BLUE BIRD®

EMERGENCY RESPONSE GUIDE

for

Blue Bird BBCV Vision

Electric Buses

Model Year 2019 to Present

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EMERGENCY RESPONSE GUIDE

Blue Bird BBCV Vision Electric Bus: Model Years 2019 - present

WARNING! *ALWAYS wear full Personal Protection Equipment (PPE) including a Self-Contained Breathing Apparatus (SCBA) when fire is involved. Fires in crash-damaged Electric Vehicles (EV)s could emit toxic or combustible gases. Small amounts of eye, skin, or lung irritants may be present. If exposed, rinse with large amounts of water for 10-15 minutes. Consider the entire bus as energized. PPE should include: Class 0 electrical insulating gloves, safety goggles, and Electrical Hazard (EH) rated safety shoes or boots, which must be at least appropriate up to 1,000 volts AND a non-conductive object approximately 5 ft (1.5 m) long to safely push someone away from the bus if they accidentally come in contact. Failure to comply can result in serious injury or death.*

WARNING! *Regardlessofthedisablingprocedureyouuse, ALWAYSASSUMETHATALLHIGHVOLTAGECOMPONENTS ARE ENERGIZED! Cutting, crushing, or touching high voltage components can result in serious injury or death.*

WARNING! *After deactivation, the High Voltage system requires 10 minutes to de-energize. Failure to acknowledge can result in serious injury or death.*

WARNING! *Do NOT handle a submerged bus without the appropriate PPE for water rescue. Failure to comply can result in serious injury or death.*

WARNING! *If High Voltage equipment or High Voltage cables (orange sheathing) are damaged due to an accident related to the equipment, there may be a short circuit. Put on insulated PPE such as insulated clothes and gloves before beginning rescue operations. Failure to comply can result in serious injury or death.*

WARNING! *The bus should be lifted or manipulated only if first responders are trained and equipped at the technician level per the applicable country's national fire training requirements and are familiar with this bus' lifting points. Never come into contact with the High Voltage battery or other High Voltage components. Failure to comply can result in serious injury or death.*

WARNING! *Never attempt to lift the bus by the tow hooks. Tow hooks are designed for horizontal pulling only; NOT FOR LIFTING. Failure to comply can result in serious injury or death.*

WARNING! *Though the High Voltage system is designed to be automatically disabled when the MSDs are removed, it is strongly recommended to only remove the MSDs AFTER the ignition key is removed and the 12V battery disconnect switch is turned to the OFF position. This further reduces the chance of an Arc Flash event which is possible while there is a load on the circuit. Failure to comply can result in serious injury or death.*

WARNING! *Flames, smoke, arcing, or hot spots like melted plastic may indicate fire or the presence of High Voltage. A thermal camera or Infrared (IR) temperature probe may be useful to identify hot spots. Clear the area around the bus (if possible) and open the bus doors to avoid build-up of gases. If a battery has began burning, it will try to burn to completion. Cool down the batteries with direct and large amounts of water. If possible, remove combustible materials from around the bus to prevent fire growth. Failure to comply can result in serious injury or death.*

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EMERGENCY RESPONSE GUIDE

Blue Bird BBCV Vision Electric Bus: Model Years 2019 - present

WARNING! *Take appropriate measures to protect civilians downwind from the incident. Failure to comply can result in serious injury or death.*

WARNING! *Do NOT use foam to extinguish a fire on electric buses. Failure to comply can result in serious injury or death.*

WARNING! *If the batteries catch fire, are exposed to high heat, or are generating heat or gases, use large amounts of water to cool the High Voltage batteries. If water is not immediately available, use CO_2, dry chemicals, or another typical fire-extinguishing agent to fight the fire until water is available. Failure to comply can result in serious injury or death.*

WARNING! *If the bus is submerged, do NOT remove the MSDs. Failure to comply can result in serious injury or death.*

WARNING! *Caging the spring brakes disables the parking brake. Chock the wheels. Failure to comply can result in serious injury or death.*

