NEW FLYER

INSTRUCTION TO SERVICE

ITS: 59014	
SECTION:	260 BATTERY COMPARTMENT
WRITTEN BY:	Curtis Matthews
SUBJECT:	MSD replacement – SR-2319, 2326, 2344, 2352, 2360, 2362, 2374, 2401

ITS59014

Contents

⚠ **WARNING:** **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:**

1.0 SAFETY PROCEDURE

1.1 Fill out and submit a Live Work Permit to the shop lead. See Appendix C for a Live Work Permit.

1.2 Turn the master run switch to the off position and wait 5 minutes before proceeding.

1.3 Turn the 12/24V battery disconnect and HV Interlock switch to the “OFF” position.

1.4 Lock and Tag the electrical system of the bus out and retain the key. See Figure 1.

1.5 Install a Lockout/Tagout Steering wheel cover as require

☞ ***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.***

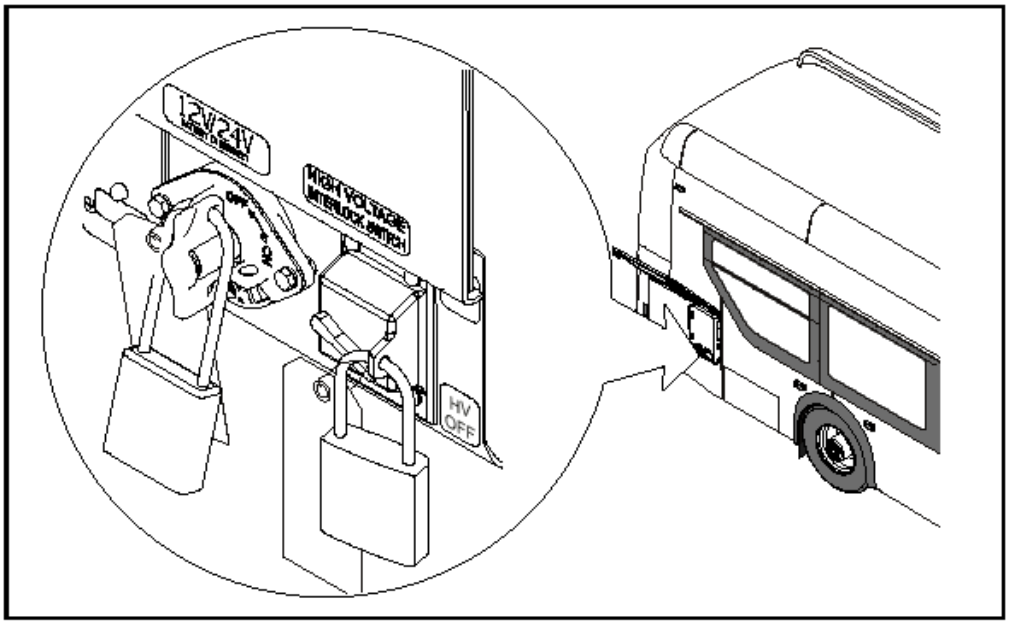


Figure 1: Lockout tagout location reference

⚠ WARNING: **High Voltage PPE Category 2 is required. Please refer to Appendix B or the safety section of your Preventive Maintenance Manual and Service Manual for more information. There shall be no communication from observers with the 2 personnel performing HV work. If required all work must stop until communication has been completed.**

1.6 Review the scope of work to be completed with the Monitor/Recorder.

1.7 Review/Rehearse the actions required in case of any possible accident scenarios.

1.8 Using an appropriate voltmeter as per appendix A, confirm that no voltage is present between HVPOS_VEH_FB & HVNEG_VEH_FB before proceeding. See Figure 2. These connections are located inside the HV Fuse box inside the inverter rack. See Figure 3 layout for location.

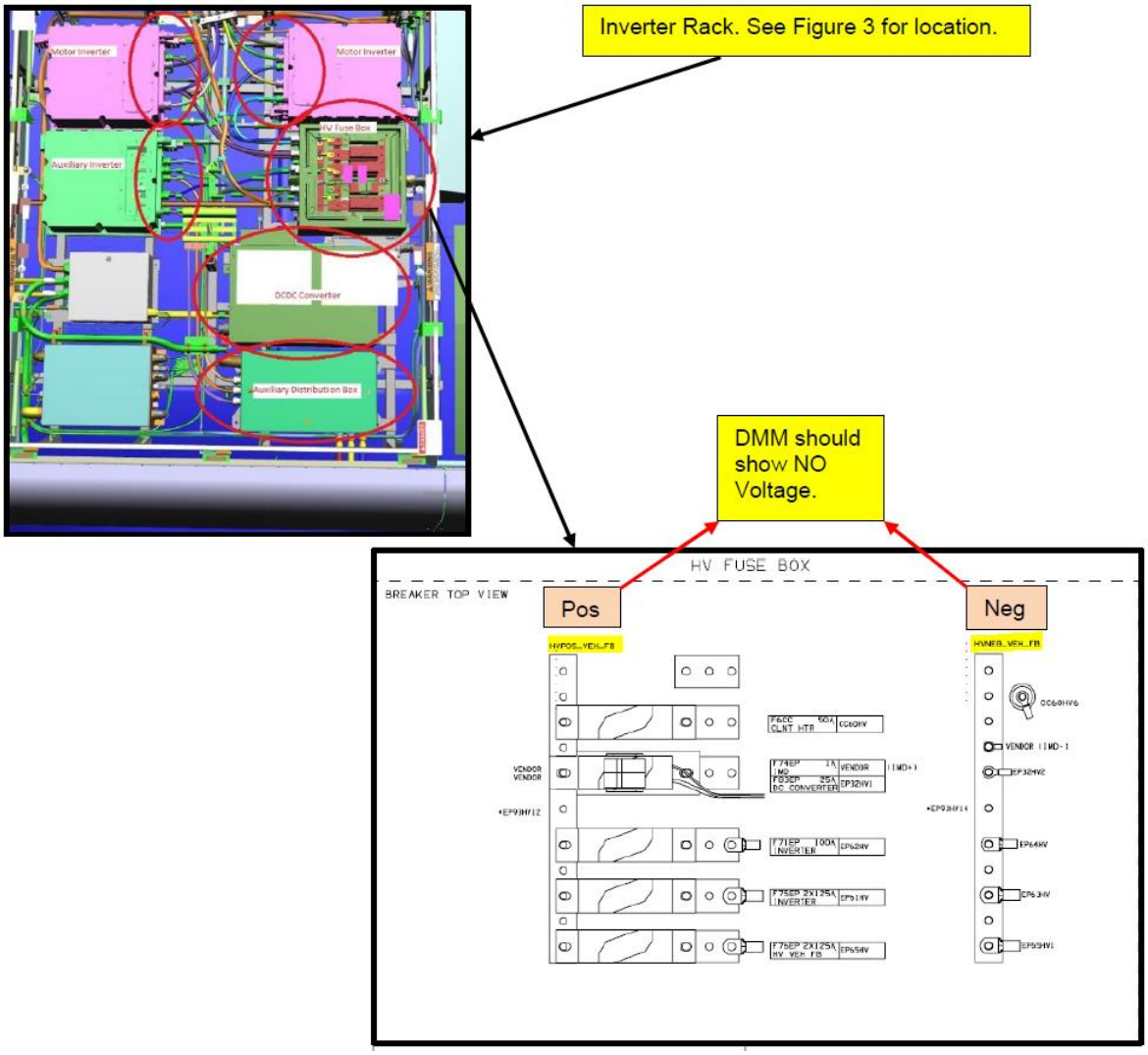


Figure 2: High voltage fuse box location reference

1.9 Identify the location(s) of the ESS compartments that will require work. See Figure 3. (Refer to your wiring schematic or schematics often located on the underside of the ESS enclosure lids)

