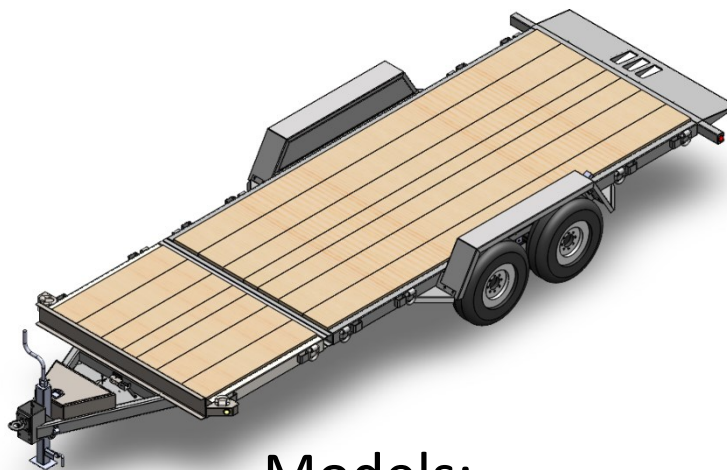




Utility Trailer Owner Manual



Models:

12TU	16TU	
12TUS (5')	16TUS (5')	18TUS (5')
12TUS (6.5')	16TUS (6.5')	

For warranty information contact Valor Trailers at (208)-810-4900

Or find us on our website:

www.valortrailers.com



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Section 1 Safe Trailer Operation

1.0 Introduction

This section describes how trailers can operate differently based on design, load configuration, gross weights, suspension, articulation, and extreme differences between loaded and unloaded weights.

Trailers have safe operating limits just as automobiles, airplanes, and other vehicles. These limits are affected by the interaction of the vehicle characteristics, maintenance, load, roadway, weather, the skill of the driver, and vehicle speed. Knowledge of how these factors affect the vehicle's operating limits and utilization of defensive driving techniques should result in safer driving.

1.1 Purpose

The purpose of this section is to describe how the vehicle characteristics, maintenance, road conditions, and weather can affect trailer control and stability limits—and how driver awareness and skill can help compensate for these factors. Awareness and knowledge of safe vehicle operating limits will ensure you can enjoy the maximum utility and productivity from your Valor Trailer.

Do not operate the trailer *until you have read and fully understand* this instruction and operating manual. It is also important that every person who operates the trailer be given the opportunity to read this manual.

1.2 Follow Vehicle and Axle Weight Ratings

Your trailer's load ratings are important to consider, prior to operating your vehicle. The following are the two key load ratings, which you must adhere to when operating your trailer:

- Gross axle weight rating (GAWR) is the rated load-carrying capacity of an individual axle and wheel assembly, which represents the load that may be steadily sustained by the components in the system. These components include tires, wheels, hubs, bearings, axles, brakes, suspension, and subframe—with the GAWR limited by the component with the *lowest* working rating.
- Gross vehicle weight rating (GVWR) is the maximum rated combined weight of a trailer and its payload or cargo (uniformly distributed) based on its structural limitations.

Note: Consideration of environmental and operational factors may require the manufacturer to reduce the nominal rating.

1.3 Understand Design and Safety Factors

Valor Trailers are designed with a *maximum* load capacity rating, which is based on **trailer use in ideal conditions**. Adherence to the load rating ensures the trailer operator can maintain an adequate level of safety for all types of *dynamic* and *static* load conditions. Under dynamic conditions the trailer encounters shifting weight, vibrations, shocks, and twists that elevate the stress levels within the major weight-bearing components of the trailer.



Valor trailers *should not be loaded past the rated capacity* and should be loaded in consideration of the load warning sticker. It is your responsibility to understand how load distribution affects your trailer's load-carrying capacity. The two types of load distribution are as follows:



- **Distributed Load:** A load is distributed evenly over the length of the trailer deck. Ideally, a trailer fully loaded to rated capacity should have its cargo evenly distributed.
- **Concentrated Load:** The cargo is localized within a shorter than normal distance on the trailer deck and therefore places greater stress in the concentrated load areas. When hauling a localized load configuration, it is not recommended to carry the maximum rated capacity of the trailer. An extremely concentrated payload might require additional support.

1.4 Vehicle Load and Handling Limits

The weight of a load, its placement and distribution over the axles, and whether or not the load is secured properly can all greatly affect your vehicle's handling limits. Tow vehicle and trailer combinations are designed to provide the driver maximum directional control and roll stability within the constraints of highway size and weight limits. Driving too fast around a curve, making too abrupt a maneuver, or leaving the roadway can cause any combination of vehicle and trailer to roll over. Locking up the wheels on an axle can also result in a jackknife or trailer swing out.

Extreme caution should be used in maneuvering a vehicle and trailer combination, or any unit that has a tall load. One of the major contributing factors to vehicle rollover is a high center of gravity on tall

loads. Positioning the load in a central, side to side location enhances directional control, roll stability, and braking. Trailers *with a shorter wheelbase* are more prone to roll during an abrupt lane change or because of quick reactions at the wheel. This rolling tendency can dramatically worsen with a tall load and a higher center of gravity.



All trailer and tow vehicle combinations are designed with a maximum load rating. Overloading the vehicle should never be permitted. Overloading results in tire blowouts, spring breakage, frame damage, diminished braking capacity, and will severely alter the vehicle's normal handling characteristics. To use these vehicles safely, the load limits on the certificate label should not be exceeded.

Adequate tongue weight (TW) is required for trailers to tow correctly. TW is the measurement of downward force that the tongue of the trailer exerts on the hitch ball of the tow vehicle. The safe range for TW is between 10-15 percent of gross trailer weight (GTW). Inadequate TW can cause a whipping action or what is known as *trailer sway*, particularly in shorter wheelbase trailers. Too much TW can overload a tow vehicle hitch resulting in reduced steering load and loss of steering control. Selecting the correct tow vehicle is crucial for the application. It is crucial to select a truck with the correct tow capacity rating for the trailer load being carried.

Always maintain enough braking and stopping distance. Erratic or unequal brake action from side to side on either tow vehicle or trailer can cause handling problems in braking situations. A balance between tow vehicle and trailer on brake application, release timing—and synchronized pressure—will reduce push/pull tendencies, which when excessive may result in a jackknife. The use of properly matched brake lining is also recommended to enhance safer braking.

Proper alignment of both tow vehicle and trailer wheels adds significantly to the handling characteristics of the combination and allows the driver to utilize all the design responsiveness of the vehicle to make evasive maneuvers in the safest manner.

Always be aware of your driving conditions/environment. Irregular terrain, steep grades and crowned roads, especially rural roadways, freeways, exit ramps, curves, bumps, and depressions introduce forces into a tow vehicle and trailer combination that could result in an accident if proper precautions and driving techniques are not followed.



Even a vehicle that meets all maintenance and load requirements can become hazardous when excessive speeds and irregular roadway characteristics are combined.



While on a downgrade, the force of gravity works against the driver's ability to maintain control of the vehicle, particularly if the road surface is wet or slick from snow and ice or covered with loose material. On upgrades, the problem changes to spinning out because of insufficient traction of the drive wheels, particularly on snow and ice or other slippery road conditions.

Great care must be taken to avoid excessive use of brakes on long downgrades. Overheated brakes are dangerously inefficient. It is very dangerous to brake on a downgrade using *only the trailer brakes*. If this is done, the trailer brakes heat up and fade and the tow vehicle brakes alone will not be able to stop the combination of two vehicles. Drivers should reduce speed, downshift, and use engine compression as the principal means of controlling speed on long grades; and use *both* trailer and tow vehicle brakes so brake temperatures can be held to a safe level.

Weather conditions can be a major factor in the cause of accidents. Rain, ice, snow, high winds, and poor visibility combined with excessive speed, sudden lane changes—or other factors that put lateral forces into a tow vehicle and trailer combination—may contribute significantly to an accident. Slippery roads can increase stopping distances and reduce the ability to control the vehicle. When the road is wet, the available tire/road friction to enable braking may be half that of a dry road. Icy roads can further reduce tire friction for braking many times over the tire friction available for wet roads. If hard braking or rapid acceleration occurs, there may be little or no friction available to prevent lateral tire movement and skidding results.

Control and stability may be maintained if the driver knows his or her vehicle, his or her load, and the road. The driver must compensate for the characteristics and conditions of his or her vehicle, the road conditions, and weather. Reducing speeds and increasing attentiveness may compensate for most of these conditions. The more familiar the driver is with the vehicle and the road, the less likely he or she will need to make abrupt emergency maneuvers, which will take the vehicle to its limits.

Either braking or accelerating while cornering can significantly reduce the controllability and stability of the vehicle and should be avoided. The best driving practice is to decelerate to a safe conservative speed, before entering a corner or approaching congested traffic, and then apply only moderate power until an essentially straight path has been established.






It is imperative that a safe speed always be maintained. The *safe speed* is defined as that speed at which control can always be maintained within the bounds of the vehicle. This reasonable speed will ensure vehicle control is maintained to allow an emergency change of lane maneuver, travel off an exit ramp with a tightening radius, and recovery from pavement drop-off or wet pavement.

Note: Safe speed will vary from one combination of vehicles to another and takes into consideration such factors as road conditions, weather, traffic, visibility, type of load, and experience of the driver.

1.5 Meaning of Alert Symbols and Signal Words

It is important that you understand the meaning of the following symbols that are used throughout this document. The signal words indicate the *level of risk*. Table 1 lists the various safety symbols used throughout this document.

Table 1: Alert Symbols and Signal Words

Alert Symbols and Signal Words		
Symbol	Signal Words	Definition
	<i>SAFETY ALERT!</i>	Alerts operator to potential personal injury hazards. Note: Obey all safety messages that follow this symbol to avoid possible injury or death.
	<i>DANGER!</i>	DANGER! indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	<i>WARNING!</i>	WARNING! indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	<i>CAUTION!</i>	CAUTION! indicates a potentially hazardous situation which, if not avoided, might result in minor or moderate injury.
	<i>CAUTION</i>	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, might result in property damage.



1.6 Reporting Safety Defects

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

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

To contact NHTSA, you may either call the vehicle safety hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to <http://www.safercar.gov>; or write to:

Administrator NHTSA
1200 New Jersey Avenue S.E.
Washington, DC 20590

Note: You can also obtain other information about motor vehicle safety from <http://www.safercar.gov>.

1.7 Pre-Trip Inspection

There are some items on every vehicle combination that require no special knowledge, training, or sophisticated equipment to inspect—and can be and should be inspected prior to every trip. Perform the following inspection in Table 3 prior to your departure.

