

North Carolina School Bus Inspection Manual

Regulations And Procedures



ATTENTION

This manual has been developed for those engaged in school bus inspection with the goal of inspection uniformity thereby increasing the likelihood that fewer buses will be operated in an unsafe condition.

The regulations described herein are accurate and complete excerpts of the Official Motor Vehicle Inspection Regulations dealing specifically with the procedures for school bus inspection

North Carolina General Statute 115C-248(a) states the following: The superintendent of each local school administrative unit, shall cause each school bus owned or operated by such local school administrative unit to be inspected at least once each 30 days during the school year for mechanical defects, or other defects which may affect the safe operation of such bus.

This means that each school and activity bus being operated is required an inspection each 30 (calendar) days. The State Vehicle Fleet Management System schedules buses for inspection and causes them to appear 7 days before they exceed the required 30-day interval. This should give technicians ample time to conduct the inspection before they are in violation of N.C.G.S 115C-248(a).

Any questions, comments, or inquiries regarding this inspection manual should be directed to the North Carolina Department of Public Instruction, Transportation Services Section.

All North Carolina School systems may copy and reproduce this document for their personnel. Anyone else wishing to copy this manual are requested to contact the North Carolina Department of Public Instruction, Transportation Services Section.

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BRAKE TESTING PROCEDURE

Inspection criteria for all sections are based upon **Federal Motor Carrier Safety Regulations**. These regulations will be noted at the beginning of each section.

393.52 Brake performance

A brake performance test shall be performed by an inspector/technician on all school buses when PM services are conducted, not on monthly inspections.

- (a) Upon application of its service brakes, a motor vehicle or combination of motor vehicles must under any condition of loading in which it is found on a public highway, be capable of –
 - (1) Developing a brake force at least equal to the percentage of its gross weight specified in the table in paragraph © of this section;
 - (2) Decelerating to a stop from 20 miles per hour at not less than the rate specified in the table in paragraph (c) of this section; and
 - (3) Stopping from 20 miles per hour in a distance, measured from the point at which movement of the service brake pedal or control begins, that is not greater than the distance specified in the table in paragraph (d) of this section.
- (b) Upon application of its emergency brake system and with no other brake system applied, a motor vehicle or combination of motor vehicles must, under any condition of loading in which it is found on a public highway, be capable of stopping from 20 miles per hour in a distance, measured from the point at which movement of the emergency brake control begins, that is not greater than the distance specified in the table in paragraph (d) of this section.
- (c) Conformity to the stopping-distance requirements of paragraphs (a) and (b) of this section shall be determined under the following conditions:
 - (1) Any test must be made with the vehicle on a hard surface that is substantially level, dry smooth, and free of loose material.
 - (2) The vehicle must be in the center of a 12-foot-wide lane when the test begins and must not deviate from that lane during the test.

(d) Vehicle brake performance table:

Type of Motor Vehicle (1)	Service Brake Systems			Emergency Brake Systems
	Braking force as a Percentage of gross Vehicle or combination weight (2)	Deceleration in feet per second per second (3)	Application and braking distance in feet from initial speed of 20 m.p.h. (4)	Application and Braking distance in feet from initial speed of 20 m.p.h. (5)
A. Passenger-carrying vehicles. (1) Vehicles with a seating capacity of 10 Persons or less, including driver, and built on a passenger car chassis.....	65.2	21	20	54
(2) Vehicles with a seating capacity of more Than 10 persons, including driver, and Built on a passenger car chassis; vehicles Built on a truck or bus chassis and having a manufacturer's GVWR of 10,000 pounds or less.....	52.8	17	25	66
(3) All other passenger-carrying vehicles....	43.5	14	35	85
B. Property-carrying vehicles. (1) Single unit vehicles having a manufacturer's GVWR of 10,000 pounds or less.....	52.8	17	25	66
(2) Single unit vehicles having a manufacturer's GVWR of more than 10,000 pounds, except truck tractors. Combinations of a 2-Axle towing vehicle and trailer having a GVWR of 3,000 pounds or less. All combinations of 2 or less vehicles in a driveway or towaway operation.....	43.4	14	35	85
(3) All other property-carrying vehicles and Combinations of property-carrying vehicles.....	43.5	14	40	90

NOTE:

- (a) There is a definite mathematical relationship between the figures in columns 2 and 3. To obtain the percentage of braking force take the deceleration number and divide by 32.2 feet per second. (For example, 21 divided by 32.2 equals 65.2 percent.) Column 2 is included in the tabulation because certain brake-testing devices utilize this factor.
- (b) The decelerations specified in column 3 are an indication of the effectiveness of the basic brakes, and as measured in practical brake testing are the maximum decelerations attained at some time during the stop. These decelerations as measured in brake tests cannot be used to compute the values in column 4 because the deceleration is not sustained at the same rate over the entire period of the stop. The deceleration increases from zero to a maximum during a period of brake-system application and brake-force buildup. Also, other factors may cause the deceleration to decrease after reaching a maximum. The added distance, which results because maximum deceleration is not sustained, is included in the figures in column 4 but is not indicated by the usual brake-testing devices for checking deceleration.
- (c) The distances in column 4 and the decelerations in column 3 are not directly related. "Brake system application and braking distance in feet" (column 4) is a definite measure of the overall effectiveness of the braking system, being the distance traveled between the point at which the driver starts to move the braking controls and the point at which the vehicle comes to rest. It includes distance traveled while the brakes are being applied and distance traveled while the brakes are retarding the vehicle.
- (d) The distance traveled during the period of brake-system application and brake-force buildup varies with vehicle type, being negligible for many passenger cars and greatest for combinations of commercial vehicles. This fact accounts for the variation from 20 to 40 feet in the values in column 4 for the various classes of vehicles.
- (e) The terms "GVWR" and "GVW" refer to manufacturers gross vehicle weight rating and the actual gross vehicle weight, respectively.

Tapley Brake Meter Test for North Carolina School Bus Inspectors

REGARDLESS OF THE TYPE OF BRAKING SYSTEM USED ON THE BUS, IT MUST BE ABLE TO PRODUCE A BRAKING EFFICIENCY OF AT LEAST 60 PERCENT UNLOADED. The purpose of requiring 60 percent braking efficiency is to be able to test the bus without the pupil load. Sixty (60) percent braking efficiency is the equivalent of the 43.5 percent braking efficiency required by law with a full load.

AIR BRAKE CHAMBER STROKE MEASUREMENTS & BRAKE ADJUSTMENT

Another way to determine if the brakes require adjustment is to measure the at-rest and applied distance of the brake push rods. The procedure is to bring reservoir pressure between 90 and 100 psi (620-690KPA), turn the engine off, release the park brake, and take an at-rest measurement from the end of the brake chamber to the center of the push rod clevis. Re-apply the brakes and check the measurement again at the same points. Subtract the difference and this would be your applied stroke. You then check the chart for the appropriate brake chamber and determine if the brake needs adjusting. **Refer to manufacturers service manual for correct brake adjustment procedure.**

**Commercial Vehicle Safety Alliance
North American Uniform Out-Of-Service Criteria
Reference Charts**

CLAMP TYPE BRAKE CHAMBER DATA

TYPE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT
6	4-1/2" (114mm)	1-1/4" (32mm)
9	5-1/4" (133mm)	1-3/8" (35mm)
12	5-11/16" (145mm)	1-3/8" (35mm)
16	6-3/8" (162mm)	1-3/4" (45mm)
20	6-25/32" (172mm)	1-3/4" (45mm)
24	7-7/32" (184mm)	1-3/4" (45mm)
30	8-3/32" (206mm)	2" (51mm)
36	9" (229mm)	2-1/4" (57mm)

NOTE: A brake at the adjustment limit is not a violation.

"LONG STROKE" CLAMP TYPE BRAKE CHAMBER DATA

TYPE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT
12	5-11/16" (14.5cm)	1-3/4" (4.5cm)
16	6-3/8" (162mm)	2.0" (51mm)
20	6-25/32" (172mm)	2.0" (51mm)
24	7-7/32" (184mm)	2.0" (51mm)
24*	7-7/32" (184mm)	2.5" (64mm)
30	8-3/32" (206mm)	2.5" (64mm)

*** For 3" maximum stroke type 24 chambers**

NOTE: A brake at the adjustment limit is not a violation.

TIE ROD STYLE PISTON BRAKE CHAMBER DATA

SIZE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT
30	6-1/2" (165MM)	2.5" (64mm)

NOTE: A brake at the adjustment limit is not a violation.

BOLT TYPE BRAKE CHAMBER DATA

TYPE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT
A	6-15/16" (176mm)	1-3/8" (35mm)
B	9-3/16" (234mm)	1-3/4" (45mm)
C	8-1/16" (205mm)	1-3/4" (45mm)
D	5-1/4" (133mm)	1-1/4" (32mm)
E	6-3/16" (157mm)	1-3/8" (35mm)
F	11" (279mm)	2-1/4" (57mm)
G	9-7/8" (251mm)	2" (51mm)

NOTE: A brake at the adjustment limit is not a violation.

ROTOCHAMBER DATA

TYPE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT
9	4-9/32" (109mm)	1-1/2" (38mm)
12	4-13/16" (122mm)	1-1/2" (38mm)
16	5-13/32" (138mm)	2" (51mm)
20	5-15/16" (151mm)	2" (51mm)
24	6-13/32" (163mm)	2" (51mm)
30	7-1/16" (180mm)	2-1/4" (57mm)
36	7-5/8" (194mm)	2-3/4" (70mm)
50	8-7/8" (226mm)	3" (76mm)

NOTE: A brake at the adjustment limit is not a violation.

DD-3 BRAKE CHAMBER DATA

TYPE	OUTSIDE DIAMETER	BRAKE ADJUSTMENT LIMIT
30	8-1/8" (206MM)	2-1/4" (57MM)

NOTE: This chamber has 3 airlines and is found on motor coaches.

NOTE: A brake at the adjustment limit is not a violation.

INSIDE BUS – BRAKE COMPONENT CHECK

Air Brakes – All of the following items should be inspected on Air Brake Equipped Vehicles:

- 1) Air Pressure Gauges – On buses built after March 1975, check for the presence of two (2) gauges (or single gauge with dual needles). One (1) gauge or needle should indicate air pressure available to the front air brake system, and the other should indicate air pressure available to the rear brake system. Both gauges must be accurate to within $\pm 7\%$ (at 100 lbs. $\times 7\% = 7\text{lbs.}$)

Note: If bus is equipped with anti-lock braking system, refer to appropriate Manufacturer's Service Manual for inspection criteria.

- 2) Air Compressor Governor – Check air brake system governor operation. While building up system air pressure, note pressure at which governor cuts-out (compressor quits compressing). With engine still running, pump brakes to lower air pressure until governor cuts-in (starts compressing again). Note pressure. If cutout pressure is below 120 p.s.i. (For buses equipped with air dryer system), it needs to be repaired. If the cutout pressure is too low (below 100 p.s.i.) or too high (above 130 p.s.i.) it should be repaired before operating.
- 3) Air Compressor Operation – Air reservoir should be drained thoroughly before making this check. Check time required for system air pressure to build up from 85 to 100 psi with engine at fast idle (approximately 1,200 R.P.M.). Repairs should be made if time for system buildup (85-100 p.s.i.) exceeds 40 seconds. Air compressor should also be checked for oil leaks.
- 4) Parking Brake – With vehicle stopped, apply park brake. Place transmission selector in drive position and accelerate engine to a fast idle (approximately 1,200 R.P.M.'s), vehicle should not move forward.
Note: Buses equipped with Rear Diesel engine and Allison World Transmission should be checked at 900 R.P.M.
- 5) Air Leaks – To check the vehicle for air leaks the system should be charged to (100-p.s.i. minimum). The engine should then be turned off, and the park brake released. **Make sure a wheel chock secures the vehicle to prevent any movement.** With brakes in released position, check for air pressure leak (pressure drop) for at least one (1) minute. Note pressure drop, if any. Firmly apply the service brake. Do not release. Check for air pressure leak (pressure drop) for at least one (1) minute. Note pressure drop, if any. If air is leaking, but the rate is less than two (2) psi per minute (brakes released) or 3 psi per minute (with service brake applied) repair the vehicle. If pressure leaks more than two- (2) psi per minute (brakes not applied) or more than three- (3) psi per minute (with service brake applied) the vehicle should be taken out of service until repairs can be made.
- 6) Low Air Warning – Check operation of low air warning buzzer and light, by building air pressure to 100-125 psi and perform the following procedures: with ignition key switch in run position, drop air pressure. Low air warning buzzer and light should activate by the time the pressure drops to 50 psi. Start the engine and build system air pressure. Warning buzzer and light should deactivate by 70 psi. If either light or buzzer is inoperative or buzzer fails to operate by 50 psi or continues to operate above 70 psi the vehicle should be repaired before operating. **Note: If air brake gauge failed previous check for accuracy, do not perform this check until gauge is repaired.**

Hydraulic Brakes – All of the following items should be checked on hydraulic brake equipped vehicles:

- 1) Any visible leaks in the brake or hydraulic assist system. If any leaks are found in the brake or hydraulic system the vehicle should be taken out of service until repaired. Check the brake warning and backup systems using the appropriate manufacturer procedure below.

