INSTRUCTION TO SERVICE

ITS60429	May 26,2022
SECTION:	284-ELECTRICAL PANELS (SC, RP)
WRITTEN BY:	Filipe Matias
SUBJECT:	Install ultracapacitor delay relay
ISSUE:	Ring gear damage causing stalling and inhibiting the bus from starting (Only for SR-2276)
SUMMARY:	Ring gears are being damaged from excessive torque upon startup. Excessive torque occurs when low voltage batteries are fully charged and ultracap engages upon startup. To remedy this issue, this ITS will add a delay to the ultracap to lower the impulse when battery charge is greater than 24V.

ITS60429

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. Turn the main battery disconnect switch to the “OFF” position.
2. Gain access to the Side Console in the Driver’s area as shown in Figure 1.

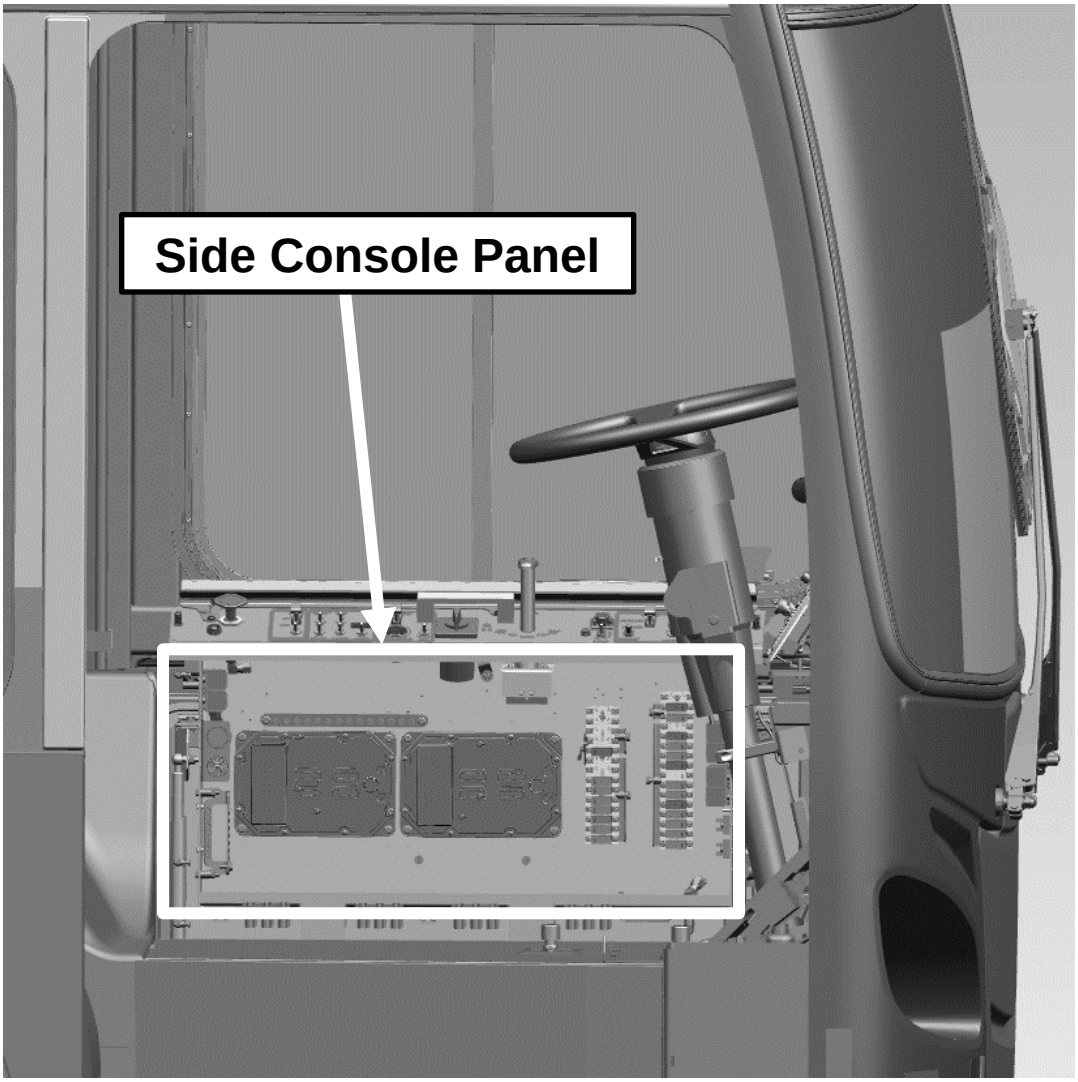

Figure 1 - Location of Side Console Panel

3. Locate the wire 11PS22VB, connected from the Start Push to Start Switch on Term 4 (see Figure 2), to connector XSC68 (Pin C) as shown in Figure 7.
4. De-pin/disconnect both ends of the wire and discard.

