# INSTRUCTION TO SERVICE

| ITS-61251 | 01/24/2025 |
|---|---|
| **SECTION:** | 260 - Battery System |
| **SUBJECT:** | Retrofit duckbill drains to the ESS units & modify breathers. (7 String Bus) |
| **ISSUE:** | Existing drains deploy under high humidity. |
| **SUMMARY:** | Remove ESS drains, remove internal mechanism, re-install and add duckbill. Remove the ESS breather, extract the internal mechanism, remove the three desiccant bags and reinstall the breather. |

# ITS-61251

| 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:

1. Set the parking brake and chock wheels.
2. Turn the main battery disconnect and HV interlock switch to the “OFF” position.

⚠ **WARNING:** ***The work detailed in this ITS involves working near exposed High Voltage (HV) compartments, even after the bus has been locked out and tagged out. It is recommended that the service personnel be trained in NFI HV safety practices, such as those included in Appendix A – NFIL Spec 532295 - High Voltage Safety Guidelines & Procedures for New Flyer Battery Bus.***

3. Perform the Lock Out Tag Out and De-Energizing procedures found in the Electrical System Section of the New Flyer Service Manual. Reference Figure 1 below.

⚠ **WARNING:** ***ENSURE MSD DUMMY PLUGS AND ARC FLASH GLOVES ARE AVAILABLE PRIOR TO STARTING ANY HV DISASSEMBLY***

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

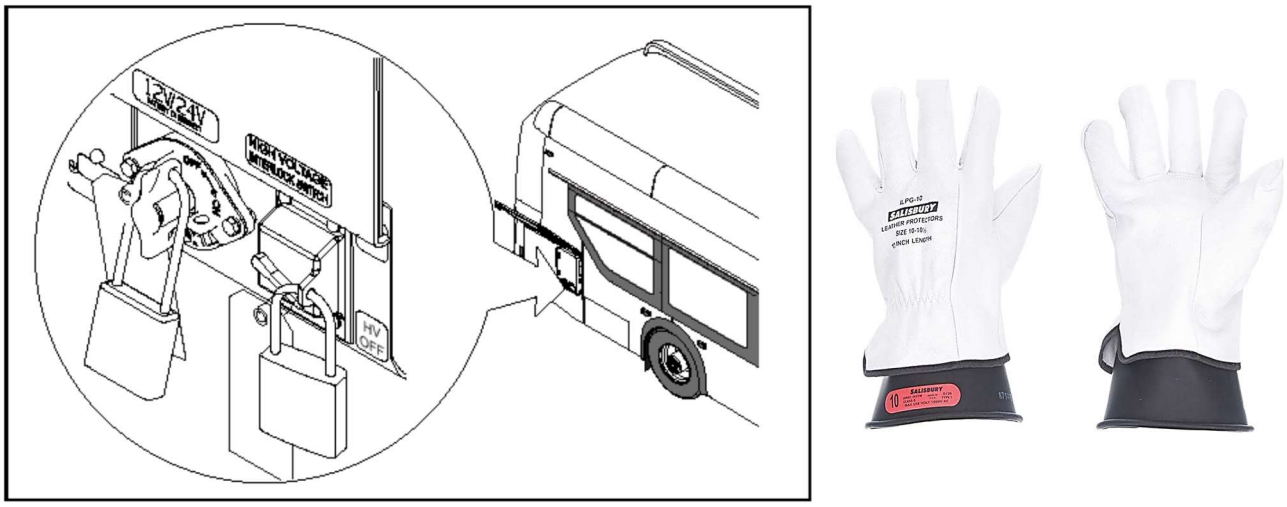


**Figure 1: HV and LV Disconnect Switch Location and Arc Flash Glove Reference**

⚠ **WARNING: ARC FLASH GLOVES MUST BE USED ANYTIME THE ESS HAS AN UNCOVERED HOLE**

4. Access the roof of the bus and locate the ESS enclosures.

⚠ **WARNING:** **Working on the ESS drains and breathers involves working on the roof of the bus. Always wear approved fall protection equipment and follow all applicable safety protocols when working on the roof of the bus.**

5. Each ESS enclosure will have four drains, there will be a drain near each corner on the long sides of the ESS enclosure.

