Publication No. CSP-003

Illustrated Parts List and Maintenance Instructions with Initial Installation Instructions

FOR

ENGINE AUTOMATIC REIGNITION

Part No. 369H90118-513 and 369H90118-515

USED ON HUGHES 500D AND

500MD (MODEL 369D) HELICOPTERS

THIS REISSUE SUPERSEDES ALL PREVIOUS ISSUES OF THIS PUBLICATION

Hughes Helicopters division of summa corporation / culver city, california

COD775211

Issued 1 February 1978

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

* THE ASTERISK INDICATES PAGES CHANGED, ADDED, OR DELETED BY THE CURRENT CHANGE.

Page	Date
Title	Original
A thru B	Original
C Blank	Original
i	Original
ii Blank	Original
F-1	Original
F-2 Blank	Original
1-1 thru 1-5	Original
1-6 Blank	Original
2-1 thru 2-7	Original
2-8 Blank	Original
3-1 thru 3-5	Original
3-6 Blank	Original

HUGHES TECHNICAL MANUAL RECOMMENDED CHANGE REPORT

This manual has been prepared and distributed by the Commercial Service Publications Department and is intended for use by personnel responsible for the maintenance of Hughes Helicopters. Periodic revision of this manual will be made to incorporate the latest information. If, in the opinion of the reader, any information has been omitted or requires clarification, please direct your comments to this office via this form (or a duplicate). An endeavor will be made to include such information in future revisions.

Hughes Helicopters
Centinela and Teale Streets
Culver City, California 90230

Attention: J. J. Dillon, Commercial Service Publications
2T17B

Originator _____

Address _____

Book Identification:

Date:

Helicopter Model _____ Volume Title _____

Issue Date _____ Revision No. _____

Discrepant Area (as applicable): _____ Revision Date _____

Page Number(s) _____ Paragraph Number(s) _____

Step(s) _____ Table Number(s) _____

Figure Number(s) _____

Remarks/Recommendations -

TABLE OF CONTENTS

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 369H90118-513 (commercial) and 369H90118-515 (military) engine automatic reignition equipment. Weight and balance data is included. This manual also contains parts lists for procuring replacement parts for the engine automatic reignition equipment.

F-3. APPLICABILITY.

F-4. Engine automatic reignition equipment is 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 engine automatic reignition equipment. 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 369H 90118-513 and 369H90118-515 Engine Automatic Reignition Equipment, 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 engine automatic reignition equipment, and shall not be used for any other purpose.

1-5. ILLUSTRATIONS.

1-6. Illustrations are provided for each group assembly parts list. Each illustration is exploded to the extent necessary to show parts relationship for the complete engine automatic reignition equipment.

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.

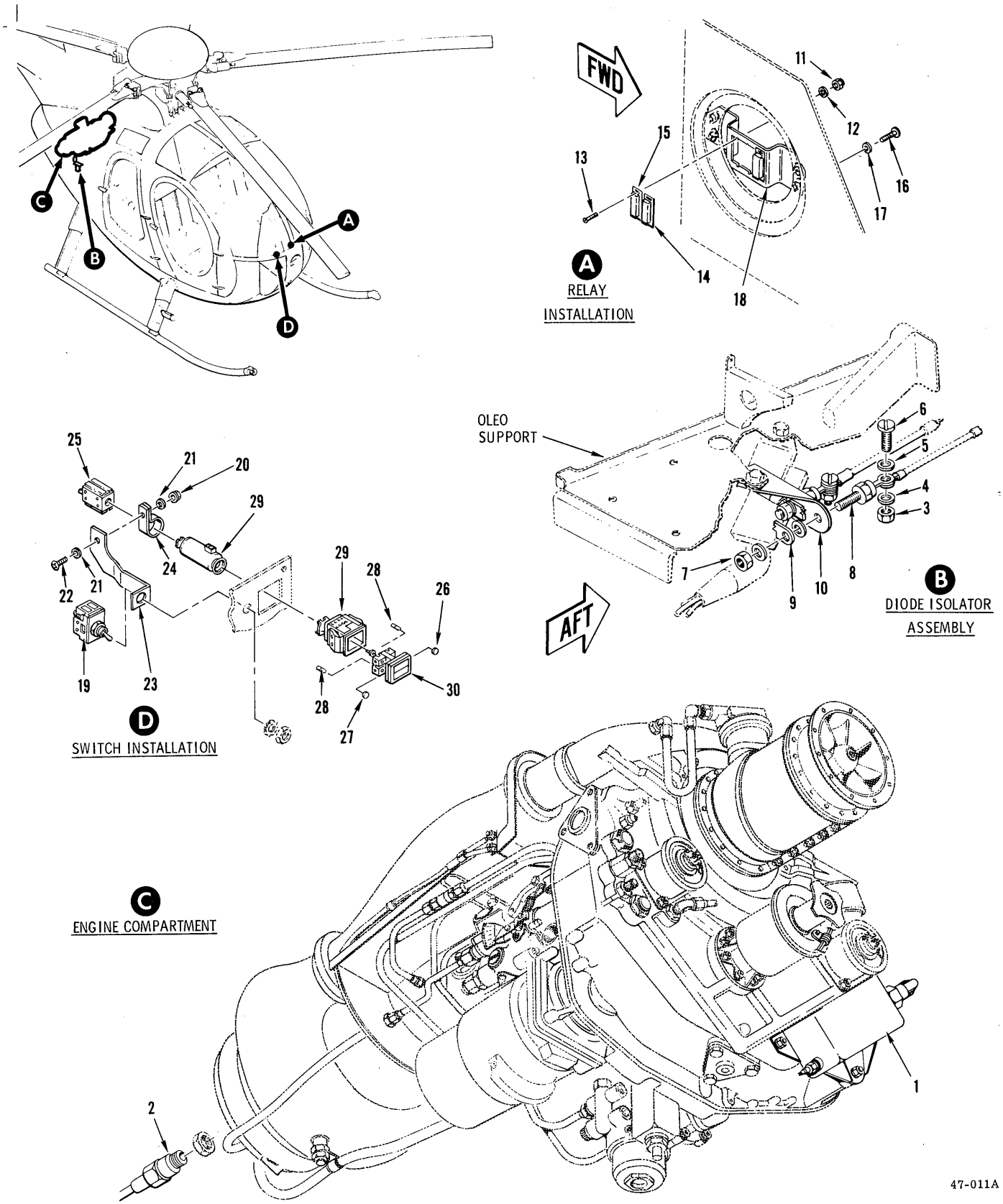


Figure 1-1. Engine automatic reignition equipment (commercial configuration)

