INSTRUCTION TO SERVICE

ITS: 61242	DATE 01/14/2025
SECTION:	260 – Battery Compartment
SUBJECT:	Rear ESS Sealing Improvements
ISSUE:	Rear ESS Skin Has Potential for Water and Debris Intrusion
SUMMARY:	Remove Rear ESS Enclosure and Clean and Seal ESS Panel Joints.

ITS61242

Ref. NHTSA Recall No.	Ref. Transport Canada Recall No.
Not Applicable	Not Applicable

THIS ITS DOCUMENT SHOULD BE RETAINED AND REFERRED TO FOR FUTURE MAINTENANCE UNTIL THE NEW FLYER PARTS AND/OR SERVICE MANUAL IS UPDATED TO REFLECT WORK DONE AS A RESULT OF THIS DOCUMENT. ENSURE THAT THIS DOCUMENT IS AVAILABLE FOR PARTS AND MAINTENANCE STAFF GOING FORWARD.

PROCEDURE:

Only trained personnel shall supervise and perform the High Voltage system testing, servicing and troubleshooting contained in this procedure. Two personnel (one called the Checker and the other called Monitor/Recorder) shall perform troubleshooting and servicing procedures, together, to ensure safety of themselves, others nearby and for the protection of vehicle and property.

1. Turn the master run switch to the off position and wait 5 minutes before proceeding.
2. Turn the 12/24V battery disconnect and HV Interlock switch to the “OFF” position.
3. Lock and Tag the electrical system of the bus out and retain the key. See Figure 1.
4. Install a Lockout/Tagout Steering wheel cover as required.

☞ ***NOTE: Refer to the Lockout/Tagout Procedure in section 1 of your Preventive Maintenance Manual or section 9 of your Service Manual for additional information.***

☞ ***NOTE: Use commercially available lock out equipment and tags being sure to follow any local laws or workplace procedures.***

☞ ***NOTE: Refer to New Flyer High Voltage Safety Guidelines and Procedures Document 532295 (Appendix A) when completing installation or service work on high voltage power cables.***

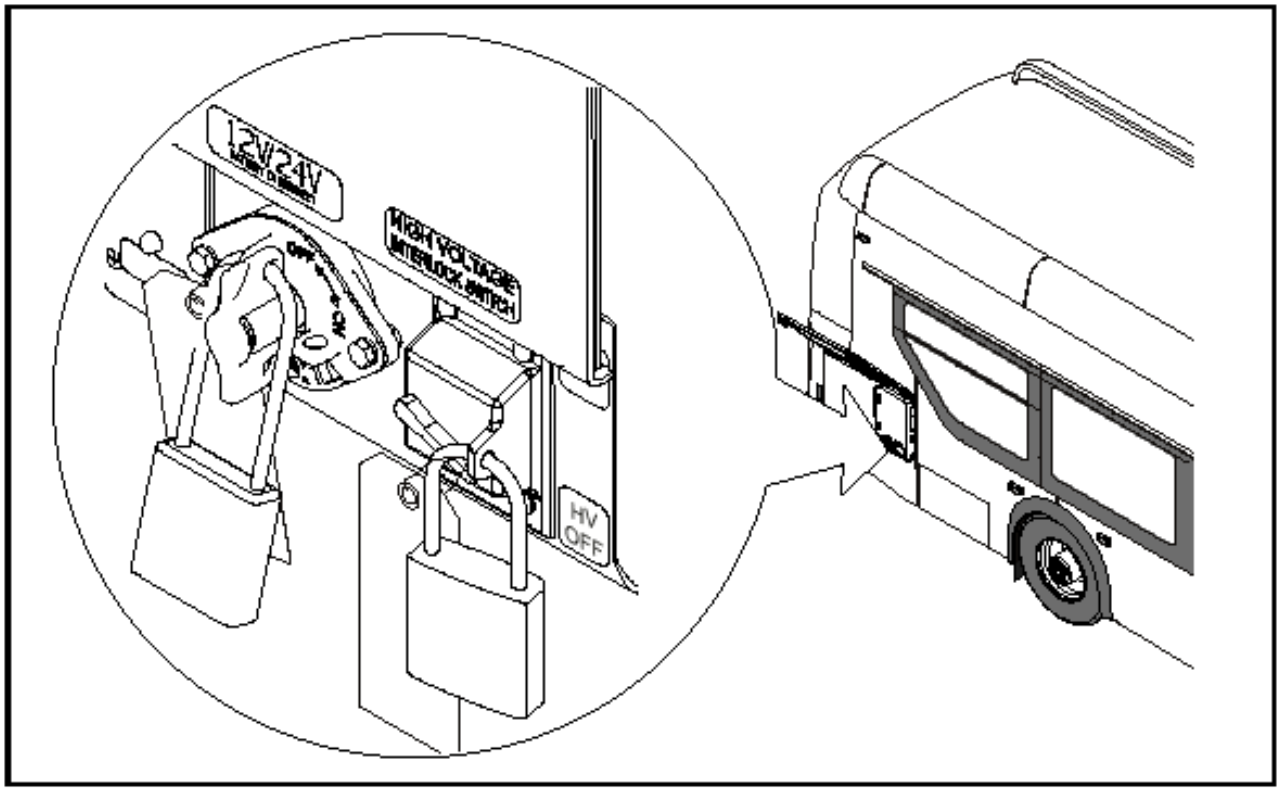
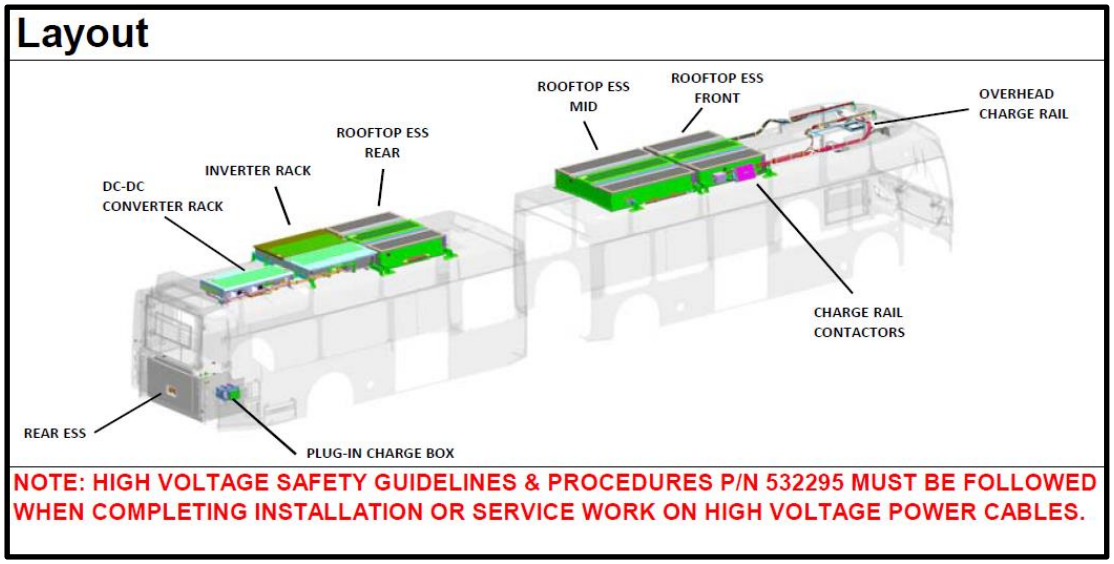


Figure 1: Lockout Tagout location reference.

