

Owner's Manual Work Ready Trailers

Rev 4

Toll Free 1-877-533-3133 www.brandt.ca

A WARNING

WARNING! This Owner's Manual contains safety information and instructions for your trailer.

You must read this manual before loading or towing your trailer.

You must follow all safety precautions and instructions.

Work Ready Trailers

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CHAPTER 1 Introduction

This manual is for use with Brandt Industries Ltd. Work Ready Trailers. Safe and efficient operation of your trailer requires that anyone who will inspect and operate this machine read and understand the information included in this manual. A person that is not trained and has not read this manual is not qualified to operate this machine. Read this manual before proceeding with any inspections or repairs on this machine.

Use the Table of Contents as a guide. Keep all manuals for future use. Contact Brandt Industries Ltd. if you need additional copies of this manual.

1.1 Operator Orientation

The directions left, right, front and rear, as mentioned throughout the manual, are as seen from the tow vehicle driver's seat facing in the direction of travel.

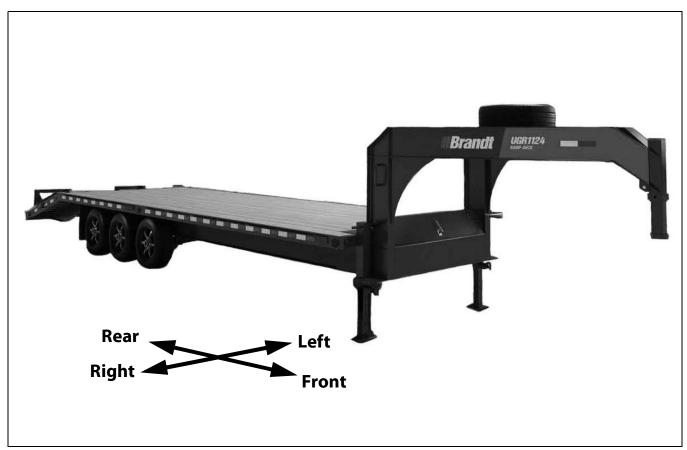


FIG. 1-1. Operator Orientation

1.2 Safety Awareness Sign Off Form

Brandt Equipment Solutions Ltd. follows the general Safety Standards specified by the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the Trailer must read and clearly understand all safety, operating and maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information.

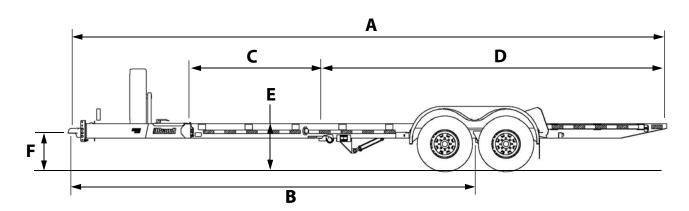
Make these periodic reviews of Safety and Operation a standard practice for all of your equipment. We feel that an untrained operator is unqualified to operate this machine.

A sign off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understood the information in the operator's manual and have been instructed in the operation of the equipment.

TABLE 1-1. Sign off Form

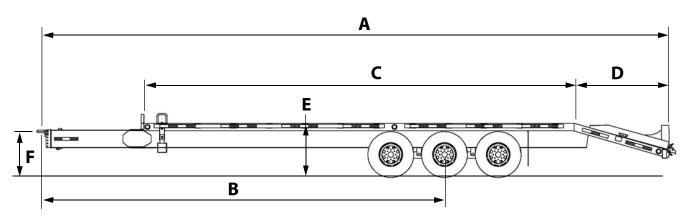
DATE	FULL NAME (PLEASE PRINT)	Signature	EMPLOYER NAME (PLEASE PRINT)	Signature

1.3 General Specifications

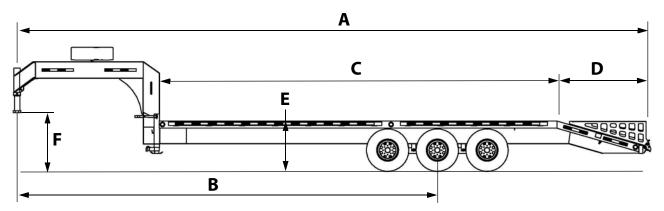


Two Axles Single Wheels

Tilt Deck Trailer Specifications					
UBT620 UBT822					
GVWR	12000 lbs	16000 lbs			
Payload	9000 lbs	12400 lbs			
A - Overall Length	25' 8"	27' 8"			
B - Wheelbase	16' 9"	18' 9"			
C - Fixed Deck Length	4'	6'			
D - Tilt Deck Length	16'	16'			
E - Deck Height	22 1/2"	25 1/4"			
F - Connection Height	16 3/4" - 24 3/4"	19 1/2" - 25 1/2"			
Deck Width	82" (102" OAW)	82" (102" OAW)			
Deck/Ramp Angle	12 degrees	12 degrees			
Turn Angle	60 degrees	60 degrees			

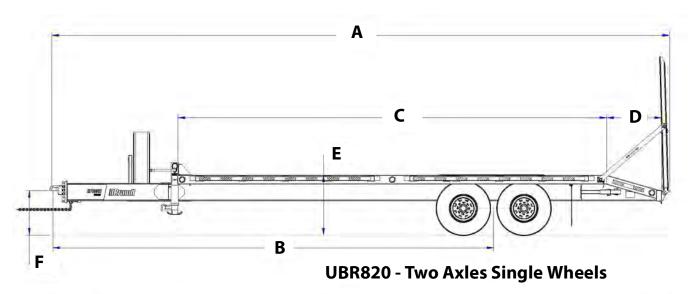


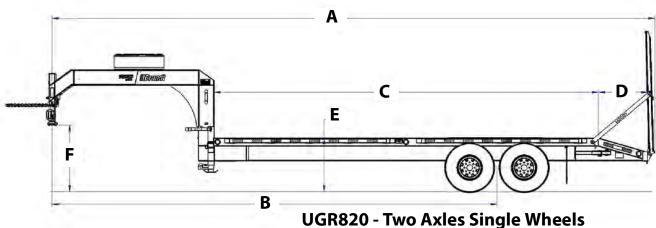
UPR1124 - Three Axles Single Wheels



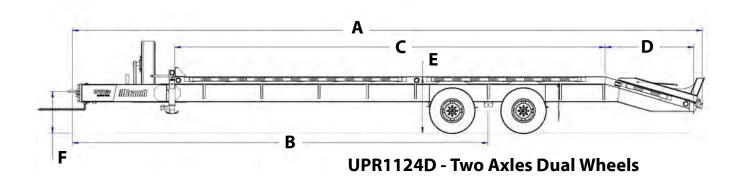
UGR1124 - Three Axles Single Wheels

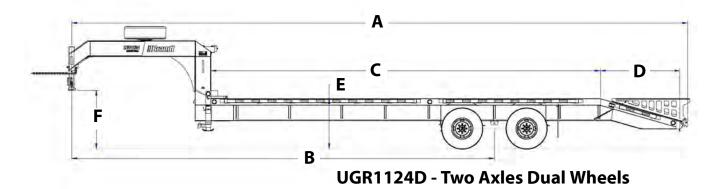
Ramp Deck Trailer Specifications					
UGR1124 UPR112					
GVWR	22000 lbs	22000 lbs			
Payload	15500 lbs	15500 lbs			
A - Overall Length	38'	35' 2"			
B - Wheelbase	25' 4"	22' 8"			
C - Straight Deck Length	24'	24'			
D - Tail Length	5'	5'			
E - Deck Height	35"	35"			
F - Connection Height	33" - 41"	21 1/2" - 29 1/2"			
Deck Width	102"	102"			
Deck/Ramp Angle	15.6 degrees	15.6 degrees			
Turn Angle	90 degrees	60 degrees			



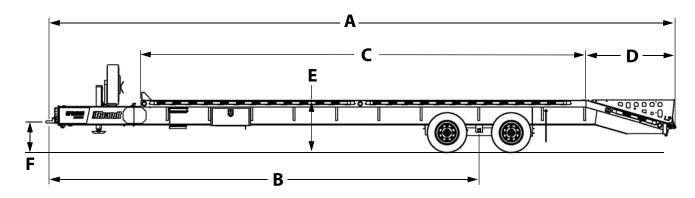


Ramp Deck Trailer Specifications UGR820 UBR820 GVWR 16800 lbs 16000 lbs Payload 12000 lbs 11700 lbs 31' 4" A - Overall Length 28' 10" B - Wheelbase 20' 7" 23' 2" C - Straight Deck Length 20' 20' D - Tail Length 2' 6" 2' 6" E - Deck Height 34" 34" F - Connection Height 33" - 41" 21" - 27" 102" 102" Deck Width Deck/Ramp Angle 16 degrees 16 degrees 90 degrees 60 degrees Turn Angle

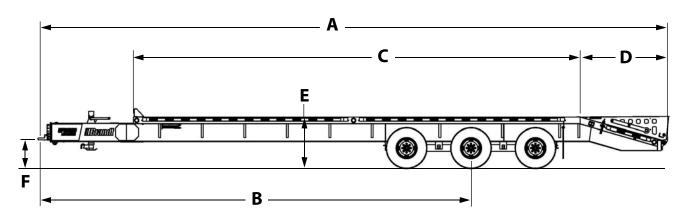




Ramp Deck Trailer Specifications				
UGR1124D UPR1124				
GVWR	22000 lbs	22000 lbs		
Payload	15500 lbs	15700 lbs		
A - Overall Length	38'	35' 2"		
B - Wheelbase	26' 1"	23' 2"		
C - Straight Deck Length	24'	24'		
D - Tail Length	5'	5'		
E - Deck Height	38"	38"		
F - Connection Height	35" - 43"	23" - 31"		
Deck Width	102"	102"		
Deck/Ramp Angle	15.6 degrees	15.6 degrees		
Turn Angle	90 degrees	60 degrees		

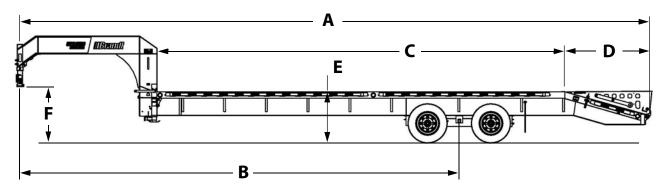


UPR1628 Platinum - Two Axles Dual Wheels



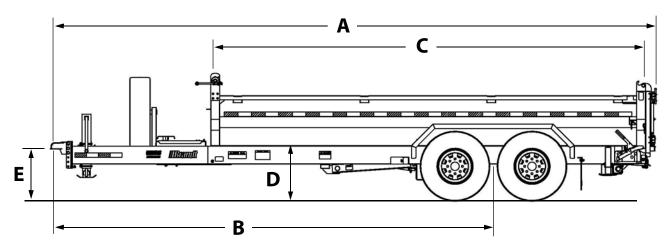
UPR1628 Performance - Three Axles Dual Wheels

Ramp Deck Trailer Specifications				
	UPR1628 Performance UPR1628 Platinum			
GVWR	32000 lbs	32000 lbs		
Payload	23300 lbs	23200 lbs		
A - Overall Length	39' 6"	39' 6"		
B - Wheelbase	27' 1"	27' 1"		
C - Straight Deck Length	28' 0"	28' 0"		
D - Tail Length	5' 1"	5' 1"		
E - Deck Height	38"	38"		
F - Connection Height	22" - 31"	22" - 31"		
Deck Width	102"	102"		
Deck/Ramp Angle	16 degrees	16 degrees		
Turn Angle	60 degrees	60 degrees		

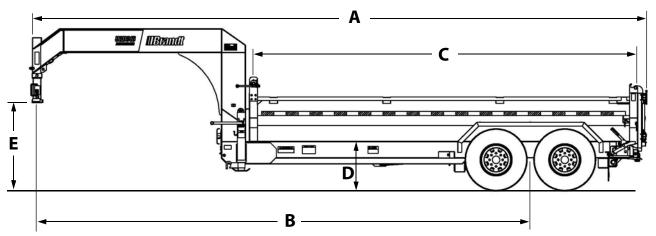


UGR1526 - Two Axles Dual Wheels

Ramp Deck Trailer Specifications			
	UGR1526		
GVWR	30000 lbs		
Payload	21100 lbs		
A - Overall Length	40' 6"		
B - Wheelbase	28' 0"		
C - Straight Deck Length	26' 0"		
D - Tail Length	5' 1"		
E - Deck Height	40"		
F - Connection Height	35" - 43"		
Dook Width	400"		
Deck Width	102"		
Deck/Ramp Angle	16 degrees		
Turn Angle	90 degrees		



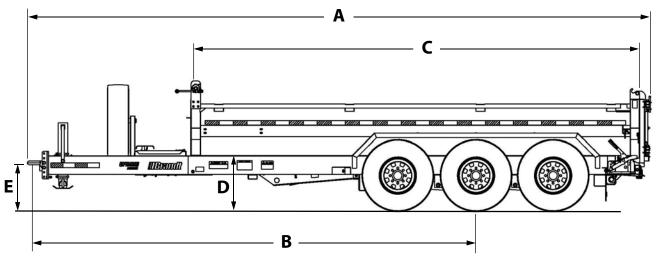
UBD814 & UBD816 - Two Axles Single Wheels



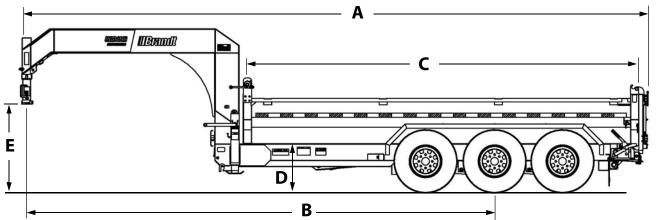
UGD814 & UGD816 - Two Axles Single Wheels

Tandem Axle Dump Trailer Specifications						
	UBD814	UBD816	UGD814	UGD816		
GVWR	16000 lbs	16000 lbs	17500 lbs	17500 lbs		
Payload	10900 lbs	10500 lbs	11600 lbs	11200 lbs		
A - Overall length	20' 2"	22' 3"	23' 4"	25' 4"		
B - Wheelbase	15' 4"	16' 2"	18' 4"	20' 4"		
C - Box Length	14' 0"	16' 0"	14' 0"	16" 0"		
D - Box Height - Wide Body	22"	22"	22"	22"		
D - Box Height - Straight Body	18 1/2"	18 1/2"	18 1/2"	18 1/2"		
E - Connection Height	17" - 26"	17" - 26"	34" - 42"	34" - 42"		
Box Width	82"	82"	82"	82"		
Max. Box Dump Angle	45 degrees	40 degrees	45 degrees	45 degrees		
Turn Angle	60 degrees	60 degrees	90 degrees	90 degrees		

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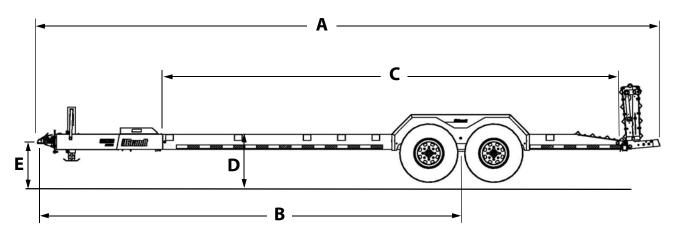
UPD1116 - Three Axles Single Wheels



UGD1116 - Three Axles Single Wheels

Tridem Axle Dump Trailer Specifications

	UPD1116	UGD1116
GVWR	22000 lbs	22000 lbs
Payload	15800 lbs	15300 lbs
A - Overall length	22' 3"	25' 4"
B - Wheelbase	15' 9"	18' 11"
C - Box Length	16' 0"	16' 0"
D - Box Height - Wide Body	24"	24"
D - Box Height - Straight Body	18 1/2"	18 1/2"
E - Connection Height	16" - 24"	34" - 42"
Box Width	82"	82"
Max. Box Dump Angle	45 degrees	45 degrees
Turn Angle	60 degrees	90 degrees



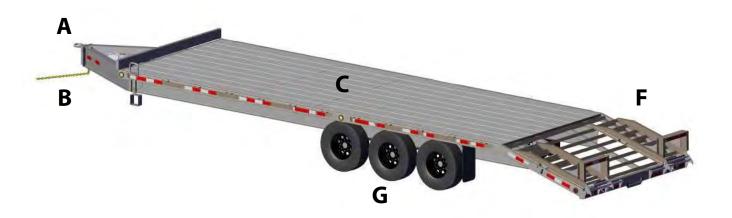
UBE518 - Two Axles Single Wheels UBE720 - Two Axles Single Wheels

Equipment Trailer Specifications		
	UBE518	UBE720
GVWR	9900 lbs	14900 lbs
Payload	7042 lbs	11242 lbs
A - Overall Length	24' 2"	27' 2"
B - Wheelbase	16' 5"	18' 4"
C - Straight Deck Length	18' 3"	20' 3"
D - Deck Height	21"	22"
E - Connection Height	16" - 24"	17" - 25"
Deck Width	81 3/4"	81 3/4"
Deck/Ramp Angle	15 degrees	13 degrees
Turn Angle	60 degrees	60 degrees

1.4 Description and Location of Major Components



Tilt Deck Trailers



Fixed Deck Trailers

A - Hitch Coupler B - Safety Chains C- Fixed Deck D- Tilt Deck E- Latch F- Ramps G - Tires and Wheels

FIG. 1-2. Major Components - Flat Deck Trailers





FIG. 1-3. Major Components - Dump Trailers

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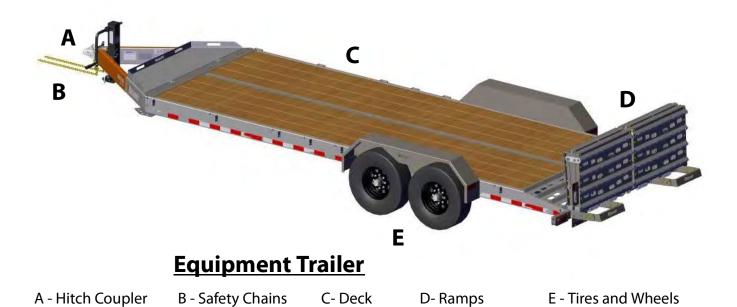


FIG. 1-4. Major Components - Equipment Trailers

CHAPTER 2 Important Safety Information

It is your responsibility as an owner, operator or supervisor to know what specific requirements, precautions and work hazards exist. It is also your responsibility to make these known to all other personnel working with the equipment or in the area, so that they too may take any necessary safety precautions that may be required.

You are responsible for the safe operation and maintenance of this equipment. Make sure that all persons who operate, maintain or work near this equipment know the contents of this manual.

You are the key to safety. These safety precautions protect you and the people near you. Include these precautions in your safety program. Accidents can be prevented.

THINK SAFETY

WORK SAFELY

2.1 Safety Symbols / Signal Words

2.1.1 Recognizing Safety Information



This is the Safety Alert Symbol. It is used to alert you to injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

2.1.2 Understanding Signal Words

A signal word – DANGER, WARNING or CAUTION – is used with the Safety Alert Symbol.



DANGER! Is reserved for a hazard that, if not avoided, will result in death or serious injury.



WARNING! Indicates a hazard that, if not avoided, could result in death or serious injury.



Caution. Shows a hazard that, if not avoided, could result in injury.

NOTICE

Notice. Indicates that your heightened awareness is required to avoid practices not related to personal injury.

These safety signs include a message that tells what the hazard is, and the steps to avoid the hazard.

2.1.3 Safety Messages / Decals

Different safety messages are displayed on this equipment. Locate, read, and understand the safety messages. The DANGER, WARNING, CAUTION or NOTICE symbol can be shown with a safety message.

These messages mean:



Note: Some of these messages will not be used on this product. They are shown for example only.

NOTICE

Notice. Replace safety signs when they become damaged. Make sure to include safety signs on replacement parts. New safety signs are available from Brandt Industries Ltd.

2.2 General Safety Precautions

- THE MOST IMPORTANT SAFETY DEVICE ON THIS MACHINE IS A SAFE OPERATOR. It is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow them.
- Trailer owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes them self and bystanders to possible serious injury or death.
- Read and understand the Operator's manual and all safety signs before coupling to, loading and unloading, operating or maintaining the Trailer.
- Keep the trailer and the area around the trailer clean.
- Do not perform unauthorized modifications to this trailer.
- Make and follow an approved maintenance and inspection schedule.
- Do not remove, change, or disable machine guards.
- Correct malfunctions and preform repairs immediately on discovery.
- Do not replace fasteners, or hardware, or mechanical connectors with a different or unknown grade or type. Torque fasteners and hardware to the correct value.
- Do not overload or exceed the trailer capacity. Do not operate the trailer at speeds that exceed the designed ratings.
- Use tools applicable to the work. Use power tools to loosen threaded fasteners only. Do not use SAE tools on SI (metric) fasteners.
- Use the correct lifting equipment for moving heavy parts. Follow recommended procedures for removal and installation of parts.
- Keep the area clear of bystanders, especially children.
- Have a first-aid kit available for use should the need arise and know how to use it.
- Provide a fire extinguisher for use in case of a fire. **Store in a highly visible place.**
- Do not allow riders on the trailer.
- Uncouple the trailer from the tow vehicle and ensure the trailer is immobilized prior to servicing, adjusting and repairing the trailer.
- Know the height of your load. Ensure clearance to electrical lines and other structures. Electrocution can occur without direct contact.
- Know the location and read all decals on the machine. They contain important alerts and precautions which are to be followed at all times.

2.3 Major Hazards

Loss of control of the trailer or trailer/tow vehicle combination can result in death or serious injury. The most common causes for loss of control of the trailer are:

- Improper sizing the trailer for the tow vehicle, or vice versa.
- Excessive Speed: Driving too fast for the conditions.
- Failure to adjust driving behavior when towing a trailer.
- Overloading and/or improper weight distribution.
- Improper or mis-coupling of the trailer to the hitch.
- Improper braking and steering under sway conditions.
- Not maintaining proper tire pressure.
- Not keeping lug nuts tight.

2.3.1 Improper Sizing of Trailer to Tow Vehicle

Trailers that weigh too much for the towing vehicle can cause stability problems, which can lead to death or serious injury. Furthermore, the additional strain put on the engine and drive train may lead to serious tow vehicle maintenance problems. For these reasons the maximum towing capacity of your towing vehicle should not be exceeded. The towing capacity of your tow vehicle, in terms of maximum Gross Trailer Weight (GTW) and maximum Gross Combined Weight Rating (GCWR) can be found in the tow vehicles Owner's Manual.



