

SERVICE MANUAL BULLETIN

This Service Manual Bulletin is prepared by the Publications Department of New Flyer Industries Canada ULC. Refer to details below.

SMB-196

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APPLICABILITY					
VEHICLE LENGTH	<input type="checkbox"/> 30ft.	<input type="checkbox"/> 35ft.	<input type="checkbox"/> 40ft.	<input type="checkbox"/> 60ft.	<input checked="" type="checkbox"/> ALL
VEHICLE TYPE	<input checked="" type="checkbox"/> Xcelsior®	<input type="checkbox"/> MiDi®	<input type="checkbox"/> Invero®	<input type="checkbox"/> ALL	
FUEL TYPE	<input type="checkbox"/> Diesel	<input type="checkbox"/> Diesel/Electric	<input type="checkbox"/> CNG	<input type="checkbox"/> LNG	<input type="checkbox"/> ALL
	<input type="checkbox"/> Fuel Cell	<input type="checkbox"/> Trolley/Electric	<input checked="" type="checkbox"/> Battery/Electric		
SUBJECT	ESS Battery Enclosure Drain Valve				
SECTION TITLE	SECTION 04, SECTION 06, SECTION 19 & PREVENTIVE MAINTENANCE				
DETAILS	<p>This bulletin provides new inspection and replacement requirements for the drain valve installed on the ESS Battery Enclosure as well as changes to the Low Coolant indicators/messages.</p> <p>This bulletin applies to all Xcelsior® Electric models fitted with Next Generation ESS enclosures.</p> <p>This information supersedes any prior information on this subject already provided in your New Flyer Service Manual. Make this Service Bulletin available to service personnel to inform them of changed information.</p>				

1. ESS BATTERY ENCLOSURE DRAIN VALVE

1.2. Operation

1.1. Description

Four drain valves are located on the lower perimeter of the ESS enclosure near each corner. See “Fig. 1: ESS Drain Valve” on page 2. The drain valves are threaded into the enclosures with an ORB (O-ring boss) type connection. The drains are fully mechanical consisting of a valve body, spring, spring cup, pin, bobbin, piston, o-rings, retention line and rivet in a contained unit.

If liquid is present inside the ESS enclosure a mechanism inside the drain valve will be activated which allows the drain valve piston to be expelled by spring force which in turn allows liquid to flow through the drain and out of the ESS enclosure. The expelled drain valve components are retained by a retention line and can be used to identify that a drain valve has been activated.