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-1-	369H90118-513	AUTOMATIC ENGINE REIGNITION KIT	1	
-1*	6870885	. IGNITION EXCITER.	1	
	43754	. IGNITION EXCITER (Interchangeable with 6870885)	1	
	6870891	. IGNITION EXCITER (Interchangeable with 6870885)	1	
	10-387150-1	. IGNITION EXCITER (Interchangeable with 6870885)	1	
-2*	FHE161-9A	. IGNITER	1	
	6843984	. IGNITER (Interchangeable with FHE161-9A). . .	1	
	6874271	. IGNITER (Interchangeable with FHE161-9A). . .	1	
	5611588 (YB63-1)	. IGNITER (Interchangeable with FHE161-9A). . .	1	
	369H90118-51	. DIODE ISOLATOR ASSEMBLY	1	
-3	MS20341-6C	. . NUT.	2	
-4	MS35338-136	. . WASHER	2	
-5	NAS620C6L	. . WASHER	4	
-6	MS35275-229	. . SCREW.	2	
-7	AN316-4	. . NUT	2	
-8	IN3210	. . DIODE (CR1, CR2).	2	
-9	369H90118-5	. . BUS.	1	
-10	369H90118-3	. . BRACKET	1	
-11	MS21042L02	. NUT	4	
-12	NAS620C2	. WASHER	8	
-13	MS35206-203	. SCREW	4	
	369H90118-71	. RELAY ASSEMBLY (K104)	1	
-14	369H4243	. . RELAY	1	
	369A4557	. . RELAY (Interchangeable with 369H4243). . . .	1	
	369H90118-91	. RELAY ASSEMBLY (K304)	1	
-15	369H4243	. . RELAY	1	
	369H4557	. . RELAY (Interchangeable with 369H4243). . . .	1	
-16	NAS600-4	. SCREW	4	
-17	AN960PD4L	. WASHER	4	
-18	369H2505-169	. BRACKET ASSEMBLY	1	
-19	MS35059-22	. SWITCH (S11)	1	
-20	MS21042L08	. NUT	1	
-21	NAS620C8L	. WASHER	2	
-22	NAS602-7	. SCREW	1	
-23	369H90118-17	. SUPPORT	1	
	369H90118-101	. SWITCH ASSEMBLY (XDS9)	1	
-24	AN742F13	. . CLAMP	1	
-25	2D26	. . SWITCH	1	
-26	2G16	. . FILTER, Amber	2	
-27	2G14	. . FILTER, Green	2	
-28	327	. . LAMP	4	
-29	2C268	. . HOUSING	1	
-30	369H90118-41	. . SCREEN ASSEMBLY	1	

*Not furnished, but must be used with engine automatic reignition equipment. Normally supplied with engine; if not, must be separately procured.

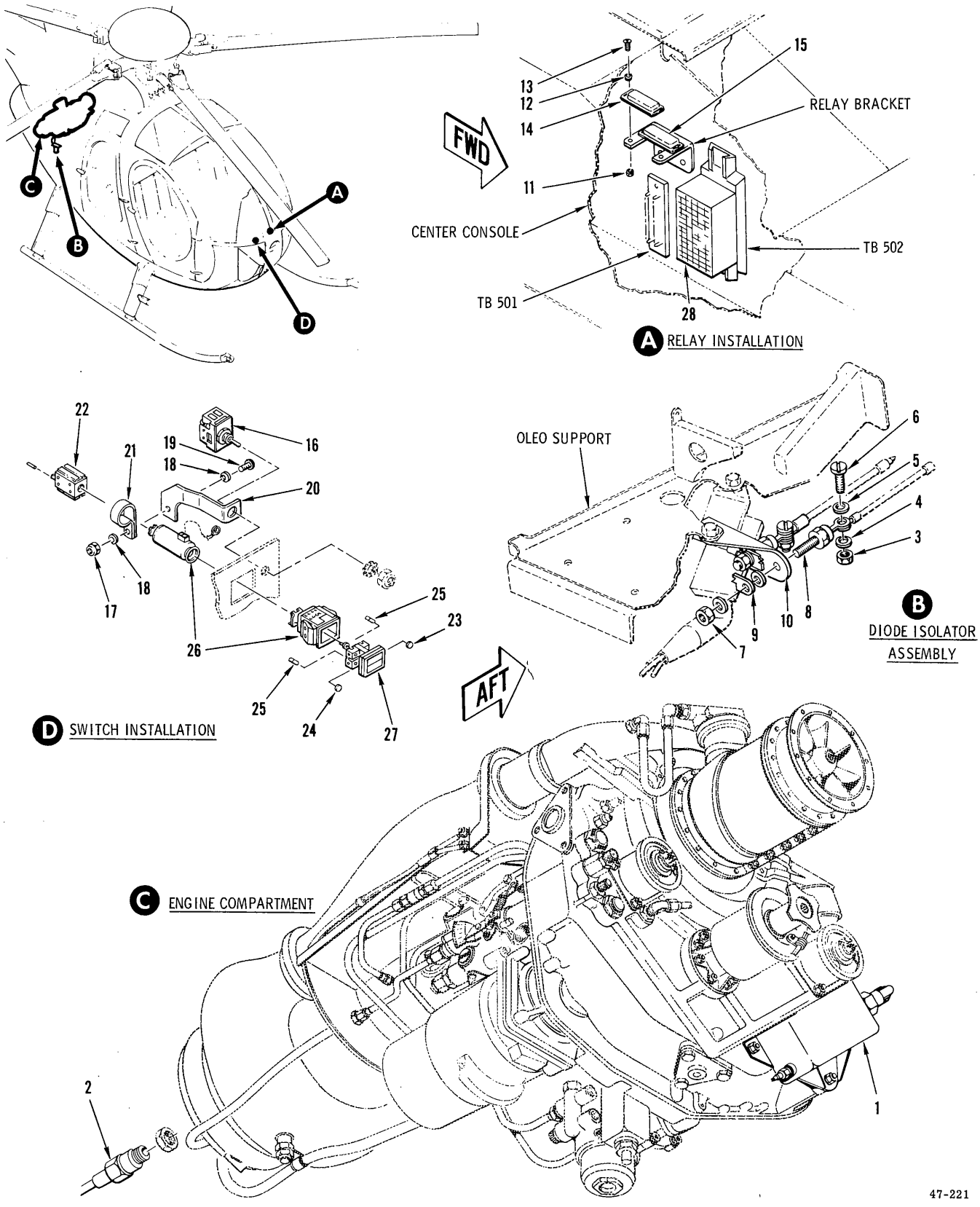


Figure 1-2. Engine automatic reignition equipment (military configuration)

FIG. & INDEX NO.	PART NO.	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-2-	369H90118-515	AUTOMATIC ENGINE REIGNITION KIT	1	
-1*	6870885	. IGNITION EXCITER	1	
	43754	. IGNITION EXCITER (Interchangeable with 6870885)	1	
	6870891	. IGNITION EXCITER (Interchangeable with 6870885)	1	
	10-387150-1	. IGNITION EXCITER (Interchangeable with 6870885)	1	
-2*	FHE161-9A	. IGNITER	1	
	6843984	. IGNITER (Interchangeable with FHE161-9A)	1	
	6874271	. IGNITER (Interchangeable with FHE161-9A)	1	
	5611588 (YB63-1)	. IGNITER (Interchangeable with FHE161-9A)	1	
	369H90118-51	. DIODE ISOLATOR ASSEMBLY	1	
-3	MS20341-6C	. . NUT	2	
-4	MS35338-136	. . WASHER	2	
-5	NAS620C6L	. . WASHER	4	
-6	MS35275-229	. . SCREW	2	
-7	AN316-4	. . NUT	2	
-8	IN3210	. . DIODE (CR1, CR2)	2	
-9	369H90118-5	. . BUS	1	
-10	369H90118-3	. . BRACKET	1	
-11	MS21042L02	. NUT	4	
-12	NAS620C2	. WASHER	8	
-13	MS35206-203	. SCREW	4	
	369H90118-71	. RELAY ASSEMBLY (K104)	1	
-14	369H4243	. . RELAY	1	
	369A4557	. . RELAY (Interchangeable with 369H4243)	1	
	369H90118-91	. RELAY ASSEMBLY (K304)	1	
-15	369H4243	. . RELAY	1	
	369H4557	. . RELAY (Interchangeable with 369H4243)	1	
-16	MS35059-22	. SWITCH (S11)	1	
-17	MS21042L08	. NUT	1	
-18	NAS620C8L	. WASHER	2	
-19	NAS602-7	. SCREW	1	
-20	369H90118-17	. SUPPORT	1	
	369H90118-101	. SWITCH ASSEMBLY (XDS9)	1	
-21	AN742F13	. . CLAMP	1	
-22	2D26	. . SWITCH	1	
-23	2G16	. . FILTER, Amber	2	
-24	2G14	. . FILTER, Green	2	
-25	327	. . LAMP	4	
-26	2C268	. . HOUSING	1	
-27	369H90118-41	. . SCREEN ASSEMBLY	1	
-28	A23DMM20T-1	. MODULE (Used with 369D294201-703 instrument panel)	1	

*Not furnished, but must be used with engine automatic reignition equipment. Normally supplied with engine; if not, must be separately procured.

