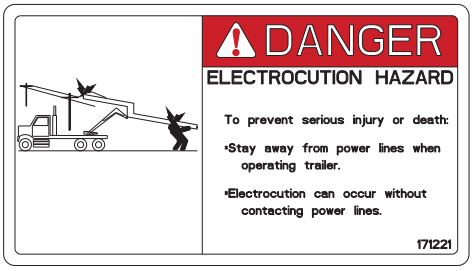
4



5



6



8



9



10



11



12



13



14



15



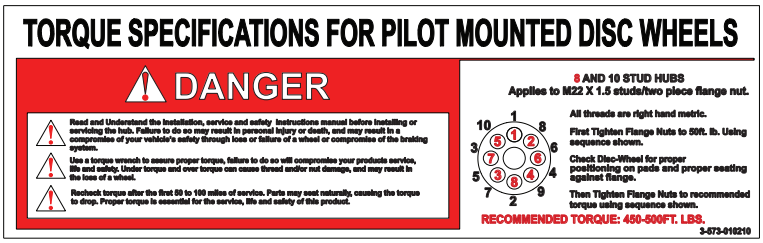
16



17



18



19



20

NOTE:
Decals must be ordered individually.

NOT SHOWN:
7 - Rivet
24 - Placard, Control Panel
25 - Screw, 1/4-20 x 3/4 UNC
26 - Nut Spiral 1/4-20



21



22A



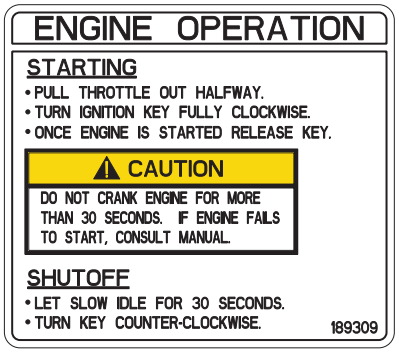
22B



23A



23B



27

Figure 3-10: Decal Locations (3 of 3)

Air System

The tractor supplies air to the trailer through the Emergency/Supply and Service/Control gladhands.

The Emergency/Supply gladhand is painted red, labeled with an Emergency ID tag, and located on the streetside front face of the gooseneck. This gladhand directs constantly supplied air flow to the air tanks, increasing system air pressure. and releasing the emergency brakes.

The Service/Control gladhand is painted blue, labeled with a Service ID tag, and located on the curbside front face of the gooseneck. This gladhand directs temporary tractor brakes applied air flow, back to the control and anti-lock brake valves, activating the trailer brakes.

Air provided by the tractor is required to operate the anti-lock brakes, air ride suspension, optional tire inflation system, optional weight scales, and optional winch operations. ***See Hitch Assembly & Service Connects on Page 3-4.***

Air Brake System

The air brake system of the trailer is operated from the tractor after coupling. The tractor's air system must be coupled to the trailer and charged to 90 psi minimum before the brakes can adequately function. ***See Hitch Assembly & Service Connects on Page 3-4.***

Emergency / Parking Brake

The park brakes are automatically applied by spring pressure with the air actuators, 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.

Anti-Lock Brake System (ABS)

See Electrical, ***Anti-Lock Brake System (ABS) on Page 3-16.***

Suspension Ride Height

CAUTION

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **If suspension air loss should occur, completely deflate suspension and temporarily operate on the air spring's internal rubber bumpers.**
- **Carefully proceed to the nearest semitrailer service facility.**

Emergency Air Ride Suspension Deflation

1. To deflate the air suspension, disconnect the lower connection on the linkage of the automatic air valve.
2. Rotate the valve control arms down about 45° to exhaust the air.
3. To restore to normal operation, simply reverse the procedure.

IMPORTANT

Protection Valves are used to maintain 65 psi (448kPa) air brake pressure during suspension or remote system air loss.

It is highly recommended to contact an authorized Landoll Service Center for servicing and repair.

The suspension ride height has been set at the factory and should not need reset, until suspension maintenance requires it.

Tire Inflation System (Option)

The tire inflation system attaches in-line and routes constant, regulated air pressure through the axles into the tires to maintain specific tire pressure. ***See Figure 3-11***.

This consists of an inlet shut-off valve, manifold assembly, replaceable particulate filter, petcock, flow sensing switch, and system pressure regulator housed in a protective control box. The axle and hub assemblies are fitted with seals, fittings, and hoses to route the air flow from the axles to each of the tires.

The protective control box has a replaceable hinged lid for accessing the internal components for adjusting, servicing, and maintaining.

The manifold assembly is a cased structure that receives supplied air flow from the trailer, routes it through the particulate filter, then directs it to the petcock and manually adjusted pressure regulator. Regulated air pressure goes through the flow sensing switch, back to the manifold assembly, exiting out the shut-off valve.

If equipped: If the flow sensing switch detects excessive amounts of air needed, it sends a signal to the tire inflation fault light. This alerts the operator of a leaking system or tire.

For the control box and fault light locations, ***See Figure 3-12*** through ***Figure 3-14***.

Parts are available through an authorized Landoll Dealer. For a list of available Landoll publications, ***See Chapter 7 on Page 7-1.***

For Operation and Maintenance procedures resource the Manufactures References, *See Chapter 7, Manufacturer Index on Page 7-1.*

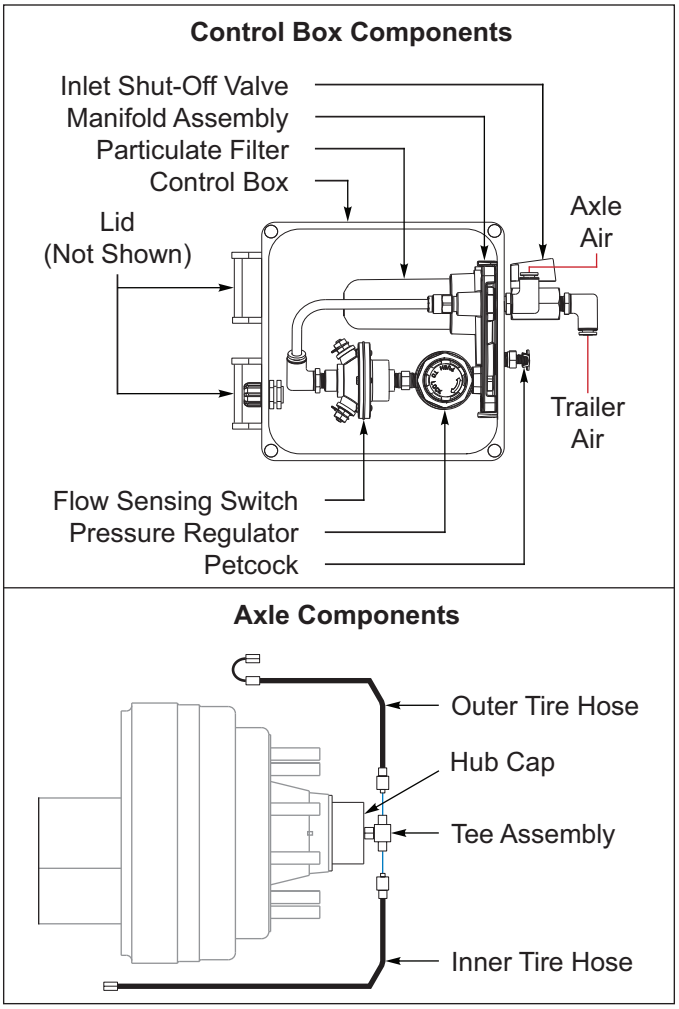


Figure 3-11: Tire Inflation Components

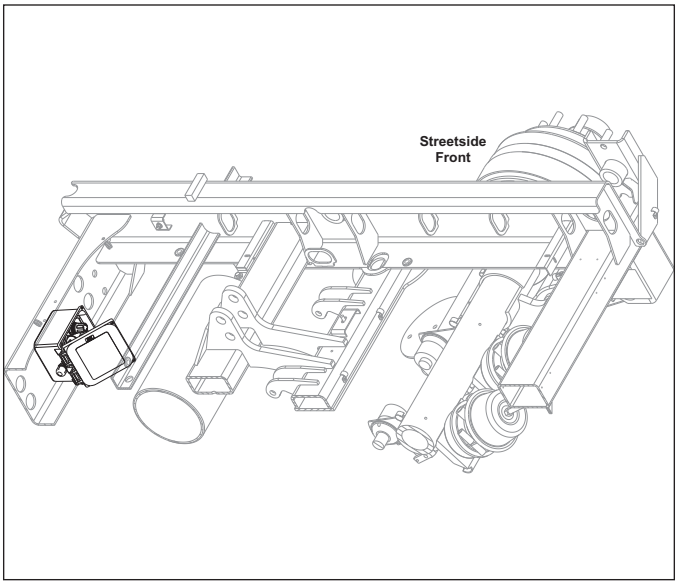


Figure 3-12: Control Box Location, 1 Axle

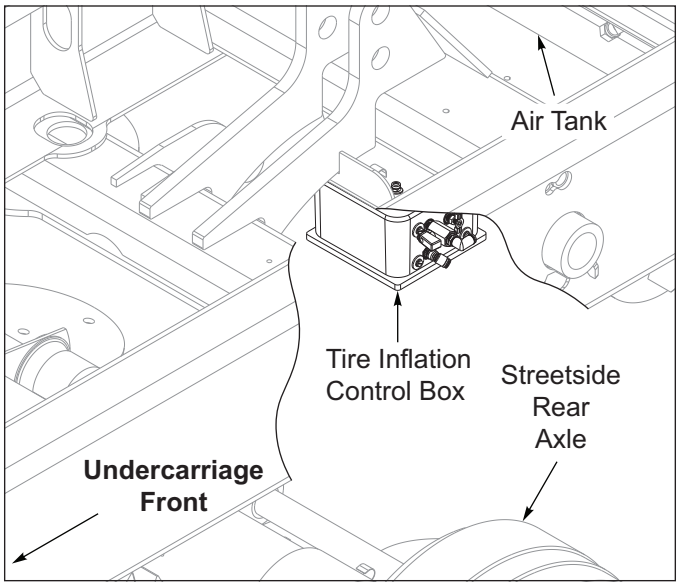


Figure 3-13: Control Box Location, 2 Axle

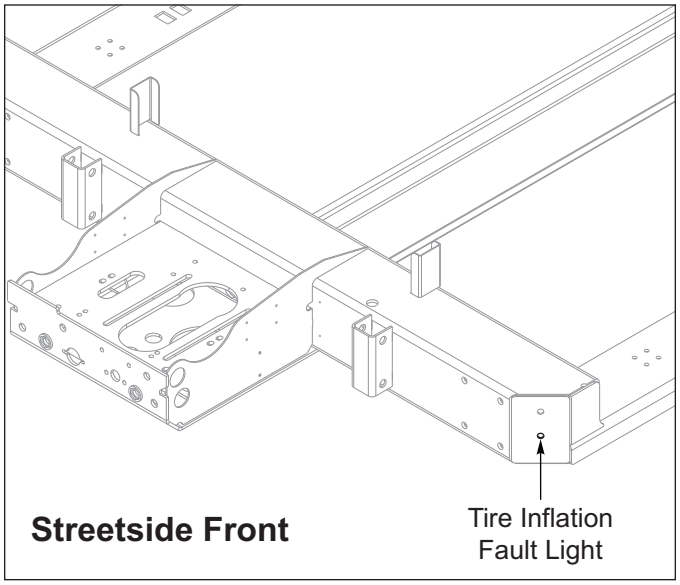


Figure 3-14: Fault Light Location

Winch Free Spool Palm Buttons (Option)

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **The winch is not designed or intended to be used for lifting or moving people. Using it this way may cause serious injury or death.**
- **NEVER use the winch to side pull cargo. This trailer is designed for straight pulling only. The trailer frame may become unstable and flip over.**
- **NEVER attempt to disengage the winch cable spool when the cable is under tension. The cargo can roll away. The rolling cargo poses a serious risk of injury or death to anyone in its path.**
- **Failure to leave at least five winch cable wraps on the winch cable spool could allow the cable to come off the spool, resulting in serious injury or death.**

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT handle the winch cable during winching operations.**
- **Hands or clothing could get caught in the cable and be pulled into the spool causing serious injury or death.**

Winches are equipped with either a manual or air operated free spool clutch, depending on the model:

- The manual free spool clutch is hand operated, by depressing the detent latch and turning the winch clutch handle located on the winch gearbox housing as indicated on the winch label.
- The air free spool clutch is operated by a palm button valve that supplies/releases air pressure to/from the winch gearbox housing. It requires 50-120 psi (245-827 kPa) of air pressure to operate the free spool clutch. ***See Figure 3-15.***

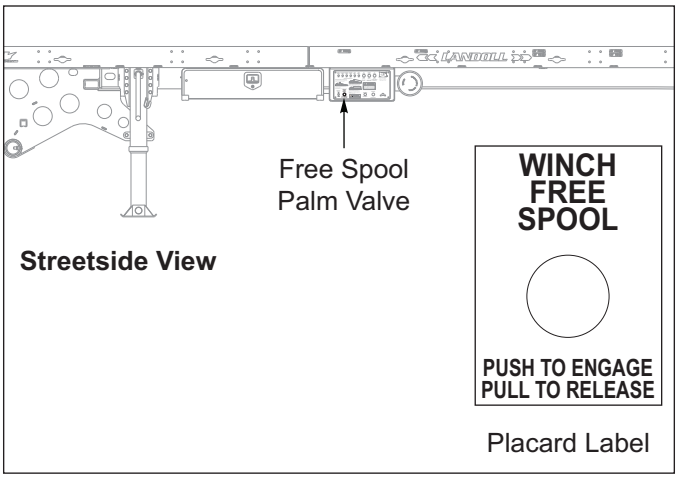


Figure 3-15: Free Spool Palm Button (Option)

Bumper, Rear, Energy Pack

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS inspect and replace any damaged or missing components of the energy pack bumper.**

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **In the event of a collision or damage to the bumper or energy pack, replacement is mandatory before further operation of the trailer.**

CAUTION

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **DO NOT hook winch line to the rear energy bumper. The bumper moves with the undercarriage.**

Vehicle Standards FMVSS No. 224, Rear Impact Protection, requires all trailers manufactured after January 26, 1998 shall be equipped with a rear impact guard certified by the manufacturer as meeting FMVSS No. 223, Rear Impact Guards.

The guard or bumper, must meet the following requirements: ***See Figure 3-16***.

- A minimum of 4 inches vertical height.
- Extend laterally to within 4 inches of the sides of the trailer.
- A ground clearance of no more than 22 inches.
- Placed no more than 12 inches from the rear of the trailer.
- Capable to deflect 5 inches.

The standard also specifies minimum force and energy absorption requirements for the guard.

The DOT Plate certifies that the guard meets FMVSS No. 223 and 224 standards.

The DOT Plate Must: ***See Figure 3-16.***

- Be mounted on the curbside of the guard or bumper.
- Be mounted 12 inches inboard on the forward-facing surface of the guard or bumper.
- Be mounted securely at all times.

Replace any component that does not allow the above minimum requirements to be met.

Any hardware that holds the rear impact guard and becomes damaged or becomes loose shall be removed and replaced.

The 3/4 inch grade 8 screws that hold the bumper energy pack shall be loctited and torqued to 280 Ft.-Lbs (379Nm)

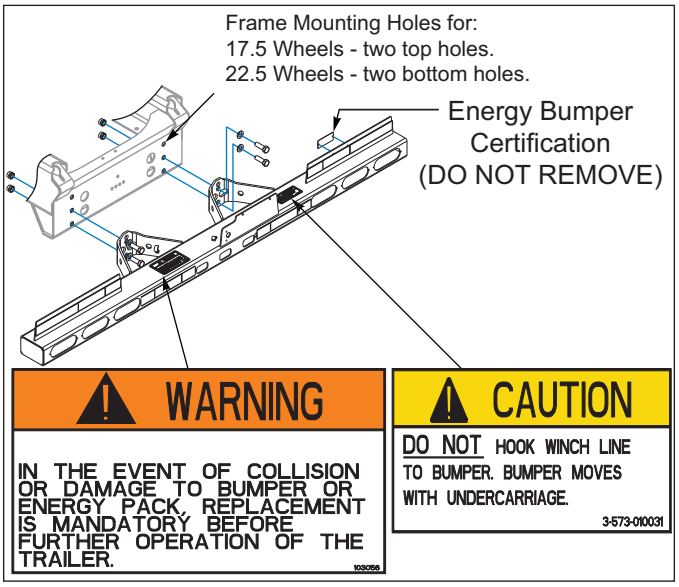


Figure 3-16: Energy Pack Rear Bumper

Electrical

The tractor supplies the electrical power to the trailer, through the 7-Way Split-Pin Electrical Receptacle to operate the electrical functions.

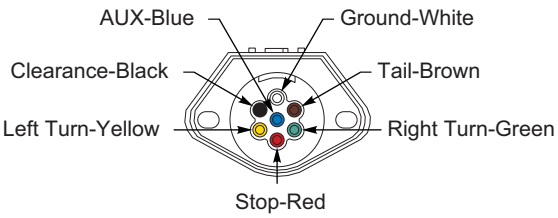
The receptacle is located on the front face of the gooseneck. It includes a spring back dual-purpose weather cover to protect the pins from damage and to secure the electrical connector from sliding out the receptacle. ***See Gooseneck Assembly on Page 3-4.***

Electrical power provided by the tractor is required to operate the anti-lock brake system, trailer running/control station lights, optional tire inflation system, optional weight scales, optional winch operations, optional remote control, and optional lighting accessories.

Connect the tractor's electrical cable plug to the trailer's electrical receptacle. Align key way, press firmly, and the cover should lock it in place.

IMPORTANT

It is necessary that the trailer blue wire be connected to the appropriate electrical source on the tractor. ***See Figure 3-17.***



7-PIN CONNECTOR WIRE DIAGRAM

Figure 3-17: Connector 7-Pin

Anti-Lock Brake System (ABS)

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **The auxiliary (blue) circuit is for powering the semitrailer ABS.**
- **This circuit must be hot when the tractor key switch is on.**
- **If a fault exists in the semitrailer ABS, normal braking will occur, but wheels may lock. Service the ABS as soon as possible.**

The Anti-Lock Brake System of the semitrailer is constantly 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.

NOTE

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. However, additional devices such as remote controls may be powered from the auxiliary circuit while the semitrailer is stationary.

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

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, and a decal or lens marked with ABS to identify the lamp. The lamp must illuminate one time whenever power is supplied to the ABS. ***See Trailer Components on Page 3-3.***

IMPORTANT

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 and Triple 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.

Parts are available through an authorized Landoll Dealer. For a list of available Landoll publications, ***See Chapter 7 on Page 7-1.***

For Operation and Maintenance procedures resource the Manufactures References, ***See Chapter 7, Manufacturer Index on Page 7-1.***

Auxiliary (Options)

The auxiliary switches are located on the control panel. They will supply power to any additional options. ***See Control Panel on Page 3-5.***

Engine Controls

CAUTION

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **DO NOT crank engine more than 10 seconds to start.**
  - If engine does not start after several attempts, consult the owner's manual supplied with the engine for troubleshooting.
- **During start-up or shutdown, allow the engine to idle for at least 30 seconds.**
  - Always start or shut the engine off with the throttle pushed all the way in to idle.

The engine ignition switch and throttle cable are located on the control panel. ***See Figure 3-18.***

They consists of a three-position spring back key ignition switch and a locking adjustable throttle cable.

The ignition switch controls the electric start, run, and shut off of the engine. ***See Figure 3-18.***

The throttle cable controls the engine speed.

It consists of a throttle lock knob, fine adjustment knob, and a course adjustment button. ***See Figure 3-18.***

The throttle lock knob is used to lock the fine adjustment knob in place to eliminate any engine speed fluctuation.

It must be unlocked to allow the fine adjustment knob to be readjusted.

Twist the fine adjustment knob in to decrease or out to increase engine speed.

The course adjustment button, when pressed, will allow the throttle cable to be fully pushed in or pulled out.

Always idle down before starting or shutting off the engine.

Parts are available through an authorized Landoll Dealer. For a list of available Landoll publications, ***See Chapter 7 on Page 7-1.***

For Operation and Maintenance procedures resource the Manufactures References, ***See Chapter 7, Manufacturer Index on Page 7-1.***

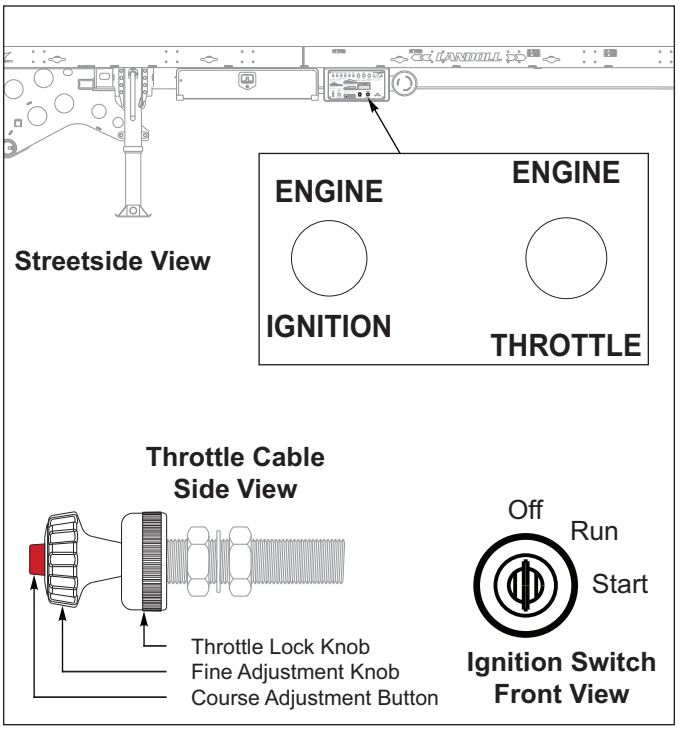


Figure 3-18: Engine Controls

Lights

Light, Control Panel

The control panel light switch is located on the control panel. It illuminates the control station. ***See Control Panel on Page 3-5***.

Lights, Strobe (Options)

- **(Standard)** The rear bumper strobe light switch is located on the streetside trailer control panel. It activates the rear bumper strobe light or lights. ***See Control Panel on Page 3-5***.
- **(Optional)** The gooseneck folding light stand strobe light switch is located on the control panel. It activates the gooseneck strobe lights. ***See Auxiliary (Options).***

Lights, Work (Option)

- The work light switch is located on the control panel. It operates the work lighting used to illuminate the deck surface. ***See Control Panel on Page 3-5***.

Lights, Work Zone, Under Deck (Option)

- The under deck light switch is located on the control panel. It operates the work lighting used to illuminate the ground surface. ***See Control Panel on Page 3-5***.

Remote, Wireless (Option)

The wireless remote controls the hitch, retrieval system drive, and traveling axle operations.

The receiver is mounted inside the control station and gets power from the trailer wiring harness.

The receiver harness connects to the hydraulic control valve solenoids to direct hydraulic pressure for operations.

Parts are available through an authorized Landoll Dealer. For a list of available Landoll publications, *See Chapter 7 on Page 7-1.*

For Operation and Maintenance procedures resource the Manufactures References, *See Chapter 7, Manufacturer Index on Page 7-1.*

Tire Inflation System (Option)

See Air System, ***Tire Inflation System (Option) on page 3-13.***

Winch 2-Speed Switch (Option)

The winch 2-speed switch is located on the control panel. ***See Control Panel on Page 3-5***

When switched to HI, it energizes the high-speed solenoid, increasing the speed of the winch.

When switched to LOW, It de-energizes the high-speed solenoid, reducing the speed of the winch.

Hydraulic System

DANGER

Proceed with caution. Failure to heed warning may cause injury to person and/or damage to product and property.

- **DO NOT operate if the fuel system or brake system is leaking. Report it immediately to your supervisor or maintenance.**
- **ALWAYS report any Class 3 leak to your supervisor or maintenance immediately.**

IMPORTANT

- **Hydraulic supply pump pressure relief valve must be set between 2,550-2,700 psi (17,581-18,615 kPa).**
- **Trailer control valve is equipped with a pressure relief valve set at a maximum of 2,500 psi (17,237 kPa).**

This trailer requires hydraulic power to operate the hitch assembly lift cylinders, and traveling axle cylinders.

The tractor supplies hydraulic power to the trailer through the pressure and return quick couplers located on the front face of the gooseneck. *See Gooseneck Assembly on Page 3-4.* For specifications, *See Hydraulic Hookup on Page 2-3.*

If the tractor does not have hydraulic capabilities, *See Hydraulic Power (Options)*.

Hydraulic Power (Options)

Parts are available through an authorized Landoll Dealer. For a list of available Landoll publications, *See Chapter 7 on Page 7-1.*

For Operation and Maintenance procedures resource the Manufactures References, *See Chapter 7, Manufacturer Index on Page 7-1.*

Landoll offers many hydraulic power options to assist the customer.

- Wet Kit options customize the tractor with the required components to produce on-board hydraulic power.
- This consists of the proper size reservoir, reservoir mount, filter, gear pump, power take off, hoses, fittings, and mounting hardware.
- Portable Hydraulic Power Package option is a quick attach unit that mounts on the gooseneck and connects to the existing trailer hydraulic couplers.
  - The portable 25HP Kohler Power Package is an electric start, gas operated, Electronic Fuel Injected, air cooled, 4-cycle, overhead valve, V-Twin cylinder, side shaft engine powering a gear pump with 0.77 cubic inch (12.6 ccm) displacement. *See Figure 3-19.*

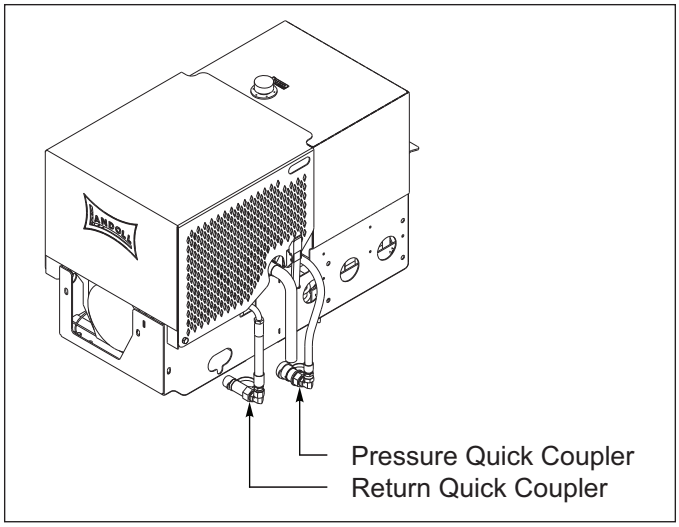


Figure 3-19: Engine Package

Hydraulic Control Levers

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS check behind and under the truck and semitrailer for persons or objects before moving.**

IMPORTANT

- **Hydraulic supply pump pressure relief valve must be set between 2,550-2,700 psi (17,581-18,615 kPa).**
- **Trailer control valve is equipped with a pressure relief valve set at a maximum of 2,500 psi (17,237 kPa).**

The hydraulic control levers are attached to the hydraulic control valve located at the control station. Movement in the control levers directs the hydraulic control valve to provide the hydraulic flow required to operate the standard and optional functions.

The control levers are self-centering and will spring back to center position when released.

For hydraulic control lever location and operation. *See Figure 3-20.*

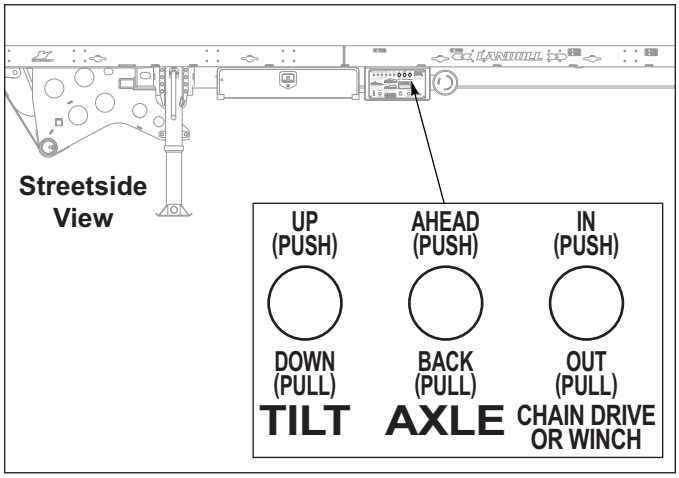


Figure 3-20: Hydraulic Control Levers

Axle Control

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS check behind and under the truck and semitrailer for persons or objects before moving.**

The axle control lever extends or retracts the undercarriage hydraulic cylinder, directing the AHEAD and BACK movement of the axles. ***See Figure 3-20.***

Chain Drive or Winch Control (Option)

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **The winch is not designed or intended to be used for lifting or moving people. Using it this way may cause serious injury or death.**
- **NEVER use the winch to side pull cargo. This trailer is designed for straight pulling only. The trailer frame may become unstable and flip over.**
- **NEVER attempt to disengage the winch cable spool when the cable is under tension. The cargo can roll away. Rolling cargo poses a serious risk of injury or death to anyone in its path.**
- **Failure to leave at least five winch cable wraps on the winch cable spool could allow the cable to come off the spool, resulting in serious injury or death.**

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT handle the chain or winch cable during winching operations.**
- **Hands or clothing could get caught in the chain or winch cable and be pulled into the spool causing serious injury or death.**

The chain drive or winch control lever directs the retrieval system drives rotation to either winch IN or winch OUT, ***See Figure 3-20.***

Tilt Control

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS check behind and under the truck and semitrailer for persons or objects before moving.**

The tilt control lever extends or retracts the gooseneck hitch assembly hydraulic cylinders, directing the UP and DOWN movement of the trailer deck. ***See Figure 3-20.***

Hydraulic Reservoir

Check Fluid Level - Hydraulic Reservoir

1. Start the hydraulic pump.
2. Using the Tilt control lever, verify the trailer tilt cylinders are fully DOWN.
3. Using the Axle control lever, move the axles fully AHEAD.
4. Shut off the hydraulic pump.
5. Operate all the hydraulic control levers to release any line pressure back to the reservoir.
6. Check the hydraulic fluid level. ***See Figure 3-21.***
   - Remove the hydraulic reservoir filler cap and visually look inside at the bottom of the strainer screen.
   - The fluid level should be seen at the bottom of the strainer screen.
   - **DO NOT** fill past the bottom of the strainer screen. Allow room for fluid heat expansion.
   - Use only recommended hydraulic fluid. ***See Lubrication Specifications on Page 5-8.***
   - Use a clean rag to wipe off dirt and debris from the filler cap.
7. Install the filler cap.
8. Start the hydraulic pump.
9. Using the Axle control lever, move the axles fully back into transport position.

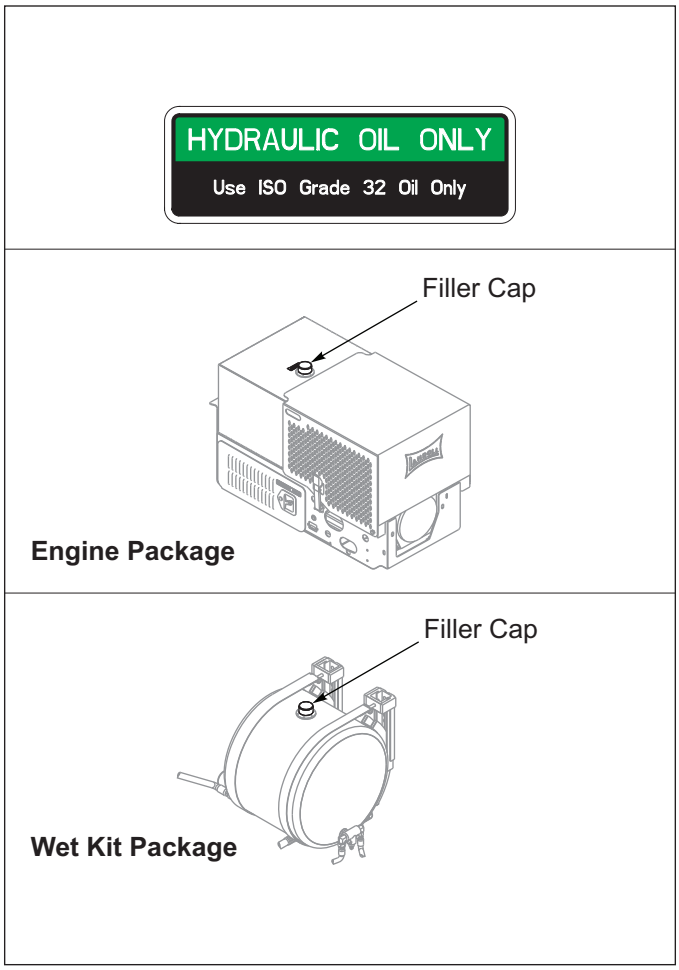


Figure 3-21: Hydraulic Filler Cap

King Pin / Hitch Plate & Lift Arm Assembly

The 2-inch (5.08 cm) king pin is non-adjustable and welded to a hydraulic controlled traveling hitch plate. ***See Gooseneck Assembly on Page 3-4***

The height is controlled by the trailer tilt control lever located at the trailer control station, which causes the lift arm assembly to pivot UP or DOWN.

Ladder Assembly (Option)

Optional ladders may be mounted on one or both sides of the trailer's front end for ease of getting on and off the trailer. ***See Figure 3-22.***

A quick release latch holds the pivoting ladder up in transport position.

For operator convenience and safety, grab handles are included.

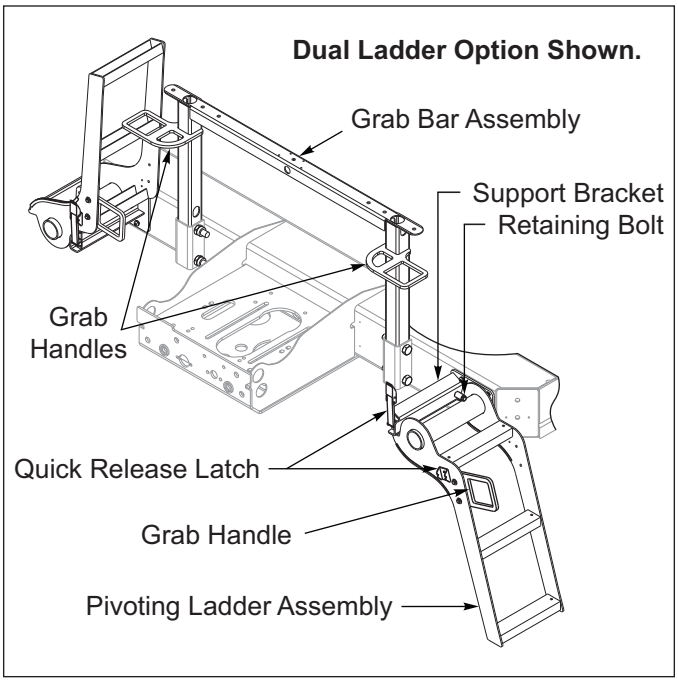


Figure 3-22: Ladder Assembly (Option)

Landing Gear / Park Stands

Landing gear is the support system that holds the front of the trailer off the ground when not attached to the tractor.

They are used to raise or lower the trailer king pin to align with the tractor's fifth wheel plate.

It has been designed to support the rated capacity of the trailer.

Options Available:

- Hand Crank, 2-Speed (Standard)
- Manual, Pinned (Option)

Hand Crank, 2-Speed (Standard)

The hand crank, 2-speed, gear driven landing gear consists of a crank handle, two gear driven telescoping legs with shoes, and interconnecting drive tubes. ***See Figure 3-23.***

To switch gear speeds, push or pull out on the crank handle.

High speed/gear requires less rotations of the handle to operate the landing gear.

- This is intended for no load operations.

Low speed/gear requires more rotations of the handle to operate the landing gear.

- This is intended to be used while the landing leg is supporting the trailer weight.

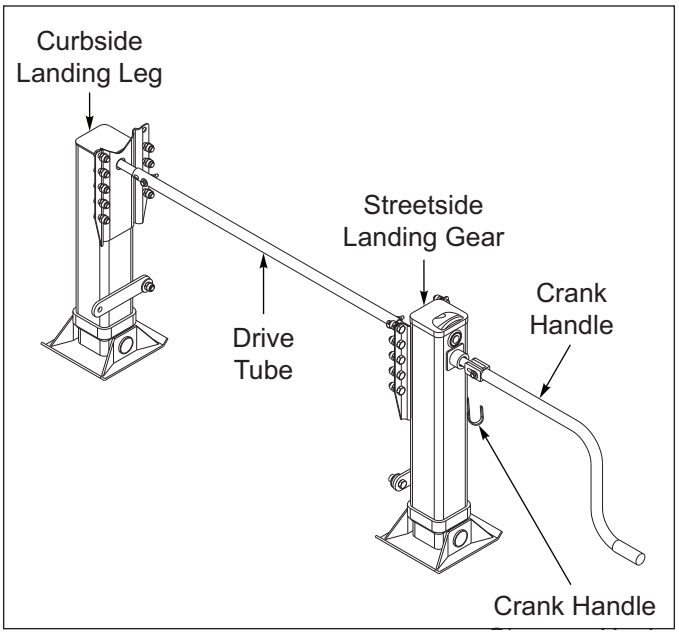


Figure 3-23: Landing Gear, 2-Speed, Hand Crank

Manual, Pinned (Option)

The manual pinned landing gear option consists of two gravity free-falling, non-spring assisted, manually operated support legs that are secured by quick release snap pins.

It consists of upper left-hand (streetside) and right-hand (curbside) support assemblies, two lower support leg assemblies, and two snap pins.

This option requires assistance by a jack or the trailer hitch hydraulics to raise and lower the trailer. ***See Figure 3-24.***

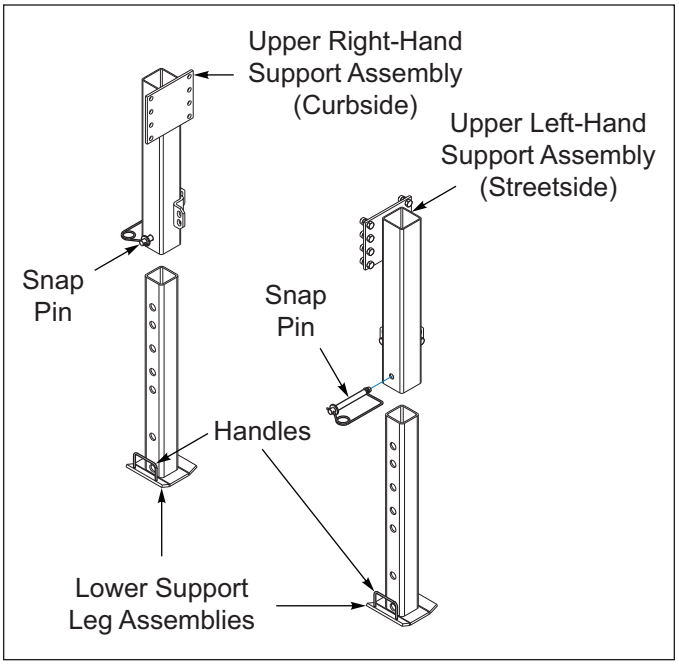


Figure 3-24: Landing Gear, Manual, Pinned (Option)

Retrieval System Accessories (Options)

IMPORTANT

USE THE ONLY APPROVED Retrieval System Accessory Options listed in this section for loading, unloading, and securing the cargo.

Retrieval System Accessories are additional components used with the retrieval system during the loading, unloading, and securing operations to increase safety and efficiency.

Landoll offers multiple retrieval system accessory options that provide the operator with the ability to properly control the cargo.

⚠ DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS check behind and under the truck and semitrailer for persons or objects before moving.**
- **The retrieval system is not designed or intended to be used for lifting or moving people. Using it this way may cause serious injury or death.**
- **NEVER use the retrieval system to side pull cargo. This trailer is designed for straight pulling only. The trailer frame may become unstable and flip over.**
- **NEVER attempt to disengage the winch cable spool when the cable is under tension. The cargo can roll away. The rolling cargo poses a serious risk of injury or death to anyone in its path.**
- **Failure to leave at least five winch cable wraps on the winch cable spool could allow the cable to come off the spool, resulting in serious injury or death.**

⚠ WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT handle the retrieval system chain or cable during winching operations.**
- **Hands or clothing could get caught in the retrieval system chain / cable and be pulled into the drive causing serious injury or death.**

Chain Assemblies

Chain Assembly, Container Loading, Front

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT use the container loading chain assemblies for ANY overhead lifting operations.**
- **DO NOT use the container loading chain assemblies for ANY tie down procedures.**

IMPORTANT

DO NOT use container loading chain assemblies for ANY tie down procedures.

The front container loading chain assembly is a quick attach adapter sling used to pull containerized cargo onto the deck. ***See Figure 3-25.***

It also may be used **ONLY** to lift one end of the container off the ground enough to slide blocks under for support.

The container connection plate may be used to hold the cargo when the front slide in stop assembly is installed. ***See Container Stop, Front, Slide In on Page 3-28.***

It consists of one 1/2 in (1.27 cm) by 87 in (220.9 cm) chain, two connector links, and two container connection plates.

Attach the Front Container Loading Chain Assembly:

- Align and insert the T-lock lugs into the locking slot of the container corner castings.
- Rotate the container connection plates 90 degrees towards the inside, to position the connector links in the direction of pull.

Detach the Front Container Loading Chain Assembly:

IMPORTANT

ALWAYS ensure cargo will not shift or move if retrieval system tension is released.

- Release any retrieval system tension.
- Detach the retrieval system from the front container loading chain assembly.
- Rotate the container connection plates 90 degrees up and remove the T-lock lugs from the container corner casting locking slots.

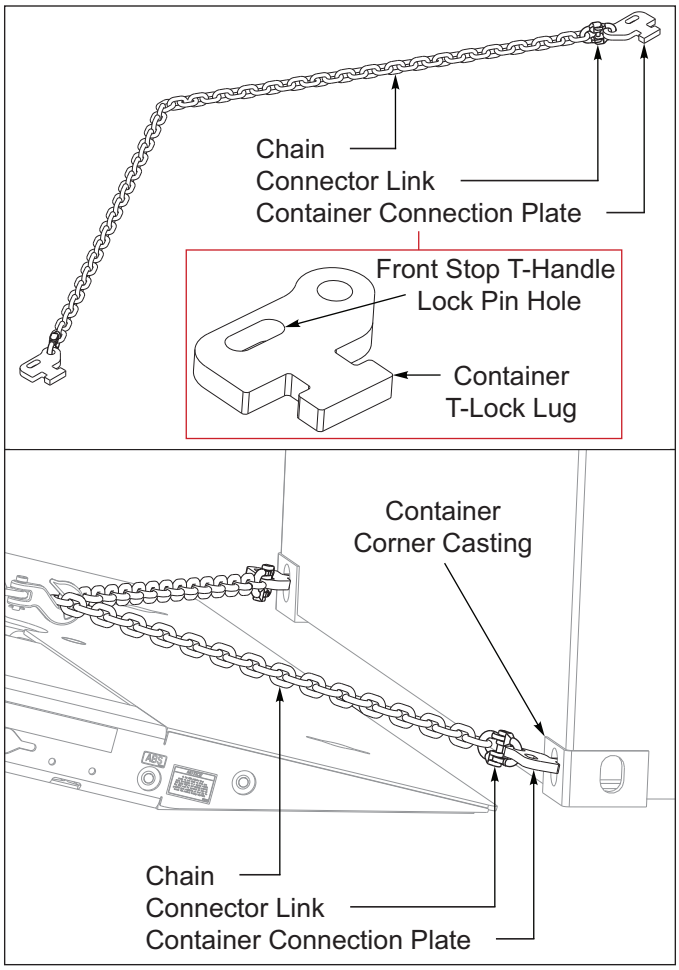


Figure 3-25: Chain Assembly, Container Loading, Front

Chain Assembly, Container Loading, Front, Chain & Bridle

IMPORTANT

DO NOT use container loading chain assemblies for ANY tie down procedures.

The front container loading chain & bridle assembly is an adjustable quick attach adapter sling used to pull containerized cargo onto the deck. ***See Figure 3-26.***

It also may be used to lift **ONLY** one end of the container off the ground enough to slide blocks under for support.

The container connection plate may be used to hold the cargo when the front slide in stop assembly is installed. ***See Container Stop, Front, Slide In on Page 3-28.***

It consists of one 1 in (2.54 cm) shackle, one 1/2 in (1.27 cm) by 53 in (134.62 cm) double hook assembly, two 1/2 in (1.27 cm) by 36 in (91.44 cm) connection plate assembly.

Attach the Front Container Loading Chain & Bridle Assembly:

- Align and insert the T-lock lugs into the locking slot of the container corner castings. ***See Figure 3-25.***
- Rotate the container connection plates 90 degrees towards the inside, to position the connector links in the direction of pull.
- Attach the double hook assembly.

Detach the Front Container Loading Chain & Bridle Assembly:

IMPORTANT

ALWAYS ensure cargo will not shift or move if retrieval system tension is released.

- Release any retrieval system tension.
- Detach the retrieval system from the double hook assembly.
- Detach the double hook assembly from the connection plate assemblies.
- Rotate the container connection plates 90 degrees up and remove the T-lock lugs from the container corner casting locking slots.

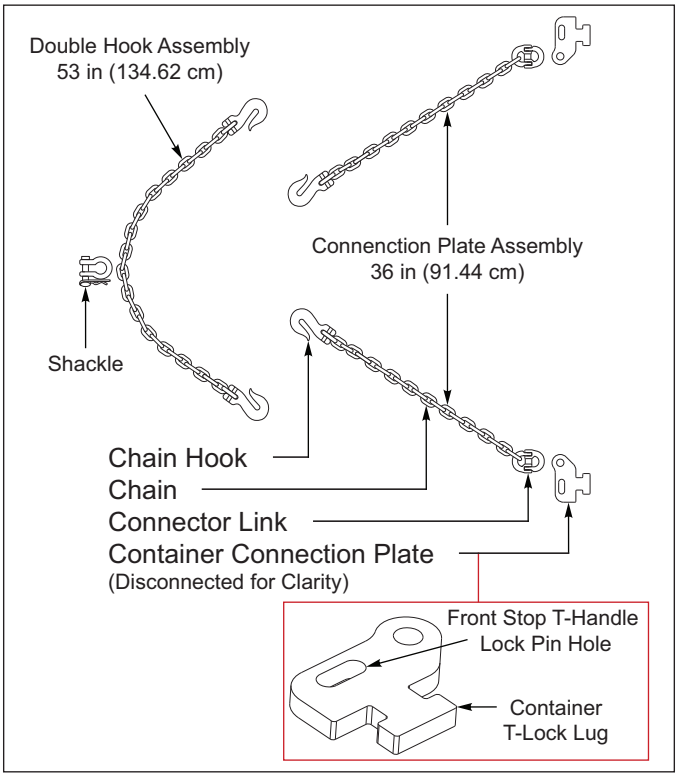


Figure 3-26: Chain Assembly, Container Loading, Front, Chain & Bridle

Chain Assembly, Container Loading, Rear

IMPORTANT

- **DO NOT use container loading chain assemblies for ANY tie down procedures.**
- **NEVER exceed 3 ft (1 m) of undercarriage travel from transport position when rear pulling cargo onto the deck.**

The rear container loading chain assemblies are quick attach adapter slings used to finish pulling containerized cargo completely onto the deck, when the retrieval system runs out of travel. ***See Figure 3-27.***

IMPORTANT

NEVER exceed 3 ft (1 m) of undercarriage travel from transport position when rear pulling cargo onto the deck.

They attach to the traveling undercarriage single keyhole notches and when the axle is moved AHEAD will pull the cargo onto the deck. ***See Figure 3-27.***

They consists of two 3/8 in (.95 cm) by 8 ft (2.44 m) chains, two connector links, one left hand container connection plate, and one right hand container connection plate.

