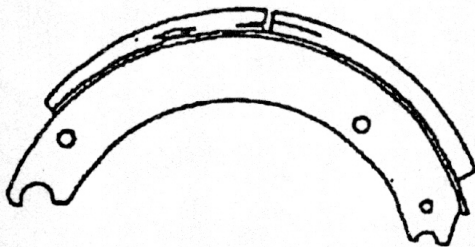


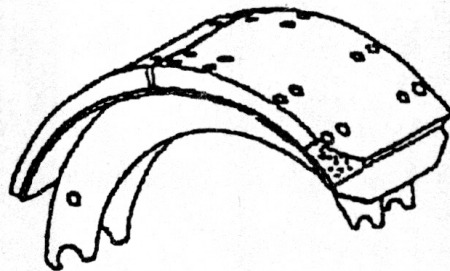
**SCHOOL BUS**  
**OUT OF SERVICE CRITERIA**  
**2009**

**I. BRAKE SYSTEM**

- A. Defective Brakes:** The number of defective brakes is equal to or greater than 20 percent of the service brakes on the bus. A defective brake includes any brake that meets one of the following criteria.
1. Absence of effective braking action upon application of the service brakes (such as brake linings failing to move or contact braking surface upon application).
  2. Missing or broken mechanical components including: shoes, linings, springs, anchor pins, cam rollers, pushrods, and air chamber mounting bolts.
  3. Loose brake components including air chambers, spiders and cam shaft support brackets.
  4. Audible air leak at brake chamber.
  5. Brake adjustment limits. Air pressure between 90 and 100 PSI, engine off and brakes fully applied. (See table 1 for chamber data)
    - a. One brake at 1/4 inch or more beyond the adjustment limit equals one defective brake.
    - b. Two brakes less than 1/4 inch beyond the adjustment limit equals one defective brake.
    - c. Any wedge brake where the combined brake lining movement of both top and bottom shoes exceeds 1/8 inch.
  6. Brake linings or pads.
    - a. Cracked, loose or missing lining
      - (1) Lining cracks or voids of 1/16 inch in width observable on edge of the lining.
      - (2) Portions of a lining segment missing such that a fastening device (rivet or bolt) is exposed when viewing the lining from the edge.
      - (3) Cracks that exceed (1 1/2) inches in length.
      - (4) Loose lining segments.
      - (5) Complete lining segment missing.
    - b. Evidence of oil seepage into or out of the brake lining / drum interface area. This must include wet contamination of the lining edge accompanied by evidence that further contamination will occur - such as oil running from the drum or bearing seal.  
**Note:** Grease on the lining edge with no evidence of fresh oil is not an out of service condition.
    - c. Air Brakes: Lining with a thickness less than 3/16 inch (1 piece linings 1988-1992 small wheel base Bluebirds) for a shoe with a continuous strip of lining or 1/4 for a shoe with two pads for drum brakes or to wear indicator if lining is so marked, or less than 1/8 inch for disc brakes.
    - d. Hydraulic Brakes: Lining with a thickness less than 1/16 inch at the shoe center for disc or drum brakes.
    - e. Mismatch across any steering axle of:
      - (1) Air chamber size
      - (2) Slack adjuster length



**Out-of-Service**  
**Cracks or voids that exceed 1/16" in width.**  
**Cracks that exceed 1 1/2" in length.**



**Out-of-Service**  
**Portion of lining missing that exposes a fastening device.**

## **B. Parking Brake**

1. Air brake Pop Off Valve does not automatically set below 15 PSI and not higher than 45 PSI. (Plus or minus 5 PSI)
2. Any non-manufactured holes or cracks in the spring brake housing section of a parking brake.
3. Hydraulic brake system mechanical parking brake does not hold bus on slope or second gear pull out.

## **C. Brake Drums or Rotors (Discs)**

1. Any drum or rotor that is cracked, improperly mounted, or worn beyond manufacturer's discard specifications.  
**Note: Do not confuse short hairline heat check cracks with flexural cracks.**
2. Rotors with any crack(s), or pitting that goes completely through the rotor or on vented rotors completely through one side.
3. Any portion of the drum or rotor missing or in danger of falling away.