DANGER! Use of a tow vehicle with a towing capacity less than the Gross Vehicle Weight Rating of the trailer can result in loss of control and may lead to death or serious injury. Be sure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your trailer.

2.3.2 Driving Too Fast for the Conditions

With ideal road conditions, the maximum recommended speed for safely towing a trailer is 60 mph (100kph). If you drive too fast, the trailer is more likely to sway, thus increasing the possibility for loss of control. Also your tires may overheat, thus increasing the possibility of a blowout.



WARNING! Driving too fast for conditions can result in loss of control and cause death or serious injury. Decrease your speed when going downhill or as road, weather, and lighting conditions deteriorate.

2.3.3 Adjusting Driving when Towing a Trailer

When towing a trailer, you will have decreased acceleration, increased stopping distance, and increased turning radius (which means you must make wider turns to keep from hitting curbs, vehicles, and anything else that is on the inside corner). Furthermore the trailer will change the handling characteristics of your towing vehicle, making it more sensitive to steering inputs and more likely to be pushed around in windy conditions or when being passed by large vehicles. In addition, you will need a longer distance to pass, due to slower acceleration and increased length. With these caveats in mind:

- Be alert for slippery conditions. You are more likely to be affected by slippery road surfaces when driving a tow vehicle with a trailer, than driving a tow vehicle without a trailer.
- Anticipate the trailer "swaying." Swaying can be caused by excessive steering, wind gusts, roadway edges, or by the trailer reaction to the pressure wave created by passing trucks and buses.
- When encountering trailer sway, take your foot off the gas and steer as little as possible in
 order to stay on the road. Use small "trim-like" steering adjustments. Do not attempt to steer
 out of the sway; you'll only make it worse. Also do not apply the tow vehicle brakes to correct
 trailer swaying. On the other hand, application of the trailer brakes alone will tend to
 straighten out the combination, especially when going downhill.
- Check rear view mirrors frequently to observe the trailer and traffic.
- Use a lower gear when driving down steep or long grades. Use the engine and transmission as a brake.
- Do not ride the brakes, as they can overheat and become ineffective.
- Be aware of your trailer height, especially when approaching electrical lines, bridges, roofed areas and around trees.

2.3.4 Trailer Not Properly Coupled to the Hitch

It is critical that the trailer be securely coupled to the hitch ball, and that the safety chains and emergency break-away brake cable are correctly attached. Uncoupling may result in death or serious injury to you and to others.

WARNING

WARNING! Proper selection and condition of the coupler and hitch are essential to safely towing your trailer. A loss of coupling may result in death or serious injury.

- Be sure the maximum load rating of the hitch on the tow vehicle is equal to or greater than the "GVWR, found on the Statement of Compliance Label".
- Be sure the hitch ball size matches the coupler size.
- Observe the hitch for wear, corrosion and cracks before coupling. Replace worn, corroded or cracked hitch components before coupling the trailer to the tow vehicle.
- Be sure the hitch components are tight before coupling the trailer to the tow vehicle.

A WARNING

WARNING! An improperly coupled trailer can result in death or serious injury. Do not move the trailer until:

- The coupler is secured and locked to the hitch ball.
- The safety chains are secured to the tow vehicle.
- The trailer jack(s) are fully retracted.
- Do not tow the trailer on the road until:
 - Tires and wheels are checked:
 - The trailer brakes are checked;
 - The breakaway switch is connected to the tow vehicle;
 - The load is secured to the trailer; and
 - The trailer lights are connected and checked.

2.3.5 Proper Use of Safety Chains

If your trailer comes loose from the hitch for any reason, we have provided safety chains so that control of the trailer can still be maintained.



WARNING! Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.
- Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

2.3.6 Proper Connection of Breakaway Brake

If equipped with brakes, your trailer will be equipped with a breakaway brake system that can apply the brakes on your trailer if your trailer comes loose from the hitch ball for any reason. You will have a separate set of instructions for the breakaway brake if your trailer is so equipped. The breakaway brake system, including battery, must be in good condition and properly rigged to be effective.



WARNING! An ineffective or inoperative breakaway brake system can result in a runaway trailer, leading to death or serious injury, if the coupler or hitch fails.

- The breakaway cable must be connected to the tow vehicle; and NOT to any part of the hitch.
- Before towing the trailer, test the function of the breakaway brake system. If the breakaway brake system is not working, do not tow the trailer; have it serviced or repaired.
- Make sure the breakaway cable is shorter than the safety chains so the brakes will be activated in the event of an uncoupling.

2.3.7 Matching Trailer and Hitch



DANGER! Be sure hitch and tow vehicle are rated for the Gross Vehicle Weight Rating (GVWR) of your trailer.

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to serious injury or death.

2.3.8 Worn Tires, Loose Wheels and Lug Nuts

Inspect all trailer tires before each tow. If a tire has a bald spot, bulge, cut, cracks, or is showing any cords, replace the tire before towing.

If a tire has uneven tread wear, take the trailer to a trailer service center for diagnosis. Uneven tread wear can be caused by tire imbalance, axle misalignment or incorrect inflation.

Tires with too little tread will not provide adequate frictional forces on wet roadways and can result in loss of control, leading to death or serious injury.

Improper tire pressure causes increased tire wear and may reduce trailer stability, which can result in a tire blowout or possible loss of control. Therefore, before each tow you must also check the tire pressure.

The proper tire pressure is listed on the Certification/ VIN label, normally mounted on the front left side of the trailer, and should be checked when tires are cold. Allow 3 hours cool-down after driving as much as 1.5 km at 60 kph (1mile at 40 mph) before checking tire pressure.



WARNING! Inflate tires to the pressure stated on the Certification / VIN label.

Improper tire pressure may cause an unstable trailer. Blowout and loss of control may occur. Death or serious injury can result.

Make sure of proper tire pressure before towing trailer.

The tightness of the wheel nuts or bolts is very important in keeping the wheels properly seated to the hub. Before each tow, check to make sure they are tight.



WARNING! Metal creep between the wheel rim and wheel nuts or bolts may cause the rim to loosen.

Death or injury can occur if wheel comes off.

Tighten lug nuts or bolts before each tow.

The proper tightness (torque) for wheel nuts or bolts and tightening sequence is listed in the Inspection, Service and Maintenance section of this manual. Use a torque wrench to tighten the lug nuts and use the crisscross star pattern sequence. Improper tightening of the lug nuts voids the axle warranty.

Wheel nuts or bolts are also prone to loosen after first being assembled. When driving a new trailer (or after wheels have been remounted), check to make sure they are tight after the first 16, 40 and 80 km (10, 25 and 50 miles) of driving and before each tow thereafter.

Failure to perform this check can result in a wheel separating from the trailer and a crash, leading to death or serious injury.

WARNING

WARNING! Wheel nuts or bolts are prone to loosen after being first assembled. Death or serious injury can result.

Check wheel nuts or bolts for tightness on a new trailer, and after re-mounting a wheel at 16, 40 and 80 km (10, 25 and 50 miles).

A WARNING

WARNING! Inadequate wheel nut or bolt torque can cause a wheel to separate from the trailer, leading to death or serious injury.

Verify wheel nuts or bolts are tight before each tow.

2.3.9 Improper Loading

The total weight of the load you put on the trailer, plus the empty weight of the trailer itself, must not exceed the trailer's Gross Vehicle Weight Rating (GVWR).

If you do not know the empty weight of the trailer plus the cargo weight, you must weigh the loaded trailer at a commercial scale. In addition, you must distribute the load in the trailer such that the load on any axle does not exceed the Gross Axle Weight Rating (GAWR).

If your trailer is equipped with a Tire & Loading Information Placard, mounted next to the Certification/ VIN label, the cargo capacity weight stated on that placard is only a close estimate. The GVWR and GAWR are listed on the Certification / VIN label normally located on the front left side of the trailer.



WARNING! An overloaded trailer can result in failure or loss of control of the trailer, leading to death or serious injury.

Never load a trailer so that the weight on any tire exceeds its rating.

Never exceed the trailer Gross Vehicle Weight Rating (GVWR) or axle Gross Axle Weight Rating (GAWR).

2.3.10 Unsafe Load Distribution

Improper front/rear load distribution can lead to an unstable trailer or poor tow vehicle handling. Poor trailer stability results from tongue weights that are too low, and poor tow vehicle stability results from tongue weights that are too high.

Refer to the "Loading And Unloading" section for more information.

In the following table, the second column shows the rule of thumb percentage of total weight of the trailer plus its cargo (Gross Trailer Weight, or "GTW") that should appear on the tongue of the trailer. For example, a large trailer with a loaded weight of 6,000 pounds, should have 10-15% of 6,000 pounds (600-900 lbs.) on the hitch.

Tongue Weight as a Percentage of Loaded Trailer Weight		
Type of Hitch	Percentage	
Ball Hitch or Ring and Pintle	10 - 15% for large trailers	
	6 - 10% for small trailers	
Gooseneck Hitch	20 - 25%	

Work Ready Trailers

The numbers quoted are for example purposes only and should be tailored to the specific trailer. For questions regarding the actual percent of tongue weight for the trailer, check with the manufacturer for specifics.

After loading, be sure to check that none of the axles are overloaded.

Uneven left/right load distribution can cause tire, wheel, axle or structural failure. Be sure your trailer is evenly loaded left/right. Towing stability also depends on keeping the center of gravity as low as possible.

Improper tongue weight (load distribution) can result in loss of control of the trailer, leading to death or serious injury.



WARNING! Make certain that tongue weight is within the allowable range.

Be sure to:

- Distribute the load evenly, right and left.
- Keep the center of gravity low.
- Distribute the load front-to-rear to provide proper tongue weight (see chart).

2.3.11 Shifting Cargo

Since the trailer "ride" can be bumpy and rough, you must secure the cargo so that it does not shift while the trailer is being towed.



WARNING! A shifting load can result in failure, or to loss of control of the trailer, and can lead to death or serious injury.

You must tie down all loads with proper sized fasteners, chains, straps, etc. to prevent the load from shifting while towing.

2.3.12 Inappropriate Cargo

The trailer may be designed for specific cargo. If your trailer is designed for specific cargo, only carry that cargo in the trailer. A trailer must not be used to carry certain items, such as people, containers of hazardous substances or containers of flammable substances.



WARNING! Do not transport people on your trailer. Besides putting their lives at risk, the transport of people on a trailer is illegal.

A WARNING

WARNING! Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer.

Exceptions:

- Fuel in the tanks of vehicles that are being towed.
- Fuel stored in the tank of an on-board generator.

2.3.13 Inoperable Brakes, Lights or Mirrors

Be sure that the electric brakes and all of the lights on your trailer are functioning properly before towing your trailer. Electric brakes and lights on a trailer are controlled via a connection to the tow vehicle, generally a multi-pin electrical connector. Check the trailer tail lights by turning on your tow vehicle headlights. Check the trailer brake lights by having someone step on the tow vehicle brake pedal while you look at trailer lights. Do the same thing to check the turn signal lights.

If your trailer has electric brakes, your tow vehicle will have an electric brake controller that sends power to the trailer brakes. Before towing the trailer on the road, you must operate the brake controller while trying to pull the trailer in order to confirm that the electric brakes operate. While towing the trailer at less than 8 kph (5 mph), manually operate the electric brake controller in the tow vehicle cab. You should feel the operation of the trailer brakes.

A WARNING

WARNING! Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the taillights, brake lights and turn signals work.
- Check that the electric brakes work by operating the brake controller inside the tow vehicle.

Work Ready Trailers

If your trailer has hydraulic "surge" brakes, pull the emergency break-away brake lanyard to check the operation of the surge mechanism.

Standard mirrors usually do not provide adequate visibility for viewing traffic to the sides and rear of a towed trailer. You must provide mirrors that allow you to safely observe approaching traffic.

2.3.14 Hazards from Modifying Your Trailer

Essential safety items can be damaged by altering your trailer. Even simply driving a nail or screw to hang something can damage an electrical circuit or other feature of the trailer.

Before making any alteration to your trailer, contact your dealer or Brandt Equipment Solutions Ltd. and describe the alteration you are contemplating. Alteration of the trailer structure or modification of mechanical, electrical or other systems on your trailer must be performed only by qualified technicians who are familiar with the system as installed on your trailer.

2.3.15 Hazards For Dump Trailers

A dump trailer is specifically designed for hauling cargo that is to be dumped or in some cases, transporting equipment. A dump trailer is not designed for transporting livestock. The major hazards associated with dump trailers are:

- Overloading.
- Improper weight distribution; both side to side and front to back.
- Getting under a raised dump body.
- Not using, or improperly using the body prop.
- Modifying or altering hydraulic components.
- Modifying or altering dump controls.
- Not dumping from a solid and level foundation.
- Not fully opening rear doors when dumping.
- Jerking the trailer, or hydraulics, to loosen the load.
- Trailer contacting or coming near overhead power lines when body is raised.



WARNING! A soft and/or uneven surface may cause the tow vehicle and trailer to tip over when the dump body is raised.

Raise the dump body ONLY if the tow vehicle and trailer are both on a firm and level surface.

A WARNING

WARNING! An overloaded trailer or improperly distributed load can result in death or serious injury.

An overloaded trailer can cause the hydraulic system to malfunction, resulting in the dump body falling.

A load that is improperly distributed in the trailer can result in the trailer tipping over when the dump body is raised.

A DANGER

DANGER! NEVER alter or substitute any hydraulic system component. Death or serious injury may result.

An altered or a substituted component in the hydraulic system may malfunction, resulting in the dump body falling without warning.

NEVER alter or substitute any hydraulic system component.

A WARNING

WARNING! Risk of electrocution.

- Dump body coming near or contacting power lines can cause electrocution. Electrocution can occur without contact.
- Be sure there are no overhead power lines over or near the trailer before raising dump body.

2.3.16 Hazards from Accessories

The "Accessories" chapter of this manual contains some information about certain optional accessories that may be on your trailer. Read and follow all of these instructions before operating the accessories.

2.3.17 Trailer Towing Guide

Driving a vehicle with a trailer in tow is vastly different from driving the same vehicle without a trailer in tow. Acceleration, maneuverability and braking are all diminished with a trailer in tow. It takes longer to get up to speed; you need more room to turn and pass, and more distance to stop when towing a trailer. You will need to spend time adjusting to the different feel and maneuverability of the tow vehicle with a loaded trailer. Because of the significant differences in all aspects of maneuverability, when towing a trailer, the hazards and risks of injury are also much greater than when driving without a trailer. You are responsible for keeping your vehicle and trailer in control, and for all the damage that is caused if you lose control of your vehicle and trailer.

As you did when learning to drive an automobile, find an open area with little or no traffic for your first practice trailering. Of course, before you start towing the trailer, you must follow all of the instructions for inspection, testing, loading and coupling. Also, before you start towing, adjust the mirrors so you can see the trailer as well as the area to the rear of it.

Drive slowly at first, 8 kph (5 mph) or so, and turn the wheel to get the feel of how the tow vehicle and trailer combination responds. Next, make some right and left hand turns. Watch in your side mirrors to see how the trailer follows the tow vehicle. Turning with a trailer attached requires more room.

Stop the rig a few times from speeds no greater than 16 kph (10 mph). If your trailer is equipped with brakes, try using different combinations of trailer/electric brake and tow vehicle brake. Note the effect that the trailer brakes have when they are the only brakes used. When properly adjusted, the trailer brakes will come on just before the tow vehicle brakes.

It will take practice to learn how to back up a tow vehicle with a trailer attached. Take it slow. Before backing up, get out of the tow vehicle and look behind the trailer to make sure that there are no obstacles. Some drivers place their hands at the bottom of the steering wheel, and while the tow vehicle is in reverse, "think" of the hands as being on the top of the wheel. When the hands move to the right (counter-clockwise, as you would do to turn the tow vehicle to the left when moving forward), the rear of the trailer moves to the right. Conversely, rotating the steering wheel clockwise with your hands at the bottom of the wheel will move the rear of the trailer to the left, while backing up. If you are towing a bumper hitch rig, be careful not to allow the trailer to turn too much, because it will hit the rear of the tow vehicle. To straighten the rig, either pull forward, or turn the steering wheel in the opposite direction.

2.4 Maintenance Safety

- Always disengage power, shut down the engine, remove the ignition key, being sure all
 moving parts have stopped before attempting to maintain or service the unit.
- Support the trailer with blocks or stands when changing tires or working beneath.
- Follow good shop practices:
 - keep service areas clean and dry.
 - be sure electrical tools are properly grounded.
 - use adequate light for the job at hand.
 - use personal protective equipment. (ie. gloves, safety glasses, etc.)
- Use only tools, jacks and hoists of sufficient capacity for the job.

2.5 Safety Decals

- Read and understand all decals before operating. Take care to follow all precautions and warnings displayed on the decals.
- Keep safety decals and signs clean and legible at all times.
- Replace safety decals and signs that are missing or have become illegible.
- Replaced parts that originally displayed a safety sign must also display the original sign.
- Safety decals or signs are available from your Dealer Parts Department or the factory.

2.6 Safety Decal Locations

The following illustrations show the position and content of the various safety decals on the trailer. If safety decals ever become damaged, removed or illegible, new decals must be applied. New decals are available from your authorized dealer.

Bumper Pull Trailers



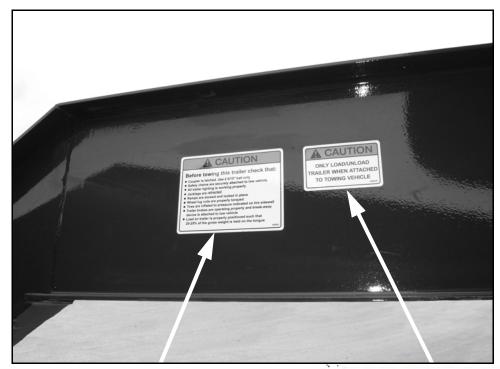


Before towing this trailer check that:

- Coupler hitch and trailer ball are the same size.
- Coupler is latched.
- Safety chains are crossed under tongue and attached to tow vehicle.
- All trailer lighting is working properly.
- Jack leg is retracted.
- Tilt deck is latched and locking pins in place.
- Wheel lug nuts are properly torqued.
- Tires are inflated to pressure indicated on tire sidewall.
- Trailer brakes are operating properly and break-away device is attached to the tow vehicle.
- Load on trailer is properly positioned such that 10-15% of the gross weight is held on the tongue.



Gooseneck Trailers

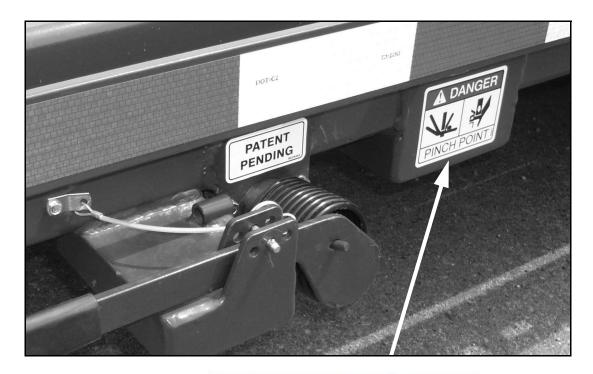




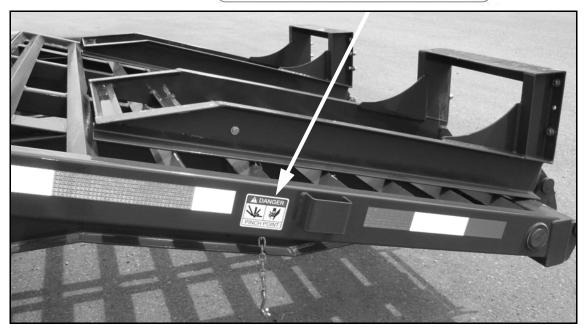
Before towing this trailer check that:

- Coupler is latched. Use 2 5/16" ball only.
- Safety chains are securely attached to tow vehicle.
- All trailer lighting is working properly.
- Jack legs are retracted.
- Ramps are stowed and locked in place.
- Wheel lug nuts are properly torqued.
- Tires are inflated to pressure indicated on tire sidewall.
- Trailer brakes are operating properly and break-away device is attached to the tow vehicle.
- Load on trailer is properly positioned such that 20-25% of the gross weight is held on the tongue.









Dump Trailers



- 1. STAY OUT FROM UNDER BODY WHEN HOIST IS OPERATING.
- 2. DURING DUMPING OPERATION, NO ONE MUST BE ALLOWED TO STAND IN OR MOVE THROUGH THE AREA WHERE THE BODY AND HOIST OPERATE OR INTO AN AREA WHERE A LOAD MIGHT FALL.
- 3. OPERATORS MUST REMAIN AT CONTROLS DURING DUMPING OPERATIONS.
- 4. NEVER LEAVE BODY RAISED OF PARTLY RAISED WHILE VEHICLE IS UNATTENDED OR WHILE PERFORMING MAINTENEANCE OR SERVICING UNDER BODY, UNLESS BODY BRACED TO PREVENT ACCIDENTAL LOWERING.
- 5. IF HOIST IS EQUIPPED WITH PTO, ALWAYS DISENGAGE WHEN NOT IN USE OR WHEN MOVING VEHICLE.
- 6, DO NOT ATTEMPT TO RAISE A LOADED BODY WHEN VEHICLE IS ON UNLEVEL GROUND.

PANDED

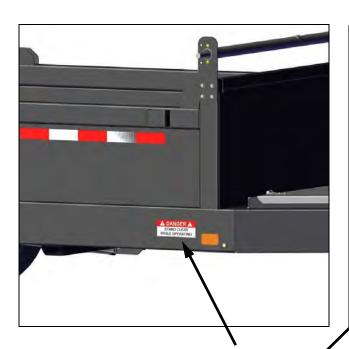


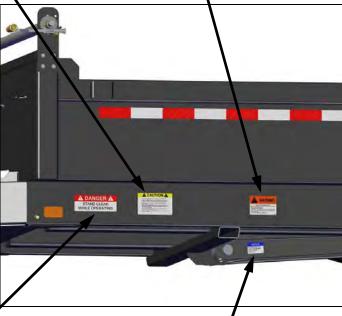
Use of Safety Prop (empty body only)

Never get under a raised empty body for any reason without the safety prop supporting the body.

- 1. Raise body to full "up" position.
- Lift prop out of retaining bracket and swing back against stop. Note: Larger capacity hoists have a prop on both sides. Both props must be up.
- 3. Lower body until resting on safety props

P10025R





A DANGER A STAND CLEAR

STAND CLEAR
WHILE OPERATING

NOTICE

ALL HOISTS MUST BE LUBRICATED BEFORE BEING PUT INTO OPERATION.

