

TECHNICAL BULLETIN
Bell Helicopter

A Textron Company

No. 206L-09-234

Date JUN 15, 2009

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MODEL AFFECTED: 206L-1 and 206L-3

SUBJECT: 5 VOLT LIGHTING SYSTEM, MODIFICATION OF

HELICOPTERS AFFECTED: 206L-1 Helicopters serial number 45154 through 45790.
206L-3 Helicopters serial number 51001 through 51513.

COMPLIANCE: At Customer's Option

DESCRIPTION:

The purpose of this bulletin is to provide modification instructions to improve the 5 volt lighting power supply system. The original system had unacceptable variation between instrument lighting intensity.

PART I of this bulletin provides instructions to upgrade the 5 volt power supply and related components.

PART II of this bulletin provides instructions to upgrade the 5 volt lighting distribution.

Depending on your helicopter model and serial number, this bulletin will be accomplished by doing both PART I and PART II. Model 206L-3 serial numbers 51390 through 51513 comply with PART I of this bulletin. Table 1 provides the modifications applicability for the affected models.

-NOTE-

If PART I must be accomplished then PART II must also be accomplished prior to releasing helicopter to service.

HELICOPTER MODEL AND SERIAL NUMBER APPLICABILITY TABLE				
Modification Kit	Upgrade	Serial Number Applicability		
		206-L1	206-L3	
		45154 through 45790	51001 through 51389	51390 through 51513
206-704-735-101 (Part I)	Power supply	X	X	
206-704-735-103 (Part II)	Lighting Distribution	X	X	X

Table 1

APPROVAL:

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

MANPOWER:

Approximately 20.0 man-hours are required to complete this bulletin. Man-hours are based on hands-on time and may vary with personnel and facilities available.

WARRANTY:

There is no warranty credit applicable for parts or labor associated with this Bulletin.

MATERIALS:

Required Material:

The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center. Order modification kit P/N 206-704-735-101 for PART I and PART II or modification kit P/N 206-704-735-103 if only PART II requires accomplishment (M206L-3 s/n 51390 through 51514).

The following parts are contained in kit P/N 206-704-735-101:

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
206-704-735-101	POWER SUPPLY KIT	1
	CONSISTING OF:	
206-704-735-103	LIGHTING DISTRIBUTION KIT	1
206-075-743-125	SUPPORT	1
222-375-012-101	POWER SUPPLY	1
1N3308B	DIODE	1
100-075-5W	PLATE-MARKING	3
130-005-5N2	INSULATING TUBING	5
140-039-20	WIRE (M22759/41-20-9)	275 INCHES
140-039-22	WIRE (M22759/41-22-9)	325 INCHES
31-065-8CR2	DECAL	1
31-065-8PS2	DECAL	1
31-065-8R5	DECAL	1
70-12911-04	POTENTIOMETER	1
AN316-4R	NUT	1
MS21042L04	NUT	2
MS21042L3	SELF LOCKING NUT	4
MS25036-102	TERMINAL	2
MS25036-103	TERMINAL	2
MS27039-1-08	SCREW	6
MS27473T10B5S	CONNECTOR	1
MS3367-1-9	STRAP TIE DOWN	6
MS35206-215	SCREW	2
MS35333-40	WASHER	1
M23053/18-304-0	UNSULATING TUBING	12 INCHES
M39029/1-101	CONTACT	2
M39029/35-274	CONTACT	3
M39029/57-357	CONTACT	3
M81824/1-1	SPLICE	1
NAS1149D0316J	WASHER	10
NAS1149D0416H	WASHER	1
RER55F10R0R	RESISTOR	1
RLR32C1000GR	RESISTOR	1
RLR32C1001FR	RESISTOR	1

The following parts are contained in kit P/N 206-704-735-103:

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
206-704-735-103	LIGHTING DISTRIBUTION KIT CONSISTING OF:	1
140-039-20	WIRE (M22759/41-20-9)	275 INCHES
206-075-277-137	SUPPORT	1
31-065-8TB3	DECAL	1
MS20470AD4-5	RIVET	8
MS25036-103	TERMINAL	2
MS21042L06	NUT	2
MS21042L3	SELF LOCKING NUT	1
MS21266-1N	GROMMET	2
MS35190-237	SCREW	2
MS35207-265	SCREW	1
MS35338-43	WASHER	2
MS35650-302	NUT	1
M39029/1-101	CONTACT	27
M39029/57-357	CONTACT	1
M81714/16-4	TERMINAL BLOCK RACK	1
M81714/2-DA1	TERMINAL BLOCK	4
M83519/2-8	SOLDER SLEEVE	13
NAS1149DN616J	WASHER	2
NAS1149D0316H	WASHER	4

Consumable Material:

The following material is required to accomplish this bulletin, however this material is considered consumable (bench stock) material and may not require ordering depending on the operators consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>	<u>Reference</u>
299-947-066, TYI	Adhesive	A/R	C-301
3950 SCOTCHCAL	Sealer	A/R	C-349
TT-N-95, TYII 1GAL	Naphtha	A/R	C-305

SPECIAL TOOLS:

None required

WEIGHT AND BALANCE:

For PART I:

<u>Weight</u>	<u>Arm</u>	<u>Longitudinal Moment</u>	<u>Arm</u>	<u>Lateral* Moment</u>
+0.8 Lbs (+0.36 kg)	22.5 in. (572 mm)	+18 in-Lbs (+2.1 kg x mm/100)	1.3 in. (33 mm)	1.0 in-Lbs (0.1 kg x mm/100)

* In lateral calculations, - is left and + is right.

