



INSTRUCTION TO SERVICE

ITS: 5022	
SECTION:	219 Engine and Transmission
WRITTEN BY:	Shaun Cardinal
SUBJECT:	UCAP Fire Bottle Relocation (Legacy)

ITS5022

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PROCEDURE:

1. Turn the main battery disconnect switch to the “OFF” position.

⚠ WARNING: ALWAYS discharge the Ultra Capacitors (UCAP) before performing high voltage system maintenance on this vehicle. Refer to Section 5 of the Service Manual under *2.17 Discharging The Ultra Capacitors* for the discharge procedure.

2. RELOCATION

- a. Open the clam shell doors on top of the bus to access the UCAP assembly. See Fig 1

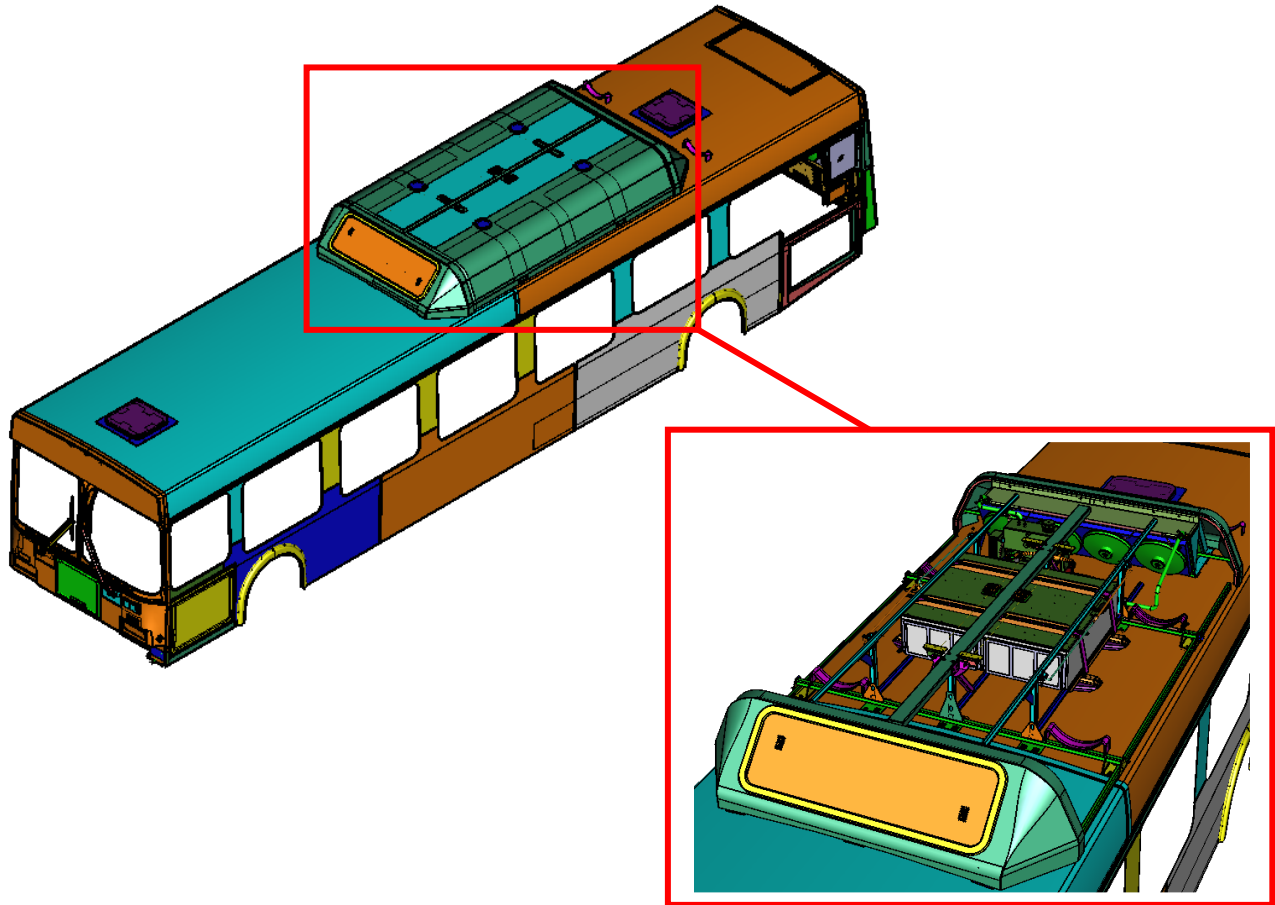
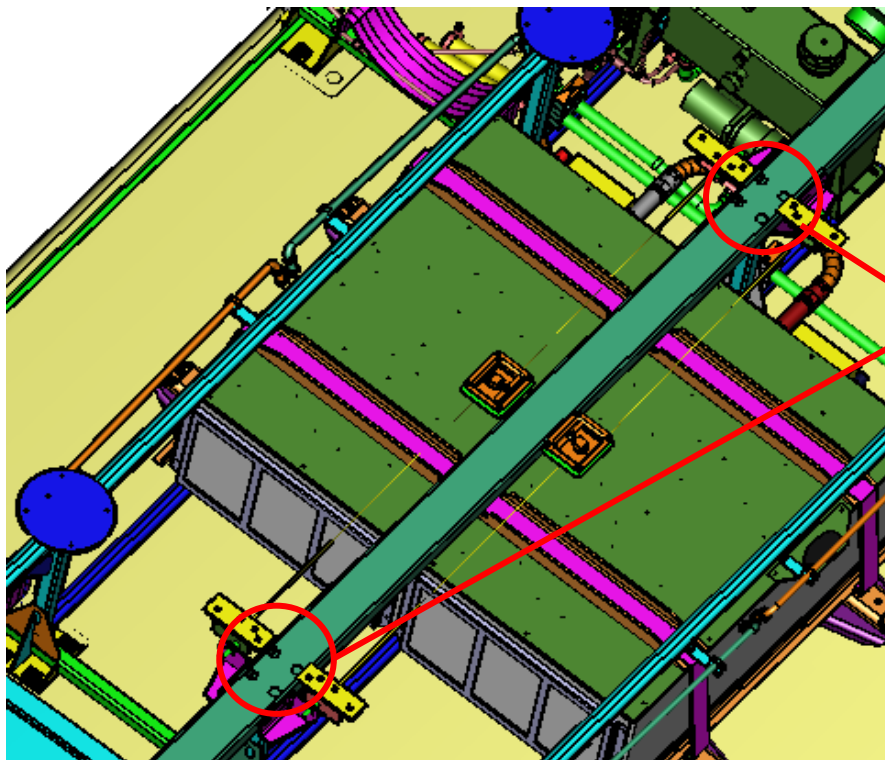
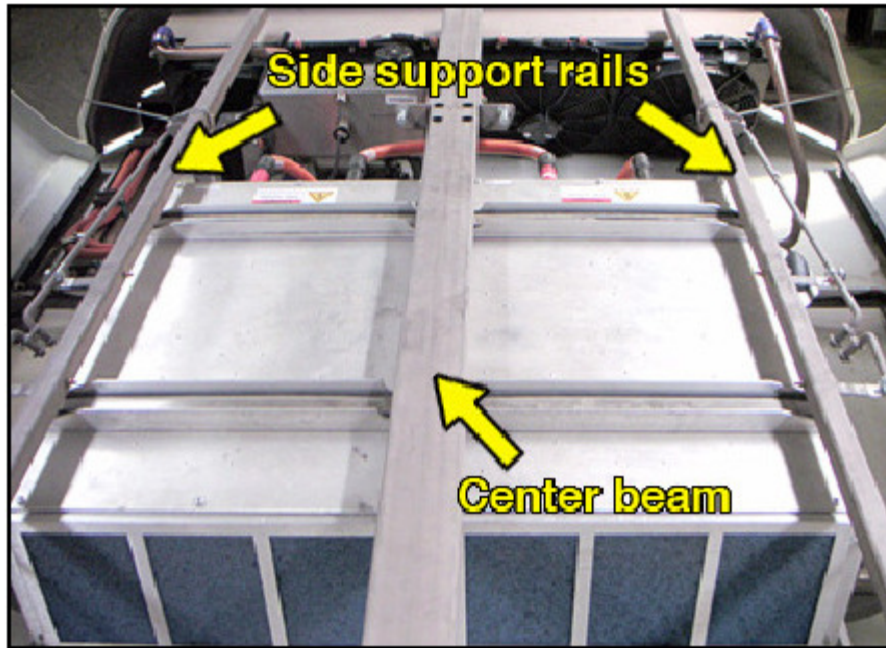


