

Introduction to the Hands-On Performance Test

Revised September, 2015

Since the purpose of this test is to determine the applicant's knowledge of what areas to inspect and how the applicant would know if something did not meet inspection standards, the score shall not be deducted or the test shall not be terminated if certain items to be checked are not applicable to the bus or vehicle being inspected.

The applicant must know about the vehicle mechanics and be able to recognize components. The applicant must know if the bus being inspected is safe and meets inspection criteria established by the Colorado Department of Education.

The applicant needs to verbalize all items, procedures, and criteria, to confirm to the tester what the applicant is inspecting.

Since it is vital that the applicant be familiar with references, the applicant shall be allowed to use any reference available except for this Introduction when taking the hands-on test. (The CSPTA Reference Manual for School Bus Technicians, and service manuals are OK). The CDE annual inspection form is recommended.

Portions of the test will require one item, as a minimum, to be inspected where there are several items the same (tires & wheels, seats, windows, etc.). The applicant will be required to inspect just one item, with the understanding that an actual inspection would require every item to be inspected.

AIR BRAKES

Description: Applicant's procedures to be followed in the AIR BRAKES hands-on test.

Note: Air brake check procedures vary from vehicle to vehicle and mechanic to mechanic. Different applicants may have learned different procedures. However, all procedures must be designed to see that the correct safety devices operate at the correct times.

Scoring Standard: Applicant should be able to perform and document (when needed) the following AIR BRAKE SYSTEM checks.

1. Inside brake check

Items to be tested:

- A. Warning Light/ Buzzer
- B. Park brake valve operation (PP-1)
- C. Air system build up time
- D. Cut-in & cut-out pressures
- E. Air consumption on one full application
- F. Air loss on full application held for 1 minute
- G. ABS system operation and light

Procedure for testing listed items above

- a. Fanning off the air pressure with the brake pedal, the applicant should note that both the warning light and buzzer do come on and at what pressure. (approximately 60 psi \pm 10).
- b. Fanning off more air pressure, the applicant should note that the PP-1 valve pops and at what pressure. (should be 20 - 40 psi).
- c. With the engine off, fan off, all the air in the system. The applicant should restart the engine and set an RPM of approximately 1200 - 1500 and note the time to rebuild the system to 120 psi (approximately 4 minutes).
- d. Restart the engine and rebuild air system to cut-out pressure. With the engine running, Fan off air pressure to the cut-in pressure and note. (should be a minimum of 85 psi).
- e. With primary & secondary air at system cut-out pressure applicant should (engine off, key on) make one full brake application. (Air consumption should be noted (10 psi \pm 2)).
- f. Holding the brake application for 1 minute, the applicant should note the air drop. (Not more than 3 psi).
- g. With foot on the brake pedal, turn key on, listen for each valve to exhaust. Foot off brake pedal, turn key off then turn back on, listen for all ABS solenoids cycling. After tests, ABS light should cancel (some models may differ). Perform any other tests as required by manufacturer.

2. Air Brake Valves check:

Items to be tested:

- A. One-way valves
- B. Two-way valves
- C. SR-I valve/system
- D. Safety valve

Procedure for testing items above

Note: Procedures for testing items above are one suggestion only. The applicants, school districts, or manufacturer's procedures may differ, and still be as effective.

- a. With the primary and secondary air at system cut-out pressure & engine off, the applicant should drain wet tank (noting that primary & secondary tanks remain at full pressure).
- b. Applicant then should drain the secondary tank (noting that the primary tank remains at full pressure). Restart the engine & rebuild the air system to cut-out pressure. With the engine off, applicant should drain the Primary tank (noting that the secondary tank remains at full pressure).
- c. Now with an assistant applying the brakes the applicant should watch to see that the primary brakes (rear) apply (noting that the SR-1 valve/system is working).
- d. With system pressure building the applicant should pull out the safety valve to make sure that it releases air.

3. Air brake checks (under bus)

Items to be checked:

- A. Air dryer (if applicable)
- B. Tanks (wet (supply), primary, & secondary)
- C. Hoses (routing and condition) and ABS wiring

Procedure for inspecting the items above shall be visual and the applicant should verbalize items such as: proper drain, proper mounting, condition, hoses have proper routing.

a. The applicant should verbalize the fact that if there is no air dryer that the wet tank shall have a water ejection valve & a safety valve.