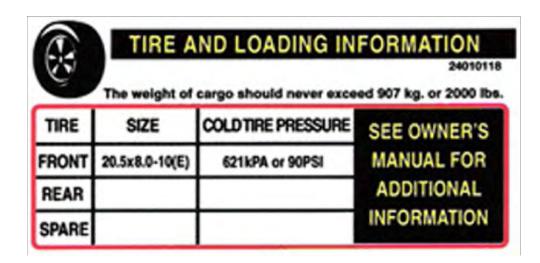
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2.7 Safe Trailer Towing Guidelines

- Recheck the load tie downs to make sure the load will not shift during towing.
- Before towing, check coupling, safety chain, safety brake, tires, wheels and lights.
- Check the lug nuts or bolts for tightness.
- Check coupler tightness after towing 80 km (50 miles).
- Adjust the brake controller to engage the trailer brakes before the tow vehicle brakes. Follow the instructions given with the brake controller manufacturer's literature.
- Use your mirrors to verify that you have room to change lanes or pull into traffic.
- Use your turn signals well in advance.
- Allow plenty of stopping space for your trailer and tow vehicle.
- Do not drive so fast that the trailer begins to sway due to speed. Generally never drive faster than 60 m.p.h. (100 kph)
- Allow plenty of room for passing. A rule of thumb is that the passing distance with a trailer is 4 times the passing distance without a trailer.
- Shift your automatic transmission into a lower gear for city driving.
- Use lower gears for climbing and descending grades.
- Do not ride the brakes while descending grades, they may get so hot that they stop working. Then you will potentially have a runaway tow vehicle and trailer.
- To conserve fuel, don't use full throttle to climb a hill. Instead, build speed on the approach.
- Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
- Do not brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve.
- Do not apply the tow vehicle brakes to correct extreme trailer swaying. Instead, lightly apply the trailer brakes with the hand controller.
- Make regular stops, about once each hour. Confirm that:
 - The coupler is secure to the hitch and is locked,
 - Electrical connectors are made,
 - There is appropriate slack in the safety chains,
 - There is appropriate slack in the breakaway switch pull pin cable,
 - The hubs are not over heating,
 - The tires are not visibly low on pressure, and
 - The cargo is secure and in good condition.

CHAPTER 3 Tire Safety Information

3.1 Steps for Determining Correct Load Limit - Trailer



3.1.1 Trailers 10,000 lbs GVWR or Less

- 1. Locate the statement, "The weight of cargo should never exceed XXX kg or XXX lbs.," on your vehicle's placard.
- 2. This figure equals the available amount of cargo and luggage load capacity.
- 3. Determine the combined weight of cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity.

The trailer's placard refers to the Tire Information Placard attached adjacent to or near the trailer's VIN (Certification) label at the left front of the trailer.

3.1.2 Trailers Over 10,000 lbs GVWR

- 1. Determine the empty weight of your trailer by weighing the trailer using a public scale or other means. This step does not have to be repeated.
- 2. Locate the GVWR (Gross Vehicle Weight Rating) of the trailer on your trailer's VIN (Certification) label.
- **3.** Subtract the empty weight of your trailer from the GVWR stated on the VIN label. That weight is the maximum available cargo capacity of the trailer and may not be safely exceeded.

3.2 Steps for Determining Correct Load Limit - Tow Vehicle

- 1. Locate the statement, "The combined weight of occupants and cargo should never exceed XXX lbs.," on your vehicle's placard.
- 2. Determine the combined weight of the driver and passengers who will be riding in your vehicle.
- 3. Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.
- 4. The resulting figure equals the available amount of cargo and luggage capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. $(1400-750 (5 \times 150) = 650 \text{ lbs.})$.
- 5. Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage capacity calculated in Step # 4.
- 6. If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult the tow vehicle's manual to determine how this weight transfer reduces the available cargo and luggage capacity of your vehicle.

3.3 Glossary of Tire Terminology

Accessory weight

The combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

Bead

The part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

Bead separation

This is the breakdown of the bond between components in the bead.

Bias ply tire

A pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

Carcass

The tire structure, except tread and sidewall rubber which, when inflated, bears the load.

Chunking

The breaking away of pieces of the tread or sidewall.

Cold inflation pressure

The pressure in the tire before you drive.

Cord

The strands forming the plies in the tire.

Cord separation

The parting of cords from adjacent rubber compounds.

Cracking

Any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT

A pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

Curb weight

The weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

Extra load tire

A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Groove

The space between two adjacent tread ribs.

Inner liner

The layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

Work Ready Trailers

Inner liner separation

The parting of the inner liner from cord material in the carcass.

Intended outboard sidewall

The sidewall that contains a white-wall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire or the outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

Light truck (LT) tire

A tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Load rating

The maximum load that a tire is rated to carry for a given inflation pressure.

Maximum load rating

The load rating for a tire at the maximum permissible inflation pressure for that tire.

Maximum permissible inflation pressure

The maximum cold inflation pressure to which a tire may be inflated.

Maximum loaded vehicle weight

The sum of curb weight, accessory weight, vehicle capacity weight, and production options weight.

Measuring rim

The rim on which a tire is fitted for physical dimension requirements.

Non-pneumatic rim

A mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

Non-pneumatic spare tire assembly

A non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

Non-pneumatic tire

A mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle and does not rely on the containment of any gas or fluid for providing those functions.

Non-pneumatic tire assembly

A non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

Normal occupant weight

This means 68 kilograms (150 lbs.) times the number of occupants specified in the second column of Table I of 49 CFR 571.110.

Occupant distribution

The distribution of occupants in a vehicle as specified in the third column of Table I of 49 CFR 571.110.

Open splice

Any parting at any junction of tread, sidewall, or inner liner that extends to cord material.

Outer diameter

The overall diameter of an inflated new tire.

Overall width

The linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

Ply

A layer of rubber-coated parallel cords.

Work Ready Trailers

Ply separation

A parting of rubber compound between adjacent plies.

Pneumatic tire

A mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

Production options weight

The combined weight of those installed regular production options weighing over 2.3 kilograms (5 lbs.) in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

Radial ply tire

A pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the centerline of the tread.

Recommended inflation pressure

This is the inflation pressure provided by the vehicle manufacturer on the Tire Information label and on the Certification / VIN tag.

Reinforced tire

A tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Rim

A metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

Rim diameter

This means the nominal diameter of the bead seat.

Rim size designation

This means the rim diameter and width.

Rim type designation

This means the industry of manufacturer's designation for a rim by style or code.

Rim width

This means the nominal distance between rim flanges.

Section width

The linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

Sidewall

That portion of a tire between the tread and bead.

Sidewall separation

The parting of the rubber compound from the cord material in the sidewall.

Special Trailer (ST) tire

The "ST" is an indication the tire is for trailer use only.

Test rim

The rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

Tread

That portion of a tire that comes into contact with the road.

Tread rib

A tread section running circumferentially around a tire.

Tread separation

Pulling away of the tread from the tire carcass.

Work Ready Trailers

Tread Wear indicators (TWI)

The projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

Vehicle capacity weight

The rated cargo and luggage load plus 68 kilograms (150 lbs.) times the vehicle's designated seating capacity.

Vehicle maximum load on the tire

The load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

Vehicle normal load on the tire

The load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I of CRF 49 571.110) and dividing by 2.

Weather side

The surface area of the rim not covered by the inflated tire.

Wheel center member

In the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle; or, in the case of a non-pneumatic tire assembly not incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic tire and provides the connection between tire and the vehicle.

Wheel-holding fixture

The fixture used to hold the wheel and tire assembly securely during testing.

3.4 Tire Safety

The National Highway Traffic Safety Administration (NHTSA) has published a brochure (DOT HS 809 361) that discusses all aspects of Tire Safety, as required by CFR 575.6. This brochure is reproduced in part below. It can be obtained and downloaded from NHTSA, free of charge.

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards, and inspecting tires for cuts, slashes, and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions, along with other care and maintenance activities, can also:

- Improve vehicle handling
- Help protect you and others from avoidable breakdowns and accidents
- Improve fuel economy
- Increase the life of your tires.

This booklet presents a comprehensive overview of tire safety, including information on the following topics:

- Basic tire maintenance
- Uniform Tire Quality Grading System
- Fundamental characteristics of tires
- Tire safety tips.

Use this information to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

3.4.1 Safety First - Basic Tire Maintenance

Properly maintained tires improve the steering, stopping, traction, and load-carrying capability of your vehicle. Under inflated tires and overloaded vehicles are a major cause of tire failure. Therefore, as mentioned above, to avoid flat tires and other types of tire failure, you should maintain proper tire pressure, observe tire and vehicle load limits, avoid road hazards, and regularly inspect your tires.

3.4.2 Finding Your Vehicle's Recommended Tire Pressure and Load Limits

Tire information placards and vehicle certification labels contain information on tires and load limits. These labels indicate the vehicle manufacturer's information including:

- Recommended tire size
- Recommended tire inflation pressure
- Vehicle capacity weight (VCW-the maximum occupant and cargo weight a vehicle is designed to carry)
- Front and rear gross axle weight ratings (GAWR– the maximum weight the axle systems are designed to carry).

Both placards and certification labels are permanently attached to the trailer near the left front.

3.4.3 Understanding Tire Pressure and Load Limits

Tire inflation pressure is the level of air in the tire that provides it with load-carrying capacity and affects the overall performance of the vehicle. The tire inflation pressure is a number that indicates the amount of air pressure—measured in kilo pascals (kPa) or pounds per square inch (psi)—a tire requires to be properly inflated.

Manufacturers of passenger vehicles and light trucks determine this number based on the vehicle's design load limit, that is, the greatest amount of weight a vehicle can safely carry and the vehicle's tire size. The proper tire pressure for your vehicle is referred to as the "recommended cold inflation pressure." (As you will read below, it is difficult to obtain the recommended tire pressure if your tires are not cold.)

Because tires are designed to be used on more than one type of vehicle, tire manufacturers list the "maximum permissible inflation pressure" on the tire sidewall. This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

3.4.4 Checking Tire Pressure

It is important to check your vehicle's tire pressure at least once a month for the following reasons:

- Most tires may naturally lose air over time.
- Tires can lose air suddenly if you drive over a pothole or other object or if you strike the curb when parking.
- With radial tires, it is usually not possible to determine under-inflation by visual inspection.

For convenience, purchase a tire pressure gauge to keep in your vehicle. A gauge can be purchased at tire dealerships, auto supply stores, and other retail outlets.

The recommended tire inflation pressure that vehicle manufacturers provide reflects the proper psi when a tire is cold. The term cold does not relate to the outside temperature. Rather, a cold tire is one that has not been driven on for at least three hours. When you drive, your tires get warmer, causing the air pressure within them to increase. Therefore, to get an accurate tire pressure reading, you must measure tire pressure when the tires are cold or compensate for the extra pressure in warm tires.

3.4.5 Steps for Maintaining Proper Tire Pressure

- 1. Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual.
- **2.** Record the tire pressure of all tires.
- 3. If the tire pressure is too high in any of the tires, slowly release air by gently pressing on the tire valve core with the edge of your tire gauge until you get to the correct pressure.
- **4.** If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.

Note: It is acceptable to top up nitrogen filled tires with clean and dry compressed air.

- **5.** At a service station, add the missing pounds of air pressure to each tire that is under-inflated.
- **6.** Check all the tires to make sure they have the same air pressure (except in cases in which the front and rear tires are supposed to have different amounts of pressure).

If you have been driving your vehicle and think that a tire is under-inflated, fill it to the recommended cold inflation pressure indicated on your vehicle's tire information placard or certification label. While your tire may still be slightly under-inflated due to the extra pounds of pressure in the warm tire, it is safer to drive with air pressure that is slightly lower than the vehicle manufacturer's recommended cold inflation pressure than to drive with a significantly under-inflated tire. Since this is a temporary fix, don't forget to recheck and adjust the tire's pressure when you can obtain a cold reading.

3.4.6 Tire Size

To maintain tire safety, purchase new tires that are the same size as the vehicle's original tires or another size recommended by the manufacturer. Look at the tire information placard, the owner's manual, or the sidewall of the tire you are replacing to find this information. If you have any doubt about the correct size to choose, consult with the tire dealer.

3.4.7 Tire Tread

The tire tread provides the gripping action and traction that prevent your vehicle from slipping or sliding, especially when the road is wet or icy. In general, tires are not safe and should be replaced when the tread is worn down to 1/16 of an inch. Tires have built-in tread wear indicators that let you know when it is time to replace your tires. These indicators are raised sections spaced intermittently in the bottom of the tread grooves. When they appear "even" with the outside of the tread, it is time to replace your tires.

3.4.8 Tire Balance and Wheel Alignment

To avoid vibration or shaking of the vehicle when a tire rotates, the tire must be properly balanced. This balance is achieved by positioning weights on the wheel to counterbalance heavy spots on the wheel-and-tire assembly. A wheel alignment adjusts the angles of the wheels so that they are positioned correctly relative to the vehicle's frame. This adjustment maximizes the life of your tires. These adjustments require special equipment and should be performed by a qualified technician.

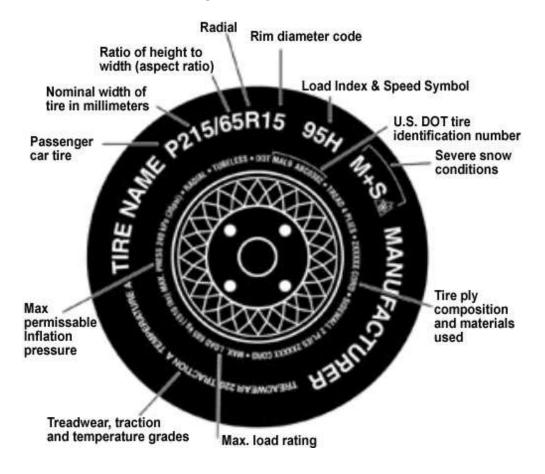
3.4.9 Tire Repair

The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.

3.4.10 Tire Fundamentals

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires. This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

3.4.10.1 Information on Passenger Vehicle Tires



P

The "P" indicates the tire is for passenger vehicles.

Next number

This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

Next number

This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

R

The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

Work Ready Trailers

Next number

This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

Next number

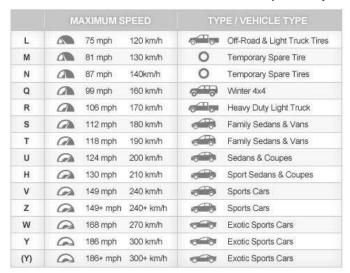
This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. Note: You may not find this information on all tires because it is not required by law.

M+S

The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

Speed Rating

The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed below. Note: You may not find this information on all tires because it is not required by law.



U.S. DOT Tire Identification Number

This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

Tire Ply Composition and Materials Used

The number of plies indicates the number of layers of rubber-coated fabric in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

Maximum Load Rating

This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

Maximum Permissible Inflation Pressure

This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

3.4.10.2 UTQGS Information

Tread Wear Number

This number indicates the tire's wear rate. The higher the tread wear number is, the longer it should take for the tread to wear down. For example, a tire graded 400 should last twice as long as a tire graded 200.

Traction Letter

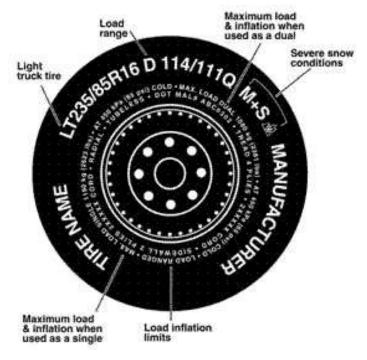
This letter indicates a tire's ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA", "A", "B", and "C".

Temperature Letter

This letter indicates a tire's resistance to heat. The temperature grade is for a tire that is inflated properly and not overloaded. Excessive speed, under-inflation or excessive loading, either separately or in combination, can cause heat build-up and possible tire failure. From highest to lowest, a tire's resistance to heat is graded as "A", "B", or "C".

3.4.10.3 Additional Information on Light Truck Tires

Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.



Work Ready Trailers

LT

The "LT" indicates the tire is for light trucks or trailers.

ST

An "ST" is an indication the tire is for trailer use only.

Max. Load Dual kg (lbs) at kPa (psi) Cold

This information indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

Max. Load Single kg (lbs) at kPa (psi) Cold

This information indicates the maximum load and tire pressure when the tire is used as a single.

Load Range

This information identifies the tire's load-carrying capabilities and its inflation limits.

3.4.11 Tire Safety Tips

Preventing Tire Damage

- Slow down if you have to go over a pothole or other object in the road.
- Do not run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.

Tire Safety Checklist

- Check tire pressure regularly (at least once a month), including the spare.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- Check tire pressure before going on a long trip.
- Do not overload your vehicle. Check the Tire Information and Loading Placard or User's Manual for the maximum recommended load for the vehicle.
- Never replace a trailer tire (ST) with a light truck tire (LT).
- Mismatched dual tires can result in excessive or uneven tire wear, overheating and possible blow out. To avoid mismatched duals:
 - ♦ Ensure inner and outer tire pressures are equal.
 - ♦ It is preferable to replace dual tires in pairs. If unable to do so, ensure the circumference of both tires is the same.

CHAPTER 4 Coupling to the Tow Vehicle

Follow all of the safety precautions and instructions in this manual to ensure safety of persons, cargo, and satisfactory life of the trailer.

4.1 Use an Adequate Tow Vehicle and Hitch

If the vehicle or hitch is not properly selected and matched to the Gross Vehicle Weight Rating (GVWR) of your trailer, you can cause an accident that could lead to death or serious injury. If you already have a tow vehicle, know your vehicle tow rating, and Gross Combination Weight Rating (GCWR) and make certain the trailer's rated capacity is less than or equal to the tow vehicle's rated towing capacity. If you already have (or plan to buy) a trailer, make certain that the tow rating of the tow vehicle is equal to or greater than the GVWR of the trailer, and that the GCWR will be within limits.



DANGER! Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury.

Be sure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your trailer.

4.1.1 Trailer Information

MANUFACTURED BY/FABRIQUÉ PAR: BRANDT EQUIPMENT SOLUTIONS LTD.				CANADA
TYPE: TRA / REM DATE:				2A6
GVWR/PNBV:	KG V.I.N. / N.I.	V:		WW. O.S.
GAWR/PNBE KG	TIRE / PNEU	RIM / JANTE	COLD INLF. PRESS./ PRESS.DE GONFL. À FROID PSI/LPC KPA S/S OR/OU D/J	

FIG. 4-1. Certification / VIN Tag

Work Ready Trailers

The trailer Certification / VIN tag contains the following critical safety information for the use of your trailer:

MANUFACTURER

Name of trailer manufacturer.

DATE OF MANUFACTURE

Month and year the trailer was manufactured.

GVWR

The Gross Vehicle Weight Rating is the maximum allowable gross weight of the trailer and its contents. The gross weight of the trailer includes the weight of the trailer and all of the items within it (such as cargo, water, food and other supplies).

GAWR

The Gross Axle Weight Rating is the maximum gross weight that an axle can support. It is the lowest of axle, wheel, or tire rating. Sometimes the tire or wheel rating is lower than the axle manufacturers rating, and will then determine GAWR.

The sum total of the GAWR for all trailer axles may be less than the GVWR for the trailer, because some of the trailer load is carried by the tow vehicle, rather than by the trailer axle(s). The total weight of the cargo and trailer must not exceed the GVWR, and the load on an axle must not exceed its GAWR.

TIRE SIZE

The tire size recommended for your trailer and load range.

PSIC

The "pounds per square inch- cold" is the tire pressure (Kilo pascals / Pounds per Square Inch) measured when Cold.

NATIONAL SAFETY MARK

This is the maple leaf shaped logo with a unique number in the centre assigned to the manufacturer. Manufacturer's authorized to affix the mark, apply the mark to certify the vehicle complies with the Canadian Motor Vehicle Safety Standards (CMVSS).

VIN

The Vehicle Identification Number.

VEHICLE TYPE

Generally the abbreviation "TRA/REM" is used. However, after this you may put a Model #, or additional descriptor.

4.1.2 Tow Vehicle Information

When equipping a new vehicle or an older vehicle to tow your trailer, ask the vehicle dealer for advice on how to outfit the towing vehicle. Discuss the following information and equipment with the vehicle dealer.

Overall Carrying and Towing Capacity of Vehicle

Vehicle manufacturers will provide you with the maximum towing capacities of their various models, as well as the GCWR. No amount of reinforcement will give a 100 horsepower, 2,500 pound truck the towing capacity that a 300 horsepower, 5,000 pound truck has.

Towing Hitch

The towing hitch attached to your tow vehicle must have a capacity equal to or greater than the load rating of the trailer you intend to tow. The hitch capacity must also be matched to the tow vehicle capacity.

Suspension System

A tow vehicle equipped with a factory installed "Towing Package" likely comes equipped with heavy duty springs, heavy duty tires and other suspension components which are able to serve the size and weight of the trailer that the vehicle is rated to tow. However, the addition of additional equipment may further improve the tow vehicle performance. These may include adjustable air shocks, helper springs, etc.

Brake Controller

The brake controller is part of the tow vehicle and is essential in the operation of the electric brakes on the trailer. If your trailer has electric brakes, it requires a brake controller be installed at the driver's position. The brake controller is not the same as the safety breakaway brake system that is installed on the trailer.

Side View Mirrors

The size of the trailer that is being towed and your state law regulations determine the size of the mirrors. However, some states prohibit extended mirrors on a tow vehicle, except while a trailer is actually being towed. In this situation, detachable extended mirrors are necessary. Check with your dealer or the appropriate state agency for mirror requirements.

Heavy Duty Flasher

A Heavy Duty Flasher is an electrical component that may be required when your trailer turn signal lights are attached to the tow vehicle flasher circuit.

Electrical Connector

An Electrical Connector connects the light and brake systems on the trailer to the light and brake controls on the towing vehicle.

Heavy Duty Engine Oil Cooling System

The tow vehicle engine works harder when a trailer is being towed. Depending on the size of the trailer, you may need to install a separate engine oil cooler. Inadequate cooling may result in sudden engine failure. Ask the tow vehicle dealer if it is necessary to install a heavy duty cooling system.

Automatic Transmission Oil Cooler

The automatic transmission of a towing vehicle handles more power when a trailer is being towed. Inadequate cooling will shorten transmission life, and may result in sudden transmission failure. Ask the tow vehicle dealer if it is necessary to install a separate oil cooler for the automatic transmission.

Fire Extinguisher

It is sensible to have a fire extinguisher in the tow vehicle.

