UNIT VII

TOWING OF TRAILERS

Before you tow a trailer behind your school bus, make sure you're familiar with driving your school bus-trailer combination. A thorough knowledge of how to connect the trailer to the school bus, mirror adjustment, a proper pre-trip inspection, load placement / securement and how to safely operate your school bus trailer combination is essential.

In addition to the information presented in the section, consult with your school district or private contractor to ensure you are following any additional requirements they may have with regards to towing of trailers behind the school bus.

7.1 TRAILER TERMINOLOGY

Towing vehicle – school bus itself

Receiver – trailer hitch mounting point on the school bus

Receiver hitch pin – pin used to secure the ball mount to the receiver

Trailer light electrical receiver – where the trailer electric cord is plugged into

Electric brake controller – the device used to supply power to the trailer brake system during brake application

Ball mount – this is piece mounted into the receiver hitch where the trailer is then connected

Hitch coupler – mounts onto the ball hitch making the trailer connection to the towing vehicle

Locking lever – locking mechanism that secures the hitch coupler to the ball mount

Locking lever securement device – a cotter key or lock use to ensure the locking lever stay closed, securing the trailer to the ball mount

Tongue jack – the device used to raise and lower the hitch coupler onto the ball mount

Safety Chains – used to maintain trailer stability in case of ball mount failure, secures trailer to towing vehicle

Electric pigtail (cord) – the electrical cord used to connect the trailer to the tow vehicle to control lighting and braking system (if applicable)

Emergency breakaway brake cable / chain – engages trailers brakes if the trailer becomes disconnected from the towing vehicle.

7.2 TRAILER CONNECTION TO THE SCHOOL BUS

Precautions must be taken when preparing to attach a trailer to any vehicle, especially a school bus. Ensure the area between the rear of the school bus and the trailer is unobstructed by other equipment, debris or persons. It is recommended the school buses 4-way emergency flashers be activated, sounding of the school bus horn, double check of your mirrors before you begin the backing procedure. When possible a second person is recommended to assist and guide you as prepare to connect to the trailer.

A. INSTALLING THE BALL MOUNT TO THE RECEIVER

1. School bus engine turned off and the parking brake set.
2. Insert ball mount into the receiver hitch on the school bus.
3. Insert receiver hitch pin and secure with cotter key or pin.
4. Give the ball mount a pull to ensure it is securely attached.
5. Check to ensure the trailer hitch ball is secured to the ball mount.
6. Verify the diameter of the hitch ball is correct for the trailer being towed.
    a. Typical sizes of hitch balls are 1 7/8, 2 and 2 5/16 inches.

B. CONNECTING TRAILER HITCH TO TOWING VEHICLE

1. Secure trailer movement (wheel chocks or other devices).
2. Align the ball mount under the trailer coupler.
3. Ensure the coupler locking mechanism is open (typically the handle is in the upright position or in the case of a screw type coupling the under jaw is fully opened).
4. Either by lifting or using the trailer jack, lower the trailer onto the ball mount.
5. Close the locking lever mechanism.
6. Insert pin or lock into the locking lever mechanism to ensure it remains. closed during towing.
7. Ensure the hitch coupler is securely attached to the ball mount by either lifting on the trailer tongue or lifting with the trailer jack. This ensures the trailer coupler is not “high hitched” which occurs when the locking jaw is not engaged / locked onto the ball mount.
8. Attach safety chains – there MUST be two chains or cables.
    a. It is recommended that the safety chains be crossed in an “X” pattern when connecting the chains or cables. This provides a cradle for the trailer tongue should the hitch or coupler fail.
    b. Safety chains must be attached securely to the towing vehicle.
9. Attached breakaway (emergency) brake cable or chain from the trailer to the towing vehicle, if equipped with a breakaway brake system. NOTE: the breakaway brake cable or chain must be securely attached to the receiver hitch or the school bus frame. The breakaway cable or chain <u>MUST NOT</u> be attached to the trailer safety chains, the breakaway cable or chain must operator separately of the safety chains.
10. Plug the trailer pigtail into the trailer light electrical receiver.

