

INSPECTION GUIDELINES

SCHOOL TRANSPORTATION
VEHICLES

3.0.1

STATE OF CONNECTICUT
DEPARTMENT OF MOTOR VEHICLES
COMMERCIAL VEHICLE SAFETY DIVISION

INSPECTION GUIDELINES

SCHOOL TRANSPORTATION VEHICLES

The following STV inspection guidelines that will be used by Department of Motor Vehicles Inspectors and STV carriers/contractors for determination of most pass/fail criteria of school transportation vehicles. These guidelines will take precedence over all previous Department of Motor Vehicles Inspection Manuals.

The Department of Motor Vehicles, Commercial Vehicle Safety Division, Vehicle Inspection Standards Unit, will, from time to time, have available up-dated or corrected guidelines. Department Inspectors will receive and shall up-date their guidelines accordingly. To maintain inspection uniformity, no additions or corrections shall be made to these guidelines without prior consent of the Vehicle Standards Section.

These guidelines have been designed to be easily revised from time to time and any revisions will include only the page or pages reflecting a given change or changes. An attempt will be made by the DMV to forward revisions to proper authorities for distribution. However, it is the responsibility of the manual holder to periodically check with the Department of Motor Vehicles to obtain any revisions that have been distributed.

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These guidelines define the criteria to be used in determining if a vehicle passes or fails inspection. The purpose is to standardize the criteria to be used during the inspection of defined equipment under a wide range of applications. It provides descriptions of various inspection procedures and objective statements of the grounds for rejecting school transportation vehicles utilizing a truck-type chassis. If the school transportation vehicle (STV) inspected is a passenger car type lightweight vehicle the user should refer to State of Connecticut, Department of Motor Vehicles, Passenger Vehicle Inspection Guidelines.

Any procedures listed in these guidelines which are not specifically referred to in the STV Inspection Procedure are provided to allow a pass/fail determination in situations where equipment covered in these guidelines have been questioned. Such situations will usually be confronted when there is an obvious problem not otherwise addressed in the Inspection Procedure.

Each section covered in these inspection guidelines can be accomplished by which every method listed is most practical, for the location where the inspection is conducted.

Although every reasonable effort has been made to assure the accuracy of these inspection guidelines, it is entirely possible that errors may be discovered or specific pieces of information may be missing.

If you believe that you have discovered an error or specific piece of information that is missing, it should be put in writing and submitted to your immediate supervisor. Supervisors should make a reasonable attempt to forward this information to the Inspection Standards Unit, Wethersfield.

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These guidelines were prepared with information obtained from the AAMA 1994 Vehicle Inspection Handbook. This manual has been continuously revised to reflect the specific requirements of the Connecticut General Statutes and Department of Motor Vehicle Regulations. Any differences between these guidelines and the AAMA Vehicle Inspection Handbook are most likely the results of the previously mentioned differences.

The Inspection Standards Unit, will, from time to time, send out up-dated or corrected guidelines. No additions or corrections shall be made without prior consent of the Vehicle Inspection Standards Unit.

These guidelines have been designed to be easily revised from time to time and any revisions will include only the page or pages reflecting a given change or changes. It is the responsibility of the user to up-date his/her guidelines upon receipt of any revisions. The original of these guidelines includes no specific date code, however, any revised pages will include a date code at the bottom of the page(s).

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SECTION 1 - REGISTRATION, MAINTENANCE AND RECORDS

Before beginning the inspection the Inspector should first determine if an adequate preventive maintenance program exists. They must then determine the adequacy of the records which indicate whether or not the program has been followed, and make an overall evaluation. Although this item is considered ADMINISTRATIVE, a practical comparison must be made between the HARDWARE condition and what the RECORD states about it.

AGREEMENT AMONG PAPERS

Inspect for agreement among vehicle registration certificate, vehicle identification number (VIN), license plates, etc. Verify insurance coverage where applicable.

Reject Vehicle If: VIN, certificate and license plate numbers do not agree.

PLATE MOUNTING

Inspect license plates to see that they are securely mounted and are clean and clearly visible.

Reject Vehicle If: Plates are hanging loosely from their mounting brackets or are obscured so that numbers cannot be identified.

VEHICLE VERIFICATION (Applies to STV'S not presently registered in Connecticut)

Procedure: Physically, verify the vehicle identification number(s) (VIN) characters on the paperwork from two (2) different locations on the vehicle.

Reject Vehicle If: Verification cannot be accomplished at level 1 or level 2 inspection in accordance with current DMV Vehicle Verification Inspection Policy.

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SECTION 1 - REGISTRATION, MAINTENANCE AND RECORDS

[X] SCHOOL BUS PREVENTIVE MAINTENANCE PROGRAM

Procedure:

- * Inspect vehicle records for compliance with maintenance program instructions. Each entry should be checked against the actual condition of the item.
- * Inspect program for technical adequacy and for compliance with statutes and regulations.

Reject Vehicle If: Inspection, maintenance and repair records are not available or records indicate vehicle has not been inspected by carrier in past 90 days or if physical inspection indicates other than what records show.

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SECTION 2 - BRAKES - METHODS OF INSPECTION

Road tests, using either a decelerometer or the measurement of stopping distance, should be done on a level, dry, hard, smooth pavement free from oil, grease or loose dirt. Tires must be properly inflated. The purpose of observing tire scuffing etc. is to confirm braking action on each wheel.

[X] STOPPING DISTANCE METHOD

Equipment: Measuring tape or pre-marked lane.

Procedure: At a speed of 20 mph (32 km/h), apply service brake firmly. Observe whether vehicle comes to a smooth stop within distance prescribed by law without pulling to right or left beyond limits, and observe tire marks left on test surface or scuff mark patterns on tires.

Reject Vehicle If: It swerves enough for any part to leave a 12 foot lane. If the vehicle fails to stop within the required distance, or no tire marks on test surface or scuff mark patterns showing on tire of each wheel are found.

Required stopping distance.

- 25 feet - Vehicles with GVWR of 10,000 pounds or less and all school buses (regardless of gross weight)
- 36 feet - STV with GVWR over 10,000 pounds other than school buses (hydraulic brakes)
- 35 feet - STV with GVWR over 10,000 pounds other than school buses (air brakes)

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SECTION 2 - SERVICE BRAKES - METHODS OF INSPECTION

[X] DECELERATION METHOD

EQUIPMENT: Decelerometer, computerized electronic type.

PROCEDURE: Mount decelerometer on windshield of vehicle. Level and calibrate the instrument. At a forward speed of aprox. 20mph (32km/h) firmly apply service brake and observe whether the vehicle pulls to right or left. Upon stopping read decelerometer in accordance with manufacturers instructions.

REJECT VEHICLE IF:

- * vehicle swerves enough for any part to leave a 12 foot lane.
- * a decelerometer reading of at least 18 f/s² (feet per second per second) or 0.56 G's cannot be achieved for passenger cars and empty light trucks and 15 f/s² or 0.47 G's for loaded light trucks or if computed equivalent stopping distance from 20 mph is greater than listed in stopping distance method.

ALTERNATE PROCEDURE: If sufficient space for the 20 mph test is not a viable option ONLY. Follow above procedure only at a forward speed of aprox. 10mph (16km/h).

REJECT VEHICLE IF:

- * vehicle pulls to the right or left.
- * a decelerometer reading as noted above is not obtained.

NOTE: The VC2000 is currently the only computerized electronic decelerometer that has been evaluated by DMV and therefore is the model shown herein.

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Mechanical Decelerometers - These decelerometers should only be used as a guide and a vehicle should only be rejected if failed with computerized electronic decelerometer. If a vehicle fails with a mechanical decelerometer based on the criteria under the computerized electronic decelerometer then further testing and inspection of the vehicle is required.

The pendulum and U-tube decelerometers used for brake testing are instruments scaled to read deceleration or equivalent braking force (sometimes referred to as brake efficiency) in percentages. The principle of the pendulum type decelerometer is that a pendulum on a vehicle moving at a uniform speed will assume a vertical position. When the vehicle speed is reduced by application of the brakes, the pendulum will swing forward to an angle away from the vertical. The tangent of the angle through which the pendulum moves is directly proportional to the deceleration. Basically the U-tube fluid-type instrument is a closed glass tube formed in the shape of a U. When vehicle speed is reduced by braking, the inertia of the fluid causes the level in the glass tube to change. The distance the level of the liquid changes is proportional to the deceleration in feet per second per second, which is read from a scale on the glass tube.

The vehicle will normally pitch because the lines of action of the inertia and braking forces are different. In order to minimize erroneous responses, the decelerometer should be put as close to the center of the vehicle as practical.

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SECTION 2 - BRAKES - METHODS OF INSPECTION

The following procedure applies to inspection of STV (s) inspected at inspection stations equipped with a platform testing machine. The tester will indicate relative effectiveness of each wheel, i.e., braking balance.

[X] PLATFORM TESTER METHOD

Equipment: "Drive on and stop" platform tester.

Procedure: Drive vehicle on to platform tester at a speed of 4 to 8 mph (6 to 13 km/h). Apply brakes firmly without wheel lockup. All wheels must be on platform before brake application.

Reject Vehicle If: Any wheel fails to indicate braking action. If the reading on any one wheel is less than 65% of the reading on the other wheel of the same axle.

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SECTION 2 - BRAKES - METHODS OF INSPECTION

[X] COMPUTERIZED PLATFORM TESTER METHOD

NOTE: See computerized alignment test procedure before concluding brake test as they are combined in this equipment.

Equipment: Computerized Plate Brake Tester.

Procedure: On vehicles with automatic transmissions the inspector should familiarize them self with the location of Drive and Neutral in the shift pattern. With "Perform Service Brake Test" or "Ready for Next Test" displayed on screen, drive vehicle onto test ramps at a speed of 4 to 8 mph. On automatic transmission vehicles shift transmission to neutral and coast onto test pads. Apply brakes firmly without wheel lockup when all wheels are on pads. Have vehicle slowly continue forward so that both axles clear weight bars. NOTE: Consult DMV standards for the use of Computerized Brake Testers if above mentioned displays can't be obtained.

Reject vehicle if: If right side of display indicates any results colored RED or if Failure indicated in CONCLUSIONS.

NOTE: If brakes are not applied quickly enough the vehicle may fail only under the deceleration results. If the Inspector suspects that the vehicle's brakes were not applied with enough force, the test should be redone. In periods of wet weather, sufficient deceleration readings may not be obtained.

NOTE: * For vehicles over 7000 lb. GVWR (3182 kg) DO NOT REJECT for front/rear balance even if RED unless front is below 35% or if "MPV/lt-trk" specs. are available and utilized. If "MPV/lt-trk" specs. are used be sure and return to "Car" specs. when done.

* If brakes are not applied quickly enough the vehicle may fail only under the deceleration results. If the Inspector suspects that the vehicle's brakes were not applied with enough force, the test should be redone applying the brake pedal firmer.

NOTE: Maximum allowable weight per axle for Hunter Tester is 8,800 lbs. and for the AREX tester it is 22,000 lbs.

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SECTION 2 - BRAKES - HYDRAULIC SYSTEM

Some vehicles are equipped with brake backing plates or inspection plugs which can be removed for viewing drum edges and brake lining thickness'. For vehicles not so equipped it is recommended that each wheel and drum be removed to view brake linings and components. For vehicles equipped with disk brakes only wheels need to be removed.

[X] MASTER CYLINDER

Procedure: Look for leakage. Thoroughly clean the area and then remove cover if required to check fluid level. Be sure that cover gasket is serviceable and that no dirt gets in reservoir when cover is removed.

Reject Vehicle If:

- * Master cylinder leaks.
- * The fluid level is more than 1/2 inch below the lowest edge of the filler opening in either reservoir chamber or is below the minimum level indicated by the manufacturer on the reservoir.
- * The gasket is torn, damaged, or swollen (swollen gasket may indicate oil in system).

NOTE: Most vehicles are equipped with a master cylinder with two chambers in the reservoir. If the fluid level is lower in one of the chambers only, wear on either the front or rear brake pads or shoes is indicated.

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SECTION 2 - BRAKES - HYDRAULIC SYSTEM

[X] HYDRAULIC LEAKS

Procedure: Engine must be running on vehicles with power brakes. While vehicle is stopped, apply 150 lbs. force to brake pedal and hold for 10 seconds. Observe if pedal moves slowly downward.

Reject Vehicle If: Pedal height cannot be maintained for 10 seconds or the brake failure warning light illuminates.

[X] Pedal Reserve

Procedure: While vehicle is stopped and the engine running on vehicles with power brakes, apply 150 lbs. force to brake pedal and observe travel (vehicle equipped with hydraulic booster apply normal foot-force, not to exceed 60 lbs.).

Reject Vehicle If: Less than 20% of total available pedal travel remains.

[X] HYDRAULIC PARTS

Procedure: Visually check hydraulic hoses and tubes for leaks, cracks, chafing, flattened or restricted sections, or improper retention.

Reject Vehicle If: Hoses or tubing leak, are cracked, flattened, restricted, insecurely fastened, or improperly retained.

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SECTION 2 - BRAKES - HYDRAULIC SYSTEM

[X] WHEEL CYLINDER - DRUM BRAKES

Procedure: When wheel is removed, check the cylinder for leakage, missing parts, proper retention and dust boot condition.

Reject Vehicle If: fluid is leaking from the cylinder, parts are missing, improper retention or dust boot condition.

NOTE: DO NOT PRY UNDER, OR OTHERWISE DISTURB DUST BOOT UNLESS LEAKAGE IS SUSPECTED.

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SECTION 2 - BRAKES - HYDRAULIC SYSTEM

[X] CALIPER DISC BRAKE

Procedure: Check the caliper assembly for leakage, missing parts, excessive wear along caliper support surfaces, and retention.

Reject Vehicle If: Fluid is leaking from caliper assembly, parts are missing, or improperly retained.

[X] DUAL CIRCUIT BRAKE WARNING LIGHT

Procedure: If original equipment, inspect as follows:

- * Apply the parking brake.
- * Start the engine. The warning light should illuminate in the "on" or "start" position. See **Reject Vehicle (a)**.
- * Release the hand brake. The warning light should no longer be illuminated. See **Reject Vehicle (b)**.

