

**MODELS AFFECTED:** 407

**SUBJECT:** CARGO HOOK KIT 206-706-341-109/-111, MANUAL AND ELECTRICAL RELEASE SYSTEMS, MODIFICATION OF.

**HELICOPTERS AFFECTED:** 407, Serial Numbers 53000 through 53152 and 53154 through 53165.

[Serial Numbers 53153, 53166 and subsequent will have the intent of this bulletin completed before delivery.]

**COMPLIANCE:** For helicopters with the cargo hook installed, in the next 300 hours but not later than March 31, 1998.

For helicopters with cargo hook provisions only, not later than September 30, 1998.

**DESCRIPTION:** This bulletin changes the position of the manual cargo release mechanism to give clearance between the cargo release handle and the copilot seat bottom cushion. This bulletin also changes the wires of the electrical release system. This will increase the amperage rating of the circuit breaker.

Part I of this bulletin gives the procedures to change the manual cargo release system.

Part II of this bulletin gives the procedures to change the electrical release system.

**APPROVAL:**

The engineering design aspects of this Service Bulletin are Transport Canada approved.

**MANPOWER:**

Approximately 8.0 man-hours are necessary to complete Part I of this Bulletin. Approximately 6.0 man-hours are necessary to complete Part II of this Bulletin. The man-hours are based on hands-on time and can change due to the personnel and facilities available.

**WARRANTY:**

Owners/operators of 407 helicopters who comply with the instructions outlined in this bulletin are eligible for a special 100% warranty credit towards the kit specified in the "required material" section of this bulletin.

To receive this credit:

- 1.The owner/operator must get the replacement hardware kit from an approved BHTI spares supply source.
- 2.The work must be done in compliance with the instructions outlined in this bulletin no later than September 30, 1998.
- 3.The owner/operator must send a completed Malfunction Report (MR) to BHT Warranty Administration. A copy of the BHTI invoice referencing the hardware kit used to accomplish this bulletin must be attached to the Malfunction Report (MR).

**- NOTE -**

Customers who comply with the instructions in this bulletin after September 30, 1998, are not eligible for the special warranty credit provisions listed above.

**MATERIAL:**

**Required Material:**

The material that follows is necessary to complete this Bulletin and can be procured through your Bell Helicopter Textron Supply Center.

Order **hardware kit CA407-98-16-1** that consists of the parts that follow:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
206-031-168-131	COVER	1
206-706-341-121	DOUBLER	1
407-070-921-103A	SUPPORT	1
407-070-921-121	CLIP	1
407-070-922-101	COVER	1
MS20470AD4-6	RIVET	4
MS20470AD4-3	RIVET	2
MS20426AD3-3	RIVET	8
MS21059L08K	NUTPLATE	4
MS26574-10	CIRCUIT BREAKER	1
MS3367-5-9	NYLON TIE	12
MS35489-11	GROMMET	1
NAS1149D0863J	WASHER	1
MS27488-20	SEAL PLUG	4
110-164-2	RIVET	4
MS21266-3N	GROMMET	1
407-076-506-103A	CABLE ASSEMBLY	1
CONSISTS OF: (NOTE 1)		
M1A18	WIRE	1
M2B18	WIRE	1
M3B18N	WIRE	1
-9	WIRE	1
-10	WIRE	1
MS25036-102	TERMINAL	1
MS25036-103	TERMINAL	1
MS3474W10-6S	CONNECTOR	1
M85049/60-1W10	BACKSHELL	1

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
30-207-1	PIN	6
202D132-25	BOOT	1
M81714/65-16-1	SPLICE	2
130-005-5-143	INSUL TUBING	1

**NOTE:**

1. Included in cable assembly P/N 407-076-506-103A as loose or assembled parts.

**Consumable Material:**

The material that follows is necessary to complete this Bulletin, however, this material is consumable (bench stock) material and does not require ordering depending on the operators consumable material stock levels. This material can be obtained through your Bell Helicopter Textron Supply Center.

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>REFERENCE NO.</u>
MAGNOBOND 6398 50 GM	ADHESIVE	C-317
MILA46050TYIICL3 1OZ	ADHESIVE	COMMERCIAL
299-947-066TYI	ADHESIVE	C-301
MIL-S-81733TY2.5 OZ	SEALANT	C-392

**- NOTE -**

The "C" REFERENCE NO. above is a cross reference to the consumable list found in the Standard Practices Manual.

**SPECIAL TOOLS:**

Part I: None required.

Part II: The special tool that follows is necessary for the connector MS3474W10-6S:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
M81969/14-11	INSERTION/REMOVAL TOOL

The special tool that follows is necessary for the terminal block 4TB1:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
M81969/16-02	INSERTION/REMOVAL TOOL

The special tools that follow are necessary for the splice M81714/65-16-1:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>
M22520/7-01	CRIMP TOOL
M22520/7-13	POSITIONER (NOTE 1)
M81969/14-03	INSERTION/REMOVAL TOOL

**NOTE:**

1. Use with the crimp tool P/N M22520/7-01. Use the selector setting 7.

**WEIGHT AND BALANCE:**

Not affected.

**ELECTRICAL LOAD DATA:**

Not affected.

**REFERENCES:**

BHT-407-II-5, Basic- 11 March 1997:

Installation Instruction for Cargo Hook Kit.

BHT-407-MM-12, rev.4- 16 December 1996:

Chapter 98, Electrical system.

BHT-407-IPB, rev.3- 16 December 1996:

Chapter 96, Electrical.

**PUBLICATIONS AFFECTED:**

BHT-407-II-5, Basic- 11 March 1997:

Installation Instruction for Cargo Hook Kit.

BHT-407-MM-12, rev.4- 16 December 1996:

Chapter 98, Electrical system.