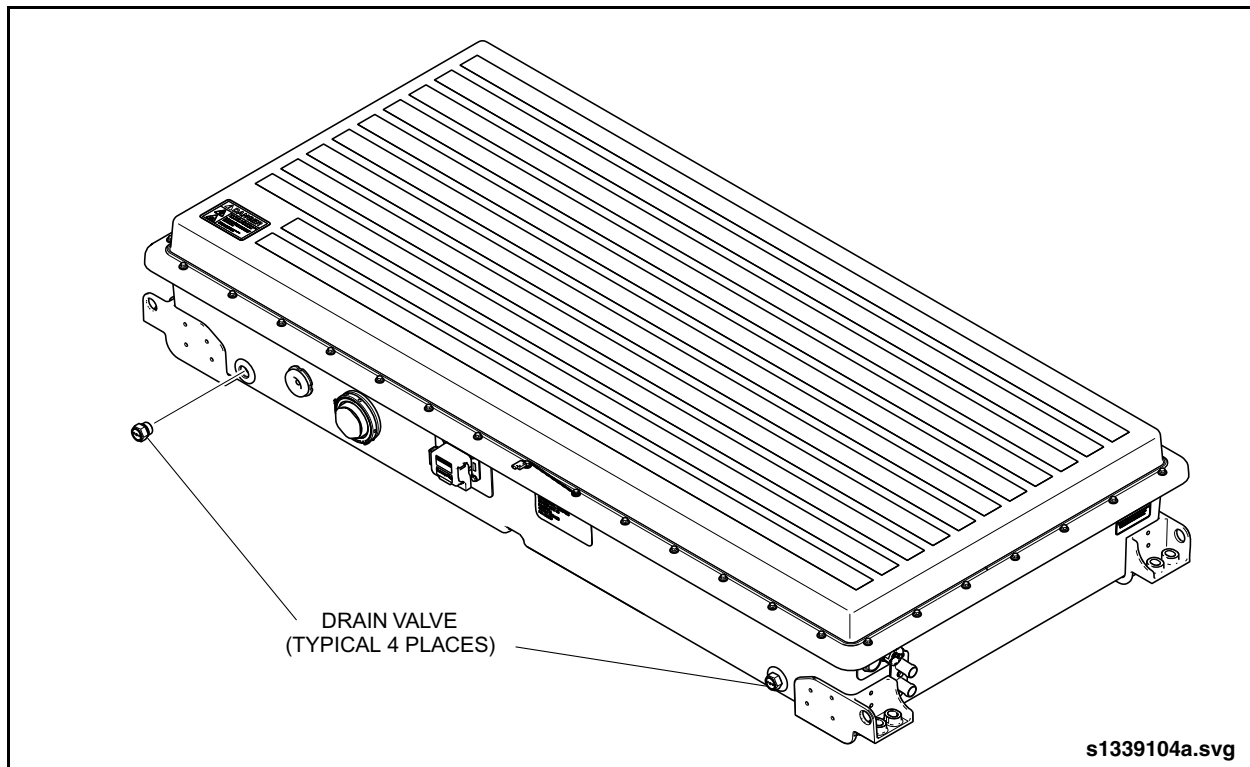


Fig. 1: ESS Drain Valve

2. PREVENTIVE MAINTENANCE

2.1. Daily Preventive Maintenance

2.1.1. Exterior Check

- ESS battery coolant reservoir level is correct.



In case of a low coolant condition, **DO NOT add coolant prior to inspecting the battery coolant circuit for leaks. Unaddressed leaks may result in the risk of fire.**

NOTE:

The coolant level in the rooftop ESS coolant reservoir can be monitored at the rear curbside fusebox coolant maintenance panel. The coolant level is indicated by the LED color as described on the panel decal.

2.2. Quarterly Preventive Maintenance



Maintenance of high voltage equipment must be performed by qualified personnel only. Refer to the high voltage safety in your New Flyer Service Manual for safety requirements. Ensure that the High Voltage Interlock and Battery Disconnect switches are set to the OFF position.

ALWAYS wear appropriate Personal Protection Equipment (PPE) and remove all jewelry while servicing the vehicle's electrical components. Refer to your New Flyer Service Manual for PPE requirements.



Refer to the high voltage safety in your New Flyer Service Manual and familiar-

ize yourself with the safety requirements before performing any maintenance or repair on the High Voltage Equipment.

2.2.1. ESS Enclosure Drain Valve Inspection



Use work platforms or scaffolding whenever working on roof-mounted components. Ensure maintenance personnel use an approved safety harness.

Inspect the ESS enclosure drain valves on a quarterly basis as follows:

1. Set Battery Disconnect switch to the OFF position.
2. Set the High Voltage Interlock switch to the OFF position.



If any ESS drain valve is found to have been activated, contact New Flyer for assistance. DO NOT return the affected ESS to service without addressing the cause of the activation.

3. Gain access to all rooftop and rear ESS enclosures and inspect the four (4) drain valves on each ESS enclosure. Visually inspect drain valve to ensure it is in the unactivated condition, with the piston face flush with the valve body and not protruding beyond the valve body. See [“Fig. 2: ESS Enclosure Drain Valve Inspection”](#) on page 4.



Excessive external contamination on the ESS enclosure drain valves could potentially prevent the valves from functioning properly.

