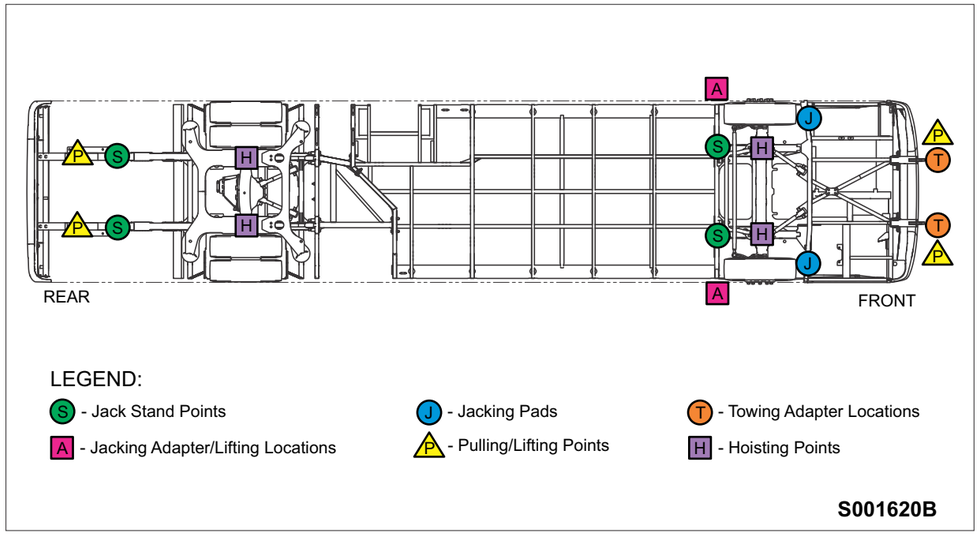
LIFTING AND RECOVERY INFORMATION

In the event of submersion or collision, where vehicle movement may be required for salvage or access purposes, only connect to the points on the frame designated for pulling the vehicle. Jacking and hoisting support can be provided to the vehicle using the locations identified in the following diagram.



VEHICLE FLUIDS

- **Antifreeze - Final Charge 50/50 Premix w/ Bitrex - 36.0 gal (136.3 L)**
- **Power Steering - MSDS #455936 - Transynd - 4.0 gal (15.1 L)**
- **Hydraulic Fluid - MSDS #3009356 - Duradrive HD Synthetic - 0.5 gal (1.9 L)**
- **Ultra Low Sulphur Diesel - MSDS #320-110 - 30.0 gal (113.6 L)**

Copyright © 2023 New Flyer Industries Canada ULC

NEW FLYER®

MARYLAND TRANSIT ADMINISTRATION

SR2725

EMERGENCY RESPONDER GUIDE

For a

Siemens/XALT 520 KWH All Electric Equipped Bus

DANGER

HIGH VOLTAGE MAINTENANCE ACCESS ONLY

This Vehicle Contains:

- **High Voltage Lithium-ion Batteries on Roof and in Rear Compartment**
- **High Voltage Equipment on Roof, in Rear Compartment and Underneath the Vehicle**
- **High Voltage Cables on Roof, in Rear Compartment and Underneath the Vehicle**

Copyright © 2023 New Flyer Industries Canada ULC

EMERGENCY SHUTDOWN AND EVACUATION PROCEDURES

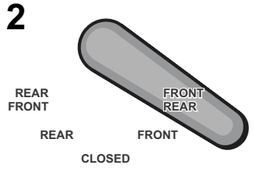
1. Secure vehicle (shift to neutral and apply parking brake).
2. Open the front and rear passenger doors. Direct all passengers to a safe area, away from the vehicle.
3. Shutdown the vehicle using the Master Run switch on the driver's side console.
4. If it is safe to do so, turn the 12/24 VDC Battery Disconnect switch located behind the Battery Disconnect and High Voltage Interlock switch access door to the OFF position.
5. Turn the High Voltage Interlock switch located behind the Battery Disconnect and High Voltage Interlock switch access door to the OFF position.
6. Chock wheels if safe to do so.
7. Report actions taken to the first responders upon arrival.