Table 2: Pre-Trip Inspection

✓	Step No.	Pre-Trip Checklist
	1.	Inspect the trailer for cracks in the structure or bent components such as the tongue or frame.
	2.	Check for any missing fasteners in the suspension—as well as other areas—and look for broken, or bent springs and spring hangers, or otherwise damaged components.
	3.	Verify that the hitch on the tow vehicle is the correct size and configuration to fit the trailer coupling. The hitch must be rated to meet or exceed the GVWR of the trailer.
	4.	Check the hitch height of the trailer and compare it to the tow vehicle; it is very important that the trailer be towed in the level position when loaded. To achieve the correct hitch height, elevate the tongue of the trailer slightly (1"–2") by adjusting the trailer hitch to compensate for the settling of tow vehicle springs when loaded.
	5.	Always visually inspect the hitch for unusual appearances such as bent components, cracks in welds, or chipped paint where stress cracks may appear from heavy loads.
	6.	Check tires for proper inflation. Tire manufacturers recommend checking inflation pressure while the trailer is unloaded and tires are cool. This will provide a more accurate reading. Note: A drop of 10 PSI in tire pressure can reduce the carrying capacity of the tire as much as 20%. This reduced capacity could cause tire failure and poor tire life.
	7.	Always check wheel nuts every 50–100 miles for the first 200 miles of operation, then periodically thereafter. Maintaining proper wheel nut torque value is essential to prevent wheel end separation or potential damage to the hub or wheel.
	8.	Repeat the same procedure after dismount and remount of the wheels.
	9.	Follow the specified tightening sequence recommended in the tire maintenance section of this manual.

1.8 Required Trailer Hookup Procedures

The consequences of not properly hooking the trailer to the tow vehicle can be very serious. Failure to adhere to the information in this section could lead to the trailer becoming detached, the trailer brakes and/or lights not working correctly, or other unsafe situations. Disregard of proper trailer hook-up could result in an accident-causing property damage, bodily injury, or death.



TRAILER HOOKUP

Table 4 lists the steps to properly hook up your trailer to the tow vehicle.

Table 3: Trailer Hookup Procedure

Trailer Hookup Procedure	
Step No.	Action
1.	Connect the tow vehicle to the trailer and check that the coupler is completely latched. Make sure that a safety pin is inserted to ensure the coupler will not unlatch during transport.
2.	Connect the electrical plug from the trailer's harness to the receptacle of the tow vehicle.
3.	Check all lights on the trailer to make sure they are working correctly with the tow vehicle's electrical system.
4.	Verify the landing leg and drop foot are fully retracted and the crank handle is stowed in transport position. Note: For trailers with 2-speed jacks, use low gear for raising and lowering the jack under load and high gear for raising and lowering the leg when it is off the ground.
5.	Check all safety chains and their attachment to both the trailer and the towing vehicle.
6.	Connect the safety chains to the tow vehicle using a crossed pattern under tongue. Allow slack for turning but avoid having chains drag on the pavement.
7.	Make certain that all attachment devices are properly installed and in good working order.
8.	Utility trailers utilize electric brakes and come equipped with an emergency breakaway device. The breakaway system is designed to operate after the coupling system has failed. Connect breakaway cable S-hook to bumper or hitch on tow vehicle. Allow slack for turning but avoid letting the cable drag on pavement. Provide as straight a connection as possible. The breakaway system is for emergencies and is not a parking brake.
9.	Always check that trailer brakes are working properly. If trailer is equipped with electric brakes, use brake controller to adjust for load. See next page for setup of Trailer Brake Controller.

1.9 Proper Use of a Trailer Brake Controller

Table 4: Setting Up Trailer Brake Controller

Setting Up Trailer Brake Controller	
Step No.	Action
1.	Plug in the trailer wiring harness. With your trailer coupled to your vehicle, the first step when towing with a brake controller is to make sure the trailer wiring harness is plugged into your vehicle. A brake controller requires power from the vehicle and a connection to the trailer brakes for proper towing. During setup, make sure your vehicle and trailer are parked on a level surface. Also, make sure you are in a safe, open area with plenty of stopping distance and no other traffic around.
2.	Allow the brake controller to calibrate. With the trailer plugged in, the brake controller may need to be calibrated. Most brake controllers are self-calibrating. Others do not require calibration at all. Typically, self-calibrating brake controllers will flash a light or signal to indicate when the unit is calibrating and when calibration is complete.
3.	Select personal settings. Some brake controllers come with personal settings that can be adjusted to your preference, such as the angle of the interface, the brightness of the screen and even the location of the brake controller itself. Be sure to adjust all these settings before driving.
4.	Set the maximum output. Maximum output is the maximum amount of power the brake controller will apply to the trailer brakes. You will need to set this level and adjust it depending on the load size. To adjust your brake controller output, press and hold the vehicle brake pedal. Set the output to the starting value specified in the instructions. Then, in an open area, test the trailer brakes by driving forward at about 25 mph and applying the brakes. If the vehicle stops too slowly, increase the maximum output. If it stops too abruptly or locks up, reduce the output.
5.	Adjust the sensitivity level. Sensitivity is how aggressively your brake controller will apply the brakes. You can set sensitivity by testing the trailer brakes again. Drive forward at about 25 mph and press the brake pedal. If the vehicle stops too slowly, increase the sensitivity setting. If it stops too abruptly, lower the sensitivity. As operation becomes more comfortable, you can test braking at various speeds to ensure smooth stops in any conditions.
6.	Manually activate brakes as needed. Most trailer brake controllers come with a manual activation button. This allows you to activate the trailer brakes whenever desired, without applying the vehicle brakes. Manual trailer brake activation can be useful for correcting minor trailer sway and gradually slowing down on a steep hill or before stops.

1.10 Proper Trailer Loading and Unloading Practices

CAUTION

Trailer Loading Practices

The consequences of ignoring proper trailer loading practices can be very **serious**. Failure to adhere to the information in this section could lead to unsafe handling, diminished braking capacity, or other unstable trailer characteristics, which could result in an accident-causing property damage, bodily injury, or death.

It is the operator's responsibility to take whatever steps that are necessary to load the trailer properly—even when it is not easy to calculate the total load or determine the load center of gravity.

Distribute the load of the trailer so that **60% of the total load weight is forward of the arrow and 40% is rearward of the arrow**. This will ensure that the proper load balance and TW are achieved. A decal on the trailer similar to the one shown below indicates the correct placement of the load.



CAUTION

Adverse Weather Conditions!

Adverse weather conditions can cause wet and slippery trailer decks and ramps. Depending on the type of equipment and existing weather conditions, it may be necessary to add traction aids to the trailer deck and ramps.

Additional Trailer Loading Precautions

It is crucial for operator safety to achieve proper load distribution, but also very important to exercise extreme caution when loading and unloading equipment on a trailer. Make sure to always include the following steps as a part of your routine:

1. Make sure the road surface is level. Loading and unloading on an uneven surface may cause damage to the trailer frame and create unsafe loading conditions.
2. Always set brakes on the tow vehicle and trailer—before loading and unloading—and use chock blocks as an added safety precaution.

3. Before securing equipment, always lower booms, loaders, and buckets. The parking brake on the equipment being transported must be engaged, where applicable.

Note: Always make sure you are under the maximum allowable height clearance.

4. Restrain equipment with crawler tracks as well as wheel type equipment in the lateral, forward, rearward, and vertical directions using a minimum of four direct tie-downs and binders.
5. Verify each of these four tie-downs and binders has a working load limit of at least 5000 lbs.
6. Block the crawler track and wheeled equipment to prevent forward movement.

Equipment with crawler tracks as well as wheel type equipment should be restrained in the lateral, forward, rearward and vertical direction using a minimum of four direct tie-downs and binders each having a working load limit of at least 5000 lbs. and should be blocked to prevent forward movement.

7. Restrain articulated vehicles in a manner that prevents articulation while in transit.
Articulated vehicles shall be restrained in a manner that prevents articulation while in transit.

Trailers with Tilt Decks

It is very important that the deck latch is always in the locked position with the safety pin inserted during transport. Always unlock the deck when unloading equipment. Failure to do this might result in damage to the deck. The deck latch is adjustable to keep the deck tight and rattle free.

CAUTION

When loading equipment onto the deck, drive slowly until the deck begins to tilt closed, and proceed forward until 10% of the load weight is on the trailer hitch. Not enough TW can result in trailer sway, which can be an unsafe condition. When unloading, reverse the procedure that was used for loading. Back up slowly until the deck begins to tilt, stop, and wait for it to completely open, and then proceed to back off slowly.

The trailer deck tilts open and tilts closed with one person's weight. The deck may tilt faster or slower depending on outside air temperature, because the air temperature affects the density of the fluid in the deck cylinder.

Section 2 Maintenance

2.0 Periodic Maintenance

Before loading the trailer, the trailer brakes should be *burnished-in*, which is critical to brake performance. The reason for a proper break-in is to establish an even layer of friction material deposited on the rotors from the brake pads.

Note: It is *very* important that this initial layer of friction material is evenly distributed. Perform the steps in Table 5 for new trailer break-in.

Table 5: New Trailer Break-In

✓	Step No.	New Trailer Break-In
	1.	Use the tractor hand brake cautiously for this procedure. Always apply slow and steady pressure on the hand brake until the trailer can be felt “pulling” on the tractor—and always be ready to release quickly in case of lockup.
	2.	Begin this burnishing process by applying the brakes 20–30 times (minimum) with approximately a 20 miles per hour (mph) decrease in speed (e.g., 40 mph–20 mph). It may require over 50–100 applications to achieve a 100% burnishing of the trailer brakes.
	3.	Allow ample time for brakes to cool between applications (roughly one mile at 40 mph). This allows the brake shoes and magnets to slightly “wear-in” to the drum surfaces. (recommendation from Lippert Axles). For further details see the attached manual in the Valor Dealer Packet. For information on Burnishing your trailer brakes. Use the Link: https://support.lci1.com/videos/the-proper-way-to-burnish-your-trailer-brakes
	4.	10 Miles of Service <ul style="list-style-type: none"> • Check Hubs for proper Grease lubrication. If oil bath hubs, check oil level.
	5.	50–100 miles <ul style="list-style-type: none"> • Re-torque wheel flange nuts. • Apply 2-3 pumps of grease into bearings through the spindle grease zerk.
	6.	1000 miles – Check axle alignment and re-torque suspension fasteners.



Perform the following steps in Table 6 to complete the various stages of periodic maintenance.

