BLUE BIRD VISION

2013

DRIVERS HANDBOOK

COUNT ON BLUE BIRD

BLUE BIRD

BLUE BIRD

VISION

10026200
Edition A

All Blue Bird products sold for use in the United States of America and its insular areas comply with all applicable Federal Motor Vehicle Safety Standards (FMVSS) and applicable Federal ADA requirements.

Many of the components of Blue Bird buses are obtained from outside suppliers. Where maintenance and/or service information conflicts with the component manufacturer's documentation, the manufacturer's documentation prevails.

In the event of any conflict between the requirements of this publication and any applicable legal requirement, the legal requirement prevails. Technical requirements that exceed the legal requirements are not considered to conflict.

Blue Bird Corporation continually endeavors to improve its products and reserves the right to change specifications without notice and without incurring obligation. Text, illustrations, photographs, and specifications in this manual are based on information available at the time of printing. Some equipment and features shown may be optional.

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Thank You
...and Congratulations!

We at Blue Bird Corporation wish to thank you for your investment of trust in Blue Bird quality, and congratulate you on being a Driver of one of the most innovative vehicles in pupil transportation; the Blue Bird Vision.

Blue Bird Strength; Blue Bird Innovation

The **BLUE BIRD VISION** is the first C-Type ("conventional") school bus built upon a chassis designed specifically for pupil transporation, rather than mounted upon a multi-purpose truck chassis. The **VISION'S** chassis is purpose-built at Blue Bird's Fort Valley, Georgia plant, as are Blue Bird's **ALL AMERICAN** transit-type buses.

The **BLUE BIRD VISION**, with its **ALL AMERICAN FE** and **RE** siblings, comprise a complete line of built-from-the-ground-up buses, providing an ideal fit for any school route need.

Unlike most "conventional" type school buses, the **VISION** is anything but ordinary. The **VISION** is the result of Blue Bird's steadily innovative engineering and over 85 years of school bus experience, applied to the C-Type category.

For 2013, there are a myriad of technical refinements inside the bus and/or under the hood with which the Driver may or may never interact with directly; but which nonetheless contribute to an overall improved operating and ownership experience.

Built to purpose. Built to last. Built to bring to your operation a new level of value, efficiency, and rugged reliability.

Backed By Blue Bird

Blue Bird provides all the behind-the-scenes support you depend upon for success in your school transportation operation:

Blue Bird Authorized Dealers

Blue Bird administers its full range of Customer Services through a nationwide network of local or regional Blue Bird Authorized Dealers. The Dealer through whom your bus was purchased should always be your first point of contact for information and assistance.

Blue Bird School Bus Support

Your Blue Bird Dealer is equipped and staffed to handle your service-related issues, and also has immediate and direct access to Blue Bird's own factory-based Customer Support. All Blue Bird Support Representatives are true technical experts with long histories at Blue Bird and are eager to support your service related needs.

Blue Bird School Bus Training

The Training staff of Blue Bird Technical Comunications conducts an ongoing program of Field and Factory training classes and seminars, to ensure that Dealer technicians are always up-to-date on the latest service information and techniques. Some of these training classes are open to customer personnel.

Blue Bird Parts Sales

Blue Bird's modern Service Parts facility ships parts directly to Blue Bird Authorized Dealers and Blue Bird Bus Spec and Bus Care centers nationwide. Blue Bird Parts Sales consists of modern warehousing facilities, efficient ordering and inventory control systems, and expert technical staff who know your bus inside and out. Service Parts also publishes its own parts catalogs, available for customer purchase.

Blue Bird Technical Publications

Blue Bird Driver's Handbooks and Service Manuals are produced and continually updated by a full-time in-house staff with full access to manufacturing assembly lines and Blue Bird Engineering. Additional manuals are available for purchase through your Blue Bird Authorized Dealer.

Blue Bird Bus Warranty

For your convenience and efficiency, warranty claims are handled at the local Dealer level, as are all other Customer Services. Be assured that your Blue Bird is backed by one of the strongest factory warranties in the industry. Refer to the limited warranty statement supplied with your bus for the terms and limitations of the limited warranty. Contact your Blue Bird Dealer if you have questions about the limited warranty or for assistance in obtaining repairs covered by the limited warranty.

Reporting Safety Defects

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Blue Bird.

If NHTSA receives similar complaints, it may open an investigation and, if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Blue Bird Corporation.

To contact NHTSA, you may call the Vehicle Safety Hotline toll-free at:
1–888–327–4236 (TTY: 1–800–424–9153)
or go to:
http://www.safercar.gov
or write to:
Administrator, NHTSA,
400 Seventh
Street, SW., Washington, DC 20590
You can also obtain other information about motor vehicle safety from:
http://www.safercar.gov.

Driver Certification

US Federal regulations require that school bus Drivers possess a Commercial Driver's License (CDL). The purpose of this manual is to acquaint the Driver with the particular Blue Bird bus model it covers. Its information must be considered supplemental to, not a replacement for, the specific requirements for Driver certification, testing, and operational procedures.

For example, the Pre-trip inspection routine described in this manual may not include all items or details of the Pre-trip inspection required by legally-mandated inspections.

Contact the Pupil Transportation Director or similar office for your particular state/district for more information.

About 2010 Emissions Standards

Buses equipped with 2010 diesel engines are designed to conform to stringent federal emissions standards. These standards affect both the equipment installed at the factory and the fuel at the pump.

Buses powered by 2010 emissions standards engines are equipped with special exhaust systems to reduce emissions. The technical details of the systems employed by various engine manufacturers differ, but share common general principles. The exhaust muffler is replaced by a diesel particulate filter which traps and burns microscopic particles in a process referred to as "regeneration." When heat in the exhaust is insufficient to fully burn the particulates, the system enters an "active" regeneration mode so the necessary catalytic reaction can take place. During active regeneration events, exhaust temperatures are elevated, and an indicator light on the instrument panel illuminates to notify the Driver that regeneration is active. This regeneration mode is automatic and normal, and requires no special action on the part of the Driver. If driving conditions have resulted in insufficient active regeneration then a "manual" regeneration may be required to clean the filter. If this condition occurs an indicator will alert the driver and a maintenance technician should be notified.

Removing particulate matter (soot) from the exhaust stream through regeneration alone will not satisfy the more stringent 2010 emission standard. This standard requires reduced levels of Nitrogen Oxides (NOx). To achieve this a Selective Catalytic Reduction system (SCR) is added downstream of the diesel particulate filter. The SCR system uses a chemical reactant – Diesel Exhaust Fluid (DEF) – which converts to ammonia in the exhaust stream and reacts with NOx to form harmless nitrogen gas and water.

Fuel Requirements: As part of the 2007 emissions standards, effective October 15, 2006 the EPA has required fuel retailers to sell lower-emission fuel, designated "ultra-low-sulfur diesel". After that date, all commercially-available number 1 and number 2 highway diesel fuels are Ultra-low-sulfur diesel. This fuel must be used in all 2013 model buses powered by a diesel engine, as indicated by a decal located near the fuel filler door, reading:

Ultra Low Sulfur Diesel Fuel Only.

For detailed information on recommended fuels and other fluids, always follow your engine manufacturer's guidlines. Also see, Cummins Bulletin No. 3379001.

Regarding Modifications

Blue Bird Corporation offers many items as standard and optional equipment to meet federal, state, and local specifications and individual customer requirements. This includes, but is not necessarily limited to, stop arms, crossing guards, warning lights, warning light monitors, mirrors, first aid kits, fire extinguishers, warning reflectors, fuses, directional and brake lights, warning buzzers, security/vandal locks, emergency exits, and seat belts.

Emergency equipment must be checked for proper operation daily. It is the driver's responsibility to report any damage to qualified service technicians, and that the condition be corrected before transporting passengers.

Those interested in modification of this vehicle should consult the Service Manual and Blue Bird Engineering Department for a more complete understanding of the vehicle.

WARNING ***Vehicle alterations, which may cause non-conformance with the Emission Control and/or Federal Motor Vehicle Safety Standards (FMVSS), are expressly not authorized by Blue Bird Corporation. It is the responsibility of the entity undertaking the modification of this product to ascertain compliance with all applicable regulations. Modification must be accomplished in accordance with strict government standards. The entity completing modification of this product must certify that all applicable regulations are met. To certify a modified vehicle, the upfitter must be a licensed vehicle manufacturer, or obtain the services of a licensed vehicle manufacturer for that purpose. Specifically, Blue Bird does not authorize the following modifications.***

- Do not modify the Front or Rear Suspension
- Do not modify the Wheelbase length
- Do not modify or remove the Body or Chassis Crossmembers
- Do not modify the Frame Rail Flanges
- Do not weld on the Engine, Radiator, Fuel Tank(s), Transmission or any component of those items
- Do not modify the Cooling System / Air Intake
- Do not modify the Exhaust / Emission system
- Do not modify the Brake System
- Do not modify the Steering System
- Do not modify the Electrical System and Lights
- Do not modify or obstruct the Mirrors
- Do not modify the Seats
- Do not install any equipment or component nearer than 2 inches (51mm) to the fuel tank(s), rotating components or "jounce" movement of driveline components
- Do not install any equipment or component that will obstruct the flow of air into, around, or from the cooling system
- Do not install any equipment, components, including flooring and/or carpeting, which will obstruct the functioning of the brake and accelerator pedals

For the terms of the Limited Warranty of this Blue Bird product, refer to the Warranty certificate provided in the owner's documents that came with the vehicle.

In addition to the safety issues involved in the modification of the unit, any "unauthorized" modification may adversely affect the warranty of this product by Blue Bird Corporation.

CAUTION ***All Blue Bird products are certified to meet or exceed all applicable motor vehicle regulations and standards in the "as purchased" configuration. Any modifications are the responsibility of the entity making those modifications. Blue Bird engineering does not authorize any modification of the vehicle.***

The complete line of Blue Bird Service Parts is available from your Blue Bird Dealer. The use of original Blue Bird replacement parts and components will help ensure that your All American remains true to its original design, best preserving performance, efficiency, and safety.

For replacement parts…

Contact your Blue Bird Dealer or Parts Sales at Blue Bird Corporation.

About This Driver's Handbook

Blue Bird Technical Communications endeavors to continuously improve the value of its manuals. Your comments and suggestions are welcome, and we value the feedback we receive from our users. Send your comments to:

Blue Bird Corporation
Attn: Technical Communications
P.O. Box 937
Fort Valley, Georgia 31030

Safety Precautions

Throughout this manual are precautions labeled Warnings and Cautions, and set in the style shown here:

WARNING ***The Warning designation is generally used for precautions which, if not properly observed while performing the related procedures, could result in serious personal injury or death.***

CAUTION ***The Caution designation is generally used for precautions which, if not properly observed, could result in damage to the bus or its equipment.***

This manual is intended for use by qualified professional bus Drivers who understand and observe all appropriate safety precautions and procedures associated with safe driving in general, and pupil transportion in particular. The user of this manual must read and abide by all safety warnings noted not only in this manual, but also on any labels and documentation for vehicle equiment and devices.

Scope and Content

This handbook is intended to acquaint the bus Driver with the Blue Bird bus model it describes. It is recommended that after being thoroughly read by the Driver, it be stored in the bus. Although not a service manual, it contains general information that may be of value in situations of roadside hazard assistance, such as the location of jacking points, or the location of fuses.

Scheduled Maintenance tables are included as a convenience. These should be regarded as the *minimum* maintenance procedures to keep the bus in proper operational condition. The service technician should refer to and become thoroughly acquainted with the separate Blue Bird Service Manual.

Please note that not all possible situations that may arise while operating the bus are addressed. The exercise of caution, common sense, and good driving practices, coupled with experience, are required for safe operation.

If questions arise that are not specifically covered in this manual, please contact your Blue Bird Dealer. Your Dealer will either answer your questions or will be able to assist in obtaining the needed information. To report a problem with your bus, contact your Blue Bird Dealer (or if you deal directly with Blue Bird, contact your Service Representative). If you are unsure of the identity of your Blue Bird Service Representative, call the Blue Bird switchboard at 478.825.2021 and ask the receptionist for the Blue Bird Service Department.

For replacement parts…

Contact your Blue Bird Dealer or Parts Sales at Blue Bird Corporation.

General Specification, Chassis

Alternator
240 Amp Leece Neville, 12 Volt, AVI-160.

Axle & Suspension, Front
Axle: Hendrickson SteerTek, 12,000 lb rating. Petroleum lubed bearings. 50 degree wheel cut. Hubcaps with window seal included.
Suspensions: Hendrickson SofTek, 8,000 lb (standard) or 10,000 lb (optional) rating. 4" x 60", Hendrickson variable rate, tapered springs with Anti-Wear liner. Maintenance free rubber bushings.
Shock Absorbers: Sachs, direct acting, 1.42" diameter bore double-action piston type with long life bushings.

Axle & Suspension, Rear
Axle: Meritor, RS21145, 21,000 lbs. capacity single speed with 5.29 ratio. Petroleum lubed bearings (Synthetic optional).
Shock Absorbers: Sachs, direct acting, 1.42" diameter bore double-action piston type with long life bushings.
Springs: 4" x 52" semi-elliptic, progressive, 17,000-21,000 lb. two stage leaf springs. Maintenance free, rubber bushed radius leaf permits axle adjustment for dog tracking.

Batteries
Three Group 31 batteries with 2100 CCA @ 0° F, 2/0 gauge battery cables, slide out battery compartment tray.

Braking System
Service Brakes, Air (Optional). Meritor air-powered, cam-operated, 5" front; 7" rear internal expanding, single leading shoe drum brakes. Meritor automatic slack adjusters. 4-channel Bendix ABS. 3-tank air system with combined capacity of 4,400 cu in. Moisture drain valve on each tank. Options available for Bendix AD-9 or AD-IP air dryer.
Emergency/Parking (units with optional air brakes). Captive spring actuators incorporated into rear air brake chambers. Release valve operation with control knob at driver's right.
Service Brakes, Hydraulic (Standard). Both front and rear systems have 15" diameter x 1.438" thick rotors. 70mm front and rear 4-piston, self adjusting Meritor Quadraulic calipers. Meritor ABS.
Emergency/Parking (units with standard hydraulic brakes). Internal expanding, transmission mounted, 9" diameter x 3" wide. Mechanical cable operation with foot control lever at driver's left.

Bumpers

Contoured 15" steel front bumper die formed from 3/16" steel plate. Rear bumper smooth profile, 12" high with 90° flanges, die formed from 3/16" steel plate, with 14" wraparound at corners and diagonal bracing.

Controls

Electronically operated accelerator, air/hydraulic brakes, valve actuated parking brake (air brakes) or cable-operated driveline shoe parking brake (hydraulic brakes) with warning light, transmission selector, dimmer switch, instrument panel lighting dimmer, key-type starter switch. Electric dual horn. Message Display Center controls on the instrument panel cluster. Cruise control on right steering column stalk. Manual outward-opening door control.

Cooling System

Charge air and down-flow radiator mounted in tandem at vehicle front. A 25" dia. nylon cooling fan with nine blades equipped with an electromagnetic fan clutch driven by polyvee fan belt with spring loaded tensioner. Fan clutch controlled by Engine ECM.

Transynd™ TS295 Synthetic Transmission fluid cooled by a heat exchanger in the lower radiator tank. Premium rubber coolant hoses with constant tension clamps.

Drive Line

Spicer SPL series 70 or SPL series 100 shafts with protective guards and lifetime lubrication. 3 1/2" diameter shaft.

Engines

Cummins ISB / 2010 Emission Standards Engines. All Blue Bird 2013 Visions are equipped with Cummins ISB engines (except propane powered units) which are specially designed to meet 2010 emission standards. These engines incorporate a Cummins Particulate Filter / SCR, Diesel Exhaust Fluid (DEF) system, and use cooled Exhaust Gas Recirculation to reduce emissions. During normal use, the system automatically enters a particulate filter regeneration mode to oxidize soot collected in the particulate filter.

Cummins ISB-10 Base 200 HP @ 2400 RPM; 520 ft lb torque @ 1600 RPM. Governed speed 2600 RPM. Certified for NOx and NMHC for 2010 emission EPA standards. High pressure common rail fuel system. 15.2 CFM single cylinder air compressor. SAE #3 Flywheel housing. Holset turbocharger. Variable Geometry Turbine (VGT) turbocharger. The ISB-10 monitors key engine parameters and logs diagnostic faults when an abnormal operating condition occurs. The engine de-rates available power and maximum vehicle speed when certain parameters pass a limit threshold or a maximum coolant temperature of 225 F. The engine's ECM keeps an electronic data log of time of occurrence, elapsed times, extreme pressures and extreme temperatures when the system detects an out-of-range condition. The following sensors mounted on the engine provide input to the engine protection system: oil pressure, coolant level sensor. Minimum pressure cap rating is 15 psi at sea level. Thermostats opening

temperature 190 F; fully open @ 205 F. Fan full-on at engine coolant temperature of 210 F. Fuel/Water Separator supplied with engine. Blue Bird diesel fuel systems are not compatible with biodiesel. Engine manufacturer's warranty regarding performance, emissions and durability can be affected by using biodiesel.

GM 8.1L with LPI (Liquid Propane Injection). 325 HP @ 4000 RPM; 450 ft lb torque @ 2800 RPM. This engine incorporates a liquid propane, sequential port injected system that is EPA/CARB cerified for NOx and NMHC 2010 emission EPA standards.

Intake

High volume canister type air cleaner with replaceable pleated fiber cartridge. Charge Air intake circuit by exhaust-driven turbocharger. Charge Air cooler mounted in front of engine coolant radiator. Intake restriction indicator.

Exhaust

4" O.D. 16 Gauge stainless steel tubing from engine turbocharger to in-line diesel particulate filter and selective catalytic reduction (SCR) device. Stainless steel DPF with catalytic converter and SCR. 4" O.D. 16 gauge aluminized steel tailpipe. Wide band exhaust clamps used at all joints. Left hand side exit tailpipe.

Visions equipped with 2010 emissions standards engines use engine manufacturer-specific diesel particulate filters which integrate with an active regeneration system to oxidize particulate soot and SCR devices which reduces overall NOx output.

Frame, Chassis

Dual "C" channels, 10 1/2" high with 3" flanges made of 1/4" thick, 50,000 psi steel. All permanent fixtures on frame are attached with hi-tensile strength Huck-Spin fasteners with swaged lock nuts.

Fuel System

60 gallon capacity aluminized steel safety tank mounted between frame rails. Includes a sender inspection plate and right side fill opening (standard) with spring loaded locking door.

Spin-on fuel filter (standard). Racor 490R30 fuel filter with see-thru bowl, self-venting drain, integral check valve on inlet side, and 200 watt heater (optional). Secondary fuel filter mounted on engine is supplied by engine manufacturer.

Horn

Electric dual tone horns.

Backing safety horn variable db. (Optional) A Variable db, backing safety horn activated whenever the bus is shifted into reverse. Sounds between 87 and 112 db automatically adjusting itself depending on the ambient noise level in the proximity of the alarm.

Instruments / Gauges

Gauges: Speedometer; Oil Pressure; Fuel Level; Coolant Temperature; Tachometer. Front Air Pressure; Rear Air Pressure on units equipped with air brakes.

LED Warnings / Telltale Indicators: HEST Indicator; Brake Failure, Wait To Start, ABS, Park Brake Applied, Check Transmission, Left Turn Signal, High Beam, Right Turn Signal, Coolant Level, Transmission Oil Temperature, Stop Light, Stop Engine, Engine Warning, Coolant Temperature, Low Fuel, Low Secondary Brake Pressure, Low Primary Brake Pressure.

Message Display Center: When configured this display will provide a continuous readout for volts, amps, transmission temperature, and applied air pressure (with optional air brakes). Interactive LCD display, also provides system alerts such as regen needed, low DEF fluid levels, voltage error, water in fuel, engine warning, J1939 communication failure, stop engine, turn signal on; and also displays service diagnostic features.

Steering

Full power Ross THP-60 integral unit with 20.4 to 1 ratio; with TRW Power Steering Pump.18" diameter, two-spoke, padded steering wheel with tilt steering column.

Tires

11R22.5 (G) Steelbelt.

Tow Hooks or Tow Eyes

Two front frame mounted (standard). Two rear frame mounted (optional).

Transmission

Allison 2500 PTS Series transmission, 5 Forward speeds- 1 reverse, with Gen 4 T-handle shifter mechanism. Transynd™ TS295 Synthetic Transmission Fluid.

Wheels

Hub Piloted steel 10 stud disc wheels, single front, dual rear, 8.25 x 22.5 rims.

Wiring

Blue Bird Multiplex chassis circuit wiring system with MPX Module located in Power Distribution Unit compartment at front of bus below dash. Includes diagnostic switch directly on module.

General Specification, Body

Panels & Compartments

Battery Compartment. Enclosed compartment 23.63"L x 24.00" D. Optional roll-out tray includes retaining pins with cables to secure the tray in a closed position. Hinged door with recessed locking "Paddle Handle" latch. Located on front of left side of bus.

Exterior Electrical Compartment. Left front side of bus, below Driver's window.

Power Distribution Unit. Inside the bus, centered on the front wall against the floor. Cover removable with two thumbscrews. Houses the main Multiplex Main Bus Controller, battery power distribution connections, and other electrical connections.

Side Electrical Channels. Inside the bus above the side windows on both sides. Houses the trunks of all body harnesses and other optional component wiring, such as radio / PA speakers, if so equipped.

Emergency Doors

Rear center door with 37.7" wide x 52.5" high opening. Single-point bar lock latch with inside handle and guard. 6" chrome-plated recessed exterior handle. Upper and lower clear tempered. 5" black upholstered header pad.

Buzzers: Two buzzers—one located in the Driver's area and one near the rear emergency door—sound when any emergency exit is engaged.

Entrance Doors

Standard: Blue Bird two-panel Outward Opening door with manual door control.
Optional: Bode electically-operated two panel outward opening door. Permanently lubricated bearings and bushings. Mechanical clutching system in the gear case disengages the worm drive to allow emergency manual opening of the door. Clear (standard) or tinted (optional) glass. 5" black upholstered header pad.

Electrical

Multiplex system incorporating chassis circuits. Power Distribution Unit under windshield near floor.

Fans (optional)

One 6" fan mounted left of the Driver seat, with or without a second 6" fan mounted right of the Driver at body centerline. Each fan has high / low speed and is controlled by a single switch.

Floor

Covering. 3/16" thick ribbed black vinyl in aisles and at entrance aisle area. Aluminum aisle trim over joint in floor covering, full lenght of body. 1/8" smooth black vinyl under seats. Molded black composite wheelhousings covers.

Subfloor. 1/2" Fir plywood, secured to steel floor panels with screws.

Heater/Defroster

90,000 BTU/h front system on Driver's side with continuous ducted defrosting of windshield and Driver's window. Washable filter. Driver selects recirculating of fresh air into system as conditions require. Manual ball type water flow control valve on heater next to driver. Purosil EPDM heater hose with constant tension clamps at all joints.

Insulation

The roof, sides, front and rear (including corners and bow cavities) are insulated with 1 ½" thick fiberglass providing an R-value of 5.75.

Lettering

SCHOOL BUS black vinyl lettering on front and rear caps. Yellow reflective background optional. Vinyl lettering on top of emergency windows and rear emergency door on both interior and exterior of vehicle, according to federal regulations. Operation instructions decal on all emergency exits. French decals options available.

Lights

Backing: Two 5" clear incandescent right and left rear.
Clearance: Two amber front and two amber rear. Switch operates clearance, cluster, and side marker lights.
Daytime Running: Head lamps, tail, license plate, parking, clearance & marker lights activated when engine is running and parking brake is released.
Directional: Two 7" amber lights mounted on rear. Two 4" plain amber fender mounted (optional).
Dome: 6 Candlepower single row equally spaced at center over aisle. Single control switch.
Headlights: Dual element 65w high beam / 45w low beam 9004 halogen bulbs mounted in contoured lens housings.
Stepwell: 14 candlepower. Wired to operate with ID lights with entrance door open.
Stop and Tail: Two combination lights, 4" right and left rear license panel in combination with 7" stop and tail lights with clear red lens.
Warning Lights: 8 light sequential system with dual hoods.

Mirrors

Exterior Crossview: A Rosco Eye-Max crossview mirror system allows a seated driver to view pedestrians while the bus is stopped. The crossview mirror system is comprised of a 10.8" x 12.5" elliptical mirror with black upper portion to reduce glare supported by a center mounting post with ball stud mounted, on both left and right sides of the bus. The mirror mounting posts are attached to the front cowls, and feature a breakaway pivot to minimize damage in the event of accidental contact. The crossview mirror system allows for viewing all areas along the front and sides of the bus which are not visible by direct view.

Exterior Rearview: Rosco Open View Split System rearview mirror. Provides view of the roadway to the rear, as well as a view of the ground along both right and left sides. Rearview mirror system is comprised of a 74 square inch flat and a 37 square inch convex, 36" radius mirror on both right and left sides. Right rearview mirrors are located so as to be visible through the wiped area of the windshield. Left rearview mirrors are located so as to be viewed through the Driver's window. Both right and left rearview mirrors feature a breakaway indexed pivot and are adjustable without tools.

Interior Rearview: 6" x 30" with 3/16" clear safety glass laminated to steel backing plate. 1 3/4" radius rounded corners. Perimiter of mirror edged with 5/8 diameter rubber padding. Interior rearview mirror is installed above the seated Driver on the front upper inner panel, and provides a clear view of the vehicle interior and roadway to the rear, through the windows of the rear emergency door.

Paint

Exterior: Heat cured polyurethane. National school bus yellow with yellow rub rails (black rubrails optional), bumpers, and around Warning Lights.

Interior: Astro White, hot sprayed-on baked enamel, except aluminized inner side panels. Seat frames, heaters and trim are black. Switch console and dash dark gray.

Rust Proofing: Body parts thoroughly rust-proofed after fabrication and before assembly.

Undercoat: Underside of body floor, skirt and wheelhousings thoroughly undercoated prior to body mount on chassis to ensure best coverage and maximum corrosion resistance.

Panels, Exterior

16 1/4" skirt. Outside side panels are constructed of 20 gauge form fluted steel. Side panels extend from below the side windows to a distance of 16 1/4" below the floor (16 1/4" skirt). Rear corner panels are constructed of 20 gauge steel and include a license plate emboss, both right and left. The left hand emboss includes nylon nuts and slot-head screws for license plate mounting. The front roof cap is formed from 18-gauge steel. The rear roof cap is formed from 20 gauge steel. Roof sheets are constructed of 20 gauge steel and span the entire width of the bus (window header to window header). Roof sheets include an embossed rain visor over side windows. Front cowl panels are constructed of 11 gauge steel. Floor panels are constructed of 14 gauge steel and are reinforced with full width "U" channel cross members.

Panels, Interior

A removable 18 gauge steel front upper inner panel is provided to allow access to the front roof cap area. A removable 20 gauge steel rear upper inner panel is provided to allow access to the rear roof cap area. Removable composite wire moldings, right and left, are provided to allow access to body wiring harnesses. Wire moldings are provided in sections. Textured aluminized steel inside side panels are provided, extending from the window sill down to the floor gusset seat ledge, for the entire length of the body on both left and right sides. Driver's and first section are acoustic headlining. Second section and rearward are solid headlining panels, spanning the entire width of the bus (window header to window header), constructed of 22 gauge steel, double-hemmed to provide additional joint strength.

Reflectors

Standard reflectors include:

- Two 3" red mounted on side of body near rear.
- Two 3" red, mounted on rear of body.
- Two 3" amber right and left intermediate side reflectors.

Reflective Tape: One-inch minimum width strip around each emergency exit (roof hatch/pushout window when ordered). One-inch wide strip of yellow reflective vinyl around the perimeter of the rear emergency door.

Rubrails

Four double-ribbed low profile 16 gauge steel applied rubrails are installed along both sides of the body, as follows: One below side windows; one at seat (Passenger) level; one near the floor level; one at the bottom of the skirt. The window rail extends from the front bow on the right or the front cowl post on the left to the rear corner radius. The floor rail extends from the front bow, both right & front, to the rear corner radius. The skirt rail extends from the front bow on the right, or the front cowl post on the left, to the rear bumper (interrupted at wheelhousing cutouts). The seat rail extends from the front bow, both right and left around the rear corner radius.

Optional bumper rubrail installed below the rear emergency door immediately above the rear bumper. Rail spans the full width of body and wraps around the rear corner panels right and left. Yellow rubrails are standard with yellow end caps. Rubrails are secured with 1/4" screws - 20 x 5/8" with Torx drive heads. Layouts may vary on options ordered

Safety Equipment

Three reflectorized triangular roadside warning devices enclosed in a plastic storage container, secured to the floor near Driver. 5 lb fire estinguisher in entrance door area. Two roof escape hatches mounted above aisle.

Seats

Driver's Seat. National NS2000 pedestal (standard) or air adjustable (optional). Seat belt is three-point, floor mounted anti-cinch emergency locking retractor.

Passenger Seats. All Passenger seats and barriers are optional and are upholstered in grey fire block.

Stepwell

Three-step riser, National Standard. 10" to 14" ground to lower step height, galvanized steel (stainless steel optional). Step treads with non-abrasive black rubber with white nosing. Three inch wide white ribbed rubber with metal backing wearplate is located at floor level step at the entrance door. Includes stainless steel assist rail at rear of stepwell.

Stop Arm, Crossing Arm

One Specialty solid state electric operated high intesnity reflective octagonal stop arm, red with a white border and 6" high lettering. "STOP" or "ARRETT" on both sides. Includes red incandescent lights over and under the word "STOP" visible from both sides.

Sun Visor

Transparent dark green tint 6.5" x 30" smooth edge plastic. Located in front of driver. Adjustable vertically on two arms pivoted at ends of visor and at anchor points on windshield header.

Switch Panel
Mounted on left of driver with rocker-type illuminated switches for electrical equipment. Brightness of illumination is controlled by a dimmer slide switch.

Ventilation
Air Intake. Heater intake left front below windshield level provides up to 100% fresh air through heater.
Roof Vent. Static non-closing vent in front roof.

Windows
Auxilliary Safety-View Vision Panel. Fresnel broad vision 7 1/2" x 13 1/2 in right front cowl.
Driver's. Double sliding aluminum sash with security fastener for locking both sash, laminated green tinted safety glass.
Side. 9" and 12" split sash with clear (standard) or tinted (optional) tempered glass. Vertically hinged push-out windows.
Rear Vision. Fixed clear tempered.

Windshield
The windshield consists of four separate pieces of flat shaded safety plate glass. Optional black grip handles and fold-up step on right and left cowls to facillitate windshield cleaning.

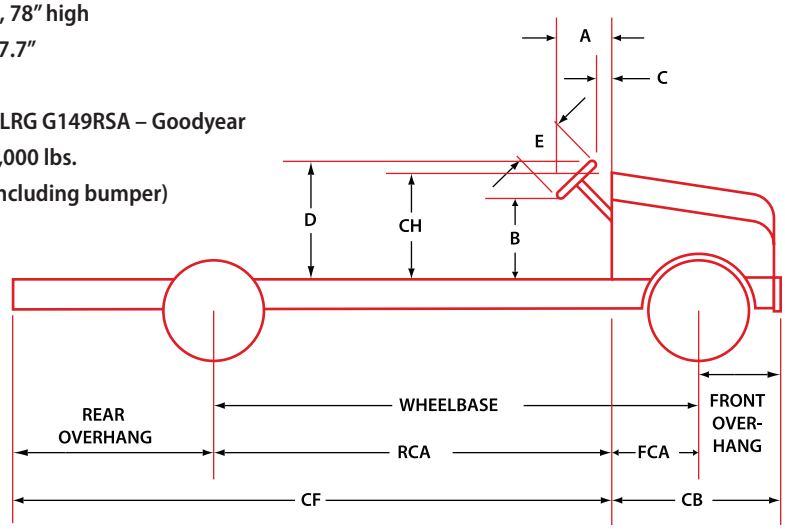
Windshield Wipers
Electric, intermittent single switch, wet arm wipers. Electric windshield washer with hard plastic one gallon capacity reservoir located under engine hood.

Wiring
Colored and continuously number coded in molding on top of side windows for access to harnesses. Body wiring protected by ATO / ATC fuses. Manual resetting circuit breakers are optional.

Dimensions

The dimensions shown exclude exterior mirrors, marker and signal lights, bumpers, fender skirts, washers, wipers, ad frames and rub rail; and are taken under static conditions at design height. Overall maximum height varies from 120" to 124" depending upon choice of tires, suspension system, and body model. Add 3" for roof vents and 3" for 77" headroom. Rear bumper adds 1.25" to overall body length. Front bumper adds 2" to overall body length.

Length:	**289"- 471"**
Width:	**96"**
Interior Width:	**90 ¾"**
Height:	**124"- 127"**
Skirt Length:	**16 ¾"**
Wheelbase:	**169" / 189" / 217" / 238" / 252" / 273" / 280"**
Interior Headroom:	**74"- 77"**
Front Door:	**27" wide, 78" high**
Rear Emergency Door:	**52.5" x 37.7"**
Wheel Cut:	**50°**
Tire Size:	**10R22.5 LRG G149RSA – Goodyear**
GVWR:	**Up to 31,000 lbs.**
Front Overhang:	**44.75" (including bumper)**
FCA (Front Cowl to Axle):	**25"**
CB (Cowl to Bumper):	**69.75"**
CH (Cowl Height):	**33"**
A:	**21.17"**
B:	**26.75"**
C:	**9.5"**
D:	**41.97"**
E:	**18"**



Dimensions & Payload Weight (standard equipment)

WHEELBASE	BODY MODEL	CAPACITY	PAYLOAD	CURB WEIGHT	TOTAL WEIGHT	OVERALL LENGTH	REAR OVERHANG	TURN RADIUS	RCA	CF
169"	BBCV1910	36	4470	14,330	18,800	309	94	23'-6"	144	238
189"	BBCV2311	48	5910	15,100	21,010	358.29	122.25	25'-10"	164	286.25
217"	BBCV2610	54	6630	16,100	22,730	393.29	129.25	32'-4"	192	321.25
238"	BBCV2807	60	7350	16,300	23,650	414.29	129.25	32'-3"	213	342.25
252"	BBCV3011	66	8070	17,400	25,470	442.29	143.25	33'-10"	227	370.25
273"	BBCV3303	72	8790	18,000	26,790	470.29	150.25	35'-3"	248	405.25
273"	BBCV3310	77	9390	18,410	27,800	477.29	157.25	35'-3"	248	405.25
280"	BBCV3507	78	9510	20190	29,700	498.29	171.25	36'-0"	255	426.25

Pupil weight @ 120 lb each. Driver @ 150 lb.
Approximate curb & total weights are based on standard equipment units. Optional equipment may significantly increase these estimated weights.

Driver Orientation

This chapter is a brief tour of the VISION's features and equipment locations.

Emergency Equipment Locations

Some emergency equipment is optional and differs between states. Generally, all school buses have first aid kits, fire extinguishers, and triangular roadside hazard reflector kits; however, the sizes of first aid kits and fire extinguishers vary. The bus may also be equipped with a body fluid kit, fire axe, crowbar, or flare kit. All such devices are generally located in the Driver's area, but specific locations are also subject to optional specifications.