1



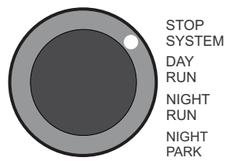
PARKING BRAKE CONTROL VALVE (ON SIDE CONSOLE)

2



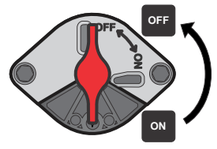
DOOR CONTROLLER (ON SIDE CONSOLE)

3



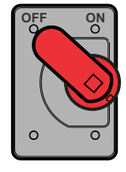
MASTER RUN SWITCH (ON SIDE CONSOLE)

4



12/24 VDC BATTERY DISCONNECT SWITCH (ON LOW VOLTAGE FUSEBOX)

5



HIGH VOLTAGE INTERLOCK SWITCH (ON LOW VOLTAGE FUSEBOX)

Copyright © 2023 New Flyer Industries Canada ULC

IN THE EVENT OF A SUBMERSION

DANGER

In the event of submersion (if water is above the bottom of the rear bumper), proper PPE gear with a minimum arc flash rating of 8cal/cm^2 is required before approaching the rear bumper, or ESS compartment area. If the ESS is submerged or partially submerged, a voltage hazard exists at the batteries and may exist between HV energized components. Avoid contact with HV components, cabling, or service disconnects on a submerged vehicle. The front and sides of the vehicle do not pose a HV risk if partially submerged. The vehicle should be retrieved from the water before other work is performed. Water levels below the bottom of the bumper should not pose any HV risk. In some instances, small bubbles may be seen coming from an immersed HV battery. This is referred to as micro-bubbling. This DOES NOT indicate a shock hazard and DOES NOT energize the surrounding water.

1. Follow Emergency Shutdown and Evacuation Procedure.
2. Assess vehicle for risks.
3. Avoid contact with High Voltage (HV) components.
4. Attend to any first aid needs.

DANGER

High Voltage Cables are routed on the roof. If these cables become damaged or exposed during an accident, they may remain live. Ensure the High Voltage system is disabled using the High Voltage Interlock switch before working in the area of damaged cables.

5. Access to passengers can be gained through the entrance and exit doors, side windows, or the roof hatch.

Copyright © 2023 New Flyer Industries Canada ULC

IN THE EVENT OF A COLLISION (REAR, SIDE OR FRONT)

1. Follow Emergency Shutdown and Evacuation Procedure.
2. Assess vehicle for risks.

☞NOTE:

A major collision from the side or rear could result in damage to high voltage cables, batteries or other reservoirs containing hazardous liquids. Ensure the High Voltage system is switched off at High Voltage Interlock Switch.

3. Avoid contact with High Voltage (HV) components. Refer to the Emergency Responder Quick Reference Guide for information on the location of High Voltage components.
4. Wear full protective clothing including helmet, face mask and self-contained positive pressure or pressure demand breathing apparatus.
5. Attend to any first aid needs.
6. Contain any spills or fluid leaks using sand or other absorbent material.

⚠ DANGER

High Voltage Cables are routed on the roof. If these cables become damaged or exposed during an accident, they may remain live. Ensure the High Voltage system is disabled using the High Voltage Interlock switch before working in the area of damaged cables.

7. Access to passengers can be gained through the entrance and exit doors, side windows, or the roof hatch.

ASSESSING DAMAGE

Proper PPE should be worn when assessing damage around battery enclosures and HV components. If there is damage to an ESS enclosure or battery module, an assessment needs to be made to determine if the vehicle can be safely towed.

⚠ DANGER

The batteries are still holding a charge and HV is present at each module.

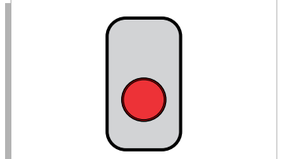
With the HV system disconnected, the HV cables should not pose a risk during towing. Properly HV trained personnel in proper PPE gear can remove the MSD's at each string to further ensure isolation of the battery packs if component damage is severe and there is concern the automatic disconnects are damaged.