Attach the Rear Container Loading Chain Assemblies:

- Align and insert the T-lock lugs into the locking slot of the container corner castings.
- Rotate the container connection plates 90 degrees towards the inside, to position the connector links in the direction of pull.

IMPORTANT

DO NOT straight pull the cargo. Cross the chain assemblies to avoid damaging the trailer flanges.

- Insert the curbside chain assembly into the streetside undercarriage single keyhole notch.
- Insert the streetside chain assembly into the curbside undercarriage single keyhole notch.
- Tighten and adjust both chain assemblies evenly in the undercarriage single keyhole notches.
- Secure the excess chain pulled through the single keyhole notches to prevent damage during undercarriage movement.

Detach the Rear Container Loading Chain Assemblies:

IMPORTANT

ALWAYS ensure cargo will not shift or move if retrieval system tension is released.

- Release any chain tension and verify the axle is fully BACK in transport position.
- Remove the chain assemblies from undercarriage single keyhole notches.
- Rotate the container connection plates 90 degrees up and remove the T-lock lugs from the container corner casting locking slots.

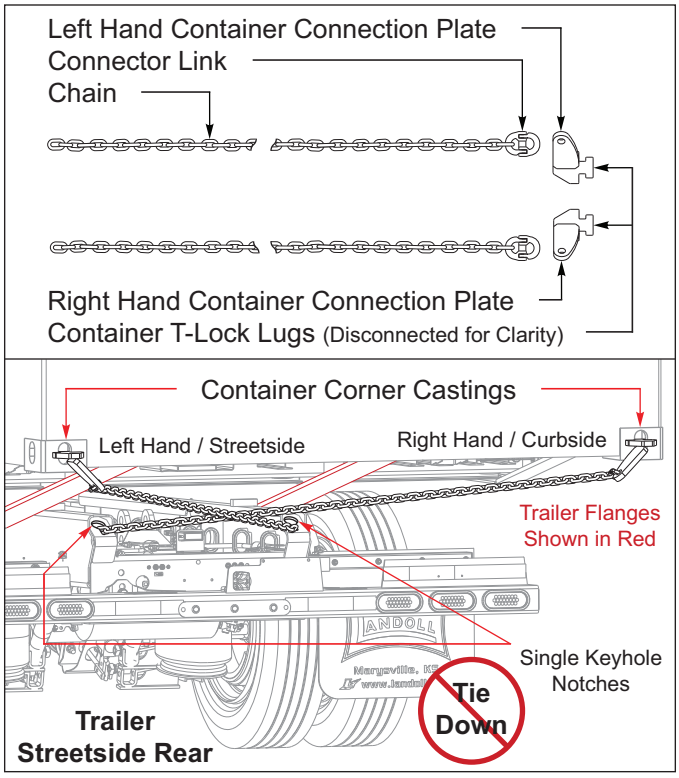


Figure 3-27: Chain Assembly, Container Loading, Rear

Chain Assembly, Single Hook

IMPORTANT

- **DO NOT use single hook chain assembly for ANY tie down procedures.**
- **A minimum of one link is required on the non-load side of the hook to secure the chain in place.**

The single hook chain assembly attaches to the chain connect hook assembly to extend the reach of the chain drive system past the approach plate. ***See Figure 3-28.***

It consists of a 1/2 in (1.27 cm) by 42 in (1.06 m) chain and one 1/2 in (1.27 cm) hook.

Attach the Single Hook Chain Assembly:

- Attach the hook end to the center of the cargo sling.
- Pull excess slack out of the chain assembly and cargo sling.

IMPORTANT

A minimum of one link is required on the non-load side of the hook to secure the chain in place.

- Attach the end of the chain assembly to the chain connect hook assembly.

Detach the Single Hook Chain Assembly:

IMPORTANT

ALWAYS ensure cargo will not shift or move if retrieval system tension is released.

- Release any retrieval system tension.
- Detach the retrieval system from the single hook chain assembly.

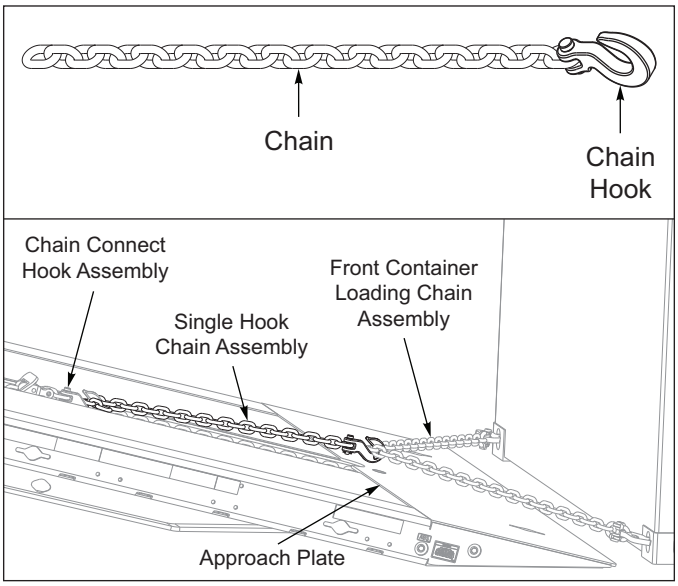


Figure 3-28: Chain Assembly, Single Hook

Container Pusher

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS attach container pusher assembly while the deck is in transport position.**
- **DO NOT use the container pusher assembly to load cargo when the deck is tilted UP. Push Bar may roll back and allow cargo to shift.**
- **DO NOT use the container pusher assembly to fully unload containerized cargo onto the ground.**
- **DO NOT use as a holding device or tie down.**

⚠ WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT use container pusher on door end, if it will contact or possible cause damage to door or door locking hardware.**

The container pusher assembly is a quick attach adapter used to assist the chain drive retrieval system to move the containerized cargo on the deck only. ***See Figure 3-29.***

The container pusher assembly is stored just behind the chain drive motor. ***See Figure 3-29.***

It consists of one shortener link chain adapter and one 48 in (1.21 m) push bar assembly.

It may be used to finish moving short cargo forward ONLY when the following conditions are met:

- The deck is in transport position.
- And the retrieval system runs out of travel.

IMPORTANT

DO NOT use the container pusher assembly to fully unload containerized cargo onto the ground.

It may also be used to move the cargo rearward to establish the proper overhang required for unloading operations.

Activating the chain drive control lever in the desired direction will cause the shortener link to move under the cargo and the push bar to contact the cargo, initiating movement.

Attach the Container Pusher Assembly:

- Position the push bar assembly at the end of the cargo requiring pushing.
- Position the shortener link towards the cargo. ***See Figure 3-29.***
- Slide the shortener link over the drive chain and pull it away from the cargo to seat on the drive chain.

Detach the Container Pusher Assembly:

IMPORTANT

ALWAYS ensure cargo will not shift or move if retrieval system tension is released.

- Release any retrieval system drive chain tension.
- Physically pull container pusher assembly from under the cargo and locate in storage brackets.
  - A pry bar may be required to dislodge the container pusher from under the cargo.
  - Additional drive chain tension may be required to unseat the shortener link from the drive chain.
- Slide the shortener link towards the cargo to unseat from the drive chain.

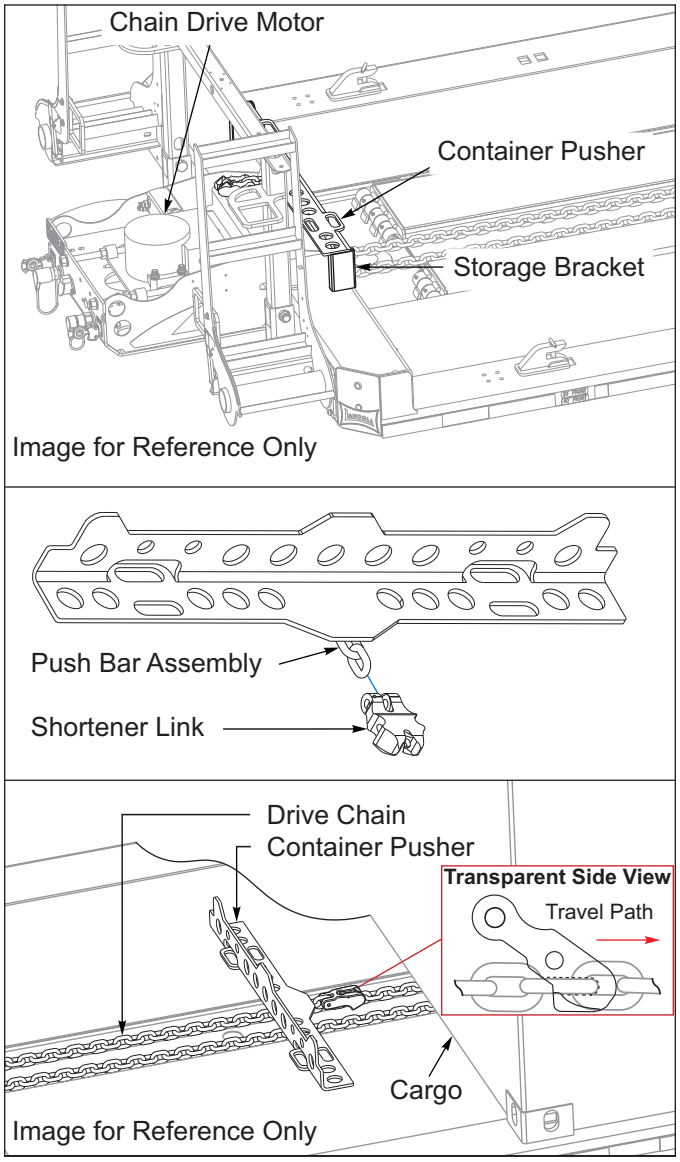


Figure 3-29: Container Pusher

Container Side Guide, Bolt On

Container side guides are bolt on bumpers that mount on each side of the deck to steer the containerized cargo straight during loading and unloading operations. ***See Figure 3-30.***

Landoll offers multiple mounting locations and configurations that provide the operator with the ability to properly control the cargo.

Each side guide assembly consists of one 40 in (1.016m) or 88 in (2.235 m) guide assembly, two quick release pins, two mounts, and mounting hardware. ***See Figure 3-30.***

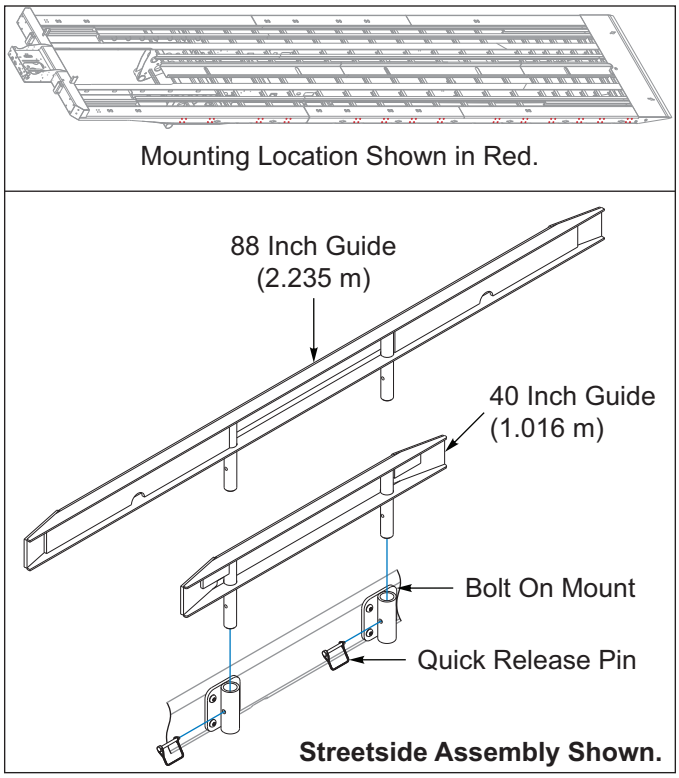


Figure 3-30: Container Side Guide, Bolt On

Container Stops

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS use both stop assemblies and set them the same distance to prevent possible cargo side shifting.**
- **NEVER use these stop assemblies as tie down devices, they are designed for holding ONLY.**

Container stops are used to stop the containerized cargo at specific locations for proper positioning during loading operations.

Proper Positioning is Important:

- To achieve the proper rear overhanging distance of the container for unloading operations.
- To achieve the proper forward loading distance when loading multiple containers.

Landoll offers multiple container stop options listed in this section that provides the operator with the ability to properly control the cargo.

Container Stop, Front, Adjustable

IMPORTANT

ALWAYS use both stop assemblies and set them the same distance to prevent possible cargo side shifting.

Front adjustable container stops are non-removable hard mounted, manually adjusted, telescoping assemblies used to stop containerized cargo during loading operations. ***See Figure 3-31.***

Each stop assembly consists of one stop assembly, one extension assembly, one welded mount, and two snap lock pins.

These provide the operator with a total of 35 inches (88.9 cm) of travel in 3 inch (7.62 cm) increments.

Fully retracted, the cargo will stop 25-1/8 inches (63.81 cm) from the front of the deck.

Fully extended, the cargo will stop 60-1/8 inches (152.71 cm) from the front of the deck.

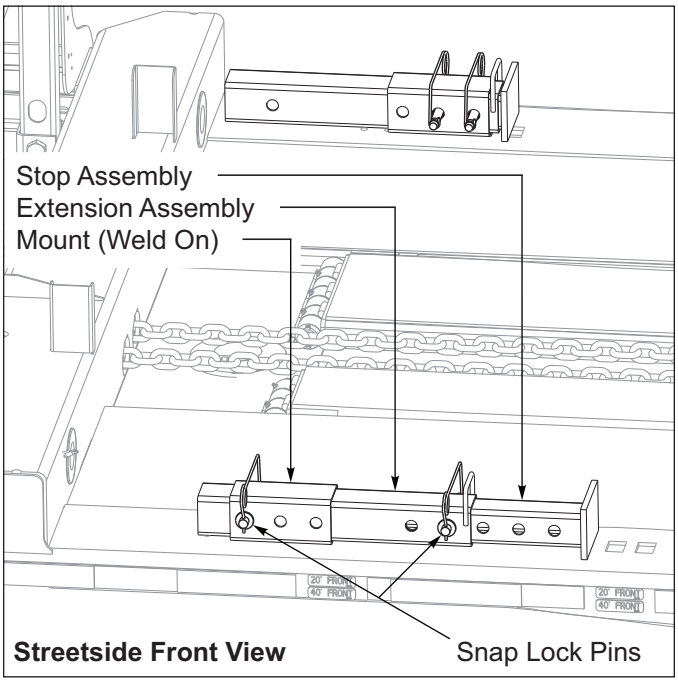


Figure 3-31: Container Stop, Front, Adjustable

Container Stop, Front, Bolt On

IMPORTANT

ALWAYS use both stop assemblies and set them the same distance to prevent possible cargo side shifting.

Front bolt on container stops are used to stop containerized cargo at the predetermined stop notch location during loading operations. ***See Figure 3-32.***

Each stop assembly consists of one bolt, one lock washer, one stop assembly, and one mount plate. ***See Figure 3-32.***

The stops lugs must be fully seated into the stop notches and bolted down to support the force of the containerized cargo. ***See Figure 3-32.***

Multiple stop notches are located along the top of each side of the deck.

Tools are required to adjust each stop:

- Remove one mount bolt, one lock washer, and one mount plate.
- Remove the front stop assembly from the stop notches.
- Determine the appropriate stop notch to facilitate the containerized cargo being loaded.
- Insert the stop assembly stop lugs into the stop notches with the stop edge facing the cargo.
- Install one mount bolt, one lock washer, and one mount plate. ***See General Torque Specifications on Page 2-5.***

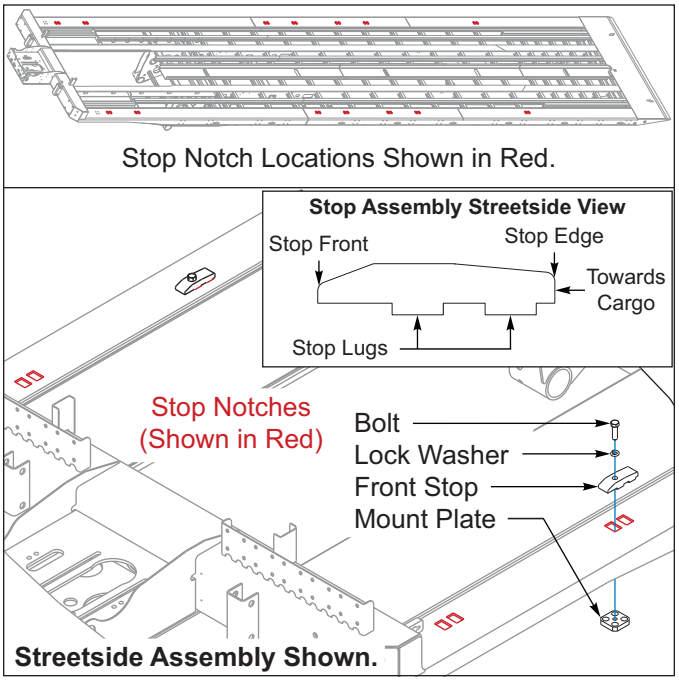


Figure 3-32: Container Stop, Front, Bolt On

Container Stop, Front, Slide In

IMPORTANT

- **ALWAYS use both stop assemblies and set them the same distance to prevent possible cargo side shifting.**
- **These stop assemblies are designed to be additional tie down devices ONLY.**
- **The use of primary tie down devices, such as chains/binders or straps ARE required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.**

Front slide in container stops are used to stop containerized cargo at the predetermined stop notch location during loading operations. ***See Figure 3-33.***

They are also designed to be used as additional tie down devices ONLY, when one of the following container loading chain assemblies are being used: ***See Figure 3-33.***

- ***See Chain Assembly, Container Loading, Front on Page 3-23***.
- ***See Chain Assembly, Container Loading, Front, Chain & Bridle on Page 3-23.***
- Primary tie down devices, such as chains/binders or straps **ARE** required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.

Each stop assembly consists of one stop assembly and one T-handle lock pin. ***See Figure 3-33.***

Multiple stop notches are located along the top of each side of the deck.***See Figure 3-33.***

Front Slide In Stop Assembly Installation:

- Insert the stop assembly stop lugs into the stop notches with the stop edge facing the cargo.
- Push the stop assembly forward to seat the lock lugs to the deck.
- Install the T-handle lock pin to hold stop in place.
- Repeat steps for opposite side stop assembly.

Front Slide In Stop Assembly Removal:

- Remove the T-handle lock pin.
- Pull the stop assembly rearward to unseat the lock lugs from the deck.
- Remove the stop assembly from the stop notches.
- Repeat steps for opposite side stop assembly.

Hold Containerized Cargo:

- ***See Loading Containerized Cargo on Page 4-9.***
- ***See Front Slide In Stop Assembly Installation:***
- Using the retrieval system, winch IN the cargo until the front container loading chain assembly is 1 ft (30.48 cm) from the stop assembly.
- Remove the streetside and curbside stop assembly T-handle lock pins. ***See Figure 3-33.***
- Using the retrieval system, winch IN the cargo until the front container loading chain assembly connection plate fully rests inside the stop assembly opening. ***See Figure 3-33.***

- Install the streetside and curbside stop assembly T-handle lock pins.

Release Containerized Cargo:

IMPORTANT

NEVER remove the stop assembly T-handle lock pins when the deck is tilted up.

- Prior to tilting up the deck, remove the streetside and curbside stop assembly T-handle lock pins.
- ***See Unloading Containerized Cargo, Chain Drive System on Page 4-13.***
- ***See Tilting Down the Trailer on Page 4-6.***
- Install the streetside and curbside stop assembly T-handle lock pins to secure the stop assemblies in the stop notches.

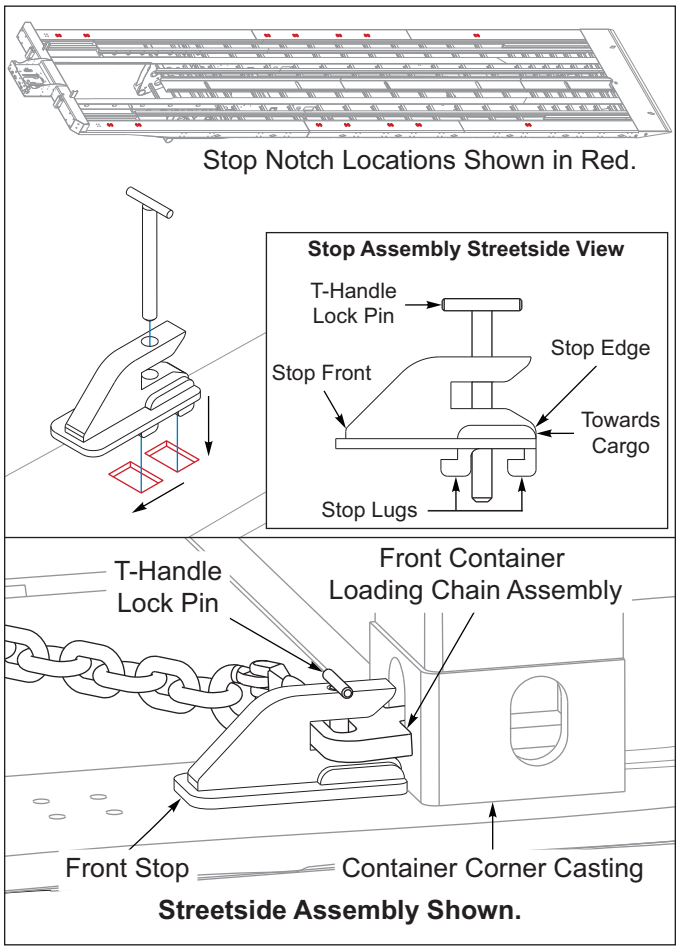


Figure 3-33: Container Stop, Front, Slide In

Container Stop, Rear, Slide In

IMPORTANT

- **ALWAYS use both stop assemblies to prevent possible cargo side shifting.**
- **These stop assemblies are designed to be additional tie down devices ONLY.**
- **The use of primary tie down devices, such as chains/binders or straps ARE required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.**

Rear slide in container stops are used when loading multiple containers or to hold the rear of smaller containers. ***See Figure 3-34.***

They are also designed to be used as additional tie down devices, to hold the rear of the front container and front of the rear container.

- Primary tie down devices, such as chains/binders or straps **ARE** required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.

Each stop assembly consists of one stop assembly and one T-handle lock pin. ***See Figure 3-34.***

Multiple stop notches are located along the top of each side of the deck. ***See Figure 3-34.***

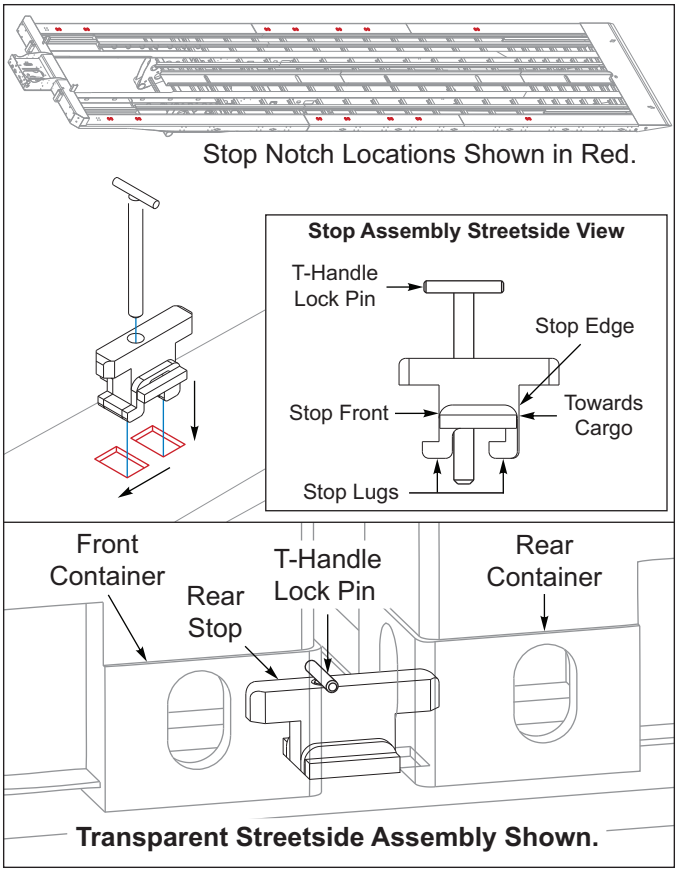


Figure 3-34: Container Stop, Rear, Slide In

Rear Slide In Stop Assembly Installation:

- Insert the stop assembly stop lugs into the stop notches with the stop edge facing the cargo.
- Push the stop assembly forward to seat the lock lugs to the deck.
- Install the T-handle lock pin to hold stop in place.
- Repeat steps for opposite side stop assembly.

Rear Slide In Stop Assembly Removal:

- Remove the T-handle lock pin.
- Pull the stop assembly rearward to unseat the lock lugs from the deck.
- Remove the stop assembly from the stop notches.
- Repeat steps for opposite side stop assembly.

Hold Containerized Cargo:

- ***See Loading Containerized Cargo on Page 4-9.***
- Install the stop assembly into the rear corner castings of the front container. ***See Rear Slide In Stop Assembly Installation:***
- If loading multiple containers, ***See Loading Containerized Cargo on Page 4-9.***
- Using the retrieval system, winch IN the cargo until the container corner castings rest against both rear stop assembly stop edges.

Release Containerized Cargo:

- Unload rear container first, ***See Unloading Containerized Cargo, Chain Drive System on Page 4-13.***
- ***See Tilting Down the Trailer on Page 4-6.***
- ***See Rear Slide In Stop Assembly Removal:***

Container Stop & Hold Block, Stop / Hold Pins

NOTE

This option is not available aftermarket, ONLY offered on special factory built trailers.

IMPORTANT

- **ALWAYS use both stop assemblies to prevent possible cargo side shifting.**
- **These stop assemblies are designed to be primary tie down devices, ONLY when the stop & lock block assemblies will secure all four corners of the container.**
- **Additional tie down devices, such as chains/binders or straps MAY BE required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.**

Container stop & hold blocks are welded to the deck and assist in guiding the cargo straight on the deck.

These are designed to be primary tie down devices ONLY when all four corners of the container can be secured to the deck.

- **All four corners ARE able to be secured:**
  - Additional tie down devices, such as chains/binders or straps **MAY BE** required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.
- **All four corners ARE NOT able to be secured:**
  - Additional tie down devices, such as chains/binders or straps **ARE** required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.

Stop pins are used in the 3-hole and 4-hole stop block bottom holes only.

Items included with option:

- (2) Left Hand / Streetside Stop Pins, Short Handles.
- (4) Left Hand / Streetside Hold Down Pins, Long Handles.
- (2) Right Hand / Curbside Stop Pins, Short Handles.
- (4) Right Hand / Curbside Hold Down Pins, Long Handles.
- (8) Retaining Pins.

Stop Pin Installation:

NOTE

Installing and removing the stop pins and hold down pins require the same procedures.

- Install stop/hold down pin into the stop block. ***See Figure 3-35.***
- Rotate handle down in the direction of the lock tab to secure the pin from falling out.
- Install the retaining pin through the lock tab and deck retaining pin holes to secure the stop pin from rotating during travel.
- Repeat steps for opposite side stop pin assembly.

Stop Pin Removal:

- Remove the retaining pin from the lock tab and deck retaining pin holes.
- Rotate the stop/hold down pin handle up until the lock tab is clear of obstruction.
- Remove the stop pin assembly.
- Repeat steps for opposite side stop pin assembly.

Hold Down Pin Installation:

- ***See Loading Containerized Cargo on Page 4-9.***
- Install the front stop pins. ***See Stop Pin Installation:***

- Using the retrieval system, winch IN the cargo until the container corner castings rest against both front stop pins.
- Install the hold down pins into the front corner castings of the container. ***See Stop Pin Installation:***
- If loading multiple containers. ***See Loading Containerized Cargo on Page 4-9.***
- Install the rear hold down pins into the rear corner castings of the front container. ***See Stop Pin Installation:***
- Install the rear stop pins. ***See Stop Pin Installation:***
- Using the retrieval system, winch IN the cargo until the container corner castings rest against both rear stop pins.
- Install the hold down pins into the front corner castings of the rear container. ***See Stop Pin Installation:***
- Install the hold down pins into the rear corner castings of the rear container, if option is available. ***See Stop Pin Installation:***

Hold Down Pin Removal:

- Remove the hold down pins. ***See Stop Pin Removal:***
- ***See Unloading Containerized Cargo, Chain Drive System on Page 4-13.***
- ***See Tilting Down the Trailer on Page 4-6.***
- If unloading multiple containers, remove the rear stop pins. ***See Stop Pin Removal:***
- Remove the rear hold down pins from the rear corner castings of the front container. ***See Stop Pin Removal:***
- Remove the front hold down pins from the front corner castings of the front container. ***See Stop Pin Removal:***
- ***See Unloading Containerized Cargo, Chain Drive System on Page 4-13.***

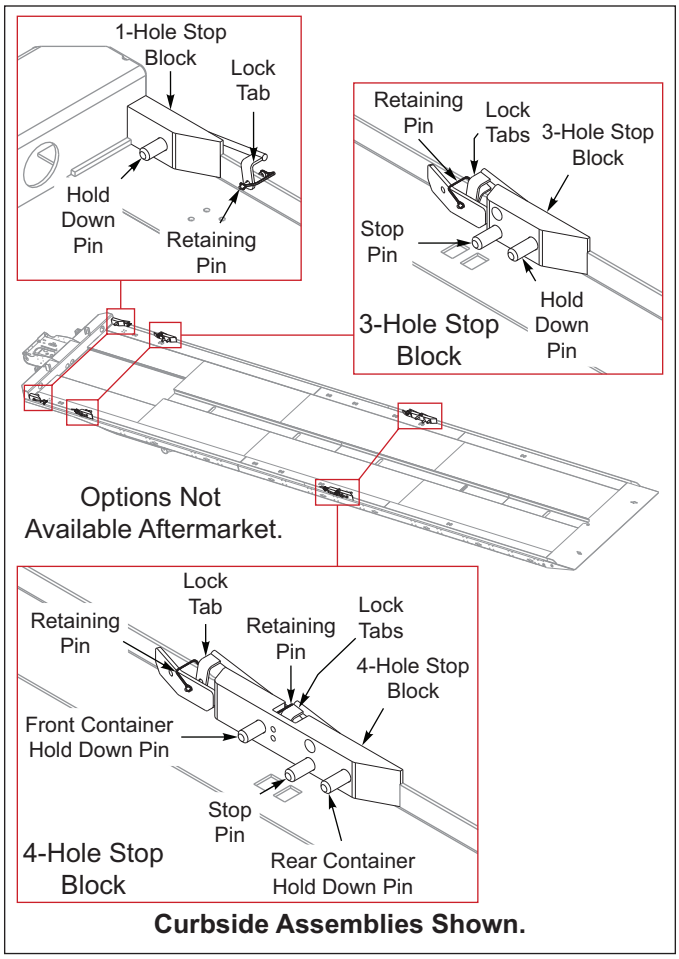


Figure 3-35: Container Stop & Lock Block, Stop / Lock Pins

Container Stop & Hold Down, Shoe Lock

NOTE

This option is not available aftermarket, ONLY offered on special ordered factory built trailers.

IMPORTANT

- **ALWAYS use both stop assemblies to prevent possible cargo side shifting.**
- **These stop assemblies are designed to be additional tie down devices ONLY.**
- **The use of primary tie down devices, such as chains/binders or straps ARE required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.**
- **DO NOT use these stop assemblies to support or drag the weight of the cargo on the ground.**

Container shoe lock assemblies are used to control side shifting of containerized cargo that must be loaded flush with the rear of the deck. ***See Figure 3-36.***

They are also designed to be used as additional tie down devices, to hold **ONLY** the rear container.

- Primary tie down devices, such as chains/binders or straps **ARE** required by State, Federal, Provincial, Local, and Industrial Regulations for proper tie down procedures.

These are not designed to support or drag the weight of the cargo on the ground.

They get installed into the container rear corner castings and pulled into the approach plate shoe lock receivers to restrict side to side movement. ***See Figure 3-36.***

This option is not available as an aftermarket application and only available on specially ordered trailers.

Each shoe lock assembly consists of one shoe lock assembly and two lock pins.

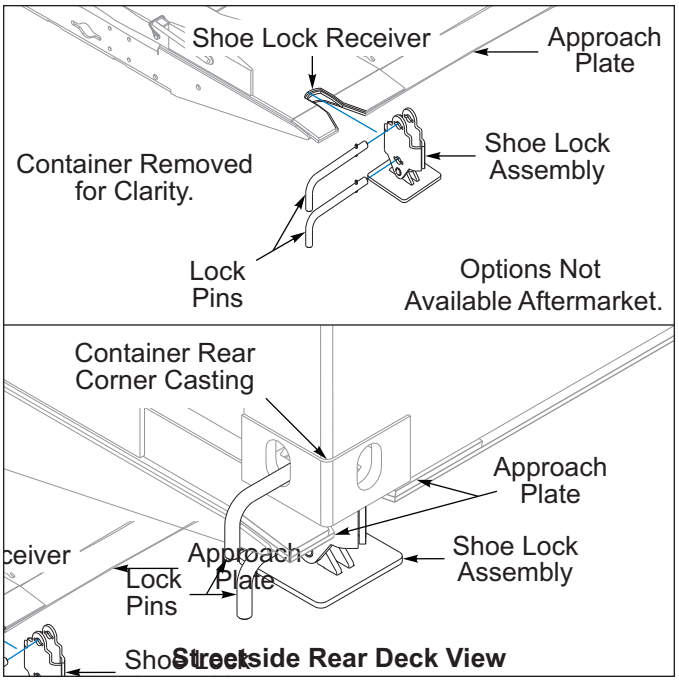


Figure 3-36: Container Stop & Hold Down, Shoe Lock Assembly

Shoe Lock Assembly Installation:

NOTE

Steps written with the understanding both lock pins have already been removed

- Install and support the shoe lock assembly into the bottom rear container corner casting opening.
- Install the top lock pin handle through the rear container corner casting and into the shoe lock assembly.
  - Rotate lock pin handle to align the retaining pin with the shoe lock assembly keyhole.
  - Install the lock pin into the shoe lock assembly keyhole.
  - Rotate the lock pin handle to the fully down position.
  - Pull the lock pin handle out to rest the lock pin retaining pin against the shoe lock assembly.
- Install the bottom lock pin handle under the rear container corner casting and into the shoe lock assembly.
  - Rotate lock pin handle to align the retaining pin with the shoe lock assembly keyhole.
  - Install the lock pin into the shoe lock assembly keyhole.
  - Rotate the lock pin handle to the fully down position.
  - Pull the lock pin handle out to rest the lock pin retaining pin against the shoe lock assembly.
- Repeat steps for opposite side.

Shoe Lock Assembly Removal:

- ***See Attach the Container Pusher Assembly: on Page 3-26.***
- Using the appropriate retrieval system hydraulic control lever, winch OUT to push the cargo rearward until it over-hangs the approach plate by 2 ft (60.96 cm). This will release any tension on the shoe lock assembly.
- Support the shoe lock assembly from falling.
- Remove the top lock pin from the shoe lock assembly.
  - Rotate lock pin handle to align the retaining pin with the shoe lock assembly keyhole.
  - Remove the lock pin from the shoe lock assembly and rear container corner casting.
- Lower the shoe lock assembly out of the rear container corner casting and the approach plate shoe lock receiver.
- Repeat steps for opposite side.

Hold Containerized Cargo:

- ***See Loading Containerized Cargo on Page 4-9.***
- Install the shoe lock assemblies. ***See Shoe Lock Assembly Installation:***
- Using the retrieval system, winch IN the cargo until the shoe lock assemblies rest against the approach plate receivers.

Release Containerized Cargo:

- Remove the shoe lock assemblies. ***See Shoe Lock Assembly Removal:***

Hook Assembly, Chain Connect

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT use the chain connect hook assembly for ANY overhead lifting operations.**
- **DO NOT use the chain connect hook assembly for ANY tie down procedures.**

IMPORTANT

DO NOT use the chain connect hook assembly for ANY tie down procedures.

The chain connect hook assembly is a quick attach adapter used to connect the chain drive retrieval system to the cargo chain assemblies. ***See Figure 3-37.***

It consists of one shortener link with safety stop, one chain hook, and two chain links.

The safety stop is designed to restrict the chain connector hook assembly from being pulled into the drive sprocket of the chain drive motor, causing damage.

Attach the Chain Connector Hook Assembly:

- Position the hook end towards the cargo. ***See Figure 3-37.***
- Position the shortener link away from the cargo.
- Slide the shortener link over the drive chain and pull it towards the cargo to seat on the drive chain.

Detach the Chain Connector Hook Assembly:

IMPORTANT

ALWAYS ensure cargo will not shift or move if retrieval system tension is released.

- Release any retrieval system drive chain tension.
- Detach any cargo chain assemblies from the hook end.
- Slide the shortener link away from the cargo to unseat from the drive chain.

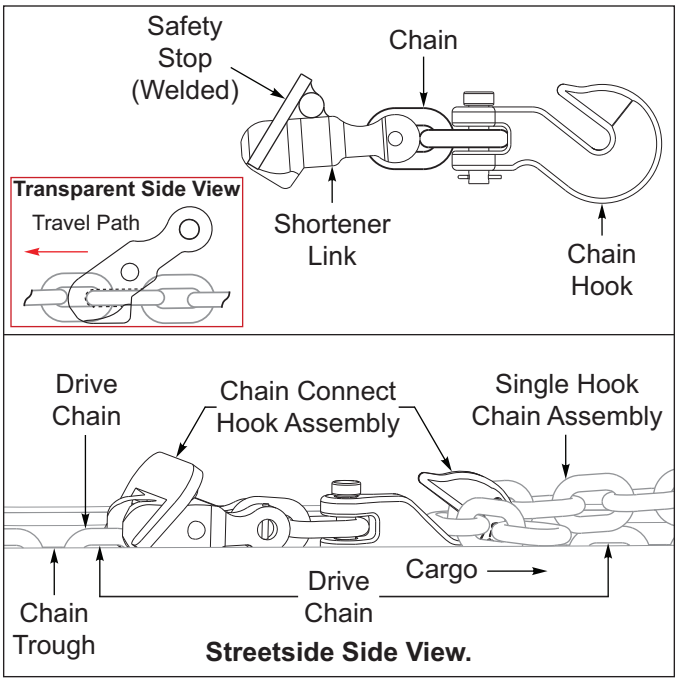


Figure 3-37: Hook Assembly, Chain Connect

Tie Down (Options)

Tie Down, Anchors

See Tie Down Anchors on Page 3-34.

Tie Down, Chain

IMPORTANT

USE THE ONLY APPROVED Trailer Tie Downs listed in this section to secure any cargo.

Tie down chains are used along with load binders and the deck tie down anchors to secure the cargo to the deck.

Landoll offers two tie down chain options that provide the operator the ability to properly secure the cargo to the trailer.

- 3/8 in x 16 ft, GR7 Chain without hook.
- 3/8 in x 24 ft, GR7 Chain without hook.

Tie Down, Strap

IMPORTANT

USE THE ONLY APPROVED Trailer Tie Downs listed in this section to secure any cargo.

4-Inch tie down straps are used along with strap pocket, strap J-hook, and strap ratchets tie down anchors to secure the cargo to the deck.

Load Binder Assembly, 3/8 Ratchet

IMPORTANT

USE THE ONLY APPROVED Trailer Tie Down Anchors listed in this section to secure any cargo.

Load binders, also known as chain binders or chain tensioners, are used along with tie down chains to secure the cargo from shifting on the deck during transport.

Landoll offers 3/8-inch ratcheting load binders that provide the operator with the ability to tighten the tie down chains for proper securement of the cargo.

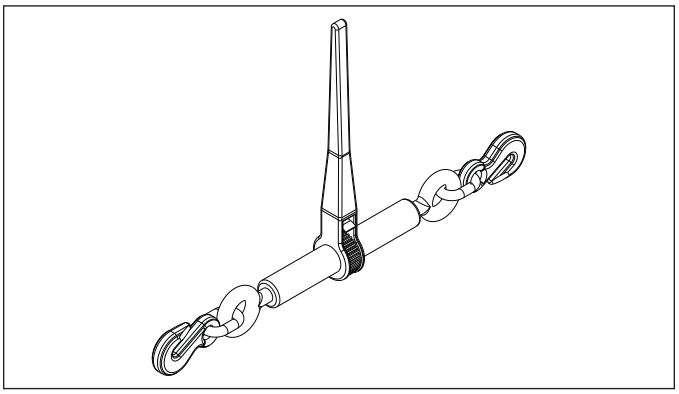


Figure 3-38: Load Binder Assembly, 3/8 Ratchet

Storage

Frame, Toolbox (Options)

Lockable toolboxes may be mounted on one or both sides of the trailer, directly across from each other.

A standard trailer comes with one, 42 in (106.68 cm) wide by 28 in (71.12 cm) deep by 9 in (22.86 cm) high toolbox mounted on the streetside of the trailer, just left of the control panel, ***See Figure 3-39.***

An optional 42 in (106.68 cm) wide by 26 in (71.12 cm) deep by 17 in (43.18 cm) high is also available.

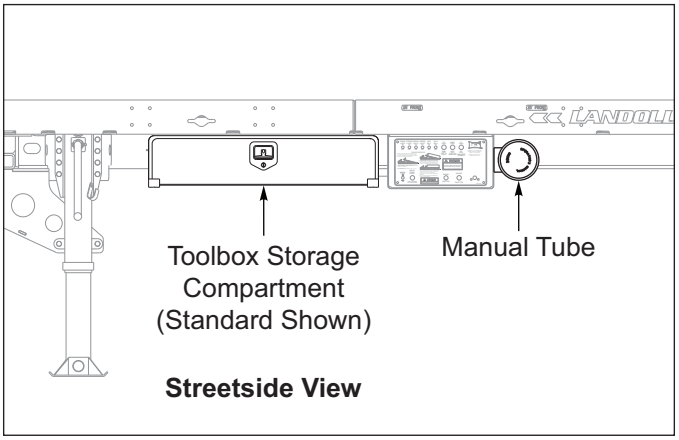


Figure 3-39: Frame Toolbox (Options)

Manual Tube

A weather tight manual tube is mounted on the right side of the control panel, this contains the Operator's and Parts Manuals for the trailer, ***See Figure 3-39.***

Tie Down Anchors

IMPORTANT

USE THE ONLY APPROVED Trailer Tie Down Anchors listed in this section to secure any cargo.

Landoll offers multiple tie down anchor options that provide the operator the ability to properly secure the cargo to the trailer.

IMPORTANT

Use of the products demonstrates an understanding of the warnings and the potential risks involved.

The purpose of these warning statements is to be used as a standard to identify only those risks that are common.

The ultimate responsibility and understanding of proper use and application of cargo securing devices rest with the end user.

Reading and understanding all Federal, State, and Local regulations associated with cargo securement is a responsibility of the end user.

Securing devices and anchors shall be used in accordance with all State, Federal, Provincial, Local, and Industry Regulations.

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **NEVER exceed the working load limits of any tie down device or anchor.**
  - The working load limit of a combined securing system (example: chain, binder, & anchor) is only as strong as the weakest point.
- **DO NOT allow slack in tie downs. Shifting cargo may create enough momentum to break tie downs devices or anchors.**
- **ALWAYS match the tie down devices to the equivalent grade and working load limits.**
- **ALWAYS secure the tie down devices to prevent them from becoming loose, opened, or released while vehicle is in transit according to Federal guidelines.**

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Deviation from straight line pulls will result in reduced working load limits on the trailer anchors.**

WARNING

Failure to follow safety procedures may cause equipment damage and personal injury.

- **Prior to the use of any product from Landoll Company, LLC.**
  - Carefully read and follow all applicable instructions, warnings and safety information enclosed, supplied, and attached to the product.
- **It is the responsibility of the Owner/Operator to inspect and evaluate the condition of all devices used to secure cargo.**
  - Including but not limited to chains, straps, winches, binders, and anchor points.
  - It is prohibited to use any device or anchor that shows damage.
  - Before use, any damaged items should be repaired or replaced.

All cargo should be properly loaded, blocked, and braced to prevent cargo shifts, and to comply to the following sections of the Department of Transportation Federal Motor Carriers Safety Regulations.

- Sections 393.100 through 393.114, Protection Against Shifting or Falling Cargo.
  - Including Front End Structures.
- Section 393.116 through 393.136, Specific Securement Requirements by Commodity Type.

NOTICE

More information about cargo securement may be found at:

- **https://www.ecfr.gov/current/title-49/subtitle-B/chapter-III/subchapter-B/part-393/subpart-I**
- **https://www.fmcsa.dot.gov/regulations/cargo-securement/cargo-securement-rules**

Remember that regulations vary from state to state. State regulations may be found at:

- **http://www.fhwa.dot.gov/webstate.htm**

Tie Downs - Not Approved

IMPORTANT

- **DO NOT use the upper/lower trailer flange or any frame component not approved in this section as a tie down anchor.** ***See Figure 3-40.***
- **These are NOT designed or approved as a tie down anchor options, in accordance with State, Federal, Provincial, Local, and Industrial Regulations.**
- **Using ANY unapproved frame components as a tie down anchor will stress, bend, and damage the trailer frame.**
- **These will NOT, in accordance with State, Federal, Provincial, Local, and Industrial Regulations, properly secure the tie down device from becoming loose and disconnecting from the trailer.**

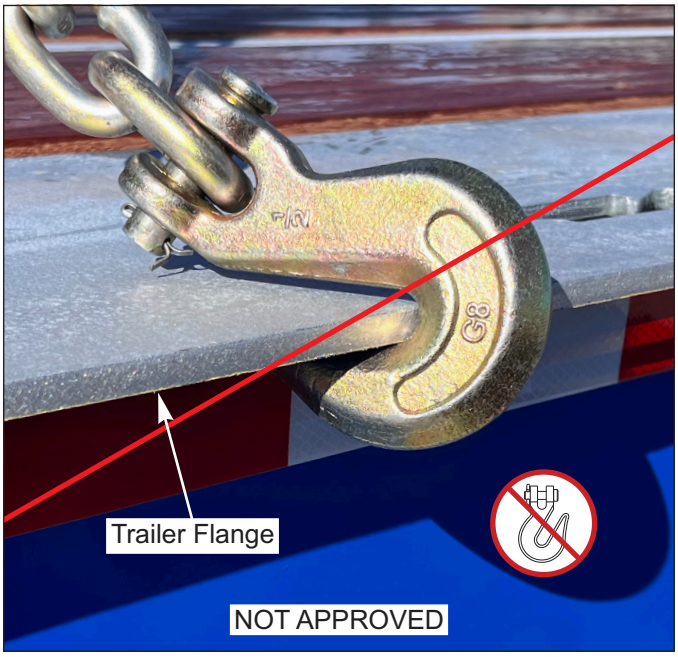


Figure 3-40: Trailer Flange Example

D-Ring Tie Downs - Approved

D-Ring Tie Downs are pivoting rings that are anchored to the trailer frame.

IMPORTANT

- **D-Ring Tie Downs are only designed to anchor one tie down line per D-Ring.**
- **DO NOT attach the chain hook to the D-Ring Tie Down.**

D-Ring Tie Down Procedures

- Select a D-Ring that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Pivot the D-Ring to the up position, ***See Figures 3-41*** to ***Figure 3-42***.
- Insert the chain hook from the outside to the inside of the opening.
- Secure hook to the chain **ONLY**.

Angled D-Ring

Angled D-Rings are mounted on the sides of the trailer, ***See Figure 3-41.***

See D-Ring Tie Down Procedures above.



Figure 3-41: Angled D-Ring

Straight D-Ring

Straight D-Rings are mounted on the top of the trailer, ***See Figure 3-42.***

See D-Ring Tie Down Procedures above.



Figure 3-42: Straight D-Ring

Keyhole Tie Downs - Approved

Keyhole Tie Downs, also known as Chain Gotchas, are machined into the top plates of the trailer. The notches point in the direction of pull.