BHT-407-IPB, rev.3- 16 December 1996:

Chapter 96, Electrical.

**ACCOMPLISHMENT INSTRUCTIONS:**

**Part I - Installation of the new support (407-070-921-103).**

**A. REMOVAL OF OLD SUPPORT 407-070-921-101.**

1. Disconnect the battery. Remove the crew seats and seat panels from the helicopter (refer to BHT-407-MM, Chapter 25).
2. Remove the handle and the jam nuts from the mechanical release cable (20, BHT-407-II-5, Figure 1-1). Keep the handle and jam nuts for subsequent installation. Remove the cover (1) and save for later. Refer to step 29 where the cover is used as a template.
3. Remove the nylon ties (21) that attach the wires to the mechanical release cable (20) above and below the helicopter floor.
4. Remove the sealant from around the release cable (20) and the grommet, where the cable goes through the floor (ref: F.S. 62.80). Isolate the electrical wires from the release cable.
5. Remove the clamps (23, 29 and 38) that attach the release cable (20) to the bottom of the helicopter and the forward crosstube. Keep the hardware for subsequent installation.

- CAUTION -

**DO NOT BEND THE RELEASE CABLE MORE THAN NECESSARY TO REMOVE IT. IF YOU BEND IT TOO MUCH, YOU CAN CAUSE CRACKS IN THE RELEASE CABLE HOUSING. THESE CRACKS CAN LET CORROSION OCCUR ON THE CABLE AND PREVENT THE SMOOTH OPERATION OF THE RELEASE CABLE.**

6. Disconnect the release cable (20) from the support (34) at STA 115. Remove the release cable and keep for subsequent installation.
  7. Remove the four bolts (16), the washers (17) and the nuts (18) that attach the support assembly (15) to the aircraft structure. Discard the support assembly (15). Keep two of the bolts (16), two of the washers (17) and two of the nuts (18) for subsequent installation.
- B. INSTALLATION OF THE NEW SUPPORT.
8. Remove the two rivets on each side of the aircraft structure (Figure 1, Views C-C and D-D).
  9. Put the new support (2) in position on the bolt holes that are in the aircraft structure (F.S. 60.47). Attach the forward legs of the support (2) with the hardware (3), (4) and (5) that you kept in step 7.
  10. Use the holes in the left hand side of the aircraft structure as a template to back drill the support (2, Figure 1, View C-C). Use a #30 drill. Install clecos through the holes in the support and the airframe structure.
  11. Put the clip (11) in position against the right hand aft side of the support (2) and against the airframe structure (refer to View D-D). Attach the clip (11) to the support (2) with a clamp.
  12. Use the holes in the right hand side of the aircraft structure as a template to back drill the clip (11). Install clecos through the holes in the clip and the airframe structure.
  13. Use a #30 drill to make two holes through the clip (11) and the support (2, Figure 1, View B-B).
  14. Remove the support (2) and the clip (11) from the helicopter.

15. Deburr the holes in the support (2), the clip (11) and the right hand side of the airframe structure.
16. Use the rivets (13) to attach the clip (11) to the support (2).
17. Put the support (2) in position on the aircraft structure and attach the forward legs to the structure with the two bolts (3), the washers (4) and the nuts (5). Use the rivets (12) to attach the support assembly to the left and right hand side of the airframe structure.
18. Install shoulder nut (19) and washer (18) on the release cable (6) and put the cable through the hole in the floor and the hole in the support (2).
19. Attach the release cable (6), with the hardware removed in step 5, to the two most forward locations (F.S. 69.5 and 83.0) under the helicopter.

**- NOTE -**

To make sure you have clearance between the release cable and the flight controls, use one of the procedures that follow:

a) Connect a hydraulic power supply to the helicopter hydraulic system. Refer to BHT-407-MM Chapter 29, paragraph 29-10.

or

b) Disconnect all four main rotor pitch change links at the swashplate. Temporarily attach the pitch links to their related blade with tape while you do the clearance check. Connect the pitch links after you complete the check.

**- NOTE -**

Give special attention to contact between the release cable and the bleed air heater tubes, if installed.

20. Make sure that the cable (6) is clear of the flight controls and other components that are close as follows:

- a. Move the cyclic controls through their full travel while you move the collective up and down.
  - b. Do the same with the anti-torque controls.
  - c. Make sure that there is a minimum clearance of 0.100 inch (2.54 mm) at all times between the release cable (6) and the bellcrank P/N 407-001-326-101 and between the release cable and the control tube P/N 407-001-021-101.
21. Put the release cable (6) in a location in the oblong hole of the support (2) that gives the maximum clearance between the release cable, the flight controls and the other components installed in the area. To find the correct location of the release cable you must install it with the washer (18), the shoulder nut (19), the jam nut (14) and the existing washer. Tighten the jam nut (14) with your fingers.
  22. When you have found the correct location of the release cable (6), index mark the position of the cable centerline on the support (2). Remove the cable from the support.
  23. Install the doubler (15) on the top of the oblong hole in the support (2). Align the hole in the doubler (15) with the index marks done in step 22.
  24. Drill four holes in the doubler (15) and the support (2) with a #40 drill (Figure 1, View A-A). Make sure you have the correct edge distance. Remove the doubler from the support and deburr all the holes. Cut the edges of the doubler (15) that are not in contact with the support (2).
  25. Use adhesive Magnobond 6398 to bond the doubler (15) to the top of the support (2). Refer to BHT-206-SRM-1 for the bonding procedure. Install the four rivets (16) through the doubler (15) and the support (2) while the adhesive is still wet. Remove the unwanted adhesive and let cure.
  26. Put the washer (18) in position on the bottom of the support (2). Align the hole of the washer with the hole in the doubler (15). Bond the washer to the support (2) with adhesive Magnobond 6398.

