

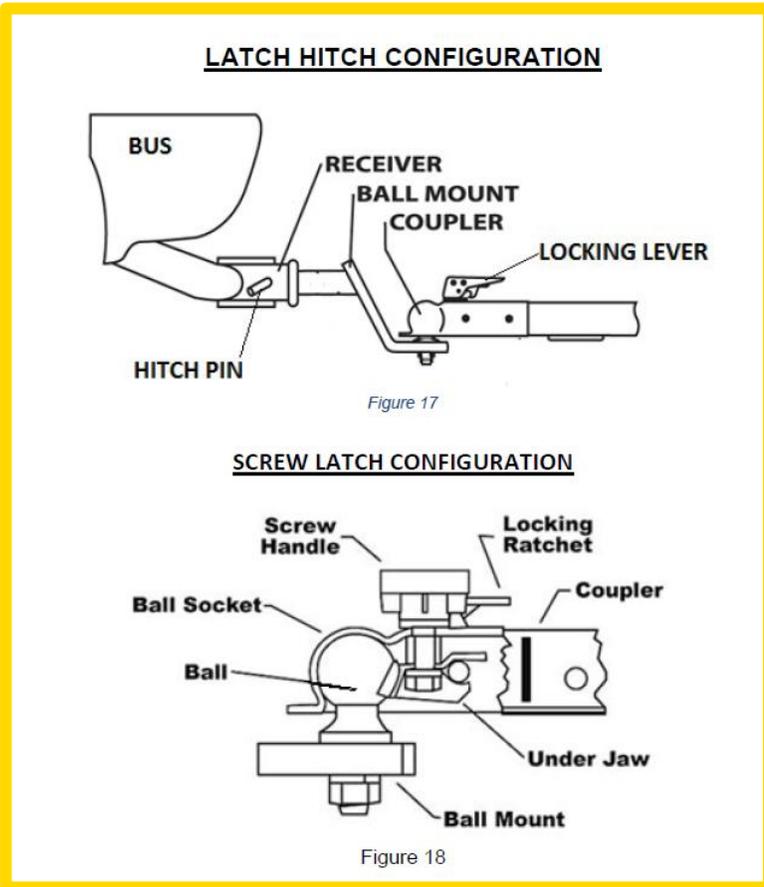
# Towing of Trailers

Towing a trailer with a school bus requires familiarity and concentration. At a minimum, you should have a thorough knowledge of connecting the trailer to the bus, mirror adjustments, pre-trip inspection, load placement / securement, and how to safely operate the combination. Communicate with your employer if you are unfamiliar trailering so you may become proficient at this task. In addition to the information presented in this section, you should consult with your school district or employer to ensure you are following any additional requirements they may have, in regards to trailer towing.



# Towing of Trailers

## TRAILER TERMINOLOGY



### **Ball mount**

A receiver hitch accessory that includes a shank and trailer ball.

### **Electric brake controller**

The device used to supply power to the trailer brake system during a brake application.

### **Emergency breakaway brake tether**

A length of wire rope or chain that activates the trailer brakes if the trailer separates from the power unit.

### **Hitch pin**

A metal pin to keep the ball mount shank from sliding out of the receiver tube.

### **Locking lever**

A locking mechanism that secures the trailer coupler to the ball mount.

### **Locking lever securement device**

A cotter key or lock use to ensure the locking lever remains closed.

# Towing of Trailers

## TRAILER TERMINOLOGY CONTINUED

### **Locking ratchet**

A device used to prevent unintentional loosening of the screw handle (screw latch trailers only)

### **Receiver**

Trailer hitch mounting point on the school bus.

### **Safety chains**

A length of chain with sufficient strength to keep the trailer connected to the tow vehicle in case of separation.

### **Tongue jack**

The device used to raise and lower the trailer coupler onto the ball mount.



### **Tow vehicle**

The power unit / school bus.

### **Trailer ball**

An exclusive connection between the trailer and the tow vehicle.

### **Trailer coupler**

In conjunction with a trailer ball, it connects the trailer to the tow vehicle.

### **Trailer wiring harness**

A length of wires that connects the power unit's electrical system to the trailer. It is used to control lighting and the brake system (if applicable).

