



BLUE BIRD®

DRIVERS HANDBOOK

**BBCV
VISION**



CUMMINS
POWERED
Electric

U.S. Edition

2023

2023 DRIVER'S HANDBOOK



BLUE BIRD

**BBCV
ELECTRIC
POWERED**

10079903 A

U.S. Edition



Thank You...and Congratulations!

We at Blue Bird 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 Conventional (C-Type) school bus built upon a chassis designed specifically for pupil transportation, 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 Front Engine (FE) and Rear Engine (RE) siblings, comprises a complete line of built-from-the-ground-up buses, providing an ideal fit for any school route need. Unlike most C-Type school buses, the Vision is anything but ordinary. The electric powered Blue Bird Vision incorporates the latest technologies to the school bus lineup, ranging from its multiplex electrical system with intelligent micro processor instrumentation and advanced electric drive motor and power supply. The Vision is the result of Blue Bird's steadily innovative engineering and over 90 years of school bus experience, applied to the C-Type category.

Many technical refinements exist 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 for purpose. Built to last. Built to bring a new level of value, efficiency, and rugged reliability to your operation.

**INTRODUCTION**

1-1

DRIVER ORIENTATION

2-1

INSTRUMENTATION

3-1

PASSENGER AREA

4-1

ROUTINE OPERATION

5-1

PRE-TRIP INSPECTION

6-1

ENROUTE EMERGENCIES

7-1

BUS/COMPONENT IDENTIFICATION

8-1

CARE AND MAINTENANCE

9-1

GENERAL SPECIFICATIONS

10-1

INDEX

i-1



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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) as of the date of manufacture indicated on the compliance label and applicable Federal ADA requirements. Blue Bird offers many items as standard and optional equipment to meet federal, state, and local specifications and individual customer 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 conflicting.

Blue Bird 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.

**INTRODUCTION**

1-1

About This Driver's Handbook	1-2
Safety Precautions	1-2
Scope and Content	1-3
Backed By Blue Bird	1-4
Blue Bird Authorized Dealers	1-4
Blue Bird School Bus Support	1-4
Blue Bird Academy	1-4
Blue Bird Parts Sales	1-5
Blue Bird Technical Publications	1-5
Blue Bird Bus Warranty	1-5
Reporting Safety Defects	1-6
Driver Certification	1-7

LIST OF ILLUSTRATIONS

NONE.



About This Driver's Handbook

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

*Blue Bird Corporation
Attn: Technical Communications
3920 Arkwright Road Suite 200
Macon, Georgia 31210*

or email at:

techcomm@blue-bird.com

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 transportation 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 equipment 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 should 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 found in the Service Manual designated for the bus model it describes. This manual can be obtained through your Blue Bird dealer or an electronic copy of the manuals can be obtained through the Blue Bird Vantage portal at <https://vantage.blue-bird.com>. The service technician should refer to and become thoroughly acquainted with the Blue Bird Service Manual.

For replacement parts...

*Contact your local
authorized Blue Bird dealer.*

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 authorized dealer. 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.



Backed By Blue Bird

Blue Bird provides all the behind-the-scenes support you depend upon for success in your school transportation operation. Further details can be obtained through the Blue Bird Vantage portal at <https://vantage.blue-bird.com> and your Blue Bird authorized dealer.

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 Academy

The training branch of Blue Bird Technical Communications group offer ongoing training opportunities. Blue Bird Academy offers online and instructor led training opportunities, available to all dealership personnel, as well as the end customer. Access to the Blue Bird Academy can be found on the Vantage Portal at <https://vantage.blue-bird.com/Portal/Academy.aspx> available to dealers, dealer sales personnel, and technicians as well as the end user's personnel.



Blue Bird Parts Sales

We sell the world's finest school bus and the genuine Blue Bird parts to go with it. Maximize the life of your bus with the same high-quality parts that were used to build your Blue Bird bus. Only available from your locally authorized Blue Bird dealer and supported by Blue Bird's state of the art Parts Distribution Center. Contact your local blue bird dealer and discover the value that only genuine Blue Bird Parts can deliver.

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. Manuals are available in electronic .pdf format through the Blue Bird Vantage website. Paper manuals are available to 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 standard 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 appropriate agency in your area of operation, in addition to notifying Blue Bird.

For buses operating in the **United States**:

Contact the National Highway Traffic Safety Administration
(NHTSA) on the Vehicle Safety Hotline toll-free at:

1-888-327-4236 (TTY: 1-800-424-9153)

or write to:

*Administrator, NHTSA,
400 Seventh Street, SW
Washington, DC 20590*

For additional information regarding Motor Vehicle Safety, visit:

<http://www.safercar.gov>

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.

For buses operating in **Canada**:

Contact Transport Canada toll free at:

1-800-333-0510

or write to:

*National Headquarters
Transport Canada
330 Sparks Street
Ottawa, Ontario K1A 0N5*

For additional information regarding Road Safety, visit:

www.tc.gc.ca/roadsafety



Driver Certification

U.S. Federal regulations require that school bus drivers possess a Commercial Driver's License (CDL) with proper endorsements. 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.



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**DRIVER ORIENTATION****2-1**

Driver Orientation	2-7
Electric Drivetrain	2-7
Emergency Equipment Locations	2-9
First Aid Kit	2-9
Body Fluids Clean-up Kit	2-10
Fire Extinguisher	2-10
Triangular Roadside Hazard Reflector Kit	2-10
Flare Kit	2-11
Wrecking Bar	2-11
Emergency Exits	2-11
Emergency Door	2-12
Emergency Pushout Windows	2-13
Emergency Roof Hatch(es)	2-14
Entrance Door Emergency Release	2-15
Wheelchair Lifts	2-16
Driver's Area	2-17
Left Switch Console	2-18
Radio Switch Panel	2-19
Upper Left Switch Panel	2-21
Heater Control Panel	2-22
Lower Left Switch Panel	2-24



Right Switch Panel	2-28
Heat and Air Controls	2-31
E-Heater	2-31
Fuel-Fired Heater	2-32
Heater Filters	2-33
Heater Cores	2-33
Air Conditioning Controls	2-34
Driver's Instrument Panel	2-36
Steering Column	2-38
Steering Wheel Position	2-38
Left Switch Stalk	2-39
Right Switch Stalk	2-39
Cruise Control	2-40
Parking Brake (w/Air Brakes)	2-41
Parking Brake (w/Hydraulic Brakes)	2-41
Parking Brake (Hand Operated)	2-43
Driver's Seat, Standard	2-44
Driver's Seat, Air	2-46
Driver's Lap and Shoulder Belt	2-47
Interior Compartments	2-49
Circuit Breakers and Fuses	2-51



Accessories and Added Components	2-51
Doran™ Warning Light Monitor	2-52
Sleeping Child Check Monitor	2-53
Back-up Camera	2-53
Exterior Compartments	2-53
Hood Compartment	2-53
12V Battery Compartment	2-58
Tire Pressure Monitoring System	2-58

LIST OF ILLUSTRATIONS

Figure 2-1. RH View of Chassis Front	2-7
Figure 2-2. RH View of Chassis Rear	2-8
Figure 2-3. Emergency Equipment Locations	2-10
Figure 2-4. Emergency Door Components	2-12
Figure 2-5. Emergency Pushout Windows	2-13
Figure 2-6. Emergency Roof Hatch	2-14
Figure 2-7. Electrically Operated Door Emergency Release	2-15
Figure 2-8. Air Operated Door Emergency Release	2-15
Figure 2-9. Driver's Area	2-17
Figure 2-10. Left Switch Console	2-18
Figure 2-11. Radio Switch Panel	2-19



DRIVER'S HANDBOOK

Figure 2-12. Upper Left Switch Panel	2-21
Figure 2-13. Side Console	2-22
Figure 2-14. Heater Control Panel	2-23
Figure 2-15. Lower Left Switch Panel	2-24
Figure 2-16. Right Switch Panel	2-28
Figure 2-17. Coolant Loop	2-31
Figure 2-18. Webasto Digital Controller	2-32
Figure 2-19. Heater Filter Access	2-33
Figure 2-20. A/C Control Panel	2-34
Figure 2-21. Driver's Instrument Panel	2-36
Figure 2-22. Tilt/Telescopic Release Lever	2-38
Figure 2-23. Steering Column Positioning	2-38
Figure 2-24. Left and Right Switch Stalks	2-39
Figure 2-25. Parking Brake Foot Pedal	2-42
Figure 2-26. Parking Brake Hand Lever	2-43
Figure 2-27. Standard Driver's Seat	2-44
Figure 2-28. Flipping the Seat Bottom Up	2-45
Figure 2-29. Air Ride Driver's Seat	2-46
Figure 2-30. Driver's Shoulder Belt	2-47
Figure 2-31. Driver's Lap Belt	2-48
Figure 2-32. Interior Compartment Locations	2-49
Figure 2-33. Power Distribution Unit	2-50
Figure 2-34. Wiring Channels	2-50



Figure 2-35. PDU Fuse Panels	2-51
Figure 2-36. Doran™ Warning Light Monitor	2-52
Figure 2-37. Back-up Camera Monitor	2-53
Figure 2-38. Opening the Hood	2-54
Figure 2-39. Closing the Hood	2-55
Figure 2-40. LH View Under the Hood	2-56
Figure 2-41. RH View Under the Hood	2-57
Figure 2-42. 12V Battery	2-58
Figure 2-43. TPMS Display	2-59



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⚠ DANGER ⚠

UNDER NO CIRCUMSTANCES SHOULD ANYONE TOUCH THE ORANGE CABLES, ATTEMPT TO ACCESS THE BATTERY PACKS OR ANY OTHER HIGH VOLTAGE AREAS ON THIS BUS EXCEPT TRAINED SERVICE TECHNICIANS QUALIFIED TO WORK ON HIGH VOLTAGE EQUIPMENT.

Driver Orientation

This chapter is a brief tour of the Blue Bird Vision's features and equipment locations.

Electric Drivetrain

The Blue Bird Electric Bus uses a highly efficient direct drive system with no additional transmission or torque coupling devices. The motor torque and energy management strategy are controlled by the Vehicle Control Unit (VCU) to maximize the overall efficiency and performance.

The bus is controlled through a series of sensor inputs provided by the operator. The driver provides these inputs using everyday bus controls such as an accelerator pedal, pushbutton shifter, and service brakes. Driver inputs are sent to a VCU along with information from other operational sensors to provide a smooth and controlled operation.

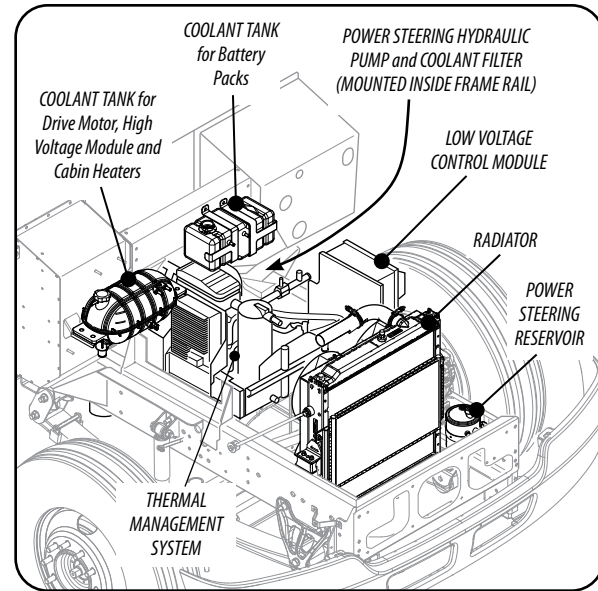


Figure 2-1. RH View of Chassis Front

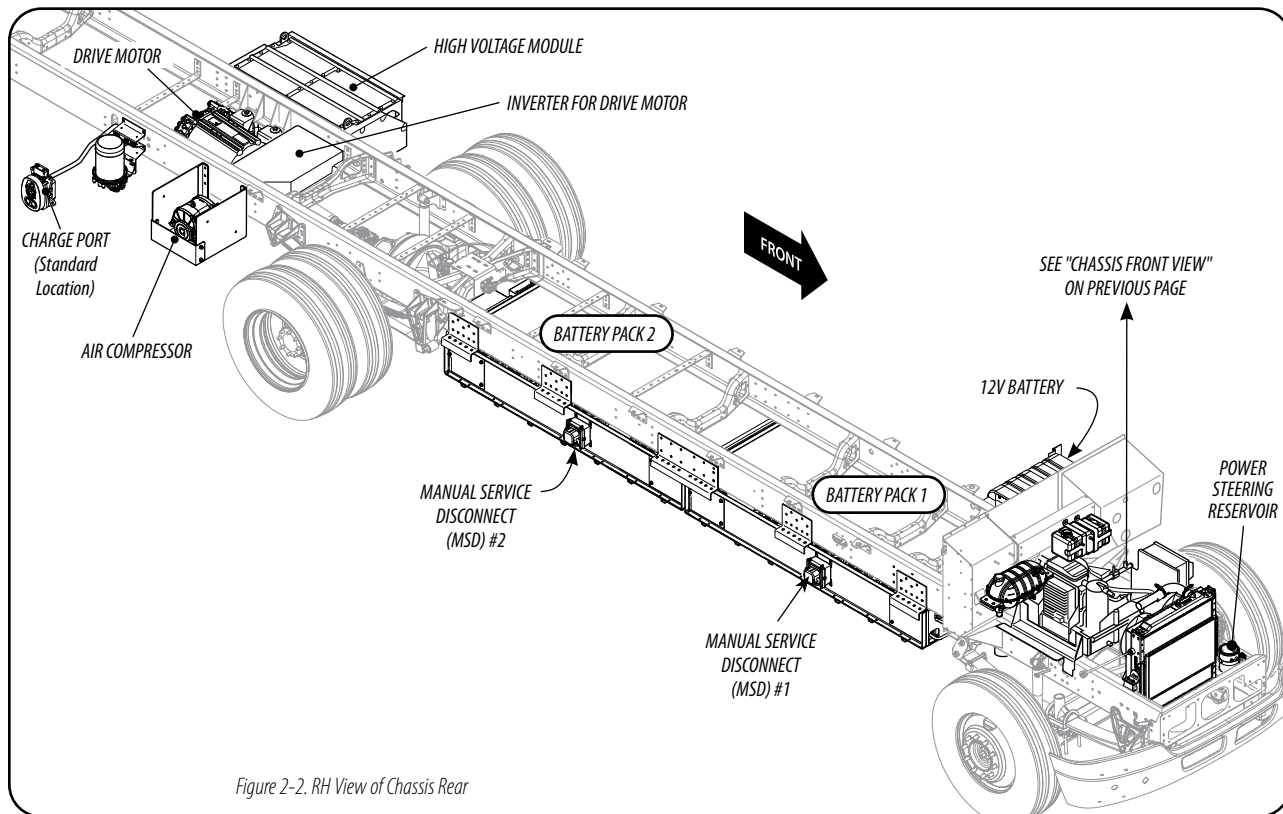


Figure 2-2. RH View of Chassis Rear



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, wrecking bar, 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 situation 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.



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

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 mounted vertically, forward of the entrance door stepwell or horizontally 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.

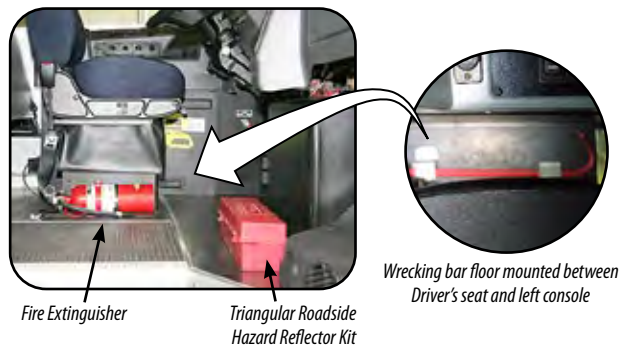


Figure 2-3. Emergency Equipment Locations

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 (LH) 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 [Enroute Emergencies](#) for instructions on deploying the reflectors.



Flare Kit

If the bus is equipped with a flare kit it will be located in the driver's area. 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.

Wrecking Bar

If the bus is equipped with a wrecking bar option, it will be located in the driver's area. The location may differ according to state specs.

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.

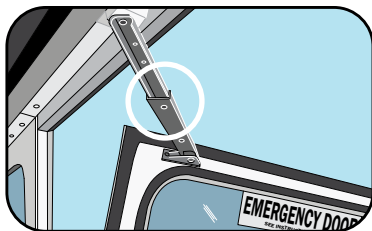
The bus is equipped with an audible alarm that sounds when an emergency exit is unlatched and the ignition switch is in the RUN position. On the Vision, the DID screen also identifies the open exit(s).



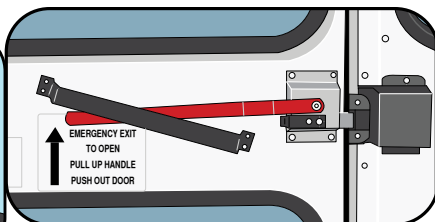
WARNING! All emergency exits should be inspected and tested daily. The labels and decals should be considered part of this inspection and should be maintained in a clearly legible condition.

Emergency Door

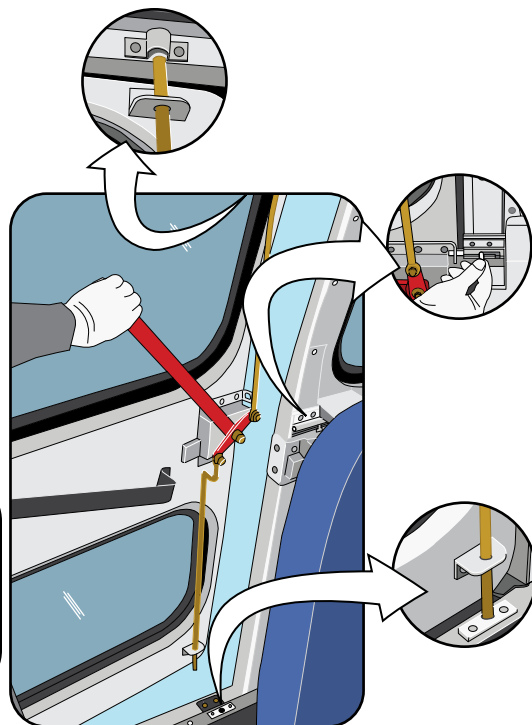
The emergency door is opened by lifting the long, horizontal handle all the way upward and pushing the door outward. The 3-point lock mechanism shown is optional. The door is equipped with a hold-open telescoping strut at the top of the opening. When the door is fully opened, a pawl in this strut rotates 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.



Door hold-open strut



Standard Emergency Door Latch with/Vandal Lock



Optional 3-Point Latch with/Vandal Lock

Figure 2-4. Emergency Door Components



WARNING! *The bus must not be operated with the emergency exit locked.*

Emergency Pushout Windows

Depending on body model, there may be as many as six emergency pushout windows in the passenger area of the bus. Pushout windows 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 lubricant may be used on the window latches and hinges to keep them in smooth operating condition.

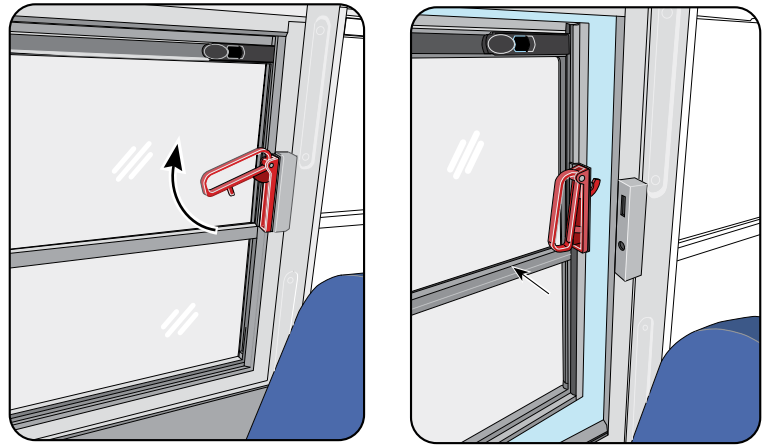


Figure 2-5. Emergency Pushout Windows



Emergency Roof Hatch(es)

Depending upon options and/or regulation, your bus may be equipped with one or two emergency roof hatches. Instructions on how to open/close the emergency roof hatch should be clearly displayed on the emergency roof hatch cover. The emergency roof hatch on your bus may be different from the one shown below. The driver should become completely familiar with the operation of their emergency roof hatch(es), prior to driving the bus.



Figure 2-6 Emergency Roof Hatch



Entrance Door Emergency Release

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

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 electrically-controlled 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 emergency 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 as indicated.



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.

Figure 2-7. Electrically Operated Door Emergency Release



Figure 2-8. Air Operated Door Emergency Release



Wheelchair Lifts

Blue Bird buses may be fitted with lifting platforms designed to aid in loading and unloading passengers. There are two optional wheelchair lifts available. The units available are the Ricon™ and the Braun™. Both offer a maximum of 48 in. (122 cm) lift from the ground to the level of the bus floor. For the correct operation and maintenance of the wheelchair lift on your bus, please refer to the operator's manual supplied by the OEM.



WARNING! *Operators should familiarize themselves with the lift manufacturer's operator's manual prior to loading passengers on the lift. All lifts have maximum weight limits that should never be exceeded.*

These lifts are operated by an independent, electro-hydraulic power system and are controlled by the operator from outside the bus. There is a master switch located in the driver's area that must be activated as well.

The bus electrical system powers a hydraulic pump, internal to the lift, which moves the lift up. The Down function is gravity type and is controlled by pressure relief valves. Manual operation of the Down function requires that the operator manually control the pressure relief valves. To provide for the manual Up function, the lift is fitted with a hand operated hydraulic jack, located on the right-hand (from inside the bus) side of the lift assembly.

A buzzer sounds when the door is unlatched or partially opened. The buzzer stops if the door is completely open.



Driver's Area

Blue Bird has designed many features into the Driver's Area. A one-piece molded dash housing spans the entire front of the bus. All gauges are incorporated in a single main instrument cluster. 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 diagrams 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.

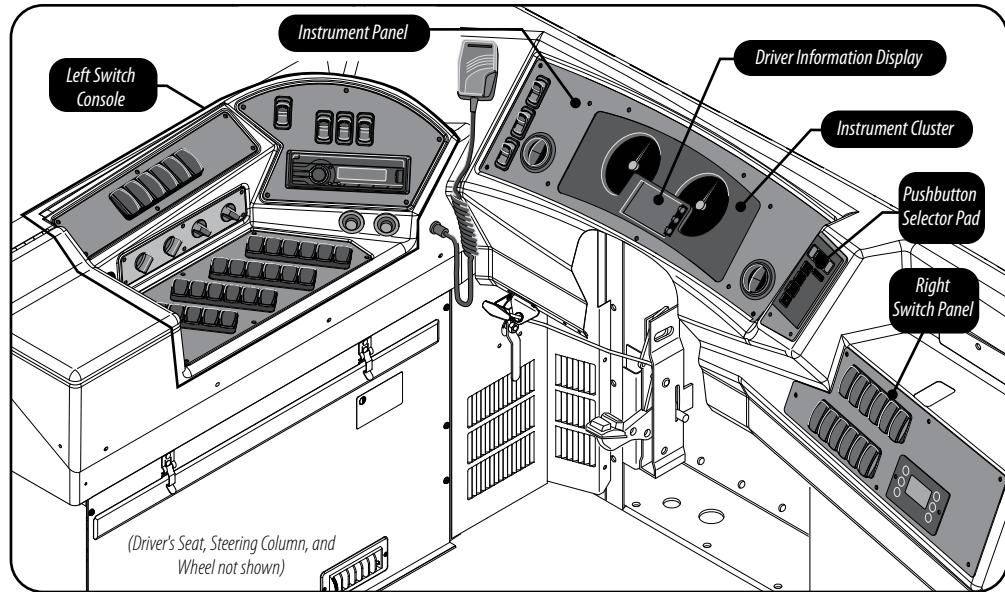


Figure 2-9. Driver's Area



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.

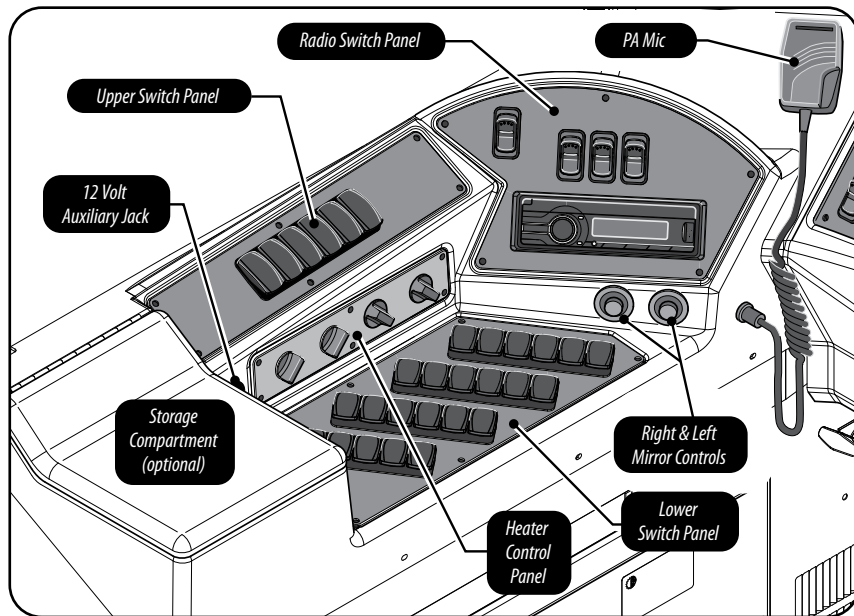


Figure 2-10. Left Switch Console



Radio Switch Panel

The Radio Switch Panel located to the left of the driver and shown below includes a Dual AM/FM media 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 the Radio Switch panel and their descriptive icons.

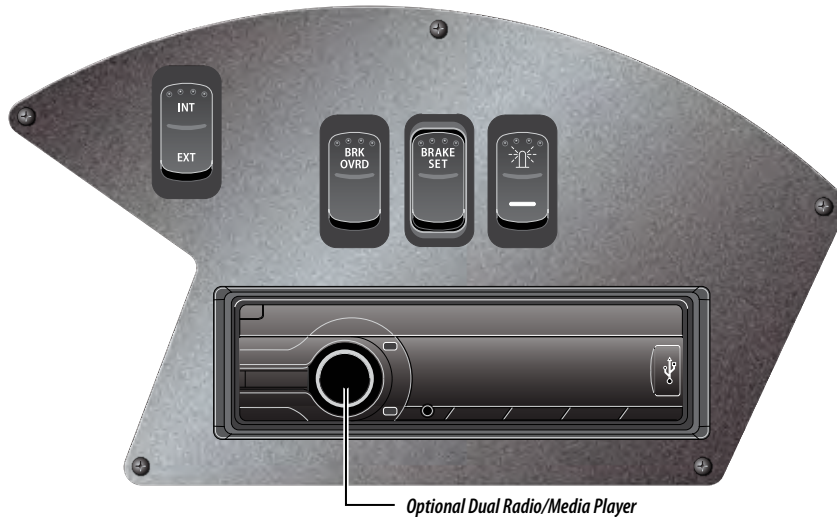
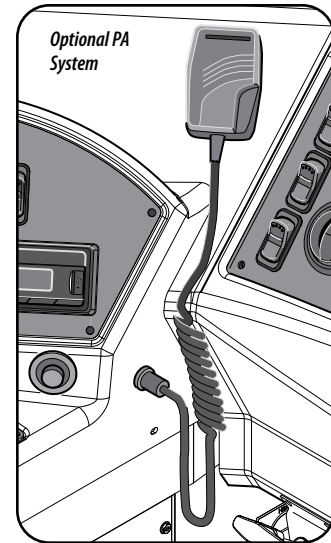


Figure 2-11. Radio Switch Panel





Public Address. Interior and exterior speakers.