## **D. Air Brake Hose / Tubing**

1. Hose with any damage extending through the outer reinforcement ply. (Rubber impregnated fabric cover is not a reinforcement ply. Thermoplastic nylon may have braid reinforcement or color difference between cover and inner tube. Exposure of second color is out-of-service.)
2. Bulge / swelling when air pressure is applied.
3. Audible air leak at other than a proper connection.
4. Two hoses improperly joined such as a splice made by sliding the hose ends over a piece of tubing and clamping the hose to the tube.
5. Air hose cracked, broken or crimped in such a manner as to restrict air flow.

## **E. Low Pressure Warning Device**

1. Low pressure warning device missing, inoperative or does not operate between 45 and 70 PSI. **Note: If either an audible or visual warning device is working as required, the bus should not be placed out-of-service.**

## **F. Air Loss Rate**

1. If an air leak is discovered and the reservoir pressure is not maintained when:
  - a. Governor is cut-in;
  - b. Reservoir pressure is between 80 & 90 PSI;
  - c. Engine is at idle, and;
  - d. Service brakes applied, leakage exceeds 3 psi/min.
  - e. Service brakes released, leakage exceeds 2 psi/min.
  - f. Fails to recover sufficient air pressure.

## **G. Air Reservoir**

1. Reservoir is separated from its original attachment points.

## **H. Air Compressor**

1. Loose compressor or mounting bolts.
2. Cracked, broken or loose pulley.
3. Cracked or broken mounting brackets, braces or adapters.

## **I. Hydraulic Brakes**

1. No pedal reserve with engine running.
2. Master cylinder less than 3/4 full.
3. Power assist unit fails to operate.
4. Seeping or swelling brake hose(s) under application of pressure.
5. Hose(s) abraded (chafed) or cracked through outer cover-to-fabric layer.
6. Fluid lines or connections restricted, crimped, cracked or broken.
7. Any visually observed leaking hydraulic fluid in the brake system upon full application.
8. Brake system failure light / low fluid warning light on and / or inoperative.

**J. Vacuum Warning**

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

**TABLE I  
BRAKE ADJUSTMENT LIMITS**

<b>CLAMP TYPE BRAKE CHAMBER DATA</b>		
<b>TYPE</b>	<b>OUTSIDE DIAMETER</b>	<b>BRAKE ADJUSTMENT LIMIT</b>
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"

<b>"LONG STROKE" CLAMP TYPE BRAKE CHAMBER DATA</b>		
<b>TYPE</b>	<b>OUTSIDE DIAMETER</b>	<b>BRAKE ADJUSTMENT LIMIT</b>
16	6 3/8"	2"
20	6 25/32"	2"
24	7 7/32"	2"
24*	7 7/32"	2.5"
30	8 3/32"	2.5"
<b>*For 3" maximum stroke type 24 chambers</b>		

<b>TIE ROD STYLE PISTON BRAKE CHAMBER</b>		
<b>SIZE</b>	<b>OUTSIDE DIAMETER</b>	<b>BRAKE ADJUSTMENT LIMIT</b>
30	6" (165mm)	2.5" (64mm)

<b>BOLT TYPE BRAKE CHAMBER DATA</b>		
<b>TYPE</b>	<b>OUTSIDE DIAMETER</b>	<b>BRAKE ADJUSTMENT</b>
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"

<b>ROTO CHAMBER DATA</b>		
<b>TYPE</b>	<b>OUTSIDE DIAMETER</b>	<b>BRAKE ADJUSTMENT</b>
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"

<b>DD-3 BRAKE CHAMBER DATA</b>		
<b>TYPE</b>	<b>OUTSIDE DIAMETER</b>	<b>BRAKE ADJUSTMENT LIMIT</b>
30	8 1/8"	2 1/4"
NOTE: This chamber has three air lines and is found on motor coaches		

<b>WEDGE BRAKE DATA</b>
The combined movement of both brake shoe lining scribe marks shall not exceed 1/8 inch (3.18mm)

**II. STEERING MECHANISM**

**A. Steering Wheel Free Play**

1. See Table II: When any of these values - inch movement or degrees - are met, bus shall be placed out-of-service. For power steering systems, engine must be running and if steering wheel movement exceeds 45 degrees before steering axle tires move, proceed as follows: Rock steering wheel left to right between points of power steering valve resistance. If that motion exceeds 30 degrees, or the inch movement value shown for manual steering, the bus shall be placed out-of-service.