### **Under jaw**

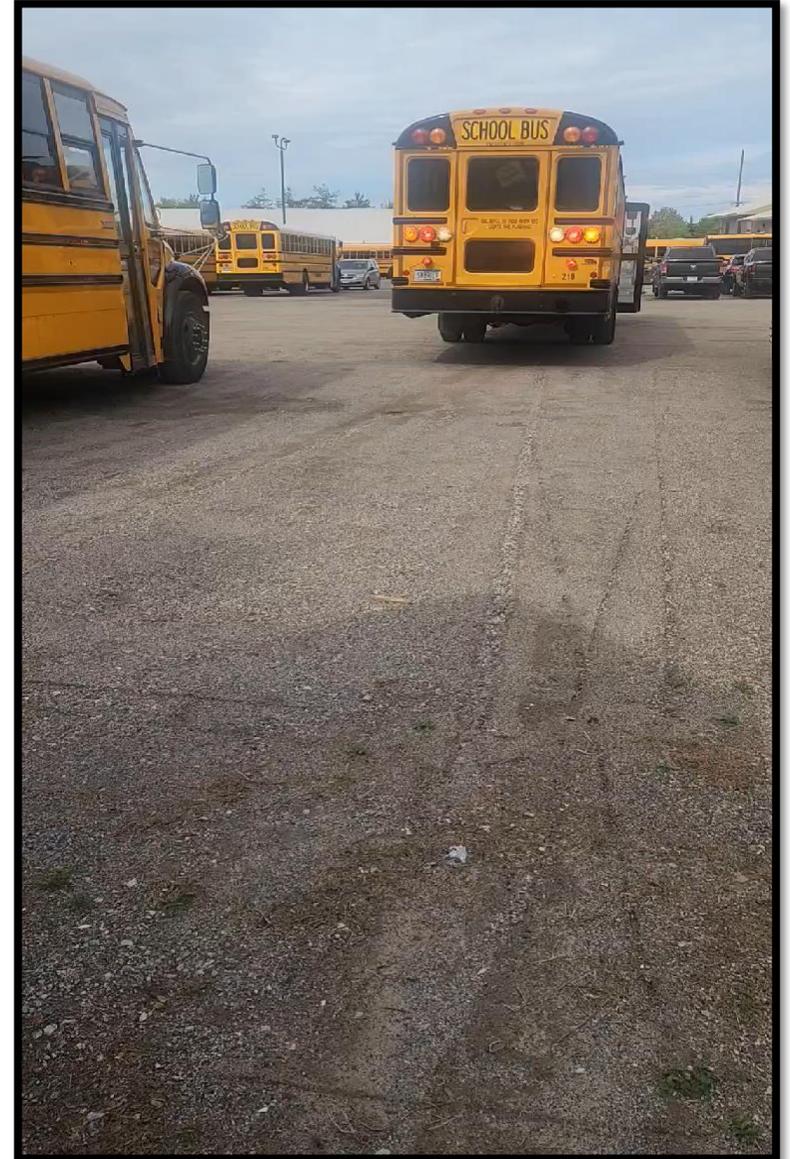
Similar to a locking lever, it's a locking mechanism that secures the trailer coupler to the ball mount (screw latch trailers only).

# Towing of Trailers

## Connecting a Trailer

Precautions must be taken when preparing to connect a trailer to a school bus. The area immediately between the school bus and trailer should be clear of any obstructions and people. Before backing the school bus up to the trailer:

1. Activate the four-way emergency flashers
2. Sound the horn with 2 short beeps
3. Double check your exterior rear view mirrors
4. If feasible, utilize a secondary person as a spotter to prevent any backing incidents. The spotter should stand at the rear of the bus, on the driver's side, within view of the driver's left exterior rear view mirror.