Brake Interlock Set. Shrouded switch for activating the Brake Interlock System.



Brake Interlock Override. Momentary switch overrides Brake Interlock system.



Strobe Light. Controls the roof-mounted strobe light.





Upper Left Switch Panel

The Upper Left Switch Panel located directly below the driver's window 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.

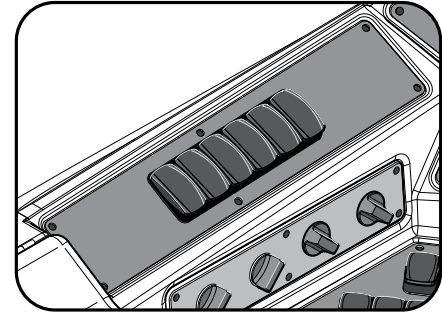
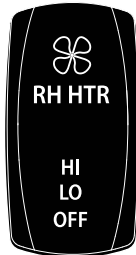


Figure 2-12. Upper Left Switch Panel

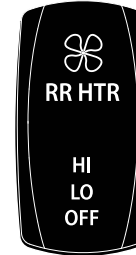
Stepwell Heater Fan. High, Low, and Off positions.



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



Underseat Heater Fan Switches. 3-position (High, Low, Off) 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.





Heater Control Panel

The Side Console contains controls for the Heater Control Panel which controls the front heater unit, housed immediately below the Side Console, left of the driver seat. Ducts from this unit also provide windshield defrosting.

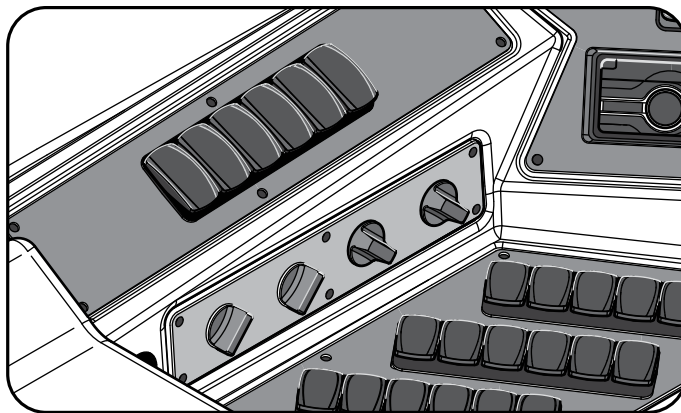


Figure 2-13. Side Console

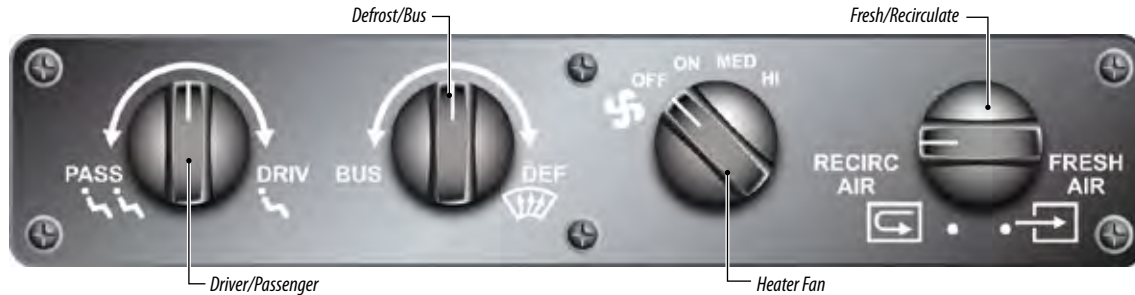


Figure 2-14. Heater Control Panel

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, three 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.



DRIVER'S HANDBOOK

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.

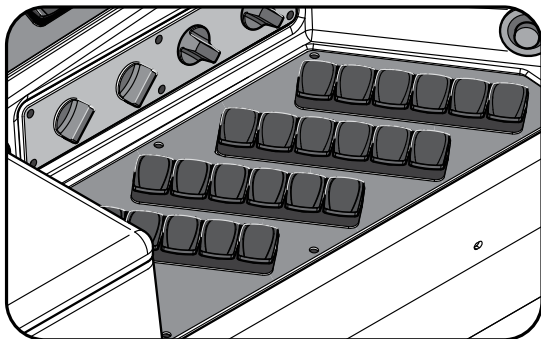
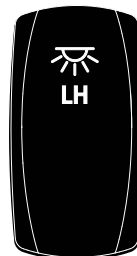


Figure 2-15. Lower Left Switch Panel

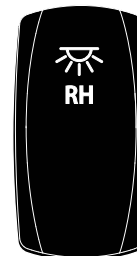
Rear Dome Lights. Turns on/off the overhead lights in the passenger area. Some Vision buses have two of these switches, one each for the dome lights in the front half and rear half or the right side and left side the bus.



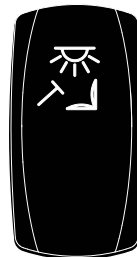
Left Side Dome Lights.



Right Side Dome Lights.



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



Warning Light Indicators. Red and yellow.





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. A momentary (amber) 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 Emergency. This momentary switch activates the red warning lights for use in the case of emergency such as a roadside hazard, regardless of entrance door position or Warning Light Master control switch position.



Warning Light Master. Enables entire warning light system. This switch must be on whenever the Warning Light 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 your 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.*



DRIVER'S HANDBOOK

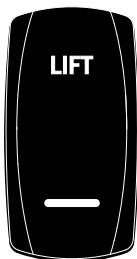
Noise Suppression. Yellow Switch. Momentary or on/off. When activated, certain noisy devices such as auxiliary fans, heater blowers, radio, PA system, and/or its speakers are disabled. This enables the driver to better hear ambient sounds, such as railroad signals and gate intercoms or personnel, etc.



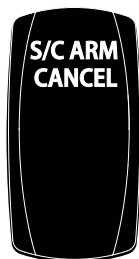
Automatic Traction Control Override. Momentary switch overrides Automatic Traction Control system. Resets at next ignition cycle.



Lift. Provides power for lift operation.



Stop Arm/Crossing Arm Cancel. Interrupts stop arm and/or crossing arm sequence. Pressing this momentary switch retracts the Stop Arm/Crossing Arm if they are extended.

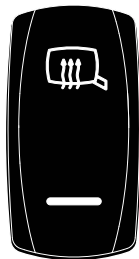


Fans. Left, center, and right auxiliary fans. High, low, and off positions. Fans are provided for general air circulation, driver comfort, and/or to help accelerate windshield de-fogging under certain conditions.





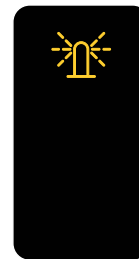
Mirror Defrost. Activates defrosting system for exterior rearview mirrors.



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



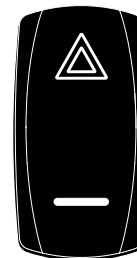
Strobe Indicator Light. Strobe light on.



Indicator Lights. Lift door open and/or Emergency door open.



Hazard Lights. This switch turns on/off the front and rear turn signals as blinking hazard flashers (optional location). Standard location is on the steering column.





Right 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 relocated air door emergency release and a location for electronic air conditioning controls may be located here.

A list of switches, indicators, and their descriptive icons found in this panel on listed on the next page.

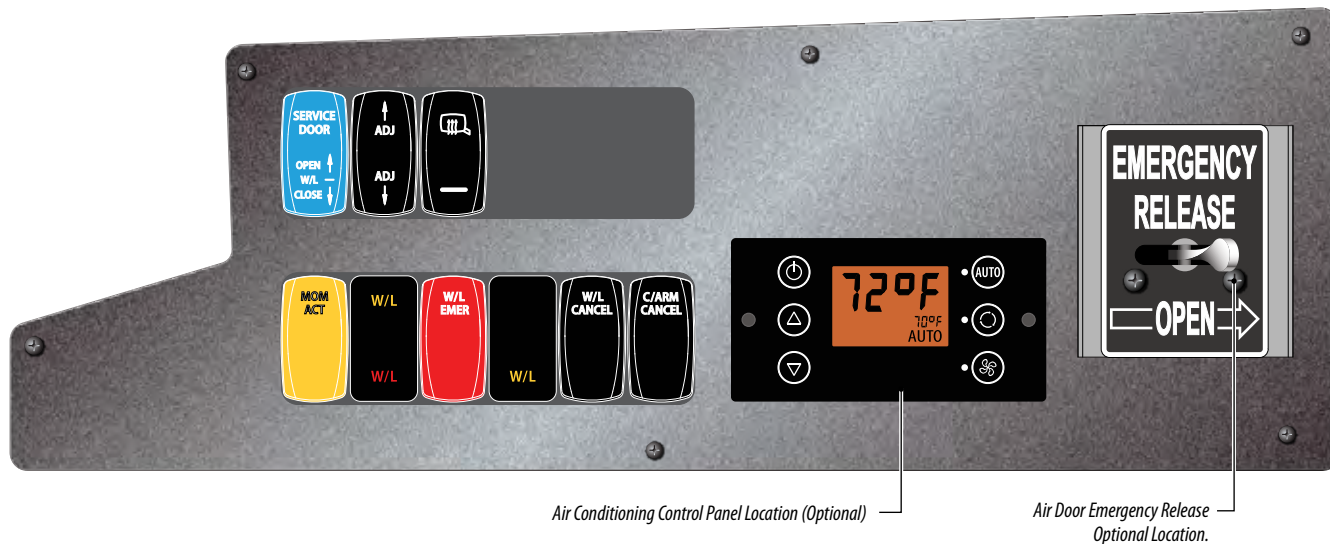


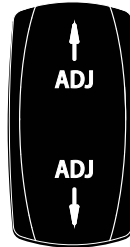
Figure 2-16. Right Switch Panel



Electric Entrance Door. Blue 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.



Accelerator Pedal Adjustment. Allows forward and rearward movement of the accelerator and brake pedal. Provides a 3 in. range of movement.



Warning Light Master. Enables entire warning light system. This switch must be on whenever the Warning Light 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 and Warning Light MASTER railroad crossings.





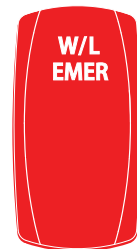
Warning Light Indicators. Red and yellow.



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



Override. Activates the red warning lights and stop arm regardless of entrance door position or master switch position (Feature Specific).





Heat and Air Controls

E-Heater

The passenger area in the electric bus obtains its heat from a Coolant Loop that passes through electric heaters in the Thermal Management Unit. The temperature of this loop is maintained separately from the electric motor and batteries. To initiate interior heating, use the heat request switch located on the lower left of the driver's instrument panel.



Heat Request Switch

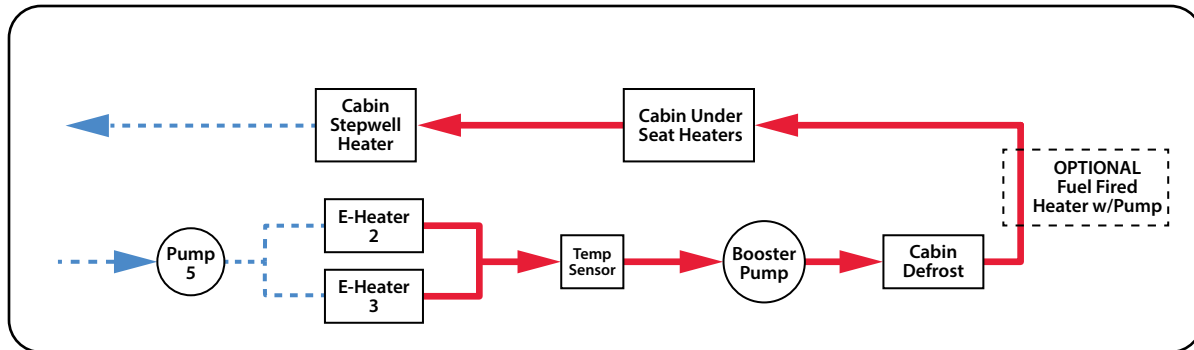


Figure 2-17. Coolant Loop



Fuel-Fired Heater

To supplement the heating system in extremely cold climates, an optional diesel fuel-fired Webasto heater is offered as an option. This heater is mounted in a compartment on the LH side of the skirt, forward of the rear axle.



WARNING! *The exhaust pipe for the Webasto heater exits the skirt line just below the compartment. The pipe and exhaust can be very hot, even when the unit is not running and may cause burns if it comes in contact with skin. Use caution when around the heater.*

The system has a 25 gallon tank mounted between the frame rails, just behind the electric motor in the overhang of the bus. The tank fill is located behind a spring-loaded door on the LH side of the bus between the rear axle and the rear of the bus. Status of the fuel level in this tank can be accessed through the message display center in the cluster. See [Instrumentation](#) for more details.

A digital timer located in the Upper LH switch panel can be programmed to have the heater preheat the passenger compartment of the bus prior to driving the route. For information on how to program the timer, refer to the information sheet provided with your bus or visit:

<https://online.flippingbook.com/view/62879/>

NOTE: For buses equipped with the 12V battery disconnect switch:

When using the preheat function, make sure that the 12V battery disconnect switch shows ON. The heater gets its power from the 12V battery and if disconnected, it will be unable to start and run the preheat cycle.



Figure 2-18. Webasto Digital Controller
(located in the heater switch panel)



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 (19,312 km).

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 clean. 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 (19,312 km).

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.



Figure 2-19. Heater Filter Access



Air Conditioning Controls

An optional rooftop Air Conditioning (A/C) unit is available for your electric bus. If ordered, this rooftop system will have a separate control panel mounted on the dash. The graphics in the control panel may display operating modes other than cooling such as heating and ventilation. These optional modes should be ignored because they are not part of your A/C unit. This control panel will only operate the air conditioner and is independent of the heating controls.

To operate the air conditioning system, the bus must be ENABLED as indicated in the instrument panel's right warning bank. For complete instructions on how to enable the bus; refer to [Starting Your Blue Bird Electric Bus](#). Once enabled, press the ON/OFF button on the A/C control pad. This will illuminate the control pad and a green LED next to the AUTO button will light up. After a brief system self check (approximately 1 minute) the compressor will engage automatically provided the temperature setting is below the ambient (outside) temperature.

To change the temperature setting press the Up arrow to increase the temperature setting or press the DOWN arrow to decrease the temperature setting. The temperature setting can be adjusted in 1 degree steps between 59 °F (15 °C) and 82 °F (28 °C).

Before shutting the bus down, turn the A/C system off by pressing the AUTO button on the A/C control pad. This will stop the cooling function by disengaging the compressor and de-energizing the electronics. *This must be done before shutting the bus down.* After 1 to 2 minutes, the electronics will be de-energized and the bus can then be shut down. See [Shutting Down Your Blue Bird Electric Bus](#).

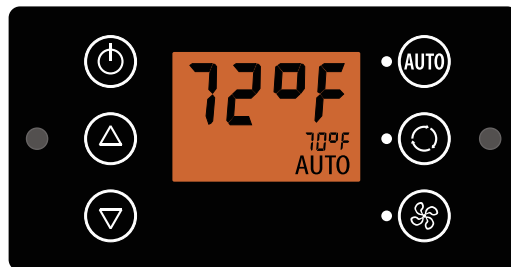


Figure 2-20. A/C Control Panel



ON/OFF button. Panel will show temperature that was last set and be in Auto Mode.



Use to increase temperature setting. Also used to increase blower speed when blower button is active.



Use to decrease temperature setting. Also used to decrease blower speed when blower button is active.



Press the AUTO button to deactivate A/C system.



Used to activate the fresh air/circulation system using outside air for 10 minutes, then shuts off.



Blower. Used to manually set blower speed or to put in automatic mode.



DRIVER'S HANDBOOK

Driver's Instrument Panel

The driver's instrument panel behind the steering wheel and shown here consists of the instrument panel cluster, headlight switch, heat request switch and panel dimmer. If your bus is equipped with air brakes the parking brake valve is also located in this panel. See [Instrumentation](#) for more details.

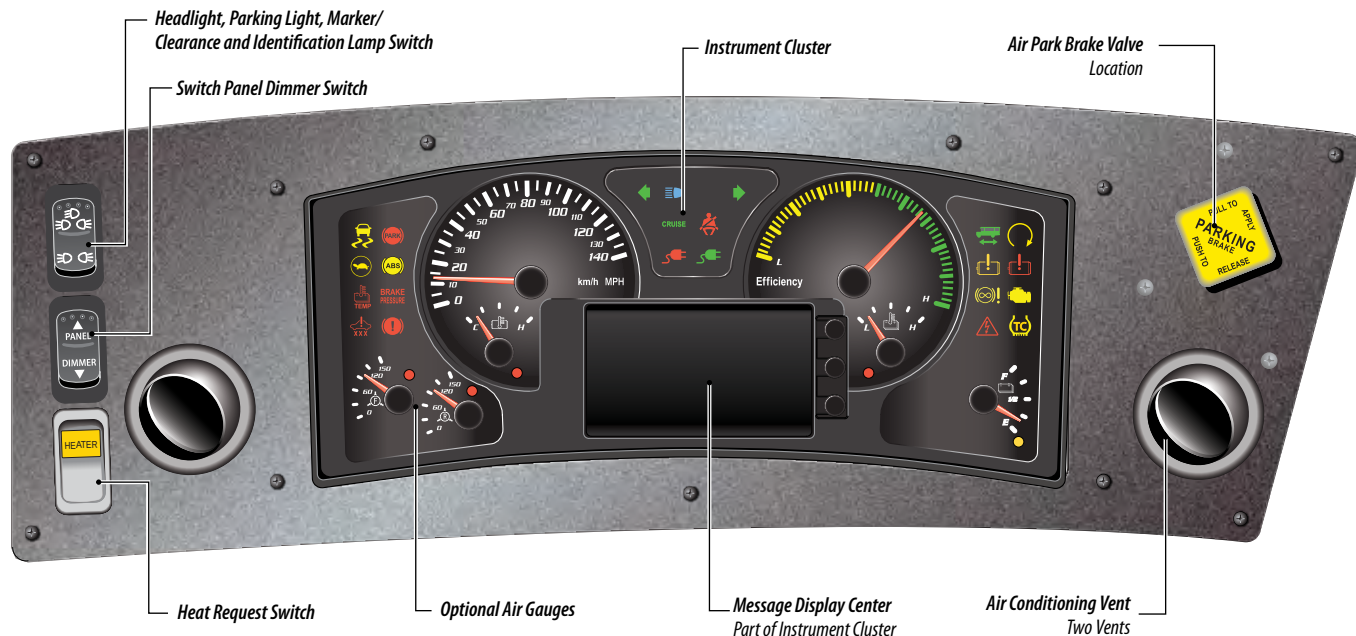
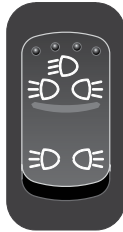


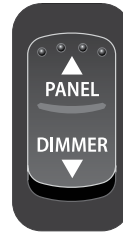
Figure 2-21. Driver's Instrument Panel



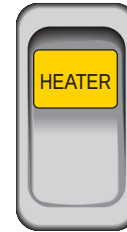
Headlights/Parking/Marker/Clearance and Identification Lights. This switch turns headlights on and off, or turns on Parking Lights.



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



Heat Request Switch. Provides the necessary control signal to request interior heat. When activated, the switch has an amber backlight.



Other switches found in driver's area:

Exterior Light Check. Momentary switch activates automated Exterior Light Check feature. See Daily Pre-Trip Inspection.





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/telescopic adjustment of the steering wheel. This is a 2-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.

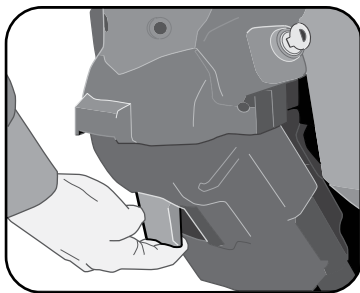


Figure 2-22. Tilt/Telescopic Release Lever

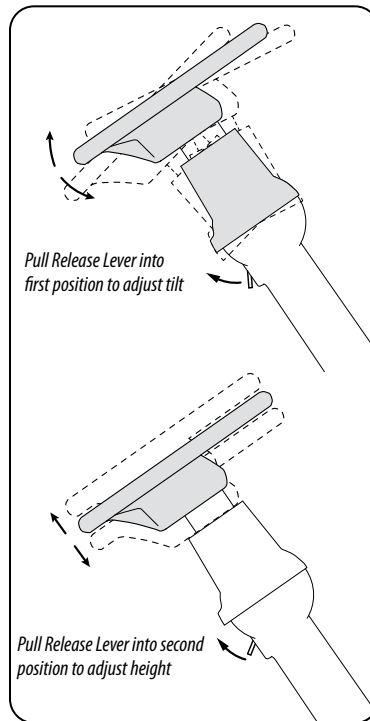


Figure 2-23. Steering Column Positioning

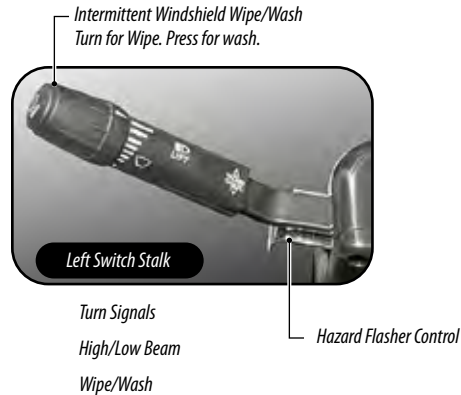


Figure 2-24. Left and Right Switch Stalks

Left Switch Stalk

The left switch 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, move 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 low, high, and 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.

Right Switch Stalk

The right switch stalk contains the cruise controls.



Cruise Control

The optional Cruise Control is provided 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.



WARNING! *Always apply the parking brake even with a transmission equipped with a Park (P) selection. Do NOT rely on the transmission park pawl alone to prevent the bus from rolling.*



Parking Brake (w/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. See [Routine Operation](#) for more details.



Parking Brake (w/Hydraulic Brakes)

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

A control cable leads from the parking brake to the parking brake pedal. The parking brake pedal is located below the driver's instrument panel to the left of the steering column.



WARNING! *This type of 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. Always apply the brake fully, pressing it down until it reaches the limit 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 release lever and pull until the parking brake is fully released. See [Routine Operation](#) for more details.



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.

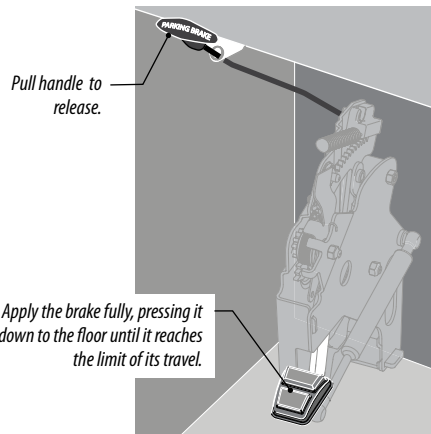


Figure 2-25. Parking Brake Foot Pedal



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 of the surface, the parking brake will not function and the bus may move.

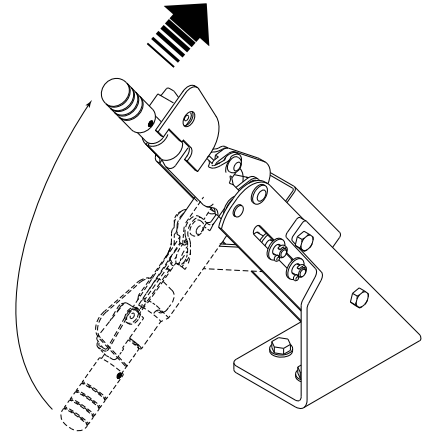


Parking Brake (Hand Operated)

Optionally, your bus may be equipped with a right side Parking Brake Hand 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:

1. Grasp the handle of the lever and pull firmly upward until it snaps over the center position.
2. Continue to pull the lever upward until it is against the top stop.
3. Now, press the lever downward to the Lock position. Stop to ensure the lock mechanism is secure.
4. To verify that the release button is locked, press down on the button.
5. To release the parking brake, apply the service brake to prevent movement when the parking brake is released.
6. Then, grasp the parking brake lever with the right hand and lift up.
7. Press the release button on the grip and lower the lever fully all the way against its lower stop.



When applying the parking brake, pull up and then press down to ensure lock mechanism is secure. (Parking Brake Decal located at right of steering column on lower dash panel.)

Figure 2-26. Parking Brake Hand Lever

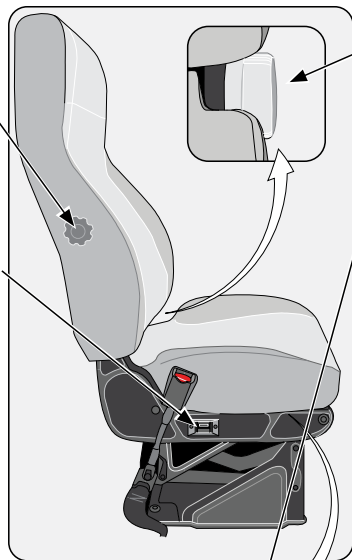


Driver's Seat, Standard

The standard driver's seat is mounted on a spring-loaded pedestal. Several manual adjustments are provided for maximum control, safety and comfort:

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.

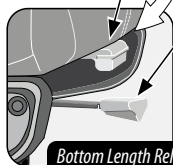
Height Control. A hand operated slide handle on the right side of the seat allows adjustment of the height of the seat. To raise the seat, crouch in the sitting position but do not apply your weight to the seat. Slide the lever toward the rear. This allows the seat base to raise to the desired position. 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 desired 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.

Seat Bottom length. Under the front edge of the seat bottom 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.

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.



Bottom Length Release &
Fore/Aft Slide Release

Figure 2-27. Standard Driver's Seat

**To Flip the Seat Bottom Up:**

1. Pivot the seat bottom forward so that it clears the seat back.
2. Hinge forward to gain service access to the seat pedestal mechanism.

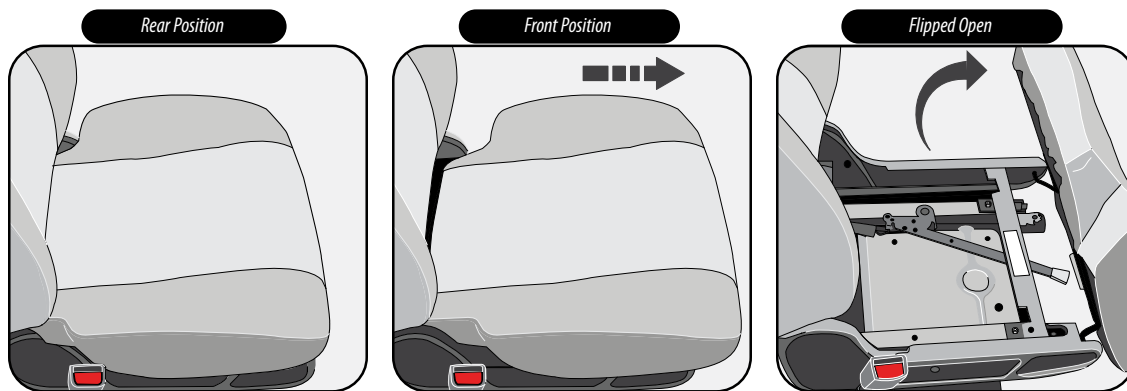


Figure 2-28. Flipping the Seat Bottom Up



Driver's Seat, Air

The air ride driver's seat 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.