Brake Failure Warning System Check	
NAVISTAR	
CONDITION	NORMAL OPERATION
PARK BRAKE LIGHT	
Key switch in START position w/park brake released – (Bulb check).	Light ON
Key switch ON w/park brake applied.	Light ON
BRAKE PRESSURE LIGHT	
Key switch OFF.	Light OFF, electric hydraulic Pump operates when service Brakes are applied.
Key switch in ON position. Engine not operating (pump and bulb check).	Light ON and electric hydraulic Pump operation (some vehicles) SEE NAVISTAR MANUAL. Light ON and electric hydraulic Pump operates when service Brakes are applied.
Key switch in START position.	Light ON momentarily and Electric hydraulic pump operates
Key switch in ON position and Engine operating with service Brakes applied.	Light OFF.

- 2) Check brake pedal reserve (distance from floor) upon one (1) firm brake application (engine off, hydraulic boost depleted). If brake pedal (reserve) is less than one (1) inch from floor, the vehicle should be removed from service until repaired.
 - a) Check brake pedal fade (continues to fall to floor after initial firm application) with engine off. If there is any brake pedal fade (falling away) after initial firm application the bus should be removed from service until repaired.
 - b) Check all brake hardware and components inside the bus for secure mounting, routing, and condition including: pushrod and clevis assembly, brake pedal assembly and rubber cover pad (if originally equipped). Repair rubber cover if it is worn. If rubber cover pad is missing or worn out the bus should be removed from service until repaired.
 - c) Check the emergency brake control assembly. If emergency brake control assembly is hard to operate or doesn't latch and release properly the vehicle should be removed from service until repaired.
 - d) Parking Brake Operation. With vehicle stopped (engine running), apply park brake. When engine torque is applied by placing transmission selector in "Drive" and accelerating the engine to a fast idle (approximately 1,200 rpm's) the vehicle should not move forward. If park brake doesn't hold or functions improperly the vehicle should be removed from service until repaired.

INSIDE BUS – STEERING COMPONENT CHECK

Check for play in the steering system, at the steering wheel, using the following procedures:

- 1) Visual check – from inside the bus with the engine running, rotate the steering wheel lightly from side to side until the turning motion can be observed at the tires and note free play (lash) at the steering wheel outer diameter. This procedure must be performed with the vehicle on the ground. If steering wheel is cracked (plastic) in the contact area it must be repaired. If free play (lash) exceeds the amounts specified in the chart below, the vehicle should be taken out of service until repaired.

Federal Motor Carrier Safety Regulations 393.209

STEERING WHEEL PLAY (LASH) MEASUREMENTS

Steering Wheel Size	Free Play (Lash) Measurements Power Assist
16" or less	4-1/2" +
18"	4-3/4" +
20"	5-1/4" +
22"	5-3/4" +
<p>Note: For power systems, if steering wheel movement exceeds 45 degrees before steering axle tires move, proceed as follows: Rock steering wheel left to right between points of power steering valve resistance. If that motion exceeds 30 degrees the vehicle should be placed out of service until repaired.</p>	

To check power assist operation run the engine at fast idle and turn steering wheel a full right and left turn and feel for binding, jamming, or belt slippage.

- 2) Column – check steering column inside the bus for up and down play (parallel to shaft), side to side play (perpendicular to shaft), and for proper mounting. If side to side play in steering column exceeds ¼ inch or up and down play exceeds one (1) inch the vehicle should be placed out of service until repaired. If column assembly mounting (including floor mounting plate) or fasteners are loose the vehicle should be placed out of service until repaired. Vehicle should also be placed out of service if any of the following conditions exist: the tilt/telescopic assembly (if equipped) will not stay in the locked position; the steering column U-joint inside the bus (if equipped) is loose, damaged, or noisy after lubrication; the flexible coupling, if equipped (rag joint) has loose or missing fasteners, damaged flexible disc, or elongated holes; if any column u-joint, inch bolt, other column fasteners, or input shaft coupling is loose, damaged, or missing; if steering gearbox is loose on frame, or fasteners or lock tabs are loose or missing; if any frame braces or crossmembers are loose or missing; if any rivets or other fasteners at frame braces or crossmembers are loose or missing; if any axle or suspension component is loose beyond specifications prescribed elsewhere in this manual. The firewall rubber boot should also be checked for proper seal. Make repairs if the boot is found damaged torn.

OUTSIDE BUS – STEERING COMPONENT CHECK

Steering Gear Box and other external components will be checked using the following procedure:

- 1) Vehicle should be on the ground and not suspended. With engine running have an assistant move the steering wheel back and forth repeatedly to load steering components. Visually observe the following external steering and related suspension and frame components for looseness while the assistant works steering (also see specific procedures under each component).
 - a) Column shaft, hardware, and steering linkage boots.
 - b) Column U-joints or flexible coupling (as equipped).
 - c) Coupling at steering gearbox.
 - d) Steering gearbox.
 - e) Pitman Arm.
 - f) Drag link.
 - g) Steering knuckle or arms.
 - h) Tie rod ends.
 - i) Idler arm (as equipped).
 - j) Check the vehicle frame cross members and frame cross members and frame braces (including associate rivets and fasteners for looseness and condition).

- 2) Have assistant carefully operate steering to full left and right turn and check for power assist pop-off and steering stops.

- 3) As a follow-up to the above steering check, also perform a visual and hands-on check of each of the listed components. See the following chart for details of component inspection.

Inspection Procedures	Repair (or note) If:	Out of Service if:
Steering Gear Box Mounting		
Check mounting, condition, and tightness of steering gear box, and check frame, frame braces, and associated rivets or fasteners for looseness and condition.		Steering gear box is loose. There is any binding in steering gear box. Frame, frame braces, and associated rivets or fasteners are loose, damaged, or missing.
Pitman Arm		
Check the pitman arm for looseness or misalignment at sector shaft splines and looseness at all joints. Check looseness of pinch bolt and fasteners and condition of pitman arm.	Pitman arm grease fitting (if originally equipped) is loose or missing (repair).	Any play is observed between pitman arm and sector shaft. Pinch bolt at sector shaft is loose or missing. Pitman arm to sector shaft timing marks are misaligned.

Inspection Procedures	Repair (or note) If:	Out of Service if:
Drag Link		
Check the drag link ends, shaft, and fasteners for looseness and condition (on vehicles with I-beam suspension).	<p>Any drag link end grease fitting (as equipped) is loose, or missing, or will not take grease (repair).</p> <p>Drag link end boot is damaged or missing (repair).</p> <p>Drag link needs lubrication (repair).</p> <p>Drag link dust boot (as originally equipped) is cut, damaged, or missing (repair).</p>	<p>Drag link ball stud is loose in pitman arm or upper steering arm.</p> <p>Any nut is loose or missing, or cotter pin is missing.</p> <p>Drag link shaft is damaged or bent.</p> <p>Drag link end (non-adjustable type) has more than 1/16 inch axial (not rotational) play.</p> <p>Horizontal socket type (adjustable) drag link end has more than 1/16 inch axial or lateral play.</p>
Steering Arm		
<p>1) Check upper steering arm (Ackerman arm) and left and right side lower steering arms for securement and condition.</p> <p>2) Check condition and securement of steering stops and lock nuts.</p>		<p>Any steering arm has been bent, is cracked, or is damaged.</p> <p>Any steering arm attachment point is loose, or any fasteners, or cotter pin is missing.</p> <p>Either steering stop or lock is loose, damaged, or missing.</p>
Tie Rod and Ends		
check the tie rod ends, tie rod, dust boots, and clamps or fasteners (as equipped) for looseness, damage, and condition.	<p>Tie rod end dust boot is cut, damaged, or missing (repair).</p> <p>Tie rod end needs lubrication (repair).</p> <p>Any tie rod end grease fitting is loose, or missing, or will not take grease (repair).</p>	<p>Tie rod clamps, fasteners, or cotter pin is stripped, missing, or loose.</p> <p>Any clamp (as equipped) is mispositioned.</p> <p>Any tie rod end is cracked or damaged.</p> <p>Any tie rod end has more than 1/16 inch axial play.</p> <p>Tie rod end ball stud is loose in steering arm or idler arm.</p>
Idler Arm		
check idler arm assembly (as equipped) for looseness, damage, and condition.	<p>Idler arm needs lubrication (repair).</p> <p>Idler arm grease fitting is loose, or missing, or will not take grease (repair).</p>	<p>Any idler arm fasteners are loose or missing.</p> <p>Idler arm is cracked, or damaged, or cotter pin is missing.</p> <p>Idler arm up and down play is greater than 1/4 inch total (1/8 inch either direction).</p>

OUTSIDE BUS – BATTERY CHECK

Hold down – Check for tightness, condition, and type of battery hold down. Make repairs as soon as possible if battery hold down assembly or tray is loose, corroded, or damaged causing insecure mounting of battery.

- 1) Battery Terminals – Check terminals for cleanliness, tightness, and condition. Make repairs as soon as possible if terminals are loose, damaged, corroded, or have missing hardware.

- 2) Battery Cables – Check cable assemblies for routing, securement, condition, and size. Make repairs if the following conditions exist: cable or insulation is cracked, damaged, or corroded; cable is misrouted, unsecured, or grommet is missing; cable is routed against the exhaust or any other extremely hot surface; cable is smaller than original equipment size.
- 3) Cleanliness – Check cleanliness of battery (ies). Repair if battery top or sides are corroded, greasy, dirty, or wet with electrolyte. If battery is cracked or damaged it should be replaced before operating.
- 4) Tray – Check battery tray for operation, condition, and securement. Make repairs if the following conditions exist: if battery slide tray is corroded, dirty, or hard to slide in and out; if battery slide tray securement device or tray stop is missing or nonfunctional; if battery tray does not slide in and out; if battery slide tray or box is damaged or deteriorated reducing security of battery(ies); if battery box door does not open or will not stay latched.
- 5) Electrolyte Level – Check electrolyte level in battery (ies) for proper level (if applicable). Repair if electrolyte is low. If electrolyte is too low and exposes plates, repair or replace.

ENGINE COMPARTMENT – FLUID LEVELS

- 1) Brake Fluid – Check brake fluid and brake power-assist hydraulic fluid (if applicable) for level and condition. If the following conditions exist make repairs as necessary: level of brake fluid in either side of master cylinder reservoir is lower than ¼ inch from top or below “Add” mark (if equipped); brake fluid or power-assist fluid shows evidence of excessive water, oil, or dirt contamination; brake power-assist hydraulic fluid is below cold “Add” mark. If fluid is low in either of these components an inspection should be made and if leaks are detected the vehicle should be placed out of service until repairs are made.
- 2) Power Steering Fluid – Check the power steering reservoir fluid levels and condition. Make repairs if power steering fluid is below cold “Add” mark or if power steering fluid shows evidence of excessive water, oil, or dirt contamination.
- 3) Oil – Check the level and condition of oil. Repair if engine oil is below “Add” mark. If no oil is observed on dipstick the vehicle should be taken out of service until reason can be determined. The vehicle should also be taken out of service if there is evidence of fuel or water contamination in the oil.
- 4) Transmission Fluid – Check the level and condition of transmission fluid. Make repairs if any of the following conditions exist: transmission fluid is below “Add” mark; transmission fluid shows evidence of excessive water or dirt contamination; transmission fluid shows need of servicing (discoloration and/or burnt smell). The vehicle should be removed from service until repairs can be made if the transmission fluid is not present on dipstick or is above the full mark (overfilled).
- 5) Windshield Washer Fluid – Check windshield washer fluid level. Make repairs if the reservoir is low or the windshield washer does not spray windshield.
- 6) Coolant – Check coolant (antifreeze) level and condition, and freeze protection. Make repairs if any of the following conditions exist: the coolant level in radiator or reservoir is low; the coolant shows evidence of excessive oil or dirt contamination, or rust and corrosion; the coolant freeze/boil protection is inadequate (acceptable freeze protection –20°F or lower); the coolant pH level is too

high or too low; the coolant additive package has deteriorated. The vehicle should be taken out of service until problem can be determined if coolant cannot be seen in reservoir or in radiator tank with cap removed.