# Towing of Trailers

## Connecting a Trailer: Installing the Ball Mount to the Receiver

1. The school bus engine should be off and the parking brake set.



2. Insert the ball mount into the receiver hitch on the school bus.



3. Insert the receiver hitch pin and secure it with a cotter key or pin.



4. Give the ball mount a pull to ensure it is securely attached.



# Towing of Trailers

## Connecting a Trailer Coupler to the Towing Vehicle



1. Secure trailer movement with wheel chocks or other devices (i.e. a piece of wood).
2. Align the ball mount under the trailer coupler.
3. Ensure the locking lever is open. For handle type levers it will be fully raised. A screw type will require looking at the trailer coupler underside and verifying the jaw is fully open.
4. Either by manually lifting or using the trailer jack, lower the trailer onto the ball mount.
5. Close the locking lever into its fully closed position.
6. Insert a pin or lock into the locking lever to prevent accidentally opening.



Verify the trailer coupler is securely attached to the ball mount by either manually lifting on the trailer tongue, or lifting with the trailer jack. This will prevent a “high hitched” situation, which occurs when the locking jaw is not engaged / locked onto the ball mount.

# Towing of Trailers

## Connecting a Trailer Coupler to the Towing Vehicle



8. Attach the safety chains. A trailer must have two chains or cables.

\* While not required, it is recommended to cross the safety chains in an “X” to the tow vehicle. Doing so creates a cradle for the trailer tongue if the ball mount or trailer coupler fail.

9. Attach the breakaway (emergency) brake cable or chain to the tow vehicle (if applicable).

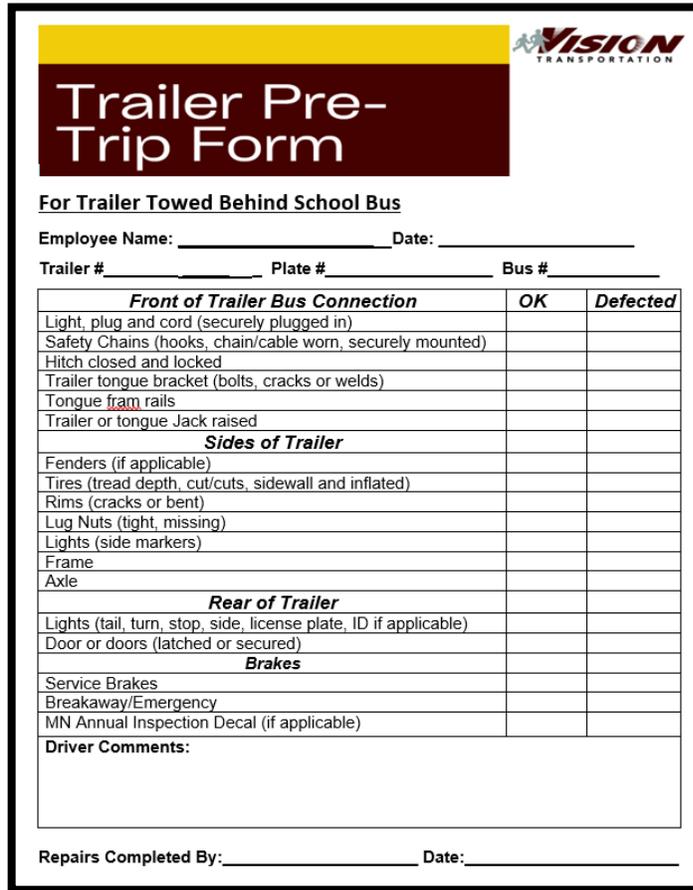
\* The breakaway brake cable or chain must be securely attached to the receiver hitch or the school bus frame. The surge brake breakaway cable or chain must be attached at a location other than to the receiver. The breakaway cable or chain **MUST NOT** be attached to the trailer safety chains. The breakaway cable or chain must operator separately of the safety chains.

10. Connect the trailer wiring harness to the tow vehicles electrical receiver. The electrical receiver will be located near the receiver hitch.

11. With the trailer connected to and in line with the school bus, the driver **MUST** verify the rear emergency exit door can be **FULLY OPENED** without interference.