WARNING! *On buses with hydraulic brakes, the parking brake becomes ineffective when the driveshaft is removed. Chock the wheels. Failure to comply can result in serious injury or death.*

WARNING! *Do NOT secure the driveshaft to any High Voltage or Low Voltage wiring, cooling hoses, or brake lines. Failure to comply can result in serious injury or death.*

WARNING! *Damaged buses should be isolated outdoors until inspected. Separate the bus from all combustibles and structures by a distance of at least 50 ft (15 m). Failure to comply can result in serious injury or death.*

CAUTION! *Moving the bus with the rear wheels on the ground and driveshaft not removed, even for a short distance, can cause the drivetrain motor to overheat and lead to irreversible damage of the motor and possibly start a fire.*

Occupational Health and Safety Administration (OSHA) refers to an ARC Flash as a phenomenon where a flashover of electric current leaves its intended path and travels through the air from one conductor to another or to the ground. The results are often violent and when a human is in close proximity to the Arc Flash, serious injury and death can occur.

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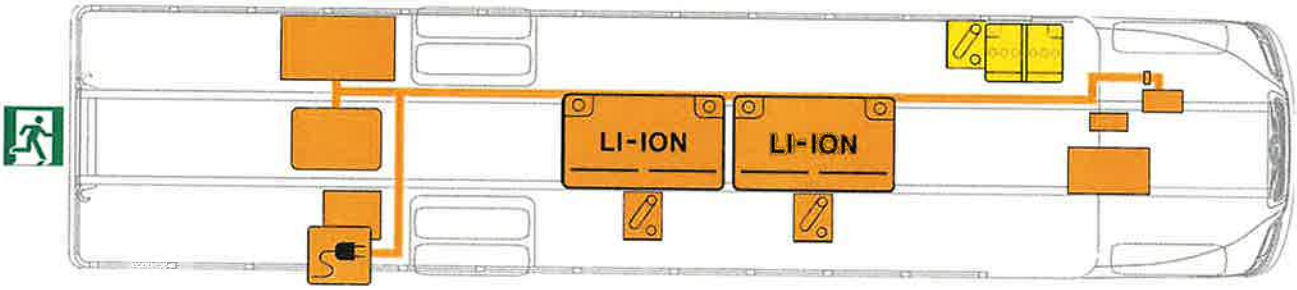
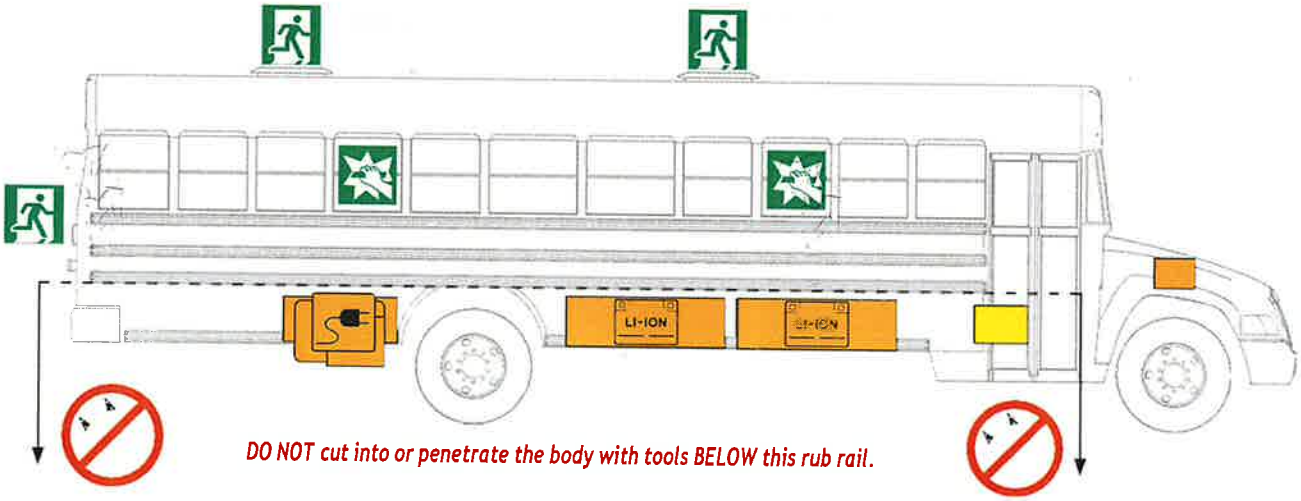
Emergency Rescue Sheet

For the Blue Bird BBCV Vision Electric Bus



NOTE: Emergency Exits and Emergency Window locations may vary based upon state specifications.