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SECTION 2 - BRAKES - HYDRAULIC SYSTEM

Reject Vehicle If:

- *(a) The brake system failure indicator light or warning light does not illuminate with ignition switch in "on" or "start" position prior to starting engine.
- *(b) The brake system failure indicator light or warning light remains illuminated after the engine is started and the parking brake is released.

Note: Some imported vehicles use a press-to-test indicator as a brake warning light. The procedure for testing this brake warning light is to press the light itself, which serves as a button. If the warning light is functioning normally, it will illuminate upon being pressed.

[X] HEIGHT SENSING BRAKE PROPORTIONING VALVE (HSBPV), IF SO EQUIPPED

The HSBPV is used on some light truck chassis to provide optimum brake balance and efficiency. Vehicle braking force is distributed to the front and rear wheels as defined by light or heavy payload conditions. Mounted on the frame, the HSBPV responds to changes in vehicle trim height as related to rear axle load.

Procedure: Visual inspection of HSBPV.

Reject Vehicle If: Link to axle is disconnected, broken, or any other parts are loose or missing.

CAUTION: Adding any suspension accessories or other equipment (such as load leveling kits, air shocks, suspension kits, additional spring leaves, etc.) or making any modification that will change the distance between the axle and the frame without changing the load, will provide a false reading to the HSBPV. Such false reading could result in unsatisfactory brake performance.

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SECTION 2 - BRAKES - AIR SYSTEM

[X] AIR PRESSURE GOVERNOR

Procedure: With the tires chocked, fully charge the system to its maximum capacity, observe the gauge pressure, and determine if the governor has "cut-out." With the engine running, make a series of brake applications and observe the gauge pressure when the governor "cuts-in."

Reject Vehicle If:

- * Governor does not "cut-out" (pressure released at pressure relief valve).
- * Governor "cut-out" pressure is higher than 135 psi.
- * Governor "cut-in" pressure is lower than 80 psi.

[X] AIR PRESSURE BUILDUP TIME

Equipment: Clock or watch calibrated in seconds.

Procedure: With tires chocked, fully charge the system to governor cut-out pressure. Make one full brake application and note air pressure reading on gauge. Continue to reduce the air pressure by moderate brake applications to at least 10 psi below the governor cut-in pressure. Release the brake and run the engine at the manufacturer's maximum recommended rpm and determine the time required to increase the air pressure from the level achieved after one brake application to the governor cut-out pressure.

Reject Vehicle If: The time required to buildup pressure from the level after one brake application to governor cut-out pressure is more than 30 seconds.

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SECTION 2 - BRAKES - AIR SYSTEM

[X] AIR PRESSURE WARNING DEVICES

Procedure: With the air system fully charged, reduce the air pressure by moderate brake application or by opening the drain cocks on the system. Observe the pressure at which the visual or audible warning device comes on.

Reject Vehicle If:

- Vehicle air pressure gauge or gauges do not function properly.
- Air pressure warning devices do not activate when pressure is lowered to below 60 psi or 1/2 the governor cutout pressure.
- Air pressure warning devices do not continuously operate below activation pressure.

[X] AIR PRESSURE LEAKAGE

Equipment: Clock or watch calibrated in seconds.

Procedure:

- Listen for audible air leaks.
- With the air system fully charged, stop the engine and with the brakes released, observe the pressure drop in one increment of the gauge (ie: 10 psi in figure below).
- After determining the pressure loss with the brakes released, make a full brake application and observe the pressure drop for one increment of the gauge while the brakes are fully applied.

Reject Vehicle If:

- Any Audible air Leak is detected
- Leakage rate with brakes released in one to five minutes exceeds:
2 psi/minute
- Leakage rate with full brake application per minute exceeds:
3 psi/minute

NOTE: It will be necessary to record the pressure over a time interval corresponding to the test gauge increments for accuracy.

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SECTION 2 - BRAKES - AIR SYSTEM

AIR PRESSURE RESERVE

Procedure: With the air system fully charged, stop the engine and note the air pressure. Make one full brake application and observe the pressure drop.

Reject Vehicle If: Pressure drop is more than 20%.

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SECTION 2 - BRAKES - AIR BRAKE PARTS

[X] AIR BRAKE PARTS

Procedure:

- Visually inspect the air compressor mounting, air intake cleaner, and belts/pulleys (if belt driven).
- Inspect the air tank(s) mounting.
- Inspect all flexible brake hoses for cracks, cuts, burns, chafing, brittleness, or swelling.
- Inspect all brake lines for cracks, breaks, crimps, flattened or restricted sections, chafing, or improper retention.
- With the brakes applied, inspect for any audible leakage at the air tank(s), valves, chambers, fittings, lines, flexible hoses.

Reject Vehicle If:

- Air compressor mounting has loose, broken, or missing bolts or other attaching parts.
- Air tank(s) mounting device such as straps, brackets, or other hardware is broken, missing, or loose.
- Flexible brake hoses are cracked, cut, burned, chafed, swollen in size, or hardened so that they crack or break when bent.
- Rigid brake lines are cracked, broken, crimped, flattened or restricted, chafed, or improperly retained.
- Any brake line or hose is in contact with or near any part of the exhaust system.
- There is any audible leakage in the air brake system.
- Air intake cleaner (for compressor) is clogged enough to prevent proper air intake.
- Air compressor drive belts are worn, frayed, or loose.
- Air compressor pulleys are bent or damaged so as to cause belt loss.

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SECTION 2 - BRAKES - AIR BRAKE ADJUSTMENT

[X] AIR BRAKE ADJUSTMENT

Equipment: Steel scale and feeler gauge or equivalent.

Procedure:

- On vehicles equipped with Cam brakes, mark each brake chamber push rod at the face of the brake chamber with the brakes released. Apply the air brakes fully, minimum air pressure of 90-100 psi, and measure the distance the push rod travels from the face of the chamber to the mark previously made when the brakes were released. This measurement is the push-rod stroke (See Table).
- On vehicles equipped with wedge brakes, remove the inspection hole cover at each dust shield and with the brakes released, scribe a line on the edge of the brake lining. Apply the air brakes fully and measure the distance the brake lining travels. (See Figures)

Reject Vehicle If:

- For Cam brakes, the push-rod travel exceeds the maximum stroke listed in Table.
- For wedge brakes, there is more than 1/16" brake shoe travel.

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SECTION 2 - BRAKES - AIR BRAKE ADJUSTMENT
CLAMP TYPE BRAKE CHAMBER DATA

TYPE	OUTSIDE DIAMETER	MAXIMUM STROKE AT WHICH BRAKES MUST BE ADJUSTED
6	4-1/2"	1-1/4"
9	5-1/4"	1-3/8"
12	5-11/16"	1-3/8"
16	6-3/8"	1-3/4"
20	6-25/32"	1-3/4"
24	7-7/32"	1-3/4"
30	8-3/32"	2"
36	9"	2-1/4"

BOLT TYPE BRAKE CHAMBER DATA

TYPE	OUTSIDE DIAMETER	MAXIMUM STROKE AT WHICH BRAKES MUST BE ADJUSTED
A	6-15/16"	1-3/8"
B	9-3/16"	1-3/4"
C	8-1/16"	1-3/4"
D	5-1/4"	1-1/4"
E	6-3/16"	1-3/8"
F	11"	2-1/4"
G	9-7/8"	2"

ROTOCHAMBER DATA

TYPE	OUTSIDE DIAMETER	MAXIMUM STROKE AT WHICH BRAKES MUST BE ADJUSTED
9	4-9/32"	1-1/2"
12	4-13/16"	1-1/2"
16	5-13/32"	2"
20	5-15/16"	2"
24	6-13/32"	2"
30	7-1/16"	2-1/4"
36	7-5/8"	2-3/4"
50	8-7/8"	3"

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SECTION 2 - BRAKES - DRUMS AND DISCS

Maximum allowable drum diameters and minimum allowable disc thickness' are required to be cast into the drums and discs of all Type I and Type II School Buses. All other STV's may have these markings at the discretion of the manufacturer.

BRAKE DISCS

Procedure: Inspect discs for mechanical damage and cracks extending to edges. (Heat-check cracks not extending to the open edge may be ignored).

Reject Vehicle If: Disc is broken or has cracks on the friction surface extending to the open edge or if mounting holes are elongated.

MEASURE THICKNESS OF DISC

Equipment: Micrometer.

Reject Vehicle If: Disc thickness is less than minimum stamped on assembly. Also check for excessive run out or end play in the assembly.

NOTE: Do not distort or remove splash shield.

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SECTION 2 - BRAKES - DRUMS

[X] BRAKE DRUMS

Procedure:

- Check friction surface for cracks extending to open edge of drum. (Heat-check cracks not extending to the open edge may be ignored).
- Inspect for mechanical damage and contaminated friction surface.

Reject Vehicle If:

- Drum has cracks on friction surface extending to the open edge or on outside of drum particularly at the drum mounting area.
- There is evidence of mechanical damage other than wear, or if the friction surface is contaminated with grease or oil.
- The mounting holes are elongated.
- "Hard Spots" appear on drums which can cause chatter from uneven friction. Should be repaired or replaced.

[X] MEASURE INSIDE DIAMETER OF BRAKE DRUM

Equipment: Drum measuring gauge.

Reject Vehicle If: Diameter is greater than maximum diameter, stamped on the drum. For unmarked drums, maximum diameter is .090" (2.3mm) greater than original drum diameter for 14 1/8" and smaller drums. For larger drums, the maximum diameter cannot be greater than .120" (3.0mm) over the original diameter.

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SECTION 2 - BRAKES - LINING, PADS AND LINKAGE

[X] CONDITION OF MECHANICAL COMPONENTS

Procedure:

- Look for worn pins and missing or defective cotter pins or caliper support key, broken or missing springs, worn cables, clevises, couplings, rods and anchor pins.
- Inspect for "frozen," rusted or inoperative adjuster screw or connections, missing spring clips and defective grease retainers. Look for restricted shoe movement at backing plate and for bind between shoes and anchor pins.
- Inspect pedal shaft and bearings for high friction, wear and misalignment.
- Insure that the brake pedal to master cylinder booster push rod retaining device is in place and secure.
- Inspect for wear along shoe support rest or guides.

Reject Vehicle If:

- Mechanical parts are missing, broken, binding or badly worn.
- There is excessive friction in pedal, linkage or components or if pedal levers are misaligned or improperly positioned.

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SECTION 2 - BRAKES - LINING, PADS AND LINKAGE

[X] BRAKE LINING AND PAD WEAR

Equipment: Measuring device, steel scale or gauge.

Reject Vehicle If:

- Bonded linings are less than 2/32 inch at thinnest point for vehicles 10,000 lbs. GVWR or less than 3/16 inch for vehicles more than 10,000 lbs. GVWR.
- Riveted linings are less than 1/32 inch above rivet head at thinnest point or 2/32 inch above shoe.
- Bolted linings are less than 5/16 inch total thickness at center of shoe.
- Wire in wire-tacked linings is visible on friction surface.

[X] CONDITION OF LININGS

Procedure: Visual inspection.

Reject Vehicle If:

- Lining is broken, not firmly attached to shoe or plate, contaminated with oil and grease.
- Wear is extremely uneven.
- Lining has cracks or breaks that extend from edge through rivet or bolt holes which are deeper than half of lining thickness. (Ignore minor cracks which do not impair attachment).

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SECTION 2 - BRAKES - LINING, PADS AND LINKAGE

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SECTION 2 - BRAKES - HYDRAULIC & VACUUM BOOSTER

[X] CONDITION OF HYDRAULIC BOOSTER POWER BRAKE SYSTEM

Procedure: Inspect system for fluid level and leaks.

Reject Vehicle If:

- There is insufficient fluid in the hydraulic (power steering) pump reservoir.
- There are broken, kinked or restricted fluid lines or hoses.
- There is any leakage (see note below) (except for common wetting or weep) of fluid at the pump, steering gear or brake booster, or any of the lines or hoses in the system.
- Belts are frayed, cracked, or excessively worn.

[X] Hydraulic Booster System Operation

Procedure:

- Stop engine, then depress brake pedal several times to eliminate all pressure.
- Depress pedal with a 25-30 lb. foot-force.
- While maintaining this force on the pedal, start engine and sense or feel slight movement of pedal when engine starts.

Reject Vehicle If: Pedal does not move slightly as engine is started while force is on brake pedal.

NOTE: Common wetting or weeping not sufficient to cause a drip. Leaks or leakage is more than common wetting or weeping. Source of leak should be obvious.

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SECTION 2 - BRAKES - CONDITION OF VACUUM BOOSTER

[X] CONDITION OF VACUUM BOOSTER POWER BRAKE SYSTEM

Procedure: Visual inspection.

Reject Vehicle If: There are collapsed, broken, badly chafed or improperly supported hoses and tubes, or loose or broken hose clamps.

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SECTION 2 - BRAKES - VACUUM SYSTEM

[X] VACUUM RESERVE

Procedure: Run engine to build full vacuum and with the engine shut off and the ignition switch off, make one full brake application.

Reject Vehicle If:

- There is insufficient vacuum reserve to permit one full brake application after engine shutoff.
- On vehicles with low vacuum indicators, the low vacuum indicator is activated after one full brake application after engine shutoff.

[X] OPERATION OF LOW-VACUUM INDICATOR

Procedure: On all school buses or other STVs greater than 10,000 lbs build full vacuum and shut off the engine. Make a series of moderate brake applications.

Reject Vehicle If: Low-vacuum indicator fails to activate at a reading of at most 8 inches Hg for vehicles over 10,000 lbs and when vacuum is fully depleted for vehicles 10,000 lbs or less.

[X] OPERATION OF VACUUM BOOSTER SYSTEM

Procedure:

- Stop engine, then depress brake pedal several times to eliminate all vacuum in system.
- Depress pedal with a 25-30 lb. foot-force.
- While maintaining this force on the pedal, start engine and sense or feel slight movement of pedal when engine starts.

Reject Vehicle If: Pedal does not move slightly as engine is started while force is on brake pedal.

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SECTION 2 - BRAKES - HYDRAULIC & VACUUM BOOSTER

[X] CONDITION OF COMBINATION VACUUM/HYDRAULIC BOOSTER POWER BRAKE SYSTEM

Procedure:

- Inspect system for hydraulic fluid level and leakage.
- Run the engine to build full vacuum and with the engine shut off and ignition switch off, make one full brake application.

