

Appendix "B"

EDITOR'S NOTE: The entire Appendix "B" is being promulgated, even though underlines don't appear below all text and figures.

DPSAFT School Bus Inspection

Procedures, Repair Criteria, & Out Of Service Criteria Inside of School Bus

A. INSIDE		
1. Stepwell/Grab Rails		
Inspection Procedures:	Repair if:	Out of Service if:
a. Stepwell 1) Check specification and condition of stepwell and tread.	Step tread is not secure or sealed at inside edge where it meets next step. Stepwell tread ribbing is worn smooth less than four (4) inches in width when measured one inch (1") or more from the edge.	Step tread is not secure or sealed elsewhere on step. Any tripping hazard. Stepwell tread ribbing is worn smooth more than four (4) inches in width when measured one inch (1") or more from the edge. Sheet metal in stepwell is rusted through, has holes or structure has weakened and step(s) flex when weight is applied.
b. Grab Rail(s) 1) Check for presence and secure mounting of entrance grab rail(s).	Mounting hardware is loose.	Handrail and/or any hardware is missing, damaged or has unauthorized modification.

A. INSIDE		
2. Emergency Equipment		
Inspection Procedures:	Repair if:	Out of Service if:
a. Fire Extinguisher: Check for presence of 2.5lbs fire extinguishers and the following: 1) Check Manufacturer's Label	Current inspection tag not affixed Labeling is not legible to determine size and type	Less than two (2) fire extinguishers on bus
2) Rating: check for proper U.L. (Underwriters Laboratory) rating.		1984 and Later – Two 5.0 Lb. Fire Extinguisher.
3) Pressure: check gauge		Pressure above or below green zone.
4) Mounting: check for accessibility and secure mounting.	Bracket mount to panel is loose.	Fire extinguisher not accessible to driver or not secured in mounting bracket. 2 nd Fire Ext. mounted in rear of bus.
5) Nozzle (If applicable), check for loose, obstructed or damaged parts.		Nozzle or hose loose, missing, obstructed or excessive damage to any parts of extinguisher.
6) Safety Pin: check for presence of safety pin and tamper proof seal.	Seal is broken. Safety pin is missing. Tamper proof seal not of approved type. (ie. material cannot be broken easily)	
b. First Aid Kit 1) Check box and condition	Not labeled Not present. Box not moisture and dust proof, won't seal, won't stay latched or contents inaccessible due to condition of box. (Continued on Next Page)	

A. INSIDE		
2. Emergency Equipment		
Inspection Procedures:	Repair if:	Out of Service if:
b. First Aid Kit: (continued)		
2) Check for presence of tamper proof seal.	Seal broken, inspect contents, replace.	
3) Mounting: Check accessibility and mounting of kit. Should be placed in the driver's area and easily accessible.	Loose mounting or loose bracket. Not mounted or inaccessible.	
4) Contents: If seal is broken, check that all contents are intact and sterile (for content list, see Chart 1).	Band-aids are missing or incomplete. Contents are not individually sealed or sterile. Contents not of proper type or incomplete (except band-aids).	
c. Body Fluid Cleanup Kit (After May of 2004)		
1) Check kit and condition	Not labeled Body Fluid Clean Up kit not present. Container not moisture and dust proof, won't seal, won't stay latched or contents inaccessible.	
2) Check for presence of tamper proof seal.	Seal broken, inspect contents. Tamper proof seal not of approved type (i.e. material cannot be broken easily).	
3) Check accessibility - Should be mounted in the driver's area and easily accessible.	Loose mounting or bracket. Not easily accessible to driver/not secured.	
4) Contents: If seal is broken, Check that all contents are intact and sterile (for contents list, see Chart 2).	Contents not of proper type, incomplete, or missing.	
	(Continued on Next Page)	

A. INSIDE		
2. Emergency Equipment (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Reflectors (After 1994) 1) Check for proper type and condition of emergency roadside reflectors.	Bus manufactured after 1994 is not equipped with self-standing, triangular, 17" tall reflectors. Any of the reflectors are broken, deformed or unusable.	
2) Check quantity: three (3) required.	Fewer than three (3) reflectors are present.	
3) Check accessibility, mounting and condition of box. Must be securely mounted in driver's area.	Storage box broken or won't remain latched. Box is not accessible or not securely mounted forward of passenger compartment.	
4) Check for presence of tamper proof seal on Fire Extinguishers.	Seal broken, inspect contents.	
e. Webbing Cutter on bus equipped with lifts.	Replace if webbing cutter is missing.	

A. INSIDE 3. Insurance Card		
Inspection Procedures:	Repair if:	Out of Service if:
a. Insurance Card 1) Check for presence of insurance card in a mounted transparent holder.	Insurance Card is not on the bus, is invalid, not legible or holder missing.	
A. INSIDE 4. Shifter, Transmission		
a. Shifter-Automatic Transmission 1) Check that shifter operates easily.	Does not shift easily into all gears.	Will not shift into all gear positions.
1b) Touch-Pad operation		
2) Correctly indicates the gear that the transmission is in.	Slightly misaligned, but indicates correct gear.	Indicates the wrong gear.
2b) LED correctly indicates the gear that the transmission is in.	Some of LED's are out but can still determine which gear its in.	LED's are out and/or can't tell which gear the transmission is in.
3) Has a functional detent mechanism with a knob or handle on end of shift lever.	Loose knob or handle.	Detent is non-functional. Knob or handle is missing from end of shifter lever.
3b) Check Markings on touch-pad.		Buttons on touch-pad unreadable.
b. Shifter-Manual Transmission 1) Check that shifter operates easily.	Does not shift easily into all gears.	Will not shift into all gears. Hangs between gears.
2) Condition of lever and knob.	Bent lever or knob cracked. Loose knob. Pattern worn off knob (floor shift only).	Lever not securely attached. Knob missing or indicates wrong pattern.
c. Neutral Safety Switch 1) Check to determine if has a functional neutral safety switch that will allow the starter to operate only in park or neutral.		The starter will engage in any gear other than park or neutral.

A. INSIDE
6. Engine Controls

Inspection Procedures:	Repair if:	Out of Service if:
a. Ignition Switch: 1) Check that switch only operates by key.	Key sticks in switch. Switch operates without key.	
2) Should be mounted securely in OEM location.	Loose	Not mounted in OEM location.
3) Should operate freely in each function (i.e., start, run, off, and accessory position).	Engine will not crank or start. Switch sticks in any position. Doesn't function properly in start, run, off, or accessory position or is intermittent in any position.	
b. Accelerator 1) Check that accelerator pedal, control design, condition, and mounting securement are OEM.	Pedal cover (as originally equipped) is worn through or smooth in any area.	Pedal and assembly not mounted securely. Pedal, control design, and mounting not OEM.
2) Inspect pedal assembly and linkage for loose or missing hardware.		Loose or missing hardware.
3) Check for smooth operation of pedal assembly and linkage in the accelerating and coast position.		Accelerator control and linkage sticks or doesn't operate freely.
4) Inspect for unauthorized modifications to pedal (i.e., extensions or other devices attached to pedal).		Pedal built up with extender or block(s), or not of OEM design.
c. Engine Shutdown 1) Only O.E.M. approved ignition controlled shutdown acceptable on all vehicles.		Not OEM or OEM approved.
2) Check for free operation of shutdown over full range with minimum effort (if equipped with manual type shutdown on diesel buses.).	Cable is sticking or hard to operate.	Engine can be started, in shut down position, or it does not stop engine.
d. Fast Idle Switch 1) Check operation of switch.	Switch On does not engage.	Switch Off does not disengage fast idle.

A. INSIDE		
7. Gauges, Indicators & Dash Lights, Engine Warning Lights, and Buzzers		
Inspection Procedures:	Repair if:	Out of Service if:
a. Gauges: Check from driver's position the visibility, OEM location, readability, operation, accuracy, and condition of the following gauges and warnings:		
1) Speedometer and odometer	Odometer doesn't work or is not working properly - Odometer is unreadable.	Speedometer is known not to work or is confirmed to be inaccurate - Speedometer is unreadable or damaged.
2) Oil pressure. 3) Temperature. 4) Fuel. 5) Voltmeter or ammeter.	Oil pressure, temperature, fuel, voltmeter or ammeter gauge are inaccurate, damaged or difficult to read.	Oil or temperature gauge does not function or is unreadable. Oil pressure gauge or tube leaks.
6) Air pressure or vacuum.		Air pressure or vacuum gauge(s) are known to be inaccurate, are unreadable or not working.
7) Tachometer (if equipped).	Inoperative	
8) Hourmeter (if equipped).	Inoperative	

A. INSIDE 7. Gauges, Indicators & Dash Lights, Engine Warning Lights, and Buzzers (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Indicators, Dash Lights: Check for presence and operation of the following indicators:	Light bulb for the following gauge or indicators is inoperative:	Light bulb for the following gauge or indicators is inoperative:
1) Low air pressure or vacuum warning light and or buzzer.		Low air pressure or vacuum.
2) High beam indicator light.	High beam indicator.	
3) Left and right turn signal and 4-way hazard.	Left or right turn signal or 4-way hazard.	
4) Check all dash and control panel lights for illumination at gauges and switches.	Oil pressure Temperature Fuel Voltmeter Ammeter Shift Indicator light is inoperative. One or more lights for control switches are inoperative. One or more panel lights is inoperative. All dash or control panel lights are inoperative. Speedometer lights are inoperative. (Continued on Next Page)	

A. INSIDE 7. Gauges, Indicators & Dash Lights, Engine Warning Lights, and Buzzers (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
c. Engine Warning Lights and Buzzer: Check for presence and operation of the following warning lights all diesel buses and buzzer on 1990 and later.		
1) High coolant temperature dash warning light and buzzer.	High water temperature dash warning light or buzzer is inoperative.	
2) Low oil pressure dash warning light and buzzer.	Low oil pressure dash warning light or buzzer is inoperative.	
A. INSIDE 8. Air Brake System:	NOTE: If vehicle is equipped with Anti-Lock Braking System, refer to appropriate manufacturer's service manual for inspection criteria.	
a. Gauge(s): 1) For vehicles equipped with air brakes check for presence of two (2) air pressure gauges (or single gauge with dual needles). One (1) gauge or needle should indicate air pressure available to the primary and one (1) to the secondary brake system.		Any gauge is missing or cannot be read. Gauge is not accurate. Any gauge is not in OEM location. More than a 15 psi difference in dual air brake system (dual gauges).
b. Park Brake: Check for proper operation and adjustment of park brake as follows: 1) With vehicle stopped, apply park brake. When engine torque is applied by placing transmission selector in "Drive" and "Reverse" (automatic transmission) and accelerating the engine to a fast idle (approximately 1,200 RPM), vehicle should not move.		Vehicle moves after speeding up the engine (transmission in gear) with park brake applied.
	(Continued on Next Page)	

A. INSIDE

8. Air Brake System (continued)

Inspection Procedures:	Repair if:	Out of Service if:
2) Lever / Knob	Pin or knob loose, broken or cracked.	Missing knob or lever.
3) Check PP-1 (pop-off style) emergency brake control valve. Check condition, location, mounting, and type of valve and knob. With pressure above 45 psi, apply and release valve to check operation.	Label identifying valve is missing or unreadable.	Valve not mounted securely (in original position). Not OEM type. Inoperative. Leaks.
4) Check (PP-1) park brake control valve for emergency activation of valve by pumping down brakes (starting with at least 60 psi in air system) and noting air pressure at which valve "pops out".		Park brake pop-off valve fails to "pop out" between 15 to 50 psi.
c. Low Air Warning: Check operation of low air warning buzzer and light.		
1) With ignition key switch in run position (engine off), pump air brake pedal to drop air pressure. Low air warning buzzer and light should activate at approximately 55 - 60 psi.	Light or buzzer is inoperative.	Light or buzzer is inoperative. Light or buzzer fails to operate by 50 psi.
2) Start engine and build up air pressure. Warning buzzer and light should deactivate by 70 psi.	(Continued on Next Page)	Continues to operate above 70 psi.

A. INSIDE 8. Air Brake System (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Pedal 1) Check air brake pedal assembly for adjustment, mounting, condition, operation, and rubber cover pad (if originally equipped). Check for presence of prohibited extender block.	Rubber cover pad is worn through or is worn smooth in any area. Rubber cover pad is missing (if originally equipped).	Any part of pedal and assembly is damaged, loose, missing, or has been modified. Pedal is equipped with any type of extender block.

A. INSIDE 9. Hydraulic Brakes:
NOTE: Since there are two (2) distinct types of hydraulic brake systems in use on school buses, this manual will cover each system individually. It is imperative that you know the type of system you will be inspecting to ensure that the proper inspection procedure is used. The two (2) types of systems are: a. Hydraulic Power Assisted Hydraulic Brakes with Electric Pump Backup and Driveshaft Park Brake Systems b. Hydraulic Power Assisted Hydraulic Brakes with Spring Set (hydraulically released) Parking Brakes (Ford Maxi brake)

A. INSIDE		
9. Hydraulic Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
a. Hydraulic Power Assisted Hydraulic Brakes with electric pump backup and driveshaft park brake system, Inspect for: (continued) 6) Check Parking Brake: With vehicle stopped (engine running), apply park brake. When engine torque is applied by partially engaging clutch in second gear and reverse (manual transmission) or by placing transmission selector in "Drive" and "Reverse" (automatic transmission) and accelerating the engine to a fast idle (approximately 1,200 R.P.M.), vehicle should not move.	Adjustment is needed, (lever type with adjustment knob on it) do so now.	Emergency brake control is hard to operate or doesn't latch and release properly. Park brake doesn't hold or functions improperly
b. Hydraulic Power Assisted Hydraulic Brakes with Spring Set (Hydraulically released). Parking Brakes (Ford Maxi brake); Inspect for: 1) Any visible leaks in the brake or power assist system.		Any leaks are found in either system.
2) Check brake warning and backup system using Chart 3.		The brake systems do not pass all tests in Chart 3.
3) Check brake pedal travel: Push brake pedal down as far as possible.		Brake pedal travels more than half way down.
4) Check for brake pedal fade. Pedal falls away to floor when held down (with engine running and with engine off), indicating brake system leaks.		There is any brake pedal fade.
(Continued on Next Page)		

A. INSIDE		
9. Hydraulic Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
a. Hydraulic Power Assisted Hydraulic Brakes with electric pump backup and driveshaft park brake system, Inspect for: 1) Any visible leaks in the brake or hydraulic assist system.		Any leaks are found in the brake or hydraulic assist system.
2) Check brake warning and backup systems using the appropriate chassis manufacturer's procedure in Chart.		The brake system does not pass entire test in appropriate chart.
3) Check brake pedal reserve (distance from floor) upon one (1) firm brake application (engine off, hydraulic boost depleted).		Brake pedal (reserve) is less than one (1) inch from floor.
4) Check brake pedal fade (continues to fall to floor after initial firm application) with engine off.		There is any brake pedal fade (falling away) after initial firm application.
5) Check all brake hardware components inside bus for secure mounting, routing, and condition, including: a) Pushrod and clevis assembly. b) Brake pedal assembly and rubber cover pad (if originally equipped). c) Emergency brake control assembly.	Rubber cover pad is worn through or worn smooth in any area. Rubber pedal cover pad is missing (if originally equipped) or worn out.	Brake pedal assembly, pushrod, and clevis, or emergency brake control assembly is insecurely mounted, has loose, missing, or worn hardware, or is damaged. Pedal is equipped with any type of "extender block". Emergency brake control is hard to operate or doesn't latch and release properly.
(Continued on Next Page)		

A. INSIDE 9. Hydraulic Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Hydraulic Power Assisted Hydraulic Brakes with Spring Set (Hydraulically released). Parking Brakes (Ford Maxi brake); Inspect for: (continued)		
<p>5) Check Parking Brake System:</p> <ul style="list-style-type: none"> a) With engine running, release the parking brake. b) Check to be sure brakes are released (bus will move). c) Turn engine off. d) System must maintain pressure (keep parking brake released) for at least five (5) minutes. e) With vehicle stopped (engine running), apply park brake. When engine torque is applied by partially engaging clutch in second gear and reverse (manual transmission) or by placing transmission selector in "Drive" and "Reverse" (automatic transmission) an accelerating the engine to a fast idle (approximately 1,200 RPM), vehicle should not move. 	<p style="text-align: center;">(Continued on Next Page)</p>	<p>Parking brake system will not hold pressure (i.e., release brakes) for at least five (5) minutes.</p> <p>Vehicle will move with park brakes applied.</p>