Upon taking delivery of the bus, the Driver must locate all the emergency equipment purchased with the bus, and become fully acquainted with its mountings; must be able to quickly remove the equipment in an emergency situtation and replace it securely. Emergency equipment must never be left loose in the bus, but must always be securely stored in its factory-installed mountings during bus operation.

As part of a daily pre-trip inspection, the Driver must verify that all emergency equipment is in place, fully stocked (First Aid Kit), up-to-date (Fire Extinguisher), and in proper working condition.

First Aid Kit

The first aid kit on most VISION buses is located over the windshield toward the curbside of the bus. Each state has a specific location and contents guide that must be followed.

Body Fluids Clean-up Kit

The body fluids clean-up kit is located in the general area of the first aid kit. However, each state has specific requirements for the location and labeling of this equipment. Know your state's requirements and maintain the kit accordingly.

Fire Extinguisher

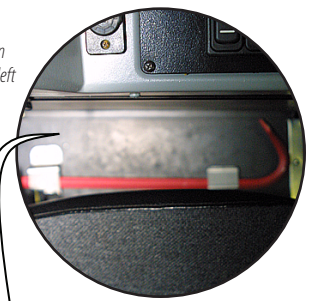
The fire extinguisher on most VISION buses is located near the floor, forward of the entrance door stepwell or mounted to the floor near the Driver's seat. States requirements vary for the type and size of the fire extinguisher for school buses. The fire extinguisher must be monitored to ensure the charge level is within the acceptable range, and the expiration date current. It is the responsibility of the driver to ensure compliance prior to each trip.

Triangular Roadside Hazard Reflector Kit

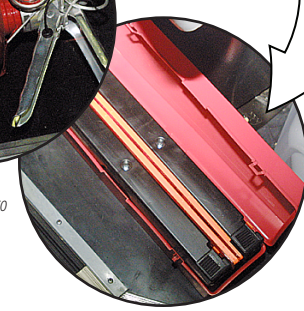
For those states requiring the triangular markers to be located in the driver's compartment, this container is mounted on the floor immediately behind the driver's seat. In some states, it is mounted on the floor, under the rearmost left-hand seat or under the second right hand seat. The contents of the triangular warning device kit should be checked each month or as the regulations of your state dictate. See the Enroute Emergencies chapter for instructions on deploying the refelectors.

The First Aid Kit is mounted on the interior header panel above the windshield. Depending upon options or regulatory requirements the bus may also be equipped with a Body Fluid KIt in the same general location.

Fire Axe floor mounted between Driver's seat and left console



Triangular Roadside Hazard Reflector Kit



Fire Extinguisher size and location varies according to options and state specs.

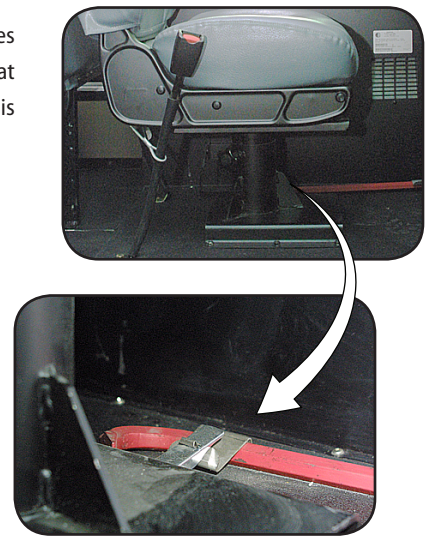
Triangular Roadside Hazard Reflector kit may also be mounted behind the Driver's seat, or at the rear of the bus just inside the Rear Emergency Door opening.

Flare Kit

If the bus is equipped with a flare kit, on most VISION buses it is typically mounted on the floor behind the Driver's seat and left side seat barrier. The location may differ according to state specs. The kit contents should be inventoried every 30 days, or as required by your state and local regulations. The mounting fasteners should be checked monthly to ensure security.

Fire Axe and Crowbar

If the bus is equipped with fire axe and/or crowbar options, on most VISION buses they are typically mounted on the floor behind the Driver's seat and left side seat barrier. The location may differ according to state specs. The Fire axe cutting edge is covered by a metal plate when mounted.

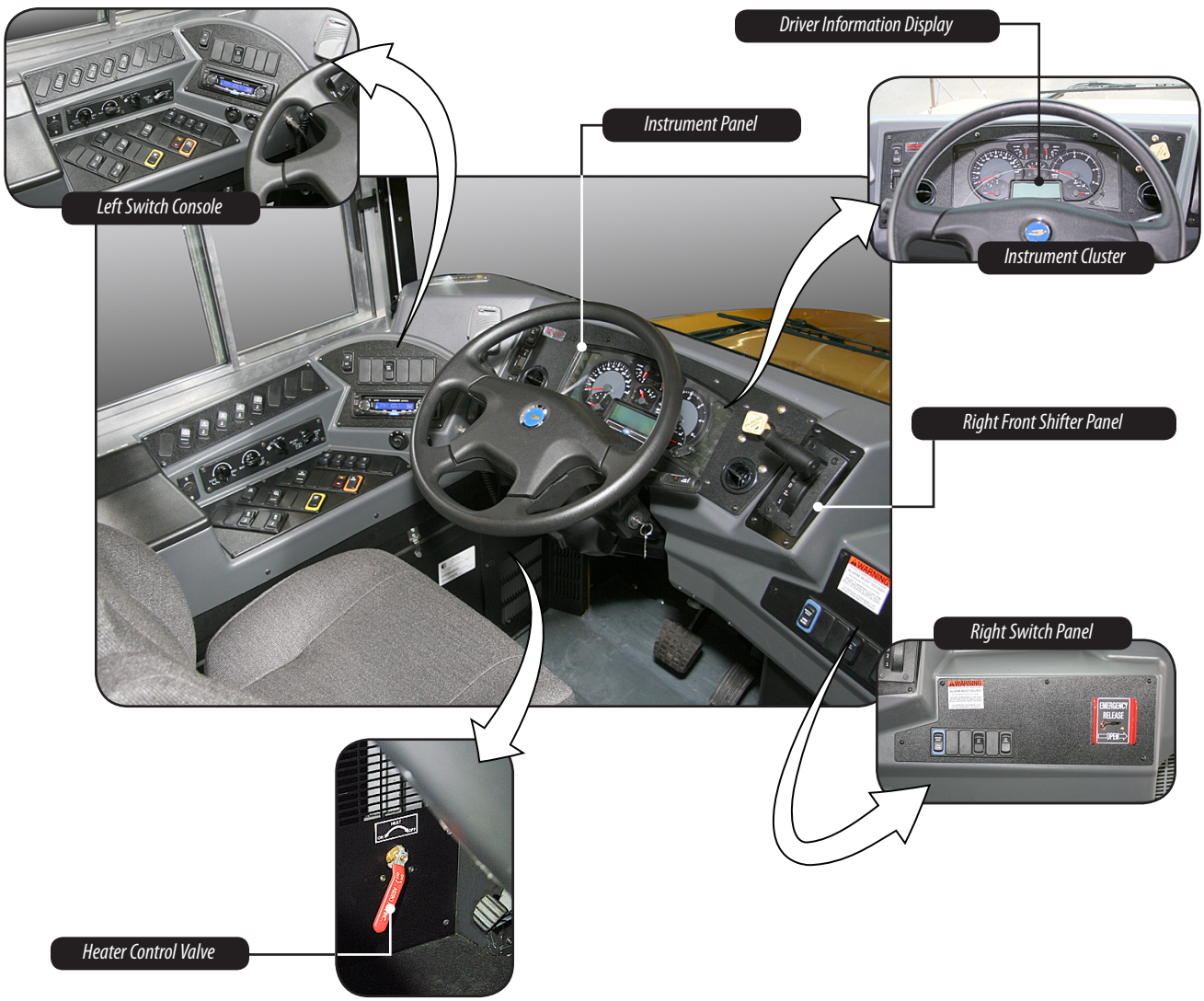


Crowbar mounting latch

Driver's Area

Blue Bird has designed many new features into the Driver's area of the VISION. A new one-piece molded dash housing spans the entire front of the bus. All gauges are incorporated in a single main instrument cluster. New switch panels are located to the right and left of the instrument panel. The exact arrangement of switches in all switch panels is somewhat dependent upon specific state specifications. (For example, some states require additional switches for red and amber Warning Light pilots.) Shown are the standard and most common configurations. If your bus differs from the diagarms shown, check with your local specifications and familiarize yourself with each switch function.

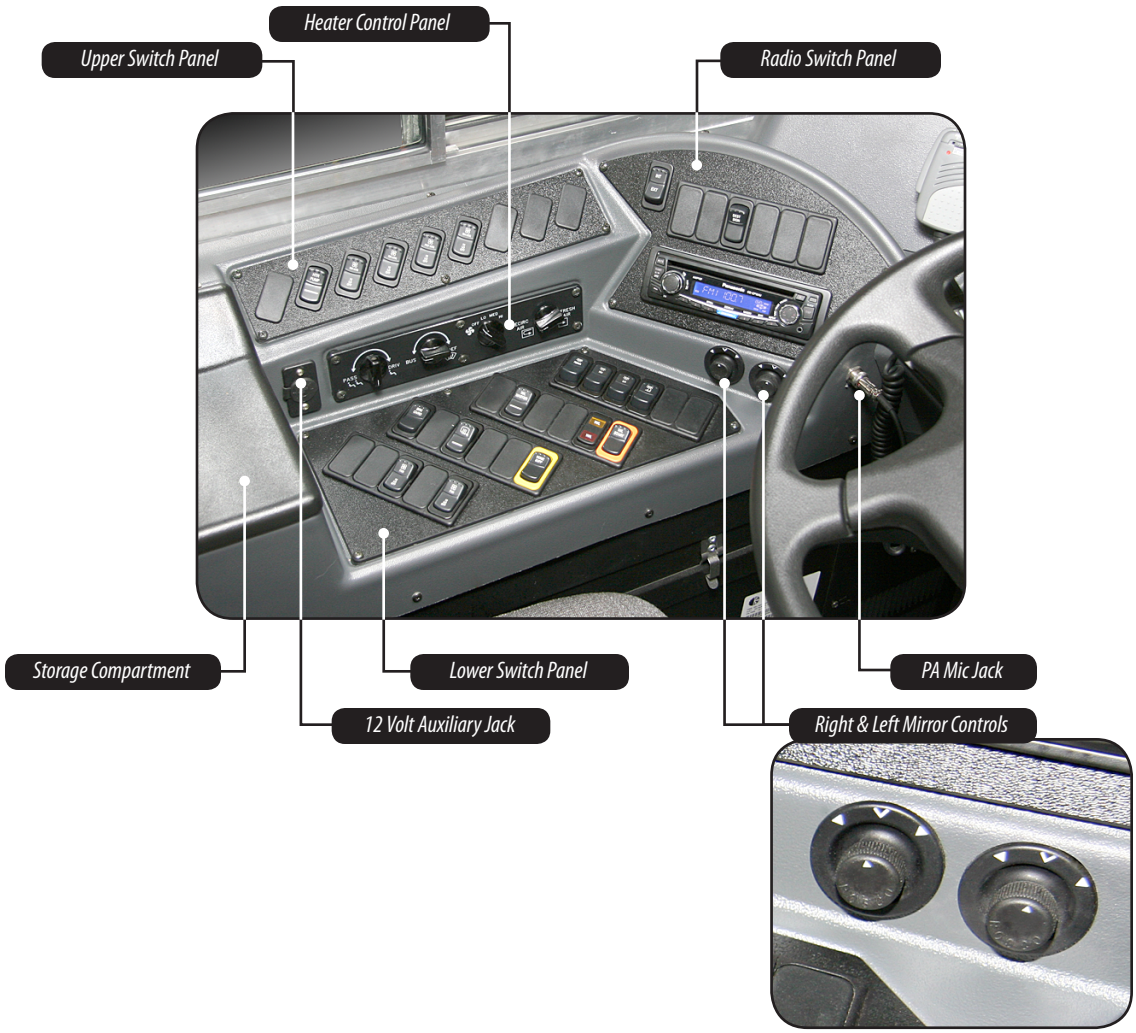
A tilt / telescope steering column provides improved adjustability range, allowing the Driver to use both hands to position the wheel for maximum comfort.



Left Switch Console

The left switch console under the driver's side window shown here consists of, the Radio Switch Panel, the Heater Control Panel, Right and left rearview mirror controls, upper and lower switch banks, an optional storage compartment, the optional PA mic jack and a 12 volt auxiliary jack.

The left switch console contains three switch panel banks. The exact arrangement of switches in all switch panels is somewhat dependent upon specific state specifications. (For example, some states require additional switches for red and amber Warning Light pilots.) Shown are the standard and most common configurations. If your bus differs from the diagrams shown, check with your local specifications and familiarize yourself with each switch function.

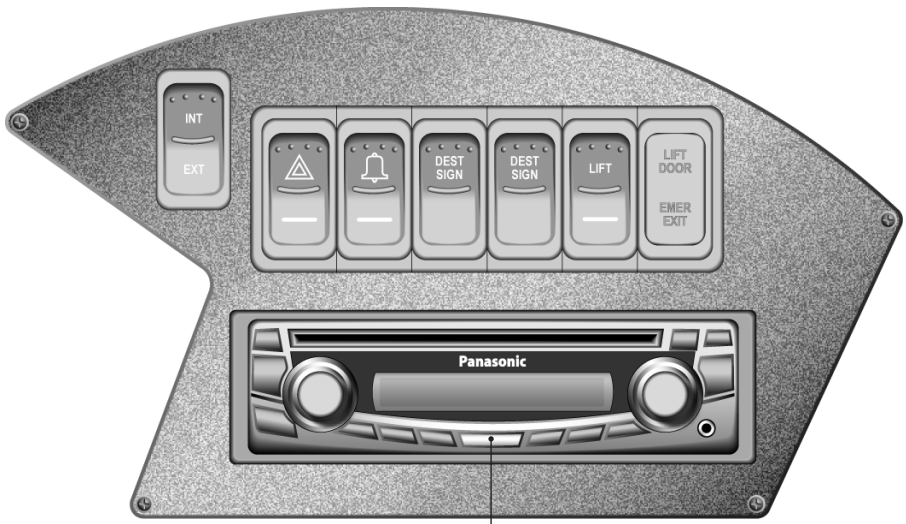


Optional

Radio Switch Panel

The radio console switch panel located to the left of the driver and shown below includes a Panasonic AM/FM stereo cassette or CD player with PA system, depending on option ordered. The panel contains switches for standard and optional equipment and will be equipped only with switches for options that are included on your bus and therefore may differ from the panel shown here. The following is a list of switches and indicators found in this panel and their descriptive icons.

PA Mic



Optional Panasonic Radio
With CD or Cassette and optional PA Mic.

INT **EXT** — **Public Address.** Interior and exterior speakers.

Hazard Lights. This switch turns on / off the front and rear turn signals as blinking hazard flashers.

Chimes. Provides power for passenger compartment chime system.

DEST SIGN — **Destination Sign.**

LIFT — **Lift.** Provides power for lift operation.

LIFT DOOR **EMER EXIT** — **Indicator Lights.** Lift door open and /or Emergency door open.

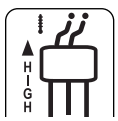
Upper Left Switch Panel

The upper left switch panel located directly below the driver's window and shown below includes switches that control the heater systems installed on your bus. The panel contains switches for standard and optional equipment heaters including front and rear heaters, the driver's heater, underseat heaters, and auxiliary heater pump. The panel will be equipped only with switches for options that are included on your bus and therefore may differ from the panel shown here. The following is a list of switches and their descriptive icons found in this panel.

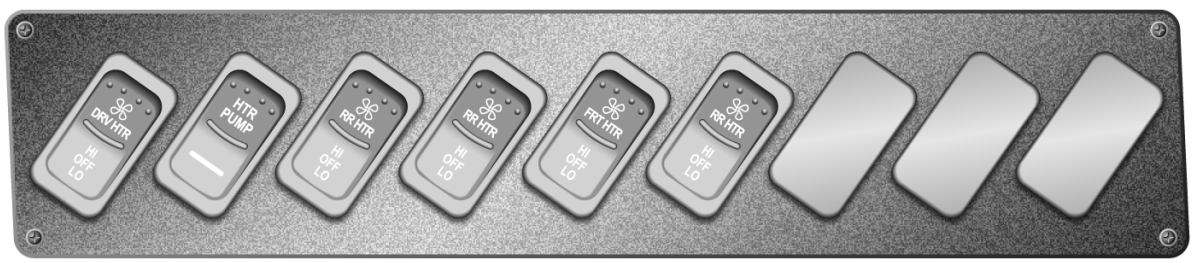
Driver's Heater Fan. High, off and low positions.

Heater pump. Provides power to auxiliary heater pump, supplying heat to the passenger compartment.

Underseat Heater Fan Switches. 3-position (High, Off, Low) . Additional 3-position heater switches may be located in the left console lower panel if the bus is equipped with optional passenger area heaters. These switches control the fan speed of underseat heaters.



Perimeter Convection Heater Switch. 2-position (On / Off). If the bus is equipped with optional perimeter convection heaters in the passenger area, a switch is provided to toggle these heaters on and off. This switch operates an electric valve which controls the flow of engine-heated water.



Heater Control Panel

The Heater Control panel of the Side Console contains controls for the front heater unit which is housed immedately below the Side Console left of the Driver seat. Ducts from this unit also provide windshield defrosting.

Fresh / Recirculate. This knob controls the type air, which is circulated by the heater system and fan. By turning clockwise, air is circulated from the interior of the vehicle. This is desirable when trying to heat passenger compartment rapidly. By turning the control knob counterclockwise air from outside the bus is used in the system. This is helpful when trying to cool the vehicle.

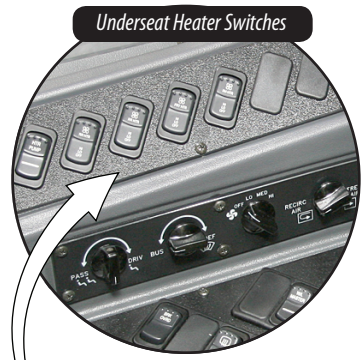
Heater Fan. This knob adjusts the speed of the fan, which circulates the air in the system. In the counter clockwise position, the blower is off. By turning clockwise, 3 speeds can be achieved — low, medium and high..

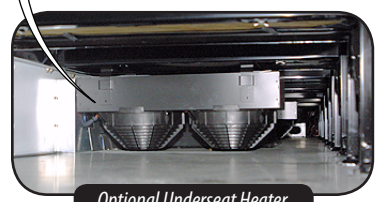
Defrost / Bus. This knob adjusts the air flow balance between the vehicle passenger compartment and the windshield. By turning knob clockwise, a damper is moved and air is diverted toward the windshield for defrosting.

Driver / Passenger. This knob Adjusts air flow balance in two directions. By turning knob clockwise, a damper is moved and air is diverted toward the driver. By turning counterclockwise, the air is diverted toward passengers. The amount of air diverted is proportional to amount the knob is turned.

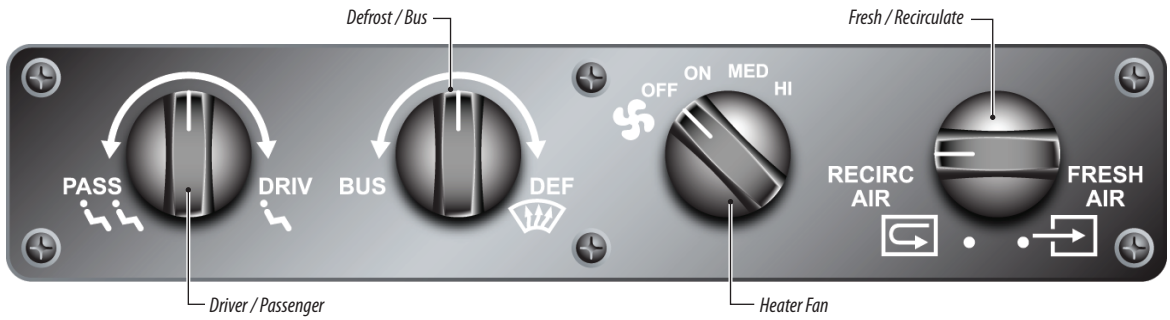
Front Entry Heater

Underseat Heater Switches





Optional Underseat Heater



Lower Left Switch Panel

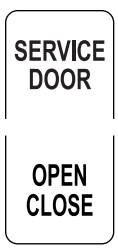
The lower left switch panel located directly beside the driver consist of switches for standard and optional equipment. The panel will be equipped only with switches for options that are included on your bus and therefore may differ from the panel shown here. The following is a list of switches and indicators found in this panel and their descriptive icons.

Rear Dome Lghts. Turns on / off the overhead lights in the passenger area. Some Vision buses have two of these switches, one each for the dome lights in the front half and rear half or the right side and left side the bus.

Left Side Dome Lights.

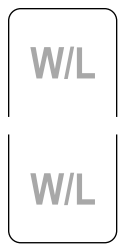
Right Side Dome Lights.

Driver's Dome Light. Turns on / off the overhead light in the Driver area.



Door Switch. Press and hold the top of this momentary rocker switch to open the entrance door. The door stops automatically when it reaches the end of its travel. Press and hold the bottom of the switch to close the door.

Warning Light Start. Switch with amber bezel. A momentary switch which initiates the Warning Light sequence. Press this switch upon approach to each school bus stop. In most Warning Light System configurations, this activates the amber warning light flashers. When the door is then opened, the red warning lights are activated and the stop arm and crossing arm extend. This also arms the Sleeping Child check system if so equipped, and is indicated in the Driver Information Display.



Warning Light Indicators. Red and yellow.

Warning Light Emergency. This momentary switch activates the red warning lights for use in the case of emergency, such as a roadside hazard.

Warning Light Master. Enables entire warning light system. This switch must be on whenever the Warning Light System system is required. Specific requirements vary according to state specifications. Generally, the use of the Warning Light System is required whenever picking up and discharging students. The Master switch enables you to disable the Warning Light System when stopping for other purposes such as fueling stops.

CAUTION ***If you bus is equipped with a battery powered warning system be sure to turn the Warning Light Master Switch off when the bus is parked overnight. Whenever the Warning Light Master switch is on, the Vision's Multiplex System will not enter its sleep mode, even if the key is removed. This will lead to battery discharge.***

Stop Arm/Crossing Arm Cancel. Interupts stop arm and/or crossing arm sequence. Pressing this momentary switch retracts the Stop Arm and Crossing Arm if they are extended. Pressing it again extends them.

NOISE SUPP

Noise Suppression. Includes yellow bezel. Momentary or on/off. When pressed and held, certain noisy devices such as auxilliary fans, heater blowers and radio are momentarily turned off to enable the Driver to better hear ambient sounds, such as railroad signals and gate intercoms or personnel, etc.

PANEL BRIG

Console Panel Dimmer. Dims or brightens Console Panel switches.

Strobe Light. Controls the roof-mounted strobe light.

Mirror Defrost. Activates defrosting system for exterior rearview mirrors.

STEP DE-ICE

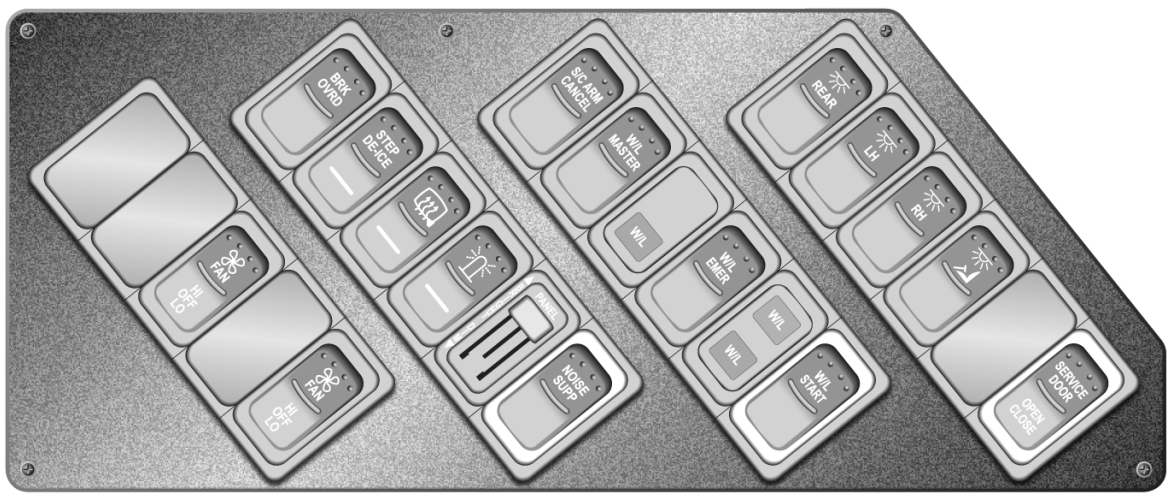
Step De-Ice. Activates de-icing system for entrance door steps.

BRK OVRD

Brake Interlock Overide. Momentary switch overides Brake Interlock system.

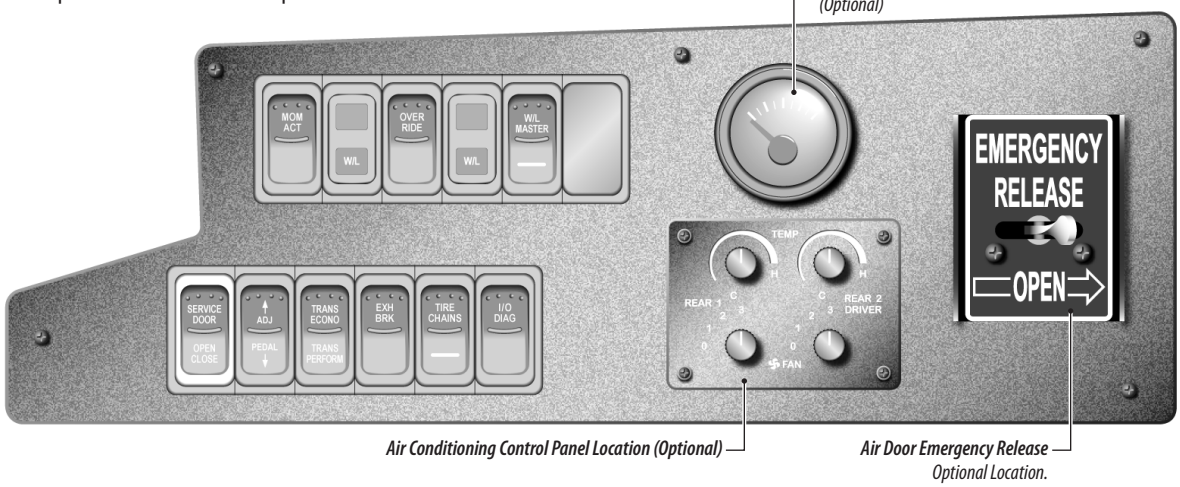
FAN

Fans. Left, center and right auxiliary fans. High, low, and off positions. Fans are provided for general air circulation, Driver comfort, and/or to help accellerate windshield de-fogging under certain conditions.



Right Console Switch Panel

The right switch panel located toward the center of the bus consist of switches for standard and optional equipment. The panel will be equipped only with switches for options that are included on your bus and therefore may differ from the panel shown here. Other options such as a dash mounted air restriction gauge, a relocated air door emergency release and a location for the standard or electronic air conditioning controls may be located here. Below is a list of switches and indicators and their descriptive icons found in this panel.



MOM ACT **Warning Light Momentary.** Activates the amber warning lights with entrance door closed or red warning lights with entrance door open.

OVER RIDE **Override.** Activates the red warning lights and stoparm regardless of entrance door position or master switch position. (Fearure Specific).

W/L MASTER **Warning Light Master.** Enables entire warning light system. This switch must be on whenever the Warning Light System system is required. Specific requirements vary according to state specifications. Generally, the use of the Warning Light System is required whenever picking up and discharging students. The Master switch enables you to disable the Warning Light System when stopping for other purposes such as fueling stops.

W/L **Warning Light Indicators.** Red and yellow.

SERVICE DOOR **Electctric Entrance Door.** Switch with blue bezel. Press and hold the top of this momentary rocker switch to open the entrance door. The door stops automatically when it reaches the end of its travel. Press and hold the bottom of the switch to close the door.

OPEN CLOSE

ADJ **Pedal Adjustment.** Allows forward and rearward movement of the accelerator and brake pedal. Provides a 3 inch range of movement.

PEDAL

TRANS ECONO **Transmission Economy.** Puts transmission into an economy shift pattern. Can be used for long trips.

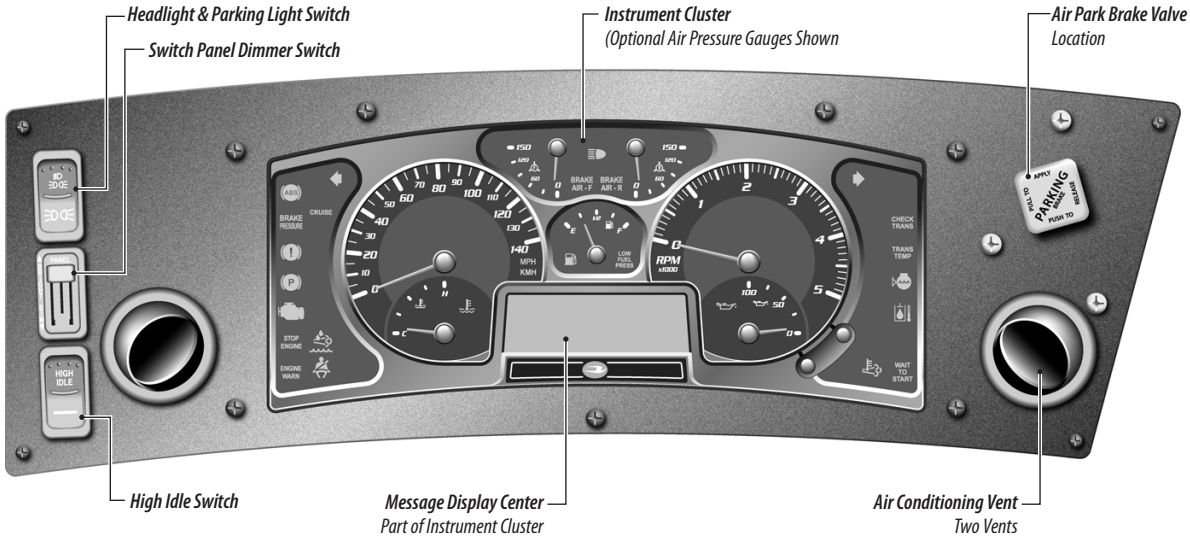
TRANS PERFORM **Transmission Perform** puts transmission into a performance shift mode. This is the default mode for the tramsmission and can be used for short stop and go trips.

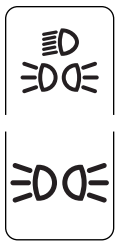
EXH BRK **Exhaust Brake.** Activates the exhaust brake to help slow engine speed during deceleration.

TIRE CHAINS **Tire Chains.** Drops tire chains into position for icy conditions.

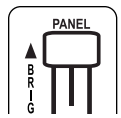
Driver's Instrument Panel

The driver's instrument panel behind the steering wheel and shown here consist of the instrument panel cluster, headlight switch, panel dimmer switch, high idle switch and air conditioning vents. If your bus is equipped with air brakes the parking brake valve is also located in this panel.





Headlights & Parking Lights. This switch turns headlights on and off, or turns on Parking Lights.



Switch Panel Dimmer. This slider switch is continuous, but has three detents. It adjusts the brightness of the switch panels backlighted switches. For brightening and dimming of the Instrument Cluster see the *Message Display Center Control Panel - Dimmer Adjustment*.

High Idle. This switch raises the engine idle RPM when in the on position. This may be used during engine / heater warmup and to increase alternator output in driving conditions which cause a high battery drain, such as very frequent stop / go while multiple accessories are on. This function is also useful when the bus is parked and left running for long periods of time or when electrical system demands are high such as running the AC or operating a wheelchair lift. Place the transmission in Neutral and set the Parking Brake before switching the engine to High Idle.

Instrument Cluster

The VISION'S instrument cluster is a single unit of all-electronic guages and warning lights, which receive both analog inputs from such components as the fuel tank sender and digital signals from components such as the engine and transmission control modules. A centrally-located Message Display Center displays the odometer reading, error alerts, and service technician diagnostic information. If the VISION is equipped with hydraulic brakes, the instrument cluster contains 5 gauges. Buses equipped with air brakes have two additional gauges indicating primary (front) and secondary (rear) air pressure.

1. **Speedometer.** Indicates vehicle speed in miles/hour or kilometers/hour.

2. **Tachometer.** Indicates engine speed in revolutions per minute times 1000.

3. **Message Display Center.** Displays additional information to the vehicle operator. See Message Display Center.

4. **Fuel Gauge.** Indicates fuel level in tank. Fuel gauge bank includes illuminated Low Fuel Indicator and Low Fuel Pressure Indicator.

5. **Coolant Temperature Gauge.** Indicates engine coolant temperature and includes an engine coolant temperature warning indicator.

6. **Oil Pressure Gauge.** Indicates engine oil pressure and includes an oil pressure warning indicator.

7. **Front Air Gauge.** Indicates air pressure in front brake reservoir and includes a low air warning indicator. (Air Brakes only.)

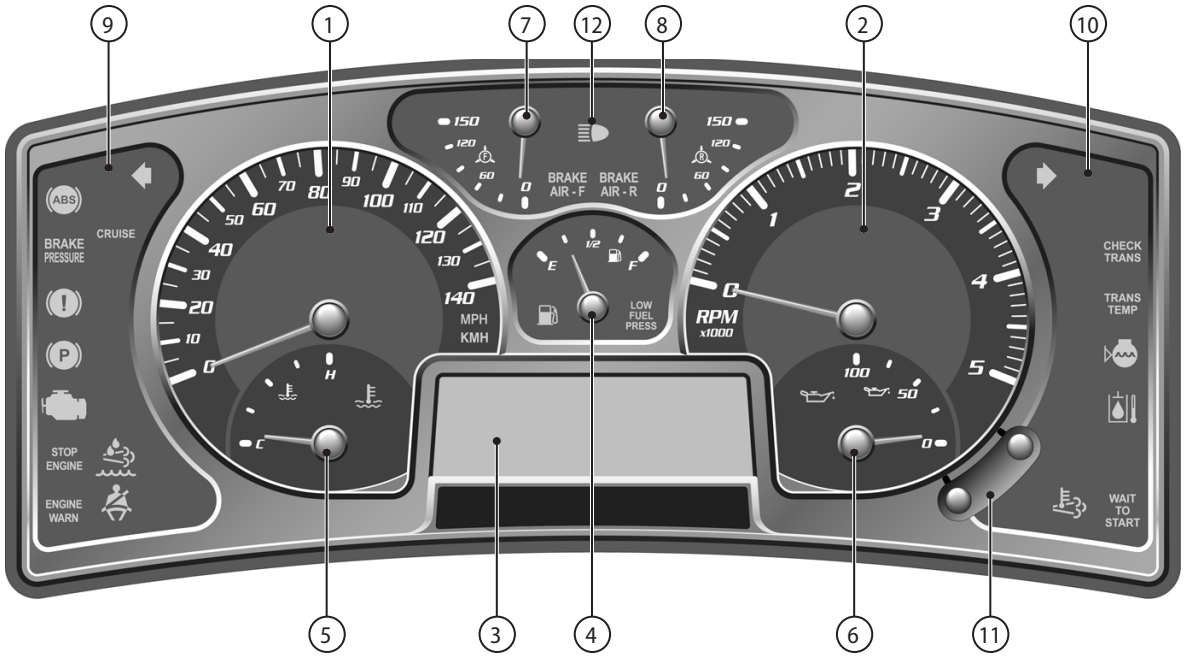
8. **Rear Air Gauge.** Indicates air pressure in rear brake reservoir and includes a low air warning indicator. (Air Brakes only.)