Reject Vehicle If:Vacuum Segment of System

- There are collapsed, broken, badly chafed or improperly supported hoses and tubes, or loose or broken hose clamps.
- There is insufficient vacuum reserve to permit one full brake application after engine shutoff.
- On vehicles with low vacuum indicators, the low vacuum indicator is activated after one full brake application after engine shutoff.

Hydraulic Segment of System

- There is insufficient fluid in the hydraulic (power steering) pump reservoir.
- There are broken, kinked or restricted fluid lines or hoses.
- There is any leakage of fluid (except for common wetting or weep) at the pump and steering gear hydraulic fluid circuit, or brake booster, or any of the lines or hoses in the system.
- Belts are frayed, cracked, or excessively worn.

[X] OPERATION OF COMBINATION VACUUM/HYDRAULIC BOOSTER SYSTEM

Procedure:

- Stop engine then depress brake pedal several times to eliminate all vacuum in system.
- Turn ignition (start) switch to "on" position. The brake warning light should illuminate.
- Depress pedal with a 25 lb. foot-force.
- While maintaining this force on the pedal, start engine and sense or feel slight movement of pedal when engine starts. The brake warning light should no longer be illuminated.

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SECTION 2 - BRAKES - HYDRAULIC & VACUUM BOOSTER

Reject Vehicle If:

- Brake warning lamp is not illuminated with ignition (start) switch in "on" position prior to starting engine.
- Pedal does not move slightly as engine is started while force is on brake pedal.
- Brake warning light remains illuminated after engine is started.

[X] CONDITION OF COMBINATION ELECTRIC HYDRAULIC BOOSTER POWER BRAKE SYSTEM

Procedure: Inspect system for fluid level and leaks.

Reject Vehicle If:

- There is insufficient fluid in the hydraulic (power steering) pump reservoir.
- There are broken, kinked or restricted fluid lines or hoses.
- There is any leakage of fluid (except for common wetting or weep, see note below) at the pump and steering gear hydraulic fluid circuit, or brake booster, or any of the lines or hoses in the system.
- Belts are frayed, cracked, or excessively worn.

NOTE: Common wetting or weeping not sufficient to cause a drip. Leaks or leakage is more than common wetting or weeping. Source of leak should be obvious.

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SECTION 2 - BRAKES - ELECTRIC HYDRAULIC BOOSTER

[X] OPERATION OF COMBINATION ELECTRIC HYDRAULIC BOOSTER SYSTEM

Procedure:

- Depress brake pedal, operation of electric motor should be audible.
- Turn ignition (start) switch to "on" position. Brake warning light should illuminate.
- Depress pedal with a light foot-force (30 lbs.).
- While maintaining this force on the pedal, start engine and sense or feel slight movement of pedal when engine starts.
- The warning light should no longer be illuminated.

Reject Vehicle If:

- Electric motor does not operate with engine off.
- The brake warning light is not illuminated and/or audible warning does not sound on school bus with ignition (start) which is "on" position prior to starting engine.
- Pedal does not move slightly as engine is started while force is on brake pedal.
- Brake warning light remains illuminated after engine is started.

[X] ANTI-LOCK SYSTEM (IF SO EQUIPPED)

Procedure: For vehicles equipped with anti-lock brakes, turn the ignition to "on" and observe the anti-lock warning device. Start the engine and run for several minutes while observing the anti-lock warning device.

Reject Vehicle if: The anti-lock warning device does not glow momentarily with the ignition "on" or during cranking or if it stays on for more than one minute after starting.

Note: On Some Heavy Duty Brakes the Anti-Lock Warning Light does not go out until the vehicle accelerates to 5-7 MPH.

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SECTION 2 - BRAKES - PARKING BRAKE

The parking brake system is a brake system used to hold and maintain a vehicle in a stationary position.

 FIELD TEST METHOD PARKING BRAKE OPERATION

Procedure: Inspect parking brake actuation mechanism function for setting and release. Set parking brake firmly. With the engine running at idle speed, place shift lever in driver position for automatic transmission or in low gear with clutch engaged for standard shift transmissions.

Reject Vehicle If: Actuation mechanism sticks, binds or fails to function or no resistance to vehicle motion is perceived.

 PARKING BRAKE

Procedure: Turn ignition (key) switch to "on" position from the driver's seated position, operate the control for the parking brake and check for application and release. With the parking brake firmly applied, determine the approximate travel reserve of the hand lever or foot pedal.

Reject Vehicle If:

- Parking brake control cannot be reached from the driver's seated position.
- Operating mechanism fails to hold brakes in applied position without manual effort.
- For mechanically activated parking brakes, the operating control "bottoms" before brakes are fully applied. (See Note).
- Parking brakes do not fully apply and release when driver control is operated.
- Parking brake warning light (if so equipped) fails to illuminate.

NOTE: If a spring type parking air brake system is utilized, inspect only for setting and release and not for travel reserve of the hand lever or foot pedal.

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SECTION 2 - BRAKES - PARKING BRAKE

[X] OPERATION OF PARKING BRAKE FOR VEHICLES BUILT AFTER JULY 1, 1977

Equipment: Test ramp of 20% grade with surface of Portland cement or equivalent.

Procedure: All vehicles manufactured after July 1, 1977 must have a parking brake which will hold the vehicle to the limit of traction on a 20% grade.

Reject Vehicle If: Vehicle fails to hold on a 20% grade, either facing forward or rearward on the ramp, with vehicle in "neutral" or parking pawl disengaged.

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SECTION 2 - BRAKES - PARKING BRAKE

[X] CONDITION OF PARKING BRAKE MECHANICAL COMPONENTS

Procedure: Inspect for worn pins, missing or defective cotter pins, broken or missing springs, worn or frozen cables, clevises, couplings, rods and anchor pins.

Reject Vehicle If: Mechanical parts are missing, frozen, broken or badly worn.

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SECTION 3 - TIRES AND WHEELS

INSPECT TIRE TYPE

Reject vehicle If:

- Radial ply tires are used on the same axle with conventional (bias or belted bias) tires or mixed on tandem drive positions even though mounted on different axles.
- Tires of significantly different size or type, such as one snow tire and one regular tire, should not be used on the same axle.

MEASURE TIRE PRESSURE

Equipment: Pressure gauge.

Reject Vehicle If: Inflation pressures are significantly above or below those recommended for tire size and load range or on dual where the inflation pressure is not within 10 psi of each other.

INSPECT FOR TIRE DAMAGE

Reject Vehicle If:

- Tire has tread cuts, snags or sidewall cracks in excess of one inch (25 mm) in any direction and deep enough to expose cords.
- Tire has visible bumps, bulges or knots indicating partial failure or separation of tire structure.
- Tire has visible object imbedded in the tread.

INSPECT FOR RE-GROOVED OR RE-CUT TIRES

Reject Vehicle If:

- Tire has been re-grooved or re-cut below original groove depth, except special tires which have under tread rubber for this purpose and are identified as such.
- Re-grooved tires mounted on front wheels.

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SECTION 3 - TIRES AND WHEELS

 TUBES & FLAPS

Reject Vehicle If:

- Radial tube type tires do not have radial tubes. (Either bias or radial tubes and flaps may be used in bias tires).
- In mounted tires, radial tubes can be identified by red paint or a red ring on the valve stem, or by the word "RADIAL" on the valve stem.

 INSPECT TIRE CORD

Reject Vehicle If:

- Tire is worn or re-grooved so that cord is exposed.
- Sidewall has damaged or exposed body cords.
- Tire has unrepaired fabric break or has been repaired with a blowout patch or has a visible bulge.
- For vehicles over 10,000 lbs. GVWR, steering axle tire has a reinforcement repair to cord body.
- Improper or temporary repair.
- When damage is done to radial tire cords and a section repair is made to reinforce the damaged sidewall or shoulder. The contour change must not project more than 3/8 inch above the surrounding sidewall area.

 INSPECT FOR TIRE WEAR

Equipment: Tread depth gauge or scale.

With Tread Wear Indicator

Reject Vehicle If: Tire is worn so that the tread wear indicators contact the road in any two adjacent grooves at three locations spaced approximately equally around the outside of the tire. (See Note).

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SECTION 3 - TIRES AND WHEELS

Without Tread Wear Indicator

Reject Vehicle If: The tire is worn so less than 2/32 inch of tread depth remains, or as noted below, when measured with a tire tread depth gauge which shall be of a type calibrated in 32 seconds of a inch. Readings shall be taken in a major tread groove of the tire nearest the center at two points of the circumference at least fifteen inches apart. Readings for a tire which has the tread design running across the tire, shall be taken at or near the center of the tire at two points of the circumference, at least fifteen inch apart. (Sec. 14-98a-3 DMV Reg.).

NOTE: For all STV vehicles:

Reject Vehicle If: Vehicle's steering axle tires are worn so less than 4/32 inch (3.2mm) tread remains when measured as described above. All other tires inspect as listed above.

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SECTION 3 - TIRES AND WHEELS

[X] INSPECT FOR RESTRICTED USAGE MARKINGS ON TIRES (RECLASSIFIED TIRES)

Reject Vehicle If:

- Tire is marked "For farm use only," "Official highway use only" or "For racing only," etc., or if the tire size is followed by the letters "NHS" or "SL."

[X] INSPECT VALVE STEM

Reject Vehicle If:

- Valve stem has cracks or is chafed from contact with the spider or rim.
- Valve contacts the brake drum.
- Valve stem is inaccessible for taking pressure readings.

[X] INSPECT WHEELS, RIMS & SPIDERS

Reject Vehicle If:

- Wheel bolts, nuts, studs or lugs are broken, missing, damaged, loose, and wheel nuts are used to retain wheel rim, at least 1 1/2 threads of the stud are not showing beyond the outer edge of the nut.
- Lock ring is mismatched with rim, cracked, bent, sprung, or otherwise damaged.
- Wheel, rim, or spider is cracked, bent, has elongated bolt holes, shows signs of in-service rewelding, or otherwise damaged.
- Rim shows evidence of slippage on spider.
- Valve stem caps are missing.

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SECTION 3 - TIRES AND WHEELS

[X] INSPECT FOR TIRE SIZE OR MISMATCHING

Equipment: Caliper or dual "matching stick" and 1/4 and 1/8 inch gauge blocks.

Procedure:

- Inspect the size and type of construction (bias, bias-belted, radial) on each axle.
- Inspect for retreaded or re-grooved tires on the steering axles.
- For dual tires, measure the difference between the outside diameters of each tire.

REJECT VEHICLE IF:

- Tires are not the same size or type construction on any given axle.
- Bus or truck have retreaded or re-grooved tire on steering axle.
- Diameter of one of the dual is not within 1/4 inch of the other on 8.25-20 and smaller or 1/2" on 9.00-20 and larger.

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SECTION 3 - TIRES AND WHEELS

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SECTION 4 - SUSPENSION & STEERING

[X] LOOSE WHEEL BEARINGS

Equipment: Floor jack or hoist, rule or gauge.

Procedure: With front end of vehicle lifted properly, and brakes released, grab front tire at top and bottom, rock vigorously in and out and record movement. Wheel bearing looseness is detected by the relative movement between the brake drum or disc and the backing plate or splash shield.

Reject Vehicle If:

- Relative movement between drum and backing plate (disc and splash shield) is more than 1/8 inch (3mm) measured at the outer circumference of the tire for vehicles 10,000 lbs. GVWR or less or 1/4 inch (6.4mm) for vehicles more than 10,000 lbs. GVWR.

[X] STEERING LINKAGE PLAY

Procedure:

- First eliminate all wheel bearing movement by applying service brake.
- With vehicle lifted as shown at left and wheels in straight ahead position, grasp front and rear of tire and attempt to move assembly right and left without moving the pitman arm.

Reject Vehicle If:

- Measured total movement at front or rear of tire is greater than:

Wheel Size: 16 inches or less - 1/4 inch (6.5mm)
17 to 18 inches - 3/8 inch (9.5mm)
Over 18 inches - 1/2 inch (13mm)

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SECTION 4 - SUSPENSION & STEERING

[X] KINGPIN PLAY

Procedure:

- First eliminate all wheel bearing movement by applying service brake.
- With front end lifted as illustrated for inspecting wheel bearings, grasp the tire at the top and bottom and attempt to move in and out to detect looseness. A pry bar may be necessary on heavy wheels.
- Measure the movement at the top or bottom of the tire at the outer circumference.

Reject Vehicle If:

- Measured movement at top or bottom of tire is greater than:
Wheel Size: 16 inches or less - 1/4 inch (6.5mm)
17 to 18 inches - 3/8 inch (9.5mm)
Over 18 inches - 1/2 inch (13mm)

Proper lifting for checking looseness of:

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SECTION 4 - SUSPENSION & STEERING

Before inspection the vehicle must be placed on a smooth, dry, level surface. For vehicles equipped with power steering, the engine must be running and the fluid level, belt tension and condition must be adequate before testing.

[X] LASH OR FREE PLAY

Equipment: Ruler, scale, or lash-checking instrument, jack or hoist, and safety stand.

Procedure: With road wheels in straight ahead position, turn steering wheel until motion can be detected at the front road wheels. Align a reference mark on steering wheel with a mark on a ruler and slowly turn steering wheel in the opposite direction until motion can again be detected at the front road wheel. Measure lash at steering wheel. Special lash-checking instruments are also available, measuring free play in inches or degrees. Such instruments should always be mounted and used according to the manufacturer's instructions. With vehicle raised, visually inspect steering leakage, ball studs, tie rod end socket assemblies and all pivot points.

NOTE: On vehicles with power steering, engine must be running.

Reject Vehicle If:

- Steering wheel movement exceeds:

Steering Wheel Size and Lash:

Power Steering

16 inches or less	- 4 1/2 inches (11.5cm)
18 inches	- 4 3/4 inches (12.0cm)
20 inches	- 5 1/4 inches (13.5cm)
22 inches	- 5 3/4 inches (14.5cm)

Manual Steering

16 inches or less	- 2 inches (5.1cm)
18 inches	- 2 1/4 inches (5.4cm)
20 inches	- 2 1/2 inches (6.4cm)
22 inches	- 2 3/4 inches (7.0cm)

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If visual inspection reveals excessive wear and/or looseness in any ball stud, end assembly, pivot point or mechanical linkage.