For PART II:

<u>Weight</u>	<u>Arm</u>	<u>Longitudinal Moment</u>	<u>Arm</u>	<u>Lateral* Moment</u>
+0.3 Lbs (+0.13 kg)	36.1 in. (917 mm)	+11 in-Lbs (+1.2 kg x mm/100)	-2.3 in. (-58 mm)	-1.0 in-Lbs (-0.1 kg x mm/100)

* In lateral calculations, - is left and + is right.

ELECTRICAL LOAD DATA:

Not Affected

REFERENCES:

BHT-206L-SERIES-IPB Illustrated Parts Breakdown
 BHT-206L1-MM Maintenance Manual
 BHT-206L3-MM Maintenance Manual
 BHT-ELEC-SPM Electrical Standard Practices Manual
 BHT-ALL-SPM Standard Practices Manual

PUBLICATIONS AFFECTED:

BHT-206L-SERIES-IPB Illustrated Parts Breakdown
 BHT-206L1-MM Maintenance Manual
 Chapter 96 - Electrical Systems
 Chapter 98 – Wiring Diagrams
 BHT-206L3-MM Maintenance Manual
 Chapter 96 - Electrical Systems
 Chapter 98 – Wiring Diagrams

ACCOMPLISHMENT INSTRUCTIONS:

PART I: Installation of modification kit P/N 206-704-735-101 (upgrade of 5 volts power supply).

1. Prepare the helicopter for maintenance.
2. Ensure all electrical power is removed from the helicopter.
3. Disconnect the helicopter battery.
4. Remove console shroud assembly from top of instrument panel (Refer to BHT-206L1-MM-10, Chapter 95).
5. Remove windshield centre post fairing.
6. Remove R/H and L/H nose console covers to gain access to terminal board 8TB1 (5, Figure 1, Sheet 2).
7. Lower circuit breaker panel to gain access to potentiometer 8U1 (1, Sheet 1).

-NOTE-

Actions specified in the "ACTION" column shown in the Wiring Modification instructions Tables are as follows:

- **DELETE** - Remove the wire completely from the helicopter.
 - **RETERMINATE** – Reposition one end of the wire FROM its previous location TO a new location.
 - **ADD** - A new wire is required
8. Perform the "DELETE" actions listed in Table 2 for 206-704-735-101 and in Table 3 for 206-704-735-103.
 9. Remove and discard resistor 8R1 (4, Figure 1, Sheet 2) and bracket assembly with related hardware.
 10. Remove and discard transistor 8Q1 and diode 8CR1 (40 and 41, Sheet 3) with related hardware.
 11. Remove and discard potentiometer 8U1 (1, Sheet 1), resistors 8R3 and 8R4 (51 and 53, Sheet 4) and splice (55). Keep knob and installation hardware.
 12. Install potentiometer (2, Sheet 1) using previously removed hardware.

-NOTE-

Ensure all solder terminations and resistors are insulated using insulation tubing P/N M23053/18-304-0 for the solder terminations and P/N 130-005-5N2 for the resistors.

13. Install resistor 8R3 (52, Sheet 4).
14. Install resistor 8R4 (54).
15. Install diode 8CR2 (42, Sheet 3). Use flat washer (43), lock washer (44) and nut (45) as installation hardware.
16. Locate, drill and deburr holes .190 - .196 inch (4.83 – 4.98 mm) to frame (3, Sheet 4) by using existing 2 (two) holes and support (7, Sheet 2).

-NOTE-

For ease of installation, wires L75A20 and L78B20 should be soldered on resistor 8R5 (14) prior to installing on support (7).

17. Install resistor 8R5 (14) on lower side of support (7) using screws (15) and nuts (16).
18. Locate support (7) on frame (3).
19. Install 5 volt power supply (6) on located support (7) using screws (8) and (11), washers (9) and (12), and nuts (10).
20. Perform the “RETERMINATE” actions listed in Table 2 for 206-704-735-101.
21. Perform the “ADD” actions listed in Table 3 for 206-704-735-101.
22. Continue on to Part II.

PART II: Installation of modification kit P/N 206-704-735-103(upgrade of the 5 volt lighting distribution).

1. If you have completed Part I of this bulletin go to step 9.
2. Prepare the helicopter for maintenance.
3. Ensure all electrical power is removed from the helicopter.
4. Disconnect the helicopter battery.
5. Remove console shroud assembly from top of instrument panel (Refer to BHT-206L1-MM-10 Chapter 95).
6. Remove windshield centre post fairing.

7. Remove R/H and L/H nose console covers to gain access to terminal board 8TB1 (5, Figure 1, Sheet 2).

-NOTE-

Actions specified in the "ACTION" column shown in the Wiring Modification instructions Table are as follows.

- **DELETE** - Remove the wire completely from the helicopter.
- **RETERMINATE** – Reposition one end of the wire FROM its previous location TO a new location.
- **ADD** - A new wire is required

8. Perform the "DELETE" actions listed in Table 3 for 206-704-735-103.
9. Remove and discard chassis jacks 8J4 and plugs 8P4 (20 and 21, Sheet 3).
10. Disconnect ground studs (23) and clamps (46, Sheet 4) from support and angle (24 and 25, Sheet 3).
11. Remove wire bundle (19) from centre hole of support (24) by disconnecting upper connections and terminals.

CAUTION

ENSURE THAT INSTRUMENT PANEL IS PROPERLY SUPPORTED BEFORE REMOVING SUPPORT AND ANGLE (24 and 25).

