



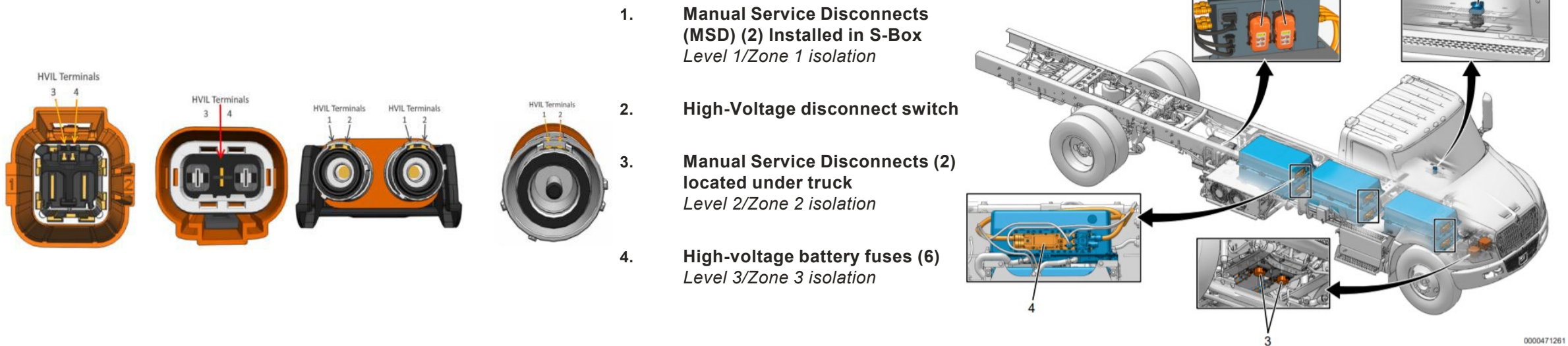
# IC BUS® CE SERIES ELECTRIC GUIDE FOR 1<sup>ST</sup> AND 2<sup>ND</sup> RESPONDERS



# HV PROTECTIVE DESIGN

International electric vehicles are designed with safety in mind and adhere to industry standards.

- **Isolation monitoring**- Detects HV presence where it shouldn't be.
- **High Voltage Interlock**- Detects when a HV cable is not fully seated.
- Manual safety disconnects allow for isolation of HV away from components.
- HV system isolated from the chassis/body
- All HV components have their own fuses.
- **IC Bus® may have additional MSDs on right frame rail**
- **IC Bus® may have additional HV batteries**