☞ Caution: High Voltage PPE Category II is required. Please refer to Appendix B or the safety section of your Preventive Maintenance Manual and Service Manual for more information.

☞ Caution: No communication from observers with the H/V Tech and Checker while work is being performed. If required, all work must stop until communication has been completed.

5. Ensure the bus is not charging and gain access to the rear ESS enclosure. See Figure 2.
6. Prior to beginning review the scope of work with the Monitor/Recorder and organize tools neatly.
7. Review/Rehearse the actions required in case of any possible accident scenarios.
8. Locate and disconnect the rear ESS quick disconnects on each side of the unit. See Figure 2.
9. Remove the MSD's and install the appropriate protective dust cap. See Figure 2.



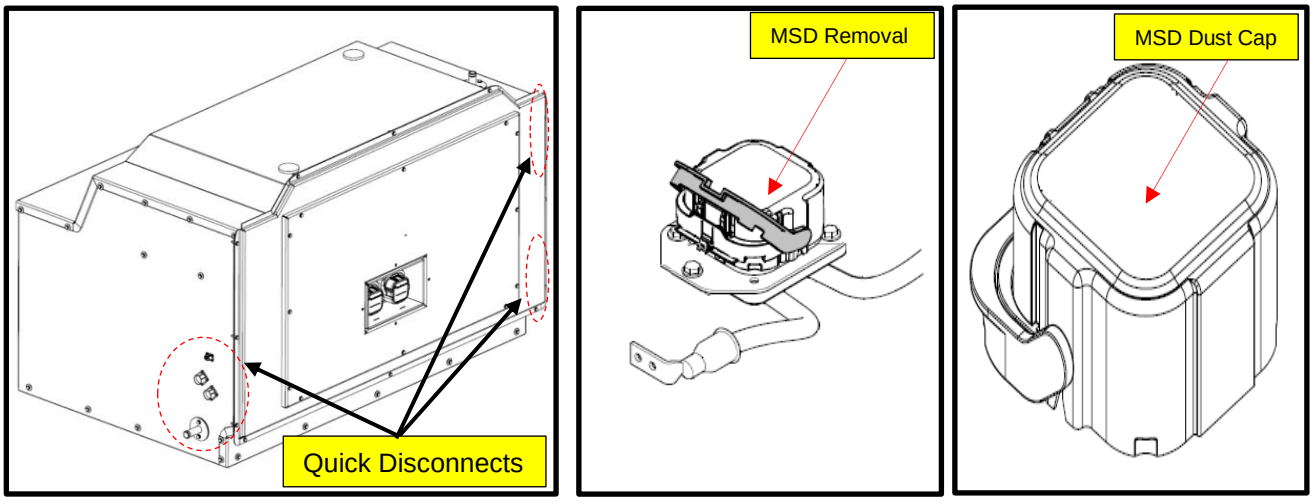
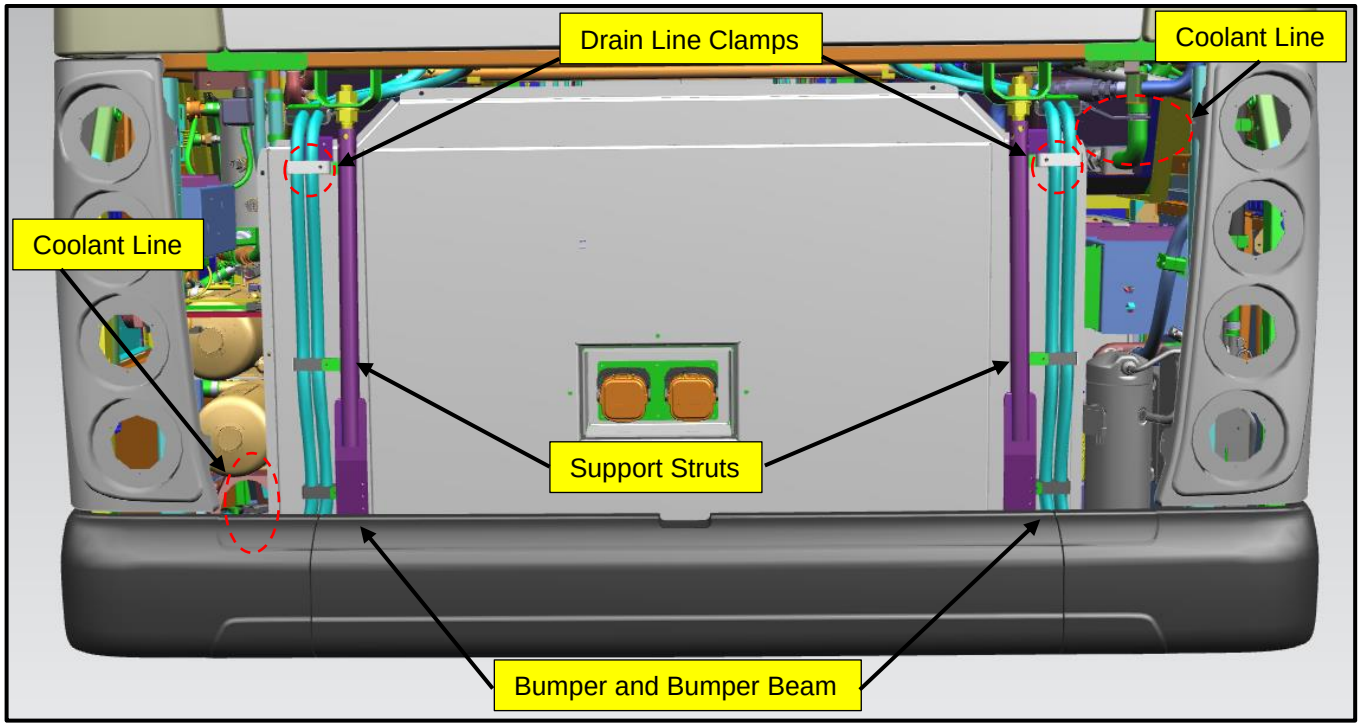


Figure 2: High/Low voltage disconnect location reference.

10. Remove the HVAC drain line clamps and set aside for re-installation. Secure lines out of the way.
11. Remove the rear bumper, support struts, bumper beam and hardware and set aside for re-installation. See Figure 3.
12. Drain the coolant from the rear ESS system in a suitable container.
13. Remove the upper and lower coolant lines and secure out of the way. See Figure 3.
14. Disconnect the appropriate cables and low voltage connections to the outside of the ESS in preparation to remove the ESS. See Figure 3.
15. Disconnect the ground cables from the underside of the ESS and secure out of the way. Set mounting hardware aside for re-installation.
16. Remove the mounting hardware from the underside of the ESS securing it to the bus structure and set mounting hardware aside for re-installation. See Figure 3.
17. Carefully remove the ESS and place is on a suitable stand for rework.



