



TECHNICAL BULLETIN

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DUAL ESSENTIAL BUS RELAYS MODIFICATION

* Supersedes Technical Bulletin 900-0018R1, dated 30 December 1999. Revised to correct the existing wiring in Figure 2 and to notify operators that the IFR procedures mentioned in paragraph 1.C. have been revised. Aircraft that complied with previous versions of TB900-018, meet the intent of this revision.

1. PLANNING INFORMATION

A. Aircraft Affected:

MD-900 (902 Configuration) helicopters, serial number 0052 thru 0068 and 0070.

B. Assembly/Components Affected By This Notice:

External Power Box Assembly, 900E2750610-117.

C. Reason:

There have been reports of the essential bus relay sticking closed on some MD-900 helicopters that have additional equipment on the essential bus, preventing the ability to disconnect the battery from the essential bus. (Example for IFR equipped helicopters; the previously published RFM "Before Takeoff" procedures require a sequence which may result in the essential bus relay sticking in the closed position. The IFR procedures in IFR RFMS 006-00845-0000, Rev AD and CAT A IFR RFMS 006-00845-0004, Rev AC have been revised, which should remove this occurrence.) Complying with this Technical Bulletin should reduce the occurrence of the relay sticking closed.

D. Description:

Procedures in this Bulletin provide owners and operators with information pertaining to adding a second essential bus relay, connected in parallel with the existing relay to share the load. Additionally, the relays will be wired so that they will close only when; the POWER switch is in the ESNTL position, when there is no external power available and there is no generator power available.

Incorporation of this Bulletin authorizes the use of relay P/N KM-U5N or KM-U5NL-011 as an alternate replacement part for the left essential bus relay, K3, P/N KM-U5NL-014.

E. Time of Compliance

Customer option, at the discretion of the owner/operator.

F. FAA Approval:

The technical design aspects of this Bulletin are FAA Approved.

G. Manpower:

Accomplishment of this Service Bulletin will require approximately seven (7) man-hours on a standard configuration aircraft.

H. Interchangeability:

None

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I. Tooling:

N/A

J. Weight and Balance:

+2.8 oz (85 gm) at FS 96.800, LBL 6.000, WL 103.038

K. Electrical Load Data:

Baseline electrical load is reduced by 120 mA for standard operating conditions. Baseline electrical load is increased 120 mA for the emergency condition of dual generator failure.

L. Other Publications Affected:

Rotorcraft Maintenance Manual - Instruments/Electrical/Avionics (CSP-900RMM-3) and Illustrated Parts List (CSP-900IPL-4).

M. Warranty Policy:

N/A

N. Material/Part Availability:

Contact MDHI Field Service Dept.

REPLACEMENT PARTS/SUPPLIES			
Nomenclature	Part No.	Qty.	Source
Relay, 50 amp, 1PST-DB, All Welded, Hermetical	KM-U5NL-014 (Preferred)	1	Leach International 6900 Orangethorpe Ave Buena Park, CA 90622-5032 (714) 736-7598
	KM-U5N (Alternate)*	1	
	KM-U5NL-011 (Alternate)*	1	
Screw, Machine-Aircraft, Pan Head, Cruciform Recess	NAS601-6P	3	MDHI
Washer, Flat-Reduced Outside Diameter	NAS620-6L	3	MDHI
Nut, Self-Locking, Plate, Two Lug, Floating	MS21059L06	3	MDHI
Terminal, Lug, Crimp, AWG 22, Stud 6	MS25036-102	8	MDHI
Terminal, Lug, Crimp, AWG 22, Stud 10	MS25036-103	1	MDHI
Terminal, Lug, Crimp, AWG 10, Stud 10	MS25036-112	2	MDHI
Terminal, Lug, Crimp, AWG 10, Stud 3/8	MS25036-114	1	MDHI
Terminal, Lug, Crimp, AWG 8, Stud 10 (or 8)	MS25036-115	1	MDHI



