



UTAH SCHOOL BUS INSPECTIONS

FACILITY ENTITIES



STATE OF UTAH
DEPARTMENT OF PUBLIC SAFETY
2021

INTRODUCTION

To satisfy the requirements of H.B. 143 and Utah code 53-8-211, this training is being provided to help provide instructional material for potential certified school bus inspectors. Inspectors may be one of two levels:

1. Certified to inspect school buses for “non-facility” entities (inspection requires an accompanying State TTB inspection); or
2. Certified to inspect school buses for “facility” entities (inspecting does not requires an accompanying State TTB inspection)



INSPECTOR CERTIFICATION

All education entity technicians/inspectors who participate in the School Bus Inspection Program are required to be certified. Certification consists of the following:

1. Obtaining an operational knowledge of the School Bus Inspection Manual
2. Passing a certification test with a score of 80% or greater (tests will be made available to education entity technicians/inspectors by the division)
3. Re-certifying every five years
4. Inspector must be an employee of entity



EXTERIOR

- Lighting
- Reflectors
- Markings
- Tires and Wheels
- Exterior Body
- Exterior Mirrors and Windows

The
content



on
nt

Let's take a closer look
at each of these



EXTERIOR - LIGHTING

- **Headlamps**

- **Out of Service** when there is not at least one operable low beam headlight on each side of the bus (two total).

- **Turn Signals/Hazard Lamps**

- **Out of service** when any turn signal or hazard light is inoperable.

- **Clearance Lamps/Triple I.D. Lamps**

- **Violation** when any clearance or I.D. lamp is missing, defective or inoperable.

- **Brake/Tail Lamps**

- Violation when any tail or brake lamp is missing, defective or inoperable not resulting in an out of service condition.
- **Out of service** if there is not at least one operable tail lamp on each side of the bus.
- **Out of service** if there is not at least one operable brake light on each side of the bus.

- **Back-up Lamps**

- Violation when any back up lamp is missing, defective or inoperable.



EXTERIOR - LIGHTING

- **License Plate Lamp**

- Violation when any license plate lamp is missing, defective or inoperable.

- **Overhead Loading Lamps**

- Violation when any lens is cracked or broken not resulting in an out of service.
- **Out of Service** when:
 - Any overhead loading light is inoperable;
 - Any loading light that stays active after being deactivated, or;
 - Any loading light is not the required color (red or amber as required)

- **Step Well Lamps**

- Violation when any step well lamp is missing, defective or inoperable.

- **Stop Arm Lamps**

- Violation when any stop arm lamp is missing, defective or inoperable, not resulting in an out of service condition.
- **Out of Service** when:
 - Any stop arm lamp fails to activate with the overhead lights;
 - Any stop arm remains in an activated position after being deactivated, or;
 - Any stop arm or stop sign is not the required color (red or amber as required)

EXTERIOR - LIGHTING

- Note: LED light assemblies are considered inoperable if less than 50% of the diodes are illuminated

EXTERIOR – REFLECTORS

- **Reflective Tape/Reflectors**
 - Violation when any required reflector or reflective material missing or defective.

Reflectors are required in three locations on each side of the bus:

1. **Front side corners (amber in color, and may accompany front side marker lamp)**
2. **Side midpoint between front and rear marker lamps (amber in color)**
3. **Rear side corners (red in color and may accompany rear side marker lamp)**

Reflective tape is required in the following locations:

1. **Outline the perimeter of:**
 - The back of the bus.
 - Emergency exits.
 - Doors and windows.
2. **Horizontally down the side of the bus.**
 - Between the floor line and the belt line.
 - The length of the bus body.

EXTERIOR – MARKINGS/COLOR

- **School Bus Markings**

- Violation when:
 - District name and required school bus markings are missing
 - Bus number is not clearly visible on all four sides of the bus
- Violation if a privately owned (non-government) bus is missing any of the following markings:
 - Company name;
 - USDOT number; and
 - Registered Weight

- **School Bus Color**

- **Out of Service** when:
 - Bus is any color other than school bus yellow (*Does not include a bus that meets the definition of a multifunction school activity bus*).

EXTERIOR - EMERGENCY EXIT MARKINGS

- It is a **Violation** when any emergency exit is not properly labeled and marked both inside and outside the vehicle as follows and as specified in 49 CFR 571.217.
 - Each school bus emergency exit provided in accordance with S5.2.3.1 shall have the designation “Emergency Door” or “Emergency Exit,” as appropriate, in letters at least 5 centimeters high (two inches), of a color that contrasts with its background.
 - For emergency exit doors, the designation shall be located at the top of, or directly above, the emergency exit door on both the inside and outside surfaces of the bus. The designation for roof exits shall be located on an inside surface of the exit, or within 30 centimeters (twelve inches) of the roof exit opening.
 - For emergency window exits, the designation shall be located at the top of, or directly above, or at the bottom of the emergency window exit on both the inside and outside surfaces of the bus.
 - Concise operating instructions describing the motions necessary to unlatch and open the emergency exit shall be located within 15 centimeters (six inches) of the release mechanism on the inside surface of the bus. These instructions shall be in letters at least 1 centimeter (half inch) high and of a color that contrasts with its background. Examples: (1) Lift to Unlatch, Push to Open (2) Turn Handle, Push Out to Open