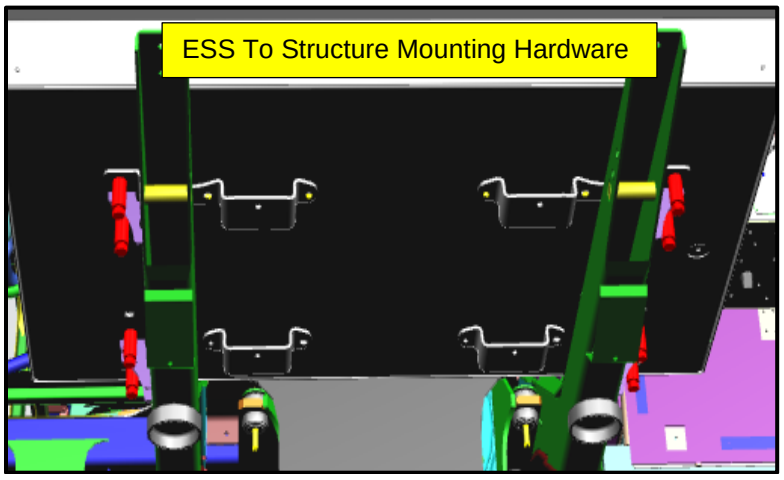
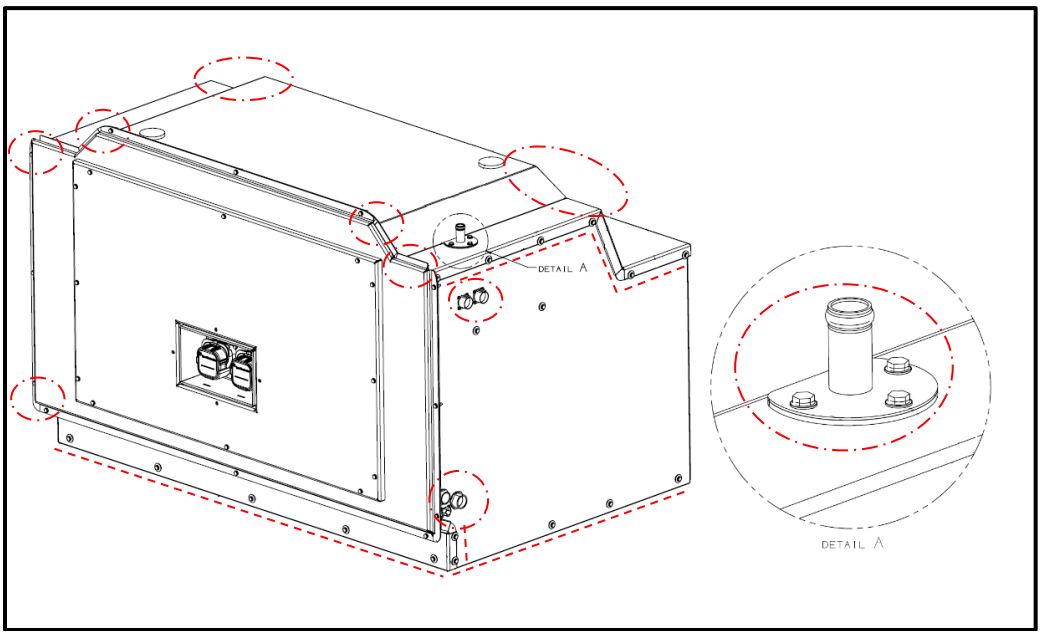
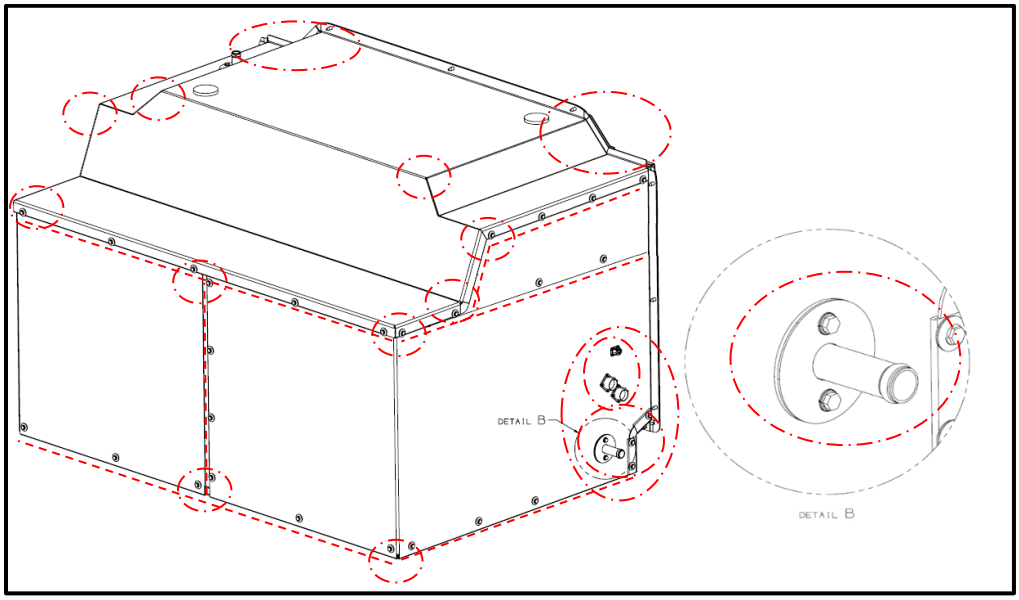


Figure 3: Rear ESS drain lines, bumper, and component location reference.

18. Using a dry lint free cloth and item #1 Alcohol clean:
    A. All welded corners on every panel on the rear ESS enclosure. See Figure 4.
    B. All seams where each panel joins or overlaps other panels on the ESS enclosure. See Figure 4.
    C. All overlapping side and underside panel joints. See Figure 4.
    D. All mounted electrical connectors and coolant line inlets flanges. See Figure 4.