9. **Left Warning Bank.** Cluster of indicator lamps. See Warning Bank Indicators.

10. **Right Warning Bank.** Cluster of indicator lamps. See Warning Bank Indicators.

11. **Message Display Center Control Panel.** Two buttons which activate and toggle the menus of the Message Display Center. These buttons also serve as an Instrument Panel Dimmer, see *Dimmer Adjustment*.

12. **Headlight Highbeam Indicator.**



Message Display Center

The message display center provides additional information to the vehicle operator. It is a Liquid Crystal Display (LCD) screen located at the bottom center of the instrument panel and is divided into four quadrants. Each quadrant displays specific data relayed to the vehicle operator from vehicle systems. The message display center can also be used for diagnostic purposes by trained service technicians. The four quadrants of the display are selected and toggled by the two buttons on the message display control panel on the lower right side of the tachometer.

Message Display Control Panel

QUAD 1	QUAD 2A
	QUAD 2B
QUAD 3	QUAD 2C
	QUAD 4

Quad 1. Displays the Odometer, Trip 1 Odometer and Trip 2 Odometer. The odometer registers the mileage on the vehicle and the trip odometers may be set to register mileage from destination to destination. On the message display control panel press and release the top button to toggle between the odometer, and trip 1 and trip 2 odometer settings. Press and hold the top button to reset the trip odometer. After the bus has been turned off the odometer reading can be displayed by activating the headlights or by pressing either the top or bottom button. This quadrant also displays all general priority messages when triggered. In most cases, the priority message will flash between forward and reverse video. The priority messages can be

acknowledged by pressing the bottom button or cycling the ignition. This will allow you to return Quad 1 to the previous display until the recurrence time-out, next ignition or the trigger logic is not satisfied. Any lamps associated with the acknowledged message will remain on until the fault is gone or the ignition is turned off. If multiple messages are present, they will cycle every two seconds.

Quad 2A. Displays Gear Selection. **P** - Park, **N** - Neutral, **R** - Reverse, and **D** - Drive.

Quad 2B. Displays alternator output voltage (in Volts) and depending on option, can display the amount of current being drawn by the vehicle electrical system (in Amps).

Quad 2C. Displays the transmission temperature. On buses equipped with and configured for air brakes the service brake pressures will be displayed, temporarily replacing the transmission temperature. This shows how much air pressure in psi (pounds per square inch) is being applied to the front and rear brakes when the brake pedal is pressed. On busses equipped and configured for hydraulic brakes, the transmission temperature will be temporarily replaced with the rear suspension air pressure when the service brakes are applied, if enabled. When the service brakes are not applied Quad 2C will return to Transmission Temperature.

Quad 3. Displays the diesel exhaust fluid (DEF) gauge. The DEF level is displayed as a percent of full tank (15 gallons) capacity.

Quad 4. Displays a clock. This clock can be displayed in either a 12 or 24 clock mode. This mode can be toggled by pressing and releasing the bottom button until Quad 4 is activated, then press and release both buttons simultaneously to highlight the quadrant in reverse video. Toggle between the two modes by pressing and releasing the top or bottom button. *Note: This quadrant configuration is for busses equipped with a 2010 emission compliant diesel engine (i.e. ISB10/ISC10). Busses equipped with an optional engine such as an export engine (i.e. ISB03/ISB05) may display information in alternate quadrants.*

Warning Bank Indicators

Two arrangements of LED-illuminated warning lights provide feedback to the Driver about various systems. These are located to the right and left sides of the instrument panel. Indicator definitions are shown on the following page.

An audible speaker is incorporated into the back of the instrument cluster, and sounds to accompany the indicator light warnings. The audible alarm also serves to indicate turn signal blink and turn signal reminder.

Priority Messages

No Engine Communication
No Transmission Communication
No ABS Communication
Data Link Warning
Vehicle Speed Error
Engine Door Open
Brake Interlock Set
Brake Interlock Fail
Brake Interlock Requested
Retarder Applied
DEF Level Low
DEF Level Critical
DEF Level Derate
DEF Level Empty
DEF Speed Limit
DEF Fluid Type
* Stop Engine
* Engine Warning
* Hi Trans Temp
* Low Oil Pressure
* High Engine Temp
* Low Coolant Level
* Turn Signal On
* Voltage Error
* Water In Fuel
* Lift Not Stowed
* Regen Needed
* High Exhaust Temp
* Alternator Fail
* Headlights On
* ATC Active
* Range Inhibit
* Transmission Oil Life
* Trans Oil Filter
* Transmission Oil Service

* *(Messages Shown with Icon)*

Left Turn. Flashes with left turn signal.

ABS. Indicates fault in the anti-lock brakes system.

Brake Pressure. Indicates brake failure. Stop vehicle and call for assistance.

Brake Alarm. Indicates a problem with the service brakes (metric units only).

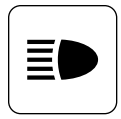
Park. Indicates parking brake is applied.

Maintenance Indicator Lamp. Indicates engine maintenance required.

Stop Engine. The engine ECU has detected a problem which can lead to engine damage. Stop the engine and call for assistance.

Engine Warn. The engine needs service.

Diesel Exhaust Fluid. DEF low level warning light. See *SCR System in Blue Bird Buses* under *Routine Operation*.



High Beam. Headlights are in high beam.

Cruise. Cruise control has been activated.

Brake Air Front. Indicates front brake air pressure outside of normal operating range.

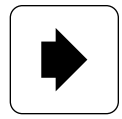
Brake Air Rear. Indicates rear brake air pressure outside of normal operating range.

Low Fuel. Indicates fuel level at 12 percent of maximum capacity.

Low Fuel Pressure. Indicates low fuel pressure on compressed natural gas vehicles.

High Coolant Temp. Indicates coolant temperature out of normal operating range.

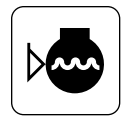
Seat Belt. Indicates driver seatbelt not engaged. (Optional)



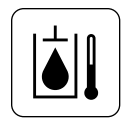
Right Turn. Flashes with right turn signal.

Check Trans. The transmission needs service.

Trans Temp. The transmission temperature is beyond normal operating range.



Coolant Level. Indicates low coolant level.



Hydraulic Fluid Temperature. The hydraulic fluid temperature is beyond normal operating range.

Wait to Start. Indicates engine preheating. Wait until indicator goes off before starting engine.

HEST. High Exhaust System Temperature. Indicates elevated exhaust temperature. See *Exhaust System* under *Routine Operation*.

Oil Pressure. Indicates low oil pressure.

Set the Clock

To set the clock, be sure the park brake is set then press and hold the bottom button on the face of the instrument cluster for approximately 5 seconds. This will display the Settings and Diagnostics screen. Press either the top or bottom button to move to the highlighted bar to menu item 6 – Set Clock. Press both buttons simultaneously to select "hours" then use the upper and lower buttons to increase or decrease the setting. Press both buttons simultaneously to set the hours. Repeat the process for the "minutes" setting. A lapse of ten seconds or more of inactivity will return the display to the previous screen automatically.

Message Display Control Panel

Dimmer Adjustment

Dimming or brightening the backlight in the instrument cluster can be accomplished two ways. The first is when the bus is stationary with park brake set. The second is in Drive Mode when the park brake is released and the headlight switch is in the "ON" position. In either case the new setting will be stored in memory.

When the bus is stationary and the park brake is set, dimming the instrument cluster is achieved through a menu in the drivers display in the cluster. Set the park brake then press and hold the bottom button on the face of the instrument cluster for approximately 5 seconds. This will display the Settings and Diagnostics screen. Press either the top or bottom button to move the highlighted bar to menu item 4 – Dimmer. Press both buttons simultaneously to select "dimmer" then use the upper and lower buttons to increase or decrease the backlight intensity. Press both buttons simultaneously to set the dimmer and exit the menu. A lapse of ten seconds or more of inactivity will return the display to the previous screen automatically.

If the bus is in drive mode by having the park brake released, the dimmer can be adjusted by pressing either the top or bottom buttons to brighten or dim the instrument cluster. The headlight switch must be in the "ON" position for this function to operate.

Contrast Adjustment

Set the park brake then press and hold the bottom button on the face of the instrument cluster for approximately 5 seconds. This will display the Settings and Diagnostics screen. Press either the top or bottom button to move the highlighted bar to menu item 3 – Contrast. Press both buttons simultaneously to select "contrast" then use the upper and lower buttons to increase or decrease the contrast. Press both buttons simultaneously to set. A lapse of ten seconds or more of inactivity while in this mode will return the display to the previous screen automatically.

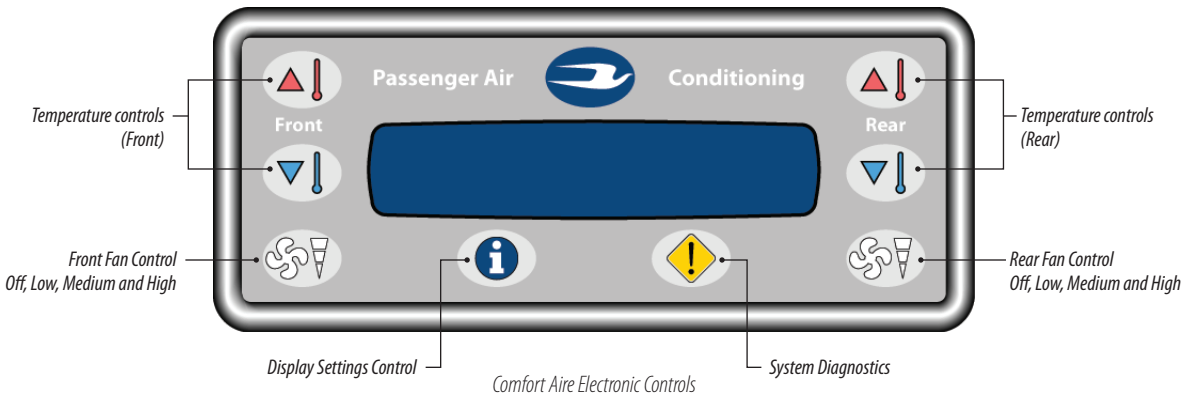
Backlight Color Adjustment

The backlight color can be adjusted to illuminate in any of five different colors (Red, Green, Blue, Lt Blue, White). To change the backlight color set the park brake then press and hold the bottom button on the face of the instrument cluster for approximately 5 seconds. This will display the Settings and Diagnostics screen. Press either the top or bottom button to move the highlighted bar to menu item 5 – BL Color. Press both buttons simultaneously to select "BL Color" then use the upper or lower buttons to toggle between a list of preset colors. Press both buttons simultaneously to set the color and exit the menu. A lapse of ten seconds or more of inactivity while in this mode will return the display to the previous screen automatically.

Heat and Air Controls

The optional heat and air control panels are defined below. For further explanation of heater switches and controls, see Upper Left Switch Panel and Heater Control Panel, under Left Console Switch Panel found in ths manual. For additional information on optional air conditioning, see your Comfort Aire publication supplied with your air conditioned bus.

Comfort Aire Manual Controls



Comfort Aire Electronic Controls

Heater Valve Lever

A red lever on the front heater housing to the left of the Driver's foot area controls the rate of heated fluid flowing through the heater unit, providing a "temperature control" for the heater.

Heater FIlters

All heater cores are protected by a filter except for the driver's heater which has a screen. The filters and screen are washable. If a filter cannot be washed or is damaged, it MUST be replaced immediately. If the screen cannot be cleaned a new screen MUST be installed immediately. The filters must be inspected, cleaned or replaced every 12 months or 12,000 miles.

The main heater filter is located behind a small panel at the driver's left. This panel is held in place by luggage type over the center clasps. To remove the filter, pull upward and outward. To replace the filter, press it firmly into position and replace the cover panel. The cover panel must be in place to maintain the airflow through the filter.

Heater Cores

The heater will be most efficient when the core is cleam. The core should be cleaned carefully with compressed dry air or a vacuum and a soft bristle brush. Damaged fins should be straightened with a fin comb to prevent air flow restrictions. Heater cores must be inspected and cleaned every 12 months or 12,000 miles.

Maintenance intervals for filters and cores are minimum. In extreme dusty and dirty environments the maintenance must be performed more often to insure proper air flow. Maintenance and inspection of all the heater cores and filters and/or screens in the heater system is critical to prevent loss of efficiency, function and/or premature heater motor failure. Replace parts with OEM parts purchased from you Blue Bird Dealer.

Heater Filter Access

Steering Column

The steering column of the Vision is designed for better access to the driver's area with easier adjustment and a greater range of movement.

Steering Wheel Position

A lever at the lower side of the column sets the tilt and telescopic adjustment of the steering wheel. This is a two position lever. Pull it out to the first position to adjust tilt. Pull to the second position to adjust steering wheel height. Releasing the lever clamps the column securely at the position selected..

Left Switch Stalk

The left stalk controls turn signals, high / low beam, intermittent windshield wipers and washers, and also contains the hazard flasher control. Turn signals operate in the normal way, push lever forward for right turn and rearward for left turn. Pull stalk up for high beam and/or low beam. Turn knob on end of stalk for intermittent windshield wiper control. Press knob on end for wash cycle. Hazard flasher is initiated by pulling the chrome lever at the base of the stalk. Cancel the flasher by using a turn signal or pressing the hazard lever in.

Right Switch Stalk

The right stalk contains the cruise controls.

Cruise Control

The Cruise Control is provided to to improve fuel economy and lessen driver fatigue during long periods of uniform speed travel. To operate the Cruise Control:

1. Attain the desired speed in the normal manner, with the foot-operated accelerator.

2. Press the "On-Off" slider switch toward the left (On) to activate the system at the current speed.

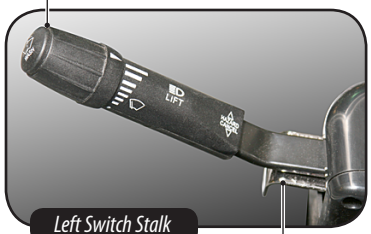
3. Press the button on the end of the stalk to incrementally adjust speed. To make larger speed adjustments, release the cruise control by tapping the brake, and then use the throttle to reach the desired speed. Then again press the slider toward the left.

4. To momentarily deactivate the cruise feature, press the brake pedal. This will disengage the cruise control and begin to apply brakes.

5. When you wish to again use the cruise control feature, press the slider switch toward the left to Resume the previously set cruise speed.

If the ignition is switched off, or if the Cruise Control slider switch is pressed toward the right (Off), the cruise control is deactivated.

Intermittent Windshield Wipe / Wash
Turn for Wipe. Press for wash



Left Switch Stalk

Turn Signals

High / Low Beam

Wipe / Wash

Hazard Flasher Control

Right Switch Stalk

Cruise Control Set

Resume, Accelerate, On / Off

Steering Column Positioning

Tilt / Telescopic Release

Parking Brake, Units With Air Brakes

On Blue Bird Vision buses equipped with air brakes, the rear wheel air chambers also enclose powerful coil springs. These springs automatically apply the rear brakes whenever air pressure is absent. These *spring brakes* also serve as the Driver-controlled parking brake.

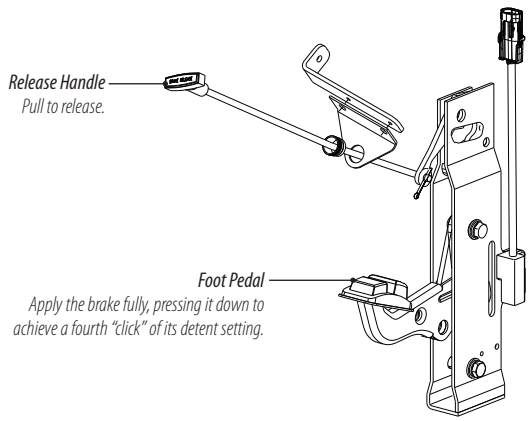
The parking brake knob is an air valve which, when pulled outward, releases air pressure from the rear wheel chambers. This allows the springs to apply the rear brakes.

Pushing the parking brake knob inward allows air brake system air pressure to retract (cage) the coil springs. If air pressure is insufficient for safe normal air brakes operation, the air pressure is also insufficient to disengage the spring brakes. Thus, it is not possible to release the parking brake until sufficient air pressure has built up in the system.

Parking Brake, Units With Hydraulic Brakes

Blue Bird Vision buses equipped with hydraulic brakes are also equipped with a drum/shoe-type brake mechanism mounted to the driveline at the rear of the transmission. When applied, the park brake prevents the driveshaft from turning.

A control cable leads from the parking brake mechanism to a foot pedal in the Driver's area immediately left of the brake pedal, just beside the steering column.



CAUTION ***This type parking brake becomes inoperative if the driveshaft is disconnected, as when the bus is being prepared for towing.***

To apply the parking brake, press down firmly on the foot pedal. When properly adjusted, the lever is designed to require a minimum of 130 pounds of pressure to apply the parking brake. Always apply the brake fully, pressing it down to achieve a forth "click" of its detent setting.

WARNING ***Improper adjustment of the parking brake can significantly reduce the holding ability of the parking brake system.***

To release the parking brake, apply the service brake to prevent movement when the parking brake is released. Then grasp the parking brake release lever with the left hand and pull until the Park Brake is fully released.

CAUTION ***Always release the parking brake fully. Leaving it in a partially released position can allow the shoes of the parking brake mechanism to drag while the bus is operated, resulting in overheating and accelerated wear of the parking brake shoes and drum.***

WARNING ***The parking brake is designed to hold on a 20% grade, on a clean, dry, and smooth road surface. Parking on wet, icy, snow-covered or loose aggregate surface will greatly diminish braking efficiency and is not recommended. Always use wheel chocks.***

WARNING ***The parking brake functionality relies on the rear wheels remaining in contact with the surface the bus is parked on. If one or both wheels are lifted off the surface the park brake will not function and the bus may move resulting in potential bodily harm or death.***

Optionally, your bus may be equipped with a right side parking brake lever. This option places the hand operated parking brake to the right of the driver's seat mounted on the floor.

To apply the parking brake, grasp the grip handle of the lever and pull firmly upward. When properly adjusted, a detent resistance is felt at the end of the lever's travel. The lever is designed to require 90-100 pounds of pressure to fully apply the parking brake. Always apply the brake fully, pulling it upward to the full extent of its travel.

To release the parking brake, apply the service brake to prevent movement when the parking brake is released. Then grasp the parking brake lever with the right hand, press the release button on the grip and lower the lever *fully* all the way against its lower stop.

The parking brake lever's grip incorporates a threaded adjustment mechanism to allow a service technician to make fine adjustments to the cable tension. The adjustment is made by loosening a set screw in the grip handle and then rotating the grip on its shaft. This adjustment is designed to be performed in the service facility, not during normal operation of the bus. During normal operation, the grip should not be free to rotate. If the Driver ever finds the grip free to rotate when applying or releasing the lever, it should be taken as indication that the setscrew is not properly tightened. This condition should be reported to service personnel, and proper adjustment and tightening should be performed.

Driver's Seat, Standard

The standard Driver's seat in the Blue Bird Vision is mounted on a spring-loaded pedestal. Several manual adjustments are provided for maximum control, safety and comfort:

Height Control. A hand operated slide handle on the right side of the seat allows adjustment of the height of the seat.To raise the seat, crouch in the sitting position but do not apply your weight to the seat. Slide the lever toward the rear. This allows the seat base to raise to the desired position. When in the desired position release the slide handle. To lower the seat apply your weight to the seat while holding the slide handle to the rear. This allows you to leverage your weight to lower the seat. Release the slide handle when seat is in the desirred position.

Back Tilt Control. Turn the large knob located at the bottom of the left side of the seat back, where the seat back attaches to the seat bottom.

Lumbar Support. The knob located at mid height on the right side of the seat back tightens / loosens a lumbar support built internally into the seat back.

Seat Bottom Fore / Aft Slide. A lever located under the front edge of the seat bottom releases the seat track allowing the seat to be adjusted fore or aft. While seated, pull the lever toward the left. Slide the seat fore or aft to the desired position and release the lever. Slide the seat slightly to ensure the lever latches into one of its locking notches.

Seat Bottom length. Under the front edge of the seat bottom, directly above the slide release lever is a handle which allows the seat bottom to be pivoted forward, effectively "lengthening" the seat bottom for Drivers with longer legs. To move the seat base to the forward position, stand beside the seat. Grasp the front handle with your right hand, and the side of the seat bottom with your left. Lift the seat slightly and pivot it forward. Then press it down firmly into position.

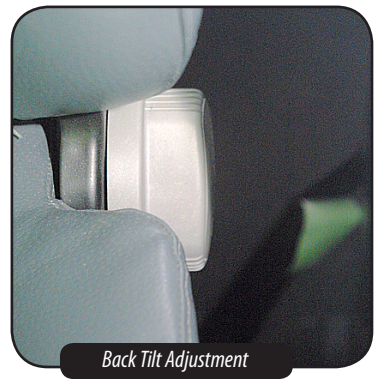
Pivoting the seat bottom forward in this way also clears the seat bottom from the seat back, allowing the bottom to be hinged forward to gain service access to the seat pedestal mechanism.

Driver Lap & Shoulder Belt

To use the seat belt/shoulder harness, pull out an adequate amount of webbing and engage the buckle. The retractors will pull the harness snugly into place. You may adjust the height of the shoulder harness by positioning the bracket to the most comfortable level. The buckle can be released by pressing on the button at the center.

WARNING ***The driver's seat belt should be worn any time the bus is moving.***

The upper mount of the shoulder harness is adjustable for proper position across the Driver's chest. Press down on the release button and slide the strap mount to the desired height. Release the button and ensure that the slide latches into the nearest preset notch.


Back Tilt Adjustment


Lumbar Adjustment

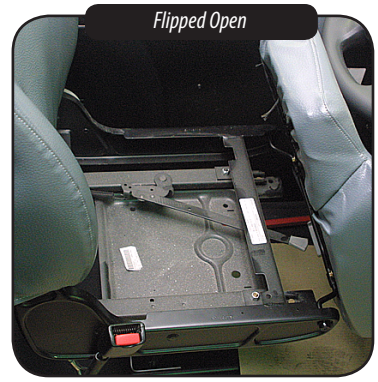

Standard Driver Seat


Fore / Aft Slide Release


Height Adjustment


Rear Position


Front Position


Flipped Open

Driver's Seat, Air

The air ride Driver's seat in the Blue Bird VISION is mounted on an air-powered scissor mechanism which houses its own electric air compressor. Several manual adjustments are provided for maximum control, safety and comfort:

Height Control. The front-most (red) switch located on the side of the seat bottom adjusts seat height. Press the top or bottom side of the rocker switch to raise / lower the seat.

Lumbar Support. The rear-most (white) switch located on the side of the seat bottom adjusts the lumbar support. Press the top or bottom side of the rocker switch to increase / decrease lumbar support.

Back Tilt Control. To adjust the overall tilt of the seat back, turn the large knob located at the bottom of the left side of the seat back, where the seat back attaches to the seat bottom.

Seat Bottom Fore / Aft Slide. A lever located under the front edge of the seat bottom releases the seat track allowing the seat to be manually adjusted fore or aft. While seated, pull the lever toward the left. Slide the seat fore or aft to the desired position and release the lever. Slide the seat slightly to ensure the lever latches into one of its locking notches.

Seat Bottom length. Under the front edge of the seat bottom, directly above the slide release lever is a handle which allows the seat bottom to be pivoted forward, effectively "lengthening" the seat bottom for Drivers with longer legs. To move the seat base to the forward position, stand beside the seat. Grasp the front handle with your right hand, and the side of the seat bottom with your left. Lift the seat slightly and pivot it forward. Then press it down firmly into position.

Pivoting the seat bottom forward in this way also clears the seat bottom from the seat back, allowing the bottom to be hinged forward to gain service access to the seat pedestal mechanism.

Driver Lap & Shoulder Belt

To use the seat belt/shoulder harness, pull out an adequate amount of webbing and engage the buckle. The retractors will pull the harness snugly into place. You may adjust the height of the shoulder harness by positioning the bracket to the most comfortable level. The buckle can be released by pressing on the button at the center.

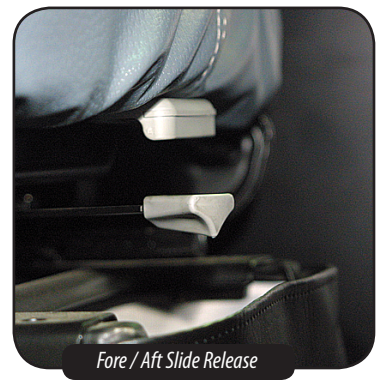
WARNING ***The driver's seat belt should be worn any time the bus is moving.***

The upper mount of the shoulder harness is adjustable for proper position across the Driver's chest. Press down on the release button and slide the strap mount to the desired height. Release the button and ensure that the slide latches into the nearest preset notch.


Back Tilt Adjustment


Lumbar & Height Adjustments


Air Ride Driver Seat


Fore / Aft Slide Release

Interior Compartments

Several interior compartments provide convenient access to service-related components. These are not storage compartments, and should only be opened for service purposes. Of these compartments, the one most applicable to the Driver is the PDU, which contains the main fuse panel.

> **CAUTION** ***The PDU, entrance door header, and wiring channels described in this section are not storage compartments. Do not place loose items in these compartments.***

Power Distribution Unit (PDU). The large black cover below the center of the dash is the main electrical panel for the Vision, and is an area of primary importance to service technicians troubleshooting electrical and device communications systems. The PDU is also referred to as Zone A of the Multiplex electrical system because it contains the Main Bus Controller module. The PDU also contains the J-1939 data link interface plug, a diagnostic interface connection used by service technicians.

The PDU contains most of the fuses used in the Vision. A chart on the inside of the cover identifies the individual fuses. The PDU cover is easily removable without tools, secured by two thumbscrews, one on each side of the cover near the top.

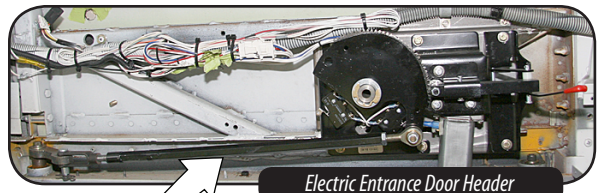
Entrance Door Header. A removable panel above the entrance door provides service access to the door opening / closing mechanism when equipped with optional powered entrance door. This compartment is a service access and should not be used for storage.

Wiring Channels. The molded housings which run the length of the bus above the passenger area windows, are wiring channels which contain the harnesses for the body. A service technician can remove the screws which retain the channels to gain access to the harnesses.

Left Console Driver Storage Box (Optional). A hinged lid just rearward of the left console switch panels provides access to a convenient storage compartment for Driver's items. The tray of this compartment is removable for service access to electric components underneath.

Right Glove Box (Optional). A large capacity glove box is molded into the right side of the dash housing, near the entrance door.

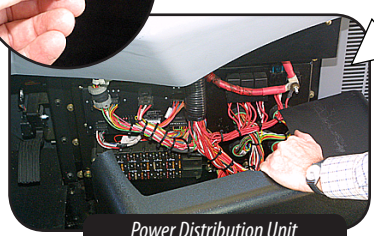
Overhead Storage



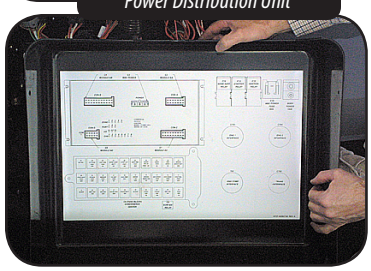
Electric Entrance Door Header

Right Glove Box

Wiring Channels

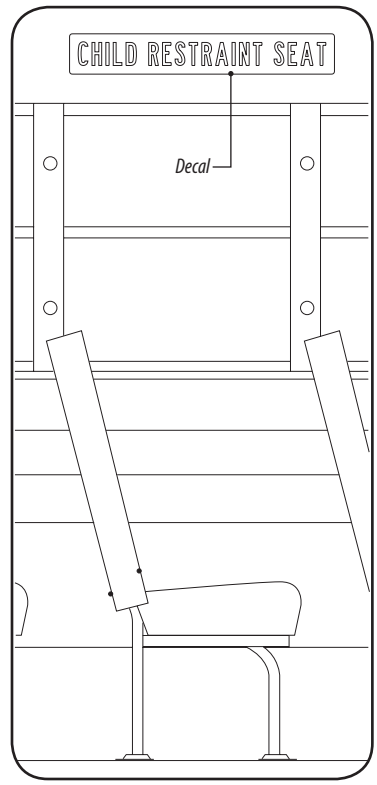


Power Distribution Unit



Left Console Driver Compartment

Child Restraint Seats



Young Children And Infants

Everyone in a vehicle needs protection. This includes infants and all other children. Neither the distance traveled nor the age and size of the traveler changes the need for everyone to use safety restraints. In fact, the law in every state in the United States and in every Canadian province says children up to a certain age must be restrained while in a vehicle.

Every time infants and young children ride in vehicles, they should have the protection provided by the appropriate restraint. Restraints must meet all applicable federal motor vehicle safety standards.

WARNING ***People should never hold a baby or young child in their arms while riding in a vehicle. During a crash a baby will become too heavy to hold. For example, in a crash at only 25 mph, a 12 lb. baby will suddenly become a 240 lb. force on a person's arms. A baby should always be secured in an infant restraint. Young children must be secured in appropriate child restraints.***

How Child Restraints Work

A child restraint system is any device designed for use in a motor vehicle to restrain, seat, or position children. A built-in child restraint system is a permanent part of the vehicle. An add-on child restraint system is a portable one that must be installed.

For years, add-on child restraints have used the adult belt system in the vehicle. To help reduce the chance for injury, the child must be secured within the restraint. The vehicle's belt system secures the add-on child restraint, and the add-on child restraint's harness system holds the child in place within the restraint.

When securing an add-on child restraint, refer to the instructions that come with the restraint. These instructions may be labeled on the restraint itself or in a booklet, or both.

Universal Child Restraint Anchorage

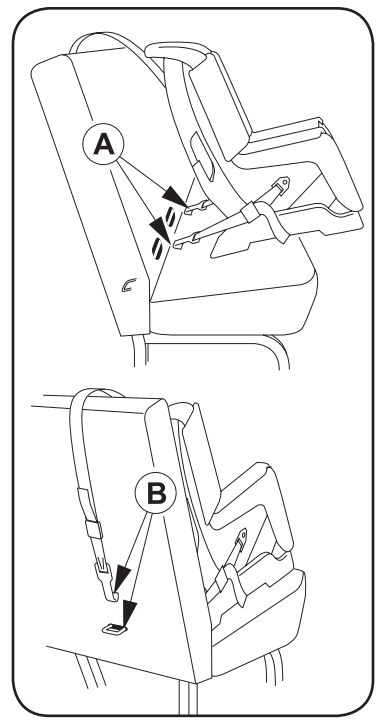
Seats in this bus equipped with the universal child restraint anchors are identified by a decal located over the seat above the window. (See Decal illustration on the following page.)

This vehicle may be equipped with a universal child restraint anchorage system. If so, you'll find two anchors in the front lower seatback where the bottom of the seatback meets the back of the seat cushion and a third anchor in the lower rear seatback. (See the Universal Child Restraint Anchorage illustration.)

In order to use this system, you need either a forward-facing child restraint that has attaching points (A) at its base and a top tether anchor (B), or a rear-facing child restraint that has attaching points (A) as shown.

Whenever applicable, use the universal child restraint anchorage system instead of the vehicle's safety belts to secure a child restraint.

WARNING ***If a child restraint isn't attached to its anchorage points, the restraint won't be able to protect a child sitting there. In a crash, the child could be seriously injured or killed. Make sure that the child restraint is properly installed using the anchorage points.***



Universal Child Restraint Anchorage

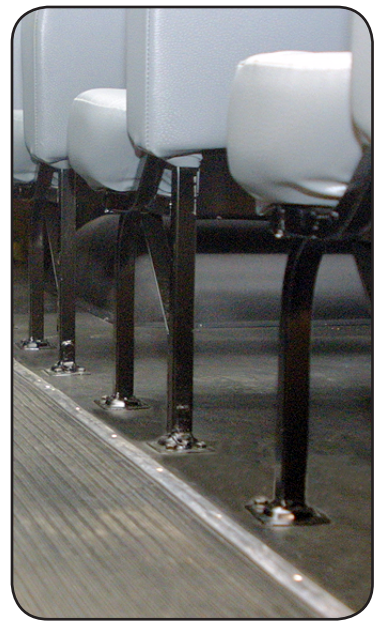
Securing A Universal Child Restraint

1. Find the anchors (A) for the seating position you wish to use, where the bottom of the seatback meets the back of the seat cushion. See Universal Child Restraint Anchorage illustration.
2. Put the child restraint on the seat.
3. Attach the anchor points on the child restraint to the anchors in the bus seat. The child restraint instructions will show you how.
4. Attach the top strap to the top strap anchor (B). Tighten the top strap according to the child restraint instructions.
5. Push and pull the child restraint in different directions to ensure it is secure.

Passenger Seats

Blue Bird passenger seats are built to comply with Federal Motor Vehicle Safety Standards (FMVSS).

The VISION's passenger seats are through-bolted to the floor of the passenger compartment.



WARNING ***School bus seat spacing is strictly regulated. The seat dimensions and spacing are engineered to provide "compartmentalization" of the passengers according to stringent safety requirements and testing. Do not alter the pasenger seat spacing or configuration.***

Passenger Area Heaters

Some VISION buses are equipped with optional passenger area heaters. The exact placement and BTU rating of these heaters varies depending upon specific options and seating configurations. Two types of passenger area heaters may be installed on VISION buses:


Optional Convection Heaters

Convection Perimeter Heaters. This type of heater system is fully enclosed within the main floor-to-wall body frame members which run the length of the body on each side. Engine coolant is circulated through finned heating tubes running inside the C-channels. Heated air circulation relies upon natural convection, rather than forced air.


Underseat Heater Switches

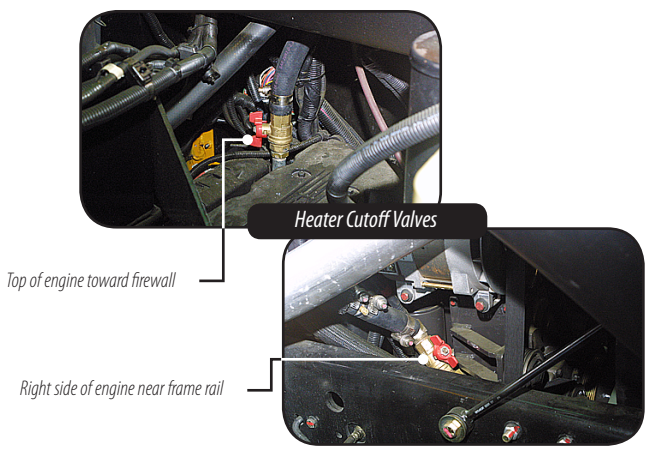
Optional Underseat Heater

Underseat Heaters. This type of heater system uses several individual heater units mounted to the underside of strategically located seats in the passenger area. Engine heated water reaches these heating assemblies via tubes running in the body at the floor. Each underseat heater unit has its own electrically driven circulation fan. The fans are controlled by 3 position (High / Off / Low) rocker switches mounted in the upper panel of the Driver's side console.