**TABLE II  
STEERING WHEEL FREE PLAY**

Steering Wheel Diameter	Manual System Movement 30 deg. or	Power System Movement 45 deg. Or
16"	4 1/2"	6 3/4"
18"	4 3/4"	7 1/8"
19"	5"	7 1/2"
20"	5 1/4"	7 7/8"
21"	5 1/2"	8 1/4"
22"	5 3/4"	8 5/8"

**B. Front Axle Beam**

1. Any crack(s) or obvious welded repair(s).

**C. Steering Column**

1. Any absence or looseness of U-bolt(s) or positioning part(s).
2. Worn, faulty or obviously repair-welded universal joint(s).
3. Steering wheel not properly secured.

**D. Steering Gear Box**

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

**E. Pitman Arm**

1. Any looseness of the pitman arm on the steering gear output shaft.
2. Any obvious welded repair(s).

**F. Power Steering**

1. Power steering pump inoperable.
2. Auxiliary power assist cylinder loose or inoperable.
3. Any dripping leak in the power steering hoses, pump, reservoir or steering gear.

**G. Ball and Socket Joints**

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

**Note: Minor tear around the rim or lip is not an OOS.**

**H. Tie Rods and Drag Links**

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

**I. Nuts**

1. Loose or missing fasteners on tie rod, Pitman Arm, drag link, steering arm or tie rod arm.

**III. SUSPENSION**

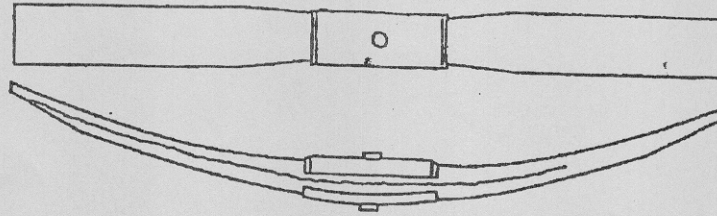
**A. Axle Part / Members**

1. Any U-bolt or other spring to axle clamp bolt(s) cracked, broken, loose, or missing.
2. Any spring hanger(s), or other axle positioning parts cracked, broken, loose, or missing that results in shifting of an axle from its normal position.

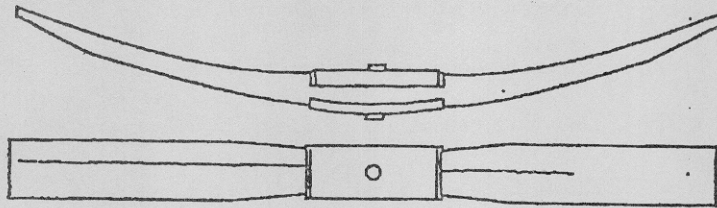
**B. Spring Assembly**

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

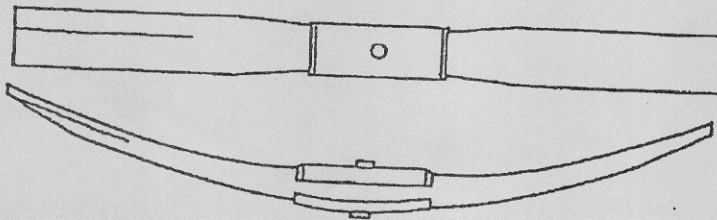
a) Side to side crack extending beyond  $\frac{3}{4}$  of the length of the spring. (A crack that extends beyond  $\frac{3}{4}$  the length of the spring.)