☞ ***NOTE:*** **Allow Alcohol to flash 5 to 10 min.**

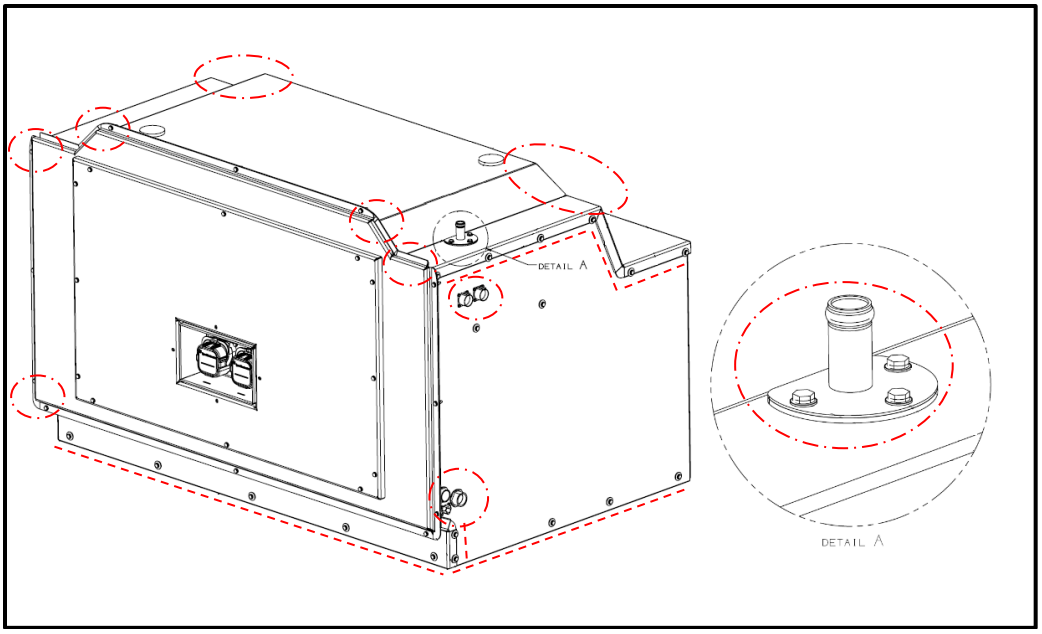


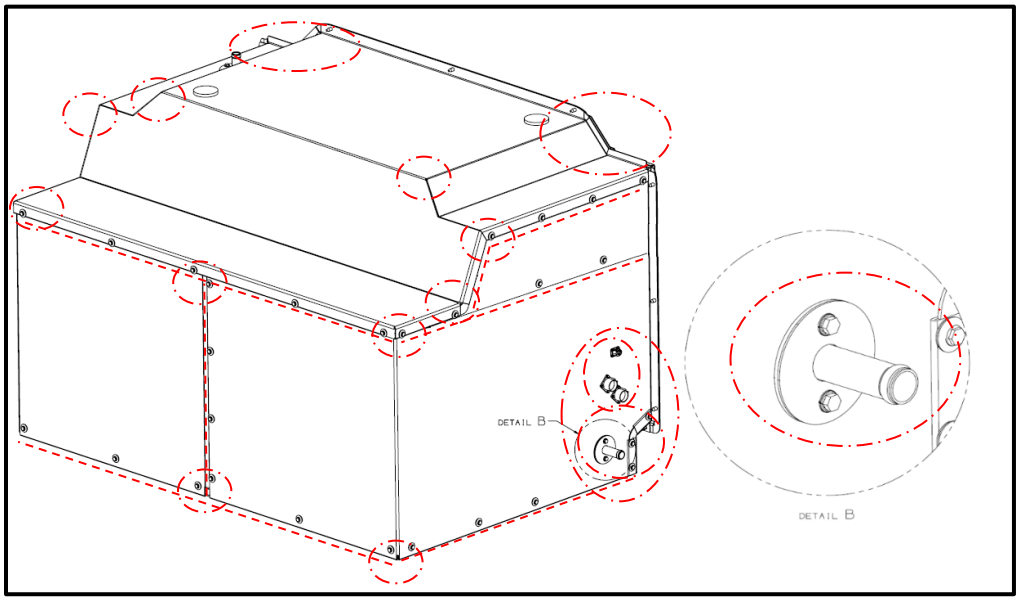


Item	Part Number	Description
1	134336	Isopropyl Alcohol

Figure 4: Rear ESS enclosure cleaning preparation location references.

19. Apply a bead of item #2 Sika Sealer to:
    E. All welded corners on every panel on the rear ESS enclosure where a gap is present. See Figure 5.
    F. All seams where each panel joins or overlaps other panels on the ESS enclosure. See Figure 5.
    G. All overlapping side and underside panel joints. See Figure 5.
    H. All mounted electrical connectors and coolant line inlets flanges. See Figure 5.
20. Make a finial inspection and seal any area on the enclosure that could all dust or debris in the unit and seal with item #2 Sika Sealer.





Item	Part Number	Description
2	242702	Adhesive – Sika 221 White

Figure 5: Rear ESS enclosure sealing location references.

21. Review the area around the ESS mounting location in the rear of the bus. Ensure it is free of any components that may be pulled or damaged while installing the unit back in the bus and carefully re-install the ESS.
22. Re-install the existing lower ESS mounting hardware applying one or two drops of item #3 Loctite to their threads. Torque to 106 FT-LBS. See Figure 6.
23. Re-connect the ground cables with existing hardware and torque to 17 FT-LBS. See Figure 6.

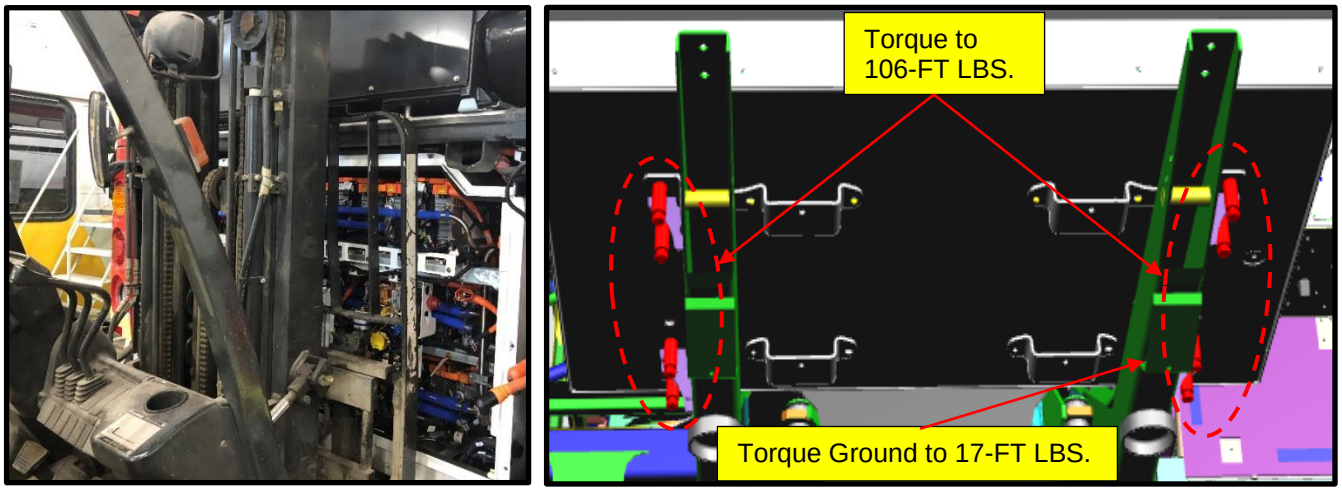


Figure 6: Rear ESS installation and lower mounting hardware location reference.

24. Place the ESS cover assembly on the rear ESS and secure lightly for the following steps. Figure 7.
25. Re-install the bumper beam and replace existing hardware. Torque all mounting hardware. (See torque spec based on location below) See Figure 7.
26. Re-install the upper and lower coolant lines. Torque clamps dry to 80 IN-LBS and allow to rest for 30 minutes and retorque. Apply torque seal after second torque check. Figure 7.

