



Service Information Letter

SIL# SL 1-33082-0804
Rev D

SUBJECT: MARATHONNORCO AEROSPACE BATTERY

MODEL: M³-25-1

APPLICABILITY: 19-25M³120, MNAI P/N: A33082-001.

SUMMARY:

This Service Information Letter informs operators of potential battery system problems and contactor failures aboard the Airbus A300 and A310 Aircraft. It identifies the changes that can be made to the battery to remedy this system problem.

BACKGROUND:

Following an operator report concerning excessive battery heating and water consumption, an investigation revealed a less than desirable battery MTBF.

DISCUSSION:

MarathonNorco Aerospace initiated an investigation into the possible cause and determined that the voltage decay on rest for the 19-25M³120 was causing excessive battery charging. The system that charges the battery on-board the A300 and A310 aircraft consists of a Transformer Rectifier Unit (TRU), a Battery Charge Limiter (BCL), and a 250 Amp/50 VDC contactor. After an event that discharges the battery to 26.5 volts or less, the contactor closes, connecting the TRU to the battery. The BCL monitors the charge current and signals the contactor to open once the charge current falls below 4 Amps. Opening the contactor disconnects the TRU from the battery. The BCL then monitors the battery voltage and will close the contactor when the battery voltage decays below 26.5 Volts. After charging, the battery voltage will decay to 26.5 volts in just a few minutes, re-initiating battery charge sequence. This results in the battery being overcharged and the inherent heating and excessive water loss associated with overcharging of a battery

MarathonNorco Engineering and FedEx worked jointly to remedy this problem. MNAI Engineering evaluated several alternatives and determined that the optimum solution was to add a 20th cell to the existing battery configuration. The additional cell provides an increased battery capacity that results in a higher, more stable battery voltage, this equates to less cycling of the contactor and allows the battery to better accept the overcharge provided. Testing revealed that the modification to the battery, M³-25-1 Mod A, would eliminate the problems of excessive contactor wear and over-charging.

M³-25-1 MOD A PRODUCTION CUT-IN:

The last production of the M³-25-1 has the serial number 10402647. The new M³-25-1 Mod A serial number will be higher.

MODICATION OF M³-25-1 (MNAI P/N 33082-001) TO M³-25-1 MOD A (MNAI P/N 33082-002):

The following procedure will be performed in-house to convert the existing M³-25-1 to the M³-25-1 Mod A. CMM BA-24-34-08 and "Conversion Kit" P/N 33179-001 are required to complete the conversion.

- 1.0 Verify performance of existing 19 cells:
 - 1.1 Connect battery to charging source and charge constant current at 12.5 Amps until all cell are 1.60 Volts or higher. Do not exceed 3.0 hours charging time.

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- 1.1.1 If a cell voltage exceeds 1.90 Volts, add five to ten cc's of distilled or demineralized water to that cell.
 - 1.1.2 If a cell voltage never reaches 1.60 Volts, mark the cell.
 - 1.2 When all cells are at 1.60 Volts minimum, reduce charge current to 5 Amps and top charge for two hours. Adjust electrolyte during the final 15 minutes of the topping charge. Upon completion of the topping charge, while still on charge, all cell voltages must be from 1.60 Volts minimum to 1.85 Volts maximum.
 - 1.2.1 If cell voltages are greater than 1.85 Volts, one reconditioning cycle should be performed (Step 1.1 – 1.4). If cell voltage is greater than 1.86 following recharge, the cell should be marked.
 - 1.3 Connect battery to a discharge source and discharge battery at a constant current of 25 Amps to a battery voltage of 19 Volts. Mark any cell that shows a negative voltage at the end of the discharge.
 - 1.4 Run down battery using a resistance load bank to a voltage of 8.0 Volts and clip off individual cells.
- 2.0 Disassemble Battery – Refer to Figure 1 & 2, and Figure 5 for parts list.
- 2.1 Remove all intercell connector screws and Bellville washers and then remove intercell connectors. Intercell connectors that can be discarded: Item number 72 (2), 74, 75, 77, & 78 on the follow Illustration.