A. INSIDE		
9. Hydraulic Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>b. Hydraulic Power Assisted Hydraulic Brakes with Spring Set (Hydraulically released). Parking Brakes (Ford Maxi brake); Inspect for: (continued)</p> <p>6) Check all brake hardware and components inside the bus for secure mounting, routing, and condition, including:</p> <ul style="list-style-type: none"> a) Brake pedal assembly and rubber cover pad (if originally equipped). b) Brake pedal pushrod and clevis assembly. c) Emergency brake control assembly. 	<p>Brake pedal rubber cover pad is loose, missing or worn through or worn smooth in any area.</p>	<p>Pedal is equipped with any “extender block”.</p> <p>Brake pedal assembly, pushrod, and clevis, or emergency brake control assembly is insecurely mounted, has loose, missing, or worn hardware, or is damaged.</p>

Hydraulic Brake System Functions

CHART 1 - WARNING LIGHTS/BUZZER			
FORD			
Normal Operation			
MODE	Indicator		
	Brake Lamp	Brk. Elec. Mtr. Lamp	Buzzer
1a. Engine Off/Ignition Off no brake applied	Off	Off	Off
1b. Engine Off/Ignition Off brake applied	Off	On	On
2. Engine Off/Ignition On or START with or without brake applied	On	On	On
3. Engine On with or without brake applied	Off	Off	Off
GMC			
1. Engine off-ignition off A. No brake applied B. Brake apply	Off On	Off Off	Off Off
2. Engine off-ignition on with or without brake applied (bulb check).	On	On	On
3. Engine off-ignition on start with or w/out brake applied.	On	Off	On
4. Engine on with or without brake applied.	Off	Off	Off

CHART 2 - BRAKE FAILURE WARNING SYSTEM CHECKS	
NAVISTAR	
CONDITION	NORMAL OPERATION
PARK BRAKE LIGHT	
Key switch in START position w/park brake released - (Bulb check).	Light ON
Key switch ON w/park brake applied.	Light ON
BRAKE PRESSURE LIGHT	
Key switch OFF.	Light OFF , Electric hydraulic pump operates when service brakes are applied.
Key switch in ON position. Engine not operating (pump and bulb check).	Light ON And electric hydraulic pump operation (some vehicles) SEE NAVISTAR MANUAL
	Light ON And electric hydraulic pump operates when service brakes are applied.
Key switch in ON position and Engine operating with service brakes applied.	Light OFF
Key switch in START position.	Light ON Momentarily and electric hydraulic pump operates.
Key switch in ON position and engine operating with service brakes applied.	Light OFF

Hydraulic Brake System Functions (continued)

CHART 3 - NORMAL BRAKE SYSTEM CONDITIONS

FORD

CHART 3 - NORMAL BRAKE SYSTEM CONDITIONS																					
FORD																					
Controls											Indicators										
Engine		Ignition			Service Brake		Parking Brake				Service Brake		Electric* Pump				Parking Brake				
							Off		On		Light		Light		Buzzer		Light		Buzzer**		
Off	On	Off	On	Start	Off	On	Part Rel	Full Rel	Part Set	Full Set	Off	On	Off	On	Off	On	Off	On	Off	On	
X		X			X			X	OR	X	X		X		X		X		X		
X		X				X		X	OR	X	X			X		X		X		X	
X				X	X or X					X		X				X			X	X	
	X		X		X or X					X	X		X		X			X	X		
	X		X		X or X		X				X		X		X			X	X		
	X		X		X or X		X				X		X		X		X		X		
	X		X		X or X			X			X		X		X		X			X	
	X		X		X or X					X	X		X		X				X		

* Whenever the ignition switch is in the START position, the Hydro-Max electric pump will cycle momentarily.

**Parking brake buzzer will sound momentarily during application of the parking brake in cold ambient conditions.

A. INSIDE		
10. Windshield Wipers & Washers		
Inspection Procedures:	Repair if:	Out of Service if:
a. Operation: Inspect both wipers for: 1) Swept area field of view.	Wiper goes past perimeter of glass.	Either wiper does not effectively clear driver's field of vision.
2) Proper operation of both wipers on high and low speeds and condition and mounting of switch(es) and knob(s).	Either wiper does not operate on low speed. - Switch(es) mounting loose or knob(s) loose. Knob(s) missing	Either wiper does not operate properly at high speed.
3) Condition and mounting of wiper motor and linkage.	Either wiper motor or linkage is visibly damaged or loose.	
4) Inspect for proper washer operation.	Washer does not operate or is improperly adjusted or out of fluid.	
b. Park: 1) Inspect for parked position of wipers when turned off.	Either wiper does not automatically return to parked position out of driver's line of sight when turned off.	
c. Blades: 1) Inspect blades for condition, mounting, and tension.	Either blade is damaged or deteriorated.	Either blade is loose or does not hold proper tension against windshield.

A. INSIDE**11. Heaters, Defrosters, Aux. Fan(s)****Inspection Procedures:****Repair if:****Out of Service if:****a. Heaters Inspect heater system for:**

1) Heating performance and water control valve (interior).

Not producing adequate heat. Water control valve hard to operate.

2) Blower operation, condition, and control switches.

Heater blowers do not work on any speeds, are noisy, or vibrate.

Blower switches are damaged, loose, or blower operates intermittently.

3) System / hose leakage, condition, and hose shielding (shielding required for exposed hoses on interior of all buses).

Heater cores, hoses, or valves have visible leakage. Heater hoses are cracked, swollen or badly chafed - Shielding is missing or does not completely cover hoses.

4) Condition of ductwork and heater box.

Heater ductwork or heater box components are missing, damaged, loose, or obstructed

Any portion of heating system within passenger area creates sharp edges, projections, or other hazards to passengers or driver.

b. Defrosters**Inspect windshield defroster system for:**

1) Airflow, heat, and coverage area.

Airflow is not present at all defroster outlets.

2) Blower operation, condition, and control switches.

Any defroster blower does not work on low speed, is noisy, or vibrates. Blower switches are damaged or loose.

Any defroster blower does not work on high or low speed.

3) Condition of ductwork, diffusers, and fresh air control (if equipped).

Any ductwork or diffusers are loose or damaged.
Fresh air control (if equipped) does not function.

(Continued on Next Page)

A. INSIDE 11. Heaters, Defrosters, Aux. Fan(s) (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
C. Driver Auxiliary Fan(s) Inspect auxiliary fan(s) for: 1) Presence of fan, mounting and condition.	Fan is not present. Fan mounting is loose or fan won't stay in adjustment.	
2) Blade condition.	Fan blade is damaged.	
3) Protective cage mounting and condition.	Protective cage is loose or damaged	Protective cage is missing.
4) Operation and switch.	Fan does not operate, one (1) speed does not function, fan is noisy or vibrates. Switch is loose or damaged.	
A. INSIDE 12. Dome and Stepwell Lights		
a. Operation and condition: 1) Check dome and stepwell lights for condition and operation.	Any lens is cracked, broken, or dirty. Any dome light is out. Stepwell light is on when door is closed. Switch mounting is loose, or knob is missing. Lens broken so that light or fixture is exposed. Dome lights are not functioning or 50% or more lights are out. Stepwell light is not functioning. Stepwell light does not activate when headlights are on and door is open.	

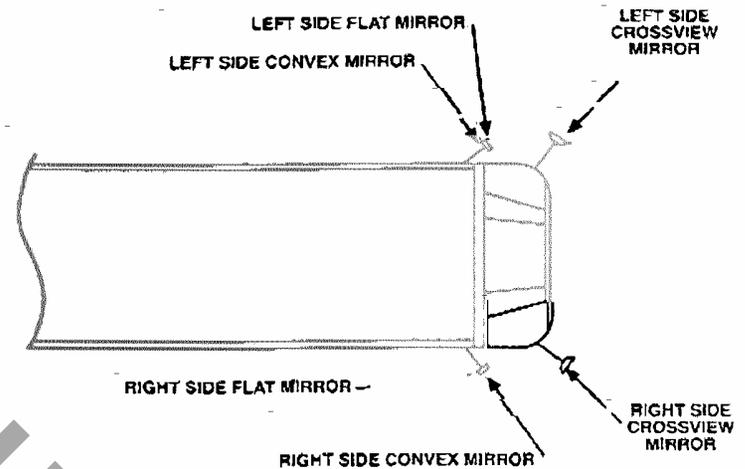
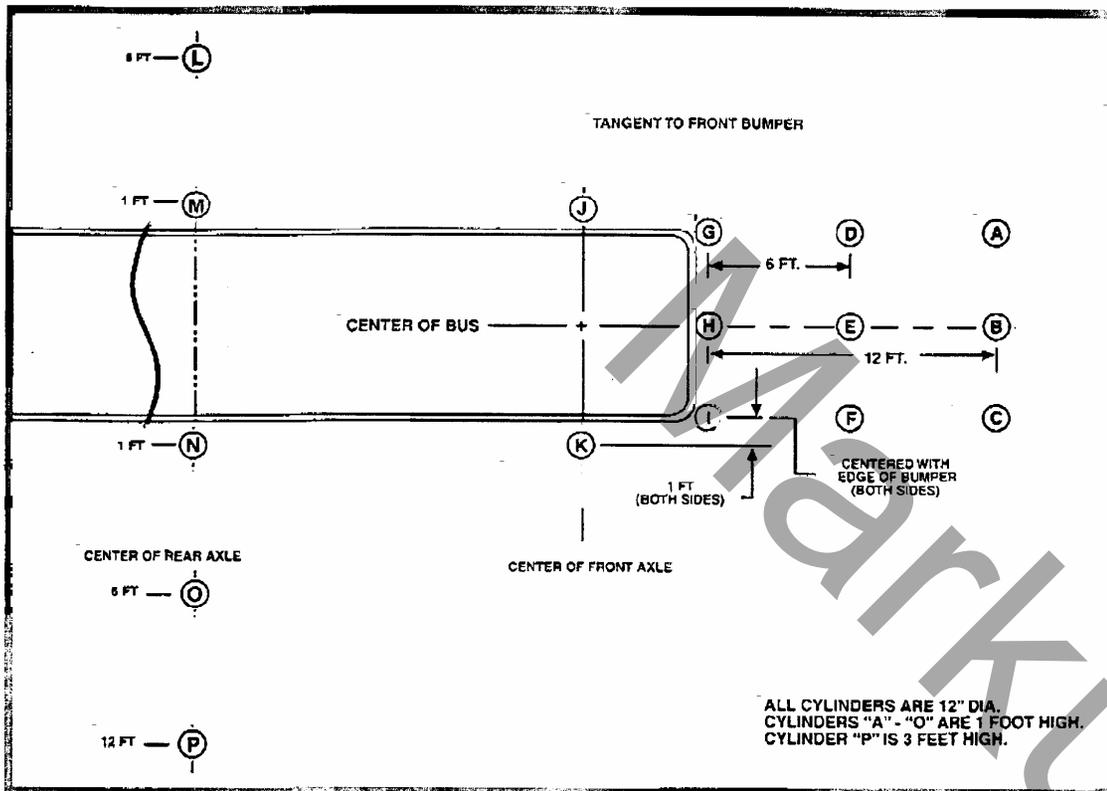
A. INSIDE 13. Service Door		
Inspection Procedures:	Repair if:	Out of Service if:
a. Operation 1) Check service door assembly for operation, adjustment, condition, mounting, and fit.	Door does not seal properly or seals are damaged, ripped, or deteriorated. 3 to 6 inch line crack in glass Glass has been replaced with Plexiglas, is broken, or has a line crack more than 6 inches.	Door jams, binds, or is difficult to close or open. Door assembly is damaged, or mounting is loose so as to affect opening/closing. Door glass is fogged more than one (1) inch from border, or visibility through glass is poor. Door is equipped with any lock except factory approved system. Door seals are not present. Door will not open or close completely
2) Check door hinge and hinge screws.	Hinge screws loose.	Hinge or pin condition interfering with operation of door.
b. Control 1) Check manual service door control and rod assembly for over-center or latching device, condition, mounting, and operation.	Control, rod hardware, or mounting is loose. Door control doesn't operate freely. (Continued on Next Page)	Manual control will not lock over-center, or latching mechanism is inoperative. Door control requires excessive force to operate.

A. INSIDE 13. Service Door (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Control (Continued) 2) Check air powered service door control assembly for leaks, operation, insecure door in closed position, and emergency release.	Air powered system leaks.	Air door emergency release does not function, or control is broken. Air door does not function properly, or at all.
c. Overhead Pad 1) Check bus for pad that is a minimum three (3) inches wide, high density foam rubber padded safety cushion, mounted directly above the inside of the service door.	Pad is loose, or cover is torn.	Pad is missing or wood is exposed.
A. INSIDE 14. Horn(s)		
a. Horn operation and condition 1) Check for operation of horn(s) and for location and condition of horn switch.	Horn button is not mounted in original OEM location. Horn button sticks, or horn button operates intermittently such as when steering wheel is rotated.	Horn(s) does not operate at all.

A. INSIDE 15. Mirrors		
Inspection Procedures:	Repair if:	Out of Service if:
a. Rear-view: 1) Check exterior rearview mirrors for specifications, condition, mounting, and adjustment.	Any exterior rearview mirror is loose in the frame. Any bracket is broken or mirror mounting is insecure.	Any exterior rearview mirror is broken or cracked. Either mirror does not give driver a clear view down to lower outside edge of rear tire at ground level, on both sides to the rear. Reflective surface is deteriorated. Any mirror does not meet applicable specification as to type and size.
b. Convex: 1) Check convex crosswalk and side-view mirrors for specifications (correct type, size, and location) condition, mounting, and adjustment.	Any mirror is loose in frame. (Continued on Next Page)	Required convex mirrors are not present. Any mirror is cracked or broken.

A. INSIDE 15. Mirrors		
Inspection Procedures:	Repair if:	Out of Service if:
b. Convex: (continued)	Any portion of mirror mounting system is loose or broken.	Any mirror reflective surface is deteriorated. Mirrors do not meet specifications for bus manufacture dates as shown on chart. Mirrors do not give driver a clear view of the area around the front of the bus.
c. Interior: 1) Check interior rearview mirror for size, condition and mounting.	Any portion of reflective surface is obstructed by sun visor, stickers, or other items or is deteriorated. Mirror mounting is loose.	Mirror does not meet minimum size/design requirements. Mirror does not have rounded corners and protected edges. Driver's view of images in mirror is not clear due to distortion or other causes.

FMVSS.111 MIRROR ADJUSTMENT



REAR VIEW MIRRORS (SYSTEM A) Used together, the left side flat mirror and the left side convex mirror must provide a view of cylinder "M" and, continuing from there, 200 feet rearward of the mirror surface.

Used together, the right side flat mirror and the right side convex mirror must provide a view of cylinder "N" and, continuing from there, 200 feet rearward of the mirror surface.

CROSSVIEW MIRRORS (SYSTEM B) Any cylinders "A-P" can be viewed using either of the crossview mirrors, but all must be visible. Only those cylinders that the driver can view by direct vision and are forward of the front bumper may be excluded.

A. INSIDE 16. Steering		
Inspection Procedures:	Repair if:	Out of Service if:
a. Play: Check for play in the steering system, at the steering wheel, using the following procedures: 1) Visual check - from inside bus with engine running, rotate steering wheel lightly from side to side until the turning motion can be observed at tires and note free play (lash) at steering wheel outer diameter. This procedure must be performed with the vehicle on the ground.		Free play (lash) exceeds amounts specified in Chart.
2) To check power assist operation run engine at fast idle and turn steering wheel a full right and left turn and feel for binding, jamming, or belt slippage.		Power assist is inadequate, or there is binding, jamming, or belt slippage.
3) Visually check condition of steering wheel.	Steering wheel plastic is cracked.	Steering wheel is loose on column. Steering wheel is non-OEM design. Plastic is missing so that metal steering wheel reinforcement is exposed. Any portion of the metal steering wheel components are cracked or broken.
b. Column: 1) Check steering column inside bus for up and down play (parallel to shaft), side to side play (perpendicular to shaft), and for proper mounting.	Rubber boot at bulkhead (if equipped) is torn, or ripped, or missing.	Side to side play in steering column exceeds 1/4 inch or up and down play exceeds 1 inch. Column assembly mounting (including floor mounting plate) or fasteners are loose.
2) Check operation of tilt and telescoping functions (if equipped).	Does not tilt or telescope.	Does not latch securely in place.