IMPORTANT

- **Keyhole Tie Downs are ONLY designed to anchor one tie down line per Keyhole.**
- **DO NOT attach the chain hook to the Keyhole Tie Down, or damage will occur. *See Figure 3-43.***

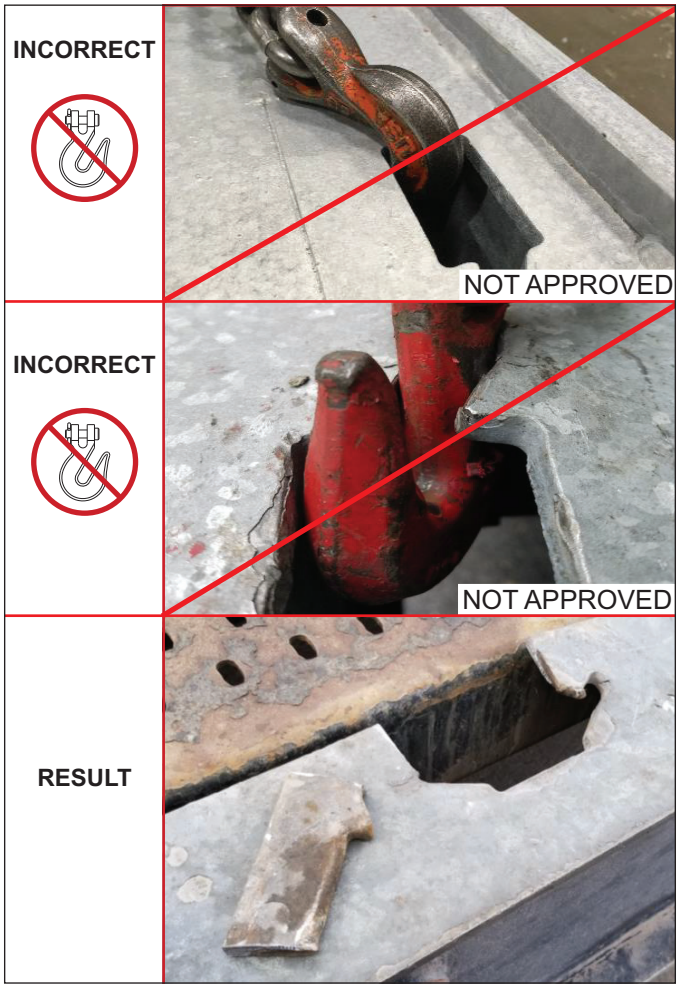


Figure 3-43: Incorrect Usage

IMPORTANT

- **DO NOT apply multiple directions of pull to any Keyhole Tie Down.**
- **Keyhole Tie Downs are designed to anchor ONLY one direction of pull at a time, *See Figure 3-44.***

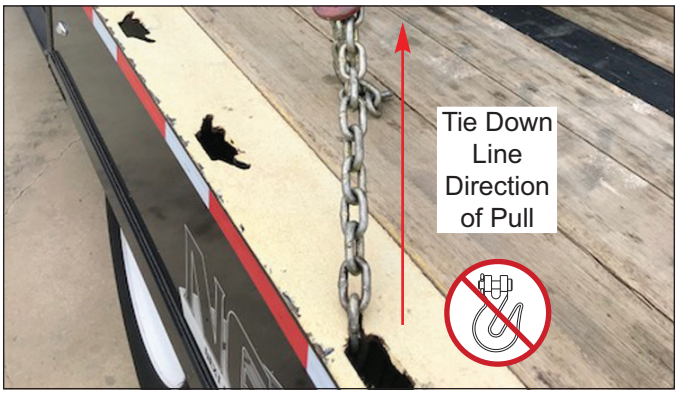


Figure 3-44: Direction of Pull

IMPORTANT

- **Keyhole Tie Downs require one chain link at a minimum below the notch to hold the chain in place, *See Figure 3-45.***
- **Keyhole Tie Downs are designed to anchor ONLY one direction of pull at a time, *See Figure 3-44.***

Keyhole Tie Down Procedures

- Select a Keyhole that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Remove chain hook, if available.
- Insert one chain link at a minimum below the opening to hold the chain in place, ***See Figures 3-45*** to ***Figure 3-47***.
- Slide a link of chain fully into the notch pointing in the direction of pull.

Single Keyhole

Depending of the model of trailer, Single Keyhole Tie Downs are located on each side of the main deck approach plate, ***See Figure 3-45.***

See Keyhole Tie Down Procedures above.

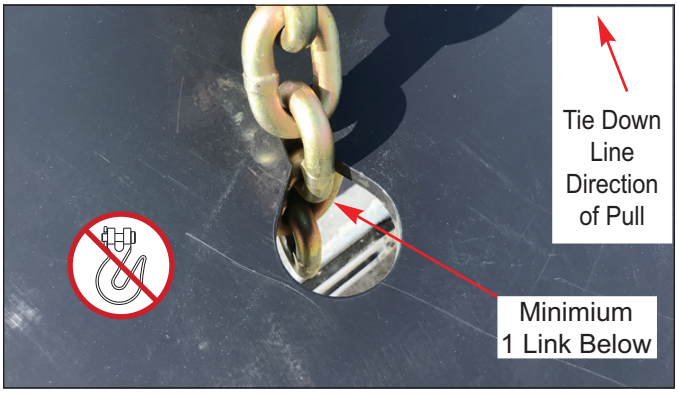


Figure 3-45: Single Keyhole

Double Keyhole

Double Keyhole Tie Downs are located on the outside beams of the trailer, ***See Figure 3-46.***

Certain trailer models also contain double keyhole tie downs on each side of the main deck towards the front.

See Keyhole Tie Down Procedures above.



Figure 3-46: Double Keyhole

Quad Keyhole

Quad Keyhole Tie Down, also known as 4-Way Gotchas, are located in the center of the trailer, ***See Figure 3-47.***

See Keyhole Tie Down Procedures above.



Figure 3-47: Quad Keyhole

Rub Rail Tie Downs - Approved

Rub Rails are full length tie down rails that protrude from one or both sides of the trailer.

They have evenly spaced supports that create a gap behind the rail allowing tie down chains to pass through.

IMPORTANT

- **Rub Rail Tie Downs are only designed to anchor one tie down line per rail support.**
- **Chain and hooks may slide along rail if not properly routed and secured to a rail support.**

Rub Rail - Chain Tie Down Procedures

- Select a Rail Support that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Slide the chain hook through the top of the rub rail on the far side of the rail support, away from the cargo. ***See Figure 3-48.***
- Hook the chain hook to the rub rail on the cargo side of the rail support, towards the cargo. ***See Figure 3-48.***
- Pull any excess chain back through the top of the far side of the rub rail.

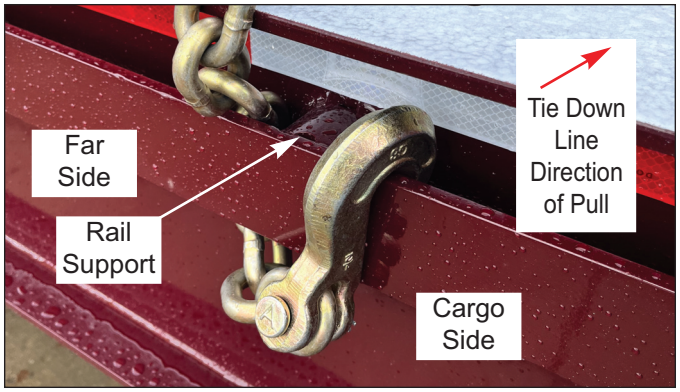


Figure 3-48: Rub Rail

Rub Rail - Strap Tie Down Procedures

IMPORTANT

Always place a rail support between the strap hook and direction of pull to prevent strap hook slippage.

- Select a Rail Support that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Properly orientate the strap's web breaking strength line in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Slide the strap hook with the hook opening facing outward up through the far side bottom of the rub rail, on the opposite side of chain hook shown in ***Figure 3-51***.

IMPORTANT

The rail support must prevent the strap hook slipping in the direction of pull.

- Rest the strap hook opening over the top of the outside of the rub rail. Example ***See Figure 3-51.***

- During tie down procedures, readjust the tie down strap to cover and apply pressure to the outside of the strap hook. Example *See Figure 3-51.*

Strap J-Hook Tie Downs - Approved

Strap J-Hooks are evenly spaced hook style tie downs that protrude from one or both sides of the trailer.

These are intended to be ONLY used with D-Ring style tie down straps, *See Figure 3-49.*

Strap Ratchets may also be available on the opposite side adjacent to the J-Hook for securing the tie down strap, *See Strap J-Hook Tie Down Procedures on Page 3-39.*

IMPORTANT

Strap J-Hook Tie Downs are only designed to anchor one tie down line per hook.

Strap J-Hook Tie Down Procedures

- Select a J-Hook that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Properly orientate the strap's web breaking strength line in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Slide the D-Ring of the strap onto the J-Hook, *See Figure 3-49.*
- During tie down procedures, readjustment of the tie down strap may be required to properly seat the strap hook to the J-hook.

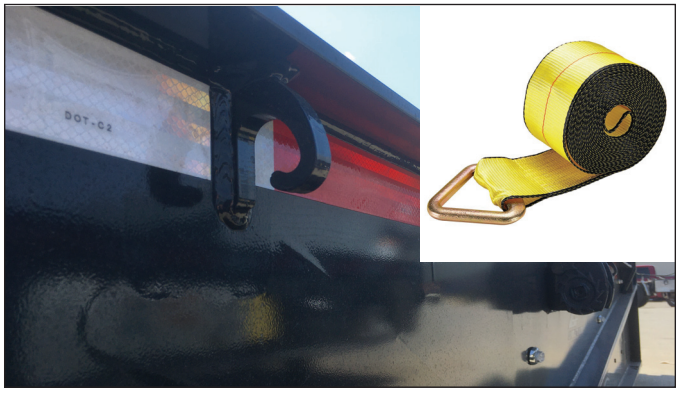


Figure 3-49: Strap J-Hook

Strap Pocket Tie Downs - Approved

Strap Pockets are evenly spaced 1-7/8 inch by 4 inch brackets that protrude from one or both sides of the trailer.

IMPORTANT

- **Strap Pocket Tie Downs are only designed to anchor one tie down line per pocket.**
- **Chain and hooks may slide along pocket if not properly routed and secured to a rail support.**

Strap Pocket - Chain Tie Down Procedures

- Select a Strap Pocket that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Slide the chain hook through the top of the strap pocket and trailer, *See Figure 3-50.*
- Pull extra chain through the bottom of the gap.
- Position chain against the cargo side of the strap pocket.
- Secure the chain hook to the strap pocket.
- Pull excess chain back through the top of the strap pocket.



Figure 3-50: Chain - Strap Pocket

Strap Pocket - Strap Tie Down Procedures

- Select a Strap Pocket that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Properly orientate the strap's web breaking strength line in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- **Weld-On Strap Pockets:** *See Figure 3-51.* Slide the strap hook up through the bottom of the strap pocket with the hook opening facing outward.
- **Machined Strap Pockets:** *See Figure 3-52.* Wrap the strap under the outer beam with the

hook opening facing the opposite side of the trailer.

- Rest the strap hook opening over the top outside of the strap pocket.
- During tie down procedures, readjust the tie down strap to cover and apply pressure to the outside of the strap hook. ***See Figure 3-51.***



Figure 3-51: Strap Pocket, Weld-On

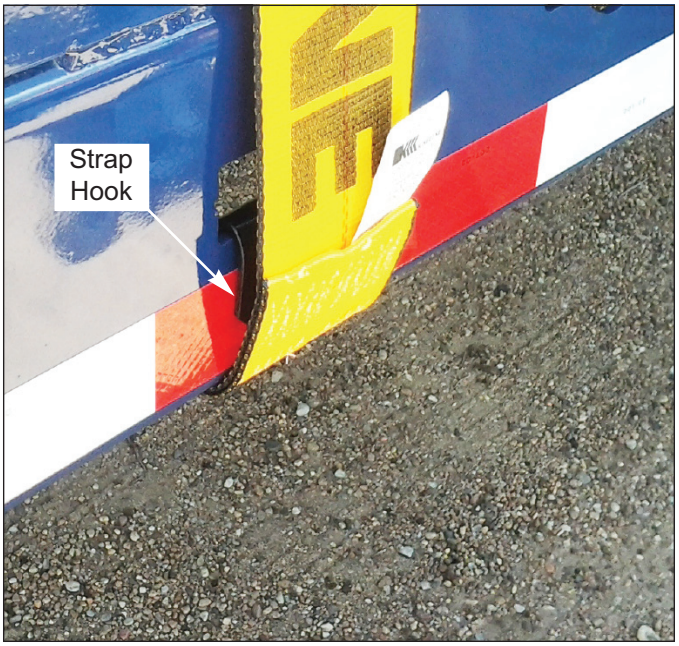


Figure 3-52: Strap Pocket, Machined

Strap Ratchet Tie Downs - Approved

Strap Ratchets are evenly spaced manually locking, manually rotated winch style tie down anchors, that protrude from one or both sides of the trailer.

These are intended to be **ONLY** used with nylon tie down straps.

IMPORTANT

Strap Ratchet Tie Downs are ONLY designed to anchor one tie down line per Ratchet.

Strap Ratchet Tie Down Procedures

To Tighten:

- Select a Strap Ratchet that provides the proper tie down angle to secure the cargo in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Properly orientate the strap's web breaking strength line to the strap winch in accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
- Slide the strap through the ratchet slot / bars, ***See Figures 3-53*** to ***Figure 3-54***.
- Pull all excess strap through the ratchet assembly.
- Manually flip the ratchet lock down to engage the strap ratchet locking teeth.
- Insert a handle into the ratchet socket to tighten.

To Release:

- Insert a handle into the ratchet socket, ***See Figures 3-53*** to ***Figure 3-54***.
- Slightly tighten the strap ratchet release tension on the ratchet lock.
- Manually flip the ratchet lock up to release the strap ratchet locking teeth.
- Slowly rotate the strap winch handle to release the strap tension.

3-Bar Strap Ratchet

3-Bar Strap Ratchet Tie Downs are located on the outside beams of the trailer, ***See Figure 3-53.***

See Strap Ratchet Tie Down Procedures above.

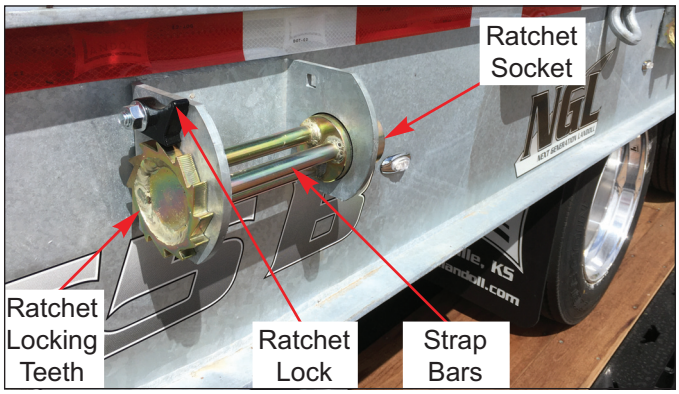


Figure 3-53: 3-Bar Strap Ratchet

Low Profile Strap Ratchet

Low Profile Strap Ratchet Tie Downs are located on the outside beams of the trailer, ***See Figure 3-54.***

See Strap Ratchet Tie Down Procedures above

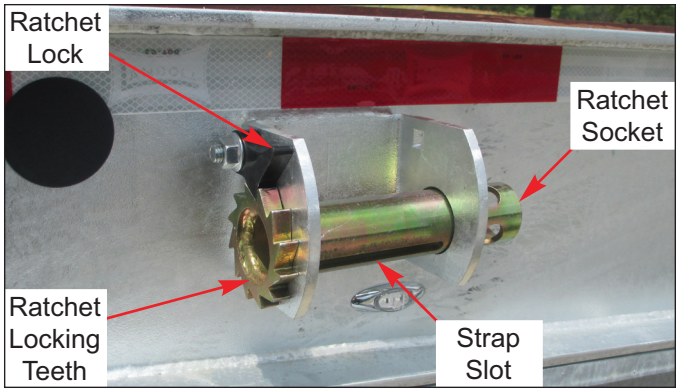


Figure 3-54: Low Profile Strap Ratchet

Pre-Coupling the Trailer

DANGER

Proceed with extreme caution. Failure to heed notice will cause injury or death to the person and/or damage to product and property.

- **ALWAYS check behind and under the truck and trailer for persons or objects before moving.**
- **ALWAYS chock trailer wheels to prevent movement of the trailer.**

CAUTION

Hydraulic supply pressure higher than 2,550-2,700 psi (17,581-18,615 kPa) can cause damage to the trailer.

IMPORTANT

If using the tractor hydraulics, some fluids may need to be removed from the tractor reservoir to allow room for 5.5 gallons (21 liters) of additional fluid displaced from the trailer hydraulic system.

1. Slowly back the tractor up aligning the fifth wheel plate to the kingpin of the trailer.
   - DO NOT couple to the trailer. Stop a few inches in front of the trailer.
2. Place the tractor in neutral/park and set the park brake.
3. Chock the trailer wheels.
4. Perform a walk-around inspection and look for anything that would make the trailer non-operational.
5. Verify the trailer's kingpin plate is properly aligned at the same height or slightly lower than the tractor's hitch plate.
6. Verify the tractor's fifth wheel is open by pulling the latch handle.
7. Connect the tractor's emergency and service air hoses to the trailer's gladhands, ***See Figure 4-1.***
   - Turn the tractor's air valves on to fill the trailer air tanks.
8. Connect the hydraulic supply return hose to the trailer's hydraulic return coupler, ***See Figure 4-1.***
9. Connect the hydraulic supply pressure hose to the trailer's hydraulic pressure coupler, ***See Figure 4-1.***
10. Adjust the trailer's gooseneck height for coupling, if needed.
    - **See specific landing leg procedures:**
      - ***Raise - 2-Speed Hand Crank on Page 4-3.***
      - ***Raise - Manual, Pinned, Trailer Uncoupled on Page 4-4.***
      - ***Lower - 2-Speed Hand Crank on Page 4-3.***
      - ***Lower - Manual, Pinned, Trailer Uncoupled on Page 4-4.***
11. Inspect the hitch assembly.
    a. Start the hydraulic pump.

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **To prevent severe injury or death from pinching: Keep all persons and objects clear while any part of the machine is in motion.**
- **DO NOT inspect the kingpin when the trailer is coupled to the trailer.**

    b. Adjust the trailer tilt control lever DOWN and inspect the kingpin and plate assembly.
    - Inspect the kingpin and hitch plate for cracked welds and visual defects.
    - Inspect that the tilt cylinder pins are properly secured.
    - Inspect the tilt cylinders and hoses for leaks.
    - Inspect the hitch lift arm for cracked welds, missing parts, or visual defects.

    c. Adjust the trailer using the trailer tilt control lever UP or DOWN to align the king pin, ***See Tilt Control on Page 3-20.***

    d. Shut off the hydraulic pump.
12. Perform a pre-coupling air brake check.
    a. Have a helper apply the service brakes. Inspect for prompt brake action application on ALL wheels.

    b. Have the helper release the service brakes, Inspect for immediate brake action release on ALL wheels. Quickly discharging air should also be heard escaping from the relay emergency valve.

c. Shut off the tractor's emergency air valve and disconnect the emergency air line gladhand from the trailer. Inspect the trailer's emergency brakes for prompt application.

d. Reconnect the tractor's emergency air line to the trailer's gladhand and open the tractor's air valve. Inspect for the releasing of the trailer's emergency brakes on ALL wheels.

13. ***See Couple the Trailer on Page 4-2.***

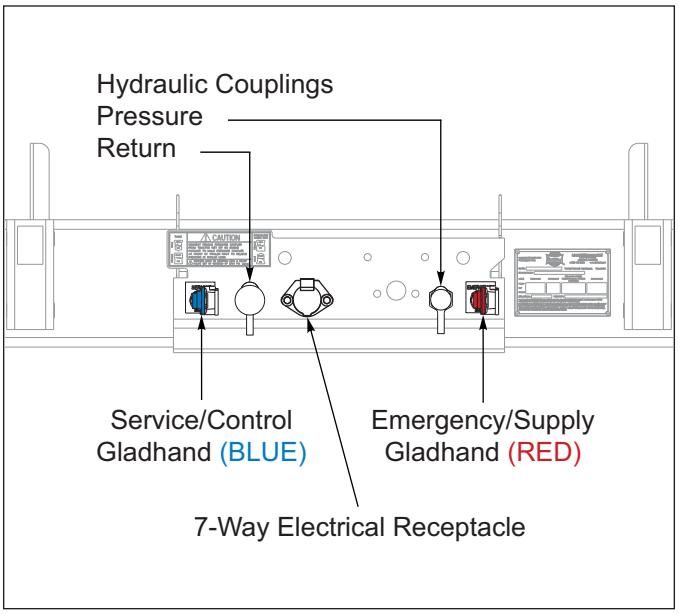


Figure 4-1: Service Hook Ups

Coupling and Uncoupling the Trailer

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **NEVER uncouple when the trailer is not fully in transport position.**
- **DO NOT allow the trailer to fall onto the landing legs.**
- **ALWAYS check behind and under the truck and trailer for persons or objects before moving.**
- **ALWAYS chock trailer wheels to prevent movement of the trailer.**
- **Keep all personnel clear of front, rear, and sides of the tractor and trailer during coupling, component operations, and uncoupling.**

Couple the Trailer

1. Perform Pre-Coupling the Trailer, ***See Pre-Coupling the Trailer on Page 4-1.***
2. Verify the trailer wheels are chocked and brakes function properly.
3. Make certain the tractor's fifth wheel is open by pulling the latch handle.
4. Back up slowly so the fifth wheel contacts the front of the kingpin plate on the trailer, and slides under the plate.
   - Continue backing until the fifth wheel coupler locks onto the trailer kingpin.
5. Verify the vehicle coupling is secure by attempting to pull the tractor forward.
   - If the tractor uncouples from the trailer, repeat steps 3-5.
   - If the tractor continues to uncouple from the trailer, set the tractor park brake. Locate the source of failure and repair before continuing.
   - It the tractor remains coupled, set the tractor park brake and verify the coupler is fully locked.
6. Set the tractor park brake.

IMPORTANT

Keep the park brakes engaged for remainder of hookup procedures.

7. Connect the tractor's 7-pin electrical plug to the trailer's electrical receptacle, ***See Figure 4-1.***
   - Align the key on the plug, to the key way in the plug socket.
8. Connect the tractor's air lines to the trailer's emergency and service connectors, ***See Pre-Coupling the Trailer on Page 4-1.***
9. Connect the hydraulic supply return hose to the trailer's hydraulic return coupler, ***See Pre-Coupling the Trailer on Page 4-1.***
10. Connect the hydraulic supply pressure hose to the trailer's hydraulic pressure coupler, ***See Pre-Coupling the Trailer on Page 4-1.***
11. Raise the landing gear fully up into transport position.

- **See specific landing leg procedures:**
  - ***Raise - 2-Speed Hand Crank on Page 4-3.***
  - ***Raise - Manual, Pinned, Trailer Coupled on Page 4-4.***

12. Remove the chocks from the trailer wheels.
13. Start the hydraulic pump.
14. Using the trailer tilt control lever, verify the trailer is tilted fully DOWN in transport position. ***See Tilt Control on Page 3-20.***

15. Using the axle control lever, verify the axles are fully BACK into transport position. ***See Axle Control on Page 3-20.***
16. Shut off the hydraulic pump.
17. Chock the trailer wheels.
18. ***See Tractor and Trailer Inspection on Page 4-4.***

Uncouple the Trailer

1. Start the hydraulic pump.
2. Using the trailer tilt control lever, verify the trailer is tilted fully DOWN in transport position. ***See Tilt Control on Page 3-20.***
3. Using the axle control lever, verify the axles are fully BACK into transport position. ***See Axle Control on Page 3-20.***
4. Shut off the hydraulic pump.
5. Park the trailer according to instructions, ***See Parking the Trailer on Page 4-19.***
6. Lower the landing gear to support the trailer.

- **DO NOT the allow trailer to fall onto the landing legs.**
- **See specific landing leg procedures:**
  - ***Lower - 2-Speed Hand Crank on Page 4-3.***
  - ***Lower - Manual, Pinned, Trailer Coupled on Page 4-3.***

7. Disconnect the tractor's emergency and service air lines from the trailer. Attach gladhand covers to the tractor and trailer connections to protect from dirt and debris, ***See Figure 4-1.***
8. Disconnect the tractor's electrical 7-pin cable from the trailer, ***See Figure 4-1.***
9. Disconnect the hydraulic supply pressure hose from the trailer's hydraulic pressure coupler, ***See Figure 4-1.***
10. Disconnect the hydraulic supply return hose from the trailer's hydraulic return coupler, ***See Figure 4-1.***
11. Attach dust boots on the tractor and trailer quick couplers to protect from dirt and debris.
12. Pull the tractor's fifth wheel plate latch release lever.
13. Verify all air, electrical, and hydraulic lines have been disconnected.
14. Attempt to pull the tractor forward.
    - If the tractor does not uncouple, repeat Steps 12-14.
    - If the tractor fails to uncouple from the trailer, set the tractor park brake. Locate the source of failure and repair before continuing.
    - If the tractor uncouples, continue to pull the tractor away from the trailer.

Landing Gear Operation

Hand Crank, 2-Speed (Standard)

Lower - 2-Speed Hand Crank

1. Remove handle from storage.
2. Rotate the handle clockwise to lower the landing gear to desired height. ***See Hand Crank, 2-Speed on Page 3-19.***
   - Pushing in or pulling out the handle and drive tube will change the speed of the landing gear.
3. Store the handle.

Raise - 2-Speed Hand Crank

1. Remove handle from storage.
2. Rotate the handle counterclockwise to raise the landing gear to the desired height. ***See Hand Crank, 2-Speed on Page 3-19.***
   - Pushing in or pulling out the handle and drive tube will change the speed of the landing gear.
3. Store the handle.

Manual, Pinned (Option)

Lower - Manual, Pinned, Trailer Coupled

IMPORTANT

The lower support leg weighs 35 lbs (16 kg). Use caution when lowering the support leg.

1. Hold the streetside lower support leg handle and remove the snap pin, ***See Manual, Pinned (Option) on Page 3-20.***
2. Manually lower the streetside lower support leg to the desired height.
3. Align the upper and lower support leg pin holes.
4. Insert snap pin into aligned holes.
5. Hold the curbside lower support leg handle and remove the snap pin.
6. Manually lower the curbside lower support leg to the desired height.
7. Align the upper and lower support leg pin holes.
8. Insert snap pin into aligned holes.

Raise - Manual, Pinned, Trailer Coupled

IMPORTANT

The lower support leg weighs 35 lbs (16 kg). Use caution when lowering the support leg.

1. Hold the streetside lower support leg handle and remove the snap pin, ***See Manual, Pinned (Option) on Page 3-20.***
2. Manually raise the streetside lower support leg to the desired height.
3. Align the upper and lower support leg pin holes.
4. Insert snap pin into aligned holes.
5. Hold the curbside lower support leg handle and remove the snap pin.
6. Manually raise the curbside lower support leg to the desired height.
7. Align the upper and lower support leg pin holes.
8. Insert snap pin into aligned holes.

Lower - Manual, Pinned, Trailer Uncoupled

1. Using a suitable lifting device, raise the front of the trailer.
2. ***See Lower - Manual, Pinned, Trailer Coupled on Page 4-3.***
3. Using the suitable lifting device, lower the front of the trailer to fully rest on the landing legs.

Raise - Manual, Pinned, Trailer Uncoupled

1. Using a suitable lifting device, raise the front of the trailer.
2. ***See Raise - Manual, Pinned, Trailer Coupled on Page 4-4.***
3. Using the suitable lifting device, lower the front of the trailer to fully rest on the landing legs.

Tractor and Trailer Inspection

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Keep all personnel clear of front, rear, and sides of the tractor and trailer during coupling, component operations, and uncoupling.**
- **ALWAYS set and check parking brake and chock wheels when parking or storing.**
- **ALWAYS transport trailer with trailer pivoting hitch assembly in the full down position.**

1. Activate the hydraulic power source.
2. Release trailer brakes.
3. Fully tilt the trailer up. ***See Tilting Up the Trailer on Page 4-5.***
4. Fully tilt the trailer down. ***See Tilting Down the Trailer on Page 4-6.***
5. Check the operation of all lights and signals on the trailer for proper response to switch positions (Stop, Right Turn, Left Turn, and Clearance).
6. Check operation of remote function, if present.
7. Check tire inflation, adjust as needed to the pressure listed on the trailer identification plate, located on the front of the trailer.
8. Check tractor and trailer for air leaks. If air leakage is found, repair the defect before transporting.
9. Check the oil in each hub for proper level and freedom from contamination. If hubs are contaminated with water, dirt or some other foreign material, clean/replace before transporting.
10. Check tractor air pressure. Pressure must not fall below 90 psi (621 kPa), even after activating brakes a couple of times. Set parking brake and carefully remove all wheel chocks.
11. Set the trailer emergency brake and try pulling forward. The trailer wheels must not rotate. If trailer brakes **DO NOT** apply, **DO NOT** transport until defects are repaired.

Tilting Up and Tilting Down the Trailer

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS keep personnel or objects clear of front, rear, and sides of the tractor and trailer during coupling/uncoupling, tilting, loading/unloading, and any components operations.**
- **DO NOT operate the trailer when uncoupled from the tractor.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **DO NOT move the axle too far ahead and overbalance the tail end. Keep the undercarriage behind the trailer's center of gravity. This may cause the tractor's rear axle to leave the ground.**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is NOT contacting the ground.**
- **ALWAYS rest the approach plate on the ground before moving the undercarriage's center in front of the cargo's center of gravity.**

WARNING

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **ALWAYS use low load angle for loading.**
- **ALWAYS use low load angle for unloading rolling or powered products.**
- **Use maximum unload angle for unloading non-powered or containerized products ONLY WHEN REQUIRED.**

CAUTION

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT allow the rear most trailer tires to leave the ground.**

Tilting Up the Trailer

Tilting up the trailer is the process of preparing the trailer for loading and unloading operations.

IMPORTANT

- **Practice all standard industrial safety standards.**
- **DO NOT load any cargo that may overload any component of the trailer or cause an unsafe condition.**

1. Park the tractor/trailer in a straight line on a flat level surface, 1 ft (30.48 cm) away from the cargo.

- Set the tractor brakes and **DO NOT** set the trailer brakes**,** ***See Figure 4-2.***
- Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.
  - **Loading:** The trailer moves during tilting operations. Allow 1 ft (30.48 cm) of clearance between the rear of the trailer and cargo.
  - **Unloading:** The trailer moves during tilting operations. Allow 1 ft (30.48 cm) of clearance between the rear of the trailer/cargo and drop spot.

2. Engage the hydraulic pump.

IMPORTANT

- **Always place wheel chocks in front and behind the tractor's front wheels to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is not contacting the ground.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

3. Use the axle control to move the undercarriage 5 to 8 ft (1.5 to 2.4 m) AHEAD, extracting the cam followers out of the pockets, ***See Axle Control on Page 3-20*** and ***See Figure 4-2.***

4. Position the approach plate on the ground, ***See Figure 4-2.***
   - Alternate between tilting up the trailer deck and moving the axles AHEAD until the approach plate rests on the ground. ***See Axle Control on Page 3-20*** and ***See Tilt Control on Page 3-20***.
   - **STOP IF:** The center of the undercarriage must move past the cargo's center of gravity, place the trailer back into transport position and move to a better surface.

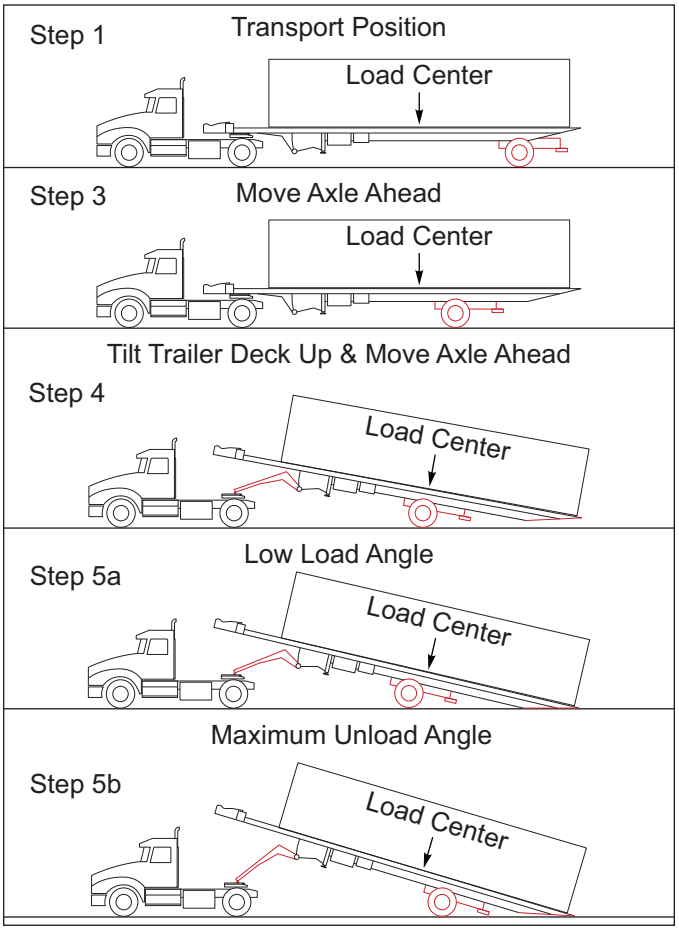


Figure 4-2: Tilting Up

5. Position the trailer deck load angle. ***See Figure 4-2.***
   a. **Low Load Angle:** Alternate between tilting DOWN the trailer deck and moving the axles fully AHEAD, while maintaining support from the rear tires and approach plate.
   - Low Load Angle is the lowest angle achieved when the axles are fully forward, and the trailer deck is also being supported by the rear tires and approach plate.
   - Low Load Angle is used for loading all cargo and unloading rolling or powered cargo.

   b. **Maximum Unload Angle:** Alternate between tilting fully UP the trailer deck and moving the axle BACK while maintaining support from the rear tires and approach plate.
   - Maximum Unload Angle is the highest angle achieved when the pivoting hitch assembly is fully extended and the trailer deck is also being supported by the rear tires and approach plate.
   - Maximum Unload Angle is used ONLY IF REQUIRED for unloading non-powered or containerized cargo.

IMPORTANT

Maximum Unload Angle is used ONLY IF REQUIRED for unloading non-powered or containerized cargo.

Tilting Down the Trailer

Tilting down the trailer is the process of preparing the trailer for travel.

IMPORTANT

- **Practice all standard industrial safety standards.**
- **DO NOT load any cargo that may overload any component of the trailer or cause an unsafe condition.**

1. Engage the hydraulic pump.
   - Loading: The trailer moves during tilting operations. Allow 1 ft (30.48 cm) of clearance between the rear of the trailer and cargo.
   - Unloading: The trailer moves during tilting operations. Allow 1 ft (30.48 cm) of clearance between the rear of the trailer/cargo and drop spot.

IMPORTANT

- **Always place wheel chocks in front and behind the tractor's front wheels to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **The loaded or unloaded trailer deck's center of gravity must be in front of the undercarriage's center point.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

2. Position the undercarriage to support the loaded or unloaded trailer deck's center of gravity, ***See Figure 4-3.***
   a. **Low Load Angle:** Alternate between tilting UP the trailer deck and moving the axles Back while maintaining support from the rear tires and approach plate, until the cargo's center of gravity is in front of the center of the undercarriage. ***See Tilt Control on Page 3-20***, ***See Axle Control on***

Page 3-20 and *See Figure 4-3.*

b. **Maximum Unload Angle:** Used **ONLY IF REQUIRED to UNLOAD** non-powered or containerized cargo. Where the bed is empty, continue to Step 3, *See Figure 4-3.*

3. Use the tilt control to lower the trailer deck fully DOWN, *See Figure 4-3.*
   - The pivoting hitch assembly will be fully recessed into the gooseneck.
4. Use the axle control to move the undercarriage fully BACK into transport position, *See Figure 4-3.*
5. Disengage the hydraulic pump.

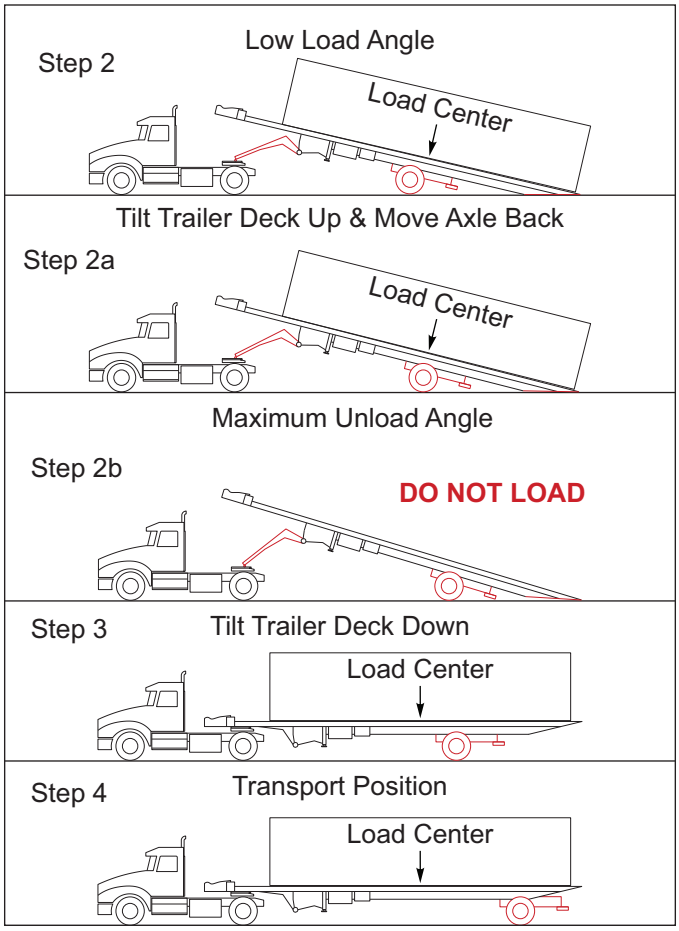


Figure 4-3: Tilt Down

Loading and Unloading the Trailer

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT operate the trailer when uncoupled from the tractor.**
- **ALWAYS check behind and under the truck and trailer for persons or objects before moving, raising and lowering of the trailer.**
- **ALWAYS keep personnel or objects clear of front, rear, and sides of the tractor and trailer during coupling/uncoupling, loading/unloading, and any components operations.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **ALWAYS ensure the cargo is steering straight and not maneuvering off the side of the trailer.**
- **DO NOT operate the trailer when uncoupled from the tractor.**
- **ALWAYS secure cargo to ONLY approved trailer tie down anchors.**
- **ALWAYS secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**
- **Failure to leave at least five winch cable wraps on the winch cable spool could allow the cable to come off the spool, resulting in serious injury or death.**
- **The winch is not designed or intended to be used for lifting or moving people. Using it this way may cause serious injury or death.**
- **NEVER use the winch to side pull cargo. This trailer is designed for straight pulling only. The trailer frame may become unstable and flip over, resulting in serious injury or death.**
- **NEVER attempt to disengage the winch cable spool when the cable is under tension. The cargo can roll away. Serious injury or death can result if people are in the path of the rolling cargo.**

⚠ WARNING

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **Model 343B trailer maximum concentrated load in a 10 ft (3.048 m) area is 10,000 lbs (4535 kg).**
- **Model 344 trailer maximum concentrated load in a 20 ft (6.096 m) area is 15,000 lbs (6803 kg).**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is not contacting the ground.**
- **DO NOT exceed the tractor/trailer gross axle weight ratings.**
- **NEVER allow the trailer and cargo combined weight exceed the Gross Vehicle Weight Rating (GVWR).**
- **DO NOT handle the winch cable/drive chain during operations.**
- **Hands or clothing could get caught in the cable/chain and be pulled into the spool/sprocket, causing serious injury or death.**

⚠ CAUTION

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT allow the rear most trailer tires to leave the ground.**

NOTICE

Retrieval System refers to any winch or chain drive component/accessory used to load or unload cargo.

Options Available:

- **Chain Drive - Front Deck Mounted.**
- **Winch Drive - Front Deck Mounted.**

Loading the Trailer

⚠ DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Practice all standard industrial safety standards.**
- **DO NOT load any cargo that may overload any component of the trailer or cause an unsafe condition.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is not contacting the ground.**
- **The cargo must not place more weight on the king pin than on the rear axles during loading and unloading.**
- **Making sure that the cargo is steering straight up onto the trailer, and does not maneuver off the side of the trailer.**
- **Position the cargo's center of gravity in front of the undercarriage's center.**
- **ALWAYS secure the cargo with proper tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**

Loading Rolling or Powered Cargo

1. Park the tractor/trailer in a straight line on a flat level surface, 1 ft (30.48 cm) away from the cargo.
   - Set the tractor brakes and **DO NOT** set the trailer brakes.
   - **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
2. Position trailer deck for low load angle, ***See Tilting Up the Trailer on Page 4-5.***

IMPORTANT

- **Practice all standard industrial safety standards.**
- **DO NOT load any cargo that may overload any component of the trailer or cause an unsafe condition.**

IMPORTANT

- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

3. Drive or winch the cargo onto the trailer and position it for proper weight distribution.
   - Position the cargo's center of gravity as close to or slightly in front of the center of the undercarriage.
4. Set the cargo parking brakes and lower any hydraulic lifting arm attachments like blades, buckets, forks, etc.
5. Apply tension to the retrieval system cable/chain to hold the cargo in place.
   - If cargo was driven onto the trailer, attach retrieval system cable/chain and apply slight tension to hold the cargo while securing the cargo and transporting.
6. ***See Securing the Cargo on Page 4-17.***

- **Secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**

7. If loading multiple rolling or powered cargo, repeat Steps 1 through 4 and 6.
8. ***See Tilting Down the Trailer on Page 4-6.***
9. After trailer deck has been returned to transport position, re-secure the cargo, ***See Securing the Cargo on Page 4-17.***

Loading Containerized Cargo

1. Park the tractor/trailer in a straight line on a flat level surface, a few inches away from the cargo.
   - Set the tractor brakes and **DO NOT** set the trailer brakes.
   - **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**

IMPORTANT

- **Practice all standard industrial safety standards.**
- **DO NOT load any cargo that may overload any component of the trailer or cause an unsafe condition.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

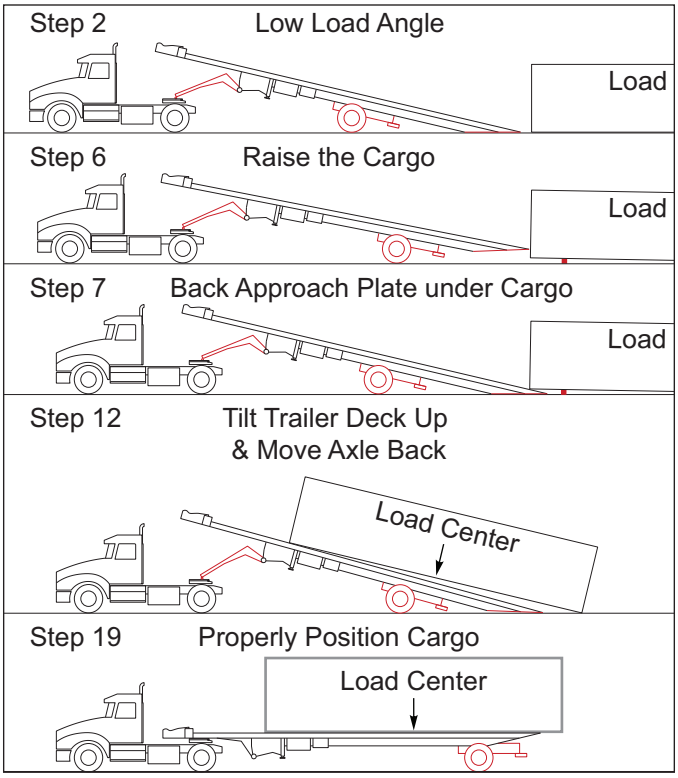


Figure 4-4: Container Loading

2. Position the trailer deck for low load angle, ***See Tilting Up the Trailer on Page 4-5.***
3. Attach the front container loading chain connection plates to the front corner of each side of the cargo. ***See Figure 4-5.***

- Depending on the trailer options purchased.
  - ***See Attach the Front Container Loading Chain Assembly: on Page 3-23.***
  - ***See Attach the Front Container Loading Chain & Bridle Assembly: on Page 3-24.***

4. Attach the retrieval system chain hook to the center of the container loading chain assembly.
   - **Chain Drive Option:** The single hook chain assembly may be attached for extended reach. ***See Figure 4-5.***

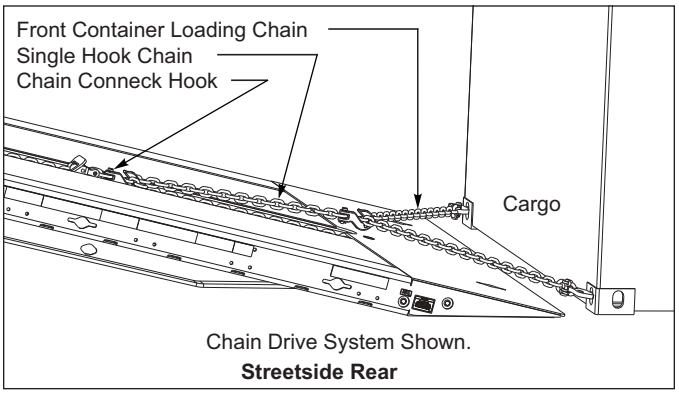


Figure 4-5: Front Container Loading Chain

5. Inspect the front of the container for clearance space for the trailer approach plate to slide under.

IMPORTANT

ALWAYS use the connection plates to support the load on the approach plate and not the chain. Chain damage may occur.

6. Raise the front of the cargo if the trailer approach plate will not slide under. ***See Figure 4-6.***
   - Using the retrieval system hydraulic control lever, winch IN the cargo until the container loading chain connection plates are over the approach plate. ***See Figure 4-6.***
   - Use the axle control lever, move the undercarriage BACK. This will raise the front of the cargo off the ground.
   - Place wooden blocks 1 to 2 ft (30.48 to 60.96 cm) under the front of each side of the cargo, to allow space for the approach plate to slide under. ***See Figure 4-6.***
   - Use the axle control lever, move the undercarriage AHEAD. This will lower the front of the cargo onto the wooden blocks.
   - Use the axle control lever, move the undercarriage AHEAD and until the approach plate is approximately 1 in (2.54 cm) off the ground.