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REPLACEMENT PARTS/SUPPLIES (Cont.)			
Nomenclature	Part No.	Qty.	Source
Terminal, Lug, Crimp, AWG 8, Stud 1/4	MS25036-116	1	MDHI
Terminal, Lug, Crimp, AWG 22/20, Stud 8	MS25036-149	6	MDHI
Terminal, Lug, Crimp, AWG 22, Stud 1/4	MS25036-150	1	MDHI
Terminal, Lug, Crimp, AWG 10, Stud 8	MS25036-156	8	MDHI
Terminal, Lug, Crimp, AWG 10, Stud 1/4	MS25036-157	1	MDHI
Contact, Socket	1662-202-1631	7	MDHI
Contact, Elec, Connector, Socket, Crimp, Removable	M39029/22-191	2	MDHI
Contact, Socket, 20-24 AWG	M39029/56-351	1	MDHI
Contact, Socket, 20-24 AWG	M39029/5-115	1	MDHI
Grommet, Silicone Rubber	MS35489-6X	1	MDHI
Wire, Elec, Fluoropolymer - Insulated	M22759/43-8-9	AR	Raychem (415) 361-3333 Judd (413) 863-4357
Wire, Elec, Fluoropolymer - Insulated	M22759/43-10-9	AR	Raychem (415) 361-3333 Judd (413) 863-4357
Wire, Elec, Fluoropolymer - Insulated	M22759/43-20-9	AR	Raychem (415) 361-3333 Judd (413) 863-4357
Wire, Elec, Fluoropolymer - Insulated	M22759/43-22-9	AR	Raychem (415) 361-3333 Judd (413) 863-4357
Rivet, Blind-Hollow, Pull-Thru, Countersunk Head	HS5422C125	6	MDHI
Adhesive, two-part epoxy	EA9330-3	AR	MDHI or Commercial Dexter Corp., Hysol Division Pittsburg, CA 91745

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REPLACEMENT PARTS/SUPPLIES (Cont.)			
Nomenclature	Part No.	Qty.	Source
Solder, tin alloy, rosin core	QQ-S-571	AR	Commercial
Sleeving, Protective, Expandable, Insulating	HS5330-1524	AR	MDHI

* These alternates are only allowed with the completion of this Bulletin.

WIRE BUILD TABLE						
Wire No.	Wire Nomenclature	Part No.	Wire Length	Termination		Source
				A	B	
1**	L12C20 EMI 3	M22759/43-20-9	9 in.	M39029/56-351 CONTACT	MS25036-149 LUG	MDHI
2**	L130E22 EMI 3	M22759/43-22-9	13 in.	M39029/22-191 CONTACT	MS25036-149 LUG	MDHI
3**	L13A22 EMI 3	M22759/43-22-9	13 in.	M39029/22-191 CONTACT	MS25036-102 LUG	MDHI
4**	L16A20 EMI 3	M22759/43-20-9	20 in.	M39029/5-115 CONTACT	MS25036-149 LUG	MDHI
5	P222A22 EMI 3	M22759/43-22-9	9 in.	MS25036-150 LUG	1662-202-1631 CONTACT	MDHI
6	P221A8 EMI 3	M22759/43-8-9	9 in.	MS25036-116 LUG	MS25036-115 LUG	MDHI
7	P225A22 EMI 3	M22759/43-22-9	5 in.	MS25036-102 LUG	1662-202-1631 CONTACT	MDHI
8	P225B22 EMI 3	M22759/43-22-9	5 in.	MS25036-102 LUG	1662-202-1631 CONTACT	MDHI
9	P223A22 EMI 3	M22759/43-22-9	5 in.	1662-202-1631 CONTACT	MS25036-149 LUG	MDHI
10	P221B10 EMI 3	M22759/43-10-9	6 in.	MS25036-156 LUG	MS25036-156 LUG	MDHI
11	P226B22 EMI 3	M22759/43-22-9	6 in.	MS25036-102 LUG	MS25036-102 LUG	MDHI

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WIRE BUILD TABLE (Cont.)						
Wire No.	Wire Nomenclature	Part No.	Wire Length	Termination		Source
				A	B	
12	P12E22 EMI 3	M22759/43-22-9	6 in.	MS25036-102 LUG	MS25036-102 LUG	MDHI
13	P231A10 EMI 3	M22759/43-10-9	8 in.	MS25036-156 LUG	MS25036-156 LUG	MDHI
14	P224B22 EMI 3	M22759/43-22-9	4 in.	1662-202-1631 CONTACT	MS25036-149 LUG	MDHI
15	P224A22 EMI 3	M22759/43-22-9	6 in.	1662-202-1631 CONTACT	MS25036-149 LUG	MDHI
16	P226A22 EMI 3	M22759/43-22-9	6 in.	1662-202-1631 CONTACT	MS25036-102 LUG	MDHI
17	P230A10 EMI 3	M22759/43-10-9	6 in.	MS25036-156 LUG	MS25036-156 LUG	MDHI
18	P229A10 EMI 3	M22759/43-10-9	9 in.	MS25036-112 LUG	MS25036-156 LUG	MDHI
19	P227A10 EMI 3	M22759/43-10-9	13 in.	MS25036-157 LUG	MS25036-114 LUG	MDHI
20	P228B22 EMI 3	M22759/43-22-9	15 in.	MS25036-103 LUG	SOLDER	MDHI
21	P228C10	M22759/43-10-9	10 in.	MS25036-156 LUG	MS25036-112 LUG	MDHI