CHART

STEERING WHEEL PLAY (LASH) MEASUREMENTS

Lash shall not exceed the following measurements.

Steering Wheel Size	Play (Lash) Manual Steering	Play (Lash) Power Steering
16 inches or less	2 inches	4 1/2 inches
18 inches	2 1/4 inches	4 3/4 inches
20 inches	2 1/2 inches	5 1/4 inches
22 inches	2 3/4 inches	5 3/4 inches

A. INSIDE		
17. Driver's Seat and Belt		
Inspection Procedures:	Repair if:	Out of Service if:
<p>a. Seat and Belt</p> <p>1) Check driver's seat and belt for specifications (type and adjustability), condition, mounting, and operation.</p>	<p>Seat adjustment binds or is difficult to operate.</p> <p>Seat adjustment is loose or adjustment hardware is missing.</p> <p>Seat upholstery or foam is deteriorated or damaged.</p> <p>Seat upholstery is wrong type (vinyl/cloth).</p> <p>Seat bottom is loose in frame or mispositioned.</p> <p>Seat belt retractor covers or belt covers are damaged or loose.</p>	<p>Driver's seat will not adjust as designed.</p> <p>Seat mounting is unstable, loose at floor, or seat mounting hardware is missing.</p> <p>Driver's seat belt is missing or not an approved type.</p> <p>Seat frame is exposed due to deterioration of upholstery or foam.</p> <p>Mounting of retractors or belt guides is not secure.</p> <p>Seat belt webbing or stitching is frayed or damaged.</p> <p>Seat belt is routed improperly.</p> <p>Seat belt does not extend or retract freely.</p> <p>Seat belt buckle and tongue assembly does not latch or release properly.</p> <p>Non-OEM extenders have been added to belt or belt mounting.</p>

A. INSIDE 18. Passenger Seats		
Inspection Procedures:	Repair if:	Out of Service if:
a. Frames: 1) Inspect passenger seat frames for condition of welds, tubing, and hardware.		Seat frames or welds are broken or cracked. Any seat back frame is repaired using non-OEM hardware. Any seat frame hardware has been added or modified to result in projections or sharp edges
2) Check for presence of non-O.E.M. seat frames.		There are any non-OEM seat frames installed.
3) Check for presence and condition of passenger restraining belts on Special Needs buses and Type "A" buses.		Restraining belts are non-functional.
b. Mounting: 1) Inspect condition of passenger seat mounting.	Seat mounting at floor or seat rail is loose. (Continued on Next Page)	

A. INSIDE 18. Passenger Seats (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
c. Pads/Safety Barriers: 1) Inspect seat back/barrier foam for specifications and condition.		Foam envelope is split, delaminated, or there is no padding between any portion of seat back frame and covering. Any bus does not have a padded safety barrier in front of any passenger seat that does not have another seat in front of it.
d. Cuts/Upholstery Damage. 1) Inspect seat and safety barrier upholstery for condition and specifications.	Seat upholstery is cut, torn, or ripped. Seat upholstery is not repaired properly. (Continued on Next Page)	Seat upholstery is missing.

A. INSIDE 18. Passenger Seats (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
e. Bottoms 1) Inspect seat bottoms for securement and condition.	Any seat bottom is not securely anchored to seat frame.	Any seat bottom padding or cushion has significant deterioration or damage. Any seat bottom has a protruding edge or plywood is broken.
f. Modesty Panels and Stanchions: 1) Inspect modesty panels and stanchions for condition, specifications, mounting, and padding (as required).	Stanchion or modesty panel mounting is loose (Special Needs buses). Stanchion padding is missing or is damaged so that metal is exposed.	
g. Optional Infant/Toddler Seating: 1) Check condition and operation of system.		Seat does not operate or function properly according to manufacturer's operational procedures.
h. Flip-Up Seats: 1) Check condition and operation of flip-up seats.	Seat does not automatically return to an upright position when not in use.	Any sharp edges, loose or protruding hardware that could injure or snag passengers. Seat or hardware malfunction that could trap arm or leg between seat or back.

A. INSIDE 19. Emergency Door/Windows/Hatches		
Inspection Procedures:	Repair if:	Out of Service if:
a. Emergency Door: 1) Inspect for operation and condition of emergency doors, door latch, door hold open feature (if equipped), and door seal.	Rear door opens too far, damaging lights. Door handle, latch, or mounting hardware is loose. Mounting of guard for inside rear door handle is loose. Hold open device (if equipped) is non-operational, bent, damaged or loose. Side emergency door seal damaged or does not effectively prevent water, and/or dirt from entering bus. Cover or padding on bar over door torn or damaged and wooden base not exposed. Emergency door exit not properly labeled.	Any emergency door latch does not operate smoothly and easily when closing or opening the door. (Latch mechanism requires more than 40 pounds of pressure to release.) Door does not open at least 90 degrees. Inside door handle is not equipped with a guard Any emergency door is equipped with any type of locking device. Rear emergency door seal damaged or does not effectively prevent exhaust, water, and/or dirt from entering bus. Padded bar over door missing or damaged to expose wood base.
b. Push out windows: 1) Check condition and operation of push out windows (if equipped).		Emergency window latch does not latch window securely or window does not open easily.
c. Roof hatches 1) Check operation of roof hatches (if equipped).	Roof hatch seal is damaged or dislodged. Roof hatch does not open to ventilation position.	Roof hatch does not open easily to full "emergency open" position from the inside or the outside.
d. Buzzers 1) Check operation of buzzers for emergency doors, emergency exit windows, and roof hatches	Buzzer gives false alarms. (Continued on Next Page)	Buzzer system for any emergency door, exit window, or any roof hatch does not function or is not audible at driver's location.

A. INSIDE 19. Emergency Door/Windows/Hatches (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
e. Labeling and Pad 1) Inspect for label and opening instructions for emergency door, emergency windows, and emergency exit/ventilator (roof hatch).	Any emergency exit does not have legible instructions for operation on the inside of the exit. Emergency exits are not clearly labeled inside the bus as "Emergency Door" or "Emergency Exit".	
2) Inspect emergency door header pad.	Pad is loose or cover is torn.	Pad is missing or wood is exposed
A. INSIDE 20. Windshield, Side & Rear Windows		
a. Glass Cracks 1) Inspect windshield and all windows for cracks and other damage.	(Continued on Next Page)	There are any cracks in the windshield in the driver's direct field of vision (area swept by wiper) greater than six (6) inches in length or any star cracks greater than two (2) inches in diameter. There is any crack in the windshield or any window, greater than twelve (12) inches in length. There is any glass missing. There is any laminated windshield or laminated window glass broken or splintered, which might cause injury when touched. There is any window to the side of the driver or behind the driver's location, which is not laminated or tempered safety glass. There is any crack in non-laminated safety glass.

A. INSIDE 20. Windshield, Side & Rear Windows (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Visibility/Fogging: 1) Check windshield and windows for fogging, reduced visibility, or improper level of tinting.	Glass fogging around edges, but less than two (2) inches.	The windshield or any window is fogged more than two (2) inches in from the outer border. Any windshield or window fogging or clouding results in reduced visibility of a mirror. There is any reduced visibility through the windshield or any windows.
2) Check windshield and windows for objects or signs obstructing driver's vision.	There is tinting on the windshield or windows to the side of the driver, which is not 70% light transmission or clearer. There is tinting on any windows behind the driver's location, which is not at least 28% light transmission or clearer.	Any object obstructing or interfering with drivers vision to the front, sides, or rear. Any sign or placard placed or mounted in or on any glass except the following approved locations. Left Side – First window behind driver's window, lower glass. Right Side – Second window behind service door lower glass. Rear – Right rear glass lower half.
c. Latches and Window Operation 1) Check latches and windows for condition and operation.	Latches are broken. Latches are hard to operate, or any window does not move up and down freely. Windows do not stay closed. (Continued on Next Page)	There is any loose or damaged window hardware protruding into the passenger compartment.

A. INSIDE 20. Windshield, Side & Rear Windows (continued)	Inspection Procedures:	Repair if:	Out of Service if:
d. Visor 1) Check driver's sun visor for condition and operation.		Driver's sun visor is clouded, dirty or has unauthorized stickers. Driver's sun visor cannot be adjusted or will not stay in position. Driver's sun visor is cracked, broken or damaged. Sun visor is missing.	

Markup

A. INSIDE 22. General Condition, Interior (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Paneling 1) Check all interior sidewall, rear, ceiling, and driver's area paneling for secure fastening, projections or sharp edges, and condition.	There is graffiti or unauthorized stickers on interior panels. (if on buses advise district) There are loose or missing attachment screws on any maintenance access panel. Interior paneling is severely mildewed, or paint (where required) is missing or damaged.	Interior paneling has any projections or sharp edges. Any Missing Panels.
c. Trash Cans/Brooms 1. Check to see that approved trash cans are present in all buses and are properly secured. 2. Check to see that brooms (if present) are properly secured in approved locations.	Trash can is damaged or missing. Trash can is not properly secured. Broom securement clips are loose. Broom is not properly secured.	
d. Dog House/Engine Cover, if equipped 1) Inspect dog house/engine cover for seals, soundproofing, weather stripping, prop-rod and latch operation.	Soundproofing is not present or deteriorated. Prop-rod does not support dog house/engine cover safely. Latch is hard to operate or does not secure dog house/engine cover properly.	Seals or weather stripping allow air/fume leaks into driver's compartment.
e. Cleanliness: 1) Inspect interior for cleanliness.	Bus is dirty. <u>Advise district.</u>	Bus is dirty and unsafe to operate. <u>Advise district.</u>

A. INSIDE 22. General Condition, Interior (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. Loose Objects 1) Check to see that all objects within the bus are secured.	Loose objects are present and are not properly secured. Any aerosol cans or other containers of flammable, hazardous, or volatile chemicals or liquids are on the bus.	
A. INSIDE 23. Wheelchair Lift, Door & Securement System		
Inspection Procedures:	Repair if:	Out of Service if:
a. Wheelchair Lift, Door, and Securement System: 1) Operate lift through complete cycle and inspect for proper operation, condition, safety features, manual backup system, fluid leaks, mounting, barrier operation, warning light, buzzer operation, and overall mechanical condition.	Dome light at inside lift area is inoperative. Lift door or latch does not operate smoothly. Evidence of fluid leaks. White light at exterior lift area (if equipped) is inoperative. Lift control cable or wiring is damaged or routed improperly.	Lift platform end barrier or handrail (if equipped) does not raise and lower reliably to the proper position. Barrier does not lock in position, or is damaged. Lift does not fold, unfold, raise and lower properly, or jerks and binds. Lift is not mounted securely to the vehicle. There is excessive side play in the lift mechanism when the platform is partially or fully extended. Door switch (to prevent lift operation when the lift door is closed), or other safety override features do not function. (2004 and Later)
(Continued on Next Page)		

A. INSIDE 24. Wheelchair Lift, Door & Securement System (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
a. Wheelchair Lift, Door, and Securement System: (continued)		<p>Any part of the lift mechanism or hardware is damaged, missing, or not secure including cams, clips, pins, rollers, and platform fasteners.</p> <p>Manual backup system does not function properly.</p>
2) Buzzer: Operation according to specifications	Lift door warning buzzer or light does not operate according to specifications.	.
3) Inspect wheelchair and occupant securement (tie-down) system for condition, mounting, proper type, and location.	Track is filled with dirt.	<p>Wheelchair tie down track or fasteners are loose, broken, or damaged.</p> <p>Wheelchair or occupant securement straps are broken, frayed, or will not operate.</p>

End of Section

**DPSAFT School Bus Inspection
Procedures, Repair Criteria, & Out Of Service Criteria
Outside of School Bus**

B. OUTSIDE		
1. Headlights, Turn Signals, Hazard, Side Marker, Brake Tail, Backup Lights, Backup Alarm (if equipped), and Park Lights		
Inspection Procedures:	Repair if:	Out of Service if:
a. Headlights: 1) Check all headlights for brightness, operation, condition of sealed beams, type and visible misalignment. 2) Check Daytime Running Lights (if equipped) for proper operation.	Left and right sealed beams are of different type (halogen vs. conventional). Any sealed beam lens is fogged, cracked, or light is dim. Trim rings not present. Upon visible inspection, there is any obvious misalignment of headlights due to adjustment. DRLs fail to function properly (Daytime Running Lights).	Either sealed beam does not light on low and high. Lights go out after being on a short time, or operation is intermittent.
3) Check high beam indicator operation	High beam indicator doesn't light.	
4) Check dimmer switch	Dimmer switch sticks, is hard to operate, or doesn't function.	
5) Check headlight switch.	Headlight switch is damaged, not securely mounted, or knob is missing.	
6) Dash light brightness control.	Inoperative and dash lights illuminate. Inoperative and dash lights do not illuminate.	
(Continued on Next Page)		

B. OUTSIDE 1. Headlights, Turn Signals, Hazard, Side Marker, Brake Tail, Backup Lights, Backup Alarm (if equipped), and Park Lights (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
a. Turn Signals: 1) Check turn signals and lens(es) for operation, condition, and specifications.	Any front, rear, or side-mounted turn signal lens is cracked and white light is not visible. Turn signal indicators do not properly indicate right and left signal. Turn signal switch does not cancel or return to neutral position.	Any front, rear, or side-mounted turn signal does not flash or is dim. Turn signal does not flash between 60 and 120 times per minute. Turn signal switch does not initiate turn signals or will not maintain set position. Any front mounted turn signal lens is not amber. Any side mounted turn signal lens is not amber if on the front half of the bus or red if on the rear half. Any turn signal lens has darkened, faded, or is dirty significantly affecting visibility or color of the light. Any front, rear, or side-mounted turn signal lens is damaged, and white light is visible.
(Continued on Next Page)		

<p>B. OUTSIDE 1. Headlights, Turn Signals, Hazard, Side Marker, Brake Tail, Backup Lights, Backup Alarm (if equipped), and Park Lights (continued)</p>		
<p>Inspection Procedures:</p>	<p>Repair if:</p>	<p>Out of Service if:</p>
<p>b. Hazard Lights: 1) Check four way hazard lights and lenses for operation and condition.</p>	<p>Any lens is cracked or dirty. Either indicator fails to function properly. Switch is damaged, not securely mounted, or knob/button is missing.</p>	<p>Four-way hazard light fails to function.</p>
<p>c. Brake Lights: 1) Check brake lights and lens(es) for operation, condition, and specifications.</p>	<p>Fewer than half of the O.E.M. installed regular brake lights fail to function when brake pedal is depressed. (i.e. 1 of 4) Any brake light lens is cracked and white light is not visible. High mount brake light fails to function (if equipped) After brake pedal is released, brake light switch sticks, or lights stay on. Any brake light lens is damaged and white light is visible. Any brake light lens is not red or is not proper type meeting SAE specification or lens has darkened, faded, or is dirty, significantly affecting the visibility or color of the light.</p> <p>(Continued on Next Page)</p>	<p>Half or more of the O.E.M. installed regular brake lights fail to function when brake pedal is depressed. (i.e. 2 of 4 , 1 of 2 or more)</p>

B. OUTSIDE 1. Headlights, Turn Signals, Hazard, Side Marker, Brake Tail, Backup Lights, Backup Alarm (if equipped), and Park Lights (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Tail Lights: 1) Check tail light(s) and lens(es) for operation, condition, and specifications.	Fewer than half of the O.E.M. installed tail lights fail to function when the headlight switch is in either the park or headlight positions. (i.e. 1 of 4) Any tail light lens is cracked and white light is not visible. Any tail light lens is damaged and white light is visible. Any tail light lens is not red or is not proper type meeting SAE specifications. Any tail light lens has darkened, faded, or is dirty, significantly affecting the visibility or color of the light.	Half or more of the O.E.M. installed tail lights fail to function when the headlight switch is in either the park or headlight positions. (i.e. 2 of 4 , 1 of 2 or more)
e. Backup Lights: 1) Check backup lights and lens(es) for proper operation and condition.	One of the installed backup lights (2 light system) fails to function. Any backup lens is cracked. All of the installed backup lights fail to function. Backup light(s) stays on all the time or stays on in any gear position other than reverse.	
f. Backup Alarm: (2004 and later buses) 1) Check for presence of back up alarm. Check operation of alarm by placing transmission in reverse (automatic transmission – engine running) and listening for alarm sound.	Alarm mounting loose. Backup alarm does not sound. (Continued on Next Page)	