Heater Cut-off Valves. The VISION's heaters operate by circulating engine coolant which is heated by the normal operation of the engine. Red-painted handled valves are provided in the engine compartment to isolate coolant flow to the engine, thereby removing all internal heaters from the circuit. Some bus operators choose to turn these valves off during summer months.

Ensure that both the heater supply and return valves are turned on and that the coolant supply valve at the driver's left knee is in the open position (ON) when the Webasto heater timer is set to start while the bus is turned off. This will prevent the heater from shutting down due to lack of coolant flow.

Also See: Heater Cores and Heater Filters



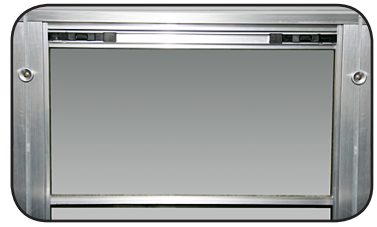
Passenger Windows

Opening split sash windows in the Blue Bird VISION, operate similarly to other windows familiar to school bus Drivers. To lower a window, place an index finger in both of the spring loaded sliding latches and slide them inward away from the frame. Hold them inward as you slide the window sash downward.

There are four intermediate opening positions between fully closed and fully opened. When the sash is opened to the desired height, release the latch slides and then push the top of the sash frame upward or downward to make sure the latches on both sides engage one of the position notches. When the window is in one of the intermediate positions, the sash can be pushed upward to close without first retracting the latches. However, the notches of the fully-opened positions are designed to latch more securely. To close a window that is fully open, slide the latches inward and then slide the sash.

The windows are designed for maintenance free operation. However, a light silicone spray lube may be applied to the slides and frames as needed to help ensure smooth operation.

Damaged latches can be replaced without removal of the window or sash. Repair technicians should refer to the Vision Service Manual for the procedure.



Push inward on both slide latches to lower window.

Each window has five open positions. When in any of the top four positons, the window sash can be closed (raised) without retracting the latches.

When the window is in its fully open (fully lowered) position, the latches must be retracted to close the window.

Emergency Exits

All emergency exits on this Blue Bird bus meet FMVSS specifications.

In true emergency situations, every second counts. It is therefore essential that every school bus Driver be completely familiar with the location and operation of all emergency exits. Read the following descriptions thoroughly, but also practice operating each of the exits to have not only a mental memorization, but also a tactile familiarity with the amount of force required to operate the opening, the amount of space available around the opening, etc. Checking for proper operation of each emergency exit must be part of the daily pre-trip inspection regimen.

Emergency exits are clearly identified with the words "EMERGENCY EXIT." Basic operating instructions are also printed on labels affixed on or near each exit.

The bus is equipped with an audible alarm that sounds when an emergency exit is unlatched. On the VISION, the DID screen also identifies the open exit(s).

WARNING ***All "Emergency Exits" should be inspected and tested daily. The labels and decals should be considered part of this inspection and should be maintained in a clearly legible condition.***

Door hold-open strut

Rear Emergency Door

The rear emergency door is opened by lifting the long horizontal handle all the way upward and pushing the door outward. The door is equipped with a hold-open telescoping strut at the top of the opening. When the door is fully opened, a pawl in this strut rotates to prevent the door from falling shut. To close the door, push it outward to the end of the strut's travel. This causes the pawl to rotate again, allowing the door to close. Close the door smoothly, push it against the frame firmly to compress its seal, and close the handle latch fully.

Vandal Lock

The rear emergency door may be equipped with an optional vandal lock. This is a sliding-bolt type latch or optional key lock with a sensor switch which detects when the vandal lock is closed. If the vandal lock is closed, the engine cannot be started, and an audible alert sounds. The vandal lock must be open during normal operation.

Emergency Pushout Windows

Depending on body model there may be as many as six pushout windows in the passenger area of the bus. Pushout windows are provide as emergency exits in accordance with state specification. Emergency exits are clearly identified by the words "EMERGENCY EXIT" and the red release handle at the rear edge of the window. Vertical hinged pushout windows are hinged at the front side and swing outward like a gate.

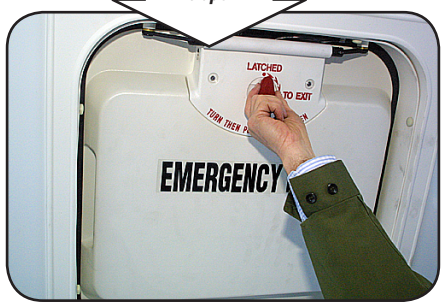
To open the pushout window, rotate the red handle parallel to the glass and away from the window frame, as indicated by the nearby decal. Then push the window outward.

The emergency windows should be operated daily as part of the Driver's pre-trip inspection. A light spray lubicant may be used on the window latches and hinges to keep them in smooth operating condition.

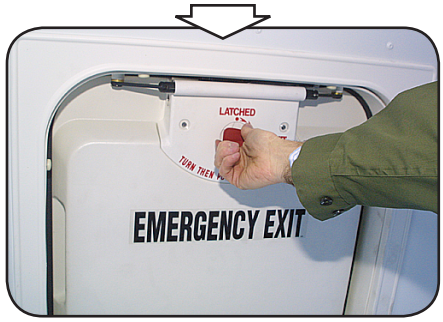
Emergency Roof Hatch

Depending upon options and/or regulation, the Vision may be equipped with one or two roof-mounted emergency escape hatches.

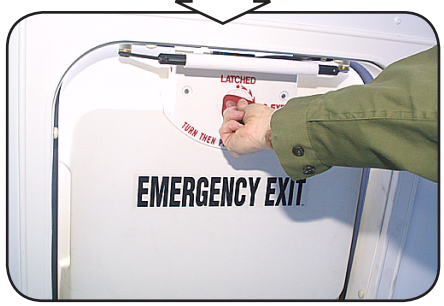
To Open



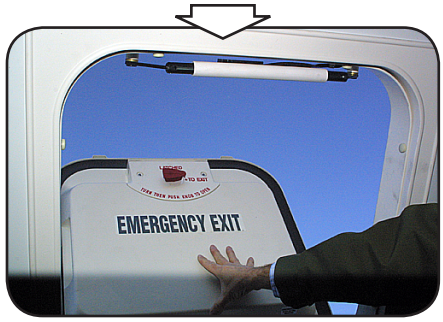
Grasp the red knob.



Rotate the red knob from the position marked "LATCHED" to the position marked "TO EXIT."



Push sharply upward on the red knob.

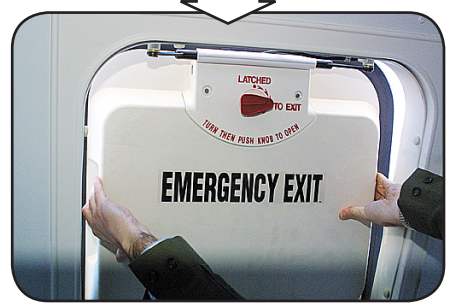


Push the hatch all the way open.

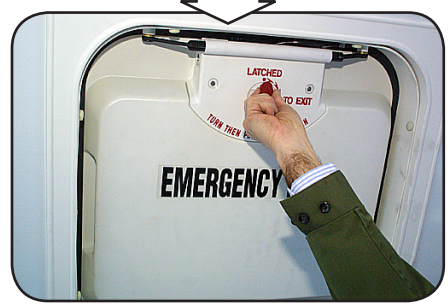
To Close

Push the white bar upward with the heel of your hand, snapping it in its upward position.

Pull the hatch downward, engaging its opening side with the white bar.



Grasp the two handholds on the sides of the hatch and pull firmly downward.



Turn the red knob to the positon labled "LATCHED."

Entrance Door Emergency Release

Depending upon purchase options, the entrance door may be manually-operated, electrically operated, or air operated.

Manually operated doors employ a door control rod connected to a handle mounted on the dash panel near the Driver. An over-center cam latching mechanism is released by the driver's thumb or palm when the handle is opened, and snaps back into latched position when closed.

Electric or air-operated doors are equipped with emergency release levers so that passengers can open the door even if the power is off or disabled.

The optional electrically-contolled entrance door is driven by a motor and gear mechanism in the door header panel. A lever protruding from the header panel serves to disengage the drive gear mechanism so that the door can be manually pushed open or shut. This serves a dual purpose: To allow the driver to close the door after parking and leaving the vehicle, and to serve as a quick door release in the case of emergency.

To release the door, push the lever to the left. The door can then be pushed open or closed manually.To re-engage the door drive mechanism, push the lever to the right.

Air-operated doors use system air pressure to open the door. Air-operated doors are also equipped with an energency release lever mounted above the door. In the case of air pressure failure, the door closure can be released by flipping the lever toward the Open direction indicated.

Electically Operated Door Emergency Release

Push forward to release the door mechanism so that the door can be manually opened or closed. Push rearward to engage the door mechanism for normal control of the door by the switch panel.

Air Operated Door Emergency Release

Exterior Compartments

Engine Compartment

The engine compartment hood of the Vision is mounted on a torsion spring hinge mechanism just above the front bumper, and is retained in its closed position by two spring latches, one on each side of the hood near the body's front cowl. The system is designed for very easy unassisted one-person opening / closing, and unobstructed access to engine compartment regular service components.

To open the engine hood:

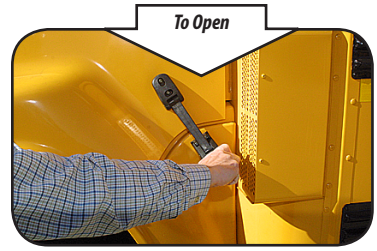
1. Unlatch the right side hood latch. Lift the latch handle and free the elastic latch from the notches of the cowl-mounted bracket. Repeat this for the latch on the left side of the bus.

2. At the front of the bus, grasp the handhold above the center of the grille. Pull lightly backward. The torsion hinge is balanced in such a way as to require very little effort to lift the hood. As the hood raises, control it with the free hand, especially in windy conditions. Open the hood fully until it stops slightly beyond vertical. A spring-cushioned cable on the engine compartment side stops the hood at its open position. A latch strut on the right side of the hood trips to prevent the hood from accidentally falling shut after being opened fully.

To close the engine hood:

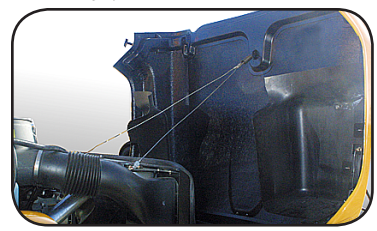
1. Standing just forward of the right front tire, grasp the engine hood overhead with the right hand. With the left hand, rotate the release cam of the hold-open strut. Slowly lower the hood. The balance of the torsion spring hinge allows the hood to be lowered in a slow and controlled fashion. There is no need to suddenly drop the hood to engage a catch. Slowly lower the hood onto its rear supports.

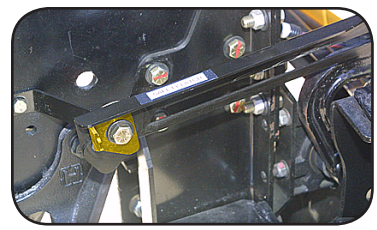
2. Grasp the handle of the hood hold-down latch and hook the end of the elastic strap into the notches of the cowl-mounted bracket. Then close the latch handle fully. Similarly secure the latch on the left side of the vehicle.

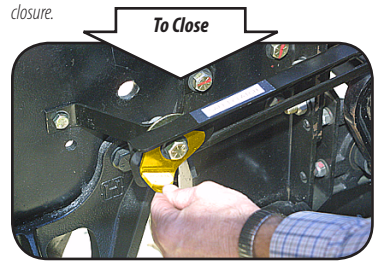


Release the hood hold-down latches.


Pull forward lightly on the front handhold.


A spring-loaded cable limits the opening range and helps support the hood in the open position.


The hold-open strut automatically trips to prevent accidental closure.



Rotate the hold-open cam to release the strut.


Gently lower the hood into position and re-latch the hold-down latches.

Battery Compartment

A hinged door located on the left side of the Vision directly below the Driver's window provides access to the vehicle's batteries. The batteries are mounted on a metal tray which is retained by a pin. To access the batteries, open the compartment door, remove the retaining pin, and slide the tray outward.

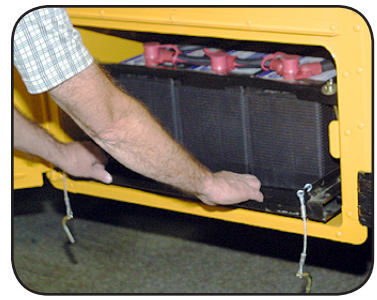
The Vision's battery compartment.

Fuel Filler

The fuel tank of the Vision is located between the chassis frame rails in the rear overhang portion of the vehicle. The fuel filler door is located on the right side of the vehicle body, rearward of the rear axle. Read and abide by the warnings on the decal on the inside of the filler door.

WARNING ***Remove the fuel cap slowly. Observe fueling instructions that are printed on the inside of the fuel access door to avoid fire and/or explosion that could result in serious bodily harm or death. Never fill to more than 95% liquid capacity. 95% capacity is reached at the initial pump cut-off.***

Remove the retaining pin. . .

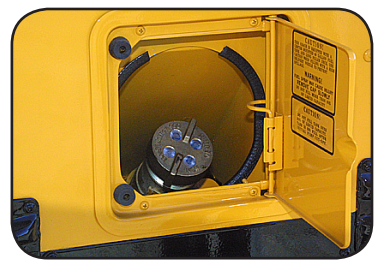


. . . and slide the battery tray outward.

DEF Filler

The DEF tank and fill door of the Vision is located to the left of the stepwell and entrance door, in the lower skirt panel of the vehicle. Read all decals carefully before refilling. When filling the DEF tank ensure the vehicle is on level ground and insert the fill station nozzle as far as possible into the fill port adapter to ensure proper auto-shutoff levels.

CAUTION ***DO NOT overfill the DEF reservoir. DEF will freeze and expand at temperatures below 12° F (-11°C). If the reservoir is overfilled and freezes, the expansion of the frozen DEF will cause catastrophic damage to reservoir and/or the vehicle SCR system.***



Fuel filler door

DEF Fill located to the left of the entrance door.

Keeping Your Bus Looking New

Before cleaning and waxing your bus a few basic rules should be followed:

- Start your project with the bus out of direct sunlight.
- Make sure the paint is not warm to the touch before applying any cleaning product or wax.
- Spray your bus with ample amounts of water before washing. Use the water to spray off dirt and other contaminates that will scratch the surface.
- Wash and rinse in sections so the wash soap doesn't dry before being rinsed off.
- Drying your bus after washing is necessary to prevent water spots – mineral deposits that etch the outline of a drop of water into your vehicle's paint.
- Read the manufacturer's directions on all products used prior to use.

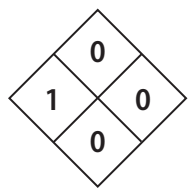
Wash. In order to preserve your vehicle's finish, Blue Bird requires protection of the finish by washing a minimum once every 3 months.

- Wash the vehicle in lukewarm or cold water.
- Use a lamb's-wool or paint-safe microfiber washing mitt to prevent scratching the surface.
- Do not use hot water or wash in the direct rays of the sun.
- Do not use strong soap or chemical detergents.

Only cleaners with an HMIS rating of 1,0,0,0 or less should be used to clean the buses. This HMIS rating is available on all product MSDS.

Hazard Rating (NFPA/HMIS)

Health = 1 Reactivity = 0
Fire = 0 Special = 0



Rating Scale

0 = Minimum 1 = Slight
2 = Moderate 3 = Serious
4 = Severe

To wash units, Blue Bird Corporation recommends Bird Bath™ Bus Wash & Wax Concentrate, available from authorized Blue Bird Dealers. Bus Wash & Wax is a concentrated vehicle wash (rated triple-zero) that is recommended to be mixed at up to a 20/1 ratio for new and reconditioned buses.

CAUTION ***Pressure washing may cause damage to finish. Pre-test pressure washer on a similar surface before applying pressure and chemicals to your vehicle. Pressure washers that re-circulate should filter the water to remove abrasive grit.***

Magnesium chloride, calcium chloride and other salts, ice melting agents, road oil and tar, tree sap, bird droppings, chemicals from industrial chimneys, and other foreign matter may damage vehicle finishes if allowed to remain on painted surfaces. Prompt washing may not completely remove all of these deposits. Additional cleaners may be needed. When using chemical cleaners developed for this purpose, be certain they are safe for use on painted surfaces.

Wax

Wax your bus a minimum of once a year with a nonabrasive wax. This is required to remove accumulated residue and eliminate any weathered appearance. It is essential that units are not waxed in direct sunlight.

Products labeled cleaner wax or polish should not be used as they are somewhat abrasive and can actually remove some paint from the surface of the vehicle. Care should be taken when choosing a wax to make sure that it does not contain abrasive materials i.e.; calcium carbonate, pumice, plastic beads, etc.

- Before waxing, thoroughly wash and dry the bus.
- Never wash or wax a bus in direct sunlight or if the paint is hot to the touch. The sun can soften the paint and make it more susceptible to scratching.
- Use a lamb's-wool mitt for washing and soft cotton rags or microfiber towels for waxing. Do not use rags for waxing; they can trap dirt and scratch the finish. Synthetic fabrics and brushes can also scratch the finish.
- Wash and wax in small sections. This saves time and if the wax stays on too long, it can be difficult to remove.

Approved Waxes

- Meguiars Gold Class Liquid Wax
- Meguiars NXT Generation® Tech Wax® 2.0 Paste or Liquid
- Black Magic Wet Shine Liquid Wax
- Turtle Wax Carnauba Car Wax T-6
- Turtle Wax 1 Step Wax & Dry T-9
- Nu Finish NFP-80

Bus Downtime Treatment

During periods of bus downtime, Blue Bird Corporation recommends the application of Bird Bath™ Bus Guard Protectant available from Blue Bird authorized dealers to protect exterior surfaces. Bus Guard is a triple-zero product that, when properly applied, protects against harmful UV rays and other damaging environmental conditions. For sufficient protection, see product instructions for the proper application requirement.

Owners should refer to the limited warranty statement supplied with the vehicle regarding their responsibilities for care and maintenance of the vehicle during the warranty period.

Floor Covering. Regular cleaning and care will prolong the life of floor covering and improve the general appearance. Floor coverings should be swept daily and mopped weekly with a mild detergent and water. Do not use floor sweeping compounds. Be sure to remove dirt, pencils, paper, and any other debris that may cause the emergency door to seal improperly. Do not use harsh detergents or excessive amounts of water. Do not use a water hose to wash out the bus. Deterioration and damage to the wood floor could occur.

CAUTION ***Petroleum products, such as oil and grease, quickly deteriorate the floor covering. These types of products should be removed from the surface as soon as possible. Continuous care must be exercised in the stepwell area, where foreign objects can create a safety hazard. The accumulation of dirt and foreign material in the stepwell area creates a hazard for passengers and could prevent the doors from operating properly. Ensure that screws for floor trims and aisle trims are seated tightly.***

Hinges, Window Slides, Latches. Light household or automotive spray lubricants such as WD-40 or silocone based lubricants may be applied as needed. Household glass cleaners may be applied to window glass.

Seats and Upholstery. Mild soap and a damp rag may be used for routine cleaning. Household or automotive cleaners formulated for automotive vinyls may be used to clean stains from the passenger seat cushions. Avoid cleaners or coatings which leave the surfaces slippery.

Product Identification Information

Federal Vehicle Certification Plate

This decal certifies that the vehicle complies with all applicable Federal Motor Vehicle Safety Standards (FMVSS) in effect on the date of manufacture. Do not remove, deface or cover this decal.

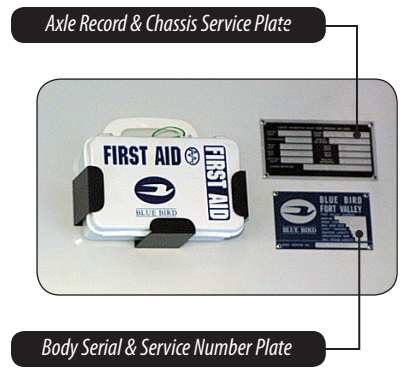
MANUFACTURED BY
BLUE BIRD BODY COMPANY
DATE OF MFR. 01/04
INC. VEH. MFG. BY DATE 03/09
SUITABLE TIRE – RIM CHOICE
GVWR : 13503 KG (29760 LB)
GAWR : FRONT 4537 KG (10000 LB) WITH 10R22.5 TIRES
22.5X7.50 RIMS. AT 758 KPA (110 PSI) COLD SINGLE
GAWR : REAR 8966 KG (19760 LB) WITH 10R22.5 TIRES
22.5X7.50 RIMS. AT 723 KPA (105 PSI) COLD DUAL
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL
MOTOR VEHICLE SAFETY STANDARDS IN EFFECT IN 03/02
V.I.N. TYPE CLASSIFICATION SCHOOL BUS

Axle Record and Chassis Service Number Plate

This plate is located inside the bus above the windshield toward the right side. It contains the serial numbers of the bus chassis and several major chassis components. These numbers are important references when ordering parts or seeking bus-specific service information from your Blue Bird distributor.

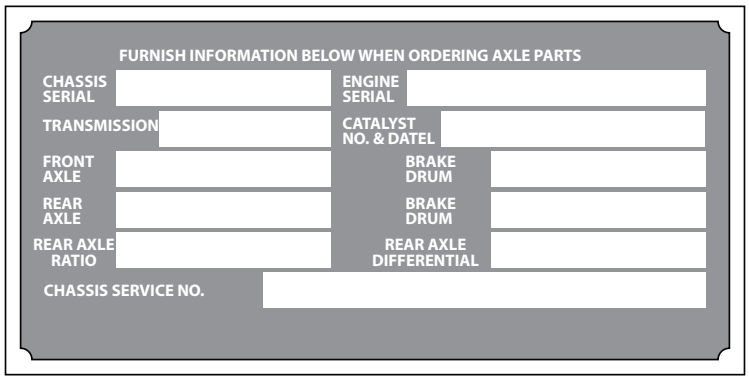
Body Serial Number and Service Number Plate

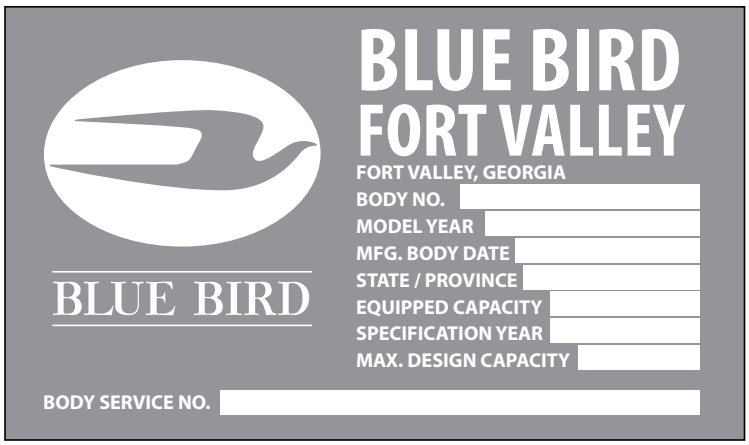
Also located above the windshield on the front upper panel. This plate contains the Body Number and several specifications pertaining to the body configuration. The Body Number is a very important reference whenever ordering parts or seeking service information.



Data Plates Reference

The illustrations below replicate the data fields on the Chassis and Body data plates. To create a convenient reference, fill in the data from the plates of the bus in which this manual is stored. This information is essential when ordering parts or obtaining service information.





Before Placing the Bus in Service

Upon taking delivery of any new school bus, Blue Bird recommends the following items be double-checked by your service technician before placing the bus in routine pupil transportation service:

- Check the suspension U-bolt torque.
- Check the service brake adjustment.
- Check the park brake adjustment on units equipped with hydraulic brakes.
- Check the torque on all the body "tie-down" bolts.
- Check the torque on the driveline universal joint straps.
- Check all engine, transmission, and other running gear fluids.
- Check the condition and air pressure of all tires.

Daily Pretrip Inspection

A daily pre-trip Driver inspection is required for all school buses. The guidelines below are Blue Bird recommendations specific to the VISION. They neither supersede nor replace pre-trip checklists provided by your pupil transportation administration or CDL requirements.

WARNING ***Overnight parking of the school bus should always be on level and secure ground. A thorough pre-trip exterior walkaround inspection involves visual inspection of tires and areas under the bus. Do not perform an exterior walk-around inspection unless it is certain that the bus is prevented from movement. Before performing the exterior inspection, enter the bus and make sure the transmission is in neutral, and that the parking brake is fully on.***

Exterior Walkaround

1. Approach bus from the front, to begin general exterior inspection.

   1.1 On approach, look for any sideways leaning or twisting of the bus which may suggest tire problems, axle misalignment, or structural damage.

   1.2 Visually inspect the condition of front bus markings such as the School Bus sign, and reflective markings. Note that the windshield is clean.

   1.3 Note that the crossing arm is properly secure and unbroken.

   1.4 Grasp mirror brackets to check them for secure mountings. Check for broken or cracked mirrors, and clean the mirrors if needed.

   1.5 Look underneath the engine compartment for any unusual conditions such as dangling harness wires. Look at the ground underneath for signs of fluid leakage, broken glass, or other debris.

✓ *Markings in good condition.*
✓ *Windshield clean.*
✓ *Crossing arm secure.*
✓ *Mirror brackets tight.*
✓ *No leaks, debris underneath*

2. Proceed around the left side (Driver's side) of the bus.

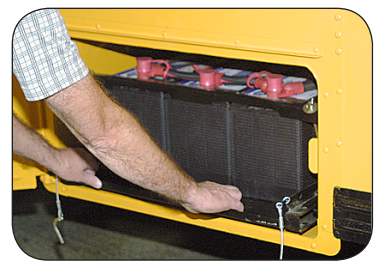
   2.1 Check the front left tire. Check for proper inflation pressure. Check the tread depth, and look for any signs of physical damage. Normal tread wear should be uniform across the width of the tread. Inspect the rim for bends or other damage. Check that all lug nuts are in place. If the bus is equipped with oil lubricated axles, check the sight glass in the center of the hub for proper oil level. Oil level should fall between the minimum and maximum level circle indicator lines on the hub.

WARNING ***Tire inflation pressure must not exceed the specifications of the tire and/or wheel rim manufacturer for the application. The inflation pressure embossed on the tire sidewall does not take the wheel or rim capacities into consideration. Tires should not be inflated above the pressure listed on the Federal Certification plate without consulting your tire/wheel distributor.***

✓ *Stop Arm in good condition.*
✓ *Tire condition & pressure.*
✓ *Lug nuts, axle oil level.*

   2.2 Check the Stop Arm for any signs of physical damage.

   2.3 Open the battery compartment door and inspect the batteries. Check for corrosion on the battery terminals and for loose connections. Close the compartment and make sure it is secure.



✓ *Batteries secure.*
✓ *Terminals secure & corrosion free.*

3. Step back for an overall view of the left side.

   3.1 Check that all markings are legible and in good condition, including emergency exit signs and reflective tapes.

   3.2 Check for broken windows and any other signs of vandalism.

   3.3 Check that all windows are clean.

✓ *Markings in good condition.*
✓ *Windows clean & in good condition.*

4. Approach the rear axle, at the front of the rear tire.

   4.1 Look under the bus, and across to the other side of the axle. Visually inspect for any missing suspension bolts, signs of cracks, misalignment, or other physical damage on the opposite side. View the shock absorber for signs of oil seepage.

   4.2 Inspect the left rear tires. Check for correct inflation pressure in both the outer and inner tires. Check the tread depth, and look for any signs of physical damage. Normal tread wear should be uniform across the width of the tread. Inspect the rim for bends or other damage. Check that all lug nuts are in place. Look at the axle center caps for missing nuts or signs of axle lubricant leakage.

   4.3 Look under the bus, behind the rear tires, and view along the back of the axle all the way across to the opposite side. Be watchful for any signs of oil leakage on the rear side of the axle; missing, bent, misaligned, or broken axle/suspension fasteners. Look on the ground for any signs of leaking fuel, broken glass, or other debris.

✓ *Rear axle undercarriage, suspension normal.*
✓ *Inner and outer tires pressure, condition.*
✓ *Lug nuts, axle cap nuts in place.*
✓ *Free of leaks, seepage, debris.*

5. Proceed around to the rear of the bus.

   5.1 Inspect the tailpipe for general condition or blockage.

   5.2 Step back for an overall view of the rear.Check that all markings are legible and in good condition, including emergency exit signs and reflective tapes. Check for broken windows and any other signs of vandalism.

✓ *Tailpipe clear.*
✓ *Markings in good condition.*
✓ *Windows clean & in good condition.*

6. Proceed around to the right side of the bus. Approach the rear axle, at the rear of the rear tire.

   6.1 Open the fuel filller door and ensure that the fuel cap is in place and securely tightened.

   6.2 Look under the bus, behind the rear tires, and view along the back of the axle all the way across to the opposite side. Be watchful for any signs of oil leakage on the rear side of the axle; missing, bent, misaligned, or broken axle/suspension fasteners. Look on the ground for any signs of leaking fuel, broken glass, or other debris.

   6.3 Inspect the right rear tires. Check for correct inflation pressure in both the outer and inner tires. Check the tread depth, and look for any signs of physical damage. Normal tread wear should be uniform across the width of the tread. Inspect the rim for bends or other damage. Check that all lug nuts are in place. Look at the axle center caps for missing bolts or signs of axle lubricant leakage.

   6.4 At the front of the rear tires, look under the bus, and across to the other side of the axle. Visually inspect for any missing suspension bolts, signs of cracks, misalignment, or other physical damage on the opposite side. View the shock absorber for signs of oil seepage.

   6.5 Step back for an overall view of the right side. Check that all markings are legible and in good condition, including emergency exit signs and reflective tapes. Check for broken windows and any other signs of vandalism. Check that all windows are clean.

- ✓ *Fuel cap in place & secure.*
- ✓ *Rear axle undercarriage, suspension normal.*
- ✓ *Inner and outer tires pressure, condition.*
- ✓ *Lug nuts, axle cap nuts in place.*
- ✓ *Free of leaks, seepage, debris.*
- ✓ *Windows clean & in good condition.*

Entrance Area Inspection

7. Approach the entrance door. Visually inspect the entrance door glass for cracks, the frame for structural damage and the closure seals for wear or damage.

   7.1 Open the door and inspect the stepwell for ice or debris that may be hazardous to passengers. Ensure that the entire entrance area is free of obstructions such as loose tools or cleaning equipment.

   7.2 Grasp the entrance handrail and check it for secure mounting.

- ✓ *Door clean and in good condition.*
- ✓ *Steps clean; treads in good condition.*
- ✓ *Free of ice, oil, loose items.*
- ✓ *Handrail secure.*

Engine Compartment Inspection

8. Step to the right side of the bus, just forward of the entrance door. Unlatch the hood latch. Walk to the opposite side and release the other hood latch. Step to the front of the hood, grasp the hood handhold and pull back to raise the hood completely. Step to the left side (Driver's side) front wheel to proceed with the under-hood inspection.

   8.1 Visually inspect the inner side of the wheel. If equipped with hydraulic brakes, inspect the calipers for any sign of brake fluid leakage. Inspect the front axle and suspension for missing, bent, misaligned, or broken fasteners. Inspect the shocks for signs of oil leakage.

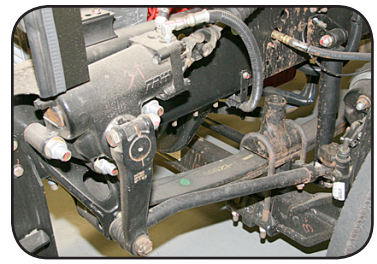
   8.2 Visually inspect the steering gear mechanism. Look for signs of fluid leakage.

   8.3 Check the engine oil level.

   8.4 Check the brake fluid level, if the bus is equipped with hydraulic brakes.

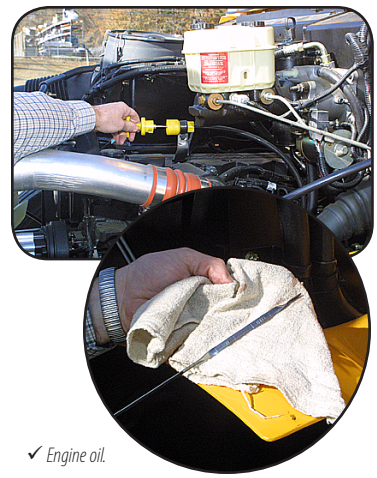
   8.5 Check the hydraulic fluid level.

   8.6 Check the transmission fluid level.

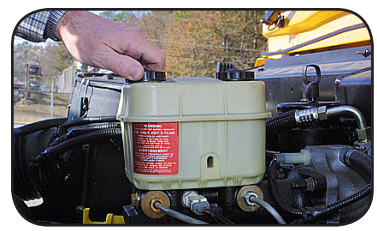


✓ *Inner side of left front wheel.*

✓ *Steering gear.*

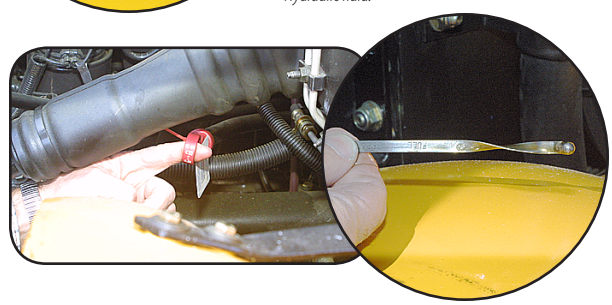


✓ *Engine oil.*



✓ *Brake fluid.*

✓ *Hydraulic fluid.*



✓ *Transmission fluid.*

9 . Step to the right side of the engine compartment.

9.1 Visually inspect the inner side of the wheel. If equipped with hydraulic brakes, inspect the calipers for any sign of brake fluid leakage. Inspect the front axle and suspension for missing, bent, misaligned, or broken fasteners. Inspect the shocks for signs of oil leakage.

9.2 Look at the air intake restriction indicator and ensure it is not indicating a restricted air intake. If indicator signals red, replace the air filter element and reset the air restriction indicator. See Blue Bird Vision Service Manual.

9.3 Visually inspect the alternator and its connections for signs of corrosion, broken wires, or other physical damage.

9.4 Check the engine coolant reservoir fluid level.

9.5 Check the washer reservoir fluid level.

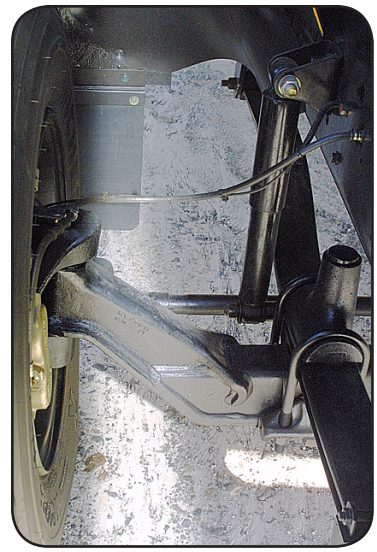
9.6 Inspect the engine fan / alternator belt for tightness and any signs of excessive wear or damage.