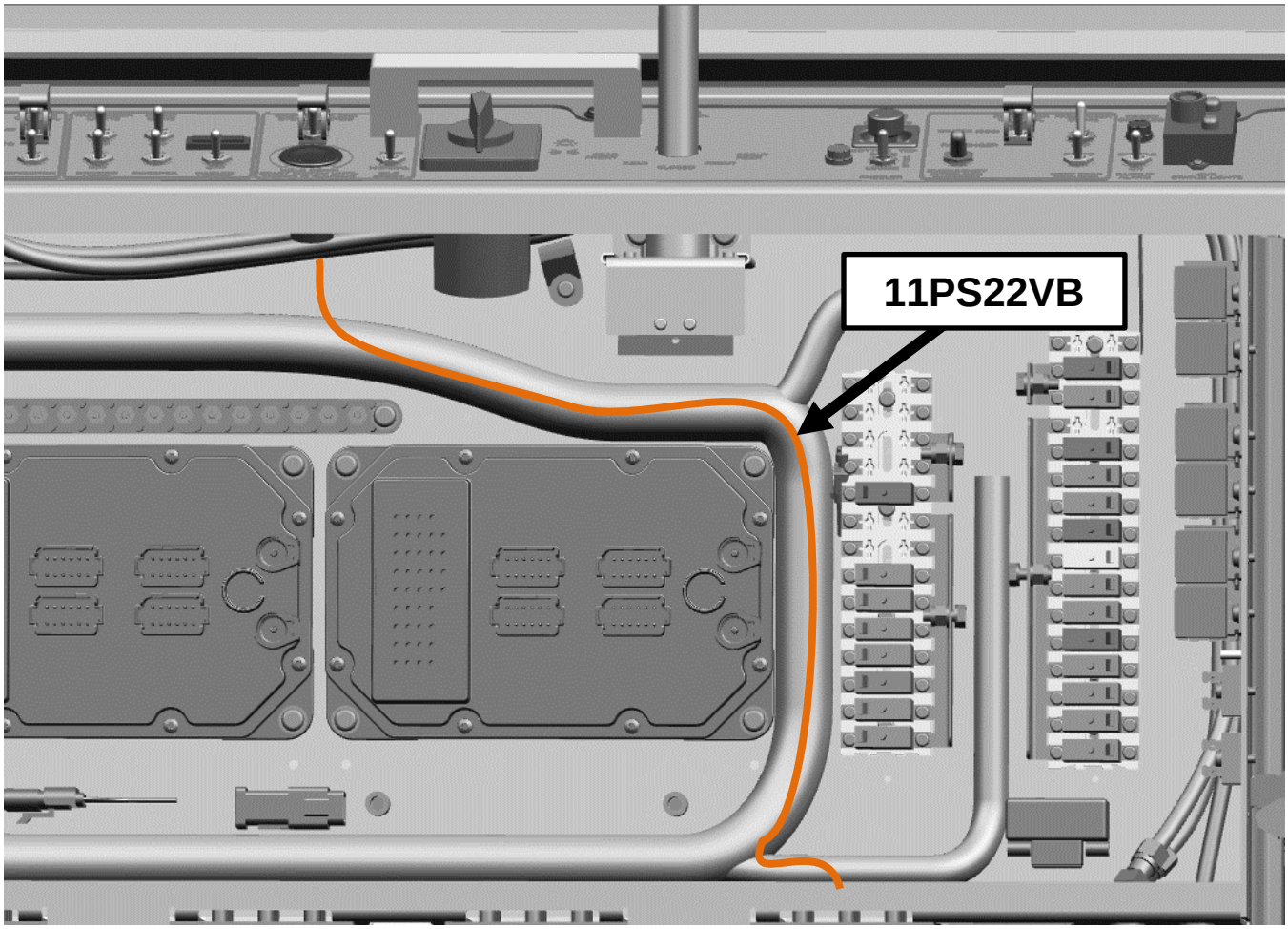

Figure 2– Location and removal of wire 11PS22VB

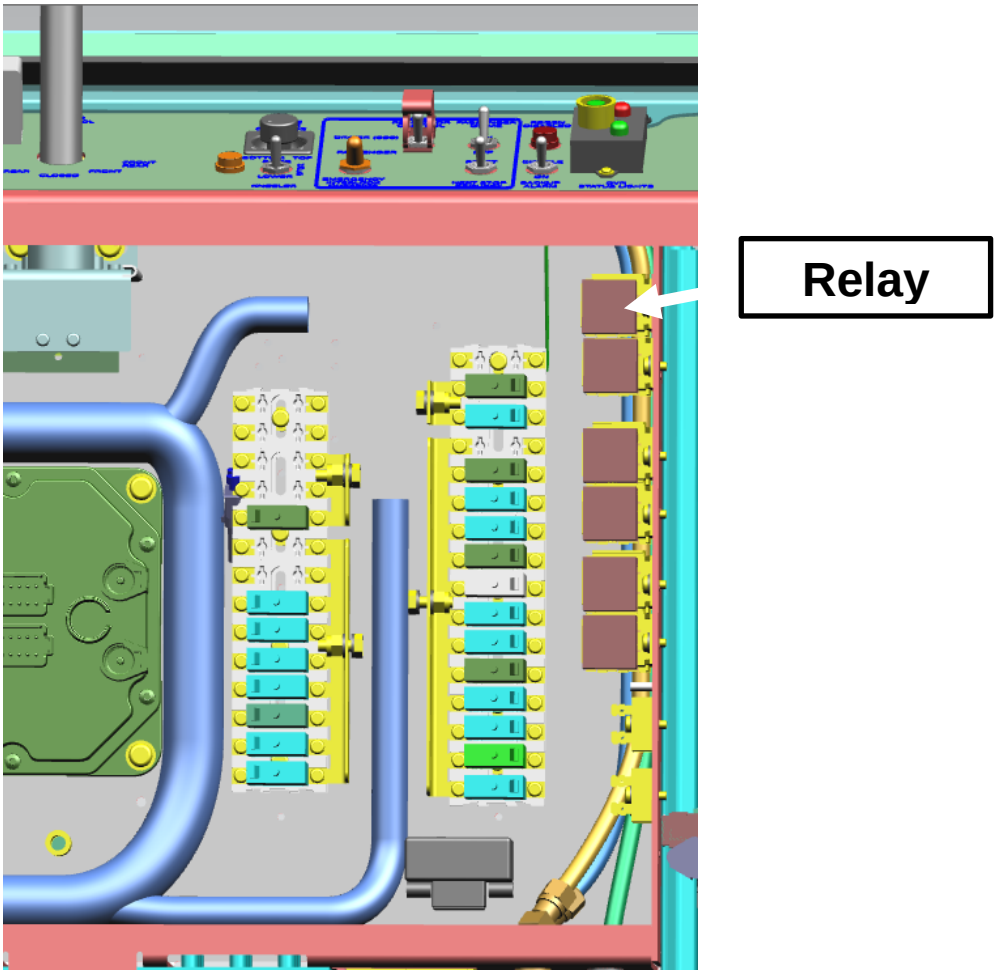

Figure 3 – Relay Location

5. Mount the new relay UCAP DELAY RLY on the right side of the Side Console Panel as shown in Figure 3.
   Use the following parts:
   a. Screw P/N: 14S00006 ☞ **NOTE:** Torque to 22 IN-LBS (DRY)
   b. Washer P/N: 659000
   c. UCAP DELAY RLY P/N: 106614
   d. Base – Locking Relay Socket P/N: 685168
   e. Lock – Relay Base P/N: 685169

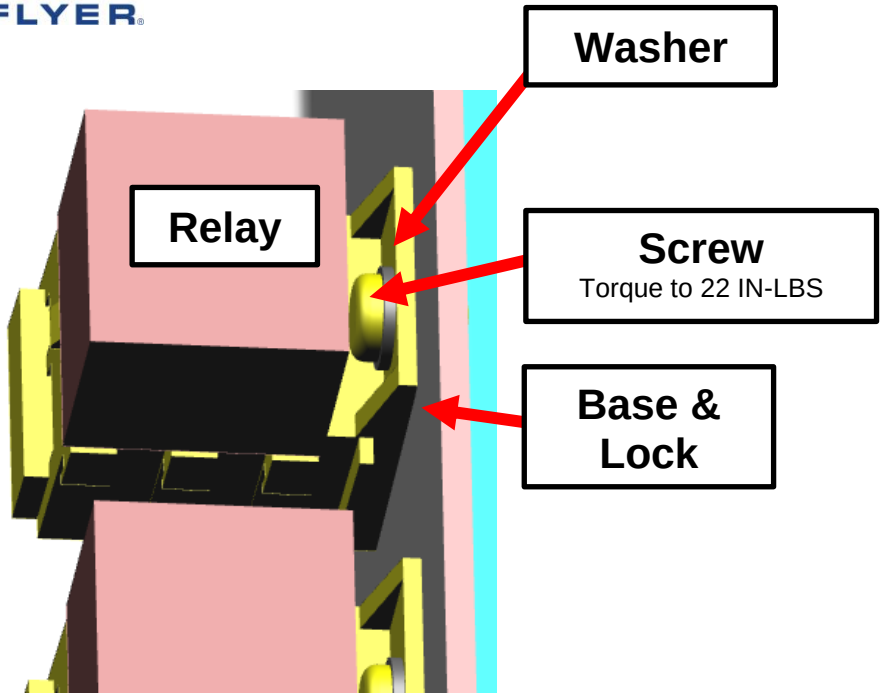

Figure 4 – Relay Installation Detail

6. Using the supplied harness P/N: 908557, route the wires to the respective locations according to the table 1 below and Figure 4. For further reference, you can also view the schematic in Figure 14.

Table 1: Jumper harness P/N: 908517 pinouts

Wire Code	X end terminal positions	UCAP terminal positions	X end terminals	UCAP terminals	Wire color
99PS22VB	XSC68-SHR-C	UCAP DELAY RLY-87a	034795	682919	Tan
99PS99AA	FRONT START PB-TWR-4	UCAP DELAY RLY-30	034794	682919	Tan
99PS99AB	XSC21-SHR-C	UCAP DELAY RLY-86	034795	682919	Tan
99PS99AC	GNDBSDS-13-2	UCAP DELAY RLY-85	170794	682919	White