ENGINE COMPARTMENT – BELTS

- 1) Tightness – Visually and physically check all drive belts for proper tension. If available, use a tension gauge. If a gauge is not available, use a ruler to measure the deflection of the belt (s) up and down at the widest point between the drive and driven pulley(s). Make repairs if any belt exceeds tension reading recommended by manufacturer, if a tension gauge is used. If ruler method is used, make repairs if any belt is less than ½ inch deflection (too tight) when firm pressure is applied. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: any belt tensioner does not pivot or move freely and apply spring pressure on belt; any tension on any belt is too loose (based on specifications of type tension gauge used); tension of any belt (using ruler method) is too loose when firm pressure is applied (greater than ¾ inch deflection).
- 2) Condition – Visually inspect belt(s) for glazing, oil contamination, dry rotting, cuts, and separation of plies. Check belts for twisting and distortion. Make repairs if any of the following conditions exist: if any belt is glazed; if any belt is oil saturated, dry-rotted, cut, or plies of belt (s) are separated; if any belt is distorted or twisted.
- 3) Routing – Visually inspect belt(s) for rubbing or contact with objects other than pulleys and for routing around correct pulleys. Make repairs if any of the following conditions exist: if any belt is making contact with objects other than pulley(s); if any belt is routed around incorrect pulley(s).
- 4) Belt Alignment – Visually inspect belts for proper alignment. Make repairs if any belt(s) is not inline or if any belt(s) is misaligned and could result in failure.

ENGINE COMPARTMENT – HOSES

NOTE: References to hoses includes all types of hoses located in the engine compartment, including power steering, coolant, air compressor intake, vacuum, brake hydraulic assist, engine oil, and transmission hoses.

- 1) Clamp (s) and Connections – Visually and physically check that hose connections or clamp (s) are tight. Make repairs if any of the following conditions exist: if any hose connection or clamp (s) is loose or is too tight digging into hose; if any hose connection or clamp (s) is stripped or damaged.
- 2) Condition – Visually inspect all hoses for cuts, abrasions, wear, oil saturation, dry rotting, or “ballooning”. Make repairs if any hose is cut, abraded, worn, oil saturated, dry-rotted, or “ballooned” to the point that failure could occur.
- 3) Routing – Visually inspect routing and securement of all hoses. Make repairs if any hose is misrouted or unsecured so heat damage, abrasion, or cuts could result in failure.

ENGINE COMPARTMENT – AIR FILTER ASSEMBLY

- 1) Check air cleaner assembly (housing, lid, piping, gasket (s), seal, and clamp (s)) for securement, condition, and record filter restriction. Check for presence of wing nut and seal (if equipped). Make repairs if any of the following condition (s) exist: if any portion of the air cleaner assembly or mounting is loose or damaged, including piping, nuts, bolts or clamps; if there are any worn or damaged seals or gaskets; if there are any air or vacuum leaks or missing components. The vehicle should be taken out of service if the diesel air filter restriction exceeds manufacturer's specifications.

ENGINE COMPARTMENT – POWER STEERING PUMP

- 1) Check securement and condition of power steering pump. Make repairs if any portion of the power steering pump, mounting bracketry or fasteners is cracked, loose, or missing.

ENGINE COMPARTMENT – AIR COMPRESSOR AND FILTER

- 1) Check securement and condition of air compressor and filter assembly. Make repairs if air compressor air filter (if equipped) is dirty. Make repairs if any portion of the air compressor, compressor air filter (if equipped), filter, compressor mounting bracketry, filter cover, or fastener is cracked, loose, or missing. Make repairs if hose from engine air cleaner to air compressor is damaged, torn, or missing.

ENGINE COMPARTMENT – WATER PUMP

- 1) Check condition of water pump and pulley. Make repairs if any of the following condition (s) exist: there is evidence of coolant seepage from water pump, seal, gasket surface, or weep hole; if water pump fasteners are loose, damaged, or missing. The vehicle should be taken out of service until repairs can be made if water pump is noisy, bearing is damaged, or coolant is leaking out.

ENGINE COMPARTMENT – FAN

- 1) Check fan blade and fan clutch assembly for securement and condition. The vehicle should be taken out of service if the fan has any cracked, bent, or broken blades; if any portion of fan mounting is loose, or if fan clutch is seized or loose.

ENGINE COMPARTMENT – ALTERNATOR

- 1) Check securement and condition of alternator assembly. Make repairs if alternator is noisy or if any portion of the alternator, mounting bracketry or fastener is cracked, loose, or missing.
- 2) Routing and Condition. Check routing, securement, and condition of all wiring and any electrical cable in the engine compartment. Make repairs if any of the following conditions exist: if there is any loose, damaged, or corroded wiring connector or terminal end; if any repair has been made using improper gauge wiring. The vehicle should be taken out of service until repairs can be made if there is any unsecured or poorly routed wiring that could cause a potential short or fire due to abrasion or heat damage or if there is any burnt wiring or wiring (other than ground wires) missing insulation.

ENGINE COMPARTMENT – FUEL SYSTEM AND LINES

- 1) Visually check the condition, operation, and securement of all fuel system components, including fuel lines and routing in the engine compartment. Make repairs if any of the following condition (s) exist: there is evidence of dirt, algae, or water in the fuel water separator (if equipped); if there is any or unsecured, or poorly routed, or loose fuel line or hose that could cause potential fire due to abrasion or heat damage. The vehicle should be removed from service if any fuel system connection is stripped, loose, cracked, or leaking.

ENGINE COMPARTMENT – RADIATOR

- 1) Radiator Mounting – Check radiator assembly and mounting for securement and condition. Make repairs if any portion of the radiator or mounting system is cracked, damaged, or has loose or missing fasteners.
- 2) Cap – Check condition of radiator cap. **Warning – always use proper procedures when removing radiator cap.** Make repairs if any of the following conditions exist: the radiator cap is hard to open or close. The radiator cap leaks down slowly at psi rating; the radiator cap is of the wrong psi rating; if there is visible damage to the pressure seat or vacuum relief seat of the cap. The vehicle should be taken out of service if the radiator cap is missing.
- 3) Reservoir – Check coolant reservoir (including any deaeration or overflow tank) and sight glass (if equipped) for mounting and condition. Make repairs if any portion of the coolant reservoir or mounting system is cracked or damaged, is leaking, or has loose or missing fasteners.
- 4) Fan Shroud – Check fan shroud for mounting and condition. Make repairs if any portion of the fan shroud or shroud mounting is cracked, damaged, or has loose or missing fasteners or if fan shroud is missing.

UNDERNEATH BUS – FRONT SUSPENSION CHECKS

- 1) Wheel Bearings – Inspect front wheel bearings and related components for condition and proper adjustment of bearings. With front wheels raised (wheels unloaded), grasp tire and attempt to rock wheel to check for movement. Spin tire to check for noise and condition of bearings.

NOTE – It is important to correctly identify the source of any play. To determine if the play is in the wheel bearings, have an assistant fully apply the brakes while rechecking play. If movement disappears with brakes applied, then play was in the wheel bearings. Make repairs if any of the following conditions exist: if there is minor seepage of grease or oil around the dust cover; if dust cover or fasteners are loose or missing. The vehicle should be taken out of service if there is any noise, binding, or roughness is discovered in bearings or if wheel bearing endplay exceeds manufacturer's specifications (maximum of .010" in and out play measured at bearing hub).

- 2) I-Beam – Inspect I-beam axle assembly. The vehicle should be taken out of service until repairs can be made if the I-beam has been cut, modified, or is damaged or if there is any bluing or other evidence that the I-beam has been heated.
- 3) King Pins – Inspect king pin assemblies for condition and play as follows:

- a) With front wheels raised, grasp tire at top and bottom or using a pry bar for leverage attempt to move the wheel assembly in and out.

NOTE – Wheel bearings must be adjusted properly (or wheel bearing play must be eliminated by locking brakes) before checking kingpins.

- b) Place a pry bar under wheel and lift tire straight up and down to determine condition of thrust bearing.

If any of the following conditions are found the vehicle needs to be repaired: if the locking pin is loose; if end cap O-rings or bolts are loose or missing. The vehicle should be taken out of service if the locking pin is backing out, loose, or missing; if the kingpin movement is more than ¼ inch measured at the outside edge of the tire. If the vertical (up and down) play in kingpin assembly is greater than .030", and/or thrust bearing is damaged or missing.

NOTE – If play is beyond specifications, wear may be kingpin, axle eye, and/or king pin bushings. Vehicle should be removed from service if side play at outside edge of tire is greater than ¼ inch. Do not tighten kingpin lock (if equipped) or grease kingpin before inspecting kingpin assembly.

- 4) Shackles – Inspect condition of shackles, spring hangers, and pinch bolts. Make repairs if any of the following conditions exist: if any front spring shackle or hanger has significant side wear at the spring eye; if any front spring shackle or hanger is worn, or pinch bolt is stripped or missing, so that spring pin cannot be clamped tightly. The vehicle should be taken out of service if any front spring shackle or hanger is cracked or broken.

- 5) Spring Mounts – Inspect spring mount bracket (s) for condition and securement. Make repairs if any front spring mount-to-frame fastener is loose or missing. The vehicle should be taken out of service if any front spring mount is broken, cracked or if the frame is cracked at any spring mounting location.
- 6) Pins and Bushings – Inspect pins and bushings as follows: Inspect front spring pins and bushings for wear and lubrication. Check for wear with front axle loaded. Insert a pry bar between spring eye and fixed point at frame and pull down. Measure total free play in pins and bushings. Make repairs if any of the following condition (s) exist: if any spring pin assembly will not accept lubrication, or zerk (grease) fitting is damaged or missing; if total free play (up and down) of pins and bushings exceed ¼ inch; if inner sleeve or rubber bushing type assembly (ies) is worn through, or rubber bushing is excessively worn (rubber is compacted or deteriorated, resulting in free play between the rubber and spring eye or the inner sleeve).
- 7) A-Frames and Bushings – Inspect A-frames and bushings for condition and securement. Make repairs if any of the following condition (s) exist: if rubber-bushing (s) is split, badly deteriorated or badly extruded from suspension joints; if any A-frame assembly is bent, missing, broken, or any fasteners or U-bolt (s) are loose or missing. The vehicle should be taken out of service if the mounting of bushing assembly (ies) is not secure; if any rubber bushing (s) is missing; or if any A-frame, bushing, or pivot arm has more than .050 free play at pivot point.
- 8) Ball Joints – Inspect ball joint (s) for condition, securement, and lubrication. Make repairs if any of the following conditions exist: if zerk (grease) fitting is missing or damaged, or ball joint will not take lubrication; if any ball joint has more than 3/32-inch axial play. The vehicle should be taken out of service until repairs can be made if the following conditions exist: any ball joint is loose or missing, or cotter pin is missing; if ball joint to A-frame mounting is cracked or loose, or has been welded.
- 9) U-Bolts – Inspect spring U-bolts for condition and securement. Make repairs if any of the following conditions exist: if any U-bolt (s) is misaligned; if there is rust underneath U-bolt nuts indicating the possibility of looseness. The vehicle should be taken out of service until repairs can be made if any U-bolt, seating plate, shock mount bracket, or nut is loose or missing, cracked, or stripped.
- 10) Shocks – Inspect shocks for condition and securement. Repair if any of the following conditions exist: if there is wetness around shock body due to leaking shock fluid; if any shock mounting or fastener is loose, missing, cracked, or broken; if any shock is broken; if any shock fails to function.
- 11) Springs – Inspect front springs for condition, securement, and alignment. Make repairs if any of the following conditions exist: if there are any loose, missing, broken or worn spring clips; if any coil or leaf spring has flattened, and ride height is less than manufacturer’s specifications; if either front spring saddle (if equipped) is worn out or missing; if rubber bumper is missing. The vehicle should be taken out of service until repairs can be made if any leaf spring (s) is broken, cracked, or missing; if any spring eye is worn or spread such that bushings are loose in spring eye. If any coil spring (s) is broken or insecurely mounted, or non-OEM blocks or spacers are installed; if there is any misalignment of spring leaves or other evidence that center pin is loose or broken; if either front coil or leaf spring is worn so that the rubber frame bumper is damaged or worn due to frequent bottoming of front suspension; if any alignment wedge is loose or damaged; if on any air bag type spring assembly, air bag is damaged or leaking.
- 12) Wheel Seals – Check for condition and leakage. Make repairs if either front wheel seal is damaged or leaking.