DO NOT cut into or penetrate the body with tools BELOW this rub rail.

Charge Port	High Voltage Li-Ion Battery	Disconnect High Voltage	Low Voltage Battery	Disconnect Low Voltage	High Voltage Component	High Voltage Power Cable	Emergency Exit	Break to obtain access
	LI-ION							

WARNING! ***If High Voltage equipment or cables (orange sheathing) are damaged due to an accident related to the equipment, there may be a short circuit. Put on insulated PPE such as insulated clothes and gloves before beginning rescue operations. Failure to comply can result in serious injury or death.***

NEVER CUT HIGH VOLTAGE CABLES (ORANGE SHEATHING)

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1. Identification

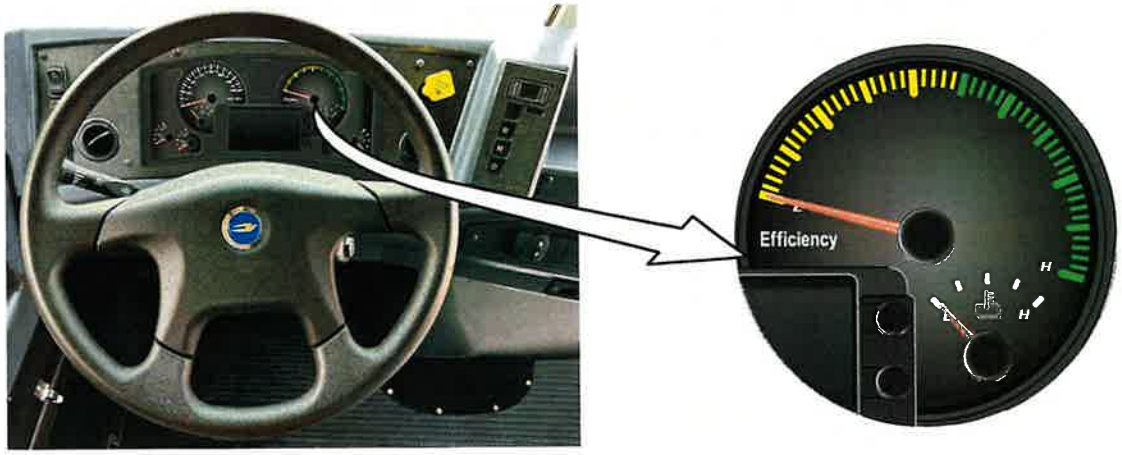
Exterior: All Blue Bird buses have a bird logo badge located on the front hood of the bus above the grille.

NOTE: Some Blue Bird electric buses may be equipped with a fuel-fired heater. These buses require a small fuel tank. You will find this tank situated behind the electric motor between the frame rails. The fuel fill door will be marked, "DIESEL FUEL ONLY". This marking pertains only to the tank used to fuel the fuel-fired heater.

An optional green bird with a cord streamer decal may be located above the entrance door and driver's window on Blue Bird electric buses.

A decal with the words, Blue Bird and a bird logo may be located aft of the entrance door and/or on a plate affixed to the rear bumper. These may be omitted based upon state specifications.

Interior: All Blue Bird buses are equipped with a bird logo badge in the center of the steering wheel.
The right-hand gauge in the instrument cluster is marked, "Efficiency" which identifies this bus as electric powered.