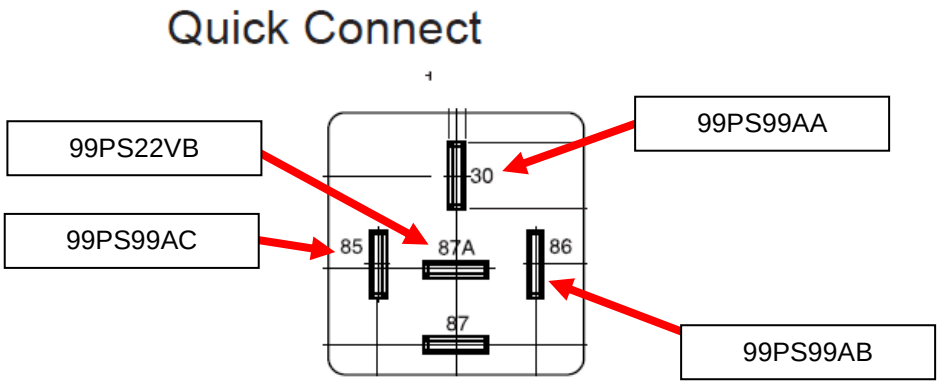

Figure 5 – Relay Connections

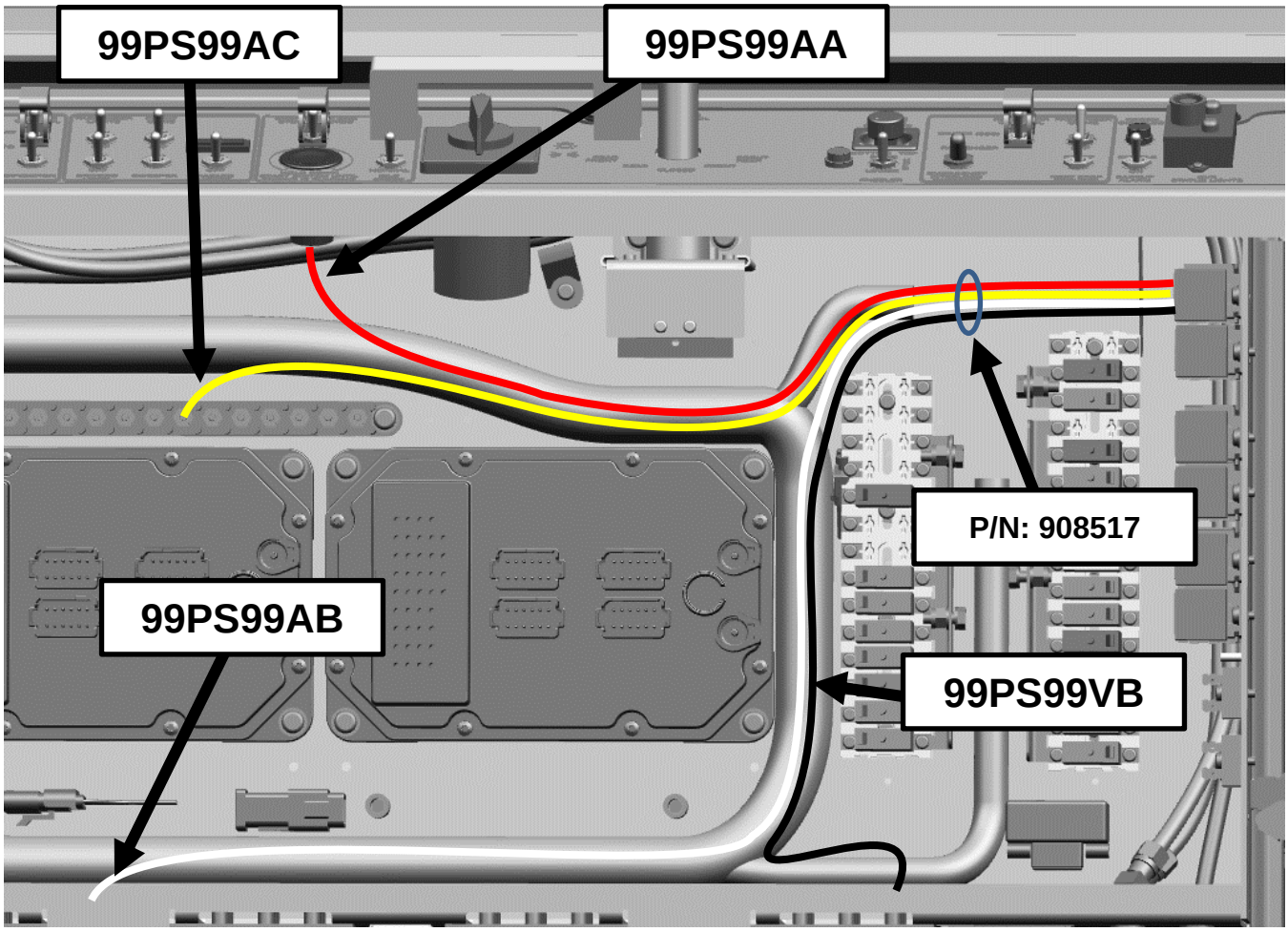

Figure 6– Harness Routing

7. Connect the wires:
   a. 99PS22VB to XSC68, Pin C
   b. 99PS99AA to Push to Start Button, Term 4
   c. 99PS99AB to XSC21, Pin C
   d. 99PS99AC to Ground stud

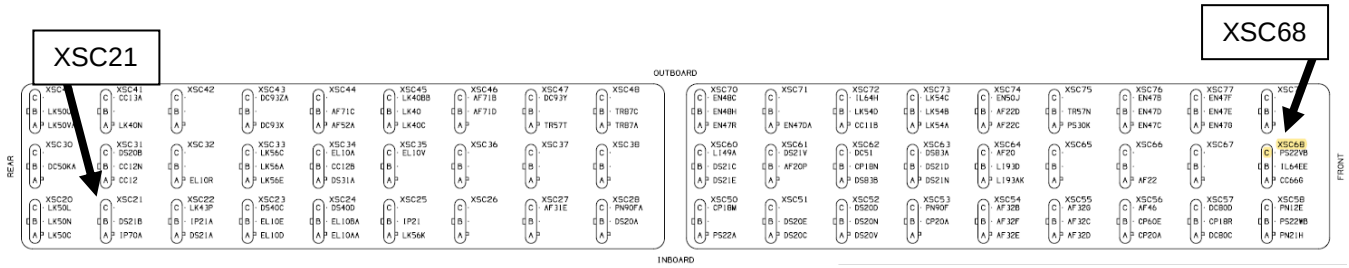

Figure 7– Connections (Bottom of Side Console)