4. Air brake checks (under the hood)

- A. Air compressor
- B. Drive belt (if applicable)
- C. Compressor, governor and line mountings
- D. Coolant lines & fittings
- E. Oil lines & fittings
- F. Filter system
- G. General condition and leaks

Procedure for the listed items above shall be visual & verbal

a. If the compressor is not belt driven the applicant should verbalize this fact.

5. Air brake checks (foundation)

- A. Shoes or pads
- B. Measurement and documentation of shoes and/or pads
- C. Mounting
- D. Drums or rotors
- E. Measurement and documentation of drums or rotors
- F. Brake chambers
- G. Slack adjusters (automatic test failure if not commented, not adjusting auto adjuster)
- H. Calipers (Air gap, and piston movement/free-play)
- I. ABS tone ring and sensor

Procedure for the listed items above shall be visual & verbal as well as showing the ability to demonstrate how to measure both shoes/pads and drums/rotors.

a. Applicant should visually inspect the shoes/pads and verbalize items like: wear, cracking, heat problems, and contamination, or shoes/pads loose from the base.

b. Applicant should demonstrate the measurement of shoes/pads and either document or verbalize doing so.

c. Applicant should physically and visually inspect the shoe/pad mounting and verbalize items like: hold down pins, springs, anti-rattle springs or clips, rollers, s-cams, and s-cam bushings.

d. Applicant should physically and visually inspect drums/rotors and verbalize items like: cracks, hard spots, heat discolored, or belled.

e. Applicant should demonstrate the proper method of measuring the drums/rotors checking for out-of-roundness, run-out, and over/under sizing, and either document or verbalize doing so according to manufacturer specifications.

- f. Applicant should visually inspect the brake chamber/caliper and verbalize items like: mounting condition, sizing/matching, dents, connectors, and lines.
- g. Applicant should visually inspect the slack adjusters and verbalize items like: splines, clevis locknuts, 90° angle.
- h. Applicant should visually inspect the brake caliper, dust boot, mounting bolts, and caliper slide for proper operation and seal condition.
- i. Visually inspect ABS tone ring and sensor for mounting, corrosion and overall condition.

6. Air brake checks (adjustment)

- A. Applicant will demonstrate how to adjust brakes
- B. Applicant will demonstrate or verbalize documentation of chamber rod travel
- C. Applicant will demonstrate or verbalize documentation of the air gap check

Procedure for the air drum brake adjustment check shall be the applied method

- a. Applicant should verbalize the fact that a system has automatic slack adjusters. The applicant should demonstrate or verbalize the proper adjustment procedure for either type of slack adjuster (manual vs automatic). This includes verbalizing that automatic slack adjusters are **NOT** to be adjusted.
- b. Applicant should demonstrate the proper method of measuring and documenting rod travel.

Procedure for the air disc brake air gap check and adjustment

- a. Applicant shall demonstrate or verbalize the manufacturer procedure for checking the pad to rotor clearance and documentation. This will include the proper adjustment procedure.
- b. Applicant should demonstrate and verify that the caliper moves freely.

HYDRAULIC BRAKES

Description: Applicant's procedures to be followed in the hydraulic brake hands-on test.

Note: Hydraulic brake check procedures vary from vehicle to vehicle, and mechanic to mechanic. Different applicants may have learned different procedures. However, all procedures must be designed to see that the correct safety devices operate at the correct times.

Scoring standard: Applicant should be able to perform and document (when needed) the following hydraulic brake checks.

1. Hydraulic brakes check (inside cab)

Items to be checked:

- A. Warning light/gauge (if applicable)
- B. Warning buzzer (if applicable)
- C. Power assist system
- D. ABS light (if applicable)
- E. Parking brake pedal or hand lever

Procedure for testing the above items

- a. The applicant should check that all warning lights work.
- b. The applicant should check that the buzzer system works (if applicable)
 - (1) If equipped with an electric booster, the applicant should check that the electric motor runs when the brake is applied (key on or off).
- c. The applicant should be able to check the operation of the power assist system.
 - (1) Check for proper pedal effort and pedal drop
 - (2) Check for assist in pedal operation
- d. The applicant should check to see that the ABS light comes on with initial start and goes off shortly (if applicable)
- e. The applicant should check that the parking brake pedal or hand lever does apply the park brake and does return to off position freely. Bring the engine to 1,000 RPM with the park brake applied. The vehicle should not move.