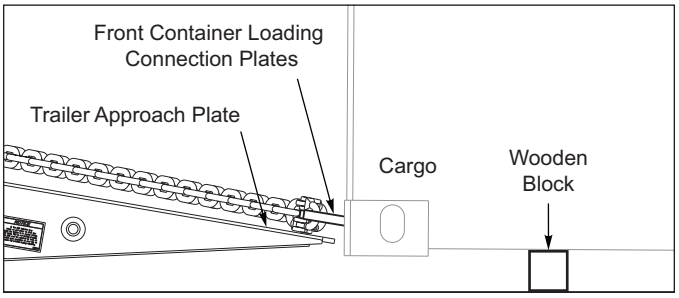


Figure 4-6: Raise the Cargo

7. Release the tractor brakes and drive the tractor and trailer backward, until the approach plate is under the front of the cargo. ***See Figure 4-7.***
   - Set the tractor brakes and DO NOT set the trailer brakes.
8. Use the axle control lever, move the undercarriage BACK to raise the cargo off the wooden blocks. ***See Figure 4-7.***
9. Remove the wooden blocks.
10. Use the axle control lever, move the undercarriage AHEAD and rest the approach plate on the ground. ***See Figure 4-7.***

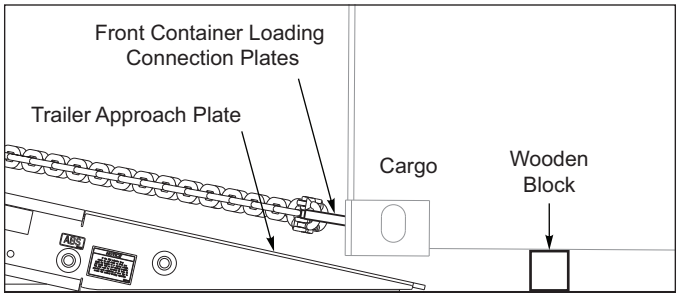


Figure 4-7: Back Approach Plate Under Cargo

11. Verify the tractor brakes are still set.

IMPORTANT

- **ALWAYS winch the containerized cargo onto the trailer. DO NOT Allow the tractor/trailer to be pulled under the cargo.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **DO NOT allow any tires or the approach plate to come off the ground.**

12. Alternate between winch IN the cargo, tilting UP the front of the trailer, and moving the axle BACK until the cargo over-hangs the approach plate by 3 ft. ***See Figure 4-4.***
13. ***See Securing the Cargo on Page 4-17.***
    - **Secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**
14. ***See Tilting Down the Trailer on Page 4-6.***
15. Set the trailer brakes.
16. Remove the tie down chains/binders or straps used to secure the cargo during deck tilting operations.
17. Install the container stops, if available.

- Depending on the trailer options purchased.
  - ***See Container Stop, Front, Adjustable on Page 3-27.***
  - ***See Container Stop, Front, Bolt On on Page 3-28.***
  - ***See Container Stop, Front, Slide In on Page 3-28.***

- *See Container Stop & Hold Block, Stop / Hold Pins on Page 3-30.*
- *See Shoe Lock Assembly Installation: on Page 3-32.*

- **Chain Drive Option:** If loading multiple containers, install the front container stops in a location that will allow the required distance to properly load the rear container.

18. Leave the retrieval system cable/chain attached to the cargo.
    - **Chain Drive Option ONLY:** To gain more travel, detach the front container loading chain assembly from the single hook chain assembly and hook directly to the chain connect hook assembly. *See Figure 4-5.*
19. Using the retrieval system hydraulic control lever, winch IN the cargo to properly position on the trailer deck. *See Figure 4-4.*
    - **Standard Approach Plate:** The rear of the cargo should over-hang the approach plate by 2 ft (60.96 cm).
    - **Optional Container Stops or Stop Pins:** The cargo should be firmly seated against the stops or stop pins.
    - **Optional Shoe Lock Assembly Approach Plate:** The rear of the cargo should be flush with the rear of the approach plate. The shoe lock assemblies should seat into the shoe lock receivers. *See Container Stop & Hold Down, Shoe Lock Assembly on Page 3-32.*

NOTICE

- **Cargo Properly Positioned:**
  - **Proceed to Step 20.**
- **If the retrieval system runs out of travel and is unable to properly position the cargo.**
  - **See A.** *Single Container Positioning: on Page 4-11.*
  - **See B.** *Multiple Container Positioning (Chain Drive System Only): on Page 4-12.*

A. Single Container Positioning:

- Disconnect the retrieval system single hook chain/chain connect assembly and secure it out of the way. *See Figure 4-5.*
- Attach the rear container loading chain connection plates to the rear corner on each side of the cargo. *See Figure 4-8* and *Chain Assembly, Container Loading, Rear on Page 3-24.*
- Insert the end of the curbside rear container loading chain into the streetside undercarriage single keyhole notch. *See Figure 4-8.*
- Remove the chain slack and secure nearest chain link into single keyhole notch.
- Insert the end of the streetside container loading chain into the curbside undercarriage single keyhole notch. *See Figure 4-8.*
- Remove the chain slack and secure nearest chain link into single keyhole notch.
- Secure the excess chain pulled through the undercarriage keyhole notches to keep from causing damage.

IMPORTANT

NEVER exceed 3 ft (1 m) of undercarriage travel from transport position in the following steps.

- Use the axle control lever, move the undercarriage AHEAD no more than 3 ft (1 m) at a time, to pull the cargo into proper position.
- Use the axle control lever, move the undercarriage fully BACK into transport position.
- If more movement is needed, reposition the chains evenly in the undercarriage notches and repeat the previous two steps.
- Verify the axle is fully BACK into transport position.
- Remove the container rear loading chains from the undercarriage keyhole notches.
- Remove the loading chain connections plates from the rear of the cargo.

IMPORTANT

DO NOT use the undercarriage notches as tie downs. This may cause damage to the trailer or cargo.

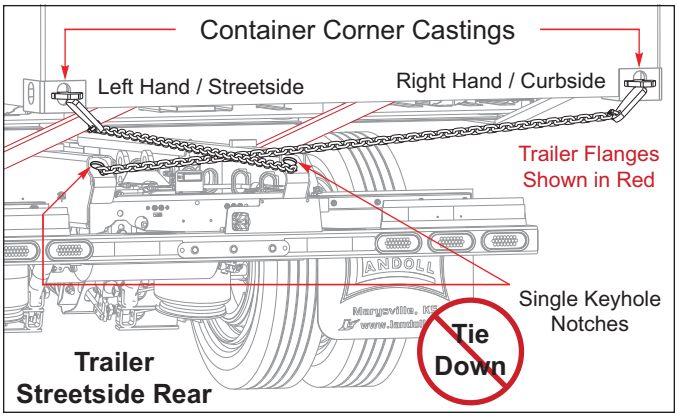


Figure 4-8: Rear Container Loading Chain

B. Multiple Container Positioning (Chain Drive System Only):

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT use container pusher on door end, if it will contact or cause possible damage to door or door locking hardware.**

- Disconnect the retrieval system single hook chain/chain connect assembly and secure it out of the way. ***See Figure 4-5.***
- Attach the container pusher to the chain drive at the rear of the cargo. ***See Figure 4-9*** and ***See Container Pusher on Page 3-25.***
- Using the retrieval system hydraulic control lever, winch IN the front cargo to properly position on the trailer deck. ***See Figure 4-9.***
- Detach the container pusher from the chain drive at the rear of the cargo. ***See Container Pusher on Page 3-25.***

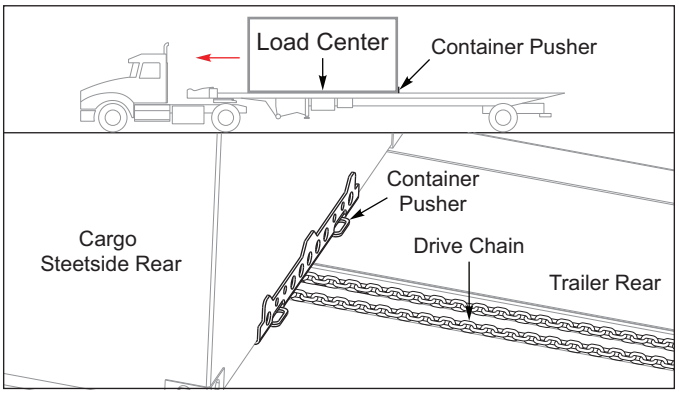


Figure 4-9: Rear Container Push

20. Install front container stop/lock pins, if available.

- Depending on the trailer options purchased.
  - ***See Container Stop, Front, Slide In on Page 3-29.***
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***

21. Install rear container stop/lock pins, if available.

- Depending on the trailer options purchased.
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***
- **Chain Drive Option:** If loading multiple containers, install the rear container stops behind the front container to secure in place, if available. ***See Figure 4-10*** and ***Container Stop, Rear, Slide In on Page 3-29.***

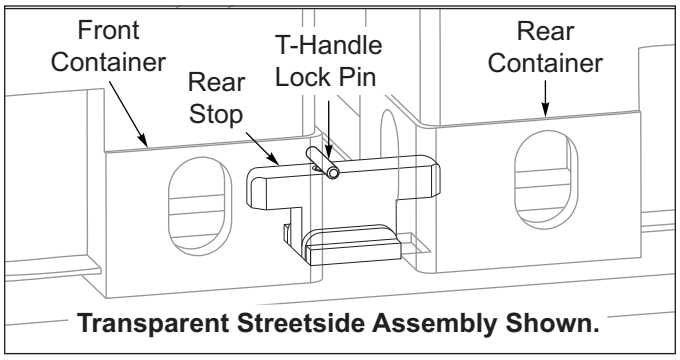


Figure 4-10: Rear Slide In Container Stops

22. ***See Securing the Cargo on Page 4-17.***
23. **Chain Drive Systems Only:** If loading multiple containers, repeat Steps 1 through 22.

Unloading the Trailer

Unloading Rolling or Powered Cargo

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Practice all standard industrial safety standards.**
- **DO NOT operate the trailer when uncoupled from the tractor.**
- **ALWAYS check behind and under the truck and trailer for persons or objects before moving, raising and lowering of the trailer.**
- **ALWAYS keep personnel and objects clear of front, rear, and sides of the tractor and trailer during coupling/uncoupling, loading/unloading, and any components operations.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is not contacting the ground.**

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **The cargo must not place more weight on the king pin than on the rear axles during loading and unloading.**
- **ALWAYS ensure the cargo is steering straight and not maneuvering off the side of the trailer.**
- **Position the cargo's center of gravity in front of the undercarriage's center.**
- **ALWAYS secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**

1. Park the tractor/trailer in a straight line on a flat level surface 1 ft (30.48 cm) away from the cargo drop point.
   - Set the tractor brakes and **DO NOT** set the trailer brakes.
   - **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
   - **DO NOT** release any tie down chains/binders or straps that are securing the cargo to the trailer at this time.
2. Verify the retrieval system cable/chain still has slight tension applied.

IMPORTANT

- **Practice all standard industrial safety standards.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

3. Position trailer deck for low load angle. ***See Tilting Up the Trailer on Page 4-5.***
4. Remove the tie down chains/binders or straps from the cargo.
5. Raise any cargo hydraulic lifting arm attachments like blades, buckets, forks, etc.
6. Unload the cargo.
   a. Drive Off:
   - Using the appropriate retrieval system hydraulic control lever, winch OUT slightly and detach the winch cable/chain from the cargo.
   - Release the parking brake.
   - Slowly drive the cargo straight off the rear of the trailer and clears the approach plate.

   b. Winch Off:
   - Using the appropriate retrieval system hydraulic control lever, winch OUT to off load the cargo.
   - Verify cargo is steering straight off the rear of the trailer and clears the approach plate.
   - Set the cargo parking brake or chock block the wheels.
   - Detach the retrieval system cable/chain hooked to the cargo.
7. ***See Tilting Down the Trailer on Page 4-6.***
8. Secure the retrieval system cable/chain to the proper tie-down point/points.

Unloading Containerized Cargo, Chain Drive System

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Practice all standard industrial safety standards.**
- **DO NOT operate the trailer when uncoupled from the tractor.**
- **ALWAYS check behind and under the truck and trailer for persons or objects before moving, raising and lowering of the trailer.**
- **ALWAYS keep personnel and objects clear of front, rear, and sides of the tractor and trailer during coupling/uncoupling, loading/unloading, and any components operations.**
- **ALWAYS unload multiple containers ONE AT A TIME to control the load.**
- **NEVER unload multiple containers at the same time.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is not contacting the ground.**
- **The cargo must not place more weight on the king pin than on the rear axles during loading and unloading.**

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS ensure the cargo is steering straight and not maneuvering off the side of the trailer.**
- **Position the cargo's center of gravity in front of the undercarriage's center.**
- **ALWAYS secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**

1. Park the tractor/trailer in a straight line on a flat level surface 1 ft (30.48 cm) away from the cargo drop point.
   - Set the tractor brakes and **DO NOT** set the trailer brakes.
   - **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
   - **DO NOT** release any tie down chains/binders or straps that are securing the cargo to the trailer at this time.

IMPORTANT

- **ALWAYS unload multiple containers ONE AT A TIME to control the load.**
- **NEVER unload multiple containers at the same time.**
- **ALWAYS secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**

NOTICE

Single Container Unloading:

- **Perform Steps 2 through 10.**

Multiple Container Unloading:

- **Perform Steps 2 through 19.**

IMPORTANT

If unloading multiple containers, DO NOT remove the container stop/lock pins that are securing the front container at this time.

2. Remove the container rear stop/lock pins, if available.
- Depending on the trailer options purchased.
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***
  - ***See Shoe Lock Assembly Removal: on Page 3-32.***
3. Using the appropriate retrieval system hydraulic control lever, winch OUT to loosen the chain tension.
- **If unloading multiple containers, DO NOT release the chain tension holding the front container at this time.**
4. Remove the container front stop/lock pins, if available.
- **If unloading multiple containers, DO NOT remove the container stop/lock pins holding the front container at this time.**
- Depending on the trailer options purchased.
  - ***See Container Stop, Front, Slide In on Page 3-29.***
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***
5. Remove the retrieval system chain assemblies from the front of the container. ***See Figure 4-5 on Page 4-10.***
- **If unloading multiple containers, DO NOT remove the chain assemblies holding the front container at this time.**

IMPORTANT

- **Practice all standard industrial safety standards.**
- **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

6. Position trailer deck for low load angle. ***See Tilting Up the Trailer on Page 4-5.***
- **Container Overhangs Approach Plate:**
  - Position the container to slightly rest on the ground.
  - **DO NOT** exert any downward force. This will apply additional tension to the tie down chain/binders or straps, and may cause damage.
- **Container DOES NOT Overhang Approach Plate:**
  - Position the approach plate to slightly rest on the ground.
7. Remove the tie down chains/binders or straps from the cargo.
- **If multiple containers are loaded, DO NOT remove the tie down chains/binders or straps holding the front container.**
8. Remove the wheel chocks in front and behind the tractor's front wheels.

9. Drive the tractor/trailer straight ahead allowing the container to slide off the trailer and clear of the approach plate. ***See Figure 4-11***

- **STOP IF** the container does not slide off the trailer.
- Reposition the tractor/trailer back to 1 ft (30.48 cm) away from the cargo drop point.
- Set the tractor park brake.
- **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- Readjust trailer for maximum unload angle.
  - ***See Figure 4-11.***
  - ***See Tilting Up the Trailer on Page 4-5.***
- Remove the wheel chocks in front and behind the tractor's front wheels.
- Drive the tractor/trailer straight ahead.

IMPORTANT

NEVER reposition the cargo when the deck is not in transport position.

10. ***See Tilting Down the Trailer on Page 4-6.***

- **Single Container Unloading:**
  - End of Task.
- **Multiple Container Unloading:**
  - Continue to Step 11.

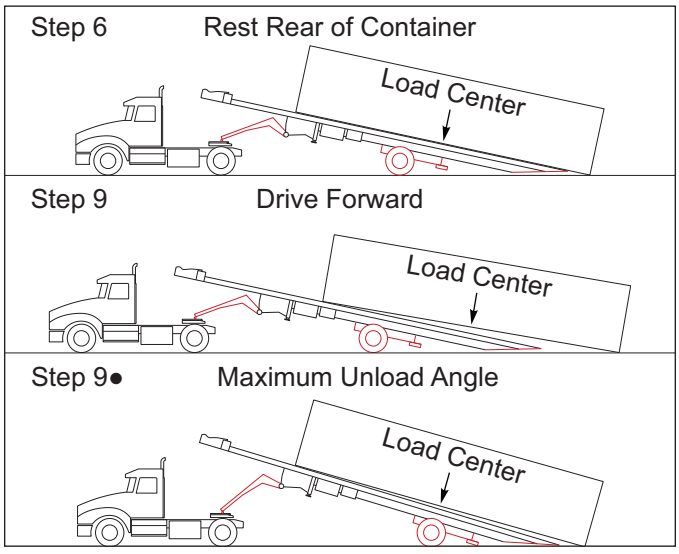


Figure 4-11: Chain Drive Container Unloading

11. If unloading multiple containers, park the tractor/trailer in a straight line on a flat level surface 1 ft (30.48 cm) away from the cargo drop point.
    - Set the tractor brakes and **DO NOT** set the trailer brakes.
    - **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
    - **DO NOT** release any tie down chains/binders or straps that are securing the cargo from the trailer at this time.
12. Remove the rear container stop/lock pins from the front container, if available.

- Depending on the trailer options purchased. container sizes.
  - ***See Container Stop, Rear, Slide In on Page 3-29.***
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***

13. Using the appropriate retrieval system hydraulic control lever, winch OUT to loosen the chain tension.
14. Remove the retrieval system chain assemblies from the front of the container.
15. Remove the container front stop/lock pins, if available.

- Depending on the trailer options purchased.
  - ***See Container Stop, Front, Slide In on Page 3-28.***
  - ***See Container Stop & Hold Block, Stop / Hold Pins on Page 3-30.***

IMPORTANT

NEVER reposition the cargo when the deck is not in transport position.

16. ***See Attach the Container Pusher Assembly: on Page 3-26.***
17. Using the appropriate retrieval system hydraulic control lever, winch OUT to push the cargo rearward until it over-hangs the approach plate by 2 ft (60.96 cm). ***See Figure 4-12 on Page 4-15.***
18. ***See Detach the Container Pusher Assembly: on Page 3-26.***
19. Repeat Steps 6 through 10.

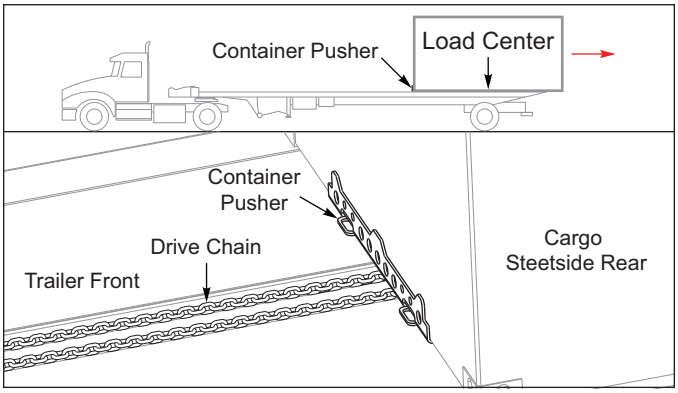


Figure 4-12: Front Container Push

Unloading Containerized Cargo, Winch Drive System

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Practice all standard industrial safety standards.**
- **DO NOT operate the trailer when uncoupled from the tractor.**
- **ALWAYS check behind and under the truck and trailer for persons or objects before moving, raising and lowering of the trailer.**
- **ALWAYS keep personnel and objects clear of front, rear, and sides of the tractor and trailer during coupling/uncoupling, loading/unloading, and any components operations.**
- **ALWAYS unload multiple containers ONE AT A TIME to control the load.**
- **NEVER unload multiple containers at the same time.**
- **Always place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **NEVER position the center of the undercarriage in front of the cargo's center of gravity when the approach plate is not contacting the ground.**
- **The cargo must not place more weight on the king pin than on the rear axles during loading and unloading.**
- **ALWAYS ensure the cargo is steering straight and not maneuvering off the side of the trailer.**
- **Position the cargo's center of gravity in front of the undercarriage's center.**
- **ALWAYS secure the cargo with tie down chains/binders or straps to prevent the load from shifting during deck tilting operations.**

1. Park the tractor/trailer in a straight line on a flat level surface 1 ft (30.48 cm) away from the cargo drop point.
   - Set the tractor brakes and **DO NOT** set the trailer brakes.
   - **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
   - **DO NOT** release any tie down chains/binders or straps that are securing the cargo to the trailer at this time.
2. Remove the container rear stop/lock pins, if available.

- Depending on the trailer options purchased.
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***
  - ***See Shoe Lock Assembly Removal: on Page 3-32.***

3. Using the appropriate retrieval system hydraulic control lever, winch OUT to loosen the cable/chain tension.
4. Remove the container front stop/lock pins, if available.

- Depending on the trailer options purchased.
  - ***See Container Stop, Front, Slide In on Page 3-29.***
  - ***See Container Stop & Lock Block, Stop / Lock Pins on Page 3-31.***

5. Remove the retrieval system cable/chain assemblies from the front of the container. ***See Figure 4-5 on Page 4-10.***

IMPORTANT

- **Practice all standard industrial safety standards.**
- **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- **DO NOT allow the tractor or trailer rear tires to leave the ground.**

6. Position trailer deck for low load angle. ***See Tilting Up the Trailer on Page 4-5.***

- **Container Overhangs Approach Plate:**
  - Position the container to slightly rest on the ground.
  - **DO NOT** exert any downward force. This will apply additional tension to the tie down chain/binders or straps, and may cause damage.
- **Container DOES NOT Overhang Approach Plate:**
  - Position the approach plate to slightly rest on the ground.

7. Remove the tie down chains/binders or straps from the cargo.
8. Remove the wheel chocks in front and behind the tractor's front wheels.

9. Drive the tractor/trailer straight ahead allowing the container to slide off the trailer and clear of the approach plate. ***See Figure 4-13***

- **STOP IF** the container does not slide off the trailer.
- Reposition the tractor/trailer back to 1 ft (30.48 cm) away from the cargo drop point.
- Set the tractor park brake.
- **Place wheel chocks in front and behind the tractor's front wheels, to prevent rolling if the tractor's rear axle/axles lose contact with the ground.**
- Readjust trailer for maximum unload angle.
  - ***See Figure 4-13***
  - ***See Tilting Up the Trailer on Page 4-5.***
- Remove the wheel chocks in front and behind the tractor's front wheels.
- Drive the tractor/trailer straight ahead.

10. ***See Tilting Down the Trailer on Page 4-6.***

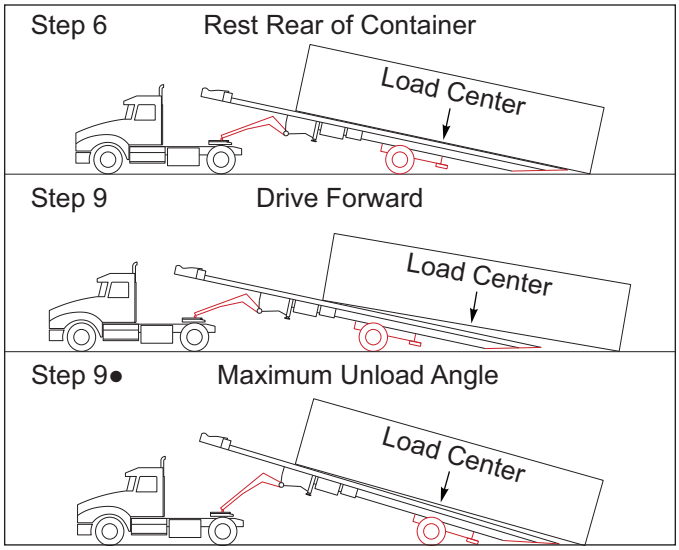


Figure 4-13: Winch Drive Container Unloading

Securing the Cargo

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **NEVER exceed the working load limits of any tie down device or anchor.**
  - **The working load limit of a combined securing system (example: chain, binder, & anchor) is only as strong as the weakest point.**
- **DO NOT allow slack in tie downs. Shifting cargo may create enough momentum to break hi-test chains or strap ties.**
- **ALWAYS match the tie down devices to the equivalent grade and working load limits.**
- **ALWAYS secure the devices to prevent them from becoming loose, opened, or released while vehicle is in transit, according to Federal guidelines.**
- **Deviation from straight line pulls will result in reduced working load limits on the trailer anchors.**

WARNING

Failure to follow safety procedures may cause equipment damage and personal injury.

- **Prior to the use of any product from Landoll Company, LLC:**
  - **Carefully read and follow all applicable instructions, warnings and safety information enclosed, supplied, and attached to the product.**
- **It is the responsibility of the Owner/Operator to inspect and evaluate the condition of all devices used to secure cargo:**
  - **Including, but not, limited to chains, straps, binders, and anchor points.**
  - **It is prohibited to use any device or anchor that shows damage.**
  - **Before use, any damaged items should be repaired or replaced.**

NOTICE

More information about cargo securement may be found at:

- **https://www.ecfr.gov/current/title-49/subtitle-B/chapter-III/subchapter-B/part-393/subpart-I**
- **https://www.fmcsa.dot.gov/regulations/cargo-securement/cargo-securement-rules**

Remember that regulations vary from state to state. State regulations may be found at:

- **http://www.fhwa.dot.gov/webstate.htm**

1. Verify the cargo position on the trailer provides proper weight distribution.
   - Reposition cargo, if required, to properly distribute the cargo weight.
   - In accordance with all State, Federal, Provincial, Local, and Industrial Regulations.
2. Prevent cargo shift by blocking and bracing.
   - If required by all State, Federal, Provincial, Local, and Industrial Regulations.
3. Tie down the cargo.
   - In accordance with all State, Federal, Provincial, Local, and Industrial Regulations.

- **For proper trailer tie down anchor use see:**
  - ***D-Ring Tie Down Procedures on Page 3-36.***
  - ***Keyhole Tie Down Procedures on Page 3-37.***
  - ***Rub Rail - Chain Tie Down Procedures on Page 3-38.***
  - ***Rub Rail - Strap Tie Down Procedures on Page 3-38.***
  - ***Strap J-Hook Tie Down Procedures on Page 3-39.***
  - ***Strap Pocket - Chain Tie Down Procedures on Page 3-39.***
  - ***Strap Ratchet Tie Down Procedures on Page 3-40.***

4. Verify all cargo tie down lines are tight.
   - In accordance with all State, Federal, Provincial, Local, and Industrial Regulations.

Towing the Trailer

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **ALWAYS check behind and under the truck and trailer for persons or objects before moving.**
- **ALWAYS verify the landing gear is fully up and secured.**
- **NEVER tow the trailer when the pivoting hitch assembly is not fully retracted into the frame and the undercarriage is not fully back into transport position.**

WARNING

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **When operating trailer, DO NOT drive or back over curbs or any other objects or obstructions. This may cause severe damage to undercarriage.**
- **If a fault exists in the trailer ABS, normal braking will occur, but wheels may lock. SERVICE THE ABS AS SOON AS POSSIBLE.**

IMPORTANT

Driving with the trailer coupled behind requires constant attention to the overall length of the combination.

The “hinged-in-the-middle” configuration of the tractor and trailer, cargo, and weight affect performance. Turning, passing, acceleration, braking, stopping, and backup require special considerations.

When executing steep grades or turning tight curves, the trailer must not be allowed to push the tractor, or jackknifing the tractor may result.

Application of the trailer brakes to keep the trailer in tow may help prevent the trailer pushing.

Braking should begin before descending a hill or attempting a curve, to assure control.

1. Perform a moving test of the trailer brakes at LOW and MEDIUM speeds before traveling at highway speed.

- The Anti-Lock Brake System (ABS) warning lamp mounted at left rear side of the trailer should come on when power is supplied to the ABS by turning the tractor key switch on.
- The warning lamp should go off once the trailer exceeds 4 mph (6 km).
- If the warning lamp does not go off, a fault exists in the trailer ABS.
- Once the vehicle speed exceeds 4 mph (6 km), the light should remain off unless a fault occurs or the key switch is turned off, then on again.

2. Monitor the air pressure gauge on the dash of the tractor. Pressure should not fall below 90 psi (621 kPa) at any time.
3. The trailer wheels track to the inside of the tractor during turns. Thus, turning corners requires a wide swing to prevent “curb hopping,” and to allow the trailer 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.
5. Backing should be done with care. Tail overhang, trailer length, and allowable space must be taken into consideration when backing the trailer.

Parking the Trailer

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **NEVER uncouple when the trailer is not fully in transport position.**
- **ALWAYS check behind and under the truck and trailer for persons or objects before moving.**
- **ALWAYS chock trailer wheels to prevent movement of the trailer.**
- **Keep all personnel clear of front, rear, and sides of the tractor and trailer during coupling, component operations, and uncoupling.**

WARNING

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **When leaving the trailer unattended, position all hydraulic controls to the NEUTRAL or OFF position, or disconnect the tractor hydraulic hook-up.**
- **When operating trailer, DO NOT drive or back over curbs or any other objects or obstructions. This may cause severe damage to undercarriage.**
- **If a fault exists in the trailer ABS, normal braking will occur, but wheels may lock. SERVICE THE ABS AS SOON AS POSSIBLE.**

1. Position truck and trailer on a level, solid surface.
2. Set the parking brake. **DO NOT** use the trailer hand brake.
   - Check for proper brake holding.
3. Chock the wheels.
4. Check for any air leaks in lines, relay valve, brake pods, or any other air system component.
5. Conduct a walk-around inspection.
6. Drain all air tanks at the end of the day.

Table provided for general use.

NOTES:

Chapter 5

Maintenance and Lubrication

General

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT operate the trailer with defective, broken or missing parts.**
- **ALWAYS chock trailer wheels to prevent movement of the trailer.**

IMPORTANT

- **Landoll Company, LLC. Is not responsible for any equipment that is not properly maintained.**
- **Troubleshooting, Repairing and Servicing must be performed by a trained technician.**
- **It is highly recommended to contact the Landoll Trailer Service Department at Landoll.com or phone 800-446-5175 / 888-522-3634.**
- **For service and repair parts, simply record the equipment serial and model number from the identification plate and contact the Landoll Trailer Service Department at Landoll.com or phone 800-446-5175 / 888-522-3634.for assistance.**

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

A well-planned preventive maintenance & inspection program is important to ensure safe and proper function of the equipment. Determine the cause of the broken, damaged or faulty part and get it repaired immediately.

Landoll Company, LLC. is not responsible for any equipment that is not properly maintained.

The operator has the most responsibility for the overall condition of the equipment. They become the most familiar with the feel, function, performance, sight, smell and sound of the equipment. When findings, faults or symptoms are found, they must effectively communicate this in writing or verbally to the technician for repair.

The technician has the responsibility of correcting the findings, faults or symptoms reported by the operator. To include correcting the findings, faults or symptoms found periodically during the technician inspections and services. The technician also has the responsibility to report any findings, faults, symptoms, causes and corrections to their supervisor.

Tools, Equipment & Personnel

Tools, equipment, and personnel normally found in a facility capable of making truck and trailer repairs will be adequate for maintenance of the trailer.

Electrical System

The electrical system does require specialized personnel, tools, equipment, or test procedures for troubleshooting, servicing, or repair.

Hydraulic System

The hydraulic system does require specialized personnel, tools, equipment or test procedures for troubleshooting, servicing or repair.

Structural Components

The structural components do require specialized personnel, tools or equipment for repair.

Maintenance Tasks

Equipment maintenance includes periodic inspection and lubrication.

For recommended Maintenance Schedules, see table below. Checklists have been provided to assist with the preventive maintenance & inspection program.

MAINTENANCE & INSPECTION SCHEDULE	
Equipment of Low Usage	*See Page 5-2*
Trailer Maintenance Schedule	*See Page 5-9*
Hydraulic Engine Maintenance	*See Page 5-13*

Cleaning

⚠ WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **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.**
- **DO NOT use a wire brush on any bearing parts or surfaces. Use a natural or synthetic 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.**
- **DO NOT use paint thinner to clean any rubber components such as grommets and hoses. The paint thinner will dry out the rubber and cause it to deteriorate.**

1. **Dirt and Grime:**
   - Wash the equipment with mild detergent to remove all accumulated dirt and grime.
2. **Grease and Fluid:**
   - Use any mineral spirits paint thinner (or its equivalent) to remove grease and fluid from all parts of the equipment.
   - Rinse degreasing solution off with low pressure cold water.
   - Dry clean parts with lint free, clean, soft absorbent, cloth or paper. Wash and dry hands.
   - **DO NOT** use paint thinner to clean any rubber components. Wipe off any grease or fluid accumulated with a rag.
3. **Corrosion and Rust:**
   - Scrape, sand, prime, and spot paint areas where finish is missing or where there is evidence of corrosion.
4. **Optional Hydraulic Engine Reservoir Filler Cap and Strainer:**
   - Remove the filler breather strainer assembly from the reservoir.
   - Separate the filler and strainer assembly.
   - Soak in mineral spirits paint thinner (or its equivalent) to remove grease and fluid from the strainer.
   - Allow to dry, then lightly wipe the interior and exterior to remove any debris.

Inspection

These inspections look for broken, defective, and leaking components, structural damage, and functionality of the equipment.

Equipment of Low Usage

Equipment that sits for 30 days or more without being operated.

Landoll recommends conducting preventive maintenance every 30 days that includes:

- Conducting the Daily, Weekly, and Monthly Maintenance Schedule checks. ***See Maintenance Schedule on Page 5-9.***
- Road Testing a minimum of 5 miles.
- Exercise all equipment functions.

Exercising the equipment will reduce premature component failure by:

- Lubricating all internal components and seals. Reducing rust and corrosion build up internally and externally.
- Reducing flat spots to form in seals, tires, and component metal-to metal contact.
- Identifies any possible equipment failure.

Fluid Leak Classification

- **Fluid loss and possible contamination in a leaking system may cause poor function and premature failure within the components.**
- **Leaks may be visible by signs of wetness appearing around components seals, gaskets, fittings, and hose/line connections. Leaking hoses may also show signs of staining that also indicates leakage.**
  - If any fittings or connections are loose, tighten.
  - If any items are broken or defective report it.

IMPORTANT

- **Any signs of a leaking fuel system or brake system, DO NOT operate and report it to your supervisor or maintenance immediately.**
- **Report any Class 3 leak to your supervisor or maintenance immediately and DO NOT operate.**

NOTE

- **Class 1 or 2 leaks may be operated but closely monitored and the fluid level checked more frequently.**
- **Report any leak to your supervisor or maintenance**

Fluid Leak Classifications:

- **Class 1:** Signs of wetness or stains that do not form drops.
- **Class 2:** Signs of drops forming but not dripping.
- **Class 3:** Signs of drops dripping.

Inspection Overview

1. Inspect the trailer, and trailer parts periodically for damage or signs of pending failure. ***See Maintenance Schedule on Page 5-9.***
   - 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 6-1*** 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

During inspections of the trailer, if lubricants are dirty, those parts should be cleaned with paint thinner, dried, and then lubricated immediately.

Dirt in the lubricant forms an abrasive compound that will wear parts rapidly.

For Lubrication Points and Specifications, see table below.

LUBRICATION POINTS AND SPECIFICATIONS	
Gooseneck & Deck	***See Page 5-5***
Centralized Undercarriage	***See Page 5-6***
Axle Hubs	***See Page 5-6***
Retrieval System, Chain Drive (Option)	***See Page 5-7***
Lubrication Specifications	***See Page 5-8***

Repair Parts

An operator’s and parts manual come from the factory and stored in the manual tube holder. ***See Figure 3-1 on Page 3-3.***

- These manuals do receive updates, which may be determined by the revision number of the manual.
  - The revision number is the last four digits of the manual’s part number.
  - Before 1 January 2023, the revision number format was the month/year (example: 0422).
  - After 1 January 2023, the revision number format changed to the year/month (example: 2301).
- When re-ordering new or updated manuals, DO NOT include the last four digits of the manual, it may be out of date.
  - Each manual has its own part number and revision, which may be found at the bottom of the pages (example: F-1234-2401).
  - Both manuals are listed on the backside of the front cover at the bottom of the Instructions for Ordering Parts page.
  - The back cover of each manual lists the replacement part number for that specific manual.

NOTICE

These manuals only cover the most common parts and options.

If a particular part or option is needed:

- Record the equipment VIN/NIV number from the identification plate and contact your locally authorized Landoll Dealer.

The operator’s manual covers the operation, troubleshooting, maintenance procedures, and torque limits needed during equipment service and repairs.

It also lists additional manufacturer references to assist in the troubleshooting, servicing, and repairing of outsourced components applied to the equipment at the factory.

Manufacturer references are also available through your locally authorized Landoll Dealer.

The parts manual displays mechanical, air, electrical, hydraulic components (with part numbers), and schematical diagrams.

It is highly recommended that all service and repair parts are acquired through an authorized Landoll Dealer.

- Simply record the equipment VIN/NIV number from the identification plate, build the parts list, and contact a dealer near you.

- To find that dealer, please visit **landoll.com**, or call 1-800-423-4320 for assistance.

Dealers Only: Parts, Trailer Manuals, and Manufacturer References are available online through the Dealer Portal at dealer.landoll.com.

Structural Defects

If any structural defect is found, the fault must be corrected before further use of the equipment.

Continued usage could endanger the equipment, its cargo, personnel, traffic, and properties.

If any cracks or breaks are found, contact the Landoll Service Department for repairs at Landoll.com or phone 800-446-5175 / 888-522-3634.

Inspect the deck daily for broken or missing decking or attachments.

Repair or replace any defective parts promptly.

Torque Specifications

Torque specifications are intended as a guide for 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 the general torque values given in the general torque tables.

Replace original fasteners with hardware of equal grade.

For torque specification, see table below.

TORQUE SPECIFICATIONS	
Air Spring Assembly	***See Page 2-4***
Bumper Assembly, Rear	***See Page 2-4***
Cam Followers	***See Page 2-4***
Suspension Assembly - Air	***See Page 2-4***
Wheel Fasteners	***See Page 2-4***
SAE, General	***See Page 2-5***
Metric, General	***See Page 2-5***
Hydraulic Fittings	***See Page 2-6***

Weather Tips

Cold Weather

IMPORTANT

- **Cold weather may cause lubricants to thicken and possible solidify, rubber to harden, and metal to contract.**
- **The moisture attracted by warm parts may condense, collect, and freeze causing immobilized components.**
- **Any of these may lead to problems found in bearings, electrical systems, and air systems.**

1. 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.
2. 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. Check tire inflation. Tire inflation decreases when the temperature decreases.
4. 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

IMPORTANT

- **Hot weather may cause lubricants to become extremely thin, rubber to soften, and metal to expand.**
- **Moisture attracted by hot parts may condense, collect, and rust causing immobilized components.**
- **Any of these may lead to problems found in bearings, electrical systems, and air systems.**

1. Hot weather operation can create certain problems which must be checked. Expansion of parts results in tightening of bearings, fasteners, and moving parts. Failure of gaskets or seals can occur.
2. The trailer should be parked in the shade if possible. Long exposure to the sun will shorten service life of rubber components (i.e. tires, lights, 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. Clean, prime, and paint bare metal surfaces.
5. The use of a filter-lubricator in the tractor's air delivery system is recommended.

Lubrication Points & Specifications

Gooseneck & Deck

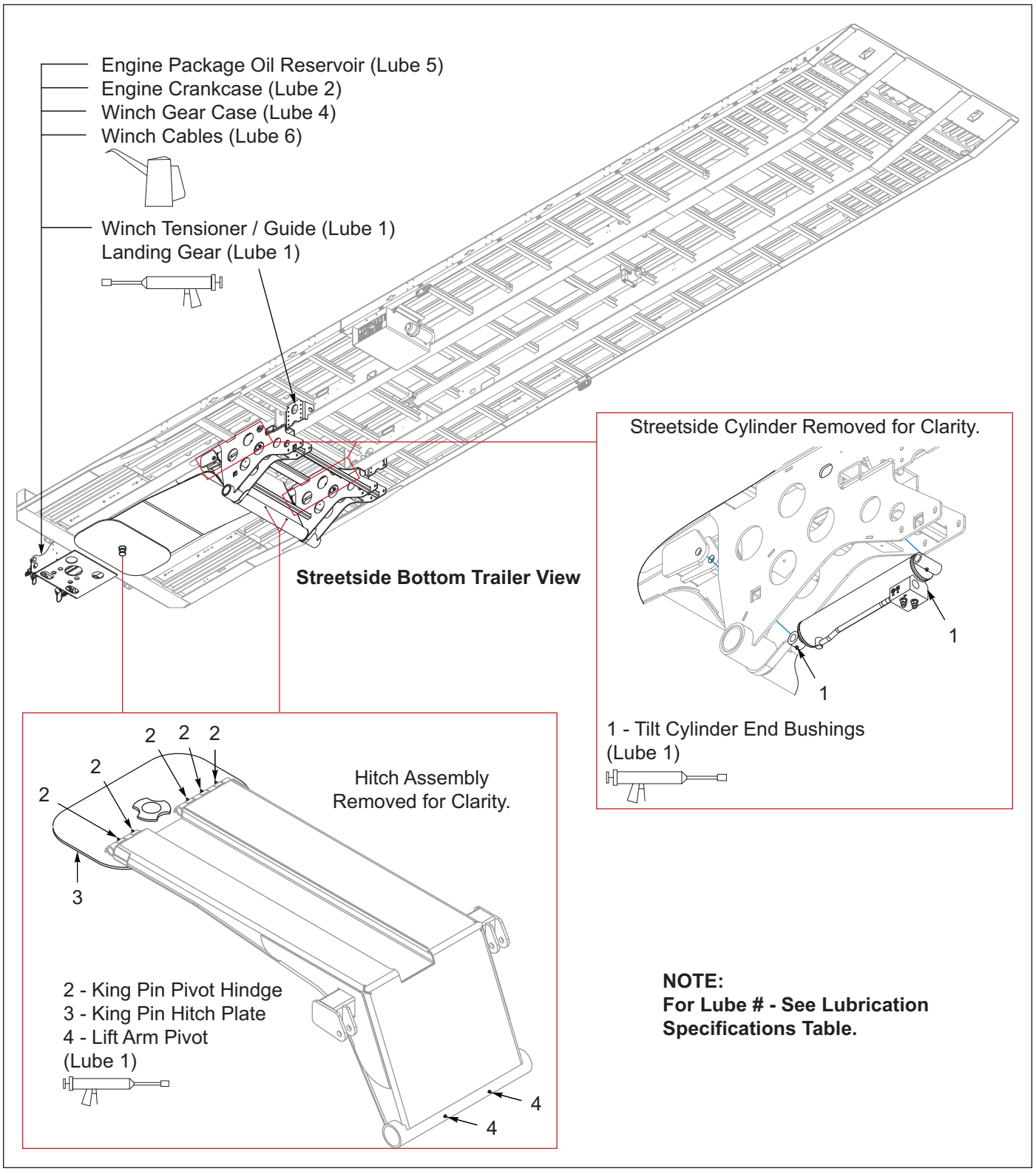


Figure 5-1: Gooseneck & Deck

Centralized Undercarriage

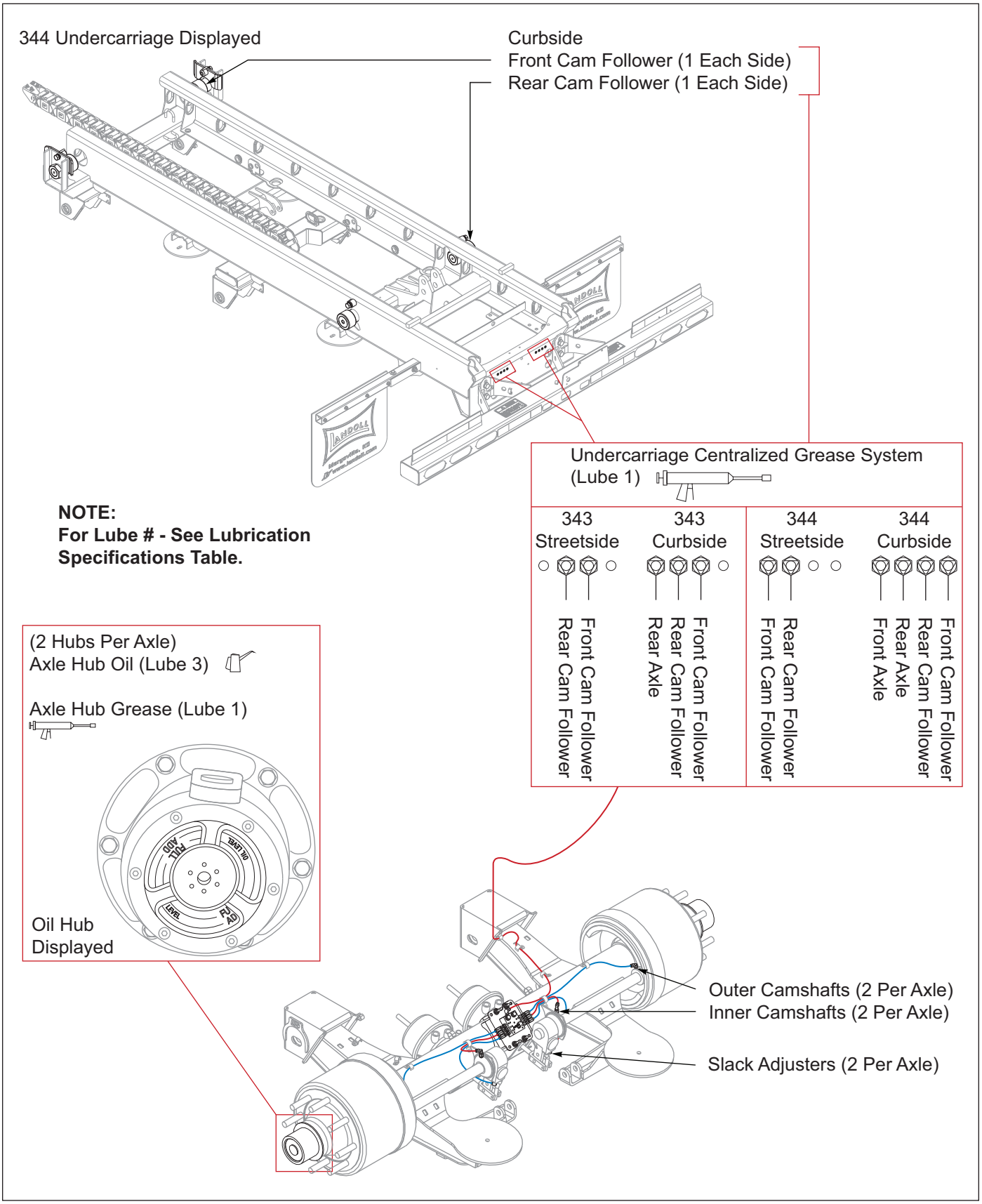


Figure 5-2: Centralized Undercarriage

Retrieval System, Chain Drive

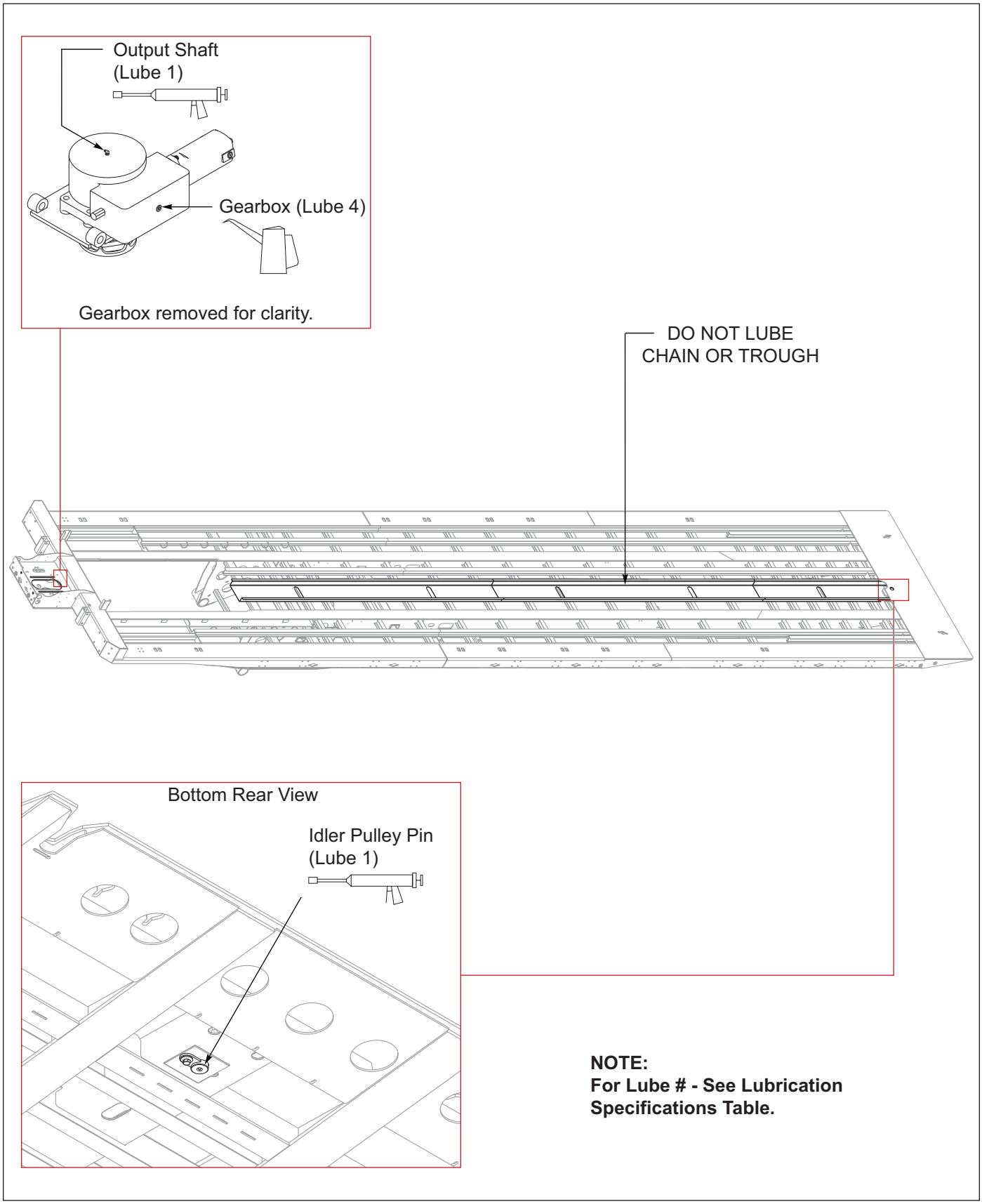


Figure 5-3: Retrieval System, Chain Drive

Lubrication Specifications			EXPECTED TEMPERATURES	
			ABOVE 15° F (-9° C)	BELOW 15° F (-9° C)
LUBE #	LUBRICATION	CAPACITIES	GRADE	GRADE
1	GREASE, MULTI PURPOSE	N/A	**LITHIUM MULTI -PURPOSE EP2 NLGI 2**	**LITHIUM MULTI -PURPOSE EP2 NLGI 2**
2	OIL, ENGINE	CRANKCASE (ENGINE OPTION) (1.7 - 2 QT) (1.6-1.9 L)	**SAE 10W-30**	**SAE 5W-20 / 5W-30**
3	OIL, GEAR	AXLE HUBS	**SAE 80W-90**	**SAE 80W-90**
4	OIL, GEAR	CHAIN DRIVE GEARBOX (OPTION) WINCH DRIVE GEARBOX (OPTION)	**SAE 85W-140**	**SAE 75W-90**
5	OIL, HYDRAULIC	RESEVOIR (Options) ENGINE PACK (30 GAL) (113 L) WET KIT (35 GAL) (132 L)	**ISO GRADE 32**	**ISO GRADE 32**
6	OIL, MULTI PURPOSE	WINCH CABLE (OPTION)	**RUST & OXIDATION PROHIBITING ISO 32**	**RUST & OXIDATION PROHIBITING ISO 32**