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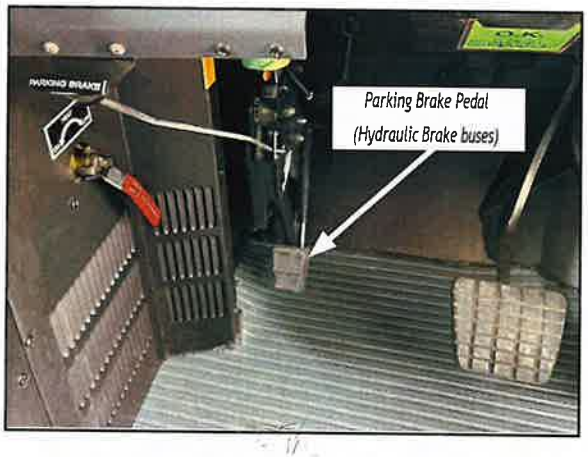
2. Immobilization/Stabilization/Lifting

Immobilization

1. Apply the parking brake.
   For buses equipped with Hydraulic Brakes: Firmly press to the floor the parking brake pedal located to the left of the service brake.
   For buses equipped with Air Brakes: Grasp the yellow knob located to the right of the steering wheel and pull out.

2. Chock the wheels.



Stabilization/Lifting

Blue Bird buses should only be lifted at the axles using jacks of sufficient capacity. Place the jack securely under the axle at the spring or suspension beam. It is strongly recommended to additionally support the bus with blocks or jack stands under the frame rails when lifted.

WARNING! *The bus should be lifted or manipulated only if first responders are trained and equipped at the technician level per the applicable country's national fire training requirements and are familiar with this bus' lifting points. Never come into contact with the High Voltage battery or other High Voltage components. Failure to comply can result in serious injury or death.*

WARNING! *Proper jacking procedures and basic safety measures must be observed to ensure 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.*

WARNING! *Never attempt to lift the bus by the tow hooks. Tow hooks are designed for horizontal pulling only; NOT FOR LIFTING. Failure to comply can result in serious injury or death.*

3. Disable Direct Hazards/Safety Regulations

If the bus is submerged, there is NOT a risk of electric shock from contacting the bus' body or frame in or out of the water although the 12/24V batteries will continue to hold a charge for 30 minutes following submersion.

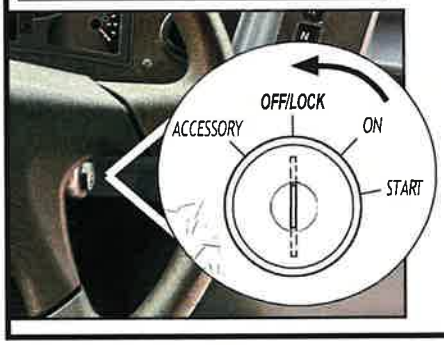
The High Voltage electricity is not grounded through the bus but is self-grounded through a separate system. This further prevents the danger of electric shock should one of the High Voltage wires be severed and brush up against the bus. This safety mechanism is in addition to the High Voltage Interlock Loop (HVIL) System detecting the severed cable and shutting the system down.

Shutting Down the Electrical System

NOTE: The 12V battery disconnect switch on the BBCV Vision is located on the rear wall of the battery compartment located just below the driver's window.

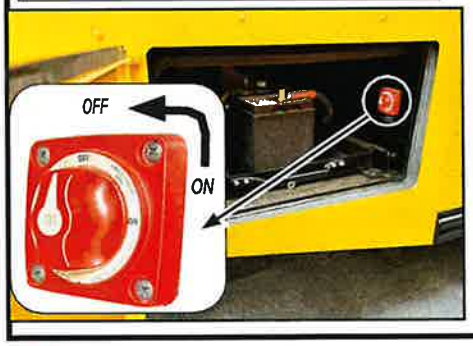
Method 1: If the ignition key is available...