27. Install a new grommet (9) on the release cable (6). Put the release cable (6) through the assembled support (2) and tighten the jam nut (14) while the adhesive on the washer is still wet. Make sure the adhesive does not contact the threads on the release cable (6). Let the adhesive cure for 24 hours at room temperature.

C. INSTALLATION OF THE NEW COVER (206-031-168-131)

28. Calculate the location of the hole in the new cover (1) for the support (2, Figure 1, View A-A). Cut the hole in the cover. Install the cover on the pedestal to make sure it fits. Make sure that a gap of 0.010 inch (2.6 mm) is between the cover (1) and the support (2).
29. Install four nutplates with eight rivets on the cover (1) for the collective stick boot support. Use the cover removed in step 2 as a template to find the locations of the nutplates on the new cover (1). Discard the cover removed in step 2.
30. Put the vinyl fabric cover (17, Figure 1, View E-E) in position on the lower surface of the cover (1). Bond the vinyl fabric cover (17) to the cover (1) with adhesive MILA46050TYIICL3 and let it cure.
31. Make a 0.54 inch (13.7 mm) hole in the vinyl fabric cover (17) that aligns with the hole in the doubler (15).
32. Install the release cable (6), use the hardware stack up shown in Figure 1 Section F-F. Do a functional check of the manual release system (BHT-407-II-5, Section 1-6) and make sure that the release cable operates smoothly.

D. MODIFICATION OF SUPPORT 206-072-938-001.

33. Install the correct length of the caterpillar type grommet (1, Figure 2) to the aft flange of the support (2) with adhesive (C-301).

**Part II - MODIFICATION OF ELECTRICAL WIRING.**

1. Make sure that you disconnect the helicopter battery.
2. Open the circuit breaker panel, remove the cover on the windshield post, remove the instrument console covers and side panels. If not already done, remove the crew seat, the crew seat panels and the center panel under the collective.
3. Remove the circuit breaker (4CB5) and replace it with the new circuit breaker (10 Amp. rating). Connect wire P14A12 to one side of circuit breaker.

**- NOTE -**

Do not connect the new wires to the terminal block 4TB1 the same as the removed wires. The new wires will be connected to splices that will be put near the terminal block 4TB1 and safetied to the wire harness.

4. Replace the wire between circuit breaker (4CB5) and the terminal block (4TB1) as follows:
  - a. Disconnect the wire (M1A20) from the circuit breaker (4CB5) and pin NH on the terminal block (4TB1).
  - b. Put the new wire (M1A18) along the same path as the removed wire (M1A20) between the circuit breaker (4CB5) and the terminal block (4TB1).
  - c. Connect one end of the wire (M1A18) to the circuit breaker (4CB5) with the terminal lug (MS25036-102).
  - d. Connect the other end of the wire to one end of the splice M81714/65-16-1, near the terminal block (4TB1).
5. Replace the wire assembly between connector (J180) and the area below the pilot seat as follows:
  - a. Remove the connector (J180) with the wires (M2B20) and (M3B20N). Remove the wire (M2B20) from the terminal block

- (4TB1). Remove the wire M3B20N from the ground lug (ND454). Keep the hardware.
- b. Install the new cable assembly which includes the new connector (J180) and the wires (M2B18) and (M3B18N). Install the new cable assembly along the same path as the removed cable assembly.
- c. Connect the wire (M3B18N) to the ground lug (ND454) with the hardware removed in step 5a.
6. Replace the wires between the cargo release button switch on the cyclic grip and the terminal block (4TB1) as follows:
- a. Pull out the cargo release button (4A5S3) from the cyclic grip.
- b. Disconnect the wires (gauge 20) numbered -9 and -10 from the cargo release switch and from their pins NJ and NL on terminal block (4TB1).
- c. Connect each end of the new wires (gauge 18) P/N -9 and P/N -10 to the ends of the disconnected wires -9 and -10. Pull the wires -9 and -10, one at a time, through the lower end of the cyclic stick until sufficient length is available for installation.
- d. Cut the new wires -9 and -10 at the upper end of the cyclic stick and connect the ends to the terminals on the cargo release switch. Give 2-3 inches of play in the wires to permit future removal of the switch.
- e. Put the new wires, -9 and -10 from the release switch, along the same path as the removed wires -9 and -10. Cut the wires from the release switch to the correct length. Connect the wire -9 to the wire (M2B18) and the wire -10 to the wire (M1A18) with the splices P/N M81714/65-16-1. Make a loop with the wires near the terminal block (4TB1) and safety them to the harness.

7. Install a seal plug P/N MS27488-20 in pins NH, NJ, NL and NM of terminal block (4TB1) to prevent the access of moisture.
8. Make sure that all the wires are safetied without chafing or preloading.
9. Connect the battery and do a functional check of the electrical release system. Refer to section 1-6 of BHT-407-II-5.
10. Install the cover (1), the seat panels, the crew seats, the console panels, the windshield post cover, and the circuit breaker panel. Connect the main rotor pitch links or disconnect the hydraulic power supply, as applicable. Return the helicopter to flight configuration.
11. Make an entry in the helicopter historical records to show that this Alert Service Bulletin is completed.
12. Make an entry in the Record of Alert Service Bulletins in the Maintenance Manual.