Emergency Flares and Emergency Triangle Reflectors

It is wise to carry these warning devices even if you are not towing a trailer. It is particularly important to have these when towing a trailer because the hazard flashers of your towing vehicle will not operate for as long a period of time when the battery is running both the trailer lights and tow vehicle lights.

4.2 Coupling and Uncoupling the Trailer

A secure coupling (or fastening) of the trailer to the tow vehicle is essential. A loss of coupling may result in death or serious injury. Therefore, you must understand and follow all of the instructions for coupling.

The following parts are involved in making a secure coupling between the trailer and tow vehicle:

Coupling

That part of the trailer connecting mechanism by which the connection is actually made to the trailer hitch. This does not include any structural member, extension of the trailer frame, or brake controller.

Hitch

That part of the connecting mechanism including the ball support platform and ball and those components that extend and are attached to the towing vehicle, including bumpers intended to serve as hitches.)

- Weight Distributing Hitch (or Equalizing Hitch): A mechanical device that connects the trailer to the towing vehicle and by means of leverage applied on both the trailer and towing vehicle structures, when properly adjusted, distributes the imposed vertical load at the hitch and coupling connection between structures of the towing vehicle and trailer.
- **Weight Carrying Hitch:** A mechanical and/or structural device that connects the trailer to the towing vehicle and that does not employ features designed to redistribute the load imposed at the hitch and carrying connection.

Safety chains or cables

Chains or cables permanently attached to the trailer such that if the coupler connection comes loose, the safety chains or cables can keep the trailer attached to the tow vehicle. With properly rigged

safety chains or cables, it is possible to keep the tongue of the trailer from digging into the road pavement, even if the coupler-to-hitch connection comes apart.

Some areas do not allow safety cables, therefore it may be wise to check with the Police to see if your area has any restrictions on the use of safety cables, if your trailer is so equipped.

Trailer lighting (and braking) connector: A device that connects electrical power from the tow vehicle to the trailer. Electricity is used to turn on brake lights, running lights, and turn signals as required. In addition, if your trailer has a separate braking system, the electrical connector will also supply power to the trailer brakes from the tow vehicle.

Breakaway switch

If the trailer becomes de-coupled from the towing vehicle, the breakaway switch lanyard, attached independently to the tow vehicle hitch, will pull a pin in the emergency electrical break-away switch on the trailer. The breakaway switch is activated by a separate battery supply in the trailer such as to energize the trailer brakes independently of the towing vehicle. It is important to check the state of charge of the emergency break-away battery before each trip. Simply pull the pin out of the switch by hand and then try to pull the trailer. If you feel a significant drag force, the brakes are activated. Be sure to re-insert the pin in the break-away switch. Also be sure to allow enough slack in the break-away brake lanyard such that the switch will only activate (pin pulls out) if the coupler connection comes loose. For additional details refer to Section 4.3.4 or 4.4.5.

Jack

A device on the trailer that is used to raise and lower the trailer tongue. On larger trailers the jack is sometimes called the "landing gear."



DANGER! An improperly coupled trailer can result in death or serious injury.

Do not move the trailer until:

- The coupler is secured and locked to hitch.
- The safety chains are secured to the tow vehicle.
- The trailer jack(s) are fully retracted.

Do not tow the trailer on the road until:

- Tires and wheels are checked.
- The trailer brakes are checked.
- The breakaway switch is connected to the tow vehicle, and the break-away battery is checked.
- The load is secured to the trailer.
- The trailer lights are connected and checked.

4.2.1 Various Coupler Designs

Trailers are produced with a variety of coupler devices. One of the sections below will pertain to your trailer.

Bumper Pull (Ball Hitch) Coupler

Pintle Ring Coupler

Gooseneck Hitch Coupler

Fifth Wheel Coupler

4.3 Bumper Pull Trailers

4.3.1 Trailer with Ball Hitch Coupler

A ball hitch coupler connects to a ball that is located on or under the rear bumper of tow vehicle. This system of coupling a trailer to a tow vehicle is sometimes referred to as "bumper pull."

A ball hitch trailer may be fitted with a tongue jack that can raise and lower the coupler. The tongue jack is mounted to the A-frame (front, or tongue) part of the trailer. By rotating the jack handle clockwise, the jack will extend and raise the tongue of the trailer.

Be sure the Ball Hitch coupler is suitable for the size and weight of the trailer. The load rating of the coupler and the necessary ball size are listed on the trailer tongue. You must provide a hitch and ball for your tow vehicle, where the load rating of the hitch and ball is equal to or greater than that of your trailer. Also, the ball size must be the same as the coupler size. If the hitch ball is too small, too large, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle, and may cause death or serious injury.

THE TOW VEHICLE, HITCH AND BALL MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR

GREATER THAN THE TRAILER GROSS VEHICLE WEIGHT RATING (GVWR).

IT IS ESSENTIAL THAT THE HITCH BALL BE OF THE SAME SIZE AS THE COUPLER.

The ball size and load rating (capacity) are marked on the ball; hitch capacity is marked on the hitch.



FIG. 4-2. Trailer with Ball Hitch Coupler

4.3.1.1 Before Coupling the Trailer to the Tow Vehicle

Be sure the size and rating of hitch ball match the size and rating of the coupler. Hitch balls and couplers are marked with their size and rating.



WARNING! Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the LOAD RATING of the hitch ball is equal or greater than the GVWR of the trailer.

Be sure the SIZE of the hitch ball matches the size of the coupler.

1. Wipe the hitch ball clean and inspect it visually and by feel for flat spots, cracks and pits.

WARNING

WARNING! A worn, cracked or corroded hitch ball can fail while towing, and may result in death or serious injury.

Before coupling trailer, inspect the hitch ball for wear, corrosion and cracks.

Replace worn or damaged hitch ball.

- 2. Rock the ball to make sure it is tight to the hitch, and visually check that the hitch ball nut is solid against the lock washer and hitch frame.
- **3.** Wipe the inside and outside of the coupler clean and inspect it visually for cracks and deformations; feel the inside of the coupler for worn spots and pits.
- **4.** Be sure the coupler is tight to the tongue of the trailer. All coupler fasteners must be visibly solid against the trailer frame.

A WARNING

WARNING! A loose hitch-ball nut can result in uncoupling, leading to death or serious injury.

Be sure the hitch ball is tight to the hitch before coupling the trailer.

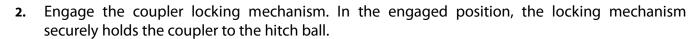
5. Raise the bottom surface of the coupler to be above the top of the hitch ball. Use the jack if one is provided; otherwise, use wood or concrete blocks to support the trailer tongue.

Prepare the Coupler and Hitch 4.3.1.2

- 1. Lubricate the hitch ball and the inside of the coupler with a thin layer of automotive bearing grease. If your trailer is equipped with a jack, raise the coupler above the ball height.
- Open the coupler locking mechanism. Ball couplers have a locking mechanism with an internal moving piece (ball clamp) and an outside handle, wheel, or latch.
- In the open position, the coupler is able to drop fully onto the hitch ball. See the coupler instructions for details of placing the coupler in the "open" position.
- Slowly back up the tow vehicle so that the hitch ball is near or aligned under the coupler, if the trailer jack has raised the coupler.

Couple the Trailer to the 4.3.1.3 **Tow Vehicle**

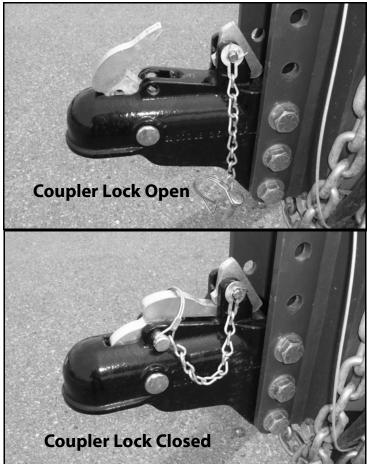
- If your trailer does not have a jack, you will have to lift the coupler and place it FIG. 4-3. Ball Hitch Coupler over the ball. If you have a jack,
 - lower the trailer tongue until the coupler fully engages the hitch ball. If the coupler does not line up with the hitch ball, adjust the position of the tow vehicle.



- Insert a pin or lock through the hole in the locking mechanism. 3.
- Be sure the coupler is all the way on the hitch ball and the locking mechanism is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1 inch, after the coupler is locked to the hitch.



Notice. Overloading can damage the tongue jack. Do not use the tongue jack to raise the tow vehicle more than 1 inch.



- 5. If the coupler cannot be secured to the hitch ball, do not tow the trailer. Call Brandt Equipment Solutions Ltd. or your dealer for assistance.
- 6. Lower the trailer so that its entire tongue weight is held by the hitch, and continue retracting the jack to its fully retraced position. Engage the lock on the Coupler.

4.3.2 Trailer with Pintle Ring and Hook Coupler

A ring connects to a pintle that is located on or under the rear bumper of tow vehicle. This system of coupling a trailer to a tow vehicle is sometimes referred to as "bumper pull."

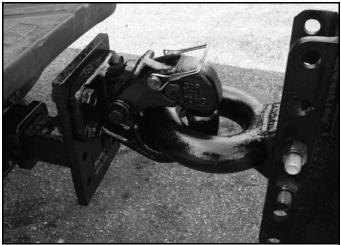


FIG. 4-4. Trailer with Ring and Pintle Coupler

A pintle hitch trailer may be fitted with a tongue

jack that can raise and lower the coupler. The tongue jack is mounted to the A-frame (front, or tongue) part of the trailer. By rotating the jack handle clockwise, the jack will extend and raise the tongue of the trailer.

Be sure the Pintle Hitch coupler is suitable for the size and weight of the trailer. The load rating of the ring and the necessary pintle size are listed on the trailer tongue. You must provide a pintle for your tow vehicle, where the load rating of the hitch and pintle is equal to or greater than the GVWR of your trailer. Also, the pintle size must be the same as the ring size. If the pintle is too small, too large, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle, and may cause death or serious injury.

THE TOW VEHICLE, HITCH AND PINTLE MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE TRAILER GROSS VEHICLE WEIGHT RATING (GVWR).

IT IS ESSENTIAL THAT THE PINTLE BE OF THE SAME SIZE AS THE RING.

The pintle size and load rating (capacity) are marked on the pintle; ring capacity is marked on the ring.

4.3.2.1 Before Coupling the Trailer to the Tow Vehicle

Be sure the size and rating of the pintle match the size and rating of the ring. Pintles and rings are marked with their size and rating.



WARNING! Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the LOAD RATING of the pintle is equal or greater than the load rating of the ring. Be sure the SIZE of the pintle matches the size of the ring. 1. Wipe the pintle clean and inspect it visually and by feel for flat spots, cracks and pits.

A WARNING

WARNING! A worn, cracked or corroded pintle can fail while towing, and may result in death or serious injury.

Before coupling trailer, inspect the pintle for wear, corrosion and cracks.

Replace worn or damaged pintle.

- 2. Rock the pintle to make sure it is tight to the hitch, and visually check that the pintle fasteners are solid against the hitch frame.
- **3.** Wipe the inside and outside of the ring clean and inspect it visually for cracks and deformations; feel the inside of the ring for worn spots and pits.
- **4.** Be sure the ring is tight to the tongue of the trailer. All ring fasteners must be visibly solid against the trailer frame.

WARNING

WARNING! A loose pintle can result in uncoupling, leading to death or serious injury.

Be sure the pintle is tight to the hitch before coupling the trailer.

5. Raise the bottom surface of the ring to be above the top of the open pintle. Use the jack if one is provided; otherwise, use wood or concrete blocks to support the trailer tongue.

4.3.2.2 Prepare the Ring and Pintle

- 1. Lubricate the pintle with a thin layer of automotive bearing grease.
- **2.** Remove the safety latch pin and open the pintle locking mechanism.
- 3. In the open position, the ring is able to drop fully onto the pintle. See the coupler instructions for details of placing the pintle in the "open" position.
- **4.** Slowly back up the tow vehicle so that the pintle is near or aligned under the ring, if the trailer jack has raised the ring.

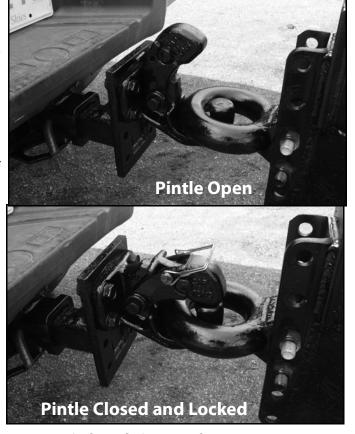


FIG. 4-5. Pintle and Ring Coupler

4.3.2.3 Couple the Trailer to the Tow Vehicle

- 1. If your trailer does not have a jack, you will have to lift the ring and place it over the pintle. If you have a jack, lower the trailer tongue until the ring fully engages the pintle. If the ring does not line up with the pintle, adjust the position of the tow vehicle.
- 2. Engage the pintle locking mechanism. In the engaged position, the locking mechanism securely holds the ring to the pintle.
- 3. Insert the safety lock pin through the hole in the locking mechanism.
- 4. Be sure the ring is all the way on the pintle and the locking mechanism is engaged. A properly engaged locking mechanism will allow the ring to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1 inch, after the coupler is locked to the hitch.



Notice. Overloading can damage the tongue jack. Do not use the tongue jack to raise the tow vehicle more than 1 inch.

- 5. If the ring cannot be secured to the pintle, do not tow the trailer. Call Brandt Equipment Solutions Ltd. or your dealer for assistance.
- **6.** Lower the trailer so that its entire tongue weight is held by the hitch, and continue retracting the jack to its fully retraced position.

4.3.3 Rig the Safety Chains

- 1. Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.
- Criss-cross the chains under the coupler so if the trailer uncouples, the safety chains can hold the tongue up above the road.
- 3. Loop the chains around a frame member of the tow vehicle or to holes provided in the hitch system but, do **not** attach them to an interchangeable part of the hitch assembly.
- **4.** Attach "S" hooks up from underneath the hole (do not just drop into hole)
- **5.** Provide enough slack to permit tight turns, but not be close to the road surface to drag.

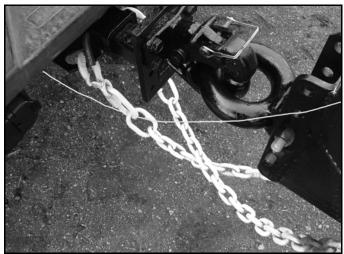


FIG. 4-6. Attaching the Safety Chains

WARNING

WARNING! Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains the to frame of tow vehicle. Do not fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.
- Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

4.3.4 Electric Breakaway Brake System

If the coupler or hitch fails, a properly connected and working breakaway brake system will apply electric brakes on the trailer. The safety chains will keep the tow vehicle attached and as the brakes are applied at the trailer's axles, the trailer/tow vehicle combination will come to a controlled stop.

The breakaway brake system includes a battery, a switch with a pull pin, and a lanyard. Some models have the ability to check the battery condition integrated into the box, some models, a battery tester must be attached to check the condition. The condition of the battery MUST be checked and verified that it is fully charged before moving the trailer. Check the battery with the trailer electrical cable DISCONNECTED from the tow vehicle, otherwise you are just checking the condition of the tow vehicle's battery. When the trailer electrical cable is connected to the tow vehicle, the charging light in the breakaway battery box will illuminate. The LED lights in the breakaway battery box will only work with 12 volt batteries. The lower the battery voltage goes, the dimmer the LEDs will illuminate.

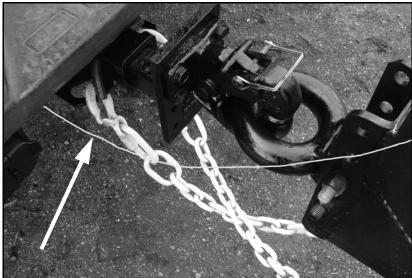
The breakaway brake system may be fitted with a "charging" capability that draws power from the tow vehicle. If the electrical system on your tow vehicle does not provide power to the breakaway brake battery, you must periodically charge the battery to keep the breakaway brake system in working order.

- 1. Connect the pull pin lanyard to the tow vehicle so that the pull pin will be pulled out before all of the slack in the safety chains is taken up (see Fig. 4-8). Do **not** connect the pull pin cable to a safety chain or to the hitch ball or hitch ball assembly. This would keep the breakaway brake system from operating when it is needed.
- Ensure the length and attachment of the breakaway cable will result in the pull pin being pulled and the brakes applied in the event of



FIG. 4-7. Breakaway Brake Controller

- a decoupling, before the safety chains catch the trailer.
- 3. To test the break-away brake battery, remove the pull pin from the switch and attempt to pull the trailer forward. You should feel the trailer resisting being towed, but the wheels will not necessarily be locked. If the brakes do not function, do not tow the trailer until brakes, or battery, are repaired.
- **4.** Immediately replace the pull pin. The breakaway brake system battery discharges rapidly when FIG. 4-8. Electric Breakaway Brake System the pull pin is removed.



A WARNING

WARNING! An ineffective breakaway brake system can result in a runaway trailer, leading to death or serious injury, if the coupler or ball hitch fails.

Connect the breakaway cable to the tow vehicle; and NOT to the hitch, ball or support.

Before towing the trailer, test the function of the breakaway brake system. If the breakaway brake system is not working, do not tow the trailer. Have it serviced or repaired.

A CAUTION

Caution. Do not tow the trailer with the breakaway brake system ON because the brakes will overheat which can result in permanent brake failure.

A WARNING

WARNING! Failure to replace the pull pin will prevent brakes from working, leading to loss of control, serious injury or death.

NOTICE

Notice. If you do not use your trailer for three or more months, or during winter months:

- Store the battery indoors.
- Charge the battery every three months.

4.3.5 Connecting the Electrical Cable

- Connect the trailer lights to the tow vehicle's electrical system using the electrical connectors.
- 2. Check all lights for proper operation.
 - Clearance and Running Lights (Turn on tow vehicle headlights).
 - Brake Lights (Step on tow vehicle brake pedal).
 - Turn Signals (Operate tow vehicle directional signal lever).

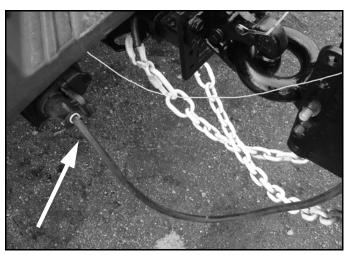


FIG. 4-9. Electrical Cable to Tow Vehicle

3. Check electric brakes for proper operation using brake controller mounted in the cab.

NOTICE

Notice. If your trailer has electric brakes, your tow vehicle will have an electric brake controller that sends power to the trailer brakes. Before towing the trailer on the road, you must operate the brake controller while trying to pull the trailer in order to confirm that the electric brakes operate. While towing the trailer at less than 8 kph (5 mph), manually operate the electric brake controller in the tow vehicle cab. You should feel the operation of the trailer brakes.

WARNING

WARNING! Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the taillights, brake lights and turn signals work.
- Check that the electric brakes work by operating the brake controller inside the tow vehicle.

4.3.6 Uncoupling the Bumper Pull Trailer

- 1. Block trailer tires to prevent the trailer from rolling, before jacking the trailer up.
- 2. Disconnect the electrical connector.
- 3. Disconnect the breakaway brake switch lanyard.
- **4.** Disconnect the safety chains from the tow vehicle.

- 5. Unlock the coupler and open it.
- **6.** Before extending jack, make certain the ground surface below the jack pad will support the tongue load.
- **7.** Rotate the jack handle (or crank) to extend the jack and transfer the weight of the trailer tongue to the jack.
- **8.** Raise the trailer to above the tow vehicle hitch.

4.4 Trailer with Gooseneck Coupler

A gooseneck coupler on the trailer connects to a gooseneck ball that you must have installed in the bed of the tow vehicle. This system of coupling a trailer to a tow vehicle permits the tow vehicle to turn to sharper angles than are permitted by a bumper hitch system. A gooseneck coupler consists of a tube in an inverted "U" shape and a gooseneck ball receiver. Fig. 4-10 shows a trailer with a gooseneck coupler.

We have installed a Gooseneck ball receiver that is suitable for the size and weight of the trailer. The load rating of the coupler and the necessary ball size are listed on the gooseneck.

You must provide a gooseneck ball and support structure that is marked with a rating that meets or exceeds the GVWR of your trailer **and** matches the size of the gooseneck ball receiver. If the gooseneck ball is too small, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle, and may lead to death or serious injury.

THE TOW VEHICLE, SUPPORT STRUCTURE AND GOOSENECK BALL MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE TRAILER GROSS VEHICLE WEIGHT RATING (GVWR).

IT IS ESSENTIAL THAT THE GOOSENECK BALL BE OF THE SAME SIZE AS THE GOOSENECK BALL RECEIVER.

The ball size and load rating (capacity) are marked on the ball; hitch capacity is marked on the hitch.



WARNING! Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the LOAD RATING of the hitch ball is equal or greater than the load rating of the coupler.



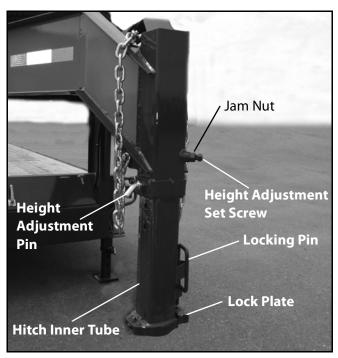
FIG. 4-10. Trailer with Gooseneck Coupler

Be sure the SIZE of the hitch ball matches the size of the coupler.

The height of the ball receiver on the trailer must be adjusted to match the height of the gooseneck ball on your tow vehicle, so that:

- There is clearance between the bottom of the trailer and the sides of the tow vehicle bed:
- The trailer is level and allows equal weight distribution on tandem axles.

Fig. 4-10 shows the gooseneck height adjustment. The height adjustment pin is used to set the length of the inner tube. There are a series of 4 holes, providing up to 8" of adjustment. The height adjustment set screw is used to prevent rattle, vibration and wear of the inner tube. Do not overtighten the set screw because the inner tube can be FIG. 4-11. Gooseneck Ball Receiver and Height deformed. After tightening the set screw, tighten Adjustment the jam nut on the set screw.



WARNING

WARNING! Improper gooseneck height adjustment can result in overloaded tires, blowout and loss of control, leading to death or serious injury.

Adjust the gooseneck receiver so that the loaded trailer is level.

A trailer having a gooseneck hitch has two drop leg jacks for raising and lowering the gooseneck ball receiver. Because several drop leg jack mechanisms are available, the general instructions below may vary slightly from jack to jack.