Fig 1 – Legacy UCAP Location (doors removed for clarity)



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- b. Remove the four front and rear hardware securing the center beam to the roof top frame. Trim foam strips on beam to access the hardware if required (Fig 2)



Hardware location for securing center beam to hybrid frame

Fig 2 – Legacy UCAP Beams



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- c. Remove the hardware securing side support rails (front and rear per side) see Fig 3. Before removal of curb side rail, remove coolant line clamps.

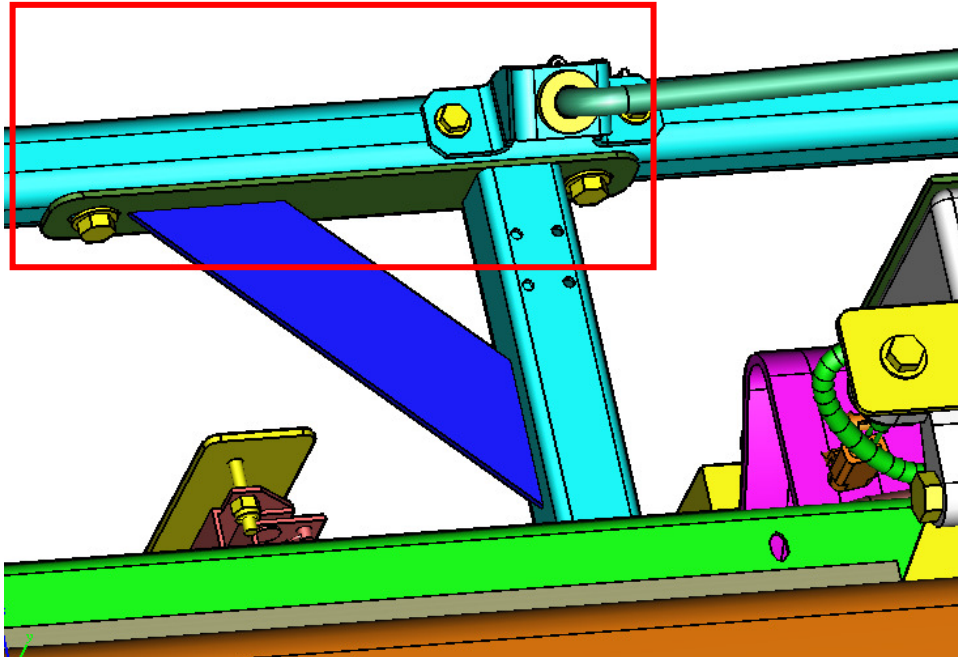


Fig 3 – Legacy UCAP Side Beams

- d. Remove the nut holding the strap to the base (one side only) of the bus. Remove strap from base and move out of the way to gain access to the UCAP lid. See Fig 4

