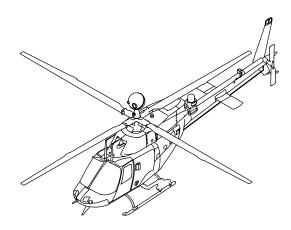
TECHNICAL MANUAL

OPERATIONAL CHECKS AND MAINTENANCE ACTION PRECISE SYMPTOMS (MAPS) DIAGRAMS

AVIATION UNIT
AND INTERMEDIATE
MAINTENANCE MANUAL
FOR ARMY
OH-58D HELICOPTERS



ARMY MODEL OH-58D HELICOPTER

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

THIS VOLUME IS ONE OF A SERIES OF THREE VOLUMES AND IS INCOMPLETE WITHOUT TM 1-1520-248-T-2 AND TM 1-1520-248-T-3.

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CHANGE

NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 January 2001

Operational Checks and Maintenance Action Precise Systems (MAPS) Diagrams

Aviation Unit and Intermediate Maintenance Manual

ARMY MODEL OH-58D HELICOPTER

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TM 1–1520–248–T–1, 28 February 2000, is changed as follows:

1. Remove and insert pages as indicated below. New or changed material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
A and B	A and B
2-75 through 2-196	2-75 through 2-196
	2-196.1/(2-196.2 blank)
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F-1 through F-43/(F-44 blank)	F-1 through F-43/(F-44 blank)
G-1 and G-2	G-1/(G-2 blank)
G-3 through G-29/(G-30 blank)	
Glossary-1 and Glossary-2	Glossary-1 and Glossary-2
Index-1 through Index-37/(In dex-38 blank)	Index-1 through Index-38
	Index-39 through Index-42

2. Retain this sheet in front of manual for reference purposes.

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Official:

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CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 November 2000

Operational Checks and Maintenance Action Precise Systems (MAPS) Diagrams

Aviation Unit and Intermediate Maintenance Manual

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Remove pages Insert pages A/(B blank) A/(B blank) c and d c and d i and ii i and ii xxiii/(xxiv blank) xxiii/(xxiv blank) 1-13 and 1-14 1-13 and 1-14 1-29 and 1-30 1-29 and 1-30 1-35 and 1-36 1-35 and 1-36 1-39 and 1-40 1-39 and 1-40 1-43 and 1-44 1-43 and 1-44 2-3 through 2-16 2-3 through 2-16 2–19 and 2–20 2-19 and 2-20 2-29 and 2-30 2-29 and 2-30 2-35 and 2-36 2-35 and 2-36 2-39 and 2-40 2-39 and 2-40 2-43 and 2-44 2-43 and 2-44 2-49 through 2-62 2-49 through 2-62

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WARNING

HIGH VOLTAGE

The helicopter contains high voltage and shall be electrically grounded when parked. Serious burns and electrical shock can result from contact with exposed electrical wires or connectors.

WARNING

HIGH VOLTAGE

High voltage may be stored in the ignition system after operation of the Aviation Ground Power Unit. This high voltage can cause injury or death.

- Do not make contact with exposed wires or connectors.
- Allow at least 5 minutes after operation of the ignition system before disconnecting or removing ignition system components.
- Turn all power switches off before making any connections or disconnections.
- Observe instructions for grounding the power cable to discharge high voltage.
- For artificial respiration, refer to FM 21-11.

WARNING

STRAY VOLTAGE

Stray voltage may exist in electronic equipment installed in the helicopter. These voltages present an explosive hazard to fuel and fuel fumes. Severe injury or death could result.

WARNING

PITOT HEAT

The pitot tube assembly is very hot during and for several minutes after operation requiring pitot heat. Severe burns will result if contacted by hands or other parts of the body.

WARNING

LUBRICATING OILS HAZARDOUS

Lubricating oils DOD-L-85734, MIL-L-7808, and MIL-L-23699 contain materials hazardous to health. They can cause paralysis if swallowed. Prolonged contact with skin can cause irritation. Fire can result if exposed to heat or flames.

- Use only in areas with adequate ventilation.
- Wash hands thoroughly after handling.

WARNING



The laser rangefinder/designator (LRF/D) is very dangerous. Looking at the laser beam or its reflection from a shiny surface can cause permanent blindness. Under noncombat conditions, the laser shall be used only in controlled areas and at times specified by a range control officer.

Laser firing system may store a charge. Take care to prevent accidental pulsing of the laser and to avoid electric shock. Personal injury may result. Reflections from the laser beam are extremely dangerous. Serious eye injury will result. It is essential that all reflective material be removed from its path.

BATTERY ELECTROLYTE

Corrosive battery electrolyte (potassium hydroxide) requires rubber gloves, apron, and faceshield when handling leaking batteries. Potassium hydroxide spilled on clothing or other material shall be washed off immediately with clean water. If spilled on personnel, severe skin burns will result. Immediately start flushing the affected area with clean water and continue flushing until medical assistance arrives.

WARNING RADIATION HAZARD



SELF-LUMINOUS DIALS

Self-luminous instrument dials contain radioactive materials.

- If glass is broken or case becomes unsealed, avoid personal contact. Injury to personnel could result.
- Forceps or gloves made of rubber or polyethylene shall be used to pick up contaminated material.
- Place material and gloves in a plastic bag and dispose of it as radioactive waste in accordance with AR 755-15 and TM 3-261.
- Repair procedure shall conform to requirements in AR 700-52.

WARNING

SOLVENT

Drycleaning solvent is flammable and toxic. It can irritate skin and cause burns.

- Use only in well-ventilated area away from heat and open flame.
- Wear rubber gloves and goggles.
- In case of contact, immediately flush skin or eyes with water for at least 15 minutes.
- Get medical attention for eyes.

WARNING

SOUND LEVEL

Sound pressure levels in this helicopter during operating conditions exceed the Surgeon General hearing conservation criteria. Hearing protection devices, such as aviator helmet or ear plugs or ear sound suppressors, are required to be worn by all personnel in and around the helicopter during its operation.

WARNING

MAIN AND TAIL ROTOR BLADES

Stay clear of turning main and tail rotor blades. Wind gusts, coast down or cyclic movement may cause the main rotor blade to flap down below the height of a person. Dangerous winds are created by the main rotor blades when blades are operated at or near top rpm. Adequate distance must be maintained from main and tail rotor blades during operation. Severe injury or death may result.

WARNING

ARMAMENT

Loaded weapons, or weapons being loaded or unloaded, shall be pointed in a direction which offers the least exposure to personnel or property in the event of accidental firing. Personnel should remain clear of all loaded weapon hazard areas. Death or severe injury may result.

WARNING

HF ANTENNA

Ensure that HF antenna is not operating while performing maintenance. When operating, HF antenna emits infrared radiation that can cause radiation burns. If exposed to infrared radiation, seek medical aid immediately.

WARNING

ASBESTOS DUST

Avoid creating dust. Breathing asbestos dust may cause serious bodily harm.

d

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical bar in the outer margins of the page. Changes to illustrations are indicated by a vertical bar or a pointing hand adjacent to the area of the change.

Dates of issue for original and changed pages are:

 Original
 0
 28 February 2000

 Change
 1
 30 November 2000

 Change
 2
 31 January 2001

TOTAL NUMBER OF PAGES IN THIS VOLUME IS 856, CONSISTING OF THE FOLLOWING:

Page	*Change	Page	*Change	Page	*Change
No.	No.	No.	No.	No.	No.
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Cover-2 Blant	k0	2-11	0	2-196.1 Adde	ed2
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iii — xxii	0	2-21 — 2-28 .	0	B-1 — B-2	2
xxiii		2-29		C-1 — C-2	2
xxiv Blank	0	2-30 — 2-34 .	0	D-1 — D-66 .	2
1-1 — 1-13	0	2-35		D-67 Added.	2
1-14		2-36 — 2-39 .	0	D-68 Blank	2
1-15 — 1-28 .	0	2-40	1	E-1 — E-6	0
1-29 — 1-30 .		2-41 — 2-43 .	0	F-1 — F-20	
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OPERATIONAL CHECKS AND MAINTENANCE ACTION PRECISE SYMPTOMS (MAPS) DIAGRAMS

AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL FOR ARMY OH-58D HELICOPTERS

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal, AL 35898-5230. You may also submit your recommended changes by E-mail directly to Is-Ip@redstone.army.mil in the format provided in the back of this manual immediately preceding the hard copy 2028. DA Form 2028's may also be faxed to DSN 788-6546 or commercial fax 256-842-6546. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

1. GENERAL

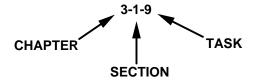
To get the job done correctly, you must be able to find all the information you need. Knowing how to use this manual is the key. You should know what is in this manual, how it is organized, and how to use it.

2. ORGANIZATION

- a. The complete OH-58D and OH-58D(R) Kiowa Warrior helicopter troubleshooting manual consists of a set of three volumes. These volumes are numbered as follows: TM 1-1520-248-T-1 through TM 1-1520-248-T-3. The troubleshooting manual, TM 1-1520-248-T, contains operational checks and maintenance action precise symptoms (MAPS) diagrams for applicable helicopter systems.
- b. Volumes are made up of chapters. Each chapter is numbered in Arabic numerals (1, 2, 3, etc.). A chapter is an individual book which has maintenance information covering a helicopter system or systems.
- c. Chapters (books) are broken down into sections. Sections are numbered in Roman numerals (I, II, III, etc.).
- d. Sections are made up of tasks. Each task is numbered in Arabic numerals (1, 2, 3, etc.). Sections cover maintenance procedures for a particular system.
- e. Tasks are detailed descriptions of operational checks and MAPS diagrams. Some tasks are brief. Some are several pages long.
- f. The title of each task contains the name of the component followed by the type of operation that is being described, e.g., operational check or MAPS diagram.
- g. A task starts with an initial setup which is followed by a step-by-step procedure on how to perform the task correctly. The steps in the procedures have illustrations to help make things clear.
- h. The words "INSPECT" or "INSPECT" may be seen in a task. "INSPECT" is a paragraph heading that introduces inspection steps to be performed by the technician. "INSPECT" means that the maintenance procedure must be stopped until a Scout Helicopter Technical Inspector (TI) has inspected the work performed to that point.
- i. If applicable, a paragraph called "FOLLOW-ON MAINTENANCE" may be seen at the end of a task. The steps listed will be required to place the helicopter in a flyable state following the completion of the maintenance task.
- j. A reference to TM 1-1520-248-23 will be made if removal and installation must be performed to effect repair of individual system components.
- k. A reference to TM 11-1520-248-23 will be made if an avionics system operational check or troubleshooting procedure needs to be performed to ensure serviceability.

3. TASK NUMBERING

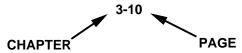
Task numbers are in three parts. The first is the chapter number. The second is the section number in that chapter. The third number is the actual task sequence number in the section. Each number is separated by a (–) as shown in the example:



Task numbers are the most important numbers in the manual. Always use the task number to find information – NOT the page number.

4. PAGE NUMBERING

All page numbering is by chapters except front matter. The first number is the number of the chapter; the second number is the number of the page in that chapter. The numbers are separated by a dash as shown in the example:



5. MANUAL INDEX

a. At the end of Volume I is an alphabetical index for the entire troubleshooting manual set. The index lists all task titles and certain key paragraphs of non-task text in alphabetical order. After you find the title in the index, it tells the task number or paragraph number of that task or text. For example, if you need information on the SCAS and hydraulic electrical system, go to the "S" sections of the index and look under "SCAS."

There you will find:

SCAS and Hydraulic Electrical System — Operational Check (OH-58D).

The index tells that the SCAS information is in chapter 2, section 6, task 43.

b. You can find your task in the index, even if you only know a single word in the title. In the sample SCAS titles you could also find your tasks by looking under "Hydraulic". Examples:

Hydraulic Electrical System, SCAS and — Operational Check (OH-58D) 2-6-43

Or, you could look under "Electrical"

Electrical System, SCAS and Hydraluic — Operational Check (OH-58D) 2-6-43

c. Any task can be located in the way described. If you know the name, job, part, assembly, procedure, description, etc., you can use one of the words to find the paragraph number in the index. It makes locating information quick and easy.

6. GLOSSARY

- a. A glossary of words used throughout the manual is located just before the alphabetical index of Volume I. The glossary contains a list of abbreviations and acronyms. Abbreviations are shortened terms for words and phrases. Acronyms are words formed by the first letter of each of several words. Abbreviations and acronyms are defined where first used. The glossary provides a good place to check if there is any doubt.
- b. Review the glossary periodically to ensure familiarity with the abbreviations and acronyms.

7. INITIAL SETUP (Example next page)

The first page of each operational check in Volume I is the initial setup. Always check the initial setup before starting a task. The initial setup contains information you must know. DON'T START A TASK UNTIL:

- You understand the task
- You understand what you are to do
- You understand what is needed to do the work
- You have the things you need.

An example initial setup is shown below. Not all tasks have the headings shown.

Each part of the initial setup is explained by the following subparagraphs (a. through g.). Each subparagraph describes initial setup entries in the order of their appearance in the example.

- a. **Title:** The title in the upper border contains the chapter/section/task number and title of the task as listed in the index.
- b. Applicable Configuration: Equipment model designator that the task is used to maintain.
- c. **This Task Covers:** This entry appears in the border below the title and provides a brief description of the task.
- d. **Tools:** This heading identifies the list of tool kit(s) by MOS(s). The tools in the kit(s) and any others listed will be all that is required to perform the task. Tasks requiring tools other than those in this tool kit are considered SPECIAL TOOLS. Special tools could be: (1) tools from the shop set: (2) tools from the kits of other MOS's, or (3) tools made especially for the OH-58D helicopter. Special tools will be listed in addition to MOS tool kits when needed. Tool kits and special tools have an item number assigned to them and are located in Appendix B. Appendix B contains a "Tools and Test Equipment Requirements" listing. Each item listed has an Equipment Reference Code. This code is used to clearly identify a tool or item of test equipment, e.g., (B18). It is acceptable to use a substitute torque wrench other than the one listed as long as the torque range is the same. Example: 1/4 inch drive torque wrench 30 INCH-POUNDS to 150 INCH-POUNDS or 3/8 -inch drive torque wrench 30 INCH-POUNDS to 150 INCH-POUNDS. If a tool or a part will have to be made, it is listed in an index in Appendix E. The index will identify the tool or part by name or part number, and a figure number in Appendix E will be referenced. All information required to construct a part or tool is provided in the figure.

INITIAL SETUP EXAMPLE

2-2-1 HYDRAULIC SYSTEM — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

ΑII

Tools:

General Mechanic Tool Kit (B15) Maintenance Stand (B9) Aviation Ground Power Unit (APU) Hydraulic Test Stand

Material:

Wiping Rags (C5)

Personnel Required:

68H Aircraft Pneudraulics Repairer 67S Scout Helicopter Repairer 67S Scout Helicopter Technical Inspection (TI)

References:

TM 1-1520-248-23

Equipment Condition:

Forward Fairing Assembly Removed (TM 1-1520-248-23)

- d. **Material:** This heading identifies the list of materials needed to complete the task. Most materials cannot be used on the helicopter a second time; they are expendable. Expendable materials are items such as solvent, grease, oil, hydraulic fluid, etc.
 - (1) Each expendable has an item number assigned to it and is located in Appendix C. The item number is placed in parentheses following the item name on the initial setup page. A typical example of an expendable item is:

Wiping Rags (C5)

See the expendable and durable item list in Appendix C for more information about expendable and durable materials.

(2) Some parts are also expendable.

- (3) It may be necessary to use a part as a tool to do a step in a task. These parts do not appear in TM 1-1520-248-23P. A typical example would be when a bolt is used to temporarily hold an assembly in place or to align two pieces of material to be fastened.
- e. **Personnel Required:** This heading lists the people required to perform the task. It also tells the MOS of each person and the number of persons required. For example:

67S Scout Helicopter Repairer

One to Assist

67S Scout Helicopter Technical Inspector (TI)

This listing would indicate that one 67S repairer, one of any MOS to assist, and a 67S technical inspector will be needed to complete the task.

IF YOUR MOS IS NOT LISTED IN THE PERSONNEL REQUIRED COLUMN IN THE INITIAL SETUP, CHECK WITH YOUR MAINTENANCE SUPERVISOR FIRST BEFORE STARTING THE TASK.

- f. **References:** This heading identifies the list of other technical manuals (TMs) needed to complete a task. The steps in the task will tell you when you must refer to another TM.
- g. **Equipment Condition:** This heading identifies the list of tasks or parts of tasks that must be accomplished before starting a task. It may require an operation such as jacking the helicopter, or just the tailboom; or removing parts, assemblies, etc. These operations are described in other tasks or technical manuals. The paragraphs or TMs that describe how to do these operations are referenced here. If the job is to be done on the helicopter, the statement "Helicopter Safed" will appear here. The reference will be to the TM 1-1520-248-23 task where aircraft or armament safing is described. It is essential that equipment conditions listed in a particular task be followed in sequence so that required conditions are not missed, and all required tasks are reviewed prior to start of maintenance.

8. WARNINGS, CAUTIONS AND NOTES

The warnings used in this manual may be in text or icon format. Text warnings are used to describe hazardous situations, and icons are for hazardous materials and certain operations where defined.

Icon warnings are pictorial images which may be used in place of words. The safety summary sheet explains in detail what each icon means.

WARNING AND CAUTION STATEMENTS

WARNING and CAUTION statements are used prior to operating or maintenance procedures, practices, or conditions considered essential to the protection of personnel (WARNING) or equipment and property (CAUTION). A WARNING or CAUTION will apply each time the related step is repeated. Prior to starting any task, the WARNINGS or CAUTIONS included in the text for that task will be reviewed and understood. Refer to the materials list figure at the beginning of the appropriate manual section for material used during maintenance of this equipment. The detailed warnings for hazardous material and operations are listed separately in the safety summary as "Hazardous Materials and Operations Icons."

HAZARDOUS MATERIALS

This publication describes physical and chemical processes which may require the use of chemicals, solvents, paints, or other commercially available hazardous material. The user of this publication should obtain the material safety data sheets (Occupational Safety and Health Act (OSHA) Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. The user must become

completely familiar with the manufacturer/supplier information and adhere to the procedures, recommendations, warnings, and cautions of the manufacturer/supplier for the safe use, handling, storage, and disposal of these materials.

HAZARDOUS MATERIALS WARNINGS

Warnings for hazardous material in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them during actual use. For each hazardous material used, the material safety data sheet (MSDS) is required to be provided and available for review by the users. Consult your local safety and health staff concerning any questions on hazardous chemicals, MSDSs, personnel protective equipment requirements, and appropriate handling and emergency procedures.

The Safety Summary gives the complete warnings for hazardous material used in this manual.

Notes tell something extra or special a person must know to do the task. They can appear before or after the item they tell about. Notes must be read and remembered when working on the helicopter.

9. USE OF SHALL, WILL, SHOULD, AND MAY

Within this technical manual the word shall is used to indicate a mandatory requirement. The word will is used to express a declaration of purpose or futurity. The word should is used to indicate a desired result or a nonmandatory but preferred method of accomplishment. The word may is used to indicate an acceptable method of accomplishment.

10. TORQUING INFORMATION

- a. An inspector shall be present to verify all torques specified in this manual.
- b. Each hardware fastener (except types used in sheet metal work) is assigned an applied torque.
- c. There are two types of applied torques. They are: special torques and standard torques.
 - (1) Special torques differ from standard torques as determined by engineers who look at each application. Special torques are given in bold type. Torque wrenches and adapters to be used when a special torque is given are listed under TOOLS in the initial setup.
 - (2) Standard torques are listed in Appendix P of TM 1-1520-248-23. Standard torques not listed in Appendix P can be found in TM 1-1500-204-23. Standard torque applies to all fasteners for which a special torque is not specified.

11. <u>INSPECTION INFORMATION</u>

General inspection information is in the front of each chapter or section for the equipment covered in that chapter or section. Inspection criteria peculiar to a specific part, assembly, or component are in the inspection steps of the removal/installation task for that part, assembly, or component.

12. GENERAL MAINTENANCE INFORMATION

The following are considered standard maintenance practices. Instructions about these practices will not normally be included in maintenance procedure task steps.

- a. Lines will be tagged before they are disconnected. Tubes and parts will be capped or plugged when they are disconnected.
- b. Used preformed packings, retainers, gaskets, cotter pins, lockwashers, etc., are to be discarded. New parts shall be installed.

- c. Packings are coated before installation. Specific instructions are provided in each maintenance procedure.
- d. Tubes and related parts will be tied out of the way with twine, not lockwire.
- e. Disassembly procedures reflect disassembly needed to support total authorized repair. You may not need to disassemble a part as far as described in the task. Follow the steps to disassemble as far as needed to repair/replace worn or damaged parts.
- f. Before a component or the disassembled parts of a component are inspected, they are cleaned as required.
- g. Components and mating surface areas will be inspected for serviceable condition before installation.
- h. Guide lines will be used when any item is hoisted overhead.
- i. When a nut is tightened or loosened on a bolt, the bolt head will be held with a wrench.
- j. When a coupling nut on a line is tightened or loosened, the mating fitting will be held with a wrench.
- k. A special torque will be cited when the words TORQUE TO are used. A standard torque is required when no specific torque is given. Standard torque information is located in Appendix P of TM 1-1520-248-23 and in TM 1-1500-204-23.
- I. When torquing hardware, observe compliance with drag torque as required. To determine drag torque, thread nut onto screw or bolt until at least two threads protrude. The nut shall not contact the mating part. The torque necessary to begin turning the nut is the drag torque. Drag torque is explained in more detail in TM 1-1500-204-23.
- m. Chafing is a condition which occurs when two or more components contact each other in such a manner that friction and consequent wear occur. This condition is not acceptable. Proper routing, clamping, and component installation are required.

13. ELECTRICAL WIRING AND CABLING

TM 1-1520-248-23 contains removal and installation procedures for wiring harness/cable assemblies that are permanently installed in the helicopter. Wiring harnesses/cable assemblies that can be or are normally removed with avionic/electronic equipment are contained in TM 11-1520-248-23. Wiring harnesses/cable assemblies applicable to Armament Systems are contained in TM 9-1090-214-23&P where these wiring harnesses/cable assemblies are external to the helicopter fuselage.

14. REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

This portion of the manual series, the TM 1-1520-248-23P, lists parts; special tools; test, measurement, and diagnostic equipment (TMDE); and other support equipment required for operation and performance of Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM), and depot maintenance of the OH-58D Scout Helicopter. Included are an Introduction, Repair Part Lists, Special Tools List, and a National Stock Number and Part Number Index.

15. UNSERVICEABLE PARTS DISPOSITION

Unserviceable parts must be tagged as unserviceable and returned to unit supply. Refer to DA PAM 738-751 for forms, records, and reporting procedures.

16. GENERAL REFERENCES

- a. Refer to TM 55-1500-323-24 for all electrical tasks of a general nature not peculiar to the OH-58D helicopter.
- b. Refer to TM 1-1500-204-23 for mechanical tasks of a general nature not peculiar to the OH-58D helicopter.

c. Refer to TM 55-1500-335-23 for approved nondestructive inspection methods.

17. APPENDICES

The organization and content of Appendices to this manual set are provided for reference as required during performance of maintenance tasks. Appendices are contained at the end of Volume I just before the glossary.

Appendix A is a list of References.

Appendix B is the Tool and Test Equipment Requirements List.

Appendix C is an Expendable Supplies and Materials List.

Appendix D is Wire Data.

Appendix E provides Manufactured Items Data.

Appendix F lists the Fault Detection Location System (FDLS) Failure Codes for OH-58D helicopters

Appendix G lists the Fault Detection Location System (FDLS) Failure Codes for OH-58D(R) helicopters

Table 1. Organization and Content of Appendix A

Organization	Content
References List	List of additional manuals required for use by Maintenance Personnel in the performance of their duties.

Table 2. Organization and Content of Appendix B

Organization	Content
Tool and Test Equipment Requirements List	List of tools and test equipment, including special tools and common tool sets required for each maintenance function as referenced in individual tasks.

Table 3. Organization and Content of Appendix C

Organization	Content
Scope	Description of purpose and limits for the Appendix.
Explanation of Columns	Description of the tabular layout by function.
	Expendable Supplies and Material List in both numerical and alphabetical order.

${\bf HOW\ TO\ USE\ THIS\ MANUAL-- continued}$

Table 4. Organization and Content of Appendix D

Organization	Content
Wire Data	Essential general wiring information about electrical systems and circuits.
Equipment List	Electrical equipment items listed by reference designator and their nomenclature, location, and access in tabular form.
Wire Repair and Replacement	Wiring repair and replacement data including wire sizes and part numbers, wire construction, marking, soldering, support, and stripping.

Table 5. Organization and Content of Appendix E

Organization	Content
Part Number Index	Part numbers arranged in alphanumeric order along with figure reference for each part number.
Illustrations of Manufactured Items	Illustrations of locally manufactured items in sufficient detail to enable their construction.

Table 6. Organization and Content of Appendix F

Organization	Content
Introduction	General information about the Appendix.
FDLS Codes	List of Fault Detection Location System (FDLS) failure codes for OH-58D helicopters.

Table 7. Organization and Content of Appendix G

Organization	Content
Introduction	General information about the Appendix.
FDLS Codes	List of Fault Detection Location System (FDLS) failure codes for OH-58D(R) helicopters.

SAFETY SUMMARY

1. GENERAL SAFETY INSTRUCTIONS.

This manual contains procedures which, if not followed properly, can cause injury or long-term health hazards to personnel. This safety summary includes general safety precautions and instructions that must be understood and applied during operation and maintenance to ensure personnel safety. Prior to performing any task, the WARNINGs included in that task shall be reviewed and understood.



WARNINGs are used in this manual to highlight operating or maintenance procedures, practices, conditions, statements which are considered essential to protection of personnel (WARNING). WARNINGs immediately precede the step or procedure to which they apply. WARNINGs consist of four parts: heading (WARNING or icon [see HAZARDOUS MATERIALS WARNINGS]), or statement of the hazard, maintenance precautions, and possible result if disregarded.

WARNING

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury or long-term health hazards to personnel.

3. HAZARDOUS MATERIALS WARNINGS.

Hazardous Materials Warnings in this manual are provided through use of the Hazard Symbols listed below. Consult the HAZARDOUS MATERIALS DESCRIPTION below or Material Safety Data Sheets (MSDS) (Occupational Safety and Health Administration (OSHA) Form 20 or equivalent) for specific information on hazards, effects, and protective equipment requirements. If you do not have an MSDS for the material involved, contact your supervisor or the base Safety or Bioenvironmental Engineering Office.

3.1 Hazardous Materials and Operations Icons. Icons are used in this manual to identify dangers associated with hazardous materials and certain conditions. The symbols used and their definitions are as follows.





















The abstract bug symbol shows that a material may contain bacteria or viruses that present a danger to your life or health.

The symbol of drops of a liquid onto a hand shows that the material will cause burns or irritation of human skin or tissue.

The symbol of a hand in a block of ice shows that the material is extremely cold and can injure human skin or tissue.

The rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.

The symbol of a person wearing goggles shows that the material will injure your eyes.

The symbol of a flame shows that a material can ignite and burn you.

The symbol of a skull and crossbones shows that a material is poisonous or is a danger to life.

The symbol of three circular wedges shows that the material emits radioactive energy and can injure human tissue or organs.

The symbol of a human figure in a cloud shows that vapors of a material present a danger to your life or health.

The symbol of a lightning bolt shows that you may contact voltage and current that may present a danger to your life or health.





To avoid violent reactions that can cause personal injury, always pour acid into water, never water into acid

The symbol of a head with the ear highlighted shows that the noise level may injure your hearing.

3.2 Hazardous Materials Description. The following hazardous materials are used in this manual. Each icon represents certain hazards as described above. Beneath the icons is the hazardous material name. Below the icons and material name is a description of the hazardous material. Only the icons and material name are used in the text of the manual. If a full description of the hazardous material is required while performing procedures in this manual, use the material name to locate the appropriate description below.









ACETONE O-A-51

Acetone is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke while using acetone, and do not use it where others are smoking. Prolonged inhalation of vapor can irritate eyes and mucous membranes and can cause dizziness and headache. If any liquid contacts skin, wash with soap and water. Immediately remove solventsaturated clothing. If vapors cause drowsiness, go to fresh air. In all cases get immediate medical attention. When handling large quantities of liquid (more than a gallon), use at air-exhausted workbench. Wear approved gloves. Store solvent and dispose of liquid-soaked rags in approved metal safety container. Metal containers of solvent must be grounded to maintain electrical continuity.









ACRYLIC LACQUER, MIL-L-81352/MIL-L-19538

Acrylic lacquer is flammable. Keep away from open flames, sparks, and heat. Overexposure may cause coma, headache, narcotic effect, confusion, depression, irritation of skin, eyes, and respiratory system. Remove contaminated clothing. Wipe off

with towel or cloth. Remove remainder with mineral spirits or lacquer remover and thoroughly wash skin area with soap and water. Immediately flush eyes with water for 15 minutes. If inhaled, move to fresh air. If breathing has stopped perform resuscitation. In all cases get immediate medical attention. When working with acrylic lacquer, wear approved protective gloves, goggles or safety glasses, protective clothing, and approved respirator. Use in a well-ventilated area.



ADHESION PROMOTER A-934BX

Adhesion promoter is flammable: keep away from sparks, flames, and non-explosion proof devices. Inhalation may cause nose and throat irritation, headache, drowsiness, weakness, or exhaustion. Prolonged or repeated skin contact may cause irritation. Vapor and liquid may cause eye irritation. Ingestion may cause intoxication and gastrointestinal irritation. Prolonged overexposure to ethanol can have adverse effects on liver. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Remove contaminated clothing and wash with soap and water. Flush eves with plenty of water for 15 minutes while holding eyelids open. If ingested, dilute with one to two glasses of water or milk. Induce vomiting by sticking finger down throat. In all cases, get immediate medical attention. When working with adhesion promoter, wear approved respirator, goggles, and rubber gloves. Work in well-ventilated area.









ADHESIVE

Adhesive can cause allergic reaction, skin sensitization, or gastrointestinal irritation. Contact with eyes can cause severe burns. Wash skin immediately with soap and water. Flush eyes with water for at least 15 minutes. Get immediate medical attention in event of eye contact with adhesive. Wash contaminated clothing before reuse. Wear approved respirator in closed area. Work in well-ventilated area using approved rubber gloves and safety glasses or goggles.



ADHESIVE, EA93NA

Adhesive may cause allergic reaction, skin sensitixation, or gastrinotestinal irriation. Contact with eyes can cause severe burns. Wash skin immediately with soap and water. Flush eys with water or at least 15 minutes. Get immediate medical attention in event of eye contact with adhesive. Wash approved respirator clothing before reuse. Wear approved respirator in closed area. Work in well ventilated area using approved rubber gloves and safety glasses or goggles.



ADHESIVE, MMM-A-1617, TYPE I, II, OR III

Adhesive may cause irritation to skin, eyes, and respiratory system. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with adhesive, wear approved protective gloves, goggles or faceshield, and respirator approved for organic solvents. Use in a well-ventilated area away from open flame, spark sources, and heat.



ADHESIVE PRIMER, BR 53

Adhesive primer is flammable and its vapor is explosive. Keep away from heat, open flame or other sources of ignition. Inhalation will cause irritation to the respiratory tract. Symptoms are headache, nausea, dizziness, and drowsiness. Move to fresh air and administer oxygen. If skin or eyes are affected wash skin with soap and water

and flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with adhesive primer, wear approved respirator, rubber gloves and splashproof goggles and faceshield. Work in well-ventilated area.



ANTI-ICING/DEICING FLUID, MIL-A-82243

Anti-icing/Decing fluid contains diluted alcohol. Alcohol is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not use while smoking or while others are smoking. Inhalation of vapors can cause drowsiness, dizziness and headache. If vapors cause drowsiness, go to fresh air. Contact with skin may cause irriation. If liquid touches skin or eyes, flush thoroughly with water. Remove contaminated clothing.



ANTISEIZE COMPOUND

Antiseize compound is flammable; do not use near open flames, welding areas, or on hot surfaces. When decomposed by heating, toxic gases are released. Do not use while smoking or when others are smoking. Liquid can cause severe skin and eye irritation. Inhalation of vapor can cause drowsiness, headache and unconsciousness. Wash affected skin with soap and water. Flush eyes with water for at least 15 minutes. If drowsiness occurs, go to fresh air. Seek medical attention if overexposed. Use approved respirator, gloves, and goggles for prolonged use. Dispose of liquid soaked rags in an approved, grounded metal safety container.



CHEMICAL CONVERSION MATERIALS, MIL-C-81706

Chemical conversion materials are strongly oxidizing and are a fire hazard in contact with acid, reducing agents, and combustible and readily oxidizing materials; separate storage is mandatory. Thoroughly rinse rags and containers contaminated with chemical conversion materials and dispose of in a fireproof container. Contact with skin and eyes can cause burns. Breathing of dust or vapors can cause ulceration of mucous membranes. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If ingested, drink milk of magnesia, aluminum hydroxide gel, or lime water followed by large amounts of water. In all cases get immediate medical attention. Wash contaminated clothing before wearing. When working with chemical conversion materials, wear approved respirator, rubber apron, gloves, and goggles or faceshield in a well-ventilated area away from heat, open flames or sparks. Follow approved toxic waste disposal procedures. Read manufacturers label for additional information.



CHROMIC ACID. O-C-303

Chromic acid is highly reactive; do not mix with organic or oxidizable materials such as paper or wood. When mixing solutions, add acid slowly to water, not water to acid. Any contact with skin, or inhalation of vapors and powder can irritate skin and can cause skin ulcers. Repeated or prolonged exposure can cause permanent injury. If any liquid or powder contacts skin, flush affected area with water, and immediately change contaminated clothing. If skin ulcers appear, get immediate medical attention. When handling dry material or solution at air-exhausted workbench, wear approved gloves, apron, and goggles. When handling dry material or solution at unexhausted

workbench, wear approved respirator, gloves, apron, and long sleeves.



CLEANING COMPOUND MIL-C-87936/MIL-C-43616

Aircraft cleaning compound is flammable and is toxic to the skin by absorption and to the liver and kidneys. It can cause irritation of the eyes and respiratory system, skin irritation and headache. Thoroughly wash skin area with water and immediately flush eyes with water for 15 minutes. If ingested, do not induce vomiting. In all cases get immediate medical attention. When working with cleaning compound, wear approved chemical cartridge respirator, rubber gloves, safety goggles, and protective clothing. Keep away from heat and open flames. Use in a well-ventilated area.



COMPRESSED AIR

When using compressed air for any cleaning or drying operation, do not exceed 30 psig at the nozzle. Eyes can be permanently damaged by contact with liquid or large particles propelled by compressed air. Inhalation of air-blown particles or solvent vapor can damage lungs. If injury occurs, get immediate medical attention. When using air for drying or cleaning at an air-exhausted workbench, wear approved goggles or faceshield. When using air for drying or cleaning at an unexhausted workbench, wear approved respirator and goggles.



CORROSION PREVENTIVE COMPOUND, MIL-C-11796

If solution of petrolatum corrosion preventive compound is decomposed by heat, toxic gases are released. Prolonged contact with solution or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If solution contacts eyes, flush eyes with water immediately. Remove saturated clothing. If solution is swallowed, do not

try to vomit. In all cases get immediate medical attention. When handling solution, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



CORROSION PREVENTIVE COMPOUND, MIL-C-16173

Corrosion preventive compound is combustible; do not use near open flames, near welding areas, or on hot surfaces. Prolonged contact with skin can cause skin irritation. Prolonged inhalation of vapor can cause dizziness, headache, and intoxication. If there is any prolonged contact with skin, wash affected area with soap and water. If liquid contacts eyes, flush eyes thoroughly with water. Remove contaminated clothing. If vapors cause light-headedness, go to fresh air. If liquid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid or when applying it at air-exhausted workbench, wear approved gloves. When handling liquid or when applying it at unexhausted workbench, wear approved gloves and goggles. Dispose of liquidsoaked rags in approved metal container.



CORROSION PREVENTIVE COMPOUND, MIL-C-27725

Corrosion preventive compound is flammable. Keep away from ignition sources. Overexposure may cause headache, dizziness, nausea, skin drying, eye irritation, and respiratory irritation. Corrosion preventive compound may also cause narcotic effects, shortness of breath and could affect the central nervous system. Thoroughly wash with soap and water and apply emollient cream or lotion and immediately flush eyes with water for 15 minutes. If inhaled move to fresh air. In all cases get immediate medical attention. When working with corrosion preventive compound, wear approved protective gloves,

goggles, and clothing. Use in a well-ventilated area. If adequate ventilation is not available, wear approved respirator.



CORROSION REMOVING AND METAL CONDITIONING COMPOUND, MIL-C-10578

Corrosion removing and steel protecting compound causes skin irritation. Avoid contact with skin and eyes. If irritation occurs, get immediate medical attention. Wear approved gloves and goggles or faceshield when handling. Wash hands thoroughly after handling.



DENATURED ETHYL ALCOHOL MIL-STD-1201B

Denatured ethyl alcohol and its vapor are flammable and explosive — do not use it where others are smoking. POISON — do not ingest. Ingestion will cause vomiting, stupor, and collapse. Inhalation of vapor may cause headache and drowsiness. If vapors cause drowsiness, go to fresh air. Immediately remove wet clothing. When working with denatured ethyl alcohol, wear approved respirator, gloves, and goggles. If splashing could occur, wear an approved faceshield over the goggles. In case of contact with eyes, flush with water for at least 20 minutes and obtain medical attention. Dispose of liquid soaked rags in approved metal container. Metal containers must be grounded to maintain electrical continuity.



DRILLING OPERATIONS

Metallic structures drilling operations produce airborne metallic dust particles that are harmful to respiratory tract and eyes. Avoid breathing dust and use eye protection when drilling. Avoid composite materials that are toxic to skin, eyes and respiratory tract. When drilling advanced composite materials, avoid inhalation of dust and wear protective gloves and eye protection.



DRY LUBRICANT

Overexposure can cause nausea, vomiting, and irritation of skin, eyes, and respiratory system. If symptoms occur, seek fresh air. Wash affected skin with soap and water. Flush eyes with water for 15 minutes. If ingested do not induce vomiting. In all cases, seek medical attention. Wear approved protective gloves, goggles, and respirator.



DRYCLEANING SOLVENT, P-D-680, TYPE II

Drycleaning solvent is combustible; do not use near open flames, near welding areas, or on hot surfaces. Prolonged contact of skin with liquid can cause skin irritation. Repeated inhalation of vapor can irritate nose and throat and can cause dizziness. If any liquid contacts skin or eyes, immediately flush affected area thoroughly with water. Remove solvent-saturated clothing. If vapors cause dizziness, go to fresh air. In all cases get immediate medical attention. When handling liquid or when applying it in an airexhausted, partially covered tank, wear approved gloves. When handling liquid or when applying it at an unexhausted, uncovered tank or workbench, wear approved respirator and goggles.



DYNASOLVE 165

Dynasolve 165 contains powerful organic solvents. It is harmful if inhaled or swallowed.

Avoid breathing vapors or mist. Keep away from heat and flame. Avoid contact with eyes and skin. Wear gloves, safety goggles, and protective clothing when handling. Use with adequate ventilation. Contact of skin with liquid or inhalation of vapor can cause severe burns, and respiratory system irritation. If any solution, liquid, or vapor contacts skin or eyes, flush affected areas thoroughly with water. Immediately change any contaminated clothing. If vapors are inhaled, go to fresh air. In all cases get immediate medical attention.



ELECTRIC SHOCK

To prevent electric shock, ensure electrical power is off before working on helicopter. Remove watches, rings and other jewelry before working on electrical circuits. Voltage and/or current may be contacted that could present a threat to your health or life. If voltage/current is contacted and breathing ceases, CPR must be administered by qualified personnel. Seek medical aid. For electrical shock safety steps and procedures, refer to TM 1-1500-204-23 and TB 385-4.



EPOXY PRIMER COATING, MIL-P-23377

Epoxy primer coating is flammable. It contains lead and may cause irritation of nose, throat, eyes, skin, respiratory system, and nervous system. Overexposure may result in headache, narcotic effect, nervousness, drying of skin, and possible death. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If ingested, do not induce vomiting. In all cases get immediate medical attention. When working with epoxy primer coating wear approved respirator, chemical splash goggles, solvent resistant gloves, apron, protective clothing, and barrier cream. Work in a well-ventilated area.



EPOXY RESIN, DOD-C-24176

Filled epoxy resin may cause skin and eye irritation. Thoroughly wash skin area with soap and warm water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with epoxy resin, wear approved protective gloves and goggles. Use in a well-ventilated area and avoid breathing vapors.









FINGERPRINT REMOVER, MIL-C-15074

Fingerprint remover is flammable. Do not use near heat or flames. Overexposure may cause skin and eye irritation, dizziness, headache and nausea. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If inhaled, move to fresh air. In all cases get immediate medical attention. When working with fingerprint remover wear approved solvent resistant gloves, goggles or faceshield, and respirator.

FLUORESCENT PENETRANT, MIL-STD-6866



Prolonged or repeated inhalation of powders and vapors of cleaning solvent, developers, and emulsifiers used in fluorescent penetrant inspection can irritate mucous membrane areas of the body. Continual exposure to penetrant inspection materials can irritate the skin. Direct exposure of eyes to light and prolonged exposure of skin to light can inflame and damage eyes and skin. Wear approved neoprene gloves when handling penetrant inspection materials. Keep insides of gloves clean. Store all pressurized spray cans containing penetrants, developers, and emulsifiers in a cool, dry area protected from direct sunlight, heat, and open flames. Temperatures higher than 120 °F (49 °C) may cause pressurized can to burst and cause injury. If direct eye contact with light causes eye problems,

get immediate medical attention. When using black light for fluorescent inspections, wear approved safety glasses.



GREASE, MIL-G-81322

Avoid any skin contact with grease. Wash hands thoroughly with soap and water after handling grease.









HYDRAULIC FLUID, MIL-H-5606

MIL-H-5606 hydraulic fluid is flammable. Flashpoint is 180 °F (82 °C). When hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If liquid contacts eyes, flush eyes with water immediately. Remove saturated clothing. If fluid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.









HYDRAULIC FLUID, MIL-H-83282

MIL-H-83282 hydraulic fluid is flammable. Flashpoint is 400 °F (204 °C). When hydraulic fluid is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist can cause skin irritation. If there is any prolonged contact with skin, wash contacted area with soap and water. If liquid contacts eyes, flush eyes with water immediately. Remove saturated clothing. If fluid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



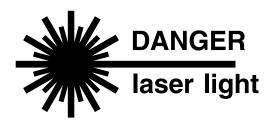
ISOPROPYL ALCOHOL, TT-I-735

Isopropyl alcohol is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not use while smoking or while others are smoking. Inhalation of vapors can cause drowsiness, dizziness, and headache. Contact with skin may cause irritation. If liquid touches skin or eyes, flush thoroughly with water. Remove contaminated clothing. If vapors cause drowsiness, go to fresh air. When handling large quantities (greater than 1 gallon), work at airexhausted workbench or covered tank. Store solvent and liquid-soaked clothes in an approved, grounded metal container.



JET FUEL, MIL-T-5624 AND MIL-T-83133

Jet fuel is flammable; do not use near open flames, welding areas, or on hot surfaces. Do not handle or store near strong oxidants, e.g., liquid oxygen or hypochlorite. Do not smoke when using jet fuel and do not use it where others are smoking. Contact of eyes with liquid can cause severe irritation and blurred vision. Inhalation of vapor may cause irritation, headache, nausea, and dizziness. If liquid contacts eyes, flush eyes thoroughly with water for a minimum of 15 minutes. Immediately remove fuel-saturated clothing. If vapors cause dizziness, go to fresh air. If liquid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling large quantities of liquid (more than 1 gallon) at an unexhausted workbench, wear approved respirator and goggles or faceshield. Dispose of liquid-soaked rags in approved metal container. Contaminated clothing shall be laundered prior to reuse. Metal containers of fuel must be closed and grounded to maintain electrical continuity.



The laser rangefinder/designator (LRF/D) is very dangerous. Looking at the laser beam or its reflection from a shiny surface can cause permanent blindness. Under noncombat conditions, the laser shall be used only in controlled areas and at times specified by a range control officer.



LHE CADMIUM SOLUTION SPS-5070

Cadmium brush plating solution is toxic and may cause damage to skin, eyes, and mucous membranes. Overexposure may cause skin sensitization and skin irritation. Thoroughly wash skin area with water and immediately flush eyes with water for 15 minutes. If vapor causes drowsiness, go to fresh air. In all cases get immediate medical attention. Wear approved rubber gloves, apron, boots, goggles or faceshield, and activated carbon respirator. Work in well-ventilated area. Wash hands thoroughly before eating or smoking.



LUBRICANT, SOLID FILM MIL-L-23398

Solid film lubricant is flammable. Do not use near fire or open flame. Lubricant may cause irritation to skin and upper respiratory system. Inhalation may cause a narcotic effect and light headedness. Swallowing may be fatal. Thoroughly wash skin area with soap and water and immediately flush with water for 15 minutes. If ingested, do not induce vomiting. In all cases get immediate medical attention. When working with lubricant, wear approved rubber gloves, respirator, and

safety glasses or goggles with unperforated side shields. Work in a well-ventilated area.



LUBRICATING OIL, DOD-L-8573/ MIL-L-7808/MIL-L-23699

If lubricating oil is decomposed by heat, toxic gases are released. Prolonged contact with liquid or mist may cause skin irritation. If there is any prolonged contact with skin, wash area with soap and water. If oil contacts eyes, flush eyes with water immediately. Remove saturated clothing. If oil is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid, wear approved rubber gloves. If prolonged contact with mist is likely, wear approved respirator.



NAPHTHA/NAPTHALENE, TT-N-97

Naphtha/Naphthalene is combustible; do not use it near welding areas, near flames, or on hot surfaces. Avoid prolonged or repeated contact with liquid. Contact of skin with liquid can cause irritation. Inhalation of vapors can cause irritation, giddiness, and drowsiness. If liquid contacts eyes, flush eyes thoroughly with water. If there is any prolonged skin contact, wash contacted area with soap and water. If vapors cause drowsiness, go to fresh air. Remove solvent-saturated clothing. If liquid is swallowed, do not try to vomit. In all cases get immediate medical attention. When handling liquid in an air-exhausted, partially covered tank, wear approved gloves. When handling liquid in an open, unexhausted container. wear approved rubber gloves and goggles. If contact with vapor is likely, wear an approved respirator. Dispose of liquid-soaked rags in approved metal container. Metal containers of liquid must be grounded to maintain electrical continuity.



NITRIC ACID, O-N-350

Nitric acid is highly reactive; do not mix with combustible organics or other oxidizable materials such as wood, paper, and cloth. When heated, toxic gases are released. When mixing solutions, add acid slowly to water, not water to acid. Contact of skin with liquid or inhalation of mist can cause severe burns, respiratory system irritation, and chronic bronchitis. If any solution, liquid, or mist contacts skin or eyes, flush affected area thoroughly with water for a minimum of 15 minutes. Immediately change any contaminated clothing. If mist is inhaled, go to fresh air. In all cases get immediate medical attention. If handling solution or concentrated liquid in air-exhausted covered tank, wear approved gloves and apron, and wear approved goggles or faceshield. When handling solution or concentrated liquid in open tank, wear approved respirator, full-body clothing, gloves, and goggles.



NOISE HAZARD

Personnel hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB (A) or greater. Wear approved hearing protection devices when working in high noise level areas. Hearing loss occurs gradually but becomes permanent over time. Hearing protection is required.



PAINT REMOVER, MIL-R-81294 AND TT-R-248

Paint remover can cause severe burns, narcotic effects, headache, dizziness, and nausea. In some cases it may cause elevated blood pressure, unconsciousness, shock, and death.

Contact with eyes may cause blindness. Avoid contact with flammable liquids. Contact with alkali metals, powdered magnesium, and aluminum may cause a violent reaction. Thoroughly wash skin area with water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. When working with paint remover wear approved respirator (manufacturer recommends approved fresh air mask), approved faceshield or goggles, neoprene or Viton gloves, solvent resistant boots, and apron. Work in a well-ventilated area. Read manufacturers label for specific instruction due to variations of each product.



PLASTIC POLISH COMPOUND, P-P-560

Plastic polish compound is flammable. Keep away from heat, open flame or other sources of ignition. Plastic polish compound may be poisonous if inhaled or absorbed through the skin. Vapors may cause dizziness or suffocation and are an irritant to the skin and eyes. Move to fresh air and thoroughly wash skin with water and flush eyes with water for 15 minutes. In all cases, get immediate medical attention. Wear approved safety glasses or goggles and gloves. Use in a well-ventilated area.



POLYURETHANE COATING MIL-C-46168 AND MIL-C-85285

Polyurethane coating is flammable. Keep away from open flame, sparks, heat, and organic material. Exposure can cause skin, eye, nose, throat, and respiratory system irritation. Prolonged exposure may cause headache, allergic sensitivity, narcotic effect, nausea, and vomiting. Ingestion causes lead poisoning. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. If inhaled, move to fresh air. In all cases get immediate

medical attention. When working with polyurethane coating, wear approved chemical resistant rubber gloves, goggles, respirator, and protective clothing. Use in a well-ventilated area.



POLYURETHANE CONDUCTIVE COATING

Polyurethane conductive coating is flammable: do not use near open flames, near welding areas, or on hot surfaces. Contact with liquid or vapor can cause skin or eye irritation. Prolonged overexposure can result in kidney and liver damage, headache, nausea, vomiting, dizziness or loss of consciousness. Prolonged occupational overexposure can result also with permanent brain and nervous system damage. Deliberately concentrating and inhaling the contents may be harmful or fatal. After prolonged skin contact, wash contacted area with lukewarm water for 15 minutes. Remove contaminated clothing promptly. If vapors cause dizziness, go to fresh air, in all cases get immediate medical attention. Dispose of contents in approved metal container. Follow approved toxic waste disposal procedures.



RESINS AND HARDENERS, RP-1257-3/EPON 828

Resins and hardeners are flammable; do not use near open flames, welding areas, or on hot surfaces. When decomposed by heating, toxic fumes are released. Inhalation of vapor can cause irritation, drowsiness, and headache. Contact with eyes can cause severe burns. Flush eyes with water for at least 15 minutes. Wash skin immediately with soap and water. In all cases get immediate medical attention. When mixing or applying liquid in air-exhausted paint spray booth, wear approved gloves and goggles. When mixing or applying liquid in unexhausted work area, wear approved gloves, long sleeves, apron, goggles, and respirator. Metal containers of solution must be grounded to maintain electrical continuity.





RIVETING OPERATIONS

Bucking rivets produces high levels of noise. Hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB (A) or greater. Wear approved hearing protection devices when working in high noise level areas. Hearing loss occurs gradually but becomes permanent over time. Hearing protection is required. Wear goggles or faceshield when riveting to prevent damaging eyes.





SANDING OPERATIONS

Avoid prolonged or repeated contact with sanding, power grinding, or drilling dust. Inhalation of dust may cause temporary coughing and wheezing, respiratory system irritation, and permanent lung problems. If dust contacts eyes, flush them thoroughly with water. If coughing or wheezing persists, get immediate medical attention. When using an air-exhausted grinding wheel, wear approved respirator and goggles or faceshield.









SEALING COMPOUND, MIL-S-22473

Anaerobic sealing compound is flammable; do not use near open flames or welding areas. Avoid prolonged exposure to light. Avoid materials such as peroxide or other strong oxidizing agents, iron rust or carbon monoxide/dioxide. Anaerobic sealing compound can cause dermatitis. It may also cause delayed eye and skin irritations and skin sensitivity. Thoroughly wash skin area with water and immediately flush eyes with water for at least 15 minutes. If ingested, do not induce vomiting. Keep individual calm. In all cases, get immediate medical attention. When working with anaerobic sealing compound, wear approved rubber apron, boots, gloves, and goggles or faceshield in well-ventilated area.









SEALING COMPOUND, MIL-S-8784

Sealing compound is flammable. Do not use near heat, open flames, or sparks. Overexposure can cause irritation of skin and eyes, headache, nausea, vomiting, and systemic problems. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. Wear approved protective gloves and goggles. Avoid breathing of vapors and prolonged or repeated skin contact.









SEALING COMPOUND, MIL-S-8802

Sealing compound is flammable. Do not use near heat, open flames, or sparks. Overexposure can cause irritation of skin and eyes, headache, nausea, vomiting, and systemic problems. Thoroughly wash skin area with soap and water and immediately flush eyes with water for 15 minutes. In all cases get immediate medical attention. Wear approved protective gloves and goggles. Avoid breathing of vapors and prolonged or repeated skin contact.









SHELLAC

Shellac is flammable. Keep away from heat, sparks, and open flame. All electrical equipment must be explosion proof. Shellac may cause irritation of eyes, nose, and throat. Headache, intoxication, and drowsiness may occur. In case of skin contact, flush contact area thoroughly with water. For inhalation, remove to fresh air and give oxygen. In all cases, get immediate medical attention. Use shellac in well-ventilated area. When handling wear approved rubber gloves and safety goggles.



SILICONE, MIL-L-46058

Conformal coating is flammable. Do not use near open flame or high temperatures. Repeated or prolonged contact or inhalation of vapors can cause skin and eye irritation, or damage to lungs, blood, liver, kidneys, and nervous system. Existing eye, skin, and respiratory disorders can be aggravated. Short-term inhalation of vapors can cause drowsiness and irritation of nose and throat. Use only in a well-ventilated area. If vapors are inhaled, go to fresh air. Short-term skin contact can cause irritation, redness, and swelling. Wipe off skin contact area and flush with fresh water. Flush eyes with with fresh water for 15 minutes. Get immediate medical attention if irritation develops or ill effects persist. If swallowed, do not induce vomiting. Vomiting can cause serious lung damage. If vomiting occurs, keep head below hips to prevent entry of liquid into lungs. When handling, wear approved protective gloves, goggles, and respirator with organic vapor cartridge. Metal storage containers must be grounded to eliminate static electricity fire hazard.



THINNER, MIL-T-81772 AND TT-T-266

Paint thinner is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using paint thinner, and do not use it where others are smoking. Contact with liquid or vapor can cause skin, nose, throat, and eye irritation, drowsiness, headache, nausea, and vomiting. After any prolonged contact of liquid with skin, wash contacted area with soap and water. Remove solvent-saturated clothing. If vapors cause drowsiness, go to fresh air. In all cases get immediate medical attention. When handling liquid at air-exhausted workbench wear approved gloves, goggles, and long sleeves. When handling liquid or liquid-soaked cloth in open unexhausted area, wear approved respirator, gloves, and goggles. Dispose of liquidsoaked rags in approved metal container. Metal containers must be grounded to maintain electrical continuity.



URETHANE ADHESIVE

Urethane Adhesive Components A and B are flammable. Keep away from heat, sparks, or any source of ignition.

Overexposure to Component A may cause headache, nausea, and skin irritation and is an irritant to the upper respiratory system. In case of skin or eye contact, flush thoroughly with water. If inhaled remove to fresh air. If swallowed give large amounts of water. In all cases get immediate medical attention.

Overexposure to Component B, which is mildly toxic, may cause headache and mild irritation of nose, throat, and eyes. Contact with skin may cause irritation and dryness. Ingestion may cause vomiting and stomach cramps. In case of ingestion, get immediate medical attention. If inhaled remove to fresh air and give artificial respiration. In case of skin contact, remove contaminated clothing and wash with soap and water. Flush eyes immediately with large quantities of water. In all cases get immediate medical attention. Use in well-ventilated area and wear approved respirator, goggles, and rubber gloves.



ZINC CHROMATE PRIMER, TT-P-1757

Zinc chromate primer is flammable; do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using zinc chromate primer, and do not use it where others are smoking. Contact with liquid or vapor can cause skin or eye irritation, dizziness, and headache. Prolonged inhalation can result in kidney and liver damage. After prolonged skin contact, wash contacted area with soap and water. If vapors cause dizziness, go to fresh air. In all cases get immediate medical attention. When handling small

quantities (less than 1 gallon), wear approved gloves. When handling large quantities of liquid (greater than 1 gallon), at unexhausted workbench, wear approved respirator, gloves, goggles, apron, and long sleeves. Do not eat, smoke, or carry smoking materials in areas where liquid is handled. Dispose of liquid-soaked rags in approved metal container. Zinc chromate primer contains chromates. Follow approved toxic waste disposal procedures.



ZINC CHROMATE PUTTY

Zinc chromate putty is flammable: do not use near open flames, near welding areas, or on hot surfaces. Do not smoke when using zinc chromate putty, and do not use it where others are smoking. Contact with liquid or vapor can cause skin or eye irritation, dizziness, and headache. Prolonged inhalation can result in kidney and liver damage. After prolonged skin contact, wash contacted area with soap and water. If vapors cause dizziness, go to fresh air. In all cases get immediate medical attention. When handling small quantities (less than 1 gallon), wear approved gloves. Do not eat, smoke, or carry smoking materials in areas where putty is handled. Dispose of putty in approved metal container. Zinc chromate putty contains chromates. Follow approved toxic waste disposal procedures.

4. SAFETY PRECAUTIONS.

The following safety precautions shall be observed while performing procedures in this manual.

- Dangerous voltages are present at system connectors. Ensure power is OFF prior to connecting or disconnecting cables.
- Do not wear metal frame glasses, rings, watches, or other metal jewelry while working on electronic equipment.
- Some cleaning materials specified herein are flammable and/or toxic. Keep away from open flame or other ignition sources. Provide adequate ventilation and avoid skin/eye exposure.
- Cleaning with compressed air can create airborne particles that may enter eyes or

- penetrate skin. Pressure shall not exceed 30 psig. Wear goggles. Do not direct compressed air against skin.
- For electrical shock safety steps and procedures, refer to TM 1-1500-204-23 and TB 385-4.

CHAPTER 1

INTRODUCTION

1-1. INTRODUCTION

troubleshooting. The chapter is divided into three sections.

This chapter contains standard data required to support unit operational checks and

		Page
Section I Section II	General Information	1-2
Section III	Equipment Description and DataPrinciples of Operation	1-3 1-18

Section I. GENERAL INFORMATION

1-2. SCOPE

Type of Manual: Aviation Unit Maintenance (AVUM); Operational Checks and Maintenance Action Precise Symptom (MAPS) Charts.

Model Number and Equipment Name: OH-58D Improved Observation/Armed Helicopter, OH-58D(R) Digital Observation/Armed Helicopter.

Purpose of Equipment:

- Provide battlefield reconnaissance, security, and aerial observation during day, night, and reduced visibility operations
- Improve the effectiveness of attack helicopter, air cavalry and field artillery units
- Supplements attack helicopter, air cavalry operations with defensive and offensive weapons capabilities.

1-3. MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-751, Functional Users Manual for The Army Maintenance Management System - Aviation (TAMMS-A).

Accidents involving injury to personnel or damage to material will be reported on DA Form 285 (Accident Report) in accordance with AR 385-40. Explosives and ammunition malfunctions will be reported in accordance with AR 75-1.

1-4. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Refer to TM 750-244-1-5.

1-5. PREPARATION FOR STORAGE OR SHIPMENT

Refer to TM 1-1520-248-S and Appendix E of TM 1-1520-248-23.

1-6. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Refer to FM 1-511.

1-7. COMMON NAME, NAMES, AND DESIGNATIONS

There is no approved nomenclature used in this manual series that differs from official nomenclature. For approved abbreviations and acronyms, refer to the Glossary.

1-8. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your OH-58D helicopter needs improvement, let us know. Send us a report. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on SF368 (Quality Deficiency Report).

Timetables and specific instructions for completing forms SF368 is covered in DA PAM 738-751.

Completed forms (SF368) may be mailed to us at:

Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-LS-DP Bldg. 5302 Sparkman Center Redstone Arsenal, AL 35898-5200.

We'll send you a reply.

1-9. WARRANTY INFORMATION

Various aircraft components are under warranty, and are identified by an AMSAV-Q overprint 2 to DA Form 2408-15. Warranty Identification Card is contained in the historical records log book. See supply letters A8-86, 3 April 1986, A17-86, 12 June 1986, and DA PAM 738-751 for additional information and appropriate action as required.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-10. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

EQUIPMENT CHARACTERISTICS

- Provides battlefield reconnaissance, security, aerial observation, and target acquisition.
- Easily transported by air.
- Totally maneuverable in the nap-of-theearth (NOE) environment.
- Reduced crew workload under combat conditions.
- OH-58D and OH-58D(R) provide defensive capability against air or ground threats and offensive attack capabilities.

CAPABILITIES AND FEATURES

- Mast mounted sight provides the capability to search for, acquire, track, laser range, and laser designate tactical targets for precision guided munitions under both day and night conditions while the helicopter is concealed.
- Electronic Supervisory Control (ESC) for governing fuel.
- Wire strike protection system.
- High agility main rotor system with autorotational characteristics.
- Composite, ballistic-tolerant rotor blades.
- Improved thrust tail rotor.

- Reserve power for hot-day, high altitude performance.
- Run dry transmission.
- Vibration isolated airframe.
- Scout mission communication and navigation systems.
- Crashworthy and ballistically tolerant fuel system.
- Mission-tailored cockpit displays.
- Reduced workload cockpit.
- Night vision goggles.
- Stability and control augmentation system (SCAS) for flight controls.
- Hydraulic system to reduce pilot effort when operating cyclic and collective controls.
- Control display system (CDS) to provide flight, engine, and navigation displays.
- Universal weapons pylon (UWP) for mounting and firing multiple weapons systems. Weapons systems are fully integrated into the CDS. Weapons systems provide capability of supplementing both defensive and offensive air cavalry operations.
- External power sensor to protect aircraft systems from out of tolerance voltages, fluctuations, and spiking.
- OH-58D(R) incorporates a Full Authority Digital Electronic Control (FADEC) to enhance aircraft performance, battlefield survivability, and reduce pilot workload.

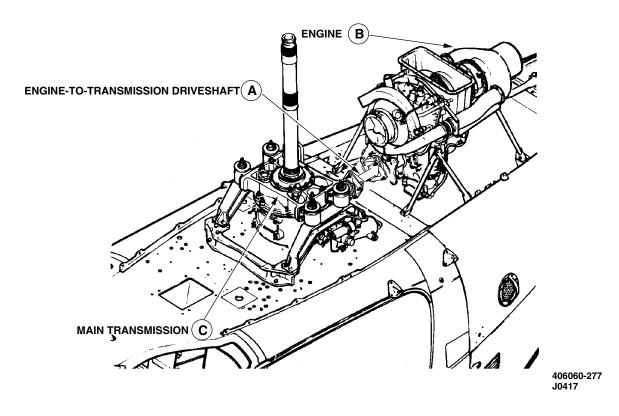
1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

A ENGINE-TO-TRANSMISSION DRIVESHAFT. Transmits power from engine-mounted freewheeling assembly to main transmission.

B ENGINE. Equipped with 250-C30R/1 (OH-58D) or 250-C30R/3 (OH-58D(R)) engine rated at

650 horsepower. An accessory drive pad is provided for mission equipment and electrical requirements.

C MAIN TRANSMISSION. Provides two stage reduction of 15.2961 to 1 (6016 to 393 rpm). First stage is bevel gear arrangement with 3.2632 to 1.0 reduction; second stage reduction is obtained with a planetary gear train providing 4.6875 to 1.0 reduction.

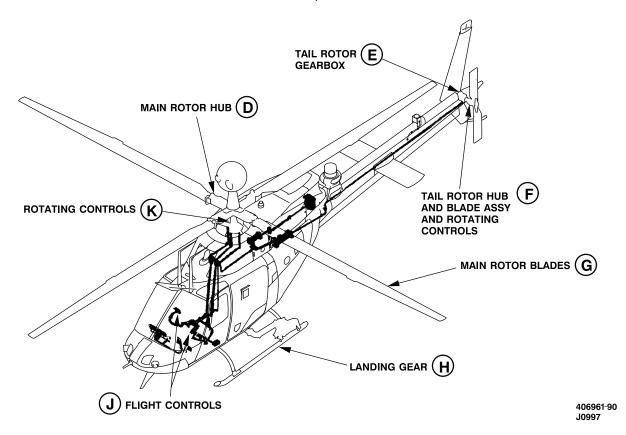


Location and Description of Major Components (Sheet 1 of 2)

- D MAIN ROTOR HUB. Main rotor hub consists of a four bladed system with the yoke constructed of fiberglass to allow independent flapping freedom for each blade.
- (E) TAIL ROTOR GEARBOX. Contains two spiral bevel gears positioned 90 degrees to each other. Direction of drive is changed 90 degrees. There is a speed reduction of 2.52 to 1.0 at the gearbox.
- F TAIL ROTOR HUB AND BLADE ASSEMBLY AND ROTATING CONTROLS. Consists of a hub, two blades, and pitch change controls. Hub and blade assembly is mounted on tail rotor gearbox shaft.
- G MAIN ROTOR BLADES. Blades have 35-foot diameter and 10.75-inch chord. Use of

fiberglass spars and skins over honeycomb core provides a lightweight rotor blade.

- (H) LANDING GEAR. Consists of two tubular main skid tubes and two curved crosstube assemblies. Each skid tube is provided with three replaceable skid shoes which are highly resistant to wear. Aft crosstube is provided with support beam which acts as a pivot point.
- J FLIGHT CONTROLS. Flight control system is positive mechanical type, actuated by typical helicopter controls. Complete dual controls are provided for both pilot and copilot/gunner (CPG). Stability and control augmentation system (SCAS) is provided.
- (K) ROTATING CONTROLS. Consists of swashplate and support, sleeve, drive links, and pitch links.

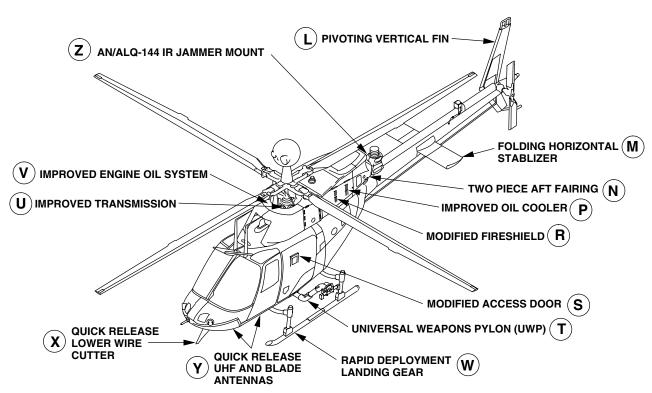


Location and Description of Major Components (Sheet 2 of 2)

- (L) Pivoting vertical fin for air transportability.
- (M) Folding horizontal stabilizer for air transportability.
- (N) Two piece aft fairing. Provides for ease of removal when IR Jammer equipment is installed.
- (P) Improved oil cooler and fan. Provides engine and main transmission oil cooling.
- (R) Modified fireshield improved fire protection.
- S Modified access door. Provides mounting provisions for laser threat detection equipment.
- (T) Universal Weapons Pylon (UWP). Provides mounting points for offensive and defensive weapon systems.
- U Improved main transmission. Provides two stage reduction of 15.2961 to 1 (6016 to 393 rpm). First stage bevel gear reduction is 3.2632 to 1.0, second stage planetary gear train reduction is 4.6875 to 1.0.
- V Improved Engine Oil System. Incorporates external oil filter for improved oil filtration.
- (W) Rapid Deployment Landing Gear. Consisting of two crosstubes with knuckle

assemblies and two skid tubes with legs. The landing gear is attached to the fuselage with four strap assemblies. Provisions are made on the skid tubes for installing ground handling wheels, and four rings are provided towing and transport loading. Each skid tube is provided with replaceable skid shoes. Knuckle assemblies provide attachment points for jacks and locking mechanism to hold crosstubes in operating position. Jacks permit helicopter to be lowered for loading onto transport aircraft and raising helicopter back to operating configuration without removing any of the landing gear components.

- (X) Quick Release Lower Wire Cutter Assembly. Provides quick removal of lower wire cutter assembly for rapid deployment.
- Y Quick Release UHF and Blade Antenna. Provides quick removal of antennas for rapid deployment.
- Z AN/ALQ-144A IR JAMMER Mount. Mounting provision for the AN/ALQ-144A Transmitter.



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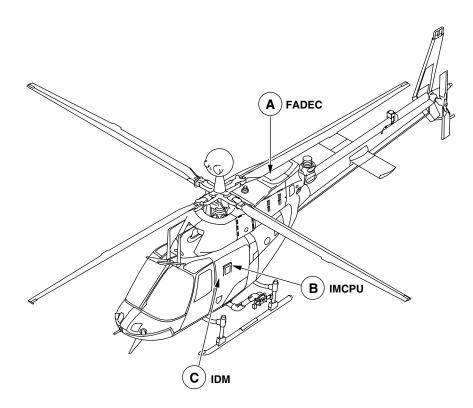
1-12. DIFFERENCES BETWEEN MODELS (OH-58D AND OH-58D(R))

The OH-58D(R) has the following major changes from the OH-58D.

- (A) Upgraded engine with a Full Authority Digital Electronic Control (FADEC).
- (B) Improved version Master Controller Processor Units (MCPUs) for greater reliability of

onboard electronics. Replaces Integrated System Processor (ISP) circuitry and functions which provides control of some weapons functions.

C Improved Data Modem (IDM) provides digital communication capability for transmitting target handover information. Replaces Airborne Target Handover System (ATHS).



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1-13. EQUIPMENT DATA
1-14. FUEL SYSTEM Capacity Total
1-15. HYDRAULIC SYSTEM Canacity 1.3 pints
Capacity
1-16. ENGINE OIL SYSTEM
Capacity
1-17. ENGINE
Model 250-C30R/1 OH-58D 250-C30R/1 OH-58D(R) 250-C30R/3 Shaft Horsepower 650
1-18. MAIN TRANSMISSION
Capacity (approximate)7 quarts Type Oil DOD-L-85734, MIL-L-7808
1-19. TAIL ROTOR GEARBOX
Capacity
1-20. ELECTRICAL SYSTEM
Primary AC

Power Source........... 10 KVA, 3-Phase,

Power Source......200-Amp, 28 VDC

120/208-Volt, 400 Hz AC Generator

Transformer/Rectifier

Engine Start and
Emergency Power 17 Ampere-Hour
Nickel Cadmium
Battery

1-21. | EQUIPMENT CONFIGURATION

- 1. Mission Avionics.
 - a. Mast Mounted Sight (MMS)
 - b. MMS Turret Assembly
 - c. MMS Central Power Supply (MCPS)
 - d. MMS Systems Processor (MSP)
 - e. MMS Control and Display System
- 2. Airborne Target Handover System (ATHS) (If Installed)
- 3. Improved Master Controller Processor Units (If Installed)
 - 4. Improved Data Modem (IDM) (If Installed)
 - 5. Winterization Configuration
 - 6. Mission Equipment
 - a. Pilot Display Unit (PDU)
 - b. Air-to-Air Stinger (ATAS)
 - c. Machine Gun Pod
 - d. 2.75 Rocket System
 - e. HELLFIRE Missile System (HMS)
 - f. Universal Weapons Pylon (UWP)

1-22. SAFETY, CARE, AND HANDLING

1. LASER. A laser rangefinder/designator unit is located in the mast mounted sight (MMS). Controls for the laser unit are located on the MMS control panel. Observe the following when in the area of operating laser.

Primary DC

WARNING



To look along the axis of a laser beam without protective glasses is extremely dangerous. Serious eye injury will result. Align the laser so that personnel are unlikely to inadvertently look along the axis of its beam.

Laser firing system may store a charge. Take care to prevent accidental pulsing of the laser and to avoid electric shock. Personal injury may result. Reflections from the laser beam are extremely dangerous. Serious eye injury will result. It is essential that all reflective material be removed from its path.

- a. Laser beam is dangerous to eyes and protective eye-wear shall be worn. There is no danger to skin.
- b. Danger exists in any direction laser beam can be pointed (± 190 degrees azimuth and ± 30 degrees elevation).
- c. Reflected laser beam viewing shall not be permitted. Reflective material shall not be allowed in the area when operating laser.
- 2. AVIONICS. Aviation electronics (AVIONICS) consists of electrical and electronic units (black boxes) required to perform various helicopter missions. The units are primarily located in the avionics compartment behind the pilot seat. Observe the following when performing maintenance:
- a. Use caution and care when removing or replacing the avionic components (black boxes). Do not drop or allow the components to be struck by a sharp blow, as the units may be damaged;

- b. When climbing on helicopter for inspection or maintenance actions, do not use any of the antennas as handholds:
- c. Special emphasis on safety procedures shall be adhered to. Safety interlock and bleed circuits on shutdown of the mast mounted sight (MMS) are provided to minimize the hazard of electrical shock. High voltage caution labels are appropriately located on MMS hardware. Observe these caution signs.

NOTE

The MMS will drift when power is applied but the MMS is not utilized. Always place the sight in the forward mode to prevent excessive drifting.

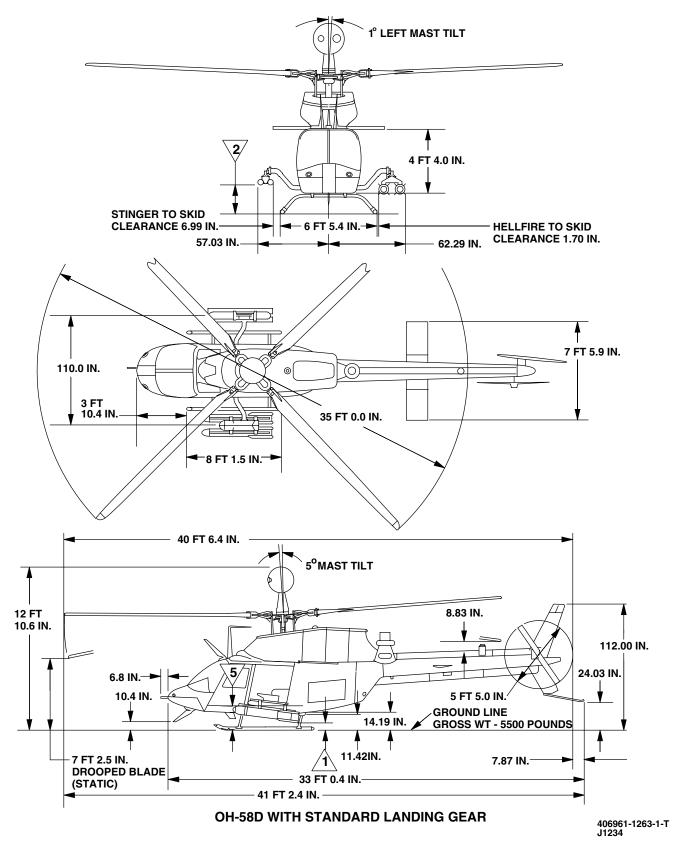
- d. Remove all electrical power and open circuit breakers prior to maintenance and removal of avionic components.
- e. Use extreme caution when troubleshooting the MMS system, multifunction display (MFD) and other sources of high voltage potential.

3. ARMAMENT.

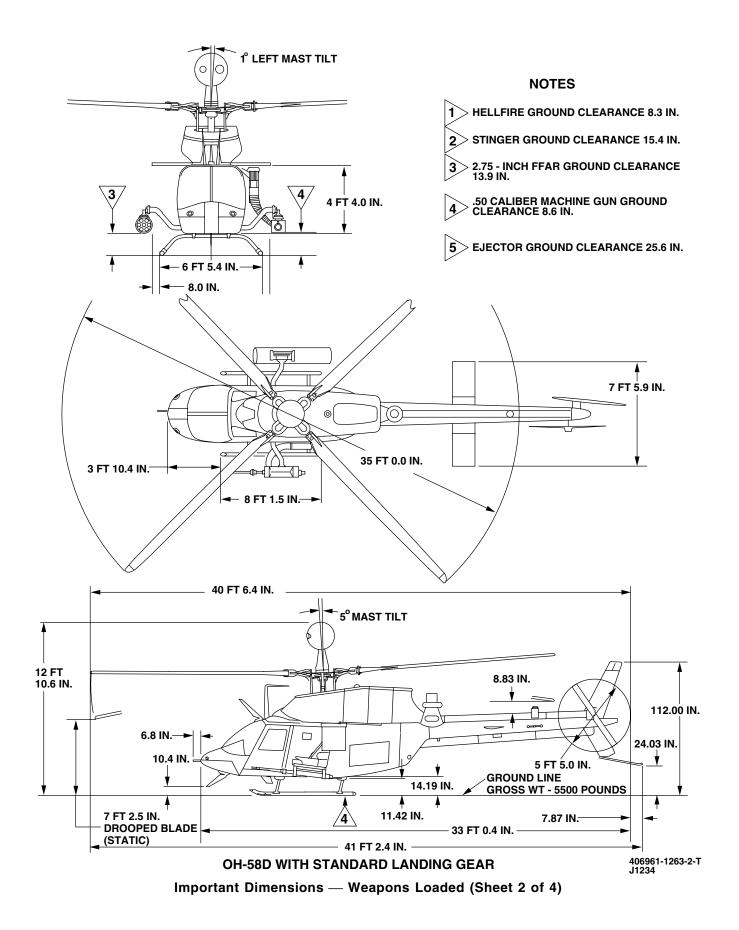
- a. Armament on the OH-58D and OH-58D(R) consists of mission equipment (paragraph 1-21). Extreme caution should always be exercised when working around these systems. Always consider systems armed.
- b. Prior to working on helicopter, comply with Helicopter Safety Procedures Armament (TM 1-1520-248-23).
- c. Comply with all procedures outlined in TM 9-1090-214-23&P for all installed armament systems.

1-23. GENERAL AIRCRAFT INFORMATION

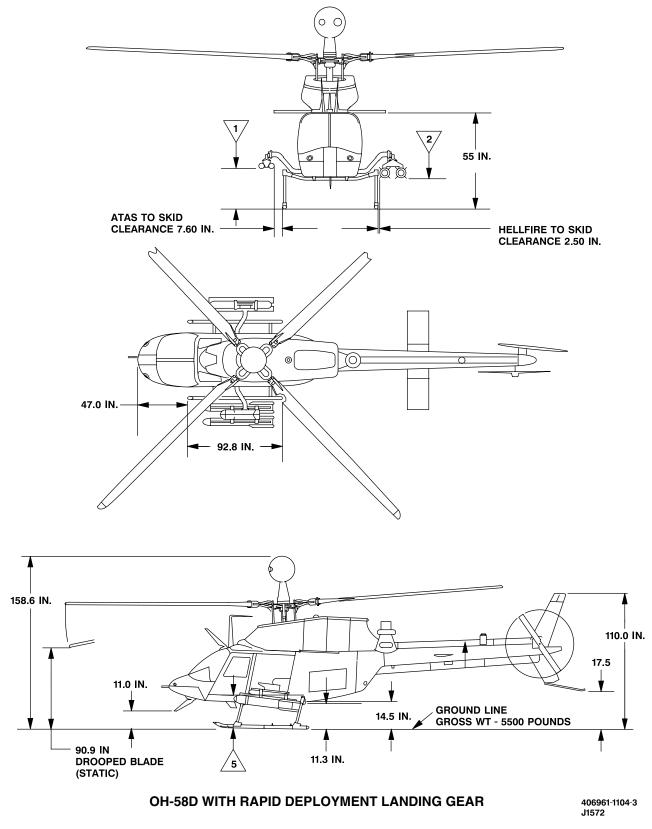
The figures on the following pages are provided to show principal dimensions and ground clearances, hazard areas, water lines (WL), buttock lines (BL) and station numbers.



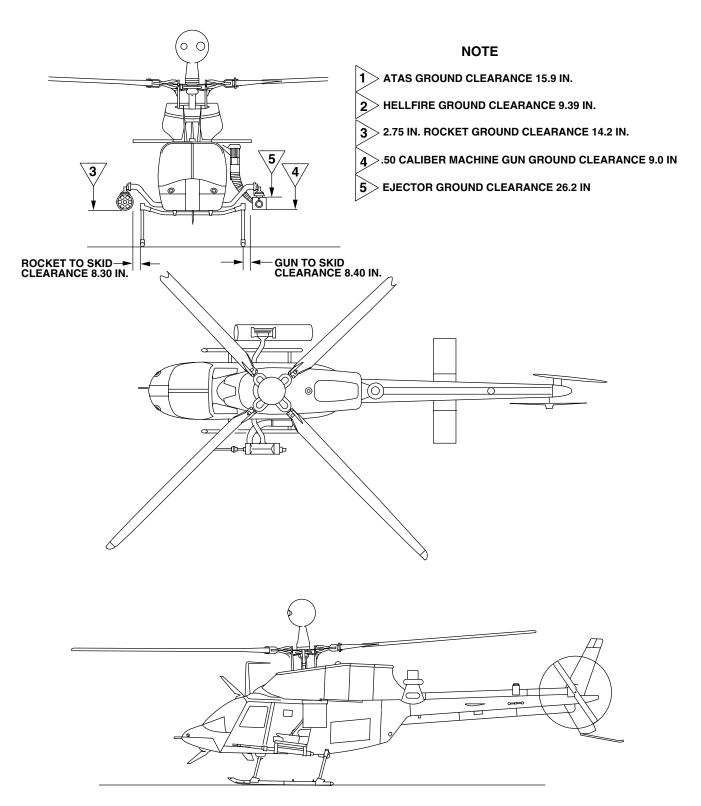
Important Dimensions — Weapons Loaded (Sheet 1 of 4)



1-11



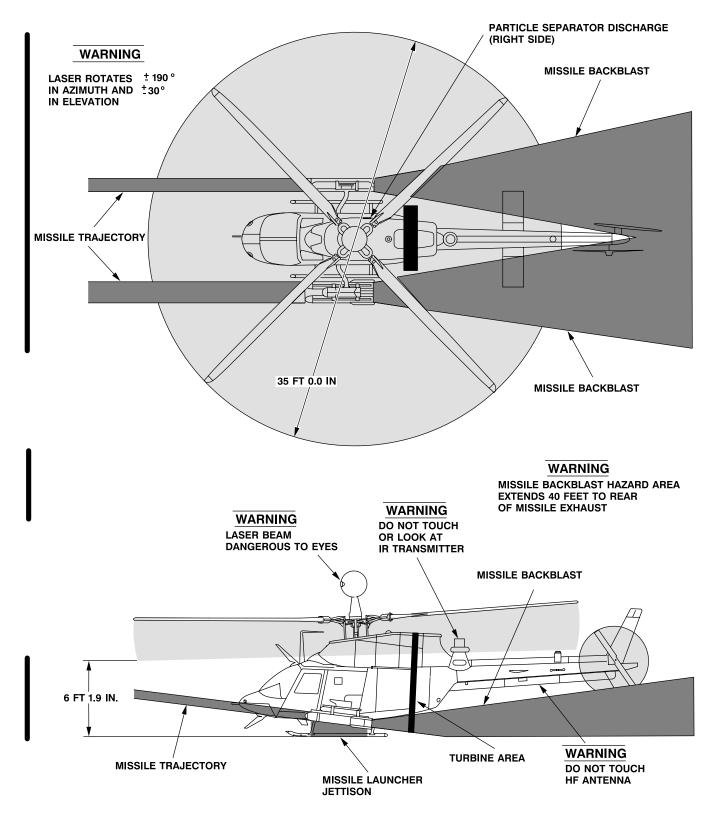
Important Dimensions — Weapons Loaded (Sheet 3 of 4)



OH-58D WITH RAPID DEPLOYMENT LANDING GEAR

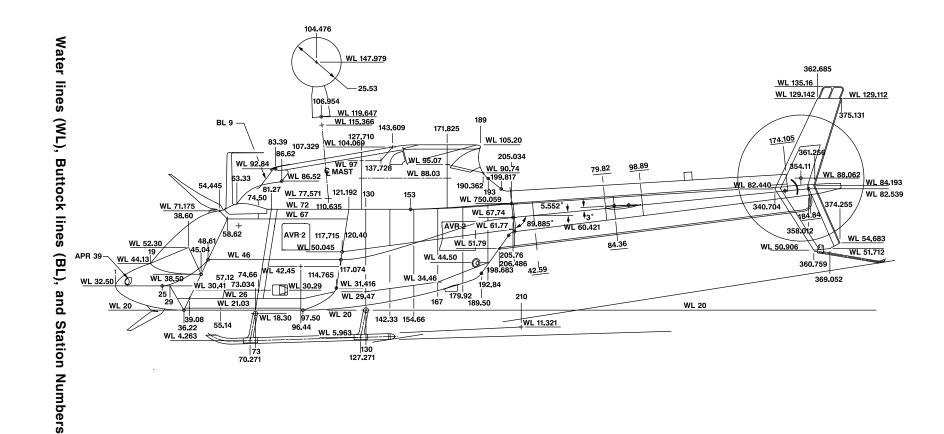
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Important Dimensions — Weapons Loaded (Sheet 4 of 4)



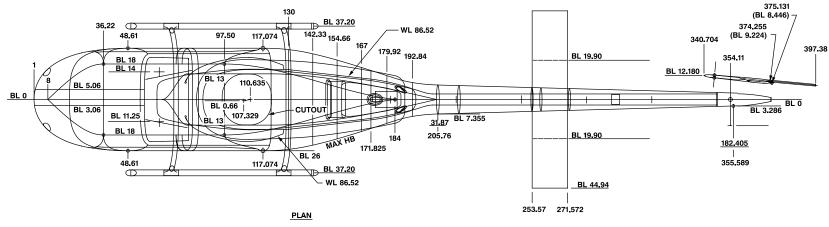
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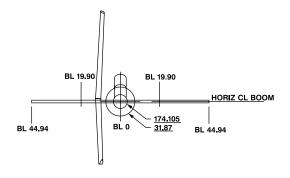
Hazard Areas



NOTE: UNIDENTIFIDIED NUMBERS ARE STATION NUMBERS

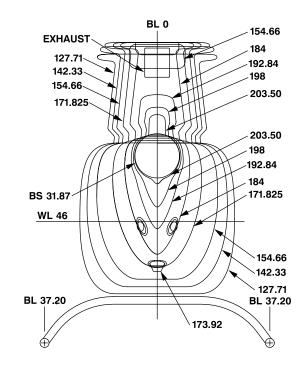


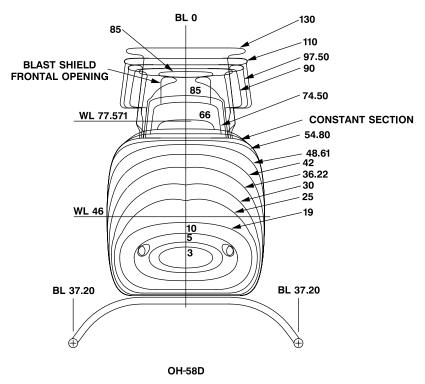




NOTE: UNIDENTIFIED NUMBERS ARE STATION NUMBERS

406961-1294-2 J1189





NOTE: UNDENTIFIED NUMBERS ARE STATION NUMBERS.

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Water lines (WL), Buttock lines (BL), and Station Numbers

Section III. PRINCIPLES OF OPERATION

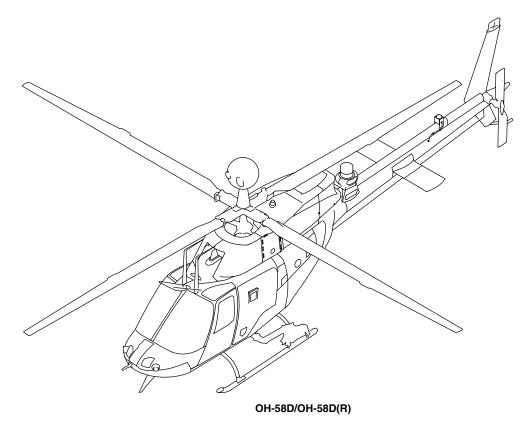
1-24. FUNCTIONAL DESCRIPTION

The OH-58D/OH-58D(R) helicopters have a fully integrated surveillance/target acquisition/ designation system and have a sufficient power margin to provide agility and total maneuverability in the nap-of-the-earth (NOE) environment.

The mast mounted sight (MMS) and other integrated electronics and instrumentation provide standoff acquisition and recognition of targets

during day or night operations in all types of weather, with reduced crew workload under combat conditions.

The attack/observation helicopter developed from the OH-58D advanced observation helicopter has an expanded role with the added weapons systems and also has offensive capabilities. The weapons systems enable the armed OH-58D to engage air-to-air, anti-armor, antifortification, and antipersonnel targets while maintaining enhanced aeroscout mission capability.



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1-25. PRINCIPLES OF OPERATION

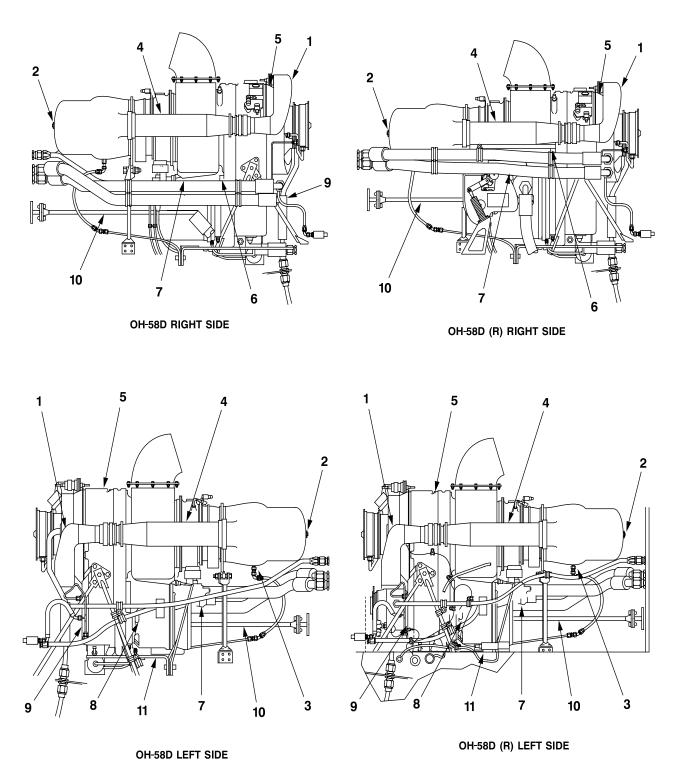
1-26. POWERPLANT

The helicopter is equipped with an internal combustion turboshaft Allison engine, model 250-C30R/1 (OH-58D), and 250-C30R/3 (OH-58D(R)).

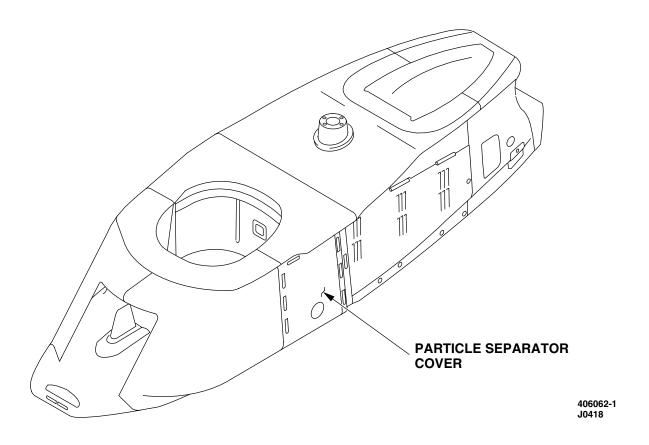
- 1. The four major components of the engine are the compressor section, combustion section, power turbine section, and the power and accessories gearbox.
- a. Compressor Section. The compressor section is a single-stage, single-entry centrifugal flow compressor and is directly coupled to a two-stage turbine drive. Compressed air exits the compressor section through the scroll assembly (1).
- b. Combustion Section. The single combustion section consists of a combustion liner, an outer case, a fuel injector (2), and one igniter plug (3). Compressed air is delivered to the combustion section by means of the discharge tubes (4).
- c. Power Turbine Section. The power turbine section consists of the two-stage power turbine drive and two-stage gas producer turbine drive.
- d. Power and Accessories Gearbox. The power and accessories gearbox (5) consists of the gas producer turbine drive geartrain and the power turbine drive geartrain. All engine components, including the engine mounted accessories, are installed on the gearbox. The power and accessories gearbox incorporates two monopole pickup units to sense and control gas producer turbine and power turbine speed. Components and accessories driven by the gas producer drive train are the engine fuel pump (6), fuel control unit (FCU) (7), pressure and scavenge oil pump, and the starter-generator drive. The power turbine drive train drives two spare drive pads, the ac generator (8), and supplies the power output for main rotor (9) and tail rotor drive (10).
- 2. The four major systems of the engine are the engine fuel system, engine lubrication system,

engine electrical system, and the engine anti-icing system.

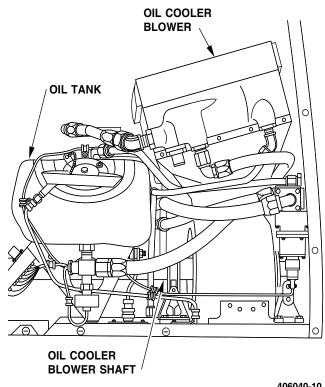
- a. Engine Fuel System. The engine fuel pump (6), Fuel Control Unit (FCU) OH-58D/Hydromechanical Unit (HMU) OH-58D(R) (7), Electronic Supervisory Control (ESC) OH-58D/Electronic Control Unit (ECU) OH-58D(R) (located in aft electrical compartment), fuel filter (11), and fuel injector (2) are the major components of the engine fuel system.
- b. Engine Lubrication System. The engine lubrication system is a circulating dry sump type with an external reservoir and heat exchanger. The major components of the engine oil lubrication system are the engine oil filter assembly, engine oil tank, engine oil cooler, oil cooler bypass valve, and two electromagnetic chip detectors. A 3-micron engine scavenge oil filter is located forward of the oil tank.
- c. Engine Electrical System. The engine electrical system consists of the turbine gas temperature measurement components, engine ignition components, turbine speed indicating components, electronic supervisory control (ESC) (OH-58D)/electronic control unit (ECU) (OH-58D(R)), AC generator, and the starter-generator.
- d. Engine Anti-Icing System. The engine anti-icing system includes a firewall shield mounted solenoid and an anti-icing solenoid valve. The compressor inlet vanes and front bearing support hub are the only components with anti-icing provisions.
- 3. Particle Separator and Induction System. An inertial type particle separator in the air induction system provides a 92-percent particle separation efficiency, while allowing maximum engine performance in hover and low speed flight. Separated particles are ejected overboard through a duct assembly, assisted by an internally mounted fan.
- 4. Infrared Suppressor. The infrared signature of the engine exhaust and other heated components is reduced by an exhaust IR suppressor and masking of other components by the cowling. An ejector type exhaust system cools the hot exhaust gases as well as induces the flow of air for engine compartment cooling.



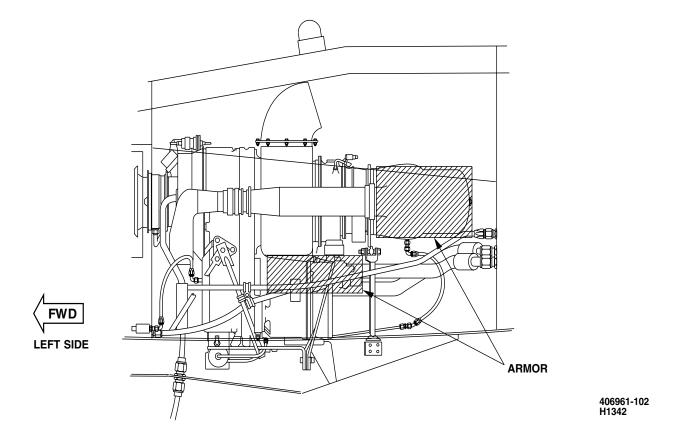
406060-22 J1285



- 5. Engine and Transmission Oil Cooler Blower. An oil cooling system combines the engine oil cooler and transmission oil cooler utilizing a common blower.
- 6. Oil Tank. The oil tank is a rubberized, self-sealing oil cell with a normal capacity of 11.2 pints. The oil tank assembly is composed of a sight glass, drain valve, oil temperature transducer, oil level switch, and a cap and adapter assembly.
- 7. Engine Cowling Mounted Armor Panel. Engine cowling mounted armor panels protect critical elements of the turbine and fuel system components.



406040-10 H1342



1-27. POWER PLANT DIFFERENCES (250-C30R/3 ENGINE WITH FADEC SYSTEM VS. 250-C30R/1 SERIES

The OH-58D(R) is equipped with an Allison turboshaft engine, model 250-C30R/3. Some of the differences between engines are shown below.

Table 1-1. Power Plant Differences

ESC Equipped Aircraft Components Removed 250- C30R/1	FADEC Equipped Aircraft Components Added 250-C30R/3	Remarks
Pneumatic Fuel Control & Fuel	Hydromechanical Unit (HMU)	HMU is both a metering unit and a
Pump (FCU) Electronic Supervisory Control (ESC)	Electronic Control Unit (ECU)	fuel pump in one assembly. ECU is a FADEC. Control software is different. Mounting location is the same.
Pneumatic tubing & PC filter and NP overspeed solenoid valve.	None	FADEC control system uses no flowing pneumatics to schedule fuel flow.
Compressor bleed valve	None	FADEC control system does not use a compressor bleed valve.
Low pressure fuel filter	Low pressure fuel filter	Same engine mount location and interfaces. FADEC filter rating is different.
Engine harness	Engine harness & Engine accessory harness.	FADEC uses two separate harnesses. Engine harness EMI hardened.
None	Compressor Inlet Temperature (CIT) sensor	CIT sensor new for FADEC. Mounted in particle separator, provides inlet temperature to ECU.
None	Torquemeter Oil Pressure (TMOP) sensor	
None	Permanent Magnet Alternator (PMA)	PMA new for FADEC. Mounts on rear of engine gearbox. Provides power for FADEC when NP above 85%.
Throttle linkage at FCU	Throttle linkage at HMU	HMU throttle lever location and angular travel slightly different.
None	Low fuel pressure warning switch	Added for FADEC suction mode operation. The "fuel boost fail" CDS warning still exists for operation with aircraft fuel boost pump turned on.
Engine fuel inlet plumbing	Engine fuel inlet plumbing	FADEC fuel inlet port oriented horizontally (250-C30R/1 points down).
Engine gearbox magnetic plugs	Engine gearbox magnetic plugs	FADEC will use fuzz burner type plugs.
None	HMU fire shield	Safety
None	ARINC-429 data bus interface	FADEC communicates fault and status information to the CDS system over this bus.
None	RS-423 data bus connection port	Located on the Data Transfer Unit. FADEC maintenance status can be downloaded via the Electronic Control Unit Interface Computer (ECUIC).

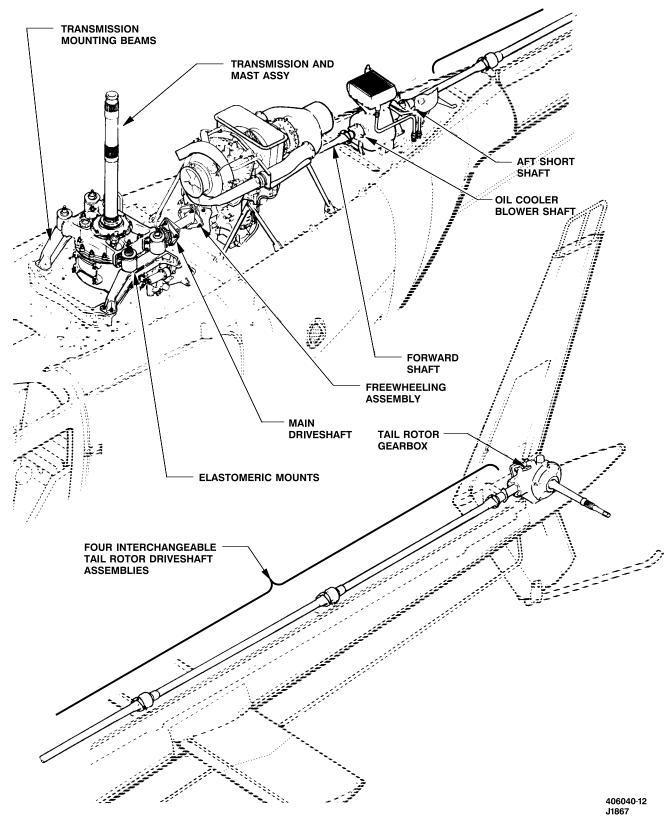
1-28. DRIVE TRAIN SYSTEM

The drive train system consists of all components between the engine and the rotors. This includes the freewheeling assembly, main driveshaft, transmission and mast assembly, oil cooler fan assembly, tail rotor driveshaft assembly, and tail rotor gearbox. Also included are the related components such as temperature and pressure indicators, torque indicator, chip detectors, oil pump and oil filter.

- 1. Freewheeling Assembly. The freewheeling assembly is mounted in the lower portion of the accessory gearbox. It passes through the gearbox to provide an adapter in the rear to connect to the tail rotor driveshaft and an adapter in the front to connect to the main driveshaft. The freewheeling assembly serves as the connecting link between the accessory gearbox and the driveshaft system. Its freewheeling mode allows free rotation of the rotor system as well as necessary accessories when power is not being applied by the engine. This is accomplished by an internal Sprague clutch. Lubrication is supplied by oil from the transmission assembly. Oil enters the freewheeling assembly at the rear by a line from the transmission. It exits the freewheeling assembly from the forward section and enters into transmission lower case. The freewheeling assembly is equipped with a chip detector that will illuminate a caution message on the multifunction display (MFD) when there are metal particles in the oil.
- 2. Main Driveshaft. The driveshaft connects the freewheeling assembly with the main transmission. It is designed for easy removal from the helicopter and to aid in rapid removal of the engine or transmission. The driveshaft is flexible to the extent it allows smooth transfer of torque even though the transmission and freewheeling assembly are transversely offset and slanted. Both ends of the driveshaft are identical Kaflex couplings, allowing mounting in either direction.
- 3. Transmission and Mast Assembly. The transmission and mast assembly transfers the engine torque to the main rotor system with a two-stage gear reduction, and has a maximum continuous rating of 550 horsepower. The assembly is mounted to the roof of the helicopter, forward of the engine, by the pylon assembly. The pylon is attached to the transmission housing, on

each side, by two elastomeric mounts. There are two restraint spring assemblies attached to the lower transmission housing, on each side that connect to the rear of each pylon support arm to dampen the pitching motion of the transmission assembly.

- a. Lubrication of the transmission assembly is accomplished by a splash type oil system. Oil is pumped through the transmission by a self-contained oil pump. This oil system lubricates all components of the transmission and the freewheeling assembly. Oil is pumped through a dual element filter that is mounted on the left side of the transmission. From the filter, depending on the position of the thermal bypass valve, oil will either bypass the oil cooler and lubricate the transmission internal components or flow to the oil cooler for cooling and then return to the transmission for lubricating internal components.
- b. An accessory gear pad is located on the left side of the transmission case immediately forward of the oil filter. This pad is used to mount and drive the flight control hydraulic boost pump and the tachometer generator.
- c. The transmission is equipped with several indicators to ensure proper operation and give immediate warning of any malfunction.
- (1) The oil level sight glass is located on the right side of the transmission case and is easily accessible for visual reference.
- (2) Two chip detectors are mounted on the transmission case. One is located on top of the transmission case and one is on the lower left side of the case. Both chip detectors have fuzz burner capabilities. A caution message will appear on the MFD when contact is made across the magnetic plug of either chip detector.
- (3) The transmission oil filter is equipped with a pop-out filter impending bypass indicator. When the oil flow through the main element is becoming restricted, the indicator button on the end of the filter cartridge will pop out, indicating that oil is on the verge of bypassing the first element and will be filtered only by the second element. This button cannot be reset unless the filter elements are changed. Filter element must be replaced prior to next flight.



Drive Train (Typical)

- (4) An oil temperature sensor is located on the oil filter assembly. This sensor transmits the transmission oil temperature to the transmission oil temperature indicator on the instrument panel. If the temperature limits are exceeded, a caution message will appear on the MFD and an audio tone will sound.
- (5) An oil pressure transducer is remotely located on the transmission deck below the transmission. This transducer measures oil pressure and transmits it to the oil pressure indicator on the instrument panel. If the pressure limits are exceeded, a caution message will appear on the MFD and an audio tone will sound.
- (6) The main rotor mast torque indicating system electrically measures the amount of twist in the mast and calculates mast torque. The indication is transmitted to the torque indicator on the instrument panel. If the 10 second torque limit is reached, a caution message appears on the MFD. If 10 seconds are exceeded or the upper limit of this range is reached, a warning message will appear on the MFD. An audio tone will accompany either condition.
- (7) The main rotor rpm measuring system measures rotor rpm in percent. This system measures rpm at the base of the main rotor mast and displays it on the dual tachometer, mounted on the instrument panel. Warning messages of high or low rpm appear on the MFD. A backup system displays a digital readout of the rotor rpm on the multiparameter display.
- 4. Transmission Oil Cooling System. The oil cooling system is mounted aft of the engine. It consists of the heat exchanger/blower unit that is shared with the engine oil cooling system. The fan of this unit is attached to the tail rotor driveshaft and forces air through the heat exchanger. A thermostat is located on the oil filter assembly to allow the oil cooler to be automatically bypassed during cold weather starting. A pressure bypass valve allows the oil cooler to be bypassed whenever the cooler core becomes clogged.
- 5. Tail Rotor Driveshaft System. The tail rotor driveshaft system delivers torque from the freewheeling assembly to the tail rotor gearbox. It is mounted along the rear portion of the engine and along the top of the tailboom. It is covered by a hinged driveshaft cover. The system consists of one steel shaft, one steel oil cooler shaft, and five aluminum shafts of which four are interchangeable. These shafts are connected at each end by a flexible coupling. The system is

supported by six hanger bearings, each equipped with a grease fitting for lubrication.

6. Tail Rotor Gearbox Assembly. The tail rotor gearbox assembly is attached to the aft end of the tailboom. It is a 90 degree gearbox and serves as the final drive for the tail rotor. The gearbox has a self-contained splash type oil lubrication system that is serviced through a cap on the top of the case. A fuzz burner chip detector is located on the lower right side of the casing. A caution message appears on the MFD and an audio warning sounds when foreign metal particles are picked up by the plug. A thermoswitch, located on the upper right area of case, transmits a caution message to the MFD when the oil reaches its maximum temperature limit. A sight glass is located at the rear of the case for visual indication of the oil level.

1-29. HYDRAULIC SYSTEM

The hydraulic system reduces crew member effort and fatigue by minimizing cyclic, collective, and directional control input and feedback sources. The following components and controls comprise the hydraulic system:

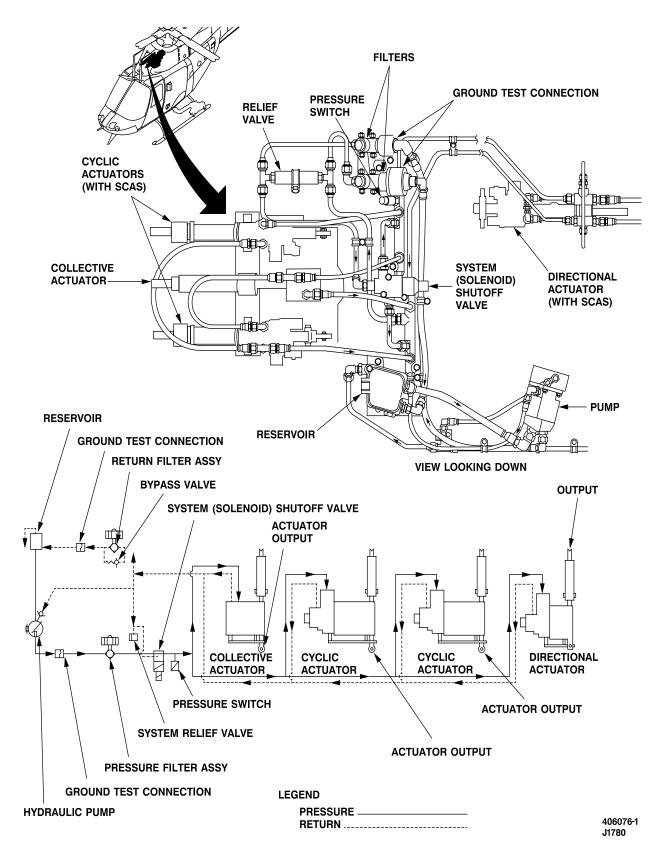
- 1. Reservoir. The reservoir is located on the cabin roof and is mounted on a bracket which is forward and left of the transmission. A window is provided on the cowling for inspection of the sight glass. The sight glass provides a means of determining when the reservoir needs servicing.
- 2. Hydraulic Pump. The hydraulic pump is an axial piston, pressure compensated, variable delivery type pump. The pump is transmission driven and internally regulated to 1000 psi for the purpose of powering the hydraulic system and the stability and control augmentation system (SCAS).
- 3. Hydraulic Filters. Two 15-micron filters with cleanable filter elements are located on the right side of the cabin roof. Both filters incorporate popout indicators that will pop out at 70 (± 10) psid. The pop-out indicators are mechanically locked out to prevent inadvertent resetting if fluid temperature is below 35 (± 15) °F. Only the return filter is equipped with an internal bypass valve. If the filter obstruction causes a 100 (± 10) psid, the bypass valve will open and return fluid will flow to the reservoir unfiltered.
- 4. System Relief Valve. The hydraulic system incorporates a relief valve located between the pressure and return portions of the hydraulic

system. The valve will protect the system from over-pressurization in the event of a hydraulic pump malfunction. The relief valve opens at 1375 psi.

- 5. Hydraulic Solenoid Valve. A solenoid valve is incorporated to provide a means of turning the hydraulic system on and off. When the solenoid is deenergized, pressure is provided to the system. The solenoid valve is deenergized when the HYD SYS switch is in HYD SYS position or in the event of loss of electrical power to the solenoid valve. Placing the HYD SYS switch to the OFF position will energize the valve, and pump pressure will be ported through the return manifold back to the reservoir.
- 6. Pressure Switch. The hydraulic pressure switch is located on the right side of the cabin roof and is mounted to the pressure manifold. The switch will close on decreasing pressure of 500 (±100) psi. Closing of the switch will cause the LOW HYD PRESSURE caution message to

appear on the MFD. The switch will open on increasing pressure of 800 (±100) psi.

- 7. Ground Test Connections. Two ground test connections are provided. The test connections are quick-disconnects attached to the hydraulic filter assemblies. They provide a means of connecting a ground test unit to the hydraulic system.
- 8. System Actuators. There are four hydraulic actuators. Two cyclic actuators are mounted on the cabin roof and both have bolt-on SCAS modules. The collective actuator is located on the cabin roof between the two cyclic actuators. The directional control actuator is located above and aft of the aft electrical compartment and also has a SCAS module.
- 9. Pressure Manifold. The pressure manifold is a distribution point that permits hydraulic fluid to flow equally to all actuators.



Hydraulic System (Typical)

1-30. INSTRUMENT SYSTEM

The helicopter is equipped with a fully integrated multiplexed cockpit. The flight control and display system includes redundant multiplex data buses, data-entry keyboard, redundant mission computers, and symbol generators.

- 1. The integrated functions include a navigation and communication control, air data, radar altitude, airborne (voiceless) target handover system (ATHS), improved data modem (IDM) replaces ATHS unit for target handover in the OH-58D(R), three-axis stability and control augmentation system (SCAS) with heading hold, a fault detection/location system, warning/caution/ advisory systems, engine condition monitoring, and mast mounted sight subsystem control panel and display. With the controls and display subsystem, the crew can access a desired format by pressing a button on the face of the display or select a display format (flight, navigation, communication or MMS) with controls on the cyclic stick.
- 2. The multifunction display will indicate warnings, cautions, and advisories. They shall fall under the categories listed below.
 - a. Warnings are as follows:

WARNING

LOW RPM ROTOR

HIGH RPM ROTOR

ENGINE OUT

LOW FUEL PRESS (OH-58D(R))

XMSN OVER TORQUE

ENG OVERTRQ (OH-58D)

ENG OVER TQ (OH-58D(R))

TGT OVER TEMP

FADEC MANUAL (OH-58D(R))

FADEC FAIL (OH-58D(R))

b. Cautions are as follows:

Brackets next to a caution (e.g. HIGH TGT TIME LIM []) display the accumulated time in seconds that the limit was exceeded.

CAUTION

AC GEN FAIL ADU FAIL BATT CHGR FAIL CHIPS ENG FREEWHEEL CHIPS ENG LOWER CHIPS ENG UPPER CHIPS T/R GRBX CHIPS XMSN SUMP CHIPS XMSN UPPER DC GEN FAIL EGI FAIL ENG TRQ TIME [] (OH-58D) ENG TRQ TIME LIM [] (OH-58D(R)) **FUEL BOOST FAIL** FUEL CONTROL (OH-58D) FUEL FILTER BYP **FUEL LOW GPS DIVERGENT** HIGH OIL PRESS ENG HIGH OIL TEMP ENG HIGH OIL TEMP XMSN HIGH TEMP T/R GRBX HIGH TRQ TIME LIM [] (OH-58D(R)) HIGH TGT TIME LIM [] HOT BATT 1 **HOT BATT 2** HOT BATT 1 & 2 IFF FAIL IFF MODE 4 FAIL INS FAIL **INV FAIL** IR JAMMER INOP ISP FAIL (OH-58D) LEFT MCPU FAIL LOW ALTITUDE (OH-58D(R)) LOW HYD PRESS LOW OIL PRESS ENG LOW OIL PRESS XMSN LOW OIL QUANTITY ENG MAST TRQ TIME LIM [] MISSILE UNLATCHED OIL BYP ENG P/R DISENG **RECT FAIL** RIGHT MCPU FAIL SCAS DISENG TGT 5 MIN LIM [] (OH-58D) TGT 30 MIN LIM [] WEAPONS FAIL (OH-58D(R)) YAW DISENG

b. Advisories are as follows: KY-75 ALARM LASER CODE MISMATCH ALARM (OH-58D(R)) LAUNCHER SAFED ALARM 1 (OH-58D) LEFT COOLANT LOW ASE FAIL (OH-58D(R)) LEFT LAUNCHER FAIL ATH AUTHENT TABLE LOW (OH-58D) MISSILE ALERT ATHS FAIL (OH-58D) MISSILE ALERT - AI ATH MESSAGE RECEIVED (OH-58D) MISSILE ALERT - SAM ATHS QUEUE FULL (OH-58D) MMS FAIL BATT PREHEAT ON MOIST VTR TAPE CARGO HOOK ARMED NAV INVALID CHECK MESSAGE CHECKALL NAV NOT ALIGNED NAV UPDT REQUIRED (OH-58D) CHECK MESSAGE CHECKFIRE NO AUTO START (OH-58D(R)) (OH-58D) NO CODE CHECK MESSAGE MAYDAY ONE YAW CHAN OFF PITOT HEAT ON (OH-58D) CODE NOT ACCEPTED P (Y) CODE INVALID DTS FAIL RHE FAIL EGI BATT LOW RIGHT COOLANT LOW RIGHT LAUNCHER FAIL ENG ANTI-ICE ON **EXT PWR** RMS FAIL (OH-58D(R)) FADEC DEGRADE (OH-58D(R)) SCAN NOT AVAILABLE (OH-58D(R)) FADEC MAINT (OH-58D(R)) TACAN FAIL FM-1 CT FAIL (OH-58D(R)) TACAN INVALID TACFIRE AUTH TABLE LOW FM-1 CUE (OH-58D(R)) FM-1 FAIL TACFIRE MSG NO (OH-58D(R)) FM-1 HUB LOW (OH-58D(R)) FM-1 PT FAIL (OH-58D(R)) TACFIRE MSG CHKALL (OH-58D(R)) TACFIRE MSG CHKFIRE (OH-58D(R)) FM-2 CT FAIL (OH-58D(R)) TACFIRE MSG MAYDAY (OH-58D(R)) FM-2 CUE FM-2 FAIL TACFIRE QUEUE FULL (OH-58D(R)) FM-2 HUB LOW (OH-58D(R)) TIMER 1 (OH-58D) FM-2 PT FAIL (OH-58D(R)) TIMER (OH-58D(R)) FUEL CONTROL (OH-58D) **UHF FAIL GPS FAIL** VDU FAIL (OH-58D(R)) HDG HOLD VHF FAIL HF RADIO FAIL VTR FAIL HF RADIO TUNE VTR TAPE FULL IDM FAIL (OH-58D(R)) WEDGE CONSTANT ZERO

WPN NOT ACTIONED

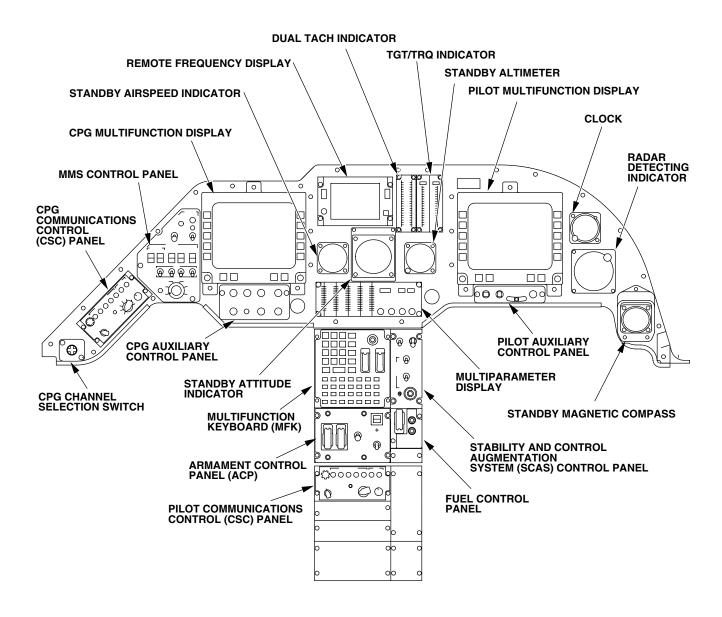
WPN NOT SELECTED

WPN NOT ARMED

IFM FAIL

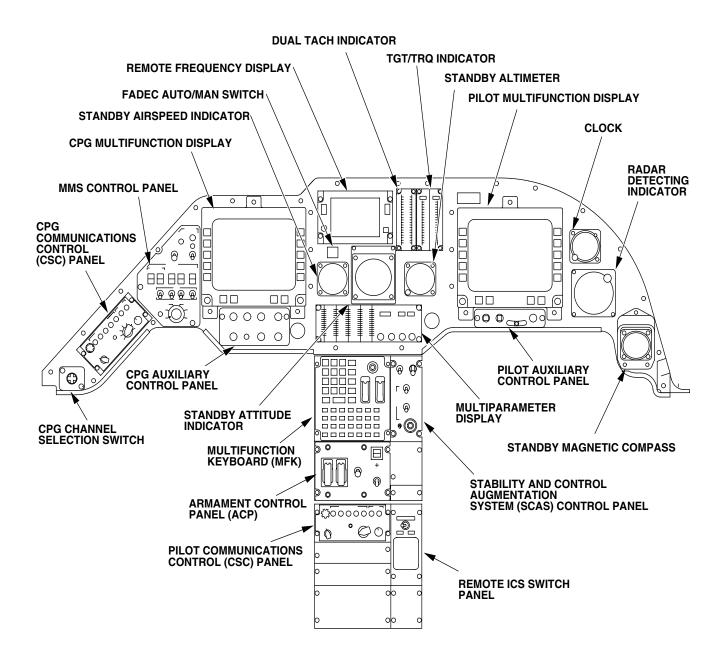
IMAGE RECEIVED (OH-58D(R))

INVALID COMMAND



406961-1408-3-T

OH-58D Instrument Panel and Center Console



406961-1408-5 J1780

OH-58D(R) Instrument Panel and Center Console

1-31. ELECTRICAL SYSTEMS

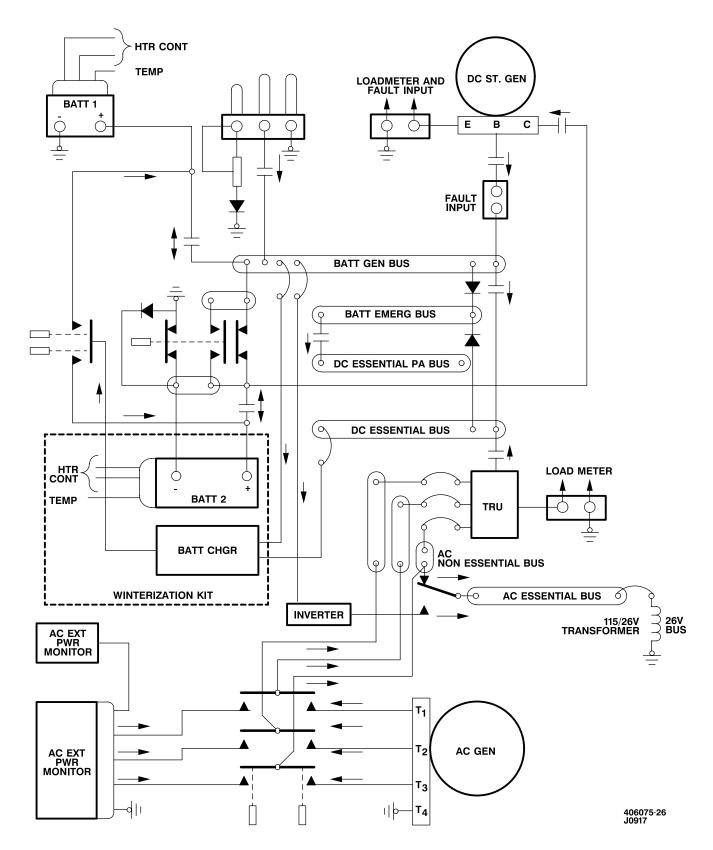
The electrical system provides all the ac and dc power required to operate the helicopter systems.

NOTE

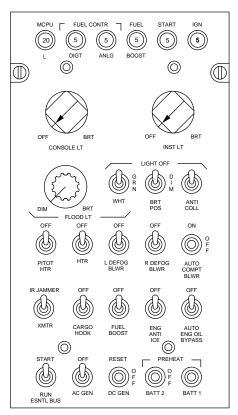
Electrical power is not required for powered flight; however, only the standby compass, clock, barometric altimeter, and airspeed indicator will continue to operate.

- 1. Primary ac electrical power for the helicopter systems is provided by a 120-208-volt, three-phase, 400 Hz, air-cooled ac generator. This generator is driven by the engine power turbine from an engine accessory drive pad.
- 2. Primary dc electrical power for the helicopter systems is provided by two sources. The dc essential bus is powered from a 28-volt, 200-ampere transformer rectifier unit (TRU), and the battery emergency bus is powered by a 28-volt, 200-ampere starter-generator. The TRU is located in the aft electrical compartment, and the starter-generator is located on the engine and driven by the engine gas producer (NG) turbine. An additional dc bus (power assured) is powered from the battery generator bus.
- 3. Backup systems for both dc and ac primary power systems are provided. These backup systems ensure that no single electrical failure will cause the loss of any system essential to tactical instrument flight. Automatic switching from primary power to backup is provided. Backup dc power is provided by the starter-generator. In the event the ac generator fails, the starter-generator output to an inverter will supply ac power. A starter-generator failure results in the TRU assuming the full load imposed by the dc essential bus, battery emergency bus and power assured bus. In the event of an ac generator failure, the inverter will assume the loads on the 115 Vac essential bus.
- 4. Electrical power for starting and emergency power supply is provided by a single 24-volt, 17 ampere-hour battery. This battery is located in the nose of the helicopter and is controlled by the BATT 1 switch in the overhead console. Complete provisions are included for the installation of a second battery. This second battery is included as part of the winterization heater installation. When installed, the second battery is located in the aft electrical compartment and controlled through the BATT 2 switch in the overhead console.

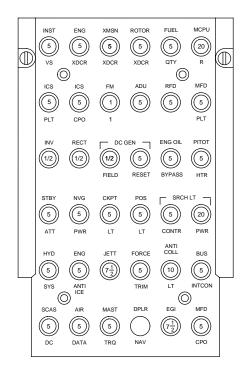
- 5. External power receptacles are provided for application of both ac and dc electrical power while on the ground. With dc external power applied, engine starting and systems checkout may be accomplished. Application of ac external power allows operation and checkout of systems powered by 115 Vac and 26 Vac power.
- 6. Battery System Operation. The battery supplies power to the battery emergency bus when the ESNTL BUS switch is in the START position. When two batteries are installed, either battery will supply bus power. In the event of total generator failure with the ESNTL BUS switch in the RUN position, the battery supplies power to the inverter, dc essential power assured bus, and the dc essential bus.
- 7. DC Electrical Power Distribution System. The dc power distribution system is divided into bus systems. The four distinct but interrelated systems are the dc essential power assured bus, battery emergency bus, dc essential bus, and battery generator bus.
- 8. AC Electrical Power Distribution System. The ac power distribution system consists of 3 buses: the ac 3-phase 115/200V non-essential bus powered by the ac generator or ac external power; the ac single-phase 115V essential bus powered by the ac generator, ac external power, or the inverter; and the ac single-phase 26V bus powered from a 115/26V transformer connected to the 115V essential bus.
 - 9. Electrical Systems Controls.
- a. DC Power Control. Dc power is controlled by the BATT 1 and BATT 2 switches, DC GEN switch and DC GEN FIELD and RESET circuit breakers in the overhead console and by a 9TH CELL circuit breaker (for battery preheat monitoring) located in the forward battery compartment. Distribution of dc power is also controlled by the ESNTL BUS switch.
- b. AC Power Control. AC power is controlled by the AC GEN switch, ESNTL BUS switch, and INV and RECT circuit breakers. These controls are located in the overhead console. In addition, 26 Vac power is controlled by 26 VAC PWR circuit breaker located on the center post circuit breaker panel.



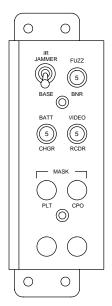
Basic AC and DC Supply Circuits



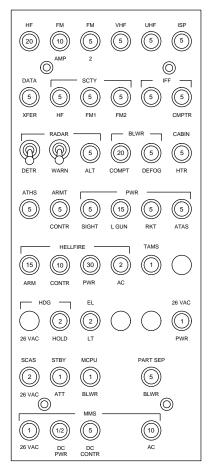
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



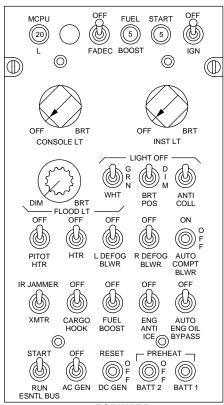
AUXILIARY CIRCUIT BREAKER PANEL



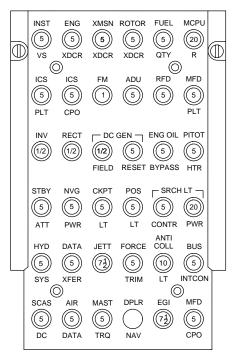
CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

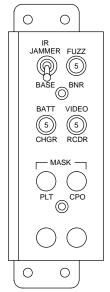
Cockpit Circuit Breaker Panels - OH-58D



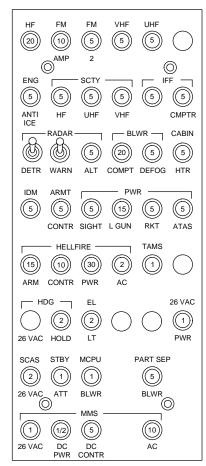
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

Cockpit Circuit Breaker Panels - OH-58D(R)

1-32. FUEL SYSTEM

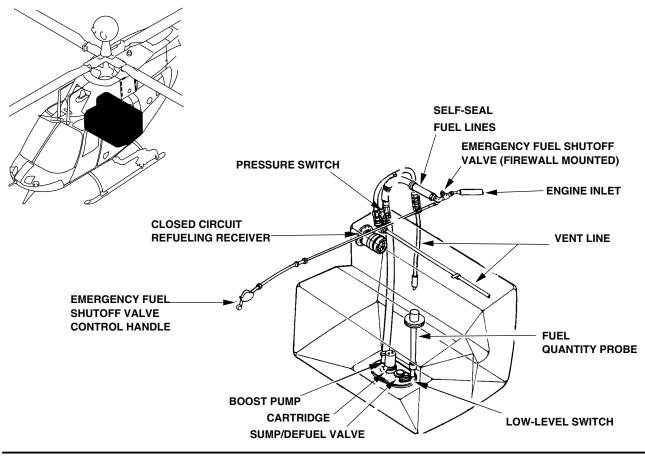
The fuel system consists of a crash resistant self-sealing fuel cell, engine-driven fuel pump, fuel cell mounted boost pump, quantity indication system, emergency fuel shutoff valve, drainage provisions, low level warning system, engine mounted filter with filter bypass indicator, and breakaway valves. Installed in the top of the cell is a breakaway vent line and a pressure switch. The system incorporates a closed circuit refueling receiver.

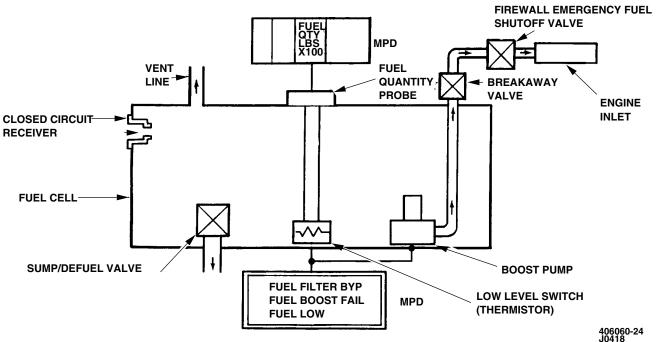
1. Controls and Indicators.

- a. Fuel quantity Indicator. Fuel quantity is displayed by a vertical scale continuous readout indicator located on the multiparameter display (MPD). The indicator is powered by the dc battery emergency bus and protected by the fuel quantity circuit breaker located on the overhead console circuit breaker panel.
- b. Fuel Boost Pump. A fuel boost pump, mounted at the bottom of the fuel cell, is provided for assisting the engine driven suction pump to deliver fuel. The pump is automatically engaged during engine starting. The fuel boost pump is activated by placing the FUEL BOOST switch to FUEL BOOST. A FUEL BOOST FAIL caution message will be displayed on the MFD when the fuel boost pump pressure is below safe operating limits.
- c. Emergency Fuel Shutoff Valve. An emergency fuel shutoff valve is mounted on the firewall. The valve is manually operated and is provided to stop fuel flow to the engine. The valve

is operated with a control handle mounted on the forward right side of the overhead console.

- d. Fuel Low Caution. A FUEL LOW caution message will be displayed on the multifunction display (MFD) when there are 115 \pm 15 pounds of fuel remaining. The message is sent to the MFD by the thermistor mounted on the fuel quantity probe.
- e. Fuel Filter Bypass Caution. A FUEL FILTER BYP caution message will be displayed on the MFD when the engine mounted fuel filter becomes partially obstructed.
- f. Pressure Switch. The pressure switch will activate FUEL BOOST FAIL caution message on the MFD when boost pump fails to deliver normal pressure.
- 2. Closed Circuit Refueling Receiver. The closed circuit refueling receiver allows refueling by either the gravity feed method or by using a closed circuit refueling nozzle. When refueling with the closed circuit refueling nozzle, an automatic shutoff of fuel is provided at a predetermined level.
- a. The sump valve is located in the lowest part of the fuel cell and is used for fuel sample and defuel purposes. The sump valve is used in determining fuel contamination levels.
- b. Filler cap and adapter is located on right side of fuselage aft of doors and provides for fueling and defueling access.





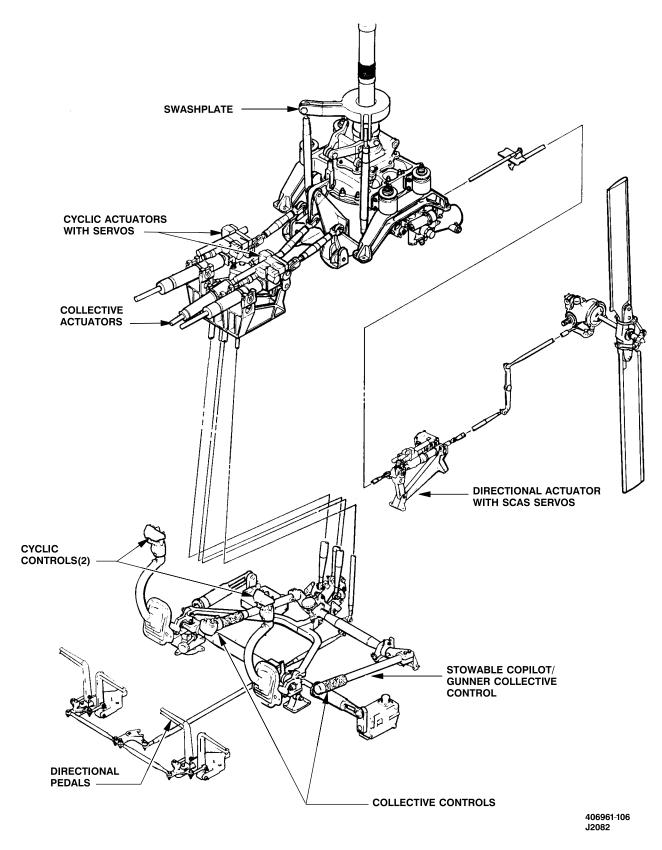
Fuel System (Typical)

1-33. FLIGHT CONTROLS

The flight control system is a positive mechanical type, actuated by conventional helicopter controls. Complete controls are provided for both pilot and CPG. The system includes a cyclic control system for attitude and directional control, a collective control system for vertical control, tail rotor control system for directional control, a force trim system, and a stability and control augmentation system (SCAS). Hydraulic servoactuators are employed in the control system to prevent feedback forces and reduce pilot fatigue.

- 1. Cyclic Control System. The cyclic control system is operated by a cyclic stick, located forward of each crewmembers seat, and is the primary attitude control. Movement of the cyclic stick produces a corresponding tilt of the swashplate through two hydraulic servoactuators, mounted on the cabin roof, for lateral and longitudinal inputs. The tilt of the swashplate induces corresponding changes in the main rotor blade pitch angles during rotation. The blades then produce differential aerodynamic lift forces, which cause the plane of rotation of the rotor to tilt. The helicopter will fly in the direction in which the rotor plane is at its lowest angle.
- 2. Collective Control System. The collective control system is operated by a collective stick, located to the left of each crewmembers seat, and is the primary control for lift. Movement of the collective stick to the up position increases the angle of attack of the main rotor blades, resulting in increased lift. The amount of collective movement determines the results of either an ascent or descent condition of the helicopter.
- 3. Tail Rotor Control System. The tail rotor control system is operated by pilot or CPG antitorque pedals. Pushing the pedals will change the pitch of the tail rotor blades, resulting in directional control. Pedal adjusters are provided to adjust the pedal distance for individual comfort.

- 4. Force Trim System. The force trim system is incorporated into the cyclic and tail rotor control systems to provide an artificial feel in the flight controls and also provide a reference point for the SCAS to operate against. The cyclic force trim system consists of two magnetic brakes and two force gradients for pitch and roll. The tail rotor force trim system consists of one magnetic brake and one force gradient for yaw.
- 5. Stability and Control Augmentation System (SCAS).
- a. The SCAS is a three-axis (pitch, roll, and yaw), limited authority, rate reference augmentation system. The SCAS cancels undesirable helicopter motion during flight. The master controller processor unit (MCPU) receives inputs from the six SCAS motion transducers, the SCAS gyros and the Embedded Global Positioning/Inertial Navigation System (EGI). From these signals the MCPU sends a signal to the appropriate SCAS actuator electro-hydraulic valve, telling it to extend or retract. The linear variable differential transformer (LVDT), located in the SCAS module, sends a signal back to the MCPU telling it how far the actuator has moved. When the movement is sufficient to cancel the undesirable movement, the MCPU signals the actuator to stop.
- b. The heading hold mode (HHM), operated in conjunction with the yaw SCAS system, is used primarily for low altitude/airspeed operation. The MCPU computes the logic necessary to maintain aircraft heading if the yaw channels are operating and SCAS is engaged. The Embedded Global Positioning/Inertial Navigation System (EGI) in the OH-58D and OH-58D(R) maintains aircraft heading by making inputs to the rotary actuator mounted to the directional control actuator magnetic brake. The rotary actuator is powered by 115 Vac single-phase and the antitorque magnetic brake is powered by 28 Vdc off the SCAS DC circuit breaker.

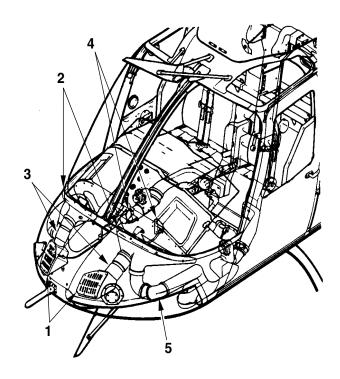


Flight Controls (Typical)

1-34. UTILITY SYSTEMS.

The utility systems are made up of the ram air system and the bleed air system.

- 1. Ram Air Defogging. Ram air for defogging the windshield enters through two air inlet grilles (1) and is directed to the defog nozzles (2). The defog nozzles are located at the base of the windshield and direct ram air towards the windshield. Defog blowers (3) are installed in each ram air duct and provide a steady flow of air when ram airflow is insufficient to defog the windshield. Ram air controls (4), identified by VENT PULL decals, control the volume of air passing through the defog nozzles. The controls are located on each side of the center console.
- 2. Bleed Air Defogging/ Defrosting. Bleed air ducts (5) carry bleed air from the bleed air heating system to the defog nozzles (2) for windshield defogging/defrosting. Openings in the bleed air ducts provide bleed air for defogging/defrosting lower crew station windows. Bleed air for defogging/defrosting is available whenever the bleed air heating system is activated.



406961-9 H1342

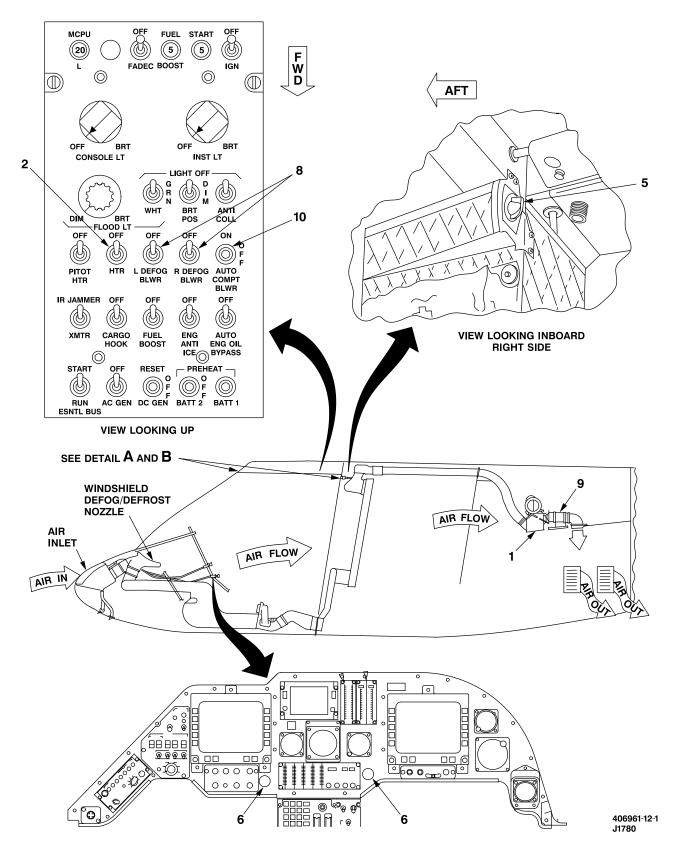
1-35. ENVIRONMENTAL CONTROL SYSTEMS.

The environmental control systems are made up of the bleed air heating system, the ventilation system, and the equipment cooling system.

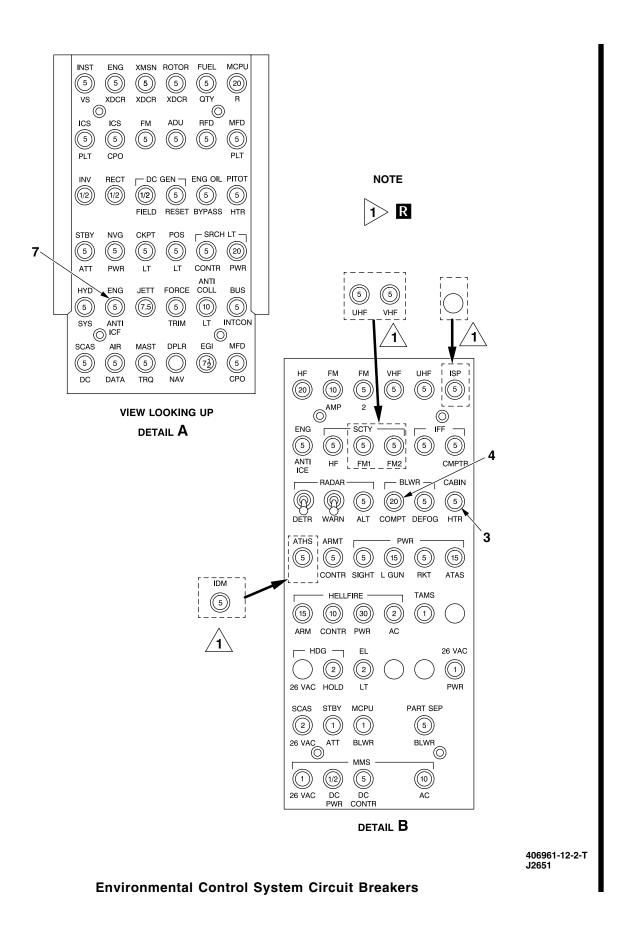
- 1. Bleed Air Heating System. The bleed air heater (1) is installed in the equipment compartment aft of the electrical shelf. A HTR switch (2) activates the system. Circuit protection is provided by the CABIN HTR circuit breaker (3, detail B) and the BLWR COMPT circuit breaker. Temperature is controlled by rotating the HEAT control knob (5) above and behind the pilots head. This knob operates a control cable in the cabin roof to adjust an air temperature sensor mounted in the heater discharge duct. Adjusting the sensor mixes the fresh air and bleed air to obtain the air temperature.
- 2. Ventilation System. The ventilation system is an integral part of the heating and defogging system. Each system uses the same duct system for air circulation in the cabin. Outside fresh air from two air inlets, located on the nose of the helicopter, is directed through the windshield defog nozzles mounted on the lower windshield frame. VENT PULL control knobs (6) open and close the fresh air inlets. The DEFOG BLOWER

circuit breaker (7, detail A) and L and R DEFOG BLWR switches (8) may be turned on to provide a larger volume of air directed to the windshield and forward cabin area. Airflow to cool both multifunction display units is provided via vent holes in a shroud located above each of the two multifunction display units. Outside fresh air also enters the aft cabin area via a scoop type air inlet located in each of the left and right access doors.

3. Equipment Cooling. A cooling blower (9) is provided to cool the electronic/avionics equipment. The blower has the capacity to adequately cool the electronic/avionics equipment up to 100 °F (37.8 °C) outside air temperature (OAT) with crew doors on and up to 120 °F (48.9 °C) OAT with crew doors off. A three-position CÓMPT BLWR switch (10), located in the overhead console, permits the system to be turned OFF, manually operated in the ON position and automatically operated by temperature sensors in the AUTO position. The temperature sensors automatically turn on the cooling blower whenever the temperature reaches 100 °F (37.8) °C). The avionics cooling blower can also be utilized to remove smoke and other contaminants from the cabin by pulling air from the crew and equipment compartments and exhausting the air overboard through the aft equipment bay.



Environmental Control System



Change 1

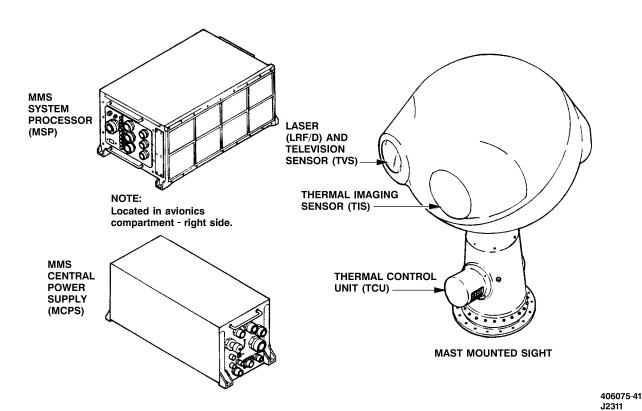
1-36. MISSION EQUIPMENT (AVIONICS)

Mission equipment (avionics) consists of the mast mounted sight subsystem (MMSS) and the airborne target handover system (ATHS) or the Improved Data Modem (IDM) if installed.

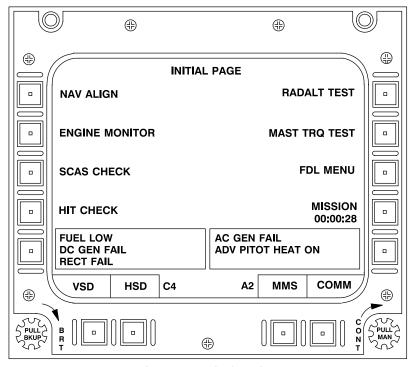
1. Mast Mounted Sight Subsystem (MMSS). The MMS provides the ability to search, detect, recognize, track, locate, and designate ground targets in both day and night environments. The subsystem is used with the cockpit control display subsystem (CDS) and the embedded global positioning/inertial navigation system (EGI) if installed. With the CDS the crew can "call up" a desired format by pressing a button on the face of the multifunction display (MFD) or selecting a display format (flight, navigation, communication, or MMS) with controls on the cyclic stick.

Targets are detected, acquired, and tracked using either the thermal imaging sensor (TIS) for infrared sensing during darkness or poor visibility and television system (TVS) during daylight operations. In addition to these two systems, a laser rangefinder/designator system (LRF/D) is provided. The LRF/D system is used for range determination, target designation and navigation and waypoint identification.

2. Airborne Target Handover System (ATHS)/ Improved Data Modem (IDM). The ATHS/IDM gathers, formats, disseminates, and controls the transmission of information between the helicopter and other aircraft and between the helicopter and ground units. The system replaces the need for voice communication when transferring targeting information among combined arms teams. The ATHS/IDM provides a digital communications link between an airborne scout and other airborne and ground activities. This digital link provides the information path to request, assign, control, and monitor both standard and COPPERHEAD artillery, indirect HELLFIRE, and autonomous attack missions, as well as providing a means of reporting/requesting team activity.



Major MMS Components

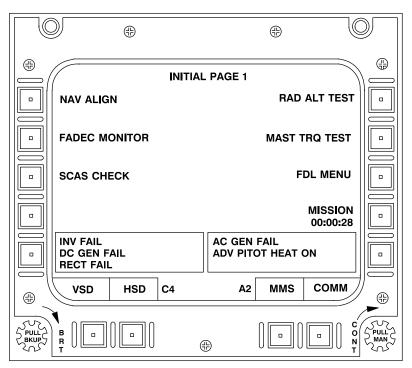


PILOT MULTIFUNCTION DISPLAY CPG MULTIFUNCTION DISPLAY

NOTE: Located on Instrument panel.

406075-88-1-T J2326

Pilot and CPG MFD (OH-58D)



PILOT MULTIFUNCTION DISPLAY CPG MULTIFUNCTION DISPLAY

NOTE: Located on instrument panel.

406075-88-2-T J2326

Pilot and CPG MFD (OH-58D(R))

1-37. MISSION EQUIPMENT (ARMAMENT)

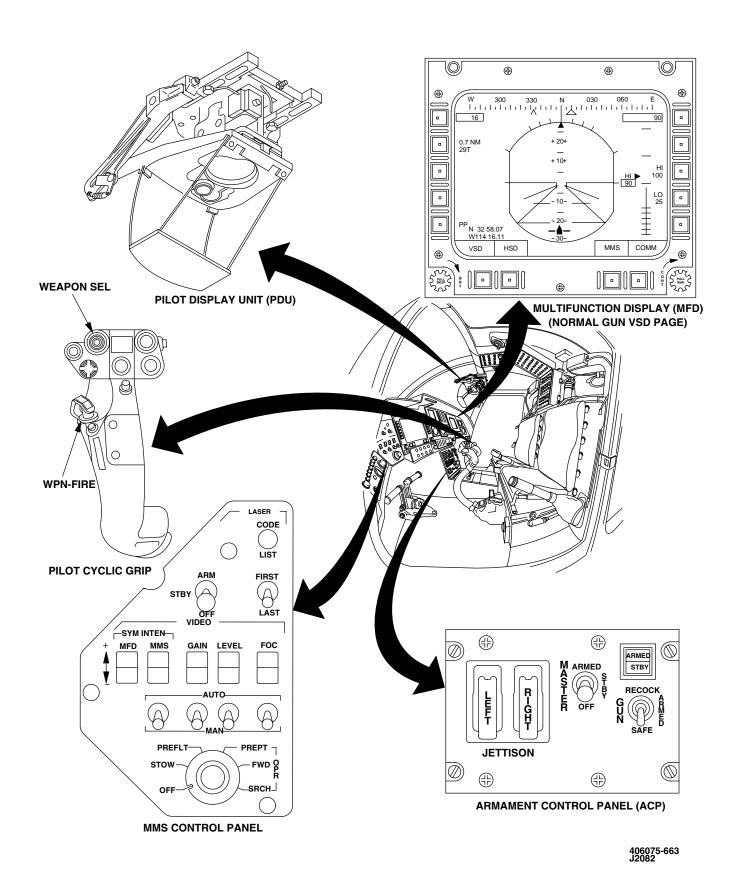
Mission equipment (armament) on the OH-58D and OH-58D(R) consists of sight assemblies, Universal Weapons Pylon (UWP), ejector racks, and weapons installed on both sides of the helicopter. The weapons systems include Air-To-Air Stinger (ATAS) weapon system and complete provisions for HELLFIRE Missiles, 2.75-inch rockets, and .50 caliber machine gun pod. The .50 caliber machine gun is used on the left Universal Weapons Pylon (UWP) only. These weapons are integrated into the cockpit using the Control Display System (CDS), Mast Mounted Sight (MMS), and Armament Control Panel (ACP). All weapons are jettisonable except the .50 caliber machine gun.

The UWP, installed in each side of the intermediate fuselage, has mounting provisions for

a variety of weapon systems. The UWP consists of the aircraft fittings, arm assemblies, pylon assemblies, and ejector rack assemblies. Expandable bolts and quick disconnect electrical connectors provide for quick removal and installation of the UWP. The UWP features a hinge fitting which allows the pylon to be folded (with weapons installed if required), reducing space required for shipping or storage of helicopter.

A rack support assembly located on the outboard end of each UWP provides a mounting point for the ejector rack and for boresight adjustment.

The ejector racks provide attaching points for weapon systems and contain explosive cartridges which allow a malfunctioning weapon to be jettisoned.