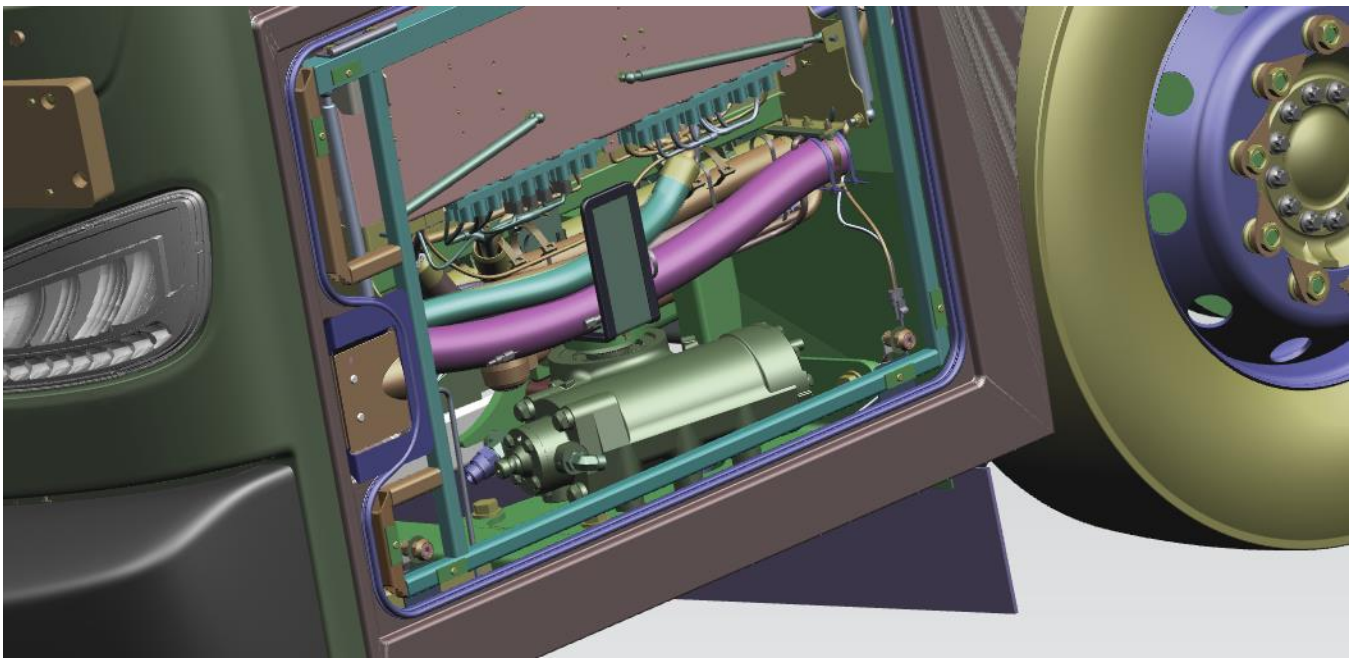

Figure 8 – Front Left side panel

8. Gain access to the Front Left side panel as shown in Figure 8.

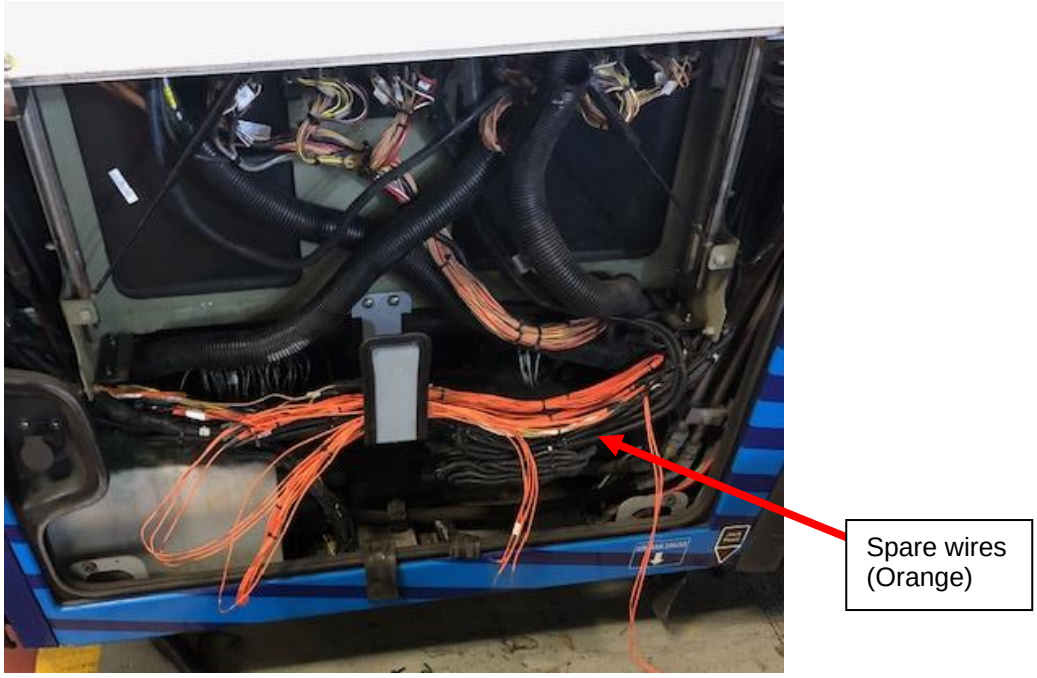

Figure 9 - Exterior side console view spare harness (Loom removed)