9.7 Inspect both sides of the radiator for debris and signs of damage.

10. Turn the cam lever of the engine hood hold-open strut. Close and latch the right side hood latch.

10.1 Reach up and inspect the condition of the right windshield wiper blade.

10.2 Walk to the left side and latch the left side hood latch. Reach up and inspect the condition of the left windshield wiper blade.



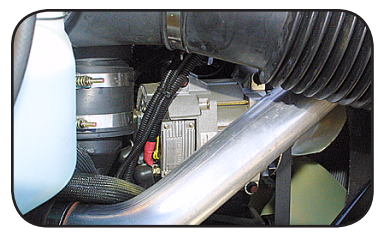
✓ *Inner side of right front wheel.*

✓ *Suspension, shock.*

✓ *Intake restriction indicator.*

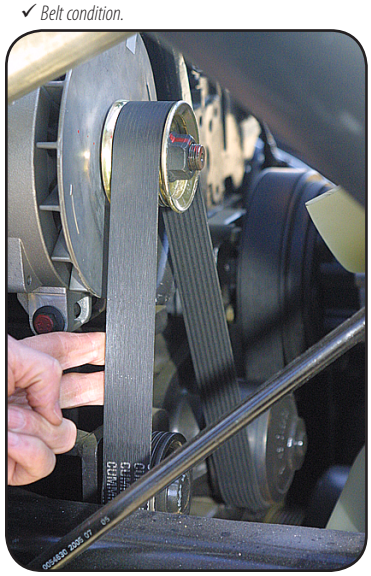
✓ *Washer fluid level.*

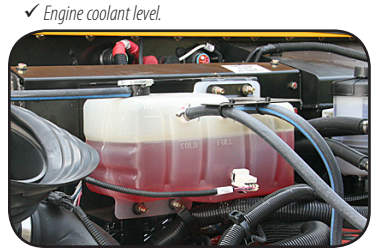
✓ *Engine coolant level.*



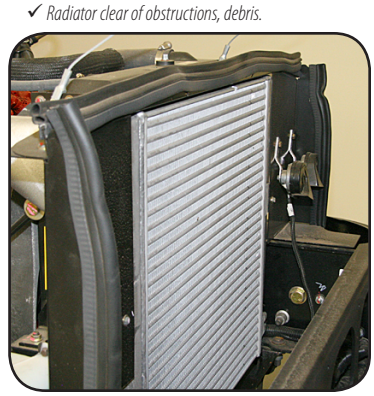
✓ *Alternator connections.*

✓ *Belt condition.*





✓ *Radiator clear of obstructions, debris.*



✓ *Close hood, latch right side. Check wiper blade.*

✓ *Latch left side. Check wiper blade.*

Instrumentation & Driver's Alert Checks

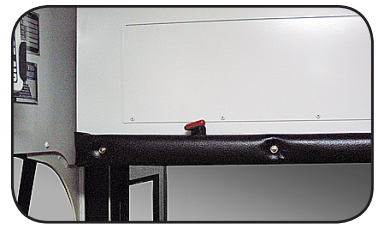
11. Enter the bus. If the bus is equipped with an electrically-operated or air-operated door, ensure that the emergency release is not tripped. Be seated in the driver's seat. Insert the ignition key and turn it to the first On position, but do not start the engine. All the instrument panel lights and the Message Display Center illuminate.

    11.1 Visually scan the lights, watching for any that do not illuminate. The gauges sweep during their initialization process. Then the indicator lights and Message Display module change to their normal monitoring mode. Turning the ignition switch to On awakens the Multiplex system. Certain conditions, such as a locked vandal lock or unlatched emergency exit, may cause audible alerts. Audible alerts may also be heard if the Message Display Center has recorded error codes.

    11.2 Note the condition of the battery charge as indicated by the instrument panel voltmeter. Fully charged batteries are necessary to complete the pre-trip inspection.

    11.3 Turn on the interior dome lights. Walk toward the rear of the bus, correcting any conditions (such as unlatched emergency windows, roof hatches, or latched rear emergency door vandal lock) that were alerted when the ignition switch was turned on.

    11.4 Return to the Driver's seat. Turn off the dome lights. Test other equipment switches in the upper panel of the side console (varies according to options).



✓ *Engage door control.*

✓ *All indicators & Message Display illuminate during initialization.*

✓ *After initialization, voltmeter indicates full battery charge.*

✓ *If Vanal lock or other alerts are indicated, turn on dome lights and correct the condition.*

✓ *Return to seat and check other left console devices.*

Exterior Lights Check

12. With the help of an assistant, operate all of the exterior lights and verify that they are all working properly.

    12.2 Note operation of all running lights, marker and clearance lights, and warning lights on the front of the bus.

    12.3 Note operation of all side marker and clearance lights on the left side of the bus.

    12.4 Note operation of all side marker and clearance lights on the right side of the bus.

    12.4 Note operation of all running lights, marker and clearance lights, and warning lights on the rear of the bus.

Passenger Area Inspection

- ✓ *Emergency door & alert buzzer working.*
- ✓ *Emergency roof hatches & alerts working.*
- ✓ *Emergency windows & alerts working.*
- ✓ *Seat mountings secure.*
- ✓ *Seat upholstery clean & in good condition.*
- ✓ *Windows clean & in good condition.*
- ✓ *Aisle clear; no loose items.*

14. Perform a general inspection of the cleanliness of the passenger area, and a functional check of all emergency exits.

    14.1 Open the Rear Emergency Door, checking it for proper operation. Ensure that the audible alert sounds when the door latch is opened. Close the door and ensure that it latches securely and that the audible alarm goes off.

    14.2 Slowly walk toward the front of the bus, inspecting the condition of the interior as you go. Look for soiled or cut seat upholstery. Grasp each seatback as you proceed, checking it for secure mounting. Look for damaged or dirty windows. Watch for any loose items such as cleaning supplies or tools.

    14.3 Upon reaching the rearmost roof hatch, fully open it, ensuring proper operation and that the audible alert sounds. Close it securely ensuring that the audible alert stops.

    14.4 Similarly open and close the two rear emergency exit windows, ensuring proper operation and that the audible alert sounds when unlatched and stops when fully closed and latched.

    14.5 Proceed forward, checking condition of each seat, window, and floor area between seats.

    14.6 Upon reaching the frontmost roof hatches and emergency windows, test them as described above.

    14.7 Proceed forward, checking condition of each remaining seat and seat barrier, window, and floor area between seats.

Emergency Equipment Check

15. Having reached the front of the bus again, check all emergency equipment.

- Check the fire estinguisher charge and expiration date.
- Inspect the flare kit and / or roadside hazard triangular reflector kit for full content and secure stowage.
- Inspect the fire axe and/or crowbar for secure mounting.
- Inspect the first aid kit and body fluid kit for fully-stocked content and secure mountings.

✓ *Fire estinguisher charged, securely stowed.*
✓ *First aid, body fluid kit(s) stocked, securely stowed.*
✓ *Axe, crowbar secured.*
✓ *Hazard reflector, flare kit(s) stocked, secured..*
✓ *All other emergency equipment in full working condition.*

Prepare For Driveaway

16. Return to the Driver's seat.

16.1 Adjust the seat height, back, and position.

16.2 Press the steering column release pedal and adjust the steering wheel position.

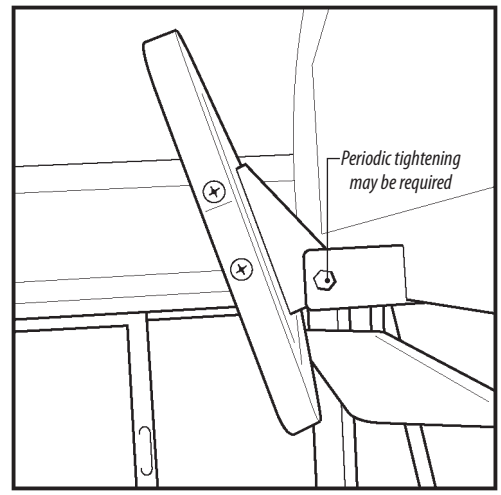
16.3 Check the alignment and positioning of all rearview mirrors, interior and exterior for optimum view. Adjust as necessary.

✓ *Adjust seat, steering wheel.*
✓ *Check all mirrors adjustments.*

Mirrors and Mirrors Adjustment

Inside rearview mirrors can be adjusted by loosening the bolts and nuts in the slotted holes on the mirror brackets. Because this is a friction mount, periodic tightening of these bolts and nuts may be required. Adjust the mirror to give the operator a clear view of the bus interior and the roadway to the rear.

WARNING ***The mirror system on this Blue Bird bus has been designed to meet all field-of-view regulations. However, it is the responsibility of the driver to properly adjust the mirrors to provide adequate safety. Mirrors provide additional visibility and they must be properly adjusted for each driver prior to each trip. Mirrors are not a substitute for proper driver training and caution. Never move the bus until each disembarking passenger is accounted for and clear of the vehicle. Failure to strictly adhere to this procedure can result in serious injury or death.***



Interior Mirror

The Blue Bird VISION is equipped with four external rearview mirrors. The curbside rearview flat mirror and convex mirrors are mounted from the top of the bus, near the top right-hand corner of the windshield in a common housing. They are positioned to be viewed by the driver through the windshield. The driver's side rearview flat mirror and convex mirrors are also mounted from the top of the bus, near the left-hand corner of the windshield. They are positioned to be viewed by the driver through the driver's side window.

Two hood-mounted crossview mirrors provide view in front of the bus and along each side. The hardware for the fender mounts must be maintained at 20 – 25 Ft lb. torque to minimize vibration.

CAUTION ***Do not over-torque the mirror mounting hardware.***


Curbside


Driver's Side


Hood Mounted

The outside rearview mirrors are designed to allow the seated driver a comprehensive view of the areas at each side of the bus and to the rear of the bus.

WARNING ***There is a "blind spot" directly behind the bus that extends several feet to the rear of the vehicle.***

Mirrors must be adjusted for each individual driver of the bus.

1. Ensure the driver's seat is properly adjusted.

2. Adjust the right-hand flat mirror so that the tops of the right-hand windows are visible in the upper edge of the mirror and the right-hand side of the bus is visible along the vertical, inside edge.

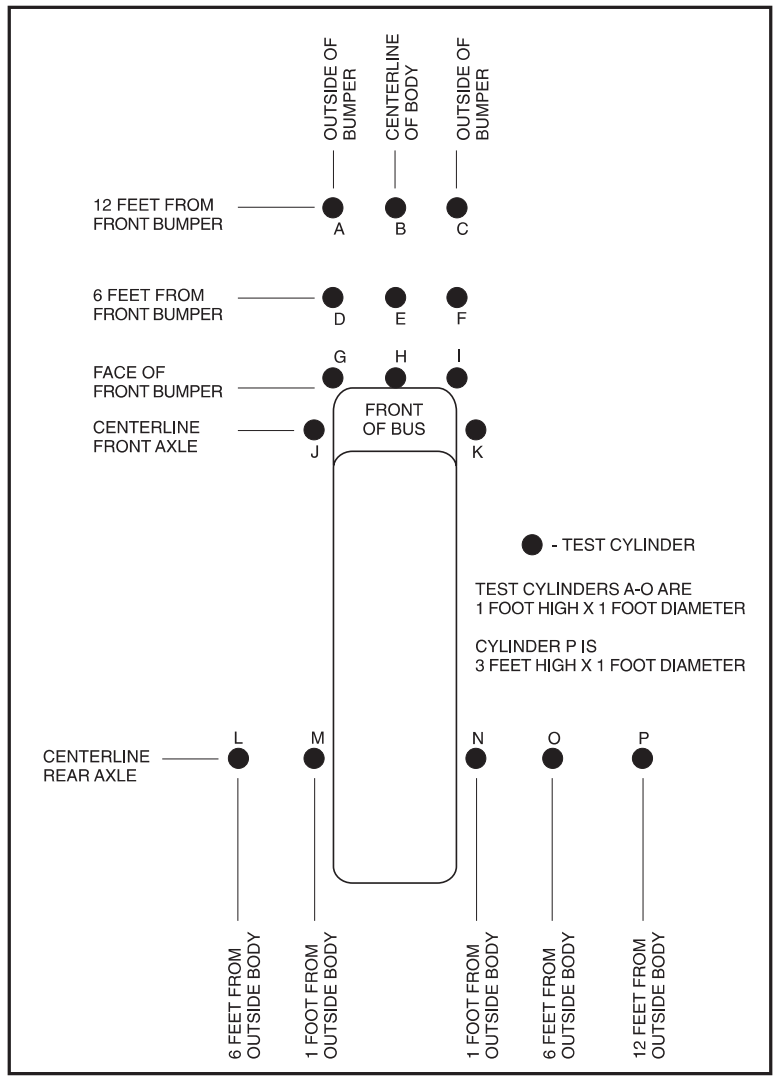
3. Adjust the right-hand convex mirror so that the view in the convex mirror overlaps the view provided by the flat mirror above it. The right-hand side of the bus must be visible in this mirror as well.

4. Adjust the left-hand flat mirror in the same manner as described for the right-hand flat mirror.

5. Adjust the left-hand convex mirror in the same manner as described for the right-hand convex mirror.

6. Adjust the elliptical cross-view mirrors by positioning each mirror so the arrow embossed on the mirror head points directly at the driver's eyes.

7. The final adjustment of the mirror system must be accomplished to provide the seated driver a view consistent with the requirements of FMVSS 111.



- The driver must be able to see the entire test cylinder in each location.

- The driver must be able to see the entire top surface of cylinders "M" and "N".

- The driver must have a view of at least 200 feet from the surface of the mirror.

- The elliptical cross-view mirrors should be adjusted so the seated driver has a complete view of all cylinders "A" through "P", when they are positioned as shown in the illustration, and not directly visible.

- The view provided by the elliptical mirrors must overlap the view afforded by the rear view driving mirror system.

All mirrors must be cleaned and adjusted as necessary to provide a safe driving environment. The use of a mild ammonia/water solution is recommended to clean mirrors.

Routine Operation

In terms of vehicle controls, driving a modern school bus like the VISION is not radically different from driving a passenger car, truck, or van. Features like power assisted brakes and steering, and modern suspensions and transmissions have removed much of the fatiguing aspects and "big truck" feeling of school buses in earlier decades. Therefore, becoming comfortable with operating the VISION will be easy.

However, the differences which do exist are extremely important and the diligent pupil transportation Driver must be ever mindful to avoid being lulled into a mental state of complacency. Despite the ease of operation, modern school buses are still very large vehicles; and the cargo they carry is the most precious of all.

This chapter describes some of the general differences which a Driver new to school bus operation may experience, and specific feature and equipment differences of the VISION in particular with which the Driver will interact every day.

Maneuvering Safety

School buses are operated in a wide variety of conditions ranging from Southwestern desert roads to tight inner-city alleyways. Refer to the dimensions chart in the General Specifications chapter to understand some of the considerations imposed by the physical size and geometry of the bus which may come into play in your school route environment. The proportionally long wheelbase means that the height of rises and humps which the bus can traverse without contacting the underskirt is dependent not just upon their height, but on their length or duration of the hump.

The rear overhang of school buses is longer than other vehicles. This must be borne in mind in situtations such as nearing curbs or embankments on sharply-rising grades, as well as in tight turns as the body overhang "swings around" behind the rear wheels.

The Driver is responsible for determining that the loading area is clear before stopping to load passengers, and must ensure that all unloaded passengers are clear before moving the bus.

States and other regional school bus adminstration organizations sometimes conduct training or practice seminars such as school bus "rodeos." Blue Bird encourages participation in any program designed to increase the skill and safety of our nation's school bus force.

Prior to Starting the Engine

For the most complete engine starting details, refer to the engine manufacturer's Operator's Manual. A copy of this manual is provided in the material shipped with your new Blue Bird bus. The information and/or instructions in the manufacturer's manual takes precedence over the more limited information in this manual.

Your Blue Bird bus is equipped with an engine alarm system, designed to help prevent major damage due to high coolant temperature and/or low engine oil pressure. If so equipped, when the engine coolant temperature exceeds 225º F (107º C) and/or the engine lubricating oil pressure falls below 6 psi, an alarm will sound.

CAUTION ***The engine must be shut down as soon as safely possible when the alarm sounds to avoid costly engine damage.***

WARNING ***Engine exhaust contains products of combustion that may be harmful to your health. Always start and operate the bus in a well-ventilated area. If the engine must be operated in an enclosed area, vent the exhaust to the outside.***

Perform the required, daily, under-the-hood inspection and maintenance. Also perform any other periodic maintenance prior to starting the engine. This routine can help avoid costly major repairs later.

Starting the Engine

WARNING ***Never use ether as an aid in trying to start the engine.***

To start the engine normally:

1. Engage the parking brake and place the transmission in neutral.

2. Turn the keyed ignition switch to the "ON" position.

3. Once the "Wait to Start" light is no longer illuminated, turn the key to "START", to crank the engine. The air inlet heater will turn on if the sum of the coolant temperature and the air inlet temperature is less than 109º F (25º C). The "Wait to Start" indicator time may vary somewhat depending upon the temperature. Colder temperatures may increase the time the "Wait to Start" indicator illuminates. Once the engine is started, the Wait to Start indicator may cycle on/off as the engine warms. It is okay to operate the bus after the first time the Wait to Start indicator has gone off.

CAUTION ***Wait until the "Wait to Start" light is no longer illuminated before turning the ignition to the "Start" position. Do not crank the engine continuously for more than 30 seconds. If the engine has not started in 30 seconds, allow the starter motor to cool for at least 2 minutes. Do not attempt to start the engine under load.***

4. While the engine is cranking, the instrument panel lights will go off. After the engine is running, the gauges will cycle through their startup sequence. After the startup sequence, if any indicator lights remain on, take appropriate action according to the indicated condition.

CAUTION ***The oil pressure should rise within 15 seconds after the engine starts. Do not increase engine speed until the oil pressure gauge indicates normal. If oil pressure is not indicated on the gauge in 15 seconds, do not operate the bus. Stop the engine and refer to qualified service personnel.***

5. Release the key switch and allow it to return to the "ON" (or run) position immediately after the engine starts. After the engine starts, ensure that the transmission is still in the neutral position. Once a normal engine oil pressure and air pressure are established, the vehicle may be operated at a light load and speed.

6. After the engine has started, the air inlet heater may continue to run in a "continuous" mode or intermittently. The air inlet heater will automatically turn off when the sum of the engine coolant temperature and the air inlet temperature exceeds 127º F (35º C).

7. If the engine is operated at a light load and low speed, it will reach normal operating temperature more quickly than if it idles at no load. When idling in cold weather, increase the engine idle speed to a maximum of 1200 revolutions per minute (RPM); this is the "HIGH IDLE" function. Do not exceed the no-load recommended RPM during the warm up process. Limit unnecessary idle time to 10 minutes.

High Idle Function

The high idle control positions the throttle at high idle. This allows the engine to warm up faster than at the normal low idle position. High idle is preset to 1300 revolutions per minute (RPM). High idle can be activated by a switch in the driver's area. With the transmission in the neutral position and the park brake set, move the toggle switch to the "HIGH IDLE" position to maintain a constant engine RPM above the normal idle speed.

CAUTION ***Do not move the toggle switch to the high idle position unless the transmission is in Neutral and the park brake is engaged.***

High Idle Switch

Engine Cooling System

In today's modern engine designs, accurate maintenance of the cooling system is critically important to engine life. Simply maintaining coolant level and performing occasional coolant changes does not adequately ensure that the cooling system is healthy. The chemical balance of engine coolant must always be correct. This requires dilligent adherance to the engine manufacturer's coolant specifications, maintenance schedules, and procedures. Accurate coolant system maintenance records should be kept.

The engine coolant level in the reservoir should be checked daily as a part of routine pre-trip inspection. But whenever the coolant level is low, it must be replenished with only pre-mixed coolant of the same type and brand installed. Never top off coolant with plain water.

Careful pre-trip inspection and a program of routine maintenance checks of the condition of the cooling system by service technicians should ensure against enroute emergencies such as worn hoses or loose clamps resulting in coolant loss. In the case of such an emergency, however, if anything other than original premixed coolant is added in order to allow the bus to proceed to a service facility, the coolant system must be completely drained, flushed, and properly refilled with approved coolant before being returned to routine service. Any enroute event requiring topping off of the coolant should be reported to service personnel responsible for maintenance of the bus.

WARNING ***Exercise extreme care when removing the cap from the engine coolant reservoir. Always allow time for the engine to cool before removing the cap. The pressurized coolant may be very hot and can spray out, causing serious burn injuries.***

Coolant Types

Engine coolant is generically divided between two types; "standard" and "long-life" (or "extended-life"). Extended-life coolants generally allow longer intervals between coolant changes (sometimes requiring additives to be added near the midpoint of their service life, and/or for special testing to be performed at certain intervals). Engine manufacturers, however, differ somewhat in regards to specificaitions for coolants which they recognize as "long-life" when used in their respective engines.

Blue Bird buses are delivered from the factory with one of two types of coolant. The standard coolant is Fleetguard Fleetcool EX 50/50 premix, which is red in color. This coolant is considered standard life when installed in Cummins engines.

Cummins equipped buses purchased with an extended life coolant option have been filled with Fleetguard ES Compleat OAT 60/40 premix, which is red in color.

Blue Bird installs a decal on or near the deaeration tank filler which state the type of coolant installed at the factory. The decal states the approved premixed coolant and coolant manufacturer's part number for one gallon quantities. The decal also lists the manufacturer's part number for the concentrate which is approved for mixing with the premix for stronger glycol concentration. Another decal near the fill neck indicates warnings for the service technician.

CAUTION ***When replenishing or replacing coolant, only use coolant of the same type already installed. Never mix coolants of different color, type, or brand. Plain water is corrosive at engine operating temperatures. Never add plain water to the system. When using concentrated coolant to raise the glycol concentration for extreme temperature environments, Blue Bird recommends only mixing the concentrate with pre-mixed coolant of the same type; not mixing with water.***

Coolant Testing and Replacement

Each engine manufacturer has its own specific requirements for coolant testing and maintenance. Therefore, refer to the engine Operator's Manual for your bus and follow the engine manufacturer's maintenance specifications.

Blue Bird recommends strictly abiding by the engine manufacturer's testing and maintenance schedules and draining, flushing, refilling procedures to maintain compliance with the engine warranty requirements. Blue Bird also recommends that you maintain accurate vehicle-specific service records of all coolant system maintenance procedures performed.

The cost of the testing is the owner's responsibility as part of the engine manufacturer's requirements for testing and maintaining the engine and coolant.

For Cummins engines using Fleetguard Fleetcool EX coolant, send coolant samples to Fleetguard for Monitor C testing, as specified in the Cummins Operator's Manual. Label sample as Conventional coolant.

For Cummins engines using Fleetguard ES Compleat OAT extended life coolant, send coolant samples to Fleetguard for Monitor C testing, as specified in the Cummins Operator's Manual. Label sample as Extended-Life coolant.

CAUTION ***Never mix coolant types.***

Routine coolant addition (top-off) must match the installed coolant type and brand. Do not mix coolants of different colors, types, or brands in the same engine.

CAUTION ***Always mix concentrate with premix coolant, not water.***

If concentrated coolant is added in order to raise the glycol ratio, use only the concentrate version of the same premix coolant type and brand as installed. Do not mix the concentrate with water. Instead mix the concentrate with the premix version of the same coolant.

CAUTION ***Only add tap water in emergency situations.***

A regularly-scheduled bus inspection and maintenance program should be followed to prevent coolant losses due to damaged or worn hoses, loose clamps, etc.

If coolant is lost while the bus is in use, and roadside emergency measures are called for, replenish the coolant with the same premix type and brand if possible. If the proper coolant is not available, and water must be used, use only de-ionized water if possible. Ordinary tap water should only be used if proper coolant or de-ionized water are not available.

Whenever tap water alone has been added, the bus should be taken to a service facility and the entire cooling system should be completely drained, flushed, and refilled with premix coolant.

Blue Bird buses equipped with Cummins engines may also be equipped with an optional coolant filter. The coolant filter should be replaced every 6 months or 6,000 miles; whichever occurs first . The coolant filter element installed at the Blue Bird factory is compatible with all of the above-described coolants:

Blue Bird Number 00064641

Shutters

The optional radiator shutters assist in maintaining a constant engine temperature by limiting the air flow through the radiator. The shutter blades are powered open/closed by either engine oil pressure or by pressure from the air system on the vehicle by means of an electric solenoid. The solenoid is controlled by the Blue Bird "Corporate" Instrument Cluster based on engine ECM broadcast values of coolant and intake manifold temperatures. Shutters should be inspected regularly and kept free of obstructing debris. The pivot points of the louvers and their linkages should be lubricated annually with an anti-seize compound, such as BB #02550549. The shutters must be cleaned and lubricated yearly. More frequent lubrication, especially during the winter months, is required on buses operating in climates that use salt and other corrosive elements on the roadways.

Service Brakes

Your Blue Bird VISION may be fitted with hydraulic disc brakes or air-powered drum type brakes, depending on the options chosen at the time of manufacture.

Although they perform the same task, hydraulic brakes and air brakes differ in "feel." Air brakes also may require additional wait time before driving the bus during warmup, to allow air system pressure to build to normal operation levels. The type of brakes installed also determines the type of parking brake installed.

About Hydraulic Brakes

WARNING ***Hydraulic brakes are power assisted. The brakes will be noticeably less effective when the engine is not running. The bus should not be moved without the engine running.***

The hydraulic brakes are arranged in a dual system, whereby the front brakes and the rear brakes operate independently of each other. The braking function is significantly diminished by the loss of either the front or the rear brakes; however, it will be possible to stop the bus.

WARNING ***Do not continue to operate the bus with the loss of either the front or the rear portion of the system. Stop the vehicle and refer to qualified service personnel.***

The hydraulic brake system includes an auxiliary electric pump which serves as a backup for the hydraulic pressure supplied by the power steering pump. With the engine not running and the key switch in the "ON" position, the electric pump will come on. This will provide some assistance in the brake system, but it will be much less effective than the power assist provided by the power steering pump.

WARNING ***Check the operation of this auxiliary pump before each trip. If it fails to come on when the key is turned to the "ON" position, before the engine starts do not operate the bus. Refer to qualified service personnel.***

WARNING ***Inspect the level of the brake fluid in the reservoir on a regular basis. Too little fluid in the system will cause a malfunction. Be careful to put only brake fluid in the brake system and power steering fluid in the steering system.***

If the brake pedal depresses more than normal, or feels "mushy", check the reservoir level. If you need to add fluid (DOT–3) frequently, have the system checked out by a professional mechanic.

Parking Brake (With Hydraulic Brakes)

A Blue Bird VISION equipped with hydraulic brakes employs a foot-operated parking brake, located to the Driver's lower left. When the driver presses this lever into the engaged position, a mechanical linkage causes a brake shoe assembly to press against a brake drum attached to the driveshaft, preventing the bus from moving. (It should be noted that this type parking brake becomes inoperative if the driveshaft is disconnected, as when the bus is being prepared for towing.) The mechanical parking brake must be kept adjusted properly for maximum holding power.

When the parking brake is properly adjusted, the lever is designed to require a minimum of 130 pounds of pressure to apply the parking brake. Always apply the brake fully, pressing it down to achieve a fourth "click" of its detent setting.

To release the parking brake, apply the service brake to prevent movement when the parking brake is released. Then grasp the parking brake release lever with the left hand and pull until the Park Brake is fully released.

The parking brake should hold the fully loaded bus on a 20% incline on a dry paved surface. If the incline is wet or covered with ice or snow, do not park on it. The brake will hold, but the tires may not.

CAUTION ***Always release the parking brake fully. Leaving it in a partially released position can allow the shoes of the parking brake mechanism to drag while the bus is operated, resulting in overheating and accelerated wear of the parking brake shoes and drum.***

WARNING ***The parking brake is designed to hold on a 20% grade, on a clean, dry, and smooth road surface. Parking on wet, icy, snow-covered or loose aggregate surface will greatly diminish braking efficiency and is not recommended. Always use wheel chocks.***

Release Handle
Pull to release.

Foot Pedal
Apply the brake fully, pressing it down to achieve a fourth "click" of its detent setting.

About Air Brakes

The optional air brakes system on the Blue Bird VISION uses compressed air pressure to operate drum brakes. The system is divided into two separate circuits; one for rear brakes (primary) and one for front (secondary). The two circuits have their own air supplies. However, the system is designed so that if pressure in either circuit drops to certain levels, the other system can supplement the pressure.

An air compressor mounted on the engine operates whenever the engine is running and maintains a normal operating pressure range within the storage tanks. The bus cannot be driven until air pressure is sufficient for normal operation. Therefore, if the bus has been parked for an extend period, or if the tanks have been drained, as in normal maintenance procedure to expel built-up moisture, it is normal for additional time to be required for the air system to fully charge.

As air is compressed, moisture vapor tends to condense inside the storage tanks. The tanks are equipped with bleeder valves to allow removal of this built-up moisture, and should be used daily, usually when the bus is parked for the night. Some buses are equipped with an air dryer to assist collection and expulsion of the excess moisture during operation. The air tank is located between the axles under the bus, inboard the frame rails (outboard, left side on 169 inch wheelbase units) and on buses equipped with an air dryer, the dryer is mounted inboard of the frame rails just forward of the air tank. During normal operation, the compressor cycles between its load mode and unload mode. As this occurs, the air dryer occasionally expells a blast of air (chuff) which can be heard by the driver. This is a normal "backflush" behavior of the air dryer.

Pull to apply parking brakes. Push to release.

The parking brake valve does not apply air brakes. It applies air to release the mechanical spring brakes.

The park brake valve cannot release the spring brakes until sufficent air is in the system for normal service air brakes opeartion. If it is pushed in before system pressure is present, it will automatically "pop out."

Parking Brakes (With Air Brakes)

On Blue Bird VISION buses equipped with air brakes, the parking brake function is provided not by the air pressure, but by coil springs incorporated within the rear wheel brake actuation chambers. When the parking brake valve on the dash is pulled outward, air pressure is vented from the rear brake actuators, allowing the springs to engage the rear brakes and locking the rear wheels. When the parking brake valve is pushed in, it allows the air pressure in the rear brake actuators to overcome the spring pressure, thereby releasing the rear spring brakes.

Therefore, although the parking brake control is an air valve, it is not air pressure which applies the parking brake, but the absense of it. The parking brake is applied by mechanical springs which are released (caged) when the air system pressure is sufficient for normal brakes operation. Pushing in the parking brake valve to release the parking brake does not release air pressure, it applies it to cage the spring brakes. This is why the parking brake button automatically "pops out" if you try to release the parking brake before sufficient air pressure has built up.

If for any reason the air reserve in both the primary and secondary circuits drops below a safe minimum, the spring brakes automatically engage and lock the rear wheels. If this occurs enroute, the Driver should call for professional service assistance. Provisions are made for a qualified service technician to mechanically release the spring brakes to allow the bus to be towed for repair.

Parking

Each time you park the bus or leave the driver's seat while the engine is running the following procedure must be followed:

1. Apply the service brakes to bring the vehicle to a complete stop, and continue to hold the brake pedal.

2. Ensure the engine idle is in the "low" position (High Idle switch is off).

3. Shift the transmission to Neutral.

4. Apply the park brake. (On buses equipped with hydraulic brakes, press the pedal down to achieve a fourth "click" of its detent setting. On buses equipped with air brakes, Pull the Park Brake valve.)

5. Release the service brake pedal, allowing the park brake to take on the load of holding the bus.

6. If parked in any unusual situation, such as a severe incline, chock the wheels and take any other precautionary measures necessary to ensure the bus doesn't move.

If this procedure is not followed, the bus could move unexpectedly and cause serious injury or death and/or property damage.

CAUTION ***Do not allow the bus to coast in neutral. This practice can result in transmission damage. Engine retard and braking assistance is not available when the transmission is in neutral. It may not be possible to get the transmission back into gear while the bus is moving.***

Do not idle in "R" (reverse) for more than five minutes. Extended idle time in "R" (reverse) may cause transmission overheating and damage. Always select "N" (neutral) whenever idle time may exceed five minutes.

Allison Automatic Transmissions

Important: Allison supplies far more detailed information about your particular transmission than space allows in this manual. Although we try to cover the most important points here, it is imperative that you read and understand the Allison Transmission Operator's Manual for more details about operation, care, and maintenance. If you did not receive this manual with your bus, please contact the transmission supplier. Both Blue Bird Corporation and Allison Transmissions continually strive to improve the quality and performance of their respective products. For this reason, information and instructions in the Allison Transmission Operator's Manual supplied with the bus will take precedence over the general information in this publication.

Allison Model 2000 Series Transmission

The Allison transmission provides five forward speeds and one reverse. The transmission is controlled with the selector lever located to the driver's right. The selector lever must be in the "N" position (neutral) to start the engine. If the engine starts in any other position, the neutral start switch is malfunctioning and should be repaired immediately. Use "D" (drive) for all normal driving conditions. The service brake must be applied before the transmission will shift from neutral to drive or reverse. If an attempt is made to shift the transmission into drive or reverse without applying the service brake it will remain in neutral, an audible alarm will sound, and the Range Inhibit light on the instrument panel will come on. If this occurs, apply the service brake and then select the desired gear. The vehicle will begin to move in first gear, and as you press the accelerator, the transmission will upshift automatically. As the vehicle slows down, the transmission will automatically downshift to the correct gear. Use "1" or "2" when the road, load, or traffic conditions make it desirable to restrict the automatic shifting to a higher range. When the conditions improve, return the range selector to the normal driving position D. These positions also provide progressively greater engine braking power (the lower the gear range, the greater the braking effect). Use "1" when pulling through mud or snow or driving up steep grades. This position provides maximum engine braking power. Use "R" (reverse) for backing the bus. The bus should be completely stopped before shifting from a forward gear to reverse. Reverse gear provides the greatest traction.

For more information on the Allison transmission, read the transmission operator's manual which was delivered with the bus.

Allison 2000 Series Transmission Gear Selection

> **WARNING** ***When leaving the vehicle while the engine is running, the operator must be sure the transmission is in Neutral, the parking brake is engaged, and the wheels are chocked. The vehicle may move unexpectedly without these precautions.***

R—Reverse. Use reverse to back up the vehicle. The vehicle must stop completely, with the engine returning to idle speed, before shifting from forward to reverse or from reverse to forward. If your bus is equipped with a reverse warning signal, it will activate when shift selector is in reverse.

> **CAUTION** ***Do not idle in "R" (reverse) for more than five minutes. Extended idle time in "R" (reverse) may cause transmission overheating and damage. Always select "N" (neutral) whenever time at idle exceeds five minutes.***

N—Neutral. Use neutral to start the engine, to check vehicle accessories, and for extended periods of engine idle operation. If the vehicle starts in any other range, seek service immediately.

> **WARNING** ***Do not allow your vehicle to coast in neutral. This practice can result in transmission damage. Engine retarding and braking assistance is not available when the transmission is in neutral. It may not be possible to get the transmission back into gear while the bus is moving.***

D—Drive. When "D" is selected, the vehicle will begin to move in first gear and the transmission will upshift automatically through each gear as speed increases. As the vehicle slows down, the transmission will downshift automatically.