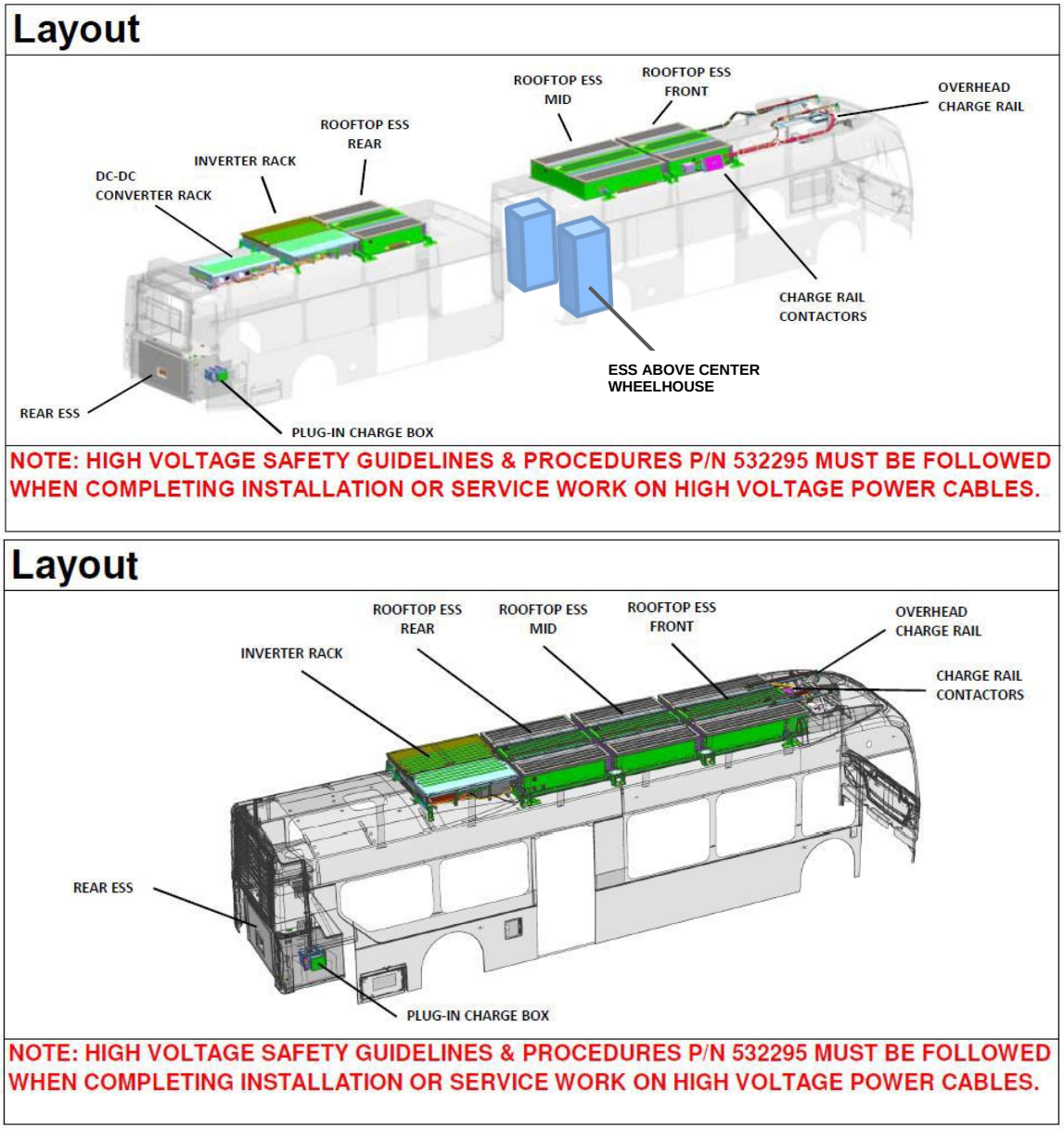


Figure 3: Battery pack string location reference

1.10 Ensure the bus is not charging and gain access to the roof of the bus ESS enclosures and the other applicable ESS enclosure(s). Ensure the appropriate fall protection PPE is used and appropriate safety procedures are followed when applicable.

1.11 Determine and organize the required tools neatly before work begins.

1.12 Before removing any MSD(s), confirm voltage is present between the positive in terminal on the BDU and negative in terminal on the BDU. See Figure 5.

1.13 Confirm that **NO** voltage is present between the positive out terminal on the BDU contactor and negative out terminal on the BDU contactor. See Figure 4.