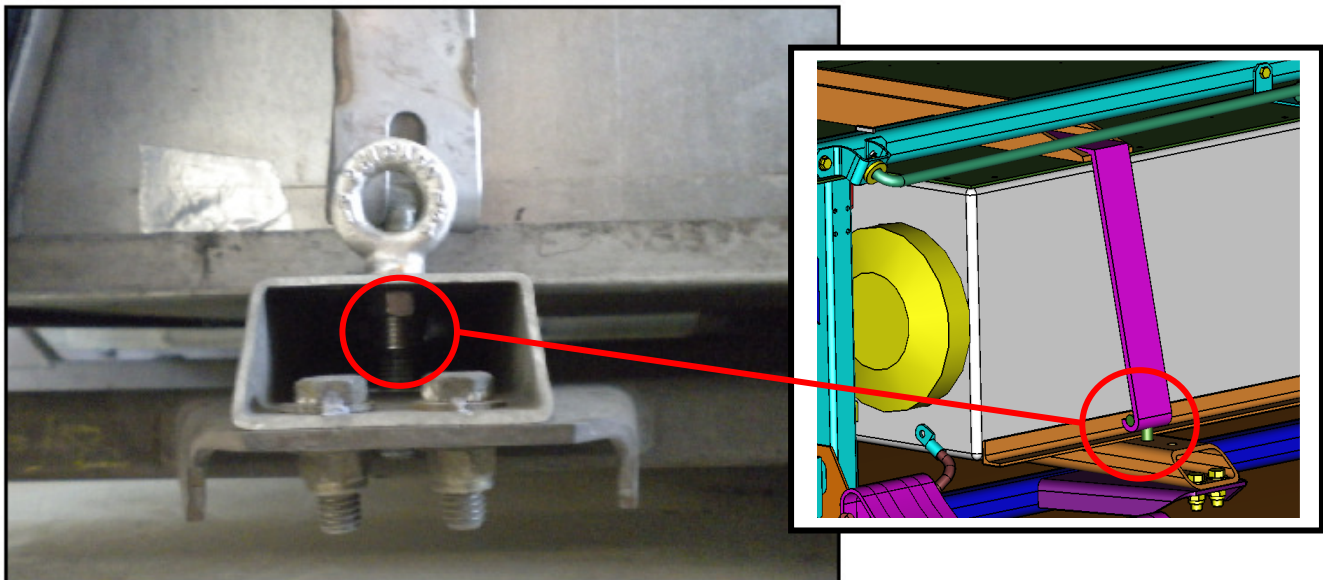


Fig 4 – Legacy UCAP Strapping



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- e. Remove all existing perimeter hardware (16x screws, washers, and lock washers per UCAP) securing the UCAP lid to UCAP box (Fig 5).

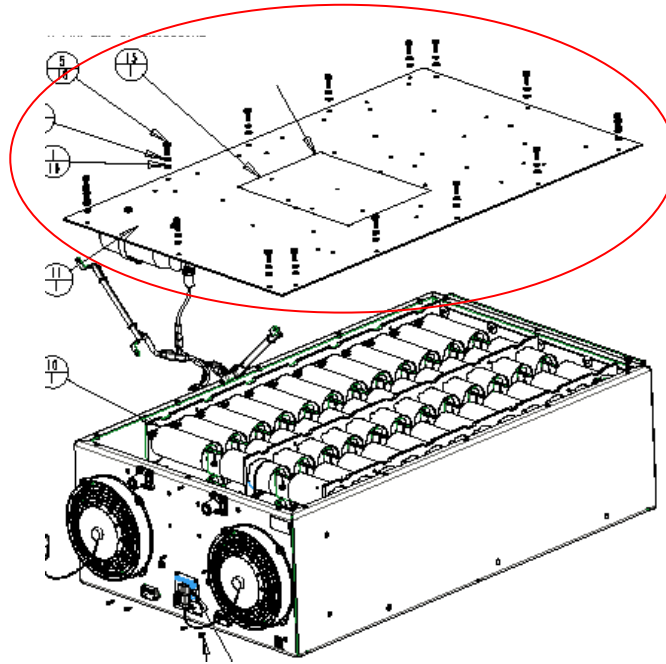


Fig 5 – UCAP Lid

- f. Deactivate (refer to orientation sticker on bottle) the bottle valve using a flat head screw driver and disconnect the fire bottle harness connection before fully opening lid and setting aside. Fig 6

