



OPERATIONS MANUAL

XL MFG

XL Mechanical Full-width Gooseneck



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GENERAL INFORMATION SHEET

MODEL TYPE: _____ MFG
VIN #: _____

TRAILER CAPACITY: DIST: _____ LBS
CONC: _____ LBS IN _____ FT

DIMENSIONS: OAL: _____
OAW: _____

DATE: _____

INSPECTED BY: _____

REPORTING SAFETY DEFECTS

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

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 any individual problems between you, your dealer or XL Specialized Trailers.

To contact NHTSA you may either call the Vehicle Safety Hotline toll-free at 1-800-327-4236 or write to:

Administrator, NHTSA
400 Seventh Street SW
Washington, DC 20590

You can obtain other information about motor vehicle safety from www.safercar.gov.

XL MFG
SAFE OPERATION and
PROCEDURES

XL MFG

SAFE TRAILER OPERATION/PRECAUTIONS



OPERATOR'S RESPONSIBILITY: MOST ACCIDENTS OCCUR BECAUSE OF NEGLIGENCE OR CARELESSNESS. AVOID NEEDLESS ACCIDENTS BY FOLLOWING ALL OF THE SAFETY PRECAUTIONS LISTED BELOW.

THE USER IS RESPONSIBLE FOR INSPECTING THEIR TRAILER AND FOR HAVING PARTS REPAIRED OR REPLACED WHEN CONTINUED USE OF THE PRODUCT WOULD CAUSE DAMAGE OR EXCESSIVE WEAR TO OTHER PARTS. IT IS THE USER'S RESPONSIBILITY TO DELIVER HIS TRAILER TO A X-L DEALER FOR SERVICE OR REPLACEMENT OF DEFECTIVE PARTS, WHICH ARE COVERED BY THE STANDARD WARRANTY. IT IS THE RESPONSIBILITY OF THE USER TO READ THE OPERATION MANUAL AND UNDERSTAND THE SAFE AND CORRECT OPERATING PROCEDURES AS PERTAINS TO THE OPERATION OF THE PRODUCT, AND TO LUBRICATE AND MAINTAIN THE PRODUCT ACCORDING TO THE MAINTENANCE SCHEDULE IN THE SERVICE MANUAL.

1. When performing adjustments or maintenance on a trailer, first lower it to the ground or block it securely at a workable height.
2. Detach the trailer in a safe area.
3. Flags or other warning devices should be used when parked with over width loads.
4. Loose fitting clothing should not be worn, to avoid catching on various parts.
5. Equipment should only be operated by those who are authorized to do so.
6. Make certain everyone is in the clear before starting, raising, or lowering the trailer if the unit is designed to do so.
7. Reduce speed on hillsides or curves so there is less danger of tipping.
8. Avoid driving too close to the edge of ditches or creeks.
9. Stop the engine, lock the brakes, and remove the ignition key before dismounting from the tractor.
10. A first aid kit should be provided for immediate treatment of all scratches, cuts, etc.
11. Never stand between tractor and trailer while tractor is being backed up to trailer hitch.
12. Do not transport wide loads on public roads without proper reflectors. Wide load and slow-moving vehicle emblems must be used in daylight and have approved warning light at night and other periods of poor visibility.
13. Observe all laws and regulations while transporting on public roads. Check the local highway regulations.

14. Carefully maintain control of equipment at all times when traveling on the highway.
15. Due to the width and height of some equipment, use extra caution on highways, farm roads, and when approaching bridges, overpasses, and underpasses.

1.0 INTRODUCTION:

- 1.1 Tractor and low bed or heavy duty platform trailer combinations may have different operational characteristics than typical tractor-trailer combinations due to gross weights, large differences between loaded and unloaded weights, suspension characteristics, and articulation.
- 1.2 Tractor and truck trailer combinations have safe operating limits just as automobiles, trains, and airplanes have operating limits. 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 defensive driving techniques should result in safer driving.

2.0 PURPOSE:

- 2.1 The purpose of this chapter is to describe how tractor and truck trailer control and stability limits are affected by the vehicle characteristics, maintenance, roadway, weather, and driver operation and how to compensate for these factors. Knowledge of these factors will assist operators in productive use of this equipment.
- 2.2 The information in this bulletin has been gathered from a number of research reports and accident summaries. These sources of information are referenced in the Bibliography at the end of this manual.
- 2.3 First and foremost, DO NOT operate the trailer until you have read and you fully understand the instruction and operating manual supplied to you by the manufacturer of the trailer. It is also important that each and every person who operates the trailer and/or is responsible for the loading and operating of the trailer be given the opportunity to read the manuals.