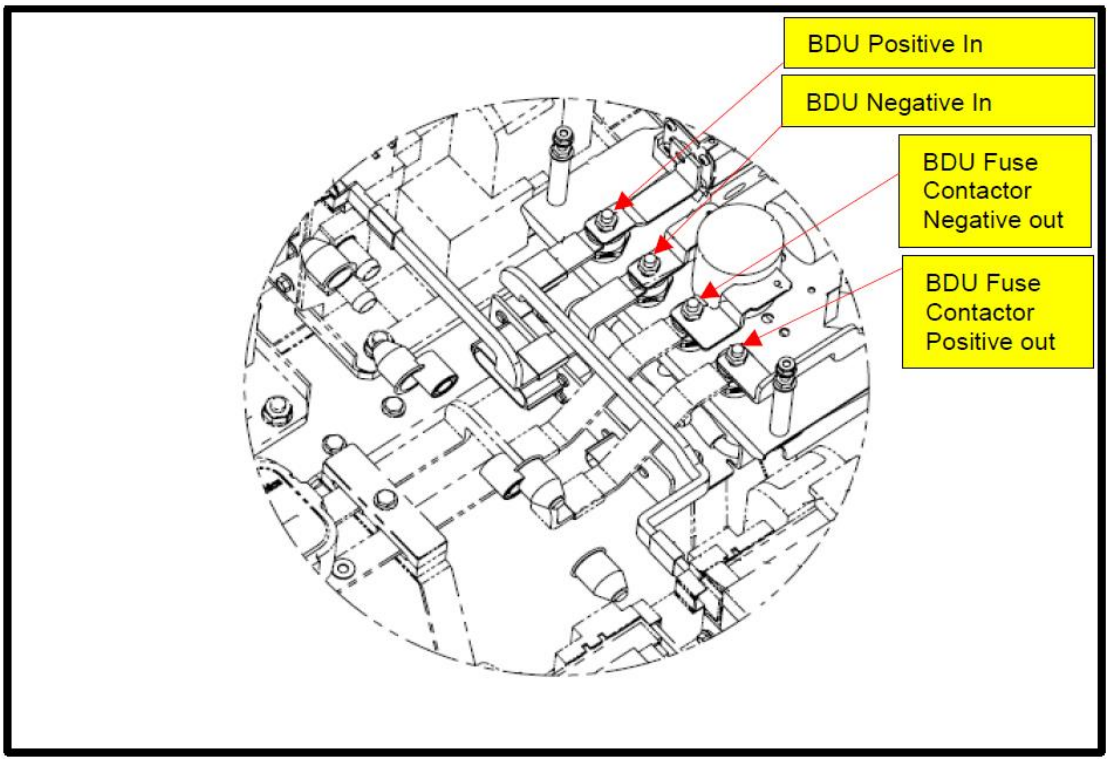


Figure 4: BDU and contactor location reference

2.0 Rear MSD Removal Procedure

2.1 Gain access to the rear ESS compartment. See figure 5.

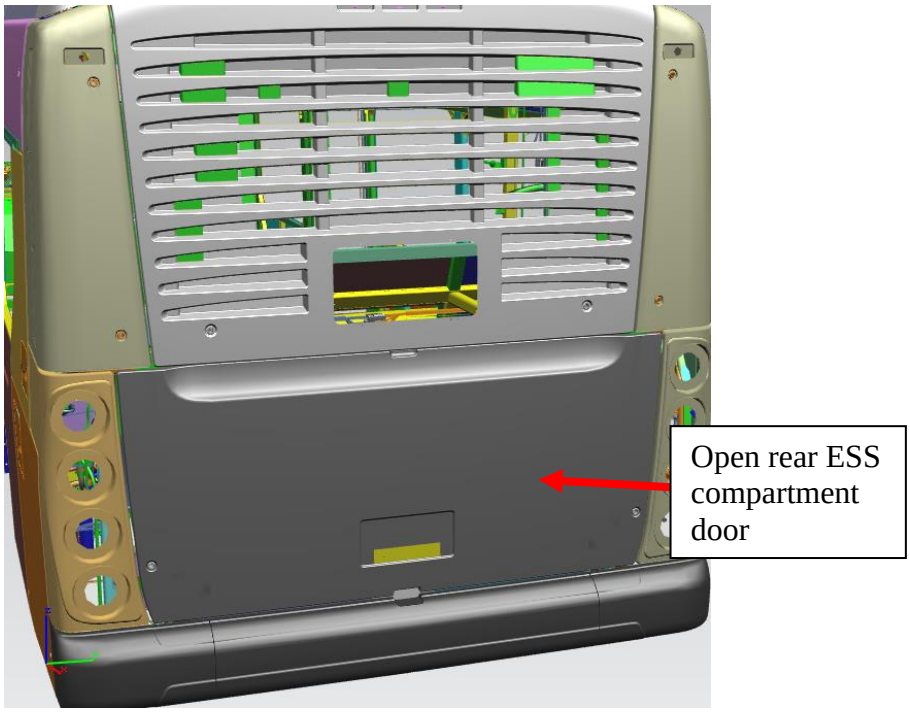


Figure 5: Rear of bus ESS compartment door

2.2 Loosen all rear ESS panel hardware x18, remove panel and set aside to be re-installed later. See figure 6.

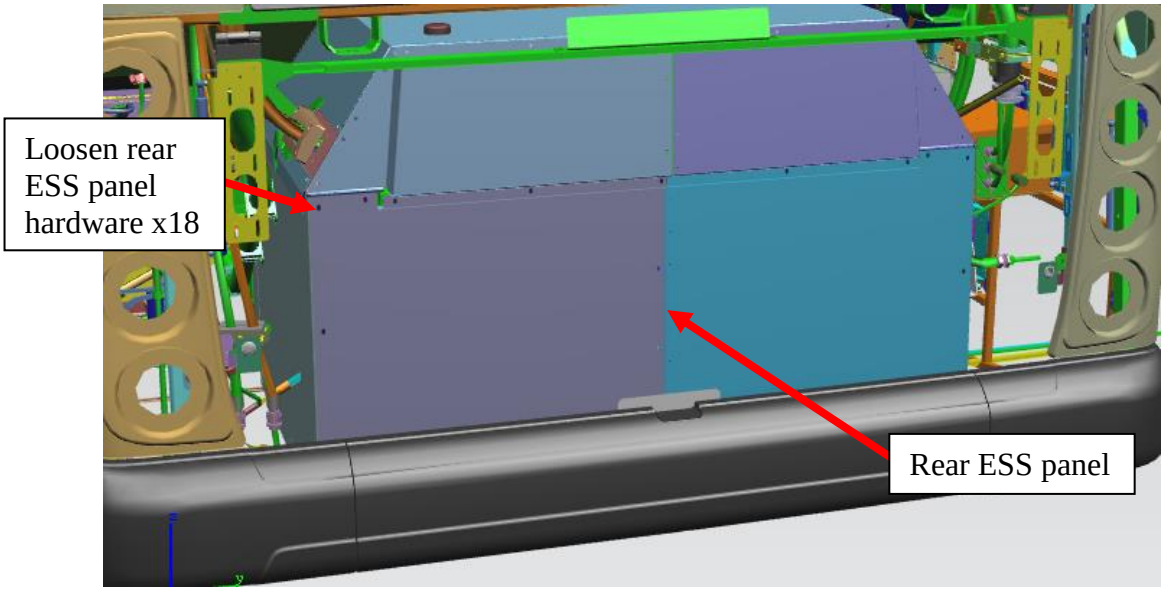


Figure 6: Rear ESS panels

2.3 Locate and remove MSD plugs x2 in rear ESS. See figure 7.

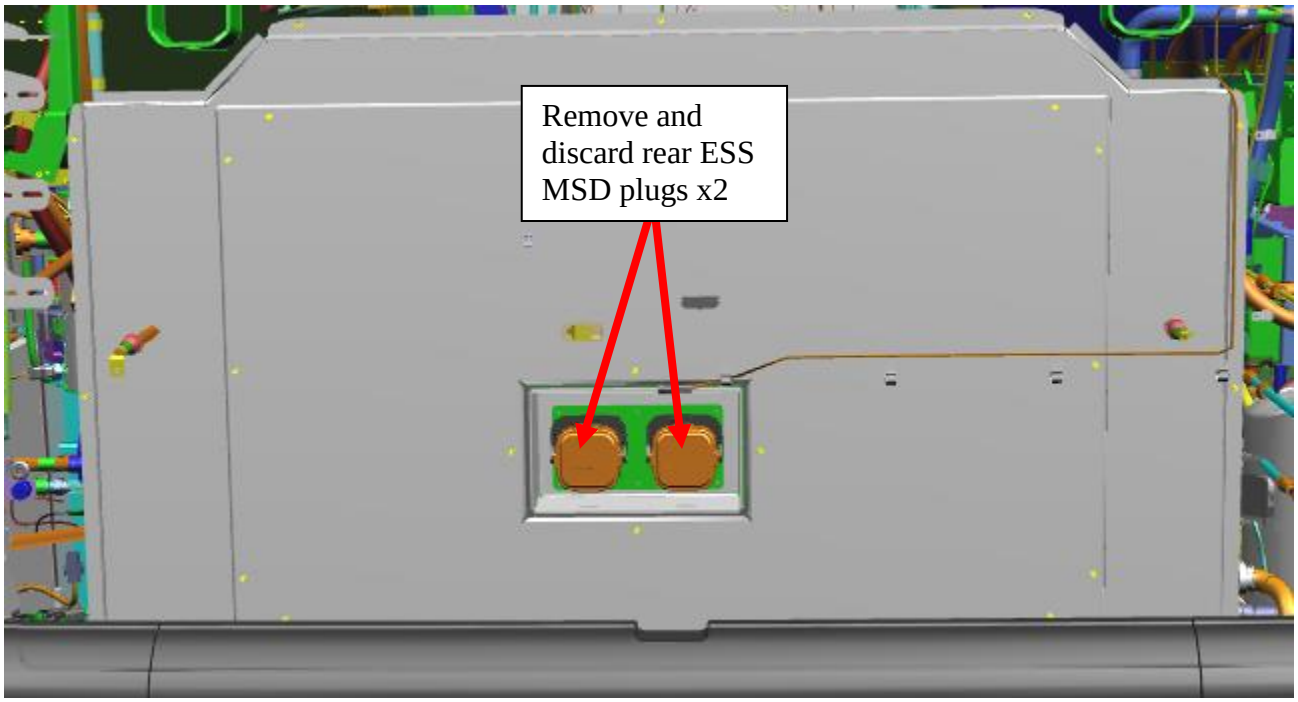


Figure 7: Rear ESS MSDs

3.3 Remove rear ESS cover and set aside.

3.1.1 Unfasten and keep hardware on rear ESS cover plate mounting hardware, bolts + washers. Keep bolts and washers. See figure 8.

3.1.2 Remove MSD closeout from rear ESS cover plate to be re-worked for new MSD hardware positions.

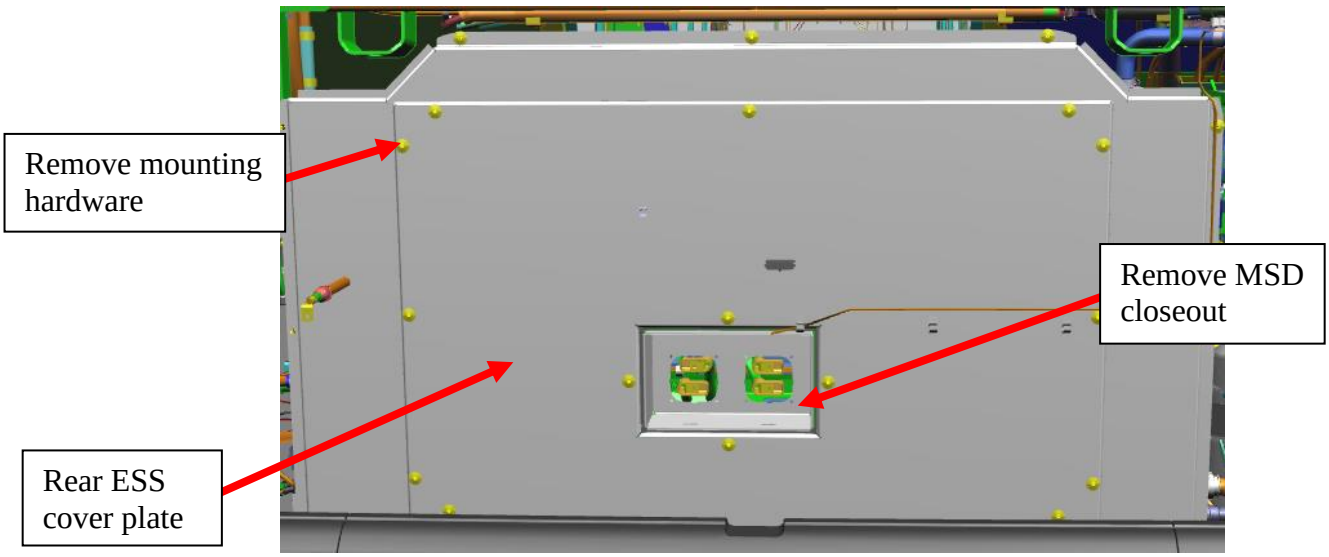


Figure 8: Rear ESS cover plate and closeout

3.0 Inspection Procedure – Rear ESS

Ensure you fill out the XE High Voltage Inspection Check Sheet for **each bus**. The ESS Inspection Sheet can be found in appendix D as well as the attachments of FSAR 190819-115712 labeled “ITS-59020 ESS Inspection Sheet.pdf”. Once complete, return to your local RPSM to upload into the attachments of the appropriate Reported Incident that can be found linked to FSAR 190819-115712.

3.1 Remove the remaining covers highlighted below in figure 9. Replace at the end of section 3 torquing cover mounting hardware to 5 ft-lbs WET with Loctite PN: 081034.

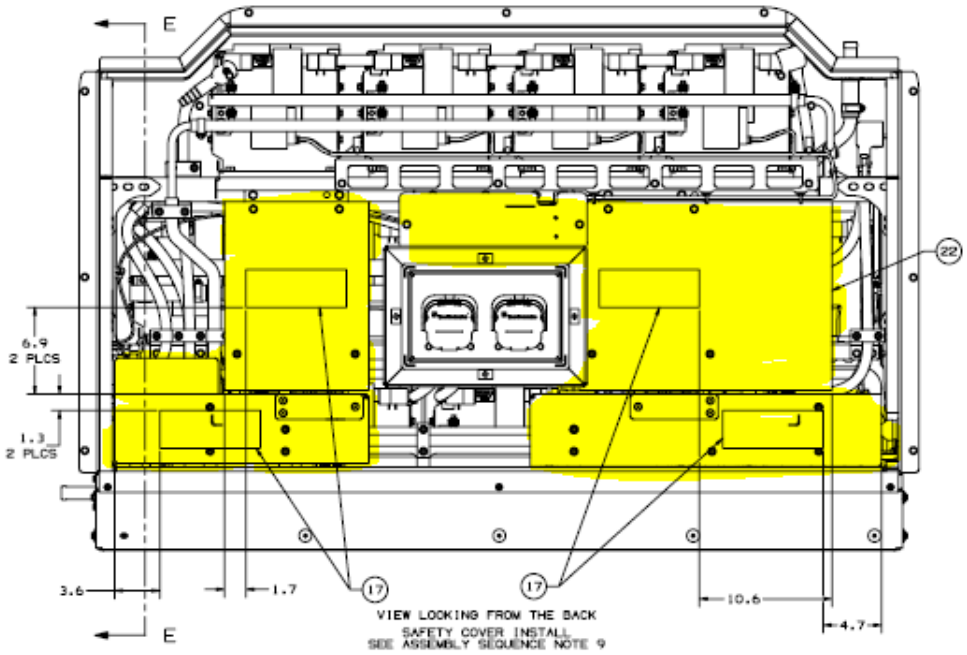


Figure 9: Rear ESS With Outer Covers Removed

3.2 Inspect the two low voltage connections at the bottom of the BDU assemblies for securement and make note on the inspection sheet. Remove the two low voltage connections at the bottom of both BDU’s.

3.3 Remove the two BDU assemblies while saving the existing hardware to re-use. 4 bolts are used to secure the BDU to the ESS and 4 nuts are used to secure the bus bars as seen below in figure 10.

3.3.1 Remove the 4 nuts securing the bus bars to the BDU as seen on the bottom of the left view in Figure 10. (97 ±8 in-lbs for re-installment).

3.3.2 Remove the 2 bolts at the back side of the BDU assembly that mounts the BDU to the ESS. These two bolts can be seen in the single circle on the right view of Figure 11. Certain

surrounding cable securements may need to be removed in order to gain access to these bolts. (torque to 50 in-lbs DRY for re-installment).

3.3.3 Remove the 2 bolts at the top of the BDU assembly. Replace at the end of section 3, torquing mounting hardware to 10 ft-lbs WET with Loctite PN: 081034.