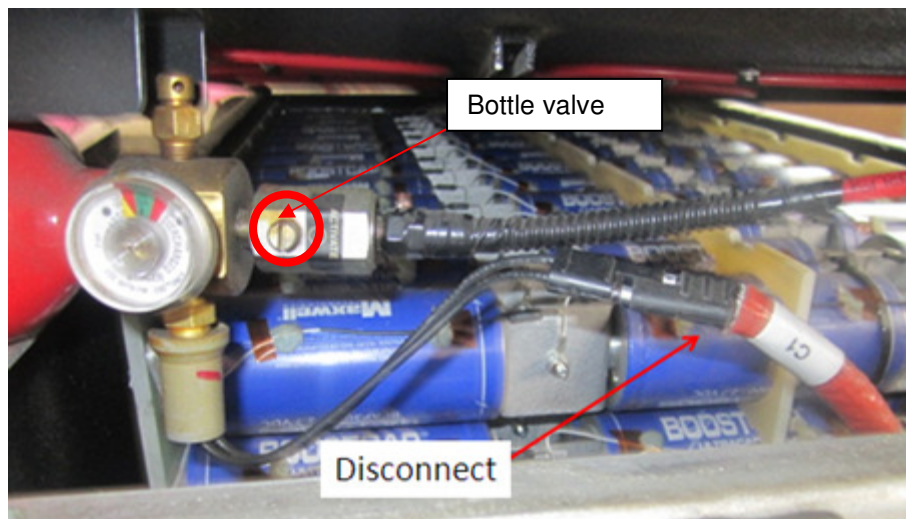


Fig 6 – Fire bottle harness

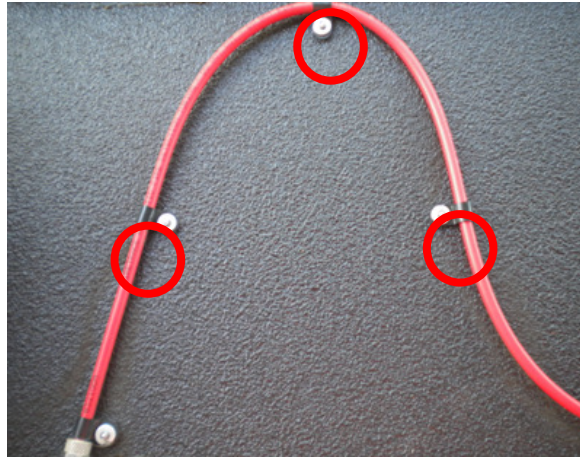
- g. Place both UCAP lids on bench to allow convenience during modifications.



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NOTE: The Ultra Capacitors located on the street side (slave pack) require you to reroute the fire suppression line. Do not perform this procedure on curbside (master pack) lid.

- h. Using a 1/8 drill bit, drill out all the rivets holding the clamps supporting the fire suppression hose under the UCAP lid on slave pack. Fig 7



 **Fig 7 – Fire suppression hose**

- i. On both lids loosen clamp for fire suppression bottle and slide out of bracket. Remove hardware securing fire suppression bottle bracket to the lid. Fig 8

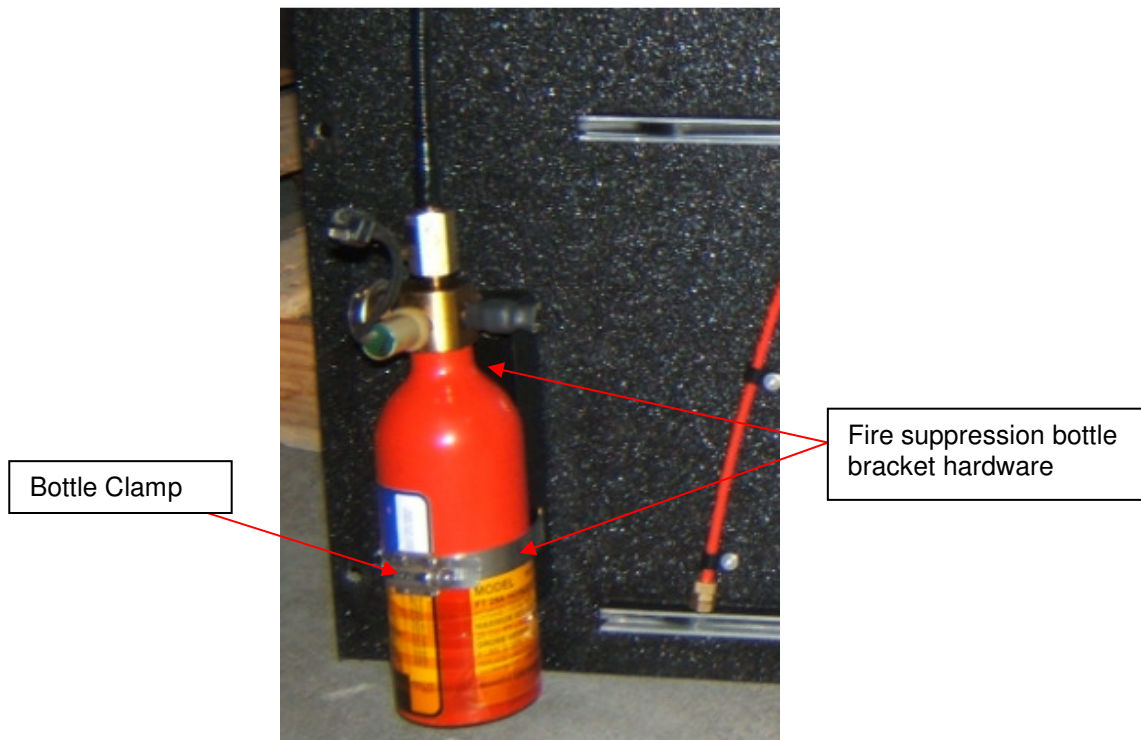


Fig 8 – Fire suppression bottle assembly

- j. Clean surface of lid to remove any residue from the mating seal.