[X] POWER STEERING

Procedure: Check fluid level and belt tension on power steering pump. Inspect power steering hoses and steering box for leaks.

Reject Vehicle If:

- Fluid is not at proper level.
- Belt is not properly tensioned.
- Leaks are found in power steering system.

[X] STEERING SYSTEM TRAVEL

Procedure: Turn steering wheel through a full right and left turn. (On vehicles without power steering, it may be desirable to unload front wheels slightly by raising wheels off the surface).

Reject Vehicle If:

- Front wheels are incapable of being turned to the right and left steering stops without binding or interference.
- Steering stops are missing or ineffective.

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SECTION 4 - SUSPENSION & STEERING

FRONT WHEEL ALIGNMENT: There are five basic factors which are the foundation of front wheel alignment: Caster, Camber, Toe and Steering Axis Inclination and Toe-Out on Turns. The first three are usually mechanically adjustable and the last two are a part of the vehicle design and not adjustable. Caster and Camber are difficult to determine without sophisticated equipment and are not critical to safety unless excessively out of adjustment or damaged. Overall front wheel alignment can be determined in a somewhat general manner by measuring front wheel toe. If the vehicle has excessive toe-in or toe-out. It is an indication that a complete professional check should be made of all front wheel alignment factors.

REAR WHEEL TRACKING

Procedure: Observe whether rear wheels follow front wheel tracks in "straight ahead" travel.

Alternate Method: Using a tape measure, determine the distance between the centerline of the front wheel spindle and the centerline of the rear axle drive shaft and compare from side to side.* (Front wheels must be in the straight ahead position).

Reject Vehicle If:

- Rear wheel does not follow the front wheel track in "straight ahead" travel.
- The wheel base on one side is different from the wheel base on the other side by more than one inch.
- Rear axle is obviously misaligned.

NOTE: Do not reject if vehicle is designed with different tread widths - front and rear.

- Not applicable if vehicle specifications indicate different left and right wheelbase dimension as designed.

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SECTION 4 - SUSPENSION & STEERING

FRONT WHEEL TOE

Equipment: Approved stationary type alignment equipment

Procedure: With wheels in "straight ahead" position and with "hands off" steering wheel momentarily, drive vehicle slowly over toe measuring device.

Reject Vehicle If: Excessive toe exists. Normally a reading of forty (40) feet per mile or greater will be considered excessive.

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SECTION 4 - SUSPENSION AND STEERING - WHEEL ALIGNMENT

[X] COMPUTERIZED FRONT WHEEL TOE TESTER

NOTE: See computerized plate brake test procedure before performing alignment test as they are combined in this equipment.

Equipment: Computerized Front Wheel Toe Tester.

Procedure: After initial stop in performing computerized brake test, with wheels in straight ahead position and with hands off steering wheel momentarily, drive vehicle slowly over toe measurement plates.

Advise driver if: Right side of display indicates a reading of 20 to 30 feet per mile in or out. Note: The Hunter tester will indicate this result in YELLOW.

Reject vehicle if: Toe (in or out) exceeds 30 except 1975 to 1981 Subaru 4wd vehicles. Note: Both testers will indicate this result in RED.

[X] COMPUTERIZED REAR WHEEL TOE TESTER

Equipment: Same as front wheel toe.

Procedure: Have driver position vehicle so rear wheels are on compensation plate. (see diagram on following page) After following individual machine procedures (noted below) have vehicle drive slowly forward over toe measurement plates.

For the Hunter machine: Press K-4 key then press the "shift key" until the SIDESLIP TESTS are indicated at bottom of screen. Under "SIDESLIP REAR" press the K-2 key.

For the AREX machine: Press "E" then press key 7. With 3 additional tests showing on the screen press key 2 for "SIDESLIP REAR AXLE".

Reject vehicle if: Toe reading exceeds 40 feet per mile in or out.

NOTE: Both testers will indicate this result in RED.

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SECTION 4 SUSPENSION AND STEERING

[X] Front End Field Inspection

Procedure: Visually inspect tire tread wear pattern on steering axle tires. Check for obvious misalignment of front wheels.

Reject vehicle if:

- Wear patterns on tires indicates
- Wheel misalignment is obvious

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SECTION 4 - SUSPENSION & STEERING

[X] VISUALLY INSPECT SPRINGS, TORSION BARS AND TORQUE ROD

Equipment: Hoist or hydraulic jack, safety stand and trouble light.

Procedure: Visually inspect for broken leaf springs, coil springs, torque rod, or torsion bar, air bag damage. Inspect spring shackles, pins or bolts bushings, "U" bolts, spring center bolts, and remaining suspension members.

Reject Vehicle If:

- Any bushings which are destroyed, damaged, deteriorated or missing.
- Springs, torque rods, torsion bars or other suspension members are broken or shifted.
- Shackles or "U" bolts are worn or loose or spring center bolt is broken or sheared.

[X] MOR/RIDE RUBBER SUSPENSION SYSTEM

Equipment: Hydraulic Jack, 3" wide blade knife, safety stand, trouble light.

Procedure: Visually inspect for cracked rubber springs or rubber springs separated from the backing plate. Damaged, loose or bent sway bar or worn sway bar bushings. Loose U-bolts, leveling pad, including missing bolts from these assemblies.

Reject Vehicle If:

- If there are cracks anywhere in the rubber, that a three inch wide blade can penetrate or if the rubber is separating from the backing plate more than 3/4".
- If sway bar is loose and/or rubber bushings are worn.
- If sway bar is bent.
- If less than 3" vertical clearance above moving suspension parts or axle.
- If less than 9/16" horizontal clearance between U-bolts and frame rails.
- If U-bolts are loose.
- If leveling pad or bolt is loose or missing.
- If hanger cross-straps are loose and/or missing
- Severe rubbing of U-bolts on chassis frame.
- If rubber spring is completely separated.
- If sway bar and/or sway bar bracket is broken loose.

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SECTION 4 - SUSPENSION & STEERING

[X] AIR SUSPENSION

Procedure:

- With the entire suspension system drained of air following the manufacturer's recommended procedures, check that air remains in the brake system then start the engine and observe the air pressure at which air begins to flow into the suspension system and lift the vehicle.
- With the system fully charged and using a spray bottle with soapy water, inspect for any leaks at the bellows, connections, height or level control valve, pressure holding valve or hoses.
- Inspect for loose suspension support studs and mounting bolts, radius rod anchor bolts & nuts, and level control valve mounting & linkage securement.
- Measure ride height between axle and bumper.
- Inspect air bag bellows for cracks, puncture, abrasions, or other damage.
- Inspect air bag piston surface for smoothness and cracks.

Reject Vehicle If:

- Pressure protection valve does not hold air pressure in primary brake supply tank.
- Air begins to flow into the suspension system below 55 psi.
- There is any audible or visible leakage observed in the air suspension system or any air bag is deflated.
- Any suspension support studs or other system components noted above are found loose, displaced, or missing.
- Ride height is not within manufacturer specifications.
- Any cracks in or damage to any air bag bellows.
- Air bag piston is rough or cracked.

CAUTION: Inspector should not use a creeper or otherwise lie underneath vehicle because there may not be enough room when air is drained from the bellows. Vehicle should be properly jacked or positioned over a pit.

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SECTION 4 - SUSPENSION & STEERING

[X] AIR SUSPENSION (continued)

DIAGRAMS OF TYPICAL COMPONENTS

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[X] INSPECT SHOCK ABSORBERS

Equipment: Hoist or hydraulic jack and safety stand, scale, trouble light.

Procedure: With vehicle on a hoist or jacked up, visually inspect shock absorbers for excessive leakage, looseness of mounting brackets and bolts.

Reject Vehicle If:

- Severe leakage (not slight dampness) is evident.
- Mounting bolts or mounts are loose or broken.
- Rubber bushings are destroyed, damaged, deteriorated or missing.
- Any portion of shock absorber is severely corroded or rusted.

[X] VISUALLY INSPECT CHASSIS

Procedure: Visually examine the chassis frame member or structural member of a unitized or monocoque body.

Reject Vehicle If:

- There are cracks, or loose or missing connecting fasteners that may degrade the safety of the vehicle or compromise the attachment of the suspension or its handling characteristics.

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Some light buses are equipped with ball joints and there is a trend toward the use of "wear-indicating" ball joints. The inspection of both ball joints with and without wear indicators will be discussed.

[X] BALL JOINTS WITHOUT WEAR INDICATORS

Equipment: Dial indicator, swivel and clamp. Floor jack or hoist, safety stand and pry bar.

Procedure:

- Depending on the construction of the suspension system, unload the ball joints by properly raising the vehicle.
- Attached dial indicated to control arm to measure movement accurately between ball joint and its socket.
- To check vertical movement, position a pry bar under the front tire and with a lifting motion sufficient to overcome the weight of the wheel assembly, move wheel up and down and observe movement shown on dial indicator.
- To check horizontal movement, grasp the tire and wheel assembly at the top and bottom. Move in and out to detect looseness. (More horizontal movement is allowable because of the nature of most ball joint construction. Some manufacturers do not accept horizontal movement as being indicative of ball joint wear).

Reject Vehicle If: Ball joint movement is in excess of manufacturers' service specifications.

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[X] PRE-LOADED BALL JOINTS

Equipment: Dial indicator, swivel and clamp. Floor jack, safety stand, pry bar.

Procedure: Using the same method as above, inspect for ball joint movement relative to its socket. These ball joints are pre-loaded by rubber or springs under load (or compression), and should have very little movement in a vertical direction - no more than manufacturer specification.

Reject Vehicle If: Vertical movement exceeds values specified manufacturers specifications.

NOTE: In checking for vertical motion of ball joints, keep in mind that the load carrying joint is unloaded, and that a pry bar pressure sufficient only to lift the weight of the wheel assembly is required. If the inspector uses the "leverage" of the pry bar to exert excessive pressure, he can easily "force" an apparent ball joint movement and get a false reading. This may result in expense replacement of perfectly good joints.

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[X] BALL JOINTS WITH WEAR INDICATORS

Procedure: Support vehicle with ball joints loaded (in normal driving attitude). Wipe grease fitting and checking surface free of dirt and grease. Determine if checking surface extends beyond the surface of the ball joint cover.

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[X] BALL JOINTS WITH WEAR INDICATORS

Reject Vehicle If: Checking surface is flush with or inside the cover surface.

NOTE: Vehicles with wear indicating ball joints - inspect with ball joints loaded.

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Steering Gear Box

Procedure - Visually inspect steering box for any cracks in the housing or mounting brackets. Note any fluid leaks. Check for loose, ineffective or missing mounting bolts.

Reject Vehicle If -

- * Any cracks are observed in the steering box case or any mounting brackets.
- * Any frame cracks in the area of the location where the steering box attaches to the vehicle.
- * Any fluid leaks from the steering box other than normal weeping.
- * Any loose, missing or ineffective fasteners.

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 Table 1 - Manufacturer's Tolerance for Ball Joint Wear With Spring
 Or Torsion Bar On Lower Arm 1971 - 1994.

Chrysler Models	Year	Vertical Movement		Horizontal Movement	
		Lower	Upper	Lower	Upper
DODGE					
B1, B2, B3, D1, D2, D3 D15, D25, D35, RD2, MB3, CB3, AD1, Ramcharger.....	71-94	.020" (b)		(a)	
Dakota 4 x 2.....	87-94	.020" (b)		(a)	
PLYMOUTH					
PB1, PB2, PB3, PD1, Trail Duster.....	74-81	.020" (b)		(a)	

General Motors Models	Year	Vertical Movement		Horizontal Movement	
		Lower	Upper	Lower	Upper
CHEVROLET/GMC					
M-Van..... C (2WD P.U.) K (4WD P.U.)..... L-Van..... R(Full P.U.), V (Utility), G-Van..... S (Small P.U.) T (Small Utility) 2WD.. S (Small P.U.) T (Small Utility) 4WD..	85-94 88-94 90-94 81-94 82-94 83-94	 Wear Ind. Wear Ind(i)	 N/A N/A Wear Ind.	(c) .08" .08" (e) N/A	 .125" .125" (f)

-
- (a) Do not test ball joints by horizontal movement.
 - (b) Preloaded by rubber or springs.
 - (c) If the lower is within specification and horizontal looseness exceeds the limit, check the upper by disconnecting ball joint from knuckle. If any looseness is found or the stud can be twisted with fingers, replace.
 - (d) Measure distance between the tip of the ball joint and the tip of the grease fitting when the wheel and tire are removed and the weight of the control arms are supported at the wheel hub and drum to hang free. Measure the distance between tip of ball joint stud and grease fitting. If the distance from the first measurement exceeds 3/32" replace.
 - (e) Upper joint is spring loaded and if there is any lateral movement or can be twisted in its socket with fingers, replace.
 - (f) Do not pry between the lower control arm and drive axle seal (damage to the seal will result).

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 Table 2 - Manufacturer's Tolerance for Ball Joint Wear -
 Light Truck and MPV's 1994 - 1997

Model	Year	V. Movement	H. Movement
<u>CHRYSLER/PLYMOUTH/DODGE</u>			
Ram Wagon/Van	94-97	.020"	(a)
Ram Pickup	94-97	.020"	(a)
Dakota	94-97	.020"	(a)
Caravan	84-97	.000"	(a)
Voyager	84-97	.000"	(a)
Town & Country	94-97	.000"	(a)
<u>FORD/MERCURY</u>			
F-150, F-250, F-350	94-97	(h)	.031"
F Super Duty Body	94-97	(h)	.031"
Bronco	94-97	(h)	.031"
Econoline (all series)	94-97	(h)	.031"
Villager	94-97	No Play	(a)
Aerostar	94-97	(h)	.031"
Ranger	94-97	(h)	.031"
Explorer	94-97	(h)	.031"
Windstar	95-97	(h)	No Play
<u>GENERAL MOTORS/CHEVROLET/OLDSMOBILE/PONTIAC</u>			
Astro, Safari	94-97	Wear Ind.	.125"
Chevy Full Size Vans incl.			
G10 and G20 models	94-97	Wear Ind. (i)	(a)
G30 models	94-97	Wear Ind. (i)	.125"
GMC and Chevy full size pickups and MPV's-			
2 wheel drive	94-97	Wear Ind. (i)	.125"
4 wheel drive	94-97	.80(j)	.125"
Pontiac Transport	90-97	.020	(a)
Olds Silhouette	90-97	.020	(a)
Chev. Lumina APV	90-97	.020	(a)

For NOTES (a) thru (f) see Table 1

(g) See inspection procedure Chrysler Ball Joint

(h) Do not test ball joints by vertical movement

(i) Vertical movement is checked by sight. Wear is indicated by the position of the housing into which the grease fitting is threaded. This round housing projects 1.27mm (0.050") beyond the surface of the ball joint cover on a new, unworn joint. (Normal wear will result in the surface of this housing retreating very slowly inward).