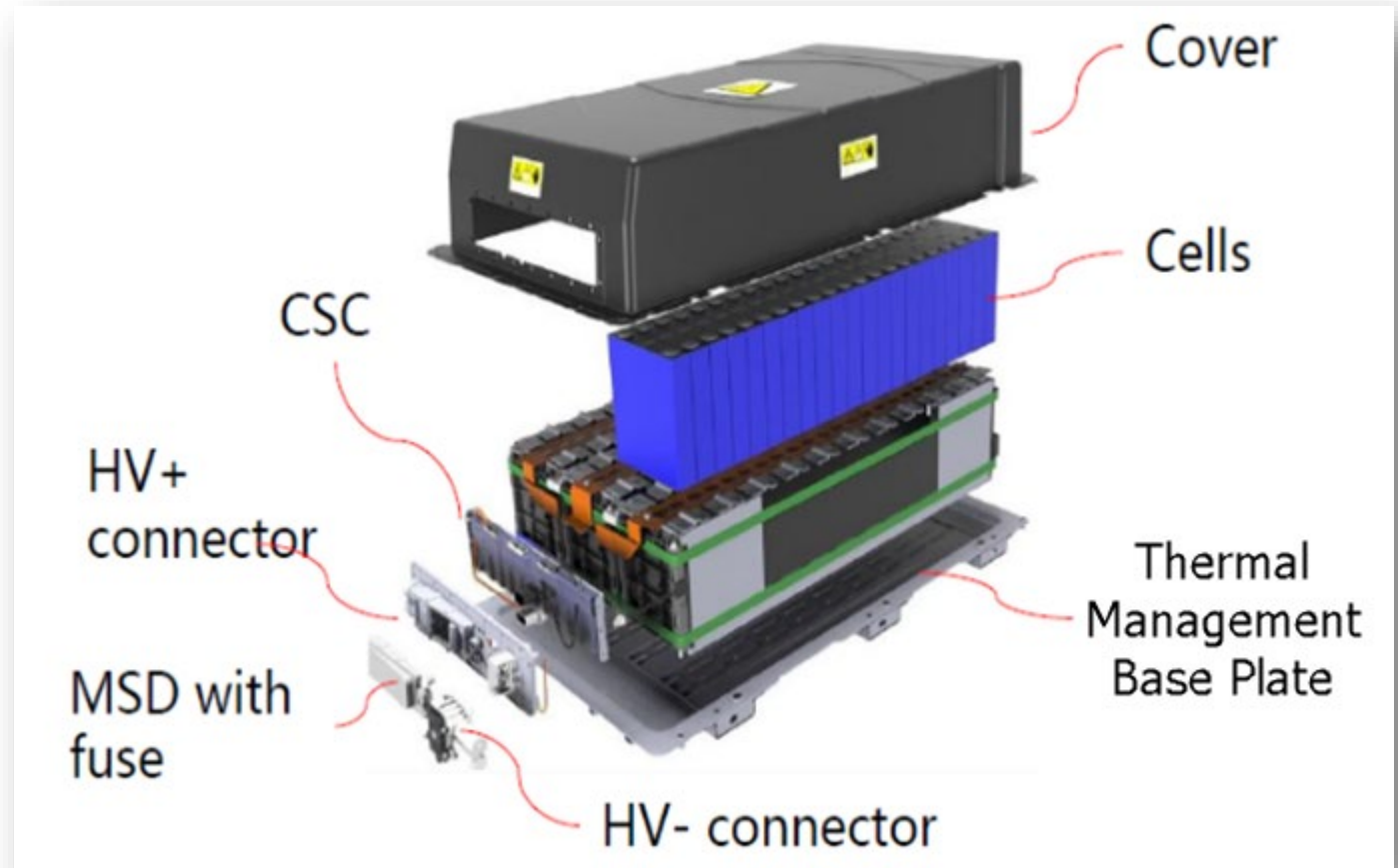
**\*\*ALWAYS REFER TO INFORMATION POSTED ON NFPA WEBSITE TO IDENTIFY SPECIFIC VEHICLE INSTRUCTIONS\*\***

# HIGH VOLTAGE BATTERY

## CATL LFP 35KWH BATTERY- 6 OR 9 BATTERY CONFIG.



- Lithium Iron Phosphate – Prismatic cells (63 per pack)
  - High temperature tolerance (runaway can happen at 270C or 518F)
  - Long life
  - No “battery memory” or degradation from 100% charge.
- Liquid cooled with standard 50/50 Glycol / Distilled Water. Target 65F internal.
- Each pack has its own fuse and can isolate itself from the rest of the system when failure occurs.
- Isolate vehicles with compromised battery pack at least 50 ft from structures or flammable materials until the battery can be removed.