SECTION 2
MAINTENANCE INSTRUCTIONS

2-1. GENERAL INFORMATION.

2-2. DESCRIPTION. The engine automatic reignition equipment consists of a switch assembly (XDS9) placarded RE-IGN/ARMED, switch (S11) placarded ARM-OFF, reignition relay assemblies (K104, K304), diode isolator assembly containing diodes CR1 and CR2, and miscellaneous wiring, hardware and splices that interconnect the foregoing components and interface with existing helicopter equipment (K301 start relay, CB106 circuit breaker, dimming unit (P12), engine power out warning control unit and the exciter). Locations of the major components are shown in figures 2-1 and 2-2.

2-3. OPERATION. The engine automatic reignition equipment provides a means to automatically reignite the engine when either or both of the following conditions exist: (1) engine N_1 (gas producer) speed (rpm) is less than 50 - 55 percent; (2) N_R (rotor) speed is less than approximately 460 rpm. The starting circuit for the starter-generator (section 19, HMI - Vol 1) is isolated by automatic reignition circuit diodes (CR1, CR2). With circuit breakers (see applicable wiring diagram fig. 2-3, 2-4, or 2-5) in closed position, and ARM-OFF switch (S11) in ARMED position, the lamps of the green ARMED portion of switch assembly (XDS9) illuminate. With the ARM-OFF switch at ARM, the ARMED indicator of the XDS9 switch assembly illuminates. A flameout causes the engine power out warning control unit (section 17, HMI - Vol 1) to energize K104 reignition relay, which then provides 28 vdc to the exciter and fires the igniter. Simultaneously, the RE-IGN indicator of the XDS9 switch assembly illuminates while the ARMED indicator remains illuminated. When the RE-IGN switch/indicator is depressed, the XDS9 switch assembly is reset and the RE-IGN indicator extinguishes.

2-4. REFERENCE DATA. Engine power out warning control unit: section 17, HMI - Vol 1. Start relay: section 19, HMI - Vol 1. Interfacing schematic and wiring diagram: section 20, HMI - Vol 1.

2-5. OPERATIONAL CHECK.

2-6. Perform the following operational check procedure whenever it is necessary to verify that the system is operating properly:

a. Check that BATTERY switch is in OFF position.

b. Connect external electrical 28 vdc power to helicopter (section 2, HMI - Vol 1).

c. Place BATTERY switch in EXT position.

d. Close circuit breakers (refer to applicable wiring diagram, figure 2-3 (commercial configuration), or figures 2-4 and 2-5 (military configurations)).

NOTE: Closing AUTO RE-IGN circuit breaker provides power to ARM-OFF switch

e. Place ARM-OFF switch (S11) in ARM position; check that green ARMED portion of switch (XDS9) illuminates.

NOTE: The green ARMED light may be dim or bright depending on the dimming switch voltage (14 or 28 volts). If the electronic dimming circuitry is in the dim mode, and it is desired to change to bright illumination, pull (open) and reset (close) COMM PNL LTS (annunciator panel lights) circuit breaker (CB104) (commercial helicopters and military helicopters with 369D 294201-703 instrument panel) or (CB123) (military helicopters with 369D294201-705 instrument panel).

f. Verify audible engine ignition.

NOTE: With engine in a flameout condition, and ARM-OFF switch (S11) in ARM position, a simultaneous signal from the engine power out warning control unit will energize the reignition relay (K104) which provides continuous 28 vdc to the ignition exciter and fires the spark igniter.

g. Verify that switch (XDS9) RE-IGN indicator lamps illuminate and that ARMED lamps remain illuminated.

h. Place ARM-OFF switch (S11) in OFF position; RE-IGN and ARMED switch (XDS9) indicator lights should go off.

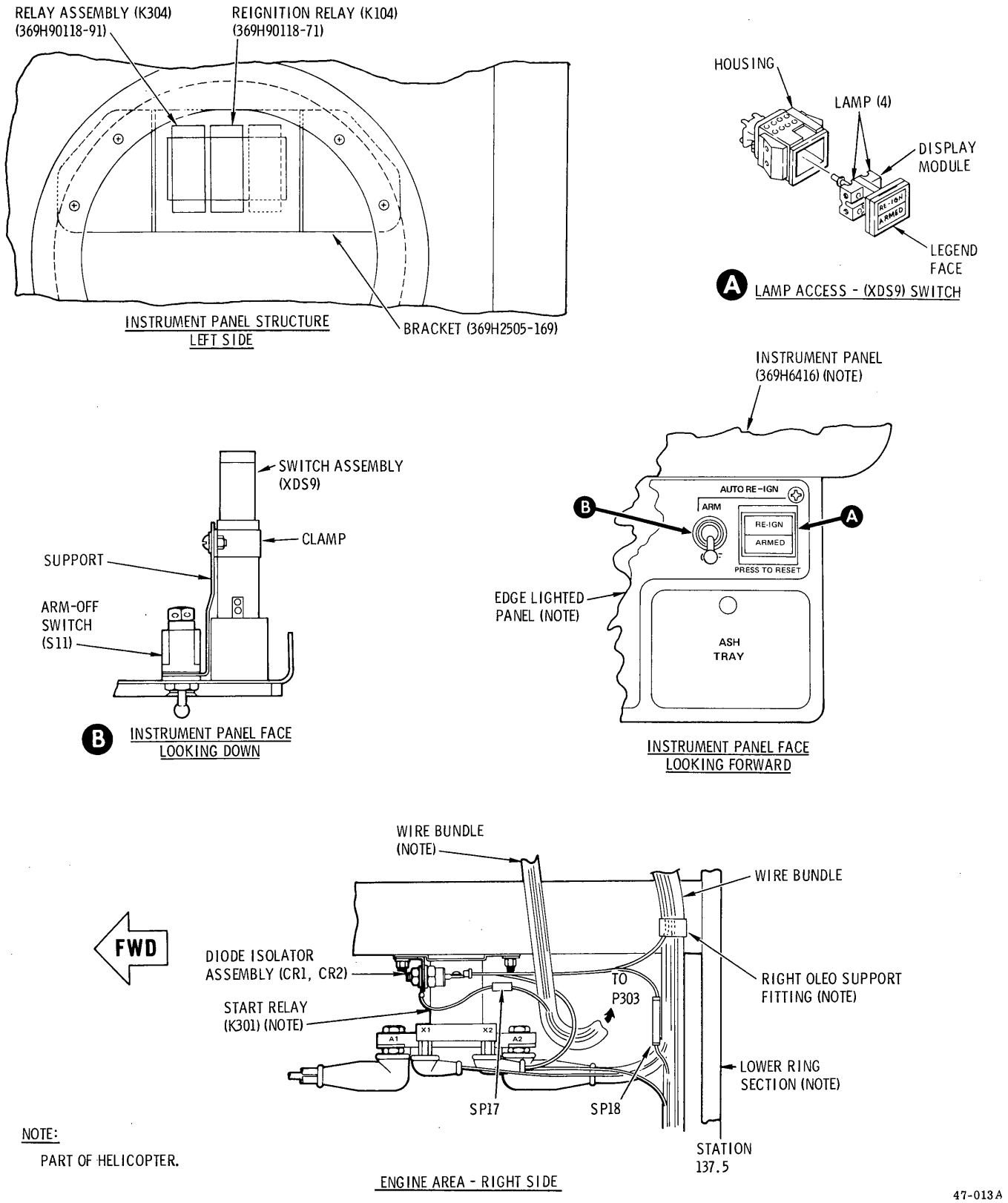


Figure 2-1. Major component locations (commercial configuration)

