APPENDIX A

BRAKES

A1  Air brake adjustment
A2  Service brake road test

WHEELS

Tire wear measurement information
A3  King pin play - steering linkage play
A4

BODY

A5-6  Body elevation

WINDOWS

A7  Glazing
AS  Glazing Chart

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A9-10  Reflectorization

LIGHTS

All-13  Bus diagrams
Air Brake System continued

[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 85 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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**Effective Outside Area Diameter’ Maximum Stroke**

<table>
<thead>
<tr>
<th>Type</th>
<th>Area (Sq. In.)</th>
<th>Diameter’</th>
<th>Maximum Stroke</th>
<th>Inches*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BOLT TYPE BRAKE CHAMBER DATA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>12</td>
<td>6 1/2</td>
<td>1 3/8</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>24</td>
<td>9 3/8</td>
<td>1 3/4</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>16</td>
<td>8 1/32</td>
<td>1 3/8</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>6</td>
<td>5 1/2</td>
<td>1 3/8</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>9</td>
<td>6 1/8</td>
<td>1 3/8</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>36</td>
<td>11</td>
<td>2 1/4</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>30</td>
<td>9 7/8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>ROTOCHAMBER DATA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>4 9/32</td>
<td>1 1/2</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>4 13/16</td>
<td>1 1/2</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>5 13/32</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>5 15/32</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>6 13/32</td>
<td>2</td>
<td></td>
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<tr>
<td>30</td>
<td>30</td>
<td>7 1/8</td>
<td>2 1/4</td>
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<td>36</td>
<td>36</td>
<td>7 5/8</td>
<td>2 3/4</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>8 7/8</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>CLAMP TYPE BRAKE CHAMBER DATA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>4 1/2</td>
<td>1 1/4</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>5 1/2</td>
<td>1 3/8</td>
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<tr>
<td>12</td>
<td>12</td>
<td>5 11/16</td>
<td>1 3/8</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>6 3/8</td>
<td>1 3/4</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>6 25/32</td>
<td>1 3/4</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>7 7/32</td>
<td>1 3/4(1)</td>
<td></td>
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<tr>
<td>30</td>
<td>30</td>
<td>8 3/32</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>36</td>
<td>9</td>
<td>2 1/4</td>
<td></td>
</tr>
</tbody>
</table>

*Dimensions listed do not include capscrew head projections for rotochambers and bolt clamp projections for clamp type brake chambers.

**The same limits that apply to manual adjustors apply to automatic adjustors.**

(1) 2" for long stroke design.

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**BENDIX WESTINGHOUSE**

<table>
<thead>
<tr>
<th>Type</th>
<th>Travel Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD2</td>
<td>2</td>
</tr>
<tr>
<td>DD3</td>
<td>2</td>
</tr>
</tbody>
</table>

**CAM BRAKES - PUSH-ROD TRAVEL LIMITS**

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3. **SERVICE BRAKE ROAD TESTS**

When road testing the stopping ability of heavy vehicles and combinations of vehicles, extreme care must be taken in order to prevent possible skidding, load shifting, jackknifing, etc. 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.

[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 prescribed distance without pulling to right or left beyond limits.

*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, usually:
- 25 feet - Vehicles with GVWR of 10,000 pounds or less.
- 35 feet - Single unit vehicles with GVWR of more than 10,000 pounds (except truck-tractor).
- 40 feet - Combination vehicles and truck-tractors with GVWR of more than 10,000 pounds.
ADDITIONAL TIRE WEAR MEASUREMENT INFORMATION

ACCEPTABLE
2/32 rear tires 4/32 front tires

UNACCEPTABLE
all tires on vehicle

UNACCEPTABLE
less than 2/32 rear tires 4/32 front tires

Minimum tire tread depth

NOTE
Tire inflation pressure should be checked against the vehicle manufacturer's recommendations (in owners manual or on tire placard). Tire pressures lower or higher than recommended are NOT cause for rejection but the vehicle owner should be advised to correct the condition at the earliest opportunity.
WHEEL BEARINGS
STEERING LINKAGE

[X] Loose Wheel Bearings

*Equipment:* Floor jack or hoist, rule or gauge.

*Procedure:* With front end of vehicle lifted properly, push pads away from rotor on disc brakes, and 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 $\frac{1}{8}$ inch (3mm) measured at the outer circumference of the tire for vehicles 1,000 lbs. GVWR or less or $\%$ 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:

<table>
<thead>
<tr>
<th>Wheel Size</th>
<th>Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 inches or less</td>
<td>$\frac{1}{4}$ inch (6.5mm)</td>
</tr>
<tr>
<td>17 to 18 inches</td>
<td>$%$ inch (9.5mm)</td>
</tr>
<tr>
<td>Over 18 inches</td>
<td>$\frac{1}{2}$ inch (13mm)</td>
</tr>
</tbody>
</table>

[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:

<table>
<thead>
<tr>
<th>Wheel Size</th>
<th>Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 inches or less</td>
<td>$\frac{1}{4}$ inch (6.5mm)</td>
</tr>
<tr>
<td>17 to 18 inches</td>
<td>$%$ inch (9.5mm)</td>
</tr>
<tr>
<td>Over 18 inches</td>
<td>$\frac{1}{2}$ inch (13mm)</td>
</tr>
</tbody>
</table>
Fig. 1

From NEA Minimum Standards for School Buses
SECTION VII - BODY AND SHEET METAL

BODY ELEVATION

CEILING LINE AT CENTER
MIN. OPENING
MIN. H.L. FROM CENTER OF CUSHION 7" FROM WALL
FLEXIBLE DOOR EDGING

BElOW LENGTH, GOWL TO REAR OF BODY AT FLOOR LEVEL
MAXIMUM OVER-ALL LENGTH 35'

Fig. 1

BODY PLAN

OPTIONAL 3:2 SEATING
INTERMEDIATE FLOOR SILLS
MAIN FLOOR SILL

Fig. 2

From N.E.A. Minimum Standards for School Buses
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 ASI (or AS 1 0 - 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 glass 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 hazardous cracks, chips, sharp edges and discoloration of the glazing.
Advise Driver: If there are signs of the beginning of glazing discoloration. "Discoloration" in this case means anything which impairs the transparency of the glazing.
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 chips (stone nicks) larger than 1% inches in diameter 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 unless all rear vision is accomplished with outside rearview mirrors.

[X] Stickers, Tinting
Procedure: Inspect all glass 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 tinting materials which limits vision.

[X] Side Windows (School Bus Only)
Procedure: Inspect the operation of all full side windows.
Reject Vehicle if:
- Any full side window cannot be readily opened.
- Any side window does not close properly.

[X] Edging (School Bus Only)
Procedure: Inspect for unbanded exposed edges of glass.
Reject Vehicle: If banding is missing, loose or broken.
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 (1977) and the meaning of each item as follows:

<table>
<thead>
<tr>
<th>Position Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Safety Glazing Material for use anywhere in motor vehicle.</td>
</tr>
<tr>
<td>15.</td>
<td>Safety Glazing Material for use anywhere in a motor vehicle except windshields and certain specified locations.</td>
</tr>
<tr>
<td>16.</td>
<td>Safety Glazing Materials for use in motor vehicles only in the following specific locations.</td>
</tr>
</tbody>
</table>

GLAZING POSITION MARKINGS

(This chart excerpted from ANSI Standard 226.1 Table AI)

<table>
<thead>
<tr>
<th>Glazing Material Applicable When Marked With &quot;AS&quot;</th>
<th>Designation Indicated Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Levels Requisite for Driving Visibility</td>
<td>At Levels Not Requisite for Driving Visibility</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRUCKS AND TRUCK TRACTORS</th>
<th>Windshields</th>
<th>1, 10</th>
<th>1*, la*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Windows to Immediate Right and Left of Driver</td>
<td>1, 2, 10, 11</td>
<td>1, 2, 3, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Rearmost Window if Used for Driving Visibility</td>
<td>1, 2, 8, 10, 11</td>
<td>1, 2, 3, 4, 5, 8, 9, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Glazing to Rear of Driver Where Other Means to Afford Visibility of the Highway is Provided</td>
<td>1, 2, 3, 4, 5, 8, 9, 10, 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Folding Doors</td>
<td>1, 2, 4, 8, la, 10, 11</td>
<td>1, 2, 3, 4, 5, 8, 9, 10, 11</td>
</tr>
<tr>
<td></td>
<td>All Other Glazing Except As Listed Above</td>
<td>1, 2, 10, 11</td>
<td>1, 2, 3, 10, 11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUSES</th>
<th>Windshields</th>
<th>1*, la*</th>
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<tbody>
<tr>
<td></td>
<td>Glazing to Immediate Right and Left of Driver</td>
<td>1, 2, 3, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Rearmost Window if Used for Driver Visibility</td>
<td>1, 2, 8, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Interior Partitions and Auxiliary Wind Deflectors</td>
<td>1, 2, 4, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Folding Doors</td>
<td>1, 2, 4, 8, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Standee Windows</td>
<td>1, 2, 3, 4, 5, 8, 9, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Openings in Roofs Not Required for Driving Visibility</td>
<td>1, 2, 3, 4, 5, 10, 11</td>
</tr>
<tr>
<td></td>
<td>Flexible Curtains. Readily Removable Windows, Ventilators Used in Conjunction with Readily Removable Windows</td>
<td>1, 2, 4, 6, 10, 11</td>
</tr>
<tr>
<td></td>
<td>All Other Glazing Except as Listed Above</td>
<td>1, 2, 3, 10, 11</td>
</tr>
</tbody>
</table>

| HOUSE TRAILERS AND PROPERTY-CARRYING TRAILERS | All Glazing | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 |