Copyright © 2023 New Flyer Industries Canada ULC

DIRECT HAZARDS AND SAFETY WARNINGS



- Be familiar with and follow applicable National, State/Provincial and Local Fire and Safety Regulations.
- This is an Electric Drive vehicle which contains 600 VDC and 230 VAC high voltage equipment in the rear compartment, on the rooftop, and interior of the vehicle.
- High voltage cables can be identified by an orange outer covering. A High Voltage Interlock switch protects all circuits and components, BUT it is still possible to receive a fatal electric shock from the system!
- DO NOT cut High Voltage Cables.
- Use extreme caution when handling, orange high voltage cables or Electric Drive components, as this could result in severe injury or death!
- If working near high voltage cabling or components, use 1,000 VDC electrical gloves, rubber-soled shoes and make sure you and the surrounding area are DRY!
- The ESS cover should never be breached or removed under any circumstances, including fire. Doing so might result in severe electrical burns, shock, or electrocution.
- The shutdown procedure should interrupt all power to the HV cables and isolate the battery modules. The battery modules within the battery enclosures will remain energized. The batteries are not discharged with the High Voltage Interlock Switch, they are disconnected and taken off-line but will remain charged. HV is present at the battery modules.
- If **vehicle** is connected to charging station, the charging station should be shut-down to prevent HV to the **vehicle** components. Push the Emergency Stop Charging Button on the charger cabinet.



EMERGENCY STOP CHARGING BUTTON

Copyright © 2023 New Flyer Industries Canada ULC

IN THE EVENT OF A FIRE

⚠ WARNING

Lithium-ion batteries use a carbon negative electrode and a Lithium Cobalt Manganese Nickel Oxide positive electrode. The electrolyte is a solution of lithium hexaflourophosphate in a mixture of organic solvent. Exposed electrolyte solution is corrosive and may be flammable in sufficient concentration.

- **DO NOT USE Class D fire extinguisher.**
- **USE CLASS A, B or C fire extinguishers for small fires.**
- **USE WATER in large amounts for large fires.**
- **Wear full protective clothing including helmet, face mask and self-contained positive pressure or pressure demand breathing apparatus.**
- **Exposure to excessive heat may lead to venting or rupture of the sealed battery, exposing the internal components which are corrosive and flammable.**
- **Establish a 20' or larger perimeter if fire or smoke is present at the ESS. PPE must be worn within the perimeter.**

SMALL FIRES (not involving the HV batteries)

- **Proper PPE gear is required if smoke is present, including a self-contained breathing apparatus. Smoke, regardless of the source, should be assumed to be toxic.**
- **Extinguish small fires that do not involve the high voltage battery using typical vehicle firefighting procedures.**

HEAT OR SMOKE PRESENT AT ESS

- **If there is heat or smoke present at the battery enclosure, there is a potential battery fire.**
- **The smoke is toxic and flammable.**
- **Do not remove or breach ESS or HV enclosure covers under any circumstances including fire. Doing so might result in severe electrical burns, shocks, or electrocution.**
- **Use large amounts of water to cool the outside of the enclosure.**

Copyright © 2023 New Flyer Industries Canada ULC

- **Skin contact - If skin contact with contents of an open battery occurs, immediately flush with lukewarm water for at least 30 minutes. Thoroughly wash (or discard) clothing and shoes before reuse.**
- **Inhalation - If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air and seek medical advice.**
- **Ingestion - If ingestion of contents of an open battery occurs, rinse mouth thoroughly with water. DO NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than the hips to help prevent aspiration. Call a physician or poison control center immediately.**

ENTERING THE VEHICLE

ONLY enter the vehicle if it is safe to do so. ONLY enter through the entrance door to retrieve the chock blocks, apply the parking brake and access the Master Run switch. Alternatively, if it is not safe to enter the vehicle, the parking brake and Master Run switch may be accessed through the driver's side window.