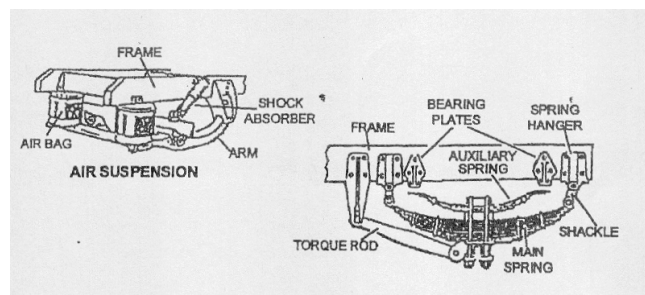
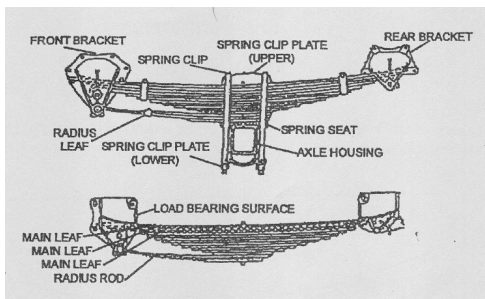
b) Top to bottom crack extending beyond  $\frac{3}{4}$  of the length of the spring. (A crack that extends beyond  $\frac{3}{4}$  the length of the spring.)



c) Intersecting cracks of any length



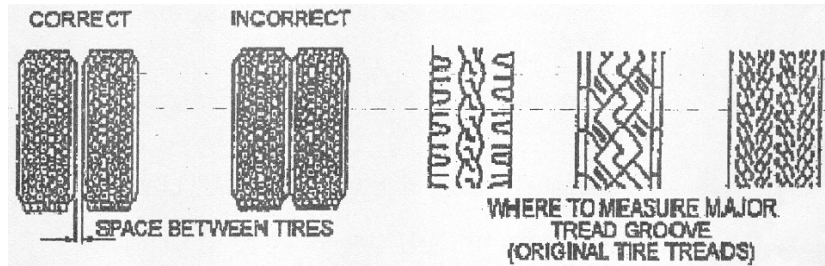
NOTE: A crack is a separation in any axis which passes completely through the spring.



#### IV. TIRES

##### A. **Tire Tread**

1. Tread depth is less than 4/32 inch on steering axle tires when measured in any two adjacent major tread grooves at three equally spaced intervals around the circumference of the tire. (UCA 41-6a-1636(7)(ii)) **Note: Do not measure on a tread wear bar.**
2. Tread depth is less than 2/32 inch on drive axle tires when measured in any two adjacent major tread grooves at three equally spaced intervals around the circumference of the tire. (UCA 41-6a-1636(7)(ii)) **Note: Do not measure on a tread wear bar.**



##### B. **Tire Sidewall**

1. Any sidewall that is cut, worn, or damaged to the extent that the ply cord is exposed.
2. Any observable bump, bulge, or knot related to sidewall or tread separation.  
EXCEPTION : A bulge due to a section repair is allowed not to exceed 3/8 inch in height. This bulge may sometimes be identified by a blue triangular label in the immediate vicinity.

##### C. **Tire Inflation**

1. Tire is flat or has noticeable leak (Flat means less than half recommended pressure.)

##### D. **Tire Type**

1. Not of proper type (load range, size, mismatched, etc. )
2. Labelled "Not For Highway Use" or carrying other markings which would exclude use on highways.
3. Regrooved, recapped or retreaded tire on steering axle.

##### E. **Tire Contact**

1. Tire contacts any part of the frame, body or suspension components.
2. Duals are found to be in contact with any part of the vehicle body or adjacent tire.

#### V. WHEELS/RIM/HUB

##### A. **Disc wheels**

1. Any nuts, bolts, studs or lugs are broken, missing, damaged or loose.
2. Any wheel/rim is cracked, improperly seated, damaged, or welded.

##### B. **Spoke (Dayton) Wheels**

1. Any spoke wheel in use on a school bus registered in Utah does not meet standards.

##### C. **Hub**

1. Any axle bearing cap is missing or broken allowing an open view into hub assembly.
2. Smoking from wheel hub assembly due to bearing failure.