Mission Equipment — Armament (Typical)

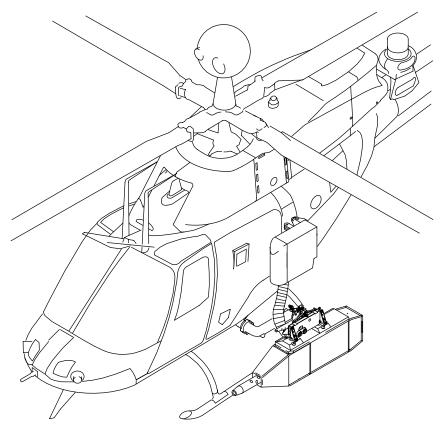
The weapons systems are described as follows:

1. The .50 caliber machine gun system consists of a .50 caliber machine gun, an ammunition feed and storage system, and the necessary controls and components to operate the system. It is capable of recocking to clear malfunctions while airborne. The system is powered by the 28 Vdc essential bus. Circuit protection is provided by the L GUN circuit

breaker located on the aft center post circuit breaker panel.

The machine gun is an air-cooled, belt-fed, recoil operated, electrically controlled weapon. The machine gun is mounted in a fixed position to the UWP on the left side of the helicopter. Symmetrical loading is not required. It is capable of firing 750-850 rounds per minute at a maximum effective range of 2000 meters.

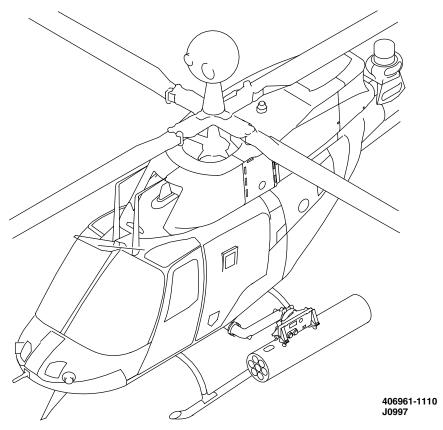
406961-1108 J0997



.50 Caliber Machine Gun

2. The 2.75-inch rocket weapon system is a light antipersonnel/area suppression weapon system. It is capable of air-to-air or air-to-ground delivery, it allows fuse selection, and can fire rockets one at a time, in pairs, or ripple. When fired in ripple mode, rockets may be segregated into zones or fired until supply is exhausted when ALL is selected. The system is comprised of a 7-tube rocket launcher(s), and the necessary components, software and switches to operate the system. The rocket launcher(s) can be jettisoned

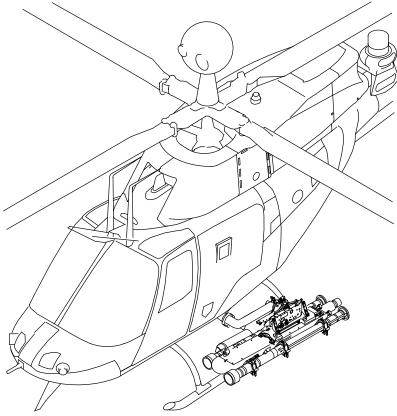
using the JETTISON switches located on the Armament Control Panel (ACP). The weapon is electrically controlled and powered by the 28 Vdc essential bus. Circuit protection is provided by the Rocket Power (RKT PWR) and Armament Control (ARMT CONTR) circuit breakers located on the aft center post circuit breaker panel. The rocket launcher(s) are mounted on the ejector rack. They may be installed on one or both sides of the helicopter. Symmetrical loading is not required.



2.75 Inch Rocket System

3. The Air-To-Air Stinger (ATAS) missile is an air-to-air, heat seeking missile system capable of launching four missiles at primarily airborne targets providing defensive and limited offensive air-to-air combat capability. The system is comprised of the ATAS launcher assembly, and necessary components and software to operate the system. The ATAS launcher assembly is mounted on the ejector rack by means of an adapter. Each launcher contains a coolant bottle and can be jettisoned during an emergency. Each

launcher is capable of mounting two missiles on each UWP for a maximum of four ATAS on the helicopter at one time. The launcher assembly receives power distribution and commands from the interface electronic assembly (IEA) and sends signals communicating its presence, processes, and response to commands to the IEA. The launcher electronics controls coolant flow to the selected missile seeker head and fires a single missile when the WPN-FIRE switch is pressed to the second detent.

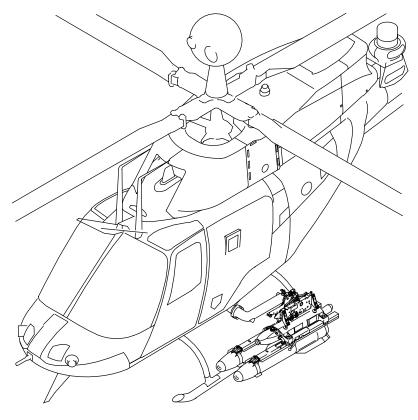


406961-1111 J0997

ATAS Missile System

4. The HELLFIRE missile is a laser guided modular anti-armor ground or airborne launched missile. The HELLFIRE missile system (HMS) is provided with fire-and-forget capability against armored or reinforced targets that are externally designated by ground or airborne laser units. Guidance is provided through automatic terminal homing on the laser signal reflected from the laser designated target. The pilot is provided with

controls and information needed for missile launching. Missile status, steering data, display of helicopter orientation for missile launching, missile selection, laser coding, and pylon mounted launchers are controlled by the copilot/gunner (CPG). Each launcher is capable of mounting and launching two missiles. The missile consists of four major sections: seeker, warhead, propulsion, and control.

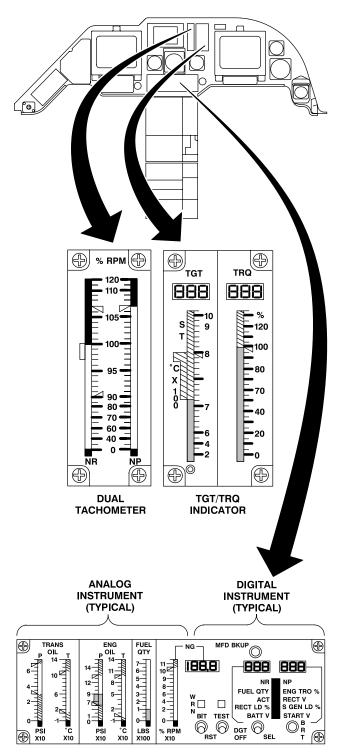


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HELLFIRE Missile System

1-38. ANALOG AND DIGITAL INSTRUMENTS

The helicopter is equipped with both analog and digital type instruments. These instruments provide the crew with helicopter interface information. The instrument display provides extended fail-safe availability of data through multiple displays.



MULTIPARAMETER DISPLAY

406075-274

CHAPTER 2

OPERATIONAL CHECKS

2-1. SCOPE

This chapter contains information required to support unit operational checks. The chapter is

divided into 6 sections. Maintenance Action Precise Symptoms (MAPS) diagrams are located in TM 1-1520-248-T-2 and TM 1-1520-248-T-3.

		Page
Section I	PowerPlant	2-1
Section II	Hydraulic System	2-8
Section III	Instruments	2-18
Section IV	Fuel System	2-64
Section V	Armament Systems	2-76
Section VI	Electrical System	2-281

Section I. POWERPLANT

2-2. TASK LIST

List of tasks provides a numerical index of operational checks contained in this section. Power Plant system operational checks are listed in column one (Task). To perform these checks refer to column two (Task Number) which will indicate the task number to be performed. The

individual task should be performed in sequence as specified in each task unless otherwise noted within the task.

Correction of malfunctions must be verified by performing an operational check using the procedures in this section.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Oil Cooler Bypass Valve — Operational Check Fuel Differential Switch — Operational Check	2-1-1 2-1-2	2-2 2-5
•		

2-1-1. OIL COOLER BYPASS VALVE — OPERATIONAL CHECK

This task covers: Check (On Helicopter)

INITIAL SETUP

67S Scout Helicopter Technical Inspector (TI)

Pilot

Applicable Configurations:

ΑII

Tools:

Aviation Ground Power Unit (AGPU) General Mechanic Tool Kit (B15) Maintenance Stand (B9)

Material:

Lubricating Oil (C4 or C8)

Personnel Required:

67S Scout Helicopter Repairer 68F Aircraft Electrician

References:

TM 1-1520-248-10 TM 1-1520-248-CL TM 1-1520-248-23

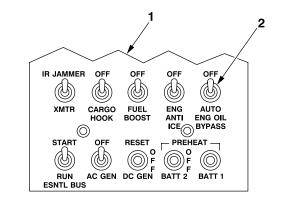
Equipment Condition:

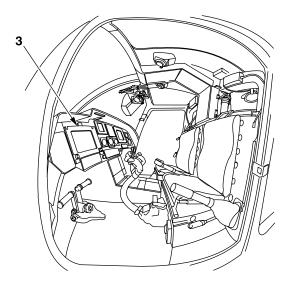
Aft Fairing Removed (TM 1-1520-248-23)
Engine Oil Tank Drained (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

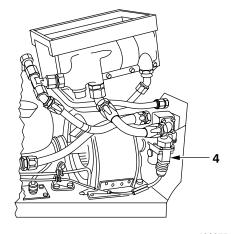
2-1-1. OIL COOLER BYPASS VALVE — OPERATIONAL CHECK (CONT)

CHECK

- 1. Apply external electrical power (TM 1-1520-248-23).
- 2. On the forward overhead console panel (1), set ENG OIL BYPASS switch (2) to AUTO.
- a. Verify OIL BYP ENG caution message is displayed on multifunction display (MFD) (3).
- b. Verify LOW OIL QUANTITY ENG caution message is displayed on MFD (3).
 - 3. Set ENG OIL BYPASS switch (1) to OFF.
- a. Listen for audible oil cooler bypass valve(4) actuation.
- b. Verify OIL BYP ENG caution message disappears from MFD (3).
- c. Verify LOW OIL QUANTITY ENG caution message is still displayed on MFD (3).
 - 4. Set ENG OIL BYPASS switch (1) to AUTO.
- a. Listen for audible oil cooler bypass valve(4) actuation.
- b. Verify OIL BYP ENG caution message is displayed on MFD (3).
- c. Verify LOW OIL QUANTITY ENG caution message is displayed on MFD (3).







406075-1625-1-T J2651

2-1-1. OIL COOLER BYPASS VALVE — OPERATIONAL CHECK (CONT)



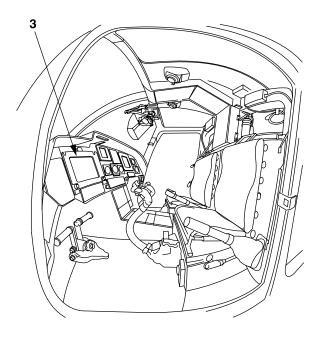
Lubricating Oil

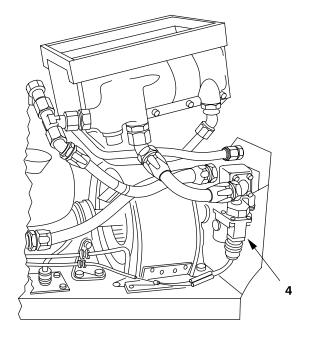
- 5. Begin filling engine oil tank (TM 1-1520-248-23). When approximately 1.1 gallons of lubricating oil (C4 or C8) has been added:
- a. Verify LOW OIL QUANTITY ENG caution message disappears from MFD (3).
- b. Listen for audible oil cooler bypass valve (4) actuation.
- c. Verify OIL BYP ENG caution message disappears from MFD (3).
- 6. Complete filling of engine oil tank (TM 1-1520-248-23).
- 7. Pilot start engine and stabilize at ground idle (TM 1-1520-248-10/CL).
- a. Verify OIL BYP ENG caution message is not displayed on MFD (3).
 - b. Verify engine oil temperature is stabilized.
- 8. Pilot shutdown engine (TM 1-1520-248-10/CL).
- 9. Disconnect external electrical power (TM 1-1520-248-23).

INSPECT

FOLLOW-ON MAINTENANCE

Install aft fairing (TM 1-1520-248-23).





406075-1625-2-T J1922

2-1-2. FUEL DIFFERENTIAL SWITCH — OPERATIONAL CHECK

This task covers: Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

ΑII

Tools:

Aviation Ground Power Unit (AGPU) General Mechanic Tool Kit (B15) Electrical Repairer Tool Kit (B14) Torque Wrench (B19)

Maintenance Stand (B9)

Material:

Protective Plug

Personnel Required:

68F Aircraft Electrician

67S Scout Helicopter Repairer

67S Scout Helicopter Technical Inspector (TI)

References:

TM 1-1520-248-23 TM 1-2840-263-23

TM 55-2840-256-23

Equipment Condition:

Aft Fairing Removed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

All Switches — Off/SAFE

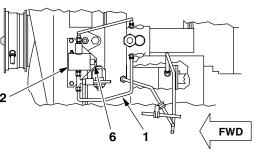
2-1-2. FUEL DIFFERENTIAL SWITCH — OPERATIONAL CHECK (CONT)

CHECK

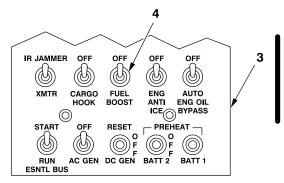


Jet Fue

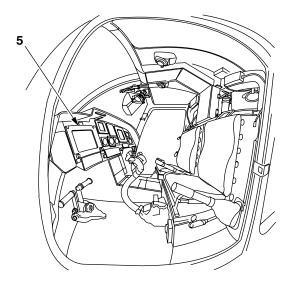
- 1. Disconnect tube (1) at the fuel differential pressure switch (2); install protective plug in tube (1).
- 2. Apply external electrical power (TM 1-1520-248-23).
- 3. On forward overhead console panel (3) set FUEL BOOST switch (4) to FUEL BOOST position to activate fuel boost pump.
- 4. Verify FUEL FILTER BYP caution message is displayed on multifunction display (MFD) (5).
- a. When FUEL FILTER BYP caution message appears:
 - (1) Place FUEL BOOST switch (4) to OFF.
- (2) Remove protective plug from tube (1) and reinstall tube (1) to fuel differential pressure switch (2). Torque tube (1) to **60 INCH-POUNDS**.
- (3) Bleed engine fuel system (TM 55-2840-256-23).
- b. If FUEL FILTER BYP caution message fails to appear on MFD (5), check electrical system, refer to Chapter 5 (MAPS 5-4-29).
- c. Check fuel differential pressure switch (2) as follows.
- (1) Disconnect electrical connector (6) from fuel differential pressure switch (2) receptacle.



BOTTOM VIEW-ENGINE



FORWARD OVERHEAD CONSOLE PANEL



406075-393-T J2651

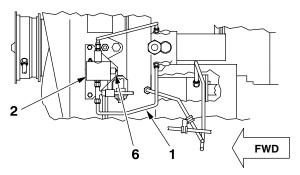
2-1-2. FUEL DIFFERENTIAL SWITCH — OPERATIONAL CHECK (CONT)

- (2) Check continuity between terminals B and C on fuel differential pressure switch (2). With FUEL BOOST switch (4) in OFF position, there should be an open circuit between terminals B and C. With tube (1) disconnected (step 1) and FUEL BOOST switch (4) set to FUEL BOOST position, there should be a closed circuit between terminals B and C.
- (3) Connect electrical connector (6) to fuel differential pressure switch (2).
- (4) If fuel differential pressure switch (2) fails step 4.b.(2) above, check for clogged or restricted pressure port in fuel differential pressure switch (2) or clogged or restricted tube (1).
- 5. Replace fuel differential pressure switch (2) (TM-1-1520-248-23) if defective.
 - 6. Repeat steps 1 through 4.a.(3).
- 7. Disconnect external electrical power (TM 1-1520-248-23).

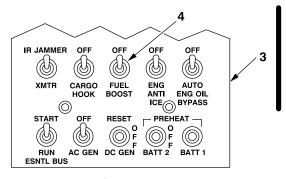
INSPECT

FOLLOW-ON MAINTENANCE

Install aft fairing (TM 1-1520-248-23).



BOTTOM VIEW-ENGINE



FORWARD
OVERHEAD CONSOLE PANEL

406075-394-T J2651

Section II. HYDRAULIC SYSTEM

2-3. TASK LIST

List of tasks provides a numerical index of operational checks contained in this section. Hydraulic system operational checks are listed in column one (Task). To perform these checks refer to column two (Task Number) which will indicate the task number to be performed. The individual task should be performed in sequence as specified in each task unless otherwise noted within the task.

Correction of malfunctions must be verified by performing an operational check using the procedures in this section.

NOTE

MFD displays shown herein are typical and may vary with the particular operational flight program in use.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Hydraulic System — Operational Check	2-2-1	2-9

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

ΑII

Tools:

Aviation Ground Power Unit (AGPU) General Mechanic Tool Kit (B15) Maintenance Stand (B9)

Hydraulic Test Stand

Material:

Wiping Rags (C5)

Personnel Required:

68H Aircraft Pneudraulics Repairer 67S Scout Helicopter Repairer

67S Scout Helicopter Technical Inspector (TI)

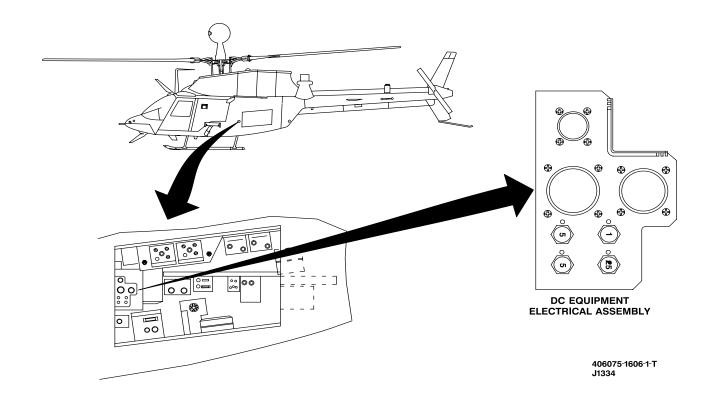
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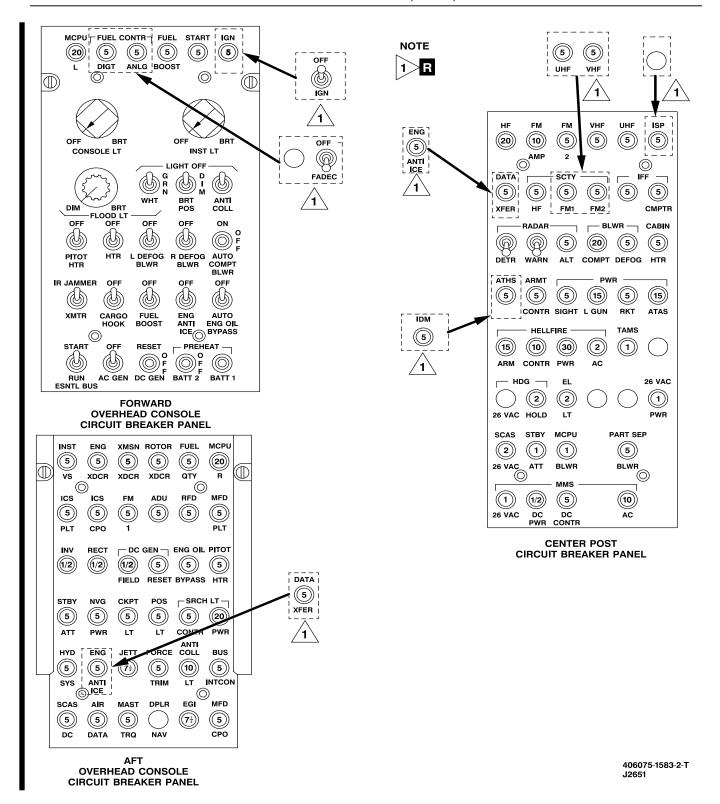
TM 1-1520-248-23

Equipment Condition:

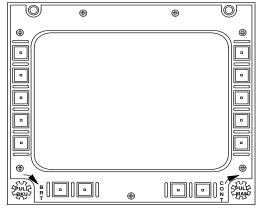
Forward Fairing Assembly Removed

(TM 1-1520-248-23)





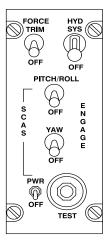
GO TO NEXT PAGE



MULTIFUNCTION DISPLAY (MFD)



PILOT AUXILIARY CONTROL PANEL



STABILITY AND CONTROL AUGMENTATION SYSTEM (SCAS) CONTROL PANEL

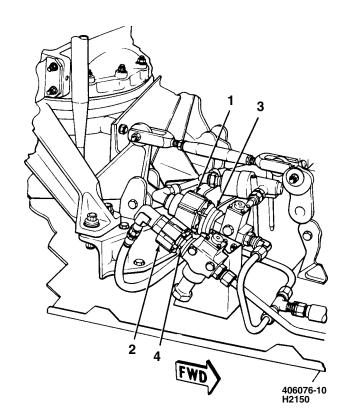
406075-1606-3-T J1334

PREPARATION

NOTE

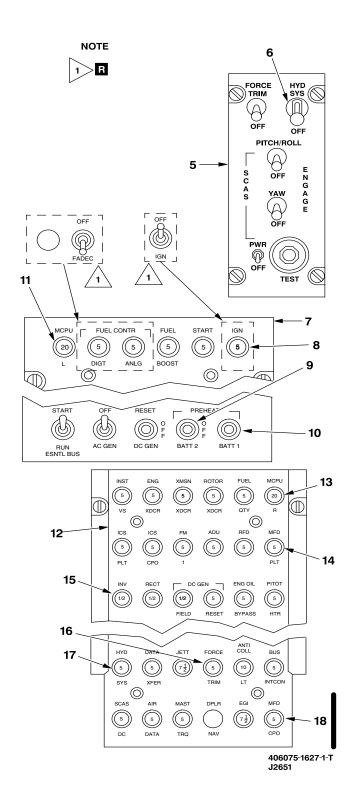
A complete visual inspection of the hydraulic system shall be accomplished before the operational check is performed to ensure that all components and lines are secure and appear capable of satisfactory operation.

- 1. Disconnect hose quick-disconnect halves (1 and 2). Cap halves.
- 2. Connect hydraulic test stand to filter assembly quick-disconnect halves (3 and 4).



- 3. On SCAS control panel (5), position HYD SYS switch (6) to HYD SYS.
- 4. On forward overhead console panel (7), open IGN circuit breaker (8).
- a. For OH-58D(R), position IGN switch (8) to OFF.
- 5. Position BATT 1 and BATT 2 switches (9 and 10) to OFF.
- 6. Apply external electrical power to helicopter (TM 1-1520-248-23).
- 7. On forward overhead console panel (7), close MCPU L (11) circuit breaker.
- 8. On aft overhead console panel (12), close these circuit breakers:

MCPU R (13) MFD PLT (14) INV (15) FORCE TRIM (16) HYD SYS (17) MFD CPO (18)



9. On center post circuit breaker panel (19), close these circuit breakers:

MCPU BLWR (21)

- 10. On forward overhead console panel (7), position AC GEN switch (22) to OFF.
 - 11. Position ESNTL BUS switch (23) to RUN.
- 12. On DC equipment electrical assembly (24), close CDS INV VOLT circuit breaker (25).

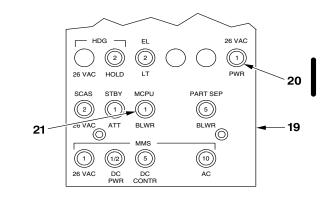
CHECK

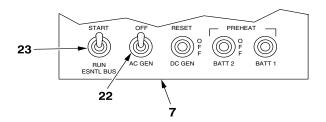
13. Apply 1000 ± 50 psig to hydraulic system.

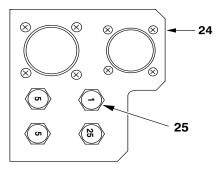
NOTE

Clearance between all moving parts shall be such that fouling of adjacent parts shall not occur. Particular attention shall be given to flexible connections to ensure pinching does not occur and vibration does not loosen attached fittings.

- 14. Slowly cycle cyclic, collective, and directional controls to stroke limit and observe movement of hydraulic servoactuators to check clearance. Verify clearance between all moving parts is adequate and no fouling of adjacent parts occurs, flexible connections are not pinched, and vibration does not loosen attached fittings.
- 15. Check for leakage throughout operational check. Observe all portions of system for evidence of external leakage. Leakage shall not exceed the allowable leakage rates specified in Table 1.







406075-1627-2-T J2651

Table 1. Allowable leakage rates for hydraulic components

	Function	Leak type	Leakage Rate (Max)	
Component			In-Service Components	New Components (Prior to Flight)
Flight control Actuators	Rod seals	D	1 drop/20 full stroke cycles	1 drop/25 full stroke cycles
		S-D	1 drop/15 minutes	1 drop/15 minutes
	Static seals	s	2 drops/day	*None
	Valve input	D	1 drops/5 cycles	1 drop/25 cycles
		S-D	1 drop/5 minutes	1 drop/15 minutes
Pumps	Output shaft	D	8 drops/minute	1 drop/10 minutes
	Housing (mating)	s	2 drops/day	*None
Distribution system	Flareless fittings	s	*None	*None
- •	Hose fittings	s	*None	*None

*Leak shall be insufficient to form a drop

NOTES:

1. Leak types: D = Dynamic

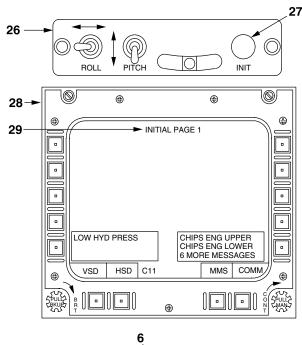
S = Static

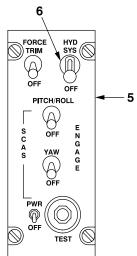
S-D = Static leakage through dynamic seal

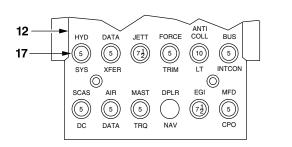
- 2. Approximately 20 drops = 1 cubic centimeter
- Components in static condition, as in parked aircraft, are allowed maximum leakage of two drops per seal or packing per day.
- 4. If hydraulic fluid can be seen in the reservoir sight gage after a two-hour flight, then servo actuator leakage is not considered excessive. The system is acceptable if hydraulic fluid is not exhausted in flight even if servicing is required before every flight.
- 5. If hydraulic fluid can not be seen in the reservoir sight gage after a flight, inspect the hydraulic system for leaks and perform a leakage check as applicable. Leakage of the hose fittings is unacceptable and shall be corrected prior to flight. If the system passes the leak check (TM 1-1520-248-23), service the hydraulic reservoir (TM 1-1520-248-23).

406947-1-T J1236

- 16. On pilot auxiliary control panel (26), press INIT switch (27). On MFD (28), observe that INITIAL PAGE 1 (29) is displayed.
- 17. Gradually decrease pressure to hydraulic system. With pressure gradually decreasing, on MFD (28), verify LOW HYD PRESS caution message is displayed at 500 \pm 100 psig.
- 18. Gradually increase pressure to hydraulic system. With pressure increasing, on MFD (28), verify LOW HYD PRESS caution message is not displayed at 800 ± 100 psig.
 - 19. Check solenoid valve as follows:
 - a. Operate system at 1000 ± 50 psig.
- b. On SCAS control panel (5), position HYD SYS switch (6) to OFF. On MFD (28), verify LOW HYD PRESS caution message is displayed.
- c. Cycle cyclic, collective, and directional controls. Verify more force is required to operate controls.
- d. On aft overhead console panel (12), open HYD SYS circuit breaker (17). Verify hydraulic pressure returns to system; and, on MFD (28), LOW HYD PRESS caution message is not displayed and all controls operate easier.
- e. On SCAS control panel (5), position HYD SYS switch (6) to HYD SYS.
- f. On aft overhead console panel (12), close HYD SYS circuit breaker (17).







406075-1627-3-T J2651

NOTE

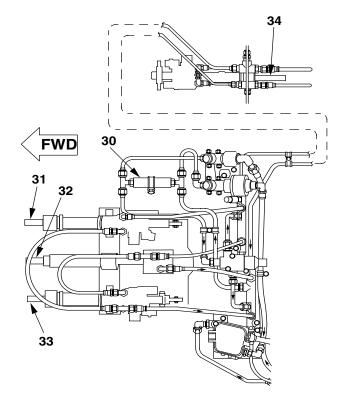
Relief valve opening may be determined by touching screwdriver to valve assembly and listening for relief valve to open and close. Relief valve normally opens (cracks) between 1075 and 1375 psig and reseats at 1075 psig.

- 20. Gradually increase system pressure to check relief valve (30) cracking pressure. Verify relief valve (30) opens between 1075 and 1375 psig.
- 21. Gradually decrease system pressure. Verify relief valve (30) reseats at 1075 psig.
 - 22. Set system to zero psig.
- 23. Cycle cyclic and collective controls to verify no hydraulic assistance is present.

NOTE

Servoactuators are operating when it is determined that the control system is functioning with hydraulic power. Initial hydraulic assistance occurs between 100 and 188 psig. Full hydraulic assistance occurs between 250 and 300 psig. No hydraulic resistance should be experienced above 300 psig.

- 24. Increase hydraulic pressure until servoactuators (31, 32, 33, and 34) are operating.
- 25. Cycle cyclic and collective controls to determine if hydraulic assist is present from 100 to 300 psig and no hydraulic resistance is present above 300 psig on all servoactuator cylinders.
 - 26. Reduce hydraulic pressure to zero psig.
- 27. Grasp rod end of servoactuator cylinder and push or pull with 50 pounds force to check servoactuators for irreversibility. Verify piston rod does not move.



406075-1627-4-T

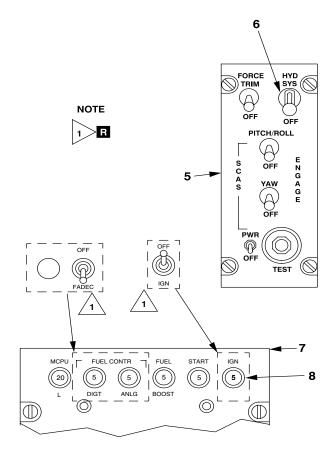
HELICOPTER FLIGHT CONFIGURATION SETUP

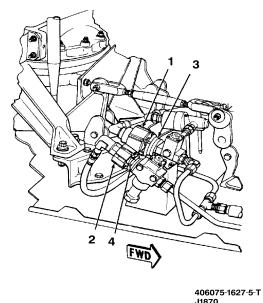
- 28. On SCAS control panel (5), position HYD SYS switch (6) to OFF.
- 29. On forward overhead console panel (7), close IGN circuit breaker (8).
- a. For OH-58D(R), verify IGN switch (8) positioned to OFF.
- 30. Disconnect external electrical power (TM 1-1520-248-23).
- 31. Disconnect hydraulic test stand from filter assembly quick-disconnect halves (3 and 4).
- 32. Remove caps and connect quick-disconnect halves (1 and 2) to quick-disconnect halves (3 and 4).
 - 33. Clean area using wiping rags (C5).

INSPECT

FOLLOW-ON MAINTENANCE

Install forward fairing assembly (TM 1-1520-248-23).





Section III. INSTRUMENTS

2-4. TASK LIST

List of tasks provides a numerical index of operational checks contained in this section. Instrument operational checks are listed in column one (Task). To perform these checks refer to column two (Task Number) which will indicate the task number to be performed. The individual task should be performed in sequence as specified in each task unless otherwise noted within the task.

Correction of malfunctions must be verified by performing an operational check using the procedures in this section.

NOTE

MFD displays shown herein are typical and may vary with the particular operational flight program in use.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Engine/Rotor/Transmission Instruments — Operational Check	2-3-1	2-19
Standby Altimeter — Operational Check	2-3-2	2-27
Standby Attitude Indicator — Operational Check	2-3-3	2-33
Standby Airspeed Indicator — Operational Check	2-3-4	2-38
Pitot-Static/Air Data System — Operational Check	2-3-5	2-43
Standby Compass Light — Operational Check	2-3-6	2-51
Clock — Operational Check	2-3-7	2-54
Digital Clock — Operational Check	2-3-8	2-57
Pitot Tube Heater — Operational Check	2-3-9	2-61

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

Equipment Condition:

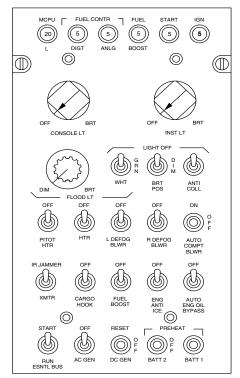
Helicopter Safed (TM 1-1520-248-23)
All Switches — Off/SAFE
All Circuit Breakers — Closed (Overhead
Console/Center Post, Nose, and Aft Electrical

Compartment)

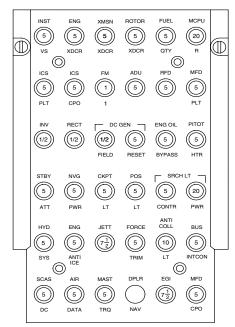
Tools:

Aviation Ground Power Unit (AGPU) Electrical Repairer Tool Kit (B14)

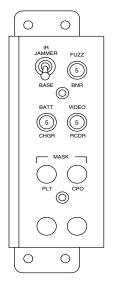
Personnel Required: 68F Aircraft Electrician



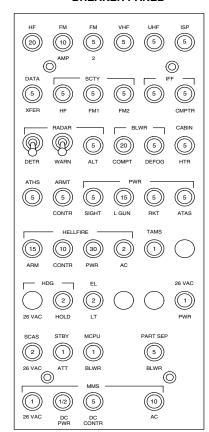
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL

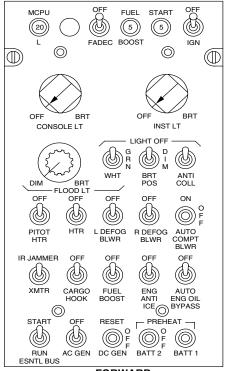


CENTER POST CIRCUIT BREAKER PANEL

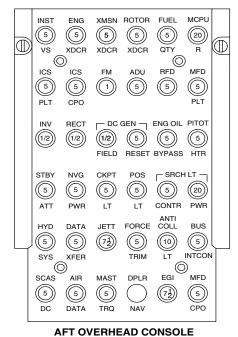
406099-90-3-T J2623

CIRCUIT BREAKER PANELS - OH-58D

GO TO NEXT PAGE



FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



CIRCUIT BREAKER PANEL

IR
JAMMER FUZZ

S
BASE
BNR

BATT VIDEO

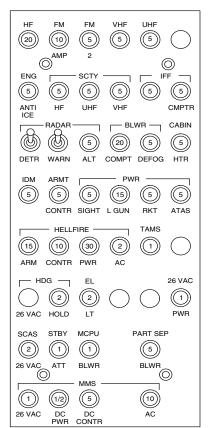
S
CHGR RCDR

MASK

PLT
CPO

O

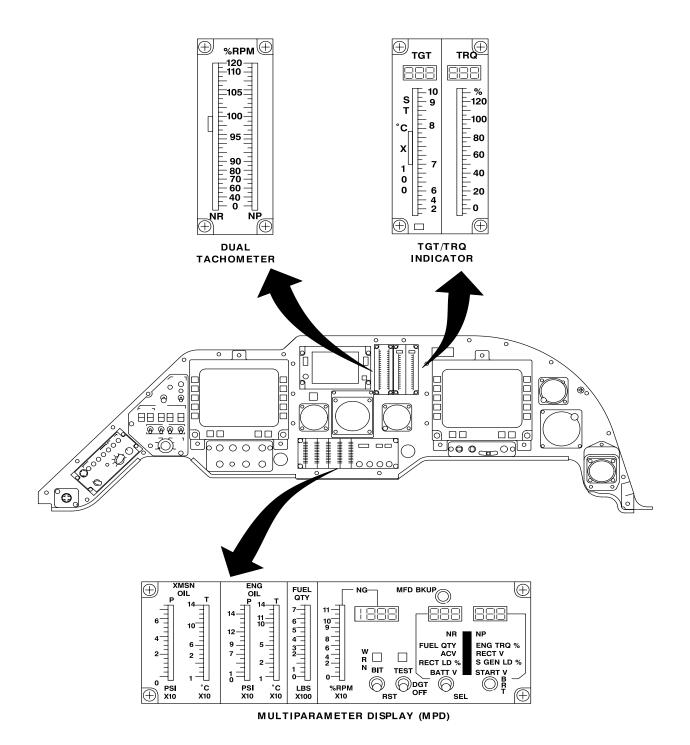
AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

CIRCUIT BREAKER PANELS - OH-58D(R)



406075-1628-1-T J1871

NOTE

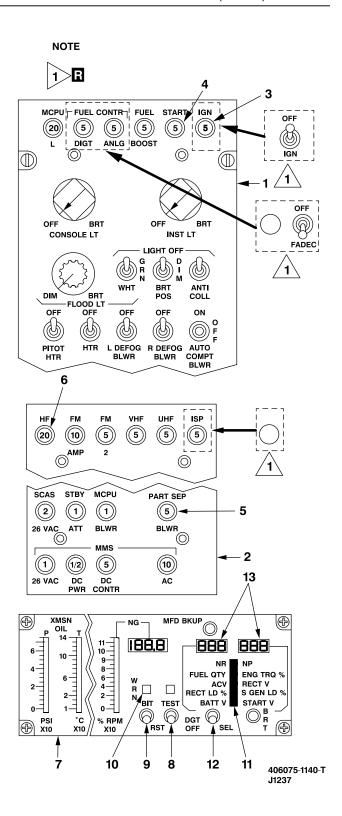
Acknowledge warnings and cautions before pressing menu or line address keys.

- 1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following breakers:
 - a. IGN (3)(OH-58D only)
 - b. START (4)
 - c. PART SEP BLWR (5)
 - d. HF (6)
- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
- 4. On MPD (7), set TEST/DGT OFF switch (8) to center position and BIT/RST switch (9) to center.

NOTE

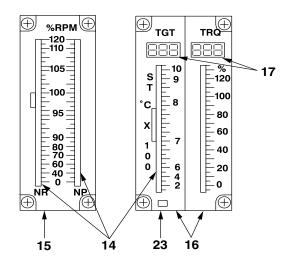
Each time the SEL switch is pressed and released (up and down) a different mode is selected as indicated by appropriate mode light.

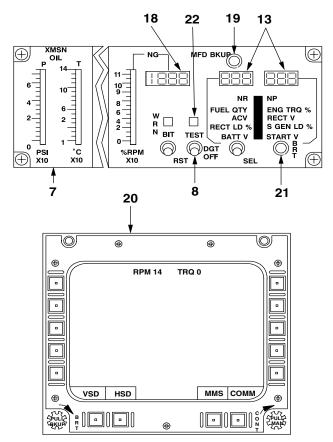
- 5. Verify that WRN light (10) is flashing and BATT V START V mode lamp (11) is lit, or toggle SEL switch (12) until BATT V START V is lit.
- 6. Verify that digital readout (13) indicates 28 \pm 2 VDC.



2-3-1. ENGINE/ROTOR/TRANSMISSION INSTRUMENTS — OPERATIONAL CHECK (CONT)

- 7. Verify that the power indicators (14) are lit (bottom segment of vertical scale instruments).
- 8. Press and hold TEST/DGT OFF switch (8) to TEST and verify:
- a. All vertical scale indicator lights on the MPD (7), dual tachometer (15), and TGT/TRQ indicator (16) are lit and driven to full scale deflection.
- b. All digital readouts (13) on MPD (7) and (17) on TGT/TRQ indicator (16) indicate all eights with the number one preceding the NG readout (18) on MPD (7).
 - c. Release TEST/DGT OFF switch (8).
- 9. Press MFD BKUP switch (19) on the MPD (7) and verify that the RPM and TRQ indications are displayed on both multifunction displays (MFD) (20).
- 10. TURN BRT control (21) on MPD (7) halfway clockwise.
- a. Shine a flashlight on photo cell (22) on MPD (7) and verify that all indicator lights on the dual tachometer (15), TGT/TRQ indicator (16), and MPD (7) brighten.
- b. Shine a flashlight on photo cell (23) on TGT/TRQ indicator (16) and verify that all indicator lights on the dual tachometer (15), TGT/TRQ indicator (16) and MPD (7) brighten.
- c. Turn BRT control (21) on MPD (7) counterclockwise to its prior setting or desired lighting level.





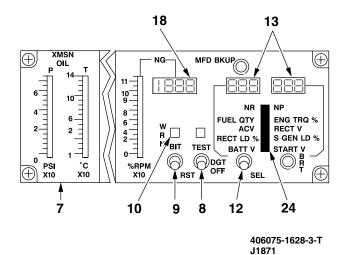
406075-1628-2-T J1871

2-3-1. ENGINE/ROTOR/TRANSMISSION INSTRUMENTS — OPERATIONAL CHECK (CONT)

- 11. On MPD (7) continue to press and release SEL switch (12) (up or down) until all modes (24) have been selected, and verify that each digital numeric display (13) changes with appropriate mode readout.
- 12. On MPD (7) set TEST/DGT OFF switch (8) to DGT OFF and verify that all numeric displays (13) and (18) are off.
- 13. Set BIT/RST switch (9) to BIT which will display the total number of errors in the numeric display (13) and WRN light (10) will stop flashing, but will remain lit until all errors are corrected.

NOTE

- Failure codes are listed in Table 2-1.
- With rotor not turning, an error of F1 05 is normal.
- 14. Press and release SEL switch (12) down to display failure codes in numeric display (13) when more than one failure exists. Error codes are automatically cycled through.
- 15. Press and release BIT/RST switch (9) to RST (when all failures have cleared) to initialize all registers.
- 16. Disconnect external dc electrical power (TM 1-1520-248-23).



2-3-1. ENGINE/ROTOR/TRANSMISSION INSTRUMENTS — OPERATIONAL CHECK (CONT)

Table 2-1. MPD BIT Failure Codes

CODE	FAULT	CODE	FAULT
02 03 04 05 06 07 08 09 10	SOFT FAILURE, PROCESSOR LEFT UART FAILURE RIGHT UART FAILURE ROTOR ERROR POWER FAILURE, MPD RCVR LOGIC FAILURE, MPD RCVR	02 03 04 05 06 07 F3 01 02 03 04	POWER FAIL, TGT/TRQ RECEIVER TGT RECEIVER FAILURE TRQ RECEIVER FAILURE TGT/TRQ DISPLAY TGT/TRQ INDICATOR NOT CONNECTED TGT RCVR LOGIC FAILURE TRQ RCVR LOGIC FAILURE POWER FAIL, NR/NP RECEIVER FAIL, NR/NP NR/NP DISPLAY FAILURE NR/NP LOGIC FAILURE NR/NP INDICATOR NOT CONNECTED
CODE	FAULT	CODE	FAULT
04 05 06 07 08 09 10 11 12 13 14	INVALID, (BATT V) BATTERY VOLTS ABOVE-SCALE, (BATT V) BATTERY VOLTS INVALID, (NG) GAS PRODUCER SPEED ABOVE-SCALE, (NG) GAS PRODUCER SPEED INVALID, (XMSN T) TRANSMISSION OIL TEMP ABOVE-SCALE, (XMSN T) TRANSMISSION OIL TEMP INVALID, (ENG P) ENG OIL PRESSURE ABOVE-SCALE, (ENG P) OIL PRESSURE INVALID, (TGT) TURBINE GAS TEMP ABOVE-SCALE, (TGT) TURBINE GAS TEMP INVALID, (TRQ) MAST TORQUE ABOVE-SCALE, (TRQ) MAST TORQUE INVALID, (RECT LD) RECTIFIER LOAD ABOVE-SCALE, (RECT LD) RECTIFIER LOAD INVALID, (NR) ROTOR SPEED ABOVE-SCALE, (NR) ROTOR SPEED	04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21	INVALID, (ENG T) ENG OIL TEMP ABOVE-SCALE, (ENG T) ENG OIL TEMP INVALID, (NP) POWER TURBINE SPEED ABOVE-SCALE, (NP) POWER TURBINE SPEED INVALID, (ENG TRQ) ENG TORQUE PRESSURE ABOVE-SCALE, (ENG TRQ) ENG TORQUE PRESSURE INVALID, (XMSN P) TRANSMISSION OIL PRESSURE ABOVE-SCALE, (XMSN P) TRANSMISSION OIL PRESSURE INVALID, (TGT2) TURBINE GAS TEMP ABOVE-SCALE, (TGT2) TURBINE GAS TEMP INVALID, (FUEL QTY) FUEL QUANTITY ABOVE-SCALE, (FUEL QTY) FUEL QUANTITY INVALID, (START V) START VOLTS INVALID, (NR2) ROTOR SPEED ABOVE-SCALE, (NR2) ROTOR SPEED INVALID, (RECT V) DC BUS VOLTS INVALID, (ACV) AC BUS VOLTS INVALID, (ACV) AC BUS VOLTS INVALID, (SGEN LD) STARTER GENERATOR ABOVE-SCALE, (SGEN LD) STARTER GENERATOR

NOTES:

- 1. F4 AND F5 CODES INDICATE ABNORMAL INPUT SIGNALS AND DO NOT INDICATE VSI MAINTENANCE ACTION.
- 2. THE "ABOVE-SCALE" CODES MEAN THAT THE PARAMETER VALUE IS ABOVE DISPLAY RANGE. FOR EXAMPLE, THE MAXIMUM OIL PRESSURE THAT CAN BE DISPLAYED IS 150 PSI, IF ENGINE OIL PRESSURE EXCEEDS 150 PSI, THE WRN LIGHT WILL FLASH AND ERROR CODE F4 08 WILL BE DISPLAYED UNTIL THE PRESSURE RETURNS TO DISPLAY RANGE.
- 3. THE "INVALID" CODES APPEAR WHEN A PARAMETER VALUE IS NEGATIVE (BELOW ZERO). CERTAIN OF THESE CODES MAY REPAIR MOMENTARILY DURING ENGINE START-UP AND SHOULD BE DISREGARDED.
- 4. CODES F5 09, F5 10, F5 15, AND F5 16 ARE LEFT MCPU OUTPUTS WHICH ARE NOT ACTIVE UNLESS THE RIGHT MCPU FAILS.

(TABLE I.D. 922365)

This task covers: Operational Check (On Helicopter)

References: **INITIAL SETUP**

TM 1-1520-248-23

Applicable Configurations:

Tools:

Electrical Repairer Tool Kit (B14)

Personnel Required: 68F Aircraft Electrician **Equipment Condition:**

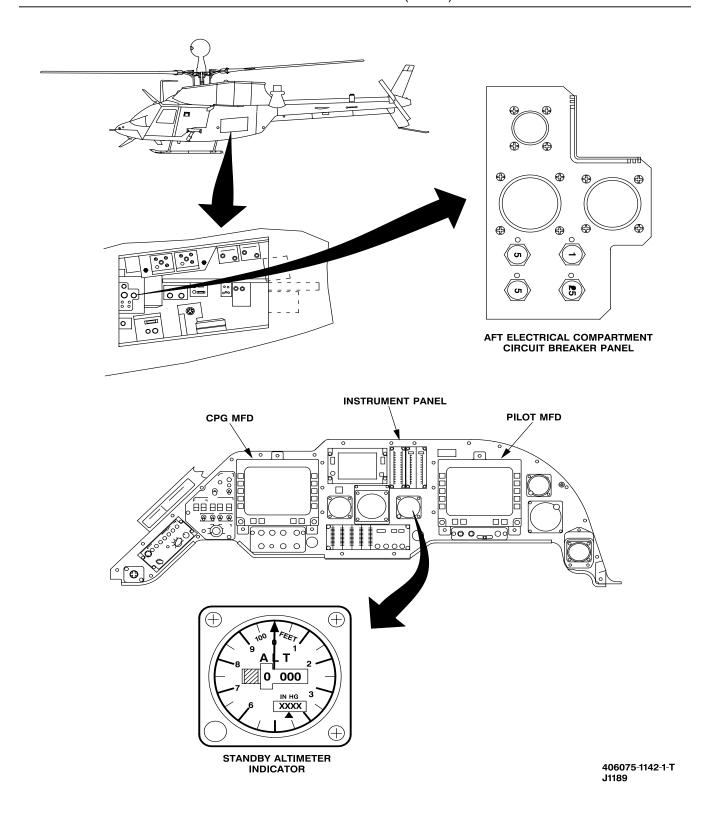
Helicopter Safed (TM 1-1520-248-23) Pitot-Static and Air Data Operational Check

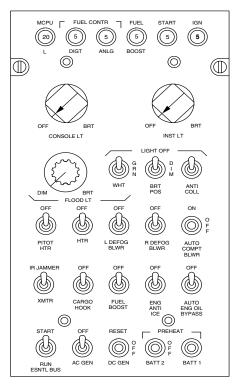
Performed (Task 2-3-5)

All Switches — Off/SAFE All Circuit Breakers — Closed (Overhead

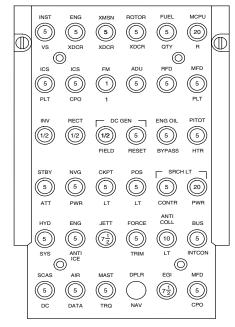
Console/Center Post, Nose and Aft Electrical

Compartment)

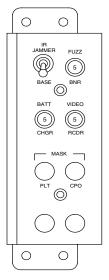




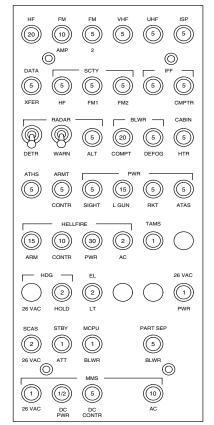
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



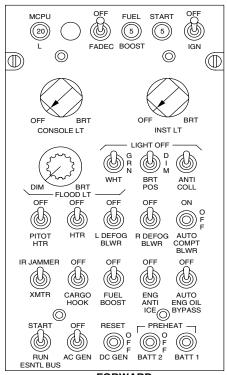
AUXILIARY CIRCUIT BREAKER PANEL



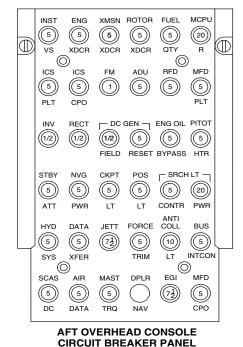
CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

CIRCUIT BREAKER PANELS – OH-58D



FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



IR
JAMMER FUZZ

BASE BNR

BATT VIDEO

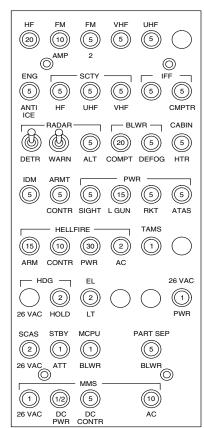
S
CHGR RCDR

MASK

PLT CPO

O

AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

CIRCUIT BREAKER PANELS – OH-58D(R)

NOTE

Acknowledge cautions and warnings before pressing menu or line address kevs.

1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

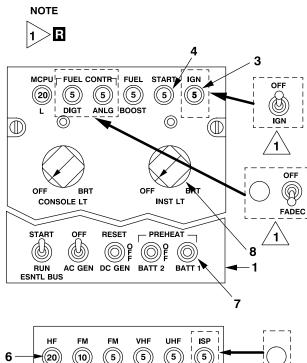
IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

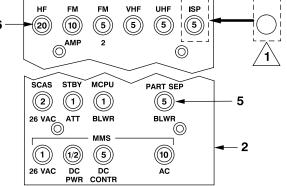
- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Set PREHEAT/OFF/BATT 1 switch (7) to BATT 1 on forward overhead console (1).
- 4. Turn INST LT control (8) on forward overhead console (1) clockwise to BRT.
- 5. Turn INST LT control (8) counterclockwise and verify that altimeter (9) lighting dims.

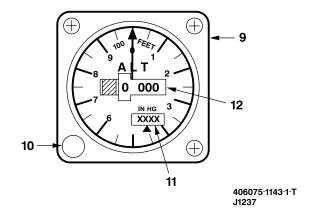
NOTE

Local barometric pressure must be used to obtain accurate altitude indications.

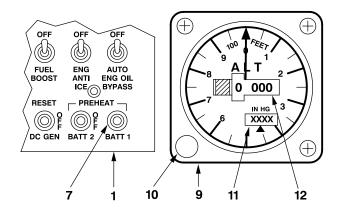
6. On altimeter (9) turn BARO PRESS/SET control (10) to set barometric pressure indicator (11) to current field barometric pressure. Verify that altimeter indication (12) shows local altitude above sea level within \pm 70 feet.

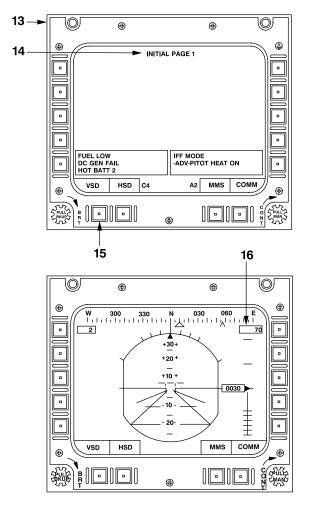






- 7. On multifunction display (MFD) (13) initial page (14), press and release VSD (vertical situation display) switch (15). Check that MFD (13) displays the local altitude (16) \pm 70 feet.
- 8. On each MFD (13) press and release VSD (vertical situation display) switch (15).
- 9. On altimeter (9) turn BARO PRESS/SET control (10) to vary altimeter indications (12) and verify that altitude (16) on each MFD (13) also varies.
- 10. On forward overhead console panel (1), turn PREHEAT/OFF/BATT 1 switch (7) to OFF.





406075-1143-2-T J1237

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

Equipment Condition:

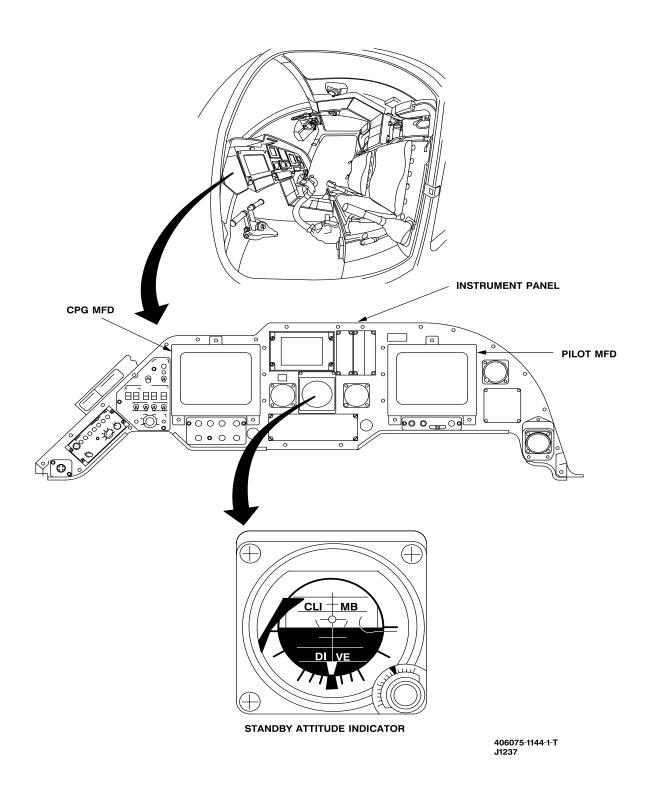
Helicopter Safed (TM 1-1520-248-23)
All Switches — Off/SAFE
All Circuit Breakers — Closed (Overhead
Console/Center Post, Nose, and Aft Electrical

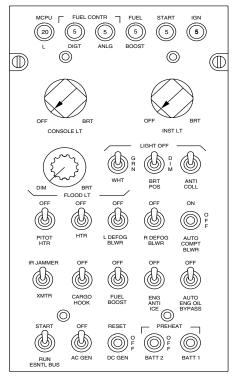
Compartment)

Tools:

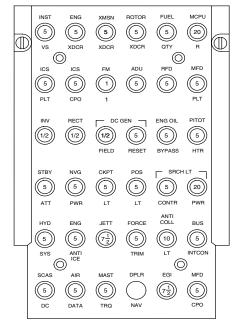
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

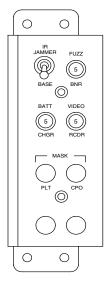




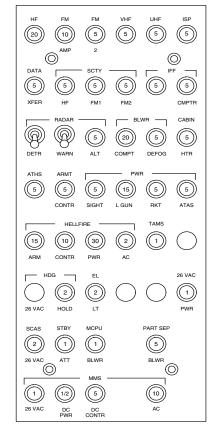
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



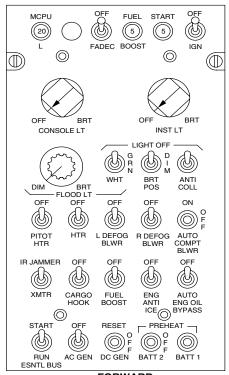
AUXILIARY CIRCUIT BREAKER PANEL



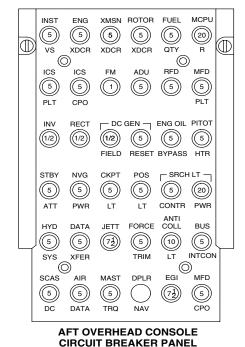
CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

CIRCUIT BREAKER PANELS – OH-58D



FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



IR
JAMMER FUZZ

S
BASE
BNR

BATT VIDEO

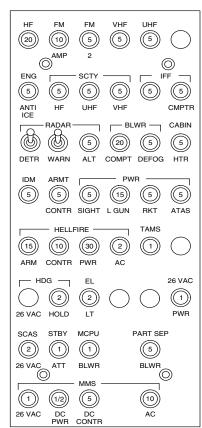
S
CHGR RCDR

MASK

PLT CPO

O

AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

CIRCUIT BREAKER PANELS - OH-58D(R)

NOTE

Acknowledge cautions and warnings before pressing menu or line address keys.

1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

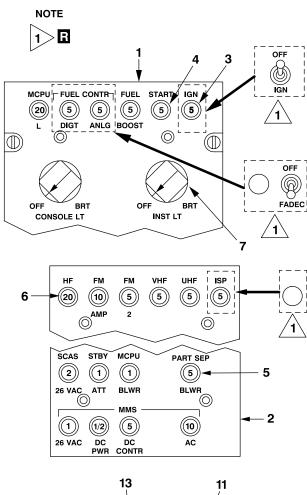
IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

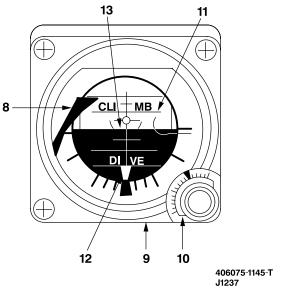
- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
- 4. Turn INST LT control (7) clockwise to BRT on overhead console (1).
- 5. Verify that red OFF flag (8) moves out of view on standby attitude indicator (9).
- 6. Pull the PULL TO CAGE knob (10) to the fully extended position and allow sphere (11) to stabilize.
- 7. Verify that roll (12) and pitch (13) displays erect within \pm 1 degree, then release knob.
 - 8. Turn PULL TO CAGE knob (10).
- a. Clockwise and verify that pitch display(13) indicates pitchup.
- b. Counterclockwise and verify that pitch display (13) indicates pitchdown.
 - c. Clockwise to center pitch display (13).

NOTE

Green electroluminescent lighting is difficult to see in daylight. Shielding the indicator may be required.

- 9. Verify that attitude indicator (9) is lit (bright) and varies (dims) when INST LT control (7) is turned counterclockwise.
- 10. Disconnect external dc electrical power (TM 1-1520-248-23).





This task covers: Operational Check (On Helicopter)

References: **INITIAL SETUP**

TM 1-1520-248-23

Applicable Configurations:

Tools:

Electrical Repairer Tool Kit (B14)

Personnel Required: 68F Aircraft Electrician Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
Pitot-Static and Air Data System Operational

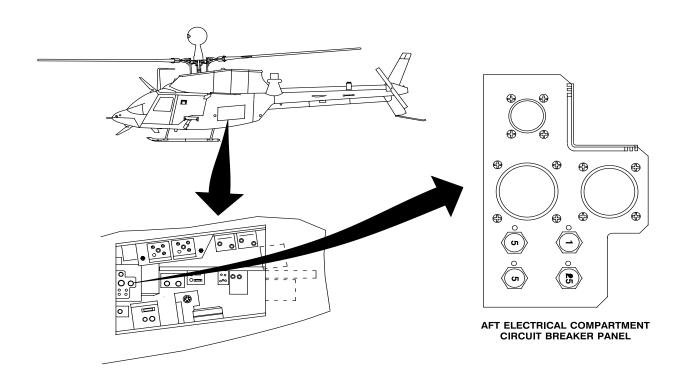
Check Performed (Task 2-3-5)

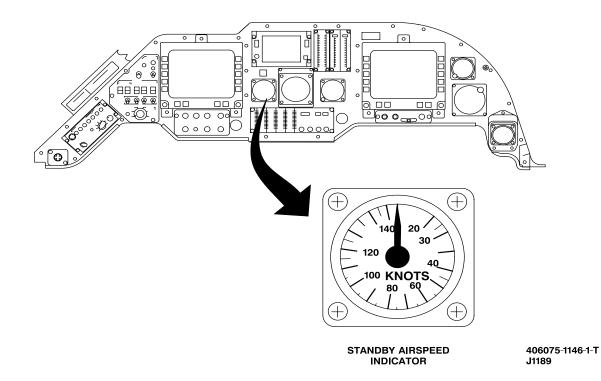
All Switches — Off/SAFE

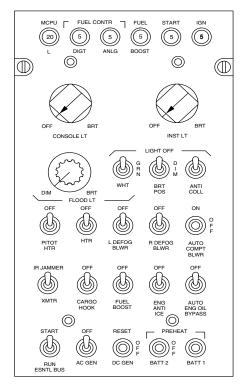
All Circuit Breakers — Closed (Overhead

Console/Center Post, Nose, and Aft Electrical

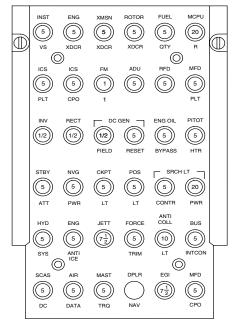
Compartment)



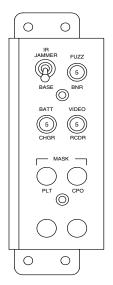




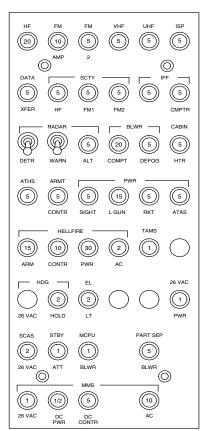
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



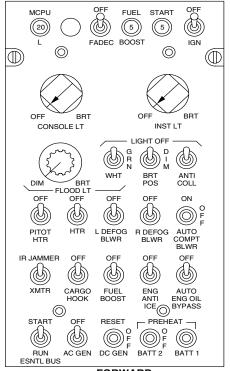
AUXILIARY CIRCUIT BREAKER PANEL



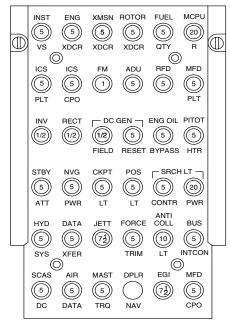
CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

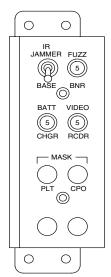
CIRCUIT BREAKER PANELS - OH-58D



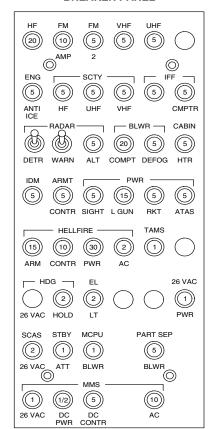
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

CIRCUIT BREAKER PANELS - OH-58D(R)

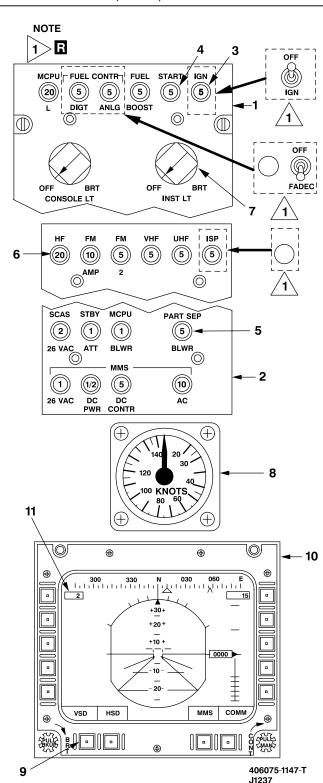
NOTE

Acknowledge cautions and warnings before pressing menu or line address keys.

1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
- 4. Turn INST LT control (7) on forward overhead console panel (1) to BRT and verify that airspeed indicator (8) is lit.
- 5. Turn INST LT control (7) counterclockwise and verify that airspeed indicator (8) lighting dims.
- 6. Press and release VSD (vertical situation display) switch (9) on each multifunction display (MFD) (10).
- 7. Verify that airspeed indication (11) is illuminated on each MFD (10).
- 8. Disconnect external dc electrical power (TM 1-1520-248-23).



This task covers: Operational Check (On Helicopter)

Applicable Configurations:

INITIAL SETUP

References: TM 1-1520-248-23

Tools:

Electrical Repairer Tool Kit (B14) Pitot-Static Tester (B13) Aviation Ground Power Unit (AGPU) Work Aid (E-4)

Material:

Electrical Tape (C6)

Equipment Condition:

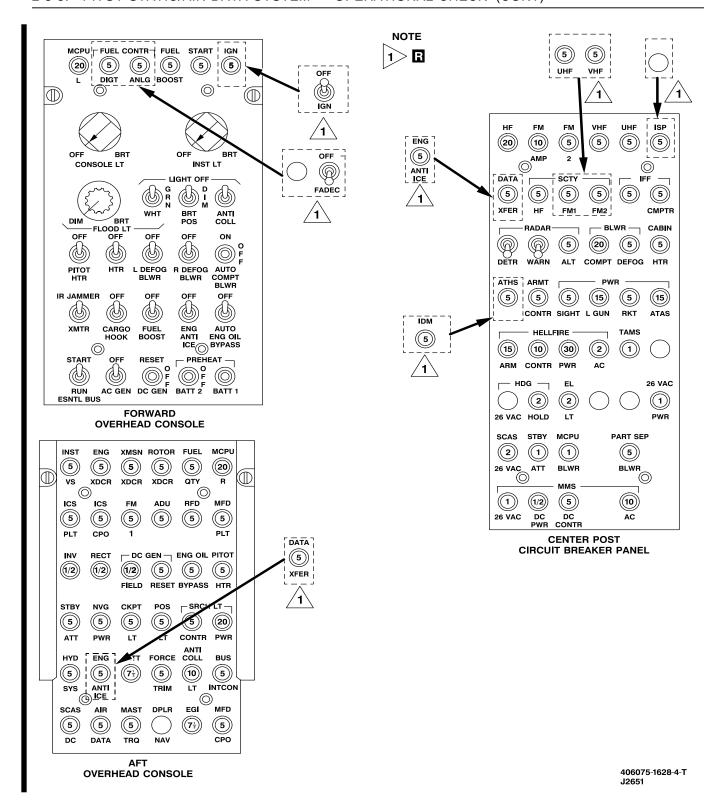
Personnel Required:

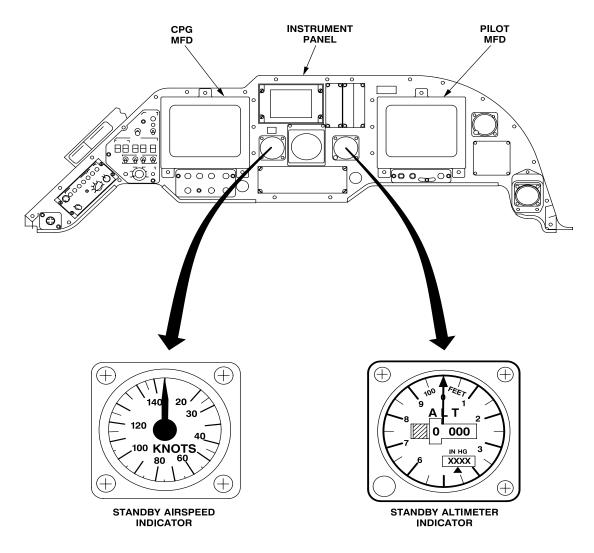
68F Aircraft Electrician

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel, Nose and Aft Electrical Compartment)

All Switches — Off/SAFE

MPD Removed (TM 1-1520-248-23)





NOTE
Set altimeter to current field barometric setting.

406075-1148-2-T J1237

WARNING

The pitot tube assembly is very hot during and immediately after operations requiring pitot heating. Keep hands and other parts of body away from this area. If burns occur, seek medical aid.

1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Gain access to instrument panel through left crew door.

NOTE

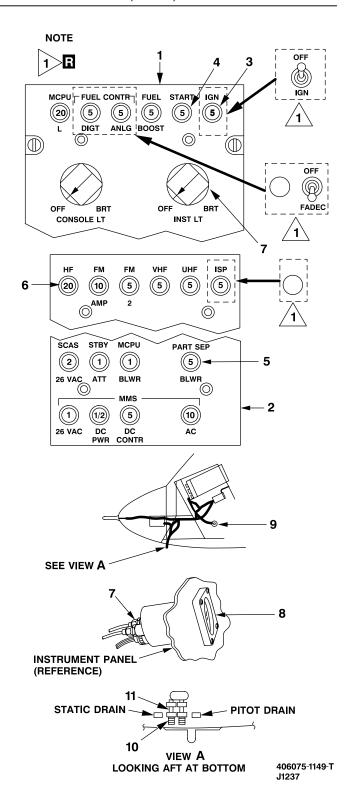
Pitot line connector may need to be removed and reconnected to gain access to the static line connector.

- 4. Disconnect static line connector (7) from standby airspeed indicator (8) (TM 1-1520-248-23) and cap off line.
- 5. Seal off two static ports (9) using black electrical tape (C6).
- 6. Remove plug (10) from static drain line connector nut (11).

NOTE

Helicopter static ports must be completely sealed for the measurements to be valid.

- 7. Install work aid E-4 to static drain line connector nut (11).
- 8. Connect pitot-static tester to work aid E-4.



NOTE

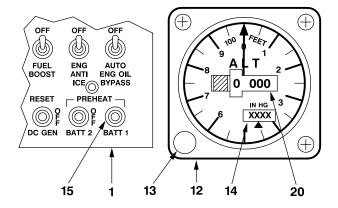
Local barometric pressure must be used to obtain accurate altitude indications.

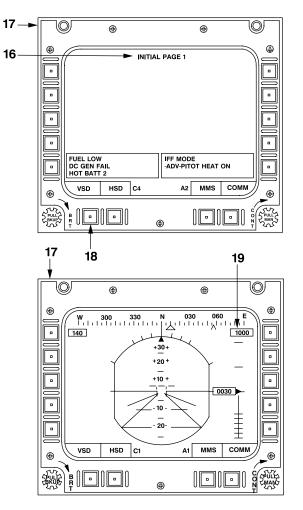
- 9. On standby altimeter (12), turn BARO PRESS/SET knob (13) to set barometric pressure indicator (14) to current field barometric setting.
- 10. Apply low pressure (vacuum) until helicopter standby altimeter (12) indicates 1000 feet above ambient pressure altitude.
- 11. Close low pressure (vacuum) line shutoff valve, wait one minute, then verify that standby altimeter indication does not exceed an indicated drop of 150 feet.
- 12. Apply external dc electrical power (TM 1-1520-248-23).
- 13. On forward overhead console (1), set PREHEAT/OFF/BATT 1 switch (15) to BATT 1.
- 14. Verify that initial page (16) appears on each MFD (17).
- 15. Place hand on standby altimeter (12) and verify vibrator is operating.
- 16. On each MFD (17) initial page (16) press and release VSD (vertical situation display) switch (18).

NOTE

Acknowledge cautions and warnings before pressing menu or line address keys.

- 17. With pitot-static tester apply low pressure (vacuum) until 1000 feet above ambient pressure altitude indication (19) is indicated on each MFD (17); close shutoff valve, wait one minute, then verify that leakage does not exceed an indicated drop of 150 feet.
- 18. On standby altimeter (12), verify that 1000 (± 75) feet above ambient pressure altitude is indicated (20).





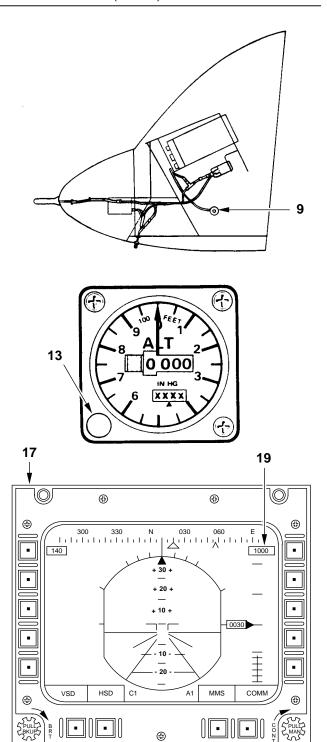
406075-1150-T J1237

19. Rotate BARO PRESS/SET knob (13) and verify that altitude indication (19) on each MFD (17) varies by same amount.

CAUTION

Before removing tape, test set pressure shall be reduced to zero (0) to prevent damage to pitot-static system or test equipment.

20. Remove electrical tape (C6) from both static ports (9) and remove tester connector from work aid E-4.

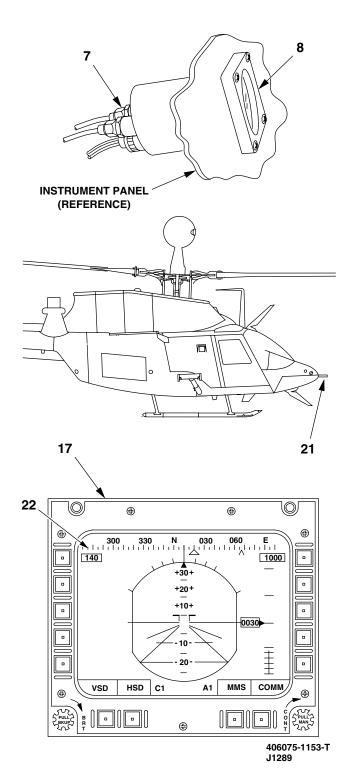


406075-1152 H1080

NOTE

Pitot line connector may need to be removed and reconnected to gain access to the static line connector.

- 21. Remove cap on static line (7) and connect to standby airspeed indicator (8) under left side of instrument panel.
- 22. Install pitot-static tester line (high pressure) on pitot tube (21).
- 23. Apply pressure until airspeed indication (22) on MFD (17) reaches 130 knots. Close pressure line shutoff valve, wait 1 minute, and verify leakage does not exceed indicated drop of 10 knots.
- 24. Verify standby airspeed indicator (8) is within ± 5 knots from MFD (17) indicated airspeed (22).



- 25. On standby airspeed indicator (8) verify that 130 ± 5 knots (23) is indicated when applied pressure is 140 knots.
- 26. On forward overhead console (1), set PREHEAT/OFF/BATT 1 switch (15) to OFF.
- 27. Disconnect external dc electrical power (TM 1-1520-248-23).

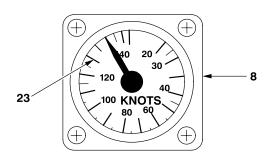
CAUTION

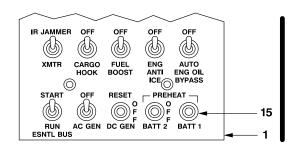
Test set pressure shall be reduced to zero (0) to prevent damage to pitot-static system or test equipment.

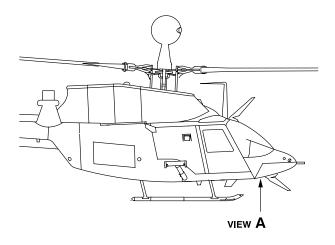
- 28. Remove pitot-static tester, and work aid E-4 from static drain line connector nut (11).
- 29. Install plug (10) to static drain connector nut (11).

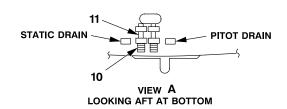
FOLLOW-ON MAINTENANCE

Install MPD (TM 1-1520-248-23).









406075-1151-T

2-3-6. STANDBY COMPASS LIGHT — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-23

Applicable Configurations:

ΑII

Equipment Condition:

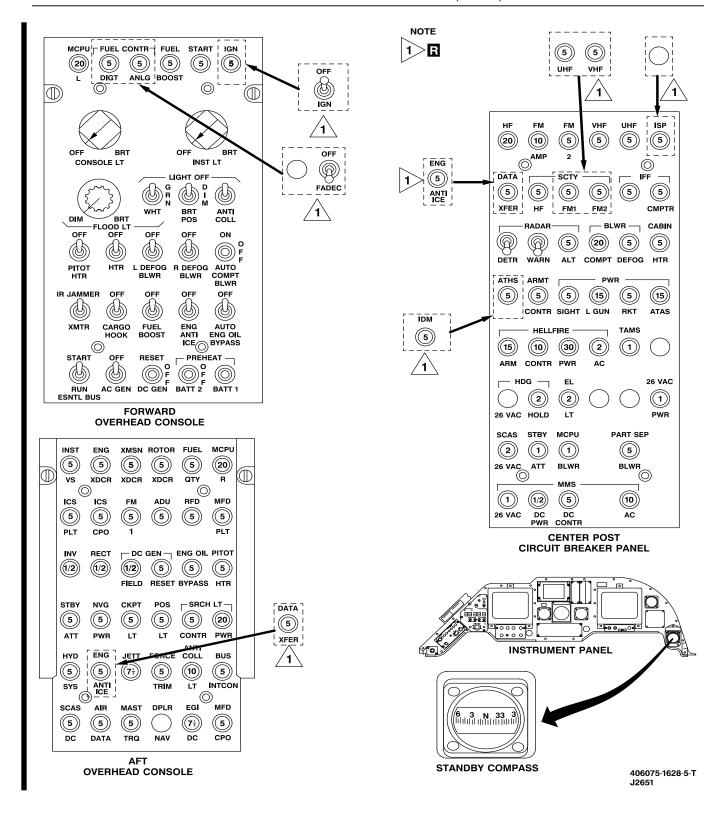
Helicopter Safed (TM 1-1520-248-23) Battery Connected (TM 11-1520-248-23)

Tools:

Electrical Repairer Tool Kit (B14)

Personnel Required: 68F Aircraft Electrician

2-3-6. STANDBY COMPASS LIGHT — OPERATIONAL CHECK (CONT)

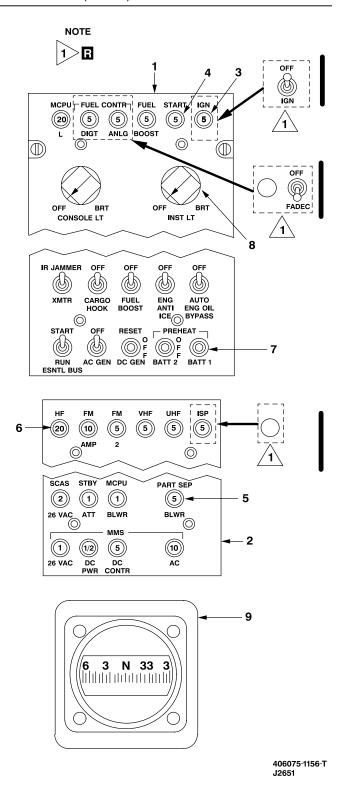


2-3-6. STANDBY COMPASS LIGHT — OPERATIONAL CHECK (CONT)

1. On forward overhead console (1) and center circuit breaker panel (2) open the following circuit breakers:

IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Set PREHEAT/OFF/BATT 1 switch (7) to BATT 1 on forward overhead console (1).
- 4. Turn INST LT control (8) on forward overhead console (1) clockwise to BRT and verify that standby compass (9) light brightens.
- 5. Turn INST LT control (8) counterclockwise and verify that standby compass (9) light dims.
- 6. Set PREHEAT/OFF/BATT 1 switch (7) to OFF.



END OF TASK

2-3-7. CLOCK — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-23 TM 11-1520-248-23

Applicable Configurations:

ÁΠ

Equipment Condition:

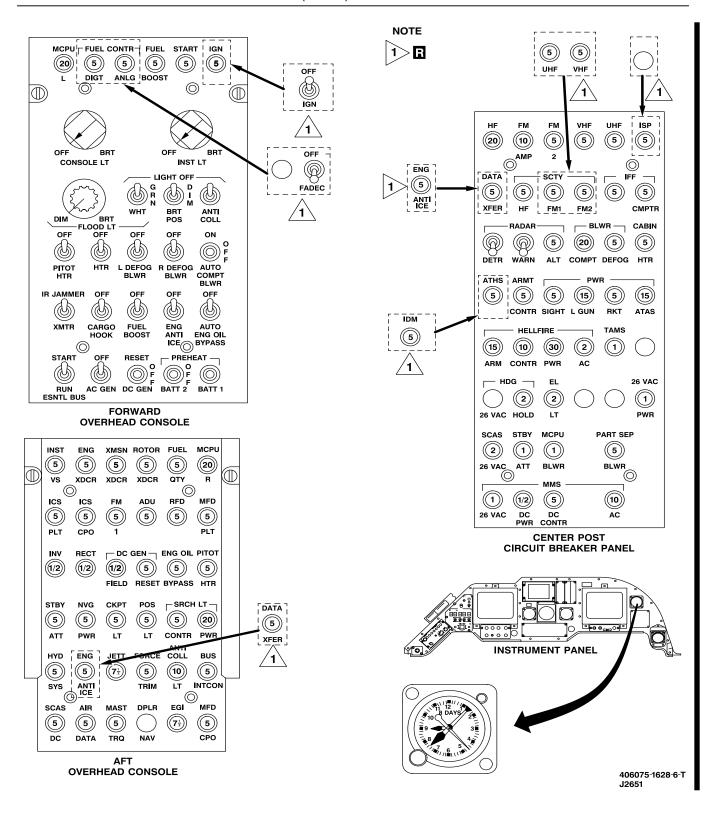
Helicopter Safed (TM 1-1520-248-23) Battery Connected (TM 11-1520-248-23) Electrical Power On (TM 1-1520-248-23)

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

2-3-7. CLOCK — OPERATIONAL CHECK (CONT)

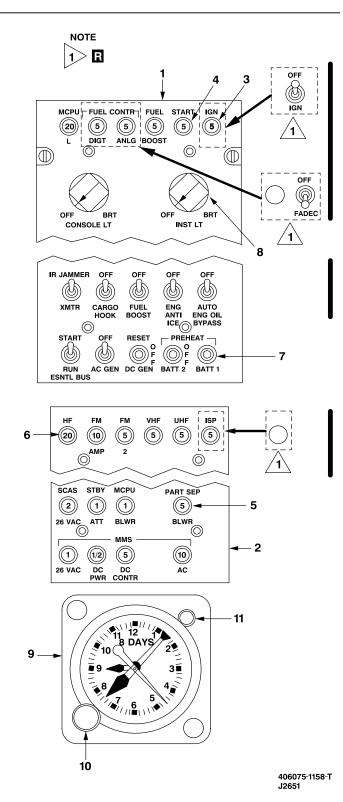


2-3-7. CLOCK — OPERATIONAL CHECK (CONT)

1. On forward overhead console (1) and center post circuit breaker panel (2), open following circuit breakers:

IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. On forward overhead console (1), set PREHEAT/OFF/BATT 1 switch (7) to BATT 1.
- 4. On forward overhead console (1), turn INST LT control (8) clockwise to BRT and verify clock (9) light brightens.
- 5. Turn INST LT control (8) counterclockwise and verify clock (9) light dims.
- 6. Set PREHEAT/OFF/BATT 1 switch (7) to OFF.
- 7. Wind clock (9) (if stopped) by turning wind/set knob (10) and verify clock (9) is running.
- 8. Set clock (9) (if inaccurate) by pulling and turning wind/set knob (10).
- 9. Press and release elapsed time knob (11) and verify stopwatch and elapsed time indicators are running.
- 10. Press and release elapsed time knob (11) (second time) and verify stopwatch and elapsed time indicators stop running.
- 11. Press and release elapsed time knob (11) (third time) and verify stopwatch and elapsed time indicators reset to 12 o'clock (zero).
- 12. Disconnect external dc electrical power (TM 1-1520-248-23).



2-3-8. DIGITAL CLOCK — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-23 TM 11-1520-248-23

Applicable Configurations:

ÀΠ

Equipment Condition:

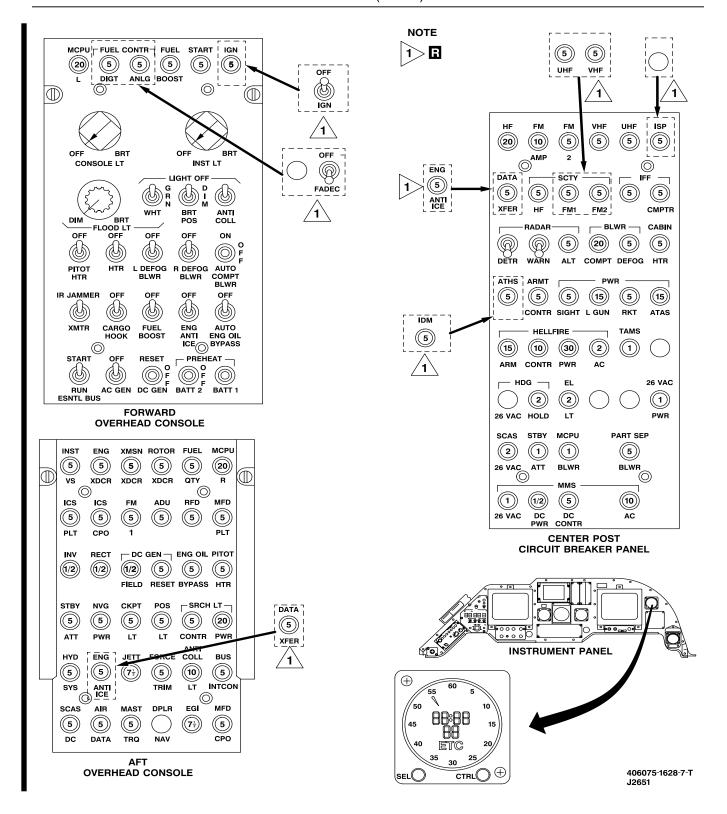
Helicopter Safed (TM 1-1520-248-23) Battery Connected (TM 11-1520-248-23) Electrical Power On (TM 1-1520-248-23)

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

2-3-8. DIGITAL CLOCK — OPERATIONAL CHECK (CONT)

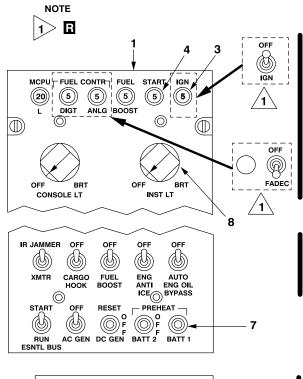


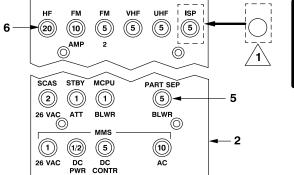
2-3-8. DIGITAL CLOCK — OPERATIONAL CHECK (CONT)

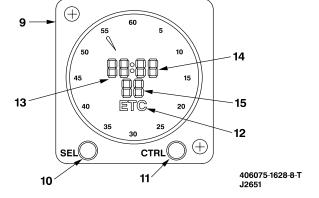
1. On forward overhead console (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3)(OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Set PREHEAT/OFF/BATT 1 switch (7) to BATT 1 on forward overhead console (1).
- 4. Turn INST LT control (8) on forward overhead console (1) clockwise to BRT and verify clock (9) brightens.
- 5. Turn INST LT control (8) counterclockwise and verify clock dims.
- 6. Set PREHEAT/OFF/BATT 1 switch (7) to OFF.
 - 7. Verify clock (9) is running.
 - 8. Set clock (9) (if inaccurate) as follows:
- a. Press SEL button (10) and CTRL button (11) simultaneously during clock mode (12). Hour digits (13) will flash.
- b. Press CTRL button (11), hours digit (13) will increment.
- c. Press SEL button (10), minutes digits (14) will flash.
- d. Press CTRL button (11), minutes digits (14) will increment.
- e. Press SEL button (10), seconds digits (15) will flash.
- f. Press CTRL button (11), seconds digits (15) will increment.
- g. Press SEL button (10), clock (9) returns to normal clock mode.





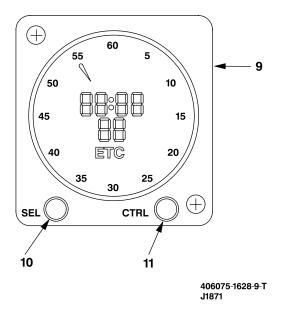


2-3-8. DIGITAL CLOCK — OPERATIONAL CHECK (CONT)

- 9. Verify selection between elapsed time or clock mode as follows:
- a. Press SEL button (10), clock (9) changes to elapsed time mode.
- b. Press SEL button (10), clock (9) changes to clock mode.
- c. Press SEL button (10), clock (9) repeats cycle.
 - 10. Verify elapsed time operation as follows:
- a. In elapsed time mode, press CTRL button (11).

1st time - Starts elapsed timer. 2nd time - Stops elapsed timer. 3rd time - Resets elapsed timer. 4th time - Repeats cycle (starts elapsed timer).

11. Disconnect external dc electrical power (TM 1-1520-248-23).



2-3-9. PITOT TUBE HEATER — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-23 TM 11-1520-248-23

Applicable Configurations:

ΑII

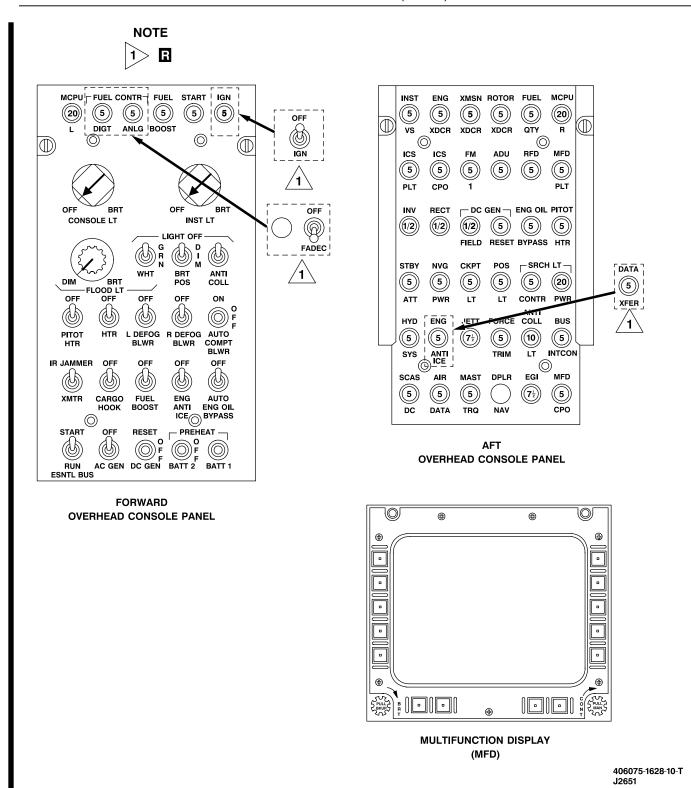
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) Battery Connected (TM 11-1520-248-23)

Tools: Electrical Repairer Tool Kit (B14)

Personnel Required: 68F Aircraft Electrician

2-3-9. PITOT TUBE HEATER — OPERATIONAL CHECK (CONT)



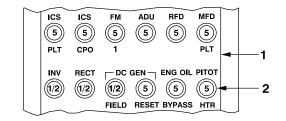
GO TO NEXT PAGE

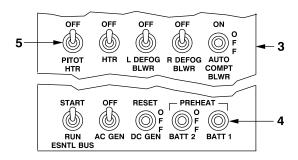
2-3-9. PITOT TUBE HEATER — OPERATIONAL CHECK (CONT)

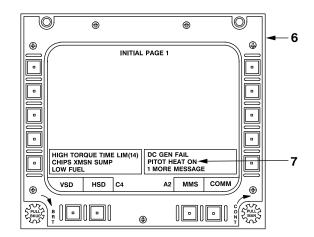
WARNING

The pitot tube assembly is very hot during and immediately after operations requiring pitot heat. Keep hands and other parts of body away from the area. If burn occurs, seek medical aid.

- 1. On aft overhead console panel (1), close PITOT HTR circuit breaker (2).
- 2. On forward overhead console panel (3), position BATT 1 switch (4) to BATT 1.
- 3. Position PITOT HTR switch (5) to PITOT HTR. On MFD (6), verify PITOT HEAT ON advisory (7) is displayed.
- 4. Hold hand near pitot tube (8) to verify tube heats up.
- 5. On forward overhead console panel (3), position BATT 1 switch (4) to OFF.
 - 6. Position PITOT HTR switch (5) to OFF.
- 7. On aft overhead console panel (1), open PITOT HTR circuit breaker (2).









406075-1628-11-T J1871

END OF TASK

Section IV. FUEL SYSTEM

2-5. TASK LIST

List of tasks provides a numerical index of operational checks contained in this section. Fuel system operational checks are listed in column one (Task). To perform these checks refer to column two (Task Number) which will indicate the

task number to be performed. The individual task should be performed in sequence as specified in each task unless otherwise noted within the task.

Correction of malfunctions must be verified by performing an operational check using the procedures in this section.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Check Valve — Operational Check	2-4-1	2-65
Fuel Probe/Indicating System — Operational Check	2-4-2	2-68

2-4-1. CHECK VALVE — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

Applicable Configurations: TM 1-1520-248-23 TM 1-1520-248-10

All TM 1-1520-248-CL

Tools: Equipment Condition:

General Mechanic Tool Kit (B15)

Helicopter safed (TM 1-1520-248-23)

All circuit breakers — Closed (Forward

Overhead Console, Center Post Circuit

Breaker Panel, Nose Electrical Compartment)

TM 1-1500-328-23

Work Aid (E-5)

All switches — Off/SAFE

Personnel Required:

67S Scout Helicopter Repairer

67S Scout Helicopter Technical Inspector (TI)

Pilot

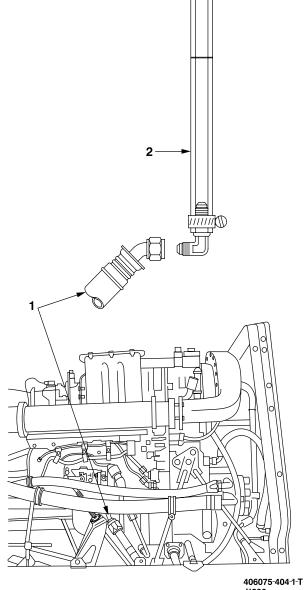
2-4-1. CHECK VALVE — OPERATIONAL CHECK (CONT)



Jet Fuel

OH-58D

- 1. Disconnect fuel hose (1) from engine.
- Connect fuel hose (1) to work aid (E-5) (2).
- 3. If closed, open fuel shutoff valve.
- 4. Support work aid (2) in a vertical position and fill with fuel (C1) to marked level on work aid.
- 5. Check fuel level after four hours. If fuel level decreases more than one inch, replace check valve (TM 1-1520-248-23).
 - 6. Drain fuel from work aid (2).
- 7. Disconnect fuel hose (1) from work aid (2) and connect to engine.



J1236

2-4-1. CHECK VALVE — OPERATIONAL CHECK (CONT)



Jet Fuel

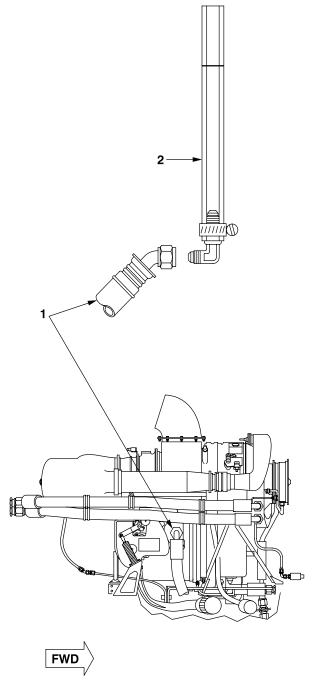
OH-58D(R)

- 8. Disconnect fuel hose (1) from engine.
- 9. Connect fuel hose (1) to work aid (E-5) (2).
- 10. If closed, open fuel shutoff valve.
- 11. Support work aid (2) in a vertical position and fill with fuel (C1) to marked level on work aid.
- 12. Check fuel level after 4 hours. If fuel level decreases more than one inch, replace check valve (TM 1-1520-248-23).
 - 13. Drain fuel from work aid (2).
- 14. Disconnect fuel hose (1) from work aid (2) and connect to engine.

INSPECT

FOLLOW-ON MAINTENANCE

Pilot perform MOC (TM 1-1520-248-10/-CL and TM 1-1500-328-23).



406075-404-2-T J1236

This task covers: Operational Check (On Helicopter)

INITIAL SETUP Personnel Required:

68F Aircraft Electrician
67S Scout Helicopter Technical Inspector (TI)

Applicable Configurations:

ÁΙΙ

References:

TM 1-1520-248-23

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU) Digital Fuel System Tester (B11)

Equipment Condition:

Helicopter Defueled (TM 1-1520-248-23)
All Circuit Breakers — Closed (Forward
Overhead Console, Center Post Circuit
Breaker Panel, Nose Electrical Compartment,

and Aft Electrical Compartment)

All Switches — Off/SAFE

Material:

Lockwire (C2)

CHECK

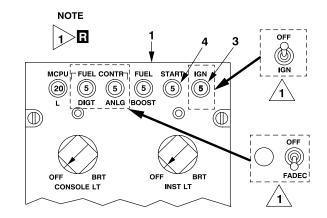


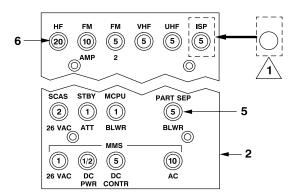
Jet Fuel

1. On forward overhead console (1) and center post circuit breaker panel (2), open following circuit breakers:

IGN (3) (OH-58D) START (4) PART SEP BLWR (5) HF (6)

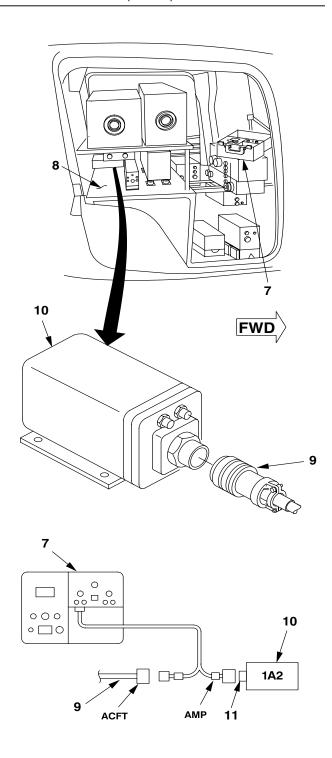
2. For OH-58D(R), position IGN switch (3) to OFF.





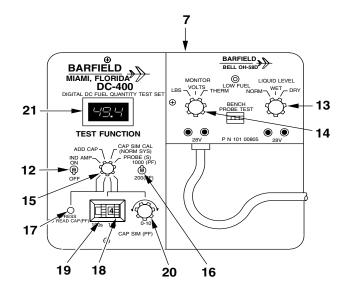
406075-1145-T

- 3. Place digital fuel system tester (7) on a flat surface near shelf (8).
 - 4. Open digital fuel system tester (7).
- 5. Disconnect electrical connector (9) from fuel quantity control unit (10).
- 6. Connect digital fuel system tester (7) as follows:
- a. Connect electrical connector (9) to tester connector marked ACFT.
- b. Connect tester connector marked AMP to electrical connector (11) on fuel quantity control unit (10).
- 7. Apply external dc electrical power (TM 1-1520-248-23).



406075-1626-1-T J1872

- 8. Use digital fuel system tester (7) as follows:
 - a. Set ON-OFF switch (12) to ON.
 - b. Set LIQUID LEVEL switch (13) to DRY.
 - c. Set MONITOR switch (14) to VOLTS.
- d. Turn TEST FUNCTION switch (15) to CAP SIM CAL (NORM SYS).
 - e. Set switch (16) to 200 (pF).
- f. Press and hold PRESS TO READ CAP (pF) switch (17).
- g. Turn thumbwheel switch (18) to show 4 (for 40 (pF)) on CAP SIM (pF) digital display (19).
- h. Turn CAP SIM (pF) knob (20) to obtain reading of 49.2 pF on digital display (21).
- i. Release PRESS TO READ CAP (pF) switch (17).
- j. Set TEST FUNCTION switch (15) to IND AMP.
- k. Verify test set digital display (21) indicates –0.28 volt.



406060-227

ADJUST

WARNING

Do not attempt to remove nut on the empty (E) or full (F) adjustments on the fuel quantity control unit. Remove only the dust caps to gain access to the adjustment potentiometers.

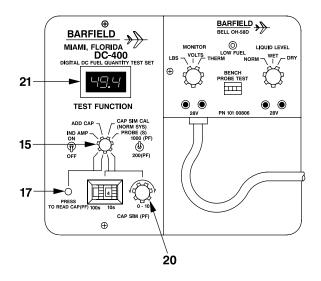
- 9. On fuel quantity control unit (10), cut lockwire from adjustment screw (22) and discard.
- 10. Adjust E (empty) adjustment screw (22) to achieve correct value.
- 11. Secure adjustment screw (22) with lockwire (C2).

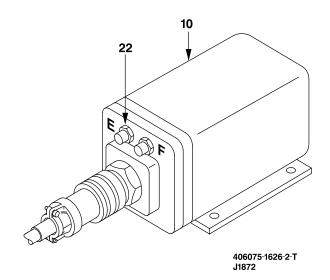
CHECK

- 12. Set TEST FUNCTION switch (15) to CAP SIM CAL (NORM SYS).
- 13. Press and hold PRESS TO READ CAP (pF) switch (17) and turn CAP SIM (pF) knob (20) to obtain reading of 50.7 (pF) on digital display (21).
- 14. Release PRESS TO READ CAP (pF) switch (17).
- 15. Set TEST FUNCTION switch (15) to IND AMP.
- 16. Reading on test set digital display (21) should be 0.00 \pm 0.02 volt.

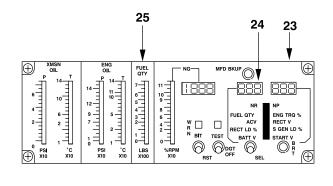
NOTE

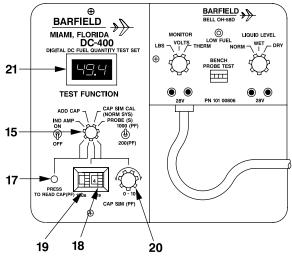
Capacitance reading of 50.7 (pF) and voltage reading of 0.00 volt corresponds to 14 pounds of unusable fuel.





- 17. Select FUEL QTY on MPD (23) and verify MPD digital display (24) and FUEL QTY vertical scale indicator (25) indicate zero.
- 18. Set TEST FUNCTION switch (15) to CAP SIM CAL (NORM SYS).
- 19. Press and hold PRESS TO READ CAP (pF) switch (17).
- 20. Turn thumbwheel switch (18) until 7 (for 70 (pF)) appears on CAP SIM (pF) digital display (19).
- 21. Turn the CAP SIM (pF) knob (20) to obtain reading of 75.5 pF on digital display (21).
- 22. Release PRESS TO READ CAP (pF) switch (17).





406075-470-T J1288

- 23. Set MONITOR switch (14) to VOLTS.
- 24. Verify MPD (23) digital display (24) and FUEL QTY vertical scale indicator (25) indicates 750 ± 3.5 pounds.
- 25. Verify test set digital display (21) reads 5.00 \pm 0.02 volts.

ADJUST

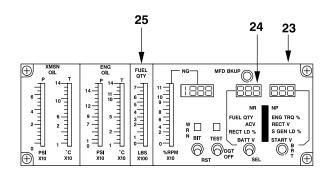
WARNING

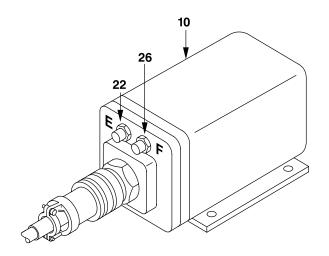
Do not attempt to remove nut on the empty (E) or full (F) adjustments on the fuel quantity control unit. Remove only the dust caps to gain access to the adjustment potentiometers.

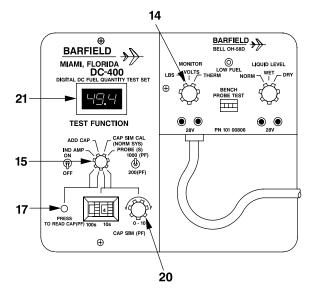
- 26. On fuel quantity control unit (10), cut lockwire from adjustment screw (26) and discard.
- 27. Adjust F (full) adjustment screw (26) to achieve correct value.
- 28. Secure adjustment screws (26) and (22) together with lockwire (C2).

CHECK

- 29. Set TEST FUNCTION switch (15) to PROBE.
- 30. Press and hold PRESS TO READ (pF) switch (17) and verify test set digital display (21) indicates 49.4 ± 0.13 pF (dry probe). If unable to obtain proper value, troubleshoot fuel quantity probe. (Refer to Chapter 3, MAPS diagram 3-4-3.)
- 31. Release PRESS TO READ (pF) switch (17).
- 32. Set MONITOR switch (14) to THERM. If unable to determine low fuel quantity indication, troubleshoot thermistor. (Refer to Chapter 3, MAPS diagram 3-4-4.)







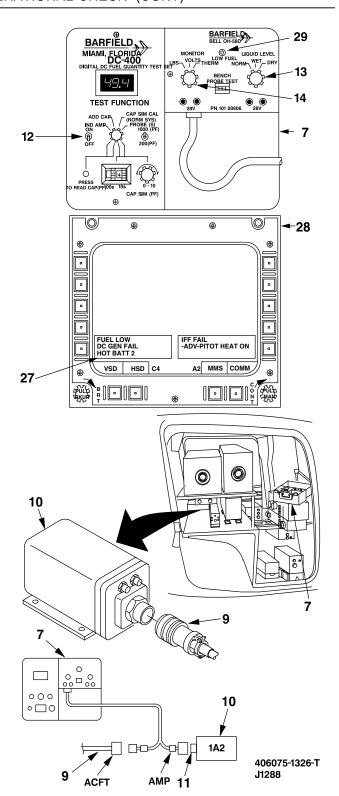
406075-524-T J1288

- 33. Verify FUEL LOW caution message (27) appears on pilot and CPG MFD (28).
- 34. Observe LOW FUEL caution light (29) on test set (7) is lit.
 - 35. Set LIQUID LEVEL switch (13) to NORM.
 - 36. Set MONITOR switch (14) to LBS.
- 37. Verify FUEL LOW caution message (27) is still displayed on pilot and CPG MFD (28).
 - 38. Set LIQUID LEVEL switch (13) to WET.
- 39. Verify FUEL LOW caution message (27) is not displayed on pilot and CPG MFD (28).
 - 40. Set ON-OFF switch (12) to OFF.
- 41. Disconnect external dc electrical power (TM 1-1520-248-23).
- 42. Remove digital fuel system tester (7) as follows:
- a. Disconnect tester connector marked AMP from electrical connector (11) on fuel quantity control unit (10).
- b. Disconnect tester connector marked ACFT from electrical connector (9).
 - c. Stow cable in digital fuel system tester (7)
- d. Close cover of digital fuel system tester (7).
- e. Remove digital fuel system tester (7) from helicopter.
- 43. Connect electrical connector (9) to electrical connector (11) on fuel quantity signal conditioner (10).

INSPECT

FOLLOW-ON MAINTENANCE

Refuel helicopter (TM 1-1520-248-23).



Section V. ARMAMENT SYSTEMS

2-6. TASK LIST

List of tasks provides a numerical index of operational checks contained in this section. Armament systems operational checks are listed in column one (Task). To perform these checks refer to column two (Task Number) which will indicate the task number to be performed. The individual task should be performed in sequence as specified in each task unless otherwise noted within the task.

Correction of malfunctions must be verified by performing an operational check using the procedures in this section.

NOTE

MFD displays shown herein are typical and may vary with the particular operational flight program in use.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
Setup Procedures for Operational Checks (OH-58D)	2-5-1	2-77
Setup Procedures for Operational Checks (OH-58D(R))	2-5-2	2-90
Air-To-Air Stinger (ATAS) Missile System — Operational Check (OH-58D)	2-5-3	2-103
Air-To-Air Stinger (ATAS) Missile System — Operational Check (OH-58D(R))	2-5-4	2-126
.50 Caliber Machine Gun System — Operational Check (OH-58D)	2-5-5	2-149
.50 Caliber Machine Gun System — Operational Check (OH-		
58D(R))	2-5-6	2-161
HELLFIRE Missile System (HMS) — Operational Check (OH-58D)	2-5-7	2-173
HELLFIRE Missile System (HMS) — Operational Check (OH-		
58D(R))	2-5-8	2-205
2.75 Rocket System — Operational Check (OH-58D)	2-5-9	2-237
2.75 Rocket System — Operational Check (OH-58D(R))	2-5-10	2-257
Jettison Circuit — Operational Check	2-5-11	2-277

This task covers: Preparation for Operational Checks (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Armament Repairer Basic Tool Set (B16) Armament Repairer Supplemental Tool Set (B17) Aviation Ground Power Unit (AGPU) Microphone Headset (2)

Personnel Required:

68J Aircraft Armament/Missile Systems Repairer (2)

References:

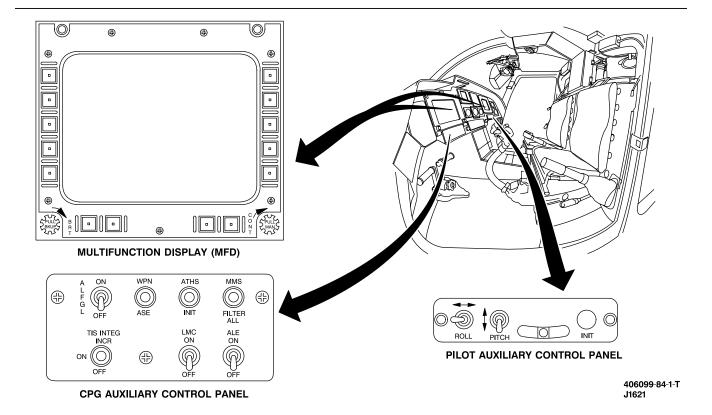
TM 1-1520-248-23

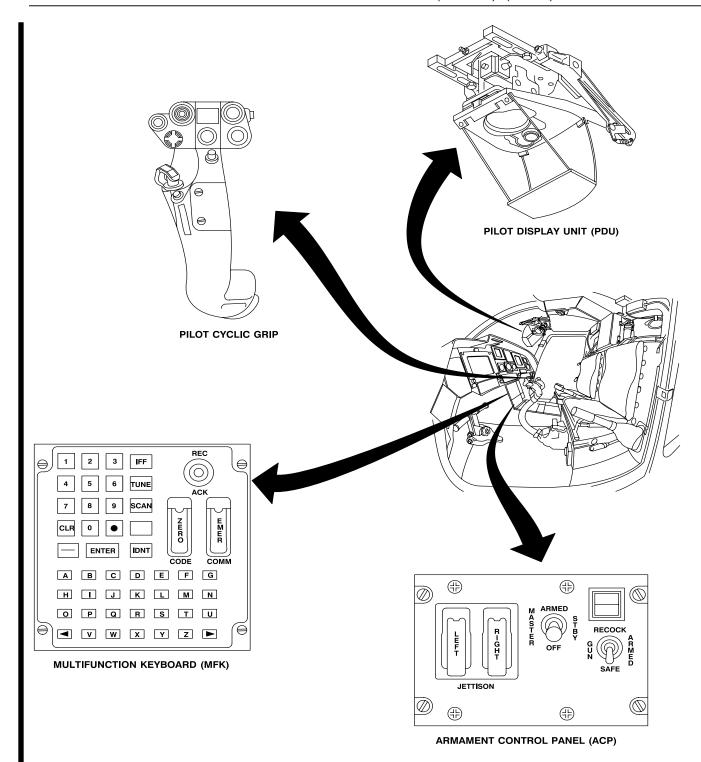
Equipment Condition:

All Switches Off/SAFE
Helicopter Safed (TM 1-1520-248-23)
Headsets Connected

Navigation Input Data Required:

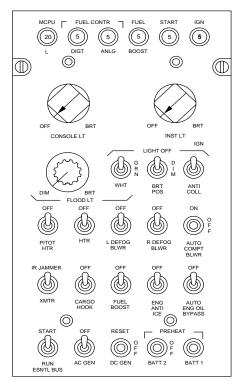
UTM Position Spheroid Code Elevation Magnetic Variation



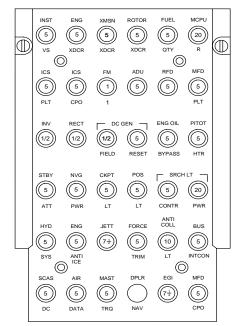


406099-84-2-T J1621

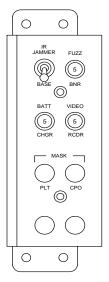
GO TO NEXT PAGE



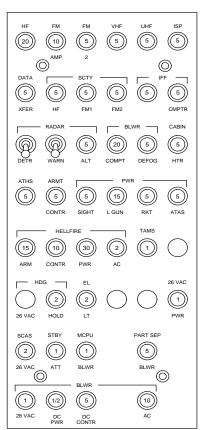
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST
CIRCUIT BREAKER PANEL 406099-85-1-T

WARNING

Ensure JETT circuit breaker is opened during all operational checkouts.

NOTE

If weapon systems operational checks are to be performed on aircraft parked in a hangar, INS NAV ALIGN procedures shall be used to avoid corrupting the EGI Almanac. EGI circuit breaker shall be open prior to applying power to the aircraft if INS NAV ALIGN procedures are to be used.

POWER ON

- 1. On forward overhead console panel (1), close MCPU L circuit breaker (2).
- 2. On aft overhead console panel (3), open JETT circuit breaker (4)
 - 3. Close these circuit breakers:

MCPU R (5) ICS PLT (6) ICS CPO (7) MFD PLT (8) RECT (9) BUS INTCON (10) EGI (11) MFD CPO (12)

4. On center post circuit breaker panel (13), close these circuit breakers:

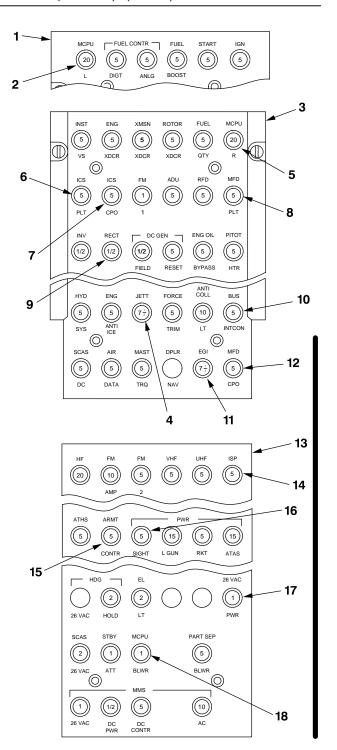
ISP (14) ARMT CONTR (15) PWR SIGHT (16) 26 VAC PWR (17) MCPU BLWR (18)

5. Apply external ac and dc electrical power (TM 1-1520-248-23).

NOTE

Allow 3 to 5 minutes for systems to warmup before continuing with setup for operational checks.

GO TO NEXT PAGE



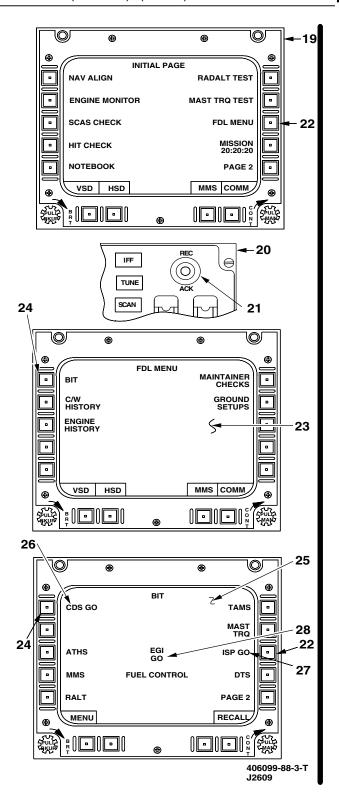
406099-88-2-T

SETUP

- 6. On pilot and CPG MFDs (19), verify INITIAL PAGE is displayed.
- 7. On MFK (20), toggle REC/ACK switch (21) to ACK to clear caution, warning, and advisory messages.
- 8. On CPG MFD (19), press R3 (22) to display FDL MENU page (23).
 - 9. Press L1 (24) to display BIT page (25).
 - 10. Press L1 (24) to activate CDS BIT.
 - 11. Press R3 (22) to activate ISP BIT.
- 12. On BIT page (25), after BIT is complete, verify CDS GO (26), ISP GO (27) and EGI GO (28) are displayed.

NOTE

- If INS NAV ALIGN procedures are used, EGI circuit breaker shall be open and EGI BIT will display NO GO.
- If INS NAV ALIGN procedures are used, step 27. INS NAV ALIGNMENT will be next.



NOTE

Navigational auto alignment is completed at 4 minutes after power is applied. This alignment should be complete before system warmup is completed. When NAV ALIGN page is displayed if AUTO is boxed and GC ALIGN is displayed at bottom center of page, alignment is in-progress. If no navigational system caution or advisory messages are displayed, auto align is complete.

- 13. On pilot MFD (19), press L1 (24) to display NAV ALIGN page (29).
 - 14. Verify UTM (30) is selected (boxed).
- 15. Verify correct UTM position data (31) is displayed.

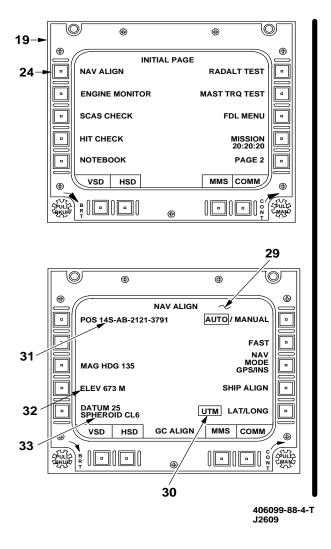
NOTE

- MAG HDG is only required when performing a shipboard alignment.
- If elevation data is entered in feet, enter F after the last digit.
- 16. Verify correct ELEV data (32) is displayed.
- 17. Verify correct DATUM and SPHEROID codes (33) are displayed.

NOTE

If navigation system AUTO align is not successful or data and codes are incorrect, a manual alignment must be performed.

18. If auto alignment is complete and navigational data and codes are correct, proceed to step 32.



MANUAL ALIGNMENT

- 19. On pilot MFD (19), verify UTM (30) is selected (boxed).
- 20. Verify UTM position data (31) is correct; if not, press L1 (24) to select POS cursor.
- 21. On MFK (20), type correct UTM position data and press ENTER (34). On pilot MFD (19), verify UTM position data (31) entered is displayed.

NOTE

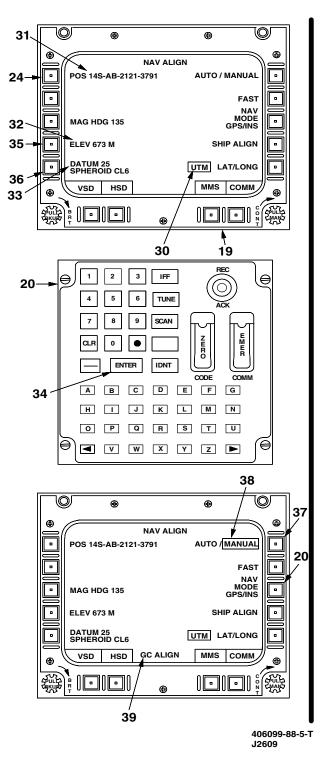
MAG HDG is only required when performing a shipboard alignment.

22. Verify correct ELEV data (32) is displayed; if not, press L4 (35) to select ELEV cursor.

NOTE

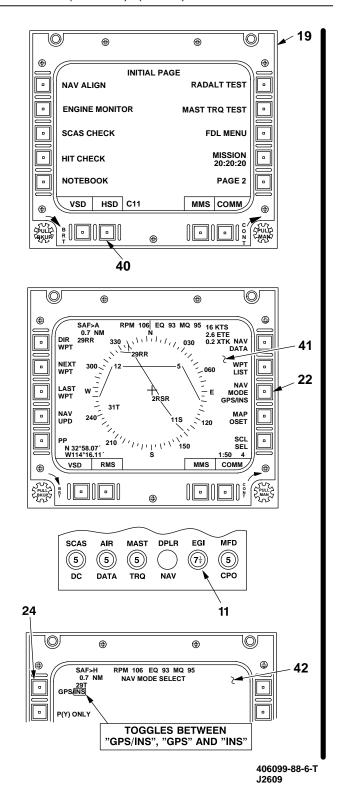
If elevation data is entered in feet, enter F after the last digit.

- 23. On MFK (20), type correct elevation data and press ENTER(34). On pilot MFD (19), verify correct ELEV data (32) entered is displayed.
- 24. Verify correct DATUM code (33) is displayed; if not, press L5 (36) to position cursor at DATUM line (33).
- 25. On MFK (20), type correct datum code and press ENTER (34). On pilot MFD (19), verify DATUM code (33) entered is displayed.
- 26. On pilot MFD (19), press R1 (37) to initiate MANUAL alignment. Verify MANUAL (38) is selected (boxed) and GC ALIGN (39) is displayed at bottom center of page.

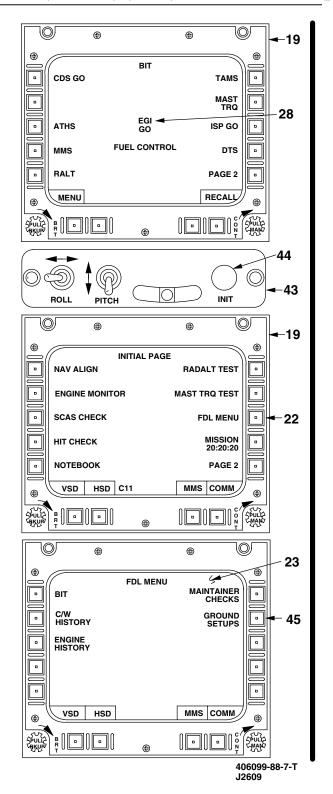


INS NAV ALIGNMENT

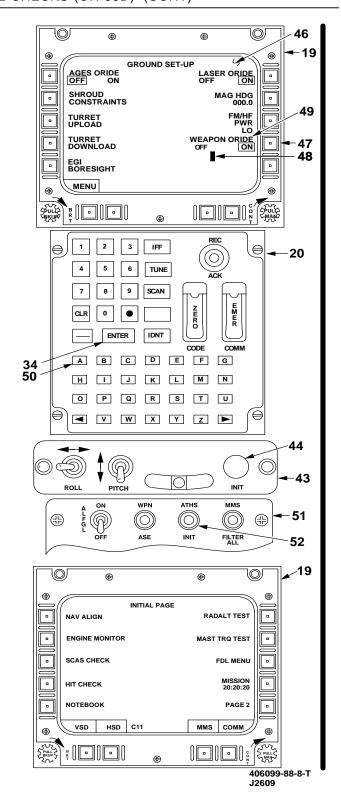
- 27. On pilot MFD (19), press HSD mode key (40) to display HSD page (41).
- 28. Press R3 (22) to display NAV MODE page (42).
- 29. Close EGI circuit breaker (11) and allow 3 to 5 seconds for system warmup.
- 30. Press L1 (24) to select INS mode (INS boxed).



- 31. On CPG MFD (19), verify EGI GO (28) is displayed.
- 32. On pilot auxiliary control panel (43), press INIT switch (44). On pilot MFD (19), verify INITIAL PAGE is displayed.
- 33. Press R3 (22) to display FDL MENU page (23).
- 34. Press R2 (45) to display GROUNDSET-UP page.



- 35. On pilot MFD (19), verify GROUND SET-UP page (46) is displayed.
- 36. Press R4 (47) to display cursor (48) below WEAPON ORIDE (49).
- 37. On MFK (20), press A (50) and ENTER (34).
- 38. On pilot MFD (19), verify ON is boxed under WEAPON ORIDE (49).
- 39. On pilot auxiliary control panel (43), press INIT switch (44). On pilot MFD (19), verify INITIAL PAGE is displayed.
- 40. On CPG auxiliary control panel (51), toggle ATHS/INIT switch (52) to INIT. On CPG MFD (19), verify INITIAL PAGE is displayed.



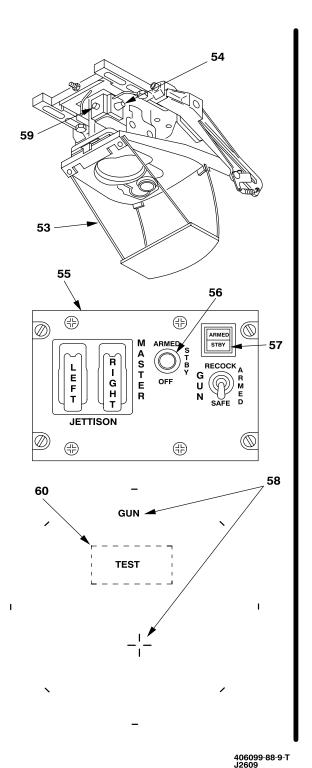
- 41. On PDU (53), rotate BRT control (54) to full clockwise position.
- 42. On ACP (55), position MASTER switch (56) to STBY. Verify ARMED/STBY indicator (57) indicates STBY.
- 43. On PDU (53), verify GUN reticle (58) is displayed within 20 seconds.
- 44. Rotate BRT control (54) throughout its range and verify corresponding change in brightness of GUN reticle (58).
- 45. Adjust BRT control (54) for desired GUN reticle brightness level.

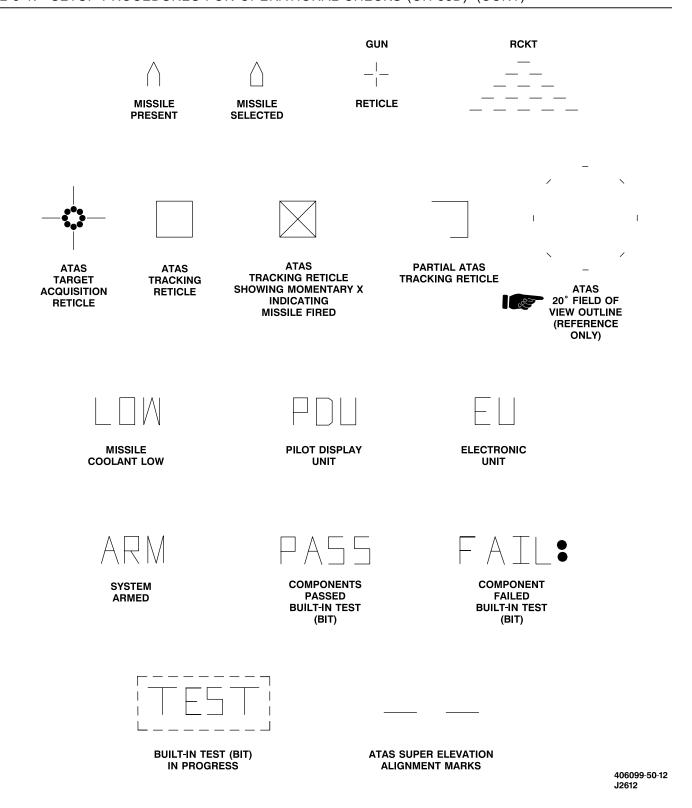
NOTE

- The PDU will display PASS upon successfulcompletion of the BIT for 5 seconds. When TEST, PASS or FAIL: is displayed, GUN will not be displayed.
- BIT failure is indicated by the word FAIL: and the LRU initials of the malfunctioning component, EU or PDU for electronic unit or pilot display unit. This display will last for 5 seconds.
- LOW indicates coolant pressure low for the ATAS seekerhead.
- The GUN reticle will reappear after 5 seconddisplay of FAIL:/PASS.
- 46. Press TEST switch (59). Verify TEST (boxed) (60) is displayed during BIT.
- 47. After test is complete, verify PASS is displayed, then after 5 secondsGUN reticle (58) display returns.

NOTE

All PDU symbology is shown on next page.



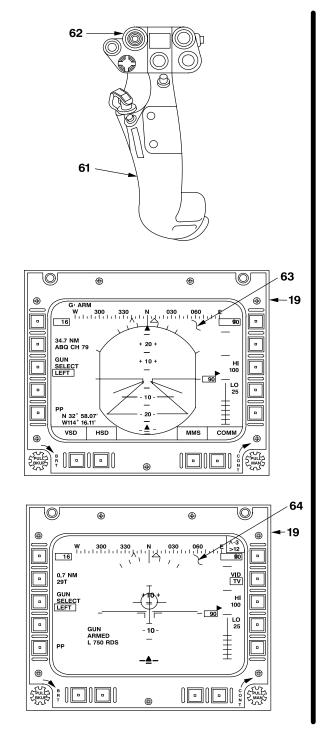


GO TO NEXT PAGE

- 48. On pilot cyclic grip (61), press WEAPON SEL switch (62) to either side.
- 49. On pilot MFD (19), verify weapons VSD page (63) is displayed with NAV heading and pitch scale.
- 50. On pilot cyclic grip (61), press WEAPON SEL switch (62) to same side again to select sparse mode. On pilot MFD (19), verify VSD sparse modepage (64) is displayed.

FOLLOW-ON MAINTENANCE

Perform operational checkouts (as required).



406099-88-10-T J2609

END OF TASK

This task covers: Preparation for Operational Checks (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Aviation Ground Power Unit (AGPU)
Microphone Headset (2)

Personnel Required:

68J Aircraft Armament/Missile Systems Repairer

References:

TM 1-1520-248-23

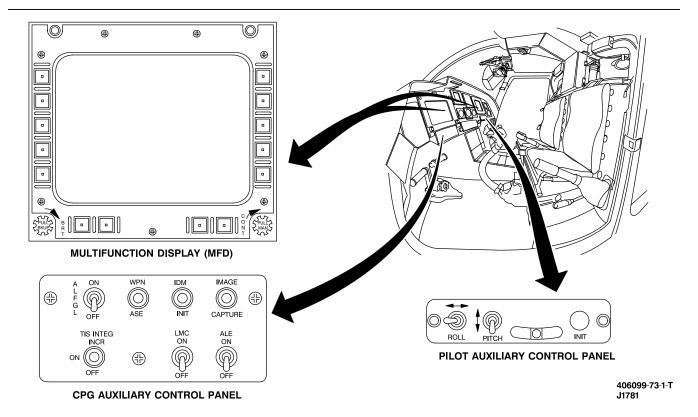
Equipment Condition: Helicopter Safed (TM 1-1520-248-23)

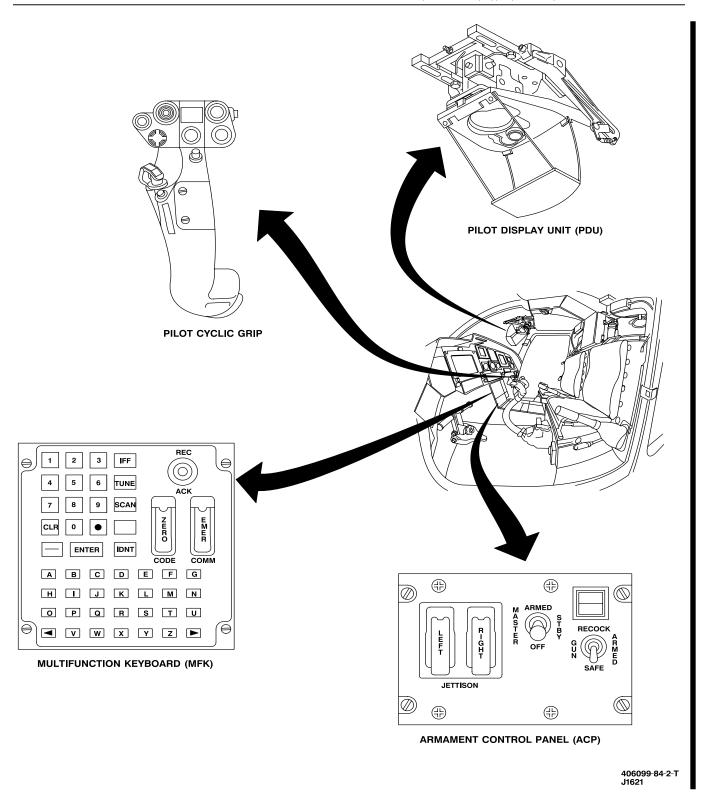
All Switches — Off/SAFE Headsets Connected

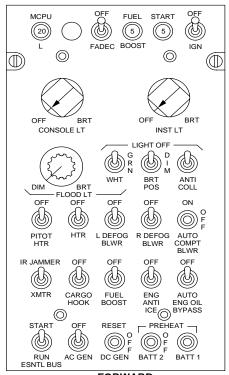
Navigation Input Data Required:

UTM Position Spheroid Code

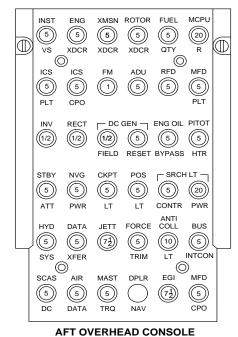
Elevation Magnetic Variation







FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



CIRCUIT BREAKER PANEL

IR
JAMMER FUZZ

S
BASE
BNR

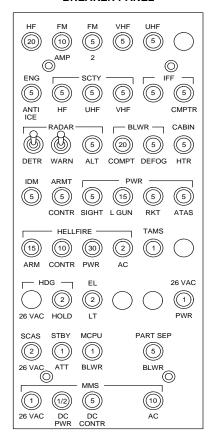
BATT VIDEO

S
CHGR RCDR

MASK
PLT
CPO

O

AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

GO TO NEXT PAGE

WARNING

Ensure JETT circuit breaker is opened during all operational checkouts.

CAUTION

To prevent a possible automatic start, ensure IGN switch is positioned to OFF prior to applying power to the aircraft.

NOTE

If weapon systems operational checks are to be performed on aircraft parked in a hangar, INS NAV ALIGN procedures shall be used to avoid corrupting the EGI Almanac. EGI circuit breaker shall be open prior to applying power to the aircraft if INS NAV ALIGN procedures are to be used.

POWERON

- 1. On forward overhead console panel (1), position IGN switch (2) to OFF.
 - 2. Close MCPU L circuit breaker (3).
- 3. On aft overhead console panel (4), open JETT circuit breaker (5).
 - 4. Close these circuit breakers:

MCPU R (6) ICS PLT (7) ICS CPO (8) MFD PLT (9) RECT (10) BUS INTCON (11) EGI (12) MFD CPO (13)

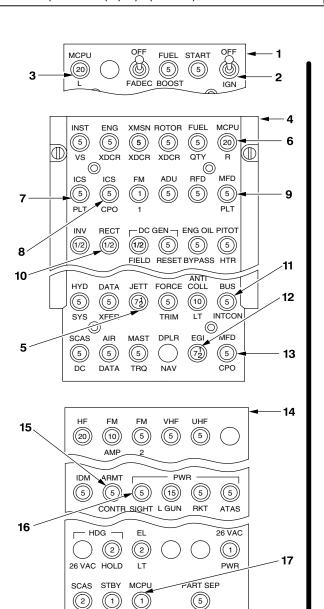
5. On center post circuit breaker panel (14), close these circuit breakers:

ARMT CONTR (15) PWRSIGHT (16) MCPU BLWR (17)

6. Apply external ac and dc electrical power (TM 1-1520-248-23).

NOTE

Allow 3 to 5 minutes for systems to warmup before continuing with setup for operational checks.



26 VAC

26 VAC

ATT

BLWR

MMS

(5)

PWR CONTR

406099-89-2-T J2613

BLWR

(10)

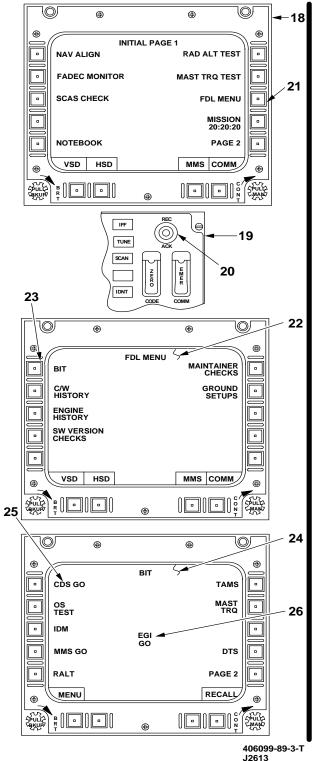
 \bigcirc

SETUP

- 7. On pilot and CPG MFDs (18), verify INITIAL PAGE 1 is displayed.
- 8. On MFK (19), toggle REC/ACK switch (20) to ACK to clear caution, warning, and advisory messages.
- 9. On CPG MFD (18), press R3 (21) to display FDL MENU page (22).
 - 10. Press L1 (23) to display BIT page (24).
- 11. On BIT page (24), after BIT is complete, verify CDS GO (25) and EGI GO (26) are displayed.

NOTE

- If INS NAV ALIGN procedures are used, EGI circuit breaker shall be open and EGI BIT will display NO GO.
- If INS NAV ALIGN procedures are used, step 26. INS NAV ALIGNMENT will be next.



J2613

NOTE

Navigational auto alignment is completed at 4 minutes after power is applied. This alignment should be complete before system warmup is completed. When NAV ALIGN page is displayed if AUTO is boxed and GC ALIGN is displayed at bottom center of page, alignment is in-progress. If no navigational system caution or advisory messages are displayed, auto align is complete.

- 12. On pilot MFD (18), press L1 (23) to display NAV ALIGN page (27).
 - 13. Verify UTM (28) is selected (boxed).
- 14. Verify correct UTM position data (29) is displayed.

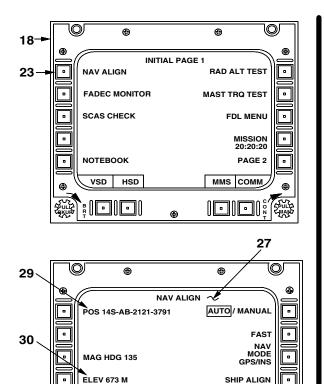
NOTE

- MAG HDG is only required when performing a shipboard alignment.
- If elevation data is entered in feet, enter F after the last digit.
- 15. Verify correct ELEV data (30) is displayed.
- 16. Verify correct DATUM and SPHEROID codes (31) are displayed.

NOTE

If navigation system AUTO align is not successful or data and codes are incorrect, a manual alignment must be performed.

17. If auto alignment is complete and navigational data and codes are correct, proceed to step 31.



GC ALIGN

28

DATUM 25 SPHEROID CL6

VSD HSD

406099-89-4-T J2613

UTM LAT/LONG

ммs сомм

MANUAL ALIGNMENT

- 18. On pilot MFD (18), verify UTM (28) is selected (boxed).
- 19. Verify UTM position data (29) is correct; if not, press L1 (23) to select POS cursor.
- 20. On MFK (19), type correct UTM position data and press ENTER (32). On pilot MFD (18), verify UTM position data (29) entered is displayed.

NOTE

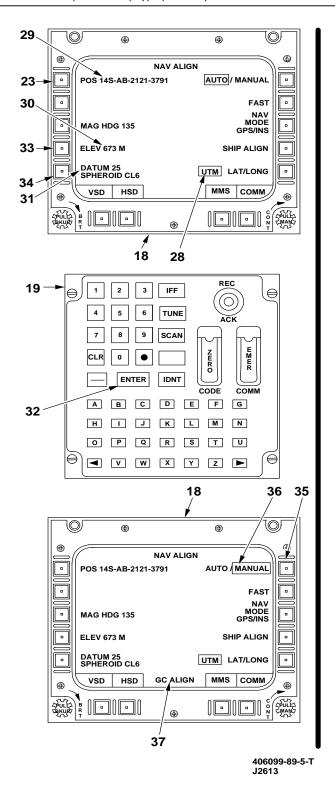
MAG HDG is only required when performing a shipboard alignment.

21. Verify correct ELEV data (30) is displayed; if not, press L4 (33) to select ELEV cursor.

NOTE

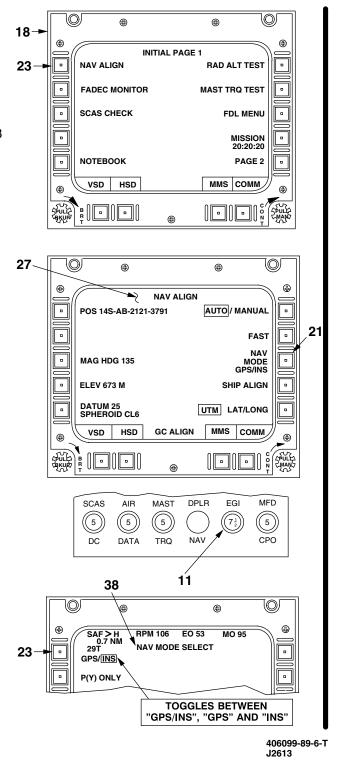
If elevation data is entered in feet, enter F after the last digit.

- 22. On MFK (19), type correct elevation data and press ENTER (32). On pilot MFD (18), verify correct ELEV data (30) entered is displayed.
- 23. Verify correct DATUM code (31) is displayed; if not, press L5 (34) to position cursor at DATUM line (31).
- 24. On MFK (19), type correct datum code and press ENTER (32). On pilot MFD (18), verify DATUM code (31) entered is displayed.
- 25. On pilot MFD (18), press R1 (35) to initiate MANUAL alignment. Verify MANUAL (36) is selected (boxed) and GC ALIGN (37) is displayed at bottom center of page.

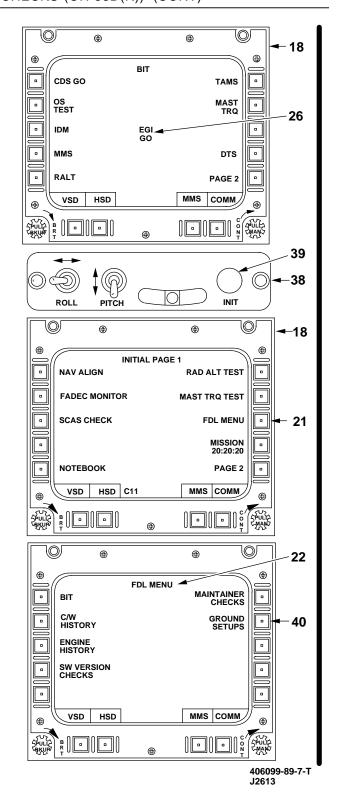


INS NAV ALIGNMENT

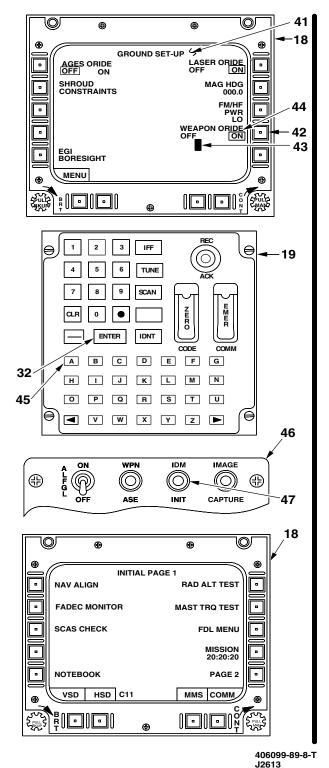
- 26. On pilot MFD (18) press L1 (23) to display NAV ALIGN page (27).
- 27. Press R3 (21) to display NAV MODE page (38).
- 28. Close EGI circuit breaker (11) and allow 3 to 5 seconds for system warmup.
- 29. Press L1 (23) to select INS mode(INS boxed).



- 30. On CPG MFD (18), verify EGI GO (26) is displayed.
- 31. On pilot auxiliary control panel (38), press INIT switch (39). On pilot MFD (18), verify INITIAL PAGE 1 is displayed.
- 32. Press R3 (21) to display FDL MENU page (22).
- 33. Press R2 (40) to display GROUND SET-UP page.



- 34. On pilot MFD (18), verify GROUNDSET-UP page (41) is displayed.
- 35. Press R4 (42) to display cursor (43) below WEAPON ORIDE(44).
- 36. On MFK (19), press A (45) and ENTER(32).
- 37. On pilot MFD (18), verify ON is boxed under WEAPON ORIDE(44).
- 38. On CPG auxiliary control panel (46), toggle IDM/INIT switch (47) to INIT. On CPG MFD (18), verify INITIAL PAGE 1 is displayed.



GO TO NEXT PAGE

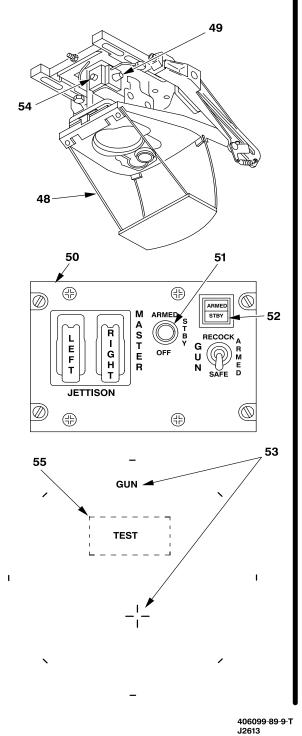
- 39. On PDU (48), rotate BRT control (49) to full clockwise position.
- 40. On ACP (50), position MASTER switch (51) to STBY. Verify ARMED/STBY indicator (52) indicates STBY.
- 41. On PDU (48), verify GUN reticle (53) is displayed within 20 seconds.
- 42. Rotate BRT control (49) throughout its range and verify corresponding change in brightness of GUN reticle (53).
- 43. Adjust BRT control (49) for desired GUN reticle brightness level.

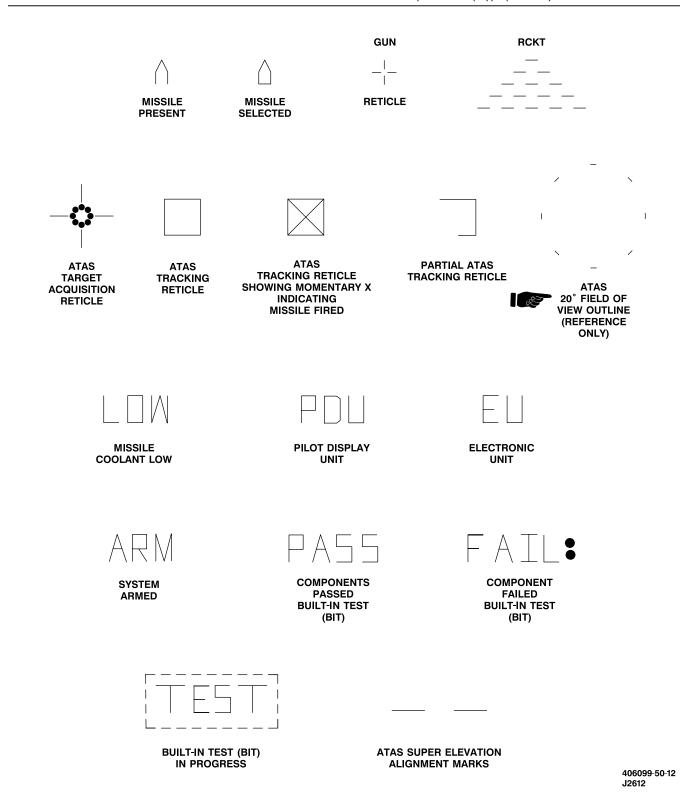
NOTE

- The PDU will display PASS upon successful completion of the BIT for 5 seconds. When TEST, PASS or FAIL: is displayed, GUN will not be displayed.
- BIT failure is indicated by the word FAIL: and the LRU initials of the malfunctioning component, EU or PDU for electronic unit or pilot display unit. This display will last for 5 seconds.
- LOW indicates coolant pressure low for the ATAS seeker head.
- The GUN reticle will reappear after 5 second display of FAIL:/PASS.
- 44. Press TEST switch (54). Verify TEST (boxed) (55) is displayed during BIT.
- 45. After test is complete, verify PASS is displayed, then after 5 seconds GUN reticle (53) display returns.

NOTE

All PDU symbology is shown on next page.

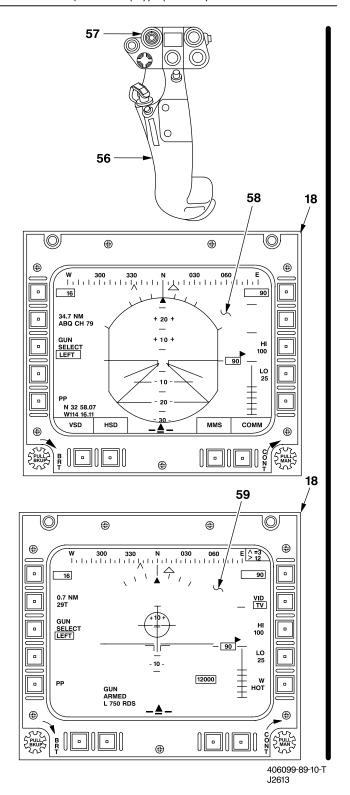




- 46. On pilot cyclic grip (56), press WEAPON SEL switch (57) to either side.
- 47. On pilot MFD (18), verify weapons VSD page (58) is displayed.
- 48. On pilot cyclic grip (56), press WEAPON SEL switch (57) to same side again to select sparse mode. On pilot MFD (18), verify VSD sparse mode page (59) is displayed.

FOLLOW-ON MAINTENANCE

Perform operational checkouts (as required).



