



# TRAINING REPS



## MTA All Electric Buses

*Lt. Michael Murphy, Fire-Rescue Academy*

The Maryland Transit Administration has recently introduced multiple New Flyer- Zero Emission Buses (ZEBs) to the Baltimore area. There are two models in production: 40' and 60' articulating buses. They can be quickly identified by a unique wrap (below) that includes "Zero Emissions Bus" in large lettering. **These vehicles possess a 520 kWh Lithium-Ion battery system** spread throughout six Energy Storage Systems (ESS). Each ESS weighs 1220 lbs. There are four (4) ESS located on the roof (4880 lbs.) and two (2) in the rear compartment of the vehicles (2440 lbs). For comparison, a Tesla Model 3 boasts a battery capacity of 50-82 kWh. It is worth noting that these buses are still equipped with 30-gallon diesel tanks to fuel the cabin heater. The weight on the roof of the bus should be considered during stabilization efforts in a rescue scenario.



We have begun to encounter electric vehicle fires within our districts and have witnessed the energy potential within these batteries. Electric vehicle fires require an immense amount of water to contain; however, that remains our best tactic for rapidly cooling the energy cells to prevent further thermal runaway. These all-electric buses have about **7-10 times** the stored energy compared to the typical electric-powered passenger vehicle.

After addressing rescue concerns, we must focus on exposure control and containment. Establishing a reliable water source is critical, as operations may be prolonged.

Consistent with other electric vehicles, high-voltage cables are orange in color. They are routed within the vehicle and on the roof. Never attempt to open or pierce the ESS covers, as this could result in electrocution. The ESS compartments have built-in fire detection and suppression systems that should activate in the event of fire. This system can be manually activated by pulling a pin on a manual actuator located within an overhead panel above the driver.



As always, treat electric vehicle fires with an abundance of caution. The MTA is currently testing these vehicles on pre-determined routes. Buses are being stored **inside** along with standard diesel-fueled buses at the depots listed below. Plans call for the installation of overhead catenary charging systems. The catenary on the roof of the buses only poses an electrocution hazard when in contact with a charging system.

Electric Bus Depots (Baltimore City):

- Eastern Bus Division, 201 Oldham St, Baltimore, MD 21224
- Northwest Bus Division, 4401 Mt Hope Dr, Baltimore, MD 21215




*Desire* ★ *Determination* ★ *Dedication*

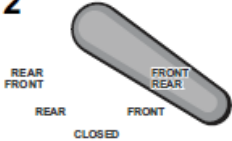
The MTA has provided their employees and first responders with the Emergency Shutdown and Evacuation Procedures, as seen below. Coordinate with the driver to ascertain what steps they have completed (if any). Additionally, drivers have a “T-Key” that will open and allow access to all bus compartments.

**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**  


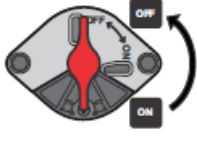
PARKING BRAKE CONTROL VALVE  
(ON SIDE CONSOLE)

**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)

Scan the QR code to view a short video published by MDOT MTA.

Please refer to the Emergency Response Guides provided for additional information.