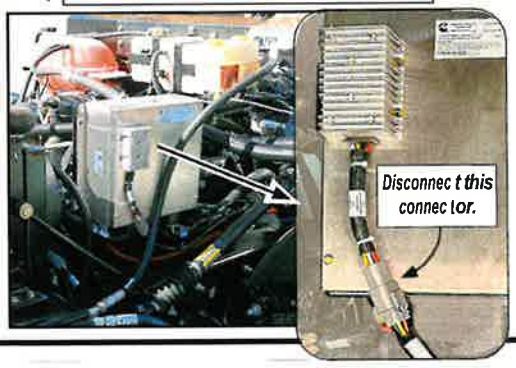
Turn OFF the ignition and remove the key. → *Turn the 12V battery disconnect switch to the OFF position.* → *Wait 10 minutes for the system to depower.*



Method 2: If the ignition key is NOT available...

Turn the 12V battery disconnect switch to the OFF position. → *Disconnect the 12/24V Converter (under the hood).* → *Wait 10 minutes for the system to depower.*





Method 3: If Methods 1 or 2 are not possible, the bus is not submerged in water, and the battery packs are equipped with external Manual Service Disconnects (MSD)s, see *Removing the MSDs* on the following page.

Removing the MSDs

Removing the MSDs to disable the High Voltage System should only be performed using NFPA-70E, 110E-rated, non-conductive, class 0 rubber gloves.

WARNING! ***Though the High Voltage system is designed to be automatically disabled when the MSDs are removed, it is strongly recommended to only remove the MSDs AFTER the key is removed and the 12V battery disconnect switch is turned to the OFF position. This further reduces the chance of an Arc Flash event which is possible while there is a load on the circuit. Failure to comply can result in serious injury or death.***

Occupational Health and Safety Administration (OSHA) refers to an Arc Flash as a phenomenon where a flashover of electric current leaves its intended path and travels through the air from one conductor to another or to the ground. The results are often violent and when a human is in close proximity to the Arc Flash, serious injury and death can occur.

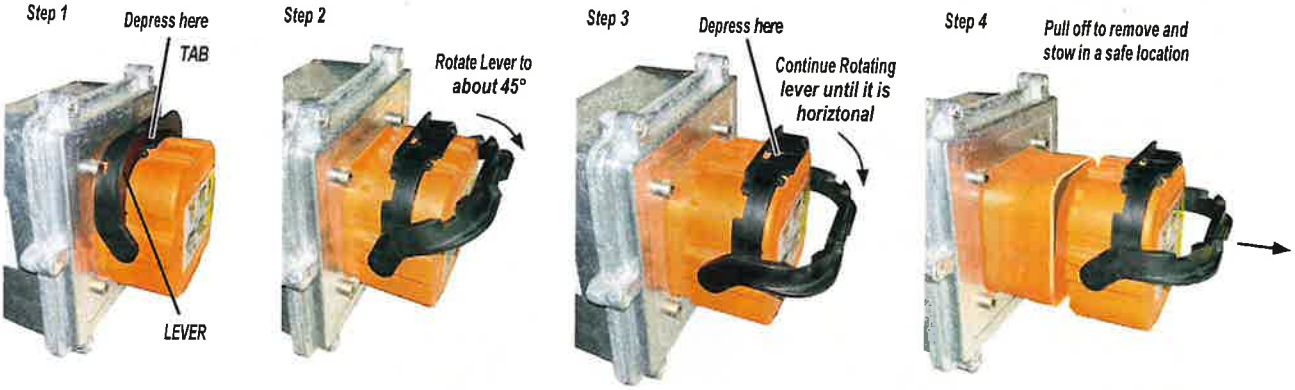
Locating the MSDs

If the bus is equipped with MSDs, they will be located on the curb side of the battery packs, visible when looking under the bus. There are two (2) MSDs; one mounted on each battery pack.

Remove as follows:

1. Depress the locking tab.
2. Rotate the locking tab lever approximately 45 degrees.
3. Depress the locking tab again and rotate lever approximately another 45 degrees.
4. Pull the MSD out.
5. Wait 10 minutes for the High Voltage system to depower.

Disabling of the system does NOT remove power from the batteries but rather opens the contactors and thus prevents power from the batteries flowing into the cables.



