



INSTRUCTION TO SERVICE

ITS: 59084	
SECTION:	260 BATTERY COMPARTMENT
WRITTEN BY:	Kristian Melo
SUBJECT:	CPAC Retrofit

ITS-59084

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PROCEDURE:

1. Turn the main battery disconnect switch to the “OFF” position.
2. Locate and gain access to the ComBox which is underneath the street-side side-skirt. Refer to figure 1 below for location.

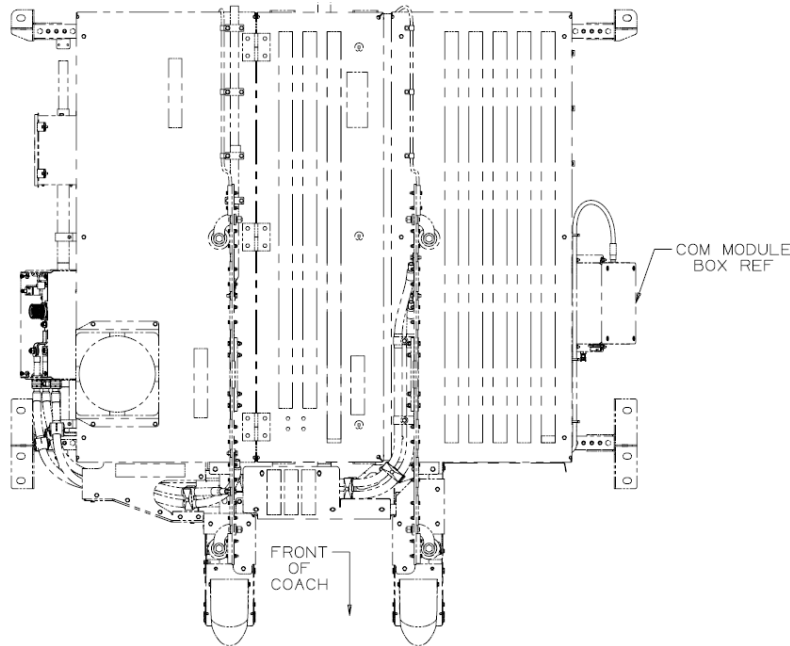


Figure 1: Location of ComBox

3. Disconnect the harnessing to the ComBox, remove the existing ComBox modules, mounting plates, and all wiring inside the container except the coax antenna cable.
4. Save ComBox so it may be returned.
5. At the 23 pin connector on the outside of the ComBox container, de-pin all the wires listed below and plug the now open cavities with the provided cavity plugs (PN: 8110650).
 - a. 49EP18#4 (DRN, BK, CLR), 49EP18C, 49EP18CA, 49EP18CB, 49EP18CC, 49EP18AE, 49EP18B, 49EP18AA.
6. Locate provided mounting plate (PN: 866418), screws (PN: 14S98008), washers (PN: 50W98000), and nuts (PN: 90N98000). Refer to figure 2.
7. Attach the provided CPAC WCCM module (PN: 819585) to the installed bracket using the provided bolts (PN: 72BM05020) and loctite (PN: 081034).