EXTERIOR - EMERGENCY EXIT MARKINGS

- It is a **Violation** when any emergency exit is not properly labeled and marked both inside and outside the vehicle as follows and as specified in 49 CFR 571.217.
 - Each opening for a required emergency exit shall be outlined around its outside perimeter with a retroreflective tape with a minimum width of 2.5 centimeters (one inch) and either red, white, or yellow in color, that when tested under the conditions specified in S6.1 of Standard No. 131 (49 CFR 571.131), meets the criteria specified in Table I of that section.
 - On the inside surface of each school bus with one or more wheelchair anchorage positions, there shall be a label directly beneath or above each “Emergency Door” or “Emergency Exit” designation specified by paragraph (a) of S5.5.3 of this standard for an emergency exit door or window. The label shall state in letters at least 25 mm (one inch) high, the words “DO NOT BLOCK” in a color that contrasts with the background of the label.

EXTERIOR – TIRES

- **Tire Tread/Wear**

- **Violation** when bus equipped with studded snow tires in violation of UCA 41-6a-1636 (*Permitted between October 15th and March 31st*).
- **Out of Service** when:
 - Any steering axle tire measures less than 4/32” in any major tread groove;
 - Any drive axle tire measures less than 2/32” in any major tread groove;
 - Any tire contacts any part of the frame, body or suspension components; or
 - Dual tires are found to be in contact with adjacent tire.

- **Tire Pressure**

- **Out of Service** when:
 - Tire is flat or has noticeable leak (Flat means 50% or less than recommended pressure.)

- **Tire Damage/Cut**

- **Violation** when:
 - Any tire is found to have a foreign item embedded in it (i.e. screw, nail etc.).
- **Out of service** when:
 - Any sidewall is cut, worn or damaged to the extent that any ply cords are exposed; or
 - Any observable bump, bulge, or knot related to sidewall or tread separation.
 - *EXCEPTION: A bulge due to a section repair is allowed not to exceed 3/8 inch in height. This repair may sometimes be identified by a blue triangular label in the immediate vicinity.*

EXTERIOR – TIRES AND WHEELS

- **Load Rating/Type**

- **Out of Service** when tire is:
 - Not of proper type; including tire load rating, mismatched tire type/size, etc;
 - Marked with restrictive markings such as; “Not for Highway Use” which would exclude use on public highways; or
 - Re-grooved, recapped or retreaded tire on steering axle.

- **Wheels/Fasteners**

- **Out of Service** when:
 - Any wheel /rim is cracked, improperly seated, damaged or welded;
 - Any nuts, bolts, studs or wheel fasteners are broken, missing, damaged or loose; or
 - Any bolt/stud holes are visibly elongated. 393.205(b)

- **Spoke (Dayton) Wheels**

- **Out of Service** when:
 - Any spoke (Dayton Style) wheel is used on a school bus registered in the State of Utah.

- **Hubs**

- **Violation** when:
 - Any inner or outer hub seal is leaking, not resulting in an out of service.
- **Out of service** when:
 - Any axle bearing cap is missing or broken allowing an open view into hub assembly.
 - Smoking from wheel hub assembly due to bearing failure. (396.3(a) (1)).
 - Any wheel seal is leaking. *(Must include evidence of wet contamination of the brake friction material and accompanied by evidence that further leaking will occur.)*
 - Lubricant is leaking from hub and is present on the wheel surface accompanied by evidence that further leaking will occur.
 - No visible or measurable amount of lubricant showing in hub.

EXTERIOR – EXTERIOR BODY

- **Batteries**

- Violation when:

- Batteries are not secured as designed by bracket or other method, or
 - Signs of leaking or excessive corrosion are present.

- **Bumpers**

- **Out of Service** when:

- Either front or rear bumper(s) are loose, missing or damaged creating a hazard, or
 - Altered creating a snag or entrapment hazard.

- **Damage/Snag Hazard**

- **Out of Service** when:

- Any school bus body part that is loose, torn, dislocated or protruding from the surface of the bus, creating a hazard.

- **Cargo Door/Hood Securement/Other Door**

- **Out of Service** when:

- Any door does not open and close properly;
 - Door control handle does not lock in the closed position; or
 - Any engine, battery or other door is not properly secured.

- **License Plate**

- Violation when:

- Missing front or rear plate mounted as required, or plate is not securely fastened.

For “Apportioned” plates, only one is needed.

- **School Bus Inspection Sticker**

- Violation when:

- State school bus inspection sticker is not affixed or expired.
 - Expired annual inspection (non-facility only)

EXTERIOR – MIRRORS AND WINDOWS

- **Rearview/Convex Mirrors**

- **Out of Service** when:

- Any mirror required to provide the driver with the entire field of view is missing, damaged, clouded or otherwise obscured so as to place children in a hazardous position.
 - Any crossover mirror system or portion thereof fails to hold a set adjustment.
 - Any crossover mirror directed to view any area other than for which they were intended; or any part of the required field of vision is obscured or not visible from the driver's seated position.
 - Any mirror is broken (inside or outside) that would create a hazard in or around the bus.