** Pull wire through grommet prior to installing lug.

2. ACCOMPLISHMENT INSTRUCTIONS

A. Preparation

- (1). Access the A610 external power box assembly (Ref. Section 96-30-00 of CSP-900RMM-3).

NOTE: Prior to removing the A610 external power box assembly, document any wires or electrical components installed in the A610 to support optional equipment. All optional equipment installed wires and electrical components must be reinstalled in their "before removed" configuration.

- (2). Remove the A610 external power box assembly (Ref. Section 96-30-00 of CSP-900RMM-3).

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B. Modify external power box assembly as follows:

(Ref. Figure 1)

- (1). Open A610 External Power Box Assembly (Ref. Section 96-30-00 of CSP-900RMM-3).
- (2). Remove jumper wire P30C10 EMI 3 or alternate HS4836-284302 bus bar between CB1 and CB2.
- (3). Remove wire P30B10 EMI 3 from CB1 to CR4.
- (4). Remove wire P30D10 EMI 3 from CR3 to CR4.
- (5). Remove wire P30A10 EMI 3 from K3-A2 to CR4.
- (6). Remove wire P105A22 EMI 3 from TB2-3 to CB2.
- (7). Remove wire P137A24 EMI 3 from A610-SP1 to K4-2-A3.
- (8). Remove wire P137B24 EMI 3 from A610-SP2 to K4-2-A2.
- (9). Remove wire L130C24 EMI 3 from TB1-1-D to K6-A1.
- (10). Remove wire P18C22 EMI 3 from A610-SP2 to K3-A1.
- (11). Remove wire P137C24 EMI 3 from A610-SP2 to K4-1-X1.
- (12). Remove wire P28A24 EMI 3 from A610-SP1 to K4-1-A3.
- (13). Remove wire P28B24 EMI 3 from A610-SP1 to K1-X1.
- (14). Remove wire P28C24 EMI 3 from K1-A1 to K3-X1.
- (15). Remove wire P18E22 EMI 3 from K4-1-A2 to K3-A1.
- (16). Remove wire P18B10 EMI 3 from K1-A1 to K3-A1.
- (17). Remove wire L16A20 EMI 3 from K6-A2 to J3-1.
- (18). Remove wire L13A22 EMI 3 from K6-X2 to TB1-2-J.
- (19). Remove wire L12C20 EMI 3 from K6-A1 to J2-F.
- (20). Relocate relay, K6, and install new relay, K7.
 - (a). Remove and retain existing relay, K6, and mounting hardware.
 - (b). Locate three each relay mounting holes on top of external power box assembly.
 - (c). Drill three each 0.209 inch (5.31 mm) relay mounting holes with a #4 drill and deburr.
 - (d). Locate six each nut plate attach holes on top of external power box assembly (orientation of the nutplates is optional).
 - (e). Drill six each 0.096 inch (2.38 mm) nut plate attach holes with a #40 drill and deburr.
 - (f). Install three each MS1059L06 nutplates with six each NAS1097AD3 rivets.