> **CAUTION** ***Do not idle in "D" (drive) for more than five minutes. Extended idle time in "D" (drive) may cause transmission overheating and damage. Always select "N" (neutral) whenever time at idle exceeds five minutes.***

1, 2, D Gears. Occasionally, the road conditions, load, or traffic conditions will make it desirable to restrict shifting to a higher gear. Positions "D", "2", and "1" provide progressively greater engine power and braking for going down grades (the lower the gear, the greater the braking effect).

1 Gear. Use position "1" gear when pulling through mud and deep snow, when maneuvering in tight spaces, or while driving up or down grades. Low gear provides the vehicle with its maximum power and maximum engine braking power.

Park. If your bus is equipped with a "Park" selection, use it only after coming to a complete stop, and then apply the parking brake. Do not rely upon the transmission park pawl position alone to prevent the bus from rolling.

Allison Model 3000 Series Transmission

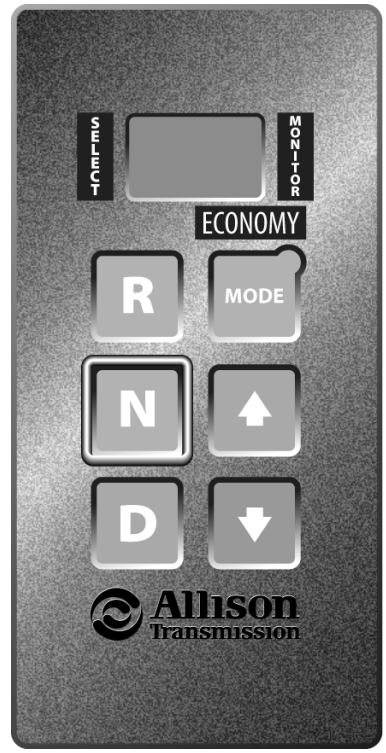
The Allison electronic transmission provides five forward speeds and one reverse. Fourth gear is a 1-to-1 ratio while the fifth gear is an overdrive with a 0.75-to-1 ratio. The push-button shift selector is located on the right area of the dash. The transmission and selector must be in neutral to start the engine.

The service brake must be applied before the transmission will shift from neutral to drive or reverse. If an attempt is made to shift the transmission into drive or reverse without applying the service brake it will remain in neutral, an audible alarm will sound, and the Range Inhibit light on the instrument panel will come on. If this occurs, apply the service bake and then select the desired gear.

Transmission and shift selector will return to "N" when engine is stopped and power switched off. If it does not return to "N" or if it starts in any other gear, the unit has malfunctioned. Seek service immediately.

The push-button shift selector has "R", "N", "D", down arrow, up arrow, a "MODE" button, and a digital display. When a range button is pressed, a tone sounds, the "SELECT" indicator displays the chosen operation (if the Electronic Control Unit [ECU] determines the shift is acceptable), and the transmission shifts to the starting range as indicated on the monitor display. In "DRIVE", selection of a specific gear can be accomplished by pressing the "UP" or "DOWN" arrow buttons. Conditions resulting in the "CHECK TRANSMISSION" light, located in the instrument cluster, will disable the pad and no tones will sound (see Check Transmission Light).

The "MODE" button, located on the push-button shift selector, activates an alternate shift schedule. By default, the start up is in primary or power mode. Pressing the "MODE" button causes the transmission to enter the economy mode. The display will indicate the economy mode is engaged. In economy mode, the transmission shifts to higher gear at lower engine rpm.



Allison Model 3000 Series Transmission Gear Selection

WARNING When leaving the vehicle while the engine is running, the operator must ensure the transmission is in "Neutral", the parking brake is engaged, and the wheels are chocked. The vehicle may move unexpectedly without these precautions.

R—Reverse. The vehicle must be completely stopped before shifting from forward to reverse or from reverse to forward. The select indicator and the monitor will display "R" when the vehicle is in reverse.

N—Neutral. Use neutral to start the engine, to check vehicle accessories, and for extended periods of engine idle operation. Under normal operation, the transmission is directed by the ECU to neutral during the startup procedure. This occurs automatically with the push-button selector. If the vehicle starts in any range except neutral, seek service immediately.

WARNING Do not allow your vehicle to coast in neutral. This practice can result in transmission damage. Engine retarding and braking assistance is not available when the transmission is in neutral. It may not be possible to get the transmission back into gear while the bus is moving.

D—Drive. When "D" is selected, the vehicle will start to move in first gear and the transmission will upshift automatically through each gear as the speed increases. As the vehicle slows down, the transmission will downshift automatically. The select indicator will display the highest gear available and the monitor will display the current operating gear.

2, 3, 4, 5 Gears. Occasionally, the road conditions, load, or traffic conditions will make it desirable to restrict the automatic shifting to a lower gear. Positions "5", "4", "3", and "2" provide progressively greater engine braking for going down grades (the lower the gear, the greater the braking effect). Push the "Up" or "Down" arrow to the desired gear. The select indicator will display your choice and the monitor will display the gear the bus is operating in.

1 Gear. Use position "1" gear when pulling through mud and deep snow, when maneuvering in tight spaces, or while driving up or down grades. Low gear provides the vehicle maximum power and maximum engine braking power.

The transmission incorporates a hold feature to prohibit upshifting beyond the gear selected during normal driving. For downhill operation, however, the transmission may upshift beyond the selected gear when the engine's governed speed is exceeded, and damage to the engine is possible.

Range Inhibit Feature

The transmission communicates with the engine to prevent over-rev conditions which could otherwise result in transmission or engine damage. If one of the range limiting transmission settings (D, 2 or 1) are selected, the transmission's range inhibit feature will take over and allow the transmission to shift to the next range if engine RPM exceeds certain speeds. Therefore, although the use of a range inhibiting transmission setting to utilize engine braking is an acceptable practice, the Driver must still control the downhill acceleration with brakes to be prepared for unexpected upshifts. When the selected transmission range is being over-ridden, the Range Inhibit indicator message will appear in the instrument panels message display center.

CAUTION ***If the transmission will not shift into "D" (drive), or "R" (reverse), it may be because of an adverse operating condition such as; engine RPM too high or service brakes not applied when attempting to shift from neutral. Check for the "RANGE INHIBITED" message or "CHECK TRANS" light. See the appropriate section of the Allison transmission manual.***

Allison Automatic Transmission Driving Tips

Accelerator Control. The pressure of your foot on the accelerator pedal influences the automatic shifting. An electronic signal tells the ECU how far the driver has depressed the pedal, and the transmission adjusts its shifting for maximum performance.

Downshift or Reverse Inhibitor Feature with Allison 3000 PTS Transmission. Although there is no limitation on upshifting, there is a limit on downshifting and shifts from neutral into drive or reverse. If a downshift or neutral-to-range shift is selected when the engine speed or throttle position is too high, the ECU/TCM will not allow the shift until reaching a lower speed. If idle speed is too high, shifts to range are prohibited. A continuous "beep" tone sounds when reverse is selected during forward movement or if a neutral-to-range shift is selected at too high an engine speed.

Cold Weather Starts. Most Allison transmissions are programmed to restrict operation until operating temperature is reached. When the transmission fluid temperature is below -25° F (-32° C), the transmission will not shift into an operating range, and the "Check Transmission" light illuminates. When the transmission fluid temperature is between -24° F and 20° F (-31° C to -7° C), the transmission will operate in 1st, 2nd, or Reverse only. If there is no other problem with the transmission, the "Check Transmission" light will not be illuminated. For transmission fluid temperatures above 20° F (-7° C), the transmission shifts and operates normally. Read the cold weather operation instructions in the Allison Transmission™ Operator's Manual supplied with the bus.

Using the Engine to Slow the Vehicle. To use the engine as a braking force, shift the range selector to the next lower range. If the vehicle is exceeding the maximum speed for a lower gear, use the service brakes to slow the vehicle to an acceptable speed where the transmission may be downshifted safely. After reaching the lower speed, the ECU will automatically downshift the transmission. Engine braking provides good speed control for going down grades. When the vehicle is heavily loaded, or the grade is steep, it may be desirable to select a lower range before reaching the grade. If engine-governed speed is exceeded, the transmission will upshift automatically to the next range.

CAUTION ***The transmission incorporates a hold feature to prohibit upshifting above the range selected during normal driving. For downhill operation, select a lower transmission range. However, if engine governed speed is exceeded, the transmission may upshift to the next higher range. Use the vehicle service brakes to prevent exceeding engine governed speed in the held range.***

WARNING ***If you only downshift or only use the service brakes when driving down a steep grade, you can lose control. To maintain control, combine downshifting, braking, and other retarding devices. Downshifting to a lower transmission range increases engine braking and helps maintain control. The transmission has a feature to prevent automatic up shifting above the lower range selected. However, during downhill operation, if the engine governed speed is exceeded in the lower range, the transmission may upshift to the next higher range. This will reduce braking and could cause a loss of control. Apply the vehicle service brakes or other retarding device to prevent exceeding engine governed speed in the lower range selected.***

Transmission Indicator Lights

The instrument panel contains two indicator lights and one priority message associated with the transmission:

Range Inhibited (priority message). Under certain operating conditions, the Transmission Control Module (TCM) may restrict gear selection to protect the engine / transmission from damage. For example, if a downshift would cause the engine to over-rev, the transmission may not respond to a change at the shift lever until engine RPM decreases. When this occurs, the "RANGE INHIBIT" warning will appear in the message display center. See the Range Inhibited Light and Shift Inhibits section of the Allison Transmission operator's manual for more information.

Check Transmission. While driving, be alert to any abnormal shifting, unusual sounds or vibrations, smells, or frequent illumination of a transmission priority message. If you experience any of these, get service immediately.

Transmission Temperature. An oil temperature readout in the message display center of the instrument panel indicates the transmission oil temperature. Extended operations at low vehicle speeds with the engine at full throttle can cause excessive oil temperatures. These temperatures may overheat the engine cooling system and lead to engine and/or transmission damage.

If excessive temperature is indicated by the engine coolant temperature gauge, stop the vehicle and check the cooling system. If the cooling system appears to be functioning properly, shift to neutral and accelerate the engine to 1,200–1,500 rpm. This will reduce the transmission temperature to operating level within two or three minutes. If high temperature persists, stop the engine and have the overheating condition investigated by service personnel.

If the transmission oil temperature readout indicates excessive temperature, check the oil level in transmission (refer to the Oil Check Procedure in your Allison Transmission Operator's Manual). Stop the vehicle and shift to neutral. Accelerate the engine to 1,200–1,500 rpm. The temperature should return to normal within two or three minutes before the vehicle resumes operation. Normal temperature for operation is 160° to 200° F. Oil temperature should never exceed 250° F. If the sump oil temperature reaches 250° F, the TCM will inhibit operation in the higher gears and turn on a priority message in the message display center indicating high transmission temperature.

If high temperature in either engine or transmission persists, stop the engine and have the overheating conditions investigated by maintenance personnel.

CAUTION ***The engine should never be operated for more than 30 seconds at full throttle with the transmission in gear and the vehicle not moving. Prolonged operation of this type will cause the transmission oil temperature to become excessively high and will result in damage to the transmission.***

Transmission Service Prognostics

Service prognostics is standard equipment on all Allison Gen 4 transmissions and requires the use of Allison approved TES 295 or TES 389 fluids and Control Main filter. Prognostics is used to predict the need for transmission maintenance. Transmission operating parameters monitored by the prognostics feature are:

1. Oil Life Monitor

2. Filter Life Monitor

3. Transmission Health Monitor

2000 Series Product

When a specified service threshold is detected for one of the parameters listed above, the TRANS SERVICE indicator in the instrument panel will illuminate to alert the operator to the need for action. Failure to perform the required service and reset the TRANS SERVICE indicator after 100 hours of operation will result in the CHECK TRANS and the TRANS SERVICE indicators illuminating. When the CHECK TRANS indicator illuminates the TCM will register a fault code which will require the use of Allison DOC® for PC-Service Tool to clear the code after the required service has been performed.

Oil Life Monitor - The TRANS SERVICE indicator will illuminate when the remaining fluid life reaches approximately 2 percent. The indicator will remain on for two minutes after the initial selection of a drive range. This condition will occur at each startup cycle thereafter until service has been performed. The indicator indicates a required change of the transmission fluid.

After the required service has been performed the TRANS SERVICE indicator can be reset with the Allison DOC® For PC-Service Tool, or by selecting N-D-N-D-N-R-N on the shift selector, pausing briefly (less than 3 seconds) between each selector movement. The ignition must be on and the engine must be off before attempting to reset.

Filter Life Monitor - The TRANS SERVICE indicator will flash after reaching time and mileage parameters set in the control module. This indicates the transmission filter needs servicing. It will flash for two minutes after selecting D (Drive) for each startup cycle until service is performed and the indicator is reset.

After the required service has been performed the TRANS SERVICE indicator can be reset with the Allison DOC® For PC-Service Tool or by selecting N-D-N-D-N-R-N on the shift selector, pausing briefly (less than 3 seconds) between each selector movement. Be sure the ignition is on and the engine is not running.

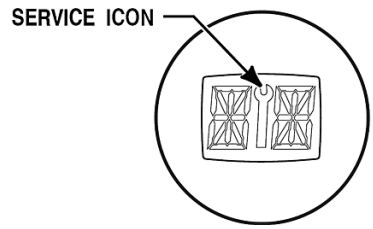
Transmission Health Monitor - The TRANS SERVICE indicator will illuminate when the remaining clutch life reaches approximately 10 percent, or if the running clearance exceeds maximum value which may indicate a non-wear-related issue. The indicator will illuminate and remain on until the required service is performed and the indicator reset.

The indicator will reset automatically upon elimination of the clutch clearance condition which initiated it. The indicator can also be reset using the Allison DOC® For PC-Service Tool if necessary.

3000 Series Product

Electronic shift selectors used with 3000 series transmissions have an integrated service icon in the shape of an open-end wrench located between the SELECT and MONITOR displays, which illuminates or flashes when a specified service threshold is reached for one of the three prognostic parameters.

When service is due for Allison 3000/4000 Series transmissions, a wrench icon on the shift selector's digital display alerts the operator. You can check the status of all three prognostics (oil, filter, clutch) simply by advancing through the shift selector's display using the diagnostic button or the up/down arrow buttons.



When the fluid is due for a change:

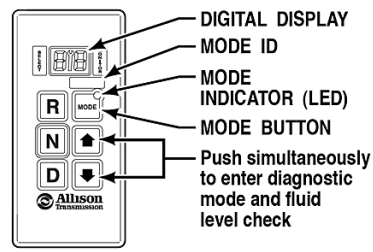
The wrench icon **stays illuminated** for two minutes after the Drive range is selected.

When the filter(s) is due for a change:

The wrench icon **flashes** on and off for two minutes after the Drive range is selected.

When clutch maintenance is due:

The wrench icon comes on and **stays on in all ranges**.



Exhaust System

New federally mandated emission standards affect all buses equipped with 2010 emission compliant diesel engines. Both nitrogen oxides (NOx) and particulate matter are reduced by 90 percent from 2004 levels. The exhaust system of the Cummins engine in Blue Bird buses are *aftertreatment* systems which incorporate a *Diesel Particulate Filter* (DPF) and a Selective Catalytic Reduction (SCR) system instead of ordinary mufflers. These sophisticated exhaust systems reduce emissions by trapping exhaust-borne particulates (soot) in a filter built into the DPF. The SCR system then reduces NOx levels through a chemical reaction changing the NOx into harmless nitrogen and water.

Soot accumulates in the DPF over time and must be removed by a process referred to as *regeneration*. Regeneration is conceptually similar to the cleaning mode of a self-cleaning oven in that heat is required to remove the soot.

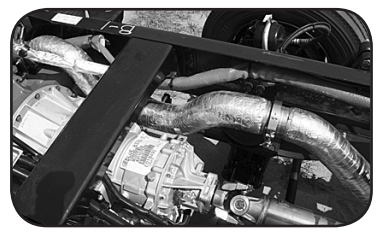
The rate at which soot accumulates is dependent upon multiple conditions including the quality of the diesel fuel, type of engine oil, ambient temperature, engine load, and other factors. Regeneration occurs in three ways:

- Some regeneration occurs "naturally" whenever operating conditions (speed, engine load, etc.) result in exhaust system temperatures high enough to oxidize accumulated soot. This unassisted regeneration process can generically be referred to as "passive" regeneration.
- Regeneration can be caused by raising the temperature of the exhaust system. Cummins engines are equipped with systems designed to increase exhaust temperature when the ECM senses that regeneration is needed, and when certain requirements, including a minimum travel speed, are met. This automatic "heat assisted" mode can be generically referred to as "active" regeneration.
- Regeneration can be manually activated by means of a switch. This procedure is generically referred to as "stationary" regeneration, and should only be performed by or under the direction of a qualified service technician, and in a controlled environment to avoid the potential for human injury or fire hazards.

The need for regeneration is communicated to the driver by a set of visual and audible signals in the instrument panel. An additional alert, the High Exhaust System Temperature (HEST) indicator, notifies the driver whenever exhaust system temperature is high due to recent regeneration.

Eventually, the normal ash accumulation which results from the regeneration process must be removed from the DPF, using equipment designed for the purpose at qualified engine service facilities. Refer to the engine manufacturer's documentation for these service intervals. The engine operator's manual provided with your bus contains additional information about exhaust system regeneration, and should be read and understood by the driver.

CAUTION ***In 2010 diesel engines, use only diesel fuel labeled Ultra Low Sulfur, per the engine manufacturer's specifications. In Cummins, use oils meeting API CJ-4/SL and Cummins Engine Standard CES-20081. See Cummins Owners Manual ISB 6.7L CM2150 for details.***



The exhaust systems of 2010 EPA emission compliant diesel engines incorporate engine-specific Diesel Particulate Filters, which operate at higher temperatures during their Regeneration cycles. Due to the hot temperatures generated through the exhaust system, front exhaust pipes, tailpipes, adjacent hoses and tubing are insulated in sensitive areas for protection from the heat on all Blue Bird products.

DPF Regeneration In Blue Bird Buses

As with most new mechanical processes, the introduction of more sophisticated exhaust systems in 2010 emission standards-compliant engines has generated some degree of initial confusion. Engine manufacturers have designed their own methods to accomplish the regeneration (cleaning) of the DPF, and therefore describe the process in somewhat differing terms.

The Cummins equipped Blue Bird bus exhaust system is not complicated. Nor should the regeneration process be regarded with alarm. Both Drivers and service technicians should be at least conceptually familiar with the regeneration process.

As soot builds up in the DPF, the driver is notified in several stages by visual and audible alerts. The alert system is designed to provide reasonable and comfortable fore-warning and adequate opportunity for the needed regeneration. As the need for regeneration becomes more severe, the alerts become increasingly imperative; and the penalty for postponing the needed regeneration also increases.

When the earliest alerts occur, there is typically ample time to complete a route and then have a Stationary Regeneration procedure performed at a proper facility. If early alerts are ignored, and the condition is allowed to worsen, the engine will eventually de-rate automatically, and performance will reduce noticeably. If the condition is allowed to become severe, a Stationary Regeneration may not be possible, and the DPF may require removal and treatment using specialized equipment. Therefore, to minimize disruption of your bus operation, the regeneration-related alerts should be heeded and responded to at their early stages as a matter of routine.

Aftertreatment Terms

The following summarizes some of the terms associated with the exhaust systems of Blue Bird buses equipped with 2010 emission standards compliant engines. Both the driver and technician should become familiar with the following terms:

Aftertreatment. The process of catalytically converting and filtering engine exhaust in order to reduce emissions, and of purging the exhaust system of accumulated exhaust residue.

DPF (Diesel Particulate Filter). A component in the exhaust system which takes the place of a traditional muffler. A DPF contains a special dissimilar metals filter which traps particulate accumulation (soot), which is then converted to carbon dioxide by the aftertreatment process. The Cummins DPF also contains a catalytic converter.

Regeneration. The process of cleaning accumulated soot from the filtering components inside the DPF. Regeneration occurs at high exhaust system temperatures to turn the soot into carbon dioxide gas. Regeneration can be thought of as conceptually similar to the clean cycle of a self-cleaning oven.

WARNING ***Postponing regeneration beyond the early indications may result in the engine being automatically de-rated, and reduction of power while driving.***

WARNING ***The aftertreatment regeneration process can cause extremely high exhaust gas temperatures hot enough to ignite or melt common materials, and to burn people.***

Carefully read, understand, and abide by all instructions, warnings, and cautions in the engine manufacturer's operator's manual (and other related engine manufacturer's literature) regarding safe operation when the HEST indicator is on.

Carefully read, understand, and abide by all instructions, warnings, and cautions in the engine manufacturer's operator's manual (and other engine manufacturer's literature) regarding safety conditions when performing Stationary regeneration.

HEST Indicator (High Exhaust System Temperature). An instrument panel indicator which appears when the exhaust temperature is unusually high due to recent regeneration. This is normal behavior of the aftertreatment system, intended to notify the driver and technician that the exhaust system temperature is high and that caution should be observed around the exhaust system.

DPF Indicator. An instrument panel indicator which displays when particulate accumulation has reached a preset level in the DPF, and regeneration is needed. The bus should either be operated with a more demanding duty cycle until the indicator goes off, or it should be scheduled for a Stationary Regeneration at a service facility.

Levels of Notification

Regeneration—the process which burns off soot accumulation in the DPF—occurs automatically as the bus is operated, as long as certain operating conditions (such as minimum speed thresholds) are met. When bus operating conditions do not provide adequate opportunity for the regeneration system to keep the DPF clear, soot begins to accumulate. A system of driver alerts keeps the driver informed when the exhaust system is in need of regeneration, and of high exhaust temperature associated with regeneration. Several levels of regeneration alerts occur in sequence, each indicating a more imperative warning.

High Exhaust Temperature Notification. The High Exhaust System Temperature (HEST) indicator appears to alert the driver when exhaust temperature is unusually high and that prudent judgement should be applied regarding the proximity of people or combustibles to the exhaust system. For example, the bus should not be parked on a surface of grass or weeds.

With the Cummins engine, the HEST indicator appears whenever the exhaust temperature is high (752°F or above), regardless of moving speed.

The driver should be familiar with and abide by all instructions, warnings, and cautions in the engine manufacturer's operator's manual regarding safe operation when the HEST indicator is on.

- The HEST alert appears in the instrument panel.
- The audible alarm sounds one beep.

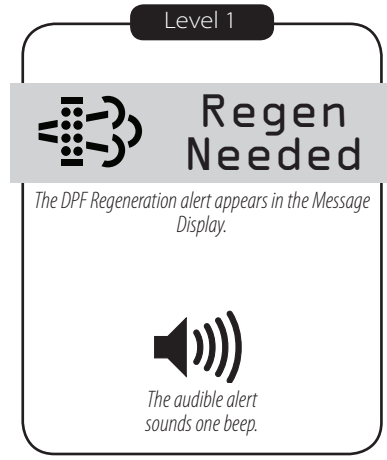
HEST Notification

The HEST alert appears in the instrument panel's warning bank.

The audible alert sounds one beep.

Level 1 Regeneration Notification: DPF Indicator Appears. In low-demand operating conditions, it is possible that the regeneration system does not have sufficient opportunity to prevent particulate build-up in the DPF. The ECM senses that accumulation is occurring and that regeneration is needed. The driver is notified as follows:

- The DPF Regeneration alert activates.
- The audible alert sounds one beep.



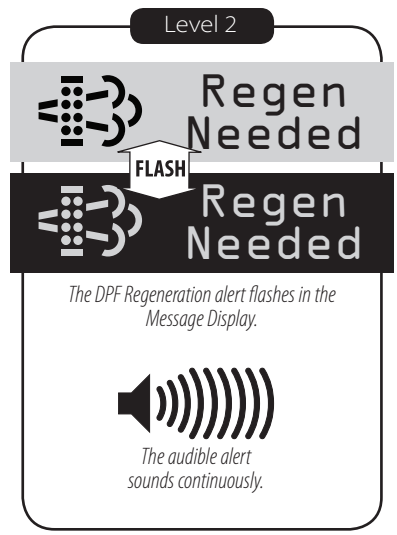
The above indicates that regeneration of the DPF is needed at the earliest convenience. The regeneration can be accomplished in either of two ways: If practical, the bus could simply be operated for a while at a speed above the automatic regeneration threshold; or the bus could be taken to a suitable location to have a Stationary Regeneration procedure performed.

If the bus is operated at a minimum highway driving speed (40 mph Cummins), the automatic regeneration system will activate. If minimum speed is maintained long enough (usually 20-30 minutes), the automatic regeneration mode can likely reduce the soot sufficiently to cause the DPF icon to go off.

Therefore, the first appearance of the DPF icon should be perceived by the driver as a normal notification of action that needs to be taken, but not as an emergency situation. Typically, even if the bus route does not afford immediate opportunity for higher-speed operation, there is sufficient time to finish the bus route and return to the bus maintenance shop before a higher level of notification occurs. Exactly how much "warning time" the first appearance of the DPF indicator represents is dependant upon specific operating conditions. However, current data from Cummins suggest that, at this level of notification, the DPF needs to undergo regeneration within the next two to six hours of bus operation. If regeneration does not begin, a more imperative notification will activate.

Level 2 Notification: DPF Indicator Blinks. If the bus continues to be operated without taking the measures indicated by a Level 1 Notification (described above), particulate accumulation continues, and a more imperative notification occurs:

- The DPF Regeneration alert begins to flash.
- The audible alarm sounds continuously.
- The engine may be automatically de-rated.



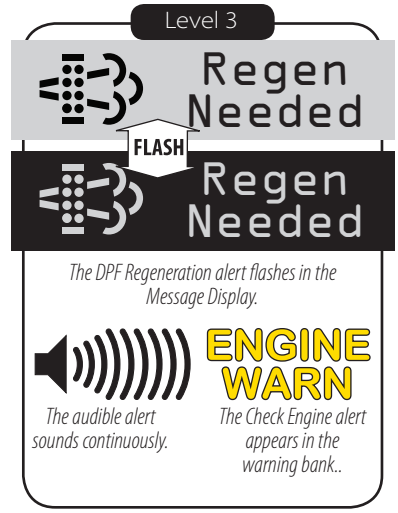
The above indications should be interpreted as a more imperative alert that the exhaust system is in need of regeneration soon. As soon as practical, the bus should be operated at or above the minimum speed needed to allow automatic regeneration to activate, or a Stationary Regeneration must be performed. Again, situation-specific variables apply. Current data from Cummins suggest that at this level of notification, the DPF needs to be regenerated within the next one to two hours of bus operation. Otherwise, the third level of notification will occur.

Level 3 Notification: Check Engine Indicator Appears. If the bus continues to be operated without taking the measures indicated by a Level 2 Notification, particulate accumulation worsens. These indicators are activated:

- The DPF Regeneration alert continues to flash.
- The audible alert sounds continuously.
- The engine is automatically de-rated.
- The Check Engine alert appears.

The above indicates that a Manual Regeneration must be performed as soon as possible. Because the engine is automatically de-rated it may not be possible to drive at sufficient speed to cause active regeneration to occur.

With the Cummins engine, depending upon the severity of the accumulation, the regeneration switch may not be allowed to initiate a regeneration without use of Cummins's PC-based diagnostic software, Insite.



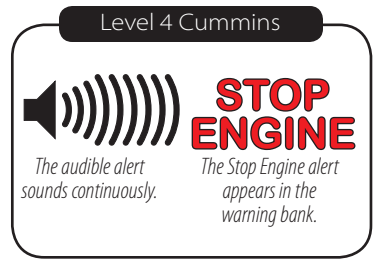
Level 4 Notification: Stop Engine Indicator Appears. If the bus continues to be operated without taking the measures indicated by a Level 3 Notification, particulate accumulation reaches a critical level. Engine power is automatically *further* de-rated by the ECM. These indicators are activated:

- The DPF Regeneration alert deactivates.
- The audible alert sounds continuously.
- The engine is further de-rated.
- The Check Engine alert deactivates.
- The red Stop Engine alert appears.

The above indicates that accumulation has progressed to critical levels and the bus should be stopped with the engine off as soon as it is safe to do so. The bus should remain shut down until the aftertreatment system has been serviced.

With the Cummins engine, the regeneration switch will not be allowed to initiate a regeneration without use of Cummins's PC-based diagnostic software, Insite.

Removal and cleaning of the DPF using specialized equipment may be required.



Stationary Regeneration Precautions

During active regeneration, the exhaust system can reach extremely high temperatures. Automatic active regeneration, which occurs while driving the bus, is programmed to occur only when the bus is moving at a minimum speed, and it stops when the vehicle slows or stops.

With the Cummins engine, the HEST indicator appears whenever the high temperature condition exists.

When performing a Stationary Regeneration, the entire process occurs for an extended period while the bus is stopped. It is therefore critical that prudent human safety and fire hazard precautions are followed. Those precautions include:

- Read, understand, and abide by all the precautions pertaining to regeneration procedures in the engine manufacturer's Operator's Manual.
- If at all possible, the Stationary Regeneration procedure should be conducted at a service facility by trained technicians.
- The Driver's first priority is the safety of the passengers. If a Stationary Regeneration must unavoidably be done by the Driver under a qualified technician's direction, alternate transportation should be arranged first, or passengers should be removed under proper supervision to a location away from the bus.
- Select an appropriate location to park the vehicle.
    - Choose a surface that will not burn or melt under high temperature, such as clean concrete or gravel, *not grass or asphalt*.
    - Ensure that nothing that can burn, melt, or explode (gasoline, wood, paper, plastics, fabric, compressed gas containers, hydraulic lines) is near the exhaust outlet. Abide by all instructions, warnings, and cautions in the engine manufacturer's operator's manual regarding safe operation when performing a Stationary Regeneration.
- Park the bus securely.
    - Set the parking brake. Put the transmission in Neutral. Chock the wheels.

- Secure the exhaust area.
    - If bystanders might enter the area, set up barriers to keep people safely away from the exhaust outlet.
    - If the procedure is performed indoors at a service facility, attach an exhaust discharge pipe rated for at least 1500°F.
    - Keep a fire extinguisher nearby.
- Check exhaust system surfaces to confirm that no tools, rags, grease, debris or any other objects are on or near the exhaust system.
- Start the engine.
- Operate the Regeneration Switch to begin the regeneration process.
- Monitor the process. If any unsafe condition occurs, shut off the engine immediately. During the regeneration process, the engine may change speed, and the turbocharger may whistle. When the process is complete, the engine will return to normal idle speed. Exhaust gas and exhaust surface temperatures will remain elevated until they have had time to cool to normal levels.

SCR System in Blue Bird Buses

Selective Catalytic Reduction (SCR) is a Nitrous Oxide control technique for diesel engine exhaust. The SCR system uses Diesel Exhaust Fluid (DEF) a nitrogenous compound which readily decomposes into ammonia. The system process involves the injection of DEF into the exhaust over a catalyst. The DEF converts to ammonia in the exhaust stream. This ammonia then reacts with NOx and produces harmless nitrogen (N_2) and water (H_2O).

The DEF-SCR system basically consists of three elements:

SCR Catalyst. The SCR is located in the exhaust stream rear of the Decomposition Reactor. It is similar in outward appearance to a small muffler. The device is comprised of a canister containing the SCR catalyst which uses the amonia contained in the injected DEF to react with NOx. This reaction is temperature dependent and transforms the NOx into harmless nitrogen gas and water.

DEF dosing system. DEF is supplied from a chassis mount tank to a Supply Module. The Supply Module is controlled by the Dosing Control Unit. The Supply module and the Dosing Control Unit are located inboard the frame rail. The Supply Module uses a very accurate metering and pumping system to supply DEF to the Dosing Module located at the Decomposition Reactor in the exhaust system. The amount of the DEF injected into the exhaust is controlled by the ECM. Water evaporates quickly and the DEF turns into amonia when in contact with hot exhaust gases.

Diesel Exhaust Fluid. DEF is carried on board the bus as an aqueous urea solution in a 15 gallon storage tank clearly identified as DEF. The storage tank is sized to minimize operator filling, but within packaging and weight constraints of the vehicle. Diesel Exhaust Fluid is urea mixed with water to a 32.5% solution. DEF solution is a clear liquid with a weak amonia odor.

The SCR system consumes DEF at a rate of approximately 2% of the amount of fuel used, depending on bus operation. Therefore a 15 gal tank of DEF will treat approximately 750 gallons of diesel fuel.

The DEF tank level indicator can be found in quadrant 3 of the message display center located on the instrument cluster. This display provides a constant reading indicating the percent of DEF in the tank. If a problem is identified with the amount of fluid or the quality of the DEF, a priority message will appear in quadrant 1 of the message display center indicating the fault.

Keeping adequate levels of DEF in the tank is crucial to the operation of the SCR system. When low levels in the DEF tank are indicated, refill the tank using only approved DEF solution. The DEF has its own tank and fill port with a cap. You will notice the fill port is smaller than the diesel fuel port. This is to prevent putting diesel fuel into the DEF tank. Conversely, care should be given not to put DEF in the diesel fuel tank. Read all decals carefully before refilling. When filling the DEF tank ensure the vehicle is on level ground and insert the fill station nozzle as far as possible into the fill port adapter to ensure proper auto-shutoff levels.

CAUTION ***DO NOT overfill the DEF reservoir. DEF will freeze and expand at temperatures below 12° F (-11°C). If the reservoir is overfilled and freezes, the expansion of the frozen DEF will cause catastrophic damage to reservoir and/or the vehicle SCR system.***

Refer to Blue Bird and Cummins Service Manuals for detailed description of the aftertreatment system.

DEF Fill Door


DEF Fill located to the left of the entrance door.


Diesel Fill

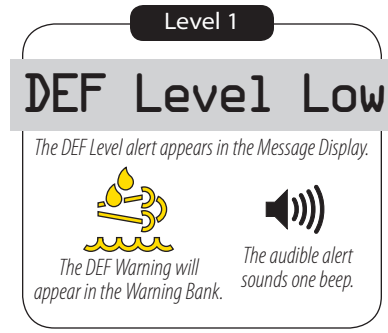
DEF Levels of Priority Notification

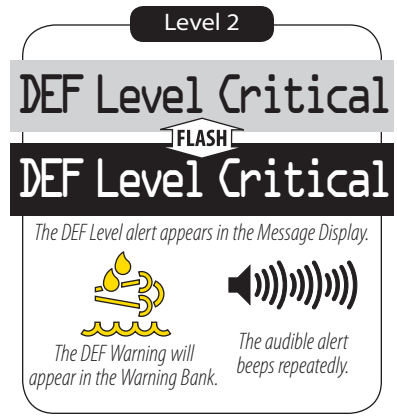
A system of driver alerts keeps the driver informed of when the DEF is in need of service. When fluid is low or contaminated, several levels of alerts occur in sequence, each indicating a more imperative warning. When priority warnings occur, they will appear in Quad 1 of the Message Display in lieu of the odometer reading while Quad 3 indicates fluid level in the DEF tank at all times. The notifications are as shown below.