- **Windshield/Windows**

- **Out of Service** when:

- Any window or glass is broken, creating a hazard (inside or outside).
 - Any window, windshield or glass is not of an approved type.
 - Any window, windshield or glass is missing.
 - Windshield, or windows to the left/right of the driver, are damaged, or in such condition that it obstructs/interferes with driver's view (*chips-clouding-cracks-sandpits-distortion-etc.*). (393.60 (c)).

INTERIOR

- Instrument Panel and Controls
- Seats
- Interior Body
- Interior Mirrors and Windows
- Emergency Equipment
- Aisles and Emergency Exits
- Lights

The interior inspection
consists of seven
different areas of focus

Let's take a closer look
at each of these



INTERIOR – INSTRUMENT PANEL/CONTROLS

- **ABS Warning**
 - Violation when ABS warning light remains on or does not function as required
- **Air Pressure Gauge**
 - **Out of Service** when primary or secondary air pressure gauge is missing, inoperative or defective (393.51)
- **Bus Pop-Off Valve/Parking Brake**
 - **Out of Service** when parking brake pop off valve does not automatically set between 15-45 psi (plus or minus 5 psi).
- **Low Air Pressure Warning /Park Brake Indicator**
 - **Out of Service** when:
 - Low pressure warning device is missing, inoperative or does not operate between 45 and 70 PSI.
Note: If either an audible or visual warning device is working as required, the bus should not be placed out-of-service.
 - Parking brake warning light fails to function as designed.
- **Horn**
 - Violation when at least one horn is not operable



INTERIOR – INSTRUMENT PANEL/CONTROLS

- **Windshield Wipers/Washers**

- Violation when no washer fluid in system
- **Out of Service** when:
 - Any wiper or washer system is inoperative, missing or damaged to the extent that renders it ineffective on the either side. (393.78(a)(b)).

Note: It is not OOS if washer fluid bottle is empty, but all other components function properly.

- **Defroster**

- **Out of Service** when defrost is inoperable or does not blow air on the windshield as required.

- **Auxiliary Heater Unit**

- **Out of Service** when:
 - Any component of an auxiliary heater system is not properly secured.
 - Any fluid leak from an auxiliary heater core assembly is detected inside the passenger compartment.

- **Doors**

- **Out of Service** when:
 - The service door does not open or close properly.
 - The door control handle does not lock in the closed position.
 - The door is equipped with a padlock or similar non-OEM locking device (excludes interlock systems).



INTERIOR – SEATS

- **Seats/Barriers/Spacing**

- **Violation** when any seat, cushion or barrier is loose or damaged not resulting in an out of service condition
- **Out of Service** when:
 - Any seat frame, cushion or barrier is completely detached from the structure to which it is designed to be secured (must be completely separated from attachment point to be OOS).
 - Any seat or barrier material(s) are defective or missing which compromises the safety or the compartmentalization and occupant protection.
 - Any seat assembly or barrier spacing fails to comply with (571.222.)

- **Driver's Seat Restraint/Adjustment**

- **Out of Service** when:
 - Driver seat is not securely fastened to vehicle or fails to adjust/maintain proper adjustment.
 - Any part of the driver's safety restraint system is missing, not properly installed, or so defective as to prevent proper securement/restraint.

- **Wheelchair (inspected by district personnel only)**

- **Out of Service** when:
 - Wheelchair lift is inoperable or does not function as designed.
 - Any hydraulic line leaking during lift operation.
 - Wheelchair securement missing, improperly secured, loose or damaged.
 - Any required wheelchair restraint system not in compliance with FMVSS No. 122.



INTERIOR – INTERIOR BODY

- **Electrical Wiring**

- **Out of Service** when:
 - Electrical Cable insulation is chafed, frayed, damaged, burnt, or causing bare cable to be exposed.
 - Missing or damaged protective grommets insulating electrical cables through metal compartment panels
 - Broken or unsecured mounting of electrical components
 - Electrical cables unsupported, hanging or missing clamps that may cause a chafing or frayed condition (393.28) (396.3(a) (I)).

- **Floor**

- **Out of Service** when any floor condition creates a hazard (integrity, tripping, slipping, etc.).

- **Hand Rails**

- Violation when:
 - Any handrail is loose, not resulting in an out of service condition
- **Out of Service** when:
 - Any handrail that is missing or loose to the extent that a gap is created between mounting surfaces, thus causing a situation where an occupant's clothing, backpack, etc. could be snagged.
 - Handrail does not meet OEM specifications.

- **Interior Panels**

- **Out of Service** when:
 - Any panel (ceiling, side, wheel well, etc.) protruding, having sharp edges or not properly secured to the extent that it may cause injuries.