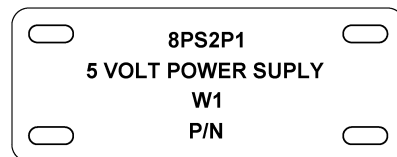
12. Remove and discard both support and angle (24 and 25).
13. Locate, drill and deburr quantity eight (8) holes .1285 inch (#30 drill) on new support (37, Sheet 4) using existing holes from support (22) and from angle (50) (Refer to View E-E).
14. Bond grommet (49) using adhesive (C-301) on support (37).
15. Install support (37) using rivets (48).
16. Install terminal block rack 8TB3 (31, Sheet 3) using screws (32), washers (33) and nuts (34) on support (37).
17. Install terminal blocks (35) in terminal block rack (31).
18. Reinstall previously removed ground studs (23) and clamps (46, Sheet 4).

19. Reroute wire bundle (19, Sheet 3) through centre hole of new support (37) and reconnect upper connections and terminals.
20. Perform the "RETERMINATE" actions listed in Table 3 for 206-704-735-103.
21. Perform the "ADD" actions listed in Table 3 for 206-704-735-103.
22. Local ground for wires L175A20N and L176A20N (58 and 59, Figure 2, Wiring diagram) is located on support (37, Figure 1, Sheet 3) and is assembled with screw (26), washers (27) and (28) and nuts (29) and (30).
23. Perform the "ADD" actions listed in Table 4 for 8TB3 Lighting (Refer to BHT-ELEC-SPM chapter 4).
24. Perform the "RETERMINATE" actions listed in Table 4 for 8TB3 Lighting.

-NOTE-

Plate markings should have the following information on them (see example below):

- End reference designator
- Harness nomenclature
- Harness "W" number
- Harness part number (when applicable)



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25. Install plate markings (56, Figure 2) within 6 inches of indicated termination point and secure with two (2) straps (57) for each plate installation.
26. Thoroughly wipe with Naphtha (C-305) the surfaces where decals (13 and 17, Figure 1, Sheet 2) and (36 and 38, Sheet 3) will be installed.
27. Install decals.
28. Seal all edges of the decals using edge sealer (C-349).
29. Reassemble helicopter as per appropriate manuals.
30. Perform instrument and control panel lighting operational check (Refer to BHT-206L1-MM-10 or BHT-206L3-MM-10 Chapter 96).
31. Make an entry in the helicopter records to show that this technical bulletin has been accomplished.

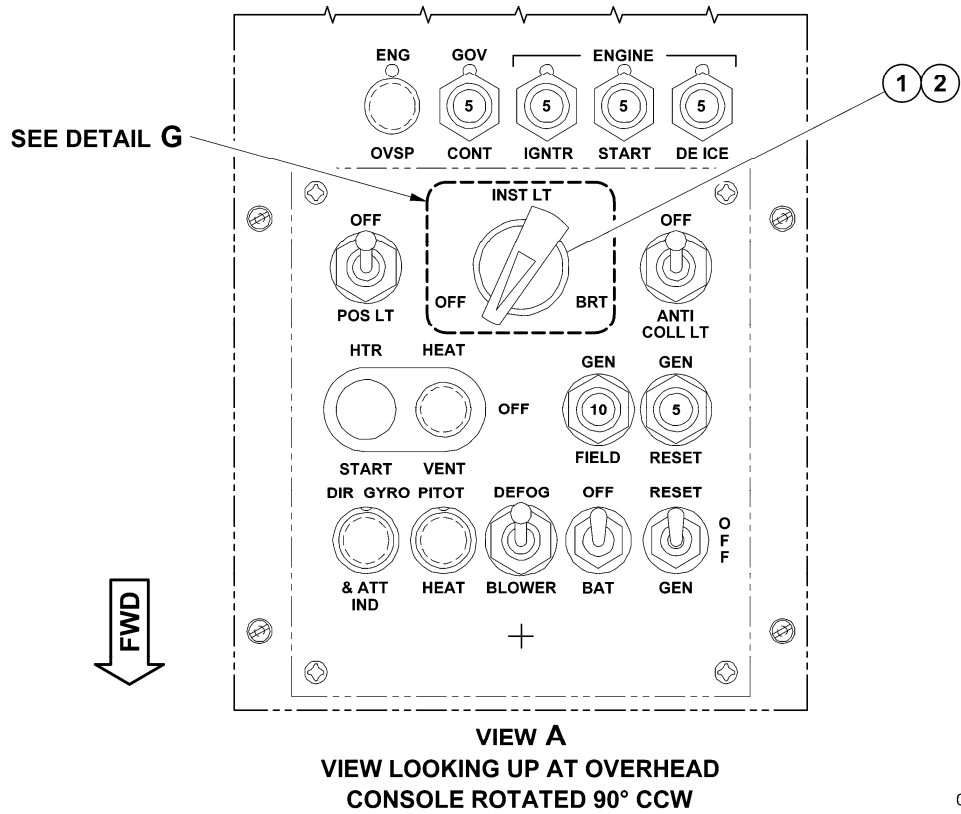
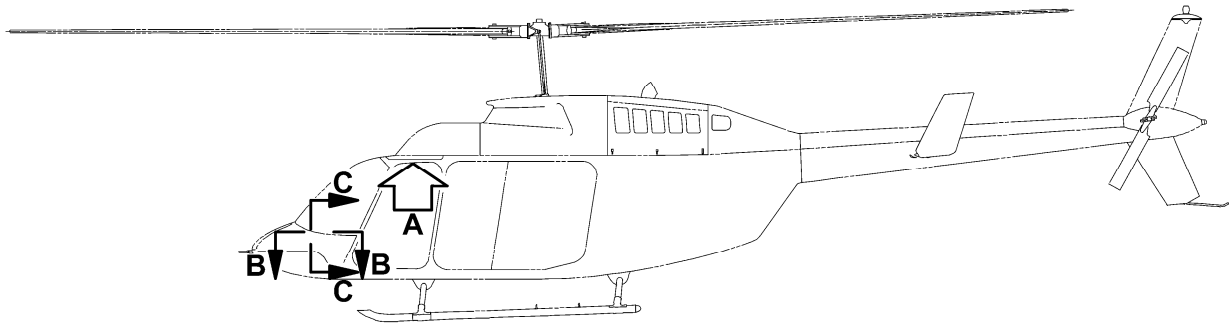