OPERATIONAL CHECK (OH-58D) 2-5-3. AIR-TO-AIR STINGER (ATAS) MISSILE SYSTEM

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: **ÖH-58D**

Tools:

Armament Repairer Basic Tool Set (B16) Armament Repairer Supplemental Tool Set Aviation Ground Power Unit (AGPU) Microphone Headset (2) Captive Flight Trainer (CFT) (2) Laser Source Simulator (LSS) (B8)

Personnel Required:

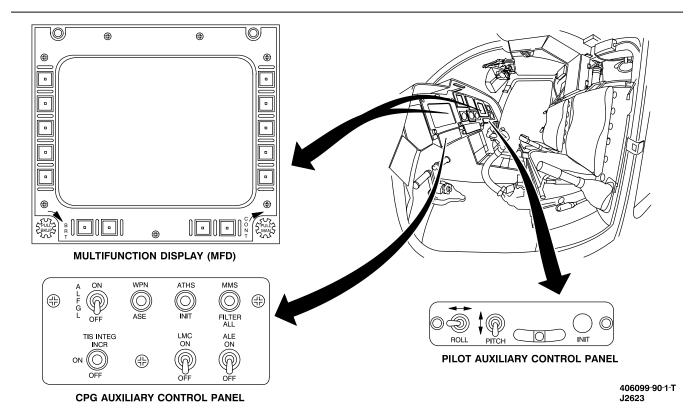
68J Aircraft Armament/Missile Systems Repairer (2) 68J Aircraft Armament/Missile Systems Technical Inspector (TI)

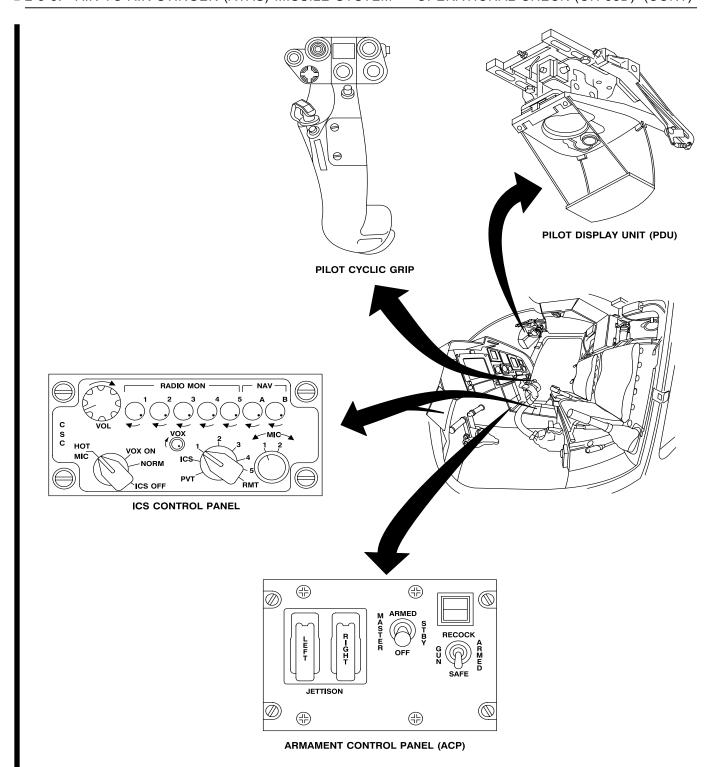
References:

FM 21-11 TM 1-1520-248-23 TM 9-1090-214-23&P TM 9-1440-431-23

Equipment Condition:

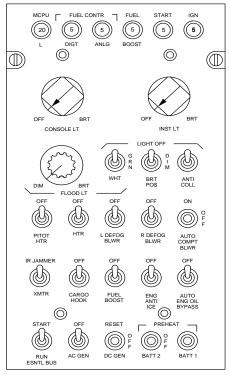
Setup Procedures for Operational Checks Completed (Task 2-5-1) Helicopter Safed (TM 1-1520-248-23) **Headsets Connected** ATAS Launcher and Adapter Installed (TM 9-1090-214-23&P) Armament Cable Installed (ATAS) (TM 9-1090-214-23&P) Captive Flight Trainers (CFT) Installed (2) (TM 9-1440-431-23) Missile Launcher Coolant Bottle Pressure 4500 PSI Minimum (TM 9-1440-431-23)



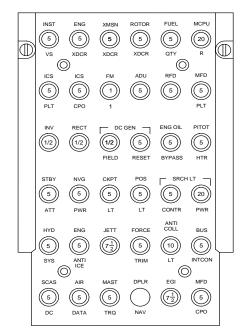


406099-90-2-T J2623

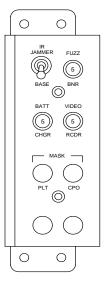
GO TO NEXT PAGE



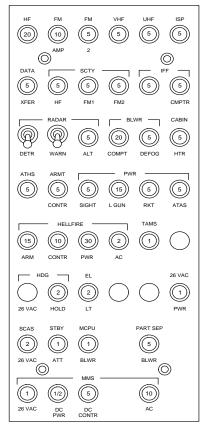
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

ATAS SYSTEM SETUP

WARNING

- To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are down.
- Maintain 15 feet minimum distance forward of CFT during maintenance. Pressure vent valve malfunction can cause excessive pressure to explode dome creating flying glass fragments and injury to personnel. Refer to FM 21-11 for treatment of injuries.
- The STINGER missile and STINGER CFT contain mercury thallium in the seeker dome. If the seeker dome is broken, do not touch the missile/CFT near the seeker gyro. This material is toxic to skin. Avoid contact with the released material unless protective equipment is worn. If skin or eyes are exposed to released material, immediately flush the affected area with large quantities of water and seek medical attention immediately.

CAUTION

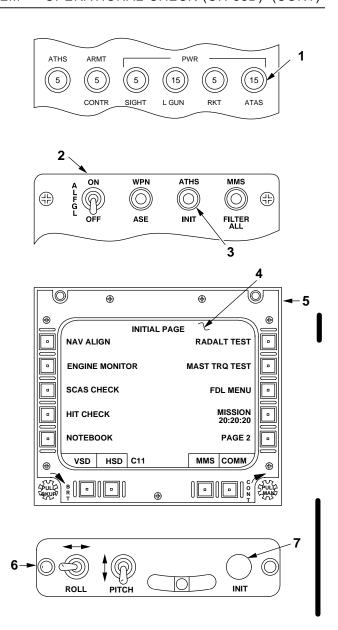
The CFT seeker head can be damaged if duty cycle is exceeded. The duty cycle is a maximum 5 minutes continuous activation (CFT activated). This will be followed by at least 10 minutes of deactivation.

NOTE

It is understood the CFT may be installed on either, or both, sides of the helicopter. Illustrations in this procedure show weapons symbology only on the left side of the helicopter.

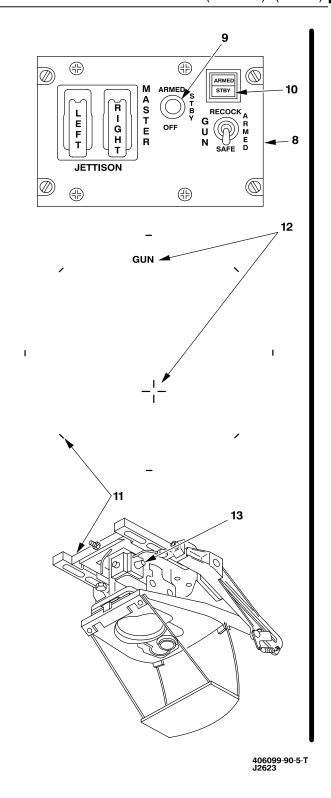
- Close PWR ATAS circuit breaker (1).
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. On CPG auxiliary control panel (2), position ATHS/INIT switch (3) to INIT to display INITIAL PAGE (4) on CPG MFD (5).
- 4. On pilot auxiliary control panel (6), press INIT switch (7) to display INITIAL PAGE (4) on pilot MFD (5).

GO TO NEXT PAGE

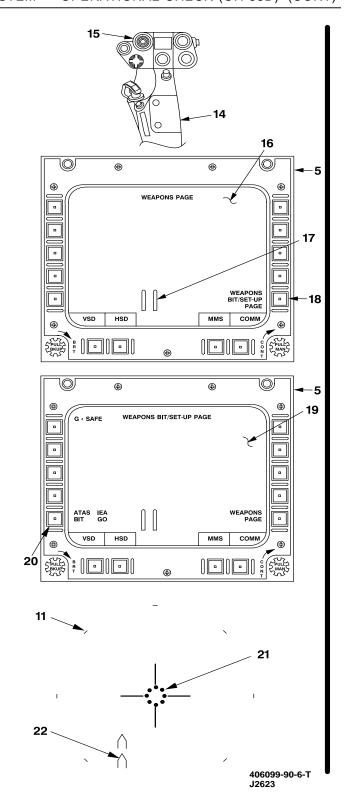


406099-90-4-T J2623

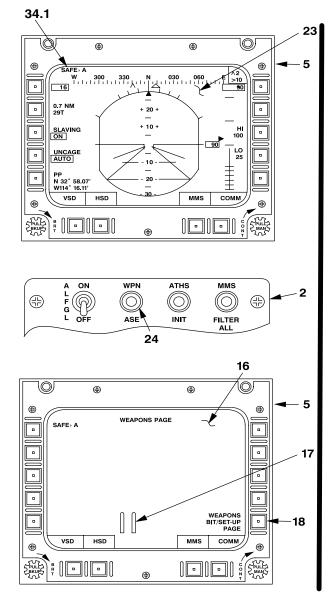
- 5. On ACP (8), position MASTER switch (9) to STBY.
- 6. Verify ARMED/STBY indicator (10) indicates STBY.
- 7. On PDU (11), verify GUN reticle (12) is displayed within 20 seconds.
- 8. Rotate BRT knob (13) to adjust brightness of GUN reticle (12) to desired level.



- 9. On pilot cyclic grip (14), press WEAPON SEL switch (15) up to select WEAPONS PAGE (16).
- 10. On pilot MFD (5), verify WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 11. Press R5 (18) to display WEAPONS BIT/SET-UP PAGE (19).
- 12. Verify WEAPONS BIT/SET-UP PAGE (19) is displayed.
 - 13. Press L5 (20) to initiate ATAS BIT.
- 14. Verify IEA GO is displayed next to ATAS BIT.
- 15. On pilot cyclic grip (14), press WEAPON SEL switch (15) to side with CFT installed.
- 16. On PDU (11), verify ATAS reticle (21) and missile symbology (22) are displayed.

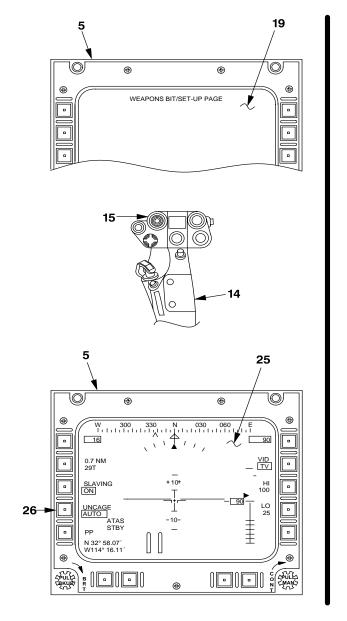


- 17. On pilot MFD (5), verify ATAS vertical situation display (VSD) page (23) is displayed. Verify SAFE (34.1) is displayed, in upper left corner, on VSD page.
- 18. On CPG auxiliary control panel (2), toggle WPN/ASE switch (24) to WPN.
- 19. On CPG MFD (5), verify WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 20. Press R5 (18) to display WEAPONS BIT/SET-UP PAGE.



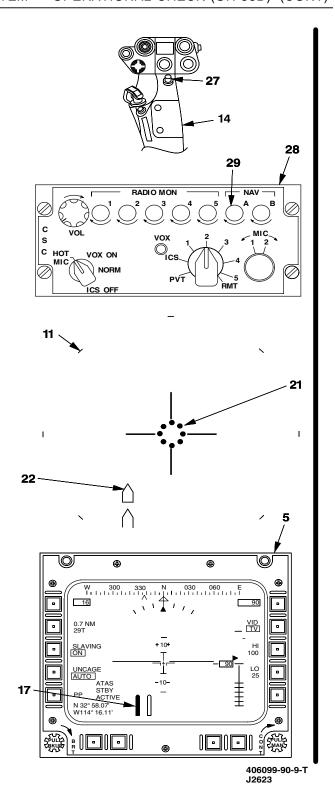
406099-90-7-T J2623

- 21. Verify WEAPONS BIT/SET-UP PAGE (19) is displayed.
- 22. On pilot cyclic grip (14), press WEAPON SEL switch (15) once to side with CFT installed.
- 23. On pilot MFD (5), verify ATAS sparce VSD page (25) is displayed.
 - 24. Press L4 (26) to set UNCAGE to AUTO.
 - 25. Verify no missiles are selected.



406099-90-8-T J2623

- 26. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 27. Verify CFT gyro spins up and seeker head is cooled by monitoring missile audio.
- 28. On ICS panel (28), adjust NAV A control (29) as desired.
- 29. Verify a high level of noise, reducing quickly (3 to 5 seconds) to a low level on pilot and CPG headsets. This indicates the system is ready for operation.
- 30. On PDU (11), verify ATAS reticle (21) is displayed with missile symbology (22) indicating missile activation.
- 31. On MFD (5), verify weapon symbology (17), indicating missile activation, is displayed.



- 32. On pilot cyclic grip (14), press and release MSL STEP switch (30).
- 33. On MFD (5) and PDU (11), verify outboard missile symbol deactivates and inboard missile activates.
- 34. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 35. Verify CFT gyro spins down (noise ceases) and displays indicate no missiles activated.

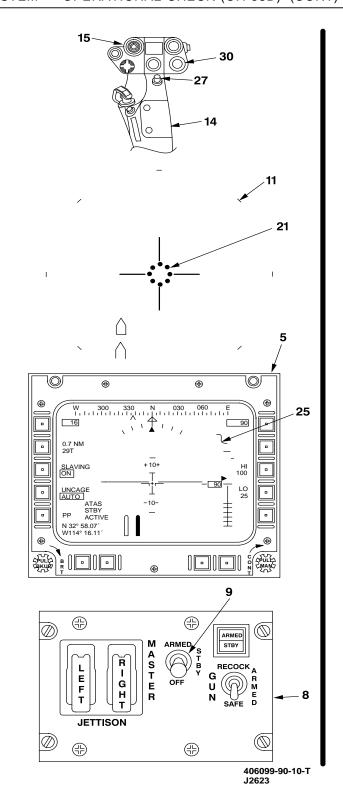
CAUTION

After a missile has been activated for 5 minutes (repeated on/off or continuous on), it should be deactivated for at least 10 minutes to prevent damage to seeker head.

NOTE

Do not obstruct line-of-sight between Laser Source Simulator (LSS) (B8) and seeker head. The seeker head will break target acquisition and acquisition audio tone will cease.

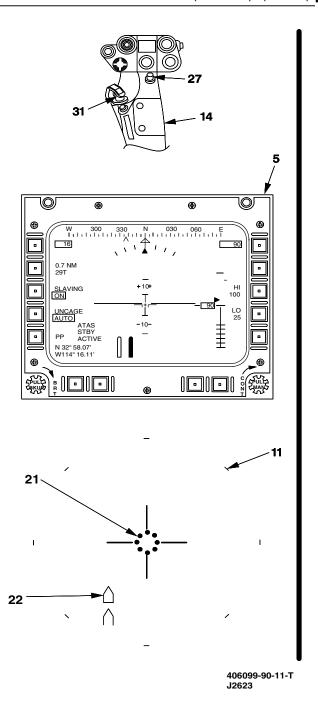
- 36. On ACP (8), cycle MASTER switch (9) from STBY, to OFF, to STBY.
- 37. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to the side with CFT installed.
- 38. On pilot MFD (5), verify ATAS sparse VSD page (25) is displayed.
- 39. On PDU (11), verify ATAS reticle (21) is displayed.
- 40. Position (LSS) (B8) 20 feet in front of helicopter and within field-of-view (FOV) of seeker head.



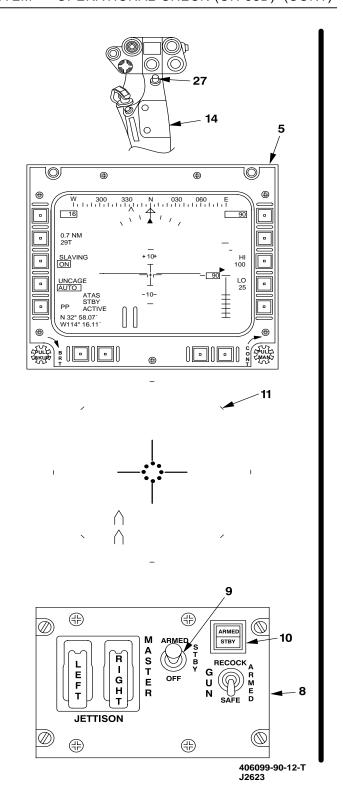
NOTE

When the missile is active and the gyro is spun up, the seeker head is caged at 0 degrees azimuth and -7 degrees elevation. The proper position for the (LSS) (B8) is 20 feet directly in front of the helicopter and approximately level with the seeker head.

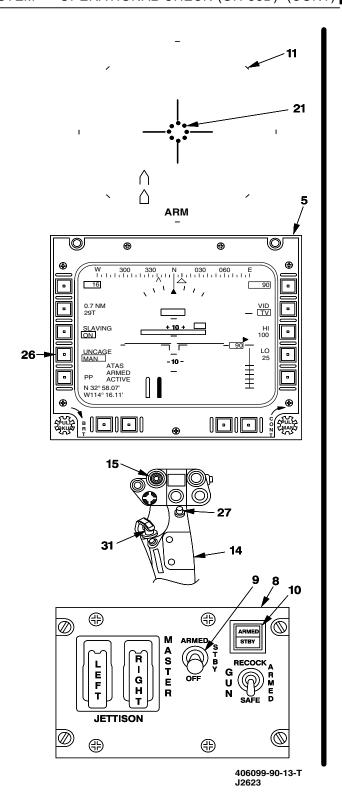
- 41. On pilot cyclic grip (14), press and release MSL ACTV switch (27). On PDU (11), verify ATAS reticle (21) is displayed with missile symbology (22) indicating missile activation.
- 42. Verify clear audio tone present indicating target acquisition.
 - 43. Move (LSS) (B8) 10 degrees left or right.
- 44. On MFD (5) and PDU (11), verify displays do not change.
- 45. Verify audio ceases when (LSS) (B8) is outside FOV.
 - 46. Return (LSS) (B8) to original position.
- 47. Verify audio tone is present indicating target acquisition.
- 48. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGE position).
 - 49. Move (LSS) (B8) 10 degrees left or right.
- 50. On MFD (5) and PDU (11), verify displays do not change.
- 51. Verify audio ceases when (LSS) (B8) is outside FOV.
 - 52. Return (LSS) (B8) to original position.
- 53. Verify audio tone is present indicating target acquisition.
- 54. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
- 55. Verify missile does not fire, displays do not change, and audio tone ceases.
- 56. Release WPN-FIRE switch (31).



- 57. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 58. On PDU (11) and MFD (5), verify missile deactivates.
- 59. Place (LSS) (B8) outside seeker head FOV.
- 60. On ACP (8), position MASTER switch (9) to ARMED.
- 61. Verify ARMED/STBY indicator (10) indicates ARMED.



- 62. On PDU (11), verify ATAS reticle (21) and ARM are displayed.
 - 63. On MFD (5), verify ARMED is displayed.
 - 64. Press L4 (26) to set UNCAGE to MAN.
- 65. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 66. On PDU (11) and MFD (5), verify missile is activated.
- 67. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGED position).
- 68. Press WPN-FIRE switch (31) through second detent and release. Verify missile fires.
- 69. On ACP (8), momentarily position MASTER switch (9) to OFF and then position to ARMED. Verify ARMED/STBY indicator (10) indicates ARMED.
- 70. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to the left.

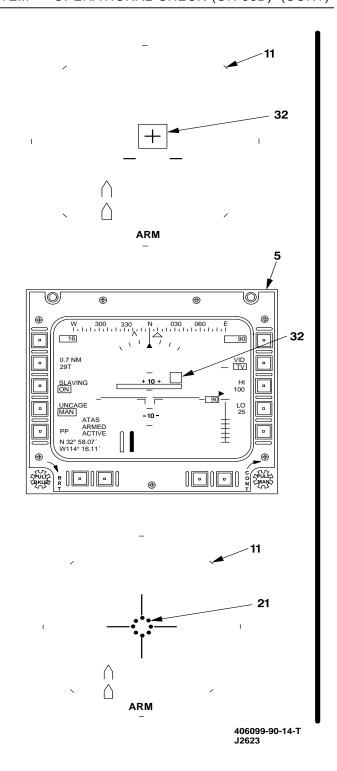


71. On PDU (11) and MFD (5), verify tracking reticle (32) is displayed. Tracking reticle appears centered over crosshairs on PDU. No acquisition tone present.

NOTE

The tracking reticle may slowly drift off axis.

- 72. On PDU (11), verify ATAS reticle (21) is displayed.
- 73. Place (LSS) (B8) in seeker head FOV. Verify audio tone is present indicating target acquisition.
 - 74. Move (LSS) (B8) 10 degrees left or right.
- 75. Verify displays do not change and audio tone ceases when (LSS) (B8) is outside seeker head FOV.
 - 76. Move (LSS) (B8) to original position.
- 77. Verify audio tone is present indicating target acquisition.

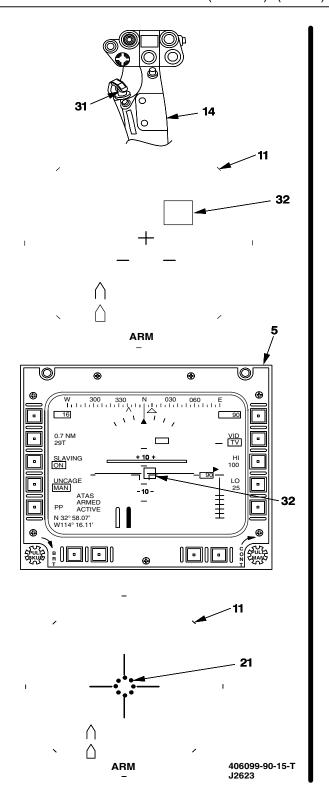


- 78. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGED position).
 - 79. Verify audio tone becomes continuous.
- 80. On PDU (11) and MFD (5), verify tracking reticles (32) are displayed.
- 81. Slowly move (LSS) (B8) 15 degrees left, right, up, and down.
- 82. Verify tracking reticles (32) follows (LSS) (B8).

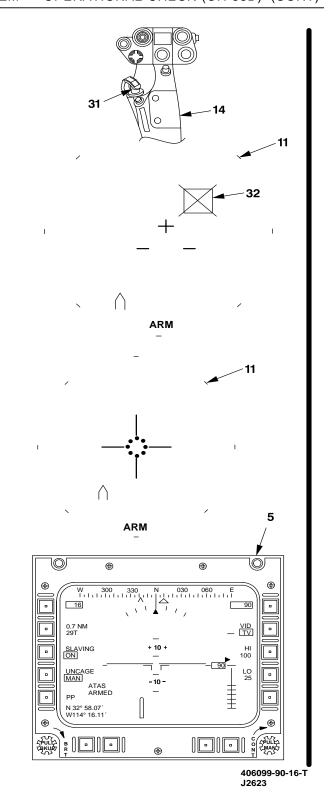
NOTE

A flashing tracking reticle on PDU indicates the ATAS seeker head is approaching a scan limit.

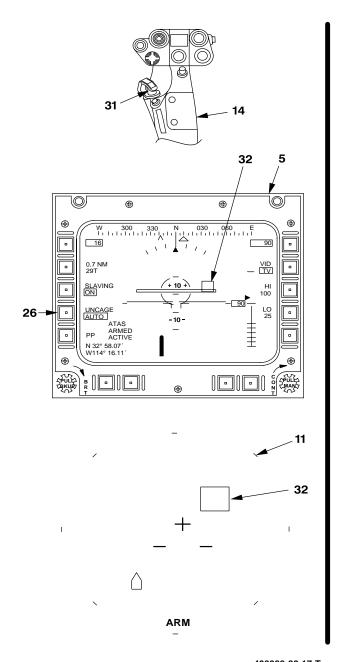
- 83. Verify partial tracking reticle (32) is displayed and flashes at 1 Hz rate when seeker head reaches limits.
- 84. On pilot cyclic grip (14), release WPN-FIRE switch (31).
- 85. On PDU (11) and MFD (5), verify seeker head cages and tracking reticle (32) is no longer displayed.
- 86. On PDU (11), verify ATAS reticle (21) is displayed.
 - 87. Move (LSS) (B8) to original position.
- 88. Verify audio tone is present indicating target acquisition.
- 89. Slowly move (LSS) (B8) left or right until the seeker head breaks target acquisition and audio tone ceases.
- 90. Move (LSS) (B8) outside seeker head FOV.
- 91. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent.
- 92. Move (LSS) (B8) into seeker head capture zone.
- 93. On PDU (11) and MFD (5), verify audio tone and tracking reticles (32) indicate target acquisition.



- 94. Continue moving (LSS) (B8) to within 12 degrees of seeker head FOV center.
- 95. Verify tracking reticle (32) follows (LSS) (B8).
- 96. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
 - 97. Verify the following:
 - a. Missile fires,
 - b. Audio tone ceases.
- c. On PDU (11), tracking reticle (32) displays "X" momentarily.
- d. Missile symbol disappears from PDU (11) and MFD (5).

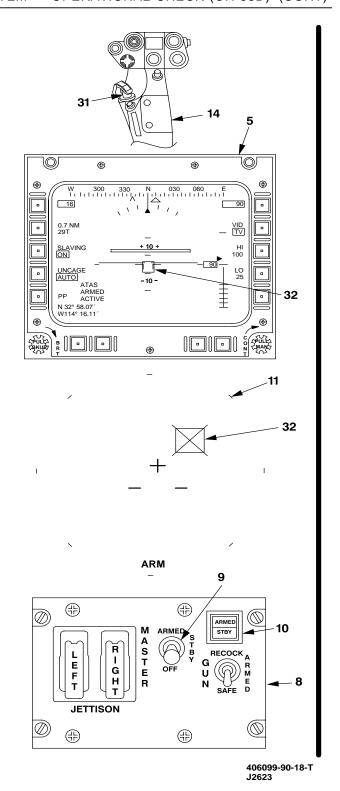


- 98. On pilot cyclic grip (14), release WPN-FIRE switch (31).
 - 99. Verify system activates remaining missile.
- 100. Verify CFT gyro spins up and seeker head is cooled by monitoring missile audio.
- 101. Move (LSS) (B8) outside FOV of second missile.
- 102. On MFD (5), press L4 (26) to set UNCAGE to AUTO.
- 103. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGE position).
- 104. On MFD (5) and PDU (11), verify tracking reticles (32) are not displayed.
- 105. Slowly move (LSS) (B8) into seeker head capture zone.
- 106. On PDU (11) and MFD (5), verify audio tone and tracking reticles (32) indicate target acquisition.
- 107. Continue moving (LSS) (B8) to within 12 degrees of seeker head FOV center.
- 108. On PDU (11) and MFD (5), verify tracking reticles (32) follow (LSS) (B8).



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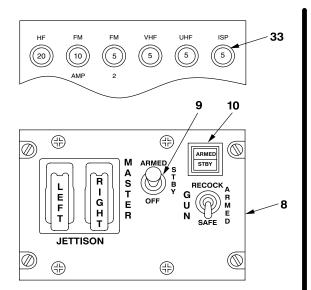
- 109. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
 - 110. Verify the following:
 - a. Missile fires,
 - b. Audio tone ceases,
- c. On PDU (11), tracking reticle (32) displays "X" momentarily,
- d. On PDU (11) and MFD (5), verify missile symbol disappears.
- 111. On pilot cyclic grip (14), release WPN-FIRE switch (31).
- 112. On PDU (11) and MFD (5), verify tracking reticles (32) or missiles are not displayed.
- 113. On ACP (8), set MASTER switch (9) to OFF.
- 114. Verify ARMED/STBY indicator (10) is not lighted.
- 115. Move (LSS) (B8) outside seeker head FOV.

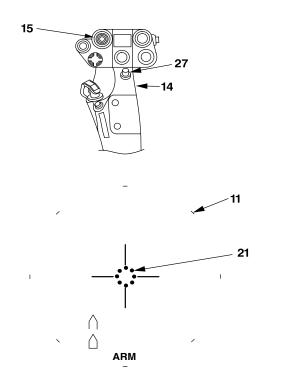


NOTE

When the Integrated System Processor (ISP) is disabled, the MFD weapons displays will not show any changes in weapons status.

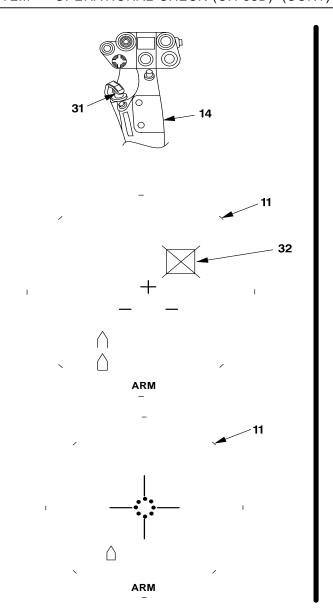
- 116. Open ISP circuit breaker (33).
- 117. Verify ISP caution is displayed on MFD.
- 118. On ACP (8), position MASTER switch (9) to ARMED.
- 119. Verify ARMED/STBY indicator (10) indicates ARMED.
- 120. On pilot cyclic grip (14), press WEAPON SEL switch (15) to side with CFT installed.
 - 121. On PDU (11), verify ARM is displayed.
- 122. Verify ATAS reticle (21), with two missiles, is displayed.
- 123. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 124. Verify CFT gyro spins up and seeker head is cooled by monitoring missile audio.





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- 125. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGE position).
- 126. On PDU (11), verify no tracking reticle (32) is displayed.
- 127. Slowly move (LSS) (B8) into seeker head FOV.
- 128. Verify audio tone and tracking reticle (32) indicate target acquisition.
- 129. Continue moving (LSS) (B8) to within 12 degrees of center of seeker head FOV.
- 130. Verify tracking reticle (32) follows (LSS) (B8).
- 131. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
 - 132. Verify the following:
 - a. Missile fires,
 - b. Audio tone ceases,
- c. On PDU (11), tracking reticle (32) displays "X" momentarily,
- d. Missile symbol disappears from PDU (11), and MFD.
- 133. On pilot cyclic grip (14), release WPN-FIRE switch (31).
 - 134. Verify second missile is activated.



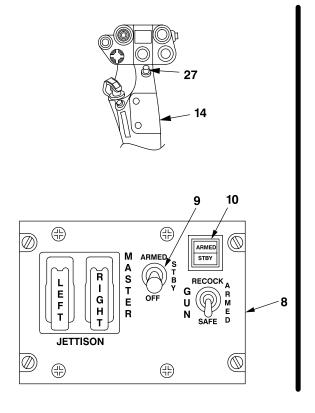
406099-90-20-T J2623

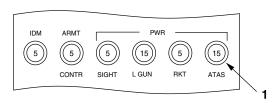
- 135. On pilot cyclic grip (14), press MSL ACTV switch (27).
 - 136. Verify missile is deactivated.
- 137. On ACP (8), position MASTER switch (9) to OFF.
 - 138. Verify ARMED/STBY (10) is not lighted.
 - 139. Verify no symbology is present on PDU.

NOTE

If CFT is loaded on both sides return to step 11. and repeat checkout on the other launcher.

140. Open PWR ATAS circuit breaker (1).

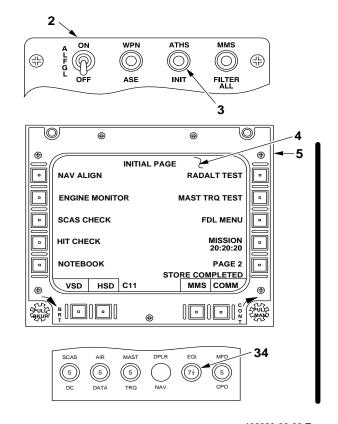




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NOTE

- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 141. On CPG auxiliary control panel (2), press ATHS/INIT switch (3) to INIT to display INITIAL PAGE (4) on CPG MFD (5).
 - 142. Open EGI circuit breaker (34).



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- 143. Disconnect external ac electrical power (TM 1-1520-248-23).
 - 144. Open following circuit breakers:

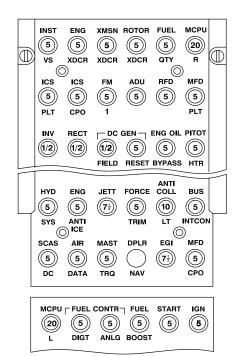
MCPU R
ICS PLT
ICS CPO
MFD PLT
RECT
BUS INTCON
MFD CPO
MCPU L
ARMT CONT
PWR SIGHT
26 VAC PWR
MCPU BLWR

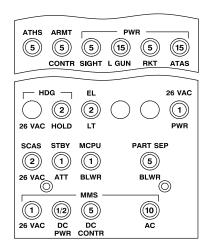
INSPECT

FOLLOW-ON MAINTENANCE

Headset disconnected.

Remove captive flight trainers and coolant bottle (TM 9-1440-431-23).





406099-90-23-T J2623

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Aviation Ground Power Unit (AGPU)
Microphone Headset (2)
Captive Flight Trainer (CFT) (2)
Laser Source Simulator (LSS) (B8)

Personnel Required:

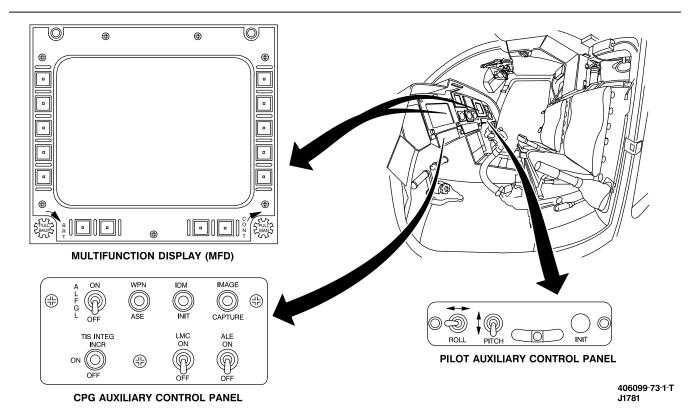
68J Aircraft Armament/Missile Systems Repairer (2)68J Aircraft Armament/Missile Systems Technical Inspector (TI)

References:

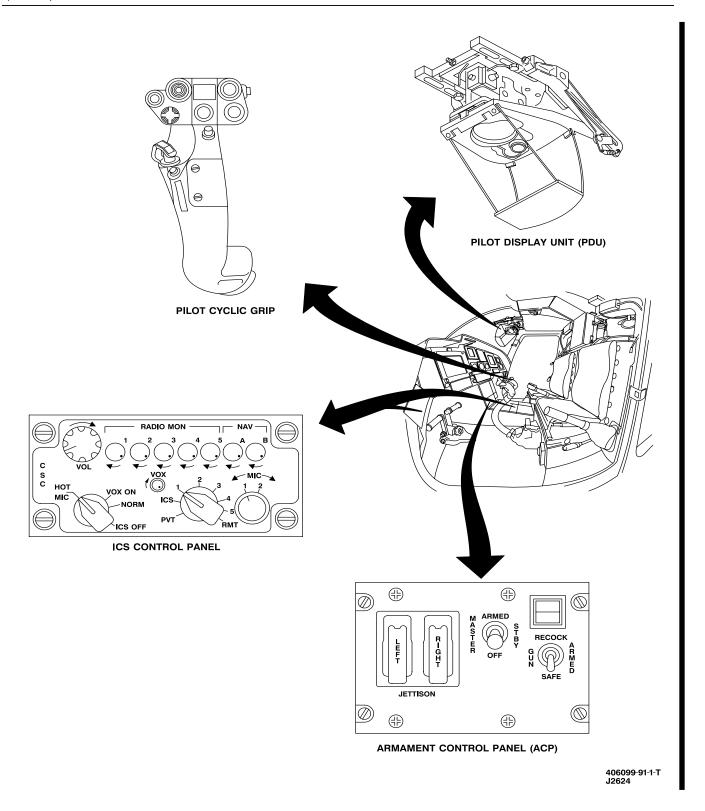
FM 21-11 TM 1-1520-248-23 TM 9-1090-214-23&P TM 9-1440-431-23

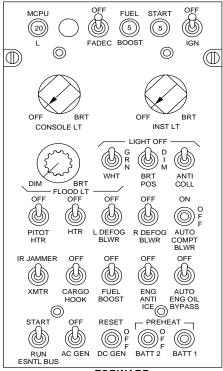
Equipment Condition:

Setup Procedures for Operational Checks
Completed (Task 2-5-2)
Helicopter Safed (TM 1-1520-248-23)
Headsets Connected
ATAS Launcher and Adapter Installed
(TM 9-1090-214-23&P)
Armament Cable Installed (ATAS)
(TM 9-1090-214-23&P)
Captive Flight Trainers (CFT) Installed (2)
(TM 9-1440-431-23)
Missile Launcher Coolant Bottle Pressure 4500
PSI Minimum (TM 9-1440-431-23)

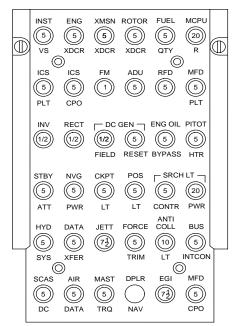


GO TO NEXT PAGE

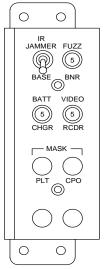




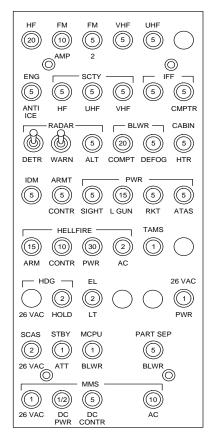
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

GO TO NEXT PAGE

2-5-4. AIR-TO-AIR STINGER(ATAS) MISSILE SYSTEM (CONT)

OPERATIONAL CHECK (OH-58D(R))

ATAS SYSTEM SETUP

WARNING

- To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are down.
- Maintain 15 feet minimumdistance forward of CFT during maintenance. Pressure vent valve malfunction can cause excessive pressure to explode domecreating flying glass fragments and injury to personnel. Refer to FM 21-11 for treatment of injuries.
- The STINGERmissile and STINGER CFT contain mercury thallium in the seeker dome. If the seeker dome is broken, do not touch the missile/CFT near the seeker gyro. This material is toxic to skin. Avoid contact with the released material unless protective equipment is worn. If skin or eyes are exposed to released material, immediately flush the affected area with large quantities of water and seek medical attention immediately.

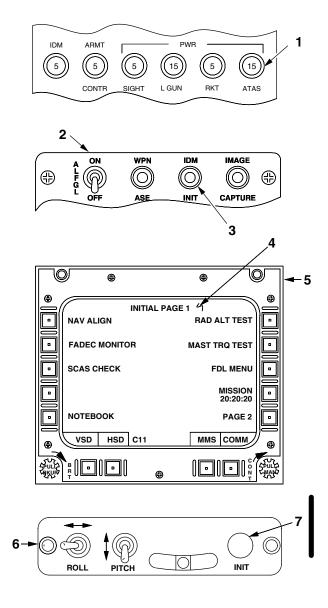
CAUTION

The CFT seeker head can be damaged if duty cycle is exceeded. The duty cycle is a maximum 5 minutes continuous activation (CFT activated). This will be followed by at least 10 minutes of deactivation.

NOTE

It is understood the CFT may be installed on either, or both, sides of the helicopter. Illustrations in this procedure show weapons symbology only on the left side of the helicopter.

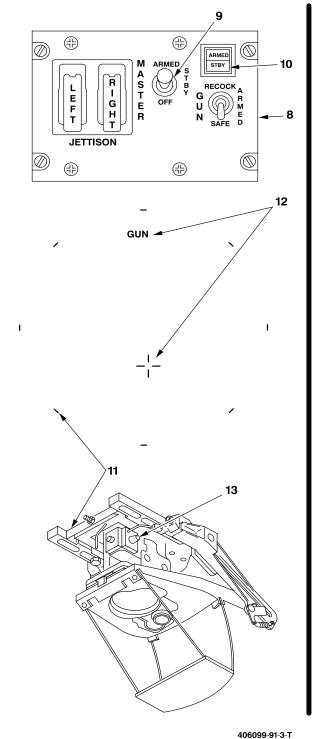
- 1. Close PWRATAS circuit breaker (1).
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. On CPG auxiliary control panel (2), position IDM/INIT switch (3) to INIT to display INITIAL PAGE 1 (4) on CPG MFD (5).
- 4. On pilot auxiliary control panel (6), press INIT switch (7) to display INITIAL PAGE 1 (4) on pilot MFD (5).



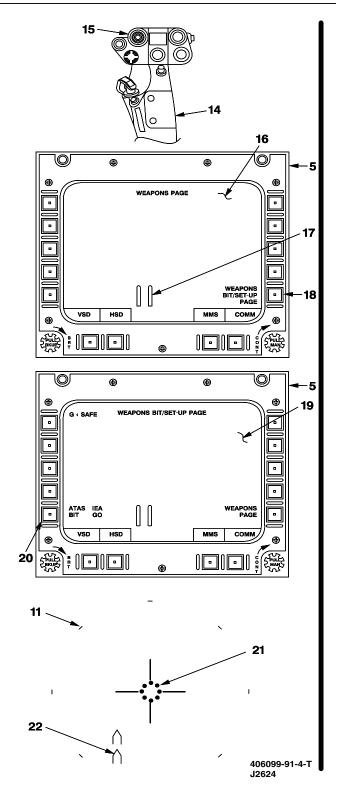
406099-91-2-T J2624

GO TO NEXT PAGE

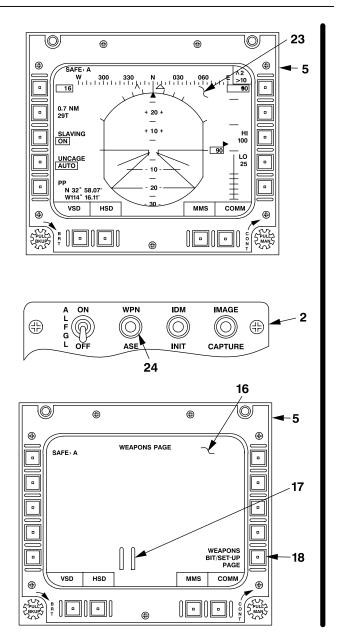
- 5. On ACP (8), position MASTER switch (9) to STBY.
- 6. Verify ARMED/STBY indicator (10) indicates STBY.
- 7. On PDU (11), verify GUN reticle (12) is displayed within 20 seconds.
- 8. Rotate BRT knob (13) to adjust brightness of GUN reticle (12) to desired level.



- 9. On pilot cyclic grip (14), press WEAPON SEL switch (15) up to select WEAPONS PAGE (16).
- 10. On pilot MFD (5), verify WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 11. Press R5 (18) to display WEAPONS BIT/SET-UP PAGE (19).
- 12. Verify WEAPONS BIT/SET-UP PAGE (19) is displayed.
 - 13. Press L5 (20) to initiate ATAS BIT.
- 14. Verify IEA GO is displayed next to ATAS BIT.
- 15. On pilot cyclic grip (14), press WEAPON SEL switch (15) to side with CFT installed.
- 16. On PDU (11), verify ATAS reticle (21) and missile symbology (22) are displayed.

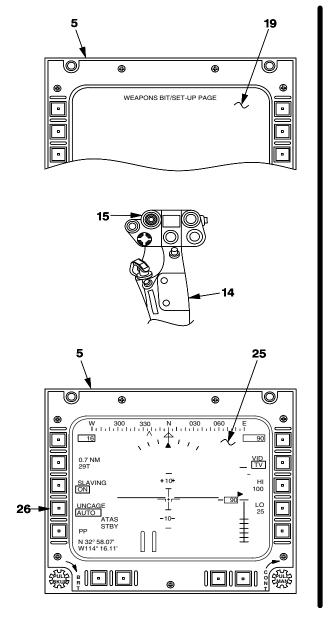


- 17. On pilot MFD (5), verify ATAS vertical situation display (VSD) page (23) is displayed. Verify SAFE is displayed in upper left corner on VSD page.
- 18. On CPG auxiliary control panel (2), toggle WPN/ASE switch (24) to WPN.
- 19. On CPG MFD (5), verify WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 20. Press R5 (18) to display WEAPONS BIT/SET-UP PAGE.



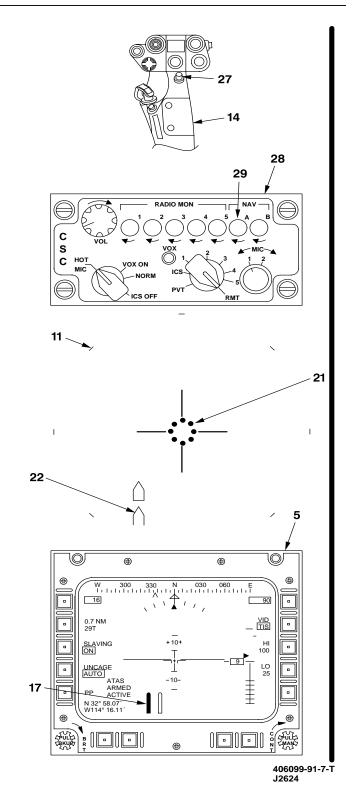
406099-91-5-T J2624

- 21. Verify WEAPONS BIT/SET-UP PAGE (19) is displayed.
- 22. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to side with CFT installed.
- 23. On pilot MFD (5), verify ATAS sparse VSD page (25) is displayed.
 - 24. Press L4 (26) to set UNCAGE to AUTO.
 - 25. Verify no missiles are selected.



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- 26. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 27. Verify CFT gyro spins up and seeker head is cooled by monitoring missile audio.
- 28. On ICS panel (28), adjust NAV A control (29) as desired.
- 29. Verify a high level of noise, reducing quickly (3 to 5 seconds) to a low level on pilot and CPG headsets. This indicates the system is ready for operation.
- 30. On PDU (11), verify ATAS reticle (21) is displayed with missile symbology (22) indicating missile activation.
- 31. On MFD (5), verify weapon symbology (17), indicating missile activation, is displayed.



2-5-4. AIR-TO-AIR STINGER (ATAS) MISSILE SYSTEM (CONT)

- OPERATIONAL CHECK (OH-58D(R))
- 32. On pilot cyclic grip (14), press and release MSL STEP switch (30).
- 33. On MFD (5) and PDU (11), verify outboard missile symbol deactivates and inboard missile activates.
- 34. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 35. Verify CFT gyro spins down (noise ceases) and displays indicate no missiles activated.

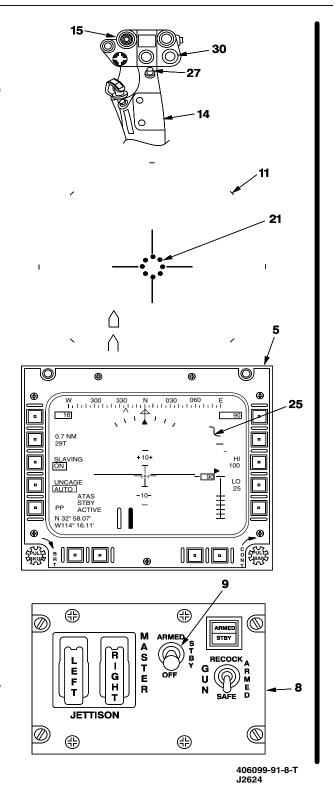
CAUTION

After a missile has been activated for 5 minutes (repeated on/off or continuous on), it should be deactivated for at least 10 minutes to prevent damage to seeker head.

NOTE

Do not obstruct line-of-sight between Laser Source Simulator (LSS) (B8) and seeker head. The seeker head will break target acquisition and acquisition audio tone will cease.

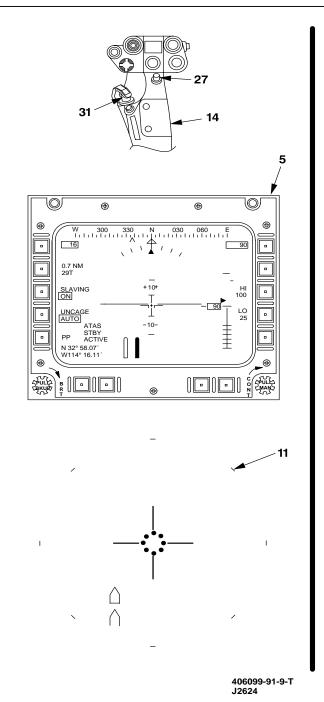
- 36. On ACP (8), cycle MASTER switch (9) from STBY, to OFF, to STBY.
- 37. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to the side with CFT installed.
- 38. On pilot MFD (5), verify ATAS sparse VSD page (25) is displayed.
- 39. On PDU (11), verify ATAS reticle (21) is displayed.
- 40. Position (LSS) (B8) 20 feet in front of helicopter and within field-of-view (FOV) of seeker head.



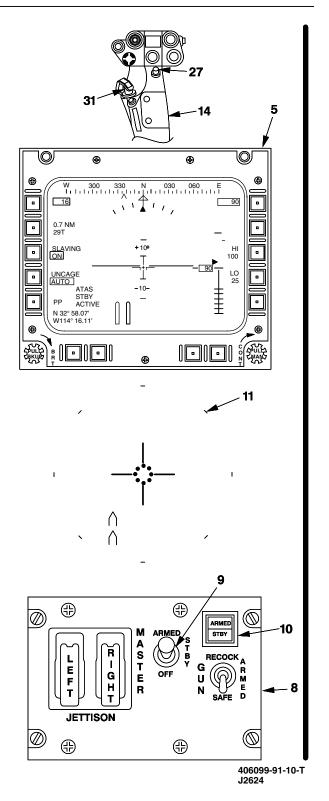
NOTE

When the missile is active and the gyro is spun up, the seeker head is caged at 0 degrees azimuth and -7 degrees elevation. The proper position for the (LSS) (B8) is 20 feet directly in front of the helicopter and approximately level with the seeker head.

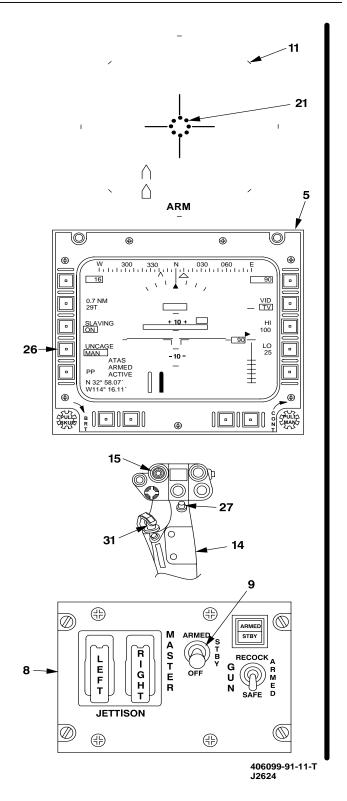
- 41. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 42. Verify clear audio tone is present indicating target acquisition.
 - 43. Move (LSS) (B8) 10 degrees left or right.
- 44. Verify MFD (5) and PDU (11) displays do not change.
- 45. Verify audio tone ceases when (LSS) (B8) is outside FOV.
 - 46. Return (LSS) (B8) to original position.
- 47. Verify audio tone is present indicating target acquisition.
- 48. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGE position).
 - 49. Move (LSS) (B8) 10 degrees left or right.
- 50. On MFD (5) and PDU (11), verify displays do not change.
- 51. Verify audio ceases when (LSS) (B8) is outside FOV.
 - 52. Return (LSS) (B8) to original position.



- 53. Verify audio tone is present indicating target acquisition.
- 54. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
- 55. Verify missile does not fire, displays do not change, and audio tone ceases.
 - 56. Release WPN-FIRE switch (31).
- 57. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 58. On PDU (11) and MFD (5), verify missile deactivates.
- 59. Place (LSS) (B8) outside seeker head FOV.
- 60. On ACP (8), position MASTER switch (9) to ARMED.
- 61. Verify ARMED/STBY indicator (10) indicates ARMED.



- 62. On PDU (11), verify ATAS reticle (21) and ARM are displayed.
 - 63. On MFD (5), verify ARMED is displayed.
 - 64. Press L4 (26) to set UNCAGE to MAN.
- 65. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 66. On PDU (11) and MFD (5), verify missile is activated.
- 67. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGED position).
- 68. Press WPN-FIRE switch (31) through second detent and release. Verify missile fires.
- 69. On ACP (8), momentarily position MASTER switch (9) to OFF and then position to ARMED.
- 70. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to the left.

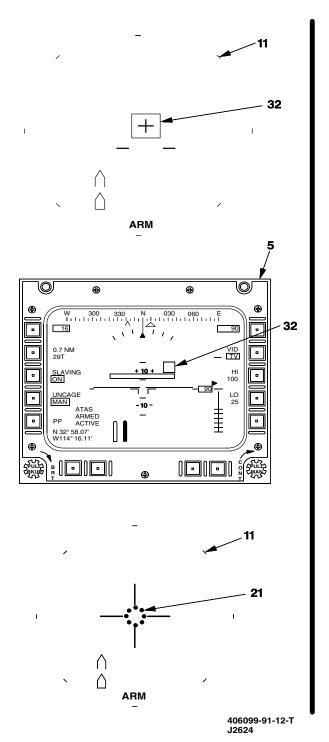


71. On PDU (11) and MFD (5), verify tracking reticle (32) is displayed. Tracking reticle appears centered over crosshairs on PDU. No acquisition tone present.

NOTE

The tracking reticle may slowly drift off axis.

- 72. On PDU (11), verify ATAS reticle (21) is displayed.
- 73. Place (LSS) (B8) in seeker head FOV. Verify audio tone is present indicating target acquisition.
 - 74. Move (LSS) (B8) 10 degrees left or right.
- 75. Verify displays do not change and audio tone ceases when (LSS) (B8) is outside seeker head FOV.
 - 76. Move (LSS) (B8) to original position.
- 77. Verify audio tone is present indicating target acquisition.



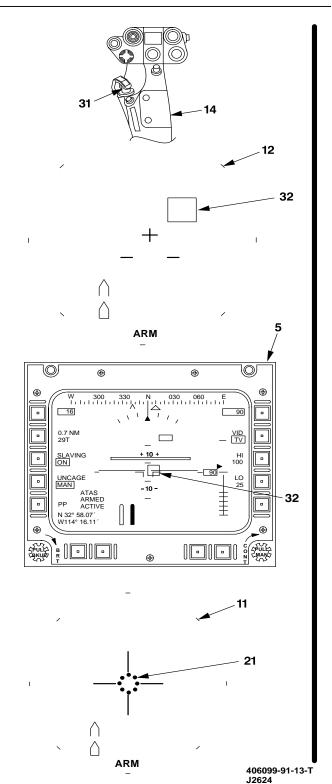
- 78. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGED position).
 - 79. Verify audio tone becomes continuous.
- 80. On PDU (11) and MFD (5), verify tracking reticles (32) are displayed.
- 81. Slowly move (LSS) (B8) 15 degrees left, right, up, and down.
- 82. Verify tracking reticles (32) follow (LSS) (B8).

NOTE

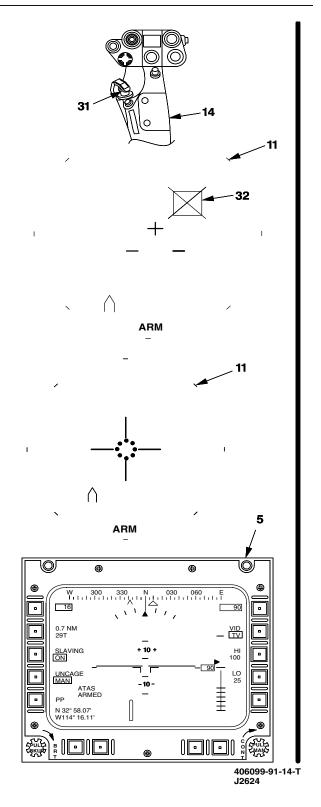
A flashing tracking reticle on PDU indicates the ATAS seeker head is approaching a scan limit.

- 83. Verify partial tracking reticle (32) is displayed and flashes at 1 Hz rate when seeker head reaches limits.
- 84. On pilot cyclic grip (14), release WPN-FIRE switch (31).
- 85. On PDU (11) and MFD (5), verify seeker head cages and tracking reticle (32) is no longer displayed.
- 86. On PDU (11), verify ATAS reticle (21) is displayed.
 - 87. Move (LSS) (B8) to original position.
- 88. Verify audio tone is present indicating target acquisition.
- 89. Slowly move (LSS) (B8) left or right until the seeker head breaks target acquisition and audio tone ceases.
- 90. Move (LSS) (B8) outside seeker head FOV.
- 91. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent.
- 92. Move (LSS) (B8) into seeker head capture zone.
- 93. On PDU (11) and MFD (5), verify audio tone and tracking reticles (32) indicate target acquisition.

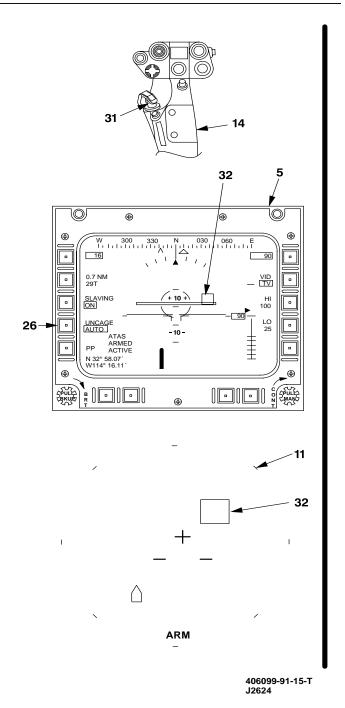
GO TO NEXT PAGE



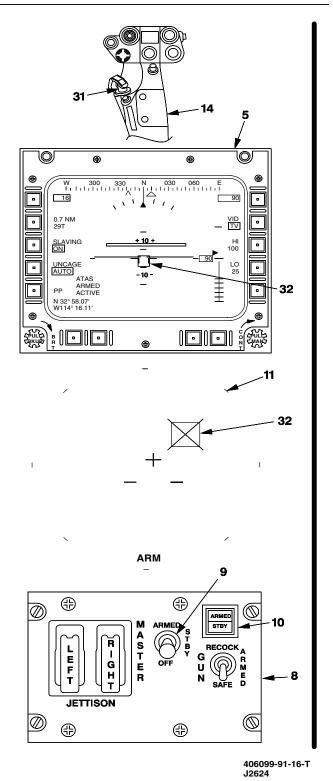
- 94. Continue moving (LSS) (B8) to within 12 degrees of seeker head FOV center.
- 95. Verify tracking reticle (32) follows (LSS) (B8).
- 96. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
 - 97. Verify the following:
 - a. Missile fires,
 - b. Audio tone ceases,
- c. On PDU (11), tracking reticle (32) displays $^{\rm a}$ X° momentarily,
- d. Missile symbol disappears from PDU (11) and MFD (5).



- 98. On pilot cyclic grip (14), release WPN-FIRE switch (31).
 - 99. Verify system activates remaining missile.
- 100. Verify CFT gyro spins up and seeker head is cooled by monitoring missile audio.
- 101. Move (LSS) (B8) outside FOV of second missile.
- 102. On MFD (5), press L4 (26) to set UNCAGE to AUTO.
- 103. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGE position).
- 104. On MFD (5) and PDU (11), verify tracking reticles (32) are not displayed.
- 105. Slowly move (LSS) (B8) into seeker head capture zone.
- 106. On PDU (11) and MFD (5), verify audio tone and tracking reticle (32) indicate target acquisition.
- 107. Continue moving (LSS) (B8) to within 12 degrees of seeker head FOV center.
- 108. On PDU (11) and MFD (5), verify tracking reticles (32) follow (LSS) (B8).



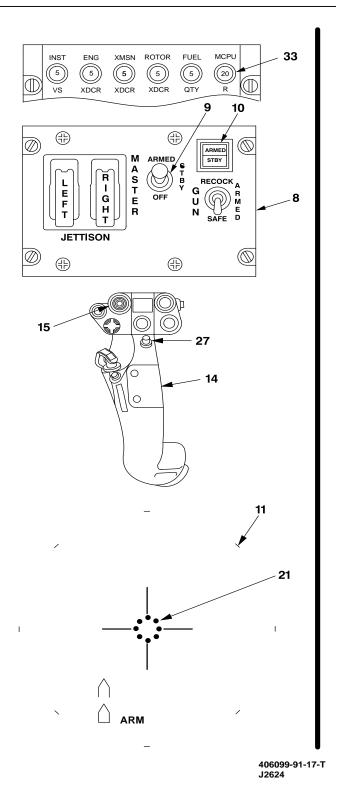
- 109. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
 - 110. Verify the following:
 - a. Missile fires,
 - b. Audio tone ceases,
- c. On PDU (11), tracking reticle (32) displays ^a X° momentarily,
- d. On PDU (11) and MFD (5), verify missile symbol disappears.
- 111. On pilot cyclic grip (14), release WPN-FIRE switch (31).
- 112. On PDU (11) and MFD (5), verify tracking reticles (32) or missiles are not displayed.
- 113. On ACP (8), set MASTER switch (9) to OFF.
- 114. Verify ARMED/STBY indicator (10) is not lighted.
- 115. Move (LSS) (B8) outside seeker head FOV.



NOTE

When the right Master Control Processor Unit (MCPU) is disabled, the MFD weapons displays are lost.

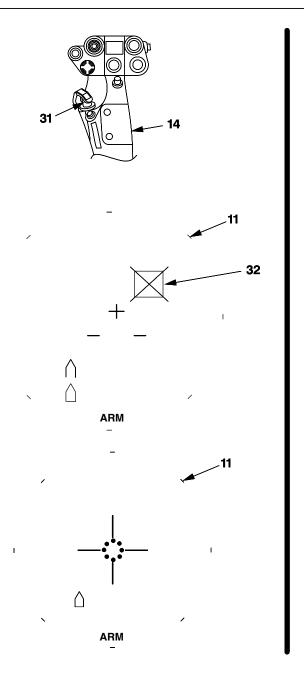
- 116. Open MCPU R circuit breaker (33).
- 117. Verify RIGHT MCPU FAIL caution is displayed on MFD.
- 118. On ACP (8), position MASTER switch (9) to ARMED.
- 119. Verify ARMED/STBY indicator (10) indicates ARMED.
- 120. On pilot cyclic grip (14), press WEAPON SEL switch (15) to side with CFT installed.
 - 121. On PDU (11), verify ARM is displayed.
- 122. Verify ATAS reticle (21), with two missiles, is displayed.
- 123. On pilot cyclic grip (14), press and release MSL ACTV switch (27).
- 124. Verify CFT gyro spins up and seeker head is cooled by monitoring missile audio.



2-5-4. AIR-TO-AIR STINGER (ATAS) MISSILE SYSTEM (CONT)

OPERATIONAL CHECK (OH-58D(R))

- 125. On pilot cyclic grip (14), press WPN-FIRE switch (31) through first detent (UNCAGE position).
- 126. On PDU (11), verify no tracking reticle (32) is displayed.
- 127. Slowly move (LSS) (B8) into seeker head FOV.
- 128. Verify audio tone and tracking reticle (32) indicate target acquisition.
- 129. Continue moving (LSS) (B8) to within 12 degrees of center of seeker head FOV.
- 130. Verify tracking reticle (32) follows (LSS) (B8).
- 131. On pilot cyclic grip (14), press WPN-FIRE switch (31) through second detent (FIRE position).
 - 132. Verify the following:
 - a. Missile fires,
 - b. Audio tone ceases,
- c. On PDU (11), tracking reticle (32) displays ^a X° momentarily,
- d. Missile symbol disappears from PDU and MFD.
- 133. On pilot cyclic grip (14), release WPN-FIRE switch (31).
 - 134. Verify second missile is activated.



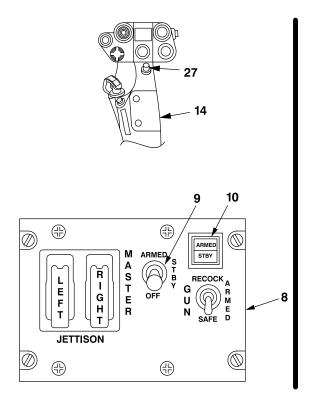
406099-91-18-T J2624

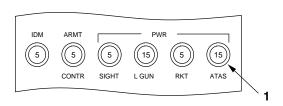
- 135. On pilot cyclic grip (14), press MSL ACTV switch (27).
 - 136. Verify missile is deactivated.
- 137. On ACP (8), position MASTER switch (9) to OFF.
- 138. Verify ARMED/STBY indicator (10) is not lighted.
 - 139. Verify no symbology is present on PDU.

NOTE

If CFT is loaded on both sides return to step 12, and repeat checkout on the other launcher.

140. Open PWR ATAS circuit breaker (1).





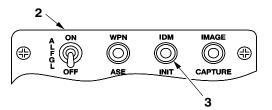
406099-91-19-T J2624

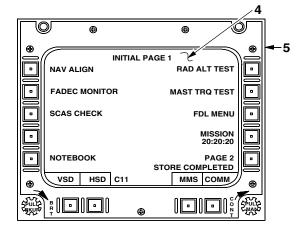
2-5-4. AIR-TO-AIR STINGER (ATAS) MISSILE SYSTEM (CONT)

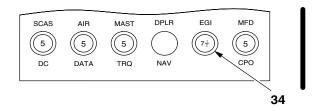
OPERATIONAL CHECK (OH-58D(R))

NOTE

- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 141. On CPG auxiliary control panel (2), press IDM/INIT switch (3) to INIT to display INITIAL PAGE 1 (4) on CPG MFD (5).
 - 142. Open EGI circuit breaker (34).







406099-91-20-T J2624

- 143. Disconnect external ac electrical power (TM 1-1520-248-23).
 - 144. Open following circuit breakers:

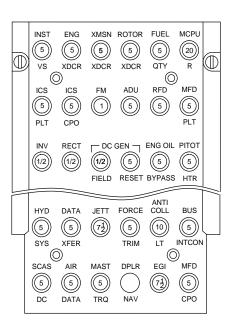
MCPU R
ICS PLT
ICS CPO
MFD PLT
RECT
BUS INTCON
MFD CPO
MCPU L
ARMT CONT
PWR SIGHT
26 VAC PWR
MCPU BLWR

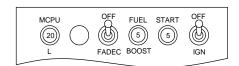
INSPECT

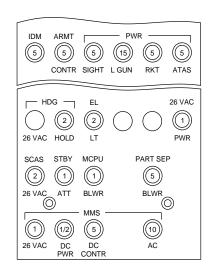
FOLLOW-ON MAINTENANCE

Headset disconnected.

Remove captive flight trainers and coolant bottle (TM 9-1440-431-23).







406099-74-6-T J2627

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Aviation Ground Power Unit (AGPU)
Microphone Headset (2)
Ruptured Cartridge Case Extractor (B246)

Personnel Required:

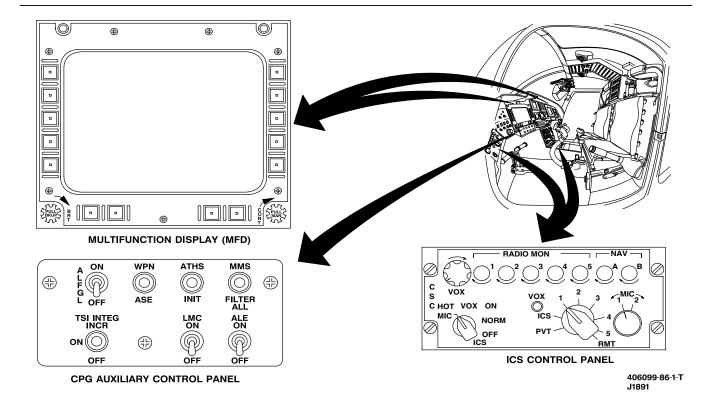
68J Aircraft Armament/Missile Systems Repairer (2)68J Aircraft Armament/Missile Systems Technical Inspector (TI)

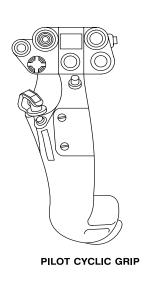
References:

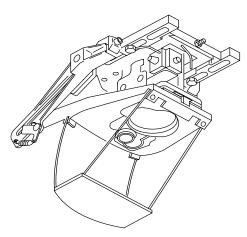
TM 1-1520-248-23 TM 9-1090-214-23 P

Equipment Condition:

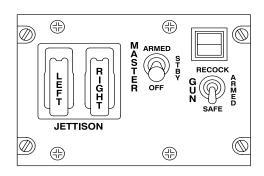
All Switches Off/SAFE
Helicopter Safed (TM 1-1520-248-23)
Headsets Connected
.50 Cal Machine Gun Pod Installed
(TM 9-1090-214-23 P)
Armament Cable Installed (GUN)
(TM 9-1090-214-23 P)
Setup Procedures for Operational Checks
Completed (Task 2-5-1)



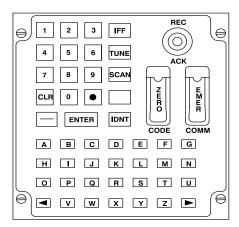




PILOT DISPLAY UNIT (PDU)



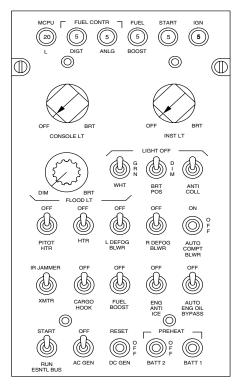
ARMAMENT CONTROL PANEL (ACP)



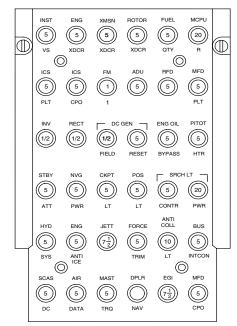
MULTIFUNCTION KEYBOARD (MFK)

406099-76-1-T J1626

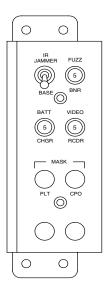
GO TO NEXT PAGE



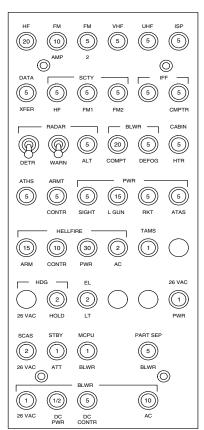
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

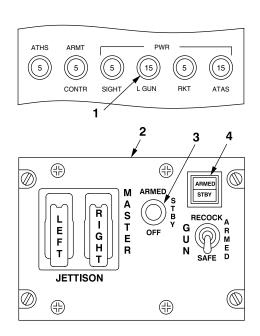
406075-1606-2-T J2598

WARNING

- To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are down.
- Extreme care must be taken during this operational check. Accidental firing of the weapon can cause death or serious injury to personnel up to TWO MILES in front of the weapon.
- Do not raise gun cover if weapon is in battery position.

SAFE AND CLEAR MACHINE GUN SYSTEM — SETUP

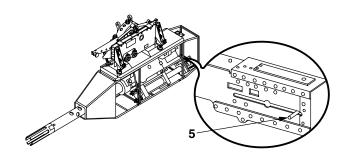
- 1. Close PWR L GUN (1) circuit breaker.
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. On ACP (2), position MASTER switch (3) to STBY.
- 4. Verify ARMED/STBY indicator (4) indicates STBY.

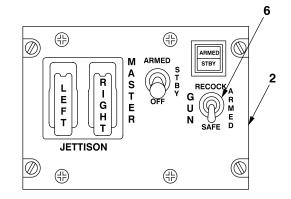


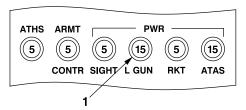
406099-76-3-T J1626

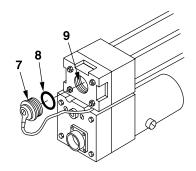
WARNING

- Never remove gun back plate prior to clearing ammunition from gun.
- Do not remove gun back plate with bolt in aft position.
- 5. Retract gun bolt to safe position, (bolt pin (5) positioned to rear of gun/full aft and latched).
- a. On ACP (2) position GUN switch (6) to SAFE.
- b. If gun charger fails to retract gun bolt, reset PWR L GUN (1) circuit breaker and retry.
- c. If second attempt fails, manually retract gun bolt to safe position.
- (1) Remove access plug (7) on forward end of gun charger and discard preformed packing (8).
- (2) Insert 11/16 socket, attached to speeder wrench, in access hole (9). Turn internal lead screw until gun bolt is fully retracted and bolt pin (5) latched by charger assembly.
- 6. Verify bolt assembly is retracted full aft and latched.









406099-76-10-T J2598

CLEAR GUN

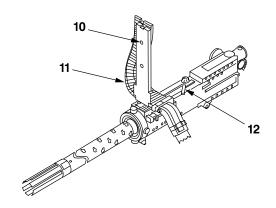
WARNING

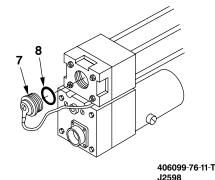
- Never remove gun back plate prior to clearing ammunition from gun.
- Gun barrel chamber may be hot.

CAUTION

Do not close gun cover with gun bolt retracted.

- 7. Open gun cover (10).
- 8. Remove ammunition belt (11) from gun feedway and block ammunition in feed chute using screwdriver.
- 9. Pry cartridge extractor arm (12) up using screwdriver.
- 10. Remove round from gun bolt T-Slot, by tapping round out T-Slot and bottom receiver.
- 11. If ruptured cartridge case is present in chamber, remove using ruptured cartridge case extractor (B246).
- a. Insert ruptured cartridge case extractor (B246) in gun bolt T-Slot in the same manner as a cartridge.
- b. Release gun bolt to forward/battery position.
- c. Manually retract bolt using 11/16 socket and speeder wrench at gun charger.
- d. Remove ruptured cartridge case extractor (B246) and cartridge case from gun.
- 12. Release gun bolt to forward/battery position.
 - 13. Close gun cover (10).
- 14. Install preformed packing (8) on access plug (7). Install access plug (7).



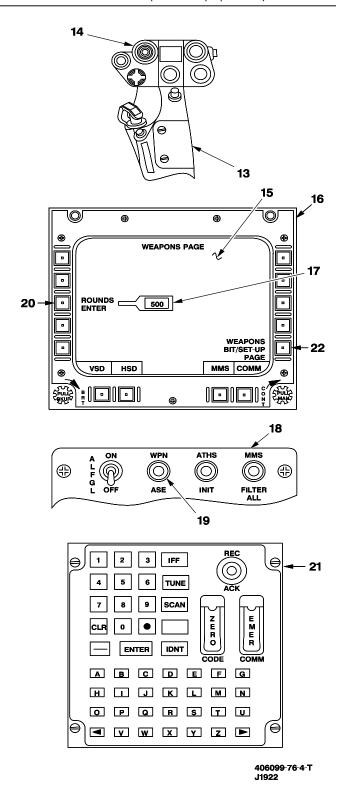


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NOTE

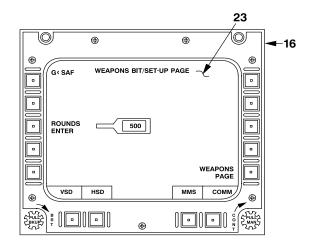
There is no BIT of the .50 caliber gun system.

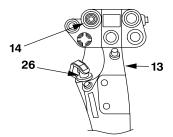
- 15. On pilot cyclic grip (13), press WEAPON SEL switch (14) up to select WEAPONS PAGE (15).
- 16. On pilot MFD (16), verify WEAPONS PAGE (15) and proper weapon symbology (17) are displayed.
- 17. On CPG auxiliary control panel (18), toggle WPN/ASE switch (19) to WPN.
- 18. On CPG MFD (16), verify WEAPONS PAGE (15) and proper weapon symbology (17) are displayed.
- 19. On pilot MFD (16), press L3 (20) to access cursor.
- 20. On MFK (21), enter 500 rounds and press ENTER key.
- 21. On pilot MFD (16), verify 500 rounds are shown on WEAPONS PAGE (15).
- 22. Press R5 (22) to display WEAPONS BIT/SET-UP PAGE.

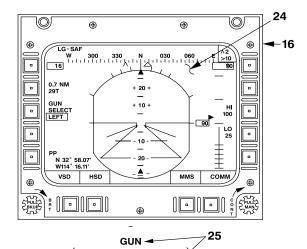


GO TO NEXT PAGE

- 23. Verify WEAPONS BIT/SET-UP PAGE (23) is displayed.
- 24. On pilot cyclic grip (13), press WEAPON SEL switch (14) to left.
- 25. On MFD (16), verify GUN vertical situation display (VSD) page (24) is displayed.
- 26. Verify GUN reticle (25) is displayed on PDU.
- 27. On pilot cyclic grip (13), press WPN-FIRE switch (26) through first detent.
- 28. Verify machine gun trigger solenoid does not engage.
- 29. Press WPN-FIRE switch (26) through second detent.
- 30. Verify machine gun trigger solenoid does not engage.
 - 31. Release WPN-FIRE switch (26).



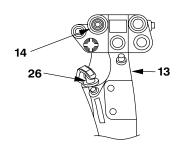


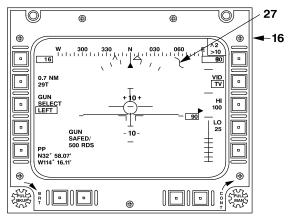


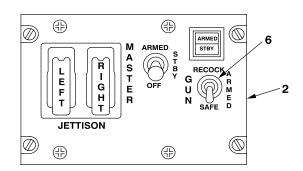


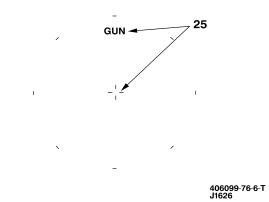
406099-76-5-T J1626

- 32. Press WEAPON SEL switch (14) to left.
- 33. On MFD (16), verify GUN SPARSE VSD PAGE (27) is displayed.
 - 34. Verify GUN reticle (25) is present on PDU.
- 35. On ACP (2), cycle GUN switch (6) from SAFE, to RECOCK, to ARMED.
- 36. On MFD (16), verify rounds count down one to three rounds.
- 37. Verify bolt assembly is released to full forward (battery) position.
- 38. On pilot cyclic grip (13), press WPN FIRE switch (26) through first detent.
- 39. Verify machine gun trigger solenoid does not engage.
- 40. Press WPN FIRE switch (26) through second detent.
- 41. Verify machine gun trigger solenoid does not engage.
 - 42. Release WPN FIRE switch (26).

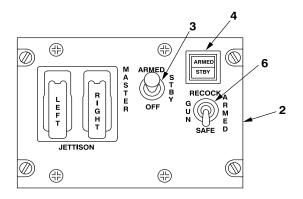


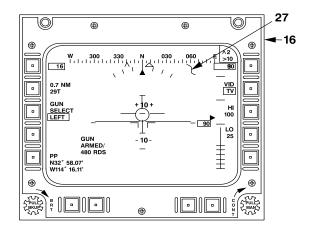


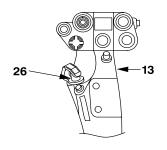




- 43. On ACP (2), position MASTER switch (3) to ARMED.
- 44. Verify ARMED/STBY indicator (4) indicates ARMED.
- 45. On MFD (16), verify GUN SPARSE VSD PAGE (27) displays ARMED.
- 46. On pilot cyclic grip (13), press WPN-FIRE switch (26) through first detent.
- 47. Verify machine gun trigger solenoid engages for approximately 1 to 2 seconds and releases.
 - 48. Release WPN-FIRE switch (26).
- 49. On ACP (2), cycle GUN switch (6) from SAFE, to RECOCK, to ARMED.
- 50. On MFD (16), verify rounds count-down one to three rounds.
- 51. On pilot cyclic grip (13), press WPN-FIRE switch (26) through second detent.
- 52. Verify machine gun trigger solenoid engages as long as WPN-FIRE switch (26) is in second detent.
 - 53. Release WPN-FIRE switch (26).





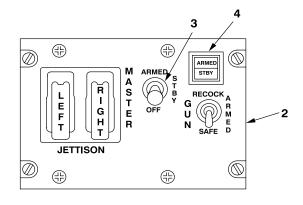


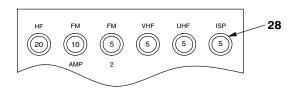
406099-76-7-T J1626

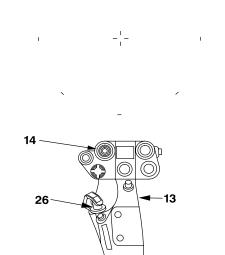
- 54. On ACP (2), position MASTER switch (3) to OFF.
- 55. Verify ARMED/STBY indicator (4) is not lighted.
 - 56. Open ISP circuit breaker (28).
- 57. Verify ISP FAIL caution is displayed on MFD.
- 58. On ACP (2), position MASTER switch (3) to ARMED.
- 59. Verify ARMED/STBY indicator (4) indicates ARMED.

NOTE

- A 10 second delay may occur to allow PDU warmup.
- 60. On pilot cyclic grip (13), press WEAPON SEL switch (14) to left twice.
- 61. Press WPN FIRE switch (26) through first detent.
- 62. Verify machine gun trigger solenoid does not engage.
- 63. Press WPN FIRE switch (26) through second detent.
- 64. Verify machine gun trigger solenoid does engage.
 - 65. Release WPN FIRE switch (26).
- 66. On ACP (2), position MASTER switch (3) to OFF.
- 67. Verify ARMED/STBY indicator (4) is not lighted.
 - 68. Verify no symbology is present on PDU.
 - 69. Close ISP circuit breaker (28).







GUN

406099-76-8-T J1626

70. Open PWR L GUN (1) circuit breaker.

NOTE

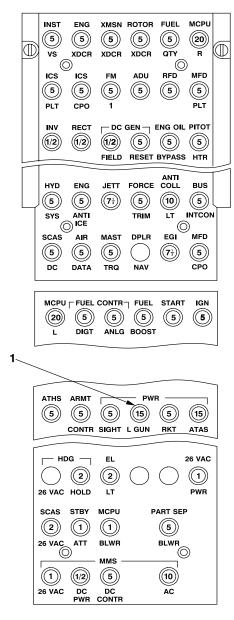
- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 71. Disconnect external ac electrical power (TM 1-1520-248-23).
 - 72. Open following circuit breakers:

MCPU R
MFD PLT
RECT
BUS INTCON
EGI
MFD CPO
MCPU L
ARMT CONTR
PWR SIGHT
26 VAC PWR
MCPU BLWR

INSPECT

FOLLOW-ON MAINTENANCE

Headsets disconnected.



406099-75-20-T

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Aviation Ground Power Unit (AGPU)
Microphone Headset (2)
Ruptured Cartridge Case Extractor (B246)

Personnel Required:

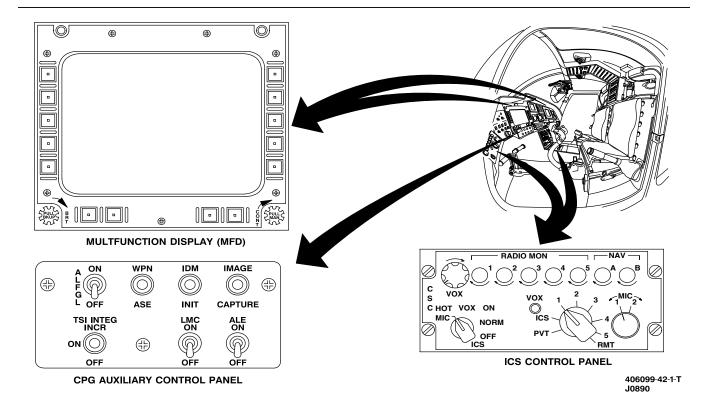
68J Aircraft Armament/Missile Systems Repairer (2)68J Aircraft Armament/Missile Systems Technical Inspector (TI)

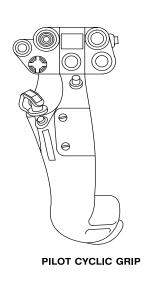
References:

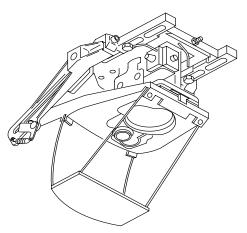
TM 1-1520-248-23 TM 9-1090-214-23&P

Equipment Condition:

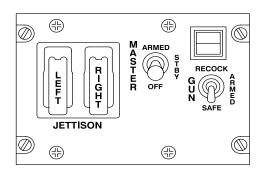
All Switches Off/SAFE
Helicopter Safed (TM 1-1520-248-23)
Headsets Connected
.50 Cal Machine Gun Pod Installed
(TM 9-1090-214-23&P)
Armament Cable Installed (GUN)
(TM 9-1090-214-23&P)
Setup Procedures for Operational Checks
Completed (Task 2-5-2)



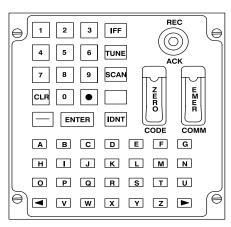




PILOT DISPLAY UNIT (PDU)



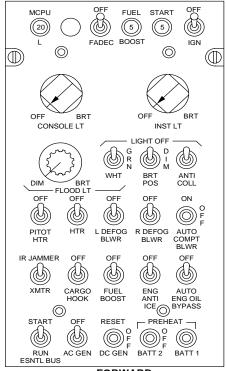
ARMAMENT CONTROL PANEL (ACP)



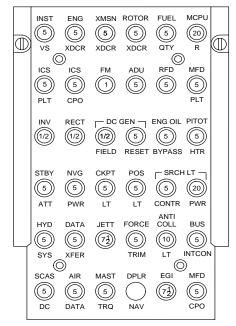
MULTIFUNCTION KEYBOARD (MFK)

406099-76-1-T J1626

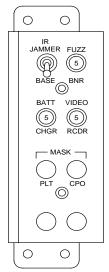
GO TO NEXT PAGE



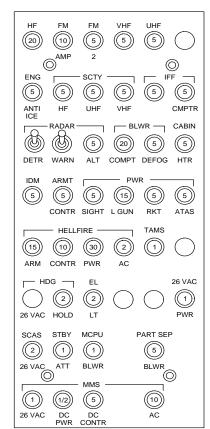
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

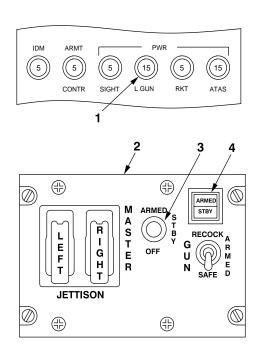
406075-1600-1-T J1328

WARNING

- To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are down.
- Extreme care must be taken during this operational check. Accidental firing of the weapon can cause death or serious injury to personnel up to TWO MILES in front of the weapon.
- Do not raise gun cover if weapon is not in battery position.

SAFE AND CLEAR MACHINE GUN SYSTEM — SETUP

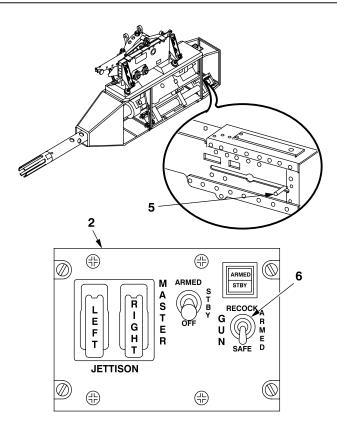
- 1. Close PWR L GUN (1) circuit breaker.
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. On ACP (2), position MASTER switch (3) to STBY.
- 4. Verify ARMED/STBY indicator (4) indicates STBY.

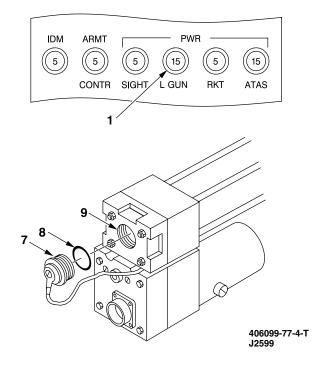


406099-77-1-T J1627

WARNING

- Never remove gun back plate prior to clearing ammunition from gun.
- Do not remove gun back plate with bolt in aft position.
- 5. Retract gun bolt to safe position, (bolt pin (5) positioned to rear of gun/full aft and latched).
- a. On ACP (2) position GUN switch (6) to SAFE.
- b. If gun charger fails to retract gun bolt, reset PWR L GUN (1) circuit breaker and retry.
- c. If second attempt fails, manually retract gun bolt to safe position.
- (1) Remove access plug (7) on forward end of gun charger and discard preformed packing (8).
- (2) Insert 11/16 socket, attached to speeder wrench, in access hole (9). Turn internal lead screw until gun bolt is fully retracted and bolt pin (5) latched by charger assembly.
- 6. Verify bolt assembly is retracted full aft and latched.





CLEAR GUN

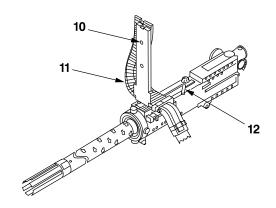
WARNING

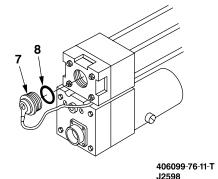
- Never remove gun back plate prior to clearing ammunition from gun.
- Gun barrel chamber may be hot.

CAUTION

Do not close gun cover with gun bolt retracted.

- 7. Open gun cover (10).
- 8. Remove ammunition belt (11) from gun feedway and block ammunition in feed chute using screwdriver.
- 9. Pry cartridge extractor arm (12) up using screwdriver.
- 10. Remove round from gun bolt T-Slot, by tapping round out T-Slot and bottom receiver.
- 11. If ruptured cartridge case is present in chamber, remove using ruptured cartridge case extractor (B246).
- a. Insert ruptured cartridge case extractor (B246) in gun bolt T-Slot in the same manner as a cartridge.
- b. Release gun bolt to forward/battery position.
- c. Manually retract bolt using 11/16 socket and speeder wrench at gun charger.
- d. Remove ruptured cartridge case extractor (B246) and cartridge case from gun.
- 12. Release gun bolt to forward/battery position.
 - 13. Close gun cover (10).
- 14. Install preformed packing (8) on access plug (7). Install access plug (7).



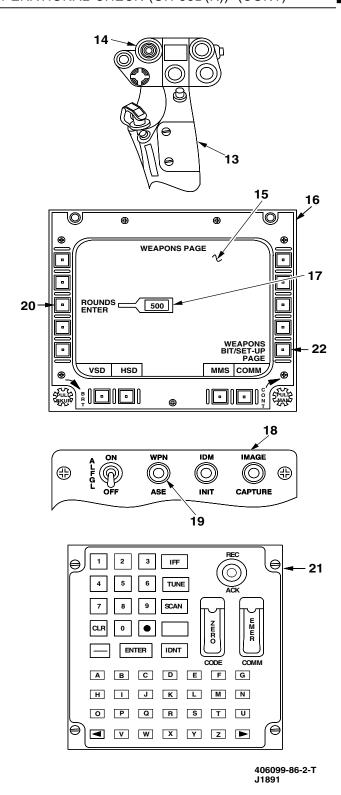


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NOTE

There is no BIT of the .50 caliber gun system.

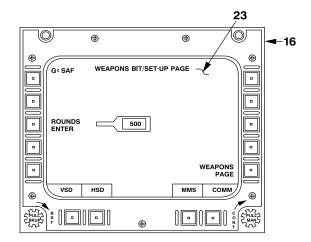
- 15. On pilot cyclic grip (13), press WEAPON SEL switch (14) up to select WEAPONS PAGE (15).
- 16. On pilot MFD (16), verify WEAPONS PAGE (15) and proper weapon symbology (17) are displayed.
- 17. On CPG auxiliary control panel (18), toggle WPN/ASE switch (19) to WPN.
- 18. On CPG MFD (16), verify WEAPONS PAGE (15) and proper weapon symbology (17) are displayed.
- 19. On pilot MFD (16), press L3 (20) to access cursor.
- 20. On MFK (21), enter 500 rounds and press ENTER key.
- 21. On pilot MFD (16), verify 500 rounds are shown on WEAPONS PAGE (15).
- 22. Press R5 (22) to display WEAPONS BIT/SET-UP PAGE.

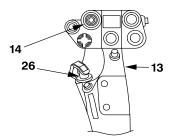


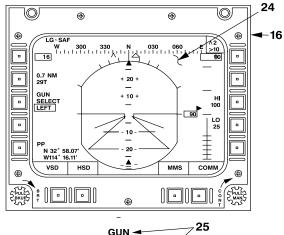
GO TO NEXT PAGE

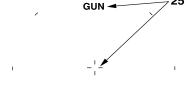
2-5-6. .50 CALIBER MACHINE GUN SYSTEM — OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 23. Verify WEAPONS BIT/SET-UP PAGE (23) is displayed.
- 24. On pilot cyclic grip (13), press WEAPON SEL switch (14) to left.
- 25. On MFD (16), verify GUN vertical situation display (VSD) page (24) is displayed.
- 26. Verify GUN reticle (25) is displayed on PDU.
- 27. On pilot cyclic grip (13), press WPN-FIRE switch (26) through first detent.
- 28. Verify machine gun trigger solenoid does not engage.
- 29. Press WPN-FIRE switch (26) through second detent.
- 30. Verify machine gun trigger solenoid does not engage.
 - 31. Release WPN-FIRE switch (26).





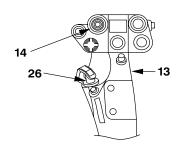


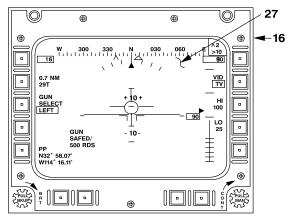


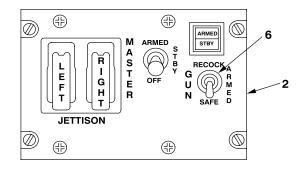
406099-76-5-T J1626

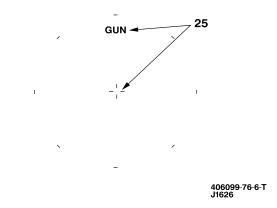
2-5-6. .50 CALIBER MACHINE GUN SYSTEM OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 32. Press WEAPON SEL switch (14) to left.
- 33. On MFD (16), verify GUN SPARSE VSD PAGE (27) is displayed.
 - 34. Verify GUN reticle (25) is present on PDU.
- 35. On ACP (2), cycle GUN switch (6) from SAFE, to RECOCK, to ARMED.
- 36. On MFD (16), verify rounds count down one to three rounds.
- 37. Verify bolt assembly is released to full forward (battery) position.
- 38. On pilot cyclic grip (13), press WPN FIRE switch (26) through first detent.
- 39. Verify machine gun trigger solenoid does not engage.
- 40. Press WPN FIRE switch (26) through second detent.
- 41. Verify machine gun trigger solenoid does not engage.
 - 42. Release WPN FIRE switch (26).



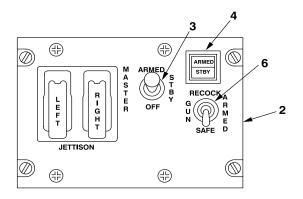


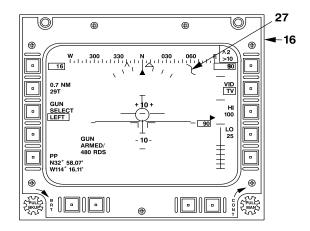


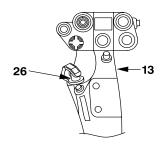


2-5-6. .50 CALIBER MACHINE GUN SYSTEM — OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 43. On ACP (2), position MASTER switch (3) to ARMED.
- 44. Verify ARMED/STBY indicator (4) indicates ARMED.
- 45. On MFD (16), verify GUN SPARSE VSD PAGE (27) displays ARMED.
- 46. On pilot cyclic grip (13), press WPN-FIRE switch (26) through first detent.
- 47. Verify machine gun trigger solenoid engages for approximately 1 to 2 seconds and releases.
 - 48. Release WPN-FIRE switch (26).
- 49. On ACP (2), cycle GUN switch (6) from SAFE, to RECOCK, to ARMED.
- 50. On MFD (16), verify rounds count-down one to three rounds.
- 51. On pilot cyclic grip (13), press WPN-FIRE switch (26) through second detent.
- 52. Verify machine gun trigger solenoid engages as long as WPN-FIRE switch (26) is in second detent.
 - 53. Release WPN-FIRE switch (26).







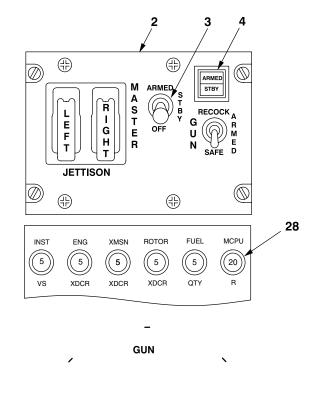
406099-76-7-T J1626

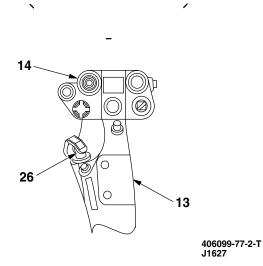
2-5-6. .50 CALIBER MACHINE GUN SYSTEM OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 54. On ACP (2), position MASTER switch (3) to OFF.
- 55. Verify ARMED/STBY indicator (4) is not lighted.
 - 56. Open MCPU R circuit breaker (28).
- 57. Verify RIGHT MCPU FAIL caution is displayed on MFD.
- 58. On ACP (2), position MASTER switch (3) to ARMED.
- 59. Verify ARMED/STBY indicator (4) indicates ARMED.

NOTE

- A 10 second delay may occur to allow PDU warmup.
- 60. On pilot cyclic grip (13), press WEAPON SEL switch (14) to left twice.
- 61. Press WPN FIRE switch (26) through first detent.
- 62. Verify machine gun trigger solenoid does not engage.
- 63. Press WPN FIRE switch (26) through second detent.
- 64. Verify machine gun trigger solenoid does engage.
 - 65. Release WPN FIRE switch (26).
- 66. On ACP (2), position MASTER switch (3) to OFF.
- 67. Verify ARMED/STBY indicator (4) is not lighted.
 - 68. Verify no symbology is present on PDU.
 - 69. Close MCPU R circuit breaker (28).





2-5-6. .50 CALIBER MACHINE GUN SYSTEM — OPERATIONAL CHECK (OH-58D(R)) (CONT)

70. Open PWR L GUN circuit breaker (1).

NOTE

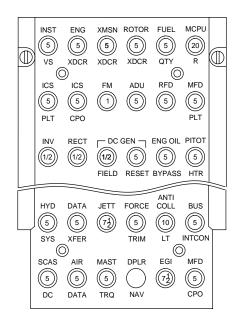
- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 71. Disconnect external ac electrical power (TM 1-1520-248-23).
 - 72. Open following circuit breakers:

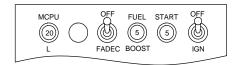
MCPU R
MFD PLT
RECT
BUS INTCON
EGI
MFD CPO
MCPU L
ARMT CONTR
PWR SIGHT
26 VAC PWR
MCPU BLWR

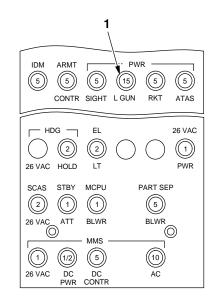
INSPECT

FOLLOW-ON MAINTENANCE

Headsets disconnected.







406099-74-6-T J1625

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Microphone Headset (2)
Aviation Ground Power Unit (AGPU)
HELLFIRE Training Missiles (2/4)
Laser Source Simulator (LSS) (B8)

Personnel Required:

68J Aircraft Armament/Missile Systems Repairer (2)68J Aircraft Armament/Missile Systems Technical Inspector (TI)

References:

TM 9-6920-475-13 TM 1-1520-248-23 TM 9-1090-214-23&P TM 9-1240-778-23

Equipment Condition:

Operational Mast Mounted Sight (MMS)
Installed

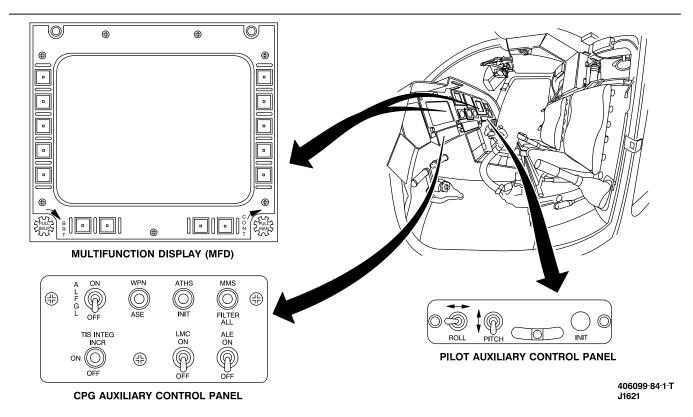
(TM-9-1240-778-23)
Headset Connected
Setup Procedures for Operational Checks
Completed (Task 2-5-1)

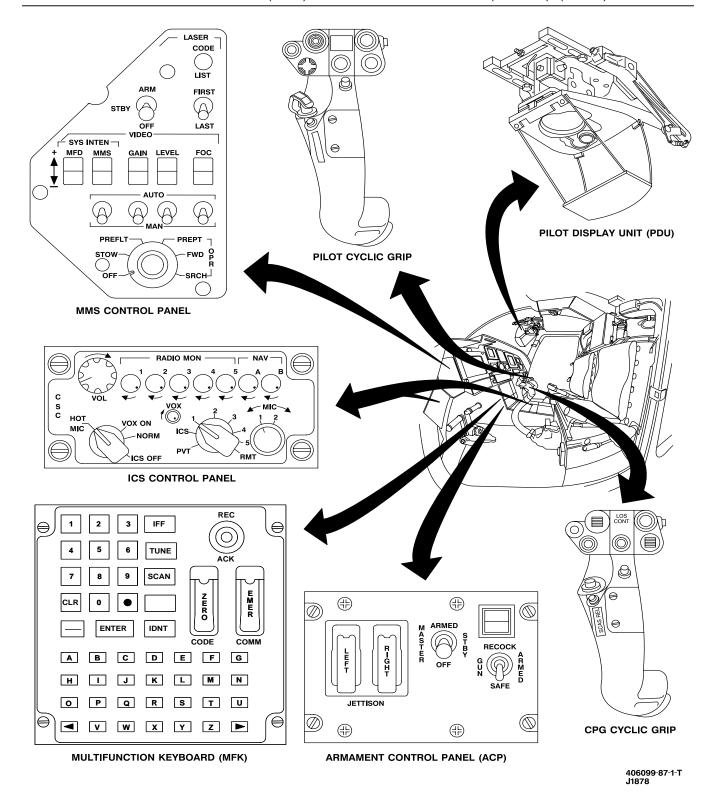
Helicopter Safed (TM 1-1520-248-23)
HELLFIRE Missile Launcher Installed
(TM 9-1090-214-23&P)

Armament Cable (HELLFIRE) Installed (TM 9-1090-214-23&P)

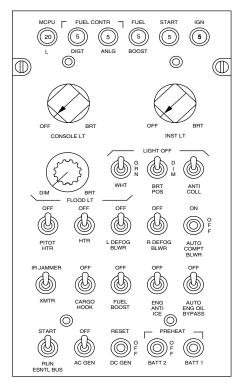
HELLFIRE Training Missile Installed (TM 9-6920-475-13)

Launcher SAFE/ARM Switch Position to SAFE

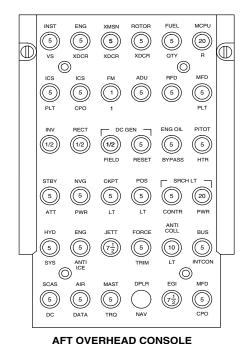




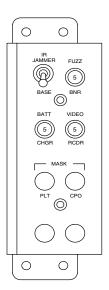
GO TO NEXT PAGE



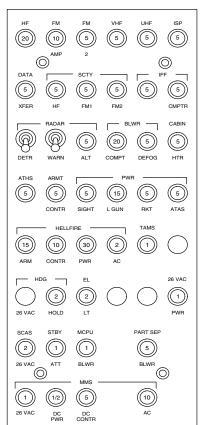
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

SYSTEM SETUP

WARNING

To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are down.

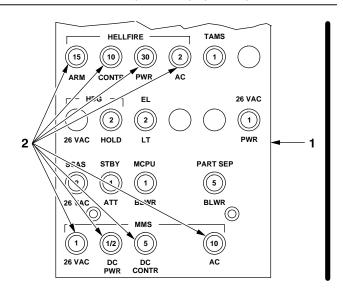
NOTE

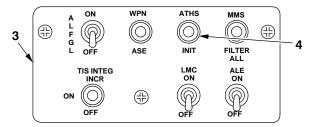
It is understood the HELLFIRE training missiles may be installed on either or both sides of the helicopter. The illustrations in this procedure show weapons symbology only on the left side of the helicopter.

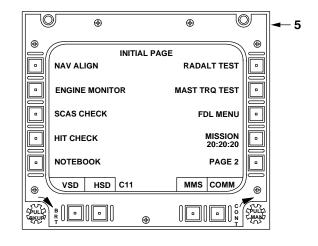
1. On center post circuit breaker panel (1), close these circuit breakers (2):

HELLFIRE ARM
HELLFIRE CONTR
HELLFIRE PWR
HELLFIRE AC
MMS 26 VAC
MMS DC PWR
MMS DC CONTR
MMS AC

- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. On CPG auxiliary control panel (3), position ATHS/INIT switch (4) to INIT. On CPG MFD (5), verify INITIAL PAGE is displayed.
- 4. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE is displayed.









GO TO NEXT PAGE

OPERATIONAL CHECK INITIAL TESTS

NOTE

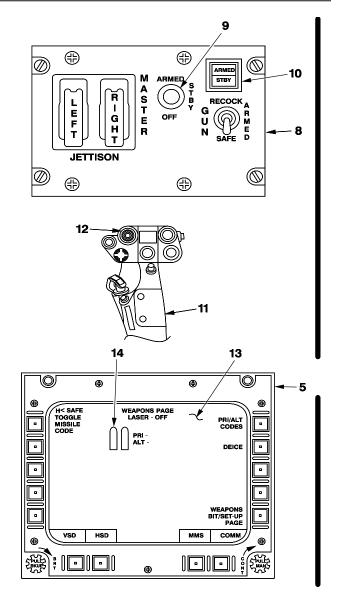
This procedure assumes only one launcher is being checked at a time and the inboard missile referred to in the procedural steps corresponds to the side being checked. If both launchers are being checked simultaneously, the inboard missile will be the left inboard missile.

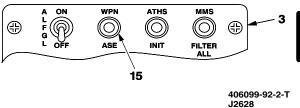
- 5. On ACP (8), position MASTER switch (9) to STBY. Verify ARMED/STBY indicator (10) indicates STBY.
- 6. On pilot cyclic grip (11), press WEAPON SEL switch (12) up. On pilot MFD (5), verify WEAPONS PAGE (13) is displayed.

NOTE

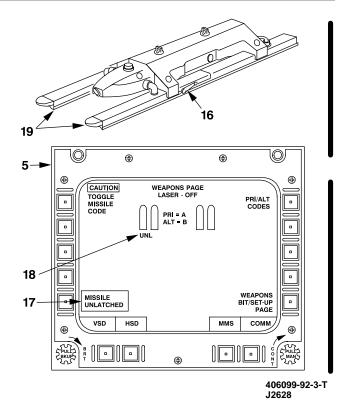
Single launcher configuration will have two missiles displayed. Dual launcher configuration will display four missiles.

- 7. Verify proper missile configuration (14) is displayed.
- 8. On CPG auxiliary control panel (3), position WPN/ASE switch (15) to WPN. On CPG MFD (5), verify WEAPONS PAGE (13) is displayed.
- 9. Verify proper missile configuration (14) is displayed.





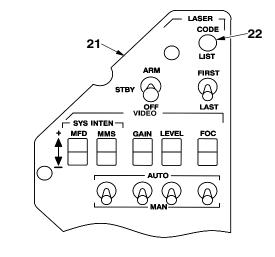
- 10. Check missile unlatched circuits for all installed HELLFIRE missiles, one missile at a time.
- a. Rotate LATCH/UNLATCH handle (16) to UNLATCH position.
- b. On both MFDs (5), verify CAUTION (boxed), MISSILE UNLATCHED (17) (boxed), and UNL (18) are displayed.
 - c. Verify bonging tone is heard in headsets.
 - d. Push missile full aft on launch rail (19).
- e. Rotate LATCH/UNLATCH handle (16) to LATCH position.
- f. On both MFDs (5), verify CAUTION (boxed), MISSILE UNLATCHED (17) (boxed), and UNL (18) are no longer displayed.
- g. Verify bonging tone is not heard in headsets.
- h. Repeat above steps for remaining missiles.

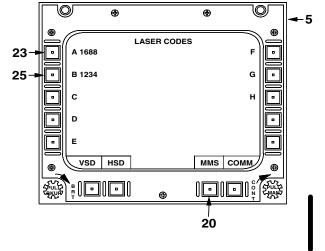


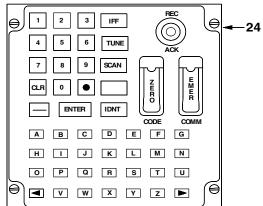
- 11. On CPG MFD (5), press MMS mode key (20).
- 12. On MMS control panel (21), press CODE LIST switch (22). On CPG MFD (5), verify LASER CODES page is displayed with laser addresses A through H.

NOTE

- The laser codes are entered into the system from the multifunction keyboard. No two addresses should have the same code.
- When entering codes into the HELLFIRE system, the first digit must be 1, the second digit can be any number from 1 through 7, the third and fourth digits can be any number from 1 through 8. The system will not accept the numbers 9 and 0.
- 13. Press L1 (23) to select laser code A. Verify cursor is displayed at L1.
- 14. On MFK (24), type 1688 and press ENTER. On CPG MFD (5), verify entered laser code is displayed next to A.
- 15. Press L2 (25) to select laser code B. Verify cursor is displayed at L2.
- 16. On MFK (24), type 1234 and press ENTER. On MFD (5), verify entered laser code is displayed next to B.







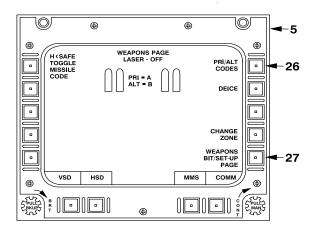
406099-92-4-T J2628

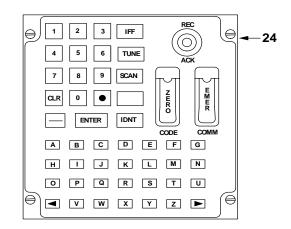
- 17. On pilot MFD (5), press R1 (26) to select PRI/ALT CODES.
- 18. On MFK (24), type A and press ENTER for PRI code.
 - 19. Type B and press ENTER for ALT code.
- 20. On pilot MFD (5), press R5 (27) to select WEAPONS BIT/SET-UP PAGE. Verify WEAPONS BIT/SET-UP PAGE (28) is displayed.
- 21. Press R1 (26) to select MISSILE PER CODE.

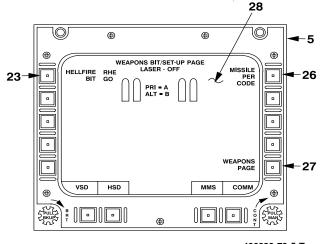
NOTE

If both launchers are being checked simultaneously, enter 2 in the following steps.

- 22. On MFK (24), type 1 and press ENTER for PRI code.
 - 23. Type 1 and press ENTER for ALT code.
- 24. On pilot MFD (5), press L1 (23) to initiate HELLFIRE BIT. Verify HELLFIRE BIT is boxed during BIT check.
- 25. When BIT is completed, verify RHE GO (BIT passed) is displayed next to HELLFIRE BIT.
 - 26. Press R5 (27) to select WEAPONS PAGE.

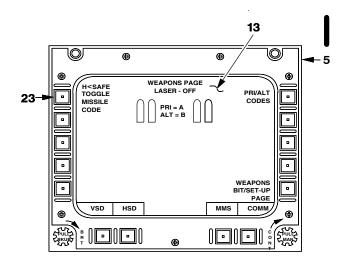


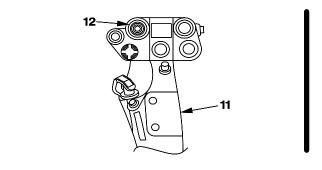


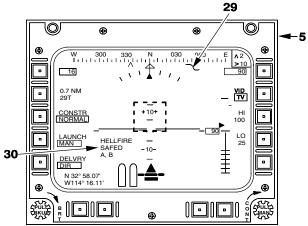


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- 27. On pilot MFD (5), verify WEAPONS PAGE (13) is displayed.
- 28. Press L1 (23) to select TOGGLE MISSILE CODE. Verify A PRI laser code address switches from PRI to ALT and back to PRI.
 - 29. Ensure PRI laser code address is A.
- 30. On pilot cyclic grip (11), press WEAPON SEL switch (12) twice to side with missiles loaded. On pilot MFD (5), verify WEAPONS sparse VSD page (29) is displayed.
- 31. Verify HELLFIRE SAFED, A, and B (30) are displayed.







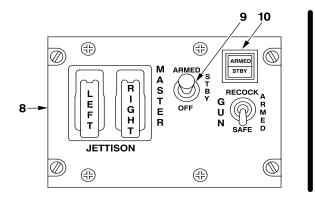
406099-92-5-T J2628

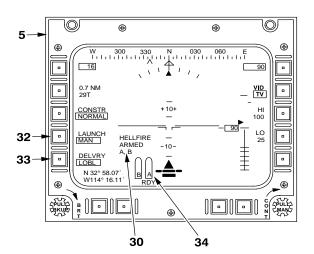
- 32. On ACP (8), position MASTER switch (9) to ARMED. Verify ARMED/STBY indicator (10) indicates ARMED.
- 33. On MFD (5), verify HELLFIRE ARMED, A, and B (30) are displayed.
- 34. Verify launcher ARM/SAFE switch (31) has moved to ARM.
- 35. On ACP (8), position MASTER switch (9) to STBY. Verify ARMED/STBY indicator (10) indicates STBY.
- 36. On MFD (5), verify HELLFIRE SAFED, A, and B (30) are displayed.
- 37. Verify launcher ARM/SAFE switch (31) remains in ARM.

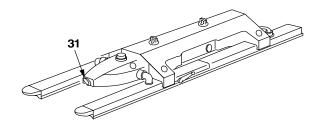
CAUTION

To prevent damage to the laser seeker allow 2 minutes after selecting LAUNCH STBY for the seeker to fully spin down.

- 38. On pilot MFD (5), press L4 (32) to sequence display from MAN, to NORM, to RIPL, to STBY, and back to MAN.
- 39. Press L5 (33) to sequence display from DIR, to LO, to HI, to LOBL, and back to DIR, to LO, to HI and set on LOBL.
- 40. Verify laser code A is displayed inside inboard missile image (34) and RDY is displayed below.
- 41. Verify missile laser seeker is pointed forward and inboard missile seeker is scanning.





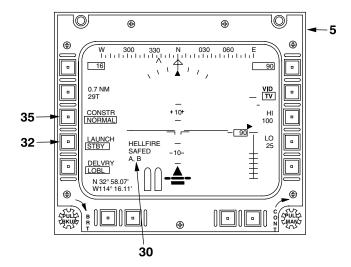


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NOTE

CONSTR OVRIDE cannot be selected if the missiles laser seeker does not receive laser energy.

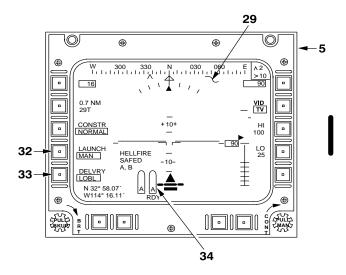
- 42. On pilot MFD (5), press L3 (35) to attempt to position between NORMAL and OVRIDE. Verify CONSTR remains set to NORMAL.
- 43. Press L4 (32) to display STBY. Verify HELLFIRE SAFED, A, and B (30) are displayed.
- 44. Verify laser code A and RDY are no longer displayed.
 - 45. Verify missile laser sensor spins down.



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OPERATIONAL CHECK — MAN LAUNCH/LOBL DELIVERY MODES

- 46. Verify both pilot and CPG MFD (5) display WEAPONS sparse VSD page (29).
 - 47. Verify missile images (34) are displayed.
 - 48. Press L5 (33) to display LOBL.
 - 49. Press L4 (32) to display MAN.
- 50. Verify laser code A is displayed inside both missile images (34).
- 51. Verify SEL is momentarily displayed below inboard missile image (34) and changes to RDY within 30 seconds.



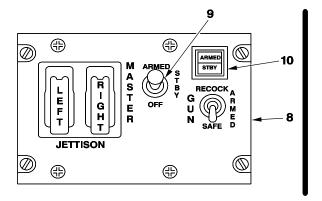
406099-92-7-T J2628

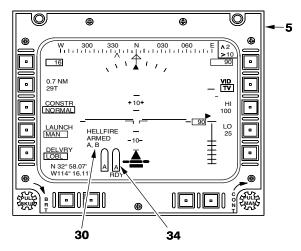
- 52. On ACP (8), position MASTER switch (9) to ARMED. Verify ARMED/STBY indicator (10) indicates ARMED.
- 53. On pilot MFD (5), verify HELLFIRE ARMED, A, and B (30) are displayed.
 - 54. Verify the following displays:
 - a. CONSTR NORMAL
 - b. LAUNCH MAN
 - c. DELVRY LOBL.
- 55. Verify laser code A is displayed inside inboard missile image (34) and RDY is displayed below.
- 56. Verify inboard missile laser sensor is scanning.
- 57. Position LSS in front of inboard missile. Verify missile stops scanning and acquires LSS.

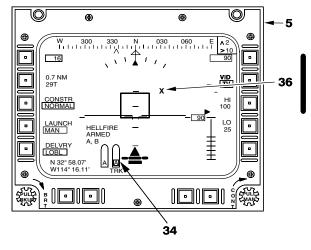
NOTE

During missile tracking, the laser code address will be boxed. If it is not boxed, cycle the DELVRY display from LOBL, to DIR, to LO, to HI, and back to LOBL.

- 58. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.
 - 59. Verify seeker cue (36) is displayed.







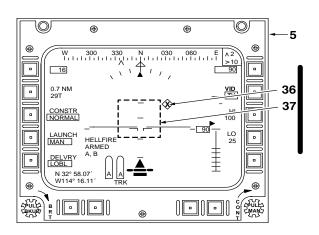
406099-92-8-T J2628

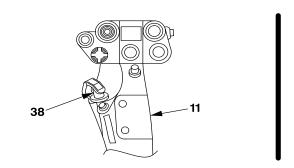
- 60. Move LSS until seeker cue (36) is outside constraint window (37) on pilot MFD (5). Verify constraint window is a dashed-line square.
- 61. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile does not fire.
- 62. On pilot MFD (5), press L3 (35) to display OVRIDE. Verify constraint window is a solid-line square.
- 63. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on MFD (5), inboard missile image is not displayed.

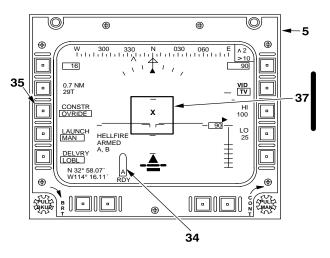
NOTE

If both launchers are being checked simultaneously, the right inboard missile will be the next missile selected.

- 64. On pilot MFD (5), verify next missile is selected.
- 65. Verify laser code A is displayed inside outboard missile image (34), SEL is momentarily displayed below, then changes to RDY within 30 seconds.

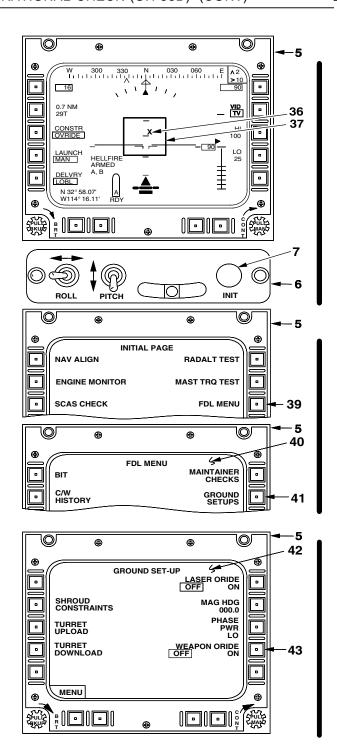






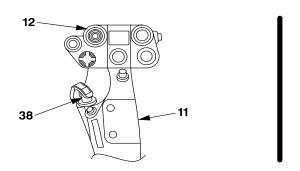
406099-92-9-T J2628

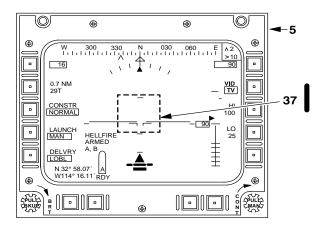
- 66. Position LSS to align seeker cue (36) inside constraint window (37) on pilot MFD (5). Verify constraint window is a solid-line square.
 - 67. Turn weapon override off as follows:
- a. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE is displayed.
- b. On pilot MFD (5), press R3 (39) to display FDL MENU page (40).
- c. Press R2 (41) to display GROUND SET-UP page (42).
- d. Press R4 (43) to step WEAPON ORIDE from ON to OFF.
- 68. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE is displayed.



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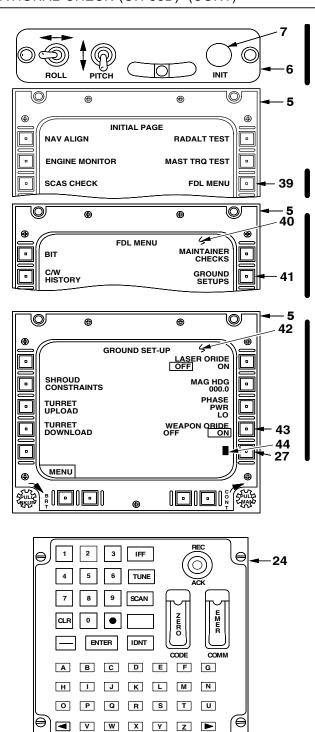
- 69. On pilot cyclic grip (11), press WEAPON SEL switch (12) twice to side with missile selected. On pilot MFD (5), verify constraint window (37) is a dashed-line square.
- 70. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent. Verify missile does not fire.





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- 71. Turn weapon override on as follows:
- a. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE is displayed.
- b. On pilot MFD (5), press R3 (39) to display FDL MENU page (40).
- c. Press R2 (41) to display GROUND SET-UP page (42).
- d. Press R4 (43) to display cursor (44) at R5 (27).
- e. On MFK (24), press A and ENTER. On pilot MFD (5), verify ON is boxed under WEAPON ORIDE.
- 72. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE is displayed.



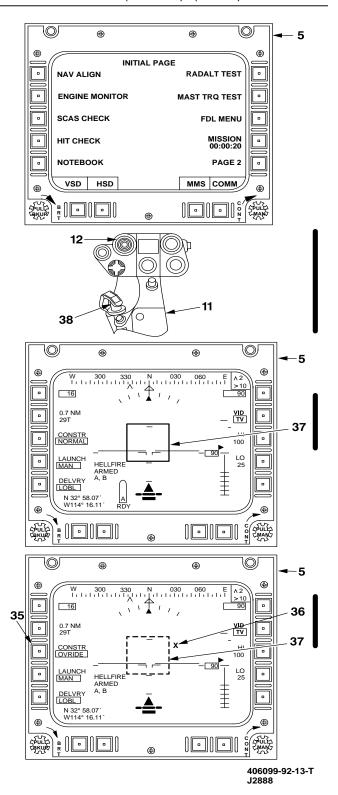
406099-92-12-T J2888

- 73. On pilot cyclic grip (11), press WEAPON SEL switch (12) twice to side with missile loaded. On pilot MFD (5), verify constraint window is a solid-line square.
- 74. Position seeker cue (36) outside of constraint window (37). Verify constraint window is a dashed-line square.
- 75. Press L3 (35) to display OVRIDE. Verify constraint window is a solid-line square.

NOTE

If both launchers are being checked simultaneously, the outboard missile images will remain with the left outboard missile selected.

76. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile fires and, on pilot MFD (5), outboard missile image is not displayed.



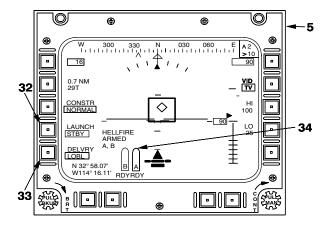
OPERATIONAL CHECK NORM LAUNCH/LOBL DELIVERY MODES

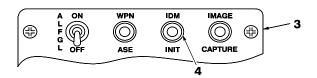
- 77. On pilot MFD (5), press L4 (32) to display STBY. Verify proper missile images (34) are displayed.
 - 78. Press L5 (33) to select LOBL.
 - 79. Press L4 (32) to display NORM.

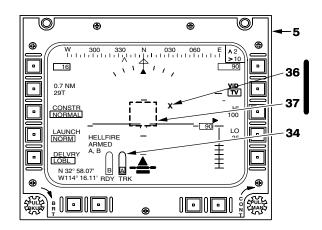
NOTE

If both launchers are being checked simultaneously, the left inboard missile image will have RDY and A displayed. The right inboard missile image will display RDY and B.

- 80. Verify laser code A is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
 - 81. Verify laser seekers are scanning.
- 82. On CPG auxiliary control panel (3), position ATHS/INIT switch (4) to INIT.
- 83. Position LSS in front of inboard missile. Verify inboard missile stops scanning and acquires LSS.
- 84. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.
 - 85. Verify seeker cue (36) is displayed.
- 86. Move LSS until seeker cue (36) is outside constraint window (37) on pilot MFD (5). Verify constraint window is a dashed-line square.

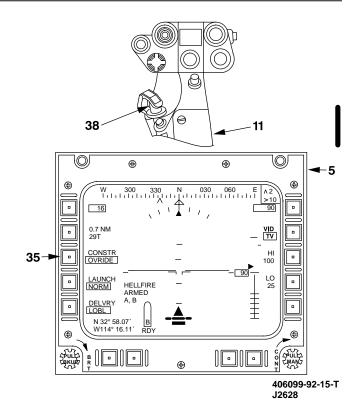






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- 87. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile does not fire.
- 88. On pilot MFD (5), press L3 (35) to display OVRIDE.
- 89. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.

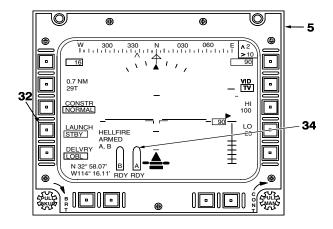


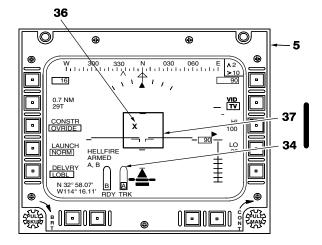
- 90. On pilot MFD (5), press L4 (32) to display STBY. Verify proper missile images (34) are displayed.
 - 91. Press L4 (32) to display NORM.
- 92. Verify laser code A is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
 - 93. Verify laser seekers are scanning.
- 94. Position LSS to align seeker cue (36), inside constraint window (37) on pilot MFD (5). Verify constraint window is a solid-line square.
- 95. Verify inboard missile stops scanning and acquires LSS.
- 96. Verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.

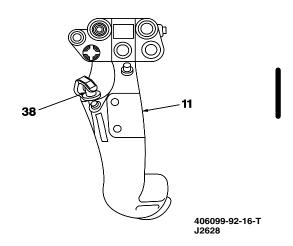
NOTE

If both launchers are being checked simultaneously, the left inboard missile image will have TRK displayed and a boxed A. The right inboard missile image will display RDY and B.

- 97. Verify seeker cue (36) is displayed.
- 98. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image (34) is not displayed.





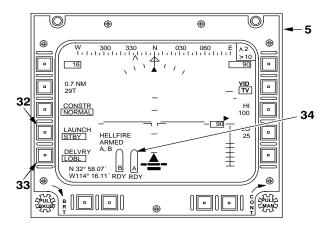


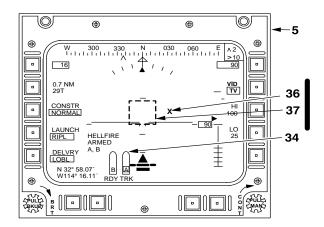
OPERATIONAL CHECK — RIPL LAUNCH MODE/ LOBL DELIVERY MODE

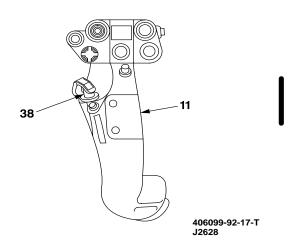
- 99. On pilot MFD (5), press L4 (32) to display STBY. Verify missile image (34) is displayed for all installed missiles.
 - 100. Press L5 (33) to select LOBL.
 - 101. Press L4 (32) to display RIPL.

NOTE

- During missile tracking, the laser code address will be boxed. If it is not boxed, cycle the DELVRY display from LOBL, to DIR, to LO, to HI, and back to LOBL.
- If both launchers are being checked simultaneously, B will be displayed in the right inboard missile.
- 102. Verify laser code A is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
 - 103. Verify both laser sensors are scanning.
- 104. Position LSS in front of inboard missile. Verify inboard missile stops scanning and acquires LSS.
- 105. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.
 - 106. Verify seeker cue (36) is displayed.
- 107. Move LSS until seeker cue is outside constraint window (37) on pilot MFD (5). Verify constraint window is a dashed-line square.
- 108. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile does not fire.





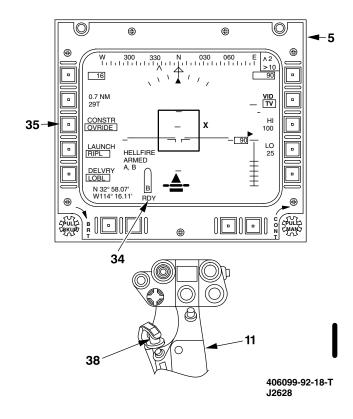


- 109. On pilot MFD (5), press L3 (35) to display OVRIDE.
- 110. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.

NOTE

The right inboard missile image will display RDY and a B, if both launchers are being checked simultaneously and the LSS is positioned in front of it.

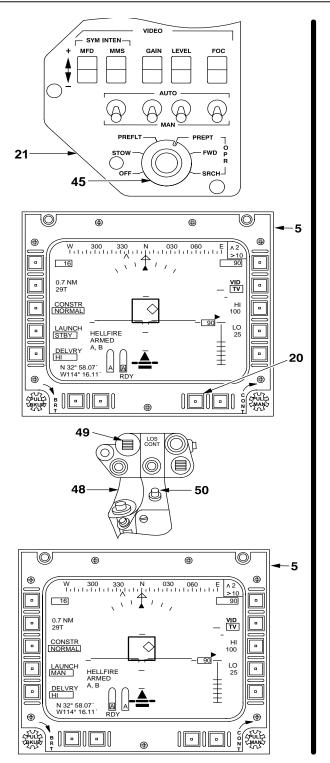
- 111. Position LSS in front of outboard missile. On pilot MFD (5), verify laser code B is displayed inside outboard missile image (34) and RDY is displayed below.
- 112. Verify laser seeker continues scanning and does not acquire the LSS.
- 113. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent. Verify missile does not fire.



OPERATIONAL CHECK — MAN LAUNCH/LOAL DELIVERY MODES

NOTE

- •LOAL delivery mode operational checks require aircraft to be parked outside hangar with prepoint target (waypoint) within missile constraint window for OH-58D Kiowa Warrior helicopters with 7.0 software version.
- •LOS switch must not be activated for a minimum of 30 seconds
- 114. Press MMS mode key (20) on CPG MFD (5).
- 115. On MMS control panel (21), rotate OPR switch (45) to PREFLT for 30 seconds.
 - 116. Rotate OPR switch (45) to FWD.
- 117. On CPG cyclic grip (48), press MNL/SLAVE switch (50) one time to set MMS in fixed forward position. Verify MMS is in forward position.
 - 118. Allow 3 to 5 minutes for system warmup.
- 119. On CPG cyclic grip (48), press FOV switch (49) down once to select narrow field of view (FOV). On CPG MFD (5), verify narrow FOV is displayed.



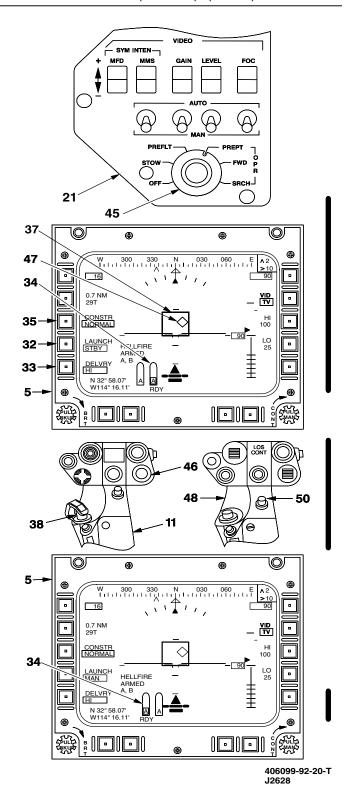
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- 120. On MMS control panel (21), rotate OPR switch (45) to PREPT.
- 121. On pilot MFD (5), press L4 (32) to display STBY. Verify missile images (34) are displayed.
 - 122. Press L5 (33) to display HI.
 - 123. Press L4 (32) to display MAN.
- 124. On CPG cyclic grip (48), press MNL/SLAVE switch (50) one time.
- 125. Position MMS LOS reticle (47) inside constraint window (37).
- 126. Press L3 (35) to display NORMAL. Verify laser code A (boxed) is displayed inside inboard missile image (34) and RDY is displayed below.
- 127. Verify laser seeker is spinning and pointed forward.
- 128. On pilot cyclic grip (11), press MSL STEP switch (46) to select other missile. Verify inboard missile laser seeker starts to spin down, outboard missile has spun up and is pointed forward.

NOTE

If both launchers are being checked simultaneously, the right inboard missile image will display RDY and an A.

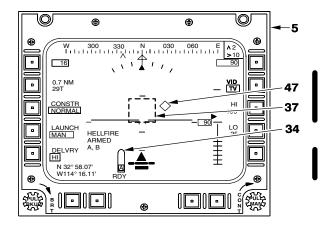
- 129. On pilot MFD (5), verify laser code A (boxed) is displayed inside outboard missile image (34) and RDY is displayed below.
- 130. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify outboard missile fires and, on pilot MFD (5), outboard missile image (34) is not displayed.

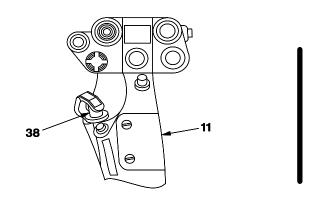


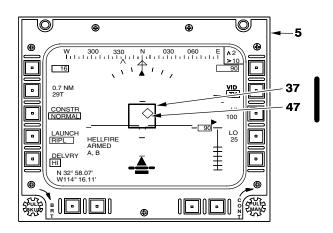
NOTE

If both launchers are being checked simultaneously, the right inboard missile will fire and the left outboard missile image will display RDY and A. The left inboard missile image will display RDY and A after the right outboard missile is fired.

- 131. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and RDY is displayed below.
- 132. Position MMS LOS reticle (47) outside constraint window (37). Verify constraint window is a dashed-line square.
- 133. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify inboard missile does not fire.
- 134. On pilot MFD (5), verify inboard missile image (34) is displayed.
- 135. Position MMS LOS reticle (47) inside constraint window (37). Verify constraint window is a solid-line square.
- 136. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.
- 137. Verify no missile images are displayed on MFD if only one launcher is being checked.







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OPERATIONAL CHECK — NORM LAUNCH/LOAL DELIVERY MODES

NOTE

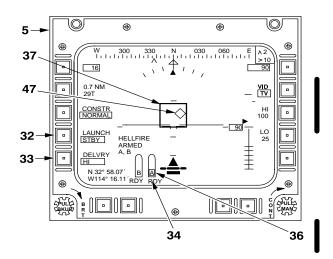
LOAL delivery mode operational checks require aircraft to be parked outside hanger with prepoint target (waypoint) within missile constraint window for OH-58D Kiowa Warrior helicopters with 7.0 software version.

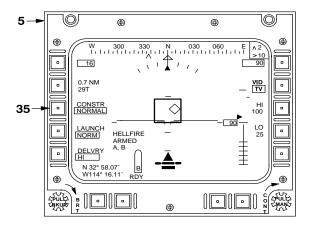
- 138. On pilot MFD (5), press L4 (32) to display STBY.
 - 139. Press L5 (33) to display HI.
 - 140. Press L4 (32) to display NORM.
- 141. Position MMS LOS reticle (47) inside constraint window (37). Verify constraint window is a solid-line square.

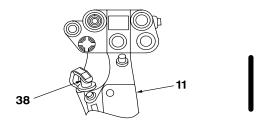
NOTE

If both launchers are being checked simultaneously, the B will be displayed in the right inboard missile image.

- 142. Verify laser code A (36) (boxed) is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
- 143. Press L3 (35) to display NORMAL. Verify laser seekers are spinning and pointed forward.
- 144. On pilot cyclic grip (11), press WPN–FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.





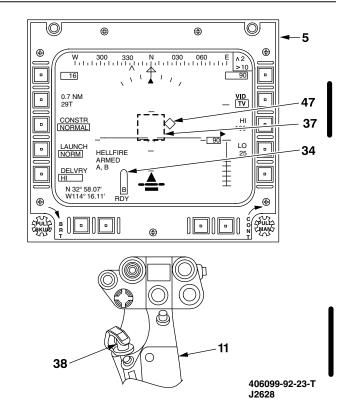


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NOTE

If both launchers are being checked simultaneously, B and RDY will be displayed in the right inboard missile image.

- 145. On pilot MFD (5), verify laser code B is displayed inside outboard missile image (34) and RDY is displayed below.
- 146. Position MMS LOS reticle (47) outside constraint window (37). Verify constraint window is a dashed-line square.
- 147. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify missile does not fire.
- 148. On pilot MFD (5), verify outboard missile image (34) is displayed.



OPERATIONAL CHECK — RIPL LAUNCH/LOAL DELIVERY MODE

NOTE

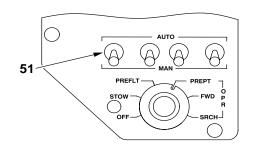
LOAL delivery mode operational checks require aircraft to be parked outside hangar with prepoint target (waypoint) within missile constraint window for OH-58D Kiowa Warrior helicopters with 7.0 software version.

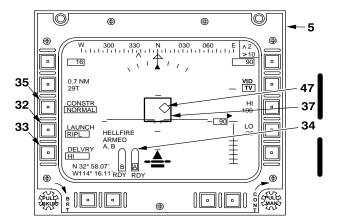
- 149. Position all four MMS control panel switches (51) to MAN.
- 150. On pilot MFD (5), position MMS LOS reticle (47) inside constraint window (37).
- 151. Press L4 (32) to display STBY. Verify missile image (34) is displayed for both installed missiles.
 - 152. Press L5 (33) to display HI.
 - 153. Press L4 (32) to display RIPL.
 - 154. Press L3 (35) to display NORMAL.

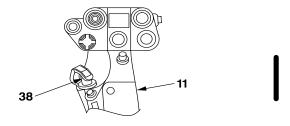
NOTE

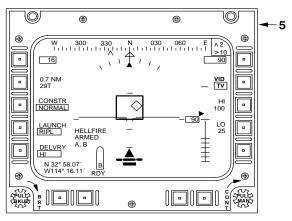
If both launchers are being checked simultaneously, A will be displayed in both inboard missile images and B in the outboard missile images.

- 155. Verify laser code A (boxed) is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
- 156. Verify laser seeker is spinning and pointed forward for both missiles.
- 157. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.









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NOTE

If both launchers are being checked simultaneously, a boxed B and RDY will be displayed in the left outboard missile image. The firing order for this configuration is left inboard, left outboard, right inboard, and right outboard.

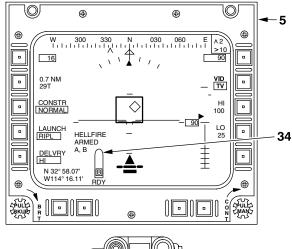
158. On pilot MFD (5), verify laser code B (boxed) is displayed inside outboard missile image (34) and RDY is displayed below.

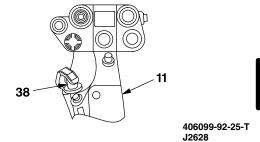
159. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent. Verify outboard missile fires and, on pilot MFD (5), outboard missile image (34) is not displayed.

NOTE

If both launchers are being checked simultaneously, both right missiles will remain. The right inboard missile will display a boxed A and RDY, the right outboard will display a B and RDY.

160. Verify no missile images are displayed on MFD.





161. On ACP (8), position MASTER switch (9) to OFF. Verify ARMED/STBY indicator (10) is not lighted.

162. On center post circuit breaker panel (1), open these circuit breakers (2):

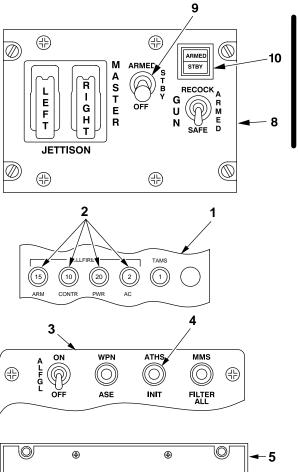
HELLFIRE ARM HELLFIRE CONTR HELLFIRE PWR HELLFIRE AC

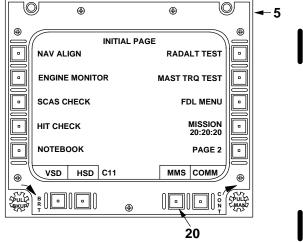
NOTE

- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.

163. On CPG auxiliary control panel (3), position ATHS/INIT switch (4) to INIT. On CPG MFD (5), verify INITIAL PAGE is displayed.

164. Press MMS key (20).





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165. On MMS control panel (21), rotate OPR switch (45) to STOW. Verify MMS rotates to the stow position.

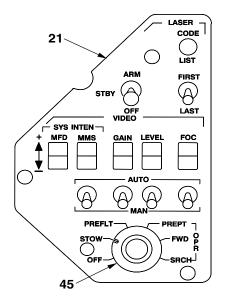
166. Allow 3 to 5 minutes for system to store data.

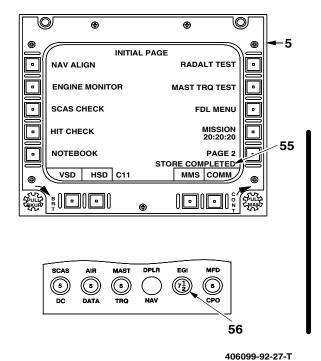
NOTE

After data has been stored, a STORE COMPLETED message will be displayed in the lower right section of CPG MFD. Only after the STORE COMPLETED is displayed can the OPR switch be positioned to OFF without degrading the system.

167. After STORE COMPLETED (55) is displayed on MFD (5), on MMS control panel (21), rotate OPR switch (45) to OFF.

168. Open EGI circuit breaker (56).





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169. Position launcher ARM/SAFE switch (31) to SAFE.

170. Disconnect external ac electrical power (TM 1-1520-248-23).

171. Open following circuit breakers:

ICS PLT
ICS CPO
MFD PLT
RECT
BUS INTCON
MFD CPO
MCPU L
ARMT CONT
PWR SIGHT
26 VAC PWR
MCPU BLWR
MMS 26 VAC
MMS DC PWR
MMS DC CONTR
MMS AC

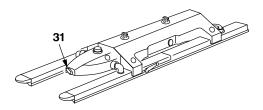
MCPU R

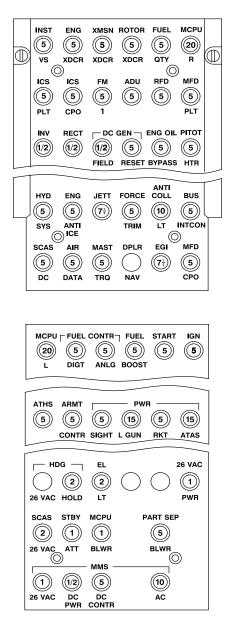
INSPECT

FOLLOW-ON MAINTENANCE

Headset disconnected.

Remove HELLFIRE training missiles (TM 9-6920-475-13).





406099-92-28-T J2628

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Microphone Headset (2)
Aviation Ground Power Unit (AGPU)
HELLFIRE Training Missiles (2/4)
Laser Source Simulator (LSS) (B8)

Personnel Required:

68J Aircraft Armament/Missile Systems Repairer (2)68J Aircraft Armament/Missile Systems Technical Inspector (TI)

References:

TM 9-6920-475-13 TM 1-1520-248-23 TM 9-1090-214-23&P TM 9-1240-778-23

Equipment Condition:

Operational Mast Mounted Sight (MMS)
Installed
Headset Connected
Setup Procedures for Operational Checks

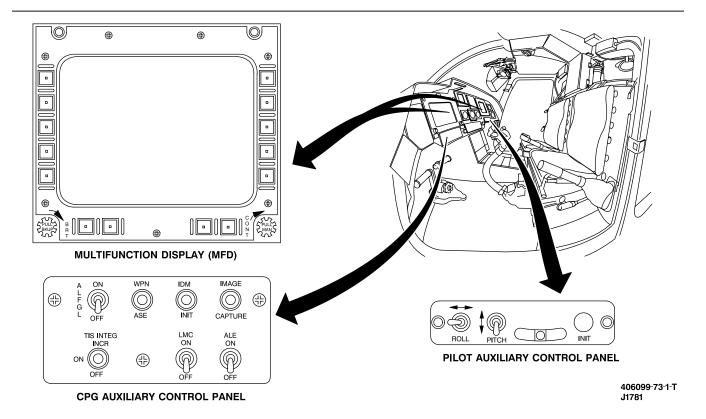
Completed (Task 2-5-2)
Helicopter Safed (TM 1-1520-248-23)
HELLFIRE Missile Launcher Installed

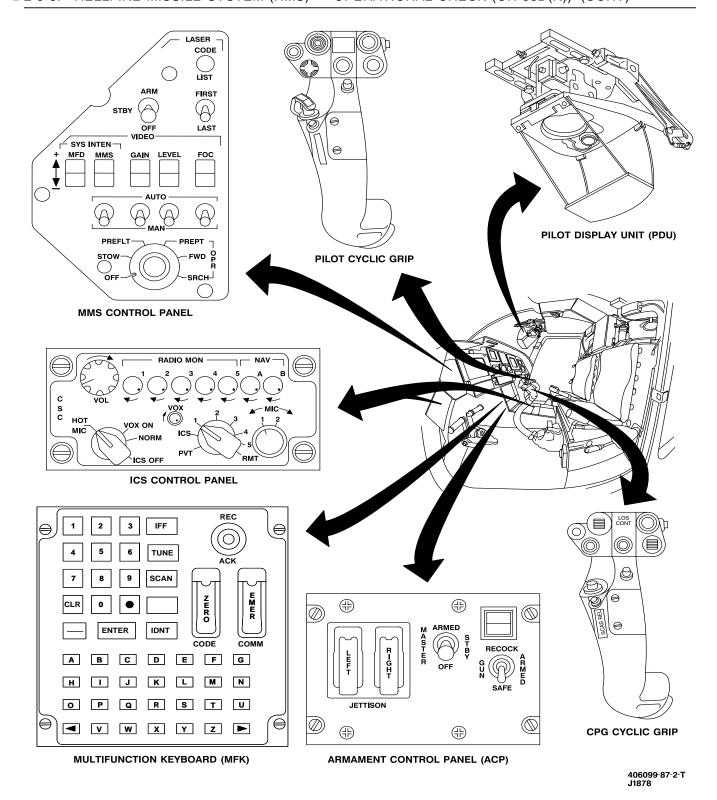
(TM 9-1090-214-23&P)
Armament Cable (HELLFIRE) Installed

(TM 9-1090-214-23&P)
HELLFIRE Training Missile Installed

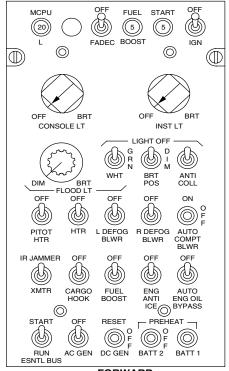
(TM 9-6920-475-13)

Launcher SAFE/ARM Switch Position to SAFE

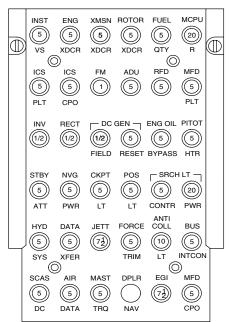




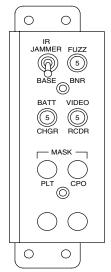
GO TO NEXT PAGE



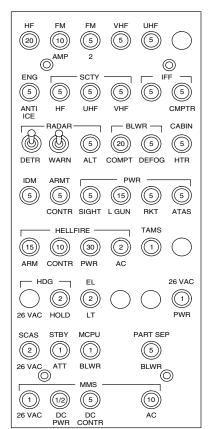
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

SYSTEM SETUP

WARNING

To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are down.

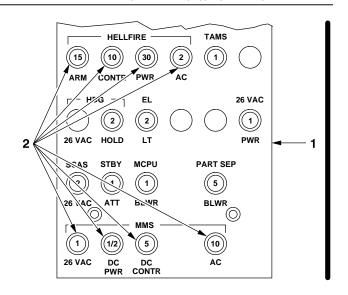
NOTE

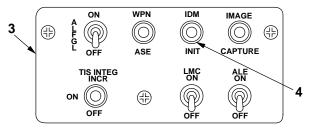
It is understood the HELLFIRE training missiles may be installed on either or both sides of the helicopter. The illustrations in this procedure show weapons symbology only on the left side of the helicopter.

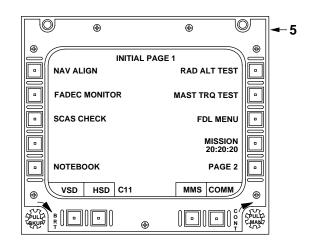
1. On center post circuit breaker panel (1), close these circuit breakers (2):

HELLFIRE ARM
HELLFIRE CONTR
HELLFIRE PWR
HELLFIRE AC
MMS 26 VAC
MMS DC PWR
MMS DC CONTR
MMS AC

- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. On CPG auxiliary control panel (3), position IDM/INIT switch (4) to INIT. On CPG MFD (5), verify INITIAL PAGE 1 is displayed.
- 4. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE 1 is displayed.









J2635

OPERATIONAL CHECK INITIAL TESTS

NOTE

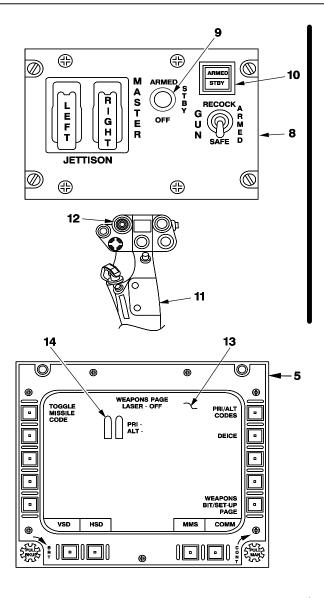
This procedure assumes only one launcher is being checked at a time and the inboard missile referred to in the procedural steps corresponds to the side being checked. If both launchers are being checked simultaneously, the inboard missile will be the left inboard missile.