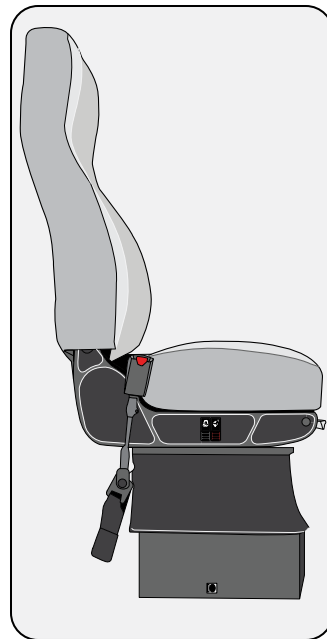
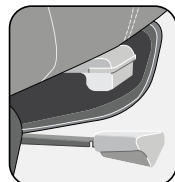
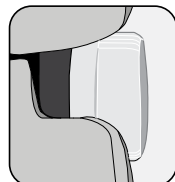


Figure 2-29. Air Ride Driver's Seat



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.

1. 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.
2. Lift the seat slightly and pivot it forward.
3. Press down firmly into position.

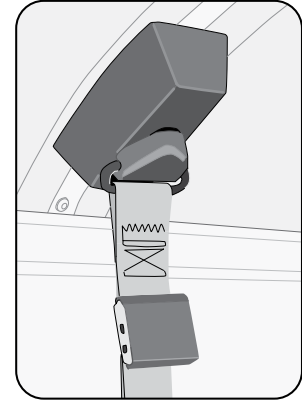
NOTE: Pivoting the seat bottom forward in this way also clears the seat bottom from the seat back, allowing the bottom to be hinged forward to gain service access to the seat pedestal mechanism.

Driver's Lap and Shoulder Belt

This belt is designed to reduce the risk of injury to the driver during an accident. When used properly, it provides the driver with increased protection. However, when used improperly, the ability to provide this safety is compromised. Proper shoulder and lap belt adjustments are necessary to allow the restraints to work effectively.

To use the seat belt/shoulder harness:

1. Adjust the driver's seat for maximum comfort and stability.
2. Sit up straight with your hips and back firmly positioned against the back of the seat.
3. Pull out an adequate amount of belt webbing and engage the buckle in the buckle receptacle until it clicks, ensuring that the belts are not twisted and that they lay flat across the chest and thigh/hip area.
4. The retractors will pull the harness snugly into place. Test that the belt is secure by tugging on it.



The upper shoulder belt height adjustment is for proper belt position across the driver's chest. Adjust to place belt at the desired height.

Figure 2-30. Driver's Shoulder Belt



WARNING! *Do NOT place the shoulder belt behind you. This will greatly reduce the belt's ability to protect you from serious injury in case of an accident.*

The lap belt should fit snugly across the upper thigh area, not the abdominal region. The shoulder harness should be adjusted to fit across your collarbone (between the base of your neck and your shoulder). Use the shoulder belt height adjustment to raise or lower the belt to the most comfortable position on the collarbone. The buckle can be released by pressing the red button on the buckle receptacle.



WARNING! *The driver's lap and shoulder belt should be worn any time the bus is in motion.*

NOTE: Refer to *Routine Operation* in this manual for information on specific visual and audible alarms, as well as notifications associated with this system.

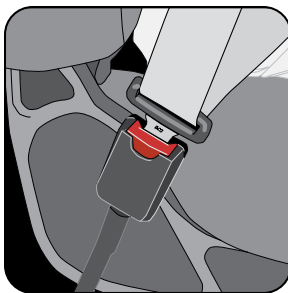


Figure 2-31. Driver's Lap Belt



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 electrical 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.

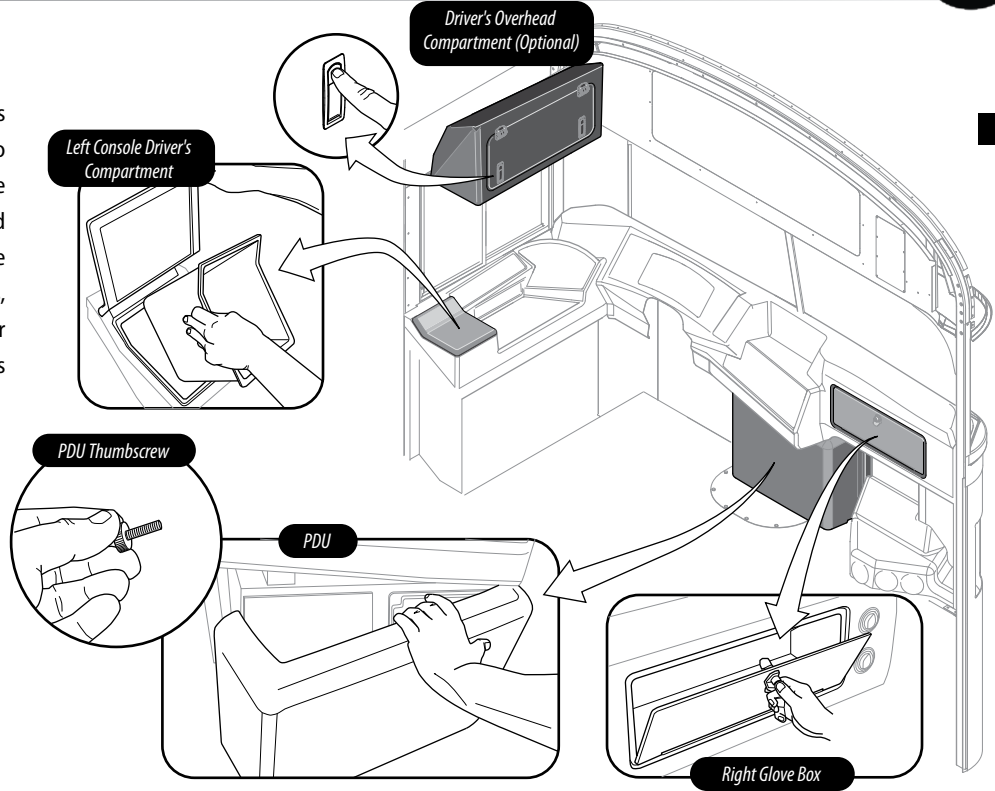


Figure 2-32. Interior Compartment Locations



DRIVER'S HANDBOOK

Power Distribution Unit. The large black cover below the center of the dash is the main chassis and body electrical panels 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 Chassis Power Management Module (PMM). The PDU also contains the chassis and body 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.

Driver's Overhead Storage Compartment. This optional box is mounted above the driver's side window with a flush door opened by dual push button latches.

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

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



Figure 2-33. Power Distribution Unit

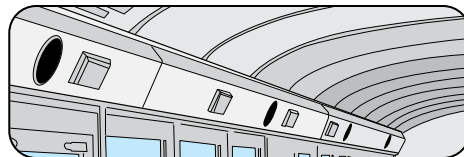


Figure 2-34. Wiring Channels



Circuit Breakers and Fuses

The electrical system is protected by fuses as standard. Manual reset circuit breakers are optional. Chassis and body circuit breakers or fuses are located on Printed Circuit Boards (PCB)s behind the PDU cover at the center of the bus below the dashboard. If a current overload or short should occur in any circuit, it will blow the fuse or trip the circuit breaker. If a short occurs and a fuse blows, the fuse will need to be replaced. If a circuit breaker breaks, the circuit breaker can be reset by pressing the tab located on the breaker. 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.

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?

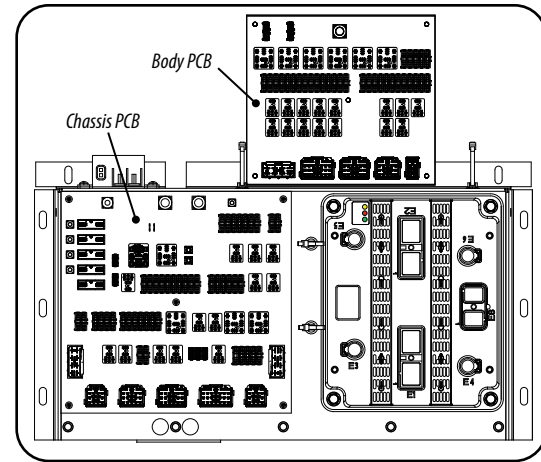


Figure 2-35. PDU Fuse Panels

Wiring Diagrams

To access all electrical wiring diagrams for your Blue Bird Bus visit our Customer Access web site and enter your body number which is located on the body serial and service number plate above the windshield at:

<https://vantage.blue-bird.com>



Doran™ Warning Light Monitor

The Doran™ monitor is a vehicle light monitor device. If current is flowing through one of the bus lamp circuits, the vehicle multiplex module electronics senses it and communicates over the J1939 data link to the Doran™ monitor to illuminate the corresponding Light Emitting Diode (LED) on the monitor. 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.

If the Doran™ monitor is not working properly, notify your service personnel or see troubleshooting procedures in your Blue Bird Service Manual.

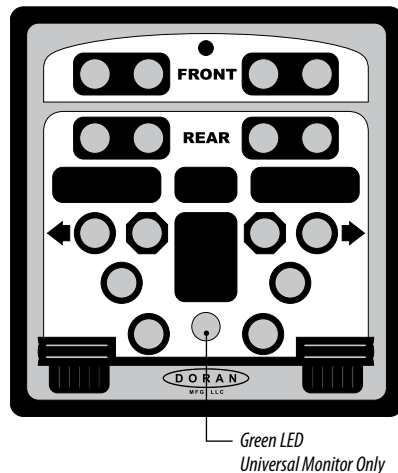


Figure 2-36. Doran™ Warning Light Monitor



Sleeping Child Check Monitor

Your bus may be equipped with a Sleeping Child Check system. This feature uses a Sleeping Child Check Monitor that once activated requires the operator to walk to the rear of the bus and press a deactivation switch on the rear wall to prevent an alarm from occurring. The purpose is to require the operator to check the bus for pupils that may be sleeping, hiding or remaining after each route has ended.

Depending on which feature your bus is equipped with, the alarm can be armed in one of several ways. Turning on the ignition and/or warning lights and/or entrance door will arm the system. If the alarm is activated the headlights and horn and/or red warning lights will be activated and begin to flash and the horn will sound on and off repetitively. If the alarm is activated the operator should close the entrance door and push the deactivation switch in the back of the bus. This system will disarm itself automatically after 10 minutes.

Back-up Camera

When the bus is shifted into Reverse, a display for the Back-Up Camera will be activated and appear in the instrument cluster message display center screen. See [Pre-trip Inspection](#) for additional information.

Exterior Compartments

Hood Compartment

The 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 regular service components.



Figure 2-37. Back-up Camera Monitor



To open the hood:

1. Unlatch the right side hood latch.
2. 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.
3. At the front of the bus, grasp the handhold above the center of the grille.
4. Pull lightly backward. The torsion hinge is balanced in such a way as to require very little effort to lift the hood.
5. As the hood raises, control it with the free hand, especially in windy conditions.
6. Open the hood fully until it stops slightly beyond vertical. A spring-cushioned cable on the underside 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.



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.

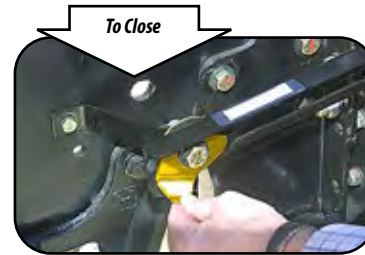


The hold-open strut automatically trips to prevent accidental closure.

Figure 2-38. Opening the Hood

**To close the hood:**

1. Standing just forward of the right front tire, grasp the hood overhead with the right hand.
2. With the left hand, rotate the release cam of the hold-open strut and 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.
3. Slowly lower the hood onto its rear supports.
4. 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.
5. Close the latch handle fully.
6. Similarly, secure the latch on the left side of the vehicle.



Rotate the hold-open cam to release the strut.



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

Figure 2-39. Closing the Hood

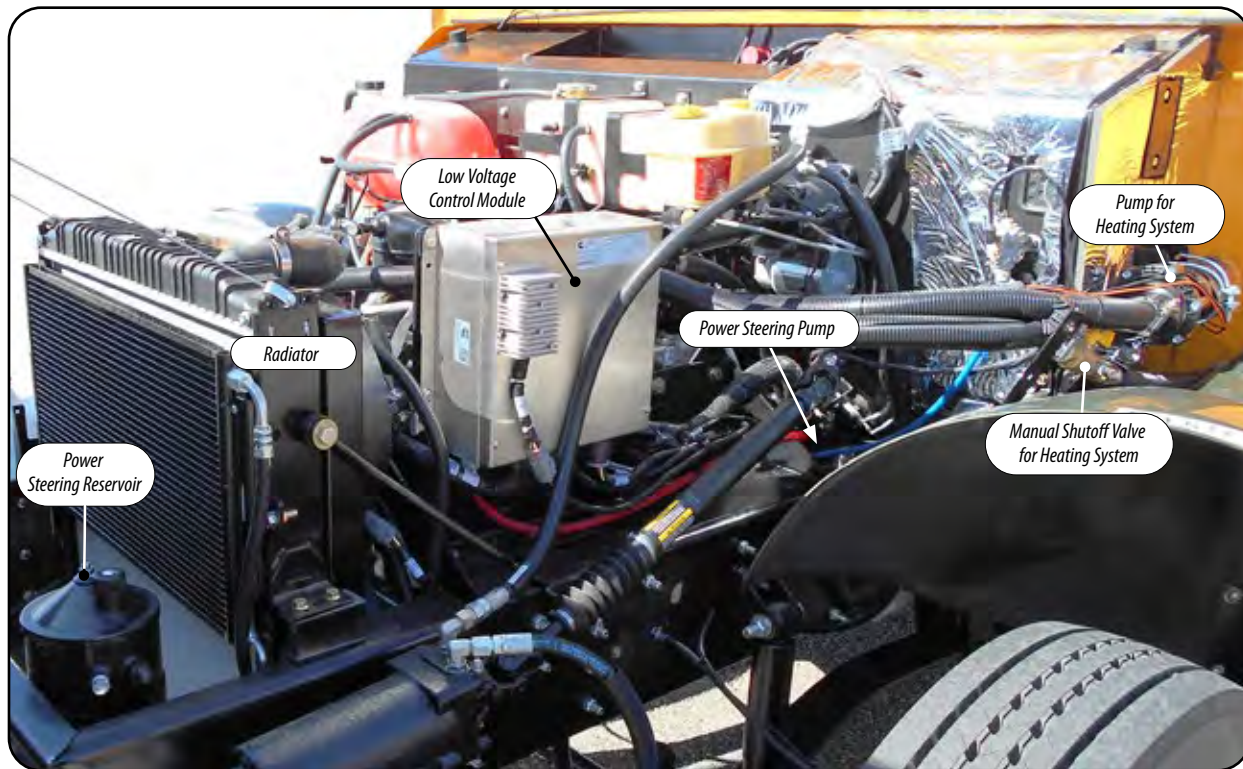


Figure 2-40. LH View Under the Hood

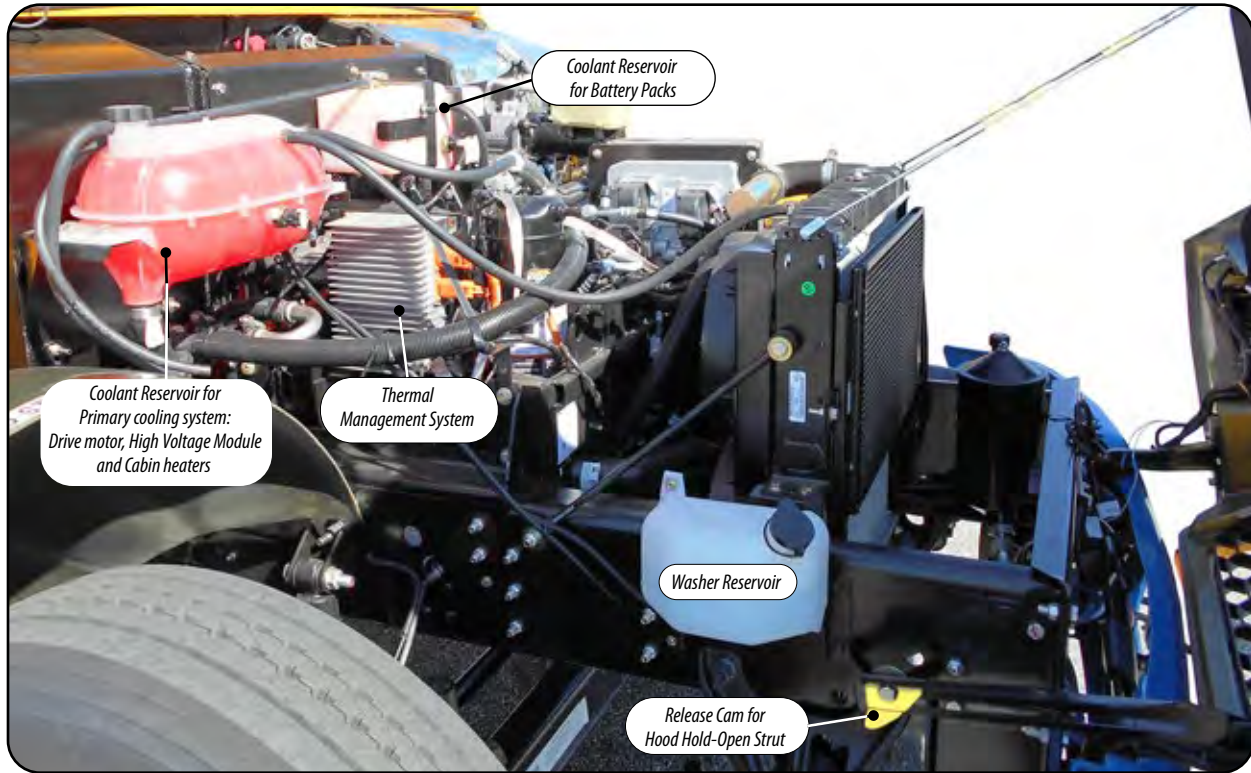


Figure 2-41. RH View Under the Hood



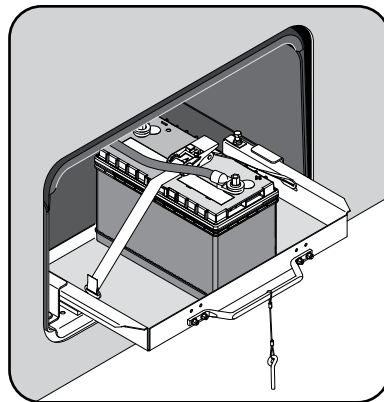
12V Battery Compartment

A hinged door located on the left side of the Vision directly below the driver's window provides access to the vehicle's 12V battery. The battery is mounted on a metal tray which is retained by a removable pin. An optional roller tray is available which is held in place with two slide latches. To access the 12V battery, open the compartment door, remove the retaining pin, and slide the tray outward.

Tire Pressure Monitoring System

The optional SmarTire™ Tire Pressure Monitoring System (TPMS) is a wireless communication network located within the buses' instrument cluster where sensors are constantly monitoring each tire on your vehicle in order to provide real-time, on-demand tire status information, and to warn the driver of a tire-related problem before it becomes dangerous. The TPMS indicates tire/axle designation, temperature, pressure, and wheel position. The TPMS menu allows you to view these details on the message display center, using the buttons as an interface for programming and diagnostics. Low Pressure alerts will appear on the screen with audible alarms. See [Instrumentation](#) for more information on the TPMS menu.

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



*Figure 2-42. 12V Battery
(located on slideout tray)*



For full details on the operation and programming of the SmarTire™ TPMS, access document BW2799 at:

www.bendix.com/en/serviceessupport/documentlibrary/doclib_1.jsp

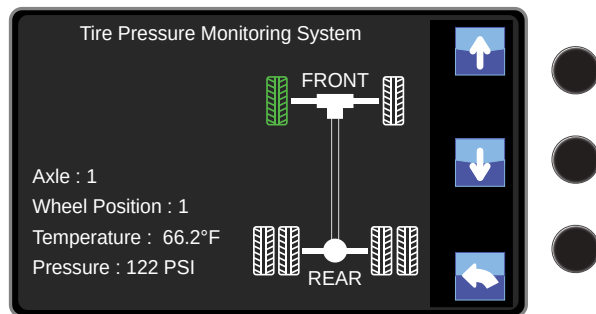


Figure 2-43. TPMS Display



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**INSTRUMENTATION****3-1**

Instrument Cluster	3-3
Message Display Center	3-5
Charging Mode	3-8
Warning Bank Indicators	3-8
Settings and Diagnostics	3-11
Settings	3-11
Diagnostics	3-13
Air Brake PSI	3-14
Component Tests	3-14
Read Parameters	3-17
Configuration Menu	3-18
Tire Pressure Monitoring System	3-18

LIST OF ILLUSTRATIONS

Figure 3-1. Instrument Cluster	3-3
Figure 3-2. Ametek Message Screen	3-5
Figure 3-3. Back-up Camera Display	3-5
Figure 3-4. Driver's Display	3-5
Figure 3-5. Fuel Fired Heater - Tank Level Status	3-6



Figure 3-6. Typical Drive Mode Screen	3-7
Figure 3-7. Typical Charge Mode Screen	3-8
Figure 3-8. Settings and Diagnostics Menu	3-11
Figure 3-9. Read Parameters	3-17



Instrument Cluster

The instrument cluster is a single unit of all-electronic gauges and warning lights, which receive both analog inputs from such components as the battery and air pressure sensors, and digital signals from components such as the headlights and turn signal control modules. A centrally-located Message Display Center displays the odometer reading, error alerts, and service technician diagnostic information. If the bus is equipped with hydraulic brakes, the instrument cluster contains five gauges. Busses equipped with air brakes have two additional gauges indicating primary (front) and secondary (rear) air pressure.

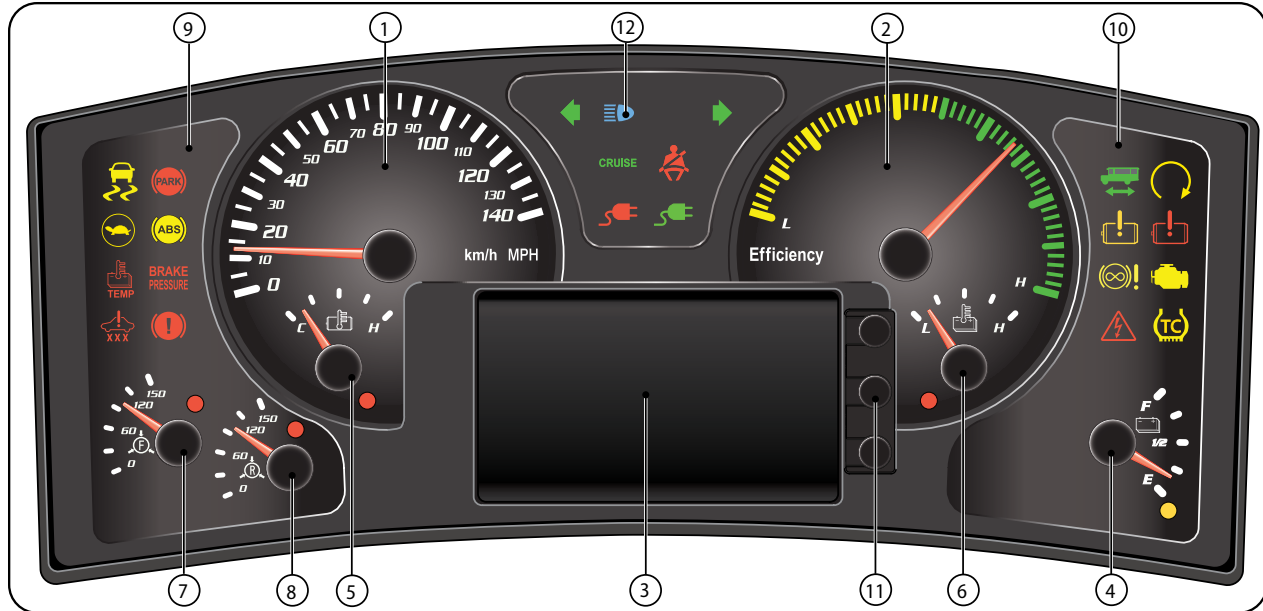


Figure 3-1. Instrument Cluster



DRIVER'S HANDBOOK

1. **Speedometer.** Indicates vehicle speed in miles/hour or kilometers/hour.
2. **Efficiency Gauge.** Indicates the degree of power usage. Yellow zone reflects inefficient power usage and the Green zone indicates efficient power usage.
3. **Message Display Center.** Displays additional information to the vehicle operator. If bus is equipped with a back-up camera, it can also serve as the monitor when the bus is shifted into Reverse. See [Message Display Center](#).
4. **State of Charge.** The State of Charge (SOC) gauge indicates the charge level of the propulsion batteries. A low charge indicator will flash rapidly and display a message when the signal is missing or out of range.
5. **Motor Temperature Gauge.** Indicates the temperature of the main drive motor. A high temperature indicator light will flash rapidly and display a message when the data is missing or out of range.
6. **Battery Temperature Gauge.** Indicates the temperature of the propulsion batteries. A high battery temperature indicator will flash rapidly and a message will be displayed for missing or out of range data.
7. **Front Air Gauge.** Indicates air pressure in front brake system and includes a low air warning indicator. The low air indicator will flash rapidly when pressure is ≤ 65 PSI and goes out when pressure is ≥ 72 PSI.
8. **Rear Air Gauge.** Indicates air pressure in rear brake system and includes a low air warning indicator. The low air indicator will flash rapidly when pressure is ≤ 65 PSI and goes out when pressure is ≥ 72 PSI.
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.** Navigation buttons are used to toggle through the menus and to select items to display in the [Message Display Center](#).
12. **Headlight Highbeam Indicator.** This indicator will illuminate when highbeam headlights are turned on.



Message Display Center

The Ametek Message Screen is a color Liquid Crystal Display (LCD) located at the bottom center of the instrument panel. It provides vehicle information to the driver and diagnostic information to trained service technicians. The screen is divided into six different areas, each with their own responsibility for identifying vehicle information. Area 1 displays the Odometer, Trip 1, and Trip 2. Area 2 displays an alternate gauge, fuel economy and priority messages.

Video Monitor for Back-up Camera. For buses equipped with certain back-up camera systems, the Message Display Center will remove all Area displays and show the Back-Up Camera Screen when the bus is shifted into Reverse. After shifting out of Reverse, the screen will return to previous display.

Navigating the display is done using the three buttons located to the right of the Driver's Display. They are identified as the top, middle, and bottom buttons. While in the normal display screen, momentarily pressing any of the buttons will display the softkeys. The softkeys will be displayed in a column adjacent to the three buttons. This provides a user-friendly navigation display used to identify the responsibility for each of the buttons which are used to change the information presented in the message center. Press the upper button to change the information displayed in Area 1. Press the middle button to change the data displayed in Area 2. Press the bottom button to adjust the display brightness. If the cluster is displaying an active fault in Area 2, pressing any of the three buttons will acknowledge most messages. Areas 1 and 2 cannot be accessed until all messages have been acknowledged or cleared.



Figure 3-2. Ametek Message Screen



Figure 3-3. Back-up Camera Screen

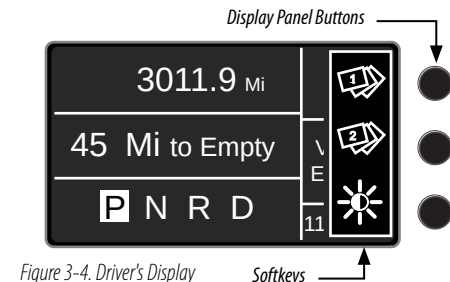


Figure 3-4. Driver's Display

Softkeys



Area 1. Press the top button while the softkey is displayed to toggle between the Odometer, Trip Odometer 1, and Trip Odometer 2. Trip 1 or Trip 2 will be displayed in the top right corner of Area 1 identifying the selected trip display. While in the trip mode press and hold the top button to zero the trip odometer displayed. Press the top button again to display the Odometer.