☞ ***NOTE: Tighten clamps at 75 RPM or less.***

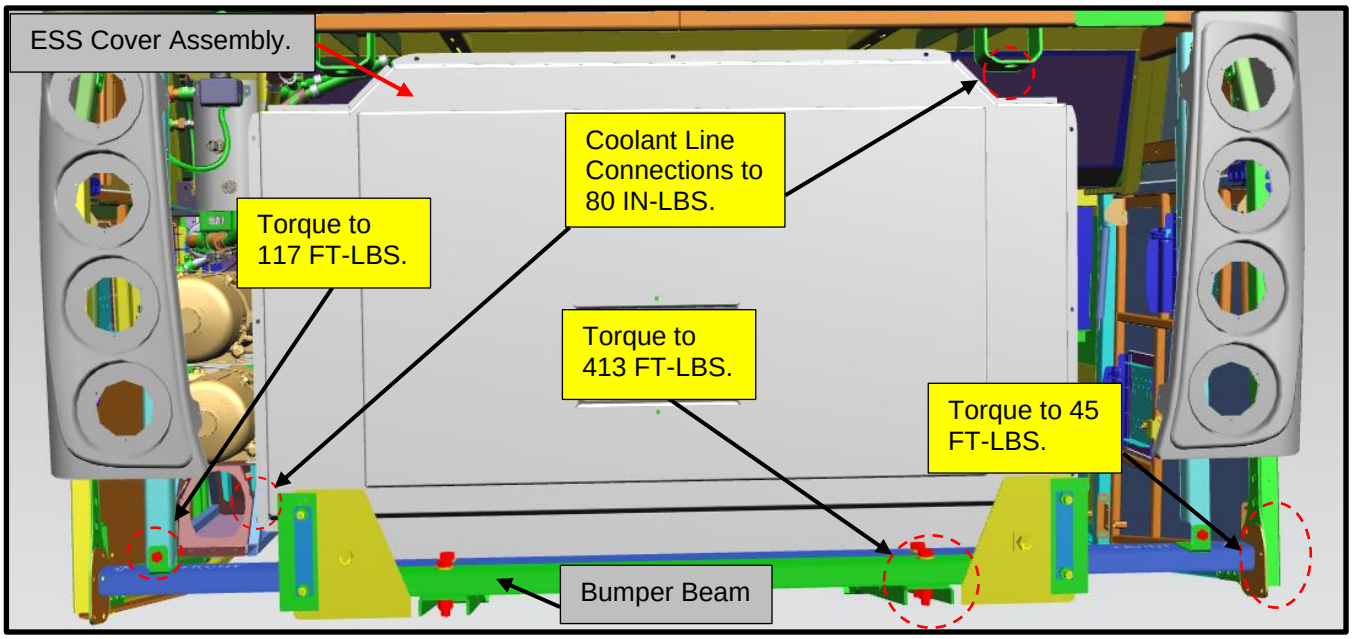


Figure 7: Bumper beam and coolant line location reference.

27. Re-installs the quick disconnects to the rear ESS. See Figure 8.
28. Ensure to wear proper PPE and Turn the 12/24 Volt battery disconnect switch to the “ON” position.
29. Using the coolant fill/deaeration procedures located on the decal on the ESS or instructions located in section 6 of the service manual refill the system.
30. Turn the 12/24 Volt battery disconnect switch to the “OFF” position.
31. Remove the ESS cover assembly and set aside for re-installation.

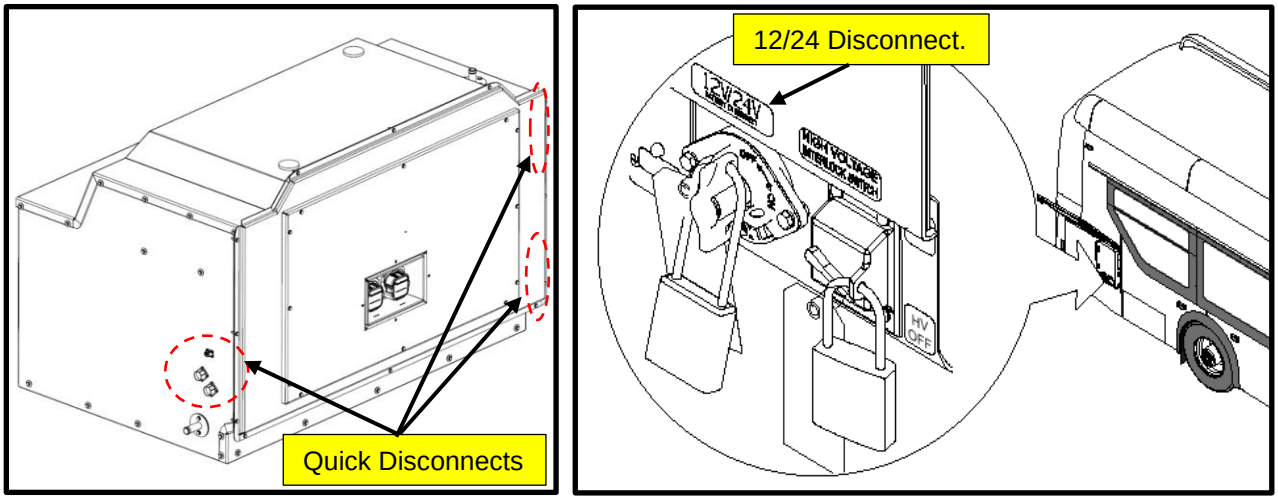


Figure 8: 12/24V power switch location reference.

32. Inspect the ESS for coolant leaks and ensure to remove all tools and debris.
33. Re-install the ESS cover assembly if removed using the existing hardware and torque to 60 IN-LBS applying torque marks when completed. See Figure 9.
34. Re-install the bumper and replace existing mounting hardware applying one or two drops of item #3 Loctite to their threads. Torque to 106 FT-LBS. See Figure 9.

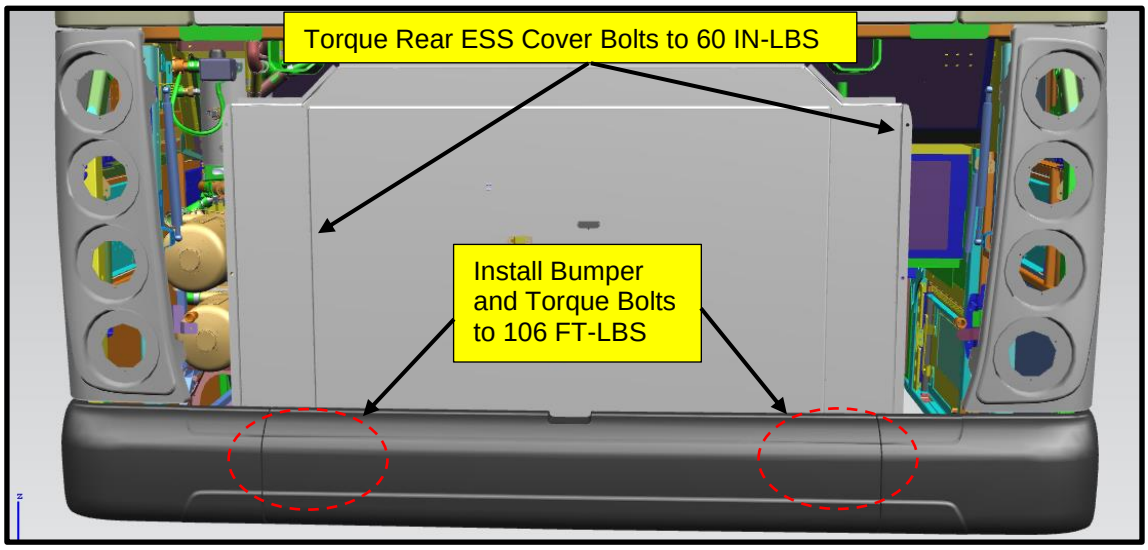


Figure 9: ESS enclosure cover and bumper hardware location reference.