# HIGH VOLTAGE PERSONAL PROTECTIVE EQUIPMENT (PPE)

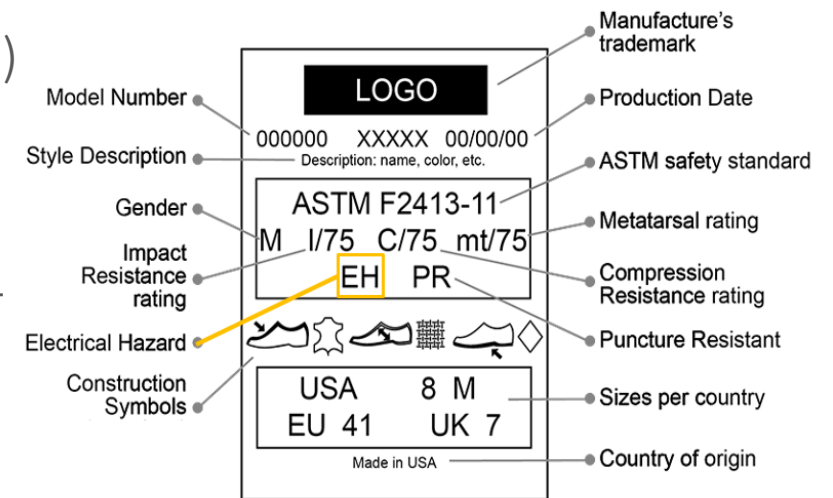


- Class 0 electrical insulating gloves (red label)
  - Re-certify every 6 months
  - If new pair, never used, the printed date is good for 1 year \*
  - Leather over gloves
- Electrical Hazard (EH) rated safety shoes or boots
- Safety glasses or goggles (non-Conductive)
- Lockout/Tagout equipment



To safety service high voltage vehicles each service facility / organization must:






- Understand and follow applicable Authority Having Jurisdiction (AHJ) control of hazardous energy standards and safety regulations
- Ensure employees are trained on types of energy, hazards, and methods to control hazardous energy
- Understand, create, and enforce control of hazardous energy / high-voltage vehicle service safety protocols
- Make appropriate safety equipment available to employees: high-voltage Person Protective Equipment
- (PPE), locks, lock boxes, sign-out sheets, etc.





**INTERNATIONAL ELECTRIC VEHICLES HAVE ADOPTED A CABLE STRIPING SYSTEM TO IDENTIFY WHAT STEPS MUST BE TAKEN TO DISCONNECT INDIVIDUAL CABLES / COMPONENTS.**

- PPE MUST BE WORN TO PERFORM THESE STEPS
- THE DISCONNECT SWITCHES CAN BE LOCKED OUT
- FOLLOW RECOMMENDATIONS POSTED ON NFPA.ORG