2. Hydraulic brake checks (valves)

Items to be checked: (all if applicable)

- A. Load leveling valve
- B. Proportioning or Combination valve
- C. ABS valve or system
- D. Pressure valve for electric/hydraulic boost

Procedures for testing the items above

- a. The applicant should check to see that all lines and linkage to the load-leveling valve are intact and free to operate.
- b. The applicant should check to see that all lines and wiring to the proportioning or combination valve are intact.
- c. The applicant should check to see that all lines and wiring to the ABS valve or system are intact.
- d. The applicant should check that the electric motor on the power assist does run when the brake pedal is applied. (Key off or on, engine not running).

3. Hydraulic brake checks (under bus)

Items to be checked:

- A. Lines
- B. Parking brake cables
- C. Parking brake

Procedure for testing items above

- a. The applicant should check for proper mounting, securement, condition, and leaks.
- b. The applicant should check for proper mounting, routing, and condition.
- c. The applicant should visually check the overall condition and adjustment of the parking brake.

4. Hydraulic brake checks (under the hood)

- A. Master cylinder for fluid level and leaks and fluid condition
- B. Lines for leaks, routing, and condition
- C. Power assist system for proper mounting and condition

The procedure for inspection of the items above shall be visual & the applicant should verbalize what the applicant is seeing.

5. Hydraulic brake checks (foundation)

- A. Shoes and/or pads
- B. Measurement and documentation of shoes and/or pads
- C. Mounting hardware
- D. Calipers and wheel cylinders
- E. Drums or rotors
- F. Measurement and documentation of drums or rotors
- G. Self-adjusters
- H. ABS tone ring and sensor
- I. ABS Integrated Traction Control/Stability Control and related dash indicators.

Procedures for testing the items above shall be visual & verbal as well as showing the ability to demonstrate how to measure shoes, pads, drums, and rotors.

- a. Applicant should physically and visually inspect the shoes/pads and verbalize items like: wear, cracking, heat problems, contamination, or loose from the base.
- b. Applicant should demonstrate the measurement the shoes/pads and either document or verbalize doing so.
- c. Applicant should physically and visually inspect the shoe and/or pad mounting and verbalize items like: Hold down pins, springs, anti-rattle springs or clips, and all remaining hardware.
- d. Applicant should physically and visually inspect the calipers and wheel cylinders and verbalize items like: leakage, corroded slides, worn bushings, and any other hardware problems.
- e. Applicant should physically and visually inspect drums or rotors and verbalize items like: cracks, hard spots, heat discolored, belled, out of round, warped, out of parallelism, or excessive run out.
- f. Applicant should demonstrate the proper method of measuring the drums/rotors and document readings and compare to manufacturer specification. This should include demonstration of the calibration of the brake drum/rotor micrometer.
- g. Applicant should visually inspect and verbalize that the self-adjuster is all-intact and that it is operational.
- h. Visually inspect ABS tone ring and sensor for mounting, corrosion and overall condition.

6. Hydraulic brake (adjustment)

- A. Applicant will demonstrate how to adjust brake according to manufacturer specification and document.

Procedure for adjusting shall be one of an industry standard with the end result being a firm brake pedal with adequate brake pedal reserve, and no brake drag.

EXHAUST

Description: Applicant should be able to check the following components.

Scoring Standard: Applicant should be able to perform the following exhaust checks.

1. Hangers and shields

Items to be checked:

- A. Hangers and shields condition
- B. Hangers and shields security
- C. Proper distance

Procedure for testing items above:

- a. Check all hangers and shields for severe rust, corrosion, and free from bends or other damage that may affect the performance of the hanger or shield.
- b. Check all hangers and shields for security to ensure performance / noise reduction.
- c. Check that the exhaust system is properly shielded where required.

2. Muffler, Manifold, Turbo, Emissions System

Items to be checked:

- A. Exhaust or oil leaks
- B. Cracks
- C. Gaskets/donuts
- D. Emissions System

Procedure for testing items above:

- a. Check for exhaust leaks at the muffler & manifold. Check for exhaust and oil leaks at the turbo (if applicable).
- b. Check for cracks in the manifold or turbo (if applicable), and check the muffler for seam cracks, or any other opening.
- c. Check the manifold or turbo gaskets (if applicable), check the exhaust pipe flange gasket (donut) for proper sealing.
- d. Check all emissions related components for leakage and sealing.