9. Cut the Plastic Ties and remove the Loom as shown in Figure 9.
10. Locate spare wire 53SPR53E 14OR. Strip the insulation from the end of the wire and crimp terminal P/N: 102879; connect to Connector XSC21, pin C.

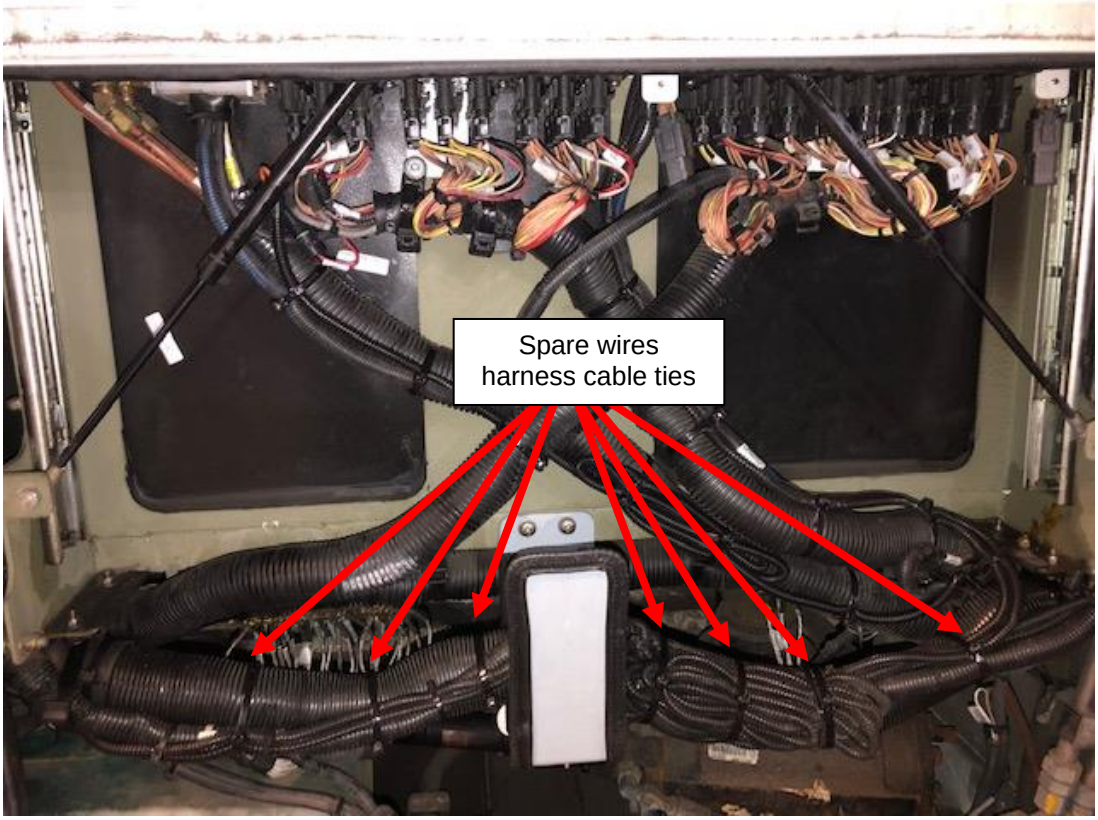

Figure 10 – Harness Detail

11. Install the Loom over the harness and secure using plastic ties P/N 5958112, 5955945 or 351161, according to the bundle diameter.

12. Gain access to the Rear Panel
13. Locate Spare wire 53SPR53E in Harness P/N 728214 (Right Hand Options) inside the Rear Panel.
14. Strip the insulation from the end of the wire and crimp terminal P/N 034793; Insert in connector XRR53_SHR, location 3 as shown in Figure 11& Figure 12.
15. Route wire 99PS99AD from Module Node 14 to connector XRR53_SHR as shown in Figure 11.
16. Insert one end of wire 99PS99AD to connector XRR53_SHR and the other to J3-6 on Node 14 (Figure 13).

