

R44-series (14V) Cockpit Camera Installation Kit Instructions

Eligible for installation on R44 Raven I (14V) S/N 2420 & prior, with helicopter electrical system voltage verification. Refer to KI-275-2 for helicopters with (28V) electrical systems. Kit provides instruction for installing cockpit camera, antenna, and required wiring, including splicing camera audio wire (-3081) with copilot headset audio wires (-1497 & -1498), or (-1795, -1796, & -1797). Kit instructions perform splice at ICS or audio panel, the location recommended by RHC. Installing technician may select an alternate splice location.

NOTE

Visit www.robinsonheli.com to verify kit instructions are current revision. Review instructions before installation; contact RHC Technical Support with questions. Verify kit contents match list; contact RHC Customer Service if parts are missing or damaged.

NOTE

Kit requires separating cabin interior pieces from bulkhead and roof, which may result in deterioration of the foam insulation. Kit does not contain replacement interior parts.

ITEM	PART NUMBER	KIT CONTENTS	QTY
1	KI-275-6Instr.	Kit Instructions	1
2	B158-2-1FT	Heat Shrink – Black, 1/8-inch diameter (one foot length)	1
3	B158-3-KI-275	Heat Shrink – Black, 3/16-inch diameter (3/4-inch length, labeled “KI-275”)	2
4	B260-2	Terminal – Ring	1
5	B260-3	Terminal – Ring	3
6	B266-4-6FT	Sleeving – Expandable, 1/4-inch diameter (6 foot length)	1
7	B267-5	Solder Sleeve – Splice	3
8	B267-6	Solder Sleeve – Splice	2
9	D269-6	Receptacle – Six Socket	1
10	D275-205	Fuse	1
11	F039-7	Enclosure Assembly – Cabin Camera	1
12	F714-2	Antenna Assembly	1
13	F714-4	Flash Drive Assembly	1
14	KI-275-3048	(B274-22) Wire, 22 gage, 130 inch length (marked “-3048”)	1
15	KI-275-3079	(B274-22) Wire, 22 gage, 220 inch length (marked “-3079”)	1
16	KI-275-3080	(B274-22) Wire, 22 gage, 140 inch length (marked “-3080”)	1
17	KI-275-3081	(B274-322) Wire, 3-conductor, 22 gage, shielded & jacketed, 250 inch length (marked “-3081”)	1
18	KI-275-ALL	Fuse Block Assembly Includes: [1] B158-2 Heat Shrink [1] B158-3 Heat Shrink, marked “5A” [1] B274-22 Wire, 22 gage, 40 inches (marked “-3078”) [1] D262-1 Fuse Block	1

ITEM	PART NUMBER	KIT CONTENTS (continued)	QTY
19	KI-275-GRN	Extraction, Removal & Insertion Tool (high density contact)	1
20	KI-275-RED	Extraction, Removal & Insertion Tool (standard density contact)	1
21	AN526C832R6	Screw	1
22	MS3367-4-9+	Ty-Rap (Note: "+" in part number indicates 20-qty pack)	1
23	MS3367-5-9+	Ty-Rap (Note: "+" in part number indicates 20-qty pack)	1
24	MS3367-7-9+	Ty-Rap (Note: "+" in part number indicates 10-qty pack)	1
25	MS21042L06	Nut	1
26	MS21042L08	Nut	1
27	MS27039C0806	Screw	2
28	MS35206-226	Screw	1
29	MS35206-227	Screw	1
30	MS35206-232	Screw	1
31	NAS1149FN616P+	Washer (Note: "+" in part number indicates 20-qty pack)	1
32	NAS1149FN816P+	Washer (Note: "+" in part number indicates 20-qty pack)	1

Consumables

Refer to R44 Maintenance Manual (MM) § 1.400 for approved materials list.

- A257-8 Rubber lubricant
- B270-1 Sealant
- B270-5 Sealant
- B270-8 Adhesive
- Solder (Sn60 or Sn63)

Special Tools:

- 90° angle drill
- Soldering iron
- Small diameter (~3/32-inch), 3-foot long rigid metal rod, such as a welding rod
- Wire stripping and crimping tools
- Adjustable heat gun with reflector [nozzle] capable of 700°F

Kit Instructions

1. Ensure battery and avionics switches are off. Disconnect battery per MM § 37-10.
2. Refer to MM Figure 2-4. Remove access and inspection panels 3A thru 3E, 4C thru 4H, and 6A. Remove LH seat back assembly per MM § 15-220. Remove avionics, avionics panel, radio tray, and equipment as required to access ICS or audio control connector. Open circuit breaker panel.
3. Refer to Figure 1. Remove and discard screw securing C039 cover assembly to D118-1 (rotor brake) bracket assembly; remove and retain screws securing cover to C710 spacers. Lower cover and disconnect cover wiring from airframe harness. Remove cover.

NOTE

Parenthetic dash numbers, such as (-2690), indicate number marked on wiring.

4. Refer to Figure 2. Wrap end of wires (-3048), (-3079), (-3080), and (-3081) together with masking tape. Attach the bundled wires to a rigid metal rod and carefully route upward behind bulkhead foam insulation on LH (seat back) side, along existing wire bundle, then forward along left side of helicopter centerline, routing above 220-242400-09 clips (see R44 Illustrated Parts Catalog [IPC] Figure 63-11). Pull wires to match the length of existing wires and trim to length. Strip wire ends and crimp (6) sockets (provided with D269 receptacle) on wires. Inspect crimps per Figure 6. Install wire sockets in D269-6 receptacle per Figure 2. Verify security of wires.

WARNING

Review appropriate Safety Data Sheet (SDS) when working in proximity to hazardous materials. Specific recommendations for use of personal protective equipment are located in the SDS.

5. Refer to Figure 1. Layout dimension on exterior roof for drilling new hole as shown in Detail B, using straight edge to maintain lateral alignment with existing holes. Using a drill stop, drill (1) .169–.175 inch diameter hole. Deburr hole and clean up debris. Using a pick or similar tool, pierce headliner at newly drilled hole. Install new AN526C832R6 screw (provided).
6. Refer to Figure 1. Remove C710-3 spacer from center screw and secure screw to roof using (1) NAS1149FN816P washer and (1) MS21042L08 nut as shown in Detail A. Install spacer to newly installed AN526C832R6 screw.
7. Refer to Figure 3. Carefully separate headliner from roof only as necessary to access antenna installation location. Connect D269-6 receptacle to camera plug in F039-7 enclosure assembly. Connect F714-2 antenna assembly to fitting in enclosure assembly and route cable forward. Position antenna with metal side down, 3.0–3.4 inches forward from enclosure, with inboard edge of antenna 1.3-1.7 inches left of helicopter centerline. Remove backing from tape on antenna and press in place on roof.
8. As required, install headliner to roof using B270-8 adhesive, tucking antenna wire inside headliner. Install enclosure assembly to C710-3 spacers using (2) MS27039C0806 screws, and to D118-1 bracket assembly using MS35206-232 screw. Secure enclosure wires to existing wires using appropriately-sized ty-raps. Cinch ty-raps until snug without over-tightening, and trim tips flush with head.

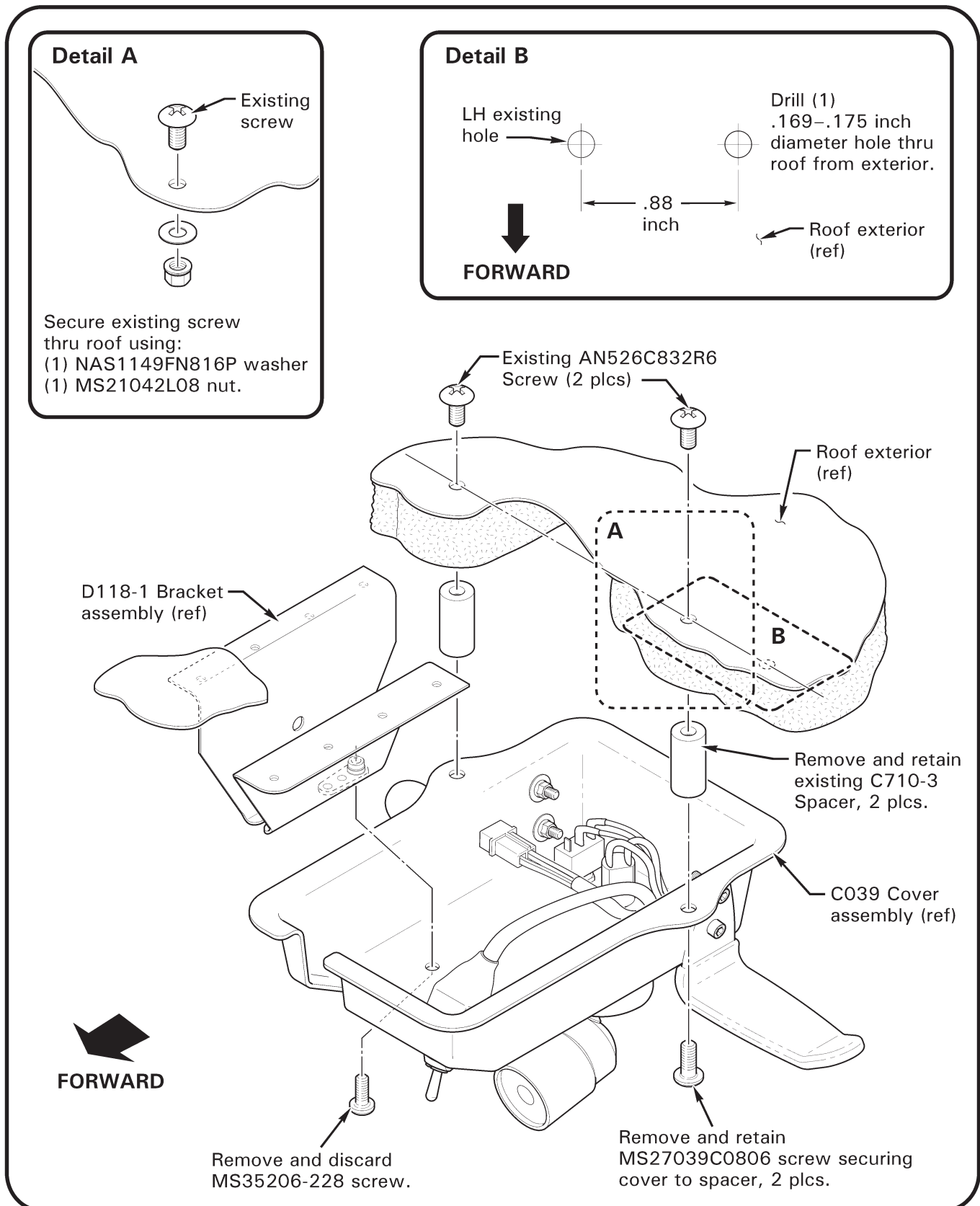


FIGURE 1 Existing C039 cover assembly installation
(includes new installation hole location)

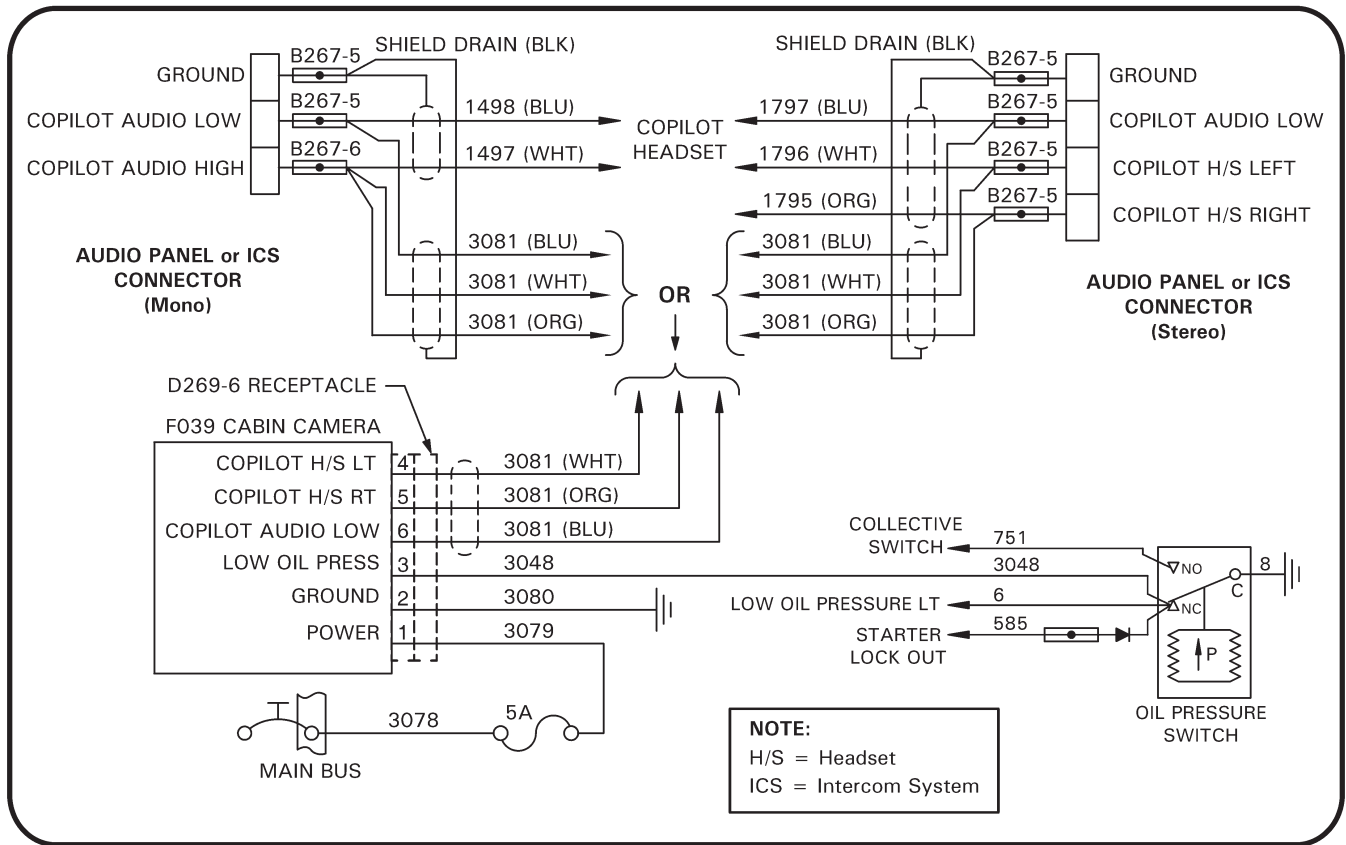


FIGURE 2 Wiring schematic
(typical; see MM § 14.00 for additional schematics)

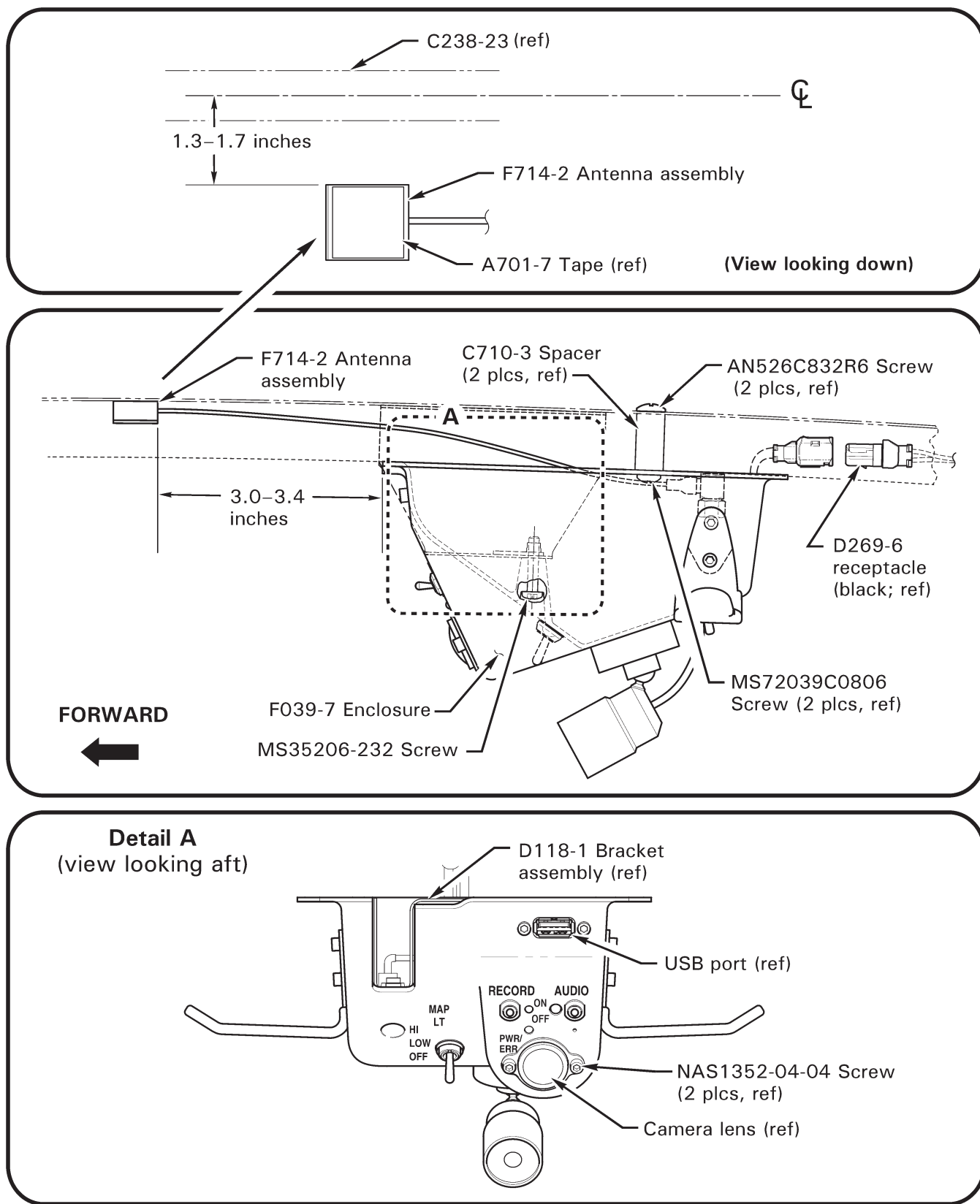


FIGURE 3 Enclosure and antenna installation

Kit Instructions (continued)

9. Refer to Figures 4A & 4B. Locate and drill (1) 0.143–0.149 inch diameter hole in C490 circuit breaker panel assembly using drill stop. Deburr hole and clean up debris. Position KI-275-ALL fuse block assembly on panel assembly with wire (-3078) outboard, and install using (1) MS35206-227 screw, (1) NAS1149FN616P washer under screw head, and (1) MS21042L06 nut. Select available location on main bus bar and trim wire (-3078) to length. Strip wire and install B260-2 ring terminal. Verify security of ring terminal. Remove existing installation screw and lockwasher from selected location; discard screw and retain lockwasher. Secure ring terminal to bus bar using new MS35206-226 screw and retained lockwasher.
10. Refer to Figure 5. Secure newly installed wires from enclosure assembly to existing wire harness along LH side of bulkhead using appropriately-sized ty-raps. Cinch ty-raps until snug without over-tightening, and trim tips flush with head.

NOTE

A257-8 lubricant may be used to aid routing of wire thru clamps.

- a. Route wire (-3080) to ground. Follow wire harness down to C351-1 LH aft seat back brace. Cut wire to length and strip end. Install B260-3 ring terminal to wire. Verify security of terminal. Install ring terminal to ground stud.
- b. Route wire (-3048) to engine oil pressure switch. Follow main harness thru C351-1 brace into tunnel, then aft thru firewall, moving B270-5 sealant as required. Follow wire bundle on aft side of firewall to oil pressure switch. Cut wire to length and strip end. Install B260-3 ring terminal on wire. Verify security of terminal. Install ring terminal to “NC” terminal on oil pressure switch. Ensure seal around wire bundle and firewall is restored, adding B270-5 sealant as required.
- c. Route wire (-3079) to newly installed fuse holder (Figure 4B) on circuit breaker panel. Slide (1) B158-3-KI-275 heat shrink onto wire, then (1) B158-2 heat shrink, cut to 1-inch length. Cut wire to length and strip end. Solder wire to fuse holder. Slide B158-2 heat shrink over soldered area and apply heat using heat gun. Slide B158-3-KI-275 heat shrink over B158-2 heat shrink and apply heat. Verify security.
- d. Route wire (-3081) forward along main harness to ICS or audio control connector under console.

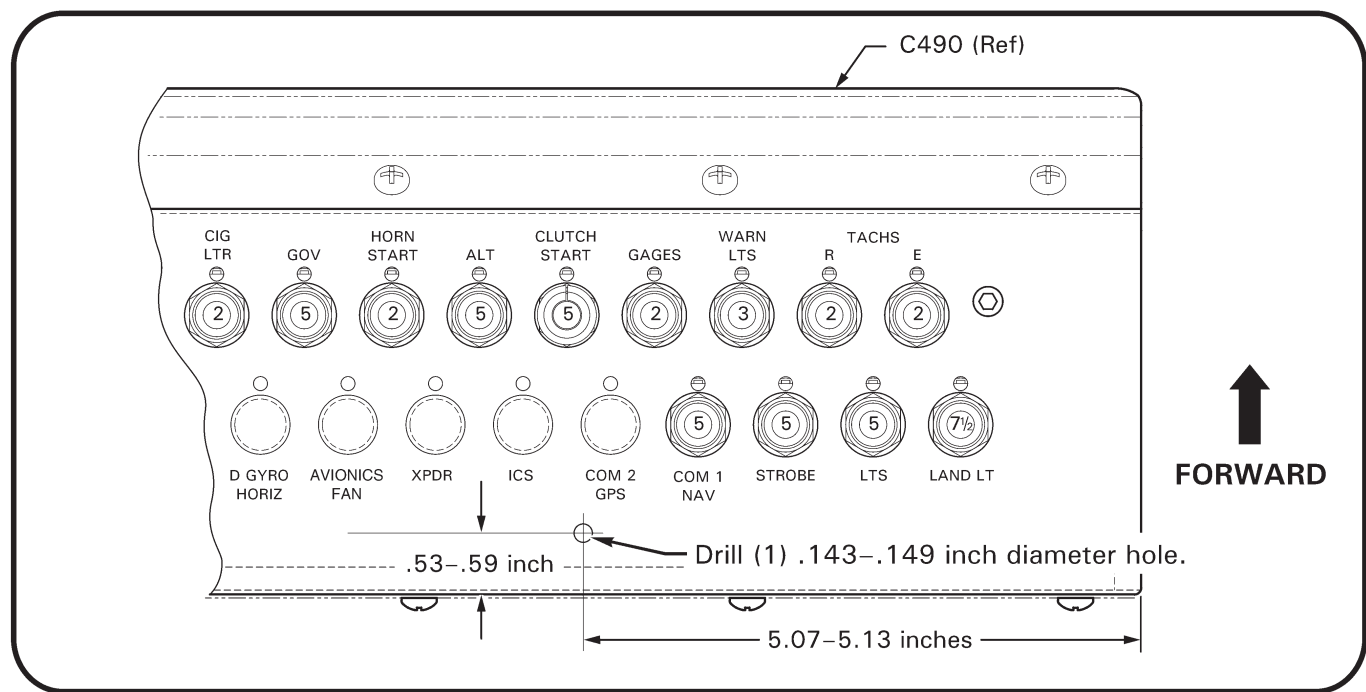


FIGURE 4A Locating screw installation hole
(view looking down)

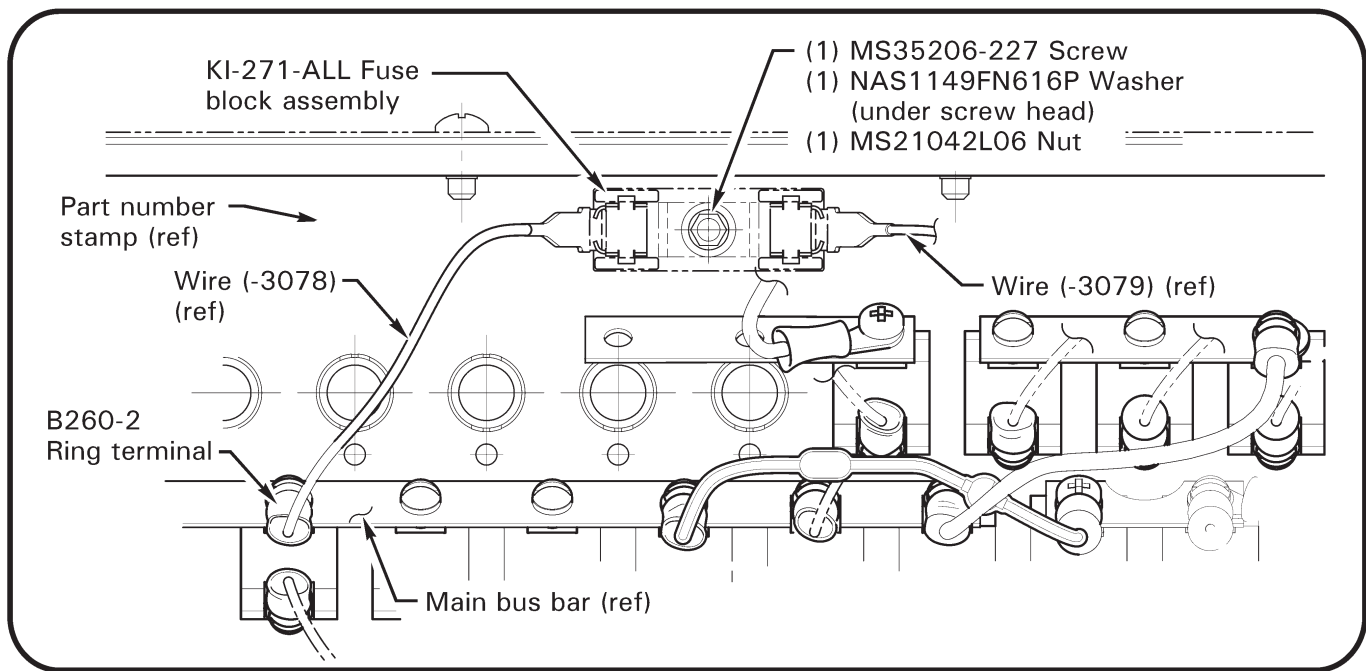


FIGURE 4B Fuse block assembly installation
(location shown for wire [-3078] is typical)

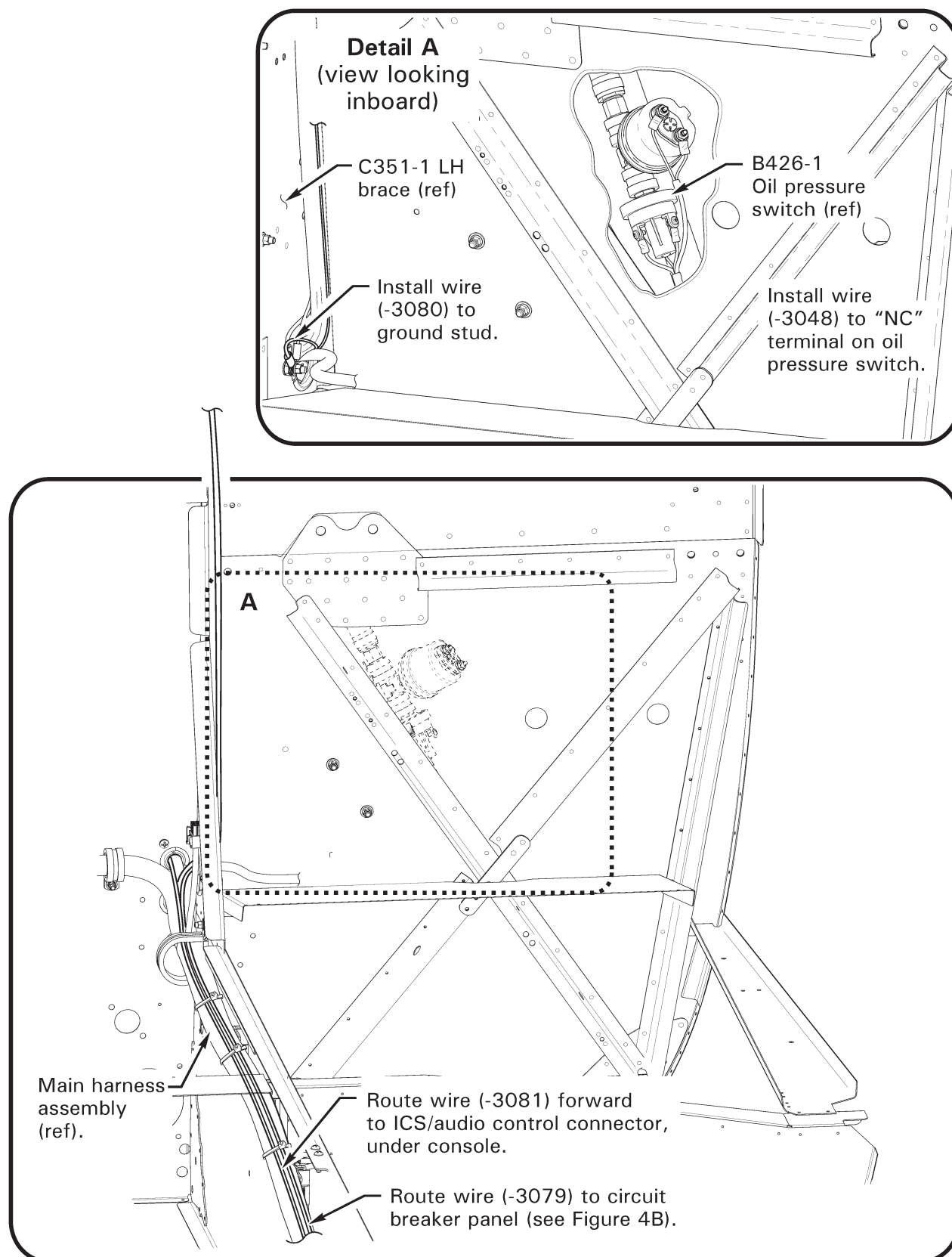
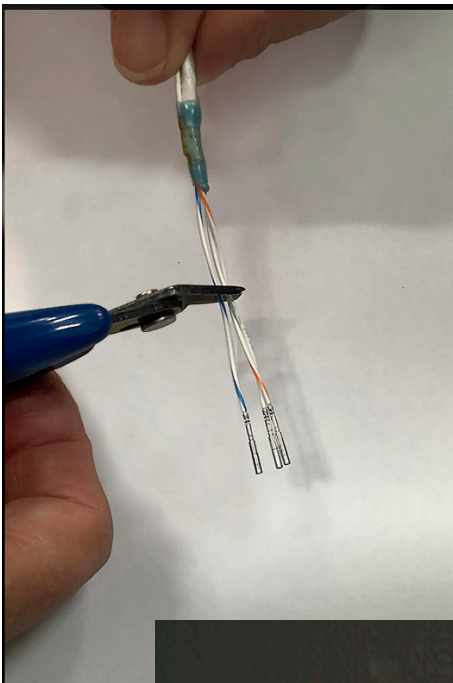
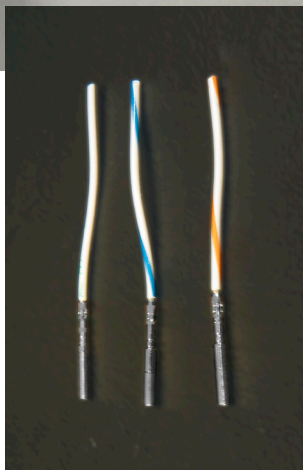


FIGURE 5 Terminating locations for new wiring
(view looking aft)

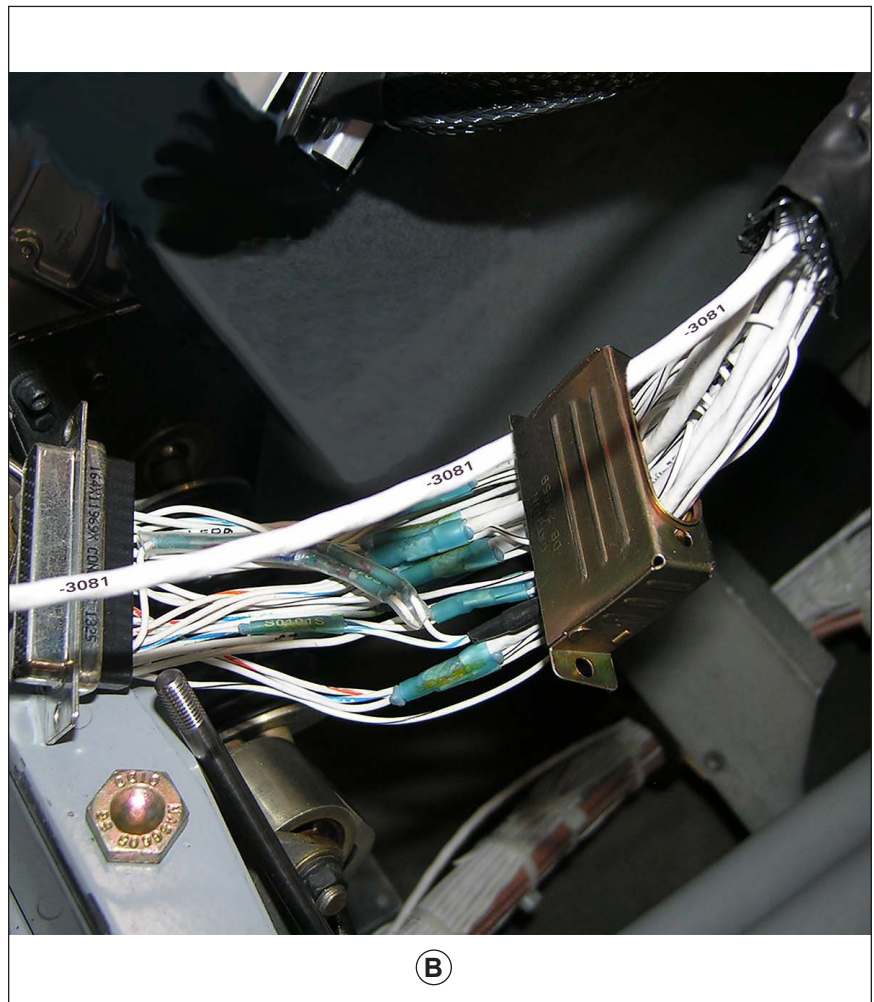
Kit Instructions (continued)**CAUTION**

Copilot audio-high and audio-low wire numbers vary. Installer is responsible for identifying copilot audio wires. Refer to MM § 14.000 for audio system schematics to identify audio wiring.

11. Refer to Figure 2, and applicable audio system schematic in MM § 14.000. Disconnect ICS or audio control connector containing copilot headset audio wires. Loosen backshell's wiring clamp & attaching screws and slide backshell away from connector. Locate copilot audio wires in connector. Extract contacts from connector. Trim each wire halfway between nearest-ends of contact and solder sleeve terminator (A), removing heat shrink or sleeving as necessary; retain wires with contact attached. Trim newly installed wire (-3081) to length using audio control connector as guide for length (B).

**(A)**

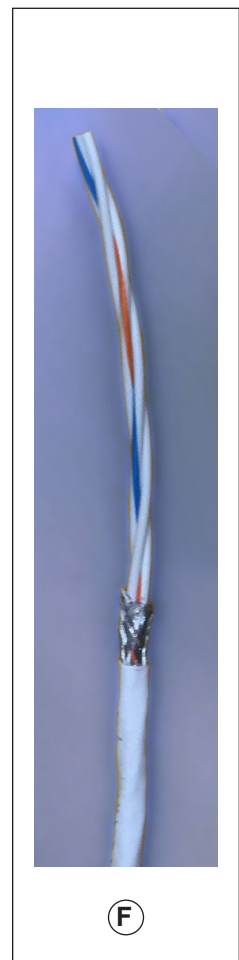
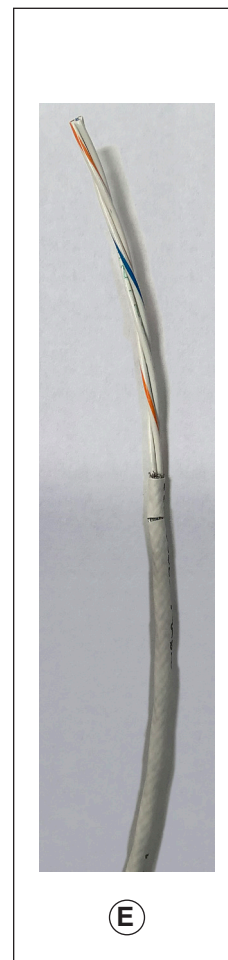
Retain cut wires

**(B)**

Kit Instructions (continued)**CAUTION**

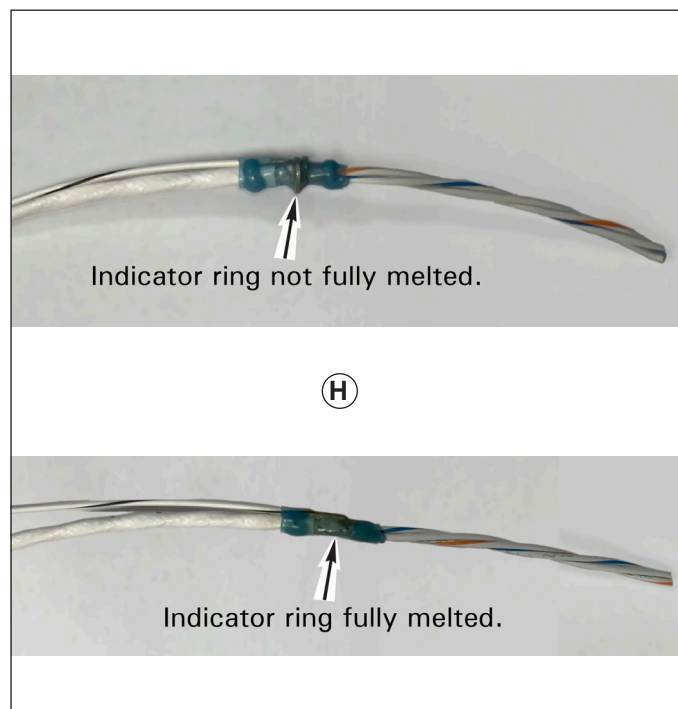
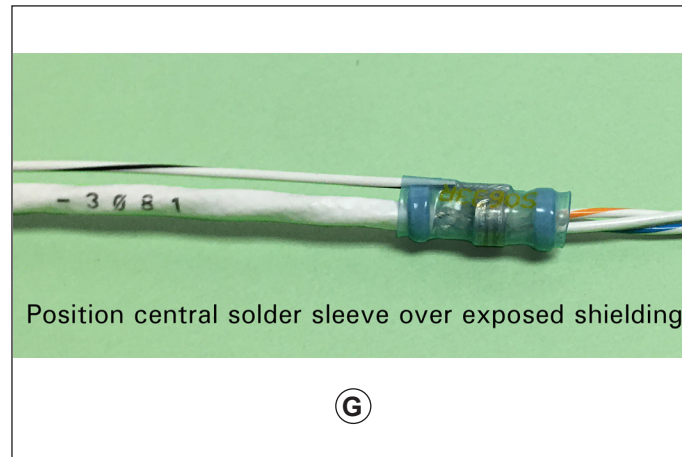
Trimmed shielding strands are conductive. Prevent contaminating connectors or wiring by covering, or trimming away from, work area.

12. Strip outer jacket on wire (-3081) approximately 2½ inches from end. Score jacket ¼ inch from stripped jacket end (C), being careful not to damage shielding or internal wires. Push shielding to create lip (C). Using cutters as shown in (D), remove shielding lip then slide shielding off wire end, exposing three internal wires (E). Remove scored ¼ inch jacket piece, exposing shielding ¼ inch beyond outer jacket (F).



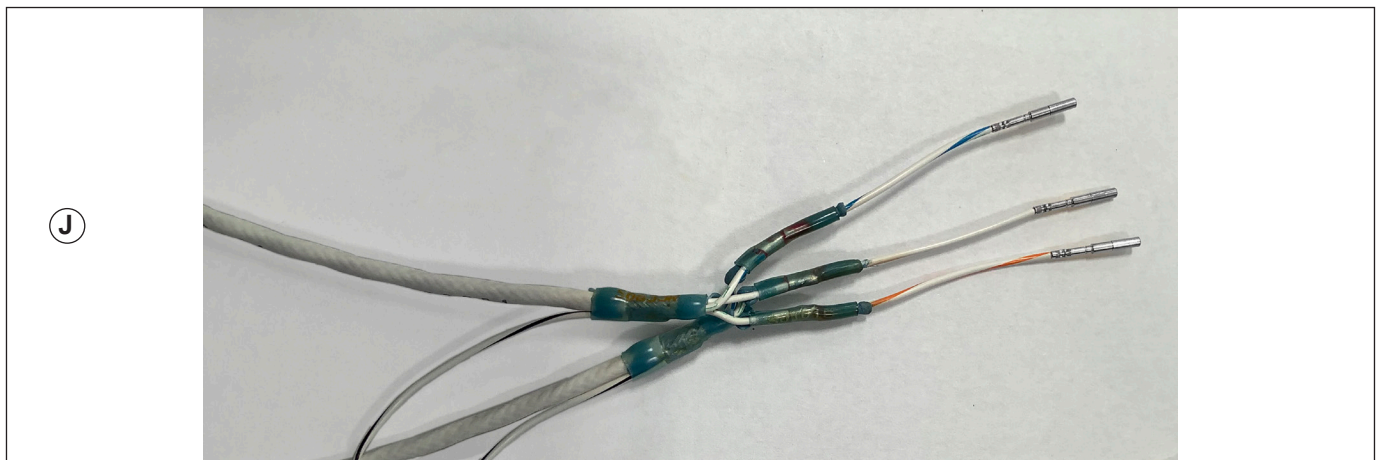
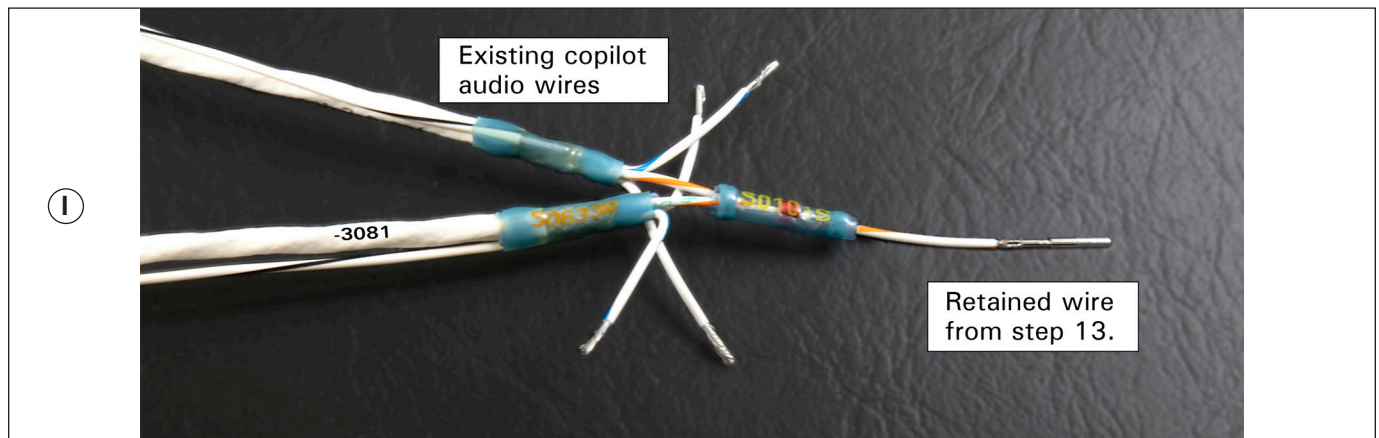
Kit Instructions (continued)

13. Install B267-3 solder sleeve terminator over internal wires of wire (-3081), with black-striped shield-drain wire towards jacketed side, positioning central solder sleeve over exposed shielding (G). Using heat gun, apply heat to solder sleeve terminator until solder sleeve and indicator ring are completely melted (H).



Kit Instructions (continued)

14. Refer to Figure 2, and applicable audio system schematic (ref. MM § 14.000), as required. Strip ends of retained wires (with contacts installed), copilot audio wires in harness, and newly exposed inner wires (-3081) ①. Install (3) B267-5 solder sleeve splices [or (2) B267-5 & (1) B267-6, as required], mating wire numbers/colors to: retained wires on one side of splice and copilot audio wires & wires (-3081) to opposite side of splice ②. Apply heat using heat gun to solder sleeve splices until solder sleeve is completely melted.



Kit Instructions (continued)

15. Locate black-striped shield-drain wire in existing wire harness and follow wire to contact in connector. Extract contact from connector and cut wire approximately 1½ - 2 inches in length, retaining wire with contact attached. Install (1) B267-5 solder sleeve splice with retained wire & contact on one side, and black & white wire from newly installed wire (-3081) with trimmed black & white wire removed from connector (K). Apply heat using heat gun to solder sleeve splice until indicator ring and solder sleeve are completely melted.



(K)

Kit Instructions (continued)

16. Refer to applicable audio system schematic. Install wire contacts to ICS or audio control connector, as noted when removed. Secure backshell to connector. Connect ICS or audio control connector to receptacle. Secure wiring using appropriately sized ty-raps; verify clamps are secured without binding on wires.
17. Install avionics face, radio tray, avionics, and equipment as required. Close and secure console, if opened.
18. Install D275-205 fuse in fuse holder. Secure circuit breaker panel.
19. Install LH seat back assembly per MM § 15-220.
20. Install access and inspection panels, as required.
21. Connect battery per MM § 37-10.
22. Function check camera installation:
 - a. Visit our website: www.robinsonheli.com and click on the Publications tab. Click on "User Guides", then "Cockpit Camera". Select and read "Quick Start Guide".
 - b. Refer to Figure 3. Insert F714-4 flash drive assembly to USB port of F039-7 enclosure. Toggle helicopter battery switch ON for minimum 30 seconds; video will record automatically. While video is recording, activate & route an audio source (such as ATIS) to copilot headset. Toggle helicopter battery switch OFF.

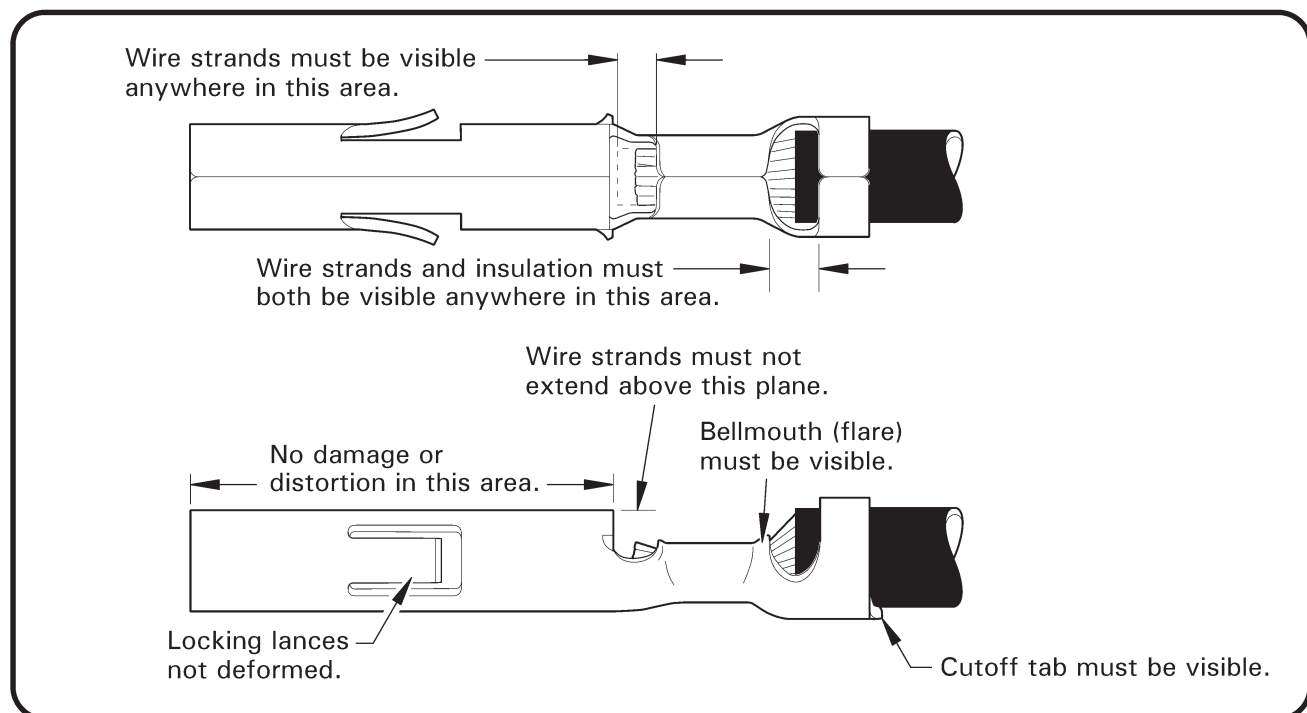


FIGURE 6 Crimp inspection
(socket shown)

Kit Instructions (continued)

22. c. Transfer flash drive to a computer and view video. If video is level with cockpit, camera lens is properly adjusted. If no audio is heard, check newly installed wiring, with attention to splices.
 - d. If horizon slants to the right (as shown in Figure 7), adjust angle by loosening two NAS1352-04-04 screws holding lens (see Figure 3) and rotate lens counterclockwise while facing lens; if horizon slants to the left, rotate lens clockwise. Tighten screws. Repeat steps 2 & 3.
23. Revise helicopter's Weight and Balance Record in Pilot's Operating Handbook (POH) Section 6 to reflect this installation by incorporating the following data:

Add:

Item	Weight	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
KI-275-6 Cockpit Camera Installation Kit	+0.62 lb	65.81 in.	+40.81 in-lb	-3.12 in.	-1.94 in-lb

24. Make appropriate maintenance record entries.

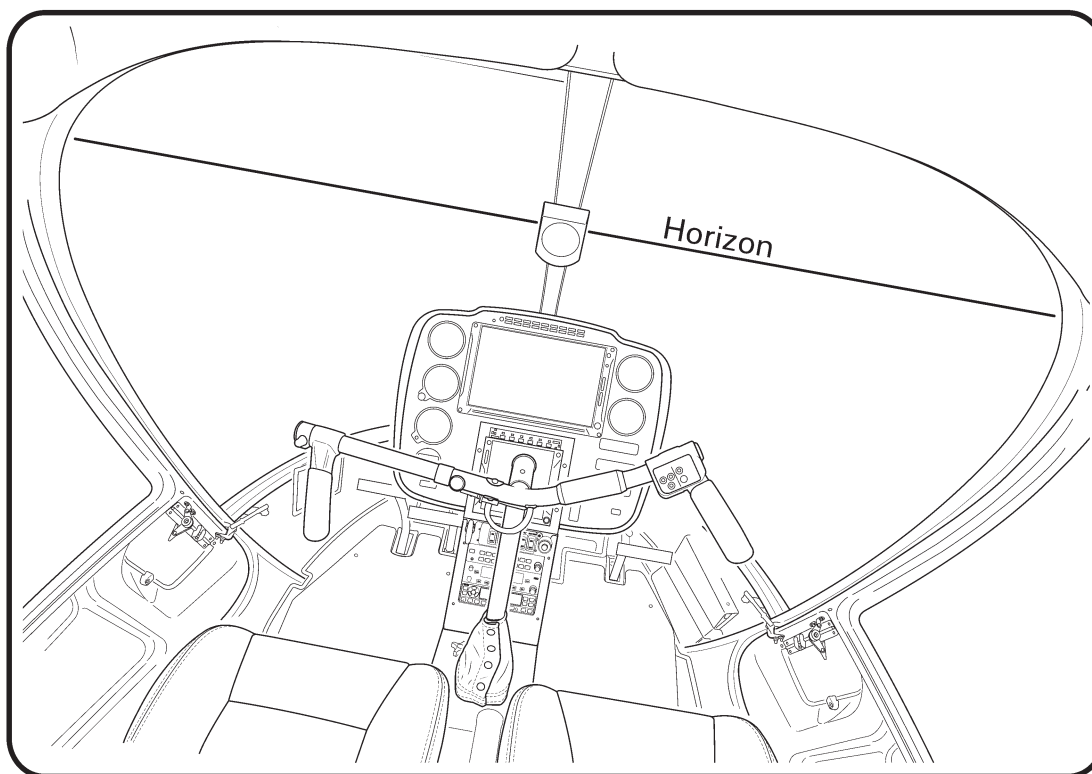


FIGURE 7 Camera view angle
(angle shown requires adjustment)