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- (g). Reinstall relay removed in step (a) on top of external power box assembly with three each NAS601-6P screws and NAS620-6L washers.
 - (h). Install KM-U5NL-014 (or alternate) relay, K7, in position where relay, K6, was removed using hardware retained in step (a).
 - (i). Change K6 label to K7 and label relocated relay, K6, on top of external power box assembly using permanent ink.
- (21). If installed, remove plug from hole labeled CB3 on side of external power box assembly.
 - (22). Install MS35489-6X grommet in hole on side of external power box assembly using EA9330-3 epoxy adhesive per manufacturer's instructions.
 - (23). Change "CB3" label below grommet to "HOVER LIGHT" using permanent ink
 - (24). Remove diode, CR2, from between terminals, TB2-7 and TB2-8, leaving existing wires intact.
 - (25). Fabricate wires in accordance with Wire Build Table and Rotorcraft Maintenance Manual (CSP-900RMM-3).
 - (26). Install new wire L12C20 EMI 3 from K6-A1 to J2-F (Ref. Figure 2).
 - (27). Install new wire L130E22 EMI 3 from K6-A1 to TB1-1-D.
 - (28). Install new wire L13A22 EMI 3 from K6-X2 to TB1-2-J.
 - (29). Install new wire L16A20 EMI 3 from K6-A2 to J3-1.
 - (30). Install HS5330-1524 expandable sleeving on wires L12C20 EMI 3, L130E22 EMI 3, L13A22 EMI 3 and L16A20 EMI 3 between grommet and hover light relay, K6, on top of external power box assembly.
 - (31). Install new wire P222A22 EMI 3 from K1-A1 to K4-1-A2.
 - (32). Install new wire P221A8 EMI 3 from K1-A1 to K3-A1.
 - (33). Install new wire P225A22 EMI 3 from K1-X1 to K4-2-A3.
 - (34). Install new wire P225B22 EMI 3 from K1-X1 to K4-1-A3.
 - (35). Install new wire P223A22 EMI 3 from K4-1-X1 to K3-A1.
 - (36). Install new wire P221B10 EMI 3 from K3-A1 to K7-A1.
 - (37). Install new wire P226B22 EMI 3 from K3-X1 to K7-X1.
 - (38). Install new wire P12E22 EMI 3 from K3-X2 to K7-X2.
 - (39). Install new wire P231A10 EMI 3 from K3-A2 to CB1 (LINE).
 - (40). Install new wire P224B22 EMI 3 from K4-2-B2 to K7-A1.
 - (41). Install new wire P224A22 EMI 3 from K4-2-A2 to K7-A1.
 - (42). Install new wire P226A22 EMI 3 from K4-2-B3 to K7-X1.
 - (43). Install new wire P230A10 EMI 3 from K7-A2 to CB2 (LINE).

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- (44). Install new wire P227A10 EMI 3 from K2-A1 to CR4 (+).
- (45). Install new wire P229A10 EMI 3 from CR4 (-) to CB1 (LINE).
- (46). Install new wire P228B22 EMI 3 from CR3 (-) to TB2-3.
- (47). Install new wire P228C10 EMI 3 from CR3 (-) to CB2 (LINE).
- (48). Check wiring in modified external power box assembly as follows:
 - (a). Check for open circuit (>1 megohm) from CB1 (LINE) to CB2 (LINE).
 - (b). Check for open circuit (>1 megohm) from CB2 (LINE) to CB1 (LINE).
 - (c). If open circuit is not indicated in steps (a) and (b) above, check polarity of diode, CR4, and associated wiring.
- (49). Ink stamp with permanent ink **MODIFIED BY TB900-018R1** next to the part number on external power box assembly.
- (50). Close and install the A610 external power box assembly (Ref. Section 96-30-00 of CSP-900RMM-3).

C. Test modified external power box assembly as follows:

- (1). Confirm Pitot Heat OFF and Landing Light OFF. Confirm all CBs are pushed in.
- (2). With battery power only (no ground power or generators), switch POWER to BAT/EXT and confirm IIDS has power.



Fuel shutoff enables fire bottles. Do not move the BOTTLE DISCHARGE switch during the next step.

- (3). Lift Left Fuel Shutoff guard and move switch to LEFT OFF and confirm that IIDS fuel supply display changes from three dashed bars to three stacked bars, indicating fuel valve closed. Return Fuel Shutoff switch to ON and close switch guard.
- (4). Switch LIGHTS on collective grip to HVR. Confirm that Hover Light is **on**. Return LIGHTS switch to OFF.
- (5). Switch POWER to ESNTL and confirm IIDS has power.



Fuel shutoff enables fire bottles. Do not move the BOTTLE DISCHARGE switch during the next step.

- (6). Lift Left Fuel Shutoff guard and move switch to LEFT OFF and confirm that IIDS fuel supply display changes from three dashed bars to three stacked bars, indicating fuel valve closed. Return Fuel Shutoff switch to ON and close switch guard.
- (7). Switch LIGHTS on collective grip to HVR. Confirm that Hover Light is **off**. Return LIGHTS switch to OFF.
- (8). Return POWER switch to OFF position.