(j) Do not pry between the lower control arm and the drive axle seal or in such a manner that the ball joint seal is contacted. Damage to the seal will result (4wd).

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[X] CHECK LAMP FUNCTION VISUALLY

Procedure: Turn on all lights and check the following:

- Actuate turn signal lever right and left and observe function of turn signal lights and indicator lamps.
- Place vehicle in reverse gear and check backup lamps (if vehicle is so equipped).
- If vehicle is manufactured after March 31, 1977 or otherwise so equipped, actuate the following and observe lamps:

Hazard warning lamps

Indicator lamps

Stop lamps

Headlamps - upper and lower beam

Tail lamps

Parking lamps

Side marker lamps

Reflex reflectors (A/K/A reflectors)

Clearance lamps

Identification lamps

License plate lamp(s)

All others

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- Additionally for school buses, observe the function of:
 - Stop Semaphore (required if manufactured after September 30, 1984)
 - Red Flasher lamps (7 inch)
 - Amber flasher lamps (optional) vehicles manufactured after 9/30/84 (required).
 - Flasher lamp indicators (individual lamps required after October 1, 1988 on Type 1 School bus only)
 - Flasher lamp indicator
 - Stepwell lamp
 - All interior lamps

Reject Vehicle If:

- Any bulb or sealed beam unit fails to light.
- Turn signals do not properly indicate right and left when so switched.
- Back-up light system does not turn off automatically when vehicle goes forward.
- Lamp shows color contrary to applicable law.
- Lamp fails to light the proper filament indicated at switch position.
- Any lamp or reflector does not direct light properly.
- Eight light warning system does not sequence properly.
- Indicator lamp fails to operate.

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Reject Vehicle If: (Cont)

- Auxiliary equipment is placed on, in, or in front of any lamp.
- Lamp assembly improperly fastened.
- Lamp has a cracked, broken, or missing lens.

Additionally for school buses

- 7 inch red or amber flasher lamps do not alternate properly.
- Lamps are not in required location.
- Stop semaphore is missing (where required) or does not operate properly if installed.
- Flasher lamp indicators are missing, or inoperative.

Note: On air operated service doors red stop on signal lamps must be installed to be operating prior to the door opening and automatically turn off upon closing the door.

WARNING: Avoid touching or contacting the inner bulb in halogen headlamps or halogen driving lamps. Severe burns could result.

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HEADLAMP AIMING - MECHANICAL METHOD

Vehicles must be located on a level area

ALWAYS ADJUST LIGHTS TO A SETTING OF 0-0 WHEN USING A MECHANICAL AIMER.
U.S. headlamps are either "sealed beam" or "replaceable bulb" types.

Sealed Beam Headlamps

1. 177mm diameter, 2D1 both upper and lower beam.
2. 146mm diameter, 1C1 upper beam, 2C1 lower beam.
3. 142x200mm rectangular, 2B1 both upper and lower beam.
4. 100x 165mm rectangular, 1A1 upper beam, 2A1 lower beam and 2E1 both upper and lower beam.

Replaceable Bulb Headlamp

9004 Replaceable Bulb, both upper and lower beam.

[X] HIGH BEAM (TYPE 1)

Equipment: Approved set of mechanical aimers. Calibrate mechanical aimer to "0" for vertical aim. Consult aimer instruction manual for procedure.
(See pages 3.5.13 and 3.5.14 for ADDITIONAL INFORMATION HEADLAMP AIMING)

Procedure: Attach mechanical aimer to Type 1 in accordance with instructions. Take readings.

Reject Vehicle If:

Horizontal aim is more than:

- 4 inches to the LEFT or
- 4 inches to the RIGHT

Vertical aim is:

- higher than 4 inches UP or
- lower than 4 inches DOWN

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[X] LOW BEAM (TYPE 2)

Equipment: Approved set of mechanical aimers. Calibrate mechanical aimer to "0" for vertical aim. Consult aimer instruction manual for procedure. (See pages 3.5.13 and 3.5.14 for ADDITIONAL INFORMATION HEADLAMP AIMING).

Procedure: Attach mechanical aimer to Type 2 units (with the Figure "2" molded at the top of the lens) in accordance with instructions. Take readings.

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Reject Vehicle If:

Horizontal aim is more than:

- 4 inches to the LEFT or
- 4 inches to the RIGHT

Vertical aim is:

- higher than 4 inches UP or
- lower than 4 inches DOWN.

Vertical Corrective Aim Chart For 25 Feet

Headlamp/Foglamp Mounting Height	Correct Screen Aim
22 inches - 36 inches	0.0
36 inches - 48 inches	-2.0 inches
48 inches - 54 inches	-2.5 inches

NOTE: All equipment for testing headlamps must comply with the Society of Automotive Engineers Recommended Practice For Headlamp Inspection Equipment. If a mechanical aimer is used, it shall be in good repair and adjustment, and shall be used according to the manufacturer's instructions and must be calibrated to the slope of the floor on which the vehicle stands.

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THE FOLLOWING LIGHTS OR REFLECTORS ARE NOW REQUIRED ON VEHICLES
MANUFACTURED AS OF THE DATES NOTED.

Note: Composite Vehicles are not subject to FMVSS

1) Motorcycles:

Red reflector on each side at rear	01/01/69
Amber reflector on each side at front	01/01/69
Turn Signals front and rear	01/01/73

2) Passenger Cars:

One white backup lamp	01/01/69
Turn signals front and rear	01/01/69
Four way flasher hazard warning	01/01/69
One red reflector OR lamp on each side near the rear	01/01/69
One amber reflector OR lamp on each side near the front	01/01/69
One red reflector AND lamp on each side near the rear	01/01/70
One amber reflector AND lamp on each side near the front	01/01/70
Park lights must go on with headlamps	01/01/70
One center high mounted stop lamp	09/01/85

3) Multipurpose Passenger Vehicles, Trucks and Buses:

Same as passenger cars except for the
center high mounted stop lamp.

Center high mounted stop lamp required
on vehicles 10,000 lbs. or less GVWR and
with overall width of less than 80".

09/01/93

Red and white reflective material
required on sides and rear of trailers
(except manufactured offices or
dwellings) 80" or wider and GVWR over
10,000 lbs.

12/01/93

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[X] HEADLAMP TESTING MACHINE - USED IN DMV INSPECTION LANE

Equipment: HEADLIGHT TESTER WEAVER MODEL WX-51 (Presently used in DMV Indoor Inspection Lanes)

Procedure:

1. Line up tester with center of vehicle using the "sight" located on left side of housing.
2. Check tester and insure that it is level and plumb.
3. Position tester in front of left or right headlight lowering tester to approximate light height.
4. Look in view window-top of tester-centering headlight with lens.
5. Turn side aim knob until needle centered.
6. Turn vertical knob until needle centered.
7. Check candlepower meter reading.
8. Check knob pointer reading indicated on face of dial.

Reject Vehicle If:

- Candlepower meter does not read good or better
- Knob pointers are not within the range of:
"4 left" or "4 right" on side aim knob and
"4 up" or "4 down" on vertical aim knob.

NOTE: If high beams are checked and acceptable it must be assumed that the low beams are also in proper or acceptable aim on headlights with a dual beam from a single housing.

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Headlamp aiming by the screen method requires a level area in a darkened location, sufficient for the vehicle and an additional 10 to 25 feet from lamps to screen. The vehicle **MUST** be located accurately in front of the screen. Study **HEADLAMP AIMING INFORMATION** for details about setting up this test properly.

[X] HIGH BEAM (TYPE 1 OR UF)

Equipment: Approved marked screen, adequate test area, and yard stick or tape measure.

Procedure: With the vehicle properly located and loaded, switch headlamps to high beam and observe center of high intensity zone on the screen.

Reject Vehicle If:

Center is Horizontally:

- More than "X" inches RIGHT
- More than "X" inches LEFT of straight ahead

Center is Vertically:

- More than "Y" inches ABOVE or
- More than "Y" inches BELOW the horizontal line.

KEY

X & Y = 1.6" at 10 ft.
2.4" at 15 ft.
3.2" at 20 ft.
4.0" at 25 ft.

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[X] LOW BEAMS (TYPE 2,, LF, OR REPLACEMENT BULB)

Equipment: Approved marked screen, adequate test area, and yard stick or tape measure.

Procedure: With the vehicle properly located and loaded, switch headlamps to low beam and observe left and top edges of high intensity zone on the screen.

Reject Vehicle If:

Left edge is Horizontally:

- More than "X" inches LEFT
- More than "X" inches RIGHT of straight ahead

Top edge is Vertically:

- More than "Y" inches ABOVE or
- More than "Y" inches BELOW the horizontal line:

KEY

X & Y = 1.6" at 10 ft.
2.4" at 15 ft.
3.2" at 20 ft.
4.0" at 25 ft.

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NOTE: ALWAYS inspect the following sealed beam and replaceable bulb headlamps on LOW BEAM only:

- 5 3/4 inch, marked 2, 2C, or 2C1
- 7 inch, marked 2, 2D, or 2D1
- 100x165mm rectangular, marked 2A, 2A1, or 2E1
- 200x142mm rectangular, marked 2B, or 2B1
- Replaceable Bulb Headlamp
- 92x160mm rectangular, marked LF.

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FOG LAMP AIMING - SCREEN METHOD

If a vehicle is equipped with fog lamps, they should be properly aimed. The movable horizontal and vertical lines on the aiming screen should be located so they cross at the "straight ahead" positions of the centerline of each fog lamp, whether symmetrical or non-symmetrical.

KEY

X & Y = 1.6" at 10 ft.
 2.4" at 15 ft.
 3.2" at 20 ft.
 4.0" at 25 ft.

[X] SYMMETRICAL BEAM - FOG LAMP AIMING-SCREEN METHOD

If vehicle is equipped with fog lamps, they should be properly aimed. The movable horizontal and vertical lines on the aiming screen should be located so they cross at the "straight ahead" positions of the centerline of each fog lamp, whether symmetrical or non-symmetrical.

[X] FOG LAMP INSPECTION

Procedure: With vehicle properly located and loaded (the same as for headlamp aim inspection) switch on the fog lamps and observe the location of the high intensity zone on the screen.

[X] SYMMETRICAL BEAM

Procedure: When properly aimed, the top edge of the high intensity zone is set "Y" inches below horizontal centerline of fog lamp, and the center of the high intensity zone is set on the vertical centerline (see illustration).

Reject Vehicle If: Center of high intensity zone is more than:

Horizontally

- X inches LEFT
- X inches RIGHT of straight ahead line, and

Top edge is:

- Vertically ABOVE centerline level.

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[X] NON-SYMMETRICAL BEAM

Procedure: When properly aimed, the top edge of the high intensity zone is set at the horizontal centerline of the fog lamp, and the left edge of the high intensity zone is set at the vertical centerline. (Same as low-beam-Type 2 headlamps).

Reject Vehicle If: Left edge of high intensity zone is:
Horizontally more than:

KEY

- X inches LEFT of, or
 - X inches RIGHT of
straight ahead line.
- Top edge is:

Vertically more than:

- Y inches ABOVE, or
- Y inches BELOW the horizontal line.

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HEADLAMP AIMING INFORMATION

HEADLAMP AIMING BY THE SCREEN METHOD

First, locate the vehicle so that it is square with the screen and with the front headlamps directly over a reference line which has been painted on the floor.

Next, locate the center line on the aiming screen so that it is in line with the center of the vehicle. This can be done, as shown below, by sighting through the center of the rear window of the vehicle and over the hood ornament - have vehicle moved until it is in alignment with these two points. If there is not a center hood ornament, mark the center of the front and rear windows with narrow strips of masking tape. Use these "sights" to locate the center line of the aiming screen directly in line with the vehicle axis. Measure the height of the headlight center when using fixed lines and find appropriate line on the screen.

AIMING AREA REQUIRED

It is desirable to have a specific aiming area in a darkened location. This should be sufficient for the vehicle and an additional 25 feet (minimum of 10 feet required), measured from the face of the lamps to the front of the visual screen.

The floor on which the car rests must be flat, and level with the bottom of the screen. If the floor is not level, compensate.

AIMING SCREEN

If a screen is used, it should be 5' high x 12' wide (8 foot minimum required) with a matte white surface, well shaded from extraneous light, and properly adjusted to the floor on which the vehicle stands, wherever possible. Provisions may be made for moving the screen so that it can be aligned parallel with the rear axle and so that a horizontal line drawn perpendicularly from the centerline of the screen will pass an equal distance midway between the two headlamps.

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AIMING SCREEN (Continued)

The screen may be provided with a fixed vertical centerline, two laterally adjustable vertical tapes, and one vertically adjustable horizontal tape.

If a regular commercial aiming screen is not available, the screen may consist of a vertical wall having a clear, uninterrupted area, approximately 6 feet high and 12 feet wide wherever possible, with a minimum of 5'x8'.

HEADLAMP AIMING INFORMATION

The surface should be finished with a washable non-gloss white paint.

After the aiming screen has been set up in its permanent location, it is necessary to paint a reference line on the floor directly under the lens of the lamps to indicate the proper location of the headlamps when they are being aimed and sufficient number of lines on the screen to account for the varying heights of headlamps.