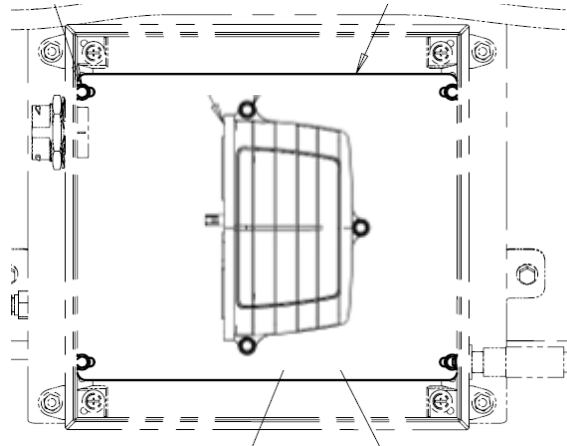


Figure 2: CPAC Bracket and Module Install

8. Locate the provided cable adapter (PN: 860398) as well as the antenna cable previously removed from the ComBox.
9. Install the appropriate end of this adapter into the antenna cable and then insert the other end into the CPAC WCCM.
10. Install the provided propulsion roof front jumper harness (PN: 866876).
 - a. Locate provided connectors WCCM-A (PN: 158113) and WCCM-B (PN: 820582). Insert the appropriate wires from this jumper as indicated in Table 1 below.
 - b. The “*99” wires in Table 1 indicate that this jumper wire will need to be made from scratch. Using the supplied wire and terminals assemble the wires as indicate in the table and install.
 - c. Note the connector WCCM DIAG will need to be created to connect to the 99EP18#3 wires. Use the provided connector (PN: 199914).
 - d. Plug the WCCM A and B connectors into the WCCM
 - e. Disconnect wires 99EP18DA, DB, and DC from the rest of the jumper harness and close the box.
 - f. Create connector XSEN99-TWR using the provided connector (PN: 162463) and pins (PN: 034794) and the 49EP18#4 wires disconnected in step 5. Refer to Table 2 for details.
 - g. Install the remaining wires from the jumper that were separated from the rest of the harness in step 10e as shown in Table 2.

Table 1: WCCM Connections

Wire Number	Wire Color	X Terminal	X Connector	Y Terminal	Y Connector
99EP18BA	RD	Provided w/ jumper	WCCM-B-2	115385	XBBEP91-B
99EP18BB	RD	Provided w/ jumper	WCCM-B-3	115385	XBBEP91-A
99EP18HA	WH	Provided w/ jumper	WCCM-B-26	115385	XBBEP92-C
99EP18HB	WH	Provided w/ jumper	WCCM-A-12	115385	XBBEP92-D



*99EP18CD	WH	158114	WCCM-B-1	034795	COMBOX-23CCT-TWR-O
*99EP18A	TN	158114	WCCM-B-30	034795	COMBOX-23CCT-TWR-A
*99PNJ9#16YL	YL	158114	WCCM-A-5	034795	COMBOX-23CCT-TWR-P
*99PNJ9#16GN	GN	158114	WCCM-A-5	034795	COMBOX-23CCT-TWR-Q
*99PNJ9#16DRN	DRN	Trim	Trim	034795	COMBOX-23CCT-TWR-R
*99EP18#3YL	YL	158114	WCCM-A-9	034794	WCCM DIAG-A (199914)
*99EP18#3GN	GN	158114	WCCM-A-10	034794	WCCM DIAG-B
*99EP18#3DRN	DRN	Trim	Trim	034794	WCCM DIAG-C
*99EP18CE	WH	158114	WCCM-A-22	034795	COMBOX-23CCT-TWR-N
*99EP18AB	RD	115385	XBBEP91-D	034795	COMBOX-23CCT-TWR-B
*99EP18AH	WH	115385	XBBEP92-E	034795	COMBOX-23CCT-TWR-D

Table 2: Propulsion Roof Front Jumper Harness Connections

Wire Number	X Connector	Y Connector
99EP18DA	XBHRFFT-TWR-7	XSEN99-SHR-A
99EP18DB	XBHRFFT-TWR-8	XSEN99-SHR-B
99EP18DC	XBHRFFT-TWR-9	XSEN99-SHR-C

11. Create and install the XBBEP93 and XBBEP94 bus bars.

- Locate the provided bus bars (PN: 119052) and label them XBBEP93 and XBBEP94 respectively.
- Locate wires 49EP18B, C, CB, AA, CC and CA disconnected in step 5. Cut and re-terminate them with the provided terminals (PN: 115385).
- Install these wires into the new XBBEP bus bars and plug the open connections with the provided terminal plugs (PN: 102904). Refer to Table 3 below.