4. Check the drain valves for any external contamination (salt, mud, etc.) and clean as necessary.

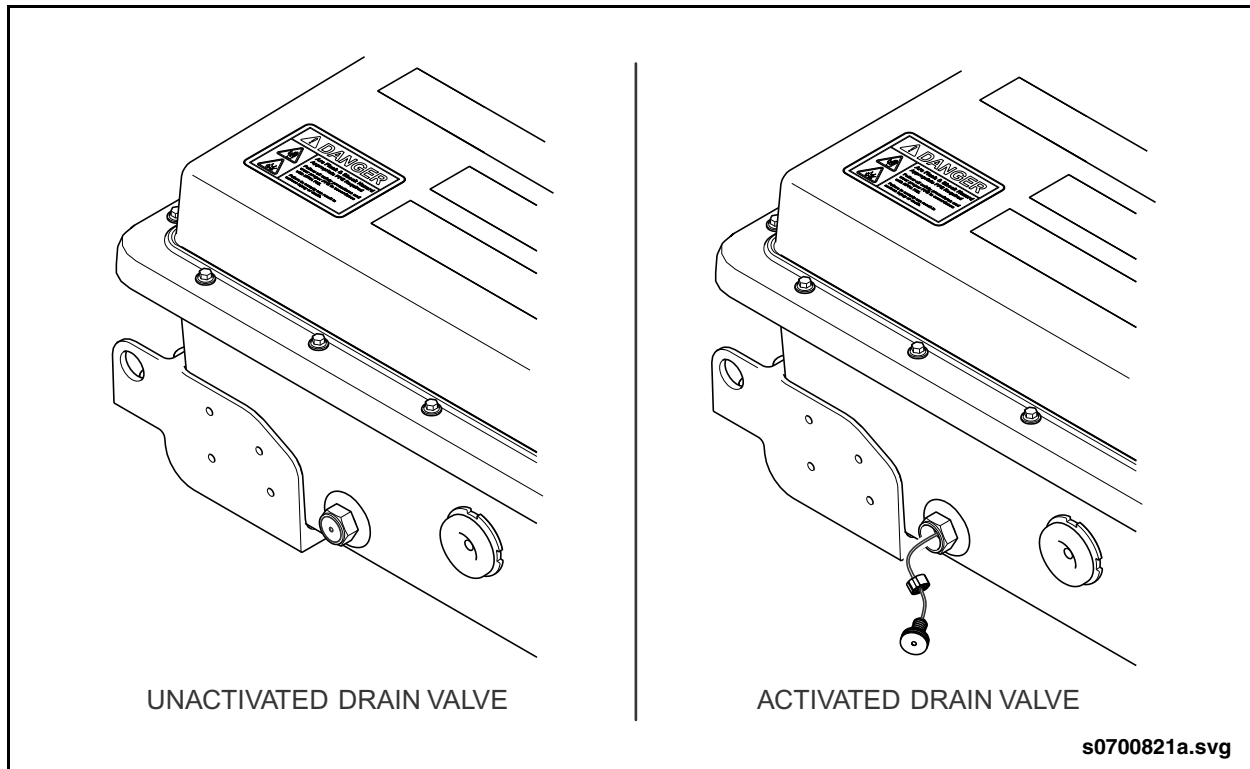


Fig. 2: ESS Enclosure Drain Valve Inspection

2.3. Four Year Preventive Maintenance



Maintenance of high voltage equipment must be performed by qualified personnel only. Refer to the high voltage safety in your New Flyer Service Manual for safety requirements. Ensure that the High Voltage Interlock and Battery Disconnect switches are set to the OFF position.

ALWAYS wear appropriate Personal Protection Equipment (PPE) and remove all jewelry while servicing the vehicle's electrical components. Refer to your New Flyer Service Manual for PPE requirements.



Refer to the high voltage safety in your New Flyer Service Manual and familiarize yourself with the safety require-

ments before performing any maintenance or repair on the High Voltage Equipment.

2.3.1. ESS Enclosure Drain Valve Replacement



Use work platforms or scaffolding whenever working on roof-mounted components. Ensure maintenance personnel use an approved safety harness.

Replace the ESS enclosure drain valves, every four years as follows:

1. Set Battery Disconnect switch to the OFF position.
2. Set the High Voltage Interlock switch to the OFF position.
3. Gain access to all rooftop and rear ESS enclosures and inspect the four (4) drain valves on each ESS enclosure. See "Fig. 3: ESS Enclosure Drain Valve Replacement" on page 5.