B. OUTSIDE		
1. Headlights, Turn Signals, Hazard, Side Marker, Brake Tail, Backup Lights, Backup Alarm (if equipped), and Park Lights (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
g. Park Lights: 1) Check park lights and lens(es) for proper operation and condition.	Park light(s) fail to function. Any park light lens is cracked or damaged.	
h. Clearance, Marker and ID lights: 1) Check light(s) and lens(es) for operation, condition, and location.	When viewed from front, rear, or side: At least 1 light is working when viewed from that direction. Any clearance or ID lens is not amber if in front of the rear wheels or red if at or behind the rear wheels. Any clearance light lens has darkened, faded, or is dirty, significantly affecting the visibility or color of the light. Any clearance light switch is hard to operate, sticks, or knob is missing. Any clearance or ID light lens is damaged or white light is visible.	When viewed from front, rear, or side: None of the lights are working when viewed from that direction.
i. License plate/light(s): 1) Check license plate and light(s) and lens(es) for condition and operation.	License plate light(s) is inoperative. License plate is loose not legible or missing. (Continued on Next Page)	

B. OUTSIDE		
1. Headlights, Turn Signals, Hazard, Side Marker, Brake Tail, Backup Lights, Backup Alarm (if equipped), and Park Lights (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
j. Strobe Light: (bus) 1) Check roof mounted white flashing strobe light for operation, location, condition and protective guard (all buses manufactured 1995 and later).	Protective guard is loose or missing. Strobe light is missing or does not function.	
k. Reflectors: 1) Check reflectors for condition and location.	Any OEM installed reflector on either side of the bus is missing, damaged, cracked, or faded. Any OEM installed reflector on either the front or the rear of the bus is missing, damaged, cracked, or faded.	
2. Eight Light Warning System		
a. Pupil Warning Lights 1) Check pupil warning lights for operation and condition (see Chart).	Either pupil warning light pilot light fails to function. Any pupil warning light hood is damaged but does not obstruct visibility of the light. Any pupil warning light hood is missing. Any pupil warning light lens is damaged, and white light is visible or is not proper type. Any pupil warning light lens has darkened, faded, is misaligned, or is dirty, affecting the color of the light or reducing the visibility to less than 500 feet in bright sunlight.	Any red light does not function or is dim. Red lights (both front and rear) do not alternately flash (side to side). Any pupil warning light is not red (outer) Pupil warning lights do not function according to all conditions in Chart. Any pupil warning light hood is damaged so that it obstructs visibility of more than 30% of the light.

EIGHT LIGHT WARNING SYSTEM

CONTROL SWITCH, and SERVICE DOOR IN THE FOLLOWING POSITIONS:			CONDITION OF STOP ARM(S), STOP ARM LIGHTS, AMBER WARNING LIGHTS AND RED WARNING LIGHTS MUST BE:				
ITEM	MOMENTARY SWITCH POSITION (ON or OFF)	SERVICE DOOR POSITION	STOP ARM, STOP ARM LIGHTS	AMBER WARNING and PILOT LIGHTS	RED WARNING and PILOT LIGHTS	CROSSING CONTROL ARM	CHILD SAFETY ALARM IF EQUIPPED
1	OFF	CLOSED	RETRACTED, OFF	OFF	OFF	RETRACTED	OFF
2	OFF	OPEN	RETRACTED, OFF	OFF	OFF	RETRACTED	OFF
3	ON	CLOSED	RETRACTED, OFF	ON	OFF	RETRACTED	OFF
3.1	OFF	OPEN	EXTENDED, ON	OFF	ON	EXTENDED	OFF
3.2	OFF	CLOSED	RETRACTED, ON	OFF	ON	RETRACTED	ON
3.3	OFF	CLOSED	RETRACTED, OFF	OFF	OFF	RETRACTED	OFF
4	FAIL-SAFE ON	EITHER	EXTENDED, ON	OFF	ON	EXTENDED	OFF

Items 3 through 3.3 are to occur in sequence once the system momentary switch is activated. By opening and closing the door control, the rest of sequence 3.3 will automatically occur after a brief time delay.

B. OUTSIDE		
3. Stop Arm, Crossing Arm, Child Safety Alarm		
Inspection Procedures:	Repair if:	Out of Service if:
a. Stop Arm 1) Check stop arm for specifications, operation (see Chart), and condition.	Wiring-ground strap is loose or not properly routed and secured. Any lens is cracked and no white light is visible. Ground strap is broken. Hinge or bushing(s) is worn or needs lubrication. Stop arm assembly or blade mounting is loose. Lights do not flash alternately. Retraction is slow. Any stop arm (paint or decal) is significantly faded or discolored.	Wiring: insulation missing exposing copper or wire(s) is broken. Any lens is damaged, broken, or missing and white light is visible. Any stop arm light does not flash. Any light does not function. Stop arm does not extend to approximately 90° (degrees) or retract. Any stop arm has an air or vacuum leak. Stop arm does not operate according to all the conditions in Chart. Stop arm not of proper type and specifications: 1) Octagonal, red w/ white border (all). 2) Flashing red lights (all).
b. Student Crossing Arm (all buses): 1) Check front bumper mounted student crossing arm for operation, condition, and mounting.	Hinge or bushing(s) is worn or needs lubrication. Arm assembly or blade mounting is loose. Loop-rod/arm is distorted or u-bolts are loose. Blade is not approved type. (72" Minimum length)	Arm does not extend to approximately 90° (degrees) and retract. Any arm has an air or vacuum leak. Arm does not operate according to all the conditions in Chart. Loop-rod/arm is missing or broken.

B. OUTSIDE		
4. Batteries:		
Inspection Procedures:	Repair if:	Out of Service if:
a. Batteries: 1) Check for condition and type.	Batteries are the wrong type for vehicle, or in multi battery sets are not matched. Battery will not start vehicle. Battery top or sides are corroded, greasy, dirty or wet with electrolyte.	Battery is cracked or damaged.
b. Hold-down: 1) Check for tightness, condition, and type of battery hold-down.	Hold-down assembly or tray is corroded or damaged but battery is secure. Hold-down assembly or tray is loose, corroded, or damaged causing insecure mounting of battery. Hold-down is a flexible strap or other non-rigid design. Hold-down/Batteries are mounted in such a way that they could short out against the hold-down and/or any body or chassis component.	
c. Battery Terminals: 1) Check terminals for type, cleanliness, tightness, and condition.	Terminals are dirty, corroded or loose and/or have missing parts. <p style="text-align: center;">(Continued on Next Page)</p>	

B. OUTSIDE
4. Batteries: (continued)

Inspection Procedures:	Repair if:	Out of Service if:
<p>d. Battery Cables: 1) Check cable assemblies for routing, securement, condition, and size.</p>	<p>Cable is corroded.</p> <p>Positive cable insulation is cracked or damaged.</p> <p>Negative cable or insulation is cracked or damaged.</p> <p>Negative cable is misrouted, unsecured, or grommet is missing to allow it to abrade on any metal or sharp edge.</p> <p>Cable appears to be of excessive length.</p> <p>Flat braided engine ground cable is frayed, corroded.</p> <p>Cable is smaller than original equipment size.</p> <p>Flat braided engine ground cable ends are not secure.</p>	<p>Positive cable is misrouted, unsecured, or grommet is missing to allow it to abrade on any metal or sharp edge.</p> <p>Cable is routed against the exhaust or any other extremely hot surface.</p>
<p>e. Tray: 1) Check battery tray for operation, condition, and securement.</p>	<p>Battery slide tray is corroded or dirty, or hard to slide in and out.</p> <p>Battery slide tray securement device or tray stop is missing or nonfunctional.</p> <p>Battery tray does not slide in and out.</p> <p>Battery slide tray or box is damaged or deteriorated reducing security of battery(ies).</p> <p>Battery box door does not open or will not stay latched.</p>	

B. OUTSIDE 5. Electrical Compartment		
Inspection Procedures:	Repair if:	Out of Service if:
a. Door: 1) Inspect door for condition, operation, mounting, and seal.	Hinge, door, latch, and/or seal are loose or damaged but still functional. Lettering (outside) or wiring diagram (inside) missing	Hinge, door, and/or latch are damaged and do not function or are missing.
b. Compartment: 1) Inspect panel(s) and components for mounting, routing and placement. Inspect visible wiring for mounting, condition, chafing/abrasion, corrosion, loose connectors, or improper repairs.	Wiring or connectors are unsecured, corroded, or improperly routed. Any panel or component is not properly mounted or loose but not in danger of shorting or failing.	Any wire or connector is cut or severely chafed, or conductor is exposed or routed against a sharp edge and is in danger of shorting or failing. Any connection of any connector is not secure and is in danger of shorting or failing. Any panel or component is not properly mounted or loose and is in danger of shorting or failing. Any component or circuit that is not protected by a fuse, circuit breaker or fusible link.
B. OUTSIDE 5.General Condition, Exterior		
a. Mirrors: 1) Check all exterior mirrors, mounting and brackets for tightness and condition.	Mirror brackets are bent or broken, or mounting is insecure and mirror will remain properly adjusted. <p style="text-align: center;">(Continued on Next Page)</p>	Mirror brackets are bent or broken, or mounting is insecure and mirror will not stay in the adjusted position or cannot be adjusted. Cross view mirrors do not extend beyond the leading edge of the vehicle.

B. OUTSIDE 6.General Condition, Exterior (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Bumpers: 1) Check bumpers for mounting, condition, color, body seal and end caps (rear bumper).	Bumper end caps are missing. Bumper is equipped with any unauthorized stickers or decals. Bumper mounting system has cracked, broken, or bent brackets, braces, welds, or missing or loose fasteners. Bumper is not adjusted properly. (i.e. interferes with hood opening) Bumper is cracked, torn, or broken. Bumper is not black (bus).	Bumper is bent away from body or has protruding metal. Bumper is not OEM or approved type.
c. Body Damage 1) Check body exterior for accident damage, scratches, dents, etc.	Body has small dents, scratches, etc... Body has small rust spots or water leaks. Rubber fender extension is missing, loose, or torn. Mud flaps loose, torn, or missing.	Any body part is damaged or dislocated creating a protrusion or sharp edge. Body panels, rivets, or other components are loose, damaged or corroded to the point where joint strength or body structural integrity is compromised. Body panels/parts missing.
d. Paint: 1) Check paint on body and trim for required coloration and condition.	Paint is severely faded, discolored, rusted, or damaged. Trim, rub rails, bumpers, warning light hoods or background are not black (buses). (Continued on Next Page)	

B. OUTSIDE 6.General Condition, Exterior (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>e. Reflective Markings (if equipped):</p> <p>1) Check reflective markings for coloration, reflectability and condition. Markings required starting 2004. Check for presence of reflective markings around any emergency exit (door, window, or roof hatch) along both sides at floor line and around rear perimeter of bus.</p>	<p>Reflective markings are faded, discolored, damaged or peeling.</p> <p>Any required reflective markings are missing.</p> <p>Any emergency exit, roof hatch, or rear perimeter reflective markings are missing, faded, or discolored</p> <p>2004 and Later Buses</p> <p>Side reflective markings are faded, discolored, damaged or peeling</p>	
<p>f. Lettering:</p> <p>1) Buses - Check all lettering for required type, size, location, and color.</p>	<p>Fuel type lettering is not present.</p> <p>Any handicapped symbol (if required) is not reflective white on blue background.</p> <p>Bus permit number not present or readable.</p> <p>Any required lettering is not readable.</p> <p>Bus is not equipped with following lettering:</p> <ol style="list-style-type: none"> 1) Eight inch (8") "SCHOOL BUS" front and rear. 2) Six inch (6") minimum "SCHOOL DISTRICT NAME" left and right sides of body. 3) Handicapped symbol (If required) 4) Minimum two inch (2") lettering "Emergency Door" at top or above door. 5) Emergency door(s) and emergency window(s) or hatch(es) not labeled "Emergency Exit" or "Emergency Door" on outside 6) Any required lettering (except handicapped symbol) is not black. 	

B. OUTSIDE 6.General Condition, Exterior (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>g. Emergency Door Operation</p> <p>1) Check emergency door for operation from exterior of bus.</p>	<p>Emergency doors equipped with a link or strap that prevents the door from opening to far and causing damage. This should be working, not damaged, tight, and should not interfere with operation of the door.</p> <p>Hold open device (if equipped) is non-operational, bent, damaged or loose.</p> <p>Side emergency door seal damaged or does not effectively prevent water, and/or dirt from entering bus.</p>	<p>Emergency door(s) is hard to open fully (at least 90 degrees) from outside of bus.</p> <p>Emergency door(s) latch mechanism requires more than 40 pounds of force to release.</p> <p>Emergency door(s) exterior handle is not OEM style and mounting.</p> <p>Rear emergency door seal damaged or does not effectively prevent exhaust, water, and/or dirt from entering bus.</p>
<p>h. Engine Hood</p> <p>1) Check engine hood for operation, condition, and safety latch.</p>	<p>Hood is misaligned or out of adjustment.</p> <p>Hood cannot be opened as designed.</p> <p>Fiberglass hoods, fender extensions and/or cowls show signs of unusual wear or damage.</p> <p>Hood support cables are loose, broken, or missing (tilt hood).</p> <p>Any hood socket, rubber cone or wedge is missing, loose or damaged.</p> <p>Any rubber/plastic hood bumper or gasket is missing, loose or damaged.</p> <p>Any hinge is missing, loose or damaged.</p> <p>Any hood hold open feature (rod, strut, self-locking support, etc...) is missing, loose or damaged.</p> <p>Hood latch is loose or damaged.</p>	<p>Hood latch does not secure hood.</p>

B. OUTSIDE 6.General Condition, Exterior (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
i. Windshield Folding Steps and Grab Handles: 1) Check condition and mounting of windshield folding steps and grab handles.	Any windshield step or grab handle is loose or missing or broken.	
j. Cleanliness 1) Check exterior of bus for cleanliness.	Exterior is dirty. <u>Advise district.</u>	Vehicle is dirty to the point visibility through any window or light lens is significantly reduced. <u>Advise district.</u>

End of Section

DPSAFT School Bus Inspection

Procedures, Repair Criteria, & Out Of Service Criteria

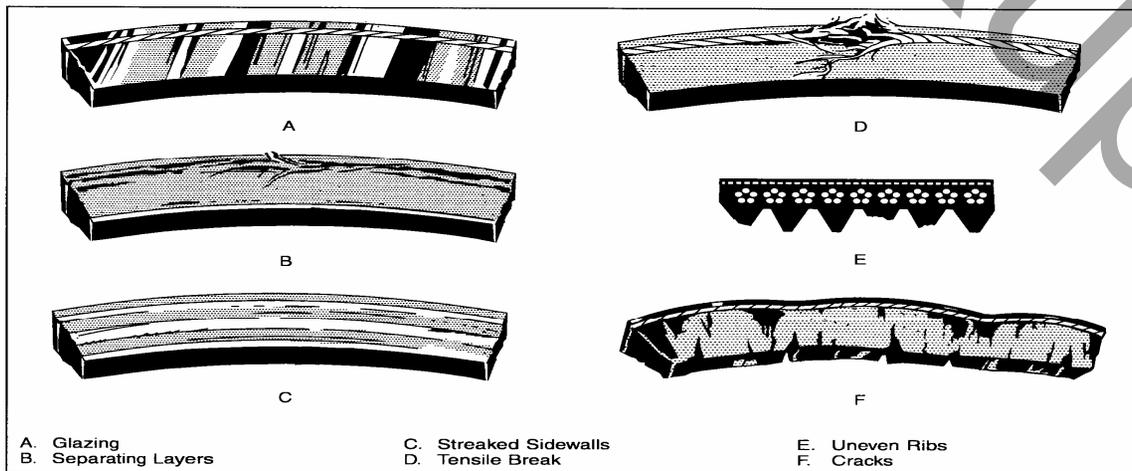
Engine Compartment of School Bus

C. ENGINE COMPARTMENT		
1. Fluid Levels and Conditions		
Inspection Procedures:	Repair if:	Out of Service if:
a. Brake Fluid: 1) Check brake fluid and brake power-assist hydraulic fluid (if equipped) for level and condition.	Level of brake fluid in either side of master cylinder reservoir is low or below "Add" mark (if equipped). Brake power-assist hydraulic fluid is below cold "Add" mark.	Brake fluid or power-assist fluid shows evidence of contamination.
b. Power Steering Fluid: 1) Check power steering fluid level and condition.	Power steering fluid is below cold "Add" mark.	Power steering fluid shows evidence of contamination.
c. Windshield Washer Fluid: 1) Check windshield washer fluid level.	Reservoir is low or washer does not spray windshield.	
d. Coolant: 1) Check coolant (antifreeze) level and condition.	Coolant level in radiator or reservoir is low but still visible in tank. Coolant level in radiator or reservoir is low and not visible in tank. Coolant shows evidence of rust and corrosion contamination.	