Maintenance Schedule

KEY	**C**-Clean, **I**-Inspect, **L**-Lubricate, **R**-Replace, **T**-Tighten/Adjust Torque ***Daily Inspections:*** *Conduct before and after each use.* ***Severe or Extreme Operating Conditions:*** *Shorten service interval time.*				
ITEM	1st 5 Hours or 50 Miles (80 Km)	Weekly or 500 Miles (805 Km)	Monthly or 2,000 Miles (3219 Km)	6 Months or 12,000 Miles (19,312 Km)	Yearly or 25,000 Miles (40,234 Km)
Air System Maintenance	• For Details, See Maintenance Schedule - Air System on Page 5-14.				
Air Tanks Drained	**DAILY**				
Air System	**DAILY**	**I**			
Air Ride Suspension	**I**	**I**			
Brake Protection Valve & Filter		**I**	**I,R**	**I,R**	**I,R**
	• **Replace filter every 3 months, unless air flow has become restricted.**				
Tire Inflation System Filter		**I**	**I,R**	**I,R**	**I,R**
	• **Replace filter every 3 months, unless air flow has become restricted.**				
Relay Valves					**I,C**
	• **Inspect every 100,000 miles (160,935 Km) or yearly, which ever comes first.**				
Axle Maintenance	• For Details, See Maintenance Schedule - Axle on Page 5-15.				
Axle Hub, Oil (STANDARD)	**DAILY**				**C,I,R**
	• See Check Fluid Level - Wheel Bearings, Oil (Standard) on Page 5-18. • See Lube# 3, Lubrication Specifications on Page 5-8.				
Wheel Bearing (Oil)					**C,I,T**
	• See Adjust - Wheel Bearings on Page 5-18.				
Axle Hub, Grease (Option)	**DAILY**			**C,I,L**	
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Wheel Bearing (Grease)				**C,I,T**	
	• See Adjust - Wheel Bearings on Page 5-18.				
Tire Inflation & Wear	**DAILY**	**I**			
	• **For Tire Pressures, see the Identification Plate on the trailer.**				
Wheel Fasteners (Lug Nuts)	**I,T**	**I**	**I,T**		
	• **Torque Specifications,** See Wheel Fasteners on Page 2-4.				
Brake Maintenance	• For Details, See Maintenance Schedule - Axle on Page 5-15.				
Brake Components	**DAILY**		**I**		
Slack Adjustment & Lining Wear	**I**		**I,T**		
	• Operational Checks - Automatic Slack Adjuster on Page 5-30. • Adjust - Automatic Slack Adjuster on Page 5-31.				
Brake Chambers	**I**		**I,T**		
Camshaft Bushing	**I**	**I,L**			
	• See Lube# 1, Lubrication Specifications on Page 5-8. • See Centralized Undercarriage on Page 5-6.				
Slack Adjusters	**I**	**I,L**			
	• See Lube# 1, Lubrication Specifications on Page 5-8. • See Centralized Undercarriage on Page 5-6.				
Electrical System Maintenance	• For Details, See Maintenance Schedule - Electrical System on Page 5-35.				
Lights & Electrical Accessories	**DAILY**		**I**		
Anti-Lock Brake System	**I**		**I**		
Remote Control System (Option)	**I**		**I**		
Tire Inflation System (Option)	**I**		**I**		
Trailer Wiring & Connectors	**I**		**I**		
Winch, 2-Speed System (Option)	**I**		**I**		
Work Lights (Options)	**I**		**I**		

Maintenance Schedule

KEY	**C**-Clean, **I**-Inspect, **L**-Lubricate, **R**-Replace, **T**-Tighten/Adjust Torque ***Daily Inspections:*** *Conduct before and after each use.* ***Severe or Extreme Operating Conditions:*** *Shorten service interval time.*				
ITEM	1st 5 Hours or 50 Miles (80 Km)	Weekly or 500 Miles (805 Km)	Monthly or 2,000 Miles (3219 Km)	6 Months or 12,000 Miles (19,312 Km)	Yearly or 25,000 Miles (40,234 Km)
Frame Maintenance	• For Details, See Maintenance Schedule - Frame Assembly on Page 5-36.				
Covers, Plates, Storage Compartments	**DAILY**			**I,T**	
	• See General Torque Specifications on Page 2-5.				
Decals				**I**	
Landing Gear	**I**	**I**		**C,I,L**	
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Mud Flaps	**DAILY**		**I,T**		**I,T**
	• See General Torque Specifications on Page 2-5.				
Tie Down Anchors	**DAILY**				
Gooseneck Maintenance	• For Details, See Maintenance Schedule - Gooseneck Assembly on Page 5-39.				
Covers, Plates, Storage Compartments	**DAILY**			**I,T**	
	• See General Torque Specifications on Page 2-5.				
Decals				**I**	
Kingpin / Hitch Plate & Lift Arm Assembly	**DAILY**		**C,I,L**		
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Ladders, Grab Bar & Handles (Options)	**DAILY**				
Steps, Ladders & Grab Handles (Options)	**DAILY**				
Tie Down Anchors	**DAILY**				
Bulkhead	**DAILY**		**I,T**		**I,T**
	• See General Torque Specifications on Page 2-5.				
Hydraulic System Maintenance	• For Details, See Maintenance Schedule - Hydraulic System on Page 5-41.				
Hydraulic System	**DAILY**	**I**			
	• See Fluid Leak Classification on Page 5-41. • See Hydraulic Fitting Torque Specifications on Page 2-6.				
Hydraulic Fluid (Fill as needed)	**I,R**	**I,L**			**R**
	• See Check Fluid Level - Hydraulic Reservoir on Page 3-20. • See Lube# 5, Lubrication Specifications on Page 5-8.				
Hydraulic Filter	**I,R**				**R**
	• See Replace - Hydraulic Filter on Page 5-42.				
Gooseneck Assembly					
Lift/Tilt Cylinders	**I**	**I**		**L**	
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Undercarriage Assembly					
Travel Cylinders	**I**	**I**		**L**	
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Cam Followers/Rollers	**I**	**I,L**			
	• See Lube# 1, Lubrication Specifications on Page 5-8. • See Centralized Undercarriage on Page 5-6.				
Suspension Maintenance	• For Details, See Maintenance Schedule - Suspension on Page 5-51.				
Suspension Control System	**I,T**		**I**	**I,T**	**I,T**
	• **Torque Specifications,** See Specific Bolt Torques on Page 2-4.				
Trailing Beams & Shocks	**DAILY**				

Maintenance Schedule

KEY	**C**-Clean, **I**-Inspect, **L**-Lubricate, **R**-Replace, **T**-Tighten/Adjust Torque ***Daily Inspections:*** *Conduct before and after each use.* ***Severe or Extreme Operating Conditions:*** *Shorten service interval time.*				
ITEM	1st 5 Hours or 50 Miles (80 Km)	Weekly or 500 Miles (805 Km)	Monthly or 2,000 Miles (3219 Km)	6 Months or 12,000 Miles (19,312 Km)	Yearly or 25,000 Miles (40,234 Km)
Engine Hydraulic Power (Option)	• See Lube# 2, Lubrication Specifications on Page 5-8. • See Maintenance Schedule - Hydraulic Engine (Option) (ALL) on Page 5-13.				
Retrieval System Maintenance	• For Details, See Maintenance Schedule - Retrieval System on Page 5-43.				
Chain Drive (Option)					
Chain & Chain Splice	**DAILY**	**I**	**I**		**I**
Chain Tension/Adjustment	**I,T**	**I,T**	**I,T**		**I,T**
Chain Trough	**DAILY**	**C,I**	**C,I**		**C,I**
Gear Case (Fill as needed)	**DAILY**	**I,L**	**I**		**R**
	• See Lube# 4, Lubrication Specifications on Page 5-8.				
Gearbox Output Shaft	**I,L**	**I,L**	**I,L**		**I,L**
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Gear Cover / Shields	**DAILY**	**I**	**I**		**I**
Chain Sprocket	**DAILY**	**C,I**	**C,I**		**C,I**
Chain Drive Anchor	**DAILY**	**C,I**	**C,I**		**C,I**
Idler Pulley Pin	**DAILY**	**I,L**	**I,L**		**I,L**
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Winch Drive (Option)					
Cable & Chain Assembly	**DAILY**	**I,L**		**I,L**	
	• See Lube# 6, Lubrication Specifications on Page 5-8.				
Cable Tensioner, Guide Rollers & Pins (Options)	**DAILY**	**C,I,L**		**C,I,L**	
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Free Spool Clutch	**DAILY**	**I**		**I**	
Gear Case (Fill as needed)	**I,R**	**I,L**		**I,R**	
	• See Lube# 4, Lubrication Specifications on Page 5-8.				
Winch Drum (Varies between models)	**I,L**	**I,L**		**I,L**	
	• See Lube# 1, Lubrication Specifications on Page 5-8.				
Retrieval Accessory Maintenance	• For Details, See Maintenance Schedule - Retrieval System on Page 5-43.				
Chain Assemblies					
Container Loading, Front	**DAILY**				
Container Loading, Chain/Bridle	**DAILY**				
Container Loading, Rear	**DAILY**				
Single Hook	**DAILY**				
Container Pusher	**DAILY**				
Container Side Guides	**DAILY**				
Container Stops					
Front, Adjustable	**DAILY**				
Front, Bolt On	**DAILY**				
Front, Slide In	**DAILY**				
Rear, Slide In	**DAILY**				
Hold Down Block Pins	**DAILY**				
Shoe Lock Assembly	**DAILY**				
Hook Assembly, Chain Connect	**DAILY**				
Tie Downs					
Chains	**DAILY**				

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

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

Maintenance Schedule - Hydraulic Engine (Option) (ALL)

KEY	**C**-Clean, **I**-Inspect, **L**-Lubricate, **R**-Replace, **T**-Tighten/Adjust Torque ***Daily Inspections:*** *Conduct before and after each use.* ***Severe or Extreme Operating Conditions:*** *Shorten service interval time.* *For Operation and Maintenance procedures resource the Manufactures References,* ***See Chapter 7 - Manufacturer Index on Page 7-1.*** *Parts are available through an authorized Landoll Dealer. For a list of available Landoll publications,* ***See Chapter 7 - Landoll Company, LLC. on Page 7-1.***					
ITEM	Daily	Weekly or 25 Hours	Yearly or 100 Hours	150 Hours	200 Hours	500 Hours
Engine Oil Level (Fill as needed, DO NOT Overfill)	**I**		**R**			
	• **See Lube# 2, Lubrication Specifications on Page 5-8.**					
Fuel Level (Fill as needed)	**I**					
Fuel System Components (Replace items as needed)	**I**					
Cooling System / Area (Clear obstructions)	**I,C**		**I,C**			
Air Cleaner Housing, Components & Shrouds	**I,C,T**		**I.C**			
Air Filter & Precleaner or Inner Element		**I,C**	**R**			
Equipment Covers & Guards	**I,C,T**		**I.C**			
Spark Arrestor (If equipped)	**I**					
Oil Cooler Fins (If equipped)			**I,C**			
Heavy Duty Filter Minder (If equipped)				**I**		
Fuel Filter					**R**	
Oil Filter					**R**	
Spark Plugs						**R**

Air System Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference. ***Refer to Manufacturer Index listed on Page 7-1.***

Maintenance Schedule - Air System

Air Tanks

Daily inspections should include the following:

1. The air tanks must be completely drained daily.

- Drain cocks are located on the bottom side of the air tanks. ***See Figure 5-4.***
  - Moisture in the system causes rust and corrosion to build inside the components and may lead to system failure.
  - Draining the air tanks will cause the emergency/park brake to apply.

343 Undercarriage Curbside Bottom Rear View

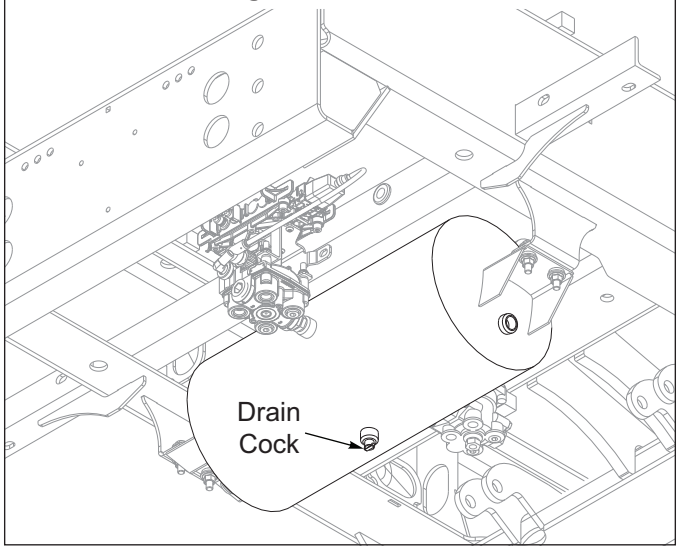


Figure 5-4: Drain Cock Locations

Air System

Daily inspections should include the following:

1. Inspect and monitor the entire air system for signs of leaks.
2. Monitor the entire air system for abnormal or erratic operation or noises.
3. Inspect all hoses, lines, and fittings for chafing, bends, kinks, or damage.
   - Replace defective parts as required.
4. Inspect the entire air system for defective or missing parts.
   - Replace defective parts as required.

Air Ride Suspension

Daily inspections should include the following:

1. Monitor the entire air ride system for abnormal or erratic operation or noises.
2. Inspect hoses, lines, and fittings for chafing, bends, kinks, or damage.
   - Replace defective parts as required.
3. Inspect air ride suspension air springs for bends, breaks, bulges, cuts, deterioration, dry rot, dents, kinks, signs of brittleness / fatigue / wear, and visual defects.
   - Replace defective parts as required.
   - When trailer is parked on level ground, the air spring should be the same firmness.

Weekly or 500 miles (805 Km) inspections should include the following:

1. Conduct a Daily Inspection.
2. Inspect ride height control valve assembly for breaks, cuts, cracks, signs of brittleness / fatigue / wear, and visual defects.
   - Replace defective parts as required.
3. Inspect ride height control valve mounting hardware for defective, loose, or missing parts.
4. Inspect air springs mounting hardware for defective, loose, or missing parts.

Brake Protection Valve / Valves

Weekly or 500 miles (805 Km) inspections should include the following:

1. Inspect hoses, lines, and fittings for chafing, bends, kinks, or damaged fittings. ***See Figure 5-5.***
   - Replace defective parts as required.
2. Inspect the brake protection valve/valves for broken or defective parts.

3 Month inspections should include the following:

1. Clean or replace brake protection filters every 3 months or when the air flow becomes restricted. ***See Figure 5-5.***
   - The particulate filter/filters may be cleaned or replaced.
2. Conduct a Weekly Inspection.

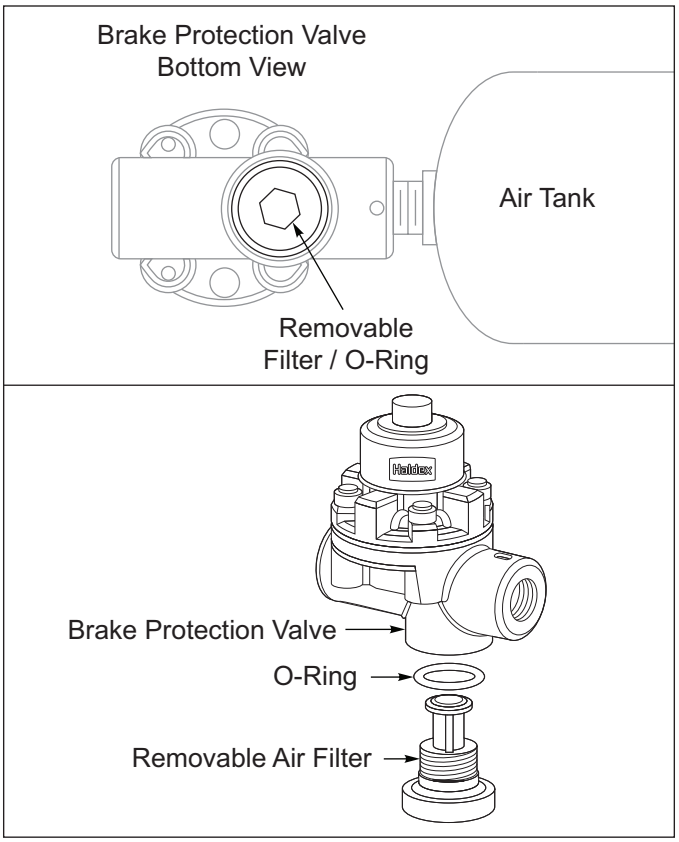


Figure 5-5: Brake Protection Valve Filter

Tire Inflation System Filter

Weekly or 500 mile (805 Km) inspections should include the following:

1. Inspect hoses, lines, and fittings for chafing, bends, kinks, or damaged fittings. ***See Figure 5-6.***
   - Replace defective parts as required.
2. Inspect the control box interior and exterior for broken or defective parts.
3. Inspect for air leaks.

3 Month inspections should include the following:

1. Replace tire inflation system filters every 3 months or when the air flow becomes restricted. ***See Figure 5-6.***
2. Conduct a Weekly Inspection.

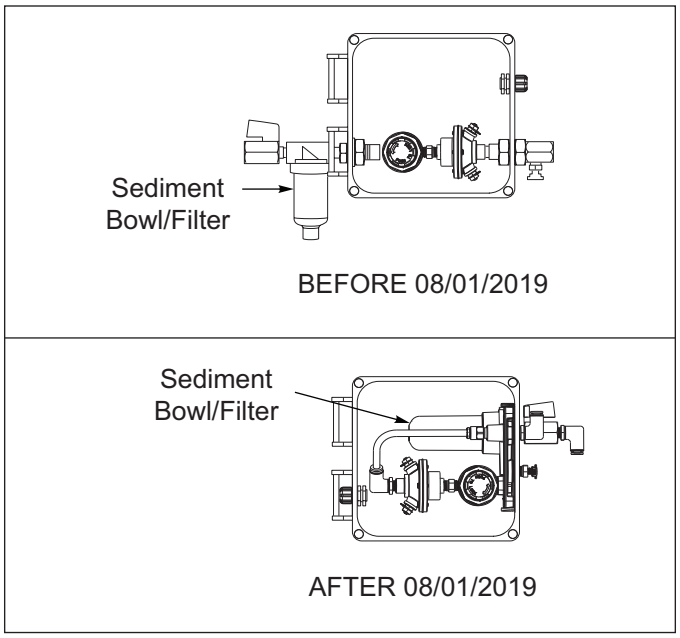


Figure 5-6: Tire Inflation Particulate Filter

Relay Valve

Yearly or 100,000 (160.935 Km) inspections should include the following:

1. Inspect the relay valve for broken, missing, and defective parts.
2. Disassemble and clean the relay valve.
   - The emergency relay valve should be disassembled, cleaned, and lubricated by a trained technician.

Axle Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, ***Refer to Manufacturer Index listed on Page 7-1.***

Maintenance Schedule - Axle

Axle Hubs, Oil (Standard)

Daily inspections should include the following:

1. Inspect the hub caps for cracks, defects, or missing parts.
2. Verify the oil level is between ADD and FULL lines on the sight window, ***See Check Fluid Level - Wheel Bearings, Oil (Standard) on Page 5-18.***
   - Add oil as needed, ***See Lubrication Specifications on Page 5-8.***
   - Replace sight window if unable to see oil level.

12 Month or 25,000 miles (40,234 Km) inspections should include the following:

1. ***Remove - Hub & Wheel Bearings on Page 5-18.***
2. Clean and inspect the wheel bearings and hub assembly for defects.
3. ***Install - Hub & Wheel Bearings on Page 5-18.***

Axle Hub, Grease (Option)

Daily inspections should include the following:

1. Inspect the hub caps for cracks, defects, or missing parts.
2. Inspect hub caps for grease build up between hub cap and hub assembly.
   - Clean as required, ***See Cleaning on Page 5-2.***
   - Fluid droplets forming around hub cap may indicate the grease is liquefying and the bearings need cleaned and new grease.

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

1. ***Remove - Hub & Wheel Bearings on Page 5-18.***
2. Clean and inspect the wheel bearings and hub assembly for defects.

IMPORTANT

The bearing will need to be packed with new grease prior to installing the hub assembly.

1. ***Install - Hub & Wheel Bearings on Page 5-18.***

Tires and Wheels

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.
2. Check the wheel fastener torque, ***See Wheel Fasteners on Page 2-4.***

Daily, During Stops, and Weekly or 500 miles (805 Km) inspections should include the following:

1. Verify that all wheel fasteners are present and tight.
2. Inspect the wheels for damage or defects.
3. Verify that all valve stem caps are present and securely fastened.
   - Tire Inflation System (Option) verify all air lines are present and securely fastened to the valve stems.
4. Inspect the tires for proper inflation, ***See Tire Inflation on Page 5-20.***
5. Inspect the tires condition for excessive/uneven wear, thread depth, and weathering.
   - When the 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 are essential for proper tire wear.
6. Inspect between the inner and outer duals for debris.
7. Inspect the inner and outer duals for proper tire matching, ***See Tire Matching Methods on Page 5-20.***

Monthly or 2000 miles (3219 Km) inspections should include the following:

1. Conduct a Daily Inspection.
2. Check the wheel fastener torque, ***See Wheel Fasteners on Page 2-4.***

Alignment, Wheel

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

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

The simplest form of checking wheel alignment and tracking is by running the trailer over a scuff gauge. A scuff gauge reading of 16 ft (5 m) 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. ***See Remove - Hub & Wheel Bearings on Page 5-18.***
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 5-7.***
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 0.015 in (0.381 mm) or more is considered excessive tire “toe” and the axle must be replaced, ***See Figure 5-7.***

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. For examples of camber, ***See Figure 5-8.***

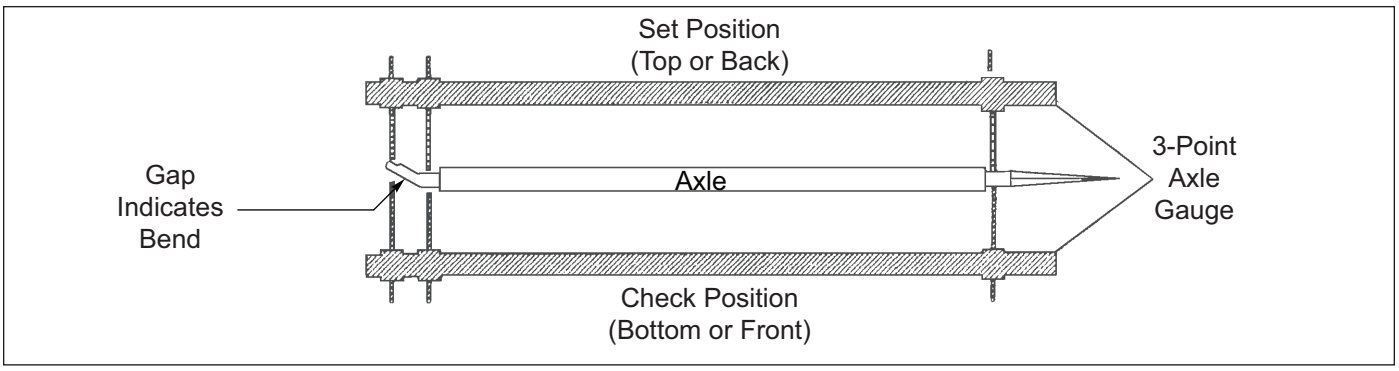


Figure 5-7: Checking Axle Straightness

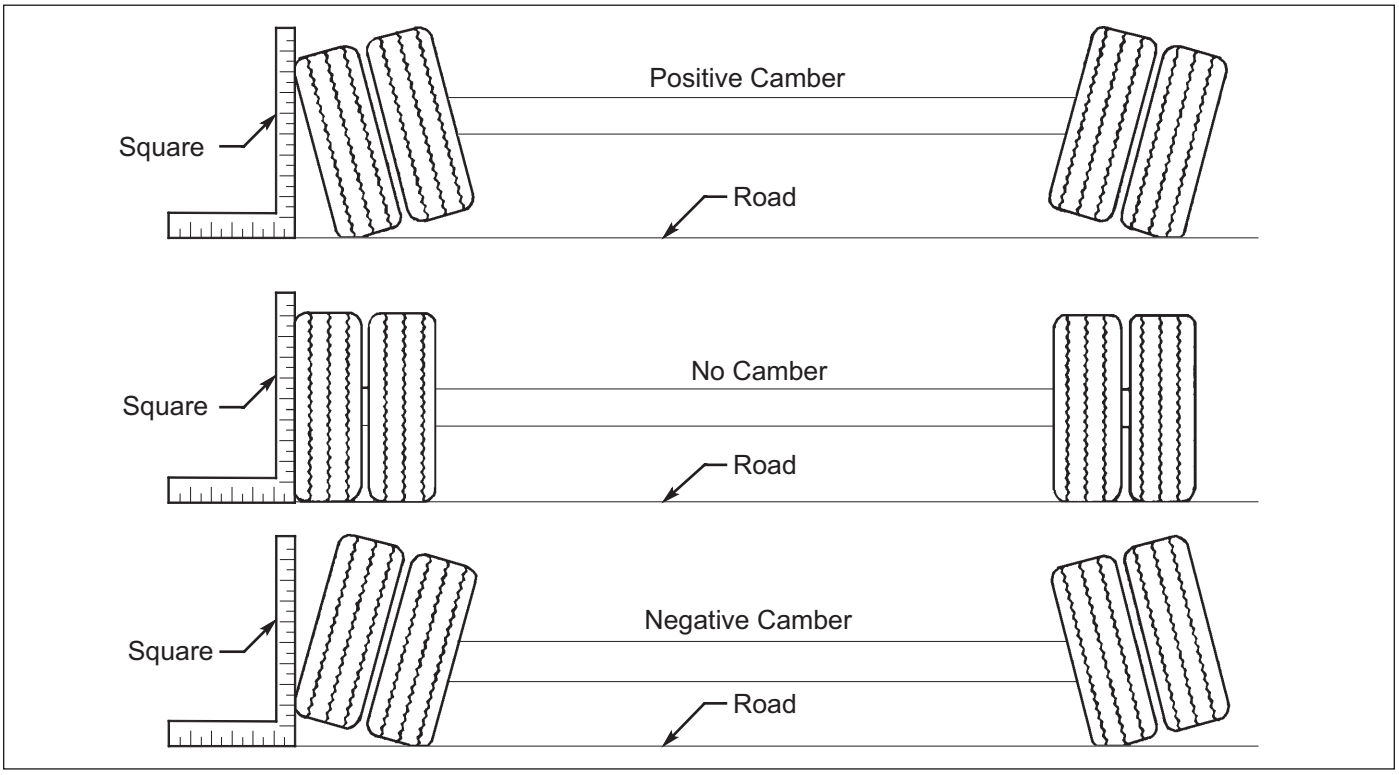


Figure 5-8: Camber Examples

Axle Hub & Wheel Bearing Maintenance

Remove - Hub & Wheel Bearings

1. Remove the brake drum. It may be necessary to release the automatic slack adjuster.
2. Remove hub cap and catch lubricant in a pan.
3. Remove outer spindle nut, tang washer, spindle locking washer, inner spindle nut, and outer bearing cone. Remove hub from axle.
4. Remove hub seal using a seal removal tool and lift out the inner bearing cone.
5. Using an appropriate driver, remove inner and outer bearing cups from hub.
6. Clean the hub cavity thoroughly to reduce any contamination to lubricant. Using commercial grade cleaner and soft rags, clean inside hub and dry all components with absorbent cloth or paper towel.
7. Test fit the hub into the drum, careful not to damage the stud threads. Inspect the hub moves freely in and out of the drum pilot hole. Inspect hub studs are properly seated into the hub flange and fit flat against the drum surface.

Install - Hub & Wheel Bearings

IMPORTANT

DO NOT mix new cups with old cones or new cones with old cups.

1. Install the inner and outer bearing cups into the hub. Thoroughly clean hub. ***See Figure 5-9.***
2. Insert the inner bearing cone, and install the seal using appropriate seal driver.
3. Align the hub bore with the axle spindle, careful not to damage seal slide hub onto spindle and support hub.
4. 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.
5. ***Adjust - Wheel Bearings on Page 5-18.***
6. Install the hub cap and proper gasket. Tighten the cap screws in a star or cross pattern sequence to 10-15 Ft.-Lbs (14-20 Nm) of torque, ***See Figure 5-9.***
7. ***Check Fluid Level - Wheel Bearings, Oil (Standard) on Page 5-18.***
8. Install Brake Drum, be care not to damage any stud threads sliding the drum on.

Adjust - Wheel Bearings

DANGER

Proceed with extreme caution. Failure to heed notice will cause injury or death to the person and/or damage to product and property.

- **Failure to torque the outer spindle nut properly could cause the wheel to come off during vehicle operation.**

1. With a drain pan under the hub cap, remove the hub cap assembly allowing oil to drain.
2. Lift the wheel off of the ground.
3. Adjust the automatic slack adjuster to eliminate brake drag during tire/wheel rotation.
4. Remove outer spindle nut, tang washer and spindle lock washer. ***See Figure 5-9.***
5. Torque the inner spindle nut to 200 Ft.-Lbs (271 Nm), while rotating wheel, to make sure proper seating of the bearings and cups in the wheel hub.
6. Back off the inner spindle nut one full turn.
7. Torque the inner spindle nut to 50 Ft.-Lbs (68 Nm). while rotating the wheel, to properly position the bearings for the final adjustment.
8. Back off the inner spindle nut 1/4 to 1/3 turn.
9. Align the spindle lock washer tang with the axle spindle groove and slide it onto the inner spindle nut dowel.
   - If the inner spindle nut dowel does not align with a hole in the spindle lock washer, tighten or loosen the inner spindle nut to fit in the nearest spindle lock washer hole.
10. Install the tang washer and outer spindle nut, and torque to 300-400 Ft.-Lbs (407-542 Nm).
11. Measure the Wheel End Play using a dial indicator, readings should be 0.001 to 0.005 (0.025-0.013 Nm).
12. Bend tang washer over outer lock nut.
13. Install the hub cap with a new gasket, and torque screws to 10-15 Ft.-Lbs (14-20 Nm) **IN SEQUENCE**, ***See Figure 5-9.***
14. Fill with oil to the full mark. ***See Check Fluid Level - Wheel Bearings, Oil (Standard) on Page 5-18.***
15. ***Adjust - Automatic Slack Adjuster on Page 5-31.***
16. Check hub oil level after the wheel has sat level in one position for a few minutes to allow the oil to work into the bearings.

Check Fluid Level - Wheel Bearings, Oil (Standard)

1. Park trailer on a level surface with the drain/fill plug towards the top.

2. Look through the axle hub sight window, ***See Figure 5-9.***
3. Oil level should be visible and between ADD and Full.
4. Fill oil as needed.
   - Remove drain / fill plug.
5. Fill the hub to the bottom FULL line on the hub cap window. ***See Lubrication Specifications on Page 5-8.***
6. Allow oil level to settle.
   - Repeat steps 4 to 6 until oil does not settle.
7. Install drain/fill plug and torque to 5-9 Ft.-Lbs (7-12 Nm), ***See Figure 5-9.***

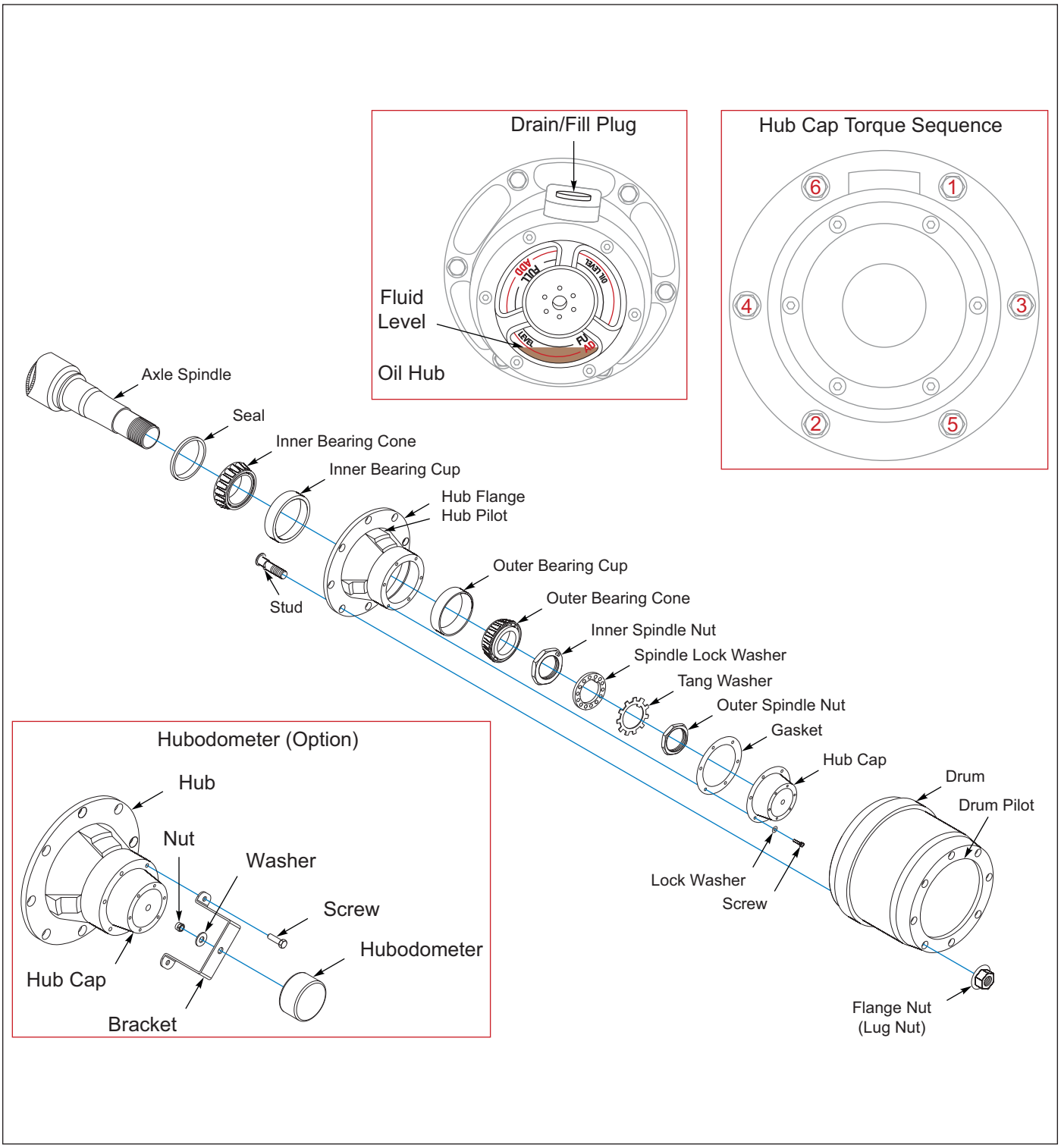


Figure 5-9: Hub Assembly

Tire Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Tires are an important part of the suspension system that provides for a stable, controllable smooth ride. The tires absorb a majority of the road's roughness and dictate how the rest of the suspension reacts.

Over-inflated tires are hard, bouncy, and fast reacting; causing a rough ride, reduced braking, higher risk of blow out, and rapid center tire tread wear. This also causes the rest of the suspension to overwork and possibly fail.

Under-inflated tires are soft and slow reacting; causing a swaying ride, reduced braking, higher fuel consumption, higher risk of blow out, and rapid outer tire tread wear. This causes the wheel to dictate how the rest of the suspension reacts and possibly fail.

Proper tire maintenance is important to ensure safety and performance of the equipment.

Maintaining tire inflation and tread depth will reduce the risk of a blow out, and maximizes the ability to grip the road in all weather conditions.

Good tire maintenance increases the life of the tire, fuel mileage, braking force, and cargo stabilization.

Tire Inflation

Tire inflation is listed on the trailer identification plate located on the front of the trailer. **Exceeding** the cold inflation pressure may result in damaged tires, rims, and wheels.

IMPORTANT

Exceeding the cold inflation pressure may result in damaged tires, rims, and wheels.

Tire inflation should be checked daily before use and during any road stops.

Also check daily before use and during any road stops for debris that may have gotten lodged between the duals.

Air pressure increases inside the tire during travel and should not be checked immediately after used. Allow time for the tires to cool down before checking the tire pressure.

Always reinstall the valve stem caps after checking tire inflation.

Tire inflation examples shown in ***See Figure 5-10***.

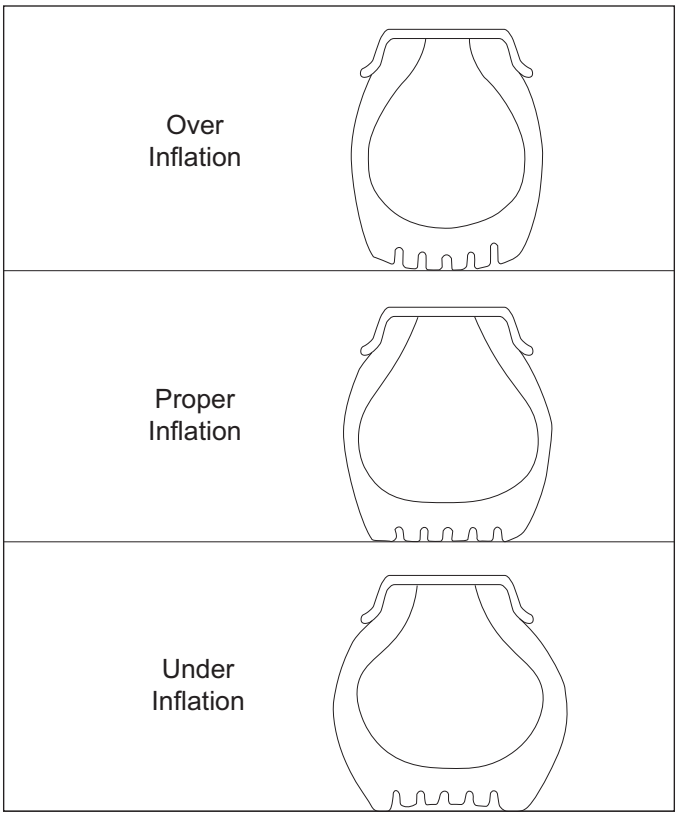


Figure 5-10: Tire Inflation Examples

Tire Matching Methods

Both tires on the same spindle MUST be the same size in order to properly distribute the cargo 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 in (19.05 mm) is allowed between the two mating tires of a dual, ***See Figure 5-11***.

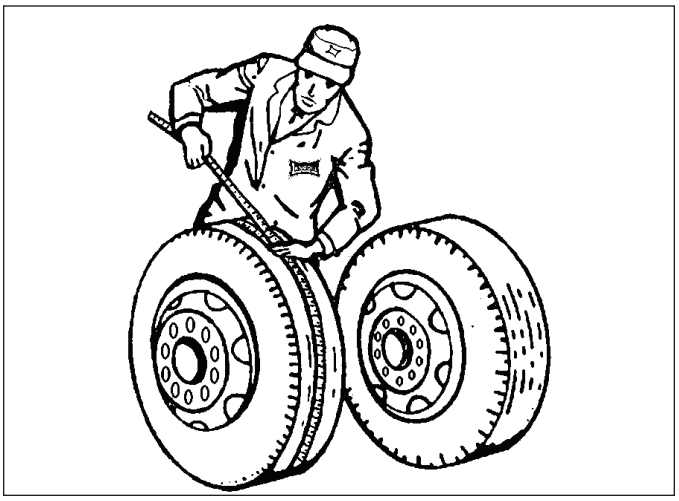


Figure 5-11: Tape Measure Method

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 in (3.18 mm) gap is allowed, ***See Figure 5-12***.

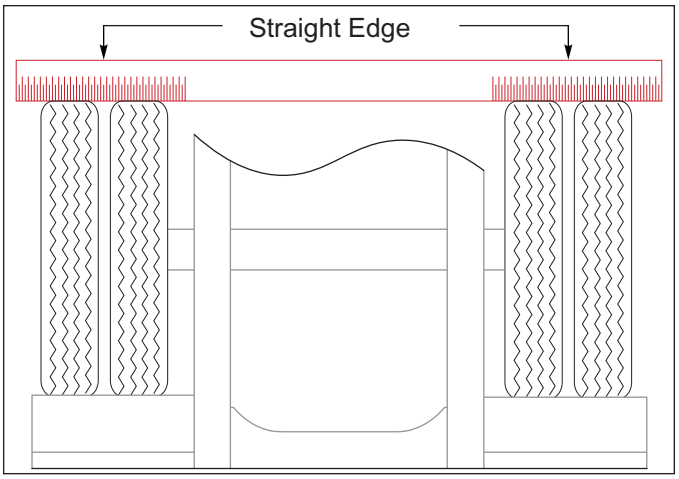


Figure 5-12: Straight Edge Method

Remove - Tire and Wheel Assemblies

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Jack may become unstable and cause the trailer to fall.**

IMPORTANT

Wheel Guards must be placed between steel and aluminum wheels.

1. Park on a level surface, set the tractor park brake, and chock the wheels.
2. **If an optional tire inflation system is installed:**
   - Locate the tire inflation system control box.
   - Shut off the control box air outlet valve.
3. Place a proper load capacity jack under the trailer axle with the flat tire.
4. Raise the jack up until it contacts the trailer axle.
   - **ONLY** apply slight pressure to secure the jack.

IMPORTANT

Make note how the tire valve stems are positioned.

5. If an optional tire inflation system is installed.
   - Disconnect the air hoses from the inner and outer tire and wheel assemblies.
   - Disconnect the air hoses from the hub cap tee assembly.
6. Break the flange nuts / lug nuts loose.
   - Slightly loosen, DO NOT remove the flange nuts / lug nuts.
7. Jack up the trailer until the tire comes off the ground.
8. Remove the flange nuts / lug nuts.
9. Remove the outer tire and wheel assembly from the wheel studs.
   - Be careful not to damage the wheel stud threads.
   - Be careful not to damage the hub cap tire inflation tee assembly, if installed.
10. Remove the wheel guard if available.
    - Wheel guards separate steel and aluminum surfaces to reduce corrosion.
11. Remove the inner tire and wheel assembly from the wheel studs.
    - Be careful not to damage the wheel stud threads.
    - Be careful not to damage the hub cap tire inflation tee assembly, if installed.

Inspect - Tire and Wheel Assemblies

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

1. Inspect tires for breaks, bulging, cuts, cracks, deterioration, dry rot, flat spots, tread condition / depth, signs of brittleness / fatigue / wear, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
2. Inspect tire valve stems for breaks, burrs, cracks, dents, leaks, thread damage, wear, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
3. Inspect wheels and mating surfaces for bends, breaks, burrs, cracks in metal or welds, dents, wear, distortion, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
4. Inspect wheels and hub mating surfaces for corrosion, dirt, rust, grease, ***See Cleaning on Page 5-2.***
5. Inspect wheel guards for damage or visual defects, ***See Repair Parts on Page 5-3.***
6. Inspect wheel fasteners for breaks, burrs, cracks, dents, leaks, thread damage, wear, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
7. Inspect wheel fasteners for corrosion, dirt, rust, grease, ***See Cleaning on Page 5-2.***

Install - Tires and Wheel Assemblies

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **Read and understand the installation, service, and safety instructions before installing or servicing the hub.**
- **ALWAYS use a torque wrench to ensure proper torque.**
  - **Under Torqued and Over Torqued wheel fasteners may result in the loss of a wheel.**
  - **Retorque after the first 50 to 100 miles (80 Km to 160 Km) of service to check for lost torque.**

IMPORTANT

Use previous notes to properly align the tire valve stems in position.

1. Install the inner tire and wheel assembly onto the wheel studs, ***See Figure 5-13.***
   - Be careful not to damage the hub cap tire inflation tee assembly, if installed.
   - Be careful not to damage the wheel stud threads.
2. Install the wheel guard if available.
   - Wheel guards separate steel and aluminum surfaces to reduce corrosion.
3. Install the outer tire and wheel assembly onto the wheel studs.
   - Be careful not to damage the hub cap tire inflation tee assembly, if installed.
   - Be careful not to damage the wheel stud threads.
4. Install and tighten the flange nuts / lug nuts.
   - **DO NOT TORQUE.**
   - Verify wheel assemblies are properly installed and firmly against the hub.
5. Lower the jack until the tire firmly touches the ground.
6. Pre-Torque all flange nuts / lug nuts in sequence to 50 Ft.-Lbs (68 Nm), ***See Figure 5-14.***
7. Torque all flange nuts / lug nuts in sequence to 450-500 Ft.-Lbs (611 to 676 Nm), ***See Figure 5-14.***
8. **If an optional tire inflation system is installed:**
   - Connect the air hoses to the hub cap tee assembly.
   - Connect the air hoses from the inner and outer tire and wheel assemblies.
9. Lower and remove the jack from under the trailer frame.
10. If an optional tire inflation system is installed.
    - Locate the tire inflation system control box.
    - Turn on the control box air outlet valve.