**NOTE:**

**On ESS enclosures supplied by ABS, the drains will be found within openings in the corner mounting brackets. Figure 3B.**

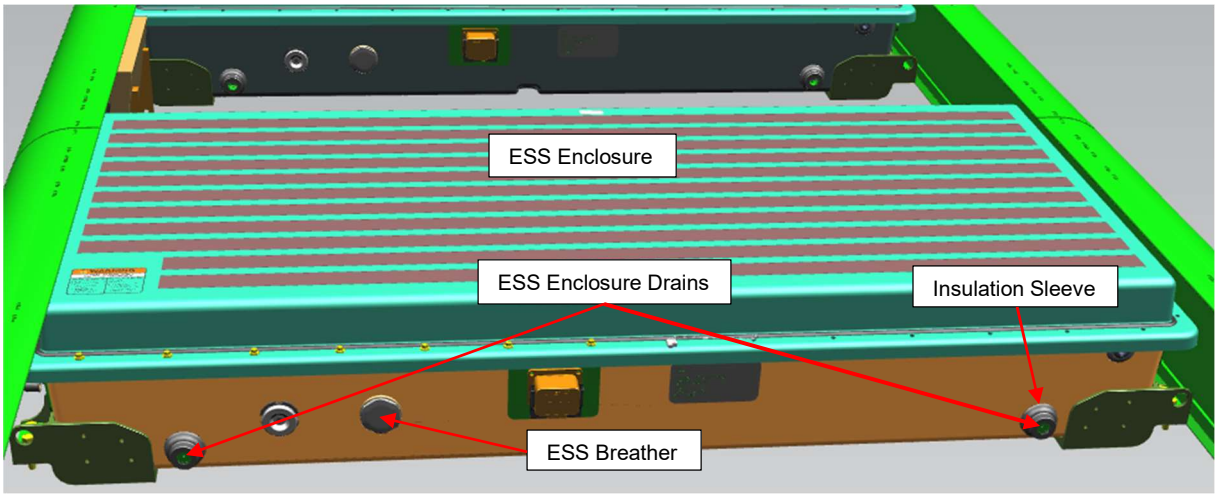


**Figure 2: ESS Drain and Breather Locations**

**Figure 3A: ESS Drain**


**Figure 3B: ESS Drains on ABS ESS**

6. Remove the rubber insulation sleeve if present on the ESS drain.
7. Using an appropriate wrench or socket, remove the drain cartridge from the ESS enclosure.
8. On the bench, push out the internal piston in the drain cartridge and cut the tether. Discard the piston components.
9. Install a new -12 ORB o-ring NF P/N 1017312 from the service kit NF P/N 6501524 on the cartridge body prior to reinstallation.