# Towing of Trailers

## Conducting the Trailer Pre-Trip Inspection



**Trailer Pre-Trip Form**

**For Trailer Towed Behind School Bus**

Employee Name: \_\_\_\_\_ Date: \_\_\_\_\_

Trailer # \_\_\_\_\_ Plate # \_\_\_\_\_ Bus # \_\_\_\_\_

<i>Front of Trailer Bus Connection</i>	<i>OK</i>	<i>Defected</i>
Light, plug and cord (securely plugged in)		
Safety Chains (hooks, chain/cable worn, securely mounted)		
Hitch closed and locked		
Trailer tongue bracket (bolts, cracks or welds)		
Tongue <del>fram</del> rails		
Trailer or tongue Jack raised		
<i>Sides of Trailer</i>		
Fenders (if applicable)		
Tires (tread depth, cut/cuts, sidewall and inflated)		
Rims (cracks or bent)		
Lug Nuts (tight, missing)		
Lights (side markers)		
Frame		
Axle		
<i>Rear of Trailer</i>		
Lights (tail, turn, stop, side, license plate, ID if applicable)		
Door or doors (latched or secured)		
<i>Brakes</i>		
Service Brakes		
Breakaway/Emergency		
MN Annual Inspection Decal (if applicable)		

Driver Comments:

Repairs Completed By: \_\_\_\_\_ Date: \_\_\_\_\_

1. Ensure the trailer ball is the correct size for the trailer coupler.
2. Connect the trailer wiring harness to the tow vehicle and verify a secure connection.
3. The locking lever must be closed and secured with either a pin or lock.
4. Safety chains shall be securely connected, checking the hooks, chain / cable for wear.
5. Emergency breakaway cable or chain (if so equipped) shall be fastened securely to the tow vehicle and the cable/chain checked for wear.
6. Trailer tongue/coupler area should be inspected for loose bolts, cracked weld points, or cracks on the metal surfaces.
7. Inspect the tongue frame rails for loose bolts, cracks or other structural damage.

# Towing of Trailers

## Conducting the Trailer Pre-Trip Inspection Continued

8. Trailer or tongue jack should be in the raised position.
9. Lighting: – Check side markers, clearance, turn, tail, brake, and ID lights, if equipped.
10. Check tires for signs of cuts, bulges in the rubber, and proper tread depth and inflation.
11. Check rims for cracks exposed axle hub ends, and loose/missing wheel fasteners (lug nuts).
12. Fenders should be securely mounted if so equipped.
13. Trailer door(s) should be latched and secured shut.
14. Check trailer brakes and breakaway brakes, if applicable
15. Document any equipment defects on the trailer pre-trip inspection report. The report must be carried in the bus during operation.



## Trailer Pre-Trip Form

**For Trailer Towed Behind School Bus**

Employee Name: \_\_\_\_\_ Date: \_\_\_\_\_

Trailer # \_\_\_\_\_ Plate # \_\_\_\_\_ Bus # \_\_\_\_\_

<i>Front of Trailer Bus Connection</i>	OK	Defected
Light, plug and cord (securely plugged in)		
Safety Chains (hooks, chain/cable worn, securely mounted)		
Hitch closed and locked		
Trailer tongue bracket (bolts, cracks or welds)		
Tongue <del>fram</del> rails		
Trailer or tongue Jack raised		
<i>Sides of Trailer</i>		
Fenders (if applicable)		
Tires (tread depth, cut/cuts, sidewall and inflated)		
Rims (cracks or bent)		
Lug Nuts (tight, missing)		
Lights (side markers)		
Frame		
Axle		
<i>Rear of Trailer</i>		
Lights (tail, turn, stop, side, license plate, ID if applicable)		
Door or doors (latched or secured)		
<i>Brakes</i>		
Service Brakes		
Breakaway/Emergency		
MN Annual Inspection Decal (if applicable)		
<b>Driver Comments:</b>   		

Repairs Completed By: \_\_\_\_\_ Date: \_\_\_\_\_

# Towing of Trailers

## **Service Brake Check (If So Equipped)**

Minnesota State Statute 169.67 subdivision 3 requires service and breakaway (emergency brakes) brakes on all trailer axles with a GVWR over 3,000 pounds.

Each manufacture, whether using an electric or hydraulic brake system, will have specific testing procedures for their model of brake controller. ALWAYS follow the manufactures procedures and recommendations when testing your specific trailer brake system to prevent damage to the braking system.