INTERIOR – INTERIOR BODY

- **Prohibited Liquids**

- **Out of Service** when:

- **Gasoline, diesel, propane, motor oil, power steering fluid, antifreeze, hydraulic fluid, windshield wiper fluid, brake fluid, starting fluid (ether) or any other liquid or gas substance used in the mechanical operation of the school bus when located in the passenger compartment.**
 - *(NOTE: All other potentially hazardous materials not associated with the mechanical operation of the school bus will be determined and stored at the discretion of the LEA. Items located during UHP inspections that are of potential concern, but not amounting to an OOS condition, will be noted on the inspection report and the LEA notified.)*

- **Step Well Integrity**

- **Out of Service** when:

- Any part of the step well or support structure is damaged.
 - Any condition that creates hazard (tripping, slipping, etc.).



INTERIOR – INTERIOR MIRRORS/WINDOWS, LIGHTS

- **Interior Mirrors**

- **Out of Service** when:

- Any interior mirror(s) is missing or damaged or are not constructed with rounded corners and protected edges. 6” X 16” minimum in size for type “A” buses and 6” X 30” minimum in size for type “C” and “D” buses
 - Mirrors are not laminated or tempered.

- **Side/Rear Windows**

- **Out of Service** when:

- Any glass is broken or missing which creates a hazard to any occupant.

- **Posters/Markings/Decorations**

- **Out of Service** when:

- Any poster, markings or decorations forward of the fourth row of occupants seating obstructs any window, mirror or required markings (emergency exit markings, emergency equipment markings, etc.).
 - Any poster, marking or decoration that obstructs required markings or creates a hazard.

- **Dome Lights**

- **Violation** when:

- Any interior dome lamp is missing, defective or inoperable.



INTERIOR – EMERGENCY EQUIPMENT

- **Body Fluid Kit**

- Violation when:

- Any bus is not equipped with a body fluid clean-up kit.

- **First Aid Kit**

- Violation when:

- Any bus is not equipped with a first aid kit.

- **Triangles**

- Violation when:

- Missing any one or more of the three required emergency triangles.

- **Fire Extinguisher**

- **Out of Service** when:

- Fire Extinguisher is discharged, missing, unsecured or not readily accessible for use within the driver compartment.



INTERIOR – AISLE EMERGENCY EXITS

- **Aisle Clearance/Obstruction/Center Strip**

- **Out of Service** when:
 - Aisle does not have required clearance.
 - Aisle or exit access is obstructed by any object.
 - Center aisle strip is missing, damaged or not properly secured creating a hazard (integrity, tripping, slipping, etc.).

- **Exit Obstruction**

- **Out of Service** when:
 - Any emergency exit that is equipped with a padlock or similar non-OEM locking device (excludes interlock systems).
 - Aisle or exit access is obstructed by any object.
 - Any self-retracting flip seat that does not retract on its own.

- **Window/Door Markings**

- Violation when:
 - Any emergency exit is not properly labeled and marked both inside and outside the vehicle as specified in (49 CFR 571.217).
 - Also see “emergency exit markings”.

- **Window/Door Buzzers**

- Violation when:
 - Any emergency exit window buzzer is inoperable.
- **Out of service** when:
 - Any audible warning device on an emergency exit door is defective or fails to function (defective emergency window warning device is not an OOS condition).



UNDERCARRIAGE

- Steering
- Brake System
- Suspension
- Fuel System
- Engine/Powertrain
- General

The undercarriage inspection consists of six different areas of focus

Let's take a closer look at each of these



UNDERCARRIAGE – STEERING

- **Ball/Socket Joints**

- **Out of Service** when:

- Any movement under steering load of a stud nut.
 - Any motion, other than rotational, between any linkage member and its attachment point of more than 1/8" measured with hand pressure only.
 - Any obvious welded repair(s).

- **Securement Devices (Nuts)**

- **Out of Service** when:

- Loose or missing fasteners or missing cotter pins on any tie rod/ends, pitman arm, drag link, or any other steering linkage component.

- **Pitman Arm**

- **Out of Service** when:

- Any looseness of the pitman arm on the steering gear output shaft.
 - Any obvious welded repair.

- **Power Steering Pump**

- **Out of Service** when:

- Power steering pump inoperable.
 - Auxiliary power assist cylinder loose (allowing movement of more than one inch in either direction) or inoperable.
 - Any dripping leak in the power steering system.



UNDERCARRIAGE – STEERING

- **Steering Column/Steering Wheel**

- **Out of Service** when:

- Any absence or looseness of U-bolt(s) or positioning part(s).
 - Worn, faulty or obviously repair-welded universal joint(s).
 - Steering wheel is not properly secured.
 - Telescopic Steering column does not lock into position.
 - Tilt steering column does not lock in at least one position.

- **Steering Gear Box**

- **Out of Service** when:

- Any mounting bolt(s) loose or missing.
 - Any crack(s) in gear box or mounting brackets.
 - Any obvious welded repair(s).