☞ **NOTE: The Ultra Capacitors lid for curbside (master pack) requires fire bottle bracket to be relocated to opposite side. Perform step below on curbside lid only.**

- k. Create new mounting holes opposite of the existing mounting location using a 9/32" drill bit. See fig 9 for locations.

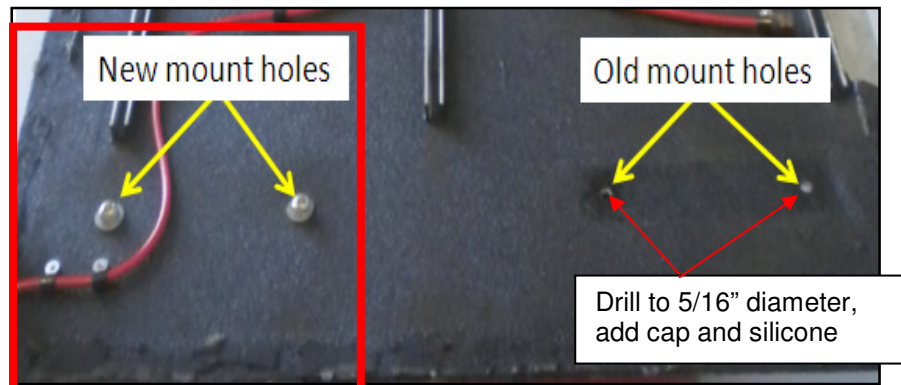
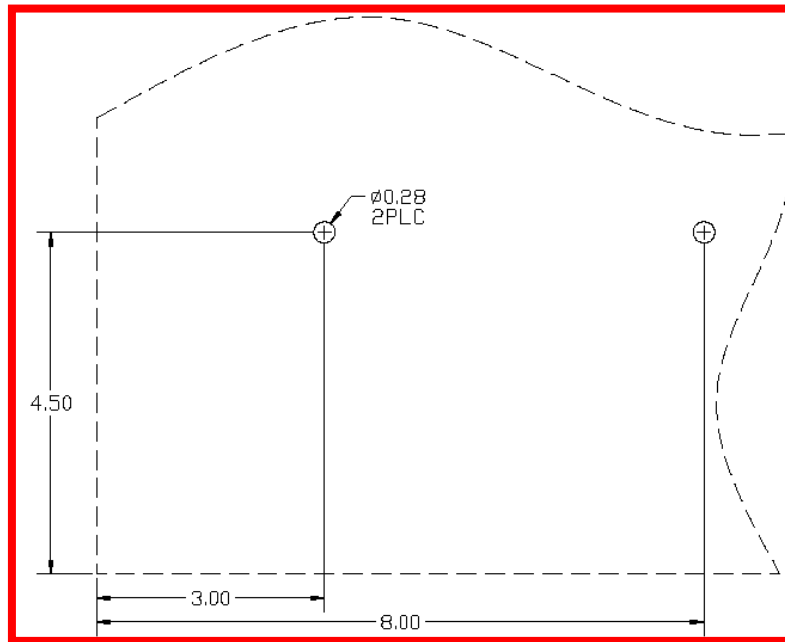


Fig 9 – Fire suppression bracket location

- l. Drill out old holes to 5/16" diameter, add caps (**NFI PN 6409106**) and silicone (**NFI PN 401722**) to the old holes to ensure they're sealed from any water intrusion. See Fig 9
- m. Re install existing fire suppression brackets to the new mounting brackets **NFI PN 485040** using existing hardware and place rubber strip (**NFI PN 362428**) on the opposite ends of the bracket. Fig 10

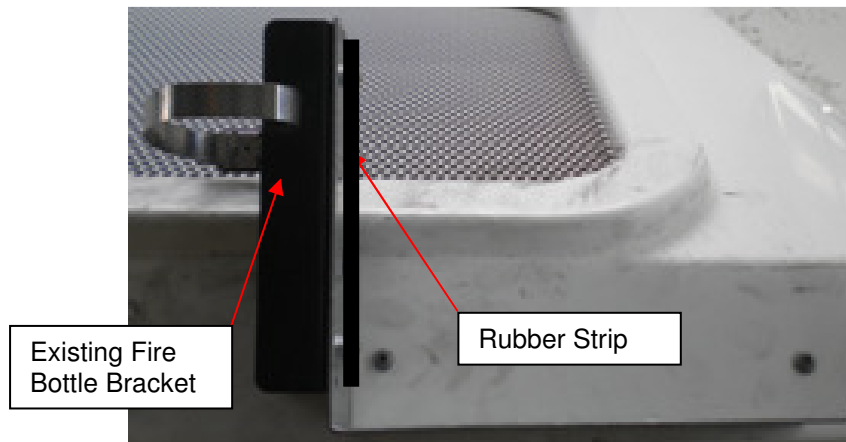


Fig 10 – Fire suppression bracket location

- n. Mount the new bracket assemblies onto both lids using two 1/4-20 UNC bolts 3/4" long (**NFI PN 10B04012**), two 1/4" lock nuts (**NFI PN 40N04000**) and four 1/4" washers (**NFI PN 10W04000**). Insert bottle gauge side out and tighten down clamp. See Fig 11