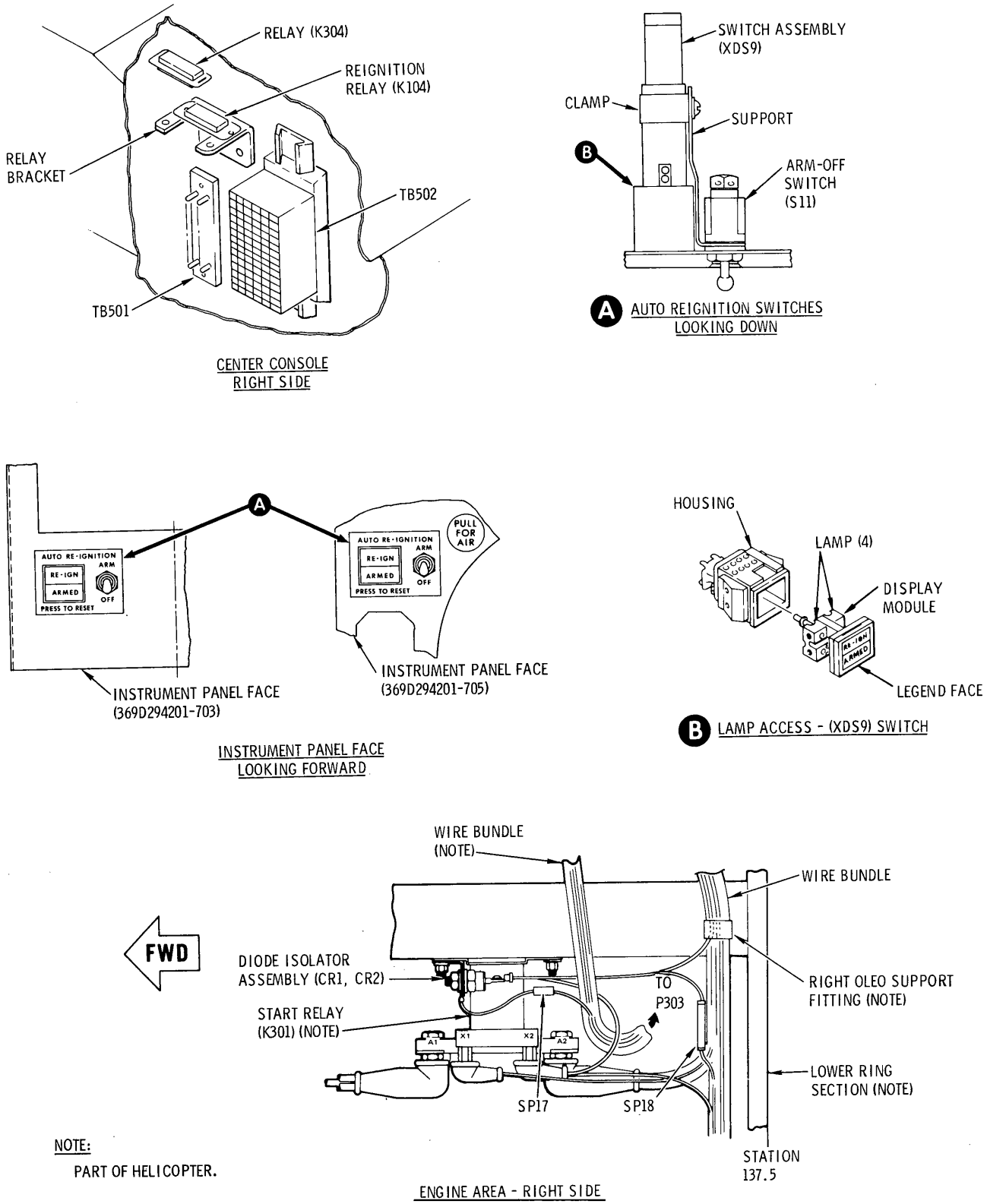


Figure 2-2. Major component locations (military configuration)

i. Press switch (XDS9) RE-IGN indicator to reset switch.

j. Deenergize electrical system as follows:
(1) Open circuit breakers.
(2) Place BATTERY switch in OFF position.
(3) Disconnect external electrical power.

2-7. TROUBLESHOOTING.

2-8. Use information in table 2-1 in conjunction with the wiring diagram for troubleshooting. The troubleshooting table presumes good indicator lamps. Whenever a trouble symptom includes or consists of failure of an indicator to be illuminated, verify lamp condition by substituting a lamp known to be good before proceeding with troubleshooting.

2-9. REMOVAL AND INSTALLATION.

2-10. For installation of components, refer to section 3. For removal, reverse procedures.

2-11. INSPECTION.

2-12. Inspect the engine automatic reignition equipment as follows:

a. Instrument Panel.
(1) Examine ARM-OFF circuit breaker and RE-IGN/ARMED indicator/switch assembly for damage and security of attachment to panel.
(2) Examine reignition relay for damage and security of attachment to bracket.
(3) Examine wiring for damage; wire terminals for security of attachment.

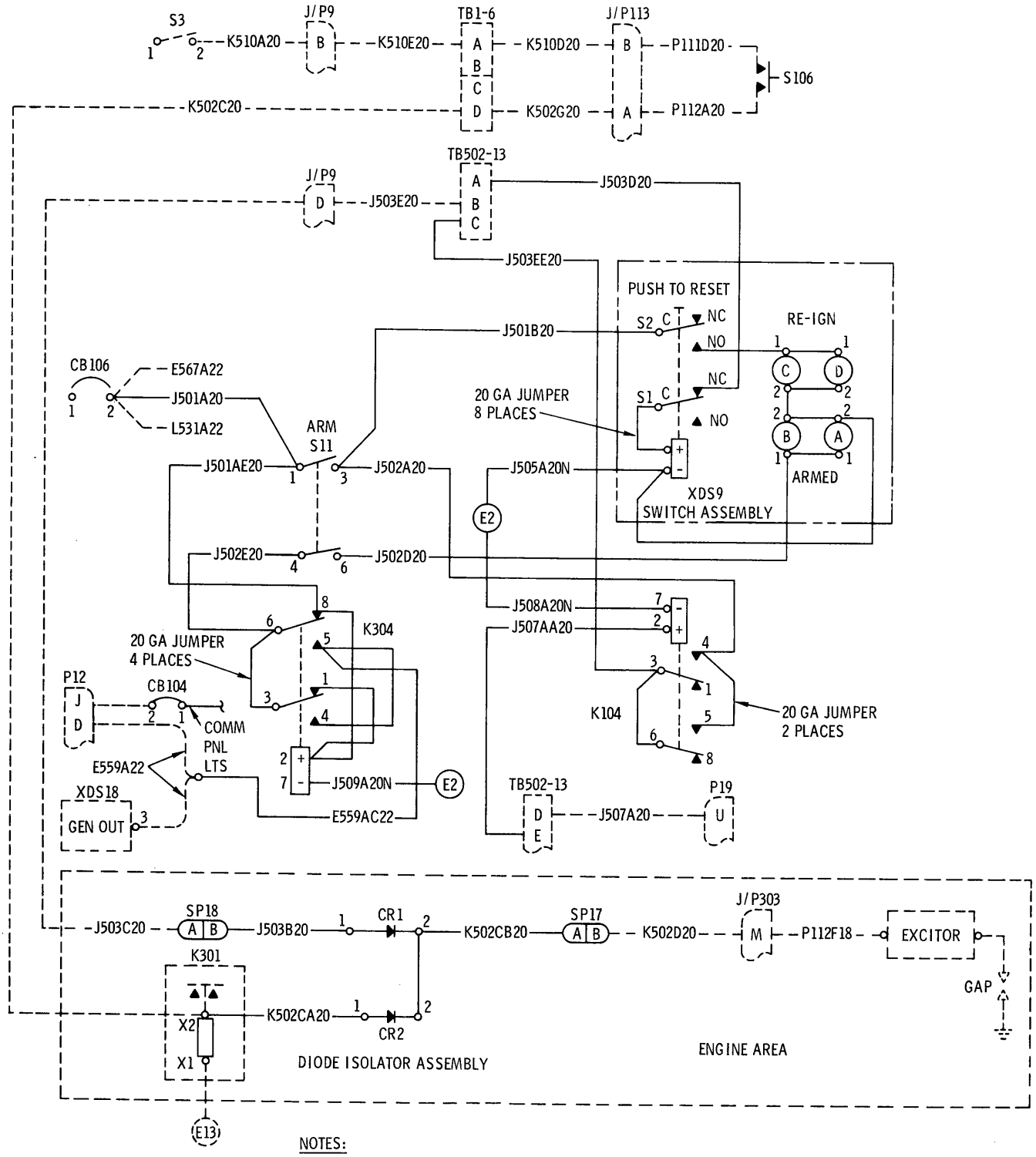
b. Engine Area.
(1) Examine diode isolator assembly for damage and security of attachment.
(2) Examine wires and splices for damage; wire terminals for security of attachment.