Copyright © 2023 New Flyer Industries Canada ULC

FIRE SUPPRESSION

This vehicle is equipped with an automatic fire suppression system. There are fire detection sensors and suppression nozzles in the rear ESS compartment, and an extinguisher cylinder behind the streetside corner pillar. In the event of a fire, the fire detectors will trigger the system to discharge fire suppressant from the nozzles and a buzzer will sound. The system can be manually activated by pulling the pin on the manual actuator located on the driver's overhead panel.

IN THE EVENT OF A BATTERY SPILL

⚠ CAUTION

The Electrolyte and its fumes are toxic. Wear full protective clothing, including helmet and face mask, and self-contained positive pressure or pressure demand breathing apparatus. If possible, stop or minimize the flow of battery electrolyte. Contain spillage from a damaged or open cell or battery with dry sand or an absorbent cloth. Battery Electrolyte is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways.

EXPOSURE HAZARDS

- Eyes - Not dangerous with normal use. Eye contact with contents of an open battery can cause severe irritation or burns to the eye.
- Skin - Not dangerous with normal use. Skin contact with contents of an open battery can cause severe irritation or burns to the skin.
- Inhalation - Inhalation of materials from a sealed battery is not an expected route of exposure. Material emitted from a ruptured battery may cause respiratory irritation.
- Ingestion - Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

FIRST AID MEASURES

- Eye contact - If eye comes in contact with contents of an open or damaged cell or battery, immediately flush the contaminated eye(s) with lukewarm water for at least 30 minutes. Get medical attention immediately. Rinse eye with calcium gluconate solution (1%) until arrival of doctor. Continue rinsing.

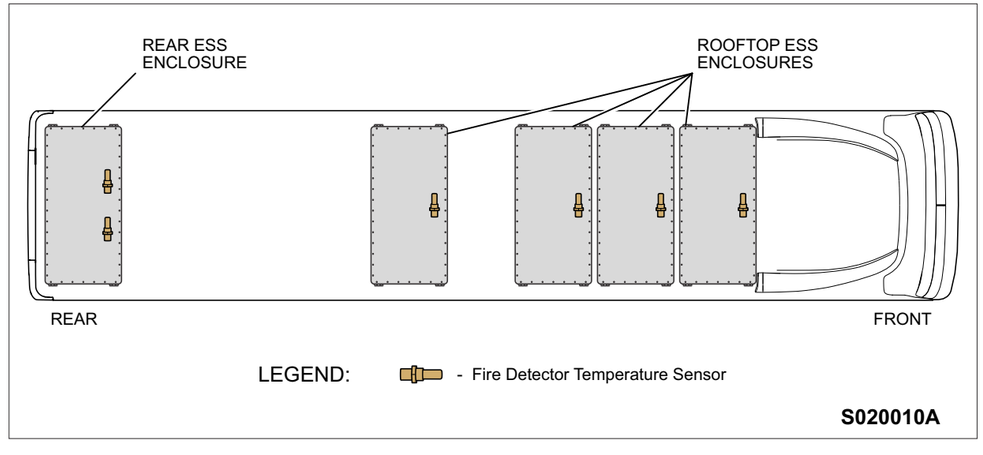
Copyright © 2023 New Flyer Industries Canada ULC

BATTERY FIRES

- A battery fire can take up to 24 hours to burn out.
- Use large amounts of water to extinguish battery fires. Establish an additional water source as required. Use a thermal imaging device to ensure all heat sources are extinguished. A battery fire has the potential to re-ignite. Use thermal imaging device to ensure that the high voltage battery is completely cooled before towing or moving the vehicle. The battery must be monitored for at least one hour after it is found to be completely cooled.
- Smoke or steam indicates that the battery is still heating. Do not release the vehicle to second responders, such as the law enforcement and towing personnel, until there has been no heating detected for one hour. Always advise second responders that there is a risk of battery re-ignition.