Figure 1. Lighting System Modification (Sheet 1 of 5)

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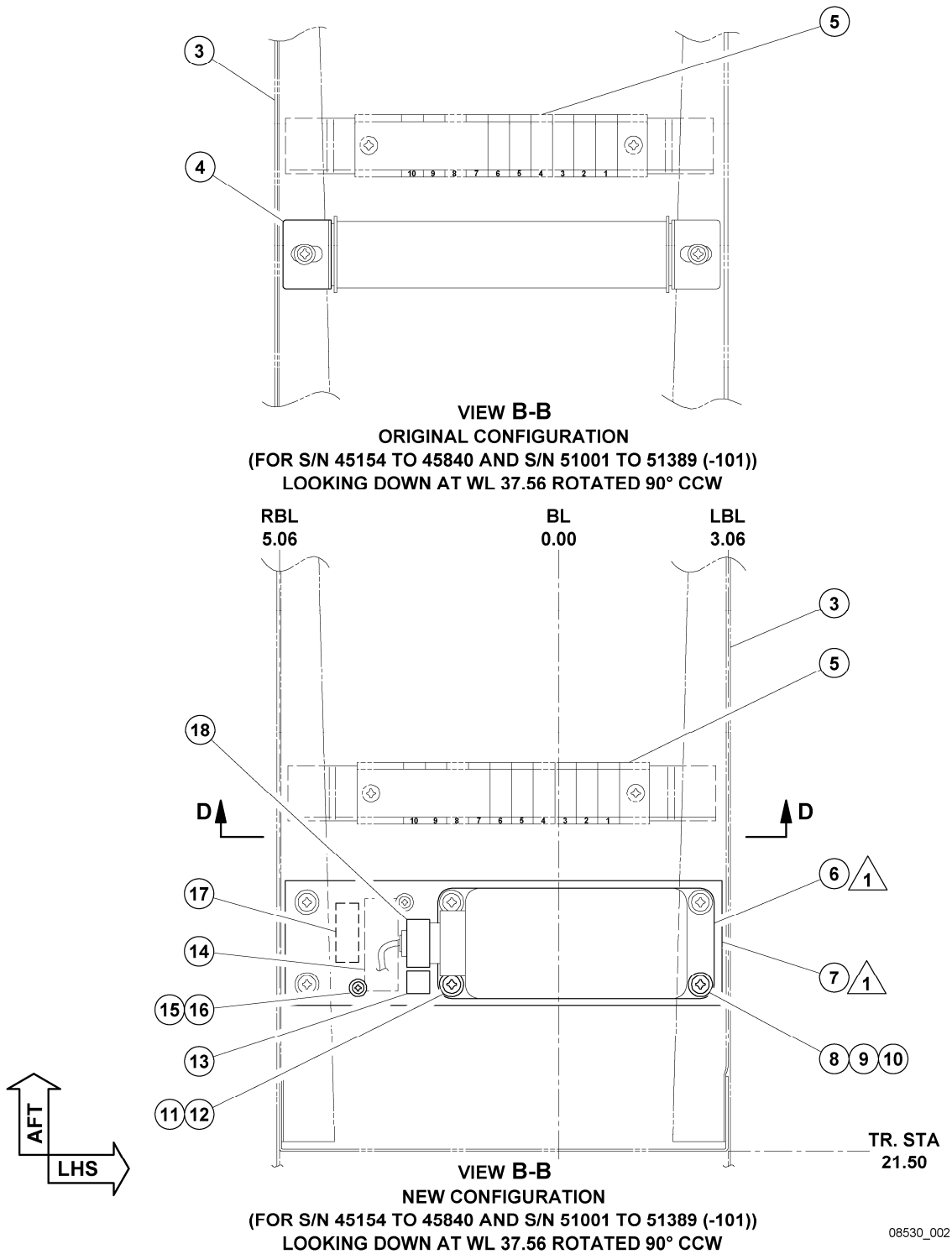
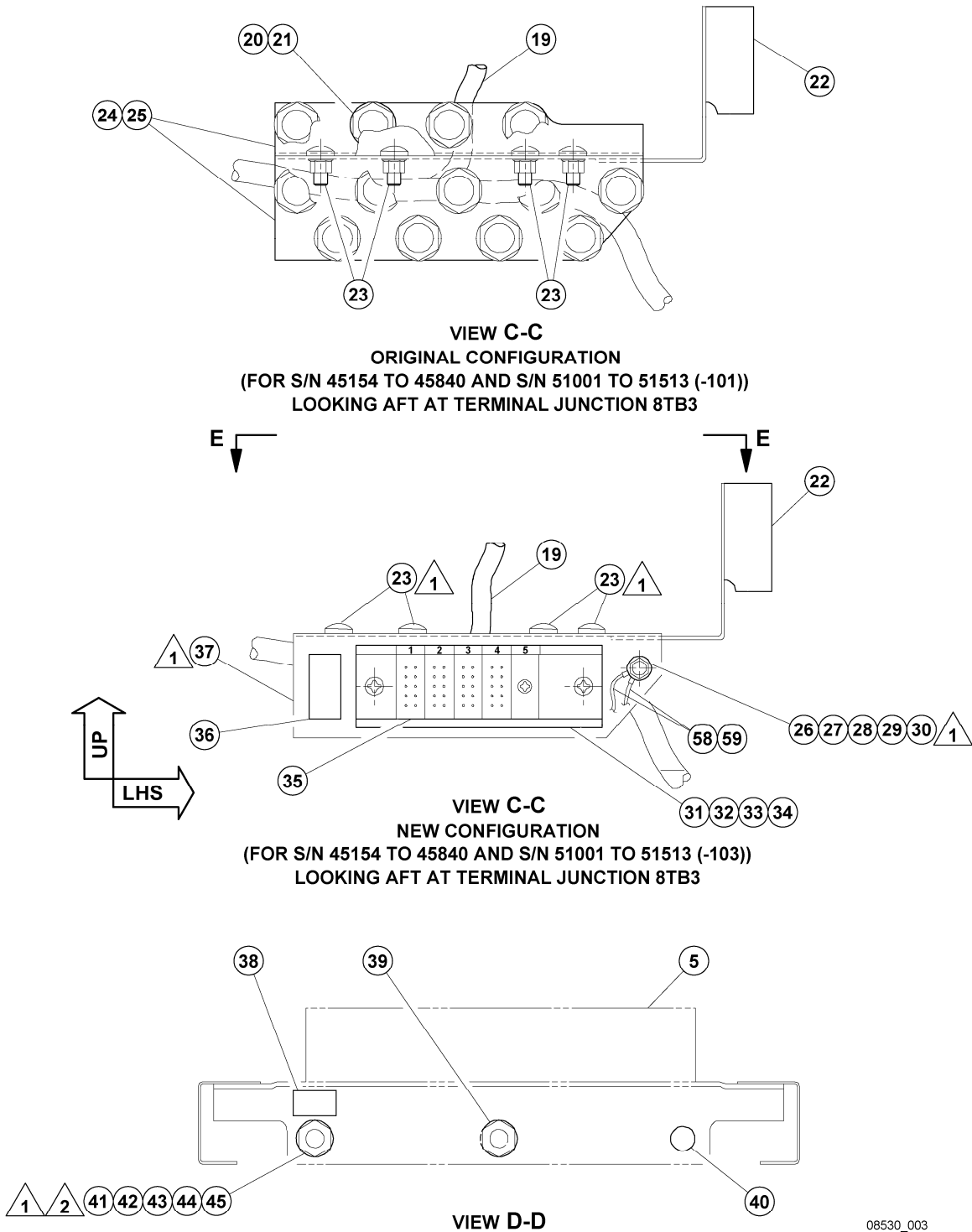
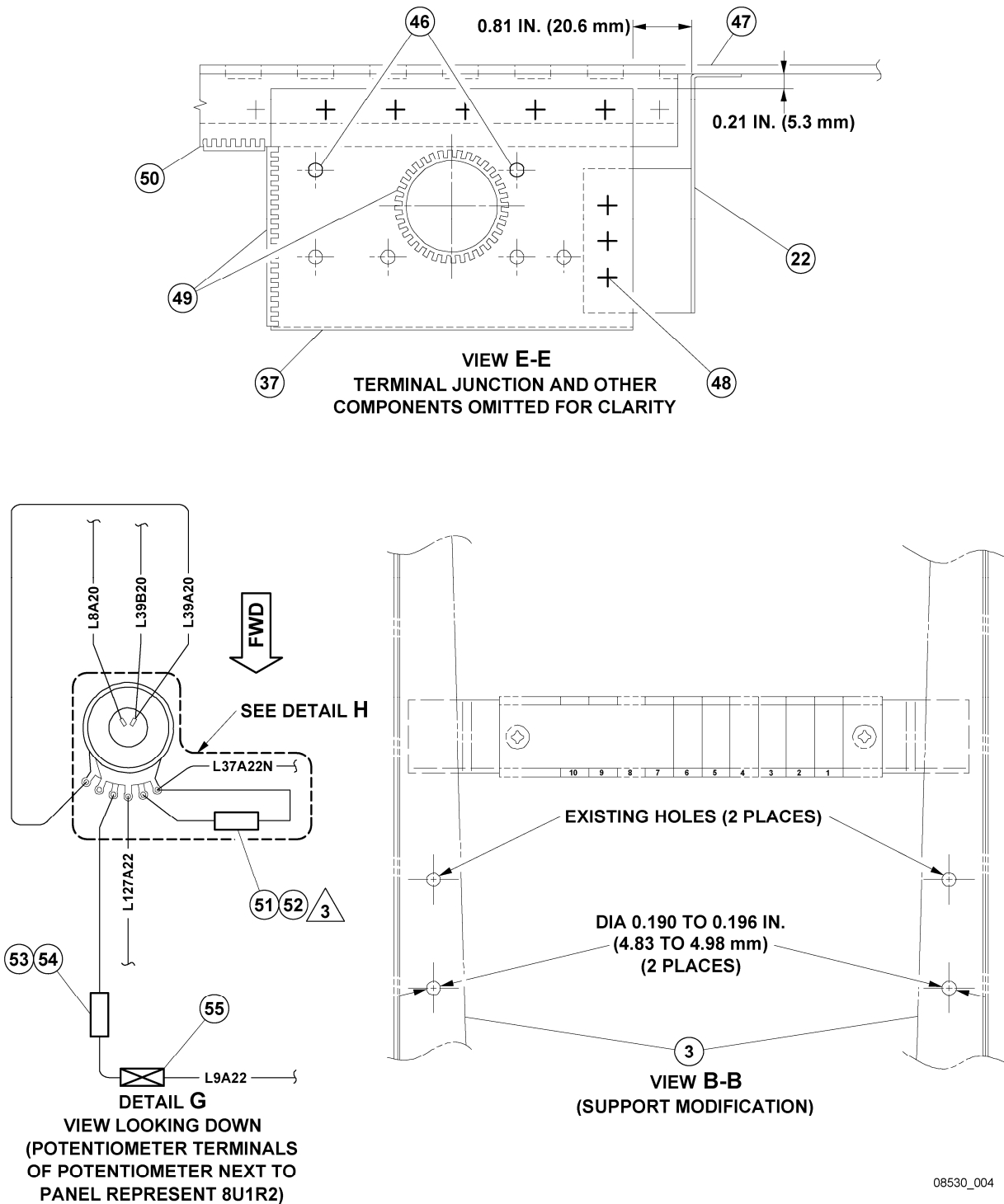