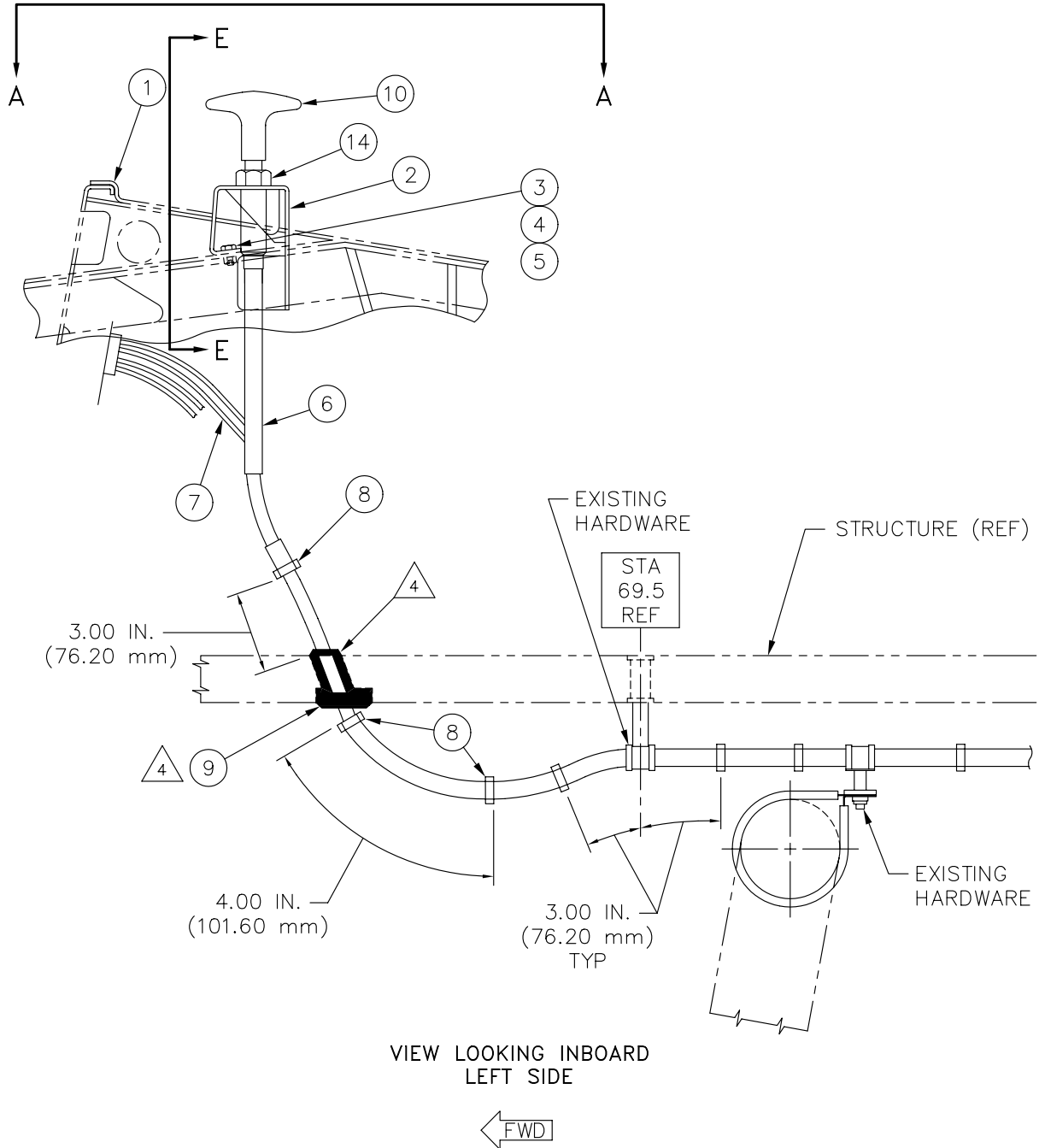


Figure 1. Installation of new support (407-070-921-103) (Sheet 1 of 5)