FIRE DETECTION

A battery fire is an extremely unlikely event. To prevent a fire from starting, the ESS system is designed to prevent thermal events from occurring inside the battery packs and warns the operator of a fire inside the battery enclosures. The ESS system uses abuse tested battery pack enclosures. They are ruggedized against external fuel fire exposure, hard short circuits, internal flooding, and over-heating. Each battery has a cooling plate separating each cell to manage cell temperature. The battery's voltage, current, state of health and temperature is actively monitored. If a battery pack is out of limits, the system automatically disconnects the damaged string connecting the faulty battery pack. In case of an enclosure fire, the fire detection system uses temperature sensors to warn of emerging thermal events, initiate a stop system, and display an instrument panel warning. The fire detectors are mounted in each of the ESS enclosures.

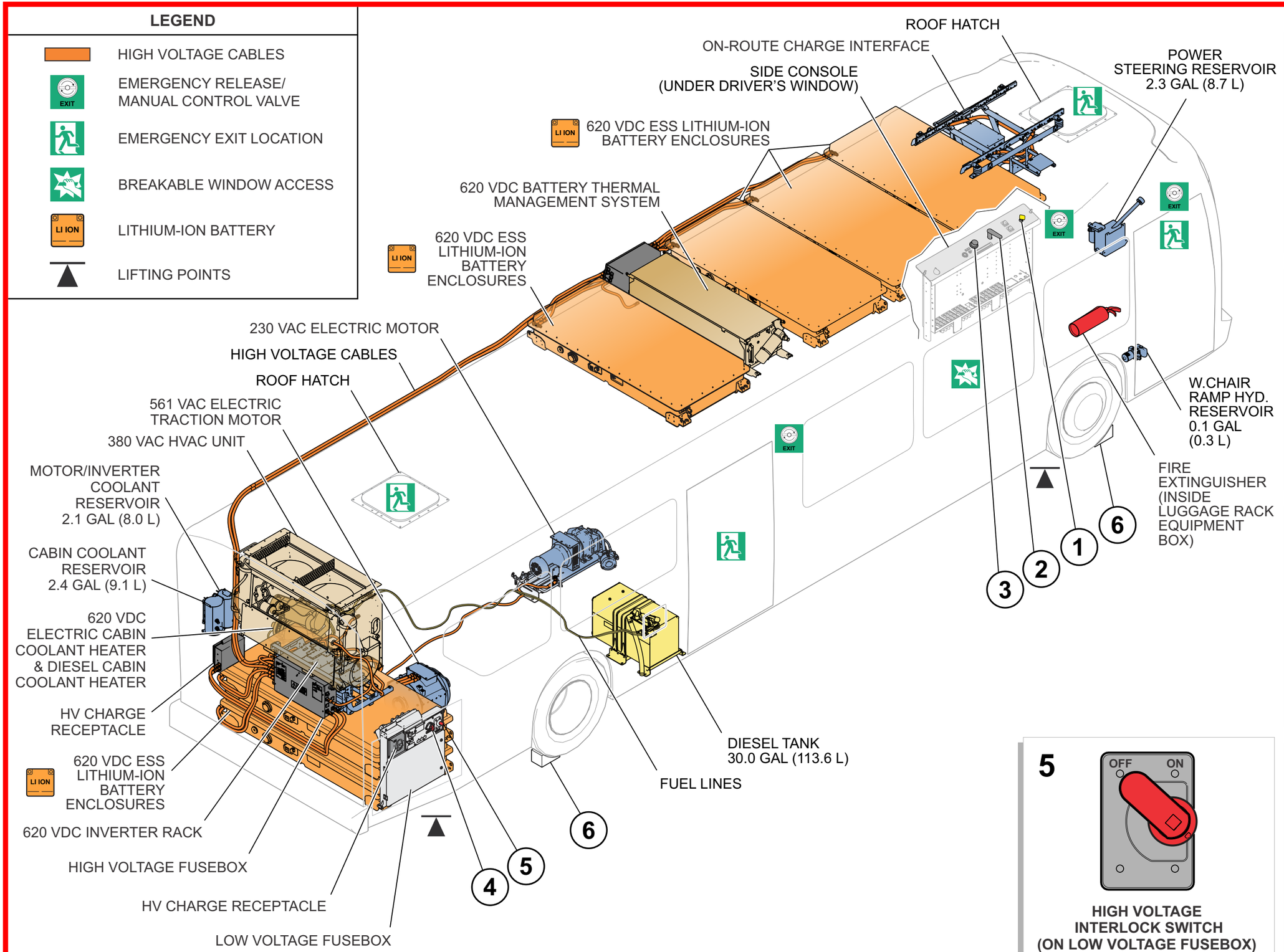


Copyright © 2023 New Flyer Industries Canada ULC

LEGEND

- HIGH VOLTAGE CABLES
- EMERGENCY RELEASE/ MANUAL CONTROL VALVE
- EMERGENCY EXIT LOCATION
- BREAKABLE WINDOW ACCESS
- LITHIUM-ION BATTERY
- LIFTING POINTS