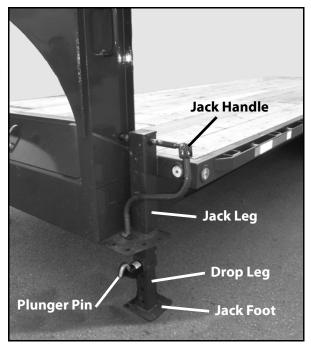


FIG. 4-12. Drop-Leg jack Arrangement

4.4.1 Before coupling the trailer to the tow vehicle

Be sure the size and rating of the gooseneck ball match the size and rating of the receiver. Gooseneck balls and receivers are marked with their size and ratings.

2. Wipe the gooseneck ball clean and inspect it visually and by feel for flat spots, cracks and pits.

A WARNING

WARNING! A worn, cracked or corroded gooseneck ball can fail while towing, and may result in death or serious injury.

Before coupling the trailer, inspect the gooseneck ball for wear, corrosion and cracks; and replace worn or damaged gooseneck ball.

3. Rock the ball to make sure it is tight to the ball support, and visually check that the gooseneck ball nut is solid against the lock washer and ball support frame.

WARNING

WARNING! A loose gooseneck ball can result in uncoupling, leading to death or serious injury.

Be sure the gooseneck ball nut is tight before coupling the trailer.

- **4.** Wipe the inside and outside of the receiver clean and inspect it visually for cracks; and feel the inside of the receiver for worn spots and pits. If any of these conditions exist, have the receiver replaced before coupling the trailer.
- **5.** Lubricate the inside of the gooseneck ball receiver with automotive bearing grease. Be sure the receiver is tight to the trailer. All receiver fasteners must be visibly solid against the trailer frame.
- **6.** Release the jack handle or crank from its holder, as shown in Fig. 4-12.
- 7. Make certain the ground beneath the jack foot is firm enough to support the tongue weight.
- 8. Rotate the handle/crank clockwise to raise the bottom surface of the gooseneck to be above the top of the gooseneck ball.

4.4.2 Prepare the Ball Receiver and Gooseneck Ball

- Release the lock plate on the gooseneck ball receiver. With the spring-loaded lock plate locking pin in the OPEN position, rotate the lock plate to a position that allows the gooseneck ball to enter the receiver (see "Fig. 4-13).
- 2. Slowly back up the tow vehicle so that the gooseneck ball is aligned under the gooseneck ball receiver.

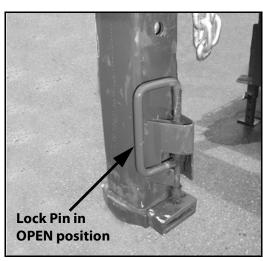


FIG. 4-13. Lock Pin Open

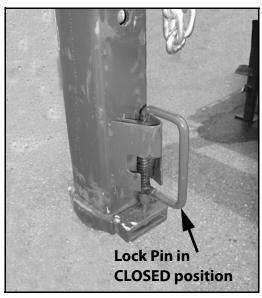
MARNING

WARNING! If the trailer drops during coupling, death or serious injury may result.

There must be no one under the trailer or coupler before or during the coupling operation.

4.4.3 **Couple the Trailer to the Tow Vehicle**

Rotate the jack handle counter-clockwise. This will retract the jack causing the gooseneck ball receiver to drop down so it can fully engage the gooseneck ball and transfer the weight of the trailer tongue to the towing vehicle hitch. If the receiver does not line up with the ball, raise the receiver again and adjust the position of the tow vehicle. Then lower the receiver over the ball. When the drop leg base is no longer resting on the ground, the FIG. 4-14. Lock Pin Closed towing vehicle hitch is holding all of the weight of the trailer tonque.

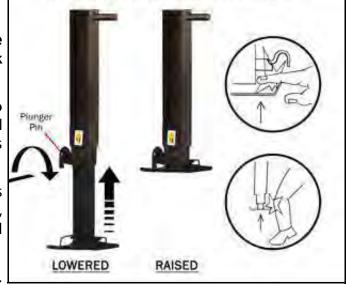


- Close the lock plate on the gooseneck ball receiver. 2.
- Move the spring-loaded lock plate locking pin to the CLOSED position. Be sure the locking pin is 3. holding the lock plate.
- Be sure the receiver is all the way on the gooseneck ball and the lock plate is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1 inch.

WARNING

WARNING! Overloading can damage the drop leg jack. Do not use the drop leg jack to raise the tow vehicle more than 1 inch.

- If the gooseneck ball cannot be secured to the receiver, do not tow the trailer. Call your dealer or Brandt Equipment Solutions Ltd. for assistance.
- After testing to see that the receiver is properly secured and locked to the ball, retract the jack(s) to its fully retracted position.
- Return the drop legs to their upper positions. The drop legs are held in the lowered FIG. 4-15. Closeup of Drop Leg Mechanism



position with a plunger pin. Rotating the plunger pin while pulling it outward will cause it to come out of engagement with the drop leg and the leg will rapidly rise. See Fig. 4-15.

A CAUTION

Caution. The drop legs are heavily spring loaded in the lowered position. They will rapidly return to the upper position when released and can inflict serious bruises, scrapes or pinching.

Keep your feet, shins and hands well clear of the drop legs and drop leg bases when releasing the drop legs.

Always wear shoes or boots while performing this operation.



FIG. 4-16. Safety Chain Arrangement

4.4.4 Rig the Safety Chains

- 1. Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.
- 2. Rig the safety chains so that they attach to the "safety chain receivers" in the bed of the truck. If you are not certain of the hitch provisions for receiving safety chains, contact the hitch manufacturer or installer. Do NOT attach the safety chains to the gooseneck ball or its support.
- 3. Rig the safety chains so they have sufficient slack to permit turning, but not too much slack the safety chains must keep the gooseneck on the tow vehicle bed if the trailer uncouples. See Fig. 4-16.

A WARNING

WARNING! Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to safety chain receivers on the hitch, not to ball.
- Have sufficient slack to permit turning and to keep gooseneck on bed of tow vehicle, if the trailer comes loose.

4.4.5 Attach and Test the Breakaway Brake System

If the coupler or hitch fails, a properly connected and working breakaway brake system will apply electric brakes on the trailer. The safety chains will keep the tow vehicle attached and as the brakes are applied at the trailer's axles, the trailer/tow vehicle combination will come to a controlled stop.

The breakaway brake system includes a battery, a switch with a pull pin, and a lanyard. Some models have the ability to check the battery condition integrated into the box, some models, a battery tester must be attached to check the condition. The condition of the battery MUST be checked and verified that it is fully charged before moving the trailer. Check the battery with the trailer electrical cable DISCONNECTED from the tow vehicle, otherwise you are just checking the condition of the tow vehicle's battery. When the trailer electrical cable is connected to the tow vehicle, the charging light in the breakaway battery box will illuminate. The LED lights in the breakaway battery box will only work with 12 volt batteries. The lower the battery voltage goes, the dimmer the LEDs will illuminate.

The breakaway brake system may be fitted with a charging facility that draws power from the tow vehicle. If the electrical system on your tow vehicle does not provide power to the breakaway brake battery, you must periodically charge the battery on the trailer to keep the breakaway brake system in working order.

Visually inspect the breakaway brake system for broken parts.

- 1. Connect the pull pin cable to the tow vehicle so that the pull pin will be pulled out before all of the slack in the safety chains is taken up (see Fig. 4-17). Do **not** connect the pull pin cable to a safety chain or a safety chain receiver or to the gooseneck ball or its support. This would keep the breakaway brake system from operating when it is needed. Contact the hitch manufacturer or installer if you are not certain of the hitch provisions for breakaway brake connection.
- 2. Ensure the length and attachment of the breakaway cable will result in the pull pin being pulled and the brakes applied in the event of a decoupling, before the safety chains catch the trailer.
- 3. To check the break-away brake battery, pull out the pull pin from the switch and attempt to pull the trailer forward. You should feel the trailer resisting being towed, but the wheels will not necessarily lock up.
- **4.** Immediately replace the pull pin. The breakaway brake system battery discharges rapidly when the pull pin is removed.

A WARNING

WARNING! An ineffective or inoperative breakaway brake system can result in a runaway trailer leading to death or serious injury, if the coupler or hitch fails.

Connect the breakaway cable to the tow vehicle; and NOT to the safety chain, safety chain receiver, gooseneck ball or gooseneck ball support.



FIG. 4-17. Breakaway Brake System

Test the function of the breakaway brake system before towing the trailer. Do not tow the trailer if the breakaway brake system is not working; have it serviced or repaired.

A CAUTION

Caution. Do not tow the trailer with the breakaway brake system ON because the brakes will overheat which can result in permanent brake failure.

A WARNING

WARNING! Failure to replace the pull pin will prevent brakes from working, leading to loss of control, serious injury or death.

NOTICE

Notice. If you do not use your trailer for three or more months, or during winter months:

- Store the battery indoors.
- Charge the battery every three months.

4.4.6 Connecting the Electrical Cable

- 1. Connect the trailer lights to the tow vehicle's electrical system using the electrical connectors.
- **2.** Check all lights for proper operation.
 - Clearance and Running Lights (Turn on tow vehicle headlights).
 - Brake Lights (Step on tow vehicle brake pedal).
 - Turn Signals (Operate tow vehicle directional signal lever).
- 3. Check electric brakes for proper operation using brake controller mounted in the cab.

NOTICE

Notice. If your trailer has electric brakes, your tow vehicle will have an electric brake controller that sends power to the trailer brakes. Before towing the trailer on the road, you must operate the brake controller while trying to pull the trailer in order to confirm that the electric brakes operate. While towing the trailer at less than 8 kph (5 mph), manually operate the electric brake controller in the tow vehicle cab. You should feel the operation of the trailer brakes.

WARNING

WARNING! Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the taillights, brake lights and turn signals work.
- Check that the electric brakes work by operating the brake controller inside the tow vehicle.

4.4.7 Uncoupling the Gooseneck Trailer with Drop Leg Jacks

- 1. Block trailer tires to prevent the trailer from rolling, before jacking the trailer up.
- **2.** Disconnect the electrical connector.
- 3. Disconnect the breakaway brake switch lanyard.
- **4.** Disconnect the safety chains from the tow vehicle.
- 5. Move the spring-loaded gooseneck receiver lock plate locking pin to the OPEN position (see Fig. 4-13).
- **6.** Rotate the lock plate to a position that permits the gooseneck ball to exit the receiver.
- **7.** Before releasing dropleg jack, make certain ground surface below jack base will support the trailer tongue load.
- **8.** Rotate the drop leg plunger pin handle so that the plunger pin is released from the drop leg (see Fig. 4-15).
- **9.** Push down on the drop leg base with your foot to place a drop leg to the desired lowered position.
- **10.** Rotate the plunger pin handle so that the plunger pin is attempting to engage the drop leg (see Fig. 4-15).
- 11. Slowly raise your foot, permitting the drop leg to raise. The plunger pin will engage a hole in the drop leg.

A CAUTION

Caution. The drop legs are heavily spring loaded in the lowered position. They will rapidly return to the upper position when released and can inflict serious bruises, scrapes or pinching.

Keep your feet, shins and hands well clear of the drop legs and drop leg bases when releasing the drop legs.

Always wear shoes or boots while performing this operation.

- **12.** Be sure the plunger pin is fully engaged. Push it in by hand if necessary. The bent part of the plunger pin handle must be touching the plunger pin housing.
- **13.** If your trailer has two drop leg jacks, lower them both to the same level, following the above instructions.

NOTICE

Notice. If the drop legs are not set at the same level, one of the drop leg jacks can be overloaded and can be damaged.

- 14. Release the handle (or crank) from its holder and engage it with the jack shaft. See Fig. 4-12.
- 15. Rotate the handle (or crank) from its hold and engage it with the jack shaft. See Fig. 4-12.
- **16.** Rotate the handle (or crank) clockwise to slowly extend the jack and transfer the weight of the trailer tongue to the jack.
- 17. On two speed jacks, pushing the handle shaft toward the gearbox can perform rapid extension. This shifts the gearbox into a high speed mode.
- **18.** When the drop leg base contacts the ground, shift the gearbox into low gear mode by pulling or pushing on the handle shaft until it locks into low gear.

NOTICE

Notice. Do not use high gear to lift the trailer; the drop leg jack mechanism can be damaged.

High gear is used only to rapidly move the drop leg base into contact with the ground.

- **19.** Continue to extend the jack(s), making sure that the ground is providing stable and level support for the trailer.
- **20.** After the jack(s) are extended and the gooseneck ball receiver is well clear of the gooseneck ball, to permit driving the tow vehicle away, disengage the handle from its shaft and return to its holder.

4.5 Tongue Weight

It is critical to have a portion of the trailer load carried by the tow vehicle. That is, the trailer tongue must exert a downward force on the hitch. This is necessary for two reasons. First, the proper amount of tongue weight is necessary for the tow vehicle to be able to maintain control of the tow vehicle/ trailer system. If, for example, the tongue exerts an upward pull on the hitch, instead of pushing down on it (because the trailer is overloaded behind its axle(s)), the rear wheel of the tow vehicle can lose traction or grip and cause loss of control. Also, even if there is some weight on the tongue, but not enough weight on the tongue, the trailer can become unstable at high speeds. Remember, the faster you go the more likely the trailer is to sway.

If, on the other hand, there is too much tongue weight, the tow vehicle is prone to jack-knife. Furthermore, the front wheels of the tow vehicle can be too lightly loaded and cause loss of steering control and traction, if the front wheels are driving.

In addition to tow vehicle control, tongue weight is necessary to insure that the trailer axle(s) do not exceed their Gross Axle Weight Rating (GAWR).

The table below has "rules of thumb" for proper tongue weight.

In the table below, the second column notes the rule of thumb percentage of total weight of the trailer plus its cargo (Gross Vehicle Weight, or "GVW") that should appear on the tongue of the trailer. For example, a trailer with a gooseneck hitch, with a loaded weight of 12,000 pounds, should have 20-25% (of 12,000 pounds) on the tongue. That is, the example trailer would have 2,400 to 3,000 pounds on its tongue.

Tongue Weight as a Percentage of Loaded Trailer Weight	
Type of Hitch	Percentage
Ball Hitch or Ring and Pindle	10 - 15% for large trailers
	6 - 10% for small trailers
Gooseneck Hitch	20 - 25%

The numbers quoted above are for example purposes only and should be tailored to the specific trailer. For questions regarding the actual percent of tongue weight for the trailer, check with Brandt Equipment Solutions Ltd. for specifics.



WARNING! Improper tongue weight (load distribution) can result in loss of control of the trailer, leading to death or serious injury.

Make certain that tongue weight is within the allowable range.

Be sure to:

- Distribute the load front-to-rear to provide proper tongue weight (see chart);
- · Distribute the load evenly, right and left, to avoid tire overload; and
- · Keep the center of gravity low.

4.5.1 Checking the Tongue Weight

To check the tongue weight, the tow vehicle and trailer must be on level ground, as they will be when the trailer is being towed.

For lighter trailers the recommended method of checking tongue weight is to use an accessory called a "tongue weight scale." If a tongue weight scale is not available from your dealer, call Brandt Equipment Solutions Ltd. for assistance.

For most trailers it is easier to go to a truck stop where there is a "certified" scale. Pull only the tow vehicle onto the scale and get the weight. This weight must be less than your tow vehicle's GVWR. Pull the trailer onto the scale and decouple it from the tow vehicle, leaving just the trailer on the scale. Get a "ticket", which lists the total trailer weight. Re-connect the trailer to your tow vehicle and the drive the tow vehicle wheels off the scale, just leaving the trailer axles on the scale. Get a second "ticket", which lists the trailer's axle weight. Simple subtract the axle weight from the total weight to determine the hitch weight.

While you are at the scale, you should weigh the entire combination vehicle. This result should be less than the Gross Combined Weight Rating (GCWR) for your towing vehicle. Some scales allow you to get individual axle weights also. If this is possible, get the tow vehicles front and rear axle weights to make sure they are in the same proportion as the tow vehicle alone, and that the rear axle is not overloaded. This is the best way to check that a weight distribution (or load leveling) hitch is adjusted properly, i.e., you have the proper number of chain links attached to the snap-up brackets.

4.6 Adjusting the Bumper Pull Trailer Hitch Height

The height of the hitch on the trailer must be adjusted so that the trailer, when loaded to rated capacity, is level while connected to the tow vehicle. A level trailer allows equal weight distribution on the axles.

Your dealer or a trailer service center can perform this adjustment or you can use the following steps to adjust the hitch height yourself.

WARNING

WARNING! Improper hitch height adjustment can result in overloaded tires, blowout and loss of control, leading to death or serious injury.

Adjust the hitch height so that the loaded trailer is level.

- 1. Connect trailer to tow vehicle and load the trailer to rated capacity (see Chapter 5 Loading and Unloading The Trailer).
- 2. Park the tow vehicle and trailer on a firm level surface.
- 3. Stand away from the trailer and visually verify if the trailer is level front-to-rear. If the front of the trailer is higher than the rear, the hitch must be raised. If the front of the trailer is lower than the rear, the hitch must be lowered.
- **4.** Uncouple trailer from tow vehicle (See Section 4.3.6).
- 5. Remove the lock nuts and cap screws on hitch. **Discard** lock nuts. See Fig. 4-18.

WARNING

WARNING! Used lock nuts are prone to loosen, resulting in the hitch separating from the trailer, which can lead to death or serious injury.

NEVER re-use a lock nut.

Two new lock nuts are provided with your trailer to use for the hitch adjustment. Use new lock nuts each time the hitch height is adjusted.

Contact your dealer for the proper grade and size of lock nut.

- **6.** Raise or lower the hitch as necessary.
- Install cap screws and **NEW** lock nuts. See Fig. 4-18.
- **8.** Tighten lock nuts to the appropriate torque for the size and grade of bolt used.

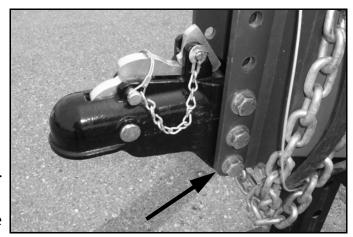


FIG. 4-18. Adjusting the Hitch Height

- **9.** Couple the trailer to the tow vehicle, verify that the trailer is level front to rear. Adjust if necessary.
- **10.** Unload trailer (see Chapter 5 Loading and Unloading The Trailer) and disconnect from tow vehicle (see Section 4.3.6).

4.7 Adjusting the Gooseneck Coupler Height

The height of the ball receiver on the trailer must be adjusted so that the trailer, when loaded to rated capacity, is level while connected to the tow vehicle. A level trailer allows equal weight distribution on the axles.

There must also be adequate clearance between the bottom of the trailer and the sides of the tow vehicle bed.

- 1. Connect trailer to tow vehicle (see Section 4.4.3) and load the trailer to rated capacity (see Chapter 5 Loading and Unloading The Trailer). Park the tow vehicle and trailer on a firm level surface.
- 2. Stand back from the trailer and visually verify if the trailer is level front to rear. If the front of the trailer is higher than the rear, the hitch must be retracted. If the front of the trailer is lower than the rear, the hitch must be extended.
- **3.** Uncouple trailer from tow vehicle (See Section 4.4.3).
- **4.** Loosen the jam nut and setscrew. Remove safety lock pin and load bearing pin. Extend or retracted the receiver as needed. The maximum the receiver can be extended is 8 1/4 inches. See Fig. 4-19.
- 5. Insert load bearing pin through hole in receiver and install safety lock pin. Make sure the hitch set screw and jam nut are torqued to a minimum 125 ft.lbs. **Never** use the setscrew or any other device as a replacement for the load bearing pin.



WARNING! Improper gooseneck height adjustment can result in overloaded tires, blowout and loss of control, leading to death or serious injury.

Adjust the gooseneck receiver so that the loaded trailer runs level.

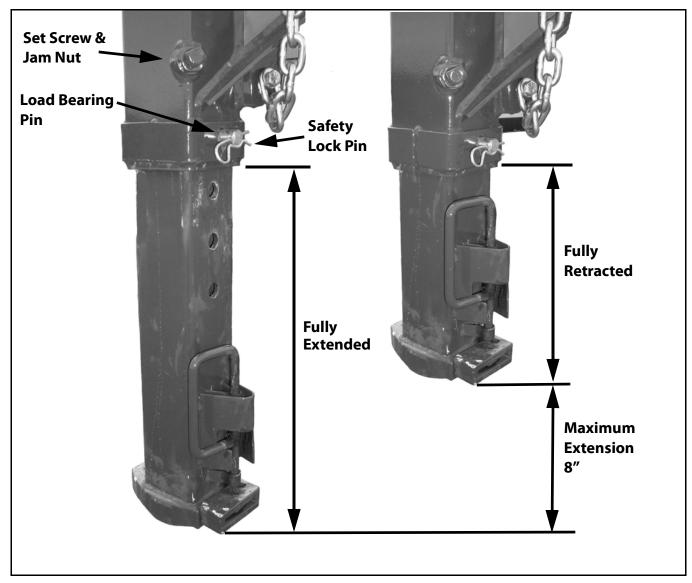


FIG. 4-19. Gooseneck Height Adjustment

CHAPTER 5 Loading and Unloading the Trailer

5.1 Loading and Unloading a Flatbed Trailer

Improper trailer loading causes many accidents and deaths. To safely load a trailer, you must consider:

Overall load weight;

Load weight distribution;

Proper tongue weight; and

Securing the load properly.

To determine that you have loaded the trailer within its rating, you must consider the *distribution* of weight, as well as the total weight of the trailer and its contents. The trailer axles carry most of the total weight of the trailer and its contents (Gross Vehicle Weight, or "GVW"). The remainder of the total weight is carried by the tow vehicle hitch. It is essential for safe towing that the trailer tongue and tow vehicle hitch carry the proper amount of the loaded trailer weight, otherwise the trailer can develop an undesirable sway at towing speeds, or the rear of the towing vehicle can be overloaded. Read the "Tongue Weight" information in Section 4.

The load distribution must be such that no component part of the trailer is loaded beyond its rating. This means that you must consider the rating of the tires, wheels and axles. For tandem and triple axle trailers, you must make sure that the front-to-rear load distribution does not result in overloading any axle.

Towing stability also depends on keeping the center of gravity as low as possible. Load heavy items on the floor and over the axles. When loading additional items, be sure to maintain even side-to-side weight distribution and proper tongue weight. The total weight of the trailer and its contents must never exceed the total weight rating of the trailer (Gross Vehicle Weight Rating, or "GVWR").



WARNING! An overloaded trailer can result in loss of control of the trailer, leading to death or serious injury.

Do not load a trailer so that the weight on any tire exceeds its rating.

Do not exceed the trailer Gross Vehicle Weight Rating (GVWR) or the Gross Axle Weight Rating (GAWR).