3.0 PRE-TRIP INSPECTION:

There are some items on every vehicle combination that can be and should be inspected prior to every trip that require no special knowledge, training, or sophisticated equipment.

- 3.1 **BRAKES**
Function test. Operate the brake pedal and hand control valve to determine if air is being supplied to the brake chambers. Use an observer or place marks on push rods to determine if the brakes are

operating. Visually inspect the brake chambers and slack adjusters for problems caused by road hazards.

Keeping brakes in proper adjustment is imperative to stable, straight line braking and maintaining minimum stopping distances. Visually inspect the air brake hoses and glad-hands to determine if air loss is occurring. Air leaks can reduce braking capability. Anti-lock devices, if provided, should be maintained and inspected routinely. Their use can prevent wheel lock-up, improve stopping capability and reduce the probability of jackknife.

3.1.1 Automatic Slack Adjusters

As automatic slack adjusters become more widely used, it is important to point out that they do require periodic maintenance. Primarily, they should be greased at specific intervals. When they are being serviced, they should be checked for proper operation by checking the brake adjustment.

3.2 TIRES AND WHEELS

Many operators use a tire billy to check air in tires, but the purchase of a good tire gauge would eliminate the guessing. Before moving the trailer, check the air pressure in the tires as a drop of 10 PSI in the tire pressure can reduce the carrying capacity of the tire by as much as 20% on certain tires. This reduced capacity could cause tire failure and loss of control of the trailer. Low tire pressure also is the main cause of poor tire life which can be very costly.

At the same time tires are checked, inspect wheels for cracks around the lugs. These can be observed in most cases by rust lines. These wheels should be replaced immediately.

There is no reason for any set of duals to be wobbling on any vehicle or tractor trailer combination. Installing duals with proper shop techniques will result in wheels running true. The result is increased tire mileage, smoother ride, and less stress on structural components, all providing a safer vehicle.

3.3 TOWING DEVICES AND SUSPENSION

Be sure the fifth wheel is locked to the king pin before pulling away. Visual inspection of the locking device is better than relying solely on applying air to the trailer brakes, and jerking against the king pin.

Inspect fifth wheel mountings for any tell-tale sign of failure or damage to load bearing components. Inspect the pintle hooks, lunette eyes, and drawbars on connector dollies by visually observing them for any

unusual appearances such as bent members, cracks in welds, or chipped paint where structural members have received high load.

Inspect the suspensions by observing if the vehicle is leaning to one side, which may indicate a broken spring or faulty air valve on air suspensions. Visually inspect radius arms to be sure they are in place and look at the spring hangers to see if springs are in the hangers and that the hangers are not bent or otherwise damaged.

3.4 FRAME

Before beginning any trip, make a thorough inspection of the trailer for cracks in the structure. Typical locations of cracks are at welds, at changes in beam depths, above suspension components, and at the upper coupler. Experience may also indicate other areas that need to be checked.

3.5 SAFETY CHAINS

Check all safety chains and their attachment to both the towed and the towing vehicle. Make certain the chains are of adequate size and are in good condition. Also make certain that all attachment devices are properly installed and all nuts are tight.

3.6 STATE LAWS

Before any trip to an area where you are not accustomed to traveling, check the state laws with regard to bridge requirements, especially if the trailer being towed has liftable axles.

3.7 DRIVER SAFETY

Be cautious when climbing on and off the trailer. If trailer is dirty, snow covered or wet, the top of trailer can be extremely slippery, and could cause injury.

4.0 LOADING TRAILER AND HAULING LOAD:

4.1 LOAD

Vehicle handling limits can be greatly affected by the weight of a load, its placement, the amount of weight distributed over the tractor axles, and whether or not the load is secured properly.

Overloading a vehicle should never be permitted. Overloads result in tire blowouts, spring breakage, frame breakage, insufficient braking capacity and will severely alter a vehicle's handling characteristics. All vehicles are designed with a maximum load capability and to best

utilize these vehicles in the safest manner, the loads as shown on the certification label should not be exceeded.

One of the major contributing factors to vehicle rollover is a high center of gravity on tall loads. Extreme caution should be used in maneuvering a vehicle, tractor trailer combination, or any unit that has a tall load. This can be done by reducing speed.