UNDERNEATH BUS – FRONT BRAKES

- 1) Brake Hoses – Inspect front brake flexible hoses for condition, securement, and routing. Make repairs if any of the following conditions exist: if any front brake flex hose supporting brackets are damaged or have loose fasteners; if any front brake flex hose is rubbing or routed against other components. The vehicle should be taken out of service until repairs can be made if any front brake flex hose or connection is leaking fluid or air pressure; if any front brake flex hose is kinked, collapsed, bulging, has damaged plies or cord, or is damaged below outer covering.
- 2) Lines – Inspect air and hydraulic brake lines for routing, securement, and condition. Make repairs if any of the following conditions exist: if brake line bracket (s) or securement system is loose or missing; if any brake line is rubbing on other components or is abraded; if any brake line is not of OEM material, size, or type. The vehicle should be taken out of service if any brake line is crimped, or damaged significantly and restricting air pressure or hydraulic fluid or if any brake line or connection is leaking air pressure or hydraulic fluid.
- 3) Chambers – Inspect front brake chamber assembly (ies) for securement, condition, and proper size. Make repairs if any front brake chamber or mounting fastener is damaged or loose. The vehicle should be taken out of service until repairs can be made if any front brake chamber-mounting bracket is cracked, bent, or broken, or if either chamber is not of the original size, or size of chambers is not matched left and right (both sides should be the same size).
- 4) Slacks – Inspect slack adjusters and S-cam assemblies for wear, condition, operation, and securement. Make repairs if any of the following conditions exist: if slack adjuster is mounted so that adjuster bolt is facing chamber; if S-cam shaft and/or S-cam bushing total wear (up and down) is greater than .040”; if S-cam in and out endplay is more than .060”; if slack adjuster (s) are dirty and prevent technician from inspecting for cracks or prevents the lock sleeve from seating. The vehicle should be taken out of service if any portion of the slack adjuster or S-cam is missing, broken, cracked, or badly worn; if S-cam snap ring is missing; or if slack adjuster has a frozen or stripped worm gear or ratchet assembly.
- 5) Pushrods – Inspect pushrod assembly (ies) for condition, securement, and alignment. Make repairs if the following conditions exist: if any portion of pushrod is rubbing against body of chamber, or chamber is misaligned; if the pushrod on the left and right side is not mounted in identical (same) slack adjuster location hole (same effective slack adjuster length). The vehicle should be taken out of service if any portion of the pushrod assembly (locknut, pushrod, clevis and pin, or cotter pin) is loose, missing or damaged.
- 6) Linings – Inspect brake lining through inspection cover or hole. Make repairs if any of the following conditions exist: If friction surface is contaminated with oil, grease, or brake fluid; if lining is worn to within 1/8 inch of shoe table (riveted type shoe); if lining is worn to within 1/16 inch of shoe table (bonded type lining). The vehicle should be taken out of service if lining is broken, cracked, or loose on shoe; if shoe platform or webbing is cracked or damaged; if there is any loose, damaged, or missing foundation brake hardware within the drum.
- 7) Drums – Inspect front brake drum (s) for condition. Make repairs if there is any grease, oil, or brake fluid on the inside of the drum or if any drum is not mounted securely to hub, or fasteners are loose.

- 8) Rotors – Inspect front brake rotor (s) for mounting and condition. Make repairs if the following conditions exist: if rotor mounting is not secure; if friction surface is contaminated with oil, grease, or brake fluid; if any rotor friction surface is significantly grooved or damaged.
- 9) Wheel Cylinders or Calipers – Inspect wheel cylinder (s) or caliper (s) for leaks and mounting, and condition. Make repairs if any wheel cylinder or caliper is not securely mounted or has loose or missing fasteners; if there is uneven brake lining or brake pad wear, evidence of rotor or drum damage, evidence of dragging, or other evidence that any wheel cylinder or caliper may be sticking.
- 10) Brake Adjustment
 - a) For air wedge brakes or hydraulic drum brakes, adjust front brakes at every monthly inspection as follows:

Brakes must be adjusted until brake drum does not turn; then back off brake adjustment until there is slight drag on drum surface (.020” clearance between lining and drum). The vehicle should be removed from service if there is any damage or condition that prevents proper adjustment of air wedge or hydraulic drum brakes.
 - b) For S-cam or air disc brakes at every monthly inspection, brake chamber pushrod travel must be checked (see Air Brake Chamber Stroke Measurements, page 4-6) at all four wheel positions, and brakes must be adjusted as necessary to achieve less than or equal to the maximum pushrod travel. The vehicle should be removed from service if there is any damage or condition that prevents proper adjustment of S-cam or air disc type brakes.
 - c) Automatic slack adjusters (ASA) must be checked as follows: Check the pushrod travel before any adjustment is made. If needed, manually adjust the ASA. Make repairs if slack adjuster travel is beyond stated limit prior to adjustment. The vehicle should be removed from service if any automatic slack adjuster arm or mechanism is damaged or loose. If adjusted stroke (pushrod travel) of any automatic slack adjuster equipped brake exceeds maximum shown in charts on pages 4-6.

UNDERNEATH BUS – ENGINE/TRANSMISSION MOUNTS/STARTER MOUNTING

- 1) Engine/Transmission Mounts – Inspect engine and transmission mounts for condition and securement. Repairs should be made if the following conditions exist: Any mounting fasteners are loose, missing, or broken; if any mount is cracked or has deteriorated rubber.
- 2) Starter Mounting – Inspect starter for securement and condition. Check for presence of heat shield (if equipped). Make repairs if any of the following conditions exist: if heat shield is loose; if any starter mounting bolts, studs, or nuts are loose, damaged, missing, or broken; if starter is loose or damaged; if heat shield is missing (if equipped).

UNDERNEATH BUS – TRANSMISSION CHECKS

- 1) Transmission Bolts – Inspect transmission assembly and mounting fasteners for condition and securement. Make repairs if any transmission assembly fastener (s) is loose, missing, or damaged. If any of the following conditions exist the vehicle should be taken out of service until repairs can be made: transmission is not mounted securely to flywheel housing; there is external indication that any torque converter bolt (s) are loose or missing.
- 2) Linkage – Inspect transmission linkage for routing, condition, and securement. Make repairs if any of the following conditions exist: if modulator (TV) cable or vacuum hose is routed where it is subject to excessive heat or abrasion; if any linkage hardware or fasteners are loose; if modulator (TV) cable is exposed or casing is damaged; if modulator vacuum hose is deteriorated or loose. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if linkage is bent or damaged, binding, or severely misadjusted; if any linkage hardware or fasteners are missing, or linkage is damaged so as to cause a sticking or binding condition; if modulator vacuum hose is leaking or not connected.
- 3) Lines – Inspect transmission lines for securement, routing, and condition. Make repairs if any of the following conditions exist: if any transmission line (s) is unsecured or routed subject to excessive heat or abrasion; if any transmission line is crimped; if there is any line of improper type; if any transmission line is worn or deteriorated to the point that failure could occur.
- 4) Auxiliary Filter – Inspect transmission external filter assembly (if equipped) for securement and condition. Make repairs if any of the following conditions exist: if external filter mounting is insecure or has loose or missing fasteners or if the filter canister is damaged. The vehicle should be taken out of service until repairs can be made if the body of the transmission cooler, including all hose connections, is cracked or damaged.
- 5) Cooler – Inspect transmission cooler (as equipped) for securement and condition. Make repairs if the mounting of separate transmission cooler (if equipped) is insecure or has loose or missing fasteners.
- 6) Clutch Operation (if equipped)
 - a) Check pedal, linkage, and clutch and release bearing for wear, slippage, and abnormal noises in the engaged and released positions. Make repairs if the following conditions exist: if there are loose bolts or nuts; if the release bearing is noisy; if the clutch is out of adjustment. The vehicle should be taken out of service until repairs can be made if and of the following conditions exist: the clutch cannot be adjusted to specifications; the release bearing is excessively noisy; the clutch is slipping, grabbing, or has excessive chatter when engaging clutch; if the linkage or return spring is binding or sticking; if the transmission is hard to shift.
 - b) Visually check clutch pedal pad for wear. Make repairs if the pedal cover pad is worn. The vehicle should be removed from service if the clutch pedal cover pad is missing.
 - c) Check clutch master and slave cylinders for hydraulic leaks and operation. The vehicle should be removed from service if either the master or slave cylinders are leaking or inoperable.
- 7) Clutch Adjustment (if equipped)
 - a) Check “free play” travel of the clutch pedal. This is the first easy movement of the clutch pedal and should be no more than 1-½ inches and no less than ¾ inch of travel. Repairs should be made if no adjustment can be made.

UNDERNEATH BUS – FLUID LEAKS

- 1) Oil – Inspect for engine oil leaks at all potential locations and determine severity. Make repairs if any of the following conditions exist: if engine oil leakage is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc.; if engine oil is dripping at any location (except on exhaust system). The vehicle should be removed from service until repairs can be made if engine oil is dripping on any portion of exhaust system.
- 2) Coolant – Inspect all potential locations for coolant leaks. Make repairs if there is coolant seepage at radiator, hoses, heater core, engine oil cooler, thermostat housing, head gaskets, freeze plugs, reservoir, water pump, or other potential locations. The vehicle should be removed from service until repairs can be made if the coolant leakage is excessive and could result in imminent engine failure.
- 3) Transmission – Inspect for transmission fluid leaks at all potential locations and determine severity. Make repairs if transmission fluid is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc. or if transmission fluid is seeping at any location (except on exhaust system). The vehicle should be removed from service until repairs can be made if transmission fluid is dripping on any portion of the exhaust system.
- 4) Power Steering – Inspect the power steering for power steering fluid leaks at all potential locations and determine the severity. Make repairs if power steering fluid is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc. or if power steering fluid is seeping. The vehicle should be removed from service until repairs can be made if the power steering fluid is dripping.

UNDERNEATH BUS – FUEL TANK

- 1) Leaks – Inspect fuel tank assembly for leaks. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: there is any fuel leakage from the tank, connections, or cap; if the fuel tank has any cracks; if any connection (s) are loose at the tank.
- 2) Mounting – Inspect fuel tank mounting system and barrier (if equipped) for securement and condition. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist; if any portion of fuel tank mounting system (including support brackets, retaining straps, and chassis frame) is missing, loose, cracked, or broken; if any fuel tank mounting fasteners are loose or missing; if barrier assembly (if originally equipped) is damaged, insecurely mounted, or missing.
- 3) Hoses – Inspect all fuel lines, and under-bus fuel system components, for routing, securement, and condition. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any fuel line or hose is unsecured or is routed subject to excessive heat or abrasion; if any fuel line or hose is deteriorated or damaged (including cracks or any damage that may cause potential leakage) or clamps are loose or missing; if any under-bus fuel system filter, water separator, or other components are insecurely mounted, cracked, or damaged.
- 4) Wiring – Inspect fuel tank sending unit wiring for securement, routing, and condition. Make repairs if any wiring or connection has damaged or missing insulation. The vehicle should be taken out of service until repairs can be made if any portion of sending unit wiring (including ground) or connections is unsecured or is routed subject to excessive heat or abrasion.

UNDERNEATH BUS – BRAKE EQUIPMENT

- 1) Bleed Reservoirs – With air system fully charged, check manual operation of safety relief valve. Partially open manual petcock valve on the first (wet) tank. Allow tank to drain until any moisture (water) or contamination is drained. Make repairs if there is moisture in reservoir (desiccant type air dryer equipped vehicles only). Repair if excessive oil is found in air system. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if the safety valve leaks or does not release pressure; if there is excessive sludge or oil contamination in the reservoir (more than (8) fluid ounces); if reservoir leaks due to corrosion or is cracked.

UNDERNEATH BUS – DRIVELINE

- 1) Driveshafts – Inspect driveshafts for condition. Make repairs if any of the following conditions exist: if any driveshaft balancing weight (if originally equipped) is missing; if there is any foreign matter wrapped around driveshaft. The vehicle should be taken out of service until repairs can be made if any driveshaft is bent or seriously dented or if there are cracks or other damage in the driveshaft which could cause structural failure.
- 2) U-Joints – Prior to lubrication, inspect U-joints or constant velocity (CV) joints (if equipped) for condition, phasing (alignment of joints), lubrication, and presence of all hardware. Make repairs if U-joints or constant velocity joints are dry of lubrication, or zerks (grease) fitting (if equipped) is missing, clogged, or inaccessible. The vehicle should be taken out of service until repairs can be made if any of the following exist: if there is any missing hardware or fasteners in any U-joint or CV joint assembly; if any U-joint has significant cross-shaft-to-bearing cup play or CV joint has significant play; if any U-joint or CV joint shows evidence of significant rusting of bearings; if any bearing cup is loose in yoke.
- 3) Yokes – Inspect driveshaft yokes for condition and lubrication. Make repairs if any of the following conditions exist: if driveshaft splines are unlubricated; if dust cap on yoke is missing; if zerks (grease) fitting is missing or clogged; if cork washer in dust cap is missing. The vehicle should be taken out of service until repairs can be made if any yoke has significant play in splines or if any yoke is cracked or damaged.
- 4) Hanger Bearings – Inspect hanger bearings and rubber insulators for condition and securement. Make repairs if hanger bearing rubber insulator is deteriorated and damaged, or oil soaked or if hanger bearing support is misaligned. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if the bearing outer race is loose in insulator, or inner race is loose on shaft; if there is significant play in hanger bearing; if there is any missing or damaged hardware or fasteners in hanger bearing or support assembly.
- 5) Guards – Inspect for presence and condition of driveshaft guards. Make repairs if any driveshaft guard is bent, damaged, missing, or has loose or damaged mounting fasteners.
- 6) Driveshaft Park Brake – Inspect driveshaft park brake assembly for condition, mounting, securement, and adjustment of linings, drum, linkage, and all other related hardware. Make repairs if any of the following conditions exist: if lining is worn down to 2/32 inch from top of rivet head; if lining is contaminated with grease or oil. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if lining is broken, cracked, or loose; if drum is cracked or has excessive heat damage or scoring of friction surface; if any actuating or mounting hardware or

fastener is damaged, loose or missing; if park brake is not adjusted per manufacturer's specifications.