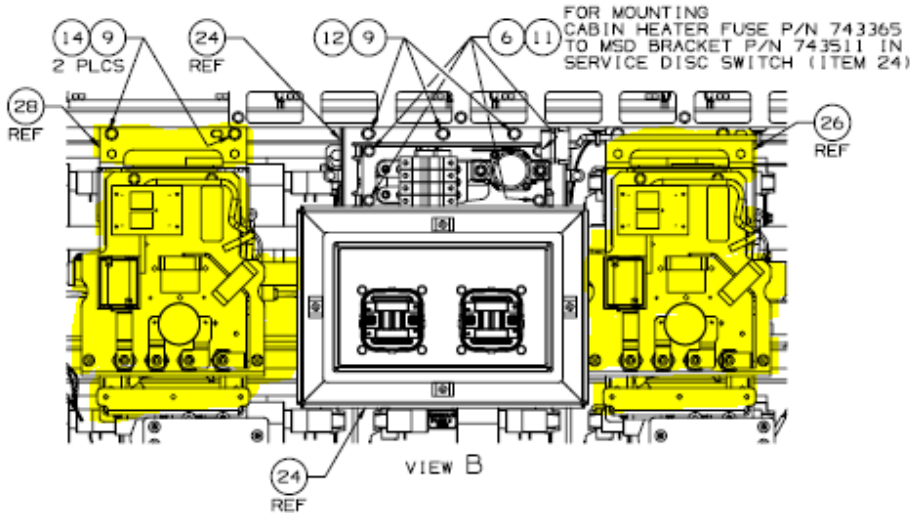


Figure 10: Rear BDU Assemblies

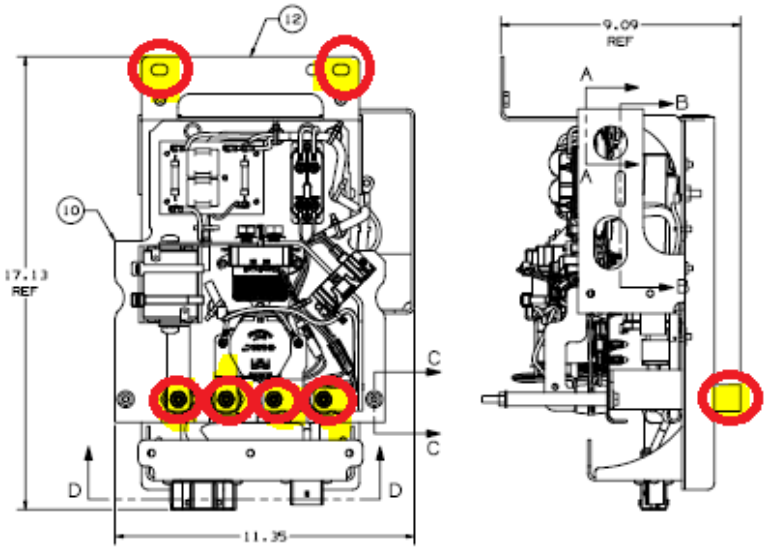


Figure 11: BDU mounting hardware

3.4 Verify all busbar to battery connections highlighted in figure 12 below are torqued to 80 INCH-LBS.

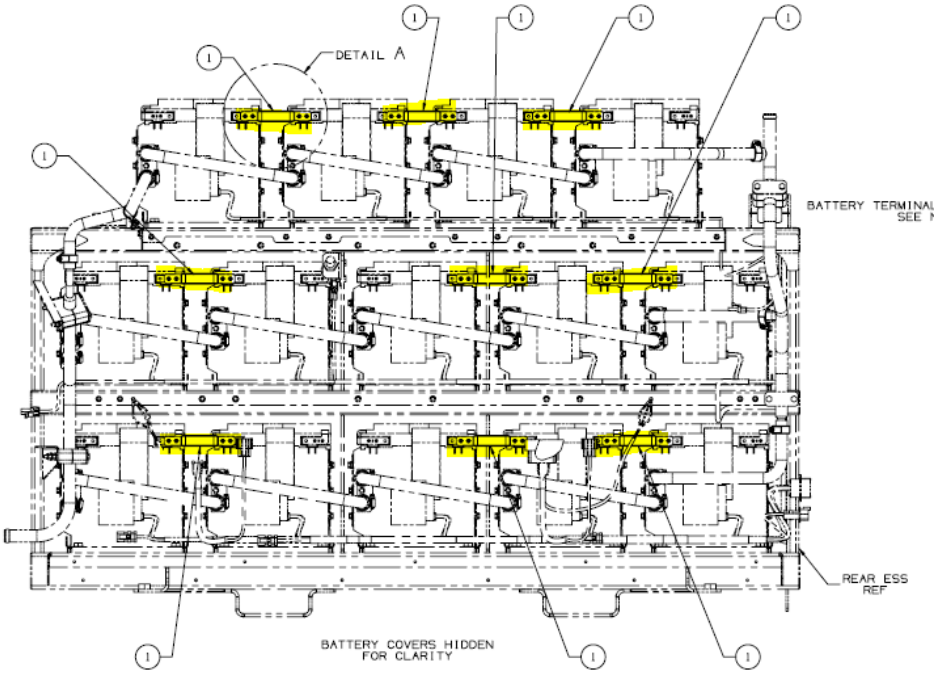


Figure 12: Rear ESS Enclosure Battery Busbar's

3.5 Re-install the BDU assemblies using the existing hardware. Ensure both J1 and J2 to BDU connections circled in Figure 13 below are seated properly.

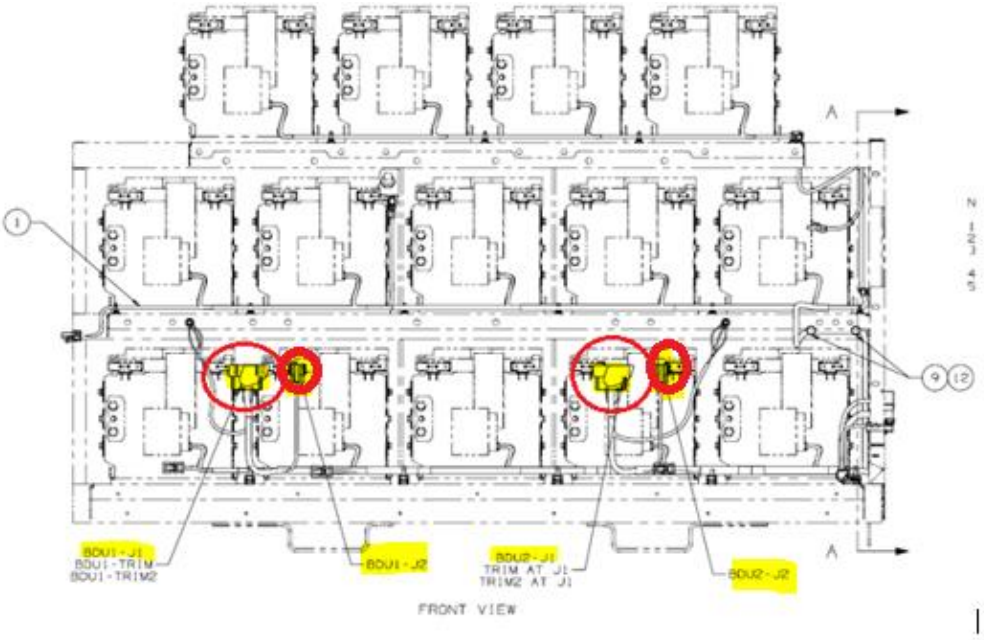


Figure 13: Rear ESS J1-BDU Connector Location

4.0 MSD Replacement Procedure – Rear ESS

4.1 Unfasten and discard MSD receptacle mounting hardware x8. See figure 14.

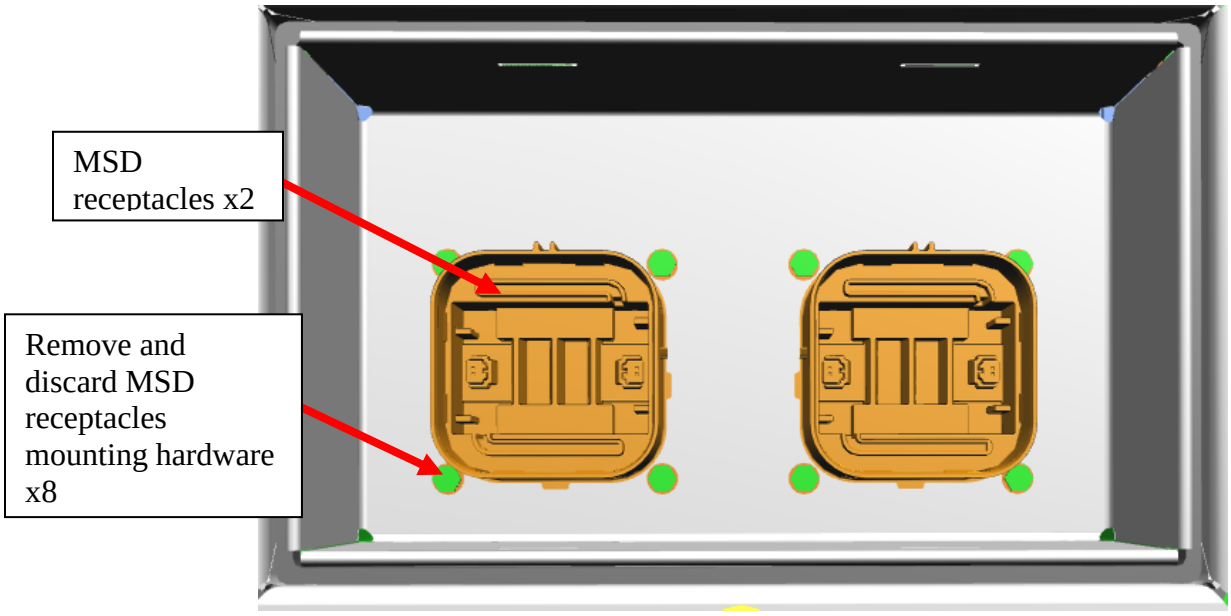


Figure 14: Rear ESS MSD Receptacles and bracket

4.2 Unfasten nuts from MSD receptacle studs x4 and keep hardware. Remove and discard MSD receptacles x2. See figure 15.

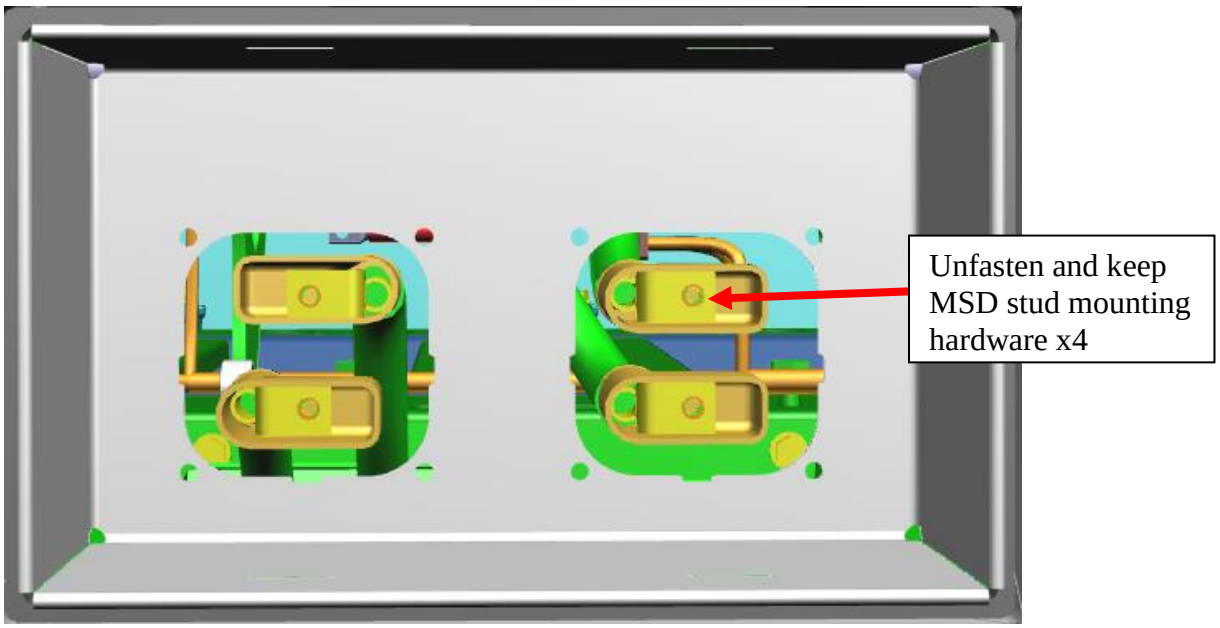


Figure 15: Rear ESS MSD Receptacle underside

3.4 Drill holes into MSD closeout and assemble new MSDs and bracket onto MSD closout.

3.4.1 Assure MSD closeout is removed from rear ESS compartment. Using bracket PN: (853975) as a template, drill 6 holes as shown in figure 16.