5.1.1 General Information

Your trailer may be equipped with a chain box on the front of the trailer. This box is for storing chains, binders, etc. Do not store items in the chain box that can blow out while driving.

The trailer may also equipped with steps at the front of the deck to ease access to and from the trailer deck. Use caution when using the steps as they may be slippery.

5.1.2 Ramp Options

Before moving the trailer, the ramps **MUST** be rotated back into the storage position and the transport clamps **MUST** be engaged.



Caution. Use a safe lifting procedure to prevent injury when handling the ramps.

5.1.2.1 Manual Kick Ramps

Your trailer may be equipped with two spring loaded ramps on the rear of the trailer.

To lower the ramps, remove the transport securing chains and rotate the ramps until they touch the ground. On trailers with two narrow ramps, adjust the position of the ramps to match the tread width of the piece of equipment being loaded.

Before moving the trailer, the ramps **MUST** be rotated back into the storage position and the transport securing chains **MUST** be reinstalled.





FIG. 5-1. Ramps in Storage Position and Working Position





FIG. 5-2. Ramps in Storage Position and Working Position

5.1.2.2 Manual Full Ramps

Your trailer may be equipped with two full spring loaded ramps on the rear of the trailer.



Caution. Always have two people present when moving the ramps

These ramps have 3 different positions in which they can be utilized: Working position, Storage position and 90° position.

To lower the ramps, remove the transport securing clamps and safely rotate the ramps until they touch the ground. When transitioning into the 90° position, the ramps are to be secured using the safety bar.





FIG. 5-3. Ramp Storage Position

FIG. 5-4. Ramp Working Position



FIG. 5-5. Ramp 90° Position

5.1.2.3 Hydraulic Ramps

Your trailer may be equipped with hydraulic ramps on the rear of the trailer.



Caution. Watch for pinch points and ensure the area is clear of hazards and debris before operating.

To lower the ramps, remove the transport securing clamps. Then feather the hydraulic controls to gently articulate the ramp until it touches the ground and avoid sudden jerking.





FIG. 5-6. Ramp Transport Securing Chain

FIG. 5-7. Ramp Transport Securing Chain

5.1.3 Loading the Trailer

Couple the trailer to the tow vehicle before loading. This is essential as the tongue trailer can rise during loading, before the cargo is properly distributed. To measure the tongue weight, you will have to uncouple the trailer after it is loaded.

Do not transport people, containers of hazardous substances, cans or containers of flammable substances, such as gasoline, kerosene, paint, etc. However, fuel in the tank of an off-road vehicle, or a car or motorcycle, etc. may be carried on your open trailer.



WARNING! Do not transport people on your trailer. Besides putting their lives at risk, the transport of people on a trailer is illegal.



WARNING! Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer.

Exceptions:

- Fuel in the tanks of vehicles that are being towed.
- Fuel stored in the tank of an on-board generator.

5.1.3.1 Preparing the Trailer for Loading

Before loading cargo onto the trailer:

1. Be sure the trailer is on level ground, both left/right and front/back. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.



WARNING! The trailer must be on level ground before loading. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.

- 2. Inspect the deck of the trailer for corrosion or damage.
- 3. Inspect the hold down openings and/or "D"-rings. Hold down openings must be sturdy with no visible cracks or kinks. D-rings must be tight to the deck and must not be bent. If the deck or any required hold-down is damaged, do not load the cargo. Bring the trailer to your dealer or a competent repair service before using it to carry cargo.



WARNING! Damaged or loose "D"-rings can break, allowing cargo to become loose inside the trailer. Loose cargo can shift the center of gravity, and result in loss of control of the trailer.

Inspect "D"-rings, and test them for looseness before loading cargo.

Do not use a damaged or loose "D"-ring to secure cargo.

5.1.3.2 Loading a Rigid Deck Trailer

- 1. Before loading a rigid-deck trailer, couple the trailer to the tow vehicle and make sure the rigid deck is level. Do not load the trailer when the deck is not level.
- **2.** Be sure the trailer is on level ground, both left/right and front/back. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.



WARNING! The trailer must be on level ground before loading. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.

- **3.** Always set the park brake on the tow vehicle and trailer before loading and unloading. Use chock blocks as an added safety precaution.
- **4.** Prior to loading, it is very important that the ramps are adjusted to the proper spacing for the equipment being transported. Make sure the top of the ramps are secure to the trailer, and the bottom is resting on firm ground. Pockets may be provided to hold the ramp to the frame of the trailer.



WARNING! Load can suddenly move or topple, which can result in death or serious injury.

Do not load or unload your open trailer unless it is prevented from tipping and is on firm and level ground.

- **5.** When loading equipment onto the deck, drive slowly forward until appropriated tongue load is achieved. Not enough tongue weight can result in swaying of the trailer, which can be unsafe.
- **6.** Before securing equipment, always lower booms, loaders and buckets. The parking brake on the equipment being transported must be engaged, where applicable. Always make sure you are under the maximum allowable height clearance.
- **7.** Secure the cargo to the trailer using appropriate straps, chains and tensioning devices.
- **8.** 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.

Note: The tie down locations on all Brandt trailers have been tested and certified to 5000 lb WLL, as per CMVSS 905.

- **9.** Articulated vehicles shall be restrained in a manner that prevents articulation while in transit.
- **10.** Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.



WARNING! Shifting cargo can result in loss of control of the trailer, and can lead to death or serious injury. Tie down all loads with proper sized fasteners, ropes, straps, etc.



Notice. Cargo securement is the drivers responsibly and may be regulated by the provinces. Most often, the regulations will refer to the National Safety Code 10 - Cargo Securement. This standard is available for free down load. If you are unable to obtain a copy, contact your dealer or Brandt Equipment Solutions Ltd. and a free copy will be sent to you.

11. Return the ramps to their stowed position, and secure them so that they will not move during transit.

5.1.3.3 Loading a Pivoting (Tilt) Deck Trailer

Some open trailers are equipped with a pivoting-deck instead of with ramps. The pivoting feature allows for easier loading and unloading.

The pivoting-deck trailer is fitted with spring-loaded latches that keep the trailer in the driving position. After the trailer is loaded and the cargo is secured with hold downs, be sure the spring loaded latches have locked the trailer into driving position.

- 1. Couple the trailer securely to the tow vehicle before attempting to unlock the deck and load the trailer.
- 2. Be sure the trailer is on level ground, both left/right and front/back. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.



WARNING! The trailer must be on level ground before loading. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.

- 3. Always set the park brake on the tow vehicle and trailer before loading. Use chock blocks as an added safety precaution.
- 4. Remove the deck lock handle safety pin and rotate the handle to the unlocked position to release the deck lock and tilt the rear end of the deck down. The deck lock is spring loaded so it will return to the locked position when the handle is released.

A WARNING

WARNING! Loading a pivoting-deck trailer without releasing the deck lock can damage the lock, which can cause loss of cargo or loss of control of the trailer. Death or serious injury may result.

Before loading the trailer, release the lock and the rear of the deck will tilt down automatically. Ensure all people are clear before unlocking.

The tilt deck is equipped with a damping cylinder to cushion the movement of the deck. Service the cylinder if cushioning has decreased.

If the deck securing lock becomes damaged, do not attempt to repair it. Replace the deck securing lock before towing the load.

Work Ready Trailers

5. When loading equipment onto the deck, drive slowly forward until the appropriate tongue load is achieved. Load the cargo onto the trailer with approximately 60% of the cargo in the front half of the bed. As the cargo is moved forward on the deck, the deck will pivot down into the driving position. Not enough tongue weight can result in swaying of the trailer, which can be unsafe. Make sure the deck lock engages and locks the deck into the driving position. Reinstall the deck lock handle safety pin.



WARNING! An unlocked pivoting deck can result in loss or cargo or loss of control of the trailer, which can result in death or serious injury.

Before towing the trailer:

- Lock the pivoting deck in the driving position.
- Double-check that the lock is engaged on the pivoting deck and the safety pin is installed.
- **6.** Before securing equipment, always lower booms, loaders and buckets. The parking brake on the equipment being transported must be engaged, where applicable. Always make sure you are under the maximum allowable height clearance.
- 7. Secure the cargo onto the trailer using appropriate straps and tensioning devices. Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.



WARNING! Shifting cargo can result in loss of control of the trailer, and can lead to death or serious injury. Tie down all loads with proper sized fasteners, ropes, straps, etc.

8. 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. Articulated vehicles shall be restrained in a manner that prevents articulation while in transit.

Note: The tie down locations on all Brandt trailers have been tested and certified to 5000 lb WLL, as per CMVSS 905.



Notice. Cargo securement is the drivers responsibly and may be regulated by the provinces. Most often, the regulations will refer to the National Safety Code 10 - Cargo Securement. This standard is available for free down load. If you are unable to obtain a copy, contact your dealer or Brandt Equipment Solutions Ltd. and a free copy will be sent to you.

5.1.4 Unloading the Trailer

5.1.4.1 Unloading a Rigid Deck Trailer

1. Before unloading a rigid-deck trailer, couple the trailer to the tow vehicle and make sure the rigid deck is level, both left/right and front/back. Do not unload the trailer when the deck is not level.



WARNING! The trailer must be on level ground before unloading. Attempting to unload on uneven ground may cause the trailer to overturn, which can result in serious injury or death.

- 2. Always set the park brake on the tow vehicle and trailer before unloading. Use chock blocks as an added safety precaution.
- 3. Prior to unloading, it is very important that the ramps are adjusted to the proper spacing for the equipment being transported. Make sure the top of the ramps are secure to the trailer, and the bottom is resting on firm ground. Pockets may be provided to hold the ramp to the frame of the trailer.
- **4.** Remove the securing straps or chains that are holding the piece of equipment to the trailer.
- 5. Start the engine of the piece of equipment being transported and raise the boom, loader or bucket until it is slightly above the trailer deck. Keep the piece of equipment's centre of gravity as low as possible when unloading.

WARNING

WARNING! Load can suddenly move or topple, which can result in death or serious injury.

Do not unload your open trailer unless it is prevented from tipping and is on firm and level ground.

- **6.** Release the piece equipment's park brake and slowly back it off the trailer, remembering to adjust the height of the boom, loader or bucket to keep it from dragging on the trailer deck.
- **7.** Return the ramps to their stowed position, and secure them so that they will not move during transit.

5.1.4.2 Unloading a Pivoting (Tilt) Deck Trailer

1. Before unloading a pivoting-deck trailer, couple the trailer to the tow vehicle and make sure the trailer deck is level, both left/right and front/back. Do not unload the trailer when the deck is not level.



WARNING! The trailer must be on level ground before unloading. Attempting to unload on uneven ground may cause the trailer to overturn, which can result in serious injury or death.

- 2. Always set the park brake on the tow vehicle and trailer before unloading. Use chock blocks as an added safety precaution.
- 3. Remove the deck lock handle safety pin, rotate the handle to the unlocked position to release the deck lock. Reinstall the safety pin to hold the lock in the open position (the spring loaded feature will otherwise re-lock the latch.
- **4.** Remove the securing straps or chains that are holding the piece of equipment to the trailer.
- 5. Start the engine of the piece of equipment being hauled and raise the boom, loader or bucket until it is just off the trailer deck. Keep the piece of equipment's centre of gravity as low as possible when unloading.



WARNING! Load can suddenly move or topple, which can result in death or serious injury.

Do not unload your trailer unless it is prevented from tipping and is on firm and level ground.

- **6.** Release the piece equipment's park brake and slowly back it off the trailer, remembering to adjust the height of the boom, loader or bucket to keep it from dragging on the trailer deck.
- **7.** Remove the safety pin, allow the deck lock handle to rotate into the locked position and return the deck to the horizontal position. Make sure the deck lock re-engages. Reinstall the safety pin

5.1.5 Securing the Cargo

Since the trailer "ride" can be bumpy and rough, you must secure your cargo so that it does not shift while the trailer is being towed.



WARNING! Shifting cargo can result in loss of control of the trailer, and can lead to death or serious injury. Tie down all loads with proper sized fasteners, ropes, straps, etc.

Use appropriate straps, chains and tensioning devises to properly secure the load. Refer to the National Safety Code 10 - Cargo Securement section for regulations regarding cargo securement rules.

5.2 Loading and Unloading the Dump Trailer

Improper trailer loading causes many accidents and deaths. To safely load a trailer, you must consider:

Overall load weight;

Load weight distribution;

Proper tongue weight; and

Securing the load properly.

To determine that you have loaded the trailer within its rating, you must consider the *distribution* of weight, as well as the total weight of the trailer and its contents. The trailer axles carry most of the total weight of the trailer and its contents (Gross Vehicle Weight, or "GVW"). The remainder of the total weight is carried by the tow vehicle hitch. It is essential for safe towing that the trailer tongue and tow vehicle hitch carry the proper amount of the loaded trailer weight, otherwise the trailer can develop an undesirable sway at towing speeds, or the rear of the towing vehicle can be overloaded. Read the "Tongue Weight" information in Section 4.

The load distribution must be such that no component part of the trailer is loaded beyond its rating. This means that you must consider the rating of the tires, wheels and axles. For tandem and triple axle trailers, you must make sure that the front-to-rear load distribution does not result in overloading any axle.

Towing stability also depends on keeping the center of gravity as low as possible. Load heavy items on the floor and over the axles. When loading additional items, be sure to maintain even side-to-side weight distribution and proper tongue weight. The total weight of the trailer and its contents must never exceed the total weight rating of the trailer (Gross Vehicle Weight Rating, or "GVWR").

Hazards For Dump Trailers

A dump trailer is specifically designed for hauling equipment or cargo that is to be dumped, not for transporting livestock. The major hazards associated with dump trailers are:

- Overloading.
- Improper weight distribution; both side to side and front to back.
- Getting under a raised dump body.
- Not using, or improperly using the body prop.
- Modifying or altering hydraulic components.
- Modifying or altering dump controls.
- Not dumping from a solid and level foundation.
- Not fully opening rear doors when dumping.
- Jerking the trailer, or hydraulics, to loosen the load.
- Trailer coming near or contacting overhead power lines when body is raised.

A WARNING

WARNING! An overloaded trailer can result in loss of control of the trailer, leading to death or serious injury.

Do not load a trailer so that the weight on any tire exceeds its rating.

Do not exceed the trailer Gross Vehicle Weight Rating (GVWR) or the Gross Axle Weight Rating (GAWR).

A WARNING

WARNING! A soft and/or uneven surface may cause the tow vehicle and trailer to tip over when the dump body is raised.

Raise the dump body ONLY if the tow vehicle and trailer are both on a firm and level surface.

A WARNING

WARNING! An overloaded trailer or improperly distributed load can result in death or serious injury.

An overloaded trailer can cause the hydraulic system to malfunction, resulting in the dump body falling.

A load that is improperly distributed in the trailer can result in the trailer tipping over when the dump body is raised.

A DANGER

DANGER! <u>NEVER</u> alter or substitute any hydraulic system component. Death or serious injury may result.

An altered or component substituted hydraulic system may malfunction, resulting in the dump body falling without warning.

NEVER alter or substitute any hydraulic system component.

A DANGER

DANGER! Risk of electrocution.

Dump body coming near or contacting power lines can cause electrocution. Electrocution can occur without contact.

Be sure there are no overhead power lines over or near the trailer before raising dump body.

5.2.1 Loading Fixed Loads - Trailers with Non-Mounted Ramps

(Including equipment such as skid-steer loaders, mowers, etc.)

Fixed loads that are to be carried or dumped should be loaded evenly throughout the trailer. Too much load in the front portion will strain and possibly overload the hydraulic hoist. Too much load in the rear can lead to trailer swaying at highway speeds.

- 1. Couple the trailer to the tow vehicle.
- 2. Park the tow vehicle and trailer on a firm and level surface, both front-to-back and side-to-side. Attempting to load on a soft or uneven surface may cause the trailer to overturn, which can result in death or serious injury.
- 3. Inspect the "D" rings for any cracks.
- 4. Clear the area around the trailer.

WARNING

WARNING! Load can suddenly move or topple, which can result in death or serious injury.

Do not load or unload trailer unless coupled to tow vehicle and is on a firm and level surface.

- 5. Lower the Rear Stands (if equipped) or place blocking under the rear of the trailer so the weight of the cargo does not raise the front of the trailer during loading. See Fig. 5-8.
- **6.** Open rear swing gates and secure open.

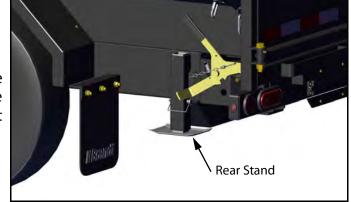


FIG. 5-8. Rear Stand Deployment



Caution. The weight of each loading ramp is 89 lbs.

Use a safe lifting procedure to prevent injury when handling ramps.

7. Remove Safety Lock Pin, rotate the Ramp Lock down and pull the ramps from storage position. See Fig. 5-9.

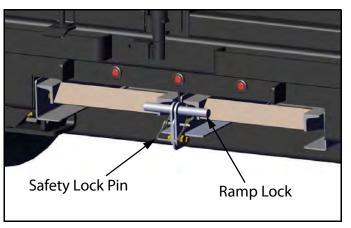
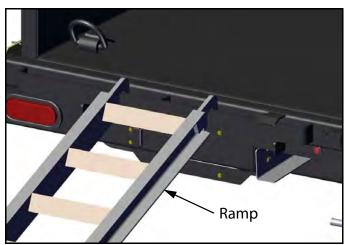


FIG. 5-9. Ramp Safety Lock

- Place the ramps over the bracket welded to the back of the trailer. See Fig. 5-10.
- Place the ramps at the proper width and load the equipment. The operator must be experienced and skilled to perform the loading and unloading.
- 10. Secure the cargo to the trailer using appropriate straps, chains and tensioning devices. Refer to NSC10 for regulations regarding cargo securement rules.
- 11. Remove the ramps and place in storage position. Rotate the Ramp Lock up and FIG. 5-10. Installing the Ramps secure it with the safety lock pin. See Fig. 5-9.



- **12.** Close and secure rear doors.
- 13. Raise the Rear Stands or remove the blocking from under the rear of the trailer

5.2.2 **Loading Fixed Loads - Trailers with End Gate Mounted Ramps**

(Including equipment such as skid-steer loaders, mowers, etc.)

Fixed loads that are to be carried or dumped should be loaded evenly throughout the trailer. Too much load in the front portion will strain and possibly overload the hydraulic hoist. Too much load in the rear can lead to trailer swaying at highway speeds.

- 1. Couple the trailer to the tow vehicle.
- Park the tow vehicle and trailer on a firm and level surface, both front-to-back and side-to-side. Attempting to load on a soft or uneven surface may cause the trailer to overturn, which can result in death or serious injury.
- Inspect the "D" rings for any cracks. 3.
- Clear the area around the trailer.

WARNING

WARNING! Load can suddenly move or topple, which can result in death or serious injury.

Do not load or unload trailer unless coupled to tow vehicle and is on a firm and level surface.

Lower the Rear Stands (if equipped) or place blocking under the rear of the trailer so the weight of the cargo does not raise the front of the trailer during loading.

Work Ready Trailers

- **6.** Open the Centre Tailgate Latch.
- **7.** Open the right Ramp Latch. See Fig. 5-11.
- **8.** Lift the right Tailgate Pin.
- **9.** Lower the right half of the Tailgate while rotating the Ramp into position as shown in Fig. 5-12.
- **10.** Repeat steps 7, 8 & 9 on the left side.
- 11. Carefully load the equipment. The operator must be experienced and skilled to perform the loading and unloading.
- **12.** Secure the cargo to the trailer using appropriate straps, chains and tensioning devices. Refer to NSC10 for regulations regarding cargo securement rules.
- **13.** Reverse steps 6 through 10 to close the Tailgate.
- **14.** Remove the blocking from under the rear of the trailer.

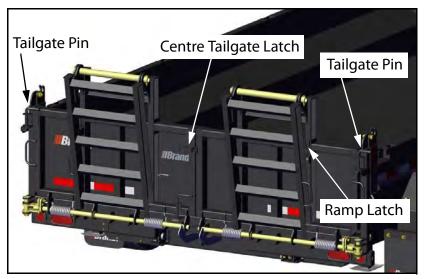


FIG. 5-11. Tailgate and Ramp Latches

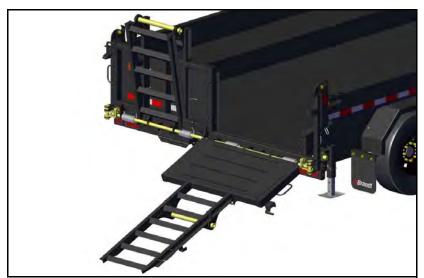


FIG. 5-12. Right Gate and Ramp Lowered

5.2.3 **Loading Fixed Loads - Trailers with Hydraulic Positioned Ramp**

(Including equipment such as skid-steer loaders, mowers, etc.)

Fixed loads that are to be carried or dumped should be loaded evenly throughout the trailer. Too much load in the front portion will strain and possibly overload the hydraulic hoist. Too much load in the rear can lead to trailer swaying at highway speeds.

- Couple the trailer to the tow vehicle.
- Park the tow vehicle and trailer on a firm and level surface, both front-to-back and side-to-side. Attempting to load on a soft or uneven surface may cause the trailer to overturn, which can result in death or serious injury.
- Inspect the "D" rings for any cracks. 3.
- Clear the area around the trailer.

WARNING

WARNING! Load can suddenly move or topple, which can result in death or serious injury.

Do not load or unload trailer unless coupled to tow vehicle and is on a firm and level surface.

- Lower the Rear Stands (if equipped) or place blocking under the rear of the trailer so the weight of the cargo does not raise the front of the trailer during loading.
- Go the rear left corner of the trailer. Pull the Lock Pin out and lift on the Latch Handle until the Lock Pin can be slid into the upper hole. This will lock the lower tailgate pivot position. See Fig. 5-13.
- 7. Activate the Tailgate hydraulics and lower the Tailgate Ramp.
- Carefully load the equipment. The operator must be experienced and skilled to perform the loading and unloading.
- Secure the cargo to the trailer using FIG. 5-14. Lowering the Tailgate Ramp appropriate chains straps,

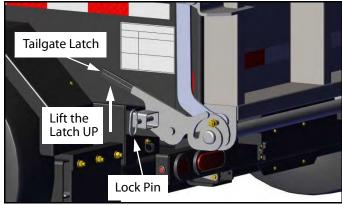


FIG. 5-13. Raising the Tailgate Latch



Work Ready Trailers

- tensioning devices. Refer to NSC10 for regulations regarding cargo securement rules.
- **10.** Activate the Tailgate hydraulics and raise the Tailgate Ramp.
- 11. Pull the Lock Pin out and push down on the Latch Handle until the Lock Pin can be slid into the lower hole. This is the position the Latch Handle <u>MUST</u> be in when transporting the trailer. See Fig. 5-15.
- **12.** Remove the blocking from under the rear of the trailer.