2-13. WIRING DIAGRAMS.

2-14. Figures 2-3, 2-4, and 2-5 are wiring diagrams for the engine automatic reignition equipment and show interconnections with the helicopter electrical system and associated instrument panel caution and wiring indicating equipment.

Table 2-1. Troubleshooting - engine automatic reignition equipment

Symptom	Probable Trouble	Corrective Action
System functions normally, except RE-IGN switch/ indicator does not illuminate.	Defective lamp	Replace lamp
	Defective switch (XDS9) assembly.	Replace switch (XDS9) assembly.
RE-IGN switch/indicator illuminates during normal (non-automatic) starting.	Defective diode (CR1)	Replace diode or diode isolator assembly.
System fails to function with 28 vdc present at terminals D and E of TB502-13 and ARMED indicator is illuminated.	Defective reignition relay (K104).	Replace reignition relay (K104).
ARMED indicator is not illuminated and system fails to function with 28 vdc at terminals D and E of TB502-13.	Defective ARM-OFF switch (S11).	Replace switch (S11).
ARMED indicator illuminated, RE-IGN switch/indicator illuminated, 28 vdc present at connector 1 of CR1, but less than 26 vdc present at connector 2 of CR1 (of diode isolator assembly). Automatic reignition fails to occur.	Defective diode (CR1).	Replace diode or diode isolator assembly.
Engine starter energizes when ARM-OFF switch is at ARM, engine is shut down, and power applied to bus.	Defective diode (CR2)	Replace diode or diode isolator assembly.

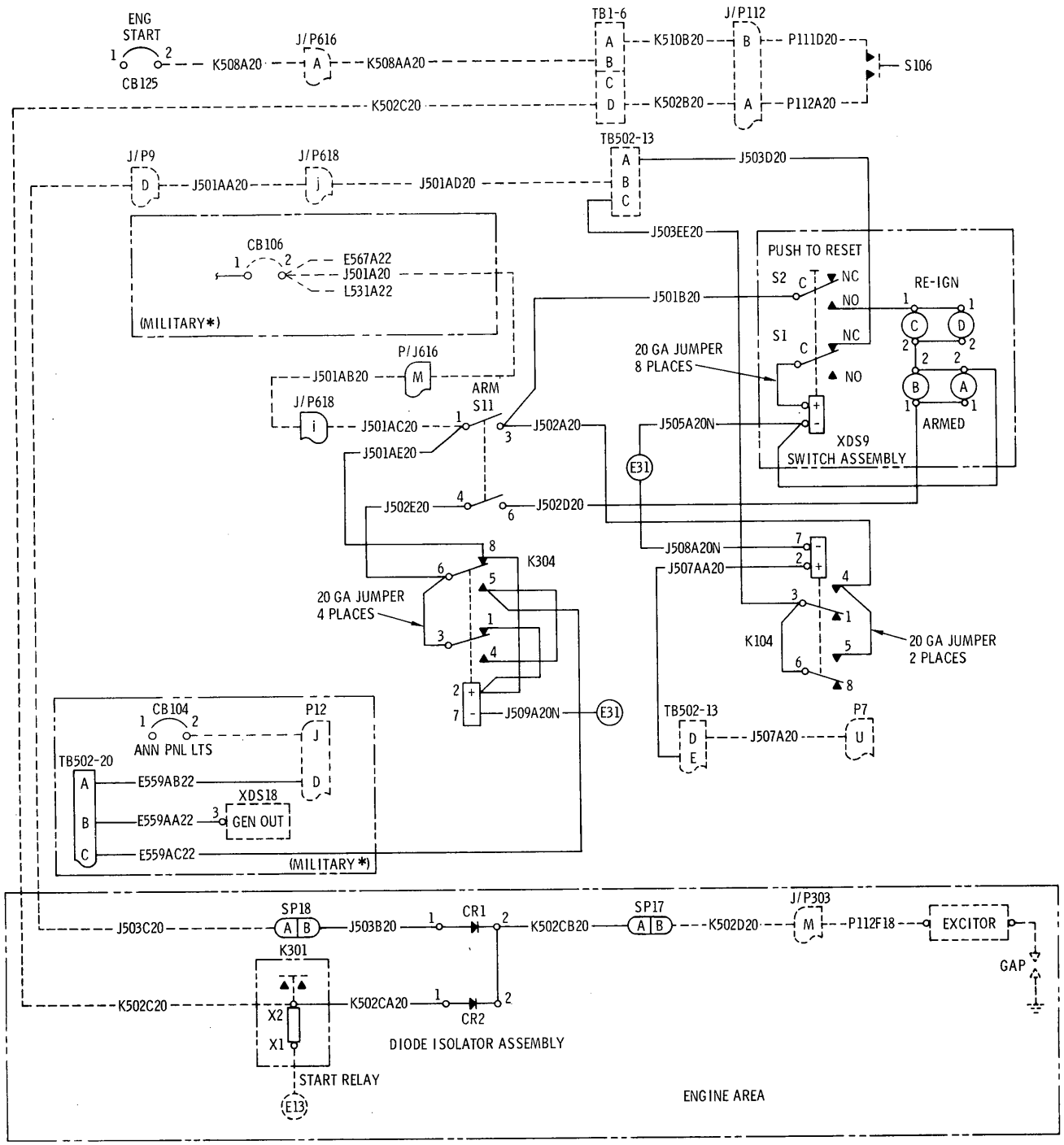


NOTES:

1. FOR ADDITIONAL INFORMATION, REFER TO SECTION 17, HMI-VOL 1.
2. SOLID LINES (——) INDICATE WIRES SUPPLIED WITH EQUIPMENT.
3. DASHED LINES (- - - -) INDICATE WIRING OR ITEM OF HELICOPTER ELECTRICAL SYSTEM (SECTION 19, HMI-VOL 1).