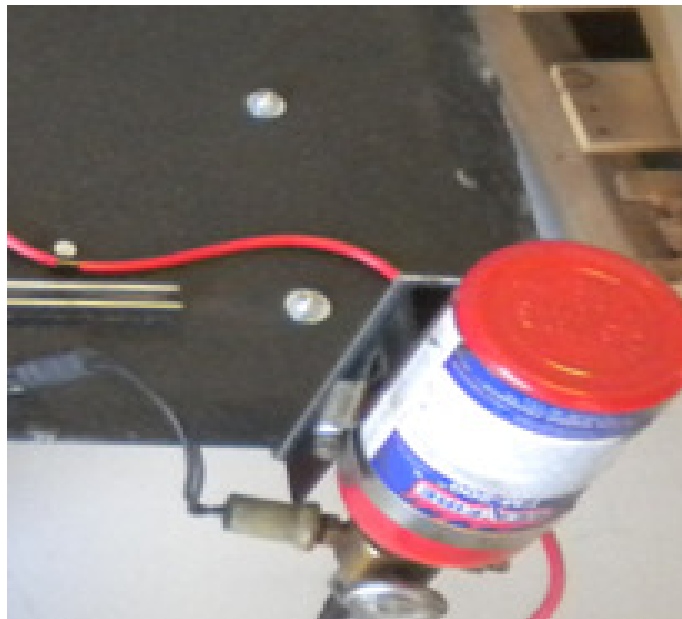


Fig 11 – Fire suppression bracket installed

- o. Route the fire suppression line back on slave pack lid using twenty two 1/8" aluminum rivets (**NFI PN 60R02005**) and twenty two #6 flat washers (**NFI PN 10W96000**) to secure clamps to the lid. Make sure to follow the same pattern of original route, basically the fire suppression hose end will be on opposite side as original configuration. Place a small amount of silicone (**NFI PN 401722**) over the rivets to ensure a water tight seal. See Fig 12.

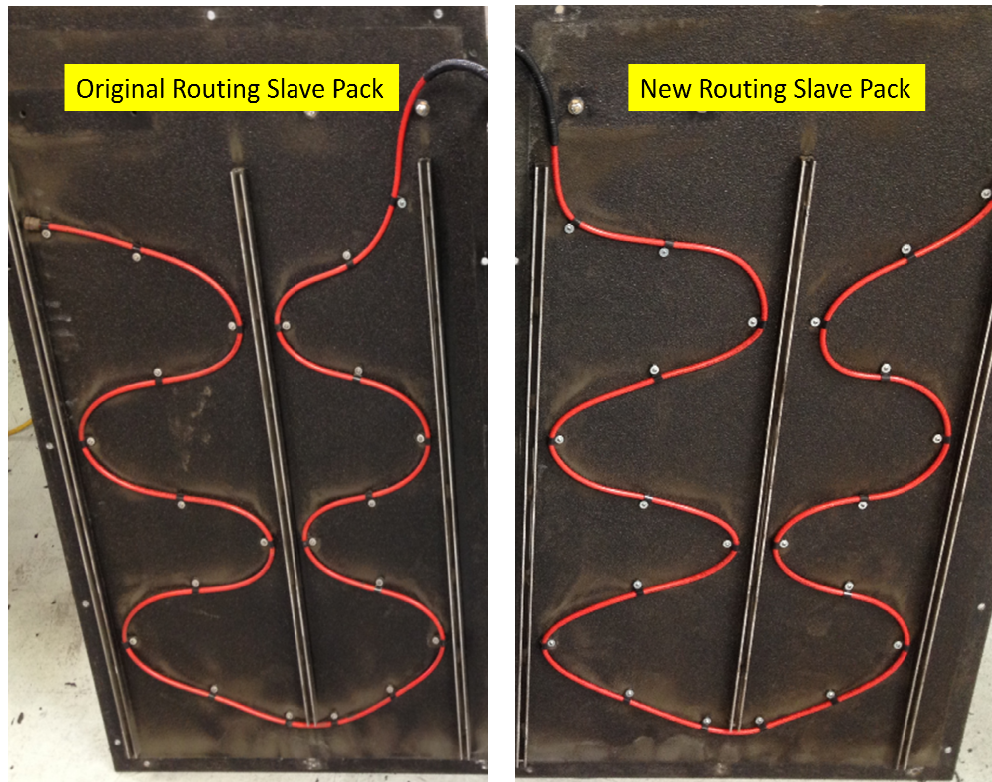
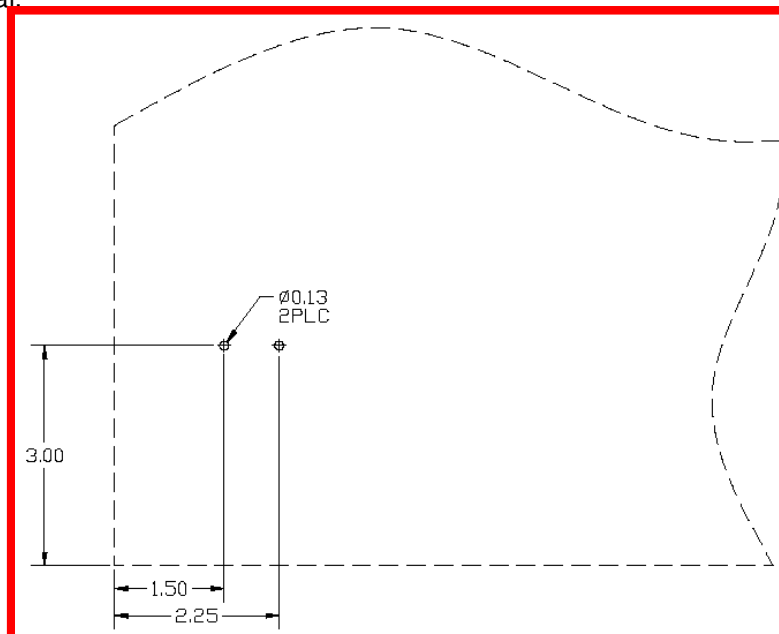


Fig 12 – Fire suppression routing

- p. Using the supplied clamps (**NFI PN 6350363**), mark their location per Fig 13 and drill holes using a 1/8" drill bit. Secure with two 1/8" aluminum rivets (**NFI PN 60R02005**) and two #6 flat washers (**NFI PN 10W96000**). Ensure a small amount of silicone (**NFI PN 401722**) is placed over the rivets to ensure a water tight seal.