Table 6: Periodic Maintenance Checklist

✓	Step No.	Periodic Maintenance Checklist
Pre-Trip Inspection		
	1.	Lube wear areas on hitch.
	2.	Examine frame and tongue members for evidence of damage or cracked welds.
	3.	Check suspension for bent or broken springs, damaged components, and loose or missing fasteners.
	4.	Check wheel hub for proper lubrication and for evidence of leaking wheel seals.
	5.	Check tire inflation pressures
	6.	Check hitch for damage or stress and verify correct hitch height.
	7.	Check lights for correct operation.
Quarterly or 10,000 Miles		
	1.	Check wheel flange nut torques
	2.	Check brakes for adjustment. For more information refer to specific axle manual.
Semiannually or 25,000 Miles		
	1.	Lubricate jack.
	2.	Re-torque suspension fasteners.
	3.	Inspect and lubricate brakes and linings. For more information refer to specific axle manual.
	4.	Lubricate tilt deck hinges.
	5.	Replace wheel bearing lubricant/grease (heavy duty/off-road service). For more information refer to specific axle manual. For grease lubricant, regrease using spindle zerk.
Annually or 100,000 Miles		
	1.	Replace wheel bearing lubricant/grease (standard duty service). For more information refer to specific axle manual. For grease lubricant, regrease using spindle zerk.

✓	Step No.	Periodic Maintenance Checklist
Special		
	1.	Accident or Overload: Check all structural components for damage. Check tires and wheels for damage. Check axle alignment.
	2.	Rear Impact: Check impact guard components for damage.
	3.	Skidding: Check tires for flat spots.

2.1 Structural Components

Subframe

Other than for periodic or special inspections, and washing, the trailer subframe requires no regular maintenance. Keeping the trailer clean helps you notice other things such as cracked welds or corrosion. If your application of the trailer requires the hauling of corrosives, then frequent washdowns are also very important.

Deck

The deck, which is the major load-carrying member of the trailer, requires no regular maintenance other than a periodic check for broken welds, loose fasteners, and corrosion. Inspect the tilt deck carefully if the trailer has been overloaded or in an accident.

It may be necessary to apply a new coat of wood preservative after decking has aged and become dry. The best time to apply wood preservative is during warm weather for better penetration. Replace decking when necessary. Occasionally check for loose, missing, or broken deck screws.

2.2 Sub-Assembly Components

Pintle Eye or Ball-Type Coupling

Check for cracks, loose fasteners, and wear. Regularly apply a coating of grease to the contact areas to prevent accelerated wear.

The fasteners are very important and deserve careful attention. Replace the bolts if they are damaged in any way and replace the locknuts if worn. Torque the fasteners to 315 to 420 ft-lbs.

Jack Assembly

Every six months, lubricate the jack as follows:

1. Extend the leg approximately two inches from the fully retracted position.
2. Add one-quarter pound molybdenum grease (with a temperature rating suitable for your operating conditions) to each of the grease fittings. For two-speed jacks, there are two on the gear leg, one on the swivel pad, and one on the gear box. For single-speed jacks, there is one on the gear leg and one on the swivel pad.

Cushion Cylinder

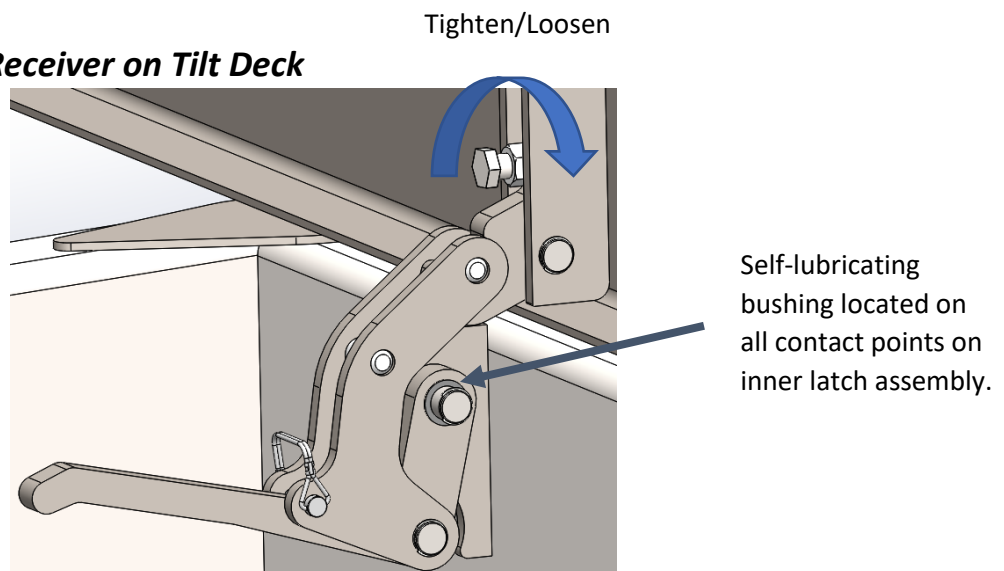
The fluid in the cylinder should be changed if the cylinder has leaked or if the deck action has become jerky or sluggish. Fully collapse the cylinder, remove the filler plug, and drain out the old fluid. Add 10W hydraulic fluid until the cylinder is full and all the air has been expelled.

Deck Latch

The latch assembly is designed with replaceable, self-lubricating bushings at the wear points. See the appropriate pages of the Parts section of this manual for further information.

Should the deck develop a rattle, adjust the hook receiver assembly on the tilt deck by tightening or loosening the bolt until tight when in locked position. Figure 3 shows example of adjusting hook and self-lubricating bushings.

Figure 1: Adjusting Hook Receiver on Tilt Deck



Deck Hinge Assembly

Check the hinge assembly frequently for cracked welds; this assembly is highly stressed during loading and unloading.

Grease the deck hinges every six months—or earlier, if service dictates. Apply grease to the fittings (one per side) until fresh grease becomes visible.

2.3 Running Gear

Suspension

The suspension on your trailer is Rubber Torsion type and requires no maintenance.

The first maintenance check should be performed after an initial break-in period of about 1,000 miles. A visual inspection of all suspension components and attachment welds should be performed to reveal any obvious problems, such as cracks or unexpected wear.

During this 'walk-around', it is essential to also check the torque on all suspension fasteners. During the initial 'shake down' period in which the components of the suspension system 'seat in', as much as 25% of the original clamp load on the bolted joints can be lost. After the parts of the suspension have worked together for a very short period of time, re-torque the bolts to ensure that undue movement are negligible, which results in excessive suspension wear, does not occur.

You cannot ascertain these torques values visually or by 'feel'. **USE A TORQUE WRENCH!**

Axle Alignment

Torsion Axle alignment is set during manufacturing and no adjustment is needed.

More detailed information is contained in the supplied axle manufacturers manual.

Axle End Component Disassembly

Whenever the hub equipment on your trailer must be removed for inspection or maintenance refer to the supplied axle manufacturer's manual.

Hub Inspection

Clean the hub with a commercial solvent for inspection. Check for cracks, elongated holes, evidence of overheating or foreign object damage. The hub is crucial to safe vehicle operation and any doubt about its condition should be cause for replacement.

Broken or Damaged Studs

Typically, when a stud is damaged it is due to under torque (loose cap nuts), over torque, or overloading. Because the studs act together to share the wheel loads, these parameters must be followed:

1. If one stud is broken, replace the studs on either side of the broken one also.
2. If two or more studs are broken, replace the entire set.
3. A stud with damaged threads should be replaced immediately.

Electric Brake General Maintenance

Refer to the supplied manufacturer's manual for specifics.

Brake Drum Inspection

Clean and inspect the brake drums whenever relining the brakes. To be suitable for further service, the brake drum should pass the following checks:

1. The brake surface should be free of scoring, excessive heat checks and free of cracks.
2. The brake surface diameter should be within the maximum diameter stamped on the drum.
3. The mounting holes and pilot must be round and true.
4. The mounting surface must be clean and flat.



WARNING BRAKE SYSTEM SAFETY!

If any of the above conditions are not met, the brake drum should be replaced. Failure to replace the brake drum will result in an unreliable braking system and may lead to an accident.

It may be desirable to machine the braking surface to remove small heat checks or other surface defects resulting from normal use. The following should be noted when turning the brake drum:

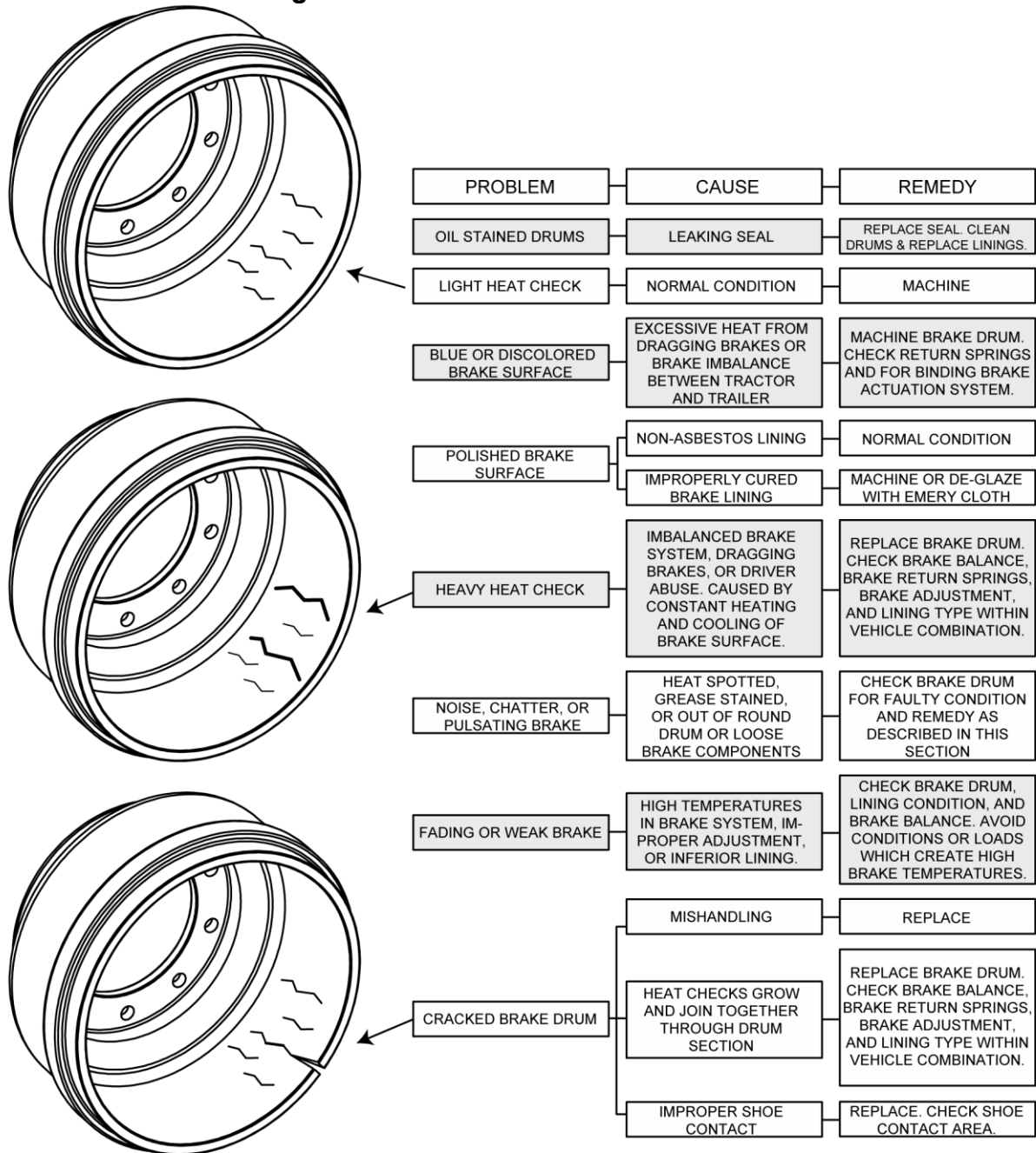
1. The maximum diameter cast into the back-plate portion of the brake drum is the discard diameter. If any portion of the brake drum exceeds the maximum diameter it must be replaced.