**VI. FRAME**

**A. Frame Members**

1. Any cracked, loose, sagging or broken frame siderail permitting shifting of the body onto moving parts or other condition indicating an imminent collapse of the frame.
2. Any cracked, loose or broken frame member adversely affecting support of functional components such as steering gear, engine, transmission, body parts and suspension.
3. 1 ½ inches or longer crack in frame siderail web which is directed toward bottom flange.
4. Any crack extending from the frame siderail web around the radius and into the bottom flange.
5. 1 inch or longer crack in siderail bottom flange.
6. Any cross member, outrigger or other structural support cracked, missing or deformed.
7. Any missing, broken, shifted or corroded part that would affect the safe operation of the vehicle.

**VII. EXHAUST SYSTEM**

- A. Any bus exhaust system leaking or discharging under the chassis.
- B. No part of the exhaust system of any bus shall be so located as to be likely to result in burning, charring or damaging the electrical wiring, fuel supply or any combustible part of the bus.

**Note: Expansion leaks prior to warming is considered standard. If tracer marks are present, the leak must be physically verified after warming.**

**VIII. FUEL SYSTEM**

**A. Liquid Fuels**

1. Any liquid fuel dripping leak at any point.
2. Any fuel tank not securely attached to the vehicle.
3. The fuel tank filler cap/cover is missing.

- B. Gaseous Fuels Compressed Natural Gas (CNG), Liquefied Petroleum Gas (LPG) and Liquefied Natural Gas (LNG)**

**OCCUPATIONAL SAFETY NOTE:** Personnel must exercise extreme caution whenever checking a gaseous fuel system for leaks. Any possibility of creating sparks, static electricity, friction, etc. must be avoided, as they could cause a fire or explosion.

**OCCUPATIONAL SAFETY NOTE:** Vehicles with leaking gaseous fuel systems must be parked carefully. Gases escaping from CNG and LNG systems will rise. If the vehicle is parked inside a building or under a canopy, roof or similar cover, combustible gasses can collect beneath the ceiling. Escaping LPG falls and can form a "pool" of combustible gas near the ground and displaces air including oxygen. LPG and liquid LNG will flow into open drains. Combustible gases can explode when ignited by an open flame or spark.

1. CNG or LPG
  - a. Any fuel leakage from the CNG or LPG system detected by smell and verified by either a bubble test using non-ammonia, non-corrosive soap solution or a flammable gas detection meter.
  - b. Any fuel leakage from the CNG or LPG system detected audibly and verified by either a bubble test using non-ammonia, non-corrosive soap solution or flammable gas detection meter.

**NOTE:** Verification is needed to ensure that the sound is not either internal to the fuel system (such as gas flowing in a pressure regulator, or pressure equalizing between manifolded tanks) or a leak in the air brake system.



- c. Any fuel leakage from the CNG or LPG system detected visibly (evidence such as ice buildup at fuel system connections and fittings) and verified by either a bubble test using non-ammonia, non-corrosive soap solution or a flammable gas detection meter.

**NOTE:** Some brief fuel leakage or decompression may occur during refueling, causing temporary frosting of CNG or LPG fuel system parts. If the vehicle has been refueled shortly before inspection, care must be taken to distinguish these temporary frosting occurrences from actual leaks

## 2. LNG

**OCCUPATIONAL SAFETY WARNING:** LNG is a cryogenic material and presents a potential safety hazard due both to the extremely cold temperature of its liquid and the flammability of its vapor. Personnel inspecting such systems should exercise utmost caution including the wearing of proper eye protection, gloves and clothing.

**NOTE:** LNG liquid and vaporized gas is odorless and undetectable by the human sense of smell. Frost buildup is not necessarily evidence of leakage. Many components of LNG fuel systems are extremely cold and will exhibit an even coat of frost produced by moisture in the surrounding air condensing and freezing on them.

- a. A cloud of water vapor coming from any component of the fuel system. NOTE: It is normal, particularly in humid conditions, for water vapor to collect around many portions of a LNG fuel system.
- b. Any leak detected by a methane detection meter.
- c. Dripping liquid that boils or vaporizes in the air.