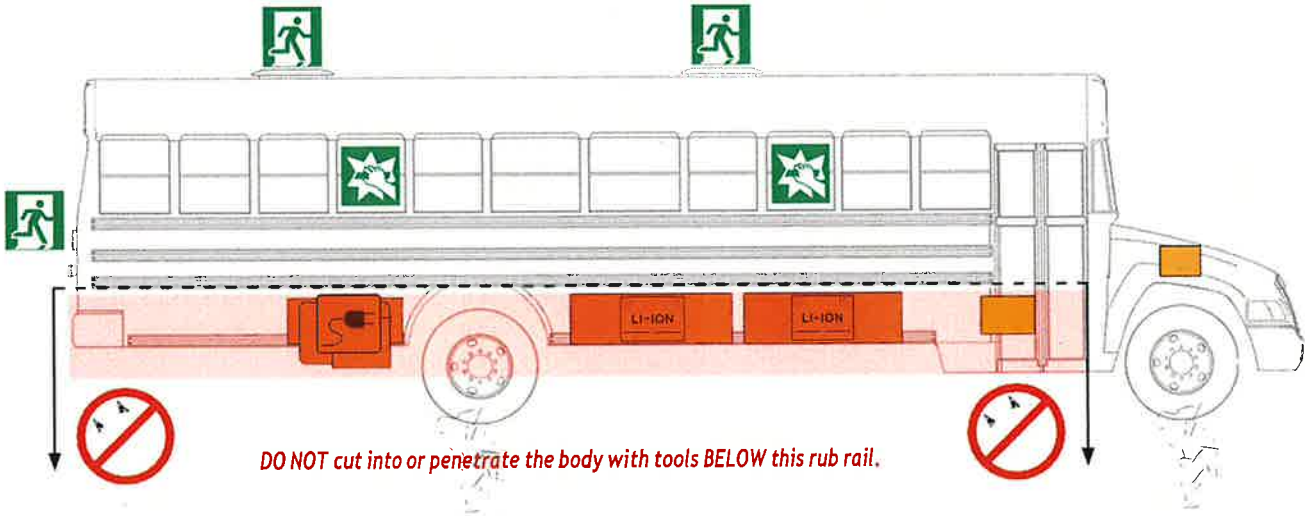
Hazardous Material Emergency Cleanup

Following an EV accident/incident, contact your local and state authorities for more information regarding proper response and cleanup of hazardous materials.

4. Access to the Occupants

For the Blue Bird BBCV Vision Electric Bus

NOTE: Emergency Exits and Emergency Window locations will vary based upon state specifications.



No-Cut Zones

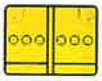
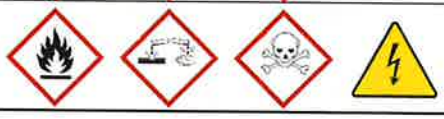
Below the rubrail that runs just above the bus' wheels.

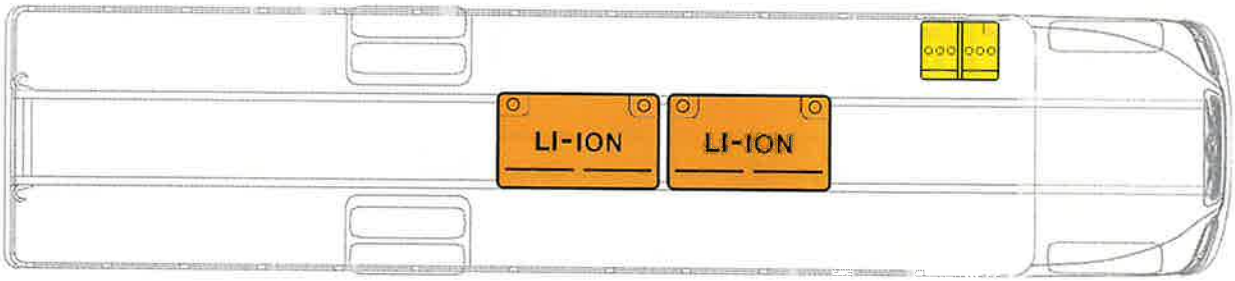
					
Charge Port	*High Voltage Li-Ion Battery*	*High Voltage Component*	*High Voltage Power Cable*	*Emergency Exit*	*Break to obtain access*