Fifth wheel placement on tractors can have an adverse effect on handling characteristics. Avoid moving the fifth wheel behind the centerline of the tandem on the tractor in an attempt to improve the ride. The result will be reduced steering load and loss of steering control. (3,4) Steering control is affected also if the fifth wheel is placed too far forward, since this position places too much weight on the front axle. There are proper ways and positions for utilizing adjustable fifth wheels and their misuse can have adverse effects as has been outlined. The most common operating range is 0 to 24 inches ahead of center of tandem or tridem.

Proper position of a load relative to the trailer wheelbase will greatly enhance handling characteristics. For instance, positioning the load to distribute the weight proportionately over the axles of the combination in a fore and aft location as well as balancing the load in a side to side position will enhance directional control, roll stability and braking.

When tying down the load on the trailer, always be sure that you have adequate strength chains. This is to prevent a failure of the chains under severe stress due to sudden stops or quick changes in direction. Many accidents are caused by shifting loads. Always be sure that the equipment is securely tied down on the trailer. Because rubber tied equipment is sometimes difficult to secure to the trailer, chock blocks ahead of and behind the tires is a good safety practice.

When tying down steel coils, refer to the Specialized Carriers and Rigging Association's information on steel securement and Federal Motor Carrier Safety Regulation requirement as specified in 49 CFR 393.100 (5,6,7). Also refer to TTMA TB 94 for more information.

4.2 AXLE LOADS

Check axle loads against the GVWR and the GAWR of the power vehicle and the trailer to insure that loading is within the limits of the vehicles being used.



CAUTION:

IMPROPER LOAD PLACEMENT CAN HAVE A DETRIMENTAL EFFECT ON BRAKING, EVASIVE MANEUVERS, AND HANDLING CHARACTERISTICS OF A VEHICLE COMBINATION TRUCK TRAILER OR COMBINATION TRACTOR TRAILER.

4.3 ROAD SURFACE

Uneven terrain, steep grades and crowned roads, especially rural roadways, freeways, exit ramps, curves, bumps and depressions introduce forces into a tractor 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 certain roadway characteristics are combined.

4.3.1 GRADES

Trucks are more likely to have accidents on grades than on level terrain. Rural non-freeways have the worst grade accident experience, particularly downgrades. Further, the steeper downgrades have the greatest accident frequency. (8)

On a downgrade, the force of gravity works against the driver in maintaining control of his vehicle, particularly if the road is covered with rain, snow, ice, or loose material. On upgrades, the problem is spinning out due to insufficient traction at the drive wheels, particularly on snow and ice.

Failure to control speed by down shifting has resulted in 6% of the interstate truck accidents. (9) Drivers should use the same gear in descending a long grade as they would in climbing it. Gear selection should be made before descending a grade to minimize the chance of missing a shift. (10)

Great care must be taken to avoid excessive use of brakes on long downgrades, as over-heated brakes are dangerously inefficient. Drivers should use engine compression as the principal means of controlling speed on long grades. (10) Unless the road is slippery, the brakes should not be fanned (alternately applied and released) since fanning brakes on a long downhill grade may reduce air pressure below the minimum pressure needed for proper brake operation. (10)

If the low air pressure warning device operates at any time, drivers must stop immediately in the safest available place and correct the loss of air pressure before proceeding.

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 tractor brakes alone will not be able to stop the combination by themselves. Only by downshifting and using all brakes can the brake temperatures be held to a safe level.

4.3.2 EXIT AND ENTRANCE RAMPS

Sixteen (16%) percent of tractor semi-trailer overturns occur at exit and entrance ramps of super highways. (11) All exit ramps are not uniform in curvature and banking and may not have a speed advisory sign proper for all truck and load combinations. Recent information indicates that jackknifing can occur without brakes being applied if a tractor semi-trailer enters a curved exit ramp at a too high rate of speed. (4)

4.3.3 LEVEL, STRAIGHT ROADS

Many overturns appear to occur due to the driver falling asleep and driving off the pavement. A high crowned road, coupled with excessive speed, can cause trailer sway and loss of stability. Driver attentiveness is essential.