- **Tie Rods and Drag Links**

- **Out of Service** when:

- Loose clamp(s) or clamp bolt(s) on tie rod or drag links.
 - Any looseness in any threaded joint.
 - Tire contacts draglink (Must be visually verified).



UNDERCARRIAGE – STEERING

- **Steering Free Play**
 - **Out of Service** when:
 - See Steering Wheel Free Play Chart – Bus will be placed out of service if any of the measurements for specific steering wheel size are exceeded based on the chart values. For steering wheel diameters not listed in chart, the steering wheel lash shall not exceed 14 degrees angular rotation for manual steering systems and 30 degrees angular rotation for power steering systems. For power steering system, the engine must be running.

Steering Wheel Free Play Chart

STEERING WHEEL SIZE	MANUAL SYSTEM MOVEMENT	POWER SYSTEM MOVEMENT
16" OR LESS	2 INCH	4 1/2 INCHES
18"	2 1/4 INCHES	4 3/4 INCHES
19"	2 3/8 INCHES	5 INCHES
20"	2 1/2 INCHES	5 1/4 INCHES
21"	2 5/8 INCHES	5 1/2 INCHES
22"	2 3/4 INCHES	5 3/4 INCHES



UNDERCARRIAGE – BRAKES

As it relates to Utah school bus inspections, **a single defective brake will result in out-of-service** (regardless of any fractional calculation that may exist utilizing the “half defect” charts).

- Absence of effective braking action upon application of the service brakes (such as any brake lining/pad failing to move or contact braking surface upon application). (393.48(a)).
- Audible air leak at air chamber. (e.g., ruptured diaphragm, loose chamber clamp, etc.). (396.3(a)(1)). NOTE: Refer to “Air Loss Rate.”
- Missing brake on any axle required to have brakes. (393.42(a))



UNDERCARRIAGE – BRAKES

Air Brake Adjustment Limits

- Bring reservoir pressure between 90-100 psi (620-690 kPa), turn engine off and then fully apply the brakes. All brake measurements shall be made in 1/8 inch (3.2 mm) increments
- One brake at 1/8 inch (3.2 mm) or more beyond the adjustment limit. (e.g., Type 30 clamp type air chamber pushrod measured at 2 1/8 inches (53.9 mm) = one defective brake.) (393.47(e))
- Any wedge brake where the combined brake lining movement of both top and bottom shoes exceeds 1/8 inch (3.2 mm). (393.47(f))

Refer to Brake Adjustments Charts in Inspection manual for adjustment limits



UNDERCARRIAGE – BRAKES

Drum (Cam-Type and Wedge) Air Brake

- **Defective** when:
 - Any portion of the drum has any external crack or has any crack that open upon brake application.
 - Missing or broken brake shoe, lining, return spring (shoe or chamber), anchor pin, spider, cam roller, camshaft, pushrod, yoke, clevis pin, clevis pin retainer (e.g., cotter pin), brake adjuster, parking brake power spring or air chamber mounting bolt. (393.48(a))
 - Camshaft Bushings -Loose air chamber, spider or camshaft support bracket. (393.48(a)).
 - Defective Lining Conditions
 - Lining cracks or voids that exceed 1/16 inch (1.6 mm) in width observable on the edge of the lining. (393.47(a)).
 - Cracks/Rust Jacking -
 - Portion of a lining segment missing such that a fastening device (rivet or bolt) is exposed when viewing the lining from the edge (393.47(a)).
 - Crack that exceeds 1 1/2 inch (38.1 mm) in length. (393.47(a))
 - Loose lining segment. (Approximately 1/16 inch (1.6 mm) or more movement.)(393.47(a)).
 - Complete lining segment missing. (393.47(a))
 - The friction surface of the brake drum and the brake friction material are contaminated by oil or grease. (393.47(a)).
 - Lining thickness less than 1/4 inch (6.4 mm) or worn into the wear indicator if lining is so marked, measured at the shoe center. (393.47(d)(2)).
 - Cracks or voids that exceed 1/16 inch in width.
 - Cracks that exceed 1 1/2 inches in length.
 - Portion of lining missing that exposes a fastening device.



UNDERCARRIAGE – BRAKES

Air Disc Brakes (Exposed Pushrods and Direct Coupled – Air Chamber to Caliper)

- **Defective** when:
 - Missing or broken caliper, pad retaining component, brake pad, shoe, or lining. (393.48(a))
 - Loose or missing brake caliper mounting bolt. (393.48(a))
 - Movement of the caliper within the anchor plate, in the direction of wheel rotation, exceeds 1/8 inch (3.2 mm). (393.48(a))
 - Rotor or drum has evidence of metal to metal contact on the friction surface. (393.47(d)(2))
 - Rotor has severe rusting on the rotor friction surface on either side (light rusting on the friction surface is normal). (393.48(a))
 - Friction surface of the brake drum or rotor and the brake friction material are contaminated by oil, grease or brake fluid. (393.47(a))
 - Lining or pad with a thickness 1/16 inch (1.6 mm) or less for disc or drum brakes. (393.47(d)(2))
 - The fluid level in any master cylinder reservoir is less than 1/4 full or below minimum marking.
 - Hydraulic or vacuum lines, hoses or connections are restricted, crimped, broken or damaged through the outer reinforcement ply.
 - Any observable seepage, bulge or swelling on a brake hose under application pressure.
 - Improperly joined, such as a splice made by sliding a hose/tube end over the brake line and clamping the hose to the brake line.
 - Any observable leaking hydraulic fluid in the brake system upon full application.
 - No pedal travel reserve with engine running upon full application.
 - Brake power assist unit is inoperable.
 - Hydraulic power brake unit is inoperable.
 - Brake failure warning system is missing, inoperative, disconnected, defective or activated while engine is running with or without brake application.
 - Hydraulic brake backup system is inoperative.