3.4.1 Re-install MSD closeout onto rear ESS cover plate, and re-install rear ESS cover plate using original hardware removed in step 3.1.1.

3.4.2 Discard 2 socket terminals and connector that come with each MSD receptacle PN: (806450) and plug PN: (805480).

3.4.3 Using bolts PN: (822309) x8, washers PN: (260173) x8, nuts PN: (75NM06000) x8 and spacer PN: (854046) x2, assemble MSD receptacles PN: (806450) x2 and plugs PN: (805480) x2 onto bracket PN: (853975). Torque all MSD mounting hardware bolts x8 to 14 ft-lbs (DRY). See figure 17.

3.4.4 Feed HV cables through MSD closeout and fasten to new MSD receptacle PN: (806450) x2 studs with nuts x4 kept from step 3.2, torque nuts to 80 in-lbs (DRY). See figure 17.

3.4.5 Install new MSD assembly onto MSD closeout using rivets PN: (60R03007) x6. See figure 18.

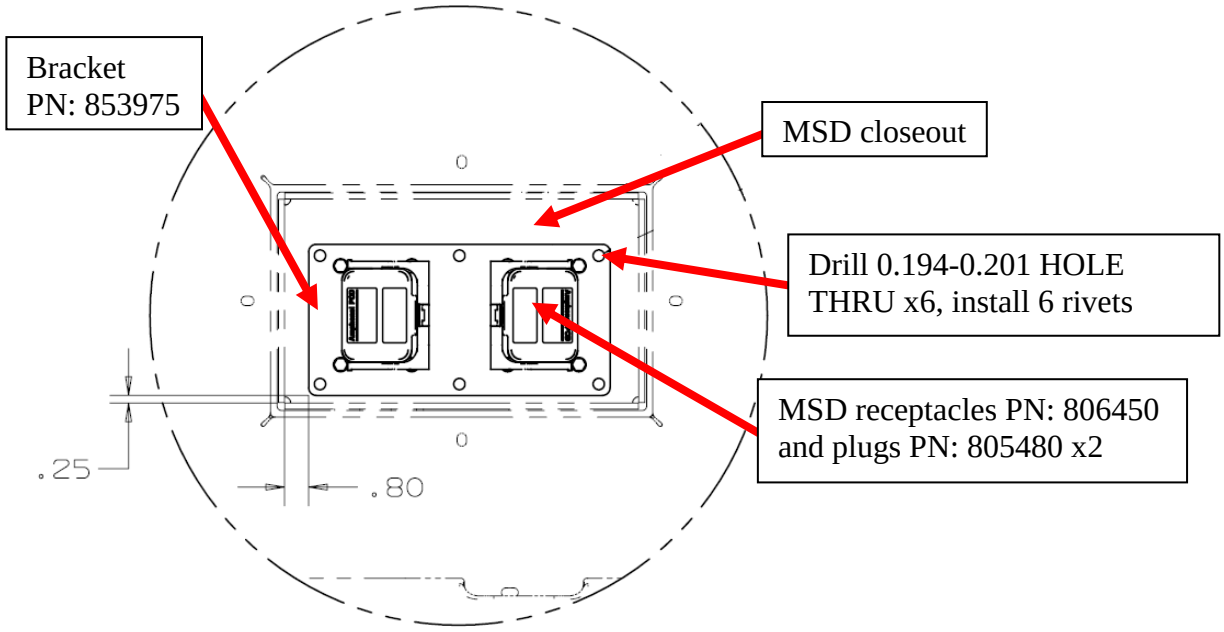


Figure 16: Rear ESS MSD closeout bench assembly

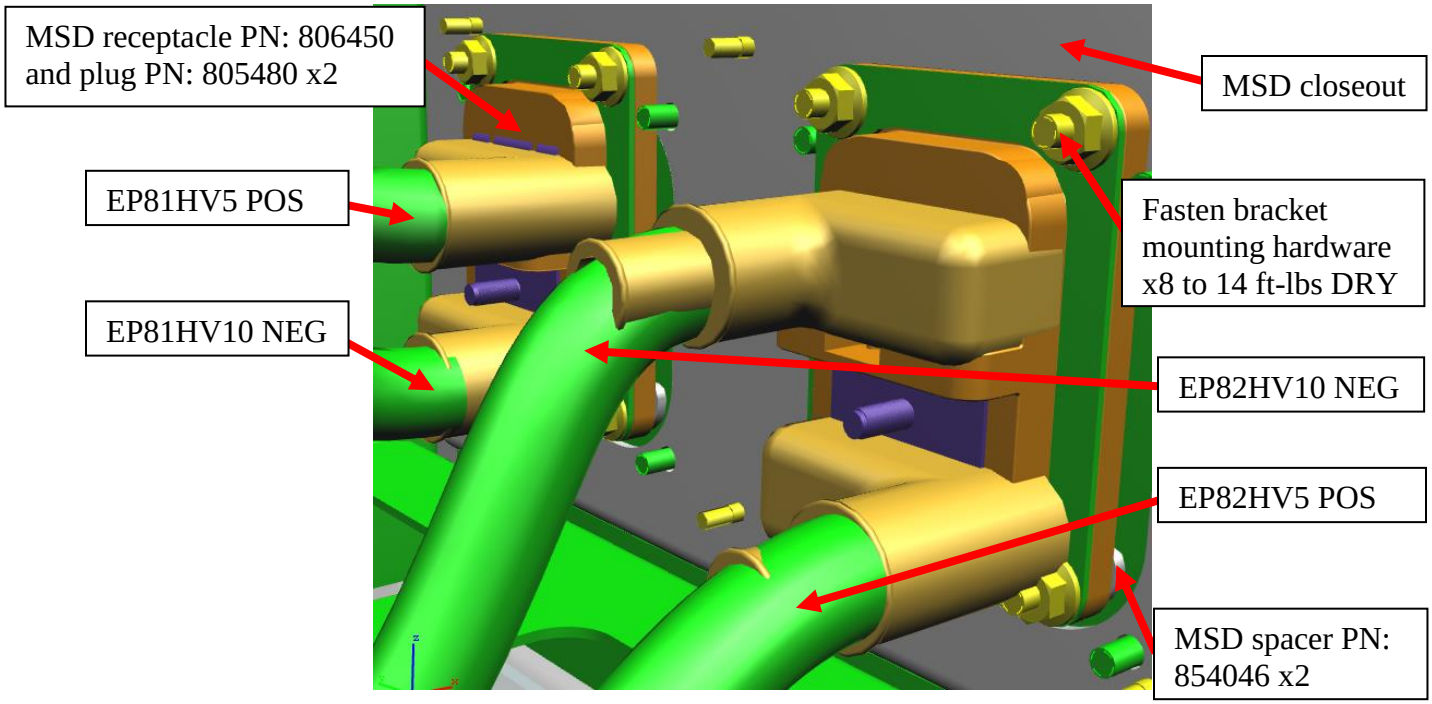


Figure 17: Backside of new MSDs mounted to MSD closeout

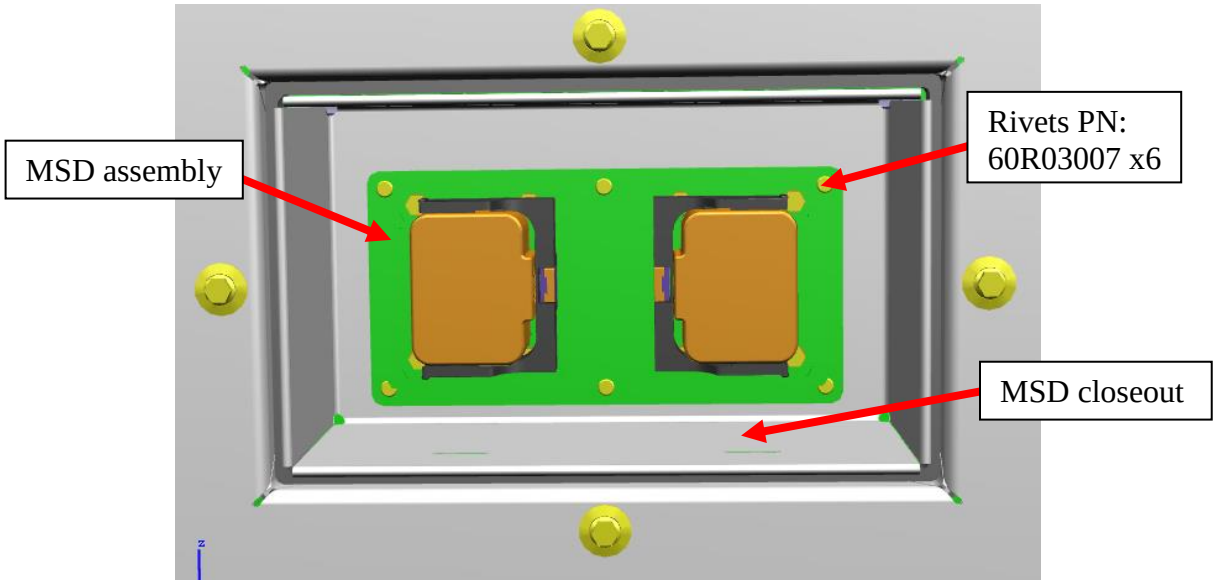


Figure 18: Rear ESS MSD final assembly

5.0 Roof MSD Removal Procedure

5.1 Locate the front and rear rooftop ESS and open ESS battery panel. See figure 19.