WARNING! ***If High Voltage equipment or cables (orange sheathing) are damaged due to an accident related to the equipment, there may be a short circuit. Put on insulated PPE such as insulated clothes and gloves before beginning rescue operations. Failure to comply can result in serious injury or death.***

NEVER CUT HIGH VOLTAGE CABLES (ORANGE SHEATHING)

5. Stored Energy/Liquids/Gases/Solids

		12V
		600V



High Voltage Components

All High Voltage components are identified by a High Voltage symbol and/or blaze-orange cabling.

The High Voltage battery packs are composed of two (2) multi-string High Voltage Lithium-Ion (Li-ion) Nickel-Manganese-Cobalt (NMC) gel batteries, temperature maintained by a coolant loop using Dex-cool (orange in color). Dependent upon the battery pack option installed, capacity will range from 155-196 kWh with an operating voltage of 550-750 VDC.

6. In Case of Fire

WARNING! *ALWAYS wear full Personal Protection Equipment (PPE) including a Self-Contained Breathing Apparatus (SCBA) when fire is involved. Fires in crash-damaged Electric Vehicles (EV)s could emit toxic or combustible gases. Small amounts of eye, skin, or lung irritants may be present. If exposed, rinse with large amounts of water for 10-15 minutes. Consider the entire bus as energized. PPE should include: Class 0 electrical insulating gloves, safety goggles, and Electrical Hazard (EH) rated safety shoes or boots, which must be at least appropriate up to 1,000 volts AND a non-conductive object approximately 5 ft (1.5 m) long to safely push someone away from the bus if they accidentally come in contact. Failure to comply can result in serious injury or death.*

WARNING! *Flames, smoke, arcing, or hot spots like melted plastic may indicate fire or the presence of High Voltage. A thermal camera or Infrared (IR) temperature probe may be useful to identify hot spots. Clear the area around the bus (if possible) and open the bus doors to avoid build-up of gases. If a battery has started burning, it will try to burn to completion. Cool down the batteries with direct and large amounts of water. If possible, remove combustible materials from around the bus to prevent fire growth. Failure to comply can result in serious injury or death.*

WARNING! *If the batteries catch fire, are exposed to high heat, or are generating heat or gases, use large amounts of water to cool the High Voltage batteries. If water is not immediately available, use CO_2, dry chemicals, or another typical fire-extinguishing agent to fight the fire until water is available. Failure to comply can result in serious injury or death.*

WARNING! *Do NOT use foam to extinguish a fire on electric buses. Failure to comply can result in serious injury or death.*

WARNING! *Take appropriate measures to protect civilians downwind from the incident. Failure to comply can result in serious injury or death.*

7. In Case of Submersion

If the bus is submerged, there is NOT a risk of electric shock from contacting the bus' body or frame in or out of the water.

The sealed battery packs should be able to hold the electricity for approximately 30 minutes when submerged; evacuate the bus immediately and perform a system shutdown as follows:

1. If the ignition key is available: Turn the ignition key to the OFF position, remove the key, and turn the 12V battery disconnect switch to the OFF position. Wait 10 minutes for the system to depower.

OR

2. If removing the ignition key is not possible: Turn the 12V battery selector switch to the OFF position and disconnect the 12/24V converter connector. Wait 10 minutes for the system to depower.

WARNING! ***If the bus is submerged, do NOT remove the MSDs. Failure to comply can result in serious injury or death.***

Continue with First Responder procedures.

8. Towing/Transportation/Storage

The preferred method of towing a Blue Bird electric bus is to tow the bus with the front wheels on the ground. If the bus is towed with the rear wheels on the ground, the driveshaft MUST be removed. See *Removing the Draftshaft* on the following page.

