

***Illustrated Parts List
and
Maintenance Instructions
with Initial Installation Instructions***

FOR

SEARCHLIGHT INSTALLATION

Part No. 369H90142

USED ON HUGHES 500D (MODEL 369D) HELICOPTERS



Hughes Helicopters division of summa corporation / culver city, california

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Remarks/Recommendations -

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FOREWORD

F-1. PURPOSE AND CONTENT OF THIS MANUAL.

F-2. This manual supplements information contained in HMI - Vol 1 and 369D - IPC, and contains instructions for initial installation and continuing maintenance for the searchlight installation. Weight and balance data is included. This manual also contains parts lists for procuring replacement parts for the searchlight installation.

F-3. APPLICABILITY.

F-4. The searchlight installation is applicable for use on any Hughes 500D (Model 369D) helicopter.

F-5. COMPATIBILITY OF COMBINED OPTIONAL EQUIPMENT.

F-6. For compatibility information on which optional equipment may or may not be used in combination at the same time, refer to section 21, HMI - Vol 1.

F-7. ORGANIZATION OF CONTENTS.

F-8. The contents of this manual are grouped into sections as outlined in the Table of Contents.

Each section is organized to provide comprehensive coverage of entire systems, major equipment groupings, and major components that are similar or associated. Procedures for each of these are presented in sequence as defined in section 1, HMI - Vol 1.

F-9. USE OF THIS MANUAL.

F-10. This manual is for use by operators of the model 369D helicopter equipped with a searchlight installation. Although this manual is a separate publication, it should be kept with HMI - Vol 1, HMI - Vol 2, 369 D - IPC and other handbooks listed in section 1, HMI - Vol 1 that form the primary information file for the helicopter.

F-11. RELATED PUBLICATIONS.

F-12. Reference is made to applicable portions of HMI - Vol 1, 369D - IPC and applicable Opt Eqpt Manuals as required to accomplish instructions contained herein.

F-13. LITERATURE CHANGES AND REVISIONS.

F-14. Changes and revisions to contents of this manual are made as defined in section 1, HMI - Vol 1.

SECTION 1

ILLUSTRATED PARTS LIST

1-1. SCOPE AND CONTENTS.

1-2. This illustrated parts list provides, by means of text (parts lists) and companion illustrations, a complete parts definition of the searchlight installation configuration, manufactured by Hughes Helicopters, Culver City, California.

NOTE: The illustrated parts list is organized and presented in the same manner as the 369D Series Illustrated Parts List (369D - IPC). (For information on use, refer to 369D - IPC.)

1-3. GROUP ASSEMBLY PARTS LIST.

1-4. The parts list furnish information for procuring replacement parts for the searchlight installation and shall not be used for any other purpose. For information or procurement of other replacement parts, refer to the 369D - IPC.

1-5. ILLUSTRATIONS.

1-6. Isometric illustrations are provided for each group assembly parts list. Each illustration is exploded to the extent necessary to show parts relationship for the searchlight installation.

1-7. USABLE ON CODE.

1-8. The USABLE ON CODE column located at the right-hand side of the Group Assembly Parts List pages indicates the effectivity of parts by aircraft serial number. In many cases two different parts are listed, one representing the original installation and another representing an improved replacement item. Alphabetic codes are used to indicate the aircraft serial number applications of a given part. When no USABLE ON CODE is listed, items are understood to have full effectivity.

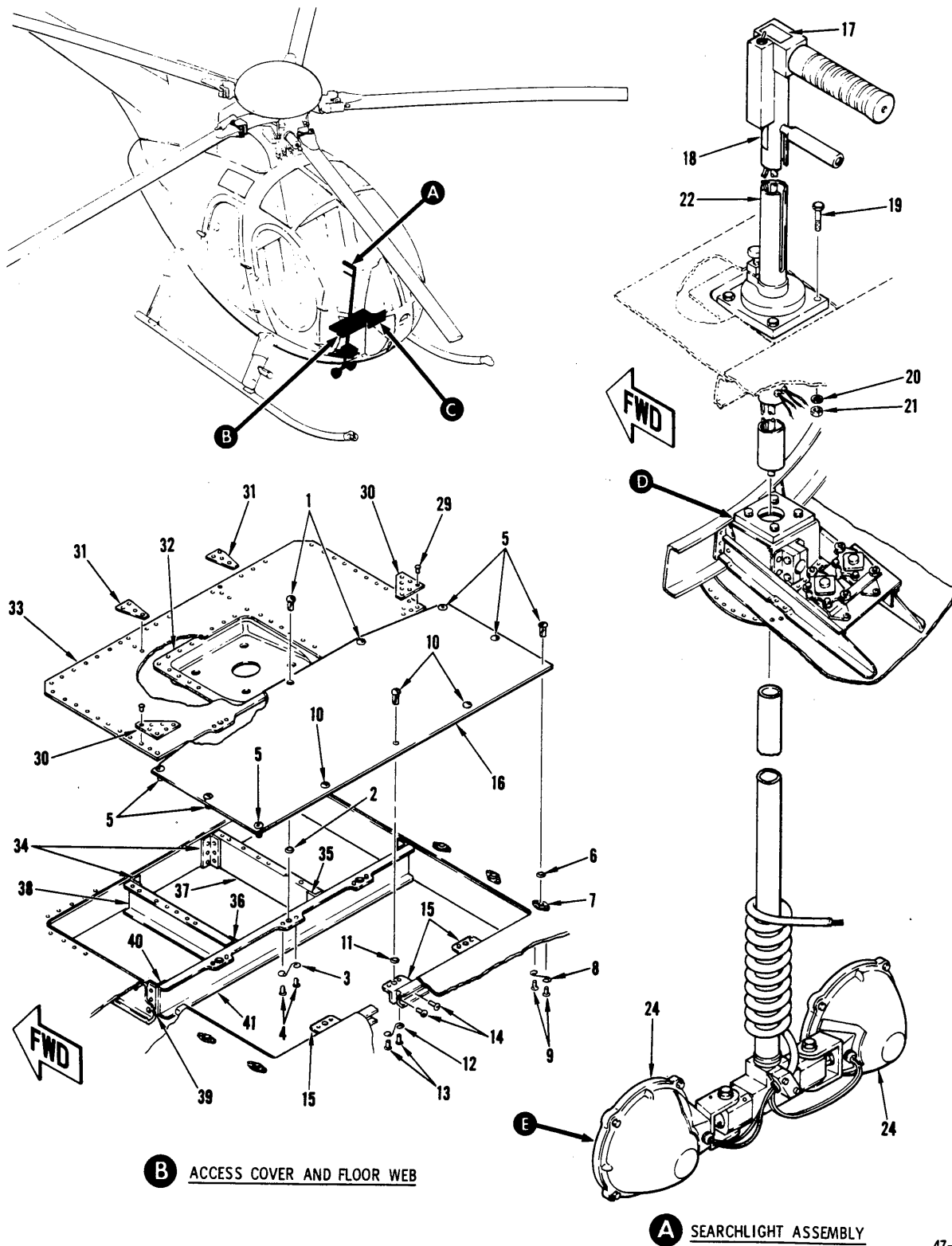


Figure 1-1. Manually operated searchlight installation (sheet 1 of 2)

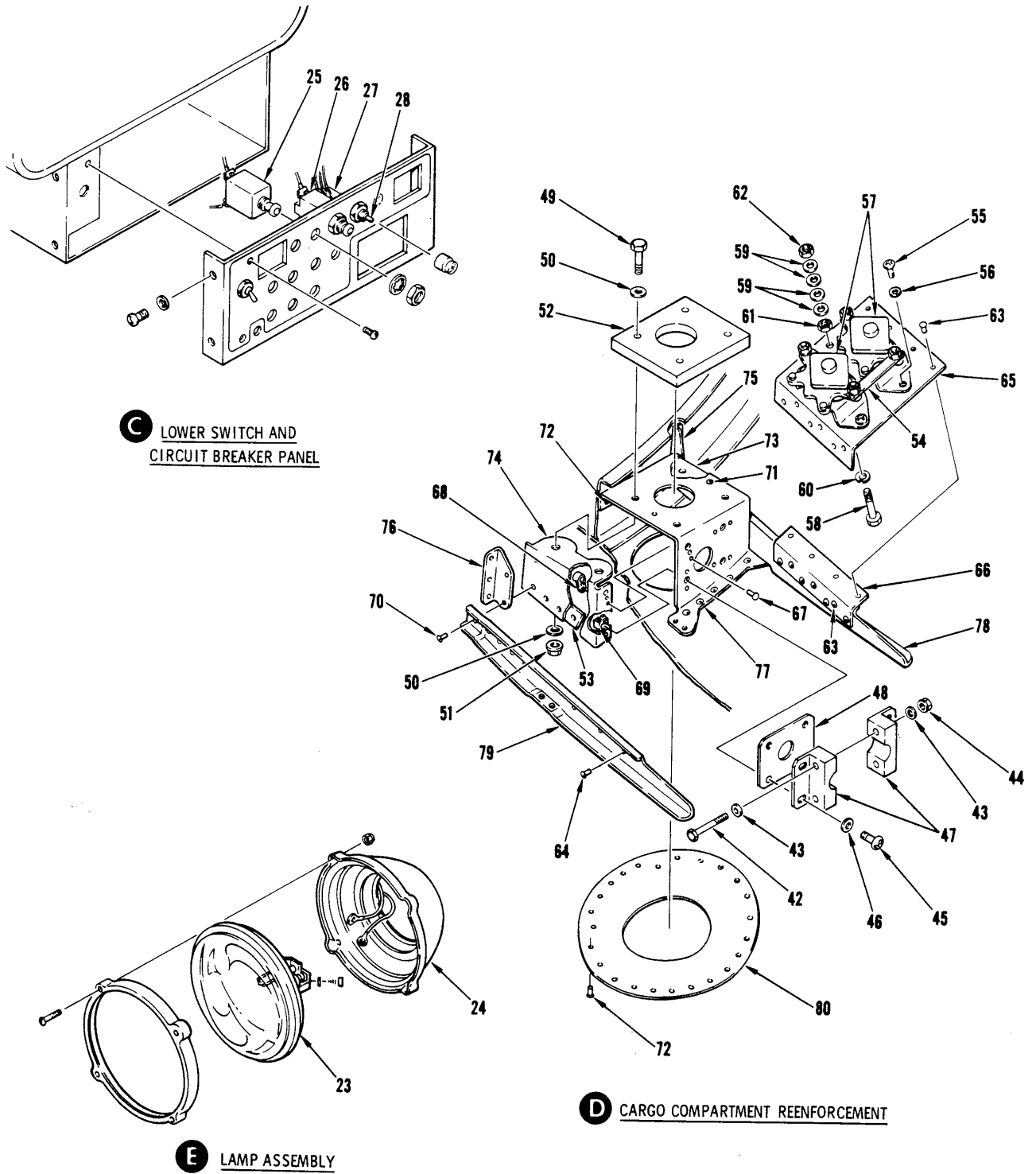


Figure 1-1. Manually operated searchlight installation (sheet 2 of 2)

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-1-	369H90142-501	SEARCHLIGHT INSTALLATION,	1	
		MANUALLY OPERATED		
-1	A3-20	. STUD	3	
-2	GH3	. GROMMET	3	
-3	S3-150	. SPRING	3	
-4	NAS1097AD3	. RIVET	6	
-5	A3-20	. STUD	6	
-6	GH3	. GROMMET	6	
-7	369H92142	. FILLER	6	
-8	S3-150	. SPRING	6	
-9	NAS1097AD3	. RIVET	12	
-10	A3-20	. STUD	3	
-11	GH3	. GROMMET	3	
-12	S3-150	. SPRING	3	
-13	MS20426AD3	. RIVET	6	
-14	MS20470AD4	. RIVET	6	
-15	369H90142-25	. ANGLE	3	
-16	369H90142-5	. COVER, ACCESS	1	
-17	369H90142-71	. DECAL	1	
-18	369H90142-69	. DECAL	1	
-19	NAS1104-10	. BOLT	4	
-20	AN960-416	. WASHER	4	
-21	NAS1291-4	. NUT	4	
-22	500-A	. SEARCHLIGHT ASSEMBLY	1	
-23	4580	. LAMP	2	
-24	31945-1	. LAMP ASSEMBLY (DS401-DS402)	2	
-25	MS25244-35	. CIRCUIT BREAKER (CB127)	1	
-26	2TC12-5	. CIRCUIT BREAKER (CB128)	1	
-27	MS25041-8	. LIGHT ASSEMBLY (XDS11)	1	
-28	AN3140-327	. LAMP	1	
-29	MS20470AD3	. RIVET	AR	
-30	369H90142-13	. STRAP	2	
-31	369H90142-15	. STRAP	2	
-32	369H90142-49	. PAN, FLOOR	1	
-33	369H90142-3	. WEB	1	
-34	369H90142-51	. ANGLE	2	
-35	369H90142-23	. ANGLE	1	
-36	369H90142-24	. ANGLE	1	
-37	369H90142-9	. CHANNEL	1	
-38	369H90142-10	. CHANNEL	1	
-39	369H90142-43	. FILLER	1	
-40	369H90142-19	. ANGLE	2	
-41	369H90142-7	. CHANNEL	1	
-42	AN3-12A	. BOLT	2	
-43	AN960-10L	. WASHER	4	
-44	NAS1291-3	. NUT	2	
-45	MS35206-245	. SCREW	4	
-46	AN960-8	. WASHER	4	
-47	369H91042-47	. CLAMP, HALF	2	
-48	369H91042-17	. SEAL	1	
-49	NAS1104-9	. BOLT	4	
-50	AN960-10	. WASHER	8	
-51	NAS1291-4	. NUT	4	
-52	369H90142-41	. PLATE, BEARING	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-1-53	369H90142-65	. STRIP, CHAFE	1	
-54	369H90142-59	. BUS	1	
-55	NAS602-5B	. SCREW	4	
-56	AN960-8	. WASHER	4	
-57	MS24166D1	. RELAY (K302-K303)	2	
-58	NAS1096-3-12	. SCREW	1	
-59	AN960-10L	. WASHER	4	
-60	AN935-10L	. LOCKWASHER	1	
-61	NAS671-10	. JAMNUT	1	
-62	MS21042L3	. NUT	1	
-63	MS20470AD3	. RIVET	11	
-64	NAS1738B4	. RIVET	6	
-65	369H90142-55	. SUPPORT, NUTPLATE	1	
-66	369H90142-57	. ANGLE	1	
-67	MS20426AD3	. RIVET	8	
-68	NAS696A08	. NUTPLATE	1	
-69	NAS1068A08	. NUTPLATE	3	
-70	MS20470AD4	. RIVET	3	
-71	MS20426AD3	. RIVET	2	
-72	MS20470AD3	. RIVET	AR	
-73	369H90142-35	. BRACKET	1	
-74	369H90142-33	. BRACKET	1	
-75	369H90142-39	. ANGLE	1	
-76	369H90142-37	. ANGLE	1	
-77	369H90142-31	. SUPPORT	1	
-78	369H90142-29	. CHANNEL	1	
-79	369H90142-27	. CHANNEL	1	
-80	369H90142-45	. DOUBLER	1	

SECTION 2

MAINTENANCE INSTRUCTIONS

2.1. GENERAL INFORMATION.

2-2. **DESCRIPTION.** The searchlight installation (fig. 2-1) consists of a control column mounted in the floor on the right side of the pilot's compartment, dual lights positioned outside of the compartment just below the control column, and an extendable support column for connecting the dual lights to the control column. A manually operated slidelock, located on the control column and attached to the extendable support column, is used to lower and extend the dual lights below the landing gear skids or floats during flight. A handle on the control column is used to position the lights fore and aft, as required, and can also be rotated in place to tilt the external lights downward approximately 120°. The tilting action is accomplished by a two-piece shaft installed inside the control and support columns; the upper shaft is attached to the gear mechanism in the control handle, and the lower shaft (which telescopes over upper shaft) is attached to the gear mechanism in the dual light assembly. A switch inside the control column is actuated whenever the searchlight is moved out of the full up and locked position (by the slidelock), and causes the SEARCHLIGHT EXT caution light on the instrument panel to come on. Other controls provided for the searchlight consist of the SEARCHLIGHT PWR and CONT circuit breakers on the instrument panel, and the SEARCHLIGHT ON-OFF switch on the control column.

2-3. **REFERENCE DATA.** Information pertaining to helicopter structural components which interface with the searchlight installation is in the Structural Repair Manual (369D-SRM). Information pertaining to standard helicopter equipment is in HMI - Vol 1 and 369D - IPC.

2-4. TROUBLESHOOTING.

2-5. Use information provided in table 2-1 for troubleshooting the searchlight installation.

2-6. OPERATIONAL CHECK.

2-7. With helicopter on ground, perform operational check of searchlight system as follows:

a. Hoist or jack up helicopter as specified in HMI - Vol 1 until landing gear skids or floats are approximately 2 feet above ground.

b. Place BATTERY-OFF-EXT PWR switch at BATTERY position.

c. Using slidelock, extend searchlight to full down position. SEARCHLIGHT EXT caution light on lower switch and circuit breaker panel should come on and stay on.

d. Using control handle, check movement of dual lights in forward aft, and tilted positions; then return lights to forward and level position. Lights should not impinge on skids or floats.

CAUTION: When installed in conjunction with floats, searchlight must be fully extended before dual lights are turned on, or damage to floats may result. Do not allow lights to remain on longer than necessary to verify operation.

e. Place SEARCHLIGHT ON-OFF switch on control column at ON position. Check that dual lights come on, then place switch at OFF position.

f. Using slidelock, secure searchlight in full up position. SEARCHLIGHT EXT caution light on circuit breaker panel should go off.

g. Place BATTERY-OFF-EXT PWR switch at OFF position.

h. Lower helicopter with jacks or hoist as specified in HMI - Vol 1.

2-8. REMOVAL OF SEARCHLIGHT COMPONENTS.

2-9. SEARCHLIGHT ASSEMBLY.

a. Open SEARCHLIGHT PWR and CONT circuit breakers (25, 26, fig. 1-1) on lower switch and circuit breaker panel. Tag circuit breakers as required.

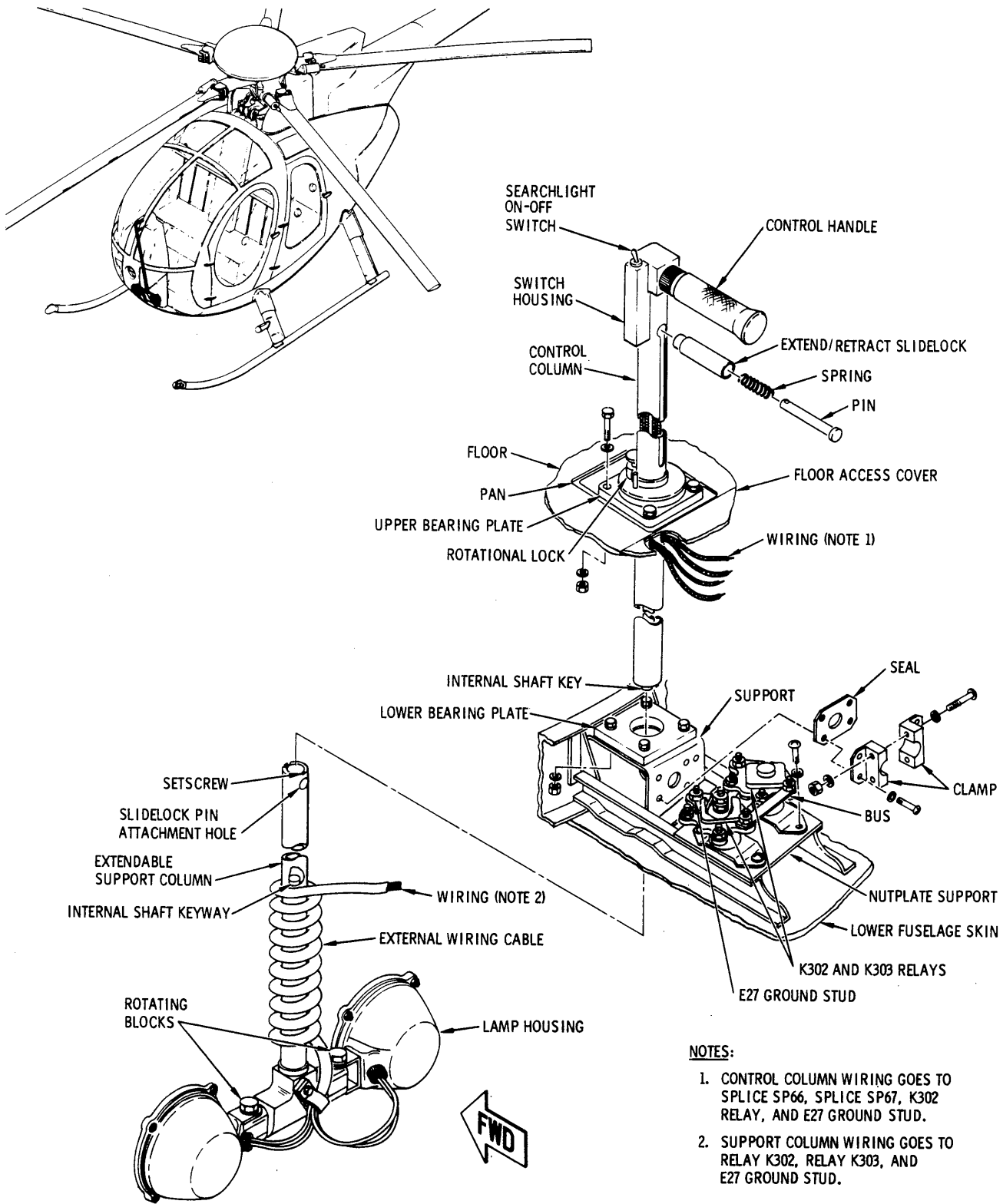
b. Verify BATTERY-OFF-EXT PWR switch at OFF position.

c. Loosen studs on floor access cover (16, fig. 1-1), just aft of searchlight control column, and remove cover.

d. Locate searchlight wiring on control and support columns (fig. 2-1) and disconnect wiring at splices SP66 and SP67, ground terminal E27, and relays K302 and K303. Tag wiring for installation.

e. Remove clamp and seal from external wiring cable at bottom of fuselage, then remove cable.

f. Remove bolts (19, fig. 1-1) from searchlight control column upper bearing plate at floorline.



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Figure 2-1. Searchlight installation

Table 2-1. Troubleshooting searchlight installation

Sympton	Probable Trouble	Corrective Action
Looseness in slidelock; lower support column will not stay in retracted position (SEARCHLIGHT EXT caution light comes on).	Setscrew not seated properly in retaining hole of slidelock pin, or setscrew not tight.	Reset setscrew so that it is seated in retaining hole of slidelock pin. Tighten setscrew.
SEARCHLIGHT EXT caution light does not come on when searchlight is extended or not fully retracted.	Lamp in EXT caution light assembly cap is burned out or missing.	Replace lamp in EXT caution light assembly cap.
External searchlights will not stay adjusted in elevation.	Setscrews in searchlight rotating blocks loose on inner shaft.	Tighten setscrews in search light rotating blocks.
Toggle arm or SEARCHLIGHT ON-OFF switch broken or inoperative.	Excessive force applied to arm or arm hit by heavy object.	Replace switch.

NOTE: Upper bearing plate is incorporated in searchlight assembly and cannot be removed from control column.

g. Hoist or jack up helicopter as specified in HMI - Vol 1 until landing gear skids or floats are approximately 2 feet above ground.

h. Pull and extend slidelock and lower slightly for access to setscrew, which secures slidelock pin to top of extending support column (fig. 2-1).

CAUTION: Take care to prevent searchlight support column (and dual lights) from dropping to ground when slidelock is removed. Also, care should be taken to retain slidelock pin which is under spring tension.

i. Loosen slidelock setscrew and remove slidelock housing, spring, and lockpin.

j. Carefully lower searchlight support column and raise interior control column until both columns are completely disengaged.

k. Remove searchlight control and support columns from helicopter.

l. Install plug buttons in helicopter floor and lower skin holes, if required.

m. Lower helicopter with jacks or hoist as specified in HMI - Vol 1.

2-10. ELECTRICAL COMPONENTS.

a. Remove relays K302 and K303 from nut-plate support at bottom of fuselage (fig. 2-1) as follows:

(1) Tag and disconnect wiring, jumper wires, IN5401 diode, and bus (with 1/2 RNF-100 sleeve) from relay terminals.

(2) Remove screws and washers from nut-plate support, and remove relays.

b. Remove SEARCHLIGHT PWR and CONT circuit breakers (25, 26, fig. 1-1) and EXT caution light assembly (27, 28) from lower switch and circuit breaker panel as follows:

(1) Remove screws and lower switch and circuit breaker panel from instrument panel for access to circuit breakers and light assembly (HMI - Vol 1).

(2) Tag and disconnect wiring from SEARCHLIGHT PWR and CONT circuit breakers. Remove circuit breakers from panel.

(3) Tag and disconnect wiring from SEARCHLIGHT EXT caution light assembly. Remove light assembly from panel.

c. Remove SEARCHLIGHT ON-OFF switch (fig. 2-1) from control column as follows:

(1) Remove screws and housing for access to switch.

(2) Disconnect wiring and remove switch from housing.

2-11. INSPECTION.

2-12. Inspect components of searchlight system in accordance with the following:

a. Inspect searchlight upper control and lower support columns for deformation and damage. Inspect inner shaft ends within columns for dryness (lack of lubrication). Inspect lower support column for corrosion.

b. Inspection condition of wiring on searchlight upper column, coiled cable on extendable support column, and wiring connectors at dual lights.

c. Inspect slidelock pin for deformation. Verify pin has adequate setscrew retaining hole.

2-13. REPAIR

2.14. Repair of searchlight system is limited to replacement of defective or damaged parts as follows:

a. Replace deformed or damaged upper control and lower support columns on searchlight. Apply thin coating of grease (6, table 3-1) on inner shaft ends within control columns, if shafts are dry. Spray lower support column with dry lubricant (5, table 3-1).

b. Replace damaged or frayed wiring and connectors.

c. Replace deformed slidelock pin. If necessary, enlarge setscrew retaining hole on slidelock pin.

2-15. INSTALLATION OF SEARCHLIGHT COMPONENTS.**2-16. ELECTRICAL COMPONENTS.**

a. Install **SEARCHLIGHT ON-OFF** switch (fig. 2-1) on control column as follows:

(1) Connect wiring and install switch in housing.

(2) Install housing on control column and secure with screws.

b. Install **SEARCHLIGHT PWR** and **CONT** circuit breakers (25, 26, fig. 1-1) and **EXT** caution light assembly (27, 28) on lower switch and circuit breaker panel as follows:

(1) Install **SEARCHLIGHT EXT** caution light assembly on panel and connect wiring to light assembly. If required, replace lamp in light assembly cap on face of panel.

(2) Install **SEARCHLIGHT PWR** and **CONT** circuit breakers on panel and connect wiring to circuit breakers.

(3) Install and secure lower switch and circuit breaker panel to instrument panel with screws (HMI - Vol 1).

c. Install relays K302 and K303 on nutplate support at bottom of fuselage (fig. 2-1) as follows:

(1) Using screws and washers, install relays on nutplate support.

(2) Install bus (with 1/2 RNF-100 sleeve), IN5401 diode, jumper wires, and wiring to relay terminals.

2-17. SEARCHLIGHT ASSEMBLY.

a. Place searchlight control column (fig. 2-1) in floor pan, and allow control column to extend through lower bearing plate and support at bottom of fuselage. Do not install bolts (19, fig. 1-1) at this time.

b. Hoist or jack up helicopter as specified in HMI - Vol 1 until landing gear skids or floats are approximately 2 feet above ground.

c. Engage lower support column into end of upper control column (fig. 2-1). Make certain that slidelock pin attachment hole on support column is aligned with control column handle during installation (handle and hole should face aft).

d. While installing lower support column, twist grip on control handle until key on upper internal shaft (in control column) engages keyway on lower internal shaft (in support column).

e. Hold searchlight in assembled position and have helicopter lowered to ground with jacks or hoist as specified in HMI - Vol 1.

f. Position upper bearing plate so that lock slot faces aft, and secure plate to floor pan with bolts (19, fig. 1-1).

g. Assemble slidelock housing, spring, and pin (fig. 2-1). Compress and hold spring compressed, with a suitable tool so that attachment end of pin protrudes from housing.

h. Insert slidelock pin through slot on control column and into hole near top of support column. Tighten setscrew on top of support column making certain that retaining hole in slidelock pin is engaged. Remove tool used to compress housing spring.

i. Check mechanical operation of searchlight by extending, rotating, tilting, retracting, and stowing unit. If excessive friction is evident, spray lower support column with dry lubricant (5, table 3-1).

j. Check that external wiring cable is properly wrapped around support column; then route cable through access holes in lower fuselage skin and searchlight lower support (69, fig. 1-1).

k. Install seal (48) and clamp (47) on support (77) to retain external wiring cable.

l. Connect wiring at splices SP66 and SP67, ground terminal E27, and relays K302 and K303. (For detailed wiring instructions, refer to paragraph 3-15.)

m. Verify that caution decal (18, fig. 1-1) is attached to forward side of control column just below switch housing.

n. Verify that light switch ON-OFF decal is attached to top of control column just forward of handle.

o. Perform operational check of searchlight system (para 2-6).

2-18. REPLACEMENT OF SEARCHLIGHT LAMP.

2-19. Refer to figure 1-1 and remove and replace searchlight lamp as follows:

- a. Remove screws from lens ring and remove ring from lamp housing (24).
- b. Lift sealed beam lamp (23) from housing (24) and remove screws from wire terminals at back of lamp. Remove lamp.
- c. Install replacement lamp by connecting wire terminals in housing to back of lamp, and secure wiring to lamp with screws. Position lamp (23) in housing (24).

- d. Install lens ring and secure to lamp housing (24) with screws.

2-20. WIRING DIAGRAM.

2-21. See figure 2-2 for the searchlight system wiring diagram.

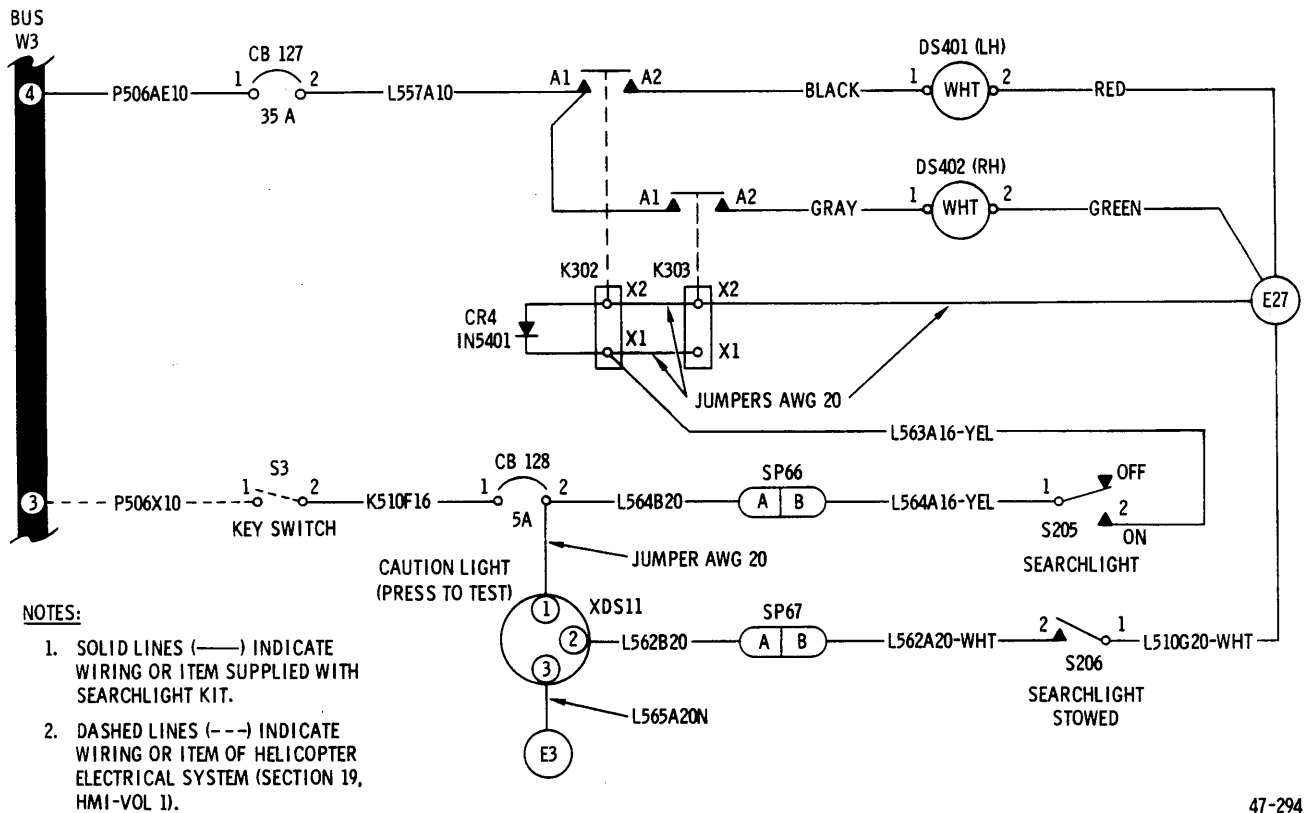


Figure 2-2. Searchlight wiring diagram

SECTION 3 INSTALLATION INSTRUCTIONS

3-1. GENERAL INFORMATION.

3-2. **SCOPE.** Procedures in this section may be performed at the operator's discretion and are applicable to all 369D helicopters. These instructions provide for the installation of the manually operated searchlight kit and include modifications to the right side pilot's floor compartment, floor, and structure.

3-3. **REFERENCE DATA.** Reference is made in the instructions to applicable data in HMI - Vol 1 required for the searchlight installation. Table 3-1 lists consumable materials and expendable items as well as electrical components required for installation of the complete searchlight kit. Items listed are recommended items of a commercial nature which may be procured locally. Alternate, but equivalent, items are acceptable.

Table 3-1. Consumable materials and expendable items

Item No.	Material	Specification No. ⁽¹⁾	Commercial Product ⁽²⁾	
			Name/No.	Manufacturer
1	Primer, zinc chromate	MIL-P-8585	(3)	
2	Sealing compound	MIL-S-7502	PR-1221	Product Research Burbank, California
3	Adhesive		EC 1751	3M Co. St. Paul, Minnesota
4	Sealant		EC 800	3M Co. St. Paul, Minnesota
5	Dry lubricant	MIL-L-46010A	Ecoalube No. 642	Everlube Corp. North Hollywood California
6	Grease, aircraft and instrument	MIL-G-23827	Brazcote 627 Aero Shell 7 Exxon 5114EP	Braz Oil Company Shell Oil Company Exxon Company
7	Tape, double faced		E-706	Arno Adhesive Tapes, Inc. Los Angeles, California
8	Tie strap, nylon	MS17821-1-9	Ty-Rap	
9	Solder, tin alloy	QQ-S-571 (composition SNGOWRP2)	(3)	
10	Wire, electrical, 10-gage	MIL-W-16878 Type EE, AWG-10, single conductor		Standard Wire and Cable El Segundo, California

Table 3-1. Consumable materials and expendable items (cont)

Item No.	Material	Specification No. (1)	Commercial Product(2)	
			Name/No.	Manufacturer
11	Wire, electrical, 16-gage	MIL-W-16878 Type EE, AWG-16, single conductor		Standard Wire and Cable El Segundo, California
12	Wire, electrical, 20-gage	MIL-W-16878 Type EE, AWG-20, single conductor		Standard Wire and Cable El Segundo, California
13	Sleeving, termofit, 1/2-inch, black	RNF-100		Transparent Products Los Angeles, California
14	Sleeving, termofit, 1/4-inch, black	RNF-100		Transparent Products Los Angeles, California
15	Sleeving, tube, 1/4-inch, clear	MIL-I-631 Type F, Form U, Grade H, Class 1, Category 1		Transparent Products Los Angeles, California
16	Splice, knife (SP66, SP67)		32445	Rayclad Redwood City, California
17	Terminal	MS25036-101		
18	Terminal	MS25036-102		
19	Terminal	MS25036-103		
20	Terminal	MS25036-106		
21	Terminal	MS25036-112		
22	Terminal	MS25036-153		
23	Terminal	MS25036-156		
24	Diode (CR4)	IN5401		
25	Cap, electrical, 3/8-inch		PD Type 1	Rayclad Redwood City, California
26	Covering (carpeting)		Aeromat 31 RNS Color 351/381	John Schneller and Associates Kent, Ohio

- NOTES:** (1) Numbers are U. S. A. Specifications and Standards. The prefix symbols are defined as follows: AMS - American Material Standard; MS - Military Standard; MIL- Military Specification; Single, double or triple alpha prefix of the same letter - Federal Specification; AN - Air Force-Navy Aeronautical Standard; NAS - National Aerospace Standard.
- (2) Primary selection. Any equivalent material may be used as an alternate selection.
- (3) Use the best comparable grade material when the conformity of available materials of the same type with the listed Specification No. cannot be determined.

3-4. PREPARATION FOR INSTALLATION.

Preparation for installation of the searchlight kit includes the following:

- a. Check all electrical switches for OFF position, and ensure that BATTERY-OFF-EXT switch is at OFF.
- b. Identify all components, including attaching hardware, to be removed for access to work areas. Protect components from damage and foreign matter until reinstalled.

3-5. REMOVAL OF HELICOPTER EQUIPMENT.

3-6. Prior to installing the searchlight kit, a limited number of items must be removed from the helicopter to accommodate kit installation. Refer to HMI - Vol 1 and perform the following:

- a. Remove seat from right side of crew compartment.
- b. Remove copilot's cyclic stick, if installed.
- c. Remove floor access door and attached carpeting from pilot's right side floor compartment.
- d. Remove stowage box from pilot's right side floor compartment.

3-7. MODIFICATION OF HELICOPTER.

3-8. Modification of the helicopter (fig. 3-1) consists of providing an access port for the searchlight assembly through the lower ship skin in the pilot's right side floor compartment as follows:

- a. Locate longitudinal support in substructure of pilot's floor compartment at BL 13.00 RH, between the aft bulkhead at canted station 64.365 and the floor compartment frame at station 50.50. Remove rivets from support using drill motor and appropriate drill bit, and remove support.
- b. Locate and mark hole center for cutout in ship skin. Center of cutout is located at BL 12.75 RH and station 52.36 (1.86 inches aft of floor compartment frame).
- c. Using chassis punch or equivalent, cut 2.50-inch diameter hole in ship skin as shown.

3-9. INSTALLATION OF SEARCHLIGHT KIT.

3-10. Installation of the searchlight kit includes procedures for installing the searchlight upper and lower supports on the right side of the pilot's floor compartment, caution light and circuit breakers on the instrument panel, the searchlight assembly and associated electrical wiring, and the access cover on the right side pilot's floor compartment. The general notes that apply to the subsequent installation procedures are as follows:

NOTES:

Use Cleco clamps and fasteners as required to facilitate rivet installation, and install rivets with wet zinc chromate primer (1, table 3-1).

Rivets are equally spaced and are normally positioned twice the diameter of the rivet shank from the outside edge of the material, edge of joggle, or flange radius.

When providing ground or electrical components, clean surface structure to bare metal.

Do not tighten electrical clamps or secure electrical wiring to existing harnesses until all electrical wiring is installed.

3-11. STOWAGE COMPARTMENT LOWER SUPPORT.

a. Position doubler (80, fig. 1-1) on outer ship skin to match cutout as shown in figure 3-1. Use doubler (80, fig. 1-1) as template, and determine 29 rivet hole locations required through ship skin. Using drill motor and appropriate drill bit, drill twenty 0.098-inch diameter rivet attach holes around circumference of doubler and nine 0.098-inch diameter holes around circumference of cutout. Attach doubler (80) to skin with rivets (72).

NOTE: Doubler (80) is provided with a 2.50-inch diameter cutout, 29 rivet attach holes, and a drain hole cutout.

b. Using drill motor and appropriate drill bit, drill 0.180-inch diameter drain hole in ship skin to match doubler (fig. 3-1).

c. Position channels (78, 79, fig. 1-1) over existing rivet attach holes in ship skin, compartment frame, and aft bulkhead. Channel (79) should abut cutout in ship skin, and channel (78) should be 3 inches outboard of channel (79). Using drill motor and appropriate drill bit, drill 0.098-inch diameter rivet attach holes through channels (78, 79) and doubler (80) as shown in figure 3-1. Attach channels (78, 79, fig. 1-1) to frame, bulkhead, and doubler (80) with rivets (72).

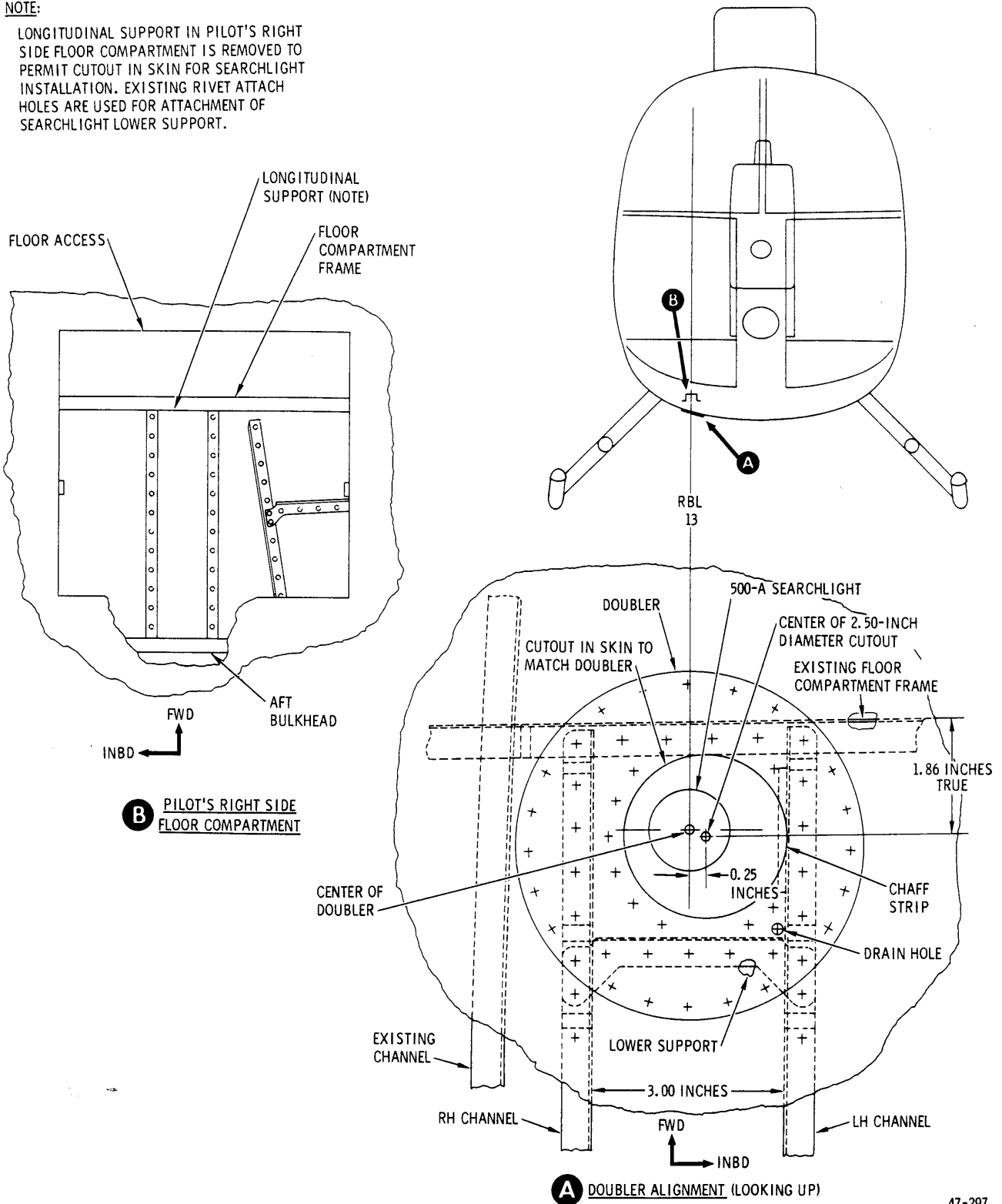
NOTE: Do not install rivets through attach holes required for securing support (77) to channels (78, 79) at this time.

d. Using existing holes in compartment frame as template, drill four additional 0.098-inch diameter rivet attach holes through doubler (80), and secure doubler to frame with rivets (72) as shown in figure 3-1.

e. Position support (77, fig. 1-1) over existing rivet holes in channels (78, 79), and against

NOTE:

LONGITUDINAL SUPPORT IN PILOT'S RIGHT SIDE FLOOR COMPARTMENT IS REMOVED TO PERMIT CUTOUT IN SKIN FOR SEARCHLIGHT INSTALLATION. EXISTING RIVET ATTACH HOLES ARE USED FOR ATTACHMENT OF SEARCHLIGHT LOWER SUPPORT.



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Figure 3-1. Doubler and lower support attachments

compartment frame. Drill four 0.098-inch diameter rivet attach holes in support (77) for attachment to channels, and five 0.098-inch diameter rivet attach holes for attachment to frame as shown in figure 3-1. Attach support (77, fig. 1-1) to frame, channels (78, 79), doubler (80), and ship skin with rivets (72).

f. Position angles (75, 76) on channels (78, 79) against compartment frame. Drill six 0.098-inch diameter rivet attach holes through angles and frame. Attach angles (75, 76) to frame with rivets (72).

g. Position bracket (74) in channel (79), angle (76), and support (77). Drill four 0.098-inch diameter rivet attach holes through channel (79) and bracket (74), and one 0.098-inch diameter rivet attach hole through top of support (77) and bracket (74). Drill additional two 0.1285-inch diameter rivet attach holes through angle (76), channel (79), and bracket (74). Attach bracket (74) to channel (79) and support (77) with rivets (71, 72). Also, attach bracket (74) to channel (79) and angle (76) with rivets (70).

h. Position bracket (73) in channel (78), angle (75), and support (77). Drill from 0.098-inch diameter rivet attach holes through channel (78) and bracket (73), and one 0.098-inch diameter rivet attach hole through top of support (77) and bracket (73). Drill additional 0.1285-inch diameter rivet attach hole through angle (75), channel (78), and bracket (73). Attach bracket (73) to channel (78) and support (77) with rivets (71, 72). Also, attach bracket (73) to channel (78) and angle (75) with rivet (70).

i. Use support (77) as template and determine attach hole locations required for nutplates on bracket (74). Drill four 0.098-inch diameter rivet attach holes through bracket (74). Attach two nutplates (68, 69) on bracket (74) and support (77) with rivets (67). Also, attach two nutplates (69) on support (77) with rivets (67).

j. Position angle (66) on channel (78) and determine attach hole locations. Drill six 0.098-inch diameter rivet attach holes through channel and angle. Attach angle (66) to channel (78) with rivets (63).

k. Position nutplate support (65) on channel (79) and angle (66) and determine attach hole locations. Drill six 0.1285-inch diameter rivet attach holes through support and channel. Attach support (65) to channel (79) with rivets (64). Also, drill four 0.098-inch diameter rivet attach holes through support (65) and angle (66). Attach support (65) to angle (66) with rivets (63).

l. Attach E27 ground stud screw (58), lock washer (60), and jam nut (61) to support (65); then place washers (59) on screw (58) and secure washers with nut (62).

m. Using screws (55) and washers (56), attach relays (57) to support (65).

n. Attach bus (54) with 1/2-inch RNF-100 sleeving (13, table 3-1) to terminals K302-A1 and K3031A1 on relays (57, fig. 1-1). For detailed wiring instructions, refer to paragraph 3-15.

o. Attach diode (24, table 3-1) to terminals K302-X1 and K302-X2 on relay (57, fig. 1-1). For detailed wiring instructions, refer to paragraph 3-15.

p. Using adhesive (3, table 3-1), bond chafe strip (53, fig. 1-1) to bracket (74) as shown in figure 3-1.

q. Using bolts (49, fig. 1-1), washers (50) and nuts (51), attach bearing plate (52) to support (77).

r. Using screws (45), and washers (46), attach clamp halves (47) and seal (48) to support (77). Install bolts (42), washers (43) and nuts (44) in clamp halves (47) but do not tighten bolts at this time.

s. Using sealant (4, table 3-1), seal box formed by support (77), brackets (73, 74), and compartment frame so that lower support is watertight.

NOTE: Do not cover clamp halves (47) or external wiring cable access hole with sealant.

3-12. COMPARTMENT FLOOR AND UPPER SUPPORT.

a. Position channel (41, fig. 1-1) on existing floor channels at pilot's right side floor compartment and determine attach hole locations for channel (41), supporting angles (40), and filler (39). Drill 0.098-inch diameter rivet attach holes as required and attach channel (41, fig. 1-1), angles (40), and filler (39) to existing floor channels with rivets (29).

NOTE: Make certain that filler (39) is positioned on left side of channel (41) between angle (40) and existing channel.

b. Position channels (37, 38) between existing floor channel on forward side of pilot's floor compartment and channel (41), and determine attach hole locations for channels (37, 38) and supporting angles (34, 35, 36). Drill 0.098-inch diameter rivet attach holes as required and attach channels (37, 38) and angles (34, 35, 36) to channel (41) and existing floor channel with rivets (29).

c. Position web (33) with floor pan (32) on existing floor channels and on channels (37, 38, 41), and determine attach hole locations. Drill 0.098-inch diameter rivet attach holes as required and attach web (33), pan (32), and straps

(30, 31) on floor channels and channels (37, 38, 41) with rivets (29).

3-13. CIRCUIT BREAKERS AND CAUTION LIGHT.

a. Remove attach screws from lower switch and circuit breaker panel on instrument panel (HMI - Vol 1). Pull out optional equipment panel and remove plug buttons from holes provided for circuit breakers (25, 26, fig. 1-1) and caution light assembly (27).

b. Install caution light assembly (27) and lamp (28) in hole identified by decal marked EXT-PRESS TO TEST.

c. Install circuit breaker (26) in hole identified by decal marked CONT.

d. Install circuit breaker (25) in hole identified by decal marked PWR.

e. Connect electrical wiring on circuit breakers and caution light assembly (para 3-15).

f. Using attach screws, attach lower switch and circuit breaker panel to instrument panel (HMI - Vol 1).

3-14. SEARCHLIGHT ASSEMBLY. For installation of searchlight assembly (22, fig. 1-1), including lamp (23) and lamp assembly (24), refer to paragraph 2-15.

3-15. ELECTRICAL WIRING.

NOTE: Steps a through g provide for wiring installations from the W3 bus to the circuit breakers, relay terminal K302-A1, caution light and ground, and splices SP66 and SP67 (see figure 2-2).

a. Attach terminals (22, table 3-1) to wire No. K510F16 (11); then connect wire to circuit breaker terminal CB128-1 and key switch terminal S3-2.

b. Attach terminal (17) to one end of jumper wire (12); then connect wire with terminal to circuit breaker terminal CB128-2. Attach other end of wire to caution light terminal XDS11-1 and secure with solder (9).

c. Attach wire No. L562B20 to caution light terminal XDS11-2 and secure with solder (9). Attach splice SP67-A (16) to other end of wire for eventual connection to searchlight wiring.

d. Attach terminal (17) to wire No. L564B20 (12); then connect wire with terminal to circuit breaker terminal CB128-2. Attach splice SP66-A (16) to other end of wire for eventual connection to searchlight wiring.

e. Attach terminal (17) to wire No. L565A20N (12); then connect wire with terminal to ground stud E3. Attach other end of wire to caution light terminal XDS11-3 and secure with solder (9).

f. Attach terminal (12) to wire No. P506AE10 (10); then connect wire with terminal to bus W3-4. Attach terminal (22) to other end of wire; then connect wire with terminal to circuit breaker terminal CB127-1.

g. Attach terminal (23) to wire No. L557A10 (10); then connect wire with terminal to circuit breaker terminal CB127-2. Attach terminal (21) to other end of wire; then connect wire with terminal to relay terminal K302-A1.

NOTE: Steps h through j provide for wiring installations between the relays and the relay ground, and wiring from the searchlight assembly. (See fig. 2-2.)

h. Attach terminals (18) on two jumper wires (12); then connect one wire with terminals to relay terminals K302-X1 and K303-X1. Connect remaining wire with terminals to relay terminals K302-X2 and K303-X2.

i. Attach terminal (18) to jumper wire (12); then connect wire with terminal to relay terminal K303-2. Attach terminal (19) to other end of wire; then connect wire with terminal to E27 ground stud.

j. Connect wiring from searchlight assembly as follows:

(1) If required, attach splice SP66-B (16) to wire No. L564A16 (yellow wire from 5205-1). Connect yellow wire with splice to splice SP66-A (on wire from circuit breaker).

(2) If required, attach splice SP67-B (16) to wire No. L562A20 (white wire from S206-2). Connect white wire with splice to splice SP67-A (on wire from caution light).

(3) If required attach terminal (19) to wire No. L510G20 (white wire from S206-1). Connect white wire with splice to E27 ground stud.

(4) If required, attach terminal (20) to wire No. L563A16 (yellow wire from S205-2). Connect yellow wire with terminal to relay terminal K302-X1.

(5) If required, attach terminals (21) to red and green wires from lamps (red wire from DS401-2 and green wire from DS402-2). Connect green and red wires with terminals to E27 ground stud.

NOTE: If required, terminals (21) are used on ends of red and green wires at lamp terminals DS401-2 and DS402-2.

(6) If required, attach terminals (21) to black and gray wires from lamps (black wire from DS401-1 and gray wire from DS402-1). Connect black wire with terminal to relay terminal K302-A2; connect gray wire with terminal to relay terminal K303-A2. Cover relay terminals with caps (25).

NOTE: If required, terminals (23) are used on ends of black and gray wires at lamp terminals DS401-1 and DS402-1.

(7) Install protective sleeving (15) over SP66 and SP67 splice connections and secure wiring with tie straps (8).

3-16. ACCESS COVER.

a. Position access cover (16, fig. 1-1) on existing floor channels and channel (41), and determine attach hole locations for fastener studs in cover (16), channel (41), and floor channels; locate from pilot holes provided in cover (16). Using drill motor and appropriate drill bit, drill 0.218-inch diameter holes for fastener studs in cover (16), channel (41), and floor.

b. Drill 0.218-inch diameter hole in each of three angles (15) for location of fastener retainer springs.

c. Position angles (15) on floor access aft channel and determine angle attach hole locations. Drill 0.1285-inch diameter rivet attach holes, two in each angle (six in floor channels). Attach angles (15) to floor channel with rivets (14).

d. Drill two each 0.098-inch diameter holes in angles (15) for retention of springs (12). Attach springs (12) to angles (15) with rivets (13). Using grommets (11), secure corresponding studs (10) to access cover (16).

e. Drill two each 0.098-inch diameter holes in floor access side channels for retention of fillers (7) and springs (8). Attach fillers (7) and springs (8) to channels with rivets (9). Using grommets (6), secure corresponding studs (5) to access cover (16).

f. Drill two each 0.098-inch diameter holes in channel (41) for retention of springs (3). Attach springs (3) to channel (41) with rivets (4). Using grommets (2), secure corresponding studs (1) to access cover (16).

g. Install access cover (16) and secure fastener studs (1, 5, 10) to fastener retaining springs (3, 8, 12) on floor compartment. Check cover for proper fit and security of fasteners.

h. Using double-faced tape (7, table 3-1), install floor carpeting (26); cut and trim carpeting to accommodate searchlight base, access cover (16, fig. 1-1), and web (3).

3-17. INSTALLATION OF HELICOPTER EQUIPMENT.

3-18. After installation of searchlight kit, a limited number of items must be replaced in the helicopter. Refer to HMI - Vol 1 and perform the following:

a. Install seat on right side of crew compartment.

b. If searchlight assembly is removed from helicopter (para 2-9), install copilot's cyclic stick as required.

3-19. WEIGHT AND BALANCE DATA.

3-20. Weight and balance data resulting from installation of searchlight kit is listed in table 3-2. After installation of kit, incorporate changes in helicopter weight and balance records as instructed in HMI - Vol 2.

Table 3-2. Weight and balance data

Item	Weight (lb)	Arm (in.)	Moment (in. -lb/100)
-501 Kit (complete)			
Added	18.2	52.0	946
Removed	4.3	53.0	227
Changed	13.9	51.7	719
-501 Kit (without 500-A searchlight assembly)			
Added	6.3	52.8	333
Removed	4.3	53.0	227
Changed	2.0	53.0	106