47-012A

Figure 2-3. Wiring diagram (commercial configuration)



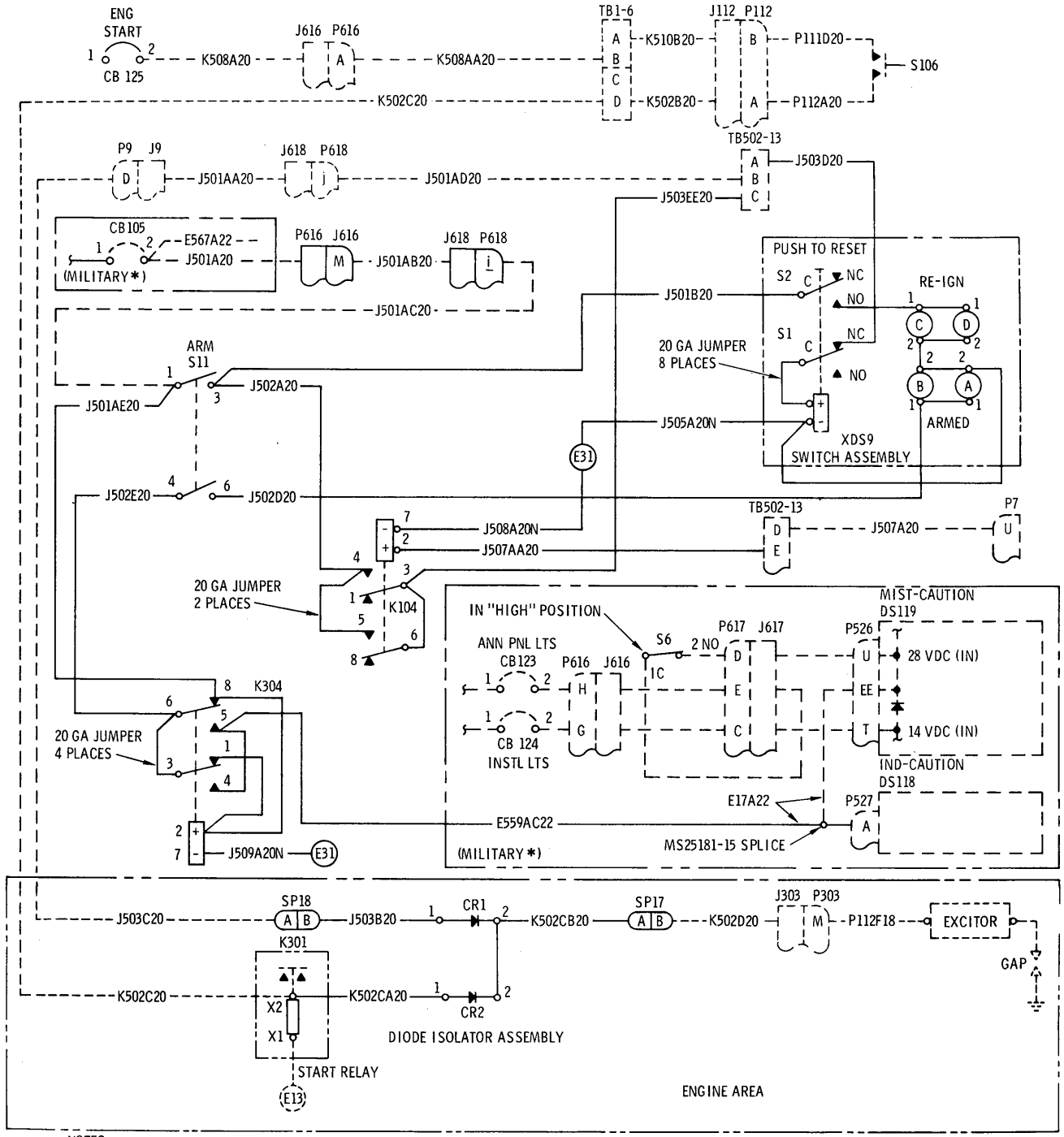
NOTES:

1. FOR ADDITIONAL INFORMATION, REFER TO SECTION 17, HMI - VOL 1.
2. SOLID LINES (——) INDICATE WIRES SUPPLIED WITH EQUIPMENT.
3. DASHED LINES (- - - -) INDICATE WIRING OR ITEM OF HELICOPTER ELECTRICAL SYSTEM (SECTION 19, HMI - VOL 1).

*MILITARY WITH 369D29420I-703 INSTRUMENT PANEL CONFIGURATION

47-227

Figure 2-4. Wiring diagram (standard military configuration)



NOTES:

1. FOR ADDITIONAL INFORMATION, REFER TO SECTION 17, HMI - VOL 1.
2. SOLID LINES (——) INDICATE WIRES SUPPLIED WITH EQUIPMENT.
3. DASHED LINES (- - - -) INDICATE WIRING OR ITEM OF HELICOPTER ELECTRICAL SYSTEM (SECTION 19, HMI - VOL 1).

*MILITARY WITH 369D294201-705 INSTRUMENT PANEL CONFIGURATION

47-299

Figure 2-5. Wiring diagram (SLAE military configuration)

SECTION 3
INITIAL MODIFICATION (INSTALLATION) INSTRUCTIONS

3-1. GENERAL INFORMATION.

3-2. SCOPE. This section provides instructions for installation of the engine automatic reignition equipment. These instructions cover removal or modification of existing equipment to accommodate reignition equipment.

3-3. REFERENCE DATA. Where directed in the following procedures, refer to the Handbook of Maintenance Instructions, Volume 1 (HMI - Vol 1) and to the Optional Equipment Manual (Opt Eqpt Manual) for the Standard Light Avionics Equipment (SLAE) for supplementary information and procedures. Refer to table 3-1 for a list of consumable materials and expendable items used during initial installation. Items listed are commercially available and may be obtained locally. Equivalent items and materials are acceptable.

3-4. PREPARATION FOR INSTALLATION.

3-5. Preparing for installation of engine automatic reignition equipment includes the following:

a. Place BAT-OFF-EXT switch in OFF position.

b. Open engine right access door (section 2, HMI - Vol 1).

c. Identify all components, including attaching hardware, removed to gain access to work areas. Protect components from damage and contamination until installed.

3-6. INSTALLATION OF ENGINE AUTOMATIC REIGNITION SYSTEM.

NOTE: The engine automatic reignition kits are supplied with as many parts assembled as practical, however, some parts may require assembly at installation. The following paragraphs provide complete assembly instructions. The operator should omit those steps which may have already been accomplished.

3-7. DIODE ISOLATOR ASSEMBLY.

NOTE: When providing ground for electrical components, clean contacting surfaces to bare metal (section 19, HMI - Vol 1). Do not tighten electrical clamps or secure electrical wiring to existing harnesses until all electrical wiring and components are installed.

a. Remove nut and washer securing forward end of K301 start relay to 369A2537 oleo support.

b. Clean area for electrical bonding around large hole in bracket (10, fig. 1-1 or 1-2) and that portion of K301 start relay bracket exposed by removal of nut and washer in step a, above.

c. Using nut and washer removed in step a, above, install diode isolator assembly so that lug-type diode connectors are aft.

d. Locate wire J503C20 (open end) in harness running vertically, just forward of station 135.5 bulkhead and approximately 6 inches aft of diode isolator assembly (fig. 2-3, 2-4, or 2-5). Place a 2.5-inch length of silicone tubing (9, table 3-1) on wire for use in step f, below.

e. Connect wire J503B20 from diode CR1 of diode isolator assembly to the B-end of knife splice SP18 (11). Connect A-end of same splice to wire J503C20 located in step d, above.

f. Slide silicone tubing (9) over SP18 splice and secure with tie-strap (2) at each end of splice.

g. Remove existing wire K502D20 from terminal X2 of K301 start relay. Cut off existing terminal, remove and save existing terminal protector, slip 2.5-inch length of silicone tubing (9) on wire, and connect wire to B-end of knife splice SP17 (11).

h. Connect A-end of SP17 splice to K502CB20 wire from common connector 2 of CR1 and CR2 diodes of diode isolator assembly.

i. Slide silicone tubing over splice and secure with tie-strap (2) at each end of SP17 splice.

j. Place terminal protector removed in step g, above, on wire K502CA20 of diode isolator assembly. Connect wire to X2 terminal of K301 start relay and slide terminal protector into place.

k. Secure wiring with string (4) as required, making certain that sufficient wire slack remains so that connectors are not stressed.

l. After assembly and test apply insulation varnish (3) to exposed threads and tips of diodes CR1 and CR2.

m. Close engine access door.