35. Place struts as shown. Secure the bottom and torque to 250 FT-LBS applying torque marks. See Figure 10.
36. Turn the top strut nut down until it meets the upper bracket then turn two additional turns and stop.
37. Secure the lower strut nut against bracket and torque to 426 FT-LBS and apply torque marks. See Figure 10.
38. After installation touch up any bare metal surfaces where struts meet the chassis/bumper with zinc primer.
39. Re-install the drain lines and any clamps that were removed using existing hardware. See Figure 10.

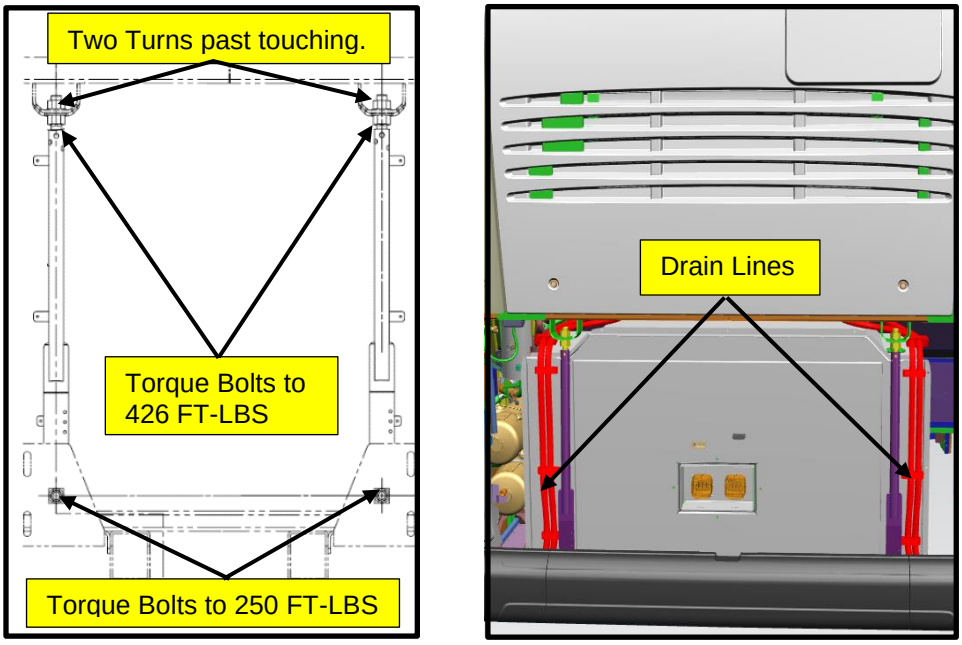


Figure 10: Strut and Drain line installation location reference.

40. Remove the protective dust caps and re-install the MSD's. See Figure 11.
41. Re-install the MSD cover plate when present on the ESS and torque to 60 IN-LBS applying torque marks. See Figure 11.

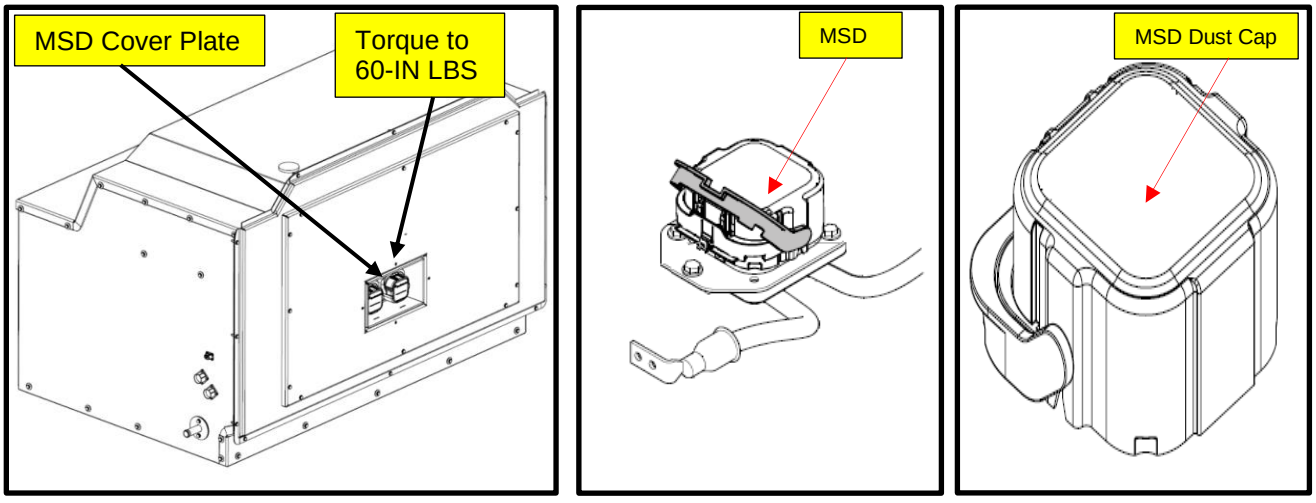


Figure 11: High/Low voltage disconnect location reference.

42. Turn the 12/24 Volt battery disconnect switch to the “ON” position.
43. Turn the high voltage interlock to the “ON” position.
44. Remove the lock out tag out equipment and return bus to service condition.

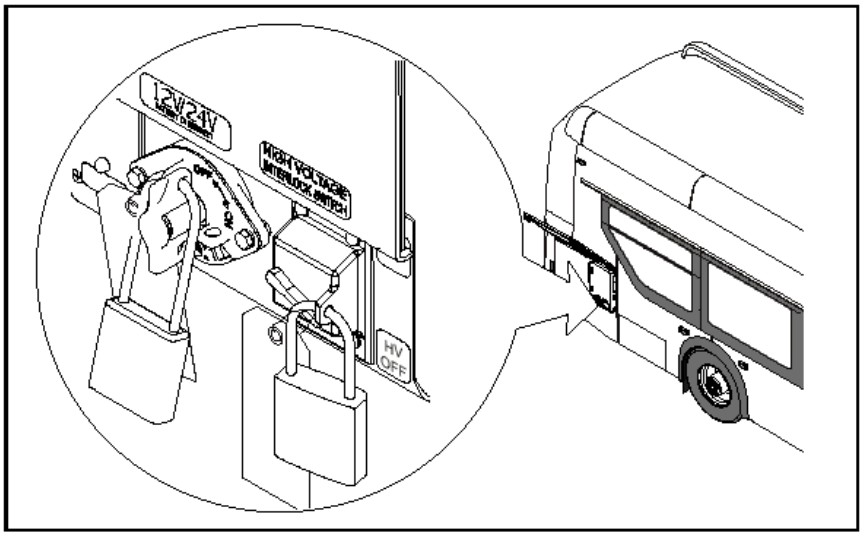


Figure 12: Lockout Tagout location reference.