- When preparing to machine a drum, allow at least .040" under the maximum diameter for further normal in-service wear. Failure to allow for service wear will result in a weakened brake drum and may result in an accident.

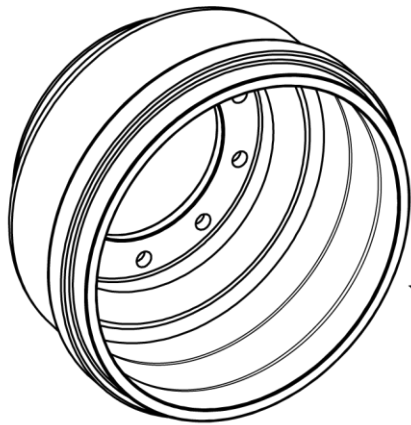
Brake drums should be replaced in pairs to achieve the same braking power on both wheels and maintain even braking load on the axle. Failure to replace both brake drums on an axle will result in uneven braking load on the axle and may significantly reduce the performance, service life and/or safety of your vehicle.

See the brake drum troubleshooting charts on the following pages for more information.

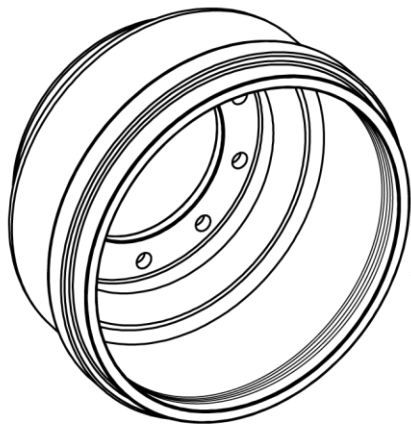
Brake Drum Troubleshooting Chart



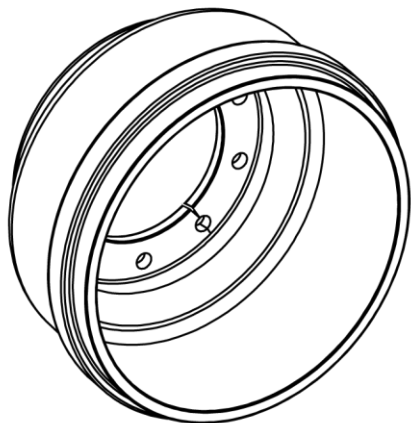
Brake Drum Troubleshooting Chart (continued)



PROBLEM	CAUSE	REMEDY
FINE GROOVES	ABRASIVE FOREIGN MATERIAL OR POOR QUALITY BRAKE LINING	MACHINE OR REPLACE BRAKE DRUM AND REPLACE LINING
	LOOSE RIVETS OR BOLTS OR FOREIGN MATERIAL IN RIVET HOLES	MACHINE OR REPLACE BRAKE DRUM. USE RIVET HOLE PLUGS.
HEAT SPOTTED OR HARD SPOTS IN BRAKE SURFACE	HIGH LOCALIZED HEATING AND COOLING CYCLES	GRIND HARD SPOT AND MACHINE DRUM



EXCESSIVE WEAR	ABRASIVE FOREIGN MATERIAL OR POOR QUALITY BRAKE LINING	MACHINE OR REPLACE
MOUNTING FLANGE SEPARATED FROM HOOP SECTION OF DRUM	INSTALLATION ON DIRTY HUB	REPLACE DRUM. CLEAN THE HUB PRIOR TO INSTALLING NEW DRUM.
	WHEEL HITTING BRAKE DRUM	INCORRECT APPLICATION. REPLACE BRAKE DRUM WITH CORRECT PART.



GROOVES ALONG EDGES OF LINING	ABRASIVE MATERIAL COLLECTING ALONG EDGES OF LINING	DUST SHIELD MAY CAUSE OR CURE THIS. MACHINE BRAKE DRUM.
OUT OF ROUND: CONCENTRICITY	IMPROPER FIT TO PILOT OR IMPROPER SEATING ON WHEEL OR HUB	MACHINE OR REPLACE. CHECK FOR CORRECT FIT & CLEARANCE TO WHEEL.
OUT OF ROUND: VARIATION IN DIAMETER	HEAT DISTORTION	MACHINE OR REPLACE
OUT OF ROUND: BALANCE	BALANCE WEIGHT FALLEN OFF OR NOT A BALANCED DRUM	REPLACE. SPECIFY BALANCED DRUM WHEN ORDERING REPLACEMENT
CRACK BETWEEN PILOT HOLE AND BOLT HOLE	MISHANDLING	REPLACE
	INSTALLATION ON DIRTY HUB	REPLACE. CLEAN HUB BEFORE INSTALLATION.

Electric Brake Burnishing

Refer to following clip:

<https://www.youtube.com/watch?v=d9HDloz9fq8>

Axle End Component Cleaning and Inspection

Refer to the supplied manufacturer's manual for specifics.

Axle End Component Assembly

Refer to the supplied manufacturer's manual for specifics.

Wheel Bearing Adjustment

Refer to the supplied manufacturers manual for specifics.

Wheel Bearing Lubrication

Refer to the supplied manufacturers manual for specifics.

2.4 Wheels and Tires

Wheels

Wheels are a very important and critical component of your running gear. Inspect them visually for cracks or elongated bolt holes whenever they are removed for any reason. If it becomes necessary to replace the wheels on your trailer, be certain that the replacement units match the originals in the following regards:

1. Type. The disc wheels and cap nuts on your trailer are of the hub pilot design.
2. Material. Do not mix aluminum and steel disc wheels or aluminum and steel disc wheel cap nuts. This may result in incorrect components being used to secure the wheels, which can lead to loosened wheels resulting in a crash.
3. Fit. Use only the correct matched parts when mounting disc wheels. Incorrect components can result in separation of the rim components.

4. Bolt Circle. Many bolt circle dimensions are available, and some vary by so little that it might be possible to attach an improper wheel that does not match the axle hub. Be sure to match your wheel to the axle hub.
5. Capacity. Be sure your wheels have enough load carrying capacity and pressure rating to match the maximum load of the tire and trailer.
6. Offset. This refers to the relationship of the center line of the tire to the hub face of the axle. Care should be taken to match a replacement wheel with the same offset wheel as originally equipped. Failure to match offset can result in reduced carrying capacity of your axle.
7. Rim Contour.

 **DANGER** *RIM CONTOURS!*

Use only the approved rim contours as shown in the Tire and Rim Yearbook or the tire manufacturers catalog. The use of other rim contours is dangerous. Failure to use the proper rim contour can result in explosive separation of the tire and wheel and could cause a serious accident.

 **WARNING** *WHEEL MODIFICATIONS!*

Do not attempt to repair or modify a wheel. Even minor modifications can have a great effect. Do not install a tube to correct a leak through the rim. If the rim is cracked, the air pressure in the tube may cause the pieces of the rim to explode with great force and can cause serious injury or death.

Wheel Torqueing Procedures

When installing the wheels, make sure that the hub and wheel mating surfaces are clean and free of rust, dirt, and excess paint. The studs and threads must be clean, dry and in good condition for applying installation torque.

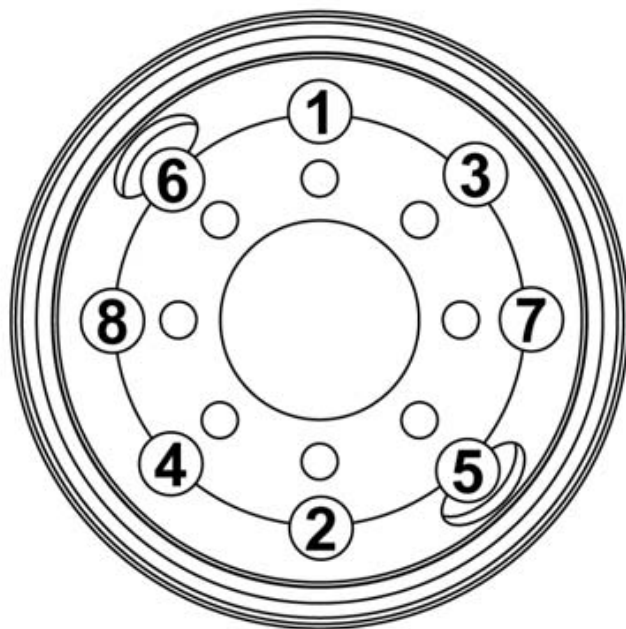
The hand torque wrench or air wrench used to install the wheels must be periodically calibrated to insure proper applied torque. Adjust the tools, as necessary.

Position the disc wheel over the studs, being careful not to damage the stud threads. Make sure the disc wheel is flat against the mounting surface and there is clearance between the disc wheel taper and the brake drum.

On applicable models position the outer disc wheel over the inner disc wheel being careful not to damage the threads on the studs. Be sure the valve stems for both the inner and outer tires are accessible.

Install the flange nuts and tighten to the Stage 1 torque value in the following chart using the sequence shown, and then tighten the flange nuts to the Stage 2 torque value (if applicable) and then the full Stage 3 torque value in sequence.

Trailer Model	Torque Range (all values in Ft-lbs.)		
	Stage 1	Stage 2	Stage 3
12TU-12TUS (6.5')	20-25	50-60	90-120
16TU-16TUS (6.5')	20-25	50-60	90-120
18TUS (5')	20-25	50-60	90-120





Tires

Before mounting tires onto wheels make certain that the rim size and contour is approved for the tire as shown in the Tire and Rim Association Yearbook or the tire manufacturers catalog. Also make sure the tire will carry the rated load. If the load is not equal on all tires due to trailer weight distribution, use the tire rated for the heaviest wheel position.

All tires must be matched to within **3/4"** of the same rolling circumference per the tire manufacturers instructions. Do not use tires that fail to meet this criterion. Doing so may result in unstable operation and significantly reduced service life.

Use tire mounting procedures as outlined by the Rubber Manufacturers Association or the tire manufacturer.