## IX. LIGHTS

- A. **When lights are required** (Note: State law requires headlight to be activated at all times)
  - 1. Headlamps - bus does not have at least one headlamp operative on low beam on each side of bus.
  - 2. Lamps on rear - not having at least one steady burning tail lamp on the rear of the bus visible from 500 feet.
- B. **At Anytime - Day or Night**
  - 1. Does not have at least one operative stop lamp on the rear of the bus visible at 500 feet.
  - 2. Does not have operative turn signals visible on each side of the front and rear of the bus.
- C. **Loading Lights**
  - 1. Any loading lights that are inoperative.
  - 2. Any loading lights or stoparm that remains in an activated position.
  - 3. Less than 50% of the stoparm lights are operative.
  - 4. LED lights have less than 50% of diodes illuminated.

## X. DEFROSTER

- A. Defroster does not blow air on windshield.

## XI. FIRE EXTINGUISHER

- A. Any fire extinguisher that is discharged or missing.

## XII. AISLE

- A. **Clearance**
  - 1. Aisle does not have the required clearance.
  - 2. Center aisle strip is missing or not secured.

**B. Obstruction**

1. There are objects blocking aisles or exits

**XIII. WINDSHIELD WIPERS / WASHER SYSTEM**

- A. Any wiper/washer that is inoperative, missing or damaged that render it ineffective. (System Failure)

**Note: When the washer fluid reservoir is empty, it is not to be place out of service.**

**XIV. BODY EXTERIOR**

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

- B. Bus is any color other than school bus yellow.

**XV. BODY INTERIOR**

**A. Panels**

1. Any panel (ceiling, side, wheel well, etc.) protruding, having sharp edges, or not secured, that may cause injuries.

**B. Floors**

1. Floor pan or inner panels having excessive perforated areas or openings sufficient to cause a hazard to an occupant.

**C. Step Well**

1. Any part of the step well or support structure is damaged.
2. Any condition that would present a tripping hazard.

**D. Seats/Barriers**

1. Any seat cushion or seat assembly (frame) that is **completely unattached** from the structure that secures it. **Note: If the seat assembly (frame) is loose then it is to be marked only as a defect.**
2. Any seat/barrier material so defective that it compromises the integrity of occupant protection and compartmentalization.
3. Seat spacing fails to comply with FMVSS No.222

**E. Seat (Driver)**

1. Fails to adjust or hold proper adjustment.
2. Any part of the driver's safety restraint assembly is missing, not properly installed or so defective as to prevent proper securement.

**F. Doors (Service)**

1. The service door does not open or close properly.
2. The door control handle does not lock in the closed position.
3. The door is equipped with a padlock or similar non- OEM locking device. (Excludes vehicles equipped with an interlock system)

**G. Wheel Chair Equipped Buses (Inspected only by school districts)**

1. Wheelchair lift does not function as designed or is inoperable.
2. Any hydraulic line leaking during lift operation.
3. Wheelchair securement missing or improperly installed loose or damaged.
4. Any required wheelchair occupant restraint system not in compliance with FMVSS No.222.

**H. Emergency Exits**

1. Any emergency exit that does not open freely or completely, as designed.
2. Any emergency exit **door** warning device that is defective or fails to function.

**Note: An emergency exit that is not marked with an emergency exit instruction decal and a window emergency exit warning device that fails to function are not OOS conditions.**

- 
3. Any emergency exit door that is equipped with a padlock or similar non-OEM locking device (Excludes vehicles equipped with an interlock system).
  4. Any emergency exit that is obstructed. (This includes self-retracting seats which must retract and maintain in the upright position.)

**I. Windows**

1. Any glass or glazing that is broken or missing which creates a hazard to any occupant. (Includes mirrors)
2. Not of approved type.
3. A windshield is required on all buses and must have the markings AS-1, AS-10, or AS-14.
  - a. There is outright breakage (glass shattered either on the inside, outside surface or glass is broken leaving sharp or jagged edges.
  - b. There are sandpits or discoloration which interferes with the driver's view.
  - c. Windshield is missing.
  - d. Damage or repair in the acute area that is larger than one inch or the size of a quarter.
  - e. Cracks from the six inch border area that extends into the acute area more than one inch.
  - f. Any intersecting cracks in the sweep of wiper blade on driver's side.
4. Driver's side area window(s) have chips, clouding or cracks that obscure the driver's vision.