C. ENGINE COMPARTMENT		
2. Belts and All Hoses		
Inspection Procedures:	Repair if:	Out of Service if:
a. Belt(s): continued 2) Condition: Visually inspect belt(s) for glazing, oil contamination, dry rotting, cuts, and separation of plies. Check belts for twisting or distortion.	Any belt is glazed. Any belt is oil saturated, dry-rotted, or cut or plies of belt(s) are separated.	Any belt is twisted or distorted.
3) Routing: Visually inspect belt(s) for rubbing or contact with objects other than pulleys and for routing around correct pulleys.		Any belt is making contact with objects other than pulley(s). Any belt is routed around incorrect pulley(s).
4) Belt Alignment: Visually inspect belts for proper alignment.	Any belt is not inline. (Less than 1/16 inch per foot)	Belt misalignment is excessive and could result in failure. (More than 1/16 inch per foot)

Belt Inspection

1. Inspect all used drive belts (including those that are being replaced) for the following conditions:
2. Inspect for glazing (shiny sidewalls). Glazing is caused by friction created when a loose belt slips in the pulleys. It can also be caused by oil or grease on the pulleys.
3. Inspect for separating layers. Oil, grease, or belt dressings can cause the belt to fall apart in layers. If engine parts are leaking, repair the oil leaks. Do not use belt dressings on any belt.
4. Check for jagged or streaked sidewalls. These are the result of a foreign object (such as sand or small gravel) in the pulley, or a rough pulley wall surface.
5. Check for tensile breaks (breaks in the cord body). Cut belts are usually caused by large foreign objects in the pulley or by prying or forcing the belt during installation or removal.
6. On poly-V belts check for uneven ribs. Foreign objects in the pulley will erode the under cord ribs, causing the belt to lose its gripping power.
7. Inspect for cracks. Small, irregular cracks are usually signs of an old belt. Replace the belt if any of the above conditions are found. Replace both belts of a set, at the same time. Matched belts must be from the same manufacturer.



NOTE: For an installed belt, gently twist the belt about 90 degrees so you can see the sidewalls and bottom.

C. ENGINE COMPARTMENT		
2. Belts and All Hoses (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Hose(s) NOTE: References to hoses include all types of hoses located in the engine compartment, including power steering, coolant, air compressor intake, vacuum, brake hydraulic assist, engine oil, and transmission hoses.		
1) Clamp(s) and Connections: Visually and physically check that hose connections or clamp(s) are tight.	Any hose connection or clamp(s) is loose or is too tight digging into hose. Any silicone hose does not have a constant torque type clamp on it.	
2) Condition: Visually inspect all hoses for cuts, abrasions and wear, oil saturation, dry rotting, or "ballooning."	Any silicone hose has been exposed to diesel fuel by contaminated coolant.	Any hose is cut, abraded, worn, oil saturated, dry-rotted, or "ballooned" to the point that failure is imminent.
3) Routing: Visually inspect routing and securement of all hoses.	Any hose is misrouted or unsecured so that heat damage, abrasion, or cuts could cause long-term failure.	Any hose is misrouted or unsecured so that heat damage, abrasion, or cuts could cause imminent failure.
4) Type: Confirm hose is of the proper type for the application.		Any hose is found to be of the improper type for the application.

C. ENGINE COMPARTMENT		
3. Components		
Inspection Procedures:	Repair if:	Out of Service if:
<p>a. Air Cleaner:</p> <p>1) Check air cleaner assembly (housing, lid, piping, gasket(s), seal, clamp(s)) for securement, condition, and record filter restriction. Check for presence of wing nut and seal (if equipped).</p> <p>Note: Do not disturb large two-stage air filters to check condition of element. If loosened or removed it must be replaced.</p>	<p>Air filter restriction exceeds manufacturer's specifications.</p> <p>Any portion of air cleaner assembly or mounting is loose or damaged, including piping, nuts, bolts or clamps.</p> <p>There are any worn or damaged seals or gaskets.</p> <p>There is any air or vacuum leaks or missing components.</p>	
<p>2) Air Restriction Gauge (diesel engines), check for presence and condition.</p>	<p>Any gauge found missing, damaged, or inoperative.</p>	
<p>b. Turbo:</p> <p>Inspect turbo and plumbing for leaks, mounting, connections, and condition.</p>	<p>Evidence of oil seepage.</p> <p>Heat shield is damaged or missing.</p>	<p>Any leak is observed on air, exhaust, or oil.</p> <p>Any mounting or connection is loose.</p> <p>Any unusual noise or vibration is observed.</p>
<p>c. Power Steering Pump</p> <p>1) Check securement and condition of power steering pump.</p>	<p>Pump has wrong type cap on reservoir (vented or not vented).</p>	<p>Any portion of the power steering pump, mounting bracketry or fastener is cracked, loose, or missing.</p>

C. ENGINE COMPARTMENT		
4. Components (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Brake Pump 1) Check securement and condition of brake pump.		Pump has wrong type cap on reservoir (vented). Any portion of the pump, mounting bracketry or fastener is cracked, loose, or missing. Any of the hoses or lines not secured or routed correctly and can touch the exhaust manifold.
e. Air Compressor and Filter 1) Check securement and condition of air compressor and filter assembly.	Air compressor air filter (if equipped) is dirty.	Any loose, leaking or damaged hose or plumbing between engine air filtration system and compressor (on vehicles that share filter). Any portion of the air compressor, compressor air filter (if equipped), filter and compressor mounting bracketry, filter cover, or fastener is cracked, loose, or missing. Any oil or coolant leaks from compressor or plumbing. Any problem with piggy-backed power steering pumps either mounting or leaks.
	(Continued on Next Page)	

C. ENGINE COMPARTMENT		
4. Components (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. Water Pump 1) Check condition of water pump and pulley.	There is evidence of coolant seepage from water pump, seal, gasket surface, or weep hole. Water pump fasteners are loose, damaged, or missing.	Water pump is noisy, bearing is damaged, or coolant is dripping out.
g. Fan 1) Check fan blade and fan clutch/drive assembly for securement and condition.	Hydraulic drive type fan always remains in the "on" position.	Fan is not OEM type. Fan has any cracked, bent, or broken blades. Any portion of fan mounting is loose. Fan clutch is seized or loose. Any leak, mounting, rotation or function problem with hydraulic motor. Electric fan does not operate. Hydraulic solenoid valve inoperative. Wiring for fan (electric) or solenoid (hydraulic) is not secured or is loose, damaged, or missing.

C. ENGINE COMPARTMENT 4. Components (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
h. Alternator 1) Check securement and condition of alternator assembly.	Alternator is noisy. Washers missing on slide portion of mount. All Vehicles except those with 6.9L & 7.3L Engines - Battery wire does not have a rubber insulating boot over the connection on the back of the Alternator.	Any portion of the alternator, mounting bracketry, or fastener is cracked, loose, or missing. Alternator is not charging. Pulley or fan is loose, bent or does not run true. Bearings are worn or damaged. All Vehicles with 6.9L & 7.3L Engines - Battery wire does not have a rubber insulating boot over the connection on the back of the Alternator.
i. Starter 1) Check starter for securement and condition.	Wire/harness not firmly attached or routed improperly. Must be clear of exhaust. Starter will not start vehicle. Starter drags, noisy or does not engage properly. Teeth missing from bendix or flywheel.	

C. ENGINE COMPARTMENT		
5. Wiring		
Inspection Procedures:	Repair if:	Out of Service if:
a. Routing and Condition 1) Check routing, securement, and condition of all wiring and any electrical cable in the engine compartment. Note: Wiring must be in OEM condition. Wire must be replaced with proper size, type, and color. Routing should be OEM, properly secured, and in harness or loom where applicable.	There is any loose, damaged, or corroded wiring connector or terminal end. Replaced wire has not been removed.	There is any unsecured or poorly routed wiring that could cause potential short or fire due to abrasion or heat damage. There is any burnt wiring or wiring with missing insulation (other than ground straps). Any repair has been made using improper gauge wiring or method.
C. ENGINE COMPARTMENT		
6. Fuel System and Lines		
a. Fuel System and Lines 1) Visually check the condition, operation, and securement of all fuel system components, including pumps, fuel lines and routing, and accelerator return springs in the engine compartment. Note: All mechanical accelerators must have a minimum of two (2) return springs.	There is evidence of contamination the fuel water separator (if equipped).	There is any unsecured, or poorly routed, or loose fuel line or hose that could cause potential fire due to abrasion or heat damage. Any fuel system connection or component that is stripped, loose, cracked, or leaking. Any fuel system component is damaged or not mounted securely. Any evidence of fuel leaking internally and contaminating oil or coolant (pump, tubes, etc.). Any electric or mechanical shutdown that does not operate properly. Any accelerator return spring is weak, broken, or missing.

C. ENGINE COMPARTMENT		
7. Radiator/Cooling		
Inspection Procedures:	Repair if:	Out of Service if:
a. Radiator Mounting 1) Check radiator assembly and mounting for securement and condition.	Any portion of radiator mounting system is cracked, damaged, or has loose or missing fasteners.	Any portion of radiator is cracked or leaking.
b. Cap 1) Check condition of radiator cap. WARNING: ALWAYS USE PROPER PROCEDURES WHEN REMOVING RADIATOR CAP.	Radiator cap is hard to open or close. Radiator cap is of the wrong pressure rating. There is any visible damage to the pressure seat or vacuum relief seat of the cap.	Radiator cap is missing.
c. Reservoir (pressurized) 1) Check coolant reservoir (including de-aeration tank) and sight glass (if equipped) for mounting and condition.	Sight glass (if OEM equipped) has been replaced with plug.	Any portion of coolant reservoir or mounting system is missing, cracked or damaged, is leaking, or has loose or missing fasteners.
d. Coolant Recovery Tank (non pressurized) 1) Check condition, securement and operation.	Any problem with tank, connections or missing parts.	
e. Fan Shroud 1) Check fan shroud for mounting and condition.	Any portion of fan shroud or shroud mounting is cracked, damaged, or has loose, or missing fasteners.	Fan shroud is missing. Shroud is in danger of contacting fan.
(Continued on Next Page)		

C. ENGINE COMPARTMENT		
7. Radiator/Cooling (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. Charge Air Cooler: 1) Check charge air cooler assembly, mounting, and plumbing for securement and condition (if equipped).	Any portion of the cooler mounting system is cracked, damaged, or has loose or missing fasteners. Any plumbing connections are loose, damaged, or missing.	Any portion of the cooler is cracked or leaking.
g. Heater Booster Pump: 1) Check for operation and condition of heater booster pump and plumbing (if equipped).	Booster pump is inoperative Booster pump mounting is loose or has missing fasteners.	Booster pump is leaking.

End of Section

DPSAFT School Bus Inspection
Procedures, Repair Criteria, & Out Of Service Criteria
Underneath of School Bus

D. Underneath
1. Steering
Note: Depending on the style of vehicle, some of the items in this section may be inspected while performing the engine compartment inspection.

Inspection Procedures:	Repair if:	Out of Service if:
<p>a. Column:</p> <ol style="list-style-type: none"> 1) Check steering column outside vehicle for up and down play (parallel to shaft), side to side play (perpendicular to shaft), and for proper mounting. 2) Column shaft and hardware. 3) Column U-joints or flexible coupling (as equipped). 4) Coupling at gear box. 	<p>Pot joint (shell coupling, trunion) rubber boot is damaged or missing.</p> <p style="text-align: center;">(Continued on Second Page)</p>	<p>Side to side play in steering column or up and down play is excessive.</p> <p>Column assembly mounting (including floor mounting plate) or fasteners are loose.</p> <p>Steering column U-joint (if equipped) is loose, damaged, or noisy after lubrication.</p> <p>Any column U-bolt, pinch bolt, shear pins, or other column fasteners, or input shaft coupling is loose, damaged, or missing.</p> <p>Column U-joint (if equipped) is loose, damaged, or noisy after lubrication.</p> <p>Flexible coupling, if equipped (rag joint) has loose or missing fasteners, damaged flexible disc, or elongated holes.</p> <p>Pot joint if equipped (shell coupling, trunion) is loose, bent, broken or damaged in any way.</p> <p>Splines are worn or damaged.</p>

Figure 1 - Column with Yoke or U-Joint Typical

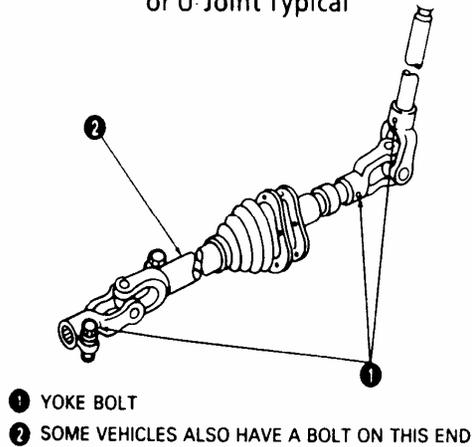
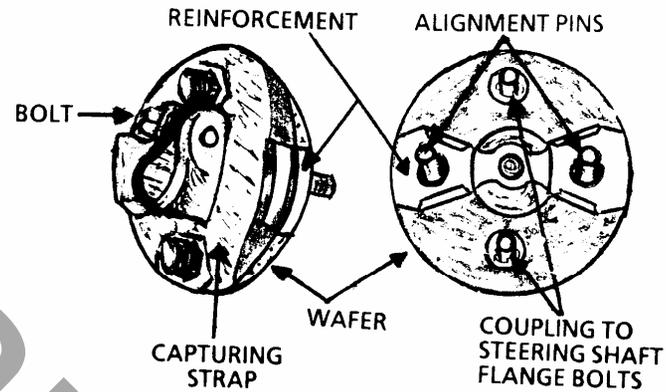
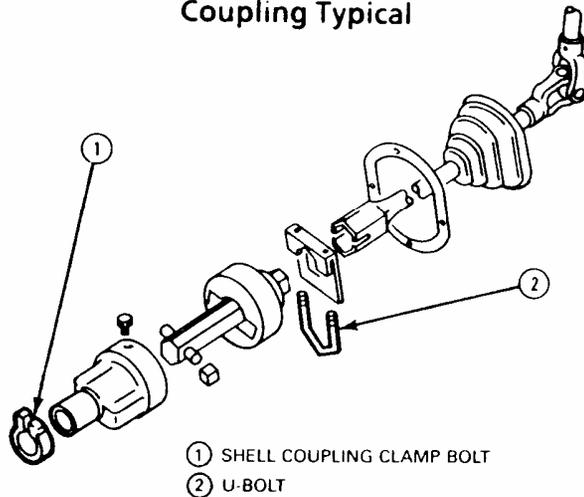


Figure 2 - Typical Flexible Type Steering Coupling



(rag joint)

Figure 3 - Column with Shell Coupling Typical



TIGHTENING STEERING COLUMN JOINT BOLTS

WARNING -- FAILURE TO MAINTAIN THE STEERING SYSTEM IN PROPER CONDITION CAN CAUSE REDUCED STEERING ABILITY RESULTING IN PERSONAL INJURY AND PROPERTY DAMAGE.

As good maintenance practice, it is recommended that steering column joint bolts be checked for tightness every 80,000 km (50,000 miles) or annually, whichever occurs first. **DO NOT OVER TIGHTEN.**

D. Underneath
1. Steering (continued)

NOTE: b – g, Steering Gear Box and other external components will be checked using the following procedure:

- 1) Vehicle should be on ground (not suspended).
- 2) With engine running have assistant move steering wheel back and forth repeatedly to load steering components.
- 3) Visually observe the following external steering and related suspension and frame components for looseness while assistant works steering (also see specific procedures under each component).
- 4) Have assistant carefully operate steering to full left and right turn and check for power assist pop-off and steering stops.
- 5) As follow-up to the above steering check, also perform a visual and hands-on check of each of the listed components.