UNDERNEATH BUS – REAR SUSPENSION

- 1) Axle Housing – Inspect axle housing for condition and leakage. Make repairs if there is leakage at or around axle housing ends. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any portion of axle housing is cracked or bent; if any portion of axle housing is leaking lubricant due to cracks, porous metal, or defective weld.
- 2) Vent – Inspect condition of axle housing vent. Make repairs if vent cap is clogged; or if vent hose (if originally equipped) is cracked, clogged, or missing.
- 3) Differential – Inspect differential assembly for condition, lubricant level, and leakage. Make repairs if any of the following conditions exist: if lubricant level is low; if differential gaskets or seals are leaking; if any external differential hardware or fasteners are loose or missing. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if there is no lubricant in the differential; if differential pinion yoke has endplay or side play exceeding manufacturer's specifications; if pinion/yoke end nut is loose or missing.
- 4) Springs – Inspect rear springs for condition, securement, and alignment. Make repairs if any of the following conditions exist: if there are any loose, missing, broken, or worn spring clips; if any leaf spring or air suspension ride height is less than manufacturer's specifications; if rubber frame bumper is missing. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any leaf spring is broken or missing; if on any air bag type spring assembly, air bag is damaged or leaking, or airlines and valving are damaged or leaking; if there is any misalignment of spring leaves or other evidence that centering pin is loose or broken; if either rear leaf spring is worn to the point that suspension bottoming has damaged rubber frame bumper.
- 5) U-Bolts – Inspect spring U-bolts for condition and securement. Make repairs if any U-bolt is misaligned or if there is rust underneath U-bolt nuts indicating possibility of looseness. The vehicle should be taken out of service until repairs can be made if any U-bolt seating plate, shock mount bracket, or nut, is loose, missing cracked, or stripped.
- 6) Shocks – Inspect rear shocks for condition and securement. Make repairs if any of the following conditions exist: if there is any wetness around shock body due to leaking shock fluid; if any shock is broken; if any shock mounting or fastener is loose, missing, cracked, or broken.
- 7) Shackles – Inspect rear suspension shackles, spring hangers, and hanger pinch bolts for condition and securement. The vehicle should be taken out of service until repairs can be made if any rear spring shackle or hanger is worn to the point, or pinch bolt is stripped or missing, so that spring pin cannot be clamped tightly.
- 8) Pins and Bushings – Inspect rear spring pins and bushings for wear and lubrication. Make repairs if any greaseable spring pin assembly will not accept lubrication, or zerk (grease) fitting is damaged or missing. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if inner sleeve, on rubber spring pin assemblies is worn through, or rubber bushing is excessively worn (rubber is compacted or deteriorated resulting in free play between rubber and

spring eye and inner sleeve); if rear spring pin bushing (metal type bushing) is worn through; if total free play (up and down) of pin and bushing exceeds 1/8 inch.; if on system that uses two (2) pins and bushings, combined free play exceeds 1/4 inch.

- 9) Hangers – Inspect hangers for mounting and condition. Make repairs as soon as possible if any hanger is found with a small crack (1/2 inch or less) that can be welded. The vehicle should be taken out of service until repairs can be made if any spring hanger or bracket is cracked (1/2 inch or more) or broken, or any mounting fastener is loose or missing.
- 10) Seals – Inspect rear wheel seals for condition and leakage. Make repairs if there is wetness or dripping of grease around axle flange or if any axle flange stud or nut is loose or missing. The vehicle should be taken out of service until repairs can be made if either wheel seal is damaged or leaking excessively.
- 11) Wheel Bearings – Inspect rear wheel bearings for condition and proper adjustment of bearings.
 - a) Raise the rear wheels (wheels unloaded) and release park brake.
 - b) Grasp tire and attempt to rock wheel assembly to check for movement.

The vehicle should be taken out of service if there is any detectable looseness or roughness in rear wheel bearings.

UNDERNEATH BUS – REAR BRAKE

- 1) Hoses – Inspect rear brake flexible hoses for condition, securement, and routing. Make repairs if any rear brake hose supporting bracket is damaged or has loose fasteners or if any rear brake hose is rubbing on or routed against other components. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any rear brake hose or connection is leaking fluid or air pressure; if any rear brake hose is kinked, collapsed, bulging, has damaged plies or cord, or is damaged below outer covering.
- 2) Lines – Inspect air and hydraulic brake lines for routing, securement, and condition. Make repairs if any brake line (s) or securement system is loose or missing or if any brake line is rubbing on other components or is abraded. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any brake line is bent, crimped, or damaged significantly restricting air pressure or hydraulic fluid; if any brake line or connection is leaking air pressure or hydraulic fluid; if any brake line is not of OEM material, size, or type.
- 3) Chambers – Inspect rear brake chamber assembly (ies) for securement, condition, and proper size. Make repairs if any rear brake chamber or mounting fastener is damaged or loose. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any rear brake chamber mounting bracket is cracked, bent, or broken; if either chamber is not original size or size of chamber is not matched (both sides to be same size).
- 4) Slacks – Inspect slack adjusters and S-cam assemblies for wear, condition, operation, and securement. Make repairs if any of the following conditions exist: if slack adjuster (s) are dirty and prevent technician from inspecting for cracks or prevents the lock sleeve from seating; if slack adjuster is mounted so that adjuster bolt is facing chamber; if S-cam shaft and/or S-cam bushing total wear (up

and down) is greater than .040"; if S-cam in and out endplay is more than .060". The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any portion of slack adjuster or S-cam is missing, broken, cracked, or badly worn; if S-cam snap ring is missing; if slack adjuster has frozen or stripped worm gear or ratchet assembly.

- 5) Pushrods – Inspect pushrod assembly (ies) for condition, securement, and alignment. Make repairs if pushrod is rubbing against body of chamber, or chamber is misaligned. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any portion of pushrod assembly (locknut, pushrod, clevis and pin, or cotter pin) is loose, missing, or damaged; if pushrod on left and right sides are not mounted in identical (same) slack adjuster location holes (same effective slack adjuster length).
- 6) Linings – Inspect brake lining through inspection cover or hole. Make repairs if any of the following conditions exist: if friction surface is contaminated with oil, grease, or brake fluid; if lining is worn to within 1/8 inch of shoe table (riveted type shoe); if lining is worn to within 1/16 inch of shoe table (bonded type lining). The vehicle should be taken out of service if lining is broken, cracked, or loose on shoe; if shoe platform or webbing is cracked or damaged; if there is any loose, damaged, or if there is any loose damaged, or missing foundation brake hardware within the drums.
- 7) Drums– Inspect rear brake drum(s) for condition. Make repairs if any of the following conditions exist: if there is any grease, oil, or brake fluid on the inside of the drum; if any drum is not mounted securely to hub, or fasteners are loose.
- 8) Rotors – Inspect rear brake rotor(s) for mounting and condition. Make repairs if the following conditions exist: If rotor mounting is not secure; if friction surface is contaminated with oil, grease, or brake fluid; if any rotor friction surface is significantly grooved or damaged.
- 9) Wheel Cylinders or Calipers – Inspect wheel cylinder (s) or caliper (s) for leaks and mounting, and condition. Make repairs if any wheel cylinder or caliper is not securely mounted or has loose or missing fasteners; if there is uneven brake lining or brake pad wear, evidence of rotor or drum damage, evidence of dragging, or other evidence that any wheel cylinder or caliper may be sticking.

10) Brake Adjustment

a) For air wedge brakes or hydraulic drum brakes, adjust rear brakes at every monthly inspection as follows: Brakes must be adjusted until brake drum does not turn. Then back off brake adjustment until there is slight drag on drum surface (.020" clearance between lining and drum). The vehicle should be removed from service if there is any damage or condition that prevents proper adjustment of air wedge or hydraulic drum brakes.

b) For S-cam or air disc brakes at every monthly inspection, brake chamber pushrod travel must be checked (see Air Brake Chamber Stroke Measurements, page 4-6) at all four wheel positions, and brakes must be adjusted as necessary to achieve less than or equal to the maximum pushrod travel. The vehicle should be removed from service if there is any damage or condition that prevents proper adjustment of S-cam or air disc type brakes.

c) Automatic slack adjusters (ASA) must be checked as follows: Check the pushrod travel before any adjustment is made. If needed, manually adjust the ASA. Make repairs if slack adjuster travel is beyond stated limit prior to adjustment. The vehicle should be removed from service if any automatic slack adjuster arm or mechanism is damaged or loose or if adjusted stroke (pushrod travel) of any automatic slack adjuster equipped brake exceeds maximum shown in charts on pages 5-7.

UNDERNEATH BUS – BODY SECUREMENTS AND STRUCTURE

- 1) Body Holddowns – Inspect for securement and condition of all body holddowns, chassis cowl mounts, and frame pads. Body holddowns include any J-bolt, U-bolt, or clamp type holddown used to secure body to chassis frame. Make repairs if any of the following conditions exist: if any body holddown is loose or misaligned, or there are any cracks or stripped fasteners at floor sill securement points; if any padding between frame rails and floor sills is missing or grossly misaligned. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if any originally installed body holddown or cowl mount is missing; if three (3) or more body holddowns are loose, misaligned, or have missing hardware; if three (3) or more body holddowns have cracks or stripped nuts at floor sill securement point.
- 2) Floor – Inspect condition of floor structure, sills, and braces. Make repairs if there are any minor cracks in floor sills, braces, or welds. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if there are any holes or cracks in floor sheet metal creating an opening to the passenger compartment; if entire cross-section of any floor sill or brace is broken; if there is any broken weld or mounting of a floor sill or brace resulting in complete separation more than one (1) foot in length; if there is any broken weld in the mounting of the bracing (K-member) at the front of the body floor (between stepwell and driver's area).
- 3) Outriggers – Inspect body outriggers and hardware for condition and securement. Make repairs if any body outrigger is cracked or has loose or missing hardware. The vehicle should be taken out of service until repairs can be made any originally installed (as required by manufacturer) outrigger is missing.
- 4) Braces – Inspect for condition and securement of all chassis and body braces. Make repairs if there is any cracked brace underneath the body or if any bumper brace is broken, cracked, or missing.
- 5) Skirts – Inspect body skirts for securement and condition. Make repair if any body skirt brace has cracked or broken sheet metal or mounting points.
- 6) Frame Rails – Inspect condition of chassis frame rails, crossmembers, and all hardware attaching points. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if there is any crack in either frame rail or any crossmember; if there is any loose or missing rivet or other fastener securing a crossmember to the frame.

UNDERNEATH BUS – EXHAUST SYSTEM

- 1) Exhaust Leaks – With engine running and at operating temperature, inspect exhaust system for leaks, condition, and securement. Make repairs if exhaust junction gasket or hardware is broken or missing or if there is any physical damage to exhaust system. The vehicle should be taken out of service until repairs can be made if there is any leakage, which is audible and can be felt around any portion of the exhaust system including manifold (s), pipe sections, or any junction.
- 2) Mounting – Inspect mounting of the exhaust system. Make repairs if any of the following conditions exist: if there is any exhaust system hanger, which is not securely mounted; if any exhaust pipe or clamp is loose; if any clamp is missing; if there is any originally installed exhaust hanger, which is

missing, broken, or detached from the exhaust system or frame mounting point.

- 3) Muffler – Inspect condition of the muffler. Make repairs if the muffler is cracked or if there is other significant physical damage to the muffler. The vehicle should be removed from service if the muffler is leaking and produces an audible sound and exhaust can be felt from the leaking area.
- 4) Tailpipe – Inspect the condition of tailpipe and insure that it extends beyond the rear bumper and exits to the left of the left frame rail. Make repairs if the tailpipe is cracked or there is other significant damage to the tailpipe. Check the tailpipe and make sure it extends at least to the edge of the rear bumper, but no more than two (2) inches beyond bumper or exits to the left or right and extends to edge of bus body. The vehicle should be removed from service if the tailpipe is leaking and produces and audible sound and exhaust can be felt from the leaking area.