UNDERCARRIAGE – BRAKES

Hydraulic and Electric Brakes

- **Defective** when:
 - Missing or broken caliper, pad retaining component, brake pad, shoe, or lining. (393.48(a))
 - Loose or missing brake caliper mounting bolt. (393.48(a))
 - Movement of the caliper within the anchor plate, in the direction of wheel rotation, exceeds 1/8 inch (3.2 mm). (393.48(a))
 - Rotor or drum has evidence of metal to metal contact on the friction surface. (393.47(d)(2))
 - Rotor has severe rusting on the rotor friction surface on either side (light rusting on the friction surface is normal). (393.48(a))
 - Friction surface of the brake drum or rotor and the brake friction material are contaminated by oil, grease or brake fluid. (393.47(a))
 - Lining or pad with a thickness 1/16 inch (1.6 mm) or less for disc or drum brakes. (393.47(d)(2))
 - The fluid level in any master cylinder reservoir is less than 1/4 full or below minimum marking.
 - Hydraulic or vacuum lines, hoses or connections are restricted, crimped, broken or damaged through the outer reinforcement ply.
 - Any observable seepage, bulge or swelling on a brake hose under application pressure.
 - Improperly joined, such as a splice made by sliding a hose/tube end over the brake line and clamping the hose to the brake line.
 - Any observable leaking hydraulic fluid in the brake system upon full application.
 - No pedal travel reserve with engine running upon full application.
 - Brake power assist unit is inoperable.
 - Hydraulic power brake unit is inoperable.
 - Brake failure warning system is missing, inoperative, disconnected, defective or activated while engine is running with or without brake application.
 - Hydraulic brake backup system is inoperative.



UNDERCARRIAGE – BRAKES

Front Steering Axle(s) Brakes

- **Defective** when:
 - Any inoperative brake (such as any brake lining/pad failing to move or contact braking surface upon application) or missing brake on either wheel of any steering axle of any vehicle equipped or required to be equipped with steering axle brakes (Missing - 393.42(a) or Inoperative - 393.48(a))



UNDERCARRIAGE – BRAKES

- **Spring Brake Chambers**

- **Out of Service** when:
 - Any non-manufactured holes or cracks in the spring brake housing section of a parking brake. (396.3(a)(1))

- **Air Compressor**

(Normally to be inspected when readily visible or when conditions indicate compressor problems.)

- **Out of Service** when:
 - Loose compressor mounting bolts. (396.3(a)(1))
 - Cracked, broken or loose pulley. (396.3(a)(1))
 - Cracked or broken mounting brackets, braces or adapters. (396.3(a)(1))

- **Parking Brake**

- **Out of Service** when:
 - No brakes on the vehicle or combination are applied upon actuation of the parking brake control, including driveline hand-controlled parking brakes, and held solely by mechanical means. (393.41).
 - Hydraulic brake system mechanical parking brake does not hold bus as required by test: engage park brake, put in drive, check for movement, put in reverse and check for movement.

- **Tie Rods and Drag Links**

- **Out of Service** when:
 - Loose clamp(s) or clamp bolt(s) on tie rod or drag links.
 - Any looseness in any threaded joint.
 - Tire contacts draglink (Must be visually verified).



UNDERCARRIAGE – BRAKES

- **Brake Drums or Rotors**

- **Out of Service** when:

- Any rotor (disc) with a crack in length of more than 75% of the friction surface and passes completely through the rotor to the center vent from either side or completely through a solid rotor or completely through a structural support connecting the rotor friction surfaces.
 - A rotor surface is worn to or through center vents.
 - Any portion of the drum or rotor missing or in danger of falling away.
 - Any portion of the drum has any external crack or has any crack that opens upon brake application. (393.47(a))
 - Any rotor (disc) with a crack in length of more than 75% of the friction surface and passes completely through the rotor to the center vent from either side or completely through a solid rotor or completely through a structural support connecting the rotor friction surfaces. (393.47(a)) NOTE: Do not confuse short hairline heat check cracks with flexural cracks.
 - A rotor surface is worn to or through center vents. (393.47(g))
 - Any portion of the drum or rotor (discs) missing or in danger of falling away (393.47(a))

- **Air Brake Hoses/Tubing**

- **Violation when:**

- Any air hose or line that is chafing or otherwise damaged not resulting in an out-of-service condition.