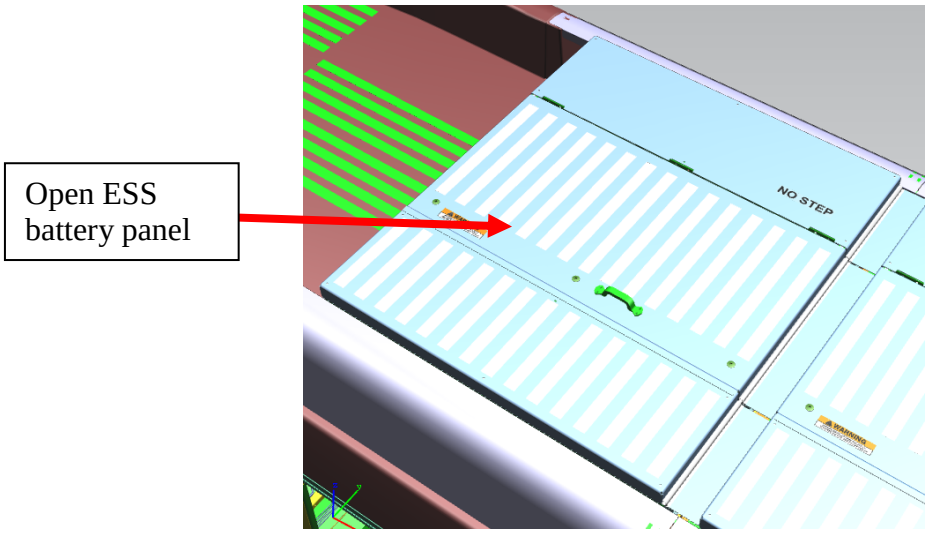


Figure 19: Front rooftop ESS

5.2 Locate, remove and discard the MSD plugs. See figure 20.

5.2.1 X2 in front rooftop ESS.

5.2.2 X2 in middle rooftop ESS.

5.2.3 X1 in rear rooftop ESS

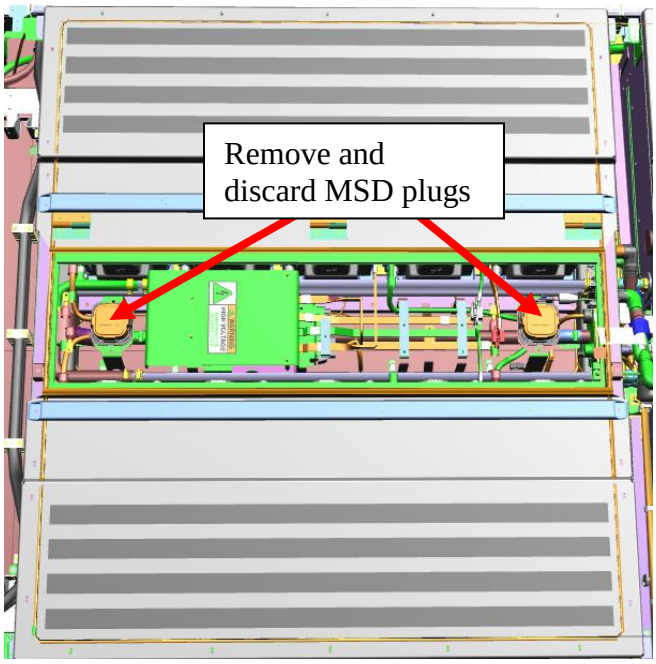


Figure 20: Rooftop ESS MSD location

6.0 Inspection Procedure – Roof ESS

6.1 Verify all battery to busbar connections are torqued to 80 INCH-LBS.

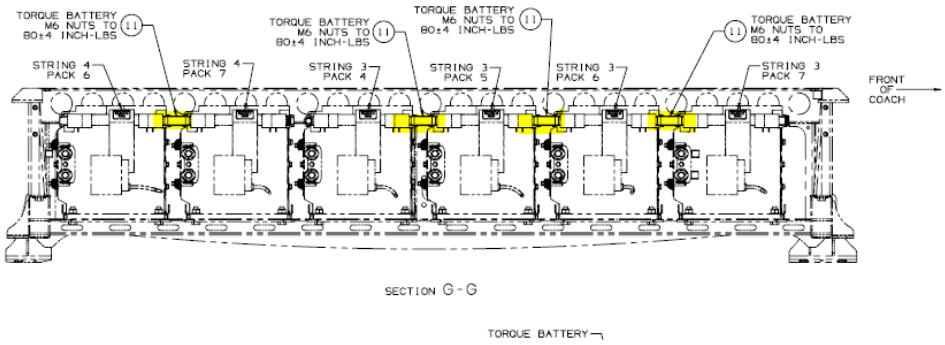


Figure 19: Roof ESS Enclosure

☞ **NOTE: ESS layout will vary depending on location.**

6.2 Ensure the J1 to BDU connections are seated properly. Refer to Figure 20 for J1-BDU connector location examples.

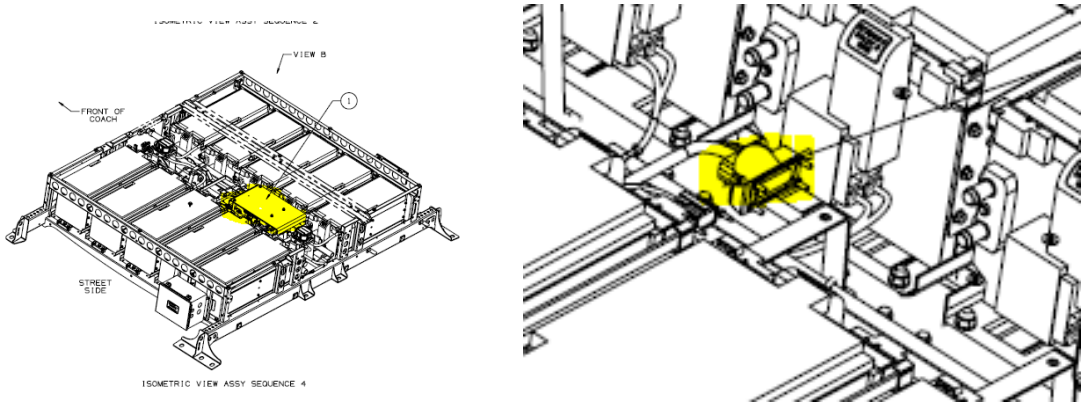


Figure 20: Roof ESS J1 Connector Location Example

☞ **NOTE: ESS layout will vary depending on location.**

6.3 Repeat steps 6.1 to 6.2 for all roof ESS enclosures.

7.0 MSD Replacement Procedure – Roof ESS

3.5 Locate rooftop MSDs in figure 21.

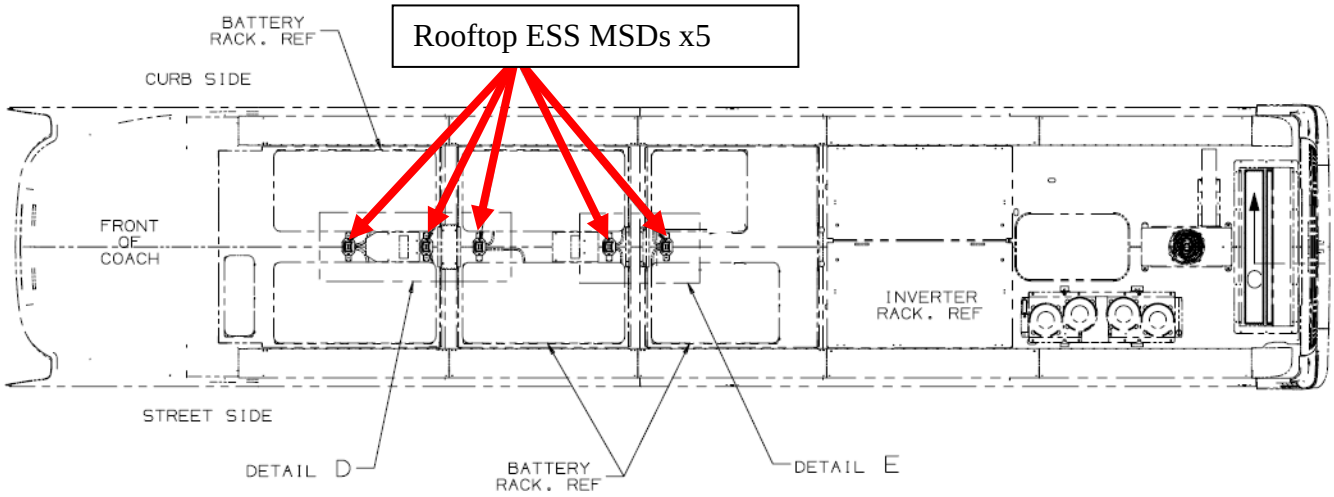


Figure 21: Rooftop ESS locations

3.6 Remove and discard rooftop MSD receptacles and brackets x5. See figure 22.

3.6.1 Unfasten bracket mounting hardware from rooftop ESS frame x2 bolts + washers + nuts. Keep bolts, washers, and nuts.