3. Exhaust pipe; tailpipe & header pipe(s)

Items to be checked:

- A. Length
- B. Leaks (visually inspection only)
- C. Condition
- D. Routing
- E. Clamps

Procedure for testing items above:

- a. Check that the exhaust pipe meets 1 CCR 301-25 (Colorado Minimum Standards) Section 20.00.
- b. Check the entire length of the exhaust pipe for leaks.
- c. Check the condition of the entire exhaust pipe.
- d. Check that the entire exhaust system is routed properly.
- e. Check all the exhaust system clamps.

STEERING & SUSPENSION

Description: Applicant should be able to check the following components.

Scoring standard: Applicant should be able to perform the following STEERING & SUSPENSION checks.

1. Steering

Items to be checked:

- A. Steering wheel
- B. Steering column and shaft
- C. Steering box
- D. Steering pump
- E. Pitman arm
- F. Drag link
- G. Steering knuckle
- H. Tie rod and tie rod ends
- I. Wheel bearings/king-pins or ball joints
- J. Castle nuts/cotter pins
- K. Steering stabilizer shock
- L. Steering radius stops

Procedure for testing items above:

- a. Applicant should check (verbalize) for cracks, security, proper position and free play. Applicant should know how to find the free play criteria as listed in 49 CFR 570.60 <https://www.gpo.gov/fdsys/pkg/CFR-2010-title49-vol6/pdf/CFR-2010-title49-vol6-sec570-60.pdf>
- b. Check for absence or looseness of U-bolts of positioning parts; worn, faulty or repair-welded U-joints. Check the shaft bearing condition.
- c. Check for leakage, hose condition, mounting security.
- d. Check the mounting, belt tension and condition, fluid level, hose condition and overall satisfactory operation of the system.
- e. Check for security, cracks, and no welded repairs.
- f. Check the play in the ball & socket joints, there should not be any movement of a stud nut under steering load, or any motion other than rotational of more than manufacturer specification.
- g. Check security and overall condition.
- h. Check for loose or missing clamps or clamp bolts, looseness in any threaded joint. Check ball socket joints as per item in procedure (f).

- i. Check wheel bearings and king-pins for excessive play and freedom of movement. Verbally describe the inspection of the bearings if the hub was removed.
- j. Check security and cotter pin placement.
- k. Check security, damage, and leakage (if applicable).
- l. Check proper adjustment. (Tires not rubbing or chafing on turns. No binding.)

2. Suspension

Items to be checked (one front and one rear axle):

- A. Springs
- B. Rubber spring or air suspension (if applicable)
- C. U-bolts
- D. Spring hangers, spacers, pins and bushings
- E. Shocks
- F. Stabilizer bars

Procedure for testing above items:

- a. Check for cracked, broken or missing leaves or coils. Check for leaves displaced in a manner that could result in contact with a tire, rim, brake drum, frame, etc.
- b. Check for deflated suspension (system failure, leaks, ride height, etc.). Check for broken or missing rubber springs and shifting or chafing of components.
- c. Check for torque, cracks, broken, loose, or missing U-bolts (verbalize the procedure for inspection of torque).
- d. Check for excessive wear, cracks, breaks, looseness, or missing.
- e. Check for integrity of rubber bushings or isolators and to see that the shock is not broken, bent or leaking and that the shock is secure.
- f. Check bushings and security of fasteners.

TIRES AND WHEELS

Description: Applicant should be able to check the following components.

Scoring Standard: Applicant should be able to perform the following **TIRE AND WHEEL** checks

1. Tread depth and inflation

Items to be checked:

- A. Tread depth
- B. Inflation pressure

Procedure for testing items above:

- a. Measure tread depth in 32nds of an inch. The measurement should be made in a major tread groove, in the area observed to have the least tread, but not at a wear bar. The applicant should know minimum allowable tread depth according to DOT specifications and documents.
- b. Measure inflation pressure, and compare the reading to the tire manufacturer's requirements, and vehicle manufacturer's specifications and document. The applicant needs

only to do one tire from each axle but should understand that all tires are required for an actual inspection.

2. Tire Matching

Items to be checked:

- A. Correct placement of radial or bias tires
- B. Tire sizes on each axle
- C. Size and tire tread on same axle

Procedure for testing items above:

- a. The applicant should check that radial and bias ply tires have not been mixed on the same axle. Different axles are OK.
- b. The applicant should check that tire sizes are matched on the same axle. Different axles are OK.
- c. The applicant should check that tire size and tire tread match between tires on the same axle.