- **Out of Service** when:

- Any Damage extending through the reinforcement ply.
 - Bulge/swelling when air pressure is applied.
 - Audible air leak at other than a proper connection.
 - Improperly joined, such as a splice made by sliding a hose end over a piece of tubing and clamping the hose to the tube.
 - Damaged by heat, broken or crimped in such a manner as to restrict air flow.



UNDERCARRIAGE – BRAKES

- **Defective Linings**

- **Out of Service** when:
 - Lining cracks or voids that exceed 1/16” in width observable on the edge of the lining.
 - Portion of a lining segment missing such that a fastening device (rivet or bolt) is exposed when viewing the lining from the edge.
 - Any lining thickness less than allowed by (393.47).
 - Lining pad is cracked, broken, not firmly attached or missing (surface or heat cracks in the lining should not be considered out-of-service).
 - The friction surface of drum, rotor or friction material are contaminated by oil, grease or brake fluid.
 - Loose components.
 - Fails to make contact with drum.
 - Absence of any braking action on any axle.
 - Any portion of the drum or rotors (discs) missing, broken, misplaced or cracked through rotor to center vent.

- **Vacuum Brakes**

- **Out of Service** when:
 - Insufficient vacuum reserve to permit one full brake application after engine is shut off.
 - Vacuum hose(s) or line(s) restricted, abraded through outer cover-to-cord ply, crimped, cracked, broken or has collapse of vacuum hose(s) when vacuum is applied.

- **Parking Brake**

- Violation when
 - Audible air leak at any location not resulting in an out-of-service condition. This shall include other systems operated by air.
- **Out of Service** when:
 - Audible air leak at the chamber.
 - System fails to maintain pressure as described in (393.3).



UNDERCARRIAGE – BRAKES

- **Air Loss Rate**

- **Out of Service** when:

- If an air leak is discovered and the reservoir pressure is not maintained when:

- Governor is cut-in;
 - Reservoir pressure is between 80 & 90 PSI;
 - Engine is at idle, and;
 - Service brakes applied, leakage exceeds 3 psi/min.
 - Service brakes released, leakage exceeds 2 psi/min.
 - Fails to recover sufficient air pressure.

- **Air Reserve Securement**

- Violation when:

- Any movement is detected.

- **Out of Service** when:

- Air reservoir is not securely fastened (movement exceeding 1”).



UNDERCARRIAGE – SUSPENSION

- **Air Ride System**

- **Out of Service** when:
 - Deflated air suspension (i.e., system failure, leak, etc.). (393.207(f)).
 - Loose, missing or detached air bag.

- **Axle/Front**

- **Out of Service** when:
 - Any crack(s) or obvious welded repair(s).

- **Axle Part/Member**

- **Out of Service** when:
 - Any U-bolt or other spring to axle clamp bolt(s) cracked, broken, loose, or missing.
 - Any spring hanger(s), or other axle positioning parts cracked, broken, loose, or missing.

- **King Pins/Ball Joint**

- **Out of Service** when:
 - Any king pin or ball joint is worn beyond manufacture's specifications or improperly installed.



UNDERCARRIAGE – SUSPENSION

- **Shock Absorbers**

- Violation when:

- Shock absorber is loose, broken, missing or wet with a dripping leak.
 - A shock absorber is leaking with evidence of a dripping leak will not result in an out-of-service condition.

- **Spring Assembly**

- **Out of Service** when:

- Any spring hanger, assembly part or leaf, broken or missing.

- **Sway Bar/Tracking Components**

- **Out of Service** when:

- Any component that violates specifications found in (393.207 (a) (c) or (d)).

- **Suspension Mounts**

- **Out of Service** when:

- Any component that violates specifications found in (393.207 (a) (c) or (d)).



UNDERCARRIAGE – FUEL SYSTEM

- **Fuel Tank Securement/Leaks/Fuel Cap**

- **Out of Service** when:

- Any liquid fuel system with a dripping leak at any point.
 - Any fuel tank not securely attached to the vehicle.
 - The fuel tank filler cap is missing.

- **Gaseous Fuels**

- CNG or LPG

- **Out of Service** when:

- Any fuel leakage from the CNG or LPG system detected by smell and verified by either a bubble test using non- ammonia, non-corrosive soap solution or a flammable gas detection meter.
 - NOTE: Verification is needed to ensure that the sound is not either internal to the fuel system (such as gas flowing in a pressure regulator, or pressure equalizing between manifold (tanks) or a leak in the air brake system.

- **Gaseous Fuels**

- LNG

- **Out of Service** when:

- A cloud of water vapor coming from any component of the fuel system.
 - Any fuel leakage from the LNG system detected visibly or audibly and verified by either a bubble test using non-ammonia, non-corrosive soap solution or a reading of more than 5,000 ppm on a flammable gas detection meter.
 - Dripping liquid that boils or vaporizes in the air.
 - Note: it is normal, particularly in humid conditions, for water vapor to collect around many portions of a LNG fuel system

Educational entities will ensure that all gaseous fuel tanks are inspected (every three years) and decommissioned (upon expiration of manufacture's stamped expiration date) by certified personnel.