3. DISPOSITION OF PARTS REMOVED

N/A

4. COMPLIANCE RECORD

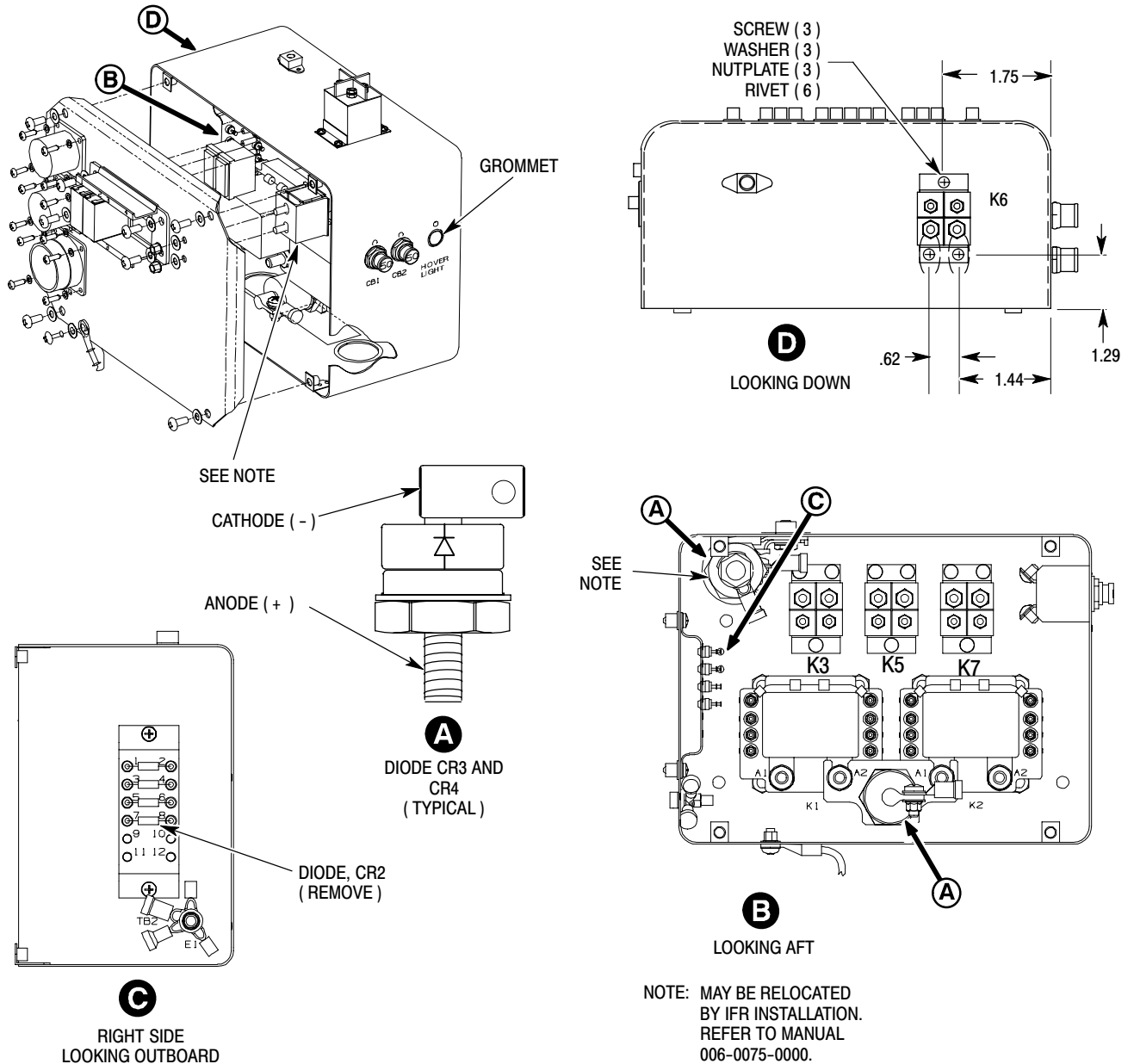
Record compliance to this Service Bulletin in the Compliance Record section of the helicopter Log Book.