3.6.2 Unfasten nuts from MSD receptacle studs x2 and keep hardware. Remove and discard MSD receptacle and bracket.

3.6.3 Unfasten and discard MSD receptacle mounting hardware x4.

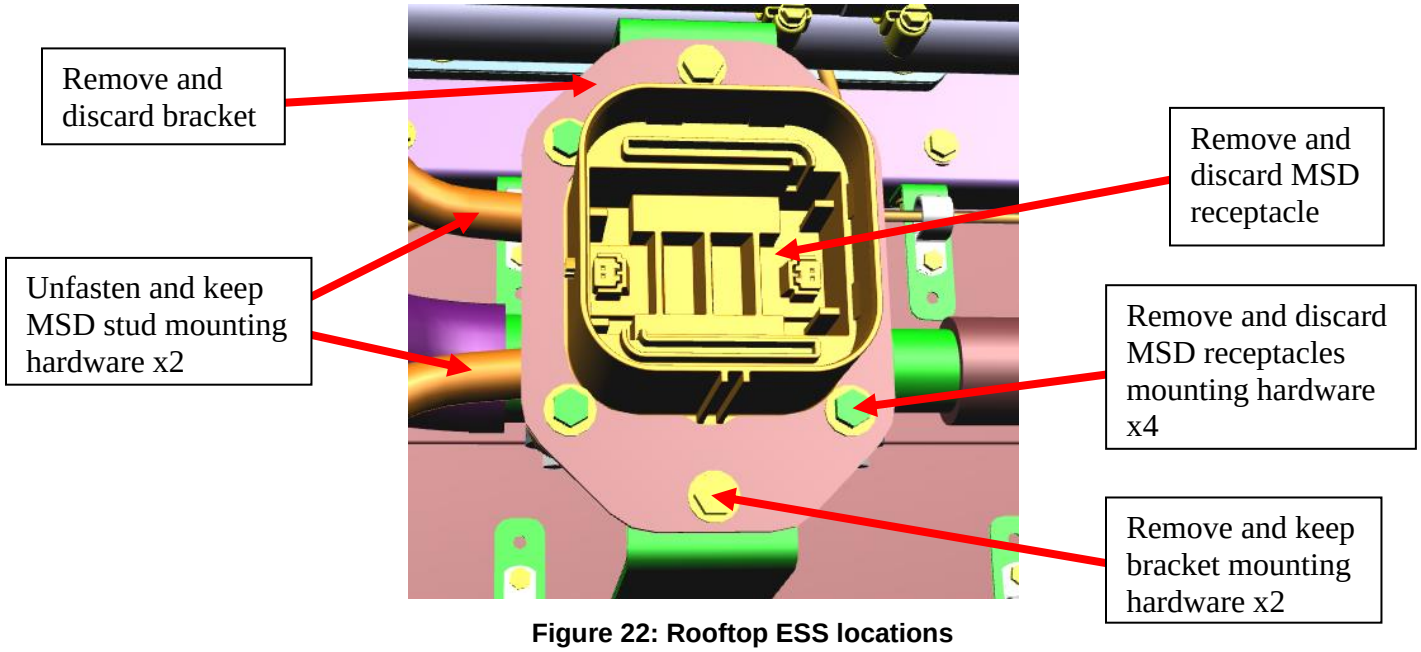


Figure 22: Rooftop ESS locations

3.7 Bench assemble new rooftop ESS MSD x5. See figure 23.

3.7.1 Discard 2 socket terminals and connector that come with each MSD receptacle PN: (806450) and plug PN: (805480).

3.7.2 Using bolts PN: (822309) x4, washers PN: (260173) x4 and nuts PN: (75NM06000) x4, bench assemble MSD receptacle PN: (806450) and plug PN: (805480) onto bracket PN: (855541).

3.7.3 Torque all MSD mounting hardware bolts x4 to 14 ft-lbs (DRY).

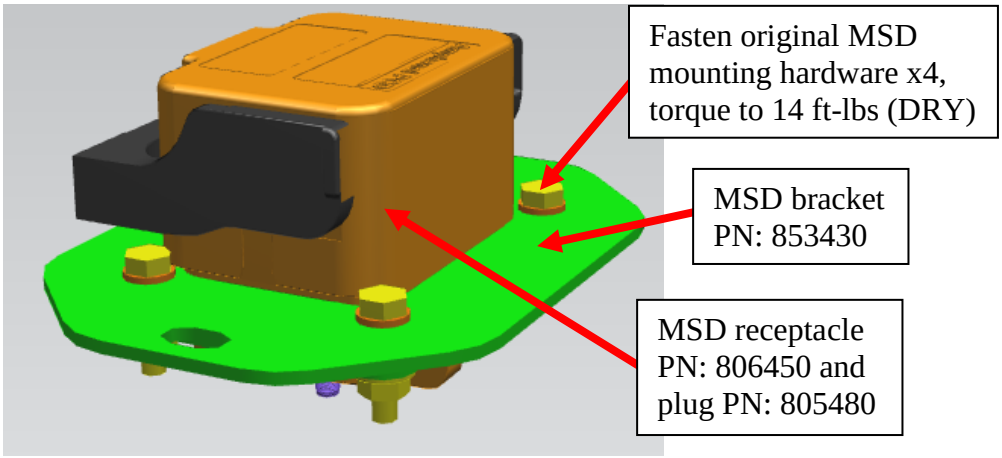


Figure 23: Rooftop ESS MSD bench assembly

3.8 Install new MSD bench assembly onto rooftop ESSs x5. See figure 24, 25.

3.8.1 Fasten HV cables to new MSD studs with nuts x2 kept from step 3.6.3, torque nuts to 80 in-lbs (DRY).

3.8.2 Fasten rear ESS bench assembly to rooftop ESS frame with the bracket mounting hardware x2 kept from step 3.6.2. Torque all hardware to 14 ft-lbs (DRY).

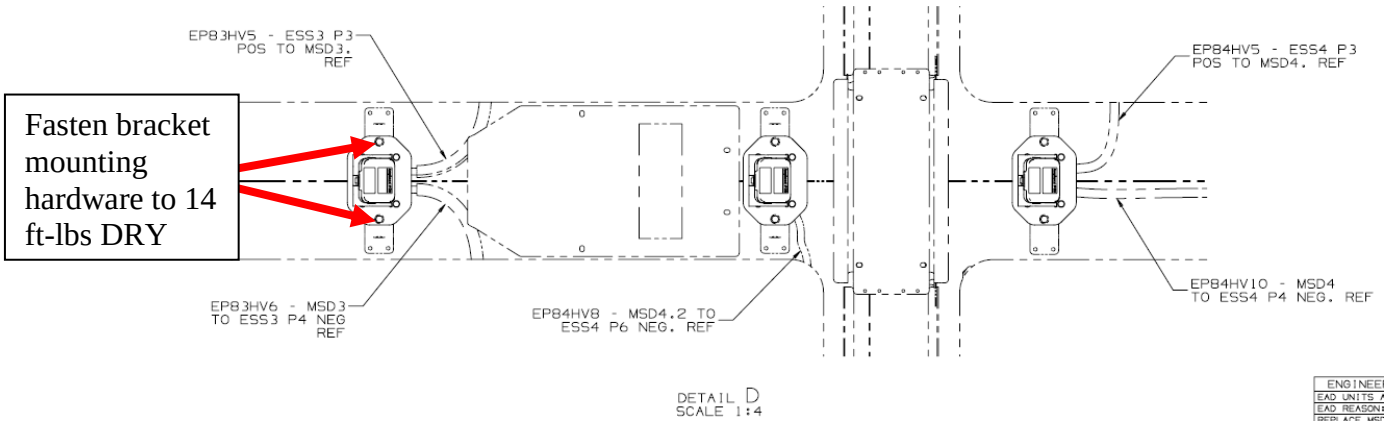


Figure 24: Front rooftop ESS (DETAIL D)

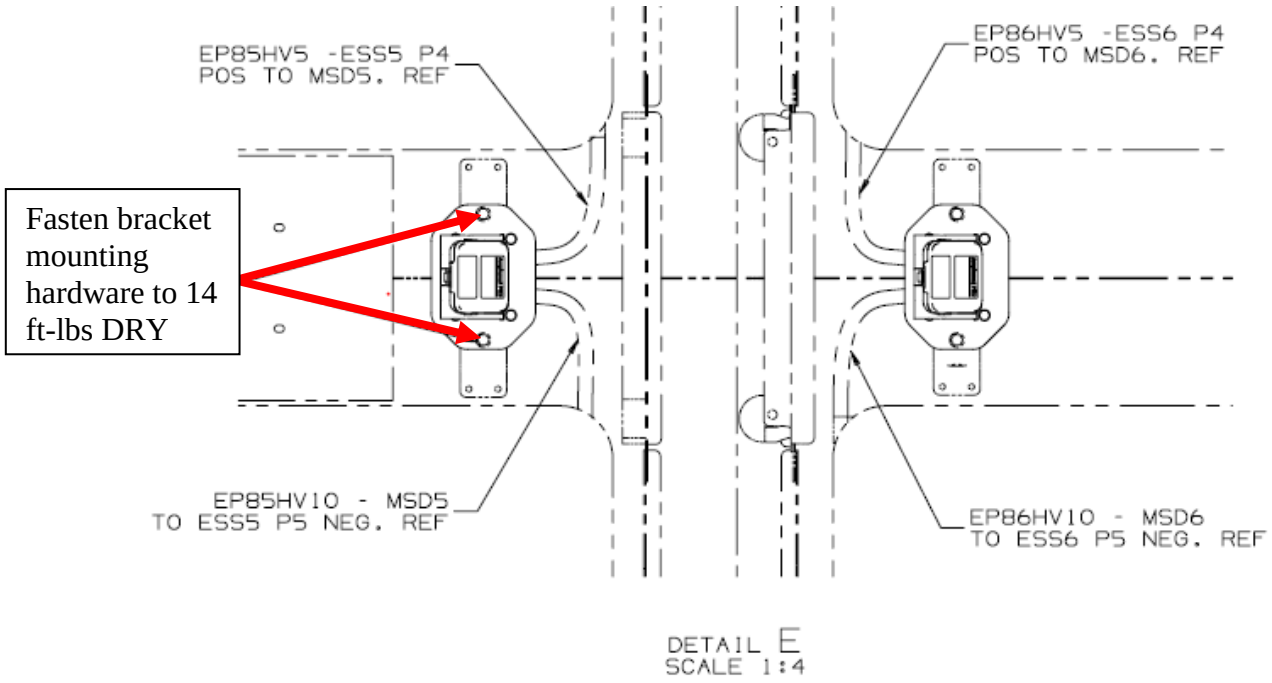


Figure 25: Rear rooftop ESS (DETAIL E)