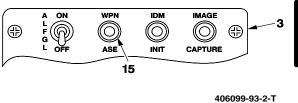
- 5. On ACP (8), position MASTER switch (9) to STBY. Verify ARMED/STBY indicator (10) indicates STBY.
- 6. On pilot cyclic grip (11), press WEAPON SEL switch (12) up. On pilot MFD (5), verify WEAPONS PAGE (13) is displayed.

NOTE

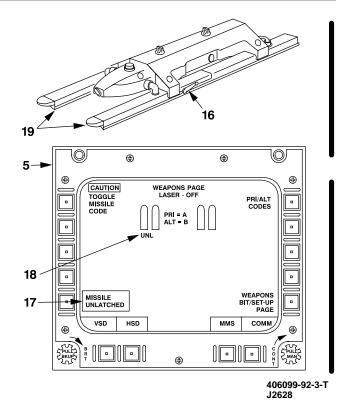
Single launcher configuration will have two missiles displayed. Dual launcher configuration will display four missiles.

- 7. Verify proper missile configuration (14) is displayed.
- 8. On CPG auxiliary control panel (3), position WPN/ASE switch (15) to WPN. On CPG MFD (5), verify WEAPONS PAGE (13) is displayed.
- 9. Verify proper missile configuration (14) is displayed.





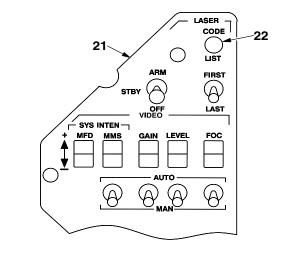
- 10. Check missile unlatched circuits for all installed HELLFIRE missiles, one missile at a time.
- a. Rotate LATCH/UNLATCH handle (16) to UNLATCH position.
- b. On both MFDs (5), verify CAUTION (boxed), MISSILE UNLATCHED (17) (boxed), and UNL (18) are displayed.
 - c. Verify bonging tone is heard in headsets.
 - d. Push missile full aft on launch rail (19).
- e. Rotate LATCH/UNLATCH handle (16) to LATCH position.
- f. On both MFDs (5), verify CAUTION (boxed), MISSILE UNLATCHED (17) (boxed), and UNL (18) are no longer displayed.
- g. Verify bonging tone is not heard in headsets.
- h. Repeat above steps for remaining missiles.

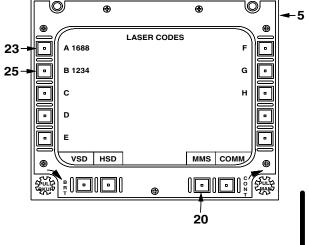


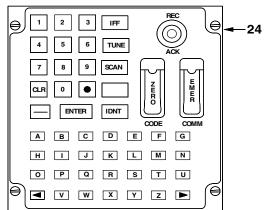
- 11. On CPG MFD (5), press MMS mode key (20).
- 12. On MMS control panel (21), press CODE LIST switch (22). On CPG MFD (5), verify LASER CODES page is displayed with laser addresses A through H.

NOTE

- The laser codes are entered into the system from the multifunction keyboard. No two addresses should have the same code.
- When entering codes into the HELLFIRE system, the first digit must be 1, the second digit can be any number from 1 through 7, the third and fourth digits can be any number from 1 through 8. The system will not accept the numbers 9 and 0.
- 13. Press L1 (23) to select laser code A. Verify cursor is displayed at L1.
- 14. On MFK (24), type 1688 and press ENTER. On CPG MFD (5), verify entered laser code is displayed next to A.
- 15. Press L2 (25) to select laser code B. Verify cursor is displayed at L2.
- 16. On MFK (24), type 1234 and press ENTER. On MFD (5), verify entered laser code is displayed next to B.







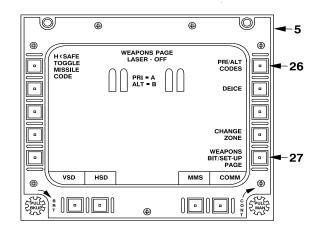
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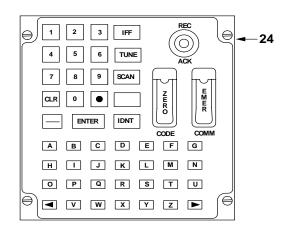
- 17. On pilot MFD (5), press R1 (26) to select PRI/ALT CODES.
- 18. On MFK (24), type A and press ENTER for PRI code.
 - 19. Type B and press ENTER for ALT code.
- 20. On pilot MFD (5), press R5 (27) to select WEAPONS BIT/SET-UP PAGE. Verify WEAPONS BIT/SET-UP PAGE (28) is displayed.
- 21. Press R1 (26) to select MISSILE PER CODE.

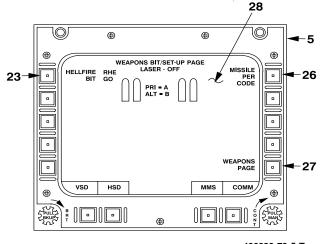
NOTE

If both launchers are being checked simultaneously, enter 2 in the following steps.

- 22. On MFK (24), type 1 and press ENTER for PRI code.
 - 23. Type 1 and press ENTER for ALT code.
- 24. On pilot MFD (5), press L1 (23) to initiate HELLFIRE BIT. Verify HELLFIRE BIT is boxed during BIT check.
- 25. When BIT is completed, verify RHE GO (BIT passed) is displayed next to HELLFIRE BIT.
 - 26. Press R5 (27) to select WEAPONS PAGE.

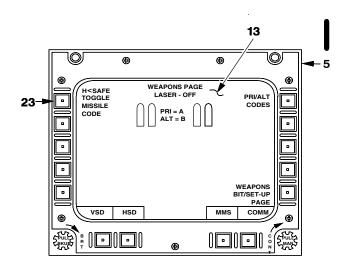


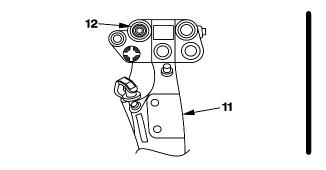


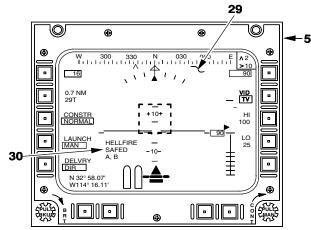


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- 27. On pilot MFD (5), verify WEAPONS PAGE (13) is displayed.
 - 28. Press L1 (23) to select TOGGLE MISSILE CODE. Verify A PRI laser code address switches from PRI to ALT and back to PRI.
 - 29. Ensure PRI laser code address is A.
 - 30. On pilot cyclic grip (11), press WEAPON SEL switch (12) twice to side with missiles loaded. On pilot MFD (5), verify WEAPONS sparse VSD page (29) is displayed.
 - 31. Verify HELLFIRE SAFED, A, and B (30) are displayed.







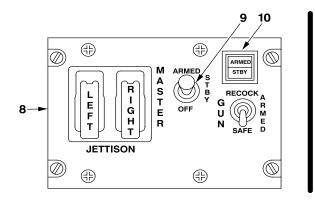
406099-92-5-T

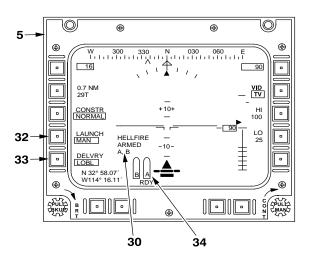
- 32. On ACP (8), position MASTER switch (9) to ARMED. Verify ARMED/STBY indicator (10) indicates ARMED.
- 33. On MFD (5), verify HELLFIRE ARMED, A, and B (30) are displayed.
- 34. Verify launcher ARM/SAFE switch (31) has moved to ARM.
- 35. On ACP (8), position MASTER switch (9) to STBY. Verify ARMED/STBY indicator (10) indicates STBY.
- 36. On MFD (5), verify HELLFIRE SAFED, A, and B (30) are displayed.
- 37. Verify launcher ARM/SAFE switch (31) remains in ARM.

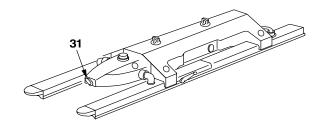
CAUTION

To prevent damage to the laser seeker allow 2 minutes after selecting LAUNCH STBY for the seeker to fully spin down.

- 38. On pilot MFD (5), press L4 (32) to sequence display from MAN, to NORM, to RIPL, to STBY, and back to MAN.
- 39. Press L5 (33) to sequence display from DIR, to LO, to HI, to LOBL, and back to DIR, to LO, to HI, and set on LOBL.
 - 40. Verify laser code A is displayed inside inboard missile image (34) and RDY is displayed below.
 - 41. Verify missile laser seeker is pointed forward and inboard missile seeker is scanning.





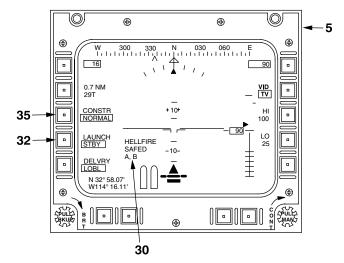


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NOTE

CONSTR OVRIDE cannot be selected if the missiles laser seeker does not receive laser energy.

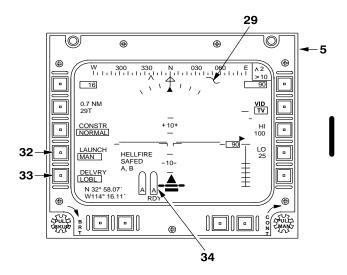
- 42. On pilot MFD (5), press L3 (35) to attempt to position between NORMAL and OVRIDE. Verify CONSTR remains set to NORMAL.
- 43. Press L4 (32) to display STBY. Verify HELLFIRE SAFED, A, and B (30) are displayed.
- 44. Verify laser code A and RDY are no longer displayed.
 - 45. Verify missile laser sensor spins down.



406099-79-8-T J1878

OPERATIONAL CHECK — MAN LAUNCH/LOBL DELIVERY MODES

- 46. Verify both pilot and CPG MFD (5) display WEAPONS sparse VSD page (29).
 - 47. Verify missile images (34) are displayed.
 - 48. Press L5 (33) to display LOBL.
 - 49. Press L4 (32) to display MAN.
- 50. Verify laser code A is displayed inside both missile images (34).
- 51. Verify SEL is momentarily displayed below inboard missile image (34) and changes to RDY within 30 seconds.



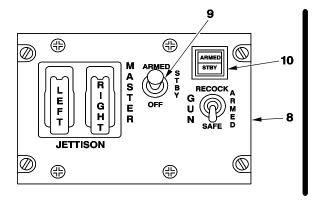
406099-92-7-T J2628

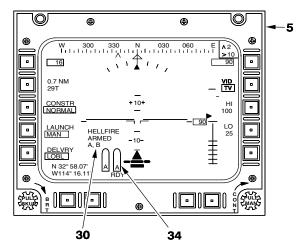
- 52. On ACP (8), position MASTER switch (9) to ARMED. Verify ARMED/STBY indicator (10) indicates ARMED.
- 53. On pilot MFD (5), verify HELLFIRE ARMED, A, and B (30) are displayed.
 - 54. Verify the following displays:
 - a. CONSTR NORMAL
 - b. LAUNCH MAN
 - c. DELVRY LOBL.
- 55. Verify laser code A is displayed inside inboard missile image (34) and RDY is displayed below.
- 56. Verify inboard missile laser sensor is scanning.
- 57. Position LSS in front of inboard missile. Verify missile stops scanning and acquires LSS.

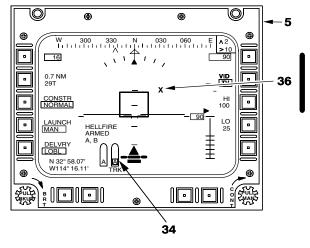
NOTE

During missile tracking, the laser code address will be boxed. If it is not boxed, cycle the DELVRY display from LOBL, to DIR, to LO, to HI, and back to LOBL.

- 58. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.
 - 59. Verify seeker cue (36) is displayed.







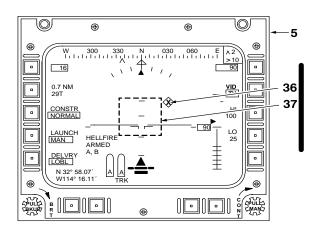
406099-92-8-T J2628

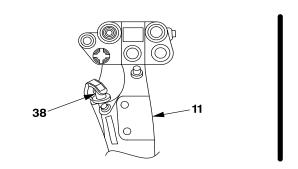
- 60. Move LSS until seeker cue (36) is outside constraint window (37) on pilot MFD (5). Verify constraint window is a dashed-line square.
- 61. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile does not fire.
- 62. On pilot MFD (5), press L3 (35) to display OVRIDE. Verify constraint window is a solid-line square.
- 63. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on MFD (5), inboard missile image is not displayed.

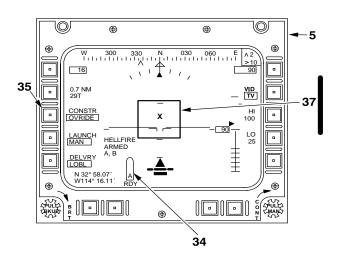
NOTE

If both launchers are being checked simultaneously, the right inboard missile will be the next missile selected.

- 64. On pilot MFD (5), verify next missile is selected.
- 65. Verify laser code A is displayed inside outboard missile image (34), SEL is momentarily displayed below, then changes to RDY within 30 seconds.

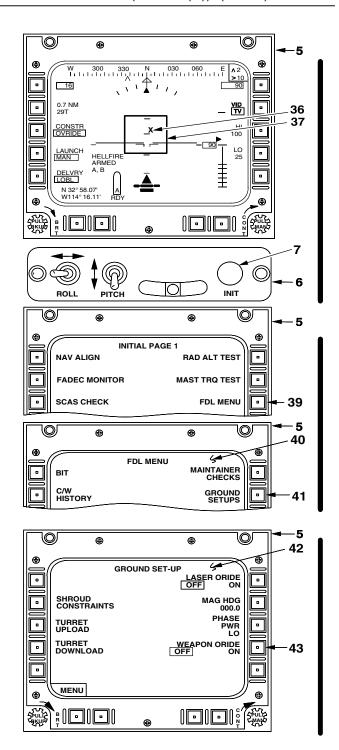






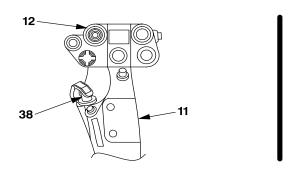
406099-92-9-T J2628

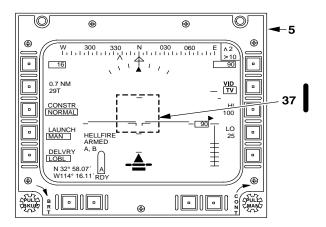
- 66. Position LSS to align seeker cue (36) inside constraint window (37) on pilot MFD (5). Verify constraint window is a solid-line square.
 - 67. Turn weapon override off as follows:
- a. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE 1 is displayed.
- b. On pilot MFD (5), press R3 (39) to display FDL MENU page (40).
- c. Press R2 (41) to display GROUND SET-UP page (42).
- d. Press R4 (43) to step WEAPON ORIDE from ON to OFF.
- 68. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE 1 is displayed.



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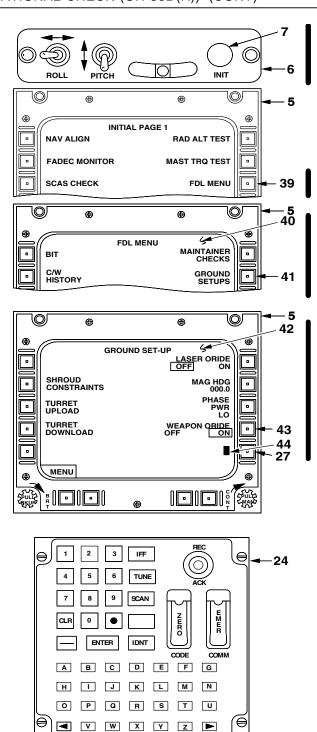
- 69. On pilot cyclic grip (11), press WEAPON SEL switch (12) twice to side with missile selected. On pilot MFD (5), verify constraint window (37) dashed-line square.
- 70. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent. Verify missile does not fire.





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- 71. Turn weapon override on as follows:
- a. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE 1 is displayed.
- b. On pilot MFD (5), press R3 (39) to display FDL MENU page (40).
- c. Press R2 (41) to display GROUND SET-UP page (42).
- d. Press R4 (43) to display cursor (44) at R5 (27).
- e. On MFK (24), press A and ENTER. On pilot MFD (5), verify ON is boxed under WEAPON ORIDE.
- 72. On pilot auxiliary control panel (6), press INIT switch (7). On pilot MFD (5), verify INITIAL PAGE 1 is displayed.



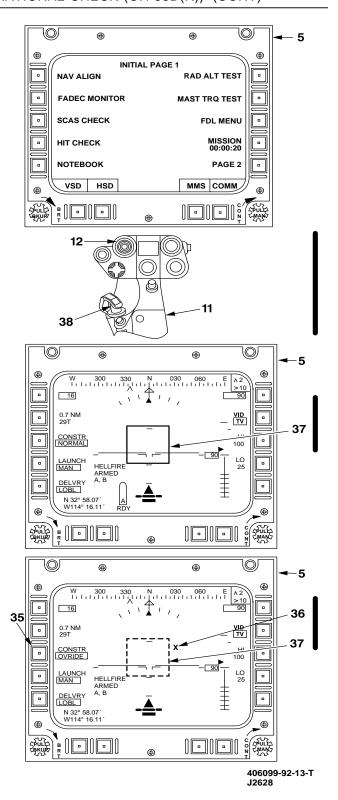
406099-92-12-T J2628

- 73. On pilot cyclic grip (11), press WEAPON SEL switch (12) twice to side with missile loaded. On pilot MFD (5), verify constraint window (37) is a solid-line square.
- 74. Position seeker cue (36) outside of constraint window (37). Verify constraint window is a dashed-line square.
- 75. Press L3 (35) to display OVRIDE. Verify constraint window is a solid-line square.

NOTE

If both launchers are being checked simultaneously, the outboard missile images will remain with the left outboard missile selected.

76. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile fires and, on pilot MFD (5), outboard missile image is not displayed.



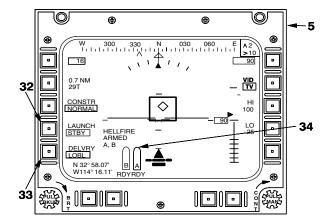
OPERATIONAL CHECK NORM LAUNCH/LOBL DELIVERY MODES

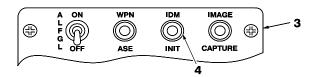
- 77. On pilot MFD (5), press L4 (32) to display STBY. Verify proper missile images (34) are displayed.
 - 78. Press L5 (33) to select LOBL.
 - 79. Press L4 (32) to display NORM.

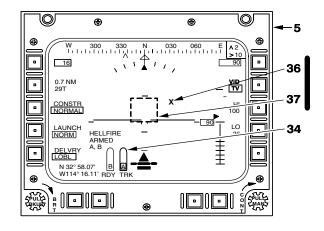
NOTE

If both launchers are being checked simultaneously, the left inboard missile image will have RDY and A displayed. The right inboard missile image will display RDY and B.

- 80. Verify laser code A is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
 - 81. Verify laser seekers are scanning.
- 82. On CPG auxiliary control panel (3), position IDM/INIT switch (4) to INIT.
- 83. Position LSS in front of inboard missile. Verify inboard missile stops scanning and acquires LSS.
- 84. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.
 - 85. Verify seeker cue (36) is displayed.
- 86. Move LSS until seeker cue (36) is outside constraint window (37) on pilot MFD (5). Verify constraint window is a dashed-line square.







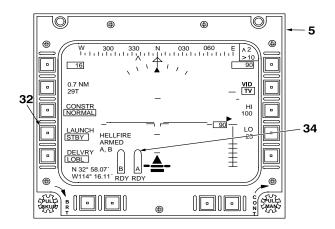
406099-92-14-T J2628

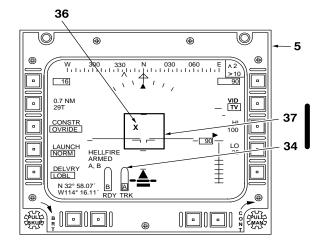
- 87. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify missile does not fire.
- 88. On pilot MFD (5), press L3 (35) to display OVRIDE.
- 89. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.
- 90. On pilot MFD (5), press L4 (32) to display STBY. Verify proper missile images (34) are displayed.
 - 91. Press L4 (32) to display NORM.
- 92. Verify laser code A (boxed) is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
 - 93. Verify laser seekers are scanning.
- 94. Position LSS to align seeker cue (36) inside constraint window (37) on pilot MFD (5). Verify constraint window is a solid-line square.
- 95. Verify inboard missile stops scanning and acquires LSS.
- 96. Verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.

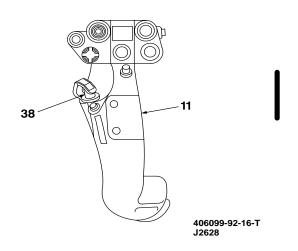
NOTE

If both launchers are being checked simultaneously, the left inboard missile image will have RDY displayed and a boxed A. The right inboard missile image will display RDY and B.

- 97. Verify seeker cue (36) is displayed.
- 98. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image (34) is not displayed.





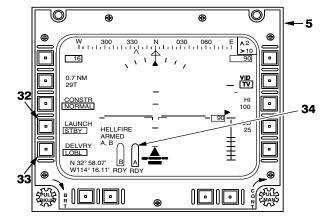


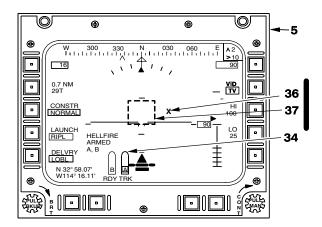
OPERATIONAL CHECK RIPL LAUNCH MODE/ LOBL DELIVERY MODE

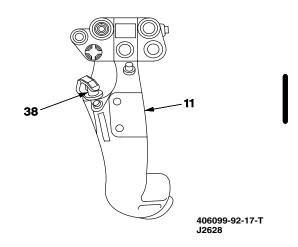
- 99. On pilot MFD (5), press L4 (32) to display STBY. Verify missile image (34) is displayed for all installed missiles.
 - 100. Press L5 (33) to select LOBL.
 - 101. Press L4 (32) to display RIPL.

NOTE

- During missile tracking, the laser code address will be boxed. If it is not boxed, cycle the DELVRY display from LOBL, to DIR, to LO, to HI, and back to LOBL.
- If both launchers are being checked simultaneously, B will be displayed in the right inboard missile.
- 102. Verify laser code A is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
 - 103. Verify both laser sensors are scanning.
- 104. Position LSS in front of inboard missile. Verify inboard missile stops scanning and acquires LSS.
- 105. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and TRK is displayed below.
 - 106. Verify seeker cue (36) is displayed.
- 107. Move LSS until seeker cue is outside constraint window (37) on pilot MFD (5). Verify constraint window is a dashed-line square.
- 108. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify missile does not fire.





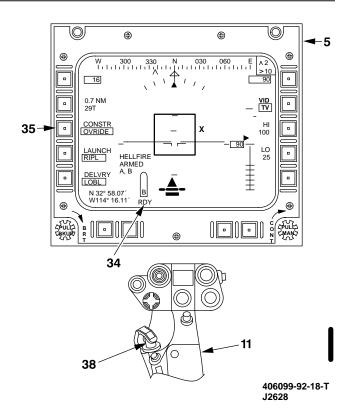


- 109. On pilot MFD (5), press L3 (35) to display OVRIDE.
- 110. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.

NOTE

The right inboard missile image will display RDY and a B, if both launchers are being checked simultaneously and the LSS is positioned in front of it.

- 111. Position LSS in front of outboard missile. On pilot MFD (5), verify laser code B is displayed inside outboard missile image (34) and RDY is displayed below.
- 112. Verify laser seeker continues scanning and does not acquire the LSS.
- 113. On pilot cyclic grip (11), press WPN–FIRE switch (38) through second detent. Verify missile does not fire.



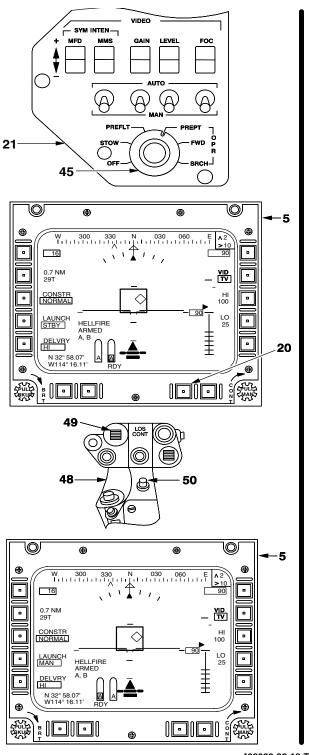
OPERATIONAL CHECK M
DELIVERY MODES

MAN LAUNCH/LOAL

NOTE

LOS switch must not be activated for a minimum of 30 seconds.

- 114. Press MMS mode key (20) on CPG MFD.
- 115. On MMS control panel (21), rotate OPR switch (45) to PREFLT for 30 seconds.
 - 116. Rotate OPR switch (45) to FWD.
- 117. On CPG cyclic grip (48), press MNL/SLAVE switch (50) one time to set MMS in fixed forward position. Verify MMS is in forward position.
 - 118. Allow 3 to 5 minutes for system warmup.
- 119. On CPG cyclic grip (48), press FOV switch (49) down once to select narrow field of view (FOV). On CPG MFD (5), verify narrow FOV is displayed.



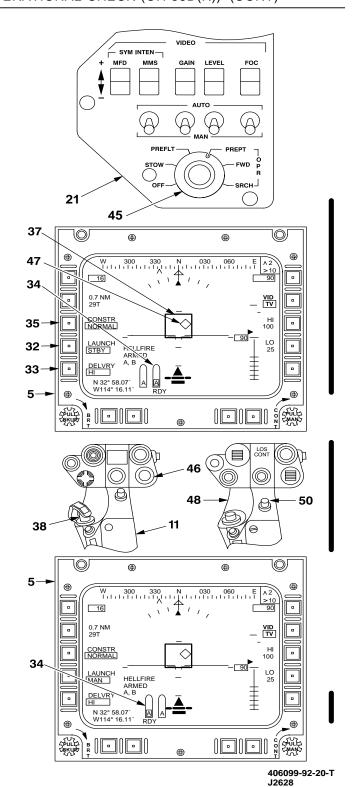
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- 120. On MMS control panel (21), rotate OPR switch (36) to PREPT.
- 121. On pilot MFD (5), press L4 (32) to display STBY. Verify missile images (34) are displayed.
 - 122. Press L5 (33) to display HI.
 - 123. Press L4 (32) to display MAN.
- 124. On CPG cyclic grip (48), press MNL/SLAVE switch (50) one time.
- 125. Position MMS LOS reticle (47) inside constraint window (37).
- 126. Press L3 (35) to display NORMAL. Verify laser code A (boxed) is displayed inside inboard missile image (34) and RDY is displayed below.
- 127. Verify laser seeker is spinning and pointed forward.
- 128. On pilot cyclic grip (11), press MSL STEP switch (46) to select other missile. Verify inboard missile laser seeker starts to spin down, outboard missile has spun up and is pointed forward.

NOTE

If both launchers are being checked simultaneously, the right inboard missile image will display RDY and an A.

- 129. On pilot MFD (5), verify laser code A (boxed) is displayed inside outboard missile image (34) and RDY is displayed below.
 - 130. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify outboard missile fires and, on pilot MFD (5), outboard missile image (34) is not displayed.

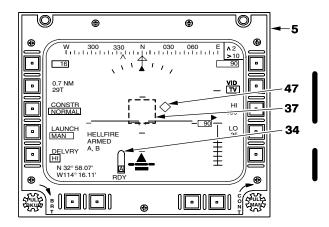


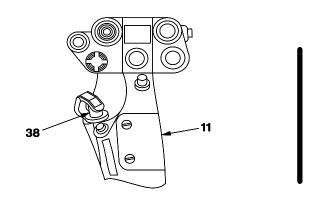
GO TO NEXT PAGE

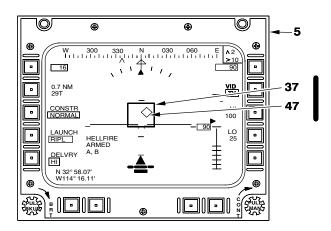
NOTE

If both launchers are being checked simultaneously, the right inboard missile will fire and the left outboard missile image will display RDY and A. The left inboard missile image will display RDY and A after the right outboard missile is fired.

- 131. On pilot MFD (5), verify laser code A (boxed) is displayed inside inboard missile image (34) and RDY is displayed below.
 - 132. Position MMS LOS reticle (47) outside constraint window (37). Verify constraint window is a dashed-line square.
 - 133. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify inboard missile does not fire.
 - 134. On pilot MFD (5), verify inboard missile image (34) is displayed.
 - 135. Position MMS LOS reticle (47) inside constraint window (37). Verify constraint window is a solid-line square.
 - 136. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.
 - 137. Verify no missile images are displayed on MFD if only one launcher is being checked.







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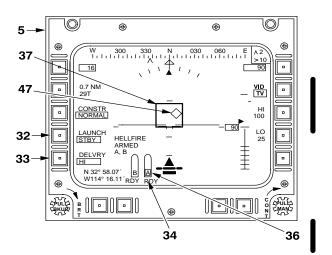
OPERATIONAL CHECK — NORM LAUNCH/LOAL DELIVERY MODES

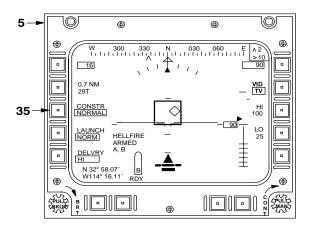
- 138. On pilot MFD (5), press L4 (32) to display STBY.
 - 139. Press L5 (33) to display HI.
 - 140. Press L4 (32) to display NORM.
- 141. Position MMS LOS reticle (47) inside constraint window (37). Verify constraint window is a solid-line square.

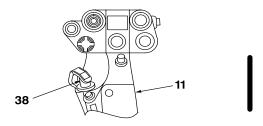
NOTE

If both launchers are being checked simultaneously, the B will be displayed in the right inboard missile image.

- 142. Verify laser code A (boxed) (36) is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
- 143. Press L3 (35) to display NORMAL. Verify laser seekers are spinning and pointed forward.
- 144. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.







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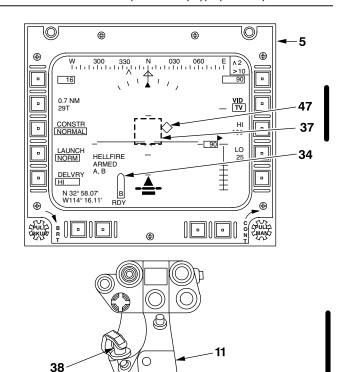
406099-92-23-T J2628

2-5-8. HELLFIRE MISSILE SYSTEM (HMS) OPERATIONAL CHECK (OH-58D(R)) (CONT)

NOTE

If both launchers are being checked simultaneously, B and RDY will be displayed in the right inboard missile image.

- 145. On pilot MFD (5), verify laser code B is displayed inside outboard missile image (34) and RDY is displayed below.
- 146. Position MMS LOS reticle (47) outside constraint window (37). Verify constraint window is a dashed-line square.
- 147. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent and release. Verify missile does not fire.
- 148. On pilot MFD (5), verify outboard missile image (34) is displayed.



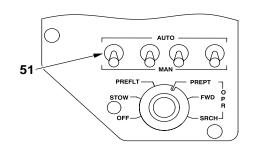
OPERATIONAL CHECK — RIPL LAUNCH/LOAL DELIVERY MODE

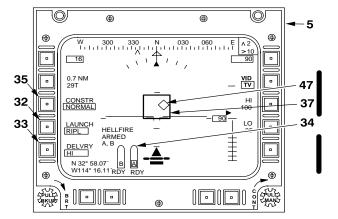
- 149. Position all four MMS control panel switches (51) to MAN.
- 150. On pilot MFD (5), position MMS LOS reticle (47) inside constraint window (37).
 - 151. Press L4 (32) to display STBY. Verify missile image (34) is displayed for both installed missiles.
 - 152. Press L5 (33) to display HI.
 - 153. Press L4 (32) to display RIPL.
 - 154. Press L3 (35) to display NORMAL.

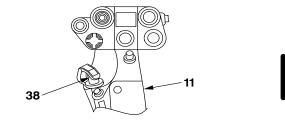
NOTE

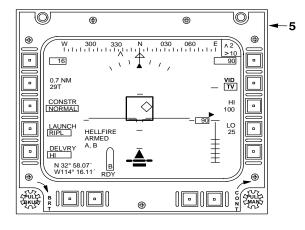
If both launchers are being checked simultaneously, A will be displayed in both inboard missile images and B in the outboard missile images.

- 155. Verify laser code A is displayed inside inboard missile image, laser code B is displayed inside outboard missile image, and RDY is displayed below both missile images (34).
- 156. Verify laser seeker is spinning and pointed forward for both missiles.
- 157. On pilot cyclic grip (11), press WPN-FIRE switch (38) through second detent and release. Verify inboard missile fires and, on pilot MFD (5), inboard missile image is not displayed.









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NOTE

If both launchers are being checked simultaneously, a boxed B and RDY will be displayed in the left outboard missile image. The firing order for this configuration is left inboard, left outboard, right inboard, and right outboard.

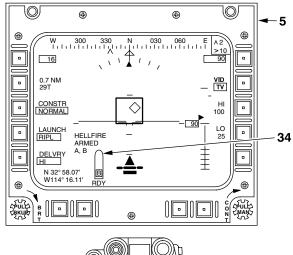
158. On pilot MFD (5), verify laser code B (boxed) is displayed inside outboard missile image (34) and RDY is displayed below.

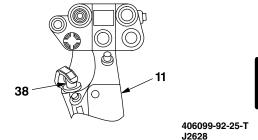
159. On pilot cyclic grip (11), press WPN FIRE switch (38) through second detent. Verify outboard missile fires and, on pilot MFD (5), outboard missile image (34) is not displayed.

NOTE

If both launchers are being checked simultaneously, both right missiles will remain. The right inboard missile will display a boxed A and RDY, the right outboard will display a B and RDY.

160. Verify no missile images are displayed on MFD.



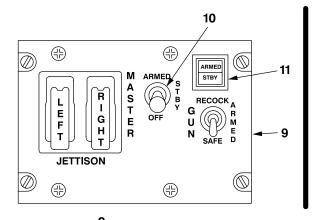


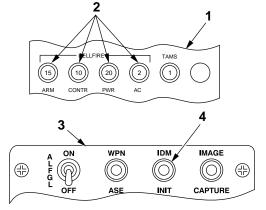
- 161. On ACP (9), position MASTER switch (10) to OFF. Verify ARMED/STBY indicator (11) is not lighted.
- 162. On center post circuit breaker panel (1), open these circuit breakers (2):

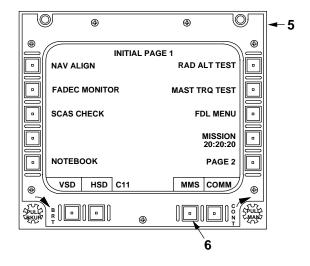
HELLFIRE ARM HELLFIRE CONTR HELLFIRE PWR HELLFIRE AC

NOTE

- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 163. On CPG auxiliary control panel (3), position IDM/INIT switch (4) to INIT. On CPG MFD (5), verify INITIAL PAGE 1 is displayed.
 - 164. Press MMS key (6).







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165. On MMS control panel (21), rotate OPR switch (45) to STOW. Verify MMS rotates to the stow position.

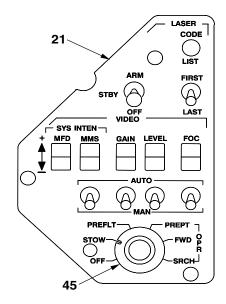
166. Allow 3 to 5 minutes for system to store data.

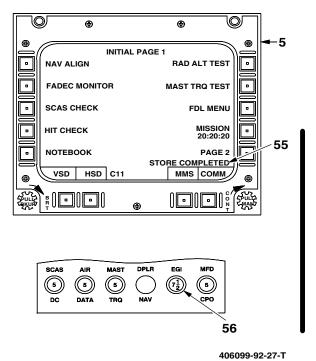
NOTE

After data has been stored, a STORE COMPLETED message will be displayed in the lower right section of CPG MFD. Only after the STORE COMPLETED is displayed can the OPR switch be positioned to OFF without degrading the system.

167. After STORE COMPLETED (55) is displayed on MFD (5), on MMS control panel (21), rotate OPR switch (45) to OFF.

168. Open EGI circuit breaker (56).





J2628

- 169. Position launcher ARM/SAFE switch (31) to SAFE.
- 170. Disconnect external ac electrical power (TM 1-1520-248-23).
 - 171. Open following circuit breakers:

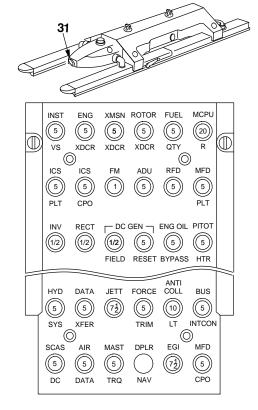
MCPU R **ICS PLT** ICS CPO MFD PLT **RECT BUS INTCON** MFD CPO MCPU L ARMT CONT **PWR SIGHT** 26 VAC PWR MCPU BLWR MMS 26 VAC MMS DC PWR MMS DC CONTR MMS AC

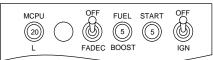
INSPECT

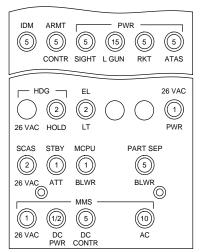
FOLLOW-ON MAINTENANCE

Headset disconnected.

Remove HELLFIRE training missiles (TM 9-6920-475-13).







406099-80-10-T J1878

2-5-9. 2.75 ROCKET SYSTEM OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Armament Repairer Basic Tool Set (B16) Armament Repairer Supplemental Tool Set (B17) Aviation Ground Power Unit (AGPU) Microphone Headset (2)

Personnel Required:

68J Aircraft Armament/Missile Systems Repairer (2)68J Aircraft Armament/Missile Systems Technical Inspector (TI)

References:

TM 1-1520-248-23 TM 9-1090-214-23&P

Equipment Condition:

Headsets Connected

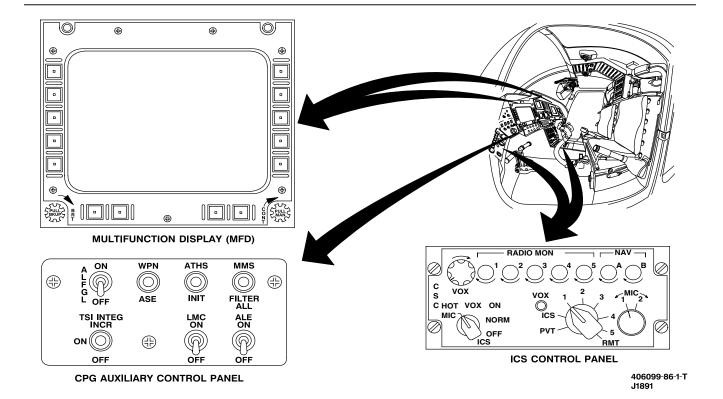
Setup Procedures for Operational Check

Completed (Task 2-5-1)
All Switches Off/SAFE

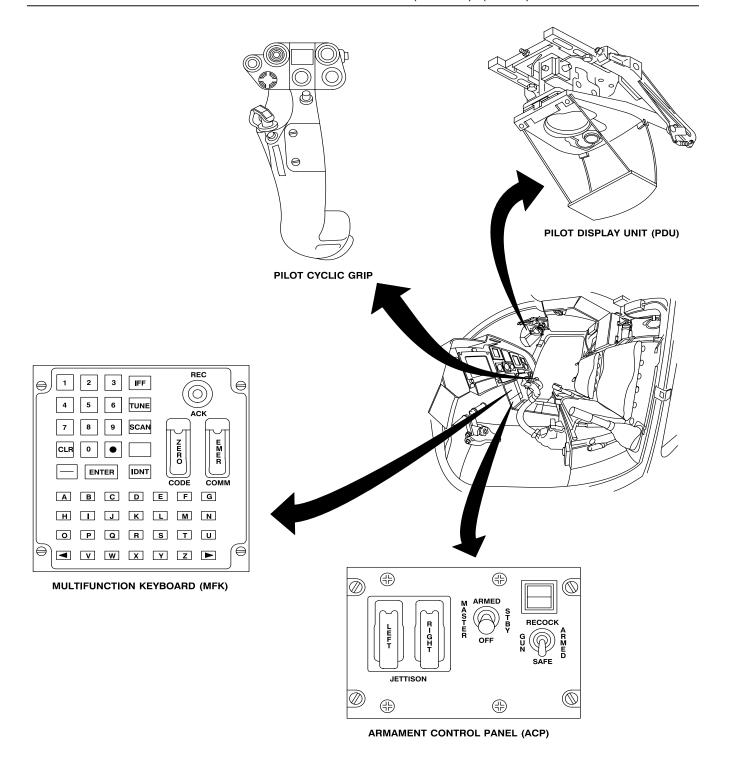
Helicopter Safed (TM 1-1520-248-23)

M260 Rocket Launcher Installed (TM 9-1090-214-23&P)

Armament Cable Installed (2.75 Rocket) (TM 9-1090-214-23&P)

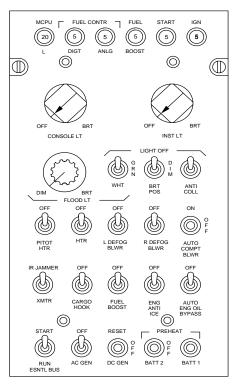


■ 2-5-9. 2.75 ROCKET SYSTEM — OPERATIONAL CHECK (OH-58D) (CONT)

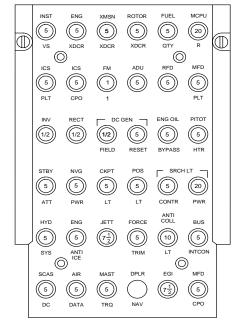


406099-94-1-T J2636

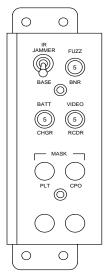
GO TO NEXT PAGE



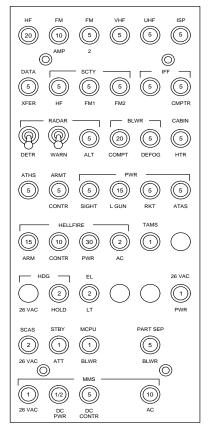
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

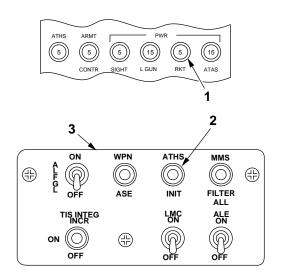
WARNING

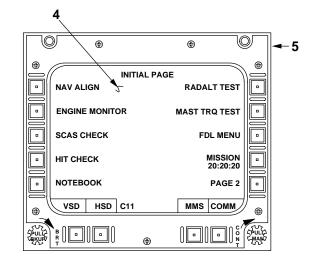
To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are in the down position.

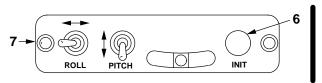
NOTE

It is understood that the rocket launcher may be installed on either or both sides of the helicopter. The illustrations in this procedure may show .50 caliber machine gun weapons symbology on the left side of the helicopter to represent any weapons loaded.

- 1. Close PWR RKT circuit breaker (1).
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. Toggle ATHS/INIT switch (2), on CPG auxiliary control panel (3), to INIT to display INITIAL PAGE (4) on CPG MFD (5).
- 4. Verify INITIAL PAGE (4) is displayed without ISP FAIL caution.
- 5. Press INIT switch (6), on pilot auxiliary panel (7), to display INITIAL PAGE (4) on pilot MFD (5).
- 6. Verify INITIAL PAGE (4) is displayed without ISP FAIL caution.
- 7. Proceed to OPERATIONAL CHECK ONE LAUNCHER/TWO LAUNCHERS (as required).





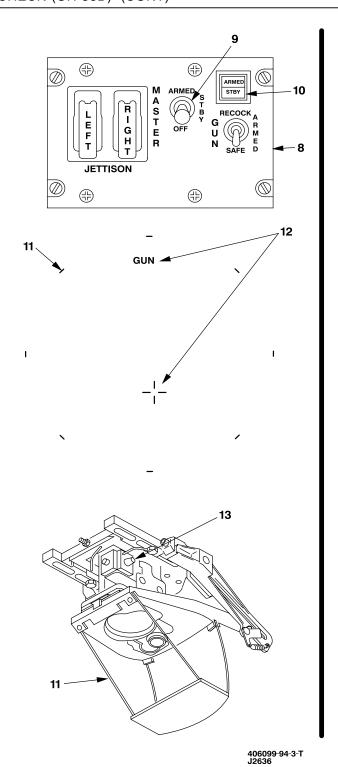


406099-94-2-T J2636

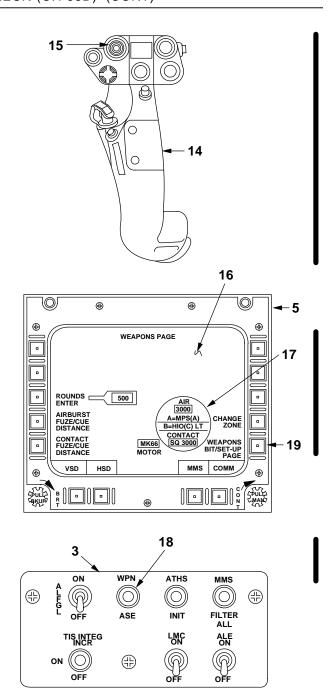
OPERATIONAL CHECK ONE LAUNCHER

NOTE

- For this checkout procedure, HELLFIRE, ATAS, or .50 caliber machine gun armament cable must be connected to the other weapons pylon.
- The following steps will show the .50 caliber machine gun symbol on the left pylon to represent any weapon loaded.
- For this checkout procedure, the PDU may be used to assure the rocket system is operational.
- 8. Ensure other weapon pylon is properly configured.
- 9. On ACP (8), position MASTER switch (9) to STBY.
- 10. Verify ARMED/STBY indicator (10) indicates STBY.
- 11. On PDU (11), verify GUN reticle (12) is displayed within 20 seconds.
- 12. Rotate BRT knob (13) to adjust brightness of GUN reticle (12) to desired level.

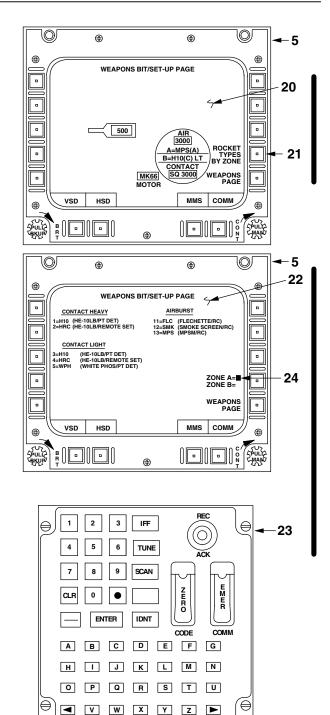


- 13. On pilot cyclic grip (14), press WEAPON SEL switch (15) up.
- 14. On pilot MFD (5), verify WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 15. On CPG auxiliary control panel (3), toggle WPN/ASE switch (18) to WPN.
- 16. On CPG MFD (5), verify rocket WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 17. On pilot and CPG MFD (5), press R5 (19) to display WEAPONS BIT/SET-UP PAGE.



406099-94-4-T J2636

- 18. On pilot and CPG MFD (5), verify WEAPONSBIT/SET-UP PAGE (20) is displayed.
- 19. On pilot MFD (5), press R4 (21) to display ROCKETTYPES BY ZONE data.
- 20. Verify WEAPONS BIT/SET-UP PAGE (22) is displayed and cursor appears at ZONE A (24).
 - 21. On MFK (23), type 13 then press ENTER.
- 22. On pilot MFD (5), verify cursor now appears at ZONE B (24).
 - 23. On MFK (23), type 3 then press ENTER.
- 24. Verify appropriate code number and type of rocket in ZONE A and B (24) are displayed.
- 25. On pilot MFD (5), verify WEAPONS BIT/SET-UP PAGE (20) is displayed.



406099-94-5-T J2636

- 26. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to the side with rocket launcher loaded.
- 27. On MFD (5), verify rocket sparse VSD page (25) is displayed.
 - 28. Press L5 (26) to select ZONE A.
- 29. Press L4 (27) to select FUZE/CUE MPS(A) distance.
- 30. Verify cursor appears and enter 6000 on MFK (23). On MFD (5), verify MPS(A) 6000 is displayed.
- 31. Press L3 (28) to sequence display from SINGLES SINGLES, to RIPPLE SINGLES, to SINGLES SINGLES.
- 32. Press L5 (26) to sequence display from A, to B, to ALL, to A.
 - 33. Ensure L5 (26) is set to display to A.
- 34. Repeat steps 31 and 32 to sequence display MPS(A) distance from 6000 to 5500 to 5000 to 4500 to 4000 to 3500 to 3000 to 2750 to 2500 to 2250 to 2000 to 1750 to 1500 to 1250 to 1000 to 750 to 500 or (L or N).

NOTE

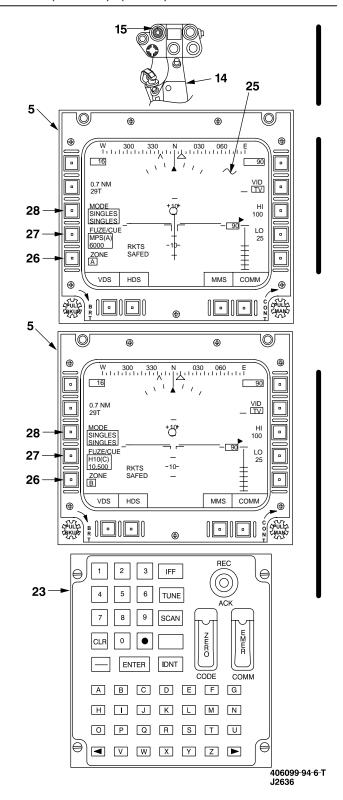
L will display as LAS for laser range and N will display as NAV for prepoint target acquisition.

- 35. Press L5 (26) to set display to B.
- 36. Verify H10(C) is displayed in FUZE/CUE box.
 - 37. Press L4 (27) to select FUZE H10(C).
- 38. Verify fuze cursor appears and enter 10 on MFK (23). On MFD (5), verify display is H10(C) 10 (meters).

NOTE

L will display as LAS for laser range and N will display as NAV for prepoint target acquisition.

39. Verify cue cursor appears; select and enter range distances between 500-8000 to (L or N); and on MFD (5), verify range distance appears.

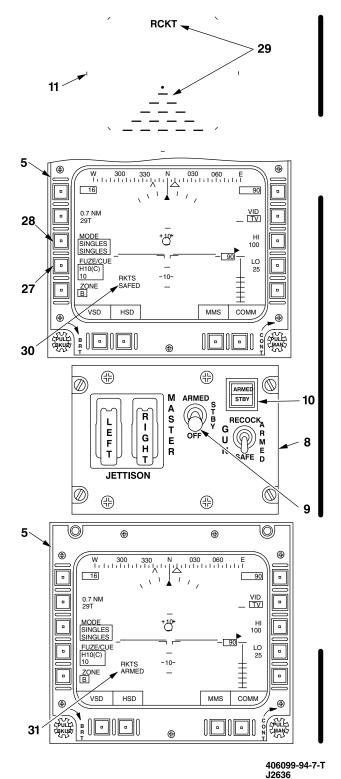


GO TO NEXT PAGE

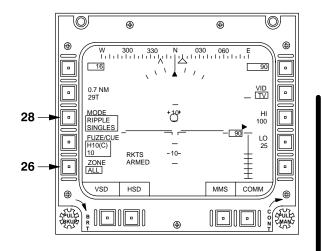
NOTE

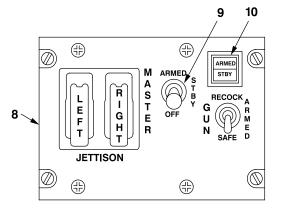
Input of S will display as SQ for superquick and B for bunker.

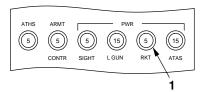
- 40. Repeat steps 37, 38, and 39 to sequence display H10(C) distance from 10 to 15 to 20 to 25 to 30 to 35 to 40 to 45 to Sq to Bunker.
- 41. Ensure L3 (28), MODE, displays SINGLES SINGLES.
- 42. On PDU (11), verify RCKT reticle (29) is displayed.
- 43. On MFD (5), verify RKTS SAFED (30) is displayed.
- 44. On ACP (8), set MASTER switch (9) to ARMED.
- 45. Verify ARMED/STBY indicator (10) indicates ARMED.
- 46. On MFD (5), verify RKTS ARMED (31) is displayed.



- 47. Press L3 (28) to select MODE RIPPLE SINGLES.
 - 48. Press L5 (26) ZONE to select ALL.
- 49. On ACP (8), position MASTER switch (9) to OFF.
- 50. Verify ARMED/STBY indicator (10) is not lighted.
 - 51. Verify no symbology is present on PDU.
 - 52. Open PWR RKT circuit breaker (1).



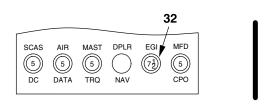




406099-94-8-T J2636

NOTE

- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 53. Open EGI circuit breaker (32).
- 54. Proceed to FOLLOW-ON MAINTENANCE.



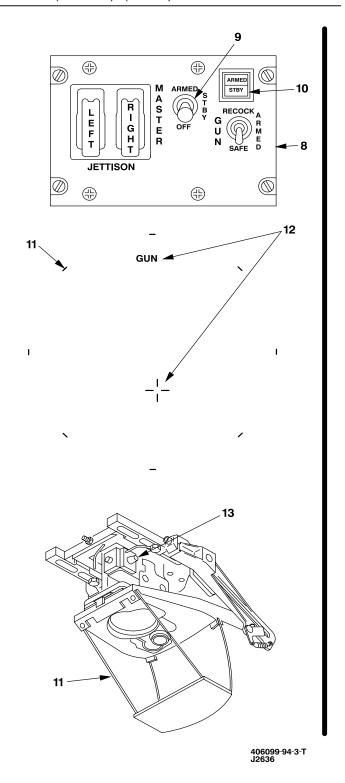
406099-94-9-T J2636

OPERATIONAL CHECK — TWO LAUNCHERS

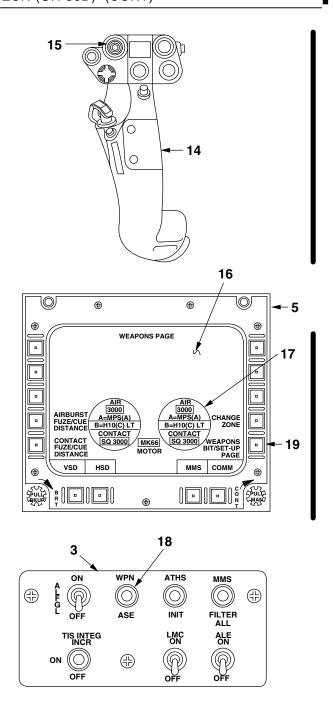
NOTE

For this checkout procedure, the PDU may be used in lieu of the MFD to assure the rocket system is operational.

- 55. On ACP (8), position MASTER switch (9) to STBY.
- 56. Verify ARMED/STBY indicator (10) indicates STBY.
- 57. On PDU (11), verify GUN reticle (12) is displayed within 20 seconds.
- 58. Rotate BRT knob (13) to adjust brightness of GUN reticle (12) to desired level.



- 59. On pilot cyclic grip (14), press WEAPON SEL switch (15) up.
- 60. On pilot MFD (5), verify WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
- 61. On CPG auxiliary control panel (3), toggle WPN/ASE switch (18) to WPN.
- 62. On CPG MFD (5), verify rocket WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
 - 63. On pilot/CPG MFD (5), press R5 (19).



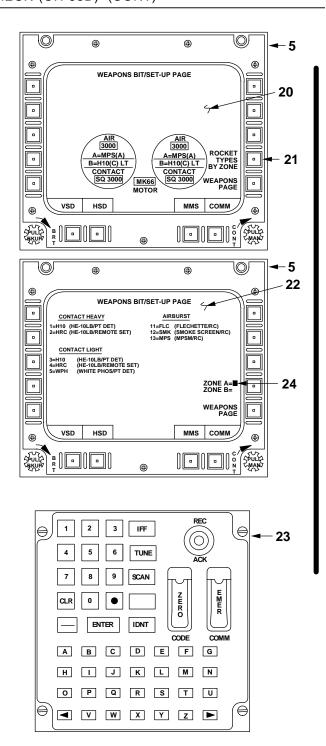
406099-94-10-T J2636

- 64. Verify WEAPONS BIT/SET-UP PAGE (20) is displayed.
 - 65. On pilot MFD (5), press R4 (21).
- 66. Verify WEAPONS BIT/SET-UP PAGE (22) is displayed and cursor appears at ZONE A (24).

NOTE

If operator presses ENTER without entering rocket type data for ZONE A or B, system will default to existing data.

- 67. On MFK (23), enter appropriate code number for type of rocket in ZONE A from screen selections (Example: type 13), then press ENTER.
- 68. Verify WEAPONS BIT/SET-UP PAGE (22) is displayed on pilot MFD (5) and cursor appears at ZONE B (24).
- 69. On MFK (23), enter appropriate code number for type of rocket in ZONE B from screen selections (Example: type 3), then press ENTER.



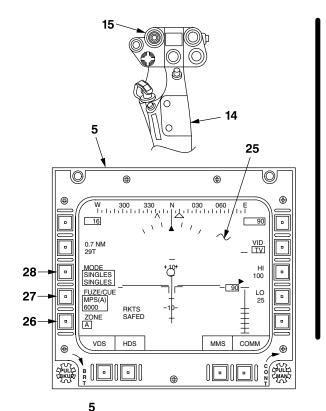
406099-94-11-T J2636

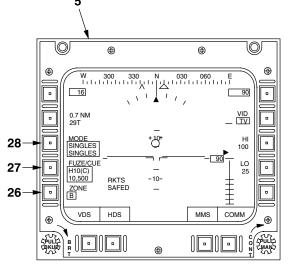
- 70. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to one side.
- 71. On MFD (5), verify rocket sparse VSD page (25) is displayed.
 - 72. Press L5 (26) to select ZONE A.
- 73. Press L4 (27) to select FUZE/CUE MPS(A) distance.
- 74. Verify cursor appears and enter 6000 on MFK. On MFD (5), verify MPS(A) 6000 is displayed.
- 75. Press L3 (28) to sequence display from SINGLES PAIRS, to RIPPLE SINGLES, to RIPPLE PAIRS, to SINGLES SINGLES.
- 76. Press L5 (26) to sequence display from A to B to ALL to A.
 - 77. Ensure L5 (26) is set to display to A.

NOTE

L will display as LAS for laser range and N will display as NAV for prepoint target acquisition.

78. Repeat steps 73 and 74 to sequence display MPS(A) distance from 6000 to 5500 to 5000 to 4500 to 4000 to 3500 to 3000 to 2750 to 2500 to 2250 to 2000 to 1750 to 1500 to 1250 to 1000 to 750 to 500 or (L or N).





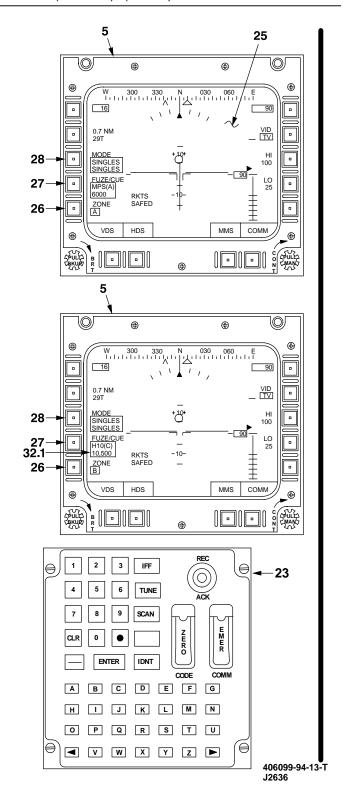
406099-94-12-T J2636

- 79. Press L5 (26) to set display to B.
- 80. Verify H10(C) (32.1) is displayed in FUZE/CUE box.
- 81. Press L4 (27) to select FUZE H10(C) (32.1).
- 82. Verify fuse cursor appears and enter 10 on MFK (23). On MFD (5) verify H10(C) distance is displayed.
- 83. Verify cue cursor appears; select and enter range distances between 500-8000 or (L or N); and on MFD (5), verify range distance appears.
- 84. Repeat steps 81, 82, and 83 to sequence display H10(C) distance from 10 to 15 to 20 to 25 to 30 to 35 to 40 to 45 to Sq to Bunker.

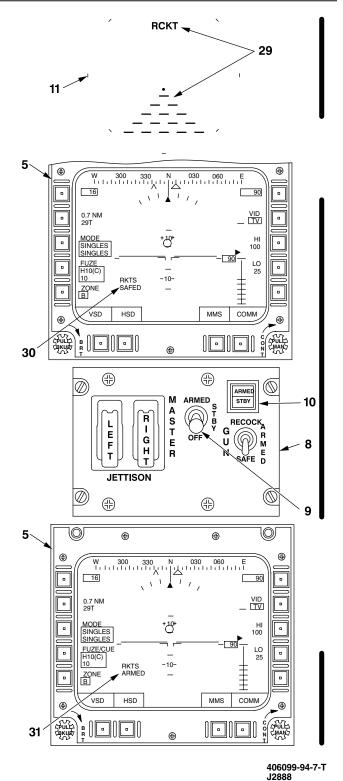
NOTE

Input of S will display as SQ for superquick and B for bunker.

85. Ensure L3 (28) displays SINGLES SINGLES.

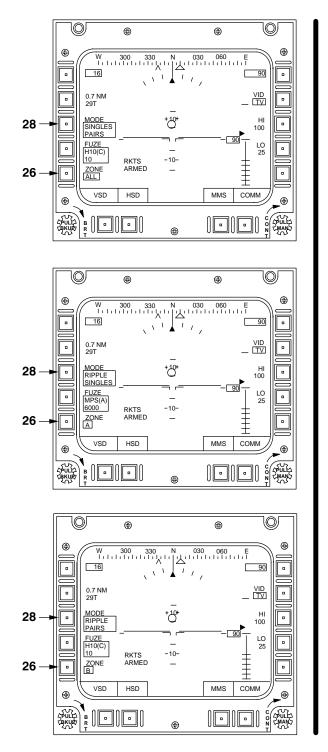


- 86. On PDU (11), verify RCKT reticle (29) is displayed.
- 87. On MFD (5), verify RKTS SAFED (30) is displayed.
- 88. On ACP (8), position MASTER switch (9) to ARMED.
- 89. Verify ARMED/STBY indicator (10) indicates ARMED.
- 90. On MFD (5), verify RKTS ARMED (31) is displayed.



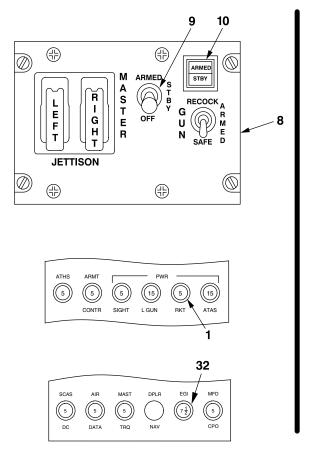
02000

- 91. On MFD (5), press L3 (28) to select MODE SINGLES PAIRS.
 - 92. Press L5 (26) to select ALL.
- 93. Press L3 (28) to select MODE RIPPLE SINGLES.
 - 94. Press L5 (26) to select A.
- 95. Press L3 (28) to select MODE RIPPLE PAIRS.
 - 96. Press L5 (26) to select B.



406099-94-14-T J2636

- 97. On ACP (8), position MASTER switch (9) to OFF.
- 98. Verify ARMED/STBY indicator (10) is not lighted.
 - 99. Verify no symbology is present on PDU.
 - 100. Open PWR RKT circuit breaker (1).
 - 101. Open EGI circuit breaker (32).
- 102. Disconnect external ac electrical power (TM 1-1520-248-23).



406099-95-4-T

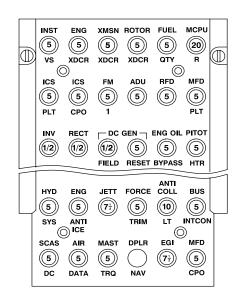
103. Open following circuit breakers:

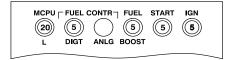
MCPU R
MFD PLT
RECT
BUS INTCON
MFD CPO
MCPU L
ARMT CONT
PWR SIGHT
26VAC PWR
MCPU BLWR

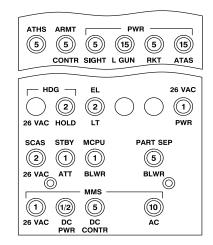
INSPECT

FOLLOW-ON MAINTENANCE

Headset disconnected.







406099-94-16-T J2636

2-5-10. 2.75 ROCKET SYSTE M OPERATIONAL CHECK (OH-58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Aviation Ground Power Unit (AGPU)
Microphone Headset (2)

Personnel Required:

68J Aircraft Armament/Missile Systems Repairer (2) 68J Aircraft Armament/Missile Systems Technical Inspector (TI)

References:

TM 1-1520-248-23 TM 9-1090-214-23&P

Equipment Condition:

Headsets Connected

Setup Procedures for Operational Check

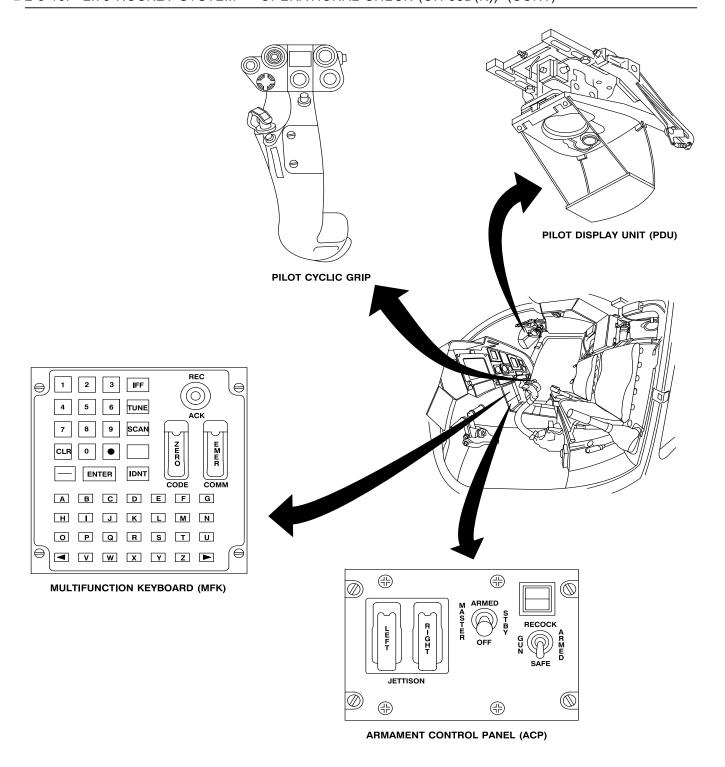
Completed (Task 2-5-2) All Switchs Off/SAFE

Helicopter Safed (TM 1-1520-248-23)

M260 Rocket Launcher Installed (TM 9-1090-214-23&P)

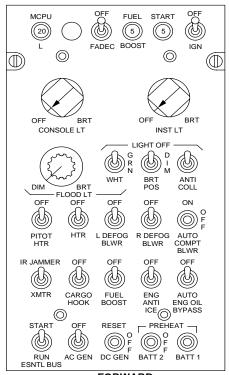
Armament Cable Installed (2.75 Rocket) (TM 9-1090-214-23&P)

PULL SMAN **MULTFUNCTION DISPLAY (MFD)** RADIO MON WPN IDM IMAGE ON (1) $((\bigcirc))$ $(\!(\!\circ\!)\!)$ (0)**(1)** C VOX S C HOT VOX ON G 👉 L OFF ASE INIT **CAPTURE** TSI INTEG on((()) ⅌ ICS CONTROL PANEL OFF **CPG AUXILIARY CONTROL PANEL** 406099-42-1-T J0890

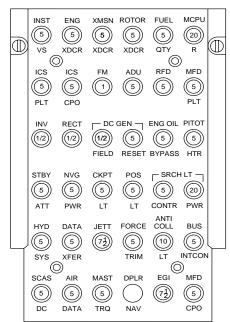


406099-94-1-T J2636

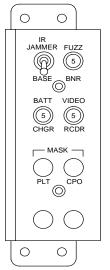
GO TO NEXT PAGE



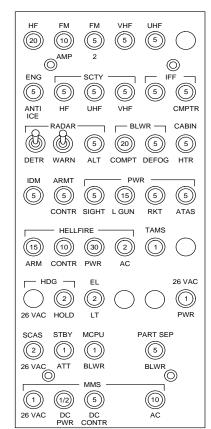
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

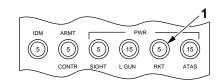
WARNING

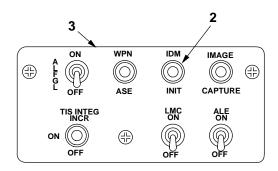
To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are in the down position.

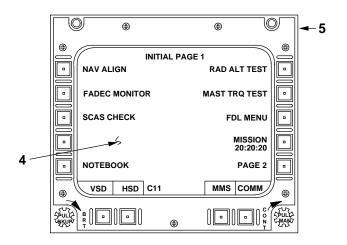
NOTE

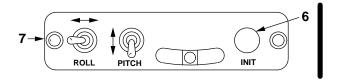
It is understood that the rocket launcher may be installed on either or both sides of the helicopter. The illustrations in this procedure may show .50 caliber machine gun weapons symbology on the left side of the helicopter to represent any weapons loaded.

- 1. Close PWR RKT circuit breaker (1).
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. Position IDM/INIT switch (2), on CPG auxiliary control panel (3), to INIT to display INITIAL PAGE 1 (4) on CPG MFD (5).
- 4. Verify INITIAL PAGE 1 (4) is displayed without MCPU FAIL caution message.
- 5. Press INIT switch (6), on pilot auxiliary control panel (7), to display INITIAL PAGE 1 (4) on pilot MFD (5).
- 6. Verify INITIAL PAGE 1 (4) is displayed without MCPU FAIL caution message.
- 7. Proceed to OPERATIONAL CHECK ONE LAUNCHER/TWO LAUNCHERS (as required).







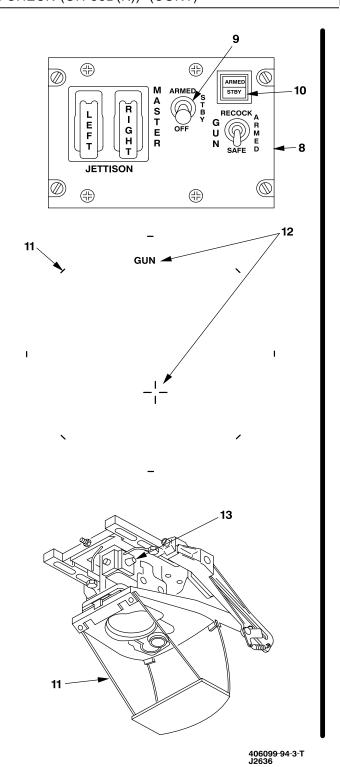


406099-95-1-T J2638

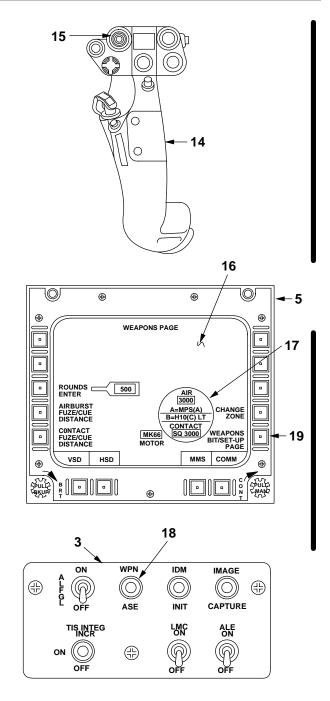
OPERATIONAL CHECK ONE LAUNCHER

NOTE

- For this checkout procedure, HELLFIRE, ATAS, or .50 caliber machine gun armament cable must be connected to the other weapons pylon.
- The following steps will show the .50 caliber machine gun symbol on the left pylon to represent any weapon loaded.
- For this checkout procedure, the PDU may be used to assure the rocket system is operational.
- 8. Ensure other weapon pylon is properly configured.
- 9. On ACP (8), position MASTER switch (9) to STBY.
- 10. Verify ARMED/STBY indicator (10) indicates STBY.
- 11. On PDU (11), verify GUN reticle (12) is displayed within 20 seconds.
- 12. Rotate BRT knob (13) to adjust brightness of GUN reticle (12) to desired level.

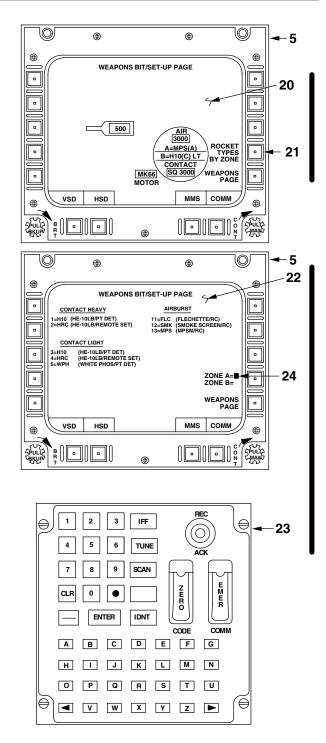


- 13. On pilot cyclic grip (14), press WEAPON SEL switch (15) up.
- 14. On pilot MFD (5), verify WEAPONS PAGE (16) and proper symbology (17) are displayed.
- 15. On CPG auxiliary control panel (3), toggle WPN/ASE switch (18) to WPN.
- 16. On CPG MFD (5), verify WEAPONS PAGE (16) and proper symbology (17) are displayed.
- 17. On pilot and CPG MFD (5), press R5 (19) to select WEAPONS BIT/SET-UP PAGE.



406099-95-2-T J2638

- 18. Verify WEAPONS BIT/SET-UP PAGE (20) is displayed.
- 19. On pilot MFD (5), press R4 (21) to select ROCKET TYPES BY ZONE data.
- 20. Verify WEAPONS BIT/SET-UP PAGE (22) is displayed and cursor appears at ZONE A (24).
 - 21. On MFK (23), type 13 then press ENTER.
- 22. On pilot MFD (5), verify cursor now appears at ZONE B (24).
 - 23. On MFK (23), type 3 then press ENTER.
- 24. Verify appropriate code number and type of rocket in ZONE A and B (24) are displayed.
- 25. On pilot MFD (5), verify WEAPONS/BIT SET-UP PAGE (20) is displayed.



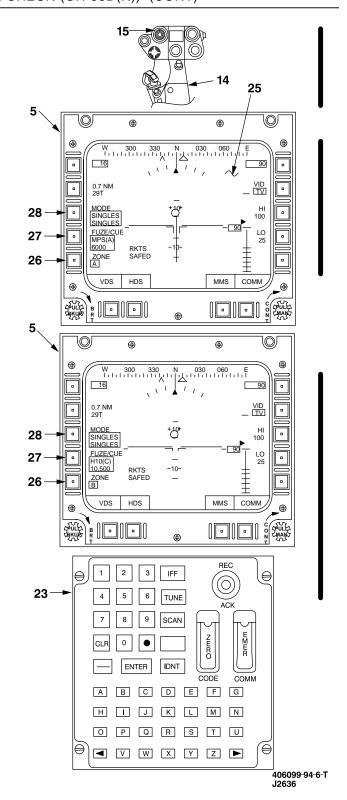
406099-94-5-T J2636

- 26. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to side with rocket launcher loaded.
- 27. On pilot MFD (5), verify rocket sparse VSD page (25) is displayed.
 - 28. Press L5 (26) to select ZONE A.
- 29. Press L4 (27) to select FUZE/CUE MPS(A) distance.
- 30. Verify cursor appears and enter 6000 on MFK (23). On MFD (5), verify MPS(A) 6000 is displayed.
- 31. Press L3 (28) to sequence display from MODE SINGLES SINGLES, to MODE RIPPLE SINGLES, to MODE SINGLES SINGLES.
- 32. Press L5 (26) to sequence display from A, to B, to ALL, to A.
 - 33. Ensure L5 (26) is set to display A.

NOTE

L will display as LAS for laser range and N will display as NAV for prepoint target acquisition.

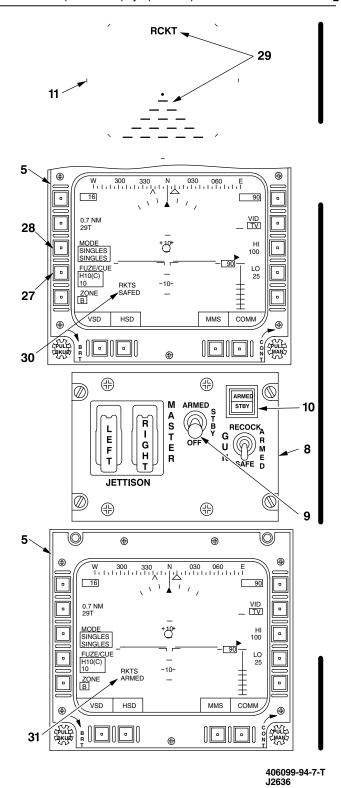
- 34. Repeat steps 31 and 32 to sequence display MPS(A) distance from 6000 to 5500 to 5000 to 4500 to 4000 to 3500 to 3000 to 2750 to 2500 to 2250 to 2000 to 1750 to 1500 to 1250 to 1000 to 750 to 500 or (L or N).
 - 35. Press L5 (26) to set display ZONE to B.
- 36. Verify H10(C) is displayed in FUZE/CUE box.
 - 37. Press L4 (27) to select FUZE H10(C).
- 38. Verify fuze cursor appears and enter 10 on MFK (23). On MFD (5), verify display is H10(C) 10 (meters).
- 39. Verify cue cursor appears; select and enter range distances between 500-8000 to (L or N); and on MFD (5), verify range distance appears.



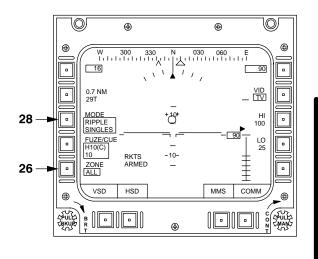
NOTE

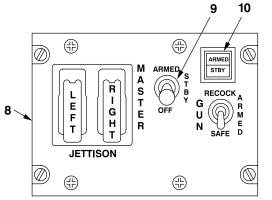
Input of S will display as SQ for superquick and B for bunker.

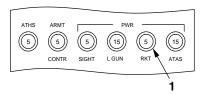
- 40. Repeat steps 37, 38, and 39 to sequence display H10(C) distance from 10 to 15 to 20 to 25 to 30 to 35 to 40 to 45 to SQ to BUNKER.
- 41. Ensure L3 (28), MODE, displays SINGLES SINGLES.
- 42. On PDU (11), verify RCKT reticle (29) is displayed.
- 43. On MFD (5), verify RKTS SAFED (30) is displayed.
- 44. On ACP (8), position MASTER switch (9) to ARMED.
- 45. Verify ARMED/STBY indicator (10) indicates ARMED.
- 46. On MFD (5), verify RKTS ARMED (31) is displayed.



- 47. Press L3 (28) to select MODE RIPPLE SINGLES.
 - 48. Press L5 (26) to select ZONE ALL.
- 49. On ACP (8), select MASTER switch (9) to OFF.
- 50. Verify ARMED/STBY indicator (10) is not lighted.
 - 51. Verify no symbology is present on PDU.
 - 52. Open PWR RKT circuit breaker (1).



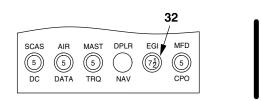




406099-94-8-T J2636

NOTE

- If another weapon system operational check is to be performed, proceed to required task.
- If no other weapon system operational checks are to be performed, proceed to the following steps.
- 53. Open EGI circuit breaker (32).
- 54. Proceed to FOLLOW-ON MAINTENANCE.



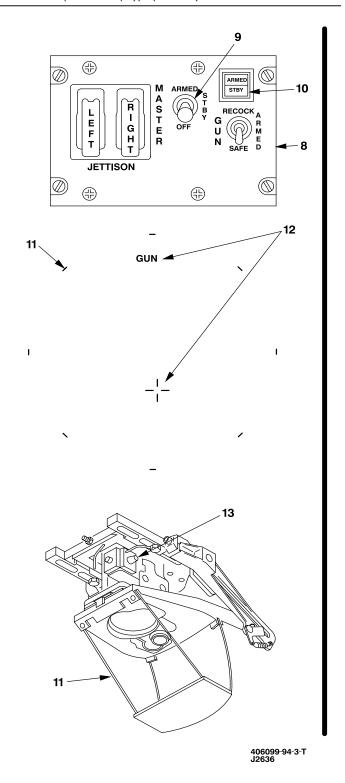
406099-94-9-T J2636

OPERATIONAL CHECK — TWO LAUNCHERS

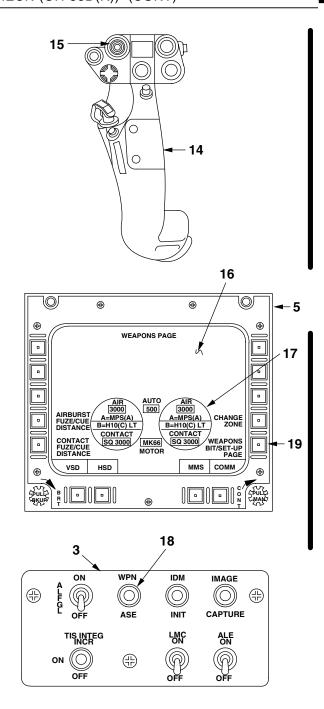
NOTE

For this check out procedure, the PDU may be used to assure the rocket system is operational.

- 55. On ACP (8), position MASTER switch (9) to STBY.
- 56. Verify ARMED/STBY indicator (10) indicates STBY.
- 57. On PDU (11), verify GUN reticle (12) is displayed within 20 seconds.
- 58. Rotate BRT knob (13) to adjust brightness of GUN reticle (12) to desired level.



- 59. On pilot cyclic grip (14), press WEAPON SEL switch (15) up.
- 60. On pilot MFD (5), verify WEAPONS PAGE (16) is displayed and proper weapon symbology (17) are displayed.
- 61. On CPG auxiliary control panel (3), toggle WPN/ASE switch (18) to WPN.
- 62. On CPG MFD (5), verify rocket WEAPONS PAGE (16) and proper weapon symbology (17) are displayed.
 - 63. On pilot and CPG MFD (5), press R5 (19).



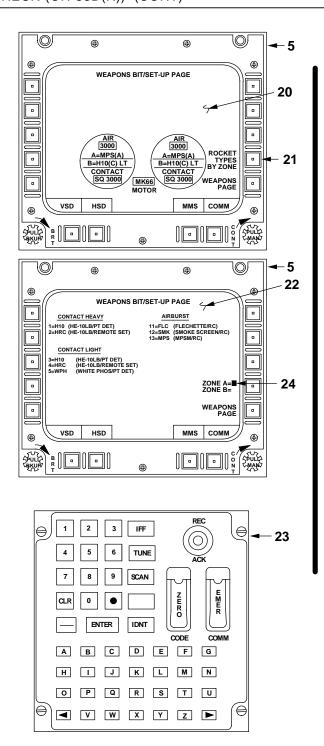
406099-95-3-T J2638

- 64. Verify WEAPONS BIT/SET-UP PAGE (20) is displayed.
 - 65. On pilot MFD (5), press R4 (21).
- 66. Verify WEAPONS BIT/SET-UP PAGE (22) is displayed and cursor appears at ZONE A (24).

NOTE

If operator presses ENTER without entering rocket type data for ZONE A or B, system will default to existing data.

- 67. On MFK (23), enter appropriate code number for type of rocket in ZONE A from screen selections (Example: type 13), then press ENTER.
- 68. Verify WEAPONS BIT/SET-UP PAGE (22) is displayed on pilot MFD (5) and cursor appears at ZONE B (24).
- 69. On MFK (23), enter appropriate code number for type of rocket in ZONE B from screen selections (Example: type 3), then press ENTER.



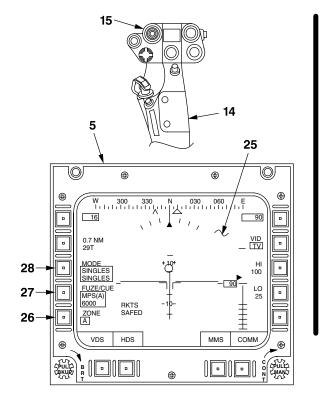
406099-94-11-T J2636

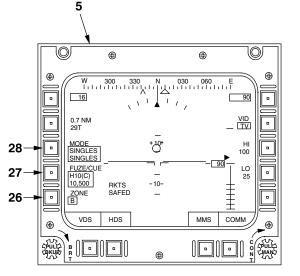
- 70. On pilot cyclic grip (14), press WEAPON SEL switch (15) twice to one side.
- 71. On pilot MFD (5), verify rocket sparse VSD page (25) is displayed.
 - 72. Press L5 (26) to select ZONE A.
- 73. Press L4 (27) to select FUZE/CUE MPS(A) distance.
- 74. Verify cursor appears and enter 6000 on MFK. On MFD (5), verify MPS(A) 6000 is displayed.
- 75. Press L3 (28) to sequence display from SINGLES PAIRS, to RIPPLE SINGLES, to RIPPLE PAIRS, to SINGLES SINGLES.
- 76. Press L5 (26) to sequence display from A, to B, to ALL, to A.
 - 77. Ensure L5 (26) is set to display A.

NOTE

L will display as LAS for laser range and N will display as NAV for prepoint target acquisition.

78. Repeat steps 73 and 74 to sequence display MPS(A) distance from 6000 to 5500 to 5000 to 4500 to 4000 to 3500 to 3000 to 2750 to 2500 to 2250 to 2000 to 1750 to 1500 to 1250 to 1000 to 750 to 500 or (L or N).





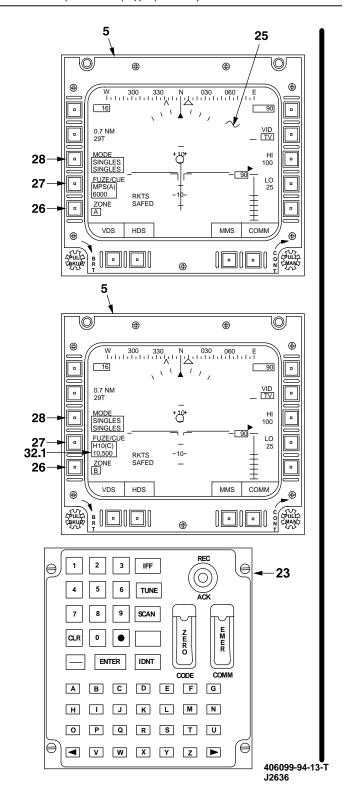
406099-94-12-T J2636

- 79. Press L5 (26) to set display to B.
- 80. Verify H10(C) is displayed in FUZE/CUE box.
 - 81. Press L4 (27) to select FUZE H10(C).
- 82. Verify fuze cursor appears and enter 10 on MFK.
- 83. Verify cue cursor appears; select and enter range distances between 500-8000 or (L or N); and on MFD (5), verify range distance appears.
- 84. Repeat steps 81, 82, and 83 to sequence display H10(C) distance from 10 to 15 to 20 to 25 to 30 to 35 to 40 to 45 to SQ to BUNKER.

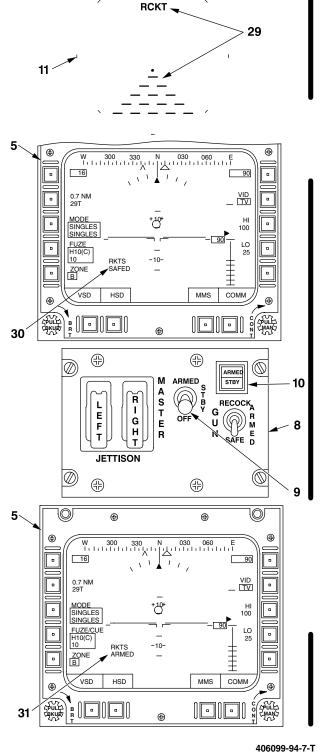
NOTE

Input of S will display as SQ for superquick and B for bunker.

85. Ensure L3 (28) displays SINGLES SINGLES.

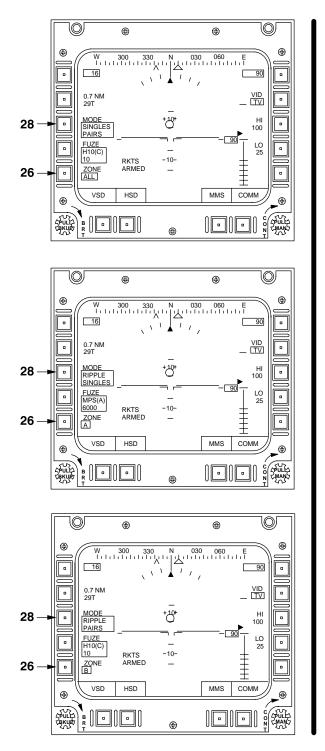


- 86. On PDU (11), verify RCKT reticle (29) is displayed.
- 87. On MFD (5), verify RKTS SAFED (30) is displayed.
- 88. On ACP (8), position MASTER switch (9) to ARMED.
- 89. Verify ARMED/STBY indicator (10) indicates ARMED.
- 90. On MFD (5), verify RKTS ARMED (31) is displayed.



J2888

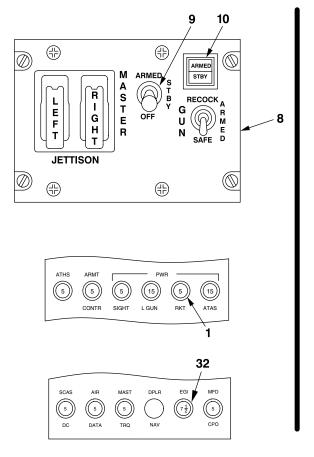
- 91. Press L3 (28) to select MODE SINGLES PAIRS.
 - 92. Press L5 (26) to select MODE ALL.
- 93. Press L3 to select MODE RIPPLE SINGLES.
 - 94. Press L5 (26) to select ZONE A.
- 95. Press L3 (28) to select MODE RIPPLE PAIRS.
 - 96. Press L5 to select ZONE B.



406099-94-14-T J2636

2-5-10. 2.75 ROCKET SYSTEM OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 97. On ACP (8), position MASTER switch (9) to OFF.
- 98. Verify ARMED/STBY indicator (10) is not lighted.
 - 99. Verify no symbology is present on PDU.
 - 100. Open PWR RKT circuit breaker (1).
 - 101. Open EGI circuit breaker (32).



406099-95-4-T

2-5-10. 2.75 ROCKET SYSTEM — OPERATIONAL CHECK (OH-58D(R)) (CONT)

102. Disconnect external ac electrical power (TM 1-1520-248-23).

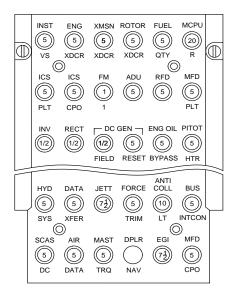
103. Open following circuit breakers:

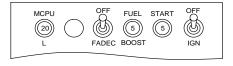
MCPU R
MFD PLT
RECT
BUS INTCON
MFD CPO
MCPU L
ARMT CONT
PWR SIGHT
26 VAC PWR
MCPU BLWR

INSPECT

FOLLOW-ON MAINTENANCE

Headset disconnected.





IDM 5	ARMT 5 CONTR	5 SIGHT	PW (15) L GUN	R	5 ATAS
26 VAC	DG — 2 HOLD	EL 2 LT	\bigcirc	\bigcirc	26 VAC
SCAS 2 26 VAC	STBY	1 BLWR	F	PART SE 5 BLWR	P O
1 26 VAC	DC PWR	DC CONTR		(10) AC	

406099-81-6-T J1631

2-5-11. JETTISON CIRCUIT OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: ALL

Tools:

Armament Repairer Basic Tool Set (B16)
Armament Repairer Supplemental Tool Set (B17)
Aviation Ground Power Unit (AGPU)
Multimeter (B3)

Personnel Required: 68J Aircraft Armament/Missile Systems Repairer (2) 68J Aircraft Armament/Missile Systems Technical Inspector (TI)

References:

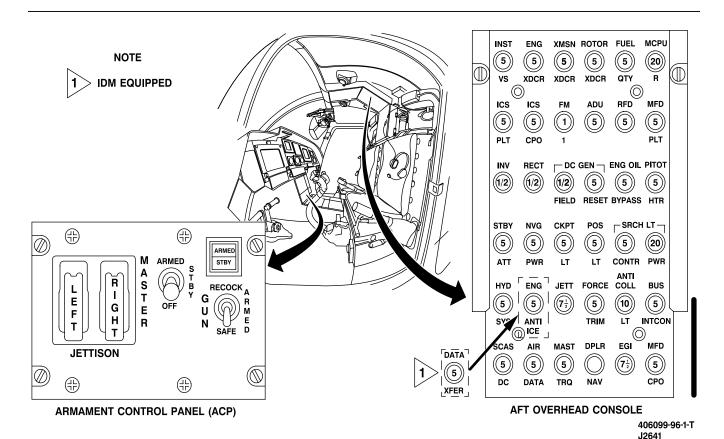
TM 1-1520-248-23 TM 9-1090-214-23&P

Equipment Condition:
All Switches Off/SAFE

Helicopter Safed (TM 1-1520-248-23)

All Impulse Cartridges Removed (TM 9-1090-214-23&P)

External AC Electrical Power Connected (TM 1-1520-248-23)



GO TO NEXT PAGE

2-5-11. JETTISON CIRCUIT — OPERATIONAL CHECK (CONT)

WARNING

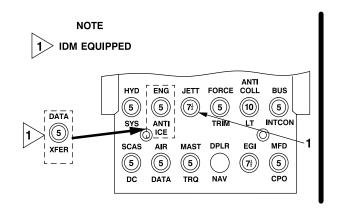
To prevent inadvertent jettison of armament stores, ensure JETT circuit breaker is open and both JETTISON switches are in the down position.

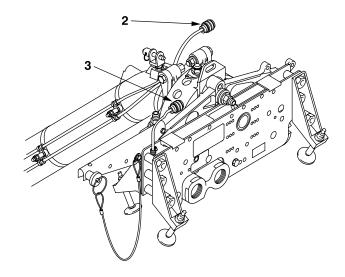
- 1. Open JETT circuit breaker (1).
- 2. Apply external ac electrical power (TM 1-1520-248-23).
- 3. Disconnect ejector rack electrical connectors (2 and 3) on both sides of helicopter.
- 4. Position LEFT JETTISON and RIGHT JETTISON switches (4 and 5) down and close covers.

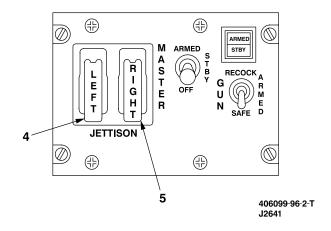
NOTE

If the left weapons pylon has a machine gun pod installed, the armament cable must be removed (TM 9-1090-214-23&P) before continuing with this checkout procedure.

- 5. Close JETT circuit breaker (1).
- 6. Set multimeter to read voltage.
- 7. Connect multimeter leads to pins A and C of left jettison ejector rack airframe electrical connector (2). Verify no voltage reading on multimeter.
- 8. Position LEFT JETTISON switch (4) to up. Verify 28 Vdc reading on multimeter.
- 9. Position LEFT JETTISON switch (4) to down and close cover. Verify no voltage reading on multimeter.

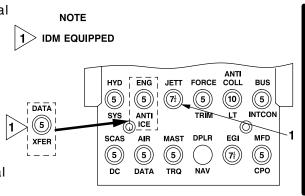


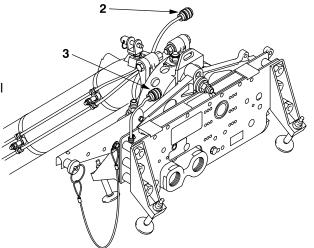


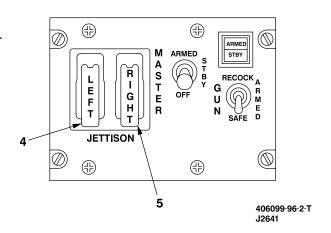


2-5-11. JETTISON CIRCUIT OPERATIONAL CHECK (CONT)

- 10. Connect multimeter leads to pins B and C of left jettison ejector rack airframe electrical connector (2). Verify no voltage reading on multimeter.
- 11. Position LEFT JETTISON switch (4) to up. Verify 28 Vdc reading on multimeter.
- 12. Position LEFT JETTISON switch (4) to down and close cover. Verify no voltage reading on multimeter.
- 13. Connect multimeter leads to pins A and C of right jettison ejector rack airframe electrical connector (2). Verify no voltage reading on multimeter.
- 14. Position RIGHT JETTISON switch (5) to up. Verify 28 Vdc reading on multimeter.
- 15. Position RIGHT JETTISON switch (5) to down and close cover. Verify no voltage reading on multimeter.
- 16. Connect multimeter leads to pins B and C of right jettison ejector rack airframe electrical connector (2). Verify no voltage reading on multimeter.
- 17. Position RIGHT JETTISON switch (5) to up. Verify 28 Vdc reading on multimeter.
- 18. Position RIGHT JETTISON switch (5) to down and close cover. Verify no voltage reading on multimeter.
 - 19. Open JETT circuit breaker (1).
 - 20. Set multimeter to read ohms.
- 21. Verify continuity present from pin C (ground) of ejector connector (3) to ejector housing of both right and left ejectors. Meter should show minimum esistance reading.







■ 2-5-11. JETTISON CIRCUIT — OPERATIONAL CHECK (CONT)

NOTE

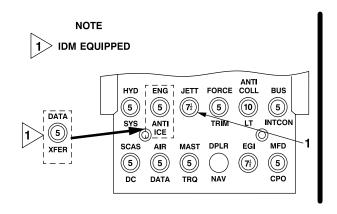
Pins A or B may be connected to contact in either breech.

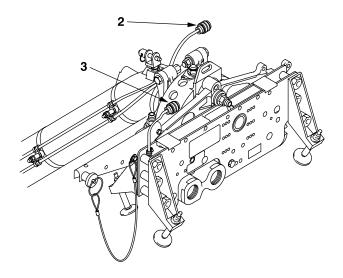
- 22. Verify continuity present from pins A and B of ejector connectors (3) to contact in breech of both right and left ejectors.
- 23. Verify continuity not present between pins A and B of ejector connector (3) on both right and left ejectors.
- 24. Verify continuity not present from pins A to C and B to C of ejector connector (3).
- 25. Install machine gun armament cable to fuselage disconnect (TM 9-1090-214-23&P).
 - 26. Close JETT circuit breaker (1).
 - 27. Position LEFT JETTISON switch (4) to up.
 - 28. Set multimeter to read voltage.
- 29. Using multimeter verify no voltage exists between pins A and C or B and C of ejector rack airframe electrical connector (2), left side of helicopter.
- 30. Position LEFT JETTISON switch (4) to down and close cover.
 - 31. Open JETT circuit breaker (1).
- 32. Disconnect external ac electrical power (TM 1-1520-248-23).
- 33. Connect ejector rack electrical connectors (2 and 3) on both sides of helicopter.
- 34. Install impulse cartridges (TM 9-1090-214-23&P).

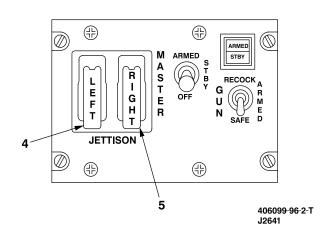
INSPECT

FOLLOW-ON MAINTENANCE

Disconnect machine gun armament cable (TM 9-1090-214-23&P) and stow.







Section VI. ELECTRICAL SYSTEM

2-7. TASK LIST

The list of tasks provides a numerical index of operational checks contained in this section. Electrical system operational checks are listed in column one (Task). To perform these checks refer to column two (Task Number) which will indicate the task number to be performed. The individual task should be performed in sequence as specified in each task unless otherwise noted within the task.

Correction of malfunctions must be verified by performing an operational check using the procedures in this section.

NOTE

MFD displays shown herein are typical and may vary with the particular operational flight program in use.

LIST OF TASKS

TASK	TASK NUMBER	PAGE NUMBER
AC Electrical Power System (Engine Operating) — Operational Check (OH-58D)	2-6-1	2-283
AC Electrical Power System (Engine Operating) — Operational Check (OH-58D(R))	2-6-2	2-288
AC Electrical Power System (Inverter Operation) — Operational Check (OH-58D)	2-6-3	2-293
AC Electrical Power System (Inverter Operation) — Operational Check (OH-58D(R))	2-6-4	2-294
Battery Charger-Monitor — Operational Check	2-6-5	2-295
Battery No. 1 — Operational Check (OH-58D)	2-6-6	2-303
Battery No. 1 — Operational Check (OH-58D(R))	2-6-7	2-304
Battery No. 2 — Operational Check (OH-58D)	2-6-8	2-305
Battery No. 2 — Operational Check (OH-58D(R))	2-6-9	2-306
Control Display System (CDS) Interface — Operational Check (OH-		
58D)	2-6-10	2-307
Control Display System (CDS) Interface — Operational Check (OH-58D(R))	2-6-11	2-316
Control Display System (CDS) Fault Detection Locator System/ Built-In Test (FDLS/BIT) — Operational Check (OH-58D)	2-6-12	2-325
Control Display System (CDS) Fault Detection Locator System/ Built-In Test (FDLS/BIT) with FADEC Monitor — Operational		
Check (OH-58D(R))	2-6-13	2-360
Environmental Electrical System — Operational Check (OH-58D) Environmental Electrical System — Operational Check (OH-	2-6-14	2-392
58D(R))	2-6-15	2-400
AC External Power — Operational Check (OH-58D)	2-6-16	2-408
AC External Power — Operational Check (OH-58D(R))	2-6-17	2-414
DC External Power — Operational Check (OH-58D)	2-6-18	2-420
DC External Power — Operational Check (OH-58D(R))	2-6-19	2-427
Mast Torque Calibration	2-6-20	2-434
Mast Mounted Sight (MMS) Interface — Operational Check (OH-		
58D)	2-6-21	2-439
Mast Mounted Sight (MMS) Interface — Operational Check (OH-	0.0.00	0.440
58D(R))	2-6-22	2-443
Multiplex (1553) (MUX) Data Bus — Operational Check (OH-58D)	2-6-23	2-447

LIST OF TASKS (CONT)

TASK	TASK NUMBER	PAGE NUMBER
Multiplex (1553) (MUX) Data Bus — Operational Check (OH-		
58D(R))	2-6-24	2-451
Starter-Generator and Control — Operational Check (OH-58D)	2-6-25	2-455
Starter-Generator and Control — Operational Check (OH-58D(R))	2-6-26	2-463
Transformer Rectifier Unit (TRU) — Operational Check (OH-58D)	2-6-27	2-471
Transformer Rectifier Unit (TRU) — Operational Check (OH-58D(R))	2-6-28	2-477
Night Vision Goggles (NVG) Power Converter — Operational		
Check	2-6-29	2-483
Transmission Attitude Measurement System (TAMS) — Operational Check (OH-58D)	2-6-30	2-487
Transmission Attitude Measurement System (TAMS) — Operational		
Check (OH-58D(R))	2-6-31	2-492
Transmission Electrical System — Operational Check (OH-58D)	2-6-32	2-497
Transmission Electrical System — Operational Check (OH-58D(R))	2-6-33	2-504
Powerplant Electrical System — Operational Check (OH-58D)	2-6-34	2-511
Powerplant Electrical System — Operational Check (OH-58D(R))	2-6-35	2-532
Floodlights — Operational Check	2-6-36	2-551
Utility Light — Operational Check	2-6-37	2-554
Instrument Lights — Operational Check	2-6-38	2-557
Console Lights — Operational Check	2-6-39	2-560
Position Lights — Operational Check	2-6-40	2-566
Anticollision Lights — Operational Check	2-6-41	2-569
Searchlight — Operational Check	2-6-42	2-572
SCAS and Hydraulic Electrical System — Operational Check (OH-		
58D)	2-6-43	2-577
SCAS and Hydraulic Electrical System — Operational Check (OH-		
58D(R))	2-6-44	2-586
Control Display System (CDS) Opto Sensors — Operational Check	2-6-45	2-595

2-6-1. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Electrical Repairer Tool Kit (B14)
Aviation Ground Power Unit (AGPU)

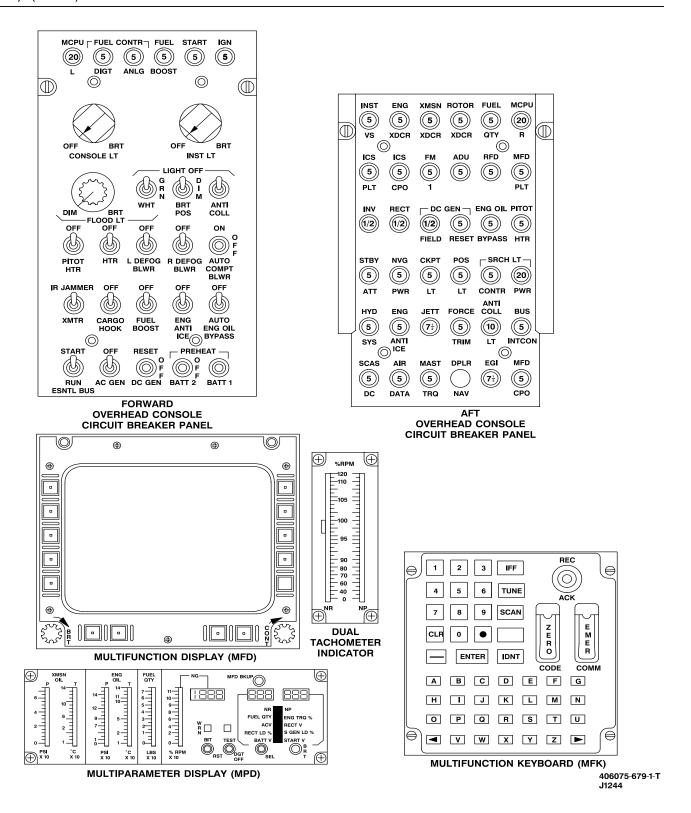
Personnel Required: 68F Aircraft Electrician Pilot References:

TM 1-1520-248-10 TM 1-1520-248-CL TM 1-1520-248-23

Equipment Condition:

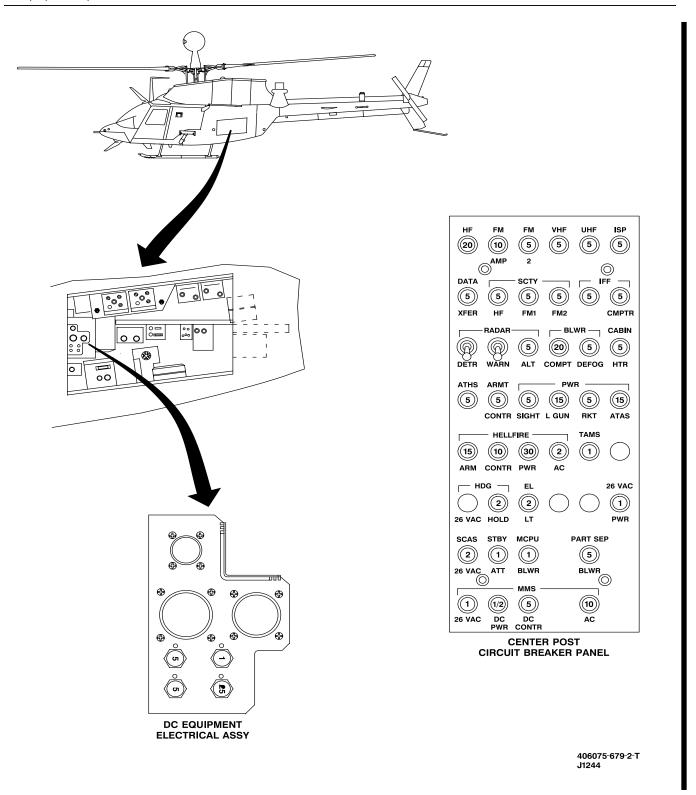
Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed
(Overhead Console/Center Post Circuit Breaker
Panel, Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

2-6-1. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH-58D) (CONT)



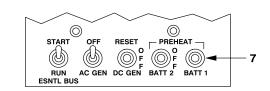
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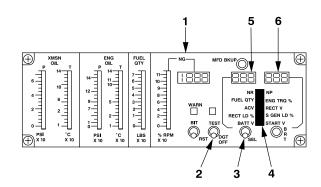
2-6-1. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH-58D) (CONT)



2-6-1. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH-58D) (CONT)

- 1. Apply external dc electrical power (TM 1-1520-248-23).
- 2. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - 3. On MPD (1):
 - a. Do not select DGT OFF (2).
- b. Toggle SEL switch (3) until ACV-RECT V position (4) is lit.
- c. Observe that 115 \pm 3 VAC is present on digital indicator (5) and 000 is present on digital indicator (6).
- 4. Turn off external dc electrical power (TM 1-1520-248-23).
 - 5. Set BATT 1 switch (7) to BATT 1.



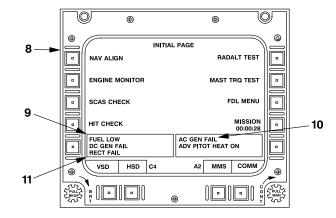


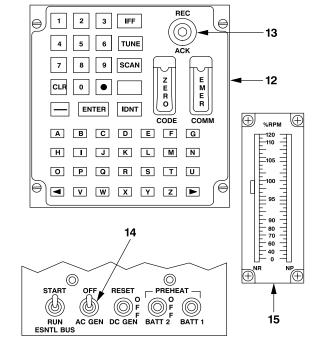
406075-679-3-T

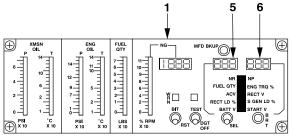
2-6-1. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH-58D) (CONT)

6. On pilot MFD (8) INITIAL PAGE:

- a. Observe that INV FAIL, AC GEN FAIL, and RECT FAIL caution messages (9,10,11) are present.
- b. If the message "x" MORE MESSAGES ("x" = the number of messages left to be displayed) is present, toggle multifunction keyboard (MFK) (12) REC/ACK switch (13) to REC as required to locate additional messages.
 - 7. Set AC GEN switch (14) to AC GEN.
- a. Pilot slowly increase engine rpm (TM 1-1520-248-10).
- b. Observe that ac generator comes on line between 93-96 percent rotor rpm indicated on dual tachometer (15). AC generator on line is indicated by 115 \pm 3 VAC being displayed on digital indicator (5) on MPD (1).
- c. Observe that digital indicator (6) on MPD(1) indicates 24 VDC to 30 VDC.
 - 8. On MFD (8).
- a. Observe that INV FAIL caution message(9) is still present.
- b. Observe that AC GEN FAIL (10) and RECT FAIL (11) caution messages are gone.
- 9. Pilot increase rotor rpm to 100 percent (TM 1-1520-248-10). Observe that voltages remain within the parameters given in steps 7.b and 7.c.
- 10. Pilot decrease rotor rpm (TM 1-1520-248-10). While observing digital indicator (5) the ac generator shall go off line at a rotor rpm between 91-88 percent.
- 11. Pilot shut down helicopter (TM 1-1520-248-10).
- 12. Disconnect external dc electrical power (TM 1-1520-248-23).







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END OF TASK

2-6-2. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH- 58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

OH-58D(R)

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician Pilot References:

TM 1-1520-248-10 TM 1-1520-248-CL TM 1-1520-248-23

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

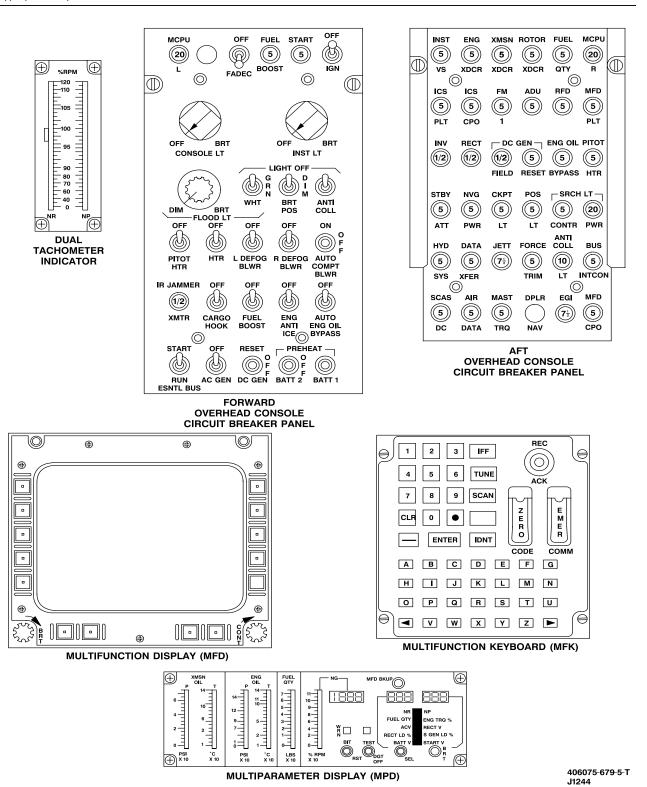
All Circuit Breakers — Closed

(Overhead Console/Center Post Circuit Breaker Panel, Nose and Aft Electrical

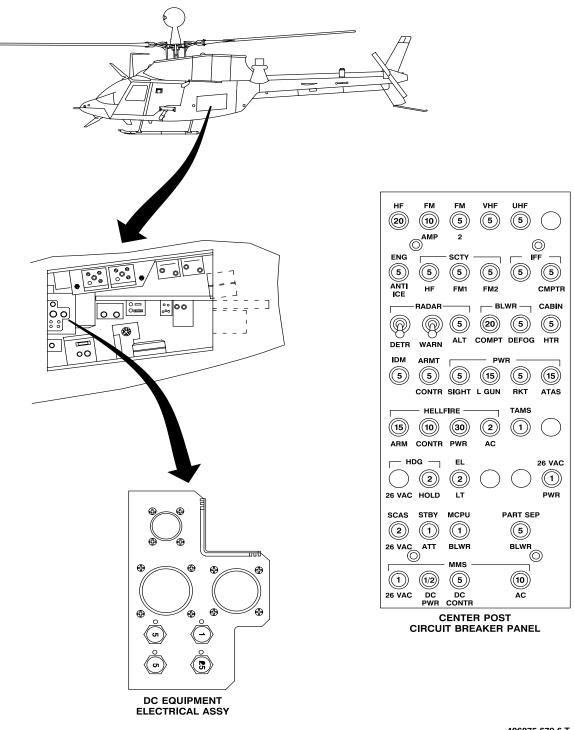
Compartment)

All Switches - Off/SAFE

2-6-2. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH-58D(R)) (CONT)



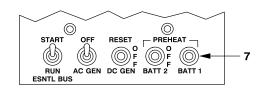
2-6-2. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH- 58D(R)) (CONT)

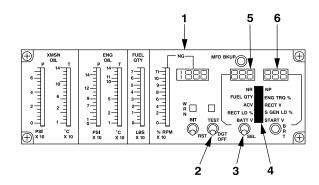


406075-679-6-T J1244

2-6-2. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH- 58D(R)) (CONT)

- 1. Apply external dc electrical power (TM 1-1520-248-23).
- 2. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - 3. On MPD (1):
 - a. Do not select DGT OFF (2).
- b. Toggle SEL switch (3) until ACV-RECT V position (4) is lit.
- c. Observe that 115 ± 3 VAC is present on digital indicator (5) and 000 is present on digital indicator (6).
- 4. Turn off external dc electrical power (TM 1-1520-248-23).
 - 5. Set BATT 1 switch (7) to BATT 1.





406075-679-7-T

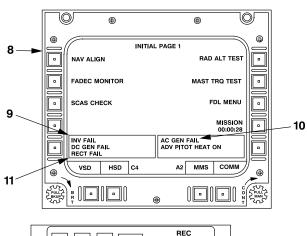
2-6-2. AC ELECTRICAL POWER SYSTEM (ENGINE OPERATING) — OPERATIONAL CHECK (OH- 58D(R)) (CONT)

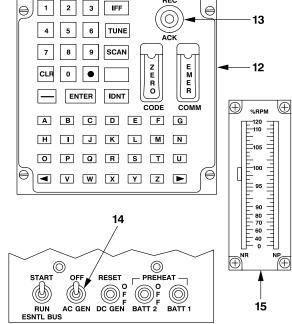
6. On pilot MFD (8) INITIAL PAGE 1:

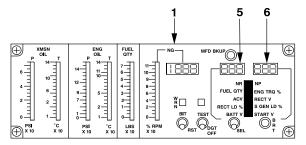
- a. Observe that INV FAIL, AC GEN FAIL, and RECT FAIL caution messages (9,10,11) are present.
- b. If the message "x" MORE MESSAGES ("x" = the number of messages left to be displayed) is present, toggle keyboard (12) REC/ACK switch (13) to REC as required to locate additional messages.
 - 7. Set AC GEN switch (14) to AC GEN.
- a. Pilot slowly increase engine rpm (TM 1-1520-248-10).
- b. Observe that ac generator comes on line between 93–96 percent rotor rpm indicated on dual tachometer (15). AC generator on line is indicated by 115 ± 3 VAC being displayed on digital indicator (5) on MPD (1).
- c. Observe that digital indicator (6) on MPD (1) indicates 24–30 VDC.

8. On MFD (8):

- a. Observe that INV FAIL caution message (9) is still present.
- b. Observe that AC GEN FAIL (10) and RECT FAIL (11) caution messages are gone.
- 9. Pilot increase rotor rpm to 100 percent (TM 1-1520-248-10). Observe that voltages remain within parameters given in steps 7.b. and 7.c.
- 10. Pilot decrease rotor rpm (TM 1-1520-248-10). While observing digital indicator (5) the ac generator shall go off line at a rotor rpm between 91-88 percent.
- 11. Pilot shut down helicopter (TM 1-1520-248-10).
- 12. Disconnect external dc electrical power (TM 1-1520-248-23).







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2-6-3. AC ELECTRICAL POWER SYSTEM (INVERTER OPERATION) — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Personnel Required: 68F Aircraft Electrician

Applicable Configurations: OH-58D

TM 1-1520-248-T-1

2-6-4. AC ELECTRICAL POWER SYSTEM (INVERTER OPERATION) — OPERATIONAL CHECK (OH- 58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Personnel Required: 68F Aircraft Electrician

Applicable Configurations: OH-58D(R)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-10 TM 1-1520-248-CL TM 1-1520-248-23

Applicable Configurations:

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel, Nose and Aft Electrical Compartment)

All Switches - Off/SAFE

Tools:

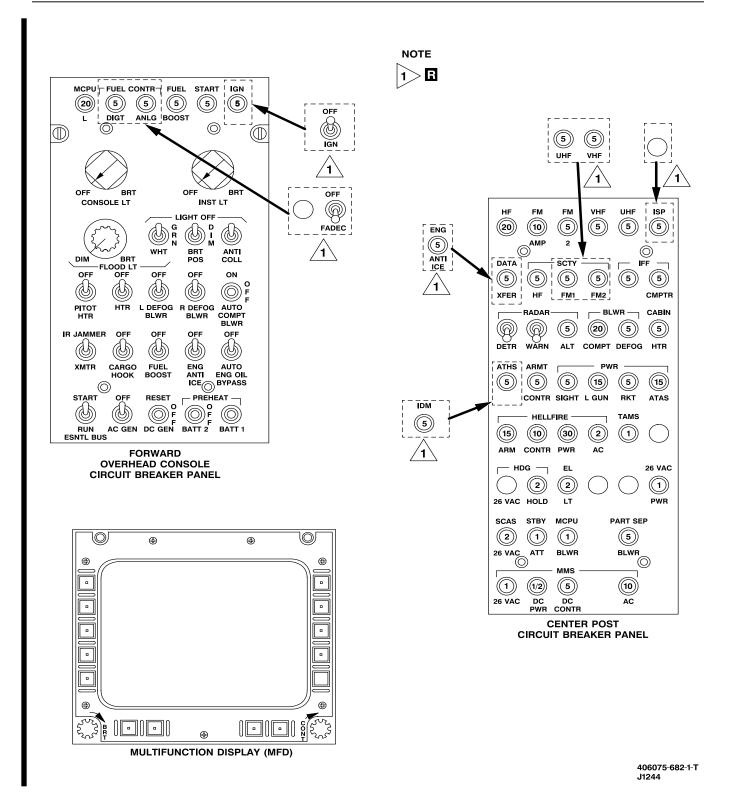
Electrical Repairer Tool Kit (B14)

Multimeter (B3)

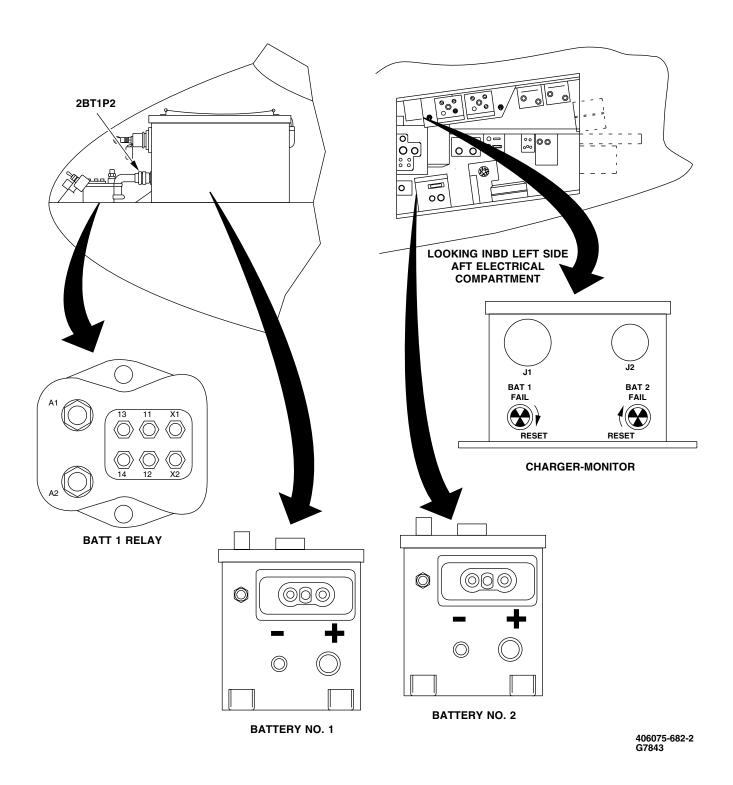
Aviation Ground Power Unit (AGPU)

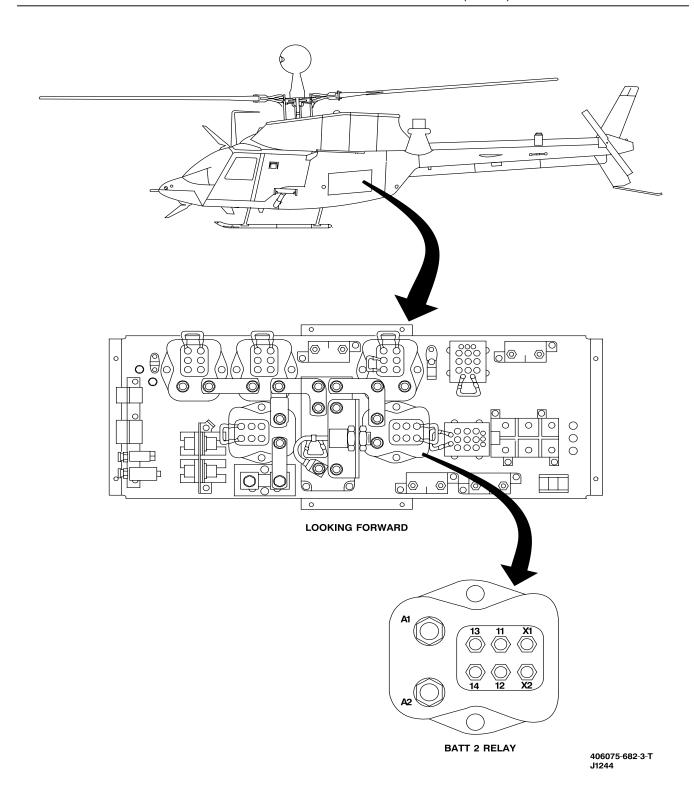
Personnel Required: 68F Aircraft Electrician

Pilot



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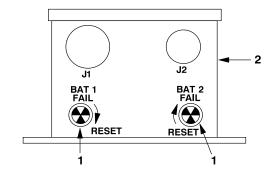


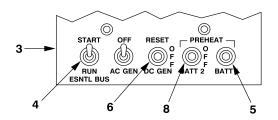


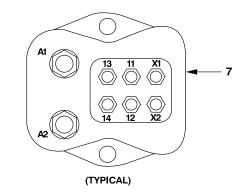
NOTE

Testing the battery charger-monitor requires installation of the battery winterization kit (charger-monitor and battery number 2). It also requires running the helicopter.

- 1. Check BAT 1 FAIL and BAT 2 FAIL indicators (1) on the charger-monitor (2). If they show a failed condition, reset them manually.
 - 2. On forward overhead console panel (3):
 - a. Set ESNTL BUS switch (4) to START.
 - b. Set BATT 1 switch (5) to BATT 1.
- 3. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - 4. On forward overhead console panel (3):
 - a. Set DC GEN switch (6) to DC GEN.
- b. Ensure that battery number 1 stays connected to the battery-generator bus through contacts A1 and A2 of number 1 battery relay (7) (there should be 0 VDC between contacts A1 and A2 of battery 1 relay).
 - 5. Set BATT 1 switch (5) to OFF.
- 6. Set BATT 2 switch (8) to BATT 2, and ensure that battery number 2 stays connected to the battery-generator bus through contacts A1 and A2 of number 2 battery relay (7) (there should be 0 VDC between contacts A1 and A2 of battery 2 relay).
 - 7. Set BATT 1 switch (5) to BATT 1.
- a. Observe that either battery number 1 or battery number 2 disconnects from battery-generator bus by the opening of contacts A1 and A2 of number 1 battery relay (7) or number 2 battery relay (7). Measure voltage across A1 and A2 of battery 1 relay and battery 2 relay. A measurement of 0 VDC indicates a closed relay. This indicates that charger-monitor (2) is not charging the battery with the open relay.







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- b. Observe the battery not being charged by the charger-monitor stays connected to the battery-generator bus through its closed relay (voltage measurement between A1 and A2 produces 0 VDC).
- 8. At open contacts A1 and A2 of either battery 1 or battery 2 relay (7):
- a. Measure dc voltage to ground from A1 of battery 1 relay (7) or A2 of battery 2 relay (7) (whichever relay has a positive or negative voltage between A1 and A2).
- b. Observe that this voltage is approximately 25 VDC or higher and gradually increases.

NOTE

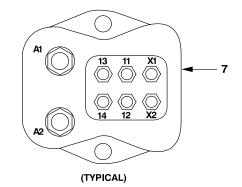
The voltage may have to be monitored for several minutes to observe increase. The charger-monitor is charging the battery with open relay and is gradually increasing its output voltage to maintain an approximately constant 17 amperes charging current into the battery in the main charge mode.

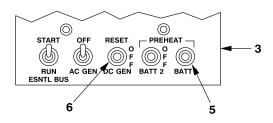
- 9. On forward overhead console panel (3):
 - a. Set DC GEN switch (6) to OFF.
- b. Observe that open battery relay contacts A1 and A2 close (dc voltage across A1 and A2 is 0).

NOTE

Both batteries are now connected to battery-generator bus.

10. Pilot shut down helicopter (TM 1-1520-248-10/CL).





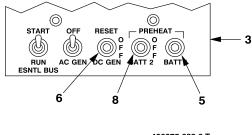
406075-682-5-T J1244

- 11. On forward overhead console panel (3):
 - a. Set BATT 1 switch (5) to OFF.
 - b. Set BATT 2 switch (8) to BATT 2.
- 12. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - 13. On forward overhead console panel (3):
 - a. Set BATT 1 switch (5) to BATT 1.
 - b. Set DC GEN switch (6) to DC GEN.
- c. Observe that opposite battery relay from step 8.a. is now open and the other relay remains connected to the battery-generator bus (determine by measuring across relay contacts A1 and A2).

NOTE

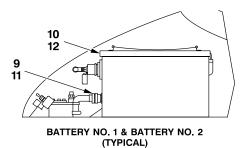
The charger-monitor is now charging the opposite battery from the one in step 8.a., because it switches batteries with each engine start.

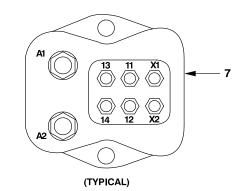
- 14. Repeat step 9. on the battery relay which is now open.
 - 15. Repeat step 10.
- 16. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 17. On forward overhead console panel (3), set BATT 1 switch (5) to OFF.

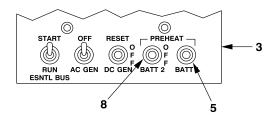


406075-682-6-T

- 18. Disconnect 2BT1P2 (9) from battery number 1 (10).
- 19. Apply external dc electrical power (TM 1-1520-248-23).
 - 20. On forward overhead console panel (3):
 - a. Set BATT 1 switch (5) to BATT 1.
 - b. Set BATT 2 switch (8) to BATT 2.
- c. Observe that both batteries are connected to battery-generator bus through closed battery relays (7), terminals A1 and A2 (0 VDC measured across A1 and A2 of each relay).
- 21. Turn off external dc electrical power (TM 1-1520-248-23).
- 22. Set BATT 1 (5) and BATT 2 (8) switches to OFF.
- 23. Connect 2BT1P2 (9) to battery number 1 (10).
- 24. Disconnect 2BT2P2 (11) from battery number 2 (12).
- 25. Turn on external dc electrical power (TM 1-1520-248-23).
- 26. Set BATT 1 (5) and BATT 2 (8) switches to BATT 1 and BATT 2.
- 27. Observe that both batteries are connected to battery-generator bus through closed battery relays (7), terminals A1 and A2 (0 VDC measured across A1 and A2 of each relay).
- 28. Disconnect external dc electrical power (TM 1-1520-248-23).
- 29. Set BATT 1 (5) and BATT 2 (8) switches to OFF.
- 30. Connect 2BT2P2 (11) to battery number 2 (12).







406075-682-7-T

2-6-6. BATTERY NO. 1 — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Personnel Required: 68F Aircraft Electrician

Applicable Configurations: OH-58D

TM 1-1520-248-T-1

2-6-7. BATTERY NO. 1 — OPERATIONAL CHECK (OH-58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Personnel Required: 68F Aircraft Electrician

Applicable Configurations: OH-58D(R)

2-6-8. BATTERY NO. 2 — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Personnel Required: 68F Aircraft Electrician

Applicable Configurations: OH-58D

TM 1-1520-248-T-1

2-6-9. BATTERY NO. 2 — OPERATIONAL CHECK (OH-58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Personnel Required: 68F Aircraft Electrician

Applicable Configurations: OH-58D(R)

2-6-10. CONTROL DISPLAY SYSTEM (CDS) INTERFACE — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

OH-58D

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post, Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

All Switches — Off/SAFE

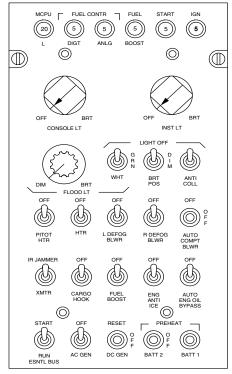
Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

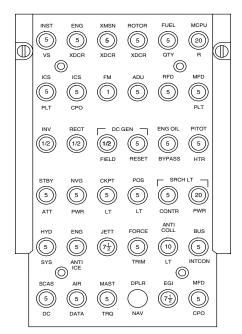
Microphone Headset

Personnel Required: 68F Aircraft Electrician

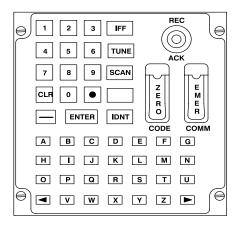
2-6-10. CONTROL DISPLAY SYSTEM (CDS) INTERFACE — OPERATIONAL CHECK (OH-58D) (CONT)



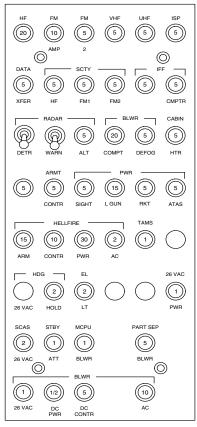
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



MULTIFUNCTION KEYBOARD (MFK)

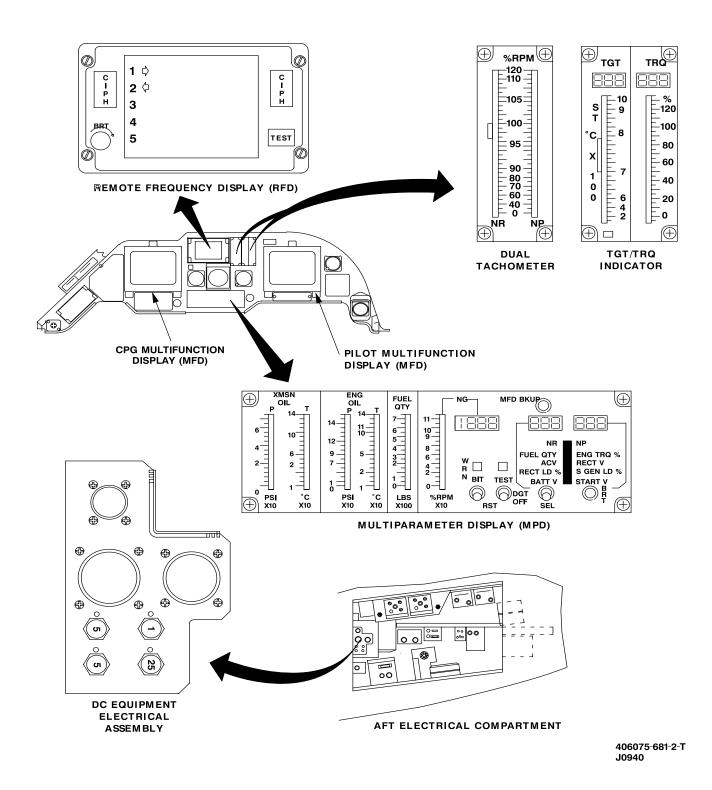


CENTER POST CIRCUIT BREAKER PANEL

406075-1576-1-T J1292

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2-6-10. CONTROL DISPLAY SYSTEM (CDS) INTERFACE — OPERATIONAL CHECK (OH-58D) (CONT)

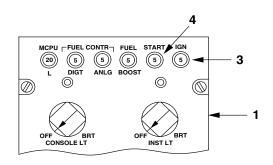


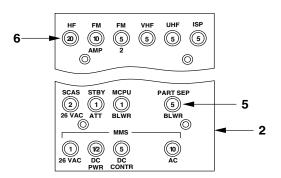
2-6-10. CONTROL DISPLAY SYSTEM (CDS) INTERFACE — OPERATIONAL CHECK (OH-58D) (CONT)

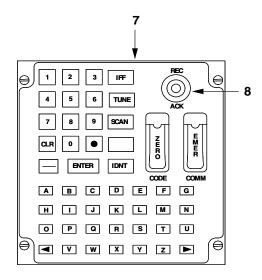
1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) START (4) PART SEP BLWR (5) HF (6)

- 2. Apply external dc electrical power (TM 1-1520-248-23). Allow 30 seconds for warmup.
- 3. Acknowledge all caution messages with keyboard (7) REC/ACK switch (8).

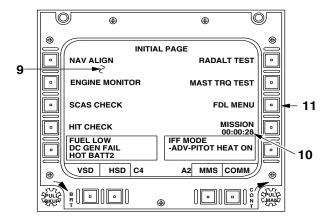


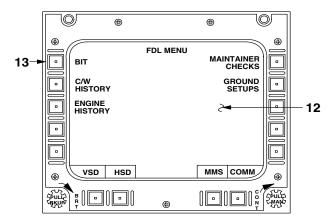


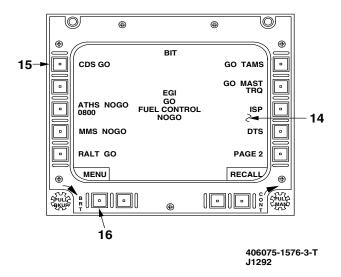


406075-1576-2-T J1292

- 4. Verify that each MFD displays an INITIAL PAGE (9) and the image is clear and legible.
- 5. Verify that MISSION display (10) on INITIAL PAGE (9) is counting in seconds.
- 6. On INITIAL PAGE (9) on either MFD, press R3 (11), FDL MENU key.
- 7. On FDL MENU page (12), press L1 (13), BIT key.
- 8. On BIT page (14), press L1 (15), CDS key. Verify that GO is displayed next to CDS. If NO GO is displayed, note the failure code and refer to Appendix F.
- 9. On BIT page (14), press mode select key A (16), MENU.





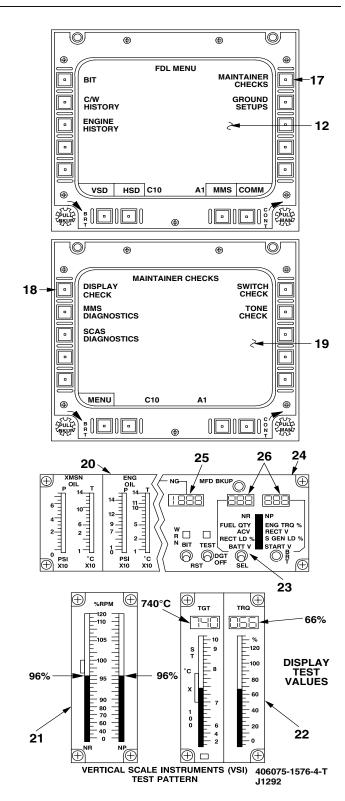


- 10. On either MFD:
- a. Press R1 (17), MAINTAINER CHECKS key, from FDL MENU page (12).
- b. Press L1 (18), DISPLAY CHECK key, from MAINTAINER CHECKS page (19).
- 11. Verify vertical scale instruments (20), (21), and (22) go to mid-scale.
- 12. Toggle SEL switch (23) on MPD (24) and verify digital displays (25) and (26) indicate the following:

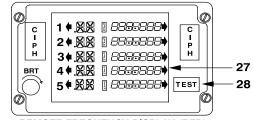
NOTE

Substeps (b) through (f) require SEL switch (23) to be toggled to verify each indication.

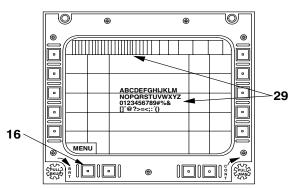
- a. NG 70
- b. NR/NP 000/95
- c. FUEL QTY/ENG TRQ % 350/11
- d. ACV/RECT V 111/11
- e. RECT LD %/S GEN LD % 11/11
- f. BATT V/START V 11/11



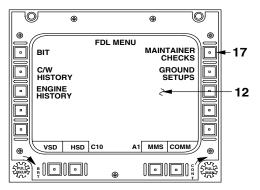
- g. RFD alternating test pattern (27) is displayed. If alternating test pattern is not displayed, press RFD TEST switch (28).
 - h. MFD test pattern (29) displayed on MFD.
- 13. On MFD, press mode select key A (16), MENU, then press R1 (17), MAINTAINER CHECKS key, from FDL MENU page (12).



REMOTE FREQUENCY DISPLAY (RFD)
TEST PATTERN
NOTE: PATTERN SHOWN FLASHES ON AND OFF



MULTIFUNCTION DISPLAY (MFD) TEST PATTERN (GRAY SCALE)



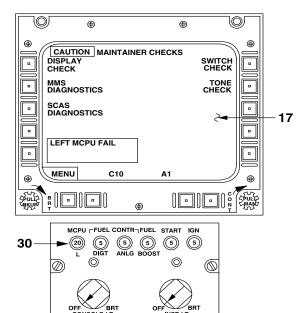
406075-1576-5-T J1292

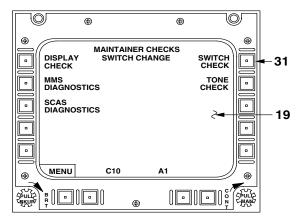
- 14. Open MCPU L circuit breaker (30) on forward overhead console panel. Verify that caution tone (one beep per second) is heard in headset and LEFT MCPU FAIL caution message is displayed in lower left corner of pilot MFD.
 - 15. Close MCPU L circuit breaker (30).
- 16. Acknowledge caution messages and repeat steps 14 and 15 with MCPU R circuit breaker open (MCPU L circuit breaker closed).
- 17. On CPG MFD, with MAINTAINER CHECKS page (19) shown, press R1 (31), SWITCH CHECK key.

NOTE

There are ten line address keys, five on each side of MFD, and four mode select keys along the bottom edge of MFD.

- 18. Press each line address and mode select key separately on CPG MFD (except the one key labeled SWITCH CHECK (31). Verify that there is a tone (one chime) in the headset for each key and that the MFD displays SWITCH CHANGE.
- 19. Repeat steps 17. through 19. for the pilot MFD.



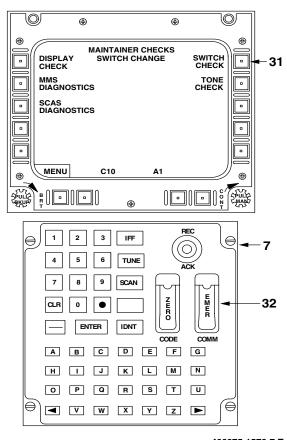


406075-1576-6-T

20. Perform keyboard check for each key and the two guarded toggle switches (32) on the keyboard (7).

NOTE

- In SWITCH CHECK mode, the cockpit switches connected through the keyboard will not operate normally i.e., system will not respond to switch actions. These switches may also be tested in the SWITCH CHECK mode.
- SWITCH CHECK mode cannot be disabled unless each cockpit switch is in the same position as when SWITCH CHECK mode was selected. If the system gets stuck in SWITCH CHECK mode because of the above constraint, the MCPUs may be powered down and then powered up again to disable SWITCH CHECK mode.
- 21. Press R1 (31), SWITCH CHECK key, on each MFD again to disable SWITCH CHECK mode.
- 22. Disconnect external dc electrical power (TM 1-1520-248-23).



406075-1576-7-T J1292

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

OH-58D(R)

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead Console/Center Post, Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

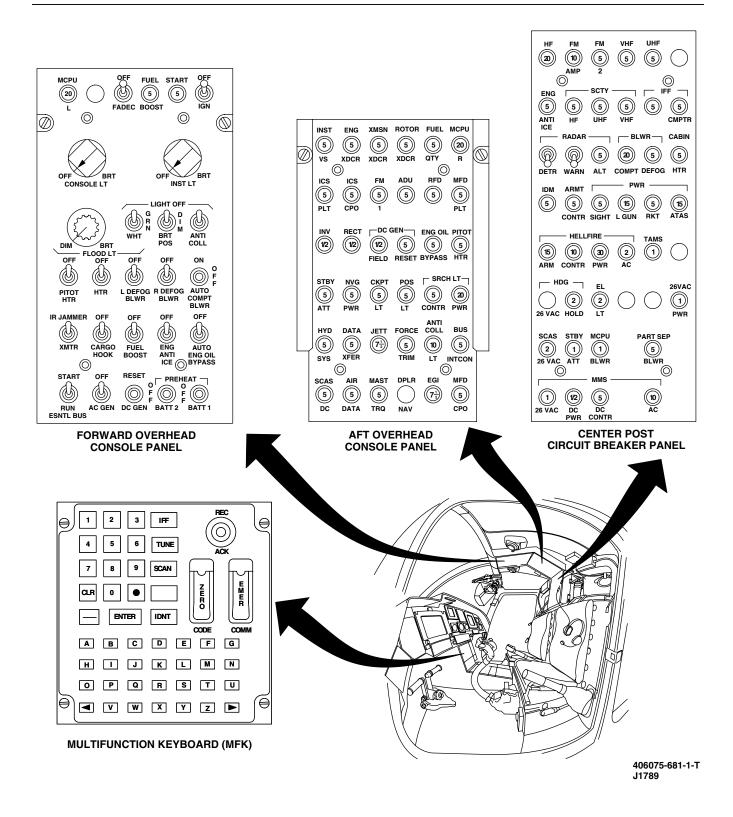
All Switches — Off/SAFE

Tools:

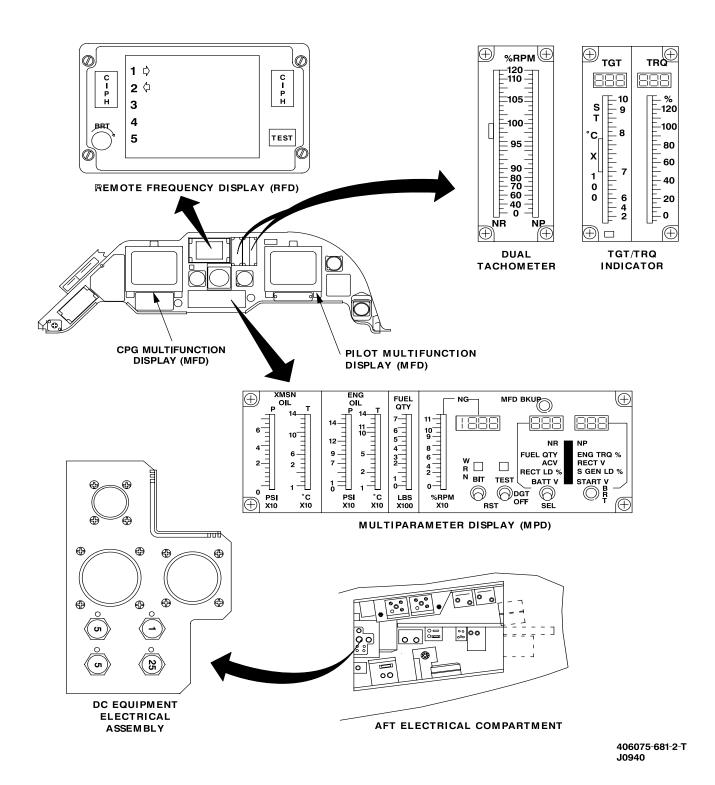
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Headset

Personnel Required: 68F Aircraft Electrician



2-6-11. CONTROL DISPLAY SYSTEM (CDS) INTERFACE — OPERATIONAL CHECK (OH-58D(R)) (CONT)

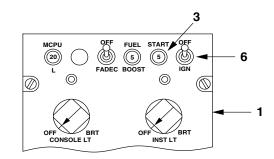


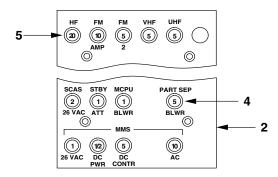
GO TO NEXT PAGE

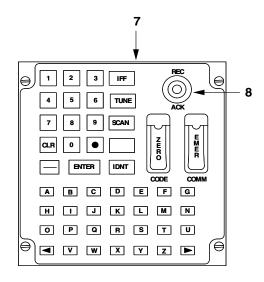
1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

START (3) PART SEP BLWR (4) HF (5)

- 2. On overhead console panel (1), position IGN switch (6) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23). Allow 30 seconds for warmup.
- 4. Acknowledge all caution messages with keyboard (7) REC/ACK switch (8).







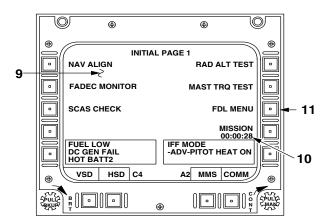
406075-681-3-T J1789

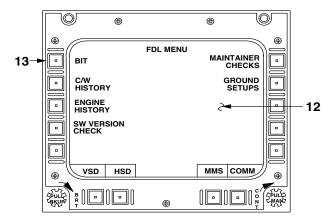
- 5. Verify that each MFD displays INITIAL PAGE 1 (9) and the image is clear and legible.
- 6. Verify that MISSION (10) is displayed and counting in seconds.

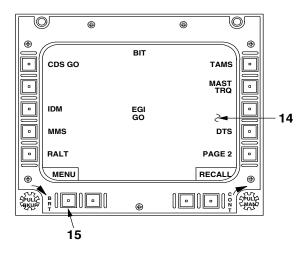
NOTE

There are ten line address keys, five on each side of MFD, and four mode select keys along the bottom edge of MFD.

- 7. On CPG MFD press R3 (11), FDL MENU key.
- 8. On FDL MENU page (12), press L1 (13), BIT key.
- 9. On BIT page (14), verify that GO is displayed next to CDS. If NO GO is displayed, note the failure code and refer to Appendix F.
 - 10. Press mode select key A (15), MENU, on BIT page (14).







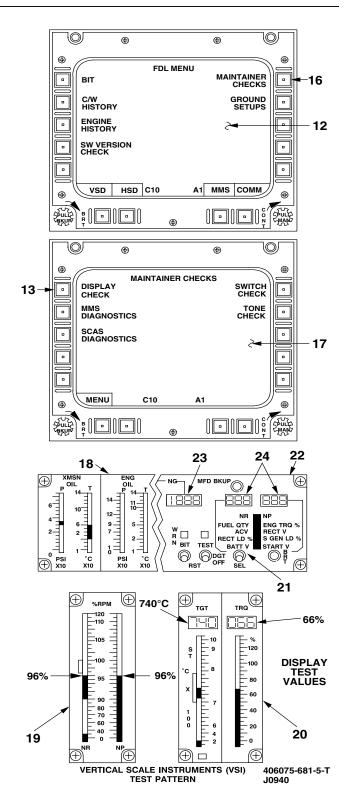
406075-681-4-T J1789

- 11. Press R1 (16), MAINTAINER CHECKS key, from FDL MENU page (12).
- 12. Press L1 (13), DISPLAY CHECK key, on MAINTAINER CHECKS page (17).
- 13. Verify vertical scale instruments (18), (19), and (20) go to mid-scale.
- 14. Toggle SEL switch (21) on MPD (22) and verify digital displays (23) and (24) indicate the following:

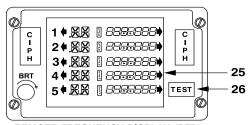
NOTE

Substeps (b) through (f) require SEL switch (21) to be toggled for each indication.

