

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

FOR

PASSENGER/CARGO HOIST SYSTEM

Part No. 369H90070-521
and 369H90070-522

USED ON HUGHES 500D AND 500MD (MODEL 369D) HELICOPTERS



Hughes Helicopters division of summa corporation / culver city, california

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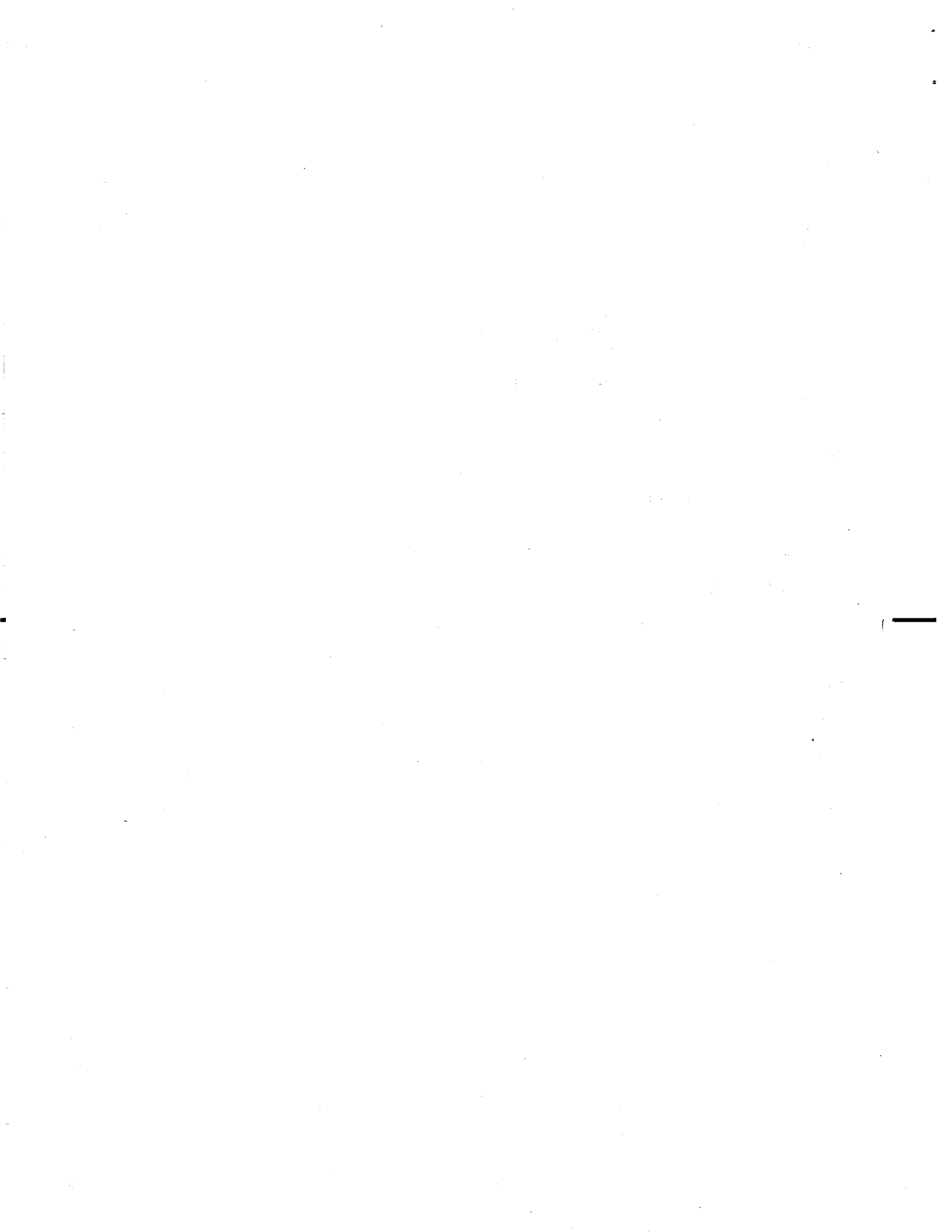
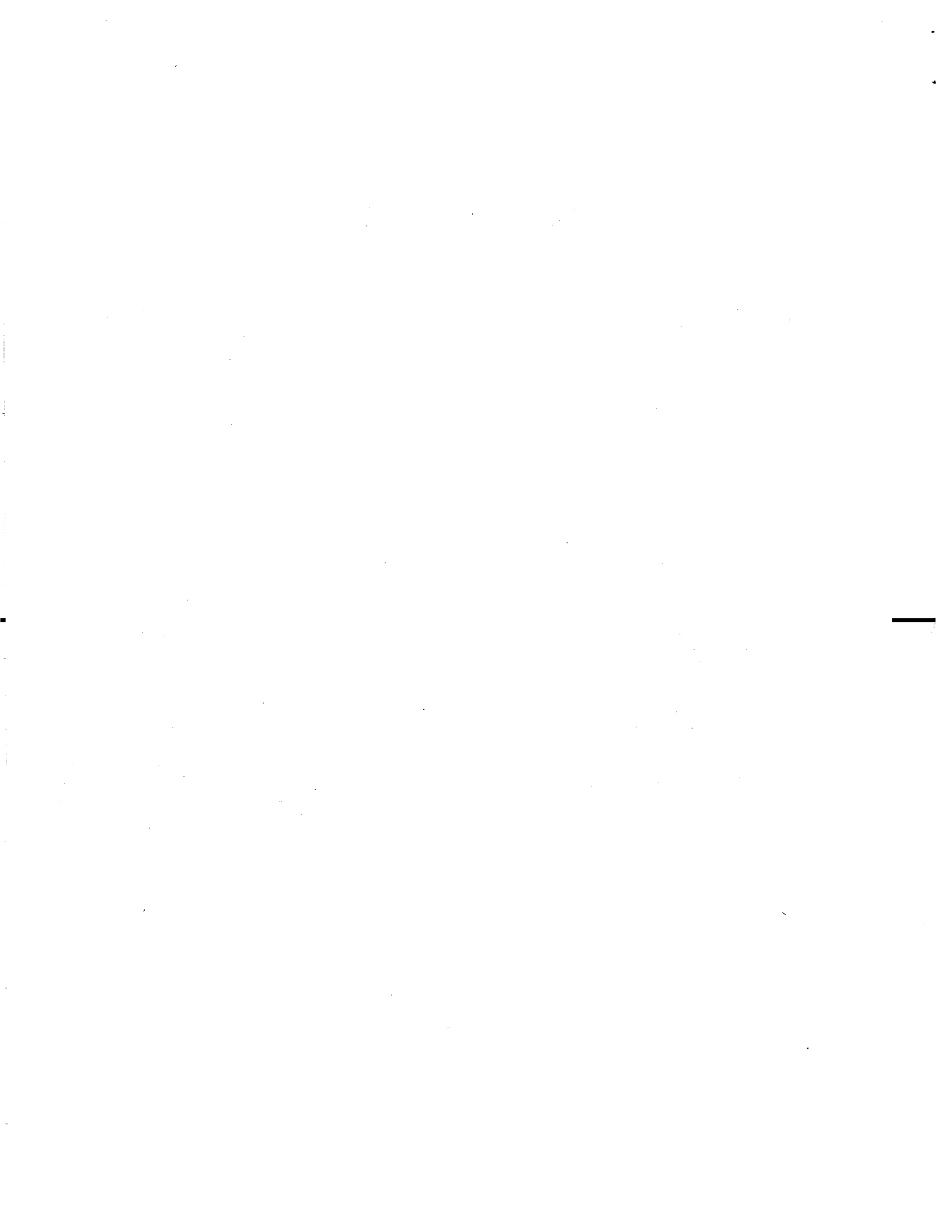


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FOREWORD

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 passenger/cargo hoist kit assemblies. Weight and balance data is included. This manual also contains parts lists for procuring replacement parts for the passenger/cargo hoist kit assemblies.

F-3. APPLICABILITY.

F-4. The passenger/cargo hoist kits are applicable for use on any Hughes 500D or 500MD (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.

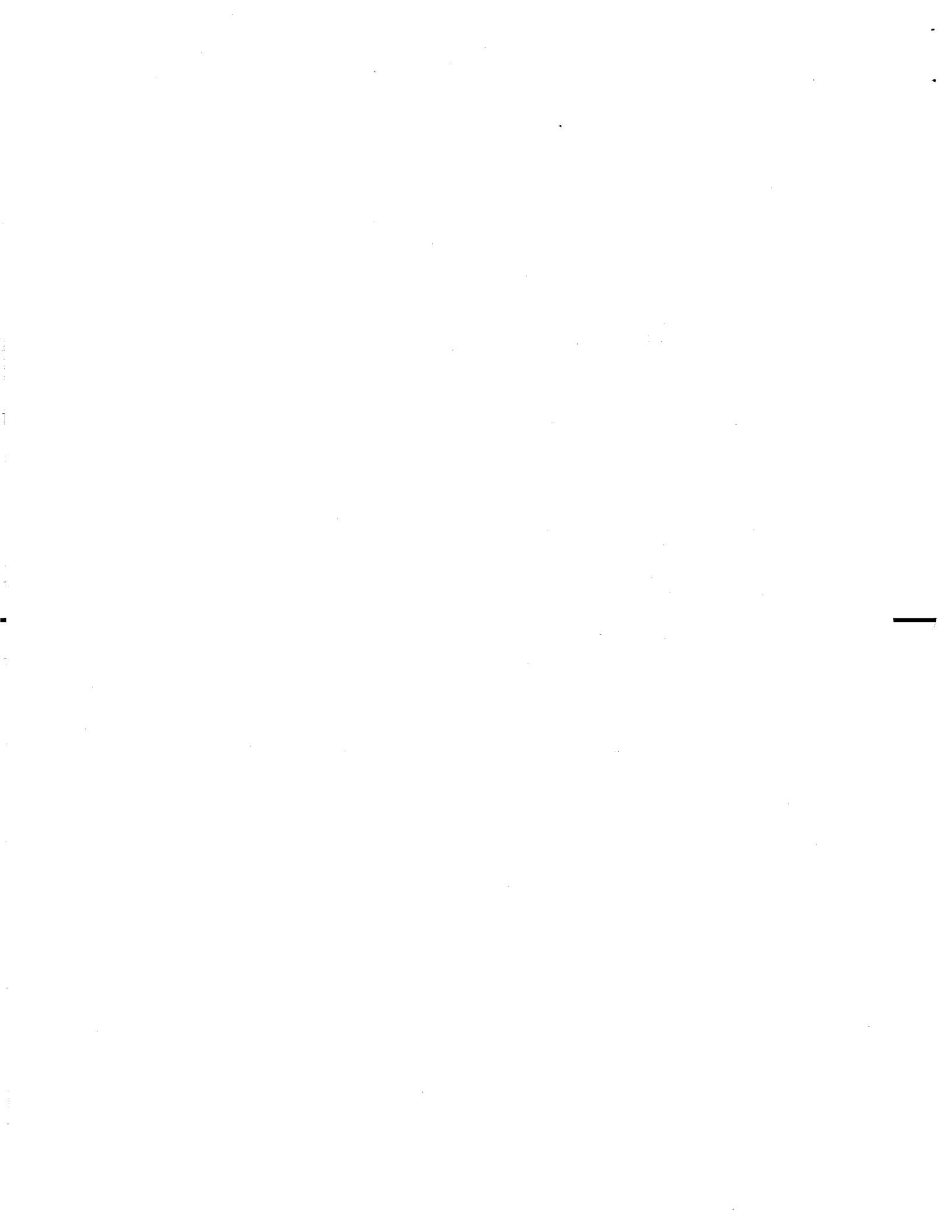
F-10. This manual is for use by operators of the Model 369D helicopter equipped with a passenger/cargo hoist kit. Although this manual is a separate publication, it should be kept with HMI - Vol 1, HMI - Vol 2, 369D - IPC and other handbooks listed in section 1, HMI - Vol 1 that form the primary information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

F-11. RELATED PUBLICATIONS.

F-12. Reference is made to applicable portions of HMI - Vol 1 and 369D - IPC 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 369H90070-521 (military configuration) and 369H90070-522 (commercial configuration) passenger/cargo hoist kits, 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 the 369D - IPC.)

1-3. GROUP ASSEMBLY PARTS LIST.

1-4. The parts lists furnish information for procuring replacement parts for the passenger/cargo hoist kits, and shall not be used for any other purpose. (For information or procurement of replacement parts, refer to 369D - IPC.)

1-5. ILLUSTRATIONS.

1-6. An isometric illustration is provided and includes a combined parts list, with variations noted, for both 369H90070-521 and 369H90070-522 passenger/cargo hoist kits. The illustrations are exploded to the extent necessary to show the parts relationship for complete passenger/cargo hoist kits.

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.

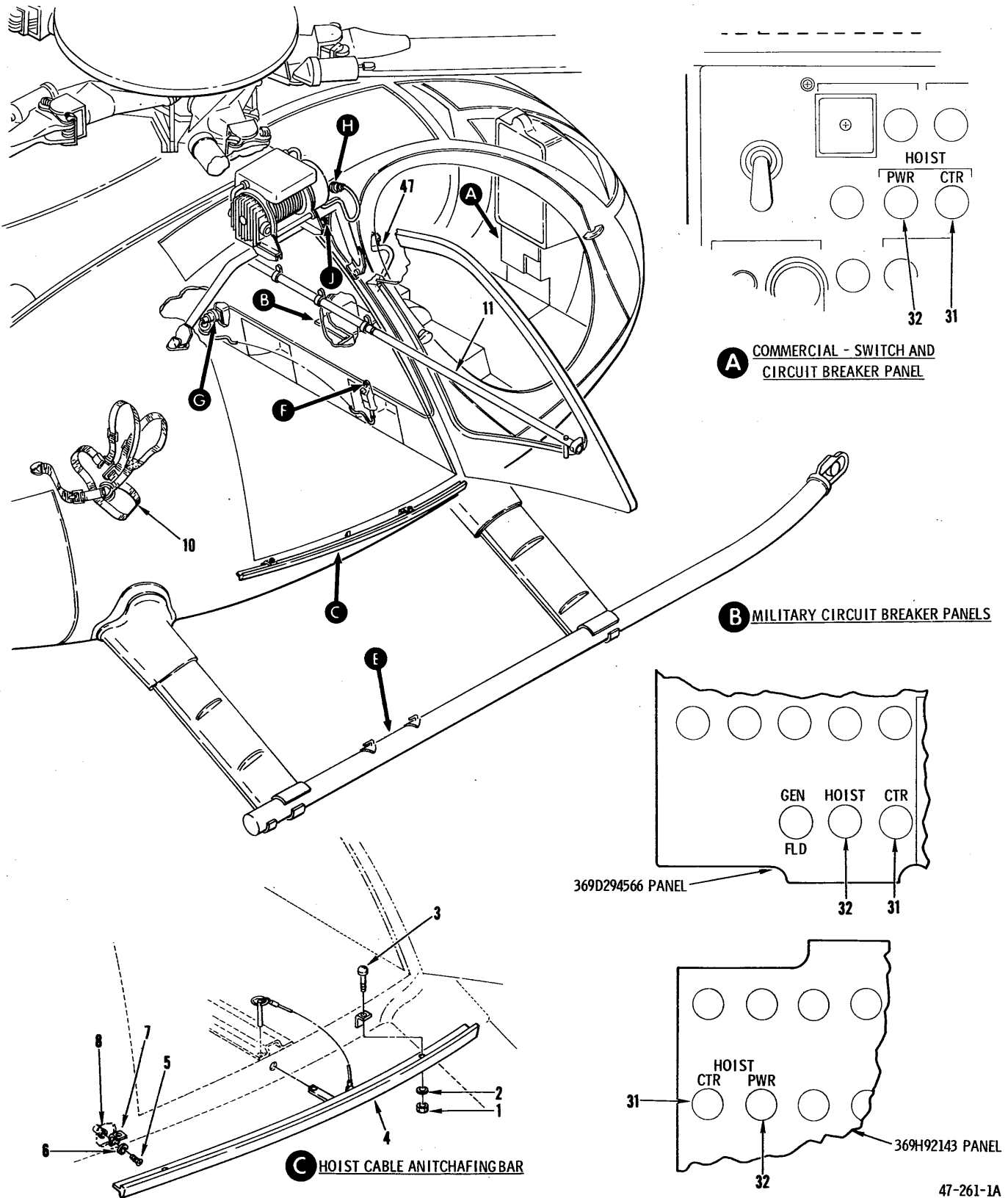
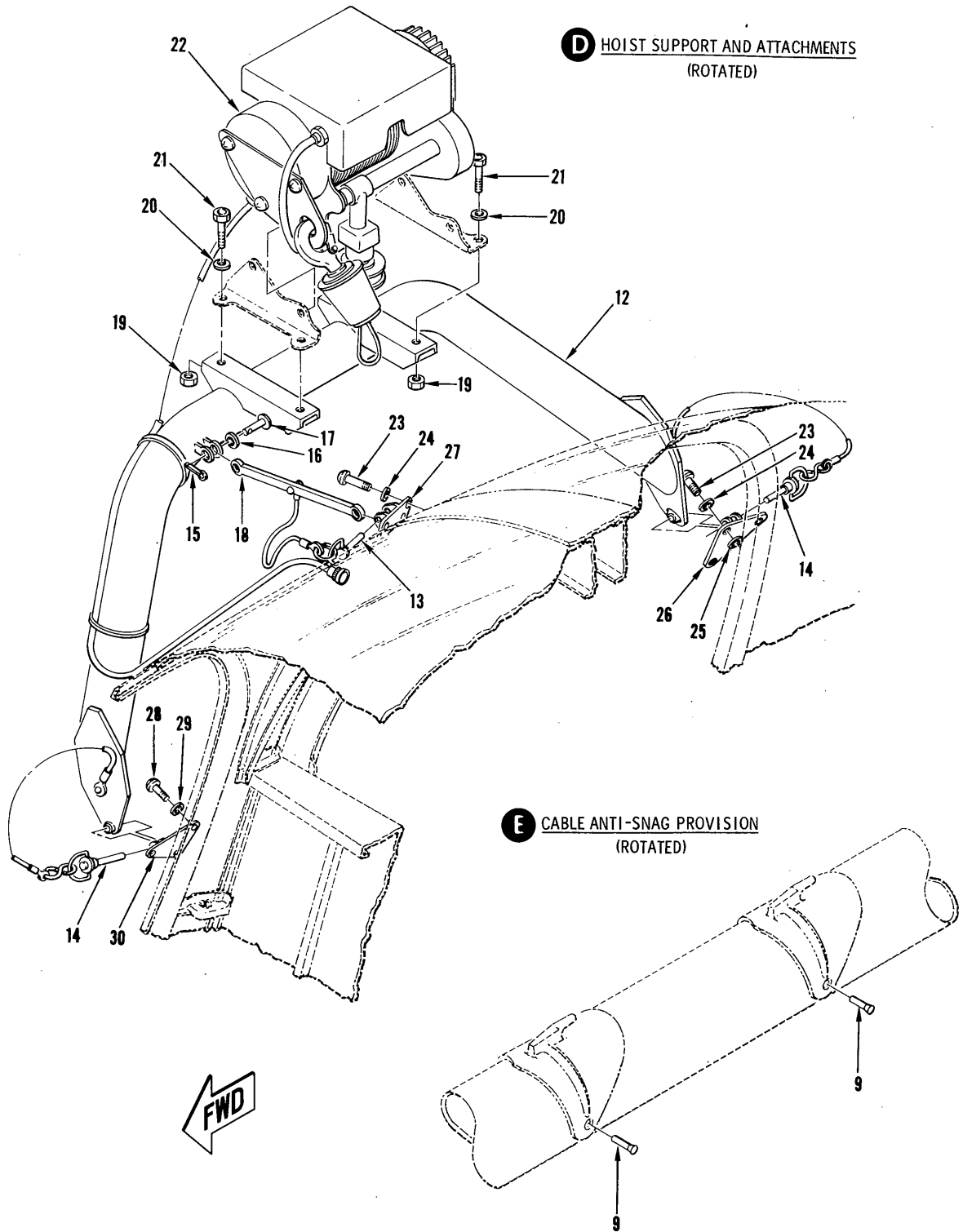


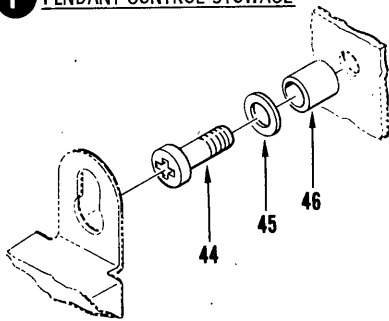
Figure 1-1. Hoist kit components (sheet 1 of 3)



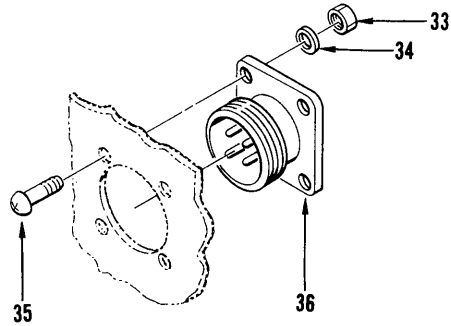
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Figure 1-1. Hoist kit components (sheet 2 of 3)

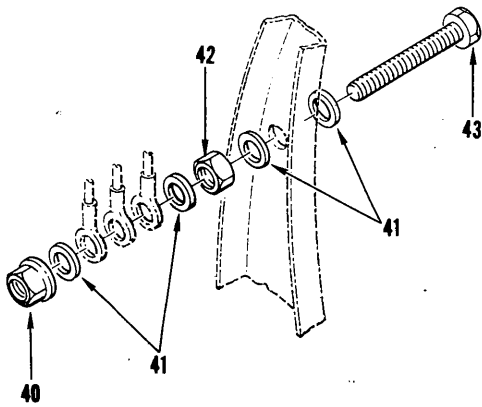
F PENDANT CONTROL STOWAGE



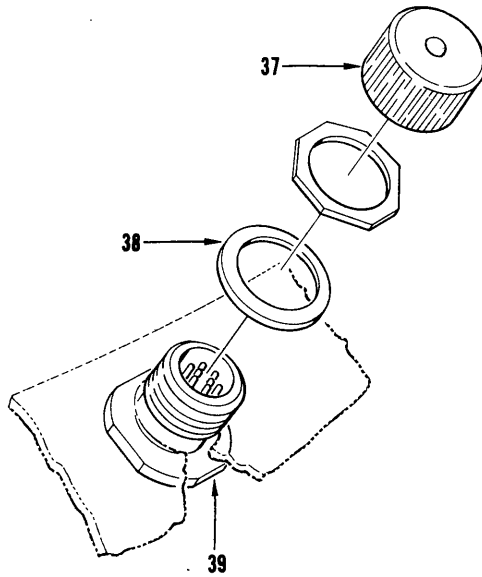
G PENDANT CONTROL CONNECTOR



J ELECTRICAL GROUNDING STUD (TYPICAL)



H HOIST CONNECTOR



47-261-3A

Figure 1-1. Hoist kit components (sheet 3 of 3)

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-1-	369H90070-522	HOIST KIT (Commercial configuration)	REF	
	369H90070-521	HOIST KIT (Military configuration)	REF	
-1	MS21043-08	. NUT	2	
-2	AN960PD8L	. WASHER	4	
-3	NAS602-8	. SCREW	2	
-4	369D292551-3	. CHAFING BAR ASSY (LH DOOR SILL)	1	
		(Component of 369H90070-521)		
	369D292551-4	. CHAFING BAR ASSY (RH DOOR SILL)	1	
		(Component of 369H90070-522)		
-5	NAS604-11	. SCREW	2	
-6	AN960PD416	. WASHER	2	
-7	369D292553	. CLIP	2	
	NAS603-8	. SCREW (Component of 369H90070-521)	3	
	369D292556	. CHAFING BAR ASSY (LH LANDING	1	
		GEAR SKID) (Component of 369H90070-521) .		
-8	S2528KB80	. RIVNUT	2	
-9	MLS100-M4-2	. RIVET	2	
-10	369H92023	. HARNESS, BODY	1	
-11	369H92173	. RETAINER INSTL, PASSENGER/CARGO	1	
		DOOR (See figure 1-2 for breakdown)		
-12	369H92012	. TUBE ASSY (Component of 369H90070-522) . . .	1	
	369H92011	. TUBE ASSY (Component of 369H90070-521) . . .	1	
-13	SLC3R08	. PIN, SAFETY	1	
-14	SLC4R09	. PIN, SAFETY	2	
-15	MS24665-132	. PIN, COTTER	1	
-16	AN960C10L	. WASHER	1	
-17	MS20392-2C21	. PIN, STRAIGHT BEARING	1	
-18	369H92006-21	. LINK ASSY, RH (Component of 369H90070-522)	1	
	369H92006-11	. LINK ASSY, LH (Component of 369H90070-521)	1	
-19	MS21044N4	. NUT	4	
-20	AN960D416	. WASHER	4	
-21	NAS1304-4	. BOLT	4	
-22	369H92563-501	. HOIST ASSY (See figure 1-3 for breakdown) . . .	1	
-23	NAS623-3-5	. SCREW	7	
-24	AN960C10L	. WASHER	7	
-25	AN960C10	. WASHER, ADJUSTMENT	3	
-26	369H92004-12	. FITTING, AFT, RH (Component of	1	
		369H90070-522)		
	369H92161-2	. FITTING, AFT, RH (Interchangeable	1	
		with 369H92004-12)		
	369H92004-11	. FITTING, AFT, LH (Component of	1	
		369H90070-521)		
	369H92161-1	. FITTING, AFT, LH (Interchangeable	1	
		with 369H92004-11)		
-27	369H92005-12	. FITTING, UPPER, RH (Component of	1	
		369H90070-522)		
	369H92506-2	. FITTING, UPPER, RH (Interchangeable	1	
		with 369H92005-12)		
	369H92005-11	. FITTING, UPPER, LH (Component of	1	
		369H90070-521)		
	369H92506-1	. FITTING, UPPER, LH (Interchangeable	1	
		with 369H92005-11)		
-28	NAS623-3-6	. SCREW	3	
-29	AN960C10L	. WASHER	3	

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-1-30	369H92162-2	. FITTING, FWD, RH (Component of 369H90070-522)	1	
	369H92167-2	. FITTING, FWD, LH (Interchangeable with 369H92162-2)	1	
	369H92162-1	. FITTING, FWD, LH (Component of 369H90070-521)	1	
	369H92167-1	. FITTING, FWD, LH (Interchangeable with 369H92162-1)	1	
-31	2TC13-7-1/2	. CIRCUIT BREAKER (CB601 or CB134)	1	
-32	MS25036-40	. CIRCUIT BREAKER (CB600 or CB133)	1	
	369H90070-131	. HARNESS ASSY, ELECTRICAL	1	
-33	NAS1291-C04M	. . NUT	4	
-34	AN960C4L	. . WASHER	4	
-35	MS51957-15	. . SCREW	4	
-36	MS3101E16S-1S	. . RECEPTACLE (XJ2)	1	
-37	MS3181-4	. . CAP, PROTECTIVE	1	
-38	369H90070-69	. . WASHER	1	
-39	PT07C14-8S	. . RECEPTACLE (J28)	1	
-40	MS21043-08	. NUT	2	
-41	AN960PD8L	. WASHER	8	
-42	NAS671-C8	. NUT	2	
-43	NAS1096-2-10	. SCREW	2	
-44	NAS623-3-8	. SCREW, PENDANT STOWAGE	1	
-45	AN960PD10	. WASHER	1	
-46	NAS43DD1-16	. SPACER	1	
-47	369H90129-505	. GRIP, CYCLIC STICK (Component of 369H90070-522) (Refer to applicable Opt Eqpt Manual)	1	

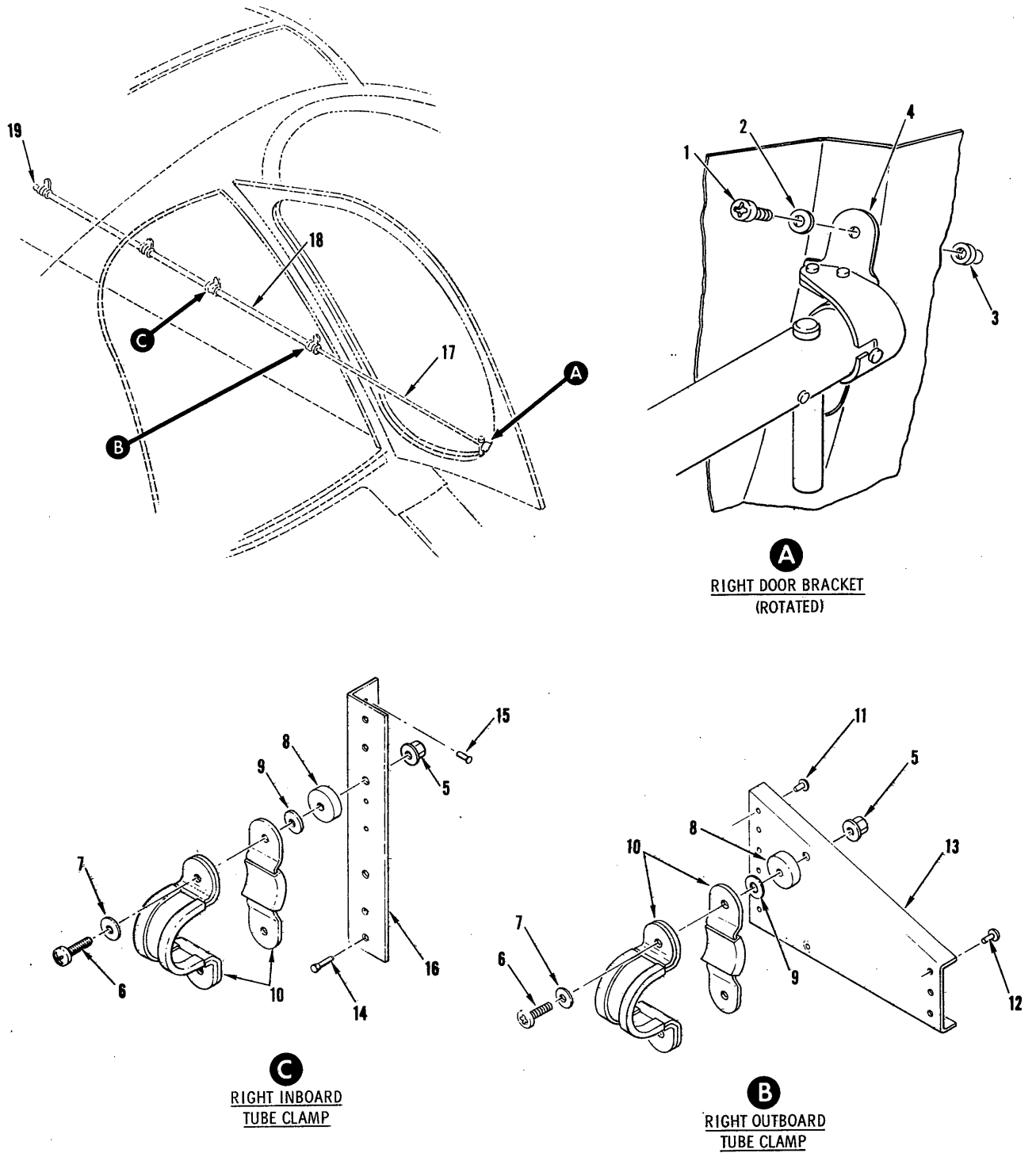
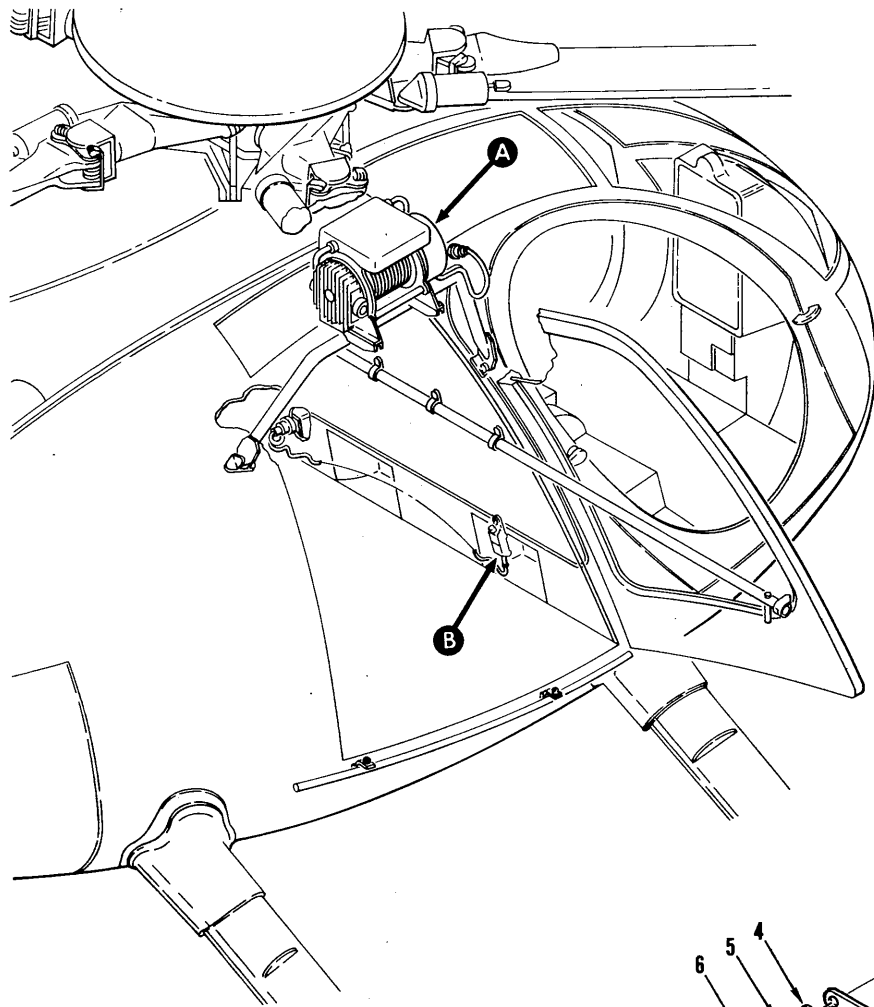


Figure 1-2. Passenger/cargo door retainer installation

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-2-	369H92173	RETAINER INSTL, PASSENGER/CARGO DOOR . (See figure 1-1 for NHA)	REF	
-1	NAS1403-2	. SCREW	2	
-2	AN960-10L	. WASHER	2	
-3	S10H85	. RIVNUT	2	
-4	369H92173-42	. BRACKET ASSY, RH	1	
-4	369H92173-41	. BRACKET ASSY, LH	1	
-5	MS21042-3	. NUT	8	
-6	NAS1403-8	. SCREW	8	
-7	AN960-10L	. WASHER	8	
-8	369H92173-15	. SPACER	8	
-9	AN960-10	. WASHER, ADJUSTMENT	AR	
-9	AN960-10L	. WASHER (Interchangeable with AN960-10)	AR	
-10	TA9C89SSR20	. CLAMP	4	
-11	MS20470AD4	. RIVET	AR	
-12	MS20470AD3	. RIVET	AR	
-13	369H92173-14	. BRACKET, RH	1	
-13	369H92173-13	. BRACKET, LH	1	
-14	MS20426AD3	. RIVET	AR	
-15	NAS1738B5-3	. RIVET	AR	
-16	369H92173-36	. ANGLE, RH	1	
-16	369H92173-35	. ANGLE, LH	1	
-17	369H92173-11	. TUBE ASSY	1	
-18	369H92173-5	. TUBE	1	
-19	369H92173-33	. END CAP	1	



A HOIST SYSTEM - WINCH, ATTACH BRACKETS, AND HOOK STOWAGE HANGER ASSEMBLY (ROTATED)

B CONTROL PENDANT CABLE CUTTER SWITCH ACCESS DOOR ASSEMBLY

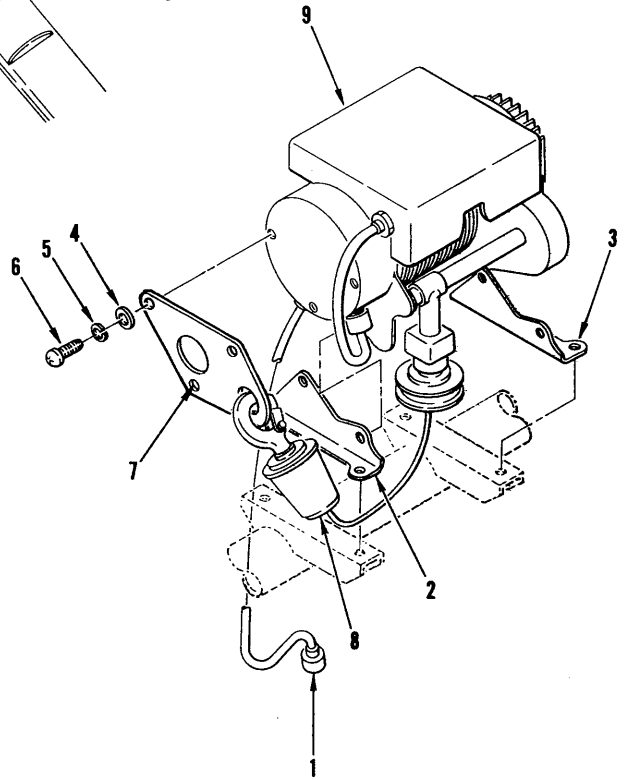
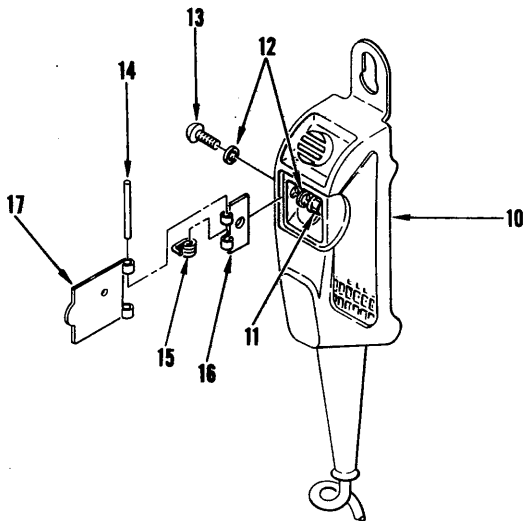


Figure 1-3. Hoist assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-3-	369H92563-501	HOIST ASSY (See figure 1-1 for NHA)	REF	
-1	PT06P14-8P	. CONNECTOR (P28)	1	
-2	369H92575-1	. BRACKET, FWD (Replaces bracket provided with hoist - installed with existing hardware)	1	
-3	369H92575-2	. BRACKET, AFT (Replaces bracket provided with hoist - installed with existing hardware)	1	
-4	AN960C6	. WASHER	3	
-5	AN935-6L	. LOCKWASHER	3	
-6	NAS601-7	. SCREW	3	
-7	369H92170	. HANGER	1	
-8	BL-7520-1	. HOOK ASSY	1	
-9	BL-16600-12	. HOIST (WINCH)	1	
	BL-7811	. . CABLE CUTTER	1	
	369H92563-41	. PENDANT ASSY	1	
-10	BL-8810-1	. . PENDANT	1	
-11	MS21042-04	. . NUT	1	
-12	AN960CL4	. . WASHER	2	
-13	AN515C4-5	. . SCREW	1	
	369H92563-31	. . HINGE ASSY	1	
-14	369H92563-7	. . . PIN	1	
-15	369H92563-9	. . . SPRING	1	
-16	369H92563-5	. . . SUPPORT	1	
-17	369H92563-3	. . . COVER	1	

SECTION 2

MAINTENANCE INSTRUCTIONS

2-1. GENERAL INFORMATION.

2-2. **DESCRIPTION.** The passenger/cargo hoist kit assembly consists of an electrically operated winch mounted on a support tube, a hoist operator's safety harness, a passenger door (hold-open) retainer assembly, a passenger door sill antichafing bar assembly, a control pendant, and associated electrical equipment. The hoist provides a means for lifting and lowering personnel or objects weighing up to 300 pounds. The hoist system employs lightweight, readily attachable and detachable exterior mounted equipment without using passenger or cargo space in the helicopter. For safety purposes, a guillotine-type cable cutting device is incorporated in the hoist winch assembly. Figure 2-1 illustrates the 500D commercial configuration hoist installed on the right side of the helicopter. The 500MD military configuration is identical except that the hoist is installed on the opposite (left) side of the helicopter. The hoist function is identical when operated from either side of the helicopter. A cyclic stick grip kit must be used on the commercial configuration.

NOTE: When the hoist kit is installed on commercial helicopters equipped with emergency floats, the floats must be in a stowed condition during hoisting operations. Emergency floats must be removed from military configurations before conducting hoisting operations.

2-3. The weatherproof winch consists of a 28-vdc motor that drives a cable drum to which a 110-foot stainless steel cable with a swivel hook is attached. The winch is equipped with an automatic brake system; up (full-in) and down (full-out) limit stop switches; and an explosive, electrically activated guillotine-type cable cutter for cutting the cable in an emergency. The hoist assembly is mounted on a support tube attached with quick-release pins to three fittings located on the exterior of the fuselage on either side and above the passenger/cargo door. The support tube positions the winch to allow raising and lowering the cable between the side of the fuselage and landing gear skid. Two modified mounting

brackets are used to accommodate installation of the winch on the support tube. The winch incorporates a disc-type brake, housed on the end of the hoist drum, which consists of spring-loaded friction plates and an actuating solenoid. The solenoid is energized to release the brake at the same time the motor is energized. Once the control pendant switch is released to the off position, the brake solenoid is deenergized and the brake sets, preventing any possibility of uncontrolled cable payout. Cable up (full-in) and down (full-out) limit switches are incorporated in the winch brake system. When either limit switch is in the closed position, the brake solenoid is energized, releasing the brake discs and allowing the winch drum to rotate. Conversely, when either limit switch is in the open position, the brake solenoid is deenergized and the winch brake automatically sets and stops the winch.

2-4. The passenger/cargo door retainer assembly consists of a tubular housing attached with four clamps securing the housing horizontally across the canted bulkhead in the passenger/cargo compartment. With the passenger/cargo door in full open position, a smaller tube stowed inside the tubular housing, extends in a telescoping effect and engages a bracket located on the outboard frame of the door, thus retaining the door in an open position. The telescoping tube can be used in either end of the tubular housing to hold the left or right passenger/cargo door open as required.

2-5. An antichafing bar, installed just below the passenger/cargo door sill, prevents the hoist cable from cutting the door frame during hoisting operations. A hoist operator's safety harness, provided with the hoist kit, is connected to the seat belt anchor fitting on the opposite side of the passenger/cargo compartment from which the hoist is installed.

2-6. The hoist system electrical equipment consists of a hand-held electrical pendant control for use in the passenger/cargo or pilot's compartments to operate the winch, an emergency cable cutter switch on the pilot's cyclic stick, circuit breaker equipment, and associated electrical

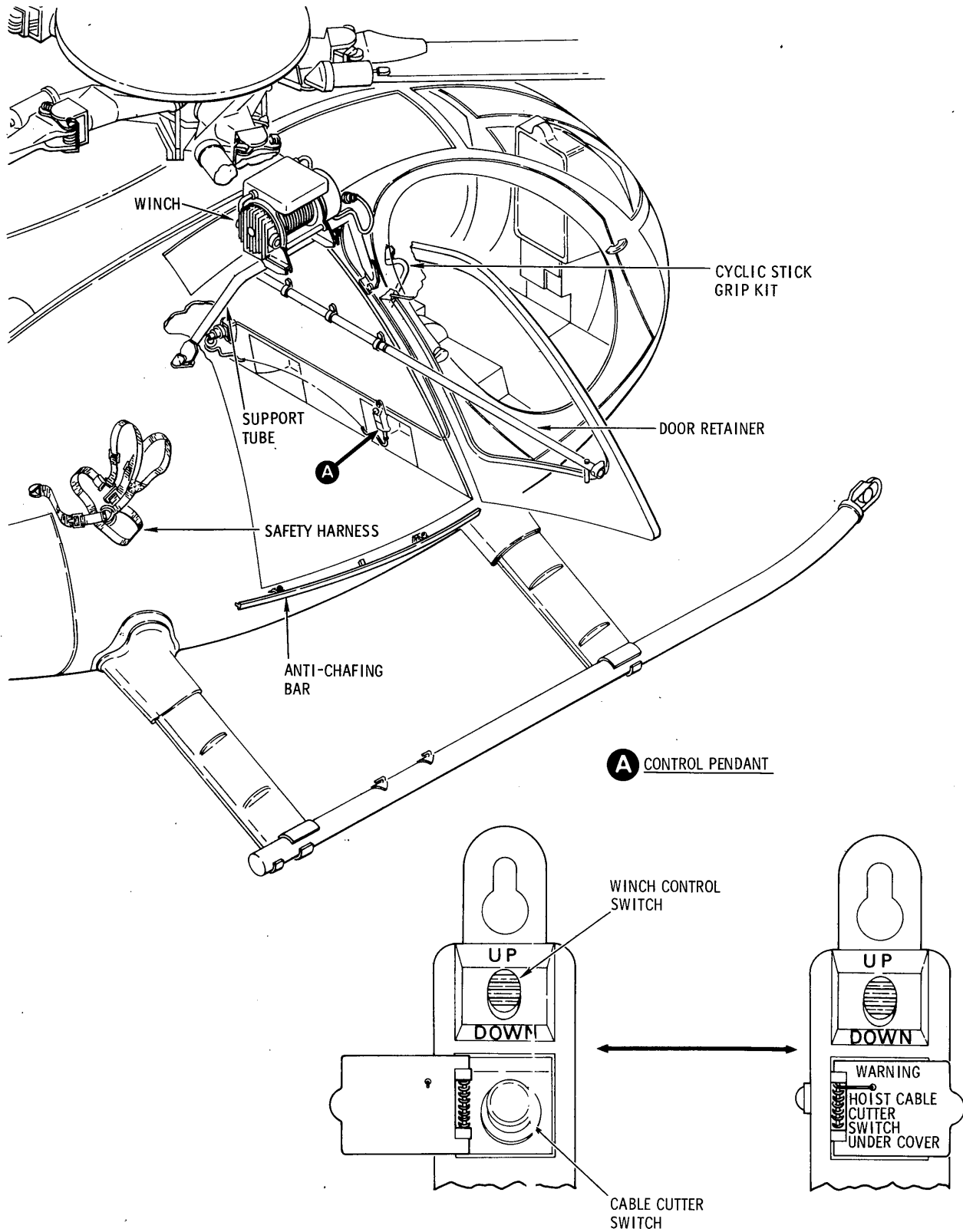


Figure 2-1. Hoist system components

wiring. The pendant control contains a three-position switch, spring loaded to the off position, for raising and lowering the swivel hook, and a guarded switch for cutting the cable at the winch in an emergency. The pilot's cyclic stick cable cutter switch allows the pilot to cut the hoist cable independent of the pendant control. (Refer to applicable Opt Eqpt Manual.) The circuit breakers are mounted on the lower switch and circuit breaker panel (commercial configuration) or on the circuit breaker panel located aft of the pilot's collective stick (military configuration). The cable cutter circuits are independently protected by a separate lower amperage circuit breaker located adjacent to the hoist power circuit breaker. Electrical wiring, plugs, receptacles, and terminals interconnect the various electrical components.

2-7. REFERENCE DATA. Refer to section 20, HMI - Vol 1, for interfacing schematics and wiring diagrams. Differences in commercial and military hoist installations and electrical circuitry are described in subsequent text and illustrations. Refer to manufacturer's publications (table 2-2, HMI - Vol 1 (BL-16600 Series 300-Lb Capacity Hoist Operating Instructions - Hoist Winch Assembly, Breeze Corporation, Inc)) for additional hoist, hook, cable, and parts information.

2-8. TROUBLESHOOTING.

2-9. Use information in table 2-1 for troubleshooting the hoist system

2-10. OPERATIONAL CHECK.

2-11. The following procedure is used to verify the capability of the hoist system to function correctly. The procedure should be performed any time a malfunction is suspected, and prior to normal use after repair.

WARNING: Remove protective electrical jumper wire (fig. 2-2) from cable cutter whenever winch is installed on helicopter. Jumper wire will prevent operation of cable cutter in an in-flight emergency.

a. Open applicable passenger/cargo door; extend door retainer tube to hold door in full open position.

CAUTION: Avoid inadvertent operation of cable cutter. Make certain cable cutter switches are not actuated when hoist system circuits are energized.

b. Energize helicopter electrical system; check that both HOIST PWR (power) and CBL CTR (cable cutter) circuit breakers are in closed position (see figure 1-1).

c. Using hoist system control pendant (fig. 2-1), exercise hoist winch by paying out 3 to 4 feet of cable under approximately 15 pounds tension; pull cable straight down to avoid cable rubbing on cable bellmouth. Reverse control and reel cable in. Check that cable winds on winch drum evenly and that winch operation is smooth and consistent. Check that winch stops automatically when top of swivel hook rubber bumper pushes against winch bumper pad.

d. Provide 300-pound weight to test hoist lifting capability.

e. With helicopter hovering approximately 100 feet above test weight, lower hoist hook between fuselage and landing gear skid. Continue lowering hook until hook can be connected to test weight.

f. Gradually maneuver helicopter to remove cable slack and to center hoist over test weight.

g. Slowly elevate helicopter to raise test weight approximately 20 feet from ground.

h. Using pendant control, payout full usable length of cable; check that hoist down limit switch stops winch with three turns of cable on winch drum. If required, adjust position at which down limit switch activates. Refer to manufacturer's publications (table 2-2, HMI - Vol 1).

i. Reverse pendant control; lift test weight to within approximately 10 feet of helicopter skid.

j. Check that hoist operates smoothly throughout hoisting and lowering operations.

NOTE: Cable retraction rate should be approximately 55 to 60 feet per minute. The full usable cable length should unwind in approximately 95 seconds and rewind in approximately 103 seconds.

Table 2-1. Troubleshooting hoist

Symptom	Probable Trouble	Corrective Action
Winch will not raise or lower cable.	Tripped circuit breaker.	Reset circuit breaker.
	Defective pendant control.	Repair pendant control.
	Defective winch assembly.	Repair winch assembly.
Improper lower cable travel limit.	Down (full-out) limit switch out of adjustment.	Reset lower limit adjustment.

k. Lower helicopter and remove hoist hook from test weight; raise hoist hook and check that hoist winch automatically stops when top of swivel hook rubber bumper pushes up against hoist bumper pad.

NOTE: Up limit switch should actuate before excessive cable pressure is applied to vertically compress bumper pad (see figure 2-2).

l. Land helicopter; deenergize electrical system.

m. Stow pendant control.

n. Stow door retainer tube; close passenger/cargo door.

2-12. REMOVAL OF HOIST ASSEMBLY.

2-13. To remove the hoist assembly, proceed as follows:

a. Check that cable is fully retracted on winch drum.

b. Check that BATTERY switch is in OFF position.

c. Install safety jumper wire on cable cutter electrical terminals (see figure 2-2).

CAUTION: Protective jumper wire should remain on cable cutter electrical terminals until winch is reinstalled for use.

d. Disconnect winch electrical plug (1, fig. 1-3) from receptacle on fuselage; install protective cap on receptacle.

e. Support winch; remove three quick-disconnect safety pins (13, 14, fig. 1-1) securing winch support tube (12) to fittings on fuselage.

f. Remove winch (22) and support tube (10) from fuselage.

g. Remove cotter pin (15), washer (16), and bearing pin (17) securing link assembly (18) to winch support tube (12).

NOTE: If support tube fittings (26, 27, 30) are to be removed from fuselage, make certain nylon screws (12, table 3-1) are installed in attachment holes.

h. Remove bolts (21, fig. 1-1) securing winch (22) to support tube brackets.

2-14. INSPECTION OF HOIST EQUIPMENT.

2-15. General inspection procedure for the hoist system is as follows:

a. Inspect components for security of attachment, damage, deformation, cracks, and excessive wear.

WARNING: Human life might depend on cable condition. Inspect full length of cable carefully and thoroughly.

WARNING: Use heavy leather gloves to protect hands from injury due to broken cable strands.

CAUTION: Keep cable clean. Provide a clean area to coil cable during inspection. Dirt and oil grime will create an abrasive wear on cable and winch components.

b. Inspect cable for fraying, corrosion, broken strands, and security of attachment to winch drum and cable ball swivel hook attachment. General criteria for cable replacement are as follows:

(1) Any single broken strand (cluster of 7 individual wires) requires cable replacement.

(2) Both ends of individual broken wires should be tucked into cable to prevent fouling when cable travels through cable guides and nonfouling mechanisms. Breaks of individual wires are allowable, unless the number is excessive as defined in (3) below.

(3) Generally, one individual broken wire (two ends) for each foot of cable is permissible, up to a total of 20 individual wire breaks for each 100-foot length of cable. A greater number of breaks requires cable replacement.

c. Refer to winch manufacturer's operating instructions (table 2-2, HMI - Vol 1) for additional information.

2-16. REPLACEMENT OF WINCH COMPONENTS.

2-17. **REPLACEMENT OF WINCH CABLE.** Replacement of the winch cable (fig. 2-2) is required if cable is damaged, worn excessively, or cable cutter has been fired (see paragraph 2-14 for inspection requirements and for cable replacement criteria).

a. Install hoist and support on helicopter (refer to paragraph 2-20).

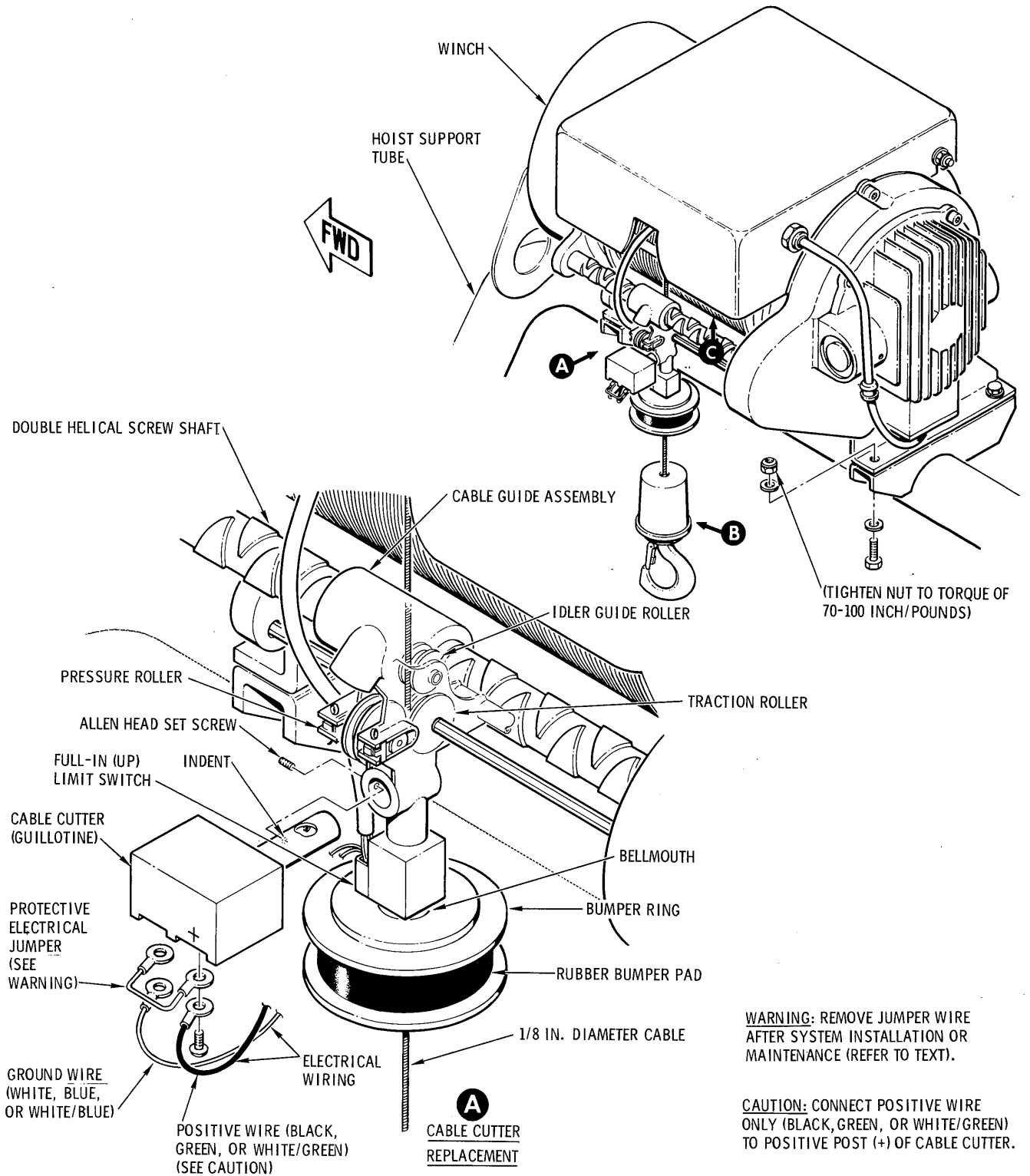
CAUTION: When electrical power is present, make certain cable cutter electrical circuits remain deenergized to eliminate the possibility of inadvertent actuation of cable cutter. To avoid possibility of cutting cable, install jumper wire between cable cutter electrical terminals (see figure 2-2).

b. Connect external electrical power source to helicopter.

c. Place BATTERY switch in EXT position.

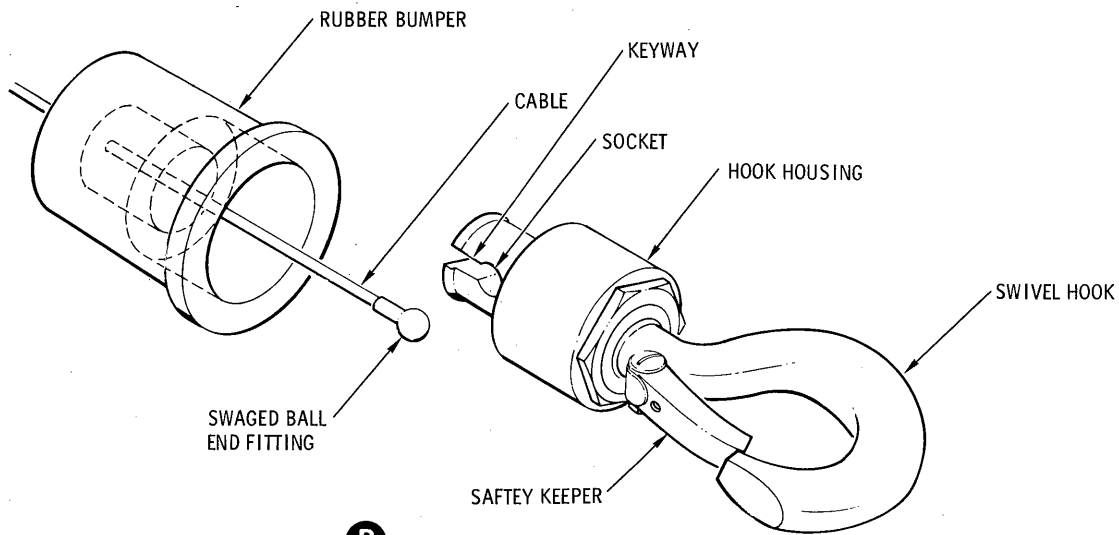
NOTE: An external power source should be connected to the helicopter to prevent excessive battery discharge. Hoist uses up to 40 amperes electrical current during operation.

d. Using hoist pendant control (fig. 2-1), reel off all cable from winch drum as follows:

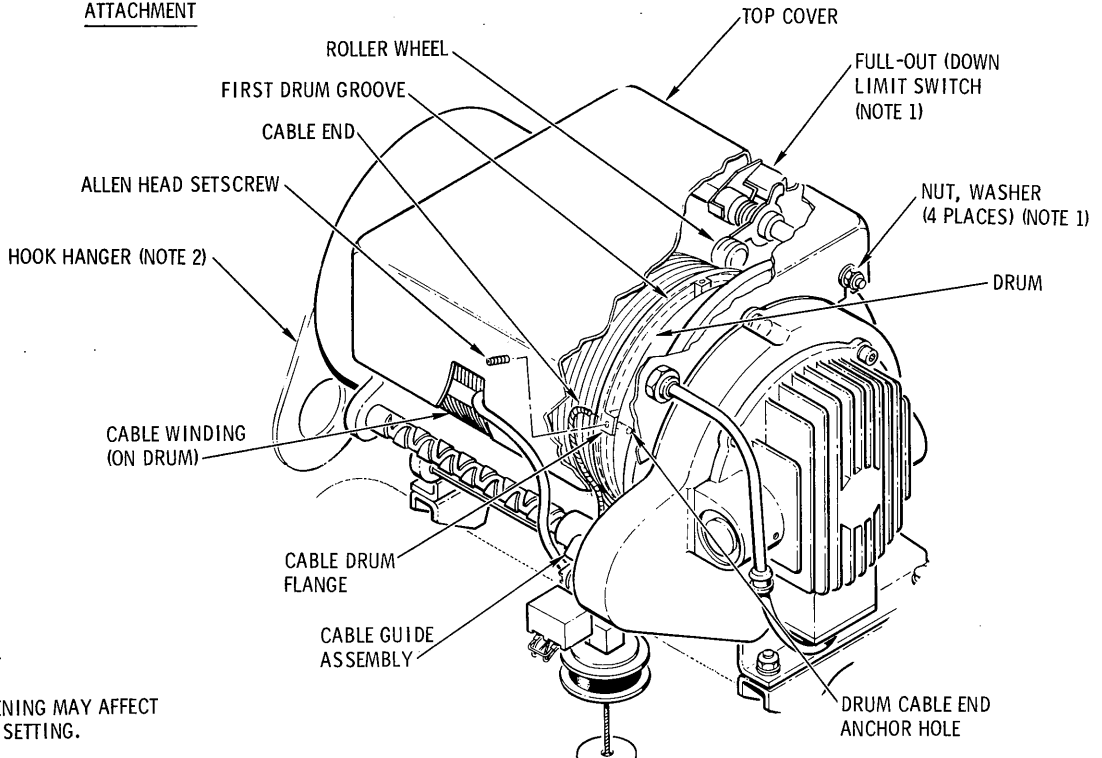


47-274-1

Figure 2-2. Winch cable, cable cutter, and swivel hook replacement (sheet 1 of 2)



B
CABLE TO HOOK
ATTACHMENT



NOTES:

1. EXCESSIVE TIGHTENING MAY AFFECT FULL-OUT SWITCH SETTING.
2. USED FOR HOOK STOWAGE

C
CABLE TO DRUM
ATTACHMENT

47-274-2

Figure 2-2. Winch cable, cable cutter, and swivel hook replacement (sheet 2 of 2)

NOTE: Two persons can facilitate cable removal: one person to operate winch and a second person to handle and coil cable.

(1) Operate winch and start reeling cable off winch drum.

CAUTION: To prevent bellmouth wear, cable should not be pulled against side of bellmouth on cable guide.

(2) As cable unwinds, maintain straight downward tension (approximately 15 pounds); lay or coil cable in a clean clear area. Position cable so that cable will not kink or tangle to facilitate rewinding.

(3) Continue unwinding cable until down (full-out) limit switch (fig. 2-2) activates (opens) and allows brake to engage, thus stopping cable payout.

NOTE: Three turns of cable will remain on winch drum when down limit switch opens.

(4) Remove winch cable drum cover.

(5) Manually raise roller wheel, at top right rear of winch drum, to close the down limit switch (release brake) and allow remaining cable to be reeled off cable drum.

(6) Using control pendant, finish unwinding cable. Stop winch when cable is fully unwound from drum.

e. Remove winch cable from drum as follows:

(1) Loosen Allen head setscrew securing cable end in drum anchor hole. Remove cable end from winch by pulling cable down through cable guide, cable cutter, and bumper guide (see figure 2-2).

CAUTION: Anchor hole setscrew should be temporarily tightened to prevent fouling winch mechanism if winch is inadvertently operated.

(2) Retighten setscrew in anchor hole.

f. Remove swivel hook from cable (para 2-18).

g. Replacement cable must be 0.125-inch diameter stainless steel, 19 by 7 cable strand, extra strength, antispin cable with a minimum breaking strength of 1800 pounds. Make certain any replacement cable, other than cable supplied by winch manufacturer, is approximately 113 feet long, is equipped with a swaged ball fitting, and is proof tested to a minimum load of 1350 pounds.

h. Install swivel hook on replacement cable (para 2-18).

i. Attach new replacement cable to winch as follows:

(1) Insert free end of replacement cable up through bumper pad guide center, bellmouth, switch, cable cutter, and between cable rollers in the cable guide assembly (see figure 2-2).

(2) Make certain that cable guide assembly is centered and aligned with first groove on double helical screw shaft. Facing cable guide mechanism, check that guide will travel from right to left when winding cable on drum.

(3) Secure cable to drum by loosening setscrew and inserting cable end into drum cable anchor hole until cable end bottoms (approximately 3/8 inch); tighten setscrew.

(4) Check that replacement cable is positioned in first drum groove at right when facing cable guide mechanism.

j. Operate hoist and wind replacement cable on winch as follows:

(1) Deactivate down limit switch by manually raising teflon roller wheel at top right rear of winch drum; use control pendant to wind replacement cable on winch. Release the down limit switch after three turns of cable are on drum.

(2) Maintain sufficient tension (approximately 15 pounds) on cable while winding cable on drum; check that cable winds straight, smooth, and snug, without kinking against cable windings on drum. Avoid cable rubbing on side of bellmouth during cable winding.

(3) Continue winding operation until entire cable is wound on drum; check that winch stops automatically when top of swivel hook pushes against winch rubber bumper pad. (Bumper pad upward movement actuates (opens) full-in (up) limit switch at cable guide base (see figure 2-2).

NOTE: The up limit switch should actuate before excessive cable pressure is applied to vertically compress bumper pad. Permanent damage can result if rubber bumper pad is stowed in a compressed state over an extended period of time; rubber bumper will remain in a compressed (set) state.

(4) Install cover on winch.

k. Perform an operational check of hoist system (para 2-10).

2-18. REPLACEMENT OF SWIVEL HOOK.

a. Remove swivel hook assembly (fig. 2-2) from cable as follows:

(1) Remove rubber bumper covering swivel hook housing by pulling bumper upward off top of hook housing (see figure 2-2).

(2) Remove cable swaged ball end fitting from hook housing socket; pull cable swaged ball fitting through rubber bumper.

b. Install swivel hook on cable as follows:

(1) Lubricate cable swaged ball end fitting with petrolatum (34, table 2-5, HMI - Vol 1).

(2) Insert cable through top of rubber bumper.

(3) Insert cable ball fitting in hook housing keyway and socket.

CAUTION: Make certain hook bumper completely covers hook housing.

(4) Secure cable ball fitting in housing socket by sliding rubber bumper down over hook housing.

NOTE: Hook bumper should completely cover housing and bumper base will overlap inward around housing base by approximately 1/16 inch when fully seated on housing.

2-19. REPLACEMENT OF (GUILLOTINE-TYPE) CABLE CUTTER. Cable must be removed from winch (para 2-17) before guillotine-type cable cutter can be replaced. Replace a spent cable cutter guillotine on winch as follows:

WARNING: The cable cutter contains an explosive squib that is electrically fired. A protective short-circuiting electrical jumper should remain connected to cable cutter, not installed on the winch, to eliminate possibility of inadvertent accidental firing (see figure 2-2).

- a. Disconnect two electrical wire terminal lugs from spent cable cutter.
- b. Loosen two Allen head setscrews at side of movable cable guide and remove spent cable cutter from guide.
- c. Check that all electrical power is OFF.

WARNING: Do not use an ohmmeter or any other device containing an internal voltage source which could fire cable cutter.

- d. Using a voltmeter, check for zero voltage between electrical wiring terminal lugs; also check for zero current between lugs with a milliammeter.
- e. Insert cylindrical end of new cable cutter into winch movable cable guide, with shorting jumper positioned downward, and secure cable cutter to guide with two Allen head setscrews. Setscrew mates with indent on cable cutter.
- f. Connect one electrical terminal lug to cable cutter terminal, leaving protective short-circuiting jumper installed on cable cutter. Then connect second wire to remaining cable cutter terminal in the same way.

CAUTION: Protective jumper wire should remain connected to cable cutter electrical terminals until hoist is to be used.

- g. Cover exposed electrical terminal areas with sealing compound (3, table 2-5, HMI - Vol 1).

2-20. INSTALLATION OF HOIST ASSEMBLY.

2-21. To install the hoist assembly, proceed as follows:

NOTE: If support tube fittings (26, 27, 30, fig. 1-1) were removed from fuselage, remove nylon screws installed in support fitting attachment holes on fuselage.

- a. If required, install winch support tube attachment fittings (26, 27, 28) on fuselage using screws (23, 28) and washers (24, 25, 29).
- b. Attach winch (22) to support tube (12) using bolts (21), washers (20), and nuts (19). Tighten bolts (21) to a torque of 70-100 inch-pounds.
- c. Attach link assembly (18) to support tube (12) using bearing pin (17), washer (16), and cotter pin (15).
- d. Attach winch support tube (12) to fuselage fittings (26, 27, 30) using quick-disconnect pins (13, 14).

NOTE: Install pins in position shown.

CAUTION: Check that all electrical power is off to eliminate possibility of inadvertent firing of cable cutter.

- e. Remove protective cap from electrical receptacle on side of fuselage. Connect winch electrical plug (1, fig. 1-3) to fuselage receptacle. Secure wire harness to support tube using tie-straps (9, table 3-1).

WARNING: Remove protective electrical jumper wire (fig. 2-2) from cable cutter whenever winch is installed on helicopter. Jumper wire will prevent operation of cable cutter in an in-flight emergency.

2-22. PREPARATION FOR HOISTING OPERATIONS.

2-23. Prepare helicopter for hoisting operations as follows:

CAUTION: To avoid inadvertent firing of cable cutter, make certain cable cutter electrical circuits are not energized.

- a. Connect external electrical power to helicopter.
- b. Place BATTERY switch in EXT position.
- c. Open passenger/cargo door; extend and secure door (hold-open) retainer tube.
- d. Using hoist system control pendant, exercise winch by paying out 3 or 4 feet of cable under approximately 15 pounds tension, pulling cable

straight down to avoid rubbing cable on cable bellmouth. Reverse control and reel cable in. Check that cable winds on winch drum evenly and that winch operation is smooth and consistent. Make certain winch stops automatically when top of swivel hook pushes against winch bumper pad.

e. If installed, remove cable cutter jumper wire (see figure 2-2, sheet 1).

WARNING: Cable cutter jumper wire must be removed to allow cable cutter electrical circuit to be completed by switch control, providing instantaneous in-flight cable cutting capability should such emergency action be required.

f. If winch has not been used for an extended period of time, or if cable has been replaced, perform an operational check (para 2-10).

g. Check that winch support tube attach safety pins are secure and fully seated.

h. Check that winch electrical connector plug is secure on receptacle on side of fuselage.

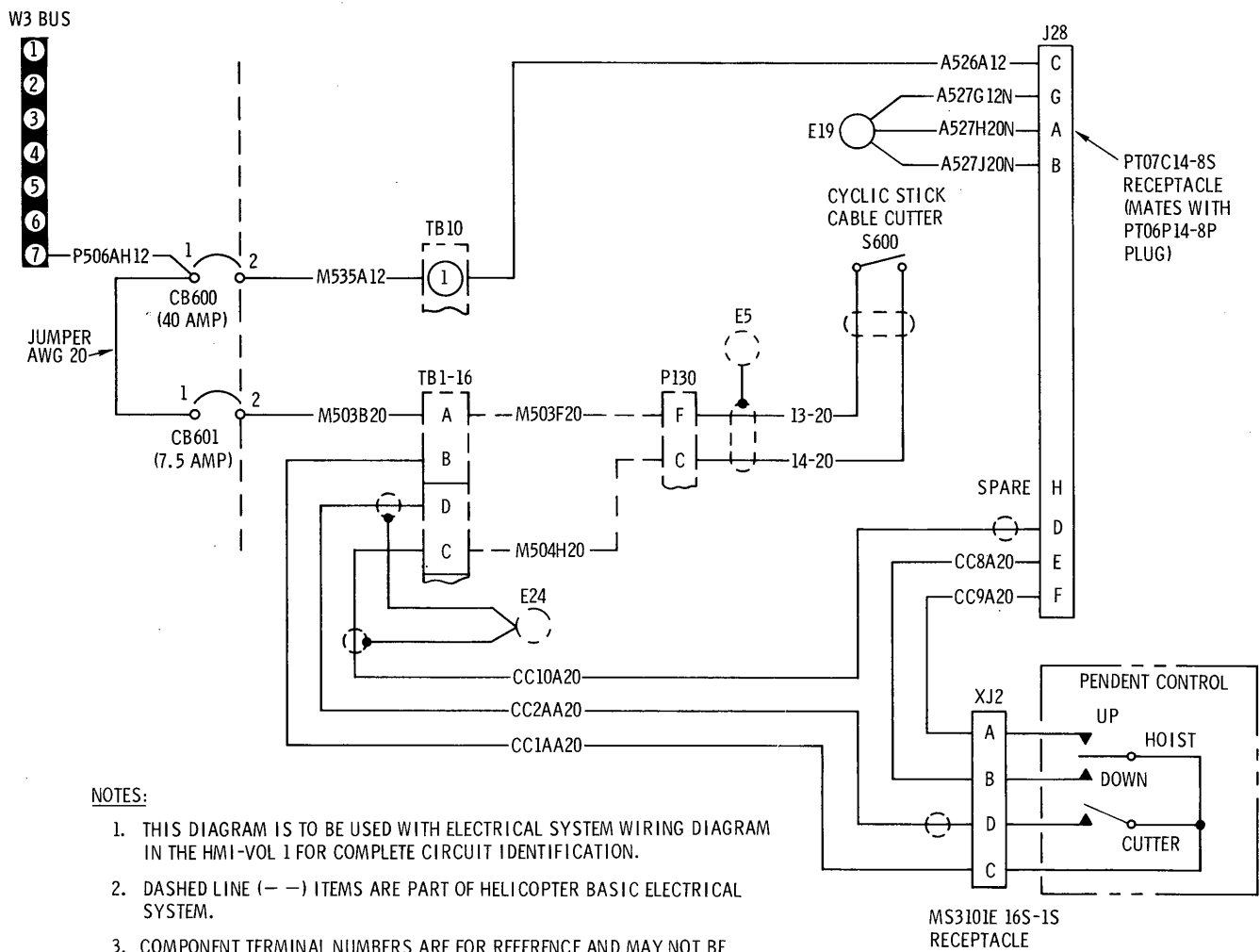
i. Connect hoist system operator's safety harness to seat belt fitting on opposite side of passenger/cargo compartment from which winch is installed.

j. Place BATTERY switch in OFF position.

k. Remove external electrical power from helicopter.

2-24. WIRING AND SCHEMATIC DIAGRAMS.

2-25. Figures 2-3 and 2-4 are wiring diagrams for the hoist systems used on commercial and military configuration helicopters, respectively. Figure 2-5 is a schematic diagram of the winch.



47-275

Figure 2-3. Hoist system wiring diagram - commercial configuration

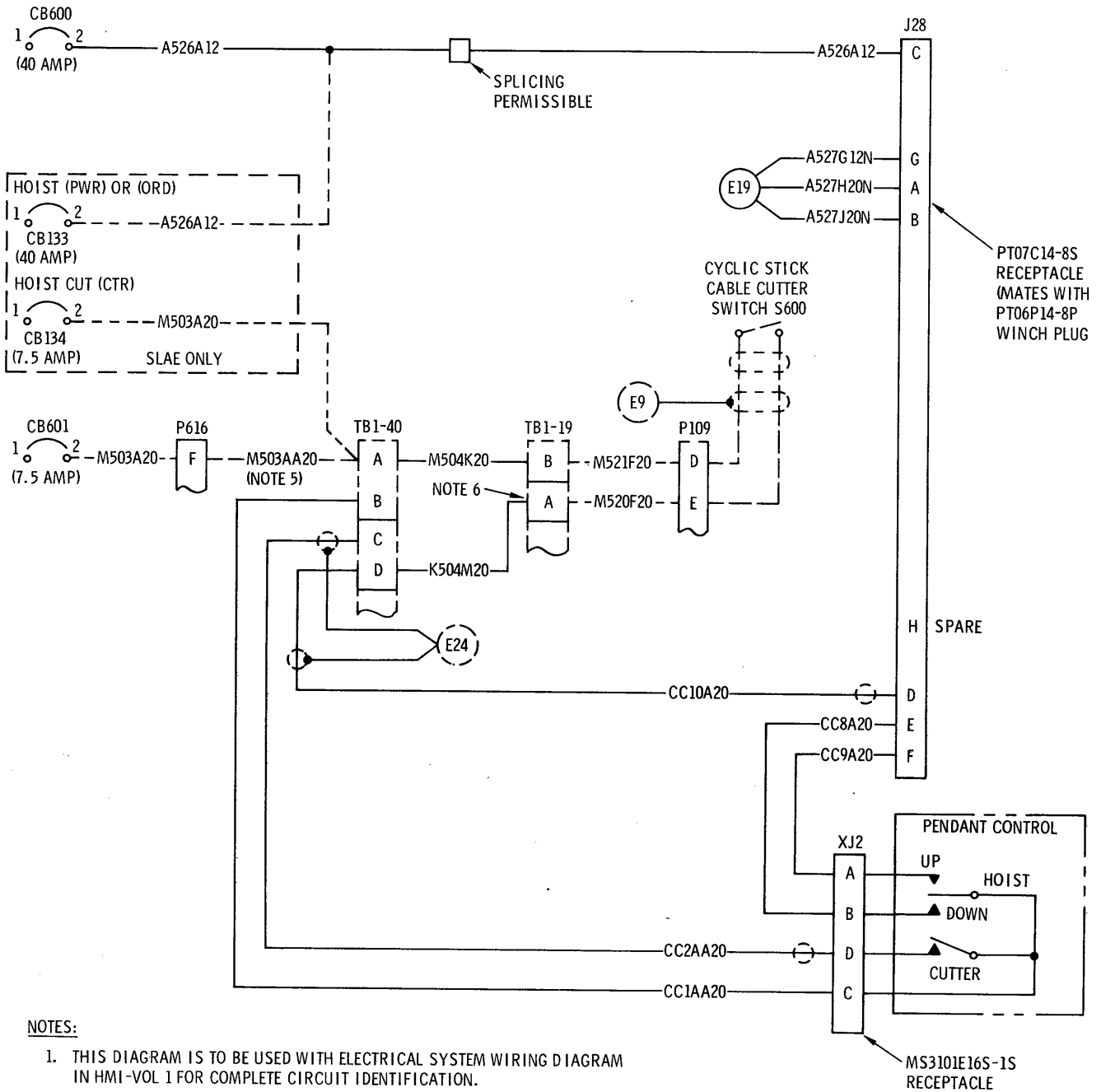
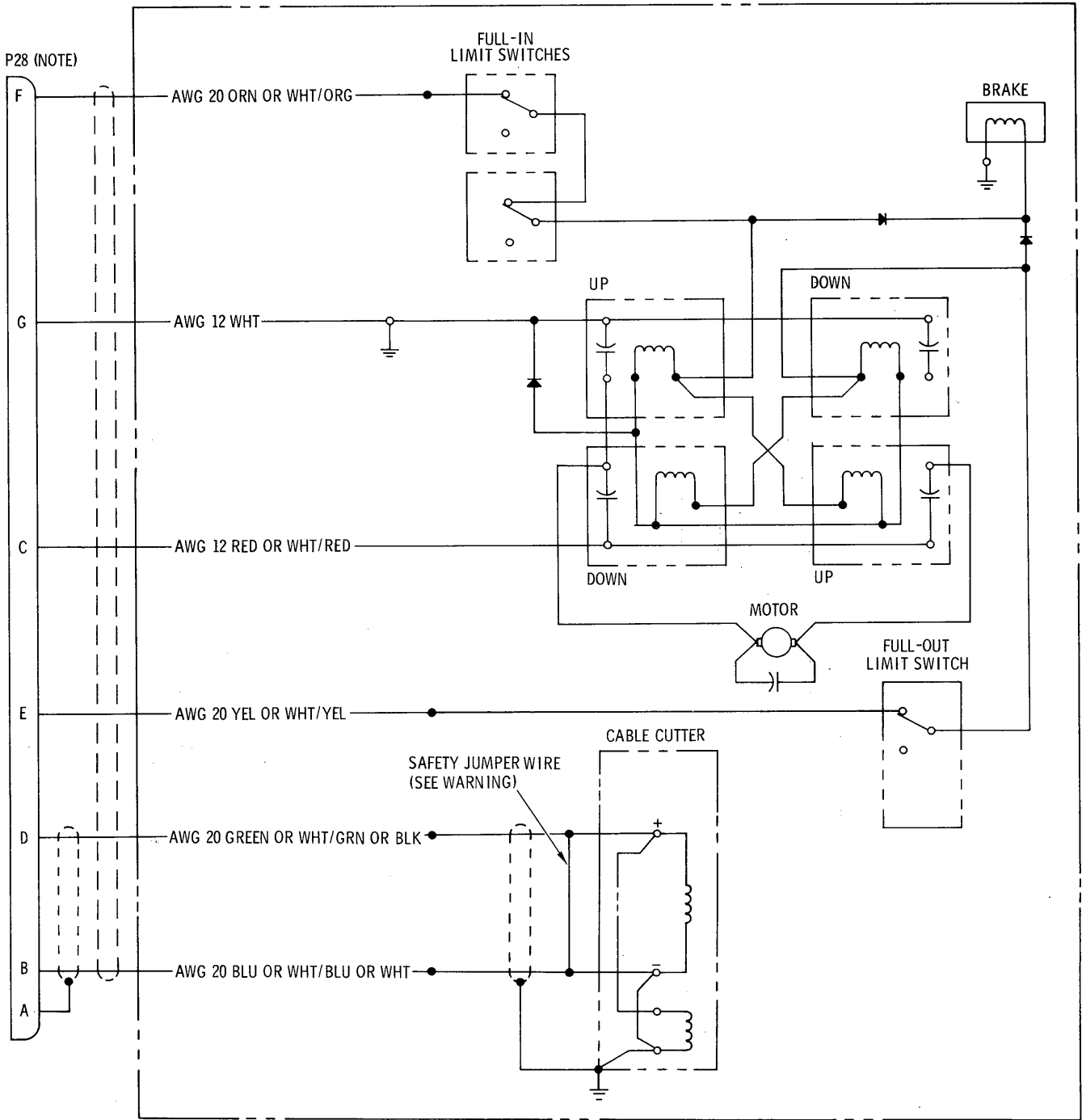


Figure 2-4. Hoist system wiring diagram - military configuration



NOTE:
REFER TO HOIST SYSTEM INTERCONNECT-
ION WIRING DIAGRAM FOR EXTERNAL
CONNECTION.

WARNING: REMOVE JUMPER WIRE
AFTER INSTALLATION OR MAIN-
TENANCE (REFER TO TEXT).

47-277

Figure 2-5. Hoist system winch schematic diagram

SECTION 3 INSTALLATION INSTRUCTIONS

3-1. GENERAL INFORMATION.

3-2. **SCOPE.** The passenger/cargo hoist kit can be installed on any Hughes 500D (commercial) or 500MD (military) Model 369D helicopter. On commercial helicopters, the hoist winch is installed on the right side of the fuselage. On military helicopters, the hoist winch is installed on the left side of the fuselage. Subsequent procedures provide separate instructions for commercial and military electrical installations to accommodate differences in component location and wire routing. A special cyclic grip kit must be installed on any Hughes 500D (Model 369D) helicopter when the hoist kit is installed. Installation instructions include procedures for installing a passenger/cargo door retainer assembly,

a door sill antichafing bar assembly, a winch and winch support tube assembly, and the electrical wiring and components required for operation of the hoist system.

3-3. **REFERENCE DATA.** Information in the installation instructions is presented as additional procedures to those given in the body of the Handbook of Maintenance Instructions (HMI - Vol 1). Reference is made in the instructions to the applicable data in the HMI - Vol 1 that is to be followed in order to accomplish the installation of the hoist kit. Table 3-1 lists consumable materials and expendable items required for installation of the hoist kit. Items listed are of a commercial nature that can be procured locally. Alternate but equivalent items are acceptable.

Table 3-1. Consumable materials and expendable items

Item No.	Material	Specification(1)	Commerical Product ⁽²⁾	
			Name/No.	Manufacturer
1	Terminal	MS25036-103		Commercially available
2	Terminal	MS25036-112		Commercially available
3	Terminal	MS25036-156		Commercially available
4	Pin, contact		MPCM2OM-H2	Burndy Corp Norwalk, CT
5	Pin, contact		HPCM2OM-H2	Burndy Corp
6	Wire, electrical, white	MIL-W-5086, Type II	AWG #20	General Cable Corp Los Angeles, CA
7	Wire, electrical, white	MIL-W-5086 Type II	AWG #12	General Cable Corp
8	Twine, nylon	MIL-T-713	(3)	Commerically available
9	Tie-strap	MS3367	AWG, size as required	Commercially available

Table 3-2. Consumable materials and expendable items (cont)

Item No.	Material	Specification ⁽¹⁾	Commerical Product ⁽²⁾	
			Name/No.	Manufacturer
10	Insulation sleeving (heat-shrinkable)	MIL-I-23053/5	RNF-100, Type 1, AWG, size as required	Raychem Corp Menlo Park, CA
11	Solder, tin alloy	QQ-S-571 (Composition SN60WRP2)	(3)	Commercially available
12	Screw, nylon		1030-010-820	Gries Reproducer Co New Rochelle, NY
13	Primer, zinc chromate	MIL-P-8585	(3)	Commercially available
14	Tape, electrical, plastic	MIL-I-7798	No. 33	3M Co., St. Paul, MN

- 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. Instructions in the following paragraphs are applicable to both left and right hoist installations except as noted.

a. Identify all components that are to be installed, along with those removed to gain access to work areas. Protect components from damage and contamination.

b. Check that all electrical switches are in OFF position.

CAUTION: Make certain BATTERY switch is in OFF position.

3-5. REMOVAL OF EQUIPMENT.

3-6. Remove following panels, access doors, and equipment as applicable to accommodate installation of the hoist system components:

a. Remove battery (section 19, HMI - Vol 1).

b. Remove left and right foot support fairings in passenger/cargo compartment (section 2, HMI - Vol 1).

c. Remove passenger/cargo compartment forward bulkhead trim panel (commercial models) and controls access door (sections 2 and 4, HMI - Vol 1).

d. Remove fuel cell forward vent from control tunnel (section 12, HMI - Vol 1).

NOTE: Fuel vent must be removed to avoid damage during structural modification hole drilling operations.

e. Remove crew compartment seat and back cushions.

f. Remove left (outboard) collective stick cover (sections 2 and 4, HMI - Vol 1).

g. Remove crew compartment lower aft trim panels (left and right) (section 4, HMI - Vol 1).

h. Remove crew compartment left or right bulkhead panel and lower portion of right upper side panel (section 4, HMI - Vol 1).

i. Remove edgelighted panel face from lower switch and circuit breaker panel. Loosen lower switch and circuit breaker panel to accommodate installation of additional circuit breakers (sections 17 and 19, HMI - Vol 1).

3-7. MODIFICATION.

3-8. Modification of the helicopter (fig. 3-1) involves cutting a hole in the fuselage skin to facilitate installation of an electrical receptacle (J28) to receive a winch electrical plug, and a hole in the lower left area of the canted bulkhead and forward bulkhead trim panel to facilitate installation of an electrical receptacle (XJ2) to receive a control pendant plug.

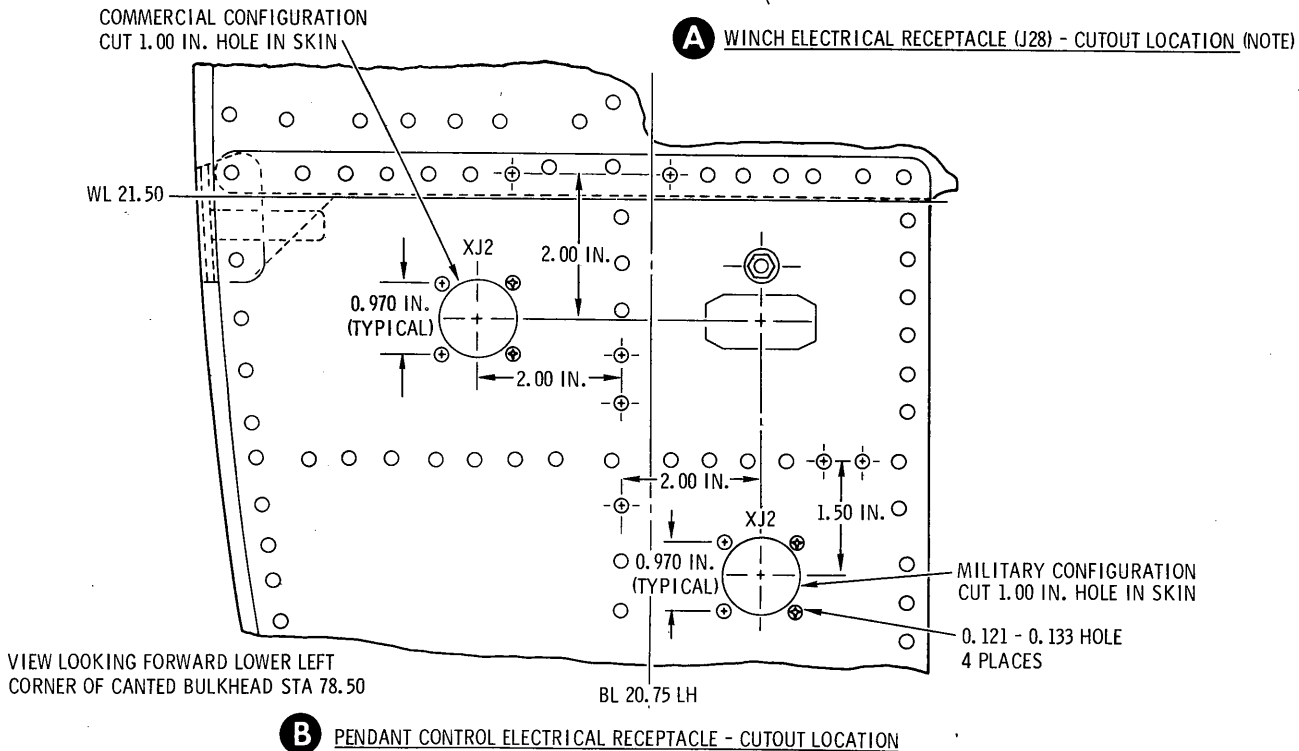
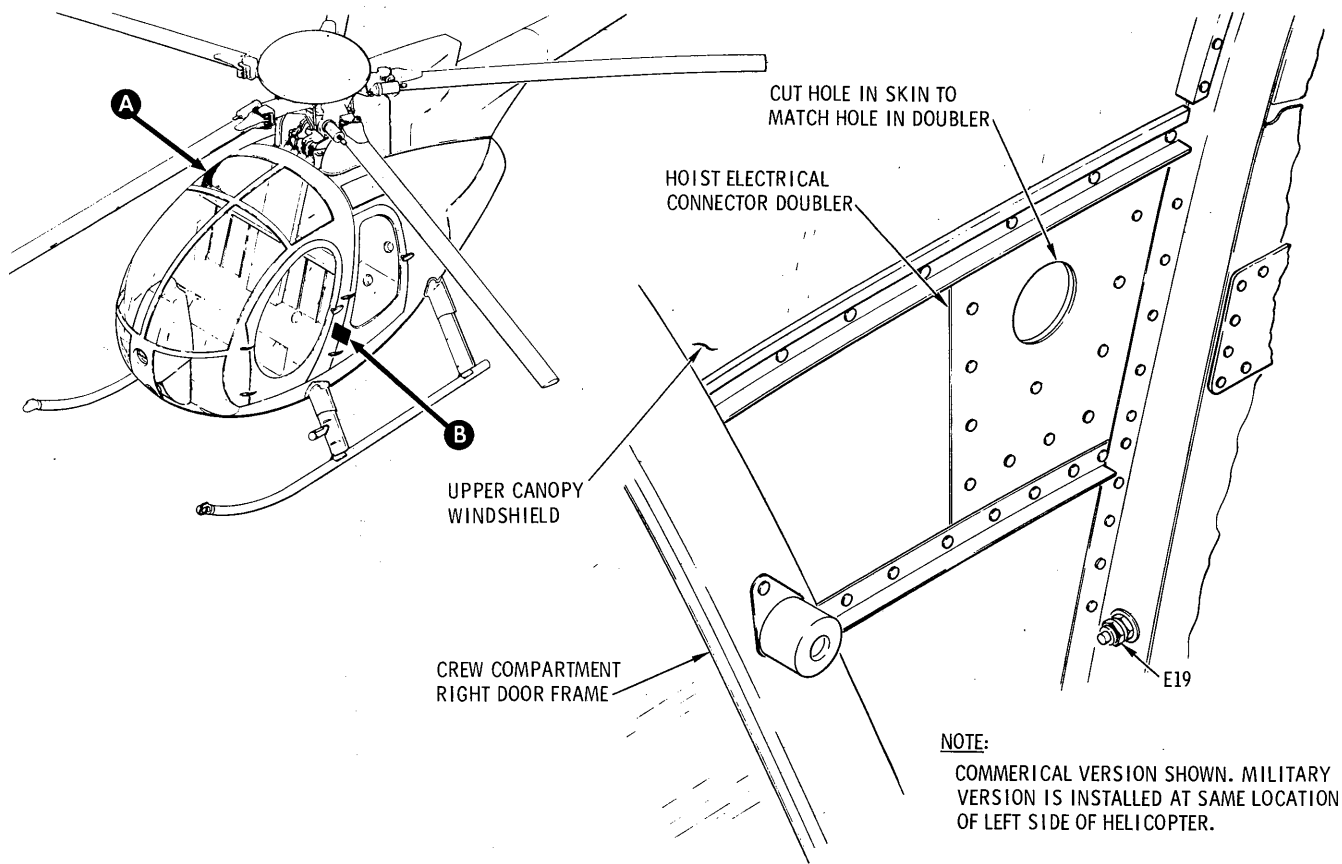


Figure 3-1. Modification of helicopter

a. Cut and deburr holes, remove chips, and apply a thin coat of primer (13, table 3-1) to exposed metal surfaces.

b. Fit forward bulkhead trim panel to canted bulkhead, locate and cut hole in trim panel to match XJ2 receptacle hole in bulkhead. Remove trim panel to accommodate installation of door retainer assembly.

NOTE: Hoist electrical connector (J28) doubler is located in the crew compartment, below the aft lower corner of the upper canopy windshield, and immediately forward of the canted frame (station 78.50) for either right side (commercial) or left side (military) hoist winch installation.

3-9. INSTALLATION OF ELECTRICAL EQUIPMENT (COMMERCIAL HELICOPTERS).

3-10. Install hoist kit electrical wire harness assembly, general wiring, and components on commercial helicopters as follows:

CAUTION: Make certain wires and/or wire bundles do not chafe or bind control mechanisms.

NOTE: When providing ground contact for electrical components, clean the contacting surfaces to bare metal (section 19, HMI - Vol 1). Route wire and wire bundles with existing wires and bundles. Temporarily tie wires in place with existing bundles until installation is complete, then secure wires with permanent twine, tie-straps, or clamps as required.

a. Install cyclic stick grip kit (47, fig. 1-1). (Refer to applicable Opt Eqpt Manual.)

b. From inside crew compartment, temporarily install J28 receptacle (39, fig. 1-1), through hole provided in right side of ship (fig. 3-1). Install washer (38, fig. 1-1) and receptacle nut externally to retain J28 receptacle in place.

NOTE: The J28 receptacle is temporarily installed to provide a means of determining wire length to receptacle.

c. Install circuit breakers (31, 32, fig. 1-1) in positions CB601 and CB600 respectively, on lower switch and circuit breaker panel.

d. Refer to figure 2-3 and install terminal (1, table 3-1) on circuit breaker jumper wire; install jumper wire on contact 1 of CB601.

e. Install terminal (2) on wire P506AH12 and install on contact 1 of CB600 together with jumper wire fabricated in step d. above. Route wire P506AH12 to contact 7 of BUSS W3; cut wire to length and install terminal (3). Connect wire P506AH12 to contact 7 of BUSS W3.

f. Install terminal (2) on wire M535A12 and connect wire to contact 1 of TB10. Route wire M535A12 to contact 2 of CB600 and install terminal (3). Connect wire M535A12 to contact 2 of CB600.

g. Install terminal (1) on wire M503B20 and connect to contact 2 of CB601. Route opposite end of wire M503B20 to TB1-16, install pin (4) and insert pin in TB1-16, contact A.

h. Connect terminal of wire A526A12 to TB10, contact 1 and route wire below floor through center beam, below crew compartment right seat and up right side aft of door frame to J28 receptacle.

NOTE: Temporarily tie wires in place. Do not cut wires until all wires are adjusted and tied in place.

i. Insert pin of wire CC10A20 in TB1-16, contact C. Connect terminal on shielding of wire CC10A20 to ground stud E24. Do not tighten ground stud nut. Route wire CC10A20 to J28 receptacle and tie in place.

j. Insert XJ2 receptacle (36, fig. 1-1) in hole provided in lower left corner of canted bulkhead (fig. 3-1). Using XJ2 receptacle bracket as a template, mark and drill four 0.121 to 0.133 attach holes. Protect attached wires during drilling operation. Install XJ2 receptacle (36, fig. 1-1) from forward side of canted bulkhead, with screws (35), washers (34), and nuts (33).

k. Route wires CC1AA20 and CC2AA20 (fig. 2-3) from XJ2 receptacle to TB1-16; install pin of wire CC1AA20 in contact B and pin of wire CC2AA20 in contact D. Connect Terminal on shielding of wire CC2AA20 to ground stud E24; tighten ground stud nut.

l. Route wires CC8A20 and CC9A20 to J28 receptacle and tie in place.

m. Cut and strip wires at J28 receptacle. Ensure sufficient wire length to provide a smooth right angle wire flow to J28 receptacle. Install approximately 6 inches of 0.50 insulation tubing (10, table 3-1) on wire bundle to cover all wires extending from J28 receptacle. Ensure that all electrical contact installations are correct and secure. Adjust wires at J28 receptacle and make certain sufficient wire slack remains to avoid stress on terminals and contacts below floor and seat areas. Use twine (8) and tie-straps (9), to secure wires in place.

CAUTION: Make certain that wires do not chafe or bind, throughout full travel of any control mechanism.

n. Remove J28 receptacle from side of ship. Install insulation sleeving (10, table 3-1) using solder (11), connect wires A526A12, A527G12N, A527H20N, A527J20N, CC10A20, CC8A20, and CC9A20 to J28 receptacle contacts as indicated in figure 2-3.

o. Install J28 receptacle and secure with washer and nut. Install protective cap (37, fig. 1-1).

p. Install ground stud 40 thru 43) on forward side of canted bulkhead frame (fig. 3-1). Identify ground stud as E19.

q. Install wires A527G12N, A527H20N, and A527J20N, from J28 receptacle, on ground stud E19. Adjust and trim insulation tubing to accommodate ground wire connection as required; heat shrink tubing.

3-11. INSTALLATION OF ELECTRICAL EQUIPMENT (MILITARY HELICOPTERS).

3-12. Install hoist kit electrical wire harness assembly, general wiring, and components on military helicopters, as follows:

CAUTION: Make certain wires and/or wire bundles do not chafe or bind control mechanisms.

NOTE: When providing ground contact for electrical components, clean the contacting surfaces to bare metal (section 19, HMI - Vol 1). Route wire and wire bundles with existing wires and bundles. Temporarily tie wires in place with existing bundles until installation is complete, then secure wires with permanent twine, tie-straps, or clamps as required.

a. From inside crew compartment, temporarily install J28 electrical receptacle (39, fig. 1-1) through hole provided in left side of ship (fig. 3-1). Install washer 38, fig. 1-1) and receptacle nut externally to retain J28 receptacle in place.

NOTE: The J28 receptacle is temporarily installed to provide a means of determining proper length of wires to be connected to receptacle.

b. On standard military helicopters, equipped with 369H92143 circuit breaker panel, install circuit breaker CB600 (32, fig. 1-1, view B), and a circuit breaker CB601 (31) in circuit breaker panel located on the pilot's collective pitch stick cover. Make certain circuit breaker connections to buss bar are secure.

c. On SLAE equipped military helicopters with 369D294566 circuit breaker panel, install circuit breaker CB133 (32) and circuit breaker CB134 (31), in circuit breaker panel located on the pilot's collective pitch stick cover. Make certain circuit breaker connections to buss bar are secure.

d. Refer to figure 2-4 and install terminal (3, table 3-1) on wire A526A12 and connect to contact 2 of CB600 on standard military helicopters, or to contact 2 of CB133 on SLAE equipped military helicopters. Route opposite end of wire A526A12 with existing wire bundles to J28 receptacle and temporarily tie in place.

e. On standard military helicopters, locate existing wire M503A20, install terminal (1) on wire M503A20, and connect to contact 2 of CB601. Locate existing wire M503AA20, remove from TB16, contact A, and relocate to TB1-40, contact A.

f. On SLAE equipped helicopters, install pin (5) on wire M503A20, insert pin in contact A of TB1-40. Route wire M503A20 to CB134; install terminal (1) and connect to contact 2 of CB134.

g. Install pin (4) on wire M504K20, insert in contact B of TB1-19, and route opposite end of wire M504K20 of TB1-40. Install pin (4) and insert pin in contact A of TB1-40.

h. Remove existing wire M520B20 from TB1-19A. Wire end is left open insulated with tape (14), and secured to basic electrical system with tie-strap (9). Install pin (4) on wire K504M20 and insert in contact A of TB1-19. Route wire K504M20 to TB1-40, install pin (4), and insert pin in contact C of TB1-40.

i. Insert pin of wire CC10A20 in contact C of TB1-40, route wire to J28 receptacle, and temporarily tie in place. Connect terminal on shielding of wire CC10A20 to ground stud E24. Do not tighten ground stud nut.

j. Insert XJ2 receptacle (36, fig. 1-1) in hole provided in lower left corner of canted bulkhead (fig. 3-1). Using XJ2 receptacle bracket as a template, mark and drill four 0.121 to 0.133 attach holes. Install XJ2 receptacle (36, fig. 1-1) from forward side of canted bulkhead, using screws (35), washers (34), and nuts (33).

k. Route wires CC1AA20 and CC2AA20 (fig. 2-4) from XJ2 receptacle to TB1-40, install pin of wire CC1AA20 in contact B, and pin of wire CC2AA20 in contact D. Contact terminal on shielding of wire CC2AA20 to ground stud E24; tighten ground stud nut.

l. Route wires CC8A20 and CC9A20 to J28 receptacle and temporarily tie in place.

m. Cut and strip wires at J28 receptacle. Ensure sufficient wire length to form a smooth right angle wire flow to J28 receptacle. Install approximately 6 inches of 0.50 insulation tubing (10, table 3-1) on wire bundle to cover all wires extending from J28 receptacle. Ensure that all hoist system electrical installations are correct and secure. Adjust wires at J28 receptacle and

make certain sufficient wire slack remains to avoid stress on terminals and contacts below floor and seat areas. Use twine (8), and tie-straps (9), to secure wires in place.

CAUTION: Ensure that wires do not chafe or bind throughout full travel of any control mechanism.

n. Remove J28 receptacle from side of ship. Install insulation sleeving (10, table 3-1) and using solder (11), connect wires A526A12, A527G12N, A527H20N, A527J20N, CC10A20, CC8A20, and CC9A20 to J28 receptacle contacts as indicated in figure 2-4.

o. Install J28 receptacle and secure with washer (38, fig. 1-1) and nut. Install protective cap (37, fig. 1-1).

p. Install ground stud (40 thru 43) on forward side of canted bulkhead frame (fig 3-1). Identify ground stud as E19.

q. Install wires A527G12N, A527H20N, and A527J20N, from J28 receptacle on ground stud E19. Adjust and trim insulation tubing to accommodate ground wire connection as required; heat shrink tubing.

3-13. ASSEMBLY OF HOIST.

3-14. The hoist assembly consists of a winch assembly, pendant control assembly, hook hanger, and two attach brackets. To assemble the hoist, proceed as follows:

NOTE: Pendant assembly is shipped assembled with no additional assembly required.

a. Install hanger (7, fig. 1-3) on winch (9) using screws (6), lockwashers (5), and washers (4).

b. Remove existing attach brackets from winch (9). Install replacement brackets (2, 3) on winch frame using existing hardware.

3-15. INSTALLATION OF PASSENGER/CARGO DOOR RETAINER.

3-16. The passenger/cargo door retainer installation consists of a tubular assembly attached to the aft side of station 78.50 canted bulkhead with four clamps. With the passenger/cargo doors in the open position, a telescoping tube slides out of the tubular assembly to engage a bracket attached to the door frame and thus retains the door in an open position. Install the passenger/cargo door retainer as follows:

a. Locate doubler angles (16, fig. 1-2) on forward side of station 78.50 canted bulkhead using two existing 0.070-inch tooling holes (fig. 3-2).

Use angles (16, fig. 1-2) as templates and determine rivet hole locations on station 78.50 bulkhead. Drill rivet attach holes, 0.069- to 0.074-inch diameter, using drill motor and appropriate drill bit. Attach angles (16) to 78.50 bulkhead using rivets (14, 15).

b. Position structural reinforcement brackets (13) on forward side of station 78.50 canted bulkhead as shown in figure 3-2. Locate nine existing rivets which must be removed prior to installation of reinforcement brackets. Remove rivets using drill motor and appropriate drill bit. Use brackets (13, fig. 1-2) as template and determine rivet hole locations on 78.50 bulkhead. Drill rivet attach holes, 0.069- to 0.074-inch diameter using drill motor and appropriate drill bit. Attach brackets (13) to 78.50 bulkhead using rivets (11, 12).

c. Using drill motor and appropriate drill bit, drill eight 0.190- to 0.199-inch diameter holes through station 78.50 canted bulkhead and structural reinforcement angles (16) and brackets (13) at locations shown in figure 3-2.

NOTE: Drill retainer tube outboard clamp holes first; install retainer tube and outboard clamps to ensure proper alignment for marking and drilling inboard clamp holes.

d. Install the retainer assembly (17, 18, 19, fig. 1-2) on station 78.50 canted bulkhead using clamps (10) washers 7, 9), spacers (8), screws (6), and nuts (5).

e. Locate bracket (4) on applicable passenger/cargo door in such a manner as to allow tube (17) to engage bracket (4) when door is in open position. Install bracket (4) on passenger/cargo door frame using rivnuts (3), washers (2), and screws (1).

3-17. INSTALLATION OF HOIST.

3-18. The hoist system winch is mounted on a support tube and attached with quick-release safety pins to three fittings installed on either side and above the passenger/cargo compartment door. The support tube positions the winch to raise and lower the cable between the side of the fuselage and the landing gear skid. The winch and support can be installed for use on either the left or right side of the helicopter as applicable. Install the hoist system as follows:

a. Remove nylon screws installed in support fitting attachment holes on fuselage.

b. Install support tube attachment fittings (26, 27, 30, fig. 1-1) on fuselage using screws (23, 28) and washers (24, 25, 29).

c. Attach winch (22) to support tube (12) using bolts (21), washers (20), and nuts (19). Tighten bolts (21) to a torque of 70-100 inch-pounds.

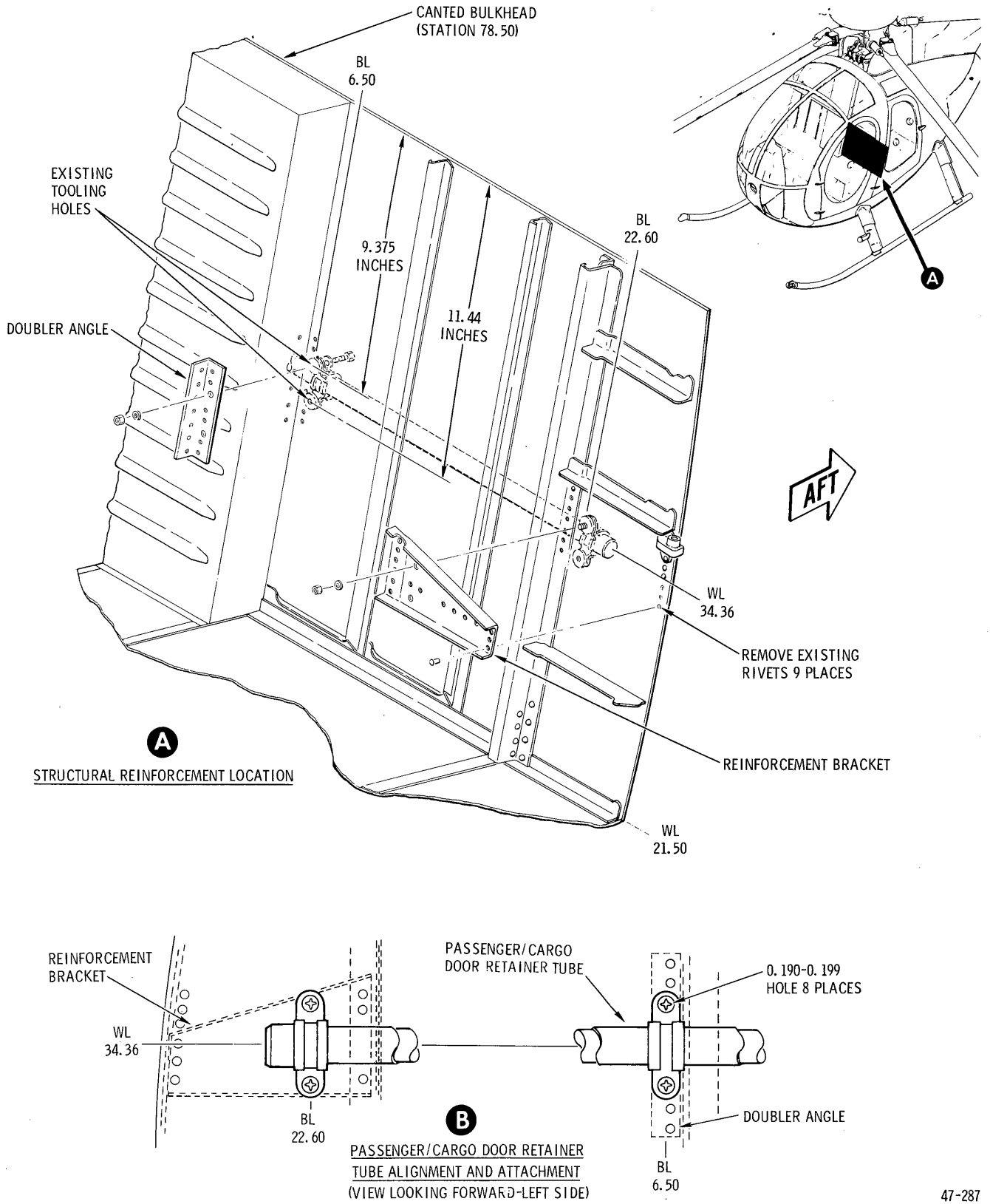


Figure 3-2. Passenger/cargo door retainer tube installation

d. Attach link assembly (18) to support tube (12) using bearing pin (17), washer (16), and cotter pin (15).

e. Attach winch support tube (12) to fuselage fittings (26, 27, 30) using quick-disconnect pins (13, 14).

NOTE: Install pins in position shown in fig. 1-1.

CAUTION: Check that all electrical power is off, eliminating possibility of inadvertent firing of cable cutter.

f. Remove protective cap from electrical receptacle on side of fuselage. Connect winch electrical plug (1, fig. 1-3) to fuselage receptacle. Secure wire harness to support tube using tie-straps (9, table 3-1).

WARNING: Remove protective electrical jumper wire (fig. 2-2) from cable cutter whenever winch is installed on helicopter. Jumper wire will prevent operation of cable cutter in an emergency.

g. Install the hoist operator's body harness (10, fig. 1-1).

h. Install flush rivets (7) in wheel fittings after removing existing rivets from locations shown in fig. 3-3.

NOTE: Do not install rivets (7) if wheel fittings have been previously equipped with flush rivets.

i. Install rivnuts (8) at locations shown in fig. 3-3. Secure clips (7, fig. 1-1) to fuselage using screws (5), and washers (6). Install bar assembly (4) using screws (3), washers (2), and nuts (1).

j. On military configuration, install landing gear skid chafing bar assembly (369D292556) as follows (see fig. 3-3):

(1) Remove bolts from inboard side of aft abrasion strip (369H6102), and aft bolt from inboard side of forward abrasion strip (369H6102), on left landing gear skid.

(2) Install screw (NAS603-8) in forward attach hole of aft abrasion strip (369H6102).

(3) Position chafing bar on inboard side of left skid with bent end of bar aft, and 3/8-inch diameter recess hole in chafing bar over aft abrasion strip forward attach screw.

(4) Align chafing bar aft screw hole with aft abrasion strip aft attach hole; install screw (NAS603-8) to secure aft portion of chafing bar.

(5) Hold chafing bar against skid; locate bar forward screw hole over forward abrasion strip aft attach hole; drill 0.190 to 0.200-inch screw hole through chafing bar.

(6) Install screw (NAS603-8) to secure forward end of chafing bar.

3-19. INSTALLATION OF EQUIPMENT.

3-20. Install equipment and panels as follows:

CAUTION: Remove all tools and foreign materials from helicopter before panel installations.

a. Prior to closing access areas, check entire hoist system installation for completeness.

b. Install edgelighted and circuit breaker panels as applicable (sections 17 and 19, HMI - Vol 1).

c. Install crew compartment left or right bulkhead panel and lower portion of left or right upper side panel as applicable (section 4, HMI - Vol 1).

d. Install crew compartment lower aft trim panels (left and right) (section 4, HMI - Vol 1).

e. Install left (outboard) collective stick cover (sections 2 and 4, HMI - Vol 1).

f. Install seats and back cushions.

g. In passenger/cargo compartment, install fuel cell forward vent in control tunnel (section 12, HMI - Vol 1).

h. In passenger/cargo compartment, install controls access door and foot support fairings.

NOTE: The forward bulkhead (station 78.50) trim panel is not installed during use of the hoist system door retainer equipment.

i. Install battery (section 19, HMI - Vol 1).

j. Perform operational check of hoist system (para 2-10).

3-21. WEIGHT AND BALANCE.

3-22. The weight and balance changes resulting from installation of the passenger/cargo hoist system are listed in table 3-2. After installation of the hoist system, incorporate changes in the helicopter weight and balance records as instructed in HMI - Vol 2.