Table 3: XBBEP Connections

Wire Number	Connector
49EP18B	XBBEP93-C
49EP18C	XBBEP93-D
49EP18CB	XBBEP93-F
49EP18AA	XBBEP94-C
49EP18CC	XBBEP94-D
49EP18CA	XBBEP94-E

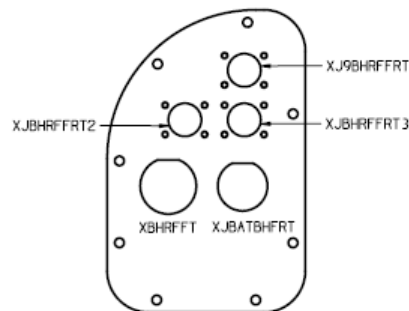
12. Create connector XJ9DCRAIL-TWR

- Located pothead connector XJBHRFFRT3 (Figure 3) on the inside of the bus and remove the 47EP18#2 wires. Plug the now open ports on this connector with the provided cavity plugs (PN: 8110650).

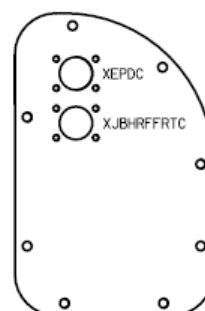
- b. Locate the provided Deutsch connector (PN: 162463) and terminate these as indicated in Table 4. This connector will now be referred to as XJ9DCRAIL-TWR.
13. Install the provided propulsion interior jumper harness (PN: 868459).
- Locate the XJ9SDS connector inside the SDS box. Connect the 99EP18#66 wires to this connector as indicated in table 4 below.
 - Insert the connector on the other end of these wires to the previously created connector XJ9DCRAIL-TWR.
 - Locate the XSDS47 connector inside the SDS box and connect wire 99EP18DC as indicated in table 4.
 - Located ground bar GNDPLHC (seen in figure 4 below) and install wires 99EP18DA and 99EP18DB using the existing hardware.
 - Route the other end of all the other wires to pothead connector XBHRFFT on the SS shown in figure 3. Connect these wires to XBHRFFT as indicated in table 4.

Table 4: Propulsion Interior Jumper Harness Connections

Wire Number	X End Connection	Y End Connection
99EP18#66DRN	XJ9SDS-TWR-F	XJ9DCRAIL-SHR-C
99EP18#66GN	XJ9SDS-TWR-E	XJ9DCRAIL-SHR-B
99EP18#66YL	XJ9SDS-TWR-D	XJ9DCRAIL-SHR-A
99EP18DA	GNDPLHC	XBHRFFT-SHR-7
99EP18DB	GNDPLHC	XBHRFFT-SHR-8
99EP18DC	XSDS47-TWR-18	XBHRFFT-SHR-9
99EP18AB	-	-
47EP18#2YL	XJ9DCRAIL-TWR-A	-
47EP18#2GN	XJ9DCRAIL-TWR-B	-
47EP18#2DRN	XJ9DCRAIL-TWR-C	-



FRONT PLATE LV POTHEAD
(LOOKING FROM REAR OF COACH)



FRONT PLATE LV POTHEAD
(LOOKING FROM REAR OF COACH)