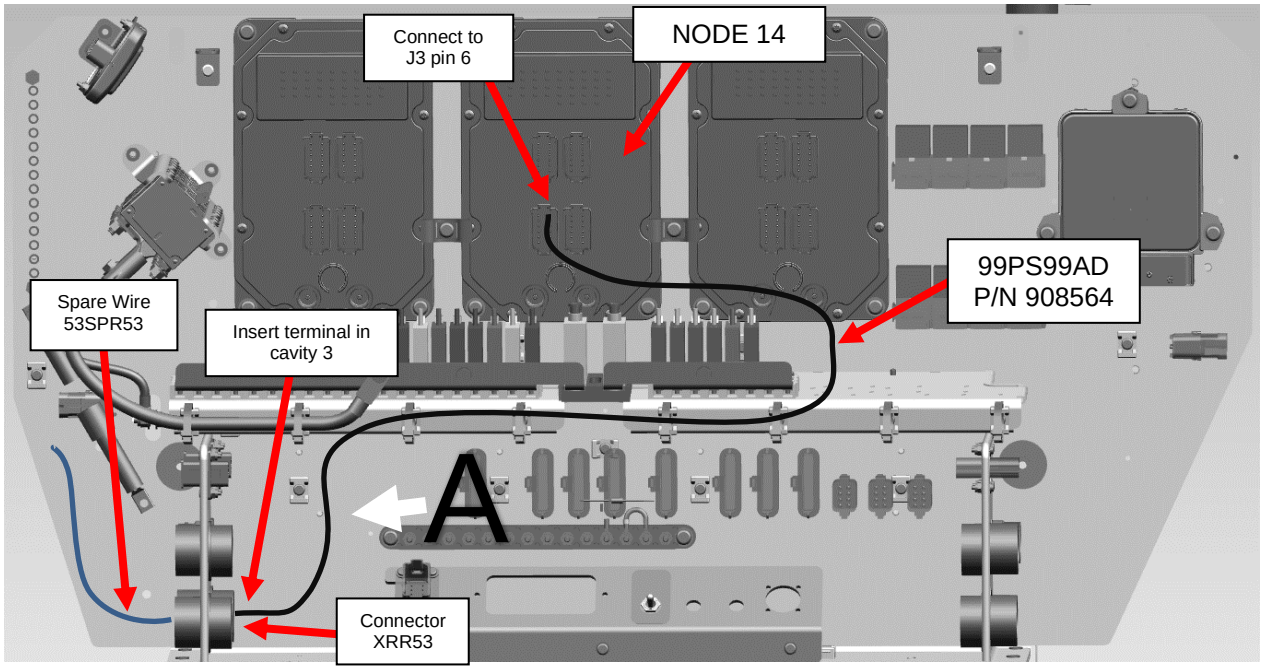

Figure 11 – Rear Panel

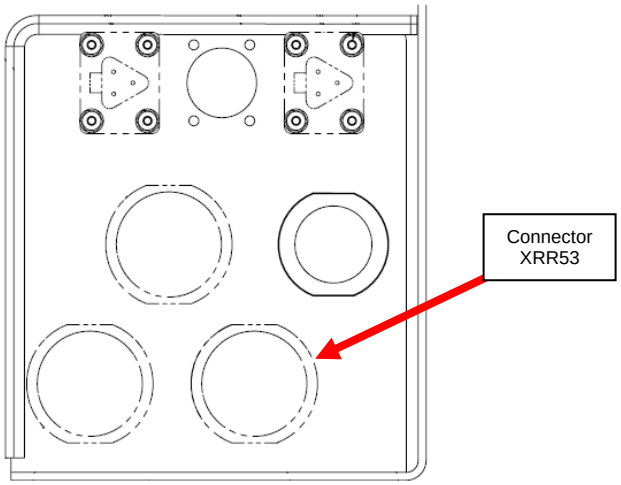

Figure 12 – View A - Connector XRR53 Location

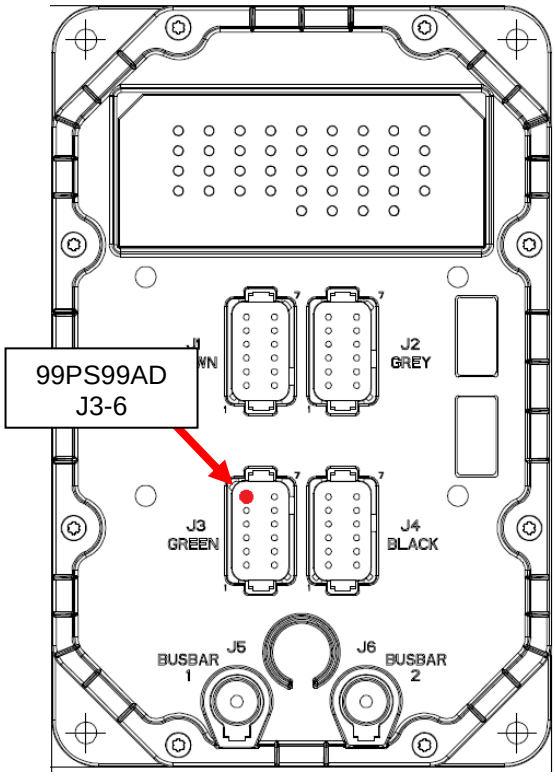

Figure 13 – Node 14 (J3-6 detail)