LABOUR ESTIMATE				
	Operation	Number of Technician(s)	Hours	Labor Time T X HR
1	Remove Rear ESS Enclosure and Clean and Seal ESS Panel Joints.	2	6	12

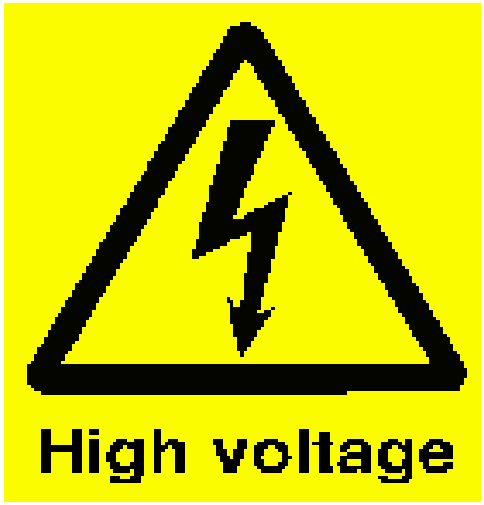
PARTS REQUIRED					
Item	Part Number	Description	Qty. per Coach	Units	Notes
1	134336	Isopropyl Alcohol	0.010	EA	
2	242702	Adhesive – Sika 221 White	0.010	EA	
3	081034	Loctite -243 Med	0.010	EA	

SPECIAL TOOLS REQUIRED					
Item	Part Number	Description	Qty.	Units	Notes
1		NO SPECIAL TOOLS REQUIRED			

Appendix A – NFIL Spec 532295 - High Voltage Safety Guidelines & Procedures for New Flyer Battery Bus

The following provides general guidelines in relation to safety and best practices when completing installation or servicing work on any New Flyer battery bus vehicle platform.

This document is not meant to supersede the actual released installation and assembly drawings and where conflicts arise, the released engineering drawings take precedence.



Introduction
The utmost concern, while working with High Voltage (HV) systems, is the safety of yourself, other personnel and the potential of damage to property. To minimize these risks, it is crucial to be properly trained and always maintain a very alert, questioning and disciplined attitude without fail. As soon as your guard is lowered, then the potential of an accident is probable that can hurt or kill yourself or someone else and possibly damage property.

What is High Voltage (HV)?
Any form of voltage that is greater than 50 volts if the person's skin at the electrical contact points is not compromised and not wet.

Equipment Required
The following equipment shall be required:

Digital Multimeter (DMM), 1000 volt Category II, 600 volt Category IV, 10Megohm impedance or greater with insulated case or rubber holster
Clamp-on current probe, 1000 volt Category II, 600 volt Category IV
High Pot Tester (Hi-Pot)
Phase rotation meter
Personal Protection Equipment (PPE) appropriate for 700volt DC & 230 volt AC with Class 00 or higher HV gloves with compatible leather over gloves. Appropriate safety glasses as well as the face shield. The PPE shall also meet the required Arc Flash & Arc Blast requirements. Before use, inspect the PPE in accordance with this guideline.
Adequate lighting
HV insulated mat
Two fused HV clip leads 10 inches long
Safety barricade with warning lights & "Danger High Voltage" signs
Belt tool pouch (use only to carry small components up/down a ladder)
Torque Screwdriver set
Imperial torque nut driver set
Metric torque nut driver set
Imperial 1/4" torque drive socket set
Imperial 3/8" torque drive socket set
Insulated rescue hook
ABC Fire extinguisher, 5 lb minimum, at the activity areas
Spare HV and low voltage fuses

Equipment Calibration
All test equipment must be within their calibration interval and recorded such with the respective serial numbers. These records must be available to the Checker.

Personnel Requirement
Only trained personnel shall supervise and perform High Voltage system testing, checkout and troubleshooting. Two personnel (one called the Checker & the other called Monitor/Recorder) shall perform Checkout Procedures, together, to ensure safety of themselves, others nearby & for the protection of vehicle & property. Refresher training shall be provided to these personnel on a regular basis and when new systems are to be checked by them. The training of the personnel shall consist of:

HV & low voltage basics, intermediate & advanced electricity
HV & low voltage electrical systems of the vehicle
Shop safety practices & procedures
First aide including CPR & the use of the shop defibrillator
How to release a victim that can’t let go HV

Quickest method of shutting down HV
Firefighting and emergency procedures
HV & arc flash safety
Organized & tidy placement of equipment & tools allowing for unrestricted movement
Operation of Hi-pot
Operation of Phase Rotation Meter

To ensure effectiveness of training, exams of the trained material shall be required with a high passing mark of at least 80% and a retraining of the missed 20 % on a one to one basis.

Checker Function

(Caution: The Checker must not have any health conditions that can be exacerbated when startled and must not have any electronic implants.)

Directed by the Monitor/Recorder
Performs all preparations & checks
Wears PPE as specified by the Checkout Procedure
Performs all restorations

Vehicle Inspection
It is necessary that the vehicle to be checked out, first be visually inspected of all systems, workmanship and with special attention to ensuring there is no HV cable or equipment damage or chafing.

High Voltage Checkout Preparation

(1) The scope of the work must be accurately defined such as a Checkout Procedure that requires systematic steps with sign offs. Before a Checkout is performed, the Supervisor, Checker and Monitor/Recorder must conduct a briefing of what shall transpire, identify potential hazards, resist pressures of “is it done yet?”, anticipate problems and question possible events. If an unexpected electrical hazard or fault occurs, during any time of the Checkout, it must be immediately reported to the supervisor. After the Checkout is completed, the same group should review the results and processes and make proposed modifications to the procedures if required.
(2) Install Safety barricade with warning lights & signs indicating "Danger High Voltage" around the vehicle perimeter and ensure no personnel are within the fenced perimeter during the checkout procedure.
(3) It shall always be the goal to check the systems as much as possible with all HV power OFF and Locked Out/Tagged Out and proven as de-energized by voltage measurement using the DMM. The functionality of the DMM must be proved before and after the verification of no HV present. Then, if possible, the HV systems should be challenged by trying to energize them while checking that no HV appears.
(4) When it is necessary to perform tests of HV systems with the power ON, then the Working Live procedure must be followed.
(5) The test personnel shall always rehearse the actions required in case of any possible accident scenarios.
(6) Before beginning the Checkout Procedure, the test personnel shall remove all their jewelry (including pierced ones), watches and any electrically conductive objects on them.

PPE Requirements

The PPE voltage class, Arc Flash and Arc Blast rating shall be compatible with the voltage and Arc Flash capability of the systems being tested. Appropriate leather glove protectors shall be worn over the HV rubber gloves.

PPE Care & Testing
Rubber insulated PPE shall be periodically cleaned and tested in accordance with 29 CFR 1910.137 and the appropriate ANSI/ASTM standards. HV gloves, sleeves and mats shall be tested every 6 months. PPE apparel shall be cleaned and maintained in accordance with the manufacturer's instructions. A record of the PPE testing shall be maintained and available to the users.