C. CONDUCTING THE TRAILER PRE-TRIP INSPECTION

NOTE – documentation of the trailer pre-trip inspection must be carried in the bus during operation.

1. Ensure the trailer ball is the correct size for the hitch coupler.
2. Plugin trailer pigtail (cord) - (ensure it is securely connected).
3. Locking lever is closed, secured with either a pin or lock.
4. Safety chains – (hooks, chain / cable worn, securely mounted).
5. Emergency brake cable or chain if so equipped (hooks, cable / chain worn, securely fastened to towing vehicle).
6. Trailer tongue/ coupler – (bolts, welds or cracks).
7. Inspect tongue frame rails for loose bolts, cracks or damage.
8. Trailer or tongue jack raised.
9. Lights (side markers, clearance, turn, tail, brake and ID lights if equipped)
10. Check wheels and rims (tire tread depth, properly inflated, no cuts, bulges in rubber; cracks in rims, axle hub ends, wheel fasteners (lug nuts) tight, none missing).
11. Fenders securely mounted if so equipped.
12. Trailer door(s) latched and secured shut.

D. SERVICE BRAKE CHECK (IF SO EQUIPPED)

Minnesota law MS169.67 requires brakes and breakaway (emergency brakes) on all axles of a trailer 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

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E. EMERGENCY BREAKAWAY BRAKE TESTS (IF SO EQUIPPED)

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

1. Electric emergency brakes;
    a. School bus engine turned off and the parking brake set.
    b. Disconnect the trailer electrical receiver cord (pull out the pigtail).
    c. Activate the emergency breakaway brake system by pulling firmly on the brake cable. Caution – this cable may be very difficult to pull out, causing injury to you or damage to the system.
    d. Return to the driver seat.

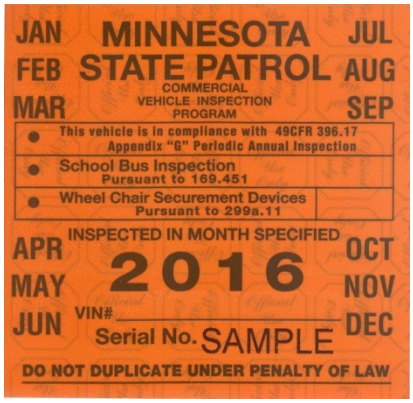
e. Start the bus.
f. Check mirrors before moving the bus to ensure it is safe to move forward.
g. Release the school buses parking brake.
h. Engage transmission.
i. Pull forward slowly.
    i. You are checking for brake resistance from the trailer.
    ii. You can also check the mirrors to see if the trailer tires are turning or moving. NOTE: the school bus will travel a few feet prior to the trailer brakes activate.
j. Upon completion of the test, disengage transmission, set parking brake, turn off engine.
k. Reconnect the breakaway brake cable end into the switch box
l. Reconnect trailer electrical connector (pigtail).

2. HYDRAULIC BREAKAWAY BRAKE TESTS (IF SO EQUIPPED)

a. School bus engine turned off and the parking brake set.
b. Activate the emergency breakaway brake system by pulling firmly on the brake cable or chain. Caution – the lever attached to the cable or chain may be very difficult to pull, causing injury to you or damage to the system.
c. Return to the driver seat.
d. Start the bus.
e. Check mirrors before moving the bus.
f. Release the school buses parking brake.
g. Engage transmission.
h. Pull forward slowly;
    i. You are checking for brake resistance from the trailer.
    ii. You can also check the mirrors to see if the trailer tires are turning or moving. NOTE: the school bus will travel a few feet prior to the trailer brakes activate.
i. Upon completion of the test, disengage transmission, set parking brake, turn off engine.
j. Push the breakaway brake level back into position to release the brakes.