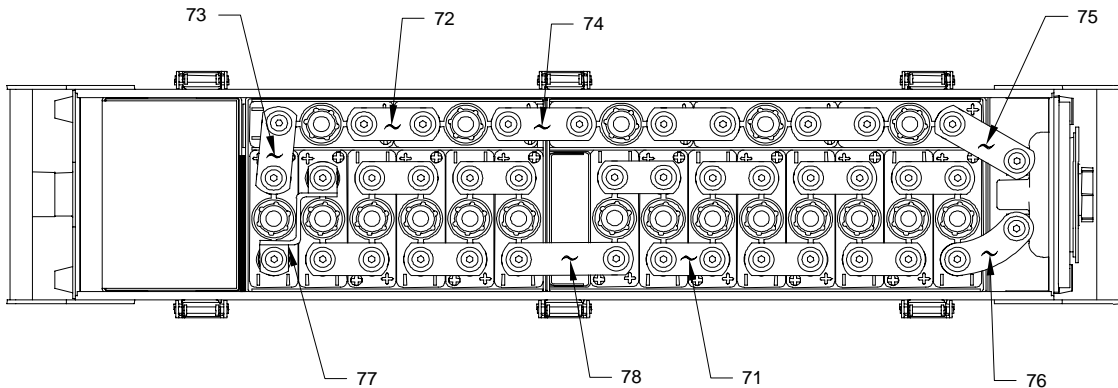


Figure 1

- 2.2 Remove and discard all cells.
 - 2.2 Remove middle and front spacer assemblies and discard. Item 61 and 62 pictured below.

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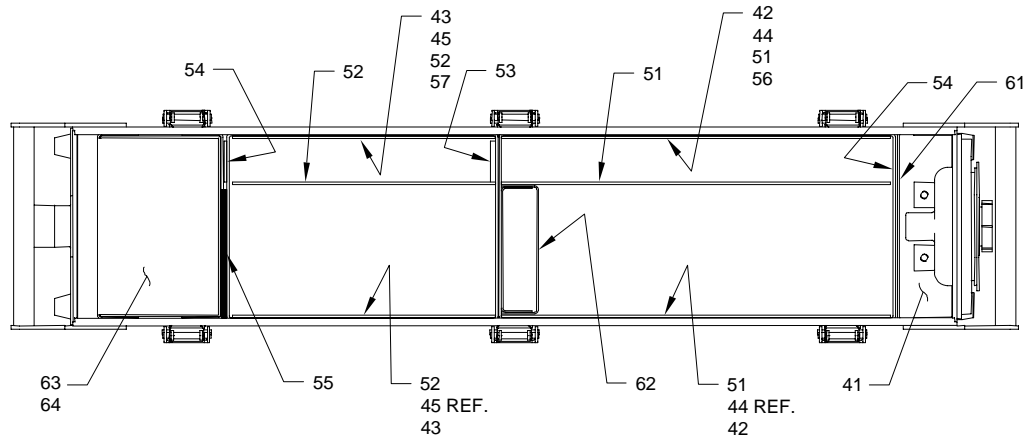


Figure 2

- 2.3 Remove all shims and liners, number each as to it's corresponding number above.
- 2.4 Remove rear spacer (Item #63) and bag liners and thoroughly clean and inspect all components.
- 3.0 Assemble Battery - Refer to Figures 3 & 4; and Figure 6 for parts list.
- 3.1 Install rear spacer and new front spacer assembly (Item # 61, P/N: 33101-002) and install bag liners, liners and shims into the new configuration below.