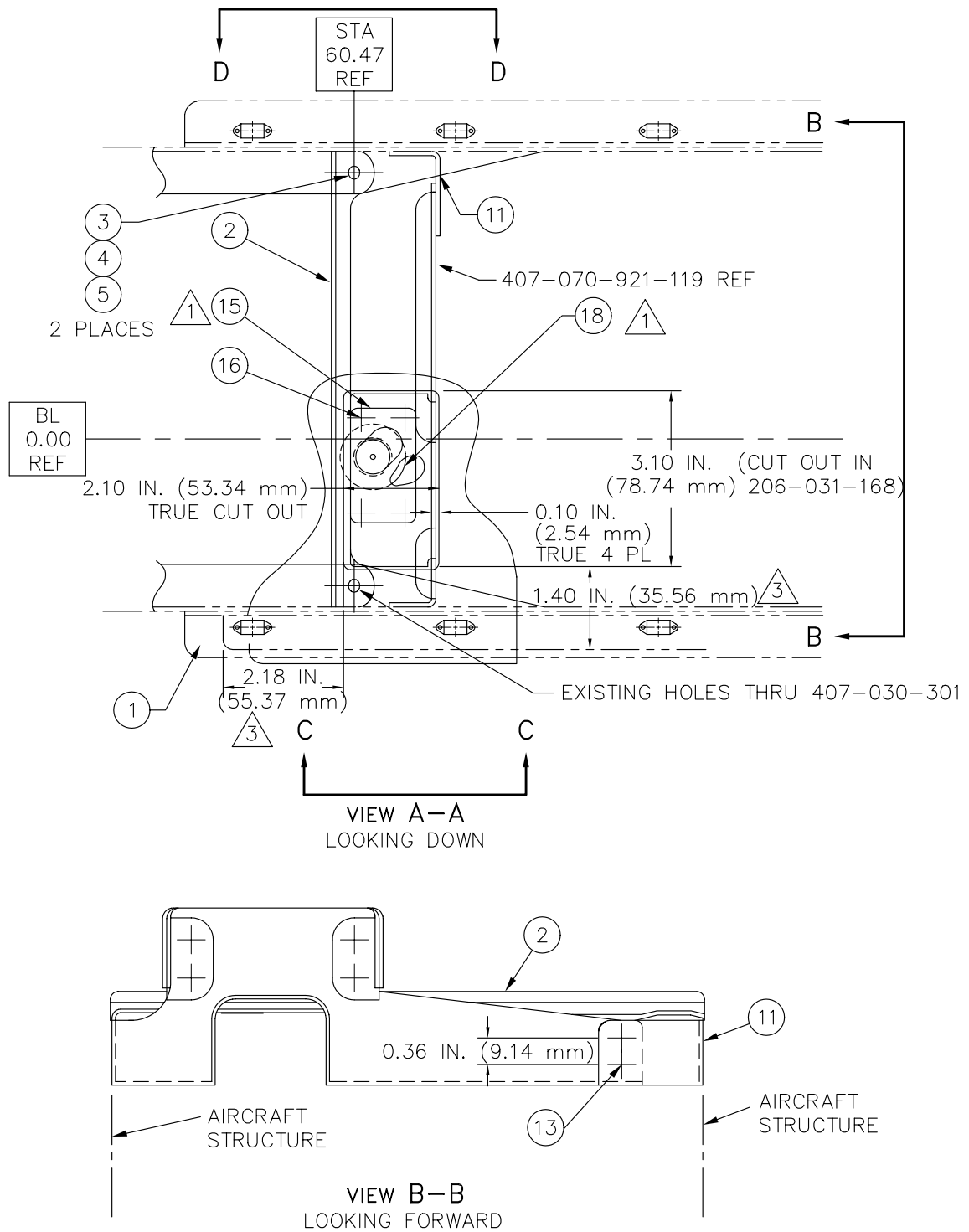


Figure 1. Installation of new support (407-070-921-103) (Sheet 2)

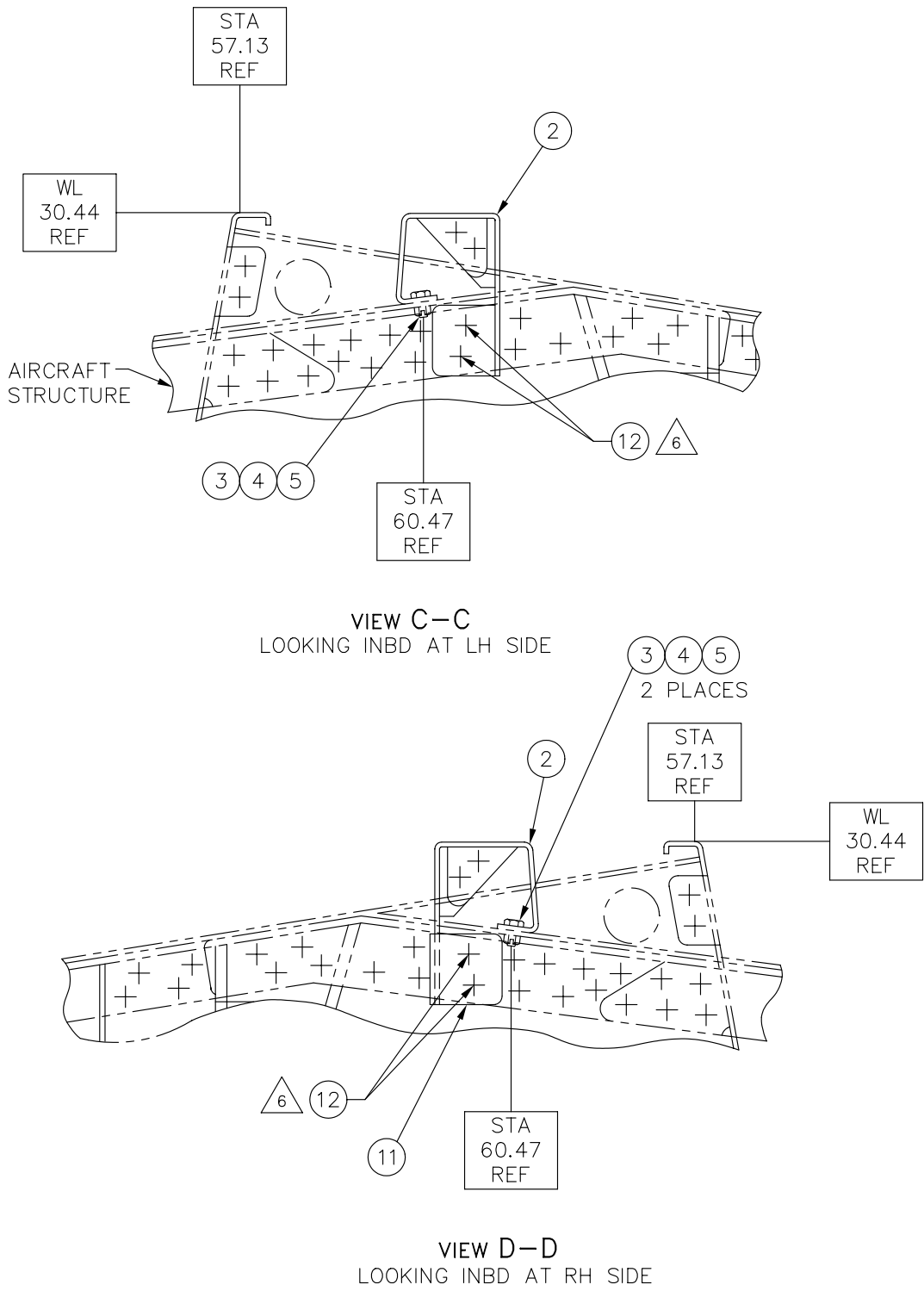


Figure 1. Installation of new support (407-070-921-103) (Sheet 3)