Figure 1. Lighting System Modification (Sheet 2)



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Figure 1. Lighting System Modification (Sheet 3)






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Figure 1. Lighting System Modification (Sheet 4)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Potentiometer 8U1 (Ref) 2. Potentiometer 8U1 (70-12911-04) 3. Support (Ref) 4. Resistor 8R1 (Ref) 5. Terminal board 8TB1 (Ref) 6. 5 Volt power supply 8PS2 (222-375-012-101) 7. Support (206-075-743-125) 8. Screw (MS27039-1-08) 4 Reqd 9. Washer (NAS1149D0316J) 8 Reqd 10. Nut (MS21042L3) 4 Reqd 11. Screw (MS27039-1-08) 2 Reqd 12. Washer (NAS1149D0316J) 2 Reqd 13. Decal (31-065-8PS2) 14. Resistor 8R5 (RER55F10R0R) 15. Screw (MS35206-215) 2 Reqd 16. Nut (MS21042L04) 2 Reqd 17. Decal (31-065-8R5) 18. Connector 8PS2P1 (MS27473T10B5S) 19. Wire bundle (Ref) 20. Chassis jack 8J4 (Ref) 21. Plug 8P4 (Ref) 22. Support (Ref) 23. Ground studs (Ref) 24. Support (Ref) 25. Angle (Ref) 26. Screw (MS35207-265) 1 Reqd 27. Washer (NAS1149D0316H) 4 Reqd 28. Washer (MS35338-43) 2 Reqd 29. Nut (MS35650-302) 1 Reqd | <ol style="list-style-type: none"> 30. Nut (MS21042L3) 1 Reqd 31. Terminal block rack 8TB3 (M81714/16-4) 32. Screw (MS35190-237) 2 Reqd 33. Washer (NAS1149DN616J) 2 Reqd 34. Nut (MS21042L06) 2 Reqd 35. Terminal block (M81714/2-DA1) 36. Decal (31-065-8TB3) 37. Support (206-075-277-137) 38. Decal (31-065-8CR2) 39. Transistor 8Q2 (Ref) 40. Transistor 8Q1 (Ref) 41. Diode 8CR1 (Ref) 42. Diode 8CR2 (1N3308B) 43. Washer (NAS1149D0416H) 1 Reqd 44. Washer (MS35333-40) 1 Reqd 45. Nut (AN316-4R) 1 Reqd 46. Clamp installation holes 47. Panel (Ref) 48. Rivets (MS20470AD4-5) 8 Reqd 49. Grommet (MS21266-1N) 50. Angle (Ref) 51. Resistor 8R3 (Ref) 52. Resistor 8R3 (RLR32C1001FR) 53. Resistor 8R4 (Ref) 54. Resistor 8R4 (RLR32C1000GR) 55. Splice (Ref) 56. Plate marking (100-075-5W) 3 Reqd 57. Strap tie down (MS3367-1-9) 6 Reqd 58. Wire L175A20N 59. Wire L176A20N |
|---|---|

NOTES

- 1  Electrically bond per BHT-ELEC-SPM.
- 2  Washer (43), washer (44) and nut (45) are installed on the aft side of 8TB1 bracket in their respective order.
- 3  Refer to Figure 2 to ensure proper wire location for resistor 8R3.

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Figure 1. Lighting System Modification (Sheet 5)