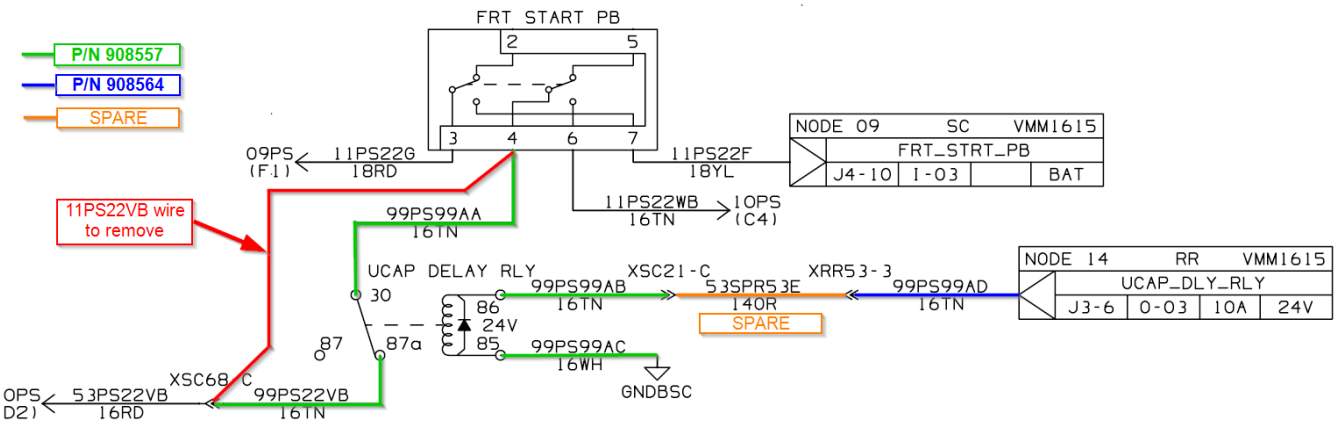

Figure 14 – Schematic

17. Secure all the wires to the existing harness bundles using the plastic ties P/N 5958112 or 5955945, according to the diameter of the bundle.

18. Ensure all connectors are connected. Remove all tools and debris from work area to return coach to service.

19. Turn the main battery disconnect switch to the “ON” position.
20. Turn 4way flashers on, then download the latest released PLC program “765061C.vmm” onto the bus. Then turn 4way flashers off once PLC program has finished downloading.

21. Test bus after ITS procedure is complete:
    a. Assure that the main battery disconnect switch has been in the “ON” position for at least 15 seconds to allow the ultracapacitor to charge.
    b. To test the ultracapacitor delay relay, the bus batteries will need to be below 24V. Use a multimeter to check voltage of the 24V system on the 24VBAT Bus Bar in the Side Console and assure the battery voltage is below 24V. Turn on bus lights to drain battery below 24V, if necessary. See location of 24VBAT in Figure 15.

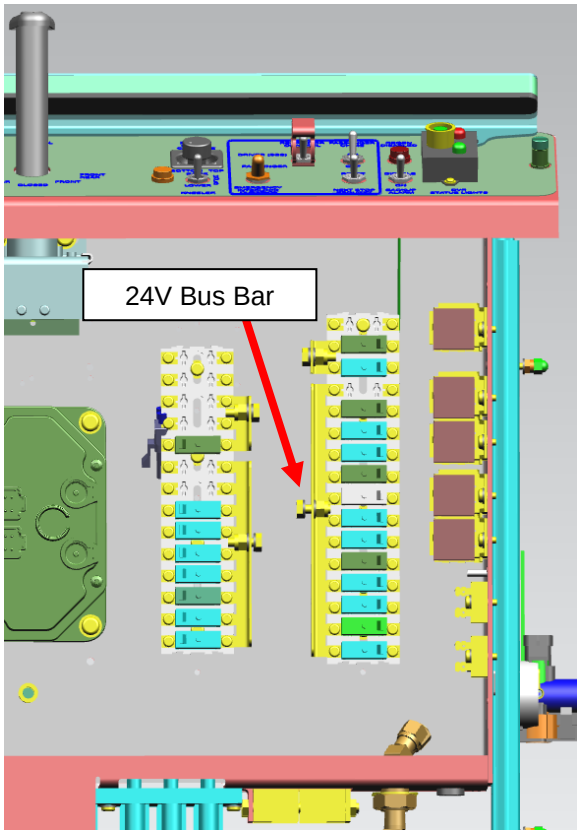

Figure 15 – Side Console (24VBAT)

    c. Once the battery voltage is under 24V, check if there is continuity across pins 30 and 87a of ultracap delay relay. See schematic in Figure 14. The relay is normally closed.

d. Press the front start push button, wait at least 1 second and check continuity across pins 30 and 87a of ultracap delay relay again. There should be no continuity across pins 30 and 87a at this point. If there is continuity, then please contact New Flyer service.

22. Rework is complete.

LABOUR ESTIMATE				
	Operation	Number of Technician(s)	Hours	Labor Time T X HR
1	Install ultracapacitor delay relay	1	3.5	3.5

PARTS REQUIRED					
Item	Part Number	Description	Qty. per Coach	Units	Notes
1	102879	SOCKET-FEM TERM	1	EA	
2	034793	SOCKET DEUTSCH 16-14AWG	1	EA	
3	659000	WASHER FLAT SST 10	1	EA	
4	14S00006	SCREW MACHINE NO 10 PN HD	1	EA	
5	685169	LOCK- RELAY BASE	1	EA	
6	685168	BASE- LOCKING RELAY SOCKET	1	EA	
7	106614	RELAY 24V SPDT	1	EA	
8	5962614	TYRAP MIN 4" BLACK	20	EA	Use as necessary
9	5958112	TYRAP-7.0 BLACK	20	EA	Use as necessary
10	5955945	TYRAP-HVY 14" BLACK	20	EA	Use as necessary
11	351161	CABLETIE-WIDE HEAVY-DUTY	4	EA	Use as necessary

SPECIAL TOOLS REQUIRED					
Item	Part Number	Description	Qty.	Units	Notes
1	NPN	DELPHI CRIMPER	1	EA	
2	NPN	MULTIMETER	1	EA	