7.3 MINNESOTA ANNUAL INSPECTION REQUIREMENTS FOR TRAILERS

Effective January 1, 2012, 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.

7.4 REGISTRATION OF TRAILER

All Minnesota based trailers must display current registration. For trailers with a gross rate weight rating of 3,000 pounds or less, a permanent Minnesota registration decal may be purchased and displayed on the trailer tongue. Trailers over 3,000 pounds GVWR must display Minnesota registration (license plate).

7.5 ADDITIONAL REQUIREMENTS

Per Minnesota statute 169.447, subdivision 5; A school bus may pull a trailer, as defined by section 169.011, subdivision 86, only when traveling to or from cocurricular or extracurricular activities, as defined in section 123B.49.

Per Minnesota statute 169.4502, subdivision 8; trailer hitches installed on school buses is permitted; the hitch MUST not extend beyond the rear bumper of the school bus. NOTE: the ball mount hitch MUST be removed when not actively towing a trailer.

7.6 TRAILER LOADING AND SECUREMENT OF CONTENTS

It is suggested by most trailer manufactures that the load carried inside the trailer be distributed with a 60 / 40 percentage. Simply put, sixty percent of the weight carried within the trailer should be loaded in front of or over the trailer axle or axles with the remaining forty percent carried behind the axle or axles. This weight split provides downward pressure on the trailer coupler to help prevent the trailer disconnecting from the bus.

The items hauled within the trailer must be secured from movement during transportation. In many cases the items hauled in a trailer behind a school bus will not have a lot of weight but will be more of a bulk type item which will not drastically affect the stability of the trailer. However, these items should be evenly distributed inside the trailer to maintain stability during transportation. Larger or heavier items must be secured to prevent movement within the trailer during transportation. The securement devices used to secure the items within the trailer must be sufficient to securely hold the item or items in place.

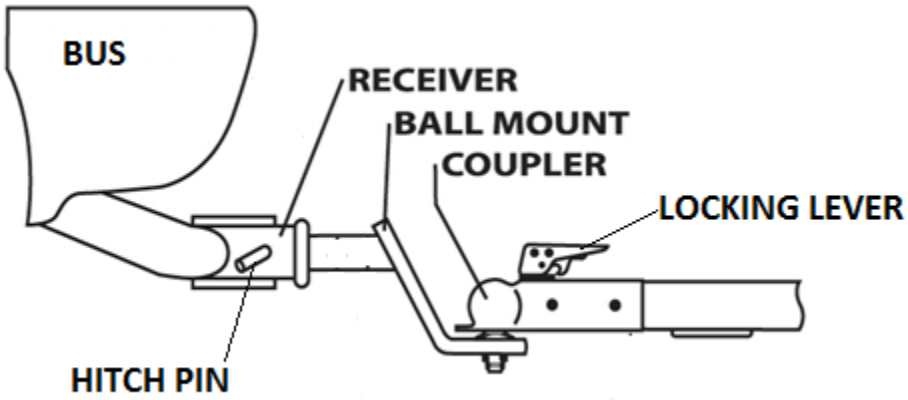
7.7 TRAILER DRIVING TECHNIQUES

It is recommended you review the information in Unit 1 of this manual prior to towing a trailer.

Towing of a trailer behind any vehicle presents a challenge to the driver no matter what it is towed with however, towing a trailer behind a school bus presents unique challenges specific to school buses. First and foremost is the school bus with a trailer now becomes a combination vehicle and must be driven as such. Consideration must be given to vehicle stability, increased stopping distances, sight line concerns, vehicle length and tail swing.

Vehicle stability will be affected based on the added length and weight of the combination. Weather conditions such as wind, rain, snow and ice will also play a factor in how you operate the combination. As a driver you must be prepared for these ever changing conditions and make the necessary adjustments in your driving operation to compensate for these conditions.

LATCH HITCH CONFIGURATION



SCREW LATCH CONFIGURATION