Area 2. The default display for Area 2 is Miles to Empty. This display will indicate the approximate distance the bus can travel with the existing power level available in the batteries. This area will also display Priority Interrupt Messages (PIM)s when triggered. Some priority messages will flash forward to reverse video. Some priority messages can be acknowledged by pressing any of the three navigation buttons. When acknowledged, the display will return to previous display until being timed out, next ignition cycle or the trigger logic is not satisfied. Any lamp associated with the acknowledged priority message will remain lit until the fault is gone or the ignition is turned off. If multiple priority messages are triggered, the highest active priority message will be displayed.

Tank Level Status for the Fuel-Fired Heater option can also be accessed in this area.

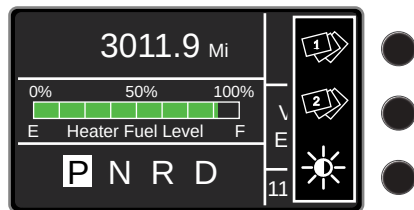


Figure 3-5. Fuel Fired Heater - Tank Level Status



Figure 3-6. Typical Drive Mode Screen

Priority Messages

- Brake Interlock
- * Turn Signal On
- Low Air Pressure
- Service Door Open
- * Lift Enabled
- * Lift Not Stowed
- * Headlights On
- Set Park Brake
- Missing Brake Input
- Fuel Level Low
(w/Optional Fuel Fired Heater only)
- *(Messages Shown with Icon)



Area 3. This display is similar to a transmission position identifier. It indicates the intended direction of travel. **N** indicates no intended motion (Neutral). **R** indicates the intent to travel in Reverse. **D** indicates the intent to travel forward (Drive). Park Mode is achieved by pressing the service brake and then applying the parking brake. While in Park Mode, the driver's display will indicate **P** and the shifter pad will also display a **P**.

When the bus batteries are being charged, Area 3 will display the time needed to complete a full charge at the current rate of charge. The display will read, **Time to Full Charge** and the value will be displayed in hours. If the ignition switch is in the OFF position, press any of the three navigation buttons to activate the display. The display will remain on for 10 seconds and then return to blank. If the ignition is on, the display will remain on until the ignition is turned off.

Area 4. The 12V auxiliary battery voltage is displayed in the Area 4 (top right corner of driver's display). If the option for an ammeter is present, the ammeter reading can be displayed below the voltage reading when configured, **ENABLED** in the configuration menu (see Blue Bird Service Manual for Ametek instrument cluster configuration settings). If the data is missing or out of range a **-V** will be displayed.

Area 5. This area will display the Vehicle Status as default. Depending on the information the instrument cluster receives, Area 5 can display the following messages:

Vehicle Initializing
Initialization Complete

Vehicle Enabled
Power-Down in Process

Emergency Power-Down
Vehicle Disabled

Charger Connected
Charging Error



Area 6 (Clock). The time is displayed in the bottom right corner of the driver's display. It can be set to show a 24-hour or a 12-hour clock and the actual time can be adjusted using the Settings and Diagnostic menus. The 12-hour clock will display AM/PM next to the hours and minutes, but the 24-hour clock will not.

Charging Mode

When the battery charge cord is plugged into the bus, Area 5 can display the Charge Mode. When the ignition is in the OFF position, press any of the three navigation buttons to display the charging status. The display will remain on for 10 seconds before timing out. If the ignition is on, the charging status will display automatically. Note that when charging, Area 3 will display the time needed to complete a full charge. Area 5 vehicle status will be over ridden and display the optional front and rear applied air pressure when triggered. To trigger this display, the service brake must be depressed and the applied air pressure function, **ENABLED** in the Configuration Menu.



Figure 3-7. Typical Charge Mode Screen

Warning Bank Indicators

The warning bank lights provide a visual indicator to the state of various systems in the bus. These function to either show the engagement of some chassis function or as a warning by illuminating when a gauge fails outside the operational parameters for that gauge. These are located within the specific gauge attributed to the fault. Indicators and their definitions are shown on the following page.



Warning bank lights may have an alarm associated with them. Some warning lights are accompanied by an audible alarm and or a message that is displayed in the LCD Message Display Screen. All warnings, with associated alarms/display messages, can be acknowledged. If the user acknowledges the warning by pressing any of the three buttons, the display will go back to the previous screen and the alarm will stop, but the indicator lamp will remain active. The alarm/display will reoccur if fault still exists at the next ignition or in a predetermined time frame. The following is a list of warning bank lights and a description for each indicator.



Left Turn. Flashes with left turn signal.



High Beam. Headlights are in high beam.



Right Turn. Flashes with right turn signal.



Park. Indicates parking brake is applied.



Seat Belt. Indicates driver seatbelt not engaged.



Malfunction Indicator Lamp (MIL). Indicates a system component failure.



ABS. Indicates fault in the Anti-lock Brakes System.



Electronic Stability Control (Optional). Indicates stability control is activated.



Brake Alarm. Indicates problem with the service brakes (Metric Units only).



Cruise. Cruise control has been activated.



DRIVER'S HANDBOOK



Bus Enabled. Indicates bus is ready for operation.



Limited Performance Mode. Indicates performance will be limited due to low charge.



Propulsion Disabled. Indicates motor no longer providing power to move bus.



Wait to Start. Indicates electric bus is preparing the system for use. Do NOT attempt to enable bus until this light is off.



Regenerative Braking Disabled. Indicates regenerative braking system is not on.



High Voltage Warning. Indicates an issue with the voltage system.



Battery Charger Status (RED and GREEN). Indicates status of connection when charging batteries.



Electric Motor Warning (AMBER and RED). Indicates an issue with the electric motor.



Settings and Diagnostics

The Settings and Diagnostics menu allows the user to change certain features from their default settings and to use diagnostics to troubleshoot your vehicle. Access this menu by setting the parking brake and then from the Drive Mode screen, press the bottom button and hold for 3+ seconds or until the menu appears.

Press the top button to move or toggle the selection box through the list as indicated by the softkey arrows. The item in the selection box will be selected when the middle button is pressed (as indicated by the softkey checkmark). To return to the Drive Mode screen, press the bottom button as indicated by the softkey home or home screen. This menu will auto exit to the Drive Mode screen after a 10 second timeout with no activity. If parking brake is released, the display will return to the Drive Mode screen.

Settings

Selecting Settings will display a sub-menu that includes Units, Brightness, and Clock. Pressing the top button will toggle to the next menu item. Pressing the middle button will select the highlighted item. Pressing the bottom button will return to the previous screen.

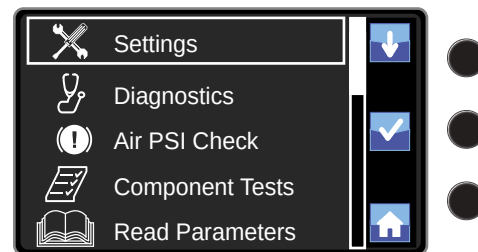


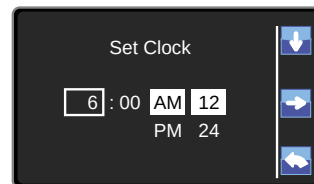
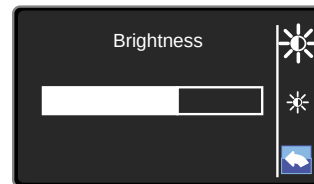
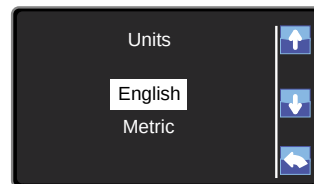
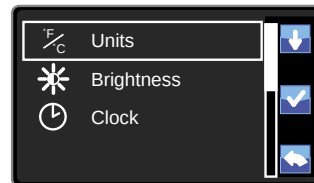
Figure 3-8. Settings and Diagnostics Menu



Units. Selecting Units will bring up a screen that is used to select displayed values in Metric or English units. This will change the Speedometer reading and units lamp on the cluster, display/menu items except Air which will always be displayed as PSI, and change which brake system fail lamp is used. Pressing the bottom button will exit to the previous screen.

Brightness. Selecting the menu item Brightness will display a screen to allow setting the cluster backlighting brightness. Pressing the middle button will decrease brightness while pressing the upper button will increase brightness. The buttons can be held for progressive dimming. This menu will auto exit to the previous screen after 10 seconds time-out with no activity or the bottom button can be pressed.

Clock. Selecting the menu item Clock will allow the user to set the clock. Hours will be the first selection upon entering the screen and will be highlighted. Press the top button to adjust the hour setting. Pressing the middle button will cycle the current selection between minutes, AM/PM, and the 12/24 display mode. Once a selected item is highlighted, the upper button can be used to increase the setting. Hours and Minutes will increment, rolling over at 12 for hours and 59 for minutes. Pressing the bottom button will save the changes and return to the previous menu. If a selection is not made this menu will timeout to the previous menu after 15 seconds.





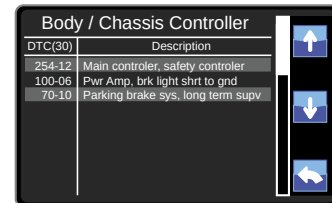
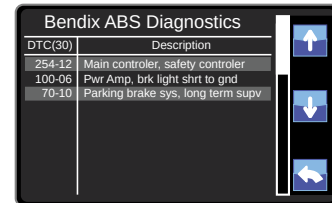
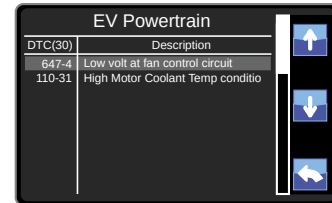
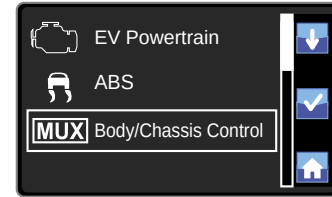
Diagnostics

Selecting the Diagnostics menu will display the following introduction screen allowing the selection of System Control Unit, ABS, or Body/Chassis Controllers diagnostics. Pressing the bottom button will exit to the previous screen. This menu will auto exit to the Settings and Diagnostics screen after a 10 second timeout with no activity. The Diagnostic display will show the Component Name at the top, the DTC Number in the Left-Hand (LH) column and the Description of the selected DTC in the Right-Hand (RH) column. The count of reported DTCs will appear in parenthesis after the DTC in the header.

System Control Unit. The System Control Unit menu displays a description of the EV powertrain active faults and associated DTCs. A complete list of faults and DTCs can be found in the service manual available for this bus.

ABS Diagnostic. The ABS menu displays active ABS fault codes from the J1939 data communication line in the form of a Suspect Parameter Number (SPN) and Failure Mode Identifier (FMI). The Brake system manufacturer name (Air=Bendix and Hydraulic=Wabco) and the number of active DTCs is located in upper left corner. Press the bottom button to exit to the previous screen.

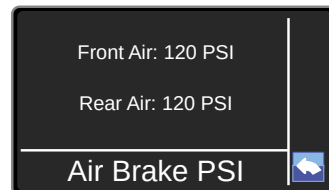
Body/Chassis Controller Diagnostic. The Body/Chassis Controller menu displays DTCs as received from the Multiplex system.





Air Brake PSI

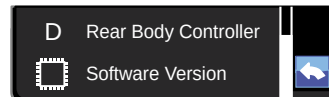
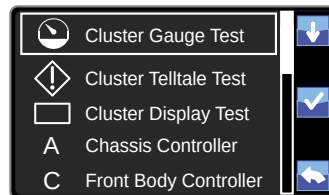
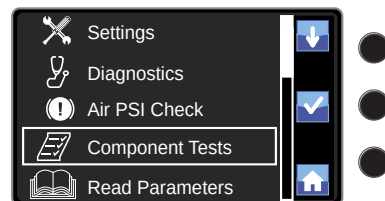
Selecting this menu item will display the screen shown in the right margin that is used to perform Pre-trip Brake Inspections. This shows the Front and Rear brake system PSI. Pressing the bottom button will exit to the previous screen.



Component Tests

Selecting menu item Component Tests in the Settings and Diagnostic menu will display the instrument selftest menu. Menu items include Gauges, Telltales, Display, Controllers for Chassis, Front Body and Rear Body, and Software Version.

Cluster Gauge Test. When Cluster Gauges is selected, Gauge Test will be displayed and will indicate the gauge to be tested. The selected gauge will be driven through three positions from Zero Scale to Mid Scale to Full Scale pausing at each position indicated in the Gauge Test. This test will proceed through all the gauges and return to the menu. Pressing the middle and top buttons will change the selected gauge. Gauges may include Frt Air, Motor Temperature, Speed, State of Charge (SOC), and Rear Air. Pressing the lower button will end the test and return to the previous menu.





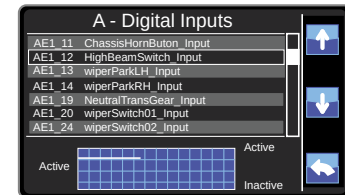
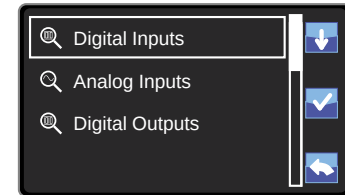
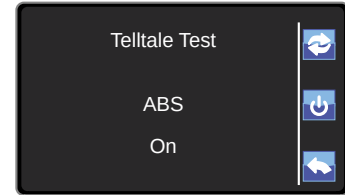
Cluster Telltale Test. When Cluster Telltales is selected Telltale Test will be displayed and will indicate the telltale light to be tested. Each warning bank lamp will be turned on then off, displaying the status of the lamp. Check each telltale light against the Telltale Light Display. This test will go through all the warning lamps one at a time and then return to the menu. Pressing the lower button will end the test and return to the previous menu.

Cluster Display Test. The display test is used to check that each of the pixels used to form the display is functioning. Each of the LCD pixels will display the following colors for 2 seconds each: RED, BLUE, and GREEN. Pressing any of the three buttons will end the test and return to the previous menu.

Chassis and Body Controllers. Selecting A Zone Chassis, C Zone Front Body, or D Zone Rear Body controllers will load choices for the type of Input/Output menus for that particular controller:

Digital Inputs. The Digital Inputs display identifies the module connector pin number and the binary digital input status as received by the vehicle's electrical system. A graph at the bottom of the display identifies the status of each of the inputs. Scroll through all of the status screens by using the Up and Down arrows. Press the bottom button to exit to the previous screen.

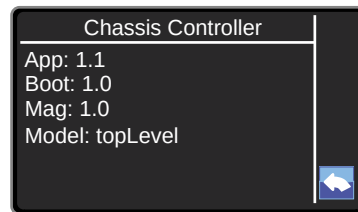
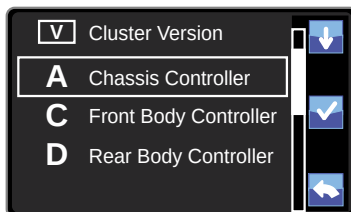
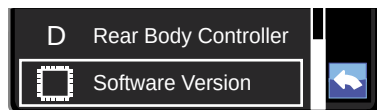
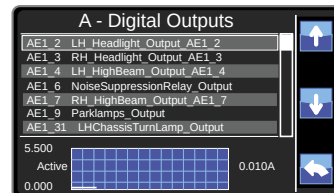
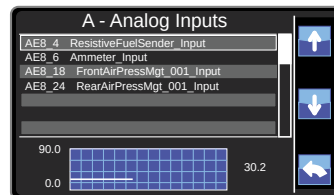
Analog Inputs. The Analog Inputs display identifies the connector pin number and the analog input signal (variable) status as received by the vehicle's electrical system. Scroll through all the status screens by using the Up and Down arrows. Press the bottom button to exit to the previous screen.





Digital Outputs. The Digital Outputs display identifies the module connector pin number and the binary digital output status as received by the vehicle's electrical system. A graph at the bottom of the display identifies the status of each of the Outputs. Scroll through all of the status screens by using the Up and Down arrows. Press the bottom button to exit to the previous screen.

Software Revision. This menu item will load a list of the cluster and multiplex controllers. Information on the current revision and version installed for that item will display when selected. Press bottom button to exit to the previous screen.





Read Parameters

When the Read Parameters is selected, the display shows all of the converted real time values for the applications in a table form for vehicle troubleshooting. Scroll through the listing using the top and middle buttons. Pressing the bottom button will exit to the previous screen.

Value	Description
86%	Average Efficiency
50° C	Motor Temperature
42 MPH	Vehicle Speed
13.6 V	Auxiliary (12V) Battery Voltage
116 PSI	Front Air Pressure
118 PSI	Rear Air Pressure
32° C	Highest Cell Temperature
24° C	Lowest Cell Temperature
26° C	Average Cell Temperature

Figure 3-9. Read Parameters

Parameters Available

Average Efficiency	Lowest Cell Temperature
Motor Temperature	Average Cell Temperature
Vehicle Speed	Gear Selection
Auxiliary (12V) Battery Voltage	Highest Propulsion Battery Voltage
Front Air Pressure (Hyd. displays NA)	Lowest Propulsion Battery Voltage
Rear Air Pressure (Hyd. displays NA)	State of Charge (SOC)
Highest Cell Temperature	Diesel-Fired Fuel Level



Configuration Menu

The instrument cluster has been set to operate from the factory in a specific manner based on the components and features ordered. Some of these default settings can be changed to accommodate an individual bus or fleet operation. The configuration menu lists the items that can be turned on or off. These items can be enabled or disabled based on the features ordered and display preferences. Items are based on hardware and software installed and affects the clusters function, performance, and accuracy of reported data. For details and operational guidelines for this menu, refer to the Blue Bird Service Manual available for your vehicle.

Tire Pressure Monitoring System

For buses equipped with an optional Tire Pressure Monitoring System (TPMS), the status of each tire can be viewed in the Setting and Diagnostics menu. Selecting TPMS will open a diagram of the tire locations on the bus.

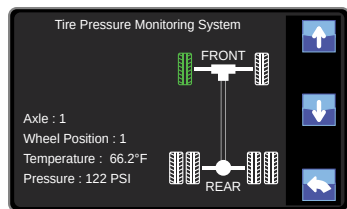
By pressing the top or middle button, you can cycle through the locations on each axle to see current temperature and pressure of each tire. The selected tire will highlight in green if the temperature and pressure values are within the correct operating range. If the selected tire's temperature or pressure is outside of the parameters, the tire will be highlighted red.

Pressing the bottom button will exit to the previous screen.

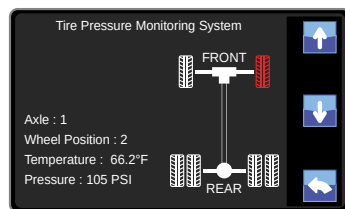
The TPMS will also notify the driver via a flashing message in the screen and an audible alert if there are any important issues in a particular tire's pressure, temperature, or other TPMS-related errors. The alert message will include a simple diagram with an X indicating which tire(s) have triggered the alert, so that the driver can quickly see where the issue is without having to navigate the TPMS status menu.

For more detailed information on how to set up your Bendix TPMS and troubleshooting, see document at:

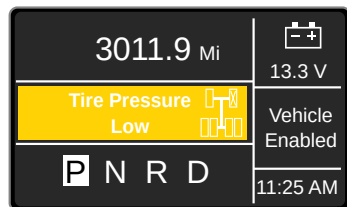
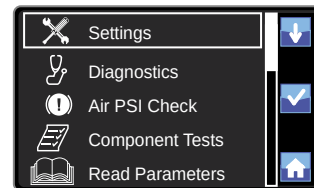
www.bendix.com/en/servicessupport/documentlibrary/doclib_1.jsp.



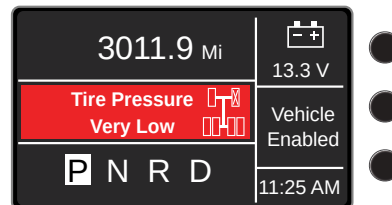
Status Diagram shown with selected tire LH front highlighted in green



Status Diagram shown with selected tire RH front highlighted in red



Tire Pressure Low alert (amber background) with RH front tire indicated



Tire Pressure Very Low alert (red background) with RH front tire indicated



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**PASSENGER AREA**

4-1

Child Restraint Seats	4-3
Young Children and Infants	4-3
How Child Restraints Work	4-4
Universal Child Restraint Anchorage	4-4
Securing a Universal Child Restraint	4-5
Passenger Seats	4-6
Blue Bird NextGen Passenger Seats	4-6
Cushion Tilt Feature	4-7
Seat Assembly Removal and Cushion Disassembly	4-9
Track Mounted Passenger Seats	4-9
Passenger Windows	4-13

LIST OF ILLUSTRATIONS

Figure 4-1. Universal Child Restraint Anchorage System	4-5
Figure 4-2. NextGen Seat	4-6
Figure 4-3. Seat Cushion Tilting	4-7
Figure 4-4. Blue Bird Non-Convertible Track Mounted Seats	4-10
Figure 4-5. C E White Child Restraint Track Mounted Seats	4-11



Figure 4-6. C E White Student Safety Seat and C E White Student Safety Seat Child Restraint Track Mounted Seats	4-11
Figure 4-7. Blue Bird NextGen Track Mounted Seats	4-12
Figure 4-8. Blue Bird NCLBR and Genesis Track Mounted Seats	4-12
Figure 4-9. Typical Passenger Window	4-13



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

This vehicle may have seats that are equipped with a Universal Child Restraint Anchorage System. If so, you will 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.

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 is not attached to its anchorage points, the restraint will not 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.*

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.
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.

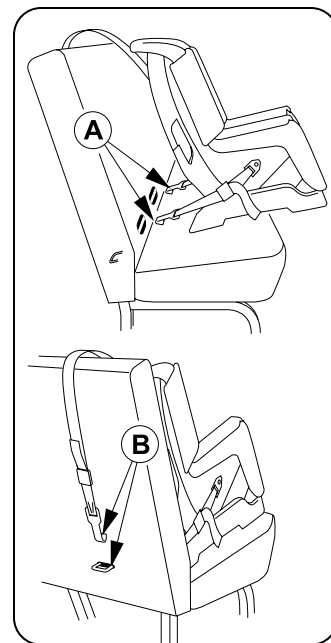


Figure 4-1. Universal Child Restraint Anchorage System



DRIVER'S HANDBOOK

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 passenger seat spacing or configuration.

Blue Bird NextGen Passenger Seats

Your bus may be equipped with NextGen convertible seats offered exclusively by Blue Bird. NextGen seats take up less space and have fewer parts, yet provide enhanced features for passengers, drivers, and bus fleet technicians.

For your passengers, comfort is enhanced by inclusion of an integrated headrest, a contoured seat back for increased knee clearance, and a lumbar support molded into the back panel.

For the bus driver, NextGen seats provide easier access for inspection, cleaning, and closing windows at the end of the route day.

For your service technicians, NextGen seats facilitate easy configuration of the buses in your fleet to any combination of seats equipped with (or which can include) lap belts, 3-point belts, or child restraints without unbolting the floor or wall mounts.

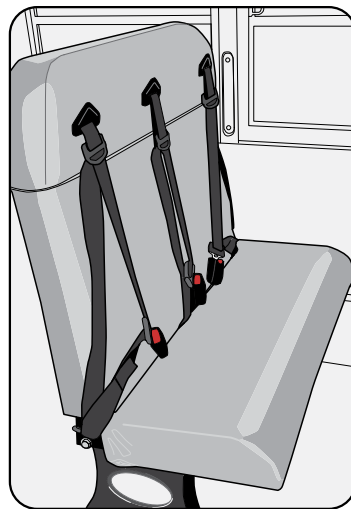


Figure 4-2. NextGen Seat



Cushion Tilt Feature

The bottom Cushion Assembly of each NextGen convertible seat is pivot-mounted to the Back Assembly so it can be tilted and latched in a vertically by the driver, to facilitate under-seat inspection, floor sweeping, or more convenient window access. The tamper-resistant tilt latch is mounted to the Cushion Assembly's frame just beneath the aisle-side rear corner of the cushion's cover and is operated by the driver using a provided special tool.

1. Uncover the cushion tilt latch located just under the cushion's cover fabric at the rear aisle-side corner of the Cushion Assembly.
2. At the center of the tilt latch is a spring loaded pin which engages the Cushion Assembly's frame to latch the cushion in either the horizontal or vertical position. Insert the tool into the socket of the latch and while pushing in, turn the tool clockwise until it drops and locks behind the ears on the plunger.
3. Grasping the tool, pull outward against its spring-loaded pressure, toward the center of the aisle.

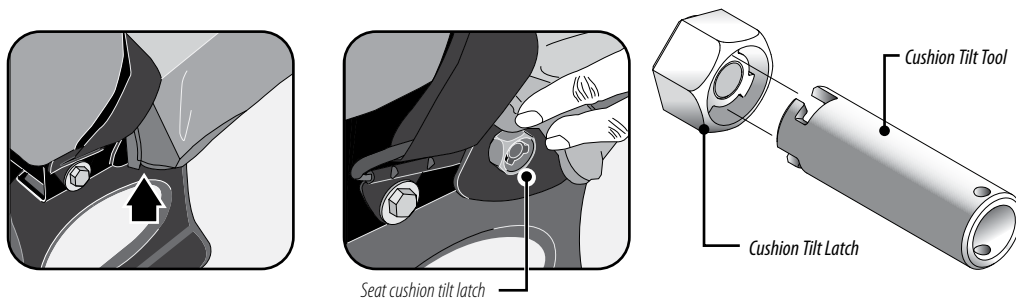


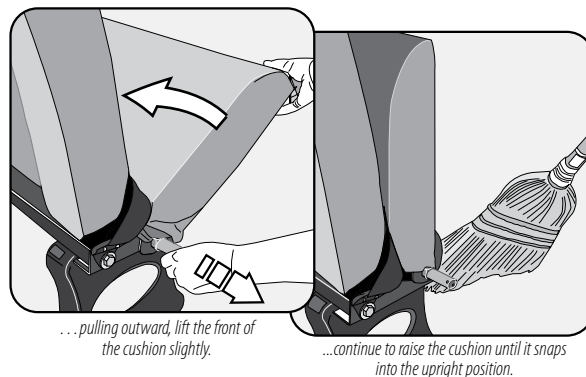
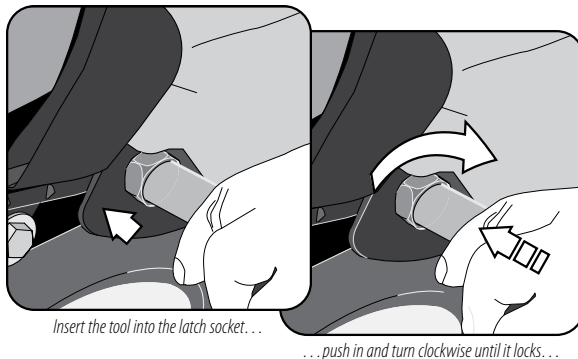
Figure 4-3. Seat Cushion Tilting



4. While applying outward pressure, begin to lift the front of the Cushion Assembly. It is not necessary to continue holding the tool outward throughout the cushion's movement. Tool can remain in tilt latch after you release your grip.
5. Continue lifting the front edge of the Cushion Assembly until it latches in an almost vertical position.

To lower the Cushion Assembly back to its normal use position, pull the tool outward toward the aisle to release the latch and gently lower the cushion, ensuring it latches into its normal position.