WIRING MODIFICATIONS INSTRUCTION TABLE FOR 206-704-735-101						
ACTION	WIRE #	LENGTH (INCH)	FROM	HARDWARE	TO	HARDWARE
DELETE	L19A22	-	8Q1-C	SOLDER TERMINAL	8CR1	SOLDER TERMINAL
DELETE	L98A22	-	8Q1-E	SOLDER TERMINAL	8J4	-
DELETE	L19C22	-	8CR1	-	8U1R1-3	SOLDER TERMINAL
DELETE	L19B22	-	8R1	SOLDER TERMINAL	8CR1	SOLDER TERMINAL
DELETE	L11A22	-	8TB1-F3	M39029/1-101	8Q2-E	SOLDER TERMINAL
DELETE	L73A22	-	8K3-B2	SOLDER TERMINAL	SPLICE	-
DELETE	L73B22	-	SPLICE	-	4DS1P1-J	MS39029/35-274
DELETE	L74A22	-	8K3-B1	SOLDER TERMINAL	8TB1-E3	M39029/1-101
DELETE	L37B22N	-	8U1R2-2	SOLDER TERMINAL	8U1R1-2	SOLDER TERMINAL
DELETE	W1B22	-	SPLICE	-	4DS1P1-C	MS39029/35-274
RETERMINATE	L39D20	-	8R1	SOLDER TERMINAL	8PS2P1-A	M39029/57-357
RETERMINATE	L37A22N	-	8U1R2-2	SOLDER TERMINAL	8U1R1-2	SOLDER TERMINAL
RETERMINATE	L127A22	-	8Q1-B	SOLDER TERMINAL	8PS2P1-D	M39029/57-357
RETERMINATE	W1C22	-	4TB2-J1	M39029/1-101	8K3-B2	SOLDER TERMINAL
ADD	L39A20	19	8U1R2-3	SOLDER TERMINAL	8U1S1-C	SOLDER TERMINAL
ADD	L11A20	15	8TB1-F3	M39029/1-101	8Q2-E	SOLDER TERMINAL
ADD	L78B20	29	8K3-A2	SOLDER TERMINAL	8R5	SOLDER TERMINAL
ADD	L75A20	15	8R5	SOLDER TERMINAL	8CR2	MS25036-102
ADD	L159A22N	17	8PS2P1-B	M39029/57-357	LOC GR	MS25036-103
ADD	L39H20	21	8K3-A1	SOLDER TERMINAL	8K3-B1	SOLDER TERMINAL
ADD	W1T22	21	8K3-B3	SOLDER TERMINAL	8K3-C3	SOLDER TERMINAL
ADD	L75B20	26	8K3-C1	SOLDER TERMINAL	8CR2	MS25036-102
ADD	L73B22	53	8K3-C2	SOLDER TERMINAL	4DS1P1-J	M39029/35-274
ADD	W1B22	53	8K3-B2	SOLDER TERMINAL	4DS1P1-C	M39029/35-274

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NOTE

1 Refer to 8K3 schematic for correct pin out.

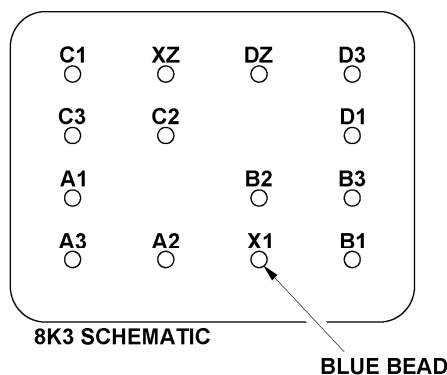


Table 2. Wiring Modification Table for 206-704-735-101

WIRING MODIFICATIONS INSTRUCTION TABLE FOR 206-704-735-103						
ACTION	WIRE #	LENGTH (INCH)	FROM	HARDWARE	TO	HARDWARE
DELETE	L98B22	-	8J4	-	-	-
DELETE	L98C22	-	8J4	-	-	-
DELETE	L98D22	-	8J4	-	-	-
DELETE	L98E22	-	8J4	-	-	-
DELETE	L98F22	-	8J4	-	-	-
DELETE	L98G22	-	8J4	-	-	-
DELETE	L98H22	-	8J4	-	-	-
DELETE	L98J22	-	8J4	-	-	-
DELETE	L98K22	-	8J4	-	-	-
DELETE	L98L22	-	8J4	-	-	-
DELETE	L98M22	-	8J4	-	-	-
DELETE	L98N22	-	8J4	-	-	-
RETERMINATE	L98A20		8PS2P1-C	M39029/57-357	8TB3-A1	M39029/1-101
ADD	L98A20	42	8PS2P1-C	M39029/57-357	8TB3-A1	M39029/1-101
ADD	L98B20	6	8TB3-K1	M39029/1-101	8TB3-K3	M39029/1-101
ADD	L175A20N	10	8TB3-K2	M39029/1-101	LOC GR	MS25036-103
ADD	L176A20N	10	8TB3-K4	M39029/1-101	LOC GR	MS25036-103