## **Emergency Breakaway Brake Tests (If So Equipped)**

ALWAYS follow the manufactures recommended procedures if different than the steps outlined below.

### **Electric Emergency Brakes**

1. The school bus engine should be turned off and the parking brake set.
2. Disconnect the trailer wiring harness by pulling it away from the vehicle. Once removed, lay the harness across the trailer tongue.
3. Locate the emergency breakaway brake actuator, and pull firmly on the brake cable. Use caution when tugging on the cable, as it can be difficult to pull out, causing injury to you or damage to the system. Once removed, the cable can rest on the ground.
4. Return to the driver seat.
5. Start the bus.
6. Check your exterior mirrors before moving the bus to ensure it is safe to move forward.

# Towing of Trailers

## Electric Emergency Brakes Continued

7. Release the school buses parking brake.

8. Shift the transmission into Drive (D).

9. Pull forward slowly by simply removing your foot from the brake pedal. If the school bus does not move forward, apply a light amount of accelerator.

- During this time, you are checking for brake resistance from the trailer. The easiest way to check for resistance is looking in the exterior rearview mirrors and watching for a lack of trailer tire rotation. A lack of wheel lockup within a short distance indicates an issue with the breakaway system. If the breakaway breaks are not working properly, they shall be serviced/diagnosed prior to using it on a trip.

- Emergency brakes on an electric system will engage quickly, only allowing the trailer to move a few inches before resistance is seen or felt. Remain cognizant of trailer wheel lockup to prevent damage to the braking system.

10. Upon completion of the test, place the transmission in Park (P) or Neutral (N), set parking brake, and turn off the engine.

11. Reconnect the breakaway plunger end into the switch box. The plunger only inserts one way into the switch box. Therefore, if you feel resistance, rotate the plunger and try again until it smoothly seats in the switch box.

12. Reconnect trailer wiring harness to the power unit.



# Towing of Trailers

## Hydraulic Breakaway Brake Test (If So Equipped)

1. The school bus engine should be turned off and the parking brake set.
2. Activate the emergency breakaway brakes by pulling firmly on the brake cable or chain. Typically, there is a diagram on the trailer tongue to indicate the direction to pull the breakaway brakes lever. If none exists, pull the cable in the opposite direction that the top of the lever is facing. • Use caution when activating the system as the lever attached to the cable or chain can be difficult to pull, which could cause injury to you or damage to the system.
3. Return to the driver seat.
4. Start the school bus.
5. Check your exterior mirrors before moving the bus to ensure it is safe to move forward.
6. Release the school buses parking brake.
7. Shift the transmission into Drive (D).

# Towing of Trailers

## Hydraulic Breakaway Brake Test Continued (If So Equipped)

8. Pull forward slowly.

- During this time, you are checking for brake resistance from the trailer. The easiest way to check for resistance is looking in the exterior rearview mirrors and watching for a lack of trailer tire rotation. A lack of wheel lockup within a short distance indicates an issue with the breakaway system. If the breakaway breaks are not working properly, they shall be serviced/diagnosed prior to using it on a trip.

- Surge brakes may take a little longer to engage – up to a few feet. Remain cognizant of trailer wheel lockup to prevent damage to the braking system.

9. Upon completion of the test, place the transmission in Park (P) or Neutral (N), set parking brake, and turn off the engine.

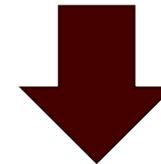
10. Push the breakaway brake lever back into position to release the brakes.

# Towing of Trailers

## Minnesota Annual Inspection Requirements (Trailers)



Trailers towed behind a school bus in intrastate operations, solely within Minnesota, with a gross vehicle combination weight greater than 26,000 pounds (GVWCR) must display a current Minnesota annual inspection decal.



This annual inspection is not performed by the Minnesota State Patrol. Trailers towed across state lines, interstate operations, with a gross vehicle combination weight greater than 10,000 pounds (GVWCR) must display a current Minnesota annual inspection decal.