To remove the tool from the latch, push the tool inward while rotating counter-clockwise until it releases from the plunger. Then, pull the tool out of the tilt latch socket.





WARNING! *Seat cushions must be latched in the horizontal, seated position whenever the bus is in operation. Proper inspection and maintenance must be routinely performed to ensure safe use and operation of passenger seats and restraints. See [Seat Belt Inspection and Maintenance](#) in this handbook.*

Seat Assembly Removal and Cushion Disassembly

Technical instructions for removing NextGen Seat assemblies and disassembling the Cushion Assembly from the Back Assembly to convert seats to alternate belt types are provided in the 2019 and later Service Manuals.

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 (FMVSS) 222 (School Bus Passenger Seating and Crash Protection) and FMVSS 217 (Bus Window Retention and Release). A decal printed with these rules is installed above the wire moulding, adjacent to the tracks.



WARNING! *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 FMVSS. As you reconfigure your bus, you may need additional barriers; available from Blue Bird Part Sales.



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.

10060842A BB

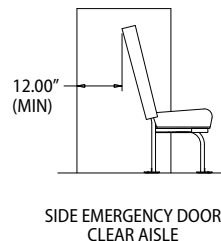
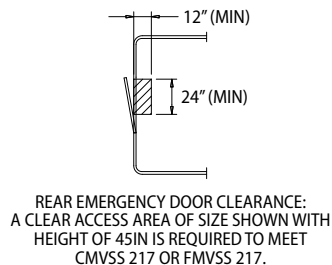
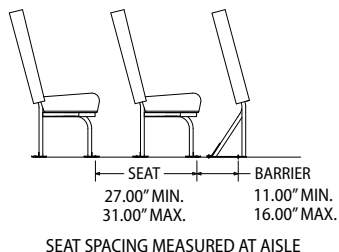


Figure 4-4. Blue Bird Non-Convertible Track Mounted Seats

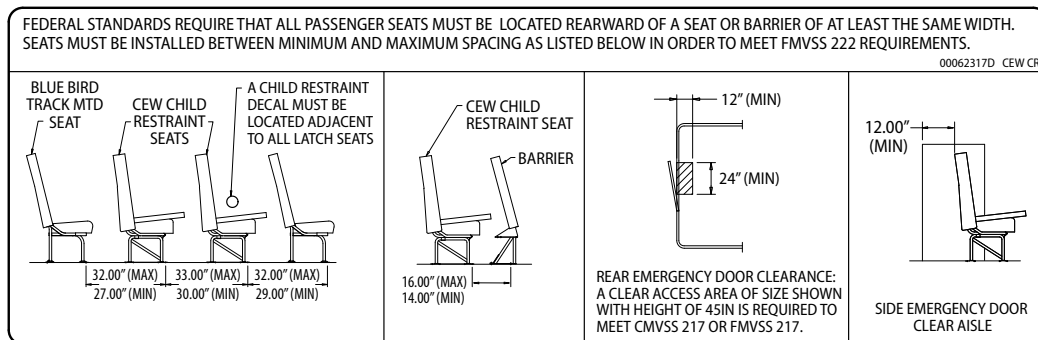


Figure 4-5. CE White Child Restraint Track Mounted Seats

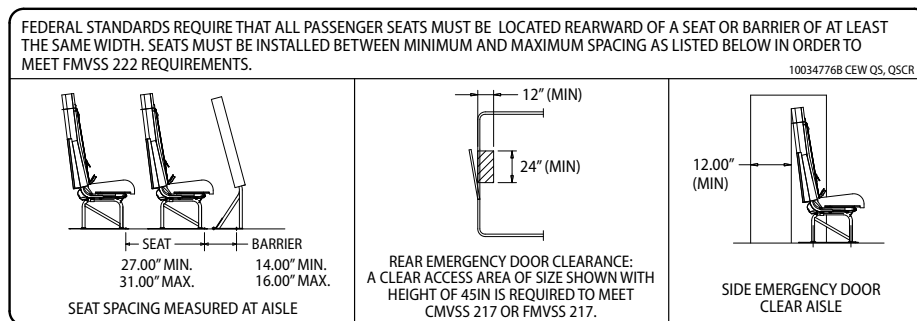


Figure 4-6. CE White Student Safety Seat and CE White Student Safety Seat Child Restraint Track Mounted Seats

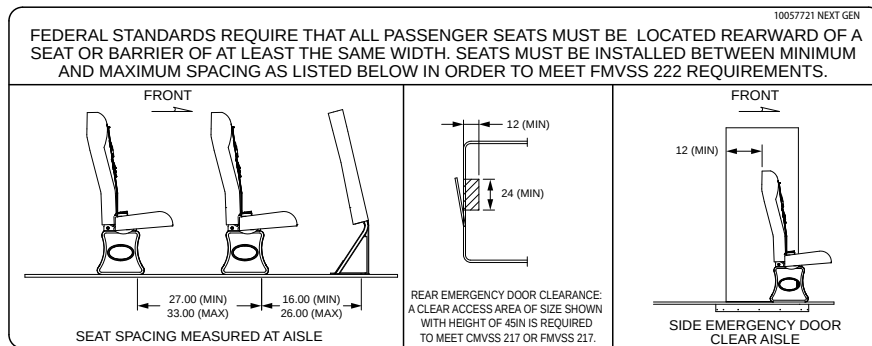


Figure 4-7. Blue Bird NextGen Track Mounted Seats

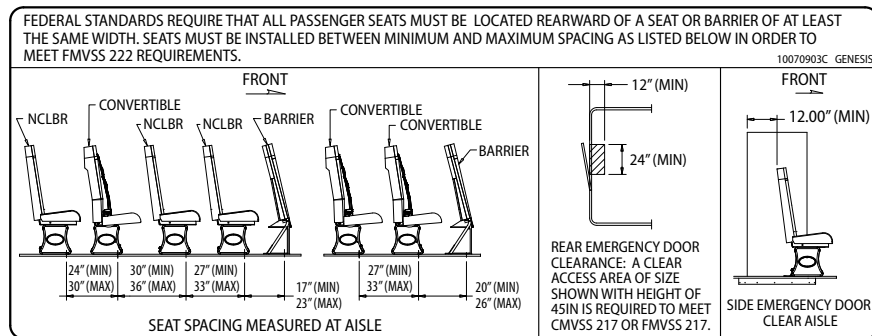


Figure 4-8. Blue Bird NCLBR and Genesis Track Mounted Seats

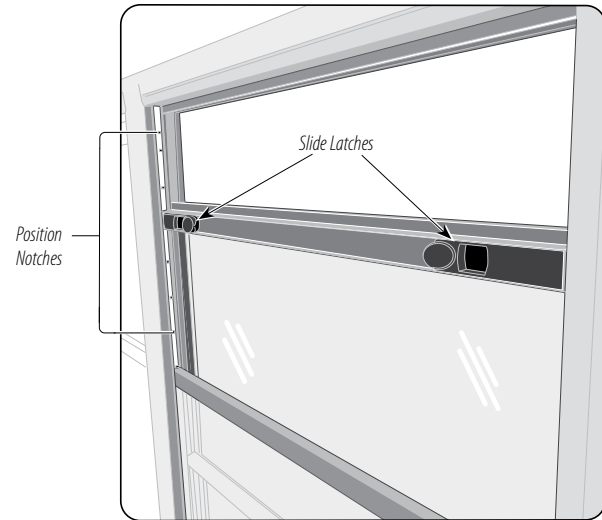


Passenger Windows

Split Sash Passenger Windows in the Blue Bird Vision operate similar 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.



Push inward on both slide latches to lower window

Figure 4-9. Typical Passenger Window



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ROUTINE OPERATION

5-1

Routine Operation	5-4
Maneuvering Safety	5-4
Starting Your Blue Bird Electric Bus	5-5
Interlocks	5-6
Pedestrian Alert System	5-6
Shutting Down Your Blue Bird Electric Bus	5-7
Coolant System	5-7
Service Brakes	5-9
Anti-lock Braking System	5-9
Regenerative Braking	5-9
Electronic Stability Control	5-10
Hydraulic Brakes	5-12
Parking Brake (w/Hydraulic Brakes)	5-13
Parking Brake (Hand Operated)	5-15
Air Brakes	5-16
Parking Brakes (w/Air Brakes)	5-17
Seat Belt and Parking Brake Alarm Indicators	5-18
Pushbutton Shifter	5-19
Park Mode	5-19
Reverse Position (R)	5-20



Neutral Position (N)	5-20
Drive Position (D)	5-20
Additional Buttons	5-20
Anti-Roll Back and Creep	5-21
Roll Back Distance	5-21
Charging	5-21
Charging Error	5-24
Battery Care	5-25
12V Battery	5-25
Wheel Differential Lock	5-26
Engaged Position (Locked)	5-27
Disengaged Position (Unlocked)	5-27

LIST OF ILLUSTRATIONS

Figure 5-1. Ignition Key Positions	5-5
Figure 5-2. Coolant Reservoirs	5-8
Figure 5-3. Parking Brake Pedal	5-13
Figure 5-4. Parking Brake Hand Lever	5-15
Figure 5-5. Pushbutton Shifter	5-19
Figure 5-6. Charging Paddles	5-22



Figure 5-7. Charge Port Location	5-22
Figure 5-8. Typical Charging Screen	5-23
Figure 5-9. 12V Battery Box	5-24



Routine Operation

In terms of vehicle controls, driving an electric bus is not radically different from driving a passenger car, truck, or van. Features like power assisted brakes, steering, and modern suspensions have removed much of the fatiguing aspects and "big truck" feel. However, the differences which exist are extremely important. The driver must be 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 most precious of all.

This chapter describes general differences that a driver new to school bus operation may experience and specific feature/equipment differences (of the Vision bus in particular) with which the driver will interact every day.

Maneuvering Safety

School buses are operated in a wide variety of conditions. Refer to Dimensions to understand some of the considerations imposed by the physical size and geometry of the bus. The proportionally long wheelbase together with height of rises and humps which the bus can roll over without damaging the underskirt is dependent upon these dimensions.

The rear overhang of school buses is longer than other vehicles. Be mindful in situations like nearing curbs or embankments on sharply-rising grades as well as in tight turns.

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 administration organizations sometimes conduct training or practice seminars; school bus rodeos. Blue Bird encourages participation in any program designed to increase the skill and safety of our nation's school bus force.



Starting Your Blue Bird Electric Bus

Starting your Blue Bird electric bus is different than starting an internal combustion engine powered bus. When starting the electric bus, you are not starting an engine. Instead, you are preparing the bus for operation. Certain steps must be followed in a specific order before systems will become operational. Prepare your bus for operation.

1. Disconnect the vehicle charging cable (if connected). See [Charging](#) for more details.
2. Wait 10 seconds then verify that the shifter is extinguished before proceeding to the next step.
3. Ensure that the parking brake is engaged.
4. Turn the ignition key to the ON position. The WAIT TO START light should illuminate.
5. Ensure the vehicle is in Park Mode (the bus is in Neutral and the parking brake is on).
6. Once the WAIT TO START light has extinguished, the bus is ready to start.
7. Turn the key to the START position. Release the key as soon as the vehicle is enabled (≈ 1 second). When the vehicle is enabled, a click may be heard from the battery contactors closing and Bus Enabled in the instrument panel's right warning bank illuminates.
8. Press the service brake pedal and release the parking brake.
9. For forward motion, push **D** while holding the service brake pedal; drive the vehicle normally. (See [Pushbutton Shifter](#) for additional information on the three drive states).

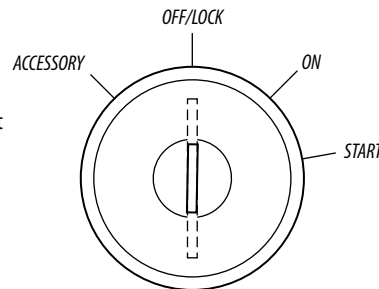


Figure 5-1. Ignition Key Positions



WAIT TO START warning
light for Electric Bus



CAUTION! *It is recommended to pause at least 5 seconds between each ignition key position. If the ignition key is cycled in rapid succession, it can potentially damage the System Control Module (SCM).*

Interlocks

Your electric bus is equipped with up to three interlocks that will prevent the bus from responding to the throttle. The first is an entrance door interlock and the second is the driver's seat belt interlock. The entrance door must be completely closed and the driver's seat belt must be fastened properly to satisfy the interlock. Failure to satisfy both of these interlocks will disconnect the accelerator pedal and there will not be a throttle response. Fastening the driver's seat belt and closing the entrance door will satisfy the interlocks and allow a response to the throttle, thus allowing the bus to move.

The third throttle interlock is linked to the optional Brake Interlock system. While in brake interlock, the throttle will not respond.

Pedestrian Alert System

Since Electric Vehicles (EV)s are nearly silent in operation, a noise generator is present on the bus. This provides additional sound to overcome ambient noise at low speeds, aiding in alerting nearby pedestrians of the vehicle's presence or approach. The sound this system makes is described as a whirring noise or a pulley with noisy ball bearings.

The bus has a speaker mounted on front of the chassis. The speaker is activated when the bus is in a forward gear, the parking brake is released, and the bus is moving at speeds ≤ 20 mph (32 kph). As the bus accelerates or decelerates, the sound changes frequency and volume in response. The sound ceases when the bus reaches speeds greater than 20 mph (32 kph). The system will reactivate when the bus slows down to 20 mph (32 kph) or less.



Shutting Down Your Blue Bird Electric Bus

To shut down your electric bus:

1. Press the service brake pedal until the vehicle has come to a complete stop.
2. Engage the parking brake while continuing to press the service brake pedal.
3. Push the **Neutral (N)** button on the selector panel.
4. Release the service brake pedal.
5. Turn the ignition key to the OFF position.
6. Remove the key from the ignition. Once the key has been removed, it may take up to 10 seconds for the system to shut down completely.



CAUTION! *Do NOT leave the key in the ignition, even in the OFF position. It may drain the 12V battery.*

Coolant System

The Blue Bird Vision electric bus has two coolant systems to maintain safe temperature ranges for components that typically fluctuate during various operating conditions.

The reservoir mounted on the Right-Hand (RH) side (curb side) of the bus is for the primary cooling system. This coolant loop keeps the electric motor and high voltage module from overheating during operation and is used to heat the interior of the bus during cold weather conditions.



A second reservoir mounted closer to the Left-Hand (LH) side (driver side) of the bus is for the Cooling system; battery packs only. By isolating the battery packs coolant loop from the rest of the components, controlling the temperature of the batteries and their performance is improved.

The coolant level in the reservoirs should be checked daily as a part of routine pre-trip inspection. If the coolant level is low, coolant can be added through the reservoir cap. Use only a 50/50 mixture of distilled or filtered water with DexCool (orange) coolant safe (for aluminum blocks when replacing or replenishing the coolant). The area around the fill cap should be cleaned before removal to prevent dirt and other contaminants from entering the system. Damage can occur if particles +60 microns are introduced into the system.

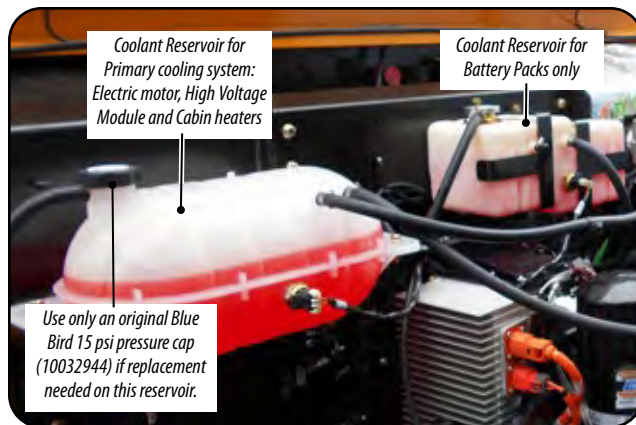


Figure 5-2. Coolant Reservoirs
(located under hood)



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



CAUTION! Only add tap water in emergency situations. If tap water is used, the system should be flushed and filled with the proper coolant at your earliest convenience.



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. 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.*

Service Brakes

Your bus may be fitted with hydraulic disc brakes, air disc brakes, or air-powered drum type brakes, depending on the options chosen at the time of manufacture. Although they perform the same task, you may feel a difference in braking characteristics. Air brakes may require additional wait time before driving during warmup to allow air system pressure to build to normal operation levels.

Anti-lock Braking System

In a vehicle equipped with an Anti-lock Braking System (ABS), motion sensors detect the speeds at which the wheels move. These sensors transmit this information to an Electronic Control Unit (ECU). If the wheels start to lock, the ECU signals the Modulator Assembly to regulate the brake pressure of each wheel.

An ABS indicator lamp on the dash warns the driver of possible system faults and provides blink code information to diagnose the system. (See [Warning Bank Indicators](#).) If this light is activated during normal vehicle operation, the driver may complete the trip but the vehicle must be serviced as quickly as possible.

Regenerative Braking

A unique aspect of an electric bus is being able to charge the main batteries using the energy available in a moving vehicle. Your Blue Bird electric bus comes equipped with a regenerative braking system. When the accelerator pedal is released, the electric motor will act as a generator to slow the vehicle down while at the same time feeding energy back into the batteries. If the batteries are over 90% State Of Charge (SOC), the regenerative braking effect will be limited.



Electronic Stability Control



WARNING! *The driver is ALWAYS responsible for the control and safe operation of the bus at any time. The ABS or ESC system(s) does NOT replace the need for a skilled, alert, professional driver reacting appropriately and in a timely matter. Safe driving practices must be followed at all times.*

The Electronic Stability Control (ESC) system offers a way to reduce the occurrence of loss-of-control events, as well as rollovers. ESC builds on the ABS with additional sensors, logic, and use of the brakes to slow and redirect the vehicle. During normal driving, ESC continuously monitors steering and vehicle direction. It compares the driver's intended direction, determined by the measured steering wheel angle, to the vehicle's actual direction determined through measured lateral acceleration, vehicle rotation, and individual road wheel speeds.

ESC intervenes only when it detects a probable loss of steering control, such as when the bus is not going where the driver is steering. This may happen when skidding during emergency evasive swerves, understeer or oversteer during poorly judged turns on slippery roads, or hydroplaning. ESC estimates the direction of the skid and then applies the brakes to individual wheels asymmetrically in order to create torque about the vehicle's vertical axis, opposing the skid and bringing the vehicle back in line with the driver's commanded direction. Additionally, the system may reduce motor power to slow the vehicle down.

ESC can function on any surface, wet or dry. It reacts to and corrects skidding much faster and more effectively than the typical human driver, often before the driver is even aware of any imminent loss of control. ESC systems will alert the driver when they intervene, so that the driver is aware that the vehicle's handling limits have been reached. An indicator light will illuminate when the ESC system is actively controlling the bus.



The ESC system is not a performance enhancement nor a replacement for safe driving practices but rather a safety technology to assist the driver in recovering from dangerous situations. ESC does not increase traction, so it does not enable faster cornering (although it can facilitate better-controlled cornering). More generally, ESC works within the limits of the bus's handling and available traction between the tires and road. A reckless maneuver can still exceed these limits, resulting in loss of control. For example, during hydroplaning, the wheels that ESC would use to correct a skid may lose contact with the road surface, reducing its effectiveness.

ESC incorporates yaw rate control into the ABS. Anti-lock brakes enable ESC to slow down individual wheels. The ESC systems also incorporate a traction control system which senses drive-wheel slip under acceleration and individually brakes the slipping wheel or wheels and/or reduces excess motor power until control is regained. However, ESC serves a different purpose from that of ABS or traction control.

The ESC system uses several sensors to determine where the driver intends to travel. Other sensors indicate the actual state of the vehicle. The control algorithm compares driver input to vehicle response and decides, when necessary, to apply brakes and/or reduce throttle by the amounts calculated.

Steering components include:

- A steering wheel angle sensor that determines where the driver wants to steer.
- A yaw rate sensor that measures the rotation rate of the bus. The data from the yaw sensor is compared with the data from the steering wheel angle sensor to determine regulating action.
- A lateral acceleration sensor that measures the vehicle's lateral acceleration. This is often called an accelerometer.
- A wheel speed sensor that measures the wheel speed.



Hydraulic Brakes



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.



WARNING! Hydraulic brakes are power assisted. The brakes will be noticeably less effective when the main hydraulic pump is not running.



WARNING! Check the operation of this auxiliary pump before each trip. If it fails to come on when the brake pedal is applied and without the key switch ON, 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.

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.

The main hydraulic pump provides the necessary pressure to operate both the power steering and hydraulic brakes. When the key switch is in the ON position, the main pump will come on.



The hydraulic brake system includes an auxiliary electric pump that serves as a backup for the hydraulic pressure supplied by the main hydraulic pump. In the event that the main hydraulic pump is not operating, the auxiliary pump will provide some assistance in the brake system but will be much less effective than the power assist provided by the main pump. 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 by a professional mechanic.

Parking Brake (w/Hydraulic Brakes)

A Blue Bird Vision bus equipped with hydraulic brakes employs a Foot Operated Parking Brake, located to the driver's lower left. When the driver presses this pedal into the Engaged (Locked) 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.

The mechanical parking brake must be kept adjusted properly for maximum holding power. To apply the parking brake, press down firmly on the foot pedal. Always apply the brake fully, pressing it down until it reaches the limit of its travel which will be nearly to the floor.

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 parking brake is fully released.

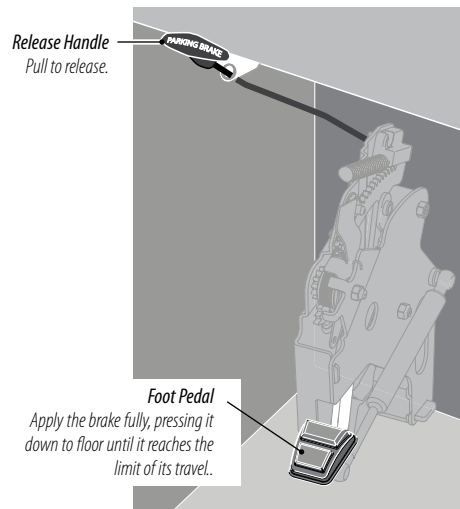


Figure 5-3. Parking Brake Pedal



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. When the ignition is on and the parking brake is applied, a yellow PARK warning light will illuminate in the instrument cluster, warning the driver that the parking brake is applied. The bus should NOT be driven when the parking brake is applied. Doing so will prematurely wear the parking brake or damage drivetrain components.



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.*

On buses equipped with a Hydraulic Parking Brake Interlock Feature, the service brake must be applied firmly before the parking brake will release. A solenoid locks the parking brake lever/pedal in the ON position until a signal is received from the service brake switch. This signal also illuminates the service brake lights.



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 of the surface, the parking brake will not function and the bus may move resulting in potential bodily harm or death.*



Parking Brake (Hand Operated)

The optional Parking Brake Hand Lever places the hand operated parking brake to the right of the driver's seat mounted on the floor. See [Parking Brake \(w/Hydraulic Brakes\)](#).

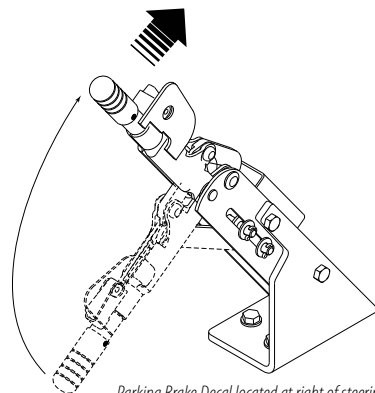
To apply the parking brake:

1. Grasp the handle of the lever and pull upward.
2. Pull lever firmly until it snaps over the center position.
3. Continue to pull the lever upward until against the top stop.
4. Press the lever downward into the Locked position. Stop to ensure the locking mechanism is secure.
5. Verify that the release button is locked; press down on the button.

To release the parking brake:

1. Press the brake pedal to prevent movement when the parking brake is released.
2. Grasp the parking brake lever with the right hand and lift up.
3. Press the release button on the grip and lower the lever all the way against its lowest 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.



Parking Brake Decal located at right of steering column on lower dash panel.

Figure 5-4. Parking Brake Hand Lever



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.

Air Brakes

Blue Bird air brake system uses compressed air pressure to operate drum or disc 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.

A motor driven air compressor maintains normal operating pressure 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. During normal operation, the compressor cycles on and off based on operating pressure. As this occurs, the air dryer occasionally expels a blast of air (chuff) which can be heard by the driver. This is a normal backflush behavior of the air dryer.



Parking Brakes (w/Air Brakes)

On Blue Bird buses, 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.

Although the parking brake control is an air valve, it is not air pressure which applies the parking brake, but the absence of air. 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 apply braking at 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.

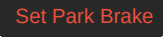


Pull to apply parking brakes. Push to release. The parking brake valve does not apply air brakes. It applies air to release the mechanical spring brakes.



Seat Belt and Parking Brake Alarm Indicators

The seatbelt warning light and audible alarm are active when the requirements are met based on the chart below.

Seatbelt and Parking Brake Alarm Condition						
Ignition ON	Park Brake ON	Seat Belt Buckled	Seat Belt Logic ENABLED	Gear in NEUTRAL or PARK	Speed: 3 mph (5 kph) or greater	Results
NO	NO	NO	NO	NO	NO	Flashing Park Brake Warning Light Continuous Alarm  
YES	YES	NO	NO	NO	YES	Flashing Park Brake Warning Light Continuous Alarm  
YES	YES	NO	NO	NO	NO	Park Brake Warning Light ON 
YES	NO	NO	YES	YES	NO	Seatbelt Warning Light ON Set Park Brake in Message Center Flashing Park Brake Warning Light Continuous Alarm    
YES	NO	NO	YES	NO	NO	Seatbelt Warning Light ON Continuous Alarm  



Pushbutton Shifter

The Blue Bird electric bus does not have a transmission. The motor is directly coupled to the rear axle via a single drive shaft. When a drive state is selected on the pushbutton shifter, a clockwise, counter-clockwise, or neutral command will be given to the main drive motor. As power is applied to the motor using the accelerator pedal, a forward or reverse motion will result. If Neutral is selected, the power will be blocked, resulting in no motion.

Three drive states (**Reverse**, **Neutral**, **Drive**) can be selected using the pushbutton shifter. Ensure that the brake pedal is pressed and the vehicle is stationary before selecting a drive state. A **P** will appear in the shifter display window when in Park Mode.

Park Mode

To enter Park Mode, apply the service brake pedal and set the parking brake. No Drivetrain power is available when in Park Mode, resulting in the drive motor being disabled.



Figure 5-5. Pushbutton Shifter



WARNING! Do NOT engage Park Mode while the vehicle is in motion or loss of vehicle control may result. The vehicle does NOT automatically enter Park Mode when the key is switched off. When the parking brake is actuated, the vehicle will enter Park Mode. The driver needs to always actuate the Park Mode before exiting the bus to avoid unwanted vehicle movement. If parking long term on an incline, it is recommended to chock the bus as well.



NOTE: If the bus is charging, the shifter will stay illuminated, even with the key removed from the ignition. While the LEDs on the shifter are still on, the bus will be inoperable. See [Charging](#) for more details.

Reverse Position (R)

The bus will move backward when in **Reverse (R)** and the accelerator is pressed. Power steering is active.

Neutral Position (N)

When the vehicle is in **Neutral (N)**, it will roll freely. No traction power is applied by the drive motor if the accelerator pedal is pressed. Power steering will be active while in **Neutral**.

Drive Position (D)

The bus will move in the forward direction when in **Drive (D)** and accelerator is pressed. Power steering is active.

Additional Buttons

Although **P** may be listed on the pushbutton shifter, it will not engage the parking brake. It is used to toggle between **Park Mode** and **Neutral** while the parking brake is engaged.