4. Visually inspect drain valve to ensure it is in the unactivated condition. Refer to 2.2.1. “ESS Enclosure Drain Valve Inspection” on page 3 for procedure.



Leaving the drain valve ports open for extended periods of time can lead to entry of moisture and/or foreign debris. Ensure replacement drain valves or plugs are available at the time of drain valve removal.

5. If no drain valves were found to be activated, proceed to replace the valves as follows:
 - a. Clean area around drain valve.
 - b. Use a hex head wrench to remove the drain valve.
 - c. Inspect threaded portion of port and clean/repair threads as necessary.
 - d. Install new drain valve and torque to 40 ft-lb. (54 Nm).

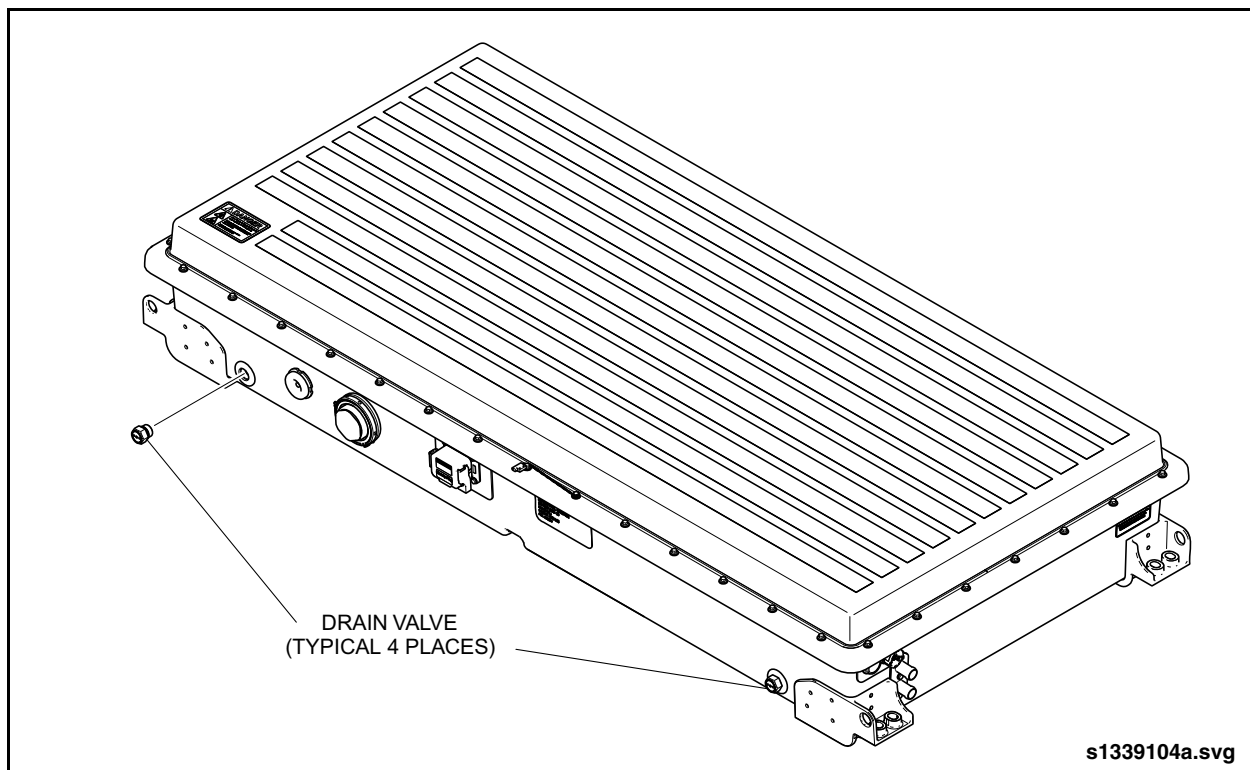


Fig. 3: ESS Enclosure Drain Valve Replacement

3. ESS BATTERY THERMAL MANAGEMENT SYSTEM

3.1. Filling & Deaeration



In case of a low coolant condition, DO NOT add coolant prior to inspecting the battery coolant circuit for leaks. Unaddressed leaks may result in the risk of fire.