Inspection Procedures:	Repair if:	Out of Service if:
<p>b. Steering Gear Box and Mounting:</p> <ol style="list-style-type: none"> 1) Check mounting, condition, and tightness of steering gear box, and check frame, frame braces, and associated rivets or fasteners for looseness and condition. 	<p>Steering gear box is damp at or near seals showing signs of seepage but no visible fluid is observed.</p>	<p>Steering gear box is loose on frame, or fasteners, or lock tabs are loose or missing.</p> <p>Mounting holes have visible cracks or are elongated.</p> <p>Steering gear box has any visible leaks.</p> <p>Any up-down or side to side motion of either shaft is observed (bearing or bushing wear).</p> <p>Any Navistar with a Saginaw gear box does not have a diamond (Dana) stamped on the end of the pitman shaft.</p> <p>There is any binding in steering gear box.</p>
<p>c. Pitman Arm:</p> <ol style="list-style-type: none"> 1) Check the pitman arm for looseness or misalignment at sector shaft splines and looseness at all joints. Check looseness of pinch bolt and fasteners and condition of pitman arm. 	<p>Pitman arm grease fitting (if originally equipped) is loose or missing.</p> <p>(Continued on Next Page)</p>	<p>Any play is observed between pitman arm and sector shaft.</p> <p>Pinch bolt at sector shaft is loose or missing.</p>

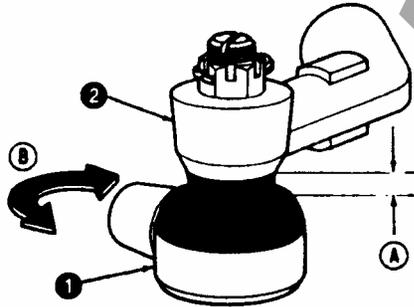
D. Underneath 1. Steering (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
c. Pitman Arm: (continued)		<p>Pitman arm to sector shaft timing marks are misaligned.</p> <p>Pitman arm ball-joint (if equipped) has more than 1/16 inch play (axial, i.e., in and out play between the ball stud and socket).</p> <p>Pitman arm ball-joint (if equipped) has loose or missing nut, or cotter pin is missing.</p> <p>Pitman arm is cracked or damaged.</p>
d. Drag Link: (if equipped) 1) Check the drag link ends, shaft, and fasteners for looseness and condition.	<p>Drag link end has more than 1/16 inch and less than 1/8 inch axial play.</p> <p>Any drag link end grease fitting (as equipped) is loose, or missing, or will not take grease.</p> <p>Drag link end boot is damaged or missing.</p> <p>Drag link needs lubrication.</p> <p>(Continued on Next Page)</p>	<p>Drag link ball stud is loose in pitman arm or upper steering arm.</p> <p>Any nut is loose or missing, or cotter pin is missing.</p> <p>Drag link shaft is damaged or bent.</p> <p>Drag link end has more than 1/8 inch axial play.</p> <p>Adjustable (length) drag link has loose clamp or damage to the threads or has any movement or play in the shaft.</p> <p>Any drag link that is installed improperly.</p>

D. Underneath 1. Steering (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
e. Steering Arm 1) Check upper steering arm (Ackerman arm) and left and right side lower steering arms for securement and condition.		Any steering arm has been bent, is cracked, or is damaged. Any steering arm attachment point is loose, or any fasteners or cotter pin is missing.
2) Check condition and securement of steering stops and lock nuts.		Either steering stop or lock is loose, damaged, or missing.
f. Tie Rod and Ends 1) Check tie rod ends, tie rod, dust boots, and clamps or fasteners (as equipped) for looseness, damage, and condition.	Tie rod end dust boot is cut, damaged, or missing. Tie rod end needs lubrication. Any tie rod end grease fitting is loose, or missing, or will not take grease. Any tie rod end has more than 1/16 inch and less than 1/8 inch axial play.	Tie rod clamps, fasteners, or cotter pin is stripped, missing, or loose. Any clamp (as equipped) is mispositioned. Any tie rod or end is cracked or damaged. Any tie rod is bent, cracked, broken or threads are damaged in any way. Any tie rod end has more than 1/8 inch axial play. Tie rod end ball stud is loose in steering arm or idler arm.
	(Continued on Next Page)	

D. Underneath 1. Steering (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
g. Idler Arm: 1) Check idler arm assembly (as equipped) for looseness, damage, and condition.	Idler arm needs lubrication. Idler arm grease fitting is loose, or missing, or will not take grease. Idler arm up and down play is greater than 1/8 inch total (1/16 inch either direction) but less than 1/4 inch.	Any idler arm fasteners are loose or missing. Idler arm is cracked, or damaged, or cotter pin is missing. Idler arm up and down play is greater than 1/4 inch total (1/8 inch either direction).
h. Alignment: 1) Check for any obvious or abnormal front tire wear.	Any front tire wear indicates an alignment problem.	
2) Check for any visible alignment problems.	Any visible alignment problems not caused by faulty components.	

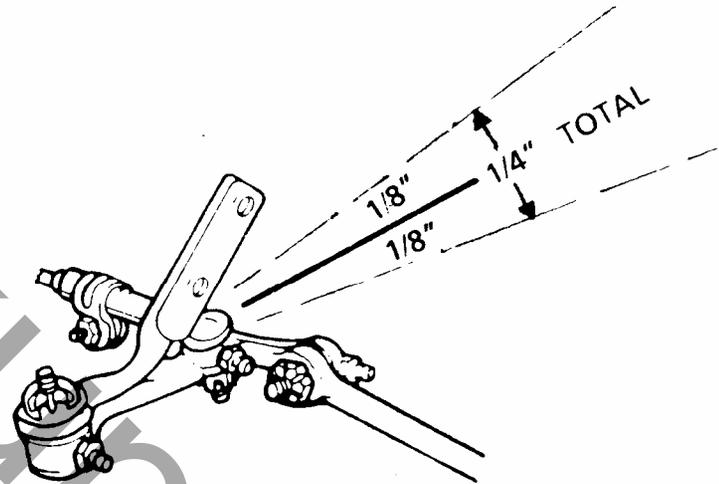
STEERING JOINTS

FIGURE 4 - Checking the Rod and Drag Link End Movement



- A Movement in the axial direction must be less than 1/16 inch.
- B Tie rod/drag link free to rotate within steering arm socket
- 1 Tie rod/drag link end
- 2 Steering arm

FIGURE 5 - Checking Idler Movement, Typical



TIRE WEAR

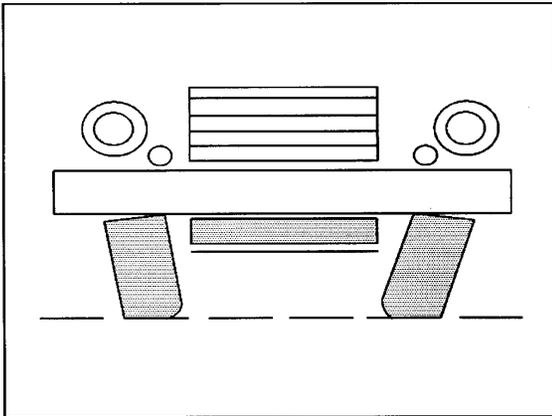
Uneven Tire Wear

The following conditions may cause spotty or uneven wear.

- Unequal caster or camber
- Bent suspension parts
- Out-of-balance wheels
- Out-of-round brake drums
- Brakes drag
- Other mechanical conditions

Locate the mechanical condition that causes uneven wear.

Correct the condition.



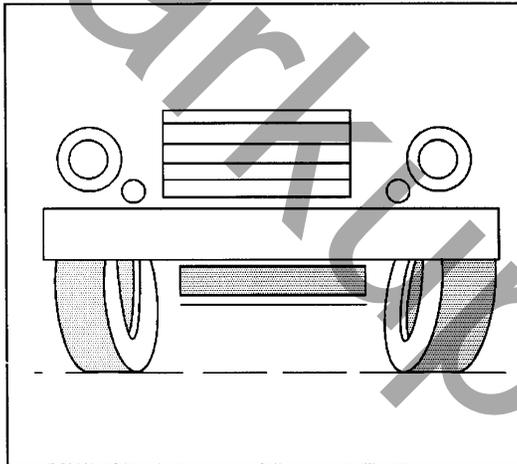
Misalignment Wear

Too much toe-in or toe-out on the front axle tires causes misalignment wear. The tires revolve with a side motion, which scrapes off the tread rubber.

Misalignment Wear (continued)

The scraping action against the face of the tire causes a small featheredge of rubber to appear on one side of the tread. This feathering is an indication of misalignment.

If the misalignment is severe, the rubber will be scraped off both tires. If the misalignment is slight, only one tire will be affected. In order to correct misalignment, adjust the toe-in or verify that the entire front-end alignment settings are correct. Refer to *Front Toe Adjustment* in *Front Wheel Alignment*.



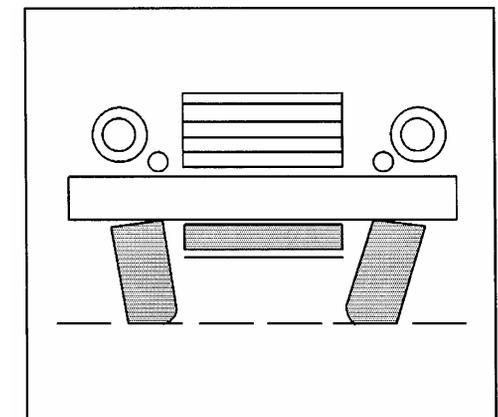
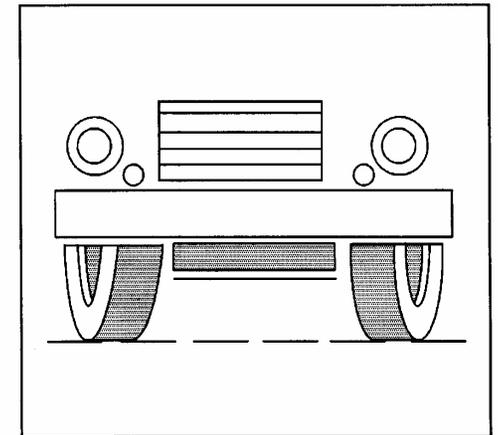
Side Wear

Side wear may be caused by the following conditions:

- Incorrect wheel camber
- Under-inflation

Side Wear (continued)

- High cambered roads
 - Excessive cornering speed
- Incorrect wheel camber and under-inflation are the most common causes of side wear.



D. Underneath 2. Frame		
Inspection Procedures:	Repair if:	Out of Service if:
a. Vehicle frame: 1) Check frame rails, extensions, modular sections, cross-members, braces, gussets, liners, and any and all fasteners for damage, condition and mounting.		Frame, frame braces, and associated rivets or fasteners are loose, damaged, or missing. Frame, extensions, liners, or modular sections are damaged, cracked, or broken. Frame braces or cross-members are damaged, cracked, or broken. Rivets or other fasteners at frame braces or cross-members are loose or missing. Any axle or suspension component is loose beyond specifications prescribed elsewhere in this manual. Any unauthorized modifications (welding, drilling, etc.).
D. UNDERNEATH 3. Front Suspension		
a. Wheel Bearings: 1) Inspect front wheel bearings and related components for condition and proper adjustment of bearings. Grasp tire and attempt to rock wheel to check for movement. NOTE: It is important to correctly identify the source of any play. To determine if the play is in wheel bearings, have an assistant fully apply brakes while rechecking play. If movement disappears with brakes applied, then play was in wheel bearings.	There is minor seepage of grease around dust cover. Dust cover fasteners are missing or loose	Any noise, binding, or roughness is discovered in bearings. Wheel bearing, end play exceeds manufacturer's specifications (maximum of .010" in and out play measured at bearing hub). There is leaking or dripping of grease or oil around dust covers or dust cover is damaged or missing.

D. UNDERNEATH		
3. Front Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. I-Beam: 1) Inspect I-beam axle assembly		I-beam has been cut, modified, or is damaged. There is any bluing or other evidence that I-beam has been heated.
c. King Pins: 1) Inspect king pin assemblies for condition and play as follows: Grasp tire at top and attempt to move the wheel assembly in and out.	One locking pin (draw key) is loose (dual). End cap O-rings or bolts are loose or missing.	Locking pin (draw key) is backing out, loose (single, both for dual), or missing. King pin movement is more than 1/4 inch measured at outside edge of tire.
2) Preliminary inspection of thrust bearings, visually inspect thrust bearing area for uneven gap, improper installation, wear, or damage.		Vertical (up and down) play in king pin assembly is greater than .030", and/or thrust bearing is damaged or missing. If side play at outside edge of tire is greater than 1/4 inch.

D. UNDERNEATH		
3. Front Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>d. Shackles:</p> <p>1) Inspect condition of shackles, spring hangers, and pinch bolts.</p> <p>NOTE: Shackles types vary from manufacturer and year models. Bolted, pinned, pinch pinned, combination etc.</p>		<p>Any front spring shackle or hanger is cracked or broken.</p> <p>Any front spring shackle or hanger has significant side wear at spring eye.</p> <p>Any front spring shackle or hanger is worn, or pinch bolt is stripped or missing, so that spring pin cannot be clamped tightly.</p> <p>Any front spring or shackle eye bolt is loose, worn, broken, damaged or missing.</p>
<p>e. Spring Mounts</p> <p>1) Inspect spring mount bracket(s) for condition and securement.</p>	<p>Any slipper type pad (insulator) that has significant wear, damage, or is missing (Ford).</p> <p>(Continued on Next Page)</p>	<p>Any front spring mount is broken or cracked.</p> <p>Any front spring mount-to-frame fastener is loose or missing.</p> <p>Frame is cracked at any spring or shock mounting location.</p>

D. UNDERNEATH		
3. Front Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>f. Pins and Bushings</p> <p>1) Inspect pins and bushings as follows: Inspect front spring pins and bushings for wear and lubrication. Check for wear with front axle loaded, look for off center spring eye, rubbing shackle, or non-symmetric joint.</p>	<p>Zerk (grease) fitting is damaged or missing.</p> <p>Inner sleeve or rubber bushing type spring pin assembly(ies) is worn through, or rubber bushing is excessively worn (rubber is compacted or deteriorated, resulting in free play between rubber and spring eye or inner sleeve).</p>	<p>Total free play (up and down) of pins and bushings exceeds 1/4 inch.</p> <p>Any pin is loose, damaged, or worn, or cannot be properly clamped by pinch type shackles. On vehicles equipped with bolt instead of pin, bolt is loose, damaged or worn or the nut is not a locking type or is missing.</p> <p>Pin is cutting into spring, shackle, or mount.</p>
<p>g. A-Frames and Bushings: (upper and/or lower control arms, struts)</p> <p>1) Inspect A-frames and bushings for condition and securement.</p>	<p>Rubber bushing(s) is split, badly deteriorated or badly extruded from suspension joints.</p>	<p>Rubber bushing(s) is missing.</p> <p>Any A-frame, control arm, or strut assembly is bent, missing, broken, or any fasteners or U-bolt(s) are loose or missing.</p> <p>Any A-frame, bushing, or pivot arm has more than .050" free play at pivot point.</p> <p>Mounting of assemblies is not secure.</p>
(Continued on Next Page)		

D. UNDERNEATH 3. Front Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
h. Ball Joints: 1) Inspect ball joint(s) for condition, securement, and lubrication.	Zerk (grease) fitting is missing or damaged.	Any ball joint has more than 3/32 inch axial play. Any ball joint nut is loose or missing, or cotter pin is missing. Ball joint to A-frame mounting is cracked or loose, or has been welded.
i. U-Bolts: 1) Inspect spring U-bolts for condition and securement.	There is rust underneath U-bolt nuts indicating possibility of looseness.	Any U-bolt, seating plate, shock mount bracket, or nut is loose or missing, cracked, or stripped.
j. Shocks 1) Inspect shocks for condition and securement.	There is wetness around shock body due to leaking shock fluid. Any shock mounting or fastener is loose.	Any shock or mount is missing, cracked, or broken.