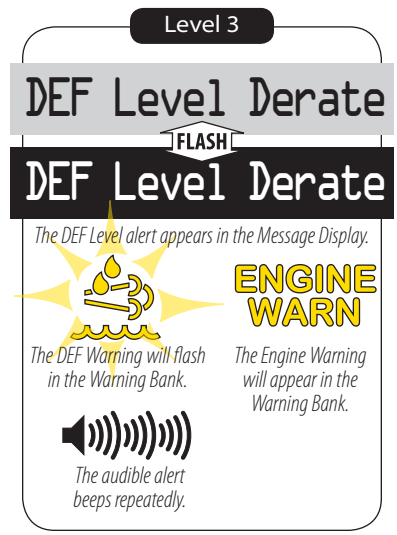
DEF Level 1. When the DEF level reaches 10% in the tank, a **DEF LEVEL LOW** warning will appear in Quad 1 of the Message Display at which point the amber DEF warning icon will appear in the lower left warning bank. This warning is accompanied with a single beep.

DEF Level 2. When the DEF level reaches 5% in the tank, a **DEF LEVEL CRITICAL** warning will appear in Quad 1 of the Message Display, this DEF LEVEL CRITICAL warning display will flash from positive to negative and the amber DEF Warning icon will remain in the lower left warning bank. This warning is accompanied with repeating beeps.

DEF Level 3. When the DEF level reaches 2.5% in the tank, a **DEF LEVEL DERATE** warning will appear in Quad 1 of the Message Display, this DEF LEVEL DERATE warning display will flash from positive to negative**.** The amber DEF Warning icon will commence flashing in the lower left warning bank and an additional amber Engine Warning light will appear. At this point a 25% engine torque derating will occur.

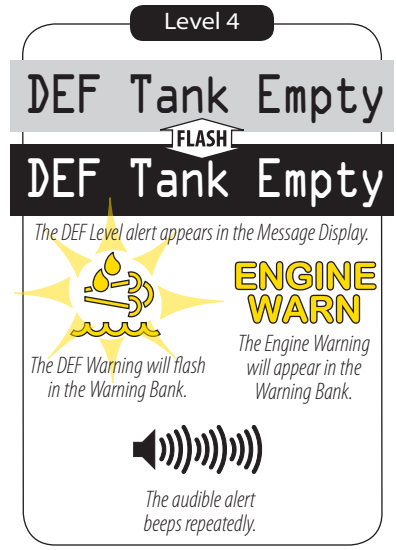


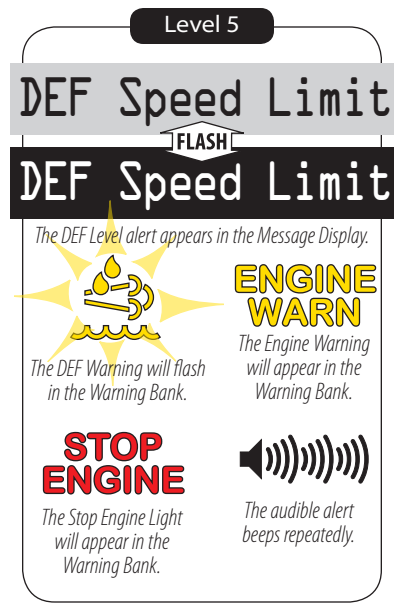




DEF Level 4. When the DEF level reaches 0% in the tank, a **DEF TANK EMPTY** warning will appear in Quad 1 of the Message Display, this DEF TANK EMPTY warning display will flash from positive to negative**.** The amber DEF Warning icon will continue flashing in the lower left warning bank and the amber Engine Warning light will be illuminated. Continued 25% engine torque derating.

DEF Level 5. When DEF sytem can no longer maintain pressure, a **DEF SPEED LIMIT** warning will appear in Quad 1 of the Message Display, this DEF SPEED LIMIT warning display will flash from positive to negative**.** The amber DEF Warning icon will continue flashing in the lower left warning bank. The amber Engine Warning light will remain illuminated and a red Stop Engine light will appear. At this point a 5 MPH speed limit will be introduced with the 25% engine torque derating.

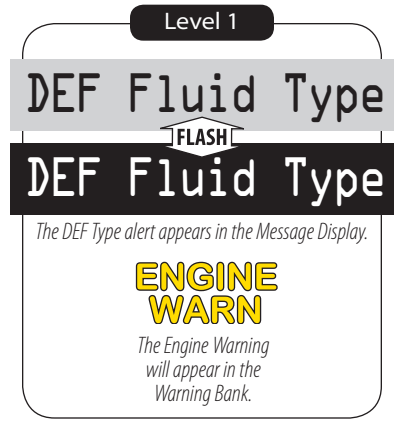


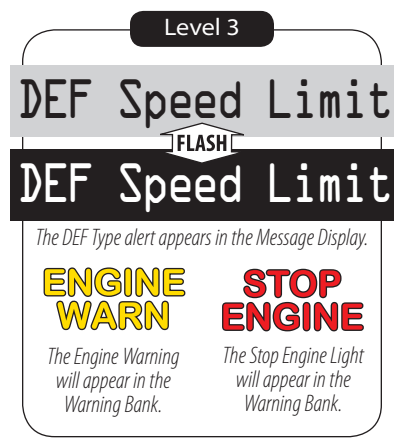


DEF Type Level 1. When incorrect fluid or mixture is introduced into the tank, a **DEF FLUID TYPE** warning will appear in Quad 1 of the Message Display, this DEF FLUID TYPE warning display will flash from positive to negative**.** The amber Engine Warning light will appear in the lower left warning bank. The integrity of the DEF solution needs to be checked using a refractometer. DEF system service should be attained within 10 hours or subsequent levels of derating will occur.

DEF Type Level 2. The **DEF FLUID TYPE** warning in Quad 1 of the Message Display continues to flash from positive to negative**.** The amber Engine Warning light will appear in the lower left warning bank. At this point a 25% engine torque derating will occur. DEF system service should be attained within 10 hours or subsequent levels of derating will occur.

DEF Type Level 3. After 10 Hours at level 2, a **DEF SPEED LIMIT** warning will appear in Quad 1 of the Message Display, this DEF SPEED LIMIT warning display will flash from positive to negative**.** The amber Engine Warning light will remain illuminated and and a red Stop Engine light will appear. At this point a 5 MPH speed limit will be introduced with the 25% engine torque derating.

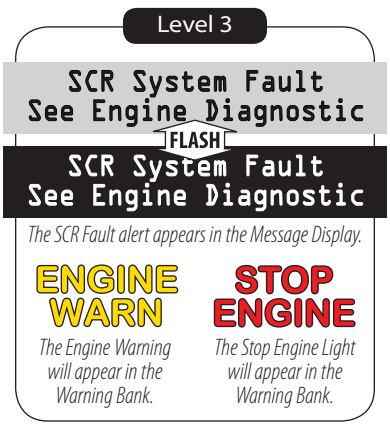




SCR Fault Level 1. When an SCR System Fault is detected, an **SCR SYSTEM FAULT SEE ENGINE DIAGNOSTIC** warning will appear in Quad 1 of the Message Display, this SCR SYSTEM FAULT SEE ENGINE DIAGNOSTIC will flash from positive to negative. The amber Engine Warning light will appear in the lower left warning bank. Engine diagnostic codes should be recorded and appropriate repairs should be made. DEF system service should be attained within 10 hours or subsequent levels of derating will occur.

SCR Fault Level 2. After 10 Hours at level 1 the amber Engine Warning light *WILL* be illuminated and a 25% engine torque derating will occur. DEF system service should be attained within 30 hours or subsequent levels of derating will occur.

SCR Fault Level 3. After 30 Hours at level 2 the amber Engine Warning light and the Stop Engine light WILL be illuminated. At this point a 5 MPH speed limit will be introduced with a 25% engine torque derating.



General Propane Tank Filling Procedures

The most important procedure of filling any propane tank is safety. Understanding the properties & characteristics and safe handling practices of the fuel is required before conducting any propane tank filling efforts.

A propane powered vehicle is equipped with a propane tank built to and certified to the regulations of the American Society of Mechanical Engineers (ASME) These tanks have a data plate with pertinent information including the ASME stamp and the plate must be securely attached and legible or the tank should be taken out of service and replaced. There are no requirements for re-certifying ASME tanks however inspection is required and maintenance is recommended if there are signs of corrosion.

Propane tanks are filled to 80% capacity to allow for the liquid fuel to expand and contract depending on ambient or other influent temperatures. All tanks built for use on motor vehicles are equipped with overfilling prevention protection. The National Fire Protection Association (NFPA) have required motor vehicle propane tanks be equipped with a stop filling device to automatically prevent overfilling or filling the tank beyond the maximum recommended capacity of 80%. This automatic stop fill system provides the primary method of preventing overfill of the fuel tanks. This rule has been in effect since January 1, 1984.

As a secondary means of preventing an overfill condition of the fuel tanks and a means of verifying the accuracy of the automatic stop fill device, the tanks are equipped with an 80% fixed maximum liquid level outage valve (Manual bleeder valve). The valve would be used to verify when the liquid fuel reaches the 80% level at which point the fill process would be stopped. This valve can be used when filling and releases fuel in a vapor phase until the fuel reaches the 80% level at which time a stream of liquid will appear indicating the fuel level in the tank is 80%. Most propane fueling stations will want to open this bleeder valve however since the propane motor vehicle tank is equipped with an overfill prevention device it is not necessarily required and may be prohibited in certain municipalities where the release of hydrocarbons to the atmosphere is prohibited. The NFPA ruled that when the tank is equipped with an overfill prevention device the use of the 80% bleeder valve is not required.

WARNING ***Technicians working with, or around, fuel systems should be properly trained to utilize extreme care and caution at all times. Failure to exercise extreme caution and care may lead to serious accidents which can result in property damage, personal injury and/or death.***

Propane Powered Motor Vehicle Filling Procedures

1. Entering the propane fueling station.

   1.1 Park the vehicle in close proximity to the motor fuel dispensing station.

   WARNING ***NO SMOKING ALLOWED.***

2. Turn off and remove the vehicle ignition key.

3. Exit the vehicle and ask all passengers to step outside the vehicle.

   3.1 Some stations may ask all passengers to stand outside the area where the fill process is taking place.

   3.2 Some stations could be self-service and the driver would perform the filling process; however in this case the driver has to be trained and certified to obtain an authorized filling station dispenser access card.

4. The attendant may need to inspect the propane tank for corrosion, dents and verify the data plate displays the ASME stamp and other pertinent information is correct. An attendant can refuse to fill your propane tank if it does not pass this inspection. Regular inspection and maintenance of your tank will prevent refusal to fill the tank.

5. Verify the meter is set to zero.

   5.1 If the dispenser is an electronic dispenser it will set to zero automatically once the transaction has been initiated.

Note: This vehicle is equipped with an Overfill Protection Device (OPD). There is no need to open the bleeder valve during refueling process.

WARNING ***For passenger safety, Blue Bird recommends all occupants disembark to a safety zone before fuel filling procedures take place.***

WARNING ***Technicians working with or around fuel systems should be properly trained to utilize extreme care and caution at all times. Failure to exercise extreme caution and care may lead to serious accidents which can result in property damage, personal injury and/or death.***

6. Connect the fuel nozzle to the vehicle fueling receptacle.

   6.1 The propane fueling nozzle has to be screwed on securely.

      A. Wear protective gloves while fueling a propane tank.

      B. Remove the protective cap from the vehicle fueling receptacle.

      C. Mate the nozzle coupling to the fueling receptacle.

      D. Turn the nozzle coupling in a clockwise direction; two or three turns until secure. A soft rubber washer or o-ring seals the connection so over tightening is not required.

      E. Most nozzles for motor vehicle fueling are much like a gasoline type nozzle. The nozzles are also minimum bleed type for safety and to meet hydrocarbon release requirements in certain jurisdictions.

7. Turn on the propane dispenser/pump and begin the filling process.

   7.1 Open the nozzle to begin filling.

   7.2 Do not fill the tank based on a mechanical float gauge reading or the fuel level gauge on the dashboard.

   7.3 Pay attention and never walk away from the filling process.

   7.4 As a primary method of determining when the tanks are full (80% capacity) an 80% stop fill device will automatically stop the filling process when the liquid propane reaches an 80% liquid level capacity in the tanks.

8. Release or close the fueling nozzle.

   8.1 Turn off the fuel dispenser/pump.

   8.2 Carefully and slowly unscrew the fueling nozzle (unscrew counter clockwise).

      A. A minimum bleed nozzle should have released any pressure left in the space between the nozzle and the receptacle when closed and should not bleed any pressure when unscrewing the connection.

      B. Some nozzles will have more pressure trapped between the nozzle and the receptacle so it is necessary to slowly unscrew the connection to allow pressure to bleed off before removing the nozzle completely. Some nozzles will be equipped with a small bleeder valve to release this trapped pressure before disconnecting the nozzle.

9. Replace the nozzle and fuel transfer hose on the dispenser.

10. Verify there are no leaks at the tank filling receptacle and replace the protective cap.

11. Document the amount of fuel received.

12. The fueling process is complete.

WARNING ***During a propane vehicle fueling process fuel may be emitted to the immediate area. There could be a combustible fuel mixture around this immediate area. The person performing the re-fueling process has total responsibility for safety in the immediate area.***

NOTES:

- It is unlawful to fill a non-compliant tank or a tank that posses a safety violation.
- Any person performing the re-fueling process must be trained and certified in the procedures of filling propane tanks and in the procedures of safe handling.

Enroute Emergencies

In the case of any enroute emergency, the Driver must ensure the safety of the passengers before performing any procedure on the bus. Safely maneuver the bus to the nearest safe location; a parking lot or emergency lane if possible, and take appropriate measures to arrange for pick up of the passengers and notify public safety officials.

WARNING ***No one should attempt to transport passengers without thorough knowledge of the controls and safety equipment. See the Driver Orientation and Pretrip Inspection sections of this manual, and thoroughly familiarize yourself with the locations of all emergency equipment.***

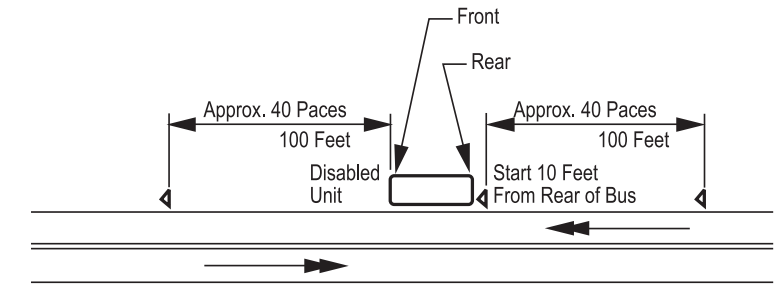
It is assumed that the Driver will seek immediate assistance of qualified service technicians in the event of any mechanical failure. The information in this section is only to provide some information which may be helpful to service technicians rendering assistance.

Using Triangular Hazard Reflectors

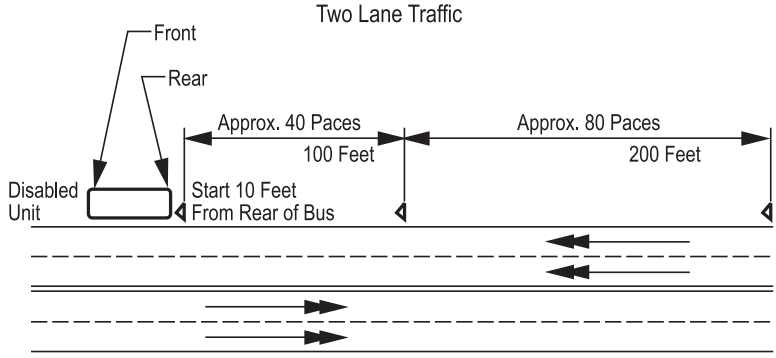
In the event that the bus must be parked in an emergency lane or road shoulder, deploy the triangular roadside hazard reflectors as follows:

On a two-lane roadway, place a triangular marker 100 feet (about 40 paces) to the front of the vehicle, with reflective side facing oncoming traffic. Place another triangular marker 100 feet (about 40 paces) to the rear of the vehicle, with the reflective side toward overtaking traffic.

On a four-lane roadway, place one triangular marker 100 feet (about 40 paces) to the rear of the vehicle. Place another triangular marker 200 feet (about 80 paces) from the first marker (300 feet behind the vehicle). The reflective side should be facing overtaking traffic.



Two Lane Traffic



Four Lane Traffic

Using Booster Cables

WARNING ***Ensure that the ignition switch of the disabled vehicle is in the "OFF" position. Always connect the POS (+) battery cable first. Connect the NEG (-) cable to the chassis, away from the batteries. The batteries produce a highly flammable gas. Do not smoke while working near batteries. Take all precautions to prevent sparks from any source in the proximity of the batteries.***

1. Ensure the posts on the jumper and bus batteries are clean.

2. Using the RED jumper cable, connect the POS (+) terminal of the bus battery to the POS (+) terminal of the jumper battery.

3. Using the BLACK jumper cable, connect one end to the NEG (-) terminal of the jumper battery.

4. Connect the other end of the BLACK jumper cable to a solid chassis ground on the bus, such as the engine. Do not connect the black jumper cable to the NEG (-) terminal of the bus battery.

CAUTION ***Do not crank the engine for more than 30 seconds. Allow the cranking motor to cool at least 2 minutes between attempts to start the engine.***

5. Allow time for the jumper battery to boost the bus battery before attempting to start the engine.

6. After the engine starts, remove the NEG (-) BLACK booster cable from the ground on the bus.

7. Remove the NEG (-) BLACK booster cable from the terminal of the booster battery.

8. Remove the POS (+) RED booster cable from the POS (+) terminal of the bus battery.

9. Remove the RED booster cable from the POS (+) terminal of the booster battery.

Starting Problems

For more detailed instructions, refer to the engine manufacturer's Operator's Manual.

One or more of the following items may cause an occasional starting problem:

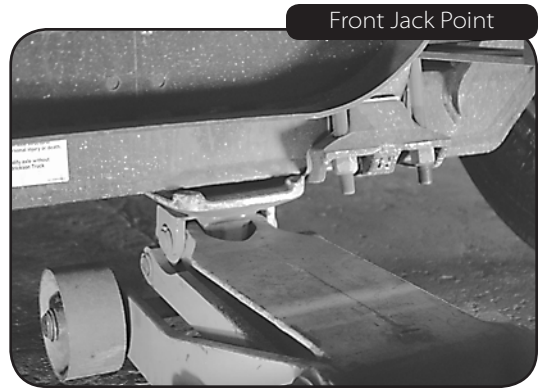
- The Park Brake must be set to start the bus.
- The Transmission must be in Neutral.
- If the bus is equipped with Vandal Locks, the bus will not start unless the doors or windows equipped with Vandal Locks are closed.
- Low battery charge.
- A malfunctioning starter.
- Problems with the wiring harness or connections.
- Out of fuel.
- Fuel door open. (Propane Bus)

Jacking and Towing

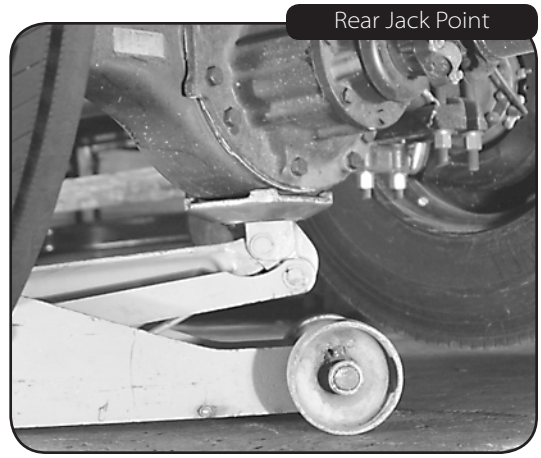
Jack Points

WARNING ***Proper jacking procedures and basic safety measures must be observed to ensure the safety of personnel while working under the bus. Always check the serviceability of any lifting equipment prior to use. Ensure that the lifting device is of sufficient strength to handle the bus, and that the surface provides the necessary firmness to support the weight of the bus concentrated on the footprint of the jack. Never move under a bus supported only by a hydraulic jack.***

Front Jack Point



Rear Jack Point



1. Park the bus on a flat, level surface of sufficient firmness to support the jack.
2. Chock the wheels in both directions.
3. Use only jacks and jack stands of sufficient capacity to support the bus. Following the jack manufacturer's recommendations, place the jack securely under the axle at the spring or suspension beam, nearest the tire/wheel to be repaired.
4. Jack the bus only to the height necessary to service.
5. Support the bus with blocks or jack stands under the frame rails.

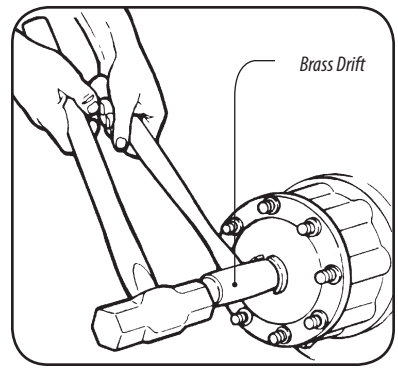
Towing

If the bus is towed with the rear wheels on the road, the driveshaft must be prevented from turning in order to avoid possible damage to the automatic transmission. This is accomplished by removing the rear axle shafts, and covering their openings with caps to prevent rear axle lubricant spillage.

Also, on VISION buses equipped with air brakes, if full normal air pressure cannot be provided the air system, the spring brakes must be mechanically caged to prevent their engagement.

1. Apply the parking brake and chock the wheels while preparing the vehicle for towing.
2. Remove the stud nuts and washers from the center hub.

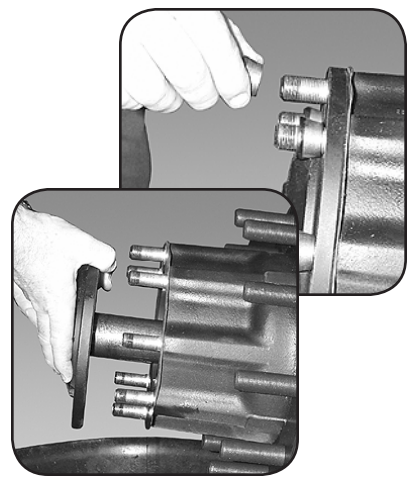
3. To loosen the tapered dowels which surround each stud, use a 1.5" diameter brass drift and 5-6 lb hammer. Hold the brass drift against the center of the axle shaft flange, inside the round driving lugs. Firmly striking the end of the brass drift with the hammer will dislodge the tapered dowels.



CAUTION ***Do not use a chisel or wedge to loosen the axle shaft and tapered dowels. Doing so can damage the axle shaft, gasket, seal, or axle hub.***

4. Mark the axle shaft so that it can easily be identified for reinstallation on the side of the axle from which it is removed. Carefully remove the axle shaft, taking measures to catch the axle lubricant which may spill. Install a cover plate over the open end of the hub to prevent dirt contamination and lubricant spillage during towing.

5. Repeat the above procedure to remove the other axle shaft.



6. If the bus is equipped with air brakes, and if full working air pressure is not present in the system, the spring brakes must be mechanically caged before the vehicle can be towed. Proceed as follows:

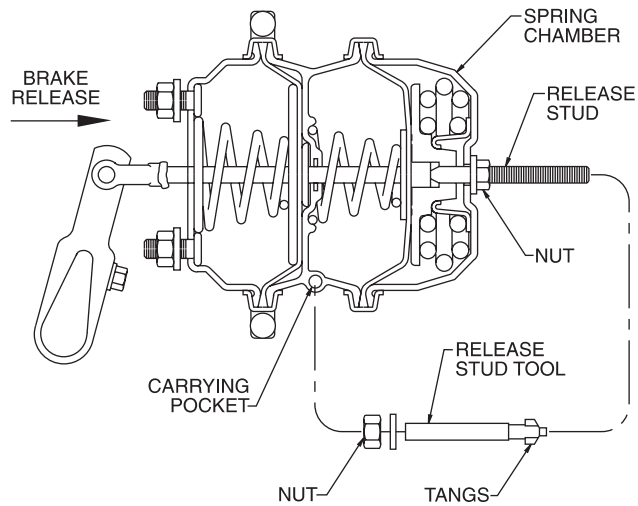
WARNING ***Caging the spring brakes disables the parking brake. Ensure that the bus is completely secured against rolling by wheel chocks before caging the spring brakes.***

6.1 On each of the rear combination brake chambers, a special release stud tool is carried in a storage socket cast into the body of the chamber. Remove the nut and washer from the end of the release stud tool, and remove the tool from its socket.

6.2 Remove the rubber dust cap from the access hole in the upper end of the spring brake chamber. Insert the toggle end of the release stud tool into the access hole. Be sure that the tapered end of the tool has entered the hole in the piston inside the chamber. Insert the tool until it bottoms.

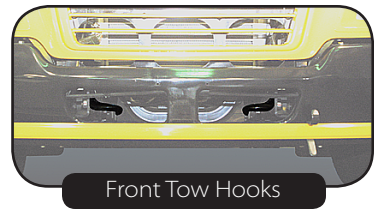
6.3 Rotate the release stud tool a quarter turn clockwise and pull outward, to engage the toggle end with the piston. While holding the bolt in its engaged position, install the washer and nut onto the end of the tool. Turn the nut down against the flat washer until finger tight.

6.4 Using a 3/4" hand wrench, (do not use an impact-type wrench), turn the release nut clockwise until the internal spring is fully caged.



6.5 Repeat the procedure for the spring brake chamber on the opposite side of the bus. The spring brakes are now released, having their springs compressed by the release bolts.

7. With the axle shafts removed and air spring brakes caged, the bus is prepared for towing. The Vision may be equipped with optional tow hooks or tow eyes, located just inside the access openings of the front and/or rear bumper.


Front Tow Hooks


Rear Tow Hooks

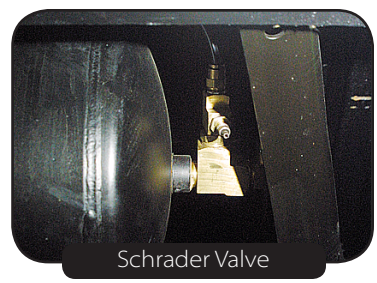
WARNING ***The tow hooks are designed for horizontal pulling only; not for lifting. Never attempt to lift the bus by the tow hooks.***

Air Tank Schrader Valve

The supply (wet tank), primary (rear brake reservoir), and secondary (front brake reservoir) air tanks are mounted under the bus, inboard of the chassis frame rails between the axles. The supply tank is located outboard the frame rails on 169 wheelbase.

The supply tank is fitted with a Schrader valve to allow manual pressurization of the system for service or testing purposes by using a common air hose, without having to charge the system by running the engine and compressor.

If a service truck rendering asistance is equipped with compressed air, the Schrader valve can be used to pressurize the air brake system of an inoperative Vision, so that its spring brakes can be released in order to move the bus.


Schrader Valve

Seat Belt Inspection And Maintenance

Inspect seat belts and their attachments, at least weekly. Check seat belt buckles and adjustability to ensure proper operation. If necessary, lubricate the buckle with a graphite lubricant. When a buckle is found to be inoperable, replace it immediately. If there are any defects in the webbing (i.e., torn or frayed), the seat belt must be replaced immediately to ensure passenger safety. Hand wash webbing with warm water and mild soap. Rinse thoroughly and dry in the shade. Do not bleach or re-dye, because such processing may severely weaken the assembly.

WARNING Do not bleach or dye the webbing. Such processing may severely weaken the assembly.

Seat Inspection And Maintenance

Blue Bird seats are built to meet Federal Motor Vehicle Safety Standards. In order to provide a greater margin of safety during passenger transportation, follow these guidelines:

- Inspect and, if necessary, tighten seat leg and wall side mounting bolts every 90 days.
- Inspect and, if necessary, tighten cushion attachments weekly.
- Inspect upholstery for cuts and tears every 90 days. If upholstery is torn, remove it by taking out the staples at the bottom front of seat back or bottom of cushion and pulling the cover away. For installation of new cover, reverse this procedure.
- School bus seats are equipped with a special foam back pad. If the pad becomes damaged, it should be replaced with an approved part. Aftermarket suppliers should be checked for compliance with Federal standards.

DRIVER'S SEAT LUBRICATION

Moving parts of the driver's seat require lubrication for ease of operation, as well as longevity of the seat and prevention of excessive wear.

Currently available is white lithium-based grease in an aerosol can. It gives excellent coverage when carefully directed into moving part joints. The very light coating of lubrication provided by aerosol-carried solvent-type solution works very well for penetrating into a joint and cleaning away dirt, but it should only be depended on for lubrication if it is applied frequently. A common 10W30 or 10W40 motor oil will provide good lubrication.

Remember that all moving part joints, tilt pivots, slide forward/back adjustment, and vertical motion pivots (four in all) require lubrication. This should be done every six months or 6,000 miles, whichever occurs first. The use of lithium-based grease in aerosol form is recommended.

SEAT CARE AND CLEANING

It is imperative that the interior of the bus be kept clean; seats are an important part of this maintenance. Regular cleaning and care will prolong the life of the seats and improve the general appearance of the bus.

Everyday dirt and soil. Most everyday soil and dirt may be removed with a soap and water solution. If the stain is persistent, a stiff bristle brush may be used. Fabric covered seats should be rinsed with clean water after the stain is removed.

Paint, tar, and asphalt. Remove the stain immediately using a damp cloth and kerosene. Rub gently, using small strokes. Rinse thoroughly. This type of stain may become permanent if not cleaned immediately.

Nail polish and lacquer based stains. Soak up as much as possible with dry cloth immediately. Any remaining stain may be removed with a non-flammable cleaning fluid such as "Tuff Stuff™" or "Armor All™" cleanser. Rinse thoroughly with clean water.

Gum, grease, and shoe polish. Remove as much as possible immediately. If left for any length of time, shoe polish will stain permanently. Clean any remaining stain with "Tuff Stuff™" or "Armor All™" cleanser.

Ink. Remove stain immediately using a damp cloth and alcohol.

SEAT CUSHION REMOVAL AND INSTALLATION—DOT SEATS & SEAT BELT SEATS

WARNING ***If seat cushions are removed for maintenance, they must be reinstalled using the following instructions. Failure to comply with these instructions could result in injury from unattached seat cushions in the event of an accident.***

1. To remove the seat cushion. Loosen and remove two Torx screws from the flanges at the front of the seat frame.

2. Lift the forward edge of the cushion 2 to 3 inches (5 to 8 cm) and pull forward.

3. To reinstall the seat cushion reverse the above procedure.

TRACK MOUNTED PASSENGER SEATS

If your bus is equipped with track mounted passenger seats and you relocate the seats or remove them to accommodate wheelchairs, you must follow rules of spacing and placement to comply with Federal Motor Vehicle Safety Standard 222 "School Bus Passenger Seating and Crash Protection" and Federal Motor Vehicle Safety Standard 217 "Bus Window Retention and Release". A decal printed with these rules (as shown below) is installed on the interior body panel above the windshield.

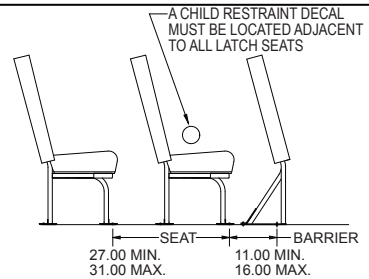
WARNING ***The federal rules governing passenger seating, spacing, and placement are explicit. When the seats are moved, the entity moving or rearranging the seating assumes responsibility for compliance with FMVSS 222 "School Bus Passenger Seating and Crash Protection" and FMVSS 217, "Bus Window Retention and Release".***

All passenger seats must have a seat or barrier in front of it to provide compartmentalization required by Federal Motor Vehicle Safety Standards. As you reconfigure your bus, you may need additional barriers, which are available from Blue Bird Corporation Part Sales.

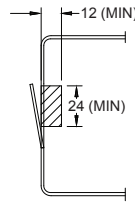
Blue Bird Track Mounted Seats

01943760 BB

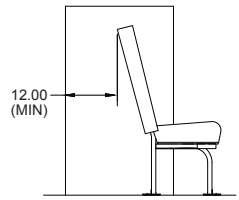
FEDERAL STANDARDS REQUIRE THAT ALL PASSENGER SEATS MUST BE LOCATED REARWARD OF A SEAT OR BARRIER OF AT LEAST THE SAME WIDTH. SEATS MUST BE INSTALLED BETWEEN MINIMUM AND MAXIMUM SPACING AS LISTED BELOW IN ORDER TO MEET FMVSS 222 REQUIREMENTS.



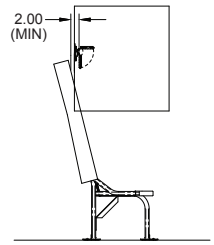
SEAT SPACING MEASURED AT AISLE



REAR EMERGENCY DOOR CLEARANCE: A CLEAR ACCESS AREA OF SIZE SHOWN WITH HEIGHT OF 45 IN. IS REQUIRED TO MEET CMVSS 217 OR FMVSS 217.



SIDE EMERGENCY DOOR CLEAR AISLE

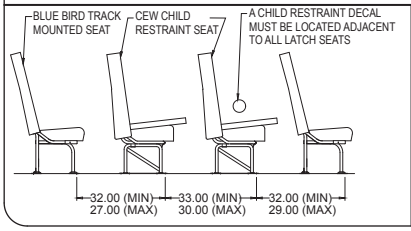


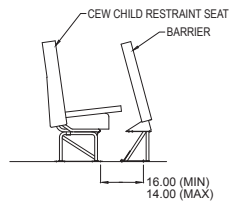
FOR 74 HEADROOM ONLY EMERGENCY EXIT RELEASE CLEARANCE

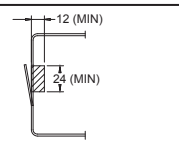
C E White, Child Restraint, Track Mounted Seats

00062317 CEW CR

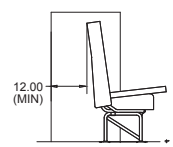
FEDERAL STANDARDS REQUIRE THAT ALL PASSENGER SEATS MUST BE LOCATED REARWARD OF A SEAT OR BARRIER OF AT LEAST THE SAME WIDTH. SEATS MUST BE INSTALLED BETWEEN MINIMUM AND MAXIMUM SPACING AS LISTED BELOW IN ORDER TO MEET FMVSS 222 REQUIREMENTS.







REAR EMERGENCY DOOR CLEARANCE: A CLEAR ACCESS AREA OF SIZE SHOWN WITH HEIGHT OF 45 IN. IS REQUIRED TO MEET CMVSS 217 OR FMVSS 217.

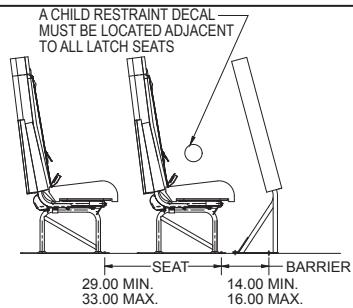


SIDE EMERGENCY DOOR CLEAR AISLE

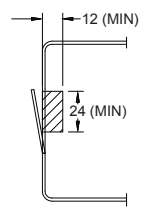
C E White Student Safety Seat, and C E White Student Safety Seat Child Restraint, Track Mounted Seats

00062639 CEW SSS, SSSCR

FEDERAL STANDARDS REQUIRE THAT ALL PASSENGER SEATS MUST BE LOCATED REARWARD OF A SEAT OR BARRIER OF AT LEAST THE SAME WIDTH. SEATS MUST BE INSTALLED BETWEEN MINIMUM AND MAXIMUM SPACING AS LISTED BELOW IN ORDER TO MEET FMVSS 222 REQUIREMENTS.