UNDERNEATH BUS – WHEELS AND TIRES

- 1) Tread Depth – Inspect and measure all tires for tread depth and record on inspection form. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if the measured tread depth of either front tire is less than 4/32-inch (2/32-inch for rear tires) at three (3) points spaced equally around the circumference of the tire in the same major tread groove. Measurement shall not be taken at a wear bar, and all three (3) points shall be less than 4/32-inch before tire is rejected. Measurement shall be taken at the most worn groove of the tire: if measured tread depth of either front tire is 2/32-inch or less (1/32-inch for rear tires) measured at the most worn single point of the tire, except at wear bar. If there is evidence that any recapped tire has been re-grooved; if any front tire is a recapped or re-grooved type tire; if there is evidence that any tire has been re-grooved using a procedure not approved by the tire manufacturer or dealer.
- 2) Pressure – With tire cold, check pressures on all tires and record on inspection form. Make repairs if any of the following conditions exist: if pressure in any tire is less than the maximum cold inflation pressure stated on the sidewall of the tire, minus 20%; if pressure in any tire is greater than 5% above maximum cold inflation pressure stated on sidewall of the tire. Adjust pressure if there is more than a 20% difference in pressure tires on a particular axle.
- 3) Damage – Inspect for damage to wheels and tires. Make repairs if any of the following conditions exist: if there is foreign material in the tire tread which could cause damage or loss of air pressure; if any valve cap or extension is missing; if there are minor dents or bends in a rim. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if there are cuts, abrasion, or other damage to tire sidewall resulting in exposed or damaged cord; if there is any evidence of separation, bulges (other than normal manufacturer bulge), or other damage within the carcass of the tire; if there are any cracks that run around the bead or sidewall of the tire; on retreaded tire there is any separation of the tire tread from the tire carcass that could result in tire or tread failure; if any valve stem is damaged or mislocated so that the tire cannot be filled with air; if there is damage to the lock ring assembly or lock ring groove of a multi-piece rim, including rust or corrosion which could cause the lock ring not to seat fully; if there are any cracks or breaks at the lugholes or any other part of a rim or cast spokes; if there are any dents or bends in a rim that could result in failure of a rim or separation of the tire from the rim.

NOTE: Weather cracking only shall not be cause for rejection.

- 4) Matching – Inspect for matching of tire construction, tire design, tire size, and load rating on each axle. Make repairs if there is mismatching of inner and outer dual tire diameter greater than 3/8 inch.

The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if there is any tire marked for other than highway use; if any tire is not of the proper type, size, and minimum load rating. If any tire on an axle are not of the same type (e.g., lug or rib) and size; if any tire is below minimum load rating; if radial and bias ply tires are intermixed on the same axle.

- 5) Alignment – Inspect tires for evidence of proper alignment. Make repairs if any tire is feather-edged, cupped, or has uneven tread wear or if lateral runout of any tire/rim assembly exceeds ¼ inch. The vehicle should be removed from service until repairs can be made if tires/wheels are grossly misaligned, affecting steering.
- 6) Wheel Hardware – Inspect for presence, type, condition, and securement of all wheel hardware. Check for proper spacing or rear dual wheels and tires. The vehicle should be taken out of service until repairs can be made if any of the following conditions exist: if there is improper matching of rims and lock rings; if there is evidence of slippage of wheel assembly on cast spoke hub; if stud holes are elongated. If any wheel or stud is loose, or there is rust or corrosion indicating possible looseness; if any wheel stud or nut is broken or missing; if an improper spacer has been installed between dual wheels.
- 7) Color and Condition – Paint color on wheel assemblies of North Carolina School Buses shall remain black. If color other than black is detected or if wheels are faded, repairs should be made as soon as possible.

INSIDE BUS – EMERGENCY EQUIPMENT

- 1) Fire Extinguisher – Check for presence of fire extinguisher. Check the gauge for the correct pressure. Check for presence of inspection sticker or tag and inspection date. Check for secure mounting and accessibility. Check for proper UL (Underwriters Laboratory) rating. Check the nozzle for looseness or damaged parts. Check for the presence of a safety pin and tamper proof seal. Make repairs if any of the following conditions exist: if bracket mount to panel is loose; if inspection will expire before next scheduled inspection; if pressure is above or below the green zone; if fire extinguisher is not accessible to driver or not secured in mounting bracket or box. The vehicle should be taken out of service until repairs can be made if the rating is less than 2 ½ pound minimum, and 10BC rating; if there is no fire extinguisher on bus; if tamper proof seal material cannot be broken.

NOTE: Six (6) years from the manufacturing date all type ABC, BC, or Halon fire extinguishers require a six (6) year maintenance. They are also required to have a hydro-test twelve (12) years from the manufacturing date. To determine the manufacturing date, look for a stamped date on the bottom of the cylinder, on the label, or around the rim. These are required to meet National Fire Protection Association (NFPA) requirements in pamphlet #10 and OSHA requirements.

- 2) First Aid Kit – Check the box and condition. Check to insure that the box is labeled as First Aid Kit. Check the contents of the box for the following:
 - 2 pkg. – 4-inch bandage compresses
 - 2 pkg. – 2-inch bandage compresses
 - 2 pkg. – 1-inch adhesive compress (16 per pkg.)
 - 2 pkg. – 40-inch triangular bandage with two safety pins
 - 2 sets – Plastic gloves (1 pair medium and 1 pair large)

Make repairs if partial contents are missing.

Remove the vehicle from service if entire contents or kit are missing.

- 3) Body Fluid Cleanup Kit – Check the container for condition. Check the contents of the box for the following.
 - 1 – 2 oz. Package of T.I.L.S.C. powder sanitizes-deodorizes-encapsulates.
 - 1 – odor reducing mask
 - 1 – pair latex gloves (large)
 - 2 – antiseptic wipes
 - 2 – paper crepe towels
 - 1 – scraper
 - 1 – plastic disposal bag w/scoop and tie

Make repairs if partial contents are missing.

Remove the vehicle from service if entire contents or kit are missing.

- 4) Reflectors – Check for emergency roadside reflectors. These are required on all buses 2000 and newer. Remove the bus from service if reflectors are missing. Check quantity for three (3) reflectors.

INSIDE BUS – NEUTRAL SAFETY SWITCH

- 1) Check to determine if automatic transmission bus has a functional neutral safety switch that will allow the starter to operate only in park or neutral. The vehicle should be taken out of service until repairs can be made if the starter will engage in any gear other than park or neutral.

INSIDE BUS – SHIFTER

- 1) Check that shifter operates easily, that it correctly indicates the gear that the transmission is in, and has a functional detent mechanism with a ball knob (handle) on end of shift lever. Make repairs if any of the following conditions exist: Shifter does not shift easily into all gears, if indicator is misaligned, or if there is a loose ball or knob (handle). The vehicle should be taken out of service until repairs can be made if shifter will not shift into all gear positions, if the indicator indicates wrong gear, if detent is non-functional, or if ball or knob (handle) is missing from end of shifter lever.

INSIDE BUS – ENGINE CONTROLS

- 1) Key Switch – Make repairs if the key sticks in switch or if it is loose or not mounted in OEM location. The vehicle should be taken out of service: if the switch operates without a key or if the bus is equipped with a push button or other devices other than key type switch; if the engine will not crank or start or if the switch sticks in any position; if the switch doesn't function properly in start, run, off, or accessory position or is intermittent in any position.
- 2) Accelerator – Check and insure that accelerator pedal, control design, and mounting securement are OEM. Inspect the pedal assembly and linkage for loose or missing hardware. All engines must have two- (2) throttle return springs. Check for smooth operation of pedal assembly and linkage in the accelerating and coast position. Inspect for unauthorized built up pedal, i.e., wooden blocks installed on pedal. Make repairs if pedal cover (as originally equipped) is worn out: if there is loose or missing hardware or if the linkage is missing one return spring or is not equipped with dual return springs (external type). The vehicle should be removed from service until repairs can be made: if pedal and assembly are not mounted securely or if control design and mounting are not of OEM design; if accelerator control and linkage sticks or doesn't operate freely; if pedal is built-up with extender block(s) or not of OEM design.
- 3) Engine Shutdown – Only OEM approved ignition controlled is shutdown acceptable on all buses. On 1985 and older buses equipped with manual engine shutdown, check for free operation of shutdown over full range with minimum effort. The vehicle should be removed from service until repairs can be made if the engine cannot be started, or if shutdown or operation is difficult. Remove the vehicle from service until repairs can be made if the bus was originally equipped with ignition switch type controlled shutdown, but has been retrofitted with Bowden Cable (manual) type shutdown.

INSIDE BUS – GAUGES, INDICATORS, DASH LIGHTS & HORN

- 1) Gauges – Check from drivers position the visibility, OEM location, readability, operation, accuracy, and condition of the following gauges.
 - A. Speedometer and odometer.
 - B. Oil Pressure.
 - C. Temperature.
 - D. Fuel.
 - E. Voltmeter and ammeter.
 - F. Air Pressure.
 - G. Tachometer

Make repairs if oil pressure, temperature, fuel, voltmeter or ammeter gauges are inaccurate, damaged or difficult to read, if odometer doesn't work or is not working properly or if odometer is unreadable. Make repairs if tachometer fails to function properly. The vehicle should be removed from service until repairs can be made: if oil or temperature gauges do not function or are unreadable; if speedometer doesn't work or is confirmed to be inaccurate; or if speedometer is unreadable or damaged; if air pressure gauge is inaccurate, unreadable or not working.

- 2) Indicators and Dash Lights – Check for the presence and operation of the following indicators.
 - A. Low air pressure.
 - B. High beam light.
 - C. Left and right turn signal and 4-way hazard.
 - D. All dash and control panel lights for illumination at gauges and switches.

Make repairs if the light bulb for the following gauges or control is inoperative: oil pressure, temperature, fuel, voltmeter, ammeter, or engine shutdown. Make repairs if one or more lights for the control switches are inoperative or one or more panel lights is inoperative.

- 3) Horn – Check horn and horn button for proper operation. Make repairs if horn fails to operate properly.

INSIDE BUS – ENGINE WARNING LIGHTS AND BUZZER

Check for presence and operation of the following warning lights and buzzer (or bell).

- A. High coolant temperature dash warning light or buzzer (or bell) on diesel buses. The vehicle should be removed from service until repairs can be made if high coolant temperature warning light or buzzer (or bell) is inoperative (either constant or momentary).
- B. Low oil pressure, dash warning light and buzzer (or bell) on diesel bus. The vehicle should be removed from service until repairs can be made if the low oil pressure warning light or buzzer (or bell) is inoperative (either constant or momentary).

INSIDE BUS – INTERIOR WIRING, CAB HOSES, AND FIRE WALL SEALS

- 1) Interior Wiring – Inspect visible wiring for mounting, condition, chafing/abrasion, corrosion, loose connectors, or improper repairs. Make repairs if any of the following conditions exist. If wiring or connectors are unsecured, corroded, or improperly routed. If any connection of any connector is not secure. The vehicle should be taken out of service if any wire or connector is cut or severely chafed, or if the conductor is exposed or routed against a sharp edge or if there is interference with the driver controls.
- 2) Cab Hoses – Inspect all hoses for leaks, condition, routing/abrasion, and presence of heater hose shielding. Make repairs if any hose is weathered, cracked, abraded, or improperly routed if hose is unshielded in the driver's compartment.
- 3) Firewall Seals – Inspect firewall for any cracks, unsealed openings, and sound insulation material. Make repairs if sound deadening/insulation package is unsecured or deteriorated or if there is any open hole or unsealed area in the firewall.

INSIDE BUS – GENERAL CONDITION, BUS INTERIOR

- 1) Floor – Inspect floor covering, plywood subfloor (if installed), aisle, and cove molding strips for condition, adhesion and/or fastening holes or cracks, and ribbed rubber aisle. Make repairs if any of the following conditions exist: if the rubber floor covering is loose, deteriorated, or cracked; if plywood is rotten or soft; if cove molding is loose or fasteners are missing. The vehicle should be removed from service until repairs can be made if the following exist: if there are any unsealed holes or cracks through the underside of the bus; if any aisle-molding strip is not securely fastened to the floor or aisle or if cove molding presents a sharp edge or protrusion; if there is any damage to the rubber floor covering which could cause a tripping hazard; if “Watch Your Step” decal is missing or unreadable (flat floor equipped buses only).
- 2) Stepwell – Check condition of stepwell and tread. Make repairs: if step tread is not secure or sealed at inside edge where it meets the next step; if stepwell tread and leading edge at aisle is not flush and securely adhered; if stepwell tread is worn more than four (4) inches in width. The vehicle should be removed from service until repairs can be made if stepwell support structure is broken, or stepwell is rusted through.
- 3) Handrails(s) – Check for the presence and secure mounting of entrance handrail(s). The vehicle should be removed from service until repairs can be made if the entrance handrail(s) is missing or not securely mounted; if any handrail fails the “NHTSA String and Nut Test”.
- 4) Paneling – Check all interior sidewall, rear, ceiling, and driver’s area paneling for secure fastening, projections or sharp edges, and condition. Make repairs if any of the following conditions exist: if there is graffiti or unauthorized stickers (seating charts and safety information are approved) on interior panels; if there are loose or missing attachment screws on any light bar panel or other maintenance access panel. If any interior paneling is mildewed, or paints (where required) is missing or damaged. The vehicle should be removed from service until repairs can be made if there are any sharp edges, rust-through, or projections from paneling that could cause injury to passengers or driver. If there are any unauthorized items affixed to the interior paneling of the bus.
- 5) Loose Objects Secured – Check to insure that all objects within the bus are secure. The vehicle should be removed from service if there are any aerosol cans, other containers or liquids of flammable or volatile chemicals on the bus or if any aerosol can is not labeled.
- 6) Dog House/Engine Cover – Inspect dog house/engine cover for seals, soundproofing, weather stripping, prop-rod and latch operation. Make repairs if soundproofing is not present or is deteriorated or if latch is hard to operate or does not secure dog house/engine cover properly. The vehicle should be removed from service until repairs can be made if seals or weather stripping allow air/fume leaks into the driver’s compartment.