IMPORTANT

Retorque after the first 50 to 100 miles (80 Km to 160 Km) of service to check for lost torque.

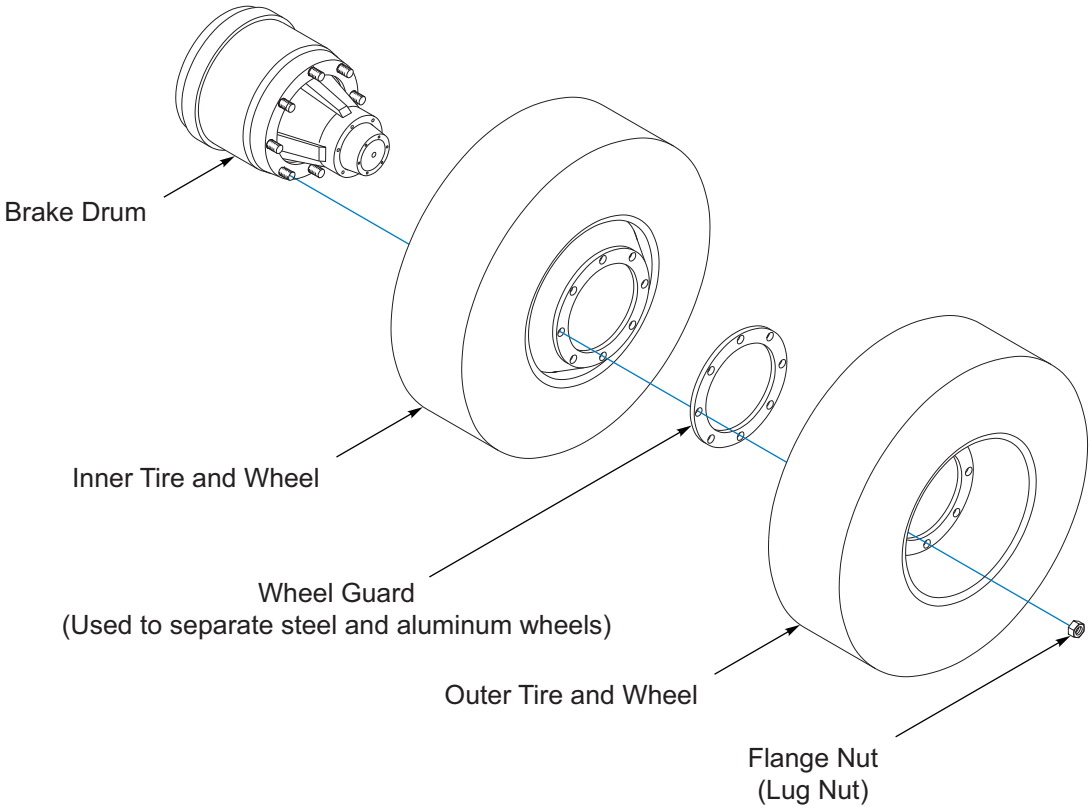


Figure 5-13: Tire and Wheel Mounting

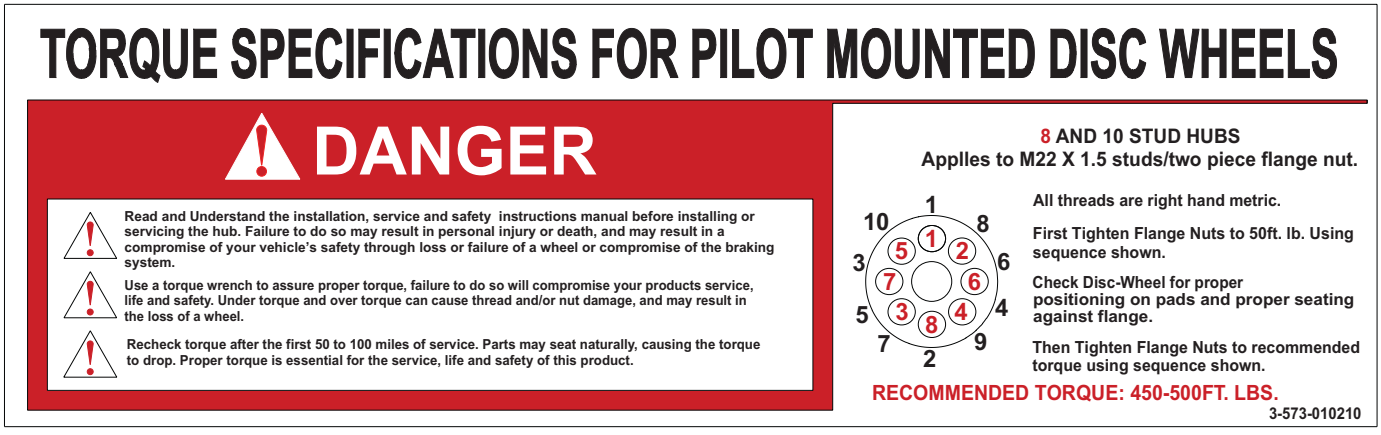


Figure 5-14: Flange Nut Tightening Sequence

Brake Maintenance

General

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference. ***Refer to Manufacturer Index listed on Page 7-1.***

Disc Brakes (Option)

The 12.25 in and 16.5 in disc brakes are an option available at the time of trailer purchase.

This manual does not cover the maintenance procedures for the disc brakes. ***Refer to Manufacturer Index listed on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference.

Drum Brakes (Standard)

The 12.25 in X 7.5 in and 16.5 in X 7 in drum brakes are standard and the maintenance procedures are covered in this chapter.

- **Procedures are the same, the parts are different.**

This trailer is equipped with automatic slack adjusters, which compensate for brake lining wear to keep brakes adjusted.

Brakes should not be adjusted manually, except when relining brakes.

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **When crawling under the trailer is necessary, chock all wheels of the trailer and tractor.**
- **When jacking is necessary, chock all wheels and support the trailer with jack stands sufficient to withstand the weight of the trailer and cargo.**
- **Use great care if wheels or brake drums must be handled. They may be very hot and can cause serious burns.**

Maintenance Schedule - Brake

Brake Components

Daily inspections should include the following:

1. Monitor the entire brake system for abnormal or erratic operation or noises.
2. Check the brake system for loose, missing, deformed, or corroded fasteners. Replace and tighten hardware as required.
3. Inspect all lines, hoses and components for any air leaks.
4. Inspect the automatic slack adjuster gap for excessively worn or distorted brake linings.
5. Drain air reservoir daily. ***See Air Tanks on Page 5-14.***

Slack Adjustment & Lining Wear

Monthly or 2,000 miles (3219 Km) inspections should include the following:

1. Inspect the brake chambers for dents, defects, leaks, and corrosion that may cause operational malfunction.
   - Inspect the condensation vent holes are not plugged and allow moisture to drain out.
   - Inspect the brake chamber clevis and pins for defects, wear, and corrosion.
2. Inspect the brake adjustment.
3. Inspect the automatic slack adjuster adjustment screw moves freely and not frozen.
4. Inspect the brake linings for excessive wear.

- **The linings must be 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 5-15.***

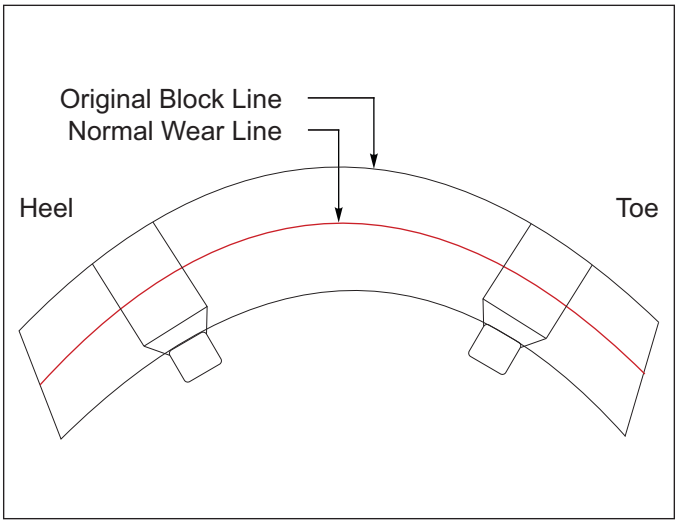


Figure 5-15: Brake Lining Wear

Brake Chambers

Monthly or 2,000 miles (3219 Km) inspections should include the following:

1. Inspect the brake chambers for dents, defects, leaks, and corrosion that may cause operational malfunction.
   - Verify the condensation vent holes are not plugged and allow moisture to drain out.
   - Inspect the brake chamber clevis and pins for missing parts, defects, wear, and corrosion.

Greasing Camshaft Bushings & Slack Adjusters

Weekly or 500 miles (805 Km) inspections should include the following:

1. Grease the brake camshaft bushings and slack adjuster. ***See Centralized Undercarriage on Page 5-6.***
   - Verify that old grease slightly gets pushed from the each assembly.
   - A grease zerk not accept grease, may indicate defective or plugged/clogged hoses, fittings, or zerk.

Drum Brake Maintenance

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage to product and property.

- **Potential Asbestos Dust Hazard. Some older brake linings my contain asbestos**
  - **Avoid creating or breathing dust.**
  - **Avoid machining, filing, or grinding the brake linings.**
  - **ALWAYS use damp brush for cleaning brake parts. DO NOT use compressed air or dry brushing for cleaning, dust.**
- **DO NOT allow grease to contact brake pads or shoes, as this could result in reduced braking performance.**
- **Failure to replace faulty brake rotors or drums may result in an unreliable braking system, and may lead to an accident.**
- **Replace brake rotors or drums in pairs to achieve the same braking power on both wheels and maintain an even braking load on the axle.**

Remove - Drum Brakes

1. Park on a level surface, set the park brake, chock the wheels, and uncouple the trailer from the tractor.
2. Jack up the trailer and support with adequate capacity jack stands under axles.
3. ***Cage - Spring Brake Chamber on Page 5-32.***
   - Tire and wheel assembly should rotate freely.
4. Rotate the automatic slack adjuster adjustment screw counterclockwise to back off the slack adjuster.
5. Remove the hubodometer option if installed. ***See Figure 5-9 on Page 5-19.***
6. Remove tire and wheel assemblies. ***See Remove - Tire and Wheel Assemblies on Page 5-21.***
7. Remove brake drum.
   - Be careful not to damage the stud threads sliding off the brake drum.
8. ***Remove - Hub & Wheel Bearings on Page 5-18.***
9. Separate the upper brake shoe from the anchor pin and remove anchor pin. ***See Figure 5-16.***
   - Allow brake shoe to retract and rest on the spider.
10. Separate the upper brake shoe cam roller from the cam shaft.
11. Remove the cam roller retainer and cam roller. ***See Figure 5-16.***
    - **12.25 x 7.5 Brakes:** Remove the cam roller retainer, cam retaining pin and cam roller.
    - **16.5 x 7 Brakes:** Remove the cam roller retainer, and cam roller.
    - Allow brake shoe to retract and rest on the cam shaft.
12. Separate the lower brake shoe from the anchor pin and remove anchor pin. ***See Figure 5-16.***
    - Allow brake shoe to retract and rest on the spider.
13. Separate the lower brake shoe cam roller from the cam shaft. ***See Figure 5-16.***
    - **12.25 x 7.5 Brakes:** Remove the cam roller retainer, cam retaining pin and cam roller.
    - **16.5 x 7 Brakes:** Remove the cam roller retainer, and cam roller.
    - Allow brake shoe to retract and rest on the cam shaft.
14. Remove the keeper springs from the upper and lower brake shoes. ***See Figure 5-16.***
15. Remove the retractor springs and retractor spring retainers from the upper and lower shoes. ***See Figure 5-16.***
16. Remove the upper and lower brake shoes from the spider.
    - Expand them outward while allowing them to pivot on the cam shaft.

17. Drive out two anchor pin bushings. ***See Figure 5-16.***

Remove Cam Shaft:

18. ***Remove - Automatic Slack Adjuster on Page 5-30.***
19. Remove one cam shaft inner snap ring and washer. ***See Figure 5-16.***
    - Once the snap ring is expanded, slide the cam shaft out enough to allow snap ring and washer to be removed from the end of the shaft.
20. Slide the cam shaft out of the spider bushing.
21. Remove the cam shaft washer from the cam shaft. ***See Figure 5-16.***
    - **12.25 x 7.5 Brakes:** Use a D-Cam washer between the cam shaft and spider bushing.
    - **16.5 x 7 Brakes:** Use a flat washer between the cam shaft and spider bushing.

Remove Cam Shaft Bushings:

22. Remove two spider seals from the spider. ***See Figure 5-16.***
23. Drive out the spider bushing. ***See Figure 5-16.***
24. Remove four cam shaft support bushing cover plate nuts, lock washers, and bolts. ***See Figure 5-16.***
25. Remove two cam shafts support cover plates and one support bushing.

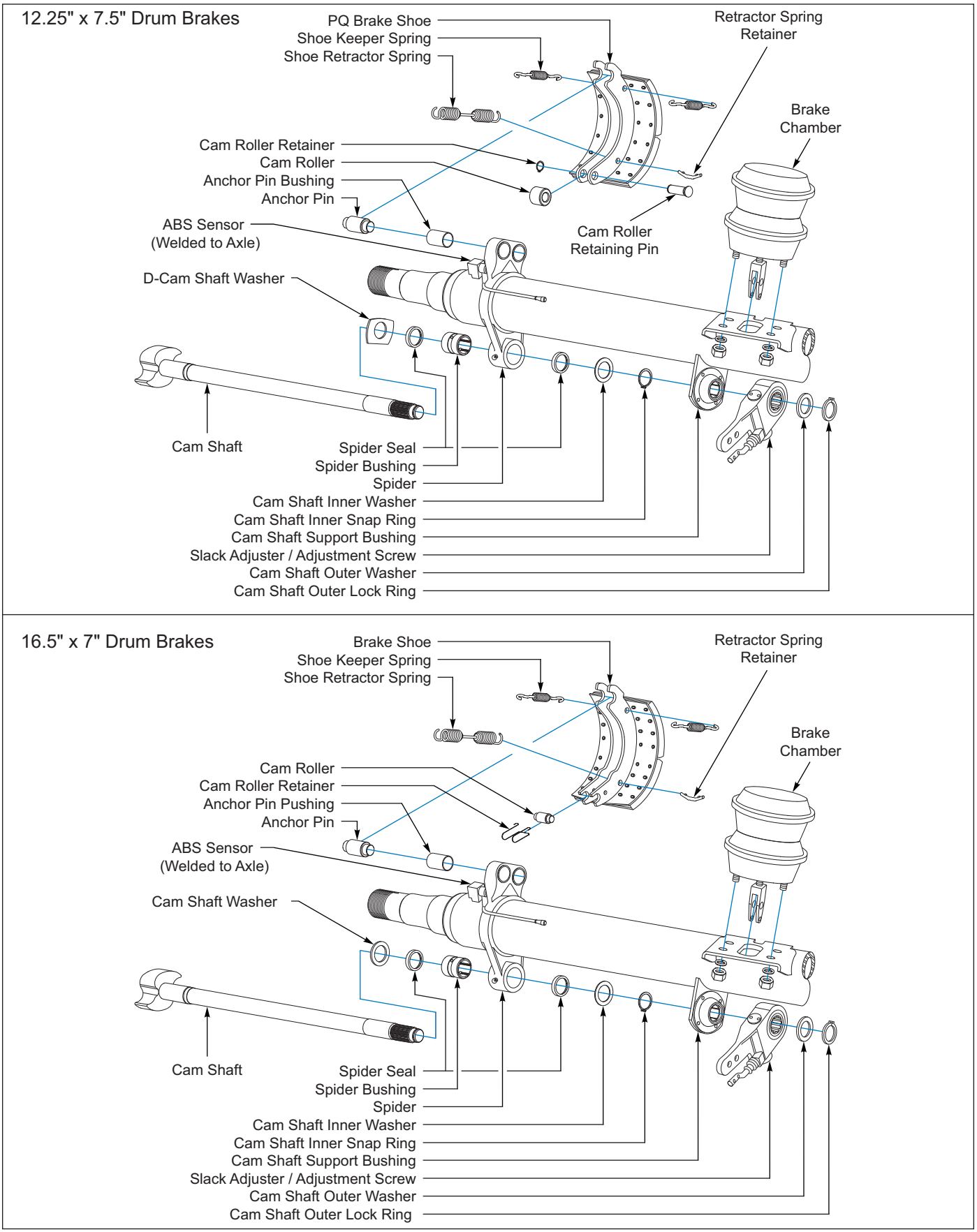


Figure 5-16: Axle and Brake Assembly

Inspect and Repair - Drum Brakes

1. Inspect brake drum for bends, breaks, burrs, chips, cracks, dents, grooves, pits, excessive wear, distortion, scouring, signs brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
2. **Measure** brake drum inside diameter at multiple locations to determine out-of-roundness and if it is within maximum diameter tolerance. Replace if defective. ***See Repair Parts on Page 5-3.***
   - The maximum tolerance should be casted or stamped into the drum.
3. Inspect stud holes and drum pilot for elongation. Replace if defective. ***See Repair Parts on Page 5-3.***
4. Inspect brake drum for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
5. Inspect brake shoes for bends, breaks, burrs, chips, cracks, dents, pits, excessive wear, distortion, signs brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
6. **Measure** brake shoe linings at multiple locations to determine if the wear limit has exceeded 3/8 in (9.5 mm) or less. Replace if defective. ***See Repair Parts on Page 5-3.***
   - **DO NOT** allow the linings to wear enough that the lining rivets groove the drum.
   - Example, ***See Figure 5-15 on Page 5-24.***
7. Inspect brake shoes links for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
8. Inspect brake cam rollers for bends, breaks, burrs, cracks, dents, wear, signs of brittleness / fatigue / heat, and visual defects. Inspect bearing spins freely. Replace if defective. ***See Repair Parts on Page 5-3.***
9. Inspect brake cam rollers for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
10. Inspect brake springs, retainers, retainer pins for bends, breaks, bulges, cuts, deterioration, kinks, stretch, wear, signs of brittleness / fatigue / heat, weak spring force, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
11. Inspect brake springs, retainers, retainer pins for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
12. Inspect cam shaft support bushing covers for bends, breaks, burrs, cracks, dents, wear, signs of brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
13. Inspect cam shaft support bushing covers for corrosion, dirt, grease, and rust. ***See Cleaning on Page 5-2.***
14. Inspect cam support cover hardware for bends, breaks, burrs, cracks, dents, wear, signs of brittleness / fatigue / heat, tread condition and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
15. Inspect cam support cover hardware for corrosion, dirt, grease, and rust. ***See Cleaning on Page 5-2.***
16. Inspect spider, anchor, and cam support bushings for bends, breaks, burrs, chips, cracks, dents, pits, wear, distortion, signs brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
17. Inspect spider, anchor, and cam support bushings for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
18. Inspect spider seals for bends, breaks, bulging, cuts, deterioration, dry rot, flat spots, kinks, wear, signs brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
19. Inspect spider seals for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
20. Inspect spider and support bushings grease fittings for cracks, dents, corrosion, function, thread damage, wear, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
21. Inspect spider and support bushings grease fittings for corrosion, dirt, rust, grease. ***See Cleaning on Page 5-2.***
22. Inspect cam shaft snap rings for bends, breaks, bulges, cuts, deterioration, kinks, stretch, wear, signs of brittleness / fatigue / heat, weak spring force, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
23. Inspect cam shaft snap rings for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
24. Inspect cam shaft washers for bends, breaks, burrs, cracks, dents, wear, signs of brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
25. Inspect cam shaft washers for corrosion, dirt, grease, and rust. ***See Cleaning on Page 5-2.***
26. Inspect cam shaft snap rings for bends, breaks, bulges, cuts, deterioration, kinks, stretch, wear, signs of brittleness / fatigue / heat, weak spring force, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
27. Inspect cam shaft snap rings for corrosion, dirt, grease. ***See Cleaning on Page 5-2.***
28. Inspect cam shaft, lobe, snap ring grooves and splines for bends, breaks, burrs, cracks, dents, wear, signs of brittleness / fatigue / heat, and visual defects. Replace if defective. ***See Repair Parts on Page 5-3.***
29. Inspect cam shaft, lobe, snap ring grooves and splines for corrosion, dirt, rust, grease. ***See Cleaning on Page 5-2.***

Resurfacing - Drum Brakes

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage to product.

- **Turning a brake drum beyond 0.04 in (1.02 mm) under the maximum diameter may result in a weaker brake drum, and may result in an accident.**

It may be necessary to turn or resurface the brake drum surface to remove small heat checks or other surface defects resulting from normal use.

- **The maximum diameter is casted into the drum back plate.**
- **Discard the drum if any portion exceeds the maximum diameter.**
- **If the maximum diameter is not present, DO NOT exceed .120 in (3.048 mm) of a new drum diameter.**
- **When resurfacing a drum, allow at least 0.04 in (1.016 mm) under the maximum diameter for additional wear.**

Install - Drum Brakes

1. Park on a level surface, set the park brake, chock the wheels, and uncouple the trailer from the tractor.
2. Jack up the trailer and support with adequate capacity jack stands under axles.

Install Cam Shaft Bushings:

3. Install one cam shaft support bushing and two support bushing cover plates. ***See Figure 5-16.***
4. Install four cam shaft support bushing cover plate bolts, lock washers, and nuts. ***See General Torque Specifications on Page 2-5.***
5. Drive in spider bushing. ***See Figure 5-16.***

IMPORTANT

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

6. Install two spider seals into the spider. ***See Figure 5-16.***
   - Seal facing hub gets installed normally.
   - Seal facing slack adjuster gets installed backwards.

Install Cam Shaft:

7. Install the cam shaft washer onto the cam shaft. ***See Figure 5-16.***
   - **12.25 x 7.5 Brakes:** Use a D-Cam washer between the cam shaft and spider bushing.
   - **16.5 x 7 Brakes:** Use a flat washer between the cam shaft and spider bushing.
8. Slide the cam shaft into the spider bushing.
   - Stop the cam shaft before it goes into the support bushing to allow room to install inner washer and snap ring.
9. Install one cam shaft inner washer and snap ring onto the cam shaft. ***See Figure 5-16.***
   - Align cam shaft to be pushed through the support bushing.
   - When shaft is fully seated, finish installing the inner washer and snap ring.
10. Install Brake Shoes:
11. Drive in two anchor pin bushings. ***See Figure 5-16.***
12. Position the upper and lower brake shoes on the spider.
    - Retract them inward while allowing them to pivot on the cam shaft.
13. Install the retractor spring and retractor spring retainers onto the upper and lower shoes. ***See Figure 5-16.***
14. Install the keeper springs onto the upper and lower brake shoes. ***See Figure 5-16.***
15. Separate the lower brake shoe away from the cam shaft.
    a. 12.25 x 7.5 Brakes:
    - Apply light coat of high temp anti-seize to the cam roller retaining pin.
    - Install the cam roller, cam roller retaining pin (head positioned inside), and cam roller retainer (positioned outside).

    b. **16.5 x 7 Brakes:**
    - Apply light coat of high temp anti-seize to the cam roller grooves on the brake shoes.
    - Install the cam roller and cam roller retainer.

    c. Allow brake shoe to retract and rest the cam roller in the cam shaft.
16. Separate the lower brake shoe away from the anchor bushing.
    - Apply light coat of high temp anti-seize to the anchor pin.
    - Install anchor pin.
    - Allow brake shoe to retract and rest on the anchor pin.
17. Separate the upper brake shoe away from the cam shaft.

a. 12.25 x 7.5 Brakes:
- Apply light coat of high temp anti-seize to the roller retaining pin.
- Install the cam roller, cam roller retaining pin (head positioned inside), and cam roller retainer (positioned outside).

b. **16.5 x 7 Brakes:**
- Apply light coat of high temp anti-seize to the cam roller grooves on the brake shoes.
- Install the cam roller and cam roller retainer.

c. Allow brake shoe to retract and rest the cam roller in the cam shaft.

18. Separate the upper brake shoe away from the anchor bushing.
    - Apply light coat of high temp anti-seize to the anchor pin.
    - Install anchor pin.
    - Allow brake shoe to retract and rest on the anchor pin.
19. ***Install - Hub & Wheel Bearings on Page 5-18.***
20. Install brake drum.
    - Be careful not to damage the stud threads when sliding the brake drum on.
21. ***Install - Automatic Slack Adjuster on Page 5-30.***
22. Install tire and wheel assembly. ***See Remove - Hub & Wheel Bearings on Page 5-18.***
23. Install the hubodometer option equipped. ***See Figure 5-9 on Page 5-19.***
24. Remove jack stands.

Slack Adjuster Maintenance, Automatic

Operational Checks - Automatic Slack Adjuster

1. Park on a level surface and chock the wheels.
2. Check that the push rod is fully extended, then apply air to release spring brake, ***See Figure 5-17***.
3. Turn the automatic slack adjuster adjustment screw counterclockwise to create an excessive clearance condition.
    - A ratcheting sound should be heard.
4. Fully apply the service brakes and release, allowing sufficient time for brake to fully retract.
    a. During the brake release, observe rotation of the slack adjuster adjustment screw
    - Lightly hold a wrench on the slack adjuster adjustment screw to see the clockwise movement.
    - This rotation indicates that an excessive clearance condition has been determined by the automatic slack adjuster, and it is making an adjustment to compensate.

    b. 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 1.5 in (2.54 cm) to 2 in (5.08 cm) with a 100 to 105 psi (689 to 724 kPa) 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.

Remove - Automatic Slack Adjuster

1. Park on a level surface, set the park brake, chock the wheels, and uncouple the trailer from the tractor.
2. ***Cage - Spring Brake Chamber on Page 5-32.***
3. Rotate the automatic slack adjuster adjustment screw counterclockwise to back off the slack adjuster, ***See Figure 5-17.***

IMPORTANT

DO NOT loosen or adjust brake chamber push rod clevis.

4. Remove two cotter pins and two clevis pins from the brake chamber push rod clevis, ***See Figure 5-17.***
5. Rotate the automatic slack adjuster adjustment screw counterclockwise to back the slack adjuster out of the clevis, ***See Figure 5-17.***
6. Remove one cam shaft outer snap ring and washer, ***See Figure 5-17.***
7. Slide automatic slack adjuster off cam shaft.

Install - Automatic Slack Adjuster

1. Slide automatic slack adjuster onto the cam shaft, ***See Figure 5-17.***
2. Install one cam shaft washer and snap ring, ***See Figure 5-17.***
3. Rotate the automatic slack adjuster adjustment screw clockwise into the clevis and align the clevis pin holes, ***See Figure 5-17.***
4. Install two brake chamber push rod clevis cotter pins and two clevis pins through the automatic slack adjuster, ***See Figure 5-17.***
5. ***Uncage - Spring Brake Chamber on Page 5-33.***
6. ***Adjust - Automatic Slack Adjuster on Page 5-31.***

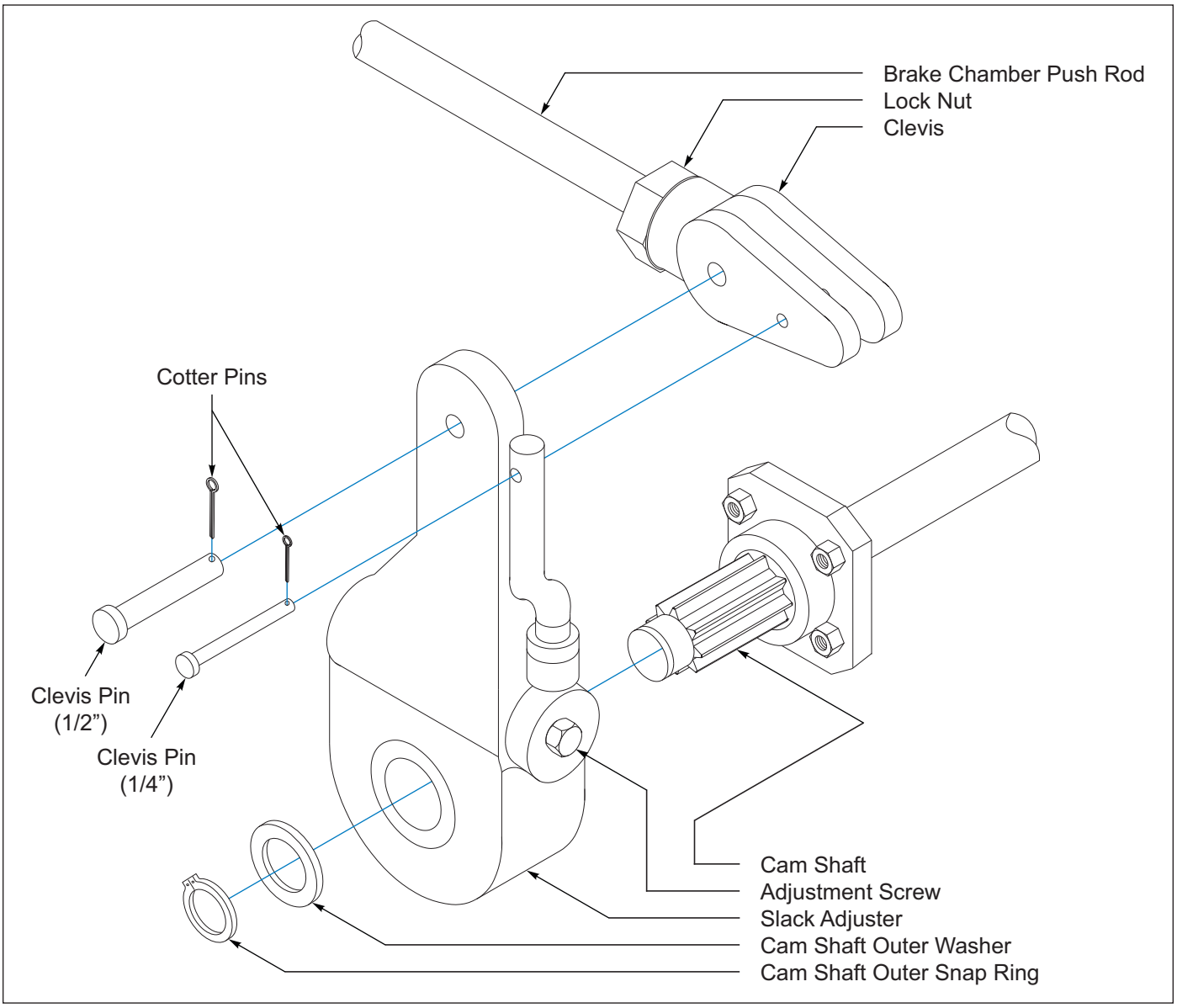


Figure 5-17: Automatic Slack Adjuster

Adjust - Automatic Slack Adjuster

1. Park on a level surface, chock the wheels, and release the trailer brakes.
2. Connect trailer to an air source to operate the brakes.
3. Using a wrench, adjust the slack adjuster adjustment screw, ***See Figure 5-17.***

   a. Adjustment screw is loose and rotates:

   • Rotate slack adjuster adjustment screw clockwise until the brake shoes contact the drum.

   b. Adjustment screw is tight or does not rotate:

   • Rotate slack adjuster adjustment screw counterclockwise until the brake shoes loose contact with the drum.

   • Rotate slack adjuster adjustment screw clockwise until the brake shoes contacts the drum.
4. Adjust the slack adjuster adjustment screw counterclockwise 1/2 turn, ***See Figure 5-17.***

   • A ratcheting sound should be heard.
5. Monitor the clockwise movement of the slack adjuster adjustment screw, ***See Figure 5-17.***

• This will allow you to monitor the adjustment process of the slack adjuster.

   a. Lightly hold a wrench on the slack adjuster adjustment screw to see the movement.

   b. Or place a timing mark from the adjustment screw onto the slack adjuster.

6. Apply and release the service brakes multiple times.
   - The slack adjuster should slightly move each time the brakes release, adjusting the slack in the brakes.
   - Continue until there is no movement in the adjustment screw.
7. Measure brake stroke travel length with service brakes released.

- **Marking Method:**
  - Place a straight edge across face of brake chamber and place a mark where the straight edge touches the brake chamber push rod.
- **Tape Measure Method:**
  - Use the same measurement locations.
  - Using a tape measure, measure from the face of the brake chamber to the center of the 1/2 inch slack adjuster clevis pin.
  - Record measurement.

8. Measure brake stroke travel length with brakes applied.

- **Marking Method:**
  - Using a tape measure, measure from the face of the brake chamber to the mark.
  - Record the brake stroke travel measurement.
- **Tape Measure Method:**
  - Use the same measurement locations as previous measurement.
  - Using a tape measure, measure from the face of the brake chamber to the center of the 1/2 inch slack adjuster clevis pin.
  - Record measurement.
  - Figure brake stroke travel (brakes applied minus brakes released)

9. **Tolerance:** Measurement must be 1-1/2 to 2 in (3.81 to 5.08 cm).
   - If measurement is 2 in (5.08 cm), repeat steps 6 to 9.
   - If measurement is not achievable, troubleshoot brakes.

Spring Brake Chamber Maintenance

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT service or rebuild spring brake chamber, it contains a high tension spring.**

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT remove spring brake chamber clamp, spring under extreme tension.**
- **If caging is required during transport, ONLY travel short distance to repair facility.**

CAUTION

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **Air pressure in excess of 130 psi (896 kpa) may damage the spring brake chamber.**

IMPORTANT

Replace the entire spring brake chamber when defective. DO NOT service or rebuild the spring brake chamber.

Cage - Spring Brake Chamber

1. Park on a level surface, set the park brake, and chock the wheels.
2. Remove the caging tool nut and washer from the caging tool and remove from the brake chamber caging tool socket, ***See Figure 5-18.***
3. Remove the brake chamber dust cap.
4. Insert the caging tool into the brake chamber and align to the internal T-Head slot, ***See Figure 5-18.***
   - Rotate it clockwise 1/2 turn to seat the caging tool.
   - Pull out on the caging tool to verify it has been seated.
5. Install the washer and nut onto the caging tool.
6. Tighten nut until finger tight.

CAUTION

Proceed with caution. Failure to heed caution may cause injury to person and/or damage to product.

- **DO NOT use an impact tool for caging and uncaging the brake chamber.**
- **DO NOT over tighten caging tool, this may cause damage to the brake chamber.**

7. Using hand tools to compress the internal spring, rotate the nut clockwise until it stops (estimated 2.25 in to 2.5 in (5.72 cm to 6.35 cm).
   - **DO NOT** use an impact gun to cage.
   - As the internal spring collapses, it will become harder to turn.
   - Once it stops, **DO NOT** attempt to further tighten nut.

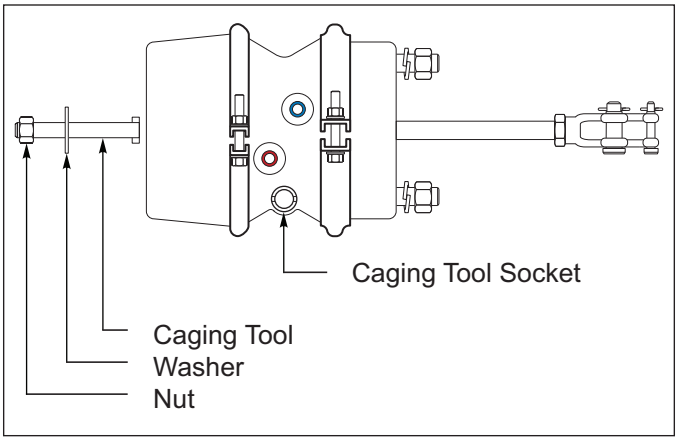


Figure 5-18: Caging Brake

Uncage - Spring Brake Chamber

1. Using hand tools to release the internal spring, rotate the nut counterclockwise until the caging tool becomes loose, ***See Figure 5-19.***
   - **DO NOT** use an impact gun to uncage.
2. Remove the nut and washer from the caging tool.
3. Push in the caging tool and rotate counterclockwise 1/2 turn to align the T-Head and remove caging tool from the brake chamber, ***See Figure 5-18.***
4. Install the brake chamber dust cap.
5. Install the caging tool into the brake chamber storage socket and align the T-Head, ***See Figure 5-19.***
6. Install the washer and nut and fully tighten.

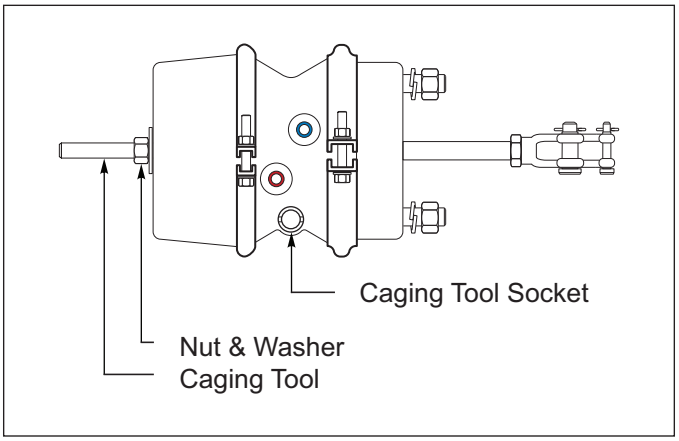


Figure 5-19: Uncaging Brake

Remove - Spring Brake Chamber

1. Park on a level surface, set the park brake, chock the wheels, and uncouple the trailer from the tractor.
2. Drain the air tanks.
3. ***Cage - Spring Brake Chamber on Page 5-32.***
4. Mark the air lines/hoses and fittings with which port they are attached to, ***See Figure 5-20.***
5. Remove the air lines/hoses from the fittings.
6. Remove the fittings from the brake chamber.
7. Rotate the automatic slack adjuster adjustment screw counterclockwise to back off the slack adjuster, ***See Figure 5-17.***
8. Remove two brake chamber push rod clevis pins and cotter pins, ***See Figure 5-20.***
9. Remove two brake chamber nuts and washers.
10. Remove brake chamber from the axle mount.
11. ***Uncage - Spring Brake Chamber on Page 5-33.***
12. Measure the brake chamber push rod length fully extended, ***See Figure 5-20.***
    - Using a tape measure, measure from the front face of the brake chamber to the first edge of the 1/2 inch slack adjuster clevis pin hole.
    - Record measurement.
13. Remove the clevis and lock nut from the brake chamber push rod.

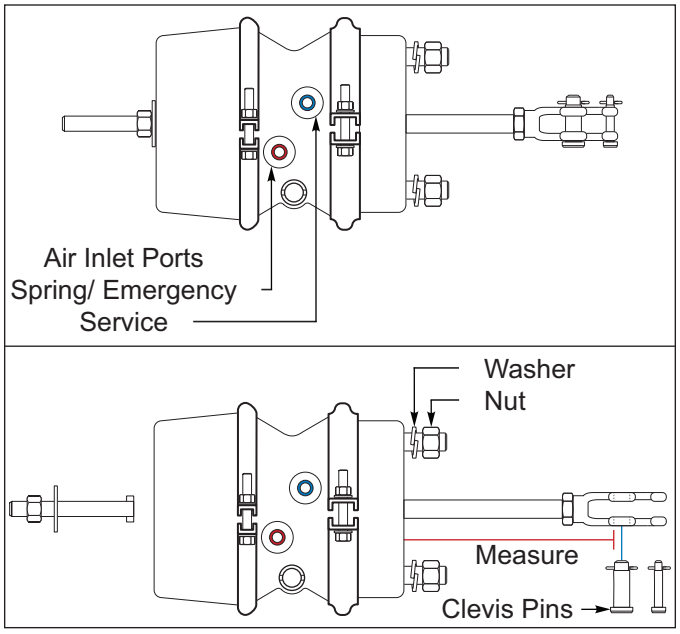


Figure 5-20: Remove Brake Chamber

Install - Spring Brake Chamber

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **DO NOT rebuild or service spring brake chamber, it contains a high tension spring.**
- **If caging is required during transport, ONLY travel short distance to repair facility.**

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage to product.

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

NOTICE

- **Use the manufacturer's installation instructions if available.**
- **If not available, use the following procedures.**

1. Install the jam nut and clevis onto the new brake chamber push rod, ***See Figure 5-21.***
   - **DO NOT** tighten the jam nut.
2. Adjust the clevis to achieve the measurements from the defective brake chamber bush rod, ***See Figure 5-21.***
   - Using a tape measure, measure from the front face of the brake chamber to the first edge of the 1/2 inch slack adjuster clevis pin hole, adjust clevis until measurement is achieved.
3. Mark the push rod where it extends through the clevis, ***See Figure 5-21.***
   - No more than a 1/16 inch should extend past the clevis.
4. Remove the clevis and move the jam nut towards the face of the brake chamber.
5. Cut the push rod to length and clean up the threads.
6. Adjust the clevis to achieve the measurements from the defective brake chamber bush rod.
   - Using a tape measure, measure from the front face of the brake chamber to the first edge of the 1/2 inch slack adjuster clevis pin hole, adjust clevis until measurement is achieved.
   - Tighten jam nut to the clevis, and torque to 50 Ft.-Lbs (68 Nm).

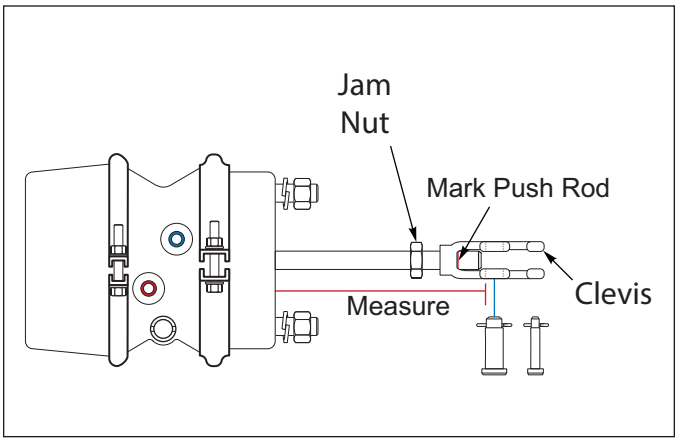


Figure 5-21: Adjust Clevis

7. ***Cage - Spring Brake Chamber on Page 5-32.***
8. Install the brake chamber on the axle mount with the condensation vent hole towards the bottom.
9. Install two brake chamber washers and nuts, ***See Figure 5-22.***

- **Torque to:**
  - **Hex Nuts:** 85-95 Ft.-Lbs (116-128 Nm).
  - **Lock Nuts:** 120-140 Ft.-Lbs (163-189 Nm).

10. Adjust the brake chamber if required, ***See Figure 5-21.***

- **Air Inlet Ports:**
  - Slightly loosen the service brake chamber clamp band nut and bolt closest to the axle and rotate the air inlet ports up.
  - Once adjusted tighten clamp band.
- **Spring Brake Chamber Vent Hole:**
  - Slightly loosen the spring brake chamber clamp band farthest from the axle and rotate cover to position vent hole towards the bottom.
  - Once adjusted, tighten clamp band.

IMPORTANT

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

11. Install fittings into proper ports, ***See Figure 5-22.***
12. Install air lines/hoses to proper fittings
13. ***Adjust - Automatic Slack Adjuster on Page 5-31.***

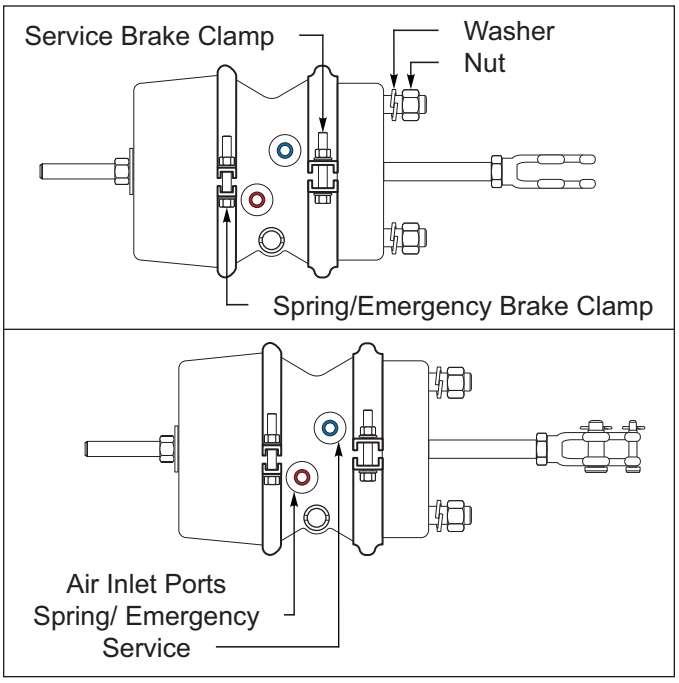


Figure 5-22: Adjusting Brake Chamber

Electrical Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, ***Refer to Manufacturer Index listed on Page 7-1.***

Maintenance Schedule - Electrical System

IMPORTANT

Fuse or circuit breaker blow-out usually indicates an electrical short-circuit, although a fuse can occasionally fail from vibration.

- **The tractor contains the fuses that control the trailer electrical.**
  - **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.**

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 it immediately.**
- **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 lamps.**

Lights & Electrical Accessories

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.

Daily inspections should include the following:

1. Monitor the entire electrical system for abnormal or erratic operation or function.
2. Inspect the tractor plug for damage, defects, dirt, and grime that may cause the trailer lights and accessories not to work.
3. Inspect the trailer plug and optional outlets for damage, defects, dirt, and grime that may cause the trailer lights and accessories not to work.
4. Verify the ABS light illuminates when power is first applied and remains off.
5. Verify all lights and lighting options are operational.
   - Inspect that all light grommets are installed and in good condition.
6. Verify the optional tire inflation system light is off.
   - The light should temporarily come on or flash to indicate the system is on and must go off to indicate that the system is ok to operate.
   - If the light remains on or goes out after a longer period of time, this may indicate an air leak in the tire inflation system.
7. Verify the optional hydraulic diverter valve solenoid is operational.
8. Verify the optional remote-control powers up and all functions are operational.
   - If the remote control does not power up, check the batteries.
9. Verify the optional winch 2-speed switch is operational.
10. Inspect that all accessory switches weather boots are installed and in good condition.

Remote Control System (Option)

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Monthly Inspection.

Monthly or 2,000 miles (3219 Km) inspections should include the following:

1. Inspect the remote control transmitter housing for bends, breaks, burrs, chips, cracks, dents, pits, wear, distortion, signs brittleness / fatigue and visual defects. Replace if defective, ***See Repair Parts on***

Page 5-3.

2. Inspect remote control transmitter housing and batteries for corrosion, dirt, grease, ***See Cleaning on Page 5-2.***
3. Inspect remote control receiver housing and mounting hardware for bends, breaks, burrs, cracks, dents, wear, signs of arcing / brittleness / fatigue / heat, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
4. Inspect remote control receiver housing and mounting hardware for corrosion, dirt and grease build up, ***See Cleaning on Page 5-2.***
5. Inspect remote control receiver electrical wiring and connector insulation for bends, breaks, bulges, cuts, deterioration, dry rot, dents, kinks, wear, signs of arcing / brittleness / fatigue / heat and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
6. Inspect remote control receiver electrical wiring and connector insulation for corrosion, dirt and grease build up, ***See Cleaning on Page 5-2.***

Tire Inflation System (Option)

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Monthly Inspection.

Monthly or 2,000 miles (3219 Km) inspections should include the following:

1. Inspect tire inflation controller housing and mounting hardware for bends, breaks, burrs, cracks, dents, wear, signs of arcing / brittleness / fatigue / heat, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
2. Inspect tire inflation controller housing and mounting hardware for corrosion, dirt and grease build up, ***See Cleaning on Page 5-2.***
3. Inspect flow sensing switch, electrical wiring and connector insulation, and light for bends, breaks, bulges, cuts, deterioration, dry rot, dents, kinks, wear, signs of arcing / brittleness / fatigue / heat and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
4. Inspect flow sensing switch, electrical wiring and connector insulation, and light for corrosion, dirt and grease build up, ***See Cleaning on Page 5-2.***

Winch, 2-Speed System (Option)

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Monthly Inspection.