Anti-Roll Back and Creep

The bus is equipped with an anti-roll back feature. The system is designed to prevent movement in the opposite direction of the selected shifter position. If in **Reverse**, it reduces forward motion or in **Drive**, it reduces backward motion. The effort to hold the vehicle still comes from the electric traction motor. Because electric motors can overheat, the anti-roll back feature will timeout and release the vehicle to roll freely after 5 seconds. The feature is reset every time the vehicle comes to a complete stop and the brake pedal is pressed.



WARNING! *The anti-roll back feature will time out and release the vehicle to roll freely 5 seconds after the brake pedal is released. Re-apply the brake pedal or accelerator pedal before that time has elapsed or the vehicle will roll due to gravity.*

Roll Back Distance

On grades up to a 10% slope, the vehicle roll back distance is <1 ft (30.5 cm) while the feature is active. The maximum grade the vehicle can launch is a 20% slope. At that grade, the maximum roll back distance is 2 ft (61 cm) while the feature is active.

Charging

Before charging, make sure the bus is in Park Mode (parking brake ON and ignition switch OFF). To charge the high voltage battery packs, your bus is equipped with a Dual Charging System. This allows the bus to use AC or DC charging stations. The charge port on the Blue Bird EV is a CCS which is a Combo port that will accept either the SAE J1772 or a CCS1 DC charger paddle. The AC charging system uses the J1772 paddle which fits in the top portion of the port. If using DC fast charge, the CCS1 paddle will use the entire port.



To charge the batteries, open the charge port door, remove dust covers (if using the J1772 Charging Paddle, the dust cover over the lower unused section of the charger port can remain in place) and insert the paddle into the Charge Port. Once inserted properly a click can be heard indicating a good connection and the initiation of the charging process. When connected properly and charging, the instrument cluster will display **Charger Connected** in Area 5 of the message display center in the instrument panel.

AC Charging

- Uses the J1772 paddle
- Typically requires 8 hours to fully recharge batteries



J1772 AC paddle

DC Fast Charging

- Uses the CCS1 paddle
- Can fully recharge batteries in 3 hours



CCS1 DC Fast Charge paddle

Figure 5-6. Charging Paddles

CCS Combo Charge Port

(shown with dust covers removed)

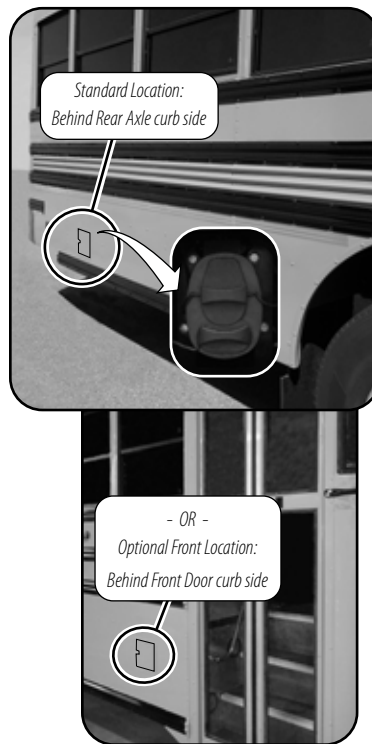


Figure 5-7. Charge Port Location



There are two charging modes that can be displayed: **Charger Connected or Charging Error**. When the ignition is in the OFF position, press any of the three buttons next to the message center to display the Charging Status. The display will remain ON for 10 seconds and then time out. If the ignition is ON, the charging status will display automatically. While charging, Area 3 in the message center will display **Time To Full Charge** indicating the time needed to complete a full charge.

When your bus is not in use for short periods of time (<7 days), it should be plugged into the battery charger (See **NOTE** on next page regarding charging, when bus is idle for +7 days). This can be particularly important in hot and cold environments. The batteries will not begin to charge until they are the proper temperature. When the battery charger is plugged into the bus, the computer checks the battery temperature and either cools or heats the batteries using the power from the charger. When the batteries are at proper temperature, the charging cycle will automatically begin.

NOTE: The **Time To Full Charge** indicated on the instrument cluster reflects the *total* time, including the time it takes to heat or cool the batteries. The Light Emitting Diodes (LED)s on the shifter will stay illuminated until the charging process is complete. While the shifter LEDs are still lit, the bus will be inoperable.



Figure 5-8. Typical Charging Status



Charging Error

If charging did not commence and you have a charging error:

1. Check the Power LED on the charger to verify that the power supplied to the charger is ON.
2. Check the charger paddle to be sure it is plugged in properly to the charge port on the bus.
3. Verify charging has begun by checking the Charging LED on the battery charger.
4. Check that **Charger Connected** and **Time To Full Charge** is displayed in the message display.

NOTE: If your bus is not going to be used for an extended period of time (+7 days), it is advisable to NOT leave it plugged into charger.



Figure 5-9. 12V Battery Box



Battery Care

Never allow the high voltage batteries to fully discharge. Even when not being driven, the batteries discharge very slowly, to power the on-board electronics. Situations can arise in which you must leave your bus unplugged for an extended period of time. In these situations, monitor the power level to be sure you leave the battery with a sufficient charge to move the bus to a working charge station.



WARNING! *The batteries have no parts that a non-authorized service technician can service. Under no circumstances should you open or tamper with the high voltage batteries. Always contact your Blue Bird dealer to arrange for battery servicing.*



CAUTION! *If the batteries charge level falls to 0%, you MUST plug it in. If you leave it unplugged for an extended period of time, it may not be possible to charge. Leaving your bus unplugged for an extended period can also result in permanent battery damage. If you are unable to charge your batteries, contact your authorized Blue Bird dealer.*

12V Battery

A standard 12V (Group 31) Battery is installed in your bus. It is located on the front left side of the bus. Open the battery door for inspection and service. This battery is kept at peak charge automatically anytime the bus is being driven or when the high voltage batteries are being charged. A DC to DC converter monitors the 12V system and based on power demand, will provide enough current for load demands and enough current to keep the battery properly charged. The 12V battery is used to power the 12V body and chassis circuits typically found on all Blue Bird buses.



Wheel Differential Lock

A Blue Bird bus may be equipped with an optional, driver controlled, Wheel Differential Lock system. The driver manually locks/unlocks the Wheel Differential using a cab mounted control switch. When the control switch is placed in the Locked position, an air supply solenoid valve opens and air pressure activates the shift unit to engage the Wheel Differential Lock. When the control switch is placed in the Unlock position, air pressure supply is shut off and air pressure is released from the shift unit to disengage the Wheel Differential Lock.



WARNING! Engage the Wheel Differential Lock *ONLY* when the vehicle is stationary or moving without wheel differentiation (spinout).



WARNING! Do NOT use the wheel differential lock when traveling downhill.



WARNING! Do NOT use the wheel differential lock at speeds over 25 mph (40 kph).



WARNING! When the wheel differential lock is engaged, be sure to allow for a larger turning radius and greater steering effort.



Engaged Position (Locked)

1. Move the control switch to the Lock position; either while the vehicle is stationary or while moving at steady speed <25 mph (40 kph) without wheel differentiation (spinout).
2. Reduce pressure momentarily on the accelerator pedal to relieve torque on the gearing and fully engage the sliding clutch.
3. When the differential lock is engaged, the indicator light will be on or an audible signal sounds.

With the cab switch in the Locked position, the vehicle system air pressure is applied to the shift system, which engages the Wheel Differential Lock and both wheels turn at the same speed.

Disengaged Position (Unlocked)

1. To disengage the Wheel Differential Lock, move the control switch to the Unlocked position.
2. Reduce pressure on the accelerator pedal momentarily to relieve torque and allow the sliding clutch to disengage.
3. When the differential lock is disengaged, the indicator light and/or audible signal goes out.



WARNING! *To ensure maximum control of the vehicle, do NOT use the wheel differential lock when traveling downhill.*



WARNING! When engaged, the wheel differential lock will cause the vehicle to under-steer, meaning that the vehicle will not turn as quickly, and more steering effort will be required.



WARNING! Use the wheel differential lock only at speeds <25 mph (40 kph). At higher speeds the under-steer handling characteristics could be dangerous.



CAUTION! Wheel Differential Lock should only be used when poor traction is encountered. It must be Disengaged when traveling on solid road surfaces.



CAUTION! The differential lock should only be Engaged when the vehicle is stationary (recommended) or moving <25 mph (40 kph) without wheel differentiation (spinout). Engagement of the wheel differential lock while wheels are rotating at different speeds (differentiation) may cause internal component failure.



CAUTION! Operating the wheel differential lock in the Engaged position on solid surfaces while turning corners (differentiating) may cause damage to internal components.

NOTE: With the cab switch in the Unlocked position, there is zero air pressure to shift system and a spring is keeping the shift assembly in the Disengaged position.

NOTE: Occasionally, the Wheel Differential Lock may not disengage immediately due to torque wrap-up. When this occurs, drive normally for a short distance with the control switch still in the Unlocked position until normal road forces release the torque wrap-up condition.

**PRE-TRIP INSPECTION****6-1**

Before Placing Your Electric Bus in Service	6-2
Daily Pre-Trip Inspection	6-2
Automated Pre-trip Exterior Light Check Feature.....	6-11
Prepare for Driveaway	6-12
Back-up Camera	6-12
Mirrors and Mirror Adjustments	6-13

LIST OF ILLUSTRATIONS

Figure 6-1. Pre-trip Inspection Components	6-3
Figure 6-2. Pre-trip Inspection Zones.....	6-5
Figure 6-3. Back-up Camera Monitor	6-12
Figure 6-4. Back-up Camera	6-13
Figure 6-5. Interior Mirror Bracket.....	6-13
Figure 6-6. External Rearview Mirrors	6-14
Figure 6-7. Hood-Mounted Crossview Mirror.....	6-15
Figure 6-8. Test Cylinder Locations for Mirror Adjustments.....	6-17



Before Placing Your Electric Bus in Service

Upon taking delivery of any new school bus, it is recommended that the bus be inspected by a qualified school bus technician. The driver of this bus **MUST** be familiar with the contents of this manual. A thorough knowledge of the operating controls is essential to the proper operation, safety, and comfort of passengers. Keep this manual in your bus for reference.

Tire inflation pressure must not exceed the specifications of the tire and/or wheel/rim manufacturer for the specific load, speed, and application. The inflation pressure embossed on the tire sidewall may not take into consideration the wheel/rim capacities.



WARNING! *Tires should not be inflated above the pressure listed on the Federal Certification plate without consulting your tire/wheel distributor. Failure to comply may result in personal injury and/or damage to equipment.*

Daily Pre-Trip Inspection

A daily school bus inspection is required by the driver before the bus is put into service. To be effective, a Pre-Trip Inspection of a school bus **MUST** be thorough and systematic. Drivers are required to have sufficient knowledge to identify vehicle deficiencies when conducting a pre-trip inspection. As school bus operations are regulated at the state and local level and many of these jurisdictions have their own pre-trip inspection forms, this checklist is not meant to be a compliance document. This checklist does detail the areas applicable to the pre-trip inspection of a school bus and can be useful to those operations that are not required to use a specific form. The forms on the following pages are minimum suggestions that can be used in developing your own checklist and not intended to be all inclusive.



WARNING! *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 bus is in Park and that the parking brake is fully on. Place wheel chocks in front of and behind rear wheels.*

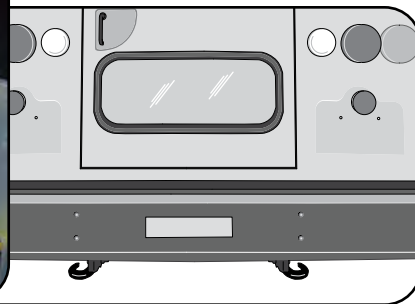
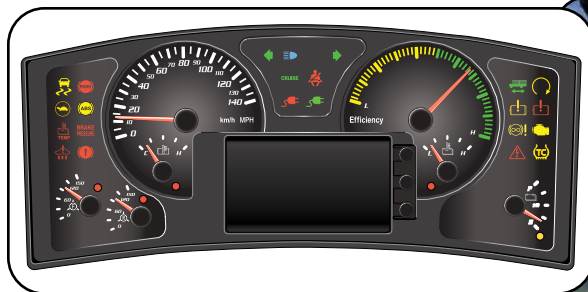
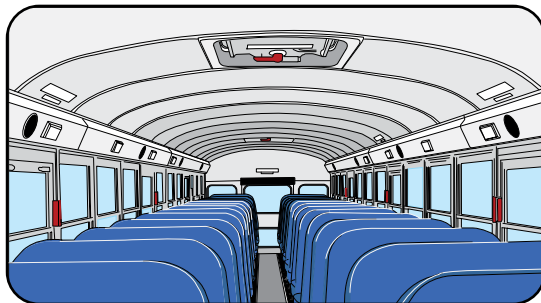


Figure 6-1. Pre-trip Inspection Components



DRIVER'S HANDBOOK

Name: _____

Date: _____

Zone 1: Rear Passenger Side of Bus

- ☐ Disconnect charging cable at rear, passenger side of bus.
 - Replace cap on charging plug.
 - Close charging plug access door.

Zone 2: Front Hood Area

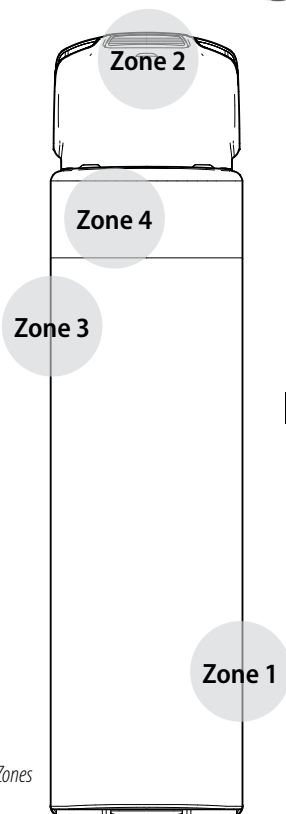
- ☐ Open hood at front of bus.
 - Check level of power steering fluid by looking at reservoir;
Fluid should be in between COLD and HOT marks. Power steering fluid is pink.
 - Check level of coolant by ensuring that coolant fluid is between COLD FULL and HOT FULL marks.
The coolant fluid is orange.
 - Visually check area around radiator for coolant leaks.
 - Close and latch hood.

Zone 3: 12V Battery Area

- ☐ Open battery access door and pull out battery tray.
 - Inspect battery connections making sure they are clean and not corroded.
 - Check tightness of cables to connection points by grabbing cables and moving them back and forth.
There should be no movement where cables are connected to battery, battery disconnect switch, and automatic disconnect switch.
 - Push battery tray back in, close, and latch access door.
- ☐ Check under bus around front axle, area under high voltage batteries and area behind rear axle for any fluid on ground which would indicate a coolant leak.

**Zone 4: Driver Compartment Area**

- ☐ Sit in driver's seat:
 - Verify that shifter light has extinguished.
 - Insert key in ignition and start bus.
 - Do NOT put on seat belt and do NOT close entrance door.
 - Firmly press brake pedal, disengage parking brake, and press **D** or **R** on gear selector.
 - Warning indicators should flash on dash, audible alarms should be heard and bus should not move.
 - Press **N** on gear selector, set parking brake, and release brake pedal.
- ☐ While still sitting in driver's seat:
 - Put on seat belt and do NOT close entrance door.
 - Firmly press brake pedal, disengage parking brake, and press **D** or **R** on gear selector.
 - Warning indicators should flash on dash, audible alarms should be heard and bus should not move.
 - Press **N** on gear selector, set parking brake, and release brake pedal.
- ☐ With seat belt still on, close entrance door:
 - Firmly press brake pedal, disengage parking brake, and press **D** or **R** on gear selector.
 - Bus should not display any warnings on dash and no audible alarms should be heard.
 - Slowly release pressure on brake pedal and bus should move.
 - Verify that Pedestrian Alert Device is working by increasing vehicle speed gradually until sound is clearly audible.
 - Bus is now ready for operation.

*Figure 6-2. Pre-trip Inspection Zones*



DRIVER'S HANDBOOK

Name: _____

Date: _____

ITEM	INSPECTION - Exterior Walk Around <i>Approach bus from front to begin general exterior inspection.</i>	PASS	FAIL
1	Condition of front bus markings such as school bus sign and reflective markings. Clean windshield if needed.		
2	Look for any leaning or twisting of bus which may suggest tire problems, axle misalignment, or structural damage.		
3	Crossing arm is properly secure and unbroken.		
4	Check mirror brackets for secure mountings. Check for broken or cracked mirrors and clean mirrors if needed.		
5	Look underneath bus for any unusual conditions such as dangling harness wires, fluid leakage, or other debris.		
6	Look at ground underneath for signs of fluid leakage, broken glass, or other debris.		
7	Check tires for proper inflation, tread depth, and any signs of physical damage. Normal tread wear should be uniform across width of tread.		
8	Inspect rim for bends or other damage. Check that all lug nuts are in place. If bus is equipped with oil lubricated axles, check sight glass in center of hub for proper oil level.		
9	Check Stop Arm for any signs of physical damage.		
10	Open battery compartment door and inspect 12V battery. Check for corrosion on battery terminals and for loose connections. Close compartment and make sure it is secure.		
11	Check overall view of left 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.		
12	Approach rear axle at front of rear tires. Visually inspect for any missing suspension bolts, signs of cracks, misalignment, or other physical damage on opposite side. View shock absorber for signs of oil seepage.		



ITEM	INSPECTION - Exterior Walk Around <i>Approach bus from front to begin general exterior inspection.</i>	PASS	FAIL
13	Inspect left rear tires. Check for correct inflation pressure in both outer and inner tires. Check tread depth and look for any signs of physical damage. Normal treadwear should be uniform across width of tread.		
14	Inspect rim for bends or other damage. Check that all lug nuts are in place. Look at axle center caps for missing nuts or signs of axle lubricant leakage.		
15	Look under bus, behind rear tires, along back, and across to opposite side. Check oil leakage on axle. Look for missing, bent, or broken axle/suspension fasteners. Look for any signs of leaking fluid, broken glass, or other debris.		
16	Check condition of braking system. Look for bent, broken, or leaking items or anything unusual. Test system for proper operation.		
17	Check rear markings are legible and in good condition, including emergency exit signs and reflective tapes. Check for broken windows and any other signs of vandalism.		
18	Proceed to left side of bus. Open battery door and ensure battery cables are securely tightened.		
19	Inspect under bus, behind rear tires, and view along back of axle. Look for any signs of oil leakage, missing, bent, misaligned, or broken axle/suspension fasteners.		
20	Inspect right rear tires for correct inflation pressure in both outer and inner tires. Check tread depth and look for any signs of physical damage. Normal tread wear should be uniform across width of tread.		
21	Inspect rim for bends or other damage. Check that all lug nuts are in place. Look at axle center caps for missing bolts or signs of axle lubricant leakage.		
22	Inspect front of rear tires, under bus, and across axle. Visually inspect for any missing suspension bolts, signs of cracks, misalignment, or other physical damage on opposite side. View shock absorber for signs of oil seepage.		
23	Check that all markings on right side 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.		



DRIVER'S HANDBOOK

Name: _____

Date: _____

ITEM	INSPECTION - Entrance Area	PASS	FAIL
1	Inspect entrance door glass for cracks, frame for structural damage, and closure seals for wear or damage.		
2	Open door and inspect stepwell for ice or debris that may be hazardous to passengers. Ensure that entire entrance area is free of obstructions such as loose tools or cleaning equipment.		
3	Grasp entrance handrail and check for secure mounting.		
4	Inspect condition of right windshield wiper blade.		
5	Inspect condition of left windshield wiper blade.		

ITEM	INSPECTION - Chassis Area <i>Unlatch right and left hood latches. Grasp front hood handhold and pull back to raise hood and set latch. Step to left side (driver's side) front wheel to proceed with under-hood inspection.</i>	PASS	FAIL
1	Visually inspect the inner side of the wheel. Inspect the wheel end for any sign of fluid or air leakage.		
2	Inspect the front axle and suspension for missing, bent, or broken fasteners. Inspect the shocks for signs of oil leakage.		
3	Visually inspect the steering mechanism. Looks for signs of fluid leakage, loose or missing parts.		
4	Check the power steering fluid level.		
5	Check the coolant reservoir fluid level.		
6	Check the washer reservoir fluid level.		
7	Inspect both sides of the radiator for debris and signs of damage.		



Name: _____

Date: _____

ITEM	INSPECTION - Driver Area Alerts <i>Insert ignition key and turn to first ON position.</i> <i>All instrument panel lights and Message Display Center illuminate.</i>	PASS	FAIL
1	Scan lights for any that do not illuminate.		
2	Check for audible alerts.		
3	Check message display center for error codes.		
4	Check condition of battery charge, as indicated by instrument panel voltmeter.		
5	Turn on and check interior dome lights.		
6	Check condition and function of emergency windows, roof hatches, or latched emergency door vandal lock.		
7	Check for proper operation of equipment switches in upper panel of side console.		
8	Operate all exterior lights and verify that all are working properly. Include all running lights, marker and clearance lights, and warning lights.		
9	Check interior mirror for damage and proper adjustment to provide a clear view of rear of bus.		
10	Check for proper front and rear air pressure. Check air pressure loss (< 3 psi) during 1 minute service brake application.		



ITEM	INSPECTION - Passenger Area <i>Inspect cleanliness of passenger area and functional check of all emergency exits.</i>	PASS	FAIL
1	Check emergency door for proper operation including audible alarm.		
2	Inspect condition of interior. Look for soiled or cut seat upholstery, loose seatbacks, and secure floor mounting.		
3	Check condition of each seat and seat barrier, window, and floor area between seats.		
4	Inspect for damaged and dirty windows.		
5	Inspect and operate roof hatches for proper alarm function and operation.		
6	Inspect and operate emergency windows for proper alarm function and operation.		
7	Check walkways and aisle for obstructions; should be free of loose items.		

ITEM	INSPECTION - Emergency Equipment	PASS	FAIL
1	Check fire extinguisher charge and expiration date.		
2	Inspect flare kit and/or roadside hazard triangular reflector kit for full content and secure stowage.		
3	Inspect fire axe and/or wrecking bar for secure mounting.		
4	Inspect first aid kit and body fluid kit for fully stocked content and secure mountings.		



Automated Pre-trip Exterior Light Check Feature

This feature allows operation of all exterior lights to be checked by the sole operator. By use of a switch in the driver's area, the operator can activate the exterior lights in a flashing sequence based on related groups. The lights will flash on and off in the sequence for five minutes and deactivate automatically. The system allows check of lights only and does not verify switch or input circuit operation. To verify switch and individual circuit operation, deactivate the Exterior Light Check feature and use the exterior light switches for circuit and switch verification.

To activate the feature, apply the park brake, and select Neutral on the pushbutton selector pad. Turn the ignition key to START position and release. To start the flash sequence, press the switch labeled, EXT LGT CHECK located in the bulkhead over the windshield and slightly to the left of the driver. Releasing the park brake, placing the bus in gear, or switching the ignition off will deactivate the system.

If your bus is equipped with a Sleeping Child Check feature, the system may be armed by activating the Pre-trip Exterior Light Check feature. An LED on the Doran™ monitor will indicate if the Sleeping Child Check feature has been armed.

Exterior light sequence activation by related groups:

- Directional/Hazards – All directional (left and right) lights at the same time.
- Tail Lights – All tail lights, tag lights, front parking lights, clearance lights, marker lights, identification lights when stop lights are in the OFF flash rate state.
- Stop Lights – All stop lights when tail lights are in the OFF flash rate state.
- Back-up Lights – Both back-up lights and the optional backing horn (if equipped).
- Rear Warning Lights – Both amber warning lights flash then both red warning lights flash.
- Stop Arm (s) – Will extend and flash stop arm lights throughout the 5 minute sequence.
- Front Warning Lights – Both amber warning lights flash then both red warning lights flash.
- Headlights – Alternately flash between high and low beam.



DRIVER'S HANDBOOK

Prepare for Driveaway

Return to the driver's seat and proceed as follows.

1. Adjust seat height, back, and position.
2. Adjust steering wheel position as needed. See [Steering Wheel Position](#).
3. Check alignment and positioning of all rearview mirrors, interior and exterior for optimum view. Adjust as necessary.

Back-up Camera

When the bus is shifted into Reverse, a display for the back-up camera will be activated and appear in the instrument cluster message display center screen, giving the driver a view behind the bus.



WARNING! Practice safe backing.

1. Whenever possible, park in such a way to avoid having to back up bus.
2. Walk around the bus before backing up to ensure path is clear of people and obstructions. Remember this acronym: G.O.A.L. – Get Out And Look.
3. Back slowly, watching for people, vehicles, or objects entering your path of travel.
4. Frequently check mirrors and blind spots, scanning from left to right.



Figure 6-3. Back-up Camera Monitor



- a. Check left blind spot by looking over your left shoulder.
- b. Check left side view mirror.
- c. Check in front of vehicle; rear view mirror.
- d. Check back-up camera monitor.
- e. Check right side view mirror.
- f. Check right blind spot by looking over your right shoulder. Repeat this frequently while backing.

NOTE: Back-up cameras can be convenient by providing a view you normally would not have.

They should not, however, be the only view you use when backing up.

Mirrors and Mirror Adjustments

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.

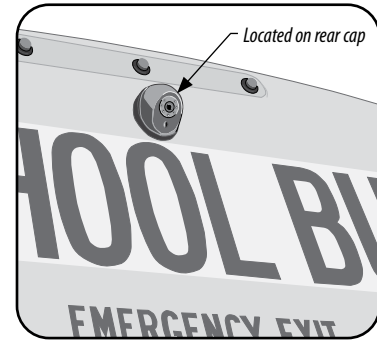


Figure 6-4. Back-up Camera

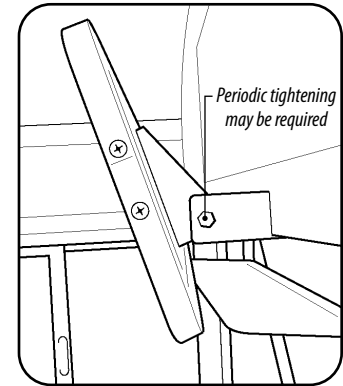


Figure 6-5. Interior Mirror Bracket



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 and backing cameras 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.*

The Blue Bird Vision is equipped with four external rearview mirrors. The exterior rearview mirrors are available with an array of optional mirrors and brackets. The right side rearview flat mirror and convex mirrors are mounted from the top of the bus, near the top right-hand corner of the windshield. 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 (LH) corner of the windshield. They are positioned to be viewed by the driver through the driver's side window.

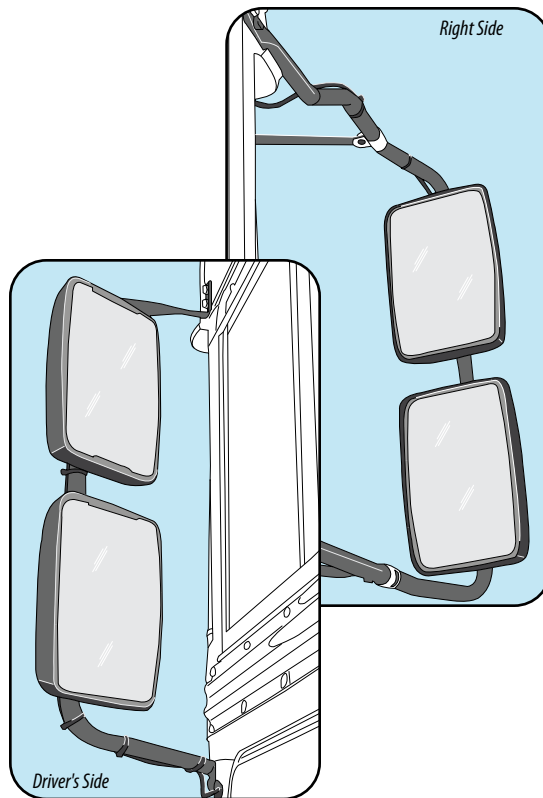


Figure 6-6. External Rearview Mirrors



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. (27-34 Nm) torque to minimize vibration.