Fill Pressure must not exceed 25 psi to avoid injury or damage to components.

 **NOTE:**

The following procedure is designed to fill the ESS Battery Thermal Management System following major service of the system. New Flyer recommends using a maximum flow rate of 2.5 gpm (9.5 l/min) when filling this system.

1. Conduct visual internal inspection of each ESS enclosure through the desiccant basket to confirm no liquid is present inside, and external inspection of drain valves to confirm none have opened.



If liquid is detected or a drain valve is found open, DO NOT PROCEED with coolant fill. Immediately investigate and correct root cause of the leak.

2. Perform a cooling system pressure test prior to filling the system. Refer to Section 6 “Coolant System Pressure Test” in your New Flyer Service Manual for procedure.



If leak is detected, DO NOT PROCEED with coolant fill. Immediately investigate and correct root cause of the leak. Repeat leak test after performing repairs.

3. Connect a battery charger to the 12/24V batteries for the duration of the fill procedure to prevent the batteries from draining excessively.
4. Check the High Voltage Interlock switch is OFF. If ON, set the Master Run switch to OFF, then High Voltage Interlock switch to OFF. See “Fig. 4: ESS Coolant Level Indicator & Fill Mode Switch” on page 7.
5. Ensure all drain cocks are closed and all drain plugs are installed.
6. Switch the 12/24V Battery Disconnect switch to ON.
7. On the driver’s side console, set the Master Run switch to DAY-RUN.
8. Open the fusebox access door.
9. Open the 1/4 turn vent valve attached to the clear vent line, located in the propulsion compartment beside the pressure fill port.
10. Place a clean bucket under the ¼ turn vent valve near the pressure fill location.
11. Connect pressure fill hose to the coupler located at the bottom curbside rear corner.
12. Fill the system until the coolant level indicator of the low voltage fusebox indicates FULL or a steady stream of coolant comes out the clear vent line into the bucket. Disconnect the pressure fill hose.
13. Turn ON the ESS Coolant Fill Mode switch on the low voltage fusebox.
14. Maintain the coolant level at FULL on the coolant level indicator. Disconnect the pressure fill hose when not filling to prevent back-filling of the filling device.
15. The fill mode will run for 20 minutes after the last CRITICAL LOW coolant indication to deaerate the system. The fill mode will turn itself off once the time has been reached.
16. Verify the coolant level display is displaying FULL.
17. Close the 1/4 turn vent valve located near the pressure fill port.
18. Remove the pressure fill tool, battery charger, and return the Master Run and 12/24V Battery Disconnect switches to the OFF position.

3.2. ESS Maintenance Indicator



High cell temperature delta is an indication of unequal flow distribution or potential HV battery problems that could lead to premature battery aging and failure. Maintenance personnel should service the ESS as soon as possible.

The ESS Maintenance indicator is located on the low voltage fusebox panel and indicates high battery cell temperature and/or high battery cell temperature deviation which could be an indication of a problem with the battery thermal management system or HV batteries.