Figure 3: Front Pothead Connectors

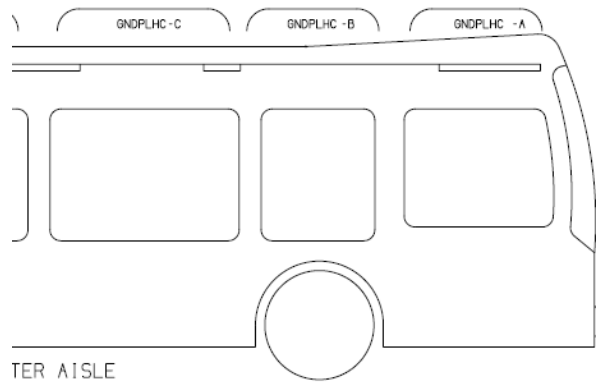


Figure 4: Ground Point GNDPLHC

14. Install the provided SDS panel jumper harness (PN: 868277).
 - a. Locate spare wire 83SPR83AE at connector XSDS30-14. Disconnect this wire and re-terminate with provided pin (PN:108874) and connect to REP66-TWR-B which is included in the jumper harness.
 - b. Gain access to VMM nodes 21 and 22 located on the back side of the SDS panel. Insert the appropriate wires from this jumper into these connectors as indicated in Table 4 below.
 - c. Locate the connector XSDS47 in the SDS box. Install the other ends of wires EP18AB and EP18DD into this connector as indicated in Table 4.
 - d. Locate connector XJ9SDS in the SDS box. Install wires 99EP18#55 into this connector as indicated in Table 4.

Table 4: SDS Panel Jumper Harness Connections

Wire Number	Connector pin
99EP18#44GN	Node 21 J1-9
99EP18#44YL	Node 21 J1-8
99EP18#44DRN	TRIM
83SPR83AE	REP66-TWR-B
99EP18DE	Node 21 J2-11
99EP18DC	XSES47-SHR-18
99EP18#55DRN	XJ9SDS-SHR-F
99EP18#55GN	XJ9SDS-SHR-E
99EP18#55YL	XJ9SDS-SHR-D

15. Once all the harnesses are installed ensure they are secured along existing routing paths using the provided tyrap (PN: 5958112).
16. Remove all tools and debris and return the bus to service condition.
17. Turn the main battery disconnect switch to the "ON" position.
18. Contact your RPSM to gain access to the PLC and IP cluster programs that accommodate this retrofit. Install this program and perform overhead charging tests when available to ensure retrofit was successful.



LABOUR ESTIMATE				
	Operation	Men	Hours	Labour Time M X HR
1	Retrofit CPAC	1	3	3

PARTS REQUIRED					
Item	Part Number	Description	Qty. per Coach	Units	Notes
1	90N98000	NUT-HEX MACH SST 8-32	4	EA	
2	866418	ASSY-WCCM MOUNTING WLD	1	EA	
3	819585	MODULE-CPAC WCCM	1	EA	
4	72BM05020	BOLT-M5X0.80X20 FLG CL10.9	3	EA	
5	50W98000	WASHER FLAT SS #8	8	EA	
6	14S98008	SCREW MACHINE 1/2	4	EA	
7	081034	LOCTITE-243 MEDIUM 10ML	0.01	EA	
8	868277	HRNS-JUMPER SDS PANEL	1	EA	
9	866876	HRNS-JUMPER PRPLN ROOF FRT	1	EA	
10	868459	HRNS-JUMPER PRPLN INT FRT	1	EA	
11	5958112	TYRAP-7.0 BLACK	40	EA	
12	860398	ASSY-CHRG RAIL ANT CBL ADAPTER	1	EA	
13	158113	CONN-22CCT TWR JAE	1	EA	
14	820582	CONN-30CCT TWR JAE	1	EA	
15	199914	KIT-CONN 3 CCT TWR DT BK	1	EA	
16	158114	SOCKET 22-18GA JAE	7	EA	
17	8110650	PLUG SEAL 16-12GA	25	EA	
18	158579	CABLE-2COND 20GA J1939	4	FT	
19	129422	WIRE-16GA TAN GXL	2	FT	
20	129424	WIRE-16GA WHITE GXL	6	FT	
21	142496	WIRE-16GA RED GXL	2	FT	
22	119052	KIT-6CCT TWR METRI PACK	2	EA	
23	102904	PLUG CONNECTOR	6	EA	
24	115385	TERM-SOCKET 18-16AWG	8	EA	
25	034795	PIN 18 16 AWG DEUTSH	11	EA	
26	162463	KIT-3CCT DEUTSCH CONN	2	EA	
27	034794	SOCKET 18 16AWG DEUTSCH	3	EA	
28	199914	SOCKET 18-20AWG WP	1	EA	