4.3.4 BUMPS AND DEPRESSIONS

Driving over a bump or depression in the road surface or running off the pavement and back on can cause the vehicle to sway and result in momentary reduction of lateral friction. Reduced speed and increased driver attentiveness are best deterrents. **VERY LOW VEHICLES CAN BE HUNG UP AT ELEVATED RAILROAD CROSSINGS OR DRIVEWAYS, SO PAY CLOSE ATTENTION TO THE ROAD SURFACE WHEN USING THESE VEHICLES.**

4.3.5 CURVES

The forces trying to roll a vehicle over increase according to the square of the speed and are inversely proportional to the radius of a curve, i.e., the smaller the radius, the greater the force trying to pull the vehicle over. Therefore, the tighter the curve, the slower the speed must be in order to avoid rollover. In order to round a curve without skidding, there must be friction keeping the tire from skidding sideways. However, the tire/road interface can generate only so much friction. Part of the friction is used up

when the tire is accelerating or braking. Thus, accelerating or braking on a curve can reduce the tire side friction and result in a skid. If the trailer tires skid, trailer swing occurs. If the rear tractor tires skid, tractor swing and jackknifing occur.

4.4 WEATHER

A major factor in the causes of accidents is weather. Rain, ice, snow, and high winds can each contribute significantly to an accident when combined with excessive speed, sudden lane changes, or other factors that put lateral forces into a tractor trailer combination.

Slippery roads can increase stopping distances and reduce the ability of a vehicle to perform maneuvers. (12) However, a study has shown that drivers often do not reduce their speed when the pavement is slippery and thus exceed the stopping and maneuvering limits of their vehicle. (13)

A tire's friction must be shared between friction required for braking or accelerating and that required to keep from skidding sideways. When the road is wet, the available tire/road friction may be half that of a dry road. If hard braking or rapid acceleration occurs, there may be little or no friction available to prevent tire lateral movement and skidding results. Many tractors have the capability to rapidly accelerate when coming off a ramp or curve. If this is done on slippery pavement, skidding may occur. On icy roads it is important to avoid deceleration, which can lock up the drive wheels. Avoid backing off the throttle suddenly, down shifting, or use of any engine retarder brake. Sudden deceleration may result in the trailer pushing the tractor around. (12,14)

Properly inflated tires get the best traction on icy roads. Don't attempt to let air out of the tires to gain traction. On ice, proper selection of drive wheel tires can make a 20 percent improvement in traction. Single reinforced chains can increase that traction by 500 percent. The interaxle lock should be used to avoid wheel spin. (14) Cross winds at bridges and near large structures such as grain elevators and passing trucks and buses may cause vehicle sway and sideways movement sufficient to push the combination off a slippery road.

4.4.1 HYDROPLANING

As a result of recent studies (15,16), the National Transportation Safety Board has concluded drivers of heavy trucks need to be made aware of the dangers of hydroplaning in wet weather. Hydroplaning occurs when water on the road builds up under the tires and literally lifts them clear of the pavement. Major contributing factors are: (1) excessive speed; (2) inadequate

tread depth, which reduces the dispersion of water between the tire and roadway; and (3) under-inflation, which results in deformation of the tread permitting water buildup. (17)

The Board recommends tires be replaced at a tread depth of 4/32 inch for high-speed operation on wet pavement. Above all, drivers should be made aware hydroplaning can affect large trucks and combinations, and the surest means of prevention is reduced speed on wet pavement. (17)



ATTENTION:

THESE ITEMS MENTIONED ARE VERY BASIC TO VEHICLE SAFETY AND ARE ITEMS INSPECTED BY STATE AGENCIES. FOR THE PURPOSE OF THIS DOCUMENT, ATTENTION IS CALLED TO THEM RELATIVE TO A VEHICLE'S STABILITY AND ITS ABILITY TO PERFORM CERTAIN EVASIVE MANEUVERS SAFELY. THE USE OF THESE WILL BY NO MEANS REPLACE A PROPER MAINTENANCE AND PREVENTIVE MAINTENANCE PROGRAM.