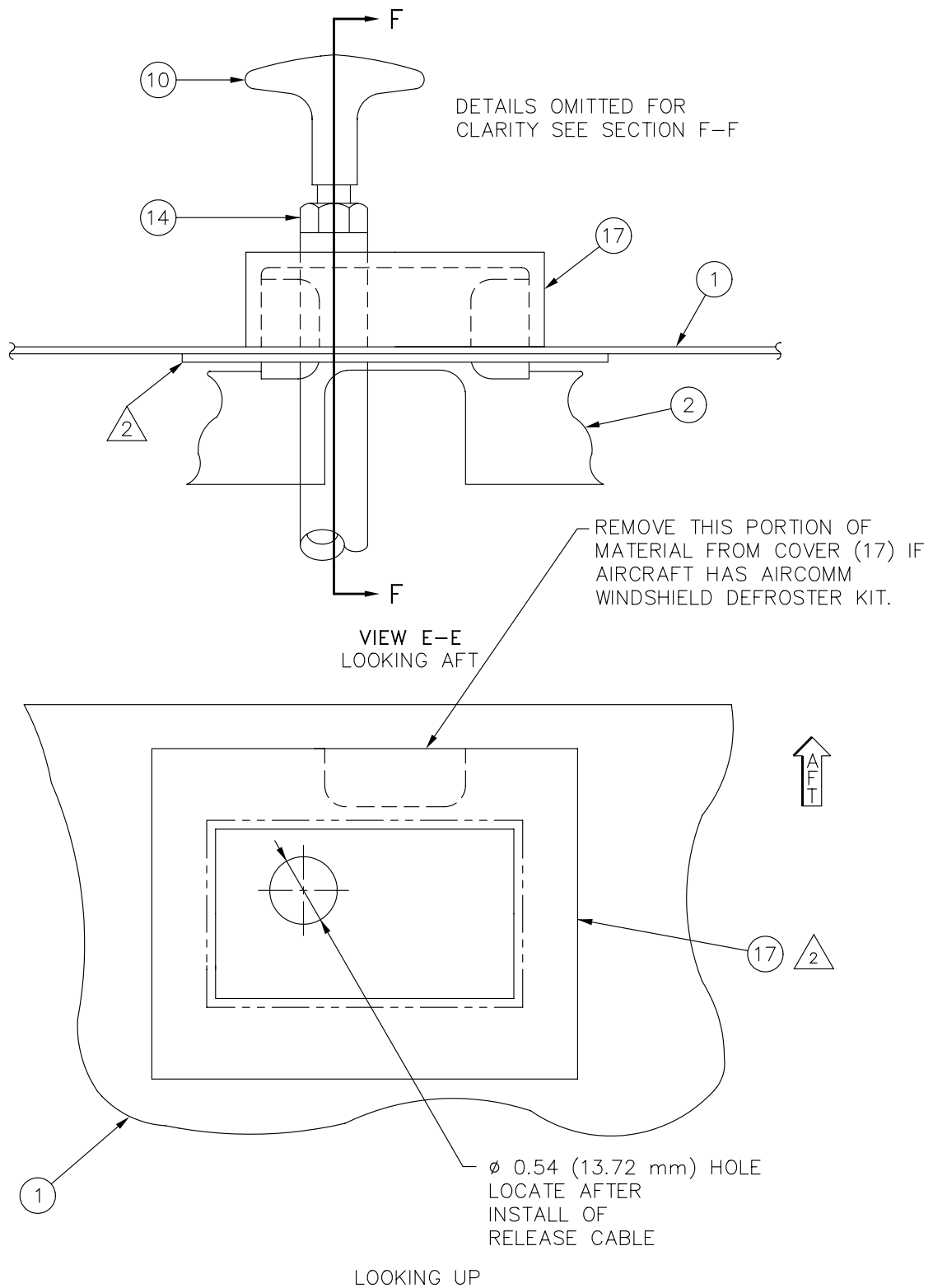
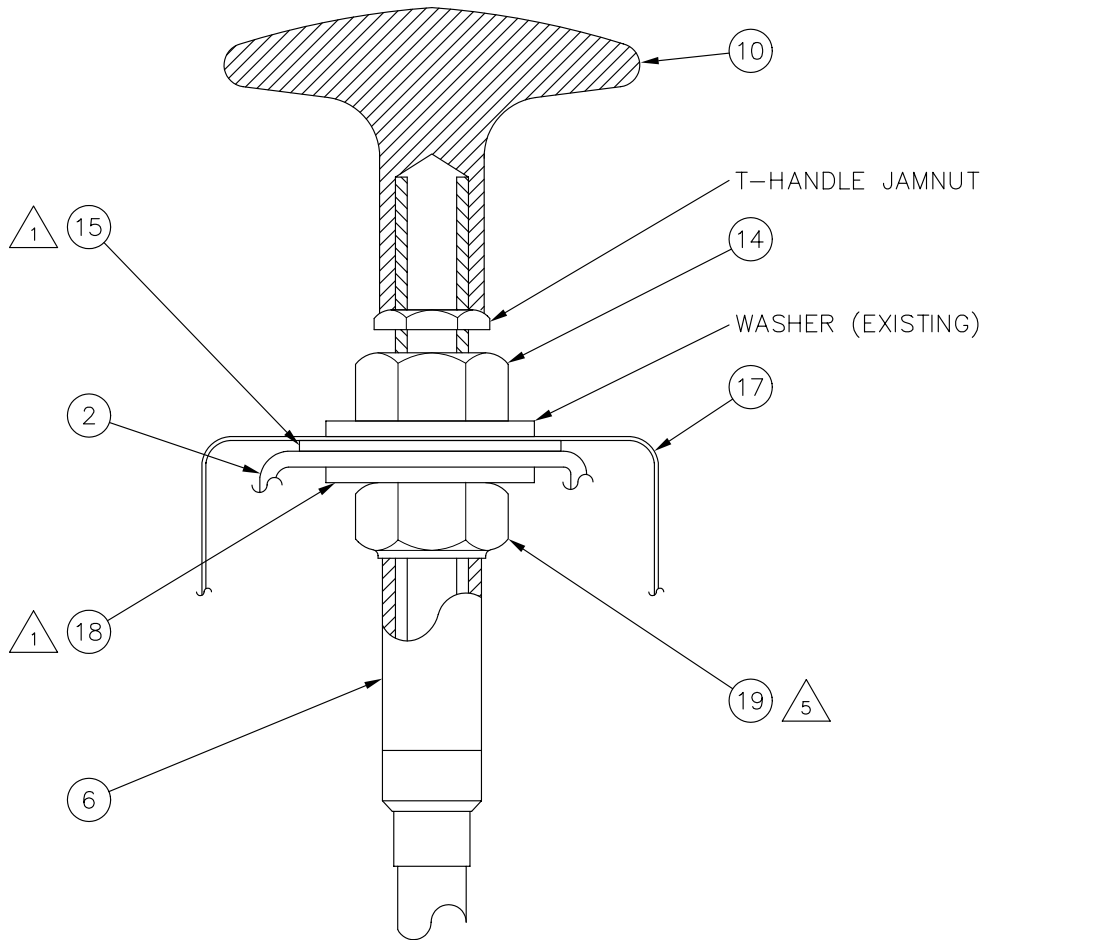