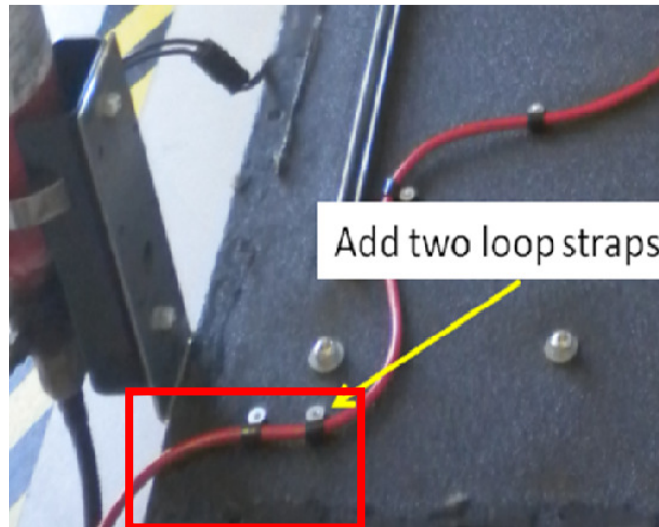


Fig 13 – Fire suppression clamping

- q. Using high temp loom (NFI PN 198159), cover the suppressor line from the bottle to the first inboard clamp. See Fig 14

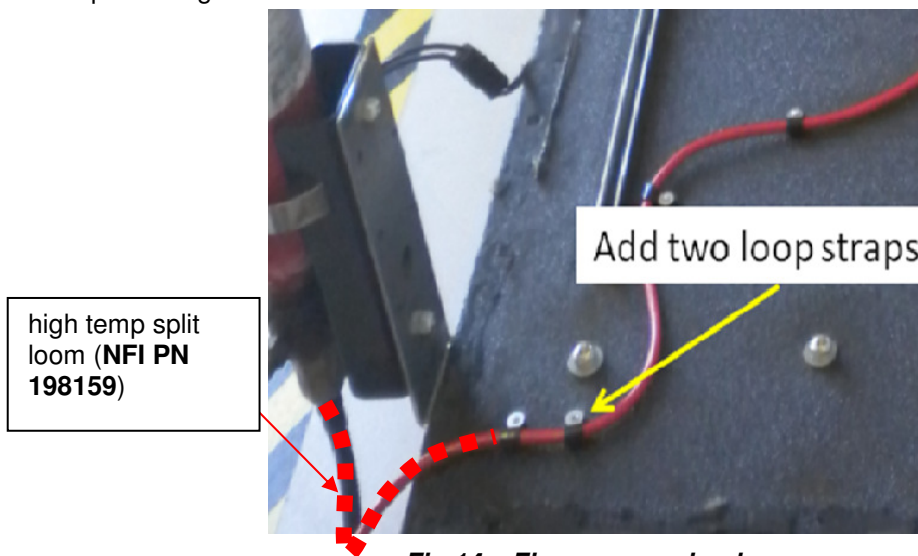


Fig 14 – Fire suppression loom

- r. Using the dimensions outlined in Fig 15, mark the location of the .9" deep notch for the suppression lines/harness. After cutting out the notch, ensure edges are smooth and free of burrs and add rubber channel NFI PN 483401.

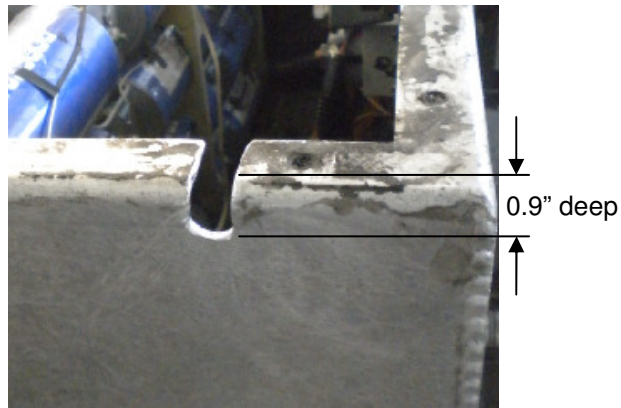
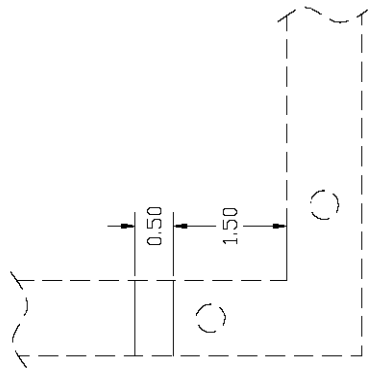


Fig 15 – Fire suppression notch

- s. Add high temperature loom (**NFI PN 198159**) to the fire suppression extension harness (**NFI PN 6409056**) and plug assembly into the circuit board harness. Leave the fire suppression bottle disconnected. See Fig 16



Fig 16 – Extension Harness Assembly

- t. Activate bottle assembly by turning the valve in the ACTIVATE position (see label on bottle). Refer to Fig 17.