CAUTION! Do NOT over-torque the mirror mounting hardware.

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! You MUST be aware: There is a blind spot located 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 (RH) flat mirror so that the tops of the RH windows are visible in the upper edge of the mirror and the RH side of the bus is visible along the vertical, inside edge.
3. Adjust the RH convex mirror so that the view in the convex mirror overlaps the view provided by the flat mirror above it. The RH side of the bus must be visible in this mirror as well.
4. Adjust the LH flat mirror in the same manner as described for the RH flat mirror.

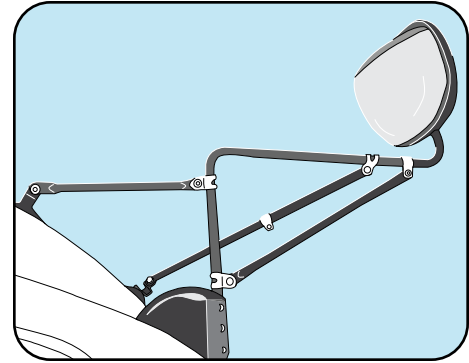


Figure 6-7. Hood-Mounted Crossview Mirror



5. Adjust the LH convex mirror in the same manner as described for the RH convex mirror.
6. Adjust the elliptical, crossview 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, either by direct view or by use of the crossview mirrors, must be able to see the entire top surface of the test cylinder in each location as well as the entire cylinder at location **P**.
 - The driver must be able to see the entire top surface of cylinders **M** and **N** using one of the two rearview mirrors on each side of the bus.
 - The driver must have a view of at least 200 ft (60 m) from the surface of the mirror using one of the two rearview mirrors on each side of the bus.
 - The elliptical, crossview mirrors should be adjusted so the seated driver is able to see the entire top surface of all cylinders **A** through **O**, as well as the entire cylinder at location **P** when positioned as shown and not directly visible by the driver.
 - 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.

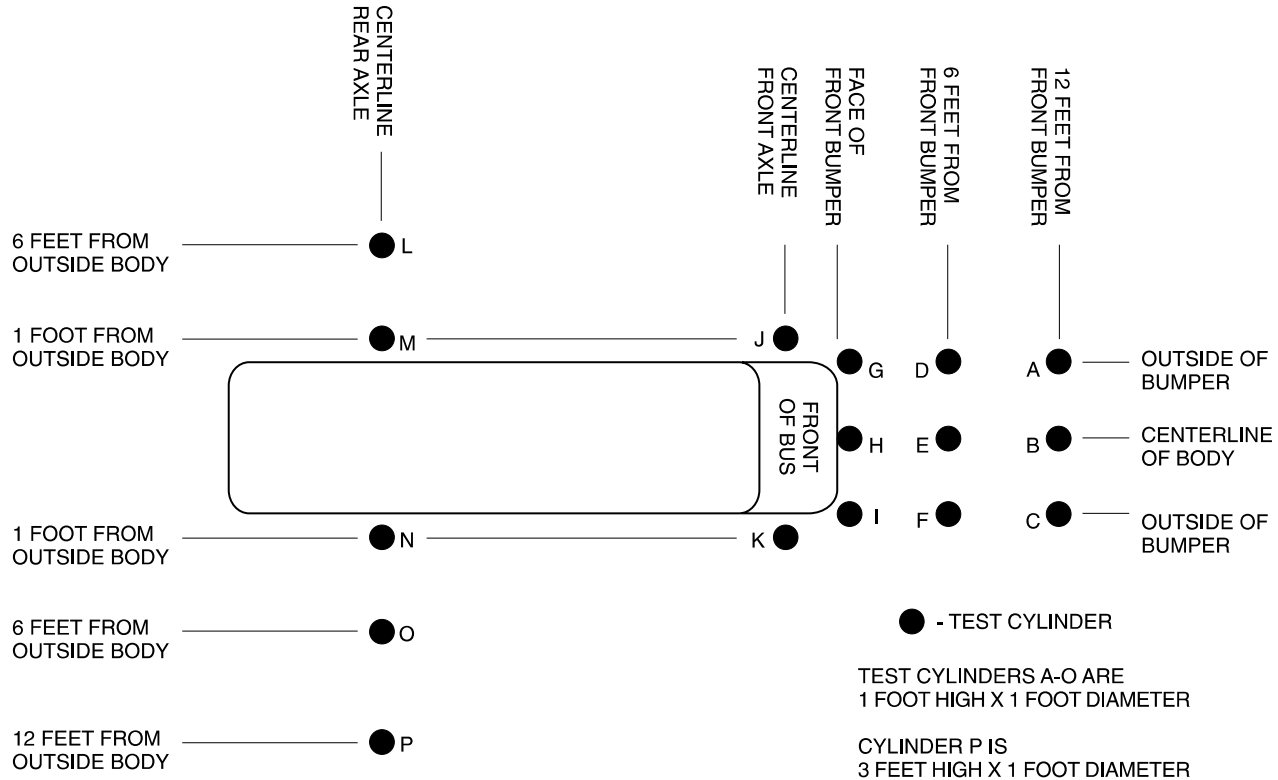


Figure 6-8. Test Cylinder Locations for Mirror Adjustments



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**ENROUTE EMERGENCIES****7-1**

High Voltage Safety	7-2
Emergency Shutdown	7-2
High Voltage Manual Service Disconnects	7-2
Enroute Emergencies	7-4
Using Triangular Hazard Reflectors	7-5
Jacking and Towing	7-6
Jacking	7-6
Towing	7-7
Caging the Spring Brakes	7-8
Air Tank Schrader Valve	7-10

LIST OF ILLUSTRATIONS

Figure 7-1. High Voltage MSDs	7-2
Figure 7-2. Triangular Hazard Reflector Placement	7-5
Figure 7-3. Jack Points	7-6
Figure 7-4. Rearmost Driveshaft	7-7
Figure 7-5. Spring Brake Chamber	7-9
Figure 7-6. Tow Hooks	7-10
Figure 7-7. Schrader Valve	7-10



High Voltage Safety

Emergency Shutdown

In the event that the vehicle must be shut down immediately, bring the vehicle to a complete stop. While still pressing the service brake pedal, enter Park Mode by engaging the parking brake and then switch the ignition key to the OFF position. Ensure that the parking brake is engaged and exit the vehicle safely.

High Voltage Manual Service Disconnects

The high voltage battery system is equipped with two safety devices to disconnect the high voltage current path. These devices are called Manual Service Disconnects (MSDs). They should be left alone unless there is a good reason to remove them. To disconnect the high voltage batteries, isolating them from the bus, perform as follows.

1. Disconnect the 12V battery (group 31) first by removing the ground cable from the battery. The battery compartment is located street side under driver's window.
2. Remove the shunt portion (front cover) of each MSD to disconnect the high voltage. This can be done by first pushing in on the orange locking tab centrally located on the black locking handle. While the tab is in the Unlocked position, rotate the black locking handle down and forward to the end of travel which will be approximately 90 degrees from the Locked position. This will unlock the shunt (front cover) from the housing. Using the black handle, pull the cover off of the housing and store in a clean environment for re-use.



Figure 7-1. High Voltage MSDs
(located on RH (curb side) under skirt)



NOTE: As you are rotating the black handle down to unlock the cover, you may feel resistance at an intermediate position at approximately 45 degrees. At this stage, the high voltage interlock connection has been broken. Continue to rotate the black handle to 90 degrees to fully unlock the outer housing.

3. Two High Voltage MSDs are on every bus. These disconnects are located on the curb side, mounted to the battery packs. Be sure to remove both (2) MSDs shunt/covers to completely disconnect the high voltage battery packs from the bus electrical system.



WARNING! *The high voltage system will remain energized for 10 minutes after the MSDs have been pulled due to capacitance.*

To reinstall the MSD: push the shunt/cover firmly in place while the black locking handle is on the Unlocked position. When the shunt/cover is firmly in place, rotate the black locking handle rearward until the orange locking button snaps into place, locking the handle. Pull on the shunt/cover to ensure it is securely locked into position. The 12V battery must be disconnected while the MSD is being reinstalled. Reconnect the 12V battery last.

NOTE: During normal maintenance, both MSDs can be left in place.



WARNING! *The high voltage system has no user serviceable parts. Do NOT disassemble, remove, or replace high voltage components, cables, or connectors. High voltage cables are typically colored orange for easy identification.*



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 [Driver Orientation](#) and [Pre-trip Inspection](#) in 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 ft (about 40 paces) to the front of the vehicle, with reflective side facing oncoming traffic. Place another triangular marker 100 ft (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 ft (about 40 paces) to the rear of the vehicle. Place another triangular marker 200 ft (about 80 paces) from the first marker (300 ft [91 m] behind the vehicle). The reflective side should be facing overtaking traffic.

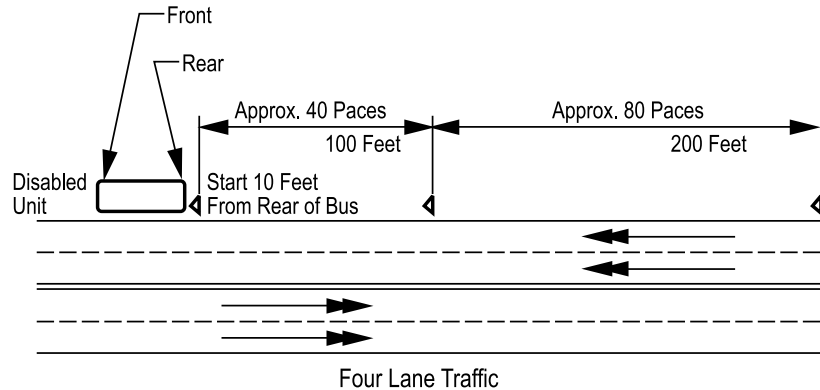
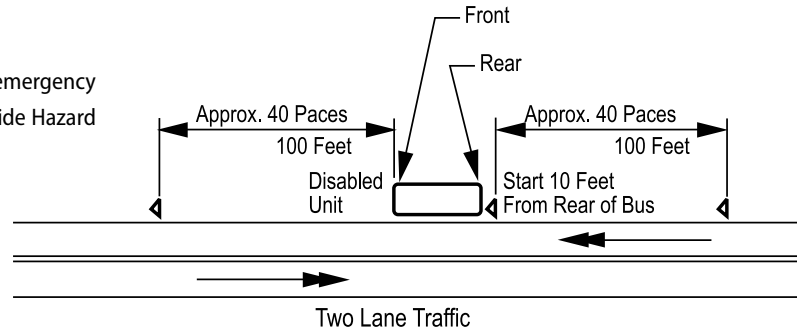


Figure 7-2. Triangular Hazard Reflector Placement



Jacking and Towing

Jacking



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.*

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.

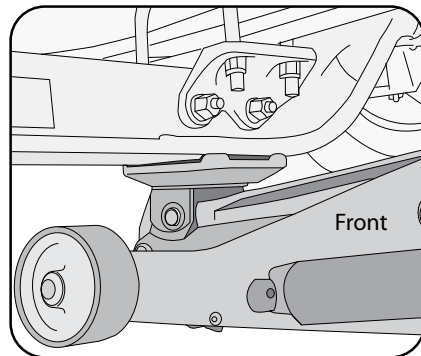
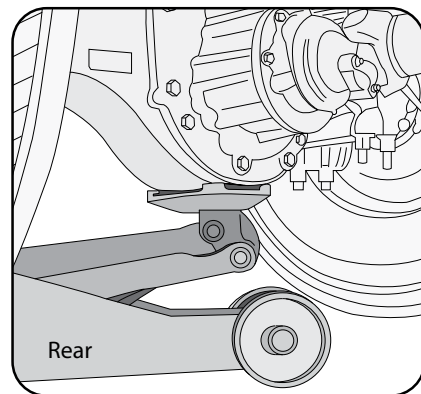


Figure 7-3. Jack Points





Towing

If the bus is towed with the rear wheels on the road, the driveshaft must be removed in order to prevent the drive motor input shaft from turning which could damage the motor. This is accomplished by removing the rearmost driveshaft. Also, on buses equipped with air brakes, if full normal air pressure cannot be provided to the air system, the parking brakes must be mechanically caged to prevent their engagement. See [Caging the Spring Brakes](#).

1. Apply the parking brake and chock the wheels while preparing the vehicle for towing.
2. From under the bus locate the driveshaft behind the axle housing for removal. Remove the capscrews that secure the yoke straps at the forward universal joint.

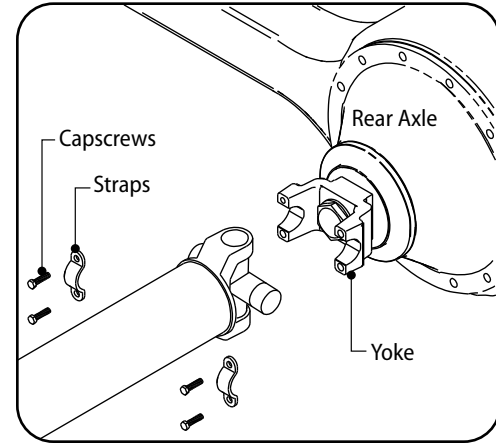


Figure 7-4. Rearmost Driveshaft



WARNING! On units with hydraulic brakes, the parking brake becomes ineffective when the driveshaft is removed which could allow the bus to roll if the wheels are not chocked. Chock the wheels.



WARNING! Do NOT secure the driveshaft to any high voltage or low voltage wiring, cooling hoses, or brake lines.



3. Using a pry bar, carefully apply linear pressure to the driveline allowing the slip joint to provide clearance from the universal joint. Carefully lower the driveline allowing it to rest in the driveline guard.
4. Wrap the universal joint on forward driveline with tape in order to retain bearings.
5. Moving to the rear joint at the axle housing differential, remove the capscrews that secure the yoke straps to the hub. Carefully lower the driveline removing it from the driveline guard.
6. Wrap the universal joint on the end of the removed driveline with tape in order to retain bearings.
7. Store driveline in rear of bus in preparation for towing.
8. After tow truck has been hooked to bus, release the parking brake and remove wheel chocks.
9. Discard removed capscrews and straps. New capscrews and straps will be required for reinstallation of driveline. Torque capscrews to 45 - 60 ft-lbs (61 - 81 Nm).

Caging the Spring Brakes

If the bus is equipped with air brakes and if full working air pressure is not present in the system, the parking 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.*



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.
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.
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.
4. Using a 3/4-in. hand wrench (do NOT use an impact-type wrench), turn the release nut clockwise until the internal spring is fully caged.
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.
6. The bus is prepared for towing. The bus may be equipped with optional tow hooks or tow eyes, located just inside the access openings of the front and/or rear bumper.

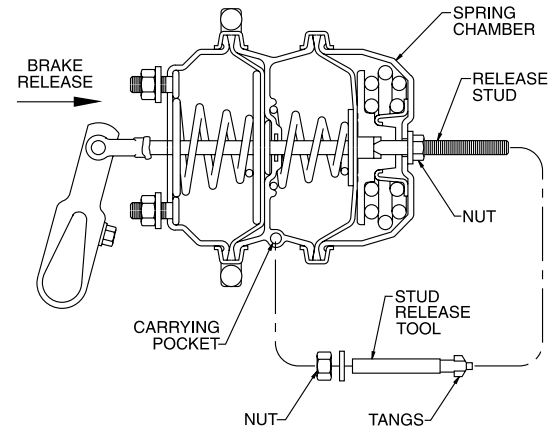


Figure 7-5. Spring Brake Chamber

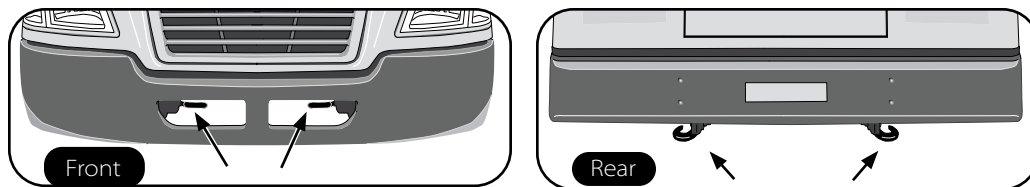


Figure 7-6. Tow Hooks



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, outboard of the chassis frame rails between the axles.

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 compressor.

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



Figure 7-7. Schrader Valve



BUS/COMPONENT IDENTIFICATION

8-1

Product Identification Information	8-2
Federal Vehicle Compliance Label	8-2
Body Serial Number and Service Number Plate	8-2
Axle Record and Chassis Service Number Label	8-2
Vehicle Identification Number	8-3
Data Plates Reference	8-4
VECI Label	8-4

LIST OF ILLUSTRATIONS

Figure 8-1. Federal Vehicle Compliance Label	8-2
Figure 8-2. Body Serial and Service Number Plate	8-2
Figure 8-3. Axle Record and Chassis Service	8-3
Figure 8-4. VIN Sample	8-3
Figure 8-5. VECI Label Sample	8-5



Product Identification Information

Federal Vehicle Compliance Label

This label 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.

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.

Axle Record and Chassis Service Number Label

These labels are located on the front headlining panel above the entrance door. 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 dealer.

MANUFACTURED BY
BLUE BIRD BODY COMPANY
DATE OF MFR. **XX/XX**

SUITABLE TIRE - RIM CHOICE

GVWR: **XXXXX** KG (**XXXXX** LB)

GAWR : FRONT **XXXXX** KG (**XXXXX** LB) WITH **XXXXXXXXX** TIRES
XXXXXXXXX RIMS. AT **XXX** KPA (**XXX** PSI) COLD SINGLE

GAWR : REAR **XXXXX** KG (**XXXXX** LB) WITH **XXXXXXXXX** TIRES
XXXXXXXXX RIMS. AT **XXX** KPA (**XXX** PSI) COLD DUAL

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S.
FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN
EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

V.I.N. **XXXXXXXXXXXXXXXXXXXX** TYPE CLASSIFICATION **XXXXXX XXX**

Figure 8-1. Federal Vehicle Compliance Label



BLUE BIRD FORT VALLEY

FORT VALLEY, GEORGIA

BODY NO.

MODEL YEAR

MFG. BODY DATE

STATE / PROVINCE

EQUIPPED CAPACITY

SPECIFICATION YEAR

MAX. DESIGN CAPACITY

BODY SERVICE NO.

Figure 8-2. Body Serial and Service Number Plate



Vehicle Identification Number

The Vehicle Identification Number (VIN) plate is located on the driver's side forward dash panel. It is visible through the driver's side windshield lower corner area near the roadside exterior rearview mirror. The VIN for your bus may also be obtained through the Customer Access website at <https://vantage.blue-bird.com> by entering your vehicle body number. The VIN is used by state, provincial, and federal government as a unique means of identifying each vehicle. It will also be used by Blue Bird for identification purposes and the manufacturer's certificate of origin.

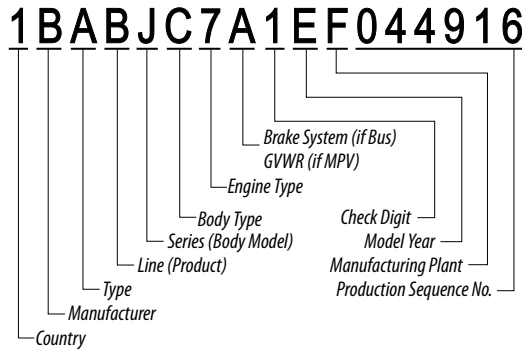
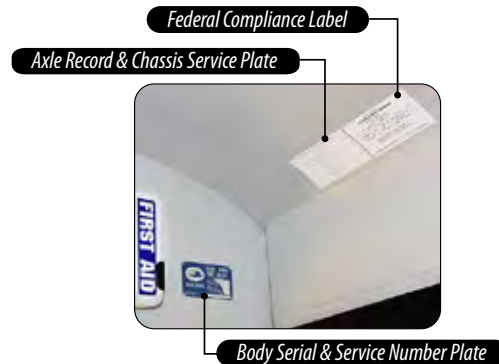


Figure 8-4. VIN Sample

FURNISH INFORMATION BELOW WHEN ORDERING PARTS	
BODY NO:	
CHASSIS NO:	
CHASSIS SERVICE NO:	
ENGINE SERIAL NO:	
TRANSMISSION SERIAL NO:	
TRANSMISSION TCM SERIAL NO:	
DPF SERIAL NO:	
SCR SERIAL NO:	
FRONT AXLE SERIAL NO:	
REAR AXLE SERIAL NO:	
REAR AXLE RATIO:	
IGN KEY NO:	

Figure 8-3. Axle Record and Chassis Service





Data Plates Reference

The information from the data fields on the Chassis label and Body data plates is essential when ordering parts or obtaining service information. Fill in the data from the plates of your bus where this manual is being stored.

VECI Label

A Vehicle Emission Control Information (VECI) label is located on the header above the entrance door. This label defines Emission Control Identifiers associated with the tires installed on your bus. New EPA Greenhouse Gas Emission Standards require Low Rolling Resistance tires to be installed on Blue Bird buses. In order to conform to the original certified vehicle configuration, any tire(s) replaced or installed after initial manufacture date must meet the standard set by the emission control identifier. The Emission Control Identifier portion of the VECI label will list which tires (front, rear, or all) meet the new low rolling resistance requirements. The Identifiers are defined below.

- **LRRA** – Low Rolling Resistance All tires - means the average of the Coefficient of Rolling Resistance (CRR) values of the front and rear originally-installed tires is ≤ 7.7 kg/metric ton and the CRR values of both the front and rear are ≤ 7.7 kg/metric ton
- **LRRS** –Low Rolling Resistance Steer tires - means the average of the CRR values of the front and rear originally-installed tires is ≤ 7.7 kg/metric ton and the CRR value of the front tires is ≤ 7.7 kg/metric ton but the drive tire CRR value is > 7.7 kg/metric ton
- **LRRD** – Low Rolling Resistance Drive tires - means the average of the CRR values of the front and rear originally-installed tires is ≤ 7.7 kg/metric ton and the CRR value the rear tires is ≤ 7.7 kg/metric ton but the steer tire CRR value is > 7.7 kg/metric ton
- **IF BLANK** – means the average of the CRR values of the front and rear originally-installed tires is > 7.7 kg/metric ton



 BLUE BIRD	VEHICLE EMISSION CONTROL INFORMATION VIN - 1BABDCPA8MXXXXXXX
Date of MFR: XX/20XX	SUB-CATEGORY: Vocational vehicles over 33,000 pounds GVWR VEHICLE FAMILY NAME – MBBB2VOCVEHD
Emission Control Identifiers:	THIS VEHICLE COMPLIES WITH U.S. AND CALIFORNIA EPA REGULATIONS FOR MY20XX HEAVY-DUTY ELECTRIC VEHICLES.
LRRR	THIS VEHICLE WAS CERTIFIED AS AN OTHER BUS UNDER 40 CFR 1037.105(h).
Fuel Type	NO FUEL-FIRED HEATERS MAY BE INSTALLED.
ELECTRIC	See driver's handbook for proper maintenance of this vehicle.

*Figure 8-5. VECI Label Sample
(located above entrance door)*

Blue Bird warrants the tires for a period of 2 years/24,000 miles/40,000 kilometers, whichever occurs first from date of delivery to the original user. Tires (excluding wear) conform with all U.S. Federal Emissions regulations at the time of manufacture and they are free of defects in material or workmanship which would cause them not to meet the U.S. federal emissions regulations. The warranties of the tire manufacturers may exceed the minimum U.S. federal emissions regulations. Refer to the tire manufacturers' limited warranty statements for complete warranty coverage by the tire manufacturers.



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**CARE AND MAINTENANCE****9-1**

Seat Belt Inspection and Maintenance	9-3
Seat Inspection and Maintenance	9-3
Driver's Seat Lubrication	9-4
Seat Care and Cleaning	9-4
Seat Cushion Removal and Installation on Non-Convertible Seats	9-5
Keeping Your Bus Looking New	9-6
Wash Down	9-7
Wax	9-8
Downtime Treatment	9-9
Windshield Washer and Wiper	9-10
Wiper Assembly Replacement	9-10
Fluids and Filters	9-12
Scheduled Maintenance	9-14
Maintenance and Service	9-14
Necessary Safety Precautions	9-14
Maintenance	9-15
High Voltage Service or Repair	9-16
High Voltage Battery Disposal	9-16
Tires	9-16



LIST OF ILLUSTRATIONS

Figure 9-1. Wiper Assembly Replacement. 9-11



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 (FMVSS). 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 10W-30 or 10W-40 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 6 months or 6,000 miles (9,656 km), 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 on Non-Convertible Seats

For instructions on NextGen Seats, see [Passenger Area](#).



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. Retain for reinstallation.
2. Lift the forward edge of the cushion 2 to 3 in. (5 to 8 cm) and pull forward.
3. To reinstall the seat cushion, push cushion down and rearward into place.
4. Install two retained Torx screws into the flanges at the front of the seat frame and tighten.



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 contaminants 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.

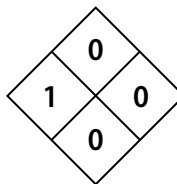
In order to preserve your vehicle's finish, wash your bus at least every 3 months or sooner if needed.

- 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 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.

Wash Down

All components mounted that are exposed to the environment are rated Ingress Protection Level 65 (IP65) or higher. Exposed components are protected from dust and protected against water projected from a nozzle. Although these components are wash-down safe, best practice is to avoid any direct water spray from hoses or pressure washers directly onto any air intakes, electrical components, enclosures or connectors.



Wax

Wax your bus at least once every 12 months or sooner as needed. Use 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



Downtime Treatment

During periods of bus downtime, Blue Bird recommends the application of Bird Bath™ Bus Guard Protectant available from Blue Bird authorized dealers to protect exterior surfaces. Bus Guard is a 000 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, floor wax, Armor-All type products, harsh detergents, or solvent-based cleaning agents on the flooring or step treads. Solvent-based products will permanently stain the flooring. Be sure to remove dirt, pencils, paper, and any other debris that may cause the emergency door to seal improperly. Do not use a water hose or excessive amounts of water. Damage to flooring and sensitive electronics in the driver's area can 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 silicone 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.

Under Body Cleaning. Flush the complete underside of your vehicle frequently. Keep body and door drain holes free from packed dirt.



CAUTION! *Use care when using a power washer to clean the driveline, especially the driveshaft and interfacing components. The high-pressure fluid could penetrate the sealed parts of the drive train and cause damage.*

Windshield Washer and Wiper

Periodically check the windshield washer solution reservoir, located under the hood on the right hand frame rail, just forward of the tire. Be sure there is an adequate supply of fluid at all times. The solution used is a 50/50 mixture of methanol and water.

Wiper Assembly Replacement

1. Remove the wiper blade by lifting the wiper arm off of the windshield and pulling back on the Wiper Blade Assembly until it unhooks from the wiper arm.
2. Assemble the new wiper blade assembly to the wiper arm as shown in the illustration below.
3. Ensure that the blade assembly is locked into position before putting into service.