Figure 1. Installation of new support (407-070-921-103) (Sheet 4)



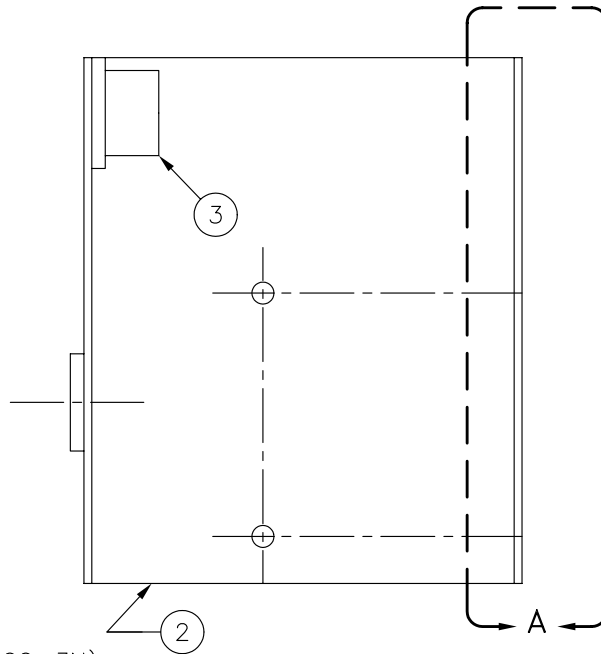
SECTION F-F

- |                                      |  |
|--------------------------------------|--|
| 1. COVER (206-031-168-131)           | 11. CLIP (407-070-921-121)   |
| 2. SUPPORT (407-070-921-103A)        | 12. RIVET (MS20470AD4-6), 4 REQD. <span style="float: right;">△ 6</span> |
| 3. BOLT (EXISTING)                   | 13. RIVET (MS20470AD4-3), 2 REQD.  |
| 4. WASHER (EXISTING)                 | 14. JAMNUT (EXISTING)  |
| 5. NUT (EXISTING)                    | 15. DOUBLER (206-706-341-121)  |
| 6. CABLE, RELEASE (EXISTING)         | 16. RIVET (110-164-2), 4 REQD.   |
| 7. CABLE ASSEMBLY (407-076-506-103A) | 17. COVER (407-070-922-101)  |
| 8. NYLON TIE (MS3367-5-9)            | 18. WASHER (NAS1149D0863J)   |
| 9. GROMMET (MS35489-11)              | 19. SHOULDER NUT (EXISTING)  |
| 10. T-HANDLE (EXISTING)              |  |

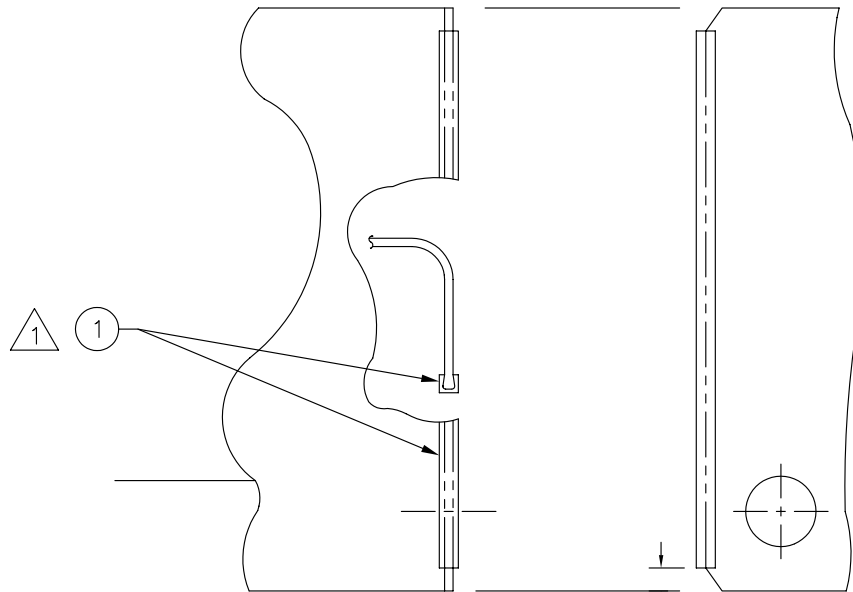
NOTES:

- △ 1 Bond with adhesive Magnobond 6398.
- △ 2 Bond with adhesive MILA46050TYIICL3.
- △ 3 Distance measured from near edge of radius on cover 206-031-168-131.
- △ 4 Seal around cable and grommet with sealant MIL-S-81733.
- △ 5 Install shoulder nut with shoulder facing down.
- △ 6 Rivets M7885/4-4-( ) can be used as an alternative.