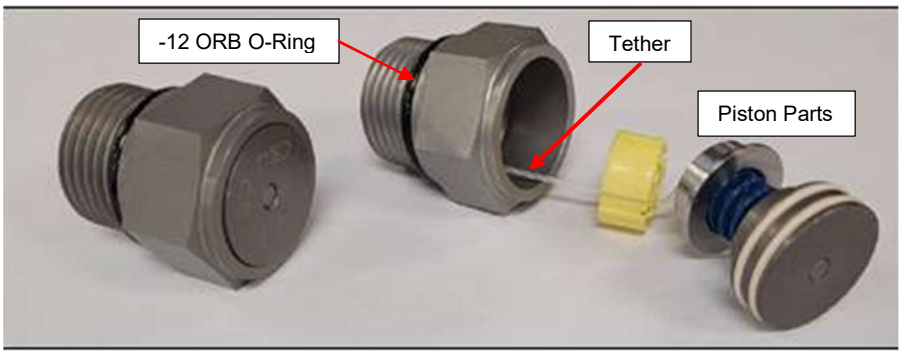


**Figure 4: Removal of Drain Cartridge Piston Components**

10. Reinstall the cartridge in the ESS enclosure and torque to 40 Ft-Lbs maximum. Take care not to over torque the cartridge as damage to the ESS enclosure could occur.
11. Once the cartridge has been installed, slide the rubber drain body adaptor NF P/N 1079298 from the kit over the hex fitting on the cartridge. You should feel the rubber lip on the drain body adapter snap into place on each side of the hex fitting when the drain body adaptor is properly seated.

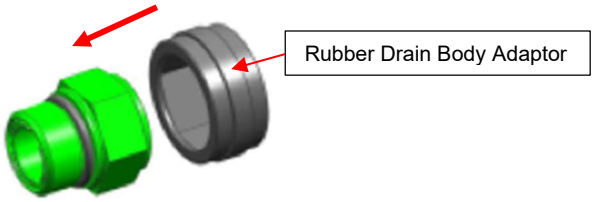


**Figure 5: Installing Rubber Drain Body Adaptor over Cartridge Hex Fitting**

12. Dip the rubber duckbill NF P/N 1086435 in some soapy water for lubrication.
13. Install the wave seal clamp NF P/N 553163 over the duck bill prior to installing the duckbill.
14. Install the duckbill over the rubber drain body adaptor previously installed on the cartridge hex fitting. Push and twist the duckbill to achieve a 6 o'clock orientation on the duckbill. You will feel the duckbill snap into place over the ridge on the rubber drain body adaptor when it is correctly seated.
15. Torque the screw on the wave seal clamp. Tighten the clamps at 75 RPM or less to 80 In-Lbs then wait 30 min and retighten to 80 In-Lbs.

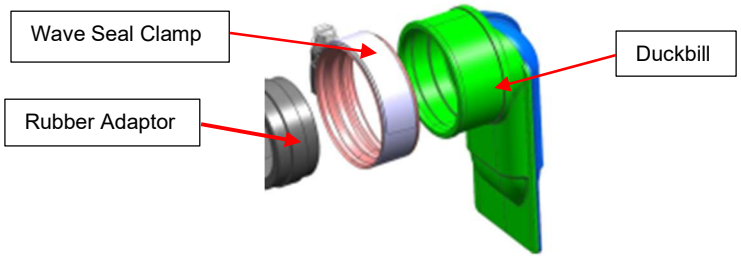


**Figure 6: Rubber Adapter, Duckbill & Wave Seal Clamp**

16. Repeat Steps #6 to #15 on the other three drains on the ESS enclosure.

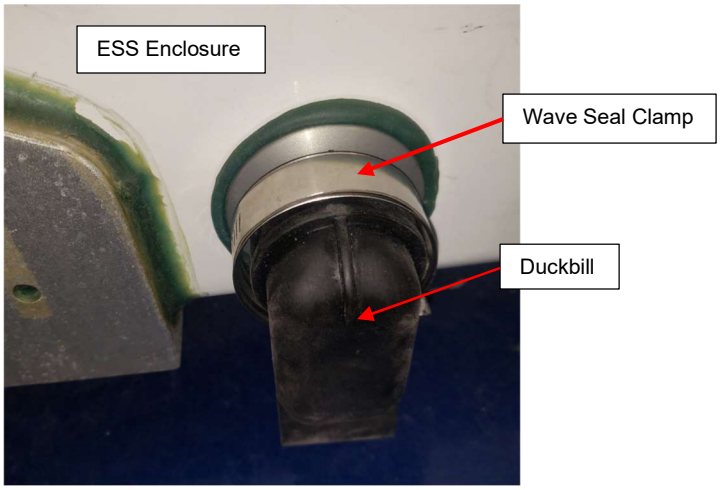


**Figure 7: Duckbill Installation (Prior to Torquing Wave Seal Clamp)**

17. Locate the ESS breather on the ESS enclosure. Figure 2.
18. Remove the large hexagonal gore plug on the ESS breather and set it aside.