Monthly or 2,000 miles (3219 Km) inspections should include the following:

1. Inspect winch 2-speed solenoid terminals for bends, breaks, burrs, chips, cracks, dents, pits, wear, distortion, signs arcing / brittleness / fatigue / heat, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
2. Inspect winch 2-speed solenoid terminals for corrosion, dirt and grease build up, ***See Cleaning on Page 5-2.***
3. Inspect winch 2-speed electrical wiring and connector insulation for bends, breaks, bulges, cuts, deterioration, dry rot, dents, kinks, wear, signs of arcing / brittleness / fatigue / heat and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
4. Inspect winch 2-speed electrical wiring and connector insulation for corrosion, dirt and grease build up, ***See Cleaning on Page 5-2.***

Frame Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, ***Refer to Manufacturer Index listed on Page 7-1.***

Maintenance Schedule - Frame Assembly

Covers, Plates, Storage Compartments

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.

Daily inspections should include the following:

1. Inspect all covers, plates, and storage compartment doors for bends, breaks, cracks, dents, signs of fatigue, and visual defects.
2. Inspect all cover, plate, and storage compartment door mounting hardware for loose, missing, or defective parts.
   - Tighten any loose hardware and replace any missing or defective parts, ***See General Torque Specifications on Page 2-5.***
3. Inspect all covers, plates, Storage compartment doors, and mounting hardware for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

1. Remove all covers and plates.
2. Clean out all storage compartments.
3. Conduct a Daily Inspection.

4. Inspect all cover and plate mounting surfaces for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***
5. Inspect cover and plate mounting surfaces for any structure damage or defects, ***See Structural Defects on Page 5-4.***
6. Install all covers and plates and tighten mounting hardware, ***See General Torque Specifications on Page 2-5.***
7. Inspect storage compartment door openings and door seals for damage or defects.
8. Inspect storage compartment door locks for damage for defects.
9. Inspect storage compartment drain holes for blockage.
10. Inspect storage compartments, doors, and locks for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***

Decals

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

1. Inspect for damaged, defective, or missing decals, ***See Decal Locations on Page 3-10.***
   - Replace if damaged, defective, or missing, ***See Repair Parts on Page 5-3.***
2. Verify that all decals are clean and legible.
   - Replace if non-legible, ***See Repair Parts on Page 5-3.***

Landing Gear

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Weekly Inspection.

NOTE

The following procedures requires the trailer to be coupled to the tractor.

Weekly or 500 miles (805 Km) should include the following:

1. Inspect the landing leg mounting hardware for loose, missing, or defective parts.
2. Inspect the landing leg mounting surfaces for structural defects, ***See Structural Defects on Page 5-4.***
3. Inspect landing mounting hardware, and mounting surfaces for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***
4. Inspect the landing legs for bends, breaks, cracks, dents, signs of fatigue, and visual defects.
5. Inspect landing legs for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***
6. Conduct functions check on the specific landing leg option that is being inspected.
   - ***Function Check, Landing Legs, Dual Crank (Standard):***
   - ***Function Check, Landing Legs, Pinned (Option):***

Function Check, Landing Legs, Dual Crank (Standard):

1. Rotate the handle to slightly lower the landing legs, ***See Figure 5-23.***
2. Pivot both shoes to check for movement.
3. Rotate the handle to fully lower the landing legs to the ground and apply a slight upward lift.
   - Monitor the landing legs for abnormal or erratic movement or noises.
   - The landing legs should support the weight.
4. Rotate the handle to fully raise the landing legs into transport position.
5. Stow the crank handle.

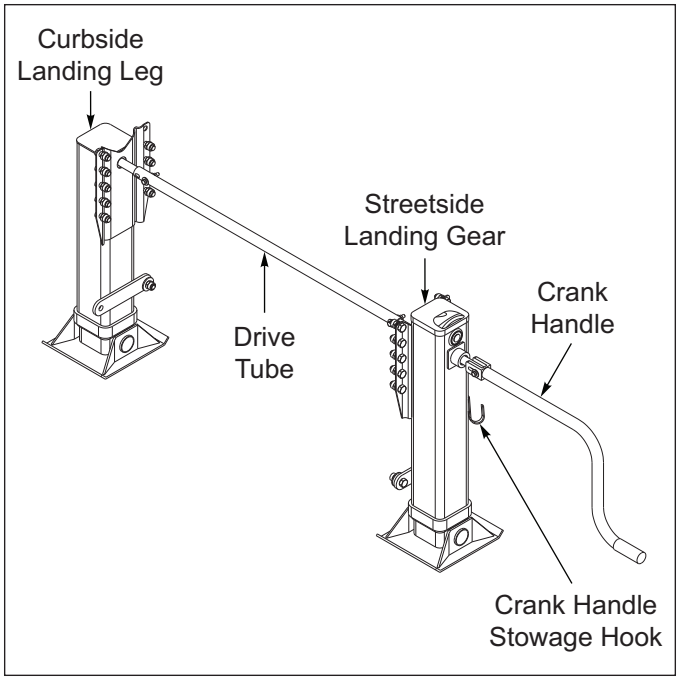


Figure 5-23: Landing Leg, Dual Crank (Standard)

Function Check, Landing Legs, Pinned (Option):

1. Manually raise the leg slightly to release pressure on the snap lock pin, ***See Figure 5-24.***
2. Remove the snap lock pin from the leg.
3. Manually lower the leg fully to the ground.
   - Monitor the landing leg for abnormal or erratic movement or noises.
   - Inspect the inside leg for bends, breaks, cracks, dents, signs of fatigue, and visual defects.

- Inspect the pin holes for breaks or cracks extending from the hole, and the hole does not present an oval appearance.

4. Inspect the snap pin lock pin for damage or defects.
5. Inspect the snap lock pin retainer for damage or defects.
6. Manually raise the leg to transport position and insert the snap lock pin.
7. Repeat steps 1 through 6 to inspect the opposite side landing leg.

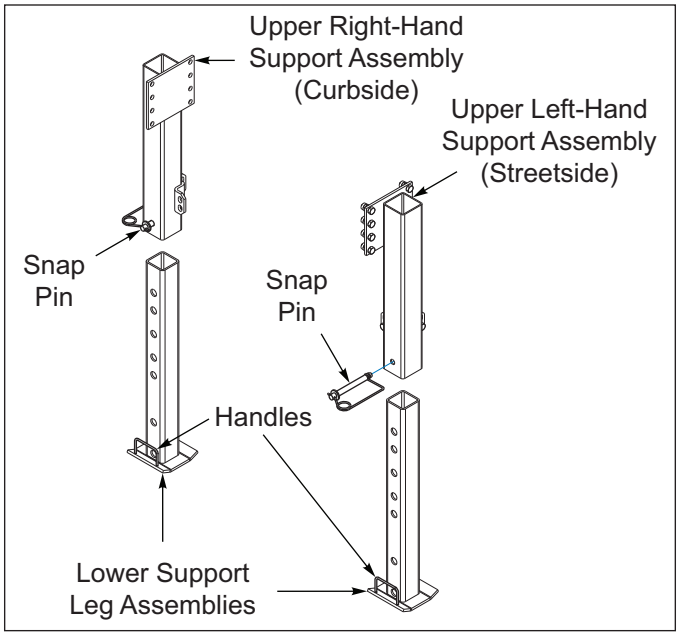


Figure 5-24: Landing Legs, Pinned (Option)

Mud Flaps

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.

Daily inspections should include the following:

1. Inspect mud flap for bends, breaks, bulges, cuts, deterioration, kinks, wear, signs of fatigue / brittleness, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
2. Inspect mud flap mounting hardware for loose, defective, or missing parts.
   - Tighten if loose, ***General Torque Specifications on Page 2-5.***
   - Replace if defective or missing, ***See Repair Parts on Page 5-3.***
3. Inspect mud flap mounting hardware for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***
4. Inspect the mud flap mount brackets for bends, breaks, cracks, dents, signs of fatigue, and visual defects. Replace if defective, ***See Repair Parts on Page 5-3.***
5. Inspect mud flap mount brackets for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***
6. Inspect the mount bracket frame mounts for bends, breaks, cracks, dents, signs of fatigue, and visual defects, Repair if defective, ***See Structural Defects on Page 5-4.***
7. Inspect mount bracket frame mounts for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***

Tie Down Anchors

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.

Daily inspections should include the following:

D-Ring Tie Downs:

1. Inspect D-ring loops for bends, breaks, bulges, burrs, cracks, dents, functionality, signs of brittleness/fatigue/wear, stretch, and visual defects, ***See Structural Defects on Page 5-4.***
2. Inspect D-ring anchors for bends, breaks, bulges, burrs, cracks/cracked welds, dents, signs of brittleness/fatigue/wear, stretch, and visual defects, ***See Structural Defects on Page 5-4.***
   - Bolt-On Anchors ONLY: Inspect anchor mounting hardware for damaged, loose, or missing parts, ***See Repair Parts on Page 5-3.***
3. Inspect D-ring tie-downs for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***

Keyhole Tie Downs:

1. Inspect keyhole tie-downs for bends, breaks, bulges, burrs, cracks, dents, signs of brittleness/fatigue/wear, and visual defects, ***See Structural Defects on Page 5-4.***
   - They should be flat across and not bent or bulged above or below the surface.
2. Inspect keyhole tie-downs for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***

Rub Rail Tie Downs:

1. Inspect rub rail for bends, breaks, bulges, burrs, cracks, dents, signs of brittleness/fatigue/wear, and visual defects, ***See Structural Defects on Page 5-4.***
2. Inspect rub rail spacers for bends, breaks, bulges, burrs, cracks/cracked welds, dents, signs of brittleness/fatigue/wear, stretch, and visual defects, ***See Structural Defects on Page 5-4.***
3. Inspect rub rail tie-downs for corrosion, dirt, grease, and rust, ***See Cleaning on Page 5-2.***

Strap Pocket Tie Downs:

1. Inspect strap pocket tie-downs for bends, breaks, bulges, burrs, cracks/cracked welds, dents, signs of brittleness/fatigue/wear, and visual defects, ***See***

Structural Defects on Page 5-4.

2. Inspect strap pocket tie-downs for corrosion, dirt, grease, and rust, *See Cleaning on Page 5-2.*

Gooseneck Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll Parts Manual on Page 7-1.

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, Refer to Manufacturer Index listed on Page 7-1.

Maintenance Schedule - Gooseneck Assembly

Covers, Plates, Storage Compartments

First 5 Hours or 50 miles (80 Km) inspection should include the following:

- **See Frame Assembly, Maintenance Schedule, *Covers, Plates, Storage Compartments on Page 5-36.***

Daily inspections should include the following:

- **See Frame Assembly, Maintenance Schedule,, *Covers, Plates, Storage Compartments on Page 5-36.***

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

- **See Frame Assembly, Maintenance Schedule, *Covers, Plates, Storage Compartments on Page 5-36.***

Decals

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

- **See Frame Assembly, Maintenance Schedule, *Decals on Page 5-37.***

King Pin / Hitch Plate & Lift Arm Assembly

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **To prevent severe injury or death from pinching: Keep all persons and objects clear while any part of the machine is in motion.**
- **DO NOT inspect the king pin when the trailer is coupled to the trailer, trailer may fall.**

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.

Daily inspections should include the following:

IMPORTANT

The trailer must be uncoupled from the tractor for safety.

1. Start up the hydraulic pump.
2. Using the tilt control lever, move the hitch assembly down for full visibility, *See Control Panel on Page 3-5.*
3. Inspect lift arm assembly for functionality.
4. Inspect the king pin / hitch plate and lift arm assembly for cracked welds, missing parts, and visual defects, *See Hitch Assembly & Service Connects on Page 3-4.*
5. Verify that the hitch pivot pin and tilt cylinder hitch pins are present and properly secured.

Monthly or 2,000 miles (3216 Km) inspection should include the following:

IMPORTANT

The trailer must be uncoupled from the tractor for safety.

1. Conduct a Daily Inspection.
2. Thoroughly clean the kingpin / hitch plate and lift arm assembly, *See Cleaning on Page 5-2.*
3. Inspect the kingpin / hitch plate and lift arm assembly for bends, breaks, cracks, dents, signs of fatigue / cracked welds, and visual defects or missing parts. Replace if defective, *See Repair Parts on Page 5-3.*
4. Inspect kingpin and hitch plate assembly for corrosion and rust, *See Cleaning on Page 5-2.*

Ladders, Grab Bar & Handles

First 5 Hours or 50 miles (80 Km) inspection should include the following:

1. Conduct a Daily Inspection.

Daily inspections should include the following:

1. Inspect quick release latch bends, breaks, bulges, cuts, deterioration, dry rot, dents, kinks, signs of brittleness / fatigue / wear, and visual defects.
2. Inspect the quick release latch mounting hardware for damage, defects, or missing parts.
3. Monitor the pivoting ladder assembly for abnormal or erratic movement or noises.
4. Inspect the pivoting ladder assembly for cracked welds, damage, or missing parts.
5. Inspect the ladder retaining bolt for damage, defects, or missing parts.
6. Inspect the ladder support bracket for cracked welds, damage, or missing parts.
7. Inspect the ladder support bracket mounting hardware for damage, defects, or missing parts.
8. Inspect the grab bar assembly for cracked welds, damage, or missing parts.
9. Inspect the grab bar assembly mounting hardware for damage, defects, or missing parts.

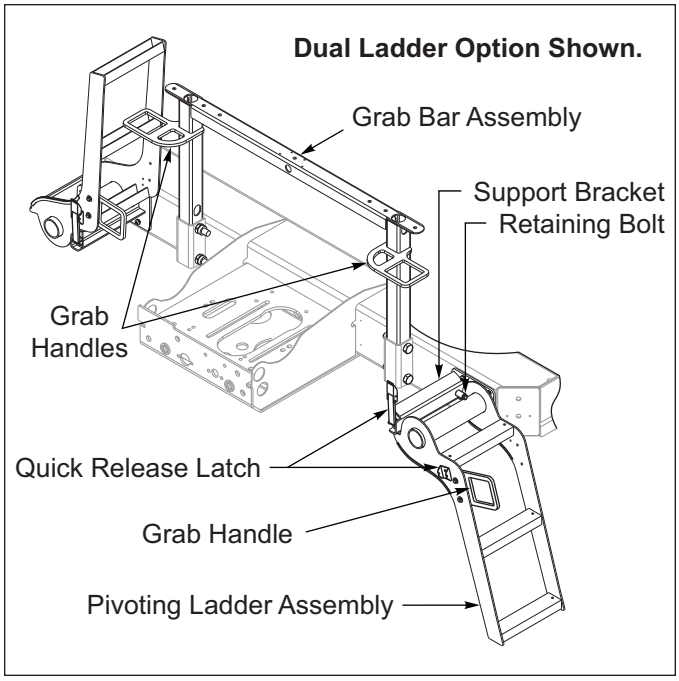


Figure 5-25: Ladders & Grab Handles

Hydraulic System Maintenance

DANGER

Proceed with caution. Failure to heed warning may cause injury to person and/or damage to product and property.

- **DO NOT operate if the fuel system or brake system is leaking. Report it immediately to your supervisor or maintenance.**
- **ALWAYS report any Class 3 leak to your supervisor or maintenance immediately.**
- **ALWAYS ENSURE hydraulic lines have been depressurized.**
  - **Hydraulic injection can cause loss of fingers and even death, *See Figure 5-26*.**

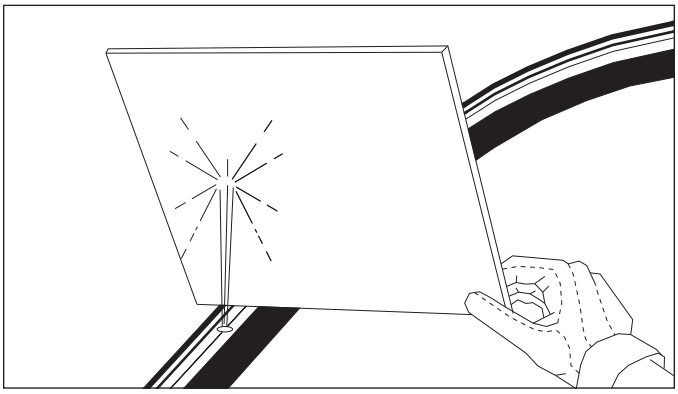


Figure 5-26: Hydraulic Leak Check

IMPORTANT

- **Hydraulic supply pump pressure relief valve must be set between 2,550-2,700 psi (17,581-18,615 kPa).**
- **Trailer control valve is equipped with a pressure relief valve set at a maximum of 2,500 psi (17,237 kPa).**

This trailer requires hydraulic power to operate, supplied by either the tractor or a trailer mounted hydraulic power pack.

Maintenance of the hydraulic system consists of inspections and minor servicing.

Fluid loss and possible contamination in a leaking system may cause poor function and premature failure within the components.

Fluid Leak Classification

IMPORTANT

- **Any signs of a leaking fuel system or brake system, DO NOT operate and report it to your supervisor or maintenance immediately.**
- **Report any Class 3 leak to your supervisor or maintenance immediately and DO NOT operate.**

NOTE

- **Class 1 or 2 leaks may be operated but closely monitored and the fluid level checked more frequently.**
- **Report any leak to your supervisor or maintenance.**

Leaks may be visible by signs of wetness appearing around components seals, gaskets, fittings, and hose/line connections. Leaking hoses may also show signs of staining that also indicates leakage.

- If any fittings or connections are loose, tighten.
- If any items are broken or defective report it.

Fluid Leak Classifications

- **Class 1:** Signs of wetness or stains that do not form drops.
- **Class 2:** Signs of drops forming but not dripping.
- **Class 3:** Signs of drops dripping.

Maintenance Schedule - Hydraulic System

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, ***Refer to Manufacturer Index listed on Page 7-1.***

Hydraulic System

Daily inspections should include the following:

1. Monitor the entire hydraulic system for abnormal or erratic operation, movement, or noises.
2. Inspect and monitor the entire hydraulic system for signs of leaks.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***

Hydraulic Fluid & Filter

First 5 hours inspection should include the following:

1. Inspect the entire hydraulic system for defects and signs of leaks.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
2. ***Replace - Hydraulic Filter on Page 5-42.***
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***

Weekly or 500 miles (805 Km) inspections should include the following:

1. Inspect the entire hydraulic system for defects and signs of leaks.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
2. ***Check Fluid Level - Hydraulic Reservoir on Page 3-20.***
   - Add hydraulic fluid as needed.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***

12 Month or 25,000 miles (40.234 Km) inspections should include the following:

1. Inspect the entire hydraulic system for defects and signs of leaks.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
2. ***Replace - Hydraulic Filter on Page 5-42.***
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
   - Under adverse conditions, change more frequently.

Gooseneck Lift/Tilt Cylinders

First 5 hours and Weekly / 500 miles (805 Km) inspections should include the following:

1. Inspect gooseneck lift/tilt cylinders mounting pins and pivot points for cracked welds and binding during movement.
   - ***See Gooseneck & Deck on Page 5-5.***
2. Inspect gooseneck lift/tilt cylinder and push rod for scouring and defects.

3. Inspect the gooseneck lift/tilt cylinder seals, hoses, and fittings for defects.
    - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

1. Conduct a First 5 Hour and Weekly Inspection.
2. Lubricate the qooseneck lift/tilt cylinder pins and pivot points, ***See Gooseneck & Deck on Page 5-5.***

Undercarriage Travel Cylinders

First 5 hours and Weekly / 500 miles (805 Km) inspections should include the following:

1. Inspect undercarriage travel cylinder mounting pins and undercarriage travel cylinder pivot points for cracked welds and binding during movement.
2. Inspect undercarriage travel cylinders and push rod for scouring and defects.
3. Inspect the undercarriage travel cylinders seals, hoses, and fittings for defects.
    - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***

6 Month or 12,000 miles (19,312 Km) inspections should include the following:

1. Conduct a First 5 Hour and Weekly Inspection.

Undercarriage Cam Followers / Rollers

First 5 hours inspections should include the following:

1. Monitor undercarriage operations for abnormal or erratic movement or noises.
2. Inspect undercarriage cam followers / rollers mounting surfaces for bends, breaks, cracks or defective welds.
    - ***See Centralized Undercarriage on Page 5-6.***
3. Inspect the undercarriage cam followers / rollers grease hoses, and fittings for defects.
    - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***

Weekly or 500 miles (805 Km) inspections should include the following:

1. Conduct a First 5 Hour Inspection.
2. Lubricate the undercarriage cam followers / rollers, ***See Centralized Undercarriage on Page 5-6.***

Hydraulic Reservoir

Replace - Hydraulic Filter

⚠ CAUTION

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **ALWAYS use suitable drip pans that will hold over 35-gallons of hydraulic fluid.**
- **ALWAYS be prepared for a large oil spill. Have rags, dry sweep, and spill containments in place before starting.**
- **ALWAYS control the flow and path of the hydraulic fluid being drained.**

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

1. Disconnect the hydraulic quick couplers from the trailer.

IMPORTANT

Fluid level must be below the return filter assembly before removing the filter.

2. Drain the hydraulic reservoir using a 35-gallon minimum high-capacity drip pan.

- **Engine Package (Option):**
    a. Place a suitable drip pan under the hydraulic return quick coupler.

NOTE

Recommend making a quick coupler and ball valve assembly to use in place of loosening the return quick coupler.

b. Carefully remove the engine package return quick coupler from the hose.
c. Once the fluid has stopped drain from the hose, clean and install the return quick coupler to the hose.
d. Open the fuel tank access panel. ***See Figure 5-27.***
e. Install a fluid channeling device between the fuel tank and hydraulic reservoir and into a suitable drip pan.
f. Remove the drain plug from the bottom center of the reservoir.
g. Inspect drain plug and seal for damage.
h. Install drain plug and seal once fluid has stopped dripping from the reservoir.

- **Wet Kit (Option):**
  a. Place a suitable drip pan under the bottom center of the reservoir. ***See Figure 5-27.***
  - Depending where the hydraulic reservoir is mounted. A fluid channeling device might have to be used.

  b. Remove the drain plug from the bottom center of the reservoir.
  c. Inspect drain plug and seal for damage.
  d. Install drain plug and seal once fluid has stopped dripping from the reservoir.

3. Remove the hydraulic filter.

- **Engine Package (Option):**
  a. Remove top enclosure cover to access the filter.
- **Wet Kit (Option):**
  a. Filter is mounted on the side of the hydraulic reservoir.

4. Clean filter housing and surrounding area.
5. Install new hydraulic filter.
6. Fill hydraulic reservoir, ***Check Fluid Level - Hydraulic Reservoir on Page 3-20.***

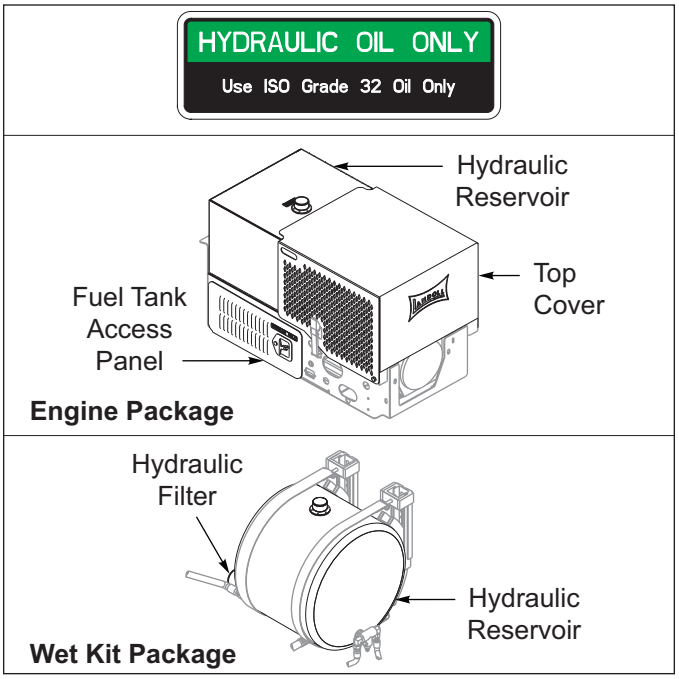


Figure 5-27: Hydraulic Filter

Retrieval System Maintenance

WARNING

- **Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.**
- **DO NOT handle any cable or chain during retrieval system operations.**
- **Hands or clothing could get caught in the cable and be pulled into the spool, causing serious injury or death.**

Maintenance Schedule - Retrieval System

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, ***Refer to Manufacturer Index listed on Page 7-1.***

Chain Drive

IMPORTANT

Due to the wide variations of chain drive gearbox options available, this manual only covers the most common maintenance procedures.

- **The chain drive gearbox requires more detailed inspections and adjustments not listed in this manual.**
- **Resource the specific chain drive gearbox manufacturer for their service requirements.**

First 5 hours or 50 miles (80 Km) inspections should include the following:

1. Conduct a Daily Inspection.
2. Inspect chain drive system mounting hardware for loose, damaged, or missing parts, ***See Repair Parts on Page 5-3.***
3. Inspect chain tension, if loose, ***See Adjust - Chain Tension on Page 5-49.***
4. Change gearbox oil, ***See Lubrication Specifications on Page 5-8.***
5. Grease gearbox output shaft.

Daily inspections should include the following:

1. Monitor the entire chain drive system for abnormal or erratic operation or noises.
   - Monitor chain for looseness.

2. Inspect chain path and trough for damage, debris, obstructions, signs of brittleness/fatigue/wear, or visual defects, ***See Structural Defects on Page 5-4.***
3. Inspect chain links, chain splice, and chain sprocket for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, or visual defects, ***See Repair Parts on Page 5-3.***
4. Inspect gearbox and chain drive anchor for damaged, worn, or missing parts, ***See Repair Parts on Page 5-3.***
5. Inspect and monitor chain drive gearbox assembly for signs of leaks.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
6. Inspect idler pulley and pin for damaged, worn, or missing parts, ***See Repair Parts on Page 5-3.***
7. Inspect gearbox protective cover/shield for damaged, worn, or missing parts, ***See Repair Parts on Page 5-3.***

Weekly or 500 miles (805 Km) inspections should include the following:

1. Conduct a Daily Inspection.
2. Inspect chain drive system mounting hardware for loose, damaged, or missing parts, ***See Repair Parts on Page 5-3.***
3. Inspect chain tension, if loose ***See Adjust - Chain Tension on Page 5-49.***
4. ***See Check Fluid Level - Chain Drive Gearbox on Page 5-50.***
5. Grease gearbox output shaft.
6. Grease idler pulley pin.

12 Month or 25,000 miles (40,234 Km) inspections should include the following:

1. Conduct a First 5 Hour Inspection.

Winch Drive

IMPORTANT

Due to the wide variations of winch options available, this manual only covers the most common maintenance procedures.

- **The winch requires more detailed inspections and adjustments not listed in this manual.**
- **Resource the specific winch manufacturer for their service requirements.**

First 5 hours or 50 miles (80 Km) inspections should include the following:

1. Conduct a Daily Inspection.
2. Inspect winch drive system mounting hardware for loose, damaged, or missing parts, ***See Repair Parts on Page 5-3.***
3. Change winch gearbox oil, ***See Lubrication Specifications on Page 5-8.***
4. Grease the winch drum drive shaft housing bushings, if the specific winch model requires.

- **Resource the specific winch manufacturer for their service requirements.**
  - Grease fittings may be located on the drum under the cable, requiring un-spooling all the cable to access.
  - Grease fittings may be mounted on the exterior of the winch housing.

Daily inspections should include the following:

1. Monitor the entire winch drive system for abnormal or erratic operation or noises.
2. Inspect winch drive mounting hardware for damaged, loose, worn, or missing parts, ***See Repair Parts on Page 5-3.***
3. Inspect and monitor winch drive assembly for signs of leaks.
   - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
4. Inspect optional tension/roller guides if installed for damaged, loose, worn, or missing parts, ***See Repair Parts on Page 5-3.***
5. Startup the hydraulic system.
6. Using the winch control lever, winch out the cable enough to verify winch system is functional.
   - Have a helper pull the cable, keeping it tight on the winch drum.
   - Verify free spool clutch engages.
   - Monitor drum for binding and smooth rotation.
7. Shut of the hydraulic system.
8. Disengage the winch free spool clutch.
9. Pull the winch cable out the length of the trailer.
   - Verify free spool clutch disengages.
   - Monitor drum for binding and smooth rotation.
10. Inspect chain and hook assembly for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects, ***See Repair Parts on Page 5-3.***
11. Inspect chain and hook assembly links move freely, ***See Repair Parts on Page 5-3.***
12. Inspect cable for bends, breaks, bulges, cuts, dents, frays, flat/worn spots, kinks, signs of brittleness/fatigue/stretch/wear, or visual defects, ***See Repair Parts on Page 5-3.***

13. Engage the winch free spool clutch.
14. Startup the hydraulic system.

NOTE

DO NOT *birds nest the cable onto the drum. Recommend applying tension to the hook end of the cable to assist in keeping the cable tight against the drum.*

15. Using the winch control lever, winch IN the cable to the transport position.
    - Verify free spool clutch engages.
    - Monitor drum for binding and smooth rotation.
    - Verify cable is properly wrapping tight onto the winch drum.
16. Inspect all winch accessories for damage, wear, or visual defects.
    - This would include container slings, push bars, etc.

Weekly or 500 miles (805 Km) inspections should include the following:

1. Conduct a Daily Inspection.
2. Inspect winch drive system mounting hardware for loose, damaged, or missing parts, ***See Repair Parts on Page 5-3.***
3. Check winch drive gearbox oil level.
    - Fill as needed, ***See Lubrication Specifications on Page 5-8.***
4. Grease the winch drum drive shaft housing bushings, if the specific winch model requires, ***See Lubrication Specifications on Page 5-8.***

- **Resource the specific winch manufacturer for their service requirements.**
    - Grease fittings may be located on the drum under the cable, requiring un-spooling all the cable to access.
    - Grease fittings may be mounted on the exterior of the winch housing.

5. Oil the winch cable, ***See Lubrication Specifications on Page 5-8.***
6. Grease cable tensioner / guide roller pins if specific model requires, ***See Lubrication Specifications on Page 5-8.***

6 Month or 12,000 miles (19.312 Km) inspections should include the following:

1. Monitor the entire winch drive system for abnormal or erratic operation or noises.
2. Inspect winch drive mounting hardware for damaged, loose, worn, or missing parts, ***See Repair Parts on Page 5-3.***
3. Inspect and monitor winch drive assembly for signs of leaks.
    - If leak/leaks develop, classify it, report it, and monitor it more frequently, ***See Fluid Leak Classifications on Page 5-41.***
4. Inspect optional tension/roller guides if installed for damaged, loose, worn, or missing parts, ***See Repair Parts on Page 5-3.***
5. Startup the hydraulic system.
6. Using the winch control lever, winch out the cable enough to verify winch system is functional.
    - Have a helper pull the cable, keeping it tight on the winch drum.
    - Verify free spool clutch engages.
    - Monitor drum for binding and smooth rotation.
7. Shut of the hydraulic system.
8. Disengage the winch free spool clutch.
9. Pull the winch cable fully out to expose the winch drum.
    - Verify free spool clutch disengages.
    - Monitor drum for binding and smooth rotation.
10. Inspect chain and hook assembly for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects, ***See Repair Parts on Page 5-3.***
11. Inspect chain and hook assembly links move freely, ***See Repair Parts on Page 5-3.***
12. Inspect cable for bends, breaks, bulges, cuts, dents, frays, flat/worn spots, kinks, signs of brittleness/fatigue/stretch/wear, or visual defects, ***See Repair Parts on Page 5-3.***
13. Inspect the winch drum and cable anchors for damage, wear, or visual defects, ***See Repair Parts on Page 5-3.***

- **Resource the specific winch manufacturer for their service requirements.**
    - Verify cable set screw torque, if the specific winch model requires.
    - Verify cable wedge is seated properly, if the specific winch model requires.

14. Grease the winch drum drive shaft housing bushings, if the specific winch model requires.

- **Resource the specific winch manufacturer for their service requirements.**
    - Grease fittings may be located on the drum under the cable, requiring un-spooling all the cable to access.
    - Grease fittings may be mounted on the exterior of the winch housing.

15. Oil the entire winch cable, ***See Lubrication Specifications on Page 5-8.***

16. Grease cable tensioner / guide roller pins if specific model requires, ***See Lubrication Specifications on Page 5-8.***
17. Engage the winch free spool clutch.
18. Startup the hydraulic system.

NOTE

DO NOT *birds nest the cable onto the drum. Recommend applying tension to the hook end of the cable to assist in keeping the cable tight against the drum.*

19. Using the winch control lever, winch IN the cable to the transport position.
    - Verify free spool clutch engages.
    - Monitor drum for binding and smooth rotation.
    - Verify cable is properly wrapping tight onto the winch drum.
20. Change winch gearbox oil, ***See Lubrication Specifications on Page 5-8.***

Retrieval System Accessories

IMPORTANT

Due to the wide variations of retrieval system accessory options available, this manual only covers the most common maintenance procedures.

Daily inspections should include the following:

Chain Assemblies:

1. Inspect chain assembly chains, connector links, container connection plates, and hooks for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect chain assembly links move freely.

Container Pusher:

1. Inspect container pusher bar, chain, and shortener link for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect chain assembly links move freely.
3. Verify shortener link properly attaches to the chain drive chain. ***See Repair Parts on Page 5-3.***

Container Side Guides:

1. Inspect container side guides for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect container side guide retaining pins and mounting hardware for loose, damaged, or missing parts.

Container Stop, Front, Adjustable:

1. Inspect adjustable container stop assembly, extension assembly, and mounting bracket for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect adjustable container stop snap lock pins and mounting hardware for loose, damaged, or missing parts.

Container Stop, Front, Bolt On:

1. Inspect front container stop and mounting plate for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect front container stop mounting hardware for loose, damaged, or missing parts.
3. Inspect all container stop notches in the deck for bends, breaks, burs, cuts, cracks, dents, signs of brittleness/fatigue/stretch/wear, or visual defects. ***See Structural Defects on Page 5-4.***

Container Stop, Front, Slide In:

1. Inspect front container stop and T-handle lock pin for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect all container stop notches in the deck for bends, breaks, burs, cuts, cracks, dents, signs of brittleness/fatigue/stretch/wear, or visual defects. ***See Structural Defects on Page 5-4.***
3. Verify the container stop properly slides into the stop notches and the T-handle lock pin secures them in place.

Container Stop, Rear, Slide In:

1. Inspect rear container stop and T-handle lock pin for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect all container stop notches in the deck for bends, breaks, burs, cuts, cracks, dents, signs of brittleness/fatigue/stretch/wear, or visual defects. ***See Structural Defects on Page 5-4.***
3. Verify the container stop properly slides into the stop notches and the T-handle lock pin secures them in place.

Container Stop & Hold Block, Stop/Hold Pins:

1. Inspect stop & hold pins for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***

2. Inspect stop & hold pins pin retaining pins and mounting hardware for loose, damaged, or missing parts.
3. Inspect stop & hold blocks for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Structural Defects on Page 5-4.***

Container Stop & Hold Down, Shoe Lock:

1. Inspect shoe lock assembly for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect shoe pivot pin and mounting hardware for loose, damaged, or missing parts.
3. Verify shoe pivots freely on lock assembly.
4. Inspect lock pins for bends, breaks, burrs, cuts, cracks, dents, kinks, signs of brittleness/fatigue/stretch/wear, or visual defects. ***See Repair Parts on Page 5-3.***
5. Inspect lock pin spring pins for loose, damaged, or missing parts.
6. Verify lock pins function properly in lock assembly.
7. Inspect approach plate shoe lock receiver for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects.

Hook Assembly, Chain Connect:

1. Inspect hook, chain, and shortener link for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect chain assembly links move freely.
3. Verify shortener link properly attaches to the chain drive chain. ***See Repair Parts on Page 5-3.***

Tie Down, Chain & Binders:

1. Inspect binders for damage, functionality, hook stretch, wear, missing parts, or visual defects.
2. Inspect tie down chains for damage, functionality, chain/hook stretch, wear, missing parts, or visual defects.
3. Verify the tie-down chains are the correct size, fit properly and remain secure in the keyhole tie-downs.

Tie Down, Strap Ratchet:

1. Inspect strap ratchet for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect strap ratchet and lock lever for damage, functionality, wear, missing parts, or visual defects.
3. Inspect strap ratchet mounting hardware for loose, damaged, or missing parts. ***See Repair Parts on Page 5-3.***

Tie Down, J-Hook/Strap Pocket:

1. Inspect J-hook/strap pocket for bends, breaks, burrs, cuts, cracked welds, dents, kinks, signs of brittleness/fatigue/stretch/wear, missing parts, or visual defects. ***See Repair Parts on Page 5-3.***
2. Inspect strap ratchet mounting hardware for loose, damaged, or missing parts.

Chain Drive - Chain

Remove - Chain

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference. ***Refer to Manufacturer Index listed on Page 7-1.***

1. Ensure the trailer deck has been unloaded and in the transport position.
2. Park on level surface, set parking brakes and chock the wheels.
3. Zero out hydraulic pressure in the chain drive gearbox hydraulic motor hoses by operating the control handle.
4. Loosen four gearbox mount screws and two threaded motor clamps, ***See Figure 5-28.***
   - Loosen enough to allow motor clamps to slide in adjusting slots.

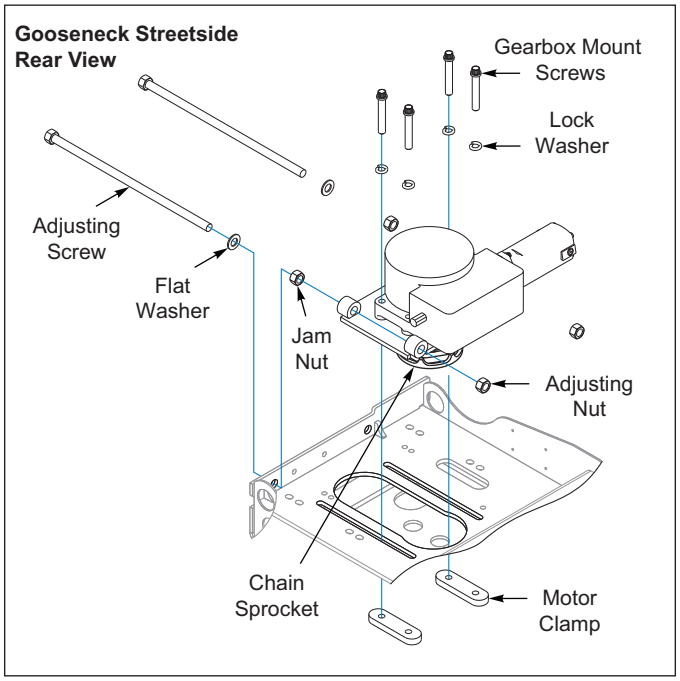


Figure 5-28: Chain Drive Components

IMPORTANT

To reduce strain on the adjusting screws and chain drive anchor, loosen the adjusting nuts evenly until chain tension is released.

5. Fully loosen two adjusting nuts to the end of the adjusting screws. **DO NOT** remove! ***See Figure 5-29.***
6. Slide the chain drive anchor fully backward to allow slack in the chain, ***See Figure 5-29.***

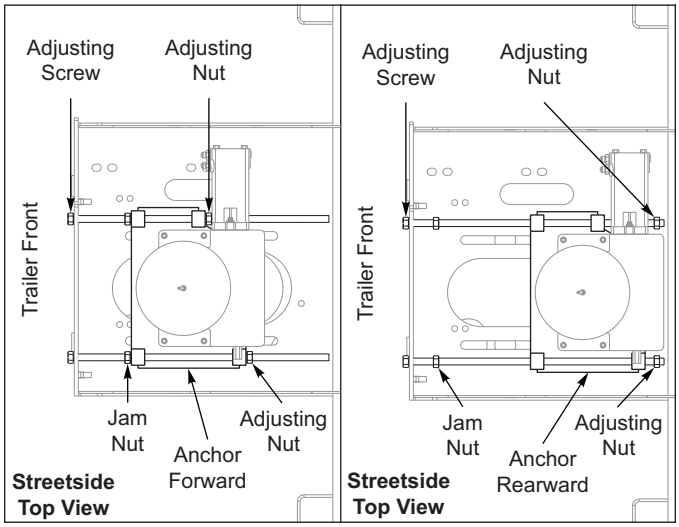


Figure 5-29: Chain Drive Anchor

7. Remove the chain from the gearbox chain sprocket, ***See Figure 5-28.***
8. Cut a link from the chain near the idler pulley assembly, ***See Figure 5-30.***
9. Route the chain out of the idler pulley assembly, ***See Figure 5-30.***

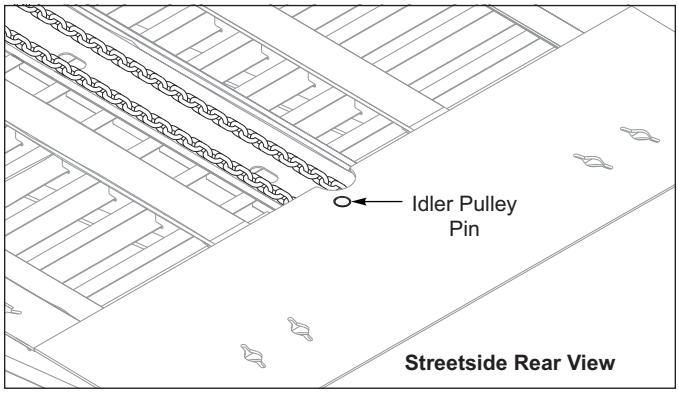


Figure 5-30: Idler Pulley Pin

Install - Chain

IMPORTANT

It is highly recommended to contact an authorized Landoll Service Center for servicing and repair.

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference. ***Refer to Manufacturer Index listed on Page 7-1.***

WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **ONLY use drive chains and chain spices sourced from Landoll for proper strength and fitment on drive sprocket and idler pulley.**
- **Recommend replacing the chain and sprocket together.**
- **DO NOT install the chain twisted.**
- **ALWAYS install the chain with the link welds facing up and out.**

1. Install the chain onto the gearbox chain sprocket, with horizontal welded links facing out and the vertical welded links facing up, ***See Figure 5-31.***
   - Leave excess chain exposed to allow for chain assembly.
2. Align the drive chain from the gearbox chain sprocket to the idler pulley assembly, with horizontal welded links facing out and the vertical welded links facing up, ***See Figure 5-30.***
3. Route the drive chain through the support idler pulley assembly and back towards the gearbox chain sprocket, ***See Figure 5-30.***
   - VERIFY that the horizontal welded links are facing out and the vertical welded links facing up,
4. Align the drive chain from the idler pulley assembly back to the gearbox chain sprocket, with horizontal welded links facing out and the vertical welded links facing up,
5. Cut a 1/2 inch opening through the welded link side of one of the ends to allow the non-cut end to fit into, ***See Figure 5-32.***
6. Assemble the two ends together. **DO NOT** weld splice at this time, ***See Figure 5-32.***
   - **VERIFY** the horizontal welded links are facing out and the vertical welded links are facing up with no twisting before continuing.

IMPORTANT

Use caution not to distort the original dimensions of the link.

7. Insert the chain splice into the center of the cut link.
   - Use 100K welding wire or 100K missile rod minimum.

- Weld the top and bottom of each side and fill in the opening.

8. Clean up the welded surfaces and paint to prevent rust.
   - Clean up all unintentional weld debris.
   - VERIFY the links move freely and the dimensions have not changed.
9. Slide the chain drive anchor forward to remove slack in the chain, ***See Figure 5-29.***
10. Slightly tighten the two adjusting nuts to hold the chain drive anchor, ***See Figure 5-29.***
11. ***See Adjust - Chain Tension on Page 5-49.***

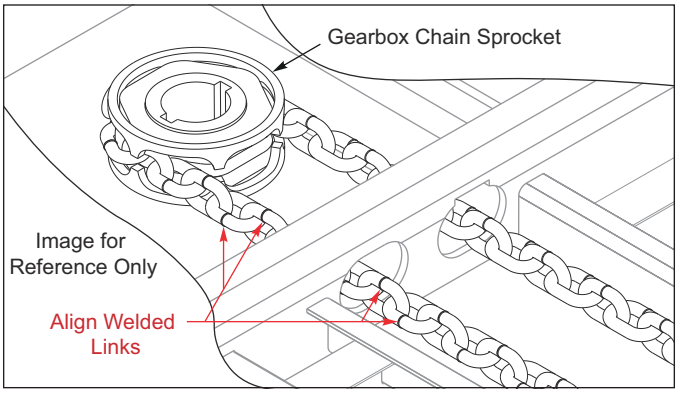


Figure 5-31: Gearbox Chain Sprocket

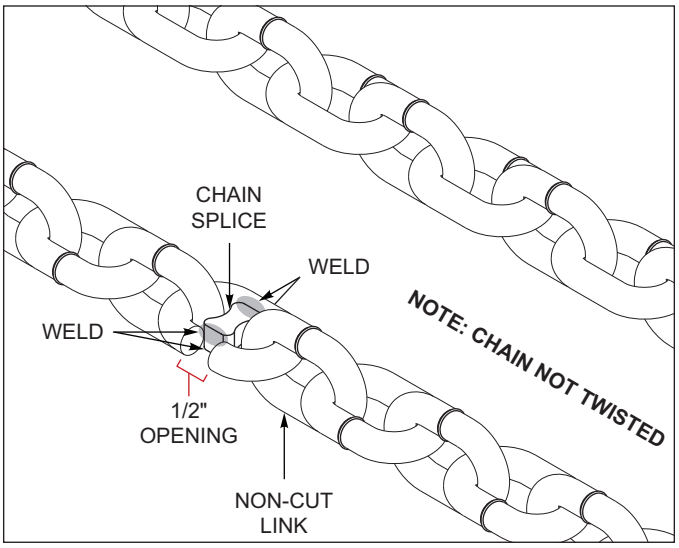


Figure 5-32: Chain Spicing

Adjust - Chain Tension

⚠ WARNING

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT install the chain twisted.**
- **ALWAYS install the chain with the link welds facing up and out.**
- **DO NOT over torque the adjusting nuts. This will cause excess strain and damage the gearbox assembly.**

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

1. Ensure the trailer deck has been unloaded and in the transport position.
2. Park on level surface, set parking brakes and chock the wheels.
3. Zero out hydraulic pressure in the chain drive gearbox hydraulic motor hoses by operating the control handle.

NOTE

If chain is being replaced, go to step 6.

If chain is just being adjusted, continue.

4. Loosen four gearbox mount screws and two threaded motor clamps, ***See Figure 5-28.***
   - Loosen enough to allow motor clamps to slide in adjusting slots.
5. Slightly loosen two chain drive anchor adjusting nuts to release any tension on the chain, ***See Figure 5-29.***
6. Verify the chain is seated properly in the gearbox chain sprocket, with horizontal welded links facing out and the vertical welded links facing up, ***See Figure 5-31.***
7. Tighten and torque the two adjusting nuts evenly to 90 Ft.-Lbs (122 Nm), ***See Figure 5-29.***
   - If unable to achieve 90 Ft.-Lbs, or the chain drive anchor is at max travel, contact the Landoll Trailer Service Department.
8. Tighten four gearbox mount screws and two threaded motor clamps, torque to 280 Ft.-Lbs (379 Nm). ***See Figure 5-28.***

DANGER

Proceed with extreme caution. Failure to heed notice may cause injury or death to the person and/or damage to product and property.

- **To prevent severe injury or death from pinching: Keep all persons and objects clear while any part of the machine is in motion.**

9. Operate the chain drive system.
10. Zero out hydraulic pressure in the chain drive gearbox hydraulic motor hoses by operating the control handle.
11. Verify the chain is seated properly in the gearbox chain sprocket and idler pulley, with the horizontal welded links facing out and the vertical welded links facing up, ***See Figure 5-31.***
12. Inspect the chain tension. Repeat steps 4 through 11 until chain tightness is achieved.