D. UNDERNEATH		
3. Front Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>k. Springs:</p> <p>1) Inspect front springs for condition, securement, and alignment.</p>	<p>There are any loose, missing, broken or worn springs clips.</p> <p>Missing insulators between leaves.</p> <p>Any coil or leaf spring has weakened and causing vehicle to lean excessively.</p> <p>Either front spring saddle (if equipped) is worn out or missing.</p> <p>Rubber bumper is missing.</p> <p>Ride height not adjusted properly (air suspension).</p>	<p>Any leaf spring(s) is broken, cracked, or missing.</p> <p>Spring eye is worn or spread such that bushings are loose in spring eye.</p> <p>Any coil spring(s) is broken, insecurely mounted, non-OEM type or non-OEM blocks or spacers are installed.</p> <p>There is any misalignment of spring leaves or other evidence that center pin is loose or broken.</p> <p>Either front coil or leaf spring is worn so that rubber frame bumper is damaged or worn due to frequent bottoming of front suspension.</p> <p>Any alignment wedge is loose or damaged.</p> <p>On any air bag type spring assembly, air bag is damaged or leaking. Any problem with ride height control valve other than adjustment.</p>
<p>l. Anti roll bar/Sway bar (If equipped)</p> <p>1) Inspect for mounting and condition.</p>	<p>Rubber mounting bushings are cracked, compressed or deteriorated to the point of allowing movement of bar.</p>	<p>Bar is bent, broken or missing.</p> <p>Any mounting hardware is broken or missing.</p> <p>Any rubber bushings or grommets are missing.</p>
<p>m. Wheel Seals</p> <p>1) Check for condition and leakage.</p>		<p>Either front wheel seal is damaged or leaking.</p>

D. UNDERNEATH		
4. Brakes		
Inspection Procedures:	Repair if:	Out of Service if:
a. Brake Hoses 1) Inspect flexible brake hoses for condition, securement, and routing.	Separator bracket on dual hoses loose or out of position. Any brake flex hose supporting brackets are damaged or have loose fasteners. Any brake flex hose is rubbing on or routed against other components.	Any brake flex hose or connection is leaking fluid or air pressure. Any brake flex hose is kinked, cracked, collapsed, bulging, has damaged plies or cord, or is damaged below outer covering. Any brake hose fittings are damaged or rusted so as to weaken the crimp.
b. Lines: 1) Inspect air and hydraulic brake lines for routing, securement, and condition.	Brake line bracket(s) or securement system is loose or missing and line is not in contact with any other component. Any brake line is rubbing on other components or is abraded.	Any brake line is bent, crimped, or damaged restricting or leaking air pressure or hydraulic fluid. Any brake line or connection is leaking air pressure or hydraulic fluid. Any brake line is not OEM material, size, or type.
(Continued on Next Page)		

D. UNDERNEATH		
4. Brakes		
Inspection Procedures:	Repair if:	Out of Service if:
<p>c. Chambers:</p> <p>1) Inspect brake chamber assembly (ies) for securement, condition, and proper size.</p>	<p>Any missing or damaged spring brake caging bolts.</p>	<p>Any brake chamber mounting bracket is cracked, bent, or broken.</p> <p>Any brake chamber or mounting fastener is damaged or loose.</p> <p>Any brake chamber is not original size, or size of chambers is not matched left and right (both sides same size).</p> <p>Any leak is detected in chamber.</p> <p>Any wear to chamber or rod (where rod exits chamber).</p> <p>Any spring brake chamber is bent, damaged or corroded and may lose containment of spring.</p>
<p>d. Slack Adjusters:</p> <p>1) Inspect slack adjusters and S-cam assemblies for wear, condition, operation, and securement.</p> <p>NOTE: Check operation of Slack Adjusters.</p>	<p>(Continued on Next Page)</p>	<p>Slack adjuster is not mounted properly or anchor bracket is loose or damaged (Haldex).</p> <p>Any portion of slack adjuster or S-cam is missing, broken, cracked, or badly worn.</p> <p>S-cam shaft and/or S-cam bushing total wear (up and down) is greater than .030 inch.</p> <p>Manual adjusters have a problem with the locking mechanism on the adjusting bolt.</p> <p>S-cam snap ring is broken or missing.</p>

D. UNDERNEATH		
4. Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Slack Adjusters: (continued)		Any slack adjuster is not operating properly. Any slack adjuster is not adjusted properly.
e. Pushrods: 1) Inspect pushrod assembly(ies) for condition, securement, and alignment.		Any portion of pushrod assembly (locknut, pushrod, clevis and pin, or cotter pin) is loose, missing, or damaged. Pushrod is rubbing against body of chamber, or chamber is misaligned. Pushrod on left and right sides are not mounted in identical (same) slack adjuster location hole (same effective slack adjuster length). Push rod length is not the same on each side.
f. Linings 1) Inspect linings and foundation brake hardware for contamination, wear, damage, and securement.		Brake lining is worn to or beyond 20% allowable limits. Lining is broken, cracked, or loose on shoe. Friction surface is contaminated with oil, grease, or brake fluid. Lining is not proper size. Shoe platform or web is cracked or damaged. There is any loose, damaged, or missing foundation brake hardware within the drum.

D. UNDERNEATH		
4. Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
g. Drums 1) Inspect the brake drum(s) for condition.		There is any crack (other than heat checks) in any drum. There is any grease, oil, or brake fluid on inside of drum. Drum is not mounted securely to hub, or fasteners are loose.
h. Rotors 1) Inspect brake rotor(s) for mounting, thickness, and condition.		Rotor mounting is not secure. Rotor has cracks (other than heat checks) or other mechanical defects. Friction surface is contaminated with oil, grease, or brake fluid. Any rotor friction surface is significantly grooved or damaged.
i. Wheel Cylinders or Calipers 1) Inspect wheel cylinder(s) or caliper(s) for leaks, mounting, and condition.	Any caliper dust boot is damaged or missing.	Any wheel cylinder or caliper is not securely mounted or has loose or missing fasteners. Any wheel cylinder or caliper is leaking. There is uneven lining or pad wear, rotor or drum damage, or evidence of dragging, or other evidence that any wheel cylinder or caliper may be sticking.

D. UNDERNEATH		
4. Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
j. Brake Adjustment: 1) For hydraulic drum brakes, check condition.		There is any damage or condition, which prevents proper adjustment of hydraulic drum brakes.
2) For air brakes, check and record brake chamber pushrod travel at all four (4) wheel positions.		There is any damage or condition, which prevents proper adjustment of S-cam. Adjusted stroke (pushrod travel) of any slack adjuster is at or beyond stroke limits in chart.
k. Air Dryer 1) Check dryer for securement and condition.	Dryer has loose or missing mounting bolts but not in danger of falling off. Canister portion of dryer is bent or damaged but is not leaking or loose.	Dryer has loose or missing mounting bolts and is in danger of falling off. Canister portion of dryer is bent or damaged and is leaking or loose.
2) Check dryer fittings, plumbing and connections.	Electrical connection for heating element Loose or damaged. Air line to dryer has a loop or low spot (sump) that can collect water and freeze.	Any air line connection is loose or has an audible leak.
3) Check purge valve for operation and contamination. Note: There may be dampness and oil residue on and around valve. A slight leak is acceptable from valve during charging cycle or if shut down prior to purge cycle.		Valve is contaminated by solid material (desiccant, cloth, rubber, metal, etc.), which would prevent it from seating. Valve continues to leak after purge cycle.
(Continued on Next Page)		

D. UNDERNEATH		
4. Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
i. Brake Valves 1) Inspect all brake system valves for securement and condition.		There are any audible air leaks or visible hydraulic fluid leaks from any brake valve. Any brake valve is not mounted securely, is cracked, or damaged. Any valve exhaust port is obstructed.
m. Reservoir Mounting 1) Inspect reservoirs (air, vacuum tanks) for securement and condition.		Any reservoir mounting strap or fastener is cracked, loose, or missing. Any leaking, damaged, or cracked tank.
n. Bleed Air Reservoirs 1) With air system fully charged, check manual operation of safety relief valve. 2) Partially open manual petcock valve on the first (wet) tank. 3) Allow any moisture (water) or contamination to drain.	There is excessive moisture in reservoir (desiccant type air dryer equipped vehicles only). Refer to service manual for guidelines on allowable water volume.	Safety relief valve leaks or does not release pressure. There is excessive sludge or oil contamination in the reservoir. Reservoir leaks due to corrosion or is cracked.

D. UNDERNEATH		
4. Brakes (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>o. Hydrovac Booster</p> <p>1) Inspect booster system for securement and condition.</p>		<p>There is any visible hydraulic brake fluid leakage.</p> <p>There is any audible vacuum leakage.</p> <p>Any brake line or vacuum hose is routed subject to excessive heat or abrasion.</p> <p>Any brake line or hose is deteriorated or damaged to the point that failure could occur (cord frayed, wall thickness thin, rubber contaminated with oil, crimped, blistered, cracked, rusted or corroded crimp, etc.).</p> <p>Any brake line or hose connection is loose.</p> <p>Any booster is not mounted securely, is cracked, or damaged.</p> <p>Any vent port is not properly plumbed or is obstructed or filter is clogged.</p>

AIR BRAKE ADJUSTMENT CHART

Chamber Type	Maximum Legal Stroke
12	1 3/8"
16	1 3/4"
24	1 3/4"
30	2"

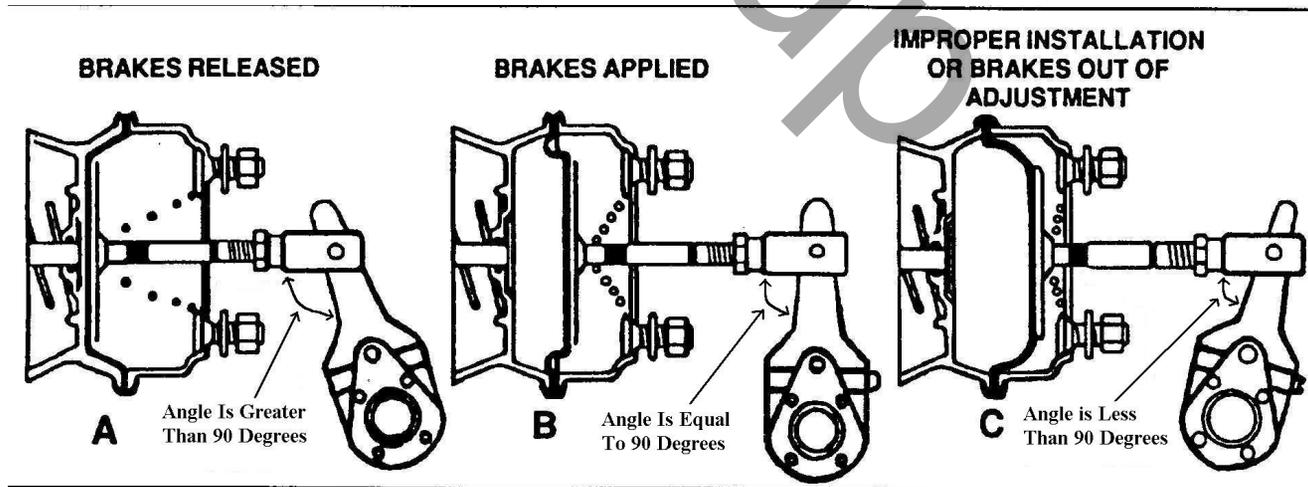
PROCEDURE FOR MEASURING PUSH ROD TRAVEL

Brake chamber push rod travel shall not exceed those specifications relating to maximum stroke at which brakes should be readjusted. Performance of the brake push rod travel inspection should be done with the brake application air pressure in the range of 80 - 90 pounds per square inch (psi), when measuring total stroke to determine proper brake adjustment.

CAUTION: Chock wheels before commencing this inspection as vehicle emergency brake(s) must be released.

1) With brakes off, mark push rod at chamber. 2) Apply brakes, measure distance of mark from chamber.

Note: When brakes are properly adjusted and fully applied, the slack adjuster should be at an angle of 90° or greater, measured from centerline of adjuster to push rod.



D. UNDERNEATH		
5. Mounts		
Inspection Procedures:	Repair if:	Out of Service if:
<p>a. Engine/Transmission Mounts</p> <p>1) Inspect engine and transmission mounts for condition and securement.</p>	<p>Replace the mount if any of the following conditions exist:</p> <p>Hard rubber surface covered with heat check cracks.</p> <p>The rubber cushion separated from the metal plate of the mount.</p> <p>The rubber cushion is split through the center.</p>	<p>Any mounting fasteners are loose, missing, or broken.</p> <p>Any mount is cracked or has missing rubber cushion.</p>
<p>b. Starter Mounting</p> <p>1) Inspect starter for securement and condition. Check for presence of heat shield (if equipped).</p>	<p>Heat shield is loose or missing (if equipped).</p> <p>Any starter mounting bolt, stud, or nut is loose, damaged, broken, or missing.</p> <p>Starter is damaged or loose.</p> <p>Heat shield looseness or damage could short positive terminal to ground or damage any other component.</p>	

D. UNDERNEATH		
6. Transmission		
Inspection Procedures:	Repair if:	Out of Service if:
a. Transmission Bolts 1) Inspect transmission assembly and mounting fasteners for condition and securement.		Transmission is not mounted securely to flywheel housing. There is any external indication that any torque converter bolt(s) are loose or missing.
b. Linkage 1) Inspect transmission linkage for routing, condition, and securement. Note: Mechanical modulator cable should have 1/16 to 1/8 inch clearance at full throttle.	Modulator cable or vacuum hose is routed where it is subject to excessive heat or abrasion. Any linkage hardware or fasteners are loose. Dust/moisture boots on cable missing or torn. Modulator cable is exposed or casing is damaged. Modulator cable is out of adjustment. Modulator vacuum hose is deteriorated or loose.	Linkage is bent, damaged, or binding, or severely misadjusted. Any linkage hardware or fasteners are missing or linkage is damaged so as to cause a sticking or binding condition. Modulator vacuum hose is leaking or not connected. Air modulator or air line leaking.
c. Lines 1) Inspect transmission lines for securement, routing, and condition.	Any transmission line(s) is unsecured or routed subject to excessive heat or abrasion. There is any transmission line of improper type.	Any transmission line is crimped. Any transmission line or fitting is leaking. Any transmission line is worn or deteriorated to the point that failure could occur. (leaking)

(Continued on Next Page)

D. UNDERNEATH		
6. Transmission (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Filter 1) Inspect transmission external filter assembly (if equipped) for securement and condition	External filter mounting is insecure or has loose or missing fasteners. Pall filter monitor indicates need for change. Filter canister is damaged (no leak).	Body of transmission filter, including all hose connections, is cracked or damaged and is leaking.
e. Cooler 1) Inspect transmission cooler		Any external leak or transmission fluid in cooling system (internal leak).
f. Clutch 1. Operation a) Check pedal, linkage, clutch, and throw-out bearing for wear, slippage, and abnormal noises in the engaged and released positions.	Loose nuts and bolts. Noisy throw-out bearing. Clutch out of adjustment.	Cannot adjust clutch to specs. Excessively noisy throw-out bearing. Clutch slipping, grabbing, or has excessive chatter when engaging clutch. Binding or sticking clutch linkage or return spring. Hard to shift transmission.
b) Visually check clutch pedal pad for wear.	Worn pedal cover pad. Missing pedal cover pad.	
c) Check clutch master and slave cylinders for hydraulic leaks and operation (if equipped).		Leaking master or slave cylinder or line and/or inoperable.
(Continued on Next Page)		

D. UNDERNEATH		
6. Transmission (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. Clutch (continued) 2) Adjustment a) Check “free play” travel of the clutch pedal. This is the first easy movement of the clutch pedal and should be no more than 1-1/2 and no less than 3/4 an inch of travel.	Free play is out of adjustment.	Clutch slips, grabs, or chatters after adjusting “free play” travel. No adjustments can be made (if it is an adjustable clutch).
D. UNDERNEATH		
7. Fluid Leaks		
a. Oil 1) Inspect for engine oil leaks at all potential locations and determine severity.	Engine oil leakage is causing deterioration of any rubber parts, such as steering linkage boots, hoses, etc. Engine oil is dripping at any location <u>except</u> on exhaust system.	Leakage is excessive and could result in imminent engine failure. Engine oil is dripping on any portion of exhaust system.
b. Coolant 1) Inspect all potential locations for coolant leaks.	There is coolant seepage at radiator, hoses, heater core, engine oil cooler, thermostat housing, head gaskets, freeze plugs, reservoir, water pump, or other potential locations.	Leakage is excessive and could result in imminent engine failure.
c. Transmission 1) Inspect for transmission fluid leaks at all potential locations and determine severity.	Transmission fluid is seeping at any location <u>except</u> on exhaust system.	Leakage is excessive and could result in imminent transmission failure. Transmission fluid is dripping on any portion of exhaust system.
(Continued on Next Page)		

D. UNDERNEATH 7. Fluid Leaks (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Power Steering 1) Inspect for power steering fluid leaks at all potential locations and determine severity	Power steering fluid is seeping or dripping.	
D. UNDERNEATH 8. Fuel Tank(s)		
a. Leaks 1) Inspect fuel tank assembly for leaks.		There is any fuel leakage from the tank, connections, or cap. The fuel tank has any cracks. Any connection(s) are loose at the tank.
b. Mounting 1) Inspect fuel tank mounting system and barrier for securement and condition.		Any portion of fuel tank mounting system (including support brackets, retaining straps, and chassis frame) is missing, loose, cracked, or broken. Any fuel tank mounting fasteners are loose or missing. Barrier assembly is damaged, insecurely mounted, or missing. Fuel tank is not OEM, been modified, or extra tank(s) have been added.
(Continued on Next Page)		

D. UNDERNEATH		
8. Fuel Tank(s) (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
c. Hoses 1) Inspect all fuel lines, hoses, and under-bus fuel system components, for routing, securement, and condition (including vents, fill, and crossover).		Any fuel line or hose is unsecured or is routed subject to excessive heat or abrasion. Any fuel line or hose is deteriorated or damaged (including cracks or any damage which may cause potential leakage) or clamps are loose or missing. Any under-bus fuel system filter, water separator, or other components are insecurely mounted, cracked, or damaged.
d. Wiring 1) Inspect fuel tank sender unit wiring for securement, routing, and condition.	Any portion of sending unit wiring (including ground) or connections is unsecured or is routed subject to excessive heat or abrasion.	Any wiring or connection has damaged or missing insulation.
2) Inspect electric fuel pump wiring for securement, routing, and condition.		Any portion of fuel pump wiring (including ground) or connections is unsecured or is routed subject to excessive heat or abrasion. Any wiring or connection has damaged or missing insulation.