4.5 JACKKNIFE

When the tractor's rear wheels are locked up, a jackknife results in the tractor rotating through about 120 degrees in one to two seconds until the cab strikes the trailer. (9) In severe cornering maneuvers, such as exiting a ramp at high speed, a directional instability may occur without tractor rear wheel lockup. This also results in a jackknife motion although the rotational rate is lower than that of a drive axle lockup jackknife. (4)

A jackknife can be prevented by avoiding rapid acceleration and deceleration, by reducing speed on curves, and by controlled braking to avoid wheel lockup. Rolling wheels are necessary to keep control. When brakes are on, they slow the vehicle. When the brakes are off, steering control is maintained. Anti-lock devices automatically fan the brakes. (14) However, most vehicles built before 1975 and after 1979 have not been equipped with anti-lock and therefore fanning the brakes is the best method of avoiding wheel lockup. Brakes should not be fanned except on slippery pavement where this type of braking gives better control, reduces danger of skidding and gives a shorter stop. Fanning reduces air pressure and serves no useful purpose on dry pavement. (10)

Tests have shown that a driver cannot recover from a jackknife when the angle between tractor and trailer is greater than 15 degrees unless the tractor is equipped with front wheel drive. (14,18)

Vertical hinged-steering and the load divider dolly rear steering trailer combinations are subject to some decrease in roll stability while turning. This is because the rear most axles are swung inboard during a turn, decreasing their contribution to roll resistance. The tighter the turn, the less roll resistance.

This decrease in roll stability is normally very slight and without consequence. However, accidents can occur due to an accumulation of minor negative factors which singly are of no great consequence. Other factors which may contribute to loss of roll stability are:

- A. High center-of-gravity
- B. High speed turns
- C. Side slopes, or super elevations in turns
- D. Emergency braking while turning sharply or during high speed turns

The prudent operator should avoid conditions where several of these factors are combined. The factor under greatest control by the operator is the vehicle's speed.

5.0 VEHICLE:

5.1 Tractor and truck trailer combinations are designed to provide maximum directional control and roll stability within the constraints of highway size and weight limits and utility. Any combination can be rolled over by driving too fast around a curve, making too abrupt a maneuver, or by leaving the roadway. Locking up the wheels on an axle of a combination can result in a jackknife or trailer swing out.

5.2 Some truck trailer combinations are less resistant to roll during an abrupt lane change due to a "whipping action". The opposite is the case for the tractor semi-trailer combination, which is relatively more roll resistant in abrupt lane changes (the long wheelbase tends to stabilize the combination compared to a steady turning maneuver). (1)

5.3 Long wheel base, multi-axle trailers with spread/steering axles present new operational concerns. The rear steering found on these rigs dramatically affects performance and must be taken into account.

6.0 MAINTENANCE

See XL Specialized Trailers Maintenance Manual

7.0 THE DRIVER

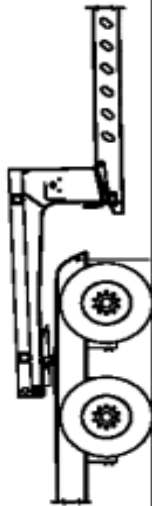
- 7.1 The driver can compensate for the characteristics and condition of his vehicle, for the road conditions and weather.
- 7.2 Either braking or accelerating while cornering can significantly reduce the controllability and stability of the vehicle and should be avoided. The best driving practice is to decelerate to a safe conservative speed before entering a corner or approaching congested traffic and then apply only moderate power until an essential straight path has been established.
- 7.3 It is imperative that a safe speed always be maintained. The safe speed is that speed at which control can be maintained over the vehicle at all times. This speed will 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. This speed will vary from one combination of vehicle to another and takes into consideration such factors as road conditions, weather, traffic, visibility, type of load, and experience of the driver.

XL MFG

OPERATING INSTRUCTIONS

DETACH INSTRUCTIONS FOR MECHANICAL DETACHABLE TRAILERS

GOOSENECK REMOVAL:
 1. STOP TRACTOR AND TRAILER ON LEVEL GROUND.
 2. SET TRAILER BRAKES.
 3. UNLOCK 5TH WHEEL.



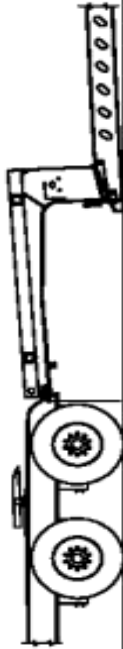
4. BACK TRACTOR UNDER GOOSENECK UNTIL 5TH WHEEL ENGAGES PIN.
 5. RETRACT STINGER SAFETY PIN HAND RELEASE LOCATED ON DRIVERS SIDE, FRONT OF TRAILER.
 10. PLACE 4" X 4" BLOCK BETWEEN GOOSENECK AND LOADING RAMP'S OF TRACTOR.