Inflation Pressure

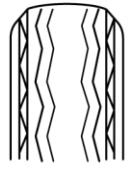
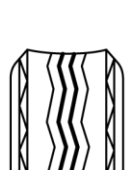
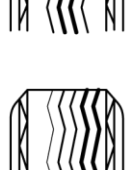
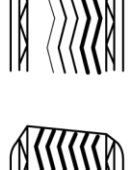


Correct tire inflation pressure is the most important factor in tire life. Inflation pressure should be as recommended by the manufacturer for the load. Pressure should be checked cold before operation. Do not bleed air from tires when they are hot. Check inflation pressure weekly during use to insure the maximum tire life and tread wear. Use the tire wear diagnostic chart to help you pinpoint the causes and solutions of tire wear problems.

NOTE: Tire wear should be checked frequently because once a wear pattern becomes firmly established in a tire it is difficult to stop, even if the underlying cause is corrected.

Tire Safety Information can be found at the following website and should be reviewed prior to operating the trailer.

<https://one.nhtsa.gov/Vehicle-Safety/Tires/Tire-Safety:-Everything-Rides-On-It>

Tire Wear Diagnostic Chart

Wear Pattern	Cause	Corrective Action
	Center Wear	Over inflation Adjust pressure to particular load per tire catalog
	Edge Wear	Under inflation Adjust pressure to particular load per tire catalog
	Side Wear	Loss of camber or over loading Adhere to load limits. Have axle aligned
	Toe Wear	Incorrect toe-in Have axle aligned
	Cupping	Loose bearing or out of balance Adjust bearing; balance tires
	Flat spots	Wheel lockup or tire skidding Adjust brakes; avoid sudden stops

2.5 Electrical

Harnesses and Lights

The electrical harnesses in the trailer run within the frame members and require no maintenance. The oval stop/turn/taillights and the round clearance lights are all of the sealed type and do not have a separately replaceable bulb. If a light does stop working, first check the plug at the light for voltage (with a test lamp or voltmeter) to verify that the electrical system is functioning properly. If it is, then replace the lamp; if not then troubleshoot the electrical system.

Junction Block

The junction block requires no regular maintenance. If an electrical problem develops, check for corroded or loose terminals.

Electrical Connection

The electrical connection (i.e.: 7-way plug or receptacle depending on model) should be kept clean and free of dirt. If an electrical problem develops, loosen the cover retaining screw, slide the cover down over the harness, and check the screws that hold the wires for security. Also check for stray or broken strands of wire.

2.6 Trailers with Tilt Decks

Tilt Deck trailers are designed to tilt open, or tilt closed with one person's weight. Outside temperatures can affect the speed the deck tilts at due to effects on the density of the fluid in the cushion cylinder. Periodic inspections should occur looking for wear, damage, or cracked welds. As an item of routine maintenance apply grease to all grease fittings until fresh grease becomes visible.

See the appropriate pages of the Parts section of this manual for further information regarding replacement parts if needed.

Cushion Cylinder

The fluid in the cylinder should be changed if the cylinder has leaked or if the deck action has become jerky or sluggish. Fully collapse the cylinder, and then remove the filler plug and drain out the old fluid. Add 10W hydraulic fluid until the cylinder is full and all the air has been expelled.

Deck Latch

The latch assembly is designed with replaceable, self-lubricating bushings at the wear points. See the appropriate pages of the Parts section of this manual for further information.

Should the deck develop a rattle, adjust the hook receiver assembly on the tilt deck.



Deck Hinge Assembly

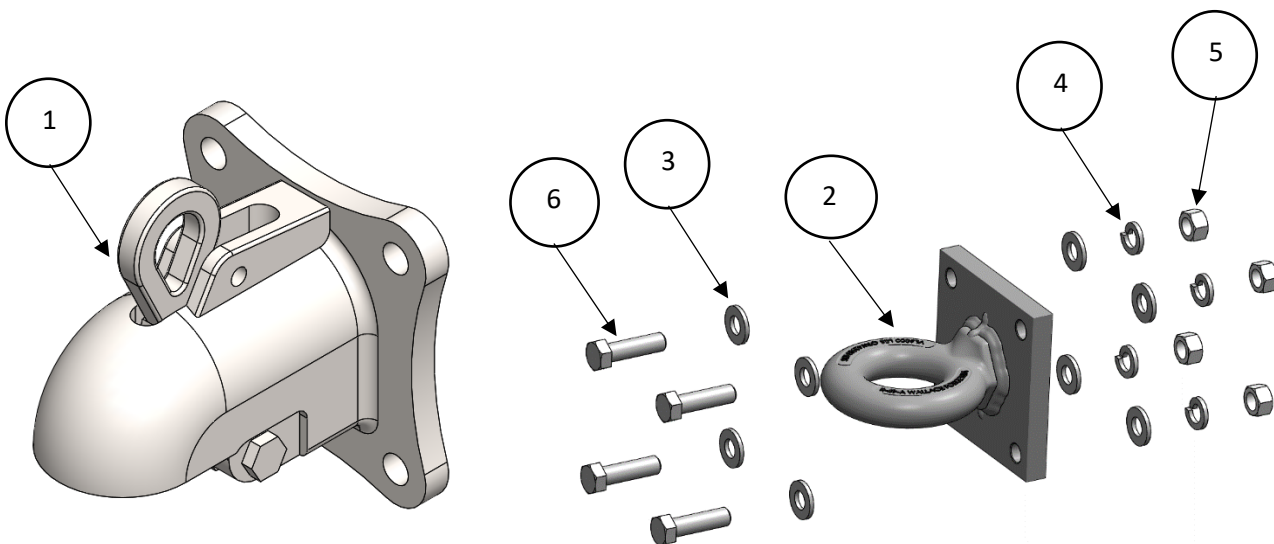
The hinge assembly is highly stressed during loading and unloading, so check it for cracked welds frequently.

Every six months, or sooner if service dictates, grease the deck hinges. Apply grease to the fittings (one per side) until fresh grease becomes visible.

Section 3 Parts

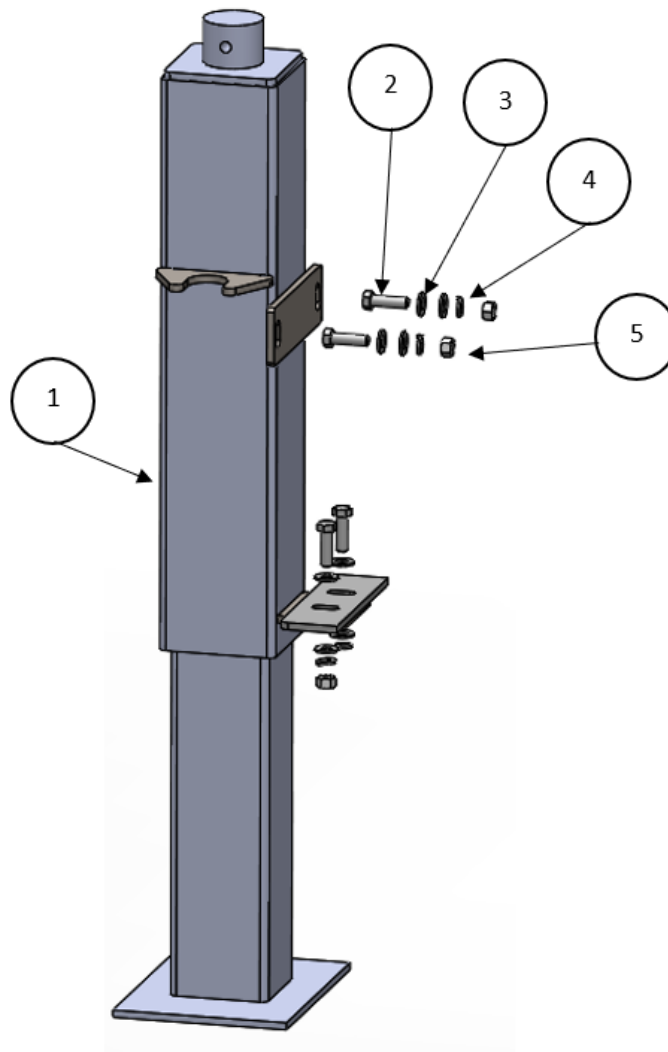
Coupler/Drawbar Eye:

Ref.	Part Number	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
1	C-000070-UT	2 5/16" Ball Coupler (Option)	1	1	1	1
2	C-000057	2.5" I.D. Drawbar Eye	1	1	1	1
3	H-000012-U	WASHER (0.625 GR. 8, ZINC)	8	8	8	8
4	H-000013-U	LOCK WASHER (0.625 GR. 8, ZINC)	4	4	4	4
5	H-000014-U	NUT (0.625-11 UNC GR. 8, ZINC)	4	4	4	4
6	H-000015-U	HEX BOLT (0.625-11 X 2.25" UNC. GR. 8, ZINC)	4	4	4	4



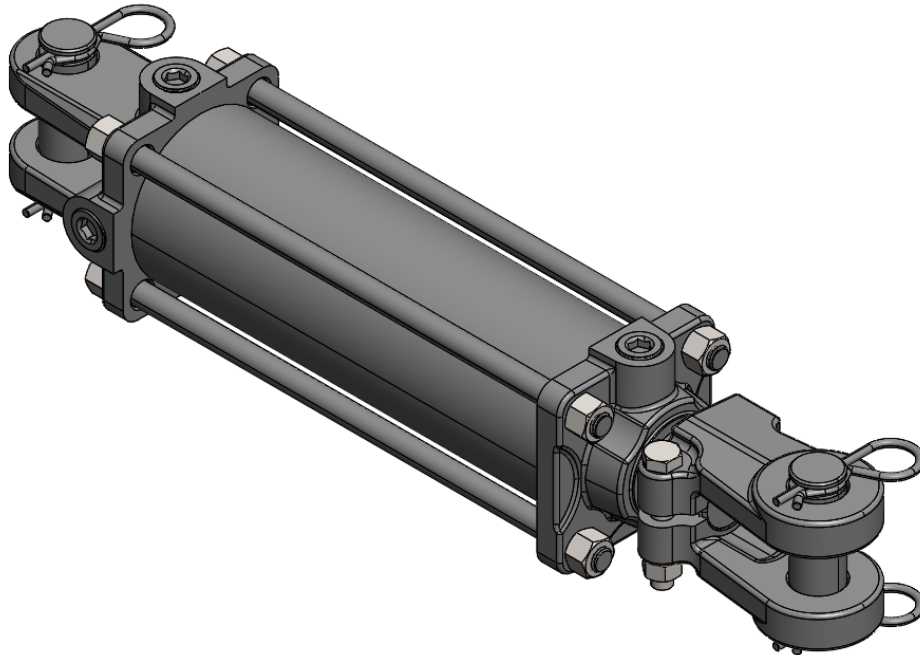
Jack Assembly

Ref.	Part Number	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
1	SA-000016-UT	JACK	1	1	1	1
2	H-000016-U	HEX BOLT (0.375-16 X 1.25" UNC GR. 8, ZINC)	4	4	4	4
3	H-000017-U	WASHER (0.375 GR. 8, ZINC)	4	4	4	4
4	H-000018-U	LOCK WASHER (0.375 GR. 8, ZINC)	4	4	4	4
5	H-000019-U	NUT (0.375-16 UNC GR. 8, ZINC)	4	4	4	4