D. UNDERNEATH		
9. Driveline		
Inspection Procedures:	Repair if:	Out of Service if:
a. Driveshafts 1) Inspect driveshafts and damper for condition.	There is any foreign matter wrapped around driveshaft.	Any driveshaft balancing weight (if originally equipped) is missing. Any driveshaft is bent or seriously dented. Any loose, damaged, or leaking Damper. There are any cracks or other damage to driveshaft, which could cause structural failure.
b. U-Joints 1) Prior to lubrication, inspect U-joints or constant velocity (CV) joints (if equipped) for condition, phasing (alignment of joints), lubrication, and presence of all hardware.	Shaft is out of Phase. U-joints or constant velocity joints are dry of lubrication, or zerk (grease) fitting (if equipped) is missing, clogged, or inaccessible.	There is any missing hardware or fasteners in any U-joint or CV joint assembly. Any U-joint has significant cross-shaft-to-bearing cup play, or CV joint has significant play. Any U-joint or CV joint shows evidence of significant rusting of bearings. Any bearing cup is loose in yoke. Any mismatched or wrong type cup straps or bolts.
(Continued on Next Page)		

D. UNDERNEATH		
9. Driveline (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
c. Yokes 1) Inspect driveshaft yokes for condition and lubrication.	Driveshaft splines are unlubricated. Dust cap on yoke is loose or missing. Zerk (grease) fitting is missing or clogged. Packing in dust cap is missing.	Any yoke has significant play in splines. Any yoke is cracked or damaged.
d. Midshaft (Midship) Bearings 1) Inspect midshaft (midship) bearings and rubber insulators for condition and securement.	Midshaft (midship) bearing rubber insulator is deteriorated, damaged, or oil soaked. Midshaft (midship) bearing support is misaligned.	Bearing outer race is loose in insulator, or inner race is loose on shaft. There is significant play in midshaft (midship) bearing. There is any missing or damaged hardware or fasteners in midshaft (midship) bearing or support assembly.
e. Guards 1) Inspect for presence and condition of driveshaft guards (if originally equipped).	Any driveshaft guard is bent or damaged. (not rubbing)	Any driveshaft guard is missing, or has loose or damaged mounting fasteners or is rubbing shaft.
(Continued on Next Page)		

D. UNDERNEATH		
9. Driveline (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. Driveshaft Park Brake 1) Inspect driveshaft park brake assembly for condition, mounting, securement, and adjustment of linings, drum, linkage, and all other related hardware.		Lining is worn beyond allowable limits. Lining is contaminated with grease or oil. Lining is broken, cracked, or loose. Drum is cracked or has excessive heat damage or scoring of friction surface. Any actuating or mounting hardware or fastener is damaged, loose, or missing. Park brake is not adjusted per manufacturer's specifications.
D. UNDERNEATH		
10. Rear Suspension		
a. Axle Housing 1) Inspect axle housing for condition and leakage.	(Continued on Next Page)	Any portion of axle housing is cracked or bent. Any portion of axle housing is leaking lubricant due to cracks, porous metal, or defective weld. There is any leakage at or around axle housing ends.

D. UNDERNEATH		
10. Rear Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>d. Springs:</p> <p>1) Inspect rear springs for condition, securement, and alignment.</p>	<p>There are any loose, missing, broken or worn springs clips.</p> <p>Missing insulators between leaves.</p> <p>Any coil or leaf spring has weakened, and vehicle is leaning excessively.</p> <p>Either rear spring saddle (if equipped) is worn out or missing (repair).</p> <p>Rubber frame bumper is missing.</p> <p>Ride height not adjusted properly (air suspension).</p>	<p>Any leaf spring(s) is broken, cracked, or missing.</p> <p>Spring eye is worn or spread such that bushings are loose in spring eye.</p> <p>Any coil spring(s) is broken, insecurely mounted, non-OEM type or non-OEM blocks or spacers are installed.</p> <p>There is any misalignment of spring leaves or other evidence that center pin is loose or broken.</p> <p>Either coil or leaf spring is worn so that rubber frame bumper is damaged or worn due to frequent bottoming of rear suspension.</p> <p>Any alignment shim or wedge is loose or damaged.</p> <p>On any air bag type spring assembly, air bag, or air lines and valving is damaged or leaking. Any problem with ride height control valve other than adjustment.</p> <p>Air ride pivot pins and bushings are loose.</p>
<p>e. Anti roll bar/Sway bar (If equipped)</p> <p>1) Inspect for mounting and condition.</p>	<p>Rubber mounting bushings are cracked, Compressed or deteriorated to the point of allowing movement of bar.</p> <p>(Continued on Next Page)</p>	<p>Bar is bent, broken or missing.</p> <p>Any mounting hardware is broken or missing.</p> <p>Any rubber bushings or grommets are missing.</p>

D. UNDERNEATH		
10. Rear Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. U-Bolts 1) Inspect spring U-bolts for condition and securement.	Any U-bolt is misaligned.	There is rust underneath U-bolt nuts indicating possibility of looseness. Any U-bolt is cracked, stripped, broken or missing. Any U-bolt is not OEM size, type and/or design. Any U-bolt seating plate, shock mount bracket, or nut, is loose, missing, cracked, or stripped.
g. Shocks 1) Inspect rear shocks for condition and securement.	There is any wetness around shock body due to leaking shock fluid. Any shock mounting or fastener is loose.	Any shock or mount is cracked, broken or missing.
h. Shackles 1) Inspect rear suspension shackles, spring hangers, and hanger pinch bolts for condition and securement. NOTE: Shackles types vary from manufacturer and year models. Bolted, pinned, pinch pinned, combination etc.	<p style="text-align: center;">(Continued on Next Page)</p>	Any rear spring shackle or hanger is cracked or broken. Any rear spring shackle or hanger is worn to the point, or pinch bolt is stripped or missing, so that spring pin cannot be clamped tightly. Any rear spring shackle or hanger has significant side wear at spring eye. Any rear spring or shackle eye bolt is loose, worn, broken, damaged or missing.

D. UNDERNEATH		
10. Rear Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
<p>i. Pins and Bushings</p> <p>1) Inspect rear spring pins and bushings for wear and lubrication. (same as front) For other types of pin and bushing configurations, see manufacturer's Service Manual.</p> <p>NOTE: any questionable condition is found, jack rear of bus up and identify source of play or movement.</p>	<p>Any Zerk (grease) fitting is damaged or missing.</p> <p>Inner sleeve or rubber bushing type spring pin assembly(ies) is worn through, or rubber bushing is excessively worn (rubber is compacted or deteriorated, resulting in free play between rubber and spring eye or inner sleeve).</p>	<p>Pin is cutting into spring, shackle, or mount.</p> <p>Any pin is loose, damaged, or worn, or cannot be properly clamped by pinch type shackles. On Vehicles equipped with bolt instead of pin, bolt is loose, damaged or worn or the nut is not a locking type or is missing.</p> <p>Rear spring pin bushing (metal type bushing) is worn through.</p> <p>Total free play (up and down) of pin and bushing exceeds 1/8 inch.</p> <p>On system using two pins and bushings, combined free play exceeds 1/4 inch.</p>
<p>j. Hangers</p> <p>1) Inspect hangers for mounting and condition.</p>		<p>Any spring hanger or bracket is cracked or broken, or any mounting fastener is loose or missing.</p>
<p>k. Control arms/rods</p> <p>1) Inspect rear axle control, torque, stabilizer, etc. arms/rods (if equipped) for condition and mounting.</p>	<p>Rubber mounting bushings are cracked, Compressed or deteriorated to the point of allowing movement of bar.</p> <p>(Continued on Next Page)</p>	<p>Bar is bent, broken or missing.</p> <p>Any mounting hardware is broken or missing.</p> <p>Any rubber bushings or grommets are missing.</p>

D. UNDERNEATH 10. Rear Suspension (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
I. Seals 1) Inspect rear wheel seals and gaskets for condition and leakage.	There is wetness or leaking of gear oil around axle flange.	Either rear wheel seal is damaged or leaking. Any axle flange stud or nut is loose or missing.
D. UNDERNEATH 11. Body Securement and Structure		
a. Body Mounts 1) Inspect for securement and condition of all body mounts, chassis cowl mounts, and frame pads. Body mounts include any J-bolt, U-bolt, shear bolt or clamp type mounts used to secure body to chassis frame.	Padding between frame rails and floor sills is missing or grossly misaligned. Any isolators (donuts) are split, cracked or deteriorated so as not to be effective.	Any combination of the following conditions are found for 25% or more of the body mounts: (if less than 25% repair or note) Originally installed body mount or cowl mount is missing. Body mount has missing hardware. Body mount is cracked, damaged or stripped. Body mount is loose or misaligned. Isolators (donuts) are missing.
(Continued on Next Page)		

D. UNDERNEATH		
11. Body Securement and Structure (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
b. Floor 1) Inspect condition of floor structure, sills, and braces.	There are any minor cracks in floor sills or braces or in welds.	There are any holes or cracks in floor sheet metal creating an opening to the passenger compartment. Entire cross section of any floor sill or brace is broken. There is any broken weld or mounting of a floor sill or brace resulting in complete separation more than one (1) foot in length.
c. Outriggers 1) Inspect body outriggers and hardware for condition and securement.	Any installed (as required by manufacturer) outrigger is missing. Any body outrigger is cracked or has loose or missing hardware.	
d. Braces 1) Inspect for condition and securement of all chassis and body braces.	Any bumper brace is broken, cracked, or missing. There is any cracked brace underneath the body.	
(Continued on Next Page)		

D. UNDERNEATH 11. Body Securement and Structure (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
e. Skirts 1) Inspect body skirts and gussets for securement and condition.	Any body skirt, brace, or gusset has cracked or broken sheet metal or mounting points.	Any skirt, brace, or gusset is bent, damaged or deformed to the point of being hazardous.
D. UNDERNEATH 12. Exhaust Systems		
a. Exhaust Leaks: 1) With engine running and at operating temperature, inspect exhaust system for leaks, condition, and securement.	There is any physical damage to exhaust system that is adding restriction or back pressure but no leak.	There is any leakage, which is audible or can be felt around any portion of the exhaust system including manifold(s), pipe sections, or any junction.
b. Mounting 1) Inspect mounting of the exhaust system	There is any exhaust system hanger, which is not securely mounted. There is any originally installed exhaust hanger, which is missing, broken, or detached from exhaust system or frame mounting point. Any exhaust pipe or clamp is loose.	Any clamp is missing.
c. Mufflers 1) Inspect for presence and condition of the muffler.	There is significant physical damage to the muffler. (Continued on Next Page)	The muffler is leaking. The muffler is missing.

D. UNDERNEATH 12. Exhaust Systems (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Tailpipe 1) Inspect condition of tailpipe.	There is any physical damage to tail pipe that is adding restriction or back pressure but no leak. The tailpipe extends more than 2 inches beyond bumper.	The tailpipe is leaking. The tailpipe does not extend at least to the edge of the rear bumper or the rearmost OEM mounting position. Exhaust discharges under occupant compartment.
e. Catalytic converter: 1) Inspect for presence and condition of converter if applicable.	There is any physical damage to converter that is adding restriction or back pressure but no leak.	The converter is leaking. The converter is missing
D. UNDERNEATH 13. Wheels and Tires		
a. Tread Depth 1) Visually inspect and measure any tire that is questionable (including spare if equipped). NOTE: Measurement shall be taken at the major tread groove exhibiting the greatest amount of wear. Measure at three (3) points spaced equally around the circumference of the tire in the same groove. Do not measure at wear bars.		Measured tread depth of either front tire (virgin carcass) at three measured points is less than 4/32 inch. Measured tread depth of either rear tire at three measured points is less than 2/32 inch.
b. Pressure 1) Visually inspect tires for obvious inflation problems (including spare if equipped).		Any tire that is obviously low in pressure or flat. Any tire that has an audible or visible a leak.

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D. UNDERNEATH 13. Wheels and Tires (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
c. Alignment 1) Inspect tires for evidence of proper alignment.	Any tire is feather-edged, cupped, or has uneven tread wear.	Tires/wheels are grossly misaligned, affecting steering control.
d. Damage 1) Inspect for damage to wheels and tires. (including spare if equipped) NOTE: Refer to Tire and Rim Manufacturer's Association manual for correct procedures in demounting and mounting of tires and rims.	There is foreign material in the tire tread, which could cause damage or loss of air pressure. Any valve cap is missing or not metal. Any valve stem is damaged or mislocated so that tire cannot be filled with air.	There are any cuts, abrasion, or other damage to tire sidewall resulting in exposed or damaged cord. There is any evidence of separation, bulges (other than normal manufacturer bulge), or other damage within the carcass of the tire. There are any cracks, which run around the bead or sidewall of the tire. There is anything wedged between the dual rear wheels. On a retread there is any separation of the tire tread from the tire carcass, which could result in tire or tread failure. There is any damage to the lock ring assembly or lock ring groove of a multi-piece rim, including rust or corrosion, which could cause the lock ring not to seal fully.
(Continued on Next Page)		

D. UNDERNEATH 13. Wheels and Tires (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
d. Damage (continued)		<p>There are any cracks or breaks at the lug holes or any other part of a rim or cast spokes.</p> <p>There are any dents or bends in a rim, which could result in failure of the rim or separation of the tire from the rim.</p>
e. Matching 1) Inspect for matching of tire construction, design, size, and load rating on each axle.		<p>There is mismatching of inner and outer dual tire diameter greater than 3/8 inch.</p> <p>There is any tire marked for other than highway use.</p> <p>Any tire is not of proper type, size, and minimum load rating. All tires on an axle are not of same type (e.g., lug or rib).</p> <p>All tires on an axle are not the same size.</p> <p>Any tire is below minimum load rating.</p> <p>Radial and bias ply tires are intermixed on the same vehicle.</p> <p>Any front tire is recapped.</p>

D. UNDERNEATH 13. Wheels and Tires (continued)		
Inspection Procedures:	Repair if:	Out of Service if:
f. Wheel Hardware 1) Inspect for presence, type, condition, and securement of all wheel hardware.	Lateral run out of any tire/rim assembly exceeds 1/4 inch.	There is improper matching of rims and lock rings. There is evidence of slippage of wheel assembly on cast spoke hub. Stud holes are elongated. Any wheel nut, stud, or clamp is loose, or there is rust or corrosion indicating possible looseness. Any wheel, nut, stud, or clamp is broken or missing.
2) Check for proper spacing of rear dual wheels and tires (proper spacer width).		Any improper spacer is installed between dual wheels.

End of Section