INSIDE BUS – WINDSHIELD WIPERS & WASHERS

- 1) Operation – Inspect both wipers for:
 - a. Swept area field of view and effectiveness of wiping.
 - b. Proper operation of both wipers on high and low speeds and condition and mounting of switch(es) and knob(s).
 - c. Condition and mounting of wiper motors and linkage.
 - d. Inspect for proper washer operation.

Make repairs if any of the following conditions exist: if either wiper does not operate on low or high speed; if wiper goes past perimeter of glass; if washer does not operate or is misadjusted; if either blade does not effectively clear driver's field of vision; if either wiper motor or linkage is visibly damaged or loose; if switch or knob mounting is loose or missing. The vehicle should be removed from service until repairs can be made if either wiper fails to operate.

- 2) Park – Inspect for parked position of wipers when turned off. Make repairs if wipers do not automatically return to parked position out of driver's line of sight when turned off.
- 3) Blades – Inspect blades for condition, mounting, and tension. Make repairs if blade(s) do not clean windshield properly. Repair if either blade(s) is damaged, deteriorated, loose, or does not hold proper tension against windshield.

INSIDE BUS – HEATERS, DEFROSTERS, & EXTERNAL DRIVER FAN

- 1) Heaters – Inspect heater system for:
 - a. Heating performance and water control valve.
 - b. Blower operations, condition, and control switches.
 - c. System leaks, condition, and hose shielding.
 - d. Condition of ductwork and heater box.

Make repairs if any of the following conditions exist: if system is not producing adequate heat; if water control valve is hard to operate; if heater blowers do not work on all speeds, are noisy, or vibrate; if blower switches are damaged, loose, or blower operates intermittently. Repair if heater hoses are cracked, swollen, or badly chafed; if shielding is missing, or does not completely cover hoses; if any portion of heating system within the passenger area creates sharp edges, projections, or other hazards to passengers.

- 2) Defrosters – Inspect windshield defroster system for:
 - a. Airflow, heat, and coverage area.
 - b. Blower operations, condition, and control switches.
 - c. Condition of ductwork, diffusers, and fresh air control (if equipped).

Make repairs if any of the following conditions exist: if any defroster blower does not work on low or high speed; if blower switches are damaged or loose, if any ductwork or diffusers are loose or damaged; if fresh air control (if equipped) does not function; if airflow is not present at all defroster outlets.

External Driver Fan – Inspect driver fan for:

- a. Presence of fan, mounting and condition.
- b. Blade condition.
- c. Protective cage mounting and condition.
- d. Operation and switch.

Make repairs: if fan mounting is loose or fan won't stay in adjustment; if fan blade is damaged; if switch is loose; if fan does not operate. The vehicle should be removed from service if protective cage is missing, loose, or damaged.

INSIDE BUS – MIRROR ADJUSTMENTS AND CONDITION

- 1) Interior Rearview Mirror – Check interior rearview mirror for size, condition, and mounting. All interior mirrors shall be 6” high and 30” long. Make repairs if any portion of reflective surface is deteriorate or if mirror mounting is loose. The vehicle should be removed from service if stickers or other items obstruct any portion of the driver’s view or if driver’s view of images is not clear due to distortion or other causes.
- 2) Outside Rearview Mirrors – Check outside rearview mirrors for vision, condition, and mounting. Check rearview mirrors to insure that the view provides the driver with a view along the left and right sides of the bus. Correct mirror adjustment will provide driver a view of rear tires at ground level and a minimum of two hundred feet (200) to the rear of the bus. It will also provide a view at least twelve (12) feet perpendicular to the side of the bus at a distance of thirty-two (32) feet back from the front bumper. Make repairs if mirrors are not in correct adjustment or if mounting brackets or mirror assembly is loose. The vehicle should be removed from service if any mirror is missing or if any mirror is cracked, pitted, clouded or deteriorated to the extent that vision is obscured. **All mirror systems must meet criteria of and be in compliance with FMVSS111.**
- 3) Crossview Mirror System – Check crossview mirrors for vision, condition, and mounting. Correct adjustment will provide the driver with indirect vision of an area at ground level from the front bumper forward and the entire width of the bus to a point where the driver can see by direct vision. It will also provide the driver with indirect vision of the area at ground level around the left and right front corners of the bus, to include the tires and service entrance on all types of buses to a point it overlaps with the rear vision mirror system. Make repairs if mirrors are not in correct adjustment or if mounting brackets or mirror assembly is loose. The vehicle should be removed from service if any mirror is missing or if any mirror is cracked, pitted, clouded or deteriorated to the extent that vision is obscured. **All mirror systems must meet criteria of and be in compliance with FMVSS111.**

INSIDE BUS – DRIVER’S SEAT AND BELT

- 1) Check driver’s seat and belt for condition, mounting, and operation. Make repairs if any of the following conditions exist: if seat adjustment binds or is difficult to operate; if seat adjustment is loose or adjustment hardware is missing; if seat upholstery or foam is deteriorated or damaged; if seat bottom is loose in frame or mispositioned; if seat belt retractor cover or belt covers are damaged or loose; if seat belt does not fully extend and retract. The vehicle should be removed from service until repairs can be made: if seat frame and mounts are cracked, broken, or distorted; if driver seat belt is missing or is inoperable or if seat belt is routed improperly; if seat belt buckle and tongue assemblies do not latch and release properly.

INSIDE BUS – PASSENGER SEATS

- 1) Frames – Inspect passenger seat frames for condition of welds, tubing, and hardware. Check for presence of non-OEM seat frames. Make repairs if any seat back frame is repaired using non-OEM hardware. The vehicle should be removed from service until repairs can be made: if seat frames or welds are broken or cracked; if any seat frame hardware has been added or modified which results in projections or sharp edges; if any non-OEM seat frames have been installed.
- 2) Mounting – Inspect condition of passenger seat mounting. Make repairs if any seat mounting at floor or seat rail is loose. Remove the vehicle from service if any seat mounting fasteners are of lower grade or different type than OEM fasteners for the specific locations.
- 3) Pads – Inspect seat back foam for specifications and condition. All North Carolina School Buses must meet FMVSS222. Check for thickness and density of foam around frame. Make repairs if any portion of seat frame can be felt when pressing down on seat back top. Repair if any portion of seat back foam is missing or damaged.
- 4) Cuts (and other upholstery damage) – Inspect seat upholstery for condition and damage. Make repairs if seat upholstery is cut or torn and foam is visible through cut. Make repairs if seat upholstery is not repaired properly. The vehicle should be removed from service if any vehicle that came equipped with fire-block upholstery has been retrofitted with upholstery other than fire-block.
- 5) Bottoms & Flip-Up Seat –To remain in compliance with FMVSS222 all seat bottoms must be secured and remain secured when students are transported. Inspect seat bottoms for securement and condition. Make repairs if any seat bottom is not securely anchored to seat frame or if any seat bottom padding or cover has damage and deterioration.

Inspect flip-up type seat bottom at side emergency door (if equipped) for proper operation. There must be clear access to the emergency door with a minimum aisle width of twelve (12) inches between seats. The vehicle should be removed from service if there is not a clear minimum twelve-(12) inch aisle width to the side emergency door. It should also be removed from service if the flip-up seat bottom will not raise or lower, stay in the raised position, or automatically retract properly when not occupied.

- 6) Modesty Panels & Courtesy Panels – Inspect modesty panels and courtesy panels for condition, mounting, and padding. Make repairs if any covering or padding is damaged or if any mounting frame or attaching hardware is missing or damaged. The vehicle should be removed from service: if any bus is not equipped with a padded safety barrier in front of any passenger seat that does not have another seat in front of it; if any fire-blocking crash barrier fabric is repaired or replaced using unapproved procedures or non-fire blocking material.

INSIDE BUS – EMERGENCY DOOR/WINDOWS/HATCHES

- 1) Operation – Inspect for operation and condition of rear emergency door and side door, door latch, door hold open feature (if equipped), door seal, emergency windows, and emergency exits/ventilator (roof hatches). Make repairs if any of the following conditions exist: if rear door opens too far, damaging lights; if door handle, latch, or mounting hardware is loose; if mounting of guard for inside rear door handle is loose; if any emergency door latch does not operate smoothly and easily when closing or opening; if door hold open feature (if equipped) does not function or secure door in the open position; if inside door handle is not equipped with a guard; if any emergency door does not open and close from the inside and outside easily; if weather-strip seal is damaged or does not seal properly; if roof hatch seal is damaged or dislodged; if roof hatch does not open easily to full “emergency open” position. The vehicle should be removed from service until repairs can be made: if any emergency door is equipped with any type of a hasp, lock, or any other locking device, except for OEM interlock system; if bus will start with any emergency door locked (OEM interlock system); if any latch mechanism will not secure door, hatch, or window in closed position.
- 2) Buzzers – Check operation of buzzers for emergency door(s), emergency exit windows, and emergency exit roof hatches. Make repairs if buzzer give false alarms. The vehicle should be removed from service if emergency exit buzzer circuit(s) fail to operate.
- 3) Labeling and Pad – Inspect for label and opening instructions for emergency door, emergency windows, and emergency exit/ventilator (roof hatch). Make repairs if any of the following conditions exist: if any emergency exits are not clearly labeled and visible inside and outside the bus as “Emergency Door” or “Emergency Exit”; if emergency door, emergency windows, or emergency exit roof hatches do not have readable instructions for operation on the inside of the exit (or readable from the inside); if emergency exit door pad is ripped or has loose mounting; if any door pad is missing or has any protruding edge.

INSIDE BUS – WINDSHIELD, SIDE & REAR WINDOWS

- 1) Glass cracks – Inspect windshield and all windows for cracks and other damage. Make repairs if any of the following conditions exist: if there are any cracks in the windshield in the driver’s direct field of vision or any pock marks that obstruct the driver’s vision; if there are any cracks in the windshield or any window, greater than two (2) inches in length; if there is any crack in non-laminated safety glass. The vehicle should be removed from service until repairs can be made if any glass is missing or if any laminated windshield or laminated window glass is broken or splintered that might cause injury when touched.
- 2) Fogging – Check windshield and windows for fogging and reduced visibility, or improper level of tinting. Make repairs: if glass is starting to fog around the edges; if there is any reduced visibility through the windshield or any windows. The vehicle should be removed from service until repairs can be made if the windshield or any window that provides visibility to any mirror is fogged more than two (2) inches in from the outer border; if any windshield or window fogging or clouding results in reduced visibility of a mirror; if there is any tinting on the windshield or windows to the side of the driver that is not 70% light transmission or clearer; if there is tinting on any windows behind the driver’s location that is not 28% light transmission or clearer.

- 3) Latches and Window Operation – Check latches and windows for condition and operation. Make repairs if any of the following conditions exist: if latches are hard to operate, or any window does not move up and down freely; if windows do not stay closed; if window will not move (full travel) up and down. The vehicle should be removed from service if there are any loose, damaged, or any protruding window hardware into the passenger compartment.
- 4) Sun Visor – Check drivers sun visor for condition and operation. Make repairs if sun visor is too tight and cannot be adjusted or if driver sun visor is cracked, damaged, clouded, dirty, or will not stay in position or has unauthorized stickers.

INSIDE BUS – WHEELCHAIR LIFT, DOOR, AND SECUREMENT SYSTEM

- 1) Operate lift through complete cycle and inspect for proper operation, condition, safety features, manual backup system, fluid leaks, mounting, barrier operation, warning light, buzzer operation, and overall mechanical condition. Make repairs if any of the following conditions exist: if dome light at inside lift area is inoperative; if lift door or latch does not operate smoothly; if there is any fluid seepage at the lift; if white light (if equipped) at exterior lift area is inoperative; if lift control cable or wiring is damaged or routed improperly; if lift does not fold, unfold, lift, and lower properly, or jerks and binds; if lift leaks fluid onto or below floor; if there is excessive side play (more than two (2) inches), in the lift mechanism when the platform is partially or fully extended; if the lift jacks up the vehicle; if manual backup system does not function properly. The vehicle should be removed from service until repairs can be made if elevator lift platform is not flush with floor in “up” position if any part of the lift mechanism or hardware is damaged, missing, or not secure including cams, clips, pins, rollers, and platform fasteners.
- 2) Inspect wheelchair and occupant securement (tie-down) system for condition, mounting, proper type, and location. Make repairs: if track is filled with dirt and trash. The vehicle should be removed from service until repairs can be made; if wheelchair tie down track or fasteners are loose, broken, or sections of track are not continuous within each wheelchair position; if wheelchair or occupant securement straps are broken, frayed, or will not operate; if wheelchair or occupant securement track is mounted using lag type bolts or sheet metal screws.
- 3) Check for presence of a durable webbing cutter (if equipped) on all buses equipped with restraining devices or wheelchair positions, securely mounted in the driver’s compartment, and within easy reach of the driver. Repair if no durable webbing cutter is present (if equipped) or if webbing cutter (if equipped) is not securely mounted in driver’s compartment within easy reach of the driver.