3. Tire and wheel condition

Items to be checked:

- A. Tires
- B. Lug nuts
- C. Wheels (rims)
- D. Valve stem caps
- E. Date code on tire (Age of casing)

Procedure for testing items above:

- a. Applicant should check tires for cracks, cuts, bulges, bruises or excessive curbing.
- b. Applicant should check lug nuts for rusting (between the nut and wheel), and tightness.
- c. Applicant should check the wheel for cracks, broken welds, or excessive run out due to a bent rim. Also, that the wheels on the same axle are the same size and width.
- d. The applicant should check that valve stem caps are installed.
- e. Compare and consider casing age and industry standard.

IDENTIFICATION & BODY

Description: Applicant should be able to check the following components.

Scoring standard: Applicant should be able to perform the following IDENTIFICATION & BODY checks.

1. Lettering and paint

Items to be checked:

- A. Lettering size
- B. Clarity
- C. Paint colors
- D. ID coloring
- E. Placement

Procedure for testing items above:

- a. Check all lettering for size and location per 1 CCR 301-25 (Colorado Minimum Standards).
- b. Check lettering for clarity.
- c. Check that body and bumper colors are in accordance with 1 CCR 301-25 (Colorado Minimum Standards).
- d. Check that ID lettering for condition and that it is in the appropriate colors and reflective backgrounds (when required). Check the retroreflective tape at emergency exits and on sides of the bus for condition and compliance with FMVSS 108.
- e. Check for proper placement of all lettering and identification.

2. Body Interior

Items to be checked:

- A. Seats and panels
- B. Flooring
- C. Step well area
- D. Windows
- E. Interior storage

Procedure for testing items above:

- a. Check all seat cushions, seat backs, and panels for cuts, tears, and protruding sharp edges. Check that all seat cushions are securely fastened. Check seat frames for security. Check seat foam for integrity.
- b. Check flooring for rips or tears. Check for floor molding that has become loose.
- c. Check the step well area for non-skid flooring where required. Check the handrail for security, sharp protrusions and areas that may grab loose clothing.
- d. Check windows for use of approved safety glass with a visible permanent mark. Check the windows for proper opening distance.
- e. Check interior storage areas for proper securement (mounted to the floor, ceiling etc.), no sharp projections, etc.

3. Body Exterior

Items to be checked:

- A. Bumpers and tow hooks
- B. Body panels
- C. Hood latches

Procedure for testing items above:

- a. Check bumpers for security, and proper construction. Bumpers should be free from severe bends or crimping.
- b. Check the body panels and rub-rails for damage that may affect the integrity of the structure. Check for sharp or protruding edges.
- c. Check that the hood latches hold the hood secure.

EMERGENCY EQUIPMENT

Description: Applicant's procedures to be followed in the EMERGENCY EQUIPMENT hands-on test.

Scoring Standard: Applicant should demonstrate knowledge of the equipment involved.

1. Emergency Reflectors

Items to be checked:

- A. Triangles
- B. Triangle storage box
- C. Triangle storage box mounting

Procedure for testing items above:

- a. The applicant should check the operation of the triangles and visually check the condition of each (a sealed box shall indicate a previous inspection and will not need to be unsealed).
- b. Check the storage box for condition and operation of the lid.
- c. Check the storage box mounting for being secure and in a location easy to locate.

2. Fire Extinguisher

Items to be checked:

- A. Fire extinguisher size and rating
- B. Operating mechanism
- C. Mounting
- D. Pressure gauge

Procedure for testing items above:

- a. Check the fire extinguisher for size, type, and rating.
 - (1) School Bus 5-pound dry chemical, approved by UL, with a total rating of not less than 2A10BC.
 - (2) Small Vehicle 2.5-pound dry chemical, approved by UL, with a total rating of not less than 1A10BC.
- b. Check the operating mechanism for a safety pin, and a seal that will break easily and not interfere with the operation of the extinguisher once broken.
- c. Check the mounting bracket for operation, and that it securely holds the extinguisher.
- d. Check the pressure gauge for readability without removal from the bracket, and that the reading indicates charged. Look for current extinguisher inspection tag. (this is not required but is considered best practice.)

3. First Aid Kits

Items to be checked:

- A. Location
- B. Contents
- C. Mounting
- D. Kit size (rating)
- E. Number of kits required

Procedure for testing items above:

- a. Check that the kits are in plain view (not obstructed or covered), or that the location is properly or clearly identified.
- b. Check that the contents are as they should be or are sealed indicating that they have been previously checked.
- c. Check that the kits are securely mounted, and the mounting is operable.
- d. Check that the kit size matches the year of manufacture for the vehicle (24 unit kits are appropriate for all vehicles).
- e. Check that the kit requirements meet minimum standards in place at date of manufacture.