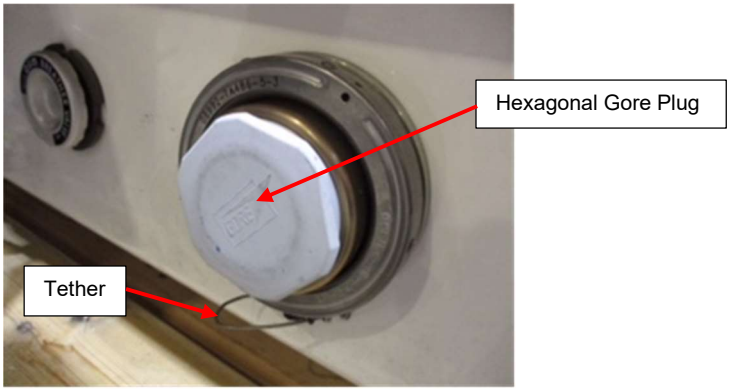


**Figure 8: Hexagonal Plug on Breather**

19. Twist the ESS breather cover counterclockwise to release the cam locks and remove the breather cover.
20. Disconnect the tether cable. Bend the bracket so that the cable end will clear the bracket screw and allow the cable end to slip through the hole in the bracket releasing the tether.

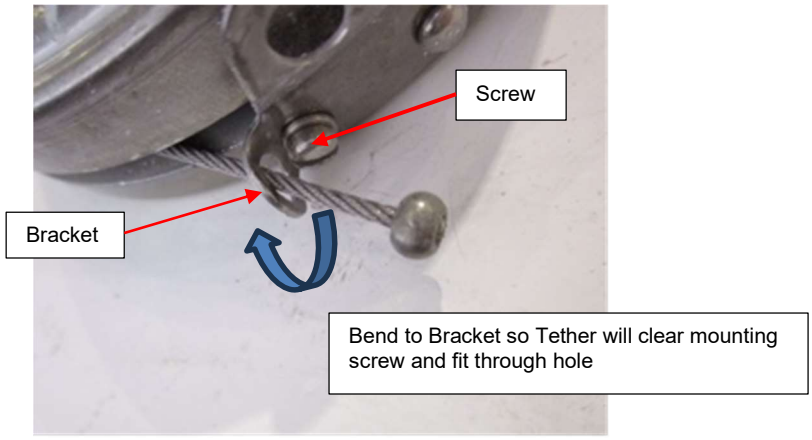


**Figure 9: Tether Bracket Detail**

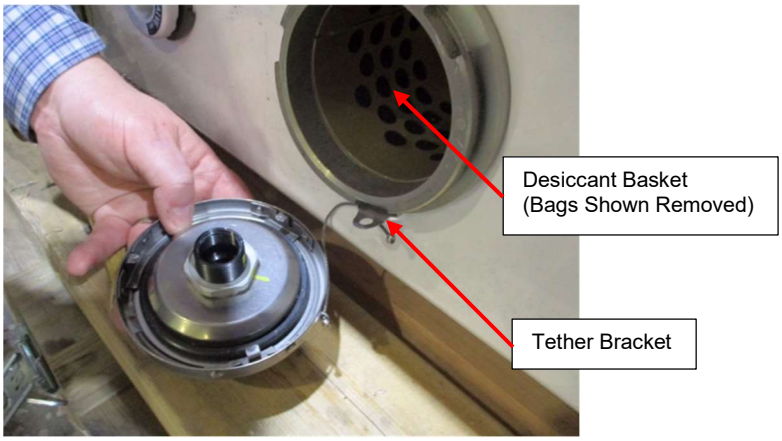


**Figure 10: Breather Cover Removed**

21. Hold the body of the breather with a vice grip pliers with rounded jaws taking care not to crush the body and using an impact driver with an extractor tool in NF P/N 6501646 remove the aluminum collar that retains the spring and piston.