OUTSIDE BUS – ALL EXTERIOR LIGHTS & BACKUP ALARM

- 1) Headlights – Check both headlights for brightness, operation, condition of sealed beams, and visible misaiming. Check high beam indicator operation and headlight switch. Make repairs if any of the following conditions exist: if left and right sealed beams are of different type (halogen vs. conventional); if either sealed beam does not light on low and high; if sealed beam lens is foggy, cracked, or light is dim; if high beam indicator doesn’t light; if upon visible inspection, there is any obvious misaiming of headlights; if dimmer switch sticks, is hard to operate, or doesn’t function; if headlight switch is damaged, nor securely mounted, or knob is mounted. The vehicle should be

removed from service until repairs can be made if lights go out after being on a short time, or operation is intermittent.

- 2) Turn Signals – Check turn signals (including bulbs and lenses) for operation and condition. Make repairs if any of the following conditions exist: if any front, rear or side-mounted turn signal lens is cracked; if any front, top of fender, rear, or side-mounted turn signal does not flash or is dim; if turn signal indicator does not properly indicate right and left; if turn signal switch does not function properly or will not maintain set position; if turn signal switch does not cancel or return to neutral position; if any front, rear or side mounted turn signal lens is damaged, and white light is visible; if any turn signal lens has darkened, faded, or is dirty, significantly affecting visibility or color of the light.
- 3) Hazard Lights – Check hazard lights for operation and condition. Make repairs if any of the following conditions exist. If any lens is cracked or dirty; if any four-way hazard light fails to function; if hazard switch does not function or will not maintain set position with steering wheel in the straight-ahead position.
- 4) Side Marker Lights – Check side marker lights (if installed) for operation and condition. Make repairs if any side marker light fails to function, or is cracked or damaged.
- 5) Brake Lights – Check brake lights and lens for operation and condition. Make repairs if any of the following conditions exist: one brake light on either or both sides fails to function (four (4) brake light systems only); if any brake light lens is cracked/damaged, or white light is visible; any brake light lens has darkened, faded, or is dirty, significantly affecting the visibility or color of the light. The vehicle should be removed from service until repairs can be made if any of the following conditions exist: if brake light circuit fails to function; if after brake pedal is released, brake light switch sticks, or lights stay on; if any brake light lens is not red or is not proper type meeting SAE specifications.
- 6) Tail Lights – Check tail light (s) and lens for operation and condition. Make repairs if any of the following conditions exist: if one (1) tail light on either or both sides fail to function (four (4) tail light system only); if any taillight lens is cracked; if any tail light lens has darkened, faded, or is dirty, significantly affecting the visibility or color of the light; if any taillight lens is damaged and white light is visible. The vehicle should be removed from service if taillight circuit fails to function or if any tail light lens is not red or is not proper type meeting SAE specifications.
- 7) Backup Lights – Check backup lights for proper operation and condition. Make repairs if either backup light doesn't function or if any backup lens is cracked. The vehicle should be removed from service if the bus is not equipped with functional white backup lights or if backup light(s) stay on all of the time or stay on in any gear position other than reverse.
- 8) Backup Alarm – Check operation and condition (if equipped) of backup alarm. Check operation by placing transmission selector in reverse gear (engine running) and listening for audible alarm sound. Make repairs if backup alarm doesn't function properly. **Backup alarms required on all 1997 and newer buses.**
- 9) Parking Lights – Check parking lights (if equipped) for proper operation. Make repairs if any of the parking lights (if equipped) are inoperable or if any park light lens is cracked or broken.

OUTSIDE BUS – CLEARANCE LIGHTS, REFLECTORS, & STROBE LIGHT

- 1) Clearance and Marker Lights – Check light(s) and lens for operation, condition, and location. Make repairs if any of the following conditions exist: if any clearance light fails to function. If any clearance light lens is damaged or white light is visible; if any rear clearance light lens is not red, or any intermediate or front lens is not amber; if any clearance light lens has darkened, faded, or is dirty, significantly affecting the visibility or color of the light.
- 2) Reflectors – Check reflectors for condition and location. Reflectors are required as follows:
 - a. Buses over 30’ in length; two- (2) red on rear, one (1) intermediate amber on side.
 - b. Buses under 30’ in length: is same, except intermediate amber is not required.

Make repairs if any of the following conditions exist: if any reflector is damaged or cracked; if any required reflectors are missing; if any red reflector is faded, significantly affecting it’s original color.

- 3) Strobe Light – Check roof mounted white flashing strobe light (if equipped) for operation, location, and condition. Make repairs if the strobe light does not function. **Strobe lights required on all 1998 and newer buses.**

OUTSIDE BUS – EIGHT LIGHT SYSTEM, STOP ARM, & CROSSING ARM

- 1) Eight Light Warning System Lights – Check eight light warning system lights for operation and condition. Make repairs if any of the following conditions exist: if any amber or red pilot light fails to function; if any light hood (if equipped) is damaged so that it obstructs visibility of the light. The vehicle should be removed from service until repairs can be made if any of the following conditions exist: if any amber or red light does not function or is dim; if amber/red lights (both front and rear) do not alternately flash (side to side); if any warning light is not red (outer) or amber (inner) or is not the proper type; if any warning light lens is damaged and white light is visible; if any warning light lens has darkened, faded, is misaimed, or is dirty, affecting the color of the light or reducing the visibility to less than 500 feet in bright sunlight; if warning lights do not function.
- 2) Stop Arm – Check stop arm for specifications, operation (fully extends to 90 degrees), and condition. Make repairs if any of the following conditions exist: if wiring ground strap is loose or not properly routed and secured; if hinge or bushing(s) is dry of lubrication; if stop arm assembly or blade mounting is loose; if stop arm extends more or less than 90 degrees; if stop arm does not fully extend or retract or is slow; if air operated stop arm diaphragm has an air leak; if any stop arm (paint or decal) is significantly faded or discolored. The vehicle should be removed from service until repairs can be made if any stop arm light does not flash or does not flash between 60 and 120 timer per minute or if stop arm does not operate as required.
- 3) Crossing Control Arm – **Crossing arms required on all 1977 and newer buses.** Check front bumper mounted student crossing arm for operation, condition, and mounting. Make repairs: if crossing arm mount bolts are loose; if hinge bushings need lubrication or are damaged; if air leaks from air operated diaphragm. The vehicle should be removed from service until repairs can be made if any of the following conditions exist: if the bus is not equipped with a student crossing arm assembly and arm; if crossing arm does not extend 90 degrees from bumper. If crossing arm does not deploy when stop arm is activated.

OUTSIDE BUS – GENERAL CONDITION, BUS EXTERIOR

- 1) Mirror Mounts and Mirror Glass – Check all exterior mirror mounting and bracketry and mirror glass for tightness and condition. Make repairs if mounting or bracket bolts or mirror glass is loose or if mounting or bracket bolts are missing. The vehicle should be removed from service if mirror brackets are bent, broken, or mounting is insecure and if mirror glass is discolored or if any required driver or passenger mirror is missing.
- 2) Body Glass – Check all body glass, gaskets, and frames for cracks, discoloration, and looseness. Make repairs if any side glass is cracked, loose, or discolored or if any piece of glass is Plexiglas. Remove the vehicle from service until repairs can be made if windshield glass is cracked and could be dislodged or is discolored and prevents driver from having clear visibility or if any glass is missing..
- 3) Bumpers – Check bumpers for mounting, condition, color, and body seal (rear bumper). Make repairs if of bumper is not black or if bumper is equipped with any unauthorized stickers or decals (only stickers approved by DPI Transportation Services are to be installed). The vehicle should be removed from service until repairs can be made if bumper is significantly bent or has protruding metal or if bumper-mounting system has cracked, broken, or bent brackets or braces, cracked welds, or missing or loose fasteners.
- 4) Body Damage – Check body exterior for accident damage, scratches, dents, etc. Make repairs if body has small dents, scratches, etc. or has rusted spots. The vehicle should be removed from service until repairs can be made if any of the following conditions exist: if any body part is damaged or dislocated creating a protrusion or sharp edge: if body panels, rivets, or other components are damaged or corroded to the point where joint strength or body structural integrity is compromised.
- 5) Paint – Check the paint on body and trim for required coloration and condition. Make repairs if paint is faded to a point that no gloss is present, or it is discolored, rusted, or damaged. The vehicle should be removed from service if the paint is not National School Bus Yellow or if the bumpers, warning light hoods and background are not black.
- 6) Reflective Markings – Check reflective markings for coloration, reflectability and condition. Make repairs if reflective markings are faded, discolored, damaged, or peeling. The vehicle should be removed from service until repairs can be made if reflective markings are missing around any emergency exit or door. **Reflective markings required on 1995 and newer buses.**
- 7) Lettering – Check all lettering for required type, size, location, and color. The vehicle should be removed from service until repairs can be made if bus is not equipped with the following lettering or it is not readable:
 - “School Bus” (8” letters) on front and rear.
 - “North Carolina Public Schools” (6” letters) on both sides.
 - “County or School Unit Name” (3” letters) below “North Carolina Public Schools” on both sides.
 - ‘Bus Number” (6” letters) on front sides and rear.
 - “Emergency Door” (2” letters) on all emergency doors.
- 8) Emergency Door Operation – Check emergency door for operation from exterior of bus. Make repairs if emergency door latch mechanisms or hinges need lubrication. Remove the vehicle from

service until repairs can be made if emergency door latch mechanism requires more than 40 pounds to release or if emergency door handle is mounted horizontally to allow “hitching” onto the bus.

- 9) Engine Hood – Check hood for operation, condition, and safety latch. Make repairs if any of the following conditions exist: if hood is misaligned or rubbing cowl; if hood hinges are not lubricated or are damaged. Repair if any bumper or securement device is damaged or missing. The vehicle should be removed from service until repairs can be made: if the hood cannot be opened as designed; if the safety latch does not secure hood; if hood prop rod or hold open feature does not function properly.
- 10) Cleanliness – Check exterior of bus for cleanliness. Make repairs if the exterior of the bus is dirty. The vehicle should be removed from service if the bus is dirty to the point that visibility through any window or light lens is significantly reduce.

ROAD TEST

- 1) Road Test – Every bus is required to have a road test when monthly inspections are performed. The following items should be checked during the road test.
 - a. **Travel angle** – The travel angle should be checked while the vehicle is being driven. Observe centerline on highway and check for side evenness to centerline. If travel angle is uneven the vehicle should be taken out of service until repairs are made.
 - b. **Steering Gear Operation** – Check steering gear for smooth operation, lost motion, and shimmy. Refer to chart on page 18 for maximum free play in steering. If free play exceeds maximum allowable amount the vehicle should be removed from service until repairs are made. If excessive tire shimmy occurs the vehicle should be removed from service until repairs are made. If roughness is detected in steering gear the vehicle should be removed from service until repairs are made.
 - c. **Engine Performance** – Check engine for acceleration, smooth operation, noise in engine or valve train, and excessive smoke. Make repairs if engine fails to operate efficiently. Remove the vehicle from service until repairs can be made if excessive noise is detected or if engine fails to operate properly.
 - d. **Rear axle and driveline** – Check rear axle and driveline for vibration and noise. Make repairs if noise is detected. If excessive noise and vibration are detected the vehicle should be removed from service until repairs can be made.
 - e. **Transmission** – Check transmission operation for upshift, downshift and slippage. Make repairs if rough upshift or downshift is experienced. If transmission is slipping the bus should be removed from service until repairs can be made.
 - f. **Road Speed Control** – Check road speed control for proper operation. Check operation for high limit cut-off and low limit cut-in. Make repairs if high limit is 48 mph or above and if low cut-in is 42 or below. Remove the vehicle from service if road speed control fails to operate.
 - g. **Instrument Gauges, Speedometer, and Odometer** – Check all instrument gauges for proper operation. Make repairs if any gauge fails to operate properly. Check speedometer and odometer for proper operation. Make repairs if speedometer needle is erratic or if odometer fails to operate. Remove the vehicle from service if speedometer fails to operate.
 - h. **Hydraulic Brake Warning Light** – Check operation of hydraulic brake warning light. Remove the vehicle from service if warning light fails to operate.
 - i. **Low Air Warning Buzzer and light** – Check low air warning buzzer and light for proper operation. Remove the vehicle from service if warning buzzer and light fail to operate properly.

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