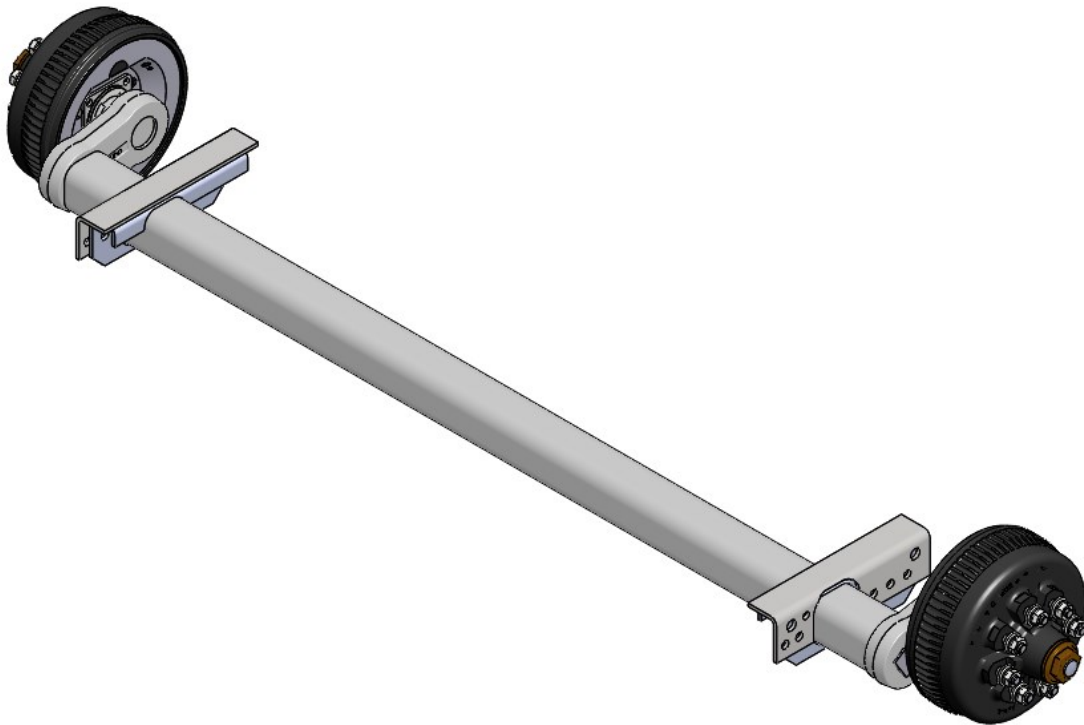
CUSHION CYLINDER

PART NUMBER	Description	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
C-000047-UT	3X8 CUSHION CYLINDER KIT	1	1	1	1



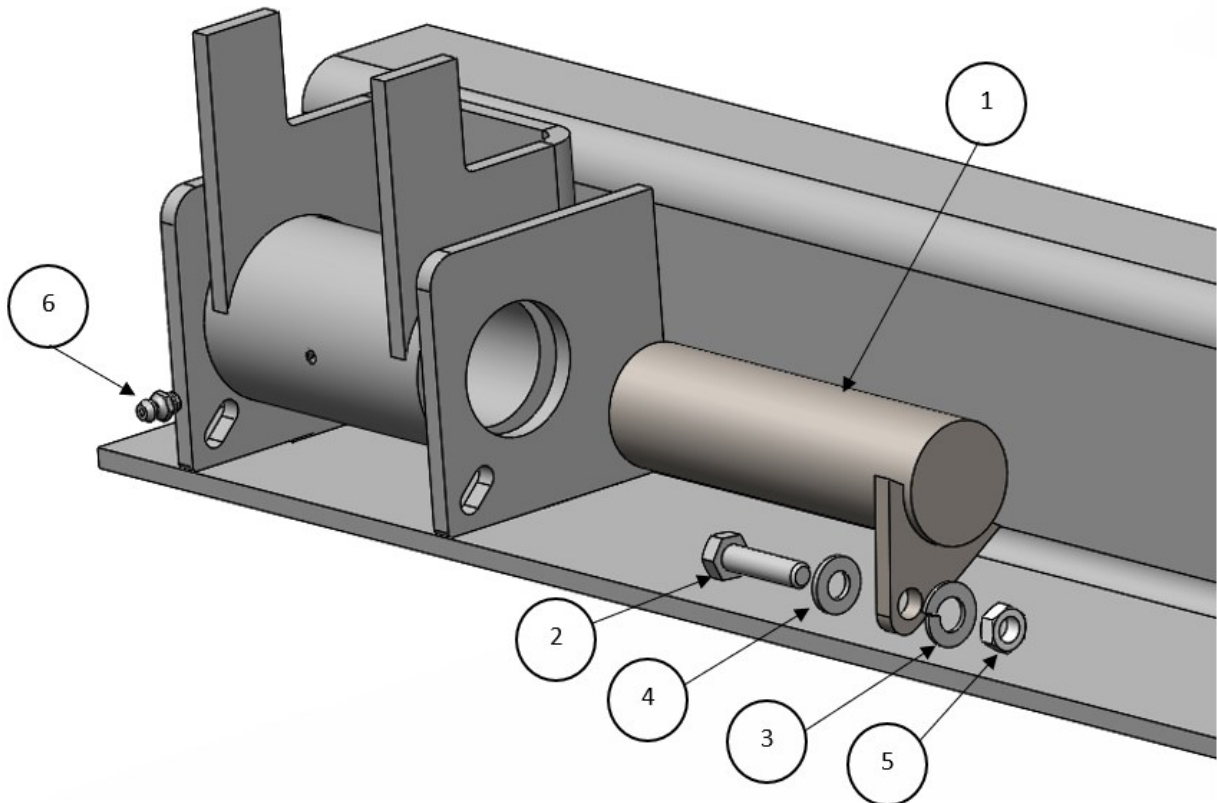
Axle Assembly (See Lippert's Owner's manual for specifications and parts list)

Trailer Model	Lippert Axle Configuration/Capacity
12TU-12TUS (6.5')	2 x 7K Torsion with Grease Lubrication
16TU-16TUS (6.5')	2 x 8K Torsion with Grease Lubrication
18TUS (5')	3 x 7K Torsion with Grease Lubrication



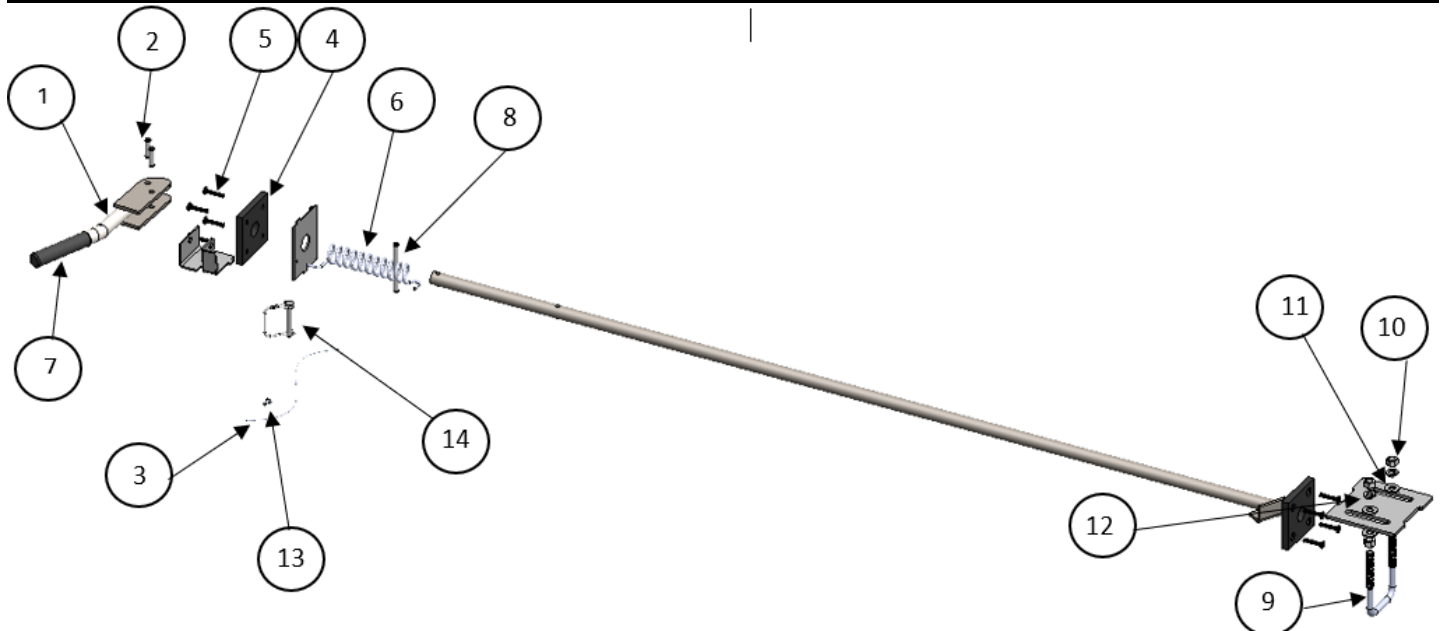
HINGE ASSEMBLY

Ref.	Part Number	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
1	SA-000012-UT	HINGE PIN	2	2	2	2
2	H-000039-U	HEX BOLT (0.3125-18 X 1.25" UNC GR. 8, ZINC)	2	2	2	2
3	H-000029-U	LOCK WASHER (0.3125 GR. 8, ZINC)	2	2	2	2
4	H-000028-U	WASHER (0.3125 GR. 8 ZINC)	2	2	2	2
5	H-000030-U	NUT (0.3125-18 UNC GR. 8, ZINC)	2	2	2	2
6	C-000073-U	1/4"-28 TAPER THREAD GREASE ZIRT	2	2	2	2