# Towing of Trailers

## Registration of Trailer

All Minnesota based trailers must display current registration. Trailers may have permanent registration if the GVWR is 3,000 pounds or less. The permanent registration decal must be displayed on the trailer tongue.

Trailers with a GVWR of 3,000 pounds or more must display a Minnesota registration in the form of a license plate.



## Additional Requirements

A school bus may pull a trailer as when traveling to or from co-curricular or extracurricular activities. A school bus is permitted to have a trailer receiver hitch installed on it, but it must not extend beyond the rear bumper. The ball mount must be removed when the school bus is not towing a trailer.

# Towing of Trailers

## Trailer Loading & Securement of Contents

Most trailer manufactures recommend loading a trailer with a 60/40 percent load distribution. The breakdown is sixty percent of the load is place at or forward of the axle(s), and forty percent is loaded behind the axle(s). More weight is placed forward of the axle(s) than the rear to keep downward pressure on the tongue. Too little downward force on the tongue can result in trailer potentially disconnecting from the ball mount, and/or causing stability issues for the vehicle combination.

Cargo securement is equally important as load distribution. In most situations, the items hauled in a trailer behind a school bus will not have a lot of weight. They will be more bulk type items which will not drastically affect the stability of the trailer. However, you should still evenly distribute the items inside the trailer, to maintain vehicle stability. Large or heavy items must be secured to prevent movement within the trailer, as they have a greater risk for affecting vehicle stability. The securement devices must have a sufficient working load limit to secure the item(s) in place.



# Towing of Trailers

## Trailer Driving Techniques

Towing a trailer behind any vehicle presents additional challenges to the driver no matter what is towed. Towing a trailer with a school bus presents unique challenges related to tail swing/turning, sight lines, vehicle length, stability, and stopping/braking techniques.

Turning means additional watchfulness with a trailer attached. You are now driving in combination (school bus & trailer) which means there is articulation between the two vehicles. There's additional caution related to tail swing because the trailer will follow the path of the school buses rear end. This means the trailer turning radius is more exaggerated than the same trailer connected to a passenger car or truck. If you are required to back up, you must survey your situation first, but also prepare ahead of time by practicing backing maneuvers with a trailer. Your steering inputs have the opposite effect on a trailer by turning the opposite direction of the school bus. Short trailers versus long trailers respond differently to the amount of steering input for a given turn.



# Towing of Trailers

## Trailer Driving Techniques Continued

Sightlines should always be taking into consideration no matter what vehicle you drive, but with a school bus and trailer, you must adjust your speed and stopping distance since you have more weight/momentum behind you. The average perception/reaction rate is 1.5 to 2 seconds before you begin to request a task of your vehicle (i.e. turning the steering wheel and/or apply the brakes). Needless to say, it will take longer to stop because of the vehicle size, but you will need more time if sightlines are diminished like curved roadways or blind driveways, so slowing down may be your best option.

Vehicle length is important as it relates to your turning, stopping distance, and intersections. Your bus is approximately 40 feet with the additional trailer length which can vary. It will take longer to complete a turn as will clearing an intersection. You must become skilled at knowing if you have enough length on the other end of the intersection. Misjudging it will result a portion of your vehicle combination sticking into the intersection which will impede other traffic and place you and your passengers at risk. Railroad crossings are another example of establishing “do I have enough room to clear the tracks with the trailer connected?”

# Towing of Trailers

## Trailer Driving Techniques Continued

Vehicle stability is another important consideration. Based on the load distribution within the trailer (Section 7.6), your steering, braking, and overall driving habits will affect the trailers response. In addition, weather events like wind, rain, snow, and ice will also play a large role in stability. Loading a trailer with too much weight at the top will make the trailer top heavy. Making a hard steering input(s) to avoid an object in the road may allow the trailer to tip over, thereby placing the school bus at risk of losing control and crashing. An empty trailer behaves differently than a loaded trailer. In severe cross winds, an empty trailer will be easily affected by additional sway. Keeping a keen awareness of your vehicle and a firm grasp of the steering wheel is important in that situation. Slowing down is another likely response when faced with severe cross winds.