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SECTION 5 - LIGHTING & ELECTRICAL

LIGHTING CODES AND DEFINITIONS

S A E IDENTIFYING CODE FOR LIGHTS AND SIGNALING DEVICES

<u>DEVICE</u>	<u>SAE IDENTIFICATION CODE DESIGNATION</u>
Reflex Reflectors	
Class A.....	A
Class B (used prior to 1969 only).....	B
Turn Signal Lamps	
Class A.....	1
Class A (spaced less than 4 inches from headlamp).....	12
Class B - Motorcycle.....	D
Side Turn Signal Lamps (for vehicles 30 feet or more in length).....	E
Side Turn Signal Lamps (for vehicles less than 30 feet in length)...	E2
Fog Lamps.....	F
Headlamp Housing.....	H
Cornering Lamps.....	K
License Plate Lamps	
Motorcycle Headlamps (motorcycle Type).....	M
Motorcycle Headlamps (Motor Driven Cycles).....	N
Spot Lamps.....	O
Identification or Parking Lamps.....	P
Clearance or Side Marker Lamps.....	P1 or P2
Combination Clearance and Side Marker Lamps.....	PC
Turn Signal Operating Units:	
Class A.....	Q
Class B.....	QB
Vehicle Hazard Warning Signal Operating Unit.....	QC
Back Up Lamps.....	R
Stop Lamps.....	S
Supplemental High-Mounted Stop and Turn Lamps.....	U
Tail Lamps.....	T
Liquid Burning Emergency Flares.....	V
Warning Lamps, Emergency and Service Vehicles.....	W or W1
Warning Lamps School Buses.....	W2
Warning Lamps 360 Degree Emergency.....	W3
Emergency Reflex Reflectors.....	W4
Emergency Electric Lanterns.....	X
Driving Lamps.....	Y
Passing Lamps (Auxiliary Low Beam Lamps).....	Z
Turn Signal Flasher.....	J590c
Hazard Warning Signal Flasher.....	J945
Warning Lamp Alternating Flasher.....	J1054

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LIGHTING TERMS AND DEFINITIONS:

Asymmetrical Beam (non-symmetrical) - An asymmetrical beam is one in which both sides are not symmetrical with respect to the median vertical plane of the beam. All lower beams are asymmetrical.

Back Up Lamps - Back up lamps are lamps used to provide illumination behind the vehicle, and to provide a warning signal when the vehicle is in reverse gear.

Cornering Lamps - Cornering lamps are steadily burning lamps used when the turn signal system is operating to supplement the headlamps by providing additional road illumination in the direction of the turn.

Driving Lamp - An auxiliary lamp or lamps that may be used to supplement the upper beam of the regular headlamps.

Emergency Warning Lamps - Emergency warning lamps are lamps which provide a flashing light to identify an authorized vehicle on an emergency mission. The emergency signal may be either a rotating beacon or pairs of alternately or simultaneously flashing lamps.

Fog Lamps - Fog lamps are lamps which may be used with or in lieu of the lower beam headlights to provide illumination under conditions of rain, snow, dust or fog.

Halogen Sealed Beam Unit - An integral and hermetically sealed optical assembly containing a halogen inner bulb.

Headlamp Lower Beam - A distribution of light so directed as to avoid glare in the eyes of oncoming drivers while providing illumination ahead of the vehicle and intended for use in congested areas and on highways when meeting other vehicles within a distance of 500 feet.

Headlamp Upper Beam - A distribution of light intended primarily for distance illumination and for use on the open highway when not meeting other vehicles.

Hazard Warning Lamps - Hazard warning lamps are turn signal lamps which flash simultaneously to warn of the presence of a vehicular hazard.

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Indicator Lamps - Indicator lamps are lamps visible to the operator of a vehicle that indicate:

1. appropriate electrical circuits are in operation.
2. malfunction of vehicle performance, and
3. requirement for remedial action by the operator of the vehicle.

Lane Changer - A lane changer is a device, usually incorporated in the turn signal switch which will actuate the turn signal lamps when held by the driver. It is intended for momentary use for signaling a lane change. When released by the operator, it will return to neutral and deactivate the signal lamp.

License Plate Lamps - License plate lamps are lamps used to illuminate the license plate on the rear of a vehicle.

Operating Units or Switches - Operating units or switches are devices by which the functioning of lamps are controlled.

Parking Lamps - Parking lamps are lamps used to designate the front of a parked vehicle.

Passing Lamp (Auxiliary Low Beam) An auxiliary lamp or lamps that may be used to supplement the low beam of a standard headlamp system. It is not intended for winding roads or congested city areas.

SAE Lighting Identification Code - The SAE lighting identification code is a series of standardized markings for lighting devices which a manufacturer or supplier may use to mark his product to indicate the SAE Lighting Standard or Standards to which the device is designed to conform. The code is not intended to limit the manufacturer or supplier in applying other markings to the devices.

School Bus Alternately Flashing Red Signal Lamps - Lamps mounted at same horizontal level, intended to identify vehicle as school bus and to inform other users of highway that such vehicle is stopped or about to stop on roadway to take on or discharge school children. There shall be two red lamps at rear of vehicle and two at front of vehicle which shall be controlled by a manually actuated switch, and when actuated shall flash alternately.

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Sealed Beam Headlamp Assembly - A sealed beam headlamp assembly is a major lighting device used to provide general illumination ahead of the vehicle. It consists of the following:

- * One or more sealed beam units (bulb assembly).
- * Means for mounting securely to the vehicle.
- * Means to permit required aim adjustment.

Sealed Beam Unit - An integral and hermetically sealed optical assembly with the name "Sealed Beam" molded in the lens.

Sealed Beam Unit 5 3/4 Inch Type 1 or 1C1 - A sealed unit 5 3/4 inches in diameter having a single filament and providing only an upper beam distribution of light.

Sealed Beam Unit 5 3/4 Inch Type 2 or 2C1 - A sealed unit 5 3/4 inches in diameter having two filaments, one filament providing the lower beam and one filament providing fill in light for the upper beam. It is aimed on the lower beam.

Sealed Beam Unit 7-Inch - A sealed unit 7 inches in diameter providing an upper and a lower beam. **Two similar units are used on a vehicle.** This unit is identified by a number "2" or "2D1" on the lens and is aimed on the lower beam.

Sealed Beam Unit 7-Inch (no identifying number on lens) - A sealed unit 7 inches in diameter providing an upper and lower beam. **Two similar units are used on a vehicle.** This is an obsolete unit no longer being installed in production. It should be aimed in the upper beam.

Sealed Beam Headlamp Type 1A or 1A1 6 1/2 x 4 1/4 Inch Rectangular - A sealed unit 6 1/2 x 4 1/4 inch rectangular headlamp having a single filament and providing only an upper beam distribution of light.

Sealed Beam Headlamp Type 2A or 2A1 6 1/2 x 4 1/4 Inch Rectangular - A sealed unit 6 1/2 x 4 1/4 inch rectangular headlamp having two filaments, one filament providing the lower beam and one filament providing fill-in light for the upper beam. It is aimed on the lower beam.

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Sealed Beam Headlamp Type 2B or 2B1 200mm x 142mm Rectangular - A sealed unit 200mm x 142mm (about 8x5 inches) rectangular headlamp having two filaments, one filament providing the lower beam and one filament providing the upper beam. It is aimed on the lower beam.

Side Marker Lamps - Side marker lamps are lamps on the left and right sides, beamed to the side. They are located near the front and rear on each side and, for vehicles over 30 feet in length, are also located at the midpoint (intermediate side marker).

Stop Lamps - Stop lamps are lamps giving a steady warning light to the rear of a vehicle, to indicate the intention of the operator of the vehicle to reduce speed or stop.

Symmetrical Beam - A symmetrical beam is one in which both sides are symmetrical with respect to the median vertical plane of the beam. Lamps having symmetrical beams are:

- * 5 3/4 inch Type 1 or 1C1
- * 5 3/4 inch Type 2 or 2C1 (upper beam filament)
- * All 7-inch units (upper beam filament)
- * 200 mm x 142mm units (upper beam filament)

Tail Lamps - Tail lamps are lamps used to designate the rear of a vehicle.

Turn signal Lamps - Turn signal lamps are lamps which provide a flashing warning light to indicate the intended direction of the turn.

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ELECTRICAL SYSTEM

To save time, the inspector should develop his own plan or sequence for checking miscellaneous electrical items, many of which can be inspected while looking at other items. This comes with practice.

[X] HORN

Procedure: Horn(s) should be securely fastened and work properly.

Reject Vehicle If: Horn(s) is loose or fails to function.

[X] REVERSE DIRECTION ALARM (required on school buses manufactured after March 31, 1977).

Procedure: With engine running and right foot firmly on service brake pedal, place transmission shift lever in reverse gear.

Reject Vehicle If:

- * alarm sound cannot be heard from driver seat.
- * alarm is not mounted at or near rear of vehicle.

[X] ELECTRICAL SWITCHES

Procedure: All switches should function properly.

Reject Vehicle If: Switches fail to function or turn signal switch fails to cancel. (if so designed).

[X] ELECTRICAL WIRING

Procedure: Check to make sure all wiring is not chafed, bare or contacting sharp objects, is sufficiently supported, and properly secured.

Reject Vehicle If: Wiring insulation is:

- * worn, chaffing, or rubbed bare.
- * shows any evidence of burning, short circuiting.
- * is not sufficiently supported or properly secured.

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ELECTRICAL SYSTEM

[X] ELECTRICAL CONNECTIONS

Procedure: All connectors shall be clean, tight, and secure.

Reject Vehicle If: Connection are loose or show signs of excessive corrosion.

[X] AUTOMATIC TRANSMISSIONS ONLY

Procedure: Check neutral starting system to determine that starter operates only with gear selector in "P" and "N". Set parking brake, place wheel blocks and with foot brake applied turn on ignition switch.

Reject Vehicle If: Starter operates with gear selector in any gear other than "P" and "N".

[X] INSTRUMENTATION

Procedure: Check for presence and operation of all required instrumentation.

Reject Vehicle If: Any required instrumentation is missing, inoperative, unreadable or not properly illuminated.

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[X] AIR BAG READINESS LIGHT

PROCEDURE:

Turn the ignition key to the on position. The air bag readiness light will indicate normal system operation by lighting for 6-8 seconds, then turn off. A system malfunction is indicated by the flashing or continuous illumination of the readiness light or failure of the light to turn on, or if five sets of five "beeps" are heard (concurrent with indicator failing to light).

REJECT VEHICLE IF:

If the air bag indicator fails to light, or continuously flashes, or if five sets of five "beeps" are heard (concurrent with indicator failing to light).

EXCEPTIONS:

The following vehicle(s) are not equipped with an AIR BAG READINESS LIGHT due the self-contained nature of their system.

Jeep: Cherokee models only. (The 5th character of the VIN will be a "T" or a "J" for the 1994-95 model years).

[X] GENERAL MOTORS VEHICLES AIR BAG READINESS LIGHT

PROCEDURE:

Turn the ignition key to the on position. The air bag readiness light will indicate normal system operation by blinking 7-9 times, then turn off. A system malfunction is indicated by the continuous flashing or illumination of the readiness light or failure of the light to turn on.

REJECT VEHICLE IF: If the air bag indicator fails to light, or continuously flashes or illuminates.

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SECTION 6 - VEHICLE GLAZING

Automotive safety glazing is marked with the manufacturer's trademark and the letters "AS" followed by a number from 1 through 11. Only AS1 (or AS10 - Bullet Resistant) may be used in the windshield. Safety glazing for 1966 and later models also has a glass manufacturer's model number or a DOT code number. See **ADDITIONAL GLAZING INFORMATION** for position numbers, discoloration areas and markings.

[X] PROPER MARKINGS

Procedure: Inspect glazing for proper markings.

Reject Vehicle If:

- * Improper or unmarked glazing materials are used for specific positions.
- * Any materials other than specified materials are used.

[X] LEFT FRONT WINDOW

Procedure: Inspect operation of window at driver's left. Window must open readily even though the vehicle has approved turn signals.

Reject Vehicle If:

- * Window at driver's left cannot be readily opened to permit arm signals.

[X] CRACKS, CHIPS AND DISCOLORATION

Procedure: Inspect windshield and all windows for cracks, chips, sharp edges and discoloration of the glazing.

Advise Driver If: There are signs of the beginning of glazing discoloration.

NOTE: "Discoloration" in this case means anything which impairs the transparency of the glazing.

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Reject Vehicle If:

- There are cracks, discoloration or scratches to the front, right, left or rear of the driver which interfere with his vision.
- Any windows are broken, have exposed sharp edges, or are cracked or separated allowing one piece of glass to be moved relative to another.
- The windshield has star chip (stone nicks) larger than 3/4 inch in diameter or more than one star chip, at any location in the unshaded portion of the diagram.
- The windshield, vent or front door has discoloration at any location in the unshaded portion of the diagrams.
- The rear window is discolored so that the driver does not have a clear view 200 feet to the rear of the vehicle.

[X] STICKERS, TINTING

Procedure: Inspect all glazing for unauthorized material or conditions that obscure driver's vision.

Reject Vehicle If:

- Glazed surfaces contain any stickers not permitted by law or regulation.
- Surfaces contain unauthorized tinted materials with limits vision.
- Signs or other articles are placed on or in any window required for drivers visibility.

[X] SIDE WINDOWS (SCHOOL BUS ONLY)

Procedure: Inspect the operation of all full side windows.

Reject Vehicle If:

- Any side window does not close properly.
- Window glazing is not securely mounted in frame.
- Any window to the left of the driver which opens beyond five (5) inches.
- Any bus using a sedan type entrance door which has an operable window.

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EDGING (SCHOOL BUS ONLY)

Procedure: Inspect for unbanded exposed edges of glass.

Reject Vehicle If: Banding is missing, loose, or broken.

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SECTION 6 - VEHICLE GLAZING

Vehicle Glazing - Additional Information

Glazing Material Position Markings:

The numbers on the chart below indicate the numerical markings following the letters AS, which should be found on glazing materials in the positions indicated. These numbers come from American National Standards Institute (ANSI) Glazing Standard Z26.1 and the meaning of each item is as follows:

Position Number	Description
1. (AS 1)	Safety Glazing Material for use anywhere in motor vehicle.
2. (AS 2)	Safety Glazing Material for use anywhere in motor vehicle except windshields.
3. (AS 3)	Safety Glazing Material for use anywhere in a motor vehicle except windshields and levels requisite for driving visibility.
4. (AS 4)	Safety Glazing Material for use in motor vehicles only in the following specific locations - interior partitions, auxiliary wind deflectors, flexible curtains, readily removable windows, ventilators. Used in conjunction with readily removable windows, rear windows in top of convertible cars.
5. (AS 5)	Safety Glazing Material for use in motor vehicles only in AS4 locations at levels not requisite for driving visibility.
6. (AS 6)	Safety Glazing Material for use only in House -or Property Carrying Trailers, in the rear windows of convertible passenger car tops, in windscreen for motorcycles, in flexible curtains or readily removable windows, or in ventilators used in conjunction with readily removable windows.
7. (AS 7)	Safety Glazing Material for use only in House - or Property Carrying Trailers and at levels not requisite for driving visibility in the rear window of convertible passenger car tops, in windscreen for motorcycles, in flexible curtains or readily removable windows, or in ventilators used in conjunction with readily removable windows.
10. (AS 10)	Bullet Resistant Glass for use anywhere in motor vehicle.
11. (AS 11)	Bullet Resistant Glass for use anywhere in motor vehicles except windshields.
14. (AS 14)	Laceration Resistant Glass Plastic Safety Glazing Material for use anywhere in a motor vehicle except that it may not be used in convertible, in vehicles that have no roof or in vehicles whose roof is completely removable.