3-8. RELAY AND SWITCH ASSEMBLY (COMMERICAL CONFIGURATION).

a. Remove instrument panel left and right side covers to expose lightening holes (HMI - Vol 1).

Table 3-1. Consumable materials and expendable items

Item No.	Material	Specification	Commercial Product	
			Name/No.	Manufacturer
1	Solder	SN60WRP2 (QQ-S-561)	As required	Commercially available
2	Strap, tiedown	MS3367	Size as required	Commercially available
3	Varnish, insulation		Glyptal No. 1201	General Electric Insulation Dept, Schenectady, NY
4	String, lacing		T-3333	General Cable Corp, Los Angeles, CA
5	Wire, white		No. 47108B AWG - as required	General Cable Corp, Los Angeles, CA
6	Wire, white	MIL-W-16878/4 type E (alternate for General Cable Corp No. 147108B	As required	Commercially available
7	Wire, bus	MIL-W-3861/5	AWG 20, soft drawn - as required	Commercially available
8	Insulation sleeving, electrical (vinyl shrink tubing)	MIL-I-631, type F, form U, Grade A, Class 1, Category 1	Size as required	Commercially available
9	Insulation sleeving, electrical		Variglass, CL. H-A-1, No. 2 - as required	Commercially available
10	Insulation sleeving, electrical (fiberglass)	MIL-L-3190 (alternate for Variglass CL. H-A-1)	Size as required	Commercially available
11	Splice, knife	MS25181-1	As required	Commercially available
12	Terminal, wire	MS25036-102	As required	Commercially available
13	Terminal, wire	MS25036-149	As required	Commercially available
14	Pin, contact	MPCM20M-H2	As required	Commercially available
15	Decal		369H90118-27	Hughes Helicopters
16	Decal		369H90118-33	Hughes Helicopters
17	Decal		369H90118-35	Hughes Helicopters
18	Decal		369H90118-37	Hughes Helicopters

b. Remove ash tray and edge lighted panel from lower switch and circuit breaker panel.

c. Remove screws and loosen lower switch and circuit breaker panel.

d. Remove and discard square cutout and adjacent round hole button covers located above PRESS TO RESET placard.

e. On left side of instrument panel structure, install relay K104 (14, fig. 1-1) in center position, and relay K304 (15) in aft position, on bracket (18) with screws (13), washers (12), and nuts (11).

NOTE: Bracket (18) is installed in upper half of largest lightening hole in left side structure of instrument panel.

f. Clean area around ARM-OFF switch (S11) (19) mounting hole in lower switch and circuit breaker panel, to prepare bonding surface for switch support (23); clean all surfaces around holes in support (23).

g. Insert threaded shank of ARM-OFF switch (19) through half-inch hole in support (23) followed by key washer with washer tang toward switch actuator arm.

h. Insert ARM-OFF switch (19) through half-inch mounting hole in lower switch and circuit breaker panel; install washer and nut making certain tang is positioned in small hole adjacent to half-inch hole in panel.

i. Clean portion of cylindrical (coil) housing (29) to contact clamp (24); insert switch assembly (XDS9), from front side of panel, into square cutout mounting hole in lower switch and circuit breaker panel.

j. Secure housing (29) of switch (XDS9) to support (23) with clamp (24), screw (22), washers (21), and nut (20).

k. Install electrical wiring as follows:

(1) Route wire J502A20 from relay K104 (14) to ARM-OFF switch (16) and connect to contact 3 of switch (S11).

(2) Route wire J503EE20 from relay K104 (14) and insert pin in contact C of terminal block 502, module 13 (TB502-13).

(3) Route wire J508A20N from relay K104 (14) and connect to ground stud E2.

(4) Route wire J507AA20 from relay K104 (14) and insert pin in contact E of TB502-13.

(5) Route wire E559AC22 from relay K304 (15) to closest proximity of GEN/OUT wire E559A22; connect wires E559AC22 and E559A22 with splice (11, table 3-1).

(6) Route wire J501AE20 from relay K304 (15, fig. 1-1) to contact 1 of ARM-OFF switch (S11) (19); install terminal (12, table 3-1) on wire J501A20; connect terminals of wires J501AE20 and J501A20 to contact 1 of ARM-OFF switch (S11). Route wire J501A20, install terminal (13) and connect to contact 2 of circuit breaker 106 (CB106).

(7) Route wire J502E20 from relay (K304) (15, fig. 1-1) and connect to contact 4 of ARM-OFF switch (S11).

(8) Arrange relay wires to form smooth flow integrating with existing wire bundles; use tie-straps (2, table 3-1) as required to secure wire bundles. Ensure sufficient wire slack to avoid stress on solder joints.

(9) If bracket (18, fig. 1-1) has been removed for installation ease, clean bracket/panel contact areas to ensure positive ground; install bracket (18) with screws (16) and washers (17).

(10) Route ground wire J505A20N from switch (XDS9) coil housing (29) and connect to ground stud E2.

(11) Route wire J502D20 from RE-IGN/ARMED switch (XDS9) (29) and connect to contact 6 of ARM-OFF switch (S11).

(12) Route wire J503D20 from switch (XDS9) (25) and insert pin in contact A of TB502-13.

(13) Route wire J501B20 from switch (XDS9) (25) and insert pin in contact A of ARM-OFF switch (S11).

l. Install instrument panel left side cover (HMI - Vol 1).

m. Clean screw attach areas of lower switch and circuit breacker panel to ensure positive grounding bond; install panel.

n. Install edge-lighted panel and ash tray on lower switch and circuit breaker panel.

o. Perform operational check of engine automatic reignition electrical system in accordance with paragraph 2-5.

3-9. RELAY AND SWITCH ASSEMBLY (MILITARY CONFIGURATION).

a. Remove console right side cover (HMI - Vol 1).

b. Remove additional panels as required to facilitate installation of engine automatic reignition switches and wiring.

c. Remove ARM-OFF and RE-IGN/ARMED switch hole covers from instrument panel.

d. Locate relay bracket (for relays K104 and K304) (14 and 15, fig. 1-2) on right side of console inner panel.

e. Install relays K104 and K304 (14 and 15) as follows:

(1) Install relay K104 (14) in outboard position, and relay K304 (15) in inboard position, on relay bracket, with screws (13), washers (12), and nuts (11).

(2) Arrange relay wires to form a smooth flow, integrating with existing wire bundles; use tie-straps (2, table 3-1) as required to secure wire bundles. Ensure,sufficient wire slack to avoid stress on solder joints.

f. Install ARM-OFF switch (S11) (16, ig. 1-2), and RE-IGN/ARMED switch assembly (21 thru 27), as follows:

(1) Clean area around ARM-OFF (S11) switch hole in instrument panel to prepare bonding

surface for switch (XDS9) support (20, fig. 1-2); install (AUTO RE-IGNITION) decal (15, table 3-1). Clean all surfaces around holes in support (20, fig. 1-2).

(2) Insert threaded shank of ARM-OFF switch (S11) (16) through half-inch mounting hole in support (20) followed by key washer with washer tang toward switch actuator arm.

(3) Insert ARM-OFF switch (S11) (16) through half-inch mounting hole in instrument panel; install washer and nut making certain key washer tang is in small hole adjacent to half-inch hole in panel.