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NOTES

1 Applicable to S/N 51390 through 51513 only.

2 Applicable to S/N 45154 through 45840 and 51001 through 51389 only.

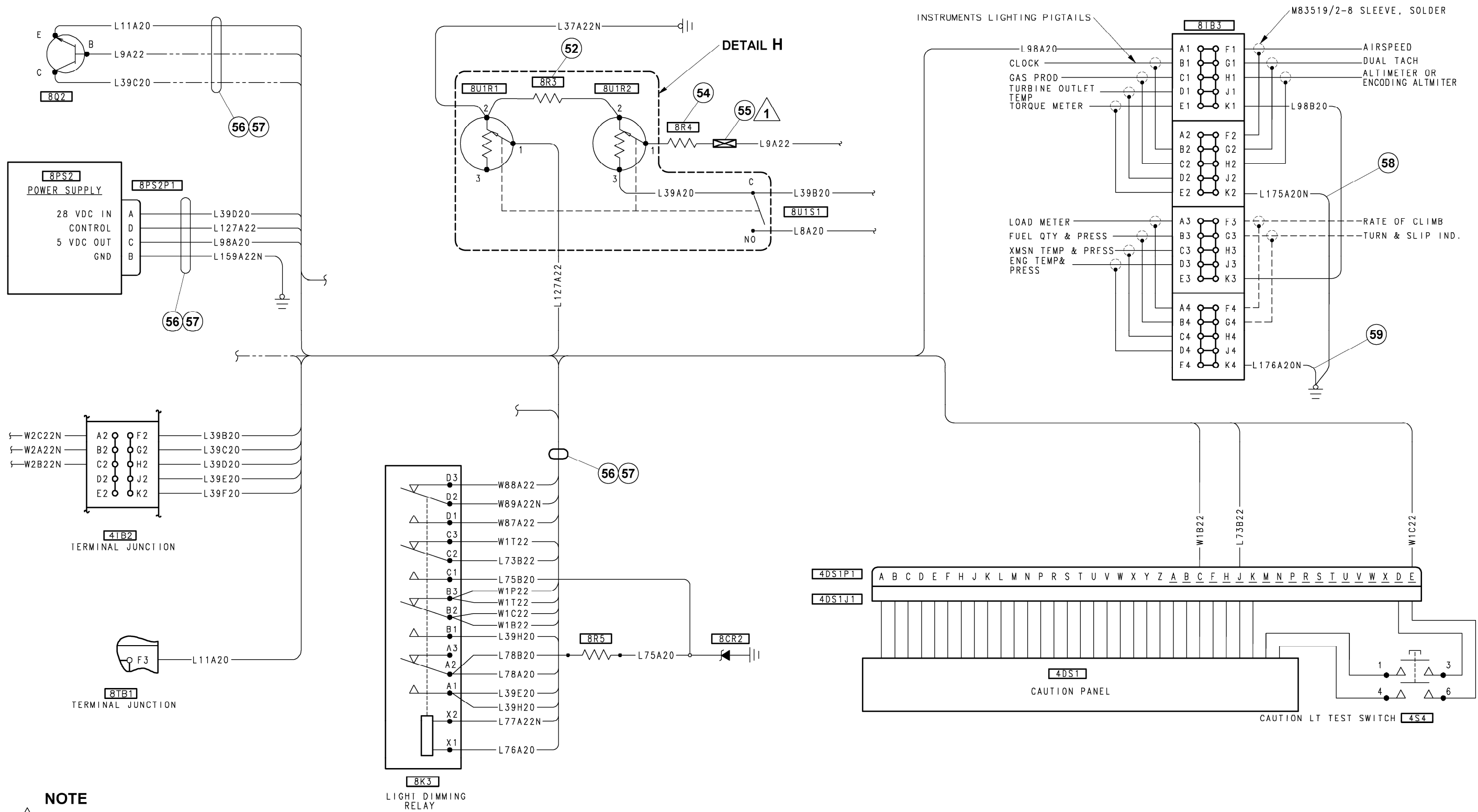
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Table 3. Wiring Modification Table for 206-704-735-103

WIRING MODIFICATIONS INSTRUCTION TABLE FOR 8TB3 LIGHTING					
ACTION	WIRE	FROM	HARDWARE	TO	HARDWARE
ADD	SOLDER SLEEVE	CLOCK SHIELD	SLEEVE	8TB3-B2	M39029/1-101
ADD	SOLDER SLEEVE	GAS PRODUCER SHIELD	SLEEVE	8TB3-C2	M39029/1-101
ADD	SOLDER SLEEVE	TOT SHIELD	SLEEVE	8TB3-D2	M39029/1-101
ADD	SOLDER SLEEVE	TORQUE SHIELD	SLEEVE	8TB3-E2	M39029/1-101
ADD	SOLDER SLEEVE	LOAD/FUEL PRESS. SHIELD	SLEEVE	8TB3-A4	M39029/1-101
ADD	SOLDER SLEEVE	FUEL QUANTITY SHIELD	SLEEVE	8TB3-B4	M39029/1-101
ADD	SOLDER SLEEVE	XMSN TEMP. & PRESS. SHIELD	SLEEVE	8TB3-C4	M39029/1-101
ADD	SOLDER SLEEVE	ENG TEMP. & PRESS. SHIELD	SLEEVE	8TB3-D4	M39029/1-101
ADD	SOLDER SLEEVE	AIRSPEED SHIELD	SLEEVE	8TB3-F2	M39029/1-101
ADD	SOLDER SLEEVE	DUAL TACHOMETER SHIELD	SLEEVE	8TB3-G2	M39029/1-101
ADD	SOLDER SLEEVE	ALTIMETER SHIELD	SLEEVE	8TB3-H2	M39029/1-101
ADD	SOLDER SLEEVE	RATE OF CLIMB SHIELD	SLEEVE	8TB3-F4	M39029/1-101
ADD	SOLDER SLEEVE	TURN & SLIP SHIELD	SLEEVE	8TB3-G4	M39029/1-101
RETERMINATE	CLOCK	-	-	8TB3-B1	M39029/1-101
RETERMINATE	GAS PRODUCER	-	-	8TB3-C1	M39029/1-101
RETERMINATE	TOT	-	-	8TB3-D1	M39029/1-101
RETERMINATE	TORQUE	-	-	8TB3-E1	M39029/1-101
RETERMINATE	LOAD/FUEL PRESS.	-	-	8TB3-A3	M39029/1-101
RETERMINATE	FUEL QUANTITY	-	-	8TB3-B3	M39029/1-101
RETERMINATE	XMSN TEMP. & PRESS.	-	-	8TB3-C3	M39029/1-101
RETERMINATE	ENG TEMP. & PRESS.	-	-	8TB3-D3	M39029/1-101
RETERMINATE	AIRSPEED	-	-	8TB3-F1	M39029/1-101
RETERMINATE	DUAL TACH.	-	-	8TB3-G1	M39029/1-101
RETERMINATE	ALTIMETER	-	-	8TB3-H1	M39029/1-101
RETERMINATE	RATE OF CLIMB	-	-	8TB3-F3	M39029/1-101
RETERMINATE	TURN & SLIP	-	-	8TB3-G3	M39029/1-101

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Table 4. Wiring Modification Table for 8TB3



Wiring Diagram. 5 Volt Lighting System Post TB