Stopping/braking techniques will be different when pulling a trailer. Regardless if your trailer is equipped with service brakes or not, you must drive the trailer and not let the trailer drive you. This means not driving faster than is safe for your skill level and the combination. The additional weight of a trailer will naturally want to push the vehicle forward until its forward momentum has ended. Therefore, the stopping distance needed for a 40 foot bus has increased since you must account for the additional weight of the trailer pushing you forward.

# Towing of Trailers

## Trailer Driving Techniques Continued

Too aggressive of a setting will cause a tugging sensation as the trailer brakes pull against the school bus. Either situation opens the door for you to lose control of the vehicle combination. The controller also has an override feature. Familiarizing yourself with the type of controller you have as each controller has some sort of sliding button or toggle switch. This feature lets you manually apply the trailer service brakes when required. There are two notable times when you would utilize this feature. Warm up the trailer brakes through friction and to counteract trailer sway. Warm brake pads respond better at stopping a vehicle as opposed to cold brake pads. To warm the trailer brake pads, you drive forward at a low speed and apply the manual override switch until you feel some light resistance from the trailer. Do not apply more than 50% of the total travel for the override switch. Counteracting trailer sway through the manual override switch will take mental planning, getting accustomed to dialing in the trailer brake settings, and warming them up as previously stated.



# Towing of Trailers

## Trailer Driving Techniques Continued

If your trailer began losing control by swaying back and forth, you can use the brake controllers override button/switch to apply enough trailer service brakes to bring the trailer back under control and in line with your school bus. While manually applying the trailer brakes, you will refrain from applying the school bus service brakes until the combination is in-line with each other. Applying too much of the trailer service brakes however will result in the trailer tugging on the school bus and further risking an out-of-control situation for the combination. Finesse is the key in a situation where you would be using the brake controller override switch.



# Roadside Inspection

As a school bus or commercial vehicle operator, you are subject to destination and/or roadside inspections. Drivers need to be familiar with the general inspection procedure and the documents that an inspector may ask for.



Commercial vehicles in general are subject to random roadside inspections, meaning they could be flagged over for an inspection at any point. When it comes to passenger carrier operations, random inspections will not be conducted on-route unless there is a safety defect or driver violation observed. Passenger carrying vehicle inspections will primarily be conducted either at the terminal or a destination location.

# Roadside Inspection

Driver's need to be familiar with the requirements for stopping at weigh stations. In Minnesota, buses are not required to report to weigh stations for weighing. The Regulations requiring certain vehicles to report to a scale are determined by each individual state. It is important for a bus driver traveling through other states to be familiar with the laws of each state they will be traveling through and to follow the direction of the posted regulatory signs.

## **Commercial Vehicle Inspection Process**

A. The inspector will greet you and explain what type of inspection they will be conducting.

1. Level 1 - Driver and full vehicle inspection
2. Level 2 - Driver and vehicle walk around
3. Level 3 - Driver only inspection

B. The inspector will explain the procedure and hand signals they will be using.

\* Follow the inspector's directions at all times. If you do not understand the instructions, ask for clarification.

C. The inspector will place wheel chocks to prevent the vehicle from rolling. Only release the parking brake when the inspector instructs you to do so.



# Roadside Inspection

## Documentation

A. Be familiar with all documentation as it relates to your trip – school or charter related. This documentation will vary depending on the nature of your trip, the clients you are transporting, and the type of carrier you work for.

### 1. School Bus

- Driver's license
- Medical waiver(s), if applicable
- Daily Vehicle Inspection Report (DVIR)/Pre-trip
- Annual School Bus Inspection Decal-located on the windshield's lower left corner
- The school bus and wheelchair, if applicable, line items will be punched, indicating the bus passed its annual inspection.



# Roadside Inspection

## Documentation Continued:

### 2. Charter

- Driver's license
- Medical waiver(s), if applicable
- Daily Vehicle Inspection Report (DVIR)/Post-trip
- Minnesota Annual Inspection Decal-located on the

windshield's lower right side

\* The Periodic Annual Inspection line item will be punched if the vehicle has passed an annual inspection. This allows for transportation outside of school bus operation(s).