Fig 17 – Fire Bottle Activated

- u. Ensure the mating surface of the UCAP lid is clean and free of dirt. Place a bead of silicone around perimeter of UCAP and secure lid with existing hardware. Place silicone around all rivet heads to prevent any water intrusion. Ensure all additional covers are re-installed after the UCAP lid has been set in place. See Fig 18

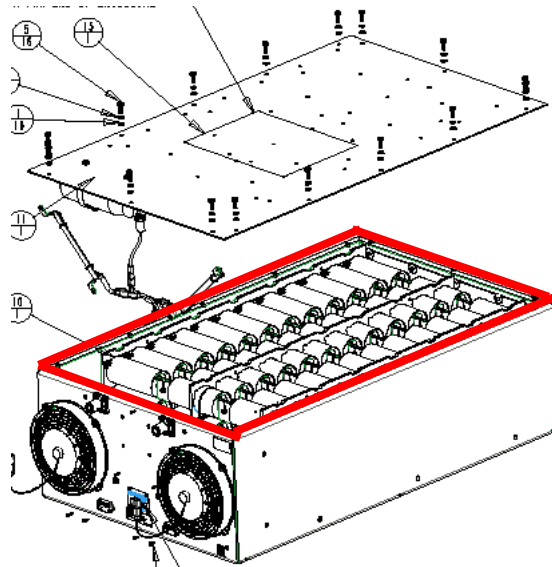


Fig 18 – UCAP Sealing

- v. Plug the extension harness into the fire bottle harness
- w. Seal around harness opening to prevent water intrusion. Fig 19 and Fig 20

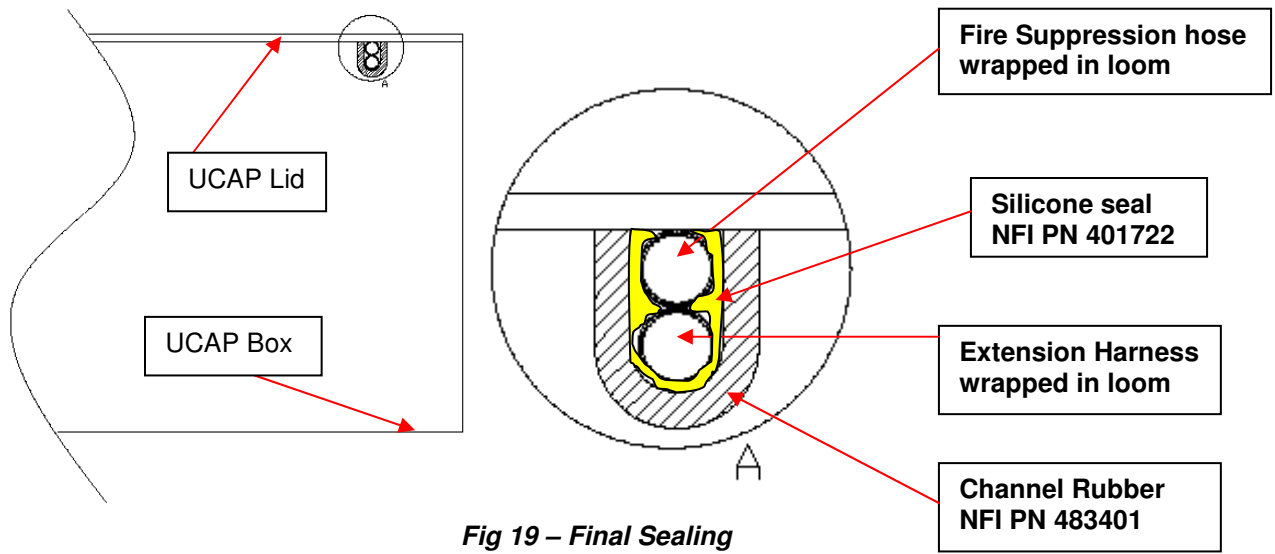


Fig 20 – Street Side and Curbside Complete

3. Re-install straps, center beam, and side supports. Insure bus is assembled and operation of each component functioning like intended.



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LABOUR ESTIMATE

	Operation	Men	Hours	Labour Time M X HR
1	Fire Bottle Relocation	2	4.0	8.0

PARTS REQUIRED

Item	Part Number	Description	Qty. per Coach	Units	Notes
1	198159	LOOM-CONVOL HIGH TEMP SPLIT .40"	4	FT	
2	485040	ANGLE-MTG FIRE SUPPRESSION	2	EA	
3	362428	TAPE-FOAM 1/2 X 3/8 THK BLK	2	FT	
4	10B04012	BOLT-HEX 1/4 20 UNC X 3/4" LG	4	EA	
5	40N04000	LOCKNUT-1/4" 20 UNC	4	EA	
6	10W04000	WASHER-FLAT 1/4 NOM	4	EA	
7	60R02005	RIVET-LOW PROFILE BLIND BREAKSTEM ALUM. 1/8"X.031	48	EA	
8	10W96000	WASHER-FLAT #6	48	EA	
9	401722	SEALANT-PROFLEX CLEAR	2	EA	
10	6409056	HARNESS-TRAILER EXTENSION 24"	2	EA	
11	6409106	PLUG-5/16 PLASTIC	4	EA	
12	483401	TRIM-GARD BLACK	0.5	FT	
13	6350363	Loop Strap, Nylon 1/4"	4	EA	