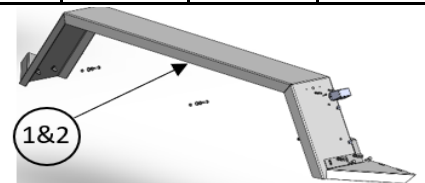
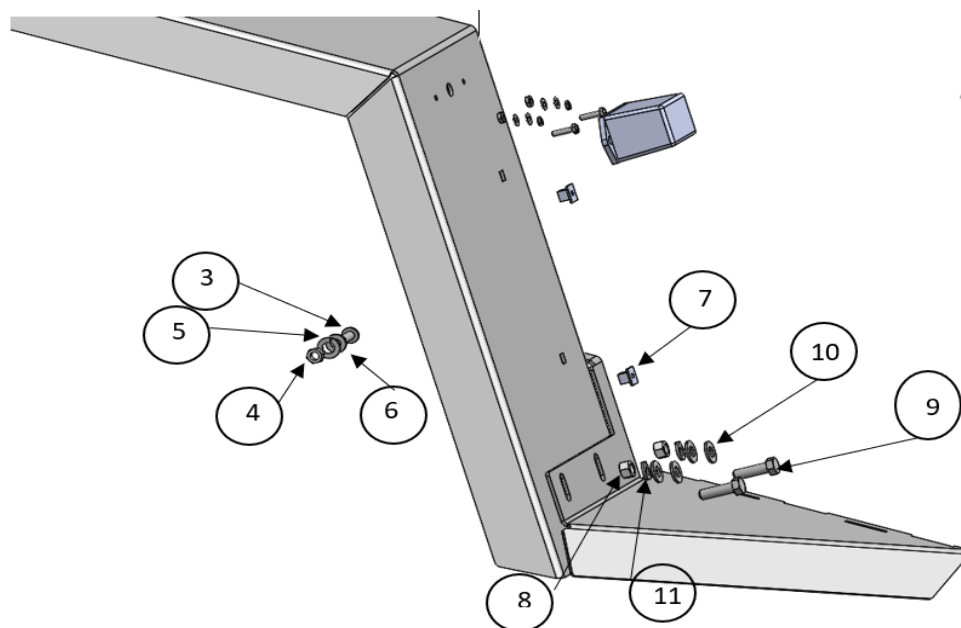
SLIDER LATCH ASSEMBLY

Ref.	PART NUMBER	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
1	SA-000017-UT	SLIDER SHAFT HANDLE	0	1	1	1
2	H-000035-UT	ROLL PIN (3/8" X 1.5")	0	2	2	2
3	H-000043-U	12" STEEL LANYARD	0	1	1	1
4	C-000084-UT	FRICTION BLOCK	0	2	2	2
5	H-000024-U	SCREW (0.3125-18 X 1.5")	0	8	8	8
6	C-000088-UT	SPRING	0	1	1	1
7	C-000087-UT	HANDLE GRIP	0	1	1	1
8	H-000004-U	ROLL PIN (3/8" X 4")	0	1	1	1
9	H-000026-UT	U-BOLT	0	1	1	1
10	H-000040-U	1/2"-20 NUT	0	8	8	8
11	H-000041-U	1/2" LOCK WASHER	0	4	4	4
12	H-000042-U	1/2" WASHER	0	2	2	2
13	H-000044-U	RIVET #10 X 1/2"	0	1	1	1
14	H-000010-UT	CLEVIS PIN	0	1	1	1



FENDERS

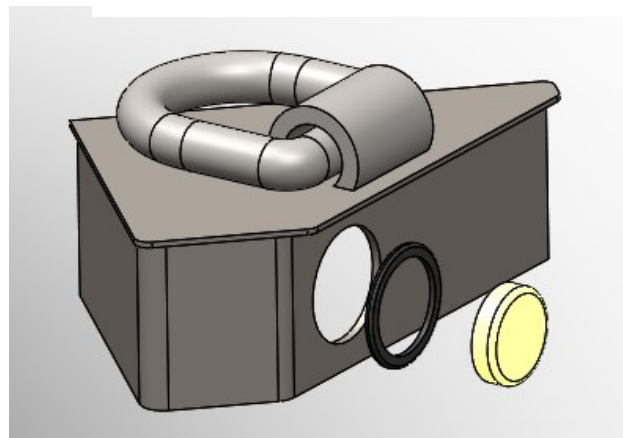
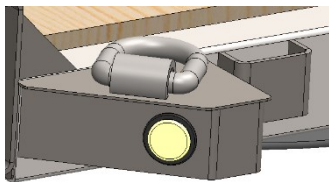
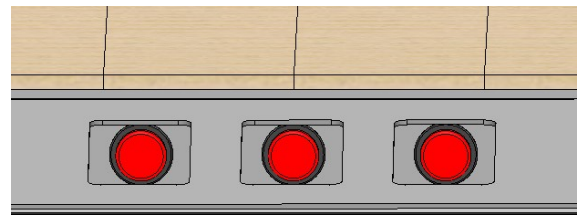
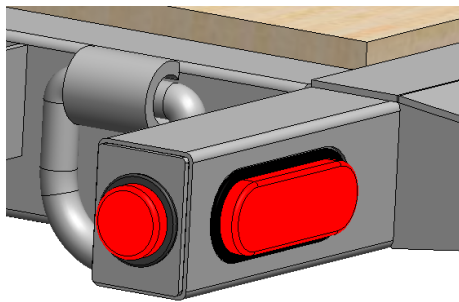
Ref.	PART NUMBER	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
1	SA-000007-UT	FENDER ASSY - CS	1	1	1	0
2	SA-000008-UT	FENDER ASSY - RS	1	1	1	0
3	H-000027-U	WELD STUD (0.3125-18 UNC X1")	6	6	6	6
4	H-000030-U	NUT (0.3125-18 UNC GR. 8, ZINC)	6	6	6	6
5	H-000029-U	LOCK WASHER (0.3125 GR. 8, ZINC)	6	6	6	6
6	H-000028-U	WASHER (0.3125 X 0.69 GR. 9, ZINC)	6	6	6	6
7	H-000025-U	Nylon Square Nut for #14 Screw	2	2	2	2
8	H-000031-U	NUT (10-32 X 1/2" UNC. GR. 8, ZINC)	2	2	2	2
9	H-000032-U	HEX BOLT (10-32 X 3/4" UNC. GR. 8, ZINC)	2	2	2	2
10	H-000033-U	WASHER (#10 x .56 GR. 8, ZINC)	4	4	4	4
11	H-000034-U	LOCK WASHER (#10 GR. 8, ZINC)	2	2	2	2
12	SA-000026-UT-F-CS	FENDER ASSY 18K - CS	0	0	0	1
13	SA-000026-UT-F-RS	FENDER ASSY 18K - RS	0	0	0	1



* #12 & #13 on 18-TUS

LIGHTS

PART NUMBER	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
C-000050-U	GROMMET (6" LIGHT)	2	2	2	2
C-000051-U	LIGHT (RED, 6")	2	2	2	2
C-000052-U	GROMMET (2" LIGHT)	7	7	7	7
C-000053-U	LIGHT (RED, 2")	5	5	5	5
C-000085-U	LIGHT (AMBER, 2")	2	2	2	2
C-000072-U	LICENSE PLATE LIGHT	1	1	1	1





ELECTRICAL HARNESSES

PART NUMBER	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
C-000089-UT	MAIN HARNESS	1	1	1	1
C-000090-UT	MID-STATIONARY HARNESS	-	1	1	1
C-000091-UT	MID NON-STATIONARY HARNESS	1	1	1	1
C-000092-UT	REAR SILL HARNESS	1	1	1	1
C-000093-UT	FRONT MARKER HARNESS - STATIONARY	-	1	1	1
C-000094-UT	FRONT MARKER HARNESS, NON-STATIONARY	1	-	-	-
C-000095-UT	BRAKE HARNESS	1	1	1	1
C-000096-UT	LICENSE LIGHT HARNESS		1	1	1
C-000097-UT	REAR MARKER HARNESS	2	2	2	2

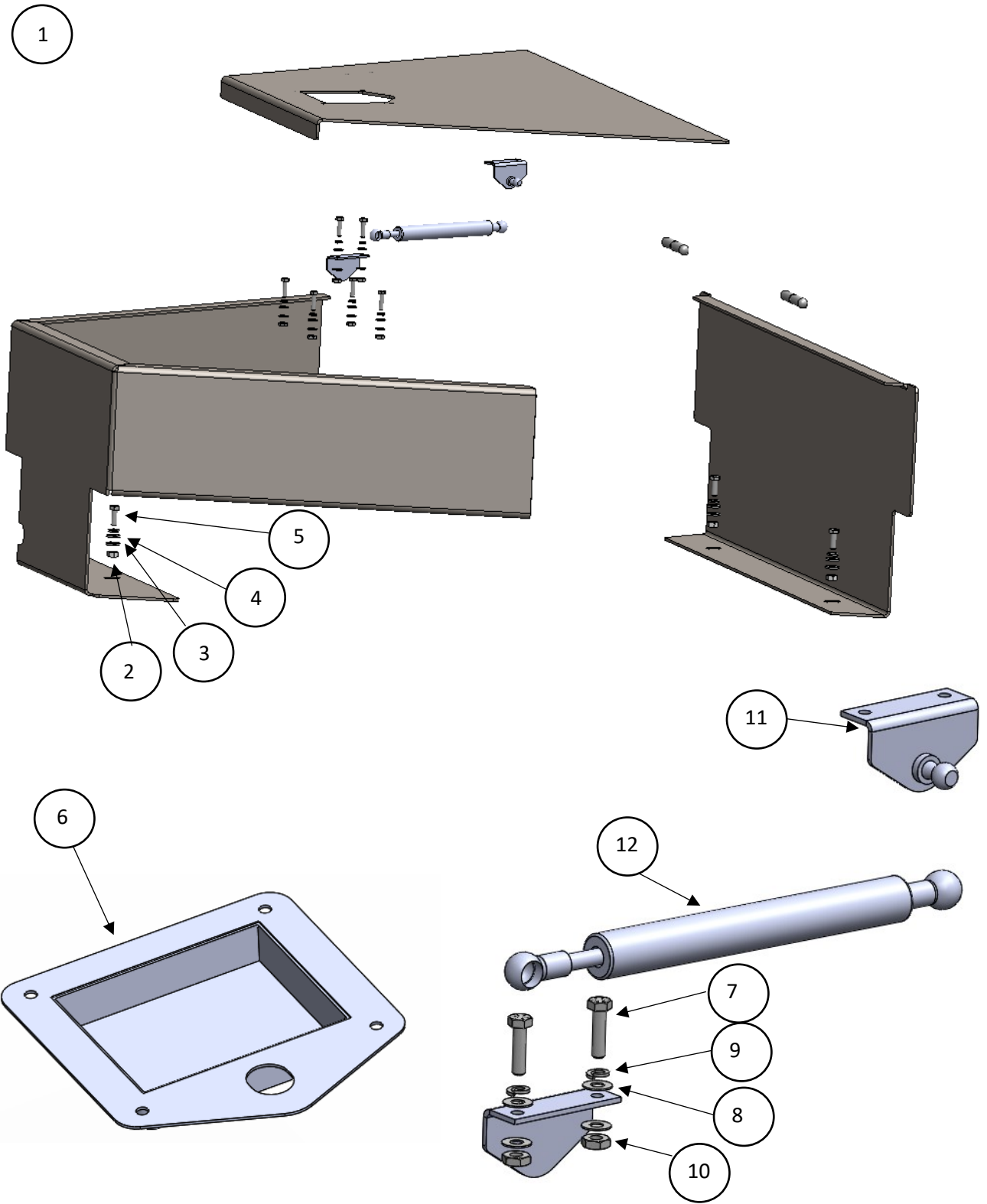
*****CALL FOR MORE INFORMATION ON TROUBLESHOOTING AND/OR REPLACEMENT ELECTRONICS*****