SEAT SPACING MEASURED AT AISLE



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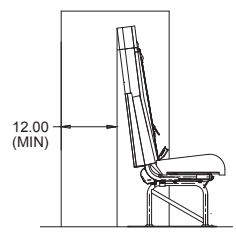
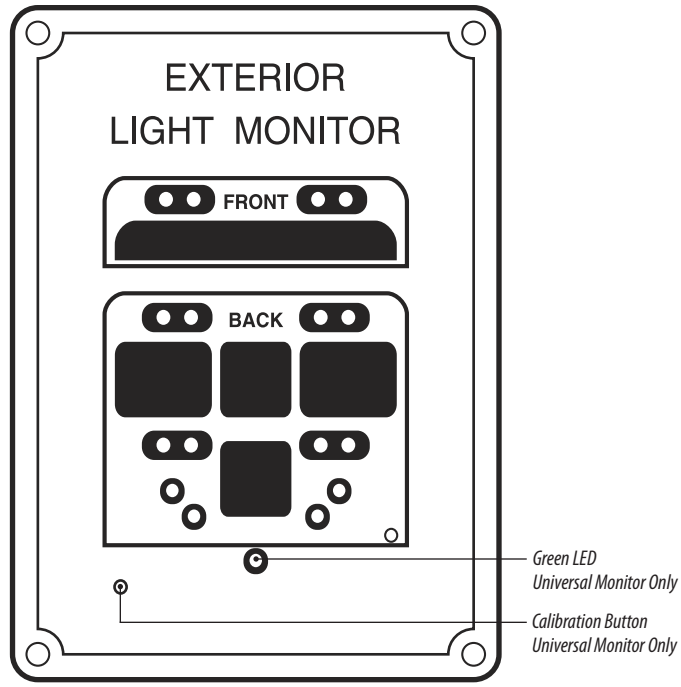


SIDE EMERGENCY DOOR CLEAR AISLE

Doran Warning Light Monitor



The Doran Monitor™ is a current sensing device. If current is flowing through one of the bus lamp circuits, the monitor senses it and illuminates the corresponding monitor light emitting diode (LED). When a lamp burns out, current flow through the circuit stops and the corresponding LED on the monitor does not illuminate, indicating the outside lamp is not functioning. The Doran™ Monitor is located in the bulkhead over the windshield and slightly to the left of the driver.

Warning lights are such an essential safety feature, it is important to know when they are not working properly. This is the function of the Doran monitor. Its display is a schematic of the lights as they appear outside the bus. It continuously monitors the current in each lamp. If current is flowing through a particular bus lamp circuit (i.e., the light is on), the monitor senses this and lights the corresponding monitor bulb. If the bus lamp burns out, current ceases and the corresponding monitor bulb goes out, indicating a fault. Once the defective lamp is replaced, and the warning lights are working normally again, this also should be shown by the monitor.

The Doran monitor is a reliable, long-life device, but as with most electrical instruments, it can be overheated and damaged if an overload occurs in a bus light. Such overloads can exist if a bus light circuit becomes shorted, forcing current through a coil in the monitor that exceeds the coil's rated capacity. Short circuits can occur if improper connections are made during installations, bus repairs, etc. If the monitor has an optional thermistor overload protection, the tail light circuits are overload-protected. (Thermistors are located on the bottom of the component side of the printed circuit board.)

If the Doran monitor is not working properly, see **Troubleshooting** for units equipped with incandescent lighting only. See **Calibration** for units equipped with LED lighting.

Troubleshooting

The Doran Warning Light Monitor™ does not display any indicator LEDs:

1. An overload situation has created an open circuit. Check the system fuses.

2. An overload or physical damage has burned or broken a conductor on the printed circuit board:

   - Extra lights have been added to the circuit; i.e., trailer lights, etc.:

     - Remove the extra lights from the circuit

     - Replace the damaged printed circuit board

   - Excessive vibration or abuse has resulted in a damaged monitor. Replace the printed circuit board

A particular LED on the Doran Warning Light Monitor™ does not display, but the bus running lights are operating properly:

1. There is an open coil in the monitor

   - The coil is burned due to an overload. Replace the coil kit.

   - A solder joint has weakened (a cold solder joint). Flow new solder on the connection.

   - The reed switch has failed. The reed has broken or the contacts have failed. Replace the reed switch kit.

   - The printed circuit board is broken or burned. Replace the printed circuit board.

   - There is an open in the LED circuit. Replace the LED.

A monitor LED indicator is on but, the bus running light indicated is not operating, or the bus running light switch is in the off position and the monitor indicates the running lights are operating:

   - Replace the coil and reed switch kit.

Neither the bus running lights nor the Doran Warning Light Monitor™ operate properly:

1. The running light bulb may be burned out. Replace the light bulb.

2. The overload thermistor has protected the circuit from overload. Remove the overload condition.

   • A short

   • Incorrect light bulb/s

   • Extra lights; i.e., trailer lights, etc.

Doran Calibration *(Universal Monitor Only)*
To self calibrate the monitor, ALL monitored lights must be in working order. For faster calibration, the operator may turn on as many exterior lights as possible at the start of the procedure. The operator will be required to activate these lights during the calibration procedure. Operator may begin with the tail/head lights on, hazard lights (for the turn signals), and the amber warning lights flashing (door closed).

1. Turn on ignition and start engine – Engine is running to assure proper voltage for operation and calibration. The GREEN LED voltage indicator at the bottom center of the monitor MUST BE ILLUMINATED indicating the voltage is within limits for proper operation. Before beginning calibration, allow time for the voltage to stabilize to its normal running voltage. After cranking the engine the battery voltage may be lower than normal. Allow time for the battery to recharge.

2. When the ignition is turned on, all LED's on monitor will be enabled for a few seconds to verify that all LED's are working.

3. To enter the calibration mode, press and hold the calibrate button through the face plate hole for longer than two (2) seconds. This button/hole may be found located at the bottom left corner of the bus image on the monitor face plate. The first light to calibrate will begin flashing when the unit enters calibration mode. You may use an object such as an allen wrench or paper clip to activate the switch.

4. The unit will begin calibrating each light in a sequence. Each light tested must be active at the time of the calibration. As each light is calibrated, the matching monitor LED will flash. Operator shall activate (if not active) the bus light corresponding to the flashing LED. The sequence is as follows:

   a. Left turn signal – switch on

   b. Right turn signal – switch on

   c. Stop lights (left, then right side 7" will flash) – press brake pedal

   d. Tail light (left, then right side 4" will flash) – switch on (brakes off)

e. Backup lights – press brake/clutch and engage reverse

f. Each Amber warning light – switch on with door closed

g. Each Red warning light – open door

5. Calibrated lights are indicated by the corresponding LED staying illuminated on the monitor. The unit continues to loop through the sequence flashing the un-calibrated lights until all lights are calibrated.

6. When all LED's are illuminated, turn off ignition to complete the calibration.

Circuit Breakers & Fuses

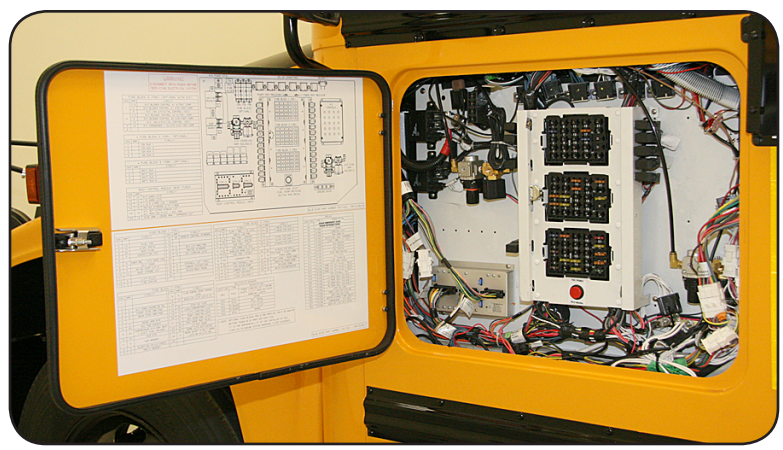
Body electrical systems are protected by fuses or circuit breakers. Most circuit breakers or fuses are located in a side mounted electrical box below the driver's window. If a current overload or "short" should occur in any body circuit, it will trip the circuit breaker. If a short occurs and the circuit breaker breaks, the circuit breaker will reset when the element cools; usually in about 15 seconds. A short may be indicated by blinking lights or fluctuating gauges. The shorted circuit should be corrected immediately. Refer to body or chassis master wiring diagrams. A complete wiring diagram is available from Blue Bird Corporation Technical Publications.

To access the electrical panel, open the access door located outside the bus below the driver's window. A reference decal is provided on the inside of the access panel.Use of appropriate amperage circuit breakers is required.

ACCESSORIES AND ADDED COMPONENTS

When adding accessories and aftermarket components, it is important to consider the results very carefully.

- Does the component over burden the electrical system?
- Does the accessory interfere with any of the driver's controls?
- Does the accessory interfere with the driver's field of vision?
- Heavy components and accessories must be mounted near, or below, the floor line to avoid raising the vertical center of gravity.
- Will passenger safety and comfort be adversely affected?



Scheduled Maintenance

A regularly-scheduled maintenance regimen will ensure that the bus you operate is always ready for safe, reliable, and efficient duty. Although it is assumed that maintenance tasks will be performed by your operation's Service Technician(s,) not by the Driver, the information in this chapter is provided for convenience, given that the Drivers Handbook will usually reside with the bus.

The Driver, however, is the individual most intimately familiar with the normal sounds, behaviors, and performance of the vehicle. The Driver should be alert to any unusual or changing conditions and bring them to the attention of the service staff. A few Notes pages are provided at the back of this handbook for that purpose.

For more comprehensive service and maintenance information, the Service Technician should obtain and become familiar with the current Blue Bird Service Manual for the particular model(s) being serviced.

Fluids & Filters

Fluids & Filters, Vision				
Fluid	Type	Capacity	Filter	Comments
Engine, Cummins ISB				
Engine Oil	High-Quality SAE 15W-40 heavy duty engine oil, such as Valvoline Premium Blue	21.4 Quarts (including filter) 19 Quarts (without filter change)		*See your Cummins ISB Owner's Manual for more details.*
Engine Coolant	Cummins, Fleetcool EX 50/50 premix (standard only)	6.8 Gallons (excluding heater system)	BB 0064641 Wix 24070	*Cummins equipped buses may have optional extended-life coolant installed. Never mix different coolant colors, types, or brands. See Engine Cooling System chapter for details..*
Transmission				
Transmission Fluid	Transynd™	7.4 Quarts (7 liters)	BB 0033381	*Transmission refill capacity is substantially less than the initial fill because some fluid remains in the transmission cavities after draining.*
Rear Axle				
Axle Oil (RS19-144)	Hypoid Gear Oil	33.3 pints (15.2 liters)		*See Rear Axle Viscosity Chart for appropriate viscosity.*
Axle Oil (RS21-145)		33.3 pints (15.2 liters)		
Axle Oil (RS23-160)		39.5 pints (18.7 liters)		
Front Axle				
Front Axle Grease	Chevron Dura Lith Grease EP NLGI 2	2.1 pounds		
Front Axle Oil	Chevron RPM Synthetic Transmission Fluid SAE 50	4 pints (1.9 liters)		
Brake System				
Brake Fluid	DOT 3		Fluid BB 0067254	*DOT 3 and DOT 5 must not be mixed. If brake system becomes contaminated with DOT 5, the system must be flushed, and major components may require replacement.*
Brake Interlock	DOT 5		Fluid BB 1940881	*On units with hydraulic brakes and brake interlock feature**
Hydraulic System				
Hydraulic Steering	Dexron III™	3 quarts (approximate)		
Pneumatic System				
AD-9 Air Dryer Element			BB 0020138	*On units with air brakes.*
AD-IP Air Dryer Element			BB 0066221	*On units with air brakes.*
		Fuel System		
Fuel Filter / Water Separator			BB 1967009	
		Other		
Windshield Washer Fluid		1.05 gallons		
Diesel Exhaust Fluid (DEF)		15 gallons	DEF Tank Filter BB 10011120	*DEF is an Aqueous Urea solution 32% (AUS 32). Must meet DIN V 70070.*

Rear Axle Viscosity /Temperature Chart				
Meritor Lubricant Specification	Description	Cross Reference	Minimum Outside Temperature	Maximum Outside Temperature
0-76-A	Hypoid Gear Oil	GL-5, S.A.E. 85W/140	+10° F (-12.2° C)	*
0-76-B	Hypoid Gear Oil	GL-5, S.A.E. 80W/140	-15° F (-26.1° C)	*
0-76-D	Hypoid Gear Oil	GL-5, S.A.E. 80W/90	-15° F (-26.1° C)	*
0-76-E	Hypoid Gear Oil	GL-5, S.A.E. 75W/90	-40° F (-40° C)	*
0-76-J	Hypoid Gear Oil	GL-5, S.A.E. 75W	-40° F (-40° C)	+35° F (+1.6° C)
0-76-L	Hypoid Gear Oil	GL-5, S.A.E. 75W/140	-40° F (-40° C)	*
** No upper limit on these temperatures. However, axle sump temperature must never exceed + 250° F (121° C).*				

Maintenance Task Schedule

Ensure that the Safety Information, warnings and instructions are read and understood before operation or maintenance procedures are performed. Use whichever interval listed (time, mileage, engine hours) occurs first. Engines operated in severe operating conditions may require more frequent maintenance. See engine manufacturer's specifications for more information.

As Specified by Engine Manufacturer	
Engine	
Test Engine Oil	Perform oil sample analysis per operators manual.

As Specified by Engine Manufacturer	
Cooling System	
Replace Coolant	See your Engine Operator's Manual. Use only premixed coolant(s) approved by the engine manufacturer. Never mix different types or brands of coolant.
Engine	
Replace Oil & Filter	See Engine operators manual for oil and filter specifications and maintenance interval.
Adjust Valves	See Engine manufacturer's Service Manual for interval.

As Specified by Transmission Manufacturer	
Transmission	
Adjust Transmission Shift Cable	See Transmission Chapter.

First 100 Miles Then Every 12,000 Miles	
Tires & Wheels	
Inspect & Tighten Lug Nuts	Torque to 450-500 ft lb with calibrated torque wrench. Do not over-tighten. Do not lubricate nuts or studs. Operating conditions may require more frequent checks.

First 1000 Miles Then Every 3 Months or 6000 Miles	
Frame	
Inspect & Tighten Body Tie Downs Body Tie Down Clamps	Inspect for missing, damaged rubber pads. Tighten clamps to 37–41 ft lb.
Inspect & Tighten Body Tie Downs Firewall Box Isolator Mounts	Inspect rubber discs for cracking or damage. Inspect spring & fastener for damage. Tighten to 52–56 ft lb.
Inspect & Tighten Body Tie Downs Front Isolator Mounts	Inspect rubber blocks for cracking or damage. Inspect spring & fastener for damage. Tighten to 52–56 ft lb.
Inspect & Tighten Body Tie Downs Rear Isolator Mounts	Inspect rubber discs for cracking or damage. Inspect spring & fastener for damage. Tighten bracket to 70–80 ft lb. Tighten Isolator to 54–58 ft lb.

First 1000 Miles Then Every 6 Months or 6000 Miles	
Axle & Suspension, Front	
Inspect & Tighten SofTek Spring Suspension U-Bolts	Tighten to 285–305 ft lb.
Axle & Suspension, Rear	
Inspect Comfort Air Suspension Ride Height	Shock length, eye-to-eye: 22.68" +/- 0.25"

First 1000 Miles Then Every 6 Months or 12,000 Miles	
Axle & Suspension, Rear	
Inspect & Tighten Comfort Air Suspension U-Bolts	Tighten 7/8" U-Bolts to 400–450 ft lb. Tighten 3/4" U-Bolts to 260–320 ft lb.

First 1000 Miles Then Every 12 Months or 12,000 Miles	
Heaters & Defrosters	
Inspect Front Heater Hoses & Clamps	Inspect for evidence of leaks or deterioration. Replace with proper parts.
Axle & Suspension, Front	
Inspect & Tighten AirTek Suspension Axle To Suspension Fasteners	Tighten to 285–305 ft lb.

First 5000 Miles Then Every 12 Months or 24,000 Miles
Transmission
Replace Transmission Sump Filter

First 5000 Miles Then Every 24 Months or 24,000 Miles
Transmission
Replace Transmission Main Fluid Filter

First 11,000 Miles Then Every 6 Months or 250 Engine Hours
Brakes
Replace Air Brakes Air Compressor Filter

First 11,000 Miles Then Every 6 Months or 5000 Miles	
Cooling System	
Inspect Charge Air Cooler	Inspect for clogging debris.

First Month Then Every 3 Months or 3000 Miles	
Cooling System	
Inspect & Tighten Hose Clamps	Tighten radiator hose clamps to 90 in lb. Tighten heater hose clamps to 45 in lb.

Every Day	
Doors	
Test Wheelchair Lift	Follow the manufacturers recommendations.
Emergency Equipment	
Inspect Fire Extinguisher Charge	Ensure that Extinguisher Charge is not expired.
Inspect Fire Extinguisher Mounting Bracket	Ensure that Extinguisher bracket is secure and operates correctly.
Inspect First Aid Kit Contents	Ensure that kit supplies are fully replenished, clean, and not expired.
Inspect First Aid Kit Mounting Bracket	Ensure that mounting bracket is secure and operates correctly.
Emergency Exits	
Inspect All Emergency Exits	Test all emergency exits for proper operation, including warning buzzer.
Warning Devices & Signs	
Test Stop Arms & Crossing Arms	
Windows	
Inspect All Mirrors	Clean, adjust mirrors.
Inspect All Windows	Clean windshield, door glass, driver's window, rear vision windows, rear door windows.
Brakes	
Inspect Air Brakes Air Lines & Fittings	Inspect for leaks or physical damage.
Drain Air Brakes Air Tanks	Drain daily in cold weather; weekly in warm weather.
Inspect Air Brakes Brake Chambers	See Air Brakes Chapter for inspection criteria.
Inspect Air Brakes Brake Shoes	Wear depends upon application environment. See Meritor Cam Brakes Appendix in Air Brakes Chapter of Service Manual for guidelines.

Cooling System	
Inspect Coolant Level	Adjust to proper level with premixed coolant of same type as installed. Never mix coolants of different colors, types, or brands. See engine Operator's Manual for details. See decal on vehicle showing original equipment.
Inspect Entire Cooling System	Visually inspect for any signs of leakage.
Electrical	
Inspect All Lights	Check all running, stop, marker, hazard, and warning lights for proper operation.
Engine	
Inspect Oil Level	See engine operators manual for oil specifications.
Fuel System	
Inspect Fuel Cap	
Inspect Water Separator Petcock Drain	Check for water contamination.
Intake System	
Inspect Intake Tract Duct & Elbow	Visually inspect for proper fit and sealing, cuts, abrasions, signs of dirt contamination.
Inspect Intake Tract Restriction Indicator	Replace filter element if indicator is red.
Steering	
Inspect Power Steering Fluid Level	Replenish to full mark. Dexron III or approved equal.
Tires & Wheels	
Inspect All Tires & Wheels	Check air pressure. Visually inspect tires, tread wear, lug nuts, including spare.
Transmission	
Inspect Transmission Fluid Level	Check production order for proper type of fluid to be added.

Every Week	
Seats	
Inspect & Tighten Passenger Seats Cusion Screws	Inspect for loose cushions clips.
Inspect Passenger Seats Seat Belts	Lubricate buckles, clean webbing as required. Replace any damaged webbing straps.
Inspect Passenger Seats Upholstery	Inspect for cuts, tears, wear and soiled areas.
Brakes	
Inspect Hydraulic Brakes Pads	Replace if worn to within 1/8" lining remaining.

Every 50,000 Miles	
Fuel System	
Inspect Spark Plugs	Inspect gap and condition; Inspect wiring

Every 60,000 Miles
Fuel System
Replace Fuel Filter

Every 90,000 Miles
Fuel System
Replace Spark Plugs

Every Month or 3000 Miles	
Doors	
Adjust Jack Knife Door Air Pressure	See Body Construction / Doors / Jack Knife Door
Lubricate Jack Knife Door Hinge Pins	LPS 1
Adjust Jack Knife Door Roller Bracket	Adjust for proper open/closed position.
Adjust Jack Knife Door Switch	See Body Construction / Doors / Jack Knife Door
Adjust Outward Opening Door Control Rod	
Adjust Outward Opening Door Control Rod Bracket	Adjust for full and secure closure without binding.
Adjust & Lubricate Outward Opening Door Linkage	Adjust linkage for firm closure, and to ensure rear panel closes first.
Lubricate Outward Opening Door Pivots	Lubricate pivot pins with LPS #1.
Adjust Outward Opening Door Roller Bracket	Adjust for full and secure closure without binding.
Lubricate Wheelchair Lift Lube Points	See model-specific literature provided with lift.
Emergency Exits	
Lubricate All Emergency Exits Hinges	LPS #1
Lubricate Rear Emergency Door Hinges	Lubricate at hinge grease fittings.
Lubricate Rear Emergency Door Hold-Open	Apply ASTM D4950 GC-LB Grade 2
Lubricate Roof Hatch Seal and Latch	Use silicone lubricant to prevent sticking of rubber seal. Spray silicone lubricant into latch mechanism.
Floor	
Inspect Floor Drains	Check drain hole in each body section under window for debris or obstruction.
Seats	
Lubricate Driver's Seat	Lubricate per manufacturers recommendation.
Inspect & Tighten Passenger Seats Mountings	Use standard torque for bolt size, thread type and grade.

Warning Devices & Signs	
Lubricate Stop Arm, Electric 4-Point Pivot	Lubricate four hinge pivot points with Try-Flow lubricant
Inspect & Tighten Stop Arm, Electric Fasteners	Check interior and exterior fasteners for loosening.
Windows	
Lubricate Passenger Windows Latches & Slides	Use silicone lubricant.
Brakes	
Inspect Hydraulic Brakes Fluid	DOT-3 brake fluid.
Doors	
Lubricate All Doors Vandal Locks	Apply spray lubricant into key locks. Use LPS #1 for sliding bolt locks.
Electrical	
Inspect Battery Electrolyte Level	Replenish with distilled water.
Every Month or 5000 Miles	
Warning Devices & Signs	
Inspect Stop Arm, Air Pressure	Adjust for full deployment and retraction.
Every Month or 12,000 Miles	
Axle & Suspension, Rear	
Inspect Rear Axle Lubricant Level	If low, refill to bottom of filler opening. Use same lubricant type as already installed.
Inspect Spring Suspension Whole Assembly	Visually inspect for damage.
Every 3 Months	
Exterior Structure	
Wash Body	Wash the vehicle in lukewarm or cold water. Do not use hot water or wash in the direct sunlight. Only cleaners with an HMIS rating of 1,0,0,0 or less should be used to clean the buses. See Exterior Cleaning section of Driver's Handbook for further information.
Every 3 Months or 3000 Miles	
Cooling System	
Inspect Radiator Fins	Clean debris from fins.
Inspect Water Pump Belt	Inspect condition and tension of belt.

Every 3 Months or 5000 Miles	
Brakes	
Lubricate Air Brakes S-Cam	See Meritor Cam Brakes Appendix in Air Brakes Chapter of Service Manual for guidelines.
Lubricate Hydraulic Brakes Calipers	Lube per Meritor specs.
Driveline	
Lubricate Driveshafts Slip Joint	Grease meeting NLGI Grade #2 grease specifications.
Lubricate Driveshafts U-Joint Bolts	Grease meeting NLGI Grade #2 grease specifications.
Inspect & Tighten Driveshafts U-Joint Bolts	Tighten to 45–50 ft lb.
Electrical	
Inspect Alternator Connections	Inspect for loose wires, damaged terminals, damaged insulators.
Inspect Battery Connections	Check for solid connection, tight fasteners and absence of corrosion.
Fuel System	
Inspect Fuel Lines	Inspect for leaks or signs of abrasion.
Inspect Fuel Tank Vent	Inspect for obstruction.
Intake System	
Inspect Air Cleaner Filter Element	Inspect for proper seating, secure lid. Replace if soiled, wet, or damaged.
Inspect Intake Tract All Fasteners	Inspect for signs of contaminate infiltration, loose clamps, wear spots, holes in piping.
Inspect Intake Tract Charged Air Tubing	Inspect for signs of contaminate infiltration, loose clamps, wear spots, holes in piping.
Inspect & Tighten Intake Tract Hose Clamps	Tighten to 10 in lb.
Inspect & Tighten Intake Tract Spring Loaded Clamps	Tighten to near full spring compression.
Inspect Intake Tract Support Bracket	Visual inspection. Repair damaged parts immediately.
Inspect & Tighten Intake Tract T-Bolt Clamps	Tighten to 50 in lb.

Inspect & Tighten Intake Tract Worm Gear Clamps	Tighten to 38–42 in lb.

Steering

Lubricate Axle Steering Linkage Drag Link	NLGI #2 EP multipurpose grease rated GC-LB or equivalent.
Lubricate Axle Steering Linkage King Pins	NLGI #2 EP multipurpose grease rated GC-LB or equivalent.
Lubricate Axle Steering Linkage Tie Rod Ends	NLGI #2 EP multipurpose grease rated GC-LB or equivalent.
Lubricate Intermediate Steering Shaft Slip Joint	Lubricate splines with multipurpose grease.

Every 3 Months or 24,000 Miles

Brakes

Inspect Air Brakes Air Dryer	See Bendix appendix for specific model in Air Brakes Chapter of Service Manual.
Inspect Hydraulic Brakes Booster & Master Cylinder	Inspect for signs of leakage or physical damage.

Every 6 Months or 5000 Miles

Warning Devices & Signs

Lubricate Destination Sign Hinges	
Lubricate Destination Sign Roller Gears	Lightweight grease such as White Lube.

Axle & Suspension, Front

Inspect AirTek Suspension Air Spring	Inspect for wear, abrasions, cuts, or other damage.
Inspect AirTek Suspension Ride Height	Shock length, eye-to-eye: 18.5" +-.25"
Inspect & Tighten AirTek Suspension Ride Height Control Valve Bolts	Tighten to 8–10 ft lb.
Inspect & Tighten AirTek Suspension Shackle Bracket Pivot Bolts	Tighten to 300–325 ft lb.

Every 6 Months or 6000 Miles	
Axle & Suspension, Front	
Inspect & Tighten AirTek Suspension Shock Absorbers	Inspect for signs of leakage, wear, or damage. Tighten mounting bolts to (125 ft.lbs - 135 ft,lbs)
Inspect AirTek Suspension Whole Assembly	Visually inspect for damage.
Inspect & Tighten SofTek Spring Suspension Shackle Bracket Pivot Bolts	Tighten to 380–420 ft lb.
Inspect & Tighten SofTek Spring Suspension Shock Absorbers	Inspect for signs of leakage, wear, or damage. Tighten mounting bolts to 215 ft lb.
Inspect & Tighten SofTek Spring Suspension Spring Pin Lock Bolts	Tighten to 380–420 ft lb.
Inspect SofTek Spring Suspension Whole Assembly	Visually inspect for damage.
Axle & Suspension, Rear	
Inspect & Tighten Comfort Air Suspension Shock Absorbers	Inspect for signs of leakage, wear, or damage. Tighten shock mounts to 150–180 ft lb.
Inspect Comfort Air Suspension Whole Assmebly	Visually inspect for damage.
Brakes	
Clean Air Brakes Check Valves	
Clean & Lubricate Air Brakes Treadle Valve	See Bendix Treadle Valve Appendix in Air Brakes Chapter of Service Manual.
Clean Air Compressor Governor	
Inspect Hydraulic Brakes Calipers	Inspect for signs of leakage or physical damage.
Adjust Hydraulic Brakes Park Brake Lever	Adjust engagement pressure at the lever to 90–100 lb.
Cooling System	
Replace Coolant Filter	
Lubricate Shutters Pivots	Use Never Seize spray lubricant.

Electrical	
Inspect Battery Posts	Clean and apply anti corrosion agent.
Exhaust System	
Inspect Exhaust Pipe Joints	Inspect for loose clamps, leaks, damage.
Fuel System	
Replace Fuel Filter Filter Element	
Clean Fuel Filter Inlet Screen	Clean. Replace if damaged.
Steering	
Lubricate Steering Gear Pitman Arm Pivot	NLGI #2 EP multipurpose grease rated GC-LB or equivalent. Use hand-operated grease gun.

Every 6 Months or 10,000 Miles	
Engine	
Test Engine Oil	Perform oil sample analysis per Cummins specifications.

Every 6 Months or 12,000 Miles	
Axle & Suspension, Rear	
Inspect & Tighten Comfort Air Suspension Air Spring Anchor Bolts	Tighten to 20–30 ft lb.
Inspect & Torque Comfort Air Suspension Air Spring Fasteners	Torque to 30–35 ft lb.
Inspect & Tighten Comfort Air Suspension Leveling Valve Mount Bolt	Tighten to 60–85 in lb.
Inspect & Tighten Comfort Air Suspension Lever Linkage Locknut	Tighten to 100–150 in lb.
Inspect & Tighten Comfort Air Suspension Lower Shock Mount	Tighten to 260–320 ft lb.
Inspect & Tighten Comfort Air Suspension Quick Align Bolts	Tighten to 525–575 ft lb.
Brakes	
Lubricate Air Brakes Cam Shaft Housing	NLGI #2 EP multipurpose grease rated GC-LB or equivalent. Use hand-operated grease gun.
Lubricate Air Brakes Haldex Slack Adjusters	See Haldex lubricant specs in Air Brakes chapter of Service Manual.
Lubricate Air Brakes Meritor Slack Adjusters	See Meritor lubricant specs in Air Brakes chapter of Service Manual.
Engine	
Inspect Belt & Tensioner	Closely inspect Belt & Tensioner
Clean Crankcase Breather	Clear breather hose of debris or obstruction.

Every 12 Months	
Exterior Structure	
Wax Body	Use of a nonabrasive wax is recommended to remove accumulated residue and eliminate any "weathered appearance". It is essential that units are not waxed in direct sunlight. See Exterior Cleaning section of Driver's Handbook for further information and approved waxes.
Intake System	
Test Intake Tract Restriction Indicator	Test indicator with vacuum gauge and pump.

Every 12 Months or 12,000 Miles	
Heaters & Defrosters	
Tighten Front Heater Fasteners	All fasteners holding such heaters in place in unit. For details on fasteners check installation prints.
Inspect, clean and replace Front Heater Filter & Screen	Wash filter and screen. If filter cannot be washed or is damaged, the filter MUST be replaced immediately. If a screen cannot be cleaned, a new screen must be installed immediately.
Inspect and clean Front Heater Heater Cores	Clean carefully with compressed dry air or vacuum and a soft bristle brush. Damaged fins should be straightened with a fin comb.
Inspect and clean Heater Cores	The core should be cleaned carefully with compressed dry air or vacuum and a soft bristle brush. Damaged fins should be straightened with a fin comb to prevent airflow restrictions.
Inspect, clean or replace Heater System Filter	The filter and screen are washable. If a filter cannot be washed or is damaged, the filter MUST be replaced immediately. If the screen cannot be cleaned, a new screen must be installed immediately. Filter may need to be cleaned or replaced more frequently in extreme dusty and dirty environments.
Axle & Suspension, Front	
Inspect & Tighten AirTek Suspension Air Spring Fasteners	See a installation. diagram for torque specifications.
Inspect & Tighten AirTek Suspension Clamp Group Hardware	Tighten to 285-305 ft lb.
Inspect AirTek Suspension Ride Height	Shock length, eye-to-eye: 18.57" +- .25"
Axle & Suspension, Rear	
Inspect Comfort Air Suspension Ride Height	Shock length, eye-to-eye: 22.68" +- .25"
Inspect & Tighten Comfort Air Suspension Shock Absorbers	Inspect for leakage or damage. Torque upper mount bolts to 50-70 ft lb. Torque lower mount bolts to 160-180 ft lb.
Inspect & Tighten Comfort Air Suspension Torque Arm Bolts	Torque to 150–205 ft lb.

Inspect & Tighten Comfort Air Suspension U-Bolts	Torque 7/8" bolts to 400–450 ft lb. Torque 3/4" bolts to 260–320 ft lb.
Inspect & Tighten Rear Axle U-Bolts	Tighten to 300–350 ft lb.
Inspect Spring Suspension Rebound Pins	Verify that cotter pins are installed.
Inspect & Torque Spring Suspension Shock Absorbers	Inspect for signs of leakage, wear, or damage. Torque locknuts to 75–100 ft lb.
Inspect & Tighten Spring Suspension Spring Radius Fasteners	Tighten locknuts to 100–125 ft lb.

Cooling System

Test Entire Cooling System	Pressure Test Cooling system.
Clean Radiator Fins	Clean as required.

Steering

Inspect Hydraulic Pump Body & Seals	Inspect for leaks.
Inspect Steering Gear Body & Seals	Inspect for leaks.

Every 12 Months or 24,000 Miles

Brakes

Clean Air Brakes Pop Off Valves

Fuel System

Inspect Fuel Pressure Regulator	Leak check all connections.
Inspect Injectors	Check for external leaks.

Steering

Replace Hydraulic Reservoir Fluid	Dexron III. Replace more frequently in severe operating conditions. Clean reservoir filter screen at each change. Replace filter if damaged.

Transmission

Inspect Transmission Vent	Clear vent of debris or obstruction.

Every 12 Months or 50,000 Miles

Axle & Suspension, Rear

Replace Rear Axle Petroleum Based Lubricant	Hypoid Gear Oil. Viscosity depends upon operating climate. See Viscosity/Temperature chart.

Every 12 Months or 90,000 Miles	
Axle & Suspension, Rear	
Replace Rear Axle Synthetic Lubricant	Viscosity depends upon operating climate. See Viscosity/Temperature chart.
Fuel System	
Inspect Controller	Check for damage. Check connection.
Inspect & Tighten Controller Mounting Bracket	
Inspect Fuel Lines	Check line routing securing points. Inspect lines for damage.
Inspect & Tighten Fuel Pressure Regulator	Must be securely attached to rail bracket.
Inspect Fuel Pressure Regulator Electrical Connectors	
Inspect & Tighten Fuel Pressure Regulator Mounting Bracket	
Inspect & Tighten Fuel Rail and Injectors	Rail bracket securely attached.
Inspect Fuel Tank	Check for rust, dents, or external impact damage.
Inspect Fuel Tank	Leak check all tank fittings and connections.
Inspect Fuel Tank Retaining devices	Check all tank retaining devices.
Inspect Injector Hose	Check for hose integrity.
Inspect & Tighten Injectors	Injectors securely attached to rail bracket.
Inspect Wire Harness	Check under hood routing and connections. Check under body routing and connections.

Every 24 Months or 24,000 Miles	
Brakes	
Clean Air Brakes Parking Brake Valve	See Bendix Appendixes in Air Brakes Chapter.
Clean Air Brakes Quick Release Valves	See Bendix Appendixes in Air Brakes Chapter.
Clean Air Brakes Relay Valves	See Bendix Appendixes in Air Brakes Chapter.
Clean Air Brakes Spring Brake Valve	See Bendix Appendixes in Air Brakes Chapter.

Every 24 Months or 225,000 Miles
Exhaust System
Replace DEF Supply Module Filter
Replace DEF Tank Head Unit Filter

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