3.9 Remove all tools and debris and return the bus to service condition.

3.10 Remove all locks and tags from battery disconnect switches and steering wheel.

3.11 Turn low voltage, then high voltage disconnect switches into the “ON” position.

LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	MSD remove and replace	2	4.5	9.0
2	ESS inspection procedures	1	1.0	1.0

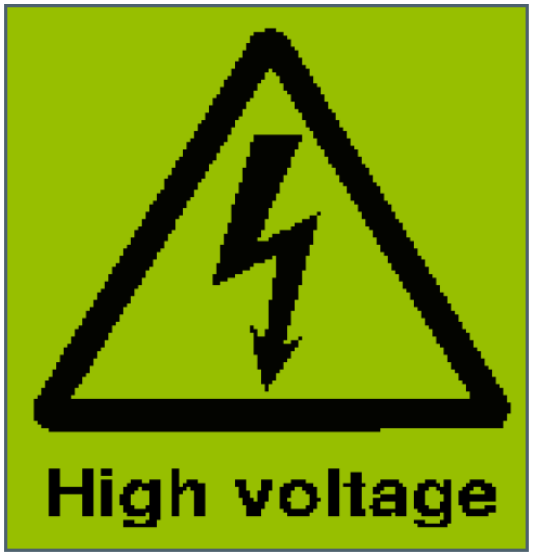
PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	806450	RCPT-MNL SVCE DISC 220 AMP	7	EA	
2	805480	PLUG-MNL SVCE DISC 250 AMP	7	EA	
3	854046	SPACER-MANUAL SERVICE DISCONNECT	2	EA	
4	853975	BRACKET-DISCONNECT SWITCH MTG	1	EA	
5	60R03007	RIVET ALUM 3/16”X..062/.250	6	EA	
6	853430	BRACKET-DISCONNECT SWITCH MTG	5	EA	
5	822309	BOLT-HEX M6 X 1 X 25LG SST	28	EA	
6	75NM06000	NUT-M6X1.00 FLG CL10.9 ZN-NI	28	EA	
7	260173	WASHER-M6 X 12 X 1.6	28	EA	
8	081034	LOCTITE-243 MEDIUM 10ML	0.05	EA	

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 III, 600 volt Category IV, 10Megohm impedance or greater with insulated case or rubber holster
Clamp-on current probe, 1000 volt Category III, 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
Fire fighting and emergency procedures
HV & arcflash 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.

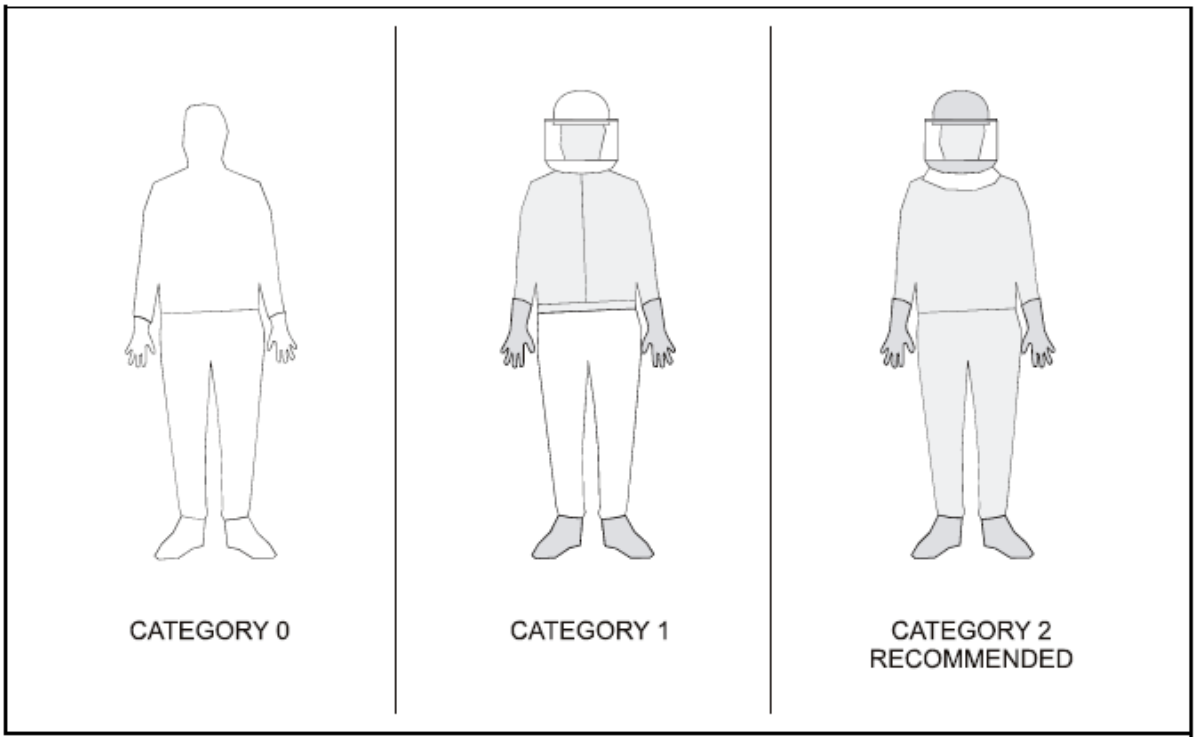
Working Live
To maximize safety, it is always important to perform the maximum amount of HV checkout in the de-energized state.
When it is necessary to work with HV equipment while energized or to verify whether HV is present, the utmost care and safety procedures must be utilized including:

(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

PPE CATEGORIES		
CATEGORY 0	**CATEGORY 1**	**CATEGORY 2**
1.2 cal/cm2	4 cal/cm2	8 cal/cm2
	Leather footwear (as needed)	Leather footwear (as needed)
High Voltage Gloves rated Class 0 (0 to 1000 VAC/1500 VDC)	High Voltage Gloves rated Class 0 (0 to 1000 VAC/1500 VDC)	High Voltage Gloves rated Class 0 (0 to 1000 VAC/1500 VDC)

Appendix C – Live Work Permit

Scope: Applies to New Flyer Transit Bus and Field Service employees and their temporary employees, contractors, sub-contractors, or contractor's agents.

FI-SAF-910-001 Rev. A
Issue Date: November 2019

ENERGIZED ELECTRICAL WORK PERMIT (ARC FLASH)		
PART I: *TO BE COMPLETED BY REQUESTER*	**Job Work Order Number:**	
Description of circuit/equipment/job location:		
Description of work to be done:		
Justification of why the circuit/equipment cannot be de-energized:		
Requesters name/title:	Date:	
PART II: *TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSON PERFORMING WORK:*		**Check when complete**
Detailed description of the job procedures to be used in performing the requested work:		☐
Description of the safe work practices to be employed:		☐
SHOCK/ARC FLASH RISK ASSESSMENT:		
Nominal Voltage to which personnel will be exposed:		☐
Distance of limited approach boundary: **4 feet** (minimum)		☐
Distance of restricted boundary: **4 feet** (minimum)		☐
Required Arc flash PPE category for coach work activity: **Category 2** (mandatory)		☐
Required Arc flash PPE category for maintenance work activity. **Circle Category:** 1 2 3 4		☐

CONTAINMENTS, TOOLS & EQUIPMENT: *Check all that apply to planned work activity below.* ***Qualified Electricians working alone is strictly prohibited.*** *Do not proceed with work activity if* ***ALL*** *required containments, tools and equipment are not available. Failure to follow these requirements will result in disciplinary action up to and including termination.*

Emergency Response	Arc Flash	Fall Protection	Forklift,Aerial,Scissor	Bus Lift / Jack Stand
☐ Certified First Responder	☐ Cat. 2 Arc Flash PPE	☐ Arc Rated Fall Harness	☐ Cert. forklift operator	☐ Bus lift
☐ First Aid Kit	☐ Cat. 3 Volt Meter	☐ Fall Rescue Plan	☐ Cert. genie operator	☐ Stationary jacks
☐ AED	☐ Cat. 3 V. Meter Leads	**Lock Out - Tag Out**	☐ Cert. scissor operator	☐ Bump cap
☐ Rescue Hook	☐ Elect. Insulated Tools	☐ Locks & Tags	☐ Forklift	
☐ Rescue Hook Attendant	☐ Arc Flash Barricade	☐ Lockout Procedure	☐ Aerial lift	
	☐ Qualified Electrician		☐ Scissor lift	

BARRICADE PLAN (coach): *Use block diagram of coach below to sketch barricade boundaries needed to maintain 4 feet (minimum) from exposed high voltage components. Take care to address access from any direction.*

BARRICADE PLAN (maintenance): *Use block diagram section below to sketch barricade boundaries needed to maintain restricted approach distance from exposed high voltage components. See arc flash label on panel.*

KEY PERSONNEL & EMERGENCY EQUIPMENT: List the names of the qualified electricians and the location of first aid supplies, AED and emergency equipment below. Locations can also be marked on barricade plan above.

Qualified Electrician	Badge #		Emergency Equipment	Location

SAFETY PLAN REVIEW: Qualified Electrician(s)will review all steps of planned work activity. Affected employees will be briefed on arc flash boundaries and relevant safety precautions.

Name	Badge #		Name	Badge #

Part III: *APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED:*

NFPA 70E requires the use of this electrical work permit for all energized work at or above 100 Volts DC. In addition, New Flyer of America requires using this electrical work permit as a planning tool for non-energized work activity to ensure that proper safety precautions have been taken. **Failure to do so may lead to serious injury or death.**

Badge # Date:

New Flyer Qualified Electrician (mandatory)

Date:

* Location Leadership

** By signing, the leadership of the affected area affirms that this plan has been communicated to all affected personnal under their supervision.*

Appendix D – ESS HV Inspection Sheet

New Flyer Xcelsior Charge

Section	Step #	Page #	Inspection	Issue (Y/N)	Issue Description (List Quantity if Applicable)	Signature of Approval
Rear ESS	3.2	9	BDU Low Voltage Connector securement (2 BDU's, 2 connectors/BDU)			
	3.4	10	Battery to Bus Bar Connections Torqued to 80 inch-lbs			
Roof ESS's	6.1	15	Battery to Bus Bar Connections Torqued to 80 inch-lbs			
	6.2	15	Proper Securement of J1 Connectors			