**Figure 1. Installation of new support (407-070-921-103) (Sheet 5)**



- 1. GROMMET (MS21266-3N)
- 2. SUPPORT (206-072-938-001) (EXISTING)
- 3. CONNECTOR (REF)



NOTE:  
1 BOND WITH ADHESIVE  
299-947-066TY1

VIEW A

Figure 2. Modification of support (206-072-938-001)

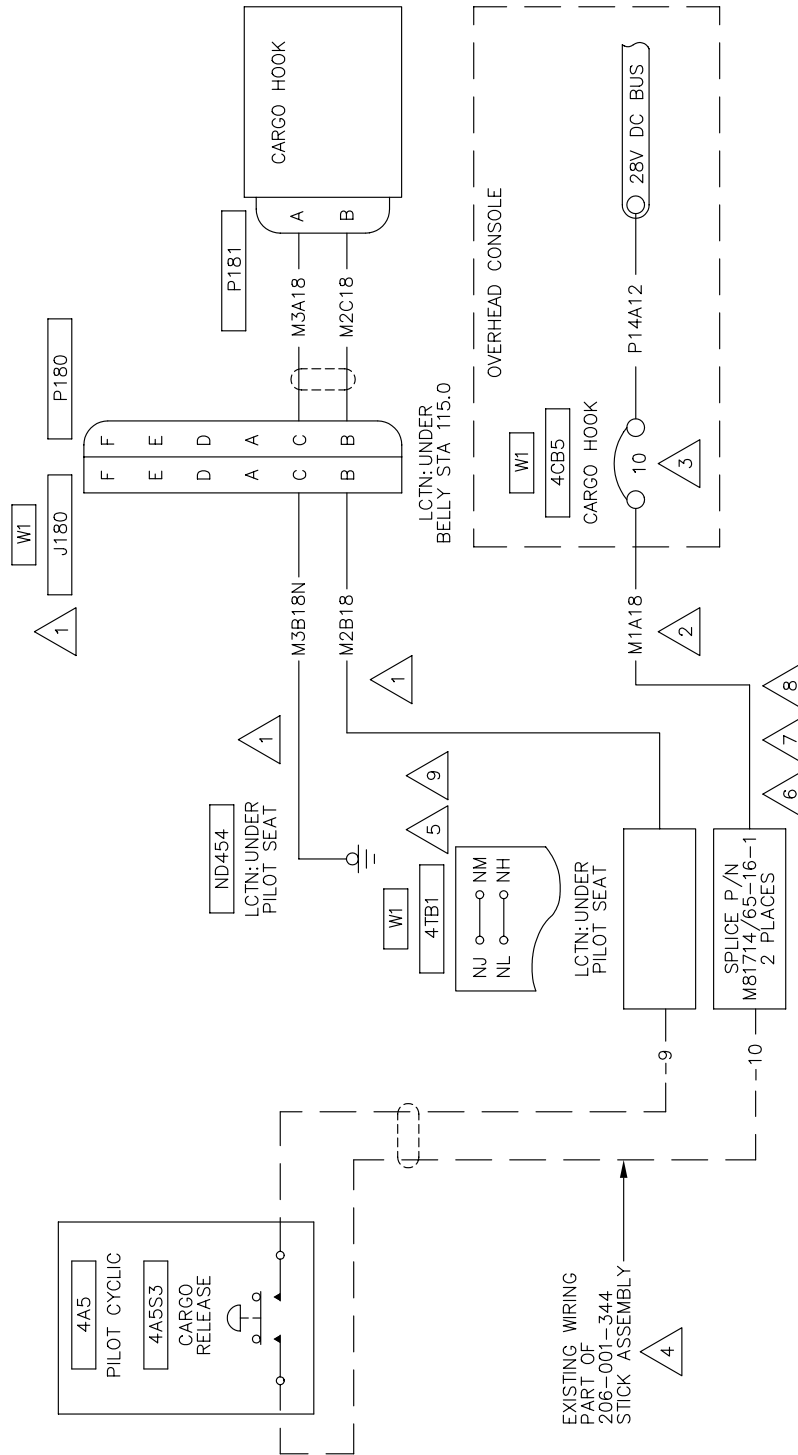


Figure 3. Modification of electrical wiring (Sheet 1 of 2)

NOTES:

- △<sub>1</sub> Replace as a unit, the cable assembly made up of the connector (J180) and wires M3B20N and M2B20, with the new cable assembly that includes the new connector (J180) and the new wires M3B18N and M2B18.
- △<sub>2</sub> Replace the wire M1A20 with the new wire M1A18.
- △<sub>3</sub> Replace the circuit breaker MS26574-5 with the new circuit breaker MS26574-10.
- △<sub>4</sub> Replace the wires -9 and -10 (gauge 20) in the cyclic stick grip assembly with the new wires -9 and -10 (gauge 18).
- △<sub>5</sub> Use insertion/removal tool M81969/16-02 for TB 4TB1.
- △<sub>6</sub> Use insertion/removal tool M81969/14-03 for the splice.
- △<sub>7</sub> Connect the wire -9 to the wire M2B18 and the wire -10 to wire M1A18 with splices P/N M81714/65-16-1. Use pins M39029/22-193 included with the splice. Make a loop with the wires near the terminal block (4TB1) and safety them to the harness.
- △<sub>8</sub> Use the correct crimp tool/positioner. Refer to Special Tools section of this bulletin.
- △<sub>9</sub> Use seal plugs P/N MS27488-20 to seal open contacts NH, NJ, NL and NM of 4TB1.