\* The State Wheelchair inspection decal will be located on lower left corner of the windshield if the vehicle is equipped to transport passengers requiring the use of a wheelchair.

- MNDOT Registration
- Passenger Authority
- International Fuel Tax Agreement (IFTA), if applicable



# Roadside Inspection

## Documentation Continued

- International Road Proration (IRP) or trip permit, if applicable
- Bill Of Lading (BOL)/Charter order
- Logbook, if applicable/ELD (electronic logging device) \* When using ELD's drivers need to be familiar with accessing the DOT inspection mode
- Additional documents required when using an ELD \* User's Manual
- \* Instruction Sheet
- \* A supply of blank record of duty status graph-grids to record the duty status for a minimum of 8 days

A sample "STRAIGHT BILL OF LADING SHORT FORM" from J.J. Keller & Associates, Inc. The form is titled "STRAIGHT BILL OF LADING - ORIGINAL - NOT NEGOTIABLE" and "Shipper's No. 2012345". It includes fields for Carrier, SCAC, Consignee, Destination, State, County, Zip, Delivery Address, Route, Delivering Carrier, and Vehicle Number. A table at the bottom is for listing articles with columns for Number of Packages, Description of Articles, Weight (toll, by connection), and Class or Rate. A "3-ply" stamp is visible in the bottom right corner. A large "SAMPLE" watermark is overlaid diagonally across the form.

# Roadside Inspection

## **Interior/Exterior Inspection.**

- A. All parts and accessories will be inspected. Inspectors will examine the same components you checked during your pre-trip/post-trip.
- B. Be knowledgeable about your bus and how to operate each function, including opening/closing emergency exits.



## **Trailer Inspection, if Applicable**

- A. Drivers need to be familiar with the trailer they are towing as well as the coupling device and brake system (if applicable).
- B. The inspector will check all parts and accessories for the trailer as well.



# Roadside Inspection

## Completion of Inspection

A. The inspector will complete a Driver/Vehicle Examination Report and review the results with the driver.

B. CVSA decal

- If an inspection does not reveal any critical safety item defects, a CVSA decal will be applied. The decal is good for 3 months, and it will be placed on the passenger loading door.
- A decal will not be applied to a school bus used solely for intrastate school bus operation.

C. Out Of Service (OOS) order, if applicable

- School Bus OOS (orange triangle), if an out of service condition exists on a school related operation, you will generally see this type of orange sticker.
- Commercial Vehicle OOS (large orange rectangular in shape, this orange sticker is generally utilized on non-school related trips, when an OOS condition(s) exists.
- If the bus is placed OOS, defects must be corrected before the bus is used for transportation.
- Failure to comply with this requirement may result in criminal charges against the carrier and driver.



PS-18087-02  
(08/01)

**OUT OF SERVICE**

N# 115084

MINNESOTA STATE PATROL  
COMMERCIAL VEHICLE SECTION

DRIVER \_\_\_\_\_ and/or VEHICLE is hereby declared UNSERVICEABLE.  
This sticker shall be removed only under the conditions stated on the DRIVER VEHICLE EXAMINATION REPORT. No person shall remove this sticker or operate this vehicle unless and until all defects listed below have been repaired. Unauthorized removal shall make the responsible person liable to penalty under Minnesota Statute 221.291.

Repairs needed before VEHICLE may be operated: \_\_\_\_\_

INSPECTION NUMBER: \_\_\_\_\_ INSPECTOR'S SIGNATURE: \_\_\_\_\_

# Summary

The School Bus Driver should be well versed and skilled in driving fundamentals. However, this alone is not enough. School Bus Drivers must also be defensive drivers and operate their vehicle in such a manner that, regardless of the type of situation that develops, they will be able to protect their students and vehicle from harm. This skill, once acquired, should be maintained and improved with daily practice of defensive driving skills and timely “on street evaluations.”

## **ADDITIONAL RESOURCES**

MAPT – [www.mnapt.org](http://www.mnapt.org)

MSBOA – [www.msoba.com](http://www.msoba.com)

Minnesota Department of Public Safety – <https://dps.mn.gov/divisions/msp/commercial-vehicles/Pages/school-bus-safety.aspx>