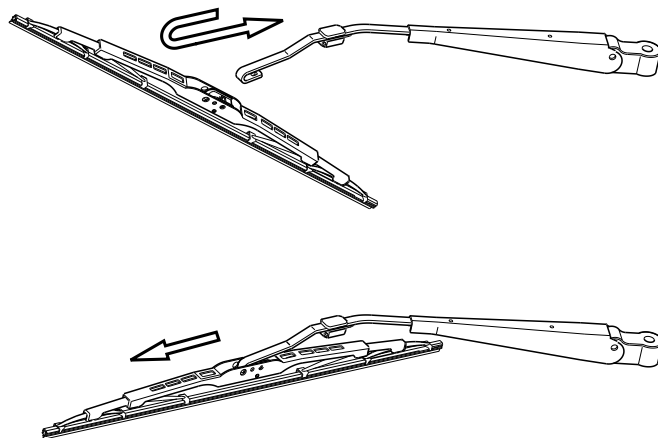


Figure 9-1. Wiper Assembly Replacement



DRIVER'S HANDBOOK

Fluids and Filters

Fluids and Filters, Vision EV				
Fluid	Type	Capacity	Filter	Comments
Coolant	OAT Long Life Coolant Orange (do NOT mix) 50/50 Mix Deionized Water Coolant	Primary system: 18.5 Gallons (70 liters) RH Reservoir	Duramax P171276 Spin-On Filter	Factory Fill: Dex-Cool 50/50 Premix (Orange) Use distilled or filtered water. Replace filter every 5 years. Check fluid level once a year or every 20,000 mi (32,000 km) Drain & refill system every 5 years or 150,000 mi (240,000 km)
		Battery packs: 7.5 Gallons (28.4 liters) LH Reservoir		
Rear Axle				
Axle Oil (23060SH)	Hypoid Gear Oil	26.2 pints (12.4 liters)		See Rear Axle Viscosity Chart for appropriate viscosity.
Drive Shaft	Lithium-Based Grease			Use NLGI Grade 2 and ASTM D4950 LB Specification
Front Axle				
Front Wheel Bearing	Hypoid Gear Oil	Fill using sight glass indicator		Use same viscosity & oil type as Rear Axle
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 be flushed, and major components may require replacement.
Brake Interlock	DOT 5		Fluid BB 1940881	On unit with hydraulic brakes and brake interlock feature
Hydraulic System				
Hydraulic Steering	Dexron III™	5 quarts (4.7 liters) approx.		



Fluids and Filters, Vision EV				
Pneumatic System				
Air Compressor				With Air Brake Buses: check intake filter every 2 months or 20,000 mi (32,000 km). Dirty or damaged filter must be replaced. Replace intake filter every 76,000 mi (122,000 km). Contact Cummins Dealer for parts.
AD-9 Air Dryer Element			BB 04311908	<i>On units with air brakes.</i>
AD-IP Air Dryer Element			BB 00114579	<i>On units with air brakes.</i>
Other				
Windshield Washer Fluid		1.05 gallons (3.9 liters)		
* Engine Coolant Capacity does not account for body heating systems. Be sure the coolant level in the coolant reservoir is at the Cold Full line when the engine is cold and the system has been completely filled and purged. * All fluid capacities should be re-checked to full level after initial fill, bleeding, or changing.				



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 Driver's 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.

Maintenance and Service

Necessary Safety Precautions

If it is necessary to weld or plasma cut anything on the bus; the 12V battery will need to be disconnected first and then both High Voltage Manual Service Disconnects (MSD) must be disconnected. You should not disconnect MSD unless you plan to weld or plasma cut. During normal maintenance, MSD can be left in place.



WARNING! *Remove the key from the ignition before working on or under the bus, to prevent unintentional system engagement. Failure to comply may result in serious personal injury.*



As standard practice, disconnect the 12V battery before performing any and electrical work. Do not disconnect any orange cables or connectors on the vehicle. The orange cables indicate High Voltage. Training is needed to perform service on high voltage components safely. Before any welding, cutting or drilling, be sure to inspect what is on the opposite side of the metal. Be cautious when welding to ensure hot metal does not melt wire insulation in the surrounding area especially on the opposite side of the work surface.

Surfaces with High Voltage under or close to the sheet metal are marked with a warning sticker. These surfaces in particular should not be welded, drilled or cut into because of the High Voltage components directly behind the sheet metal. These panels must be removed to be modified.

Maintenance

The maintenance interval for chassis components are in the Service Manual available through your Blue Bird dealer and should be followed by your service technician. An additional maintenance item that needs to be monitored is the coolant level for the EV drive system cooling loop. Regular maintenance consists of a visual inspection of the cooling system checking for any damage or coolant leaks and the coolant level. If the level is low, coolant can be added through the reservoir cap. System capacities are noted in *Fluids and Filters*. The system should be filled with Dex-Cool (orange) that is safe for aluminum blocks prepared in a 50/50 blend of coolant and distilled water. Bleed screws are located on the radiator end caps to aid in removing trapped air in the system.



CAUTION! Do NOT mix different types of coolant. The system must be drained and flushed anytime the coolant type is changed.



High Voltage Service or Repair

When the bus requires service or repair to the electric drive and high voltage systems, contact your dealer. In the event of an unexpected loss of power, unexpected driving behavior, or the vehicle fails to turn on, contact your service provider for assistance.

High Voltage Battery Disposal

The lithium drivetrain batteries on these buses are designed to be recycled. Due to their NMC chemistry, they usually have a positive value to recyclers unlike many other lithium variants. Contact a recycling center in your area to find out where you can take the NMC batteries to be recycled.

Tires

In order to conform to the original certified vehicle configuration, any tire(s) replaced or installed after initial manufacture date must meet the standard set by the emission control identifier. Tire inflation pressure must not exceed the specifications of the tire and/or wheel/rim manufacturer for the specific load, speed and application. The inflation pressure embossed on the tire sidewall may not take into consideration the wheel/rim capacities. Tires should not be inflated above the pressure listed on the Federal Certification plate without consulting your tire/wheel distributor.



GENERAL SPECIFICATIONS

10-1

Modifications	10-5
Dimensions	10-8
General Specification, Chassis	10-9
Air Compressor	10-9
Axle and Suspension, Front	10-9
Axle and Suspension, Rear	10-9
Batteries	10-10
Braking System	10-10
Bumpers	10-11
Charger	10-11
Controls	10-11
Coolant A/C Compressor	10-11
Coolant Water Heater	10-11
Cooling Systems	10-12
DC to DC Converter	10-12
Frame, Chassis	10-12
Horn	10-12
Instruments/Gauges	10-12
LED Warnings/Telltale Indicators	10-13
Manual Service Disconnect	10-13



Main Drive Motor	10-13
Main Drive Motor Inverter	10-13
Message Display Center	10-13
Pedestrian Alert System	10-14
Steering	10-14
Tires	10-14
Tow Hooks or Tow Eyes	10-14
Wheels	10-14
Wiring	10-14
General Specification, Body	10-15
Back-up Camera	10-15
Emergency Doors	10-15
Entrance Doors	10-15
Electrical	10-15
Fans	10-16
Floor	10-16
Heater/Defroster	10-16
Insulation	10-16
Lettering	10-16
Lights	10-17
Mirrors	10-17



Paint	10-18
Panels, Exterior and Interior	10-18
Reflectors	10-19
Rubrails	10-20
Safety Equipment	10-20
Seats	10-20
Stepwell	10-20
Stop Arm, Crossing Arm	10-21
Sun Visor	10-21
Switch Panel	10-21
Ventilation	10-21
Windows	10-21
Windshield	10-22
Windshield Wipers	10-22
Wiring	10-22

LIST OF ILLUSTRATIONS

NONE.



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Modifications

Blue Bird 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 daily for proper operation. 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 modifications of this vehicle should consult the Blue Bird Service Engineering Department for a more complete understanding of this vehicle. Any modifications are the responsibility of the entity making those modifications.

Vehicle alterations, which may cause non-conformance with the Emission Control and/or Federal Motor Vehicle Safety Standards (FMVSS) and/or Canada Motor Vehicle Safety Regulations and/or Canada Motor Vehicle Safety Standards, are expressly not authorized by Blue Bird.

ATTENTION: Installation of a fuel-fired heater in this vehicle is prohibited by California Air Resources Board (CARB).

Installing a non-CARB approved air conditioning system on this vehicle would cause this vehicle to be in a non-CARB certified configuration.

It is the responsibility of the entity undertaking the modification of this product to ascertain compliance of the modified vehicle with any and all applicable regulations.



The entity completing modification of this product is responsible for certifying that all applicable regulations are met. In order to certify a modified vehicle, the entity or 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 any modifications including the following:

- Front or rear suspensions
- Body or chassis crossmembers
- Wheelbase length
- Frame rail flanges
- Cooling system nor installation of any equipment or component that may obstruct the flow of air into, around or from the cooling system
- Addition of any equipment or component nearer than 2 in. (51 mm) to the battery packs, rotating components or jounce movement of driveline components.



WARNING! *Vehicle alterations, which may cause non-conformance with the Emission Control and/or FMVSS, are expressly NOT authorized by Blue Bird. It is the responsibility of the entity undertaking the modification of this product to ascertain compliance with all applicable regulations. Any modifications are the responsibility of the entity making those modifications. 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 entity 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.*



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.



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 Blue Bird remains true to its original design, best preserving performance, efficiency, and safety.

For replacement parts...

Contact your local authorized Blue Bird dealer.



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 in. to 124 in. (3.05 to 3.15 m) depending upon choice of tires, suspension system, and body model. Add 3 in. (7.6 cm) for roof vents. Rear bumper adds 1.25 in. (3.18 cm) to overall body length. Front bumper adds 2 in. (5 cm) to overall body length.

Width:	96 in. (2.4 m)	Front Door:	27 in. (68.5 cm) wide,
Interior Width:	90-3/4 in. (2.3 m)		78 in. (198 cm) high
Height:	127 in. (3.2 m)	Rear Emergency Door:	52.5 in. (133.3 cm) x 37.7 in. (95.8 cm)
Height, with Air Conditioning:	Add 16 in. (40.6 cm)	Wheel Cut:	50° (nominal)
Skirt Length:	16-3/4 in. (42.5 cm)	Tire Size:	11R22.5
Interior Headroom:	77 in. (1.95 m)	Front Overhang:	44.75 in. (1.13 m) including bumper

Dimensions and Payload Weight (Standard Equipment)

WHEELBASE	BODY MODEL	CAPACITY	PAYLOAD LB (KG)	OVERALL LENGTH INCHES (METERS)	REAR OVERHANG INCHES (METERS)	TURN RADIUS CURB-TO-CURB FT-IN (METERS)	TURN RADIUS WALL-TO-WALL FT-IN (METERS)
252 in.	BBCV3011	66	8070 lb (3660 kg)	442.29 in. (11.23 m)	144.29 in. (3.66 m)	33 ft-10 in. (10.31 m)	34 ft-5 in. (10.49 m)
273 in.	BBCV3303	72	8790 lb (3987 kg)	470.29 in. (11.95 m)	151.29 in. (3.84 m)	35ft-3 in. (10.74 m)	36 ft-6 in. (11.12 m)
273 in.	BBCV3310	77	9390 lb (4259 kg)	477.29 in. (12.12 m)	158.29 in. (4.02 m)	35 ft-3 in. (10.74 m)	36 ft-6 in. (11.12 m)

Pupil weight @120 lb (54.4 kg) each. Driver @150 lb (68 kg).

Approximate curb and total weights are based on standard equipment units. Optional equipment may significantly increase these estimated weights.



General Specification, Chassis

Air Compressor

Electro-Pneumatic, water cooled.

Axle and Suspension, Front

Axle: Hendrickson SteerTek, 12,000 lb (5443 kg) rating. Petroleum lubed bearings. 50 degree wheel cut.

Suspensions: Hendrickson SofTek, 8,500 lb [3855 kg] (standard) or 10,000 lb [4535 kg] (optional) rating. 4 in. x 60 in. (10 x 152.4 cm), Hendrickson variable rate, tapered springs with Anti-Wear liner. Maintenance free rubber bushings. Option available for Air Ride suspension.

Shock Absorbers: Direct acting, 1.42 in. (36 mm) diameter bore double-action piston type with long life bushings.

Axle and Suspension, Rear

Axle: Dana, 23,000 lbs (10,432 kg) capacity with 5.29 gear ratio. Hypoid Gear Oil.

Suspensions: 4 in. x 52 in. (10 x 132 cm) semi-elliptic, progressive, 23,000 lb. (10,432 kg) leaf springs. Maintenance free, rubber bushed radius leaf permits axle adjustment for dog tracking. Option available for Air Ride suspension.

Shock Absorbers: Direct acting, 1.42 in. (3.6 cm) diameter bore double-action piston type with long life bushings.



Batteries

One Group 31 battery with 12V, 700 CCA @ 0 °F

Two Seven Module Strings HV Lithium-Ion NMC (Nickel-Manganese-Cobalt) Gel Batteries, Water Cooled, 155 kWh Capacity, 550V to 750V DC Operating Voltage.

12V Battery Compartment. Enclosed compartment 23.50 in. (59.6 cm) L x 15.50 in. (39.3 cm) D. Sliding tray includes retaining pin with cables to secure the tray in a closed position. Hinged door with single locking latch. Located on front left side of bus.

Braking System

Regenerative Braking System. Assists in slowing bus during deceleration and service brake application while charging the batteries.

Service Brakes, Air Drum. Meritor air-powered, cam-operated, 6 in. front; 7 in. or 8.72 in. 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. (72.1 liter). Moisture drain valve on each tank. Options available for Bendix AD-9, AD-IP, and AD-SP air dryer.

Emergency/Parking (w/Air Brakes). Captive spring actuators incorporated into rear air brake chambers. Release valve operation with control knob at driver's right.

Service Brakes, Hydraulic. Both front and rear systems have 15 in. diameter x 1.438 in. thick rotors. 70mm front and rear 4-piston, self adjusting Meritor Quadraulic calipers. Meritor ABS.

Emergency/Parking (w/Hydraulic Brakes). Internal expanding, axle mounted, 9 in. diameter x 3 in. wide. Mechanical cable operation with a foot control pedal at driver's left.

Electronic Stability Control: The Electronic Stability Control (ESC) is an automatic system that reduces the occurrence of loss of control events, as well as rollovers. ESC builds on the ABS with additional sensors, logic, and use of the brakes to slow and redirect the vehicle. An indicator light on the instrument cluster will illuminate whenever the ESC system is actively controlling the bus.

**Bumpers**

Contoured 15 in. (38.1 cm) steel front bumper die formed from 3/16 in. steel plate. Rear bumper smooth profile, 12 in. (30.48 cm) high with 90 degree flanges, dye-formed from 3/16 in. steel plate, with 14 in. (35.6 cm) wraparound at corners and diagonal bracing.

Charger

Water Cooled, 90-264VAC/45-65Hz Input, 80Amp-19.7kW, CCS1 socket SAEJ1772 compliant for AC or DC fast charge.

Controls

Electronically operated accelerator, air brakes, valve actuated parking brake (air brakes) or cable-operated driveline shoe parking brake (hydraulic brakes) with warning light, instrument panel lighting dimmer, key-type starter switch. Electric dual horns. Message Display Center controls on the instrument panel cluster. Electric powered door with optional air powered door available.

Coolant A/C Compressor

Copeland Scroll, 407 refrigerant, 600V, 5-20kW

Coolant Water Heater

HV module controlled, 600VDC Input Power,(2) 12.5 kW units Output Power



Cooling Systems

Primary cooling system circulating DexCool (Orange) coolant through the Thermal Management Unit for Electric Motor, components in the High Voltage Management unit and cabin heating. Primary system reservoir mounted on RH (curb side) of bus under front hood.

Secondary independent cooling system that circulates DexCool (Orange) coolant through Thermal Management unit for the battery packs only. Reservoir for this system mounted near LH (driver side) of bus under front hood.

DC to DC Converter

2 Units 2.8kW each, Water Cooled, 400-720 VDC/0-4A Input Power, 14 VDC/0-200A Output Power each for 400A total output.

Frame, Chassis

Dual C channels, 10-1/2 in. (26.6 cm) high with 3 in. (7.6 cm) flanges made of 1/4 in. thick, 100,000 psi steel. All permanent fixtures on frame are attached with hi-tensile strength Huck-Spin fasteners with swaged lock nuts.

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; Average Efficiency, HV battery temperature, Motor temperature, State of Charge (SOC), Front Air Pressure, and Rear Air Pressure.

**LED Warnings/Telltale Indicators**

Brake Failure, ABS, Park Brake Applied, Electronic Stability Control, Left Turn Signal, High Beam, Right Turn Signal, Coolant Level, Motor Enable, Motor Fault Indicator, HV Battery Fault Indicator, Charging Status, Limited Performance Mode, Propulsion Disabled, Wait to Start, High Voltage Electrical Failure, and Regenerative Braking Disabled.

Manual Service Disconnect

A MSD is provided for each of the two high voltage battery packs which will disconnect power to the high voltage bus systems.

Main Drive Motor

TM4, Permanent Magnet Induction, Water Cooled, 778/2,400 ft-lb (3,254 Nm), 194/315 HP, 3000 RPM, 157/235kW, 315 Peak/187 Cont Power.

Main Drive Motor Inverter

150kW Maximum Power, 250kW Peak Power, water cooled.

Message Display Center

When configured this display will provide a readout for volts, kilometers, vehicle status and priority messages. Interactive LCD display also provides system alerts such as voltage error, turn signal on; and also displays service diagnostic features. Screen can be used as a monitor for backup camera.



DRIVER'S HANDBOOK

Pedestrian Alert System

Device mounted on front of bus that emits noise to alert pedestrians that the bus is approaching. Activated when bus is in forward gear, parking brake off and speeds up to 20 mph (32 kph). The sound changes in frequency and volume as the bus accelerates or decelerates.

Steering

Full power Ross THP-60 integral unit with 20.4 to 1 ratio; with electric Pump. 18 in. (45.7 cm) diameter, two-spoke, padded steering wheel with tilt steering column.

Tires

11R22.5 (G) Low Rolling Resistance. In order to conform to the original certified vehicle configuration, any tire(s) replaced or installed after initial manufacture date must meet the standard set by the emission control identifier.

Tow Hooks or Tow Eyes

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

Wheels

Hub Piloted steel 10 stud disc rims, single front, dual rear, 8.25 in. (20.95 cm) x 22.5 in. (57.1 cm) rims.

Wiring

Blue Bird multiplex chassis and body circuit wiring system with three Power Management Modules (PMM) and two Printed Circuit Boards (PCB)s containing fuses and relays. Zone A PMM, chassis and body PCBs located in PDU compartment at front of bus below dash. Zone C PMM located at front RH bulkhead and D PMM located at rear LH bulkhead.



General Specification, Body

Back-up Camera

Exterior camera mounted near top of rear cap. When bus is shifted into reverse gear, screen in instrument cluster will display camera view.

Power Distribution Unit (PDU). Located behind PDU cover under dash. Cover removable with two thumbscrews. PCB for body and chassis with connections for battery power distribution, fuses, relays, and circuit protection.

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 in. (95.7 cm) wide x 52.5 in. (133.3 cm) high opening. Single-point bar lock latch with inside handle and guard. 6 in. (15.24 cm) black recessed exterior handle. Upper and lower clear tempered glass. 4 in. (10.6 cm) black upholstered header pad.

Buzzers: One located in the driver's area and one near the rear emergency door — sound when any emergency exit is engaged and ignition switch is at RUN position.

Entrance Doors

Standard: Blue Bird two-panel outward opening door with electric control.

Optional: Air drive outward opening doors.

Electrical

New Electrical Architecture incorporating CAN switches, J1939 and multiplex modules. PDU located in front of bus below dash houses Chassis multiplex module, body and chassis PCBs. More diagnostic tools accessible on instrument cluster.



Fans

(Optional) One 6 in. (15.24 cm) fan mounted left of the driver's seat, with or without a second 6 in. (15.24 cm) fan mounted right of the driver at body centerline. Each fan has high/low speed and is controlled by a single switch. Other locations available by option.

Floor

Covering. 3/16 in. (4.7 mm) thick ribbed material in aisles and 1/8 in. (3.18 mm) smooth under the seats. Optional aluminum aisle trim over joint in floor covering, full length of body is available. Molded black composite wheelhousings covers.

Subfloor. 1/2 in. (12.7 mm) or 5/8 in. (15.8 mm) APA certified fir plywood, secured to steel floor panels with screws.

Heater/Defroster

90K BTU/h front system on driver's side with continuous ducted defrosting of windshield and driver's window. Washable filter. Driver selects recirculating or fresh air into system as conditions require.

Insulation

The roof, sides, front and rear (including corners) are insulated with 1.5 in. (3.81 cm) thick insulation 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 decal options available.



Lights

Backing: Two 5 in. (12.7 cm) clear, incandescent right and left rear.

Clearance/Marker: Two amber front and two red rear. Tail light circuit energizes clearance, cluster, and side marker lights.

Daytime Running: Low beam head lamps, tail, license plate, parking, clearance and marker lights activated when engine is running, parking brake is released, and the head light switch is off.

Directional: Two 7 in. (17.8 cm) amber lights mounted on rear. Two 4 in. (10.1 cm) front located in headlight assembly.

Dome: 15 Candlepower single row equally spaced at center over aisle. Single control switch.

Headlights: Dual element 65w high beam/45w low beam 9007 halogen bulbs mounted in contoured lens housings.

Stepwell: 15 candlepower. Wired to operate with ID lights with entrance door open.

Stop and Tail: Two combination lights, 4 in. (10.1 cm) right and left rear tag panel in combination with 7 in. (17.8 cm) stop and tail lights with red lens.

Warning Lights: Halogen 8 lamp sequential system with hoods.

Mirrors

Exterior Crossview: A Rosco Eye-Max LP crossview mirror system allows a seated driver to view pedestrians while the bus is stopped. The crossview mirror is asymmetric shaped, LH and RH, with tunnel tube mount supported by a center mounting post. The mirror mounting posts are attached to the hood. 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 two independent mirror assemblies with one flat mirror glass measuring 7.38 in. x 10.00 in. (18.7 x 25.4 cm) and one convex mirror glass measuring 7.38 in. x 5.00 in. (18.7 x 12.7 cm) on each side of the bus. 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. Rosco Accustyle mirrors are optional.

Interior Rearview: 6 in. x 30 in. (15.2 x 76.2 cm) with 3/16 in. clear safety glass laminated to steel backing plate. 1-3/4 in. (44.4 mm) radius rounded corners. Perimeter of mirror edged with 5/8 in. (15.9 mm) 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.

Paint

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

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 wheel housings thoroughly undercoated prior to body mount on chassis to ensure best coverage and maximum corrosion resistance.

Panels, Exterior and Interior

Exterior. Outside side panels are constructed of 20-gauge steel. Side panels extend from below the side windows to a distance of 16-1/4 in. (41.3 cm) below the floor (16-1/4 in. [41.3 cm] skirt). Rear corner panels are constructed of 20-gauge steel and include a license plate emboss, both right and left. The LH 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.

Interior. A removable 18-gauge steel front upper inner panel is provided to allow access to the front roof cap area. A 20-gauge steel rear upper inner panel is installed at 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 galvalume 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. Headlining panels may solid or acoustic, or a combination of both, 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 in. (7.6 cm) red, mounted on side of body near rear.
- Two 3 in. (7.6 cm) red, mounted on rear of body.
- Two 3 in. (7.6 cm) amber, right and left intermediate side reflectors.

Reflective Tape: 1 in. (2.5 cm) minimum width strip around each emergency exit (roof hatch/pushout window when ordered). 1 in. wide (2.5 cm) 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, seat, and floor rails extend from the front bow 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). Rubrails are secured with 1/4 in. screws - 20 x 5/8 in. 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 (2.2 kg) fire extinguisher 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 3-point, floor mounted anti-cinch emergency locking retractor.

Passenger Seats. All Passenger seats and barriers are optional. Standard upholstery is 42 oz. polyester-backed gray vinyl.

Stepwell

3-step riser, National Standard. 10 in. to 14 in. (25.4 to 35.56 cm) ground to lower step height, G90 galvanized steel. Stainless steel optional. Step treads with non-abrasive black rubber with white nosing. 3 in. wide (7.6 cm) 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 intensity reflective octagonal stop arm, red with a white border, and 6 in. (15.24 cm) 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 in. x 30 in. (16.5 x 76.2 cm) 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 and right of driver with rocker-type illuminated switches for electrical equipment. Brightness of illumination is controlled by the dimmer 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

Driver's. Double sliding aluminum sash with security fastener for locking both sash, clear tempered safety glass.

Side. 12 in. (30.5 cm) 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. Two piece curved windshield is optional. Optional black grip handles and fold-up step on right and left cowls to facilitate windshield cleaning.

Windshield Wipers

Electric, intermittent single switch, column mounted, wet arm wipers. Electric windshield washer with hard plastic one gallon capacity reservoir located under the 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. Circuit breakers optional.



Index

A

About this Driver's Handbook 1-2
Accessories and Added Components 2-51
Air Brakes 5-16
Automated Pre-trip Exterior Light Check Feature 6-11

B

Backed by Blue Bird 1-4
Back-up Camera 2-53, 6-12
Battery Care 5-25
Before Placing the Electric Bus in Service 6-2
Blue Bird NextGen Passenger Seats 4-6
Blue Bird Strength and Innovation 2
Blue Bird Technical Communications 1-2

C

Certification, Driver 1-7
Charging 5-21
Child Restraint Seats 4-3
Circuit Breakers and Fuses 2-51
Console, Left Switch 2-18
Coolant System 5-7

D

Daily Pre-Trip Inspection 6-2
Dimensions 10-8
Doran Warning Light Monitor 2-52
Driver Orientation 2-7
Driver's Area 2-17
Driver's Instrument Panel 2-36
Driver's Lap and Shoulder Belt 2-47
Driver's Seat, Air 2-46
Driver's Seat, Standard 2-44



E

Electric Drivetrain 2-7
Emergency Equipment Locations 2-9
Emergency Exits 2-11
Enroute Emergencies 7-4
Exterior Compartments 2-53

F

Fluids and Filters 9-12

G

General Specification, Body 10-15
General Specification, Chassis 10-9

H

Heat and Air Controls 2-31
High Voltage Safety 7-2
Hydraulic Brakes 5-12

I

Instrument Cluster 3-3
Interior Compartments 2-49
Interlocks 5-6

J

Jacking and Towing 7-6

K

Keeping Your Bus Looking New 9-6

M

Maintenance and Service 9-14
Maneuvering Safety 5-4
Message Display Center 3-5
Mirrors and Mirrors Adjustment 6-13
Modifications 10-5

**N**

NHTSA 1-6

P

Parking Brake (Hand Operated) 2-43

Parking Brake (w/Air Brakes) 2-41

Parking Brake (w/Hydraulic Brakes) 2-41

Passenger Seats 4-6

Passenger Windows 4-13

Pedestrian Alert System 5-6

Prepare for Driveaway 6-12

Product Identification Information 8-2

Pushbutton Shifter 5-19

R

Right Switch Console 2-28

Routine Operation 5-4

S

Safety Defects 1-6

Safety Precautions 1-2

Scheduled Maintenance 9-14

Seat Belt Inspection and Maintenance 9-3

Seat Inspection and Maintenance 9-3

Service Brakes 5-9

Settings and Diagnostics 3-11

Shutting Down Your Blue Bird Electric Bus 5-7

Starting Your Blue Bird Electric Bus 5-5

Steering Column 2-38

T

Tire Pressure Monitoring System 2-58

Track Mounted Passenger Seats 4-9

Transport Canada 1-6



W

Warning Bank Indicators 3-8

Wheelchair Lifts 2-16

Wheel Differential Lock 5-26

Windshield Washer and Wiper 9-10



NOTES



NOTES



NOTES



NOTES



NOTES



NOTES



NOTES



NOTES



NOTES



NOTES



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