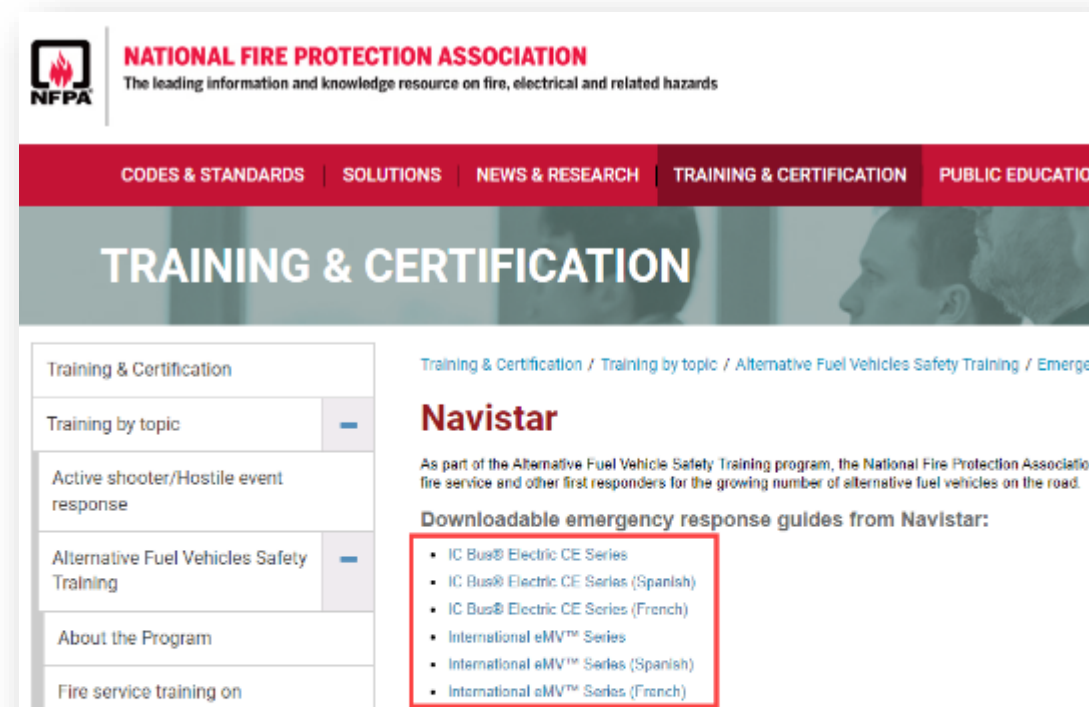
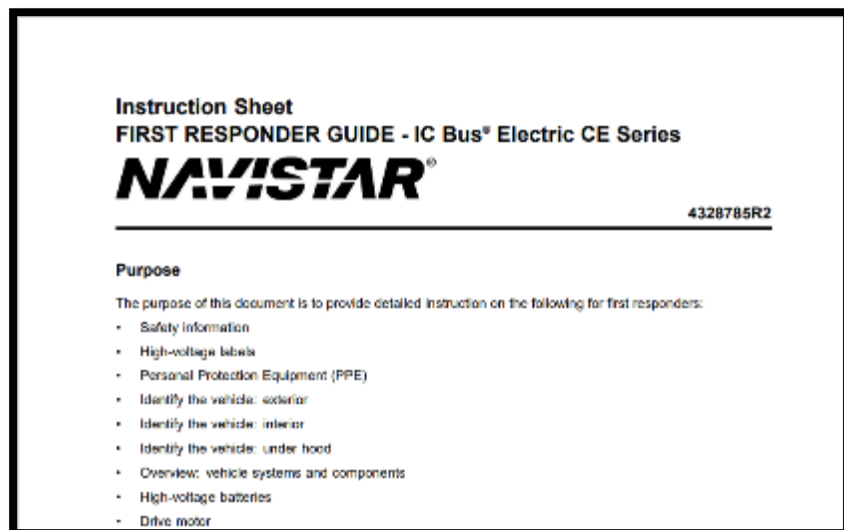
CABLE STRIPING AND ISOLATION OF HV	
<b><u>Solid Orange Cable:</u></b> Level 1 Isolation- 12v and HV disconnect OFF , rear MSDs out.	
<b><u>Blue Striped Cable:</u></b> Level 2 Isolation- All the above, plus removal of front MSDs.	 
<b><u>White Striped Cable:</u></b> Level 3 Isolation- All the above, plus removal of battery fuses.	 





- First responder guides for IC Bus and eMV can be found on the NFPA site.
- English, Spanish, and French versions available.

## International NFPA Emergency Response Guides



- IC Bus® Electric CE Series
- IC Bus® Electric CE Series (Spanish)
- IC Bus® Electric CE Series (French)
- International eMV™ Series
- International eMV™ Series (Spanish)
- International eMV™ Series (French)

# EXTRACTION- HV SAFETY



INTERNATIONAL ELECTRIC VEHICLES DO NOT HAVE HV COMPONENTS WITHIN THE PASSENGER CABIN AREAS. ALL COMPONENTS ARE EITHER UNDER-HOOD OR BELOW TOP OF CHASSIS RAIL.

BODY CUTTING IS SAFE ABOVE CABIN FLOOR LEVEL  
AVOID CUTTING IN THE ORANGE AREAS BELOW.



\*school bus shown, but also applies to EMV\*

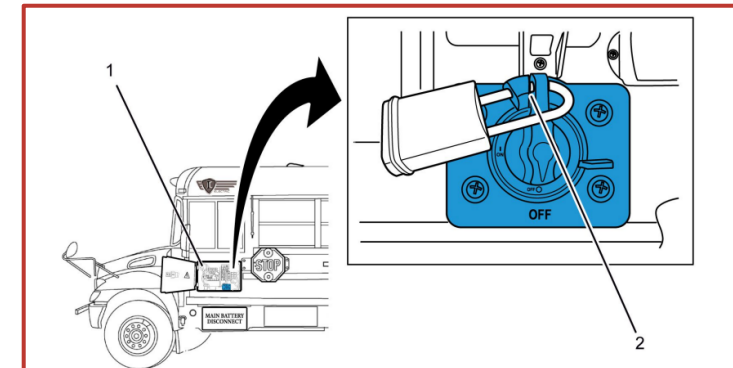
# VOLTAGE DISCONNECTS - EMV



HV DISCONNECT

12V DISCONNECT

- In the event of an accident the vehicle can be disabled by turning off the 12V disconnect switch.
- 12V should be turned off during extended periods of disuse.
- When performing HV isolation steps, wait 3 minutes after switching off disconnects.
- Drivers do not need to interact with the HV disconnect switch.