PPE Inspection
Inspect PPE equipment, before use, for any degradation or damage and ensure that the HV gloves have been tested every 6 months. Also perform an air pressure test on the HV gloves before and after each use. If during PPE use a potential damaging incident occurred to the PPE, stop further testing and inspect the PPE. If at any time the PPE is defective, reject it, and obtain an accepted one.

PPE Storage
PPE apparel should be stored lying flat, undistorted, right-side out and not folded in protective containers. The HV mats can be rolled with an inside diameter greater than 2 inches.
Rubber HV gloves should be stored in cool, dark, dry, and free from damaging chemicals or vapors. The glove cuffs should face downwards, without folding, in the appropriate glove bag and hung vertically.

Insulated Tools
Insulated tools should be visually inspected for insulation damage before and after each session of use.

Lockout/Tagout Procedure
The Lockout/Tagout procedure should be followed that is specified in the respective Checkout procedure. When removing the lock and tag:

(1) The locks and tags shall be removed by the installer of them or under her/his supervision.

(2) If the installer of the locks and tags is not available, then her/his supervisor:
   (a) Ensures that the installer of the locks and tags in not in the facility.
   (b) Contacts the installer to inform her/him that the locks and tags will be removed.
   (c) Reminds the installer of the lock and tag removal when she/he resumes work.

Stored Energy
Personnel must always remember the characteristics of stored energy devices such as capacitors and batteries and when energy is available from.

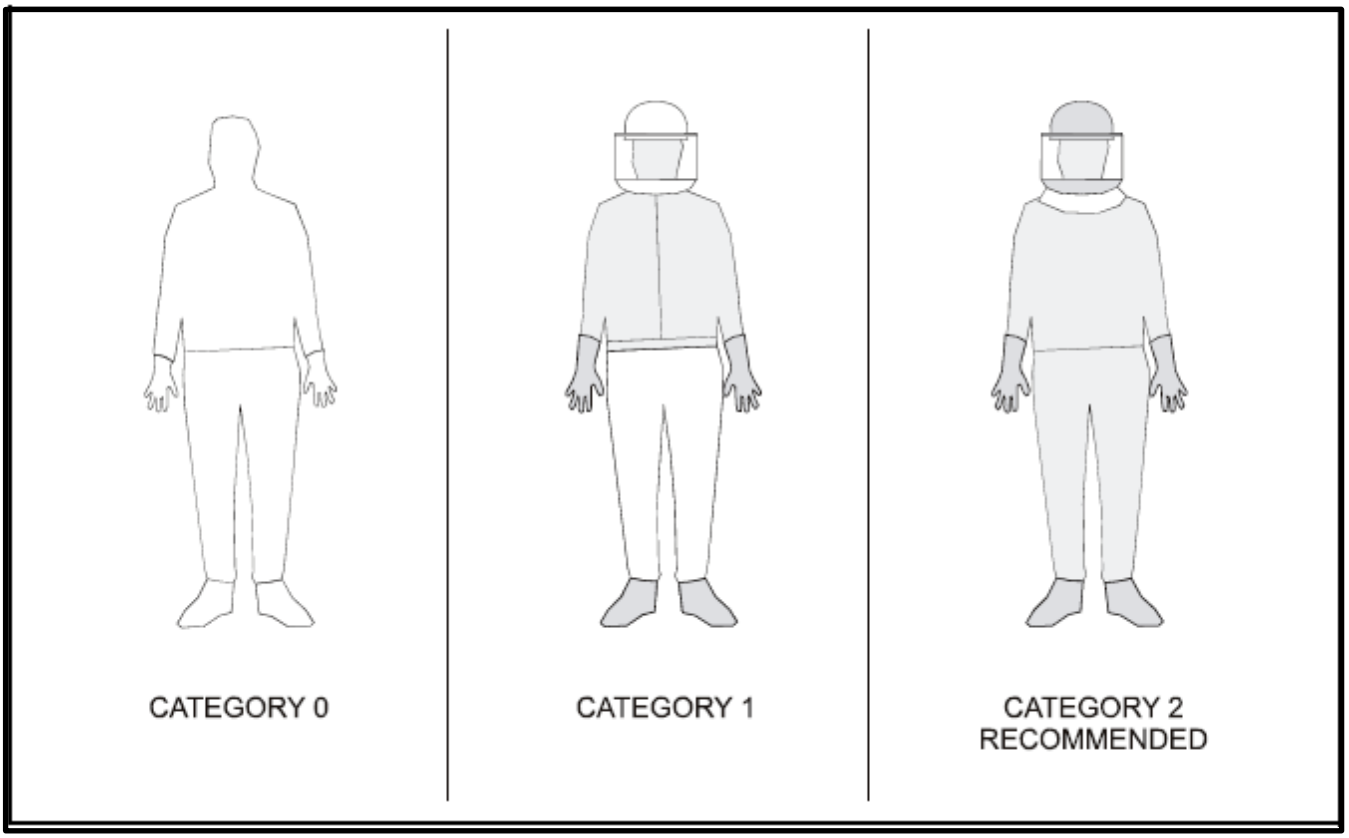
Working Live
To maximize safety, it is always important to perform the maximum amount of HV checkout in the de-energized state.
When it is necessary to work with HV equipment while energized or to verify whether HV is present, the utmost care and safety procedures must be utilized including:
(1) Wearing appropriate PPE with protector gloves over top of the HV rubber gloves
(2) Ensure all personnel, except the Checker and Monitor/Recorder, are clear of the vehicle.
(3) Kneeling or standing on HV insulated mat.

Energizing & De-energizing Procedure
It is critical that before any HV system is energized that a visual check be performed to ensure that all possible HV compartments are closed and there is no debris, tools or test equipment lying on HV terminations. If there is a

certain sequence of energizing and de-energizing the HV system, then all personnel involved must be trained in this sequence. (**CAUTION:** Never try to connect or disconnect circuit components such as cables, fuses, connectors, etc while there is current flowing in the circuit.)

Electrical Injuries
Electrical injuries should be immediately reported to the first aide personnel and the supervisor. Other than electrostatic shocks, even non-injurious electrical shocks should be reported to the supervisor. These should be immediately investigated and documented to determine the cause and prevent the occurrence in the future.

Appendix B – NFIL PPE Categories



PPE CATEGORIES		
CATEGORY 0	**CATEGORY 1**	**CATEGORY 2**
1.2 cal/cm2	4 cal/cm2	8 cal/cm2
Arc Rated Clothing:		
Untreated cotton long sleeve shirt and pants	AR long sleeve shirt and pants or AR coverall	AR long sleeve shirt and pants or AR coverall
	AR flash suit hood or AR face shield	AR flash suit hood or AR face shield and AR balaclava
	AR jacket, parka, rainwear or hard hat liner (as needed)	AR jacket, parka, rainwear or hard hat liner (as needed)
Other Equipment:		
Hard hat	Hard hat	Hard hat
Safety glasses	Safety glasses or goggles	Safety glasses or goggles
Hearing protection	Hearing protection (with inserts)	Hearing protection (with inserts)
	Heavy duty leather gloves	Heavy duty leather gloves