UNDERCARRIAGE – ENGINE/POWERTRAIN

- **Coolant Leaks**

- Violation when:
 - Any dripping fluid leaks from the cooling system not resulting in an out-of-service condition.
- **Out of Service** when:
 - Any fluid leak from an auxiliary heater core assembly detected inside the passenger compartment.

- **Differential Cracks/Leaks**

- **Out of Service** when:
 - Cracked housing or dripping leak.

- **Driveline/Driveshaft**

Yoke Ends (Including Slip Yoke, Yoke Shaft, Tube Yoke and End Fitting Yoke)

- **Out of Service** when:
 - Any visible crack in a yoke end (396.3(a) (1)).
 - Any yoke-mounting hardware loose (with hand pressure only), broken or missing.
 - Any horizontal or vertical movement of slip joint yoke shaft of greater than 1/2 inch with hand pressure only.
 - Any loose, broken or missing end fitting fastener. (396.3)



UNDERCARRIAGE – ENGINE/POWERTRAIN

- **Driveshaft**

- **Out of Service** when:
 - Any independent vertical movement between opposing yoke ends greater than
 - 1/8 inch (3.2 mm), with hand pressure only. (396.3(a)(1))
 - Any missing universal joint bearing cap. (Also see item 4.b.(1)) (396.3(a)(1))
 - Any missing, broken or loose universal joint bearing cap bolt or retainer bolt. (396.3(a)(1))
 - Any bearing cap retainer clip is missing. (396.3(a)(1))

- **Driveline Guard**

- **Out of Service** when:
 - Driveline guard missing, loose, improper placement or bent to the extent it is out of position.

- **Center Bearing (Carrier Bearing)**

- **Out of Service** when:
 - Any broken or loose center bearing bracket, bracket bolts or mounting hardware. (396.3(a)(1))
 - Any center bearing bracket crack equaling 50 percent or more of the original bracket width. (396.3(a)(1))
 - More than 1/2 inch (12.7 mm) vertical movement (with hand pressure only) of the shaft in the center bearing carrier. (396.3(a)(1))



UNDERCARRIAGE – ENGINE/POWERTRAIN

- **Driveshaft Tube**

- **Out of Service** when:
 - Any original metal crack in the shaft tube greater than 1/4 inch (6.4 mm) in length. (396.3(a)(1))
 - Obvious cracked weld at shaft tube end. (396.3(a)(1)).
 - Any shaft tube with obvious twist. (396.3(a)(1)).

Inspection Bulletin 2014-01 – Driveline/Driveshaft Inspections

- **Engine Fluid Leaks**

- Violation when:
 - Any dripping fluid leaks from engine not resulting in an out-of-service condition.
- **Out of Service** when:
 - Any defect which may cause an imminent hazard or potential fire.

- **Engine/Transmission Mounts**

- **Out of Service** when:
 - Any critical component fails to function as designed (396.3)
 - Any cracked, loose, or broken frame member adversely affecting support of functional components, such as steering gear, engine, transmission, body parts and suspension. (393.201(a))



UNDERCARRIAGE – ENGINE/POWERTRAIN

- **Exhaust System**

- **Out of Service** when:
 - Any exhaust system leaking or discharging under the chassis.
 - No part of the exhaust system of any bus shall be so located as to be likely to result in burning, charring or damaging the electrical wiring, fuel supply or any combustible part of the bus.
 - Note: Expansion clamps may allow some leakage when cold. If evidence of leakage is present, allow the system to warm up and re-check prior to documenting a violation.

- **Transmission Fluid Leak**

- Violation when:
 - Any dripping fluid leaks from the transmission not resulting in an out-of-service condition.
- **Out of Service** when:
 - Any defect which may cause an imminent hazard or potential fire.

- **Frame**

- Violation when:
 - Any frame component is broken, missing or damaged not resulting in an out-of-service.
- **Out of Service** when:
 - Any cross member, outrigger or other structural support is missing, cracked, shifted or damaged to the extent it affects the structural integrity or safe operation of the bus.
 - Any area of the floor that is sagging or soft due to broken cross member or would present a hazard.
 - Three or more adjacent cross members or outriggers broken or detached.



UNDERCARRIAGE – GENERAL

- **Any Fire/Crash/Failure Hazard**
 - **Out of Service** when:
 - Any defect which may cause an imminent hazard or potential fire.
 - Any condition that is likely to cause a crash or breakdown of the vehicle.



CONGRATULATIONS!

YOU'VE COMPLETED THE TRAINING AND ARE READY TO TAKE THE EXAM.

Send an EMAIL requesting to take the test to:

utahschoolbus_UHP@Utah.gov

A link to take the test will be sent to your email.

Please allow up to 7 business days before calling in. After 7 business days if you haven't received the link call the Safety Inspection Office at (801)965-4888. If no one answers, leave a message with your name, phone number and date you completed the training.