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5. POINTS OF CONTACT

For further assistance, contact your local MDHI Field Service Representative (refer to the latest revision of the "At Your Service" handbook for address and telephone numbers) or contact the Field Service Department at MDHI, Mesa, Arizona. Telephone 1-800-388-3378 or (480) 346-6387. DATAFAX: (480) 346-6813.



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Figure 1. External Power Box Assembly Modification

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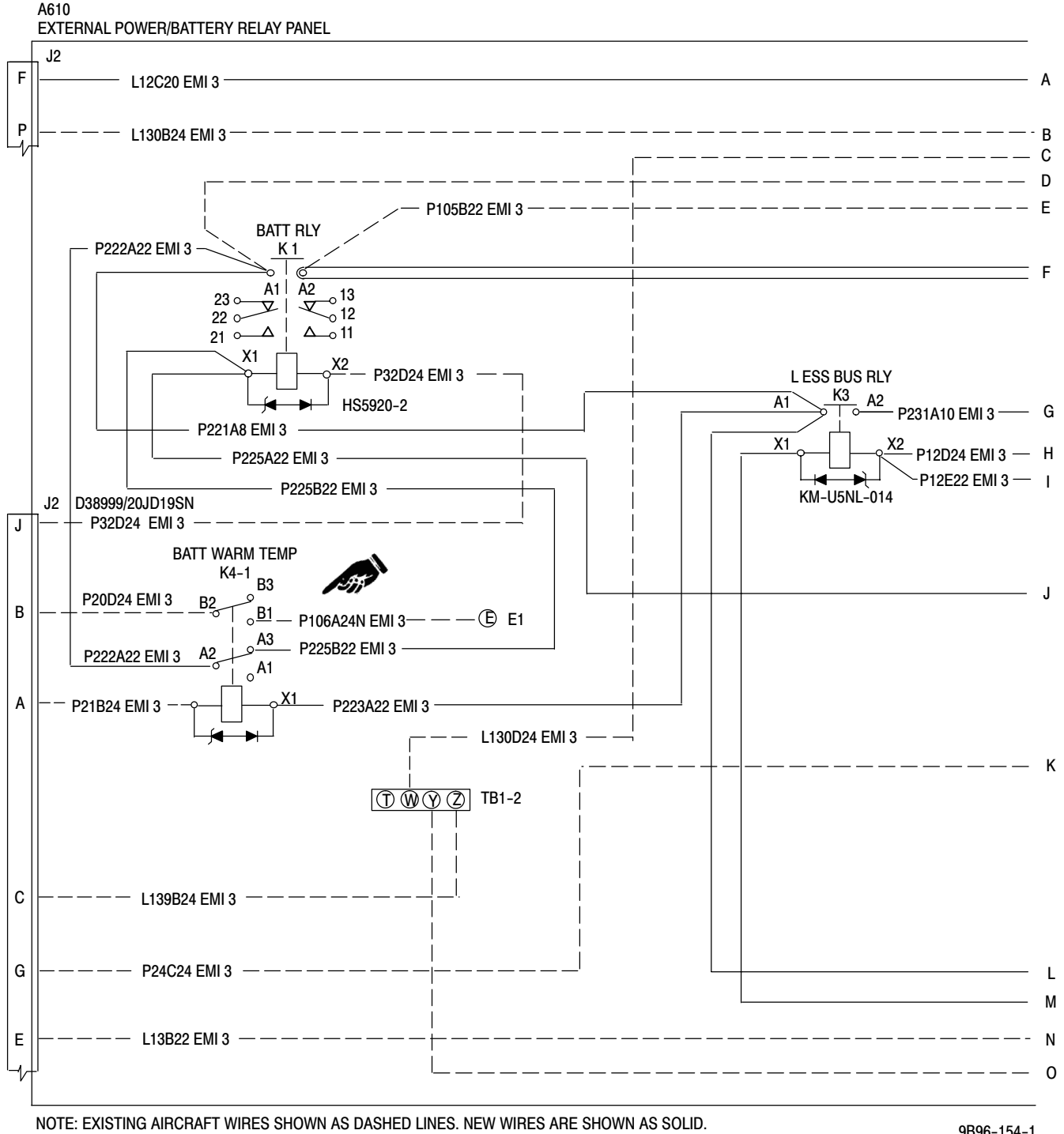