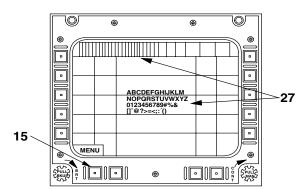
- a. NG 70.0
- b. NR/NP 000/95
- c. FUEL QTY/ENG TRQ % 350/11
- d. ACV/RECT V 11.1/11
- e. RECT LD %/S GEN LD % 11/11
- f. BATT V/START V 11/11



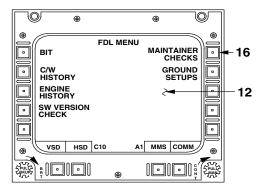
- 15. Verify RFD alternating test pattern (25) is displayed. If alternating test pattern is not displayed, press RFD TEST switch (26).
 - 16. MFD test pattern (27) displayed on MFD.
- 17. Press mode select key A (15), MENU, then press R1 (16), MAINTAINER CHECKS key, on FDL MENU page (12).



REMOTE FREQUENCY DISPLAY (RFD)
TEST PATTERN
NOTE: PATTERN SHOWN FLASHES ON AND OFF



MULTIFUNCTION DISPLAY (MFD) TEST PATTERN (GRAY SCALE)



406075-681-6-T J1066

NOTE

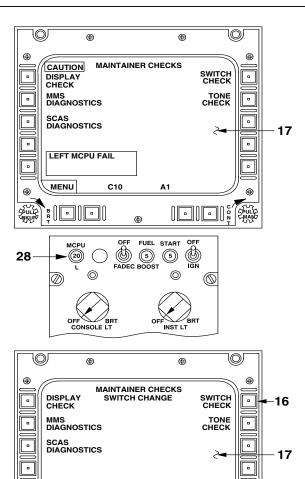
Caution and advisory message displays will be indicated on both MFD screens regardless of page position.

- 18. Open MCPU L circuit breaker (28) on forward overhead console panel. Verify that caution tone (one beep per second) is heard in headset and LEFT MCPU FAIL caution message is displayed in lower left corner of the pilot MFD.
 - 19. Close MCPU L circuit breaker (28).
 - 20. Acknowledge caution messages.
- 21. Repeat steps 18 through 20 using MCPU R circuit breaker. RIGHT MCPU FAIL and WEAPONS FAIL caution messages are displayed in lower left corner of CPG MFD, along with ASE FAIL advisory message. RMS FAIL advisory message will display in lower right corner of CPG MFD.
 - 22. Repeat step 7, then step 11.
- 23. Press R1 (16), SWITCH CHECK key, on MAINTAINER CHECKS page (17).

NOTE

There are ten line address keys, five on each side of MFD, and four mode select keys along the bottom edge of MFD.

- 24. Press each line address and mode select key separately on CPG MFD (except key R1 (16) labeled SWITCH CHECK). Verify that there is a tone (one chime) in the headset for each key pressed and MFD displays SWITCH CHANGE.
- 25. Press R1 (16), SWITCH CHECK key, again to disable SWITCH CHECK mode.



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(11)

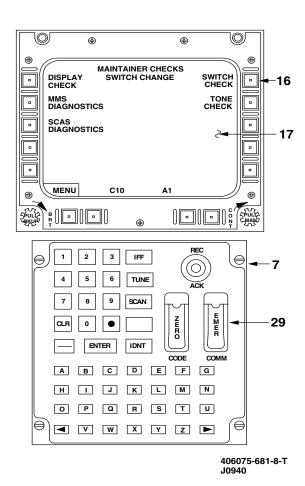
MENU

406075-681-7-T

- 26. Repeat step 7, then step 11, from pilot MFD.
- 27. With MAINTAINER CHECKS page (17) showing on pilot MFD, press R1 (16), SWITCH CHECK key.
- 28. Press each line address and mode select key separately on pilot MFD (except key R1 (16) labeled SWITCH CHECK). Verify that there is a tone (one chime) in the headset for each key pressed and MFD displays SWITCH CHANGE.

NOTE

- In SWITCH CHECK mode, the cockpit switches connected through the keyboard will not operate normally i.e., system will not respond to switch actions. These switches may also be tested in the SWITCH CHECK mode.
- SWITCH CHECK mode cannot be disabled unless each cockpit switch is in the same position as when SWITCH CHECK mode was selected. If the system gets stuck in SWITCH CHECK mode because of the above constraint, the MCPU's may be powered down and then powered up again to disable SWITCH CHECK mode.
- 29. Press each key and the two guarded toggle switches (29) on the keyboard (7).
- 30. Press R1 (16), SWITCH CHECK key, on pilot MFD again to disable SWITCH CHECK mode.
- 31. Disconnect external dc electrical power (TM 1-1520-248-23).



END OF TASK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References: TM 1-1427-779-23

TM 1-1427-779-23 TM 11-1520-248-23 TM 1-1520-248-23

Applicable Configurations: OH-58D

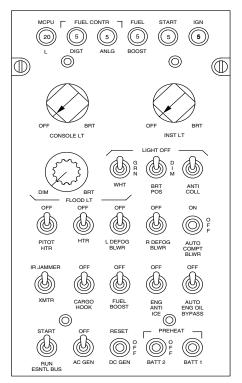
Tools:

Electrical Repairer Tool Kit (B14)
Aviation Ground Power Unit (AGPU)

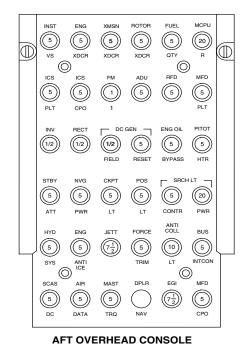
Personnel Required: 68F Aircraft Electrician **Equipment Condition:**

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

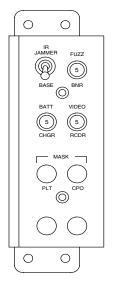
All Switches - Off/SAFE



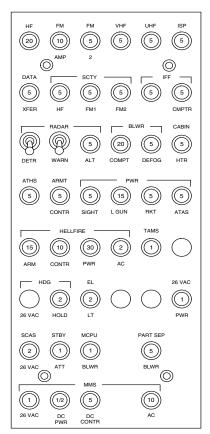
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



CIRCUIT BREAKER PANEL



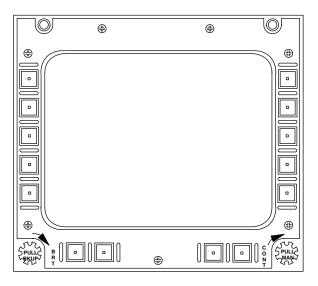
AUXILIARY CIRCUIT BREAKER PANEL



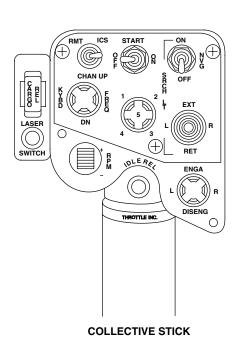
CENTER POST CIRCUIT BREAKER PANEL

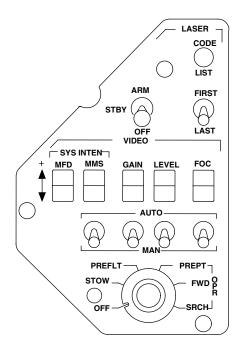
406099-90-3-T J2623

GO TO NEXT PAGE



MULTIFUNCTION DISPLAY (MFD)

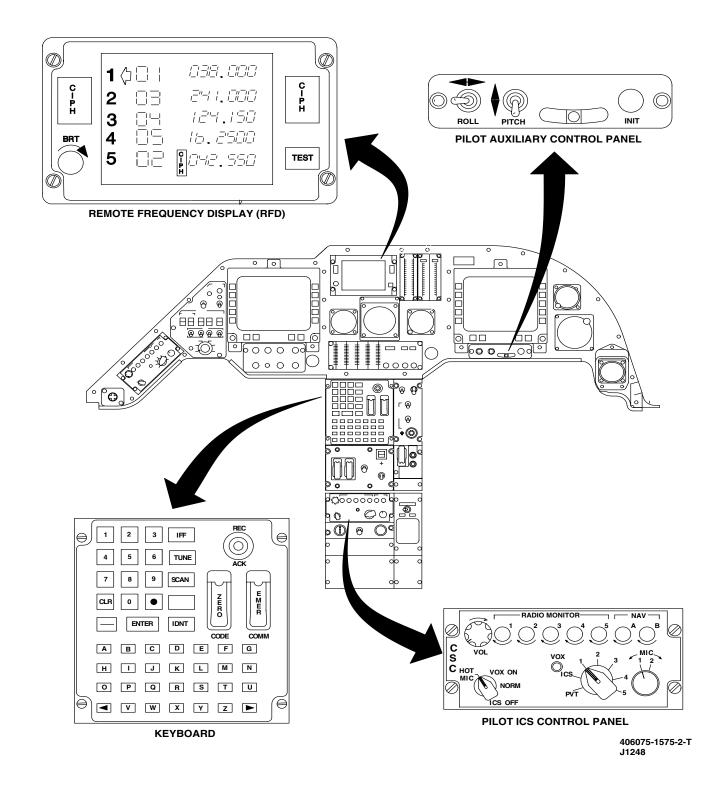




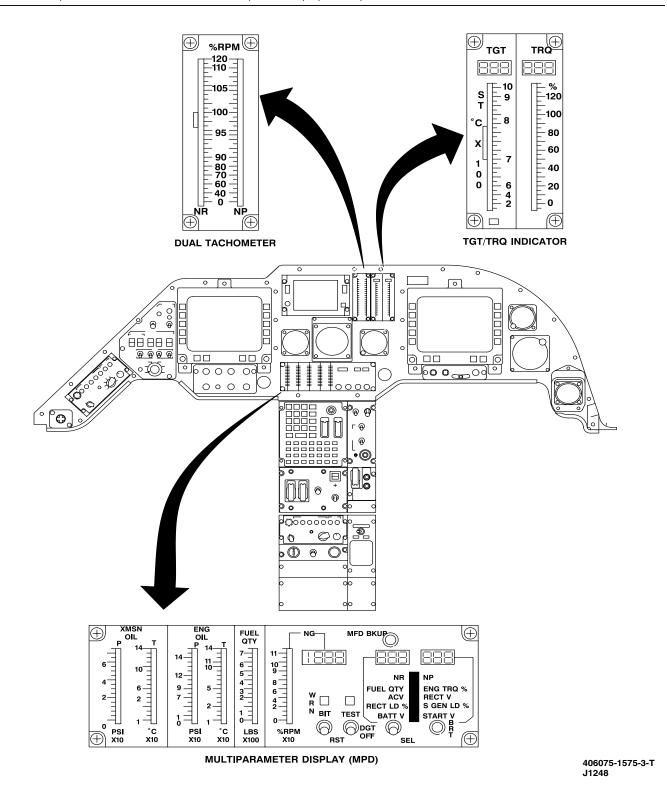
MMS CONTROL PANEL

406075-1575-1-T J1248

2-6-12. CONTROL DISPLAY SYSTEM (CDS) FAULT DETECTION LOCATOR SYSTEM/BUILT-IN TEST (FDLS/BIT) — OPERATIONAL CHECK (OH-58D) (CONT)



2-6-12. CONTROL DISPLAY SYSTEM (CDS) FAULT DETECTION LOCATOR SYSTEM/BUILT-IN TEST (FDLS/BIT) — OPERATIONAL CHECK (OH-58D) (CONT)



- 1. This task contains procedures for maintenance personnel to conduct CDS FDLS/BIT checkout. Performance of all checks may not be required. Perform steps 2. through 6. and applicable step(s) 7. through 12.
 - 2. Open the following circuit breakers:

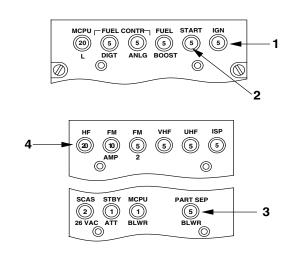
IGN (1) START (2) PART SEP BLWR (3) HF (4)

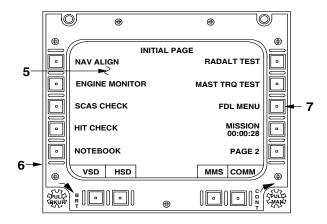
- 3. Apply external ac and dc electrical power (TM 1-1520-248-23).
 - 4. Verify voltage is correct.
- 5. Verify INITIAL PAGE (5) appears on each MFD (6). Acknowledge advisory and caution messages.
- 6. Press R3 (7), FDL MENU key. Verify that FDL MENU page (8) appears.

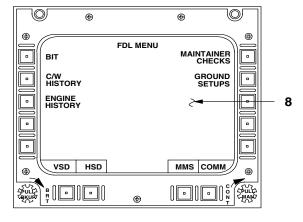
NOTE

FDL MENU page will list information that the maintainer can check in less than a minute to an hour depending on what is to be performed. The maintainer can perform checks of any item on the FDL MENU page without starting at step 7. Find the item listed below and go to that step:

BIT step 7 C/W HISTORY step 8 ENGINE HISTORY step 9 MAINTAINER CHECKS step 10

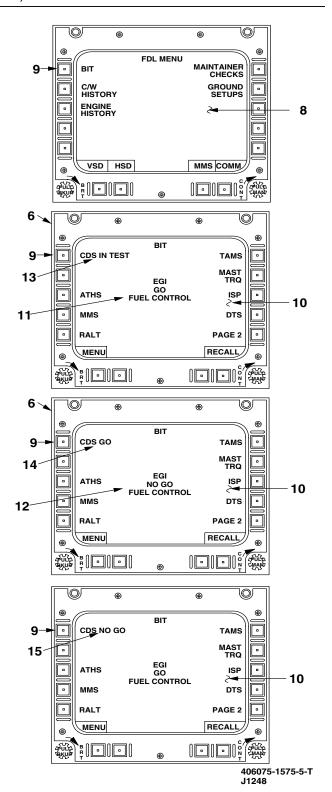






406075-1575-4-T J1248

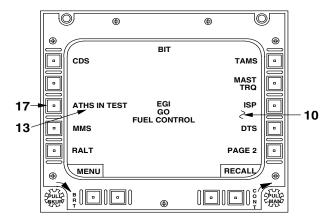
- 7. On FDL MENU page (8), press L1 (9), BIT key. Verify that BIT page (10) appears, and that a display appears at center of MFD (6) with EGI GO (11) or EGI NO GO (12). If EGI NO GO is displayed, refer to TM 11-1520-248-23.
- a. Press L1 (9), CDS key, on BIT page (10). Verify that:
- (1) IN TEST (13) is displayed next to CDS while test is running.
- (2) GO (14) appears next to CDS if no failure is detected.
- (3) NO GO (15) appears next to CDS if a failure is detected, and a fault code(s) is displayed below CDS.
- (4) Fault codes and failures for the control display system are defined in Appendix F.

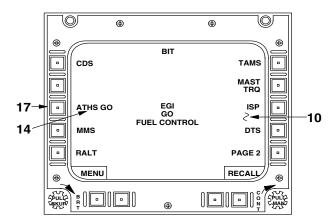


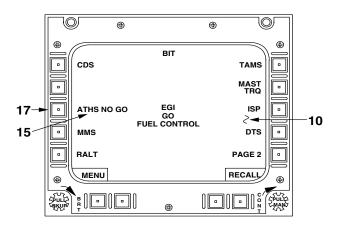
NOTE

BITs must be run one at a time. If a new BIT is selected while another BIT is running, the first BIT is aborted and the new test is performed.

- b. Press L3 (17), ATHS key, on BIT page (10). Verify that:
- (1) IN TEST (13) is displayed next to ATHS while test is running.
- (2) GO (14) appears next to ATHS if no failure is detected.
- (3) NO GO (15) appears next to ATHS if a failure is detected, and a fault code(s) is displayed below ATHS.
 - (4) Fault codes are defined in Appendix F.

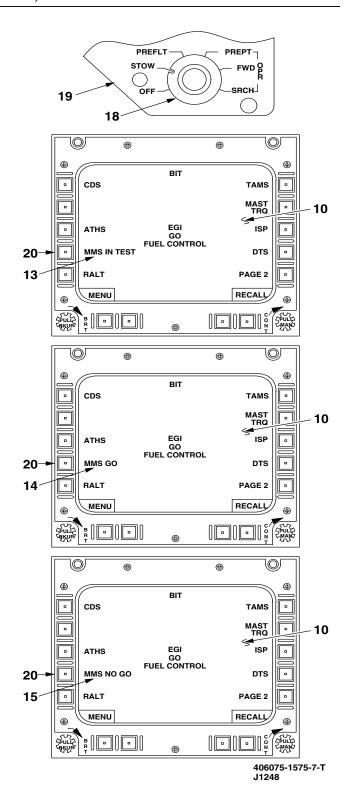






406075-1575-6-T J1248

- (5) Set MMS mode select switch (18) on MMS control panel (19) to STOW.
- c. Press L4 (20), MMS key, on BIT page (10). Verify that:
- (1) IN TEST (13) is displayed next to MMS while test is running.
- (2) GO (14) appears next to MMS if no failure is detected in mast mounted sight.
- (3) NO GO (15) appears next to MMS if a failure is detected in the mast mounted sight system, and a fault code(s) is displayed below MMS.
 - (4) Fault codes are defined in Appendix F.

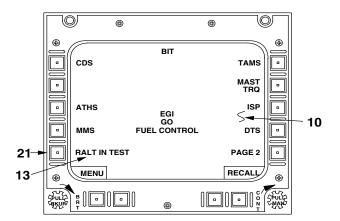


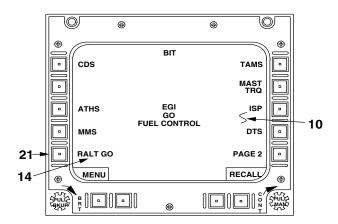
- d. Press L5 (21), RALT key, on BIT page (10). Verify that:
- (1) IN TEST (13) is displayed next to RALT while test is running.

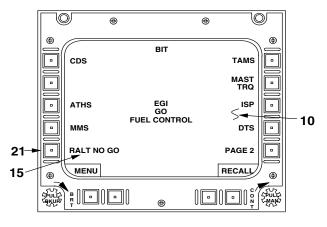
NOTE

If the other MFD has VSD selected, the RALT indication goes to 1000 feet and returns to 0 during testing.

- (2) GO (14) appears next to RALT if no failure is detected in radar altimeter system.
- (3) NO GO (15) appears next to RALT if a failure is detected in radar altimeter system.
- (4) There are no fault codes for radar altimeter system.

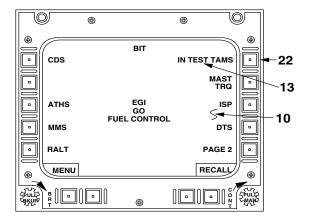


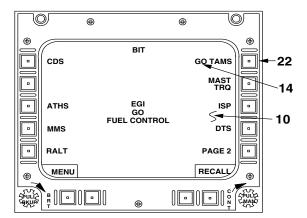


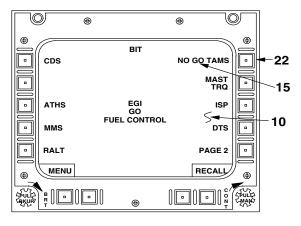


406075-1575-8-T J1248

- e. Press R1 (22), TAMS key, on BIT page (10). Verify that:
- (1) IN TEST (13) is displayed next to TAMS while test is running.
- (2) GO (14) appears next to TAMS if no failure is detected in transmission attitude measurement system.
- (3) NO GO (15) appears next to TAMS if a failure is detected in the transmission attitude measurement system, and a fault code(s) is displayed below TAMS.
 - (4) Fault codes are defined in Appendix F.

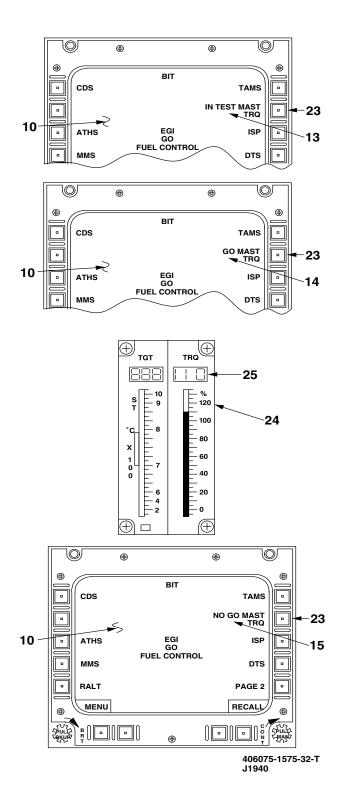




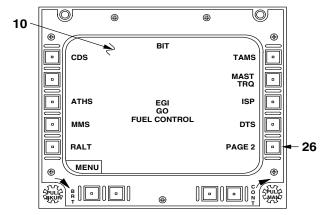


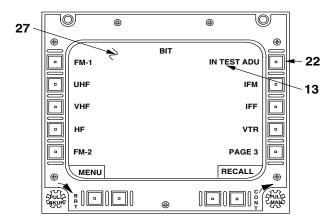
406075-1575-9-T J1248

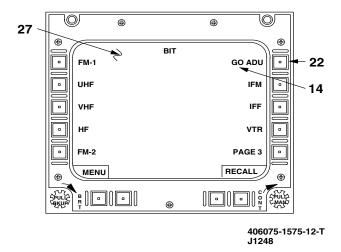
- f. Press R2 (23), MAST TRQ key, on BIT page (10). Verify that:
- (1) IN TEST (13) is displayed next to MAST TRQ while test is running.
- (2) GO (14) appears next to MAST TRQ if no failure is detected in mast torque.
 - (3) On VSI (24), TRQ reads $110\% \pm 2\%$.
- (4) On VSI (24), digital indicator (25) reads 110% \pm 2%.
- (5) NO GO (15) appears next to MAST TRQ if a failure is detected in mast torque system.
- (6) There are no fault codes for the mast torque system.



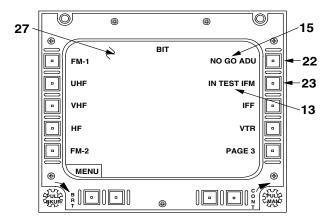
- g. Setup for ADU BIT check as follows:
- h. Press R5 (26), PAGE 2, on BIT page 1 (10), .
- i. Press R1 (22), ADU key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to ADU while test is running.
- (2) GO (14) appears next to ADU if no failure is detected in ADU.

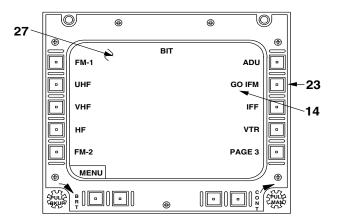


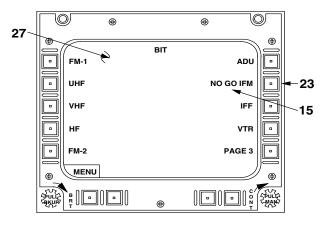




- (3) NO GO (15) appears next to ADU if a failure is detected in ADU. Refer to TM 11-1520-248-23.
- (4) There are no fault codes for the audio distribution unit.
- j. Press R2 (23), IFM key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to IFM while test is running.
- (2) GO (14) appears next to IFM if no failure is detected in the improved frequency modulation system.
- (3) NO GO (15) appears next to IFM if a failure is detected in the improved frequency modulation system.
 - (4) There are no fault codes for the IFM.

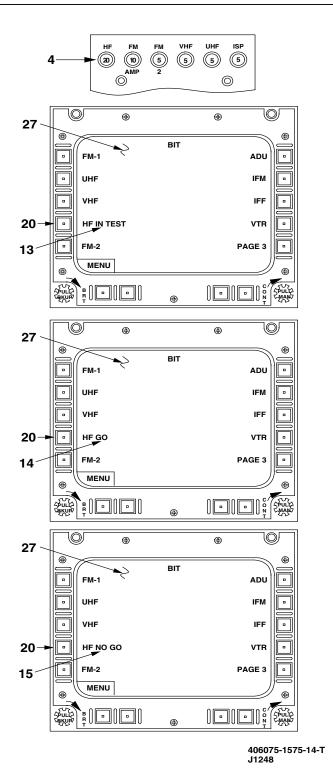




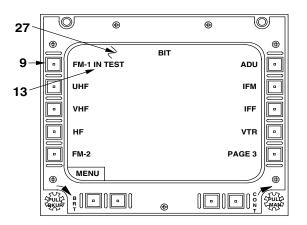


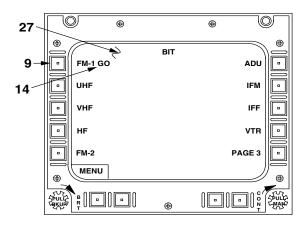
406075-1575-13-T J1248

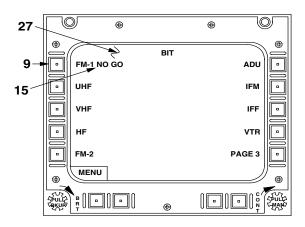
- k. Press L4 (20), HF key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to HF while test is running.
 - (2) Close HF circuit breaker (4).
- (3) Verify GO (14) appears next to HF if no failure is detected in the high frequency system.
- (4) Verify NO GO (15) appears next to HF if a failure is detected in the high frequency system, and a fault code(s) is displayed below HF.
 - (5) Fault codes are defined in Appendix F.



- I. Press L1 (9), FM-1 key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to FM-1 while test is running.
- (2) GO (14) appears next to FM-1 if no failure is detected in FM-1 radio system.
- (3) NO GO (15) appears next to FM-1 if a failure is detected in FM-1 radio system, and a fault code(s) is displayed below FM-1 (Refer to TM 11-1520-248-23).
 - (4) Fault codes are defined in Appendix F.

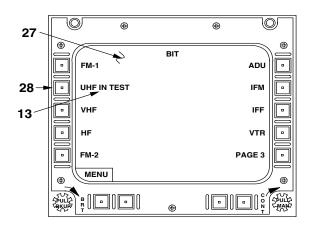


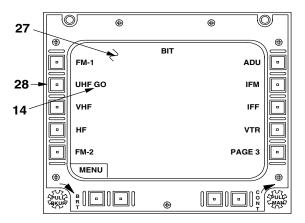


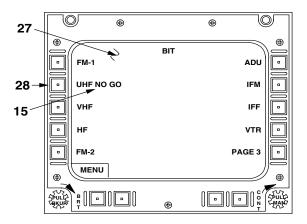


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- m. Press L2 (28), UHF key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to UHF while test is running.
- (2) GO (14) appears next to UHF if no failure is detected in UHF system.
- (3) NO GO (15) appears next to UHF if a failure is detected in UHF system. Refer to TM 11-1520-248-23.
- (4) There are no fault codes for UHF system.

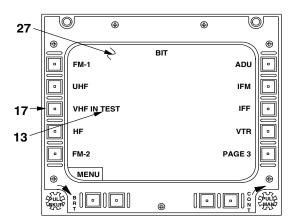


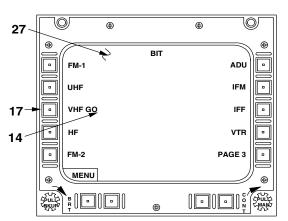


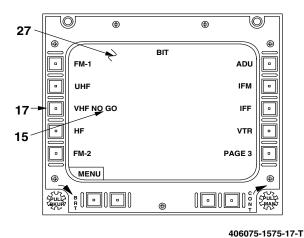


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- n. Press L3 (17), VHF key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to VHF while test is running.
- (2) GO (14) appears next to VHF if no failure is detected in VHF radio system.
- (3) NO GO (15) appears next to VHF if a failure is detected in VHF radio system. Refer to TM 11-1520-248-23.
- (4) There are no fault codes for VHF radio system.







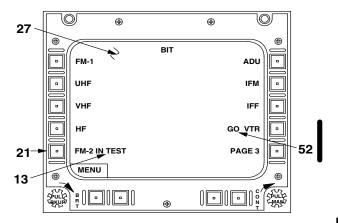
J1248

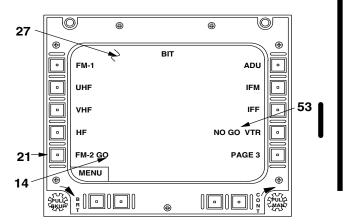
- o. Press L5 (21), FM-2 key, on BIT page 2 (27). Verify that:
- (1) IN TEST (13) is displayed next to FM-2 while test is running.
- (2) GO (14) appears next to FM-2 if no failure is detected in FM-2 radio system.
- (3) NO GO (15) appears next to FM-2 (21) if a failure is detected in FM-2 radio system, and a fault code(s) is displayed below FM-2 (Refer to TM 11-1520-248-23).
 - (4) Fault codes are defined in Appendix F.
 - p. Verify VTR automatic BIT is functional.
- (1) Verify GO (52) appears next to VTR if no failure is detected.

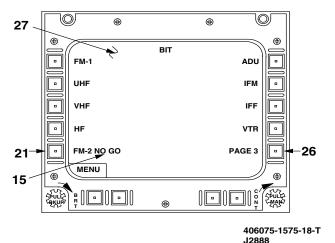
NOTE

There are no fault codes for the video tape recorder system.

(2) Verify NO GO (53) appears next to VTR if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.







- q. On BIT page 2 (27) press R3 (7), IFF key.
- (1) On IFF page 2 (54) press R5 (26) page 1 key.
- (2) On IFF page 1 (55) press L1 (9), STBY/NORM key. Verify STBY/NORM display has NORM boxed.
- (3) On IFF page 1 (55) press R5 (26), PAGE 2 key.
- (4) Press L1 through L5 (9/28/17/20/21), in sequence, to box TEST and initiate BIT.

NOTE

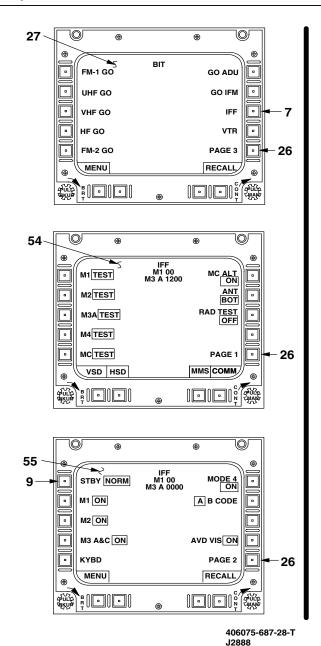
If KIT-1C/TSEC is not installed or loaded, IFF mode 4 test will display NO GO during BIT on IFF page 2 (54).

(5) GO appears next to TEST if no failure is detected.

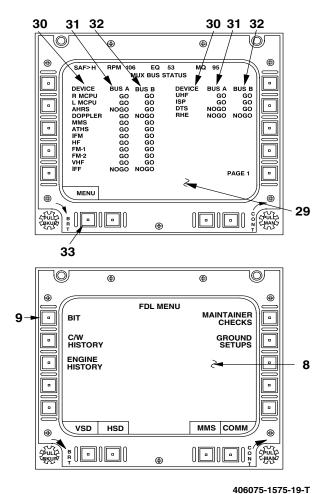
NOTE

No fault codes are identified for the identification friend-or-foe system.

- (6) NO GO appears next to TEST if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.
- (7) On IFF page 2 (54) press R5 (26), PAGE 1 key.
- (8) On IFF page 1 (55) press L1 (9), STBY/NORM key. Verify STBY/NORM display has STBY boxed.
- r. Press R5 (26), PAGE 3 key, on BIT page 2 (27).

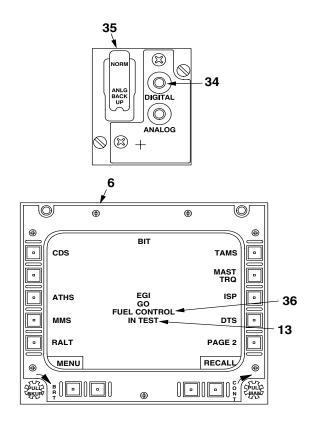


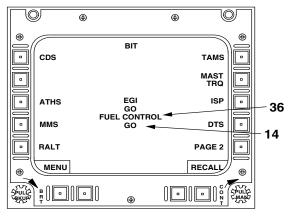
- s. On BIT page 3 (29), verify that:
- (1) A list of LRU's (30) appears with a status of GO or NO GO on Bus A (31) and Bus B (32).
 - (2) Fault codes are defined in Appendix F.
- t. On BIT page 3 (29), press mode select key A (33), MENU.
- u. Press L1 (9), BIT key, on FDL MENU page (8).



J1248

- v. Press DIGITAL test switch (34) on fuel control test panel (35). Verify that:
- (1) A caution tone (one beep per second) is heard in headset.
- (2) FUEL CONTROL (36) is displayed on MFD (6).
- (3) IN TEST (13) is displayed below FUEL CONTROL (36) while test is running.
- (4) GO (14) appears below FUEL CONTROL (36) if no failure is detected.





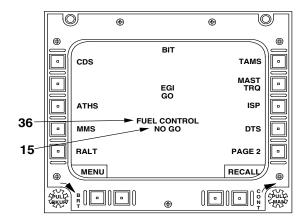
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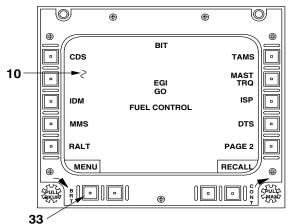
(5) NO GO (15) appears below FUEL CONTROL (36) if a failure is detected and one or more fault codes are displayed below FUEL CONTROL (36).

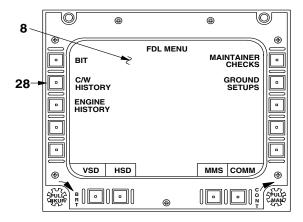
NOTE

Multiple failure codes are separated by commas with four fault codes per line. Only the first eight fault codes generated will be displayed.

- (6) Fault codes are defined in Appendix F.
- w. Press mode select key A (33), MENU, on BIT page (10). Verify that FDL MENU page (8) appears.
- 8. Press L2 (28), C/W HISTORY key, on FDL MENU page (8).





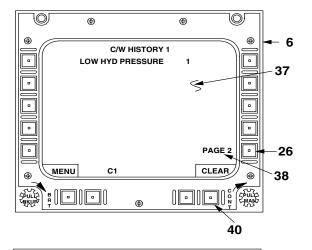


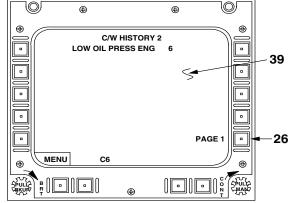
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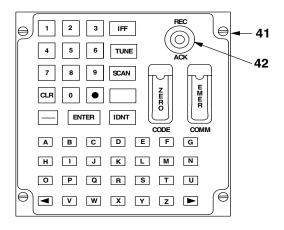
- a. Verify that C/W HISTORY 1 page (37) appears, displaying the number of caution, warning, and advisory occurrences, located to the right of event.
- b. Verify that if more than one page, words PAGE 2 (38) are displayed in lower right corner of MFD (6).
- c. Verify that C/W HISTORY 2 page (39) appears when R5 (26), PAGE 2 key, is pressed. Pressing R5 (26), PAGE 1 key, recalls C/W HISTORY 1 page (37).

CAUTION

- CLEAR key (40) on MFD (6) enables keyboard (41) for entry of clear code (Julian date followed by four numbers). A valid clear code entry causes C/W history pages to be cleared.
- Caution, warning, and advisory events occurring on the ground are not recorded for C/W HISTORY, but are displayed on MFD (6). These can be blanked from the screen by actuating REC/ACK switch (42) to ACK.

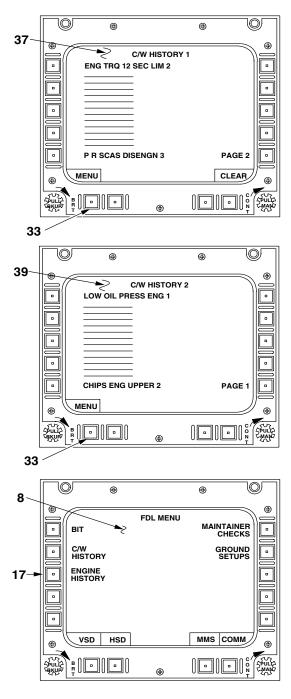






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- d. Press mode select key A (33), MENU, on C/W HISTORY 1 page (37) or C/W HISTORY 2 page (39).
- 9. Press L3 (17), ENGINE HISTORY key, on FDL MENU page (8).



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- a. Verify ENGINE HISTORY 1 page (42) appears, displaying engine data stored by engine condition monitor.
- b. Verify pressing R5 (26), PAGE 2 key, calls up ENGINE HISTORY 2 page (43) and pressing R5 (26), PAGE 1 key, recalls ENGINE HISTORY 1 page (42).

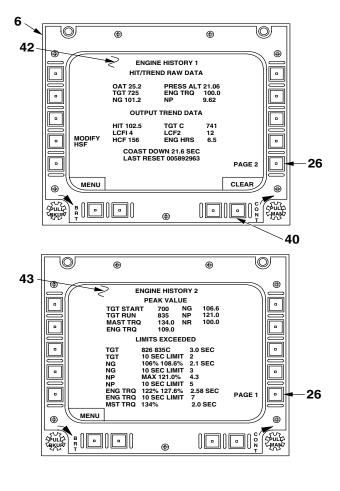
CAUTION

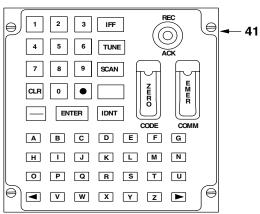
CLEAR key (40) on MFD (6) enables keyboard (41) for entry of clear code (Julian date followed by four numbers). A valid clear code entry causes engine history data to be cleared.

c. The following types of information are found on ENGINE HISTORY pages (42) and (43):

HIT TREND RAW DATA

DISPLAY	DESCRIPTION
OAT	Outside air temperature during HIT check (°C).
PRESS ALT	Pressure altitude during HIT check.
TGT	Average during HIT check (°C).
ENG TRQ	Average during HIT check (%).
NG	Average during HIT
NP	check (%). Average during HIT check (%).





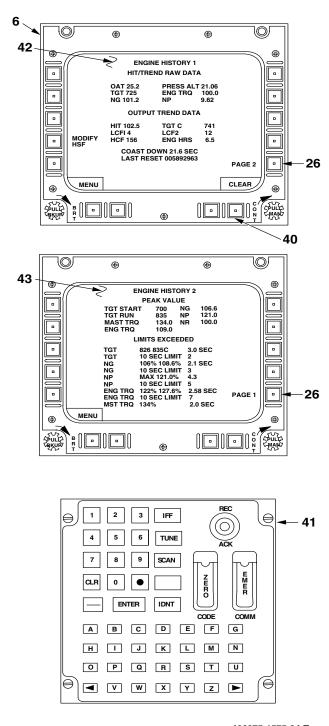
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CAUTION

CLEAR key (40) on MFD (6) enables keyboard (41) for entry of clear code (Julian date followed by four numbers). A valid clear code entry causes engine history data to be cleared.

OUTPUT TREND DATA

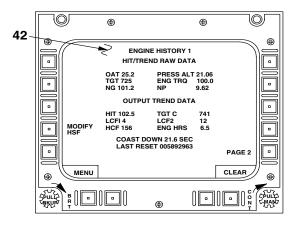
DISPLAY	DESCRIPTION
HIT	Health indicator test result (%).
TGT C	Corrected TGT during HIT check (°C).
LCF 1	Low cycle fatigue counter 1 – Advances one count each time NG traverses range of 50%
LCF 2	NG to 95% NG Low cycle fatigue counter 2 – Advances one count each time NG traverses range of 85% NG to 95% NG
HSF	Hot Section Factor counts per second as follows: a. 1 = TGT >700 but <720°C b. 4 = TGT >/equal to 720 but <740°C c. 30 = TGT >/equal to 740 but <760°C d. 100 = TGT >/equal
ENG HRS	to 760°C Engine run time since last reset.
COAST DOWN	Time for NG to coast from 30% NG to 10% NG.
LAST RESET	Julian date of last reset (clear procedure) and four digits of personal identifier.

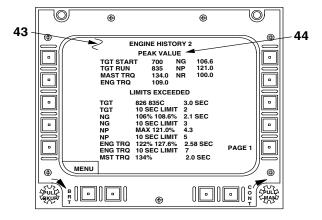


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d. PEAK VALUE (44) is displayed on ENGINE HISTORY 1 page (42) or ENGINE HISTORY 2 page (43). When a limit has been exceeded, the following display will appear:

DISPLAY	DESCRIPTION
TGT START	Maximum TGT during engine start in degrees Celsius. No limit need be exceeded for TGT START to be displayed.
TGT RUN	Maximum TGT during post- start running conditions in degrees Celsius. No limit needs to be exceeded for
MAST TRQ	TGT RUN to be displayed. Peak mast torque is displayed as a percentage. No limit needs to be exceeded for
ENG TRQ	MAST TRQ t be displayed. Peak engine torque is displayed as a percentage. No limit needs to be exceeded for ENG TRQ to be
NG	displayed. Peak turbine gas generator speed is displayed as a percentage. No limit needs to be exceeded for NG to be
NP	displayed. Peak power turbine speed is displayed as a percentage. Two setpoint limits for NP
	vary according to engine torque. Normal operating conditions for NP are below both limits. The lower limit must be exceeded for a percentage to be displayed. For example, if the two limits were 105% and 110%, NP would have to be greater than
NR	105% for a percentage to be displayed. Peak main rotor speed is displayed as a percentage. This percentage is displayed when either of the following conditions have been met: a. NR exceeded 107% while NR was greater than NP. b. NR exceeded 103% while





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NP.

NR was less than or equal to

e. LIMITS EXCEEDED (45) is displayed on ENGINE HISTORY 1 page (42) or ENGINE HISTORY 2 page (43). When a limit has been exceeded, the following display will appear:

DISPLAY DESCRIPTION

TGT >871°C If TGT exceeds 871°C, time above that limit is displayed

along with the peak TGT.

TGT 10 SEC LIMIT Each time TGT exceeds 802°C 10 seconds, a counter

increments by one. Total

count is displayed.

TGT 5 MIN LIMIT If TGT exceeds 785°C for 5

consecutive minutes, a counter increments by one.

Total count is displayed.

TGT 30 MIN LIMIT If TGT has exceeded 715°C

for more than 30 consecutive minutes, a counter increments by one. Total count is

displayed.

NG >106% If turbine gas generator speed (NG) exceeds 106%, time

above that limit is displayed

along with peak NG.

NG 10 SEC LIMIT Each time NG exceeds 105%

for 10 seconds, a counter increments by one. Total

count is displayed.

NP >MAX Two setpoint limits for power

turbine speed (NP) vary according to engine torque. Normal operating conditions are below both limits. If both lower and upper limits are exceeded, time above lower limit is displayed along with the NP percentage above the upper limit. For example, if the two limits were 105% and 110%, NP would have to be greater than 110% for the

time above 105% to be displayed.

NP 10 SEC LIMIT Each time NP exceeds the lower variable limit for 10

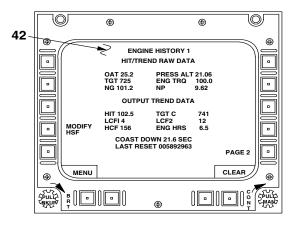
seconds, a counter increments by one. Total

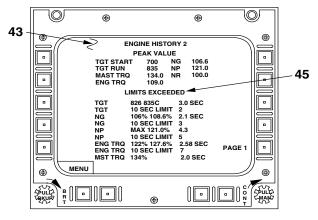
count is displayed.

ENG TRQ >131% If engine torque exceeds

131%, time above the limit is displayed along with peak

ENG TRQ.





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DISPLAY DESCRIPTION

ENG TRQ 2 SEC LIMIT

Each time engine torque exceeds 121.6% for 2 seconds, a counter increments by one. Total count is displayed.

LIMIT

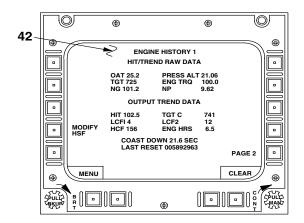
ENG TRQ 10 SEC Each time engine torque exceeds 112% for 10 seconds, a counter increments by one. Total count is displayed.

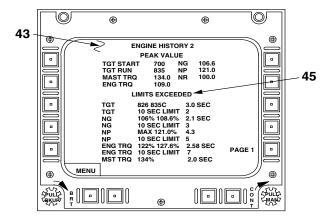
MAST TRQ

If mast torque exceeds 100%, the peak value is displayed. The CDS records time spent in each of five overtorque segments:

- a. 103% to 107%
- b. 107% to 110%
- c. 110% to 113%
- d. 113% to 116%
- e. over 116%

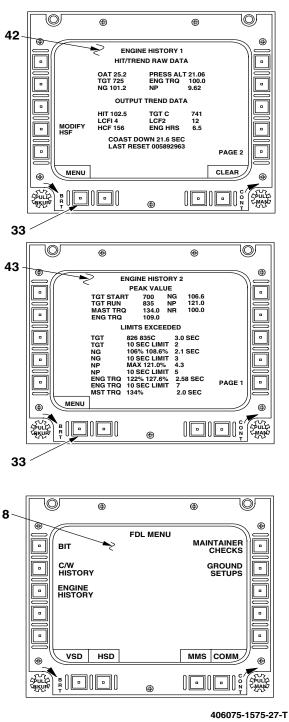
Time is displayed for the segment in which the peak value appears. For example, if the peak value were 112%, the time would indicate the number of seconds between 110% and 113%.





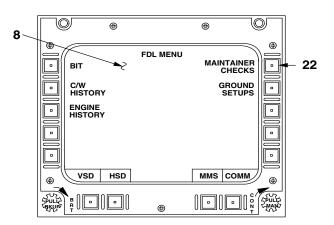
406075-1575-26-T J1248

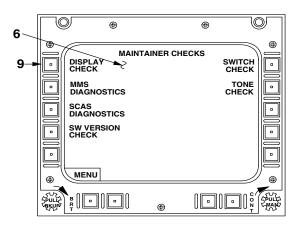
f. Press mode select key A (33), MENU, on ENGINE HISTORY 1 or 2 page (42 or 43). Verify that FDL MENU page (8) appears.

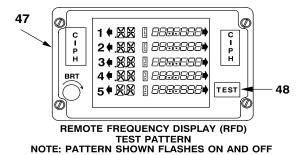


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- 10. Press R1 (22), MAINTAINER CHECKS key, on FDL MENU page (8). Verify that MAINTAINER CHECKS page (46) appears.
- a. Press L1 (9), DISPLAY CHECK key, on MAINTAINER CHECKS PAGE (46).
- (1) Verify that test pattern appears on RFD (47) and alternates between all segments on, and blank screen. If alternating test pattern is not displayed, press RFD TEST switch (48).

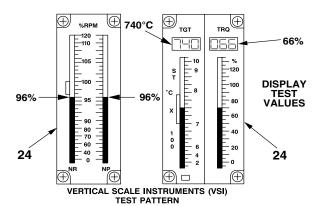


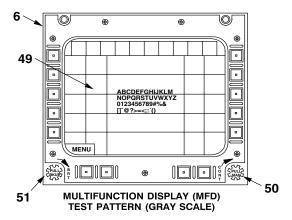




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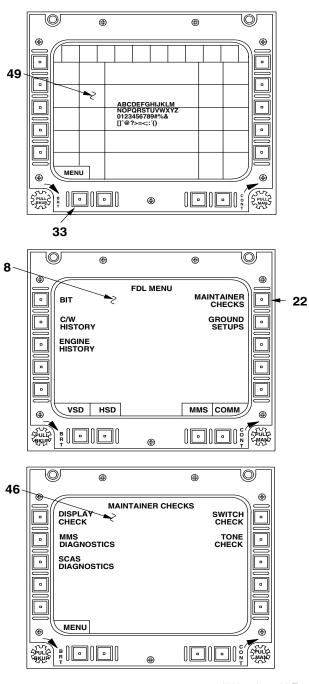
- (2) Verify that vertical scale indicators (24) are driven to half the full scale.
- (3) Verify that each MFD (6) displays a gray scale on display check page (49).
- b. Adjust contrast control CONT (50) on each MFD (6) to provide maximum contrast between the shades of gray.
- c. Adjust brightness control BRT (51) to a level that does not degrade contrast at the light or dark ends of the gray scale.
- d. Repeat steps b. and c. as needed to obtain the highest quality picture.





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- e. Press mode select key A (33), MENU, on display check page (49). Verify FDL MENU page (8) appears.
- f. Press R1 (22), MAINTAINER CHECKS key, on FDL MENU page (8). Verify MAINTAINER CHECKS page (46) appears.



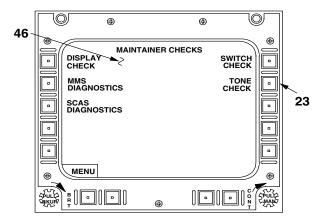
406075-1575-30-T J1248

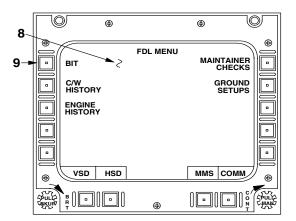
g. Press R2 (23), TONE CHECK key, on MAINTAINER CHECKS page (46). Verify that each time TONE CHECK is pressed, an audio tone is heard in headsets.

NOTE

The audio tone for LOW or HIGH RPM ROTOR is a "whoop", and for all other warnings is a "bong".

- 1. On MAINTAINER CHECKS page (46), press mode select key A (33), MENU.
- 2. Press L1 (9), BIT key, on FDL MENU page (8).
- 3. Disconnect external ac and dc electrical power (TM 1-1520-248-23).





406075-1575-31-T J1248

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

OH-58D(R)

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

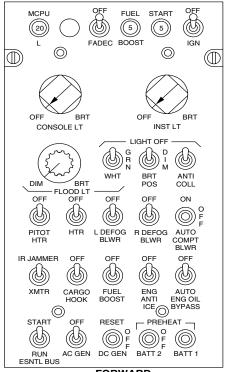
Personnel Required: 68F Aircraft Electrician References:

TM 1-1427-779-23 TM 1-1520-248-23 TM 11-1520-248-23

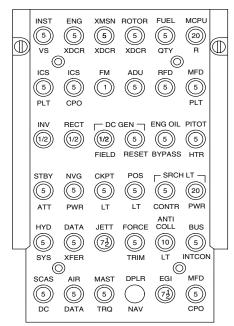
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

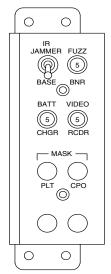
All Switches — Off/SAFE



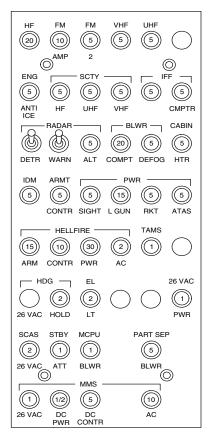
FORWARD
OVERHEAD CONSOLE
CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

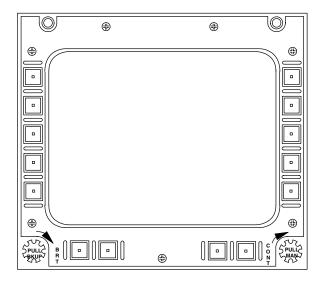


AUXILIARY CIRCUIT BREAKER PANEL

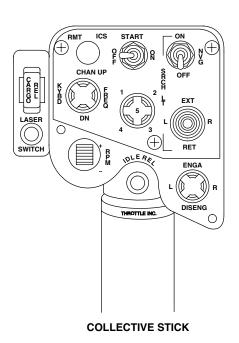


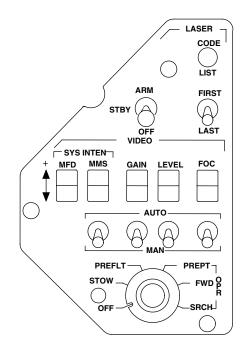
CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328



MULTIFUNCTION DISPLAY (MFD)

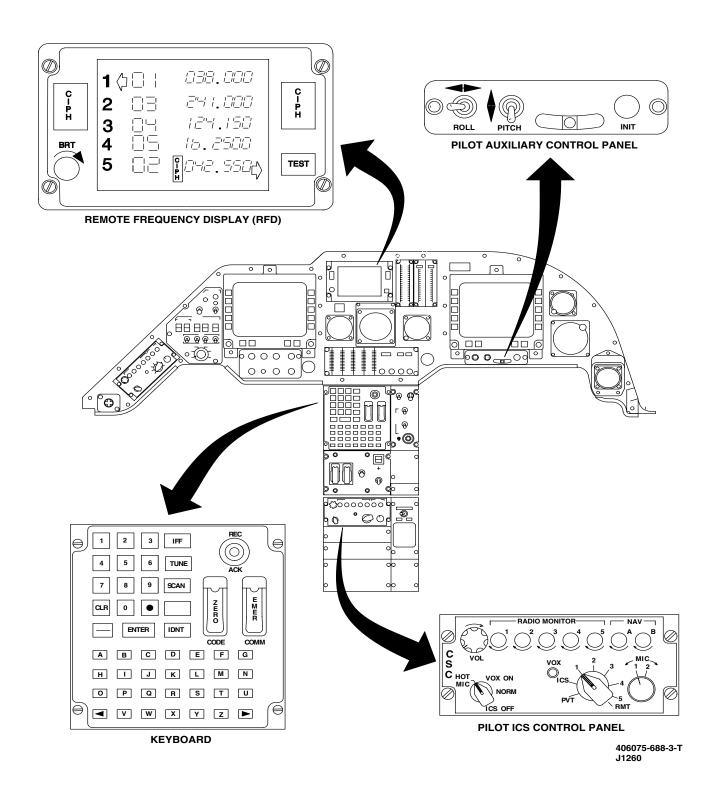




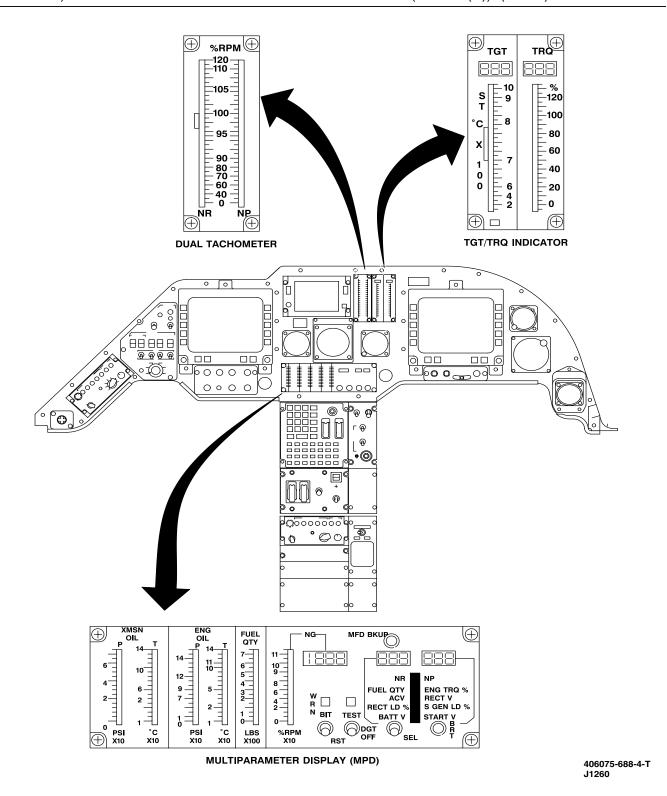
MMS CONTROL PANEL

406075-1575-33-T J1940

GO TO NEXT PAGE



2-6-13. CONTROL DISPLAY SYSTEM (CDS) FAULT DETECTION LOCATOR SYSTEM/BUILT-IN TEST (FDLS/BIT) WITH FADEC MONITOR — OPERATIONAL CHECK (OH-58D(R)) (CONT)

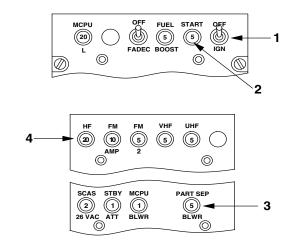


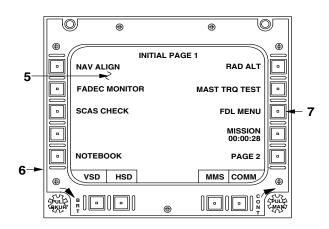
GO TO NEXT PAGE

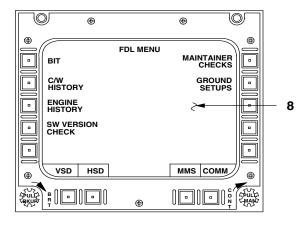
NOTE

- Upon power up and prior to displaying INITIAL PAGE 1, the MCPU ensures that both MCPUs contain identical software part numbers.
- If an MCPU determines that its software part number does not match the opposite MCPU software part number, the MCPU halts and displays the error message MCPU SOFTWARE MISMATCH ERROR along with the software part numbers.
- 1. This task contains procedures for maintenance personnel to conduct CDS FDLS/BIT checkout. Performance of all checks may not be required. Perform steps 2. through 6. and applicable step(s) 7. through 14.
- 2. On the forward overhead console panel, ensure IGN toggle switch (1) is set to OFF.
 - 3. Open the following circuit breakers:

- 4. Apply external ac and dc electrical power (TM 1-1520-248-23). Allow 30 seconds for warmup.
 - 5. Verify voltages are correct.
- 6. Verify that INITIAL PAGE 1 (5) appears on each MFD (6). Acknowledge caution and advisory messages.
- 7. Press R3 (7), FDL MENU key, on initial page (5). Verify that FDL MENU page (8) appears.







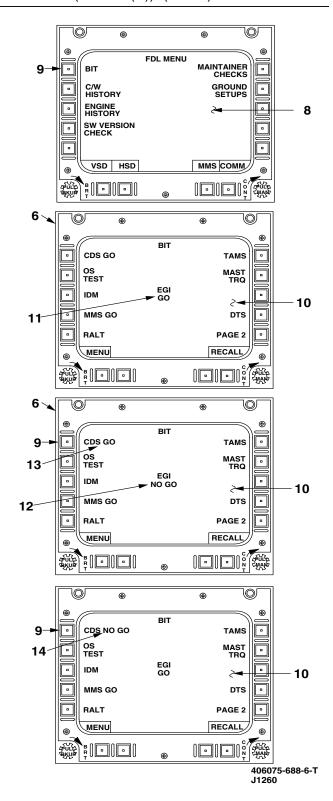
406075-688-5-T J0891

NOTE

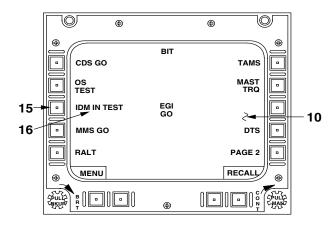
- BITs must be run one at a time. If a new BIT is selected while another BIT is running, the first BIT is aborted and the new test is performed.
- It is possible for a BIT to result in NO GO with no fault codes identified. Refer to Appendix F for action required.
- Fault codes, test status codes, and messages are defined in Appendix F.
- FDL MENU page will list information that the maintainer can check in less than a minute to an hour depending on what is to be performed. The maintainer can perform checks of any item on the FDL MENU page without starting at step 6. Find the item listed below and go to that step:

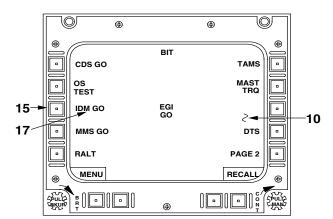
BIT step 8 C/W HISTORY step 9 FADEC MONITOR step 10 ENGINE HISTORY step 11 SW VERSION CHECK step 12 MAINTAINER CHECKS step 10

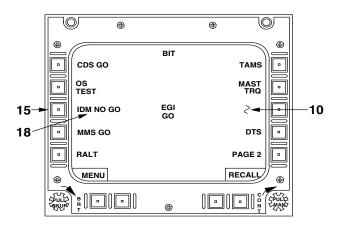
- 8. On FDL MENU page (8), press L1 (9), BIT key. Verify that BIT page (10) appears, and that a display appears at center of MFD (6) with EGI GO (11) or EGI NO GO (12). If EGI NO GO is displayed, refer to TM 11-1520-248-23.
- a. Verify CDS automatic BIT is functional by the following:
- (1) GO (13) appears next to CDS if no failure is detected.
- (2) NO GO (14) appears next to CDS if a failure is detected and, a fault code(s) is displayed below CDS.
 - (3) Fault codes are defined in Appendix F.



- b. On BIT page (10) press L3 (15), IDM key. Verify the following:
- (1) IN TEST (16) is displayed next to IDM while test is running.
- (2) GO (17) appears next to IDM if no failure is detected.
- (3) NO GO (18) appears next to IDM if a failure is detected. Fault code(s), if any, are displayed below IDM.
- (4) Fault codes and failures of the IDM are defined in Appendix F.

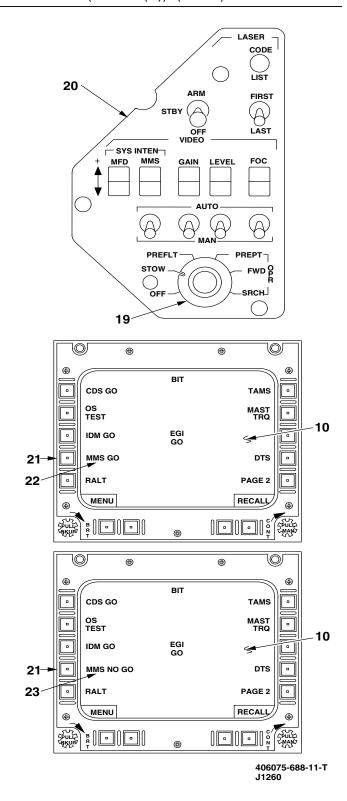






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- c. Set MMS mode select switch (19) on MMS control panel (20) to STOW. Verify the following:
- (1) GO (22) appears to the right of L4 (21), next to MMS if no failure is detected.
- (2) NO GO (23) appears to the right of L4 (21) next to MMS if a failure is detected and, one or more fault codes are displayed below MMS.
 - (3) Fault codes are defined in Appendix F.



- (1) IN TEST (25) is displayed next to RALT while test is running.

NOTE

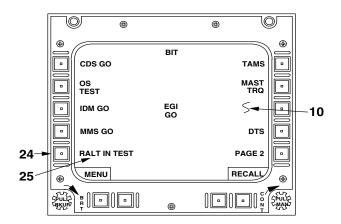
If the other MFD has VSD selected, the RALT digital indication goes to 1000 feet \pm 100 and returns to 0 during testing.

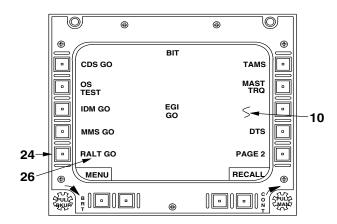
(2) GO (26) appears next to RALT if no failure is detected.

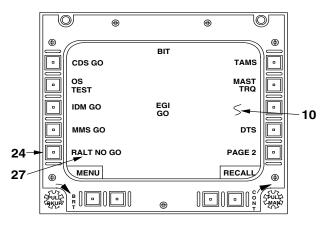
NOTE

There are no fault codes for the radar altimeter system.

(3) NO GO (27) appears next to RALT if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.

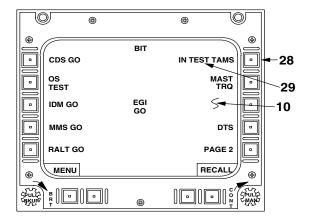


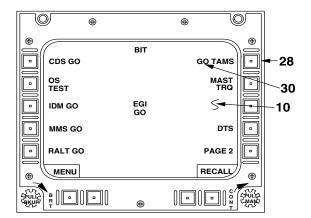


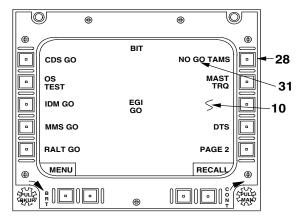


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- e. On BIT page (10) press R1 (28), TAMS key. Verify the following:
- (1) IN TEST (29) is displayed next to TAMS while test is running.
- (2) GO (30) appears next to TAMS if no failure is detected.
- (3) NO GO (31) appears next to TAMS if a failure is detected and, a fault code is displayed below TAMS.
 - (4) Fault codes are defined in Appendix F.







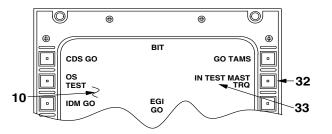
406075-688-13-T J1260

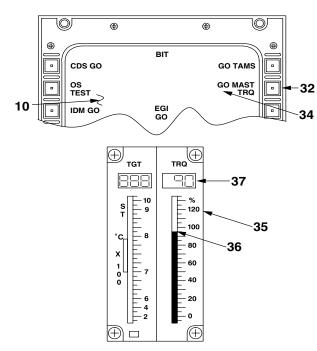
- f. On BIT page (10) press R2 (32), MAST TRQ key. Verify the following:
- (1) IN TEST (33) is displayed next to MAST TRQ while test is running.
- (2) GO (34) appears next to MAST TRQ if no failure is detected.
- (3) On VSI (35), TRQ analog indicator (36) reads 90% \pm 2%.
- (4) On VSI (35), TRQ digital indicator (37) reads 90% \pm 2%.

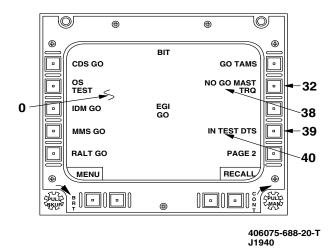
NOTE

There are no fault codes for the mast torque system.

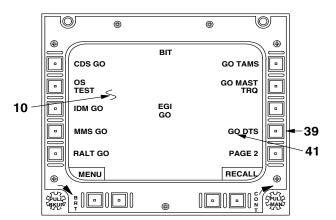
- (5) NO GO (38) appears next to MAST TRQ if a failure is detected.
- g. On BIT page (10) press R4 (39), DTS key. Verify the following:
- (1) IN TEST (40) is displayed next to DTS while test is running.

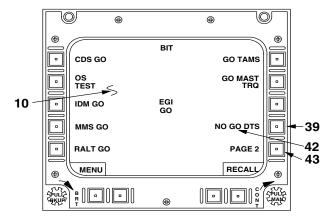






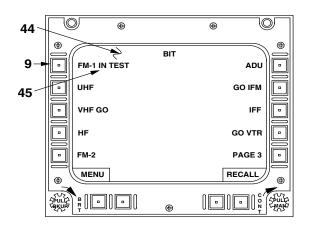
- (2) GO (41) appears next to DTS if no failure is detected.
- (3) NO GO (42) appears next to DTS if a failure is detected and, a fault code(s) is displayed below DTS.
 - (4) Fault codes are defined in Appendix F.
- (5) Refer to TM 11-1520-248-23 if additional troubleshooting is required.
- h. On BIT page 1 (10) press R5 (43), PAGE 2 key.

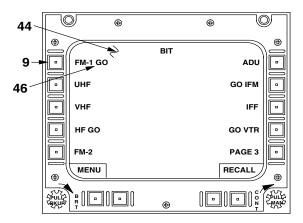


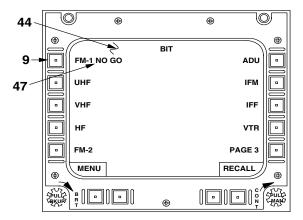


406075-688-19-T J1260

- i. On BIT page 2 (44) press L1 (9), FM-1 key. Verify the following:
- (1) IN TEST (45) is displayed next to FM-1 while test is running.
- (2) GO (46) appears next to FM-1 if no failure is detected.
- (3) NO GO (47) appears next to FM-1 if a failure is detected. Fault codes, if any, are displayed to the right of NO GO.
- (4) Fault codes and failures of FM-1 system are defined in Appendix F. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.







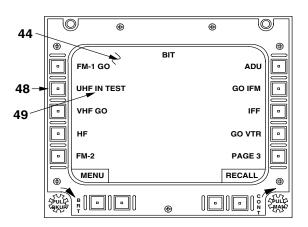
406075-687-1-T J1260

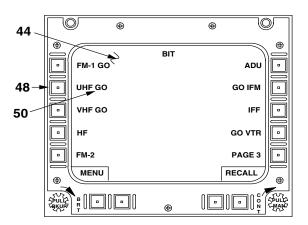
- j. On BIT page 2 (44) press L2 (48), UHF key. Verify the following:
- (1) IN TEST (49) is displayed next to UHF while test is running.
- (2) GO (50) appears next to UHF if no failure is detected.

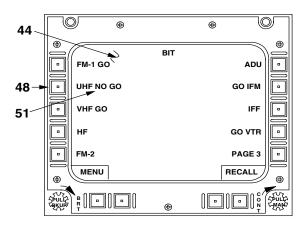
NOTE

There are no fault codes for UHF system.

(3) NO GO (51) appears next to UHF if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.







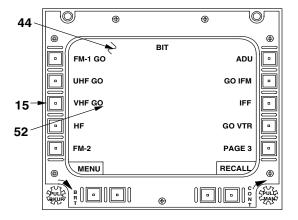
406075-687-2-T J1260

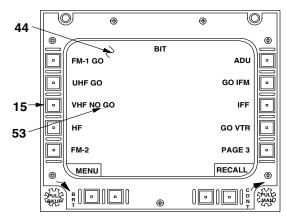
- k. Verify VHF automatic BIT is functional:
- (1) Verify GO (52) appears to the right of L3 (15), next to VHF if no failure is detected.

NOTE

There are no fault codes for VHF radio system.

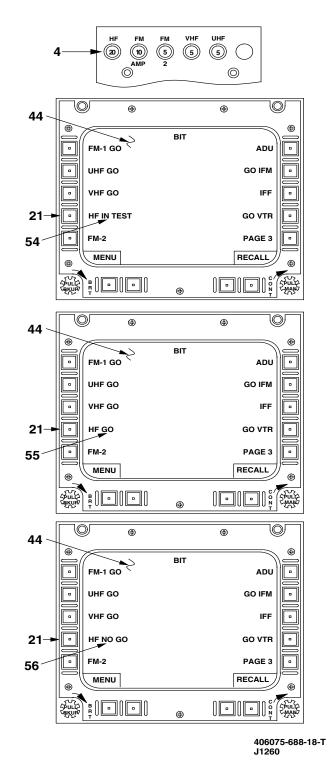
(2) Verify NO GO (53) appears to the right of L3 (15), next to VHF if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.





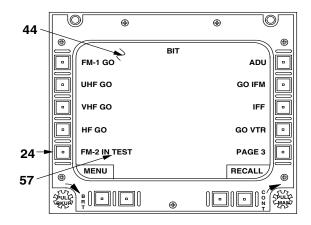
406075-687-3-T J1260

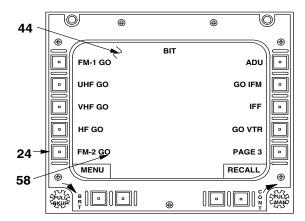
- I. Close HF circuit breaker (4).
- m. On BIT page 2 (44) press L4 (21), HF key. Verify the following:
- (1) IN TEST (54) is displayed next to HF while test is running.
- (2) GO (55) appears next to HF if no failure is detected.
- (3) NO GO (56) appears next to HF if a failure is detected. Fault code(s), if any, are displayed below HF.
- (4) Fault code(s) and failures are defined in Appendix F. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.
 - (5) Open HF circuit breaker (4) at completion of HF BIT.

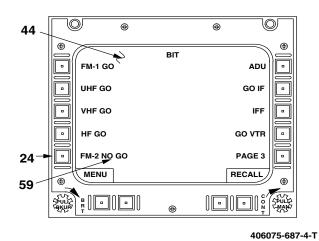


GO TO NEXT PAGE

- n. On BIT page 2 (44) press L5 (24), FM-2 key. Verify the following:
- (1) IN TEST (57) is displayed next to FM-2 while test is running.
- (2) GO (58) appears next to FM-2 if no failure is detected.
- (3) NO GO (59) appears next to FM-2 if a failure is detected. Fault codes, if any, are displayed to the right of NO GO.
- (4) Fault codes and failures of FM-2 system are defined in Appendix F. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.







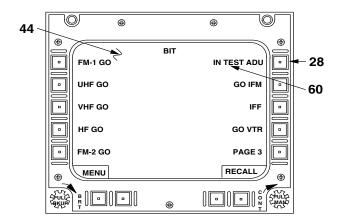
J1260

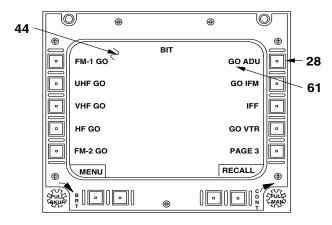
o. On BIT page 2 (44) press R1 (28), ADU key. Verify the following: $\ \ \,$

NOTE

ADU FAIL caution message will display in the lower left corner of both MFDs.

- (1) IN TEST (60) is displayed next to ADU while test is running.
- (2) GO (61) appears next to ADU if no failure is detected.





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NOTE

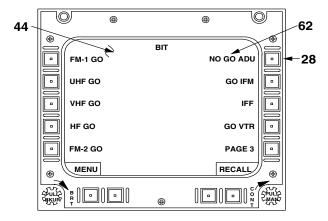
There are no fault codes for the audio distribution unit.

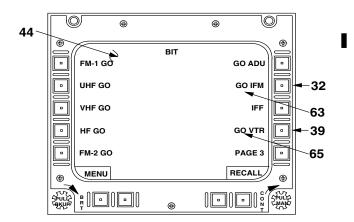
- (3) NO GO (62) appears next to ADU if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.
 - p. Verify IFM automatic BIT is functional:
- (1) Verify GO (63) appears next to IFM if no failure is detected.
- (2) Verify NO GO (64) appears next to IFM if a failure is detected. Fault code(s), if any, are displayed below IFM.
- (3) Fault codes and failures are defined in Appendix F. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.
 - q. Verify VTR automatic BIT is functional:
- (1) Verify GO (65) appears next to VTR if no failure is detected.

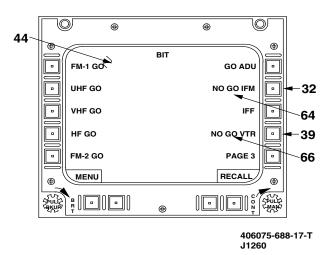
NOTE

There are no fault codes for the video tape recorder system.

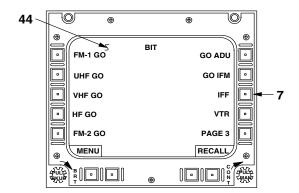
(2) Verify NO GO (66) appears next to VTR if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.

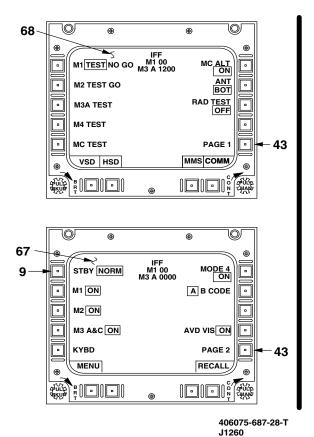






- r. On BIT page 2 (44) press R3 (7), IFF key.
- (1) On IFF page 2 (68) press R5 (43) page 1 key.
- (2) On IFF page 1 (67) press L1 (9), STBY/NORM key. Verify STBY/NORM display has NORM boxed.
- (3) On IFF page 1 (67) press R5 (43), PAGE 2 key.





(4) Press L1 through L5 (9/48/15/21/24), in sequence, to box TEST and initiate BIT.

NOTE

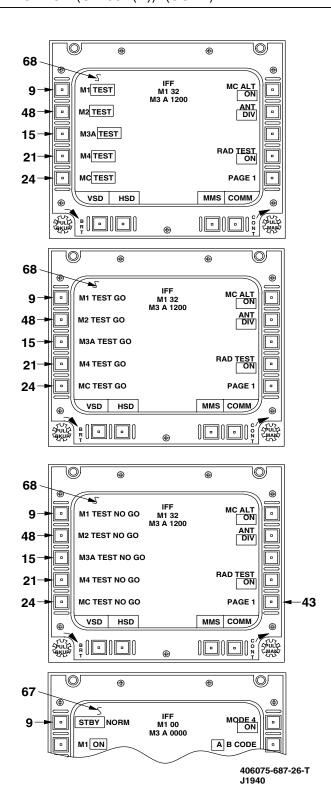
If KIT-1C/TSEC is not installed or loaded, IFF mode 4 test will display NO GO during BIT on IFF page 2 (68).

(5) GO appears next to TEST if no failure is detected.

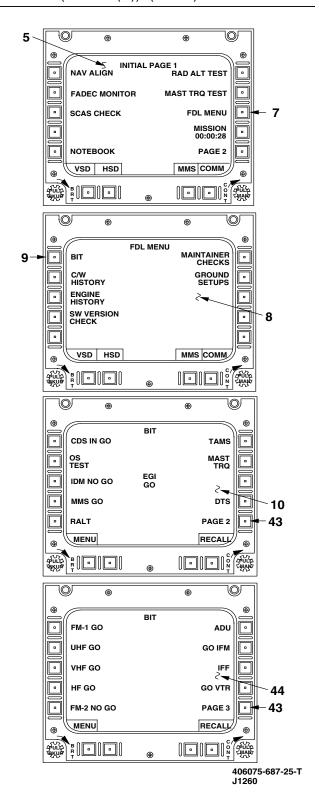
NOTE

No fault codes are identified for the identification friend-or-foe system.

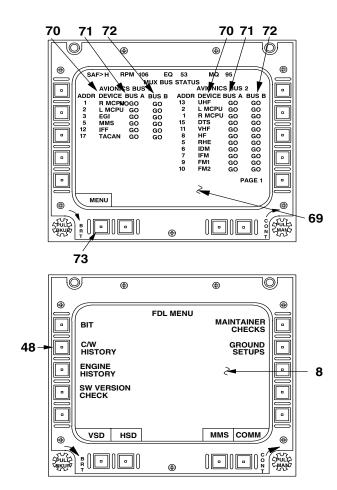
- (6) NO GO appears next to TEST if a failure is detected. Refer to TM 11-1520-248-23 for additional troubleshooting, if required.
- (7) On IFF page 2 (68) press R5 (43), PAGE 1 key.
- (8) On IFF page 1 (67) press L1 (9), STBY/NORM key. Verify STBY/NORM display has STBY boxed.



- s. Press INIT button on either CPG or pilot MFD auxiliary control panel.
- (1) Verify INITIAL PAGE 1 (5) appears on MFD.
- (2) Press R3 (7), FDL MENU key. Verify that FDL MENU page (8) appears.
- (3) On FDL MENU page (8) press L1 (9), BIT key.
- (4) On BIT page 1 (10) press R5 (43), PAGE 2 key.
- (5) On BIT page 2 (44) press R5 (43), PAGE 3 key.



- t. On BIT page 3 (69), verify list of LRUs (70) appears with a status of GO or NO GO on Bus A (71) and Bus B (72).
- u. On BIT page 3 (69), press mode select key A (73), MENU.
 - v. Verify FDL MENU page (8) appears.
- 9. On FDL MENU page (8) press L2 (48), C/W HISTORY key.



406075-687-5-T J1260

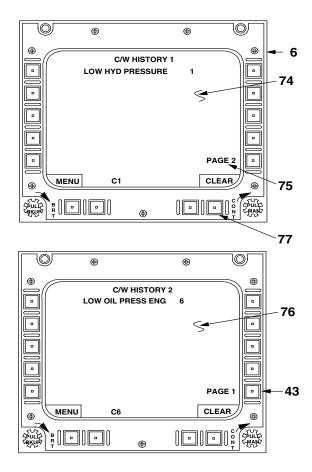
NOTE

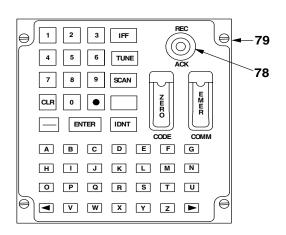
The C/W HISTORY page displays only non-zero cautions and warnings with the number of occurrences from the last time the page was cleared. A total count is displayed for each C/W event. Each counter can accumulate up to 255 counts.

- a. Verify that C/W HISTORY 1 page (74) appears, displaying the number of caution, warning, and advisory occurrences, located to the right of event.
- b. Verify that if more than one page exists, PAGE 2 (75) is displayed in lower right corner of MFD (6).
- c. Verify that C/W HISTORY 2 page (76) appears when R5 (43), PAGE 2 key, is pressed. Pressing R5 (43), PAGE 1 key, recalls C/W HISTORY 1 page (74).

CAUTION

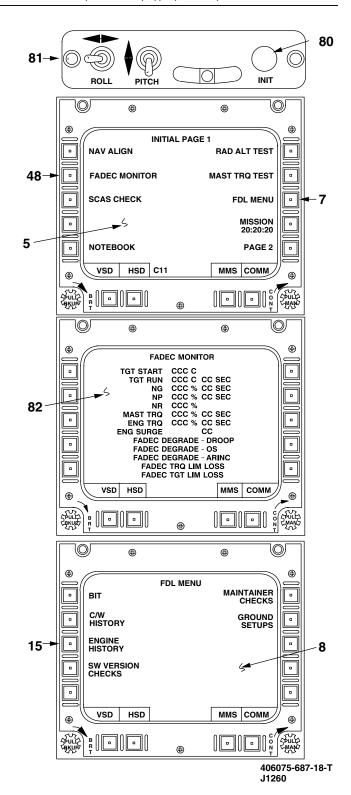
- MODE SELECT key (77) on MFD (6) enables keyboard for entry of clear code (Julian date followed by four numbers). A valid clear code entry causes C/W history pages to be cleared.
- Caution, warning, and advisory events occurring on the ground are not recorded for C/W HISTORY, but are displayed on MFD (6). These can be blanked from the screen by actuating REC/ACK switch (78) on MFK (79) to ACK.





406075-687-8-T

- d. Press INIT button (80) on pilot MFD AUX control panel (81). Verify that INITIAL PAGE 1 (5) appears.
- 10. On INITIAL PAGE 1 (5) press L2 (48), FADEC MONITOR key.
- a. Verify FADEC MONITOR page (82) appears.
- b. Press INIT button (80) on pilot MFD AUX control panel (81). Verify INITIAL PAGE 1 (5) appears.
- c. On INITIAL PAGE 1 (5) press R3 (7), FDL MENU key. Verify FDL MENU page (8) appears.
- 11. On FDL MENU page (8) press L3 (15), ENGINE HISTORY key.

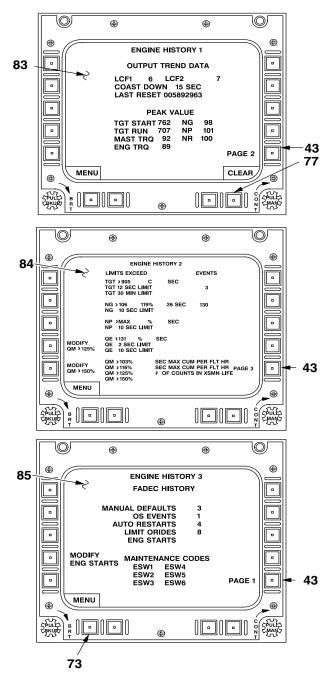


NOTE

- Pressing MODE SELECT key (77) on MFD enables the keyboard to be used to enter a clear code (Julian date followed by four numbers).
- A valid clear code entry causes engine history data to be cleared.
- a. Verify ENGINE HISTORY 1 page (83) appears, displaying OUTPUT TREND DATA and PEAK VALUES.
- b. Verify pressing R5 (43), PAGE 2 key, calls up ENGINE HISTORY 2 page (84) displaying LIMITS EXCEEDED.
- c. Verify pressing R5 (43), PAGE 3 key, calls up ENGINE HISTORY 3 page (85) displaying FADEC HISTORY and MAINTENANCE CODES. Ensure that pressing R5 (43), PAGE 1 key, recalls ENGINE HISTORY 1 page (83).

NOTE

- Refer to Appendix F for a description of information displayed on ENGINE HISTORY page(s).
 - d. Press mode select key A (73), MENU.

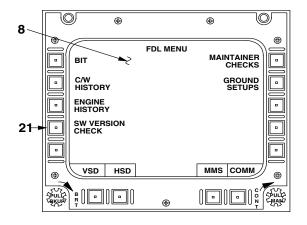


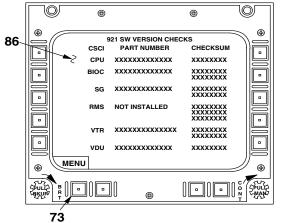
406075-687-13-T J1260

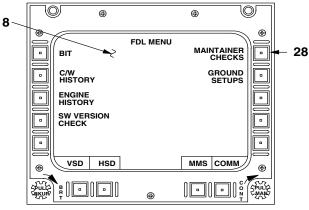
e. Verify FDL MENU page (8) appears.

NOTE

- The actual display in step 12. is dependent upon whether the page is selected from the CPG or pilot MFD.
- If this page is activated from the CPG MFD, the display reflects the software versions for the left MCPU (921). No results are shown for the RMS as the left MCPU does not contain an RMS circuit card assembly (CCA). Instead the text NOT INSTALLED is displayed for the part number, and the checksum value is blank.
- If the page is selected from the pilot MFD, the title reflects that the results for the right MCPU (940) are being displayed. As the right MCPU does not contain the CCAs for the VTR and VDU, no part numbers and checksums are provided. Instead the part number column displays the text NOT INSTALLED.
- 12. On FDL MENU page (8) press L4 (21), SW VERSION CHECK key. Verify SW VERSION CHECKS page (86) appears.
- 13. Press mode select key A (73), MENU. Verify FDL MENU page (8) appears.
- 14. On FDL MENU page (8) press R1 (28), MAINTAINER CHECKS key.

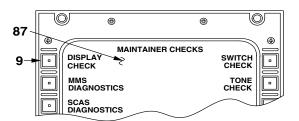


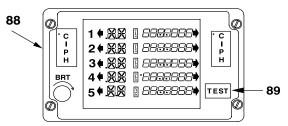




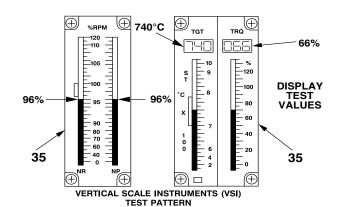
406075-687-14-T J1260

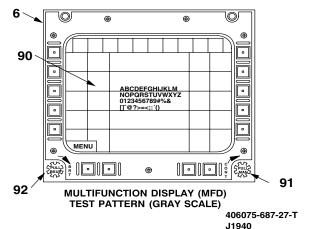
- a. Verify MAINTAINER CHECKS page (87) appears.
- b. On MAINTAINER CHECKS PAGE (87) press L1 (9), DISPLAY CHECK key.
- c. Verify test pattern appears on RFD (88) and alternates between all segments on, and blank screen. If alternating test pattern is not displayed, press RFD TEST switch (89).
- d. Verify vertical scale indicators (35) are driven to half the full scale.
- e. Verify pilot MFD (6) displays a gray scale on DISPLAY CHECK page (90).
- f. Adjust contrast control CONT (91) on pilot MFD (6) to provide maximum contrast between the shades of gray.
- g. Adjust brightness control BRT (92) to a level that does not degrade contrast at the light or dark ends of the gray scale.
- h. Repeat steps f. and g. as needed to obtain highest quality picture.





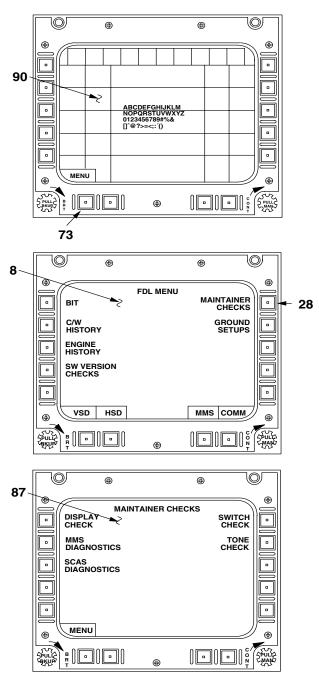
REMOTE FREQUENCY DISPLAY (RFD)
TEST PATTERN
NOTE: PATTERN SHOWN FLASHES ON AND OFF





GO TO NEXT PAGE

- i. On DISPLAY CHECK page (90) press mode select key A (73), MENU. Verify FDL MENU page (8) appears.
- j. On FDL MENU page (8) press R1 (28), MAINTAINER CHECKS key. Verify MAINTAINER CHECKS page (87) appears.



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NOTE

The following steps for SWITCH CHANGE should be first accomplished for pilot, then CPG MFD.

k. On MAINTAINER CHECKS page (87) press R1 (28), SWITCH CHECK key. Verify SWITCH CHANGE page (93) appears.

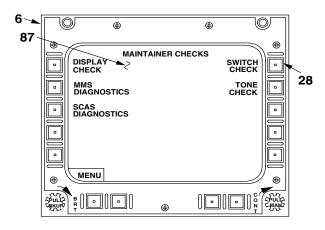
NOTE

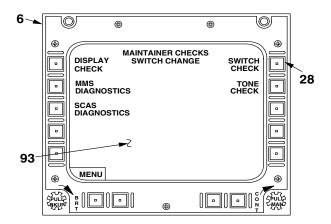
The MFD does not identify the individual key or switch being pressed. Changes in switch position are indicated on the MFD by the message SWITCH CHANGE.

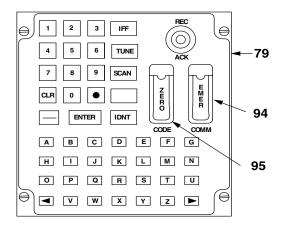
- I. Press each line address and mode select key separately on MFD (6) (except for R1 (28), SWITCH CHECK). Verify MFD displays SWITCH CHANGE with each key pressed.
- m. Press each key and the two guarded toggle switches (94) and (95) on the MFK (79). Verify MFD displays SWITCH CHANGE with each key and switch pressed.

NOTE

- In SWITCH CHECK mode, the cockpit switches connected through the keyboard will not operate normally (i.e., system will not respond to switch actions). These switches may also be tested in the switch check mode.
- SWITCH CHECK mode can not be disabled unless each cockpit switch is in the same position as when SWITCH CHECK mode was selected. If the system gets "stuck" in SWITCH CHECK mode because of the above constraint, the MCPUs may be powered down and then powered up again to disable SWITCH CHECK mode.
- n. Press R1 (28), SWITCH CHECK key, again to disable switch check mode.







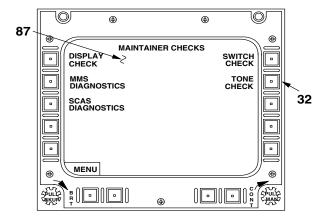
406075-687-20-T J1260

GO TO NEXT PAGE

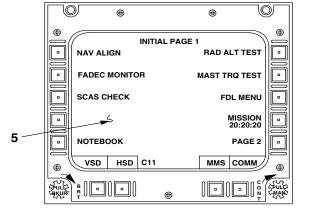
NOTE

There are five different audio tones (advisory, caution, warning, low RPM, and FADEC) that can be checked. As each tone is checked, text indicating the tone being tested is displayed below the bottom line of the TONE CHECK legend and offset three characters to the left from the right side of the word CHECK. The text that will appear will either be ADVISORY, CAUTION, WARNING, LOW RPM, or FADEC.

- o. On MAINTAINER CHECKS page (87) press R2 (32), TONE CHECK key. Verify each time R2 (32) is pressed, an audio tone is heard in headsets.
- p. On pilot AUX MFD control panel (81), press INIT switch (80).
 - 15. Verify INITIAL PAGE 1 (5) appears.
- 16. Press mode select key A, MENU, on CPG MFD and repeat steps 12. through 15. as required.
- 17. Disconnect external ac and dc electrical power (TM 1-1520-248-23).







406075-687-17-T

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-23 TM 11-1520-248-23

Applicable Configurations:

ÖH-58D

Equipment Condition:

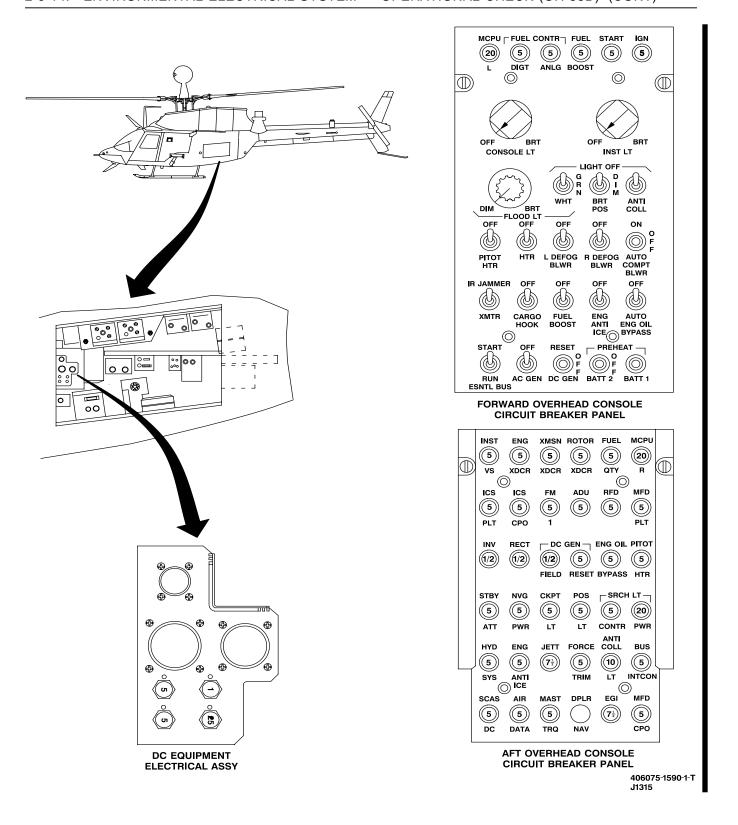
Tools:
Electrical Repairer Tool Kit (B14)
Aviation Ground Power Unit (AGPU)

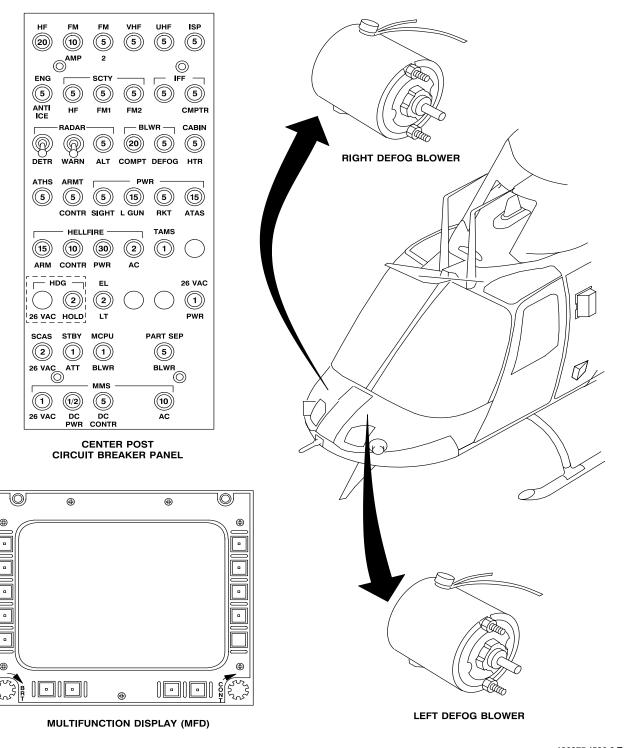
Heat Gun (B1)

Helicopter Safed (TM 1-1520-248-23)
EGI Unit Removed (TM 11-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post, Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

All Switches — Off/SAFE

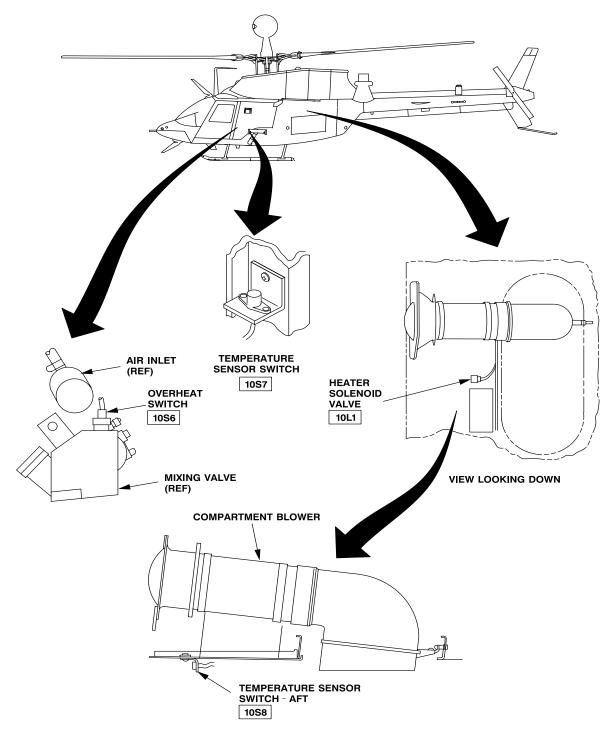
Personnel Required: 68F Aircraft Electrician





406075-1590-2-T J1315

GO TO NEXT PAGE



406075-1590-3-T J1315

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

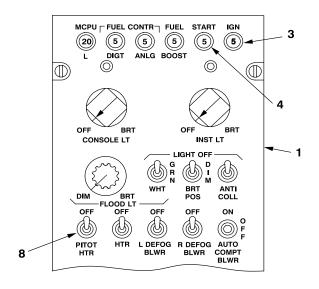
IGN (3) START (4) PART SEP BLWR (5) HF (6)

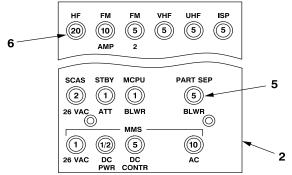
2. Apply external dc electrical power (TM 1-1520-248-23).

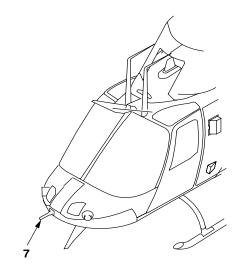
WARNING

The pitot tube assembly is very hot during and immediately after operations requiring pitot heat. Severe burns will result if contacted by hands or other parts of the body.

- 3. Check pitot tube heater (7). Ensure that tube is cool.
- a. Set PITOT HTR switch (8) to PITOT HTR (on).
- b. Determine that pitot tube heater (7) begins to heat.

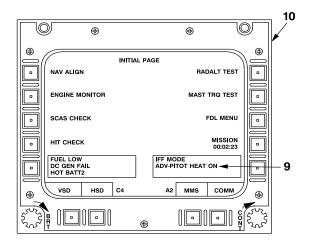


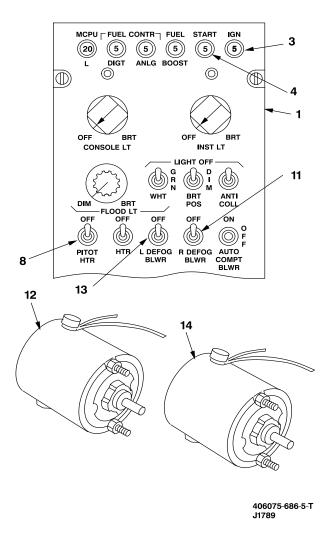




406075-686-4-T

- c. Verify PITOT HEAT ON advisory message (9) appears on pilot MFD (10).
- d. Set PITOT HTR switch (8) to OFF. Observe that PITOT HEAT ON (9) advisory message on MFD (10) disappears.
 - 4. Check defog blowers:
- a. Set R DEFOG BLWR switch (11) to R DEFOG BLWR (on). Determine that right defog blower (12) is operating.
- b. Set R DEFOG BLWR switch (11) to OFF. Determine that right defog blower (12) stops operating.
- c. Set L DEFOG BLWR switch (13) to L DEFOG BLWR (on). Determine that left defog blower (14) is operating.
- d. Set L DEFOG BLWR switch (13) to OFF. Determine that left defog blower (14) stops operating.





- 5. Check avionics compartment blower (15):
- a. Set COMPT BLWR switch (16) to ON. Determine that compartment blower (15) is operating.
- b. Set COMPT BLWR switch (16) to OFF. Determine that blower (15) stops operating.

NOTE

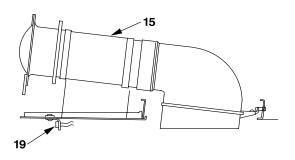
The compartment blower will come on when the compartment temperature switches sense that the compartment temperature is above 100 °F.

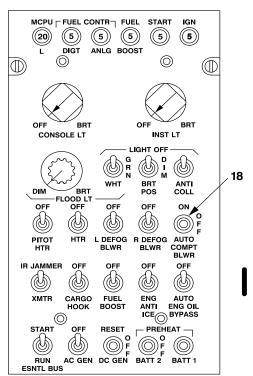
c. Set COMPT BLWR switch (16) to AUTO.

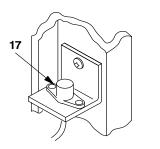
WARNING

Use care when handling heat gun to prevent burns. If burns occur seek medical aid.

- d. If the blower (15) is not operating, heat the forward temperature sensor switch (17) with heat gun until the switch actuates and turns on the blower (15).
- e. With the blower (15) operating, cool the temperature sensor switch (17) by blowing unheated air over it with heat gun. When the temperature drops sufficiently, the blower (15) should stop.
- f. Perform steps d. and e. using the aft compartment sensor (18).
 - g. Set COMPT BLWR switch (16) to OFF.







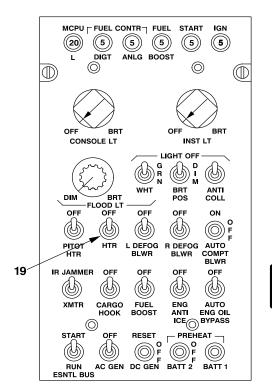
406075-1590-4-T

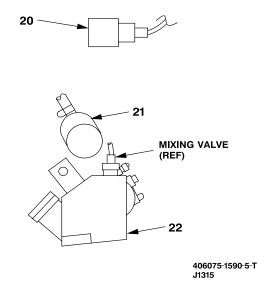
6. Check cabin heater:

- a. Set HTR switch (19) to HTR (on). Listen to determine that heater solenoid valve (20) opens.
- b. Set HTR switch (19) to OFF. Listen to determine that heater solenoid valve (20) closes.
- c. Remove overheat switch (21) from heater duct (22).
- d. Set HTR switch (19) to HTR. Heat overheat switch (21) with heat gun. Determine that switch closes and heater solenoid valve (20) closes.
- e. Allow overheat switch (21) to cool and note that heater solenoid valve (20) reopens.
- f. Set HTR switch (19) to OFF and reinstall overheat switch (21) in heater duct (22).
- 7. Disconnect external dc electrical power (TM 1-1520-248-23).

FOLLOW-ON MAINTENANCE

Install EGI unit (TM 11-1520-248-23).





END OF TASK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-23 TM 11-1520-248-23

Applicable Configurations:

OH-58D(R)

Equipment Condition:

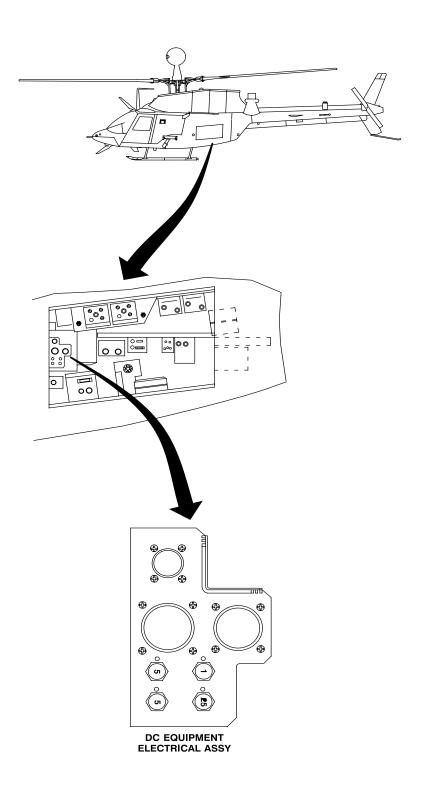
Tools:
Electrical Repairer Tool Kit (B14)
Aviation Ground Power Unit (AGPU)

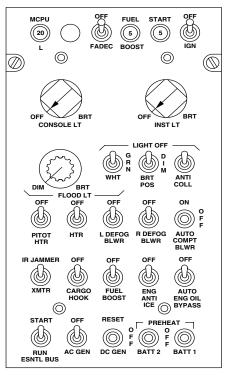
Heat Gun (B1)

Helicopter Safed (TM 1-1520-248-23)
EGI Unit Removed (TM 11-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post, Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

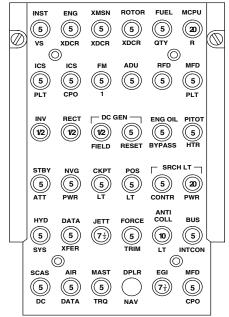
All Switches — Off/SAFE

Personnel Required: 68F Aircraft Electrician

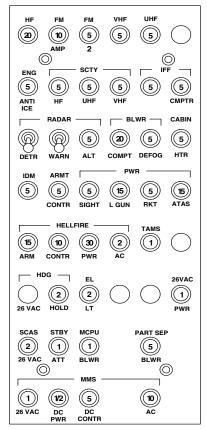




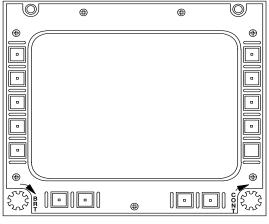
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



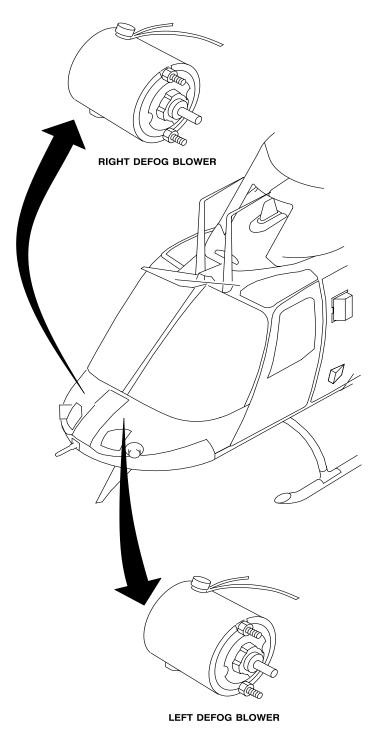
AFT OVERHEAD
CONSOLE CIRCUIT BREAKER PANEL
406075-1591-1-T



CENTER POST CIRCUIT BREAKER PANEL

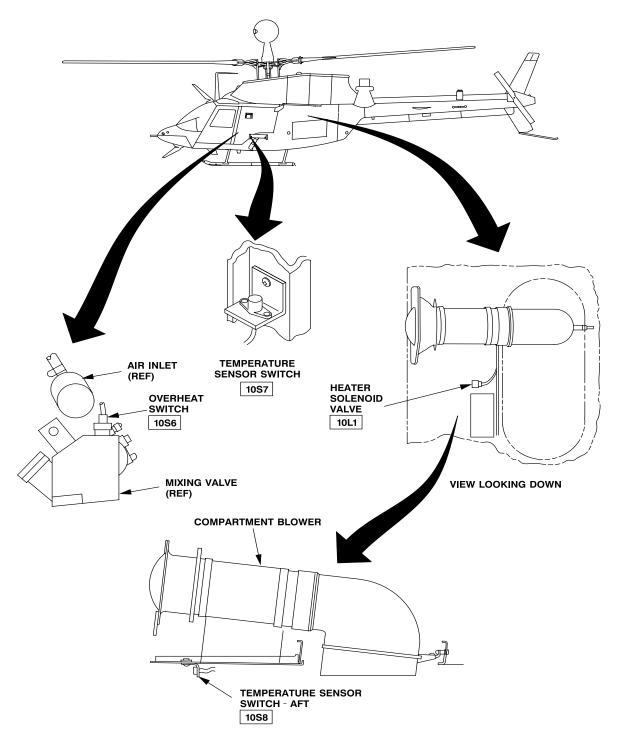


MULTIFUNCTION DISPLAY (MFD)



406075-1591-2-T J1316

GO TO NEXT PAGE



406075-1590-3-T J1315

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

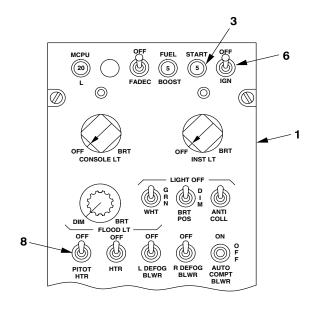
START (3) PART SEP BLWR (4) HF (5) IGN (6) – OFF

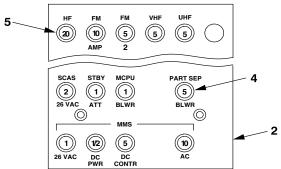
2. Apply external dc electrical power (TM 1-1520-248-23).

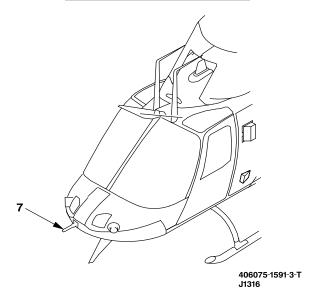
WARNING

The pitot tube assembly is very hot during and immediately after operations requiring pitot heat. Severe burns will result if contacted by hands or other parts of the body.

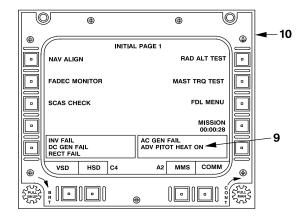
- 3. Check pitot tube heater (7). Ensure that tube is cool.
- a. Set PITOT HTR switch (8) to PITOT HTR (on).
- b. Determine that pitot tube heater (7) begins to heat.

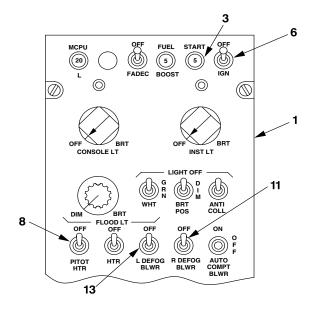


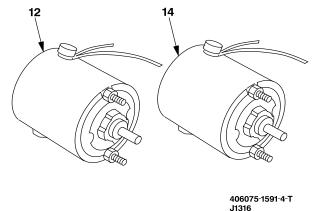




- c. Verify PITOT HEAT ON advisory message (9) appears on pilot MFD (10).
- d. Set PITOT HTR switch (8) to OFF. Verify PITOT HEAT ON (9) advisory message on MFD (10) disappears.
 - 4. Check defog blowers:
- a. Set R DEFOG BLWR switch (11) to R DEFOG BLWR (on). Determine that right defog blower (12) is operating.
- b. Set R DEFOG BLWR switch (11) to OFF. Determine that right defog blower (12) stops operating.
- c. Set L DEFOG BLWR switch (13) to L DEFOG BLWR (on). Determine that left defog blower (14) is operating.
- d. Set L DEFOG BLWR switch (13) to OFF. Determine that left defog blower (14) stops operating.







- 5. Check avionics compartment blower (15):
- a. Set COMPT BLWR switch (16) to ON. Determine that compartment blower (15) is operating.
- b. Set COMPT BLWR switch (16) to OFF. Determine that blower (15) stops operating.

NOTE

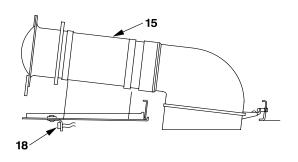
The compartment blower will come on when the compartment temperature switches sense that the compartment temperature is above 100 °F.

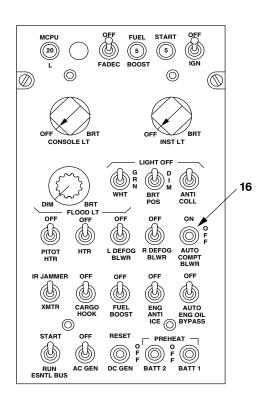
c. Set COMPT BLWR switch (16) to AUTO.

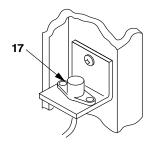
WARNING

Use care when handling heat gun to prevent burns. If burns occur seek medical aid.

- d. If the blower (15) is not operating, heat the forward temperature sensor switch (17) with heat gun until the switch actuates and turns on the blower (15).
- e. With the blower (15) operating, cool the temperature sensor switch (17) by blowing unheated air over it with heat gun. When the temperature drops sufficiently, the blower (15) should stop.
- f. Perform steps d. and e. using the aft compartment sensor (18).
 - g. Set COMPT BLWR switch (16) to OFF.







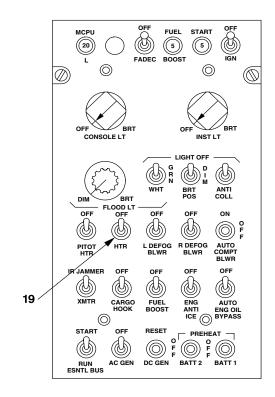
406075-1591-5-T J1316

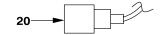
6. Check cabin heater:

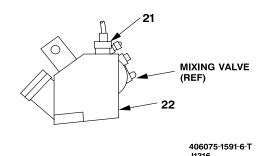
- a. Set HTR switch (19) to HTR (on). Listen to determine that heater solenoid valve (20) opens.
- b. Set HTR switch (19) to OFF. Listen to determine that heater solenoid valve (20) closes.
- c. Remove overheat switch (21) from heater duct (22).
- d. Set HTR switch (19) to HTR. Heat overheat switch (21) with heat gun. Determine that switch closes and heater solenoid valve (20) closes.
- e. Allow overheat switch (21) to cool and note that heater solenoid valve (20) reopens.
- f. Set HTR switch (19) to OFF and reinstall overheat switch (21) in heater duct (22).
- 7. Disconnect external dc electrical power (TM 1-1520-248-23).

FOLLOW-ON MAINTENANCE

Install EGI unit (TM 11-1520-248-23).







This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

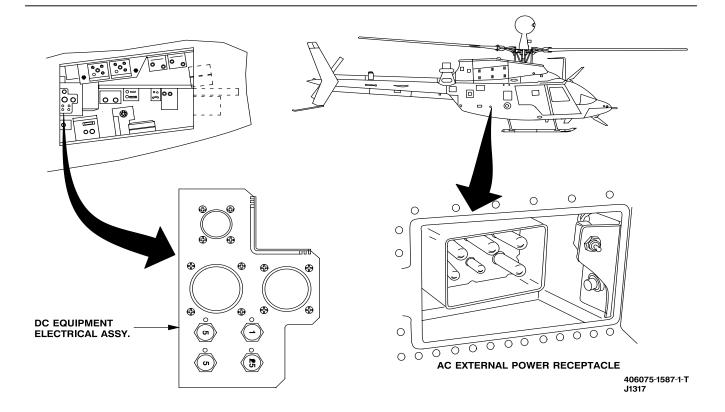
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

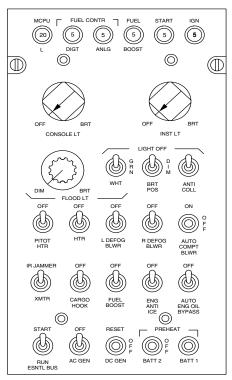
Personnel Required: 68F Aircraft Electrician References:

TM 1-1520-248-23

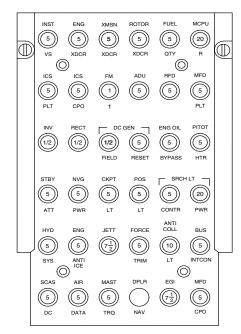
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

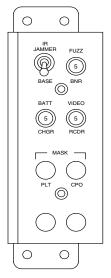




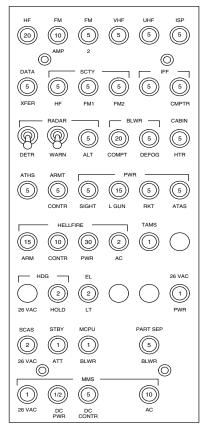
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

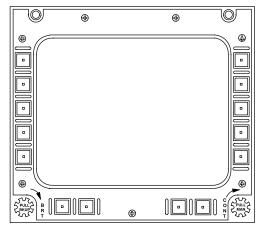


AUXILIARY CIRCUIT BREAKER PANEL

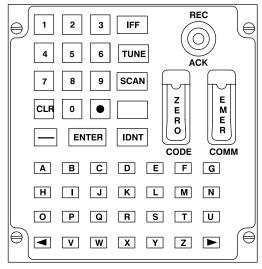


CENTER POST CIRCUIT BREAKER PANEL

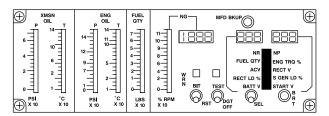
406099-90-3-T J2623



MULTIFUNCTION DISPLAY (MFD)



KEYBOARD



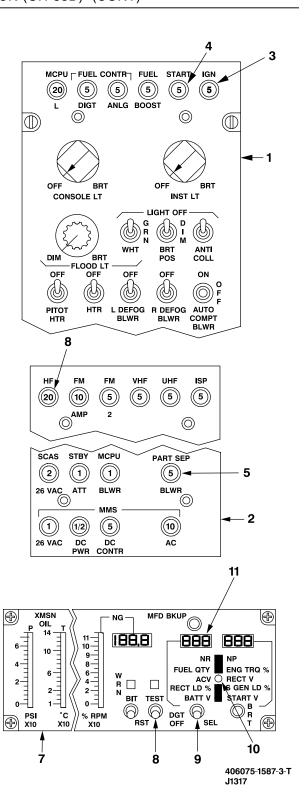
MULTIPARAMETER DISPLAY (MPD)

406075-1587-2-T J1317

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) START (4) PART SEP BLWR (5) HF (6)

- 2. Apply external ac electrical power (TM 1-1520-248-23).
 - 3. On MPD (7):
- a. Place TEST/DGT/OFF switch (8) to center position.
- b. Toggle SEL switch (9) until ACV RECT V position (10) is lit.
- c. An indication of 115 \pm 3 VAC should be displayed on left digital indicator (11) of MPD.



NOTE

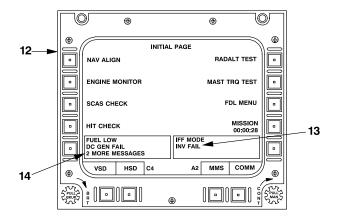
The inverter does not operate with external ac electrical power applied.

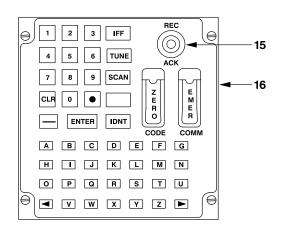
4. On pilot MFD (12):

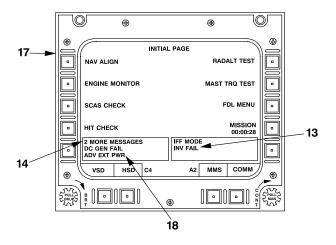
- a. INV FAIL caution message (13) should be displayed.
- b. Check for "x" MORE MESSAGES (14) ("x" = the number of messages left to be displayed). If present, toggle REC/ACK switch (15) on keyboard (16) as required to locate above message.

5. On CPG MFD (17):

- a. Toggle REC/ACK switch (15) on keyboard(16) until INV FAIL caution message (13) appears.
- b. Toggle REC/ACK switch (15) on keyboard (16) until EXT PWR advisory message (18) appears.
- c. Check for "x" MORE MESSAGES (14) ("x" = the number of messages left to be displayed). If present, toggle the REC/ACK switch (15) on keyboard (16) as required to locate above message(s).

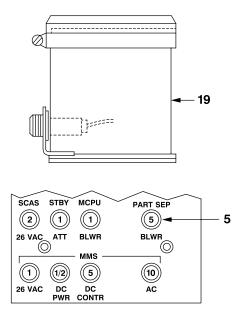






406075-1587-4-T J1317

- 6. Close PART SEP BLWR circuit breaker (5). Verify particle separator blower (19) operates.
- 7. Disconnect external ac electrical power (TM 1-1520-248-23).



406075-1587-5-T J1317

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

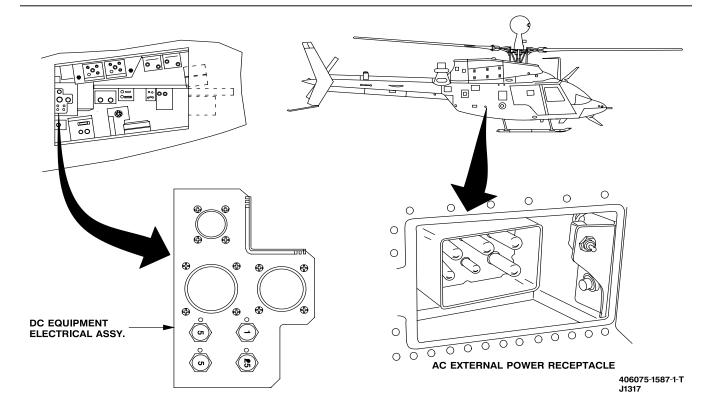
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

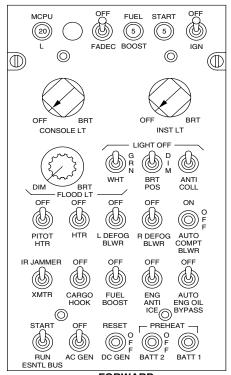
Personnel Required: 68F Aircraft Electrician References:

TM 1-1520-248-23

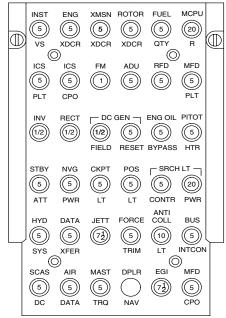
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

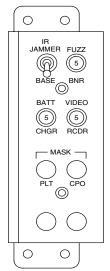




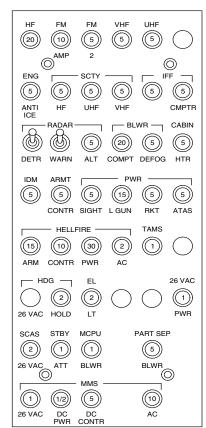
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

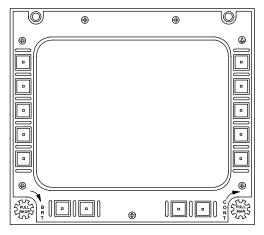


AUXILIARY CIRCUIT BREAKER PANEL

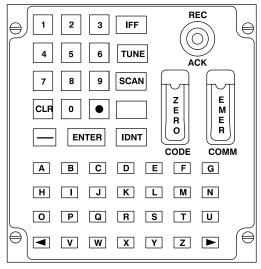


CENTER POST CIRCUIT BREAKER PANEL

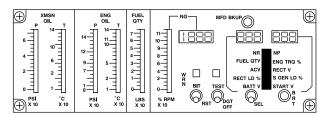
406075-1600-1-T J1328



MULTIFUNCTION DISPLAY (MFD)



KEYBOARD



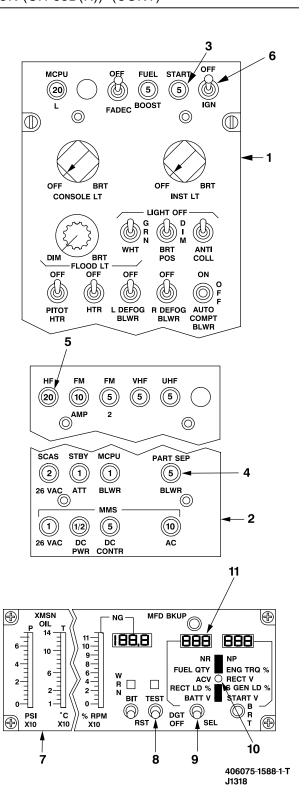
MULTIPARAMETER DISPLAY (MPD)

406075-1587-2-T J1317

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) - OFF START (4) PART SEP BLWR (5) HF (6)

- 2. Apply external ac electrical power (TM 1-1520-248-23).
 - 3. On MPD (7):
- a. Place TEST/DGT/OFF switch (8) to center position.
- b. Toggle SEL switch (9) until ACV RECT V position (10) is lit.
- c. An indication of 115 \pm 3 VAC should be displayed on left digital indicator (11) of MPD.



NOTE

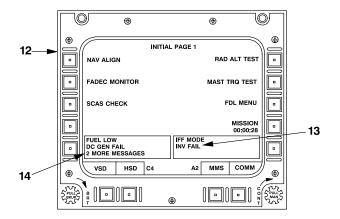
The inverter does not operate with external ac electrical power applied.

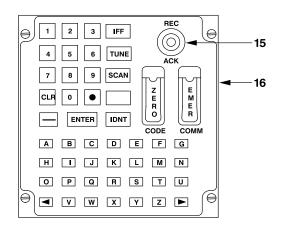
4. On pilot MFD (12):

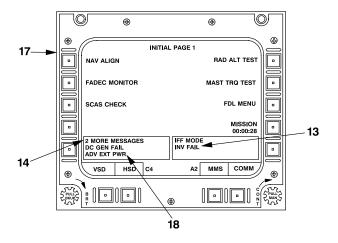
- a. INV FAIL caution message (13) should be displayed.
- b. Check for "x" MORE MESSAGES (14) ("x" = the number of messages left to be displayed). If present, toggle REC/ACK switch (15) on keyboard (16) as required to locate above message.

5. On CPG MFD (17):

- a. Toggle REC/ACK switch (15) on keyboard(16) until INV FAIL caution message (13) appears.
- b. Toggle REC/ACK switch (15) on keyboard (16) until EXT PWR advisory message (18) appears.
- c. Check for "x" MORE MESSAGES (14) ("x" = the number of messages left to be displayed). If present, toggle the REC/ACK switch (15) on keyboard (16) as required to locate above message(s).

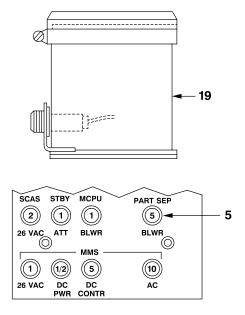






406075-1588-2-T J1318

- 6. Close PART SEP BLWR circuit breaker (5). Verify particle separator blower (19) operates.
- 7. Disconnect external ac electrical power (TM 1-1520-248-23).



406075-1587-5-T J1317

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

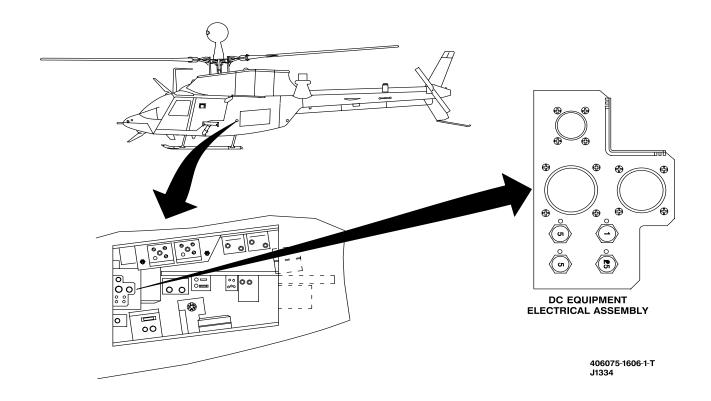
Aviation Ground Power Unit (AGPU) Multimeter (B3) Electrical Repairer Tool Kit (B14)

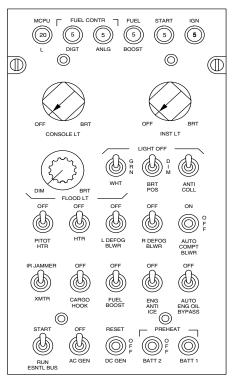
Personnel Required: 68F Aircraft Electrician References:

TM 1-1520-248-23

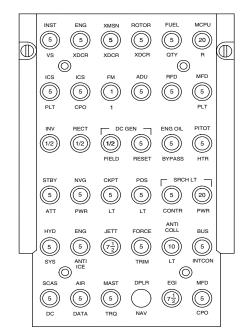
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

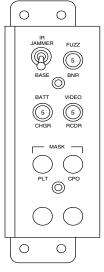




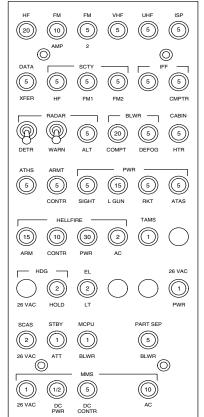
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

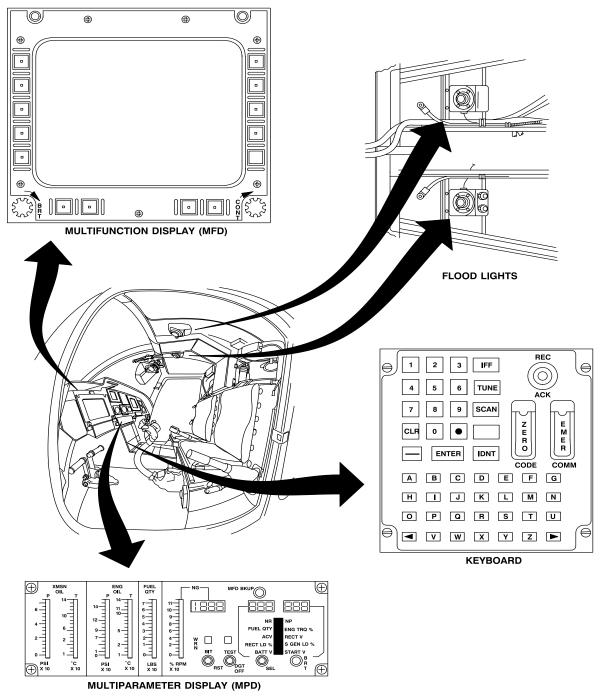


AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

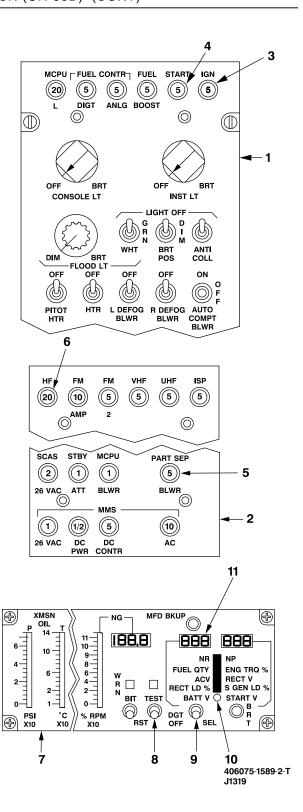


406075-1589-1-T J1319

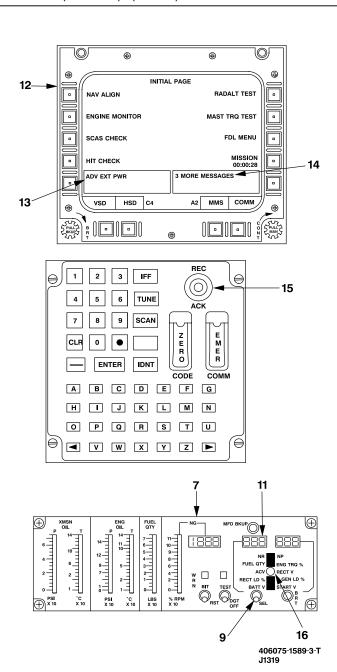
1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) START (4) PART SEP BLWR (5) HF (6)

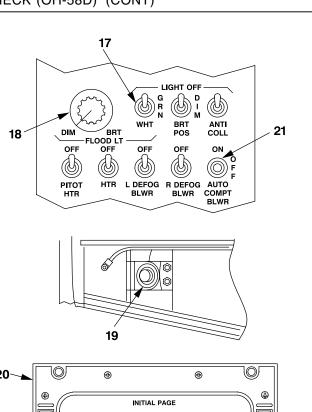
- 2. Apply external dc electrical power (TM 1-1520-248-23).
 - 3. On MPD (7):
- a. Place TEST/DGT/OFF switch (8) to center position.
- b. Toggle SEL switch (9) until BATT $V-START\ V$ position (10) is lit.
- c. An indication of 28 \pm 2 VDC should be displayed on the digital indicator (11) above BATT V

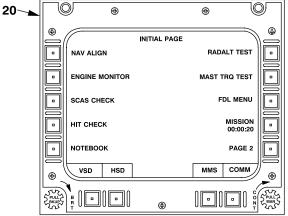


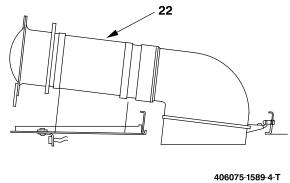
- 4. On pilot MFD (12):
- a. EXT PWR advisory message (13) should be displayed.
- b. Check for "x" MORE MESSAGES (14) ("x" = the number of messages left to be displayed). If present, toggle REC/ACK switch (15) as necessary to locate the above message.
- 5. On MPD (7), toggle SEL switch (9) until ACV RECT V (16) position is lit. Observe that 115 \pm 3 VAC is displayed on digital indicator (11) above ACV.



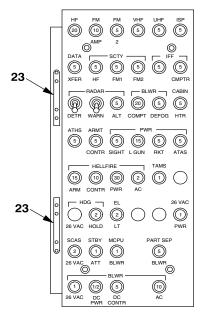
- 6. Set FLOOD LT switch (17) to GREEN. Turn FLOOD LT control (18) clockwise to BRT. Observe green flood light (19) is on. Set flood light switch (17) to LIGHT OFF.
- 7. Observe that INITIAL PAGE on CPG MFD (20) comes on.
- 8. Set COMPT BLWR switch (21) to ON. Verify compartment blower (22) operates.



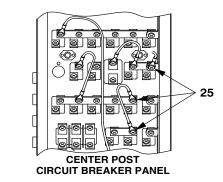


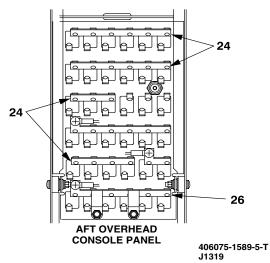


- 9. Turn off external dc electrical power (TM 1-1520-248-23).
- 10. Lower overhead console (TM 1-1520-248-23).
- 11. Open center post circuit breaker panel by loosening two fasteners (23).
- 12. Turn on external dc electrical power (TM 1-1520-248-23).
- 13. Measure, with multimeter (B3) that 28 ± 2 Vdc is present on all dc buses: battery emergency (24), essential (25), and power assured (26).
- 14. Disconnect external dc electrical power (TM 1-1520-248-23).
- 15. Raise overhead console (TM 1-1520-248-23).
- 16. Close center post circuit breaker panel and tighten two fasteners (23).



FRONT VIEW





This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

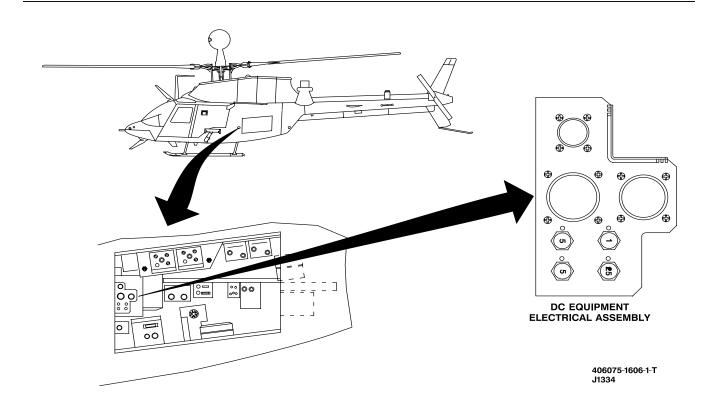
Aviation Ground Power Unit (AGPU) Multimeter (B3) Electrical Repairer Tool Kit (B14)

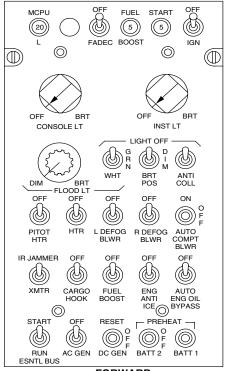
Personnel Required: 68F Aircraft Electrician References:

TM 1-1520-248-23

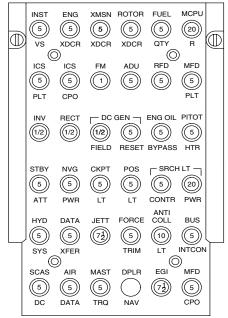
Equipment Condition:
Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,

Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

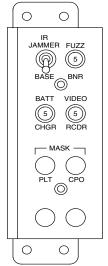




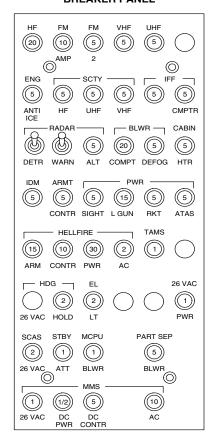
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



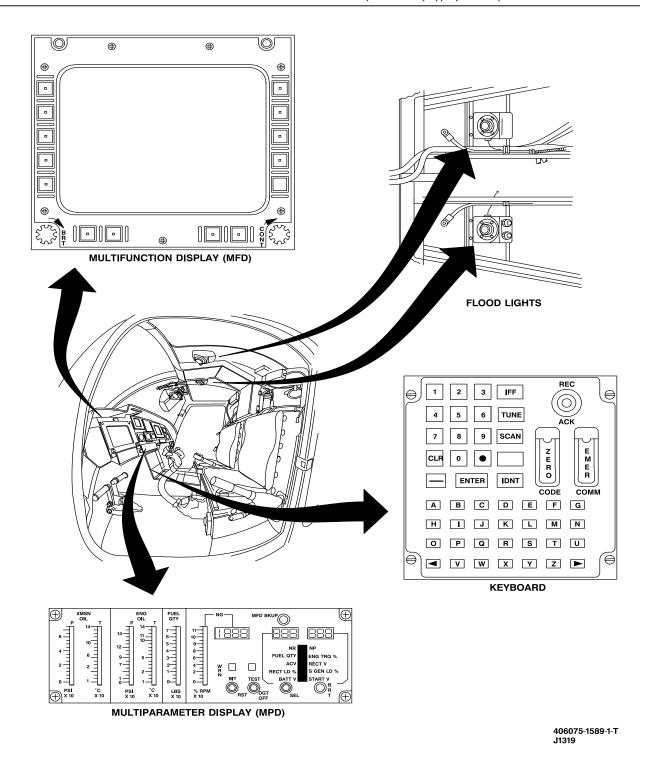
AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

GO TO NEXT PAGE

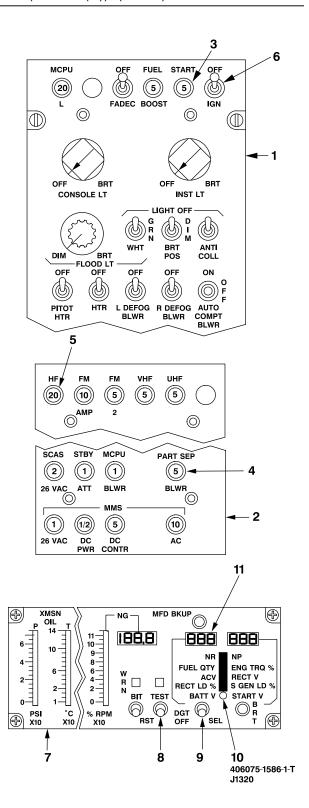


GO TO NEXT PAGE

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

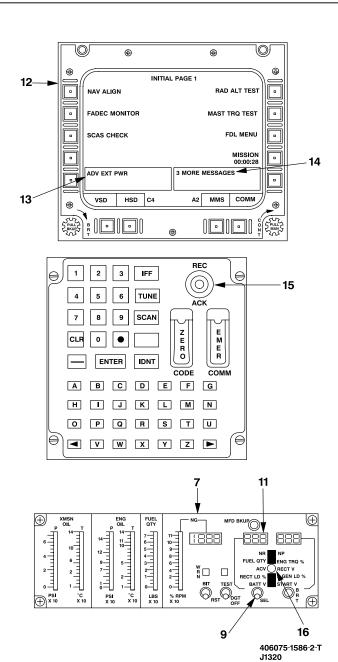
START (3) PART SEP BLWR (4) HF (5) IGN (6) – OFF

- 2. Apply external dc electrical power (TM 1-1520-248-23).
 - 3. On MPD (7):
- a. Place TEST/DGT/OFF switch (8) to center position.
- b. Toggle SEL switch (9) until BATT V START V (10) position is lit.
- c. An indication of 28 \pm 2 VDC should be displayed on the digital indicator (11) above BATT V

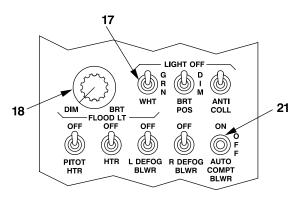


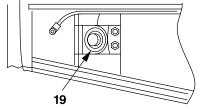
4. On pilot MFD (12):

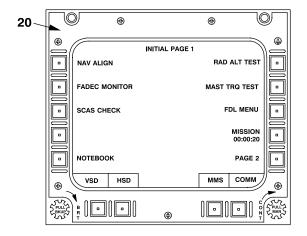
- a. EXT PWR advisory message (13) should be displayed.
- b. Check for "x" MORE MESSAGES (14) ("x" = the number of messages left to be displayed). If present, toggle REC/ACK switch (15) as necessary to locate the above message.
- 5. On MPD (7), toggle SEL switch (9) until ACV RECTV (16) position is lit. Observe that 115 \pm 3 VAC is displayed on digital indicator (11) above ACV.

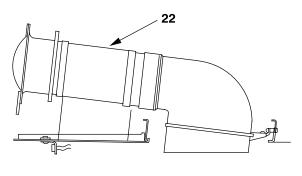


- 6. Set FLOOD LT switch (17) to GREEN. Turn FLOOD LT control (18) clockwise to BRT. Observe green flood light (19) is on. Set flood light switch (17) to LIGHT OFF.
- 7. Observe that INITIAL PAGE 1 on CPG MFD (20) comes on.
- 8. Set COMPT BLWR switch (21) on ON. Verify compartment blower (22) operates.



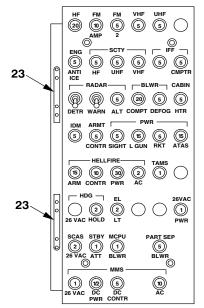




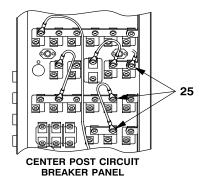


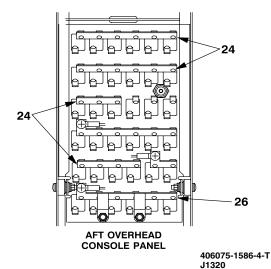
406075-1586-3-T J1320

- 9. Turn off external dc electrical power (TM 1-1520-248-23).
- 10. Lower overhead console (TM 1-1520-248-23).
- 11. Open center post circuit breaker panel by loosening two fasteners (23).
- 12. Turn on external dc electrical power (TM 1-1520-248-23).
- 13. Measure, with multimeter (B3) that 28 ± 2 Vdc is present on all dc buses: battery emergency (24), essential (25), and power assured (26).
- 14. Disconnect external dc electrical power (TM 1-1520-248-23).
- 15. Raise overhead console (TM 1-1520-248-23).
- 16. Close center post circuit breaker panel and tighten two fasteners (23).



FRONT VIEW





END OF TASK

2-6-20. MAST TORQUE CALIBRATION

This task covers: Calibration of Mast Torque (On Helicopter)

INITIAL SETUP

Applicable Configurations:

Tools:

Multimeter (B3) Electrical Repairer Tool Kit (B14) Torque Wrench (B18)

Material:

Lockwire (C7)

Personnel Required:

Pilot

68F Aircraft Electrician

67S Scout Helicopter Technical Inspector (TI)

References:

TM 1-1520-248-23

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

Forward Fairing Assembly Removed

(TM 1-1520-248-23)

Main Rotor Blades Removed

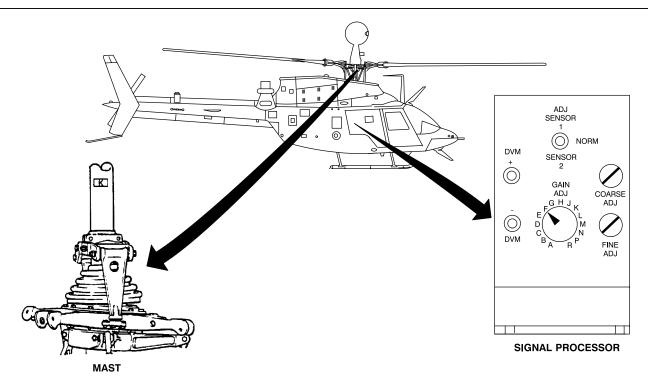
(TM 1-1520-248-23)

Main Rotor Balance Weights Removed

(TM 1-1520-248-23) (If Required)

Right Access Door Removed

(TM 1-1520-248-23)



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J1839

WARNING

Maintenance personnel shall exercise extreme caution while working around rotating controls during ground run operations. Serious injury may occur.

NOTE

 Mast torque calibration is required any time one or more of the following is accomplished:

Transducer replaced or, removed and installed.

Mast replaced.

Mast standpipe removed and installed.

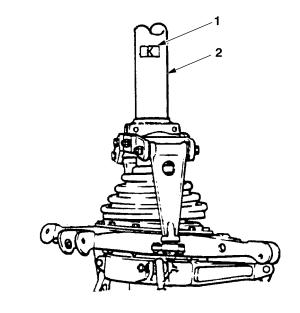
Signal processor replaced.

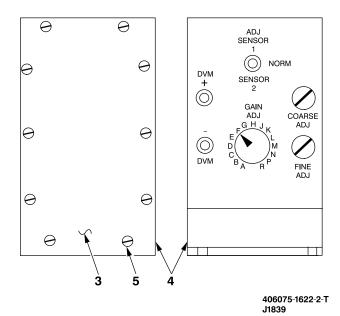
- Calibration of the mast torque system requires two adjustments, which are Gain Adjustments and Zero Adjustments.
- 1. Gain Adjustment.

NOTE

Stiffness of mast varies because of machining and heat treating tolerances. Stiffness code letter can be A thru R, denoting progressive stiffness.

- a. Locate mast identification plate (1) on mast (2) and determine mast stiffness code letter.
- b. Remove cover (3) from signal processor (4) by removing 10 screws (5). Lift cover (3) from signal processor (4).





c. Find code letter stamped on mast identification plate (1) in top row of translation table below.

TRANSLATION TABLE

 Mast

 Stiffness

 Code
 A B C D E F G H J K L M N P R

 Signal
 R P N M L K J H G F E D C B A

 Conditioner

 Code

(TABLE I.D. 922089)

NOTE

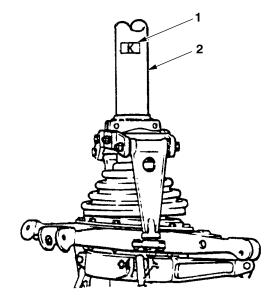
- The code letter beneath the mast stiffness code is the corresponding signal processor code letter.
- Mast to signal processor mating must be reaffirmed anytime the mast or signal processor is replaced.
- d. On signal processor (4), rotate rotary switch (6) to match signal processor code letter found in bottom row of translation table above.

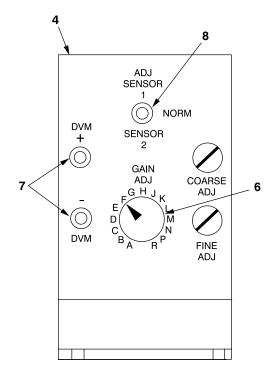
NOTE

- All system connections must be secure prior to zero adjustment.
- The adjustment potentiometers are continuous, however, they have a null area. It is required that coarse and fine potentiometers not be in the null area while adjusting to zero. The null area will cause erratic readings on the voltmeter.

2. Zero Adjustment.

- a. Check all system connections to ensure connections are secure.
- b. Connect multimeter (B3) to DVM(+) and DVM (-) test pins (7).
- c. On signal processor (4), position toggle switch (8) to ADJ SENSOR 1.





406075-1622-3-T J1839

d. Remove lockwire (9).

CAUTION

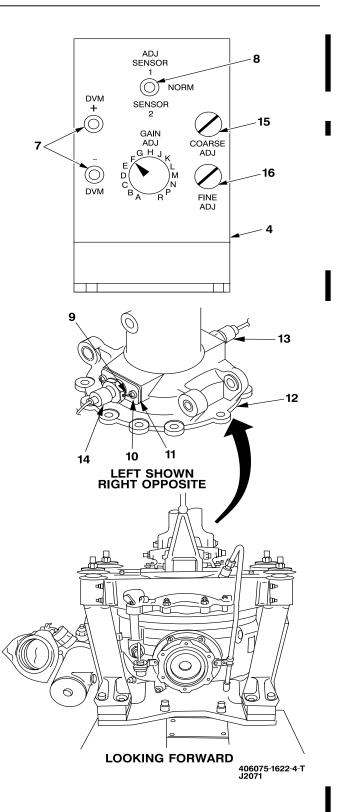
Shims are installed between the transducer and its mounting bracket at installation. The correct number of shims must be present to prevent the transducer from contacting the mast.

- e. Loosen two screws (10) securing lower right transducer mounting bracket (11) to swashplate support (12).
- f. Pilot run engine at 100% RPM, and fuel control in analog.
- g. Slide right transducer (13) fore and aft until output voltage on multimeter (B3) is -0.75 \pm 0.15 Vdc.
 - h. Tighten retaining screws (10).

NOTE

Ensure that multimeter reading obtained in step g. remains within specified limits after tightening screws.

- i. On signal processor (4), position toggle switch (8) to ADJ SENSOR 2, and repeat steps d through h for lower left transducer (14).
 - j. Position toggle switch (8) to NORM.
- k. Using screwdriver, turn COARSE ADJ screw (15) left or right, as applicable, to adjust multimeter (B3) as close to 0.000 Vdc as possible.
- I. Using screwdriver, turn FINE ADJ screw (16) left or right, as applicable, to make final adjustment to 0.000 Vdc.
 - m. Pilot shut down engine.
- n. Disconnect multimeter (B3) from test pins (7).
- o. Torque retaining screws (10) 20 TO 25 INCH-POUNDS.
 - p. Install lockwire (C7).



q. Install cover (3) on signal processor (4) using 10 screws (5).

INSPECT

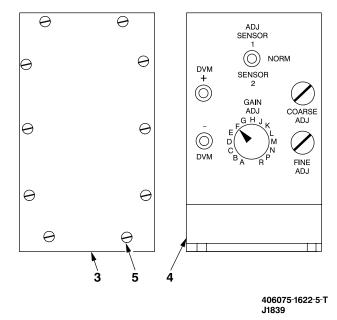
FOLLOW-ON MAINTENANCE

Install main rotor balance weights (TM 1-1520-248-23) (If removed).