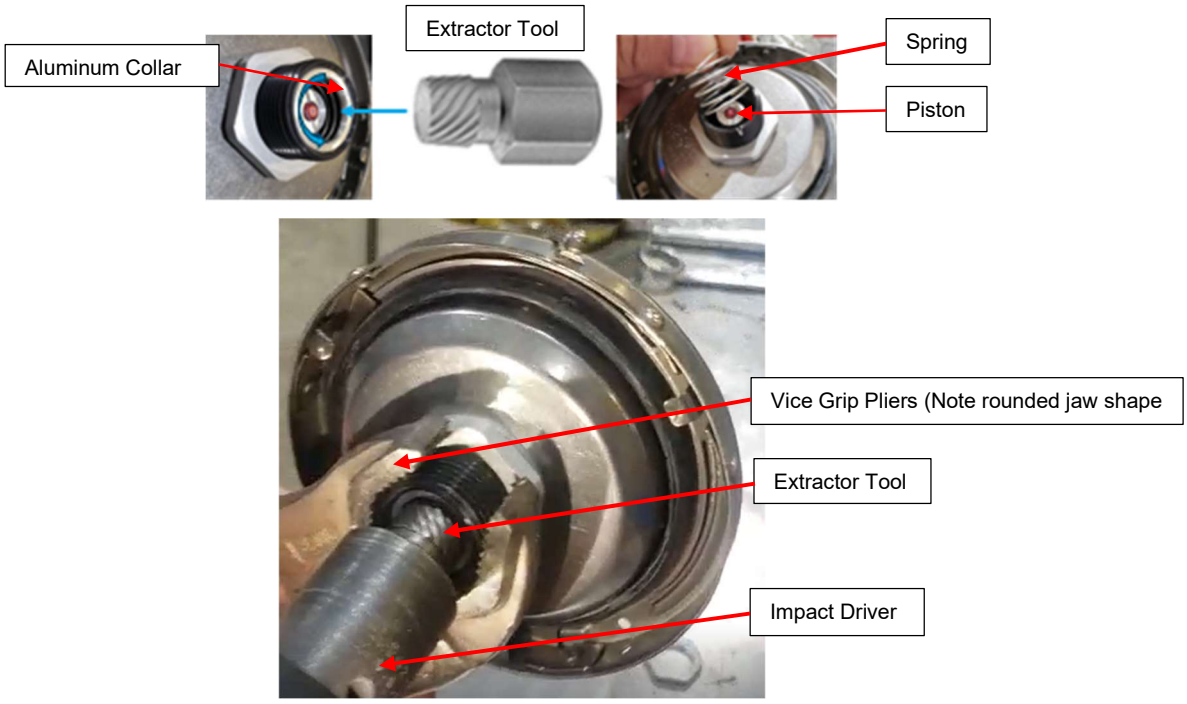


**Figure 11: Using an Extractor Tool to Remove the Aluminum Collar in the Breather**

22. Once the aluminum collar is removed the spring will pop out. Use a needle nose pliers to remove the piston from the breather or use a small screwdriver to push the piston out from the other side. Discard the piston and aluminum collar.
23. Prior to reinstalling the breather, remove the three white desiccant bags in the basket inside the breather opening in the ESS enclosure. Discard the three desiccant bags.

**Figure 12: Desiccant Bags to be Removed**

24. Reinstall the breather cover by aligning the tangs on the cover with the slots on the breather body then twist the collar clockwise to lock the collar in place. Reinstall the large hexagonal gore plug hand tight.
25. Re-attach the breather cover tether and tap the bracket with a hammer to secure the tether end.
26. Clean the area on the ESS enclosure above the gore plug to ensure the surface is free of dirt and debris, using a 50/50 mix of isopropal alcohol and water, allow a minimum of 10 min of flash off time. Install a “No Desiccant Required” label NF P/N 1114663 on the ESS enclosure directly above the gore plug.
27. This completes the ESS drain and breather retrofit on one ESS enclosure. Repeat Steps #6 to #25 to retrofit the drains and breather on each of the ESS enclosures on the roof of the bus. It is not necessary to perform this retrofit on the ESS enclosures located in the rear compartment area of the bus.
28. Open the access door on the rear of the bus.
29. Locate the gore plugs on the two ESS enclosures at the lower rear compartment.