TOOLBOX ASSEMBLY (cont. on next page)

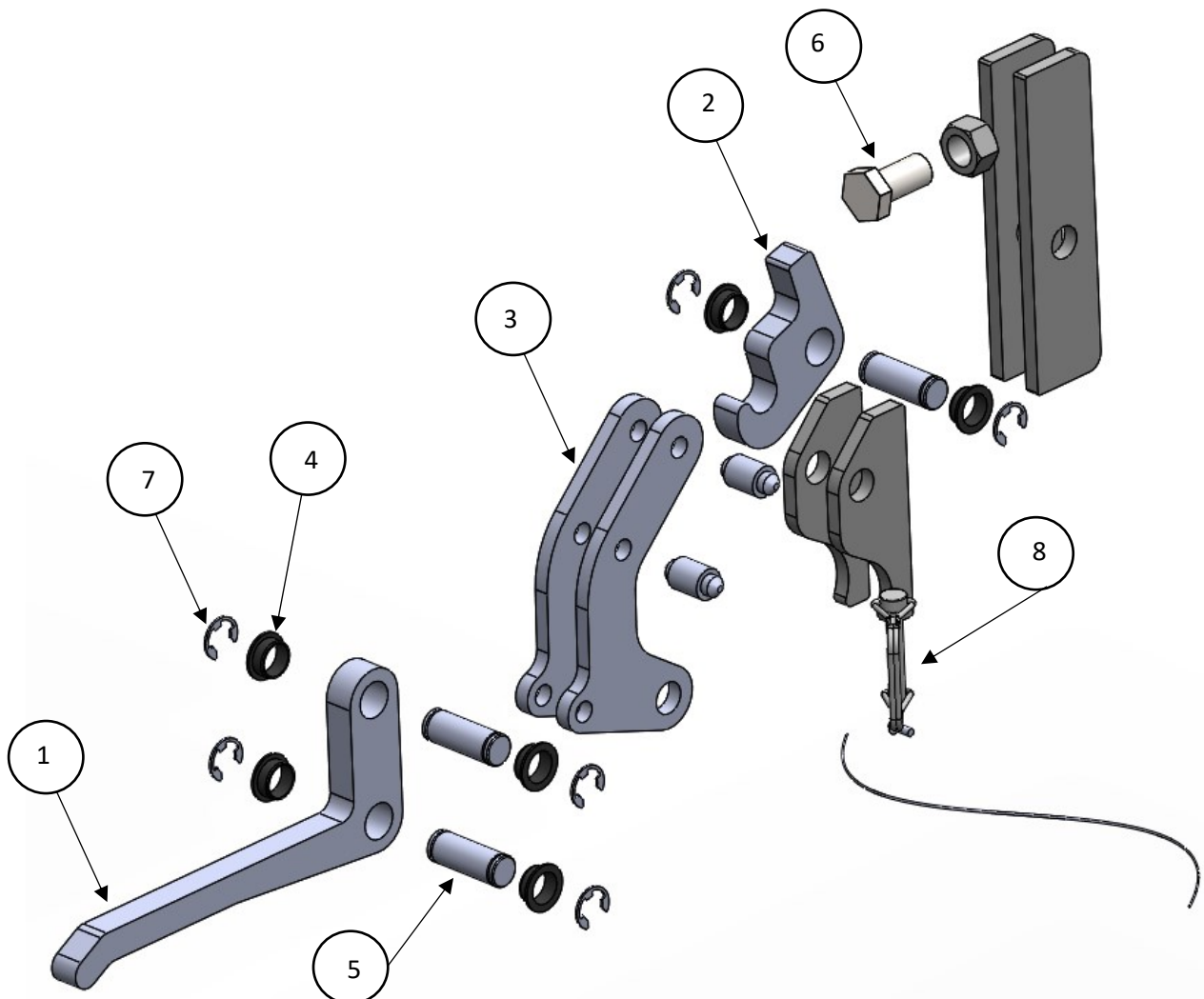
Ref.	PART NUMBER	DESCRIPTION	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
1	SA-000011-UT	TOOLBOX	1	1	1	1
2	H-000005-U	NUT (0.250-20 UNC GR. 8, ZINC)	3	3	3	3
3	H-000006-U	WASHER (0.250 x 0.625 GR. 9, ZINC)	6	6	6	6
4	H-000007-U	LOCK WASHER (0.250 GR. 8, ZINC)	3	3	3	3
5	H-000008-U	HEX BOLT (0.250-20 X 0.75" UNC. GR. 8, ZINC)	3	3	3	3
6	C-000058-UT	TOOLBOX LATCH	1	1	1	1
7	H-000032-U	HEX BOLT (10-32 X 3/4" UNC. GR. 8, ZINC)	6	6	6	6
8	H-000033-U	WASHER (#10 x .56 GR. 8, ZINC)	12	12	12	12
9	H-000034-U	LOCK WASHER (#10 GR. 8, ZINC)	6	6	6	6
10	H-000031-U	NUT (10-32 X 1/2" UNC. GR. 8, ZINC)	6	6	6	6
11	H-000023-U	GAS SPRING MOUNT	1	1	1	1
12	H-000022-UT	Gas Spring	1	1	1	1

TOOLBOX ASSEMBLY CONT.



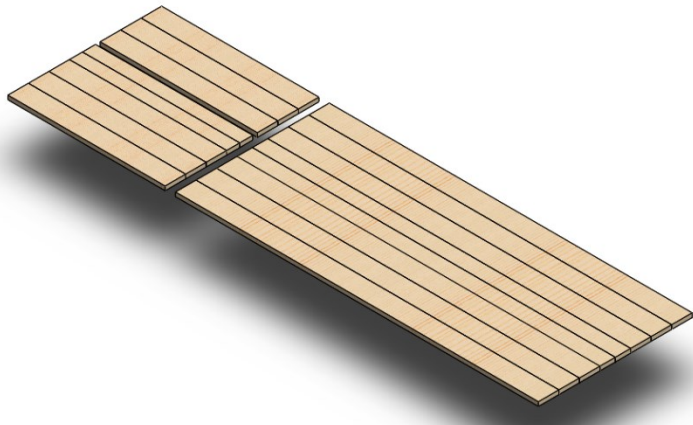
STANDARD LATCH

Ref.	Part Number	Description	16-TU
1	C-000107-UT	HANDLE_UT	1
2	C-000108-UT	HOOK_UT	1
3	SA-000024-UT	LATCH ARM	1
4	H-000049-UT	BUSHING	6
5	H-000047-UT	E-CLIP PIN	3
6	H-000051-UT	¾" BOLT (Tension Adjuster)	1
7	H-000048-UT	E-CLIPS	6
8	H-000010-UT	CLEVIS PIN	1

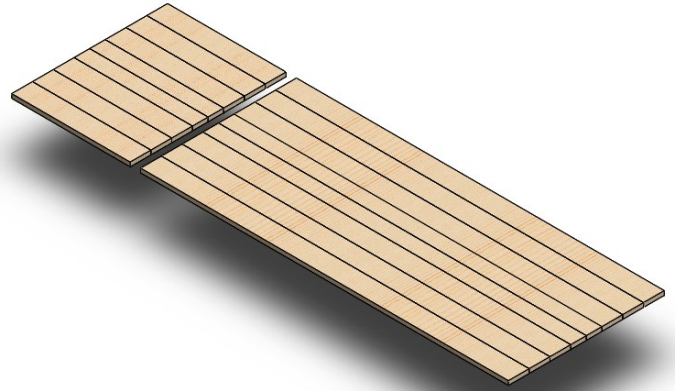


DECK BOARD SIZING

Board (type)	16-TU	16-TUS (5+16)	16-TUS (6.5+16)	18-TUS (5+16)
2X10X177"	6	6	6	6
2X7.5X177"	2	2	2	2
2X10X57"	-	6	-	6
2X7.5X57"	-	2	-	2
2X10X76.7"	-	-	6	-
2X7.5X76.7"	-	-	2	-

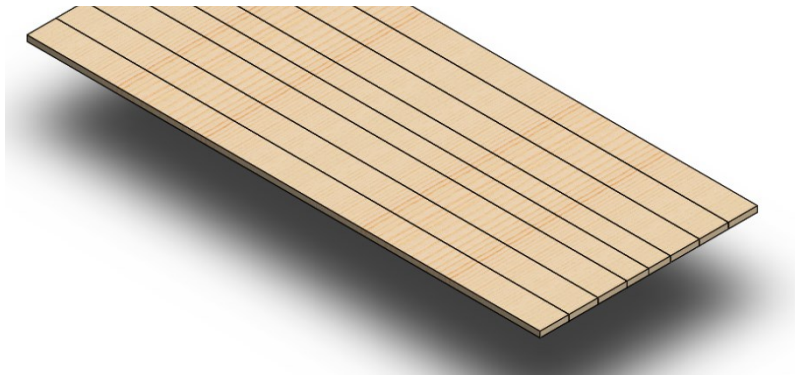


3: 16-TUS (6+16) Deck



5: 16-TUS (4+16) & 18-TUS (4+16) Stationary Deck

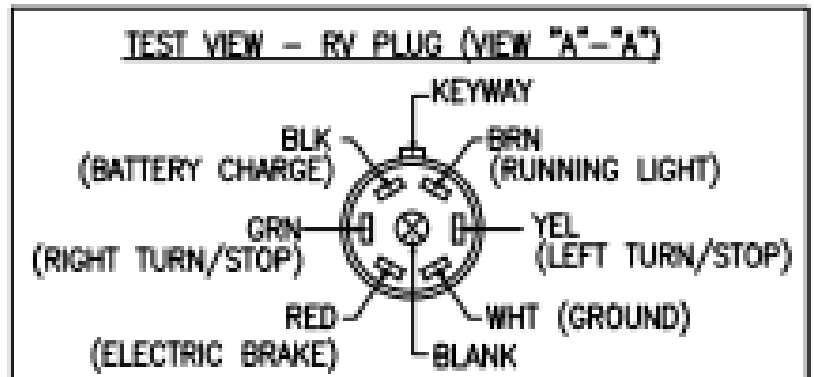
4: 16-TUS (6+16) Deck



1: 16-TU Deck

2: 16-TU Deck

ELECTRICAL PLUGS



CALL FOR MORE INFORMATION ON TROUBLESHOOTING AND/OR REPLACEMENT ELECTRONICS

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