4. Body Fluid Cleanup Kit

Items to be checked:

- A. Location
- B. Contents
- C. Mounting

Procedure for testing items above:

- a. Check that kit is in plain view, or that the location is properly identified.
- b. Check that contents are as they should be or are sealed indicating that they have been previously checked.
- c. Check that kit is securely mounted, and the mounting is operable.

EMERGENCY EXITS & DOORS

Description: Applicant should be able to check the following components.

Scoring standard: Applicant should be able to perform the following EMERGENCY EXITS & DOORS checks.

1. Alarms

Items to be checked:

- A. Driver audible
- B. Switch condition
- C. Switch enclosure

Procedure for testing items above:

- a. Check that the alarm (buzzer) is audible to the driver when seated in the driver's seat when an emergency exit is opened.
- b. Check the condition of the switch. Check the plunger, contacts, and case.
- c. Check that the switch is enclosed and secure.

2. Ignition interlock systems (if applicable)

Items to be checked:

- A. Back emergency door switches
- B. Side emergency door switches and wheelchair lift doors and switches
- C. Emergency door and starter interlock warning buzzers
- D. Circuit wiring and solenoids

Procedures for testing items above:

- a. Momentarily start engine and shut off, then with the back-door vandal lock secured, restart the engine. If the rear door switch is working, the engine should not restart.
 - (1) Check the switch for secure mounting and covering.
 - (2) Check that the emergency door buzzers sound when attempting a restart.
- b. Secure the vandal lock on the side emergency door (if applicable). Attempt to restart the engine. If the side emergency door switch is working, the engine should not restart.
 - (1) Check the switch for secure mounting and covering.
 - (2) Check that the emergency door and starter interlock buzzers sound when attempting a restart.
 - (3) Repeat this procedure for each side emergency exit as applicable.
- c. By checking the performance of the interlock system as outlined above, you will have checked the operation of the circuit wiring and solenoids.
 - (1) Check the interlock solenoid(s) for secure mounting.
 - (2) Check the interlock wiring for proper routing (free from chafing and cuts).

3. Emergency exits

Items to be checked:

- A. Seals
- B. Latches
- C. Head bumper
- D. Door assembly and glass
- E. Aisle width at the door
- F. Flip seat (if applicable)
- G. Hold-open device

Procedure for testing items above:

- a. Check seals of all doors, windows, and roof escape hatches for contact and leaks.
- b. Check all latches for security and integrity.
- c. Check the head bumper pad for proper placement, cuts, tears, and security.
- d. Check the door for damage that may affect the integrity of the structure. Check the glass for approved type safety glass with a visible permanent mark, and good visibility.
- e. Check for unobstructed aisle width at all emergency exits.
- f. Check for proper flip seat operation (if applicable).
- g. Check hold-open device for proper operation.

FUEL SYSTEMS

Description: Applicant must be able to check the following components.

Scoring Standard: Applicant should be able to perform and document (if needed) the following FUEL SYSTEM checks.

1. Fuel tank

Items to be checked:

- A. Tank mounting
- B. Leakage
- C. Tank venting
- D. Fuel filler cap
- E. Tank drain plug
- F. Fuel door interlock switch (Alt. Fuel If applicable.)
- G. Tank certification date (Alt. Fuel If applicable.)

Procedure for checking items listed above:

- a. Check fuel tank for a secure mounting in an approved cage. Tank mounting should be free from wedged rocks or iron that could rub and possibly penetrate the tank.
- b. The tank should be checked for any visible leakage.
- c. Check the tank for proper venting outside the passenger area of the bus.
- d. Check the fuel filler cap for leakage and proper placement outside the passenger area of the bus.
- e. Check the fuel tank drain plug for leakage and proper placement. Check the size of the plug and check that it does not protrude beyond the cage.
- f. Check that fuel door interlock switch works properly. With fuel door open, bus should not start.
- g. Check certification date

2. Fuel lines and filters

Items to be checked:

- A. Lines/filters
- B. Mounting
- C. Condition

Procedure for checking items listed above:

- a. Thoroughly check all fuel lines/filters for leakage.
- b. Check that all fuel lines/filters are properly mounted and secure.
- c. Check the condition of all lines/filters that they are free from cracking, kinks, chafing, crimping, or wear.