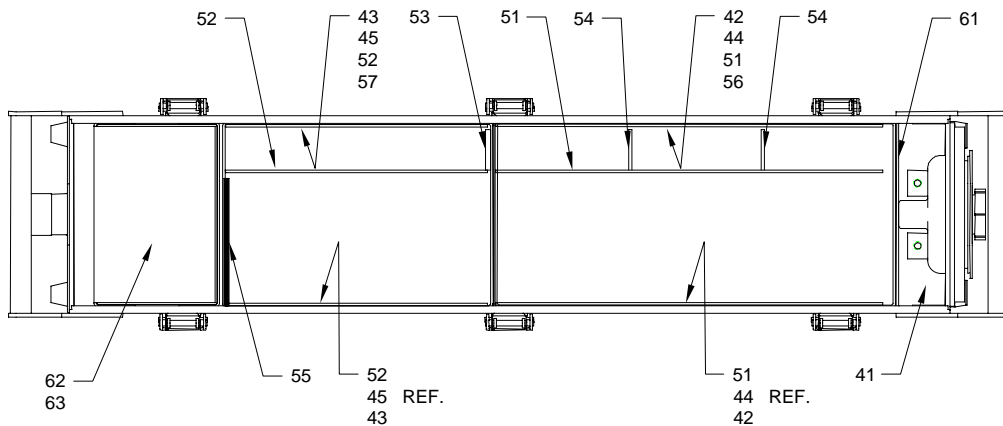


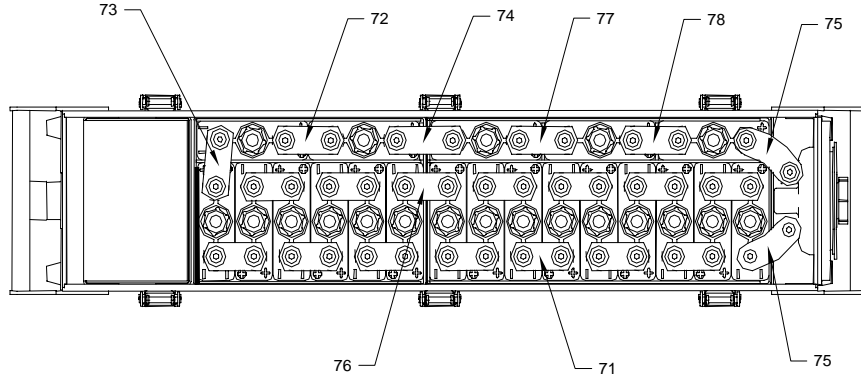
Figure 3

- 3.2 Install 20 new cells into the new configuration below, making sure to orient the positive and negative terminals exactly as in the illustration.

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- 3.3 Install the intercell connectors, Bellville washers, and socket screws. Be sure to torque screws to 45 – 50 Inch-pounds. Substitute the new intercell connectors as follows:



40-70 REF.

Figure 4

New P/N	Replaces	Old P/N	Detail Drawing Item #
16102-015		16102-078	74
18006-001		16102-010	75
16102-006		16102-053	77
16102-018		16105-053	78

- 4.0 Verify Battery performance prior to placing back in service (Repeat steps 1.1 – 1.4).
- 5.0 On the name Plate with permanent ink Stamp “XXX” over –001 of the P/N so that the P/N reads “33082-XXX”. Then stamp “-002” below the “XXX”. Record the serial number and report information to MarathonNorco Aerospace MRR Lab Manager.
- 6.0 For Batteries that have already been changed and stamped with “Mod A” next to the Battery Type M³-25-1, perform the following during the next service (NOTE: This can be performed by FedEx repair station):
- 6.1 Stamp “XXX” over the “Mod A” stamp and perform step 5.0 above.

INTERCHANGEABILITY INFORMATION:

The new MarathonNorco Aerospace M³-25-1 Mod A battery (MNAI P/N 33082-002) is interchangeable with the existing M³-25-1 battery (MNAI P/N 33082-001) with serial numbers lower than 10604325.

COMMERCIAL ASPECTS OF THIS SERVICE LETTER WILL BE COVERED UNDER SEPARATE COVER.

MARATHONNORCO AEROSPACE CONTACT INFORMATION:

Any inquiries or comments should be addressed to:

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ILLUSTRATED PARTS LIST

Figure Item	Part Number	Nomenclature	Units Per Assy
1	33082-001	BATTERY,19-25M ³ 120	1
10	40596-001	CAN ASSEMBLY, MARKED	1
11	33132-001	CAPLUG, FRONT TUBE (RBF)	1
12	16065-005	CAP, DUST (RBF)	1
30	32688-002	CELL ASSEMBLY, 25M ³ 120	19
31	16934-009	ASSEMBLY, FILLER CAP & VENT	19
-40		LINERS	
41	33098-001	LINER, BOTTOM	1
42	33098-002	LINER, FRONT SIDE	2
43	33098-003	LINER, REAR SIDE	2
44	33099-001	LINER, FRONT BAG	1
45	33100-001	LINER, REAR BAG	1
-50		SHIMS	
51	9988-325	SHIM, FRONT	3
52	9988-324	SHIM, REAR	3
53	9988-105	SHIM	1
54	9988-236	SHIM	2
55	9988-085	SHIM	5
56	9988-326	SHIM	1
57	9988-327	SHIM	1
-60		SPACERS	
61	33101-001	ASSY, SPACER FRONT	1
62	32692-002	ASSY, SPACER	1
63	33106-001	ASSY, SPACER REAR	1
64	33131-001	FILLER, BLOCK	1
-70		CONNECTORS	
71	16102-052	CONNECTOR	11
72	16102-053	CONNECTOR	3
73	16102-057	CONNECTOR	1
74	16102-078	CONNECTOR	1
75	16102-010	CONNECTOR	1
76	18006-001	CONNECTOR, CURVE	1
77	28099-003	CONNECTOR, OFFSET	1
78	16102-225	CONNECTOR	1
80	16128-001	BELLEVILLE WASHER	40
90	10488-020	SCREW, SOCKET HD. CAP #10-32	40
100	40597-001	ASSEMBLY, COVER MARKED	1
110	16163-007	ASSEMBLY RECEPTACLE	1
111	24583-001	RING, RECTANGULAR	1
112	23084-001	SCREW, FL.HD. SEMS 8-32 x 3/8	4
113	26916-006	COVER, INSULATOR M ³ (RBF)	1

RBF - REMOVE BEFORE FLIGHT

(RBF)

Figure 5 – M³-25-1 Parts List

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ILLUSTRATED PARTS LIST

Figure Item	Part Number	Nomenclature	Units Per Assy
1	33082-001	BATTERY, M ³ -25-1 MOD A 20-25M ³ 120	1
10	40596-001	CAN ASSEMBLY, MARKED	1
11	33132-001	CAPLUG, FRONT TUBE (RBF)	1
12	16065-005	CAP, DUST (RBF)	1
30	32688-002	CELL ASSEMBLY, 25M ³ 120	20
31	16934-009	ASSEMBLY, FILLER CAP & VENT	20
-40		LINERS	
41	33098-001	LINER, BOTTOM	1
42	33098-002	LINER, FRONT SIDE	2
43	33098-003	LINER, REAR SIDE	2
44	33099-001	LINER, FRONT BAG	1
45	33100-001	LINER, REAR BAG	1
-50		SHIMS	
51	9988-325	SHIM, FRONT	3
52	9988-324	SHIM, REAR	3
53	9988-105	SHIM	1
54	9988-236	SHIM	2
55	9988-085	SHIM	5
56	9988-326	SHIM	1
57	9988-327	SHIM	1
-60		SPACERS	
61	33101-002	ASSY, SPACER FRONT	1
62	33106-001	ASSY, SPACER REAR	1
63	33131-001	FILLER, BLOCK	1
-70		CONNECTORS	
71	16102-052	CONNECTOR	13
72	16102-053	CONNECTOR	1
73	16102-057	CONNECTOR	1
74	16102-015	CONNECTOR	1
75	18006-001	CONNECTOR, CURVE	2
76	16102-124	CONNECTOR	1
77	16102-006	CONNECTOR	1
78	16102-018	CONNECTOR	1
80	16128-001	BELLEVILLE WASHER	42
90	10488-020	SCREW, SOCKET HD. CAP #10-32	42
100	40597-001	ASSEMBLY, COVER MARKED	1
110	16163-007	ASSEMBLY RECEPTACLE	1
111	24583-001	RING, RECTANGULAR	1
112	23084-001	SCREW, FL.HD. SEMS 8-32 x 3/8	4
113	26916-006	COVER, INSULATOR M ³ (RBF)	1

RBF - REMOVE BEFORE FLIGHT (RBF)

Figure 6 - M³-25-1 Mod A Parts List