Install main rotor blades (TM 1-1520-248-23).

Install forward fairing assembly (TM 1-1520-248-23).

Install right access door (TM 1-1520-248-23).



2-6-21. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÓH-58D

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead

Console/Center Post Circuit Breaker Panel, Nose and Aft Electrical Compartment)

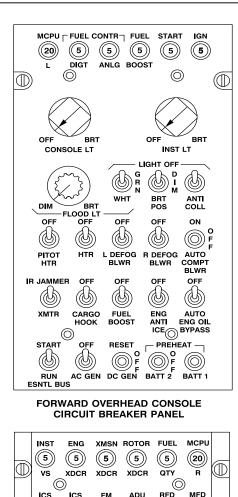
All Switches — Off/SAFE

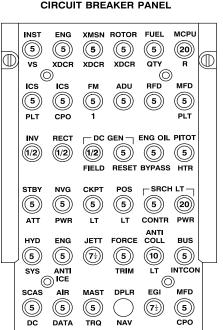
Tools:

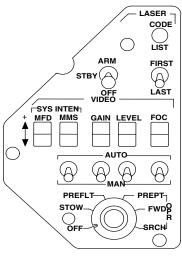
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

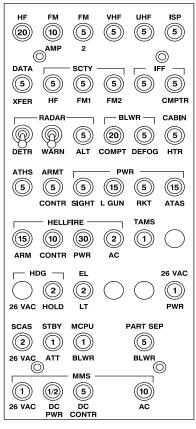
2-6-21. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D) (CONT)



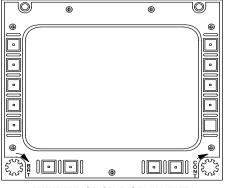




MMS CONTROL PANEL



CENTER POST CIRCUIT BREAKER PANEL



MULTIFUNCTION DISPLAY (MFD)

406075-1592-1-T J1321

GO TO NEXT PAGE

AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

2-6-21. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D) (CONT)

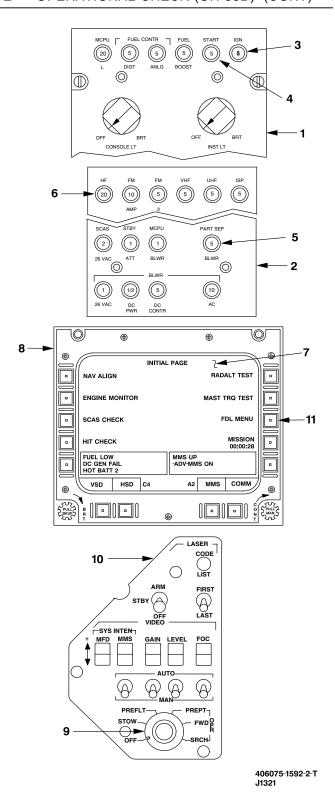
NOTE

The MMS will drift when power is applied and the MMS is not utilized. Always place the sight in the forward mode to prevent excessive drifting.

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) START (4) PART SEP BLWR (5) HF (6)

- 2. Apply external ac electrical power (TM 1-1520-248-23). Verify INITIAL PAGE (7) displays on MFD (8).
- 3. Set mode select switch (9) on MMS control panel (10) to STOW.
- 4. On INITIAL PAGE (7), press R3 (11), FDL MENU key.



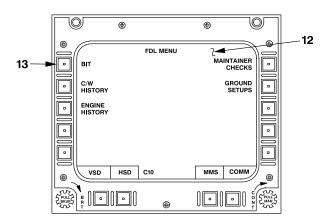
2-6-21. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D) (CONT)

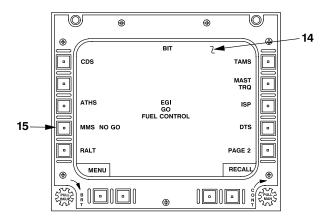
- 5. On FDL MENU page (12), press L1 (13), BIT key.
- 6. On BIT page 1 (14), press L4 (15), MMS key.
 - 7. Verify GO appears next to MMS.
- 8. If NO GO appears next to MMS, with or without fault code(s) displayed, refer to Appendix F for required action.

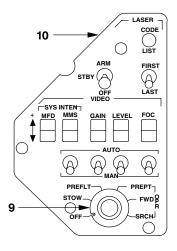
NOTE

Check for STOW COMPLETE message on MFD before turning MMS control panel switch to OFF.

- 9. Set mode select switch (9) on MMS control panel (10) to OFF.
- 10. Disconnect external ac electrical power (TM 1-1520-248-23).







406075-1592-3-T

2-6-22. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

OH-58D(R)

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

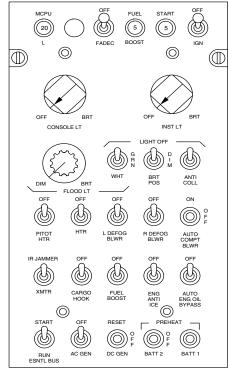
All Switches — Off/SAFE

Tools:

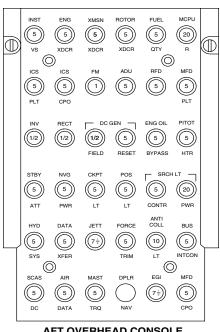
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

2-6-22. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D(R)) (CONT)

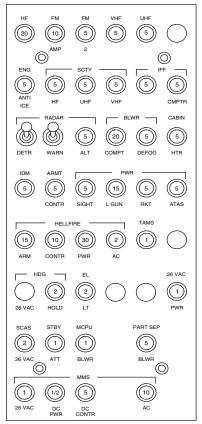


FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



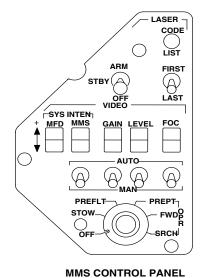
AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

(#)



CENTER POST CIRCUIT BREAKER PANEL

(III)



MULTIFUNCTION DISPLAY (MFD)

406075-1593-1 .11322

GO TO NEXT PAGE

2-6-22. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D(R)) (CONT)

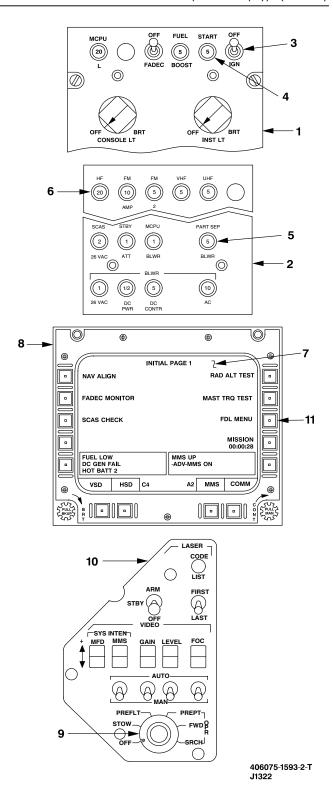
NOTE

The MMS will drift when power is applied and the MMS is not utilized. Always place the sight in the forward mode to prevent excessive drifting.

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

START (3) PART SEP BLWR (4) HF (5)

- 2. On overhead console panel (1), position IGN switch (6) to OFF.
- 3. Apply external ac electrical power (TM 1-1520-248-23). Verify INITIAL PAGE 1 (7) displays on MFD (8).
- 4. Set mode select switch (9) on MMS control panel (10) to STOW.
- 5. On INITIAL PAGE 1 (7), press R3 (11), FDL MENU key.



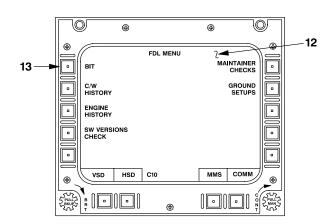
2-6-22. MAST MOUNTED SIGHT (MMS) INTERFACE — OPERATIONAL CHECK (OH-58D(R)) (CONT)

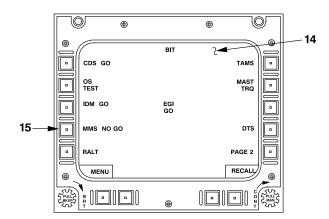
- 6. On FDL MENU page (12), press L1 (13), BIT key.
- 7. On BIT page 1 (14), press L4 (15), MMS key.
 - 8. Verify GO appears next to MMS.
- 9. If NO GO appears next to MMS, with or without fault code(s) displayed, refer to Appendix F for required action.

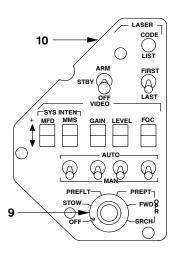
NOTE

Check for STOW COMPLETE message on MFD before turning MMS control panel OFF.

- 10. Set mode select switch (9) on MMS control panel (10) to OFF.
- 11. Disconnect external ac electrical power (TM 1-1520-248-23).







406075-1593-3-T

2-6-23. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÓH-58D

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

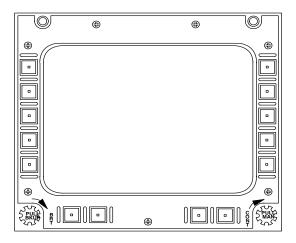
All Switches — Off/SAFE

Tools:

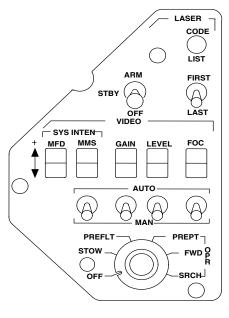
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

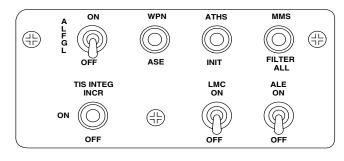
2-6-23. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D) (CONT)



MULTIFUNCTION DISPLAY (MFD)



MMS CONTROL PANEL



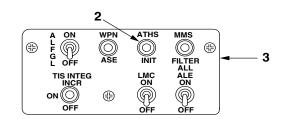
CPG AUXILIARY CONTROL PANEL

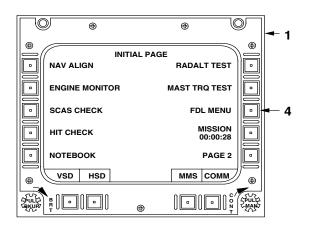
406075-1594-1-T J1323

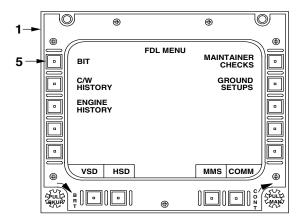
GO TO NEXT PAGE

2-6-23. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D) (CONT)

- 1. Apply external dc electrical power (TM 1-1520-248-23).
- 2. Select INITIAL PAGE on MFD (1) by pressing INIT button (2) on auxiliary control panel (3) below MFD.
- 3. Press R3 (4), FDL MENU key, and verify FDL MENU page appears on MFD (1)
 - 4. On MFD (1):
 - a. Press L1 (5), BIT key.



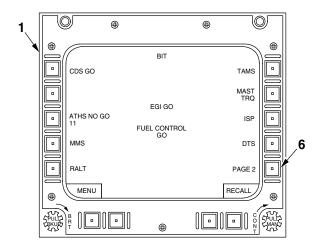


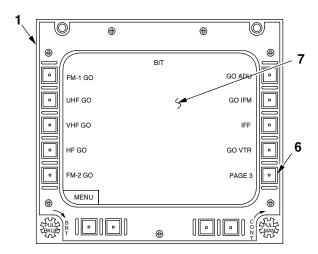


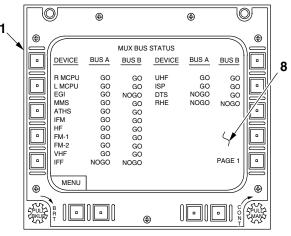
406075-1594-2-T J1323

2-6-23. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D) (CONT)

- b. Verify BIT page appears.
- 5. Press R5 (6), PAGE 2 key, and verify BIT page 2 (7) appears on MFD (1).
- 6. Press R5 (6), PAGE 3 key, and verify BIT page 3 (8) appears on MFD (1).
- 7. On MFD (1), verify that GO appears next to each device being tested.
- 8. If NO GO appears next to a device either in Bus A or Bus B, a failure is present. Refer to Appendix F.
- 9. Disconnect external dc electrical power (TM 1-1520-248-23).







406075-1594-3-T J1323

2-6-24. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

OH-58D(R)

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead

Console/Center Post Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

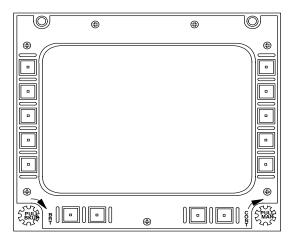
Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

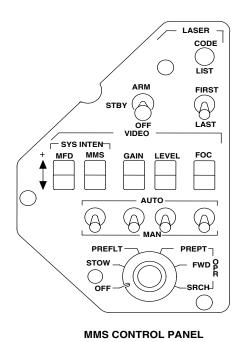
All Switches — Off/SAFE

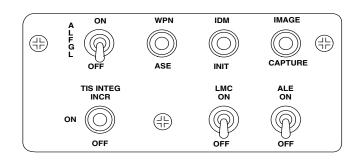
Personnel Required: 68F Aircraft Electrician

2-6-24. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D(R)) (CONT)



MULTIFUNCTION DISPLAY (MFD)





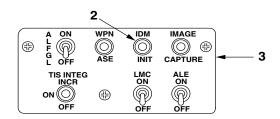
CPG AUXILIARY CONTROL PANEL

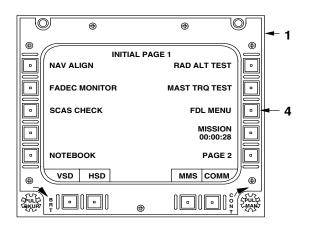
406075-1595-1-T J1324

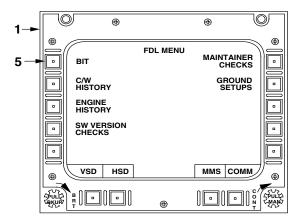
GO TO NEXT PAGE

2-6-24. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 1. Apply external dc electrical power (TM 1-1520-248-23).
- 2. Select INITIAL PAGE 1 on MFD (1) by pressing INIT button (2) on auxiliary control panel (3) below MFD.
- 3. Press R3 (4), FDL MENU key, and verify FDL MENU page appears on MFD (1).
 - 4. On MFD (1):
 - a. Press L1 (5), BIT key.



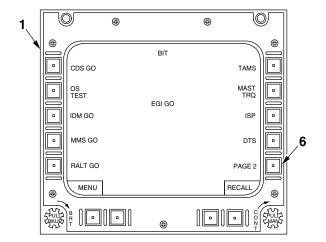


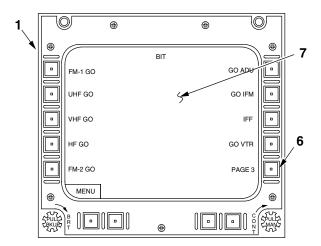


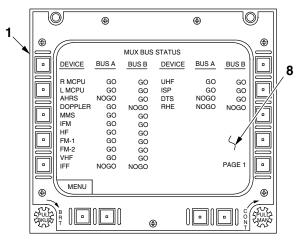
406075-1595-2-T J1324

2-6-24. MULTIPLEX (1553) (MUX) DATA BUS — OPERATIONAL CHECK (OH-58D(R)) (CONT)

- b. Verify BIT page appears.
- 5. Press R5 (6), PAGE 2 key, and verify BIT page 2 (7) appears on MFD (1).
- 6. Press R5 (6), PAGE 3 key, and verify BIT page 3 (8) appears on MFD (1).
- 7. On MFD (1), verify that GO appears next to each device being tested.
- 8. If NO GO appears next to a device either in Bus A or Bus B, a failure is present. Refer to Appendix F.
 - 9. Disconnect external dc electrical power (TM 1-1520-248-23).







406075-1595-3-T J1324

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-CL TM 1-1520-248-10 Applicable Configurations: TM 1-1520-248-23

ÓH-58D

Tools: Equipment Condition:
Helicopter Safed (TM 1-1520-248-23)

Electrical Repairer Tool Kit (B14)

Aviation Ground Power Unit (AGPU)

DC Electrical Assembly Cover Removed (TM 1-1520-248-23)

Personnel Required:

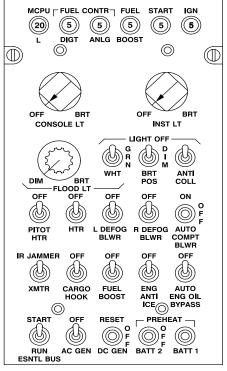
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

68F Aircraft Electrician

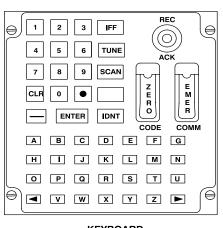
Pilot

Nose and Aft Electrical

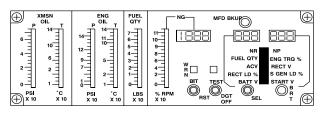
All Switches — Off/SAFE



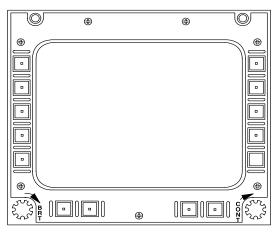
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



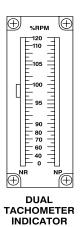
KEYBOARD



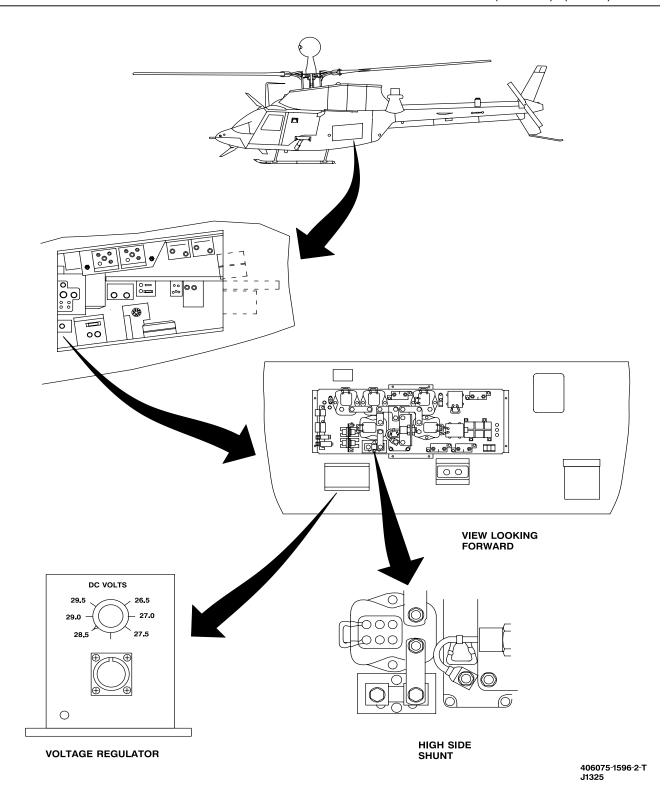
MULTIPARAMETER DISPLAY (MPD)



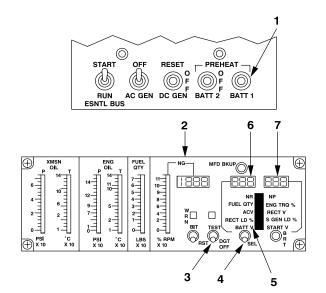
MULTIFUNCTION DISPLAY (MFD)

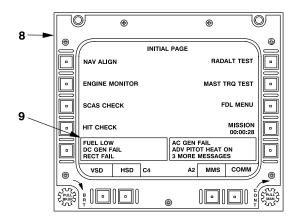


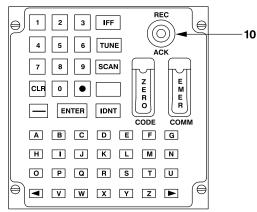
406075-1596-1-T J1325



- 1. Apply external dc electrical power (TM 1-1520-248-23).
 - 2. Set BATT 1 switch (1) to BATT 1.
 - 3. On MPD (2):
- a. Set TEST/DGT/OFF switch (3) to center position.
- b. Toggle the SEL switch (4) to select position labeled BATT V START V (5).
- c. Observe that indication (6) above BATT V shows 28 \pm 2 Vdc, and no indication (7) is present above START V.
 - 4. On pilot MFD (8):
- a. Verify DC GEN FAIL caution message (9) is present.
- b. If "x" MORE MESSAGES ("x" = the number of messages left to be displayed) is displayed, toggle keyboard ACK switch (10) to find DC GEN FAIL caution message (9).
- 5. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
- a. During start, observe that a voltage indication (7) slightly lower than BATT V appears above START V and increases to near BATT V indication (6) toward the end of the start.
- b. Observe that START V indication (7) disappears at starter cutoff.







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- c. Set DC GEN switch (11) to DC GEN (on).
- d. Observe that voltage 28 ± 2 Vdc of the dc generator appears at indication (6) on MPD (2). If voltage does not appear proceed to either step (1) below.

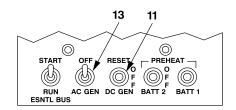
NOTE

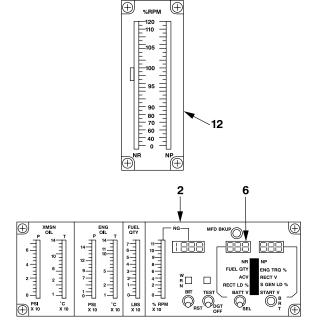
To bring dc generator on line a battery voltage of approximately 18 volts or higher is required to close the DC GEN FIELD RCCB. If low battery voltage is suspected to be the problem, proceed as follows:

- (1) Set DC GEN switch (11) to OFF.
- (2) Allow external power to charge the battery for a few minutes or until the battery voltage is above 18 Vdc.
- (3) Set the DC GEN switch (11) to DC GEN and the dc generator will come on line.

Alternate procedure:

- (1) Set DC GEN switch (11) to OFF.
- (2) Pilot increase NP RPM (12) to 100% (TM 1-1520-248-10/CL).
- (3) Set AC GEN switch (13) to AC GEN. Set DC GEN switch (11) to DC GEN.



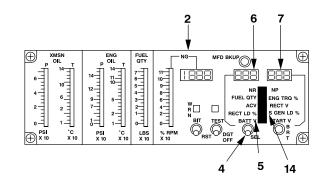


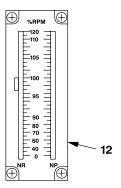
406075-1596-4-T

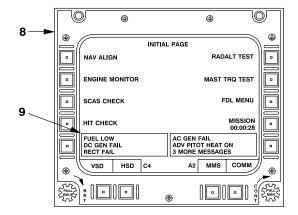
NOTE

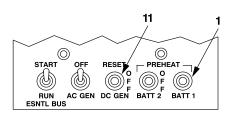
It is normal for feedback voltage (approximately the same as dc generator) to appear above START V. This does not indicate that starter is still engaged.

- e. Toggle SEL switch (4) on MPD (2) to select RECT LD % S GEN LD % (14) position.
- f. Observe the % load indication (7) above S GEN LD %.
- g. Observe that the % load indication (7) decreases as battery becomes charged.
- h. On pilot MFD (8), observe that DC GEN FAIL caution message (9) is no longer present.
- 6. Pilot increase NP RPM (12) to 100% (TM 1-1520-248-10).
- a. Toggle SEL switch (4) to select BATT V-START V (5).
 - b. Set BATT 1 switch (1) to OFF.
- c. Turn off external dc electrical power (TM 1-1520-248-23).
- d. Observe from indication (6) that dc generator voltage is present.
 - e. Set BATT 1 switch (1) to BATT 1 (on).
- f. Toggle SEL switch (4) to select the RECT LD % S GEN LD % position (14).
- g. Observe that % load indication (7) decreases as battery becomes charged.
- h. On pilot MFD (8), observe that the DC GEN FAIL caution message (9) is not present.
- i. Turn on external dc electrical power (TM 1-1520-248-23).
 - j. Set DC GEN switch (11) to OFF.
 - k. Set BATT 1 switch (1) to OFF.









406075-1596-5-T J1325

- I. Observe that external dc electrical power comes back on as indicated by voltage change on indicator (6).
 - m. Set BATT 1 switch (1) to BATT 1 (on).
- n. Observe that S GEN LD % indication (7) goes to near zero and the DC GEN FAIL (9) message comes back on MFD (8).
 - o. Set DC GEN switch (11) to DC GEN (on).
 - p. Set BATT 1 switch (1) to OFF.
- q. Turn off external dc electrical power (TM 1-1520-248-23).
- r. Rotate voltage setting knob (15) on voltage regulator (16) to higher and lower voltages.
- s. Observe that BATT V indication (6) changes with each step.

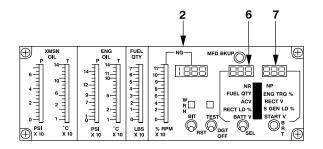
WARNING

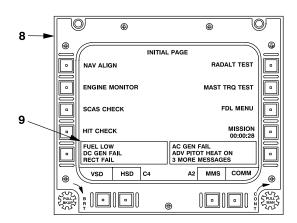
Overcharging of the battery at high ambient temperatures could be a contributing factor to an overheated battery.

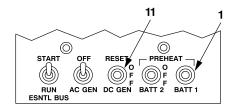
t. Reset voltage setting knob (15) on voltage regulator (16) to limits listed below in accordance with ambient operating temperatures.

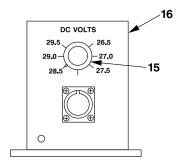
Average	Regulator
Temp °F	Setting Vdc
100 & UP⚠	28.0/1
60	28.5
20	29.0
0 & BELOW	29.5

1 If excessive water usage occurs, reduce to 27.5 or 27.0, provided adequate battery starting performance is maintained.



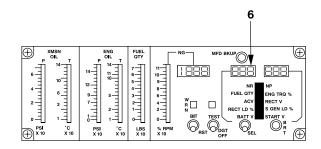


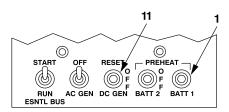


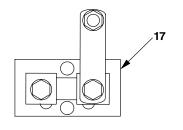


406075-1596-6-T J1325

- u. Set BATT 1 switch (1) to BATT 1 (on).
- 7. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 8. Disconnect wire P44B22 (BLU) or wire P44B22 (WHT) from the dc generator high side shunt (17).
- 9. Turn on external dc electrical power (TM 1-1520-248-23).
- 10. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - a. Set BATT 1 switch (1) to BATT 1 (on).
 - b. Set DC GEN switch (11) to DC GEN (on).
- c. Observe indication (6) that dc generator comes on and immediately trips off due to simulated feeder fault.
- 11. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 12. Disconnect external dc electrical power (TM 1-1520-248-23).
- 13. Connect wire P44B22 (BLU) or wire P44B22 (WHT) to dc generator high side shunt (17).
- 14. Install dc electrical assembly cover (TM 1-1520-248-23).







406075-1596-7-T J1325

This task covers: Operational Check (On Helicopter)

INITIAL SETUP References:

TM 1-1520-248-CL TM 1-1520-248-10 Applicable Configurations: TM 1-1520-248-23 OH-58D(R)

Tools:

Electrical Repairer Tool Kit (B14)

DC Electrical Assembly Cover Removed (TM 1-

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

Aviation Ground Power Unit (AGPU) 1520-248-23)

Personnel Required:

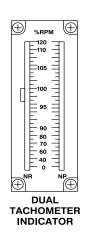
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

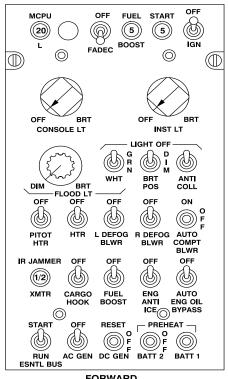
68F Aircraft Electrician

Pilot

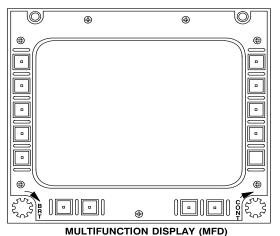
Nose and Aft Electrical

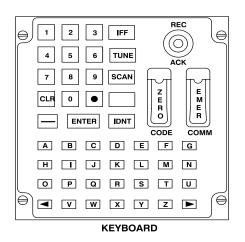
All Switches — Off/SAFE



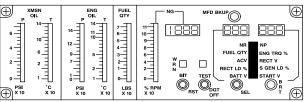


FORWARD OVERHEAD CONSOLE



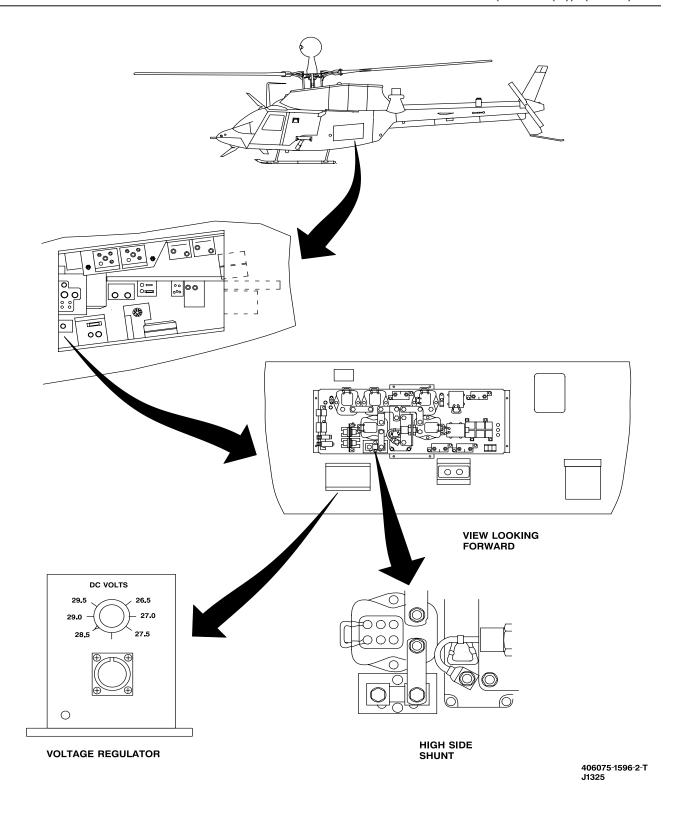


TION DISPLAY (WIFD)

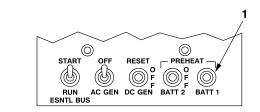


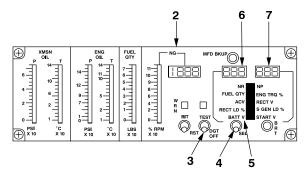
MULTIPARAMETER DISPLAY (MPD)

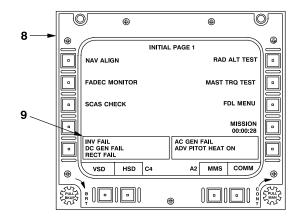
406075-1597-1-T J1326

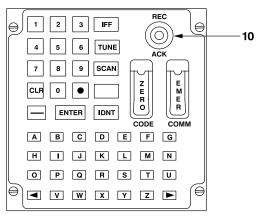


- 1. Apply external dc electrical power (TM 1-1520-248-23).
 - 2. Set BATT 1 switch (1) to BATT 1 (on).
 - 3. On MPD (2):
- a. Set TEST/DGT OFF switch (3) to center position.
- b. Toggle the SEL switch (4) to select position labeled BATT V START V (5).
- c. Observe that indication (6) above BATT V shows 28 \pm 2 Vdc, and no indication (7) is above START V.
 - 4. On pilot MFD (8):
- a. Observe that the DC GEN FAIL caution message (9) is present.
- b. If "x" MORE MESSAGES ("x" = the number of messages left to be displayed) is displayed toggle keyboard ACK switch (10) to find DC GEN FAIL caution message (9).
- 5. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
- a. During start, observe that a voltage indication (7) slightly lower than BATT V appears above START V and increases to near BATT V indication (4) toward the end of the start.
- b. Observe that START V indication (7) disappears at starter cutoff.









406075-1597-2-T J1326

- c. Set DC GEN switch (11) to DC GEN (on).
- d. Observe that voltage 28 ± 2 Vdc of the dc generator appears at indication (6) on MPD (2). If voltage does not appear proceed to either step (1) below.

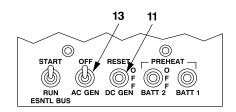
NOTE

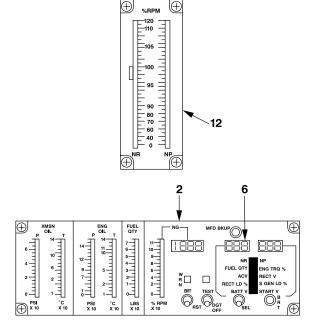
To bring dc generator on line a battery voltage of approximately 18 volts or higher is required to close the DC GEN FIELD RCCB. If low battery voltage is suspected to be the problem, proceed as follows:

- (1) Set DC GEN switch (11) to OFF.
- (2) Allow external power to charge the battery for a few minutes or until the battery voltage is above 18 Vdc.
- (3) Set the DC GEN switch (11) to DC GEN and the dc generator will come on line.

Alternate procedure:

- (1) Set DC GEN switch (11) to OFF.
- (2) Pilot increase NP RPM (12) to 100% (TM 1-1520-248-10/CL).
- (3) Set AC GEN switch (13) to AC GEN. Set DC GEN switch (11) to DC GEN.



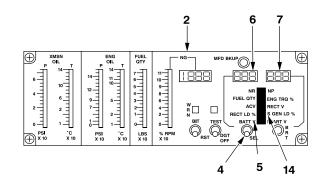


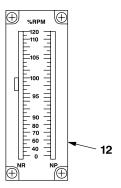
406075-1596-4-T

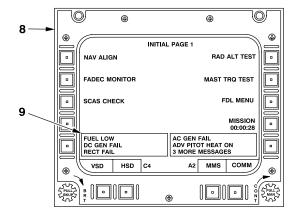
NOTE

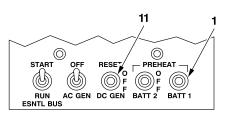
It is normal for feedback voltage (approximately the same as dc generator) to appear above START V. This does not indicate that starter is still engaged.

- e. Toggle SEL switch (4) on MPD (2) to select RECT LD % S GEN LD % (14) position.
- f. Observe the % load indication (7) above S GEN LD %.
- g. Observe that the % load indication (7) decreases as battery becomes charged.
- h. On pilot MFD (8), observe DC GEN FAIL caution message (9) is no longer present.
- 6. Pilot increase NP RPM (12) to 100% (TM 1-1520-248-10).
- a. Toggle SEL switch (4) to select BATT $V-START\ V$ (5).
 - b. Set BATT 1 switch (1) to OFF.
- c. Turn off external dc electrical power (TM 1-1520-248-23).
- d. Observe from indication (6) that dc generator voltage is present.
 - e. Set BATT 1 switch (1) to BATT 1 (on).
- f. Toggle SEL switch (4) to select the RECT LD % S GEN LD % position (14).
- g. Observe that % load indication (7) decreases as battery becomes charged.
- h. On pilot MFD (8), observe DC GEN FAIL caution message (9) is not present.
- i. Turn on external dc electrical power (TM 1-1520-248-23).
 - j. Set DC GEN switch (11) to OFF.
 - k. Set BATT 1 switch (1) to OFF.









406075-1597-4-T J1326

- I. Observe that external dc electrical power comes back on as indicated by voltage change on indicator (6).
 - m. Set BATT 1 switch (1) to BATT 1 (on).
- n. Observe that S GEN LD % indication (7) goes to near zero and the DC GEN FAIL (9) message comes back on MFD (8).
 - o. Set DC GEN switch (11) to DC GEN (on).
 - p. Set BATT 1 switch (1) to OFF.
- q. Turn off external dc electrical power (TM 1-1520-248-23).
- r. Rotate voltage setting knob (15) on voltage regulator (16) to higher and lower voltages.
- s. Observe that BATT V indication (6) changes with each step.

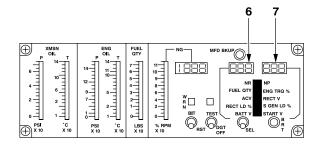
WARNING

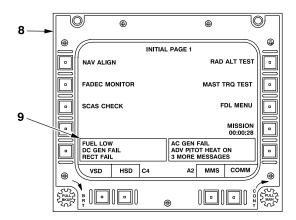
Overcharging of the battery at high ambient temperatures could be a contributing factor to an overheated battery.

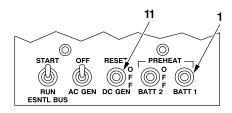
t. Reset voltage setting knob (15) on voltage regulator (16), to limits listed below in accordance with ambient operating temperatures.

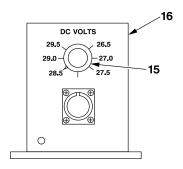
Average	Regulator
Temp ◦F ្	Setting Vdc
100 & UP⚠	28.0/1
60	28.5
20	29.0
0 & BELOW	29.5

If excessive water usage occurs, reduce to 27.5 or 27.0, provided that adequate battery starting performance is maintained.



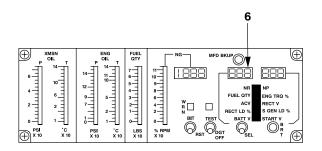


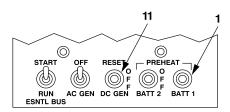


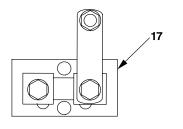


406075-1597-5-T J1326

- u. Set BATT 1 switch (1) to BATT 1 (on).
- 7. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 8. Disconnect wire P44B22 (BLU) or wire P44B22 (WHT) from the dc generator high side shunt (17).
- 9. Turn on external dc electrical power (TM 1-1520-248-23).
- 10. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - a. Set BATT 1 switch (1) to BATT 1 (on).
 - b. Set DC GEN switch (11) to DC GEN (on).
- c. Observe indication (6) that dc generator comes on and immediately trips off due to simulated feeder fault.
- 11. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 12. Disconnect external dc electrical power (TM 1-1520-248-23).
- 13. Connect wire P44B22 (BLU) or wire P44B22 (WHT) to dc generator high side shunt (17).
- 14. Install dc electrical assembly cover (TM 1-1520-248-23).







406075-1596-7-T J1325

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÓH-58D

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead

Console/Center Post Circuit Breaker Panel,

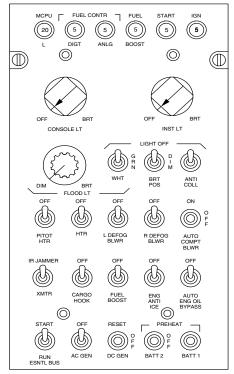
Nose and Aft Electrical Compartment)

All Switches — Off/SAFE

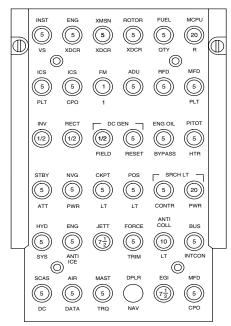
Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

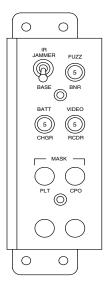
Personnel Required: 68F Aircraft Electrician



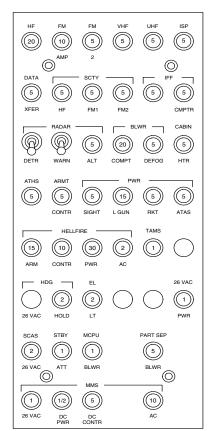
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

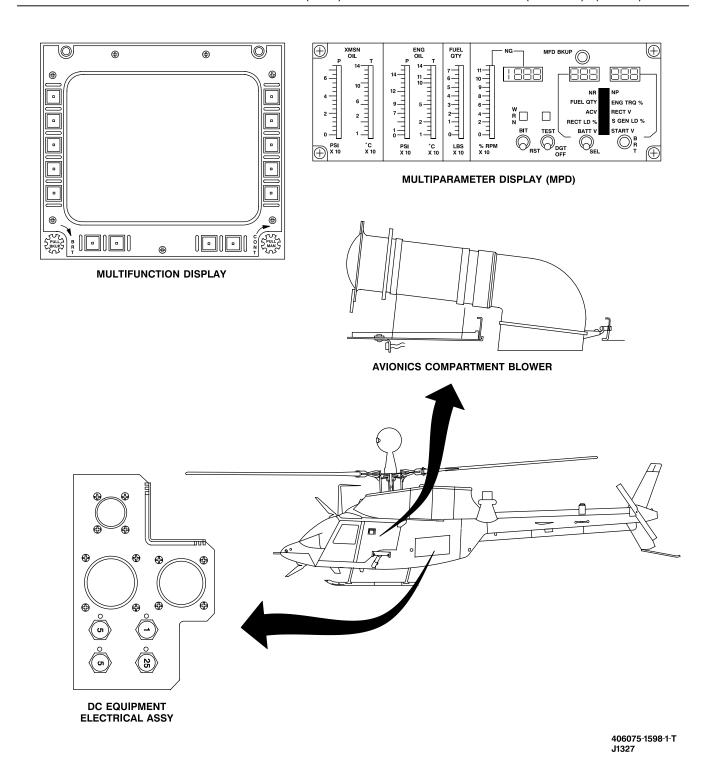


AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623



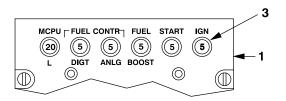
NOTE

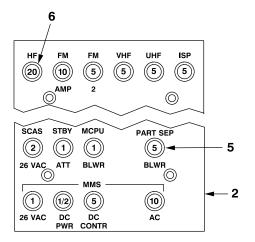
The transformer rectifier unit nomenclature used on OH-58D panels etc., is RECT.

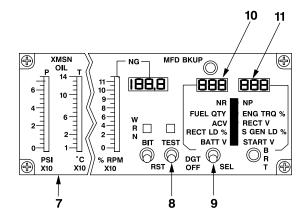
1. On forward overhead console panel (1) and center post circuit breaker panel (2), open following circuit breakers:

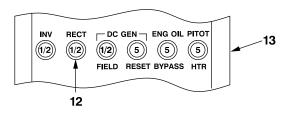
IGN (3) START (4) PART SEP BLWR (5) HF (6)

- 2. Apply external ac electrical power (TM 1-1520-248-23).
 - 3. On the MPD (7):
- a. Determine that TEST/DGT/OFF switch (8) is in the center position.
 - b. Toggle SEL switch (9) to ACV RECT V.
- c. Observe 115 \pm 3.0 Vac on left digital readout (10) above ACV.
- d. Observe 24 to 30 Vdc on right digital readout (11) above RECT V.
- e. Toggle SEL switch (9) to RECT LD % S GEN LD %.
- f. Observe indication of percent load greater than 0 on left digital readout (10) and indication of 0 on right digital readout (11).
- 4. Apply external dc electrical power (TM 1-1520-248-23). <u>Do not</u> disconnect/turn off external ac electrical power.
- 5. Open RECT circuit breaker (12) on aft overhead console panel (13).







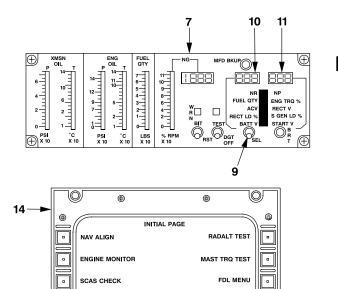


406075-1598-2-T J1327

NOTE

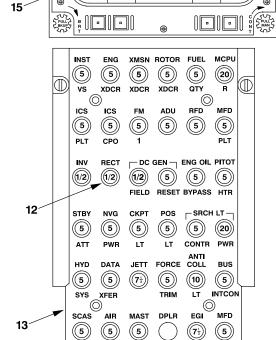
An indication of 0 Vdc on the right digital readout selected to RECT V indicates the transformer rectifier unit has failed to come on.

- 6. On the MPD (7):
 - a. Toggle SEL switch (9) to ACV RECT V.
- b. Observe that RECT V now reads 0 on the right digital readout (11).
- c. Toggle SEL switch (9) to RECT LD % S GEN LD %.
- d. Observe that RECT LD % now reads 0 on the left digital readout (10).
- 7. On pilot MFD (14), observe RECT FAIL caution message (15) is present.
- 8. Close RECT circuit breaker (12) on the aft overhead console panel (13).
- 9. Turn off external dc electrical power (TM 1-1520-248-23).



AC GEN FAIL ADV PITOT HEAT ON

MMS COMM



TRQ

DC

DATA

HIT CHECK FUEL LOW DC GEN FAIL RECT FAIL

(

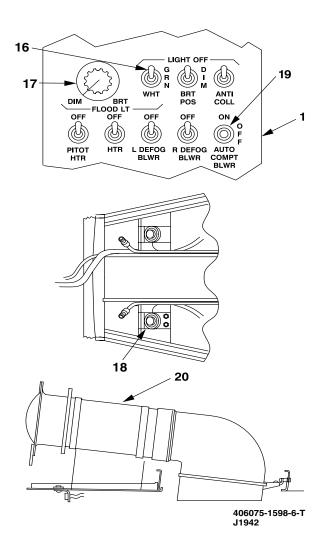
VSD HSD C4

406075-1598-3-T

NOTE

Steps 10. and 11. indicate that transformer rectifier unit is operating properly and is supplying power to battery emergency bus, power assured bus, and essential bus.

- 10. Set the FLOOD LT switch (16) to WHT.
- 11. Turn the FLOOD LT control (17) clockwise to BRT.
- 12. Observe that the white flood light (18) is on. Set the flood light switch (16) to LIGHT OFF.
- 13. Set the COMPT BLWR switch (19) on forward overhead console (1) to ON.
- 14. Observe that the compartment blower (20) operates.
 - 15. Set COMPT BLWR switch (19) to OFF.
- 16. Disconnect external ac and dc electrical power (TM 1-1520-248-23).



This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÖH-58D(R)

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

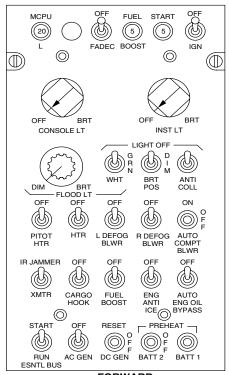
All Switches — Off/SAFE

Tools:

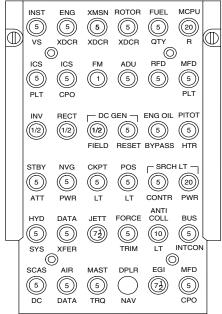
Electrical Repairer Tool Kit (B14)

Aviation Ground Power Unit (AGPU)

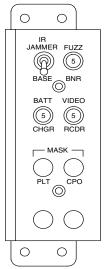
Personnel Required: 68F Aircraft Electrician



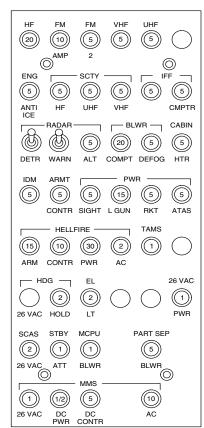
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

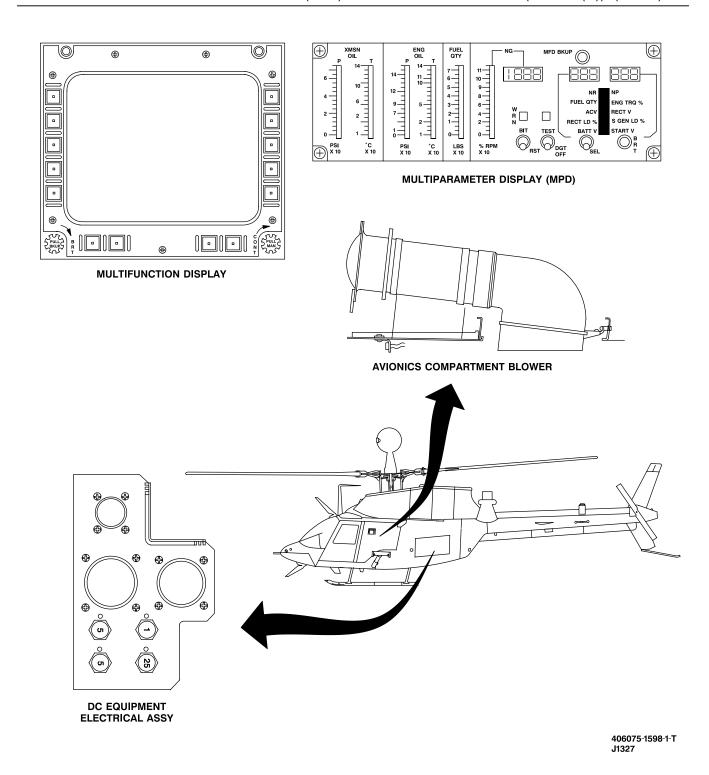


AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328



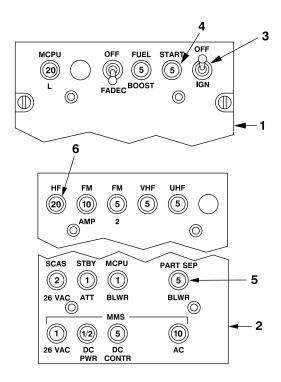
NOTE

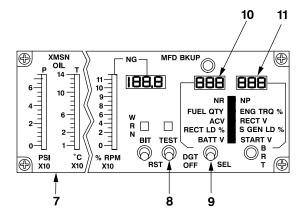
The transformer rectifier unit nomenclature used on OH-58D panels etc., is RECT.

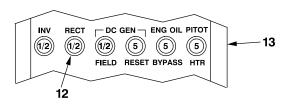
1. On forward overhead console panel (1) and center post circuit breaker panel (2), open following circuit breakers:

IGN (3) – OFF START (4) PART SEP BLWR (5) HF (6)

- 2. Apply external ac electrical power (TM 1-1520-248-23).
 - 3. On the MPD (7):
- a. Determine that TEST/DGT/OFF switch (8) is in the center position.
 - b. Toggle SEL switch (9) to ACV RECT V.
- c. Observe 115 \pm 3.0 Vac on left digital readout (10) above ACV.
- d. Observe 24 to 30 Vdc on right digital readout (11) above RECT V.
- e. Toggle SEL switch (9) to RECT LD % S GEN LD %.
- f. Observe indication of percent load greater than 0 on left digital readout (10) and indication of 0 on right digital readout (11).
- 4. Apply external dc electrical power (TM 1-1520-248-23). Do not disconnect/turn off external ac electrical power.
- 5. Open RECT circuit breaker (12) on aft overhead console panel (13).





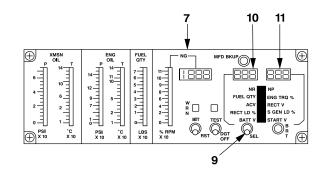


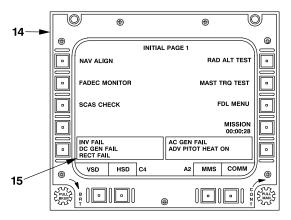
406075-1600-2-T J1328

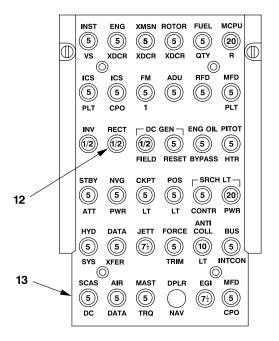
NOTE

An indication of 0 Vdc on the right digital readout selected to RECT V indicates the transformer rectifier unit has failed to come on.

- 6. On the MPD (7):
 - a. Toggle SEL switch (9) to ACV RECT V.
- b. Observe that RECT V now reads 0 on the right digital readout (11).
- c. Toggle SEL switch (9) to RECT LD % S GEN LD %.
- d. Observe that RECT LD % now reads 0 on the left digital readout (10).
- 7. On pilot MFD (14), observe RECT FAIL caution message (15) is present.
- 8. Close RECT circuit breaker (12) on the aft overhead console panel (13).
- 9. Turn off external dc electrical power (TM 1-1520-248-23).





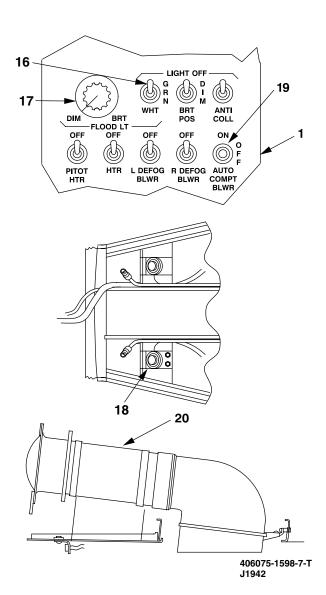


406075-1600-3-T J1328

NOTE

Steps 10. and 11. indicate that transformer rectifier unit is operating properly and is supplying power to battery emergency bus, power assured bus, and essential bus.

- 10. Set the FLOOD LT switch (16) to WHT.
- 11. Turn the FLOOD LT control (17) clockwise to BRT.
- 12. Observe that the white flood light (18) is on. Set the flood light switch (16) to LIGHT OFF.
- 13. Set the COMPT BLWR switch (19) on forward overhead console (1) to ON.
- 14. Observe that the compartment blower (20) operates.
 - 15. Set COMPT BLWR switch (19) to OFF.
- 16. Disconnect external ac and dc electrical power (TM 1-1520-248-23).



2-6-29. NIGHT VISION GOGGLES (NVG) POWER CONVERTER — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References: TM 1-1520-248-23

Applicable Configurations:

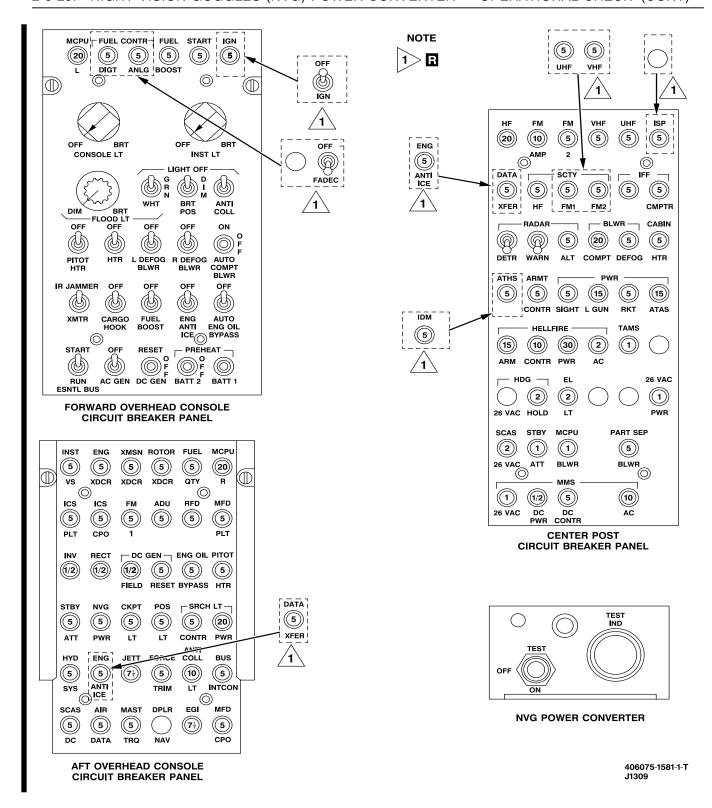
ΑII

Tools:

Aviation Ground Power Unit (AGPU)
Electrical Repairer Tool Kit (B14)
AN/AVS-6 NVG with Daylight Training or
Opaque Lens Covers or,
Jumper Wire Assembly (E-2)

Personnel Required: 68F Aircraft Electrician Equipment Condition:
Helicopter Safed (TM 1-1520-248-23)
Battery Disconnected (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

2-6-29. NIGHT VISION GOGGLES (NVG) POWER CONVERTER — OPERATIONAL CHECK (CONT)



2-6-29. NIGHT VISION GOGGLES (NVG) POWER CONVERTER — OPERATIONAL CHECK (CONT)

1. On overhead console panel (1) and center post circuit breaker (2), open following circuit breakers:

IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
 - 3. Apply external dc electrical power.

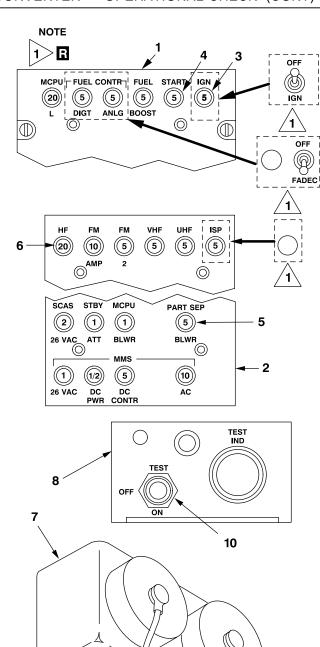
NOTE

- On helicopters serial number 43006 through 43065 with NVG power converter P/N 5002614 installed, and no night vision goggles available, go to alternate procedure, step 13.
- On helicopters serial number 43006 and subsequent with NVG power converter P/N 402-100-002 installed and no night vision goggles available, proceed to step 10. If night vision goggles are available, complete steps 4 through 12.
- 4. Remove batteries from battery pack (7) located on back of night vision goggles. Connect goggles to pilot NVG power converter (8).

WARNING

Opaque lens covers must be used to prevent NVG damage from bright sunlight conditions during daylight training.

- 5. Set switch (9) on night vision goggle battery pack (7) to ON.
- 6. Set pilot NVG power converter switch (10) to ON.
 - 7. Observe goggles come on.



406075-1581-2-T J1309

2-6-29. NIGHT VISION GOGGLES (NVG) POWER CONVERTER — OPERATIONAL CHECK (CONT)

- 8. Set pilot NVG power converter switch (10) to OFF.
 - 9. Observe that night vision goggles go off.
- 10. Set pilot NVG power converter switch (10) momentarily to TEST.
- 11. Observe that TEST IND lamp (11) on pilot NVG power converter (8) comes on.
- 12. Repeat steps 4. through 11. using CPG NVG power converter.

ALTERNATE PROCEDURE

13. If a set of night vision goggles is not available, fabricate a small jumper wire (E-2) to make a short between pins 2 and 3 of NVG power converter pigtail connector.

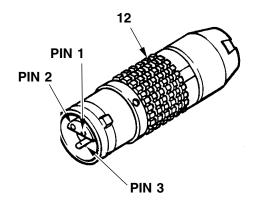
CAUTION

The pins and sockets on pigtail connector are very small and delicate; avoid damage.

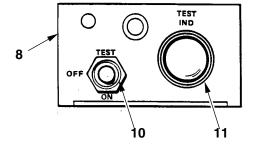
- 14. Connect jumper (E-2) to pins 2 and 3 of pilot NVG power converter pigtail connector (12).
- 15. Press TEST switch (10) on the NVG power converter (8) momentarily to TEST.
- 16. Observe that TEST IND lamp (11) on the NVG power converter (8) comes on.
- 17. Repeat steps 14., 15. and 16. using the CPG power converter.
- 18. Disconnect external dc electrical power (TM 1-1520-248-23).

FOLLOW-ON MAINTENANCE

Connect battery (TM 1-1520-248-23).



PIGTAIL CONNECTOR (VIEW LOOKING AT END OF CONNECTOR. PIN 1 AND 2 ARE FEMALE AND PIN 3 IS MALE)



406075-694-3 H0070 2-6-30. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D)

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

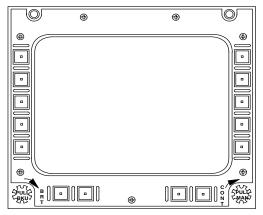
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician References:

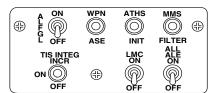
TM 1-1520-248-23

Equipment Condition:

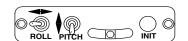
Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE



MULTIFUNCTION DISPLAY



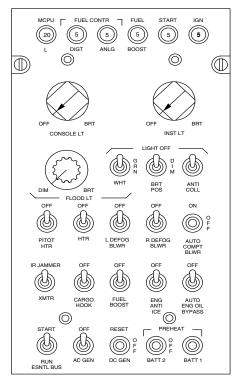
CPG AUXILIARY CONTROL PANEL



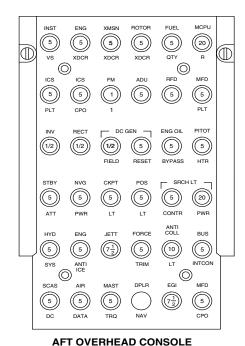
PILOT AUXILIARY CONTROL PANEL

406075-1601-1-T J1329

2-6-30. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D) (CONT)



FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



CIRCUIT BREAKER PANEL

IR
JAMMER FUZZ

S
S
BASE
BNR

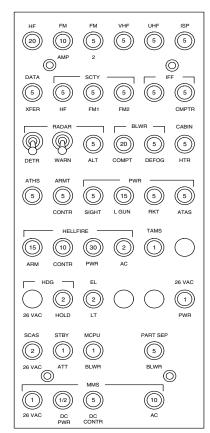
BATT VIDEO

S
OHGR RCDR

MASK

PLT
OPO

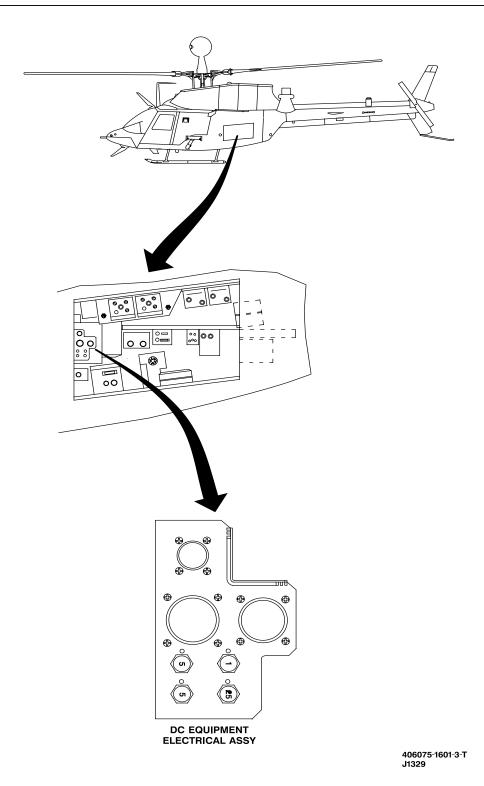
AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

2-6-30. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D) (CONT)



2-6-30. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D) (CONT)

1. On overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

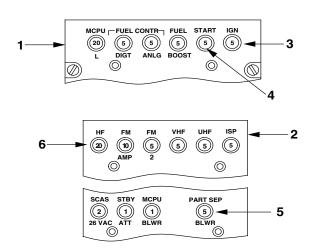
IGN (3) START (4) PART SEP BLWR (5) HF (6)

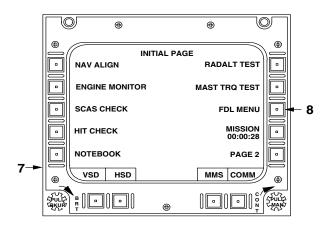
- 2. Apply external dc electrical power (TM 1-1520-248-23).
- 3. Verify INITIAL PAGE is displayed on both MFDs (7). Acknowledge warning, caution, and advisory messages.

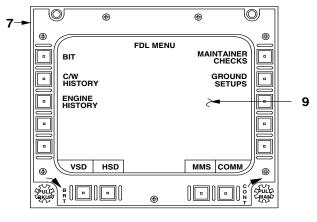
NOTE

Although it is possible to perform the TAMS BIT test with the rotor turning, movement of the cyclic control could result in the TAMS BIT function detecting a failure in one or more LVDT. All TAMS BITs are valid only when performed with the rotor stopped.

4. On MFD (7) press R3 (8), FDL MENU key, verify FDL MENU page (9) appears.



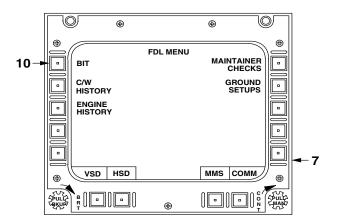


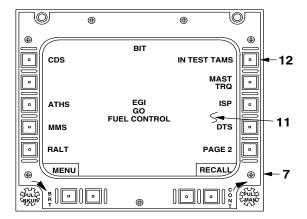


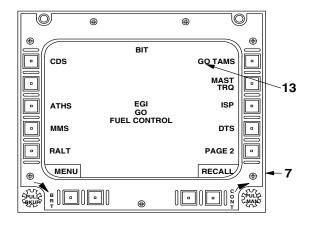
406075-1601-4-T J1329

2-6-30. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D) (CONT)

- 5. Press L1 (10), BIT key, verify BIT page (11) appears.
 - 6. Press R1 (12), TAMS key.
- 7. Observe that GO (13) appears next to TAMS on MFD (7).
- 8. If NO GO appears next to TAMS, refer to Appendix F for required action.
- 9. Disconnect external dc electrical power (TM 1-1520-248-23).







406075-1601-5-T J1329

END OF TASK

2-6-31. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D(R))

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician References:

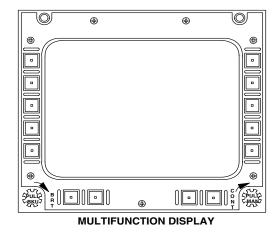
TM 1-1520-248-23

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)

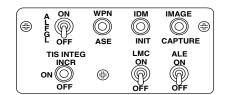
All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel, Nose and Aft Electrical Compartment)

All Switches — Off/SAFE





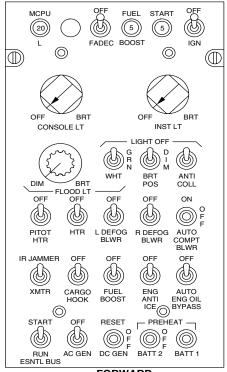
PILOT AUXILIARY CONTROL PANEL



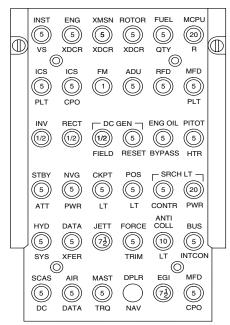
CPG AUXILIARY CONTROL PANEL

> 406075-1599-1-T J1330

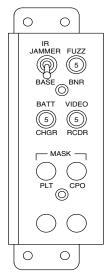
2-6-31. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D(R)) (CONT)



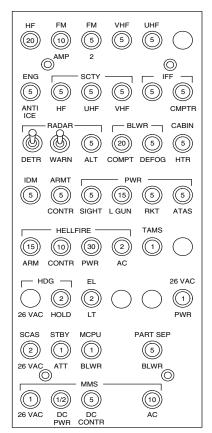
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



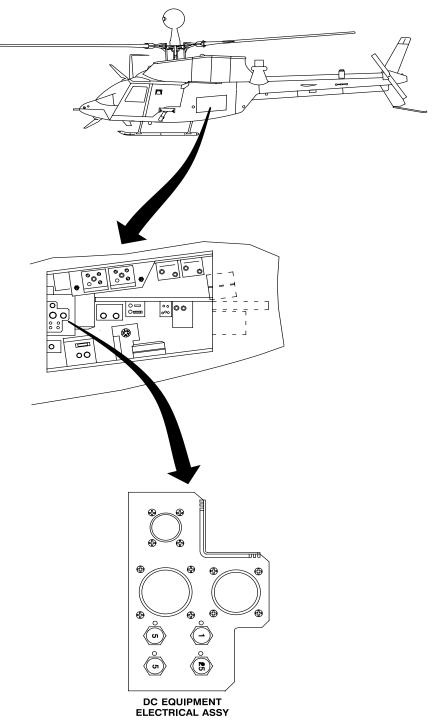
AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406075-1600-1-T J1328

2-6-31. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D(R)) (CONT)



406075-1601-3-T J1329

2-6-31. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D(R)) (CONT)

1. On overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

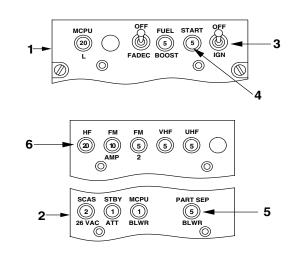
IGN (3) - OFF START (4) PART SEP BLWR (5) HF (6)

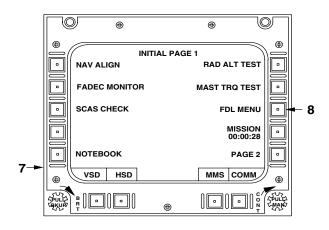
- 2. Apply external dc electrical power (TM 1-1520-248-23).
- 3. Verify INITIAL PAGE 1 is displayed on both MFDs (7). Acknowledge warning, caution, and advisory messages.

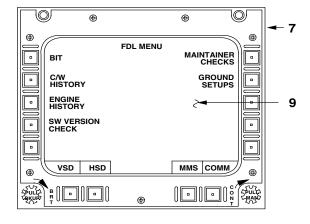
NOTE

Although it is possible to perform the TAMS BIT test with the rotor turning, movement of the cyclic control could result in the TAMS BIT function detecting a failure in one or more LVDT. All TAMS BIT are valid only when preformed with the rotor stopped.

4. On MFD (7) press R3 (8), FDL MENU key, verify FDL MENU page (9) appears.



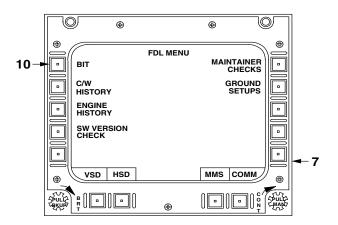


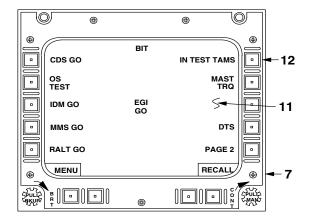


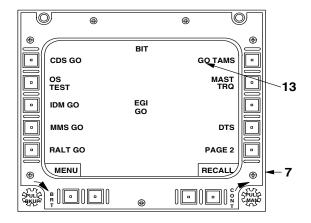
406075-1599-3-T J1330

2-6-31. TRANSMISSION ATTITUDE MEASUREMENT SYSTEM (TAMS) — OPERATIONAL CHECK (OH-58D(R)) (CONT)

- 5. Press L1 (10), BIT key, verify BIT page (11) appears.
 - 6. Press R1 (12), TAMS key.
- 7. Observe that GO (13) appears next to TAMS on MFD (7).
- 8. If NO GO appears next to TAMS, refer to Appendix F for required action.
 - 9. Disconnect external dc electrical power (TM 1-1520-248-23).







406075-1599-4-T J1330

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Aviation Ground Power Unit (AGPU) Chip Detector Fuzz Burner Tester (B10) Electrical Repairer Tool Kit (B14) Jumper Wire Assembly (E-3)

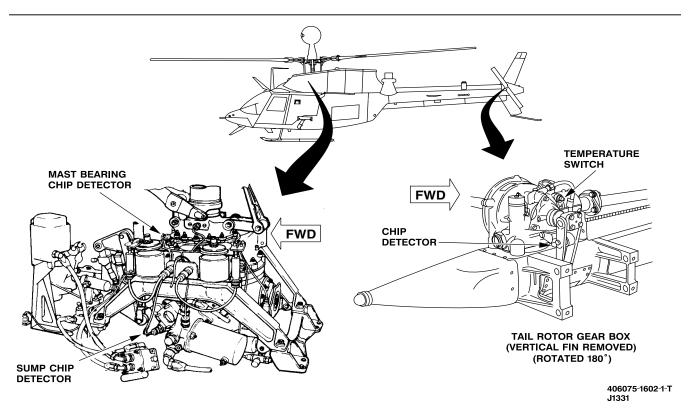
Personnel Required: 68F Aircraft Electrician Pilot

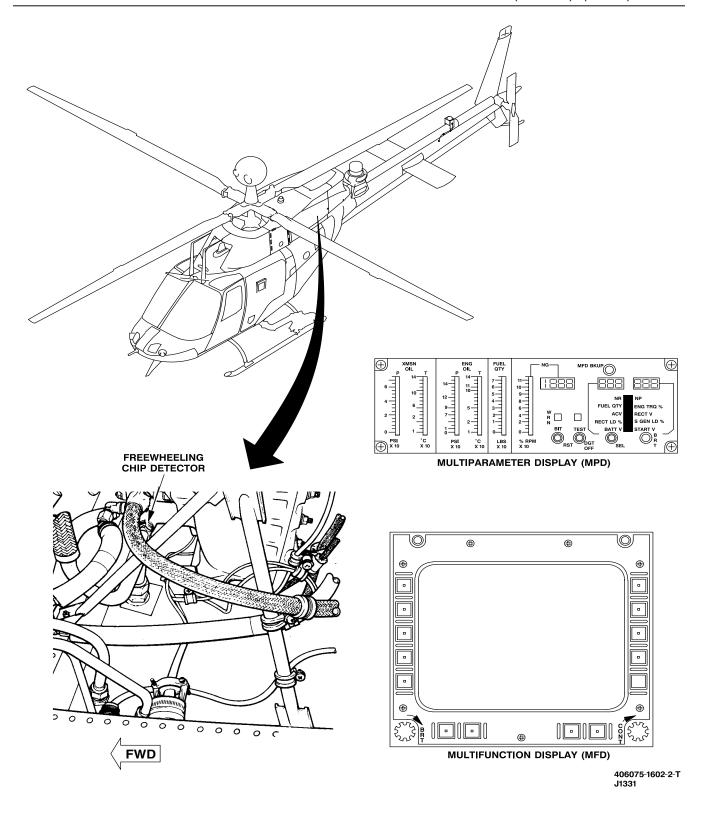
References:

TM 1-1520-248-CL TM 1-1520-248-10 TM 1-1520-248-23

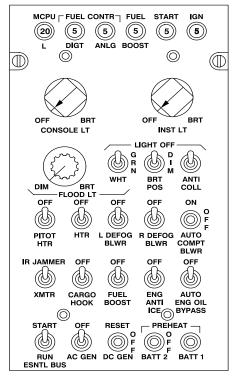
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electric Compartment)
All Switches — Off/SAFE

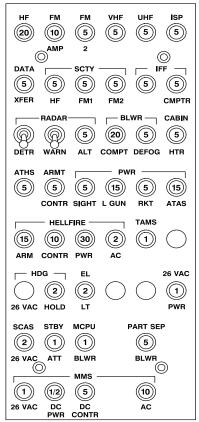




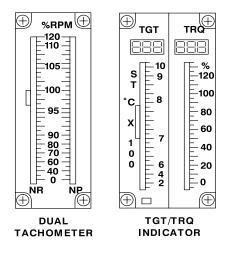
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FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

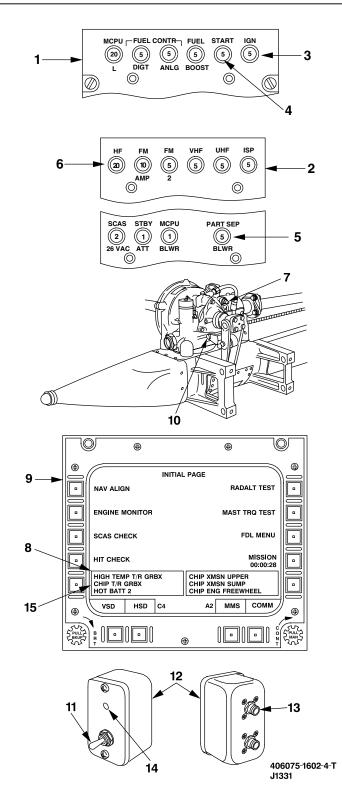


406075-1602-3-T J1331

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

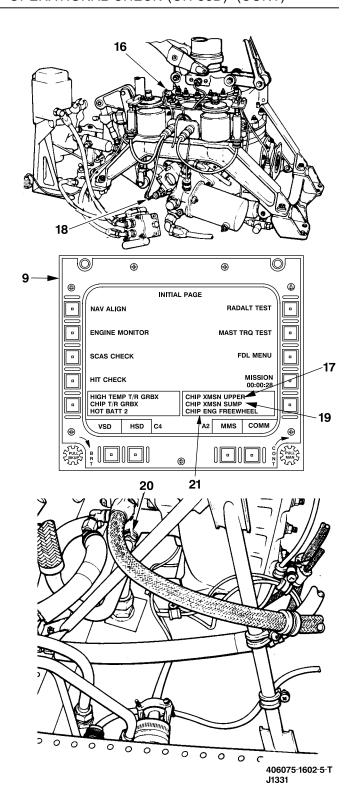
IGN (3) START (4) PART SEP BLWR (5) HF (6)

- 2. Install jumper wire (E-3) between stud and airframe ground at the tail rotor gearbox temperature switch (7).
- a. Apply external dc electrical power (TM 1-1520-248-23).
- b. Observe HIGH TEMP T/R GRBX caution message (8) appears on MFD (9).
- c. Remove jumper wire from stud and observe message goes off.
- 3. Remove connector (10) from tail rotor gearbox chip detector.
- a. Set switch (11) on chip detector fuzz burner tester (B10) (12) to OFF.
- b. Install connector (10) to fuzz burner tester connector (13) marked XMSN (J1).
- c. Set switch (11) on fuzz burner tester (12) to ON.
- (1) Observe fuzz burner tester LED (14) flashes one time.
- (2) Observe CHIP T/R GRBX caution message (15) appears on MFD (9).
- d. Set switch (11) on fuzz burner tester (12) to OFF. Observe caution message on MFD (9) goes off.
- e. Disconnect connector (10) from fuzz burner tester.
- f. Remove tail rotor gearbox chip detector (TM 1-1520-248-23).
- g. Connect connector (10) to tail rotor gearbox chip detector and short across end of chip detector.
- h. Observe CHIP T/R GRBX caution message (15) appears on MFD (9).
- i. Install tail rotor gearbox chip detector (TM 1-1520-248-23).

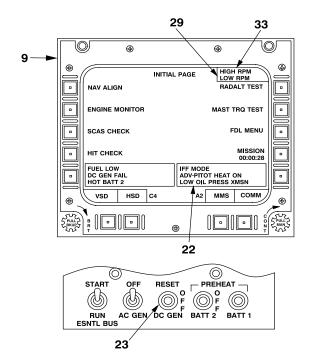


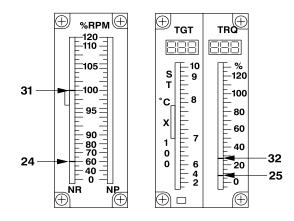
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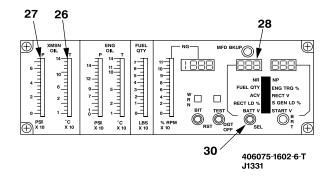
- 4. Repeat step 3. at the mast bearing chip detector connector (16). CHIP XMSN UPPER caution message (17) will be displayed on MFD (9).
- 5. Repeat step 3. at the transmission sump chip detector connector (18). CHIP XMSN SUMP caution message (19) will be displayed on MFD (9).
- 6. Repeat step 3. at the freewheeling unit chip detector (20). CHIP ENG FREEWHEEL caution message (21) will be displayed on MFD (9).



- 7. Observe LOW OIL PRESS XMSN caution message (22) appears on MFD (9).
- 8. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - a. Set DC GEN switch (23) to DC GEN (on).
- b. Observe that LOW OIL PRESS XMSN caution message (22) goes off.
- c. Observe the following approximate readings:
 - (1) Main rotor rpm 59% (24)
 - (2) Mast torque 8% (25)
- (3) Transmission oil temperature Green Range (26)
- (4) Transmission oil pressure Green Range (27)
 - (5) Main rotor rpm on MPD 59% (28)
- 9. Pilot increase rpm to 100% (TM 1-1520-248-10/CL).
- a. Observe LOW RPM ROTOR warning message (29) goes off of MFD (9).
 - b. Toggle select switch (30) to NR NP.
- c. Observe the following approximate readings:
 - (1) Main rotor rpm 100% (31)
 - (2) Mast torque 27% (32)
- (3) Transmission oil temperature Green Range (26)
- (4) Transmission oil pressure Green Range (27)
 - (5) Main rotor rpm on MPD 100% (28)



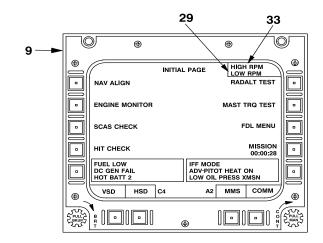




NOTE

Pilot may be required to perform an autorotation to check HIGH RPM warning message operation.

- 10. Pilot increase rpm (TM 1-1520-248-10/CL) until HIGH RPM warning message (33) appears on MFD. (This should occur at approximately 107% rpm.)
- 11. Pilot decrease rpm to 100% (TM 1-1520-248-10/CL). Observe HIGH RPM warning message (33) goes off on MFD (9).
- 12. Pilot decrease rpm (TM 1-1520-248-10/CL). Observe that LOW RPM ROTOR warning message (29) appears at approximately 97% RPM.
- 13. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 14. Disconnect external dc electrical power (TM 1-1520-248-23).



406075-1602-7-T J1331

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Aviation Ground Power Unit (AGPU) Chip Detector Fuzz Burner Tester (B10) Electrical Repairer Tool Kit (B14) Jumper Wire Assembly (E-3)

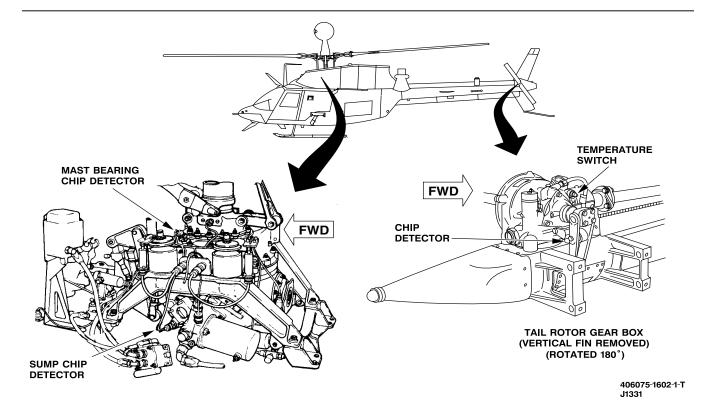
Personnel Required: 68F Aircraft Electrician Pilot

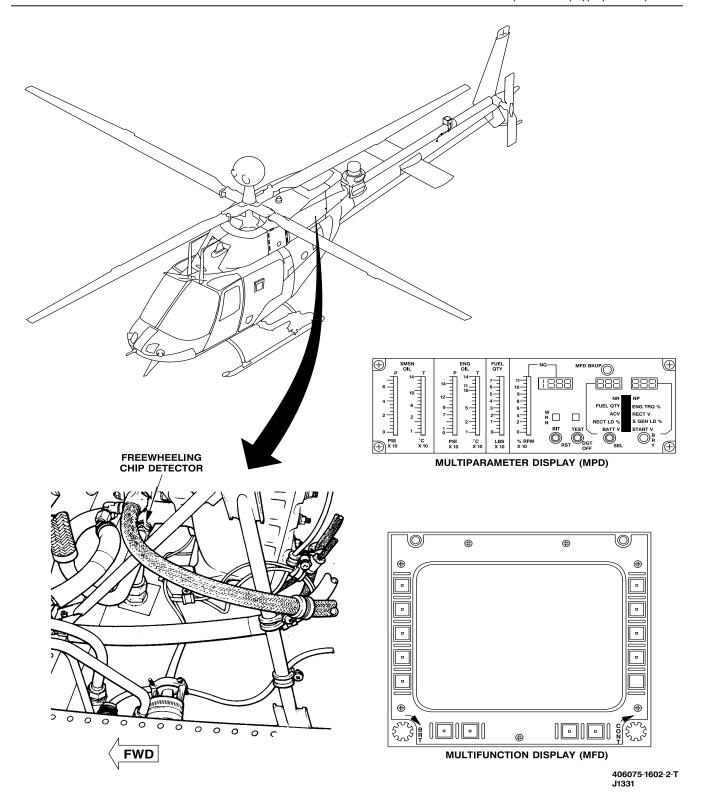
References:

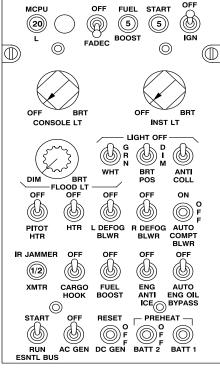
TM 1-1520-248-CL TM 1-1520-248-10 TM 1-1520-248-23

Equipment Condition:

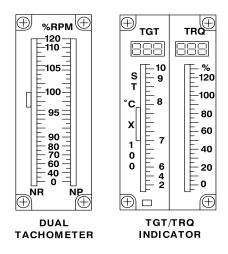
Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electric Compartment)
All Switches — Off/SAFE

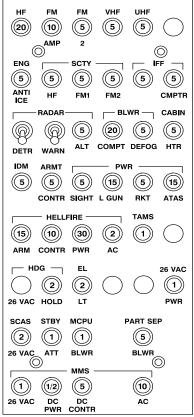






FORWARD
OVERHEAD CONSOLE
CIRCUIT BREAKER PANEL



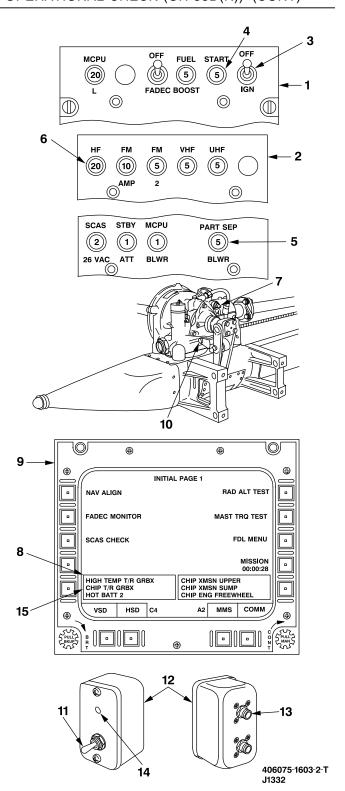


CENTER POST CIRCUIT BREAKER PANEL

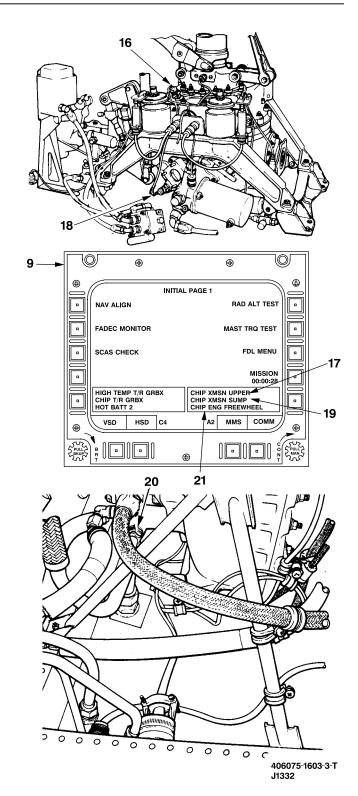
406075-1603-1-T J1332

1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

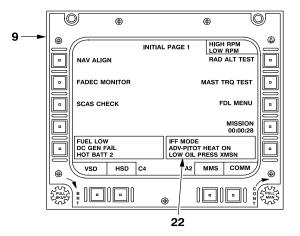
- 2. Install jumper wire (E-3) between stud and airframe ground at tail rotor gearbox temperature switch (7).
- a. Apply external dc electrical power (TM 1-1520-248-23).
- b. Observe HIGH TEMP T/R GRBX caution message (8) appears on MFD (9).
- c. Remove jumper wire from stud and observe message goes off.
- 3. Remove connector (10) from tail rotor gearbox chip detector.
- a. Set switch (11) on chip detector fuzz burner tester (B10) (12) to OFF.
- b. Install connector (10) to fuzz burner tester connector (13) marked XMSN (J1).
- c. Set switch (11) on fuzz burner tester (12) to ON.
- (1) Observe fuzz burner tester LED (14) flashes one time.
- (2) Observe CHIP T/R GRBX caution message (15) appears on MFD (9).
- d. Set switch (11) on fuzz burner tester (12) to OFF. Observe caution message on MFD (9) goes off.
- e. Disconnect connector (10) from fuzz burner tester.
- f. Remove tail rotor gearbox chip detector (TM 1-1520-248-23).
- g. Connect connector (10) to tail rotor gearbox chip detector and short across end of chip detector.
- h. Observe CHIP T/R GRBX caution message appears on MFD (9).
- i. Install tail rotor gearbox chip detector (TM 1-1520-248-23).

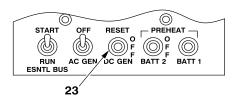


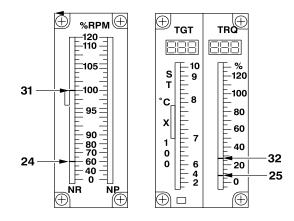
- 4. Repeat step 3. at the mast bearing chip detector connector (16). CHIP XMSN UPPER caution message (17) should be displayed on MFD (9).
- 5. Repeat step 3. at the transmission sump chip detector connector (18). CHIP XMSN SUMP caution message (19) should be displayed on MFD (9).
- 6. Repeat step 3. at the freewheeling unit chip detector (20). CHIP ENG FREEWHEEL caution message (21) should be displayed on MFD (9).

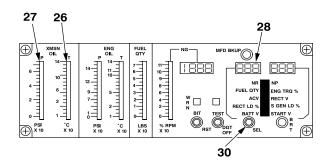


- 7. Observe LOW OIL PRESS XMSN caution message (22) appears on MFD (9).
- 8. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
 - a. Set DC GEN switch (23) to DC GEN (on).
- b. Observe LOW OIL PRESS XMSN caution message (22) goes off.
- c. Observe the following approximate readings:
 - (1) Main rotor rpm 59% (24)
 - (2) Mast torque 8% (25)
- (3) Transmission oil temperature Green Range (26)
- (4) Transmission oil pressure Green Range (27)
 - (5) Main rotor rpm on MPD 59% (28)
- 9. Pilot increase rpm to 100% (TM 1-1520-248-10/CL).
- a. Observe LOW RPM ROTOR warning message (29) goes off of MFD (9).
 - b. Toggle select switch (30) to NR NP.
- c. Observe the following approximate readings:
 - (1) Main rotor rpm 100% (31)
 - (2) Mast torque 27% (32)
- (3) Transmission oil temperature Green Range (26)
- (4) Transmission oil pressure Green Range (27)
 - (5) Main rotor rpm on MPD 100% (28)







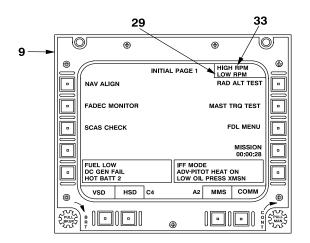


406075-1603-4-T J1332

NOTE

Pilot may be required to perform an autorotation to check HIGH RPM ROTOR warning message operation.

- 10. Pilot increase rpm (TM 1-1520-248-10/CL) until HIGH RPM ROTOR warning message (33) appears on MFD (9). (This should occur at approximately 107% rpm.)
- 11. Pilot decrease rpm to 100% (TM 1-1520-248-10/CL). Observe HIGH RPM ROTOR warning message (33) goes off on MFD (9).
- 12. Pilot decrease rpm (TM 1-1520-248-10/CL). Observe LOW RPM ROTOR warning message (29) appears at approximately 97% RPM.
- 13. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- 14. Disconnect external dc electrical power (TM 1-1520-248-23).



406075-1603-5-T J1332

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

ÓH-58D

Tools:

Aviation Ground Power Unit (AGPU) Ohmmeter (B4) Chip Detector Fuzz Burner Tester (B10) Gas Turbine Temperature Tester (B12) Electrical Repairer Tool Kit (B14)

Jumper Wire Assembly (E-1) Jumper Wire Assembly (E-3)

Personnel Required: 68F Aircraft Electrician Pilot

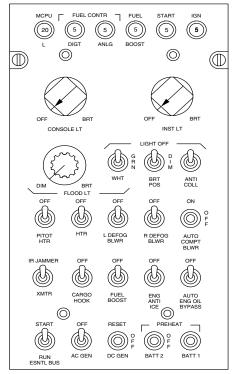
References:

TM 1-1520-248-CL TM 1-1520-248-10 TM 1-1520-248-23 TM 55-2840-256-23

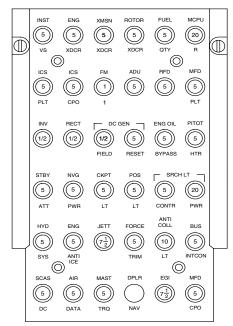
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23) All Circuit Breakers — Closed (Overhead Console/Center Post Circuit Breaker Panel, Nose and Aft Electrical Compartment)

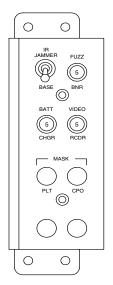
All Switches — Off/SAFE



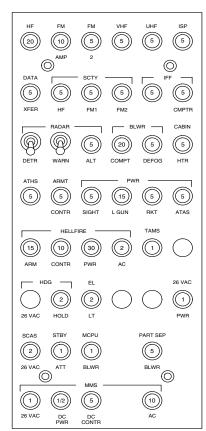
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



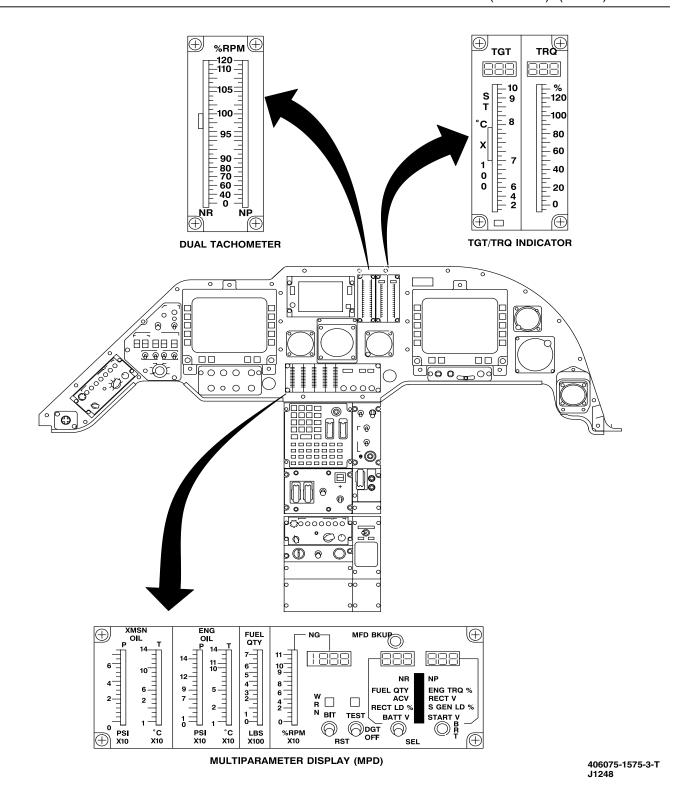
AUXILIARY CIRCUIT BREAKER PANEL

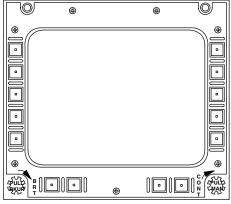


CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

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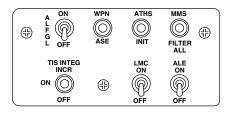




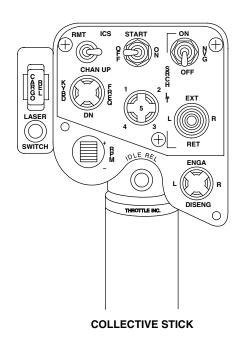
MULTIFUNCTION DISPLAY (MFD)



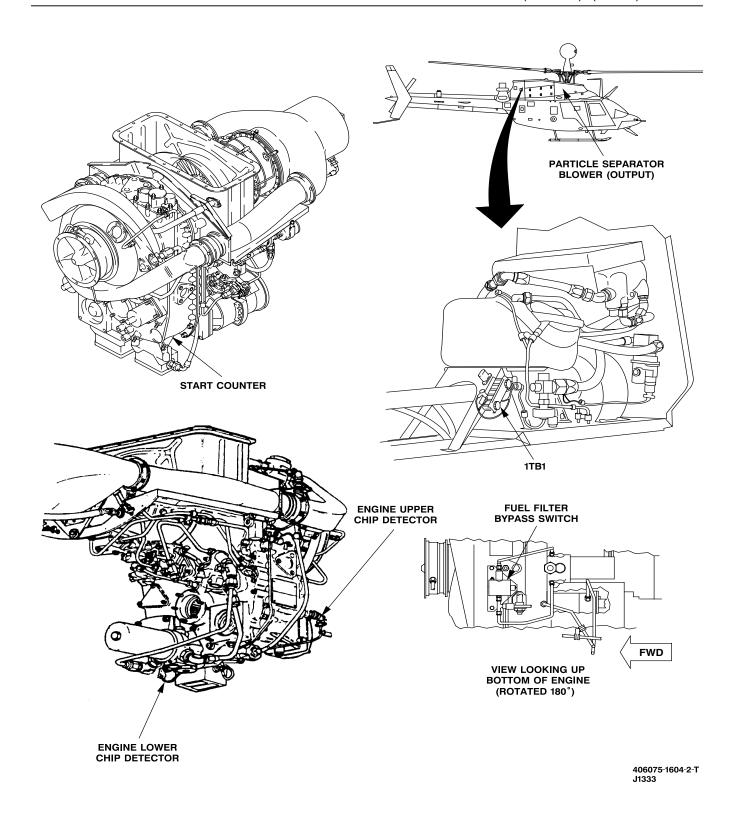
DIGITAL FUEL CONTROL PANEL

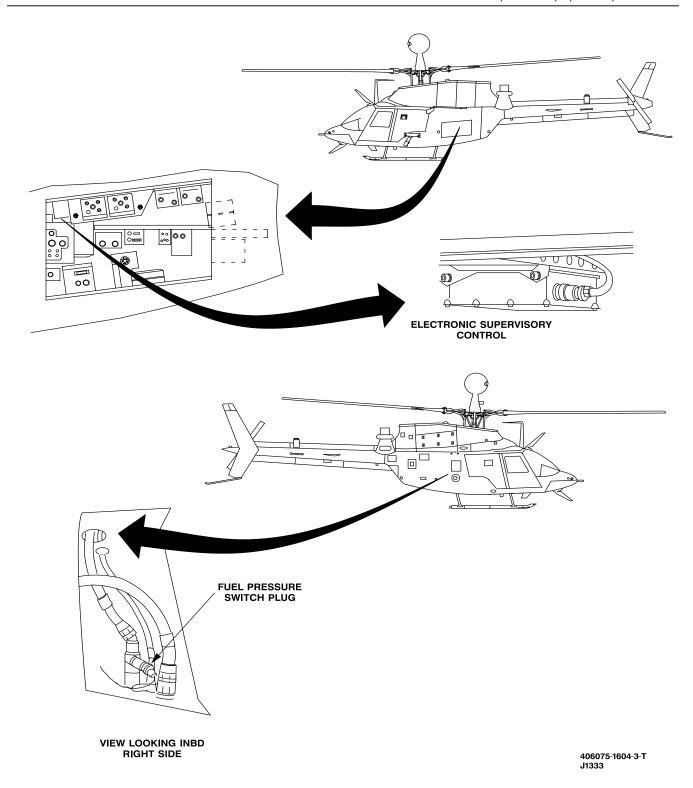


CPG AUXILIARY CONTROL PANEL



406075-1604-1-T J1333

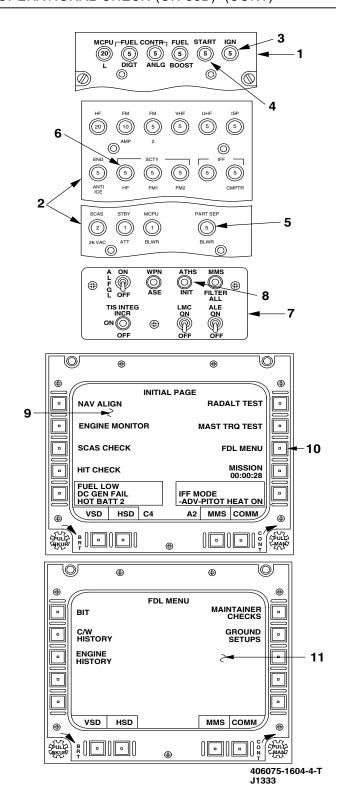




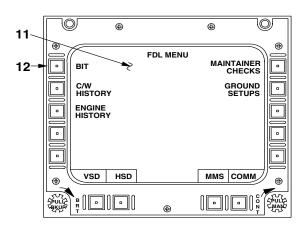
1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

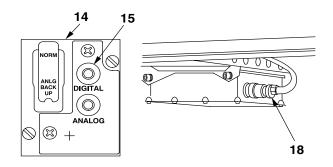
IGN (3) START (4) PART SEP BLWR (5) HF (6)

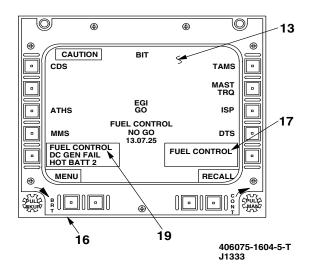
- 2. Apply external dc electrical power (TM 1-1520-248-23).
- 3. On CPG MFD auxiliary control panel (7), toggle ATHS/INIT switch (8) to INIT to access INITIAL PAGE (9).
- 4. Press R3 (10), FDL MENU key, and observe that FDL MENU page (11) appears on INITIAL PAGE (9).



- 5. On FDL MENU page (11) press L1 (12), BIT key, and observe that BIT page (13) appears.
- 6. On fuel control panel (14), press DIGITAL test switch (15).
- a. Observe FUEL CONTROL GO, or FUEL CONTROL NO GO with one or more fault codes appears on MFD (16).
- b. Observe that FUEL CONTROL advisory message (17) also appears.
 - c. Release DIGITAL test switch (15).
- 7. Turn off external dc electrical power (TM 1-1520-248-23).
- 8. Disconnect electronic supervisory control connector (18).
- 9. Turn on external dc electrical power (TM 1-1520-248-23).
- 10. On MFD (16), observe that FUEL CONTROL appears as a caution message (19).
- 11. Turn off external dc electrical power (TM 1-1520-248-23).
- 12. Connect electronic supervisory control connector (18).





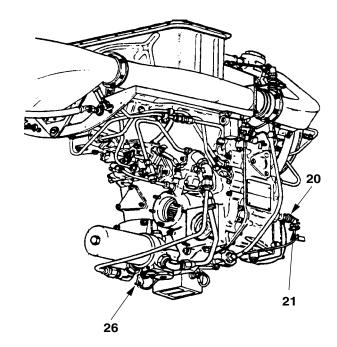


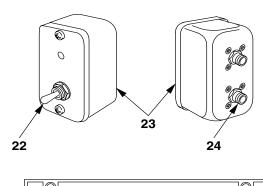
- 13. On engine upper chip detector (20), remove connector (21).
- a. Set switch (22) on chip detector fuzz burner tester (23) (B10) to OFF.
- b. Connect engine upper chip detector connector (21) to receptacle (24) marked ENG on chip detector fuzz burner tester (B10).
- c. Turn on external dc electrical power (TM 1-1520-248-23).
- d. Set switch (22) on fuzz burner tester (23) to ON. Observe CHIPS ENG UPPER caution message (25) appears on MFD (16).

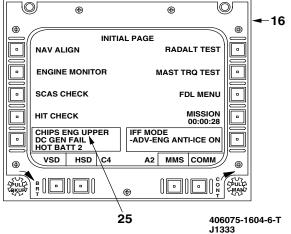
NOTE

LED on fuzz burner tester will not flash as it does on transmission chip detectors, because fuzz burner circuits are not connected to engine chip detectors.

- e. Set switch (22) on fuzz burner tester (23) to OFF. Observe CHIPS ENG UPPER caution message (25) on MFD (16) goes off.
- f. Turn off external dc electrical power (TM 1-1520-248-23).
- g. Disconnect engine upper chip detector connector (21) from fuzz burner tester.
- h. Remove engine upper chip detector (20) (TM 55-2840-256-23).
- i. Connect connector (21) to engine upper chip detector (20).
 - j. Short across end of chip detector (20).
- k. Turn on external dc electrical power (TM 1-1520-248-23).
- I. Observe CHIPS ENG UPPER caution message (25) appears on MFD (16).
- m. Turn off external dc electrical power (TM 1-1520-248-23).
- n. Install engine upper chip detector (20) (TM 55-2840-256-23).
- 14. Repeat step 13. using the engine lower chip detector connector (26). CHIPS ENG LOWER caution message will replace CHIPS ENG UPPER caution message (25) on MFD (16).



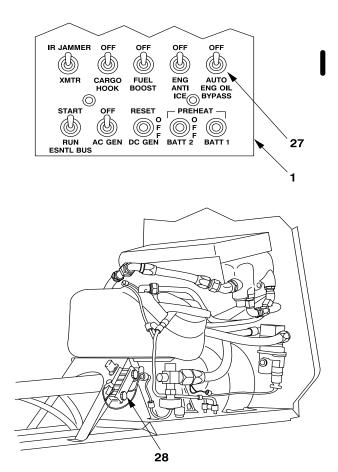


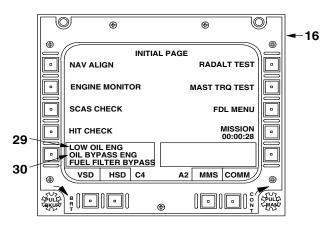


NOTE

The engine oil bypass procedure assumes there is oil in the tank.

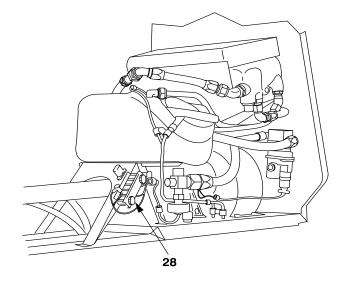
- 15. On forward overhead console panel (1):
- a. Verify ENG OIL BYPASS switch (27) is OFF.
- b. Connect jumper wire (E-3) from 1TB1 (28) terminal 1 to airframe ground.
- c. Turn on external dc electrical power (TM 1-1520-248-23).
- d. Observe LOW OIL QUANTITY ENG caution message (29) appears on MFD (16).
- e. Disconnect jumper wire (E-3) and observe that caution message (29) on MFD (16) goes off.
 - f. Reconnect jumper wire (E-3).
- g. Set ENG OIL BYPASS switch (27) to AUTO.
- h. Observe OIL BYP ENG caution message (30) appears on MFD (16). This is an indication that the engine oil bypass relay actuated, and the engine oil bypass valve is in bypass position.
- i. Observe LOW OIL QUANTITY ENG caution message (29) remains on MFD (16).
 - j. Set ENG OIL BYPASS switch (27) to OFF.
- k. Observe OIL BYP ENG caution message (30) goes off. This is an indication that the engine oil bypass relay deenergized, and the engine oil bypass valve is in non-bypass position.
- I. Observe LOW OIL QUANTITY ENG caution message (29) remains on MFD (16).
- m. Disconnect jumper wire (E-3) and observe LOW OIL QUANTITY ENG caution message (29) goes off.
- n. Turn off external dc electrical power (TM 1-1520-248-23).

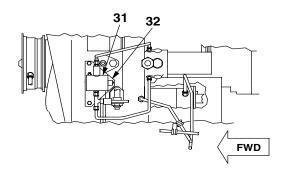


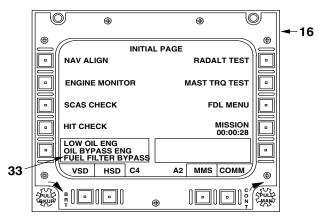


406075-1604-7-T J1333

- o. Connect ohmmeter between terminal 1 of 1TB1 (28) and airframe ground to check oil level float switch.
 - (1) Drain oil from the tank.
- (2) Observe that float switch closes and ohmmeter reads continuity to ground at approximately 5.5 pints drained.
- (3) Refill tank and observe that ohmmeter does not read continuity to ground.
 - (4) Disconnect ohmmeter.
 - 16. On fuel filter bypass switch (31):
 - a. Disconnect plug (32).
- b. Connect jumper wire (E-1) from pin B to pin C of plug (32).
- c. Turn on external dc electrical power (TM 1-1520-248-23).
- d. Observe FUEL FILTER BYP caution message (33) on MFD (16) comes on.
 - e. Disconnect jumper wire (E-1).
- f. Observe that FUEL FILTER BYP caution message (33) goes off.
- g. Turn off external dc electrical power (TM 1-1520-248-23).
 - h. Reconnect plug (32).







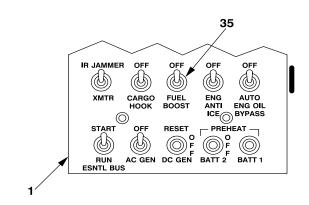
406075-1604-8-T J1333

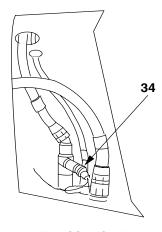
- 17. Fuel boost and pressure switch (34).
- a. Turn on external dc electrical power (TM 1-1520-248-23).
- b. On forward overhead console panel (1), set FUEL BOOST switch (35) to FUEL BOOST.
- (1) Determine, by listening, that fuel boost pump is running.
- (2) Observe FUEL BOOST FAIL caution message (36) is not displayed on MFD (16).

NOTE

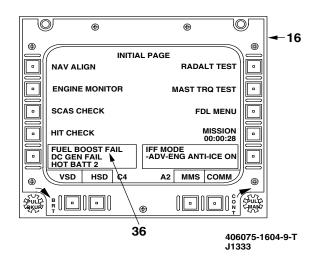
FUEL BOOST FAIL caution message may appear momentarily while fuel pressure increases.

- c. Turn off external dc electrical power (TM 1-1520-248-23).
 - d. Disconnect fuel pressure switch plug (34).
- e. Connect jumper wire (E-1) between pins A and B of plug (34).
- f. Turn on external dc electrical power (TM 1-1520-248-23).
- g. With fuel boost pump still on, observe FUEL BOOST FAIL caution message (36) appears.
- h. Disconnect jumper wire (E-1) and observe FUEL BOOST FAIL caution message (36) goes off.
- i. Turn off external dc electrical power (TM 1-1520-248-23).
 - j. Reconnect fuel pressure switch plug (34).
- k. On forward overhead console panel (1), set FUEL BOOST switch (35) to OFF.

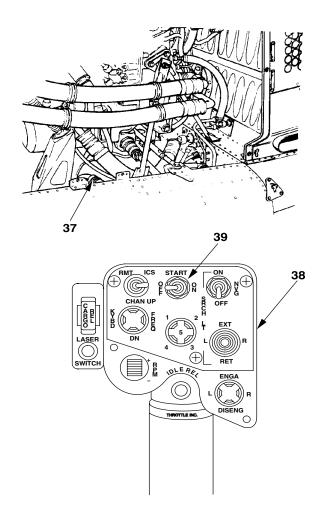


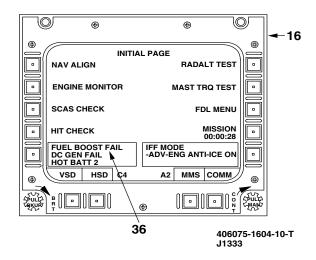


VIEW LOOKING INBD RIGHT SIDE

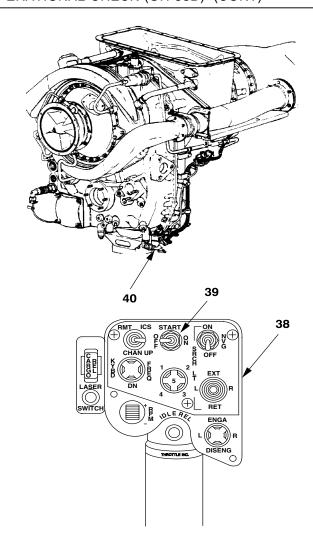


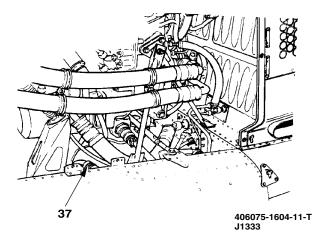
- I. Disconnect starter-generator connector (37).
- 18. Turn on external dc electrical power (TM 1-1520-248-23).
- 19. On pilot collective stick (38), set START switch (39) to ON.
- 20. Observe FUEL BOOST FAIL caution message (36) is not displayed on MFD (16). This indicates that fuel boost pump is running.
- 21. On pilot collective stick (38), set START switch (39) to OFF.
- 22. Turn off external dc electrical power (TM 1-1520-248-23).



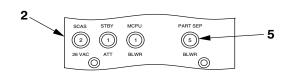


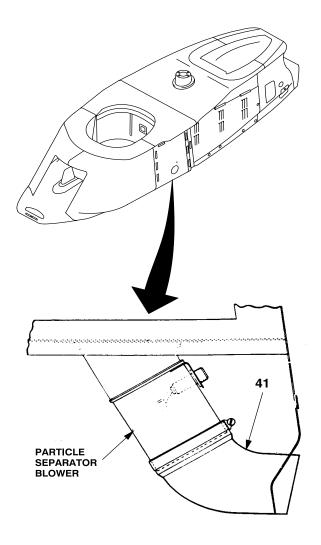
- 23. Ignition and start counter.
- a. Observe start counter (40) on engine and record count number.
- b. Turn on external dc electrical power (TM 1-1520-248-23).
- c. On pilot collective stick (38), set START switch (39) to ON. Listen for clicking sound indicating that engine igniter is firing.
 - d. Set START switch (39) to OFF.
- e. Observe that start counter (40) on engine has increased one count.
- f. Turn off external dc electrical power (TM 1-1520-248-23).
 - g. Reconnect starter-generator plug (37).





- 24. Particle separator blower.
- a. Turn on external dc electrical power (TM 1-1520-248-23).
- b. On center post circuit breaker panel (2), close PART SEP BLWR circuit breaker (5).
- c. Observe that particle separator blower runs and exhausts air overboard through the right particle separator blower (41).
- d. Open PART SEP BLWR circuit breaker (5).





VIEW LOOKING FORWARD

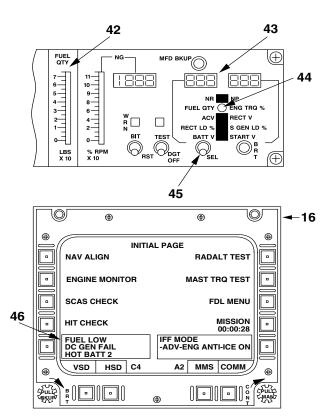
406075-1604-12-T J1333

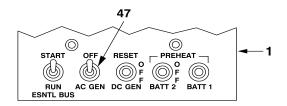
25. Fuel quantity.

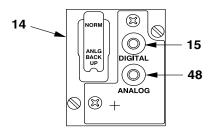
NOTE

Allowable tolerance on indicated fuel load is 4% of the reading plus 2% of full scale. This equates to \pm 42 pounds for 715 pounds of JP-4 and \pm 44 pounds for 748 pounds of JP-5. This will preclude what is perceived as an aircraft fuel quantity malfunction.

- a. Observe that fuel quantity vertical display (42) reads approximately the known amount of fuel on board.
- b. On selectable digital readout (43), select FUEL QTY-ENG TRQ % (44), using SEL switch (45).
- c. Observe that digital readout (43) agrees with vertical display (42).
- d. Partially defuel helicopter until approximately 115 \pm 15 pounds fuel is indicated. (If engine run is required go to step 26 and monitor fuel quantity until required amount is indicated to perform the following step.)
- e. On MFD (16), observe FUEL LOW caution message (46) comes on at approximately 97.5 pounds remaining.
- 26. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
- a. On forward overhead console (1), set DC GEN switch (47) to DC GEN.
- b. Observe that LOW OIL PRESS ENG caution message and ENGINE OUT warning message are not displayed on MFD (16).
- 27. Pilot reduce rotor rpm to the 70% 80% range.
- a. Press DIGITAL test switch (15) on digital fuel control test panel (14), and observe engine deceleration.
 - b. Release DIGITAL switch (15).
- c. Press ANALOG test switch (48) on digital fuel control test panel (14), and observe decrease in engine rpm.
 - d. Release ANALOG switch (48).







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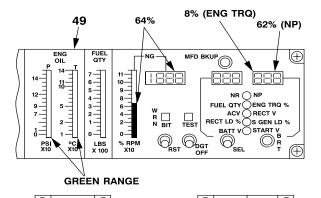
e. Observe that the following approximate readings appear on dual tachometer, multiparameter display and TGT/TRQ indicator (49).

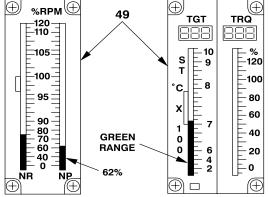
NP (vertical scale) 62% NG (vertical scale) 64%

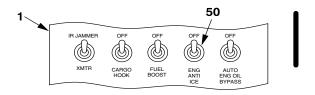
ENG OIL °C Green Range
ENG OIL PSI Green Range
TGT °C Green Range

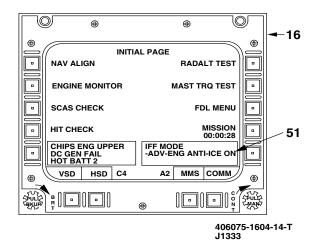
NP (digital) 62% NG (digital) 64% ENG TRQ % (digital) 8%

- 28. On forward overhead console panel (1):
- a. Set ENG ANTI-ICE switch (50) to ENG ANTI-ICE.
- b. Observe that engine mounted anti-ice solenoid valve opens (indicated by an increase in TGT).
- c. Observe ENG ANTI-ICE ON advisory message (51) appears on MFD (16).
 - 29. On forward overhead console panel (1):
 - a. Set ENG ANTI-ICE switch (50) to OFF.
- b. Observe that engine mounted anti-ice solenoid valve closes (indicated by a decrease in TGT).
- c. Observe ENG ANTI-ICE ON advisory message (51) disappears from MFD (16).







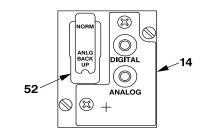


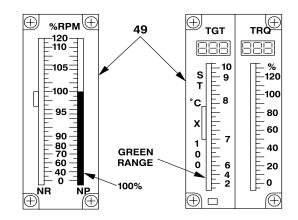
- 30. Pilot increase engine rpm to 100%.
- 31. On digital fuel control panel (14):
 - a. Set switch (52) to ANLG BACK UP.
 - b. Observe increase in engine rpm.
 - c. Return switch to NORM.
- d. Observe the following approximate readings appear on dual tachometer, multiparameter display, and TGT/TRQ indicator (49).

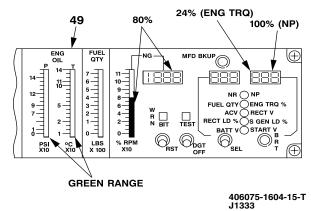
NP (vertical scale) 100% NG (vertical scale) 80%

ENG OIL °C Green Range
ENG OIL PSI Green Range
TGT °C Green Range

NP (digital) 100% NG (digital) 80% ENG TRQ % (digital) 24%



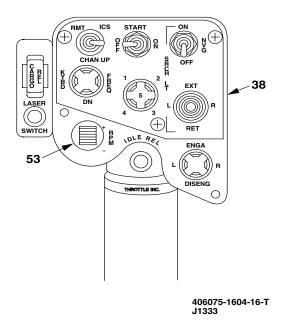




NOTE

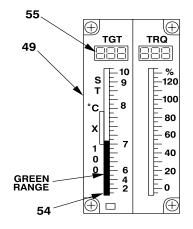
Range set by RPM switch (53) will vary engine rpm from approximately 97 to 102%.

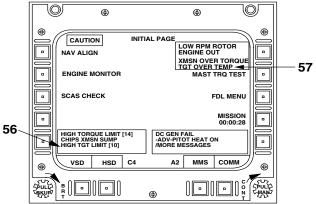
- 32. On pilot collective stick (38), set engine rpm to maximum (+), then minimum (-), then back to 100% with RPM switch (53).
- a. Pilot shut down helicopter (TM 1-1520-248-10/CL).
- b. Turn off external dc electrical power (TM 1-1520-248-23).



33. Turbine Gas Temperature

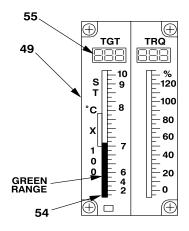
- a. Turn on external dc electrical power (TM 1-1520-248-23).
- b. On TGT/TRQ indicator (49), observe that indicated turbine gas temperature is ambient, or below scale.
- c. Disconnect electrical connector 1P1 (engine disconnect).
- d. On gas turbine temperature test set, position FUNCTION knob to INDICATOR TEST and position RESISTANCE RANGE knob to $2M\Omega$ (0 ohm system resistance).
- e. Connect black clip from test set to connector pin 1P1-31 (-) and red clip to connector pin 1P1-30 (+).
 - f. Position test set ON/OFF switch to ON.
- g. Rotate TEMP ADJ knob on test set until 720 °C is displayed.
- h. Observe TGT vertical scale (54), on TGT/TRQ indicator, for a reading of 720 $^{\circ}$ C. The digital display (55) above the vertical scale should indicate 710 $^{\circ}$ C to 730 $^{\circ}$ C.
- i. Rotate TEMP ADJ knob on test set until 800 °C is displayed.

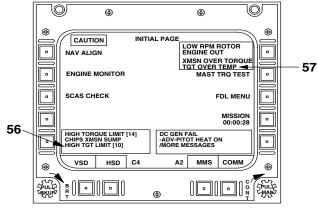




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- j. Observe TGT vertical scale (54), on TGT/TRQ indicator, for a reading of 800 °C. The digital display (55) should indicate 790 °C to 810 °C.
- k. Rotate TEMP ADJ knob on test set counterclockwise until approximately 700 $^{\circ}$ C is displayed on test set.
- I. While observing MFD, rotate TEMP ADJ knob clockwise until 790 °C is displayed on test set. Observe that MFD displays HIGH TGT LIMIT [] caution message (56) followed by seconds counter in brackets ([]). Observe that seconds counter increments upward and after approximately 10 seconds the TGT OVER TEMP warning message appears (57).
- m. Rotate TEMP ADJ knob on test set counterclockwise until approximately 700 °C is displayed on MFD. Observe that both caution/warning messages go off.
 - n. Position test set switch to OFF.
 - o. Disconnect test set from connector 1P1.
- p. Reconnect connector 1P1 (engine disconnect).
- q. Disconnect external dc electrical power (TM 1-1520-248-23).





406075-1604-17-T J1333

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Aviation Ground Power Unit (AGPU) Ohmmeter (B4) Chip Detector Fuzz Burner Tester (B10) Gas Turbine Temperature Tester (B12) Electrical Repairer Tool Kit (B14) Jumper Wire Assembly (E-1) Jumper Wire Assembly (E-3)

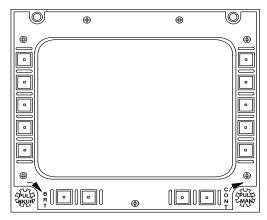
Personnel Required: 68F Aircraft Electrician Pilot

References:

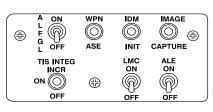
TM 1-1520-248-CL TM 1-1520-248-10 TM 1-1520-248-23 TM 1-2840-263-23

Equipment Condition:

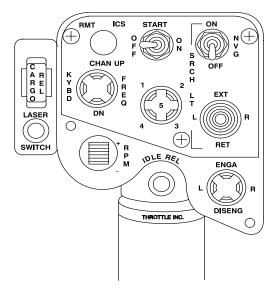
Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE



MULTIFUNCTION DISPLAY (MFD)

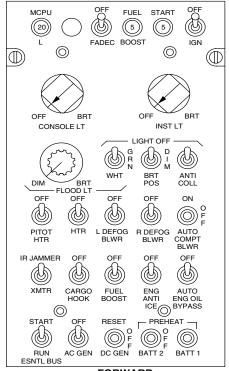


CPG AUXILIARY CONTROL PANEL

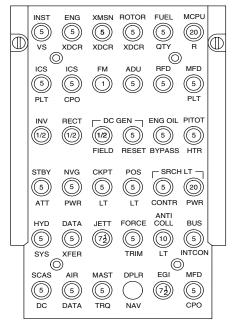


COLLECTIVE STICK

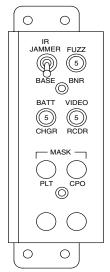
406075-1623-1-T J1843



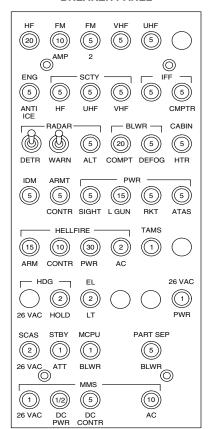
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

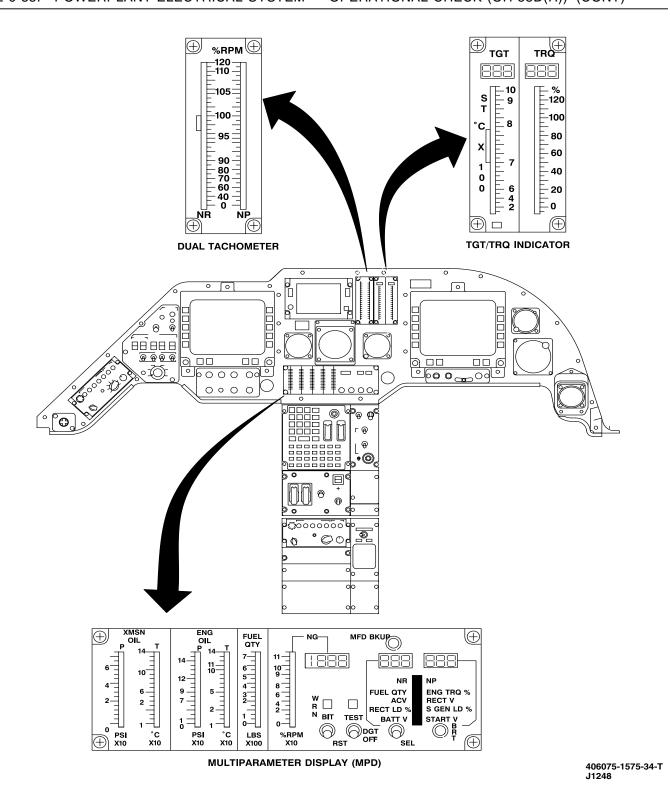


AUXILIARY CIRCUIT BREAKER PANEL

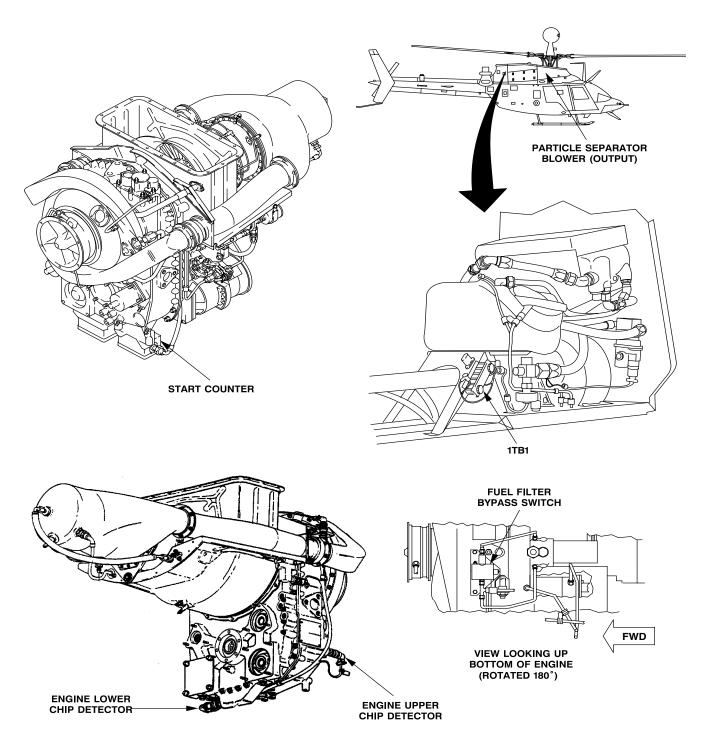


CENTER POST CIRCUIT BREAKER PANEL

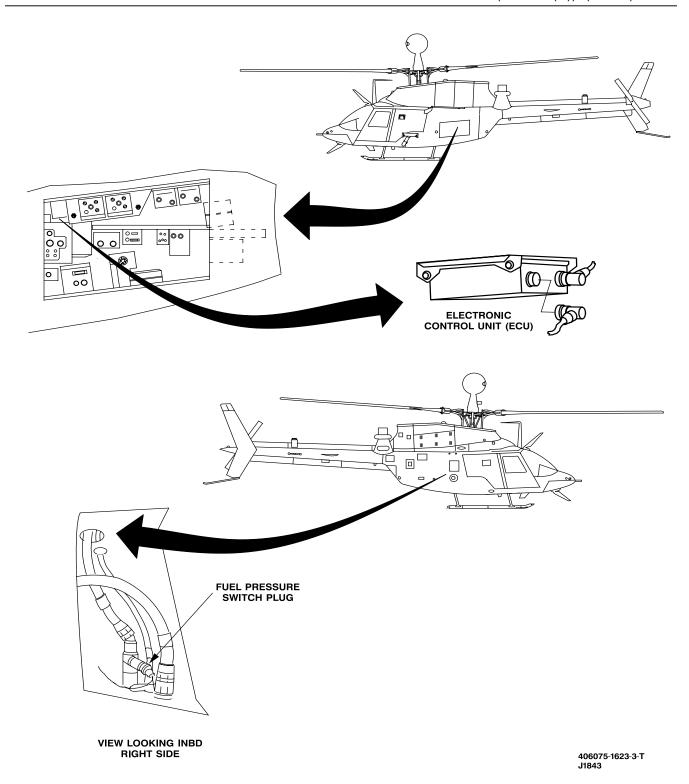
406075-1600-1-T J1328



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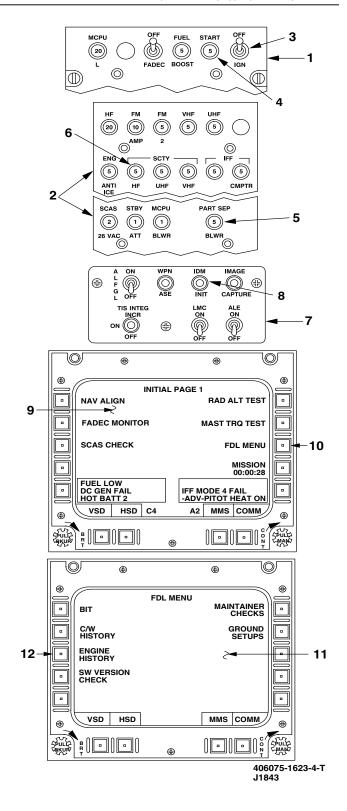
406075-1623-2-T J1843



1. On overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) - OFF START (4) PART SEP BLWR (5) HF (6)

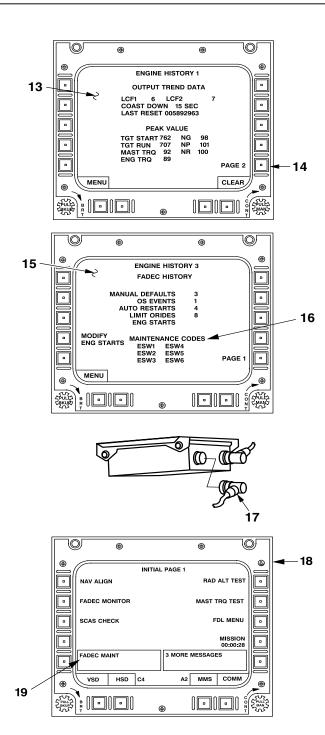
- 2. Apply external dc electrical power (TM 1-1520-248-23).
- 3. On CPG MFD auxiliary control panel (7), toggle IDM/INIT switch (8) to INIT to access INITIAL PAGE 1 (9).
- 4. Press R3 (10), FDL MENU key, and observe that FDL MENU page (11) appears on MFD.
- 5. On FDL MENU page (11), press L3 (12), ENGINE HISTORY key.



- 6. Verify ENGINE HISTORY 1 page (13) appears.
- 7. Press R5 (14) until ENGINE HISTORY 3 page (15) is displayed.
- a. On ENGINE HISTORY 3 page (15), check MAINTENANCE CODES (16) for any Engine Status Words (ESWs) fault codes displayed in ESW2 and/or ESW4 position that indicate a fault with the ECU and/or fuel system.

NOTE

- Refer to Appendix F to convert ESW codes and determine the appropriate maintenance action for those codes.
- 8. Turn off external dc electrical power (TM 1-1520-248-23).
 - 9. Disconnect ECU connector (17).
- 10. Turn on external dc electrical power (TM 1-1520-248-23).
- 11. On MFD (18), observe FADEC MAINT advisory message (19) appears.
- 12. Turn off external dc electrical power (TM 1-1520-248-23).
 - 13. Connect ECU connector (17).



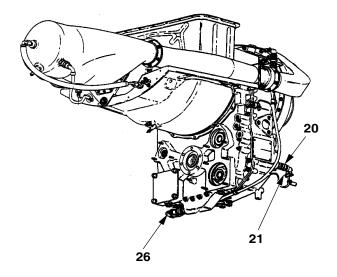
406075-1623-5-T J1843

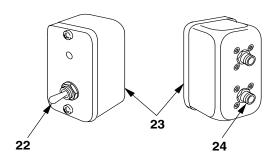
- 14. On engine upper chip detector (20), remove connector (21).
- a. Set switch (22) on chip detector fuzz burner tester (B10) (23) to OFF.
- b. Connect engine upper chip detector connector (21) to receptacle (24) marked ENG on chip detector fuzz burner tester (B10) (23).
- c. Turn on external dc electrical power (TM 1-1520-248-23).
- d. Set switch (22) on fuzz burner tester (23) to ON. Observe CHIPS ENG UPPER caution message (25) appears on MFD (18).

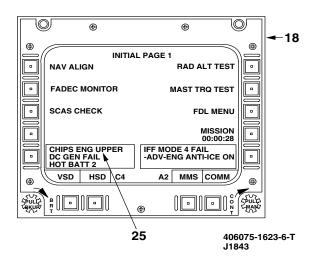
NOTE

LED on fuzz burner tester will not flash as it does on transmission chip detectors, because fuzz burner circuits are not connected to engine chip detectors.

- e. Set switch (22) on fuzz burner tester (23) to OFF. Observe CHIPS ENG UPPER caution message (25) on MFD (18) goes off.
- f. Turn off external dc electrical power (TM 1-1520-248-23).
- g. Disconnect engine upper chip detector connector (21) from fuzz burner tester.
- h. Remove engine upper chip detector (20) (TM 1-2840-263-23).
- i. Connect connector (21) to engine upper chip detector (20).
 - j. Short across end of chip detector (20).
- k. Turn on external DC electrical power (TM 1-1520-248-23).
- I. Observe CHIPS ENG UPPER caution message (25) appears on MFD (18).
- m. Turn off external DC electrical power (TM 1-1520-248-23).
- n. Install engine upper chip detector (20) (TM 1-2840-263-23).
- 15. Repeat step 14. using the engine lower chip detector connector (26). CHIPS ENG LOWER caution message will replace CHIPS ENG UPPER caution message (25) on MFD (18).



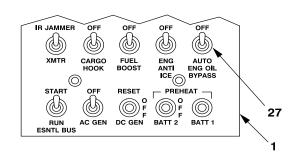


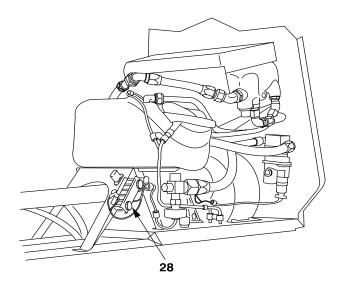


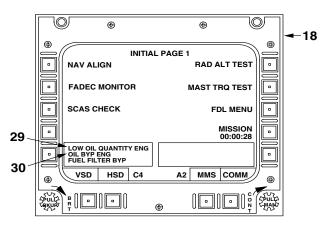
NOTE

The engine oil bypass procedure assumes there is oil in the tank.

- 16. On forward overhead console panel (1):
- a. Verify ENG OIL BYPASS switch (27) is OFF.
- b. Connect jumper wire (E-3) from 1TB1-1 (28) to airframe ground.
- c. Turn on external dc electrical power (TM 1-1520-248-23).
- d. Observe LOW OIL QUANTITY ENG caution message (29) appears on MFD (18).
- e. Disconnect jumper wire (E-3) and observe LOW OIL QUANTITY ENG caution message (29) on MFD (18) goes off.
 - f. Reconnect jumper wire (E-3).
- g. Set ENG OIL BYPASS switch (27) to AUTO.
- h. Observe OIL BYP ENG caution message (30) appears on MFD (18). This is an indication that the engine oil bypass relay actuated, and the engine oil bypass valve is in bypass position.
- i. Observe LOW OIL QUANTITY ENG caution message (29) remains on MFD (18).
 - j. Set ENG OIL BYPASS switch (27) to OFF.
- k. Observe OIL BYP ENG caution message (30) goes off. This is an indication that the engine oil bypass relay deenergized, and the engine oil bypass valve is in non-bypass position.
- I. Observe LOW OIL QUANTITY ENG caution message (29) remains on MFD (18).
- m. Disconnect jumper wire (E-3) and observe LOW OIL QUANTITY ENG caution message (29) goes off.
- n. Turn off external dc electrical power (TM 1-1520-248-23).



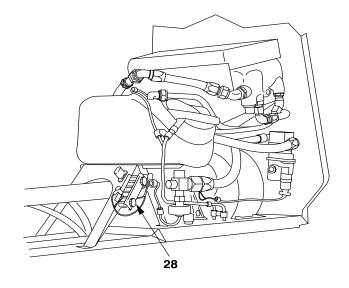


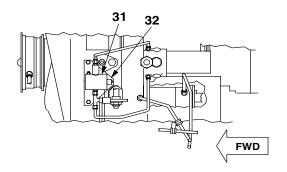


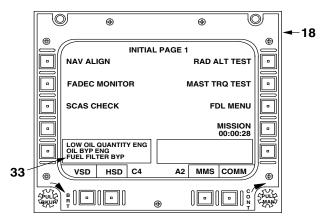
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- o. Connect ohmmeter between 1TB1-1 (28) and airframe ground to check oil level float switch.
 - (1) Drain oil from the tank.
- (2) Observe that float switch closes and ohmmeter reads continuity to ground at approximately 5.5 pints drained.
- (3) Refill tank and observe that ohmmeter does not read continuity to ground.
 - (4) Disconnect ohmmeter.
 - 17. On fuel filter bypass switch (31):
 - a. Disconnect connector (32).
- b. Connect jumper wire (E-1) from pin B to pin C of plug (32).
- c. Turn on external dc electrical power (TM 1-1520-248-23).
- d. Observe FUEL FILTER BYP caution message (33) on MFD (18) comes on.
 - e. Disconnect jumper wire (E-1).
- f. Observe FUEL FILTER BYP caution message (33) goes off.
- g. Turn off external dc electrical power (TM 1-1520-248-23).
 - h. Reconnect connector (32).







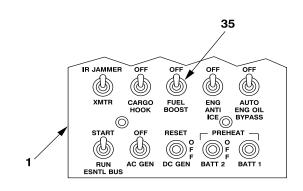
406075-1623-8-T J1843

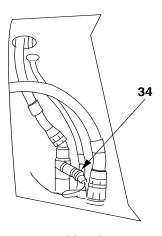
- 18. Fuel pressure switch and connector (34).
- a. Turn on external dc electrical power (TM 1-1520-248-23).
- b. On forward overhead console panel (1), set FUEL BOOST switch (35) to FUEL BOOST.
- (1) Determine by listening that fuel boost pump is running.
- (2) Observe FUEL BOOST FAIL caution message (36) is not displayed on MFD (18).

NOTE

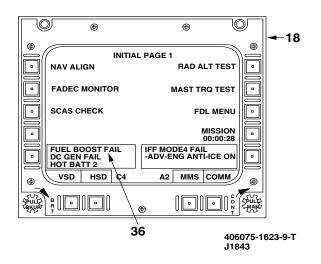
Message may appear momentarily while fuel pressure increases.

- c. Turn off external dc electrical power (TM 1-1520-248-23).
- d. Disconnect fuel pressure switch connector (34).
- e. Connect jumper wire (E-1) between pins A and B of plug (34).
- f. Turn on external dc electrical power (TM 1-1520-248-23).
- g. With fuel boost pump still on, observe FUEL BOOST FAIL caution message (36) appears.
- h. Disconnect jumper wire (E-1) and observe FUEL BOOST FAIL caution message (36) goes off.
- i. Turn off external dc electrical power (TM 1-1520-248-23).
- j. Reconnect fuel pressure switch connector (34).
- k. On forward overhead console panel (1), set FUEL BOOST switch (35) to OFF.

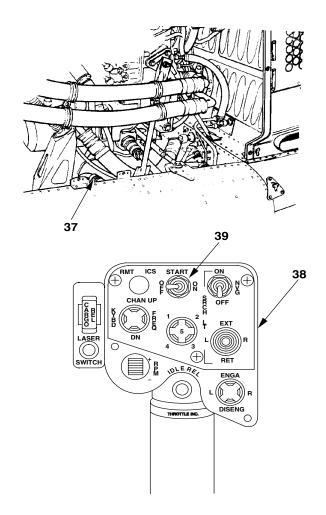


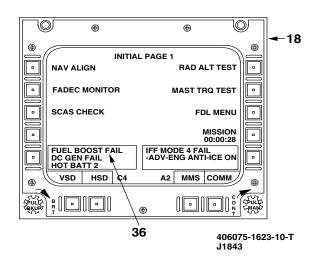


VIEW LOOKING INBD RIGHT SIDE

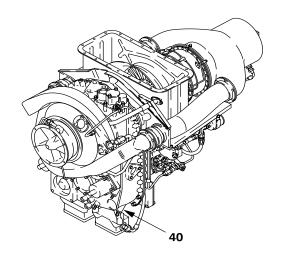


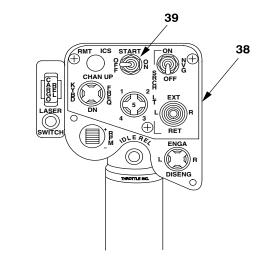
- I. Disconnect starter-generator connector (37).
- 19. Turn on external dc electrical power (TM 1-1520-248-23).
- 20. On pilot collective stick (38), hold START switch (39) in ON position.
- 21. Observe FUEL BOOST FAIL caution message (36) is not displayed on MFD (18). This indicates that fuel boost pump is running.
- 22. On pilot collective stick (38), release START switch (39).
- 23. Turn off external dc electrical power (TM 1-1520-248-23).

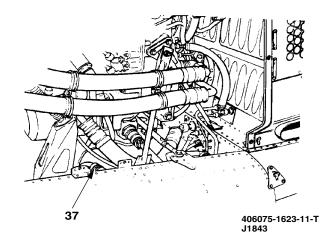




- 24. Ignition and start counter.
- a. Observe start counter (40) on engine and record count number.
- b. Turn on external dc electrical power (TM 1-1520-248-23).
- c. On pilot collective stick (38), hold START switch (39) in ON position. Listen for clicking sound indicating that engine igniter is firing.
 - d. Release START switch (39).
- e. Observe that start counter (40) on engine has increased one count.
- f. Turn off external dc electrical power (TM 1-1520-248-23).
- g. Reconnect starter-generator connector (37).

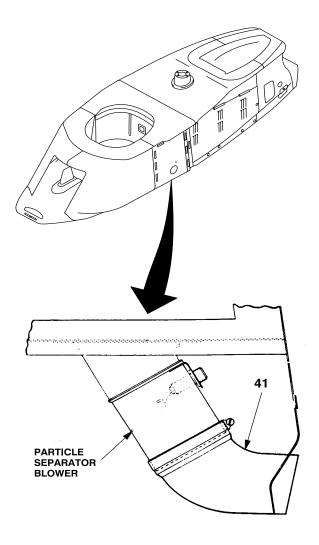






- 25. Particle separator blower.
- a. Turn on external dc electrical power (TM 1-1520-248-23).
- b. On center post circuit breaker panel (2), close PART SEP BLWR circuit breaker (5).
- c. Observe that particle separator blower runs and exhausts air overboard through the right particle separator blower (41).
- d. Open PART SEP BLWR circuit breaker (5).





VIEW LOOKING FORWARD

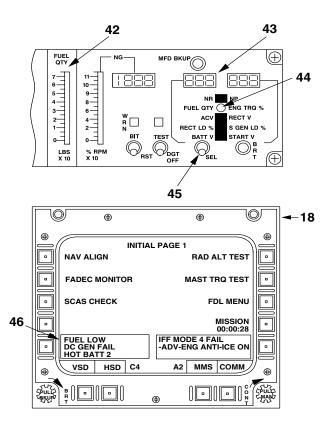
406075-1604-12-T J1333

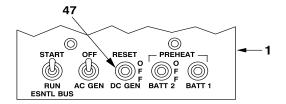
26. Fuel quantity.

NOTE

Allowable tolerance on indicated fuel load is 4% of the reading plus 2% of full scale. This equates to \pm 42 pounds for 715 pounds of JP-4 and \pm 44 pounds for 748 pounds of JP-5. This will preclude what is perceived as an aircraft fuel quantity malfunction.

- a. Observe that fuel quantity vertical display (42) reads approximately the known amount of fuel on board.
- b. On selectable digital readout (43), select FUEL QTY-ENG TRQ % (44), using SEL switch (45).
- c. Observe that digital readout (43) agrees with vertical display (42).
- d. Partially defuel helicopter until approximately 115 \pm 15 pounds fuel is indicated. (If engine run is required go to step 27 and monitor fuel quantity until required amount is indicated to perform the following step.)
- e. On MFD (18), observe FUEL LOW caution message (46) comes on at approximately 97.5 pounds remaining.
- 27. Pilot start helicopter and stabilize at flight idle (TM 1-1520-248-10/CL).
- a. On forward overhead console (1), set DC GEN switch (47) to DC GEN.
- b. Observe that LOW OIL PRESS ENG caution message and ENGINE OUT warning message are not displayed on MFD (18).





406075-1623-13-T J1843

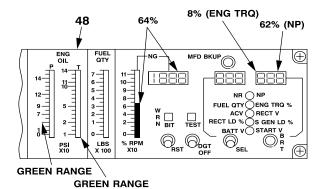
- 28. Pilot reduce rotor rpm to the 70% 80% range.
- a. Observe that the following approximate readings appear on dual tachometer, multiparameter display and TGT/TRQ indicators (48).

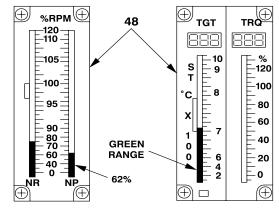
NP (vertical scale) 62% NG (vertical scale) 64%

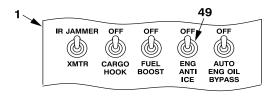
ENG OIL °C Green Range ENG OIL PSI Green Range TGT °C Green Range

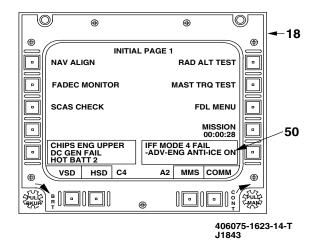
NP (digital) 62% NG (digital) 64% ENG TRQ % (digital) 8%

- 29. On forward overhead console panel (1):
- a. Set ENG ANTI ICE switch (49) to ENG ANTI-ICE.
- b. Observe that engine mounted anti-ice solenoid valve opens (indicated by an increase in TGT).
- c. Observe ENG ANTI-ICE ON advisory message (50) appears on MFD (18).
 - 30. On forward overhead console panel (1):
 - a. Set ENG ANTI-ICE switch (49) to OFF.
- b. Observe that engine mounted anti-ice solenoid valve closes (indicated by a decrease in TGT).
- c. Observe ENG ANTI-ICE ON advisory message (50) disappears from MFD (18).









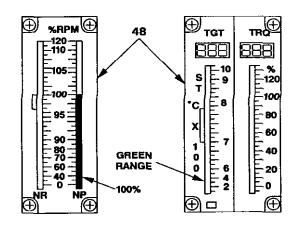
- 31. Pilot increase engine rpm to 100%.
- a. Observe the following approximate readings appear on dual tachometer, multiparameter display, and TGT/TRQ indicators (48)

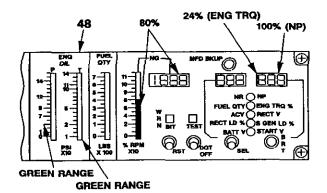
NP (vertical scale)	100%	
NG (vertical scale)	80%	
ENG OIL °C	Green	Range
ENG OIL PSI	Green	Range
TGT ° C	Green	Range
NP (digital)	100%	
NG (digital)	80%	
ENG TRQ % (digital)	24%	

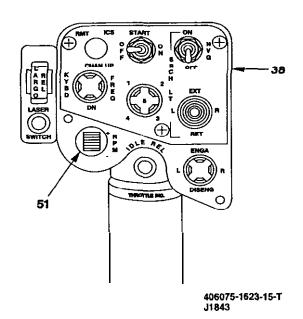
NOTE

Range set by RPM switch (51) will vary engine rpm from approximately 97 to 102%.

- 32. On pilot collective stick (38), set engine rpm to maximum (+), then minimum (-), then back to 100% with RPM switch (51).
- a. Pilot shut down helicopter (TM I-1520-248-10/CL).
- b. Turn off external dc electrical power (TM 1-1520-248-23).

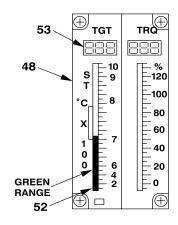






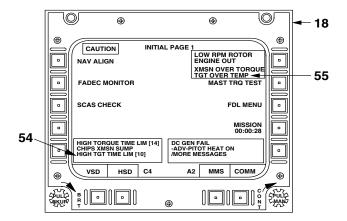
33. Turbine Gas Temperature

- a. Turn on external dc electrical power (TM 1-1520-248-23).
- b. On TGT/TRQ indicator (48), observe that indicated turbine gas temperature is ambient, or below scale.
- c. Disconnect electrical connector 1P1 (engine disconnect).
- d. On gas turbine temperature test set, position FUNCTION knob to INDICATOR TEST and position RESISTANCE RANGE knob to $2M\Omega$ (0 ohm system resistance).
- e. Connect black clip from test set to connector pin 1P1-31 (-) and red clip to connector pin 1P1-30 (+).
 - f. Position test set ON/OFF switch to ON.
- g. Rotate TEMP ADJ knob on test set until 720 $^{\circ}\text{C}$ is displayed.
- h. Observe TGT vertical scale (52), on TGT/TRQ indicator, for a reading of 720 $^{\circ}$ C. The digital display (53) above the vertical scale should indicate 710 $^{\circ}$ C to 730 $^{\circ}$ C.
- i. Rotate TEMP ADJ knob on test set until 800 °C is displayed.
- j. Observe TGT vertical scale (52), on TGT/TRQ indicator, for a reading of 800 °C. The digital display (53) should indicate 790 °C to 810 °C.
- k. Rotate TEMP ADJ knob on test set counterclockwise until approximately 700 $^{\circ}\text{C}$ is displayed on test set.