DETACH GOOSENECK:
 1. RELEASE STINGER SAFETY PINS WITH HAND RELEASE.
 (AUTOMATICALLY RELEASE WHEN STINGER ENGAGES WITH TRIGGER MECHANISM)
 2. BACK TRACTOR TO TRAILER.
 (GOOSENECK SELF-CLOCKS AND TRIGGER SAFETY IN LOCKS)
 3. REMOVE 4" X 4" BLOCK AND RELEASE 5TH WHEEL.



4. DETACH TRUCK.
 5. DETACH SAFETY CLIPS.
 6. SLIDE HANGERS FORWARD AWAY FROM TRAILER.
 7. DISCONNECT AIR AND ELECTRICAL LINES BETWEEN GOOSENECK AND TRAILER.



11. DRIVE TRACTOR FORWARD REMOVING GOOSENECK.

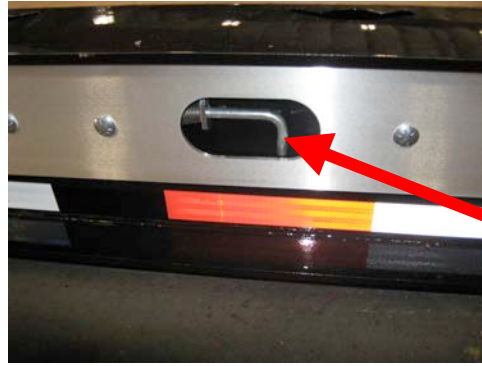


4. DRIVE TRACTOR FORWARD UNTIL NECK IS CLEAR FROM LOADING RAMP'S.
 5. SLIDE HANGERS BACK TO TRAILER AND REPLACE SAFETY CLIPS.
 6. REATTACH AIR AND ELECTRICAL CONNECTIONS.

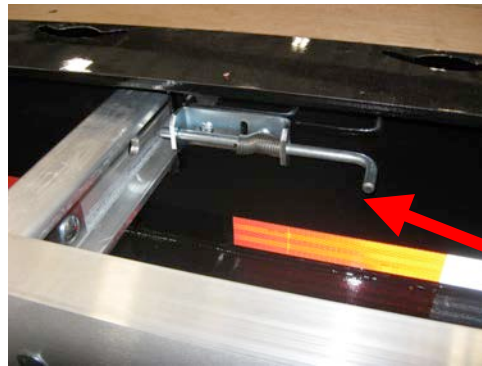


Aluminum Pullout Operation

1. Reach into oval hole in outer channel to access lock pin.



2. Pull out pin and rotate 90° clockwise to lock in bracket.

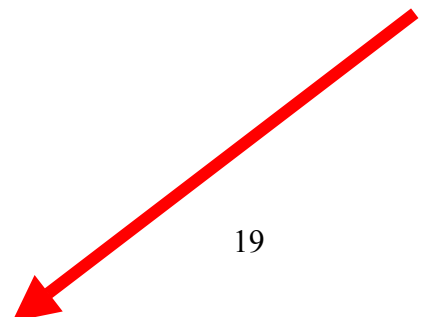


3. Pull outrigger out to desired lock hole.



Main Deck Securement Options

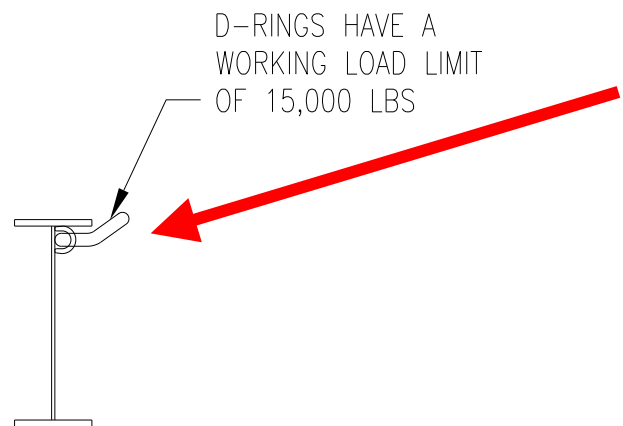
The d-rings equipped on HDG style trailers, are vital to securing the



load on trailer.

To use d-ring:

1. Wrap chain or hook on d-ring
2. Secure other end of chain to load



Alongside d-rings, optional chain drops in the main deck allow additional securement, giving the user a full range of options to secure load properly

To use chain drop:

1. Slide a link of chain into slot, on either side
2. Secure other end of chain to load