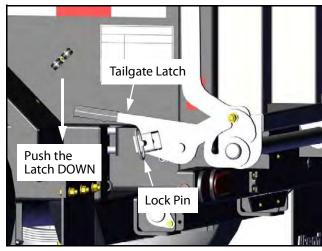


FIG. 5-15. Lowering the Tailgate Latch

5.2.4 Loading And Unloading Bulk Materials

Payload Capacity: Check if the trailer has "payload" decals on the sides. If not, then determine the payload, or Cargo Capacity, by subtracting the empty weight of the trailer from the GVWR given on the Certification / VIN tag. Determine the density of the material to be loaded and dumped so that you will know, approximately, how many cubic yards of material may be safely loaded, carried, and dumped.



WARNING! Trailer, hitch or dump body can fail.

You or others can die or be seriously injured.

Load in the trailer must not exceed capacity and must be distributed evenly.

5.2.4.1 Prepare Trailer For Loading

Couple the trailer to the towing vehicle before loading. This is essential because the tongue can raise during loading, To measure the tongue weight you will have to uncouple the trailer after it is loaded.

Be sure the trailer is located on firm level ground. Attempting to load on uneven ground may cause the trailer to overturn, which can result in serious injury or death.

Do not transport people, containers of hazardous substances, or flammable liquids. The exception is fuel in the tank of vehicles or equipment that are being hauled.

A WARNING

WARNING! Do not transport flammable, explosive, poisonous or other dangerous materials in your trailer. The exception is fuel in the tank of vehicles or equipment that are being hauled.

A WARNING

WARNING! RAISED DUMP BODY CAN DROP OR TIP OVER SUDDENLY. YOU AND OTHERS CAN DIE OR BE SERIOUSLY INJURED.

YOU MUST:

- Have trailer on level, firm ground before dumping.
- Keep others away while dumping.
- Stay at controls until dump body is down.

A WARNING

WARNING! NEVER LEAVE THE SCENE WHEN DUMP BODY IS LIFTED.

- Lock hoist controls after use.
- Have dump body down before moving trailer.
- Use body-prop and have dump body empty before getting under raised dump body.
- If the hoist does not lift the load:
 - -Manually reduce the load obtain service from a qualified hydraulics technician.

A WARNING

WARNING! <u>NEVER ASSIST THE HOIST.</u> (i.e., with a jack, crane, heavy equipment, etc.

- If the load does not leave the dump body: Lower the dump body and manually free the load.
- Never attempt to free a load from a raised dump body.

5.2.4.2 Loading Bulk Material

- 1. Couple the trailer to the tow vehicle.
- **2.** Park the trailer and tow vehicle on a firm and level surface, both side-to-side and front-to-rear.
- **3.** Check the dump body for damage. Repair before loading trailer.
- 4. Close and latch trailer gates. On trailers with the hydraulic tailgate, make sure the Tailgate Latch is in the lowered position. See Fig. 5-16.
- 5. Tell the loader operator the GVWR of your trailer. The loader operator will have an approximate weight of the material to be loaded.
- 6. Use common sense when loading. If you are uncertain of the weight of the material, load a small amount and weigh your trailer. It is much easier to add to a light load than to remove material from an overloaded trailer.
- **7.** Level (evenly distribute) the load within the trailer from front to back and from side to side.
- **8.** If material may blow out while driving, tarp the trailer.
- 9. If the trailer is overloaded, **DO NOT attempt**to raise the dump body. The excess material must be removed by equipment designed for this purpose, or by hand.

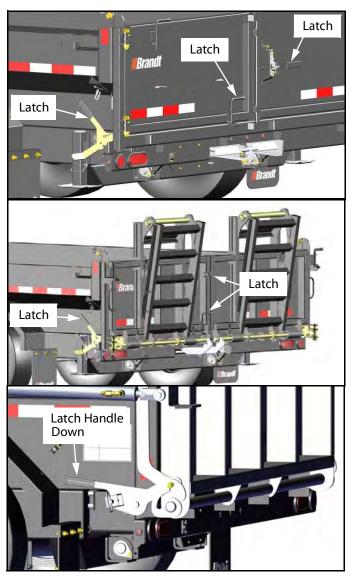


FIG. 5-16. Tailgate Latches Closed

5.2.4.3 Unloading Bulk Material Using The Spreader Gate

Read and understand the hoist operating procedure before operating the dump body.

- 1. Clear the area around the dump trailer.
- 2. Park the tow vehicle and trailer on a firm and level surface both left / right and front / rear. Attempting to unload on a soft or uneven surface may cause the trailer to overturn, which can result in death or serious injury.
- **3.** For spreading material, the surface in which the tow vehicle and trailer will travel **MUST** be firm and level.

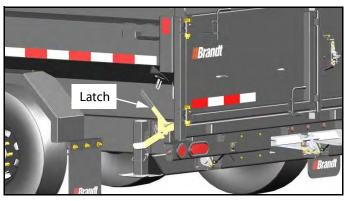


FIG. 5-17. Tailgate Latch is Open

A WARNING

WARNING! A soft and/or uneven surface may cause the tow vehicle and trailer to overturn when the dump body is raised or while spreading material.

Raise the dump body ONLY if the tow vehicle and trailer are both on a firm and level surface.

A WARNING

WARNING! An overloaded trailer or improperly distributed load can result in death or serious injury.

An overloaded trailer can cause the hydraulic system to malfunction, resulting in the dump body falling.

A load that is improperly distributed in the trailer can result in the trailer overturning when the dump body is raised.

4. Non-Hydraulic Tailgates

The dump box has "Banjo Eye" holes and metering chains to control the tailgate while unloading. Set the metering



FIG. 5-18. Metering Chain

chains at the desired number of links to control the opening distance of the spreader gate. See Fig. 5-18. Be sure to set both chains at equal length. Push down on Tailgate Latch to unlock the Tailgate. See Fig. 5-17.

A CAUTION

Caution. Loaded materials can exert pressure against the spreader gate. This may cause the spreader gate to swing out with force when unlocked, causing serious injury.

Stand on the side of the trailer to unlock spreader gate.

Hydraulic Tailgate

Make sure the Latch Handle is locked in the down position. See Fig. 5-19. This will allow the tailgate to rotate on the upper pivot. Operate the tailgate using the gate hydraulics, as shown in Fig. 5-20.



A CAUTION

Caution. The hydraulic tailgate may FIG. 5-19. Hydraulic Gate Latch Handle contact the ground if the box is raised to a high dump angle before opening the tailgate.

Make sure the tailgate is open before raising the box.

5. Open the battery box and locate the dump body controller. While using the dump body controller, position yourself in a safe location clear of the dump body. Check for overhead power lines and other obstructions before raising dump body.

A DANGER

DANGER! Risk of electrocution.

Dump body coming near or contacting power lines may result in electrocution. Electrocution can occur without contact.

Be sure there are no overhead power lines over or near the trailer before raising dump body.

A DANGER

DANGER! A lowering or falling dump body can result in death or serious injury.

<u>NEVER</u> enter the area under the dump body unless the empty dump body is supported by the body prop.

A DANGER

DANGER! The body prop is designed to support an empty dump body only.

NEVER support a loaded dump body by the body prop.

Unload the dump body before using body prop.

Press and hold the Box UP button to raise the dump body. See Fig. 5-20. Release the button when the body has reached approximately the halfway point of its dumping angle, or if the load begins to shift rearward.

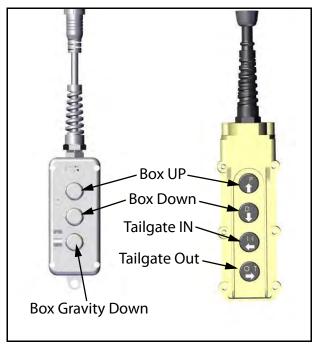
WARNING

WARNING! Never leave the dump body control when operating the dump body.

Fully raising the loaded dump body may result in the tow vehicle rear wheels loosing traction.

Do not fully raise a loaded dump body or place the entire load at the rear of trailer.

Return the dump body control to the battery box. Watch for and avoid obstructions such as tree FIG. 5-20. Hydraulic Controls limbs, overhead lines, potholes, etc. and SLOWLY drive the tow vehicle and trailer ahead to spread the material.



- **DO NOT** drive forward and stop quickly to "shock" the load out of the body. **DO NOT** "jerk" the control button up and down to dislodge the load. The proper procedure for a stuck load is to fully lower the dump and dislodge the material by hand.
- 9. You may need to raise the dump body higher after a portion of the load has been spread to place the remaining material at the rear of the dump body.
- **10.** Stop tow vehicle after all material has exited the dump body.
- 11. Press and hold the Box DOWN button to lower the dump body. See Fig. 5-16. Release the button when the dump body is fully lowered. Place dump body controller in the storage or travel location. Close and lock battery box.
- **12.** Close and lock rear gate before moving trailer.

5.2.4.4 **Unloading Bulk Material Using The Swing Gates**

- Read and understand the hoist operating procedure before dumping the load.
- Be sure the trailer is on level ground, both side-to-side and front-to-rear. Attempting to unload on uneven ground may cause the trailer to overturn, which can result in death or serious injury.

WARNING

WARNING! A soft and/or uneven surface may cause the tow vehicle and trailer to overturn when the dump body is raised or while spreading material.

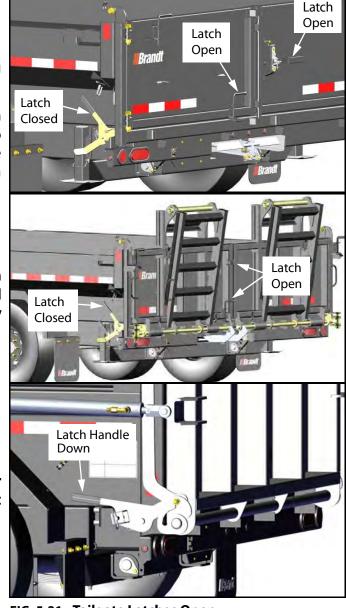
Raise the dump body ONLY if the tow vehicle and trailer are both on a firm and level surface.

WARNING

WARNING! An overloaded trailer or improperly distributed load can result in death or serious injury.

An overloaded trailer can cause the hydraulic system to malfunction, resulting in the dump body falling.

A load that is improperly distributed in FIG. 5-21. Tailgate Latches Open the trailer can result in the trailer overturning when the dump body is raised.



A CAUTION

Caution. Loaded materials can exert pressure against the swing gates. This may cause the gates to swing out with force when unlatched, causing serious injury.

Stand away from the trailer to unlock swing gates.

Clear the area around the dump trailer. 3.

4. Non-Hydraulic Tailgates

Remove safety lock pin, pull up on gate latch to release swing gates. See Fig. 5-21. Lock the gates against the side of trailer.

Hydraulic Tailgate

Make sure the Latch Handle is locked in the down position. See Fig. 5-21. This will allow the tailgate to rotate on the upper pivot. Operate the tailgate using the gate hydraulics, as shown in Fig. 5-22.

5. Open the battery box and locate the dump body controller. While using the dump body controller, position yourself in a safe location clear of the dump body. Check for overhead power lines and other obstructions before raising dump body.

A DANGER

DANGER! Risk of electrocution.

Dump body coming near or contacting power lines may result in electrocution. Electrocution can occur without contact.

Be sure there are no overhead power lines over or near the trailer before raising dump body.

A DANGER

DANGER! A lowering or falling dump body can result in death or serious injury.

NEVER enter the area under the dump body unless the empty dump body is supported by the body props.

A DANGER

DANGER! The body props are designed to support an empty dump body only.

NEVER support a loaded dump body by the body props.

Unload the dump body before using body props.

6. Standing well clear of the dump body in a safe location, push and hold the up button on the control until the dump body reaches approximately the halfway point of its dumping angle. See Fig. 5-22. Never leave the control when operating the dump body.

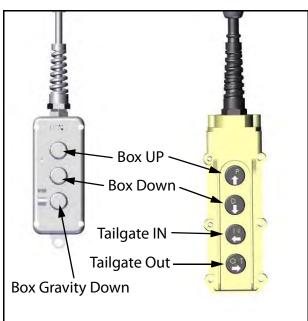


FIG. 5-22. Hydraulic Controls

- 7. Discontinue pushing the up button and walk to the rear of the trailer so you can estimate if there is enough space for the remainder of the load to be safely dumped. If not, then you need to fully lower the dump body by pushing and holding the down button and then pull the trailer forward and then repeat the previous step.
- 8. Standing well clear of the dump body, raise the dump body to the **three quarter point** of the maximum dump angle. Discontinue pushing the up button and walk to the rear of trailer to check to see if there is enough space for continued dumping.
- 9. Repeat the process until the load has been completely dumped.
- 10. If the load has not completely dumped DO NOT drive forward and stop quickly to "shock" the load out of the body. Also DO NOT "jerk" the control button up and down to dislodge the load. The proper procedure for a stuck load is to lower the dump and dislodge the material by hand.
- 11. Press and hold the down button to lower the dump body.
- **12.** Release the button when the dump body is fully lowered. Place dump body control in the storage or travel location. Close and lock battery box.
- **13.** Close and lock rear doors before moving the trailer.

5.2.5 Hydraulic Components

Do not alter or substitute and hydraulic components on the dump trailer. The hoist system is designed with each component being compatible with the safe and reliable operation of the hoist system. Under no circumstances should you alter the hydraulic pressure or flow rate to the hoist system.

Always have the hoist system repaired or maintained by a qualified technician.



DANGER! <u>NEVER</u> alter or substitute any hydraulic system component. Death or serious injury may result.

An altered or component substituted hydraulic system may malfunction, resulting in the dump body falling without warning.

NEVER alter or substitute any hydraulic system components.



WARNING! HIGH PESSURE FLUID HAZARD.

Always relieve the pressure on a system before repairing or adjusting or disconnecting.

Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of you hands.

Keep all components in good repair.

5.2.6 Body Prop

The body prop supplied as part of the trailer is to be used only when the dump body is empty. The purpose of the body prop is a back-up to the hydraulic system and will hold the empty dump body in a raised position while performing maintenance on the hoist, trailer body, or the trailer itself.

DO NOT use the body prop to support a loaded dump body.

DO NOT perform maintenance under a raised dump body without first blocking the empty dump body up with the body prop.

Park the trailer on a firm and level surface. Raise the dump body and lock the body prop in the upright position. Lower the dump body onto the body prop.



DANGER! Risk of death by crushing.

Empty dump body before using body prop.

WARNING

WARNING! Risk of death by crushing.

Make sure dump body is empty.

DO NOT manipulate the body prop if a person is near the control.

A WARNING

WARNING! Risk of death by crushing.

Dump body can drop unexpectedly.

Never go under a raised dump body.

Use body prop for maintenance.



FIG. 5-23. Body Prop Rod

5.2.7 Securing The Cargo

Since the trailer cargo is subjected to longitudinal (front / back) and lateral (side/side) forces you must secure all cargo, that is not flowable, so that it does not shift while the trailer is being towed.

Refer to NSC10 for regulations regarding cargo securement rules.



WARNING! Shifting cargo can result loss of control of the trailer, and can lead to death or serious injury.

Tie down all loads with proper sized fasteners, ropes, straps, etc.

Chapter 6 Checking the Trailer Before and During Each Tow

6.1 Pre-tow Checklist

Before towing, double-check all of these items: See section 9.1, "Inspection, Service & Maintenance Summary Charts," for more information.

- Tires, wheels and lug nuts (see Section 9.2.8, 9.2.9, 9.2.10 and 9.2.11)
- Tire Pressure. Inflate tire on trailer and tow vehicle to the pressure stated on the VIN / Certification label (see Section 4.1.1).
- Coupler secured and locked (see Section 4.3.1.3, 4.3.2.3 or 4.4.3)
- Safety chains properly rigged to tow vehicle, not to hitch or ball (see Section 4.3.4 or 4.4.4)
- Test of lights: Tail, Stop, and Turn Lights
- Test trailer brakes.
- Safety breakaway switch cable fastened to tow vehicle, not to safety chains (see Section 4.3.4 or 4.4.5)
- Cargo properly loaded, balanced and tied down (see Section 5.1.1, 5.1.3, 5.2.1, 5.2.2, 5.2.3 and 5.2.4)
- Tongue weight and weight distribution set-up.
- Doors and gates latched and secured
- Fire extinguisher
- Flares and reflectors

6.2 Make Regular Stops

After each 80 km (50 miles), or one hour of towing, stop and check the following items:

- Coupler secured
- Safety chains are fastened and not dragging
- Cargo secured
- Cargo door latched and secured
- Wheel Hubs are not over-heating

CHAPTER 7 Breaking In a New Trailer

7.1 Re-tightening the Lug Nuts at 16, 40 & 80 km (10, 25 & 50 miles)

Wheel lugs can shift and settle quickly after being first assembled, and must be checked after the **first** 16, 40 and 80 km (10, 25 & 50 miles) of driving. Failure to perform this check may result in a wheel coming loose from the trailer, causing a crash leading to death or serious injury. See Section 9 for torque specs and the nut tightening sequence.



WARNING! Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury.

Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 16, 40 and 80 km (10, 25 & 50 miles) of driving.

7.2 Break-in Period for Electric Drum Brakes

Electric drum brakes will require a break-in period to achieve full performance. This break-in period applies for new axles and anytime new brake shoes and/or magnets are installed as a part of regular maintenance.

The normal break-in period for electric drum brakes is 20 to 50 brake applications.

Brakes can be seated in by applying approximately 8 - 10 volts to the trailer brakes at an initial speed of 60 kph (40 mph) and allowing the truck/trailer combination to slow down to 32 to 40 kph (20 to 25 mph). For beat results, do not apply the truck brakes during this procedure. The trailer brakes will seat in much quicker by using them to slow down both the truck and the trailer. The easiest method is to apply the trailer brakes using the manual activation lever located on the in-cab brake controller. Care must be taken not to overheat the lining material, therefore brake applications conducted at 1.5 km (1 mile) intervals will suffice. The driver should feel a noticeable difference in the brake performance during this period, sometimes in as few as 10 applications. After 50 applications, the brake lining material will be fully cured from the heat and develop close to 100% contact with the brake drum surface.

This break-in period not only seats the shoe lining material but also seats in the brake electromagnets. During the break-in period, the linings will wear at a faster rate than they do after they are seated.

7.3 Adjusting the Brake Shoes at the First 320 km (200 miles)

Brake shoes and drums experience a rapid initial wear. The brakes must be adjusted after the first 320 km (200 miles) of use, and each 5,000 km (3,000 miles) thereafter. Some axles are fitted with a mechanism that will automatically adjust the brake shoes when the trailer is "hard braked" from a rearward direction. Refer to the Axle, Hub and Brake manual for further instructions.

A hard stop is used to:

- Confirm that the brakes work;
- Confirm that the trailer brakes are properly synchronized with the tow vehicle brakes using the brake controller in the tow vehicle
- Adjust the brake shoes as necessary.
- For surge brakes check the Master cylinder reservoir for fluid.

Brandt Work Ready Trailers equipped with 3,500 to 10,000 lb axles use forward self adjusting electric brakes. The advantage to this is they adjust during every forward stop, providing optimal brake performance and wear.

If your trailer is not fitted with automatically adjusting brakes, the brakes will need to be manually adjusted. See Section 9 for instructions.

7.4 Synchronizing the Brake Systems

Trailer brakes are designed to work in synchronization with the brakes on the tow vehicle. When the tow vehicle and trailer braking systems are synchronized, both braking systems contribute to slowing, and the tongue of the trailer will neither dive nor rise sharply.



WARNING! If trailer and tow vehicle brakes do not work properly together, death or serious injury can occur.

Road test the brakes in a safe area at no more than 50 kph (30 mph) before each tow.

To ensure safe brake performance and synchronization, read and follow the instructions in the Axle, Hub and Brake manual and the brake controller manufacturers' instructions.

7.5 Tire Pressure

Check tire pressures on both the trailer and tow vehicle. Inflate to the maximum shown on the VIN/Certification Label.

CHAPTER 8 Accessories

This chapter provides some basic information for the safe operation of accessories. You must read and follow these instructions before using the accessory. If you are uncertain whether you have all of the instructions, call Brandt Equipment Solutions Ltd. before operating the accessory.

8.1 Accessory Battery

Your trailer may be outfitted with an accessory battery that operates lighting, dump body or other accessories. An accessory battery may be kept charged either by the tow vehicle or by using an external battery charger.

A disconnect switch may be provided to disconnect the accessory battery when you do not plan to be using the trailer for an extended period, such as seasonal storage. If there is no disconnect switch, then remove the cables from the battery terminals.

The accessory battery must be kept in a charged condition during storage. The battery could freeze and break if it becomes discharged.

8.2 DC Hydraulic Power Unit for Dump Trailers

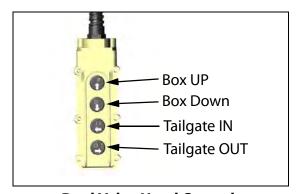
The Dump Trailers have a self contained DC Hydraulic Power Unit installed to control the box tilting function. The units are mounted in the storage cabinet at the front of the trailer.

Trailers with the hydraulically controlled dump box only use a single valve double acting power unit. Trailers with the hydraulically controlled dump box and the hydraulically controlled tail gate use a dual valve double acting power unit.

The hydraulic power unit uses an electric over hydraulic hand held control to activate the hydraulic functions.



Single Valve Hand Control



Dual Valve Hand Control

8.2.1 DC Hydraulic Power Unit Service Items

Hydraulic Oil Type - Valpar HVI 22 Hydraulic Oil (Brandt part no. 603281)- Suitable for year round use.



WARNING! Do not mix the hydraulic oil with other types or grades of oil.