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- I. While observing MFD (18), rotate TEMP ADJ knob clockwise until 790 °C is displayed on test set. Observe that MFD displays HIGH TGT TIME LIM [] caution message (54) followed by seconds counter in brackets ([]). Observe that seconds counter increments upward and after approximately 10 seconds TGT OVER TEMP warning message appears (55).
- m. Rotate TEMP ADJ knob on test set counterclockwise until approximately 700 °C is displayed on MFD. Observe that both caution/warning messages go off.
 - n. Position test set switch to OFF.
 - o. Disconnect test set from connector 1P1.
- p. Reconnect connector 1P1 (engine disconnect).
- q. Disconnect external dc electrical power (TM 1-1520-248-23).



406075-1623-18-T

2-6-36. FLOODLIGHTS — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÁLL

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,

Nose and Aft Electrical Compartment)

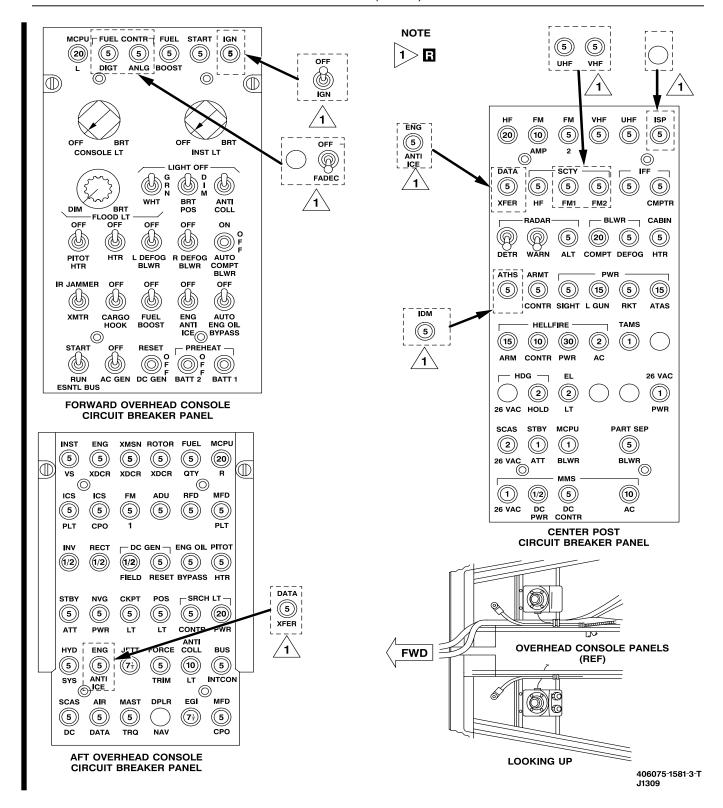
All Switches — Off/SAFE

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

2-6-36. FLOODLIGHTS — OPERATIONAL CHECK (CONT)



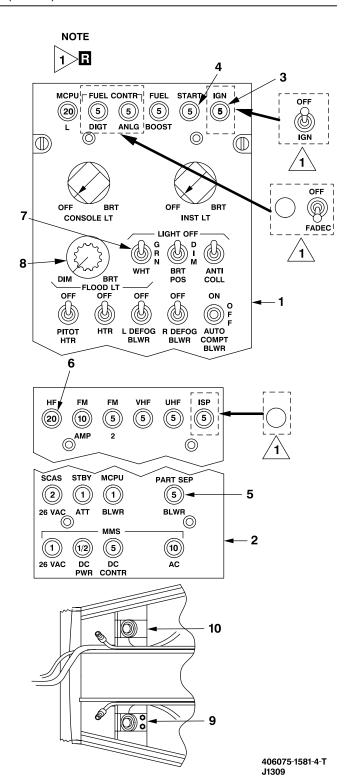
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2-6-36. FLOODLIGHTS — OPERATIONAL CHECK (CONT)

1. On overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
 - 4. On forward overhead console panel (1):
 - a. Set FLOOD LT switch (7) to GRN.
- b. Turn FLOOD LT control (8) clockwise toward BRT.
- c. Observe that green floodlight (9) comes on and increases in brightness with clockwise rotation and brightness decreases with counterclockwise rotation of FLOOD LT control (8).
 - d. Set FLOOD LT switch (7) to WHT.
- e. Observe that green floodlight (9) goes off, and white floodlight (10) comes on and is controlled by FLOOD LT control (8), same as green floodlight.
 - f. Set FLOOD LT switch (7) to LIGHT OFF.
- g. Disconnect external dc electrical power (TM 1-1520-248-23).



END OF TASK

INITIAL SETUP

2-6-37. UTILITY LIGHT — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

Applicable Configurations:

ÄLL

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician References:

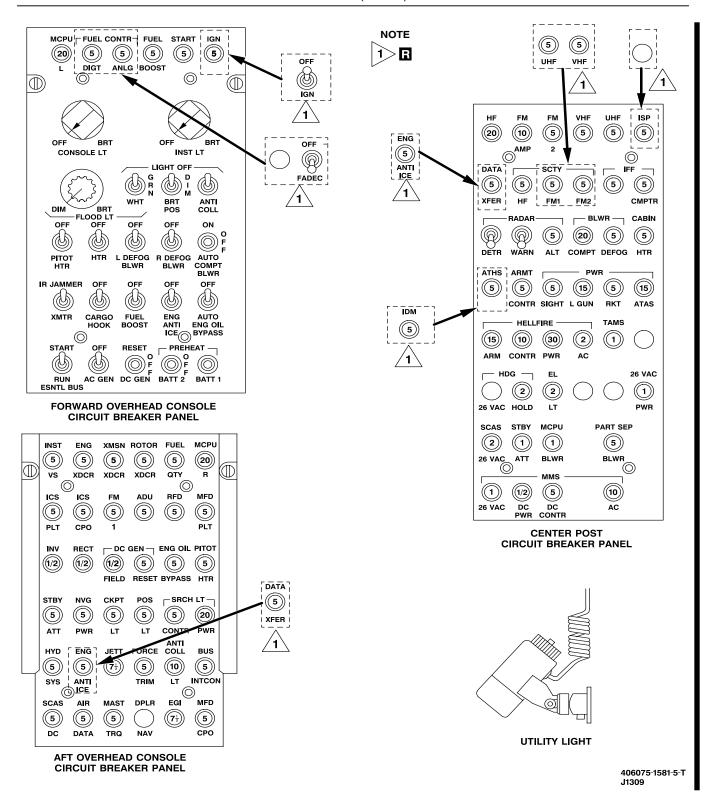
TM 1-1520-248-23

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

All Switches — Off/SAFE

2-6-37. UTILITY LIGHT — OPERATIONAL CHECK (CONT)

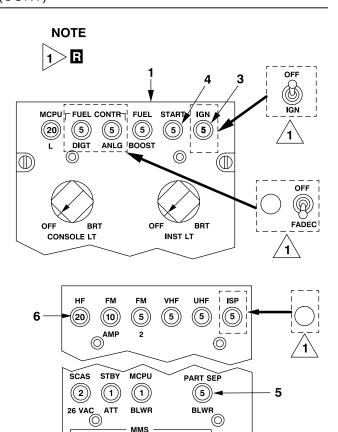


2-6-37. UTILITY LIGHT — OPERATIONAL CHECK (CONT)

1. On overhead console panel (1) and center post circuit breaker panel (2), open following circuit breakers:

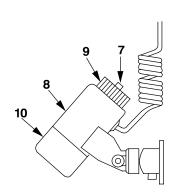
IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
- 4. Press momentary switch (7) on back of utility light (8).
- 5. Observe utility light (8) comes on full bright, regardless of rheostat (9) setting.
- 6. Rotate rheostat (9), on back of utility light, clockwise.
- 7. Observe utility light (8) comes on and intensity increases from dim to full bright.
- 8. Rotate lens housing (10) on front of light assembly.
- 9. Observe utility light (8) focus changes from spot to flood and vice versa as lens housing (10) is rotated in both directions.
- 10. Rotate rheostat (9), on back of utility light, counterclockwise.
- 11. Observe utility light (8) intensity decreases from bright to dim and then to off.
- 12. Disconnect external dc electrical power (TM 1-1520-248-23).



(10)

AC



(1)

26 VAC

((1/2)

(5)

DC DC PWR CONTR

> 406075-1581-6-T J1309

- 2

2-6-38. INSTRUMENT LIGHTS — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

ÁLL

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

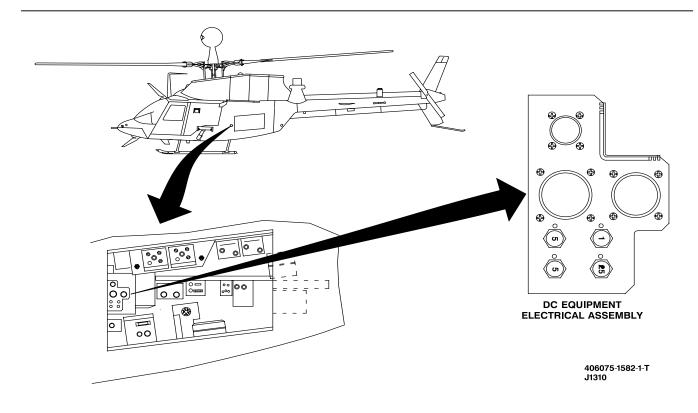
Personnel Required: 68F Aircraft Electrician References:

TM 1-1520-248-23

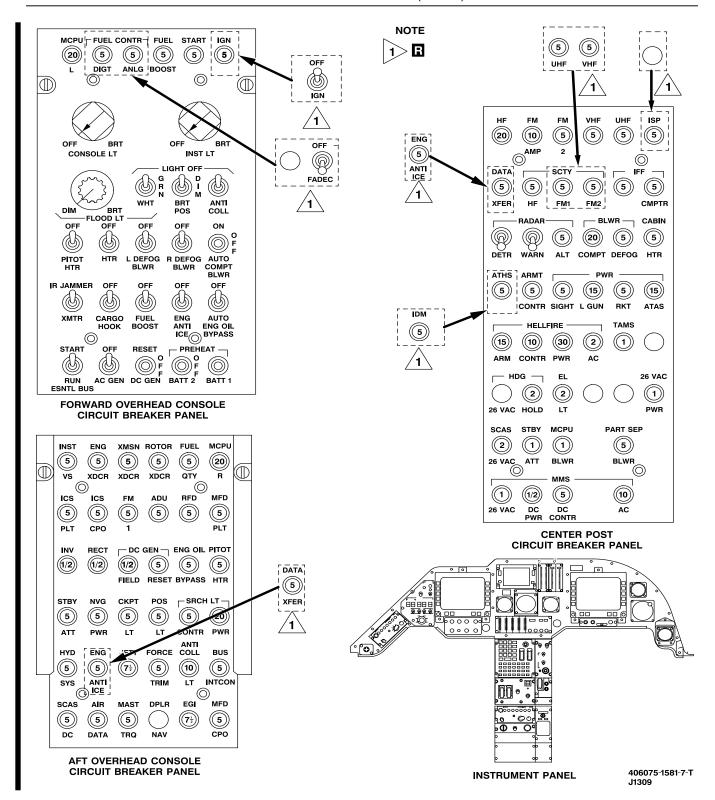
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

All Switches — Off/SAFE



2-6-38. INSTRUMENT LIGHTS — OPERATIONAL CHECK (CONT)



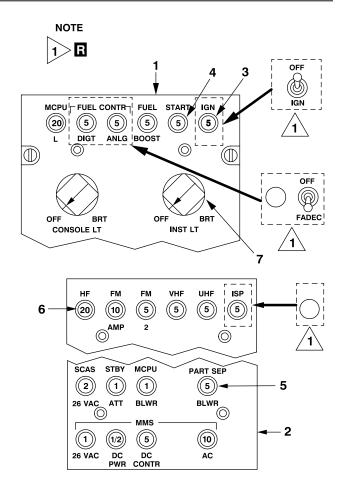
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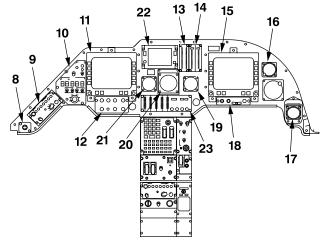
2-6-38. INSTRUMENT LIGHTS — OPERATIONAL CHECK (CONT)

1. On forward overhead console panel (1) and center post circuit breaker panel (2), open following circuit breakers:

IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external ac electrical power (TM 1-1520-248-23).
- 4. On forward overhead console panel (1), turn INST LT control (7) clockwise from OFF to BRT and observe following instrument panel lights come on and increase in brightness:
 - a. CPG channel select switch (8)
 - b. CPG ICS panel (9)
 - c. MMS control panel (10)
 - d. CPG MFD (11)
 - e. CPG MFD auxiliary panel (12)
 - f. Dual tachometer (13)
 - g. TGT/TRQ indicator (14)
 - h. Pilot MFD (15)
 - i. Clock (16)
 - Standby compass (17)
 - k. Pilot MFD auxiliary panel (18)
 - I. Altimeter (19)
 - m. Gyro attitude indicator (20)
 - n. Airspeed indicator (21)
 - o. RFD (22)
 - p. MPD (23)
 - 5. Turn INST LT control (7) OFF.
- 6. Disconnect external ac electrical power (TM 1-1520-248-23).





406075-1581-9-T J1309

END OF TASK

2-6-39. CONSOLE LIGHTS — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: ALL

Tools:

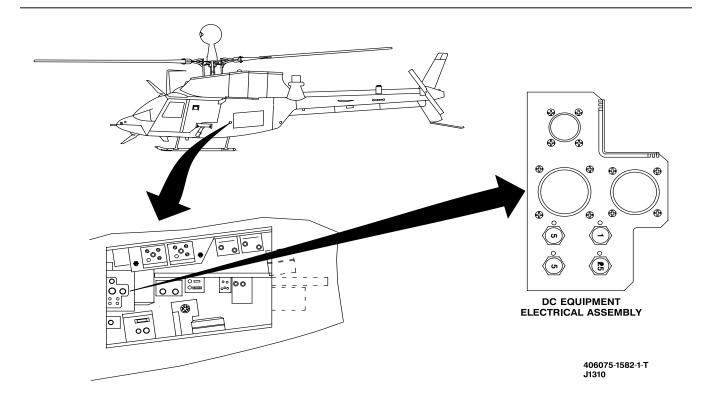
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician References:

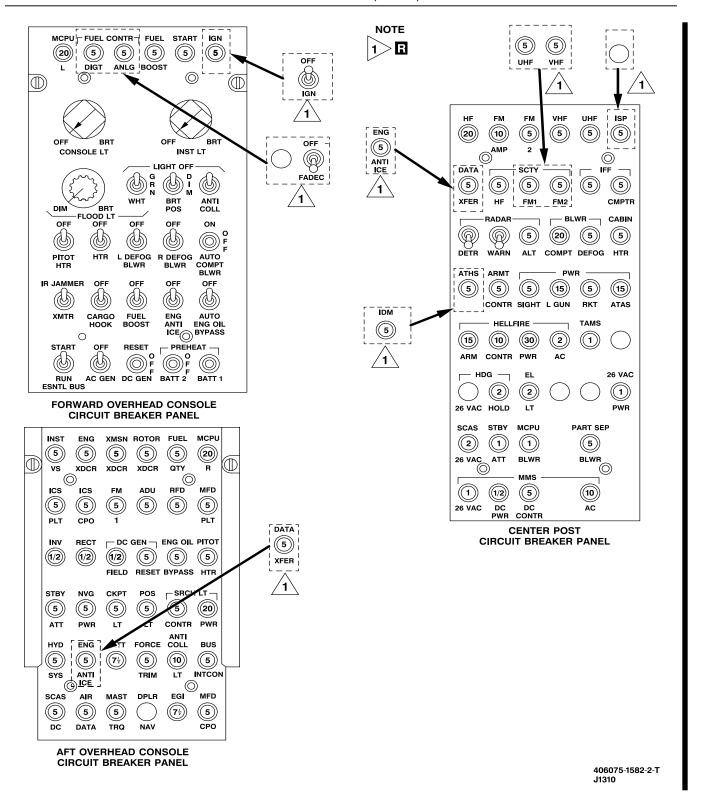
TM 1-1520-248-23

Equipment Condition:

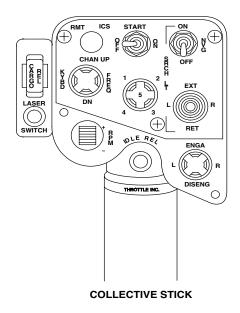
Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE

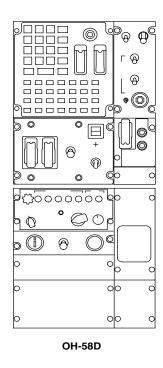


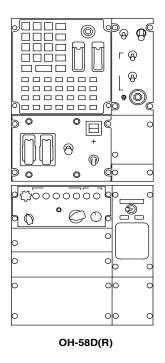
2-6-39. CONSOLE LIGHTS — OPERATIONAL CHECK (CONT)



2-6-39. CONSOLE LIGHTS — OPERATIONAL CHECK (CONT)







406961-1582-3-T J1310

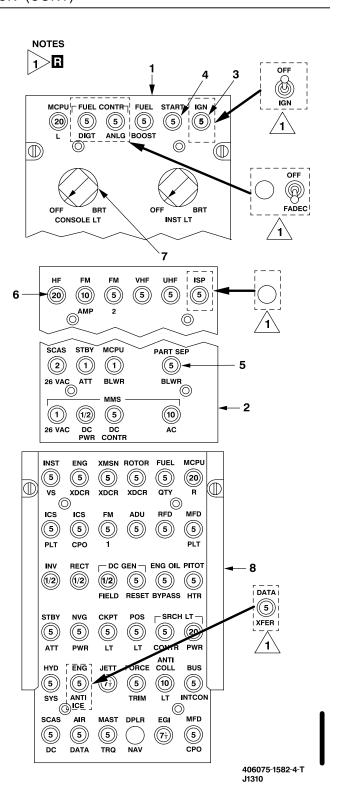
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2-6-39. CONSOLE LIGHTS — OPERATIONAL CHECK (CONT)

1. On forward overhead console circuit breaker panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

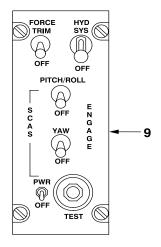
IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

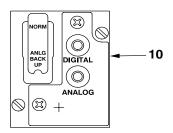
- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external ac electrical power (TM 1-1520-248-23).
- 4. On forward overhead console circuit breaker panel (1), turn CONSOLE LT control (7) clockwise from OFF to BRT and observe that the following panel lights come on and increase in brightness.
- a. Aft overhead console circuit breaker panel (8).
- b. Forward overhead console circuit breaker panel (1).
 - c. Center post circuit breaker panel (2).

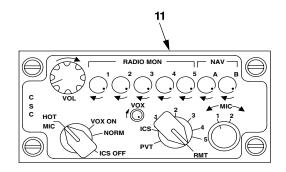


2-6-39. CONSOLE LIGHTS — OPERATIONAL CHECK (CONT)

- d. SCAS control panel (9).
- e. Fuel control panel OH-58D only (10).
- f. Pilot ICS panel (11).



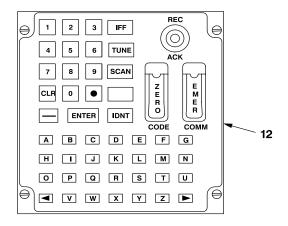


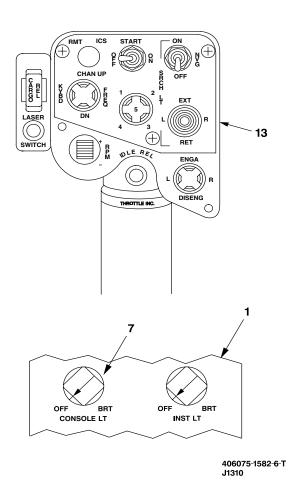


406075-1582-5-T J1310

2-6-39. CONSOLE LIGHTS — OPERATIONAL CHECK (CONT)

- g. Keyboard (12).
- h. Pilot collective stick (13).
- i. On forward overhead console circuit breaker panel (1), position CONSOLE LT control (7) to OFF.
- 5. Disconnect external ac electrical power (TM 1-1520-248-23).





END OF TASK

2-6-40. POSITION LIGHTS — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations:

ÀLL

Tools:

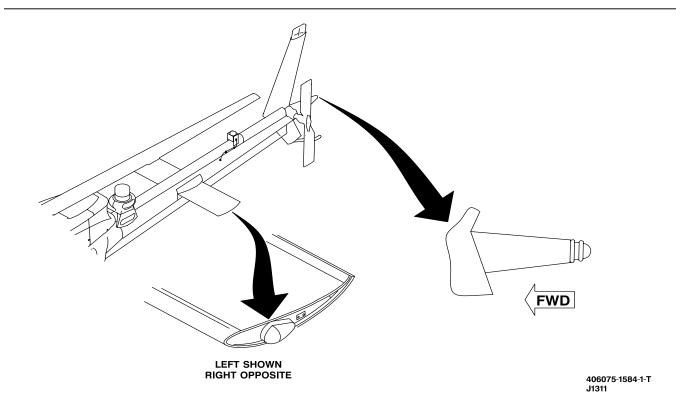
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician References:

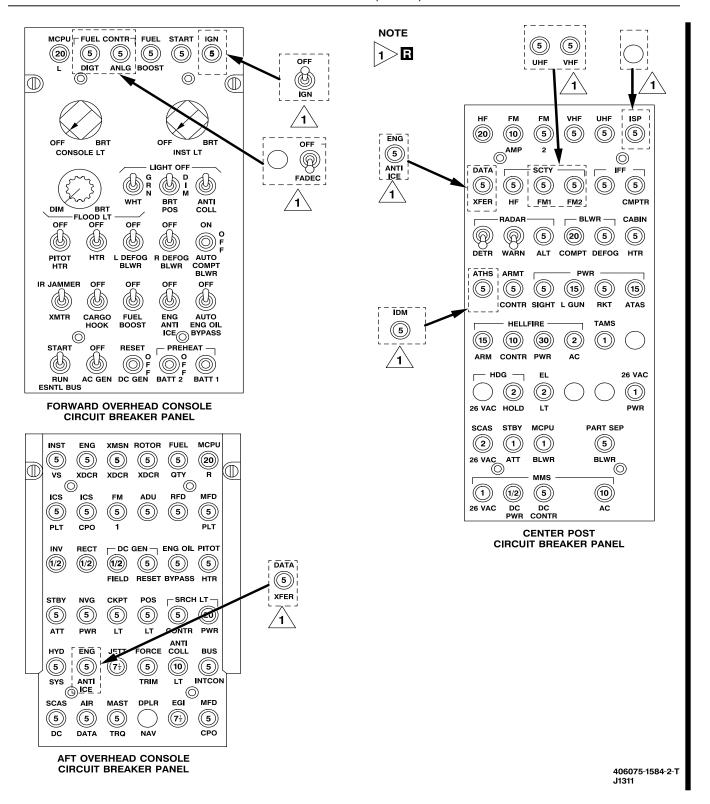
TM 1-1520-248-23

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE



2-6-40. POSITION LIGHTS — OPERATIONAL CHECK (CONT)

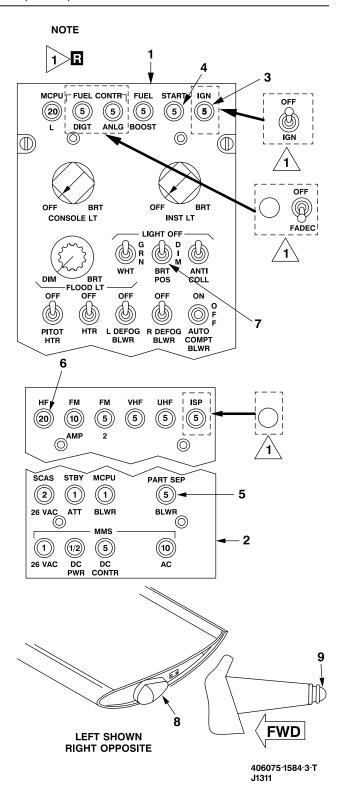


2-6-40. POSITION LIGHTS — OPERATIONAL CHECK (CONT)

1. On forward overhead console panel (1) and center post circuit breaker panel (2), open following circuit breakers:

IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
 - 4. On forward overhead console panel (1):
 - a. Set POS light switch (7) to DIM.
- b. Observe three position lights (8 and 9) come on dim.
 - c. Set POS light switch (7) to BRT.
- d. Observe three position lights (8 and 9) change from dim to bright.
 - e. Set POS light switch (7) to LIGHT OFF.
- 5. Disconnect external dc electrical power (TM 1-1520-248-23).



2-6-41. ANTICOLLISION LIGHTS — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÁLL

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)

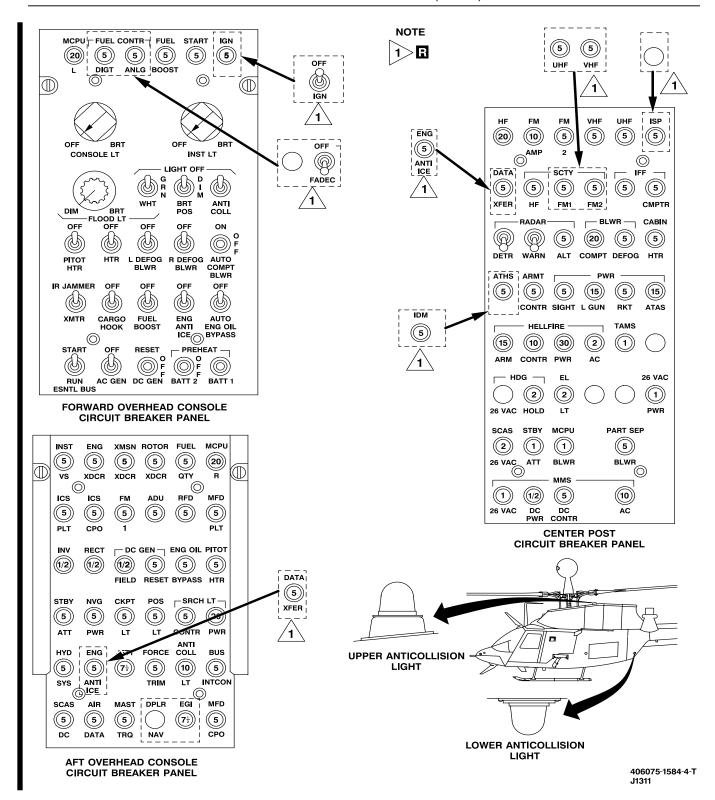
All Switches — Off/SAFE

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

2-6-41. ANTICOLLISION LIGHTS — OPERATIONAL CHECK (CONT)



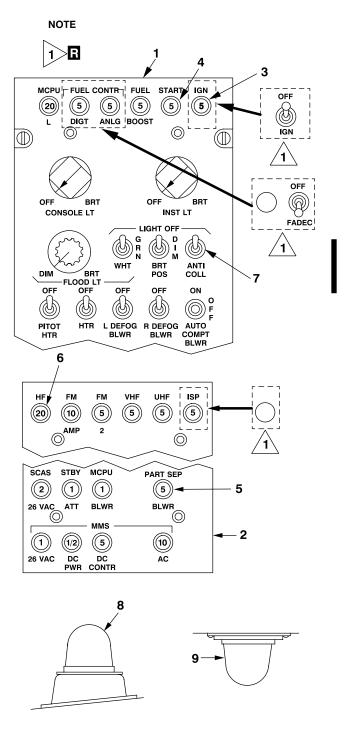
GO TO NEXT PAGE

2-6-41. ANTICOLLISION LIGHTS — OPERATIONAL CHECK (CONT)

1. On forward overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).
 - 4. On forward overhead console panel (1):
 - a. Set ANTI COLL switch (7) to ANTI COLL.
- b. Observe that each anticollision light, upper (8) and lower (9), flashes approximately 90 times per minute.
 - c. Set ANTI COLL switch (7) to LIGHT OFF.
- 5. Disconnect external dc electrical power (TM 1-1520-248-23).



406075-1584-5-J1311

END OF TASK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: ALL

Tools:

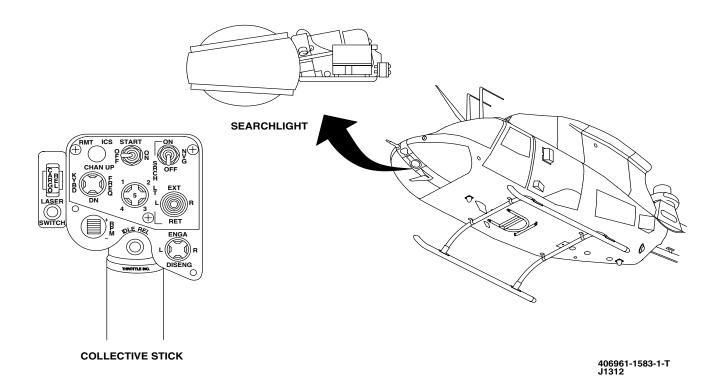
Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

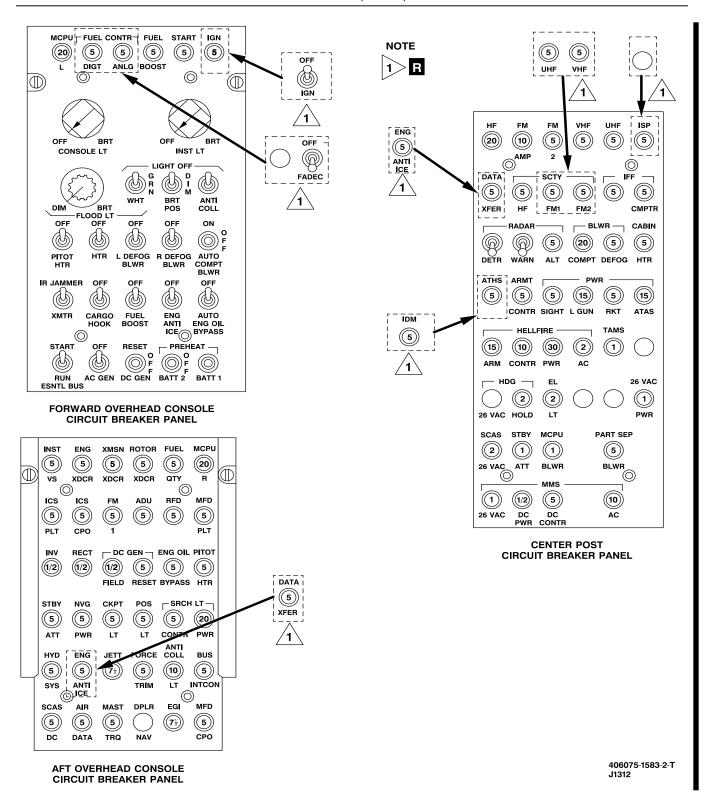
Personnel Required: 68F Aircraft Electrician References:

TM 1-1520-248-23

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE





1. On forward overhead console panel (1) and center post circuit breaker panel (2), open the following circuit breakers:

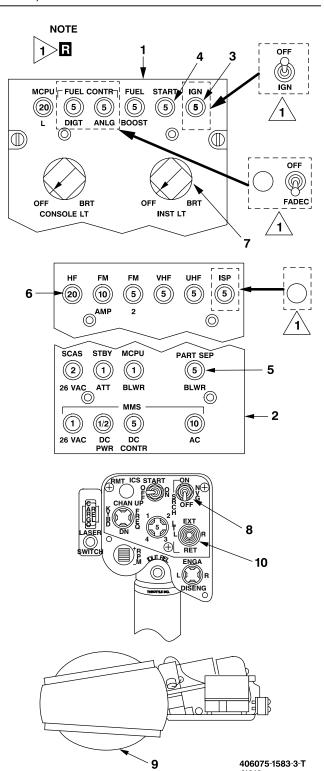
IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external dc electrical power (TM 1-1520-248-23).

CAUTION

Do not leave the 250 watt searchlight on longer than necessary. Overheating will result.

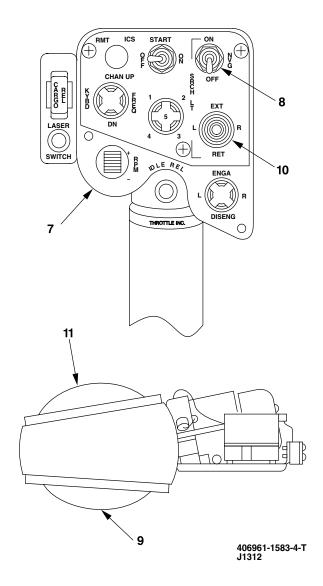
- 4. On pilot collective stick (7).
 - a. Set SRCH LT switch (8) to ON.
 - b. Observe that searchlight (9) comes on.
- c. Toggle SRCH LT control switch (10) to EXT and hold.
- d. Observe that searchlight (9) extends approximately 98° and stops.
- e. Toggle switch (10) to RET and release when searchlight (9) is at approximately 90° extension (straight down).
 - f. Toggle switch (10) to R and hold.
- g. Observe that searchlight (9) goes off at approximately 120° and rotates a full 360° to the right.
 - h. Toggle switch (10) to L and hold.
- i. Observe that searchlight (9) goes off at approximately 120° and rotates a full 360° to the left.
 - 5. Rotate searchlight (9) 180° right.



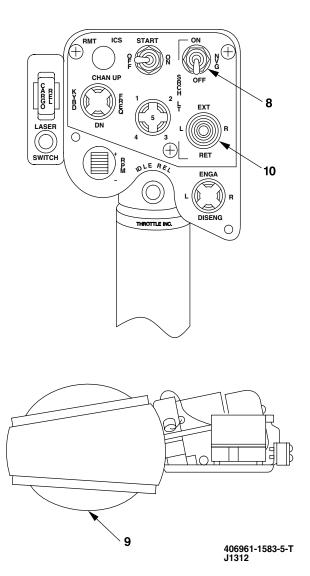
WARNING

Do not look at IR light (when lit) without wearing NVG goggles or daylight training filters. Eye damage could result from extended viewing at close range.

- 6. On pilot collective stick (7), set SRCH LT power switch (8) to NVG. Determine IR light (11) is lit by sensing the radiated heat with palm of hand at approximately one foot from the lens.
- 7. Set SRCH LT power switch (8) to ON on pilot collective stick (7).
- 8. Toggle SRCH LT control switch (10) to RET and stop searchlight (9) at an angle of approximately 45° and straight ahead.
 - 9. Toggle switch (10) to R and hold.
- 10. Observe that searchlight (9) comes on at approximately 90° right rotation.
 - 11. Toggle switch (10) to L and hold.
- 12. Observe that searchlight (9) goes off at approximately 90° right rotation and comes back on again at approximately 90° left rotation.



- 13. Toggle switch (10) to EXT and hold.
- 14. Observe that searchlight (9) comes back on at approximately 60° extension.
- 15. With searchlight (9) extended and rotated left, toggle switch (10) to RET and hold.
- 16. Observe that searchlight (9) retracts fully and shuts off.
 - 17. Set SRCH LT power switch (8) to OFF.
- 18. Disconnect external dc electrical power (TM 1-1520-248-23).



This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D

Tools:

Aviation Ground Power Unit (AGPU)
Maintenance Stand (B9)
Electrical Repairer Tool Kit (B14)
General Mechanic Tool Kit (B15)
Hydraulic System Components Test Stand

Material:

Wiping Rags (C5)

Personnel Required:

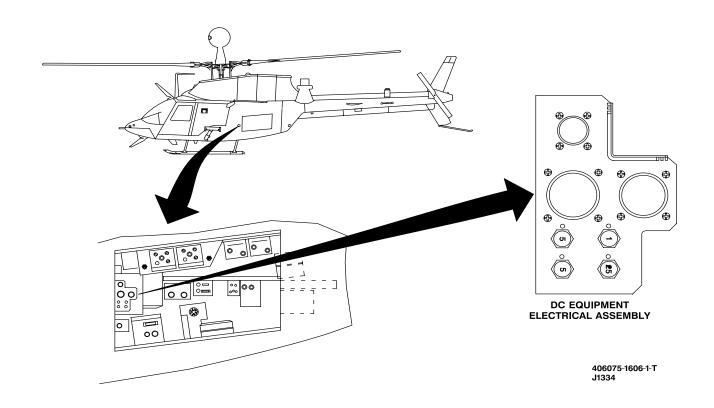
67S Scout Helicopter Repairer 67S Scout Helicopter Technical Inspector (TI) 68F Aircraft Electrician

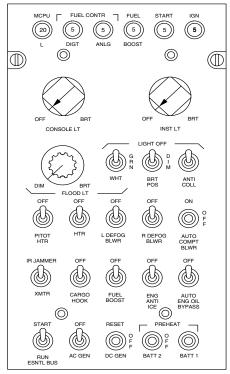
References:

TM 1-1520-248-23 TM 11-1520-248-23

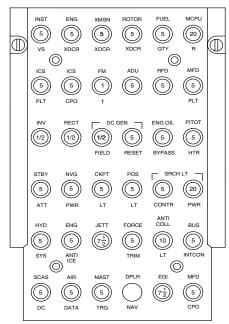
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE
Forward Fairing Assembly — Removed (TM 11520-248-23)
NAV Aligned (TM 11-1520-248-23)

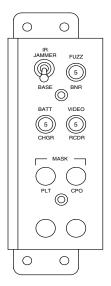




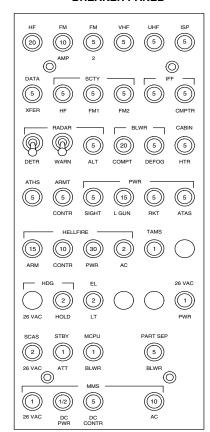
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



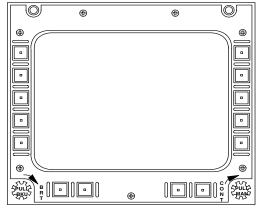
AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

406099-90-3-T J2623

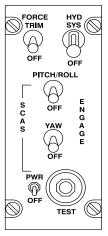
GO TO NEXT PAGE



MULTIFUNCTION DISPLAY (MFD)



PILOT AUXILIARY CONTROL PANEL



STABILITY AND CONTROL AUGMENTATION SYSTEM (SCAS) CONTROL PANEL

406075-1606-3-T J1334

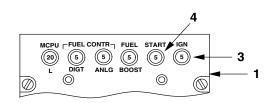
NOTE

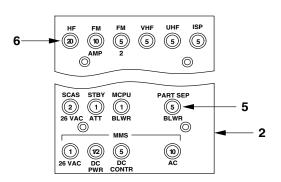
This operational check cannot be performed when the aircraft is operating under its own hydraulic power.

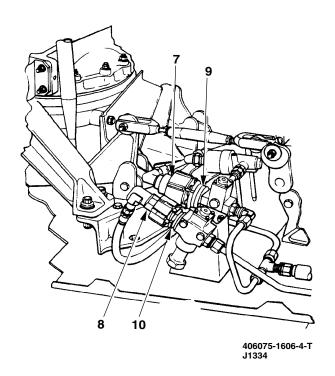
1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

IGN (3) START (4) PART SEP BLWR (5) HF (6)

- 2. Disconnect hydraulic hose quick-disconnect halves (7 and 8).
- 3. Cap hydraulic hose quick-disconnect halves (7 and 8).
- 4. Connect hydraulic system components test stand to filter assembly quick-disconnect halves (9 and 10).
- 5. Apply external dc electrical power (TM 1-1520-248-23).





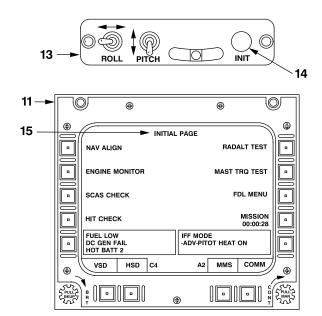


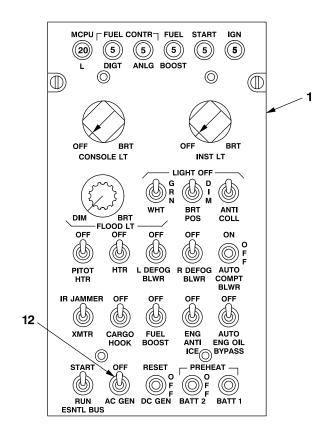
6. Turn on hydraulic test stand. Adjust hydraulic test stand to 1000 psi (TM 1-1520-248-23).

NOTE

Allow 6 minutes for EGI to align before proceeding. Alignment is complete when EGI FAIL and NAV NOT ALIGNED are extinguished from lower portion of MFD (11). Refer to TM 11-1520-248-23.

- 7. On forward overhead console panel (1), set AC GEN switch (12) to OFF.
- 8. On pilot auxiliary panel (13), press INIT button (14).
 - 9. Observe that INITIAL PAGE (15) appears.

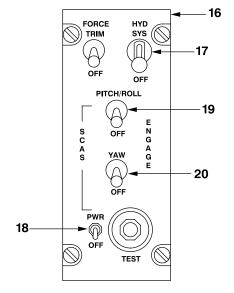




406075-1606-5-T J1334

- 10. On SCAS control panel (16).
 - a. Set HYD SYS switch (17) to HYD SYS.
 - b. Set SCAS PWR switch (18) to PWR.
- c. Set PITCH/ROLL ENGAGE switch (19) to PITCH/ROLL.
 - d. Set YAW ENGAGE switch (20) to YAW.
- 11. Observe that none of the following caution and advisory messages appear.
 - a. P/R DISENG
 - b. YAW DISENG
 - c. SCAS DISENG
 - d. ONE YAW CHAN OFF
- 12. Initiate SCAS diagnostics automatic test as follows:
 - a. Verify the following switches are ON:

HYD SYS switch (17) SCAS PWR switch (18) PITCH/ROLL ENGAGE switch (19) YAW ENGAGE switch (20)

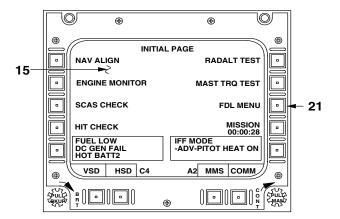


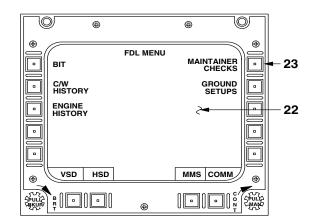
406075-1606-6-T J1334

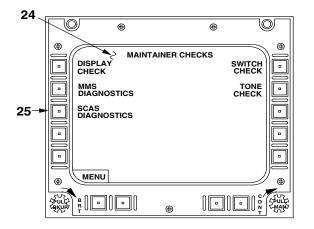
- b. On INITIAL PAGE (15) press R3 (21), FDL MENU key.
- c. Observe that FDL MENU page (22) appears.
- d. Press R1 (23), MAINTAINER CHECKS key.
- e. Observe that MAINTAINER CHECKS page (24) appears.
 - f. Press L3 (25), SCAS DIAGNOSTICS key.

NOTE

PITCH/ROLL ENGAGE and YAW ENGAGE switches will trip to OFF. Associated caution and advisory messages will display on MFD.

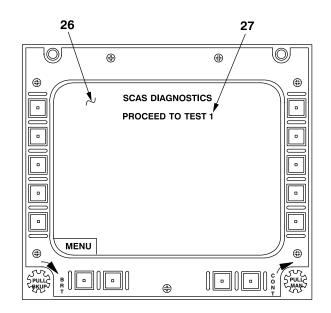


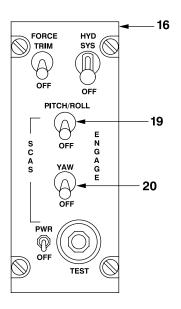




406075-1606-7-T J1334

- g. Observe that SCAS DIAGNOSTICS page (26) appears.
- h. Observe that any faults found during SCAS diagnostics automatic test will be displayed on SCAS DIAGNOSTICS page (26).
- 13. Observe that the words PROCEED TO TEST 1 (27) appears on SCAS DIAGNOSTICS page (26) initiating SCAS manual test. Proceed with test 1 as follows:
- a. On the SCAS control panel (16), position PITCH/ROLL ENGAGE switch (19) to PITCH/ROLL.
- b. Position YAW ENGAGE switch (20) to YAW.
- c. Observe that PITCH/ROLL ENGAGE switch (19) and YAW ENGAGE switch (20) return to OFF position after approximately 15 seconds.
- 14. Observe that the words PROCEED TO TEST 2 appear on SCAS DIAGNOSTICS page (26). Proceed with test 2 as follows:





406075-1606-8-T

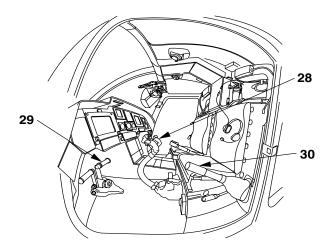
- a. Move cyclic stick (28) to the right, then aft. Push right pedal (29) forward. Pull collective stick (30) up.
- b. Verify that GO is displayed on SCAS DIAGNOSTICS page (26).

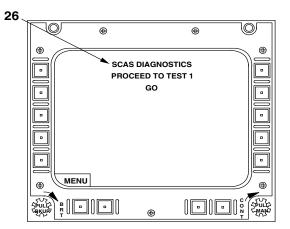
NOTE

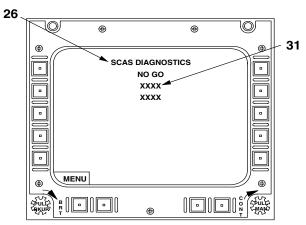
- Faults detected during SCAS checks are indicated by the words NO GO displayed on the SCAS DIAGNOSTICS page, and identified by two error codes.
- Error codes can be converted to fault codes using Appendix F.
- c. If error codes (31) are displayed on SCAS DIAGNOSTICS page (26), refer to Appendix F for error code conversion and actions required.
- 15. Remove power to hydraulic system components test stand (TM 1-1520-248-23).
- 16. Disconnect external dc electrical power (TM 1-1520-248-23).
- 17. Disconnect hydraulic system components test stand from filter assembly quick-disconnect halves.
- 18. Remove caps and connect hydraulic hose quick-disconnect halves to filter assembly quick-disconnect halves.
 - 19. Clean area using wiping rags (C5).

FOLLOW-ON MAINTENANCE

Install forward fairing assembly (TM 1-1520-248-23).







406075-1606-9-T J1334

END OF TASK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

Applicable Configurations: OH-58D(R)

Tools:

Aviation Ground Power Unit (AGPU)
Maintenance Stand (B9)
Electrical Repairer Tool Kit (B14)
General Mechanic Tool Kit (B15)
Hydraulic System Components Test Stand

Material:

Wiping Rags (C5)

Personnel Required:

67S Scout Helicopter Repairer

67S Scout Helicopter Technical Inspector (TI)

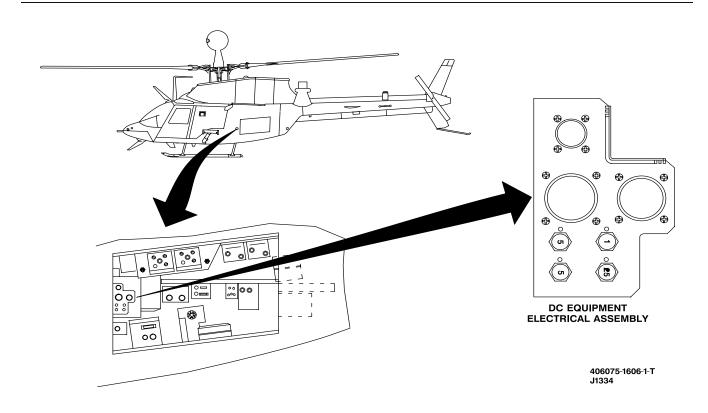
68F Aircraft Electrician

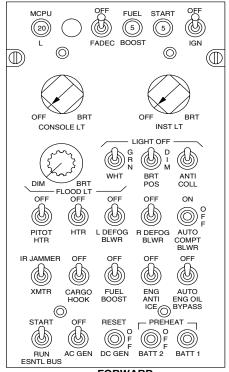
References:

TM 1-1520-248-23 TM 11-1520-248-23

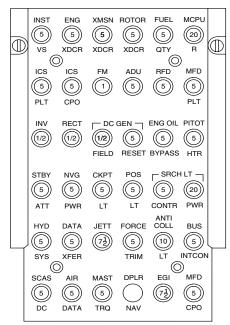
Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,
Nose and Aft Electrical Compartment)
All Switches — Off/SAFE
Forward Fairing Assembly — Removed (TM 11520-248-23)
NAV Aligned (TM 11-1520-248-23)

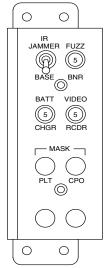




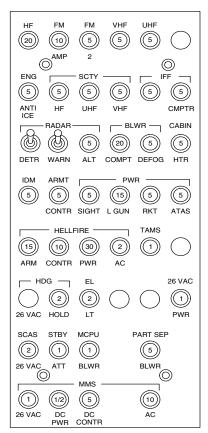
FORWARD OVERHEAD CONSOLE CIRCUIT BREAKER PANEL



AFT OVERHEAD CONSOLE CIRCUIT BREAKER PANEL

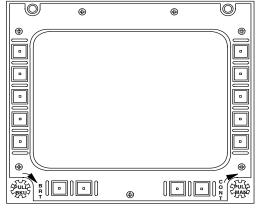


AUXILIARY CIRCUIT BREAKER PANEL



CENTER POST CIRCUIT BREAKER PANEL

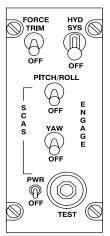
406075-1600-1-T J1328



MULTIFUNCTION DISPLAY (MFD)



PILOT AUXILIARY CONTROL PANEL



STABILITY AND CONTROL AUGMENTATION SYSTEM (SCAS) CONTROL PANEL

406075-1606-3-T J1334

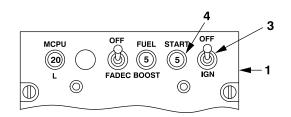
NOTE

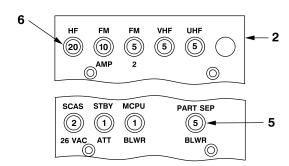
This operational check cannot be performed when the aircraft is operating under its own hydraulic power.

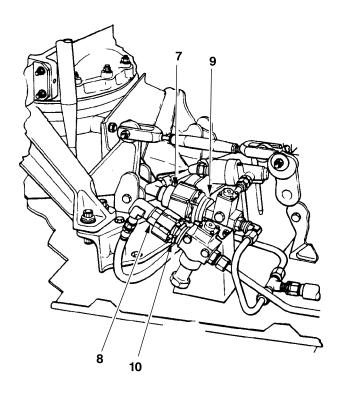
1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breakers:

IGN (3) OFF START (4) PART SEP BLWR (5) HF (6)

- 2. Disconnect hydraulic hose quick-disconnect halves (7 and 8).
- 3. Cap hydraulic hose quick-disconnect halves (7 and 8).
- 4. Connect hydraulic system components test stand to filter assembly quick-disconnect halves (9 and 10).
- 5. Apply external dc electrical power (TM 1-1520-248-23).







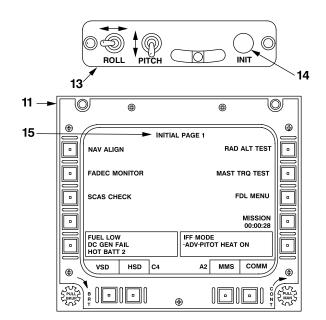
406075-1605-2-T J1335

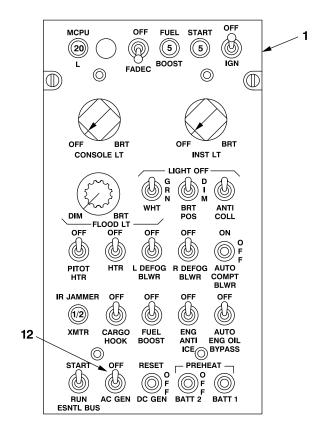
6. Turn on hydraulic test stand. Adjust hydraulic test stand to 1000 psi (TM 1-1520-248-23).

NOTE

Allow 6 minutes for EGI to align before proceeding. Alignment is complete when EGI FAIL and NAV NOT ALIGNED are extinguished from lower portion of MFD (11). Refer to TM 11-1520-248-23.

- 7. On forward overhead console panel (1), set AC GEN switch (12) to OFF.
- 8. On pilot auxiliary panel (13), press INIT button (14).
 - 9. Observe that INITIAL PAGE 1 (15) appears.

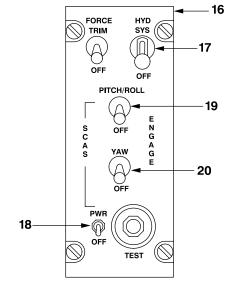




406075-1605-3-T J1335

- 10. On SCAS control panel (16).
 - a. Set HYD SYS switch (17) to HYD SYS.
 - b. Set SCAS PWR switch (18) to PWR.
- c. Set PITCH/ROLL ENGAGE switch (19) to PITCH/ROLL.
 - d. Set YAW ENGAGE switch (20) to YAW.
- 11. Observe that none of the following caution and advisory messages appear.
 - a. P/R DISENG
 - b. YAW DISENG
 - c. SCAS DISENG
 - d. ONE YAW CHAN OFF
- 12. Initiate SCAS diagnostics automatic test as follows:
 - a. Verify the following switches are ON:

HYD SYS switch (17) SCAS PWR switch (18) PITCH/ROLL ENGAGE switch (19) YAW ENGAGE switch (20)

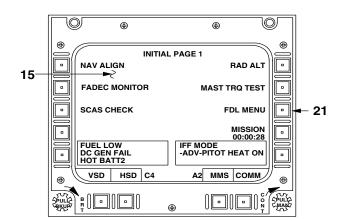


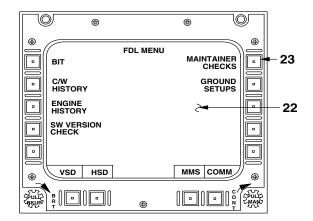
406075-1606-6-T J1334

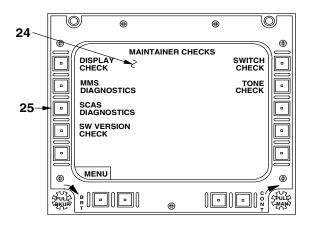
- b. On INITIAL PAGE 1 (15) press R3 (21), FDL MENU key.
- c. Observe that FDL MENU page (22) appears.
- d. Press R1 (23), MAINTAINER CHECKS key.
- e. Observe that MAINTAINER CHECKS page (24) appears.
 - f. Press L3 (25), SCAS DIAGNOSTICS key.

NOTE

PITCH/ROLL ENGAGE and YAW ENGAGE switches will trip to OFF. Associated caution and advisory messages will display on MFD.

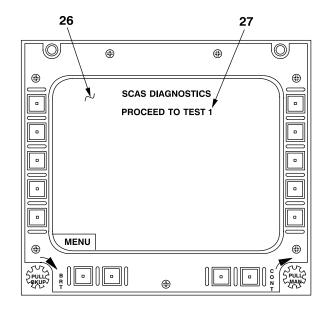


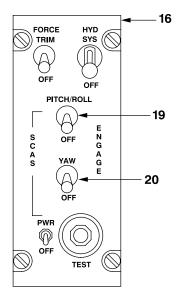




406075-1605-4-T J1335

- g. Observe that SCAS DIAGNOSTICS page (26) appears.
- h. Observe that any faults found during SCAS diagnostics automatic test will be displayed on SCAS DIAGNOSTICS page (26).
- 13. Observe that the words PROCEED TO TEST 1 (27) appears on SCAS DIAGNOSTICS page (26) initiating SCAS manual test. Proceed with test 1 as follows:
- a. On the SCAS control panel (16), position PITCH/ROLL ENGAGE switch (19) to PITCH/ROLL.
- b. Position YAW ENGAGE switch (20) to YAW.
- c. Observe that PITCH/ROLL ENGAGE switch (19) and YAW ENGAGE switch (20) return to OFF position after approximately 15 seconds.
- 14. Observe that the words PROCEED TO TEST 2 appear on SCAS DIAGNOSTICS page (26). Proceed with test 2 as follows:





406075-1606-8-T

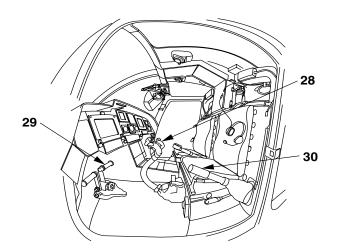
- a. Move cyclic stick (28) to the right, then aft. Push right pedal (29) forward. Pull collective stick (30) up.
- b. Verify that GO is displayed on SCAS DIAGNOSTICS page (26).

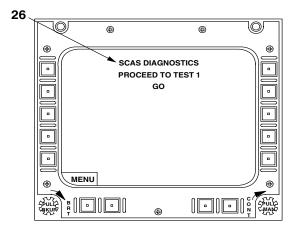
NOTE

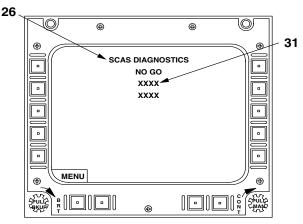
- Faults detected during SCAS checks are indicated by the words NO GO displayed on the SCAS DIAGNOSTICS page, and identified by two error codes.
- Error codes can be converted to fault codes using Appendix F.
- c. If error codes (31) are displayed on SCAS DIAGNOSTICS page (26), refer to Appendix F for error code conversion and actions required.
 - 15. Remove power to hydraulic system components test stand (TM 1-1520-248-23).
 - 16. Disconnect external dc electrical power (TM 1-1520-248-23).
 - 17. Disconnect hydraulic system components test stand from filter assembly quick-disconnect halves.
 - 18. Remove caps and connect hydraulic hose quick-disconnect halves to filter assembly quick-disconnect halves.
 - 19. Clean area using wiping rags (C5).

FOLLOW-ON MAINTENANCE

Install forward fairing assembly (TM 1-1520-248-23).







406075-1606-9-T

2-6-45. CONTROL DISPLAY SYSTEM (CDS) OPTO SENSORS — OPERATIONAL CHECK

This task covers: Operational Check (On Helicopter)

INITIAL SETUP

References:

TM 1-1520-248-23

Applicable Configurations:

ÁLL

Equipment Condition:

Helicopter Safed (TM 1-1520-248-23)
All Circuit Breakers — Closed (Overhead
Console/Center Post Circuit Breaker Panel,

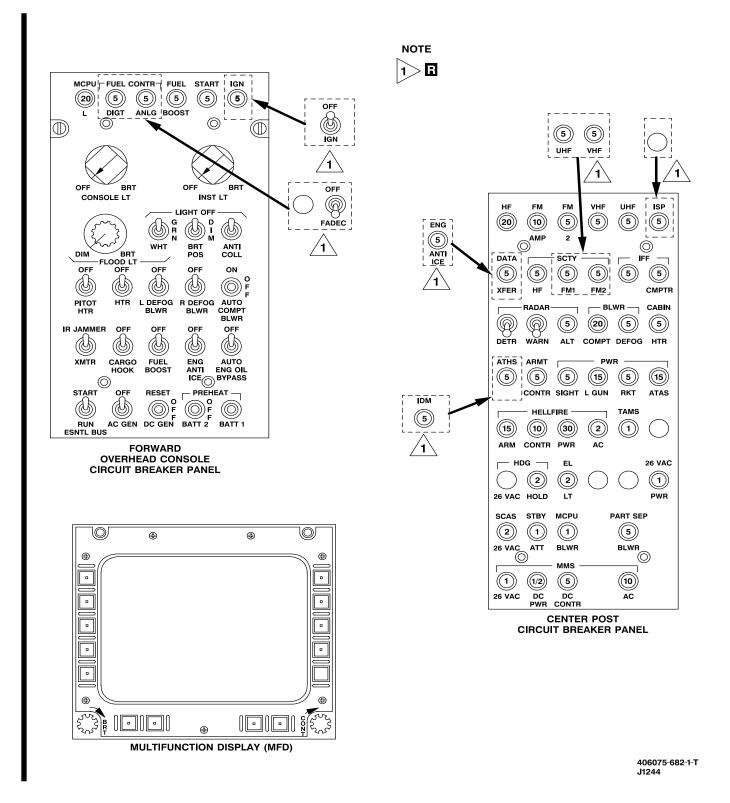
Nose and Aft Compartment) All Switches — Off/SAFE

Tools:

Electrical Repairer Tool Kit (B14) Aviation Ground Power Unit (AGPU)

Personnel Required: 68F Aircraft Electrician

2-6-45. CONTROL DISPLAY SYSTEM (CDS) OPTO SENSORS — OPERATIONAL CHECK (CONT)



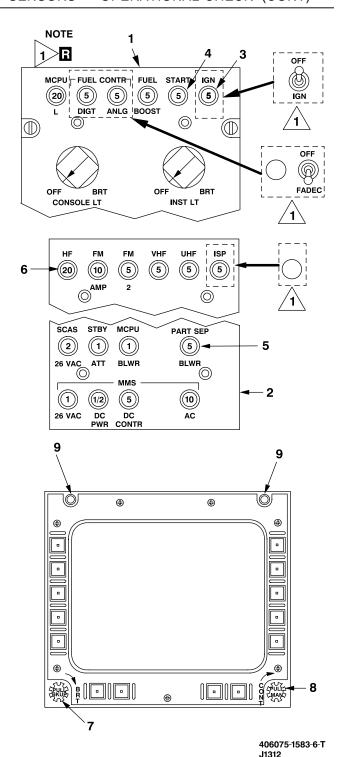
GO TO NEXT PAGE

2-6-45. CONTROL DISPLAY SYSTEM (CDS) OPTO SENSORS — OPERATIONAL CHECK (CONT)

1. On forward overhead console panel (1) and center post circuit breaker panel (2) open the following circuit breaker:

IGN (3) (OH-58D only) START (4) PART SEP BLWR (5) HF (6)

- 2. For OH-58D(R), position IGN switch (3) to OFF.
- 3. Apply external ac and dc electrical power (TM 1-1520-248-23). Verify voltage is correct.
- 4. Turn brightness control knob (7) to full counterclockwise.
- 5. Turn contrast control knob (8) to full counterclockwise.
- 6. Turn contrast control knob (8) clockwise until the display is dimly lit.
- 7. Brush either opto sensor (9) with a lighted flashlight. The display brilliance should increase.
- 8. Disconnect external ac and dc electrical power (TM 1-1520-248-23).



END OF TASK

APPENDIX A

REFERENCES

A-1. REFERENCES

The following references, of the issue in effect, are required for use by Organizational Maintenance Personnel to perform operational checks and troubleshooting.

PUBLICATION NUMBER	TITLE
AR 75-1	Malfunctions Involving Ammunition and Explosives
AR 385-40	Accident Reporting and Records
B-58-600	Tester/Analyzer Kit for MIL-STD-1553B Data Bus with Hook Up Harness
DA PAM 738-751	Functional Users Manual for The Army Maintenance Management System - Aviation (TAMMS-A)
FM 1-500	Army Aircraft Quality Control and Technical Inspection
FM 21-11	First Aid for Soldiers
TB 385-4	Safety Precautions for Maintenance of Electrical/Electronic Equipment
TB 43-0106	Aeronautical Equipment Army Oil Analysis Program (AOAP)
TM 1-1427-779-23	Aviation Unit Maintenance: Control Display Subsystem (CDS)
TM 1-1500-204-23	Aviation Unit and Aviation Intermediate Maintenance for General Aircraft Maintenance: Electrical and Instrument Maintenance Procedures and Practices
TM 1-1520-248-CL	Operator and Crewmember Checklist Army OH-58D Helicopter
TM 1-1520-248-S	Preparation for Shipment of Army Model OH-58D/OH-58D(R) Helicopter
TM 1-1520-248-T-1	Operational Checks and Maintenance Action Precise Symptoms (MAPS) Diagrams Manual Volume I
TM 1-1520-248-T-2	Operational Checks and Maintenance Action Precise Symptoms (MAPS) Diagrams Manual Volume II
TM 1-1520-248-T-3	Operational Checks and Maintenance Action Precise Symptoms (MAPS) Diagrams Manual Volume III
TM 1-1520-248-10	Operator's Manual for Army Model OH-58D Helicopter
TM 1-1520-248-23	Aviation Unit and Intermediate Maintenance Manual for Army Model OH-58D Helicopter
TM 1-2840-263-23	Operation and Maintenance Manual for Model 250-C30R/3 Engine
TM 9-1090-214-23&P	Aviation Unit and Intermediate Maintenance Manual for Armament Subsystems
TM 9-1240-778-23	Aviation Unit and Aviation Intermediate Maintenance Manual: Mast Mounted Sight (MMS) Subsystem

PUBLICATION NUMBER	TITLE	
TM 9-1425-475-20	Maintenance Instructions Aviation Unit Maintenance for Launcher, Guided Missile; Aircraft, M272, Part No. 13009444	
TM 9-1440-431-23	Aviation Unit and Aviation Intermediate Maintenance Manual (for) Air-to-Air (ATAS) Weapon System (Including M292 & AN/ASQ-201)	
TM 9-6920-475-13	Maintenance Instructions Aviation Unit and Intermediate Maintenance Aviation Unit and Intermediate Maintenance Training Equipment Dummy Guided Missile M34 Guided Missile, Training, M36, Launch Shoe Alignment for Test Equipmer	
TM 11-1520-248-23	Aviation Unit and Intermediate Maintenance: Avionic Equipment Configuration Army Model OH-58D Helicopter	
TM 55-1500-323-24	Organizational, DS, GS, and Depot Maintenance Manual: Installation Practices for Aircraft Electric and Electronic Wiring	
TM 55-1500-328-23	Aeronautical Equipment Maintenance Management Policies and Procedures	
TM 55-2840-256-23	Aviation Unit and Intermediate Maintenance Manual for Model T703-AD-700 Engine	
TM 750-244-1-5	Procedure for Destruction of Aircraft and Associated Equipment to Prevent Enemy Use	

APPENDIX B

TOOLS AND TEST EQUIPMENT

B-1. TOOLS AND TEST EQUIPMENT

The following table lists the tools and test equipment, both special tools and common tool sets, required for AVUM personnel to perform operational checks and troubleshooting.

TOOL OR TEST EQUIPMENT				
REFERENCE CODE	MAINT. LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	AVUM	Gun, Heat	4940-00-314-9789	CV-5700 MINIGUN 3
2	AVUM	Gun, Heat	4940-01-286-7079	M83521/5-01
3	AVUM/ AVIM	Multimeter, Digital	6625-01-139-2512	T00377
4	AVUM	Ohmmeter	6625-01-125-3471	247000
5	AVUM	Scale, Spring, 0 to 10 Pounds	6670-00-939-2540	719-10
6	AVUM	Scale, Spring, 0 to 50 Pounds	6670-00-254-4634	AAA-S-133
7	AVUM	Scale, Spring, 0 to 100 Pounds	6635-00-578-5285	PPT100
8	AVUM	Simulator, Laser Source	5860-01-373-5386 or Equivalent	V706-50020-001
9	AVUM	Stand, Maintenance (Suitable for job)		
10	AVUM	Tester, Chip Detector Fuzz Burner	1560-01-258-1281	T103389-101
11	AVUM	Tester, Fuel System, Digital	4920-01-208-3635	102-00805
12	AVUM	Tester, Gas Turbine Temp, Barfield	4920-01-279-0652	TT-1000A
13	AVUM	Tester, Pitot-Static	4920-01-388-6790	TS-4463/P
1				
14	AVUM/ AVIM	Tool Kit, Aircraft Maintenance, Electrical Repairer	5180-01-375-6926	SC 5180-99-B06

 $[\]triangle$ Sequential insertion point for item entered out of alphabetical order. See end of list.

TOOL OR TEST EQUIPMENT				
REFERENCE	MAINT. LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
15	AVUM/ AVIM	Tool Kit, Aircraft Maintenance, General Mechanic	5180-01-375-6925	SC 5180-99-B01
16	AVUM/ AVIM	Tool Set, Aircraft Armament Repairer Basic	5180-00-987-9816	SC 5180-95-CL- B09
17	AVUM/ AVIM	Tool Set, Aircraft Armament Repairer, Supplemental	5180-00-994-9242	SC 5180-95-CL- B10
18	AVUM	Wrench, Torque, 0 to 30 Inch-Pounds	5120-00-117-4832	A-A-2411
19	AVUM	Wrench, Torque, 40 to 200 Inch-Pounds	5120-01-292-4410	GGG-W-686
20	AVUM/ AVIM	Tool, Ruptured Cartridge Case Extractor	4933-00-716-0041	7160041

APPENDIX C

EXPENDABLE AND DURABLE ITEMS LIST

C-1. SCOPE

This appendix lists expendable supplies and materials you will need to perform operational checks and troubleshooting on the OH-58D Scout Helicopter (Table C-1). These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. EXPLANATION OF COLUMNS

AVIM — Aviation Intermediate Maintenance

(CAGE) in parentheses followed by the part number.

it to request or requisition the item.

- a. Column 1 Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g. "Use Wiping Rags (C5)...").
- Column 2 Maintenance Level. This column identifies the lowest level of maintenance that requires the listed item (enter as applicable): AVUM — Aviation Unit Maintenance
- c. Column 3 National Stock Number. This is the National stock number assigned to the item; use
- d. Column 4 Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer
- e. Column 5 Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Table C-1.

ITEM NO.	MAINT. LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	AVUM	9130-01-305-5597 9130-00-256-8613 9130-00-273-2379	Fuel, Jet, JP8 MIL-T-83133 (CAGE 81349) Fuel, Jet, JP4 MIL-T-5624 (CAGE 81349) Fuel, Jet, JP5 MIL-T-5624 (CAGE 81349)	GL
2	AVUM	9505-00-596-5101	Lockwire, Steel, Corrosion Resistant, 0.020 Inch Diameter, MS20995C20 (CAGE 81348)	LB
<u></u>				
3	AVUM	9505-01-209-2684	Lubricating Oil, Synthetic Base, DOD-L-85734 (CAGE 81349)	QT
4	AVUM	9150-00-782-2627	Lubricating Oil, Synthetic, 2627 Base, (Aircraft Turbine Engine) MIL-L-7808 (CAGE 81349)	
5	AVUM	7920-00-205-1711	Rag, Wiping, Cotton and Cotton Synthetic, A-A-531, Grade B (CAGE 58536)	LB
6	AVUM	5920-00-959-0012	Tape, Electrical, MIL-I-15126 (CAGE 81349)	RO
7	AVUM	9505-00-293-4208	Lockwire, Steel, Corrosion Resistant, 0.032 Inch Diameter, MS20995C32 (CAGE 96906)	LB
8	AVUM	9150-00-180-6266	Lubricating Oil, Synthetic Base, Aircraft Turbine Engine, MIL-L-23699 (FSCM 81349)	QT

Sequential insertion point for item that has been added out of alphabetical order. See end of list.

APPENDIX D

WIRING DATA

Paragraph	Page No.	
D-1 Wiring Data	D-1	
D-2 Wire Identification	D-2	
D-3 Abbreviation	D-2	
D-4 Symbols	D-2	
D-5 Typical Electrical Connector Pin Arrangement	D-2	
D-6 Equipment List	D-8	
D-7 Description - Equipment List	D-8	
D-8 Wire Repair and Replacement	D-64	

D-1. WIRING DATA

This appendix contains wiring data and essential wiring information for troubleshooting electrical systems and circuits on the OH-58D and OH-58D(R) helicopter.

NOTE

- 1. WIRE NUMBER SUFFIX () DENOTES THE FOLLOWING ELECTROMAGNETIC INTERFERENCE (EMI) CATEGORIES THAT ARE SHOWN ON WIRING DIAGRAMS:
 - a. AC power wiring (1)
 - 115 volts ac
 - 26 volts ac
 - 32 volts ac
 - 115 volts electroluminescent lighting
 - b. DC power wiring (2)
 - 28 volts dc
 - Relay and solenoid control wiring
 - c. Control wiring (3)
 - Discretes
 - High level analog wiring
 - d. Digital wiring (4)
 - Wiring carrying digital signals
 - Wiring that can produce pulse energy
 - e. Red audio (5)
 - Requires minimum 1-inch physical separation

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- f. Susceptible wiring (6)
- Audio wiring (not in Category 5)
- Sensor signal wiring
- Low level analog wiring
- g. Antenna Coaxes (7)
- h. System wiring (8)
- Wiring within one subsystem, routing between two or more boxes of that subsystem, i.e., CDS wiring between keyboard and the RFD, wiring between keyboard and the MPD.
- 2. UNDERLINED CONNECTOR CONTACT LETTERS DENOTE LOWER CASE.
- 3. EMI SHIELDS ARE SOLDER CONNECTED UNLESS INDICATED BY A TERMINAL, SPLICE, OR END CAP.
 - 4. MODULE TERMINAL JUNCTION POSITION IDENTIFICATION:

FIRST LETTER = MODULE SECOND LETTER = CONTACT LETTER = CONTACT NUMBER = MODULE

5. RECTANGULAR BOX PICTURED AT CONNECTOR REPRESENTATION INDICATES AN RFI TYPE ADAPTER WITH SOLDER SLEEVE PIGTAILS SECURED BETWEEN THE RFI RINGS.

D-2. WIRE IDENTIFICATIONS

All wires on diagrams are identified by coded wire numbers exactly as they are marked in the helicopter. The coded wire numbers indicate circuit function, wire number, wire segment letter, and wire size (gauge). (See figure D-1).

D-3. | ABBREVIATION

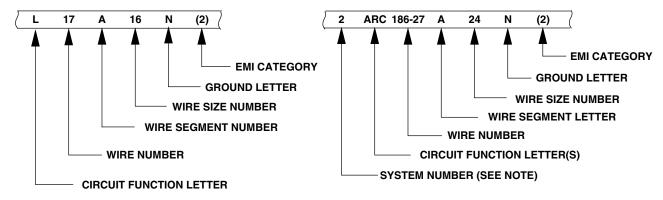
Abbreviations are in accordance with MIL-STD-12 and AR 310-50, except when the abbreviations depict a marking or decal contained in or on the helicopter.

D-4. SYMBOLS

Wiring diagram component symbols are drawn in accordance with ANSI Y14.15, Part 1, the symbols chart (figure D-2) illustrates electrical symbols used in the wiring diagrams.

D-5. TYPICAL ELECTRICAL CONNECTOR PIN ARRANGEMENT

Figure D-3 shows some typical electrical connector pin arrangements. Illustrations of this type are provided throughout the Maintenance Action Precise Symptom (MAPS) diagrams manuals (TM 1-1520-248-T-2 and TM 1-1520-248-T-3). Their purpose is to aid the technician in quickly and accurately identifying required pin numbers/letters. An electrical connector may have the identifying numbers/letters rubbed off of the environmental seals, and on those occasions, these illustrations should aid in locating the correct pin(s).



CIRCUIT FUNCTIONS

CODE	NOMENCLATURE	CODE	NOMENCLATURE
Α	ARMAMENT	E	ENGINE INSTRUMENTS
ALQ144	IR JAMMER	EGI	EMBEDDED GLOBAL POSITIONING SYSTEM/INERTIAL NAVIGATION
APN209	RADAR ALTIMETER		SYSTEM
APR39	RADAR DETECTING	F	FLIGHT INSTRUMENTS
APR44	RADAR WARNING	Н	HEATING, VENTILATION AND DEICING
APX100	IFF COMMUNICATION	IDM	IMPROVED DATA MODEM
ARC164	UHF COMMUNICATION	L	LIGHTING
ARC186	VHF-AM COMMUNICATION	J	IGNITION
ARC199	HF COMMUNICATION	K	ENGINE CONTROL
ARC201	VHF-FM COMMUNICATION	KY	COMSEC
AVR2	LASER DETECTING	Р	DC POWER
С	SCAS, HYDRAULIC AND	Q	FUEL AND OIL
040444	STANDBY ATTITUDE INDICATOR	M	MISCELLANEOUS ELECTRIC
C10414	INTERCOMMUNICATION	R	AIRBORNE TARGET HANDOVER SYSTEM
C11746	INTERCOMMUNICATION	Т	MAST MOUNTED SIGHT
D	INSTRUMENTS (OTHER THAN FLIGHT OR	U	MISCELLANEOUS ELECTRONIC
	ENGINE)	V	DC POWER AND DC CONTROL CABLES FOR AC
		W	WARNING AND EMERGENCY
		X	AC POWER

NOTE: Number preceding circuit function indicates more than one unit,

facility or system.

Example: 3ARC186-27A24N(2)

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Figure D-1. Wire Identifications

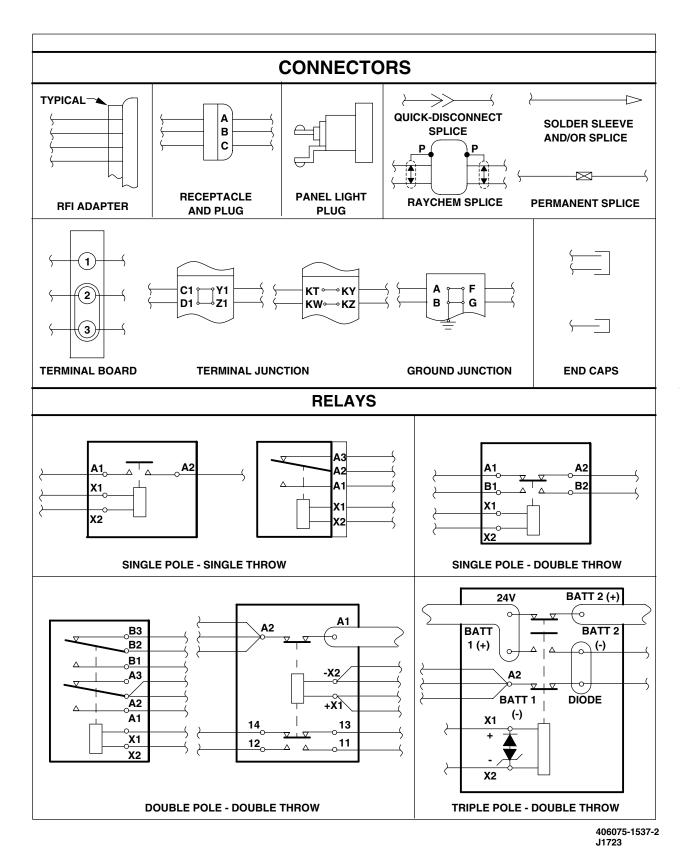


Figure D-2. Symbols Chart (Sheet 1 of 3)

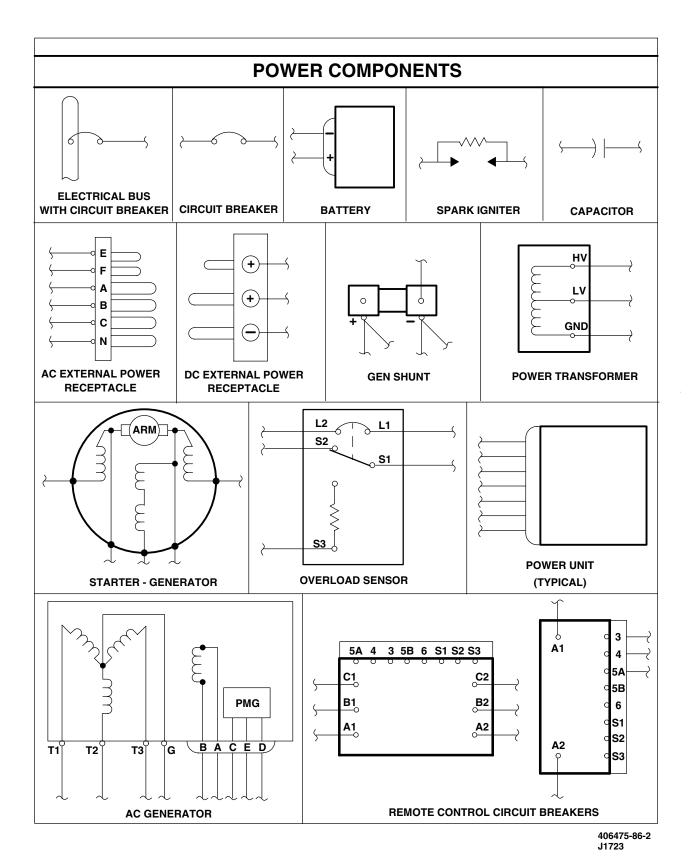


Figure D-2. Symbols Chart (Sheet 2 of 3)

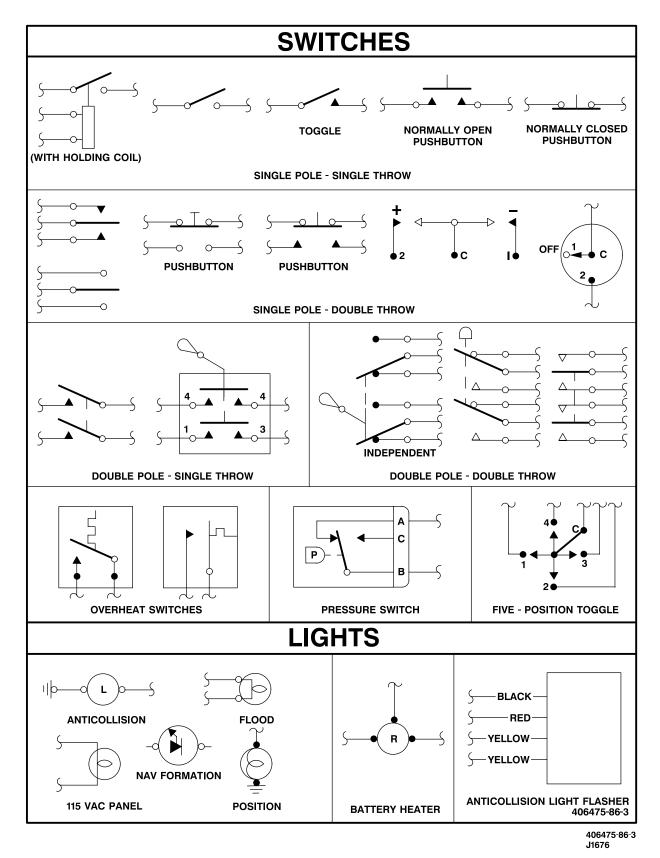
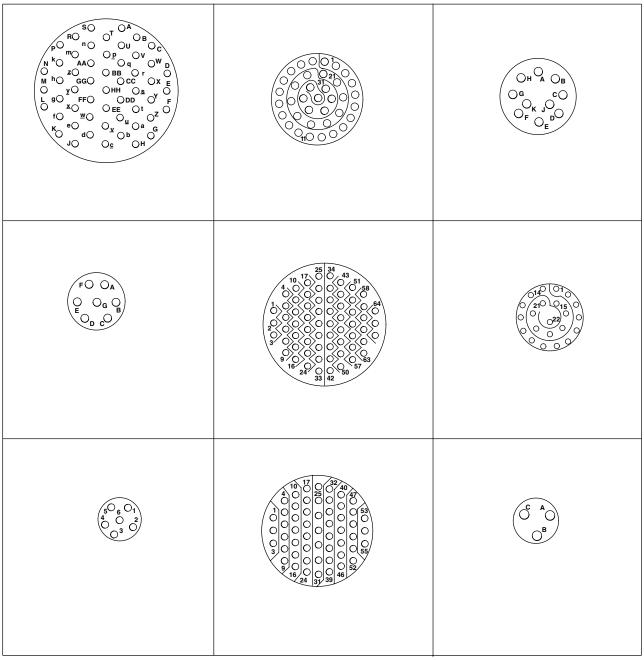


Figure D-2. Symbols Chart (Sheet 3 of 3)



406477-42-6 J1723

Figure D-3. Typical Electrical Connector Pin Arrangement

D-6. | EQUIPMENT LIST

D-7. DESCRIPTION - EQUIPMENT LIST

Table D-1 lists each item of equipment called out or shown in the Operational Checks and Maintenance Action Precise Symptom (MAPS) Diagrams and on the electrical system wiring diagrams in TM 1-1520-248-23.

Each item of equipment is identified by the reference designator and nomenclature. Each reference designator consists of system number, unit number and item number as follows; for sample reference designator - 1M1P3, the "1" indicates system number, "M1" indicates unit number, and "P3" indicates item number. For reference designators that are not listed in this manual, refer to TM 11-1520-248-23. In the following tabular listing, system number and system description are given.

SYSTEM NO.	SYSTEM DESCRIPTION
1	Propulsion
2	DC Power
3	AC Power
4	Pilot Instruments and Panels
5	CPG Instruments and Panels
8	Lighting
9	SCAS, Hydraulic and Standby Attitude Indicator
10	Environmental Control
18	Air Data
21	Armament
22	Miscellaneous Avionics and Armament
23	Communication
24	Armament
34	Navigation

Each item of avionics equipment is identified by four numbers and one or two letters followed by one or more numbers: Example 2301CB2, the 23 is for communication, 01 is for intercommunication (ICS), CB is for circuit breaker, and 2 is for the second unit. In the following tabular listing, system numbers (the two numbers that follow either 23 (communication) or 34 (navigation)), and letters are used to indicate system descriptions:

SYSTEM NO.	SYSTEM DESCRIPTION
Communication	
2300	Miscellaneous
2301	Intercommunication (ICS)
2302	UHF
2303	VHF AM
2304	VHF FM
2309	HF
2345	IDM
Navigation	
3408	Radar Altimeter
3431	CDS
3443	EGI
Other	
3410	IFF
3422	RWR

To locate an item shown in a wiring diagram, first find the reference designator. The nomenclature will indicate what the item is. If the item is identified in the helicopter with a decal or placard, the nomenclature will be printed in capital letters exactly as it appears in the helicopter. The item location will be determined within a general area of the helicopter, the mode of access is also provided to aid the technician.

Table D-1. Equipment List (Electrical)

Reference			
Designation	Nomenclature	Location	Access
P7	Connector, Speed Sensor, NG Dual Coil	Connected to NG Dual Coil Speed Sensor	Engine Right Cowling
S1	Switch, FORCE TRIM	Pedestal	Left or Right Crew Door
S2	Switch, HYD SYS	Pedestal	Left or Right Crew Door
S3	Switch, PWR	Pedestal	Left or Right Crew Door
S4	Switch, TEST	Pedestal	Left or Right Crew Door
S5	Switch, PITCH/ROLL	Pedestal	Left or Right Crew Door
S6	Switch, YAW	Pedestal	Left or Right Crew Door
TD6	Light, Tail Formation	Vertical Fin	Vertical Fin
TLS1	Control, On/Off/Brightness, Formation Light	Overhead Console	Left or Right Crew Door
1A1	Panel, Digital Fuel Control	Pedestal	Left or Right Crew Door
1A1J1	Connector, Digital Fuel Control Panel	Connected to 1A1	Left or Right Crew Door
1A1J2	Connector, Integral Lighting	Connected to 1A1	Left or Right Crew Door
1A1P1	Connector, Fuel Quantity Control Panel	Connected to 1A1J1	Left or Right Crew Door
1A2	Unit, Fuel Quantity Control	Avionics Compartment, on Top of Fuel Cell	Right Access Door
1A2P1	Connector, Fuel Quantity Control Unit	Connected to 1A2	Right Access Door
1A3	Control, Electronic Supervisory	Aft Electrical Compartment, On Overhead	Aft Electrical Compartment Door
1A3P1	Connector, Electronic Supervisory Control	Connected to 1A3	Aft Electrical Compartment Door
1A4	Signal Conditioning Unit, Mast Torque	Avionics Compartment Right, On Top of Fuel Cell	Right Access Door
1A4P1	Connector, Signal Conditioning Unit, Mast Torque	Connected to 1A4	Right Access Door
1A5	Accelerometer, (Rotor Smoothing)	Transmission Lower Left	Transmission Left Access Panel

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1A5P1	Connector, Accelerometer (Rotor Smoothing)	Connected to 1A5	Transmission Left Access Panel
1A6	FADEC	Aft Electrical Compartment	Aft Electrical Compartment Access Door
1A6P1	Connector, FADEC	Aft Electrical Compartment	Aft Electrical Compartment Access Door
1A6P2	Connector, FADEC	Aft Electrical Compartment	Aft Electrical Compartment Access Door
1B1	Blower, Particle Separator	Transmission Compartment, Right Outboard, Aft of Mast	Transmission Right Access Panel
1B1P1	Connector, Particle Separator Blower	Connected to 1B1	Transmission Right Access Panel
1B2	Valve, Engine Oil Bypass	Oil System Aft Compartment	Aft Right Fairing
1B2J1	Connector, Bypass Valve, Engine Oil	Connected to 1B2	Aft Right Fairing
1B2P1	Connector, Engine Oil Pressure	Connected to 1B2	Aft Right Fairing
1B3	Fuel Pump	Bottom of Center Fuel Cell	Cell Door Beneath Fuselage
1B3TB1	Terminal Board	Internal to Fuel Pump	None
1CB1	Circuit Breaker, START	Forward Overhead Console 4A4	Left or Right Crew Door
1CB2	Circuit Breaker, IGN	Forward Overhead Console 4A4	Left or Right Crew Door
1CB3	Circuit Breaker, FUEL CONTR DIGT	Forward Overhead Console 4A4 (will be replaced with 1CB18 FADEC CB upon upgrade to R3 engine)	Left or Right Crew Door
1CB4	Circuit Breaker, FUEL CONTROL ANALOG	Forward Overhead Console 4A4 (will be replaced with 1CB18 FADEC CB upon upgrade to R3 engine)	Left or Right Crew Door
1CB5	Circuit Breaker, FUEL BOOST	Forward Overhead Console 4A4	Left or Right Crew Door
1CB6	Circuit Breaker, ENG OIL BYPASS	Aft Overhead Console 4A5	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1CB7	Circuit Breaker, ENG ANTI ICE	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
1CB8	Circuit Breaker, PART SEP BLWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
1CB9	Circuit Breaker, FUEL QTY	Aft Overhead Console 4A5	Left or Right Crew Door
1CB10	Circuit Breaker, XMSN XDCR	Aft Overhead Console 4A5	Left or Right Crew Door
1CB11	Circuit Breaker, ROTOR XDCR	Aft Overhead Console 4A5	Left or Right Crew Door
1CB12	Circuit Breaker, MAST TRQ	Aft Overhead Console 4A5	Left or Right Crew Door
1CB13	Circuit Breaker, ENG XDCR	Aft Overhead Console 4A5	Left or Right Crew Door
1CB14	Circuit Breaker, INST VS	Aft Overhead Console 4A5	Left or Right Crew Door
1CB15	Circuit Breaker, Fuel Control (OH-58D)	Forward Battery Compartment	Forward Battery Compartment Door
1CB15	Circuit Breaker, VOLTAGE MONITOR (OH-58D(R))	Forward Battery Compartment	Forward Battery Compartment Door
1CB16	Circuit Breaker, XMSN FUZZ BNR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
1CB17	Circuit Breaker, START VOLTAGE	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
1CB18	Circuit Breaker, FADEC	Forward Overhead Console 4A4 (upon upgrade to R3 engine)	Left or Right Crew Door
1CR1	Diode, Battery Relay	DC Equipment Electrical Assembly 1A2, on 1K2	Aft Electrical Compartment Door
1CR2	Diode, Battery Relay	DC Equipment Electrical Assembly 1A2, on 1K2	Aft Electrical Compartment Door
1CR3	Diode, Start Relay	DC Equipment Electrical Assembly 1A2, on 1K1	Aft Electrical Compartment Door
1CR5	Diode, Start Relay	DC Equipment Electrical Assembly 1A2, on 1K1	Aft Electrical Compartment Door
1CR6	Diode, Chip Detector Relay	Avionics Compartment Lower Forward Bulkhead Connected to 22TB1	Right Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1CR7	Diode, Chip Detector Relay	Avionics Compartment, Lower Forward Bulkhead Connected to 22TB1	Right Access Door
1C1	Capacitor — Fuzz Burner	Avionics Compartment Lower Forward Bulkhead Connected to 22TB1	Right Access Door
1C2	Capacitor — Fuzz Burner	Avionics Compartment Lower Forward Bulkhead Connected to 22TB1	Right Access Door
1C3	Capacitor — Fuzz Burner	Avionics Compartment Lower Forward Bulkhead Connected to 22TB1	Right Access Door
1C4	Capacitor — Fuzz Burner	Avionics Compartment, Lower Forward Bulkhead Connected to 22TB1	Right Access Door
1E1	Chip Detector, Transmission Sump	Transmission Compartment, Lower Left Side of Transmission	Transmission Left Cowling
1E1P1	Connector, Transmission Sump Chip Detector	Connected to 1E1	Transmission Left Cowling
1E2	Chip Detector, Mast Bearing	Transmission Compartment, Left Side of Transmission	Transmission Left Cowling
1E2P1	Connector, Mast Bearing Chip Detector	Connected to 1E2	Transmission Left Cowling
1E3	Tail Rotor Gearbox Chip Detector	Tailboom, Aft	Direct
1E3P1	Connector, Tail Rotor Gearbox Chip Detector	Connected to 1E3	Direct
1E4	Chip Detector, Freewheeling Assembly	Engine Compartment, Lower Forward Left Side of Engine	Left Engine Cowling Door
1E4P1	Connector, Freewheeling Assembly Chip Detector	Connected to 1E4	Left Engine Cowling Door
1G1	Magnetic Pickup, (Rotor Smoothing)	Mast Ring Assembly	Transmission Upper Left
1G1J1	Connector, Magnetic Pickup	Connected to 1G1	Transmission Upper Left
1G1P1	Connector, Magnetic Pickup	Connected to 1G1	Transmission Upper Left

Table D-1. Equipment List (Electrical) (Cont)

Reference	•	dipinent List (Licetifical) (con	•
Designation	Nomenclature	Location	Access
1J1	Connector Engine Disconnect	Engine Compartment, Lower Part of Engine	Engine Right Cowling
1J2	Connector, Engine Pan	Engine Compartment	Engine Upper Cowl
1J3	Connector, Transmission/ Roof	Avionics Compartment Overhead	Left Access Door
1J4	Connector, Oil Cooler Compressor	Aft Electrical Compartment Overhead	Aft Electrical Compartment Door
1J5	Connector, Upper Mast Torque	Avionics Compartment Overhead	Right Access Door
1J6	Connector, Oil Temperature	Transmission Compartment, Lower Left and Outboard of Mast, Connected to 1P6	Transmission Left Cowling
1J7	Connector, Transmission Mast Sensors and Chip Detector	Transmission Compartment, Right and Outboard of Mast	Transmission Right Access Panel
1J8	Connector, Accelerometer (Rotor Smoothing)	Forward Side Below CPG Seat	Left Crew Door
1J9	Connector, Magnetic Pickup (Rotor Smoothing)	Forward Side Below CPG Seat	Left Crew Door
1J11	Disconnect, Left Engine Deck	Forward Left Side of Engine Compartment, Lower Deck Sidewall	Engine Left Cowling Door
1K1	Relay, Start	Left Side of Aft Electrical Compartment, DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
1K2	Relay, Battery	Left Side of Aft Electrical Compartment, DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
1K3	Relay, Series Start Control	Right Side of Aft Electrical Compartment, DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
1K4	Relay, Engine Oil Bypass	Oil System Compartment	Aft Fairing
1K5	Relay, Fuel Boost Pump	Right Side of Aft Electrical Compartment, DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
K6	Relay, Chip Detector (Right Burnoff)	Avionics Compartment, Lower Forward Bulkhead	Right Access Door
K7	Relay, Chip Detector (Left Burnoff)	Avionics Compartment, Lower Forward Bulkhead	Right Access Door
K8	Relay, Ignition	Right Forward Console Access Panel	Right Forward Console Access Panel
K9	Relay, ECU Start (OH-58D(R))	Right Forward Console Access Panel	Right Forward Console Access Panel
K10	Relay, Manual Mode	Right Forward Console Access Panel	Right Forward Console Access Panel
K11	Relay, FADEC Fail	Right Forward Console Access Panel	Right Forward Console Access Panel
MT1	Transducer, Lower Mast Torque	Transmission Compartment	Transmission Left Access Panel
MT1P1	Connector, Lower Mast Torque Transducer	Connected to 1MT1	Transmission Left Access Panel
MT2	Transducers. Lower Mast Torque	Transmission Compartment	Transmission Right Access Panel
MT2P1	Connector, Lower Mast, Torque transducer	Connector 1MT2	Transmission Right Access Panel
МТЗ	Transducer, Transmission Oil Pressure	Transmission Compartment	Transmission Left Access Panel
MT3P1	Connector, Transmission Oil Pressure Transducer	Connected to 1MT3	Transmission Left Access Panel
MT4	Transducer, Transmission Oil Temperature	Transmission Lower Left	Transmission Left Access Panel
MT5	Transducer, Engine Oil Temperature	Oil System Compartment	Aft Fairing
МТ6	Transducer, Engine Oil Pressure	Transmission Compartment, Right	Transmission Right Access Panel
MT6P1	Connector, Engine Oil Pressure	Connected to 1MT6	Transmission Right Access Panel
MT7	Transducer, Engine Torque	Transmission Compartment, Left	Transmission Left Access Panel
MT7P1	Connector, Engine Torque Transducer	Connected to 1MT7	Transmission Left Access Panel

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1MT8	Transducer, Upper Mast Torque	MMS Turret Assembly 3429A1 Base	MMS Turret Assembly 3429A1 Removed
1MT8P1A	Connector, Upper Mast Torque	Connected to 1MT8	MMS Turret Assembly 3429A1 Removed
1MT9	Transducer, Rotor Position	MMS Turret Assembly 3429A1 Base	MMS Turret Assembly 3429A1 Removed
1MT10	Transducer, Collective Pitch	Under CPG Seat	Left Crew Door
1MT10J1	Connector, Collective Pitch Transducer	Under CPG Seat	Left Crew Door
1MT10P1	Connector, Collective Pitch Transducer	Under CPG Seat	Left Crew Door
1M1	Display, Multiparameter	Pedestal	Left or Right Crew Door
1M1P1	Connector, Multiparameter Display	Connected to 1M1	Left or Right Crew Door
1M1P2	Connector, Multiparameter Display	Connected to 1M1	Left or Right Crew Door
1M1P3	Connector, Multiparameter Display	Connected to 1M1	Left or Right Crew Door
1M2	Indicator, Dual Tachometer	Instrument Panel	Left or Right Crew Door
1M2P1	Connector, Dual Tachometer	Connected to J1 on 1M2	Left or Right Crew Door
1M3	Indicator, TRQ and TGT	Instrument Panel	Left or Right Crew Door
1M3P1	Connector, Torque and Turbine Gas Temperature	Connected to 1M3	Left or Right Crew Door
1P1	Connector, Engine Disconnect	Engine Compartment, Lower Part of Engine	Engine Right Cowling
1P2	Connector, Engine Compartment Disconnect	Engine Compartment, Firewall	Engine Right Cowling
1P3	Connector, Transmission Roof Disconnect	Hydraulic Compartment Left Side	Transmission Forward Cowling
1P4	Connector, Oil Cooler Compartment Disconnect	Oil System Compartment	Aft Fairing Access Door
1P5	Connector, Mast Torque Disconnect	Avionics Compartment Overhead	Left Access Door
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Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1P6	Connector, Transmission Oil Temperature Transducer	Transmission Compartment Outboard from Mast	Transmission Left Cowling
1P7	Connector, Transmission Disconnect	Transmission Compartment Outboard from Mast	Transmission Right Access Panel
1P11	Disconnect, Left Engine Deck	Forward Left Side of Engine Compartment, Lower Deck Sidewall	Engine Left Cowling Door
1P12	Connector, Ignition Exciter	Connected to Exciter Unit on Engine	Engine Left Cowling Door
1RT1	Sensor, Mast Torque Temperature	Transmission, Lower Left	Transmission Left Access Panel
1RT1P1	Connector, Mast Torque Temperature Sensor	Connected to 1RT1	Transmission Left Access Panel
1R1	Resistor, Fuzz Burner	Avionics Compartment Lower Forward Bulkhead, Connected to 22TB1	Right Access Door
1S1	Switch, START	Pilot Collective Stick	Right Crew Door
1S2	Switch, Oil Level Float	Oil System Compartment	Aft Fairing
1S3	Switch, Fuel Filter Bypass	Engine Lower Left	Engine Left Cowling Door
1S3P1	Connector, Fuel Filter Bypass Switch	Connected to 1S3	Engine Left Cowling Door
1S4	Switch, Fuel Pressure	Above Fuel Filler Cap, Right Side	Access Panel Aft of Right Access Door
1S4J1	Connector, Fuel Pressure Switch	Connected to 1S4	Access Panel Aft of Right Access Door
1S4P1	Connector, Fuel Pressure Switch	Connected to 1S4	Access Panel Aft of Right Access Door
1S5	Switch, FUEL BOOST Pump	Forward Overhead Console 4A4	Left or Right Crew Door
1S6	Switch, ENG OIL BYPASS	Forward Overhead Console 4A4	Left or Right Crew Door
1S7	Switch, Gearbox Oil Temperature	Tailboom, Aft Right	Direct
1S8	Switch, FUEL CONTROL	Pedestal, On Digital Fuel Control Panel 1A1	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1S9	Switch, DIGITAL TEST	Pedestal, On Digital Fuel Control Panel 1A1	Left or Right Crew Door
1S10	Switch, ANALOG TEST	Pedestal, On Digital Fuel Control Panel 1A1	Left or Right Crew Door
1S11	Switch, Governor RPM	Pilot Collective Stick Panel	Right Crew Door
1S12	Switch, ENG ANTI ICE	Forward Overhead Console	Left or Right Crew Door
1S13	Switch, Transmission Oil Pressure	Transmission Compartment, Aft Left	Transmission Left Access Panel
1S14	Switch, Keylock	Pedestal	Left or Right Crew Door
1S14J1	Connector, Keylock Switch	Pedestal	Left or Right Crew Door
1S14J2	Connector, Keylock Switch	Pedestal	Left or Right Crew Door
1TB1	Terminal Board	Oil System Compartment	Aft Fairing
1TB2	Terminal Board, Engine Temperature	Avionics Compartment Left Side on Upper Equipment Shelf, Aft of Fuel Cell	Left Access Door, Avionic Compartment Aft Soundproofing
1XK3	Socket, Series Start Control Relay	Connected to 1K3	Aft Electrical Compartmen
1XK4	Socket, Engine Oil Bypass Relay	Connected to 1K4	Aft Fairing
1XK5	Socket, Fuel Boost Pump Relay	Connected to 1K5	Aft Electrical Compartmen Door
1XK6	Socket, Chip Detector (Right Burnoff) Relay	Connected to 1K6	Right Access Door
1XK7	Socket, Chip Detector (Left Burnoff) Relay	Connected to 1K7	Right Access Door
1XK8	Socket, Ignition Relay	Connected to 1K8	Right Forward Console Access Panel
1XK9	Socket, ECU Start Relay	Connected to 1K9	Right Forward Console Access Panel
1XK10	Socket, Manual Mode Relay	Connected to 1K10	Right Forward Console Access Panel
1XK11	Socket, FADEC Fail Relay	Connected to 1K11	Right Forward Console Access Panel
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Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
1Z1	Transmitter, Fuel Quantity	Avionics Compartment On Top of Fuel Cell	Left Access Door
2A1	Assembly, DC Equipment Electrical	Aft Electrical Compartment, Forward Bulkhead	Aft Electrical Compartment Door
2A1J1	Connector, DC Equipment Electrical Assembly	On 2A1	Aft Electrical Compartment Door
2A1J2	Connector, DC Equipment Electrical Assembly	On 2A1	Aft Electrical Compartment Door
2A1J3	Connector, DC Equipment Electrical Assembly	On 2A1	Aft Electrical Compartment Door
2A1P1	Connector, DC Equipment Electrical Assembly	Connected to 2A1J1	Aft Electrical Compartment Door
2A1P2	Connector, DC Equipment Electrical Assembly	Connected to 2A1J2	Aft Electrical Compartment Door
2A1P3	Connector, DC Equipment Electrical Assembly	Connected to 2A1J3	Aft Electrical Compartment Door
2BT1	BATT 1	Forward Battery Compartment	Forward Battery Compartment Door
2BT1P1	Connector, BATT 1	Connected to 2BT1	Forward Battery Compartment Door
2BT1P2	Connector, BATT 1	Connected to 2BT1	Forward Battery Compartment Door
2BT2	BATT 2 (Aft Battery)	Aft Electrical Compartment	Aft Electrical Compartment Door
2BT2P1	Connector, BATT 2	Connected to J1 on 2BT2	Aft Electrical Compartment Door
2BT2P2	Connector, BATT 2	Connected to J2 on 2BT2	Aft Electrical Compartment Door
2CB1	Circuit Breaker, Generator Field Remote Control	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
2CB2	Circuit Breaker, DC GEN FIELD	Aft Overhead Console 4A5	Left or Right Crew Door
2CB3	Circuit Breaker, Rectifier Remote Control	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
2CB4	Circuit Breaker, RECT	Aft Overhead Console 4A5	Left or Right Crew Door

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Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
2CB5	Circuit Breaker, DC GEN RESET	Aft Overhead Console 4A5	Left or Right Crew Door Compartment Door
2CB6	Circuit Breaker, BUS INTCON	Aft Overhead Console 4A5	Left or Right Crew Door
2CB7	Circuit Breaker, Battery Charger	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
2CB8	Circuit Breaker, BATT CHGR	Aux Circuit Breaker Panel 4A8	Right Crew Door
2CB9	Circuit Breaker, 9TH CELL	Forward Battery Compartment	Forward Battery Compartment Door
2CB10	Circuit Breaker, Overload Sensor	Above DC Equipment Electrical Assembly 2A1	Aft Electrical Compartmen
2CB11	Circuit Breaker, Rectifier Volts	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartmen
2CB12	Circuit Breaker, 28 VDC AUX RCPT	Above DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
2CR1	Diode, Battery Emergency Bus	Avionics Compartment Left Side of Roof	Left Access Door
2CR2	Diode, Battery Emergency Bus	Avionics Compartment Left Side of Roof	Left Access Door
2CR3	Diode, Battery Emergency Bus	Avionics Compartment Left Side of Roof	Left Access Door
2CR4	Diode, Battery Emergency Bus	Avionics Compartment Left Side of Roof	Left Access Door
2CR5	Diode, Power Assured Bus Relay	Connected to 22TB3	Left Crew Door, Pedestal
2CR6	Diode, Power Assured Bus Relay	Connected to 22TB3	Left Crew Door, Pedestal
2CR7	Diode, Inverter Enable Relay and Rectifier Relay	DC Equipment Electrical Assembly 2A1, on 2TB3	Aft Electrical Compartmen
2CR8	Diode, Rectifier Relay	DC Equipment Electrical Assembly 2A1, on 2K6	Aft Electrical Compartmen
2CR9	Diode, Bus Interconnect Relay	DC Equipment Electrical Assembly 2A1, on 2K5	Aft Electrical Compartmen
2CR10	Diode, Line Relay	DC Equipment Electrical Assembly 2A1, on 2K1	Aft Electrical Compartment Door

Table D-1. Equipment List (Electrical) (Cont)

2CR12 Diode, BA 2CR13 Diode, Ex Relay 2DS1 Lamp, BA	ATT 2 Relay ATT 1 Relay sternal Power	DC Equipment Electrical Assembly 2A1, on 2K4 Forward Battery Compartment on 2K2 Forward Battery Compartment on 2K3	Aft Electrical Compartment Door Forward Battery Compartment Door Forward Battery
2CR13 Diode, Ex Relay 2DS1 Lamp, BA	cternal Power	Compartment on 2K2 Forward Battery	Compartment Door
Relay 2DS1 Lamp, BA			Forward Rattony
·	TT 1 DDCUCAT	•	Compartment Door
	ATT 1 PREHEAT	On Floodlight, Above Pilot Seat	Right Crew Door
DS2 Lamp, BA	ATT 2 PREHEAT	On Floodlight, Above Pilot Seat	Right Crew Door
2J1 Connecto	r GEN FIELD	Engine Compartment	Engine Upper Cowl
J2 Connecto Power (A	r, DC External PU)	Nose	Access Door, APU
J3 Connecto RCPT	r, 28 VDC AUX	Forward Side Below CPG Seat	Left Crew Door
K1 Relay, Lir	ne	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
Relay, BA	ATT 1	Battery Compartment	Forward Battery Compartment Door
Relay, Ex	ternal Power	Battery Compartment	Forward Battery Compartment Door
Relay, BA	ATT 2	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
K5 Relay, Bu	us Interconnect	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment
:K6 Relay, Re	ectifier	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment
Relay, Ba Temperat	attery Low cure	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment
K8 Relay, Po	ower Assured Bus	Above CPG	Left Crew Door
K9 Relay, Fe	eder Fault Inhibit	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
MG1 Starter-G	enerator	Lower Right Part of Engine	Engine Right Cowling
PS1 TRU		Floor, Right Side	Aft Electrical Compartment

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
2PS1P1	Connector, XMFR RECT UNIT	Connected to 2PS1	Aft Electrical Compartment Door
2PS2	Charger-Monitor	Upper Equipment Shelf, Left of Aft Fuel Cell	Left Access Door, Avionics Compartment Aft Soundproofing Blanket
2PS2J2	Connector, Charger- Monitor	Upper Equipment Shelf Left of Aft Fuel Cell Connected to 2PS2P2 When 2PS2 is Not Installed.	Left Access Door, Avionics Compartment Aft Soundproofing Blanket
2PS2P1	Connector, Charger- Monitor	Connected to 2PS2	Left Access Door, Avionics Compartment Aft Soundproofing Blanket
2PS2P2	Connector, Charger- Monitor	Connected to 2PS2	Left Access Door, Avionics Compartment Aft Soundproofing Blanket
2P1	Connector, Starter- Generator	Lower Right Part of Engine	Engine Right Cowling
2R1	Shunt, Generator	Upper Equipment Shelf, Aft Right of Fuel Cell	Right Access Door, Avionics Compartment Aft Soundproofing Blanket
2R2	Shunt, Generator High	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
2R3	Shunt, TRU	Floor, Right Side	Aft Electrical Compartment Door
2S1	Switch, PREHEAT BATT 1	Forward Overhead Console 4A4	Left or Right Crew Door
2S2	Switch, PREHEAT BATT 2	Forward Overhead Console 4A4	Left or Right Crew Door
2S3	Switch, ESNTL BUS	Forward Overhead Console 4A4	Left or Right Crew Door
2S4	Switch, DC GEN	Forward Overhead Console 4A4	Left or Right Crew Door
2S5	Switch, DC External Power Door	Nose	Access Door APU
2TB1	Junction Block, DC Power	Left Side of Roof	Left Access Door
2TB2	Junction Block, DC Power	Left Side of Roof	Left Access Door
2TB3	Terminal Board, DC Power	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
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Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
2TB4	Terminal Board, BATT 1 Power	Forward Battery Compartment, Left Side	Forward Battery Compartment Door
2TB5	Terminal Board, BATT 1 and External Power	Pedestal	Left or Right Crew Door, Pedestal
2VR1	Regulator, Voltage	Left Forward Bulkhead	Aft Electrical Compartment Door
2VR1P1	Connector, Voltage Regulator	Connected to 2VR1	Aft Electrical Compartment Door
2XK7	Socket, Battery Low Temperature Relay	DC Equipment Electrical Assembly 2A1, Connected to 2K7	Aft Electrical Compartment Door
2XK8	Socket, Power Assured Bus Relay	Above CPG Connected to 2K8	Left Crew Door
2XK9	Socket, Feeder Fault Inhibit Relay	DC Equipment Electrical Assembly 2A1, Connected to 2K9	Aft Electrical Compartment
2Z1	Sensor, DC Voltage	Nose Compartment Left	Left Crew Door
2Z1P1	Connector, DC Voltage Sensor	On 2Z1	Left Crew Door
3A1	Unit, External Power Control	Right Forward Bulkhead	Aft Electrical Compartment Door
3A1P1	Connector, EXT PWR	Connected to 3A1	Aft Electrical Compartment Door
3CB1	Circuit Breaker, RCCB INV	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
3CB2	Circuit Breaker, INV	Aft Overhead Console 4A5	Left or Right Crew Door
3CB3	Circuit Breaker, 26 VAC PWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3CB4	Circuit Breaker, CDS INV VOLT	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
BCR1	Diode, AC External Power Relay	DC Equipment Electrical Assembly 2A1, Connected to 3K2	Aft Electrical Compartment Door
3CR2	Diode, AC Generator Transfer Relay	DC Equipment Electrical Assembly 2A1, Connected to 3K3	Aft Electrical Compartment Door
3G1	Generator, AC	Lower Left Part of Engine	Engine Left Cowling Change 2 D-2

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3G1P1	Connector, AC Generator	Connected to 3G1	Engine Left Cowling
3J1	Connector, AC Generator Firewall	Engine Left Firewall, Connected to 3P1	Engine Left Cowling
3J2	Connector, AC External Power	Fuselage, Aft or Right Crew Door	Aft Electrical Compartment Door
3K1	Relay, Inverter Enable	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
3K2	Relay, AC External Power	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
3K3	Relay, AC Generator Transfer	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
3K4	Relay, Inverter	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
3PS1	Inverter	Wall, Right Side, Aft Electrical Compartment	Aft Electrical Compartment Door
3PS1J1	Connector, Inverter	Connected to 3PS1	Aft Electrical Compartment Door
3PS1P1	Connector, Inverter	Connected to 3PS1	Aft Electrical Compartment Door
3P1	Connector, AC Generator Firewall	Engine Left Firewall	Engine Left Cowling
3S1	Switch, AC GEN	Forward Overhead Console 4A4	Left or Right Crew Door
3S2	Switch, EXT PWR RESET	Aft of Right Access Door	External Power Receptacle Door
3S3	Switch, AC External Power Door	Aft or Right Access Door	External Power Receptacle Door
3T1	Autotransformer, 26V	Left Side of Roof	Left Access Door
3VR1	Unit, Alternator Control	Right Forward Bulkhead	Aft Electrical Compartment Door
3VR1P1	Connector, AC Generator Control Unit	Connected to 3VR1	Aft Electrical Compartment Door
3XK1	Socket, Inverter Enable Relay	DC Equipment Electrical Assembly 2A1, Connected to 3K4	Aft Electrical Compartment Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3XK4	Socket, Inverter Relay	DC Equipment Electrical Assembly 2A1, Connected to 3K4	Aft Electrical Compartment Door
4A1	Stick, Pilot Cyclic	Pilot Station	Right Crew Door
4A1J1	Connector, Pilot Cyclic Stick	Under Pilot Seat, Connected to 4A1P1	Right Crew Door, Armored Panel Under Pilot Seat
4A1P1	Connector, Pilot Cyclic Stick	Under Pilot Seat, Connected to 4A1	Right Crew Door, Armored Panel Under Pilot Seat
4A2	Panel, Pilot Collective Stick	Pilot Station	Right Crew Door
4A2J1	Connector, Pilot Collective Stick	Below At End of Pilot Collective Stick, Connected to 4A2P1	Right Crew Door, Armored Panel Under Pilot Seat
4A2J2	Connector, Panel Integral Lighting	Pilot Collective Stick	Right Crew Door
4A2P1	Connector, Panel Collective Stick	Below Aft End of Pilot Collective Stick, Connected to 4A2J1	Right Crew Door, Armored Panel Under Pilot Seat
4A4	Panel, Forward Overhead Console	Crew Station Overhead	Left or Right Crew Door
4A4J1	Connector, Forward Overhead Console Panel	Connected to 4A4	Left or Right Crew Door
4A5	Panel, Aft Overhead Console	Crew Station Overhead	Left or Right Crew Door
4A5J1	Connector, Aft Overhead Console Panel	Connected to 4A5	Left or Right Crew Door
4A6	Panel, Center Post Circuit Breaker	Crew Station Post	Left or Right Crew Door
4A6J1	Connector, Center Post Circuit Breaker Panel	Connected to 4A6	Left or Right Crew Door
4A7	MFD Panel, Integral Lighting	Pilot Station MFD Auxiliary Switch Panel	Right Crew Door
4A7J1	Connector, Panel Integral Lighting	MFD Auxiliary Switch Panel	Right Crew Door
4A8	Panel Assembly, Aux CB	Forward Cabin Roof, Right Side	Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
4A8J1	Connector, Aux CB Panel Assembly	Part of Panel Assembly, AUX CB, Forward Cabin Roof	Right Crew Door
4J2A	Splice, Pilot MFD Auxiliary Switch Panel	MFD Auxiliary Switch Panel, Integral Lighting	Right Crew Door
4J2B	Splice, Pilot MFD Auxiliary Switch Panel	MFD Auxiliary Switch Panel, Integral Lighting	Right Crew Door
4M1	Indicator, Altimeter	Pilot Station, Instrument Panel	Right Crew Door
4M1P1	Connector, Altimeter Indicator	Connected to J1 on 4M1	Right Crew Door
4M2	Indicator, Airspeed	Instrument Panel	Left Crew Door
4M2P1	Connector, Airspeed Indicator	Connected to 4M2	Left Crew Door
4M3	Clock	Instrument Panel	Right Crew Door
4M3P1	Connector, Clock	Connected to 4M3	Right Crew Door
4M4	Compass, Standby	Pilot Station Instrument Panel	Right Crew Door
4M4P1	Connector, Standby Compass	Connected to 4M4	Right Crew Door
4P1	Connector, Pilot Night Vision Goggles	Above Pilot Station	Right Crew Door
5A1	Stick, CPG Cyclic	CPG Station	Left Crew Door
5A1J1	Connector, CPG Cyclic Stick	Under CPG Seat	Left Crew Door, Armored Panel Under CPG Seat
5A1P1	Connector, CPG Cyclic Stick	Connected to 5A1	Left Crew Door, Armored Panel Under CPG Seat
5A2	Panel Assembly, Instrument	Cockpit	Left or Right Crew Door
5A2J1	Connector, Integral Lighting Panel	CPG Station, Lower Left Side of Instrument Panel	Left Crew Door
5A2J2	Connector, Integral Lighting Panel	CPG Station, Below MFD Integral Lighting	Left Crew Door
5J2A	Splice, CPG MFD Auxiliary Switch Panel	Behind CPG Auxiliary Switch Panel	Left Crew Door
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Table D-1. Equipment List (Electrical) (Cont)

	•		,
Reference Designation	Nomenclature	Location	Access
5J2B	Splice, CPG MFD Auxiliary Switch Panel	Behind CPG Auxiliary Switch Panel	Left Crew Door
5J3A	Splice, CPG Channel Select Panel	Behind CPG Channel Select Panel	Left Crew Door
5J3B	Splice, CPG Channel Select Panel	Behind CPG Channel Select Panel	Left Crew Door
5P1	Connector, CPG Night Vision Goggles	Above CPG Station	Left Crew Door
8CB1	Circuit Breaker, EL LT	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
8CB2	Circuit Breaker, NVG PWR	Aft Overhead Console 4A5	Left or Right Crew Door
8CB3	Circuit Breaker, CKPT LT	Aft Overhead Console 4A5	Left or Right Crew Door
8CB4	Circuit Breaker, POS LT	Aft Overhead Console 4A5	Left or Right Crew Door
8CB5	Circuit Breaker, SRCH LT CONTR	Aft Overhead Console 4A5	Left or Right Crew Door
8CB6	Circuit Breaker, SRCH LT PWR	Aft Overhead Console 4A5	Left or Right Crew Door
8CB7	Circuit Breaker, ANTI COLL LT	Aft Overhead Console 4A5	Left or Right Crew Door
8DS1	Light, Upper Anti-Collision	On Top of Engine Fairing	Direct
8DS2	Light, Lower Anti-Collision	On Bottom of Aft Fuselage	Direct
8DS3	Light, Tail Position	Tail Fairing	Direct
8DS4	Light, Right Position	Right Horizontal Stabilizer	Direct
8DS5	Light, Left Position	Left Horizontal Stabilizer	Direct
8DS6	Searchlight	Nose Compartment	Direct
8DS6TB1	Terminal Board, Searchlight	Connected to 8DS6	Searchlight Lowered
8DS9	Floodlight, White	Above CPG	Left Crew Door
8DS10	Floodlight, Green	Above Pilot	Right Crew Door
8DS11	Light, Utility	Between Top of Crew Seats	Left or Right Crew Door
8J1	Connector, Anti-Collision Light	On Top of Engine Fairing, Connected to 8P1	Upper Anticollision Light Removed

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
8J2	Splice, Anticollision Light	Connected Near 8DS3	Tail Position Light Removed
8J3	Splice, Anticollision Light	Connected Near 8DS3	Tail Position Light Removed
8PS1	Power Supply, CPG Night Vision Goggle	Above CPG	Left Crew Door
8PS1J1A	Splice, CPG Night Vision Goggle Power Supply	Above CPG	Left Crew Door
8PS1J1B	Splice, CPG Night Vision Goggle Power Supply	Above CPG	Left Crew Door
8PS1TB1	Terminal Board, Power Supply, CPG Night Vision Goggle	Above CPG	Left Crew Door
8PS2	Power Supply, Pilot Night Vision Goggle	Above Pilot	Right Crew Door
8PS2J1A	Splice, Pilot Night Vision Goggle Power Supply	Above Pilot	Right Crew Door
8PS2J1B	Splice, Pilot Night Vision Goggle Power Supply	Above Pilot	Right Crew Door
8PS2S1	Switch, Test, Pilot Night Vision Goggle Power Supply	Above Pilot	Right Crew Door
8PS2TB1	Terminal Board, Power Supply, Pilot Night Vision Goggle	Above Pilot	Right Crew Door
8P1	Connector, Upper Anticollision Light	On Top of Engine Fairing, Connected to 8J1	Upper Anticollision Light Removed
8R1	Transformer, CONSOLE LT, Pedestal and Overhead Dimming	Forward Overhead Console 4A4	Left or Right Crew Door
8R2	Transformer, INST LT, Panel Dimming	Forward Overhead Console 4A4	Left or Right Crew Door
8R3	Resistor, FLOOD LT Dimming	Forward Overhead Console 4A4	Left or Right Crew Door
8R4	Resistor, Position Light Dimming	Above Aft Electrical Compartment, Left Side	Aft Electrical Compartment Door
8R5	Resistor, Console Dimming	Pedestal, Aft End	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference	<u></u>	. , , , , ,	
Designation	Nomenclature	Location	Access
8R6	Resistor,INST LT Dimming	Pedestal, Aft End	Left or Right Crew Door
8S1	Switch, ANTI COLL LIGHT OFF	Forward Overhead Console	Left or Right Crew Door
8S2	Switch, SRCH LT ON/NVG/ OFF	Pilot Collective Stick Panel 4A2	Right Crew Door
8S3	Switch, SRCH LT EXT/L/R/ RET	Pilot Collective Stick Panel 4A2	Right Crew Door
8S4	Switch, POS LIGHT OFF/ DIM/BRT	Forward Overhead Console 4A4	Left or Right Crew Door
8S5	Switch, FLOOD LT	Forward Overhead Console 4A4	Left or Right Crew Door
8TB1	Terminal Board, Lighting	Pedestal	Left or Right Crew Door
8TB2	Terminal Board, Lighting	Pedestal	Left or Right Crew Door Pedestal
8TB3	Terminal Board, Utility Light	Above CPG	Left Crew Door
8TB4	Terminal Board, Position Lights	Inside Tailboom Above Horizontal Stabilizer	Upper Support, Above Horizontal Stabilizer
8Z1	Flasher, Anti-Collision Light	Upper Equipment Shelf, Aft Right of Fuel Cell	Aft Electrical Compartment Door
9A1	Panel, SCAS Control	Pedestal	Left or Right Crew Door
9A1J1	Connector, SCAS Control Panel	Connected to 9A1	Left or Right Crew Door
9A1P1	Connector, SCAS Control Panel	Connected to 9A1	Left or Right Crew Door
9CB1	Circuit Breaker, SCAS 26 VAC	Center Post, Circuit Breaker Panel 4A6	Left or Right Crew Door
9CB2	Circuit Breaker, HDG HOLD	Center Post, Circuit Breaker Panel 4A6	Left or Right Crew Door
9CB3	Circuit Breaker, SCAS DC	Aft Overhead Console 4A5	Left or Right Crew Door
9CB4	Circuit Breaker, HYD SYS	Aft Overhead Console 4A5	Left or Right Crew Door
9CB5	Circuit Breaker, FORCE TRIM	Aft Overhead Console 4A5	Left or Right Crew Door
9CB6	Circuit Breaker, STBY ATT	Aft Overhead Console 4A5	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
9CR1	Diode, Trim Actuator Brake	Connected to 9TB3	Aft Electrical Compartment Door
9CR2	Diode, Trim Actuator Clutch	Connected to 9TB3	Aft Electrical Compartment Door
9CR3	Diode, Lateral Cyclic Magnetic Brake	Under Pilot Seat, Connected to 9TB2	Right Crew Door
9CR4	Diode, Fore/Aft Cyclic Magnetic Brake	Under Pilot Seat, Connected to 9TB2	Right Crew Door
9CR5	Diode, Pitch/Roll Engage	Avionics Compartment, Left Side of Equipment Rack Forward of Fuel Cell, Connected to 9TB1	Left Crew Door
9J1	Connector, Yaw Actuator Disconnect	Connected to 9L3	Aft Electrical Compartment Door
9K1	Relay, Trim Actuator Brake	Aft Electrical Compartment Right Side	Aft Electrical Compartment Door
9L1	Actuator, Right Cyclic	Transmission Compartment, Right Forward End	Transmission Right Access Panel
9L1J1	Connector, Right Cyclic Actator	Connected to P1 on 9L1	Transmission Right Access Panel
9L1J2	Connector, Right Cyclic Actuator	Connected to P2 on 9L2	Transmission Right Access Panel
9L1P1	Connector, Right Cyclic Actuator	Connected to J1 on 9L1	Transmission Right Access Panel
9L1P2	Connector, Right Cyclic Actuator	Connected to J2 on 9L2	Transmission Right Access Panel
9L2	Actuator, Left Cyclic	Forward End of Transmission, Left	Transmission Left Access Panel
9L2J1	Connector, Left Cyclic Actuator	Connected to P1 on 9L2	Transmission Left Access Panel
9L2J2	Connector, Left Cyclic Actuator	Connected to P2 on 9L2	Transmission Left Access Panel
9L2P1	Connector, Left Cyclic Actuator	Connected to J1 on 9L2	Transmission Left Access Panel
9L2P2	Connector, Left Cyclic Actuator	Connected to J2 on 9L2	Transmission Left Access Panel

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
9L3	Actuator, Yaw	Aft Electrical Compartment, Right Side	Aft Electrical Compartment Door
9L3J1	Connector, Yaw Actuator	Connected to 9L3	Aft Electrical Compartment Door
9L3J2	Connector, Yaw Actuator	Connected to 9L3	Aft Electrical Compartment Door
9L3P1	Connector, Yaw Actuator	Connected to 9L3	Aft Electrical Compartment Door
9L3P2	Connector, Yaw Actuator	Connected to 9L3	Aft Electrical Compartment Door
9L4	Actuator, Magnetic Brake	Below CPG Seat	Left Crew Door
9L4P1	Connector, Magnetic Brake Actuator	Below CPG Seat	Left Crew Door
9L5	Actuator, Magnetic Brake	Below Pilot Seat	Right Crew Door
9L5P1	Connector, Magnetic Brake Actuator	Below Pilot Seat	Right Crew Door
9L6	Valve, Hydraulic Solenoid	Transmission Compartment	Transmission Cowling
9L6P1	Connector, Hydraulic Solenoid Valve	Connected to 9L6	Transmission Cowling
9L7	Actuator, Trim	Aft Electrical Compartment, Right Side	Aft Electrical Compartment Door
9L7J1	Connector, Trim Actuator	Connected to P1 on 9L7	Aft Electrical Compartment Door
9L7P1	Connector, Trim Actuator	Connected to J1 on 9L7	Aft Electrical Compartment Door
9L7J2	Connector, Trim Actuator	Connected to P2 on 9L7	Aft Electrical Compartment Door
9L7P2	Connector, Trim Actuator	Connected to J2 on 9L7	Aft Electrical Compartment Door
9MP1	Gyro, Rate, Pitch/Yaw	Avionics Compartment, Right of Fuel Cell	Right Access Door
9MP1J1	Connector, Rate Gyro, Pitch/Yaw	Connected to 9MP1P1	Right Access Door
9MP1J2	Connector, Rate Gyro, Pitch/Yaw	Connected to 9MP1P2	Right Access Door

Table D-1. Equipment List (Electrical) (Cont)

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Reference Designation	Nomenclature	Location	Access
9MP1P1	Connector, Rate Gyro, Pitch/Yaw	Connected to 9MP1J1	Right Access Door
9MP1P2	Connector, Rate Gyro, Pitch/Yaw	Connected to 9MP1J2	Right Access Door
9MP2	Sensor, Roll Rate	Avionics Compartment, Right of Fuel Cell	Right Access Door
9MP2J1	Connector, Roll Rate Sensor	Connected to 9MP2P1	Right Access Door
9MP2J2	Connector, Roll Rate Sensor	Connected to 9MP2P2	Right Access Door
9MP2P1	Connector, Roll Rate Sensor	Connected to 9MP2J1	Right Access Door
9MP2P2	Connector, Roll Rate Sensor	Connected to 9MP2J2	Right Access Door
9MT1	Transducer, Control Motion F/A Cyclic	Below CPG Seat	Left Crew Door
9MT1J1	Connector, F/A Cyclic CMT	Below CPG Seat	Left Crew Door
9MT1J2	Connector, F/A Cyclic CMT	Below CPG Seat	Left Crew Door
9MT1P1	Connector, F/A Cyclic CMT	Below CPG Seat	Left Crew Door
9MT1P2	Connector, F/A Cyclic CMT	Below CPG Seat	Left Crew Door
9MT2	Transducer, Control Motion Lateral Cyclic	Below CPG Seat	Left Crew Door
9MT2J1	Connector, Lateral Cyclic CMT	Below CPG Seat	Left Crew Door
9MT2J2	Connector, Lateral Cyclic CMT	Below CPG Seat	Left Crew Door
9MT2P1	Connector, Lateral Cyclic CMT	Below CPG Seat	Left Crew Door
9MT2P2	Connector, Lateral Cyclic CMT	Below CPG Seat	Left Crew Door
9MT3	Transducer, Collective No.	Below CPG Seat	Left Crew Door

Table D-1. Equipment List (Electrical) (Cont)

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Reference Designation	Nomenclature	Location	Access
9MT3J1	Connector, Collective No. 1 CMT	Below CPG Seat Connected to 9MT3P1	Left Crew Door
9MT3J2	Connector, Collective No. 1 CMT	Below CPG Seat Connected to 9MT3P2	Left Crew Door
9MT3P1	Connector, Collective No. 1 CMT	Below CPG Seat	Left Crew Door
9MT3P2	Connector, Collective No. 1 CMT	Below CPG Seat	Left Crew Door
9MT4	Transducer, Collective No. 2 Control Motion	Below CPG Seat	Left Crew Door
9MT4J1	Connector, Collective No. 2 CMT	Below CPG Seat	Left Crew Door
9MT4J2	Connector, Collective No. 2 CMT	Below CPG Seat	Left Crew Door
9MT4P1	Connector, Collective No. 2 CMT	Below CPG Seat	Left Crew Door
9MT4P2	Connector, Collective No. 2 CMT	Below CPG Seat	Left Crew Door
9MT5	Transducer, Pedestal No. 1 Control Motion	Below CPG Seat	Left Crew Door
9MT5J1	Transducer, Pedestal No. 1	Below CPG Seat	Left Crew Door
9MT5J2	Transducer, Pedestal No. 1	Below CPG Seat	Left Crew Door
9MT5P1	Connector, Pedestal No. 1 CMT	Below CPG Seat	Left Crew Door
9MT5P2	Connector, Pedestal No. 1 CMT	Below CPG Seat	Left Crew Door
9MT6	Transducer, Pedestal No. 2 Control Motion	Below CPG Seat	Left Crew Door
9MT6J1	Connector, Pedestal No. 2 CMT	Below CPG Seat	Left Crew Door
9MT6J2	Connector, Pedestal No. 2 CMT	Below CPG Seat	Left Crew Door
9MT6P1	Connector, Pedestal No. 2 CMT	Below CPG Seat	Left Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
9MT6P2	Connector, Pedestal No. 2 CMT	Below CPG Seat	Left Crew Door
9P1	Connector, Yaw Actuator Disconnect	Connected to 9L3	Aft Electrical Compartment Door
9S1	Switch, Hydraulic Pressure	Transmission Compartment, Right and Forward of Mast	Transmission Access Pane
9S1P1	Connector, Hydraulic Pressure Switch	Connected to 9S1	Transmission Access Pane
9S2	Switch, Yaw Spring	Aft Electrical Compartment, Right Side	Aft Electrical Compartment Door
9S2J1	Connector, Yaw Spring Switch	Connected to 9S2P1 on Bracket Near 9S2	Aft Electrical Compartment Door
9S2P1	Connector, Yaw Spring Switch	Aft Electrical Compartment on Bracket Near 9S2	Aft Electrical Compartment Door
9S3	Switch, SCAS ENGA/ DISENG	Pilot Collective Stick Panel 4A2	Right Crew Door
9S4	Switch, SCAS REL	Pilot Cyclic Stick Grip	Right Crew Door
9S5	Switch, SCAS REL	CPG Cyclic Grip	Left Crew Door
9S6	Switch, TRIM REL	Pilot Cyclic Stick Grip	Right Crew Door
9S7	Switch, TRIM REL	CPG Cyclic Grip	Left Crew Door
9TB1	Terminal Board, SCAS	Avionics Compartment, Left Side of Equipment Rack Forward of Fuel Cell	Left Access Door
9TB2	Terminal Board, SCAS	Under Pilot Seat	Right Crew Door
9TB3	Terminal Board, SCAS	Aft Electrical Compartment, Right Side	Aft Electrical Compartment Door
9WT1	Ground Module, SCAS	Avionics Compartment, Lower Left	Left Access Door
9WT2	Ground Module, SCAS	Avionics Compartment, Lower Right Forward Bulkhead	Right Access Door
9WT3	Ground Module	Upper Shelf Aft Avionics Compartment	Access Door, Right Side
9WT4	Ground Module	Upper Shelf Aft Avionics Compartment	Access Door, Right Side
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Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
9WT5	Ground Module	Transmission Deck	Transmission Pylon Fairing
9XK1	Socket, Trim Actuator Brake Relay	Connected to 9K1	Aft Electrical Compartment
10A1	Mask, CPG	Cockpit	Left Crew Door
10A1P1	Connector, CPG Mask	Aft CPG Seat	Left Crew Door
10A2	Mask, Pilot	Cockpit	Right Crew Door
10A2P1	Connector, Pilot Mask	Aft Pilot Seat	Right Crew Door
10B1	Blower, Avionics Compartment	Avionics Compartment, Equipment Rack Aft of Fuel Cell	Left or Right Access Door Aft
10B2	Blower, Right Defog	Nose Compartment	Nose Compartment
10B2FL1	Filter, Right Defog Blower	Nose Compartment	Nose Compartment
10B3	Blower, Left Defog	Nose Compartment	Nose Compartment
10B3FL1	Filter, Left Defog Blower	Nose Compartment	Nose Compartment
10CB1	Circuit Breaker, PITOT HTR	Aft Overhead Console 4A5	Left or Right Crew Door
10CB2	Circuit Breaker, DEFOG BLWR	Aft Overhead Console 4A5	Left or Right Crew Door
10CB3	Circuit Breaker, COMPT BLWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
10CB4	Circuit Breaker, CABIN HTR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
10CB5	Circuit Breaker, CPO MASK	Auxiliary Circuit Breaker Panel 4A8	Left or Right Crew Door
10CB6	Circuit Breaker, PLT MASK	Auxiliary Circuit Breaker Panel 4A8	Left or Right Crew Door
10CR1	Diode, Heater Solenoid	Avionics Compartment, Right Side Upper Equipment Shelf Aft of Fuel Cell, Connected to 10TB1	Right Access Door, Avionics Compartment, Aft Soundproofing Blanket
10HR1	Heater, Pitot	Inside Pitot Tube	Nose Compartment
10HR1P1	Connector, Pitot Heater	Connected to 10HR1	Nose Compartment

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
10K1	Relay, Heater Control	Avionics Compartment, Right Side of Upper Equipment Shelf Aft of Fuel Cell	Aft Electrical Compartment Door
10K2	Relay, Heater Blower	Avionics Compartment, Right Side of Upper Equipment Shelf Aft of Fuel Cell	Aft Electrical Compartment Door
10L1	Heater, Solenoid Valve	Avionics Compartment, Left Side of Upper Equipment Shelf Aft of Fuel Cell	Left Access Door, Avionics Compartment, Aft Soundproofing Blanket
10L1P1	Connector, Heater Solenoid Valve	Connected to 10L1	Left Access Door, Avionics Compartment, Aft Soundproofing Blanket
10S1	Switch, PITOT HTR	Forward Overhead Console 4A4	Left or Right Crew Door
10S2	Switch, HTR	Forward Overhead Console 4A4	Left or Right Crew Door
10S3	Switch, L DEFOG BLWR	Forward Overhead Console 4A4	Left or Right Crew Door
10S4	Switch, R DEFOG BLWR	Forward Overhead Console 4A4	Left or Right Crew Door
10S5	Switch, AUTO COMPT BLWR	Forward Overhead Console 4A4	Left or Right Crew Door
10S6	Switch, Heater Overheat	In Heater Located Above Aft Compartment, Left Side of Shelf	Aft Electrical Compartment Door
10S7	Switch, Forward Temperature	Avionics Compartment, Bottom of Bulkhead Adjacent to Fuel Cell, Near Center Line	Left Access Door Bottom of Lower Forward Left Bulkhead
10S8	Switch, Temperature Sensor Aft of Compartment	Avionics Compartment, Left Side of Equipment Shelf Aft of Fuel Cell	Left Access Door, Avionics Compartment, Aft of Soundproofing Blanket
10TB1	Terminal Board, Heater Solenoid Valve and Blower Relay	Avionics Compartment, Right Side of Upper Equipment Shelf Aft of Fuel Cell	Right Access Door, Avionics Compartment, Aft Soundproofing Blanket

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
	Homonolatare	Location	
10XK1	Socket, Heater Control Relay	Avionics Compartment, Right Side of Upper Equipment Shelf, Aft of Fuel Cell, Connected to 10K1	Right Access Door, Avionics Compartment, Aft Soundproofing Blanket
10XK2	Socket, Heater Blower Relay	Avionics Compartment, Right Side of Upper Equipment Shelf, Aft of Fuel Cell	Aft Electrical Compartment Door
16A1	Unit, TAMS Signal Conditioning	Avionics Compartment, Right Side of Roof	Right Access Door
16A1P1	Connector, TAMS Signal Conditioning Unit	Connected to J1 on 16A1	Right Access Door
16CB1	Circuit Breaker, TAMS	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
16J1	Disconnect, TAMS	Avionics Compartment, Right Side of Cabin Roof	Right Access Door
16MT1	Transformer, TAMS Linear Variable Differential Transformer No. 1	Transmission	Transmission Left Access Panel
16MT1J1	Connector, TAMS Linear Variable Differential Transformer No. 1	Connected to 16MT1P1	Transmission Left Access Panel
16MT1P1	Connector, TAMS Linear Variable Differential Transformer No. 1	Transmission	Transmission Left Access Panel
16MT2	Transformer, TAMS Linear Variable Differential Transformer No. 2	Transmission	Transmission Right Access Panel
16MT2J1	Connector, TAMS Linear Variable Differential Transformer No. 2	Connected to 16MT2P2	Transmission Right Access Panel
16MT2P1	Connector, TAMS Linear Variable Differential Transformer No. 2	Transmission	Transmission Right Access Panel
16MT3	Transformer, TAMS Linear Variable Differential Transformer No. 3	Transmission	Transmission Left Access Panel
16MT3J1	Connector, TAMS Linear Variable Differential Transformer No. 3	Connected to 16MT3P1	Transmission Left Access Panel

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
16MT3P1	Connector, TAMS Linear Variable Differential Transformer No. 3	Transmission	Transmission Left Access Panel
16MT4	Transformer, TAMS Linear Variable Differential Transformer No. 4	Transmission Compartment, Aft End	Transmission Right Access Panel
16MT4J1	Connector, TAMS Linear Variable Differential Transformer No. 4	Connected to 16MT4P1	Transmission Right Compartment
16MT4P1	Connector, TAMS Linear Variable Differential Transformer No. 4	Transmission	Transmission Right Compartment
16P1	Connector, TAMS Roof Disconnect	Transmission Compartment, Right Outboard	Transmission Right Access Panel
18CB1	Circuit Breaker, AIR DATA	Aft Overhead Console 4A5	Left or Right Crew Door
18MT1	Transducer, Air Data	Nose Compartment, Right Side of Helicopter Centerline	Right Crew Door
18MT1P1	Connector, Air Data Transducer	Connected to 18MT1	Right Crew Door
18PS1	Air Data Power Supply	Nose Compartment, Right	Right Crew Door
18PS1P1	Connector, Air Data Power Supply	Connected to 18PS1	Right Crew Door
18RT1	Bulb, OAT	Under CPG Seat	Left Crew Door
18RT1J1	Connector, OAT Bulb	Connected to 18RT1	Under CPG Seat
18RT1P1	Connector, OAT Bulb	Connected to 18RT1	Under CPG Seat
21A1	Panel, Armament Control	Pedestal	Left or Right Crew Door
21A1CR1	Diode, Integral Lighting	On 21A1TB1	Left or Right Crew Door
21A1DS1	Indicator, ARMED/STBY	On 21A1	Left or Right Crew Door
21A1J1	Connector, Armament Control Panel	On 21A1	Left or Right Crew Door
21A1J2	Connector, Armament Control Panel	On 21A1	Left or Right Crew Door
21A1J3	Connector, Integral Lighting	On 21A1	Left or Right Crew Door
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Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
21A1K1	Relay, Gun Jettison Inhibit	On 21A1	Left or Right Crew Door
21A1P1	Connector, Armament Control Panel	On 21A1	Left or Right Crew Door
21A1P2	Connector, Armament Control Panel	Connected to 21A1J2	Left or Right Crew Door
21A1S1	Switch, LEFT JETTISON	On 21A1	Left or Right Crew Door
21A1S2	Switch, RIGHT JETTISON	On 21A1	Left or Right Crew Door
21A1S3	Switch, GUN RECOCK	On 21A1	Left or Right Crew Door
21A1S4	Switch, MASTER ARMED	On 21A1	Left or Right Crew Door
21A1TB1	Terminal Board	On 21A1	Left or Right Crew Door
21A1XK1	Socket, Gun Jettison Inhibit Relay	On 21A1	Left or Right Crew Door
21A2	Electric Unit, Missile Sight System	Avionics Compartment on Bottom of Top Shelf	Right Access Door
21A2J1	Connector, Missile Sight System	On 21A2	Right Access Door
21A2P1	Connector, Missile Sight System	Connected to 21A2	Right Access Door
21A2P2	Connector, Missile Sight System	Connected to 21A2	Right Access Door
21A3	Unit Interface Electric	Avionics Compartment Right side, On Top of Fuel Cell	Right Access Door
21A3P1	Connector, Interface Electric Unit	On 21A3	Right Access Door
21A3P2	Connector, Interface Electric Unit	On 21A3	Right Access Door
21A3P3	Connector, Interface Electric Unit	On 21A3	Right Access Door
21A3P5	Connector, Interface Electric Unit	On 21A3	Right Access Door
21A3P6	Connector, Interface Electric Unit	On 21A3	Right Access Door
21A4	Unit, Pilot Display	Pilot Side Windshield	Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
21A4J1	Connector, Pilot Display Unit	On 21A4	Right Crew Door
21A5	Launcher, Left Side ATAS	Left Side Ejector Rack	Direct
21A5/6P1	Connector, Left and Right ATAS Launcher	On 21A5/6	Direct
21A6	Launcher, Right Side ATAS	Right Side Ejector Rack	Direct
21A7	Gun, .50 Caliber	Left Side Ejector Rack	Direct
21A7J1	Connector, .50 Caliber Gun	On 21A7	Direct
21A7P1	Connector, .50 Caliber Gun	On 21A7	Direct
21A9	Launcher, Left Rocket	Left Side Ejector Rack	Direct
21A9/10P1	Connector, Left or Right Rocket Launcher Fuselage	On 21A9/A10	Direct
21A9/10P2	Connector, Left or Right Rocket Launcher Squib	On 21A9/A10	Direct
21A10	Launcher, Right Rocket	Right Side Ejector Rack	Direct
21A11	Assembly, Rocket Remote	Avionics Compartment On Bottom of Top Shelf	Right Access Door
21A11P1	Connector, Rocket Remote Assembly	On 21A11	Right Access Door
21A11P2	Connector, Rocket Remote Assembly	On 21A11	Right Access Door
21A11P3	Connector, Rocket Remote Assembly	On 21A11	Right Access Door
21A12	Electrical Unit, Armt	Avionics Compartment, Top of Fuel Cell	Right Crew Door
21A12J1	Connector, AEU	Part of ARMT Electrical Unit	Right Crew Door
21A12J2	Connector, AEU	Part of ARMT Electrical Unit	Right Crew Door
21A12P1	Connector, AEU	Part of ARMT Electrical Unit	Right Crew Door
21A12P2	Connector, AEU	Part of ARMT Electrical Unit	Right Crew Door
21CB1	Circuit Breaker, ATAS PWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
21CB2	Circuit Breaker, JETT	Forward Overhead Console Panel 4A5	Left or Right Crew Door
21CB3	Circuit Breaker, SIGHT PWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
21CB4	Circuit Breaker, ARMT CONTR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
21CB5	Circuit Breaker, L GUN PWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
21CB6	Circuit Breaker, RKT PWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
21J1	Connector, Left Side Fuselage Disconnect	Left Side Lower Fuselage	Direct
21J2	Connector, Right Side Fuselage Disconnect	Right Side Lower Fuselage	Direct
21J3	Connector, Left Side Jettison	Left Side Lower Fuselage	Direct
21J4	Connector, Right Side Jettison	Right Side Lower Fuselage	Direct
21J5	Connector, Left Side Jettison	Left Side Ejector Rack	Direct
21J6	Connector, Right Side Jettison	Right Side Ejector Rack	Direct
21P1	Connector, Left Side Fuselage Disconnect	Connected to 21J1	Direct
21P1/2	Connector, Left Side Fuselage Disconnect	Connected to 21J1	Direct
21P2	Connector, Right Side Fuselage Disconnect	Connected to 21J2	Direct
21P3	Connector, Left Side Jettison	Connected to 21J3	Direct
21P4	Connector, Right Side Jettison	Connected to 21J4	Direct
22WT2	Ground Module	Pedestal	Left or Right Crew Door, Pedestal
22A1	Cargo Hook	Bottom of Aircraft (When Installed)	Direct

Table D-1. Equipment List (Electrical) (Cont)

Deference	Poforonoo			
Reference Designation	Nomenclature	Location	Access	
22A1P1	Connector, Cargo Hook Disconnect	Connected to 22A1 (When Installed)	Direct	
22CB1	Circuit Breaker, CARGO HOOK	On Forward Overhead Console Panel 4A4	Left or Right Crew Door	
22CR1	Diode	On 22TB3	Left Crew Door Pedestal	
22J1	Connector, Engine Pan Miscellaneous	Engine Compartment Connected to 22P1	Engine Left Cowling Door	
22J2	Connector, Tailboom to Fuselage	Tailboom Right Attachment Station	Tailboom Disconnect Right Access Door	
22J3	Connector, Windshield Post	Bottom of Windshield Behind Instrument Panel	Left or Right Crew Door	
22J4	Connector, Windshield Post	Bottom of Windshield Behind Instrument Panel	Left or Right Crew Door	
22J5	Connector, indshield Post	Bottom of Windshield Behind Instrument Panel	Left or Right Crew Door	
22J6	Connector, FSE DSC-HL	Right Side Lower Fuselage	Direct	
22J7	Connector, FSE DSC-HL	Left Side Lower Fuselage	Direct	
22J8	Connector, Cargo Hook Disconnect	Bottom of Helicopter Near Cargo Hook	Direct	
22K1	Relay, Cargo Hook Armed	Under Pilot Seat	Right Crew Door	
22P1	Connector, Engine Pan Disconnect	Engine Compartment	Engine Cowling Left Door	
22P2	Connector, Tailboom to Fuselage	Tailboom Right Attachment Station	Tailboom Disconnect Right Access Door	
22P3	Connector, Windshield Post	Bottom of Windshield Behind Instrument Panel	Left or Right Crew Door	
22P4	Connector, Windshield Post	Bottom of Windshield Behind Instrument Panel	Left or Right Crew Door	
22P5	Connector, Windshield Post	Bottom of Windshield Behind Instrument Panel	Left or Right Crew Door	
22P6/7	Connector, FSE DSC-AT	Left Side Lower Fuselage	Direct	
22P6/7	Connector, FSE DSC-HL	Left Side Lower Fuselage	Direct	
22P6/7	Connector, FSE DSC-RK	Left Side Lower Fuselage	Direct	