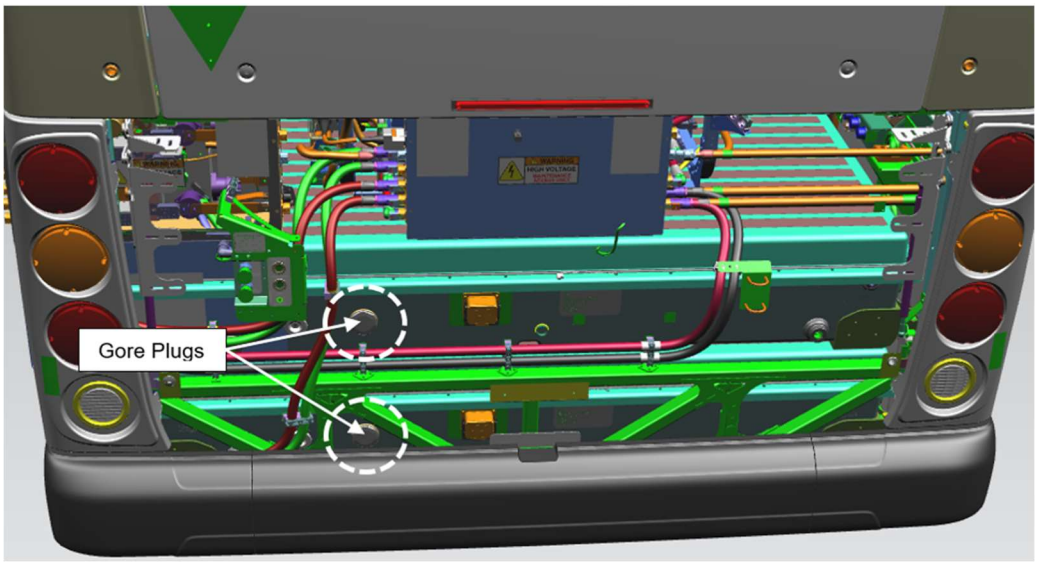


**Figure 13: Location of Rear Compartment ESS Gore Plugs.**

30. Perform steps #18 - #26 to rework the gore plugs on the two ESS enclosures in the rear compartment.
31. Remove all tools and debris from work area to return coach to service.
32. Close and secure the rear compartment access door.
33. Remove the tags and lockouts from the HV lockout and main battery switches. Turn HV lockout switch and the main battery disconnect switch to the “ON” position.

| LABOUR ESTIMATE | | | | |
|---|---|---|---|---|
| | Operation | Number of Technician(s) | Hours | Labor Time T X HR |
| 1 | Remove ESS drain internal parts and install duckbills, four per ESS enclosure. Remove breather piston and desiccant bags, one per ESS enclosure (7 ESSs) | 1 | 2.02 | 2.02 |

| PARTS REQUIRED | | | | | |
|---|---|---|---|---|---|
| Item | Part Number | Description | Qty. per Coach | Units | Notes |
| 1 | 6501524 | KIT-DRAIN DUCKBILL, FRP ESS XMOD | 20 | EA | 4 kits required per ESS enclosure |
| 2 | 1114663 | DECAL – NO DESICCANT | 7 | EA | |

| SPECIAL TOOLS REQUIRED | | | | | |
|---|---|---|---|---|---|
| Item | Part Number | Description | Qty. | Units | Notes |
| 1 | 6501646 | 1.18 – 1.19 Extractor Tool | 1 | EA | |