8.2.2 Hydraulic Power Unit Quick Reference Trouble Shooting Guide

Possible Cause	Not Building Pressure	Motor Not Running	Cylinder Won't Extend	Cylinder Won't Retract	Won't Hold Load	Excessive Heat from Unit	Aeration of Hydraulic Fluid	Reservior Overflows	Cylinder Extends with Unit Not Operating	Struggles to Lift Load	Load Bounces when Cylinder Retracts	Start Solenoid Just Clickes - Motor Not Engaging	Won't Lift Load (DC Motor Under Load)	Won't Lift Load (DC Motor Not Under Load)	Won't Lower	Start Solenoid Stays On	Cylinder Won't Retract - Motor Under Load
Low Battery Voltage		Х	Х	Х		Х		Χ		Х		Χ					
Poor Ground Condition		Χ	Χ	Χ		Χ		Χ		Χ		Χ					
Check Hand Control												Χ			Χ		Χ
Debris in Hold Holding Valve					Χ												
Thermal Pressure Lock			Χ														Χ
Coil Not Energizing			Χ	Χ									Χ		Χ		Χ
Bad Seals in Cylinder	Χ										Х						Χ
Loose Inlet				Χ			Χ	Χ			Χ						Χ
Packing on Cylinder Rod Worn Out			Χ		Χ				Χ		Χ				Χ		Χ
Hoses Connected Backwards											Χ						
Pump Not Priming	Χ		Χ														
Clogged Orifice				Х											Χ		Χ
Rust in Motor		Χ															
Bad Diode				Х													Χ
Check for Additional Valving On or					X												
Connected to Cylinder																	
Directional Valve Not Shifting Properly			Х	Х						Х					Χ		Χ
Bad Start Solenoid												Х			Χ	Χ	
Dirty Contacts on Hand Control			Χ	Χ								Χ	Χ				

<u>Hydraulic Power Unit Trouble Shooting Symptoms and Solutions</u>

- Not Building Pressure
 - a. Gear Pump not priming

Remove relief valve. Operated pump for a few seconds until fluid comes out of port. Replace relief valve.

- **b.** Loose inlet on gear pump.
- **c.** Bad O-rings on relief valve or directional valve.
- Motor not Running
 - a. Check power to Start Solenoid.
 - **b.** Check power to DC Motor
 - c. If a. & b. check out OK, check for rust in the DC motor.
- Cylinder won't Extend
 - **a.** Check voltage at the Start Solenoid when trying to run the unit. Voltage must be 10 volts or higher.
 - **b.** Check to see if the power unit is bypassing over the relief valve.
 - **c.** Improper fluid in the reservoir (viscosity too high)
 - d. Check the Directional Control Valve.
 - e. Check the packing on the Cylinder.
- Cylinder won't Retract
 - **a.** Check to see if coil on the Load Holding Valve is activating.
 - **b.** Check the Directional Control Valve.
 - c. Pilot Operated Check Valve not opening.
 - d. Low voltage or poor ground.
- Excessive heat from Unit
 - a. Low Battery.
 - **b.** Poor ground.

- Reservoir overflows
 - a. Low Battery
 - **b.** Poor ground
 - c. Air in hydraulic system.
 - d. Too small of reservoir.
- Struggles to lift Load
 - a. Low Battery.
 - **b.** Poor ground.
 - c. Gear Pump sucking air.
 - d. Directional Control Valve partially engaging.
 - e. Debris in Relief Valve.
- Start Solenoid just clicks Motor not engaging
 - a. Carbon buildup on contacts in Start Solenoid.
 - **b.** Rust inside Motor.
 - c. Loose wire from Start Solenoid to DC Motor.
 - d. Cracked Housing on Start Solenoid.
- Won't lift Load (DC Motor not under load)
 - a. Low Fluid Level
 - **b.** Loose inlet on Gear Pump (air being introduced in hydraulic system).
 - c. Gear Pump not priming

Remove relief valve. Operated pump for a few seconds until fluid comes out of port. Replace relief valve.

- d. Worn out packing on Cylinder.
- Start Solenoid stays on
 - **a.** Low battery or poor ground caused Start Solenoid to weld on Replace Start Solenoid and check Battery and ground.

- Cylinder won't retract (DC Motor under load)
 - a. Low Battery.
 - **b.** Poor ground.
 - c. Coil on Load Holding Valve not energizing.
 - **d.** Directional Control Valve not returning to spring offset position.
 - e. Bad packing on Cylinder.

CHAPTER 9 Inspection, Service & Maintenance

9.1 Inspection, Service & Maintenance Summary Charts

You must inspect, maintain and service your trailer regularly to insure safe and reliable operation. If you cannot or are unsure how to perform the items listed here, have your dealer do them.

Note: In addition to this manual, also check the Axle, Hub and Brake manual.

Inspection and Service Before Each Use						
ltem	Inspection/Service	Manual Section Reference				
Breakaway Brakes						
> Electric	Check Operation.	Sections 4.3.4 & 4.4.5				
> Hydraulic	Check Fluid Levels.	Section 9.2.3.6				
Breakaway Battery	Fully Charged, Connections Clean.	Sections 4.3.4, 4.4.5 & 9.2.3.3				
Brakes, all types	Check Operation.	Section 7.3				
Brake Shoes and Drums	Adjust.	Sections 7.2 & 9.2.3.2				
Coupler and Hitch Ball	Check for cracks, pits, and flats. Replace w/ball & coupler have trailer GVW rating.	Section 4.3.1.1 & 9.2.4.1				
	Grease.	Section 4.3.1.2				
	Check locking device & replace if worn.	Section 43.1.1				
Ring & Pintle	Check for cracks, pits, and flats. Replace w/ball & coupler have trailer GVW rating.	Section 4.3.2.1 & 9.2.4.2				
	Grease.	Section 4.3.3.2				
	Check locking device & replace if worn.	Section 4.3.2.1				

Inspection	and Service Before Each	Use - con't	
ltem	Inspection/Service	Manual Section Reference	
Gooseneck Ball	Check for cracks, pits, and flats. Replace w/ball & coupler have trailer GVW rating.	Section 4.4.1 & 9.2.4.3	
	Grease	Section 4.4.1	
	Check locking device & replace if worn	Section 4.4.1 & 9.2.4.3	
Safety Chains & Hooks	Check for wear and damage	Section 4.3.3 & 4.4.4	
Tires	Check air pressure when cold. Inflate as needed.	Section 6.1 & 9.2.8	
Wheels - Lug Nuts (Bolts) &	Check for tightness.	Section 6.1	
Hub	Tighten. For new and remounted wheels, check torque after first 16, 40 & 80 km of driving and after impact.	Section 7.1 & 9.2.11	
Inspection and Serv	ice Each 3 Months or 5,0	00 km (3,000 miles)	
Suspension Pivot Points	Grease	Section 9.2.1.1	
Inspection and Servi	ce Each 6 Months or 10,0	000 km (6,000 miles)	
Tires	Rotate @ 8,000 km (5,000 miles)	Section 9.2.8	
	Inspect tread and sidewalls.	Section 9.2.8	
	Replace tire when treads are worn, when sidewall has a bulge, or sidewall is worn.	Section 9.2.8	
Brakes, electric			
> Magnets	Check wear and current draw	Section 9.2.3.5	
> Controller (in tow vehicle)	Check power output (amperage) and modulation	Section 9.2.3.4	
Jack	Lubricate leg		

Inspection and Service Each Year or 12,000 Miles (20,000 km)						
ltem	Inspection/Service	Manual Section Reference				
Brakes - All Types	Check for scoring and wear.	Section 9.2.3				
> Shoes and Drums	Replace if required.	See Axle Hub & Brake Mfr's Manual				
Jack - Drop-leg	Grease gears at top	See Section 9.2.5.				
> Frame Members	Inspect all frame members, bolts & rivets. Repair or replace damaged, worn or broken parts	Section 9.2.1, 9.2.2 & 9.2.2.1				
> Welds	Inspect all welds. Repair as needed.	Section 9.2.2.2				
Wheels						
> Sealed Bearings (Hubs)	Check and confirm free running. Replace if necessary.	Section 9.2.10				
> Unsealed Bearings (Hubs)	Grease. Replace promptly if immersed in water.	Section 9.2.10				
> Rims	Inspect for cracks and dents. Replace as needed.	Section 9.2.9				
Structure						
> Axle Attachment Bolts	Check by DEALER	Section 9.2.1				

Inspection and Service Each Year or 36,000 Miles (60,000 km)						
ltem	Inspection/Service	Manual Section Reference				
Wheels						
> Unsealed Bearings (Hubs)	Disassemble / Inspect / repack and reassemble. Replace promptly if immersed in water.	Section 9.2.10				

9.2 Inspection and Service Instructions

9.2.1 Axle Bolts, Frame, Suspension, & Structure



WARNING! Worn or broken suspension parts can cause loss of control and injury may result.

Have trailer professionally inspected annually and after any impact.

To perform many of the inspection and maintenance activities, you must jack up the trailer.

When jacking and using jack stands, place them so as to clear wiring, brake lines, and suspension parts (springs, torsion bars, etc.). Place jacks and jack stands under the outer frame rail to which the axles are attached.



WARNING! Never crawl under your trailer unless it is on firm and level ground and resting on properly placed and secured jack stands.

9.2.1.1 Suspension

All the components of your suspension system should be visually inspected for signs of wear, damage or loose fasteners at least every 10,000 km (6,000 miles).

Any points requiring lubrication should be done every 3 months or 5,000 km (3,000 miles).

Refer to the Axle, Hub and Brakes manual for service and maintenance on the axle.

9.2.2 Trailer Structure

Because the trailer floor receives the most abuse, it will most likely corrode before any other part of the structure.

Using a power washer and a detergent solution, wash the floor and walls of the trailer. Rinse the trailer floor and walls.

9.2.2.1 Fasteners and Frame Members

Inspect all of the fasteners and structural frame members for bending and other damage, cracks, or failure. Repair or replace any damaged fastener and repair the frame member. If you have any questions about the condition or method of repair of fasteners or frame members, get the recommendation of, or have the repair done by, your dealer.

WARNING

WARNING! Broken or damaged fasteners or welds can cause injury or damage to trailer and contents.

Inspect for, and repair all damaged parts at least once a year.

9.2.2.2 Welds

All welds can crack or fail when subjected to heavy loads or movement of cargo that was not properly tied to prevent movement. Any time that you know or suspect that the trailer has been subjected to heavy loads or movement of cargo, immediately inspect the welds and fasteners for damage. To prevent severe damage to your trailer, inspect all of the welds for cracks or failure at least once a year.

WARNING

WARNING! Improper weld repair will lead to early failure of the trailer structure and can cause serious injury or death.

Do not repair cracks or broken welds unless you have the skills and equipment to make a proper repair. If not, have the welds repaired by your dealer.

Improper or delayed repairs may void the warranty.

9.2.2.3 Trailer Finish - Galvanizing

When compared to paint or powder systems, hot-dip galvanizing provides significantly less potential for damage. If damage does occur, hot-dip galvanizing naturally mitigates further corrosion:

- The adjacent zinc will provide cathodic protection to the affected area.
- Cathodic protection will prevent under-film corrosion of the adjacent coating, preventing the area of concern from becoming larger.
- If the damage is the result of severe handling due to transportation or erection, a zinc iron alloy layer will typically remain in place, further protecting the area.

If the following conditions are present, we recommend repairing the affected areas with zinc-rich paint.

- 1. Any area with a remaining alloy layer larger than 30mm in diameter or more than 10mm in width, if longer than 30mm.
- 2. Any area where the base metal is exposed to a width of more than 4mm.

When repairing the areas according to ASTM A780 A2 and using zinc-rich paints, the following procedures must be in place:

1. If the zinc alloy layer is still present, the surface must be clean, dry and free of oil and grease.

- 2. If the zinc has been completely removed in the damaged area, the surface must be blast cleaned in accordance with SSPC-SP5, white metal blast. If circumstances prevent blast cleaning, it's permissible to power disk sand affected areas to a bright metal. To ensure a smooth reconditioned coating, surface preparation may extend into the undamaged galvanized coating.
- **3.** The zinc-rich paint is spray or brush applied as per the paint manufacturer's recommendations. Multiple passes are required to achieve a minimum, total dry film thickness of 100 microns. Paint must overlap slightly onto the area around the patch, but caution must be taken to prevent overpainting, which may exaggerate the size of the repaired area.
- **4.** Take measurements of the coating with a magnetic gage to ensure that the applied thickness is as specified.

9.2.3 Trailer Brakes

9.2.3.1 Brake Shoes and Drums

Properly functioning brake shoes and drums are essential to ensure safety. You must have your dealer inspect these components at least once per year, or each 20,000 km (12,000 miles).

The brake shoes must be adjusted after the first 320 km (200 miles) of use, and each 5,000 km (3,000 miles) thereafter. Most axles are fitted with a brake mechanism that will automatically adjust the brake shoes when the trailer is "hard braked" from a rearward direction. Refer to the Axle, Hub and Brakes manual for service and maintenance on the brakes.

9.2.3.2 Manually Adjusting Brake Shoes

Some braking systems are not automatically adjusted by hard stopping. These brakes require manual adjustment. The following steps apply to adjust most manually adjustable brakes. Refer to the Axle, Hub and Brakes manual for service and maintenance on the brakes.

- 1. Jack up the trailer and secure it on adequate capacity jack stands. Be sure the wheel and brake drum rotate freely.
- 2. Remove the adjusting-hole cover from the adjusting slot on the bottom of the brake backing plate.
- **3.** With a screwdriver or standard adjusting tool, rotate the star wheel of the adjuster assembly to expand the brake shoes.
- **4.** Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.

Note: Your trailer maybe equipped with drop spindle axles. See axle manual for your axle type. You will need a modified adjusting tool for adjusting the brakes in these axles. With drop spindle axles, a modified adjusting tool with about an 80 degree angle should be used.

5. Rotate the star wheel in the opposite direction until the wheel turns freely with a slight drag.

- **6.** Replace the adjusting-hole cover.
- **7.** Repeat the above procedure on all brakes.
- **8.** Lower the trailer to the ground.

9.2.3.3 Brakes, Electric

Two different types of electric brakes may be present on the trailer: an electric braking system that acts whenever the brakes of the tow vehicle are applied and/or an emergency electric breakaway system, which acts only if the trailer comes loose from the hitch and the breakaway pin is pulled.

Breakaway Brake

Breakaway Battery - This battery supplies the power to operate the trailer brakes if the trailer uncouples from the tow vehicle. Be sure to check and maintain the battery.

Breakaway Switch - This switch causes the breakaway battery to operate the electric brakes if the trailer uncouples from the tow vehicle.

The lanyard for the pull pin is connected to the tow vehicle, and the switch is connected to the trailer. To check for proper functioning of the switch, battery and brakes, you must pull the pin from the switch and confirm that the brakes apply to each wheel. You can do this by trying to pull the trailer with the tow vehicle, after pulling the pin. The trailer brakes may not lock, but you will notice that a greater force is needed to pull the trailer.



A WARNING

WARNING! If electric breakaway brakes do not operate when trailer is uncoupled from the tow vehicle, death or serious injury can occur.

Check emergency breakaway brake system BEFORE each tow.

9.2.3.4 Tow Vehicle Operated Electric Brakes

The electric brakes that operate in conjunction with the tow vehicle brakes must be "synchronized" so that braking is properly distributed to the tow vehicle brakes and the trailer brakes. For proper operation and synchronization, refer to the Axle, Hub and Brakes manual for information on the brakes.

9.2.3.5 Magnets for all Electric Brakes

To make certain an electrically-operated braking system will function properly, you must have your dealer inspect the magnets at least once a year, or each 20,000 km (12,000 miles). Refer to the Axle, Hub and Brakes manual for information on the brakes.

9.2.4 Trailer Connection to Tow Vehicle

9.2.4.1 Bumper Pull Coupler and Ball

The coupler on the trailer connects to the ball attached to the hitch on the tow vehicle. The coupler, ball and hitch transfer the towing forces between the tow vehicle and the trailer. Before each tow, coat the ball with a thin layer of automotive bearing grease to reduce wear and ensure proper operation; and check the locking device that secures the coupler to the ball for proper operation.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the ball or coupler, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and coupler system. If wear in the coupler exceeds 1/8" from the original surface, it must be replaced. All bent or broken coupler parts must be replaced before towing the trailer.

The coupler handle lever must be able to rotate freely and easily snap into the latched position. Oil the pivot points, sliding surfaces, and spring ends with SAE 30W motor oil. Keep the ball pocket and latch mechanism clean. Dirt or contamination can prevent proper operation of the latching mechanism.

When replacing a ball, the load rating must match or exceed the GVWR of the trailer.

9.2.4.2 Ring and Pintle

The ring on the trailer connects to the pintle attached to the hitch on the tow vehicle. The ring, pintle and hitch transfer the towing forces between the tow vehicle and the trailer. Before each tow, coat the ring with a thin layer of automotive bearing grease to reduce wear and ensure proper operation; and check the locking device that secures the pintle to the ring for proper operation.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the ring or pintle, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ring and pintle system. If wear in the ring or pintle exceeds 1/8" from the original surface, it must be replaced. All bent or broken coupler parts must be replaced before towing the trailer.

The pintle handle lever must be able to rotate freely and easily snap into the latched position. Oil the pivot points, sliding surfaces, and spring ends with SAE 30W motor oil. Keep the ring pocket and latch mechanism clean. Dirt or contamination can prevent proper operation of the latching mechanism.

When replacing a ring, the load rating must match or exceed the GVWR of the trailer.

9.2.4.3 Gooseneck Ball Receiver

The gooseneck receiver on the trailer connects to a hitch-mounted ball on the towing vehicle. The receiver, ball and hitch transfer the towing forces between the tow vehicle and the trailer. Before each tow, coat the ball with a thin layer of automotive bearing grease to reduce wear and ensure proper operation; and check the locking device that secures the receiver to the ball for proper operation. Make sure the hitch set screw and jam nut are torqued to a minimum 125 ft.lbs.

If you see or can feel evidence of wear, such as flat spots, pitting or corrosion, on the ball or receiver, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and receiver system.

When replacing a ball, the load rating must match or exceed the GVWR of the trailer.

9.2.5 Landing Leg or Jack

If a grease fitting is present, you must use a grease gun to lubricate the jack mechanism. Grease the gears in the top of hand-cranked jacks once a year, by removing the top of the jack and pumping or hand packing grease into the gears.

9.2.6 Lights, Signals and Conspicuity Tape

Before each tow, check the trailer taillights, stoplights, turn signals and any clearance lights for proper operation. Check the conspicuity tape for proper adhesion and condition.



WARNING! To avoid collisions, taillights, stoplights and turn signals must work.



WARNING! The reflective (conspicuity) tape originally installed on the trailer is part of the CNVSS lighting requirements. Replace and missing or substantially damaged sections.

9.2.7 Accessory Battery

Your trailer may be outfitted with an accessory battery that operates electric brakes, lighting, electric landing gear or other accessories. An accessory battery may be kept charged either by the tow vehicle or by an external battery charger.

A disconnect switch may be provided to disconnect the accessory battery when you do not plan to be using the trailer for an extended period, such as seasonal storage. If there is no disconnect switch, then remove the cables from the battery terminals.

The accessory battery must be kept in a charged condition during storage. The battery could freeze and break if it becomes discharged.

9.2.8 Tires

Before each tow, be sure the tire pressure is at the value indicated on the Certification / VIN label. Tire pressure must be checked while the tire is cold. Do not check the tire pressure immediately after towing the trailer. Allow at least three hours for a tire to cool, if the trailer has been towed for as much as 1.5 km (1 mile). Replace the tire before towing the trailer if the tire treads have less than 2/32 inch depth or the telltale bands are visible.

A bubble, cut or bulge in a side wall can result in a tire blowout. Inspect both side walls of each tire for any bubble, cut or bulge; and replace a damaged tire before towing the trailer.



WARNING! Worn, damaged or under-inflated tires can cause loss of control, injury and damage.

Check tires before each tow.



WARNING! Do not substitute light truck (LT) tires for trailer (ST) tires.

9.2.9 Wheel Rims

If the trailer has been struck, or impacted, on or near the wheels, or if the trailer has struck a curb, inspect the rims for damage (i.e. being out of round); and replace any damaged wheel. Inspect the wheels for damage every year, even if no obvious impact has occurred.

9.2.10 Wheel Bearings

A loose, worn or damaged wheel bearing is the most common cause of brakes that grab.

To check your bearings, jack trailer and check wheels for side-to-side looseness. If the wheels are loose, or spin with a wobble, the bearings must be serviced or replaced.

Refer to the Axle, Hub and Brake manual for more information.

9.2.11 Lug Nuts

Lug nuts are prone to loosen right after a wheel is mounted to a hub. When driving on a remounted wheel, check to see if the lug nuts are tight after the first 16, 40 and 80 km (10, 25 and 50 miles) of driving, and before each tow thereafter.



WARNING! Lug nuts are prone to loosen after being first assembled. Death or serious injury can result.

Check lug nuts for tightness on a new trailer, and after re-mounting a wheel at 16, 40 and 80 km (10, 25 and 50 miles).

A WARNING

WARNING! Metal creep between the wheel rim and lug nuts (bolts) will cause rim to loosen.

Death or injury can occur if wheel comes off.

Tighten lug nuts (bolts) before each tow.

Tighten the lug nuts to the proper torque for the axle size on your trailer, to prevent wheels from coming loose. Use a calibrated torque wrench to tighten the fasteners. Verify that wheel studs are free of contaminates such as paint or grease, which may result in inaccurate torque readings. Overtightening will result in breaking the studs or permanently deforming the mounting stud holes in the wheels.

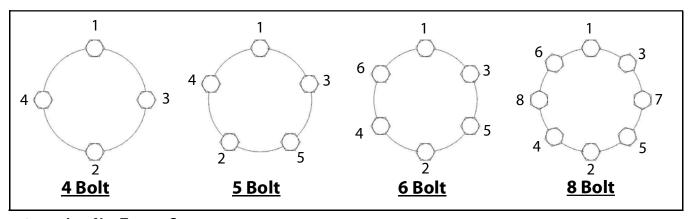


FIG. 9-1. Lug Nut Torque Sequence

Wheel Torque Requirement Chart							
Wheel Size	Stud Size	Torque Sequence					
	Stud Size	1st Stage	2nd Stage	3rd Stage			
14"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs			
15"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs			
16"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs			
16.5 x 6.75"	1/2"	20-25 ft-lbs	50-60 ft-lbs	90-120 ft-lbs			
16"	9/16"	20-25 ft-lbs	60-70 ft-lbs	120-130 ft-lbs			
16.5 x 6.75"	9/16"	20-25 ft-lbs	60-70 ft-lbs	120-130 ft-lbs			
16" Dual and 17.5" Cone Nut	5/8"	50-60 ft-lbs	100-120 ft-lbs	190-210 ft-lbs			
16" Dual and 17.5" Flange Nut	5/8"	50-60 ft-lbs	150-200 ft-lbs	275-325 ft-lbs			
17.5" Dual Flange Nut	M22	50-100 ft-lbs	250-300 ft-lbs	450-500 ft-lbs			
14.5" Demount	5/8"	Tighten sequentially to 85-95 ft-lbs					



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