ROOF HATCH
ON-ROUTE CHARGE INTERFACE
SIDE CONSOLE (UNDER DRIVER'S WINDOW)
620 VDC ESS LITHIUM-ION BATTERY ENCLOSURES
620 VDC BATTERY THERMAL MANAGEMENT SYSTEM
620 VDC ESS LITHIUM-ION BATTERY ENCLOSURES
230 VAC ELECTRIC MOTOR
HIGH VOLTAGE CABLES
ROOF HATCH
561 VAC ELECTRIC TRACTION MOTOR
380 VAC HVAC UNIT
MOTOR/INVERTER COOLANT RESERVOIR 2.1 GAL (8.0 L)
CABIN COOLANT RESERVOIR 2.4 GAL (9.1 L)
620 VDC ELECTRIC CABIN COOLANT HEATER & DIESEL CABIN COOLANT HEATER
HV CHARGE RECEPTACLE
620 VDC ESS LITHIUM-ION BATTERY ENCLOSURES
620 VDC INVERTER RACK
HIGH VOLTAGE FUSEBOX
HV CHARGE RECEPTACLE
LOW VOLTAGE FUSEBOX
DIESEL TANK 30.0 GAL (113.6 L)
FUEL LINES
POWER STEERING RESERVOIR 2.3 GAL (8.7 L)
W.CHAIR RAMP HYD. RESERVOIR 0.1 GAL (0.3 L)
FIRE EXTINGUISHER (INSIDE LUGGAGE RACK EQUIPMENT BOX)

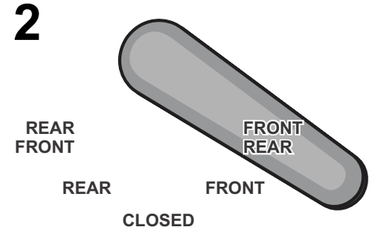


1



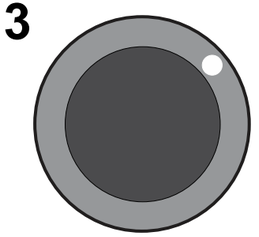
PARKING BRAKE CONTROL VALVE (ON SIDE CONSOLE)

2



DOOR CONTROLLER (ON SIDE CONSOLE)

3

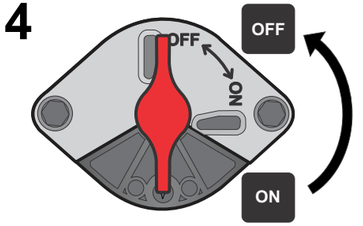


MASTER RUN SWITCH (ON SIDE CONSOLE)

5

HIGH VOLTAGE INTERLOCK SWITCH (ON LOW VOLTAGE FUSEBOX)

4



12/24 VDC BATTERY DISCONNECT SWITCH (ON LOW VOLTAGE FUSEBOX)

Copyright © 2023 New Flyer Industries Canada ULC