(4) Clean portion of cylindrical (coil) housing (26) to contact clamp (21); insert switch assembly (XDS9) into square cutout mounting hole in instrument panel.

(5) Secure housing (26) of switch (XDS9) to support (20) with clamp (21), screw (19), washers (18), and nut (17).

g. Install electrical wiring as follows:

(1) Route wire J502A20 from relay K104 (14) to ARM-OFF switch (S11) (16) and connect to contact 3 of ARM-OFF switch (S11).

(2) Route wire J503EE20 from relay K104 (14) and insert pin in contact C of terminal block 502, module 13 (TB502-13).

(3) Route wire J508A20N from relay K104 (14) and connect to ground stud E31.

(4) Route wire J507AA20 and insert pin in contact E of TB502-13.

(5) On aircraft equipped with 369D294201-703 instrument panel, install wire E559AC22 as follows:

(a) Install module No. 20 (28) on TB502.

(b) Route wire E559AC22 from relay K304 (15) to TB502 and insert pin in contact C of TB502-20.

(c) Install pin (14, table 3-1) on wire E559AB22; insert pin in contact A of TB502-20 and route wire to plug P12. Crimp pin on opposite end of wire E559AB22 and insert pin in contact D of P12.

(d) Install pin (14) on wire E559AA22; insert pin in contact B of TB502-20. Route opposite end of wire E559AA22 to GEN OUT (XDS18) warning light and solder (1) to contact 3.

(6) On aircraft equipped with 369D294201-705 instrument panel, install wire E559AC22 as follows:

(a) Route wire E559AC22 to closest proximity of wire E17A22 (routed between P526-EE and P527-A).

(b) Cut wire E17A22; install 2.5-inch length of silicone tubing (9) and splice (11) wires E559AC22 and E17A22. Slide tubing over splice and secure with tie-straps (2).

(7) Route wire J501AE20 from relay K304 (15, fig. 1-2), and connect to contact 1 of ARM-OFF switch (S11) (16).

(8) Route wire J502E20 and connect to contact 4 of ARM-OFF switch (S11).

(9) Route ground wire J505A20N from switch (XDS9) (26) and connect terminal to ground stud E31.

(10) Route wire J502D20 from switch (XDS9) (26) and connect terminal to contact 6 of ARM-OFF switch (S11).

(11) Route wire J503D20 from switch (XDS9) (22) and insert pin in contact A of TB502-13.

(12) Route wire J501B20 from switch (XDS9) (22) and connect to contact 3 of ARM-OFF switch (S11).

(13) Relocate wire J501A20 as follows:

(a) On aircraft equipped with 369D 294201-703 instrument panel, disconnect wire J501A20 from CB124 on circuit breaker panel, and connect to contact 2 of CB106.

(b) On aircraft equipped with 369D 294201-705 instrument panel, disconnect wire J501A20 from CB119 on circuit breaker panel, and connect to contact 2 of CB105.

h. Install black cover decals (17 and 18, table 3-1) over AUTO RE-IGN markings of previously used circuit breaker position on edge lighted circuit breaker panel; install new AUTO RE-IGN decal (16), see figure 3-1.

i. Install console right cover.

j. Secure all panels loosened or removed for access.

k. Perform operational check of engine automatic reignition system in accordance with paragraph 2-5.

3-10. WEIGHT AND BALANCE.

3-11. Weight and balance changes resulting from installation of engine automatic reignition equipment are listed in table 3-2. After installation of the engine automatic reignition system equipment, incorporate changes in helicopter weight and balance record as instructed in HMI - Vol 2.

Table 3-2. Weight and balance data

	Weight (lb)	Arm (in.)	Moment (in.-lb/100)
Added	1.5	91.5	1.4
Removed	0.0	0.0	0.0
Change	+1.5	91.5	+1.4

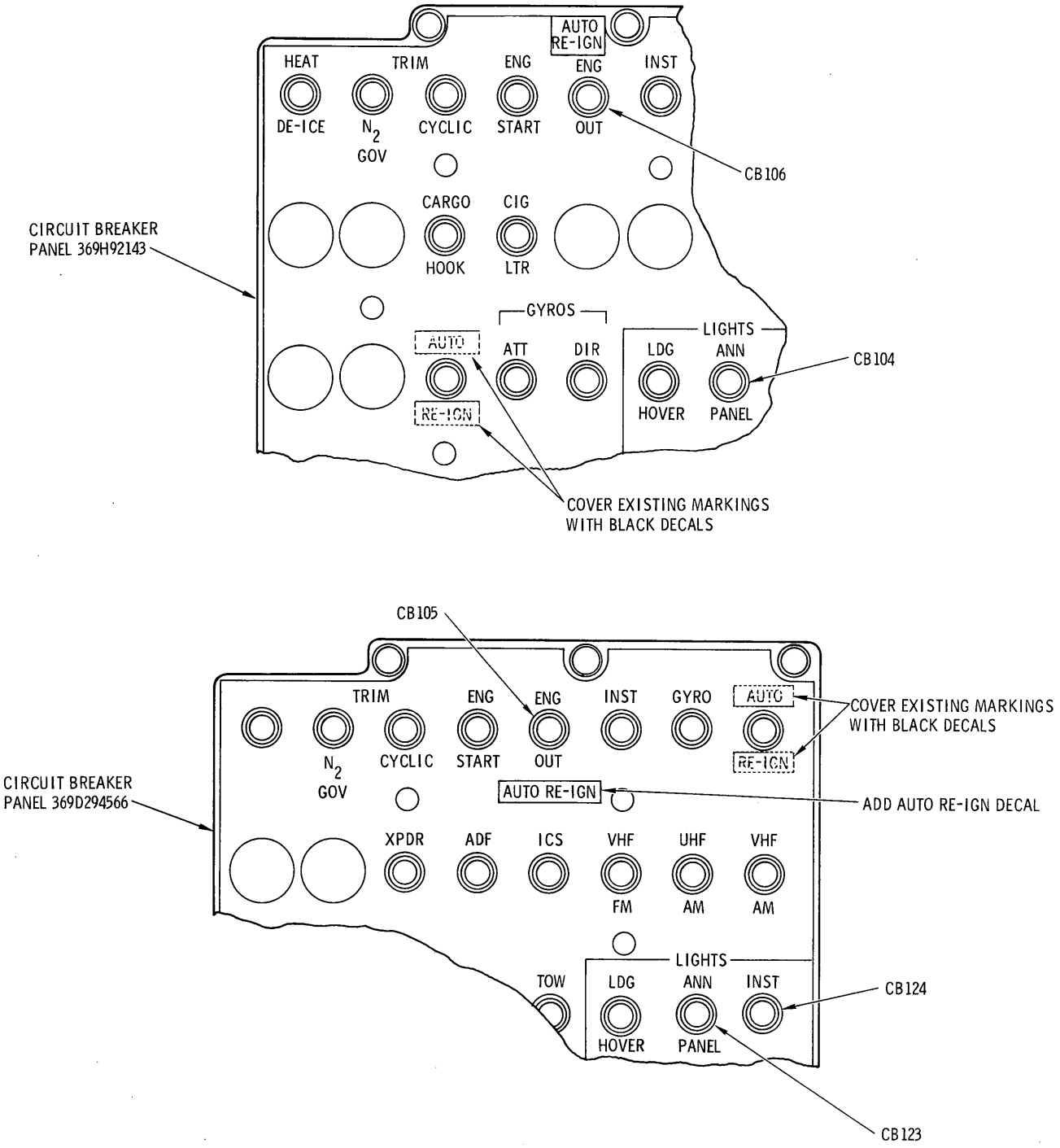


Figure 3-1. Circuit breaker panel - decal installation (military configurations)