3. System Leaks

Items to be checked:

- A. Carburetor or injection pump for leaks
- B. Carburetor or injection pump mounting
- C. Transfer pump for leaks and mounting

Procedure for checking items listed above:

- a. Carburetor or injection pump should be checked for fuel, oil, or air leaks.
- b. Check that the carburetor or injection pump is securely mounted.
- c. Check the transfer pump (electric or mechanical) for leakage and secure mounting.

LIGHTING

Description: Applicant's procedures to be followed in the LIGHTING hands-on test.

Scoring Standard: Applicant should be able to perform (when needed) the following LIGHTING checks. LED lamps failure above approximately 25 percent LED's not working. (This is in keeping with the national standard with NCST.)

1. Switches

Items to be checked:

- A. Operation
- B. Mounting

Procedure for testing items listed above:

- a. Check to see that the switches operate in a characteristic manner, free from binding, and have defined detents to hold in position.
- b. Check that the switches are mounted securely.

2. Eight-way lights (complete system)

Items to be tested:

- A. Flashing frequency
- B. Visibility
- C. Operation and sequencing
- D. Pilot or indicator lights
- E. Stop sign and diaphragm (if applicable)

Procedure for testing items listed above:

- a. Check to see that the lights flash on completely and off completely between 60 and 120 flashes per minute.
- b. Check the lenses and bulbs for cleanliness and brightness, the lights should be able to be seen at a distance of 500 feet. Check visors and the black background for aiding visibility in sunshine.
- c. Check that the start switch engages the 8-way light system. (door open or closed) Check that the door switch properly sequences the 8-way lights from yellow to red when the door is opened and red to off when the door is re-closed. Check that the door switch sequences the lights directly to red if the door *was* already open. Check that the override switch sequences the lights directly to red if engaged. Check that the cancel switch turns the 8-way light system off if engaged. Check that the master switch does not allow the 8-way light system to engage when in the off position. Checks in italics are if applicable.
- d. Check the indicator lights (or pilot lights) for sequencing and operation.
- e. Check the stop sign lights for visibility of lenses, flashing frequency, and reflectorized material (not faded). Check that the stop sign is operational.

3. Lights

Items to be checked:

- A. Head lights
- B. Tail lights
- C. License plate lights
- D. Brake lights
- E. 4-way hazards lights
- F. Back up lights
- G. Interior lights
- H. Reflectors
- I. Clearance lights
- J. Turn signal lights
- K. Light monitor
- L. Strobe light (if applicable)

Procedure for checking items listed above:

- a. Check the headlights for proper illumination, alignment, and high beam/low beam operation. Check for proper and secure mounting.
- b. Check tail lights for proper illumination, lenses, and mounting. Check the lenses cleanliness and proper type.
- c. Check the license plate light for illumination and mounting. Check the lenses for cleanliness.
- d. Check that the brake lights illuminate at the proper time. (either when the brake pedal is applied and/or when the retarder/secondary braking system is engaged). Check the lenses for cleanliness and proper type. The retarder was required to be wired into the brake light system 10/1/93 (Colorado Minimum Standards).
- e. Check that the 4-way hazard lights illuminate the turn signal lenses only. Check that the 4-way hazard lights are independent of other lighting systems, and that they are usable with the key on or off. Check the lenses for cleanliness and proper type.
- f. Check that the backup lights illuminate at the proper time (when the transmission has been placed in reverse and the key is on). The controlling switch may be either mechanical or hydraulic. Check the lenses for cleanliness and proper type.
- g. Check all dome and step well lights for proper illumination. Check all instrumentation, all indicator lights, all switch lights for proper illumination.
- h. Check the reflectors for proper type, color, cleanliness, and the degree of fading.
- i. Check clearance lights for proper lenses (color and type). Check for illumination and cleanliness.
- j. Check that the turn signal lights self-cancel after completing a turn. Check the lenses for cleanliness and proper type.
- k. If equipped, check that all indicators function.
- l. Check for proper function, mounting, and color.

Special Needs Equipment

Special needs equipment (if equipped)
Lift - interlock (after Jan 2005)
Tie-downs
Track floor & wall
CPS restraints - integrated seats
Other equipment tie-downs (Oxygen)
Decals
Belt cutter
FMVSS 210 ready seat frames
Air conditioning