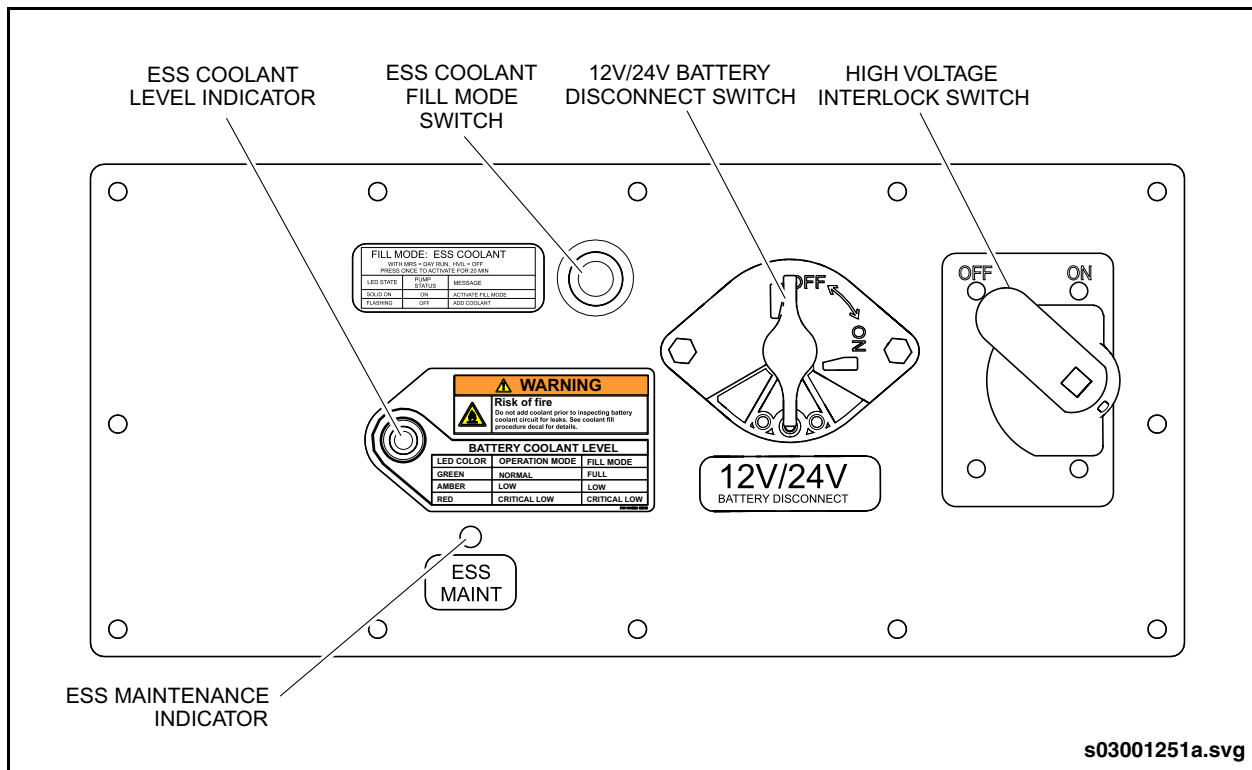


Fig. 4: ESS Coolant Level Indicator & Fill Mode Switch

4. INSTRUMENTATION & CONTROLS

4.1. Instrument Panel



4.1.1. Low Coolant Indicator (Amber)

The Low Coolant indicator illuminates if an insufficient amount of coolant is present in the cabin heating or traction motor/inverter coolant reservoirs.

4.1.2. Operator Screen

4.1.2.1. Text Messages



DO NOT OPERATE THE VEHICLE if the Critical Low Coolant indicator illuminates.

- ❑ CRITICAL LOW COOLANT (Red) - The Critical Low Coolant message will appear on the LCD screen and a buzzer will sound to indicate that the coolant level in traction motor/inverter cooling or cabin heating system is too low for proper operation.



DO NOT OPERATE THE VEHICLE if the ESS Critical Low Coolant indicator illuminates.

- ❑ ESS CRIT LOW COOLANT (Red) - The ESS Critical Low Coolant message will appear on the LCD screen and a buzzer

will sound to indicate that the coolant level in ESS battery thermal management system is too low for proper operation.

- ❑ ESS LOW COOLANT (Amber) - The ESS Low Coolant message will appear on the LCD screen if an insufficient amount of coolant is present in the ESS battery thermal management system reservoir.

NOTE:

DO NOT add coolant prior to inspecting the ESS coolant circuit for leaks. Refer to Section 6 of your New Flyer Service Manual for pressure test and coolant fill procedures.

- ❑ ESS LOW ISO FAULT (Red) - The ESS Low Isolation Fault message will appear on the LCD screen and a buzzer will sound shortly after the MRS is turned OFF or ON if the battery system detects an isolation fault within the disconnected strings. The vehicle cannot be started while this fault is active.

NOTE:

NOTE:

To resolve this fault the affected part of the battery system must be repaired or replaced in the affected string.

- ❑ ESS COOLANT LEAK (Amber)

NOTE:

This message has been removed from the text messages.