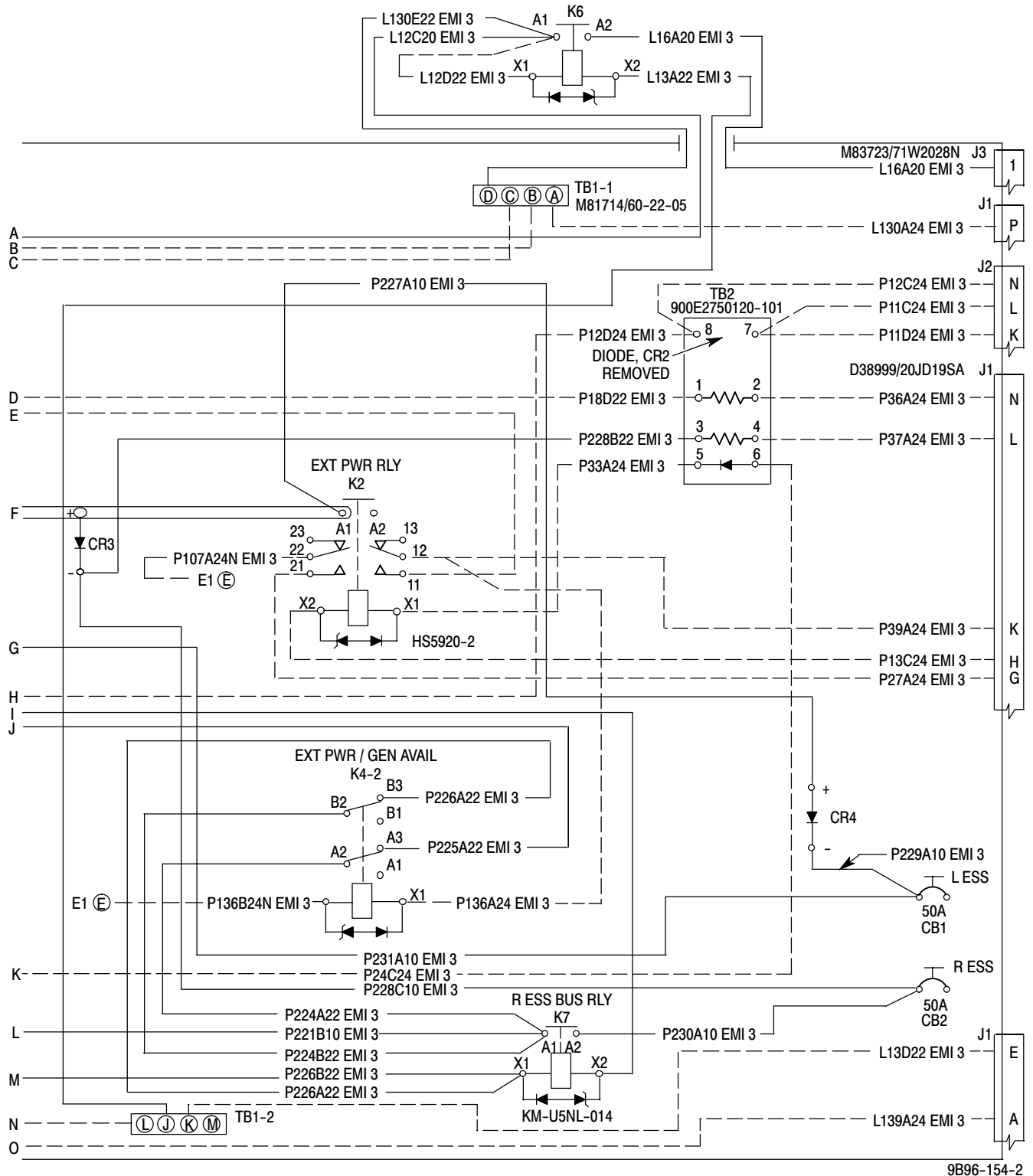


Figure 2. External Power Box Assembly Wiring Diagram (Sheet 1 of 2)

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Figure 2. External Power Box Assembly Wiring Diagram (Sheet 2 of 2)



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Parts Request Form: Please fill in the following information and return to MDHI for parts/supplies required for compliance. This form may be faxed to MDHI Warranty and Repair Department at (602) 891-3952.

Aircraft Ser. No.:

Aircraft Total Time:

Date:

Parts Required:

Part Ser. No. (if required):

Ship to: