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Illustrated Parts List and Maintenance Instructions with Initial Installation Instructions

FOR

CYCLIC STICK GRIP KIT INSTALLATION

Part No. 369H90129-31
Part No. 369H90129-505

USED ON HUGHES 500D (MODEL 369D) HELICOPTERS

Hughes Helicopters division of summa corporation / culver city, california

COD775150

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FOREWORD

F-1. PURPOSE AND CONTENT OF THIS MANUAL. This manual supplements information contained in HMI - Vol 1 and 369D - IPC, and contains instructions for initial installation and continuing maintenance for the cyclic stick grip kit assemblies. Weight and balance data is included. This manual also contains parts lists for procuring replacement parts for the cyclic stick grip kit assemblies.

F-2. APPLICABILITY. The cyclic stick grip kits are applicable for use on any Hughes 500D (Model 369D) helicopter.

F-3. COMPATIBILITY OF COMBINED OPTIONAL EQUIPMENT. 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-4. ORGANIZATION OF CONTENTS. 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-5. USE OF THIS MANUAL. This manual is for use by operators of the Model 369D helicopter equipped with a cyclic stick grip 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-6. RELATED PUBLICATIONS. Reference is made to applicable portions of HMI - Vol 1 and 369D - IPC as required to accomplish instructions contained herein.

F-7. LITERATURE CHANGES AND REVISIONS. 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. This illustrated parts list provides, by means of text (parts lists) and companion illustrations, a complete parts definition of the 369H90129-31 and 369H90129-505 Cyclic Stick Grip 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.)

1-2. GROUP ASSEMBLY PARTS LIST. The parts lists furnish information for procuring replacement parts for the cyclic stick grip kits, and shall not be used for any other purpose. (For information or procurement of replacement parts for the standard cyclic stick refer to 369D - IPC.)

1-3. ILLUSTRATIONS. An isometric illustration is provided and includes a combined parts list, with variations noted, for both the 369H90129-31 and 369H90129-505 cyclic stick grip kits. The illustration is exploded to the extent necessary to show the parts relationship for the complete cyclic stick grip kits.

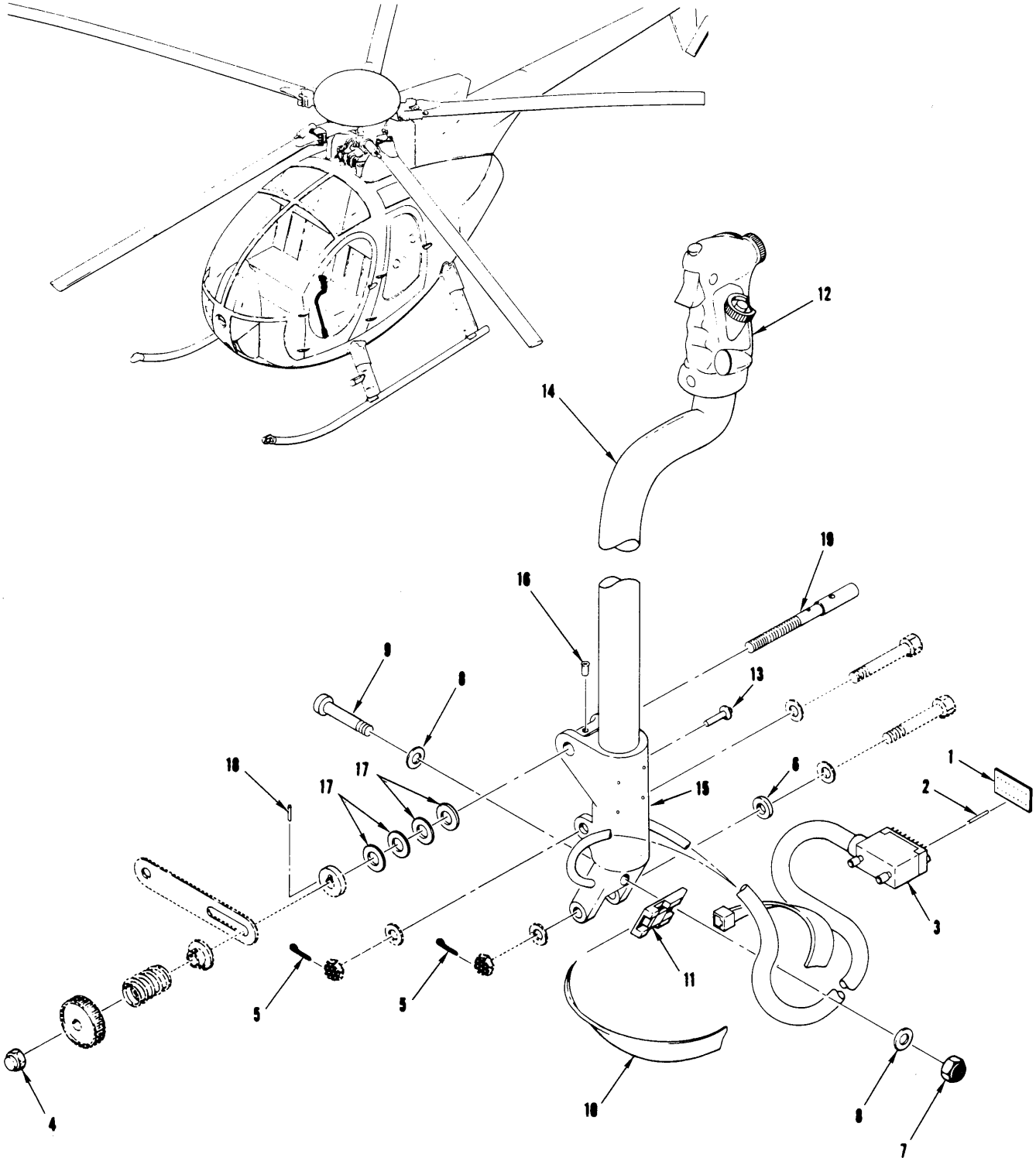


Figure 1-1. Cyclic stick grip kit assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY
1-1-	369H90129-31	CYCLIC STICK GRIP KIT (Complete assy)	REF
	369H90129-505	CYCLIC STICK GRIP KIT (Grip only)	REF
-1	XMRA20-0000F	. GASKET	1
-2	MS1-7803-16-20	. PIN (Component of 369H90129-31)	20
	MS100-2520P	. PIN (Component of 369H90129-505)	20
-3	MRAC20P-JTC6H9	. PLUG (Component of 369H90129-31)	1
-4	22K1-048	. NUT (Component of 369H90129-31)	1
-5	MS24665-151	. PIN, COTTER (Component of 369H90129-31)	2
-6	HS626-4-326	. BUSHING (Component of 369H90129-31)	1
-7	MS20365-832	. NUT	1
-8	AN960PD8L	. WASHER	2
-9	MS27039-0824	. SCREW	1
-10	MS17821-1-9	. STRAP	1
-11	TC-826	. MOUNTING PLATE, STRAP (Component of 369H90129-31)	1
-12	369H90153	. GRIP, CYCLIC STICK	1
-13	NAS1398B5-4	. RIVET (Component of 369H90129-31)	7
-14	369D27132	. TUBE ASSY (Component of 369H90129-31)	1
-15	NAS561P2-5	. PIN (Component of 369H90129-31)	1
-16	AN960PD516L	. WASHER (Component of 369H90129-31)	4
-17	MS20470B3	. RIVET (Component of 369H90129-31)	1
-18	369A7129	. STUD (Component of 369H90129-31)	1
-19	369A7141	. SOCKET (Component of 369H90129-31)	1

SECTION 2
MAINTENANCE INSTRUCTIONS

2-1. GENERAL INFORMATION. A special cyclic stick grip assembly is provided for use when a combination of the cargo hoist/hook and emergency float kits are installed on the helicopter at the same time.

2-2. DESCRIPTION. The cyclic stick grip kit may be procured in two forms. The 369H90129-31 kit contains a complete pilot's cyclic stick assembly. The 369H90129-505 kit contains only the stick grip and required parts for installation on the existing pilot's cyclic stick. Each cyclic grip kits provides a four-way cyclic trim switch, a two-position trigger type communication switch, and two guarded button switches for emergency floats and cargo hook or hoist installations. A plug covers an opening which may be used for an additional switch if required.

2-3. REFERENCE DATA. Maintenance of the cyclic stick grip kits is similar to that of the standard cyclic stick and grip (Section 7, HMI - Vol 1). Refer to Section 20, HMI - Vol 1 for interfacing schematic and wiring diagrams. Differences in the grip switches and electrical wiring are discussed in the following paragraphs.

2-4. OPERATIONAL CHECK.

a. Place BATT-OFF-EXT switch in the OFF position. Ensure that all electrical power is off.

b. Disconnect electrical plug located near floorline aft of pilot's cyclic stick.

c. Using ohmmeter, conduct continuity check of all switch circuits to ensure proper hookup of wiring and for switch operation.

d. Connect electrical plug to receptacle; safety with lockwire (3, table 3-1).

e. Energize electrical system.

f. Check operation of four-way trim switch by momentarily activating switch and checking that both lateral and longitudinal trim actuators operate properly.

g. Check operation of RADIO/ICS switch as applicable to installed communications systems.

CAUTION: Do not activate emergency float switch or hoist cable cutter switch.

h. If installed, check operation of emergency float and cargo hook/hoist switches in accordance with the applicable Opt Eqpt Manual.

i. Remove electrical power; place BATT-OFF-EXT switch in OFF position.

2-5. REPLACEMENT OF CYCLIC STICK GRIP SWITCHES (see Figure 2-1).

a. Check that all electrical power is OFF.

NOTE: Disassemble only to the extent required for the replacement of damaged or defective switches. The wiring through the grip assembly is tied with nylon cord (7, table 3-1) and covered with an insulating sleeve. Do not remove twine ties or insulating sleeves unless wire replacement is required.

b. Remove screws securing affected switches.

c. Unscrew RADIO/ICS trigger switch pin and carefully withdraw pin while holding switch in place.

d. Unsolder wiring terminals on switch to be disconnected. If more than one switch is to be replaced, tag wires to ensure correct reinstallation.

e. Solder wiring to terminal of replacement switches as applicable. Remove any wire identification tags.

f. Insert replacement switch in grip mounting receptacle; secure switches using original attacking hardware.

NOTE: Make certain switch is properly positioned with applicable keyway, pin hole, etc, for proper alignment of matering parts.

2-6. WIRING DIAGRAM. Figure 2-2 contains a wiring diagram for the cyclic stick grip kit installation. Refer to Section 20, HMI - Vol 1 for wiring information on interfacing helicopter electrical systems.

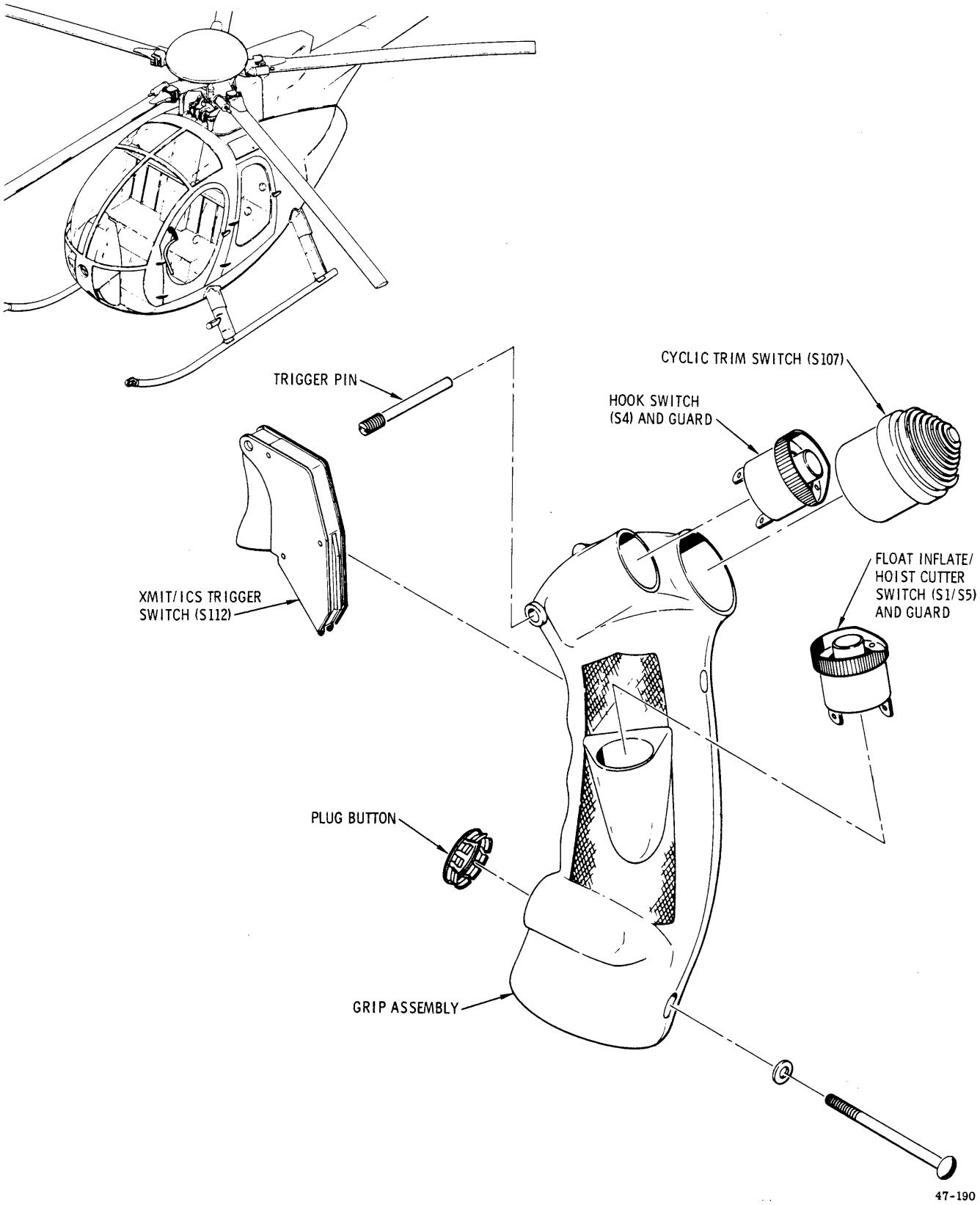
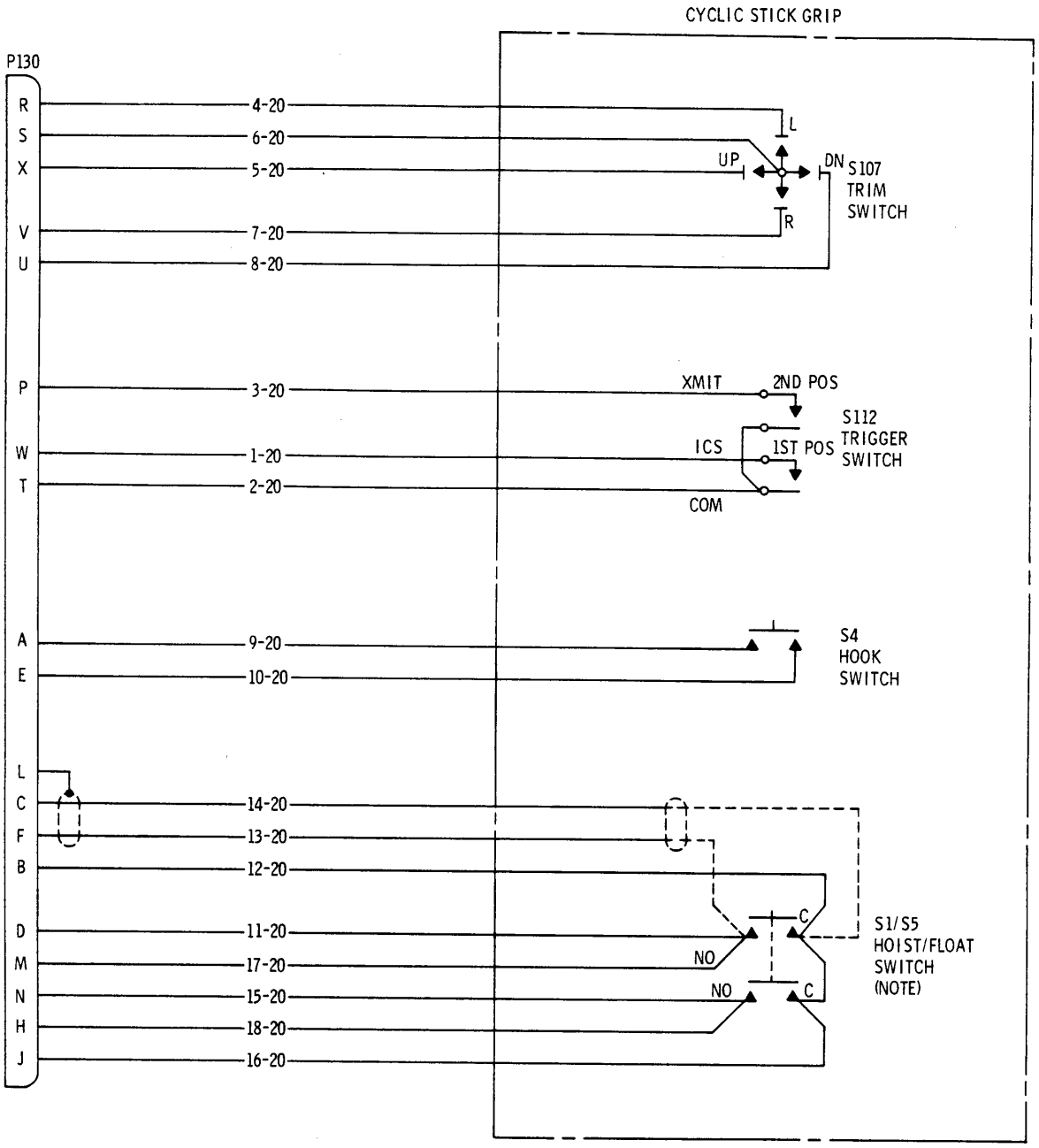


Figure 2-1. Cyclic stick grip switches - replacement



NOTE:

IF THE HOIST IS BEING INSTALLED REMOVE WIRES 11-20, 12-20, 17-20 AND JUMPER FROM SWITCH S1/S5 AND CONNECT WIRES 13-20 AND 14-20 AS SHOWN

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Figure 2-2. Wiring diagram - cyclic stick grip kit

SECTION 3
INSTALLATION INSTRUCTIONS

3-1. GENERAL INFORMATION. The cyclic stick grip kit must be installed on any Hughes 500 Model 369D Series Helicopter when a combination of the 369H90065 cargo hook kit, 369H90070 hoist kit, and/or 369H90121 emergency float kit are installed on a helicopter.

Two configurations of the cyclic stick grip kit are offered, the 369H90129-31 and the 369H90129-505. The 369H90129-31 kit consists of a factory assembled cyclic stick which is ready to install with a minimum of labor, whereas, the 369H90129-505 kit consists of all the components necessary for the owner or operator to assemble and install a cyclic stick grip on the helicopter.

Procedures as given are to be utilized for installing a cyclic stick kit on a helicopter designated to receive any combination of the above mentioned optional kits. Information in the installation instructions is presented as additional procedures over and above 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 HMI - Vol 1 that is to be followed in order to accomplish the installation of a cyclic stick kit.

3-2. REFERENCE DATA. Table 3-1 lists consumable materials and expendable items required for installation. Items listed in the consumable materials and expendable items table are recommended items and are of a commercial nature that may be procurable locally. Alternate but equivalent items are acceptable. Table 3-2 lists special tools and equipment required to accomplish installation.

Table 3-1. Consumable materials and expendable items

Item No.	Material	Specification	Commercial Product Name/No.	Commercial Product Manufacturer
1	Tubing, vinyl	MIL-I-631, Type F, form U, grade A, class 1, category 1	3/8 in.	Commercial
2	Tubing, Vinyl	MIL-I-631, Type F, form U, grade A class 1, category 1	1/2 in.	Commercial
3	Lockwire	MS20995C	CRES Safety wire (3) (diameter as required)	Commercial
4	Solder	SN60WRP2 (QQ-S-571)	as required	Commercial
5	Cord, Tying		No. 17 Flat Air-Tect braid	Commercial
6	Tape, Vinyl		CT93C	Commercial

Table 3-2. Special tools and equipment

Item	Nomenclature	Manufacturer
1	Removal tool, pin, No. 107R1001	Winchester Electronics Division of Litton Industries Oakville, Conn.
2	Insertion tool, pin, No. 107-1015	Winchester Electronics Division of Litton Industries Oakville, Conn.

3-3. PREPARATION. Instructions in the following paragraphs are applicable to both cyclic stick grip kits. Preparation for installation of a grip kit includes the following:

a. Identify all components removed, including hardware, to gain access to work areas. Protect components from damage and contamination.

b. Disconnect battery.

(1) Check that all electrical switches are in OFF position.

CAUTION: Make certain BATT-OFF-EXT switch is in OFF position.

(2) Raise pilot compartment floor left-hand access door; remove screws and washers securing battery to mounting brackets and remove cover.

(3) Disconnect electrical wiring harness male connector from battery receptacle located at inboard end of battery case.

3-4. REMOVAL OF CYCLIC STICK. Remove the pilot's cyclic stick in accordance with the following instructions:

a. Disconnect cyclic stick electrical plug located on pilot's lower seat structure.

b. Remove the hardware that secures pilot's lateral control rod to stick socket; remove split bushing from aft bolt hole to avoid loss.

NOTE: Retain all removed hardware, less cotter pin, for reuse.

c. Remove the hardware that secures the lateral friction mechanism link to the cyclic torque tube.

d. Remove the hardware that secures the stick socket to the end of the cyclic torque tube. Remove stick assembly.

3-5. DISASSEMBLY OF CYCLIC STICK. Disassemble the pilot's cyclic stick only if 369H90129-505 grip kit is to be installed. Disassemble the cyclic stick as follows:

a. Remove nylon strap that secures electrical wiring bundles to base of cyclic stick assembly.

b. Remove standard configuration cyclic stick grip from cyclic stick tube assembly as follows:

(1) Using contact removal tool (1, table 3-2), disconnect removable contacts from electrical plug.

(2) Remove retaining screw and lockwasher from base of grip. Separate grip from stick tube assembly.

(3) Tie a "fish" string (5, table 3-1) to each wire bundle to aid reassembly. Push wire into wiring exit holes in stick socket while carefully pulling grip wiring from stick tube assembly. Remove grip and wiring.

NOTE: Leave strings in tube to assist in reassembly.

3-6. ASSEMBLY OF CYCLIC STICK GRIP KIT. The 369H90129-31 grip kit is shipped with as many parts assembled as practical, however, the 369H90129-505 grip kit will require assembly at installation. Assemble 369H90129-505 grip kit as follows:

a. Remove retaining screw and lockwasher from the grip contained in the kit.

b. Divide the grip kit wires into two approximately equal bundles as follows:

(1) Form one bundle with twisted shielded wires plus five additional wires.

(2) Form a second bundle with remaining 11 wires.

NOTE: Ensure a smooth flow of wires from switch contacts in grip.

c. Cut two pieces vinyl tubing (1, table 3-1) to length of cyclic stick tube/socket assembly; allow approximately 6-inches excess on each piece. Insert wire bundles from grip through vinyl tubing. Slide tubing into grip approximately 2-inches.

d. Attach "fish" strings to ends of grip wire bundles; carefully draw wire bundles through stick assembly and out wiring exit holes at base of stick socket (15, fig. 1-1).

NOTE: Push wire bundles at grip end while pulling vinyl covered bundles through exit holes in stick socket.

e. Position grip assembly on cyclic stick tube assembly and install with lockwasher and retaining screw.

f. Insert vinyl tubing (2, table 3-1) over ends of electrical wiring routed through base of cyclic tube assembly socket. Trim vinyl tubing as necessary.

g. Push as much electrical wiring slack as possible back into the stick assembly. Secure wiring to tube assembly socket with nylon strap (10, fig. 1-1).

h. Cut electrical wiring to approximately 16-inches in length from center of nylon strap.

i. Using solder (4, table 3-1) install contact pins (2, fig. 1-1) to ends of electrical wiring.

j. Using contact insertion tool (2, table 3-2), connect pinned ends of electrical wiring to plug (See fig. 2-2, Electrical Wiring Diagram).

k. Wrap tape (6, table 3-1), as required around electrical wiring where 1/2-inch vinyl tubing commences at base of cyclic stick tube assembly socket.

l. Connect electrical plug to mating receptacle safety plug retaining screws with lockwire (3, table 3-1).

3-7. INSTALLATION OF CYCLIC STICK. Install the cyclic stick kit (369H90129-31 or 369H90129-505) as follows:

a. Install washers (17, fig. 1-1), pin (18), and disc on lateral friction stud (19).

b. Position cyclic stick to align with mating holes in cyclic torque tube; insert cyclic stick lateral friction stud into guide slot of lateral friction link.

c. Attach cyclic stick to cyclic torque tube using original hardware and replacement cotter pin (5). Install bolt head aft.

d. Install slotted bushing (6) in aft position of lower bolt hole in stick socket (15); align pilot's lateral control rod with socket (15) and install original hardware and replacement cotter pin (5). Install bolt head aft.

e. Assemble balance of lateral friction mechanism components on cyclic stick friction stud as follows:

(1) Install spring retainer, spring, adjustment knob, and nut (4).

(2) Adjust friction knob nut (4) to stop friction knob when spring reaches free length (no compression) ±1/32-inch.

f. Insure sufficient slack in wire bundles between stick/socket wire exit holes and strap mounting plate (11, fig. 1-1); install strap (10, fig. 1-1) over end of 1/2-inch vinyl tubing and combined wire bundles.

3-8. WEIGHT AND BALANCE. The weight and balance changes resulting from installation of the 369H90129-31 or 369H90129-505 cyclic stick grip kits is negligible. However, record the addition of the grip kits in the basic weight and balance record in accordance with HMI - Vol 2.