**XVII. HAZARDOUS MATERIALS**

- A. Gas, oil, power steering fluid, antifreeze, hydraulic fluid, windshield wiper fluid or starting fluid(ether) present in the passenger compartment.

**XVIII. GENERAL MAINTENANCE**

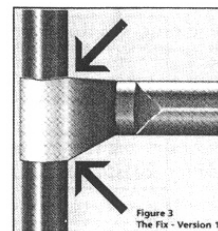
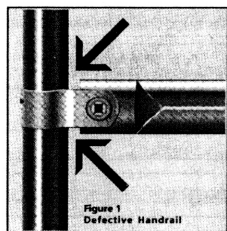
- A. Any item which may cause an imminent hazard or fire.

**XVI. HANDRAIL**

- A. Fails the nut/drawstring test or has not complied with a recall. (See table # 3 on next page)
- B. The left side handrail is missing or it has a portion of that handrail that is completely unattached from its securement position, or if it does not meet or exceed the OEM specifications.

**Note: A loose handrail alone is not an OOS condition.**

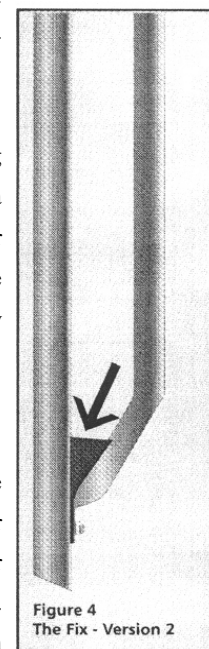
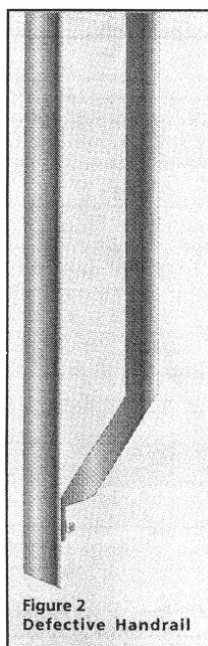
**TABLE 3**  
**HANDRAIL INSPECTION TOOL & PROCEDURE**



Across the United States, children are being injured or killed when their clothing or accessories are caught in their school bus's handrail or door as they exit the school bus. As a result, they may fall and be violently dragged by the bus and run over by its rear wheels. The most common piece of clothing that can be snagged on the handrail is a jacket with a drawstring at the waist. These drawstrings commonly have a large bobble or knot at the ends that can become lodged in the handrail. However, other articles such as scarves, long straps on backpacks or dangling key chains can also be snagged on the handrail. School bus handrails have had the same basic design for more than 30 years.

However, with the current change in fashion toward oversized and baggy clothing, handrail designs have contributed to tragic and avoidable injuries and deaths. Typical handrail designs that have the potential for snagging are illustrated in Figures 1 and 2. School bus manufacturers have taken extraordinary and costly steps to remove snagging hazards from school bus entrances. More than 400,000 school buses have been recalled and manufacturers have absorbed the cost of the repairs. In most cases, a simple spacer can be added to the existing handrail eliminating the potential for snagging.

In other cases, manufacturers have redesigned the handrail. Figures 3 and 4 illustrate handrails that have been modified.



The school bus driver is a trained professional concerned with getting children to school and returning them home safely. Driving a school bus is a demanding task. There is a lot of activity in and around the bus. The bus driver must be aware of ever-changing traffic conditions, the children on the bus, and the children who enter and exit at each school bus stop. Compounding this already complex situation is the need for the driver to maintain the school bus schedule.

The major reason for injury and death due to handrail snagging incidents is the driver's failure to notice that the child's drawstring has become snagged. The driver should observe all children, especially those with long drawstrings, oversized or baggy clothing, or other items that may become snagged in handrails, as they exit. Additionally, to ensure safety at each stop, the driver should be certain that each child has completely exited the bus and cleared the danger zones before closing the

door and moving the vehicle. The driver should secure the bus and check around and underneath the bus if there is a question of whether a child has moved safely away from the bus. Finally, the driver must be alert for warnings as the bus pulls away. In many of the snagging incidents that have occurred to date, someone inside or outside the bus attempted to warn the driver that a child was being dragged by the bus.