* 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 At 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.
PLACEMENT OF REFLECTIVE MARKINGS
FOR VEHICLES OF 80 OR MORE INCHES OVERALL WIDTH
RECOMMENDED LAMP AND REFLECTOR LOCATIONS
IN ACCORDANCE WITH THE
FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108
(DRAWING IS NOT TO SCALE)

LEGEND
1. Headlamps (2) white (4 optional)
2. Front side marker lamps (2) amber
3. Front side reflectors (2) amber
4. Front turn-signal lamps (2) amber
5. Front identification lamps (3) amber
6. Front clearance lamps (2) amber
7. Combination rear clearance & side marker lamps (2) red (may be four separate lamps, See 54.6 Fed. Reg. No. 108)
8. Rear side reflectors (2) red
9. Rear identification lamps (3) red
10. Intermediate side marker lamps (2) amber
11. Intermediate side reflectors (2) amber
12. Intermediate rear warning lamps (2) red
13. Rear school bus warning lamps (2) red
14. Rear school bus warning lamps (2) red
15. Rear School Bus Warning Lamps (2) red
16. Rear school bus rear warning lamps (2) red
17. Rear stop lamp (1) red
18. Rear taillamps (2) red
19. Rear license plate lamp (1) white
20. Rear clearance lamps (2) amber
21. Rear clearance lamps (2) amber
22. Rear clearance lamps (2) amber
23. Rear clearance lamps (2) amber
24. Rear clearance lamps (2) amber
25. Rear clearance lamps (2) amber
26. Rear clearance lamps (2) amber
27. Rear clearance lamps (2) amber
28. Rear clearance lamps (2) amber
29. Rear clearance lamps (2) amber
30. Rear clearance lamps (2) amber
31. Rear clearance lamps (2) amber
32. Rear clearance lamps (2) amber
33. Rear clearance lamps (2) amber
34. Rear clearance lamps (2) amber
35. Rear clearance lamps (2) amber
36. Rear clearance lamps (2) amber
37. Rear clearance lamps (2) amber
38. Rear clearance lamps (2) amber
39. Rear clearance lamps (2) amber
40. Rear clearance lamps (2) amber
41. Rear clearance lamps (2) amber
42. Rear clearance lamps (2) amber
43. Rear clearance lamps (2) amber
44. Rear clearance lamps (2) amber
45. Rear clearance lamps (2) amber
46. Rear clearance lamps (2) amber
47. Rear clearance lamps (2) amber
48. Rear clearance lamps (2) amber

The general areas indicated for lamps and reflectors are acceptable to the U.S. Department of Transportation’s National Highway Traffic Safety Administration and the Bureau of Motor Carrier Safety. Consult Federal MVSS No. 108 and the applicable tables therein for exact requirements, such as; mounting height limitations, lamp combinations, and alternate locations.

THE FOLLOWING SHALL BE MOUNTED WITHIN THE DASHED AREA ACCORDING TO MANUFACTURER’S DESIGN.
15. Rear turn-signal lamp (2) red or amber
16. Rear stop lamp (1) red
17. Rear taillamps (2) red
18. Rear license plate lamp (1) white combined with taillamp
19. Rear reflectors (2) red

108
FOR VEHICLES OF 80 OR MORE INCHES OVERALL WIDTH

RECOMMENDED LAMP AND REFLECTOR LOCATIONS
IN ACCORDANCE WITH THE
FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108
(DRAWING IS NOT TO SCALE)

LEGEND

1. Headlamps (2) white (4) optional
2. Combination front clearance & side marker lamps (2) amber may be four separate lamps. See 54.4 Fed Std No. 108
3. Front side reflectors (2) amber
4. Front turn signal lamps (2) amber
5. Front identification lamps (3) amber
6. Combined on rear clearance & side marker lamps (2) - set may be four separate lamps. See 54.4 Fed Std No. 108
7. Rear side reflectors (2) red
8. Rear identification lamps (3) red
9. Intermediate side marker lamps (3) amber (4) vehicle > 20' or more overall length
10. Intermediate side reflectors (2) amber (4) vehicle > 20' or more overall length
11. Front school bus warning lamps (2) red (4) lamp system optional. 2 red & 2 amber **
12. Rear school bus warning lamps (2) red (4) lamp system optional. 2 red & 2 amber **
13. Rear backup lamp (1) white (location optional provided optical requirements are met)

THE FOLLOWING SHALL BE MOUNTED WITHIN THE DASHED AREA ACCORDING TO MANUFACTURER'S DESIGN

14. Rear turn signal lamps (2) red or amber
15. Rear side lamps (3) red
16. Rear tail lamps (2) red
17. Rear license plate lamp (1) white combined with taillamp
18. Rear reflectors (2) red

The general area underfoot for lamps and reflectors are acceptable to the U.S. Department of Transportation's National Highway Traffic Safety Administration and the Bureau of Motor Carrier Safety. Consult Federal MVSS No. 108 and the applicable Federal laws for exact requirements, such as, mounting height limitations, lamp combinations, and alternate incandescents.
From NEA Minimum Standards for School Buses

**FRONT ELEVATION**

**REAR ELEVATION**