Check Fluid Level - Chain Drive Gearbox

1. Ensure the trailer deck has been unloaded and in the transport position.
2. Park on level surface, set parking brakes and chock the wheels.
3. Zero out hydraulic pressure in the chain drive gearbox hydraulic motor hoses by operating the control handle.
4. Remove fill plug, ***See Figure 5-33.***
5. Oil should seep out the fill hole.
   - Add fluid if lower than 1/2 inch below the fill hole.
   - Fill as needed.
6. Inspect the fill plug for contamination, moisture, and metal shavings.
7. Wipe off fill plug with a rag.
8. Install the fill plug and tighten.
9. Wipe off any oil around the fill plug and gearbox surfaces.

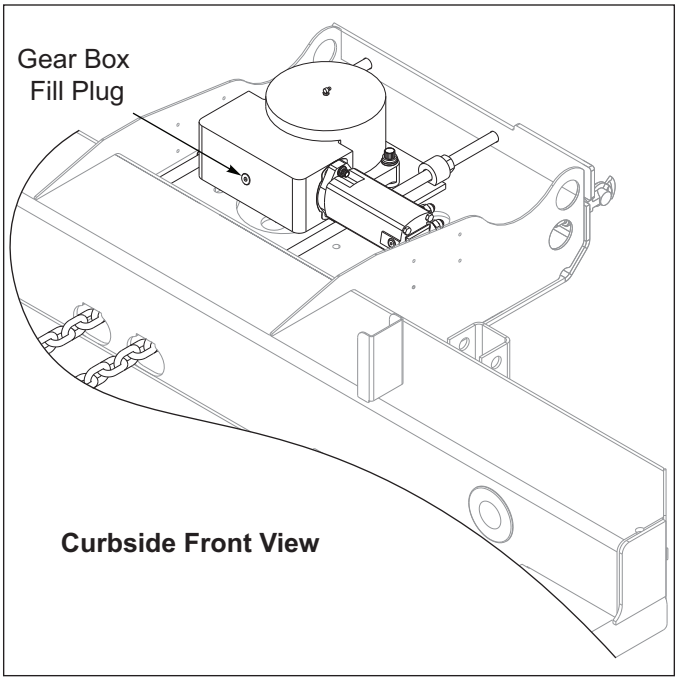


Figure 5-33: Gearbox Fill Plug

Suspension Maintenance

NOTE

For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll ***Parts Manual on Page 7-1.***

Contact an authorized Landoll Dealer for parts or assistance with the Manufacturer Reference, ***Refer to Manufacturer Index listed on Page 7-1.***

Alignment, Air Ride, Trailer Axles

The air ride suspension is aligned at the factory and should not need realignment, until suspension maintenance requires.

- If alignment is need, ***See Alignment, Suspension on Page 5-55.***

Maintenance Schedule - Suspension

Suspension Control System

First 5 hours or 50 miles (80 Km) inspections should include the following:

1. Monitor the entire suspension system for abnormal or erratic movement or noises.
   - Including dog tracking.
2. Inspect the suspension trailing beams for bends, breaks, cracked welds, damage, dents, or wear.
   - RLU-228 Suspensions, ***See Figure 5-34.***
   - LSS-25K-3.5 RLU CC Suspension, ***See Figure 5-35.***
   - LSS-25K-5.5 RLU CC Suspension, ***See Figure 5-36.***
3. Inspect the suspension trailing beam and axle contact points for cracked welds, damage, or missing parts.
4. Inspect the suspension trailing beam mounting hardware for damage, defects, or missing parts.
5. Inspect the shocks for bends, breaks, bulges, cracks, dents, or wear.
6. Inspect the shock mounts for bends, breaks, cracked welds, damage, dents, or wear.
7. Inspect the shock mounting hardware for damage, defects, or missing parts.
8. Inspect the optional shock straps, if available, for bends, breaks, cuts, damage, frays, kinks, or wear.
9. Retorque all suspension trailing beam and shock mounting hardware. ***See Suspension Assembly - Air Ride on Page 2-4.***
   - Recommend applying torque stripes or witness marks to the mounting hardware after retorquing.

Monthly or 2,000 miles (3219 Km) inspections should include the following:

1. Inspect the suspension trailing beams for bends, breaks, cracked welds, damage, dents, or wear.
   - RLU-228 Suspensions, ***See Figure 5-34.***
   - LSS-25K-3.5 RLU CC Suspension, ***See Figure 5-35.***
   - LSS-25K-5.5 RLU CC Suspension, ***See Figure 5-36.***
2. Inspect the suspension trailing beam and axle contact points for cracked welds, damage, or missing parts.
3. Inspect the suspension trailing beam mounting hardware for damage, defects, or missing parts.
4. Verify trailing beam mounting hardware torque stripes / witness marks are aligned, if available.
5. Inspect the shocks for bends, breaks, bulges, cracks, dents, or wear.
6. Inspect the shock mounts bends, breaks, cracked welds, damage, dents, or wear.
7. Inspect the shock mounting hardware for damage, defects, or missing parts.
8. Inspect the optional shock straps, if available, for bends, breaks, cuts, damage, frays, kinks, or wear.
9. Verify shock and optional shock strap mounting hardware torque stripes / witness marks are aligned, if available.

6 Months or 12,000 miles (19.315 Km) inspections should include the following:

1. Conduct a First 5 Hour or 50 mile (80 Km) inspection.

12 Months or 25,000 miles (40,234 Km) inspections should include the following:

1. Conduct a First 5 Hour or 50 mile (80 Km) inspection.

Trailing Beams & Shocks

Daily inspections should include the following:

1. Monitor the entire suspension system for abnormal or erratic movement or noises.
   - Including dog tracking.
2. Inspect trailing beams for damage, defects, or wear.
3. Inspect trailing beam mounting hardware for damage or missing parts.
4. Verify trailing beam mounting hardware torque stripes / witness marks are aligned, if available.
5. Inspect shock and optional shock strap for damage, defects, or wear.
6. Inspect shock and optional shock strap mounting hardware for damage or missing parts.
7. Verify shock and optional shock strap mounting hardware torque stripes / witness marks are aligned, if available.

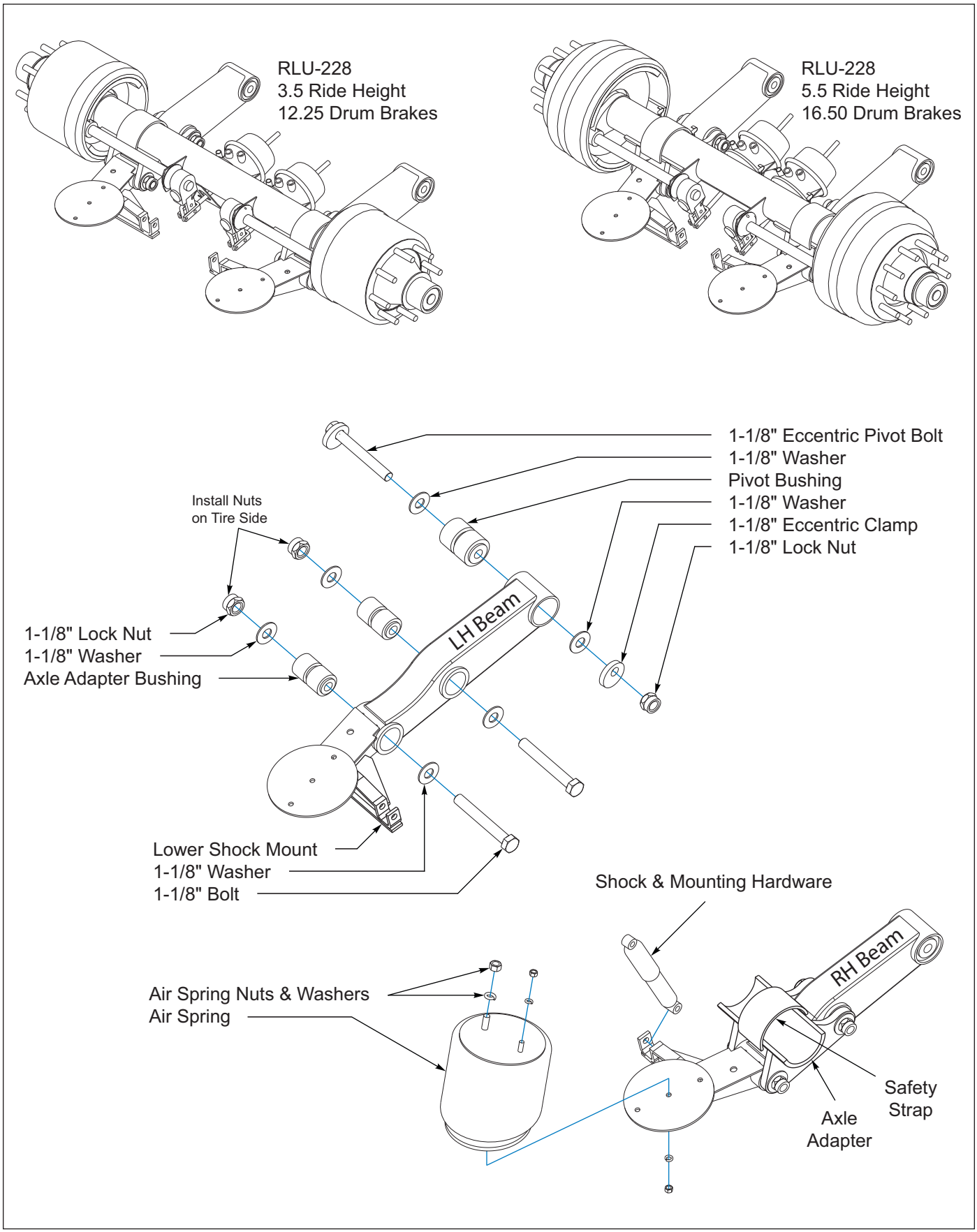
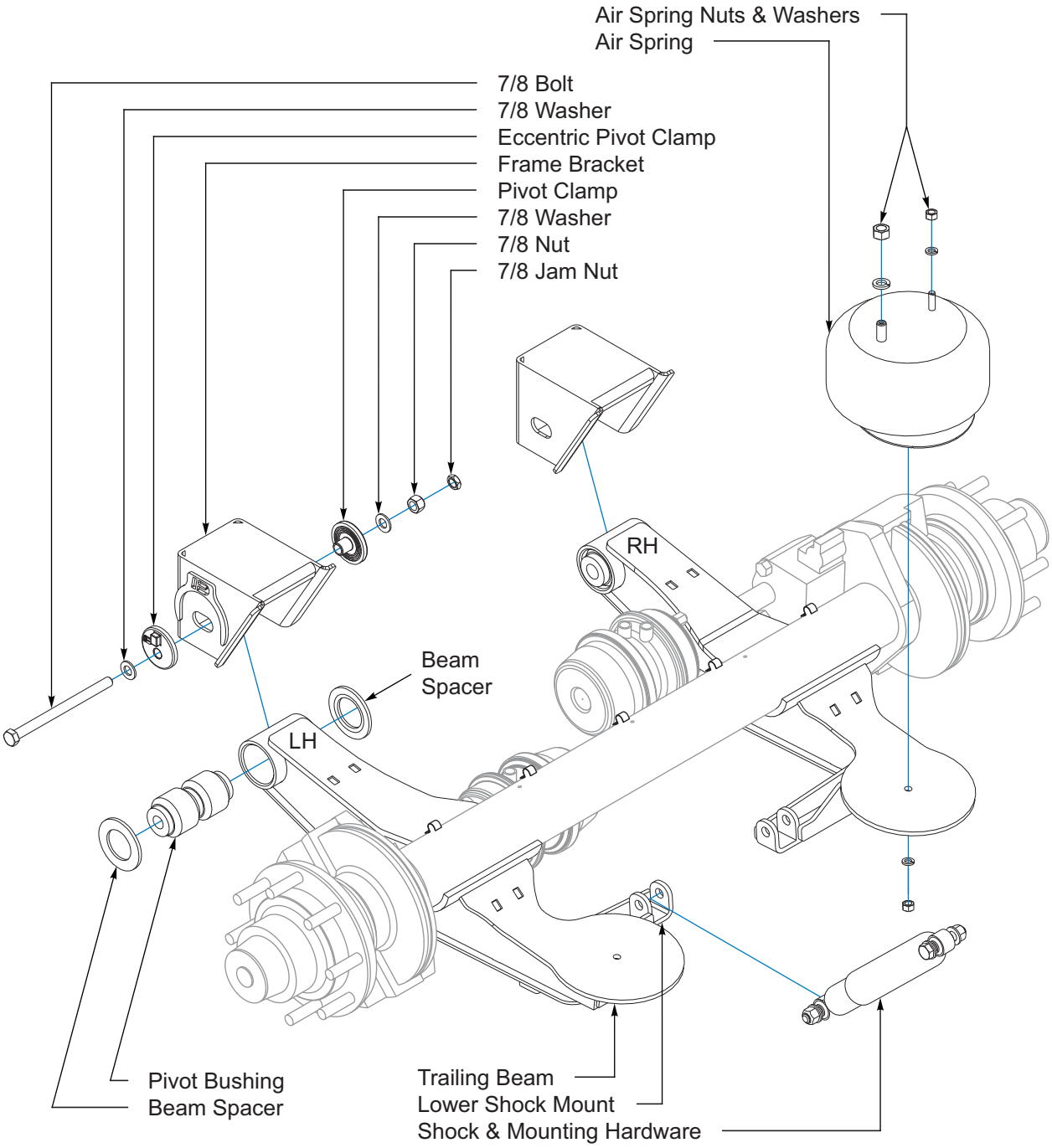


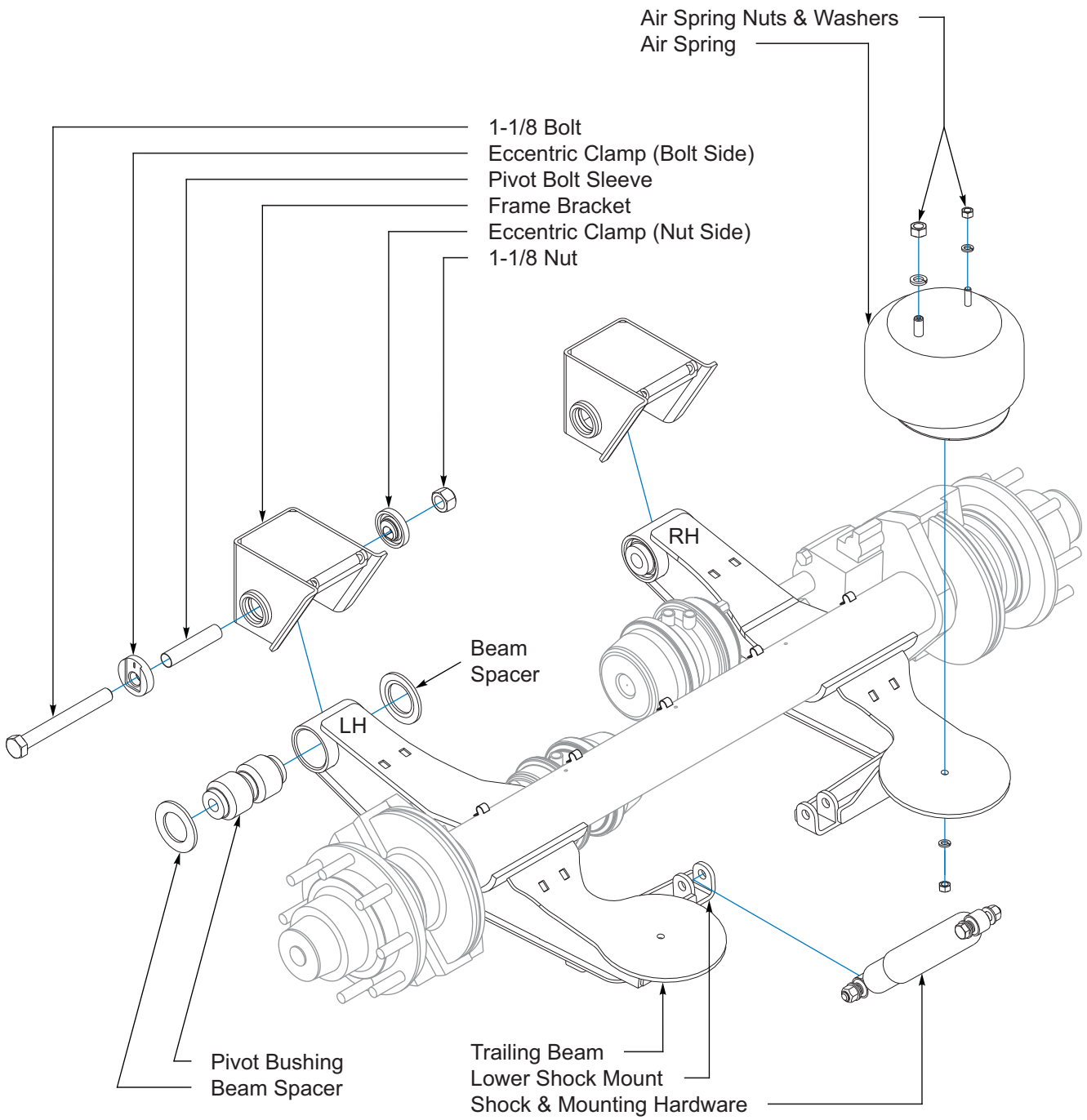
Figure 5-34: RLU-228 Suspension Components



(Optional) Disc Brake Assembly Shown.

LSS-25K-3.5 RLU Assembly Image for Reference Only

Figure 5-35: LSS-25K-3.5 RLU CC Suspension Components



(Optional Disc Brake Assembly Shown.

LSS-25K-3.5 RLU CC Assembly Image for Reference Only

Figure 5-36: LSS-25K-5.5 RLU CC Suspension Components

Alignment, Suspension

IMPORTANT

Proper axle-to-kingpin alignment is necessary to obtain straight tracking. If axle alignment is off, "dog tracking" occurs. "Dog tracking" means the rear of the vehicle will angle, appearing to travel sideways, with its rear end off to one side.

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.

Alignment, Air Ride, 1st Axle

IMPORTANT

It is highly recommended to contact an authorized Landoll Service Center for servicing and repair.

The air ride suspension is aligned at the factory and should not need realignment, until suspension maintenance requires.

1. Position trailer on a firm and level surface. Eliminate any suspension binding or restrictions due to sharp turns or unusual maneuvers. Make sure that the undercarriage is in the rear most transport position.
2. Uncouple the tractor from the trailer. If needed, jack up the front of the trailer to allow measurement under the trailer.
3. Inspect the suspension for serviceability. Replace parts as required before aligning.
4. Suspend a plumb bob from the center of the kingpin and set at axle center height.
5. Measure **Curbside (D)** from the plumb bob to the 1st axle center. Measure **Streetside (D1)** from the plumb bob to the 1st axle center. **Curbside (D)** should be about 1/8 in (3.18 mm) shorter than **Streetside (D1)**. ***See Figure 5-38.***
6. **Align if measurement requires:**
   a. **1-1/8 in Pivot Bolts:** Loosen pivot bolt lock nuts and rotate eccentric pivot bolts clockwise or counterclockwise to adjust. Repeat Steps 5 through 6 until measurement is achieved. ***See Figure 5-37.***
   - **SAF-Holland Only:** Break weld holding the inner nuts to the eccentric alignment blocks.

   b. **7/8 in Pivot Bolts:** Break welds, if present, between hanger mounts/eccentric collars and pivot lock nuts/jam nuts. Loosen jam nuts if installed. Loosen lock nuts. Rotate eccentric pivot bolts clockwise or counterclockwise to adjust. Repeat Steps 5 through 6 until measurement is achieved. ***See Figure 5-37.***
7. Tighten and torque suspension pivot bolts and lock nuts. ***See Suspension Assembly - Air Ride on Page 2-4.***
8. **7/8 in Pivot Bolts ONLY:** Install new jam nuts if damaged or not present. Tighten and torque jam nuts to 150 Ft.-Lbs (205Nm). ***See Suspension Assembly - Air Ride on Page 2-4.***

IMPORTANT

DO NOT tack weld Dexter suspension pivoting hardware.

9. **SAF-Holland Only:** Tack weld the inner nuts to the eccentric alignment blocks.

Alignment, Air Ride, 2nd / 3rd Axle

IMPORTANT

It is highly recommended to contact an authorized Landoll Service Center for servicing and repair.

The air ride suspension is aligned at the factory and should not need realignment, until suspension maintenance requires.

1. Align the 1st axle using the method outlined in ***See Alignment, Air Ride, 1st Axle.***
2. Measure from 1st axle center to the trailer 2nd axle center on the curbside then the streetside. Measurements should be the same. Use **(Y)** and **(Y1)** as reference. ***See Figure 5-38.***
3. **Align if measurement require:**
   a. **1-1/8 in Pivot Bolts:** Loosen pivot bolt lock nuts and rotate eccentric pivot bolts clockwise or counterclockwise to adjust. Repeat Steps 2 through 3 until measurement is achieved. ***See Figure 5-37.***
   - **SAF-Holland Only:** Break weld holding the inner nuts to the eccentric alignment blocks.

   b. **7/8 in Pivot Bolts:** Break welds, if present, between hanger mounts/eccentric collars and pivot lock nuts/jam nuts. Loosen jam nuts if installed. Loosen lock nuts. Rotate eccentric pivot bolts clockwise or counterclockwise to adjust. Repeat Steps 2 through 3 until measurement is achieved. ***See Figure 5-37.***
4. Tighten and torque suspension pivot bolts and lock nuts. ***See Suspension Assembly - Air Ride on Page 2-4.***
5. **7/8 in Pivot Bolts ONLY:** Install new jam nuts if damaged or not present. Tighten and torque jam nuts to 150 Ft.-Lbs (205Nm). ***See Suspension Assembly - Air Ride on Page 2-4.***

IMPORTANT

DO NOT tack weld Dexter suspension pivoting hardware.

6. **SAF-Holland Only:** Tack weld the inner nuts to the eccentric alignment blocks.
7. If additional trailer axles are available, use the same procedures performed on the previous axle aligned and repeat steps 2 through 6.

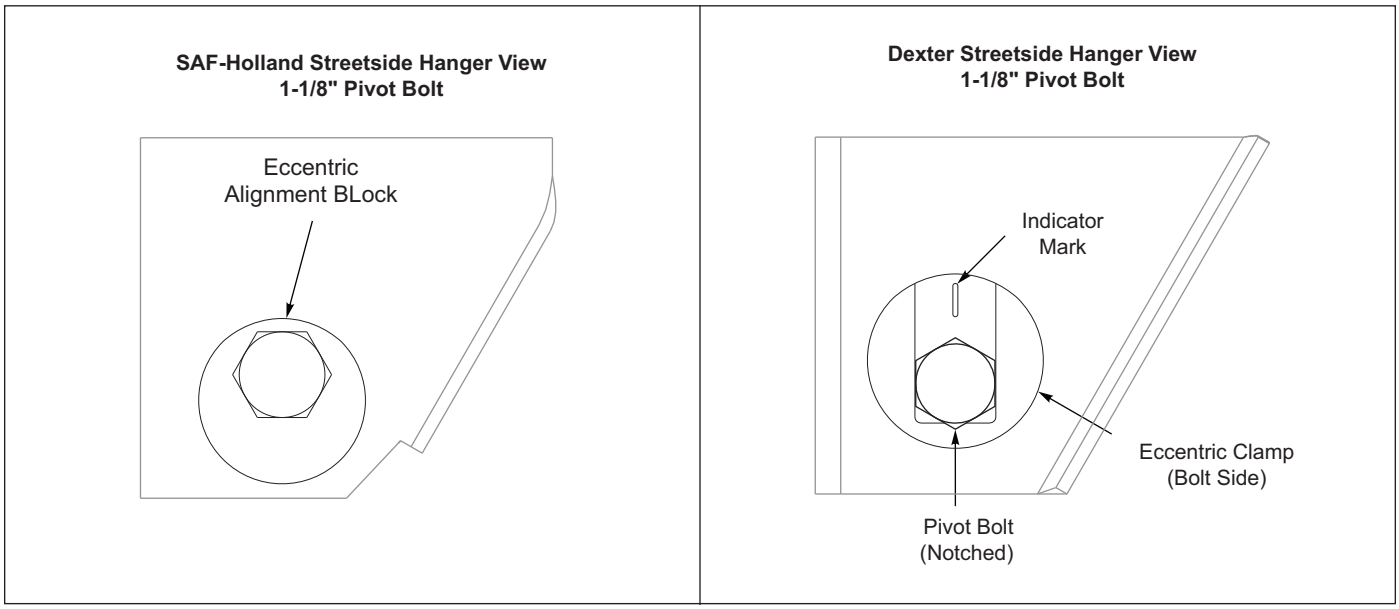


Figure 5-37: Streetside Suspension Hanger

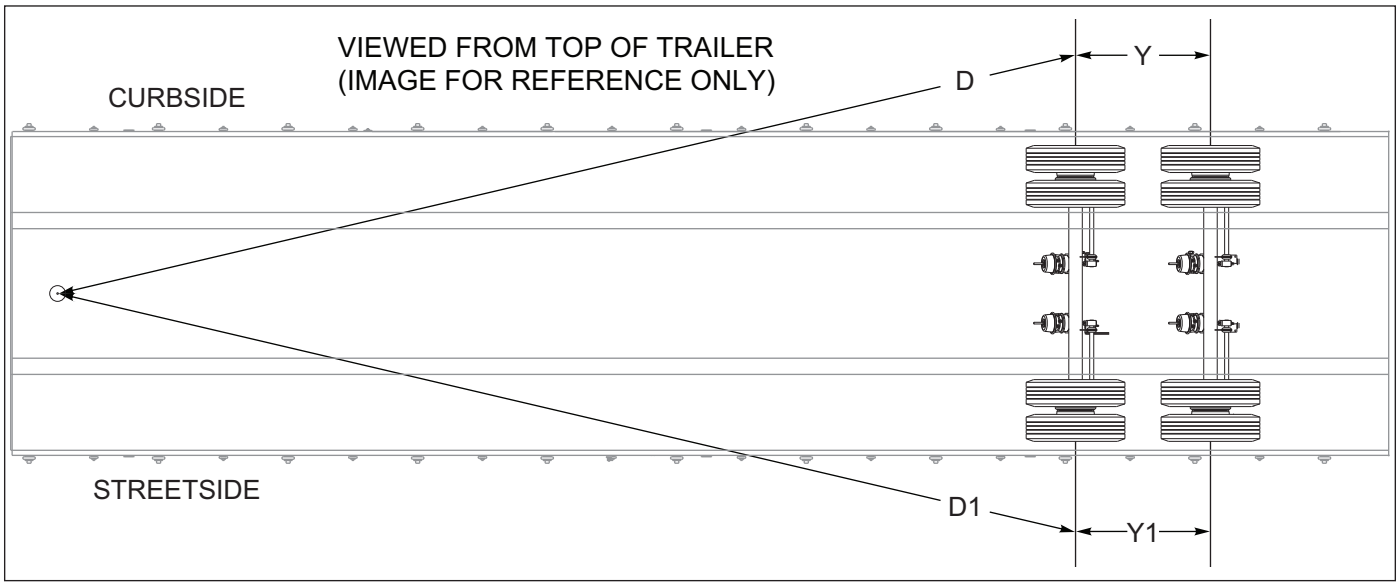


Figure 5-38: Checking Suspension Alignment

Ride Height Adjustment

⚠ CAUTION

Proceed with caution. Failure to heed warning may cause injury to person and/or damage product and property.

- **DO NOT ADJUST BY LOOSENING THE 1/4 in ADJUSTING LOCK NUT AND BOLT, *See Figure 5-39.***
- **This procedure may cause damage to the valve and require replacement.**
- **Failure to follow proper installation and adjustment procedures can result in broken shock absorbers, burst air bags and/or over-height problems.**
- **Contact Landoll Service Department for detailed instructions on suspension ride height adjustment.**

NOTICE

- **This manual DOES NOT cover the suspension ride height installation or adjustment procedures, due to the setup steps variation of the different trailers frames.**
- **For proper ride height installation and adjustment, simply record the equipment number from the identification plate and contact the Landoll Trailer Service Department.**
- **Please visit https://landoll.com/contact-us/service-contacts/landoll-trailer-service/ or call 1-800-446-5175 for assistance.**

NOTE

*For additional mechanical, air, electrical, and hydraulic components / diagrams, see the listed Landoll **Parts Manual on Page 7-1.***

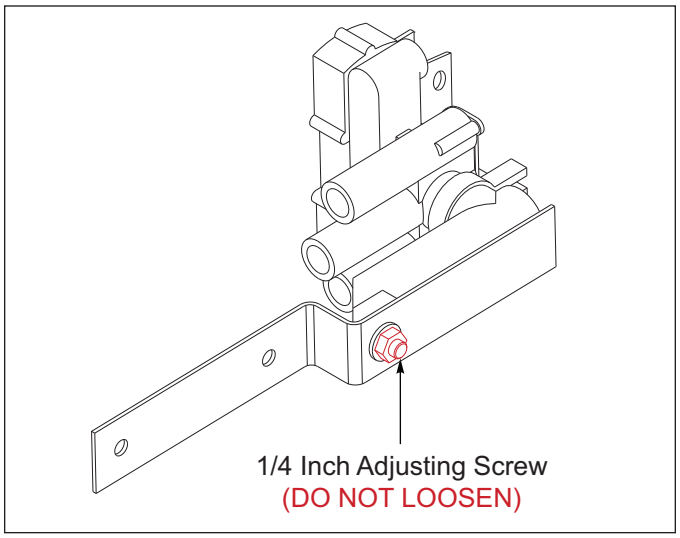


Figure 5-39: Height Control Valve

Chapter 6

Troubleshooting Guide

General

This chapter provides information for identifying and correcting problems that may develop while operating or maintaining the trailer.

1. The Troubleshooting Guide Index lists common problems that may occur and refers you to the proper troubleshooting guide.
2. If you are unsure of an item mentioned, or are needing a diagram for air, electrical or hydraulics, ***See Chapter 7 - Landoll Company, LLC. parts manual on Page 7-1.***
3. Before performing any troubleshooting procedure, read and understand, ***Understanding Safety Statements on Page 1-2***. Also read and understand Chapter 3, ***Overview on Page 3-1***.
4. This guide cannot list all problems that may occur or all tests, inspections, solutions. If the appropriate problem is not listed, notify your service department.
5. When troubleshooting a problem:
   a. Locate the problem or problems that best describe the fault in the Troubleshooting Guide Index, listed by system.
   b. The Troubleshooting Guide is organized using the following headings:
   - Problem
   - Probable Cause
   - Solution

Explanation of the Headings

1. **PROBLEM** - A visual or operational indication that something is wrong with the equipment.
2. **PROBABLE CAUSE** - Equipment defect that may cause the problem.
3. **SOLUTION** - A procedure to possibly correct the problem.

Troubleshooting Guide Index

1. ***Brakes Problems - Drum on Page 6-2***
2. ***Electrical Light Problems on Page 6-5***
3. ***Hydraulic System Problems on Page 6-6***
4. ***Suspension Problems on Page 6-8***
5. ***Tire and Wheel Problems on Page 6-9***

Brakes Problems - Drum

IMPORTANT

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

BRAKE PROBLEM	PROBABLE CAUSE	SOLUTION
No Brakes / Intermittent Brakes	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 / Locking Up	Broken internal brake component.	Locate and replace broken part, ***See Figure 5-16 on Page 5-26***.
	Flat spot on cam follower or cam shaft.	Replace and lubricate.
	Improper adjustment.	Adjust slack adjusters, ***See Adjust - Automatic Slack Adjuster on Page 5-30.***.
	Spider bushing or cam bracket bushing binding.	Lubricate or replace bushing.
	Improper lubrication.	Lubricate per, ***Centralized Undercarriage on Page 5-6***.
	Worn brake shoe bushing.	Replace bushing.
	Brake drum distortion.	Replace drum.
	Broken brake chamber spring.	Replace brake chamber.
	Brake chamber push rod 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.	Replace brake shoes / pads.
	Grease on linings.	Replace brake shoes / pads.
	Broken slack adjuster.	Replace slack adjuster, ***See Remove - Automatic Slack Adjuster on Page 5-29.***.
	Leaking brake chamber diaphragm.	Replace brake chamber.
Brakes Apply Too Slowly	Brakes need adjusting or lubrication.	Adjust or lubricate as needed.
	Air pressure below 105 psi (724 kPa).	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 (724 kPa) min.

BRAKE 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.
	Restricted tubing or line.	Locate restriction and remove.
	Defective tractor protection valve.	Troubleshoot tractor air system.
	Park Brake locked.	Troubleshoot air system.
	Moisture in air system.	Check air system.
	Tractor pressure too low.	Adjust to provide 105 psi (724 kPa) min.
Brakes Weak	Brakes need adjusting.	Adjust brakes, ***See Adjust - Automatic Slack Adjuster on Page 5-30.***.
	Brakes need lubricating.	Lubricate brakes.
	Brakes need relining.	Replace brake shoes / pads.
	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.	Replace brake shoes / pads.
	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 brake chamber.
	Call Factory or see qualified Trailer / Brake Technician.	
	Leaking tubing or hose.	Replace defective part.
Excessive Leakage with Emergency System Applied ONLY	Defective relay emergency valve.	Repair or replace valve.
Excessive Water Present in Brake System	Reservoir not drained often enough.	Drain reservoir daily.
Excessive Fluid Present in Brake System	Compressor on tractor passing excessive oil.	Repair compressor.
Brakes Will Not Apply Properly	Flat spot on cam follower 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 (621 kPa) 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	ABS system failure.	Troubleshoot ABS System, ***Refer to Chapter 7 - Wabco on Page 7-1.***

BRAKE PROBLEM	PROBABLE CAUSE	SOLUTION
Excessive Loss of Brakes / Fading Brakes	Overheated brake drums.	Check for defective or improperly adjusted 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 / 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 or replace drums.

Electrical Light Problems

IMPORTANT

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

ELECTRICAL PROBLEM	PROBABLE CAUSE	SOLUTION
No Lights	Tractor Fuse blown.	Replace tractor 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 trailer).
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 Burning Out	Voltage difference between semitrailer and tractor.	Match bulbs with tractor voltage.
Fuse Blown or Circuit Breaker Trip	Vibration.	Locate source of vibration and repair.
	Short circuit.	Replace tractor fuse and try all accessories. If tractor fuse blows right away, locate short and repair.
Light Burned Out	Vibration.	Locate source of vibration and repair.
	Short circuit.	Replace tractor fuse and try all accessories. If tractor 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.

Hydraulic System Problems

IMPORTANT

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

HYDRAULIC PROBLEM	PROBABLE CAUSE	SOLUTION
System Inoperative	Not enough fluid in system.	Fill, check for leaks.
	Wrong fluid in system.	Change oil, see specifications, ***See Lubrication Specifications on Page 5-8.***.
	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 Trailer Specifications on Page 2-1.***.
	Slipping or broken pump drive.	Repair or replace couplings. Check for alignment.
	Valve compensator stuck.	Clean, repair, or replace.
System Operates Erratically	Air in the system.	Check suction side of system for leaks. Repair leaks.
	Cold fluid.	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 fluid in system.	Fill and check for leaks.
System Operates Slowly	Fluid viscosity too high, or “cold fluid.”	Allow oil to warm up before operating.
	Low pump drive speed.	Increase engine speed (check pump owners manual for specifications).
	Low fluid 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.
	Fluid leaks.	Tighten fittings. Replace seals, gaskets and damaged lines.
System Operates Fast	Engine running too fast.	Reduce engine speed.

HYDRAULIC PROBLEM	PROBABLE CAUSE	SOLUTION
Hydraulic Fluid Over Heating	Fluid passing through relief valve for excessive time.	Return control valve to neutral when not in use.
	Incorrect, low, dirty fluid.	Use recommended fluid, ***See Lubrication Specifications on Page 5-8.***. Fill reservoir with clean fluid. 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.
Hydraulic Fluid Foaming	Incorrect, low, or dirty fluid.	Replace, clean or add fluid as needed.
	Water in fluid.	Replace fluid.
	Air leaks.	Check suction line and component seals for suction leaks. Replace defective parts.
Pump Noisy	Low, incorrect, foamy fluid.	Replace, clean, or add fluid as needed.
	Suction line plugged.	Clean out obstruction or replace line. Flush system, replace filter.
	Pump damaged.	Repair or place.
Pump Leaking	Damaged or worn shaft seal.	Replace seal and/or shaft and check for misalignment.
	Loose or broken parts.	Tighten or replace.
Control Valves Leaks	Seals damaged or worn.	Replace.
Hydraulic Components Leaking	Seals worn or damaged.	Replace.
	Internal parts damaged.	Replace.
	Housing damaged.	Replace.
Hydraulic Components Still Move with Control Valve in NEUTRAL Position	Leaking seals, fittings, or hoses.	Replace worn or defective parts.
	Control lever not returning to center.	Check linkage for binding and repair.
	Spool valve binding or stuck.	Replace valve section.
	Solenoid is stuck.	Replace defective solenoid.
	Valve damaged.	Repair or replace.
Hydraulic Components 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.

Suspension Problems

IMPORTANT

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

SUSPENSION PROBLEM	PROBABLE CAUSE	SOLUTION
Air Ride Height Too High	Axle to control valve linkage.	Readjust linkage, ***See Ride Height Adjustment on Page 5-56.***
	Height Control Valve internal leak.	Repair or replace valve.
Air Ride Height 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 is below 65 psi (414 kPa) minimum required.	Troubleshoot air supply.
Air Ride Height 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.
Tracking to One Side	Suspension alignment.	Re-align axle, ***See Alignment, Suspension on Page 5-54.***.
Tracking to Either Side	Broken or bent springs or equalizers.	Replace defective parts.
	Axles not parallel.	Re-align axles.
Vibrations While Driving	Improper tire inflation.	Inflate to proper pressure, ***See Tire Inflation on Page 5-19.***.
		Troubleshoot Tire Inflation System (Option) if installed, ***Refer to Chapter 7 - Pressure System International on Page 7-1.***
	Tires cupped or have flat spots.	Replace tires.
	Wheels bent or loose.	Replace or tighten.
	Tires incorrectly mounted.	Remount, ***See Remove - Tire and Wheel Assemblies on Page 5-20.***.
	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).

Tire and Wheel Problems

IMPORTANT

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

TIRE & WHEEL PROBLEM	PROBABLE CAUSE	SOLUTION
Broken Studs **WARNING:** Replace broken studs before using the trailer!	Over tightening.	Use correct torque when mounting, ***See Wheel Fasteners on Page 2-4.***.
Tire Center Tread Wear	Over inflation.	Deflate to correct inflation, ***See Tire Inflation on Page 5-19.***.
		Adjust Tire Inflation System (Option) if installed, ***Refer to Chapter 7 - Pressure System International on Page 7-1.***
Tire Shoulder Tread Wear - One Shoulder	Axle damage.	Straighten or replace axle, ***See Axle Hubs, Oil (Standard) on Page 5-14.***.
	Axles not parallel.	Check axle alignment.
Tire Shoulder Tread Wear - Both Shoulders	Under inflation.	Increase inflation to correct pressure. Check axle alignment, ***See Tire Inflation on Page 5-19.***.
		Adjust Tire Inflation System (Option) if installed, ***Refer to Chapter 7 - Pressure System International on Page 7-1.***
	Overload.	Loads are above rated tire capacity. **DO NOT** load above rated tire capacity.
Tire 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 Methods on Page 5-19.***.
Tire Flat Spots	Quick stops.	Adjust braking practices.
	Grabbing brakes.	Adjust brakes properly, ***See Adjust - Automatic Slack Adjuster on Page 5-30.***.
	Worn or loose wheel bearings.	Adjust or replace as needed, ***See Adjust - Wheel Bearings on Page 5-17.***.
	Out of balance wheels and tire.	Balance wheels and tires. Check ABS system function.
Tire Uneven Wear	Suspension bushings worn.	Replace bushings.
	Worn or loose wheel bearings.	Adjust or replace as needed, ***See Adjust - Wheel Bearings on Page 5-17.***.
	Out of balance wheels and tires.	Balance wheels and tires.

TIRE & WHEEL PROBLEM	PROBABLE CAUSE	SOLUTION
Wheel Cracking **WARNING:** Replace any defective rim immediately!	Overinflated tires.	Deflate tire to proper pressure.
	High speeds.	Adjust speed according to road and load conditions.
	High speed cornering.	Adjust cornering practices.
	Over loading.	Check rim load rating.
Wheel Bending or Warping **WARNING:** Replace any defective rim immediately!	Curb-hopping or potholes.	Adjust turning practices and adjust speed accordingly with road conditions.
	Improper tightening sequence.	Follow proper tightening sequence, ***See Flange Nut Tightening Sequence on Page 5-22.***.

Chapter 7

Manufacturer References

Disclaimer

The documentation provided here has been appended to this Landoll Manual for reference **ONLY** and is subject to change without notice.

The specific contents of the information is not the responsibility of Landoll Company, LLC. or any of it's affiliates.

General

Explanation of the Headings

1. **Manufacturer** - The manufacturer that supplies the product.
2. **Component** - The manufacturer's component covered by the reference.
3. **Reference Title** - The reference title that supports the component.

The Trailer Manual Manufacturer References are available online through the Dealer Portal at **dealer.landoll.com.** For assistance with Manufacturer References, contact an Authorized Landoll Dealer, ***See Instructions for Ordering Parts on Page 1-2.***

Manufacturer Index

1. ***Braden on Page 7-1.***
2. ***Dexter on Page 7-1.***
3. ***Haldex on Page 7-1.***
4. ***Kohler on Page 7-1.***
5. ***Landoll Company, LLC. on Page 7-1.***
6. ***Pressure System International on Page 7-1.***
7. ***Ramsey on Page 7-1.***
8. ***Wabco on Page 7-1.***
9. ***Warn on Page 7-1.***

Manufacturer	Component	Reference Title (subject to change without notice)
Braden	Winch, Gearbox	**https://www.paccarw.com/publications-library/**
Dexter	Drum Brakes & Axles (PQ STYLE) (22,500-27,500 lbs) (10,206-12,474 Kg)	**Operation Maintenance Service Manual - Lit-002-00 Rev 2019.01**
Haldex	Anti-Lock Brake System	**Tandem / Tri-Axle Trailers, 4S/2M System, L60066W 02/09**
Kohler	Engine, 25Hp	**KOHLER Command Pro Owner's Manual - 24 590 49 Rev C (ECH630-ECH749, CH735-CH26, CH745, ECV630-749, CV735, CV745)**
		KOHLER Command Pro EFI Service Manual - 24 690 01 Rev Q (ECH630-ECH749, CH735, CH26, CH745)
Landoll Company, LLC.	Operators Manual	**F-1177 (343B / 344 Trailer Operators Manual)**
	Parts Manual	**F-1178 (343B / 344 Trailer Parts Manual)**
	Remote Control System (Brand)	**Wireless Hydraulic Control System Installation and Operation Manual - Rev 1.8 - 2-2-2022**
Pressure System International	Tire Inflation System (Meritor)	**Meritor Tire Inflation System Standard MTIS with the ThermALERT System - Maintenance Manual 14P Rev 10-19**
Ramsey	Winch	**https://www.ramseyw.com/contact/**
Wabco	Anti-Lock Brake System	**Enhanced Easy-Stop Trailer ABS with PLC Maintenance Manual MM0180 Ver 05-2018**
	Disc Brakes (12-1/4")	**PAN 17 Mechanical Sliding Caliper Disc Brake Assembly & Maintenance Instruction - Ver 01-07-2013**
	Disc Brakes (16-1/2")	**PAN 22 Mechanical Sliding Caliper Disc Brake Assembly & Maintenance Instruction - Ver 01-08-2013**
Warn	Winch, Gearbox	**https://www.warn.com/product-literature#guides**

MANUFACTURER REFERENCES

Table provided for general use.

NOTES:

Instructions for Ordering Parts

**** Repair parts must be ordered through an Authorized Dealer ****

DEALER INSTRUCTIONS FOR ORDERING PARTS FROM LANDOLL PARTS DISTRIBUTION CENTER

Phone #: 800-423-4320 or 785-562-5381 **Fax #: 888-527-3909**
Order online: dealer.landoll.com

IDENTIFICATION PLATE

The identification plate, which lists the model number and serial number, is located on the front of the frame.

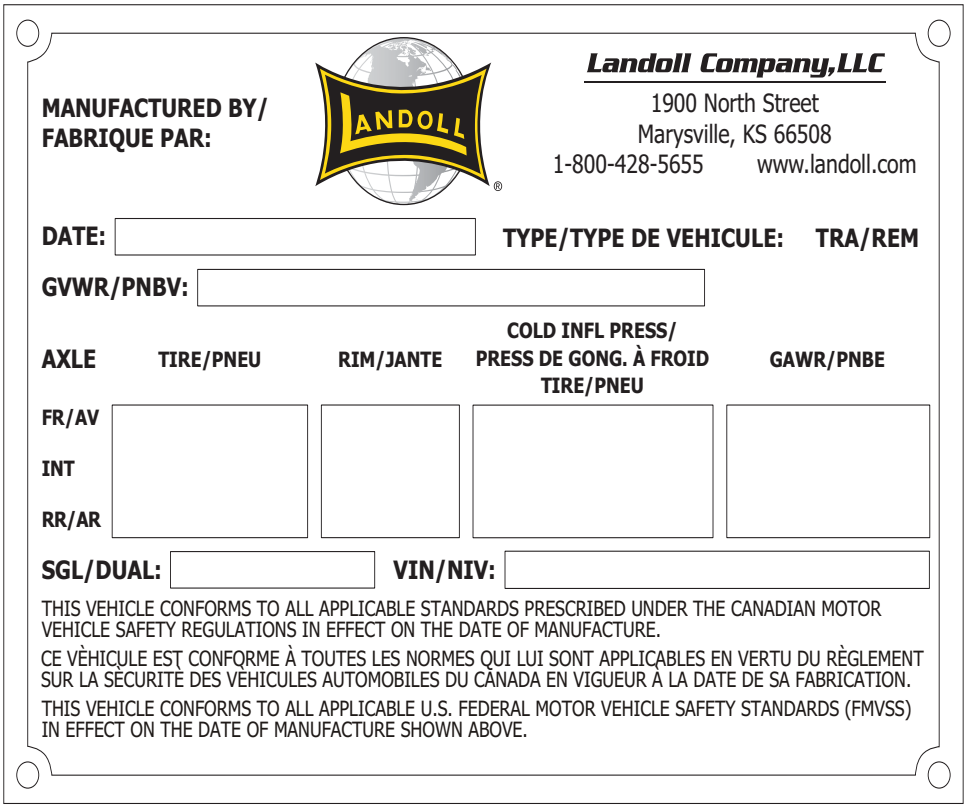
SERIAL NUMBER

The serial number is located on the identification plate.
The Following information will help decode the trailer serial number

AAABBBCDEFGHJJJJJ

AAA	= world manufacturer identifier
BBB	= model
C	= length
D	= axle type
E	= federal check digit

F	= model year
G	= plant of manufacture
H	= model version
JJJJJ	= serial number



Identification Plate and Location

Manuals for 343B/344 Semitrailers

Manual Number	Manual Type
F-1177	Operator's Manual
F-1178	Parts Manual

Document Control Revision Log:

Date	Form #	Improvement(s): Description and Comments
01/13/2025	F-1177-2501	New Release
02/13/2025	F-1177-2502	Chapter 3, Tie Down Anchor Section Updated to Show Approved / Not Approved Anchors.
07/18/2025	F-1177-2507	Updated Chapter 2 Wheel Fastener Specifications & Chapter 4 Wheel Bearing Adjustment, Wheel End Play and Torque Limits.
01/19/2026	F-1177-2601	Updated Suspension 7/8” Pivot Bolt Torque from 425-440 to 500-550 ft lbs. Added New Lubrications Specifications, Maintenance Schedule, and Engine Package Maintenance Schedule.

Equipment from Landoll Company, LLC is built to exacting standards ensured by ISO 9001:2015 registration at all Landoll manufacturing facilities.

343B / 344

Operator's Manual

Re-order Part Number F-1177

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