CAUTION! ***Moving the bus with the rear wheels on the ground and driveshaft not removed, even for a short distance, can cause the drivetrain motor to overheat and lead to irreversible damage of the motor and possibly start a fire.***

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.

Caging the Spring Brakes (for buses equipped w/Air Brakes)

WARNING! ***Caging the spring brakes disables the parking brake. Chock the wheels. Failure to comply can result in serious injury or death.***

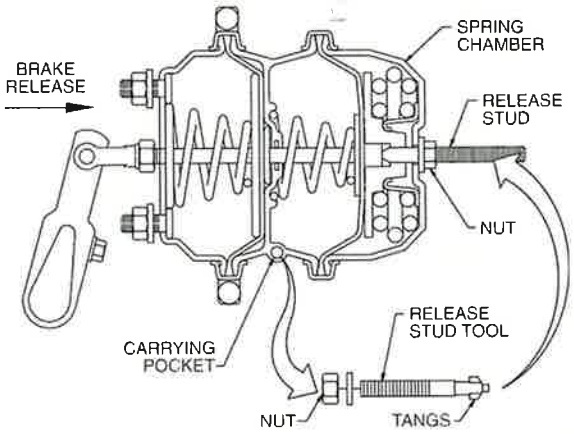
1. On each of the rear combination brake chambers, a special release stud tool is carried in a storage socket cast into the body of the chamber. Remove the nut and washer from the end of the release stud tool and remove the tool from its socket.

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.

NOTE: The bus may be equipped with optional tow hooks located just inside the access openings of the front and/or rear bumper.

WARNING! ***Never attempt to lift the bus by the tow hooks. Tow hooks are designed for horizontal pulling only; NOT FOR LIFTING. Failure to comply can result in serious injury or death.***

Removing the Driveshaft

WARNING! *On buses with hydraulic brakes, the parking brake becomes ineffective when the driveshaft is removed. Chock the wheels. Failure to comply can result in serious injury or death.*

WARNING! *Do NOT secure the driveshaft to any High Voltage or Low Voltage wiring, cooling hoses, or brake lines. Failure to comply can result in serious injury or death.*

1. From under the bus, locate the driveshaft behind the rear axle housing and remove the capscrews that secure the yoke straps at the forward universal joint.

2. 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.

3. Wrap the universal joint on the forward driveline with tape in order to retain bearings.

4. 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.

5. Wrap the universal joint on the end of the removed driveline with tape in order to retain bearings.

6. Store driveline in the rear of the bus in preparation for towing.

7. After the tow truck has been hooked to the bus, release the parking brake and remove the wheel chocks.

8. Discard removed capscrews and straps.

WARNING! *Damaged buses should be isolated outdoors until inspected. Separate the bus from all combustibles and structures by a distance of at least 50 ft (15 m). Failure to comply can result in serious injury or death.*

9. Important Additional Information

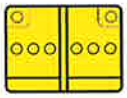
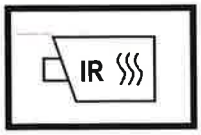
Additional information about accident assistance and recovery of the bus with High Voltage Systems can be found at:

- www.nfpa.org/Training-and-Events/By-topic/Alternative-Fuel-Vehicle-Safety-Training
- www.vda.de/en/services/Publications/rescue-and-towing-of-vehicles-with-high-voltage-systems.html
- SAE J2990 Hybrid and EV First and Second Responder Recommended Practice
- National Transportation Safety Board (NTSB) www.ntsb.gov

Contact Us

Visit Blue Bird at our website: www.blue-bird.com or call our Service Department at 478-825-2100.

10. Explanation of Pictograms

 *Electric Propulsion*	 *High Voltage Warning*	 *High Voltage Li-Ion Battery*	 *Arc Flash Warning*
 *Low Voltage Battery*	 *High Voltage Power Cable*	 *12V Battery Disconnect*	 *Charge Port*
 *Flammable*	 *Corrosive Substances*	 *Hazardous to Human Health*	 *Acute Toxicity*
 *Use Water to Extinguish Fire*	 *Thermal Camera*