**LOCK-OUT / TAG-OUT**

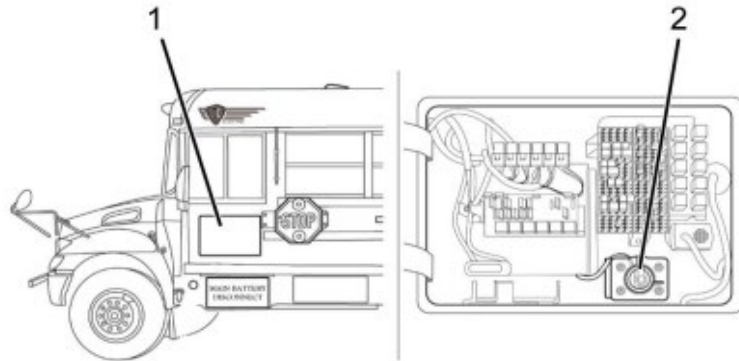


# VOLTAGE DISCONNECTS - BUS



## — High Voltage Disconnect Switch

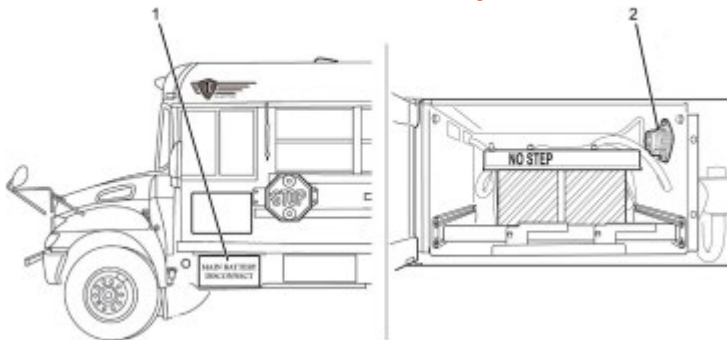
— Inside the fuse panel



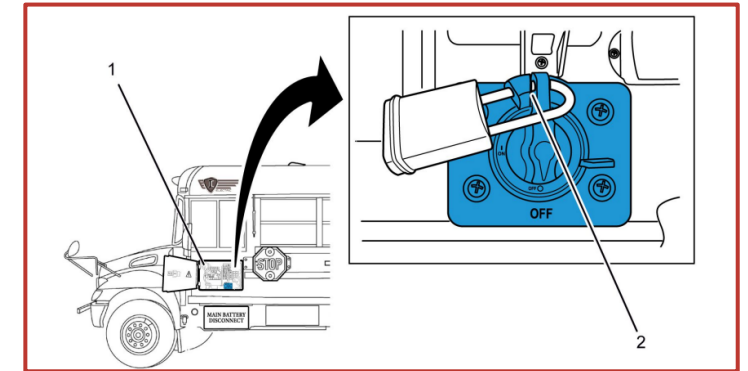
- 1. Access Panel
- 2. High Voltage Disconnect Switch

## - Low Voltage Disconnect Switch

- Inside the 12V battery box



- 1. Battery Box Cover
- 2. Low Voltage Switch



**LOCK-OUT / TAG-OUT**

**NOTE:** You must wait 3 minutes for HV energy to dissipate before working on HV components

# TOWING PROCEDURE



**When towed, the vehicle must be lifted from the rear  
OR the drive shaft or axle shafts must be removed.**

**Air Tanks can be filled through adapter  
port found on air tank.**

**Brakes can be caged using the supplied  
Cage bolt. This holds them in a released  
condition.**