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- Glazing material which is intentionally made so that only a portion of a single sheet has a luminous transmittance of not less than 70 percent will be marked at the edge of the sheet to show limits of the area that may be used at levels requisite for driving visibility. The marks A S1 or A S2 etc. will be used with the arrow pointing to the portion of the sheet having a luminous transmittance of not less than 70 percent, and the number indicating the item with which that portion of the sheet complies.

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SECTION 6 - VEHICLE GLAZING - TINTED OR REFLECTORIZED GLAZING TEST

COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

General Information:

1. The inspection process will be conducted if the vehicle's glazing is suspected to violate CGS 14-99g or has been issued a written warning (P-2) pursuant to that section:
2. Per Section 14-99g:

PASSENGER MOTOR VEHICLES

The front side windows are required to pass only 35% plus or minus 3% of the total light measured at the surface resulting in an allowable measurement of 32%.

The rear side windows are also required to pass 35% plus or minus 3% of the total light resulting in an allowable measurement of 32%.

The rear most window may be tinted as dark as desired as long as the left and right side outside mirrors are present.

In the event one or both of these outside mirrors are missing or unusable the rear window is also required to pass 35% plus or minus 3% of the total light resulting in an allowable measurement of 32%.

Windshield - Transparent material is permitted provided it is, affixed or applied to the topmost portion of the windshield, and;

- A) The bottom edge of the material is at least twenty-nine inches above the undepressed driver's seat when measured from a point five inches in front of the bottom of the backrest with the driver's seat with the driver's seat in its rearmost and lowermost position with the vehicle on a level surface.
- B) the material is not red or amber in color.

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COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

Diagram Of Acceptable Windshield Tint Band

ALL OTHER MOTOR VEHICLES

The front side windows are required to pass only 35% plus or minus 3% of the total light measured at the surface resulting in an allowable measurement of 32%.

The windows behind the driver may be tinted as dark as desired on any truck, motor bus, trailer mobile manufactured home, or multipurpose passenger vehicle, as defined in the Code of Federal Regulations, Title 49, Section 571.3, as amended from time to time, provided said vehicle is equipped with outside mirrors on the left and right-hand sides, which are so located as to reflect to the driver a view of the highway for a distance of at least two hundred feet to the rear of such motor vehicle.

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COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

MEDICAL EXEMPTIONS: Connecticut General Statutes §14-99g(b) provides for the issuance of medical waivers to those persons who must limit their exposure to sun light due to certain medical conditions. This statute provides for the exemption but does not provide for a minimum safety standard.

The established Department standard for these waivers is the minimal light transmittance of 23 percent plus or minus three percent. The resulting minimum reading for light transmittance is 20%.

Medical exemptions are allowed provided a validated exemption form (E-220) is carried and the level of tinting does not exceed the percentage listed in Part B or the established minimum standard (20%).

NOTE: Out of state vehicles with non-complying tinting material applied whose owners claim medical exemption shall be rejected for inspection and referred to obtain a temporary medical exemption form.

Description of Equipment:

Testing procedures for fixed glazing will only be conducted as described, using the Mars Window Trans-Meter WT-02, issued by the Connecticut Department of Motor Vehicles.

1. INSTRUMENTATION - Mars Illumination Detector WT-02D, accurate to plus or minus 3%.
2. Controlled Light Source Fixture - Mars Light Source WT-02S.
3. Calibrated sample tinted test plate TS-01, with certificate of calibration showing matching serial number.
4. Plug-in light source Ni-Cad battery charger.
5. Equipment storage case - for storage of above equipment.

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COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

Diagram of Mars Window Trans-Meter Model WT-02

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SUBJECT: COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

Testing Procedure:

1. Turn on Light Source switch (6) and Detector switch (3).
2. Make sure the battery indicator light on the Light Source shows green. When the indicator light is red, it means the rechargeable battery needs recharging and that there is not enough power to make accurate measurements.
3. Align arrows on Detector and Light Source. Press and hold trigger switch on Detector Unit. Adjust calibration knob (4) on Detector until the reading on the Detector display reads 100, which indicates 100% light transmission.
4. Hold Light Source in one hand, the Detector in the other hand. Place Light Source against surface of vehicle's glazing to be measured, such that the cushioning material around the light is fully in contact with the window. Place Detector on opposite side of glazing, directly in line with the Light source, insuring arrows are aligned on both units.
5. Press and hold trigger switch on the Detector for a three (3) second interval. Release the trigger switch without moving the Detector. The Detector can now be moved so that the recorded measurement on the display can be conveniently read. The number displayed is the percentage of light transmitted.
6. Record reading on the Inspection ticket (B-269) or on the written warning ticket.
7. Reading should be between 32% and 100% to be acceptable.

NOTE: If the reading is close to 32% have owner clean window and retest. While owner is cleaning window recheck calibration. Without readjusting calibration knob the reading should be in the range of 98 to 102%. If outside this range, recalibrate the detector and take new readings.

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SUBJECT: COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

MAINTENANCE INSTRUCTIONS:

1. Perform a glazing measurement on a daily basis using the sample tinted test plate provided by the manufacturer.

NOTE: Refer to page 7 of the Operation and Maintenance Manual for Light Source Ni-Cad battery charger instructions. To insure that tester is ready for use, Ni-Cad batteries should be recharged at least once per month. If experience indicates it is necessary to recharge more frequently, light source should be charged overnight. Most Ni-Cad battery manufacturers recommend that Ni-Cad batteries be fully discharged prior being recharged.

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SUBJECT: COMPLIANCE TEST FOR TINTED OR REFLECTORIZED GLAZING

Procedure For Laser Labs Tint Meter Model 100

Laser Labs Model 100 Tint Meter - This meter works by sliding the black cut out slot, in the meter plastic housing, down over a piece of glazing material. The meter is auto on/off, and self calibrating each time it is used. It is possible to slide the meter too slowly over the desired piece of glazing material so it is important to slide the meter gently down with a smooth continuous motion. If the meter was moved too slowly it will give a continuous reading of 98 or 99 from the auto-calibration process. This meter is only useable on moveable glazing material so the MARS meter will have to be used on any stationary glass. All meter readings directly give the percentage of transmitted light.

- 1) User should remove any sunglasses they are wearing since this is not a lighted display and reading the display can be difficult with sunglasses on.
- 2) Check calibration by sliding "STANDARD OF TRANSMITTANCE" plate into meter slot until it stops and compare reading to that indicated on plate label. Reading must be within plus or minus 3 percent of the value indicated on the plate.
- 3) Open vehicle door and roll side window halfway down.
- 4) Hold meter in upright position and place slot on top of window.
- 5) Slide meter straight downward until the meter stops and read digital display. Be careful not to force the meter side to side at all.
- 6) If reading shows a failure by 3% or less then remove meter, clean window in measurement area and repeat steps 4 and 5.

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SECTION 7 - BODY AND SHEET METAL - MIRRORS

All school transportation vehicles shall be equipped with left and right hand mirrors.

[X] EXTERIOR REARVIEW MIRRORS

Procedure: From the driver's position, visually inspect exterior mirror(s) for a clear and reasonably unobstructed view to the rear. Look for stable mounting, cracks sharp edges, unnecessary protrusion, and ease of proper adjustment.

Reject Vehicle If:

- Right or left exterior mirror is missing.
- Mirror is very difficult to adjust or will not maintain a set adjustment.
- Mirror(s) protrudes an unnecessary amount beyond line offering satisfactory rear vision.
- Mirror is cracked, has sharp edges, pitted or clouded to other extent that rear vision is obscured.
- Any required mirror is missing.

[X] INTERIOR REARVIEW MIRROR

Procedure: From the driver's position, visually inspect interior mirror for proper mounting, location, cracks, sharp edges and ease of proper adjustment.

Reject Vehicle If:

- Interior mirror is missing.
- Mirror is loosely mounted.
- Mirror does not provide a clear view of highway at least 200 feet to rear and of the interior of a bus.
- Mirror is cracked, broken, has sharp edges cannot be cleaned such that rear vision is obscured.
- Mirror is very difficult to adjust or will not maintain a set adjustment.
- Mirror does not have required padding around edges.
- Mirror contains any vision reducing or distracting material.

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SECTION 7 - BODY AND SHEET METAL - MIRRORS

[X] EXTERIOR CROSS VIEW MIRROR SYSTEM (SCHOOL BUS ONLY)

Procedure: From the driver's position, visually inspect the cross view mirror system for the required view. Inspect for stable mounting, cracks, discoloration, and sharp edges.

Reject Vehicle If:

- Exterior cross view mirrors are missing.
- Mirror is loosely mounted.
- Mirror will not maintain a set adjustment.
- Mirror is cracked, broken, has sharp edges, pitted or clouded to the extent that vision is obscured.
- Mirror can't be adjusted to meet visibility requirement.

All Type I and Type II school buses must be equipped with the following exterior mirrors:

- 1) Cross view mirrors at the right and left front corners of the bus.
- 2) A flat mirror of at least 5" (horizontal) by 10" (vertical) on both sides of the bus just forward of the drivers seat.
- 3) A convex mirror of at least 5" diameter on both sides to provide additional field of view.

As shown in DIAGRAM 1 (attached), the cross view mirrors must provide a view of the ground from the front bumper forward to the point where direct observation is possible, at the left and right front corners, and along the right and left sides of the bus. This must be done with the driver seated normally and wearing their seat belt. The view along the right side of the bus must show the ground from the front bumper rearward to the rear edge of the service door on conventional and to the rear edge of the front tire on transit type buses (which ever is more rearward). The view along the left side of the bus must show the ground from the front bumper rearward to the rear edge of the drivers seat on conventional and to the rear edge of the front tire on transit style buses (which ever is more rearward).

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As shown in DIAGRAM 2 (attached) the flat mirror and convex mirror must show the area along the left and right sides of the bus from the rear edge of the drivers seat or service door, on conventional or from the rear edge of the front tires on transit style buses, to a point approximately 2' to the rear of the school bus. In addition, the flat mirrors must provide a view 200 feet to the rear of the bus necessary for driving visibility. These views must be provided to the driver when seated normally wearing their seat belt.

Note : Individual diagram 2's are attached for Type I Conventional Buses, Type I Transit Style Buses, and Type II Van Style Buses. The shall only use the appropriate Diagram 2 for the type of bus being inspected.

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Diagram 1

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Diagram 2 (Conventional Bus)

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Diagram 2 (Transit Style Bus)

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Diagram 2 (Van Style Bus)

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SECTION 7 - BODY AND SHEET METAL

WINDSHIELD WIPERS & WASHERS

U.S. vehicles produced after January 1, 1968, must be equipped with a windshield wiper system capable of operating at two or more speeds, and a windshield washer system. A CYCLE shall consist of blade movement from one extreme of the wiper pattern to the other and return.

 WINDSHIELD WIPER OPERATION

Procedure: Inspect for satisfactory operation. (If vacuum operated, engine must be idling and control full on) Windshield must be free of insects, oil film or other foreign matter, and must be continuously wet when tested.

Reject Vehicle If:

- Wipers do not operate at a minimum speed of 45 cycles per minute.
- If vehicles produced after January 1, 1969, do not have two or more speed systems.
- Blades smear or severely streak windshield after 5 cycles.
- Any portion of wiper linkage is exposed where a student could come in contact with moving parts.

 DAMAGED BLADES

Procedure: Inspect for damaged, torn or hardened rubber elements of blades.

Reject Vehicle If:

- Blades show signs of physical breakdown of rubber wiping element.

 DAMAGED METAL PARTS

Procedure: Inspect for damaged metal parts of wiper blades or arms.

Reject Vehicle If:

- Parts of blades or arms are missing or are damaged.

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SECTION 7 BODY AND SHEET METAL

WINDSHIELD WIPERS & WASHERS

[X] BLADE AND WINDSHIELD CONTACT

Procedure: Inspect for proper contact of blades with windshield. Raise arm away from windshield and release. Arm should return to original position and upper blade should contact the windshield firmly.

Reject Vehicle If: Arm fails to return to original position or the blade fails to contact the windshield firmly.

[X] WINDSHIELD WASHER SYSTEM

Procedure: Inspect for proper operation of hand or foot control and an effective amount of fluid delivered to the outside of the windshield opposite each outboard front seating position.

Advise Driver If: Fluid level is low.

Reject Vehicle If:

- System fails to function.
- Fluid in system is frozen.
- System not capable of cleaning an effective wash area within 10 wiper cycles.

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SECTION 7 - BODY AND SHEET METAL

DEFROSTER, VISORS, SEATS & BELTS

WINDSHIELD DEFROSTER - It is very important that the defroster be given a minimum check as shown below. Vehicles produced after January 1, 1969 must be equipped with windshield defroster systems **except** that all school buses must have a windshield defroster.

WINDSHIELD DEFROSTER

Equipment: Ribbons may be used for checking air movement.

Procedure: Turn on windshield defroster fan switch "high" blower speed and inspect for heated air blowing over the inside of the windshield, covering areas directly in front of the driver and the front seat passenger. (Engine must be warm and all elements of the defroster system must be "on").

Reject Vehicle If:

- Defroster fan fails to function.
- Fan functions but a stream of air cannot be "felt" blowing against the proper area of the windshield.