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
22P6/7CP1	Adapter, FSE DSC-RKT	Left Side Lower Fuselage	Direct
22P6/7CP1	Adapter, FSE DSC-ATAS	Left Side Lower Fuselage	Direct
22P6/7CP1	Adapter, FSE DSC-HLFR	Left Side Lower Fuselage	Direct
22P8	Connector, Cargo Hook Disconnect	Bottom of Helicopter Near Cargo Hook	Direct
22\$1	Switch, Cargo Hook Release	On Pilot Cyclic Stick	Right Crew Door
22TB1	Terminal Board	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
22TB2	Terminal Board	Avionics Compartment, Left Side of Upper Equipment Shelf, Aft of Fuel Cell	Left Access Door, Avionics Compartment, Aft Soundproofing Blanket
22TB3	Terminal Board	Pedestal	Left Crew Door, Pedestal
22TB6	Terminal Board	Pedestal	Left Crew Door, Pedestal
22WT1	Ground Module	Pedestal	Left or Right Crew Door, Pedestal
22WT2	Ground Module	Pedestal	Left or Right Crew Door, Pedestal
22WT3	Ground Module	Pedestal	Left or Right Crew Door, Pedestal
22WT4	Ground Module	Pedestal	Left or Right Crew Door, Pedestal
22WT5	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Left or Right Crew Door
22WT6	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Left or Right Crew Door
22WT7	Ground Module	Pedestal	Left or Right Crew Door
22WT9	Ground Module	Pedestal	Left or Right Crew Door
22WT10	Ground Module	Transmission Deck	Transmission Pylon Fairing
22WT11	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Left or Right Crew Door
22WT12	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
22WT14	Ground Module	Aft Bulkhead, Avionics Compartment	Left or Right Access Door
22WT15	Ground Module	Roof in Aft Cabin	Left or Right Access Door
22XK1	Socket, Cargo Hook Armed Relay	Connected to 22K1	Right Crew Door
2300A1	Unit, Audio Distribution	Avionics Compartment	Left Access Door
2300A1P2	Connector, Audio Distribution Unit	Connected to 2300A1	Left Access Door
2300A1P4	Connector, Audio Distribution Unit	Connected to 2300A1	Left Access Door
2300A1P8	Connector, Audio Distribution Unit	Connected to 2300A1	Left Access Door
2300A1P9	Connector, Audio Distribution Unit	Connected to 2300A1	Left Access Door
2300A1P14	Connector, Audio Distribution Unit	Connected to 2300A1	Left Access Door
2300WT3	Ground Module	Avionics Compartment, Top of Fuel Cell	Left or Right Crew Door
2301A1	Panel, CPG ICS	Left Side of Instrument Panel	Left Crew Door
2301A1P1	Connector, CPG ICS Panel	Rear of CPG ICS Panel	Left Crew Door at Rear of CPG ICS Panel
2301A1P2	Connector, CPG ICS Panel	Rear of CPG ICS Panel	Left Crew Door at Rear of CPG ICS Panel
2301A2	Panel, Pilot ICS	Pedestal	Left or Right Crew Door
2301A2P1	Connector, Pilot ICS Panel	Pedestal at Rear of Pilot ICS Panel	Left or Rear Crew Door at Rear of Pilot ICS Panel
2301A2P2	Connector, Pilot ICS Panel	Pedestal at Rear of Pilot ICS Panel	Left of Rear Crew Door at Rear of Pilot ICS Panel
2301CB1	Circuit Breaker, ICS CPG	Aft Overhead Console 4A5	Left or Right Crew Door
2301CB2	Circuit Breaker, ICS PLT	Aft Overhead Console 4A5	Left or Right Crew Door
2301CB3	Circuit Breaker, ADU	Aft Overhead Console 4A5	Left or Right Crew Door
2301CB4	Circuit Breaker, SCTY VHF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
2302CB1	Circuit Breaker, UHF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2302K1	Relay, UHF TOD	Avionics Compartment, Lower Forward Bulkhead	Right Access Door
2302XK1	Socket, UHF TOD Relay	Connected to 2302K1	Right Access Door
2302TR1	Receiver/Transmitter, UHF-AM	Avionics Compartment Left Side, Mounted Under #1 MCPU	Left Access Door
2302TR1P1	Connector, UHF-AM R/T	Connected to 2302TR1	Left Access Door
2302TR1P4	Connector, UHF-AM R/T	Connected to 2302TR1	Left Access Door
2302TR1P6	Connector, UHF-AM R/T	Connected to 2302TR1	Left Access Door
2302TR1P7	Connector, UHF-AM R/T	Connected to 2302TR1	Left Access Door
2302TR1P8	Connector, UHF-AM R/T	Connected to 2302TR1	Left Access Door
2303CB1	Circuit Breaker, VHF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2303TR1	Receiver/Transmitter, VHF-AM	Avionics Compartment Right Side, Mounted Under #2 MCPU	Right Access Door
2303TR1P5	Connector, VHF-AM R/T	Connected to 2303TR1	Right Access Door
2303TR1P6	Connector, VHF-AM R/T	Connected to 2303TR1	Right Access Door
2304AR1	Amplifier, IFM	Aft Electrical Compartment on Overhead Shelf	Aft Electrical Compartment Door
2304AR1P2	Connector, IFM Amplifier	Connected to IFM Amplifier	Aft Electrical Compartment Door
2304AR1P3	Connector, IFM Amplifier	Connected to IFM Amplifier	Aft Electrical Compartment Door
2304CB1	Circuit Breaker, FM 1	Aft Overhead Console 4A5	Left or Right Crew Door
2304CB2	Circuit Breaker, SCTY UHF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2304CB3	Circuit Breaker, FM AMP	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2304CB4	Circuit Breaker, FM 2	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
2304TR1	Receiver/Transmitter, #1 VHF-FM	Aft Electrical Compartment, Left Side	Aft Electrical Compartment
2304TR1P5/9	Connector, #1 VHF-FM R/T	Connected to 2304TR1 (When RT-1300B/ARC- 186(V) is Installed)	Aft Electrical Compartment Door
2304TR1P6/8	Connector, #1 VHF-FM R/T	Connected to 2304TR1 (When RT-1300B/ARC- 186(V) is Installed)	Aft Electrical Compartment Door
2304TR1P7A	Connector, #1 VHF-FM R/T	Connected to 2304TR2 (When RT-1478/E ARC- 201(V) is Installed)	Aft Electrical Compartmen Door
2304TR2	Receiver/Transmitter, #2 VHF-FM	Aft Electrical Compartment, Left Side	Aft Electrical Compartment Door
2304TR2P5/9	Connector, #2 VHF-FM R/T	Connected to 2304TR2 (When RT-1300B/ARC- 186(V) is Installed)	Aft Electrical Compartmen Door
2304TR2P6/8	Connector, #2 VHF-FM R/T	Connected to 2304TR1 (When RT-1300B/ARC- 186(V) is Installed)	Aft Electrical Compartmen Door
2304TR2P7A	Connector, #2 VHF-FM R/T	Connected to 2304TR2 (When RT-1478/E ARC- 201(V) is Installed	Aft Electrical Compartmen Door
2309CB1	Circuit Breaker, HF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2309CB2	Circuit Breaker, SCTY HF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2309TR1	Unit, HF R/T	Aft Cabin, Left Door	Left Access Door
2309TR1P4	Connector, HF R/T Unit	Connected to HF/RT Unit	Left Access Door
2309TR1P5	Connector, HF R/T Unit	Connected to HF/RT Unit	Left Access Door
2309Z2	Unit, TSEC/KY-75 Speech Security	Avionics Compartment, Right Side of Equipment Rack Forward of Fuel Cell	Right Access Door
2309Z2P3	Connector, TSEC/KY-75 Speech Security Unit	Connected to 2309Z2 (When Installed)	Right Access Door
2332CB1	Circuit Breaker, ATHS	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
2332TR1	ATHS	Aft Cabin, Left Side	Left Access Door
D-46	Change 2		

Table D-1. Equipment List (Electrical) (Cont)

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Reference Designation	Nomenclature	Location	Access
2332TR1P1	Connector, ATHS	Connected to 2332TR1	Left Access Door
2345CB1	Circuit Breaker, IDM	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
24A1	Unit, Remote HELLFIRE Electronics	Avionics Compartment, Top of Fuel Cell	Left or Right Crew Door
24A1P1	Connector, RMT H/F ELECT	Part of Remote HLFR Electronics	Left or Right Crew Door
24A1P2	Connector, RMT H/F ELECT	Part of Remote HLFR Electronics	Left or Right Crew Door
24A1P4	Connector, RMT H/F ELECT	Part of Remote HLFR Electronics	Left or Right Crew Door
24A1P5	Connector, RMT H/F ELECT	Part of Remote HLFR Electronics	Left or Right Crew Door
24A2	Launcher, HELLFIRE Right Side	Universal Weapons Pylon	Right Side of Helicopter
24A2/3J1	Connector, H/F LAUNCHER	Universal Weapons Pylon	Right Side of Helicopter
24A2/3P1	Connector, H/F LAUNCHER	Universal Weapons Pylon	Right Side of Helicopter
24A3	Launcher, HELLFIRE Left Side	Universal Weapons Pylon	Left Side of Helicopter
24CB1	Circuit Breaker, HELLFIRE PWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
24CB2	Circuit Breaker, HELLFIRE AC	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
24CB3	Circuit Breaker, HELLFIRE ARM	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
24CB4	Circuit Breaker, HELLFIRE CONTR	Center Post Circuit Breaker Panel	Left or Right Crew Door
24CR1	Diode	On 24K1	Left Crew Door
24K1	Relay, HLFR PWR	Pilot Console Left Side	Left Access Door
24TB1	Terminal Board	Aft Bulkhead, Avionics Compartment	Left or Right Crew Door
24WT1	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
24WT2	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Right Crew Door
24WT3	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Left or Right Crew Door
24WT4	Ground Module	Fwd Fuel Cell Bulkhead, Avionics Compartment	Right Crew Door
24WT5	Ground Module	Aft Bulkhead, Avionics Compartment	Left or Right Crew Door
24XK1	Socket, HLFR PWR Relay	Connected to 24K1	Left Access Door
3407A1	Panel, Directional Gyro Control	Instrument Panel	Left or Right Crew Door
3407A1P1	Connector, Directional Gyro Control Panel	Connected to 3407A1	Directional Gyro 3407A1 Removed
3407CB1	Circuit Breaker, DIR GYRO	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3407CB2	Circuit Breaker, HDG 26 VAC	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3408CB1	Circuit Breaker, RADAR ALT	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3410CB1	Circuit Breaker, IFF	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3410CB2	Circuit Breaker, IFF CMPTR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3410J3	Splice, Weight-on-Gear Switch	Center Post, Left Side, Rear Floor	Left Access Door
3410TR1	IFF Transponder	Aft Cabin, Left Side	Left Access Door
3410TR1P1	Connector, IFF Transponder	Connected to IFF Transponder	Left Access Door
3410WT1	Ground Module	Connected to IFF Transponder	Left Access Door
3416CB1	Circuit Breaker, TACAN	Auxiliary Circuit Breaker Panel 4A8	Left or Right Crew Door
3422A1	Panel, RWR Control	Instrument Panel, Right Side	Right Crew Door
3422A1P1	Connector, RWR Control Panel	Rear of RWR Control Panel	RWR Control Panel 3422A1, Removed
D-48	Change 2		

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3422CB1	Circuit Breaker, RADAR WARN	Center Post Circuit Breaker	Left or Right Crew Door
3425CB3	Circuit Breaker, STBY ATT	Aft Overhead Console 4A5	Left or Right Crew Door
3425DS1	Indicator, Standby Attitude	Instrument Panel - Center	Left or Right Crew Door
3425DS1P1	Connector, Standby Attitude Indicator	Connected to 3425DS1	Left or Right Crew Door
3426CB1	Circuit Breaker, IR JAMMER BASE	Auxiliary Circuit Panel 4A8	Left or Right Crew Door
3429A1	Assembly, Turret (MMS)	Above Rotor	Direct
3429A1J1	Connector, Turret Assembly	MMS Standpipe, Connected to 3429A1P1	MMS Turret Assembly 3429A1 Removed
3429A1P1	Connector, Turret Assembly	MMS Standpipe, Connected to 3429A1J1	MMS Turret Assembly 3429A1 Removed
3429A1P1A	Connector, Turret Assembly	MMS Turret Assembly 3429A1 Base, Near 1MT8 Upper Mast Torque Transducer	MMS Turret Assembly 3429A1 Removed
3429A2	Signal Processor, MMS	Avionics Compartment Above Fuel Cell	Right Access Door
3429A2P1	Connector, MMS Signal Processor	Connected to 3429A2	Right Access Door
3429A2P2	Connector, MMS Signal Processor	Connected to 3429A2	Right Access Door
3429A2P3	Connector, MMS Signal Processor	Connected to 3429A2	Right Access Door
3429A2P4	Connector, MMS Signal Processor	Connected to J4 on 3429A2	Right Access Door
3429A2P5	Connector, MMS Signal Processor	Connected to J5 on 3429A2	Right Access Door
3429A2P6	Connector, MMS Signal Processor	Connected to J6 on 3429A2	Right Access Door
3429A2P9	Connector, MMS Signal Processor	Connected to J9 on 3429A2	Right Access Door
3429A2P10	Connector, MMS Signal Processor	Connected to J10 on 3429A2	Right Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3429A2P11	Connector, MMS Signal Processor	Connected to J11 on 3429A2	Right Access Door
3429A2P12	Connector, MMS Signal Processor	Connected to J12 on 3429A2	Right Access Door
3429A2P13	Connector, MMS Signal Processor	Connected to J13 on 3429A2	Right Access Door
3429A2P16	Connector, MMS Signal Processor	Connected to J16 on 3429A2	Right Access Door
3429A2P17	Connector, MMS Signal Processor	Connected to J17 on 3429A2	Right Access Door
3429A3	Panel, MMS Control	Instrument Panel, Left Side	Left Crew Door
3429A3J1	Connector, MMS Control Panel	Connected to 3429A3	Left Crew Door
3429A3J2	Connector, MMS Control Panel	In Back of 3429A3	Left Crew Door
3429A3P1	Connector, MMS Control Panel	Connected to 3429A3J1	Left Crew Door
3429A3TB1	Terminal Board, MMS Control Panel	In Back of 3429A3	Left Crew Door
3429CB1	Circuit Breaker, MMS AC	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3429CB2	Circuit Breaker, MMS 26 VAC	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3429CB3	Circuit Breaker, MMS Remote Control	DC Equipment Electrical Assembly 2A1	Aft Electrical Compartment Door
3429CB4	Circuit Breaker, MMS DC	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3429CB5	Circuit Breaker, MMS DC CONTR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3429PS1	Power Supply, MMS Central	Avionics Compartment, Right Side on Top of Fuel Cell	Right Access Door
3429PS1P1	Connector, MMS Central Power Supply	Connected to J1 on 3429PS1	Right Access Door
3429PS1P2	Connector, MMS Central Power Supply	Connected to J2 on 3429PS1	Right Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3429PS1P3	Connector, MMS Central Power Supply	Connected to J3 on 3429PS1	Right Access Door
3429PS1P5	Connector, MMS Central Power Supply	Connected to J5 on 3429PS1	Right Access Door
3429PS1P6	Connector, MMS Central Power Supply	Connected to J6 on 3429PS1	Right Access Door
3429PS1P7	Connector, MMS Central Power Supply	Connected to J7 on 3429PS1	Right Access Door
3429PS1P8	Connector, MMS Central Power Supply	Connected to J8 on 3429PS1	Right Access Door
3429S1	Switch, LASER	CPG Cyclic Grip	Left Crew Door
3429S2	Switch, FOV SEL	CPG Cyclic Grip	Left Crew Door
3429S3	Switch, LOS CONT	CPG Cyclic Grip	Left Crew Door
3429S4	Switch, FR FRZ	CPG Cyclic Grip	Left Crew Door
3429S5	Switch, TV/TIS	CPG Cyclic Grip	Left Crew Door
3429S6	Switch, PNT TRK	CPG Cyclic Grip	Left Crew Door
3429S7	Switch, MNL/SLAVE	CPG Cyclic Grip	Left Crew Door
3429S8	Switch, AREA TRK	CPG Cyclic Grip	Left Crew Door
3429S9	Switch, OPR	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S10	Switch, LASER/ARM/ STBY/OFF	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S11	Switch, LASER CODE LIST	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S12	Switch, LASER FIRST/ LAST	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S13	Switch, VIDEO SYM INTEN MFD	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S14	Switch, VIDEO SYM INTEN MMS	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S15	Switch, VIDEO GAIN	Mast Mounted Sight Panel 3429A3	Left Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3429S16	Switch, VIDEO LEVEL	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S17	Switch, VIDEO FOC	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S18	Switch, AUTO MAN (Video Sym Inten MMS)	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S19	Switch, AUTO MAN (Video Gain)	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S20	Switch, AUTO MAN (Video Level)	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S21	Switch, AUTO MAN (Video FOC)	Mast Mounted Sight Panel 3429A3	Left Crew Door
3429S22	Switch, LOS CONT	CPG Cyclic Grip	Left Crew Door
3429S23	Switch, Hover BOB UP	Pilot Cyclic Grip	Right Crew Door
3431AT1 🛆	Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT1P2	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT1P3	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT2 🛆	Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT2P2	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT2P3	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT3 🛆	Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT3P1	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431AT3P2	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT3P3	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT4 🗘	Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT4P1	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT4P2	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT4P3	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT5 🛆	Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT5P1	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT5P2	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT5P3	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT6 🛆	Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT6P1	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT6P2	Connector, Bus Coupler	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431AT7 🗘	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT7P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT7P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT7P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT8 ⚠	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT8P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT8P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT8P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT9 △	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT9P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT9P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT9P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT10 🗘	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431AT10P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT10P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT10P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT11 🛆	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT11P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT11P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT11P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT12 🛆	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT12P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT12P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT12P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT13 🛆	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT13P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431AT13P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT13P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT14 ⚠ ■	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT14P1 ■	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT14P2 ■	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT14P3 ■	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT15 🛆	Bus Coupler	Aft Electrical Compartment, Right Side on Overhead	Aft Electrical Compartment Door
3431AT15P1	Connector, Bus Coupler	Aft Electrical Compartment, Right Side on Overhead	Aft Electrical Compartment Door
3431AT15P3	Connector, Bus Coupler	Aft Electrical Compartment, Right Side on Overhead	Aft Electrical Compartment Door
3431AT16 🛆	Bus Coupler	Aft Electrical Compartment, Right Side on Overhead	Aft Electrical Compartment Door
3431AT16P1	Connector, Bus Coupler	Aft Electrical Compartment, Right Side on Overhead	Aft Electrical Compartment Door
3431AT16P3	Connector, Bus Coupler	Aft Electrical Compartment, Right Side on Overhead	Aft Electrical Compartment Door
3431AT17 🛆	Bus Terminator	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT18 🛆	Bus Terminator	Avionics Compartment, Left Side of Lower Forward Bulkhead	Left Access Door
3431AT19 🛆	Bus Terminator	Aft Electrical Compartment on overhead	Aft Electrical Compartment Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431AT20 🛆	Bus Terminator	Aft Electrical Compartment on overhead	Aft Electrical Compartment Door
3431AT21	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT21P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT21P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT21P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT22	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT22P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT22P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT22P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Lower Forward Bulkhead	Right Access Door
3431AT23	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT23P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT23P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT23P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT24	Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
			Change 2 D-

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431AT24P1	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT24P2	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT24P3	Connector, Bus Coupler	Avionics Compartment, Right Side of Fuel Cell, Upper Forward Bulkhead	Right Access Door
3431AT33	Bus Terminator	Avionics Compartment	Right Access Door
3431AT33J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT34	Bus Terminator	Avionics Compartment	Right Access Door
3431AT34J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT35	Bus Coupler	Avionics Compartment	Right Access Door
3431AT36	Bus Coupler	Avionics Compartment	Right Access Door
3431AT37	Bus Terminator	Avionics Compartment	Right Access Door
3431AT37J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT38	Bus Terminator	Avionics Compartment	Right Access Door
3431AT38J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT39	Bus Terminator	Avionics Compartment	Right Access Door
3431AT39J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT40	Bus Terminator	Avionics Compartment	Right Access Door
3431AT40J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT41	Bus Terminator	Avionics Compartment	Right Access Door
3431AT41J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431AT42	Bus Terminator	Avionics Compartment	Right Access Door
3431AT42J1	Connector, Bus Terminator	Avionics Compartment	Right Access Door
3431A1	MCPU, Left	Avionics Compartment, Equipment Rack, Forward Left Side of Fuel Cell	Left Access Door
3431A1P3	Connector, Left MCPU	Connected to 3431A1	Left Access Door
D-58	Change 2		

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431A1P4	Connector, Left MCPU	Connected to 3431A1	Left Access Door
3431A1P5	Connector, Left MCPU	Connected to 3431A1	Left Access Door
3431A1P6	Connector, Left MCPU	Connected to 3431A1	Left Access Door
3431A1P7	Connector, Left MCPU	Connected to J7 on 3431A1	Left Access Door
3431A1P8	Connector, Left MCPU	Connected to 3431A1	Left Access Door
3431A1P9	Connector, Left MCPU	Connected to J9 on 3431A1	Left Access Door
3431A1P10	Connector, Left MCPU	Connected to J10 on 3431A1	Left Access Door
3431A1P11	Connector, Left MCPU	Connected to J11 on 3431A1	Left Access Door
3431A1P12	Connector, Left MCPU	Connected to J12 on 3431A1	Left Access Door
3431A1P14	Connector, Left MCPU	Connected to J14 on 3431A1	Left Access Door
3431A2	MCPU, Right	Avionics Compartment, Equipment Rack, Forward Right Side of Fuel Cell	Right Access Door
3431A2P1	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P3	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P4	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P5	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P6	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P7	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P8	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P9	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P10	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P11	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P12	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A2P20	Connector, Right MCPU	Connected to 3431A2	Right Access Door
3431A3	Keyboard	Pedestal	Left or Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431A3P1	Connector, Keyboard	Connected to 3431A3	Left or Right Crew Door
3431A3P2	Connector, Keyboard	Connected to 3431A3	Left or Right Crew Door
3431A3P3	Connector, Keyboard	Connected to 3431A3	Left or Right Crew Door
3431A3P4	Connector, Keyboard	Connected to 3431A3	Left or Right Crew Door
3431A4	Integrated System Processor	Avionics Compartment, Left Side	Left Access Door
3431A4P1	Connector	Connected to 3431A4	Left Access Door
3431A4P2	Connector	Connected to 3431A4	Left Access Door
3431A4P3	Connector	Connected to 3431A4	Left Access Door
3431A4P4	Connector	Connected to 3431A4	Left Access Door
3431A4P5	Connector	Connected to 3431A4	Left Access Door
3431A5	Loader, Data	Roof in Aft Cabin	Left or Right Crew Door
3431A5P1	Connector, Data Loader	Connected to 3431A5	Left or Right Crew Door
3431CB1	Circuit Breaker, MFD CPO	Aft Overhead Console 4A5	Left or Right Crew Door
3431CB2	Circuit Breaker, MFD PLT	Aft Overhead Console 4A5	Left or Right Crew Door
3431CB3	Circuit Breaker, RFD	Aft Overhead Console 4A5	Left or Right Crew Door
3431CB4	Circuit Breaker, MCPU R	Aft Overhead Console 4A5	Left or Right Crew Door
3431CB5	Circuit Breaker, MCPU L	Forward Overhead Console 4A4	Left or Right Crew Door
3431CB6	Circuit Breaker, MCPU BLWR	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3431CB7	Circuit Breaker, ISP	Center Post Circuit Breaker Panel 4A6	Left or Right Crew Door
3431CB8	Circuit Breaker, DATA XFER	Aft Overhead Console Panel 4A5	Left or Right Crew Door
3431CB9	Circuit Breaker, VIDEO RCDR	Auxiliary Circuit Breaker Panel 4A8	Left or Right Crew Door
3431J1	Connector, Bus A Test	Aft Electrical Compartment Mounted Horizontally	Aft Electrical Compartment Door
3431J2	Connector, Bus B Test	Aft Electrical Compartment Mounted Horizontally	Aft Electrical Compartment Door
D-60	Change 2		

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431J3	Splice, Weight-On-Gear Switch	Center Post, Left Side Near Floor	Left Access Door
3431J4	Splice, Weight-On-Gear Switch	Center Post, Left Side Near Floor	Left Access Door
3431J5	Connector, Bus A Test	Aft Electrical Compartment Mounted Horizontally	Aft Electrical Compartment Door
3431M1	MFD, CPG	Instrument Panel	Left Crew Door
3431M1P1	Connector, CPG MFD	Connected to J1 on 3431M1	Left Crew Door
3431M1P2	Connector, CPG MFD	Connected to J2 on 3431M1	Left Crew Door
3431M1P4	Connector, CPG MFD	Connected to J4 on 3431M1	Left Crew Door
3431M1P5	Connector, CPG MFD	Connected to J5 on 3431M1	Left Crew Door
3431M2	MFD, Pilot	Instrument Panel	Right Crew Door
3431M2P1	Connector, Pilot MFD	Instrument Panel, Connected to J1 on 3431M2	Right Crew Door
3431M2P2	Connector, Pilot MFD	Instrument Panel, Connected to J2 on 3431M2	Right Crew Door
3431M2P4	Connector, Pilot MFD	Instrument Panel, Connected to J4 on 3431M2	Right Crew Door
3431M2P5	Connector, Pilot MFD	Instrument Panel, Connected to J5 on 3431M2	Right Crew Door
3431M3	Display, Remote Frequency (RFD)	Instrument Panel	Left or Right Crew Door
3431M3P1	Connector, RFD	Instrument Panel, Connected to J1 on 3431M3	Left or Right Crew Door
3431M3P2	Connector, RFD	Instrument Panel, Connected to J2 on 3431M3	Left or Right Crew Door
3431S1	Switch, Pilot INIT	Instrument Panel, Connected to Panel 4A7	Right Crew Door
3431S2	Switch, PITCH	Instrument Panel, Connected to Panel 4A7	Right Crew Door
3431S3	Switch, ROLL	Instrument Panel, Connected to Panel 4A7	Right Crew Door
3431S4	Switch, IMAGE CAPTURE	Instrument Panel, Connected to Panel 5A2	Right Crew Door

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access
3431S5	Switch, INIT/IDM Page	Instrument Panel, Connected to Panel 5A2	Left Crew Door
3431S6	Switch, TIS INTEG	Instrument Panel, Connected to Panel 5A2	Left Crew Door
3431S7	Switch, MMS FXD FWD	Pilot Cyclic Stick 4A1	Right Crew Door
3431S8	Switch, DSPL SEL	Pilot Cyclic Stick 4A1	Right Crew Door
3431S9	Switch, Weight-On-Gear	Forward Crosstube, Center	Underside Fuselage
3431S10	Switch, ALFGL	Instrument Panel, Connected to Panel 5A2	Left Crew Door
3431S11	Switch, DCS-ARE/DSC-ALE	Instrument Panel, Connected to Panel 5A2	Left Crew Door
3431S12	Switch, LMC	Instrument Panel, Connected to Panel 5A2	Left Crew Door
3431S13	Switch, WPN/ASE	Instrument Panel, On Panel 5A2	Left Crew Door
■ 3443A1	Unit, EGI Receiver	Avionics Compartment, Center Floor	Left Access Door
3443A1P1	Connector, EGI Receiver	Connected to 3443A1	Left Access Door
3443A1P2	Connector, EGI Receiver	Connected to 3443A1	Left Access Door
3443A1P4	Connector, EGI Receiver	Connected to 3443A1	Left Access Door
3443A1P6	Connector, EGI Receiver	Connected to 3443A1	Left Access Door
3443CB1	Circuit Breaker, EGI	Aft Overhead Console Panel 4A5	Left or Right Crew Door
3443E1	Antenna, EGI	Top of Tailboom Near Aft End	Direct
3443E1P1	Connector, EGI Antenna	Connected to 3443E1	Direct
■ 3443J1	Tailboom Disconnect, EGI	Tailboom Right Attachment Station	Tailboom Disconnect Right Access Door
■ 3443P1	Tailboom Disconnect, EGI	Tailboom Right Attachment Station	Tailboom Disconnect Right Access Door
3443K1	Relay, EGI	Pilot Console Left Side	Left Access Door
3443XK1	Socket, EGI Relay Connector	Connected to 3443K1	Left Access Door
D-62	Change 2		

Table D-1. Equipment List (Electrical) (Cont)

Reference Designation	Nomenclature	Location	Access	
	data bus couplers do	not have connectors		

D-8. WIRE REPAIR AND REPLACEMENT

1. The following data provides recommended wire replacement part numbers versus wire size requirements. Also, wire construction, wire marking, soldering, wire support, and wire stripping recommendations are presented.

NOTE

- + Insert AWG wire size
- \$ Insert number of conductors 2 through 7
- * Insert number of conductors 1 through 7
- a. Open harness airframe wiring:

Wire Size
AWG 22
AWG 27 through 10
AWG 24

Part Number 140-082-22-9 M81381/12-(+)N M81381/13-(+)N

b. Open harness in high temperature areas (engine compartment):

Wire Size AWG 1 through 0 AWG 22 through 8 Part Number M22759/2-(+)-9 M81381/12-(+)N

c. Shielded twisted wire pair, high capacitance from the ACU to the ground crew ICS connector:

Wire Size AWG 22 **Part Number** 140-013-1

- d. Shielded and jacketed cable in all areas:
- e. Unshielded and unjacketed cable in all areas:

Wire Size AWG 24 through 12 Part Number 30-156-(+)N(\$)

f. Control panels, control sticks or assemblies not part of airframe wiring:

Wire Size
Single Conductor 24 through 10
Multiconductor Shielded Jacketed 24
through 10
Multiconductor Jacketed 24 through 10

Part Number M22759/16-(+)-9 M27500-(+)/TG(*)T15

M27500-(+)TG(\$)U15

2. Wire Type Construction.

a. 140-028-22-9 is constructed of nickel-coated copper of copper alloy with insulation of crosslinked, extruded, modified ethylene-tetrafluoroethylene copolymer. This wire is rated at 600 volts with a maximum continuous operating temperature of 392 °F (200 °C).

D-64 Change 2

- b. M81381/12 is constructed of nickel-plated soft annealed copper with two layers of counter helically-wound fluorocarbon/polyamide (KAPTON) tape and an overcoat of dark opaque yellow modified polyamide resin. This wire is rated at 600 volts with a maximum continuous operating temperature of 392 °F (200 °C).
- c. M81381/13 is the same as M81381/12 except that the conductor is silver plated high strength copper alloy.
- d. M22759/2 is constructed of nickel-plated soft annealed copper with two or more polytetrafluorocarbon (TFE), also referred to as TEFLON, tapes and TFE-coated glass tapes with an overbraid of glass fiber. This wire is rated at 600 volts with maximum continuous operating temperature of 500 $^{\circ}$ F (260 $^{\circ}$ C).
- e. 140-013-1 is constructed of two stranded copper wire conductors. The insulation of one of the conductors is red, and the other is green. This wire is rated at 600 volts with a maximum continuous temperature of 500 $^{\circ}$ F (260 $^{\circ}$ C).
- f. 30-155 is constructed using M81381/8 wire for SWG 22 through 12 and M81381/9 wire for AWG 24. These basic wires are similar to M81381/12 and /13 except that the KAPTON tapes used are thinner. The wire(s) have an overbraid of tin-coated soft annealed copper with an outer jacket of two KAPTON tapes. This cable is rated at 600 volts with a maximum continuous operating temperature of 392 °F (200 °C).
- g. 30-156 is constructed of M81381/12 wire for AWG 12 through 12 and M81381/13 wire for AWG 24.
- h. M22759/16 is constructed of tin-coated soft annealed copper wire with a single extrusion of ethylene-tetrafluoroethylene copolymer (ETFE), also referred to as TEFZEL. This wire is rated at 600 volts with a maximum continuous operating temperature of 302 °F (150 °C).
- i. M27500(+)TG(*)T15 is constructed using basic wire M22758/18 with a tin-coated soft annealed copper conductor. The wire(s) have an overbraid of tin-coated soft annealed copper with an outer jacket of ETFE. M22759/18 is similar to M22759/16 except for thinner wall insulation.
 - j. M27500-(+)TG(*)U15 is the same as M27500-(+)TG(*)T15 except the copper braid is omitted.

3. Wire Stripping.

- a. Before any wire can be assembled to connectors, terminals, splices, etc., the insulation must be stripped from the connecting ends to expose the bare conductor. While stripping wire insulation is the most common operation in electrical maintenance, it probably receives the least care. With insulations as thin as 0.006 inch (0.127 mm), ringing the wire with a pocket knife will invariably cut or nick strands.
- b. BH 110 electrical connector kit contains two plier-type hand stripper frames, one for stripping KAPTON wire and one for stripping other types of wire. Plier-type hand strippers are the easiest and most reliable to use, but only if equipped with the proper blades. Blades designed for use with PVC, TEFLON or any heavy wall insulation will not perform satisfactorily with KAPTON. Stripper blades designed for KAPTON, however, will perform excellently on the thicker wall insulating materials.
- c. For all insulating materials except KAPTON, make a cut around the wire at the desired strip length. Do not cut completely through the insulation. Make a second cut lengthwise along the stripping length, again do not cut completely through the insulation. Peel off the insulation following the lay of the strands. When stripping M22759/2 wire, the insulation will not easily peel off due to the counterwound tape construction. After the outer glass fiber braid is removed, the tapes can easily be unwrapped one layer at a time.

d. KAPTON insulations are best removed by nicking the insulation to about 1/2 its thickness and flexing at the nick (approximately ± 45 degrees). The insulation will separate completely around the wire. This method is recommended for removing the outer jacket from 30 - 155 cable.

NOTE

Lengthwise scratches on the conductor strands are not considered cause for rejection or rework.

e. After the wire has been stripped, it should be inspected for nicked or broken strands. Maximum allowed number of damaged strands is given below.

AWG SIZE	TOTAL ALLOWABLE NICKED
	OR BROKEN STRANDS
24 through 14	NONE
12	1
10	2
8	4
	CAUTION

Do not use sleeves to change identification of wire cable which has already been marked, except in case of spare wires in potted connectors.

4. Wire Marking. Hot stamp marking machine imprinting is the most widely accepted method of identifying wire. Good marking is obtained only by the proper combination of temperature, pressure, dwell and foil type and is arrived at by trial. TEFLON insulated wires cannot be marked by the hot stamp process. These wires must be identified by imprinting the wire number on plastic sleeving and installing over the outer covering at each terminating end. When stamping any wire, always use minimum pressure and temperature. This is most important when imprinting KAPTON insulated wire. As stated before, regarding wire stripping, KAPTON is notch sensitive; any cut or nick in the insulation will break the insulation under flexing conditions. Cuts or nicks most frequently occur when imprinting numbers containing a dash (-) or Numeral No. 1. After determining the minimum temperature and pressure to obtain an imprint on the KAPTON insulated wire, a sample should be wrapped about a mandrel with the imprint to the outside and examined visually for any cracks in the insulation. Mandrel sizes should be as follows:

WIRE SIZE	MANDREL DIAMETER
24, 22, 20	0.125 in.
18, 16	0.250 in.
14, 12, 10	0.350 in.

5. Spacing of Stamped Marks.

- a. Stamp wires and cables at intervals of not more than 15 inches along their entire length.
- b. Stamp wires within 3 inches of each junction (except permanent splices) and at each terminating point.
 - c. Stamp wires which are 3 to 7 inches long in the center.
 - d. Wires less than 3 inches long need not be stamped.

6. Soldering.

- a. Tin-coated and silver-plated conductors present no unusual problems where soldering is required. Common 60/40 resin solder will produce an acceptable solder joint. With nickel-plated conductors, an active flux solder or the addition of an active flux will help in producing a reliable solder joint.
- b. Care should be used in soldering to prevent excessive wicking of solder under the insulation. Excessive wicking can be determined by visually examining the solder connection. If the contour of the individual strands of the conductor is not visible below the termination of the insulation, excessive wicking has occurred.
- 7. Wire Support. Conductor breakage can be virtually eliminated with care and attention to the area of wire termination.
- a. Wire must be routed and clamped such that under vibration or maintenance conditions, any flexing of the wire will not occur at the termination of the insulation.
- b. Crimp contact connectors should have either a strain relief or a rubber sealing grommet on the rear of the connector.
- c. When installing crimp terminals, always be sure that the wire is installed far enough in the terminal that after crimping the insulation grip of the terminal has contacted the wire insulation.

CAUTION

Care should be taken where a solder termination is required on any device mounted in the airframe. Wire breakage at solder joints is usually due to the fact that small gage wire is used and poor soldering techniques result in excessive wicking of the solder under the wire insulation.

d. Before making the solder connection, place a suitable piece of heat shrinkable sleeving over the wire. After soldering, slide the sleeving over the soldered joint as far as practical and shrink it to its minimum recovery diameter.

8. Wire Routing and Grouping.

- a. Interconnecting KAPTON wiring can provide conditions creating EMI (electromagnetic interference) due to sensitive circuits being routed in close proximity to each other. Wiring for these sensitive circuits has been grouped into eight categories, and clamping arrangements are designed to eliminate or minimize EMI.
- b. When maintaining or repairing wires, it is necessary to maintain the original wire clamping and routing design in order not to induce EMI into the sensitive avionic system circuits. Route and clamp replacement wires by category (i.e., category (2) with other category (2) wires) through original clamps. Category number (1) through (8) appears at the end of each wire number.
- c. Refer to TM 1-1520-248-23, Appendix F, for location of the clamping and categories for OH-58D/OH-58D(R) helicopters.

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APPENDIX E

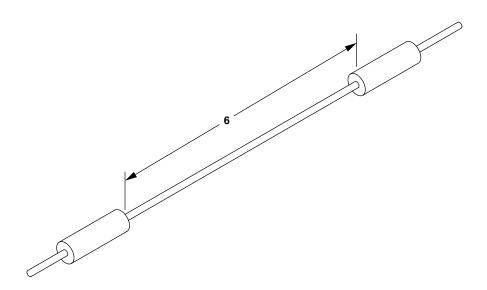
ILLUSTRATED LIST OF MANUFACTURED ITEMS (AVUM, AVIM)

This appendix includes complete instruction for making items authorized to be manufactured or fabricated at aviation unit maintenance (AVUM), aviation intermediate maintenance (AVIM), and repair parts and special tools list (RPSTL). These items shall bear MO and MF source codes.

A part number index, in alpha numeric order, is provided for cross-referencing the part number of an item to be manufactured or fabricated to the figure which covers the fabrication criteria for that item. All bulk materials needed for manufacture or fabrication of an item are listed by part number, specification, and/or national stock number (NSN) in a tabular list on the illustration.

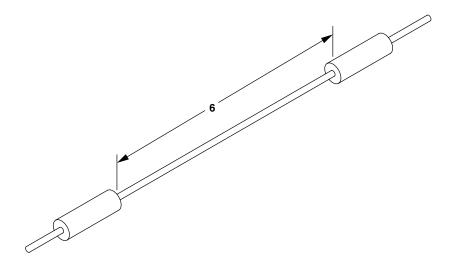
PART NUMBER INDEX

PART NUMBER	NUMBER
Work Aid, Jumper Wire, Engine Bypass Solenoid Valve and Fuel Pressure Switch	E-1
Work Aid, Jumper Wire, NVG	E-2
Work Aid, Jumper Wire, Temperature Switch to Airframe or 1TB1-1 to Airframe	E-3
Work Aid, Pitot-Static Tube Extension	E-4
Work Aid, Tubing, Flexible, PVC Fuel and Oil Resistant	E-5



PART NUMBER	ITEM NAME	FABRICATE FROM
WORKAID	JUMPER WIRE, ENGINE BYPASS SOLENOID VALVE AND FUEL PRESSURE SWITCH (QTY 2)	
M81381/12-22-N OR	WIRE	NSN 6145-01-101-6168
140-028-22-9		NSN 6145-01-157-0937
M39029/29-16-16 OR	PIN, ELECTRIC CONTACT	NSN 5999-01-068-2590
M39029/22-212	(QTY 2)	
	NOTE	
	Dimensions are in inches.	
		406961-1401-126
		.10403

Figure E-1. Work Aid, Jumper Wire, Engine Bypass Solenoid Valve and Fuel Pressure Switch

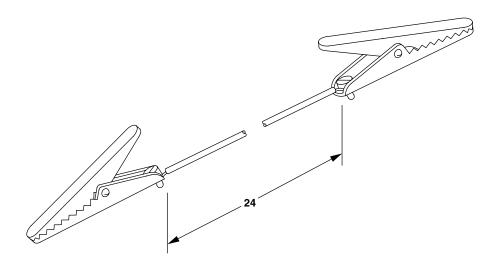


PART NUMBER	ITEM NAME	FABRICATE FROM
WORKAID	JUMPER WIRE, NVG	
M81381/12-22-N OR	WIRE	NSN 6145-01-101-6168
140-028-22-9		NSN 6145-01-157-0937
MS90461A23-22	PIN, ELECTRIC CONTACT	NSN 5999-00-484-5391
M39029/56-348 OR	PIN, ELECTRIC CONTACT	NSN 5999-01-106-7076
MS27490-22D	·	NSN 5999-00-473-3551

NOTE Dimensions are in inches.

406961-1401-120 J0403

Figure E-2. Work Aid, Jumper Wire, NVG

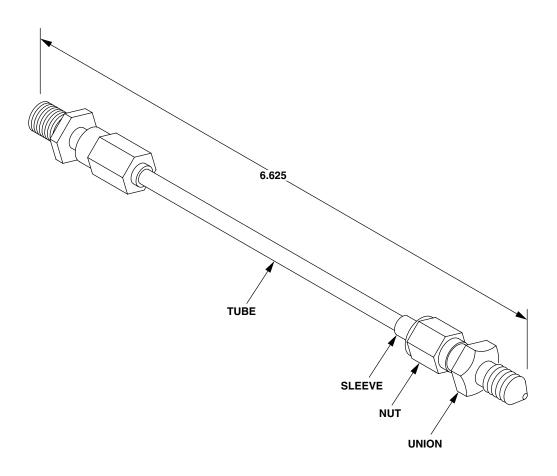


PART NUMBER	ITEM NAME	FABRICATE FROM
WORKAID	JUMPER WIRE, TEMPERATURE SWITCH TO AIRFRAME OR 1TB1-1 TO AIRFRAME	
TC OR TCM, SPEC. W-C-440B	CLIP, ELECTRICAL (QTY 2)	NSN 5999-00-501-8365
M81381/12-22-N OR 140-028-22-9	WIRE	NSN 6145-01-101-6168 NSN 6145-01-157-0937

NOTE Dimensions are in inches.

406961-1401-125 J0403

Figure E-3. Work Aid, Jumper Wire, Temperature Switch to Airframe or 1TB1-1 to Airframe



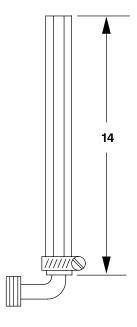
PART NUMBER	ITEM NAME	FABRICATE FROM
WORKAID	PITOT-STATIC TUBE EXTENSION	
MS21921-4	NUT	NSN 4730-00-554-8015
AN818-43	NUT	NSN 4730-00-287-0289
AN832-4	UNION	NSN 4730-00-277-6458
MS21924-4	UNION	NSN 4730-00-541-1750
MS21922-4	SLEEVE (QTY 2)	NSN 4730-00-580-7471
MIL-T-6845	TUBE	NSN 4710-00-825-5894

NOTE

Dimensions are in inches.

406961-1401-140 J0403

Figure E-4. Work Aid, Pitot-Static Tube Extension



PART NUMBER	ITEM NAME	FABRICATE FROM
130-038-26-28	TUBING, FLEXIBLE, PVC FUEL AND OIL RESISTANT	NSN 4720-01-173-1212
AN833-10	ELBOW, FLARED TUBE	NSN 4730-00-203-3477
AN737-30	CLAMP, HOSE, AIRCRAFT	NSN 4730-00-278-0649

NOTES

- 1. Dimensions in inches.
- 2. No leaks allowed.

406961-1401-337 J1274

Figure E-5. Work Aid, Tubing, Flexible, PVC Fuel and Oil Resistant

APPENDIX F

FAULT DETECTION LOCATION SYSTEM (FDLS) FAILURE CODES

F-1. | FDLS FAILURE CODES

This appendix contains a listing of the FDLS Fault Codes for OH-58D and OH-58D(R) helicopters.

NOTE

When multiple faults are indicated, replace or repair one unit at a time. If replacement or repair of first unit does not clear the fault, remove (if no repair was required) and install the original unit. Replace or repair the second unit. If replacement or repair of second unit does not clear the fault, install the original unit. Proceed through replacement or repair of multiple units utilizing this procedure.

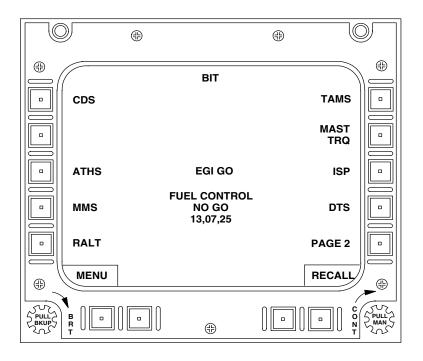
F-2. BUILT-IN TEST (BIT)

An operator calls up the built-in test (BIT) page 1 (see Figures F-1 and F-2) from the FDL MENU page by pressing line address key L1. The helicopter must be on the ground to access this page. The BIT page provides control and display of built-in fault detection and location.

R There are four BIT pages, each accessed by pressing L5 on the current BIT page. Pressing L5 on BIT page 4 returns the operator to BIT page 1.

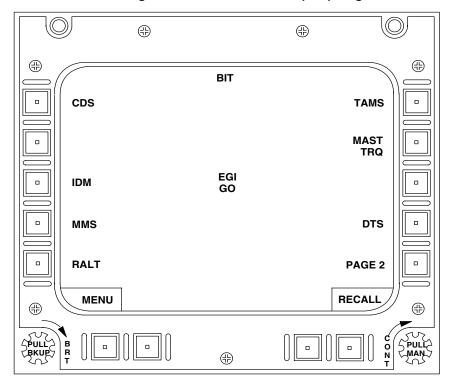
When BIT page 1 is called up, the result of the continuously running EGI BIT is displayed in the center of the screen. All other BITs must be initiated by the operator as described in subsequent paragraphs. In some cases a fault code is identified along with a NO GO status.

The ability to communicate with each subsystem through the helicopter wiring is verified when any BIT is selected. If the CDS is unable to communicate with a subsystem, a failure is noted and NO GO is displayed. When a NO GO condition exists, in some cases, fault codes are displayed below the NO GO status. An exit to FDL MENU is made by pressing the mode select key labeled MENU. The operator exits to INITIAL PAGE 1 by pressing the INIT button on the pilot or CPG auxiliary panel. Leaving the BIT page causes GO/NO GO conditions and fault codes to be cleared from the page.



406075-1618-1-T J1674

Figure F-1. Built-In Test (BIT) Page



406075-1478-1 J1008

Figure F-2. R Built-In Test (BIT) Page

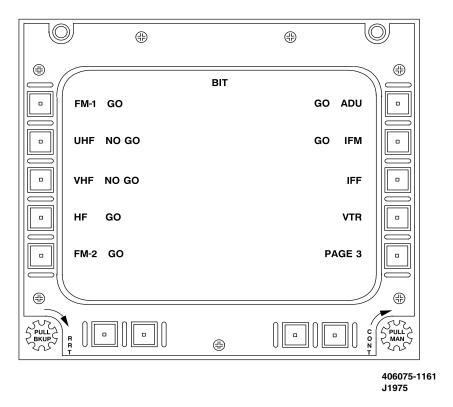


Figure F-3. BIT Page 2 with Test Results

TM 1-1520-248-T-1

The BIT functions and their respective paragraphs are:

BIT	<u>PARAGRAPH</u>
LAST FLIGHT RECALL	F-8
R LAST FLIGHT RECALL	F-10
EGI BIT	F-17
FUEL CONTROL BIT	F-17
R FADEC MONITOR	F-20
R ENGINE HISTORY 1	F-23
R ENGINE HISTORY 2	F-25
R ENGINE HISTORY 3	F-27
R R3 ENGINE BIT	F-28
CDS BIT	F-31
ATHS BIT	F-32
R IDM BIT	F-33
MMS BIT	F-33
RADAR ALTIMETER BIT	F-35
TAMS BIT	F-35
MAST TORQUE BIT	F-35
ADU BIT	F-36
IFM AMPLIFIER BIT	F-36
RADIO BIT	F-36
R FM AN/ARC-201D BIT	F-36
HF RADIO BIT	F-37
SCAS BIT	F-38
IFF BIT	F-39
ISP BIT	F-40
DTS BIT	F-40
VTR BIT	F-41
MUX BUS STATUS	F-41
R MUX BUS STATUS	F-42

Each digit of the fault code indicates the failure status for four built-in tests. See Table F-1 and R Table F-2 to learn which self-tests have failed. Compare each digit with the table. An X indicates a built-in test has failed. The number 3 in the first digits indicates tests 12 and 13 have failed. The following are examples of typical fault codes and the built-in tests they indicate as having failed.

TYPICAL FAULT CODE	BUILT-IN TESTS FAILED
0040	06
1010	12, 04
A108	15, 13, 08, 03
4230	14, 09, 05, 04

R TYPICAL ALL CODE	BUILT-IN TESTS FAILED
0040	06
1010	12, 04
A108	15, 13, 08, 03
4230	14, 09, 05, 04
0C30	11, 10, 05, 04
F000	15, 14, 13, 12

△ Use Table F-1 to Decode.

NOTE

Table F-2 applies to LAST FLIGHT RECALL only, which contains an eight digit fault code.

R TYPICAL FAULT CODE	BUILT-IN TESTS FAILED
10064200	28, 18, 17, 14, 09
1E900000 81002D00	28, 27, 26, 25, 23, 20 31, 24, 13, 11, 10, 08
AC000010	31, 29, 27, 26, 04

NOTE

This table also applies to R R/3 ENG BIT.

Table F-1. Fault Code Conversion

		FIRST	DIGIT	-	S	ECON	D DIG	IT		THIRD	DIGIT	-	F	OURT	H DIG	IT
DIGIT DISPLAY		Tests	Failed													
2.0. 2	15	14	13	12	11	10	09 08		07	06	05	04	03	02	01	00
0																
1				Х				Х				Х				Х
2			Х				Х				Х				Х	
3			Х	Х			Х	Х			Х	Х			Х	Х
4		Х				Х				Х				Х		
5		Х		Х		Х		Х		Х		Х		Х		Х
6		Х	Х			Х	Х			Х	Х			Х	Х	
7		Х	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х
8	Х				Х				Х				Х			
9	Х			Х	Х			Х	Х			Х	Х			Х
Α	Х		Х		Х		Х		Х		Х		Х		Х	
В	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х
С	Х	Х			Х	Х			Х	Х			Х	Х		
D	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х		Х
E	Х	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х	
F	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х

(TABLE I.D. 910516)

TM 1-1520-248-T-1

Table F-2. Fault Code Conversion (Last Flight Recall Only)

DIGIT	F	IRST	DIG	iIT	SECOND DIGIT			Т	HIRE	DIC	TIE	FOURTH DIGIT					IFTH	, DIG	SIT	s	IXTE	, DIC	TIE	SEV	/EN	ŢH D	IGIT	EIGHTH DIGIT					
DISPLAYED	T	ests	Faile	ed	T	ests	Faile	ed	T	Tests Failed			Tests Failed				(1	ests	Fail	led	T	ests	Fail	led	T	ests	Fail	ed	Tests Failed				
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	
0																																	
1				х				х				x				х				х				х				х				х	
2			х				х				х				х				х				х				х				х		
3			х	х			х	х			х	х			х	х			х	х			х	х			х	х			х	х	
4		х				х				х				X				х				х				х				х			
5		х		х		х		х		х		х		х		х		X		х		х		х		х		х		x		x	
6		х	х			х	х			x	х			х	x			х	х			х	х			х	х			х	х		
7		х	х	х		х	х	х		x	х	x		х	х	х		Х	x	x		Х	х	х		х	х	x		x	X	x	
8	х				х				х				х				х				х				х				х				
9	х			х	х			х	х			х	X			x	х			x	х			х	х			х	х			х	
Α	х		х		х		х		х		х		x		х		x		х		х		х		х		х		х		х		
В	х		х	х	х		х	х	х		х	х	х		х	х	x		х	х	х		х	х	х		х	х	х		х	x	
С	х	х			х	х			х	х			х	х			х	х			х	х			x	х			х	х			
D	х	х		х	х	Х		х	х	х		х	х	х		х	х	х		х	х	х		х	х	х		х	х	х		х	
E	х	х	х		х	х	х		х	х	х		х	х	х		х	х	х		х	Х	х		х	х	х		х	х	х		
F	х	х	х	х	х	х	х	х	Х	х	х	Х	X	х	х	х	Х	х	х	х	Х	Х	х	Х	X	х	х	х	Х	х	х	х	

406075-1532-1 J2810

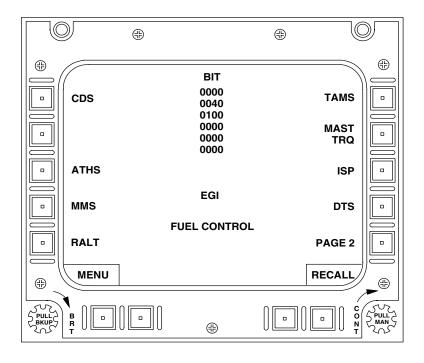
Table F-2. Fault Code Conversion

21012		FIRST	DIGIT	-	S	ECON	D DIG	IT		THIRD	DIGIT		F	OURT	H DIG	IT
DIGIT DISPLAY		Tests	Failed													
	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0																
1				Х				Х				Х				Х
2			Х				Х				Х				Х	
3			Х	Х			Х	Х			Х	Х			Х	Х
4		Х				Х				Х				Х		
5		Х		Х		Х		Х		Х		Х		Х		Х
6		Х	Х			Х	Х			Х	Х			Х	Х	
7		Х	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х
8	Х				Х				Х				Х			
9	Х			Х	Х			Х	Х			Х	Х			Х
Α	Х		Х		Х		Х		Х		Х		Х		Х	
В	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х
С	Х	Х			Х	Х			Х	Х			Х	Х		
D	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х		Х
E	Х	Х	Х		Х	Х	Х		Х	Х	Х		Х	Х	Х	
F	Х	Х	Х	Х	Х	Х	Х	Х	х	Х	Х	Х	Х	Х	Х	Х

(TABLE I.D. 910516)

F-3. LAST FLIGHT RECALL

Selecting the RECALL button will bring up the RECALL Page (Figure F-4). The recall data shows failures for the SCAS, Navigational System, and CDS when a normal engine shutdown was performed at the end of the last flight. There are 66 possible tests. A fault code appears as a hexadecimal number. Five 4-digit fault codes are displayed along with a sixth unusable code of 0000.



406075-1618-3-T J1674

Figure F-4. Recall Page

The fault codes provide information on built-in test as follows:

*TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 1)	(REPLACE)	
01 02 03 04 05 06 07 08 09 10 11 12 13	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	Processor Test Failure ROM Check Sum Failure A/D + 15 Vdc Invalid + 14 Vdc Invalid 1553 Data Wraparound Invalid RTI Fail Line Test ± 10 Vdc Ref Failed 15 Vdc AET Failed Data Bus Test #1 Failure Data Bus Test #2 Failure Data Bus Test #3 Failure UART Wraparound Failure Type G Radio Output Failure Type AA Radio Output Failure
15	Discrete Deleted	Type F Radio Output Failure

A Refer to TM 1-1520-248-T-3, Chapter 5 MAPS Diagrams.

^{*} Spare TEST NUMBERS are not called out.

*TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 2)	(Replace)	
00	EGI	EGI Data Not Changing
01	Discrete Deleted	EGI Validity Discrete (Hard Wire)
02	EGI .	EGI Validity Discrete Invalid (1553)
03	5-6-9 ሷ	EGI/Gyro Roll Rate Mistrack
04	5-6-7 ሷ	EGI/Gyro Pitch Rate Mistrack
05	5-6-11 🛕	EGI/Gyro Yaw Rate Mistrack
06	5-6-11 🛕	Second Yaw Rate Mistrack
07	5-6-20 🗘	Pitch Stick Inputs Mistrack
08	5-6-14 🗘	Roll Stick Inputs Mistrack
09	5-6-15 🗘	Pedal Inputs Mistrack
11	5-6-16 🔼	Collective Stick Inputs Mistrack
13	5-3-4 🗘	Airspeed Input Mistrack
14	5-4-46 🛆	Engine Torque Input Invalid
15	MCPU	SCAS Summed Wraparound Invalid

⚠ Refer to TM 1-1520-248-T-3, Chapter 5 MAPS Diagrams. * Spare TEST NUMBERS are not called out.

*TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 3)	(Replace)	
00 01 02 03 04 05 06 10 11 12 13 14	5-1-51 1 MCPU 5-6-6 1 5-6-5 1 5-6-11 1 5-6-17 1 5-6-20 1 5-6-21 1 5-6-21 1 5-6-17 1 5-6-17 1	26 Vac Ref Failed ± 5 Vac Failed Left Cyclic Model Mistrack Right Cyclic Model Mistrack Yaw Model Mistrack Second Yaw Model Mistrack Trim Rate Model Mistrack P/R Latch W/A Discrete Invalid Yaw Latch W/A Discrete Invalid P/R Solenoid W/A Discrete Invalid Yaw Solenoid W/A Discrete Invalid Trim Brake/Spare W/A Discrete Invalid Trim/Clutch Transformer Rectifier Unit
		Control W/A Discrete Invalid

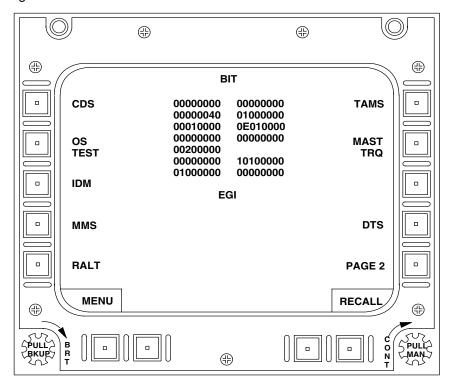
⚠ Refer to TM 1-1520-248-T-3, Chapter 5 MAPS Diagrams * Spare TEST NUMBERS are not called out.

TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 4)	(REPLACE)	
00 01 02	MCPU	SCAS Discrete Output BIT Pattern Invalid
03 04	No Action Required MCPU	EGI Not Aligned Power Supply Over Temperature

TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 5)	(Replace)	
01	Right MFD	Right MFD 1 Failed
02	Left MFD	Left MFD 2 Failed
03	MFK	MFK Data Stream Check — Sum Valid
04	MFK	MFK Indicators Failed
05	MFK	MFK Test Pattern Invalid
06	MCPU	MUX #1 Test Failed
07	MCPU	MUX #2 Test Failed
08	MCPU	MUX #3 Test Failed
09	MCPU	MUX #4 Test Failed
10	MCPU	MUX #5 Test Failed
11	MCPU	MUX #6 Test Failed
12	MCPU	MUX #7 Test Failed
13	MCPU	+5 Vdc Test Failed
14	MCPU	MMS Failed

F-4. R LAST FLIGHT RECALL

Selecting the RECALL button will bring up the RECALL Page (Figure F-5). The recall data shows failures for the SCAS, Navigational System, and CDS when a normal engine shutdown was performed at the end of the last flight. There are 212 possible tests. A fault code appears as a hexadecimal number. There are a total of 13 8-digit fault codes in a two column format.



406075-1478-2 J1008

Figure F-5. R Recall Page

If the CPG MFD RECALL bezel is pressed, the status of the left (921) MCPU is displayed on the left MFD. Pressing the RECALL bezel on the pilots MFD displays the status of the right (940) MCPU on the right MFD.

The information is displayed in the center of the page above the EGI status. If no faults exist the data appears on the applicable display as the following:

0000 0001	0000 0001
0000 0001	0000 0001 🛆
0000 0001	0000 0001
0000 0001	0000 0001
0000 0001	
0000 0001	0000 0000
0000 0001	0000 0000

△ 0000 0081 and 1000 0081 are also acceptable.

Each fault code corresponds to one MCPU CCA. To determine which CCA is represented by each word, match the position of each eight character word shown on figure F-5 with the corresponding position in the CCA listing below:

ASE CCA
RMS CCA
VTR CCA
VDU CCA
SCAS BIT
MISC BIT

Since the weapons, ASE and RMS CCAs are only in the right MCPU, the text NOT INSTALLED is reported for these CCAs on the left MFD. The same is true for the VTR and VDU CCAs, when the right MCPU status is reported. Refer to Table F-2 for hexadecimal to test number conversion. The fault codes provide information on built-in tests as follows:

*TEST NUMBER (FAULT CODE 1) 1960CPU CCA	ACTION ITEM (REPLACE)	TEST DESCRIPTION
01 02 03 04 05 06 07 08 15 16 17 18 19 20 21	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	WDT Fail RTC Fail Global Bus Fail Flash Checksum Fail Fault Fail CPU Fail NVM Fail Not Installed Partial RAM Test Fail 10ms Task Overrun 20ms Task Overrun 80ms Task Overrun 160ms Task Overrun 320ms Task Overrun
31	MCPU	Power-up RAM Test Fail

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 2) 1553 BIOC CCA	(Replace)	
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	Term 2 Bus B Encoder Fail Term 2 Bus A Encoder Fail Term 2 Bus B Data Fail Term 2 Bus A Data Fail Term 2 Bus Seq Fail Term 2 Pri Seq Fail Term 2 FIFO Fail Term 2 Fail Safe Time Fail Term 2 Terminal Address Parity Term 2 Self Test Fail Term 2 Init Regs Fail Term 2 RAM Fail Term 2 EEPROM Fail Term 1 Bus B Encoder Fail Term 1 Bus B Data Fail Term 1 Bus A Data Fail Term 1 Bus Seq Fail Term 1 Pri Seq Fail Term 1 FIFO Fail Term 1 Fail Safe Time Fail
23 24	MCPU MCPU	Term 1 Self Test Fail Term 1 Init Regs Fail
25 26	MCPU MCPU	Term 1 RAM Fail Term 1 EEPROM Fail
27	MCPU	Not Installed

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 3) Digital I/O CCA	(Replace)	
01	MCPU	Tach Test
02	MCPU	Discrete Test
03	MCPU	UART Test
04	MCPU	KY-58 Test
05	MCPU	MPM Test
06	MCPU	Not Installed

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 4) Analog I/O CCA	(Replace)	
01	MCPU	Not Installed
02	MCPU	MPM Test
03	MCPU	MUX BIT
04	MCPU	Sequencer Failure

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	ACTION ITEM TEST DESCRIPTION	
(FAULT CODE 5) ADSS I/O CCA	(Replace)		
01	MCPU	Not Installed	
02	MCPU	EEPROM Test	
03	MCPU	Cathode Test	
04	MCPU	Anode Test	
05	MCPU	RAM Page 1 Clear Test	
06	MCPU	RAM Page 0 Clear Test	
07	MCPU	RAM Page 1 Write Test	
08	MCPU	RAM Page 0 Write Test	

^{*} Spare TEST NUMBERS are not called out.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 6) Sym Gen CCA	(Replace)	
91 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	SG1 Not Installed SG1 Tri Port RAM Failure SG1 Pong Delay Exceeded SG1 RAM Data SG1 RAM Address SG1 Multi Port RAM Data SG1 Multi Port RAM Address SG1 Checksum SG1 VRAM Data SG1 VRAM Data SG1 VRAM Output SG1 Color Register SG1 VRAM Output SG1 DAC Palette SG1 Incorrect CPU Triport Patterns Tests Completed SG2 Not Installed SG2 Tri Port RAM Failure SG2 Pong Delay Exceeded SG2 RAM Data SG2 RAM Address SG2 Multi Port RAM Data
23 24	MCPU MCPU	SG2 Multi Port RAM Address SG2 Checksum
25	MCPU	SG2 VRAM Data
26 27 28	MCPU MCPU MCPU	SG2 VRAM Address SG2 SYNC Interrupt SG2 Color Register
29 30 31	MCPU MCPU MCPU	SG2 VRAM Output SG2 DAC Palette SG2 Incorrect CPU Triport Patterns

R *TEST NUMBER	ST NUMBER ACTION ITEM TEST DESCRIPTION OF THE STREET TEST DESC	
(FAULT CODE 7) Weapons CCA	(Replace)	
01	MCPU	Not Installed
02	MCPU	RAM Fault
03	MCPU	Output Discrete Fault
04	MCPU	BIT Volt 5 Fault
05	MCPU	BIT Volt 4 Fault
06	MCPU	BIT Volt 3 Fault
07	MCPU	BIT Volt 2 Fault
08	MCPU	BIT Volt 1 Fault
09	MCPU	Analog Out Sum Fault

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 8) ASE CCA	(Replace)	
01 03 04 05 06 07 08 09 11 12	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	Not Installed Tone Generator Type CW Fault Type CN Fault Type CK Fault Type DQ Fault Type CE Fault Type CD Fault Type CG Fault Type CH Fault Type CX Fault
14 15	MCPU MCPU	Type CF Fault Type CA Fault

^{*} Spare TEST NUMBERS are not called out.

(FAULT CODE 9) RMS CCA	ACTION ITEM (Replace)	TEST DESCRIPTION
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	Not Installed Test Time-out RAM Test Fail Flag 320C40 #1 RAM Checksum 320C40 #2 RAM Checksum 34020 RAM Checksum MDU Receptacle Cache RAM #2 Memory Cache RAM #1 Memory 34020 Multiport 320C40 #2 Multiport 320C40 #1 Multiport FFM1 Memory FFM2 Memory DAC 320C40 #2 34020 VRAM 320C40 #1 Interrupt 320C40 #2
18	MCPU	320C40 #2 Interrupt 320C40 #1

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION		
19	MCPU	320C40 #1 Interrupt 34020		
20	MCPU	320C40 #2 Interrupt 34020		
21	MCPU	320C40 COMM Port #2		
22	MCPU	320C40 COMM Port #1		
23	MCPU	34020 EEPROM Checksum		
24	MCPU	320C40 EEPROM Checksum		
25	MCPU	34020 Interrupt C40 #2		
26	MCPU	34020 Interrupt C40 #1		
27	MCPU	320C40 #1 34020 VRAM		
28	MCPU	MDU Cartridge		
29	MCPU	320C40 #2 RAM Memory		
30	MCPU	320C40 #1 RAM Memory		
31	MCPU	34020 RAM Memory		
R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION		
(FAULT CODE 10)	(Replace)			

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 10) VTR CCA	(Replace)	
01 02 03 05 06 07 08 09 10	MCPU MCPU MCPU MCPU MCPU MCPU MCPU MCPU	Not Installed Continuous BIT Count LSB Continuous BIT Count MSB RS-422 Wrap Test GP2/GP1 Communication Fail GP1/GP2 Communication Fail GP2 Display Interrupt GP1 Display Interrupt GP2 EEPROM Checksum GP1 EEPROM Checksum
12 13 14	MCPU MCPU MCPU	GP2 Video RAM GP1 Video RAM GP2 RAM
15	MCPU	GP1 RAM

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 11) VDU CCA	(Replace)	
01	MCPU	VTR Not Installed
02	MCPU	VDU Not Installed
03	MCPU	PBI Init Timeout
04	MCPU	PBI Test Timeout
05	MCPU	VDU BIT Timeout
06	MCPU	Shared RAM Failure
16	MCPU	PBI Fail
17	MCPU	VDU RAM Fail
18	MCPU	VDU EEPROM Fail
19	MCPU	VDU Discrete Fail
20	MCPU	VTR Installed
24	MCPU	Wrap-Around Fail

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 12) SCAS BIT CCA	(Replace)	

NOTE

Replace the shown helicopter LRU with a known good one first. If the problem still exists, the fault is airframe related: proceed with the map as indicated.

00 01 02 03	MCPU**N-227 MCPU**N-220 MCPU**N-221 MCPU	Cyclic FA Pos Sensor Fail Cyclic LAT Pos Sensor Fail Pedal Pos Sensor Fail Collective Pos Sensor Fail
04	MCPU**N 015	Summed Analog Out WA Fail
05 06	MCPU**N-215 MCPU**N-214	Left Cyclic Model Mistrack Right Cyclic Model Mistrack
07	MCPU	First Yaw Model Mistrack
08	MCPU**N-218	Second Yaw Model Mistrack
09	MCPU**N-223	Trim Rate Model Mistrack
10	MCPU	Ref 9 and 5 Volts Fail
11	MCPU	Positive 15 Volts Fail
12	MCPU**N-224	Primary 26 VAC Fail
13	MCPU/EGI	EGI Not Responding on Bus
14	MCPU/EGI	EGI Not Aligned
15	MCPU/EGI	EGI Invalid
16	MCPU	EGI Gyro Roll Rate Mistrack
17	MCPU	EGI Gyro Pitch Rate Mistrack
18	MCPU	EGI Gyro Yaw Rate Mistrack
19	MCPU**N-218	Second Yaw Rate Mistrack
20	MCPU**N-14	Airspeed Input Invalid
21	MCPU**N-135	Engine Torque Invalid

^{*} Spare TEST NUMBERS are not called out.

R *TEST NUMBER	ACTION ITEM TEST DESCRIPTION			
(FAULT CODE 13) MISC BIT	(Replace)			
00	MCPU	GBI Timeout		
01	MCPU	CPU Fault		
16	KBU	KB Data Is Bad		
17	KBU	KB Toggle Fail		
18	KBU	KB Test BIT Fail		
19	MCPU	KU Bus Fail		
20	MCPU	ARINC Bus Fail		

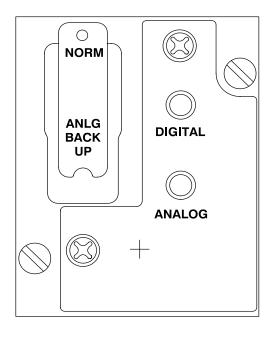
^{*} Spare TEST NUMBERS are not called out.

F-5. EGI BIT

A GO or NO GO condition is indicated at the center of the display when the BIT page is called up. No operator interaction is required.

F-6. FUEL CONTROL BIT

The operator presses the DIGITAL test switch on the Fuel Control Test Panel (Figure F-6) to call up the results of a continuously running fuel control BIT.



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Figure F-6. Fuel Control Test Panel

The words GO or NO GO appear on the line below FUEL CONTROL when the BIT is completed (Figure F-1). If a NO GO condition is indicated, fault codes (Table F-3) are displayed on the line below. There are 28 possible fault codes. A fault code appears as a two-digit number. Multiple fault codes are separated by commas with four fault codes per line. Only the first eight fault codes generated will be displayed. The fault codes are as follows:

Table F-3. ESC FAULT CODE LIST

Code	Fault	Eng Cont	O'Speed Protect	Analog Gov	Notes
00 🗘	No PWR ESC	M	No	No	1
01 🗘	End of MSG not Rec'd	UNK	UNK	UNK	2
11 🗘	NP A vs B	D	A/D	Av	9
12 🗘	NG A vs B	D	A/D	Av	10
13 🗘	NP B	D	A/D	Av	3,9
14 🗘	NP A	D	D	No	3,9
15 🗘	NG B	D	A/D	Av	10
16 🗘	NG A	D	A/D	Av	10
21	Internal	Α	Α	Op	4,5,6
22	Internal	Α	Α	О́р	4,5,6
23	Internal	M	A/D	No	4,5,6
24 🗘	PY TM coil open		A/D	No	4,5,7,11
25 🗘	PY TM coil	M	A/D	No	4,5,7,11
26	Internal	M	A/D	No	4,5,6
31 🛕	Internal	D	No	Av	12
32 🛆	TGT	D	A/D	Av	4,13
33	PA	D	A/D	Av	5,6,8
34 🗘	Collective Pitch	D	A/D	Av	5,14
35	Internal	Α	Α	Op	4,5,6
36	Internal	Α	Α	O ^ʻ p	4,5,6
41	Internal	Α	Α	O ^ʻ p	4,5,6
42	Internal	Α	A/D	Ор	4,5,6
43	Internal	Α	A/D	Op	4,5,6
44	Internal	D	A/D	Op	6
45	Internal	D	A/D	Op	6
54	Internal	D	A/D	Op	
55	Internal	Α	Α	Op	4,5,6
56	Internal	Α	Α	Op	4,5,6
61	Internal	Α	Α	Op	4,5,6
62	Internal	Α	Α	Op	4,5,6
	Digital Power Loss	Α	Α	Op	4,5
	Complete Power Loss	М	No	No	4,5

A Perform troubleshooting using maintenance manuals for the appropriate signal required prior to replacing the Electronic Supervisory Control Unit.

NOTES:

- 1. Power not reaching ESC, check wiring for continuity.
- 2. Possible MCPU or ESC problem, replace/test MCPU, if ok replace ESC.
- 3. Loss of signal will cause loss of analog govenor control.
- 4. Start temperature limiting not available.
- 5. System performance degraded.
- 6. Replace Electronic Supervisory Control (ESC).
- 7. Replace Fuel Control Unit (FCU).

8. Code 33 will illuminate the "FUEL CONTROL" advisory message anytime ambient pressure is greater than 15.23 PSIA.

NOTE

This ambient pressure (15.23 PSIA) is equal to a density altitude of approximately minus 1200 feet and can be computed using the E6B computer (i.e. whiz wheel). The selection of 15.23 PSIA as the fault latch for code 33 was an arbitrary number and future revisions to the ESC should correct this problem. Disregard "FUEL CONTROL" advisory message if only code 33 displays under heading "FUEL CONTROL" on BIT/FDL page while performing a digital fuel control check and you calculate the DA to be below approximately minus 1200 feet.

- 9. Perform the following:
 - a. Inspect/check NP speed pickup and replace as necessary.
- b. Perform FUEL CONTROL BIT test. If fault persists, inspect/check NP branch of engine wiring harness.
 - c. Perform FUEL CONTROL BIT test. If fault persists, replace ESC.
 - 10. Perform the following:
 - a. Inspect/check NG speed pickup and replace as necessary.
- b. Perform FUEL CONTROL BIT test. If fault persists, inspect/check NG branch of engine wiring harness.
 - c. Perform FUEL CONTROL BIT test. If fault persists, replace ESC.
 - 11. Perform the following:
 - a. Inspect/check electrical torque motor on fuel control and replace as necessary.
- b. Perform FUEL CONTROL BIT test. If fault persists, inspect/check fuel control branch of engine wiring harness.
 - c. Perform FUEL CONTROL BIT test. If fault persists, replace ESC.
 - 12. Perform the following:
 - a. Inspect/check NP overspeed solenoid and replace as necessary.
- b. Perform FUEL CONTROL BIT test. If fault persists, inspect/check overspeed branch of engine wiring harness.
 - c. Perform FUEL CONTROL BIT check. If fault persists, replace ESC.
 - 13. Perform the following:
 - a. Inspect/check the thermocouple probes and replace as necessary.
- b. Perform FUEL CONTROL BIT test. If fault persists, inspect/check thermocouple branch of engine wiring harness.
 - c. Perform FUEL CONTROL BIT test. If fault persists, replace ESC.

- 14. Perform the following:
 - a. Inspect/check collective pitch transducer and replace as necessary.
- b. Perform FUEL CONTROL BIT test. If fault persists, inspect/check collective pitch transducer branch of engine wiring harness.
 - c. Perform FUEL CONTROL BIT test. If fault persists, replace ESC.

Abbreviations:	
A	Analog
D	Digital
$M \; \ldots \ldots \ldots \ldots \ldots$	Manual
UNK	Unknown
Av	Available
Op	Operating
TM	Torque Motor

F-7. R FADEC MONITOR

Pressing L2 on INITIAL PAGE 1 calls up the FADEC MONITOR page (Figure F-7).

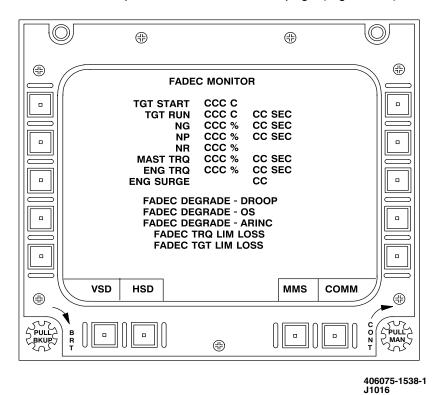


Figure F-7. R FADEC MONITOR Page

The FADEC MONITOR page displays the maximum values recorded for seven engine parameters. These values are recorded from the last time the page was cleared. If a value exceeds a predefined limit, the number of seconds the limit was exceeded is displayed until cleared (even over successive flights). It also displays the FADEC degrade decipher flags and engine surges. An exit from this page is made by pressing MFD mode select buttons, pilot cyclic grip display, or the INIT button on the pilot MFD auxiliary panel or CPG auxiliary panel. The FADEC data is provided to the CDS by both an ARINC-429 communications bus and hardwired discretes. This data is then processed by the CDS for display.

The following is a description of the parameters displayed on the FADEC MONITOR page:

DISPLAY ITEM	DESCRIPTION
TGT START	Maximum turbine gas temperature (TGT) during an engine start is displayed in degrees Celsius. The peak TGT from the latest engine start, including aborted starts, is always displayed.
TGT RUN	Maximum turbine gas temperature (TGT) during regular running conditions and the time above the lower limit (715 $^{\circ}$ C) is displayed if TGT exceeds 767.8 $^{\circ}$ C. Otherwise, only the maximum TGT is displayed.
NG	Peak turbine gas generator speed (NG) (highest value since last clearing) is displayed as a percentage. If the NG exceeds 106%, time above the limit is displayed in seconds. Otherwise, the time is not displayed.
NP	Two set point limits for power turbine speed (NP) vary according to engine torque. Normal NP operating conditions are below both limits. If the lower of the two limits is exceeded for more than 15 seconds, or if upper limit is exceeded, then NP is displayed as a percentage along with the time in seconds spent above the lower limit. For example if Engine Torque is 50%, the two limits are 110.9% and 114.5%. NP has to be greater than 110.9% for more than 15 seconds or NP has to be greater than 114.5% for the percentage and time above 110.9% to be displayed.
	In the case of multiple occurrances prior to this page being cleared, the system retains the worst case based on the following criteria:
	1. If all events have only exceeded the lower limit for more than 15 seconds, the event which has the longest time is stored.
	2. If all events exceeded the upper limit but have not exceeded the lower limit for more than 15 seconds, then the event which has the highest absolute NP is stored.
	3. If the multiple occurrances consist of a combination of events where either the lower limit has been exceeded for more than 15 seconds, the upper limit has been exceeded or both, then the event which has the highest absolute NP is stored.
NR	NR Peak main rotor speed (NR) is displayed at all times as a percentage.
MAST TRQ	Peak transmission mast torque (MAST TRQ) (highest since last clearing) is displayed as a percentage. Percentage and time (seconds) are displayed only if above the limit (103%).
ENG TRQ	Peak engine output torque (ENG TRQ) (highest since last clearing) is displayed as a percentage. If ENG TRQ exceeds 131%, the time above the limit is displayed in seconds.
ENG SURGE	This event counter monitors the number of engine surge events. The counter increments each time a latched surge event indication occurs. The counter does not increment for engine surges which occur subsequent to a latched surge event indication unless the latched indication has been reset either by power down of the ECU or transition from manual to auto mode.

DISPLAY ITEM DESCRIPTION

FADEC DEGRADE -

DROOP

When a FADEC DEGRADE - DROOP condition is active, the FADEC DEGRADE advisory is activated and the text FADEC DEGRADE - DROOP is displayed on this page. Activation of this advisory occurs when the FADEC ECU Degraded keyboard discrete is active and the ARINC's Handling Quality Degrade Fault bit is set. This message is an indication that the FADEC System has detected a fault which could result in possible rotor droop.

FADEC DEGRADE - OS

When a FADEC DEGRADE - OS (Overspeed) condition is active, the FADEC DEGRADE advisory is activated and the text FADEC DEGRADE - OS is displayed on this page. Activation of this advisory occurs when the FADEC ECU Degraded keyboard discrete is active and either the ARINC's Overspeed Power Supply Functional Fault bit or ARINC NP O/S Power Supply Fault is set. This message is an indication that the FADEC System has detected a loss of overspeed parameter limiting.

FADEC DEGRADE - ARINC

When the FADEC DEGRADE - ARINC condition is active, the FADEC DEGRADE advisory is activated and the text FADEC DEGRADE - ARINC is displayed on this page. Activation of this advisory occurs when the ARINC Hardware Fault bit is set or the CDS has determined a problem with the ARINC Communication Bus. This message is an indication that the CDS or FADEC System has detected a loss of the ARINC Bus.

FADEC TRQ LIM LOSS

When the FADEC TRQ LIM LOSS condition is active, the FADEC DEGRADE advisory is activated and the text FADEC TRQ LIM LOSS is displayed on this page. Activation of this advisory occurs when the FADEC ECU Degraded keyboard discrete is active, ARINC Limit Loss Degrade Fault bit is set and ARINC Torque Sensor Fault bit is set. This message is an indication that the FADEC System has detected a loss of FADEC torque parameter limiting.

FADEC TGT LIM LOSS

When the FADEC TGT LIM LOSS condition is active, the FADEC DEGRADE advisory is activated and the text FADEC TGT LIM LOSS is displayed on this page. Activation of this advisory occurs when the FADEC ECU Degrade keyboard discrete is active, ARINC Limit Loss Degrade Fault bit is set and either the ARINC MGT Thermocouple Fault bit or the ARINC Thermocouple Cold Junction Fault is set. This message is an indication that the FADEC System has detected a loss of FADEC TGT parameter limiting.

F-8. R ENGINE HISTORY 1

When this page is active, output trend data that provides engine performance trends is displayed. The date that the engine history was LAST RESET (cleared) is also shown (Figure F-8).

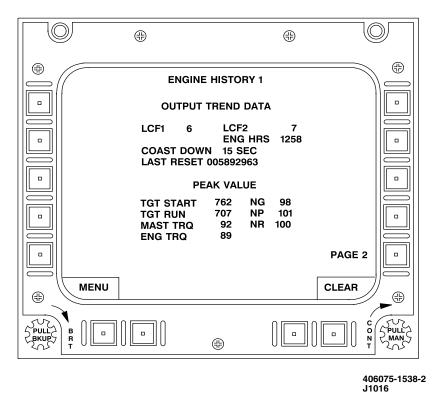


Figure F-8. R ENGINE HISTORY 1 Page

1. Output Trend Data

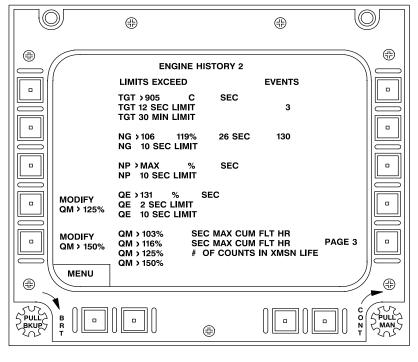
DISPLAY ITEM	DESCRIPTION
LCF 1	Low cycle fatigue (LCF) 1 displays the number of times NG has traversed the range of 50% NG to 95% NG.
LCF 2	LCF 2 displays the number of times NG has traversed the range of 85% NG to 95% NG.
COAST DOWN	The time taken for the engine to slow to a stop is recorded. The engine must be shut down and the helicopter must be on the ground. Time is recorded in seconds while NG goes from 30% to 10%.
LAST RESET	The date that the last engine history reset (clear) was performed is displayed.

2. Peak Value.

DISPLAY ITEM	DESCRIPTION
TGT START	Maximum TGT during an engine start is displayed in degrees Celsius. No limit needs to be exceeded for TGT START to be displayed.
TGT RUN	Maximum TGT during post-start running conditions is displayed in degrees Celsius. No limit needs to be exceeded for the TGT RUN to be displayed.
MAST TRQ	Peak mast torque (MAST TRQ) is displayed as a percentage. No limit needs to be exceeded for MAST TRQ to be displayed.
ENG TRQ	Peak engine torque (ENG TRQ) is displayed as a percentage. No limit needs to be exceeded for ENG TRQ to be displayed.
NG	Peak turbine gas generator speed (NG) is displayed as a percentage. No limit needs to be exceeded for the NG to be displayed.
NP	Peak power turbine speed (NP) is displayed as a percentage. Two set point limits for NP vary according to engine torque. Normal operating conditions for the NP are below both limits. The lower limit must be exceeded for a percentage to be displayed. For example if the Engine Torque is 50%, and the two limits are 110.9% and 114.5%. NP has to be greater than 110.9% for a percentage to be displayed.
	In the case of multiple occurrances prior to this page being cleared, the maximum NP achieved is displayed.
NR	Peak main rotor speed (NR) is displayed as a percentage. This percentage is displayed when either of the following conditions have been met:
	1 - NR exceeded 107% while NR was greater than NP (power on).
	2 - NR exceeded 103% while NR was less than or equal to NP (power off).

F-9. R ENGINE HISTORY 2

1. <u>Limits Exceeded.</u> The following items appear on the display only if that limit has been exceeded (Figure F-9):



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Figure F-9. R ENGINE HISTORY 2 Page

DISPLAY ITEM	DESCRIPTION
TGT>905	If TGT exceeds 905 $^{\circ}\text{C},$ time above that limit is displayed along with the peak TGT.
TGT 12 SEC LIMIT	If TGT exceeds 802 $^{\circ}\text{C}$ for 12 seconds, a counter increments by one. Total count is displayed.
TGT 30 MIN LIMIT	If TGT has exceeded 715 °C for more than 30 consecutive minutes, a counter increments by one. Total count is displayed.
NG>106	If turbine gas generator speed (NG) exceeds 106%, time above that limit is displayed along with peak percentage NG above the upper limit.
NG 10 SEC LIMIT	Each time NG exceeds 105% for 10 seconds, a counter increments by one. Total count is displayed.
NP>MAX	Two set point limits for power turbine speed (NP) vary according to engine torque. Normal operating conditions for NP are below both limits. If the upper limit is exceeded, then the NP percentage is displayed.
	In the case of multiple occurrances prior to this page being cleared, the

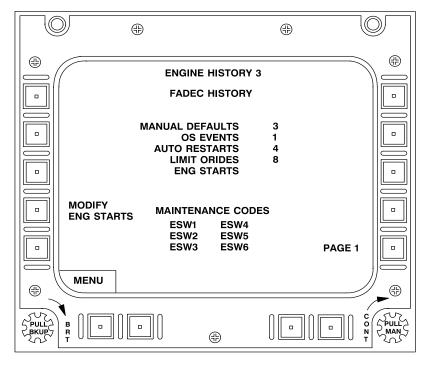
maximun NP achieved is displayed.

DISPLAY ITEM	DESCRIPTION
NP 15 SEC LIMIT	Each time NP exceeds the lower variable limit for 15 seconds, a counter increments by one. Total count is displayed.
QE>131	If engine torque (QE) exceeds 131%, time above the limit is displayed along with peak QE.
QE 2 SEC LIMIT	Each time QE exceeds 121.6% for two seconds, a counter increments by one. Total count is displayed.
QE 10 SEC LIMIT	Each time QE exceeds 112% for 10 seconds, a counter increments by one. Total count is displayed.
QM>103%	If Mast Torque (QM) exceeds 103%, the highest accumulated exceedance time within any 60 minute period, since last cleared, will be displayed.
QM>116%	If QM exceeds 116%, the highest accumulated exceedance time within any 60 minute period, since last cleared, will be displayed.
QM>125%	Each time QM exceeds 125%, a counter increments by one. Total count is displayed for the life of the transmission.
QM>150%	Each time QM exceeds 150%, a counter increments by one. Total count is displayed for the life of transmission.

- 2. MODIFY QM>125%. Pressing L4 displays the cursor next to the L4 legend. This allows the operator to enter a number between 0 through 99 for the QM>125% counter. After pressing the ENTER key on the keyboard, the number is displayed next to the text # OF COUNTS IN XMSN LIFE. If an invalid entry is made, the entry is blanked, the cursor reappears and the text ERR is displayed.
- 3. MODIFY QM>150%. Pressing L5 displays the cursor next to the L5 legend. This allows the operator to enter a number between 0 through 99 for the QM>150% counter. After pressing the ENTER key on the keyboard, the number is displayed next to the text # OF COUNTS IN XMSN LIFE. If an invalid entry is made, the entry is blanked, the cursor reappears and the text ERR is displayed.

F-10. R ENGINE HISTORY 3

When activated this page displays the following (Figure F-10):



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Figure F-10. R ENGINE HISTORY 3 Page

DISPLAY ITEM	DESCRIPTION
MANUAL DEFAULTS	This event counter is incremented once each time the FADEC System enters the manual mode.
OS EVENTS	When the turbine gas generator speed (NG) is greater than 66%, this event counter is incremented once for each overspeed event.
AUTO RESTARTS	This event counter is incremented once each time an automatic engine restart occurs.
LIMIT ORIDES	This event counter is incremented once each time an engine limit is overridden.
ENG STARTS	This event counter is incremented by one for each successful engine start.
MAINTENANCE CODES	The FADEC maintenance codes are a four character (alphanumeric) hexadecimal representation of the six R3 Engine Status Words (ESWs) obtained from the ECU over the ARINC Bus. These codes are stored in memory until they are either cleared using CLEAR on ENGINE HISTORY 1 Page or any time the engine is started.

DISPLAY ITEM DESCRIPTION

MODIFY ENG STARTS

Pressing the L4 bezel causes the cursor to be displayed next to the L4 legend. This allows the operator to enter a number (0-9999) for the engine starts. After pressing ENTER on the keyboard, the number is displayed next to the text ENG STARTS. If an invalid entry is made, the entry is blanked, the cursor reappears and the text ERR is displayed.

F-11. R R3 ENGINE BIT

The operator calls up the ENGINE HISTORY 3 page by pressing the L3 key on the FDL MENU page, the R5 key on the ENGINE HISTORY 1 page, or the ENGINE HISTORY 2 page. The helicopter must be on the ground to access this page.

Under the heading MAINTENANCE CODES, six 4-digit fault codes are displayed (Figure F-11). Each fault code appears as a hexadecimal number. These fault codes are known as Engine Status Words (ESWs).

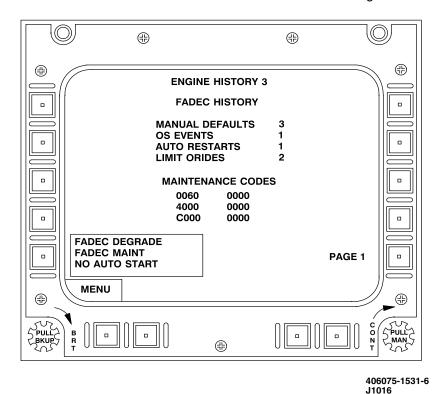


Figure F-11. R ENGINE HISTORY 3 Page

Each ESW reports the status of up to 16 engine parameters. These parameters are identified in the following tables and the status is provided by the ECU over the ARINC bus. Since the CDS does not report all of the parameters provided by the ECU, the following tables contain only the CDS reported parameters (e.g., ESW5 is not reported by the CDS and no table is provided). The fault codes provide information on built-in test as follows:

Each four character maintenance code represents one ESW word (16 parameters) and each character reports the status for four of the parameters reported. Using one characters value the specific parameter(s) is identified as follows.

1. First, it is necessary to determine which ESW is being represented. This is determined by its position on the ENGINE HISTORY 3 page. Each word has a specific location with respect to the other five ESWs and is identified by noting its position (Figure F-11). The left column contains ESWs 1 through 3 and the right column contains ESWs 4 through 6. For example, assume the MAINTENANCE CODE display on ENGINE HISTORY 3 page appears as shown below.

0000	0000
0C30	0000
0000	F000

Such a display indicates that ESW2 and ESW6 faults are being reported.

2. Second, note the column position and value for any maintenance code character that is not zero. The column position is determined by noting whether the character is the first, second, third or fourth digit from the left. For example, the maintenance code 03C0 has parameters reported in the second and third digit columns with values of C and 3 respectively.

NOTE

Any column position with a value equal to zero indicates that the four parameter codes represented by that character have not been set.

- 3. Third, with the information obtained in the previous two steps (1 and 2), utilize Table F-1 to decode the fault code(s) and determine which parameter code(s) is being reported. Continuing with the examples shown above, the information is ESW2, second digit column with a character value of C. Using the second digit column and character value C, enter Table F-1 to determine that parameter codes 10 and 11 are being reported.
- 4. Finally, using ESW2 and the two parameter codes 10 and 11, the last step is to enter the Engine Status Words 2 (ESW2) table and determine which faults are being reported. In this example, the following parameters are being reported:
 - a. ECU exceeding allowable temperature (fault 10)
 - b. Ignition circuit failure (fault 11)

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 1) (ESW1)	(Probable Failed LRU)	
07		Override Limits Selected
08	ECU	12 BIT A/D Conversion Fault
09	ECU	8 BIT A/D Conversion Fault
10	A/C CP Pot 🛆	Collective Pitch Fault Status
11	ECU	Watchdog Timer Hard Fault
12	ECU	Gain Fault
13	ECU	High Level Reference Voltage Fault
14	ECU, Ng Sensor 🗘	Ng Hard Fault (Loss of both Ng signals)
15	ECU, Np Sensor 🛆	Np Hard Fault (Loss of both Np signals)

A Harness interconnections are also a probable failure cause.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 2) (ESW2)	(Probable Failed LRU)	
00 01 02 03 04 05 06 07 08 10 11 12 13	A/C Bus APMA APMA APMA APMA APMA APMA APMA APM	Loss of Airframe 28V Alternator Failure Auto/Manual Mode Solenoid Failure Auto/Manual Switch Fault Low Level Offset Fault Cockpit Nr Beep Fault Thermocouple Cold Junction Comp Fault P1 Hard Fault PLA Hard Fault ECU Exceeding Allowable Temperature Ignition Circuit Fault Ignition Relay Fault MGT Thermocouple Fault Engine Speed Pickup 1 Fault
15	Ng Pickup 🕰	Engine Speed Pickup 2 Fault

 \triangle Harness interconnections are also a probable failure cause.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 3) (ESW3)	(Probable Failed LRU)	
00 01 02 03 04 05 06 07 08 09 10	Np Pickup Np Pickup Nr Sensor ECU ECU HMU, ECU A/C Switch ECU ECU HMU HMU Q-Sensor	Power Turbine Speed Pickup 1 Fault Power Turbine Speed Pickup 2 Fault Rotor Speed Pickup Fault PLA Reference Voltage Fault PROM Hardware Fault Overspeed System Functional Fault Overspeed Test Switch Fault P1 Pressure Sensor Fault 10 Volt Pulse Width Modulator Fault PLA Potentiometer Input 1 Fault PLA Potentiometer Input 2 Fault Torque Sensor Fault
12 13 14 15	Engine HMU, ECU 1 ECU, A/C Relay 1 HMU, ECU 1	Engine Surge Occurrence Stepper Motor Fault Start Motor Circuit Fault Start Solenoid Current Fault

 \triangle Harness interconnections are also a probable failure cause.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 4) (ESW4)	(Probable Failed LRU)	
00 01	T1 Sensor ⚠ T1 Sensor ⚠	Engine Inlet Temp Signal 1 Fault Engine Inlet Temp Signal 2 Fault
02 03 04	T1 Sensor 🗘 ECU 🗘 HMU 🗘	Engine Inlet Temp Signal A/B Difference Indicating Test Cell Mode on Helicopter Fuel Metering Valve Fault

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
05	ECU.	RAM Hardware Fault
06	HMU 🛆	Fuel Flow has Been Limited for more than
		10 Seconds
07	HMU, ECU 🗘	Step Count Fault
80	T1 Sensor 🛆	T1 Hard Fault
09	ECU	15 Volt Power Supply Fault
10	ECU.	5 Volt Power Supply Fault
11	HMU 🗘 .	Hard Fault on Fuel Flow
12	HMU, ECU 🛆	Fuel Flow Step Count Fault

A Harness interconnections are also a probable failure cause.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 6) (ESW6)	(Probable Failed LRU)	
00 01 02 03 04 05 06	ECU ECU ECU ECU ECU HMU	Np O/S Power Supply Fault "OR" Diode Fault ARINC Hardware Fault Background Complete Fault EEPROM Calibration Data Fault EEPROM Hardware Fault Open Metering Valve Warning Prior to Start
07 08	HMU ⚠ HMU, ECU ⚠	PLA Hard Fault Start Solenoid VBIT Fault
09 10	ECU ECU	Foreground Complete Fault 28 Volt OR'ed Power Fault
11 12 13	ECU ECU ECU	Software Interrupt Fault UART Hardware Fault Unused Interrupt Fault
14 15	ECU ECU	Watchdog Timer First Timeout Fault Watchdog Timer Fault

A Harness interconnections are also a probable failure cause.

F-12. CDS BIT

Pressing line address key L1 initiates the CDS BIT. A GO or NO GO condition is displayed next to the word CDS. When a NO GO condition exists, the failed LRU will be identified by a four-digit fault code appearing below the words CDS NO GO. The fault codes, decoded using Table F-1, identify tests that failed. Replace LRU that corresponds to failed test numbers. For example, a fault code of 000C indicates the RFD and the MFK must be replaced. A fault code of 0010 indicates the right MFD must be replaced.

The CDS runs a continuous BIT. A GO or NO GO condition is displayed next to the word CDS. When a NO GO condition exists, the failed LRU will be identified by a four-digit fault code appearing below the words CDS NO GO. Table F-1 and the procedures in paragraph F-11, steps 1 through 4 are used to decode the fault codes. The fault codes identify the test that failed. Replace LRU that corresponds to failed test number.

NOTE

When a multiple fault is indicated, replace one LRU at a time. If replacement of first LRU does not clear the fault, remove the replacement LRU and install the original LRU. Replace the second LRU. If replacement of second LRU does not clear the fault, remove the replacement LRU and install the original LRU. Proceed through replacement of multiple LRU's utilizing this procedure.

TEST NUMBER ACTION ITEM		TEST DESCRIPTION
	(Replace)	
00 01 02 03 04 05	Right MCPU Left MCPU MFK RFD Right MFD Left MFD	Right MCPU Left MCPU MFK RFD Right MFD Left MFD
R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
	(Replace)	
00 01 02	Right MCPU Left MCPU MFK	Right MCPU Left MCPU MFK

F-13. ATHS BIT

Pressing line address key L3 initiates the ATHS BIT. A GO or NO GO condition is indicated next to the word ATHS. In some cases the BIT can identify a faulty LRU. A four-digit fault code appears beneath the words ATHS NO GO when a built-in test has failed. Refer to Table F-1 for decoding. The fault code provides information on 13 built-in tests as follows:

TEST NUMBER	ACTION ITEM (Replace)	TEST DESCRIPTION
01	ATHS signal conditioning unit	AVIONIC CONTROLLER
02	ATHS signal conditioning unit	AUDIO SWITCH
03	ATHS signal conditioning unit	MODEM
04	ATHS signal conditioning unit	MODEM CONTROL
05	ATHS signal conditioning unit	READ/WRITE MEMORY
06	ATHS signal conditioning unit	EPROM NO. 3
07	ATHS signal conditioning unit	EPROM NO. 2
08	ATHS signal conditioning unit	EPROM NO. 1
09	ATHS signal conditioning unit	CPU

TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
10	ATHS signal conditioning unit	1553 SUBSYSTEM INTERFACE
11	ATHS signal conditioning unit	1553 ENCODE/DECODE
12	ATHS signal conditioning unit	1553 VALIDATION
13	ATHS signal conditioning unit	1553 ANALOG

F-14. R IDM BIT

Pressing line address key L3 initiates the IDM BIT. IN TEST is displayed to the right of L3 next to the word IDM. When the test is complete GO or NO GO replaces IN TEST. If a NO GO condition occurs and no fault code is displayed, this indicates that the IDM is not responding on the 1553 Bus. A four-digit fault code appears beneath the words IDM NO GO when a built-in test has failed. Refer to Table F-1 for decoding. The fault code provides information on 7 built-in tests as follows:

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
	(Replace)	
09	IDM	GIP Failure
10	IDM	DSP #2 Failure
11	IDM	DSP #1 Failure
12	IDM	System Self-Test Failure
13	IDM	System Self-Test Failure
14	IDM	System Self-Test Failure
15	IDM	System Self-Test Failure

F-15. MMS BIT

Pressing line address key L4 initiates the MMS BIT. A GO or NO GO condition is indicated next to the word MMS. In some cases the BIT can identify a faulty LRU. A four-digit fault code appears beneath the words MMS NO GO when a built-in test has failed. The fault code provides information on 16 built-in tests.

The MMS runs a continuous BIT. Table F-1 and the procedures in paragraph F-11, steps 1 through 4 are used to decode the fault codes. The fault code provides information on 16 built-in tests.

NOTE

Verify failure codes through the MMS diagnostics.

TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
	(Replace)	
00	_	MMS POWER ON BIT
01	MCPS	MCPS BIT STATUS
02	MSP	MSP DSC BIT
03	MSP	MSP VTS BIT
04	MSP	MSP 771 BIT

TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
05	MSP	MSP GENERAL BIT
06		TURRET BIT
07	IEA	IEA BIT
08	OBS	OBS BIT
09	TCU	TCU BIT
10	TIS	TIS BIT
11	TVS	TVS BIT
12	GEA	GEA BIT
13	GBA	GBA BIT
14	LRF/D	LRF/D BIT
15		MMS LRU CONTINUOUS BIT

Each digit of fault code indicates the failure status for four built-in tests. See Table F-1 to learn which self-tests have failed. Compare each digit with the table, an X indicates a built-in test has failed. The number 3 in the first digit indicates tests 12 and 13 have failed. The following are examples of typical fault codes and the built-in tests they indicate as having failed.

TYPICAL FAULT CODE	BUILT-IN TESTS FAILED
0040	06
1010	12, 04
A108	15, 13, 08, 03,
4230	14, 09, 05, 04

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
	(Replace)	
00	<u> </u>	Spare
01	MCPS	MCPS DSC BIT Status
02	MSP	MSP DSC BIT Status/VPS BIT Status 🛆
03	MSP	MSP VTS BIT Status
04	MSP	MSP 771 BIT Status
05	MSP	MSP General BIT Status
06		Turret BIT Status
07	IMUX	IMUX BIT Status
08	OBS	OBS BIT Status
09	TCU	TCU BIT Status
10	TIS	TIS BIT Status
11	TVS	TVS BIT Status
12	GEA	GEA BIT Status
13	GBA	GBA BIT Status
14	LRF/D	LR/FD BIT Status
15	_	MMS LRU Continuous BIT Status

 $[\]triangle$ This BIT indicates MSP DSC BIT status for the MSP configuration only.

F-16. RADAR ALTIMETER BIT

Pressing line address key L5 initiates the RALT (radar altimeter) BIT. A GO or NO GO condition is indicated next to the word RALT. No fault codes are identified.

If a NO GO is indicated without a failure code:

- a. Verify the NO GO is valid by performing Radar Altimeter operational check (TM 11-1520-248-23).
- b. Proceed to appropriate troubleshooting procedure (MAPS).

F-17. TRANSMISSION ATTITUDE MEASUREMENT SUBSYSTEM (TAMS) BIT

Pressing line address key R1 initiates the TAMS BIT. A GO or NO GO condition is indicated next to the word TAMS. A four-digit fault code appears beneath the words TAMS NO GO when a self-test has failed. The fault codes shown in Table F-1 indicate which unit has failed. Replace or repair a unit when an X appears on the same line as the fault code. For example, a fault code of 0003 indicates the left aft LVDT and the TAMS signal conditioning unit must be replaced.

NOTE

When a multiple fault is indicated, replace or repair one unit at a time. If replacement or repair of first unit does not clear the fault, remove (if no repair was required) and install the original unit. Replace or repair the second unit. If replacement or repair of second unit does not clear the fault, install the original unit. Proceed through replacement or repair of multiple units utilizing this procedure.

TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
	(Replace)	
00	TAMS Signal Conditioning Unit	Signal Conditioning Unit
01	Left Aft LVĎT	Left Aft LVDT
02	Left Fwd LVDT	Left Fwd LVDT
03	Right Aft LVDT	Right Aft LVDT
04	Right Fwd LVDT	Right Fwd LVDT

F-18. | MAST TORQUE BIT

Pressing line address key R2 initiates the mast torque (MAST TQ) BIT. A GO or NO GO condition is indicated next to the word MAST TQ. No fault codes are identified.

NOTE

This MAST TQ test is valid only with a static rotor system. To accomplish the test, the essential bus switch must be in the RUN position.

If a NO GO is indicated without a failure code:

TM 1-1520-248-T-1

- a. Verify the NO GO is valid by performing Mast Torque operational check (TM 1-1520-248-23).
- b. Proceed to appropriate troubleshooting procedure (MAPS).

F-19. AUDIO DISTRIBUTION UNIT (ADU) BIT

Pressing line address key R1 on BIT page 2 initiates the ADU BIT. A GO or NO GO condition is indicated next to the word ADU. No fault codes are identified.

If a NO GO is indicated:

- a. Verify the NO GO is valid by performing ADU operational check (TM 11-1520-248-23).
- b. Proceed to appropriate troubleshooting procedure (MAPS).

F-20. | IFM AMPLIFIER BIT

Pressing key R2 on BIT page 2 initiates the improved FM BIT. A GO or NO GO condition is indicated next to the word IFM. The following fault codes are identified if NO GO appears:

FAULT CODE	ACTION ITEM	TEST DESCRIPTION	
	(Replace)		
0001	IFM Amplifier	Power Level Fault	
0004	IFM Amplifier	VPA Fault	
0005	IFM Amplifier	VPA and Power Level Fault	

F-21. RADIO BIT

On BIT page 2, keys L1, L2, L3, L5, initiates BIT for the FM-1, UHF, VHF, and FM-2 radios respectively. If NO GO appears, replace radios. If this does not clear fault, perform operational check (TM 11-1520-248-23).

F-22. R FM AN/ARC-201D BIT.

Pressing L1 or L5 on BIT page 2 initiates the FM-1 or FM-2 BIT, respectively. A GO or NO GO condition is indicated next to the word FM-1 or FM-2. Three 4-digit fault codes are displayed. The second 4-digit code provides additional clarification of the Receiver-Transmitter (RT) test and the third 4-digit code provides additional clarification of the RF test. Table F-1 and the procedures in paragraph F-11, steps 1 through 4 are used to decode the fault codes. The following table provides fault codes for the first 4-digit code:

F-36 Change 2

NOTE

- A NO GO without fault codes indicates that the radio is not responding on the bus. Possible problems include no power to the radio and/or both 1553 buses are not connected to the radio.
- A NO GO with fault codes of all zeroes indicates that the radio did not respond to a BIT complete status in the allotted 30 second time frame. A time-out has been added to prevent the CDS and radio from being hung in a BIT always in progress condition. These results will most often occur if BIT is performed on the radio prior to the radio finishing its POWER-ON BIT.

If a NO GO is indicated with fault codes of all zeroes:

- 1. Perform BIT again.
- 2. If same problem exists, cycle power to the radio, wait at least 30 seconds, and perform BIT a third time. A third failure indicates a radio failure.

R FAULT CODE	ACTION ITEM	TEST DESCRIPTION
	(Replace)	
07	Battery	Hold UP Battery (HUB) Low
09	Radio	1553 Test Fail ()
10	Radio∕₁	COMSEC Test Fail
11	Radio	Control Processor Test Fail
12	Radio	Data Processor Test Fail
13	Radio	ECCM Processor Test Fail
14	Radio	RF Test Fail
15	Radio	RT Test Fail

⚠ May be recoverable with COMSEC/HOPSET refill.

F-23. HF RADIO BIT

Pressing line address key L4 on BIT page 2 initiates the HF radio BIT. A GO or NO GO condition is indicated next to the word HF. A four-digit fault code appears beneath the words TAMS NO GO when a self-test has failed.

If a NO GO is indicated without a failure code:

- a. Verify the NO GO is valid by performing HF radio operational check (TM 11-1520-248-23).
- b. Proceed to appropriate troubleshooting procedure (MAPS).

FAULT CODE	ACTION ITEM	TEST DESCRIPTION
0001	Check/Replace Antenna Connections	Antenna Coupler
0002	Replace HF Radio	Receiver/Exciter Fail
0003	Do both ACTION ITEMs above	Antenna Coupler and Receiver/Exciter Fail

F-24. SCAS BIT

On INITIAL PAGE 1 select line select switch R3 (FDL MENU) while on the ground. This will bring up the FDL MENU page. Press line select switch L1 (BIT). This will bring up the BIT page. In the lower right hand corner (in place of the COMM mode select switch), press mode select switch D (RECALL). This will display the failure codes which look the same as MEMORY INSPECT on the SCAS Flight Test Page. The displayed failure codes will be from the last flight. Power must be turned off and back on after the last flight to display the last failure codes. These are updated each time the helicopter lands, turns power off then back on and is airborne again. The following is a list of the failure codes and corresponding failures for each code as seen on the MFD. The fault codes, shown in Table F-1, identify faulty LRU.

*TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 1)	<u>^</u>	
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14	*Right MCPU *Left MCPU — — — — *Yaw Actuator *Right Cyclic Actuator *Left Cyclic Actuator *Pitch Rate Gyro *Roll Rate Gyro *Yaw Rate Gyro *Yaw Rate Gyro *Fore/Aft Cyclic CMT *Lateral Cyclic CMT *Pedal CMT Collective CMT	Right MCPU Test Left MCPU Test Not Used Not Used Not Used Yaw Actuator Test Right Cyclic Actuator Left Cyclic Actuator Pitch Rate Gyro Roll Rate Gyro Yaw Rate Gyro Fore/Aft Cyclic CMT Lateral Cyclic CMT Collective CMT
(FAULT CODE 2)		
00 01 02 03 04 05 thru 15	*Airspeed Sensor *Torque Sensor — *Trim Motor Check 26 Vac —	Airspeed Sensor Torque Sensor Not Used Not Used Trim Motor 26 Vac System Test Not Used

 $[\]triangle$ Replace an LRU when an * appears on the same line as the action item.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
	\triangle	
00	*Right MCPU	Right MCPU Failure
01	*Left MCPU	Left MCPU Failure
03	*Trim Motor	Trim Motor Failure
04	Check 26 Vac	26 Vac Failure
06	*Yaw Actuator	Yaw Actuator Mistrack Failure
07	*Right Cyclic Actuator	Right Cyclic Actuator Mistrack Failure
08	*Left Cyclic Actuator	Left Cyclic Actuator Mistrack Failure
09	*Pitch Rate Gyro	Pitch Gyro Mistrack Failure
10	*Roll Rate Gyro	Roll Gyro Mistrack Failure
11	*Yaw Rate Gyro	Yaw Gyro Mistrack Failure
12	*Fore/Aft Cyclic CMT	Fore/Aft Cyclic Position Sensor Failure
13	*Lateral Cyclic CMT	Lateral Cyclic Position Sensor Failure
14	*Pedal CMT	Pedal Position Sensor Failure
15	*Collective CMT	Collective Position Sensor Failure

 \triangle Replace an LRU when an * appears on the same line as the action item.

NOTE

In flight failures of the SCAS system are displayed with the LAST FLIGHT RECALL fault codes (paragraph F-3).

F-25. IFF BIT

Pressing key R3 on BIT page 2 initiates the IFF BIT. A GO or NO GO condition is indicated next to the word IFF. No fault codes are displayed for the IFF. Six self-tests can be selected. GO or NO GO is displayed for each test.

NOTE

The IFF must be in NORM mode for the test to pass. All tests will fail if either antenna is disconnected and the respective antenna is also selected for use.

M1 TEST (MODE 1)
M2 TEST (MODE 2)
M3 TEST (MODE 3)
M4 TEST (MODE 4)
MC TEST (MODE C)
RAD TEST (Transmitter Test)

F-26. ISP BIT

Pressing key R3 on BIT page 1 initiates the ISP built-in test. A GO or NO GO condition is indicated next to the acronym DTS. No fault codes are identified.

F-27. DTS BIT

Pressing key R4 on BIT page 1 initiates the DTS built-in test. A GO or NO GO condition is indicated next to the word DTS. No fault codes are identified.

Pressing R4 on BIT page 1 initiates the DTS BIT, IN TEST is displayed to the left of R4 next to the word DTS. When the test is complete GO or NO GO replaces IN TEST. Two lines of 4-digit fault codes appear beneath the word DTS. Table F-1 and the procedures in paragraph F-11, steps 1 through 4 are used to decode the fault codes.

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 1)	(Failed LRU)	
02	DRU	RAM Program Checksum Test Fail
03	DRU	DMA 2 Test Fail
04	DRU	DMA 1 Test Fail
05	DRU	RS422 Serial B Wrap Test Fail
06	DRU	RS422 Serial B Loopback Test Fail
07	DRU	RS422 Serial A Loopback Test Fail
11 12	DRU DRU DRU	Watchdog Timer Fault Fail RAM Test Lower Byte Fail
13	DRU	RAM Test Upper Byte Fail
14	DRU	PROM Program Checksum Test Fail
15	DRU	Processor Instruction/Register Test Fail

R TEST NUMBER	ACTION ITEM	TEST DESCRIPTION
(FAULT CODE 2)	(Failed LRU)	
00 02 03 04 05 06 07 09 10 11 12	DRU	SCSI Register Test Fail 1553 Internal Test Fail RT Address Parity Test Fail 1553 Channel B Loopback Test Fail 1553 Channel A Loopback Test Fail 1553 Memory/Addressing Test Fail 1553 Register Test Fail DTM Memory Access Test Fail DTM Formatted Test Fail DTM Power Regulator Test Fail DTM Communication Monitor Test Fail
14 15	DRU DRU	DTM Power Wrap Test Fail DTM Data Wrap Test Fail

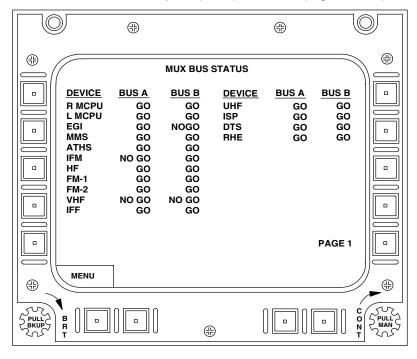
F-28. VTR BIT

Pressing key R4 on BIT page 2 initiates the VTR built-in test. A GO or NO GO condition is indicated next to the word VTR. No fault codes are identified.

The VTR BIT is continuous, pressing L3 will only redisplay the status from the last continuous bit test. A GO or NO GO condition is indicated next to the word VTR. No fault codes are identified.

F-29. MUX BUS STATUS

Pressing R4 on BIT Page 3 calls up BIT Page 4, MUX BUS STATUS Page. This page displays the status of LRU's interfaced on the MIL-STD-1553 multiplex (MUX) data bus (Figure F-12).



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Figure F-12. MUX BUS Status

Two bus cables, Bus A and Bus B, are installed in the helicopter. Each LRU can use either bus. The system periodically tests each LRU on each bus. The device refers to the LRU being tested and a GO or NO GO status is displayed for both Bus A and Bus B. Since these buses are redundant, a NO GO status can be displayed for a device, but since the other bus is still GO, the device will still function normally with no apparent problem.

- 1. The MUX BUS STATUS data is used to update failures of the data bus cables and also the devices. A NO GO means either:
 - a. The cable to that device is defective.
 - b. The device has an internal failure.

- c. The device is off or not installed.
- 2. Use the following guidelines:
- a. If a device is NO GO for one bus and all other devices on that bus are GO, repair the bus cable to the device (see note).
- b. If a device is NO GO for both buses, check for proper installation of and wiring to the device, if OK, replace the device.
- c. If all or several devices are NO GO on the same bus, repair the bus cable (see note). By comparing the devices that are NO GO with the physical layout of the bus, the problem can be isolated to one cable segment or coupler.
- d. For the example shown in figure F-12, IFM BUS A cable (see note) and the VHF radio should be replaced.

NOTE

If replacing the cable segment does not solve the problem, replace the data bus coupler module.

F-30. R MUX BUS STATUS

Pressing R5 on BIT page 3 calls up BIT page 4. This page displays the status of LRU's interfaced on the MIL-STD-1553 multiplex (MUX) data bus. Two bus cables, Bus A and Bus B, are installed in the helicopter. Each LRU can use either bus. The system periodically tests each LRU on each bus. The result is displayed on BIT page 4 (Figure F-13).

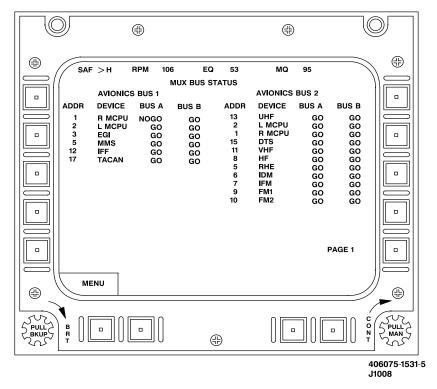


Figure F-13. R BIT Page 4 (MUX BUS Status)

The device refers to the LRU being tested and a GO or NO GO status is displayed for both Bus A and Bus B. Since these buses are redundant, a NO GO status can be displayed for a device, but since the other bus is still GO, the device will still function normally with no apparent problem.

- 1. The MUX BUS STATUS data is used to update failures of the data bus cables and also the devices. A NO GO means that one of the following conditions exists:
 - a. The cable to that device is defective.
 - b. The device has an internal failure.
 - c. The device is off or not installed.
 - 2. Use the following guidelines:
- a. If a device is NO GO for one bus and all other devices on that bus are GO, repair the bus cable to the device (see note).
- b. If a device is NO GO for both buses, check for proper installation of, and wiring to, the device; if OK, replace the device.
- c. If all or several devices are NO GO on the same bus, repair the bus cable (see note). By comparing the devices that are NO GO with the physical layout of the bus, the problem can be isolated to one cable segment or coupler.
- d. For the example shown in figure F-13, the EGI BUS B cable, IFM BUS A cable (see note), and the VHF radio should be replaced.

NOTE

If replacing the cable segment does not solve the problem, replace the data bus coupler module.

APPENDIX G

All data has been moved to Appendix F.

GLOSSARY

<u>Abbreviation</u> <u>Meaning</u>

AC Alternating Current

ACK Acknowledge

ACP Armament Control Panel

ADS Air Data system

ADSS ANVIS Display Symbology System

ADU Audio Distribution Unit

ADV Advisory

AEU Armament Electrical Unit
AGPU Aviation Ground Power Unit

ALT Altimeter ANLG Analog

ANVIS Aviators Night Vision Imaging System

AOAP Army Oil Analysis Program

APU Auxiliary Power Unit
AR Army Regulation

ARMT Armament

ASE Aircraft Survivability Equipment

ATAS Air-to-Air Stinger

ATHS Airborne Target Handover System

ATT Attitude
AUX Auxiliary

AVIM Aviation Intermediate Maintenance

AVIONICS Aviation Electronics

AVUM Aviation Unit Maintenance
AWG American Wire Gage

BATT Battery
BIT Built-in Test

BITE Built-in Test Equipment

BL Buttock Line

BLWR Blower
BNR Burner
BRT Bright
BYP Bypass

CAGE Commercial and Government Entity Code

CB Circuit Breaker

CDS Control Display System

Glossary (Cont)

Abbreviation Meaning

CFT Captive Flight Trainer

CHGR Charger
CIPH Cipher

CIT Compressor Inlet Temperature

CKPT Cockpit

CMPTR Computer

COLL Collision

COMPT Compartment

CPG Copilot/Gunner

DA PAM Department of the Army Pamphlet

DC Direct Current

DEFOG Windshield Defogger System

DETR Detector
DIGT Digital
DIR Directional
DISENG Disengage
DN Down

DOD Department of Defense
DTS Data Transfer System

ECUIC Electronic Control Unit Interface Computer

ECU Electronic Control Unit

EGI Embedded Global Positioning/Inertial Navigation

ELEV Elevation

EMC Electromagnetic Interference
EMC Electromagnetic Compatibility
EMV Electromagnetic Vulnerability

ENG Engine Engage

ESC Electronic Supervisory Control

ESNTL Essential EXT External

FADEC Full Authority Digital Electronic Control

FCU Fuel Control Unit
FM Field Manual

FM Frequency Modulation

Glossary (Cont)

<u>Abbreviation</u> <u>Meaning</u>

FDLS Fault Detection Location System

FOC Focus

FOV Field of View FREQ Frequency FWD Forward GEN Generator GRBX Gearbox HDG Heading

HF High Frequency
HHM Heading Hold Mode

HLFR HELLFIRE

HMS HELLFIRE Missile System
HMU Hydromechanical Unit

HTR Heater

HSD Horizontal Situation Display

HYD Hydraulic

IEA Interface Electronics Assembly
ICS Intercommunication System
ICS Internal Communication System

IDM Improved Data Modem

IFF Identification Friend or Foe

IFM Improved Frequency Modulation

IGN Ignition
INIT Initial
INST Instrument
INV Inverter
IR Infrared

ISP Intergrated Systems Processor

JETT Jettison

LOSL Laser Detecting System

LOAL Lock-On After Launch

LOBL Lock-On Before Launch

LOS Line-of-Sight

LRF/D Laser Range Finder/Designator System

LRU Line Replaceable Unit

LT Light

LSS Laser Source Simulator

MCPU

Glossary (Cont)

<u>Abbreviation</u> <u>Meaning</u>

LVDT Linear Variable Differential Transformer

MAPS Maintenance Action Precise Symptom

MCPS Mast Mounted Sight Central Power Supply

Master Controller Processor Unit

MFD Multifunction Display
MFK Multifunction Keyboard
MMS Mast Mounted Sight

MMSS Mast Mounted Sight Subsystem

MNL Manual

MOC Maintenance Operational Check

MPD Multiparameter Display

MSP Mast Mounted Sight System Processor

MSS Missile Sight System

MTA Mast Mounted Sight Turret Assembly

MTF Maintenance Test Flight

MUX Multiplex NAV Navigation

NG Engine Turbine Gas Generator Speed

NOE Nap-of-the-Earth

NP Engine Power Turbine Speed

NR Main Rotor RPM

NSN National Stock Number

NVG Night Vision Goggles

OAT Outside Air Temperature

ODA Optical Display Assembly

OPR Operate
ORIDE Override
OS Overspeed
OSET Offset

PART SEP Particle Separator
PCG Pilot Cyclic Grip
PDU Pilot Display Unit

PLT Pilot

PMA Permanent Magnet Alternator

POS Position
PRESS Pressure

PSI Pounds Per Square Inch

Glossary-4

Glossary (Cont)

<u>Abbreviation</u> <u>Meaning</u>

PSIA Pounds Per Square Inch Absolute
PSIG Pounds Per Square Inch Gauge

PWR Power

QA Quality Assurance
QC Quality Control
QE Engine Torque
QM Mast Torque
QTY Quantity

RALT Radar Altimeter

RCCB Remote Control Circuit Breaker

RCDR Recorder
REC Receive
RET Retract

RDS Radar Detecting System

RECT Rectifier
REL Release

RFD Remote Frequency Display
RHE Remote HELLFIRE Electronics

RKT Rocket

RPM Revolutions Per Minute
RRA Remote Rocket Assembly
RT Receiver/Transmitter

SCAS Stability and Control Augmentation System

SCTY Security
SEL Select

SINCGARS Single Channel Ground/Air Radio System

SRCH Search
STA Station
STBY Standby
SYMB Symbology
SYS System
T/R Tail Rotor

TAMMS-A The Army Maintenance Management System-

Aviation

TAMS Transmission Attitude Measurement System

TB Technical Bulletin
TB Terminal Board

Glossary (Cont)

<u>Abbreviation</u> <u>Meaning</u>

TCU Temperature Control Unit
TGT Turbine Gas Temperature

TI Technical Inspector

TIS Thermal Imaging Sensor
TIS Thermal Imaging System

TM Technical Manual

TMOP Torquemeter Oil Pressure Sensor

TRQ Torque

TRU Transformer Rectifier Unit

TVS Television System

UART Universal Asynchronous Receiver/Transmitter

UHF Ultra High Frequency
UWP Universal Weapons Pylon
VAC Volts Alternating Current

VAR Variation

VDC Volts Direct Current

VHF Very High Frequency

VIXL Video Image Cross-link

VS Vertical Scale

VSD Vertical Situation Display
VTR Video Tape Recorder

WL Water Line
XDCR Transducer
XFMR Transformer
XMSN Transmission
XMTR Transmitter
WARN Warning
WPN Weapon

ALPHABETICAL INDEX

Subject	Para/Task	Subject	Para/Task
.50 Caliber Machine Gun System — Operational Check (OH-58D)	2-5-6	A	(Cont)
.50 Caliber Machine Gun System — Operational Check (OH- 58D(R))	2-5-7	Activates but does not	show on sile4-5-6
2.75 Rocket System —		Activates but does not	show on
Operational Check (OH-58D) 2.75 Rocket System —		Activating missile caus	
Operational Check (OH-58D(R)) 26 VAC failure, Error code 0010	2-5-11	missile to activate the deactivate and seco	
word 2	5-1-51	to activate then dead With ATAS AUTOCA	
voltage, Auxiliary	5-1-52	selected, Missile ima	ages remain
28 Vdc, MPD does not illuminate or digital readout does not			vated
indicate approximately	3-3-1	Advisory message ENO ON is not lit (helicop	
Α		and ENG ANTI ICE	switch is
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Mast Mounted Sight (MMS)		Caution Message CHIPS ENG UPPER	
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MFD (external AC power in use), EXT PWR advisory message	F 4 4F	MFD DISPLAY CHECK scale instruments te	st pattern
not displayed on		MFD does not come or	5-3-20 n (BATT 2
EXT PWR advisory message not displayed on	5-1-16	MFD does not come or	
MFD (OH-58D), ATAS does not pass BIT on	4-5-4	MFD does not correspondent target/seeker moven	
not pass BIT on	4-5-5		reticle on4-5-9
indicate as installed on	4-3-1	target/seeker moven	nent (OH-
MFD (OH-58D(R)), Gun does not indicate as installed on	4-3-2	58D(R)), ATAS track	4-5-10

Subject	Para/Task	Subject	Para/Task
M (Cont)		М	(Cont)
MFD does not display INITIAL		MFD indicates HELLFI	
PAGE 1 on power up and image is not legible and clea	ar	system is installed be does not operate (O	out system 'H-58D)4-6-17
(OH-58D)	5-3-2	MFD indicates HELLFI system is installed by	
PAGE 1 on power up and image is not legible and clea	ar	does not operate (O	H-58D(R))4-6-18 bes not
(OH-58D(R))		display MMS ON MFD INITIAL PAGE tir	5-8-2
images and BIT cannot be initiated (OH-58D), With			me 5-3-4
HELLFIRE missiles installed		control is turned from	m OFF to
and ON	4-6-3	MFD keys do not respe	
images and BIT cannot be initiated (OH-58D(R)), With		MFD keys do not respe	PG
HELLFIRE missiles installed and ON		MFD not lit after INST	
MFD does not indicate ATAS is installed (OH-58D)		is turned from OFF MFD PLT circuit break	to BRT, Left
MFD does not indicate ATAS is installed (OH-58D(R))	3	stay closed	5-3-1 ATAS
MFD does not indicate HELLFI missile system is installed (C	RE	symbology, PDU do	
58D)		MFD SWITCH CHECK	
missile system is installed (C 58D(R))	DH-	MFD test pattern displa	
MFD does not indicate rocket		MFD when ATAS select	cted and
system installed (OH-58D) MFD does not indicate rocket		armed (OH-58D), SA	
system installed (OH-58D(R) MFD does not indicate RPM ar		MFD when ATAS select armed (OH-58D(R)),	
TRQ readings with backup switch on MPD pressed		MFD when HELLFIRE	missile
MFD does not respond properly gun position (OH-58D), ARM	1/		
SAFE indication on MFD does not respond properly		MFD when HELLFIRE armed and selected	(OH-
gun position (OH-58D(R)), ARM/SAFE indication on	4-3-6	58D(R)), SAFE disp MFD when left and/or	layed on4-6-20 right
MFD does not respond to weapons with ISP NO GO		launcher argon bottl is low (OH-58D), LE	
displayed on MUX BUS STATUS page (OH-58D)	4-10-25	RIGHT COOLANT L advisory message n	OW
MFD does not respond to weapons with R MCPU NO			4-10-3
displayed on MUX BUS STATUS page (OH-58D(R))		launcher argon bottl is low (OH-58D(R)),	e pressure
MFD fails (MCPU L circuit brea open), Tone check test on	aker	or RIGHT COOLAN advisory message n	ΓLOW
MFD fails (MCPU R circuit		on	
breaker open), Tone check ton			yed on4-4-19
		MFD when rockets sel- 58D(R)), SAFED dis	ected (OH- played on

MFD when rockets selected, armed, and able to be fired (OH-58D), RKTS OFF displayed on4-4-17 MFD when rockets selected, armed, and able to be fired (OH-58D(R)), RKTS OFF displayed on4-4-18 MFD, BATT PREHEAT ON advisory message not displayed on5-1-18 MFD, Cannot access WEAPONS BIT/SET-UP PAGE on CPG4-10-18 MFD, Cannot access WEAPONS PAGE on pilot4-10-19 MFD, CHIPS T/R GRBX caution message on3-1-5 MFD, CHIPS T/R GRBX caution message on3-1-11 MFD, CHIPS XMSN SUMP caution message on3-1-10 MFD, CHIPS XMSN UPPER caution message on totisplayed on3-1-10 MFD, CHIPS XMSN UPPER caution message on3-1-10 MFD, CHIPS XMSN UPPER caution message on totisplayed on3-1-10 MFD, CHIPS XMSN UPPER caution message on3-1-20 MFD, CHIPS XMSN UPPER caution message on3
armed, and able to be fired (OH-58D), RKTS OFF displayed on
armed, and able to be fired (OH-58D), RKTS OFF displayed on
MFD when rockets selected, armed, and able to be fired (OH-58D(R)), RKTS OFF displayed on
(OH-58D(R)), RKTS OFF displayed on
MFD, BATT PREHEAT ON advisory message not displayed on
on
BIT/SET-UP PAGE on CPG
PAGE on CPG 4-10-18 MFD, Cannot access WEAPONS PAGE on pilot 4-10-19 MFD, CHIPS ENG FREEWHEELING UNIT caution message on 3-1-5 MFD, CHIPS T/R GRBX caution message on 3-1-11 MFD, CHIPS XMSN SUMP caution message on 3-1-11 MFD, CHIPS XMSN UPPER caution message on 3-1-3 MFD, CHIPS XMSN UPPER caution message on 3-1-10 MFD, CHIPS XMSN UPPER caution message on 3-1-3 MFD, CHIPS XMSN UPPER caution message on 3-1-10 Missile fails to uncage due to signal failure 4-5-2 Missile is activated, No ATAS acquisition audio present when 4-5-19 Missile quantity shown on MFD (OH-58D), Improper HELLFIRE 4-6-11 Missile System (HMS), HELLFIRE Operational Check (OH-58D) 2-5-7 MFD, CHIPS XMSN UPPER caution message on 3-1-3 MFD, CHIPS
PAGE on pilot
FREEWHEELING UNIT caution message on
MFD, CHIPS T/R GRBX caution message on
MFD, CHĪPS XMSN SUMP caution message on
MFD, CHIPS XMSN UPPER caution message on
MFD, DC GEN FAIL caution message not displayed on
MFD, GUN VSD PAGE not 58D(R))2-5-8 displayed on4-1-8 Missile system is installed (OH-
MFD, Pitch rate sensor failure 58D), MFD does not indicate
CODE 21 is displayed on
MFD, RECT FAIL caution Missile system is installed (OH-message not displayed on
MFD, Roll rate sensor failure HELLFIRE
MFD, TAMS NO GO appears on5-5-2 system does not operate (OH-MFD, WEAPONS PAGE not 58D), MFD indicates HELLFIRE4-6-17
displayed on
CODE 24 on
ARMED and RDY displayed on Missile System, Air-to-Air Stinger MFD but cannot fire4-6-25 (ATAS) — Operational Check
Missile (OH-58D(R)), HELLFIRE (OH-58D)
MFD but cannot fire
(HELLFIRE) will not step to next
Missile (OH-58D(R)), System 58D(R)), SAFE displayed on
next

Subject	Para/Task	Subject		Para/Task
M (Cont)		М	(Cont)	
Missile, System (ATAS) will not		MPD, Starter-Generato		
step to next	4-5-13	load does not appea MPD, Transformer-Rec	tifier is on	5-1-50
does not display missile images and BIT cannot be initiated	4.0.0	but no 24 - 30 VDC above RECT V on		5-1-48
(OH-58D), With HELLFIRE Missile installed and ON, MFD	4-6-3	MPD, Voltage regulator knob does not change	ge BATT V	E 0 04
does not display missile images and BIT cannot be initiated	4.0.4	indication on MSS fails BIT		4-7-3
(OH-58D(R)), With HELLFIRE Mission Equipment (Armament) Principles of Operation		MSS fails to perform B Multiparameter display lit after CONSOLE L	(MPD) not	4-7-6
Mission Equipment (Avionics) Principles of Operation		turned from OFF to Multiplex (1553) (MUX)	BRT	5-2-49
MMS BIT (Appendix F)	F-15	 Operational Chec Multiplex (1553) (MUX) 	k (OH-58D)) Data Bus	2-6-23
MMS GO advisory message not displayed on MFD and MMS FAIL is displayed	502	— Operational Chec 58D(R))		2-6-24
MMS laser fail	4-9-2	(Appendix F) MUX Bus Status (OH-5		F-29
designation, CPG cannot code \dots Models (OH-58D and OH-58D(R)),		(Appendix F) MUX BUS STATUS pa	ge (OH-	F-30
Differences Between	1-12	58D), MFD does not weapons with ISP N displayed on	O GO	4-10-25
come on when		MUX BUS STATUS pa 58D(R)), MFD does	ge (OH- not	
F), FADEC		respond to weapons MCPU NO GO displa MUX BUS STATUS pa	ayed on	4-10-26
Motoring (creeping), Directional control pedals		58D), RHE NO GÒ (on	displayed	4-8-5
MPD disagrees with fuel quantity readout on vertical scale		MUX BUS STATUS pa 58D(R)), RHE NO G	O	
instrument, Fuel quantity readout on	5-4-35	displayed on MUX DATA BUS, CDS provides NO GO erro	BIT	4-8-6
voltage	5-1-45	MFD when checking		5-8-1
voltage	5-1-44	Name Names and Dag	N	
readout does not indicate approximately 28 VDC	3-3-1	Name, Names and Des Common		1-7
MPD does not indicate 115 and particle separator does not operate (external AC power is		NG RPM indicator (dig MPD does not indica approximately 64% (ate (OH-58D),	
on)		Engine NG RPM indicator (dig MPD does not indicate)	ital) on	5-4-47
indication is not present on MPD operating normally, Dual tachometer does not function		approximately 64% (58D(R)), Engine	(OH- 	5-4-48
properly with	3-3-3	NG RPM indicator (dig MPD does not indica approximately 85% (ate	
TRQ indicators do not function properly with	3-3-2	Engine		5-4-55

Subject Para/Task
N (Cont)
NP RPM indicator (digital) on MPD does not indicate approximately 62% (OH- 58D(R)), Engine
do not come on when5-2-2
Off line (RPM below flight idle), DC generator does not go

Subject	Para/Task	Subject	Para/Task
O (Cont)		0	(Cont)
Oil System Data, Engine Oil temperature does not indicate in green range, Transmission		Outside air temperatur not displayed on MF Overhead console circ	D`5-7-10
Oil temperature indicator does not indicate in green range (helicopter at 100% RPM),		panel not lit after Co control is turned from BRT, Forward	
Engine Oil temperature indicator does not indicate in green range	5-4-22	Overhead console pan after CONSOLE LT	el not lit control is
(helicopter at flight idle), Engine On line (reset has been	5-4-20	turned from OFF to	BRT, Aft5-2-47
attempted), Generator will not come	5-1-8	Page appears in flight,	
One or more NVG formation lights do not come on	5-2-3	Page does not display GO, or FUEL CONT	
as installed but do not Operate (OH-58D(R)), Rockets		advisory message a DIGITAL test switch	
show as installed but do not Operate, Gun shows as installed but does not		PAGE does not display	
Operation, Analog and Digital Instruments Principles of			
Operation, Drive Train System Principles of Operation, Electrical Systems	1-28	Page will not appear, in Panel lights do not con CONSOLE LT control	
Principles of		Panel not lit after CON	
System Principles of Operation, Flight Controls Principles of		control is turned from BRT (OH-58D), Digition	
Operation, Fuel System Principles of		Panel not lit after CON control is turned from	ISOLE LT m OFF to
Operation, Hydraulic System Principles of Operation, Instrument System	1-29	Panel not lit after CON control is turned from	
Principles of			
(Armament) Principles of Operation, Mission Equipment (Avionics) Principles of		Panel not lit after CON control is turned from BRT, Pilot intercomm	m OFF to
Operation, Power Plant Principles of	1-26		5-2-44 ISOLE LT
Operation, Principles of, Functional Description		BRT, Stability and C Augmentation Syste	Control m (SCAS)
Operational Charles (OH 58D EG)	1-34	controlPanel not lit after INST is turned from OFF	
Operational Checks (OH-58D EGI Equipped), Setup Procedures for	2-5-1		5-2-31 Γ LT control
Operational Checks (OH-58D(R)), Setup Procedures for Opposite battery relay, Chargermonitor does not open		CPG intercommunic	

Subject	Para/Task	Subject	Para/Task
P (Cont)		P (Cont)	
Panel not lit after INST LT control		Pilot Display Unit (PDU) fails to	
is turned from OFF to BRT,		power up	4-7-1
Mast Mounted Sight (MMS)		Pilot intercommunication system	
control	5-2-34	(ICS) panel not lit after	
Particle separator blower does not		CONSOLE LT control is turned	
operate (external AC power is		from OFF to BRT	5-2-44
on)	5-4-1	Pilot MFD auxiliary switch panel	
Particle separator blower operates	5 4 0	not lit after INST LT control is	
backward	5-4-2	turned from OFF to BRT	5-2-33
Particle separator does not		Pilot MFD keys do not respond	5 0 40
operate (external AC power is		during SWITCH CHECK	5-3-12
on), MPD does not indicate 115	F 1 10	Pilot night vision goggles (NVG)	
VAC and	5-1-46	do not come on when NVG	E 0 0
Particles found during inspection	0 1 4	power switch is set to ON	5-2-2
of oil filter, Rubber	3-1-4	Pin Arrangement (Appendix D),	D.E.
PDU (OH-58D), Gun symbology not displayed on	115	Typical Electrical Connector Pitch and roll (only) will not	D-3
PDU (OH-58D(R)), Gun	4-1-5	engage	5 6 20
symbology not displayed on	1-1-6	Pitch rate sensor failure (OH-	
PDU displays GUN reticle with	4-1-0	58D), Error code 0200 word 1	5-6-7
ATAS installed	1_0_1	Pitch rate sensor failure (OH-	
PDU displays TEST for	4-0-4	58D(R)), Error code 0200 word	
approximately 15 seconds then		1	5-6-8
PDU displays FAIL IEU, If BIT		Pitch rate sensor failure CODE 21	
is initiated	4-7-7	is displayed on MFD	5-6-1
PDU does not correspond to	, ,	Pitch/roll and one yaw will not	
target/seeker movement (OH-		engage	5-6-19
58D), ATAS tracking reticle on	4-5-11	Pitch/roll and yaw will not engage	
PDU does not correspond to		PITOT HEAT ON advisory	
target/seeker movement (OH-		message not displayed on MFD	
58D(R)), ATAS tracking reticle		with PITOT HTR switch set to	
on	4-5-12	ON	5-7-6
PDU does not display gun reticle		Pitot tube does not get hot	
with gun installed and selected		Pitot Tube Heater — Operational	
(PDU displays ATAS)	4-7-5	Check	2-3-9
PDU does not operate and MFD		Pitot tube will not heat	
shows incorrect ATAS		Pitot-Static/Air Data System —	
symbology	4-5-16	Operational Check	2-3-5
PDU when argon bottle pressure		Pointer sticks, Standby altimeter	3-3-11
is low, LOW is not indicated on	4-10-5	Position Lights — Operational	
PDU when in MANUAL with		Check	2-6-40
missile armed, selected and		Position lights do not come on	
WPN-FIRE switch pressed to		(POS LIGHT switch set to DIM)	5-2-4
the first detent, ATAS tracking		Position lights do not get bright	
reticle does not appear on	4-8-1	when switched from DIM to	
PDU, ATAS missile activates but		_ BRT	5-2-5
does not display on	4-5-8	Potentiometer causes dimming for	
PDU, Reticle not displayed on		CW rotation, Instrument lights	
PDU, TEST not displayed on	4-1-3	secondary dimming	5-2-52
Pedal control motion transducer	5	Potentiometer does not control	
failure, Error code 4000 word 1	5-6-15	CPG channel select panel,	
Percent load does not appear on	E 4 E2	Instrument lights secondary	5
MPD, Starter-Generator	5-1-50	dimming	5-2-59
Pilot Display Unit (PDU) displays	470		
vertical dashed line	4-7-2		

Subject	Para/Task	Subject	Para/Task
P (Cont)		Р	(Cont)
Potentiometer does not control			son upon4-2-1
CPG communication system control panel, Instrument lights			(OH-58D)
secondary dimming Potentiometer does not control	5-2-55	Power, External AC — Operational Check (Power, External DC —	(OH-58D(R))
CPG MFD auxiliary switch panel, Instrument lights secondary dimming	5-2-60		(OH-58D)
Potentiometer does not control dual tachometer, Instrument	3-2-00		(OH-58D(R))
lights secondary dimming Potentiometer does not control left	5-2-54	C30R/3 Engine with System vs. 250-C30	FADEC)R/1 Series)
MFD, Instrument lights secondary dimming	5-2-56	Powerplant Electrical S	1-27 System5-9
Potentiometer does not control MMS control panel, Instrument	5.0.00		(ŎH-58D)
lights secondary dimming Potentiometer does not control	5-2-62	Powerplant Electrical S Operational Check (Powerplant Principles	(ÓH-58D(R))
pilot MFD auxiliary switch panel, Instrument lights secondary dimming	5-2-61		1-26
Potentiometer does not control RFD, Instrument lights		temperatures above Battery 2	· -10 °F, 5-1-28
secondary dimming Potentiometer does not control	5-2-58	Preheat light is lit at to above -10 °F, Batte	ry 15-1-20
right MFD, Instrument light secondary dimming	5-2-57	Preheat light not lit du to-test, Battery 1	5-1-19
Potentiometer does not control TGT/TRQ indicator, Instrument	5.0.50	Preheat light not lit du to-test, Battery 2 PREHEAT ON advisor	5-1-27
lights secondary dimming Power comes on but no indication above ACV on MPD, External	5-2-53	not displayed on MF	
ACPower comes on but no indication	5-1-12	PREHEAT ON advisor	
above BATT V on MPD, External DC	5-1-13	Preparation for Storag Shipment	
Power does not come on, External DC	5-1-10	Principles of Operation	n
Power does not disconnect when DC generator is turned on,	- 4 44	Principles of Operation	ents
External DC	5-1-11	Principles of Operation	n, Electrical 1-31
External DC	5-1-14	Principles of Operation	
Operating), AC Electrical — Operational Check (OH-58D)	2-6-1		
Power System (Engine Operating), AC Electrical —			
Operational Check (OH-58D(R)) Power System (Inverter	2-6-2		1-29
Operation), AC Electrical — Operational Check (OH-58D)	2-6-3	Principles of Operation Instrument System Principles of Operation	
Power System (Inverter Operation), AC Electrical — Operational Check (OH-58D(R))	2-6-4	Equipment (Armame	ent)1-37

Subject	Para/Task	Subject	Para/Task
P (Cont)		R	(Cont)
Principles of Operation, Mission Equipment (Avionics) Principles of Operation, Power Plant Principles of Operation, Utility Systems Probe/Indicating System, Fuel Operational Check Procedures for Operational Checks (OH-58D EGI Equipped), Setup Procedures for Operational Checks (OH-58D(R)), Setup Procedures for Operational Checks (OH-58D(R)), Setup Pump does not operate (FUEL BOOST switch set to FUEL BOOST), Fuel boost Pump does not operate when START switch and KEYLOCK switch are ON, Fuel boost Pump, No fuel flow to engine	1-26 1-34 2-4-2 2-5-1 2-5-2 5-4-30	Receptacle will not sup voltage, Auxiliary 28 RECOCK command, Grespond to GUN sw RECOCK, Gun does not when GUN switch is Records, Maintenance RECT FAIL caution medisplayed on MFD. Rectifier does not command transformer	pply 3 VDC
driven PWR SIGHT circuit breaker trips		References (Appendix	2-6-28 A)A-1
Q		Regulator control knob change BATT V ind	ication on
Quality Assurance/Quality Control (QA/QC)	3-4-4	Relay not actuated (no 1TB1-3), Engine oil Remote frequency disp is not lit after INST is turned from OFF	bypass
Fuel		Replacement (Appending Repair and Reporting Equipment I	D-8 ix D), Wire D-8
R		Restricted, Fuel flow to	o engine
R MCPU NO GO displayed on MUX BUS STATUS page (OH-58D(R)), MFD does not respond to weapons with	. 4-10-26	Reticle not displayed of Reticle with gun install selected (PDU displ	ays ATAS),
R3 Engine BIT (OH-58D(R)) (Appendix F) Radar Altimeter BIT (Appendix F) Radio BIT (Appendix F)	F-11 F-16	Retract, Searchlight wi RFD test pattern abse DISPLAY CHECK.	
Radio BIT (Appendix F), HF		RHE NO GO displayed BUS STATUS page	(OH-58D) 4-8-5 d on MUX (OH-
Fuel quantity	F-3	Right cyclic actuator factor code 0080 word 1. Right defog blower doc	
Last Flight	F-4	000.0.0	

<u>Subject</u> <u>F</u>	ara/Task	Subject	Para/Task
R (Cont)		R (Cont)	
Right defog blower does not		Rocket will not fuse (OH-58D(R)),	
operate (during Battery 1	575	All or a single	4-4-12
operational check)	5-7-5	SINGLE is selected (OH-58D)	4-4-23
does not go off at		Rockets fire in both zones when	
approximately 90 degrees	5-2-15	SINGLE is selected (OH-	
RIGHT MCPU FAIL caution		58D(R))	4-4-24
message displayed on MFD		Rockets fire in pairs when	4 4 10
and WPN-FIRE switch pressed to second detent (OH-58D(R)),		SINGLE is selected (OH-58D) Rockets fire in pairs when	4-4-13
Gun does not fire with	4-1-19	SINGLE is selected (OH-	
RIGHT MCPU FAIL caution		58D(R))	4-4-14
message displayed on pilot and		Rockets fire in singles when RIPL	
CPG MFD (OH-58D(R))	4-10-2	SINGLES is selected (OH-58D)	4-4-15
Right MFD is not lit after INST LT		Rockets fire in singles when RIPL	
control is turned from OFF to	E 0 41	SINGLES is selected (OH-	4 4 16
BRTRight, Searchlight will not turn		58D(R))	4-4-16
RIPL SINGLES is selected (OH-		to fire (OH-58D)	4-4-21
58D), Rockets fire in singles		Rockets fire in zones not selected	
when	4-4-15	to fire (OH-58D(R))	4-4-22
RIPL SINGLES is selected (OH-		Rockets selected (OH-58D),	
58D(R)), Rockets fire in singles		SAFED displayed on MFD	
when	4-4-16	when	4-4-19
RKTS OFF displayed on MFD when rockets selected, armed,		Rockets selected (OH-58D(R)), SAFED displayed on MFD	
and able to be fired (OH-58D)	4-4-17	when	4-4-20
RKTS OFF displayed on MFD		Rockets selected, armed, and	4 20
when rockets selected, armed,		able to be fired (OH-58D),	
and able to be fired (OH-		RKTS OFF displayed on MFD	
58D(R))	4-4-18		4-4-17
Rocket fuse time for manual		Rockets selected, armed, and	
setting does not agree with MFD (OH-58D)	4.4.0	able to be fired (OH-58D(R)), RKTS OFF displayed on MFD	
Rocket fuse time for manual	4-4-9	when	4-4-18
setting does not agree with		Rockets show as installed but do	
MFD (OH-58D(R))	4-4-10	not operate (OH-58D)	4-4-3
Rocket squib does not fire when		Rockets show as installed but do	
system is armed and selected		not operate (OH-58D(R))	4-4-4
and WPN-FIRE switch is	4 4 7	Rockets show SAFE when	4 4 5
pressed (OH-58D)	4-4-7	selected and armed (OH-58D)	4-4-5
Rocket squib does not fire when system is armed and selected		Rockets show SAFE when selected and armed (OH-	
and WPN-FIRE switch is		58D(R))	4-4-6
pressed (OH-58D(R))	4-4-8	Roll and yaw will not engage,	
Rocket system installed (OH-58D),		Pitch/	5-6-18
MFD does not indicate	4-4-1	Roll (only) will not engage, Pitch	
Rocket system installed (OH-		and	5-6-20
58D(R)), MFD does not indicate	4-4-2	Roll and one yaw will not engage,	F C 10
Rocket System, 2.75 —	2-5 0	Pitch/	5-6-19
Operational Check (OH-58D)	2-5-9	Roll rate sensor failure (OH-58D), Error code 0400 word 1	5-6-0
Operational Check (OH-58D(R))	2-5-10	Roll rate sensor failure (OH-	
Rocket will not fuse (OH-58D), All		58D(R)), Error code 0400 word	
or a single	4-4-11	1	5-6-10

Subject	Para/Task	Subject	Para/Task
R (Cont)		s	(Cont)
Roll rate sensor failure CODE 22 is displayed on MFD Rotor balancing equipment inoperative, Chadwick Rotor NR RPM indicator (vertical scale) does not indicate approximately 64% Rotor rpm is between 93 and 96%, AC generator will not come on line when Rotor rpm reaches 93-96%, AC generator comes on before RPM and TRQ readings with backup switch on MPD pressed, MFD does not indicate RPM is between 88 and 91%, AC generator remains on when RPM switch does not increase and/or decrease engine RPM (OH-58D) RPM switch does not increase and/or decrease engine RPM	5-5-20 5-4-44 5-1-3 5-1-1 3-3-12 5-1-2	SCAS and Hydraulic E System — Operatio (OH-58D(R)) SCAS BIT (Appendix I Scope	nal Check
(OH-58D(R))		120 degrees Searchlight does not g	5-2-10 go off at egrees left
S		from forward Searchlight does not g	5-2-16 go off at
SAFE displayed on MFD when ATAS selected and armed (OH- 58D) SAFE displayed on MFD when ATAS selected and armed (OH- 58D(R)) SAFE displayed on MFD when HELLFIRE missile armed and selected (OH-58D)	4-5-18	Searchlight does not see properly	
SAFE displayed on MFD when HELLFIRE missile armed and selected (OH-58D(R)) SAFE position, Gun not in hold back with GUN switch in	4-6-20	Second detent (OH-58 does not fire when	0
SAFE, Gun charger will not go forward from	4-10-6 4-10-7 4-4-19 4-4-20	Second detent (OH-58 does not fire when switch is pressed to Second detent (OH-58 does not fire with IS caution message dimensional MFD and WPN-FIRE	IGHT MCPU age and WPN- d to

Subject	Para/Task	Subject		Para/Task
S (Cont)		s	(Cont)	
SEL then MF displayed on MFD		SINGLE is selected (C		
under HELLFIRE MSL image (OH-58D)	4-6-21	Rockets fire in pairs Single rocket will not f		4-4-14
SEL then MF displayed on MFD under HELLFIRE MSL image		58D), All or a Single rocket will not f		4-4-11
(OH-58D(R))	4-6-22	58D(R)), All or a		4-4-12
Selected and armed (OH-58D), Rockets show SAFE when	4-4-5	Solenoid valve does n reduction in TGT) (0	OH-58D), `	
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Subject	Para/Task	Subject	Para/Task
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(OH-58D(R))		Tachometer does not properly with MPD of	function operating
Stores fail to jettison	4-2-2 4-2-1	normally, Dual Tachometer is not lit a LT control is turned to BRT, Dual	
Sump chip detector fuzz burner failure - special test tool LED does not flash with test switch		Tail rotor gearbox chip fuzz burner failure -	· special test
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<u>Subject</u> P	ara/Task	Subject	Para/Task
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Subject	Para/Task	<u>Subject</u>	Para/Task
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— Operational Check (OH-	0.0.04	58D(R))	
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Subject Para/Task	Subject	Para/Task
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<u>Subject</u> <u>Para</u>	/Task	Subject	Para/Task
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