SEATS AND SAFETY BELTS

Procedure:

- Inspect for presence of seat belts in required locations.
- Inspect seats for proper operation of adjusting mechanism and to see that seats are securely anchored.
- Inspect safety belts for frayed, split or torn webbing; malfunctioning buckles; loose or damaged anchorages of floor pan.
- Inspect safety belt retractors for proper function (when so equipped)

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DEFROSTER, VISORS, SEATS & BELTS

Advise Driver: If a retractor fails to maintain the restrained occupant belt length or fails to roll the belt onto the retractor when buckle is disconnected.

Reject Vehicle If:

- All seats anchor bolts are not securely fastened to floor or are missing.
- Seat adjusting mechanism slips out of set position.
- Safety belt webbing is frayed, split or torn.
- Belt buckles do not operate properly.
- Belt anchorages are loose, badly corroded, missing or not fastened to belt.
- Belt mounting surfaces are badly deformed, damaged or corroded. (School Bus Only)
- Any seat cover material is torn or seat springs exposed which may present a hazard to pupils.
- Any tape or vinyl patches used to repair seat covers doesn't meet the requirements of US DOT Standard 302 for resistance to flame propagation.
- Any repair to a seat cover is made over a previously repaired area. All repairs shall be made to the base material.
- If more than fifty percent (50%) of the base seat cover material is missing from any one side of a cushion.
- Seat belt is not installed for driver.
- Mismatching seat back heights.

[X] SUN VISORS

Procedures: Inspect sun visors for broken, bent or loose parts which prevents the visors from being positioned; or for visors which will not stay in a set position.

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Advise Driver If:

- * Visor cannot be positioned to protect driver's eyes from sun
- * Vibration from running engine causes visors to move from set position.

Reject Vehicle If:

- * Driver visor is missing.
- * Sun visor is not supported by two brackets (Type 1 school bus only)

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SECTION 7 - BODY AND SHEET METAL - REQUIRED EMERGENCY EQUIPMENT

All emergency equipment listed below must be securely mounted in the vehicle or contained in the (optional) locked compartment of the vehicle.

[X] FIRE EXTINGUISHER

Procedure: Inspect for the presence of, location, and readiness of a fire extinguisher.

Reject Vehicle If:

- * Extinguisher is missing
- * Extinguisher is not properly filled.
- * Visual determination of charge cannot be made.
- * Extinguisher is not readily accessible to the driver.
- * For school buses, it is not a dry chemical-type with a rating of at least 10 B.C.

[X] FIRST AID KIT

Procedure: Inspect for the presence and general condition of an approved first aid kit.

Reject Vehicle If:

- * The first aid kit is missing or it does not contain all the required items in good condition.

[X] WARNING DEVICES

Procedure: Inspect for three required warning devices.

Reject Vehicle If:

- * Warning devices required are missing or inoperative.

[X] FLASHLIGHT (SPEC. ED. VEHICLES)

Procedure: Inspect for presence and condition.

Reject Vehicle If:

- * Missing or does not operate.

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SECTION 7 - BODY AND SHEET METAL
INTERIOR & DOORS

Several interior bus items should be inspected to insure the safety of its passengers. Tripping hazards, loose handrails, etc. can cause significant injuries and inoperative or inaccessible emergency exits which are potentially disastrous.

[X] STEPWELL/FLOOR COVERING

Procedure: Inspect the stepwell and floor covering for any condition which presents a tripping hazard such as loose, curled, or worn floor covering or cluttering of the stepwell or aisles.

Reject Vehicle If: The stepwell or floor is cluttered or worn to present a tripping hazard.

[X] STANCHIONS AND GUARD RAILS

Procedure: Inspect all stanchion, guard rails, grab rails, etc. for tightness. Inspect grab handle in the stepwell for crevices which may snag articles of clothing or book bags while children are exiting the bus. Test vehicles which the inspector visually determines pose a potential hazard.

Reject Vehicle If:

- There is any looseness or the fastening parts are missing.
- Found to have crevices at the lower attachment point of the grab rail which may snag an article of clothing or book bag while children are exiting the bus.

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INTERIOR & DOORS

HEATING/VENTILATION SYSTEM

Procedure: With engine at operating temperature, check the function of the heater and ventilation systems at their maximum settings. Inspect the general condition of these systems and for any leakage from the system.

Reject Vehicle If:

- There is any leakage or malfunction of the heating system.
- Ventilation system fails to furnish fresh air under operating conditions.
- If heater hose or lines are unprotected from contact by occupants.

INTERIOR SHEET METAL

Procedure: Visually inspect for torn, loose or protruding metal parts or moldings and for evidence of roof leaks.

SERVICE DOOR(S)

Reject Vehicle If:

- Any parts protrude from the surface of the interior causing a safety hazard to occupants.
- Any evidence of a roof leak that can be confirmed.

Procedure: From the driver's seated position, operate the opening and closing mechanism to check its function. Inspect the condition of the flexible material on the vertical closing edges.

Reject Vehicle If:

- Opening and closing mechanism shows evidence of binding, jamming, excessive wear, or malfunction.
- Flexible material on vertical closing edges is excessively loose, torn, or missing.

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INTERIOR & DOORS

[X] EMERGENCY DOOR(S) AND WINDOWS

Procedure:

- Inspect for clear passageway to emergency exits.
- Check the operation of the emergency door warning signal indicating the door is not fully closed.
- Inspect for function of the push-out windows.
- Check the emergency exit instruction decals.
- Inspect inside and outside quick-release mechanism.
- Check the length of stroke on the slide bar/cam operated lock (if so equipped).

Reject Vehicle If:

- Any emergency exit is not easily accessible.
- Inside or outside quick-release mechanism fails to function positively or opens accidentally or too easily.
- Emergency Exit warning signal fails to operate when Exit is slightly opened.
- Push-out windows do not function properly.
- Emergency exit instruction decals are missing or not legible.
- Passageway to emergency door is blocked or restricted in any way.
- Slide bar has less than one-inch stroke length.

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EXTERIOR PARTS & SHEET METAL

Body exterior components and sheet metal parts if damaged and/or dislocated so that they protrude from the vehicle to present a safety hazard to occupants, pedestrians or other vehicles, may be cause for rejection of the vehicle.

[X] PROTRUDING METAL

Procedure: Inspect for rusted or torn metal parts, moldings, etc., which may protrude from vehicle.

Reject Vehicle If: Torn metal, glass, or other loose or dislocated parts protrude from the surface of the vehicle causing a safety hazard to pedestrians or cyclists.

[X] BUMPERS

Procedure: Inspect bumpers for hazardous condition, unsafe mounting and compliance Department of Motor Vehicles Regulations.

Reject Vehicle If:

* The bumper is missing, badly displaced, loosely attached, or a broken or torn portion is protruding, creating a hazard.

* Bumper does not conform to Department of Motor Vehicles Regulations.

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[X] HOOD

Procedure: Open hood and inspect safety catch for proper operation. Close hood and inspect for proper full closure. Manually inspect latch or remote control for proper operation.

Reject Vehicle If:

- Hood latch or hinges do not securely hold hood in its proper fully closed position.
- Secondary or safety latch does not function properly.
- Latch release mechanism or its parts are broken, missing or badly adjusted so that the hood cannot be opened and closed properly.
- Hood hinge or its parts are broken, missing or badly adjusted.

EXTERIOR PARTS AND SHEET METAL

[X] DOORS

Procedure: Inspect door latches, locks, hinges and handles for proper operation, fastening, adjustment, broken or missing components. (Operate all doors and locks)

Reject Vehicle If: Doors or door parts are missing, broken, sagging so that the door cannot be tightly closed.

[X] FENDERS

Procedure: Inspect for removal or damage of front or rear fenders or mud flaps where required.

Reject Vehicle If:

- Any fender or required mud flap is missing. So as to allow dirt, water or other materials to be thrown on the windshield of the vehicle, or on the windshield of following vehicle(s).
- Any fender is loose or damaged to the point which the damage affects the aim of any required lighting or adjustment of any mirror.

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EXTERIOR PARTS & SHEET METAL

FLOOR PAN, INNER PANELS AND BODY MOUNTING

Procedure: Inspect floor pan, body mountings and inner panels of occupant compartment for rusted-out or deformed areas, loose panels or mountings or openings which could permit entry of exhaust gases or which would not support occupants adequately.

Reject Vehicle If:

- Floor pan or inner panels have rusted areas or openings sufficient to cause a hazard to an occupant, or so that exhaust gases can enter the occupant compartment.
- Any frame to body mount has a rust through hole or is deformed or if mounting hardware is loose or missing.

BODY TO FRAME INSULATION. (SCHOOL BUS)

Procedure: Visually check insulating material mounted between the bus body and frame.

Reject Vehicle If:

- Insulating material is missing, torn or displaced from the frame/body.

OTHER EXTERIOR SHEET METAL

Procedure: Inspect for rusting or damaged metal parts.

Reject Vehicle If:

- Rusting or damage is such that the attachment of lamp mountings is improper or affects aiming of lamp.

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SECTION 7 - BODY AND SHEET METAL

STV IDENTIFICATION AND MARKINGS

The primary concern of inspection of identification and markings is to insure that the STV is readily identified as such through required coloration, markings and displays.

SCHOOL BUS

Procedure: Visually inspect bus exterior for proper coloration and required markings.

Reject Vehicle If:

- * Coloring and/or markings do not meet Department of Motor Vehicles for the School Bus type and year.

STV OTHER THAN SCHOOL BUS

Procedure: Visually inspect vehicle for proper required display of the words "CARRYING SCHOOL CHILDREN". (May be portable, decal or painted signs).

Reject Vehicle If:

- * Sign is not displayed when required.
- * Sign is not placed at a height of at least (4) feet.
- * Sign is not in black letters at least three (3) inches high on a yellow background.
- * Sign is not visible to operators of vehicles approaching from front and rear.
- * Portable signs do not meet DMV regulations.

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SECTION 8 - FUEL & EXHAUST SYSTEM

The exhaust system is a series of mechanical devices for the purpose of receiving combustion exhaust gas and expelling it into the atmosphere. The exhaust system may include exhaust pipes, turbo charger, catalytic converter, mufflers, resonators, and tail piping in varying combinations. The fuel system includes the fuel tank, fuel pump and necessary piping to carry the fuel from the tank to any consuming source.

[X] EXHAUST SYSTEM

Procedure:

- Visually examine, exhaust system and related parts including as applicable, mufflers catalytic converters, resonators, tail pipes, exhaust pipes, heat shields and supporting hardware while vehicle is on a hoist or over a pit.
- Rusted or corroded surfaces should be given particular attention.
- (Holes in the system made by the manufacturer for drainage are not cause for rejection.)

Advise Driver If:

- There is considerable rust or corrosion.

Reject Vehicle If:

- * Vehicle is not equipped with proper exhaust system.
- * There are loose or leaking joints.
- * There are holes, leaking seams, or patches on mechanical devices.
- * Tail pipe end is pinched or damaged.
- * Elements of system are not securely fastened.
- * There is an exhaust system cut-out or similar device that allows excessive noise.
- * Any part of system passes through occupant compartment.
- * jointed flex pipe is utilized.
- * Required heat shields are missing (school bus only).

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SECTION 8 - FUEL & EXHAUST SYSTEM

[X] FUEL SYSTEM

Procedure: Visually examine the fuel tank, fuel tank support straps, filler tube (rubber, plastic, metal) tube clamps, fuel tank vent hoses or tubes, filler housing drain, overflow tubes, and filler cap.

Reject Vehicle If:

- Any part of system is not securely fastened
- There is vapor or liquid fuel leakage caused by deterioration, at any point in the system.
- Fuel tank filler cap is missing.
- There is excessive physical damage caused by heat, aging or chafing.

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SECTION 9 - OTHER INSPECTED PARTS AND ACCESSORIES

Procedure: Inspect vehicle for evidence of excessive leaks of combustible fluids or fluids causing degradation of safety related components.

Note: Combustible fluids include gear lube, lubricating oil, antifreeze, automotive transmission fluid and power steering fluid.

Lubricating oil, transmission fluids and power steering fluids will degrade rubber components such as brake hoses, tires, control arm bushings and body mounts.

Reject Vehicle If: Excessive leaks of combustible fluids are observed or if observable fluid leaks are wetting degradable safety related components.

Note: Excessive leaks would be indicated by observable flow of leaking fluid or fresh wetting of other components such as brake hose or exhaust components. Fluids under pressure may weep at joints or seals this seepage is considered acceptable.

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SECTION 10 - INSPECTION OF NEW/USED SCHOOL BUSES
NEWLY PLACED INTO SERVICE

The purpose of this type of inspection is to determine if a school bus meets the requirements of the applicable regulations governing construction and equipment. It should be realized that the primary concern of this portion of inspection is not the preventative maintenance aspect. This section applies to school buses newly placed into service in the State of Connecticut. Any questions raised during this inspection relative to wear or maintenance should be referred to the appropriate section of these guidelines.

The following procedure(s) will be used while conducting this type of inspection.

NEW SCHOOL BUSES.

Procedure:

- refer to portion of Section 1 of these guidelines regarding agreement among papers.
- determine date of manufacture and size of bus.
- using "INITIAL" school bus inspection form appropriate for the size and date of manufacture of bus inspect all items listed on the school bus inspection form for compliance.
(see Section 6 [Internal forms])
- using an STV Inspection form check all operational equipment for compliance.

Reject Vehicle If:

- * if there is a disagreement with any part of Section 1 of these guidelines.
- * any one item listed on the "INITIAL" school bus inspection form does not meet listed requirements.
- * Any operational equipment does not comply with current regulations.

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SECTION 10 - INSPECTION OF NEW/USED SCHOOL BUSES NEWLY PLACED IN SERVICE

[X] USED SCHOOL BUSES

Procedure:

- * refer to the portion of Section 1 of these guidelines regarding agreement among papers.
- * determine date of manufacture and size of bus.
- * using "INITIAL" school bus inspection form appropriate for the size and date of manufacture of bus, inspect all items listed on the school bus inspection form for compliance.
- * Pay particular attention between Connecticut requirements and State of Origin.
- * using an STV Inspection form check all operational equipment for compliance.
- * if a school bus is 10 years old or older and/or requires an Out of State Inspection its pass/fail status should be recorded on Inspection Report (DMV form #B-269 or #199).
- * inspect and measure brake foundation components, measurements to be recorded.

Reject Vehicle If:

- there is a disagreement with any part of Section 1 of these guidelines.
- any area or item is found in non-compliance with current DMV regulations.

